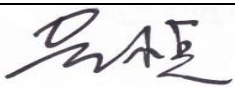


Quartz crystal specification

制品料号: CS-3225-G12QSA-24.0000MHz

送待承认样: ___/PCS

| | | | |
|------|---|------|---|
| 责任担当 |  | 技术担当 |  |
| 营业担当 | 余志权 | 检定担当 | 李淑梅 |

承认者: GKK LIMITED

■ ELECTRICAL SPECIFICATIONS

Standard atmospheric conditions

Unless otherwise specified. The standard range of atmospheric conditions for making measurement and tests are as follow:

Ambient temperature : $25 \pm 5^{\circ}\text{C}$

Relative humidity: 40%~70%

If there is no doubt the results, measurement shall be made within the following limits:

Ambient temperature : $25 \pm 1^{\circ}\text{C}$

Relative humidity: 40%~70%

Measure equipment

Electrical characteristics measured by S&A 250B or equivalent.

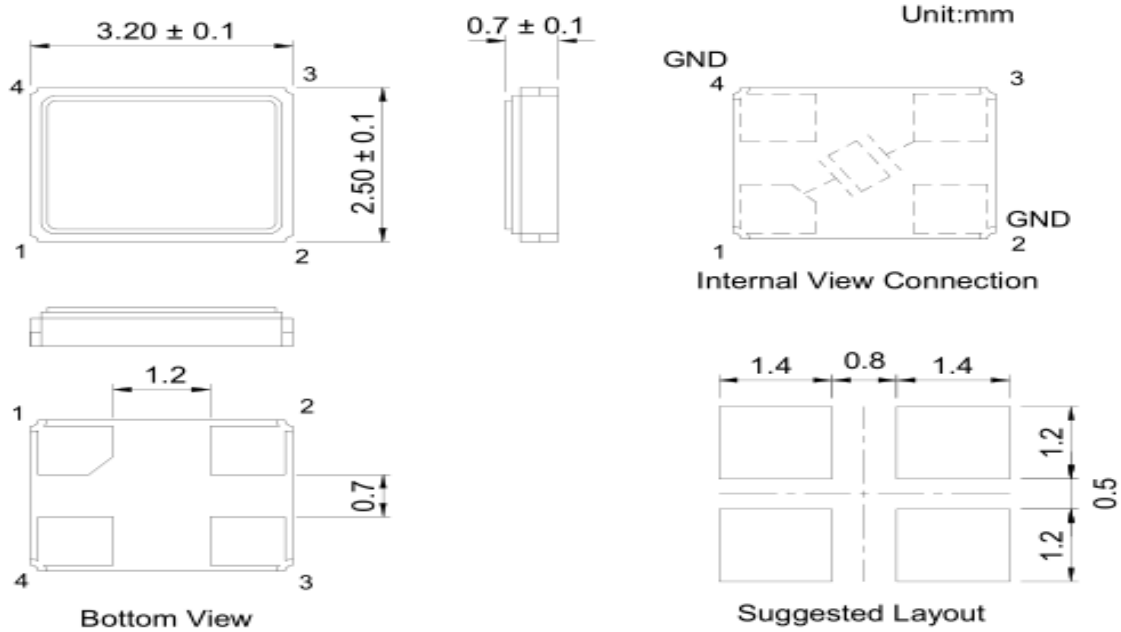
Crystal cutting type

The crystal is using AT CUT (thickness shear mode)

| | Parameters | SYM | Electrical spec. | UNITS | Notes |
|----|---------------------------|------|------------------|--------------------|--|
| 1 | Nominal Frequency | FL | 24.000000 | MHz | - |
| 2 | Oscillation Mode | - | Fund | - | - |
| 3 | Load Capacitance | CL | 12 | pF | - |
| 4 | Frequency Tolerance | - | ± 20 | ppm | MAX |
| 5 | Frequency Tolerance | - | ± 30 | ppm | Over Operating Temp. Range (Reference 25°C) |
| 6 | Operating Temperature | - | $-40 \sim +85$ | $^{\circ}\text{C}$ | - |
| 7 | Aging | - | ± 0.5 | ppm | 1st Year |
| 8 | Drive Level | DL | 100 | μW | - |
| 9 | Effective Resistance Rr | Rr | 50 | Ω | MAX |
| 10 | Shunt Capacitance C0 | C0 | 7.0 | pF | MAX |
| 11 | Motional Capacitance C1 | C1 | N/A | fF | - |
| 12 | Spurious Response | SPDB | - | dB | The spec. is $< -3\text{dB}(\text{Max.})$ Within $\pm 5000\text{ppm}$ of nomial Freq. unless otherwise specified. |
| 13 | Insulation Resistance | - | 500 | $\text{M}\Omega$ | at DC 100V |
| 14 | Storage Temperature Range | - | $-55 \sim +125$ | $^{\circ}\text{C}$ | - |
| 15 | Others | - | - | - | - |

■ **DIMENSION**

1. Crystal enclosure seal : Seam Weld
2. Crystal enclosure medium : Vacuum



■ **MARKING**

24.000
MHz

Ref. Purchase Specification

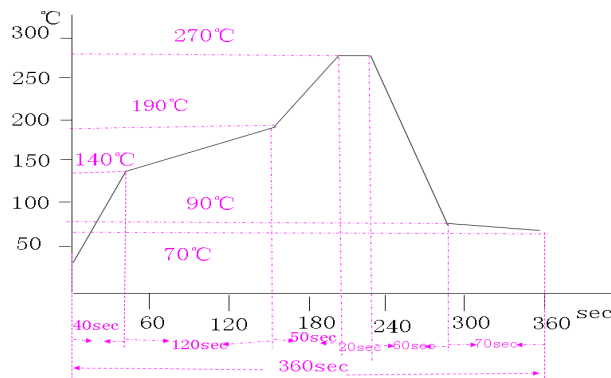
■ **SHELF LIFE & STORAGE CONDITIONS**

No shipment is allowed by manufactured over 1 year .
Storage Conditions:

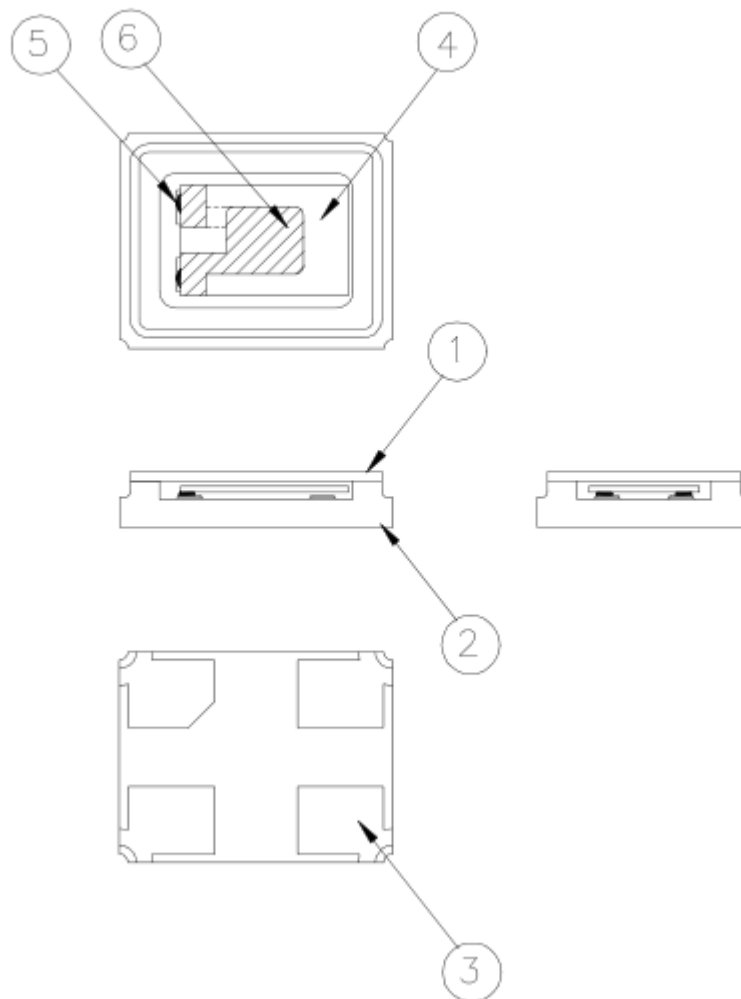
| Temp. | Humidity |
|----------|----------|
| 25 ± 3°C | 40~60% |

■ **SUGGESTED REFLOW PROFILE**

Total time : 360sec.Max.

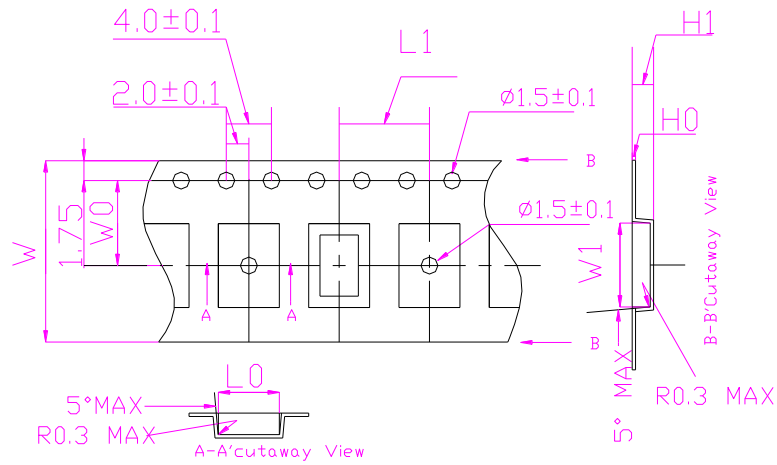


■ **STRUCTURE ILLUSTRATION**



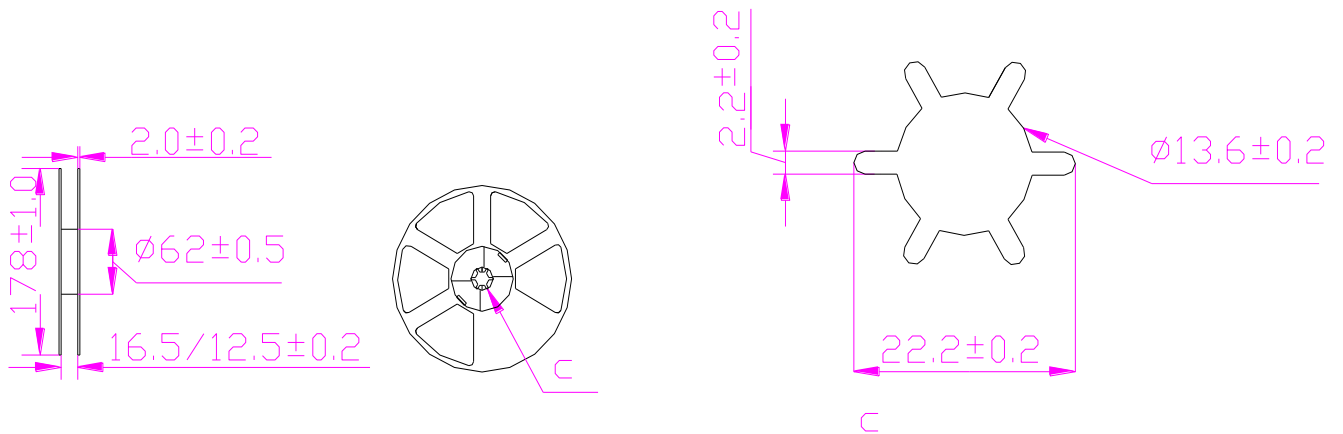
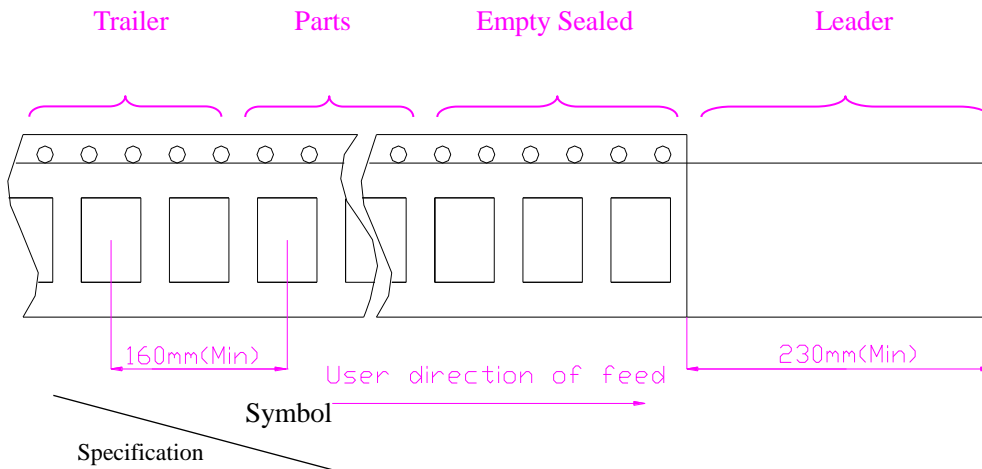
| NO | COMPONENTS | MATERIALS | QTY | FINISH/SPECIFICATIONS |
|----|---------------------|------------------|-----|---|
| 1 | Cap | Metal (Fe) | 1 | - |
| 2 | Base | Ceramic | 1 | Color black |
| 3 | PAD | Au | 4 | Tungsten metalize +Ni plating +Au plating |
| 4 | Crystal blank | SiO ₂ | 1 | - |
| 5 | Conductive adhesive | Ag | 4 | Epoxy resin |
| 6 | Electrode | Ag + Cr | 2 | - |

- **PACKING: (EIA-481-2)**
 - Shear strength between cover and carrier tape should be 30-100g.
 - Carrier tape should be folded over three times with no break at all.



| | Dimension Tolerance (mm) | | | | | | |
|--------|--------------------------|---------|---------|---------|---------|----------|---------|
| | W | W0 | W1 | L0 | L1 | H0 | H1 |
| 3225-8 | 8.0±0.3 | 3.5±0.1 | 3.6±0.1 | 2.9±0.1 | 4.0±0.1 | 0.3±0.05 | 1.5±0.1 |

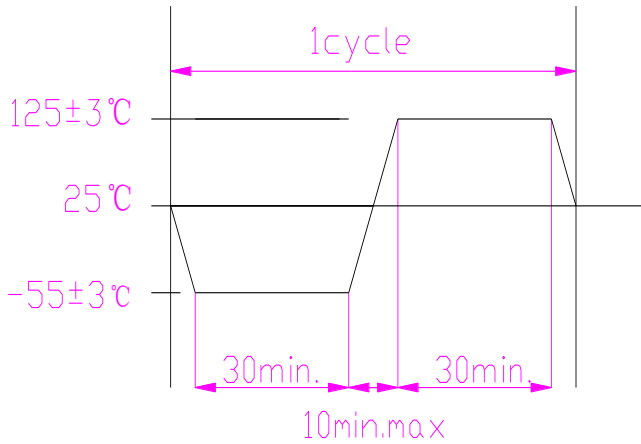
REMARK:



Unit : mm

Standard Reel Quantity is 3,000 pcs per reel.

■ RELIABILITY SPECIFICATIONS

| NO | Test Item | Test Methods | Ref.Doc |
|----|------------------------------|--|---------|
| 1 | Drop test | 75 cm height, fall freely onto stainless plate 3times. | - |
| 2 | Mechanical Shock | Device are shocked to half sine wave (1000G) three mutually pendicular axes each 3 times.0.5sec.duration time. | - |
| 3 | Vibration | Frequency range 10~2000Hz Amplitude 1.52mm Sweep time 20 minute Pendicular axes each test time 4 hours (Total test time 12 hours) | - |
| 4 | Solderability | Temperature 255°C ± 5°C Immersing depth 0.5mm minimum Immersion time 10 ± 0.5seconds Flux Rosin resin methyl alcohol Solvent (1:4) | - |
| 5 | Resistance To Soldering Heat | Pre-heat temperature 125°C Pre-heat time 60~120sec. Test temperature 260 ± 5°C Test time 5 ± 1sec. | - |
| 6 | High Temp. Storage | +125°C ± 2°C for 1000 ± 12hours | - |
| 7 | Low temp. Storage | -40°C ± 2°C for 1000 ± 12hours | - |
| 8 | Thermal Cycles | Total 100 cycles of the following temperature cycle  <p>The diagram illustrates a temperature cycle with three levels: 125±3°C, 25°C, and -55±3°C. A single cycle is defined by a double-headed arrow at the top. The cycle starts at 25°C, ramps down to -55±3°C (labeled '30min.'), dwells at -55±3°C (labeled '30min.'), ramps up to 125±3°C (labeled '10min.max'), dwells at 125±3°C (labeled '30min.'), and then ramps back down to 25°C. The 25°C level is shown as a horizontal line between the high and low dwell periods.</p> | - |

环境管理物质使用规范
Specification of the environment-related substances

| 范围 Range | 产品 Products | 包材 Packing Material | Test Method |
|--|---------------------------------------|---------------------------------------|---|
| 禁限物质 Banned Substances | 最高含量 Maximum concentration ppm(mg/kg) | 最高含量 Maximum concentration ppm(mg/kg) | |
| 1.镉及镉化合物 Cadmium and cadmium compounds | 5 | 5 | ICP-AES as per EN1122, method B2001 or other acid digestion. |
| 2.铅及铅化合物 Lead and lead compounds | 40 | 100 | ICP-AES after as per EPA 3050B or other acid digestion. |
| 3.汞及汞化合物 Mercury and mercury compounds | 5 | 5 | ICP-AES after as per EPA 3052 or other acid digestion. |
| 4.六价铬化合物 Hexavalent-Chromium VI (Cr ⁺⁶) | 10 | 10 | As per US EPA 7196A and US EPA 3060A. |
| 5.聚溴联苯 PBB Polybrominated biphenyls | 5 | 5 | With reference to USEPA 3540 or USEPA3550. Analysis was performed by LPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS),83/261/EEC, and76/769/EEC) |
| 6.聚溴二苯醚 PBDE Polybrominated diphenyl ethers | 5 | 5 | With reference to USEPA3540or USEPA3550. Analysis was performed by HPLC/DAD LC/MS or GC/MS.(prohibited by 2002/95/EC(RoHS), 83/264/EEC, and 76/769/EEC) |
| 7.多氯联苯 (PCB) Polychlorinated biphenyl | 5 | 5 | |
| 8.多氯化萘 (PCN) Polychlorinated naphthalene | 5 | 5 | |
| 9.氯代烷烃 (CP) Chlorinated paraffin | 5 | 5 | |
| 10.其他有机氯化物 Other chlorinated organic compounds | 5 | 5 | |
| 11.其他有机溴化合物 Other brominated organic compounds | 5 | 5 | |
| 12.有机锡化合物 (三丁基锡化合物,三苯基锡化合物) Organic tin compounds (Tributyl tin category & Triphenyl tin category) | 5 | 5 | |
| 13.石棉 Asbestos | 5 | 5 | |
| 14.偶氮化合物 Azo compounds | 5 | 5 | |
| 15.甲醛 Formaldehyde | 5 | 5 | |
| 16.聚氯乙烯(PVC)以及聚氯乙烯混合物 Polyvinyl chloride (PVC) and PVC blends | No detect | No detect | |
| 17.包装材料中重金属(汞、镉、六价铬、铅、PBB、PBDE)之总量 Heavy metals (mercury, cadmium, lead, Cr ⁺⁶ ,PBB and PBDE) in packing materials | N/A | <100 | |

Lead Free Products are “Directive 2002/95/EC of The European Parliament of 27 January 2003 on the restriction of certain hazardous substances (RoHS) in electrical and electronic equipment” and Sony SS-00259 Compliant.