



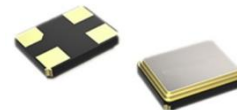
- *MHz SMD Crystals*
- *MHz Plastic SMD Crystals*
- *MHz SMD Crystals- Glass Seal*
- *MHz Thru Hole Crystals*
- *MHz Plastic SMD Crystals*
- *KHz SMD Crystals*
- *KHz Plastic SMD Crystals*
- *KHz Thru Hole Crystals*

MAIN FEATURE

- Ultra-small SMD Package, Seam Sealed Ceramic-Metal, 4pads
- High precision & High frequency stability

APPLICATION

- Small Bluetooth & wireless device • IoT, Health care equipment

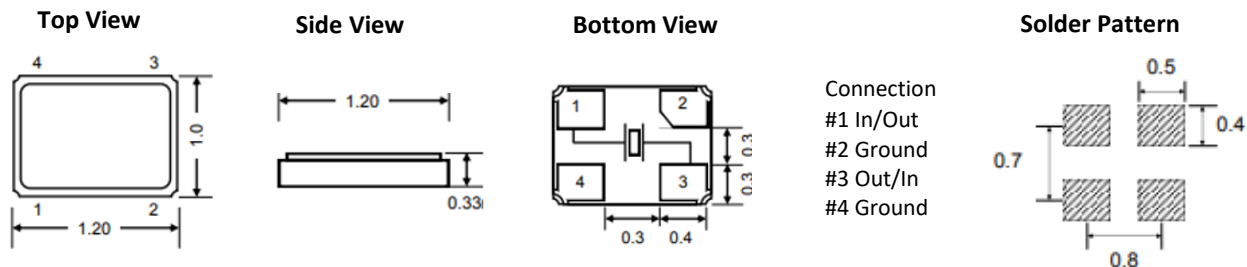


L1.2*W1.0*H0.33mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	26.00		96.00	MHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±50		ppm@25 °C	See p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	See p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance(CL)	-	18	-	pF	See p/n guide for more option
Frequency Stability	-	±50	-	ppm	See p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@26.000 ~ 32.0MHz
			80		@32.001~40.00MHz
			60		@40.001~96.00MHz
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CM12 48M0A50-18-50-40-80 TLF

[Part Number and Part Code Structure](#)

TGS	CM12	48M0	A	50	-18	-50	-40	-80	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

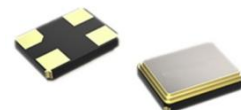
- 1) TGS: Company Code
- 2) CM12: MHz SMD Crystal, 4 pads, L1.2*W1.0*H0.33mm
- 3) 48M0: Frequency Range 48.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund.
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 80: Equivalent Series Resistance (ESR), 80: 80 ohm Max.
- 10) T: Package in Tape/Reel, 5000pcs/Reel
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

MAIN FEATURE

- Ultra-small SMD Package, Seam Sealed Ceramic-Metal, 4pads
- High precision & High frequency stability

APPLICATION

- Small Bluetooth & wireless device • IoT, Health care equipment

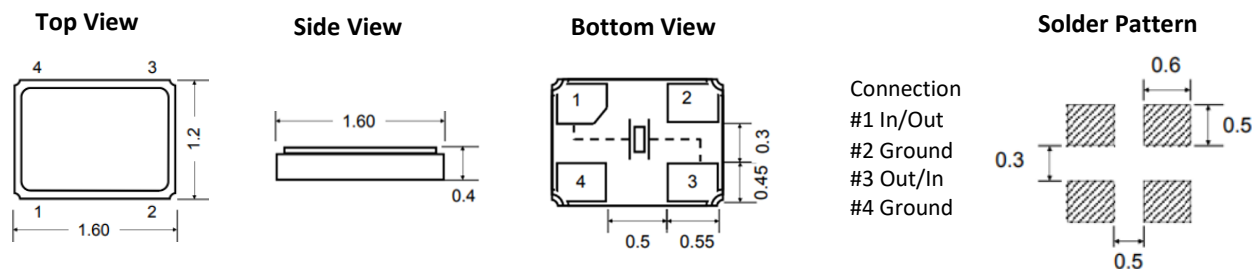


L1.6*W1.2*H0.40mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	24.00		96.00	MHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±50		ppm@25 °C	See p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	See p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance(CL)	-	18	-	pF	See p/n guide for more option
Frequency Stability	-	±50	-	ppm	See p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@24.000 ~ 32.0MHz
			100		@32.001~38.00MHz
			80		@38.001~96.00MHz
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CM11 48M0A50-18-50-40-80 TLF

[Part Number and Part Code Structure](#)

TGS	CM11	48M0	A	50	-18	-50	-40	-80	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

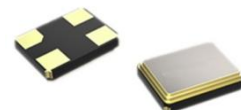
- 1) TGS: Company Code
- 2) CM11: SMD Crystal, 4 pads, L1.6*W1.0*H0.40mm
- 3) 48M0: Frequency Range 48.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund.
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 80: Equivalent Series Resistance (ESR), 80: 80 ohm Max.
- 10) T: Package in Tape/Reel, 3000pcs/Reel
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

MAIN FEATURE

- Ultra-small SMD Package, Seam Sealed Ceramic-Metal, 4pads
- Low Cost, High precision & High frequency stability

APPLICATION

- TV, STB LCDM and Cable Modem • Health care equipment



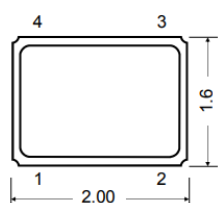
L2.0*W1.6*H0.46mm

STANDARD SPECIFICATION

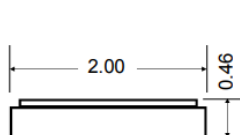
Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	16.000		54.000	MHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance(CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@16.000 ~ 20.000MHz
			100		@20.001~30.000MHz
			80		@30.001~36.000MHz
			60		@36.001~54.000MHz
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

DIMENSION (mm)

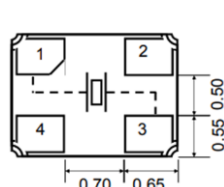
Top View



Side View

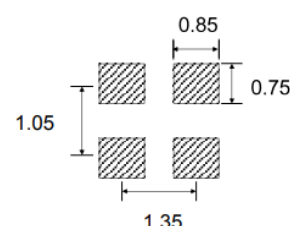


Bottom View



Connection
 #1 In/Out
 #2 Ground
 #3 Out/In
 #4 Ground

Solder Pattern



PART NUMBER GUIDE

Example: TGS CM21 26M0A50-18-50-40-100 TLF

Part Number and Part Code Structure

TGS	CM21	26M0	A	50	-18	-50	-40	-100	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CM21: SMD Crystal, 4 pads, L2.0*W1.6*H0.46mm
- 3) 26M0: Frequency Range 26.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund.
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~ +85°C; 10: -10°C ~ +60°C; 20: -20°C ~ +70°C; or Specify detail value
- 9) 100: Equivalent Series Resistance (ESR), 100: 100 ohm Max.
- 10) T: Package in Tape/Reel, 3000pcs/Reel
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

MAIN FEATURE

- Small SMD Package, Seam Sealed Ceramic-Metal, 4pads
- Low Cost, High precision & High frequency stability

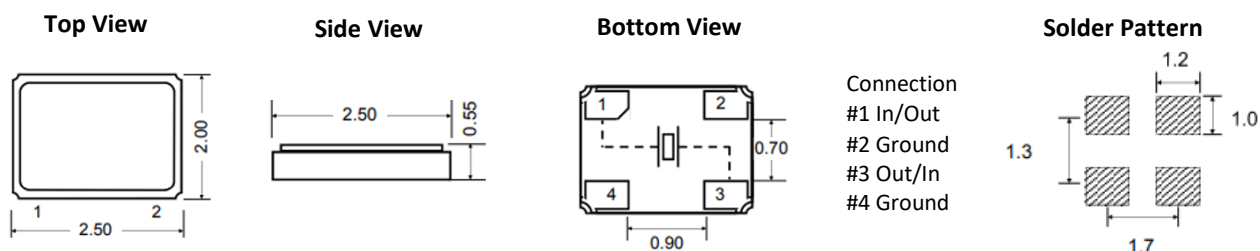
APPLICATION

- TV, STB LCDM and Cable Modem • Health care equipment

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	12.00		66.000	MHz	
Oscillation Mode	AT Fund.				3 rd Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			200	ohm	@12.000 ~ 13.000MHz
			150		@13.001~16.000MHz
			80		@16.001~20.000MHz
			60		@20.001~30.000MHz
			50		@30.001~35.000MHz
			40		@35.001~66.000MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

DIMENSION (mm)



PART NUMBER GUIDE

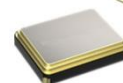
Example: TGS CM22 24M0A50-18-50-40-60 TLF

[Part Number and Part Code Structure](#)

TGS	CM22	24M0	A	50	-18	-50	-40	-60	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CM22: SMD Crystal, 4 pads, L2.5*W2.0*H0.55mm
- 3) 24M0: Frequency Range 24.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. ; 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 60: Equivalent Series Resistance (ESR), 60: 60 ohm Max.
- 10) T: Package in Tape/Reel, 3000pcs/Reel
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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L3.2*W2.5*H0.70mm



MAIN FEATURE

- Small SMD Package, Seam Sealed Ceramic-Metal, 4pads
- Low Cost, High precision & High frequency stability

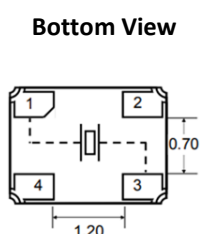
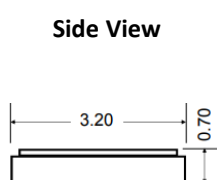
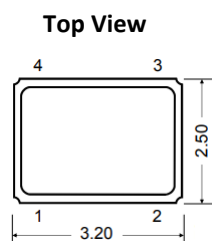
APPLICATION

- TV, STB LCDM and Cable Modem • Health care equipment

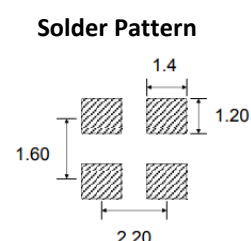
STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.000		125.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			350	ohm	@8.000 ~ 10.000MHz
			100		@10.001~16.000MHz
			80		@16.001~19.000MHz
			60		@19.001~30.000MHz
			40		@30.001~54.000MHz
			100		@54.001~125.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

DIMENSION (mm)



Connection
 #1 In/Out
 #2 Ground
 #3 Out/In
 #4 Ground



PART NUMBER GUIDE

Example: TGS CM32 24M0A50-18-50-40-60 TLF

[Part Number and Part Code Structure](#)

TGS	CM32	24M0	A	50	-18	-50	-40	-60	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

1) TGS: Company Code

2) CM32: SMD Crystal, 4 pads, L3.2*W2.5*H0.70mm

3) 24M0: Frequency Range 24.000MHz or specify detail frequency range

4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone

5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value

7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value

9) 60: Equivalent Series Resistance (ESR), 60: 60 ohm Max.

10) T: Package in Tape/Reel, 3000pcs/Reel

11) LF: RoHS Compliant

12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

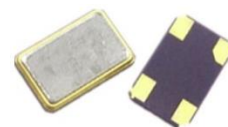
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MAIN FEATURE

- Small SMD Package, Seam Sealed Ceramic-Metal, 4pads
- Low Cost, High precision & High frequency stability

APPLICATION

- TV, STB LCDM and Cable Modem • Health care equipment

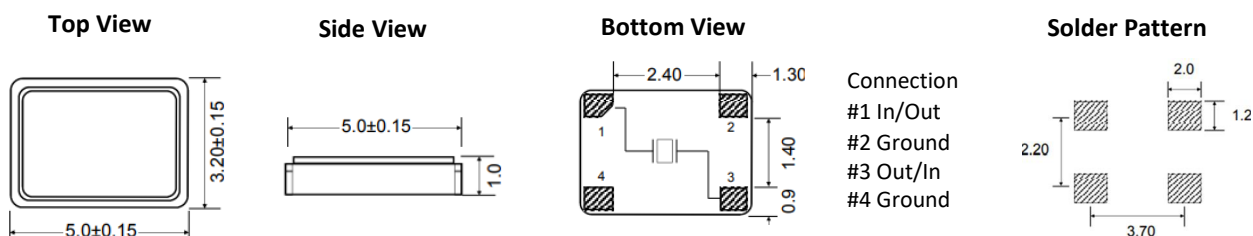


L5.0*W3.2*H1.0mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.000		150.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@8.000 ~ 10.000MHz
			100		@10.001~15.000MHz
			50		@15.001~40.000MHz
			40		@40.001~52.000MHz
			100		@40.001~80.000MHz, 3 rd OT
			80		@80.001~150.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CM53 24M0A50-18-50-40-50 TLF

[Part Number and Part Code Structure](#)

TGS	CM53	24M0	A	50	-18	-50	-40	-50	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CM53: SMD Crystal, 4 pads, L5.0*W3.2*H1.0mm
- 3) 24M0: Frequency Range 24.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 50: Equivalent Series Resistance (ESR), 50: 50 ohm Max.
- 10) T: Package in Tape/Reel, 1000pcs/Reel
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- Small SMD Package, Seam Sealed Ceramic-Metal, 2 pads
- Low Cost, High precision & High frequency stability

APPLICATION

- TV, STB LCDM and Cable Modem • Health care equipment

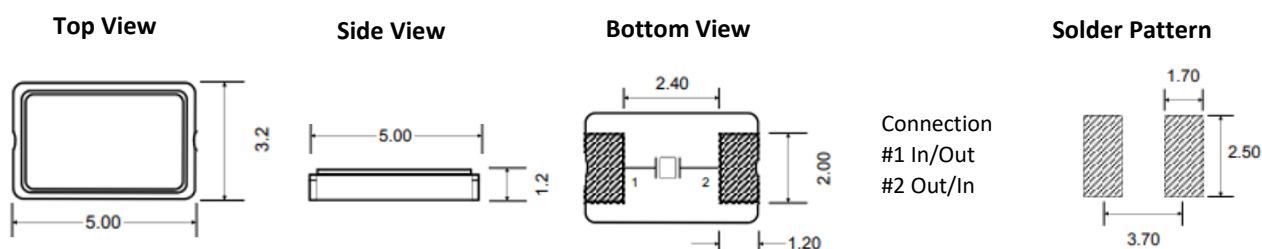


L5.0*W3.2*H1.2mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.000		150.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@8.000 ~ 10.000MHz
			100		@10.001~15.000MHz
			50		@15.001~40.000MHz
			40		@40.001~52.000MHz
			100		@40.001~80.000MHz, 3 rd OT
			80		@80.001~150.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CM532 24M0A50-18-50-40-50 TLF

[Part Number and Part Code Structure](#)

TGS	CM532	24M0	A	50	-18	-50	-40	-50	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CM532: SMD Crystal, 2 pads, L5.0*W3.2*H1.2mm
- 3) 24M0: Frequency Range 24.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 50: Equivalent Series Resistance (ESR), 50: 50 ohm Max.
- 10) T: Package in Tape/Reel, 1000pcs/Reel
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- SMD Package, Seam Sealed Ceramic-Metal, 4 pads
- Low Cost, High precision & High frequency stability

APPLICATION

- TV, STB LCDM and Cable Modem • Health care equipment

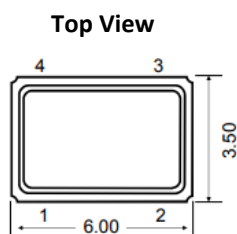


L6.0*W3.5*H1.0mm

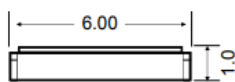
STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	7.000		50.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			100	ohm	@7.000 ~ 8.000MHz
			60		@8.001~10.000MHz
			50		@10.001~14.000MHz
			40		@14.001~20.000MHz
			30		@20.001~50.000MHz
			80		@40.001~50.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

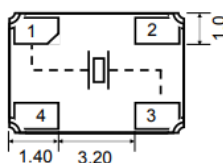
DIMENSION (mm)



Side View

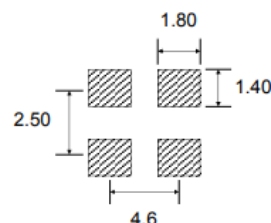


Bottom View



Connection
#1 In/Out
#2 Ground
#3 Out/In
#4 Ground

Solder Pattern



PART NUMBER GUIDE

Example: TGS CM63 24M0A50-18-50-40-30 TLF

[Part Number and Part Code Structure](#)

TGS	CM63	24M0	A	50	-18	-50	-40	-30	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

1) TGS: Company Code

2) CM63: SMD Crystal, 4 pads, L6.0*W3.5*H1.0mm

3) 24M0: Frequency Range 24.000MHz or specify detail frequency range

4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone

5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value

7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value

9) 30: Equivalent Series Resistance (ESR), 30: 30 ohm Max.

10) T: Package in Tape/Reel, 1000pcs/Reel

11) LF: RoHS Compliant

12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- SMD Package, Seam Sealed Ceramic-Metal, 2 pads
- Low Cost, High precision & High frequency stability

APPLICATION

- TV, STB LCDM and Cable Modem • Health care equipment

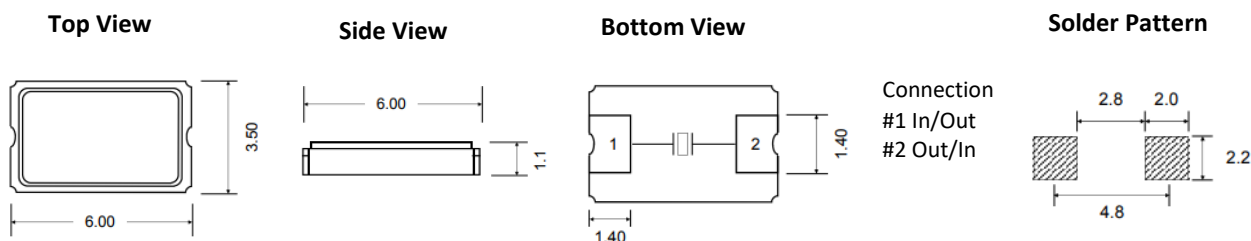


L6.0*W3.5*H1.1mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	7.000		50.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			100	ohm	@7.000 ~ 8.000MHz
			60		@8.001~10.000MHz
			50		@10.001~14.000MHz
			40		@14.001~20.000MHz
			30		@20.001~50.000MHz
			80		@40.001~50.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CM632 24M0A50-18-50-40-30 TLF

[Part Number and Part Code Structure](#)

TGS	CM632	24M0	A	50	-18	-50	-40	-30	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CM632: SMD Crystal, 2 pads, L6.0*W3.5*H1.1mm
- 3) 24M0: Frequency Range 24.000MHz or please specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 30: Equivalent Series Resistance (ESR), 30: 30 ohm Max.
- 10) T: Package in Tape/Reel, 1000pcs/Reel
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

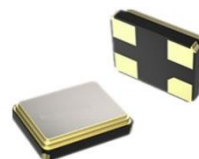
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MAIN FEATURE

- SMD Package, Seam Sealed Ceramic-Metal, 4 pads
- Low Cost, High precision & High frequency stability

APPLICATION

- TV, STB LCDM and Cable Modem • Health care equipment

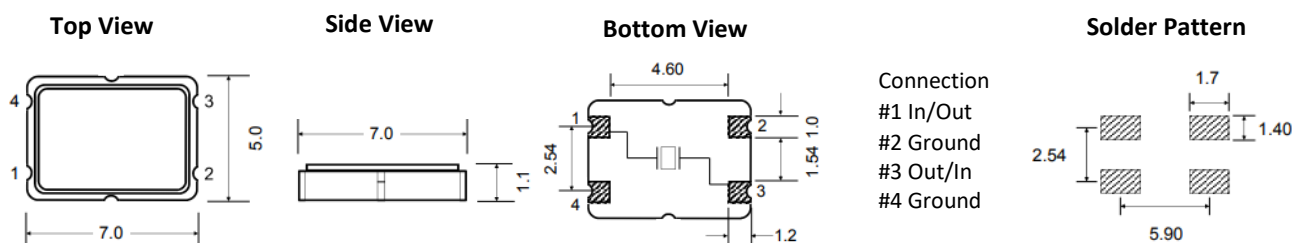


L7.0*W5.0*H1.1mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	6.000		150.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			100	ohm	@6.000 ~ 8.000MHz
			80		@8.001~12.000MHz
			60		@12.001~16.000MHz
			50		@16.001~20.000MHz
			40		@20.001~40.000MHz
			80		@40.001~150.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CM75 24M0A50-18-50-40-40 TLF

[Part Number and Part Code Structure](#)

TGS	CM75	24M0	A	50	-18	-50	-40	-40	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CM75: SMD Crystal, 4 pads, L7.0*W5.0*H1.1mm
- 3) 24M0: Frequency Range 24.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 40: Equivalent Series Resistance (ESR), 40: 40 ohm Max.
- 10) T: Package in Tape/Reel, 1000pcs/Reel
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- Low cost and short lead time
- Wide Frequency Range

APPLICATION

- PC, TV and all kind of consumer electronics products

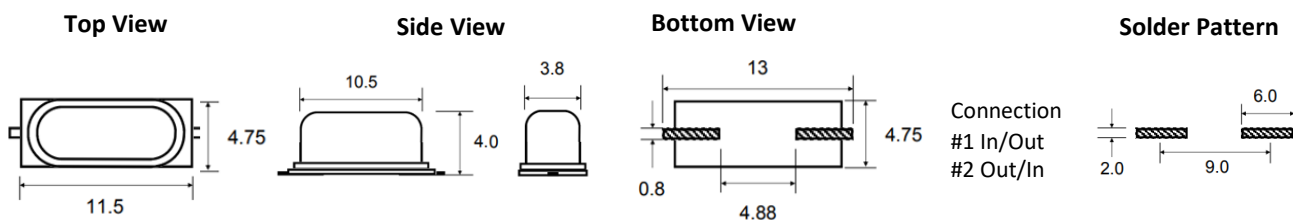


L11.5*W4.75*H4.0mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	3.000		150.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@3.000 ~ 4.000MHz
			120		@4.001 ~ 6.000MHz
			80		@6.001 ~ 10.000MHz
			60		@10.001 ~ 54.000MHz
			80		@30.001 ~ 40.000MHz, 3 rd OT
			70		@40.001 ~ 150.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

DIMENSION (+/-0.2mm)



PART NUMBER GUIDE

Example: TGS CSM2 4M0A50-18-50-40-150 TLF

[Part Number and Part Code Structure](#)

TGS	CSM2	4M0	A	50	-18	-50	-40	-150	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CSM2: SMD Crystal, 2 pads, L11.5*W4.75*H4.0mm
- 3) 4M0: Frequency Range 4.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 150: Equivalent Series Resistance (ESR), 150: 150 ohm Max.
- 10) T: Package in Tape/Reel, 1000pcs/Reel
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

MAIN FEATURE

- Low cost and short lead time
- Wide Frequency Range

APPLICATION

- PC, TV and all kind of consumer electronics products



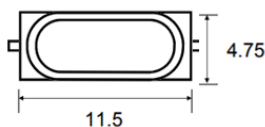
L11.5*W4.75*H2.5mm

STANDARD SPECIFICATION

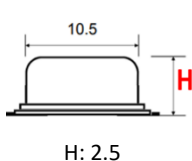
Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	3.000		150.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@3.000 ~ 4.000MHz
			120		@4.001 ~ 6.000MHz
			80		@6.001 ~ 10.000MHz
			60		@10.001 ~ 54.000MHz
			80		@30.001 ~ 40.000MHz, 3 rd OT
			70		@40.001 ~ 150.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

DIMENSION (+/-0.2mm)

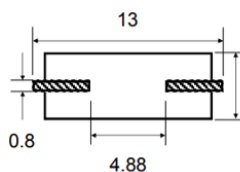
Top View



Side View

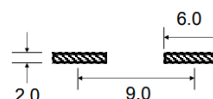


Bottom View



Solder Pattern

Connection
#1 In/Out
#2 Out/In



PART NUMBER GUIDE

Example: TGS CSSM2 4M0A50-18-50-40-150 TLF

[Part Number and Part Code Structure](#)

TGS	CSSM2	4M0	A	50	-18	-50	-40	-150	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

1) TGS: Company Code

2) CSSM2: SMD Crystal, 2 pads, L11.5*W4.75*H2.5mm

3) 4M0: Frequency Range 4.000MHz or specify detail frequency range

4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone

5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value

7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value

9) 150: Equivalent Series Resistance (ESR), 150: 150 ohm Max.

10) T: Package in Tape/Reel, 1000pcs/Reel

11) LF: RoHS Compliant

12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

MAIN FEATURE

- Low Cost and short lead time
- Wide Frequency Range

APPLICATION

- PC, TV and all kind of consumer electronics products

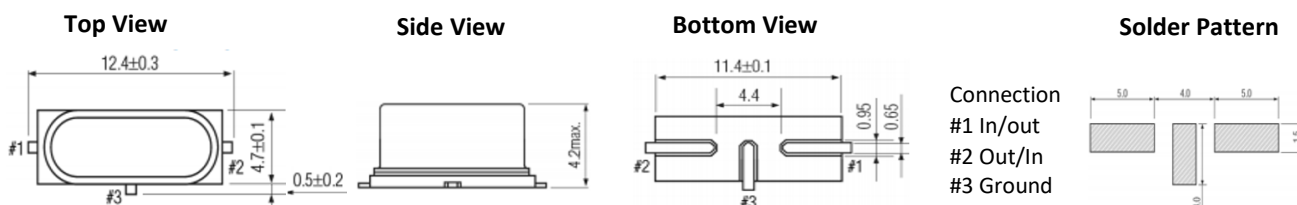


L12.4*W4.7*H4.2mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	3.000		150.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@3.000 ~ 4.000MHz
			120		@4.001 ~ 6.000MHz
			80		@6.001 ~ 10.000MHz
			60		@10.001 ~ 54.000MHz
			80		@30.001 ~ 40.000MHz, 3 rd OT
			70		@40.001 ~ 150.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CSM3 4M0A50-18-50-40-150 TLF

[Part Number and Part Code Structure](#)

TGS	CSM3	4M0	A	50	-18	-50	-40	-150	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CSM3: SMD Crystal, 3 pads, L12.4*W4.7*H4.2mm
- 3) 4M0: Frequency Range 4.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 150: Equivalent Series Resistance (ESR), 150: 150 ohm Max.
- 10) T: Package in Tape/Reel, 1000pcs/Reel
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

MAIN FEATURE

- Low Cost and short lead time
- Wide Frequency Range

APPLICATION

- PC, TV and all kind of consumer electronics products

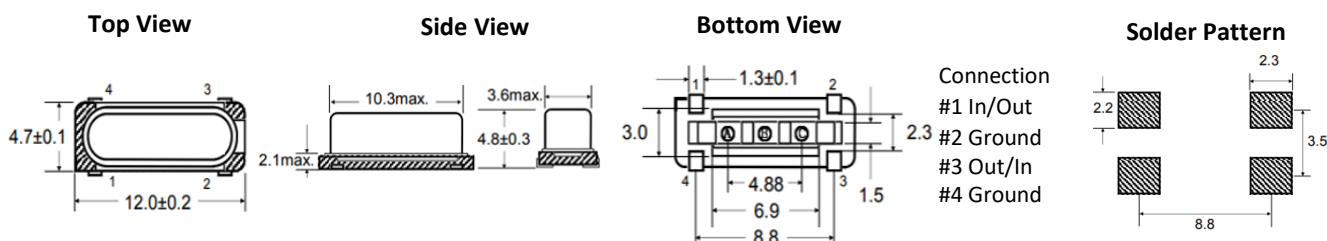


L12.0*W4.7*H4.8mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	3.500		100.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@3.000 ~ 4.000MHz
			120		@4.001 ~ 6.000MHz
			80		@6.001 ~ 10.000MHz
			60		@10.001 ~ 54.000MHz
			80		@30.001 ~ 40.000MHz, 3 rd OT
			70		@40.001 ~ 100.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CSM4 4M0A50-18-50-40-150 TLF

[Part Number and Part Code Structure](#)

TGS	CSM4	4M0	A	50	-18	-50	-40	-150	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CSM4: SMD Crystal, 4 pads, L12.0*W4.7*H4.8mm
- 3) 4M0: Frequency Range 4.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 150: Equivalent Series Resistance (ESR), 150: 150 ohm Max.
- 10) T: Package in Tape/Reel, 1000pcs/Reel
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A



L12.5*W4.6*H3.7mm



MAIN FEATURE

- Low Cost and short lead time
- Wide Frequency Range

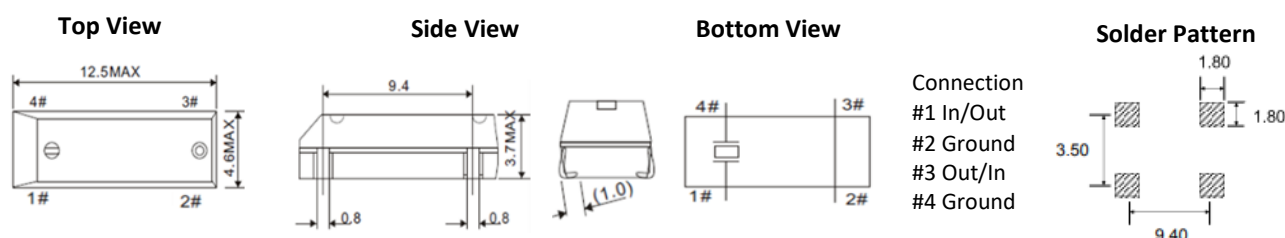
APPLICATION

- PC, TV and all kind of consumer electronics products

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	3.570		70.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@3.5700 ~ 5.000MHz
			120		@5.001 ~ 10.000MHz
			80		@6.001 ~ 16.000MHz
			40		@16.001 ~ 36.00MHz
			100		@30.001 ~ 36.00MHz, 3 rd OT
			80		@40.001 ~ 70.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

DIMENSION (mm)



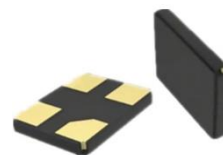
PART NUMBER GUIDE

Example: TGS CCME 4M0A50-18-50-40-150 TLH

[Part Number and Part Code Structure](#)

TGS	CCME	4M0	A	50	-18	-50	-40	-150	T	LH	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CCME: SMD Crystal, 4 pads, L12.5*W4.6*H3.7mm
- 3) 4M0: Frequency Range 4.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 150: Equivalent Series Resistance (ESR), 150: 150 ohm Max.
- 10) T: Package in Tape/Reel, 1000pcs/Reel
- 11) LH: RoHS/RoHS II Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A



L2.5*W2.0*H0.75mm



MAIN FEATURE

- High reliable • Low Cost and short lead time • 4 Pads

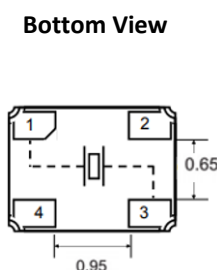
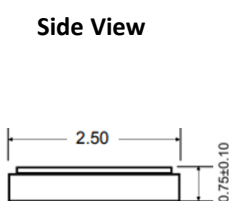
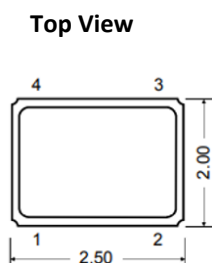
APPLICATION

- NB, DSC, USB and portable consumer electronics products

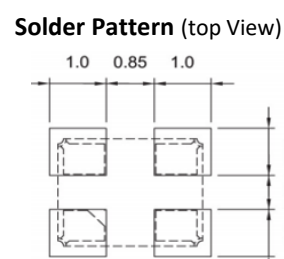
STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	12.0		64.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			200	ohm	@12.000 ~ 13.00MHz
			150		@13.001 ~ 15.00MHz
			120		@15.001 ~ 17.00MHz
			100		@17.001 ~ 20.00MHz
			80		@20.001 ~ 27.00MHz
			60		@27.001 ~ 64.00MHz
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

DIMENSION (mm)



Connection
#1 In/Out
#2 Ground
#3 Out/In
#4 Ground



PART NUMBER GUIDE

Example: TGS CMG22 16M0A50-18-50-40-120 TLH

[Part Number and Part Code Structure](#)

TGS	CMG22	16M0	A	50	-18	-50	-40	-120	T	LH	XX
1	2	3	4	5	6	7	8	9	10	11	12

1) TGS: Company Code

2) CMG22: SMD Crystal Glass seal, 4 pads, L2.5*W2.0*H0.75mm

3) 16M0: Frequency Range 16.000MHz or specify detail frequency range

4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone

5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value

7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value

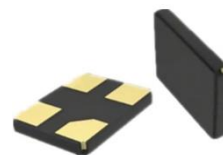
9) 120: Equivalent Series Resistance (ESR), 120: 120 ohm Max.

10) T: Package in Tape/Reel, 1000pcs/Reel

11) LH: RoHS/RoHS II Compliant

12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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L3.2*W2.5*H0.80mm



MAIN FEATURE

- High reliable • Low Cost and short lead time • 4 Pads

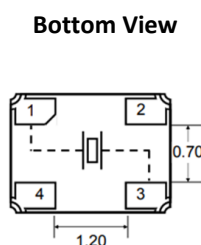
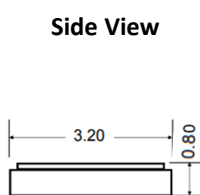
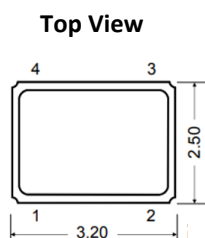
APPLICATION

- PC, TV, Hard Disk, Consumer electronics products and more

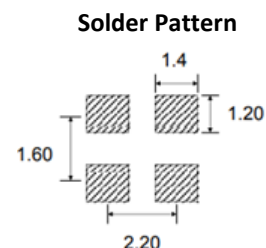
STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	10.0		54.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@10.000 ~ 12.00MHz
			120		@12.001 ~ 15.00MHz
			100		@15.001 ~ 16.00MHz
			80		@16.001 ~ 20.00MHz
			70		@20.001 ~ 27.00MHz
			60		@27.001 ~ 54.00MHz
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

DIMENSION (mm)



Connection
#1 In/Out
#2 Ground
#3 Out/In
#4 Ground



PART NUMBER GUIDE Example: TGS CMG32 16M0A50-18-50-40-100 TLH

Part Number and Part Code Structure

TGS	CMG32	16M0	A	50	-18	-50	-40	-100	T	LH	XX
1	2	3	4	5	6	7	8	9	10	11	12

1) TGS: Company Code

2) CMG32: SMD Crystal Glass seal, 4 pads, L3.2*W2.5*H0.80mm

3) 16M0: Frequency Range 16.000MHz or specify detail frequency range

4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone

5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value

7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value

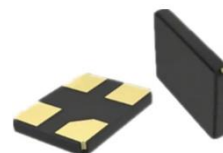
9) 100: Equivalent Series Resistance (ESR), 100: 100 ohm Max.

10) T: Package in Tape/Reel, 1000pcs/Reel

11) LH: RoHS/RoHS II Compliant

12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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L5.0*W3.2*H1.4mm

MAIN FEATURE

- High reliable • Low Cost and short lead time • 4 Pads

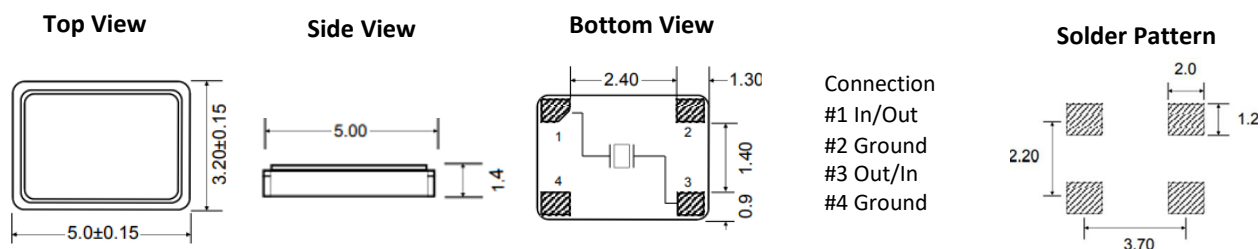
APPLICATION

- PC, TV, Hard Disk, Consumer electronics products and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.0		80.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			80	ohm	@8.000 ~ 12.00MHz
			70		@12.001 ~ 20.00MHz
			60		@20.001 ~ 40.00MHz
			50		@40.001 ~ 50.00MHz
			120		@40.000 ~ 60.00MHz, 3 rd OT
			100		@60.001 ~ 80.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

DIMENSION (mm)



PART NUMBER GUIDE

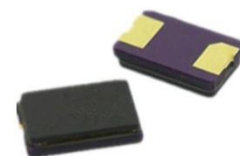
Example: TGS CMG53 16M0A50-18-50-40-70 TLH

Part Number and Part Code Structure

TGS	CMG53	16M0	A	50	-18	-50	-40	-70	T	LH	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CMG53: SMD Crystal Glass seal, 4 pads, L5.0*W3.2*H1.40mm
- 3) 16M0: Frequency Range 16.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 70: Equivalent Series Resistance (ESR), 70: 70 ohm Max.
- 10) T: Package in Tape/Reel, 1000pcs/Reel
- 11) LH: RoHS/RoHS II Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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L5.0*W3.2*H1.2mm

MAIN FEATURE

- High reliable • Low Cost and short lead time • 2 Pads

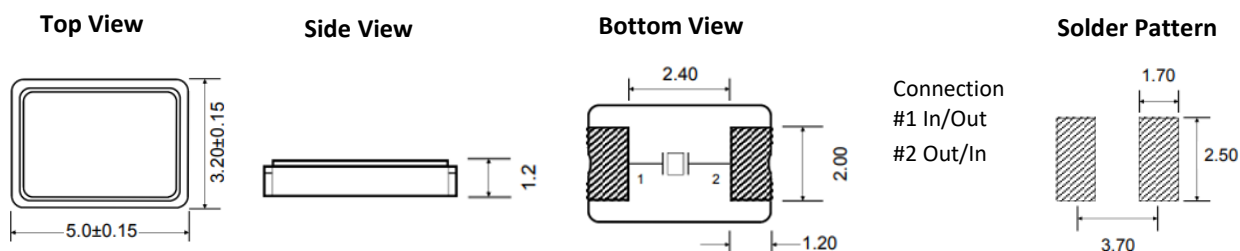
APPLICATION

- PC, PDA, USB, DSC, Consumer electronics products and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.0		80.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			80	ohm	@8.000 ~ 12.00MHz
			70		@12.001 ~ 20.00MHz
			60		@20.001 ~ 40.00MHz
			50		@40.001 ~ 50.00MHz
			120		@40.000 ~ 60.00MHz, 3 rd OT
			100		@60.001 ~ 80.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CMG532 16M0A50-18-50-40-70 TLH

Part Number and Part Code Structure

TGS	CMG532	16M0	A	50	-18	-50	-40	-70	T	LH	XX
1	2	3	4	5	6	7	8	9	10	11	12

1) TGS: Company Code

2) CMG532: SMD Crystal Glass seal, 2 pads, L5.0*W3.2*H1.2mm

3) 16M0: Frequency Range 16.000MHz or specify detail frequency range

4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone

5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value

7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value

9) 70: Equivalent Series Resistance (ESR), 70: 70 ohm Max.

10) T: Package in Tape/Reel, 1000pcs/Reel

11) LH: RoHS/RoHS II Compliant

12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

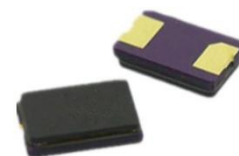
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MAIN FEATURE

- High reliable • Low Cost and short lead time • 2 Pads

APPLICATION

- PC, PDA, USB, DSC, Consumer electronics products and more



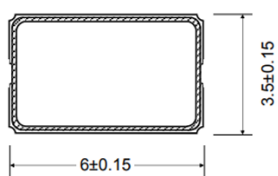
L6.0*W3.5*H1.5mm

STANDARD SPECIFICATION

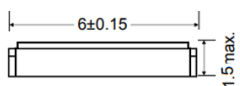
Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.0		80.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			80	ohm	@8.000 ~ 12.00MHz
			70		@12.001 ~ 20.00MHz
			60		@20.001 ~ 40.00MHz
			50		@40.001 ~ 50.00MHz
			120		@40.000 ~ 60.00MHz, 3 rd OT
			100		@60.001 ~ 80.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

DIMENSION (mm)

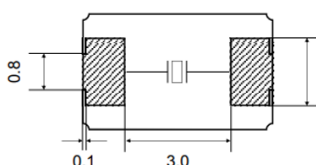
Top View



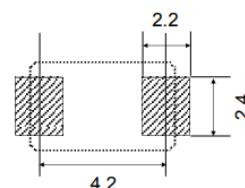
Side View



Bottom View



Solder Pattern



Connection
#1 In/Out
#2 Out/In

PART NUMBER GUIDE

Example: TGS CMG632 16M0A50-18-50-40-70 TLH

[Part Number and Part Code Structure](#)

TGS	CMG632	16M0	A	50	-18	-50	-40	-70	T	LH	XX
1	2	3	4	5	6	7	8	9	10	11	12

1) TGS: Company Code

2) CMG632: SMD Crystal Glass seal, 2 pads, L6.0*W3.5*H1.5mm

3) 16M0: Frequency Range 16.000MHz or specify detail frequency range

4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone

5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value

7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value

9) 70: Equivalent Series Resistance (ESR), 70: 70 ohm Max.

10) T: Package in Tape/Reel, 1000pcs/Reel

11) LH: RoHS/RoHS II Compliant

12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

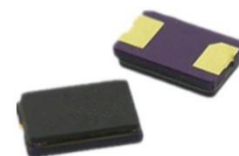
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MAIN FEATURE

- High reliable • Low Cost and short lead time • 2 Pads

APPLICATION

- TPMS, ECM, ABS and Sensor modules

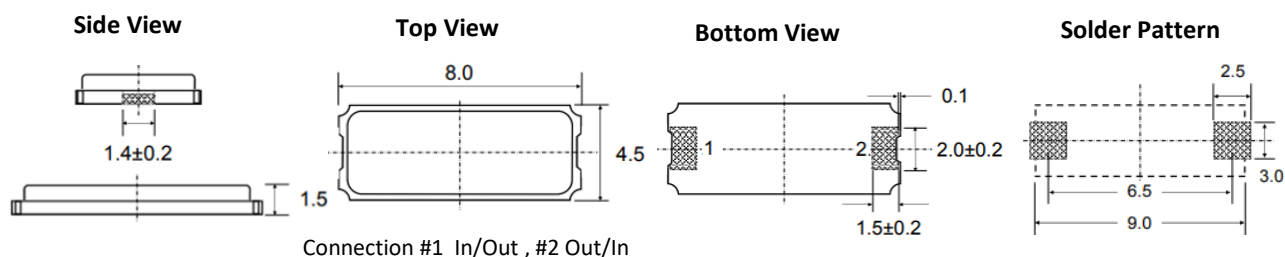


L8.0*W4.5*H1.5mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.0		80.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			80	ohm	@8.000 ~ 12.00MHz
			70		@12.001 ~ 20.00MHz
			60		@20.001 ~ 40.00MHz
			50		@40.001 ~ 50.00MHz
			120		@40.000 ~ 60.00MHz, 3 rd OT
			100		@60.001 ~ 80.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CMG842 16M0A50-18-50-40-70 TLH

[Part Number and Part Code Structure](#)

TGS	CMG842	16M0	A	50	-18	-50	-40	-70	T	LH	XX
1	2	3	4	5	6	7	8	9	10	11	12

1) TGS: Company Code

2) CMG842: SMD Crystal Glass seal, 2 pads, L8.0*W4.5*H1.5mm

3) 16M0: Frequency Range 16.000MHz or specify detail frequency range

4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone

5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value

7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value

8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value

9) 70: Equivalent Series Resistance (ESR), 70: 70 ohm Max.

10) T: Package in Tape/Reel, 1000pcs/Reel

11) LH: RoHS/RoHS II Compliant

12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- High reliable • Low Cost and short lead time • 2 Pins

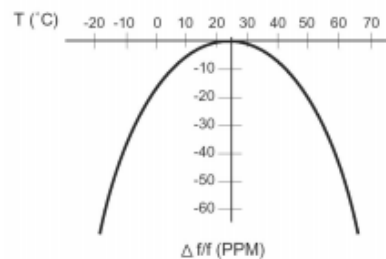
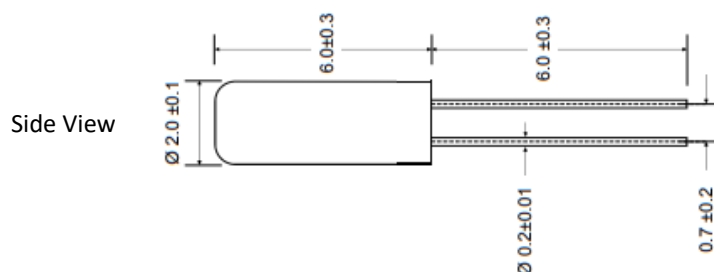
APPLICATION

- IoT, IT and consumer electronics and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	4.0		60.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@4.000 ~ 5.00MHz
			120		@5.001 ~ 7.00MHz
			80		@7.001 ~ 10.00MHz
			60		@10.001 ~ 12.00MHz
			40		@12.001 ~ 30.00MHz
			80		@30.000 ~ 60.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +10%
Aging per year	-	±3		ppm	@25 °C

DIMENSION (mm)



Temperature Coefficient

PART NUMBER GUIDE

Example: TGS CCC 8M0A50-18-50-40-80 BLF

[Part Number and Part Code Structure](#)

TGS	CCC	8M0	A	50	-18	-50	-40	-80	B	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CCC: MHz Thru Hole Crystal, 2 pins, Ø2.0*L6.0mm
- 3) 8M0: Frequency Range 8.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~ +85°C; 10: -10°C ~ +60°C; 20: -20°C ~ +70°C; or Specify detail value
- 9) 80: Equivalent Series Resistance (ESR), 80: 80 ohm Max.
- 10) B: Package in Bulk.
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- High reliable • Low Cost and short lead time • 2 Pins

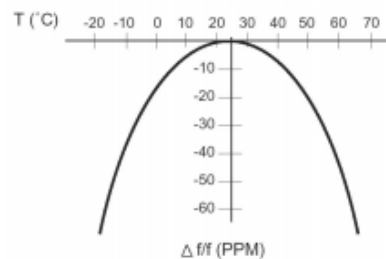
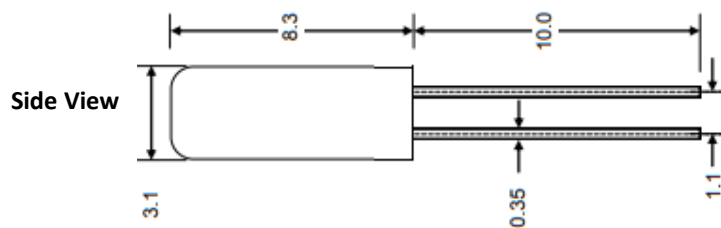
APPLICATION

- IoT, IT and consumer electronics and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	4.0		60.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@4.000 ~ 5.00MHz
			120		@5.001 ~ 7.00MHz
			80		@7.001 ~ 10.00MHz
			60		@10.001 ~ 12.00MHz
			40		@12.001 ~ 30.00MHz
			80		@30.00 ~ 60.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

DIMENSION (mm)



Temperature Coefficient

PART NUMBER GUIDE

Example: TGS CCD 8M0A50-18-50-40-80 BLF

[Part Number and Part Code Structure](#)

TGS	CCD	8M0	A	50	-18	-50	-40	-80	B	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CCD: MHz Thru Hole Crystal, 2 pins, Ø3.1*H8.3mm
- 3) 8M0: Frequency Range 8.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 80: Equivalent Series Resistance (ESR), 80: 80 ohm Max.
- 10) B: Package in Bulk.
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

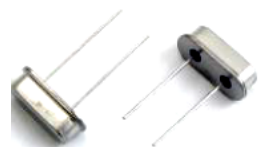
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MAIN FEATURE

- Wide Frequency Range • Low Cost and short lead time • 2 Pins

APPLICATION

- IoT, HDTV, IT and consumer electronics and more

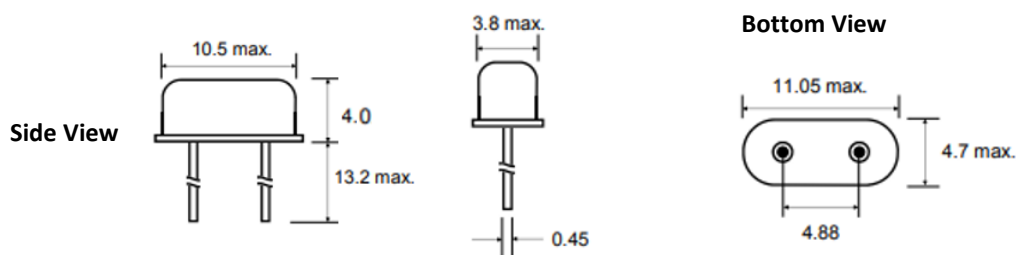


L11.05*W4.7*4.0mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	3.0		100.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			200	ohm	@3.000 ~ 5.0000MHz
			80		@5.001 ~ 10.000MHz
			60		@10.001 ~ 20.000MHz
			40		@20.001 ~ 36.00MHz
			100		@27.001 ~ 50.00MHz, 3 rd OT
			80		@50.01 ~ 100.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +10%
Aging per year	-	±3		ppm	@25 °C

DIMENSION (+/-0.2 mm)



PART NUMBER GUIDE

Example: TGS CS 8M0A50-18-50-40-80 BLF

[Part Number and Part Code Structure](#)

TGS	CS	8M0	A	50	-18	-50	-40	-80	B	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CS: MHz Thru Hole Crystal, 2 pins, L11.05*W4.7*4.0mm
- 3) 8M0: Frequency Range 8.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 80: Equivalent Series Resistance (ESR), 80: 80 ohm Max.
- 10) B: Package Code, B: in Bulk T: in Tape and Box.
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- Wide Frequency Range • Low Cost and short lead time • 2 Pins

APPLICATION

- IoT, HDTV, IT and consumer electronics and more

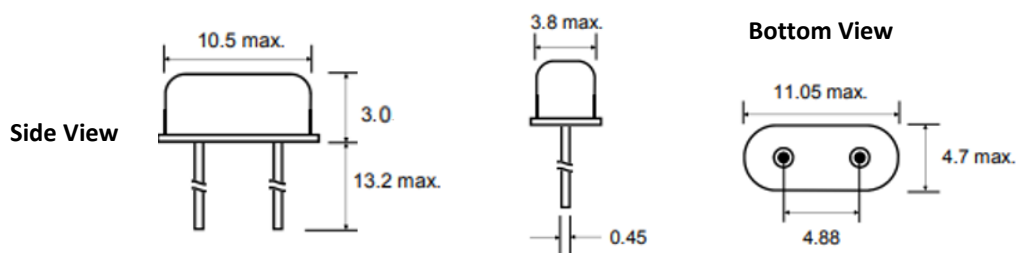


L11.05*W4.7*3.0mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	3.0		100.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			200	ohm	@3.000 ~ 5.0000MHz
			80		@5.001 ~ 10.000MHz
			60		@10.001 ~ 20.000MHz
			40		@20.001 ~ 36.00MHz
			100		@27.001 ~ 50.00MHz, 3 rd OT
			80		@50.01 ~ 100.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

DIMENSION (+/-0.2 mm)



PART NUMBER GUIDE

Example: TGS CSS 8M0A50-18-50-40-80 BLF

[Part Number and Part Code Structure](#)

TGS	CSS	8M0	A	50	-18	-50	-40	-80	B	LF	XX
1	2	3	4	5	6	7	8	9	10	11	12

- 1) TGS: Company Code
- 2) CSS: MHz Thru Hole Crystal, 2 pins, L11.05*W4.7*3.0mm
- 3) 8M0: Frequency Range 8.000MHz or specify detail frequency range
- 4) A: Oscillation Mode, A: AT Fund. 3: 3rd Overtone
- 5) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 6) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify detail CL value
- 7) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify detail value
- 8) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify detail value
- 9) 80: Equivalent Series Resistance (ESR), 80: 80 ohm Max.
- 10) B: Package Code, B: in Bulk T: in Tape and Box.
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

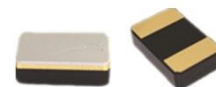
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MAIN FEATURE

- 32.768KHz • Ultra-Small Package • 2 Pads

APPLICATION

- Smart phone and mobile communication and more

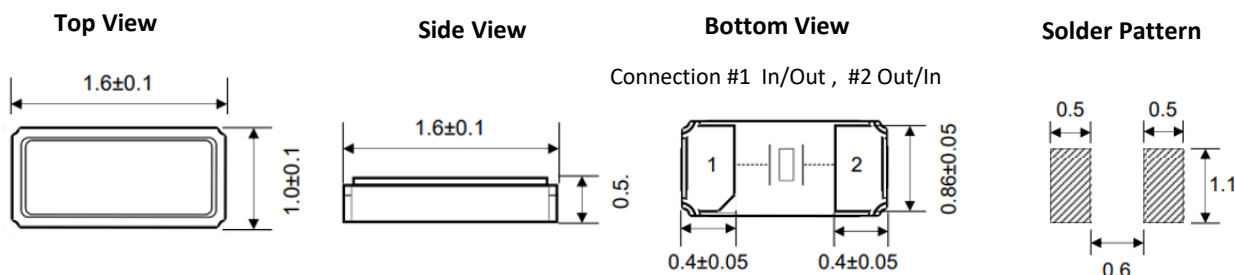


L1.6*W1.0*H0.5mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	-	32.768	-	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	@25 °C or Specify
Operating Temperture Range	-40	-	+85	°C	CL: 9.0pF or Specify
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.04	ppm/C ²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	90	Kohm	
Drive Level	-	-	0.5	μW	
Shunt Capacitance	0.9	1.5	2.0	pF	
Dynamic Capacitance	-	2.3	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CCMV 32K768A20-12.5-40-90 TLF

[Part Number and Part Code Structure](#)

TGS	CCMV	32K768	A	20	-12.5	-40	-90	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

1) TGS: Company Code

2) CCMV: KHz SMD Crystals, L1.6*W1.0*H0.5mm

3) 32K768: Frequency Range 32.768000KHz

4) A: Oscillation Mode, AT Fund.

5) 20: Frequency tolerance: +/-20ppm or specify

6) 12.5: Load Capacitance, 12.5pF; 9: 9.0pF or Specify

7) 40: Operating Temp. Range -40°C ~+85°C,

8) 90: Equivalent Series Resistance, 90 Kohm Max.

9) T: Package in Tape/Reel, 3000pcs/Reel

10) LF: RoHS compliant

11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

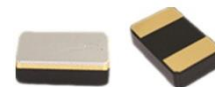
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MAIN FEATURE

- 32.768KHz • Ultra-Small Package • 2 Pads

APPLICATION

- Smart phone and mobile communication and more



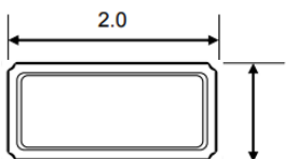
L2.0*W1.2*H0.6mm

STANDARD SPECIFICATION

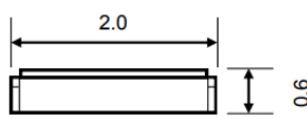
Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	-	32.768	-	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	@25 °C or Specify
Operating Temperture Range	-40	-	+85	°C	CL: 7.0pF, 9.0pF or Specify
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.04	ppm/C ²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	90	Kohm	
Drive Level	-	-	0.5	μW	
Shunt Capacitance	0.9	1.3	2.0	pF	
Dynamic Capacitance	-	5.0	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		@ 100Vdc ± 15V
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	

DIMENSION (+/-0.1mm)

Top View

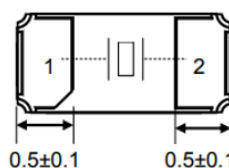


Side View

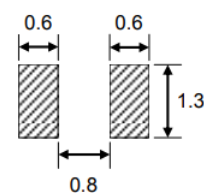


Bottom View

Connection #1 In/Out , #2 Out/In



Solder Pattern



PART NUMBER GUIDE

Example: TGS CCMS 32K768A20-12.5-40-90 TLF

[Part Number and Part Code Structure](#)

TGS	CCMS	32K768	A	20	-12.5	-40	-90	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

1) TGS: Company Code

2) CCMS: KHz SMD Crystals, 2 pads, L2.0*W1.2*H0.6mm

3) 32K768: Frequency Range 32.768000KHz

4) A: Oscillation Mode, AT Fund.

5)20: Frequency tolerance: +/-20ppm or specify

6) 12.5: Load Capacitance, 12.5pF; 9: 9.0pF or Specify

7) 40: Operating Temp. Range -40°C ~+85°C,

8) 90: Equivalent Series Resistance, 90 Kohm Max.

9) T: Package in Tape/Reel, 3000pcs/Reel

10) LF: RoHS compliant

11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- 32.768KHz • SMD Package 2 Pads with Metal Lid

APPLICATION

- Mobile Communications, Consumer Devices and more

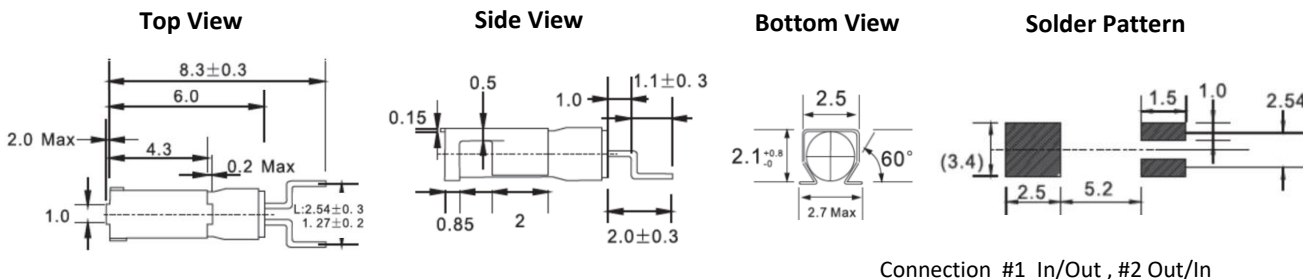


Ø2.0*L6.0mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	30.00	32.768	200.00	KHz	@25 °C or Specify CL: 7.0pF, 9.0pF or Specify
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	
Operating Temperture Range	-40	-	+85	°C	
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.04	ppm/C ²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	50	Kohm	
Drive Level	-	-	1.0	μW	
Shunt Capacitance	0.9	1.1	2.0	pF	
Dynamic Capacitance	-	5.0	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CCMA 32K768A20-12.5-40-50 TLF

[Part Number and Part Code Structure](#)

TGS	CCMA	32K768	A	20	-12.5	-40	-50	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

- 1) TGS: Company Code
- 2) CCMA: KHz SMD Crystals, Ø2.0*L6.0mm with Metal Lid
- 3) 32K768: Frequency Range 32.7680KHz or Specify
- 4) A: Oscillation Mode, AT Fund.
- 5) 20: Frequency tolerance: +/-20ppm or specify
- 6) 12.5: Load Capacitance, 12.5pF; 9: 9.0pF or Specify
- 7) 40: Operating Temp. Range -40°C ~+85°C,
- 8) 50: Equivalent Series Resistance, 50 Kohm Max.
- 9) T: Package in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS compliant
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- 32.768KHz • SMD Package 2 Pads with Lead Formed

APPLICATION

- Mobile Communications, Consumer Devices and more



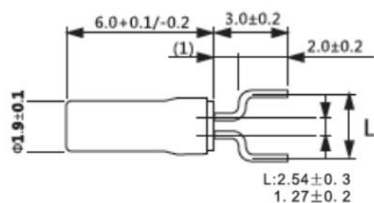
Ø2.0*L6.0mm

STANDARD SPECIFICATION

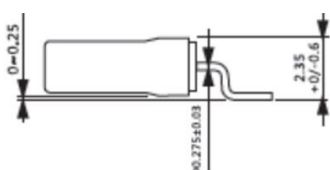
Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	30.00	32.768	200.00	KHz	CL: 7.0pF, 9.0pF or Specify
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	
Operating Temperture Range	-40	-	+85	°C	
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.04	ppm/C ²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	50	Kohm	
Drive Level	-	-	1.0	μW	
Shunt Capacitance	0.9	1.1	2.0	pF	
Dynamic Capacitance	-	5.0	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

DIMENSION (mm)

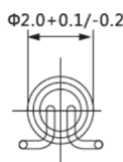
Top View



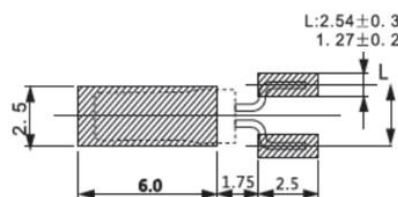
Side View



Bottom View



Solder Pattern(Top View)



Connection #1 In/Out , #2 Out/In

PART NUMBER GUIDE

Example: TGS CCMB 32K768A20-12.5-40-50 TLF

[Part Number and Part Code Structure](#)

TGS	CCMB	32K768	A	20	-12.5	-40	-50	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

1) TGS: Company Code

2) CCMB: KHz SMD Crystals, Ø2.0*L6.0mm with Lead Formed

3) 32K768: Frequency Range 32.7680KHz or Specify

4) A: Oscillation Mode, AT Fund.

5) 20: Frequency tolerance: +/-20ppm or specify

6) 12.5: Load Capacitance, 12.5pF; 9: 9.0pF or Specify

7) 40: Operating Temp. Range -40°C ~+85°C,

8) 50: Equivalent Series Resistance, 50 Kohm Max.

9) T: Package in Tape/Reel, 3000pcs/Reel

10) LF: RoHS compliant

11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

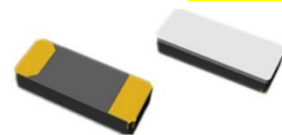
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MAIN FEATURE

- 32.768KHz • Ultra-Small Package, 2 Pads • High Precision & Reliability

APPLICATION

- Smart Meter, PDA, Wave Clock
- Mobile Communication Devices and more



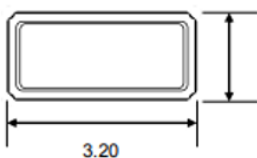
L3.2*W1.5*H0.80mm

STANDARD SPECIFICATION

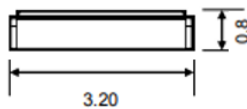
Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	-	32.768	-	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	@25 °C or Specify
Operating Temperature Range	-40	-	+85	°C	CL: 7.0pF, 9.0pF or Specify ESR: 50 Kohm Max. available
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.04	ppm/°C²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	70	Kohm	
Drive Level	-	-	0.5	µW	
Shunt Capacitance	0.9	0.95	2.0	pF	
Dynamic Capacitance	-	3.4	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

DIMENSION (+/-0.1mm)

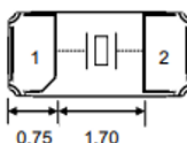
Top View



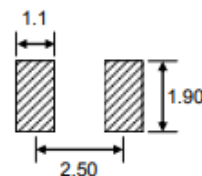
Side View



Bottom View



Solder Pattern



Connection
#1 In/Out
#2 Out/In

PART NUMBER GUIDE

Example: TGS CCMM 32K768A20-12.5-40-70 TLF

[Part Number and Part Code Structure](#)

TGS	CCMM	32K768	A	20	-12.5	-40	-70	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

1) TGS: Company Code

2) CCMM: KHz SMD Crystals, 2 pads L3.2*W1.5*H0.80mm

3) 32K768: Frequency Range 32.768000KHz

4) A: Oscillation Mode, AT Fund.

5) 20: Frequency tolerance: +/-20ppm or specify

6) 12.5: Load Capacitance, 12.5pF; 9: 9.0pF or Specify

7) 40: Operating Temp. Range -40°C ~ +85°C,

8) 70: Equivalent Series Resistance, 70 Kohm Max.; 50 Kohm Max. available

9) T: Package in Tape/Reel, 3000pcs/Reel

10) LF: RoHS compliant

11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

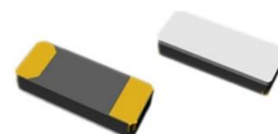
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MAIN FEATURE

- 32.768KHz • Ultra-Small Package, 2 Pads • High Precision & Reliability

APPLICATION

- Smart Meter, PDA, Wave Clock
- Mobile Communication Devices and more

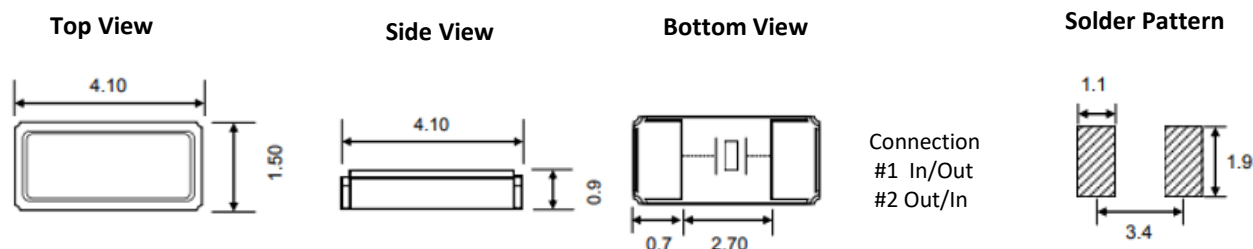


L4.1*W1.5*H0.90mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	-	32.768	-	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	@25 °C or Specify
Operating Temperature Range	-40	-	+85	°C	CL: 7.0pF, 9.0pF or Specify
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.04	ppm/°C²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	80	Kohm	
Drive Level	-	-	0.5	µW	
Shunt Capacitance	0.9	1.3	2.0	pF	
Dynamic Capacitance	-	2.1	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

DIMENSION (+/-0.1mm)



PART NUMBER GUIDE

Example: TGS CCMJ 32K768A20-12.5-40-80 TLF

[Part Number and Part Code Structure](#)

TGS	CCMJ	32K768	A	20	-12.5	-40	-80	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

1) TGS: Company Code

2) CCMJ: KHz SMD Crystals, 2 pads L4.1*W1.5*H0.90mm

3) 32K768: Frequency Range 32.768000KHz

4) A: Oscillation Mode, AT Fund.

5) 20: Frequency tolerance: +/-20ppm or specify

6) 12.5: Load Capacitance, 12.5pF; 9: 9.0pF or Specify

7) 40: Operating Temp. Range -40°C ~+85°C,

8) 80: Equivalent Series Resistance, 80 Kohm Max.

9) T: Package in Tape/Reel, 3000pcs/Reel

10) LF: RoHS compliant

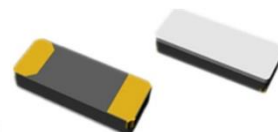
11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

MAIN FEATURE

- 32.768KHz • Ultra-Small Package, 2 Pads • High Precision & Reliability

APPLICATION

- Smart Meter, PDA, Wave Clock
- Mobile Communication Devices and more

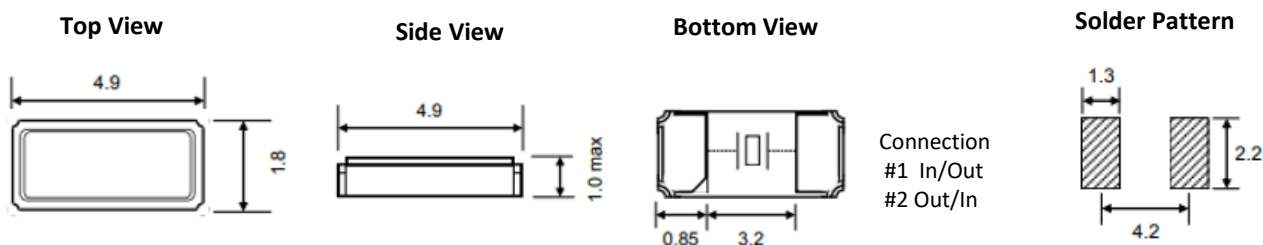


L4.9*W1.8*H1.0mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	-	32.768	-	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	@25 °C or Specify
Operating Temperature Range	-40	-	+85	°C	CL: 7.0pF, 9.0pF or Specify
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.04	ppm/°C²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	70	Kohm	
Drive Level	-	-	0.5	µW	
Shunt Capacitance	0.9	1.15	2.0	pF	
Dynamic Capacitance	-	2.1	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

DIMENSION (+/-0.1mm)



PART NUMBER GUIDE

Example: TGS CCMX 32K768A20-12.5-40-70 TLF

[Part Number and Part Code Structure](#)

TGS	CCMX	32K768	A	20	-12.5	-40	-70	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

1) TGS: Company Code

2) CCMX: KHz SMD Crystals, 2 pads L4.9*W1.8*H1.0mm

3) 32K768: Frequency Range 32.768000KHz

4) A: Oscillation Mode, AT Fund.

5) 20: Frequency tolerance: +/-20ppm or specify

6) 12.5: Load Capacitance, 12.5pF; 9: 9.0pF or Specify

7) 40: Operating Temp. Range -40°C ~+85°C,

8) 70: Equivalent Series Resistance, 70 Kohm Max.

9) T: Package in Tape/Reel, 3000pcs/Reel

10) LF: RoHS compliant

11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A



L7.0*W1.5*H1.4mm



MAIN FEATURE

- 32.768KHz • Plastic Package • High Precision & Reliability

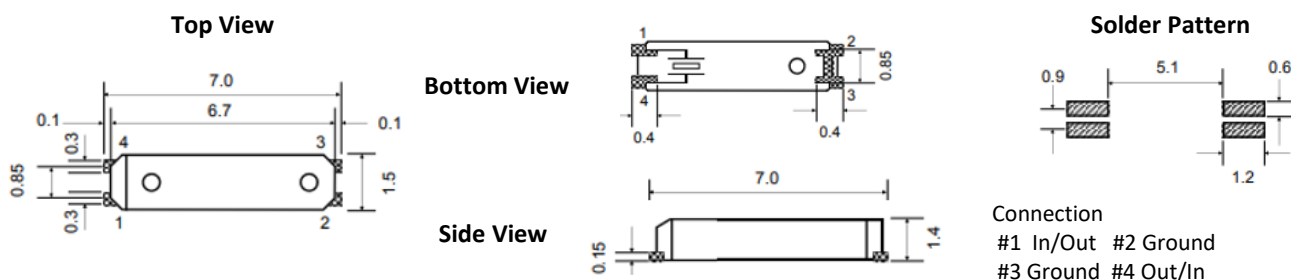
APPLICATION

- Notebook computer, TV, STB, LCDM and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	-	32.768	-	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	@25 °C or Specify
Operating Temperature Range	-40	-	+85	°C	CL: 7.0pF, 9.0pF or Specify
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.04	ppm/C ²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	65	Kohm	
Drive Level	-	-	1.0	μW	
Shunt Capacitance	0.9	1.8	2.0	pF	
Dynamic Capacitance	-	1.9	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

DIMENSION (+/-0.1mm)



PART NUMBER GUIDE

Example: TGS CCMN 32K768A20-12.5-40-65 TLH

Part Number and Part Code Structure

TGS	CCMN	32K768	A	20	-12.5	-40	-65	T	LH	XX
1	2	3	4	5	6	7	8	9	10	11

- 1) TGS: Company Code
- 2) CCMN: KHz Plastic SMD Crystals, 2 pads L7.0*W1.5*H1.4mm
- 3) 32K768: Frequency Range 32.768000KHz
- 4) A: Oscillation Mode, AT Fund.
- 5) 20: Frequency tolerance: +/-20ppm or specify
- 6) 12.5: Load Capacitance, 12.5pF; 9: 9.0pF or Specify
- 7) 40: Operating Temp. Range -40°C ~+85°C,
- 8) 65: Equivalent Series Resistance, 65 Kohm Max.
- 9) T: Package in Tape/Reel, 9000pcs/Reel
- 10) LH: RoHS//RoHS II compliant

11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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L8.0*W3.8*H2.4mm



MAIN FEATURE

- 32.768KHz • Plastic Package • High Precision & Reliability

APPLICATION

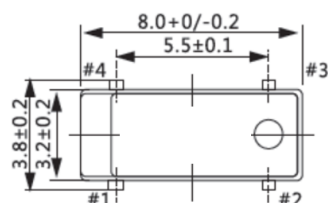
- Notebook computer, TV, STB, LCDM and more

STANDARD SPECIFICATION

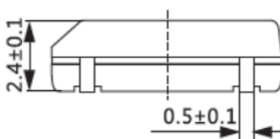
Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	30.00	32.768	200.00	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	@25 °C or Specify
Operating Temperature Range	-40	-	+85	°C	CL: 7.0pF, 9.0pF or Specify See Part number Guide for option
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.04	ppm/C ²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	50	Kohm	
Drive Level	-	-	1.0	μW	
Shunt Capacitance	0.9	1.35	2.0	pF	
Dynamic Capacitance	-	1.8	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

DIMENSION (+/-0.1mm)

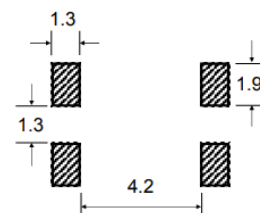
Top View



Side View



Solder Pattern



Connection
#1 In/Out
#2 Ground
#3 Ground
#4 Out/In

PART NUMBER GUIDE

Example: TGS CCMC 32K768A20-12.5-40-50 TLH

Part Number and Part Code Structure

TGS	CCMC	32K768	A	20	-12.5	-40	-50	T	LH	XX
1	2	3	4	5	6	7	8	9	10	11

1) TGS: Company Code

2) CCMC: KHz Plastic SMD Crystals, 2 pads L8.0*W3.8*H2.4mm

3) 32K768: Frequency Range 32.768000KHz or specify from 30.00~200.00KHz

4) A: Oscillation Mode, AT Fund.

5) 20: Frequency tolerance: +/-20ppm or specify

6) 12.5: Load Capacitance, 12.5pF; 9: 9.0pF or Specify

7) 40: Operating Temp. Range -40°C ~+85°C, 10: -10°C ~+60°C, 20: -20°C ~+70°C or specify

8) 50: Equivalent Series Resistance, 50 Kohm Max.

9) T: Package in Tape/Reel, 1000pcs/Reel

10) LH: RoHS//RoHS II compliant

11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- 32.768KHz High Precision & Reliability • Low Cost

APPLICATION

- Clock/Watch and more

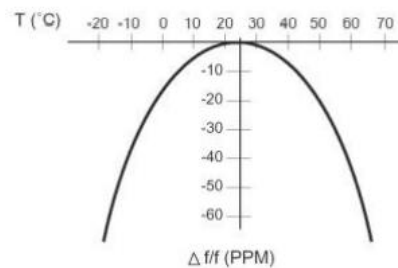
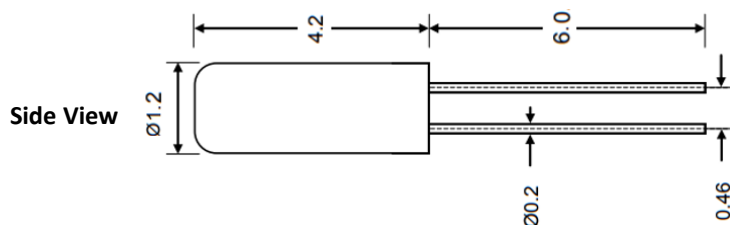


Ø1.2*H4.2mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range		32.768		KHz	
Oscillation Mode		AT Fund.			
Frequency Tolerance	-	±20		ppm	@25 °C or Specify
Operating Temperature Range	-20	-	+70	°C	CL: 7.0pF, 9.0pF or Specify Wide Operating Temp. range See Part number Guide for option
Storage Temperature Range	-40	-	+85	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.031	0.036	0.041	ppm/°C	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	60	Kohm	
Drive Level	-	-	1.0	µW	
Shunt Capacitance			2.0	pF	
Dynamic Capacitance	-	0.0030	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±5		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

DIMENSION (+/-0.1mm)



Temperature Coefficient

PART NUMBER GUIDE

Example: TGS CCE 32K768A20-12.5-20-60 BLF

Part Number and Part Code Structure

TGS	CCE	32K768	A	20	-12.5	-20	-60	B	LF	XX
1	2	3	4	5	6	7	8	9	10	11

1) TGS: Company Code

2) CCE: KHz Thru Hole Crystals, Ø1.2*H4.2mm

3) 32K768: Frequency Range 32.768000KHz

4) A: Oscillation Mode, AT Fund.

5) 20: Frequency tolerance: +/-20ppm or specify

6) 12.5: Load Capacitance, 12.5pF; 9: 9.0pF or Specify

7) 20: Operating Temp. Range -20°C ~+70°C; 40: -40°C ~+85°C or Specify

8) 60: Equivalent Series Resistance, 60 Kohm Max.

9) B: Package in Bulk

10) LF: RoHS Compliant

11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- 32.768KHz Std and wide Frequency range
- Low Cost, Short lead time and massive quantity supply

APPLICATION

- Clock/Watch and more

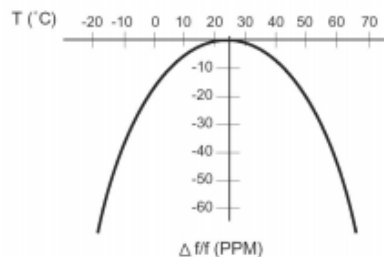
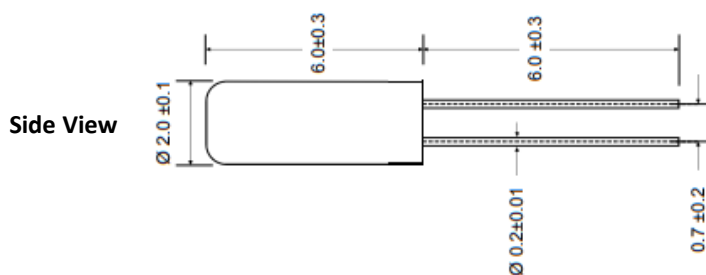


Ø2.0*H6.0mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	30.00	32.768	200.00	KHz	@25 °C or Specify CL: 7.0pF, 9.0pF or Specify Wide Operating Temp. range See Part number Guide for option
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	
Operating Temperature Range	-10	-	+60	°C	
Storage Temperature Range	-40	-	+85	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.040	ppm/°C	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	35	Kohm	
Drive Level	-	-	1.0	µW	
Shunt Capacitance	0.9	1.8	2.0	pF	
Dynamic Capacitance	-	0.003	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±5		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

DIMENSION (mm)



Temperature Coefficient

PART NUMBER GUIDE

Example: TGS CCA 32K768A20-12.5-10-35 BLF

Part Number and Part Code Structure

TGS	CCA	32K768	A	20	-12.5	-10	-35	B	LF	XX
1	2	3	4	5	6	7	8	9	10	11

1) TGS: Company Code

2) CCA: KHz Thru Hole Crystals, Ø2.0*H6.0mm

3) 32K768: Frequency Range 32.768KHz standard or specify from 30.00KHz to 200.00KHz

4) A: Oscillation Mode, AT Fund.

5) 20: Frequency tolerance: +/-20ppm or specify

6) 12.5: Load Capacitance, 12.5pF; 7: 7.0pF; 9: 9.0pF or Specify

7) 10: Operating Temp. Range -10°C ~+60°C; 20: -20°C ~+70°C; 40: -40°C ~+85°C or specify

8) 35: Equivalent Series Resistance, 35 Kohm Max.

9) B: Package in Bulk

10) LF: RoHS Compliant

11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- 32.768KHz Std and wide Frequency range
- Low Cost, Short lead time and massive quantity supply

APPLICATION

- Clock/Watch and more

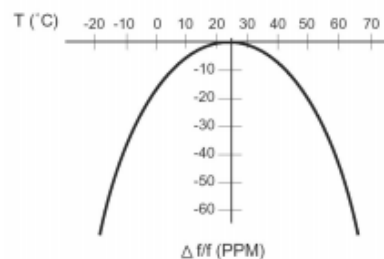
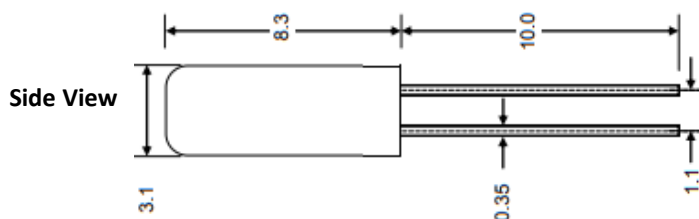


Ø3.1*H8.3mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	30.00	32.768	200.00	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	@25 °C or Specify
Operating Temperature Range	-10	-	+60	°C	CL: 7.0pF, 9.0pF or Specify Wide Operating Temp. range See Part number Guide for option
Storage Temperature Range	-40	-	+85	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.040	ppm/C ²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	30	Kohm	
Drive Level	-	-	1.0	µW	
Shunt Capacitance	0.9	1.8	2.0	pF	
Dynamic Capacitance	-	2.1	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±5		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

DIMENSION (+/-0.1mm)



Temperature Coefficient

PART NUMBER GUIDE

Example: TGS CCA 32K768A20-12.5-10-30 BLF

Part Number and Part Code Structure

TGS	CCA	32K768	A	20	-12.5	-10	-30	B	LF	XX
1	2	3	4	5	6	7	8	9	10	11

- 1) TGS: Company Code
- 2) CCA: KHz Thru Hole Crystals, Ø3.1*H8.3mm
- 3) 32K768: Frequency Range 32.768KHz standard or specify from 30.00KHz to 200.00KHz
- 4) A: Oscillation Mode, AT Fund.
- 5) 20: Frequency tolerance: +/-20ppm or specify
- 6) 12.5: Load Capacitance, 12.5pF; 7: 7.0pF; 9: 9.0pF or Specify
- 7) 10: Operating Temp. Range -10°C ~+60°C; 20: -20°C ~+70°C; 40: -40°C ~+85°C or specify
- 8) 60: Equivalent Series Resistance, 30 Kohm Max.
- 9) B: Package in Bulk
- 10) LF: RoHS Compliant
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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- *KHz SMD Discriminator*
- *MHz SMD Ceramic Filter*
- *MHz Thru Hole Ceramic Filter*
- *KHz SMD Ceramic Filter*
- *KHz Thru Hole Ceramic Filter*

MAIN FEATURE

- Extra SMD Package, 2 pads
- Low Cost and short lead time

APPLICATION

- Clock oscillators for microprocessors
- Small electronic equipment and more

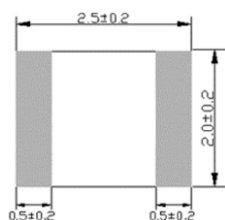
STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	20.00		60.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Capacitance (C1/C2)		-	-	pF	
		15	-		MX: 20.00~25.99MHz
	-	5	-		MX: 26.00~60.00MHz
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	-	-	60	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MX: 1/6TC74HCU04				

* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)

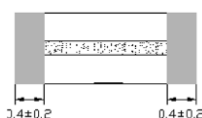
Top View



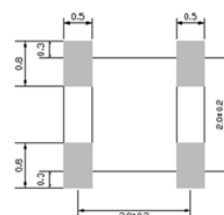
Side View



Bottom View



Solder Pattern



Connection
#1 In/Out
#2 Output/Input

PART NUMBER GUIDE

Example: TGS CRAW 30.0MX TLF

Part Number and Part Code Structure

TGS	CR	A	W	30.0	MX	T	LF	XX
1	2	3	4	5	6	7	8	9

- 1) TGS: Company Code
- 2) CR: SMD Ceramic Resonator
- 3) A: Without Built-in Capacitance , 2 Pads
- 4) W: Outline Dimensions L2.5*W2.0*H0.9mm
- 5) 30.0: Frequency Range in MHz, 30.000MHz or Specify
- 6) MX: Design Mode for different Frequency range, MX: 20.00~60.00MHz
- 7) T: Package in Tape/Reel, 3000pcs/Reel
- 8) LF: RoHS Compliant
- 9) XX: Intenal Control Code; Blank: N/A

MAIN FEATURE

- Extra SMD Package, 3 pads
- Built-in Capacitance
- Low Cost and short lead time

APPLICATION

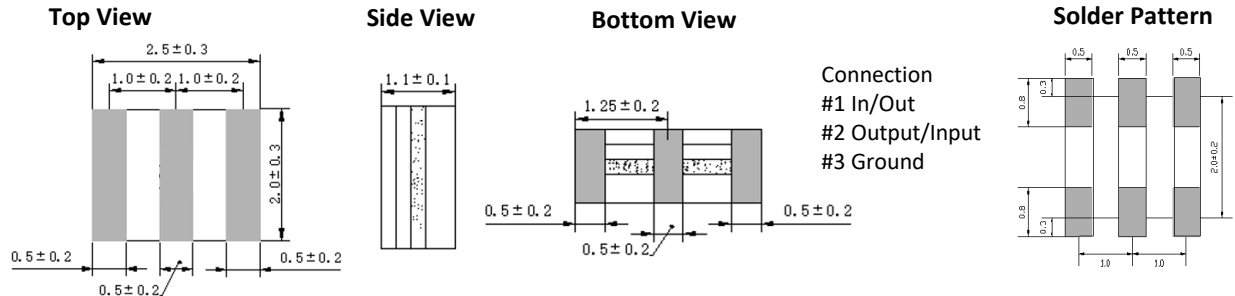
- Clock oscillators for microprocessors
- Small electronic equipment and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	20.00		60.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Built-in Capacitance		-	-	pF	-
		15	-		MX: 20.00~25.99MHz
	-	5	-		MX: 26.00~60.00MHz
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	-	-	60	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MX: 1/6TC74HCU04				

* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CRTW 25.0MX TLF

[Part Number and Part Code Structure](#)

TGS	CR	T	W	25.0	MX	T	LF	XX
1	2	3	4	5	6	7	8	9

- 1) TGS: Company Code
- 2) CR: SMD Ceramic Resonator
- 3) T: Built-in Capacitance , 3 Pads, different value pF for frequency range
- 4) W: Outline Dimensions L2.5*W2.0*H1.1mm
- 5) 25.0: Frequency Range in MHz, 25.000MHz or Specify
- 6) MX: Design Mode for different Frequency range, MX: 20.00~60.00MHz
- 7) T: Package in Tape/Reel, 3000pcs/Reel
- 8) LF: RoHS Compliant
- 9) XX: Intenal Control Code; Blank: N/A

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MAIN FEATURE

- Extra SMD Package, 3 pads
- Built-in Capacitance
- Low Cost and short lead time

APPLICATION

- Clock oscillators for microprocessors
- Small electronic equipment and more

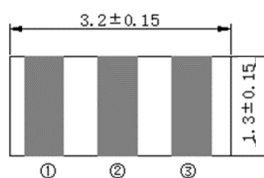
STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.00		12.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Built-in Capacitance		30	-	pF	MG: 8.00~12.00MHz
		-	-		-
	-	-	-		-
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	-	-	40	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MG: 1/6TC4069UBP				

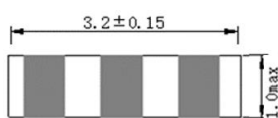
* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)

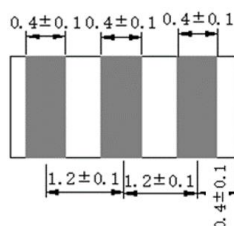
Top View



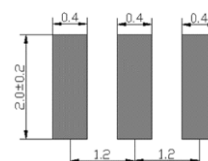
Side View



Bottom View



Solder Pattern



Connection #1 In/Out #2 Output/Input #3 Ground

PART NUMBER GUIDE

Example: TGS CRTE 8.0MG TLF

[Part Number and Part Code Structure](#)

TGS	CR	T	E	8.0	MG	T	LF	XX
1	2	3	4	5	6	7	8	9

- 1) TGS: Company Code
- 2) CR: SMD Ceramic Resonator
- 3) T: Built-in Capacitance , 3 Pads, different value pF for frequency range
- 4) E: Outline Dimensions L3.2*W1.3*H1.0mm
- 5) 8.0: Frequency Range in MHz, 8.000MHz or Specify
- 6) MG: Design Mode for different Frequency range, MG: 8.00~12.00MHz
- 7) T: Package in Tape/Reel, 3000pcs/Reel
- 8) LF: RoHS Compliant
- 9) XX: Intenal Control Code; Blank: N/A

MAIN FEATURE

- Extra SMD Package, 2 pads
- Low Cost and short lead time

APPLICATION

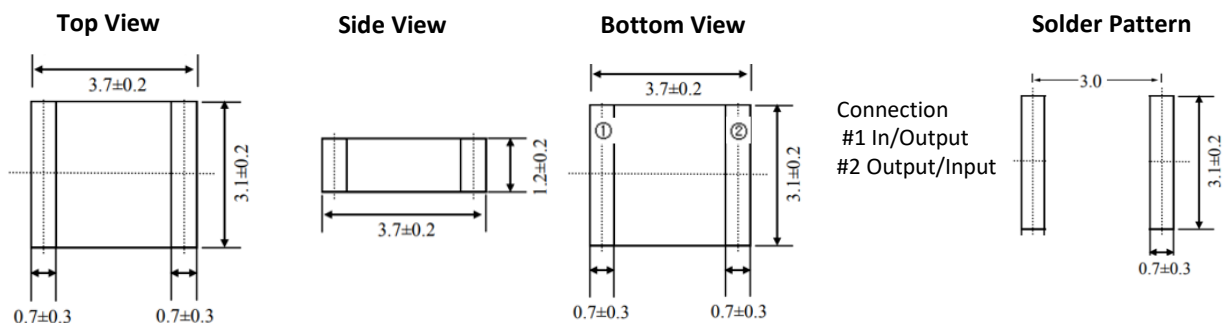
- Clock oscillators for microprocessors
- Small electronic equipment and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.00		60.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Capacitance (C1/C2)		N/A	-	pF	MT(8.00~13.00MHz)/MX (16.00~20.00MHz)
		-	-		MX: 20.01~25.99MHz
	-	-	-		MX: 26.00~60.00MHz
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	-	-	40	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MX: 1/6TC74HCU04. MT: 1/6TC4069UBP				

* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CRAV 8.0MT TLF

[Part Number and Part Code Structure](#)

TGS	CR	A	V	8.0	MT	T	LF	XX
1	2	3	4	5	6	7	8	9

- 1) TGS: Company Code
- 2) CR: SMD Ceramic Resonator
- 3) A: Without Built-in Capacitance , 2 Pads
- 4) V: Outline Dimensions L3.7*W3.1*H1.2mm
- 5) 8.0: Frequency Range in MHz, 8.000MHz or Specify
- 6) MT: Design Mode for different Frequency range; MT: 8.00~13.00MHz; MX:16.00~60.00MHz
- 7) T: Package in Tape/Reel, 4000pcs/Reel
- 8) LF: RoHS Compliant
- 9) XX: Intenal Control Code; Blank: N/A

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MAIN FEATURE

- Extra SMD Package, 3 pads
- Built-in Capacitance
- Low Cost and short lead time

APPLICATION

- Clock oscillators for microprocessors
- Small electronic equipment and more



L3.7*W3.1*H1.5mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.00		60.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Built-in Capacitance		30	-	pF	MT(8.00~13.00MHz)/MX (16.00~20.00MHz)
		15	-		MX: 20.01~25.99MHz
	-	5	-		MX: 26.00~60.00MHz
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	-	-	40	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MX: 1/6TC74HCU04. MT: 1/6TC4069UBP				

* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

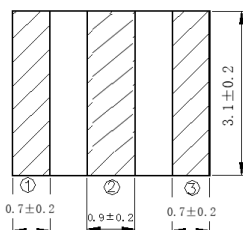
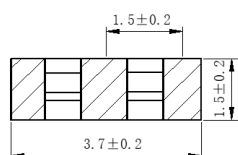
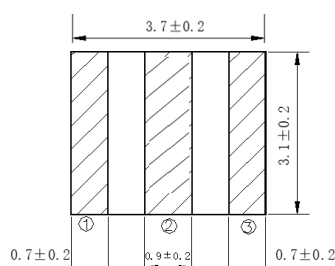
DIMENSION (mm)

Top View

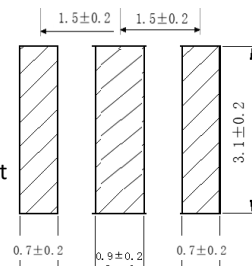
Side View

Bottom View

Solder Pattern



Connection
#1 In/Output
#2 Ground
#3 Output/Input



PART NUMBER GUIDE

Example: TGS CRTV 16.0MX TLF

[Part Number and Part Code Structure](#)

TGS	CR	T	V	16.0	MX	T	LF	XX
1	2	3	4	5	6	7	8	9

- 1) TGS: Company Code
- 2) CR: SMD Ceramic Resonator
- 3) T: Built-in Capacitance , 3 Pads, different value pF for frequency range
- 4) V: Outline Dimensions L3.7*W3.1*H1.5mm
- 5) 16.0: Frequency Range in MHz, 16.000MHz or Specify
- 6) MX: Design Mode for different Frequency range; MT: 8.00~13.00MHz; MX:16.00~60.00MHz
- 7) T: Package in Tape/Reel, 4000pcs/Reel
- 8) LF: RoHS Compliant
- 9) XX: Intenal Control Code; Blank: N/A

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MAIN FEATURE

- Extra SMD Package, 2 pads
- Low Cost and short lead time

APPLICATION

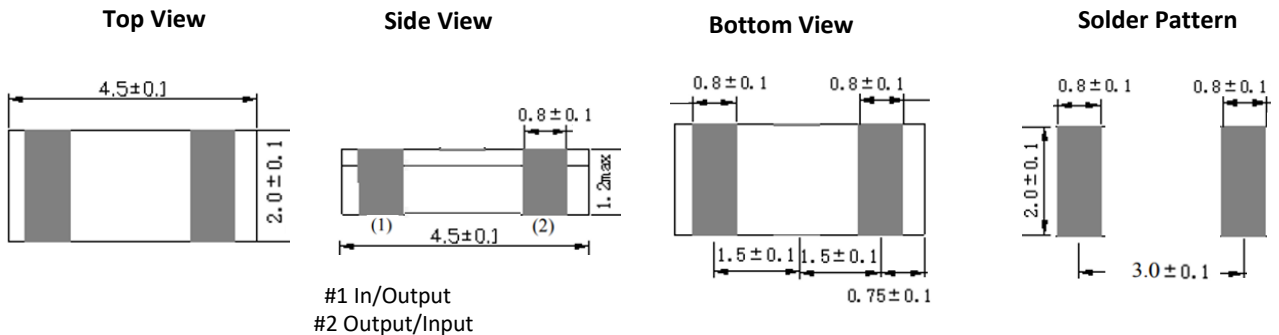
- Clock oscillators for microprocessors
- Small electronic equipment and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	4.00		8.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Capacitance (C1/C2)		30	-	pF	MG: 4.00~8.00MHz
		-	-		-
	-	-	-		-
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	-	-	40	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MG: 1/6TC4069UBP				

* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CRAR 8.0MG TLF

[Part Number and Part Code Structure](#)

TGS	CR	A	R	8.0	MG	T	LF	XX
1	2	3	4	5	6	7	8	9

- 1) TGS: Company Code
- 2) CR: SMD Ceramic Resonator
- 3) A: Without Built-in Capacitance , 2 Pads
- 4) R: Outline Dimensions L4.5*W2.0*H1.2mm
- 5) 8.0: Frequency Range in MHz, 8.000MHz or Specify
- 6) MG: Design Mode for different Frequency range; MG: 4.00~8.00MHz
- 7) T: Package in Tape/Reel, 3000pcs/Reel
- 8) LF: RoHS Compliant
- 9) XX: Intenal Control Code; Blank: N/A

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MAIN FEATURE

- Extra SMD Package, 3 pads
- Built-in Capacitance
- Low Cost and short lead time

APPLICATION

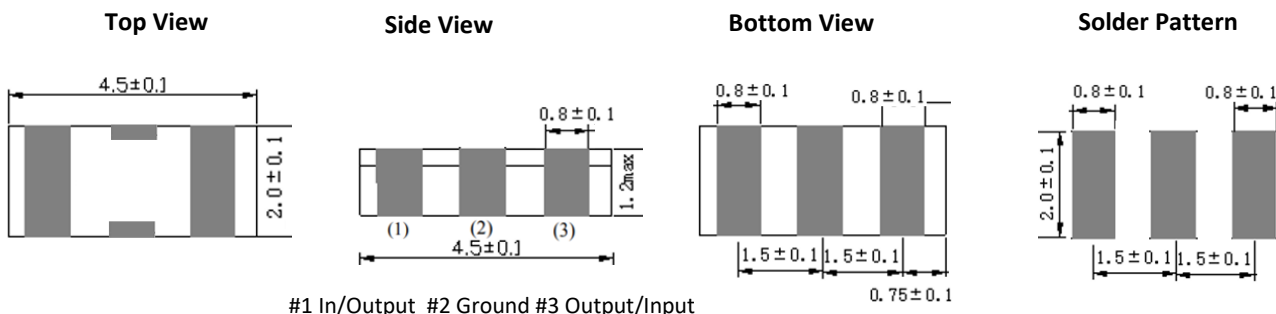
- Clock oscillators for microprocessors
- Small electronic equipment and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	4.00		8.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Built-in Capacitance		30	-	pF	MG: 4.00~8.00MHz
		-	-		-
	-	-	-		-
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	-	-	40	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MG: 1/6TC4069UBP				

* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CRTR 8.0MX TLF

[Part Number and Part Code Structure](#)

TGS	CR	T	R	8.0	MG	T	LF	XX
1	2	3	4	5	6	7	8	9

- 1) TGS: Company Code
- 2) CR: SMD Ceramic Resonator
- 3) T: Built-in Capacitance , 3 Pads, different value pF for frequency range
- 4) R: Outline Dimensions L4.5*W2.0*H1.2mm
- 5) 8.0: Frequency Range in MHz, 16.000MHz or Specify
- 6) MG: Design Mode for different Frequency range; MG: 4.00~8.00MHz
- 7) T: Package in Tape/Reel, 3000pcs/Reel
- 8) LF: RoHS Compliant
- 9) XX: Intenal Control Code; Blank: N/A

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MAIN FEATURE

- Extra SMD Package, 2 pads
- Low Cost and short lead time

APPLICATION

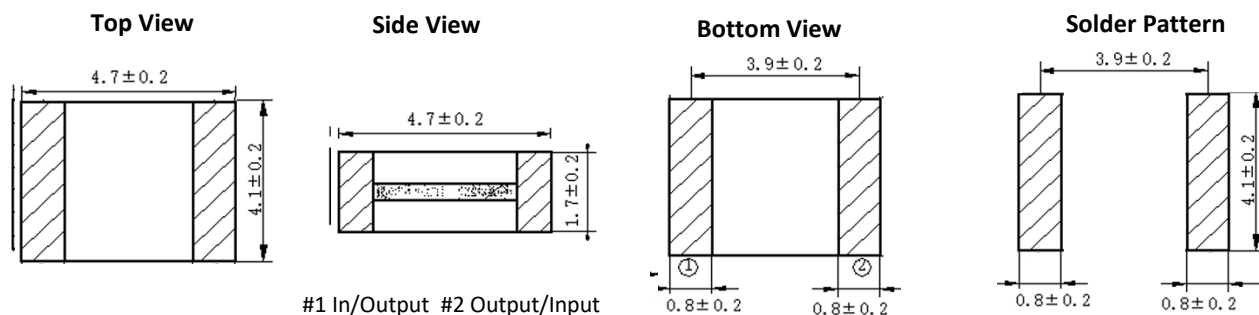
- Clock oscillators for microprocessors
- Small electronic equipment and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	6.00		60.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Capacitance (C1/C2)		30	-	pF	MT(6.00~13.00MHz)/MX (13.01~20.00MHz)
		15	-		MX: 20.01~25.99MHz
	-	5	-		MX: 26.00~60.00MHz
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	-	-	40	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MX: 1/6TC74HCU04. MT: 1/6TC4069UBP				

* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CRAS 16.0MG TLF

[Part Number and Part Code Structure](#)

TGS	CR	A	S	16.0	MX	T	LF	XX
1	2	3	4	5	6	7	8	9

- 1) TGS: Company Code
- 2) CR: SMD Ceramic Resonator
- 3) A: Without Built-in Capacitance , 2 Pads
- 4) S: Outline Dimensions L4.7*W4.1*H1.7mm
- 5) 16.0: Frequency Range in MHz, 16.000MHz or Specify
- 6) MX: Design Mode for different Frequency range; MT: 6.00~13.00MHz; MX: 13.01~60.00MHz
- 7) T: Package in Tape/Reel, 1000pcs/Reel
- 8) LF: RoHS Compliant
- 9) XX: Intenal Control Code; Blank: N/A

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MAIN FEATURE

- Extra SMD Package, 3 pads
- Built-in Capacitance
- Low Cost and short lead time

APPLICATION

- Communication and more



L4.7*W4.1*H1.8mm

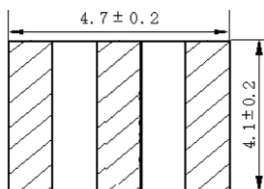
STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	6.00		60.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Built-in Capacitance		30	-	pF	MT(6.00~13.00MHz)/MX (13.01~20.00MHz)
		15	-		MX: 20.01~25.99MHz
	-	5	-		MX: 26.00~60.00MHz
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	-	-	40	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MX: 1/6TC74HCU04. MT: 1/6TC4069UBP				

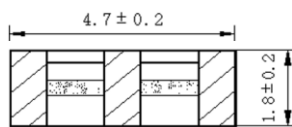
* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)

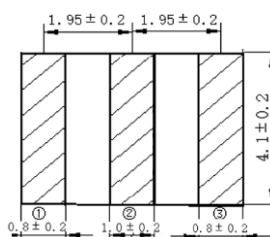
Top View



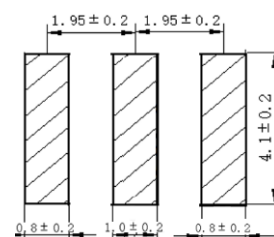
Side View



Bottom View



Solder Pattern



#1 In/Output #2 Ground #3 Output/Input

PART NUMBER GUIDE

Example: TGS CRTS 16.0MX TLF

[Part Number and Part Code Structure](#)

TGS	CR	T	S	16.0	MX	T	LF	XX
1	2	3	4	5	6	7	8	9

- 1) TGS: Company Code
- 2) CR: SMD Ceramic Resonator
- 3) T: Built-in Capacitance , 3 Pads, different value pF for frequency range
- 4) S: Outline Dimensions L4.7*W4.1*H1.8mm
- 5) 16.0: Frequency Range in MHz, 16.000MHz or Specify
- 6) MX: Design Mode for different Frequency range; MT: 6.00~13.00MHz; MX: 13.01~60.00MHz
- 7) T: Package in Tape/Reel, 1000pcs/Reel
- 8) LF: RoHS Compliant
- 9) XX: Intenal Control Code; Blank: N/A

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MAIN FEATURE

- Extra SMD Package, 2 pads
- Low Cost and short lead time

APPLICATION

- Communication and more



L6.0*W3.0*H1.4mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	2.00		12.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperature Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Capacitance (C1/C2)		30	-	pF	MG: 2.00~12.00MHz
		-	-		-
	-	-	-		-
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	-	-	30	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MG: 1/6TC4069UBP				

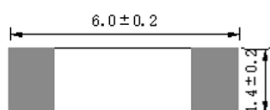
* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)

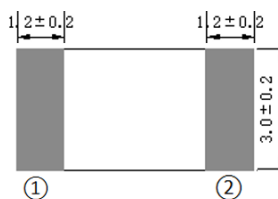
Top View



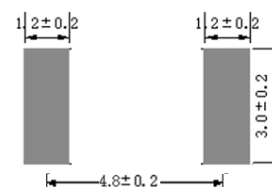
Side View



Bottom View



Solder Pattern



#1 In/Output #2 Output/Input

PART NUMBER GUIDE

Example: TGS CRAP 8.0MG TLF

[Part Number and Part Code Structure](#)

TGS	CR	A	P	8.0	MG	T	LF	XX
1	2	3	4	5	6	7	8	9

- 1) TGS: Company Code
- 2) CR: SMD Ceramic Resonator
- 3) A: Without Built-in Capacitance , 2 Pads
- 4) P: Outline Dimensions L6.0*W3.0*H1.4mm
- 5) 8.0: Frequency Range in MHz, 8.000MHz or Specify
- 6) MG: Design Mode for different Frequency range; MG: 2.00~12.00MHz
- 7) T: Package in Tape/Reel, 4000pcs/Reel
- 8) LF: RoHS Compliant
- 9) XX: Intenal Control Code; Blank: N/A

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MAIN FEATURE

- Extra SMD Package, 3 pads
- Built-in Capacitance
- Low Cost and short lead time

APPLICATION

- Communication and more



L6.0*W3.0*H1.5mm

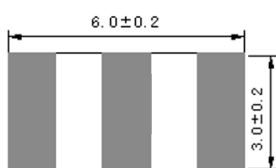
STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	6.00		60.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Built-in Capacitance		30	-	pF	MG: 2.00~12.00MHz
		-	-		-
	-	-	-		-
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	-	-	40	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MG: 1/6TC4069UBP				

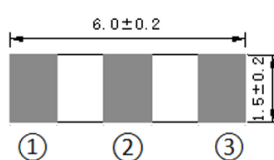
* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)

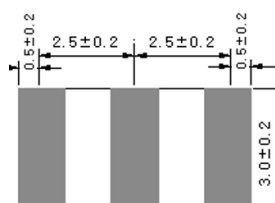
Top View



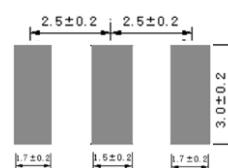
Side View



Bottom View



Solder Pattern



#1 In/Output #2 Ground #3 Output/Input

PART NUMBER GUIDE

Example: TGS CRTP 8.0MG TLF

[Part Number and Part Code Structure](#)

TGS	CR	T	P	8.0	MG	T	LF	XX
1	2	3	4	5	6	7	8	9

- 1) TGS: Company Code
- 2) CR: SMD Ceramic Resonator
- 3) T: Built-in Capacitance, 3 Pads, different value pF for frequency range
- 4) P: Outline Dimensions L6.0*W3.0*H1.5mm
- 5) 8.0: Frequency Range in MHz, 8.000MHz or Specify
- 6) MG: Design Mode for different Frequency range; MG: 2.00~12.00MHz
- 7) T: Package in Tape/Reel, 1000pcs/Reel
- 8) LF: RoHS Compliant
- 9) XX: Intenal Control Code; Blank: N/A

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MAIN FEATURE

- Thru Hole type, 2 pins
- Height for different frequency range
- Low Cost and short lead time

APPLICATION

- Communication and more



L10.0*W5.0*H

H: Different Height for Freq. Range

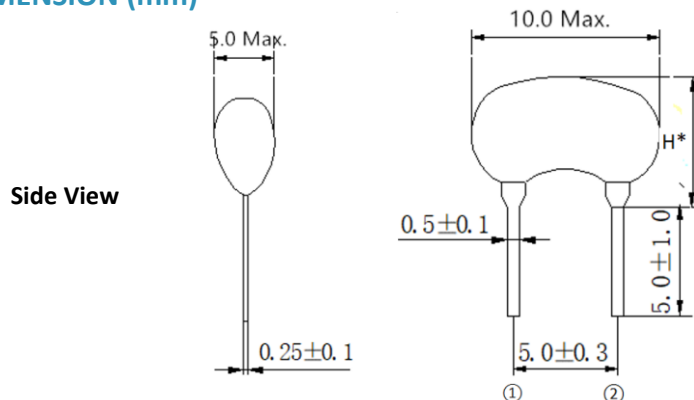
STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	1.79		60.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Capacitance (C1/C2)		30	-	pF	MG/MT/MX(12.00~23.99MHz)
		15	-		MX: 24.00~31.99MHz
	-	5	-		MX: 32.00~60.00MHz
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	25	30	80	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MG/MT: 1/6TC4069UBP, MX: 1/6TC74HCU04				

* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)

Table 1



H* (mm)	Design Mode	Frequency Range (MHz)
7.5 Max	MG	1.7900~6.000
10.0 Max.	MT	6.010~13.00
10.0 Max.	MX	12.00~23.99
7.5 Max.	MX	24.00~31.99
6.5 Max.	MX	32.00~60.00

#1 In/Output
#2 Output/Input

PART NUMBER GUIDE

Example: TGS CRA 18.4MX BLF

[Part Number and Part Code Structure](#)

TGS	CRA	18.4	MX	B	LF XX
1	2	3	4	5	6 7

- 1) TGS: Company Code
- 2) CRA: Ceramic Resonator, Without Built-in Capacitance, 2 Pins
- 4) 18.4: Frequency Range in MHz, 18.40MHz or specify
- 5) MX: Design Mode for different Frequency range, see table 1
- 6) B: Package in BULK, 500pcs/Plastic Bag
- 7) LF: RoHS Compliant
- 8) XX: Internal Control Code- 2 letter or digits; Blank: N/A

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MAIN FEATURE

- Thru Hole type, 3 pins
- Height for different frequency range
- Low Cost and short lead time
- Tape/box package option

APPLICATION

- Communication and more



L10.0*W5.0*H

H: Different Height for Freq. Range

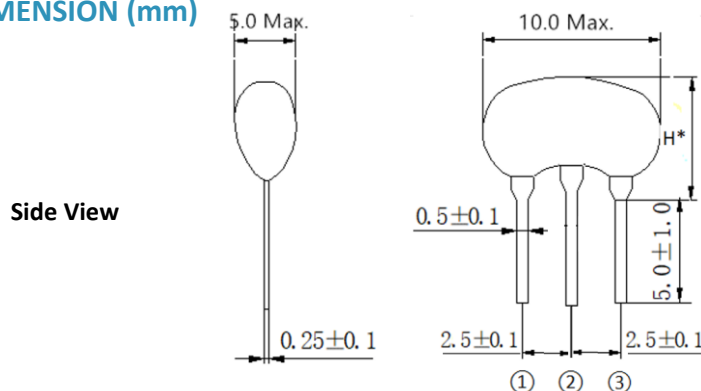
STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	2.00		60.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Built-in Capacitance		30	-	pF	MG/MT(8.01~13.0MHz)/MX(13.01~20.0MHz)
		15	-		MX: 20.01~25.99MHz
	-	5	-		MX: 26.00~60.00MHz
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	25	30	80	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MG/MT: 1/6TC4069UBP, MX: 1/6TC74HCU04				

* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)

Table 1



H* (mm)	Design Mode	Frequency Range (MHz)
7.5 Max	MG	2.000~8.000
10.0 Max.	MT	8.010~13.00
10.0 Max.	MX	13.01~60.00

#1 In/Output
#2 Ground
#3 Output/Input

PART NUMBER GUIDE

Example: TGS CRT 18.4MX BLF

[Part Number and Part Code Structure](#)

TGS	CRT	18.4	MX	B	LF XX
1	2	3	4	5	6 7

- 1) TGS: Company Code
- 2) CRT: Ceramic Resonator Built-in Capacitance, 3 Pins
- 4) 18.4: Frequency Range in MHz, 18.40MHz or specify
- 5) MX: Design Mode for different Frequency range, see table 1
- 6) B: Package in BULK, 500pcs/Plastic Bag
- 7) LF: RoHS Compliant
- 8) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- Thru Hole type, 2 pins
- Height for different frequency range
- Low Cost and short lead time
- Tape/box package option

APPLICATION

- Communication and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	2.00		6.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Capacitance (C1/C2)		30	-	pF	MG:2.00~6.00MHz
		-	-		
	-	-	-		
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance			30	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MG/: 1/6TC4069UBP				

* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)

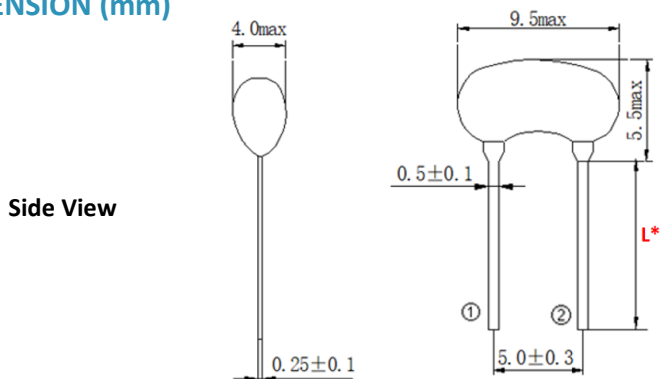


Table 1

L* (mm)	Package	Frequency Range (MHz)
13.5 Max	Tape/Box	2.000~6.000
5.0 Max.	In Bulk	2.000~6.000

#1 In/Output
#2 Output/Input

PART NUMBER GUIDE

Example: TGS CRA 4.0MG BLF

[Part Number and Part Code Structure](#)

TGS	CRA	4.0	MG	B	LF XX
1	2	3	4	5	6 7

- 1) TGS: Company Code
- 2) CRA: Ceramic Resonator, Without Built-in Capacitance, 2 Pins
- 4) 4.0: Frequency Range in MHz, 18.40MHz or specify
- 5) MG: Design Mode for different Frequency range. MG: 2.00~6.00MHz
- 6) B: Package in Bulk, 500pcs/Plastic Bag; T: Packed in Tape/Box, 2000pcs/Tape
- 7) LF: RoHS Compliant
- 8) XX: Internal Control Code- 2 letter or digits; Blank: N/A

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MAIN FEATURE

- Thru Hole type, 3 pins
- Height for different frequency range
- Low Cost and short lead time
- Tape/box package option

APPLICATION

- Communication and more

STANDARD SPECIFICATION

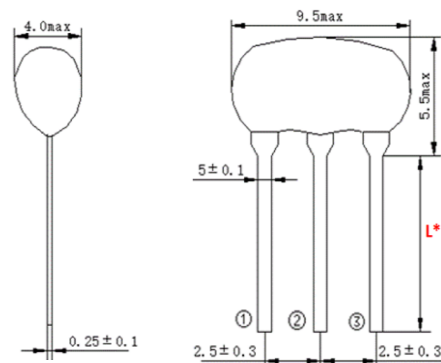
Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	2.00		6.00	MHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-25	-	+85	°C	
Storage Temperature Range	-55	-	+85	°C	
Built-in Capacitance		30	-	pF	MG: 2.00~6.00MHz
			-		
	-		-		
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-25 °C ~+85 °C
Resonant Impedance	25	30	80	ohm	
Aging per year*	-	-	±0.3	%	From initial value
Withstanding Voltage		50		V	DC, 5s Max.
Insulation Resistance Ri	500			MΩ	10V, 1min
Rating Voltage UR		6		V	DC
		15		V	p-p AC
IC	MG: 1/6TC4069UBP				

* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)

Table 1

Side View



L* (mm)	Package	Frequency Range (MHz)
13.5 Max	Tape/Box	2.000~6.000
5.0 Max.	In Bulk	2.000~6.000

#1 In/Output
#2 Ground
#3 Output/Input

PART NUMBER GUIDE

Example: TGS CRT 4.0MG TLF

[Part Number and Part Code Structure](#)

TGS	CRT	4.0	MG	T	LF XX
1	2	3	4	5	6 7

- 1) TGS: Company Code
- 2) CRT: Ceramic Resonator Built-in Capacitance, 3 Pins
- 4) 4.0: Frequency Range in MHz, 4.00MHz or specify
- 5) MG: Design Mode for different Frequency range. MG: 2.00~6.00MHz
- 6) T: Package in Bulk, 500pcs/Plastic Bag; T: Packed in Tape/Box, 2000pcs/Tape
- 7) LF: RoHS Compliant
- 8) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

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MAIN FEATURE

- SMD Package, 2 Pins, Lead Formed
- Compatible to Murata CSBFB
- Low Cost and short lead time
- Varies with Frequency Range

APPLICATION

- Communication and more



L7.0*W3.5*H9.0mm
Varies with Frequency Range

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	375	455	1250	KHz	see p/n guide or Specify
Frequency Accuracy		±0.5		%	@25 °C
Operating Temperture Range	-20	-	+85	°C	
Storage Temperature Range	-35	-	+85	°C	
Capacitance (C1/C2)	-	120/470	-	pF	C1: 120; C2: 470 for 375~429 KHz
		100	-		430~1250 KHz
	-		-		-
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-20 °C ~+85 °C
Resonant Impedance	-	-	100	ohm	See table 1
Aging per year*	-	-	±0.5	%	From initial value
Withstanding Voltage		100		V	DC, 5s Max.
Insulation Resistance Ri	100			MΩ	10V, 1min
Rating Voltage UR		50		V	DC
		15		V	p-p AC
IC	1/6CD4069UBE				

* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)

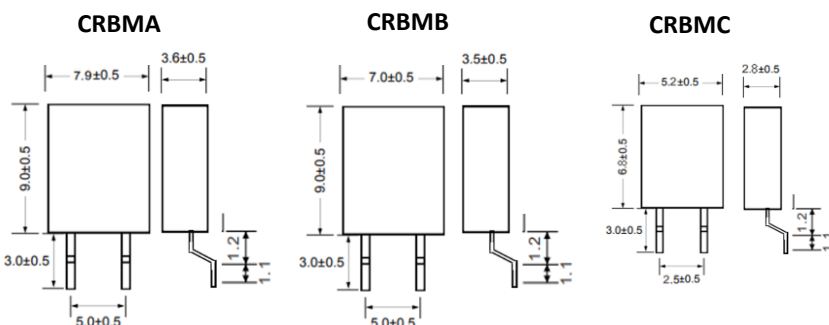


Table 1

Series No.	ESR (ohm) Max.	Frequency Range (KHz)
CRBMA	20	375~400
CRBMB	20	401~509
CRBMB	30	510~699
CRBMC	50	700~900
CRBMC	70	901~999
CRBMC	100	1000~1250

#1 In/Output #2 Output/Input

PART NUMBER GUIDE

Example: TGS CRBMB 455 TLF

[Part Number and Part Code Structure](#)

TGS	CR	B	M	B	455	T	LF	XX
1	2	3	4	5	6	7	8	9

1) TGS: Company Code

2) CR: Ceramic Resonator

3) B: 2 Pins

4) M: SMD Package , Lead Formed

5) B: Outline dimension, A: L7.9*W3.6*H9.0mm, B: L7.0*W3.5*H9.0mm; C: L5.2*W2.8*H6.8mm

6) 455: Frequency range; 455: 455KHz or specify

7) T: Package in Tape/Reel, 1000pcs/Reel

8) LF: RoHS Compliant

9) XX: Internal Control Code; Blank: N/A

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L7.0*W3.5*H9.0mm

Varies with Frequency Range

MAIN FEATURE

- Thru Hole Type, 2 Pins
- Low Cost and short lead time
- Varies with Frequency Range
- Compatible to Murata CSB Series

APPLICATION

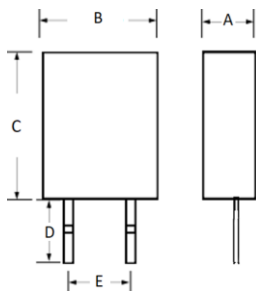
- Communication and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	190	455	1250	KHz	see p/n guide or Specify
Frequency Accuracy		±1.0		KHz	@25 °C , see table 1
Operating Temperature Range	-20	-	+85	°C	
Storage Temperature Range	-35	-	+85	°C	
Capacitance (C1/C2)	-	330/470	-	pF	330/470: 190~249KHz
		-	-		220/470: 250~374KHz; 120/470: 275~429KHz
	-	100	-		430~1250KHz
Temperature Coefficient	-	±0.3	-	%	Oscillation Freq. drift @-20 °C ~+85 °C
Resonant Impedance	-	-	100	ohm	See table 1
Aging per year*	-	-	±0.5	%	From initial value
Withstanding Voltage		100		V	DC, 5s Max.
Insulation Resistance Ri	100			MΩ	10V, 1min
Rating Voltage UR		50		V	DC
		15		V	p-p AC
IC	1/6CD4069UBE				

* Parts shall be left in a chamber of +85 °C ±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

DIMENSION (mm)



#1 In/Output
#2 Output/Input

Table 1

Frequency Range (KHz)	Dimension (+/-0.3mm)					ESR (ohm) Max.	Frequency Tolerance @25 °C
	A	B	C	D	E		
190~249	3.8	13.5	14.7	8.0	10.0	20	+/-1.0KHz
250~374	3.8	11.0	12.2	7.0	7.7	20	
375~449	3.6	7.9	9.3	6.0	5.0	20	+/-2.0KHz
450~699	3.5	7.0	9.0	5.0	5.0	40	
700~1250	2.2	5.0	6.0	3.5	2.5	100	+/-0.5%

PART NUMBER GUIDE

Example: TGS CRB 455E BLF

[Part Number and Part Code Structure](#)

TGS	CR	B	455	E	B	LF	XX
1	2	3	4	5	6	7	8

- 1) TGS: Company Code
- 2) CR: Ceramic Resonator
- 3) B: 2 Pins
- 4) 455: Frequency range; 455: 455KHz or specify
- 5) E: Grade for different frequency range
- 6) B: Packed in Bulk
- 7) LF: RoHS Compliant
- 8) XX: Internal Control Code; Blank: N/A

MAIN FEATURE

- Extra SMD Package, 2 pads, 10.7000MHz
- Low Cost and short lead time • Compatible to Murata CDACC Series

APPLICATION

- Clock oscillators for microprocessors
- Small electronic equipment and more



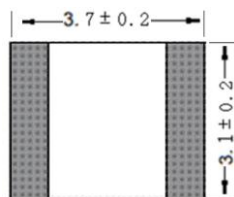
L3.7*W3.1*H1.4mm

STANDARD SPECIFICATION

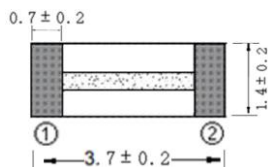
Part Number	Demodulation Output at F0 mv (Min.)	Distortion Factor at F0% (max.)	3dB Band Width kHz (max.)	Applicable IC Model No.
TGS CDCV 10.7MG1 TLF	25	1.0	345	CX-2009, CX-20111
TGS CDCV 10.7MG3 TLF	650	1.0	±150	TA7303P, TA7130, PC1028H, LA1150
TGS CDCV 10.7MG16 TLF	60-90	0.9	300	TA8122AN
TGS CDCV 10.7MG18 TLF	60-90	0.9	300	TA8132N
TGS CDCV 10.7MG33 TLF	45	0.7	250	TA2007
TGS CDCV 10.7MG80 TLF	65	1.0	300	TA2104AFN
TGS CDCV 10.7MG82 TLF	90	0.8	320	TA2099N
TGS CDCV 10.7MG92 TLF	60	1.0	300	TA2132P
TGS CDCV 10.7MC1 TLF	35	1.0	242	CXA1019M, CX-20091

DIMENSION (mm)

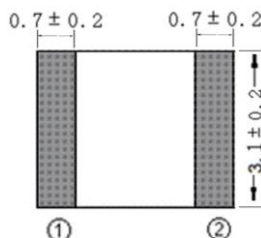
Top View



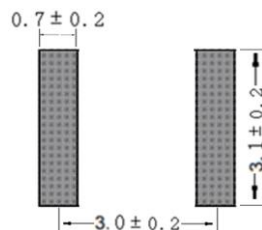
Side View



Bottom View



Solder Pattern



#1 In/Output #2 Output/Input

PART NUMBER GUIDE

Example: TGS CDCV10.7MG1 TLF

[Part Number and Part Code Structure](#)

TGS	CD	CV	10.7M	G1	T	LF	XX
1	2	3	4	5	6	7	8

- 1) TGS: Company Code
- 2) CD: Ceramic Discriminators
- 3) CV: SMD type, Outline Dimensions L3.7*W3.1*H1.4mm
- 4) 10.7M: Frequency Range in MHz, 10.70MHz
- 5) G1: Design Mode for IC
- 6) T: Packed in Tape/Reel, 3000pcs/Reel
- 7) LF: RoHS Compliant
- 8) XX: Internal Control Code; Blank: N/A

MAIN FEATURE

- SMD Package, 2 pads, 450KHz & 455KHz
- Low Cost and short lead time • Compatible to Murata CDBKB Series

APPLICATION

- Communication and more



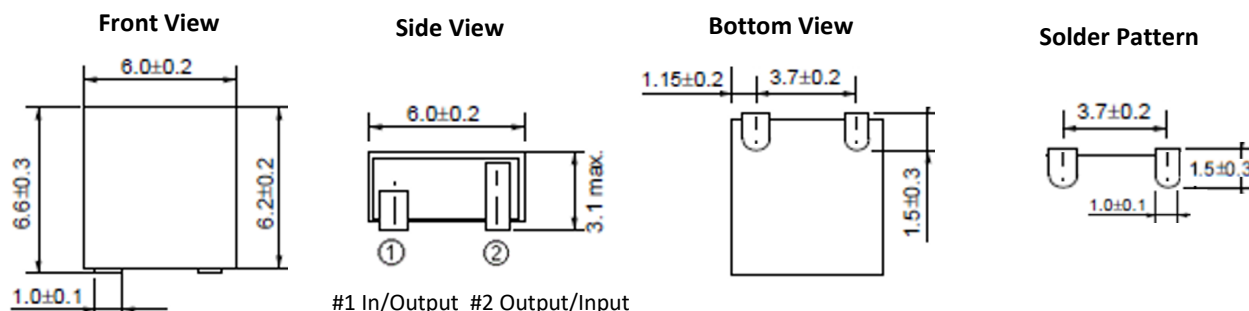
L6.2*W6.0*H3.1mm

STANDARD SPECIFICATION

Short Part Number	*Freq. (f0) ± 1.0 (KHz)	Bandwidth Min. (KHz)	Output Min. (mV)	Factor @f0 Max. (%)	IC Model No.
TGS CDBC455C07 TLF	455.00	±4.0	350 ± 60	3.0	MC3357
TGS CDBC455C09 TLF	455.00	±4.0	120 ± 40	1.5	NE604N
TGS CDBC455C13 TLF	455.00	±4.0	330 ± 50	4.0	CXA1003BM
TGS CDBC455C16 TLF	455.00	±4.0	175 ± 40	2.0	MC3372
TGS CDBC455C24 TLF	455.00	±4.0	100 ± 40	2.0	TA31136
TGS CDBC455C27 TLF	455.00	±4.0	90 ± 30	2.0	TK10487
TGS CDBC455C28 TLF	455.00	±4.0	40 ± 20	3.0	TA31142F
TGS CDBC455C29 TLF	455.00	±4.0	100 ± 30	2.5	NE605
TGS CDBC455C35 TLF	455.00	±4.0	100 ± 40	2.5	TK10930
TGS CDBC455C36 TLF	455.00	±13.0	90 ± 30	2.5	NE(SA)606
TGS CDBC455C39 TLF	455.00	±11.0	130 ± 20	2.5	NE607/NE617
TGS CDBC455C40 TLF	455.00	±4.0	40 ± 20	3.5	TA31145
TGS CDBC455C49 TLF	455.00	±4.0	45 ± 10	3.0	MC3361
TGS CDBC455C50 TLF	455.00	±4.0	64 ± 6.4	4.0	CXA3117N
TGS CDBC455C66 TLF	455.00	±4.2	40 ± 10	4.0	NJM2590
TGS CDBC455C70 TLF	455.00	±5.0	85 ± 10	4.5	NJM2591V(JRC)
TGS CDBC455C71 TLF	455.00	±5.0	90 ± 30	5.0	NJM2590-2597
TGS CDBC455C72 TLF	455.00	±5.0	100 ± 40	3.0	NJM2590-2597

*Center Frequency Range 450.000KHz is also available

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CDBC455C24TLF

[Part Number and Part Code Structure](#)

TGS	CD	BC	455	C24	T	LF	XX
1	2	3	4	5	6	7	8

- 1) TGS: Company Code
- 2) CD: Ceramic Discriminators
- 3) BC: SMD Type, Outline Dimensions, L6.5*W6.0*H2.8mm
- 4) 455: Frequency Range in KHz, 455KHz or specify
- 5) C24: Design mode code
- 6) T: Package in Tape/Reel, 1000pcs/Reel
- 7) LF: RoHS compliant
- 8) XX: Internal Control Code- 2 letter or digital ; Blank: N/A

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MAIN FEATURE

- SMD Package, 4 pads, 10.70MHz • Low Cost and short lead time
- Compatible to Murata SFEFC/SFECV Series

APPLICATION

- Communication and more



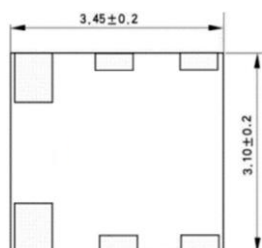
L3.45*W3.1*H1.4mm

STANDARD SPECIFICATION

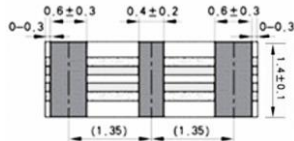
Short Part Number	Unit	CF33 10.7MS3	CF33 10.7MS2	CF33 10.7MSA5	CF33 10.7MSA20
3dB Band Width kHz (Min.)	KHz	180±40	230±50	280±50	330±50
20dB Band Width kHz (Max.)	KHz	470	510	590	700
Insertion Loss (Max.)	dB	4.5±2.0	3.5±2.0	3.0±2.0	3.0±2.0
Spurious Attenuation (9-12MHz)	dB	30	30	30	30
Operating Temp. Range	°C	-20~+85			
Storage Temp. Range	°C	-40~+85			
Ripple Max.	dB	1.0			
Temp. Coefficient of Freq. Max.	ppm/°C	±50 '@ -20 ~ +80 °C			
Input/Output Impedance typ.	ohm	330			
Insulation Resistance Min.	Mohm	100 @DC 10V 1 minute+/-5 sec.			
Withstand DC Voltage Max.	V	50 @ 1 min			

DIMENSION (mm)

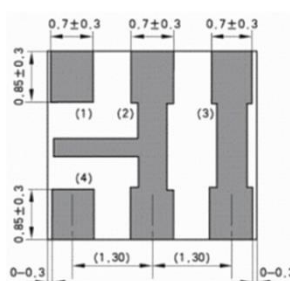
Top View



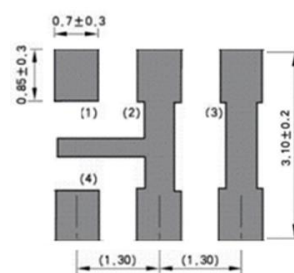
Side View



Bottom View



Solder Pattern



① Input ② Ground ③ N/A ④ Output

PART NUMBER GUIDE

Example: TGS CF33 10.7M SA5TLF

[Part Number and Part Code Structure](#)

TGS	CF 33	10.7M	SA5	T	LF	XX
1	2	3	4	5	6	7

- 1) TGS: Company Code
- 2) CF33: Ceramic Filter, SMD Type L3.45*W3.1*H1.4mm
- 3) 10.7M: Frequency Range in MHz, 10.70MHz
- 4) SA5: Design Mode Code or Specify
- 5) T: Package in Tape/Reel, 4000pcs/Reel
- 6) LF: RoHS Compliant
- 7) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

MAIN FEATURE

- SMD Package, 3 pads, 10.70MHz • Low Cost and short lead time
- Compatible to Murata SFEFCF/SFECV Series

APPLICATION

- Communication and more

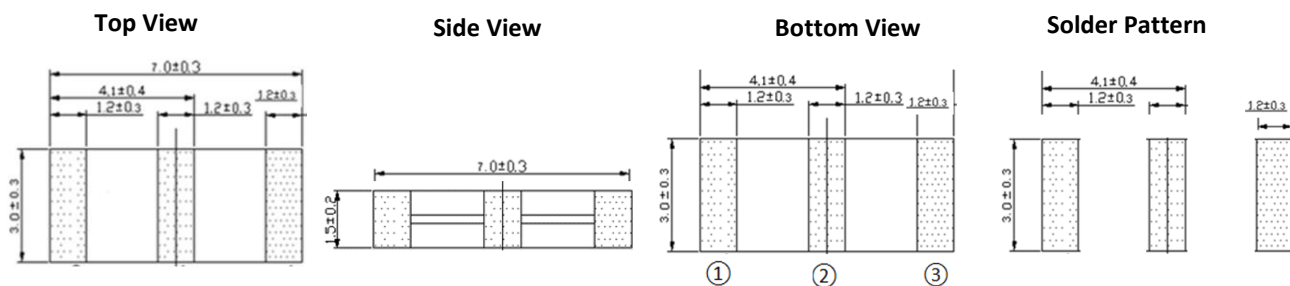


L7.0*W3.0*H1.5mm

STANDARD SPECIFICATION

Short Part Number	3dB Band Width	20dB Band Width	Insertion Loss	Spurious Attenuation (9-12MHz)	Operating Temp. Range	Storage Temp.	Ripple	Temp. Coefficient of Freq.	Input/ Output Impedance	Insulation Resistance	Withstand DC Voltage
	KHz Min	KHz Min	dB Max.	dB	°C	°C	dB Max.	ppm/°C Max.	ohm	Mohm Min.	V Max.
CF7310.7MAJ	150±40	430	≤10.0	30	-20~+85	-40~+85	1.0	±50	330	100 @DC 10V 1 minute +/-5 sec.	50 @ 1 min
CF7310.7MVJ	150±40	380	5.5±2.0	35							
CF7310.7MAS3	180±40	520	≤6.0	30							
CF7310.7MVS3	180±40	470	4.0±2.0	35							
CF7310.7MAS2	230±40	570	≤6.0	30							
CF7310.7MVS2	230±40	510	3.5±2.0	35							
CF7310.7MAA5	280±40	650	≤6.0	30							
CF7310.7MVA5	280±40	590	3.0±2.0	35							
CF7310.7MVA20	330±40	700	3.0±2.0	30							
CF7310.7MVA19	Fn±175.	950	3.0±2.0	20 (5-15MHz)					470		

DIMENSION (mm)



① Input ② Ground ③ Output

PART NUMBER GUIDE

Example: TGS CF73 10.7MAA5 TLF

[Part Number and Part Code Structure](#)

TGS	CF73	10.7M	AA5	T	LF	XX
1	2	3	4	4	4	7

- 1) TGS: Company Code
- 2) CF73: Ceramic Filter, SMD Type L7.0*W3.0*H1.5mm
- 3) 10.7M: Frequency Range in MHz, 10.70MHz
- 4) AA5: Design Mode Code or specify
- 5) T: Package in Tape/Reel, 4000pcs/Reel
- 6) LF: RoHS Compliant
- 7) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

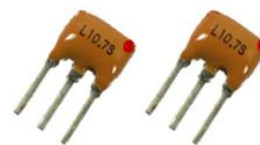
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MAIN FEATURE

- SMD Package, 3 pins, 10.70MHz • Low Cost and short lead time
- Compatible to Murata SFEFCF/SFEVCV Series

APPLICATION

- Communication and more



L7.0*W4.0*H7.0mm

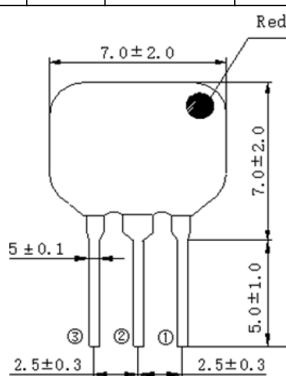
STANDARD SPECIFICATION

Part Number	3dB Band Width	20dB Band Width	Insertion Loss	Spurious Attenuation (9-12MHz)	Operating Temp. Range	Storage Temp. Range	Ripple	Temp. Coefficient of Freq.	Input/Output Impedance	Insulation Resistance	Withstand DC Voltage
	KHz Min	KHz Min	dB Max.	dB	°C	°C	dB Max.	ppm/°C Max.	ohm	Mohm Min.	V Max.
CF10.7MA5	280±50	650	6.0	30	-20~+85	-40~+85	1.0	±50	330	100 @DC 10V 1 minute +/-5 sec.	50 @ 1 min
CF10.7MS2	230±50	600	6.0	40							
CF10.7MS3	180±40	520	7.0	40							
CF10.7MA5A10	280±50	591	2.5±2.0	30							
CF10.7MS2A10	230±50	520	3.0±2.0	35							
CF10.7MS3A10	180±40	470	3.5±2.0	35							
CF10.7MJA10	150±40	360	4.5±2.0	35							
CF10.7MA21	400 min.	950	3.0±2.0	20							
CF10.7MA19	±170	950	3.0±2.0	20							
CF10.7MA20	330±50	680	4.0±2.0	30							
CF10.7MHY	110±30	350	5.5±2.0	30							
CF10.7MFP	20 Min.	95	6.0 Max.	24							
CF10.7MA5L	280±50	650	6.0	30							
CF10.7MS2L	230±50	600	6.0	40							
CF10.7MS3L	180±40	520	7.0	40							
CF10.7MJL	150±40	400	10.0	40							
CF10.7MA5LA10	280±50	590	2.5±1.5	30							
CF10.7MS2LA10	230±50	520	3.±2.0	35							
CF10.7MS3LA10	180±40	470	3.5±1.5	35							
CF10.7MJLA10	150±40	360	5.5±2.0	35							

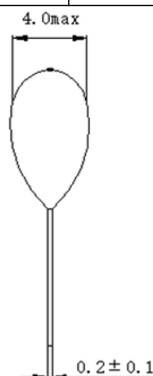
DIMENSION (mm)

Top View

- ① Input
- ② Ground
- ③ Output



Side View



PART NUMBER GUIDE

Example: TGS CF 10.7MS3 BLF

Part Number and Part Code Structure

TGS	CF	10.7M	S3	B	LF	XX
1	2	3	4	5	6	7

- 1) TGS: Company Code
- 2) CF: Ceramic Filter, 3 pins, L7.0*W4.0*H7.0mm
- 3) 10.7M: Frequency Range in MHz, 10.70MHz
- 4) S3: Design Mode Code
- 5) B: Package in BULK, 500pcs/Plastic Bag
- 6) LF: RoHS Compliant
- 7) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

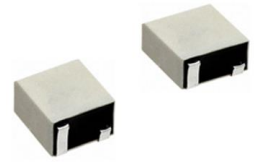
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MAIN FEATURE

- SMD Package, 3 Pads, 455KHz & 450KHz
- Compatible to Murata CFUK Series • Low Cost and short lead time

APPLICATION

- Communication and more



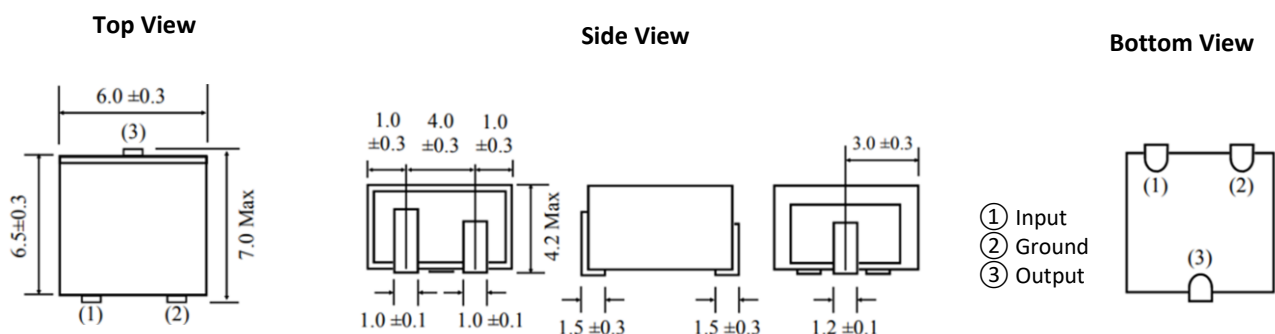
L6.5*W6.0*H4.2mm

STANDARD SPECIFICATION- 455KHz

Table 1

Short Part Number	Insertion Loss	6dB Band width	40dB Band width	GDT Deviation	Ripple	Spurious	Input/ Output	Temp. Stability	Insulation Resistance	Operating Temp. Range	Storage Temp.							
	dB Max.	KHz Max.	KHz Max.	μs Max.	dB Max.	dB	K ohm	%	M ohm Min.	°C	°C							
CFTC455AU	2.0	20.0	40.0	N/A	1.0	20	1000	±0.5	100 @DC 10V 1 minute +/-5 sec.	-20~+85	-40~+85							
CFTC455BU	2.0	15.0	30.0				1500											
CFTC455CU	2.0	12.5	24.0															
CFTC455DU	2.0	10.0	20.0		2.0		1500											
CFTC455EU	6.0	7.5	15.0		1.0							1000						
CFTC 455FU	2.0	6.0	12.5															
CFTC455GU	2.0	4.5	10.0				1500											
CFTC455HU	2.0	3.0	9.0															
CFTC455IU	4.0	2.0	7.5				1500											
CFTC455JUT	6.0	1.5	7.5															
CFTC455KU	8.0	1.0	6.0		50		1.0					1000						
CFTC455LU	2.0	24.0	48.0															
CFTC455KAU	2.0	20.0	48.0	1500														
CFTC455KBU	2.0	15.0	40.0															
CFTC455KCU	2.0	12.5	30.0	1500														
CFTC455KDU	2.0	10.0	24.0															
CFTC455KEU	2.0	7.5	20.0	1000														
CFTC455KFU	2.0	6.0	15.0															
CFTC455KGU	2.0	4.5	12.5	1500														
CFTC455KHU	2.0	3.0	10.0															
CFTC455KIU	4.0	2.0	9.0	15								1000						
CFTC455KJU	6.0	1.5	7.5															
CFTC455KKU	8.0	1.0	6.0									1500						
CFTC455KLU	2.0	24.0	60.0	20														
CFTC455KAU	2.0	20.0	48.0	15	1000													
CFTC455KBU	2.0	15.0	40.0															
CFTC455KCU	2.0	12.5	30.0		25							1500						
CFTC455KDU	2.0	10.0	24.0															
CFTC455KEU	2.0	7.5	20.0	1000														
CFTC455KFU	2.0	6.0	15.0															
CFTC455KGU	2.0	4.5	12.5	1500														
CFTC455KHU	2.0	3.0	10.0															
CFTC455KIU	4.0	2.0	10.0	1000														
CFTC455KJU	6.0	1.5	9.0									15						
CFTC455KKU	8.0	1.0	7.5	1000														
CFTC455KLU	2.0	24.0	60.0									15						

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CFTC 455KDU TLF

Part Number and Part Code Structure

TGS	CFTC	455	K	D	U	T	LF	XX
1	2	3	4	5	6	7	8	9

- 1) TGS: Company Code
- 2) CFTC: KHz SMD Ceramic Filter,
- 3) 455: Frequency range 455KHz; 450: 450.000KHz
- 4) K: K: GTD Deviation version; Blank: N/A
- 5) D: D: +/-10.0KHz Max. @6 dB; Please see Table 1 for A~L's different value
- 6) U: 3 pads, L6.5*W6.0*H4.2mm
- 7) T: Package in Tape/Reel, 1000pcs/Reel
- 8) LF: RoHS compliant
- 9) XX: Blank: N/A; XX: Internal Control Code- 2 letter or digits

MAIN FEATURE

- SMD Package, 4 Pads, 455KHz & 450KHz
- Compatible to Murata CFWK Series • Low Cost and short lead time

APPLICATION

- Communication and more



L12.0*W6.5*H3.0mm

STANDARD SPECIFICATION- 455KHz

Table 1

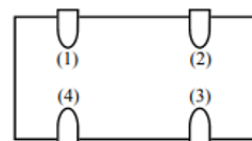
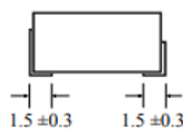
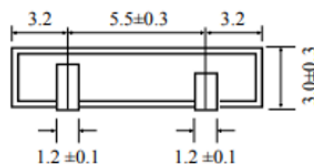
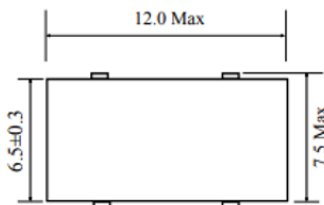
Short Part Number	Insertion Loss	6dB Band width	40dB Band width	GDT Deviation	Ripple	Spurious	Input/ Output	Temp. Stability	Insulation Resistance	Operating Temp. Range	Storage Temp.										
	dB Max.	KHz Max.	KHz Max.	μs Max.	dB Max.	dB	K ohm	%	M ohm Min.	°C	°C										
CFTC455AW	2.0	20.0	40.0	N/A	1.0	20	1000	±0.5	100 @DC 10V 1 minute +/-5 sec.	-20~+85	-40~+85										
CFTC455BW	2.0	15.0	30.0				1500														
CFTC455CW	2.0	12.5	24.0		2.0																
CFTC455DW	2.0	10.0	20.0		1500																
CFTC455EW	6.0	7.5	15.0		1.0		1000														
CFTC 455FW	2.0	6.0	12.5																		
CFTC455GW	2.0	4.5	10.0				1500														
CFTC455HW	2.0	3.0	9.0																		
CFTC455IW	4.0	2.0	7.5				1500														
CFTC455JW	6.0	1.5	7.5																		
CFTC455KW	8.0	1.0	6.0		50		1.0					1000									
CFTC455LW	2.0	24.0	48.0																		
CFTC455KAW	2.0	20.0	48.0	1500																	
CFTC455KBW	2.0	15.0	40.0																		
CFTC455KCW	2.0	12.5	30.0	1500																	
CFTC455KDW	2.0	10.0	24.0																		
CFTC455KEW	2.0	7.5	20.0	1000																	
CFTC455KFW	2.0	6.0	15.0																		
CFTC455KGW	2.0	4.5	12.5	1500																	
CFTC455KHW	2.0	3.0	10.0																		
CFTC455KIW	4.0	2.0	9.0	15								1000									
CFTC455KJW	6.0	1.5	7.5																		
CFTC455KKW	8.0	1.0	6.0									1500									
CFTC455KLW	2.0	24.0	60.0																		
CFTC455KAW	2.0	20.0	48.0									1000									
CFTC455KBW	2.0	15.0	40.0																		
CFTC455KCW	2.0	12.5	30.0									1500									
CFTC455KDW	2.0	10.0	24.0																		
CFTC455KEW	2.0	7.5	20.0	25								1000									
CFTC455KFW	2.0	6.0	15.0																		
CFTC455KGW	2.0	4.5	12.5									1500									
CFTC455KHW	2.0	3.0	10.0																		
CFTC455KIW	4.0	2.0	10.0									15			1000						
CFTC455KJW	6.0	1.5	9.0																		
CFTC455KKW	8.0	1.0	7.5									1500									
CFTC455KLW	2.0	24.0	60.0																		

DIMENSION (mm)

Top View

Side View

Bottom View



- ① Input
- ② Output
- ③ ④ Ground

PART NUMBER GUIDE

Example: TGS CFTC 455KDU TLF

[Part Number and Part Code Structure](#)

TGS	CF TC	455	K	D	W	T	LF	XX
1	2	3	4	5	6	7	8	9

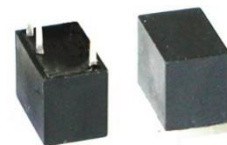
- 1) TGS: Company Code
- 2) CFTC: KHz SMD Ceramic Filter
- 3) 455: Frequency range 455KHz; 450: 450.000KHz
- 4) K: K: GTD Deviation version; Blank: N/A
- 5) D: D: +/-10.0KHz Max. @6 dB; Please see Table 1 for A~L's different value
- 6) W: 4 Pads, L12.0*W6.5*H3.0mm
- 7) T: Package in Tape/Reel, 1000pcs/Reel
- 8) LF: RoHS compliant
- 9) XX: Blank: N/A; XX: Internal Control Code- 2 letter or digits

MAIN FEATURE

- Thru Hole Package, 3 Pads, 455KHz & 450KHz
- Compatible to Murata CFU Series • Low Cost and short lead time

APPLICATION

- Communication and more



L8.0*W7.0*H8.0mm

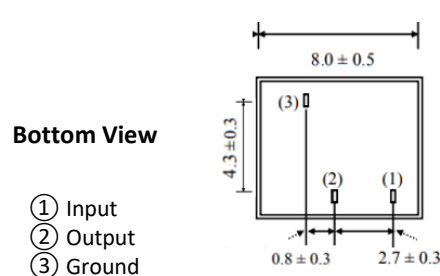
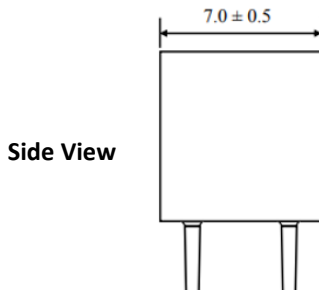
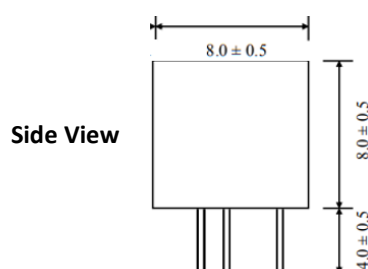
STANDARD SPECIFICATION- 455KHz

Table 1

Short Part Number	Center* Freq.	Insertion Loss	6 dB Band width	50 dB Band width	Ripple	Input/ Output	Temp. Stability	Insulation Resistance	Operating Temp. Range	Storage Temp.
	KHz	dB Max.	KHz Max.	KHz Max.	dB Max.	K ohm	%	M ohm Min.	°C	°C
CF455BU	455±2.0	4.0	±15.0	±30.0	2.0	1500	±0.5	100 @DC 10V 1 minute +/-5 sec.	-20~+85	-40~+85
CF455CU	455±2.0	4.0	±12.5	±24.0		1500				
CF455DU	455±1.5	4.0	±10.0	±20.0		1500				
CF455EU	455±1.5	6.0	±7.5	±15.0		1500				
CF455FU	455±1.5	4.0	±6.0	±12.5		2000				
CF455GU	455±1.5	6.0	±4.5	±10.0		2000				
CF455HU	455±1.0	6.0	±3.0	±9.0		2000				
CF455IU	455±1.0	6.0	±2.0	±7.5		2000				
CF455HTU	455±1.0	6.0	±3.0	±9.0		2000				
CF455ITU	455±1.0	6.0	±2.0	±7.5		2000				

*Center Frequency Range 450.000KHz is also available

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CF455EU BLF

[Part Number and Part Code Structure](#)

TGS	CF	455	E	U	B	LF	XX
1	2	3	4	5	6	7	8

- 1) TGS: Company Code
- 2) CF: Ceramic Filter
- 3) 455: Frequency Range 455: 455KHz; 450: 450KHz
- 4) E: Design Mode Code
- 5) U: 3 Pins, L8.0*W7.0*H8.0mm
- 6) B: Package in Bulk
- 7) LF: RoHS compliant
- 8) XX: Internal Control Code- 2 letter or digital ; Blank: N/A

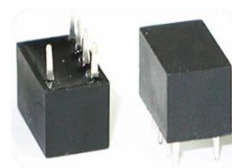
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MAIN FEATURE

- Thru Hole Package, 5 Pads, 455KHz & 450KHz
- Compatible to Murata CFW Series • Low Cost and short lead time

APPLICATION

- Communication and more



L11.0*W7.0*H8.0mm

STANDARD SPECIFICATION- 455KHz

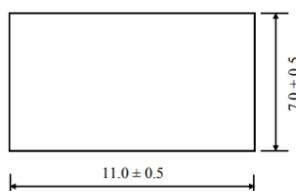
Table 1

Short Part Number	Center* Freq.	Insertion Loss	6 dB Band width	50 dB Band width	Ripple	Input/ Output	Temp. Stability	Insulation Resistance	Operating Temp. Range	Storage Temp.
	KHz	dB Max.	KHz Max.	KHz Max.	dB Max.	K ohm	%	M ohm Min.	°C	°C
CF455BW	455±2.0	4.0	±15.0	±30.0	2.0	1500	±0.5	100 @DC 10V 1 minute +/-5 sec.	-20~+85	-40~+85
CF455CW	455±2.0	4.0	±12.5	±24.0		1500				
CF455DW	455±1.5	4.0	±10.0	±20.0		1500				
CF455EW	455±1.5	6.0	±7.5	±15.0		1500				
CF455FW	455±1.5	4.0	±6.0	±12.5		2000				
CF455GW	455±1.5	6.0	±4.5	±10.0		2000				
CF455HW	455±1.0	6.0	±3.0	±9.0		2000				
CF455IW	455±1.0	6.0	±2.0	±7.5		2000				
CF455HTW	455±1.0	6.0	±3.0	±9.0		2000				
CF455ITW	455±1.0	6.0	±2.0	±7.5		2000				

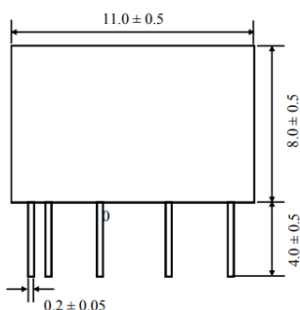
*Center Frequency Range 450.000KHz is also available

DIMENSION (mm)

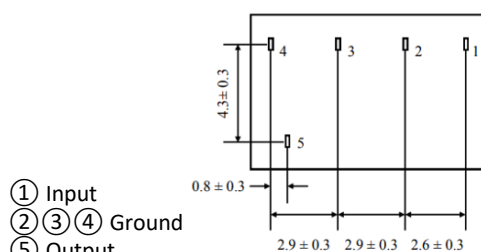
Top View



Side View



Bottom View



- ① Input
- ② ③ ④ Ground
- ⑤ Output

PART NUMBER GUIDE

Example: TGS CF455EW BLF

Part Number and Part Code Structure

TGS	CF	455	E	W	B	LF	XX
1	2	3	4	5	6	7	8

- 1) TGS: Company Code
- 2) CF: Ceramic Filter
- 3) 455: Frequency Range 455: 455KHz; 450: 450KHz
- 4) E: Design Mode Code
- 5) W: 3 Pins, L11.0*W7.0*H8.0mm
- 6) B: Package in Bulk
- 7) LF: RoHS compliant
- 8) XX: Internal Control Code- 2 letter or digital ; Blank: N/A

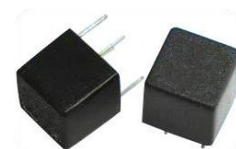
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MAIN FEATURE

- Thru Hole Package, 4 Pads, 455KHz & 450KHz
- Compatible to Murata CFMU Series • Low Cost and short lead time

APPLICATION

- Communication and more



L6.5*W6.5*H6.3mm

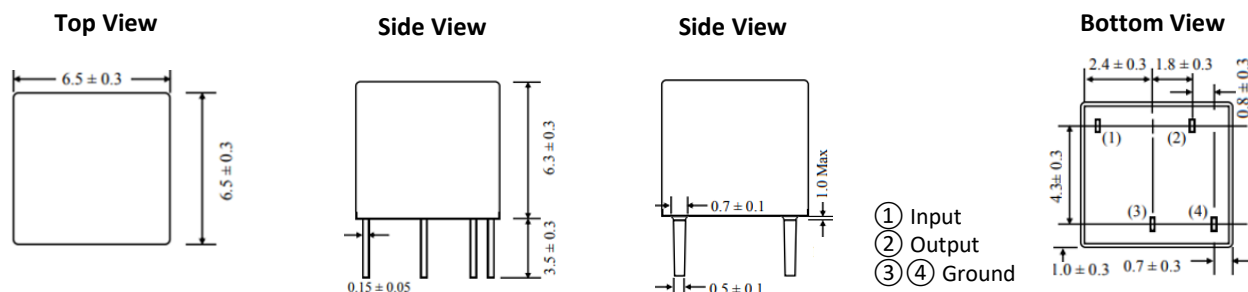
STANDARD SPECIFICATION- 455KHz

Table 1

Short Part Number	Center Freq.	Insertion Loss	6 dB Band width	50 dB Band width	Ripple	Input/ Output	Temp. Stability	Insulation Resistance	Operating Temp. Range	Storage Temp.
	KHz	dB Max.	KHz Max.	KHz Max.	dB Max.	K ohm	%	M ohm Min.	°C	°C
CFM455BU	455±2.0	4.0	±15.0	±30.0	2.0	1500	±0.5	100 @DC 10V 1 minute +/-5 sec.	-20~+85	-40~+85
CFM455CU	455±2.0	4.0	±12.5	±24.0		1500				
CFM455DU	455±1.5	4.0	±10.0	±20.0		1500				
CFM455EU	455±1.5	6.0	±7.5	±15.0		1500				
CFM455FU	455±1.5	4.0	±6.0	±12.5		2000				
CFM455GU	455±1.5	6.0	±4.5	±10.0		2000				
CFM455HU	455±1.0	6.0	±3.0	±9.0		2000				
CFM455IU	455±1.0	6.0	±2.0	±7.5		2000				
CFM455HTU	455±1.0	6.0	±3.0	±9.0		2000				
CFM455ITU	455±1.0	6.0	±2.0	±7.5		2000				

*Center Frequency Range 450.000KHz is also available

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS CFM455EU BLF

[Part Number and Part Code Structure](#)

TGS	CFM	455	E	U	B	LF	XX
1	2	3	4	5	6	7	8

- 1) TGS: Company Code
- 2) CFM: Ceramic Filter, M type, L6.5*W6.5*H6.3mm
- 3) 455: Frequency Range 455: 455KHz; 450: 450KHz
- 4) E: Design Mode Code
- 5) U: 3 Pins
- 6) B: Package in Bulk
- 7) LF: RoHS compliant
- 8) XX: Internal Control Code- 2 letter or digital ; Blank: N/A

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L9.5*W6.5*H6.3mm

MAIN FEATURE

- Thru Hole Package, 5 Pads, 455KHz & 450KHz
- Compatible to Murata CFMW Series • Low Cost and short lead time

APPLICATION

- Communication and more

STANDARD SPECIFICATION- 455KHz

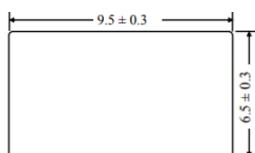
Table 1

Short Part Number	Center Freq.	Insertion Loss	6 dB Band width	50 dB Band width	Ripple	Input/ Output	Temp. Stability	Insulation Resistance	Operating Temp. Range	Storage Temp.
	KHz	dB Max.	KHz Max.	KHz Max.	dB Max.	K ohm	%	M ohm Min.	°C	°C
CFM455BW	455±2.0	4.0	±15.0	±30.0	2.0	1500	±0.5	100 @DC 10V 1 minute +/-5 sec.	-20~+85	-40~+85
CFM455CW	455±2.0	4.0	±12.5	±24.0		1500				
CFM455DW	455±1.5	4.0	±10.0	±20.0		1500				
CFM455EW	455±1.5	6.0	±7.5	±15.0		1500				
CFM455FW	455±1.5	4.0	±6.0	±12.5		2000				
CFM455GW	455±1.5	6.0	±4.5	±10.0		2000				
CFM455HW	455±1.0	6.0	±3.0	±9.0		2000				
CFM455IW	455±1.0	6.0	±2.0	±7.5		2000				
CFM455HTW	455±1.0	6.0	±3.0	±9.0		2000				
CFM455ITW	455±1.0	6.0	±2.0	±7.5		2000				

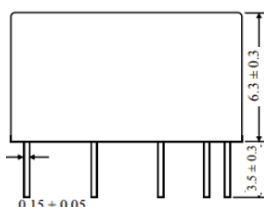
*Center Frequency Range 450.000KHz is also available

DIMENSION (mm)

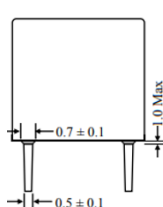
Top View



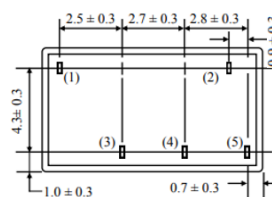
Side View



Side View



Bottom View



- ① Input
② Output
③ ④ ⑤ Ground

PART NUMBER GUIDE

Example: TGS CFM455EW BLF

[Part Number and Part Code Structure](#)

TGS	CFM	455	E	W	B	LF	XX
1	2	3	4	5	6	7	8

- 1) TGS: Company Code
- 2) CFM: Ceramic Filter, M type, L9.5*W6.5*H6.3mm
- 3) 455: Frequency Range 455: 455KHz; 450: 450KHz
- 4) E: Design Mode Code
- 5) W: 5 Pins
- 6) B: Package in Bulk
- 7) LF: RoHS compliant
- 8) XX: Internal Control Code- 2 letter or digital ; Blank: N/A

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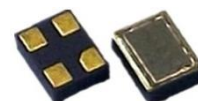
- *MHz SMD Oscillators*
- *MHz Thru Hole Oscillators*
- *KHz SMD Oscillators*
- *MHz Thru Hole OCXO*
- *MHz SMD VCXO*
- *MHz SMD TCXO*

MAIN FEATURE

- Wide Frequency range
- 1.8V, 2.5V and 3.3Voption • Industry standard option

APPLICATION

- PDA, PND, DSC, Smart phone, WiLAN, Bluetooth and more

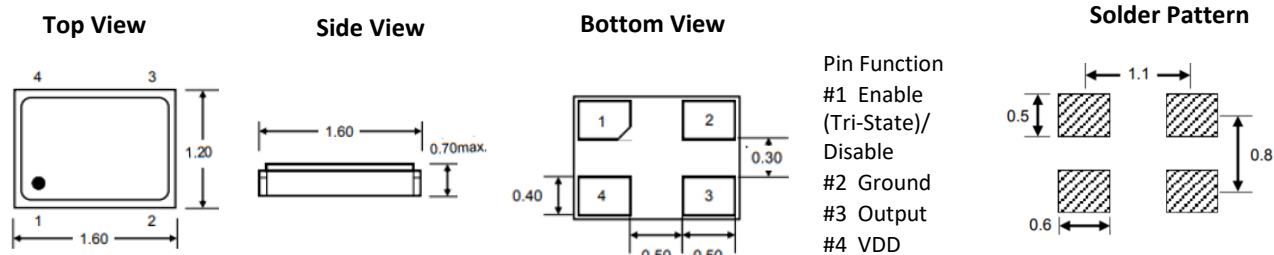


L1.6*W1.2*H0.70mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	or Specify 1.8V/2.5V
Frequency Range	1		80	MHz	or Specify
Overall Freq. Tolerance	-	±50		ppm	or Specify
Operating Temp. Range	0	-	70	°C	see p/n guide or Specify
Output	VOH	90%	-	V	@90% x VDD
	VOL	-	10%	V	@10% x VDD
	Load	-	15	pF	see p/n guide or Specify
Enable/Disable Function	-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry	40	-	60		see p/n guide or Specify
Startup Time	-	-	10	ms	
Supply Current	-	-	2	mA	Subject to different frequency range
Rise/ Fall time	-	-	10	ns	
Storage Temperature Range	-55	-	125	°C	
Aging per year	-	±5		ppm	

DIMENSION (+/-0.1mm)



PART NUMBER GUIDE

Example: TGS COM1131BDH03TLF-24M000

[Part Number and Part Code Structure](#)

TGS	COM11	3 1	B D H	03	T	LF XX	-24M000
1	2	3 4	5 6 7	8	9	10 11	12

- 1) TGS: Company Code
- 2) COM11: MHz SMD Oscillator, 4 pads, L1.6*W1.2*H0.70mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: Output Load: 01: 1-10TTL//15pF; 03: HCMOS//15pF; 04: HCMOS//30pF; 05: HCMOS//50pF or Specify
- 9) T: Packed in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Complaint 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 24M000: Frequency Range 24.000MHz or specify

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MAIN FEATURE

- Wide Frequency range
- 1.8V, 2.5V and 3.3Voption • Industry standard option

APPLICATION

- PDA, PND, DSC, Smart phone, WiLAN, Bluetooth and more

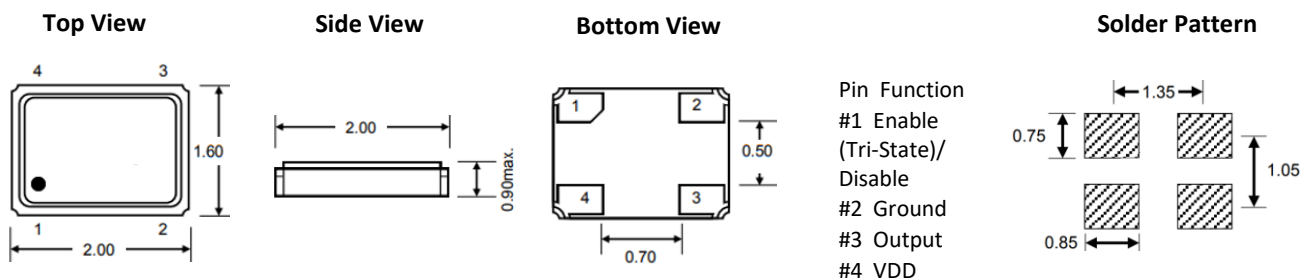


L2.0*W1.6*H0.90mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	or Specify 1.8V/2.5V
Frequency Range	1.00		80.00	MHz	or Specify
Overall Freq. Tolerance	-	±50		ppm	or Specify
Operating Temp. Range	0	-	70	°C	see p/n guide or Specify
Output	VOH	90%	-	V	@90% x VDD
	VOL	-	10%	V	@10% x VDD
	Load	-	15	pF	see p/n guide or Specify
Enable/Disable Function	-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry	40	-	60		see p/n guide or Specify
Startup Time	-	-	10	ms	
Supply Current	-	-	5	mA	Subject to different frequency range
Rise/ Fall time	-	-	10	ns	
Storage Temperature Range	-55	-	125	°C	
Aging per year	-	±5		ppm	

DIMENSION (+/-0.1mm)



PART NUMBER GUIDE

Example: TGS COM2131BDH03TLF-24M000

[Part Number and Part Code Structure](#)

TGS	COM21	3 1	B D H	03	T	LF XX	-24M000
1	2	3 4	5 6 7	8	9	10 11	12

- 1) TGS: Company Code
- 2) COM21: MHz SMD Oscillator, 4 pads, L2.0*W1.6*H0.90mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A-+/-25ppm; B: +/-50ppm; C: +/-100ppm; J-+/-20ppm or Specify
- 6) D: Operating Temp. Range, D-0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: Output Load: 01: 1-10TTL//15pF; 03:HCMOS//15pF; 04: HCMOS//30pF; 05: HCMOS//50pF or Specify
- 9) T: Packed in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Complaint 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 24M000: Frequency Range 24.000MHz or specify

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MAIN FEATURE

- Wide Frequency range
- 1.8V, 2.5V, 3.3 and 5.0V option • Industry standard option

APPLICATION

- PDA, PND, DSC, Smart phone, WiLAN, Bluetooth and more

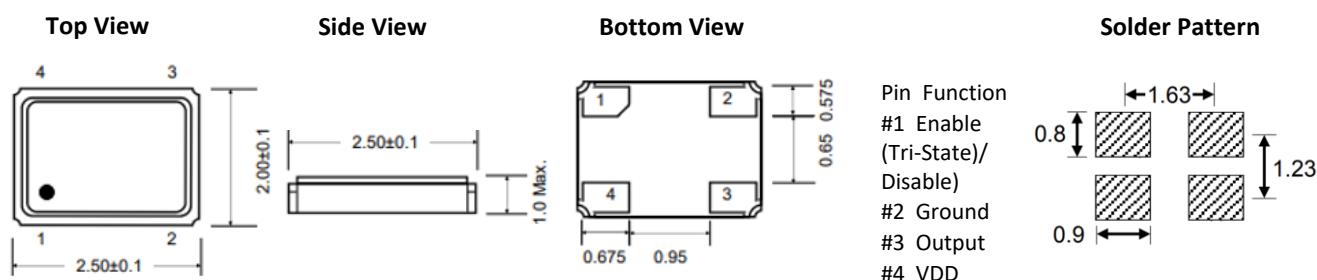


L2.5*W2.0*H1.0mm

STANDARD SPECIFICATION

Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	see p/n guide or Specify
Frequency Range		1.00		150.00	MHz	see p/n guide or Specify
Overall Freq. Tolerance		-	±50		ppm	see p/n guide or Specify
Operating Temp. Range		0	-	70	°C	see p/n guide or Specify
Output	VOH	90%	-	-	V	@90% x VDD
	VOL	-	-	10%	V	@10% x VDD
	Load	-	15	-	pF	see p/n guide or Specify
Enable/Disable Function		-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry		40	-	60		see p/n guide or Specify
Startup Time		-	-	10	ms	
Supply Current		-	-	15	mA	Subject to different frequency range
Rise/ Fall time		-	-	10	ns	
Storage Temperature Range		-55	-	125	°C	
Aging per year		-	±5		ppm	

DIMENSION (+/-0.1mm)



PART NUMBER GUIDE

Example: TGS COM2231BDH03TLF-24M000

[Part Number and Part Code Structure](#)

TGS	COM22	3 1	B D H	03	T	LF XX	-24M000
1	2	3 4	5 6 7	8	9	10 11	12

- 1) TGS: Company Code
- 2) COM22: MHz SMD Oscillator, 4 pads, L2.5*W2.0*H1.0mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V; 5: 5.0V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: Output Load: 01: 1-10TTL//15pF; 03: HCMOS//15pF; 04: HCMOS//30pF; 05: HCMOS//50pF or Specify
- 9) T: Packed in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Complaint 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 24M000: Frequency Range 24.000MHz or specify

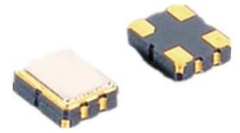
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MAIN FEATURE

- Wide Frequency range
- 1.8V, 2.5V, 3.3 and 5.0V option • Industry standard option

APPLICATION

- PDA, PND, DSC, Smart phone, WiLAN, Bluetooth and more

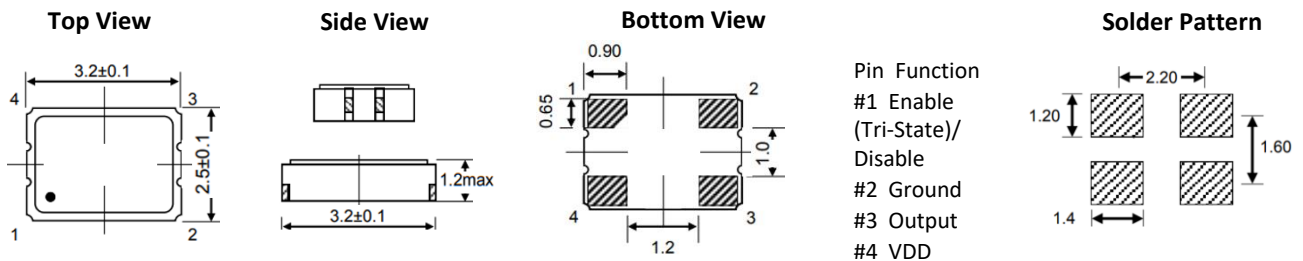


L3.2*W2.5*H1.2mm

STANDARD SPECIFICATION

Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	see p/n guide or Specify
Frequency Range		1.00		150.00	MHz	see p/n guide or Specify
Overall Freq. Tolerance		-	±50		ppm	see p/n guide or Specify
Operating Temp. Range		0	-	70	°C	see p/n guide or Specify
Output	VOH	90%	-	-	V	@90% x VDD
	VOL	-	-	10%	V	@10% x VDD
	Load	-	15	-	pF	see p/n guide or Specify
Enable/Disable Function:		-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry		40	-	60		see p/n guide or Specify
Startup Time		-	-	10	ms	
Supply Current		-	-	15	mA	Subject to different frequency range
Rise/ Fall time		-	-	10	ns	
Storage Temperature Range		-55	-	125	°C	
Aging per year		-	±5		ppm	

DIMENSION (+/-0.1mm)



PART NUMBER GUIDE

Example: TGS COM3231BDH03TLF-24M000

[Part Number and Part Code Structure](#)

TGS	COM32	3 1	B D H	03	T	LF XX	-24M000
1	2	3 4	5 6 7	8	9	10 11	12

- 1) TGS: Company Code
- 2) COM32: MHz SMD Oscillator, 4 pads, L3.2*W2.5*H1.2mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V; 5: 5.0V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: Output Load: 01: 1-10TTL//15pF; 03: HCMOS//15pF; 04: HCMOS//30pF; 05: HCMOS//50pF or Specify
- 9) T: Packed in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Complaint
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 24M000: Frequency Range 24.000MHz or specify

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MAIN FEATURE

- Wide Frequency range
- 1.8V, 2.5V, 3.3 and 5.0V option • Industry standard option

APPLICATION

- PDA, PND, DSC, Smart phone, WiLAN, Bluetooth and more

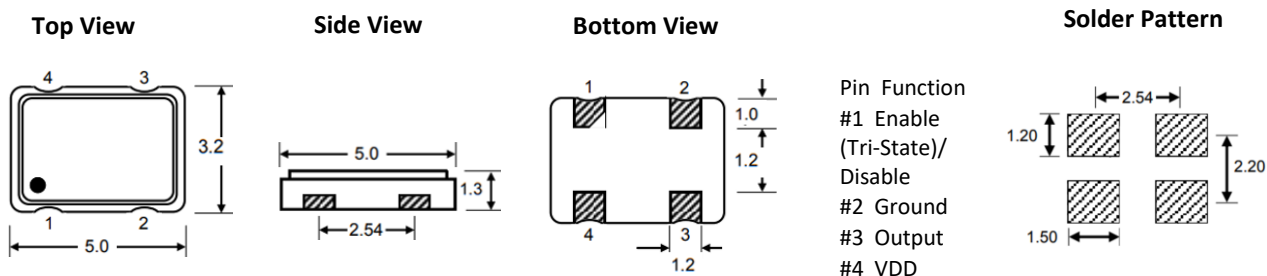


L5.0*W3.2*H1.3mm

STANDARD SPECIFICATION

Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	see p/n guide or Specify
Frequency Range		1.00		125.00	MHz	see p/n guide or Specify
Overall Freq. Tolerance		-	±50		ppm	see p/n guide or Specify
Operating Temp. Range		0	-	70	°C	see p/n guide or Specify
Output	VOH	90%	-	-	V	@90% x VDD
	VOL	-	-	10%	V	@10% x VDD
	Load	-	15	-	pF	see p/n guide or Specify
Enable/Disable Function:		-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry		40	-	60		see p/n guide or Specify
Startup Time		-	-	10	ms	
Supply Current		-	-	15	mA	Subject to different frequency range
Rise/ Fall time		-	-	10	ns	
Storage Temperature Range		-55	-	125	°C	
Aging per year		-	±5		ppm	

DIMENSION (+/-0.1mm)



PART NUMBER GUIDE

Example: TGS COM5331BDH03TLF-24M000

[Part Number and Part Code Structure](#)

TGS	COM53	3 1	B D H	03	T	LF XX	-24M000
1	2	3 4	5 6 7	8	9	10 11	12

- 1) TGS: Company Code
- 2) COM53: MHz SMD Oscillator, 4 pads, L5.0*W3.2*H1.3mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V; 5: 5.0V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: Output Load: 01: 1-10TTL//15pF; 03: HCMOS//15pF; 04: HCMOS//30pF; 05: HCMOS//50pF or Specify
- 9) T: Packed in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Complaint
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 24M000: Frequency Range 24.000MHz or specify

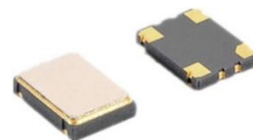
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MAIN FEATURE

- Wide Frequency range
- 1.8V, 2.5V, 3.3 and 5.0V option • Industry standard option

APPLICATION

- PDA, PND, DSC, Smart phone, WiLAN, Bluetooth and more

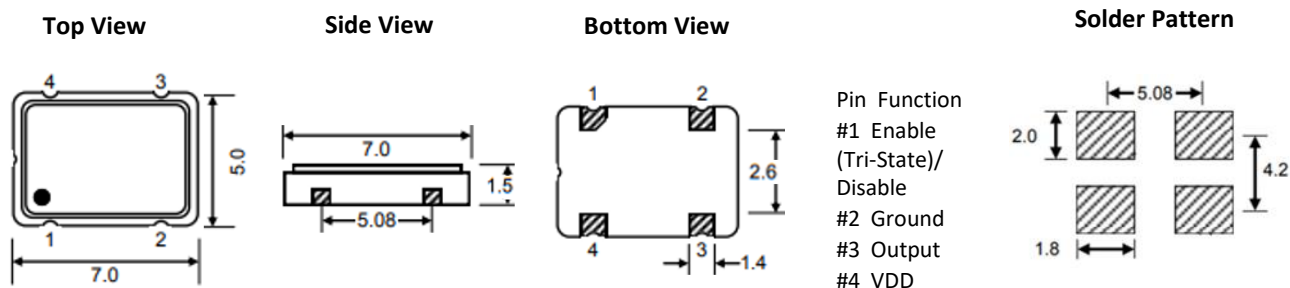


L7.0*W5.0*H1.5mm

STANDARD SPECIFICATION

Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	see p/n guide or Specify
Frequency Range		1.54		125.00	MHz	see p/n guide or Specify
Overall Freq. Tolerance		-	±50		ppm	see p/n guide or Specify
Operating Temp. Range		0	-	70	°C	see p/n guide or Specify
Output	VOH	90%	-	-	V	@90% x VDD
	VOL	-	-	10%	V	@10% x VDD
	Load	-	15	-	pF	see p/n guide or Specify
Enable/Disable Function:		-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry		40	-	60		see p/n guide or Specify
Startup Time		-	-	10	ms	
Supply Current		-	-	80	mA	Subject to different frequency range
Rise/ Fall time		-	-	10	ns	
Storage Temperature Range		-55	-	+125	°C	
Aging per year		-	±5		ppm	

DIMENSION (+/-0.1mm)



PART NUMBER GUIDE

Example: TGS COM7531BDH03TLF-24M000

Part Number and Part Code Structure

TGS	COM75	3 1	B D H	03	T	LF XX	-24M000
1	2	3 4	5 6 7	8	9	10 11	12

- 1) TGS: Company Code
- 2) COM75: MHz SMD Oscillator, 4 pads, L7.0*W5.0*H1.5mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V; 5: 5.0V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: Output Load: 01: 1-10TTL//15pF; 03: HCMOS//15pF; 04: HCMOS//30pF; 05: HCMOS//50pF or Specify
- 9) T: Packed in Tape/Reel, 1000pcs/Reel
- 10) LF: RoHS Complaint
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 24M000: Frequency Range 24.000MHz or specify

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MAIN FEATURE

- Low cost, Short Lead time and Wide Frequency range
- 1.8V, 2.5V, 3.3V, 5.0V option • Industry standard option

APPLICATION

- IT Applications and more • Telecommunications



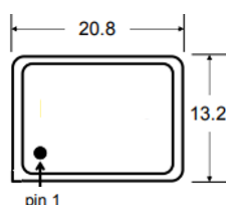
L20.8*W13.2*H5.08mm

STANDARD SPECIFICATION

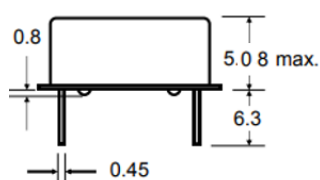
Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	5.0	-	V	see p/n guide or Specify
Frequency Range		1.00		155.00	MHz	see p/n guide or Specify
Overall Freq. Tolerance		-	±50		ppm	see p/n guide or Specify
Operating Temp. Range		-40	-	+85	°C	see p/n guide or Specify
Output	VOH	90%	-	-	V	@90% x VDD
	VOL	-	-	10%	V	@10% x VDD
	Load	-	15	-	pF	see p/n guide or Specify
Enable/Disable Function:		-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry		45	-	55		see p/n guide or Specify
Startup Time		-	-	10	ms	
Supply Current		-	-	35	mA	Subject to different frequency range
Rise/ Fall time		-	-	10	ns	
Storage Temperature Range		-55	-	+125	°C	
Aging per year		-	±5		ppm	

DIMENSION (+/-0.1 mm)

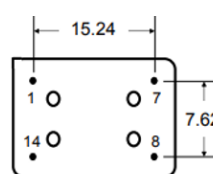
Top View



Side View



Bottom View



Pin Function
 #1 Enable(Tri-State)
 /Disable
 #7 Ground
 #8 Output
 #14 VDC

PART NUMBER GUIDE

Example: TGS CO1451BGI05 BLFXX- 48M000

[Part Number and Part Code Structure](#)

TGS	CO14	5 1	B G I	05	B	LF XX	-48M000
1	2	3 4	5 6 7	8	9	10 11	12

1)TGS: Company Code

2) CO14: MHz Thru Hole Oscillator, Full size, L20.8*W13.2*H5.08mm

3) 5: Supply Voltage, 5: 5.0V; 3: 3.3V; 2: 2.5V; 1: 1.8V 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A

5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify

6) G: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify

7) I: Symmetry H: 40/60; I: 45/55

8) 05: Output Load: 01: 1-10TTL//15pF; 03: HCMOS//15pF; 04: HCMOS//30pF; 05: HCMOS//50pF or Specify

9) B: Packed in Plastic Tube, 25pcs/Tube for CO14 series

10) LF: RoHS Complaint 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

12) 48M000: Frequency Range 48.000MHz or specify

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MAIN FEATURE

- Low cost, Short Lead time and Wide Frequency range
- 1.8V, 2.5V, 3.3V, 5.0V option • Industry standard option

APPLICATION

- IT Applications and more • Telecommunications



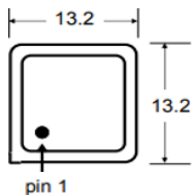
L13.2*W13.2*H5.08mm

STANDARD SPECIFICATION

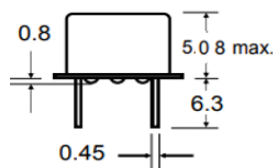
Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	5.0	-	V	see p/n guide or Specify
Frequency Range		1.00		155.00	MHz	see p/n guide or Specify
Overall Freq. Tolerance		-	±50		ppm	see p/n guide or Specify
Operating Temp. Range		-40	-	+85	°C	see p/n guide or Specify
Output	VOH	90%	-	-	V	@90% x VDD
	VOL	-	-	10%	V	@10% x VDD
	Load	-	15	-	pF	see p/n guide or Specify
Enable/Disable Function:		-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry		45	-	55		see p/n guide or Specify
Startup Time		-	-	10	ms	
Supply Current		-	-	35	mA	Subject to different frequency range
Rise/ Fall time		-	-	10	ns	
Storage Temperature Range		-55	-	+125	°C	
Aging per year		-	±5		ppm	

DIMENSION (+/-0.1 mm)

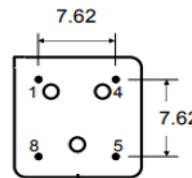
Top View



Side View



Bottom View



Pin Function
 #1 Enable(Tri-State)/
 Disable
 #4 Ground
 #5 Output
 #8 VDC

PART NUMBER GUIDE Example: TGS CO851BGI05 BLFXX- 48M000

Part Number and Part Code Structure

TGS	CO8	5	1	B	G	I	05	B	LF	XX	-48M000
1	2	3	4	5	6	7	8	9	10	11	12

- 1)TGS: Company Code
- 2) CO8: MHz Thru Hole Oscillator, Half size, L13.2*W13.2*H5.08mm
- 3) 5: Supply Voltage, 5: 5.0V; 3: 3.3V; 2: 2.5V; 1: 1.8V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A:-/-25ppm; B: +/-50ppm; C: +/-100ppm; J:-/-20ppm or Specify
- 6) G: Operating Temp. Range, D:0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) I: Symmetry H: 40/60; I: 45/55
- 8) 05: Output Load: 01: 1-10TTL//15pF; 03:HCMOS//15pF; 04: HCMOS//30pF; 05: HCMOS//50pF or Specify
- 9) B: Packed in Plastic Tube, 40pcs/Tube for CO8 series
- 10) LF: RoHS Complaint
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 48M000: Frequency Range 48.000MHz or specify

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MAIN FEATURE

- 32.768KHz standard • 1.8V, 2.5V, 3.3V and 5.0V option
- Industry standard option

APPLICATION

- PDA, PND, DSC, Smart phone, WiLAN, Bluetooth and more

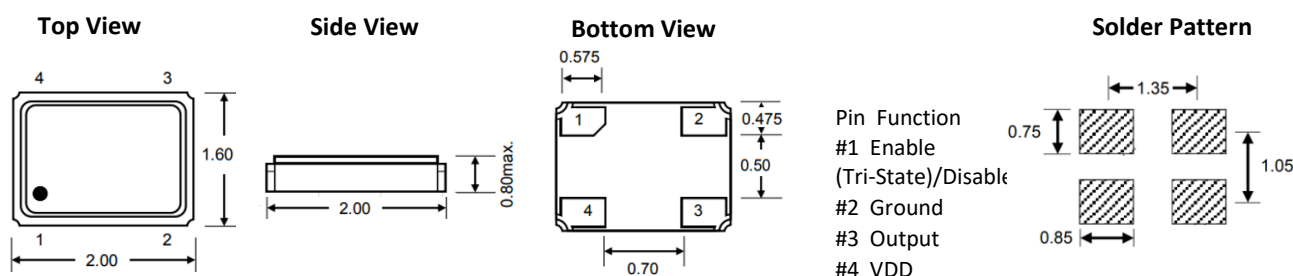


L2.0*W1.6*H0.80mm

STANDARD SPECIFICATION

Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	see p/n guide or Specify
Frequency Range		-	32.768	-	KHz	
Overall Freq. Tolerance		-	±50		ppm	see p/n guide or Specify
Operating Temp. Range		-0	-	+70	°C	see p/n guide or Specify
Output (HCMOS)	VOH	90%	-	-	V	@90% x VDD
	VOL	-	-	10%	V	@10% x VDD
	Load	-	15	-	pF	see p/n guide or Specify
Enable/Disable Function:		-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry		40	-	60		see p/n guide or Specify
Startup Time		-	-	10	ms	
Supply Current		-	-	240	μA	
Rise/ Fall time		-	-	200	ns	
Storage Temperature Range		-55	-	+125	°C	
Aging per year		-	±5		ppm	

DIMENSION (+/-0.1mm)



PART NUMBER GUIDE

Example: TGS COK2131BDH03TLF-32K768

[Part Number and Part Code Structure](#)

TGS	COK21	3 1	B D H	03	T	LF XX	-32K768
1	2	3 4	5 6 7	8	9	10 11	12

- 1) TGS: Company Code
- 2) COK21: KHz SMD Oscillator, 4 pads, L2.0*W1.6*H0.80mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V; 5: 5.0V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60 °C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: Output Load: 03: HCMOS//15pF; 04: HCMOS//30pF; 05: HCMOS//50pF or Specify
- 9) T: Packed in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Complaint
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 32K768: Frequency Range 32.76800KHz

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MAIN FEATURE

- 32.768KHz, standard • 1.8V, 2.5V ,3.3V and 5.0V option
- Industry standard option

APPLICATION

- PDA, PND, DSC, Smart phone, WiLAN, Bluetooth and more

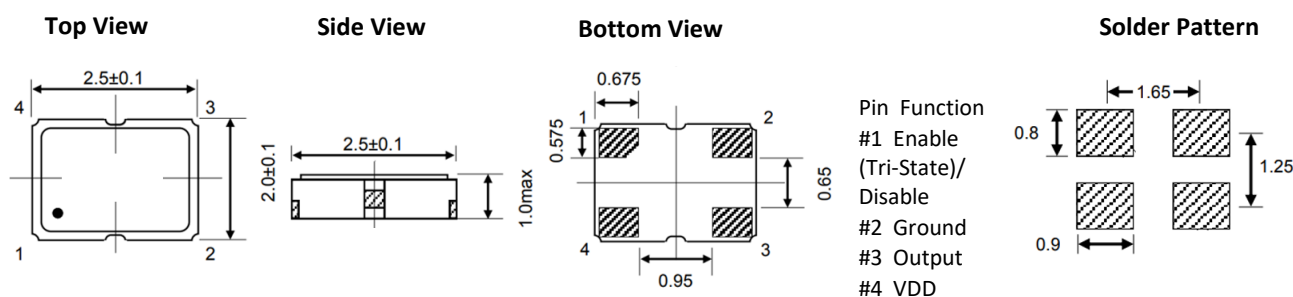


L2.5*W2.0*H1.0mm

STANDARD SPECIFICATION

Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	see p/n guide or Specify
Frequency Range		25.00	32.768	100.00	KHz	see p/n guide or Specify
Overall Freq. Tolerance		-	±50		ppm	see p/n guide or Specify
Operating Temp. Range		0	-	+70	°C	see p/n guide or Specify
Output (HCMOS)	VOH	90%	-	-	V	@90% x VDD
	VOL	-	-	10%	V	@10% x VDD
	Load	-	15	-	pF	see p/n guide or Specify
Enable/Disable Function:		-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry		40	-	60		see p/n guide or Specify
Startup Time		-	-	10	ms	
Supply Current		-	-	200	μA	
Rise/ Fall time		-	-	30	ns	
Storage Temperature Range		-55	-	+125	°C	
Aging per year		-	±5		ppm	

DIMENSION (+/-0.1mm)



PART NUMBER GUIDE

Example: TGS COK2231BDH03TLF-32K768

[Part Number and Part Code Structure](#)

TGS	COK22	3 1	B D H	03	T	LF XX	-32K768
1	2	3 4	5 6 7	8	9	10 11	12

- 1) TGS: Company Code
- 2) COK22: KHz SMD Oscillator, 4 pads, L2.5*W2.0*H1.0mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V; 5: 5.0V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60 °C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: 03: HCMOS//15pF; 04: HCMOS//30pF; 05: HCMOS//50pF or Specify
- 9) T: Packed in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Complaint
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 32K768: Frequency Range 32.768KHz or Specify

MAIN FEATURE

- 32.768KHz standard • 1.8V, 2.5V, 3.3V and 5.0V option
- Industry standard option

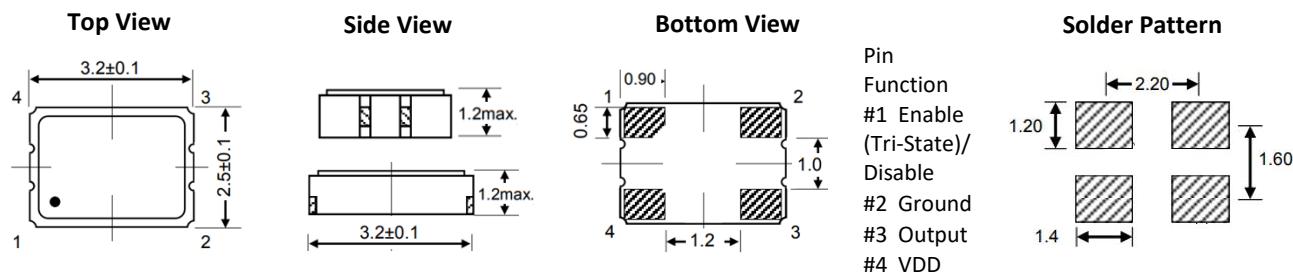
APPLICATION

- PDA, PND, DSC, Smart phone, WiLAN, Bluetooth and more

STANDARD SPECIFICATION

Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	see p/n guide or Specify
Frequency Range		-	32.768	-	KHz	
Overall Freq. Tolerance		-	±50		ppm	see p/n guide or Specify
Operating Temp. Range		0	-	+70	°C	see p/n guide or Specify
Output (HCMOS)	VOH	90%	-	-	V	@90% x VDD
	VOL	-	-	10%	V	@10% x VDD
	Load	-	15	-	pF	see p/n guide or Specify
Enable/Disable Function:		-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry		40	-	60		see p/n guide or Specify
Startup Time		-	-	10	ms	
Supply Current		-	-	2.0	mA	
Rise/ Fall time		-	-	10	ns	
Storage Temperature Range		-55	-	+125	°C	
Aging per year		-	±5		ppm	

DIMENSION (+/-0.1mm)



PART NUMBER GUIDE

Example: TGS COK3231BDH03TLF-32K768

[Part Number and Part Code Structure](#)

TGS	COK32	3 1	B D H	03	T	LF XX	-32K768
1	2	3 4	5 6 7	8	9	10 11	12

- 1) TGS: Company Code
- 2) COK32: KHz SMD Oscillator, 4 pads, L3.2*W2.5*H1.2mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V; 5: 5.0V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: 03: HCMOS//15pF; 04: HCMOS//30pF; 05: HCMOS//50pF or Specify
- 9) T: Packed in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Complaint
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 32K768: Frequency Range 32.768KHz

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MAIN FEATURE

- 32.768KHz standard • 1.8V, 2.5V, 3.3V and 5.0V option
- Industry standard option

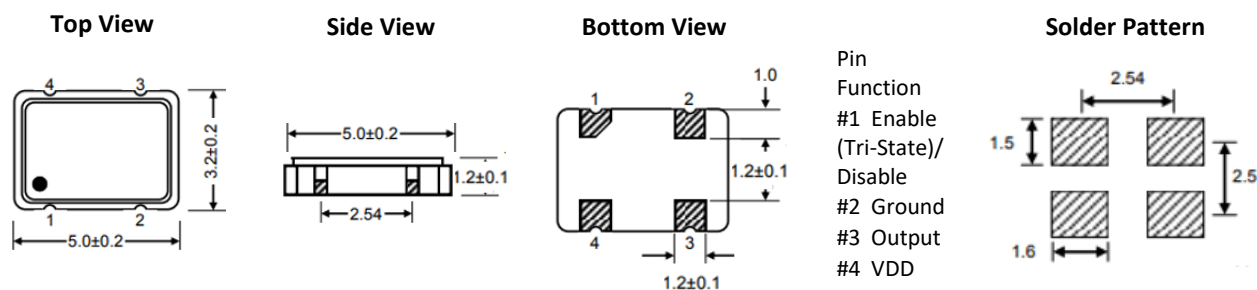
APPLICATION

- PDA, PND, DSC, Smart phone, WiLAN, Bluetooth and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	see p/n guide or Specify
Frequency Range	25.00	32.768	100.00	KHz	see p/n guide or Specify
Overall Freq. Tolerance	-	±50		ppm	see p/n guide or Specify
Operating Temp. Range	0	-	+70	°C	see p/n guide or Specify
Output (HCMOS)	VOH	90%	-	V	@90% x VDD
	VOL	-	10%	V	@10% x VDD
	Load	-	15	pF	see p/n guide or Specify
Enable/Disable Function:	-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry	40	-	60		see p/n guide or Specify
Startup Time	-	-	10	ms	
Supply Current	-	-	15	mA	
Rise/ Fall time	-	-	10	ns	
Storage Temperature Range	-55	-	+125	°C	
Aging per year	-	±5		ppm	

DIMENSION (+/-0.1mm)



PART NUMBER GUIDE

Example: TGS COK5331BDH03TLF-32K768

[Part Number and Part Code Structure](#)

TGS	COK53	3 1	B D H	03	T	LF XX	-32K768
1	2	3 4	5 6 7	8	9	10 11	12

- 1) TGS: Company Code
- 2) COK53: KHz SMD Oscillator, 4 pads, L5.0*W3.2*H1.2mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V; 5: 5.0V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60 °C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: 03: HCMOS//15pF; 04: HCMOS//30pF; 05: HCMOS//50pF or Specify
- 9) T: Packed in Tape/Reel, 1000pcs/Reel
- 10) LF: RoHS Complaint
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 32K768: Frequency Range 32.768KHz or specify

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MAIN FEATURE

- 32.768KHz standard • 1.8V, 2.5V, 3.3V and 5.0V option
- Industry standard option

APPLICATION

- PDA, PND, DSC, Smart phone, WiLAN, Bluetooth and more

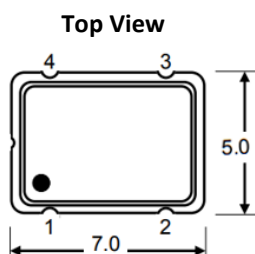
STANDARD SPECIFICATION

Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	see p/n guide or Specify
Frequency Range		25.00	32.768	1000.0	KHz	see p/n guide or Specify
Overall Freq. Tolerance		-	±50		ppm	see p/n guide or Specify
Operating Temp. Range		0	-	+70	°C	see p/n guide or Specify
Output (HCMOS)	VOH	90%	-	-	V	@90% x VDD
	VOL	-	-	10%	V	@10% x VDD
	Load	-	15	-	pF	see p/n guide or Specify
Enable/Disable Function:		-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry		40	-	60		see p/n guide or Specify
Startup Time		-	-	10	ms	
Supply Current		-	-	15	mA	
Rise/ Fall time		-	-	10	ns	
Storage Temperature Range		-55	-	+125	°C	
Aging per year		-	±5		ppm	

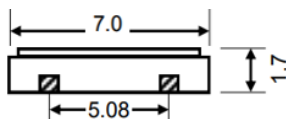


L7.0*W5.0*H1.7mm

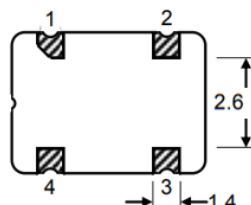
DIMENSION (+/-0.1mm)



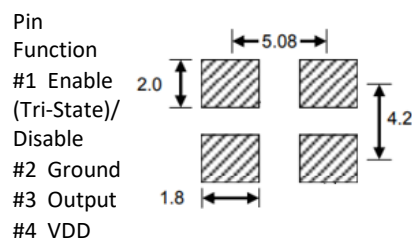
Side View



Bottom View



Solder Pattern



PART NUMBER GUIDE

Example: TGS COK7531BDH03TLF-32K768

[Part Number and Part Code Structure](#)

TGS	COK75	3 1	B D H	03	T	LF XX	-32K768
1	2	3 4	5 6 7	8	9	10 11	12

- 1) TGS: Company Code
- 2) COK75: KHz SMD Oscillator, 4 pads, L7.0*W5.0*H1.7mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V; 5: 5.0V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: Output Load: 03: HCMOS//15pF; 04: HCMOS//30pF; 05: HCMOS//50pF or Specify
- 9) T: Packed in Tape/Reel, 1000pcs/Reel
- 10) LF: RoHS Complaint 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 32K768: Frequency Range 32.768KHz or specify

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MAIN FEATURE

- Ultra stable • Wide Temp. Range and Fast Warming-up

APPLICATION

- Base Stations • Instrumentations



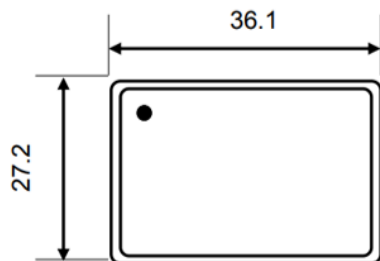
L36.0*W27.0*H13.0mm

STANDARD SPECIFICATION

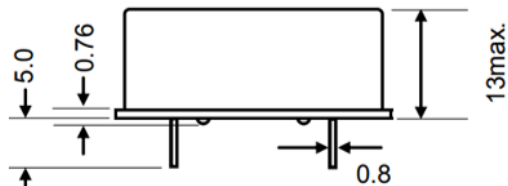
Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	5.0V/12.0V or specify
Power Consumption		-	-	5	W	During Warming-up
		-	-	1.5	W	Steady @25°C & still Air
Frequency Range		2.00~100.00			MHz	see P/N guide or specify
Nominal Frequency		10.0/12.288/38.88			MHz	
Initial Frequency Tolerance		-	-	±100	ppb	@shipment, nominal EFC
Freq. Stability Vs. Temp		-0.8	-	0.8	ppb	@-40°C ~+85°C
Sine Wave	Output Level	7	-	-	dBm	
	Harmonica	-	-	-35	dBm	
	Spurious	-	-	-70	dBc	
	Load	-	50	-	Ω	
HCMOS	VOH	2.4	-	3.5	V	LVTTL Output, Load=15pf
	VOL	0.4	-	0.5	V	LVTTL Output, Load=15pf
	Duty Cycle	45	-	55	%	(VOH - VOL)/2
	Rise/Fall Edge	-	-	6	ns	LVTTL Output, Load=15pf
	Load	-	15	-	pF	
Short-term Stability(1S)		-	-	5×10 ⁻¹²		Test after 15 Min.
Timing Accuracy		-	-	24	us	Test after 24 Us.
Warm-up Time		-	-	10	Min.	At +25°C, with accuracy of ±5ppb
Supply Sensitivity		-	-	±5	ppb	Vcc±5%
Load Sensitivity		-	-	±5	ppb	Load±5%
Aging per Day		-	-	±0.5	ppb	After 30 days of operation
Aging per Year		-	-	±50	ppb	After 30 days of operation
SSB Phase Noise @10MHz		-95	-	-	dBc/Hz	Offset 1Hz
		-125	-	-		Offset 10Hz
		-140	-	-		Offset 100Hz
		-145	-	-		Offset 1KHz
		-145	-	-		Offset 10KHz
Control Voltage Range		0	-	5	V	@25°C
Frequency Turning Range		±125	-	±250	ppb	
Operating Temperature Range		-40		+85	°C	
Storage Temperature Range		-55		+125	°C	Or specify

DIMENSION (+/-0.1mm)

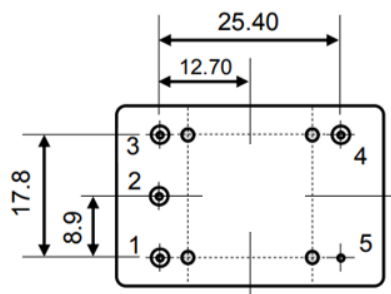
Top View



Side View



Bottom View



Pin Function

- #1 V con or NC
- #2 V ref (Ref. Voltage) or NC
- #3 VDC
- #4 Output
- #5 GND

PART NUMBER GUIDE

Example: TGS O362703DGS BLF-10M000

Part Number and Part Code Structure

TGS	O	3627	03	D	G S	B LF XX	-10M000
1	2	3	4	5	6 7	8 9 10	11

1) TGS: Company Code

2) O: OCXO

3) 3627 Holder type Outline: 3627: L36.0*W27.0*H13.0mm

4) 03: Supply Voltage: 12: 12 V; 05: 5.0V; 03:3.3V

5) D: Temperature Stability: D: ± 20 ppb; C: ± 10 ppb; B: ± 5 ppb; A: ± 3 ppb or specify

6) G: Operating Temp. Range: H: $-0 \sim 70$ °C; E: $-10 \sim +60$ °C; F: $-20 \sim +70$ °C; G: $-40 \sim +85$ °C or Specify

7) S: Output: S: Sine Wave; L: LVTTTL; H: HCMOS

8) B: Packed in Bulk

9) LF: RoHS Complaint

10) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

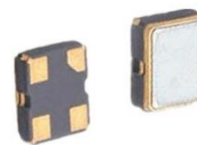
11) 10M000: Frequency Range in MHz 10.0000MHz or Specify

MAIN FEATURE

- Low Power Consumption • 1.8V, 2.5V and 3.3V option
- Industry standard option

APPLICATION

- Mobile, GPS and more

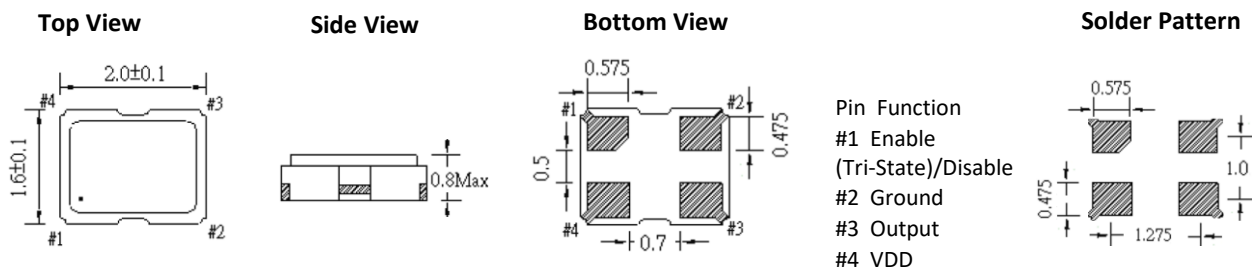


L2.0*W1.6*H0.80mm

STANDARD SPECIFICATION – CMOS Output

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	+/-0.5% or Specify 1.8V/2.5V
Frequency Range	9.50		60.00	MHz	
Frequency Tolerance @25°C			±2.0	ppm	see p/n guide or Specify
Freq. Stability @Temp. Range	-	-	±2.5	ppm	see p/n guide or Specify
Operating Temp. Range	-40	-	85	°C	see p/n guide or Specify
Load	-	15	-	pF	@ CMOS output or Specify
Enable/Disable Function	-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry	45	-	55		see p/n guide or Specify
Startup Time	-	-	10	ms	
Rise/Fall Time	-	-	5	ns	
Supply Current	-	-	10	mA	
Phase Noise	-	-145		dBc/Hz	@10KHz offset
Storage Temperature Range	-55	-	+125	°C	
Aging per year	-	±2		ppm	

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS TM21T31A25GH03 TLF-26M000

[Part Number and Part Code Structure](#)

TGS	TM21T	3 1	A 25	G H 03	T	LF XX	-26M000
1	2	3 4	5 6	7 8 9	10	11 12	13

1) TGS: Company Code

2) TM21T: MHz SMD TCXO, CMOS Output, 4 pads, L2.0*W1.6*H0.80mm

3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V

4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A

5) A: Frequency tolerance, A+/-2.0ppm or Specify

6) 25: Frequency Stability vs Temp. range. 25: 2.5ppm or specify

7) G: Operating Temp. Range, D-0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify

8) H: Symmetry H: 40/60; I: 45/55

9) 03: Output Load: 03: CMOS//15pF or specify

10) T: Packed in Tape/Reel, 3000pcs/Reel

11) LF: RoHS Compliant

12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

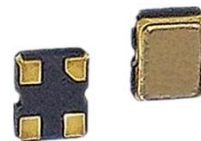
13) 26M000: Frequency Range 26.000MHz or specify

MAIN FEATURE

- Low Power Consumption • 1.8V, 2.5V and 3.3V option
- Industry standard option

APPLICATION

- Mobile, GPS and more

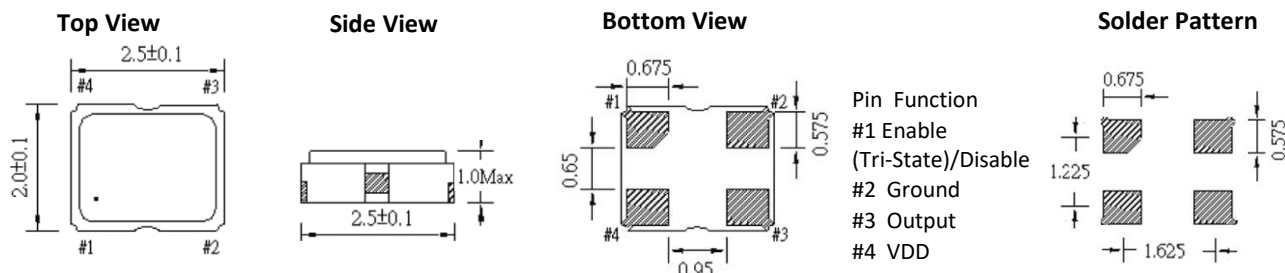


L2.5*W2.0*H1.0mm

STANDARD SPECIFICATION – CMOS Output

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	+/-0.5% or Specify 1.8V/2.5V
Frequency Range	9.50		60.00	MHz	
Frequency Tolerance @25°C			±2.0	ppm	see p/n guide or Specify
Freq. Stability @Temp. Range	-	-	±2.5	ppm	see p/n guide or Specify
Operating Temp. Range	-40	-	85	°C	see p/n guide or Specify
Load	-	15	-	pF	@ CMOS output or Specify
Enable/Disable Function	-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry	45	-	55		see p/n guide or Specify
Startup Time	-	-	10	ms	
Rise/Fall Time	-	-	5	ns	
Supply Current	-	-	10	mA	
Phase Noise	-	-145		dBc/Hz	@10KHz offset
Storage Temperature Range	-55	-	+125	°C	
Aging per year	-	±2		ppm	

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS TM22T31A25GH03 TLF-26M000

[Part Number and Part Code Structure](#)

TGS	TM22T	3 1	A 25	G H 03	T	LF XX	-26M000
1	2	3 4	5 6	7 8 9	10	11 12	13

- 1) TGS: Company Code
- 2) TM22T: MHz SMD TCXO, CMOS Output, 4 pads, L2.5*W2.0*H1.0mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) A: Frequency tolerance, A+/-2.0ppm or Specify
- 6) 25: Frequency Stability vs Temp. range. 25: 2.5ppm or specify
- 7) G: Operating Temp. Range, D-0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 8) H: Symmetry H: 40/60; I: 45/55
- 9) 03: Output Load: 03: CMOS//15pF or specify
- 10) T: Packed in Tape/Reel, 3000pcs/Reel
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 13) 26M000: Frequency Range 26.000MHz or specify

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MAIN FEATURE

- Low Power Consumption • 1.8V, 2.5V and 3.3V option
- Industry standard option

APPLICATION

- Mobile, GPS and more

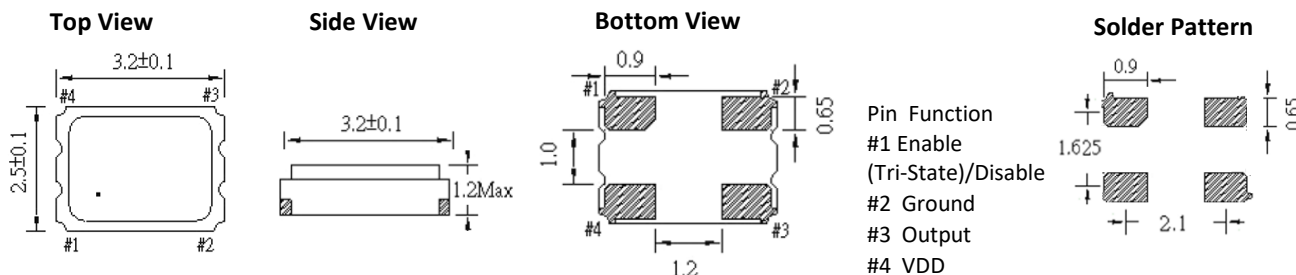


L3.2*W2.5*H1.2mm

STANDARD SPECIFICATION – CMOS Output

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	+/-0.5% or Specify 1.8V/2.5V
Frequency Range	9.50		60.00	MHz	
Frequency Tolerance @25°C			±2.0	ppm	see p/n guide or Specify
Freq. Stability @Temp. Range	-	-	±2.5	ppm	see p/n guide or Specify
Operating Temp. Range	-40	-	85	°C	see p/n guide or Specify
Load	-	15	-	pF	@ CMOS output or Specify
Enable/Disable Function	-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry	45	-	55		see p/n guide or Specify
Startup Time	-	-	10	ms	
Rise/Fall Time	-	-	5	ns	
Supply Current	-	-	10	mA	
Phase Noise	-	-145		dBc/Hz	@10KHz offset
Storage Temperature Range	-55	-	+125	°C	
Aging per year	-	±2		ppm	

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS TM32T31A25GH03 TLF-26M000

Part Number and Part Code Structure

TGS	TM32T	3 1	A 25	G H	03 T	LF XX	-26M000
1	2	3 4	5 6	7 8	9 10	11 12	13

- 1) TGS: Company Code
- 2) TM32T: MHz SMD TCXO, CMOS Output, 4 pads, L3.2*W2.5*H1.2mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) A: Frequency tolerance, A +/-2.0ppm or Specify
- 6) 25: Frequency Stability vs Temp. range. 25: 2.5ppm or specify
- 7) G: Operating Temp. Range, D-0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 8) H: Symmetry H: 40/60; I: 45/55
- 9) 03: Output Load: 03: CMOS//15pF or specify
- 10) T: Packed in Tape/Reel, 3000pcs/Reel
- 11) LF: RoHS Complaint
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 13) 26M000: Frequency Range 26.000MHz or specify

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MAIN FEATURE

- Low Power Consumption • 1.8V, 2.5V and 3.3V option
- Industry standard option

APPLICATION

- Mobile, GPS and more

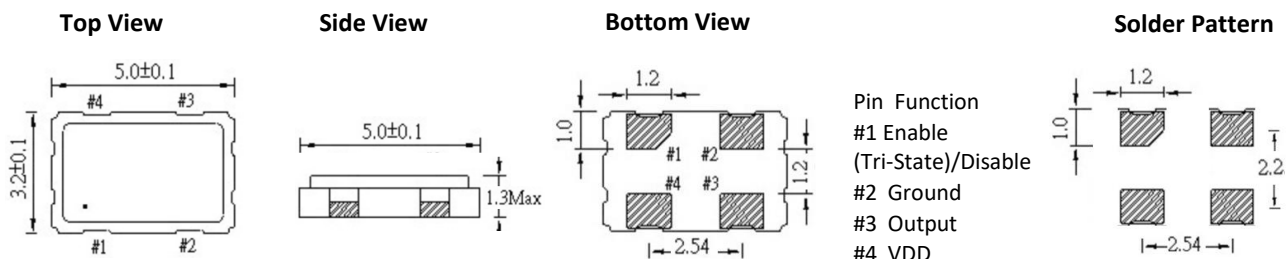


L5.0*W3.2*H1.3mm

STANDARD SPECIFICATION – COMS Output

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	+/-0.5% or Specify 1.8V/2.5V
Frequency Range	9.50		60.00	MHz	
Frequency Tolerance @25°C			±2.0	ppm	see p/n guide or Specify
Freq. Stability @Temp. Range	-	-	±2.5	ppm	see p/n guide or Specify
Operating Temp. Range	-40	-	85	°C	see p/n guide or Specify
Load	-	15	-	pF	@ CMOS output or Specify
Enable/Disable Function	-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry	45	-	55		see p/n guide or Specify
Startup Time	-	-	10	ms	
Rise/Fall Time	-	-	5	ns	
Supply Current	-	-	10	mA	
Phase Noise	-	-145		dBc/Hz	@10KHz offset
Storage Temperature Range	-55	-	+125	°C	
Aging per year	-	±2		ppm	

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS TM53T31A25GH03 TLF-26M000

[Part Number and Part Code Structure](#)

TGS	TM53T	3 1	A 25	G H	03 T	LF XX	-26M000
1	2	3 4	5 6	7 8	9 10	11 12	13

1) TGS: Company Code

2) TM53T: MHz SMD TCXO, CMOS Output, 4 pads, L5.0*W3.2*H1.3mm

3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V

4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A

5) A: Frequency tolerance, A+/-2.0ppm or Specify

6) 25: Frequency Stability vs Temp. range. 25: 2.5ppm or specify

7) G: Operating Temp. Range, D-0~70 °C; E: -10 ~+60 °C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify

8) H: Symmetry H: 40/60; I: 45/55

9) 03: Output Load: 03: CMOS//15pF or specify

10) T: Packed in Tape/Reel, 3000pcs/Reel

11) LF: RoHS Compliant

12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A

13) 26M000: Frequency Range 26.000MHz or specify

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MAIN FEATURE

- Low Power Consumption • 1.8V, 2.5V and 3.3V option
- Industry standard option

APPLICATION

- Mobile, GPS and more

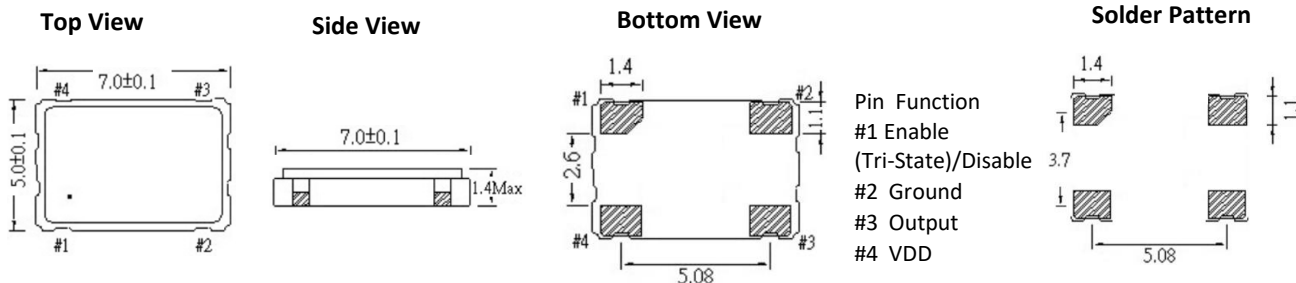


L7.5*W5.0*H1.4mm

STANDARD SPECIFICATION – COMS Output

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	+/-0.5% or Specify 1.8V/2.5V
Frequency Range	9.50		60.00	MHz	
Frequency Tolerance @25°C			±2.0	ppm	see p/n guide or Specify
Freq. Stability @Temp. Range	-	-	±2.5	ppm	see p/n guide or Specify
Operating Temp. Range	-40	-	85	°C	see p/n guide or Specify
Load	-	15	-	pF	@ CMOS output or Specify
Enable/Disable Function	-	Tri-State	-		@ Control via pin 1 or see p/n guide
Symmetry	45	-	55		see p/n guide or Specify
Startup Time	-	-	10	ms	
Rise/Fall Time	-	-	5	ns	
Supply Current	-	-	10	mA	
Phase Noise	-	-145		dBc/Hz	@10KHz offset
Storage Temperature Range	-55	-	+125	°C	
Aging per year	-	±2		ppm	

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS TM53T31A25GH03 TLF-26M000

Part Number and Part Code Structure

TGS	TM75T	3 1	A 25	G H	03 T	LF XX	-26M000
1	2	3 4	5 6	7 8	9 10	11 12	13

- 1) TGS: Company Code
- 2) TM75T: MHz SMD TCXO, CMOS Output, 4 pads, L7.0*W5.0*H1.4mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V
- 4) 1: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) A: Frequency tolerance, A-+/-2.0ppm or Specify
- 6) 25: Frequency Stability vs Temp. range. 25: 2.5ppm or specify
- 7) G: Operating Temp. Range, D-0~70 °C; E: -10 ~+60 °C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 8) H: Symmetry H: 40/60; I: 45/55
- 9) 03: Output Load: 03: CMOS//15pF or specify
- 10) T: Packed in Tape/Reel, 3000pcs/Reel
- 11) LF: RoHS Compliant
- 12) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 13) 26M000: Frequency Range 26.000MHz or specify

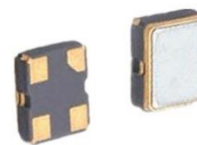
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MAIN FEATURE

- Low Power Consumption • 1.8V, 2.5V and 3.3V option
- Industry standard option

APPLICATION

- Mobile, GPS and more



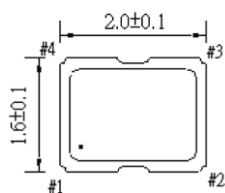
L2.0*W1.6*H0.80mm

STANDARD SPECIFICATION – Clipped Sine Wave Output

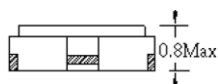
Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	+/-0.5% or see p/n guide
Frequency Range		13		52	MHz	
Freq. Stability	Temp. Range	±0.5	-	±2.5	ppm	see p/n guide or Specify
	Supply Voltage			±0.2	ppm/Vdc	@VDC +/-0.5%
	Load			±0.2	ppm	@10 Kohm/10pF (+/-10%)
Operating Temp. Range		-40	-	85	°C	see p/n guide or Specify
Output (Clipped Sine Wave)	Voltage	0.8 Vp-p	-	-	V	
	Load	10 Kohm/10pF				
Startup Time		-	-	2	ms	
Supply Current		-	-	2	mA	13.00~26.00MHz
		-	-	2.5	mA	26.001~52.00MHz
Storage Temperature Range		-40	-	85	°C	
Aging per year		-	±2		ppm	

DIMENSION (mm)

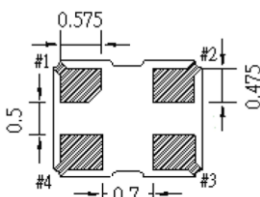
Top View



Side View

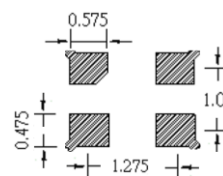


Bottom View



Pin Function
 #1 Ground
 #2 Ground
 #3 Output
 #4 VDD

Solder Pattern



PART NUMBER GUIDE

Example: TGS TM21F3A25GTLF-26M000

[Part Number and Part Code Structure](#)

TGS	TM21F	3	A 25	G	T	LF XX	-26M000
1	2	3	4 5	6	7	8 9	10

- 1) TGS: Company Code
- 2) TM21F: MHz SMD TCXO, Clipped Sine Wave Output, 4 pads, L2.0*W1.6*H0.80mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V
- 4) A: Overall Frequency tolerance, A: +/-2.0pm or Specify
- 5) 25: Frequency Stability vs Temp. range. 05: +/-0.5ppm; 10: +/-1.0ppm; 25: 2.5ppm or specify
- 6) G: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) T: Packed in Tape/Reel, 3000pcs/Reel
- 8) LF: RoHS Complaint
- 9) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 10) 26M000: Frequency Range 26.000MHz or specify

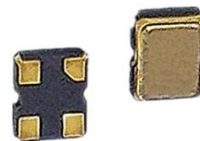
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MAIN FEATURE

- Low Power Consumption • 1.8V, 2.5V and 3.3V option
- Industry standard option

APPLICATION

- Mobile, GPS and more

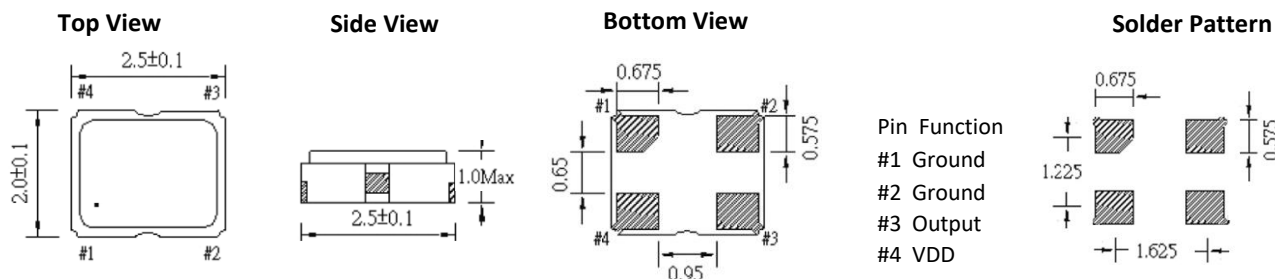


L2.5*W2.0*H1.0mm

STANDARD SPECIFICATION – Clipped Sine Wave Output

Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	+/-0.5% or see p/n guide
Frequency Range		13		52	MHz	
Freq. Stability	Temp. Range	±0.5	-	±2.5	ppm	see p/n guide or Specify
	Supply Voltage			±0.2	ppm/Vdc	@VDC +/-0.5%
	Load			±0.2	ppm	@10 Kohm/10pF (+/-10%)
Operating Temp. Range		-40	-	85	°C	see p/n guide or Specify
Output (Clipped Sine Wave)	Voltage	0.8 Vp-p	-	-	V	
	Load	10 Kohm/10pF				
Startup Time		-	-	2	ms	
Supply Current		-	-	2	mA	13.00~26.00MHz
		-	-	2.5	mA	26.001~52.00MHz
Storage Temperature Range		-40	-	85	°C	
Aging per year		-	±2		ppm	

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS TM22F3A25GTLF-26M000

[Part Number and Part Code Structure](#)

TGS	TM22F	3	A 25	G	T	LF XX	-26M000
1	2	3	4 5	6	7	8 9	10

- 1) TGS: Company Code
- 2) TM22F: MHz SMD TCXO, Clipped Sine Wave Output, 4 pads, L2.5*W2.0*H1.0mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V
- 4) A: Overall Frequency tolerance, A: +/-2.0pm or Specify
- 5) 25: Frequency Stability vs Temp. range. 05: +/-0.5ppm; 10: +/-1.0ppm; 25: 2.5ppm or specify
- 6) G: Operating Temp. Range, D-0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) T: Packed in Tape/Reel, 3000pcs/Reel
- 8) LF: RoHS Complaint
- 9 XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 10) 26M000: Frequency Range 26.000MHz or specify

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MAIN FEATURE

- Low Power Consumption • 1.8V, 2.5V and 3.3V option
- Industry standard option

APPLICATION

- Mobile, GPS and more

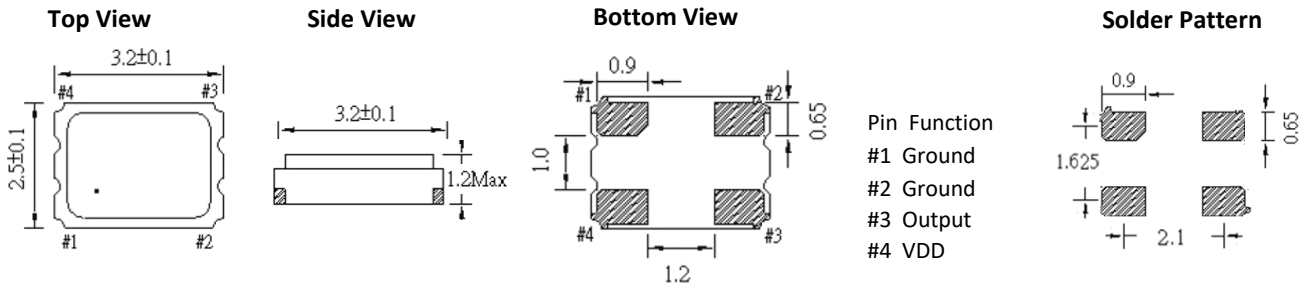


L3.2*W2.5*H1.2mm

STANDARD SPECIFICATION – Clipped Sine Wave Output

Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	+/-0.5% or see p/n guide
Frequency Range		13		52	MHz	
Freq. Stability	Temp. Range	±0.5	-	±2.5	ppm	see p/n guide or Specify
	Supply Voltage			±0.2	ppm/Vdc	@VDC +/-0.5%
	Load			±0.2	ppm	@10 Kohm/10pF (+/-10%)
Operating Temp. Range		-40	-	85	°C	see p/n guide or Specify
Output (Clipped Sine Wave)	Voltage	0.8 Vp-p	-	-	V	
	Load	10 Kohm/10pF				
Startup Time		-	-	2	ms	
Supply Current		-	-	2	mA	13.00~26.00MHz
		-	-	2.5	mA	26.001~52.00MHz
Storage Temperature Range		-40	-	85	°C	
Aging per year		-	±2		ppm	

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS TM32F3A25GTLF-26M000

Part Number and Part Code Structure

TGS	TM32F	3	A	25	G	T	LF	XX	-26M000
1	2	3	4	5	6	7	8	9	10

- 1) TGS: Company Code
- 2) TM32F: MHz SMD TCXO, Clipped Sine Wave Output, 4 pads, L3.2*W2.5*H1.2mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V
- 4) A: Overall Frequency tolerance, A: +/-2.0pm or Specify
- 5) 25: Frequency Stability vs Temp. range. 05: +/-0.5ppm; 10: +/-1.0ppm; 25: 2.5ppm or specify
- 6) G: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) T: Packed in Tape/Reel, 3000pcs/Reel
- 8) LF: RoHS Complaint
- 9) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 10) 26M000: Frequency Range 26.000MHz or specify

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MAIN FEATURE

- Low Power Consumption • 1.8V, 2.5V and 3.3V option
- Industry standard option

APPLICATION

- Mobile, GPS and more

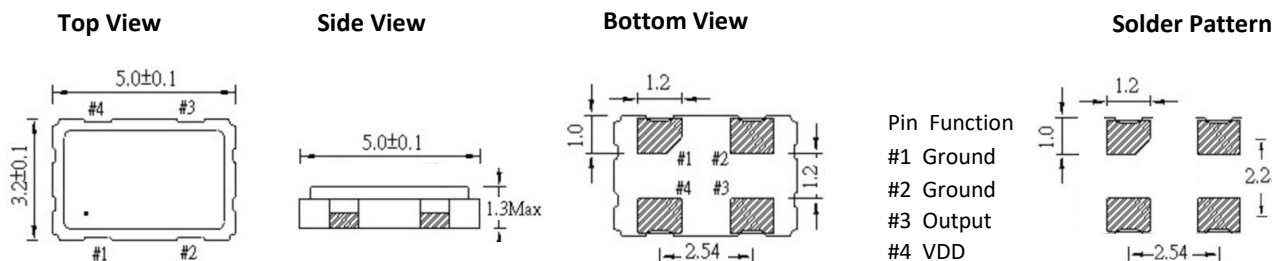


L5.0*W3.2*H1.3mm

STANDARD SPECIFICATION – Clipped Sine Wave Output

Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	+/-0.5% or see p/n guide
Frequency Range		13		52	MHz	
Freq. Stability	Temp. Range	±0.5	-	±2.5	ppm	see p/n guide or Specify
	Supply Voltage			±0.2	ppm/Vdc	@VDC +/-0.5%
	Load			±0.2	ppm	@10 Kohm/10pF (+/-10%)
Operating Temp. Range		-40	-	85	°C	see p/n guide or Specify
Output (Clipped Sine Wave)	Voltage	0.8 Vp-p	-	-	V	
	Load	10 Kohm/10pF				
Startup Time		-	-	2	ms	
Supply Current		-	-	2	mA	13.00~26.00MHz
		-	-	2.5	mA	26.001~52.00MHz
Storage Temperature Range		-40	-	85	°C	
Aging per year		-	±2		ppm	

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS TM53F3A25GTLF-26M000

[Part Number and Part Code Structure](#)

TGS	TM53F	3	A 25	G	T	LF XX	-26M000
1	2	3	4 5	6	7	8 9	10

- 1) TGS: Company Code
- 2) TM53F: MHz SMD TCXO, Clipped Sine Wave Output, 4 pads, L5.0*W3.2*H1.3mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V
- 4) A: Overall Frequency tolerance, A: +/-2.0pm or Specify
- 5) 25: Frequency Stability vs Temp. range. 05: +/-0.5ppm; 10: +/-1.0ppm; 25: 2.5ppm or specify
- 6) G: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) T: Packed in Tape/Reel, 1000pcs/Reel
- 8) LF: RoHS Compliant
- 9) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 10) 26M000: Frequency Range 26.000MHz or specify

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MAIN FEATURE

- Low Power Consumption • 1.8V, 2.5V and 3.3V option
- Industry standard option

APPLICATION

- Mobile, GPS and more

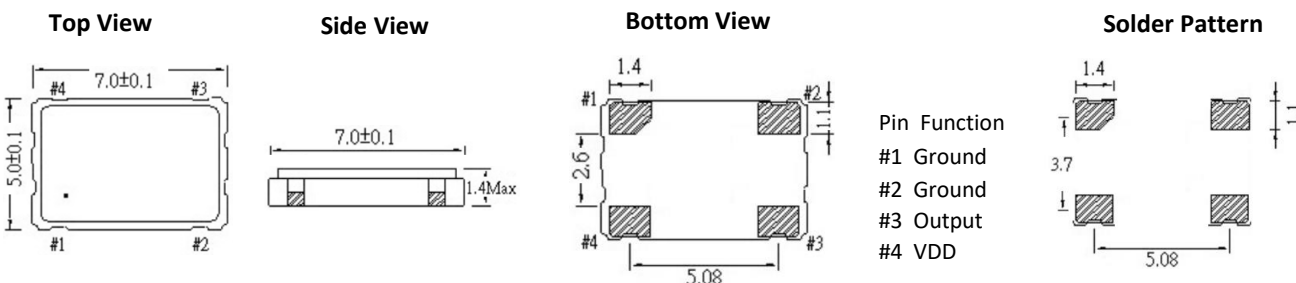


L7.5*W5.0*H1.4mm

STANDARD SPECIFICATION – Clipped Sine Wave Output

Parameter		Value			Unit	Condition
		Min.	Type	Max.		
Supply Voltage		-	3.3	-	V	+/-0.5% or see p/n guide
Frequency Range		13		52	MHz	
Freq. Stability	Temp. Range	±0.5	-	±2.5	ppm	see p/n guide or Specify
	Supply Voltage			±0.2	ppm/Vdc	@VDC +/-0.5%
	Load			±0.2	ppm	@10 Kohm/10pF (+/-10%)
Operating Temp. Range		-40	-	85	°C	see p/n guide or Specify
Output (Clipped Sine Wave)	Voltage	0.8 Vp-p	-	-	V	
	Load	10 Kohm/10pF				
Startup Time		-	-	2	ms	
Supply Current		-	-	2	mA	13.00~26.00MHz
		-	-	2.5	mA	26.001~52.00MHz
Storage Temperature Range		-40	-	85	°C	
Aging per year		-	±2		ppm	

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS TM53F3A25GTLF-26M000

[Part Number and Part Code Structure](#)

TGS	TM75F	3	A 25	G	T	LF XX	-26M000
1	2	3	4 5	6	7	8 9	10

- 1) TGS: Company Code
- 2) TM75F: MHz SMD TCXO, Clipped Sine Wave Output, 4 pads, L7.5*W5.0*H1.4mm
- 3) 3: Supply Voltage, 3: 3.3V; 2: 2.5V; 1: 1.8V
- 4) A: Overall Frequency tolerance, A: +/-2.0pm or Specify
- 5) 25: Frequency Stability vs Temp. range. 05: +/-0.5ppm; 10: +/-1.0ppm; 25: 2.5ppm or specify
- 6) G: Operating Temp. Range, D-0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) T: Packed in Tape/Reel, 1000pcs/Reel
- 8) LF: RoHS Complaint
- 9) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 10) 26M000: Frequency Range 26.000MHz or specify

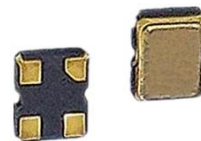
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MAIN FEATURE

- Low Power Consumption • 3.3V, 4 pads
- Industry standard option

APPLICATION

- Mobile, GPS and more

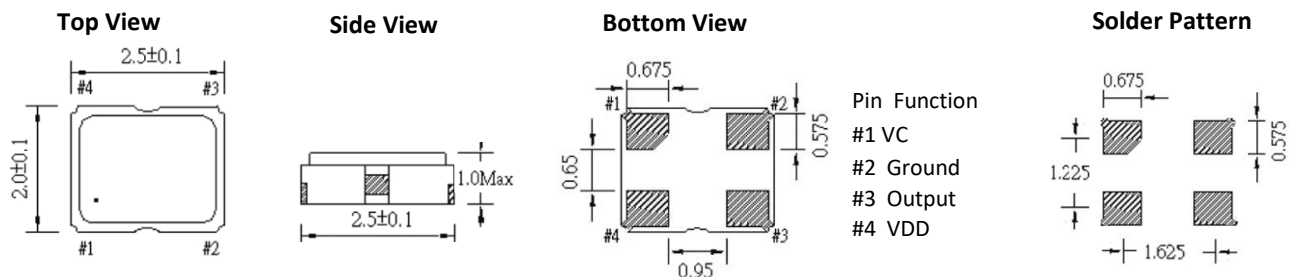


L2.5*W2.0*H1.0mm

STANDARD SPECIFICATION – CMOS Output

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	+/-10%
Control Voltage Range	0.3	1.65	3	V	
Frequency Range	1.25		62.00	MHz	
Frequency Tolerance @25°C		±50		ppm	see p/n guide or Specify
Freq. Stability @Temp. Range	-	±50		ppm	see p/n guide or Specify
Operating Temp. Range	-20	-	70	°C	see p/n guide or Specify
Output	VOH	90%		V	@90% x VDD
	VOL	-	10%	V	@10% x VDD
	Load	-	15	pF	@ CMOS output or Specify
Symmetry	45	-	55		see p/n guide or Specify
Startup Time	-	-	10	ms	
Rise/Fall Time	-	-	10	ns	
Supply Current	-	-	15	mA	
Storage Temperature Range	-55	-	125	°C	
Aging per year	-	±3		ppm	

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS VM22A30BDH03 TLF-26M000

[Part Number and Part Code Structure](#)

TGS	VM22A	3 0	B D	G H 03	T	LF XX	-26M000
1	2	3 4	5 6	7 8 9	10	11 12	13

- 1) TGS: Company Code
- 2) VM22A: MHz SMD VCXO, CMOS Output, 4 pads, L2.5*W2.0*H1.0mm
- 3) 3: Supply Voltage, 3: 3.3V
- 4) 0: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: Output Load: 03: CMOS//15pF or specify
- 9) T: Packed in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Compliant
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 26M000: Frequency Range 26.000MHz or specify

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MAIN FEATURE

- Low Power Consumption • 3.3V, 6 pads
- Industry standard option • High reliability and low aging

APPLICATION

- Mobile, GPS and more

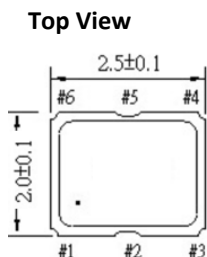


L2.5*W2.0*H1.1mm

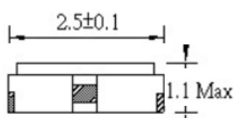
STANDARD SPECIFICATION – CMOS Output

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	+/-10%
Control Voltage Range	0.3	1.65	3	V	
Frequency Range	1.25		62.00	MHz	
Frequency Tolerance @25°C		±50		ppm	see p/n guide or Specify
Freq. Stability @Temp. Range	-	±50		ppm	see p/n guide or Specify
Operating Temp. Range	-20	-	70	°C	see p/n guide or Specify
Output	VOH	90%		V	@90% x VDD
	VOL	-	10%	V	@10% x VDD
	Load	-	15	pF	@ CMOS output or Specify
Symmetry	45	-	55		see p/n guide or Specify
Startup Time	-	-	10	ms	
Rise/Fall Time	-	-	10	ns	
Supply Current	-	-	15	mA	
Storage Temperature Range	-55	-	125	°C	
Aging per year	-	±3		ppm	

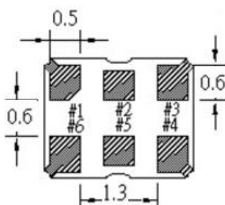
DIMENSION (mm)



Side View

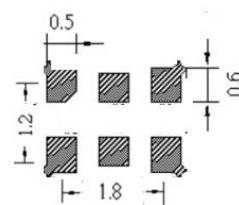


Bottom View



Pin Function
 #1 Vcon
 #2 Enable
 (Tri-State)/Disable
 #3 Ground
 #4 Output
 #5 NC
 #6 VDD

Solder Pattern



PART NUMBER GUIDE

Example: TGS VM22C30BDH03 TLF-26M000

[Part Number and Part Code Structure](#)

TGS	VM22C	3 0	B D	G H 03	T	LF XX	-26M000
1	2	3 4	5 6	7 8 9	10	11 12	13

- 1) TGS: Company Code
- 2) VM22C: MHz SMD VCXO, CMOS Output, 6 pads, L2.5*W2.0*H1.1mm
- 3) 3: Supply Voltage, 3: 3.3V
- 4) 0: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: Output Load: 03: CMOS//15pF or specify
- 9) T: Packed in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Complaint
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 26M000: Frequency Range 26.000MHz or specify

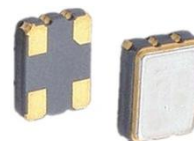
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MAIN FEATURE

- Low Power Consumption • 3.3V, 4 pads
- Industry standard option • High reliability and low aging

APPLICATION

- Mobile, GPS and more

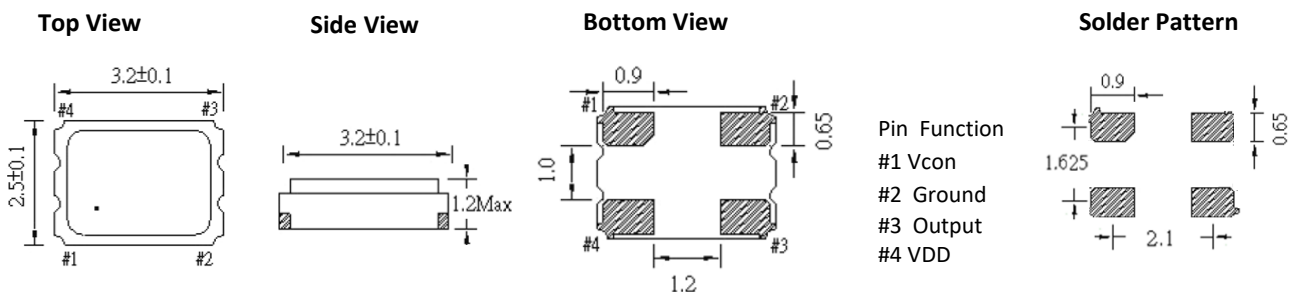


L3.2*W2.5*H1.2mm

STANDARD SPECIFICATION – CMOS Output

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	+/-10%
Control Voltage Range	0.3	1.65	3	V	
Frequency Range	1.25		62.00	MHz	
Frequency Tolerance @25°C		±50		ppm	see p/n guide or Specify
Freq. Stability @Temp. Range	-	±50		ppm	see p/n guide or Specify
Operating Temp. Range	-20	-	70	°C	see p/n guide or Specify
Output	VOH	90%		V	@90% x VDD
	VOL	-	10%	V	@10% x VDD
	Load	-	15	pF	@ CMOS output or Specify
Symmetry	45	-	55		see p/n guide or Specify
Startup Time	-	-	10	ms	
Rise/Fall Time	-	-	10	ns	
Supply Current	-	-	15	mA	
Storage Temperature Range	-55	-	125	°C	
Aging per year	-	±3		ppm	

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS VM32A30BDH03 TLF-26M000

[Part Number and Part Code Structure](#)

TGS	VM32A	3 0	B D	G H 03	T	LF XX	-26M000
1	2	3 4	5 6	7 8 9	10	11 12	13

- 1) TGS: Company Code
- 2) VM32A: MHz SMD VCXO, CMOS Output, 4 pads, L3.2*W2.5*H1.2mm
- 3) 3: Supply Voltage, 3: 3.3V
- 4) 0: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: Output Load: 03: CMOS//15pF or specify
- 9) T: Packed in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Compliant
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 26M000: Frequency Range 26.000MHz or specify

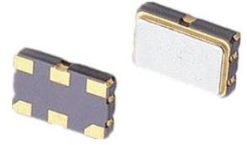
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MAIN FEATURE

- Low Power Consumption • 3.3V, 6 pads
- Industry standard option • High reliability and low aging

APPLICATION

- Mobile, GPS and more



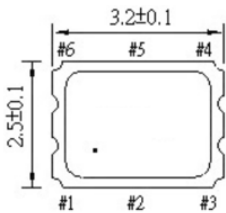
L3.2*W2.5*H1.2mm

STANDARD SPECIFICATION – CMOS Output

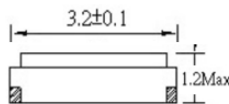
Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	+/-10%
Control Voltage Range	0.3	1.65	3	V	
Frequency Range	1.25		62.00	MHz	
Frequency Tolerance @25°C		±50		ppm	see p/n guide or Specify
Freq. Stability @Temp. Range	-	±50		ppm	see p/n guide or Specify
Operating Temp. Range	-20	-	70	°C	see p/n guide or Specify
Output	VOH	90%		V	@90% x VDD
	VOL	-	10%	V	@10% x VDD
	Load	-	15	pF	@ CMOS output or Specify
Symmetry	45	-	55		see p/n guide or Specify
Startup Time	-	-	10	ms	
Rise/Fall Time	-	-	10	ns	
Supply Current	-	-	15	mA	
Storage Temperature Range	-55	-	125	°C	
Aging per year	-	±3		ppm	

DIMENSION (mm)

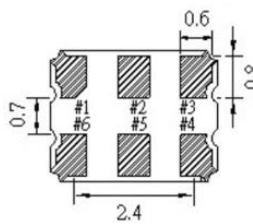
Top View



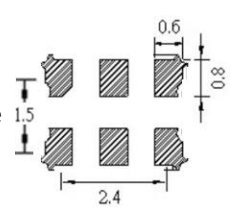
Side View



Bottom View



Solder Pattern



Pin Function

- #1 Vcon
- #2 Enable (Tri-State)/Disable
- #3 Ground
- #4 Output
- #5 NC
- #6 VDD

PART NUMBER GUIDE

Example: TGS VM32C30BDH03 TLF-26M000

[Part Number and Part Code Structure](#)

TGS	VM32C	3 0	B D	G H 03	T	LF XX	-26M000
1	2	3 4	5 6	7 8 9	10	11 12	13

- 1) TGS: Company Code
- 2) VM32C: MHz SMD VCXO, CMOS Output, 6 pads, L3.2*W2.5*H1.2mm
- 3) 3: Supply Voltage, 3: 3.3V
- 4) 0: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: Output Load: 03: CMOS//15pF or specify
- 9) T: Packed in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Complaint
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 26M000: Frequency Range 26.000MHz or specify

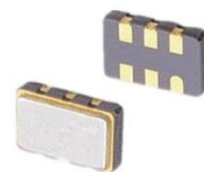
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MAIN FEATURE

- Low Power Consumption • 3.3V, 6 pads
- Industry standard option • High reliability and low aging

APPLICATION

- Mobile, GPS and more



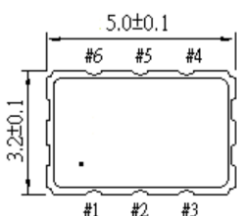
L5.0*W3.2*H1.3mm

STANDARD SPECIFICATION – CMOS Output

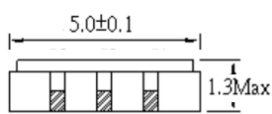
Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	+/-10%
Control Voltage Range	0.3	1.65	3	V	
Frequency Range	1.25		62.00	MHz	
Frequency Tolerance @25°C		±50		ppm	see p/n guide or Specify
Freq. Stability @Temp. Range	-	±50		ppm	see p/n guide or Specify
Operating Temp. Range	-20	-	70	°C	see p/n guide or Specify
Output	VOH	90%		V	@90% x VDD
	VOL	-	10%	V	@10% x VDD
	Load	-	15	pF	@ CMOS output or Specify
Symmetry	45	-	55		see p/n guide or Specify
Startup Time	-	-	10	ms	
Rise/Fall Time	-	-	10	ns	
Supply Current	-	-	15	mA	
Storage Temperature Range	-55	-	125	°C	
Aging per year	-	±3		ppm	

DIMENSION (mm)

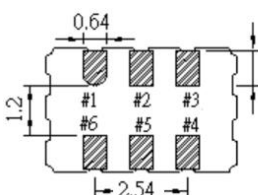
Top View



Side View

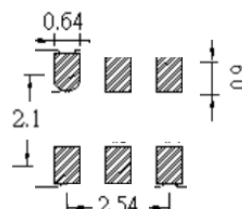


Bottom View



Pin Function
 #1 Vcon
 #2 Enable (Tri-State)/Disable
 #3 Ground
 #4 Output
 #5 NC
 #6 VDD

Solder Pattern



PART NUMBER GUIDE

Example: TGS VM53C30BDH03 TLF-26M000

[Part Number and Part Code Structure](#)

TGS	VM53C	3 0	B D	G H 03	T	LF XX	-26M000
1	2	3 4	5 6	7 8 9	10	11 12	13

- 1) TGS: Company Code
- 2) VM53C: MHz SMD VCXO, CMOS Output, 6 pads, L5.0*W3.2*H1.3mm
- 3) 3: Supply Voltage, 3: 3.3V
- 4) 0: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: 0~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
- 8) 03: Output Load: 03: CMOS//15pF or specify
- 9) T: Packed in Tape/Reel, 1000pcs/Reel
- 10) LF: RoHS Complaint
- 11) XX: Internal Control Code- 2 letter or digits ; Blank: N/A
- 12) 26M000: Frequency Range 26.000MHz or specify

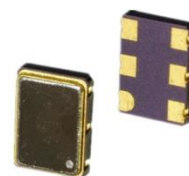
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MAIN FEATURE

- Low Power Consumption • 3.3V, 6 pads
- Industry standard option • High reliability and low aging

APPLICATION

- Mobile, GPS and more

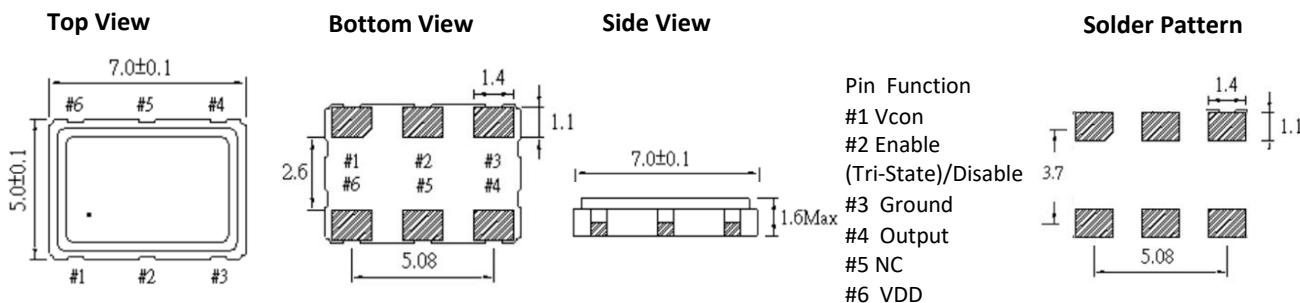


L7.0*W5.0*H1.6mm

STANDARD SPECIFICATION – CMOS Output

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Supply Voltage	-	3.3	-	V	+/-10%
Control Voltage Range	0.3	1.65	3	V	
Frequency Range	1.25		62.00	MHz	
Frequency Tolerance @25°C		±50		ppm	see p/n guide or Specify
Freq. Stability @Temp. Range	-	±50		ppm	see p/n guide or Specify
Operating Temp. Range	-20	-	70	°C	see p/n guide or Specify
Output	VOH	90%		V	@90% x VDD
	VOL	-	10%	V	@10% x VDD
	Load	-	15	pF	@ CMOS output or Specify
Symmetry	45	-	55		see p/n guide or Specify
Startup Time	-	-	10	ms	
Rise/Fall Time	-	-	10	ns	
Supply Current	-	-	15	mA	
Storage Temperature Range	-55	-	125	°C	
Aging per year	-	±3		ppm	

DIMENSION (mm)



PART NUMBER GUIDE

Example: TGS VM75C30BDH03 TLF-26M000

[Part Number and Part Code Structure](#)

TGS	VM75C	3 0	B D	G H 03	T	LF XX	-26M000
1	2	3 4	5 6	7 8 9	10	11 12	13

- 1) TGS: Company Code
- 2) VM75C: MHz SMD VCXO, CMOS Output, 6 pads, L7.0*W5.0*H1.6mm
- 3) 3: Supply Voltage, 3: 3.3V
- 4) 0: Enable/Disable Function, 1: Tri-state Via Pin 1; 0: N/A
- 5) B: Overall Frequency tolerance, A: +/-25ppm; B: +/-50ppm; C: +/-100ppm; J: +/-20ppm or Specify
- 6) D: Operating Temp. Range, D: -20~70 °C; E: -10 ~+60°C; F: -20 ~+70 °C; G: -40 ~+85 °C or Specify
- 7) H: Symmetry H: 40/60; I: 45/55
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