



A Product Line of  
Diodes Incorporated



# SPECIFICATION FOR APPROVAL

CUSTOMER

NOMINAL FREQUENCY

**16.000000 MHz**

PRODUCT TYPE

**TYPE FL 3.2x2.5 SEAM SEALED CRYSTAL**

PART NUMBER

**FL1600074**

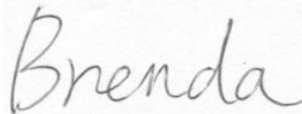


CUSTOMER P/N

ISSUE DATE

**September 25, 2017**

VERSION

**D**

APPROVED	PREPARED	QA
		

## Diodes Incorporation

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\*Pb-free

\*RoHS Compliant

\*HF-Halogen Free

\*REACH Compliant

# TYPE FL 3.2x2.5 SEAM SEALED CRYSTAL

**FL1600074**

VER.D 25-SEP-17

## VERSION HISTORY

Version No.	Version Date	Customer Receipt Date	Supplier Receipt Date	Description	Notes
A	Oct. 19, 2011			Initial Release	
B	Nov. 10, 2011			Changed Frequency Stability to +/-40ppm for Initial frequency tolerance at 25°C, Stability over temperature range, Aging over lifetime and frequency variations due to variations in CL.	
C	Nov. 22, 2011			Changed Frequency Stability from +/- 40ppm overall to Calibration Tolerance: +/- 15ppm, Frequency Stability: +/-20ppm, and Aging: +/-3ppm Max for 1st year	
D	Sep. 25, 2017			Updated logo	

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## ELECTRICAL SPECIFICATIONS

Item	Symbol	Specifications	Units	Notes
Nominal Frequency	Fn	16.000000	MHz	
Mode of Oscillation	MO	AT Cut-Fundamental		
Calibration Load Capacitance	CL	12	pF	
Calibration Tolerance	FL	± 15	ppm	at 25°C±3°C
Operating Temperature Range	TR	-20 to +70	°C	
Frequency Stability(Frequency Deviation over the Operating Temperature Range)	F/T	± 20	ppm	Reference to the Frequency at 25°C
Operating Drive Level		10	μW	
Maximum Drive Level		200	μW	
Equivalent Series Resistance	ESR	70	Ω	Max.
Shunt Capacitance	C0	2	pF	Max.
Aging at 25°C		± 3	ppm	Max, 1st year
Storage Temperature		-55 to +125	°C	
Insulation Resistance		500	MΩ	Min

\*\* This product doesn't include harmful substance that stipulated by SONY SS-00259 Level 1 and S-AT2-001 Level 1 standard. RoHS Compliant (Pb - Free).

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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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## MARKING



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

### Recommended Land Pattern



\*\* Recommended - Pin 1 & 3 : CRYSTAL  
Pin 2 & 4 : GND

### Notes:

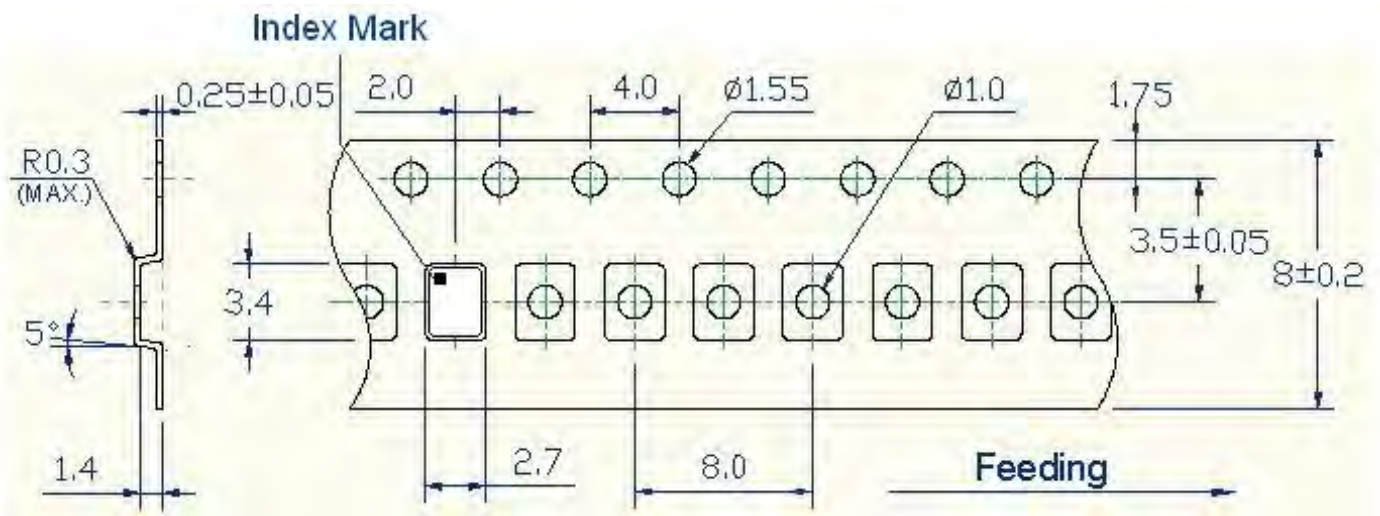
1. Package drawings are for reference only, and the appearances of objects may vary. Actual packages are based on the real product.
2. The marking dot denotes Pin#1.
3. The position and shape of the chamfer pin may vary and are based on the real product.

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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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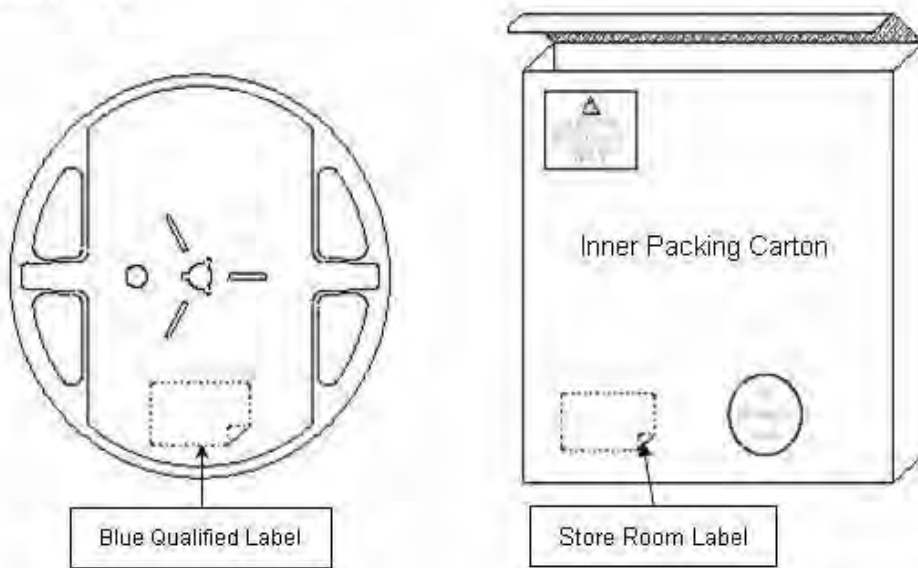
FL1600074

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## PACKING

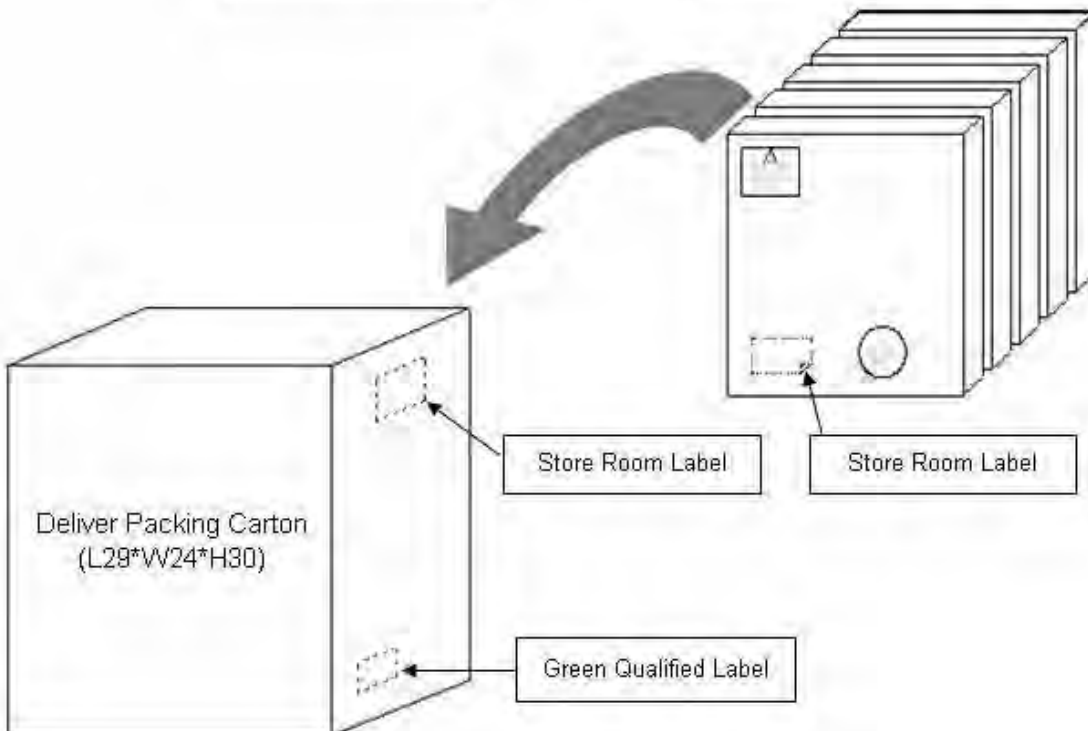


3000pcs-Product Tape



Blue Qualified Label

Store Room Label



Store Room Label

Store Room Label

Green Qualified Label