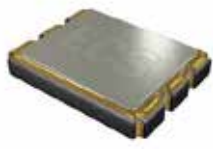


The ECX2-LMV is SMD LVDS Oscillator with MultiVolt™ capability of 2.375 ~ 3.63 V. Lowest in-class RMS jitter (12 KHz to 20 MHz) sub 50 fs at 156.250 MHz.

## OPERATING CONDITIONS / ELECTRICAL CHARACTERISTICS

ECX2-LMV LVDS XO	PARAMETERS	CONDITIONS	ECX2-LMV			UNITS
			MIN	TYP	MAX	
 <p><b>Features</b></p> <ul style="list-style-type: none"> <li>Ultra-low jitter: sub 50 fs at 156.25 MHz</li> <li>RoHS Compliant</li> <li>Tight Stability</li> <li>Wide Supply Voltage</li> <li>Compatible with +2.5V or +3.3V Power Supply</li> <li>Low Power consumption</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>Networking &amp; communications</li> <li>Optical Transceivers</li> <li>Fibre Channel</li> <li>Ethernet/Gbe/SyncE</li> <li>PON</li> <li>Test and measurement</li> </ul>	Frequency Range		100.000		320.000	MHz
	* Frequency Stability	-40 ~ +85°C (CN Opt)			±25	ppm
	Supply Voltage		2.375		3.63	V
	Input Current	Pin 1 Open or ViH			24	mA
	Stand-by Current	Pin 1 ViL			30	µA
	Symmetry	@ crossing point		45/55		%
	Rise & Fall time	20% Vdd – 80% Vdd			0.3	nS
	“0” Level	VOL	0.9	+1.10		V
	“1” Level	VOH		+1.43	+1.6	V
	Output Load	LVDS			100	Ω
	Differential Output Voltage		0.247	0.33	0.454	mV
	Differential Output error				50	mV
	Output offset voltage		0.247	0.33	0.454	mV
	Output offset error				50	mV
	Start Up Time				10	mS
	Disable delay time				200	ns
	Enable delay time				2	ms
	Aging	1 <sup>st</sup> year			±5	ppm
RMS Jitter (12 kHz to 20 MHz Band)	@ 156.25 MHz 3.3V		46.8	60	fs	
Operating Temp*	(N Opt)	-40		+85	°C	
Storage Temp		-55		+125	°C	

## PART NUMBERING GUIDE: Example ECX2-LMV-3CN-156.250-TR

SERIES	Package Size (mm)	Stability	Temp Range	Frequency	PACKAGING
ECX2-LMV LVDS, Ultra Low Jitter MultiVolt™ Oscillator	3 = 3.2 x 2.5 5 = 5 x 3.2 7 = 7 x 5	A = ±100 ppm B = ±50 ppm C = ±25 ppm ** D = ±20 ppm	M = -20 ~ +70°C N = -40 ~ +85°C	156.250 MHz	-TR = Tape & Reel

\* Frequency Stability includes initial tolerance, temperature, supply voltage and load change reflow frequency shift.

\*\* Contact ECS for availability over -40 ~ +85°C.

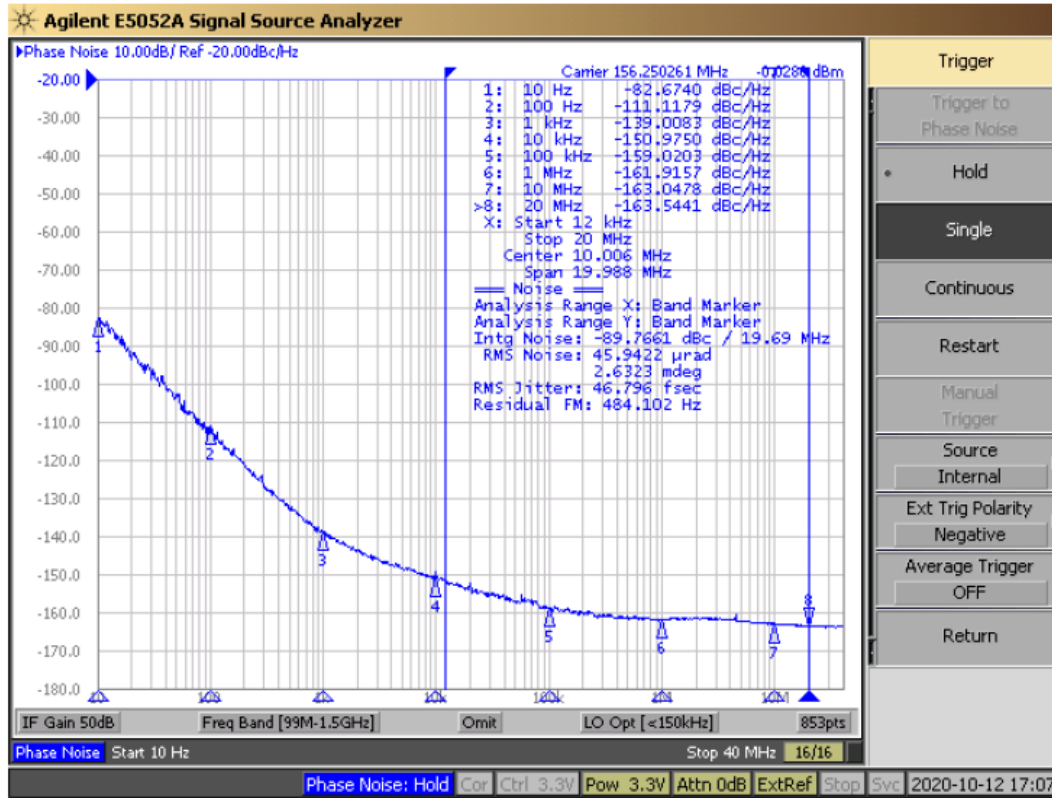


# ECX2-LMV

SMD MultiVolt™ LVDS, low jitter  
Crystal Oscillator



## Typical Phase noise/Jitter



SSB Phase Noise Data (dBc/Hz typical)	Frequency (offset)	100.000	125.000	156.250	200.000	285.714	312.500
	10 Hz	-89.3	-76.7	-82.6	-74.0	-52.57	-45.2
100 Hz	-118.2	-106.7	-111.1	-103.8	-84.2	-80.2	
1 KHz	-140.3	-135.6	-139.0	-130.7	-118.6	-112.7	
10 KHz	-154.2	-153.5	-150.9	-150.0	-146.4	-142.5	
100 KHz	-160.0	-159.7	-159.0	-158.4	-156.1	-153.8	
1 MHz	-162.6	-162.6	-161.9	-162.6	-160.5	-158.3	
10 MHz	-163.0	-163.0	-163.0	-163.9	-161.9	-159.4	
20 MHz	-163.2	-163.3	-163.5	-164.0	-162.3	-159.7	
<b>RMS Phase Jitter 12 KHz ~ 20 MHz</b>		70.9 fs	56.9 fs	46.8 fs	33 fs	29.1 fs	35.2 fs

Table 1) Typical Phase Noise/Jitter

# ECX2-LMV

SMD MultiVolt™ LVDS, low jitter  
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## DIMENSIONS (mm)

### 3 = 3.2 x 2.5 Pkg

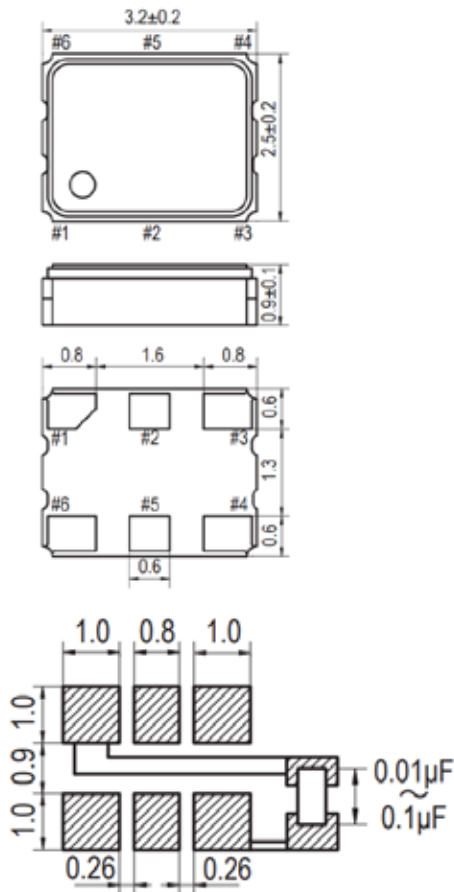


Figure 1) Top, Side, Bottom & Land

### 5 = 5 x 3.2 Pkg

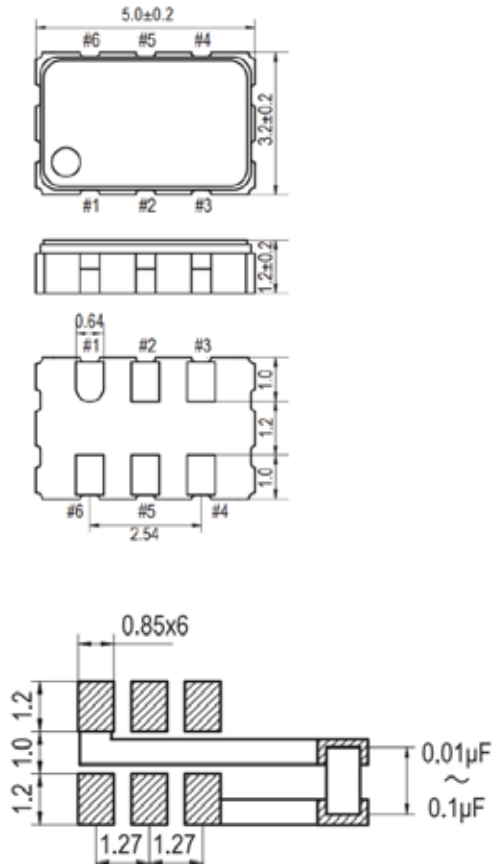


Figure 2) Top, Side, Bottom & Land

### 7 = 7 x 5 Pkg

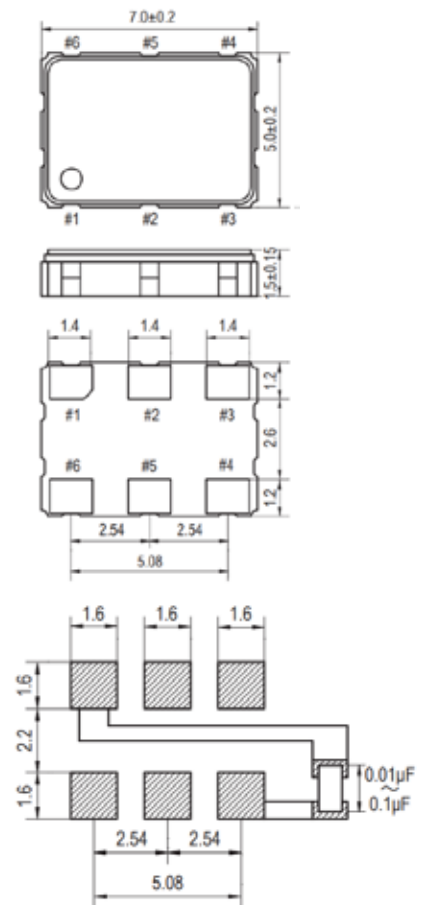


Figure 3) Top, Side, Bottom & Land

PIN	CONNECTIONS	
1	"L"	OPEN or "H"
2		NC
3		Gnd
4	Z	OUTPUT
5	Z	C-OUTPUT
6		VDD

Z : High Impedance

# ECX2-LMV

SMD MultiVolt™ LVDS, low jitter  
Crystal Oscillator

## SOLDER PROFILE

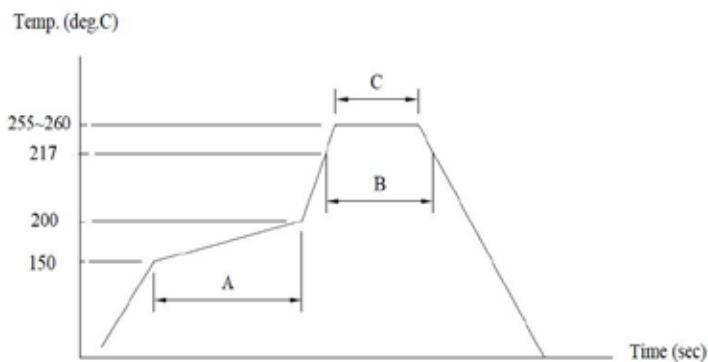
Peak solder Temp +260°C ±5°C 10 ±5 Sec Max.

2 Cycles Max.

MSL 1, Lead Finish Au

## Develop Frequencies

100.000 MHz
125.000 MHz
156.250 MHz
200.000 MHz
285.714 MHz
312.500 MHz

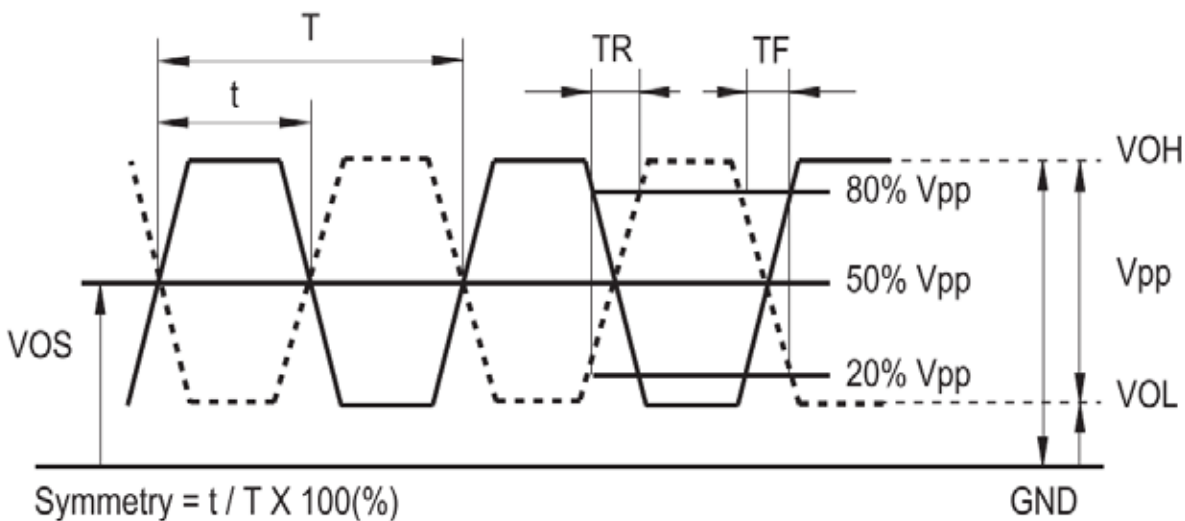


- (A)→Preheating area : 150~200°C, 60~120sec.
- (B)→Heating area : 217°C, 60~150sec.
- (C)→Peak temperature : 255~260°C, 30sec. Max.
- Ramp-up rate (217→260°C) : 3°C/sec. Max.
- Ramp-down rate (260→217°C) : 6°C/sec. Max.
- Time 25°C→260°C : 480sec. Max.

\*Reference JEDEC J-STD-020

Figure 4) Suggested Reflow Profile

## OUTPUT WAVEFORM

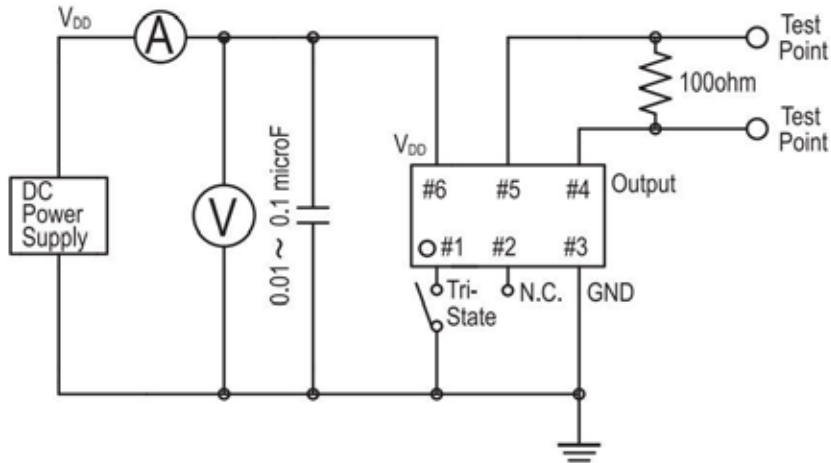


# ECX2-LMV

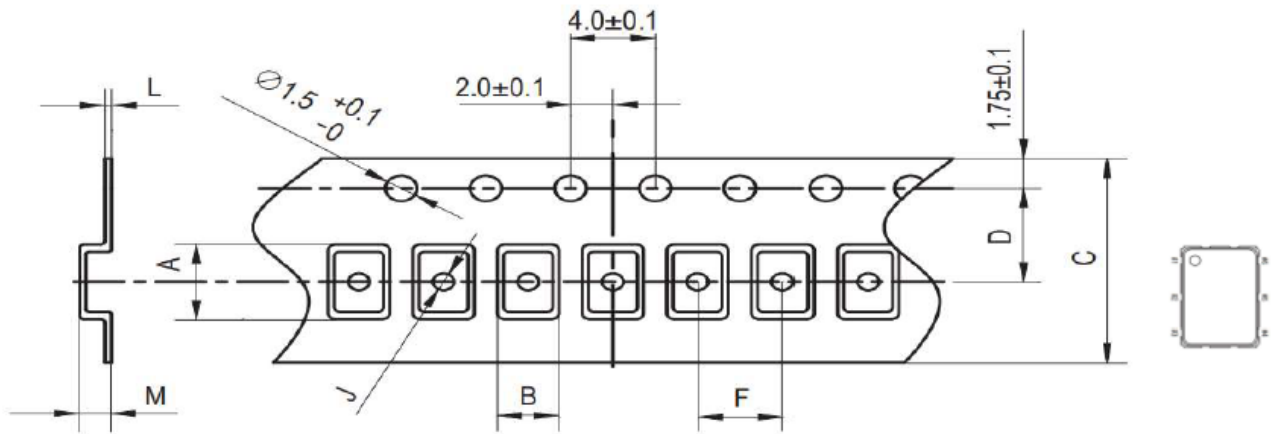
SMD MultiVolt™ LVDS, low jitter  
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## TEST CIRCUIT



## POCKET TAPE DIMENSIONS (mm)



Pkg	A	B	C	D	F	J	L	M	Reel Dia
3.2 x 2.5	3.5	2.8	8.0	3.5	4.0	1.0	0.25	1.4	180 mm
5 x 3.2	5.4	3.5	12.0	5.5	8.0	1.5	0.30	1.4	180 mm
7 x 5	7.4	5.4	16.0	7.5	8.0	1.5	0.30	1.9	180 mm