

## Ultra-Low Noise 3.2mm x 5.0mm SMD Oscillator

## ISM42 Series

### Product Features:

- Frequency Range, 20.000MHz to 50.000MHz
- Supply Voltages, 1.8Vdc, 2.5Vdc, or 3.3Vdc
- Tri-State Function on Pin 1
- Ultra-Low Phase Jitter and Phase Noise
- Industry-standard 3.5mm x 5.0mm package
- LVCMOS Output
- RoHS and REACH compliant

### Applications:

- SD/HD Video
- Wireless Base Stations
- Sonet/SDH
- Digital Audio

### Electrical Specifications:

<b>Frequency Range</b>	20.000MHz to 50.000MHz	
<b>Frequency Stability</b>	See Part Number Guide	Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change and Output Load Change
<b>Operating Temperature Range</b>	See Part Number Guide	
<b>Aging at 25°C</b>	±3ppm Maximum First Year	
<b>Supply Voltage</b>	See Part Number Guide	Tolerance ±10%
<b>Input Current</b>	No Load 3mA Typical, 5mA Maximum 4.7mA Typical, 7mA Maximum 7mA Typical, 10mA Maximum	Vdd = 1.8Vdc Vdd = 2.5Vdc Vdd = 3.3Vdc
<b>Output Voltage Logic High (Voh)</b>	90% of Vdd Minimum	IOH = -4mA
<b>Output Voltage Logic Low (Vol)</b>	10% of Vdd Maximum	IOL = +4mA
<b>Rise Time/Fall Time</b>	Measured at 10% to 90% of waveform 5nSec Typical, 10nSec Maximum 2nSec Typical, 7nSec Maximum 1.5nSec Typical, 5nSec Maximum	Vdd = 1.8Vdc Vdd = 2.5Vdc Vdd = 3.3Vdc
<b>Duty Cycle</b>	50 ±5(%)	Measured at 50% of waveform
<b>Load Drive Capability</b>	15pF Maximum	
<b>Output Logic Type</b>	LVCMOS	
<b>Pin 1 Connection</b>	Tri-State (High Impedance)	
<b>Tri-State Input Voltage (Vih and Vil)</b>	70% of Vdd Minimum or No Connect to Enable Output 30% of Vdd Maximum to Disable Output (High Impedance)	
<b>Standby Current</b>	20µA Maximum	Disabled Output: High Impedance
<b>Tri-State Output Disable Time</b>	200nSec Maximum	
<b>RMS Phase Jitter (Random)</b>	Fj = 49.152MHz, Fj = 12kHz to 20MHz 118fSec Typical 100fSec Typical 48fSec Typical	Vdd = 1.8Vdc Vdd = 2.5Vdc Vdd = 3.3Vdc
<b>Start Up Time</b>	5mSec Maximum	
<b>Phase Noise</b>	See Table 1 and Table 2 (on page 3)	
<b>Storage Temperature Range</b>	-50°C to +100°C	

### Notes:

### Absolute Maximum Limits

Storage Temperature	-50°C to +100°C
Supply Voltage (Vdd)	-0.5 VDC to 4.0 VDC
Electrostatic Discharge	2000 V max
Solder Temperature (follow standard Pb free soldering guidelines)	260°C max
Junction Temperature	150°C max

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### Ordering Information:

Part Number Guide				
Package	Operating Temperature Range	Frequency Stability	Supply Voltage	Frequency
ISM42-	1 = 0°C to +70°C 6 = -10°C to +70°C 3 = -20°C to +70°C 2 = -40°C to +85°C	A = ±25ppm B = ±50ppm C = ±100ppm	1 = 1.8Vdc 6 = 2.5Vdc 3 = 3.3Vdc	- Frequency

Sample Part Number: **ISM42-2B3-32.000000 MHz**

This is 3.2mm x 5mm SMD Oscillator with an Operating Temperature Range of -40°C to +85°C with a Frequency Stability of ±50ppm. Supply Voltage of +3.3Vdc and with an Operating Frequency of 32.000000 MHz.

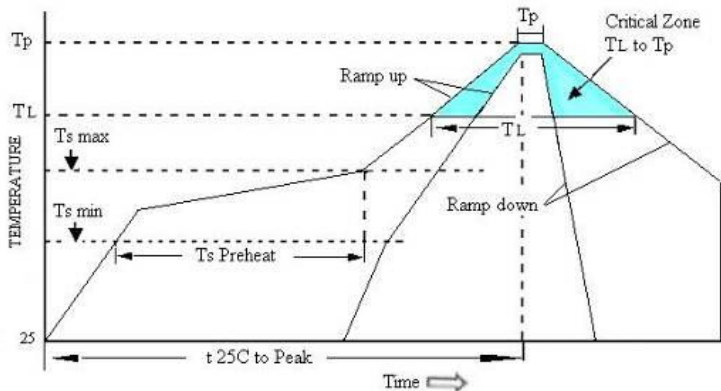
**Notes:**

- Not all options are available at all frequencies and temperatures ranges.
- Please consult with sales department for any other parameters or options.
- Oscillator specification subject to change without notice.

### Environmental Specifications:

Environmental Compliance	
Parameter	Condition/Test Method
ESD Susceptibility	MIL-STD-883, Method 3015, Class 1, HBM: 1500V
Flammability	MIL-STD-883, Method 1014, Condition A
Gross Leak Test	UL94-V0
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Moisture Resistance	MIL-STD-883, Method 1004
Moisture Sensitivity	J-STD-020, MSL 1
Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Resistance to Solvents	MIL-STD-202, Method 215
Solderability	MIL-STD-883, Method 2003
Temperature Cycling	MIL-STD-883, Method 1010, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A

### Pb Free Solder Reflow Profile



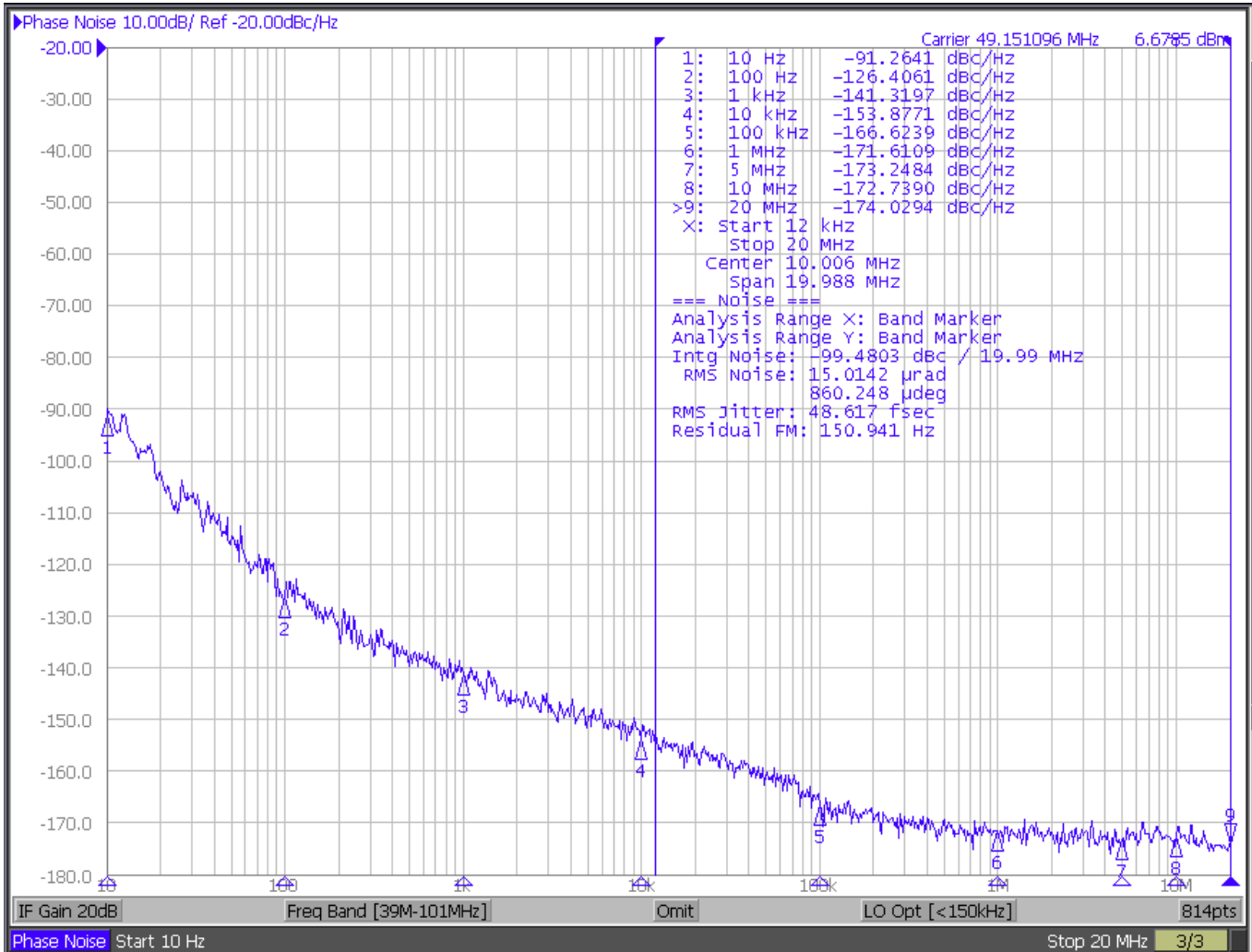
$T_s$ max to $T_L$ (Ramp-up Rate)	3°C / second max
Preheat	
Temperature min ( $T_s$ min)	150°C
Temperature typ ( $T_s$ typ)	175°C
Temperature max ( $T_s$ max)	200°C
Time ( $T_s$ )	60 to 180 seconds
Ramp-up Rate ( $T_L$ to $T_p$ )	3°C / second max
Time Maintained Above Temperature ( $T_L$ )	217°C
Time ( $T_L$ )	60 to 150 seconds
Peak Temperature ( $T_p$ )	260°C max for seconds
Time within 5°C to Peak Temperature ( $T_p$ )	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

Units are backward compatible with +240°C reflow processes

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Typical Phase Noise, Vdd = 3.3Vdc, 25°C



**TABLE 1**

49.152MHz at 3.3Vdc

Offset	Phase Noise (Typical)
10 Hz	-91 dBc/Hz
100 Hz	-126 dBc/Hz
1.0 kHz	-141 dBc/Hz
10 kHz	-153 dBc/Hz
100 kHz	-166 dBc/Hz
1.0 MHz	-171 dBc/Hz
10 MHz	-172 dBc/Hz
20 MHz	-174 dBc/Hz

**TABLE 2**

49.152MHz at 1.8Vdc

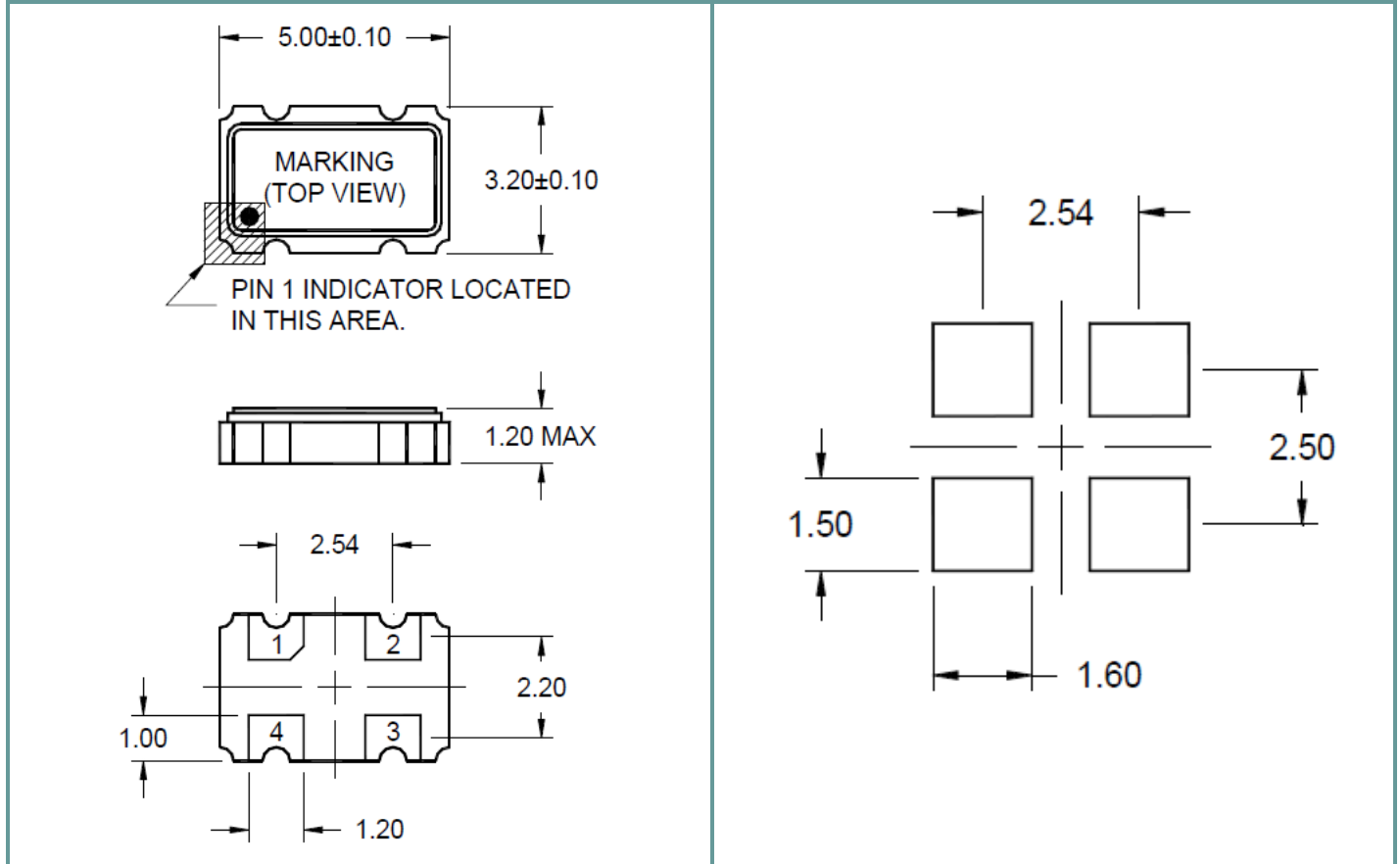
Offset	Phase Noise (Typical)
10 Hz	-97 dBc/Hz
100 Hz	-126 dBc/Hz
1.0 kHz	-132 dBc/Hz
10 kHz	-146 dBc/Hz
100 kHz	-159 dBc/Hz
1.0 MHz	-164 dBc/Hz
10 MHz	-164 dBc/Hz
20 MHz	-165 dBc/Hz

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**ISM42 Series**

**Mechanical Detail**

**Package Dimensions and Suggest Land Pattern**



All dimension in millimeters (mm).

**Pin Connections**

- Pin 1: Enable / Disable
- Pin 2: Ground
- Pin 3: Output
- Pin 4: Supply Voltage (Vcc)

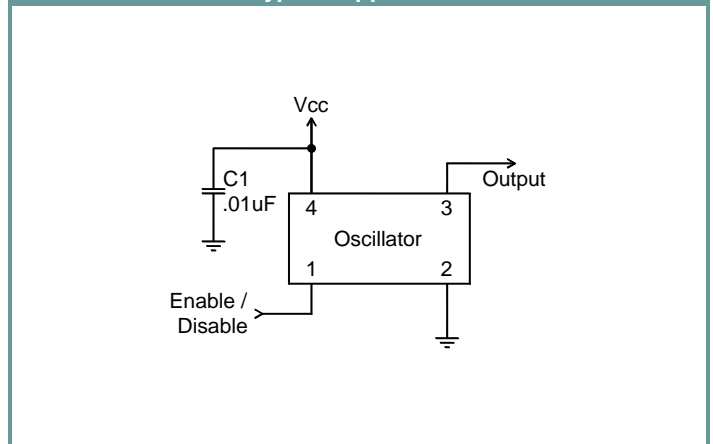
**Marking**

- Line 1 = I-Date Code (YWW)
- Line 2 = Frequency

**Package Information**

- Termination = e4
- Au over Ni over W base metallization

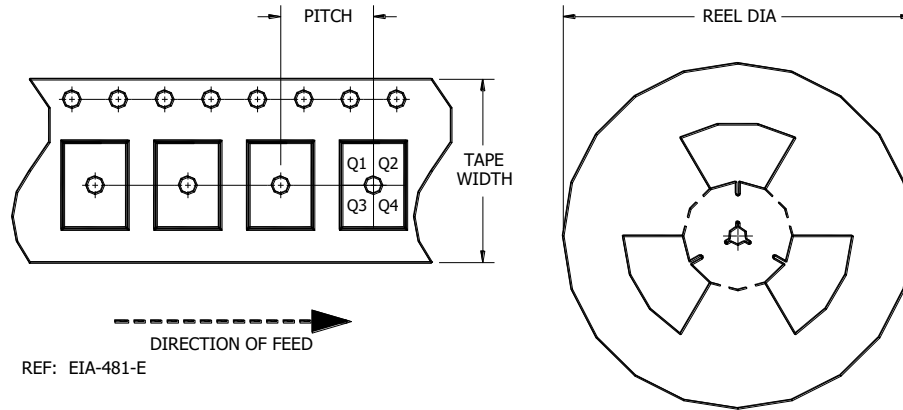
**Typical Application**



**Ultra-Low Noise 3.2mm x 5.0mm SMD Oscillator**

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**Tape and Reel Dimensions**



Part Number	Size	Pitch	Tape Width	Pin Orient.	Reel Dia.	Count
ISM42	3.2 x 5.0	4.0 ± 0.1	8.3 MAX	Q1	180	1000
					330	3000

Notes:

- All dimensions are in millimeters (mm).

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