



A Product Line of
Diodes Incorporated



SPECIFICATION FOR APPROVAL

CUSTOMER	_____
NOMINAL FREQUENCY	12.000000 MHz
PRODUCT TYPE	TYPE GB 49S QUARTZ CRYSTAL
PART NUMBER	GB1200038
CUSTOMER P/N	_____
ISSUE DATE	February 20, 2018
VERSION	D

APPROVED	PREPARED	QA

Diodes Incorporated

No.2, Ziqiang 5th Rd., Zhongli Industrial Park,
Zhongli Dist., Taoyuan City 32063, Taiwan (R.O.C.)
TEL:886-3-451-8888
FAX:886-3-461-3865
<https://www.diodes.com>

- *RoHS Compliant
- *HF-Halogen Free
- *REACH Compliant

TYPE GB 49S QUARTZ CRYSTAL

GB1200038

VER.D 20-FEB-18

ELECTRICAL SPECIFICATIONS

Item	Symbol	Specifications	Units	Notes
Nominal Frequency	Fn	12.000000	MHz	
Mode of Oscillation	MO	AT Cut-Fundamental		
Calibration Load Capacitance	CL	12	pF	
Calibration Tolerance	FL	± 30	ppm	at 25°C $\pm 3^{\circ}\text{C}$
Operating Temperature Range	TR	-20 to +70	°C	
Frequency Stability(Frequency Deviation over the Operating Temperature Range)	F/T	± 30	ppm	Reference to the Frequency at 25°C
Operating Drive Level		100	μW	
Equivalent Series Resistance	ESR	40	Ω	Max.
Shunt Capacitance	C0	5	pF	Max.
Aging at 25°C		± 3	ppm	Max, 1st year
Storage Temperature		-55 to +125	°C	
Insulation Resistance		500	M Ω	Min

TYPE GB 49S QUARTZ CRYSTAL

GB1200038

VER.D 20-FEB-18

RELIABILITY SPECIFICATIONS

MECHANICAL AND ENVIRONMENTAL RATINGS:

- a) FINE LEAK TEST: JESD22-A109 (Condition 1A)
- b) GROSS LEAK TEST: JESD22-A109 (Condition C)
- c) MOISTURE RESISTANCE: JESD22-A113
- d) SHOCK: JESD22-B104 (Condition B)
- e) SOLDERABILITY : (RoHS version): J-STD-002
- f) VIBRATION: JESD22-B103
- g) SOLVENT RESISTANCE: JESD22-B107
- h) RESISTANCE TO SOLDERING HEAT (RoHS version): J-STD-020D Table 5.2 Pb free devices (3 cycles max)

SUGGESTED IR REFLOW PROFILE

*As per IPC-JEDEC J-STD-020D



Note:

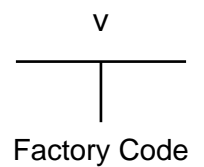
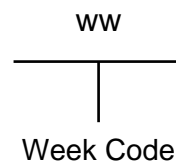
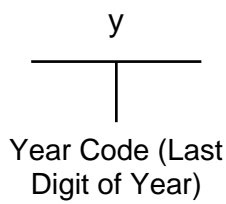
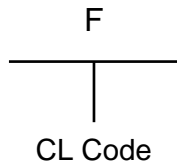
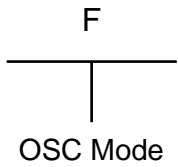
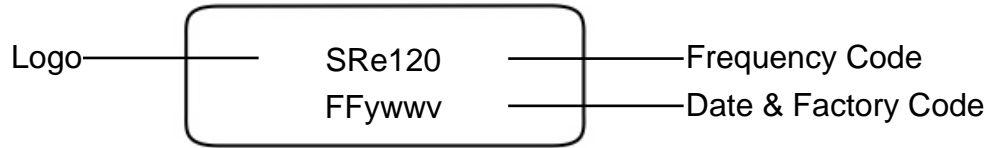
	Stage	Temperature	Time
A	Preheat	150~200°C	60~120 Sec
B	Primary Heat	217°C	60~150 Sec
C	Peak	260°C	10 Sec

TYPE GB 49S QUARTZ CRYSTAL

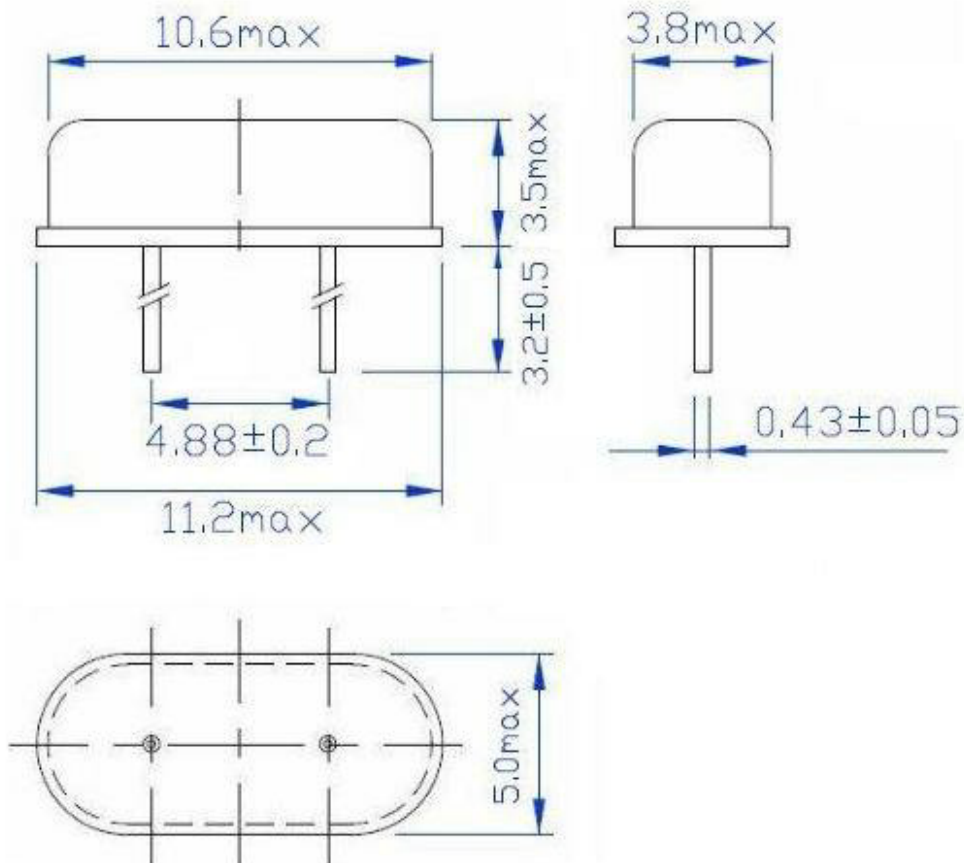
GB1200038

VER.D 20-FEB-18

MARKING



MECHANICAL DRAWINGS (Scale: None. Dimensions are in mm.)

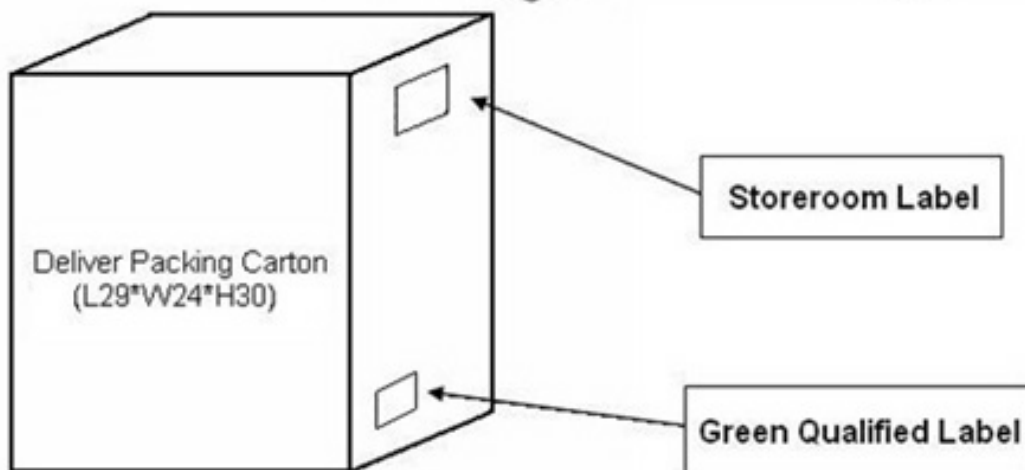
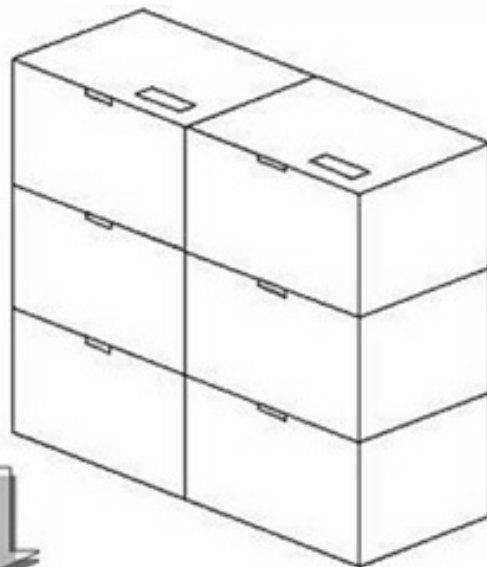
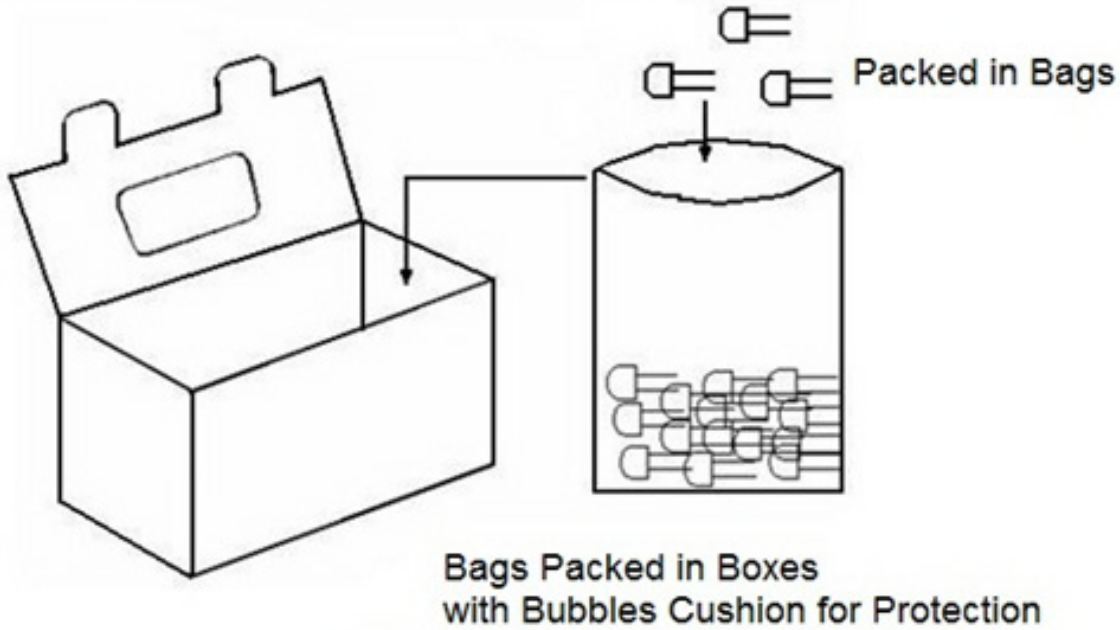


TYPE GB 49S QUARTZ CRYSTAL

GB1200038

VER.D 20-FEB-18

PACKING



TYPE GB 49S QUARTZ CRYSTAL

GB1200038

VER.D 20-FEB-18

VERSION HISTORY

Version No.	Version Date	Description	Notes
D	Feb. 20, 2018	Updated packing & logo	