



A Product Line of
Diodes Incorporated



SPECIFICATION FOR APPROVAL

CUSTOMER _____

NOMINAL FREQUENCY 16.000000 MHz

PRODUCT TYPE TYPE FL 3.2x2.5 SEAM SEALED CRYSTAL

SPEC. NO. (P/N) FL1600168Q

CUSTOMER P/N _____

ISSUE DATE July 10, 2018

VERSION B

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

Diodes Incorporated

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

TYPE FL 3.2x2.5 SEAM SEALED CRYSTAL

FL1600168Q

VER. B 10-Jul-18

VERSION HISTORY

| Version No. | Version Date | Description | Notes |
|-------------|--------------|-----------------|-------|
| A | May.12,2017 | Initial Release | |
| B | Jul.10,2018 | Updated logo | |
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ELECTRICAL SPECIFICATIONS

| Item | Symbol | Specifications | Units | Notes |
|--|--------|--------------------|-------|------------------------------------|
| Nominal Frequency | Fn | 16.000000 | MHz | |
| Mode of Oscillation | MO | AT Cut-Fundamental | | |
| Calibration Load Capacitance | CL | 8 | pF | |
| Calibration Tolerance | FL | ±50 | ppm | at 25°C±3°C |
| Operating Temperature Range | TR | -40 to +125 | °C | |
| Frequency Stability (Frequency Deviation over the Operating Temperature Range) | F/T | ±150 | ppm | Reference to the Frequency at 25°C |
| Operating Drive Level | | 10 | μW | |
| Maximum Drive Level | | 500 | μW | |
| Equivalent Series Resistance | ESR | 120 | Ω | Max |
| Shunt Capacitance | C0 | 1.1 | pF | Max |
| Aging at 25°C | | ±20 | ppm | Max, 10 years |
| Storage Temperature | | -55 to +125 | °C | |
| Insulation Resistance | | 500 | MΩ | Min |

※ 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).

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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

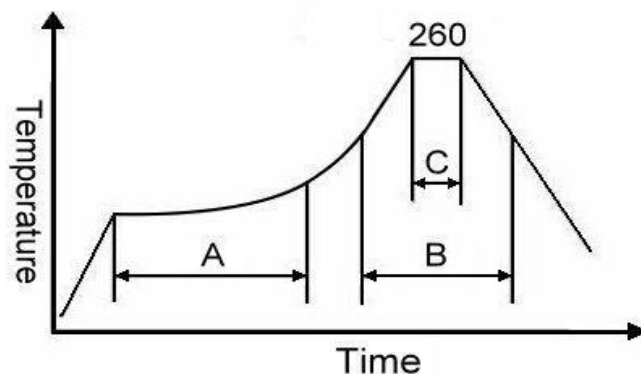
- 2.1 Mechanical Shock: MIL-STD-202 Method 213
- 2.2 Vibration: MIL-STD-202 Method 204
- 2.3 Solderability: J-STD-002
- 2.4 Board Flex: AEC Q200-005
- 2.5 Terminal Strength (SMD): AEC Q200-006

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:

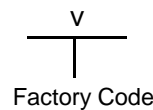
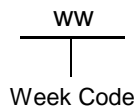
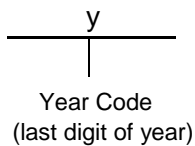
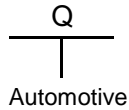
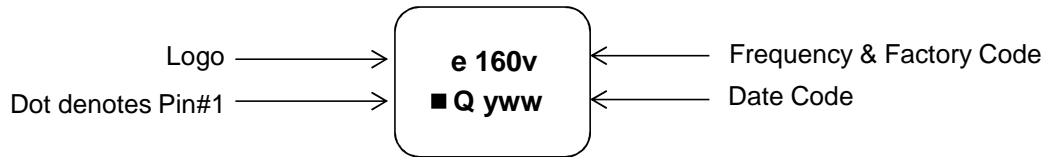
| | Stage | Temperature | Time |
|---|--------------|-------------|------------|
| A | Preheat | 150~200°C | 60~120 Sec |
| B | Primary Heat | 217°C | 60~150 Sec |
| C | Peak | 260°C | 10 Sec |

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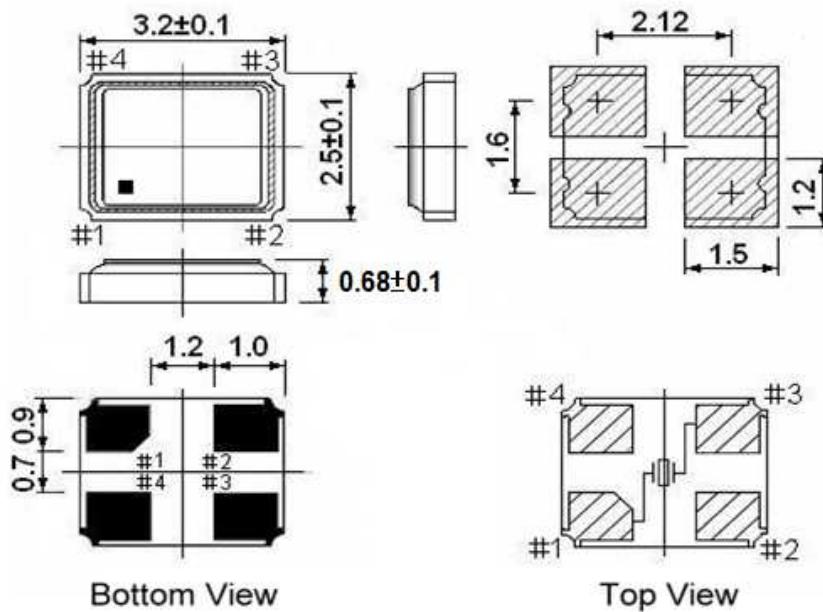
VER. B 10-Jul-18

MARKING



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

Recommended Land Pattern



** Recommended - Pin 1 & 3 : CRYSTAL
Pin 2 & 4 : GND

Notes:

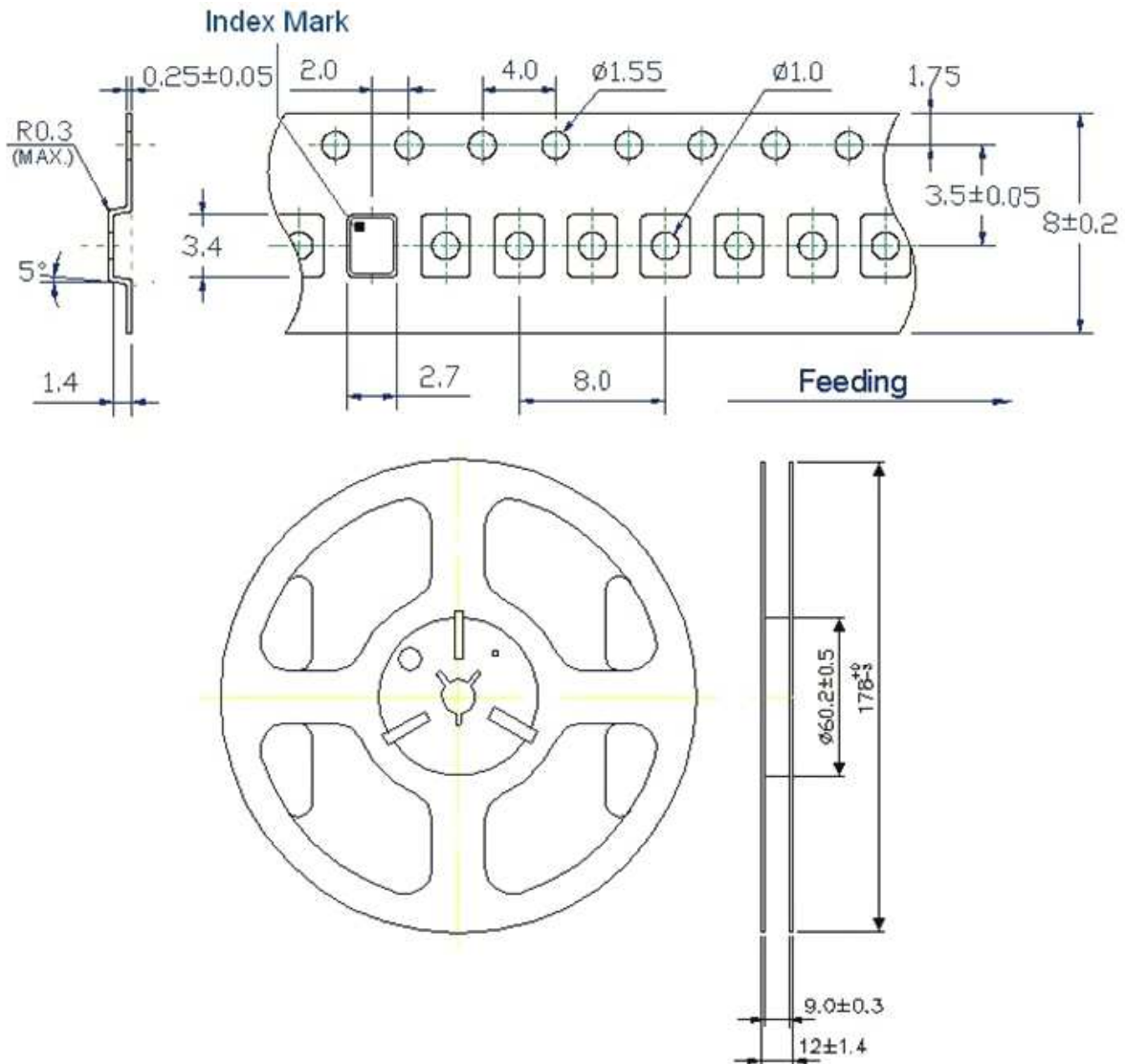
1. Package drawings are for reference only, and the appearances of objects may vary.
Actual packages are based on the real product.
2. The marking dot denotes Pin#1.
3. The position and shape of the chamfer pin may vary and are based on the real product.

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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

