




**SPECIFICATION SHEET**

<b>SPECIFICATION SHEET NO.</b>	Q0501-CG24M00000S001
<b>DATE</b>	May 01, 2023
<b>REVISION</b>	A0
<b>DESCRIPTION</b>	SMD Ceramic Resonator, 3731 Type, L3.7*W3.1*H1.2mm, Without Built-in Capacitance, 2 pads, CRAV Series 24.000MHz, 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 CRAV 24.0MX TLF
<b>PART CODE</b>	CG24M00000S001

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

<b>CUSTOMER APPROVE</b>	
DATE:	

5/1/2023

**SMD CERAMIC RESONATOR CRAV SERIES**

**MAIN FEATURE**

- SMD Ceramic Resonator, L3.7\*W3.1\*H1.2mm, 2 pads
- Low cost & Without 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](#)

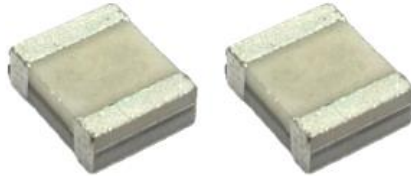
CG	24M00000	S	001
1	2	3	4

- 1) CG: Part family Code for SMD Ceramic Resonator, L3.7\*W3.1\*H1.2mm, 2 pads, CRAV series
- 2) 24M00000: Frequency range code for 24.00000MHz
- 3) S: SMD type, Package Tape/Reel, 1000pcs/Reel
- 4) 001: Specification code for original part No.: **TGS CRAV 24.0MX TLF**

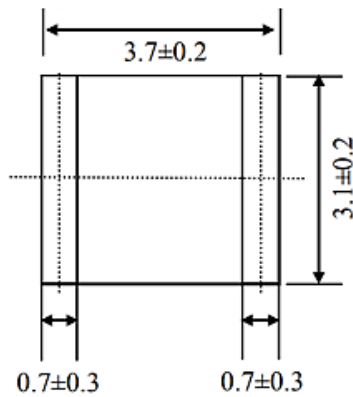
**SMD CERAMIC RESONATOR CRAV SERIES**

**DIMENSION (Unit: mm)**

Image for reference

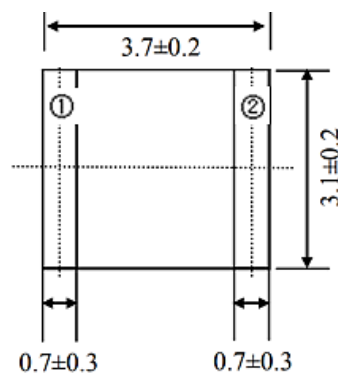


CRAV



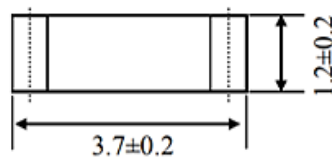
**Marking**

Line 1: Freq. Range+ QC Code (A~Z)



**Connection**

#1 In/Output #2 Output/Input



**SMD CERAMIC RESONATOR CRAV SERIES**
**ELECTRICAL PARAMETERS**

Parameter	Part No. Symbol	Units	Value			Condition
			Min.	Typical	Max.	
Original Manufacturer	TGS	TGS Crystals				
Holder Type	CRAV	SMD Ceramic Resonator, L3.7*W3.1*H1.2mm, 2 pads				
Frequency Range	24.0	MHz	24.00			
Withstanding Voltage		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	6.0			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			1/6TC4069UBP			
Design Mode	MX					
Built-in Capacitance		pF	N/A			
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 CRAV 24.0MX TLF**

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

**SMD CERAMIC RESONATOR CRAV SERIES**
**RELIABILITY**

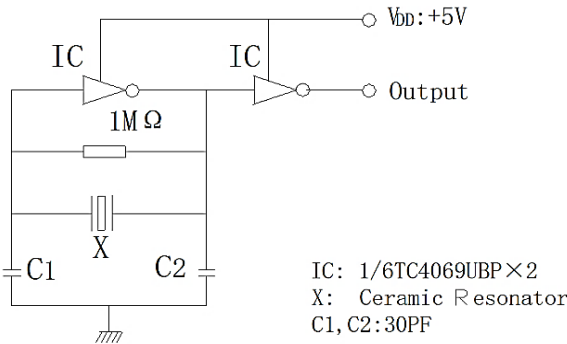
Test Items	Test Method And Conditions	Performance Requirements
<b>Humidity</b>	Keep the resonator at 40°C±2°C and 90%-95% RH for 96h. Then Release the resonator into the room Condition for 1h prior to the Measurement.	It shall fulfill the specifications in Table 1.
<b>High Temperature Exposure</b>	Subject 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 CRAV SERIES**

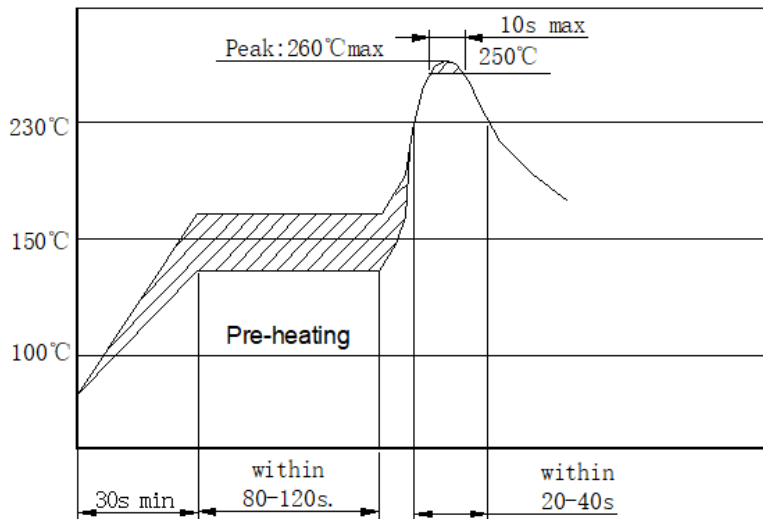
**TEST CIRCUIT (For Reference Only)**



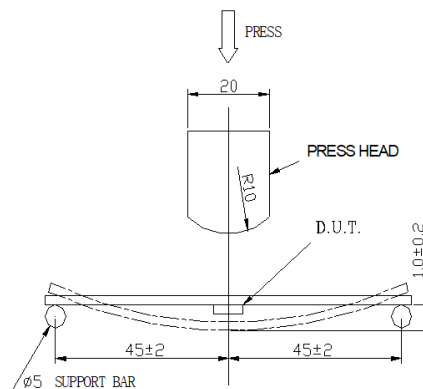
**Note:**

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

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



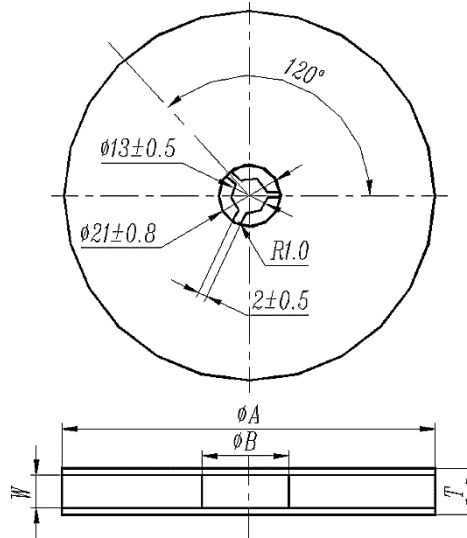
**BOARD BENDING TEST- FIGURE 1**



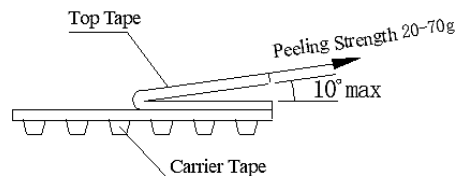
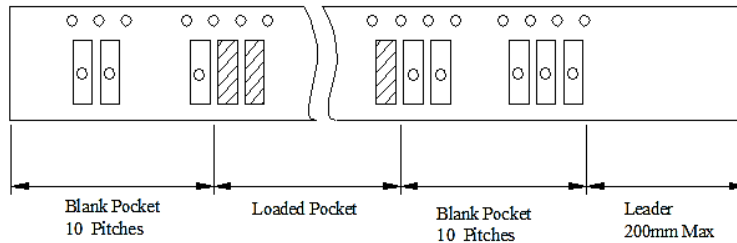
**SMD CERAMIC RESONATOR CRAV SERIES**

**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 $\pm$ 3.0
$\phi B$	60.0 Min.
W	12.4 Min.
T	19.4 Max.



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