

## **PSE Technology Corporation**

### **SPECIFICATION FOR APPROVAL**

CUSTOMER \_\_\_\_\_

NOMINAL FREQUENCY \_\_\_\_\_ 32.768 KHz \_\_\_\_\_



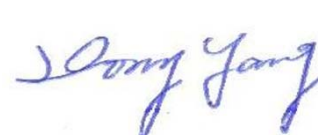
PRODUCT TYPE \_\_\_\_\_ **TYPE G8 SMD CRYSTAL** \_\_\_\_\_

SPEC. NO. ( P/N ) \_\_\_\_\_ G83270021 \_\_\_\_\_

CUSTOMER P/N \_\_\_\_\_

ISSUE DATE \_\_\_\_\_ Jun.16,2016 \_\_\_\_\_

VERSION \_\_\_\_\_ A \_\_\_\_\_

APPROVED	PREPARED	QA
		
APPROVED BY CUSTOMER :		AVL Status
Please return one copy with approval to PSE-TW		

### **PSE Technology Corporation**

No.2, Tzu-Chiang 5th Rd, Chung Li Industrial Park,  
Chung Li City, Taoyuan County, Taiwan (R.O.C.)  
TEL: 886-3-451-8888  
FAX: 886-3-461-3865  
<http://www.saronix-ecera.com.tw>

\*RoHS Compliant

# TYPE G8 SMD CRYSTAL

**G83270021**

VER. A 1-Jun-16

## VERSION HISTORY

Version No.	Version Date	Customer Receipt Date	Supplier Receipt Date	Description	Notes
01	Jun.1,2016			New	
02	Jun.2,2016			1. Updated Temperature Coefficient & C0 2. Added Reliability	
03	Jun.15,2016			Updated Shunt Capacitance & Motional Capacitance	
A	Jun.16,2016			Release formal version	

# TYPE G8 SMD CRYSTAL

## G83270021

VER. A 1-Jun-16

### ELECTRICAL SPECIFICATIONS

**SRe Part Number : G83270021**

Parameters	Symbol	Specifications	Units	Notes
Nominal Frequency	Fn	32.768	KHz	
Frequency Tolerance	FT	± 20	ppm	at 25 °C ± 5 °C
Load Capacitance	CL	12.5	pF	Typ.
Drive Level	DL	0.1 / 0.5	μW	Typ. / Max.
Equivalent Series Resistance	ESR	70	KΩ	Max.
Temperature Coefficient	K	-0.03	ppm/°C <sup>2</sup>	± 0.01ppm/°C <sup>2</sup>
Operating Temperature Range	TR	-40 to 85	°C	
Shunt Capacitance	C0	1.5	pF	Typ.
Motional Capacitance	C1	6.5	fF	Typ.
Quality Factor	Q	13	K	Min.
Aging		± 3	ppm	Max. 1st year
Storage Temperature Range		-40 to 85	°C	
Insulation Resistance		500	MΩ	Min.

### Reliability ( Mechanical and environmental performances )

No.	Test Items	Conditions	Requirements
1	Bending test	Apply pressure in the direction of the arrow at a rate of about 0.5mm/s until bent width reaches 5mm, and hold for 30 seconds.	<ul style="list-style-type: none"><li>• Without mechanical damage such as breaks and satisfy sealing specification.</li><li>• Frequency change: Within ±5ppm</li><li>• Equivalent series resistance(E.S.R) change: Within 5kΩ</li></ul>
2	Shear test	Apply 20N(2.04kgf) static load to the core of quartz crystal units in the direction of the arrow using a R0.5 scratch tool, then hold for 5 seconds.	
3	Core body strength	Apply 10N(1.02kgf) static load to the quartz crystal units center in the direction of the arrow using a R0.5 pushing tool, then hold for 10 seconds.	
4	Vibration	Frequency sweep method shall be applied as follows. Quartz crystal units shall be vibrated with the sweeping frequency from 10Hz to 55Hz and return to 10Hz in 1 minute, with 1.5mm amplitude. This vibration shall be applied for 2 hours in each 3 perpendicular axes. Other procedures conform to JIS C 60068-2-6.	
5	Shock	Quartz crystal units shall be accelerated at 9810m/s <sup>2</sup> by 1ms pulse duration. This shock shall be applied 3 times in each 3 perpendicular axes. Other procedures conform to JIS C 60068-2-27.	

# TYPE G8 SMD CRYSTAL

**G83270021**

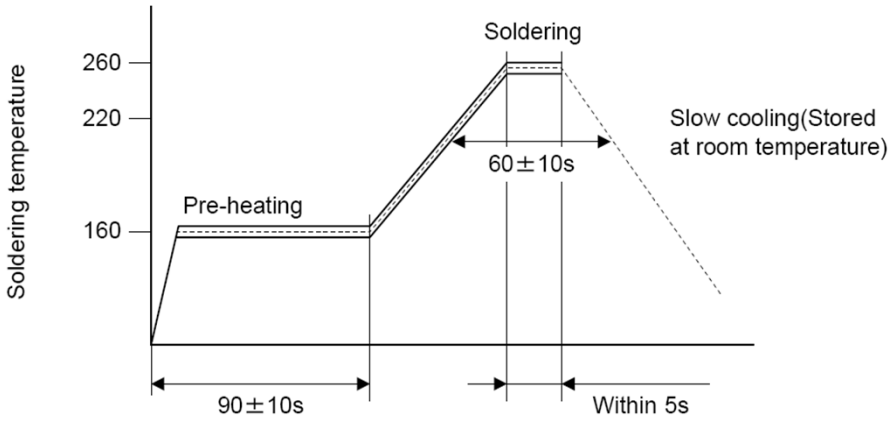
VER. A 1-Jun-16

6	Cold	Quartz crystal units shall be stored in the -40±3℃ atmosphere for 1000 hours. Other procedures conform to JIS C 60068-2-1.	<ul style="list-style-type: none"><li>• Frequency change: Within ±5ppm</li><li>• Equivalent series resistance(E.S.R) change: Within 5kΩ</li><li>• After conditioning, quartz crystal units shall be subjected to standard atmospheric conditions for 1 hour, and measured.</li></ul>														
7	Dry heat	Quartz crystal units shall be stored in the 100±2℃ atmosphere for 100 hours. Other procedures conform to JIS C 60068-2-2.															
8	Damp heat	Quartz crystal units shall be stored in the 40±2℃ atmosphere with 90 to 95% relative humidity for 1000 hours. Other procedures conform to JIS C 60068-2-3.															
9	Change of temperature	Quartz crystal units shall be subjected successively 100 cycles of temperature change shown below. Other procedures conform to JIS C 0025. <table><tr><td></td><td>Temperature</td><td>Duration</td></tr><tr><td>1</td><td>-40±3℃</td><td>30min.</td></tr><tr><td>2</td><td>Normal temperature</td><td>Within 30 sec.</td></tr><tr><td>3</td><td>100±2℃</td><td>30min.</td></tr><tr><td>4</td><td>Normal temperature</td><td>Within 30 sec.</td></tr></table>			Temperature	Duration	1	-40±3℃	30min.	2	Normal temperature	Within 30 sec.	3	100±2℃	30min.	4	Normal temperature
	Temperature	Duration															
1	-40±3℃	30min.															
2	Normal temperature	Within 30 sec.															
3	100±2℃	30min.															
4	Normal temperature	Within 30 sec.															
10	Sealing	Both the test methods specified below shall be applied.															
		Quartz crystal units shall be soaked in 90℃ or higher temperature hot water for 5 minutes.	<ul style="list-style-type: none"><li>• Without repetitive leaking bubbles from quartz crystal units.</li></ul>														
		Quartz crystal units shall be tested by Mass spectrometric leakage detector to measure the leakage rate of helium gas.	<ul style="list-style-type: none"><li>• 1×10-9 Pa·m3/s or less</li></ul>														
11	Aging	Quartz crystal units shall be stored in the 85±3℃ atmosphere for 720±12 hours.	<ul style="list-style-type: none"><li>• Frequency change: Within ±5ppm</li><li>• Equivalent series resistance(E.S.R) change: Within 5kΩ</li><li>• After conditioning, quartz crystal units shall be subjected to standard atmospheric conditions for 1 hour, and measured.</li></ul>														
12	Solder-ability	Terminals coated with flux shall be immersed in the solder bath for 3.5±0.5 seconds. <table><tr><td></td><td>Items</td><td>Conditions</td></tr><tr><td>1</td><td>Solder</td><td>Sn-3.0Ag-0.5Cu</td></tr><tr><td>2</td><td>Flux</td><td>Approximately 25wt% methanol(JIS K 8891) solution of resin(JIS K 5902).</td></tr><tr><td>3</td><td>Solder temperature</td><td>245±5℃</td></tr></table>		Items	Conditions	1	Solder	Sn-3.0Ag-0.5Cu	2	Flux	Approximately 25wt% methanol(JIS K 8891) solution of resin(JIS K 5902).	3	Solder temperature	245±5℃	<ul style="list-style-type: none"><li>• Minimum 95% of immersed terminal shall be covered with new uniform solder.</li></ul>		
	Items	Conditions															
1	Solder	Sn-3.0Ag-0.5Cu															
2	Flux	Approximately 25wt% methanol(JIS K 8891) solution of resin(JIS K 5902).															
3	Solder temperature	245±5℃															

# TYPE G8 SMD CRYSTAL

G83270021

VER. A 1-Jun-16

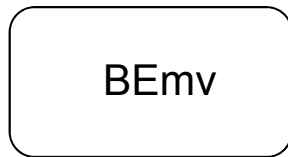
13	Resistance to soldering heat	<p>Reflow soldering method</p> <p>Temperature profile</p>  <p>Peak temperature: <math>260 \pm 5^{\circ}\text{C}</math> for within 5seconds. Soldering temperature: <math>220^{\circ}\text{C}</math> or higher for <math>60 \pm 10</math> seconds. Pre-heating temperature: <math>160 \pm 10^{\circ}\text{C}</math> for <math>90 \pm 10</math> seconds. Quartz crystal units which is put on PCB shall be through reflow soldering furnace twice with the condition shown above.</p> <ul style="list-style-type: none"> <li>• Frequency change: Within <math>\pm 5\text{ppm}</math></li> <li>• Equivalent series resistance (E.S.R) change: Within <math>10\text{k}\Omega</math></li> <li>• After conditioning, quartz crystal units shall be subjected to standard atmospheric conditions for 1 hour, and measured.</li> <li>• Without distinct deformation in appearance.</li> </ul>
		<p>Hot Air method</p> <p>Apply hot air for <math>7 \pm 0.5</math>seconds, distance 10mm, <math>300 \pm 5^{\circ}\text{C}</math>, flow 10L/minutes</p> <ul style="list-style-type: none"> <li>• Frequency change: Within <math>\pm 5\text{ppm}</math></li> <li>• Equivalent series resistance(E.S.R) change: Within <math>5\text{k}\Omega</math></li> <li>• After conditioning, quartz crystal units shall be subjected to standard atmospheric conditions for 1 hour, and measured.</li> <li>• Without distinct deformation in appearance.</li> </ul>
14	Solubility to resistance	<p>Soak cleaning</p> <p>Quartz crystal units shall be soaked in isopropyl alcohol at normal temperature for 90 seconds.</p> <ul style="list-style-type: none"> <li>• Without mechanical damage such as breaks and satisfy sealing specification.</li> <li>• Frequency change: Within <math>\pm 5\text{ppm}</math></li> <li>• Equivalent series resistance(E.S.R) change: Within <math>5\text{k}\Omega</math></li> <li>• Without distinct deformation in appearance.</li> <li>• Marking shall be legible.</li> </ul>

# TYPE G8 SMD CRYSTAL

G83270021

VER. A 1-Jun-16

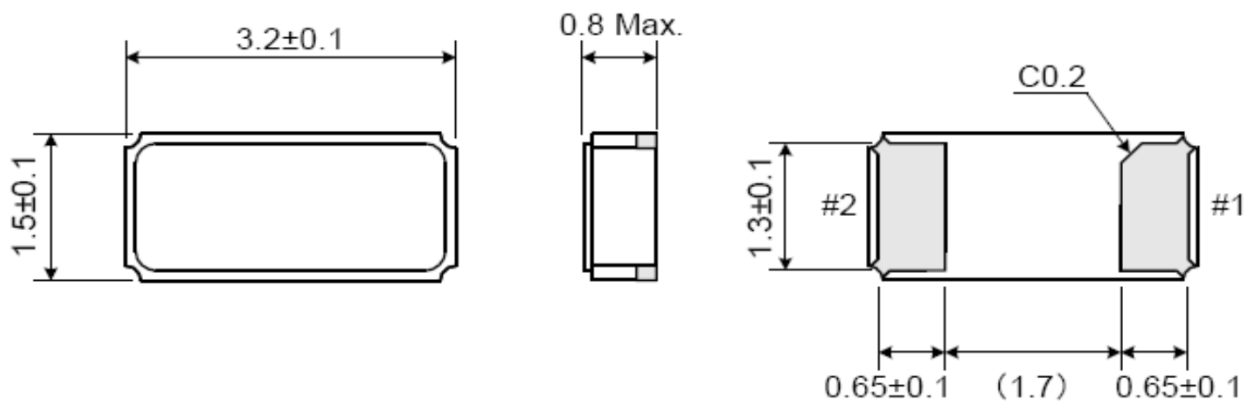
## Marking



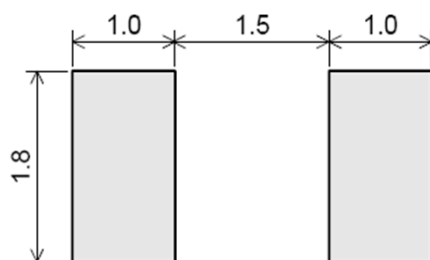
m  
Date Code

v  
Factory Code

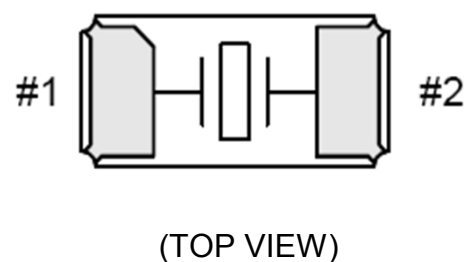
## Dimensions (Units: mm)



## Recommended Soldering Pattern



## Internal connection



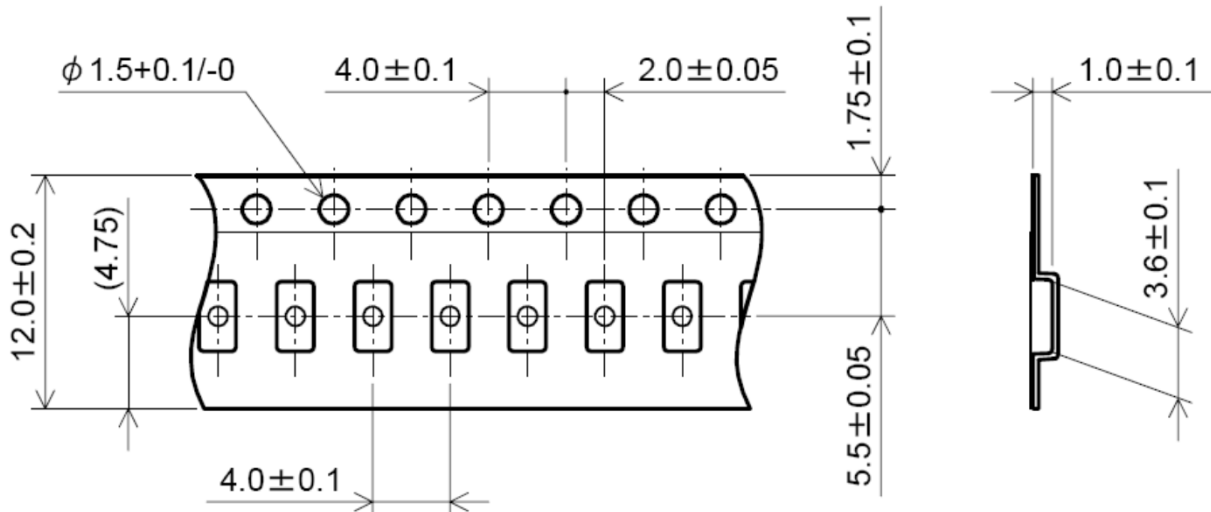
# TYPE G8 SMD CRYSTAL

G83270021

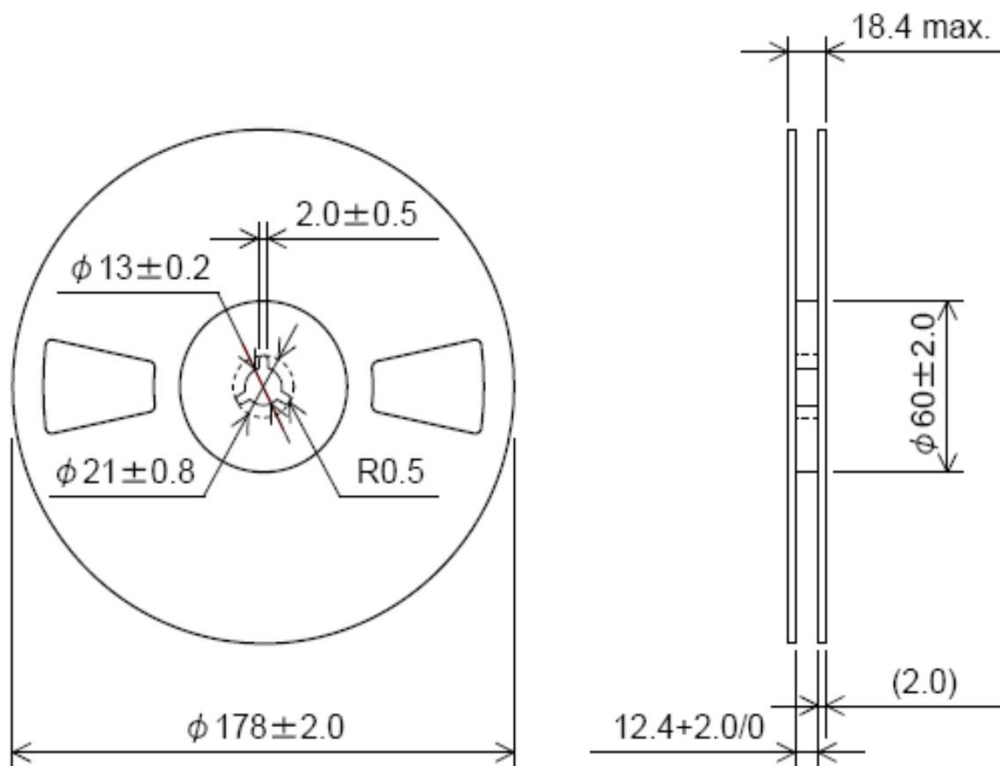
VER. A

1-Jun-16

## TAPING (Units: mm)



## REEL (Units: mm)



Quantity : 3000pcs / Reel

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Diodes Incorporated:](#)

[G83270021](#)