



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 |
| SPEC. NO. (P/N) | FL2400271Q |
| CUSTOMER P/N | _____ |
| ISSUE DATE | May 13, 2021 |
| VERSION | A |

| APPROVED | PREPARED | QA |
|----------|----------|------------|
| Brenda | Kelly | Sheng Yang |

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

FL2400271Q

VER. A 13-May-21

VERSION HISTORY

[illegible]

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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 | 12 | pF | |
| Calibration Tolerance | FL | ±10 | 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 | ±50 | ppm | Reference to the Frequency at 25°C |
| Operating Drive Level | | 10 | μW | |
| Maximum Drive Level | | 300 | μW | |
| Equivalent Series Resistance | ESR | 50 | Ω | Max |
| Shunt Capacitance | C0 | 5 | pF | Max |
| Aging at 25°C | | ±3 | 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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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

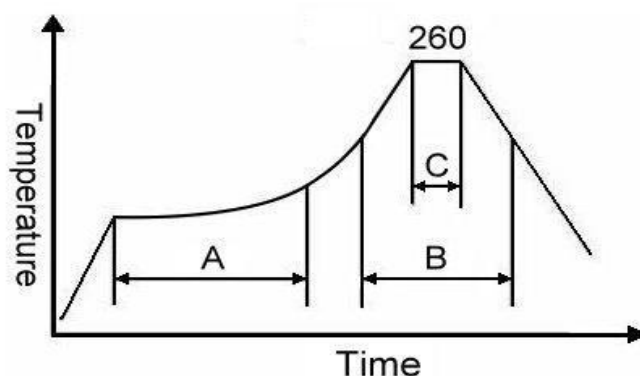
- 2.1 Mechanical Shock: MIL-STD-202 Method 213
- 2.2 Vibration: MIL-STD-202 Method 204
- 2.3 Solderability: J-STD-002
- 2.4 Board Flex: AEC Q200-005

3.Environmental

- 3.1 Temperature 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 Temperature Exposure: MIL-STD-202, Method 108
- 3.5 High Temperature & 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:

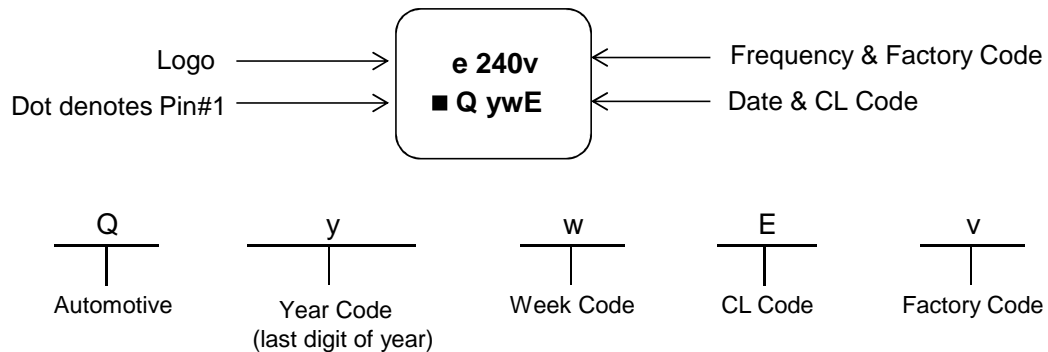
| | Stage | Temperature | Time |
|---|--------------|-------------|------------|
| A | Preheat | 150~200°C | 60~120 Sec |
| B | Primary Heat | 217°C | 60~150 Sec |
| C | Peak | 260°C | 10 Sec |

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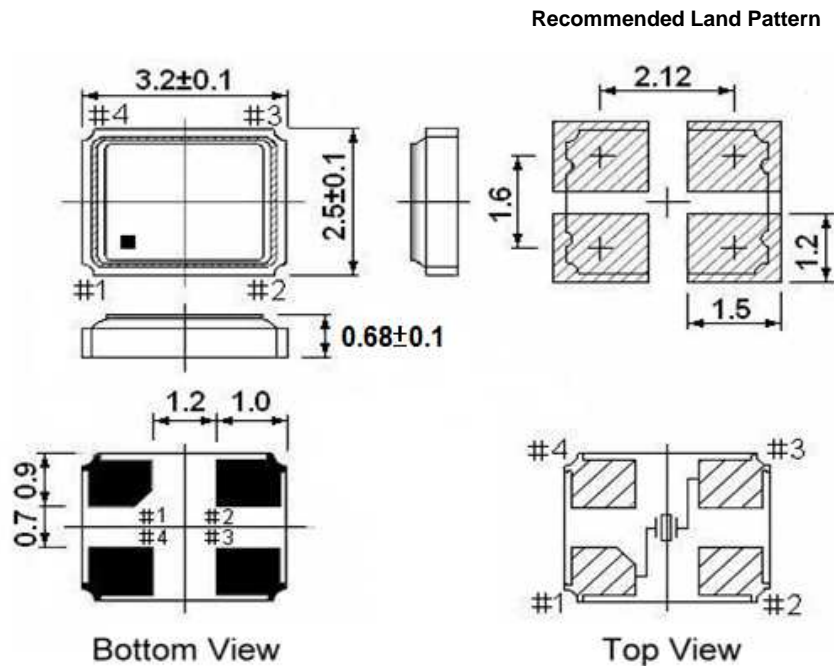
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MARKING



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



**** Recommended - 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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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

