Dynamic Engineers Inc.
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XO5300AJSQ3
Ultra-low Phase Noise Clock Oscillator

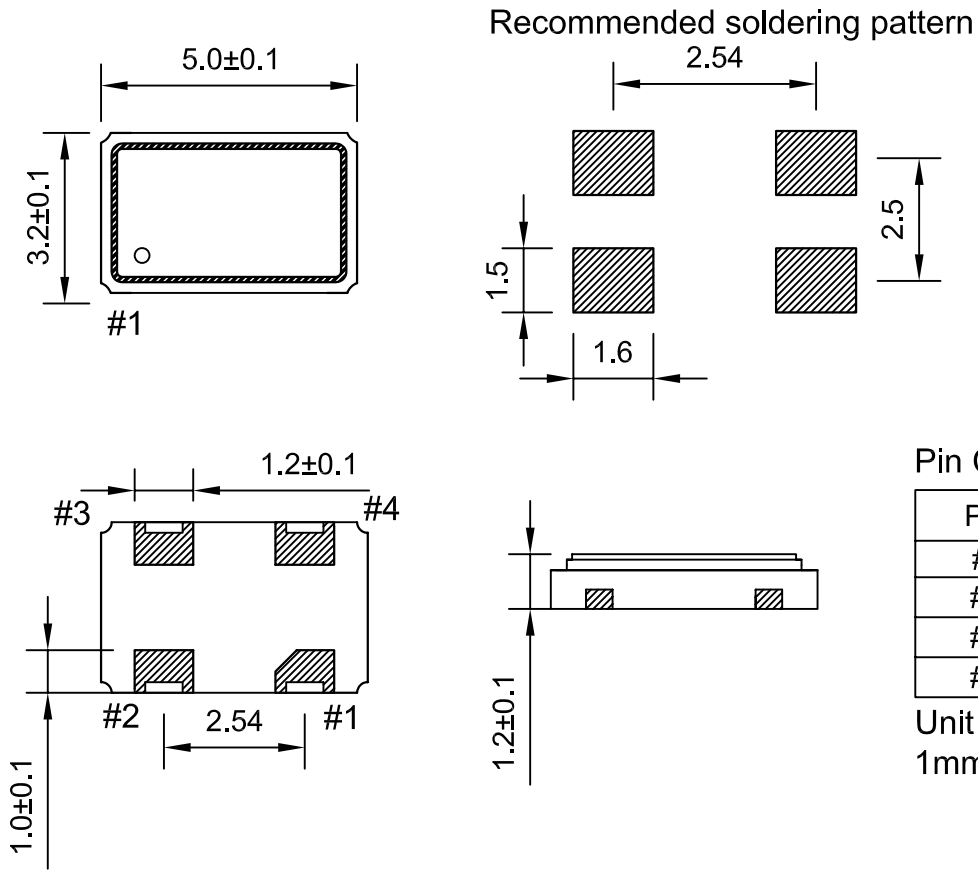
Features and Benefits
Low phase noise (up to -166dBc/Hz @ 100 KHz offset)
Superb integrated phase jitter level up to 48fsec (femto-seconds)

Typical Applications
Digital-to-analog Converters (DAC's)
High quality digital audio systems

Description
XO5300AJSQ3 offers superb integrated phase jitter and low phase noise in a compact package suitable for high-quality digital audio systems that require extremely low jitter master clocks for high time-resolution (sample rates, conversion accuracy).

Mechanical Drawing & Pin Connections

Drawing No: MD170015-2



Pin Connection

Pin	Function
#1	Enable/Disable
#2	GND
#3	Output
#4	Supply Voltage

Unit in mm
1mm = 0.0394 inches

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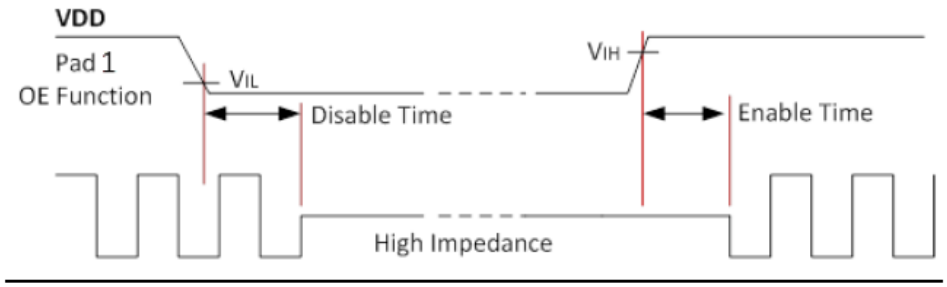
Specifications

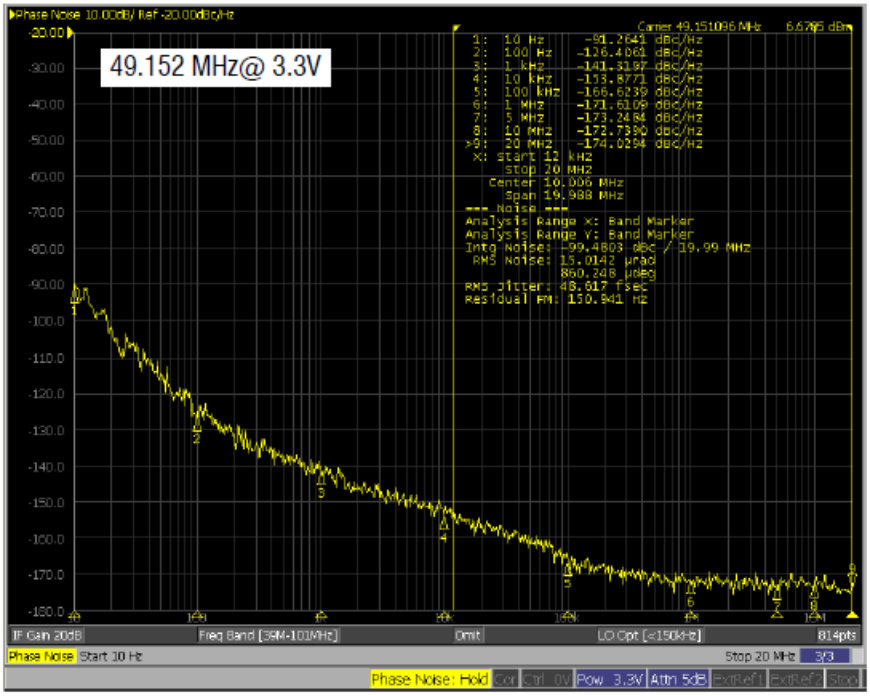
Oscillator Specification	Sym	Condition	Value			Unit	Note
			Min.	Typ.	Max.		
Frequency Range	F		10		50	MHz	
Output Waveform				LVCMOS			
Output Logic "High", "1"		90% of V_{DD} min		2.97		V	
Output Logic "Low", "0"		10% of V_{DD} max		0.33		V	
Duty Cycle		at 50% V_{DD}		50		%	±5%
Rise Time / Fall Time	Tr / Tf	10% <-> 90% waveform		1.5	10.0	ns	
Output Load				15		pF	
Start-up Time					5.0	ms	
Tri-State Control on Pad 1			0.9 of V_{DD} minimum or no connection to enable output				
			0.1 of V_{DD} maximum to disable output (high impedance)				
Output Enable Time					1	ms	
Output Disable Time					200	ns	
Power Supply							
Voltage	V_{DD}	±10%		+3.3		V	
Current Consumption		25 MHz 49 MHz		4.3 7.0		mA	
Supply Voltage Sensitivity		At all V_{DD} ±10%		±1		ppm	
Frequency Stability							
Frequency Stability		Over -40°C to +85°C	±25		±100	ppm	Refer to ordering codes
Environmental Conditions							
Operating temperature range	-40°C to +85°C						
Storage temperature range	-55°C to +125°C						
Green Environment	RoHS 3 (2015/863/EU) compliant, no exemptions, Pb (lead) free						
Moisture Sensitivity Level	Level 1 (infinite) according to IPC/JEDEC J-STD-020D.1						
Humidity	85% RH, +85°C, 48 hours						
Fine Leak / Gross Leak	MIL-STD-883, Method 1014, Condition A and Condition C						
Solderability	MIL-STD-202F method 208E						
Reflow	+260°C for 10 sec max. Two times						
Vibration	MIL-STD-202F Method 204, 35G, 50 to 2000 Hz						
Shock	MIL-STD-202F Method 213B, test condition E, 1000GG ½sine wave						
Resistance to Solvent	MIL-STD-202 Method 215						
Temperature Cycling	MIL-STD-883, Method 1010						
ESD Rating	Human Body Model (HBM) 1500 V min						
Pad Surface Finish	Gold (0.3 µm to 1.0 µm) over nickel (1.27 µm to 8.89 µm)						
Weight	0.045 grams (average)						

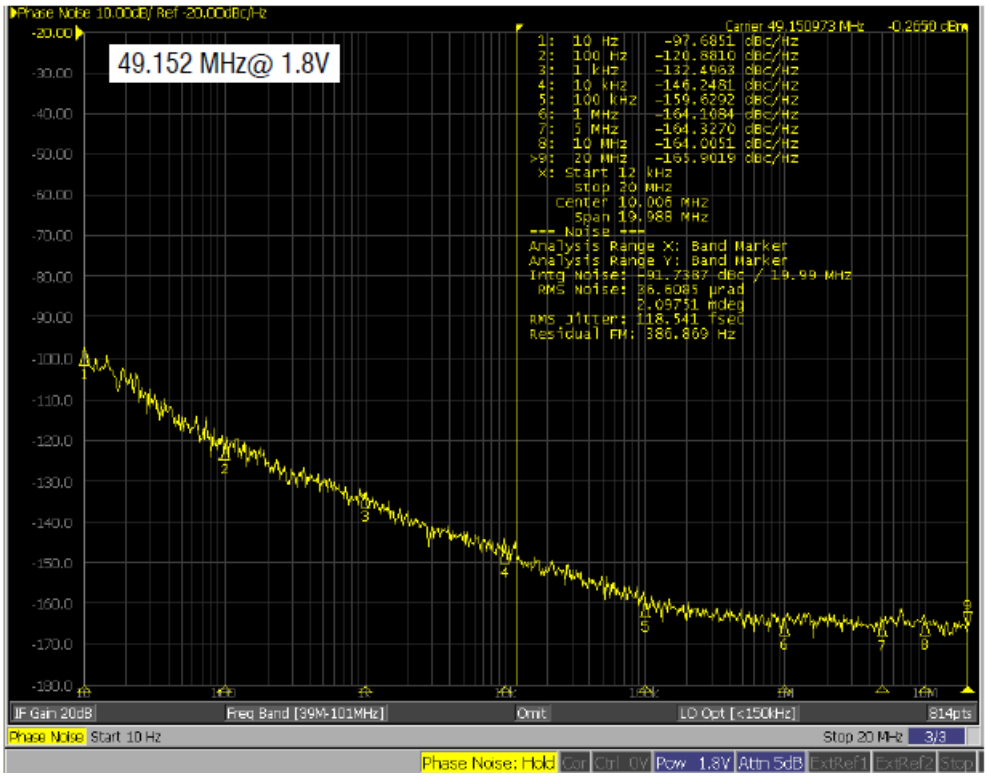
Tri-State Function on pad 1 – High Enable



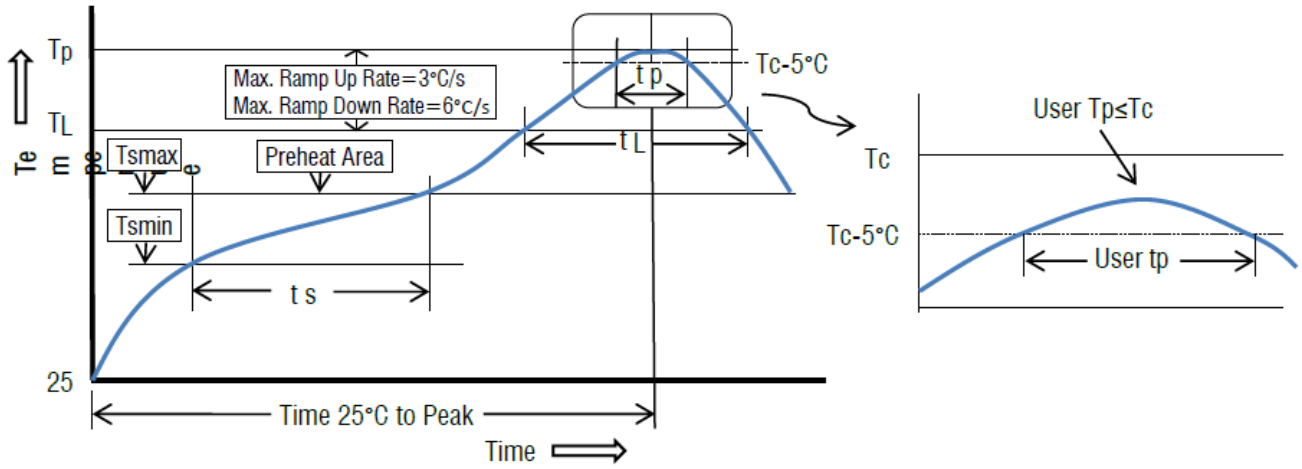
Phase Noise Plots and Phase Jitter Data (typical) +25°C

SSB Phase Noise Data (dBc / Hz) Phase Jitter (RMS, 12 KHz ~ 20 MHz)				
Frequency (MHz) Offset	49.152 MHz @ 1.8V	49.152 MHz @ 2.5V	49.152 MHz @ 3.3V	25.000 MHz @ 3.3V
100 Hz	-120 dBc / Hz	-125 dBc / Hz	-126 dBc / Hz	-115 dBc / Hz
1 KHz	-132 dBc / Hz	-140 dBc / Hz	-141 dBc / Hz	-141 dBc / Hz
10 KHz	-146 dBc / Hz	-149 dBc / Hz	-153 dBc / Hz	-156 dBc / Hz
100 KHz	-159 dBc / Hz	-164 dBc / Hz	-166 dBc / Hz	-169 dBc / Hz
1 MHz	-164 dBc / Hz	-165 dBc / Hz	-171 dBc / Hz	-171 dBc / Hz
5 MHz	-169 dBc / Hz	-164 dBc / Hz	-173 dBc / Hz	-171 dBc / Hz
10 MHz	-164 dBc / Hz	-168 dBc / Hz	-172 dBc / Hz	-171 dBc / Hz
20 MHz	-165 dBc / Hz	-171 dBc / Hz	-174 dBc / Hz	-171 dBc / Hz
Phase Jitter	118 fs	66 fs	48 fs	54 fs





Recommended Solder Reflow Profile (per IPC/JEDEC J-STD-020D.1)



Profile Feature	Sn-Pb Eutectic Assembly	Pb-free Assembly
Preheat / Soak - Temperature min. (Ts min.) - Temperature max. (Ts max) - Time (ts) (Ts min. to Ts max)	 100°C 150°C 60 to 120 seconds	 150°C 200°C 60 to 180 seconds
Ramp-up rate (T_L to T_P)	3°C / sec. max	
Liquidous Temperature (T_L)	183°C	217°C
Time (t_L) maintained above T_L	60 to 150 seconds	
Peak package body temperature (T_P)	235°C	260°C
Time (T_P) within 5°C of the classification temperature T_C	10 to 30 seconds	20 to 40 seconds
Ramp-down rate (T_P to T_L)	6°C / second max	
Time +25°C to peak temperature	6 minutes max	8 minutes max.

All temperatures refer to topside of the package, measured on the package body surface

Ordering Options: Frequency Stability

Frequency Stability (w)	
Code	Stability [ppm]
1	±25
2	±50
3	±100

Ordering Codes

Model	Frequency in MHz (up to 4 digits)	Operating Temperature vs Frequency Stability
XO5300AJSQ3	xx.yyyy	w

Example:XO5300AJSQ3-30.0000-2 has the following specifications

Operating Frequency = 30.0000 MHz
Operating Temperature = -40°C to +85°C
Frequency Stability = ±50 ppm