




**SPECIFICATION SHEET**

<b>SPECIFICATION SHEET NO.</b>	Q0501-CM12M00000S022
<b>DATE</b>	May 01, 2023
<b>REVISION</b>	A0
<b>DESCRIPTION</b>	SMD Ceramic Resonator, 3731 Type, L3.7*W3.1*H1.5mm, Built-in Capacitance, 3 pads, CRTV Series 12.000MHz, Frequency Accuracy +/-0.5%, Operating Temp. Range -25°C ~+85°C, Reflow Profile Condition 260 °C Max. RoHS/RoHS III compliant, Tape/Reel
<b>CUSTOMER</b>	
<b>CUSTOMER PART NUMBER</b>	
<b>CROSS REF. PART NUMBER</b>	
<b>ORIGINAL PART NUMBER</b>	TGS CRTV 12.0MT-22 TLF
<b>PART CODE</b>	CM12M00000S022

<b>VENDOR APPROVE</b>			
Issued/Checked/Approved			
DATE: May 01, 2023			

<b>CUSTOMER APPROVE</b>	
DATE:	

5/4/2023

**SMD CERAMIC RESONATOR CRTV SERIES**

**MAIN FEATURE**

- SMD Ceramic Resonator, L3.7\*W3.1\*H1.5mm, 3 pads
- Low cost & Built-in Capacitance
- Reflow Profile Condition 260 °C Max.
- Wide Frequency Range
- Cross more competitors part
- RoHS III compliant



**APPLICATION**

- Bluetooth, wireless communication set
- Communication Electronics

**PART CODE GUIDE**

**RFQ**  
Request For Quotation

CM	12M00000	S	022
1	2	3	4

1) CM: Part Code for SMD Ceramic Resonator, Built-in Capacitance, L3.7\*W3.1\*H1.5mm, 3 pads, CRTV series

2) 12M00000: Frequency range code for 12.00000MHz

3) S: SMD type, Package Tape/Reel, 1000pcs/Reel

4) 022: Specification code for original part No.: **TGS CRTV 12.0MT-22 TLF**

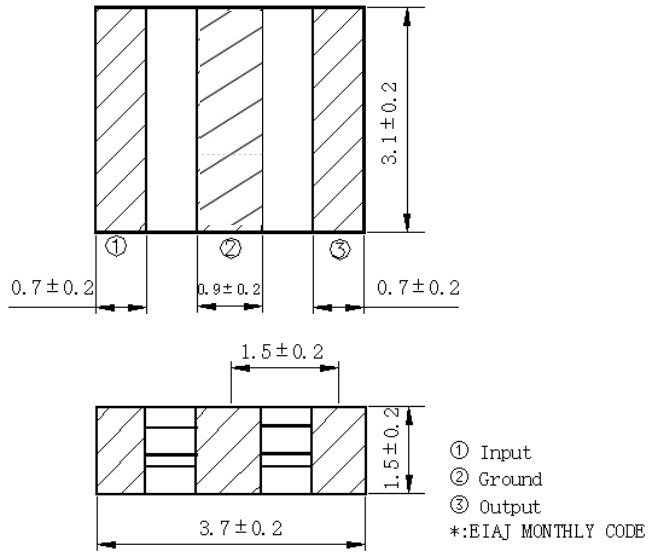
**SMD CERAMIC RESONATOR CRTV SERIES**

**DIMENSION (Unit: mm)**

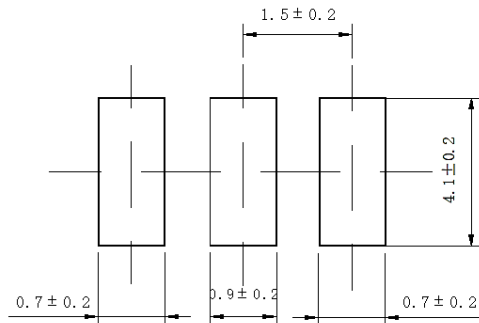
Image for reference



**CRTV**



**Recommend Pad Layout**



**SMD CERAMIC RESONATOR CRTV SERIES**
**ELECTRICAL PARAMETERS**

Parameter	Part No. Symbol	Units	Value			Condition
			Min.	Typical	Max.	
Original Manufacturer	TGS	TGS Crystals				
Holder Type	CRTV	SMD Ceramic Resonator, L3.7*W3.1*H1.3mm, 3 pads				
Frequency Range	12.0	MHz	12.0			
Withstanding Voltage	MT	V	50			@DC, 1 min
Insulation Resistance		MΩ	500			@AV, 1 min.
Operation Temperature		°C	-25		+85	
Storage Temperature		°C	-55		+85	
Rating Voltage	V	6			DC	
		15			p-p	
Frequency Accuracy	%	0.5				
Resonant Impedance	Ω			40		
Temperature Coefficient of Oscillation Frequency	%			+/-0.3	Oscillation Frequency drift, -25°C ~ +85°C)	
Oscillation Frequency Aging Rate (10 years)	%			+/-0.3	From initial value	
IC application		1/6TC74HCU04Px2				
Design Mode						
Built-in Capacitance	-22	pF	22pF (+/-20%)			
Other	Package	T	Tape/Reel			
	RoHS Status	LF	RoHS III compliant			
	Add Value		N/A			
	Internal Control Code *		N/A			

Note: 1) Original Part Number: **TGS CRTV 12.0MT-22 TLF**

2) \* Internal Control Code- 2 letter or digits; Blank: N/A

**SMD CERAMIC RESONATOR CRTV SERIES**
**RELIABILITY**

Test Items	Test Method And Conditions	Performance Requirements
<b>Humidity</b>	Keep the resonator at 40°C±2°C and 90%-95% RH for 96h. Then Release the resonator into the room Condition for 1h prior to the Measurement.	It shall fulfill the specifications in Table 1.
<b>High Temperature Exposure</b>	Subject the resonator to -85°C±2°C for 96h, then release the resonator into the room conditions for 1h prior to the measurement.	It shall fulfill the specifications in Table 1.
<b>Low Temperature Exposure</b>	Subject the resonator to -55°C±2°C for 96h, then release the resonator into the room conditions for 1h prior to the measurement.	It shall fulfill the specifications in Table 1.
<b>Temperature Cycling</b>	After temperature cycling of blow table was performed 5 times, resonator shall be measured after being placed in natural conditions for 1h. Time: 30 min.@ -25 +/--3°C ; Time: 30 min. @85 +/--3°C	It shall fulfill the specifications in Table 1.
<b>Vibration</b>	Subject the resonator to vibration for 2h each in x, y and z axis With the amplitude of 1.5mm, the frequency shall be varied uniformly between the limits of 10 Hz—55Hz.	It shall fulfill the specifications in Table 1.
<b>Mechanical Shock</b>	Drop the resonator randomly onto a wooden floor from the height of 100cm 3 times.	It shall fulfill the specifications in Table 1.
<b>Soldering Test</b>	Passed through the re-flow oven under the following condition and left at room temperature for 1h before measurement	It shall fulfill the specifications in Table 1.
<b>Solder Ability</b>	Dipped in 245°C±5°C solder bath for 3s±0.5 s with rosin flux (25wt% ethanol solution.)	The terminals shall be at least 95% covered by solder.
<b>Board Bending</b>	Mount a glass-epoxy board (Width=40mm,thickness=1.6mm),then bend it to 1mm displacement and keep it for 5s. (See the following figure 1)	Mechanical damage such as breaks shall not occur.

**Table 1**

Item	Specification after test
Oscillation Frequency Change $\Delta F_{osc}/F_{osc}$ (%) max	±0.3
Resonant Impedance ( $\Omega$ ) max	40
The limits in the above table are referenced to the initial measurements.	

**SMD CERAMIC RESONATOR CRTV SERIES**

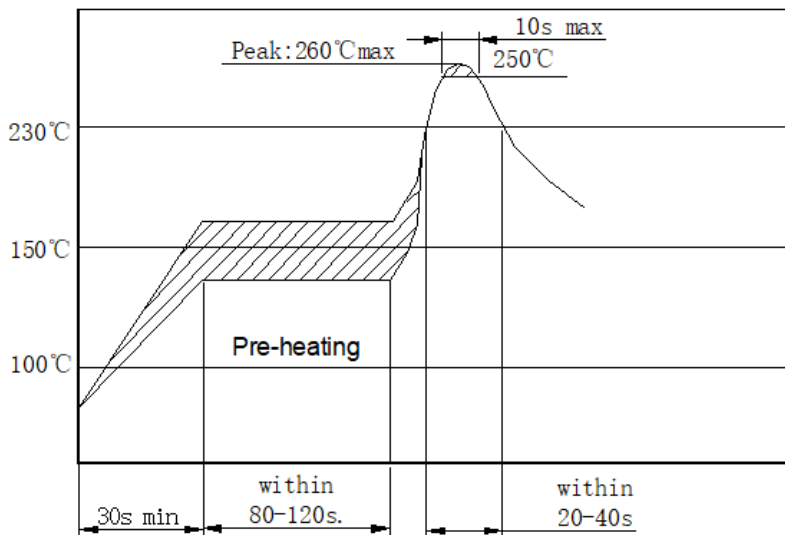
**TEST CIRCUIT (For Reference Only)**



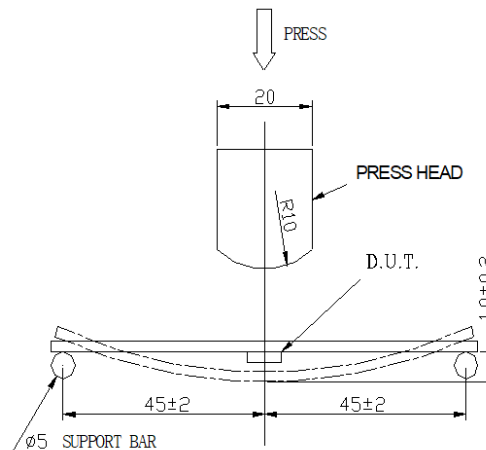
**Note:**

Parts shall be tested under the condition (Temp.:  $20 \pm 15^\circ C$ , Humidity  $65 \pm 20\%$  R.H.) unless the standard condition (Temp.:  $25 \pm 3^\circ C$ , Humidity :  $65 \pm 10\%$  R.H.) is regulated to measure.

**SUGGESTED REFLOW PROFILE (For Reference Only)**



**BOARD BENDING TEST- FIGURE 1**



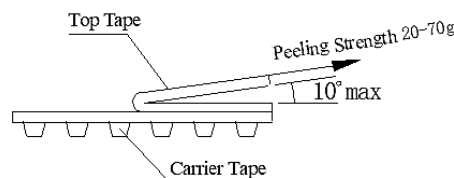
**SMD CERAMIC RESONATOR CRTV SERIES**

**TAPE/REEL (Unit: mm)**

All Devices are packed in accordance with EIA standard RS-481-2 and specifications., 1000pcs/Reel



Symbol	Dimension
$\phi A$	180±3.0
$\phi B$	60.0 Min.
W	12.4 Min.
T	19.4 Max.



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5/4/2023