



Dynamic Engineers Inc.

2550 Gray Falls Dr., Suite#128, Houston, TX, 77077 USA
TEL: 1-281-870-8822 EMAIL: Sales@DynamicEng.com

VCXO5300AJLD1

Part of the VCXO5300AJLD1 family

Features and Benefits

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

Typical Applications

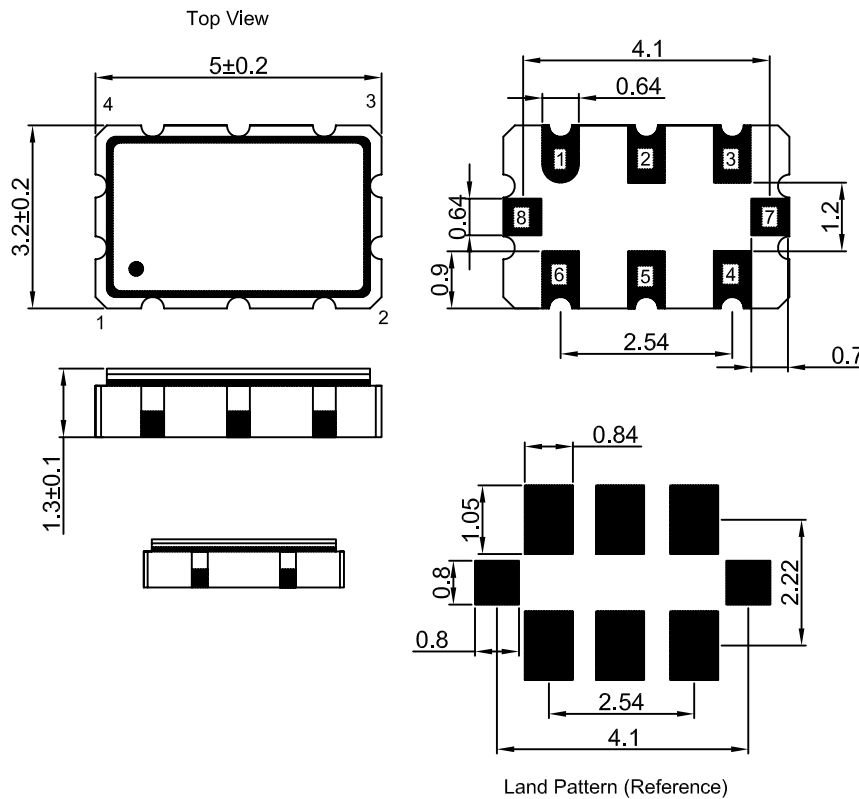
- Low noise synthesizer VCO reference
- Optical Communication
- Test Instruments
- High performance microwave synthesizer circuits

Description

VCXO5300AJLD1 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



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Part of the VCXO5300AJLD1 family, featuring a 5.3V supply voltage and a 100Ω load.

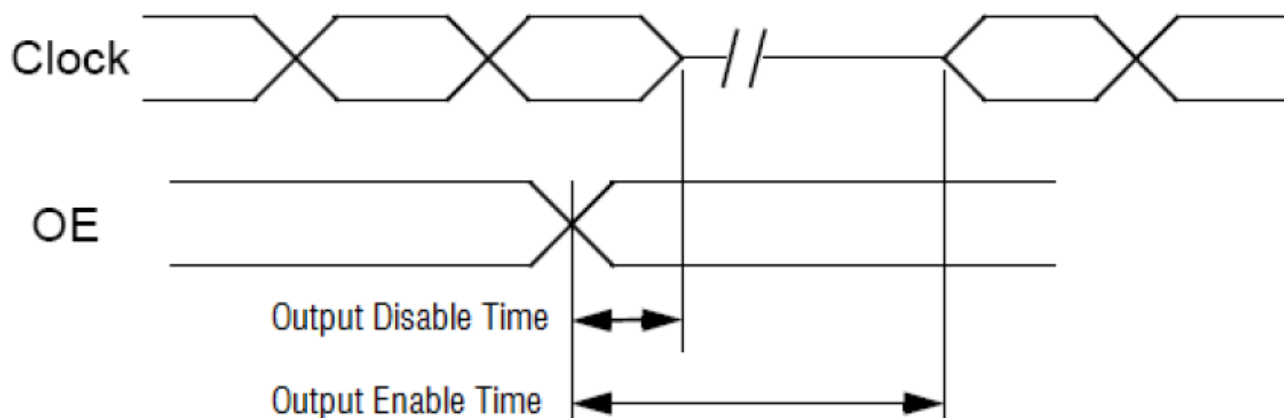
Specifications

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 Q/.				
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} = 2.5V		+1.25		V	
Control Voltage Range			+0.25		+2.25	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}	±5%		+2.5		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	



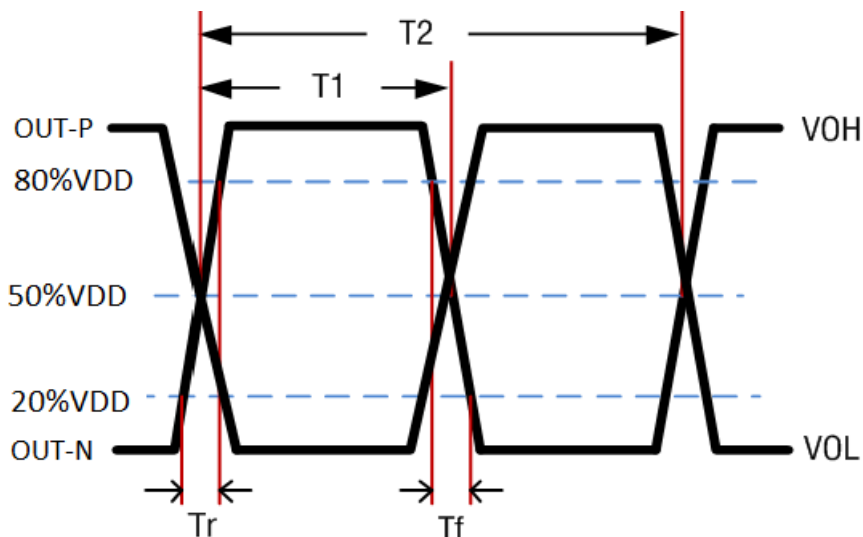
Environmental Conditions		
Operating Temperature Range	-40°C to +85°C	
Storage Temperature Range	-55°C to +125°C	
Green Requirement	RoHS 3 (2015/863/EU) compliant, no exemptions, Pb (lead) free	
Humidity	85% RH, +85°C, 48 hours	
Fine Leak / Gross Leak	MIL-STD-883, Method 1014, Condition A and Condition 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}



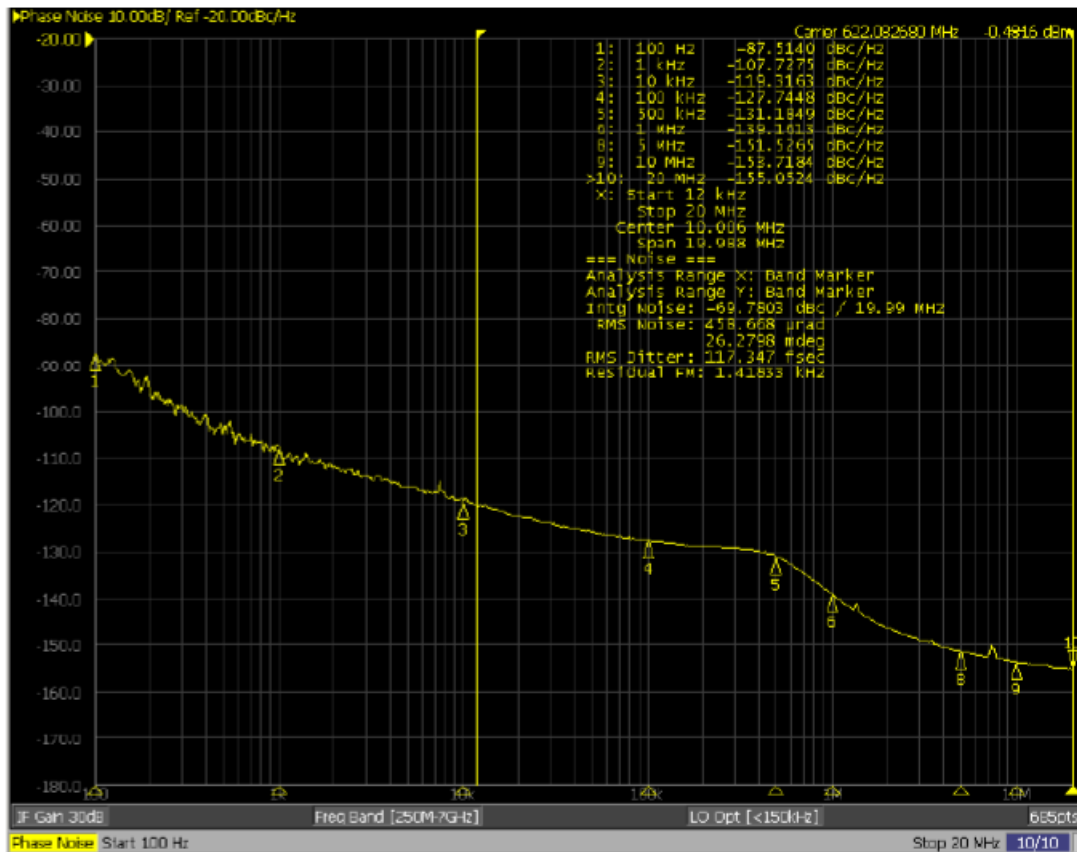


Phase Noise and Phase Jitter Data (typical), $V_{DD} = +3.3V$, LVPECL, Voltage Control = Ground

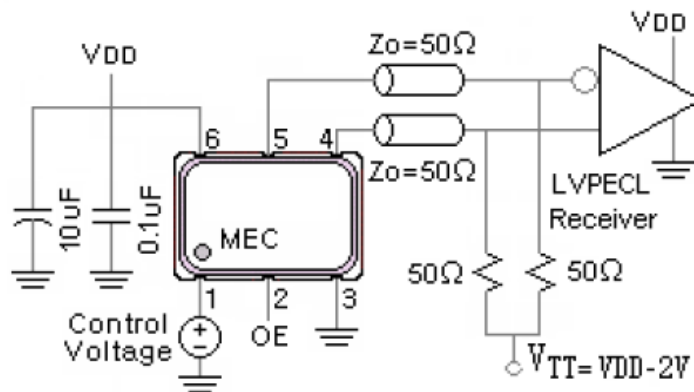
SSB Phase Noise Data (dBc /Hz; typical)	Frequency (MHz) Offset	156.250	491.520	644.530	1480.000	2100.000
	10 Hz	-39	-16	-31	-12	-18
	100 Hz	-74	-48	-58	-54	-49
	1 KHz	-99	-83	-86	-80	-77
	10 KHz	-123	-112	-110	-104	-100
	100 KHz	-139	-128	-126	-119	-116
	1 MHz	-149	-140	-137	-130	-125
	5 MHz	-156	-151	-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



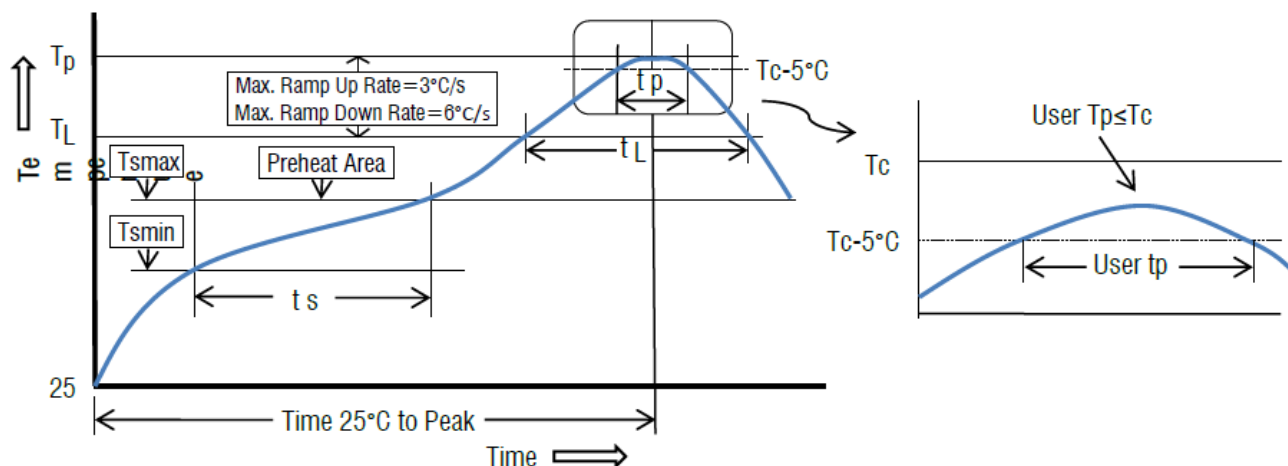


Differential Outputs Terminating Schematics : LVPECL 2.5V





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



Profile Feature	Sn-Pb Eutectic Assembly	Pb-free Assembly
Preheat / Soak		
- Temperature min. (Ts min.)	100°C	150°C
- Temperature max. (Ts max)	150°C	200°C
- Time (ts) (Ts min. to Ts max)	60 to 120 seconds	60 to 180 seconds
Ramp-up rate (TL to TP)	3°C / sec. max	
Liquidous Temperature (TL)	183°C	217°C
Time (tL) maintained above TL	60 to 150 seconds	
Peak package body temperature (TP)	235°C	260°C
Time (TP) within 5°C of the classification temperature TC	10 to 30 seconds	20 to 40 seconds
Ramp-down rate (TP to TL)	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
VCXO5300AJLD1	xx.yyyy	w

Example: VCXO5300AJLD1-100.0000-2 has the following specifications

Operating Frequency = 100.0000 MHz
Frequency Stability = ±50 ppm