



Features and Benefits

Standard and custom frequencies up to 2100 MHz
Femto-second (f sec.) RMS phase jitter
Short lead time

Typical Applications

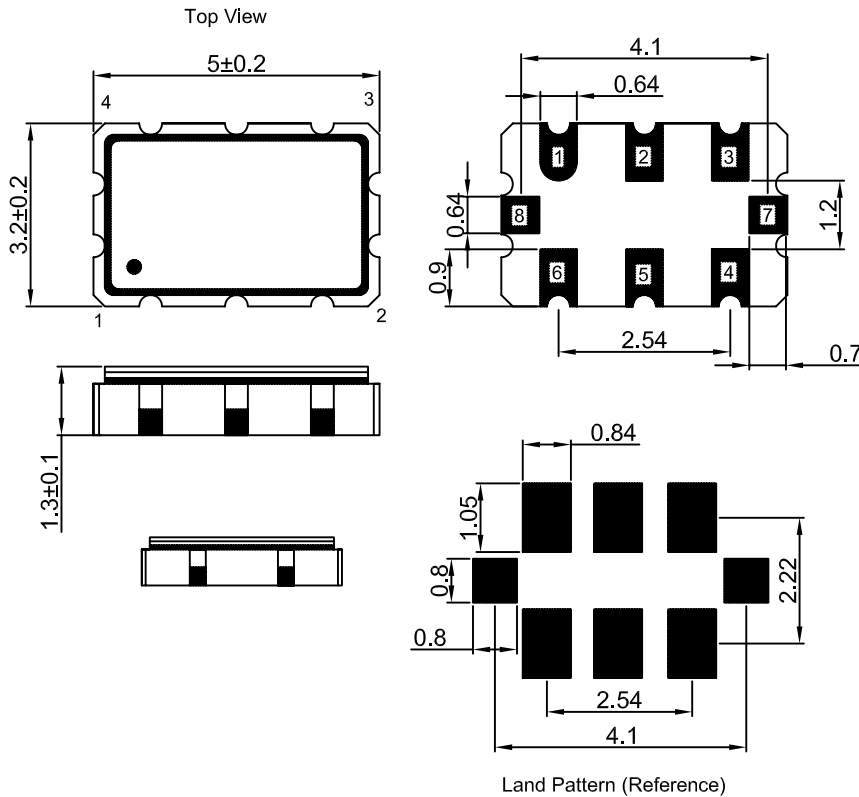
Low noise synthesizer VCO reference
Optical Communication
Test Instruments
High performance microwave synthesizer circuits

Description

VCXO5300AJLD2 offers high frequency and ultra-low phase jitter with short lead time in one simple package, ideal for optical communication, synthesizer VCO reference and synthesizer circuits applications.

Mechanical Drawing & Pin Connections

Drawing No: MD160040-2



Pin Connection

Pad 1	Control Voltage
Pad 2	OE
Pad 3	Ground
Pad 4	Output
Pad 5	Complementary Output
Pad 6	Supply Voltage
Pad 7	Do not Connect
Pad 8	Do not Connect

Unit in mm
1mm = 0.0394 inches



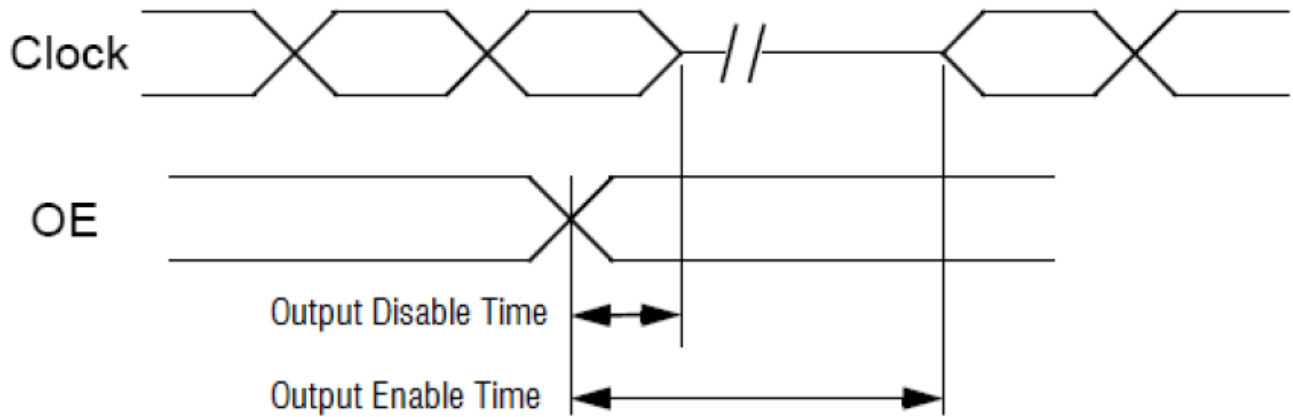
Specifications

Oscillator Specification	Sym	Condition	Value			Unit	Note
			Min.	Typ.	Max.		
Frequency Range	F		15		2100	MHz	
Output Waveform			LVDS				
Output Load			100 Ω between Q and Q1.				
Output Common-mode Voltage	V _{OCM}		1.125	1.200	1.375	V	
Change in V _{OCM} between complementary Output States	ΔV _{OCM}				50	mV	
Output Leakage Current		Output off. V _{out} = 0.75 ~ 1.75V	-20		+20	μA	
Rise / Fall Time	Tr / Tf	20% <-> 80% waveform			0.35	ns	
Duty Cycle		Measured at 50% differential level	45	50	55	%	
Start-up Time				5	10	m sec	
Phase Jitter, rms		12 KHz to 20 MHz		150	300	f sec	
Period Jitter	pk - pk				50	ps	
Cycle to Cycle Jitter	pk				50	ps	
Output Enable Function on Pad 2							
Output Enable Control			0.8 of V _{DD} minimum or no connection to enable output				
			0.2 of V _{DD} maximum to disable output (high impedance)				
Output Enable Time					2.5	m sec	
Output Disable Time					10	μ sec	
Frequency Deviation Control Voltage Function on Pad 1							
Control Voltage Center		V _{DD} = 3.3V		+1.65		V	
Control Voltage Range			+0.3		+3.0	V	
Frequency Pulling Range			±50		±250	ppm	
Linearity				±5	±10	%	
Transfer Function			Positive Transfer				
Input Impedance			5			MΩ	
Bandwidth		Measured at -3 dB		10		KHz	
Harmonics					-5.0	dBc	
Power Supply							
Voltage	V _{cc}	±10%		+3.3		V	
Current Consumption		At V _{DD} = 3.3V		75	90	mA	
Current with Output Disabled				74		mA	
Differential Output Voltage	V _{OT}	15 MHz ~ 700 MHz 700 MHz ~ 2100 MHz	247 150		454 454	mV	
Change in V _{OT} between Complementary Output States	ΔV _{OT}				50	mV	
Frequency Stability							
Frequency Stability vs. Operating Temperature		-40°C to +85°C	±25		±100	ppm	Refer to ordering options
Aging – first year		At Ta = +25°C			±3	ppm	
Aging – per year thereafter						±2	ppm



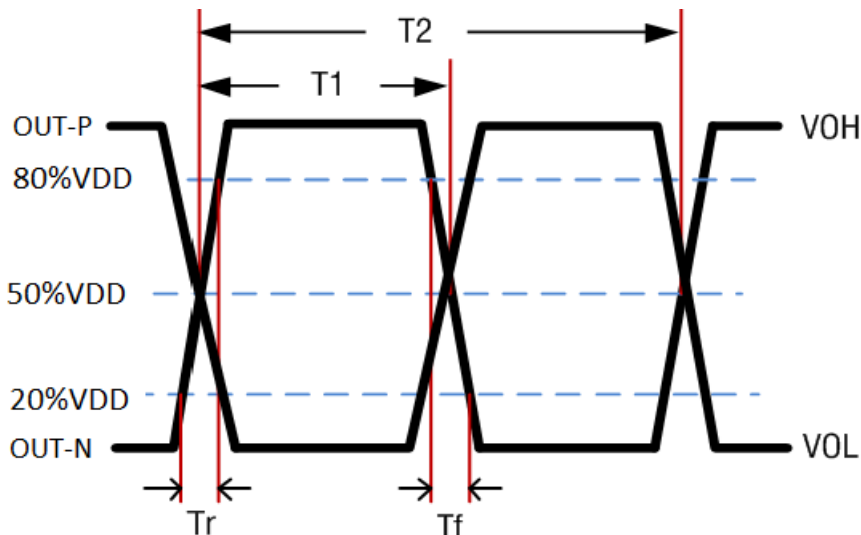
Environmental Conditions		
Operating Temperature Range	-40°C to +85°C	
Storage Temperature Range	-55°C to +125°C	
Green Requirement	RoHS 3 (2015/863/EU) compliant, no exemptions, Pb (lead) free	
Humidity	85% RH, +85°C, 48 hours	
Fine Leak / Gross Leak	MIL-STD-883, Method 1014, Condition A and Condition 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	HBM (Human Body Model) per JEDEC JS-001-2012): 2000 V min MM (Machine Model) per JEDEC JESD22-A115B: 200V 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)	
Absolute Maximum Ratings		
Supply Voltage to Ground Potential	-0.5V to +3.8V	Operation conditions exceed the absolute maximum ratings listed may cause permanent damage to the device
Input Voltage	-0.5V to +3.8V	

Output OE function on Pad 2



Differential Output Waveforms

Duty Cycle = $(T1/T2) + 100\%$ Measured at 50% V_{DD}

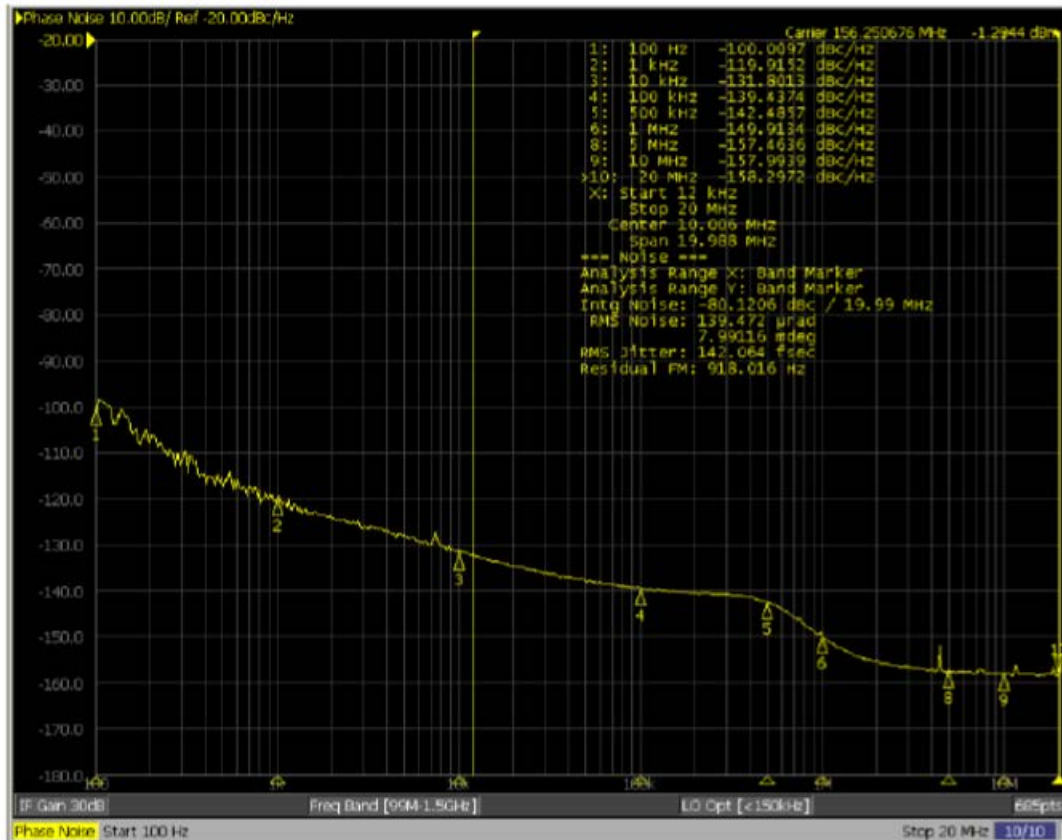


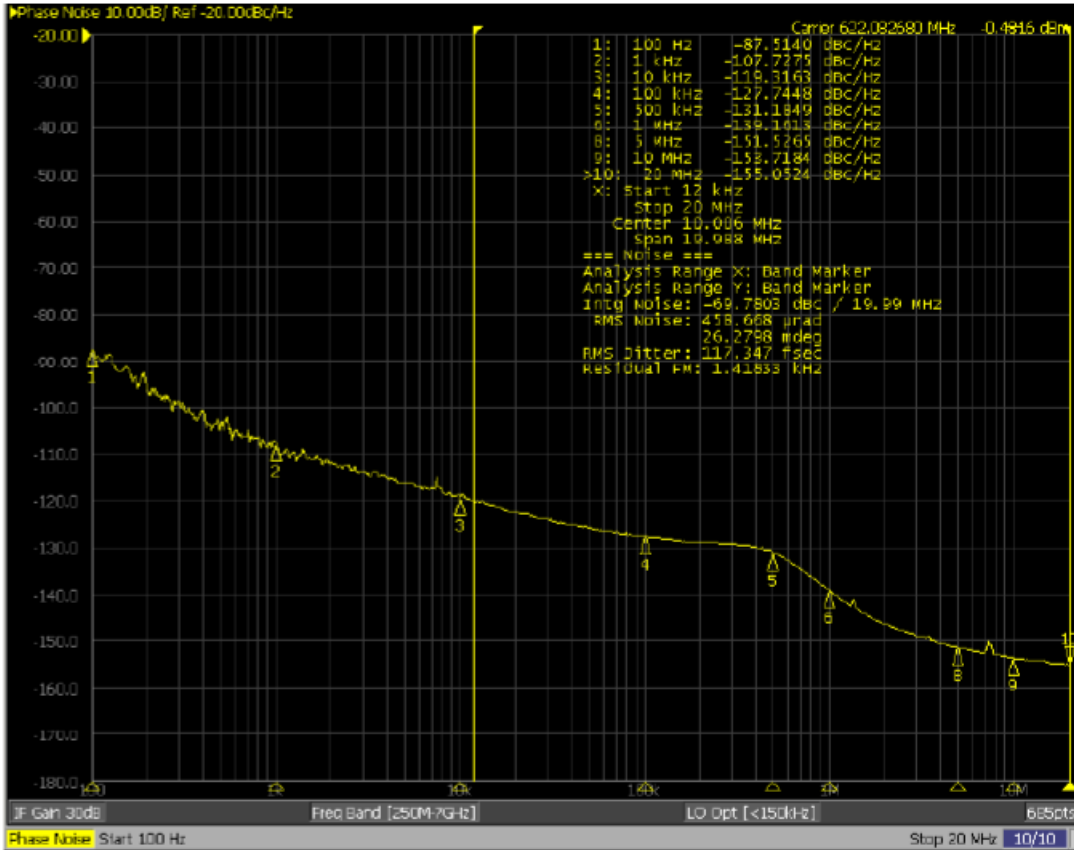


Phase Noise and Phase Jitter Data (typical), $V_{DD} = +3.3V$, LVPECL, Voltage Control = Ground

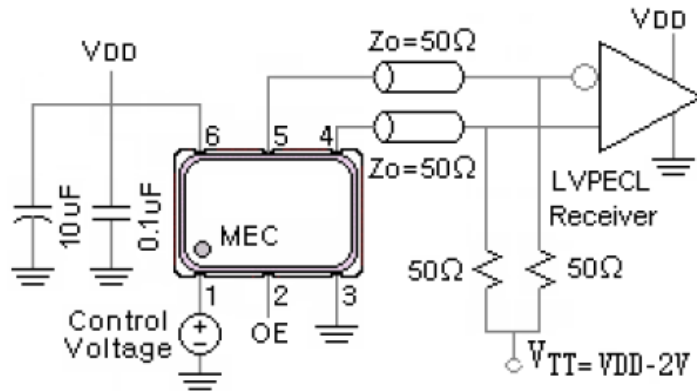
SSB Phase Noise Data (dBc /Hz; typical)	Frequency (MHz) Offset	156.250	491.520	644.530	1480.000	2100.000
		10 Hz	-39	-16	-31	-12
	100 Hz	-74	-48	-58	-54	-49
	1 KHz	-99	-83	-86	-80	-77
	10 KHz	-123	-112	-110	-104	-100
	100 KHz	-139	-128	-126	-119	-116
	1 MHz	-149	-140	-137	-130	-125
	5 MHz	-156	-151	-150	-145	-141
	10 MHz	-157	-153	-153	-148	-145
	20 MHz	-157	-154	-153	-150	-147
Phase Jitter fsec (12 KHz ~ 20 MHz, RMS, typical)		159	155	151	147	163

Phase Noise Plot of 156.250 MHz and 622.080 MHz, Voltage Control = Ground



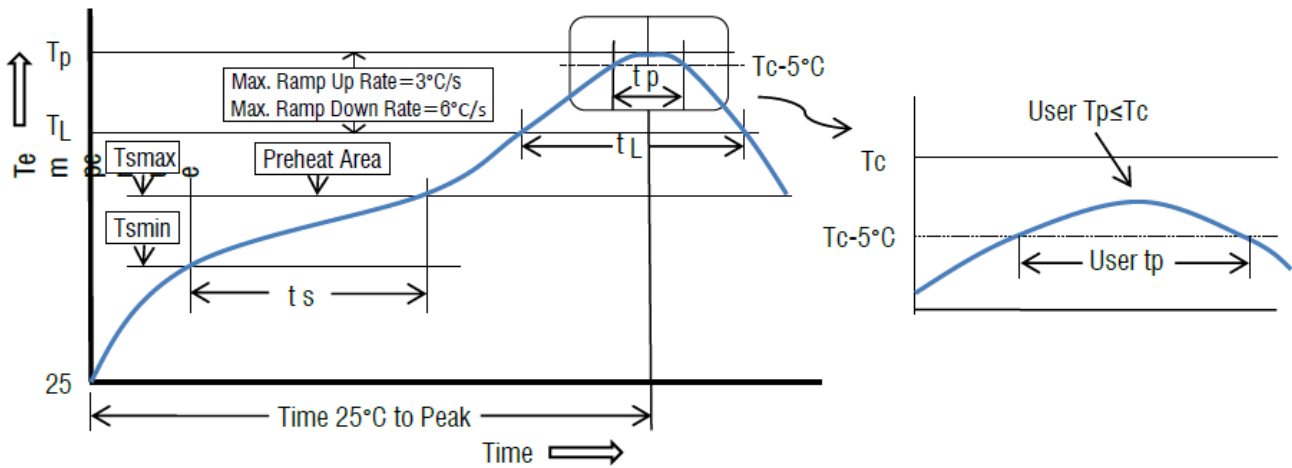


Differential Outputs Terminating Schematics : LVPECL 2.5V





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



Profile Feature	Sn-Pb Eutectic Assembly	Pb-free Assembly
Preheat / Soak		
- Temperature min. (T _s min.)	100°C	150°C
- Temperature max. (T _s max)	150°C	200°C
- Time (t _s) (T _s min. to T _s max)	60 to 120 seconds	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)	Frequency Stability
VCXO5300AJLD2	xx.yyyy	w

Example: VCXO5300AJLD2-100.0000-2 has the following specifications

Operating Frequency = 100.0000 MHz
 Frequency Stability = ±50 ppm