






A Product Line of
Diodes Incorporated



SPECIFICATION FOR APPROVAL

| | |
|-------------------|--|
| CUSTOMER | |
| NOMINAL FREQUENCY | 24.000000 MHz |
| PRODUCT TYPE | TYPE FL 3.2x2.5 SEAM SEALED CRYSTAL |
| PART NUMBER | FL2400136 |
| CUSTOMER P/N | |
| ISSUE DATE | February 1, 2018 |
| VERSION | B |

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

Diodes Incorporated

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

TYPE FL 3.2x2.5 SEAM SEALED CRYSTAL

FL2400136

VER.B 01-FEB-18

VERSION HISTORY

| Version No. | Version Date | Description | Notes |
|-------------|---------------|-----------------|-------|
| A | Sep. 30, 2013 | Initial Release | |
| B | Feb. 1, 2018 | Updated logo | |

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ELECTRICAL SPECIFICATIONS

| Item | Symbol | Specifications | Units | Notes |
|---|--------|--------------------|---------------|------------------------------------|
| Nominal Frequency | Fn | 24.000000 | MHz | |
| Mode of Oscillation | MO | AT Cut-Fundamental | | |
| Calibration Load Capacitance | CL | 18 | pF | |
| Calibration Tolerance | FL | ± 15 | ppm | at 25°C $\pm 3^{\circ}\text{C}$ |
| Operating Temperature Range | TR | 0 to +110 | °C | |
| Frequency Stability(Frequency Deviation over the Operating Temperature Range) | F/T | ± 40 | ppm | Reference to the Frequency at 25°C |
| Operating Drive Level | | 10 | μW | |
| Maximum Drive Level | | 100 | μW | |
| Equivalent Series Resistance | ESR | 60 | 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 | M Ω | 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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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

