




SPECIFICATION SHEET

| | |
|--------------------------------|---|
| SPECIFICATION SHEET NO. | Q0501-CG20M00000S001 |
| DATE | May 01, 2023 |
| REVISION | A0 |
| DESCRIPTION | SMD Ceramic Resonator, 3731 Type, L3.7*W3.1*H1.2mm, Without Built-in Capacitance, 2 pads, CRAV Series 20.000MHz, Frequency Accuracy +/-0.5%, Operating Temp. Range -25°C ~+85°C, Reflow Profile Condition 260 °C Max. RoHS/RoHS III compliant, Tape/Reel |
| CUSTOMER | |
| CUSTOMER PART NUMBER | |
| CROSS REF. PART NUMBER | |
| ORIGINAL PART NUMBER | TGS CRAV 20.0MX TLF |
| PART CODE | CG20M00000S001 |

| | | | |
|-------------------------|---|--|---|
| VENDOR APPROVE | | | |
| Issued/Checked/Approved |  |  |  |
| DATE: May 01, 2023 | | | |

| | |
|-------------------------|--|
| CUSTOMER APPROVE | |
| | |
| 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

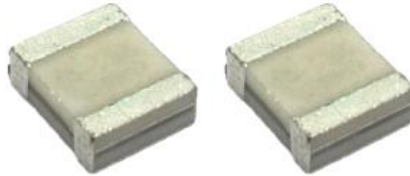
| CG | 20M00000 | S | 001 |
|----|----------|---|-----|
| 1 | 2 | 3 | 4 |

- 1) CG: Part family Code for SMD Ceramic Resonator, L3.7*W3.1*H1.2mm, 2 pads, CRAV series
- 2) 20M00000: Frequency range code for 20.00000MHz
- 3) S: SMD type, Package Tape/Reel, 1000pcs/Reel
- 4) 001: Specification code for original part No.: **TGS CRAV 20.0MX TLF**

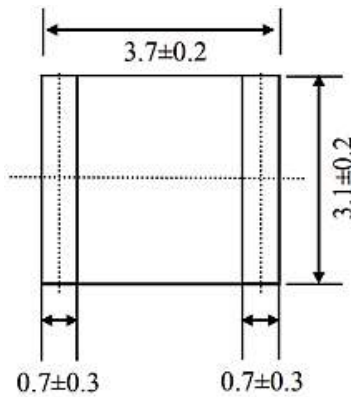
SMD CERAMIC RESONATOR CRAV SERIES

DIMENSION (Unit: mm)

Image for reference

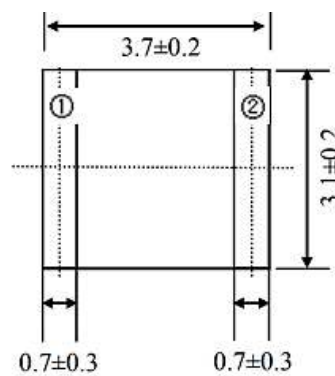


CRAV



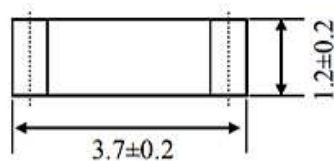
Marking

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 | 20.0 | MHz | 20.00 | | | |
| 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 20.0MX TLF**

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

SMD CERAMIC RESONATOR CRAV SERIES
RELIABILITY

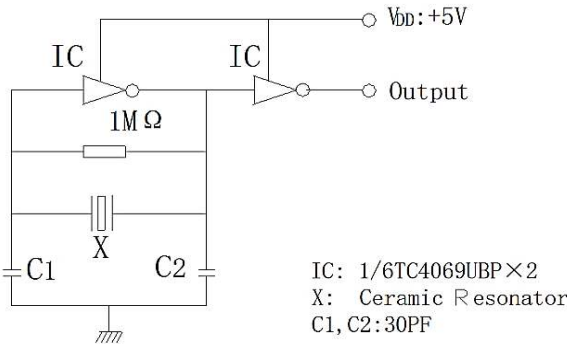
| Test Items | Test Method And Conditions | Performance Requirements |
|----------------------------------|---|--|
| Humidity | Keep the resonator at 40°C±2°C and 90%-95% RH for 96h. Then Release the resonator into the room Condition for 1h prior to the Measurement. | It shall fulfill the specifications in Table 1. |
| High Temperature Exposure | 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. |
| Low Temperature Exposure | 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. |
| Temperature Cycling | 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. |
| Vibration | 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. |
| Mechanical Shock | Drop the resonator randomly onto a wooden floor from the height of 100cm 3 times. | It shall fulfill the specifications in Table 1. |
| Soldering Test | 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. |
| Solder Ability | 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. |
| Board Bending | 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 (Ω) max | 40 |
| The limits in the above table are referenced to the initial measurements. | |

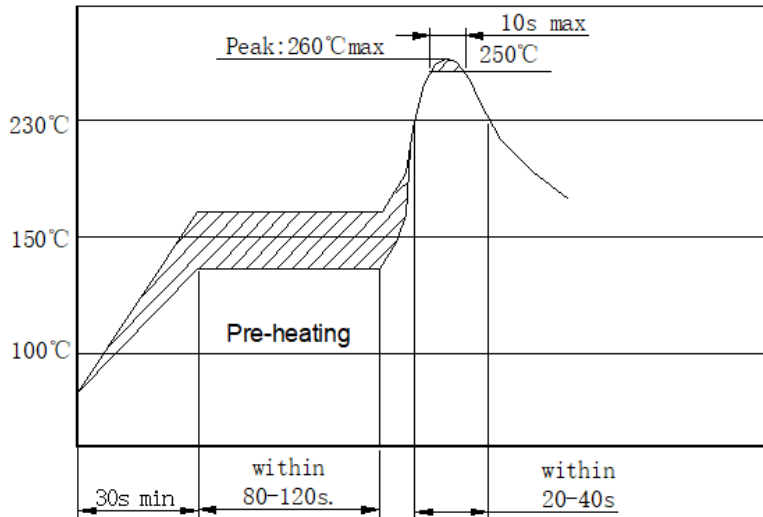
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TEST CIRCUIT (For Reference Only)

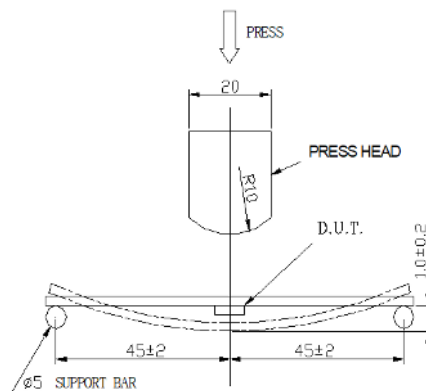


Note:
 Parts shall be tested under the condition
 (Temp.: 20±15°C, Humidity 65±20% R.H.) unless the
 standard condition (Temp.: 25±3 °C, Humidity :65±10%
 R.H.) is regulated to measure.

SUGGESTED REFLOW PROFILE (For Reference Only)



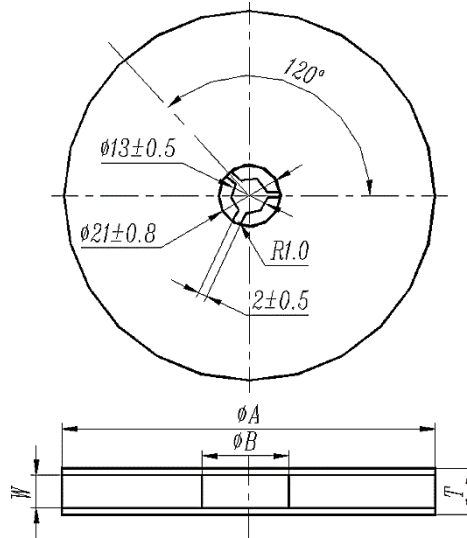
BOARD BENDING TEST- FIGURE 1



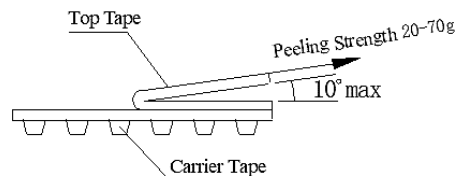
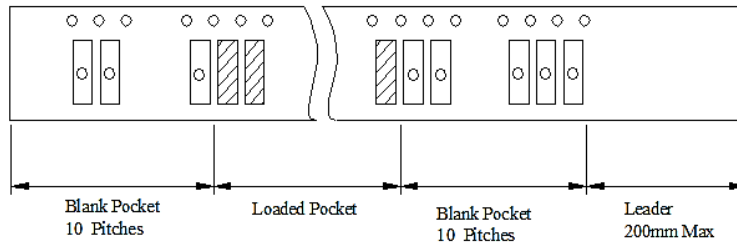
SMD CERAMIC RESONATOR CRAV SERIES

TAPE/REEL (Unit: mm)

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



| Symbol | Dimension |
|----------|---------------|
| ϕA | 180 \pm 3.0 |
| ϕB | 60.0 Min. |
| W | 12.4 Min. |
| T | 19.4 Max. |



DISCLAIMER

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5/1/2023