



A Product Line of  
Diodes Incorporated



## SPECIFICATION FOR APPROVAL

CUSTOMER \_\_\_\_\_

NOMINAL FREQUENCY \_\_\_\_\_

25.000000 MHz

PRODUCT TYPE \_\_\_\_\_

TYPE FD 5.0x3.2 SEAM SEALED CRYSTAL CLOCK OSCILLATOR

SPEC. NO. ( P/N ) \_\_\_\_\_

FD2500121

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

ISSUE DATE \_\_\_\_\_

January 30, 2019

VERSION \_\_\_\_\_

B

APPROVED	PREPARED	QA
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### Diodes Incorporated

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\*Pb-free

\*RoHS Compliant

\*HF-Halogen Free

\*REACH Compliant

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

FD2500121

VER. B 30-Jan-19

## VERSION HISTORY



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

**FD2500121**

VER. B 30-Jan-19

## ELECTRICAL SPECIFICATIONS

SRe Part Number : **FD2500121**

Item	Symbol	Specifications	Units	Notes
Nominal Frequency	F <sub>0</sub>	25.000000	MHz	
Frequency Stability	F <sub>T</sub>	±25	ppm	**See note
Operating Temperature Range	T <sub>R</sub>	-40 to +85	°C	
Supply Voltage	V <sub>DD</sub>	+3.3 ± 5.0%	V	
Logic Type	L <sub>T</sub>	LVCMS		
Supply Current, Output Enabled	I <sub>DD/OE</sub>	15	mA	Max.
Supply Current, Output Disabled	I <sub>DD/OD</sub>	10	μA	Max.
Duty Cycle (Symmetry)	D <sub>C/SY</sub>	45 / 55	%	Measured 50% of Waveform
Rise / Fall Time	T <sub>R/T<sub>F</sub></sub>	4.5	ns	Max. measured 20/80% of Waveform
Output Voltage "0" Level	V <sub>OL</sub>	10% V <sub>DD</sub>	V	Max.
Output Voltage "1" Level	V <sub>OH</sub>	90% V <sub>DD</sub>	V	Min.
Output Load	C <sub>L</sub>	30	pF	Max
Jitter, Phase	RMS	1	ps	Max. 12KHz ~ 20MHz Frequency Band
Jitter, Accumulated	RMS(1-σ)	5	ps	Max. 20,000 Consecutive Periods
Jitter, Peak to Peak	P <sub>k</sub> -P <sub>k</sub>	50	ps	Max. 100,000 Random Periods
Start Up Time		10	ms	Max.
Output Current		5	mA	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 <sub>DD</sub>			V	Or Open
Input Voltage (Pin1), Output Disable (low power standby)			0.3V <sub>DD</sub>	V	Output is Hi-Z
Internal Pullup Resistance	30			KΩ	
Output Disable Delay			50	ns	
Output Enable Delay			500	us	

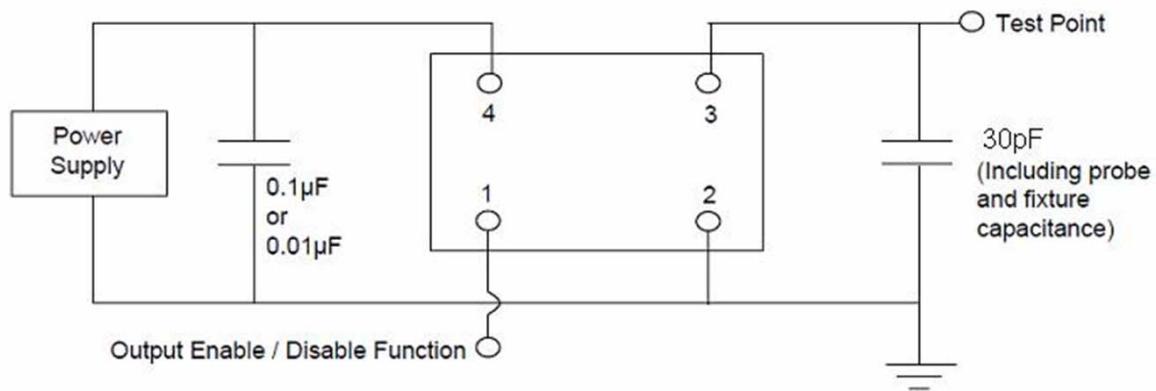


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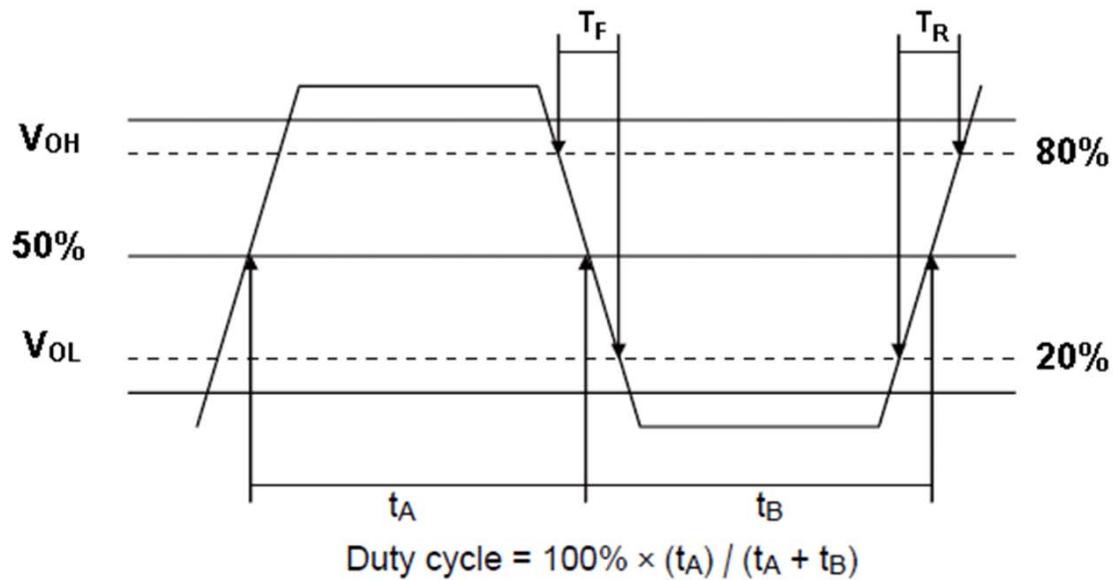
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## TEST CIRCUIT



## OUTPUT WAVEFORM



**DIODES**  
INCORPORATED

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## RELIABILITY SPECIFICATIONS

### ENVIRONMENTAL:

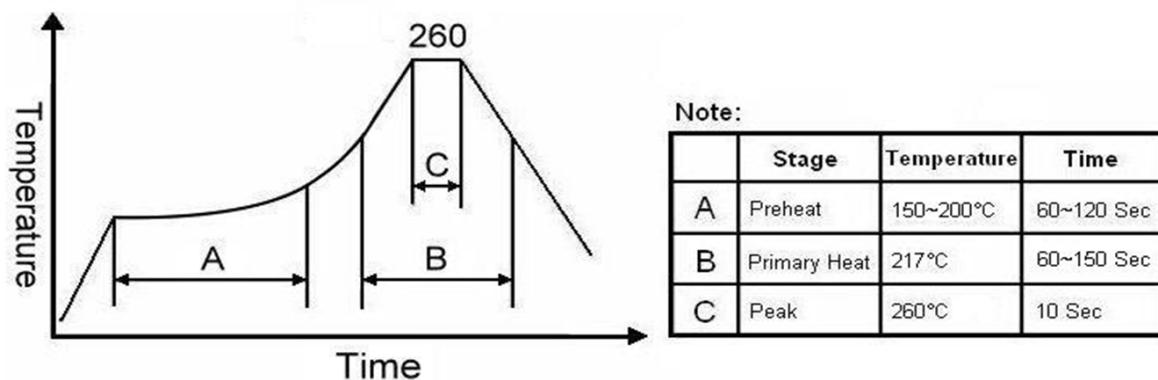
- a) THERMAL SHOCK: MIL-STD-883, Method 1011, Condition A
- b) MOISTURE RESISTANCE: MIL-STD-883, Method 1004
- c) VIBRATION: MIL-STD-883, Method 2007, Condition A
- d) RESISTANCE TO SOLDERING HEAT: J-STD-020D Table 5-2 Pb-free devices  
(except 2 cycles max)
- e) HAZARDOUS SUBSTANCE: Pb - free and RoHS 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,  $R1=2\times10^{-8}$  atm cc/s
- f) SOLVENT RESISTANCE: MIL-STD-202, Method 215

## SUGGESTED IR REFLOW PROFILE

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



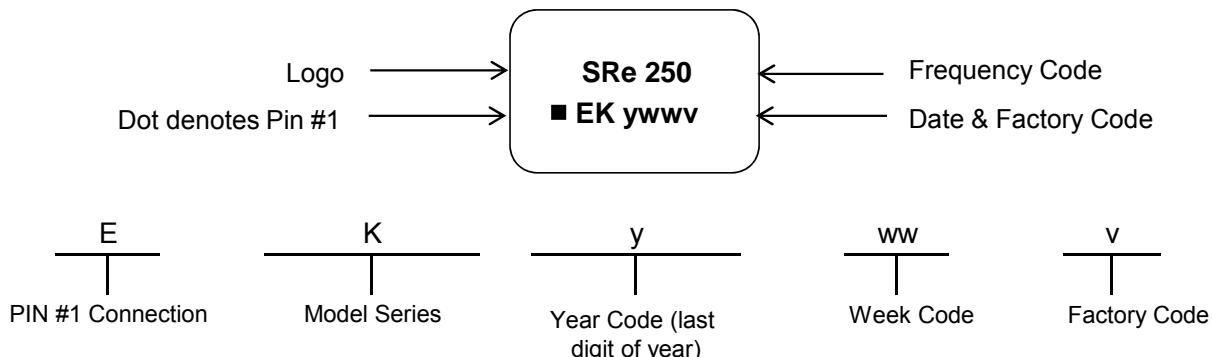
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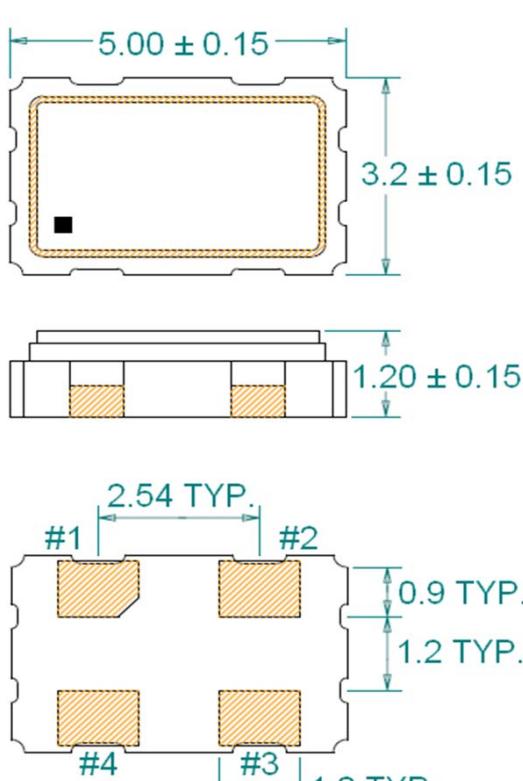
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## MARKING

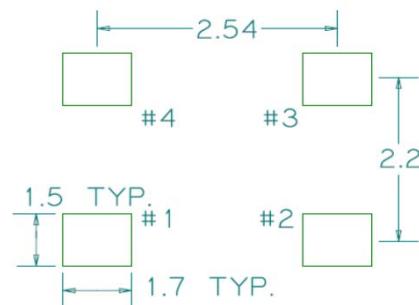


## MECHANICAL DRAWINGS ( Scale: None. Dimensions are in mm.)



(Bottom View)

### 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 <sub>DD</sub>

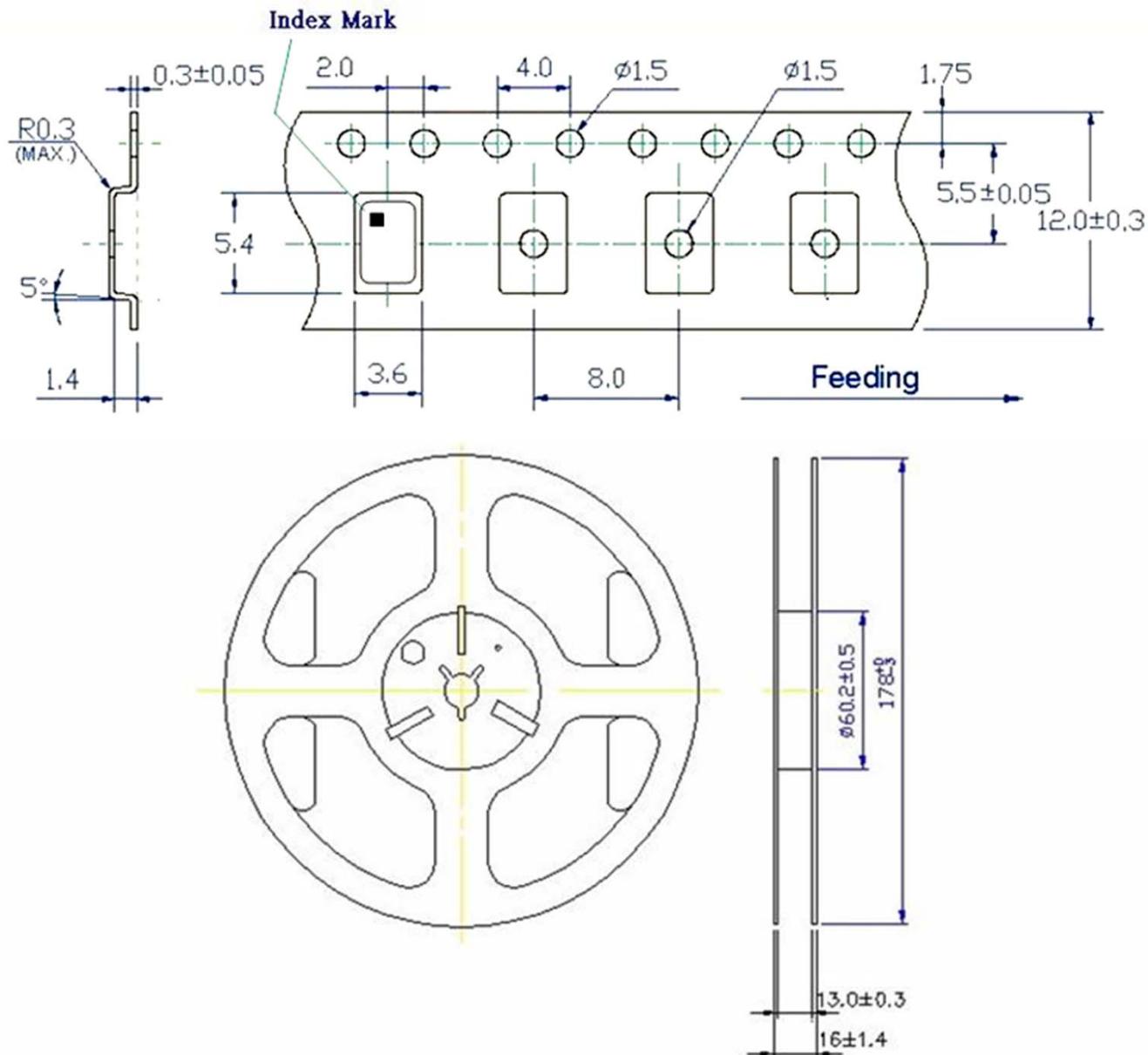
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## Tape & Reel



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.

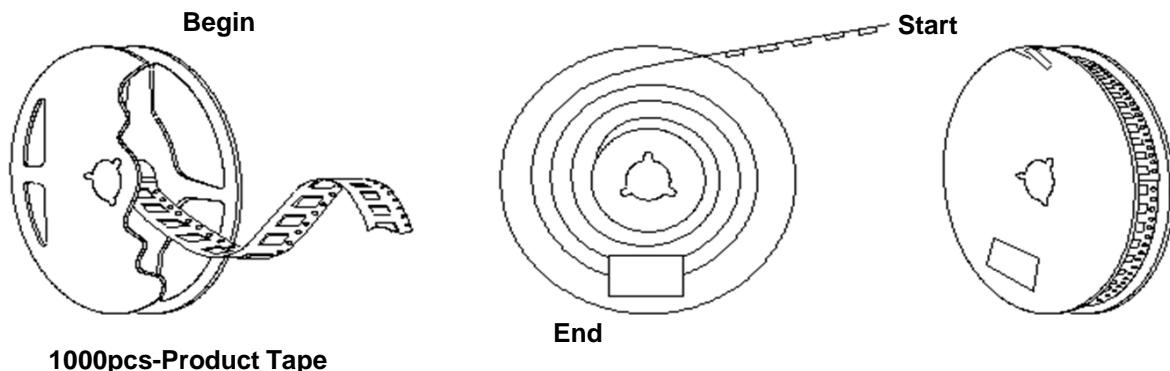
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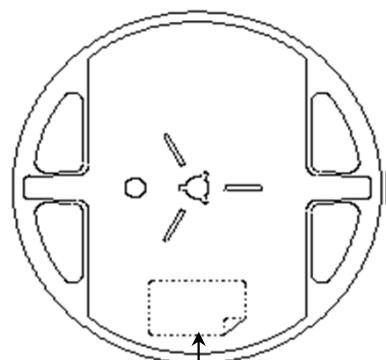
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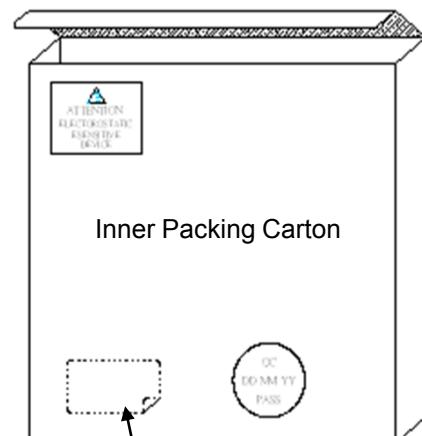
## PACKING



1000pcs-Product Tape

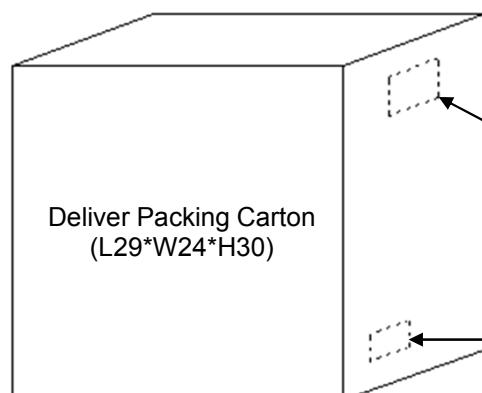
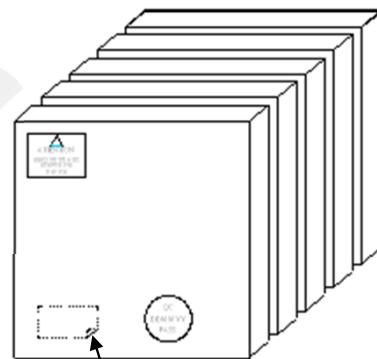


Blue Qualified Label



Inner Packing Carton

Storeroom Label



Deliver Packing Carton  
(L29\*W24\*H30)

Storeroom Label

Storeroom Label

Green Qualified Label

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