




**SPECIFICATION SHEET**

<b>SPECIFICATION SHEET NO.</b>	Q0620-CS16M00000S001
<b>DATE</b>	June 20, 2023
<b>REVISION</b>	A0
<b>DESCRIPTION</b>	MHz SMD Ceramic Resonator, 4741 Type, L4.7*W4.1*H1.7mm, Without Built-in Capacitance, 2 pads, CRAS Series 16.00000MHz, Frequency Accuracy $\pm 0.5\%$ , Operating Temp. Range $-25^{\circ}\text{C} \sim +85^{\circ}\text{C}$ , Reflow Profile Condition $260^{\circ}\text{C}$ Max. RoHS/RoHS III compliant, Tape/Reel, 1000pcs/Reel
<b>CUSTOMER</b>	
<b>CUSTOMER PART NUMBER</b>	
<b>CROSS REF. PART NUMBER</b>	
<b>ORIGINAL PART NUMBER</b>	TGS CRAS 16.0MX TLF
<b>PART CODE</b>	CS16M00000S001

<b>VENDOR APPROVE</b>			
Issued/Checked/Approved			
DATE: June 20, 2023			

<b>CUSTOMER APPROVE</b>	
DATE:	

6/20/2023

**SMD CERAMIC RESONATOR CRAS SERIES**

**MAIN FEATURE**

- SMD Ceramic Resonator, L4.7\*W4.1\*H1.7mm, 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](#)

<b>CS</b>	<b>16M00000</b>	<b>S</b>	<b>001</b>
1	2	3	4

1) CS: Part Code for SMD Ceramic Resonator, Without Built-in Capacitance, 2 pads, L4.7\*W4.1\*H1.7mm, CRAS SERIES

2) 16M00000: Frequency range code for 16.000000MHz

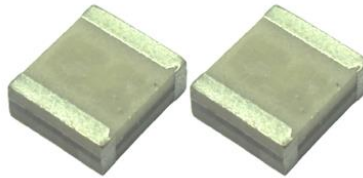
3) S: SMD type, Package Tape/Reel

4) 001: Specification code for original part No.: TGS CRAS 16.0MX TLF

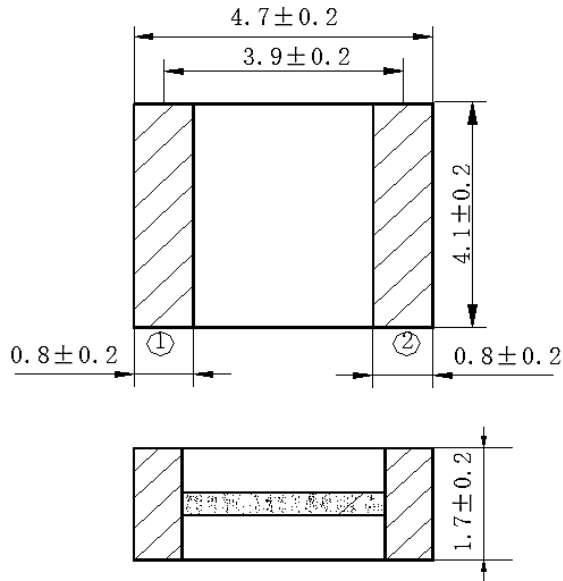
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**DIMENSION (Unit: mm)**

Image for reference

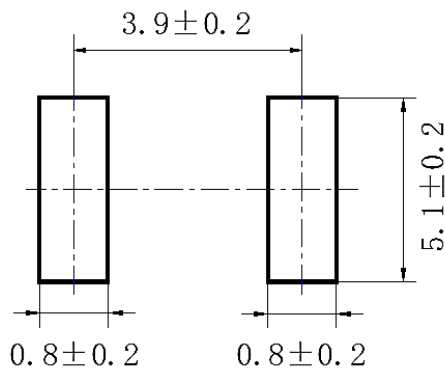


**CRAS**



- ① Input
- ② Output

**Recommend Pad Layout**



**SMD CERAMIC RESONATOR CRAS SERIES**
**ELECTRICAL PARAMETERS**

Parameter	Part No. Symbol	Units	Value			Condition
			Min.	Typical	Max.	
Original Manufacturer	TGS	TGS Crystals				
Holder Type	CRAS	SMD Ceramic Resonator, 2 pads Without Built-in Capacitance, L4.7*W4.1*H1.7mm,				
Frequency Range	16.0	MHz	16.000000			
Withstanding Voltage	MX	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			60	
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		1/6TC74HCU04				
Design Mode						
Built-in Capacitance		pF	Blank: N/A			
Other	Package	T	Tape/Reel			
	RoHS Status	LF	RoHS III compliant			
	Add Value		N/A			
	Internal Control Code		2 letter or digits; Blank: N/A			

Note: 1) Original Part Number: TGS CRAS 16.0MX TLF 2) Components shall be left in a chamber of +85±2°C for 1000 hours, then measured after leaving in natural condition for 1 hour.

**SMD CERAMIC RESONATOR CRAS SERIES**

**RELIABILITY**

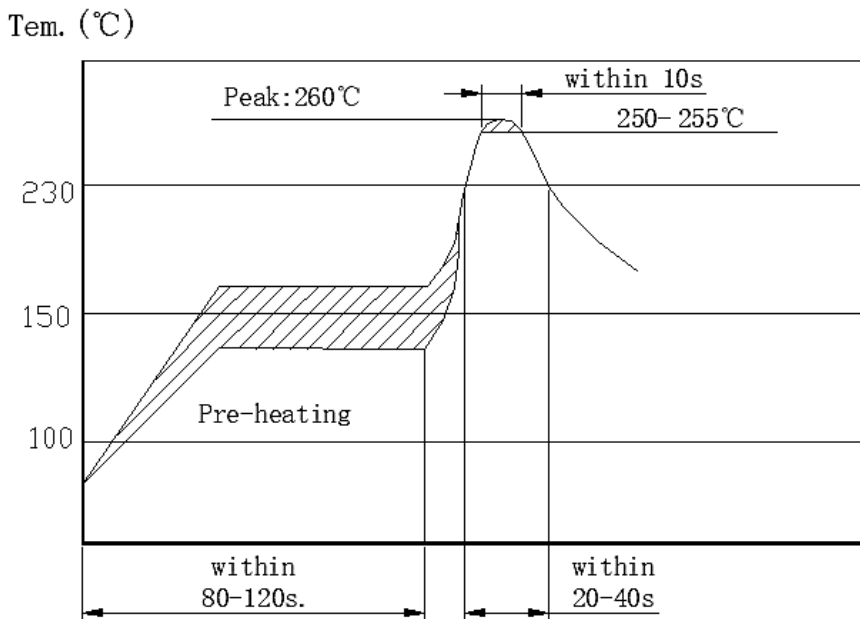
Test Items	Test Method And Conditions	Performance Requirements
<b>Humidity</b>	Keep the resonator at 40°C±2°C and 90%-95% RH for 96h. Then Release the resonator into the room Condition for 1h prior to the Measurement.	It shall fulfill the specifications in Table 1.
<b>High Temperature Exposure</b>	Subject 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>	Subject the resonator to -25°C±3°C for 30±3 min. followed by a high temperature of 85°C ±3°C for 30±3 min. Cycling shall be repeated 5 times with a transfer time of 15s. At the room temperature for 1h prior to the measurement.	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.

**SMD CERAMIC RESONATOR CRAS SERIES**

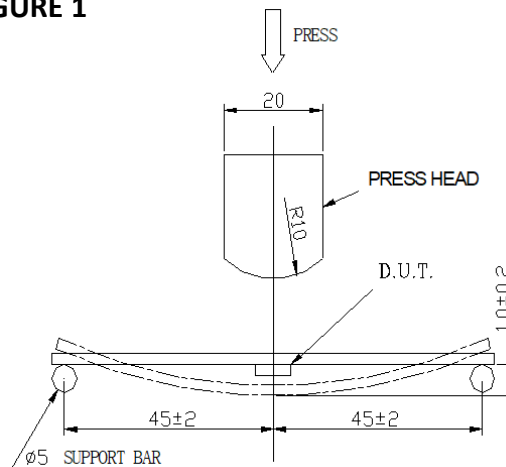
**Table 1**

Item	Specification after test
Oscillation Frequency Change $\Delta F_{osc}/F_{osc}$ (%) max	$\pm 0.3$
Resonant Impedance ( $\Omega$ ) max	60
The limits in the above table are referenced to the initial measurements.	

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

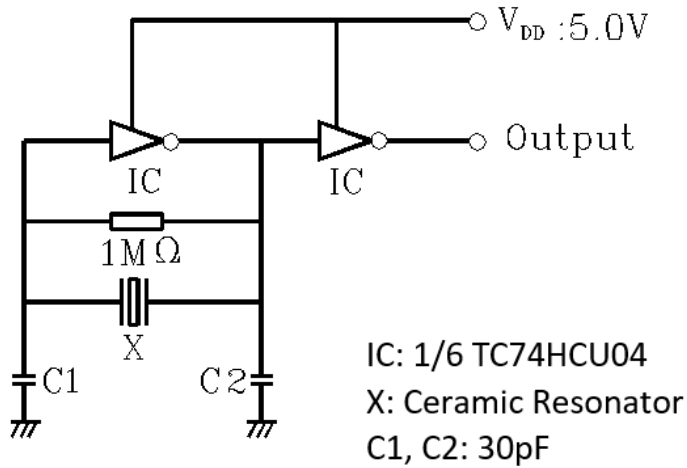


**BOARD BENDING TEST- FIGURE 1**



**SMD CERAMIC RESONATOR CRAS SERIES**

**TEST CIRCUIT (For Reference Only)**



**Note:**

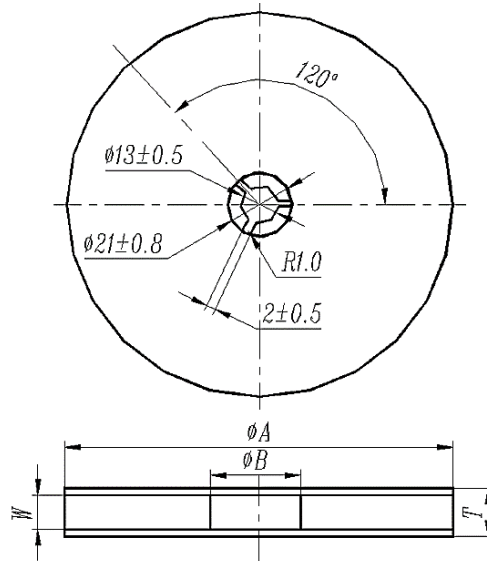
Parts shall be tested under the condition ( Temp.:  $20 \pm 15^\circ\text{C}$ , Humidity  $65 \pm 20\%$  R.H.) unless the standard condition (Temp.:  $25 \pm 3^\circ\text{C}$ , Humidity :  $65 \pm 10\%$  R.H.) is regulated to measure.

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

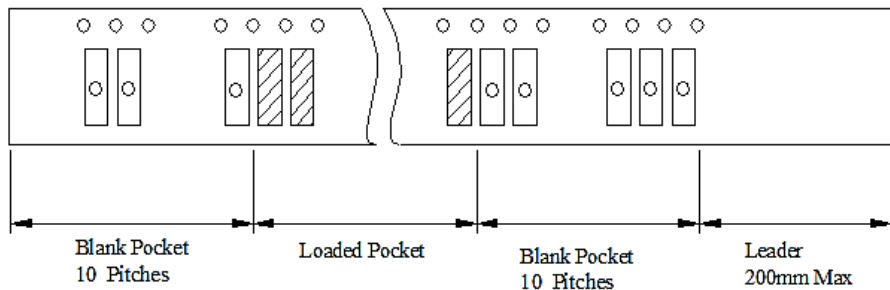
All Devices are packed in accordance with EIA standard RS-481-2 and specifications, 1000pcs/Reel, Carrier tape size-12,

Reel



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

Packing Method Sketch Map



Test Condition Of Peeling Strength





## SMD CERAMIC RESONATOR CRAS SERIES

### NOTES

- Don't apply excess mechanical stress to the component and terminals at soldering. Do not use this product with bend.
- Do not clean or wash the component for it is not hermetically sealed.
- Do not use strong acidity flux, more than 0.2wt% chlorine content, in flow soldering.
- Don't be close to fire.
- This specification mentions the quality of the component as a single unit. Please insure the component is thoroughly evaluated in your application circuit
- Expire date (Shelf life) of the products is 12 months after delivery under the conditions of a sealed and an unopened package. Please use the products within 12 months after delivery. If you store the products for a long time (more than 12 months), use carefully because the products may be degraded in the solder-ability or rusty. Please confirm solder-ability and characteristics for the products regularly.
- Exposure components under soldering condition that is exceeding our recommendation will increase the failure dangerous.
- Please contact us before using the product as automobile electronic component.
- Please return one of these specifications after your signature of acceptance.
- When something gets doubtful with this specifications, we shall jointly work to get an agreement.
- For questions on technology, prices and delivery, please contact our sales offices or e-mail:  
[sales@NextGenComponent.com](mailto:sales@NextGenComponent.com) .

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