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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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## PSE Technology Corporation

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# SPECIFICATION FOR APPROVAL

CUSTOMER	
NOMINAL FREQUENCY	32.768 KHz
PRODUCT TYPE	<b>TYPE G9 SMD CRYSTAL</b>
SPEC. NO. ( P/N )	G93270001
CUSTOMER P/N	
ISSUE DATE	Jan.8,2014
VERSION	C

APPROVED	PREPARED	QA
<i>Brenda</i>	<i>Clair</i>	<i>Bedley</i>
<b>APPROVED BY CUSTOMER :</b>		<b>AVL Status</b>
<b>Please return one copy with approval to PSE-TW</b>		

### PSE Technology Corporation

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- \*Pb-free
- \*RoHS Compliant
- \*HF-Halogen Free
- \*REACH Compliant



# TYPE G9 SMD CRYSTAL

G93270001

VER. C 3-Oct-11

## ELECTRICAL SPECIFICATIONS

SRe Part Number : G93270001

Parameters	Symbol	Specifications	Units	Notes
Nominal Frequency	Fn	32.768	KHz	
Frequency Tolerance	FT	± 20	ppm	at 25 °C ± 5 °C
Load Capacitance	CL	9	pF	Typ.
Drive Level	DL	0.1 / 0.5	μW	Typ / Max.
Equivalent Series Resistance	ESR	90	KΩ	Max.
Temperature Coefficient	K	-0.03	ppm/°C <sup>2</sup>	Typ.
Operating Temperature Range	TR	-40~85	°C	
Shunt Capacitance	C0	7	pF	Max.
Storage Temperature Range		-55~125	°C	
Aging		± 3	ppm	Max 1st year
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	A static load of 20N(2.04kgf) using a R0.5 scratch tool, shall be applied on the core of the component and in the direction of the arrow and held for 5 seconds.	
3	Core body strength	A static load of 10N(1.02kgf) using a R0.5 pressure rod shall be applied to the center in the direction of the arrow and held for 10 seconds.	
4	Vibration	Endurance conditioning by a frequency sweep shall be made. The entire frequency range, from 10Hz to 55Hz and return to 10Hz, shall be transversed in 1 minute. Amplitude (total excursion) : 1.5mm, This motion shall be applied for a period of 2 hours in each of 3 mutually perpendicular axes (a total of 6 hours). For other procedures, refer to JIS C 60068-2-6.	
5	Shock	Peak acceleration : 9810m/s <sup>2</sup> · Duration of the pulse : 1ms, Three successive shock shall be applied 3 times perpendicular axes. For other procedures, refer to JIS C 60068-2-27.	

# TYPE G9 SMD CRYSTAL

G93270001

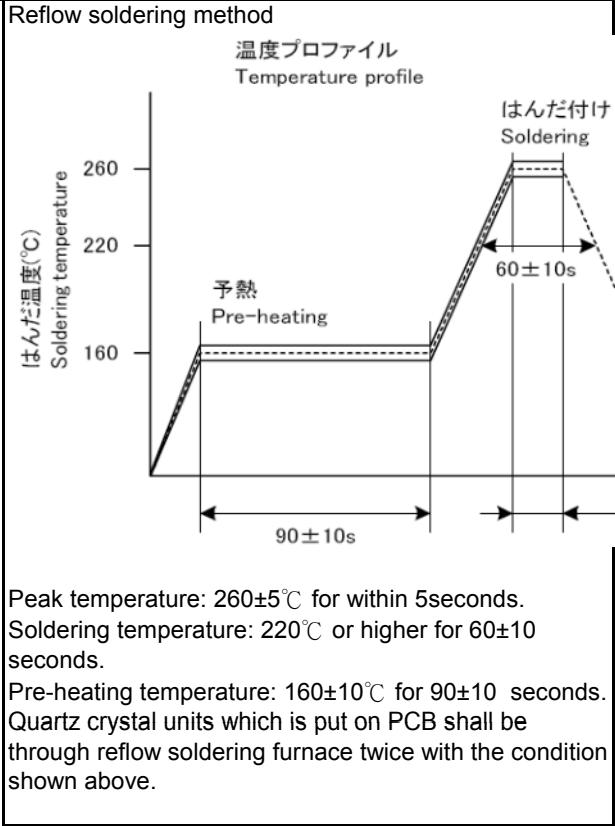
VER. C 3-Oct-11

6	Cold	Quartz crystal units shall be stored in the $-40\pm 3^{\circ}\text{C}$ atmosphere for 1000 hours. Other procedures conform to JIS C 60068-2-1.	<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> </ul>														
7	Dry heat	Quartz crystal units shall be stored in the $100\pm 2^{\circ}\text{C}$ atmosphere for 100 hours. Other procedures conform to JIS C 60068-2-2.															
8	Damp heat	Quartz crystal units shall be stored in the $40\pm 2^{\circ}\text{C}$ atmosphere with 90 to 95% relative humidity for 1000 hours. Other procedures conform to JIS C 60068-2-3.															
9	Change of temperature	<p>Quartz crystal units shall be subjected successively 100 cycles of temperature change shown below. Other procedures conform to JIS C 0025.</p> <table border="1"> <thead> <tr> <th></th> <th>Temperature</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>-40\pm 3^{\circ}\text{C}</math></td> <td>30min.</td> </tr> <tr> <td>2</td> <td>Normal temperature</td> <td>Within 30 sec.</td> </tr> <tr> <td>3</td> <td><math>100\pm 2^{\circ}\text{C}</math></td> <td>30min.</td> </tr> <tr> <td>4</td> <td>Normal temperature</td> <td>Within 30 sec.</td> </tr> </tbody> </table>			Temperature	Duration	1	$-40\pm 3^{\circ}\text{C}$	30min.	2	Normal temperature	Within 30 sec.	3	$100\pm 2^{\circ}\text{C}$	30min.	4	Normal temperature
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10	Sealing	Both the test methods specified below shall be applied.															
		Quartz crystal units shall be soaked in $90^{\circ}\text{C}$ 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>• <math>1\times 10^{-9}\text{ Pa}\cdot\text{m}^3/\text{s}</math> or less</li> </ul>														
11	Aging	Quartz crystal units shall be stored in the $85\pm 3^{\circ}\text{C}$ atmosphere for $720\pm 12$ hours.	<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> </ul>														
12	Solder-ability	Terminals coated with flux shall be immersed in the solder bath for $3.5\pm 0.5$ seconds.	<ul style="list-style-type: none"> <li>• Minimum 95% of immersed terminal shall be covered with new uniform solder.</li> </ul>														
		<table border="1"> <thead> <tr> <th></th> <th>Items</th> <th>Conditions</th> </tr> </thead> <tbody> <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><math>255\pm 5^{\circ}\text{C}</math></td> </tr> </tbody> </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	$255\pm 5^{\circ}\text{C}$		
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G93270001

VER. C 3-Oct-11

<p>13 Resistance to soldering heat</p>	<p>Reflow soldering method</p> <p>温度プロファイル Temperature profile</p>  <p>はんだ温度(°C) Soldering temperature</p> <p>予熱 Pre-heating</p> <p>はんだ付け Soldering</p> <p>徐冷(常温自然放置) Slow cooling(Stored at room temperature)</p> <p>90±10s</p> <p>60±10s</p> <p>Within 5s</p> <p>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.</p>	<ul style="list-style-type: none"> <li>• Frequency change: Within ±5ppm</li> <li>• Equivalent series resistance (E.S.R) change: Within 10kΩ</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>Soldering iron method</p> <p>Terminals shall be applied 400±10°C soldering iron heat for 3.5±0.5 seconds twice.</p>	<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> <li>• Without distinct deformation in appearance.</li> </ul>
<p>14 Solubility to resistance</p>	<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 ±5ppm</li> <li>• Equivalent series resistance(E.S.R) change: Within 5kΩ</li> <li>• Without distinct deformation in appearance.</li> <li>• Marking shall be legible.</li> </ul>

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VER. C 3-Oct-11

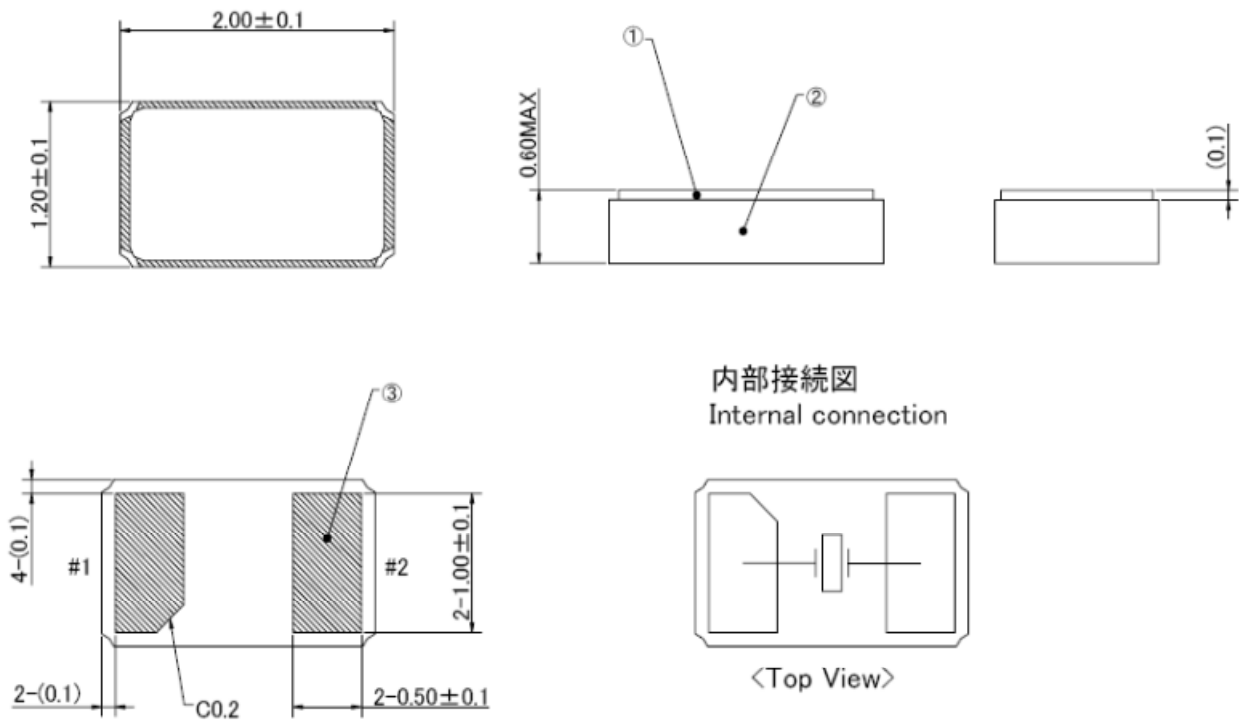
## Marking



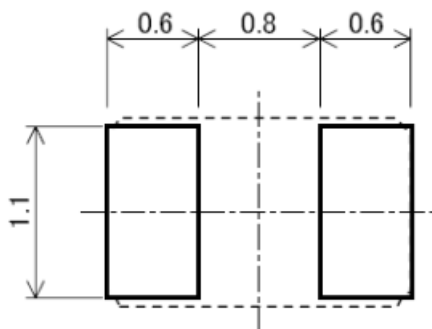
m  
Date Code

v  
Factory Code

## Dimensions (Units: mm)



## Land dimensions(unit: mm)

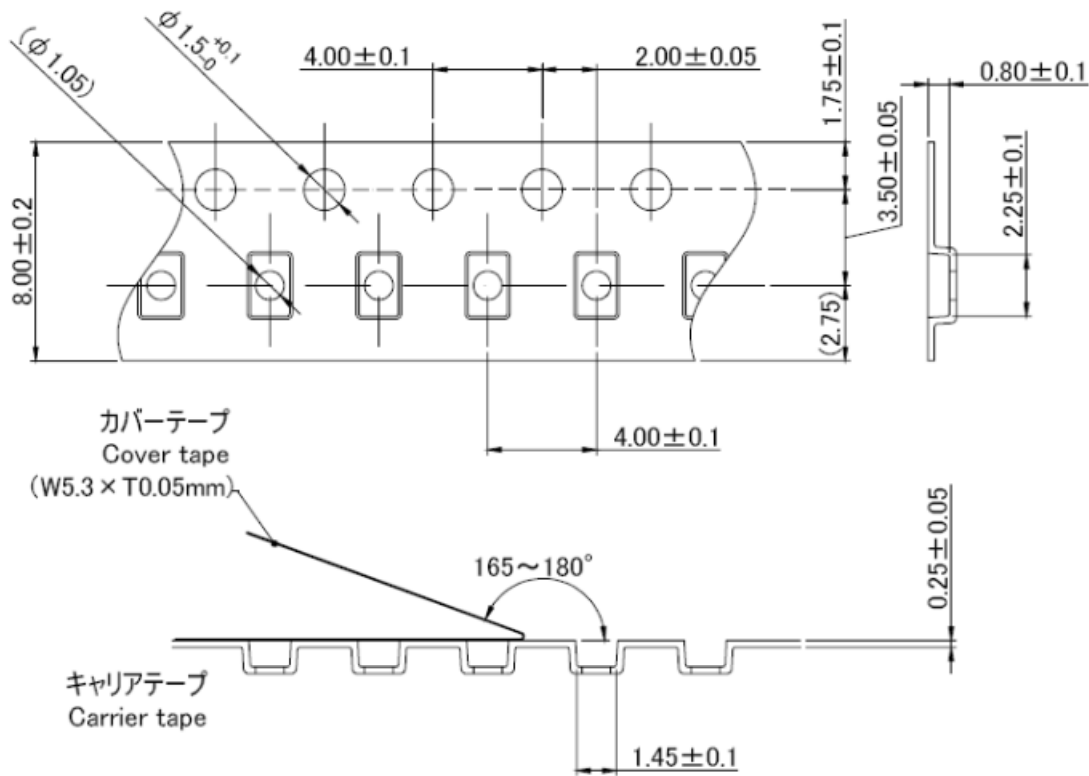


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G93270001

VER. C 3-Oct-11

## TAPING



## REEL

Reel

