



A Product Line of
Diodes Incorporated



SPECIFICATION FOR APPROVAL

CUSTOMER

NOMINAL FREQUENCY

12.000000 MHz

PRODUCT TYPE

TYPE F9 5x3.2 GLASS SEALED CRYSTAL

PART NUMBER

F91200064

CUSTOMER P/N

ISSUE DATE

May 14, 2018

VERSION

D

APPROVED	PREPARED	QA
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*RoHS Exemption

*HF-Halogen Free

*REACH Compliant

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VER.D 11-MAY-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	20	pF	
Calibration Tolerance	FL	± 30	ppm	at 25°C $\pm 3^{\circ}\text{C}$
Operating Temperature Range	TR	-40 to +85	°C	
Frequency Stability(Frequency Deviation over the Operating Temperature Range)	F/T	± 30	ppm	Reference to the Frequency at 25°C
Operating Drive Level		10	μW	
Maximum Drive Level		100	μW	
Equivalent Series Resistance	ESR	70	Ω	Max.
Shunt Capacitance	C0	5	pF	Max.
Aging at 25°C		± 5	ppm	Max, 1st year
Storage Temperature		-55 to +125	°C	
Insulation Resistance		500	M Ω	Min

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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:

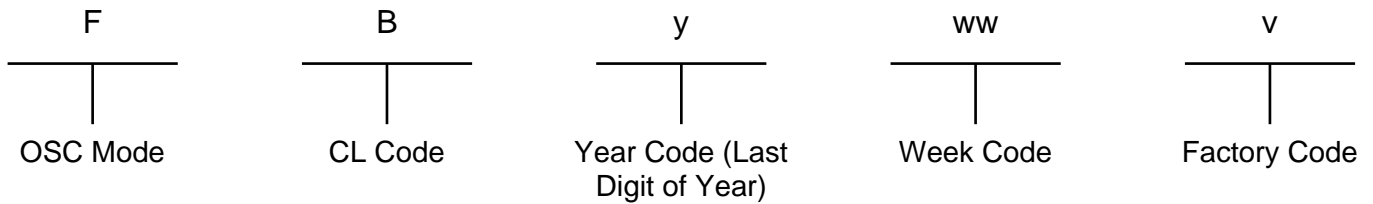
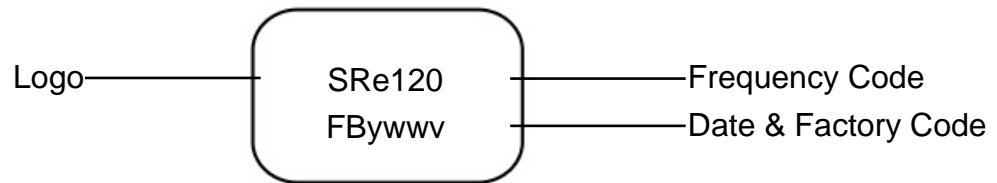
	Stage	Temperature	Time
A	Preheat	150~200°C	60~120 Sec
B	Primary Heat	217°C	60~150 Sec
C	Peak	260°C	10 Sec

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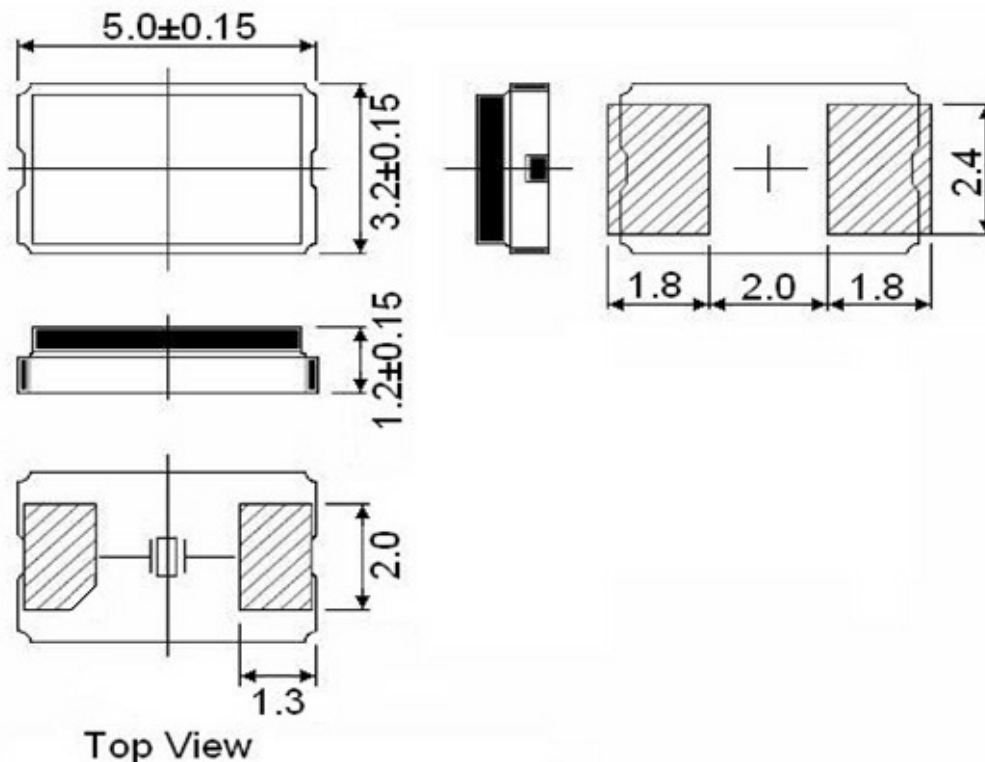
F91200064

VER.D 11-MAY-18

MARKING



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



Note:

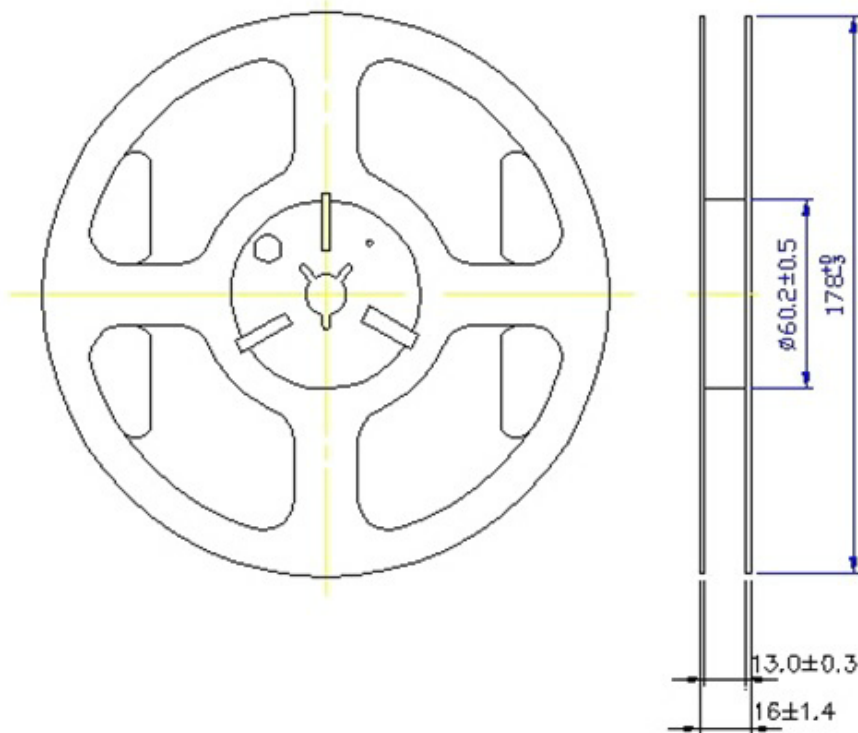
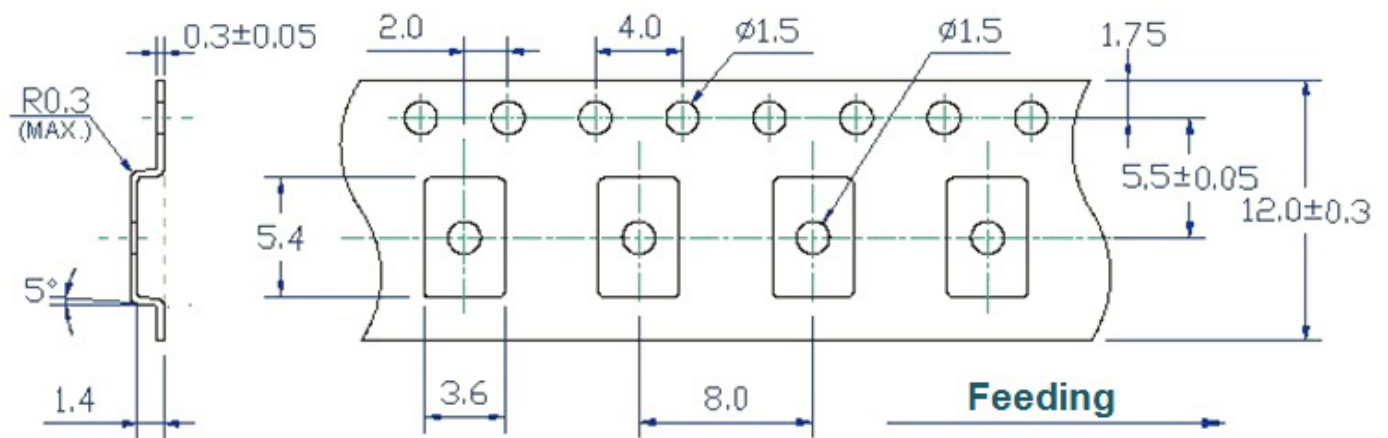
Pin shape is only for reference, and the Pin with chamfer or without chamfer is based on the real product.

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F91200064

VER.D 11-MAY-18

Tape & Reel



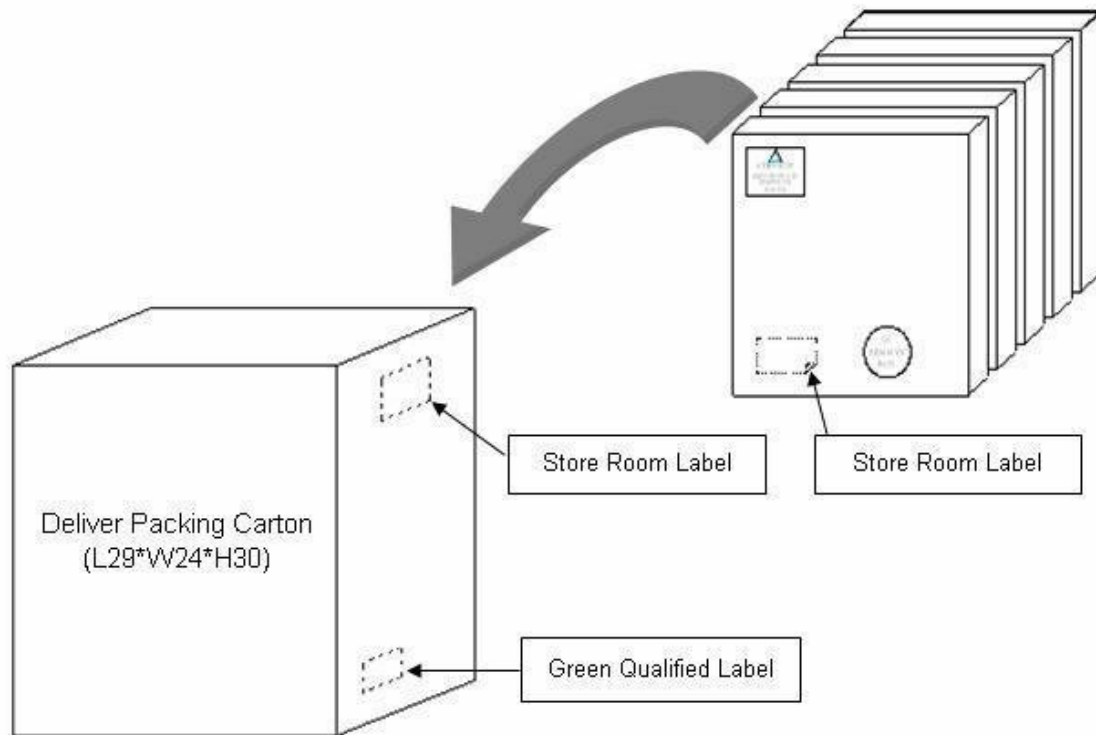
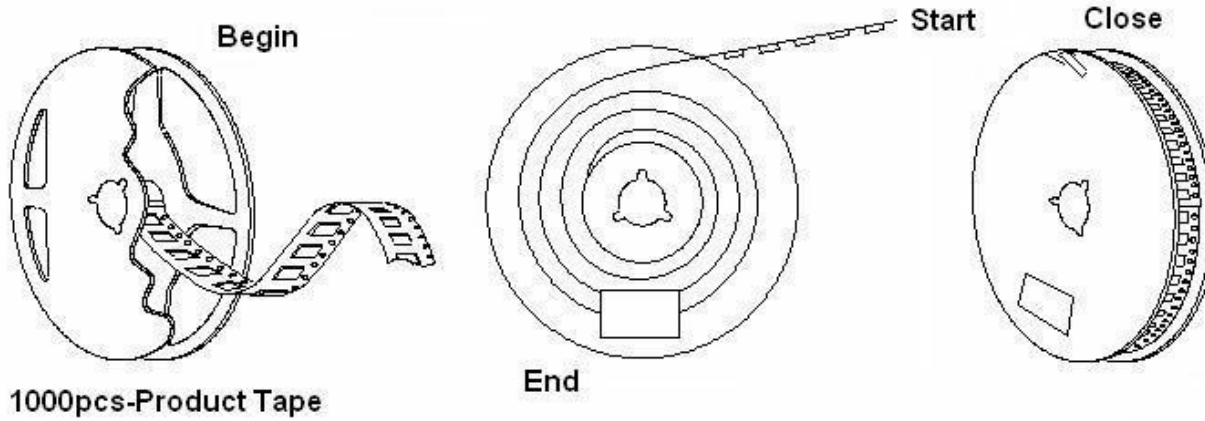
1. 230mm minimum leader which consist of carrier and/or tape followed by a minimum of 160mm of empty carrier tape sealed with cover tape.
2. 160mm minimum trailer of empty carrier tape sealed with cover tape.

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VER.D 11-MAY-18

PACKING



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VER.D 11-MAY-18

VERSION HISTORY

Version No.	Version Date	Description	Notes
A	Jul. 22, 2010	Initial Release	
B	Jul. 31, 2012	Updated Suggested IR Reflow Profile & Format	
C	Sep. 17, 2012	Updated Mechanical Drawing	
D	May. 11, 2018	Updated Logo	