



A Product Line of  
Diodes Incorporated



# SPECIFICATION FOR APPROVAL

CUSTOMER \_\_\_\_\_

NOMINAL FREQUENCY 50.000000 MHz




PRODUCT TYPE TYPE PB 7.0 x 5.0 SEAM SEALED CRYSTAL CLOCK OSCILLATOR

SPEC. NO. ( P/N ) PB5000010

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

ISSUE DATE July 27, 2018

VERSION B

| APPROVED  | PREPARED  | QA  |
|---|---|---|
|  |  |  |

## Diodes Incorporated

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



# TYPE PB 7.0 x 5.0 SEAM SEALED CRYSTAL CLOCK OSCILLATOR

**PB5000010**

VER. B 27-Jul-18

## ELECTRICAL SPECIFICATIONS

**SRe Part Number : PB5000010**

| Item                            | Symbol                         | Specifications             | Units | Notes                                  |
|---------------------------------|--------------------------------|----------------------------|-------|--|
| Nominal Frequency               | F <sub>0</sub>                 | 50.000000                  | MHz   |  |
| Frequency Stability             | FT                             | ± 50                       | 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                             | LVPECL                     |       |  |
| Supply Current, Output Enabled  | I <sub>CC/OE</sub>             | 80                         | mA    | Max.                                   |
| Supply Current, Output Disabled | I <sub>CC/OD</sub>             | 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>                | V <sub>CC</sub> -1.620V    | V     | Max.                                   |
| Output Voltage "1" Level        | V <sub>OH</sub>                | V <sub>CC</sub> -1.025V    | V     | Min.                                   |
| Output Load                     |                                | 50Ω to V <sub>CC</sub> -2V |       |  |
| Jitter, Phase                   | RMS                            | 0.5 / 1                    | ps    | Typ./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    |                |

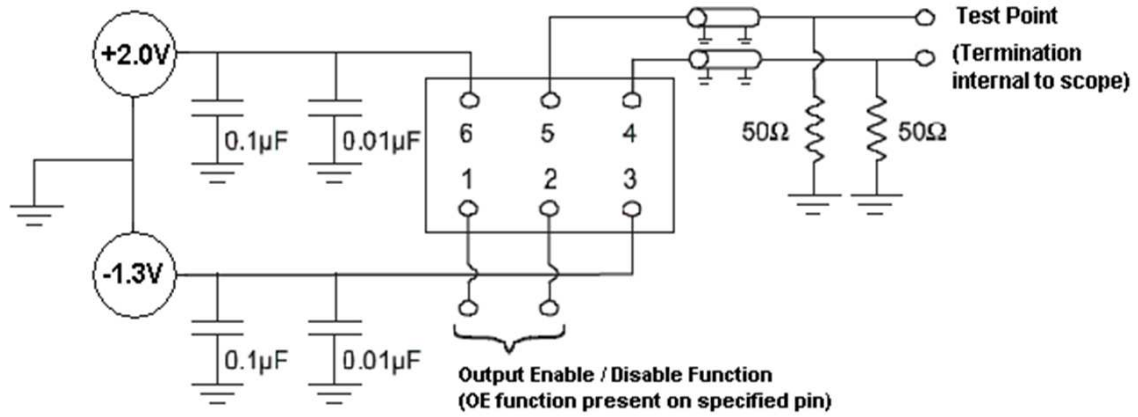


# TYPE PB 7.0 x 5.0 SEAM SEALED CRYSTAL CLOCK OSCILLATOR

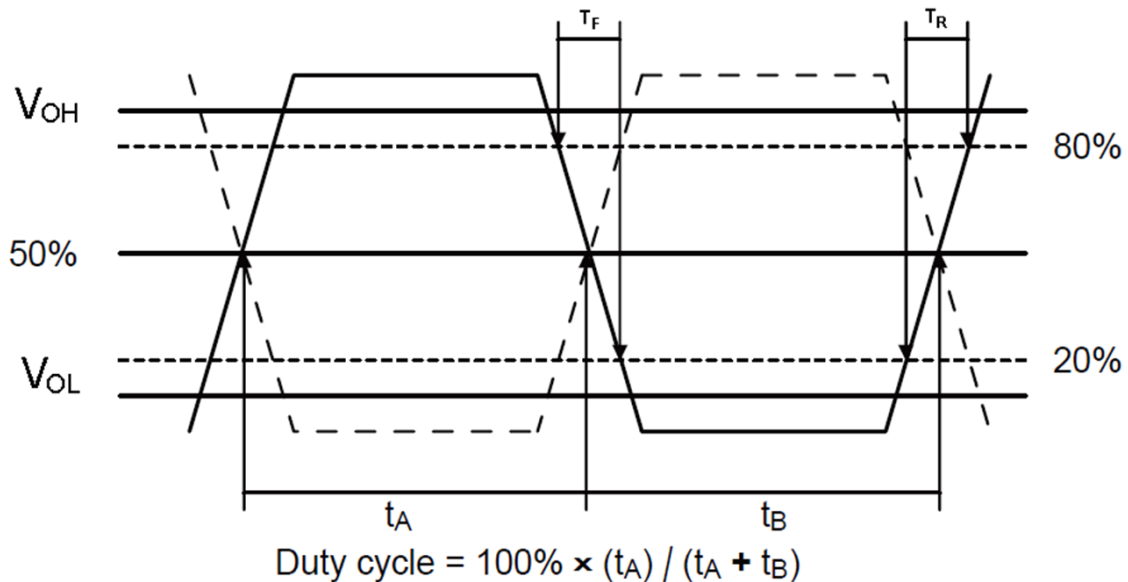
**PB5000010**

VER. B 27-Jul-18

## TEST CIRCUIT



## OUTPUT WAVEFORM



### RELIABILITY SPECIFICATIONS

#### ENVIRONMENTAL:

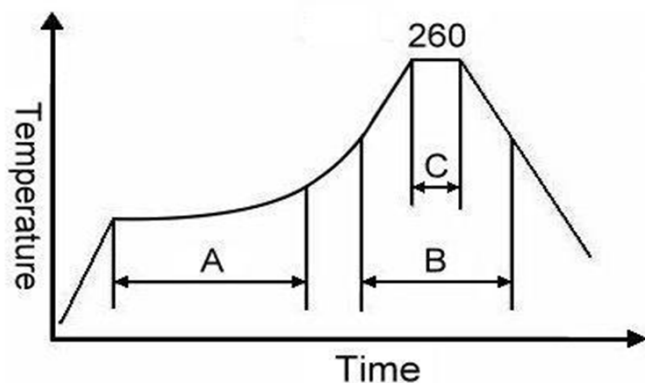
- a) THERMAL SHOCK: MIL-STD-883, Method 1011, Condition A
- b) MOISTURE RESISTANCE: MIL-STD-883, Method 1004
- c) VIBRATION: MIL-STD-883, Method 2007, Condition A
- d) RESISTANCE TO SOLDERING HEAT: J-STD-020D Table 5-2 Pb-free devices (except 2 cycles max)
- e) HAZARDOUS SUBSTANCE: Pb - free and RoHS/Green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



Note:

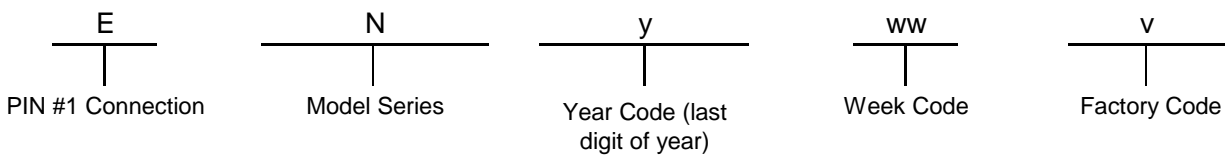
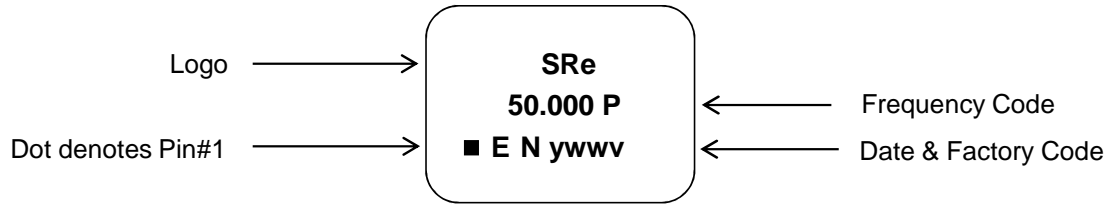
|   | Stage        | Temperature | Time       |
|---|--------------|-------------|------------|
| A | Preheat      | 150~200°C   | 60~120 Sec |
| B | Primary Heat | 217°C       | 60~150 Sec |
| C | Peak         | 260°C       | 10 Sec     |

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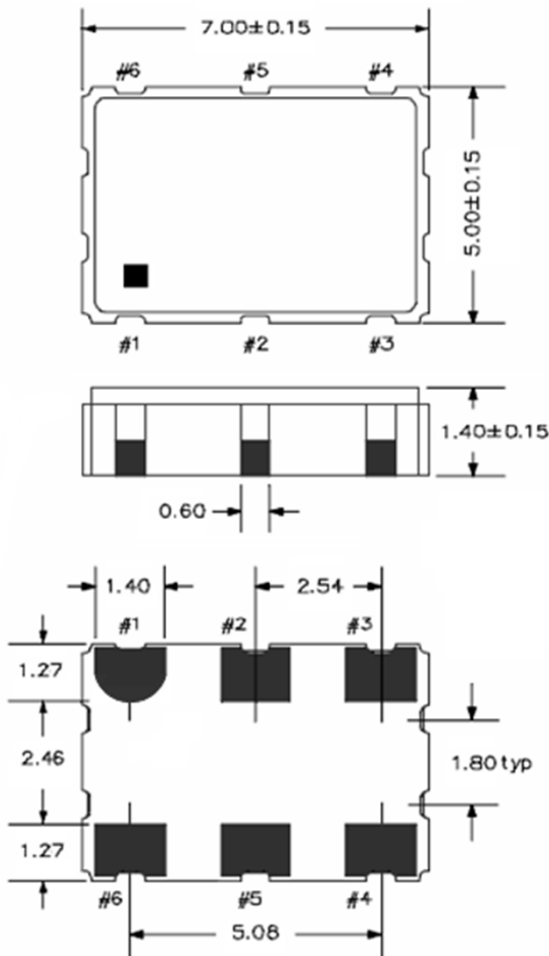
**PB5000010**

VER. B 27-Jul-18

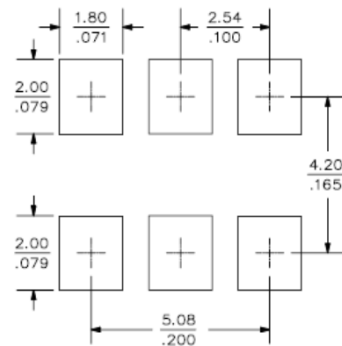
## MARKING



## 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.

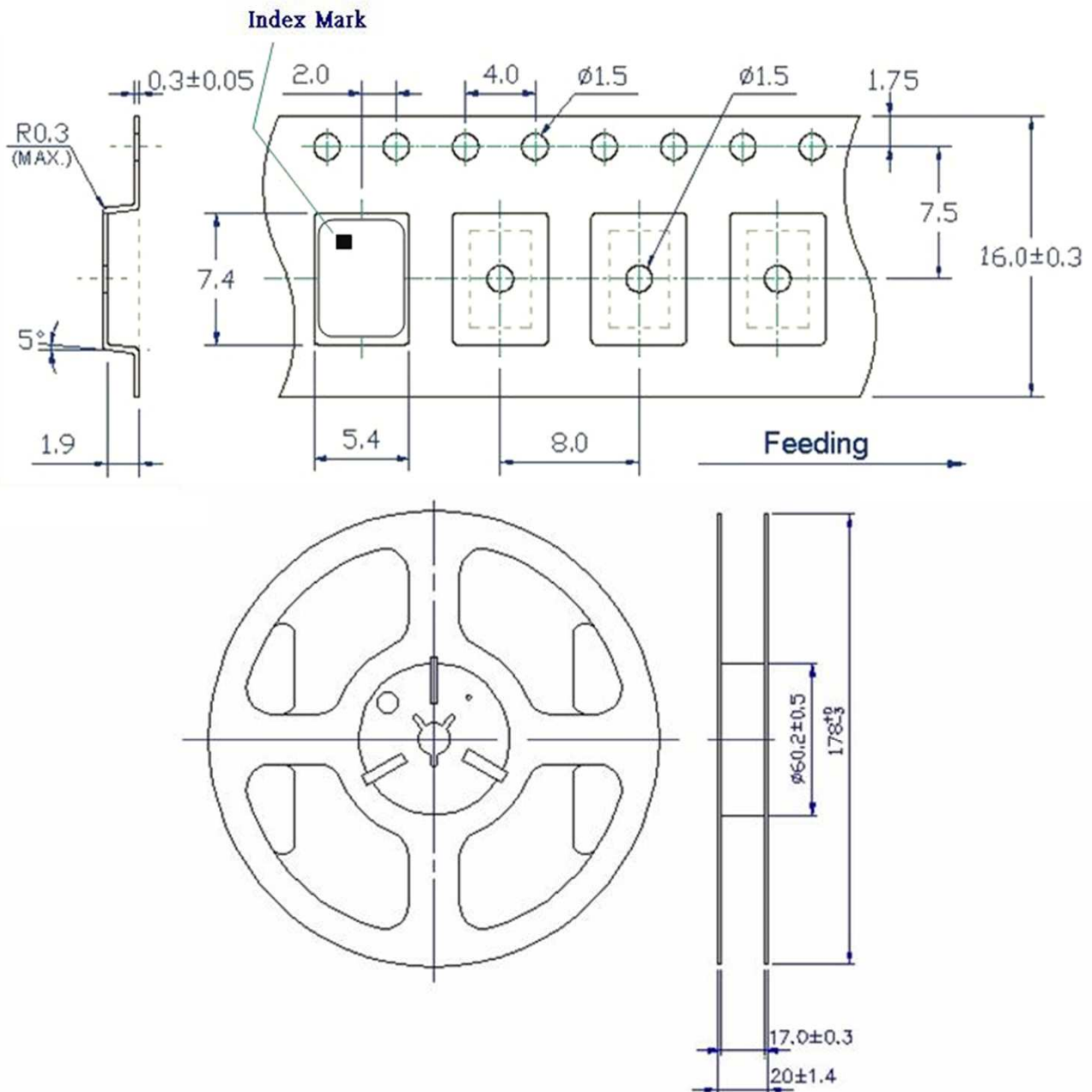
| Pin | Function        |
|-----|-----------------|
| 1   | OE              |
| 2   | NC              |
| 3   | V <sub>EE</sub> |
| 4   | OUTPUT          |
| 5   | OUTPUT N        |
| 6   | V <sub>CC</sub> |

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**PB5000010**

VER. B 27-Jul-18

## 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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VER. B 27-Jul-18

## PACKING

