



A Product Line of
Diodes Incorporated



SPECIFICATION FOR APPROVAL

| | |
|-------------------|--|
| CUSTOMER | _____ |
| NOMINAL FREQUENCY | 125.000000 MHz |
| HOLDER TYPE | TYPE HX 3.2x2.5 SEAM SEALED CRYSTAL CLOCK OSCILLATOR |
| SPEC. NO. (P/N) | HX31C5018Q |
| CUSTOMER P/N | _____ |
| ISSUE DATE | July 3, 2018 |
| VERSION | A |

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

Diodes Incorporated

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
<https://www.diodes.com>

- *Pb-free
- *RoHS Compliant
- *HF-Halogen Free
- *REACH Compliant
- *AEC-Q200 Compliant

TYPE HX 3.2x2.5 SEAM SEALED CRYSTAL CLOCK OSCILLATOR

HX31C5018Q

VER. A 3-Jul-18

VERSION HISTORY

| Version No. | Version Date | Description | Notes |
|-------------|--------------|-----------------|-------|
| A | Jul.3,2018 | Initial Release | |
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ELECTRICAL SPECIFICATIONS

SRe Part Number : HX31C5018Q

| Item | Symbol | Specifications | Units | Notes |
|---------------------------------|--------------------------------|---------------------|-------|--------------------------------------|
| Nominal Frequency | F ₀ | 125.000000 | MHz | |
| Frequency Stability | FT | ± 50 | ppm | **See note |
| Operating Temperature Range | TR | -40 to +105 | °C | |
| Supply Voltage | V _{DD} | +2.5 ± 5.0% | V | |
| Logic Type | LT | LVC MOS | | |
| 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 | 40 / 60 | % | Measured 50% of Waveform |
| Rise / Fall Time | T _R /T _F | 2.5 | ns | Max. measured 20/80% of Waveform |
| Output Voltage "0" Level | V _{OL} | 10% V _{DD} | V | Max at I _{OL} = 4.0mA Min. |
| Output Voltage "1" Level | V _{OH} | 90% V _{DD} | V | Min at I _{OH} = -4.0mA Max. |
| Output Load | CL | 15 | pF | Max. |
| Jitter, Phase | RMS | 1 | ps | Max. 12KHz ~ 20MHz Frequency Band |
| Jitter, Accumulated | RMS(1-σ) | 3 | ps | Typ. 20,000 Consecutive Periods |
| Jitter, Peak to Peak | Pk-Pk | 30 | 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 | | | 200 | ns | |

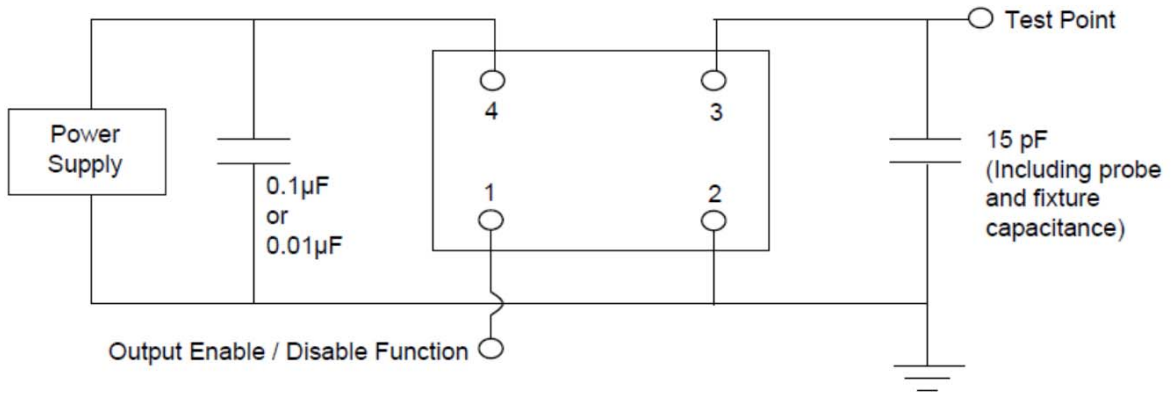


TYPE HX 3.2x2.5 SEAM SEALED CRYSTAL CLOCK OSCILLATOR

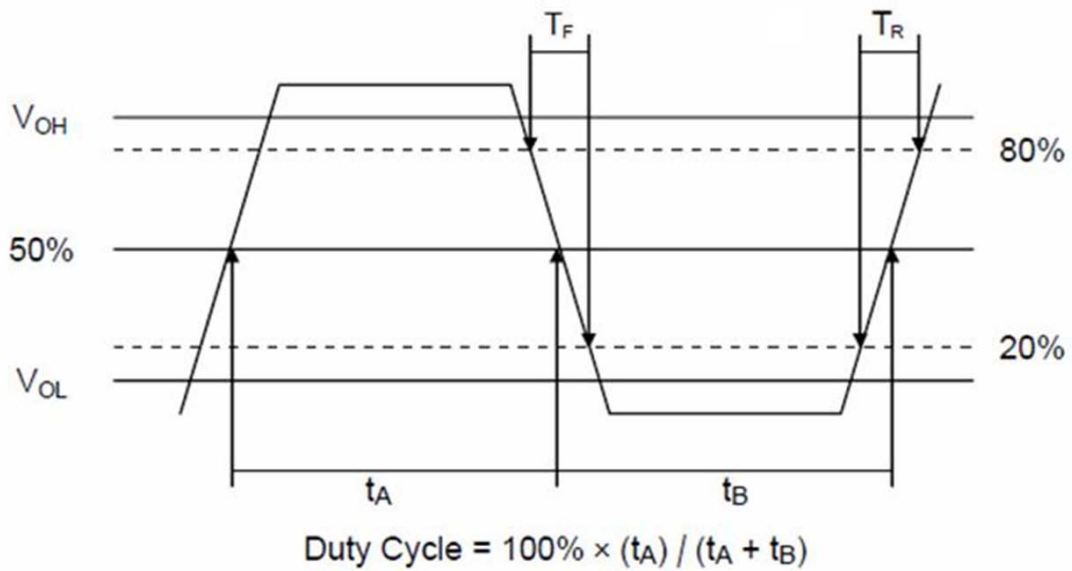
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TEST CIRCUIT



OUTPUT WAVEFORM



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AEC-Q200 RELIABILITY TEST SPECIFICATIONS:

1. Initial

- 1.1 Physical Dimensions: JESD22, Method JB1-100
- 1.2 External Visual: MIL-STD-883, Method 2009
- 1.3 Freq. Vs. Temperature: Per Specification/Datasheet

2. Mechanical

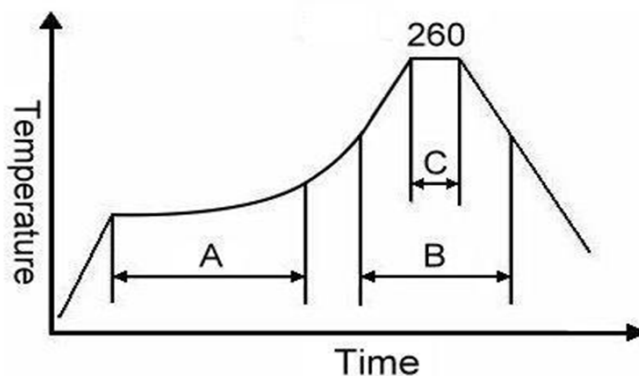
- 2.1 Mechanical Shock: MIL-STD-202 Method 213
- 2.2 Vibration: MIL-STD-202 Method 204
- 2.3 Solderability: J-STD-002
- 2.4 Board Flex: AEC Q200-005
- 2.5 Terminal Strength (SMD): AEC Q200-006

3.Environmental

- 3.1 Temp Cycle: JESD22, Method JA-104
- 3.2 Resistance to Solder Heat: MIL-STD-202 Method 210
- 3.3 High Temperature Operating Life: MIL-STD-202, Method 108
- 3.4 High Temp Exposure: MIL-STD-202, Method 108
- 3.5 High Temp & High Humidity: MIL-STD-202, Method 103
- 3.6 Thermal Shock: MIL-STD-202, Method 107

SUGGESTED IR REFLOW PROFILE

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



Note:

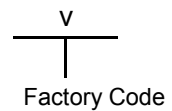
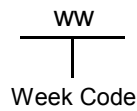
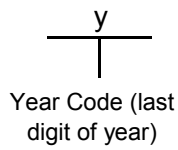
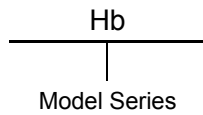
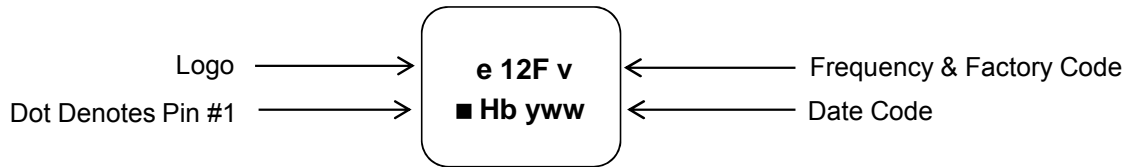
| | Stage | Temperature | Time |
|---|--------------|-------------|------------|
| A | Preheat | 150~200°C | 60~120 Sec |
| B | Primary Heat | 217°C | 60~150 Sec |
| C | Peak | 260°C | 10 Sec |

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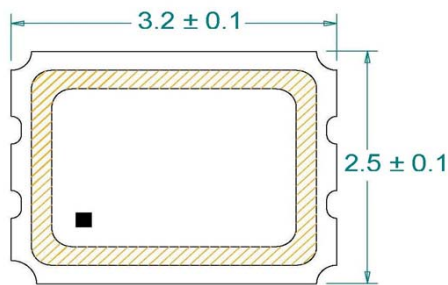
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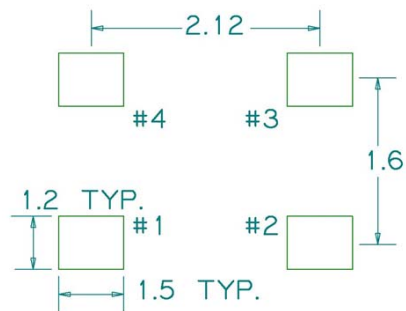
MARKING



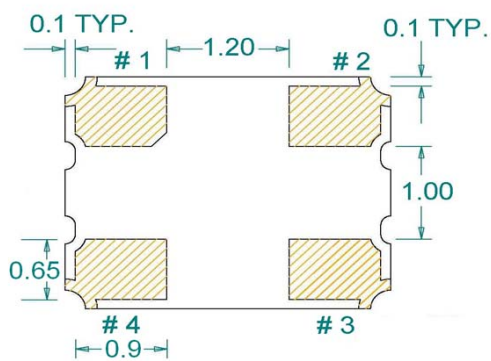
MECHANICAL DRAWINGS (Scale: None. Dimensions are in mm.)



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.



(Bottom View)

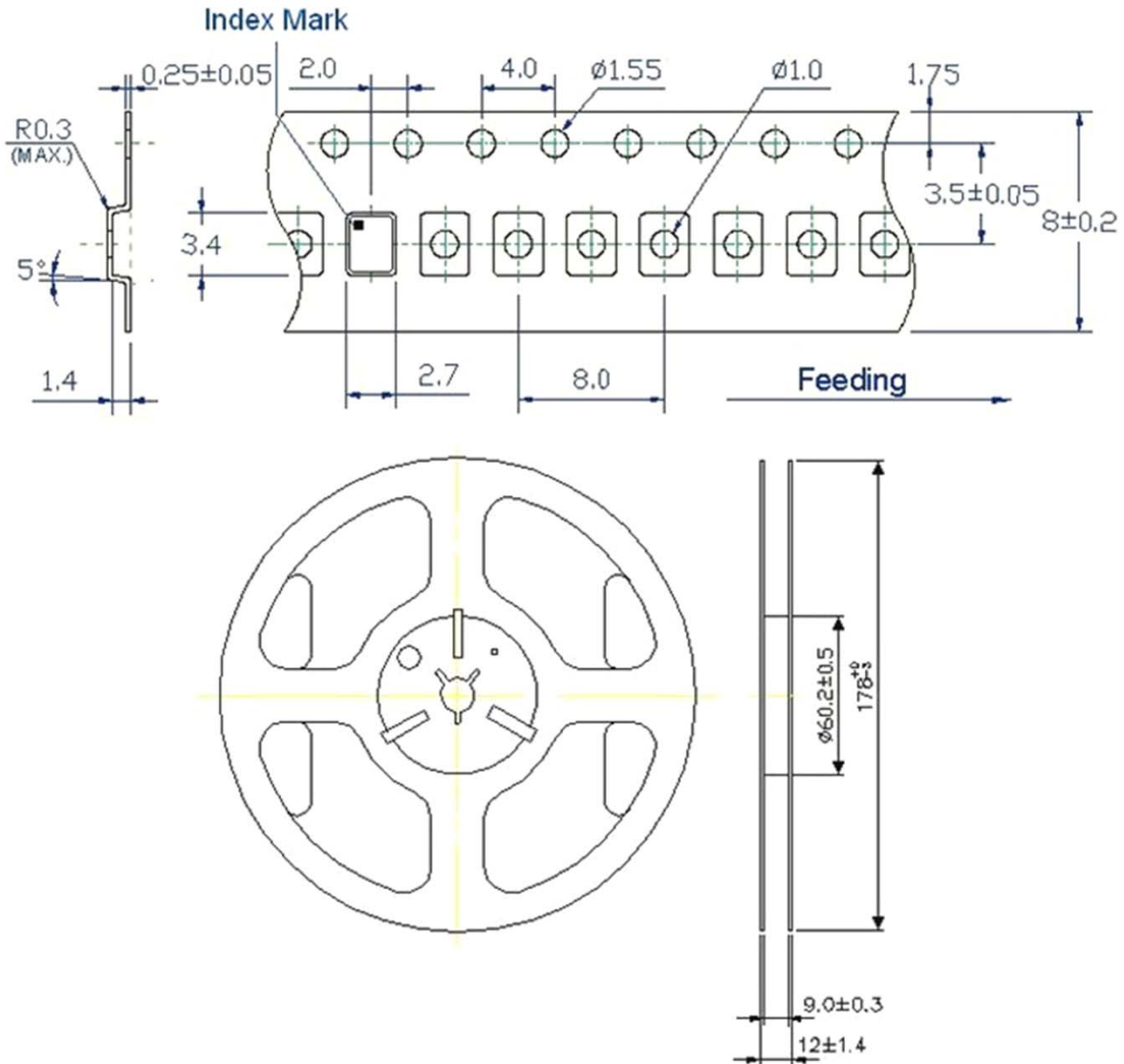
| Pin | Function |
|-----|-----------------|
| 1 | OE |
| 2 | Ground |
| 3 | Clock Output |
| 4 | V _{DD} |

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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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PACKING

