

PSE Technology Corporation

SPECIFICATION FOR APPROVAL

CUSTOMER _____

NOMINAL FREQUENCY _____ 32.768 KHz _____



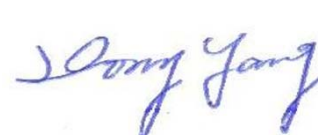
PRODUCT TYPE _____ **TYPE G8 SMD CRYSTAL** _____

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	

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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.	<ul style="list-style-type: none">• 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/s ² 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.	

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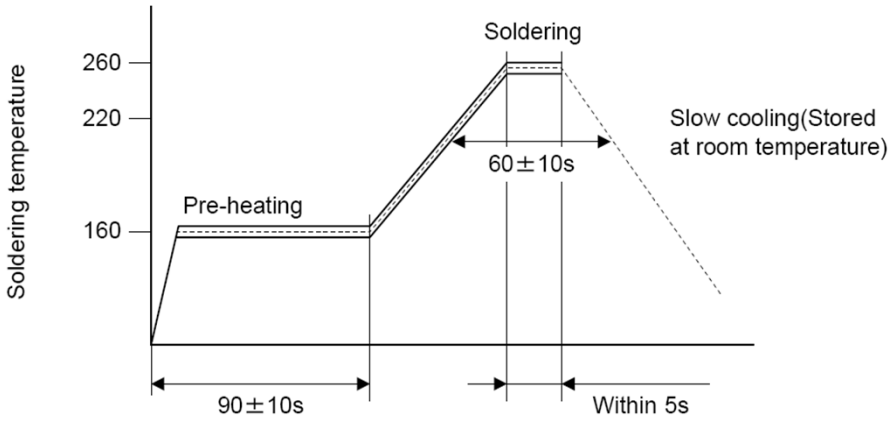
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6	Cold	Quartz crystal units shall be stored in the -40±3℃ atmosphere for 1000 hours. Other procedures conform to JIS C 60068-2-1.	<ul style="list-style-type: none">• Frequency change: Within ±5ppm• Equivalent series resistance(E.S.R) change: Within 5kΩ• After conditioning, quartz crystal units shall be subjected to standard atmospheric conditions for 1 hour, and measured.														
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">• Without repetitive leaking bubbles from quartz crystal units.														
		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">• 1×10-9 Pa·m3/s or less														
11	Aging	Quartz crystal units shall be stored in the 85±3℃ atmosphere for 720±12 hours.	<ul style="list-style-type: none">• 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.														
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">• Minimum 95% of immersed terminal shall be covered with new uniform solder.		
	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℃															

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

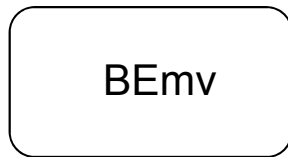
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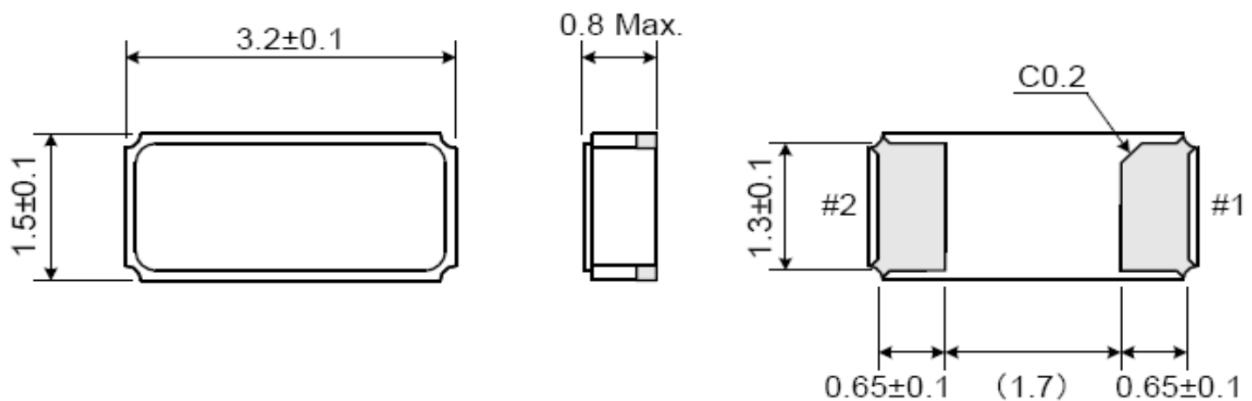
Marking



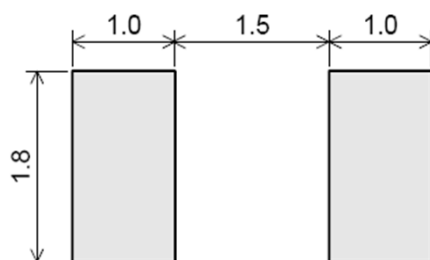
m
Date Code

v
Factory Code

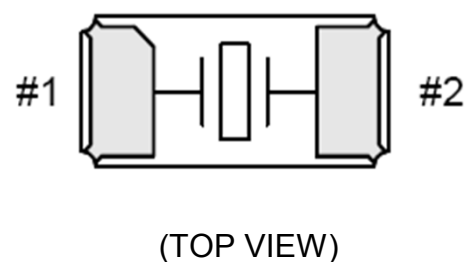
Dimensions (Units: mm)



Recommended Soldering Pattern



Internal connection



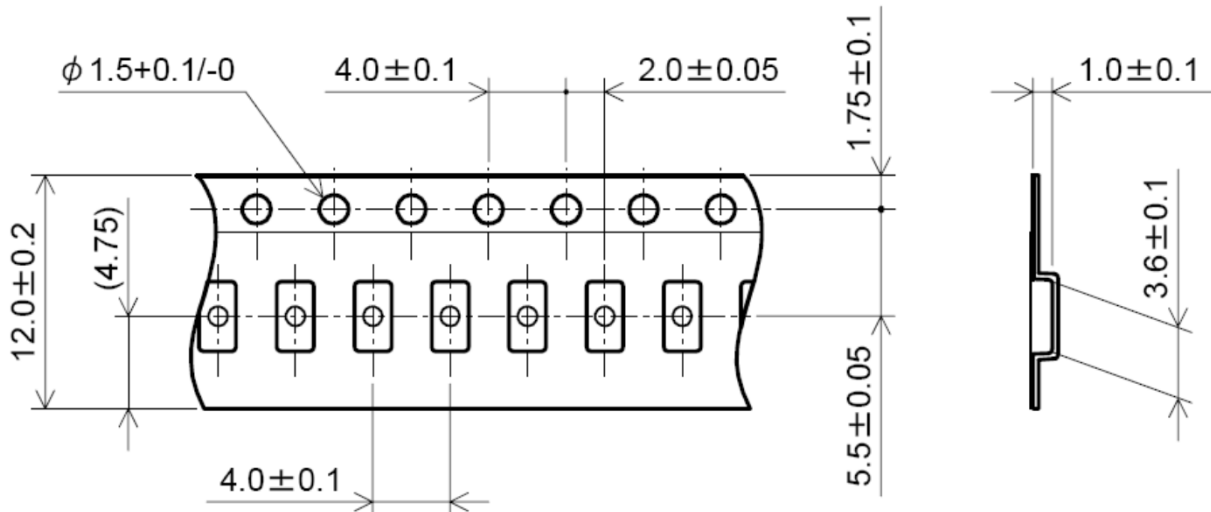
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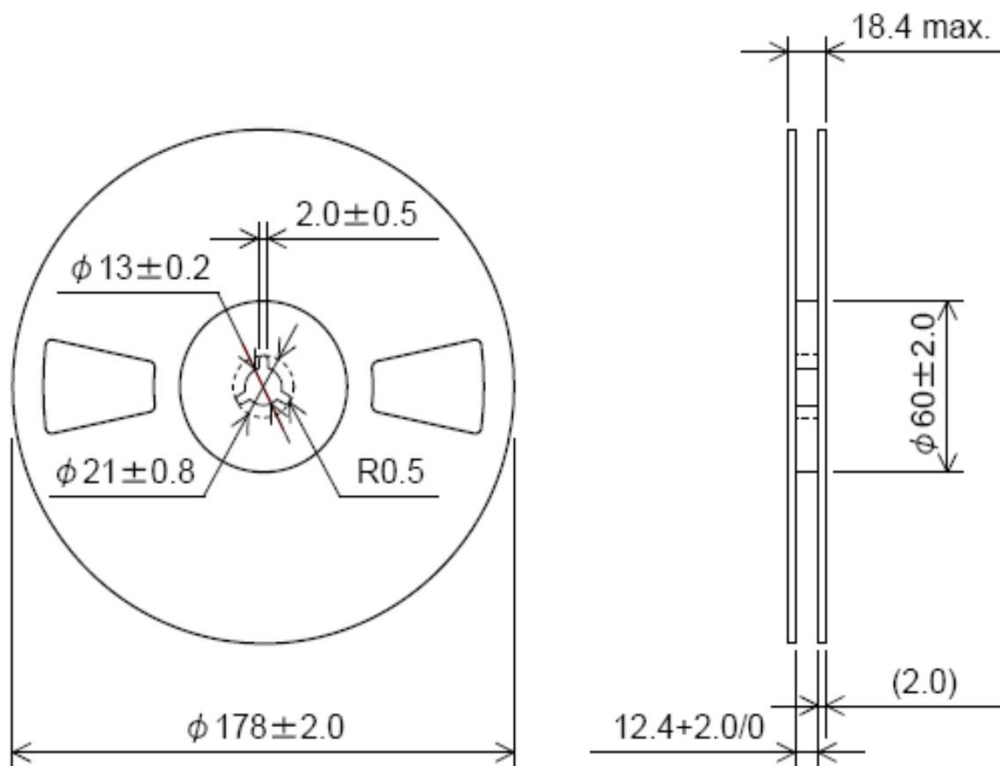
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TAPING (Units: mm)



REEL (Units: mm)



Quantity : 3000pcs / Reel