



A Product Line of  
Diodes Incorporated



# SPECIFICATION FOR APPROVAL

CUSTOMER	
NOMINAL FREQUENCY	<b>48.000000 MHz</b>
PRODUCT TYPE	<b>TYPE F9 5x3.2 GLASS SEALED CRYSTAL</b>
PART NUMBER	<b>F94800031</b>
CUSTOMER P/N	
ISSUE DATE	<b>May 14, 2018</b>
VERSION	<b>E</b>

APPROVED	PREPARED	QA
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## Diodes Incorporated

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\*RoHS Exemption

\*HF-Halogen Free

\*REACH Compliant

# TYPE F9 5x3.2 GLASS SEALED CRYSTAL

## F94800031

VER.E 14-MAY-18

### ELECTRICAL SPECIFICATIONS

Item	Symbol	Specifications	Units	Notes
Nominal Frequency	Fn	48.000000	MHz	
Mode of Oscillation	MO	AT Cut-Fundamental		
Calibration Load Capacitance	CL	12	pF	
Calibration Tolerance	FL	$\pm 20$	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	$\pm 20$	ppm	Reference to the Frequency at 25°C
Operating Drive Level		10	$\mu\text{W}$	
Maximum Drive Level		100	$\mu\text{W}$	
Equivalent Series Resistance	ESR	70	$\Omega$	Max.
Shunt Capacitance	C0	7	pF	Max.
Aging at 25°C		$\pm 2$	ppm	Max, 1st year
Storage Temperature		-55 to +125	°C	
Insulation Resistance		500	M $\Omega$	Min

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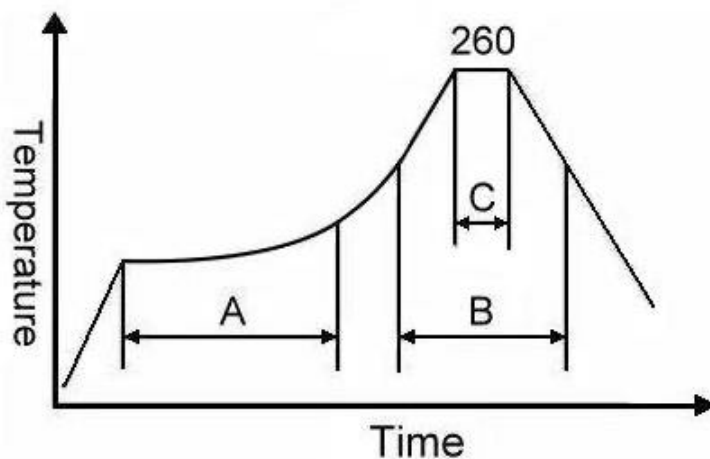
## RELIABILITY SPECIFICATIONS

### 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:

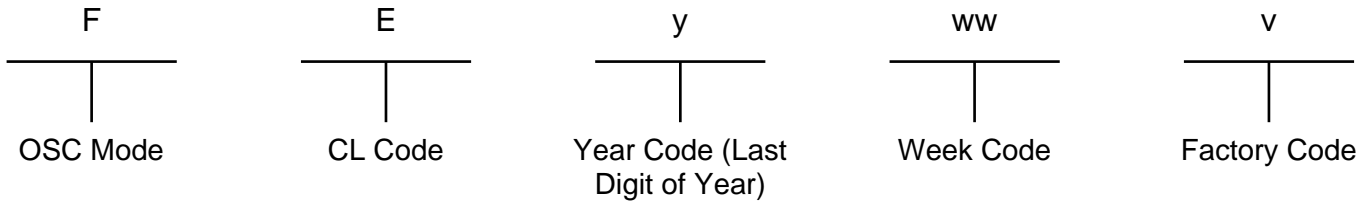
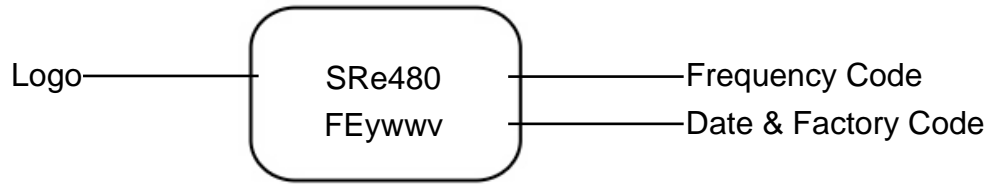
	Stage	Temperature	Time
A	Preheat	150~200°C	60~120 Sec
B	Primary Heat	217°C	60~150 Sec
C	Peak	260°C	10 Sec

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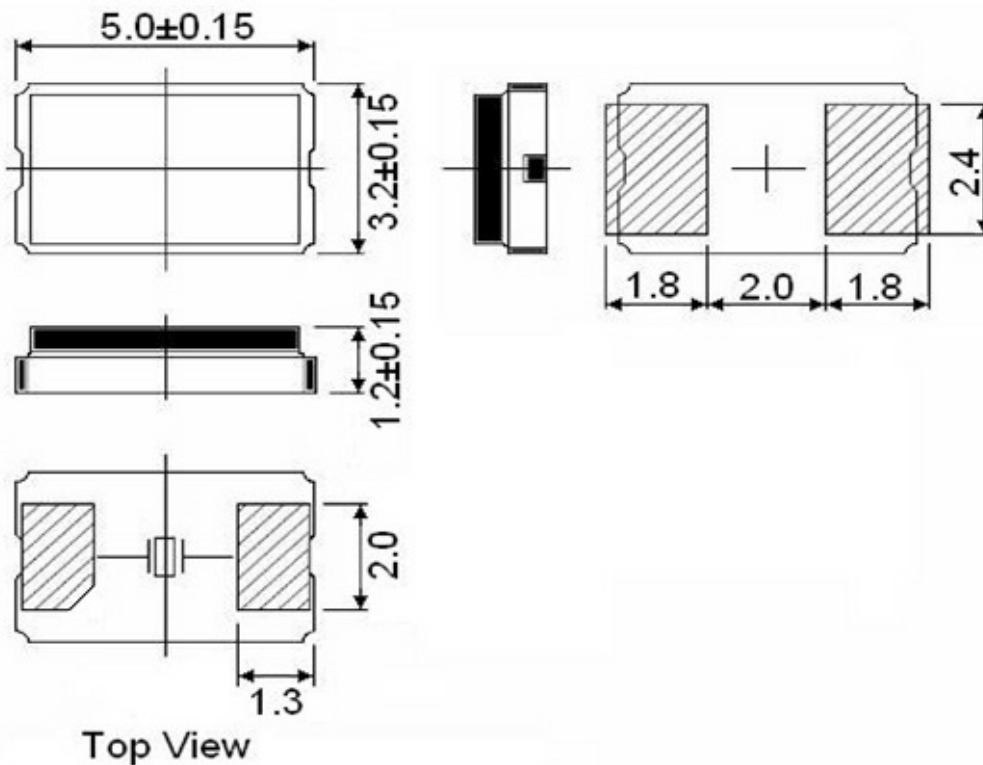
**F94800031**

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## MARKING



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



### Note:

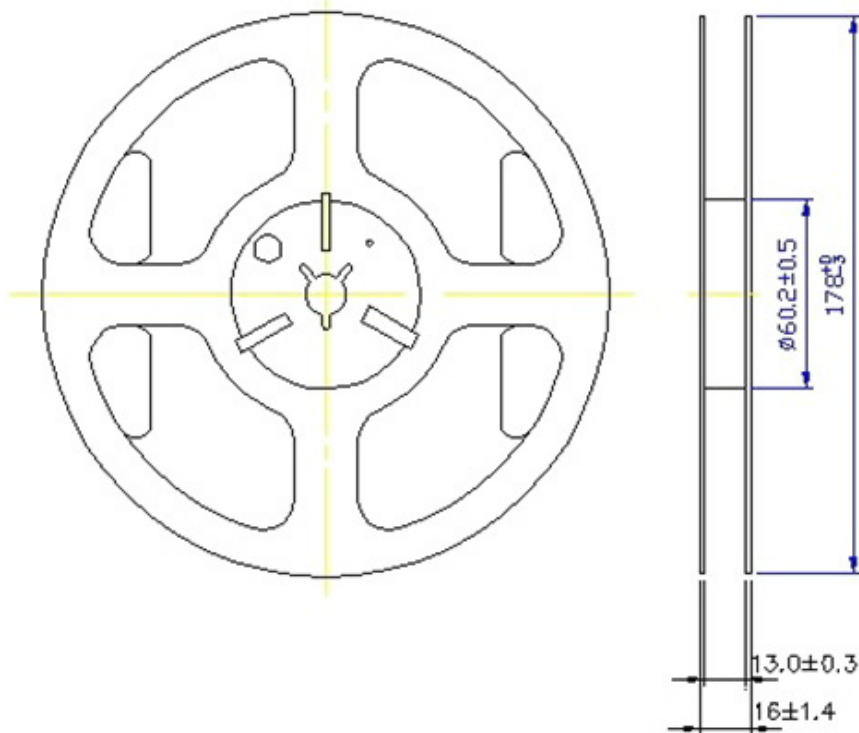
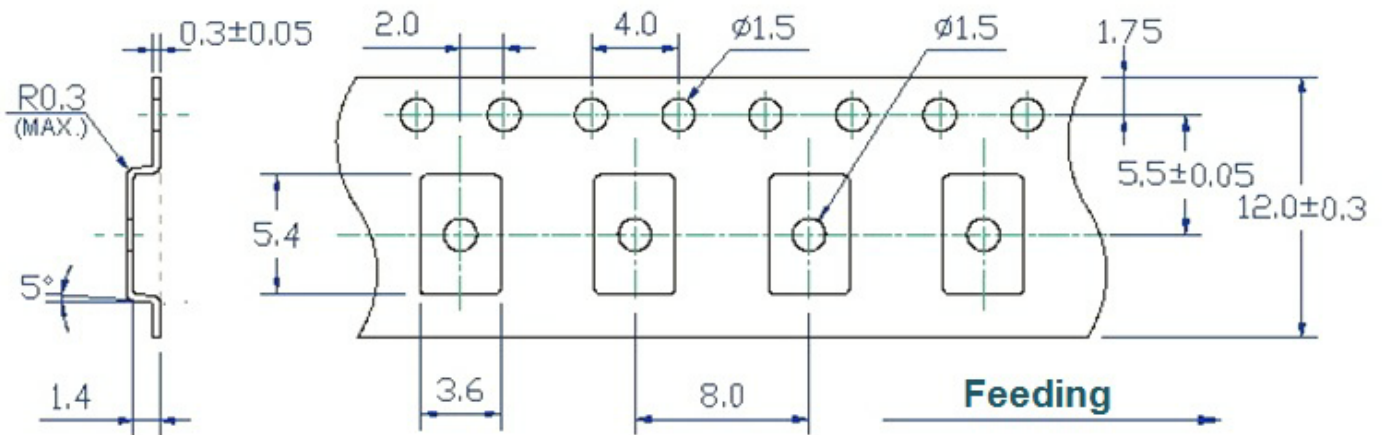
Pin shape is only for reference, and the Pin with chamfer or without chamfer is based on the real product.

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### Tape & Reel



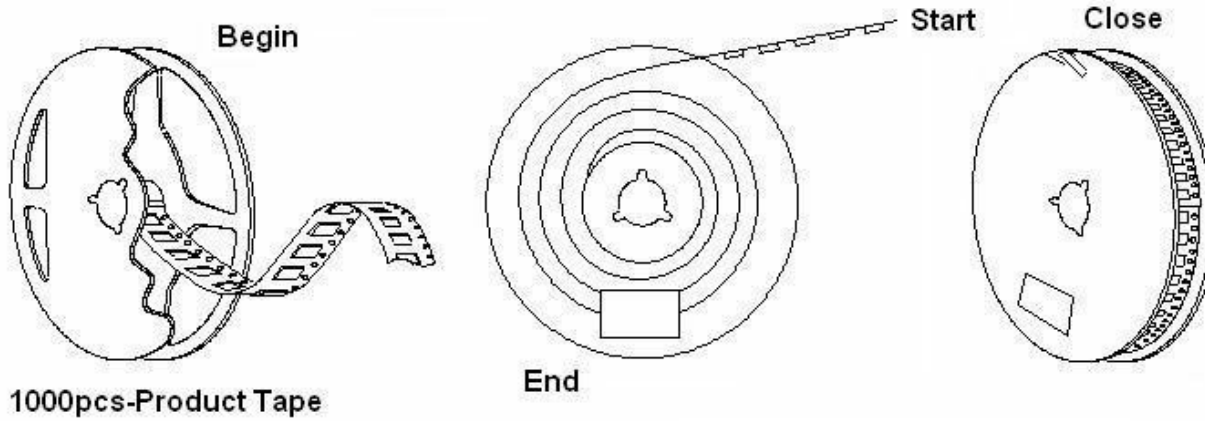
1. 230mm minimum leader which consist of carrier and/or tape followed by a minimum of 160mm of empty carrier tape sealed with cover tape.
2. 160mm minimum trailer of empty carrier tape sealed with cover tape.

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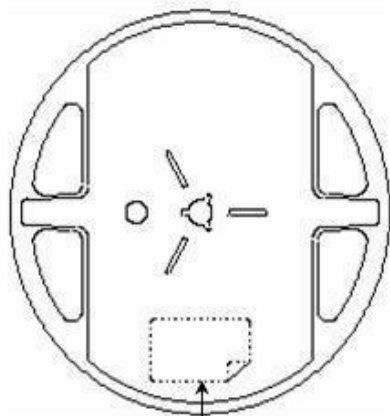
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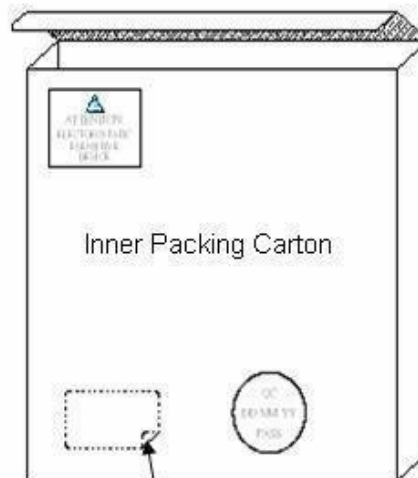
## PACKING



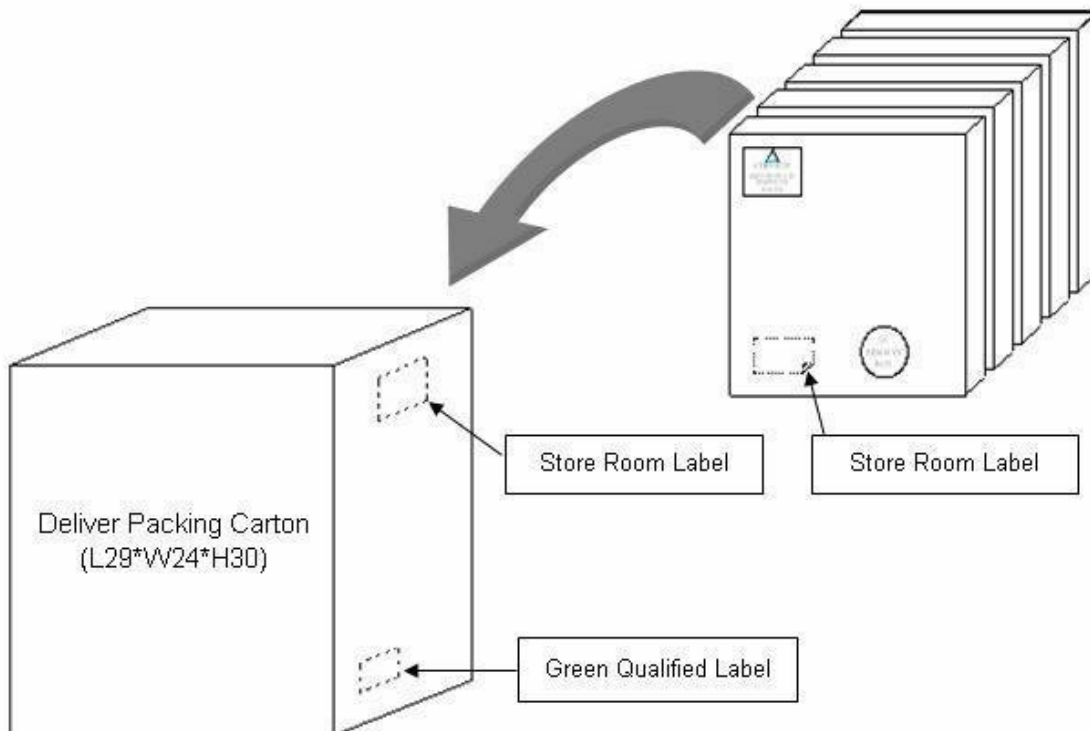
1000pcs-Product Tape



Blue Qualified Label



Store Room Label



Store Room Label

Store Room Label

Green Qualified Label

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## VERSION HISTORY

Version No.	Version Date	Description	Notes
A	May. 30, 2011	Initial Release	
B	Jul. 8, 2011	Changed Frequency Stability from $\hat{A}\pm 30\text{ppm}$ to $\hat{A}\pm 20\text{ppm}$ 2. Changed Operating Drive Level from $100\hat{I}\frac{1}{4}\text{W}$ to $10\hat{I}\frac{1}{4}\text{W}$ & Maximum Drive Level from $150\hat{I}\frac{1}{4}\text{W}$ to $100\hat{I}\frac{1}{4}\text{W}$ 3. Changed Equivalent Series Resistance from 40 ohms to 70ohms & Shunt Capacitance from 5pF to 7pF & Aging at 25'C from $\hat{A}\pm 5\text{ppm}$ to $\hat{A}\pm 2\text{ppm}$	
C	Aug. 21, 2012	Updated mechanical drawing	
D	Nov. 21, 2012	Revised mechanical drawing	
E	May. 14, 2018	Updated Logo	