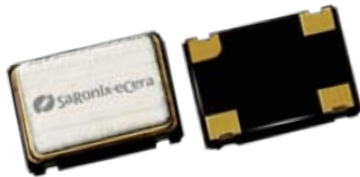


## 2.5V CMOS SSXO

**MD**



5.0 × 3.2mm Ceramic SMD

### Product Features

- Wide Frequency Range – 16MHz to 67MHz
- Flexible modulation rate options
- Center Spread:  $\pm 0.25\%$  to  $\pm 1.15\%$
- Down Spread:  $-0.5\%$  to  $-1.7\%$
- Integrated Phase-locked loop
- Output Enable w/ internal pull-up (default enable)
- 2.5V CMOS Compatible logic levels
- Very low power consumption
- Industry standard 5.0 x 3.2mm ceramic SMD pkg.
- Pb-Free and RoHS/Green compliant

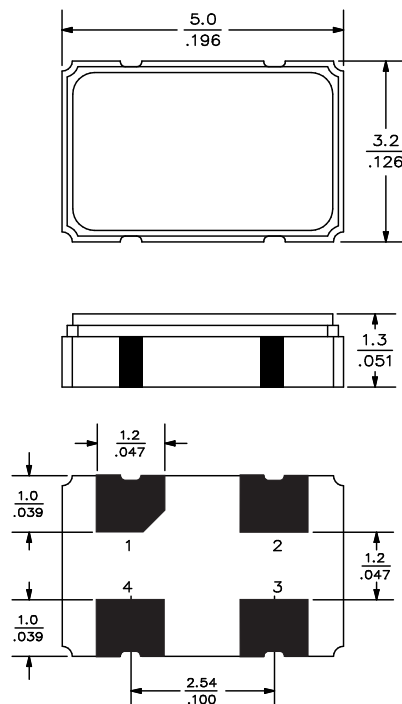
### Product Description

The MD Series is used in digital electronic systems to reduce the Electro-Magnetic Interference (EMI). The device uses proprietary PLL and Spread-Spectrum Clock Generator (SSCG) technology to synthesize from and modulate the frequency of the input crystal. Measured radiated energy at the fundamental and harmonic frequencies are reduced to comply with Electro Magnetic Compliance (EMC) requirement. The internal factory setting function enables flexible selection of output frequency, modulation rate and spread ratios.

### Applications

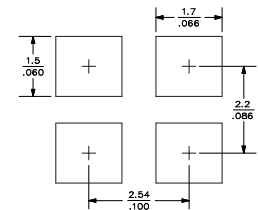
- Multi-function Printers
- Wired and Wireless networking devices
- Media Players
- LCD Panel
- Digital Television
- Video Surveillance

### Package:



Note: All above dimensions in mm

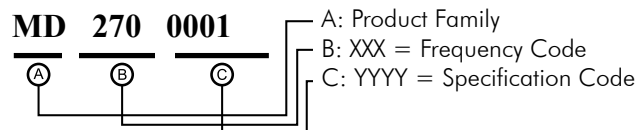
### Recommended Land Pattern:



### Pin Functions:

| Pin | Function        |
|-----|-----------------|
| 1   | OE Function     |
| 2   | Ground          |
| 3   | Clock Output    |
| 4   | V <sub>DD</sub> |

### Part Ordering Information:



Following the above format, Saronix-eCera part numbers will be assigned upon confirmation of exact customer requirements.

### Electrical Performance

| Parameter                      | Min.         | Typ. | Max.                 | Units | Notes                       |
|--------------------------------|--------------|------|----------------------|-------|-----------------------------|
| Output frequency               | 16           |      | 67                   | MHz   | As specified                |
| Supply voltage ( $V_{DD}$ )    | +2.375       | +2.5 | +2.625               | V     |                             |
| Supply current, output enabled |              |      | 6                    | mA    | @27mA                       |
| Frequency stability            |              |      | $\pm 20$ to $\pm 50$ | ppm   | See Note 1 below            |
| Operating temperature          | -20          |      | +70                  | °C    | Commercial (standard)       |
|                                | -40          |      | +85                  |       | Industrial (standard)       |
| Output logic 0, $V_{OL}$       |              |      | 10% $V_{DD}$         | V     |                             |
| Output logic 1, $V_{OH}$       | 90% $V_{DD}$ |      |                      | V     |                             |
| Output load                    |              |      | 15                   | pF    |                             |
| Duty cycle                     | 45           |      | 55                   | %     | Measured 50% $V_{DD}$       |
| Rise and fall time             |              | 1.2  | 2.5                  | ns    | Measured 20/80% of $V_{DD}$ |
| Cycle-to-Cycle jitter          |              | 200  | 300                  | ps    |                             |

#### Notes:

- 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.
- For specifications other than those listed, please contact sales.

### Output Enable / Disable Function

| Parameter   | Min.                | Typ. | Max.                | Units      | Notes          |
|---|---------------------|------|---------------------|------------|----------------|
| Input Voltage (pin 1), Output Enable                      | $0.7 \times V_{DD}$ |      |                     | V          | or open        |
| Input voltage (pin 1), Output Disable (low power standby) |                     |      | $0.3 \times V_{DD}$ | V          | Output is Hi-Z |
| Internal pullup resistance                                | 50                  |      |                     | k $\Omega$ |                |

### Absolute Maximum Ratings

| Parameter           | Min. | Typ. | Max. | Units | Notes |
|---------------------|------|------|------|-------|-------|
| Storage temperature | -55  |      | +125 | °C    |       |

### Spread Options Table

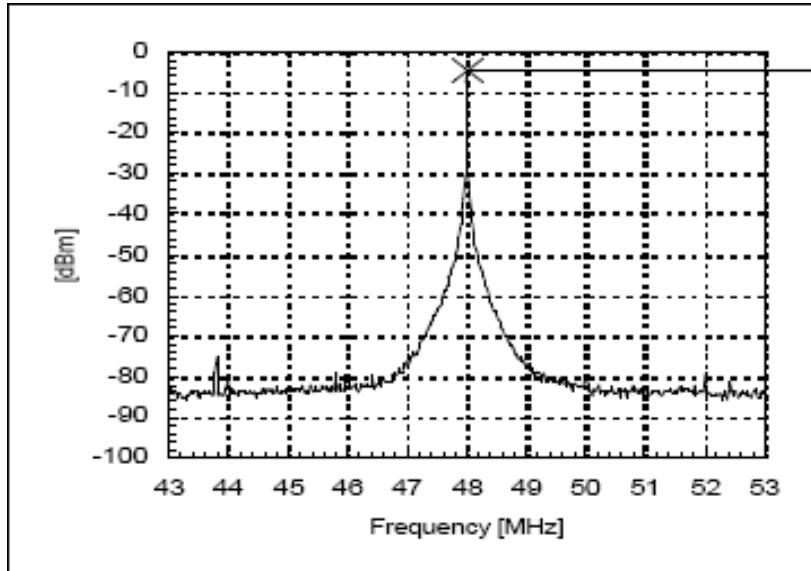
| Center Spread | Down Spread |
|---------------|-------------|
| $\pm 0.25\%$  | -0.5%       |
| $\pm 0.35\%$  | -0.7%       |
| $\pm 0.45\%$  | -0.9%       |
| $\pm 0.55\%$  | -1.1%       |
| $\pm 0.625\%$ | -1.3%       |
| $\pm 0.65\%$  | -1.7%       |
| $\pm 0.85\%$  | -2.0%       |
| $\pm 1\%$     | -2.3%       |
| $\pm 1.15\%$  |             |

### Modulation Rate Options

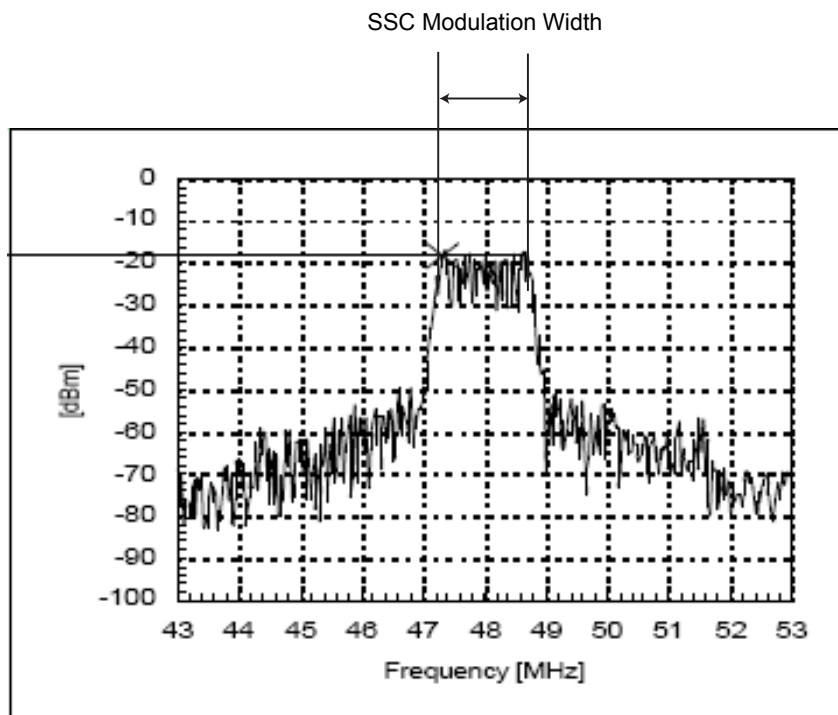
|                 |
|-----------------|
| $F_{IN} / 496$  |
| $F_{IN} / 608$  |
| $F_{IN} / 640$  |
| $F_{IN} / 750$  |
| $F_{IN} / 1088$ |

$F_{IN}$  is the input crystal frequency

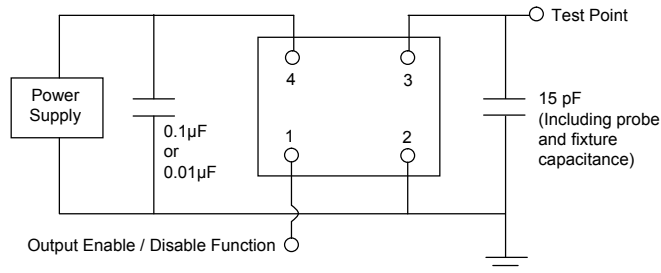
## Spectral Plot without SSXO



## Spectral Plot with SSXO

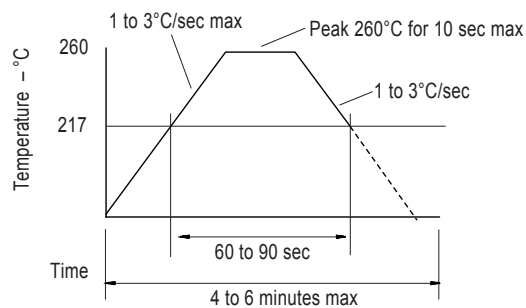


### Test Circuit



### Reflow Soldering Profile

As per IPC/JEDEC J-STD-020C



### Reliability Test Ratings

This product is rated to meet the following test conditions:

| Type          | Parameter                    | Test Condition  |
|---------------|------------------------------|---|
| Mechanical    | Shock                        | MIL-STD-883, Method 2002, Condition B                                       |
| Mechanical    | Solderability                | JESD22-B102-D Method 2 (Preconditioning E)                                  |
| Mechanical    | Terminal strength            | MIL-STD-883, Method 2004, Condition D                                       |
| Mechanical    | Gross leak                   | MIL-STD-883, Method 1014, Condition C                                       |
| Mechanical    | Fine leak                    | MIL-STD-883, Method 1014, Condition A2 ( $R_1 = 2 \times 10^{-8}$ atm cc/s) |
| Mechanical    | Solvent resistance           | MIL-STD-202, Method 215   |
| Environmental | Thermal shock                | MIL-STD-883, Method 1011, Condition A                                       |
| Environmental | Moisture resistance          | MIL-STD-883, Method 1004  |
| Environmental | Vibration                    | MIL-STD-883, Method 2007, Condition A                                       |
| Environmental | Resistance to soldering heat | J-STD-020C Table 5-2 Pb-free devices (2 cycles max)                         |