

## Automotive Grade, 4 Pad 3.2mm x 2.5mm SMD, LVC MOS Oscillator

**ISA16 Series**

### Product Features:

- AEC-Q200 qualified
- IATF 16949 certified production lines
- LVC MOS compatible output
- Industry-standard package 3.2mm x 2.5mm
- Five supply voltages options, 1.8V, 2.5V, 2.8V, 3.0V or 3.3V
- Pb-free, Halogen-free, and Antimony-free
- RoHS and REACH compliant

### Typical Applications:

- Navigation, GPS
- Infotainment System
- Instrument Panel, Ethernet
- ADAS, Camera, Engine Control Units
- LIDAR Systems, TPMS

### ELECTRICAL SPECIFICATIONS

|                                    |  |   |
|------------------------------------|--|---|
| <b>Frequency Range</b>             | 1MHz to 156.250MHz<br>1MHz to 135MHz   | Vdd = 2.5V, 2.8V, 3.0V or 3.3V<br>Vdd = 1.8V  |
| <b>Frequency Stability</b>         | ±50ppm Maximum<br>±100ppm Maximum  | Inclusive of Initial Tolerance, Stability over Operating Temperature Range, Load (±5%), Voltage (±10%), and Aging (First Year at +25°C) |
| <b>Operating Temperature Range</b> | -40°C to +85°C<br>-40°C to +105°C<br>-40°C to +125°C   |   |
| <b>Supply Voltage (Vdd)</b>        | 1.8V<br>2.5V, 2.8V, 3.0V or 3.3V   | ±5%<br>±10%   |
| <b>Input Current</b>               | 20mA Maximum   | No Load   |
| <b>Output Logic Type</b>           | LVC MOS  |   |
| <b>Output Drive Capability</b>     | 15pF Maximum   |   |
| <b>Aging</b>                       | ±3ppm/year Maximum   | at +25°C  |
| <b>Duty Cycle</b>                  | 50 ±5(%)   | Measured at 50% of waveform   |
| <b>Rise / Fall Time</b>            | 6nSec Maximum  | Measured from 20% to 80% of waveform  |
| <b>Output Voltage Logic High</b>   | 90% of Vdd Minimum   |   |
| <b>Output Voltage Logic Low</b>    | 10% of Vdd Maximum   |   |
| <b>Input Voltage Logic High</b>    | 70% of Vdd Minimum or No Connect to Enable Output  |   |
| <b>Input Voltage Logic Low</b>     | 30% of Vdd Maximum to Disable Output (High Impedance)  |   |
| <b>Standby Current</b>             | 10µA Maximum   | Disabled Output, High Impedance   |
| <b>Startup Time</b>                | 10mSec Maximum   |   |
| <b>RMS Period Jitter</b>           | 5pSec Maximum<br>6pSec Maximum   | Vdd = 2.5V, 2.8V, 3.0V or 3.3V<br>Vdd = 1.8V  |
| <b>Peak-to-Peak Period Jitter</b>  | 30pSec Maximum<br>40pSec Maximum   | Vdd = 2.5V, 2.8V, 3.0V or 3.3V<br>Vdd = 1.8V  |
| <b>NOTES:</b>                      | <ul style="list-style-type: none"> <li>• All minimum and maximum limits are specified over temperature and rated operating voltage with 15pF output unless otherwise stated.</li> <li>• A 0.1µF bypass capacitor is recommended between Vdd (pad 4) and GND (pad 2) to minimize power supply noise.</li> </ul> |   |

### ABSOLUTE MAXIMUM LIMITS

|                                  |   |
|----------------------------------|---|
| <b>Storage Temperature Range</b> | -55°C to +125°C   |
| <b>Supply Voltage Range</b>      | -0.3Vdc to Vdd +0.3Vdc  |
| <b>Electrostatic Discharge</b>   | 2000V Maximum   |
| <b>Solder Temperature</b>        | 260°C Maximum   |
| <b>Junction Temperature</b>      | 150°C Maximum   |
| <b>NOTE:</b>                     | If the part is used beyond absolute maximum ratings, it may cause internal destruction. The part should be used under the recommended operating conditions or the reliability of this part may be damaged if those conditions are exceeded. |

### PART NUMBER GUIDE

| Series | Supply Voltage   | Operating Temperature Range                                      | Frequency Stability                     | Function          | Frequency   |
|--------|--|--|---|-------------------|-------------|
| ISA16- | 1 = 1.8V<br>6 = 2.5V<br>2 = 2.8V<br>7 = 3.0V<br>3 = 3.3V | 2 = -40°C to +85°C<br>E = -40°C to +105°C<br>F = -40°C to +125°C | A = ±25ppm<br>B = ±50ppm<br>C = ±100ppm | H = Output Enable | -25.000 MHz |

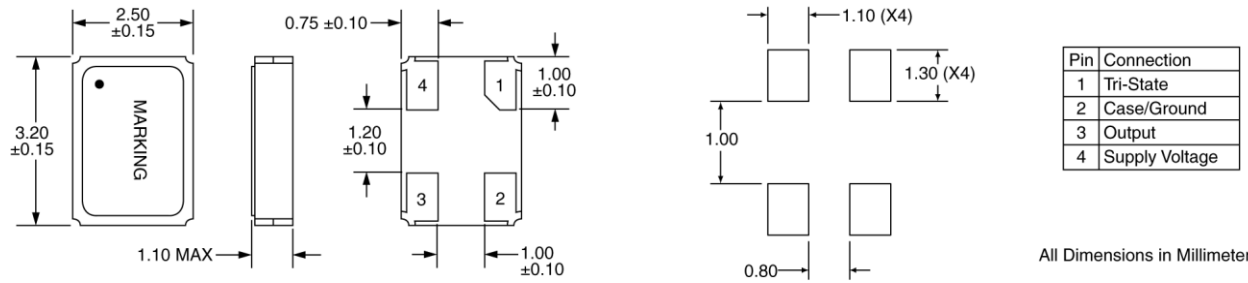
**Sample Part Number: ISA16-3FCH-25.000 MHz**

- NOTES:**
- Not all Frequency Stability options are available at all frequency and Operating Temperature Ranges.
  - Please consult with Sales Department any other parameters or options.

## Automotive Grade, 4 Pad 3.2mm x 2.5mm SMD, LVCMOS Oscillator

ISA16 Series

### MECHANICAL & SOLDER PAD LAYOUT DIMENSIONS



### MARKING

**Line 1:** Frequency (X.XXX or XX.XX or XXX.X)

**Line 2:** Date Code (YWW)

**Pin 1 Dot**

### PACKAGE INFORMATION

**Termination = e4** (Au over Ni over W base metallization)

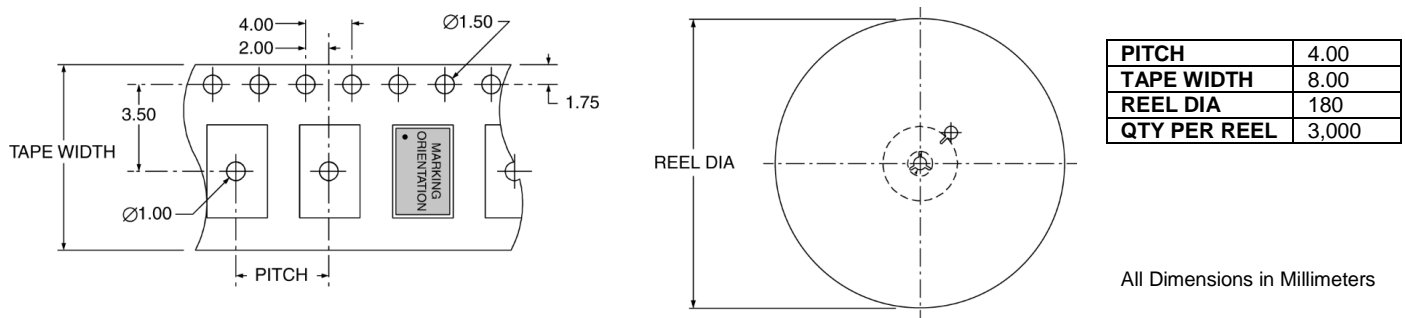
**Terminal Plating Thickness:**

Gold (0.3µm to 1.0µm), Nickel (1.27µm to 8.89µm)

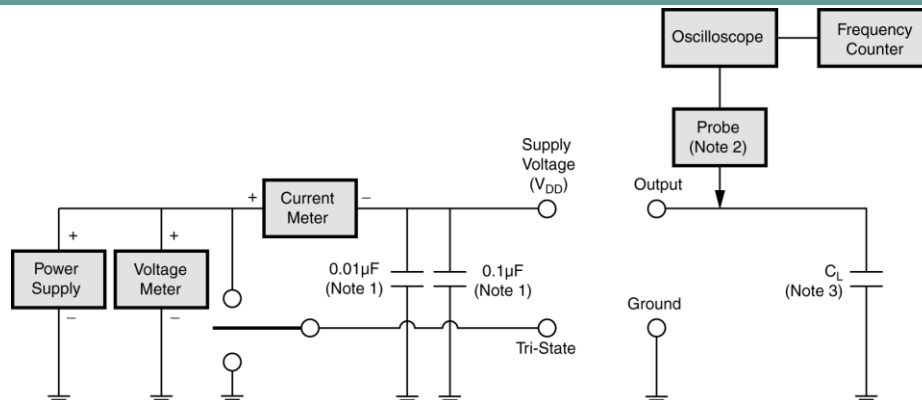
### ENVIRONMENTAL SPECIFICATIONS

|                                     |                          |
|-------------------------------------|--------------------------|
| <b>Mechanical Shock</b>             | MIL-STD-202, Method 213  |
| <b>Mechanical Vibration</b>         | MIL-STD-202, Method 204  |
| <b>Resistance to Soldering Heat</b> | MIL-STD-202, Method 210  |
| <b>Solderability</b>                | J-STD-002                |
| <b>Gross Leak</b>                   | MIL-STD-883, Method 1014 |
| <b>Fine Leak</b>                    | MIL-STD-883, Method 1014 |
| <b>Moisture Sensitivity Level</b>   | MSL 1 (+260°C)           |

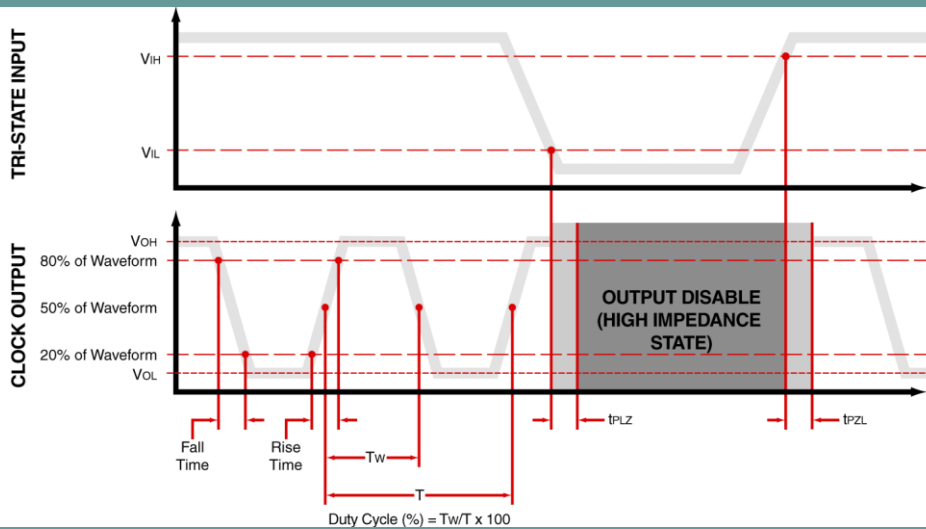
### TAPE & REEL DIMENSIONS



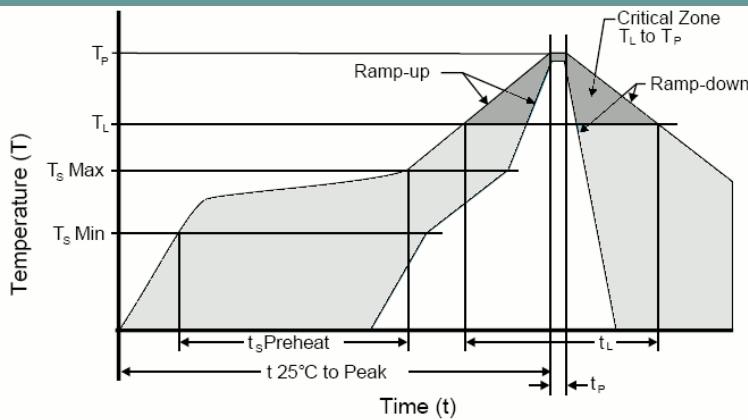
### TEST CIRCUIT



**WAVEFORM**



**SOLDER REFLOW PROFILE**



Units are backward compatible with +240°C reflow process

|  |                            |
|--|----------------------------|
| Ts max to TL (Ramp-up Rate)                      | 3°C / second max           |
| Preheat  |                            |
| Temperature min (Ts min)                         | 150°C                      |
| Temperature typ (Ts typ)                         | 175°C                      |
| Temperature max (Ts max)                         | 200°C                      |
| Time (Ts)  | 60 to 180 seconds          |
| Ramp-up Rate (TL to TP)                          | 3°C / second max           |
| Time Maintained Above Temperature (TL) Time (TL) | 217°C<br>60 to 150 seconds |
| Peak Temperature (TP)                            | 260°C max for 10 seconds   |
| Time within 5°C to Peak Temperature (TP)         | 20 to 40 seconds           |
| Ramp-down Rate                                   | 6°C / second max           |
| Tune 25°C to Peak Temperature                    | 8 minute max               |
| Moisture Sensitivity Level (MSL)                 | Level 1                    |

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