



A Product Line of  
Diodes Incorporated



## SPECIFICATION FOR APPROVAL

CUSTOMER \_\_\_\_\_

NOMINAL FREQUENCY 20.000000 MHz

PRODUCT TYPE TYPE F9 5.0x3.2 GLASS SEALED CRYSTAL

SPEC. NO. ( P/N ) F92000024Q

CUSTOMER P/N \_\_\_\_\_

ISSUE DATE January 3, 2018

VERSION B

APPROVED	PREPARED	QA

### Diodes Incorporated

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\*RoHS Exemption  
\*HF-Halogen Free  
\*REACH Compliant  
\*AEC-Q200 Compliant



# TYPE F9 5.0x3.2 GLASS SEALED CRYSTAL

## F92000024Q

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### ELECTRICAL SPECIFICATIONS

Item	Symbol	Specifications	Units	Notes
Nominal Frequency	Fn	20.000000	MHz	
Mode of Oscillation	MO	AT Cut-Fundamental		
Calibration Load Capacitance	CL	8	pF	
Calibration Tolerance	FL	±50	ppm	at 25°C±3°C
Operating Temperature Range	TR	-40 to +125	°C	
Frequency Stability (Frequency Deviation over the Operating Temperature Range)	F/T	±100	ppm	Reference to the Frequency at 25°C
Operating Drive Level		10	µW	
Maximum Drive Level		500	µW	
Equivalent Series Resistance	ESR	50	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	MΩ	Min

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## AEC-Q200 RELIABILITY TEST SPECIFICATIONS:

### 1. Initial

- 1.1 Physical Dimensions: JESD22, Method JB1-100
- 1.2 External Visual: MIL-STD-883, Method 2009
- 1.3 Freq. Vs. Temperature: Per Specification/Datasheet

### 2. Mechanical

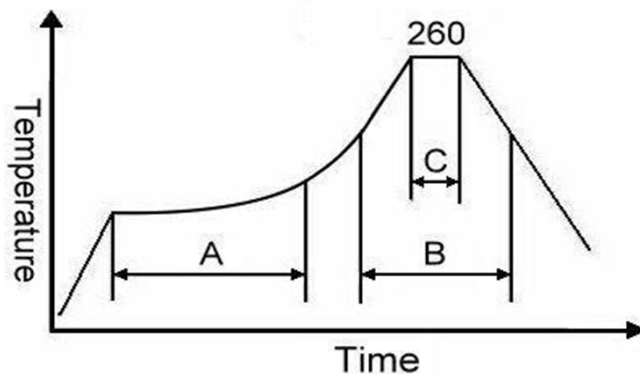
- 2.1 Mechanical Shock: MIL-STD-202 Method 213
- 2.2 Vibration: MIL-STD-202 Method 204
- 2.3 Solderability: J-STD-002
- 2.4 Board Flex: AEC Q200-005
- 2.5 Terminal Strength (SMD): AEC Q200-006

### 3.Environmental

- 3.1 Temp Cycle: JESD22, Method JA-104
- 3.2 Resistance to Solder Heat: MIL-STD-202 Method 210
- 3.3 High Temperature Operating Life: MIL-STD-202, Method 108
- 3.4 High Temp. Exposure: MIL-STD-202, Method 108
- 3.5 High Temp. & High Humidity: MIL-STD-202, Method 103
- 3.6 Thermal Shock: MIL-STD-202, Method 107

## SUGGESTED IR REFLOW PROFILE

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



Note:

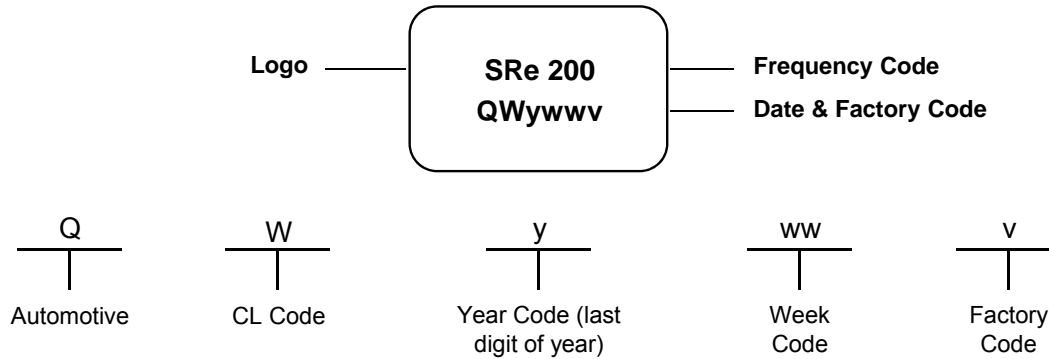
	Stage	Temperature	Time
A	Preheat	150~200°C	60~120 Sec
B	Primary Heat	217°C	60~150 Sec
C	Peak	260°C	10 Sec

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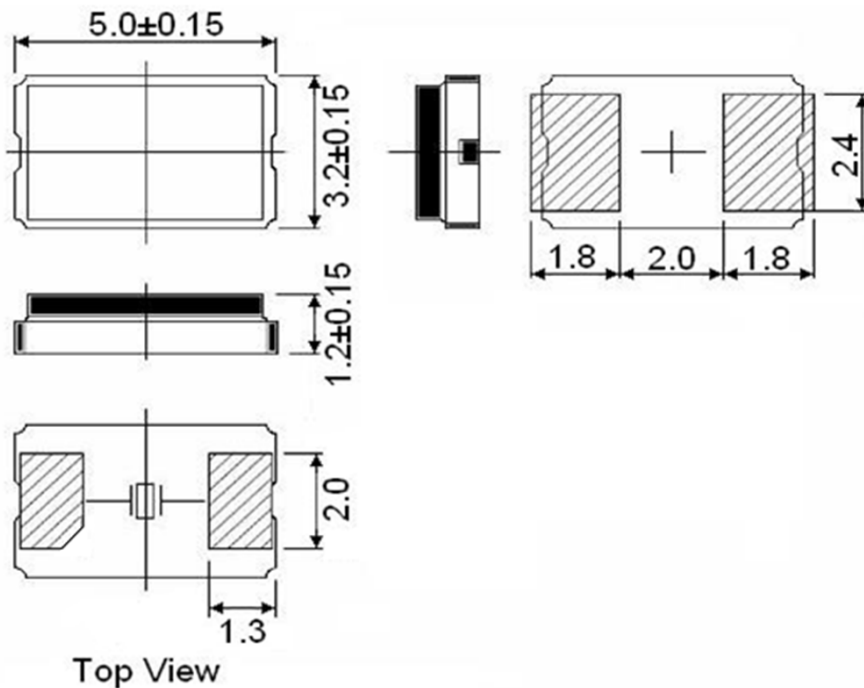
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### MARKING



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



Note:

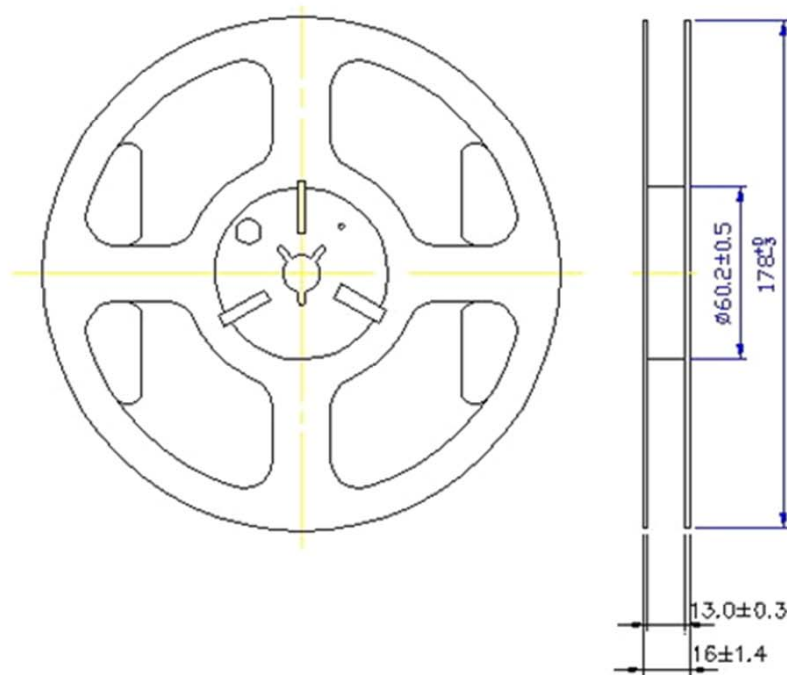
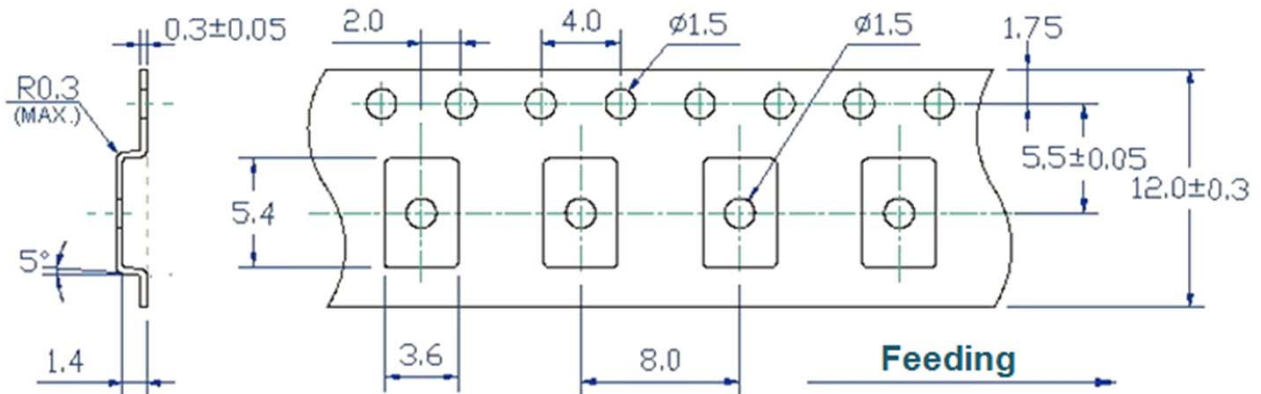
Pin shape is only for reference, and the Pin with chamfer or without chamfer is based on the real product.

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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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### PACKING

