




**SPECIFICATION SHEET**

|                                |   |
|--------------------------------|---|
| <b>SPECIFICATION SHEET NO.</b> | Q0129 - XP12M28800S420  |
| <b>DATE</b>                    | Jan. 29, 2023   |
| <b>REVISION</b>                | A0  |
| <b>DESCRIPTION</b>             | MHz SMD Crystal, L6.0*W3.5*H1.2mm, Glass Seal, 2 Pads, CMG632 series<br>12.288000MHz, Tolerance +/-30ppm, Load Capacitor 20pF,<br>Frequency stability +/-30ppm @Operating Temp. Range -40°C ~+85°C,<br>ESR 70 ohm Max, Reflow Profile Condition 260 °C Max.<br>Tape/Reel, 1000pcs/Reel<br>RoHS/RoHS III compliant, RoHS Annex III lead Exemption (exempt per RoHS<br>EU 2015/863) |
| <b>CUSTOMER</b>                |   |
| <b>CUSTOMER PART NUMBER</b>    |   |
| <b>CROSS REF. PART NUMBER</b>  |   |
| <b>ORIGINAL PART NUMBER</b>    | TGS CMG632 12M288A30-20-30-40-70 TLH  |
| <b>PART CODE</b>               | XP12M28800S420  |

|                         |   |  |   |
|-------------------------|---|--|---|
| <b>VENDOR APPROVE</b>   |   |  |   |
| Issued/Checked/Approved |  |  |  |
| DATE: Jan. 29, 2023     |   |  |   |

|                         |  |
|-------------------------|--|
| <b>CUSTOMER APPROVE</b> |  |
|                         |  |
| DATE:                   |  |

1/29/2023

**MHZ SMD CRYSTAL GLASS SEAL 6035 TYPE 2 PADS**

**MAIN FEATURE**

- MHz SMD Crystal Glass seal, 2 Pads, L6.0\*W3.5\*H1.2mm
- Low cost, High precision, High frequency stability
- Reflow Profile Condition 260 °C Max.
- Cross more competitors part
- RoHS/RoHS III compliant, RoHS Annex III lead Exemption (exempt per RoHS EU 2015/863)



**APPLICATION**

- Measurement Instrument
- Communication Electronics

**PART CODE GUIDE**

**RFQ**

Request For Quotation

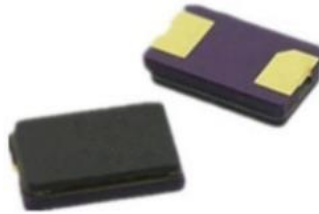
| XP | 12M28800 | S | 420 |
|----|----------|---|-----|
| 1  | 2        | 3 | 4   |

- 1) XP: Part family Code for SMD Crystal Glass seal, L6.0\*W3.5\*H1.2mm, 2 Pads, CMG632 series
- 2) 12M28800: Frequency range code for 12.2880MHz
- 3) S: SMD type, Package Tape/Reel, 1000pcs/Reel
- 4) 420: Specification code for original part no. **TGS CMG632 12M288A30-20-30-40-70 TLH**

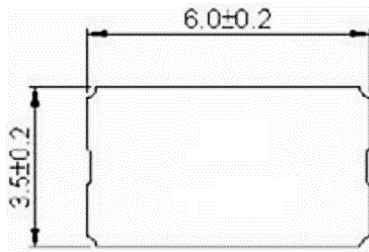
**MHZ SMD CRYSTAL GLASS SEAL 6035 TYPE 2 PADS**

DIMENSION (Unit: mm, +/-0.2mm)

Image for reference



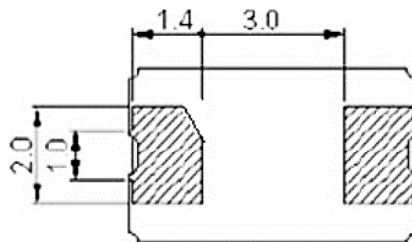
Top View



**Marking**

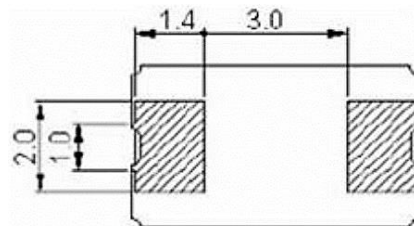
Frequency Range  
or Internal control  
code

Bottom type 1  
View



OR

Bottom Type 2  
View

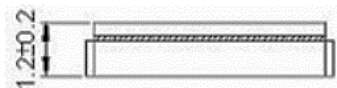


Pin Configuration

#1 Crystal

#2 Crystal

Side View



**MHZ SMD CRYSTAL GLASS SEAL 6035 TYPE 2 PADS**
**ELECTRICAL PARAMETERS**

| Parameter                            | Part No. Symbol         | Units    | Value   |         |      | Condition             |
|--------------------------------------|-------------------------|----------|---|---------|------|-----------------------|
|                                      |                         |          | Min.  | Typical | Max. |                       |
| Original Manufacturer                | TGS                     |          | TGS Crystals  |         |      |                       |
| Holder Type                          | CMG632                  |          | MHz SMD Crystal, Glass Seal, L6.0*W3.5*H1.2mm, 2 pads                           |         |      |                       |
| Frequency Range                      | 12M288                  | MHz      | 12.288000   |         |      |                       |
| Mode of Oscillation                  | A                       |          | AT Fundamental  |         |      |                       |
| Frequency Tolerance                  | 30                      | ppm      | -30   |         | +30  | @25°C                 |
| Load Capacitance                     | -20                     | pF       | 20  |         |      |                       |
| Stability over Operation Temperature | -30                     | ppm      | -30   |         | +30  |                       |
| Operation Temperature                | -40                     | °C       | -40   |         | +85  |                       |
| Storage Temperature                  |                         | °C       | -40   |         | +85  |                       |
| Equivalent Series Resistance (ESR)   | 70                      | Ω        |   |         | 70   |                       |
| Drive Level                          |                         | μW       |   |         | 100  |                       |
| Shunt Capacitance (C0)               |                         | pF       | 0   |         | 5.0  |                       |
| Motional Capacitance (C1)            |                         | fF       | N/A   |         |      |                       |
| DLD2                                 |                         | Ω        | N/A   |         |      |                       |
| FLD2                                 |                         | ppm      | N/A   |         |      |                       |
| RDL2                                 |                         | Ω        | N/A   |         |      |                       |
| SPDB                                 |                         | dB       | N/A   |         |      |                       |
| Aging                                |                         | ppm/year |   |         | ±3   | @1 <sup>st</sup> year |
| Insulation Resistance                |                         | MΩ       | 500   |         |      | @100VDC<br>± 15Vdc    |
| Others                               | Package                 | T        | Tape/Reel, 1000pcs/Reel   |         |      |                       |
|                                      | RoHS Status             | LH       | RoHS III compliant, RoHS Annex III lead Exemption (exempt per RoHS EU 2015/863) |         |      |                       |
|                                      | Add Value               |          | N/A   |         |      |                       |
|                                      | Internal Control Code * |          | N/A   |         |      |                       |

 Note: 1) Original Part Number: **TGS CMG632 12M288A30-20-30-40-70 TLH**

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

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**MHZ SMD CRYSTAL GLASS SEAL 6035 TYPE 2 PADS**

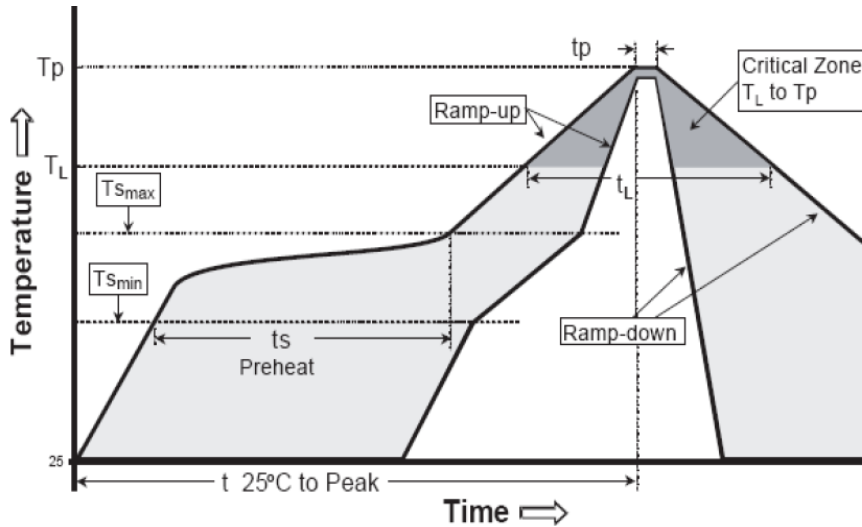
**RELIABILITY**

| Test Items                                | Test Method And Conditions  | Reference Documents                       |
|---|---|---|
| High Temperature<br>High Humidity Storage | Temperature: 85°C±3°C<br>Relative Humidity:85%RH<br>Time: 96 Hours  | JIS C5023                                 |
| High Temperature<br>Storage               | Temperature: 125°C±3°C<br>Time: 96 Hours.   | MIL-STD-883E<br>Method 1005.8             |
| Low Temperature<br>Storage                | Temperature: -40°C±3°C<br>Time: 96 Hours.   | MIL-STD-883E<br>Method 1013               |
| Thermal Shock                             | Temperature 1: -55°C±5°C<br>Temperature 2: 85°C±5 °C<br>Temperature change between T1 and T2 5 min<br>10cycles maintain T1 and T2 for 30 minutes each cycle | MIL-STD-202F<br>Method 107<br>Condition A |
| Resistance to Solder<br>Heat              | Solder Temperature: 260°C±5°C<br>Time: 10±1 Seconds   | MIL-STD-202F<br>Method 210E               |
| Solderability                             | The solder pot temperature is 245±5°C , dwell time 5±0.5sec   | J-STD-002B                                |
| Drop Test                                 | 3 Times Free Fall from 50cm height table to 3cm thickness<br>hard wood board  | J-STD-002B                                |
| Mechanical Shock                          | Half sine wave,1000 G<br>3 Times for all 3 directions(X,Y Z)  | MIL STD 202F<br>Method 213B               |
| Vibration                                 | Frequency Range: 10Hz ~ 55Hz<br>Amplitude: 0.75mm<br>2 Hours in each direction, total 6 Hours   | MIL-STD-883E<br>Method 2007.3             |
| Leakage Test                              | Take measurements with a helium<br>Leakage detector<br>Leakage Rate≤1×10 <sup>-3</sup> Pa cm <sup>3</sup> /s  | MIL-STD-883E                              |

**MHZ SMD CRYSTAL GLASS SEAL 6035 TYPE 2 PADS**

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

Total time: 200 Sec. Max. Solder melting point: 220°C

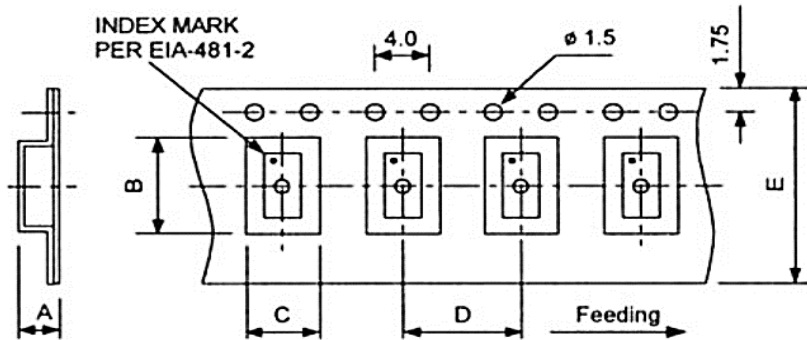


|  |                                  |                   |
|--|----------------------------------|-------------------|
| <b>Profile Feature</b>                                 |                                  | Pb-Free Assembly  |
| <b>Average Ramp-up Rate (Ts Max to Tp)</b>             |                                  | 3°C/second Max    |
| <b>Preheat</b>   | <b>Temperature Min (Ts Min.)</b> | 125°C             |
|  | <b>Temperature Max (Ts Max.)</b> | 200°C             |
|  | <b>Time (ts Min. to ts Max.)</b> | 60 ~ 180 seconds  |
| <b>Time maintained above</b>                           | <b>Temperature (Tl)</b>          | 217°C             |
|  | <b>Time (tL)</b>                 | 60 ~ 150 seconds  |
| <b>Peak/Classification Temperature (Tp)</b>            |                                  | 260 °C            |
| <b>Time within 5°C of actual Peak Temperature (tp)</b> |                                  | 20 ~ 40 seconds   |
| <b>Ramp-down rate</b>                                  |                                  | 6 °C /Second Max. |
| <b>Time 25 °C to Peak Temperature</b>                  |                                  | 8 minutes Max.    |
| <b>Suggest reflow times</b>                            |                                  | 3 Times Max.      |

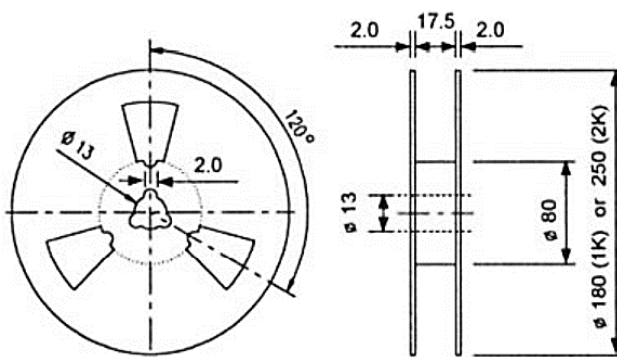
**MHZ SMD CRYSTAL GLASS SEAL 6035 TYPE 2 PADS**

**TAPE/REEL (Unit: mm, 1000pcs/Reel)**

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



| Code | Dimension (mm) |
|------|----------------|
| A    | 1.70           |
| B    | 5.45           |
| C    | 3.65           |
| D    | 8.00           |
| E    | 12.0           |



**DISCLAIMER**

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