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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
Brenda	Claire	Tony Yang
APPROVED BY CUSTOMER :		**AVL Status**
Please return one copy with approval to PSE-TW		

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Chung Li City, Taoyuan County, Taiwan (R.O.C.)
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http://www.saronix-ecera.com.tw

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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

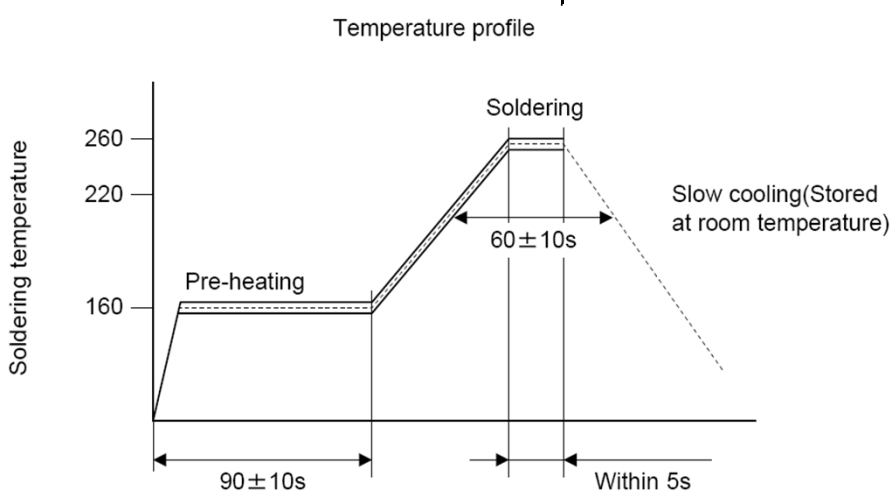
SRe Part Number : G83270021

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^2	± 0.01ppm/°C^2
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.

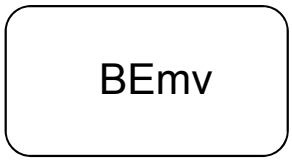
Reliability (Mechanical and environmental performances)

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.	• Without mechanical damage such as breaks and satisfy sealing specification. • Frequency change: Within ±5ppm • Equivalent series resistance(E.S.R) change: Within 5kΩ
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/s2 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.	

<table>
<tr><td>6</td><td>Cold</td><td>Quartz crystal units shall be stored in the -40±3℃ atmosphere for 1000 hours. Other procedures conform to JIS C 60068-2-1.</td><td rowspan="4">• Frequency change: Within ±5ppm
• Equivalent series resistance(E.S.R) change: Within 5kΩ
• After conditioning, quartz crystal units shall be subjected to standard atmospheric conditions for 1 hour, and measured.</td></tr>
<tr><td>7</td><td>Dry heat</td><td>Quartz crystal units shall be stored in the 100±2℃ atmosphere for 100 hours. Other procedures conform to JIS C 60068-2-2.</td></tr>
<tr><td>8</td><td>Damp heat</td><td>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.</td></tr>
<tr><td>9</td><td>Change of temperature</td><td>Quartz crystal units shall be subjected successively 100 cycles of temperature change shown below. Other procedures conform to JIS C 0025.
<table>
<tr><th></th><th>Temperature</th><th>Duration</th></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></td></tr>
<tr><td rowspan="3">10</td><td rowspan="3">Sealing</td><td>Both the test methods specified below shall be applied.</td><td></td></tr>
<tr><td>Quartz crystal units shall be soaked in 90℃ or higher temperature hot water for 5 minutes.</td><td>• Without repetitive leaking bubbles from quartz crystal units.</td></tr>
<tr><td>Quartz crystal units shall be tested by Mass spectrometric leakage detector to measure the leakage rate of helium gas.</td><td>• 1×10-9 Pa·m3/s or less</td></tr>
<tr><td>11</td><td>Aging</td><td>Quartz crystal units shall be stored in the 85±3℃ atmosphere for 720±12 hours.</td><td>• Frequency change: Within ±5ppm
• Equivalent series resistance(E.S.R) change: Within 5kΩ
• After conditioning, quartz crystal units shall be subjected to standard atmospheric conditions for 1 hour, and measured.</td></tr>
<tr><td>12</td><td>Solder-ability</td><td>Terminals coated with flux shall be immersed in the solder bath for 3.5±0.5 seconds.
<table>
<tr><th></th><th>Items</th><th>Conditions</th></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°C</td></tr>
</table></td><td>• Minimum 95% of immersed terminal shall be covered with new uniform solder.</td></tr>
</table>

13	Resistance to soldering heat	Reflow soldering method  Peak temperature: 260±5°C for within 5seconds. Soldering temperature: 220°C or higher for 60±10 seconds. Pre-heating temperature: 160±10°C for 90±10 seconds. Quartz crystal units which is put on PCB shall be through reflow soldering furnace twice with the condition shown above.	• Frequency change: Within ±5ppm • Equivalent series resistance (E.S.R) change: Within 10kΩ • After conditioning, quartz crystal units shall be subjected to standard atmospheric conditions for 1 hour, and measured. • Without distinct deformation in appearance.
		Hot Air method Apply hot air for 7±0.5seconds, distance 10mm, 300±5° C, flow 10L/minutes	• Frequency change: Within ±5ppm • Equivalent series resistance(E.S.R) change: Within 5kΩ • After conditioning, quartz crystal units shall be subjected to standard atmospheric conditions for 1 hour, and measured. • Without distinct deformation in appearance.
14	Solubility to resistance	Soak cleaning Quartz crystal units shall be soaked in isopropyl alcohol at normal temperature for 90 seconds.	• Without mechanical damage such as breaks and satisfy sealing specification. • Frequency change: Within ±5ppm • Equivalent series resistance(E.S.R) change: Within 5kΩ • Without distinct deformation in appearance. • Marking shall be legible.

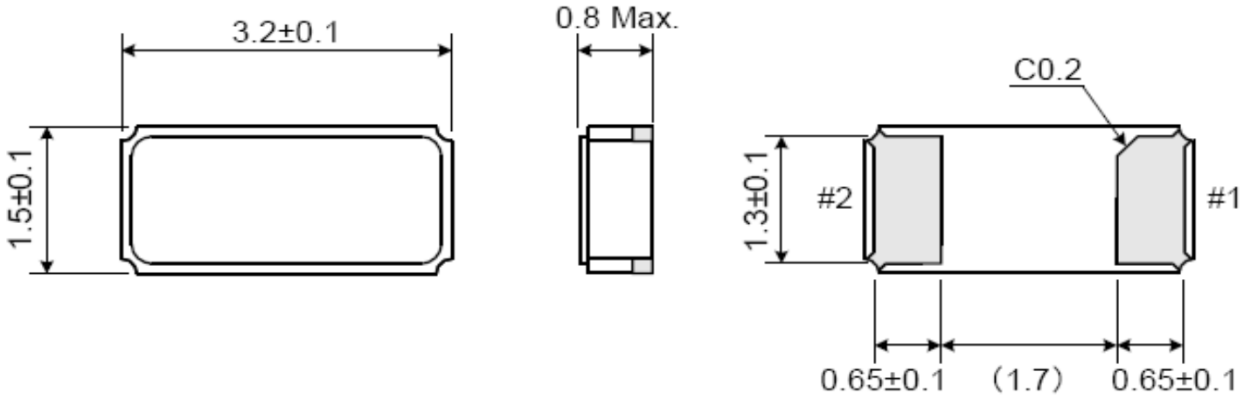
Marking



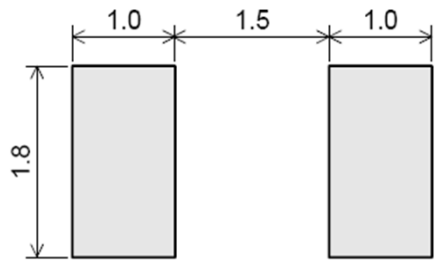
m — Date Code

v — Factory Code

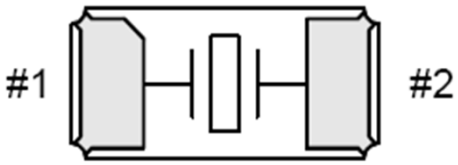
Dimensions (Units: mm)



Recommended Soldering Pattern

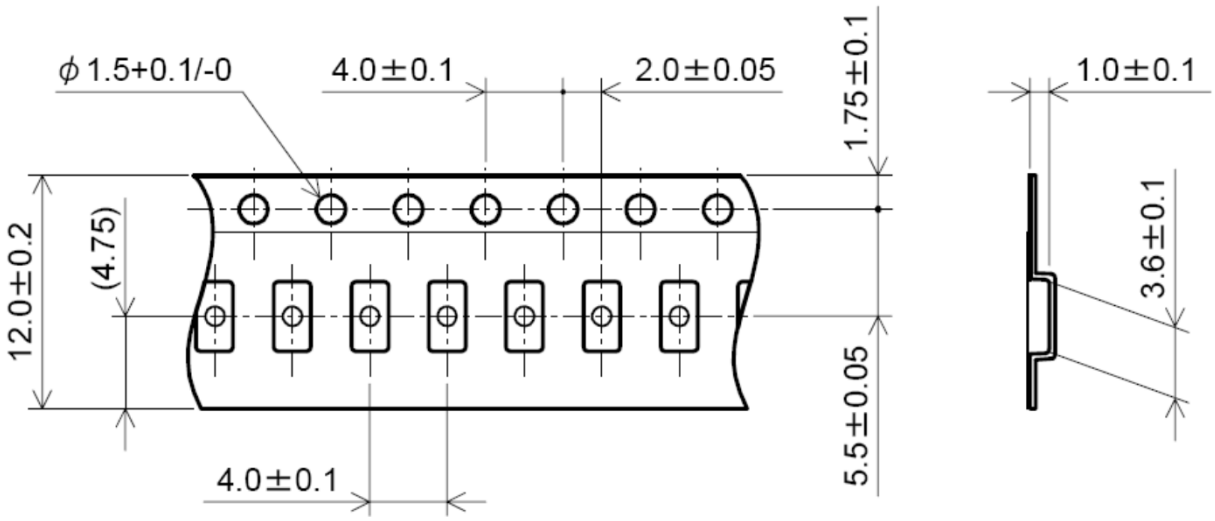


Internal connection

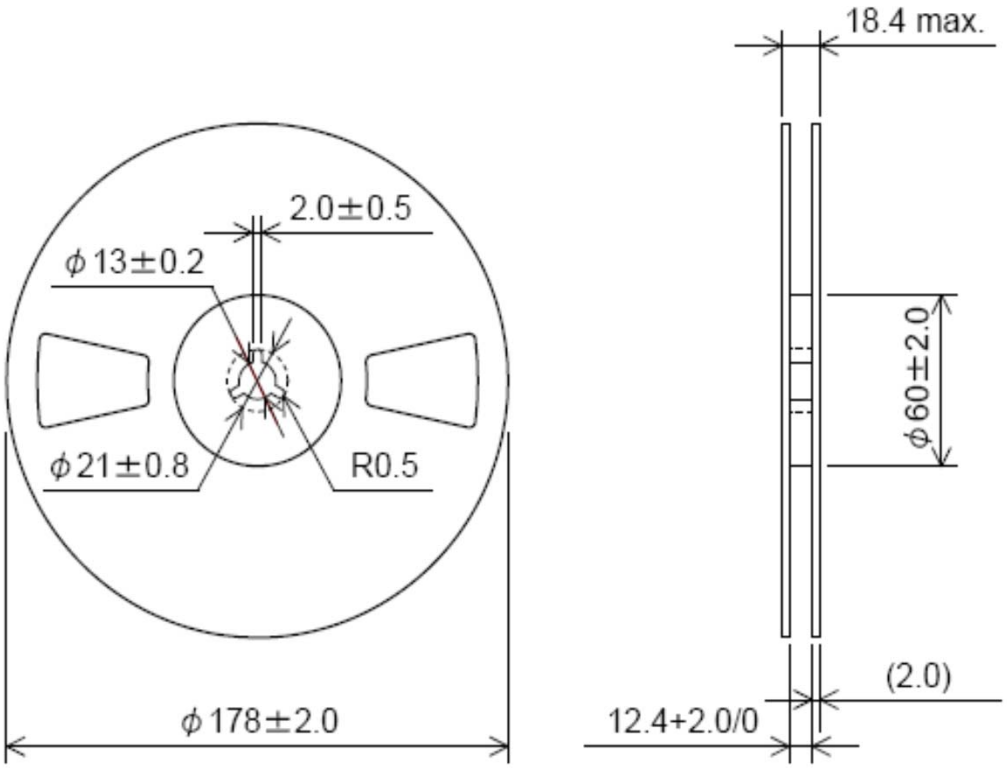


(TOP VIEW)

TAPING (Units: mm)



REEL (Units: mm)



Quantity : 3000pcs / Reel