



A Product Line of
Diodes Incorporated



SPECIFICATION FOR APPROVAL

CUSTOMER _____

NOMINAL FREQUENCY 12.000000 MHz

PRODUCT TYPE **TYPE FL 3.2x2.5 SEAM SEALED CRYSTAL**

SPEC. NO. (P/N) FL1200083

CUSTOMER P/N _____

ISSUE DATE December 21, 2017

VERSION D

| APPROVED | PREPARED | QA |
|---------------|--------------|------------------|
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Diodes Incorporated

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

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ELECTRICAL SPECIFICATIONS

| Item | Symbol | Specifications | Units | Notes |
|--|--------|--------------------|-------|------------------------------------|
| Nominal Frequency | Fn | 12.000000 | MHz | |
| Mode of Oscillation | MO | AT Cut-Fundamental | | |
| Calibration Load Capacitance | CL | 9 | pF | |
| Calibration Tolerance | FL | ±20 | ppm | at 25°C±3°C |
| Operating Temperature Range | TR | -20 to +70 | °C | |
| Frequency Stability (Frequency Deviation over the Operating Temperature Range) | F/T | ±20 | ppm | Reference to the Frequency at 25°C |
| Operating Drive Level | | 10 | μW | |
| Maximum Drive Level | | 100 | μW | |
| Equivalent Series Resistance | ESR | 100 | Ω | Max |
| Shunt Capacitance | C0 | 5 | pF | Max |
| Aging at 25°C | | ±5 | ppm | Max, 1st year |
| 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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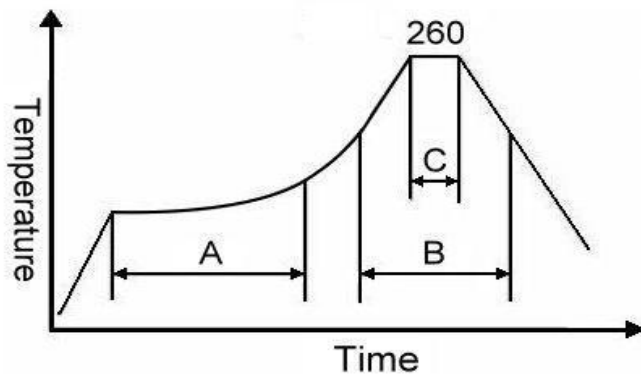
RELIABILITY SPECIFICATIONS

MECHANICAL AND ENVIRONMENTAL RATINGS:

- a) FINE LEAK TEST: JESD22-A109 (Condition 1A)
- b) GROSS LEAK TEST: JESD22-A109 (Condition C)
- c) MOISTURE RESISTANCE: JESD22-A113
- d) SHOCK: JESD22-B104 (Condition B)
- e) SOLDERABILITY : (RoHS version): J-STD-002
- f) VIBRATION: JESD22-B103
- g) SOLVENT RESISTANCE: JESD22-B107
- h) RESISTANCE TO SOLDERING HEAT (RoHS version): J-STD-020D Table 5.2 Pb free devices (3 cycles max)

SUGGESTED IR REFLOW PROFILE

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



Note:

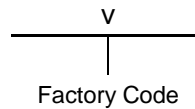
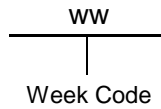
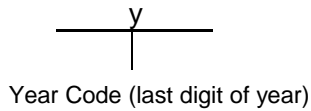
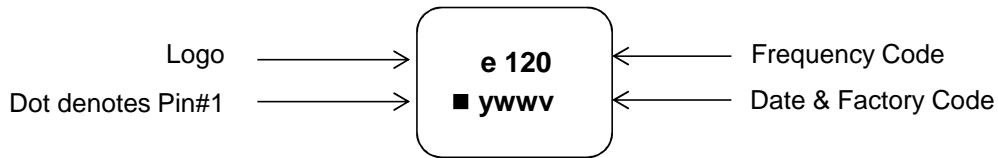
| | Stage | Temperature | Time |
|---|--------------|-------------|------------|
| A | Preheat | 150~200°C | 60~120 Sec |
| B | Primary Heat | 217°C | 60~150 Sec |
| C | Peak | 260°C | 10 Sec |

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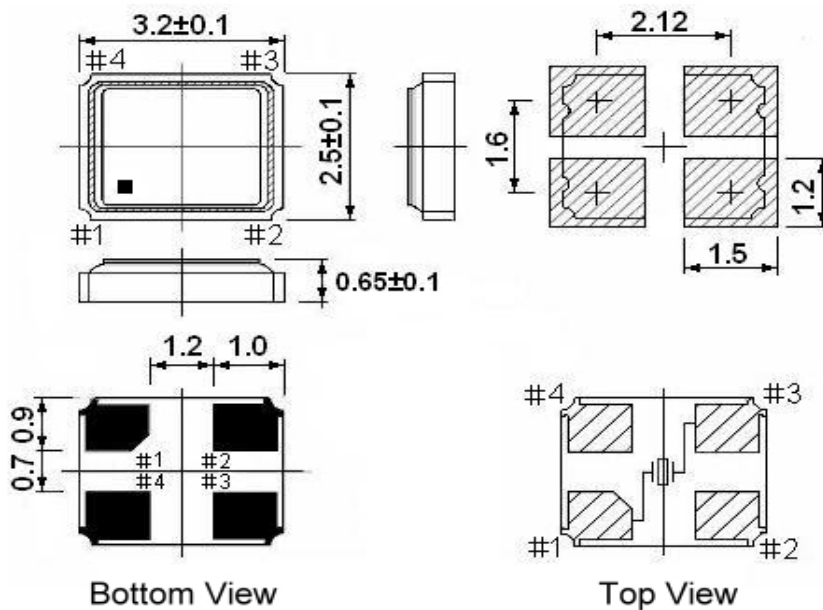
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MARKING



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

Recommended Land Pattern



** 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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PACKING

