

PRODUCT SPECIFICATION

NOMINAL FREQUENCY	32.768 KHz
PRODUCT TYPE	TYPE G4 SMD X'TAL
SPEC. NO. (P/N)	G43270009
ISSUE DATE	Jun.24,2022
VERSION	I

Diodes Incorporated

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*RoHS Exception
*HF-Halogen Free
*REACH Compliant
*MSL: Level 1

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VERSION HISTORY

Version No.	Version Date	Description	Notes
A	Mar.1,2010	Initial Release	
B	Mar.2,2010	Cancel Pb-free	
C	Sep.24,2010	New Logo	
D	Mar.18,2011	Revised Format	
E	Nov.8,2012	Changed mechanical drawing	
F	Dec.10,2012	Changed Shunt Capacitance from 1.35pF to 1.6pF	
G	Oct.23,2017	Updated logo	
H	Apr.1,2021	Added C1, C0/C1, Quality Factor & Mode of Operation.	
I	Jun.24,2022	Updated Dimension Height: from 2.5+-0.1mm to 2.4+-0.1mm	

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ELECTRICAL SPECIFICATIONS

SRe Part Number : G43270009

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	1	μW	Max.
Equivalent Series Resistance	ESR	50	KΩ	Max.
Temperature Coefficient	K	-0.035	ppm/°C ²	Typ.
Shunt Capacitance	C0	1.6	pF	Typ.
Motional Capacitance	C1	3.3	fF	Typ.
C0/C1 Ratio	C0/C1	500		Typ.
Quality Factor	Q	50000		Typ.
Operating Temperature Range	TR	-40 to +85	°C	
Storage Temperature Range		-55 to +85	°C	
Aging		± 3	ppm	Max 1st year
Mode of Operation		Fundamental		
Insulation Resistance		500	MΩ	Min.

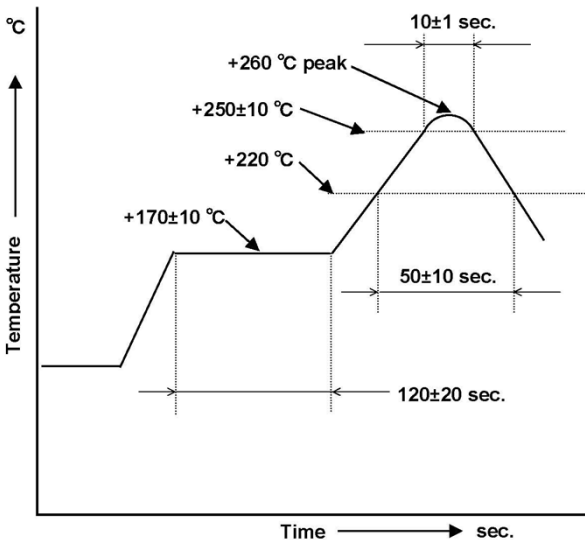
Reliability (Mechanical and Environmental Endurance)

No.	Test Items	Test Method and Condition	Requirements
1	Vibration	(1) Vibration Frequency: 10 to 55Hz (2) Vibration Amplitude: 1.5mm (3) Cycle Time: 1-2min(10-55-10Hz) (4) Direction: X.Y.Z (5) Duration: 2h/each direction	Frequency Change: ±10ppm Max. Resistance Change: ±15% or 5kΩ Max.
2	Shock	3 Times free drop from 75cm height to hard wooden board of thickness more than 30mm	Frequency Change: ±10ppm Max. Resistance Change: ±15% or 5kΩ Max.
3	Leakage	Put crystal units into a hermetic container and Helium for 0.5-0.6Mpa, and keep it for 1h; Check the leakage by a Helium leak detector	Leakage: 1×10 ⁻⁸ Pa·m ³ /s Max.

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4	Reflow soldering	 <p>Note: the temperature used herein means the temperature on the circuit board. Reflow: 2 times max.</p>	<p>Frequency Change: ± 10ppm Max. Frequency Change: ± 10ppm Max. Resistance Change: $\pm 25\%$ or 10kΩ Max.</p>
5	Lead Strength (DIP)	The crystal lead with the 0.9kg(9N) power (keep it for 30s \pm 5s) and bend the crystal lead 90° with 0.45kg power and two times	The crystal lead is not abnormality
6	High Temperature Endurance	The crystal units shall be put in somewhere for 2 hrs at temperature of -85°C \pm 2°C, then keep it for 1 to 2 hrs under room temperature.	<p>Frequency Change: ± 10ppm Max. Resistance Change: $\pm 15\%$ or 5kΩ Max.</p>
7	Low Temperature Endurance	The crystal units shall be put in somewhere for 2 hrs at temperature of -25°C, then keep it for 1 to 2 hrs under room temperature.	
8	Humidity Endurance	The crystal units shall be put in somewhere at 40°C in relative humidity of 90-95% for 48 hrs, then keep it for one or two hours under room temperature.	
9	Temperature Cycle	Temperature shift from low(-40°C) to high(100°C, keep 30 mins), satisfy high(100°C) to low(-40°C, keep 30 mins), then go up to room temperature for 5 cycles.	
10	Salt Spray Test	Put the crystal units in the salt spray room (salt density: 5%) at the temperature of 35°C for 96 hrs. Then clean it with water and dry its surface.	<p>The appearance shall has no abnormality and soldering is good. Frequency Change: ± 10ppm Max. Resistance Change: $\pm 15\%$ or 5kΩ Max.</p>

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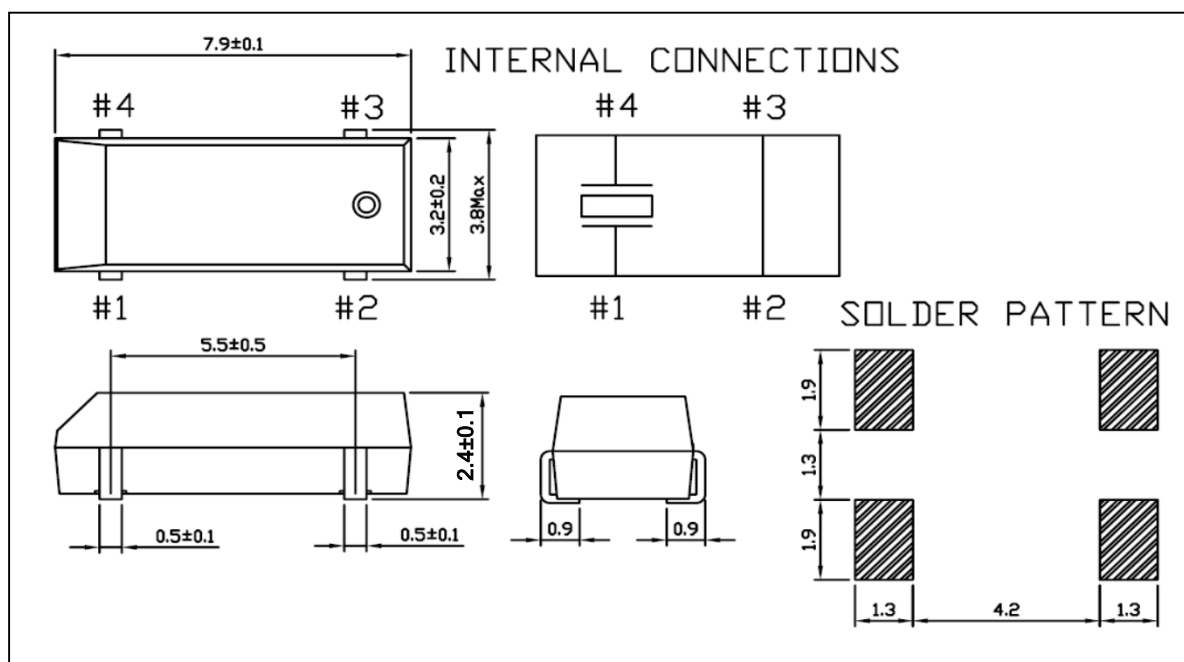
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Marking

32768

Dimensions (Units: mm)



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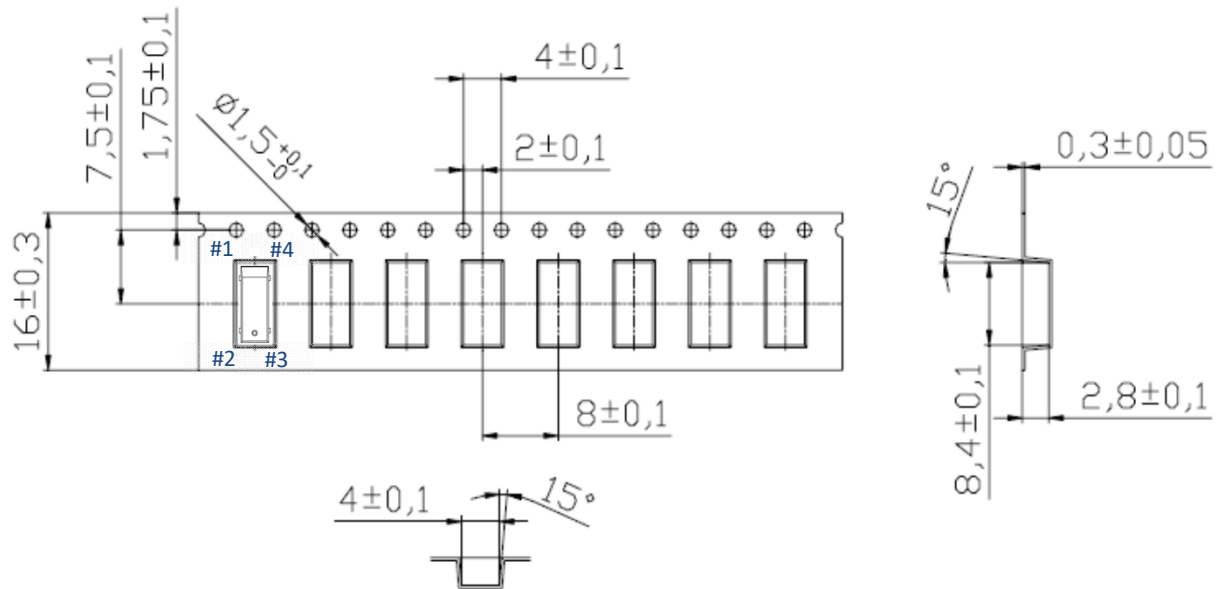
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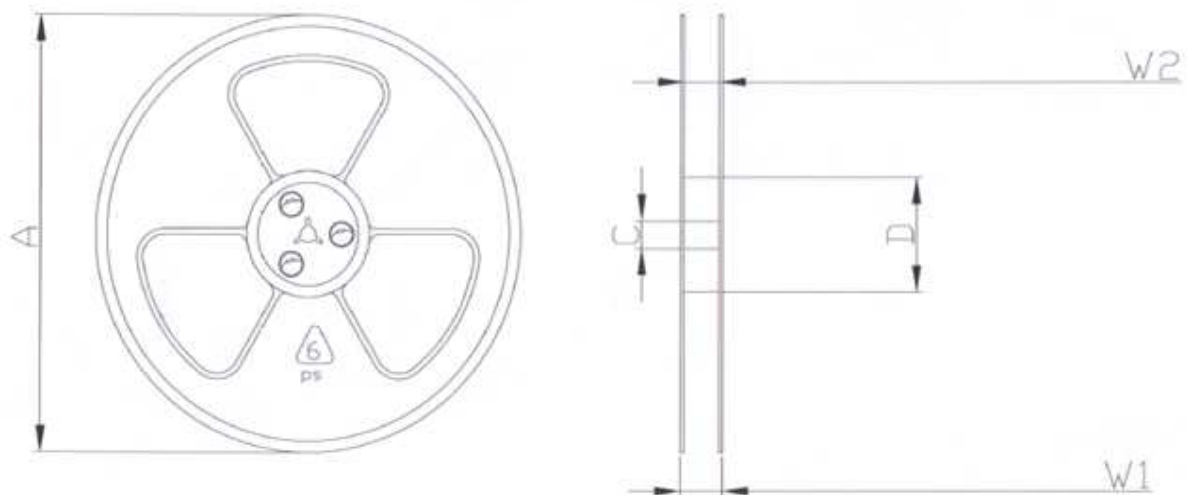
TAPE AND REEL SPECIFICATION

1. Tape and Reel form conform to EIA-481-B
2. The quantity of crystal units per reel shall be 3000PCS.
3. A "LABEL" on which necessary information is clearly written is on the surface of packing box and the reel.

CARRIER TAPE DIMENSIONS



REEL DIMENSIONS



$A \pm 0.5$	$C \pm 0.2$	$D \pm 0.3$	$W1 \pm 0.2$	$W2 \begin{smallmatrix} +0.4 \\ +0.2 \end{smallmatrix}$
330	25	100	20	16