A Product Line of Diodes Incorporated

SPECIFICATION FOR APPROVAL

CUSTOMER	
NOMINAL FREQUENCY	12.288000 MHz
PRODUCT TYPE	TYPE FD 5.0x3.2 SEAM SEALED CRYSTAL CLOCK OSCILLATOR
SPEC. NO. (P/N)	FD1220022
CUSTOMER P/N	
ISSUE DATE	September 29, 2017
VERSION	B

APPROVED	PREPARED	QA
Brenda	Nikki Lu	Jenny Yang

Diodes Incorporation

No.2, Ziqiang 5th Rd., Zhongli Industrial Park,
Zhongli Dist., Taoyuan City 32063, Taiwan (R.O.C.)
TEL: 886-3-451-8888
FAX: 886-3-461-3865
http://www.diodes.com

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

VERSION HISTORY

Version No.	Version Date	Customer Receipt Date	Supplier Receipt Date	Description	Notes
A	May.13,2015			Initial Release	
B	Sep.29,2017			Updated logo	

TYPE FD 5.0x3.2 SEAM SEALED CRYSTAL CLOCK OSCILLATOR

FD1220022

VER. B 29-Sep-17

ELECTRICAL SPECIFICATIONS

SRe Part Number : FD1220022

Item	Symbol	Specifications	Units	Notes
Nominal Frequency	Fo	12.288000	MHz	
Frequency Stability	FT	±25	ppm	**See note
Operating Temperature Range	TR	-40 to +85	°C	
Supply Voltage	V_{DD}	+1.8 to +3.3	V	at +2.5V Typ.
Logic Type	LT	LVCMOS		
Supply Current, Output Enabled	I_{DD}/OE	15	mA	Max.
Supply Current, Output Disabled	I_{DD}/OD	10	µA	Max.
Duty Cycle (Symmetry)	DC/SY	45 / 55	%	Measured 50% of Waveform
Rise / Fall Time	T_R/T_F	10	ns	Max. measured 20/80% of Waveform
Output Voltage "0" Level	V_{OL}	10% V_{DD}	V	Max.
Output Voltage "1" Level	V_{OH}	90% V_{DD}	V	Min.
Output Load	CL	15	pF	Max
Jitter, Phase	RMS	1	ps	Max. 12KHz ~ 5MHz Frequency Band
Jitter, Accumulated	RMS(1-σ)	5	ps	Max. 20,000 Consecutive Periods
Jitter, Peak to Peak	Pk-Pk	50	ps	Max. 100,000 Random Periods
Start Up Time		10	ms	Max.
Storage Temperature Range		-55 to +125	°C	

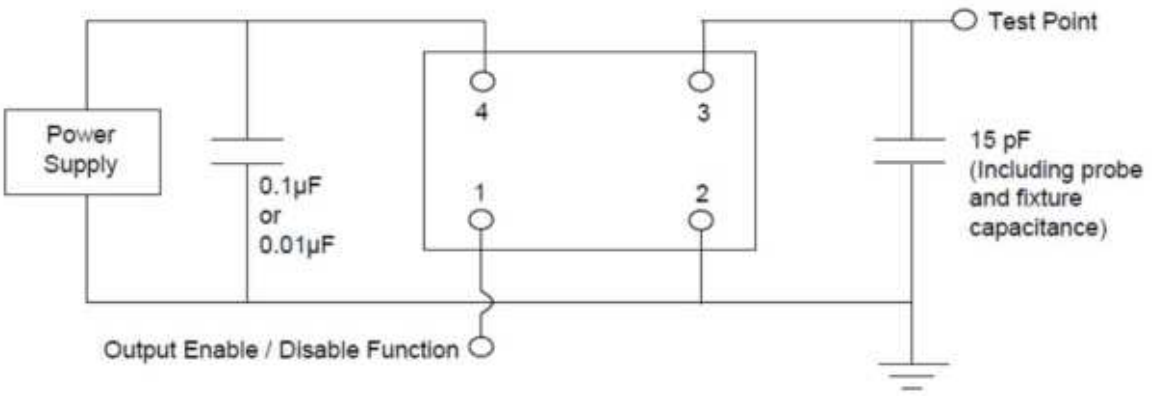
※ This product doesn't include harmful substance that stipulated by SONY SS-00259 Level 1 and S-AT2-001 Level 1 standard. RoHS Compliant (Pb-Free).

****Stability includes all combinations of Operating Temperature, Load changes, rated Input (Supply) Voltage changes, Initial Calibration Tolerance (25°C), Aging (1 year at 25°C Average Effective Ambient Temperature), Shock and Vibration.**

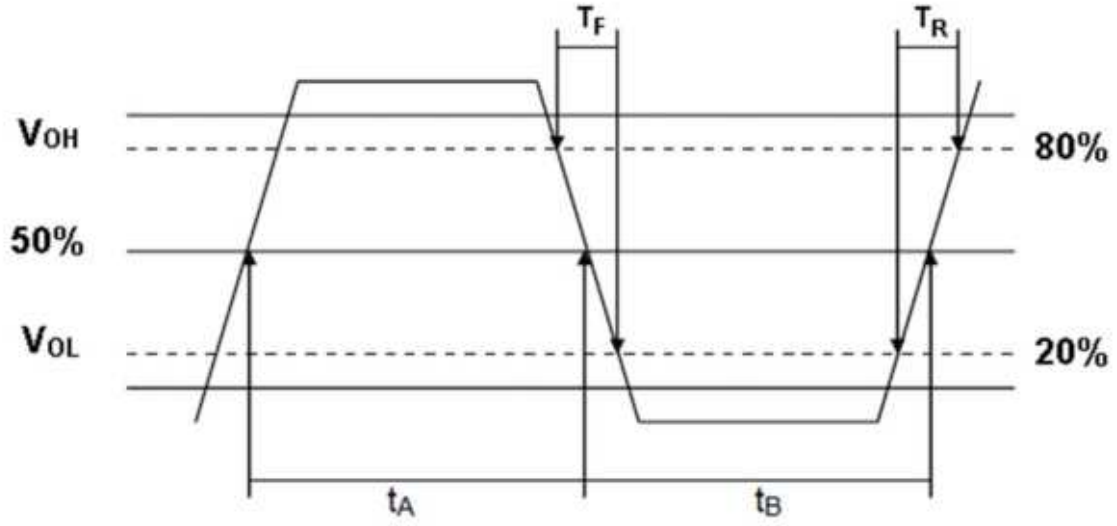
Output Enable / Disable Function

Parameter	Min.	Typ.	Max.	Units	Notes
Input Voltage (Pin1), Output Enable	$0.7V_{DD}$			V	Or Open
Input Voltage (Pin1), Output Disable (low power standby)			$0.3V_{DD}$	V	Output is Hi-Z
Internal Pullup Resistance	30			KΩ	
Output Disable Delay			50	ns	

TEST CIRCUIT



OUTPUT WAVEFORM



Duty cycle = 100% × (t_A) / (t_A + t_B)

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 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

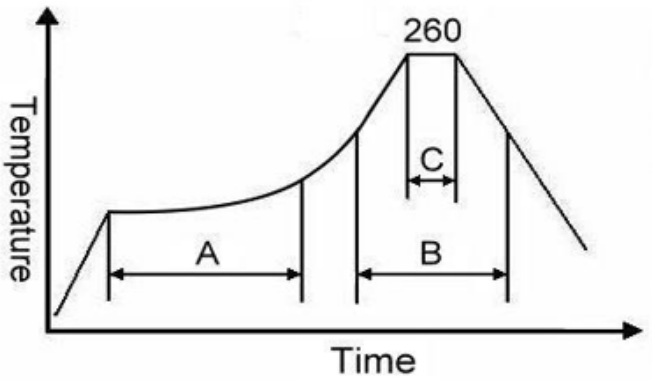
d) GROSS LEAK: MIL-STD-883, Method 1014, Condition C

e) FINE LEAK: MIL-STD-883, Method 1014, Condition A2, R1=2x10^{-8} atm cc/s

f) SOLVENT RESISTANCE: MIL-STD-202, Method 215

SUGGESTED IR REFLOW PROFILE

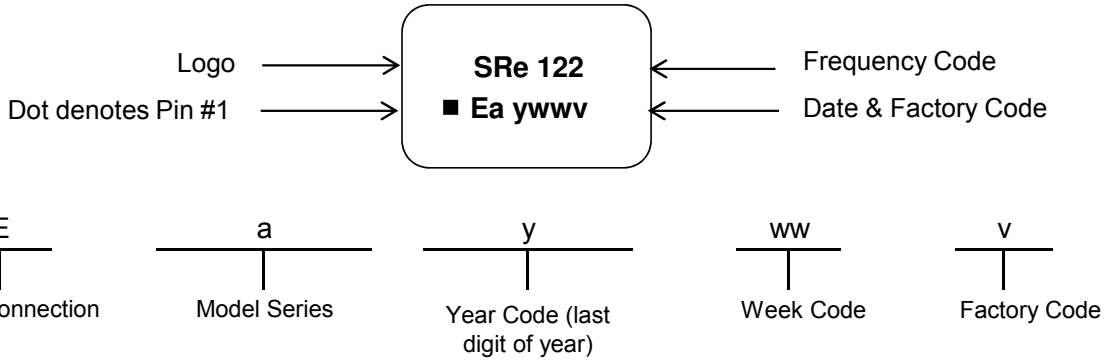
*As per IPC-JEDEC J-STD-020D



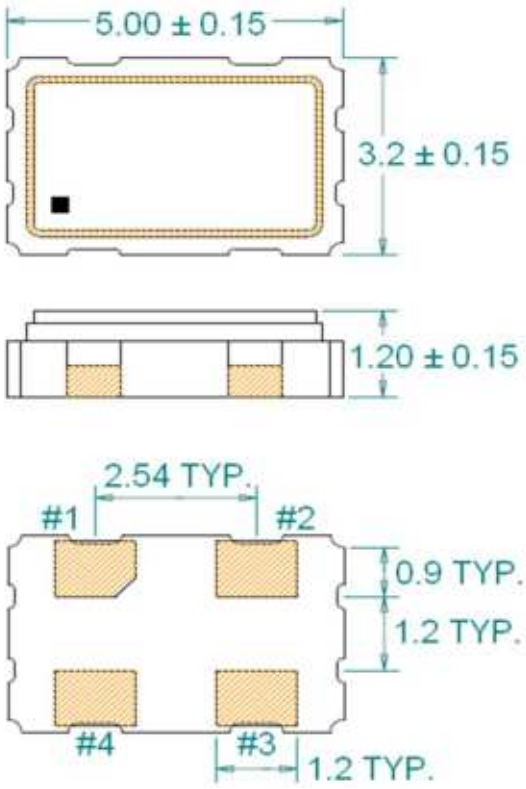
Note:

	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

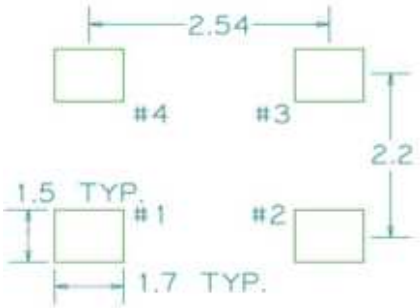
MARKING



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



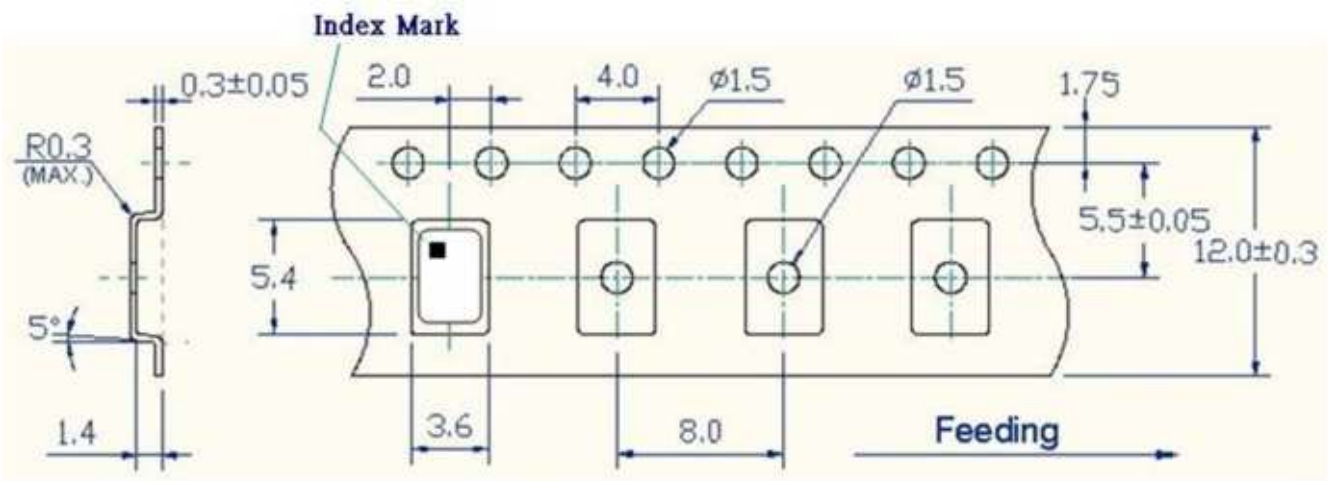
Recommended Land Pattern*

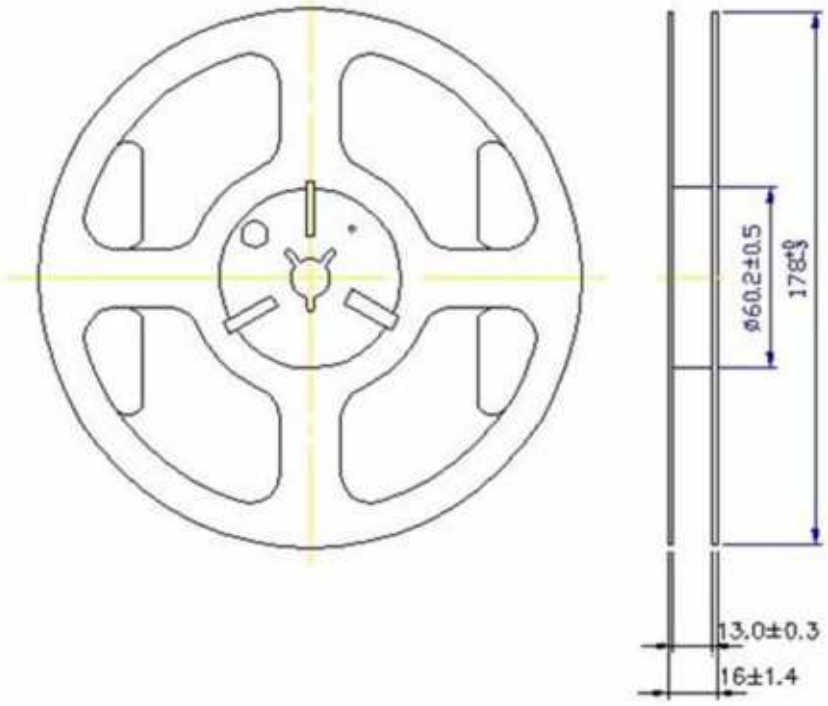


*External high-frequency power decoupling is recommended.(see test circuit for minimum recommendation). To ensure optimal performance, do not route traces beneath the package.

Pin	Function
1	OE
2	Ground
3	Clock Output
4	V_{DD}

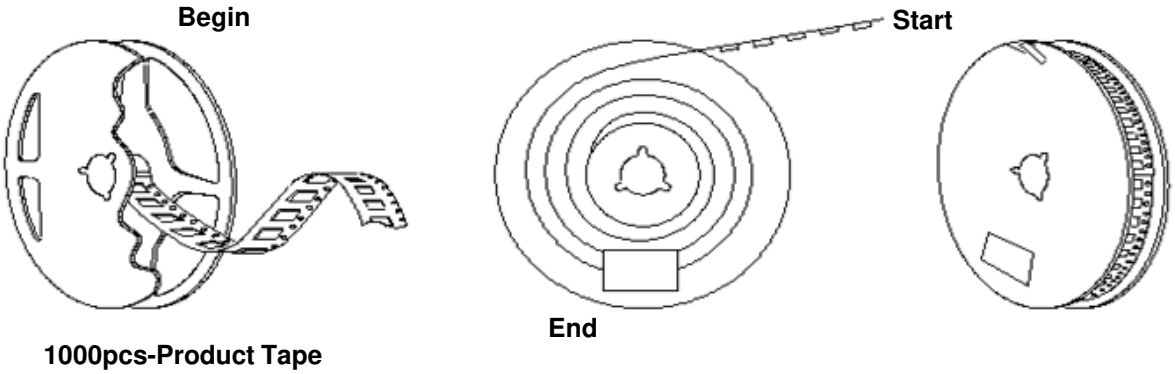
Tape & Reel

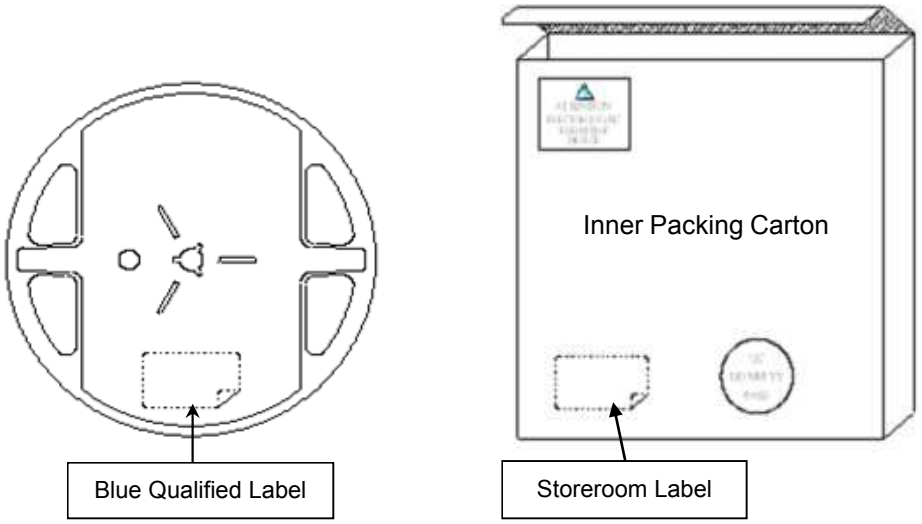


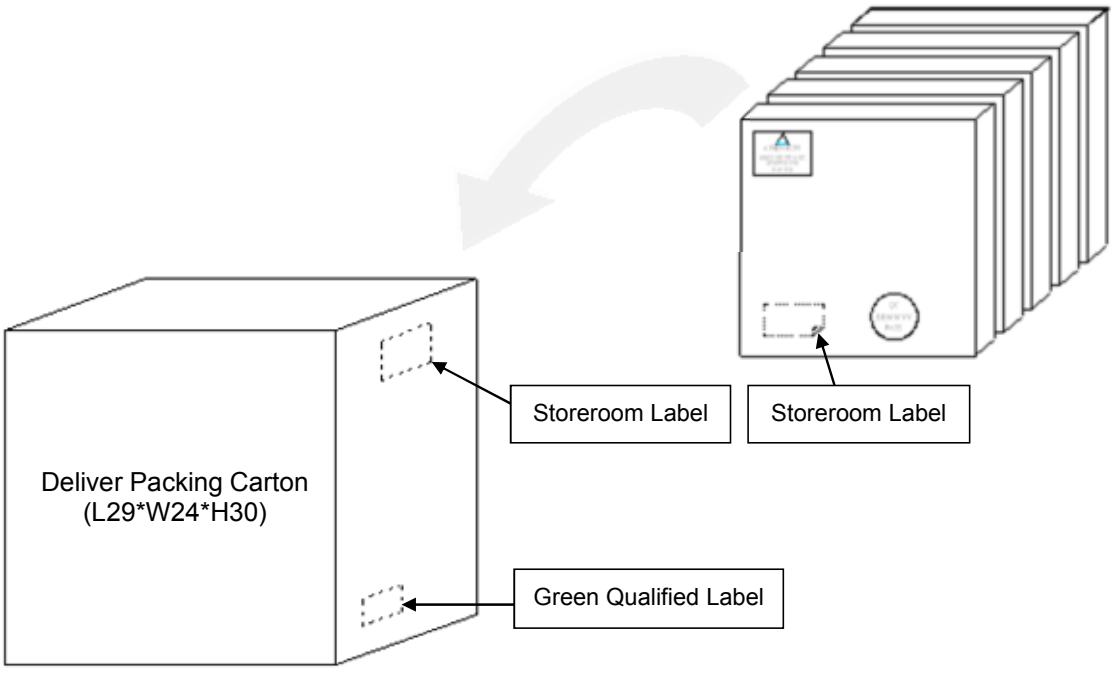


1. 230mm minimum leafer which consist of carrier and/or tape followed by a minimum of 160mm of empty carrier tape sealed with cover tape.
2. 160mm minimum trailer of empty carrier tape sealed with cover tape.

PACKING


Begin
Start
End
1000pcs-Product Tape


Inner Packing Carton
Blue Qualified Label
Storeroom Label


Deliver Packing Carton
(L29*W24*H30)
Storeroom Label
Storeroom Label
Green Qualified Label