

## Automotive Grade, 4 Pad 2.5mm x 2.0mm SMD, LVCMOS Oscillator

## ISA12 Series

### Product Features:

- AEC-Q200 qualified
- IATF 16949 certified production lines
- LVCMOS compatible output
- Industry-standard package 2.5mm x 2.0mm
- 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 60MHz	
<b>Frequency Stability</b>	±50ppm Maximum ±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 -40°C to +105°C -40°C to +125°C	
<b>Supply Voltage (Vdd)</b>	1.8V 2.5V, 2.8V, 3.0V or 3.3V	±5% ±10%
<b>Input Current</b>	20mA Maximum	No Load
<b>Output Logic Type</b>	LVCMOS	
<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 6pSec Maximum	Vdd = 2.5V, 2.8V, 3.0V or 3.3V Vdd = 1.8V
<b>Peak-to-Peak Period Jitter</b>	30pSec Maximum 40pSec Maximum	Vdd = 2.5V, 2.8V, 3.0V or 3.3V 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
ISA12-	1 = 1.8V 6 = 2.5V 2 = 2.8V 7 = 3.0V 3 = 3.3V	2 = -40°C to +85°C E = -40°C to +105°C F = -40°C to +125°C	A = ±25ppm B = ±50ppm C = ±100ppm	H = Output Enable	-25.000 MHz

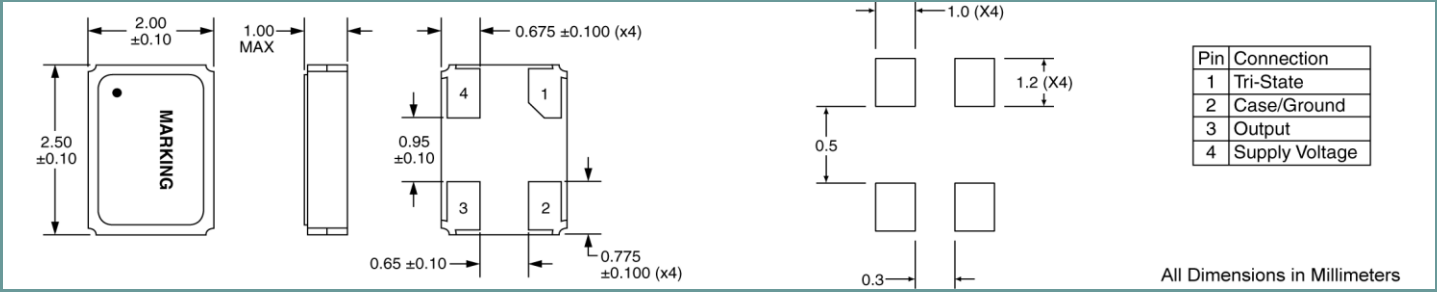
Sample Part Number: ISA12-3FCH-25.000 MHz

- 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.

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### MECHANICAL & SOLDER PAD LAYOUT DIMENSIONS



### MARKING

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

Line 2: Date Code (YWW)

Pin 1 Dot

### PACKAGE INFORMATION

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

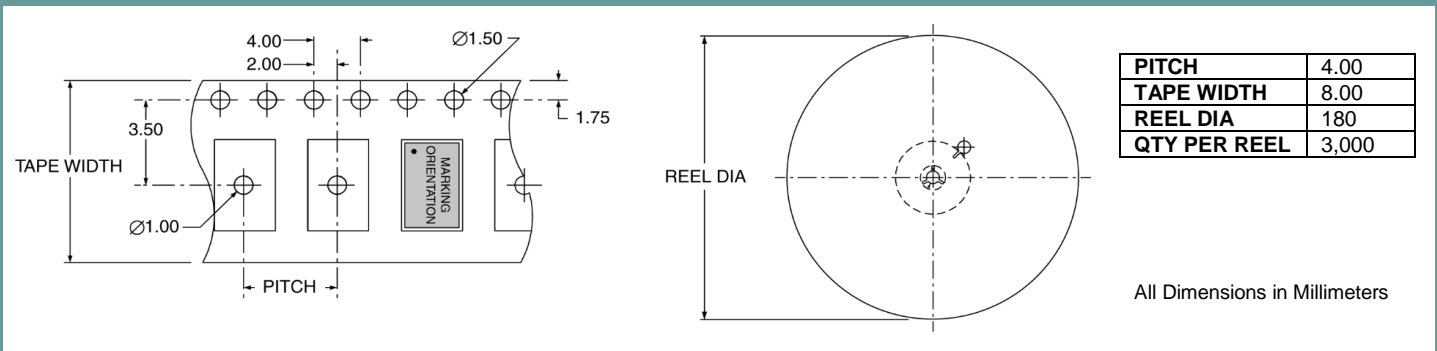
Terminal Plating Thickness:

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

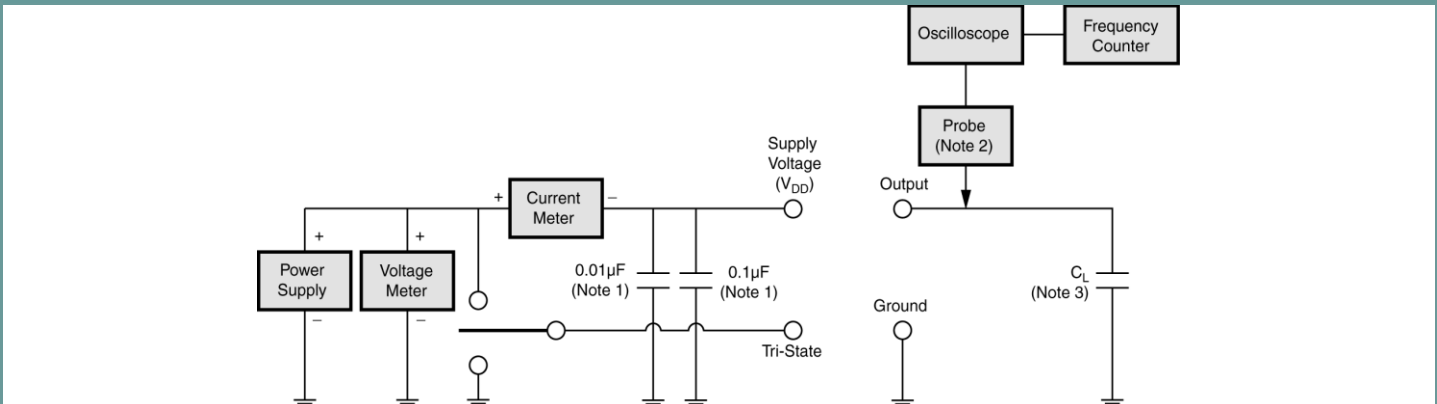
### ENVIRONMENTAL SPECIFICATIONS

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

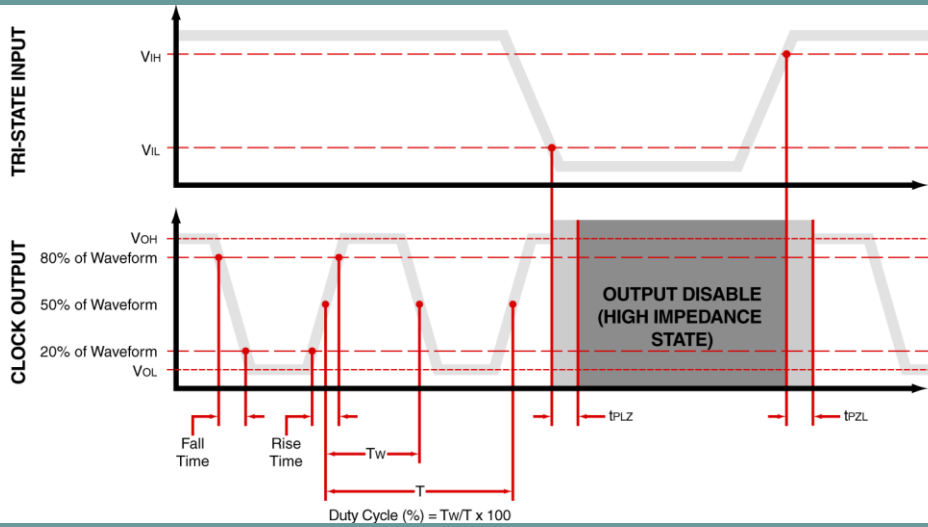
### TAPE & REEL DIMENSIONS



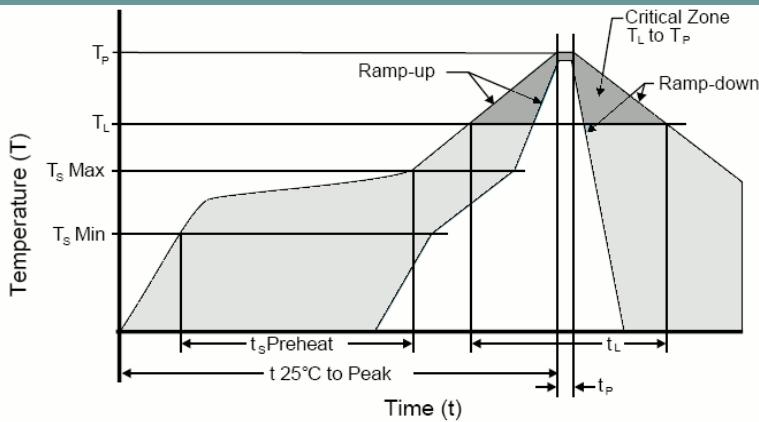
### TEST CIRCUIT



**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 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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