



A Product Line of  
Diodes Incorporated



# SPECIFICATION FOR APPROVAL

CUSTOMER \_\_\_\_\_

NOMINAL FREQUENCY 156.244531 MHz

PRODUCT TYPE TYPE LD 5.0x3.2 SEAM SEALED CRYSTAL CLOCK OSCILLATOR

SPEC. NO. ( P/N ) LDF620011

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

ISSUE DATE April 26, 2019

VERSION B

APPROVED	PREPARED	QA

## Diodes Incorporated

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- \*Pb-free
- \*RoHS Compliant
- \*HF-Halogen Free
- \*REACH Compliant

# TYPE LD 5.0x3.2 SEAM SEALED CRYSTAL CLOCK OSCILLATOR

**LDF620011**

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## VERSION HISTORY

Version No.	Version Date	Description	Notes
A	Dec.10,2015	Initial Release	
B	Apr.26,2019	Updated logo	



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### ELECTRICAL SPECIFICATIONS

SRe Part Number : LDF620011

Item	Symbol	Specifications	Units	Notes
Nominal Frequency	F <sub>0</sub>	156.244531	MHz	
Frequency Stability	FT	± 20	ppm	**See note
Operating Temperature Range	TR	-20 to +70	°C	
Supply Voltage	V <sub>CC</sub>	+3.3 ± 10.0%	V	
Logic Type	LT	LVDS		
Supply Current, Output Enabled	I <sub>CC</sub> /OE	80	mA	Max.
Supply Current, Output Disabled	I <sub>CC</sub> /OD	30	uA	Max.
Duty Cycle (Symmetry)	DC/SY	45 / 55	%	Measured 50% of Waveform
Rise / Fall Time	T <sub>R</sub> /T <sub>F</sub>	0.8	ns	Max. measured 20/80% of Waveform
Output Voltage "0" Level	V <sub>OL</sub>	1.10 / 0.9	V	Typ. / Min.
Output Voltage "1" Level	V <sub>OH</sub>	1.43 / 1.6	V	Typ. / Max.
Output Load		100Ω & 5pF LVDS		
Differential Output Voltage		247 / 454	mV	Min. / Max.
Jitter, Phase	RMS	1	ps	Max., 12KHz ~ 20MHz Frequency Band
Jitter, Accumulated	RMS(1-σ)	4	ps	Typ. 20,000 Consecutive Periods
Jitter, Peak to Peak	Pk-Pk	40	ps	Max. 100,000 Random Periods
Start Up Time		10	ms	Max.
Storage Temperature Range		-55 to +125	°C	

※ 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).

\*\*Stability includes all combinations of Operating Temperature, Load changes, rated Input (Supply) Voltage changes, Initial Calibration Tolerance (25°C), Aging (5 years at 40°C Average Effective Ambient Temperature), Shock and Vibration.

#### Output Enable / Disable Function

Parameter	Min.	Typ.	Max.	Units	Notes
Input Voltage (Pin1), Output Enable	0.7V <sub>CC</sub>			V	Or Open
Input Voltage (Pin1), Output Disable (low power standby)			0.3V <sub>CC</sub>	V	Output is Hi-Z
Output Disable Delay			200	ns	
Output Enable Delay			2	ms	

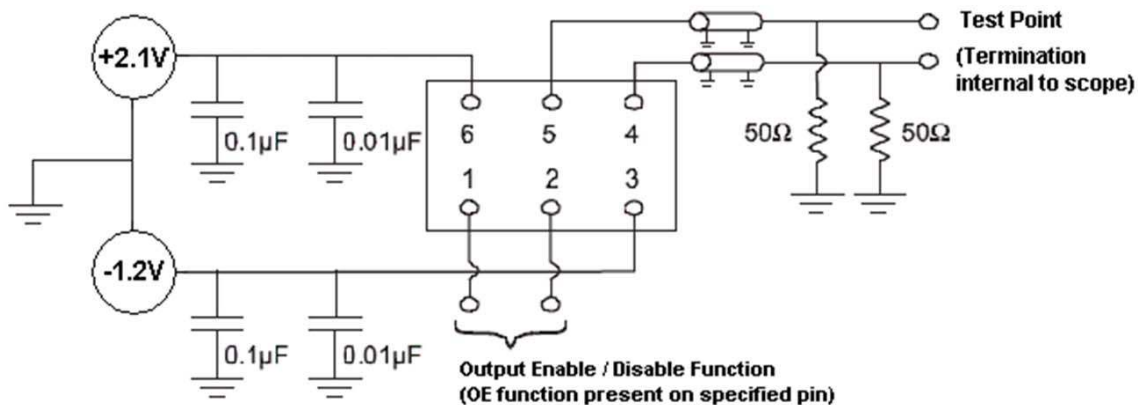


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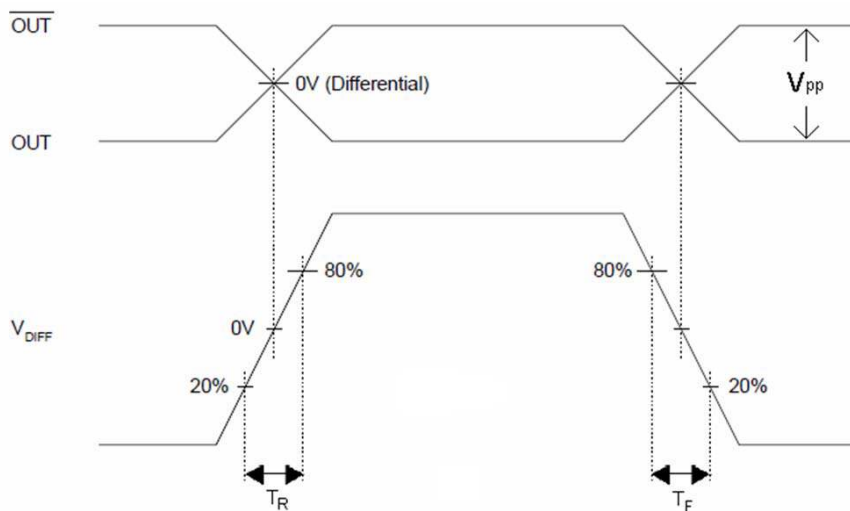
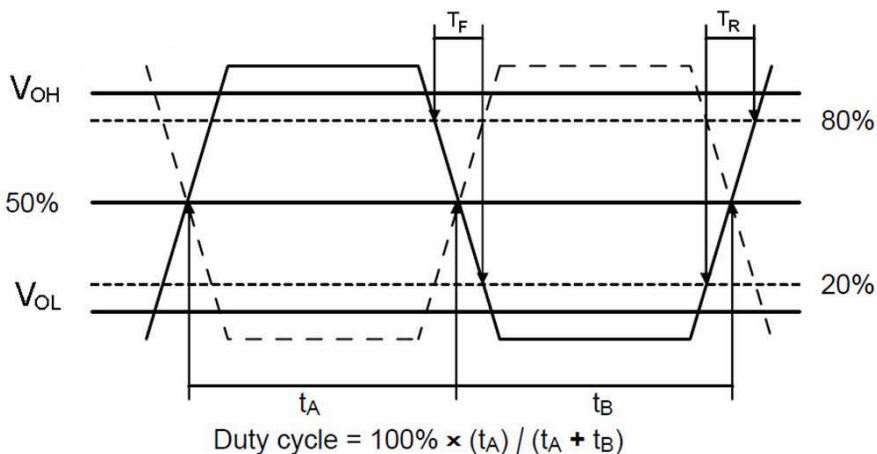
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### TEST CIRCUIT



### OUTPUT WAVEFORM



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### RELIABILITY SPECIFICATIONS

#### ENVIRONMENTAL:

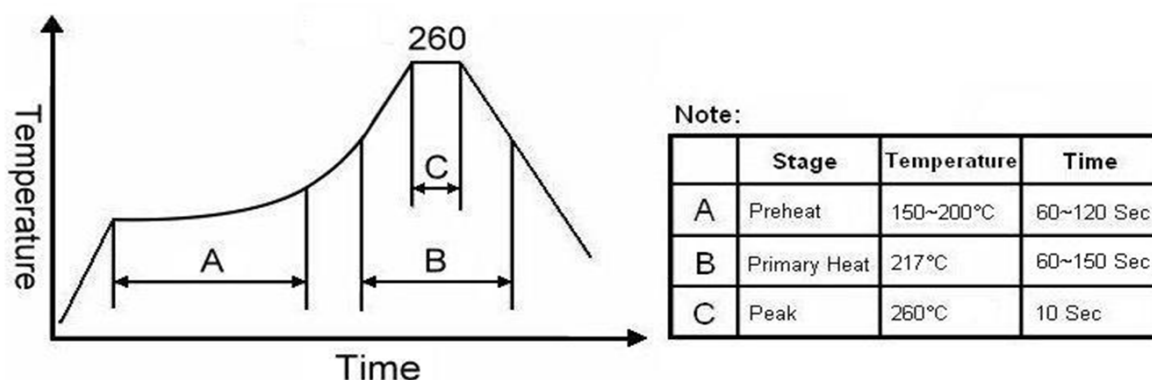
- a) THERMAL SHOCK: MIL-STD-883, Method 1011, Condition A
- b) MOISTURE RESISTANCE: MIL-STD-883, Method 1004
- c) VIBRATION: MIL-STD-883, Method 2007, Condition A
- d) RESISTANCE TO SOLDERING HEAT: J-STD-020D Table 5-2 Pb-free devices (except 2 cycles max)
- e) HAZARDOUS SUBSTANCE: Pb - free and RoHS/ Green Compliant.

#### MECHANICAL:

- a) SHOCK: MIL-STD-883, Method 2002, Condition B
- b) SOLDERABILITY: JESD22-B102-D Method 2 (Preconditioning E)
- c) TERMINAL STRENGTH: MIL-STD-883, Method 2004, Test Condition D
- d) GROSS LEAK: MIL-STD-883, Method 1014, Condition C
- e) FINE LEAK: MIL-STD-883, Method 1014, Condition A2,  $R1=2 \times 10^{-8}$  atm cc/s
- f) SOLVENT RESISTANCE: MIL-STD-202, Method 215

### SUGGESTED IR REFLOW PROFILE

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

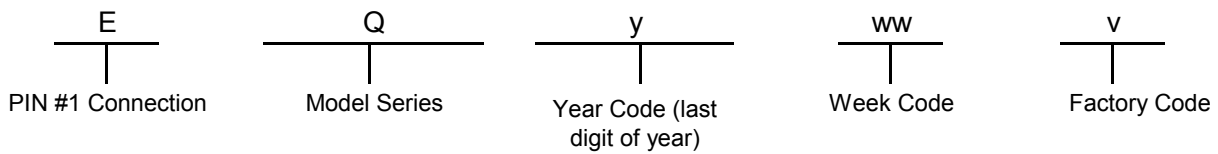
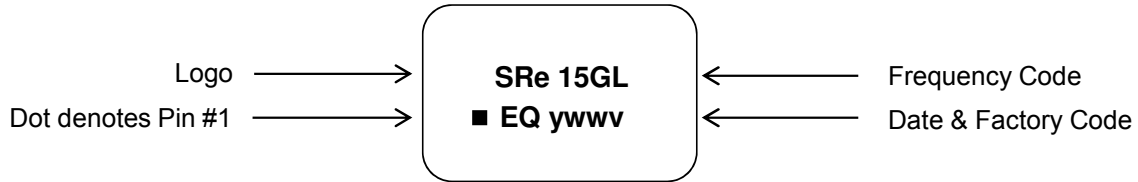


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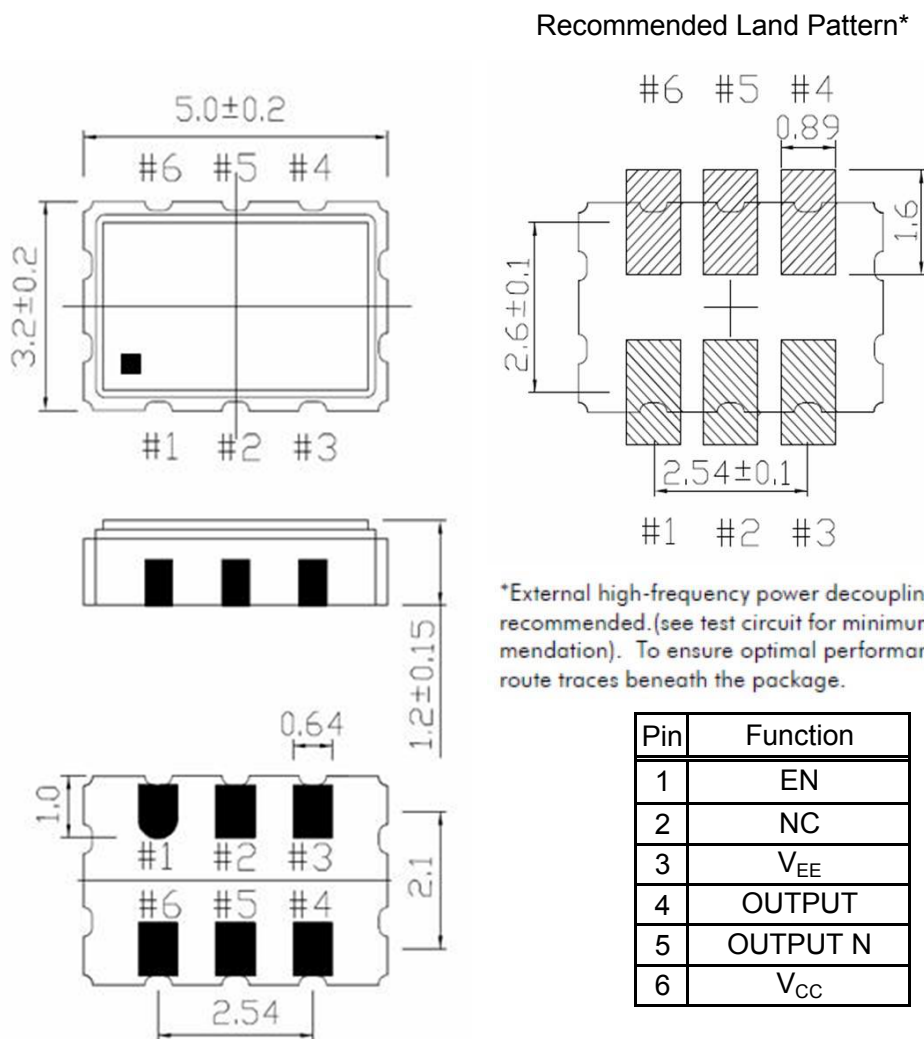
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## MARKING



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

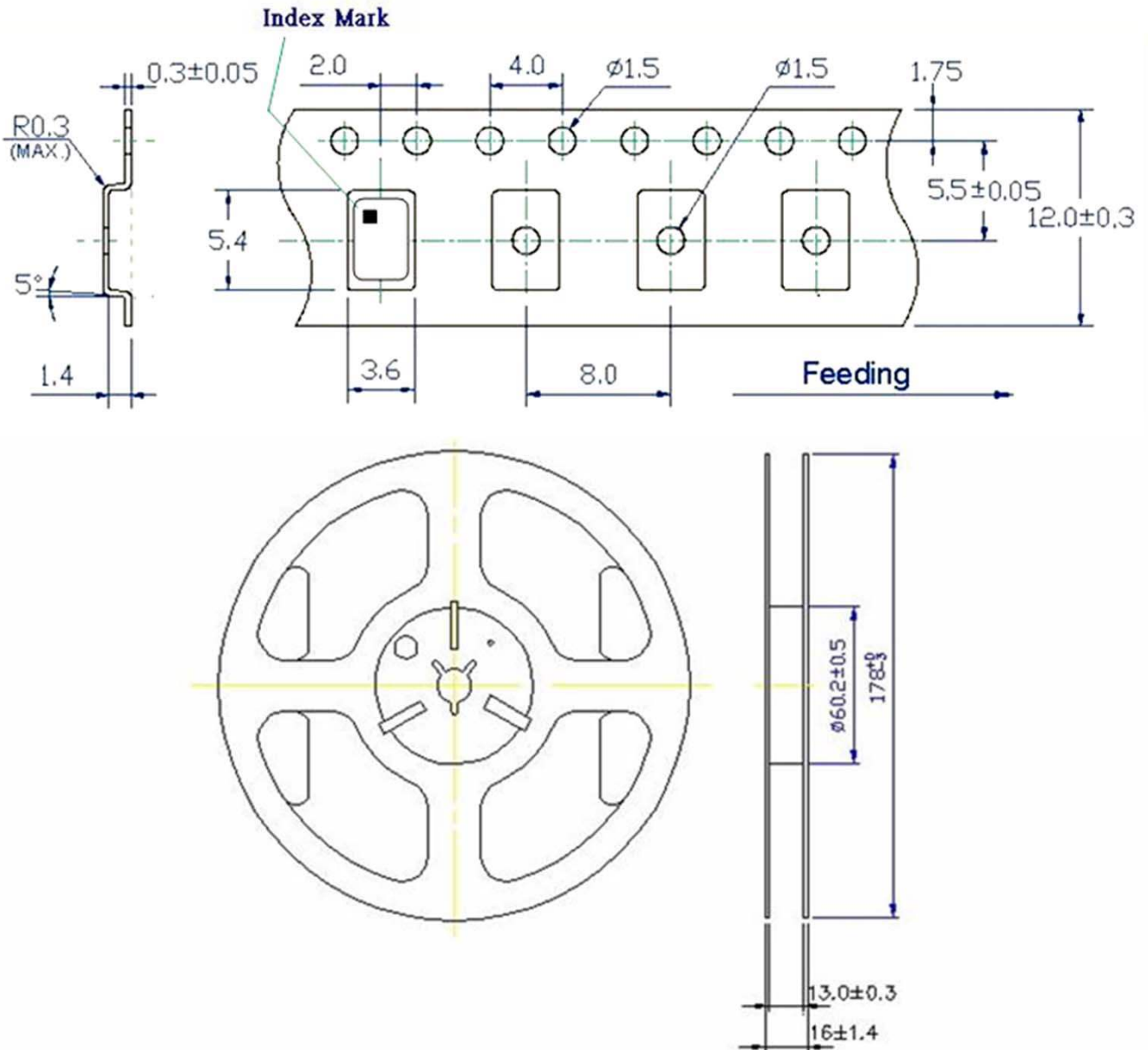


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### TAPE & REEL



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

