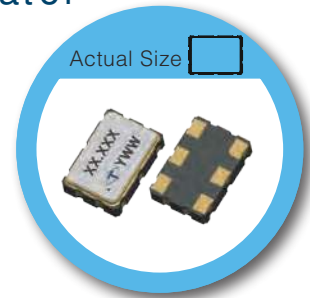


# OA-U Type Ultra low noise Crystal Oscillator

## 3.2 x 2.5 x 0.9 mm SMD package (RMS jitter : 50fs typical)



### FEATURE

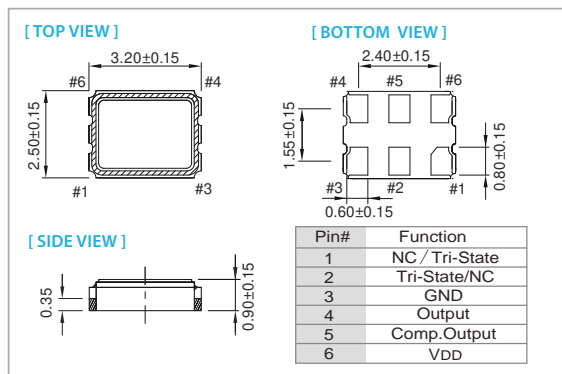
- Typical 3.2 x 2.5 x 0.9mm ceramic SMD package.
- Ultra low integrated phase jitter < 100fs, 12kHz to 20MHz
- Typical phase jitter 50fs @ 156.25MHz
- Differential output level : LVPECL /LVDS/HCSL
- Operation supply voltage: 1.8V, 2.5V and 3.3V
- Pb-free/RoHS compliant

### TYPICAL APPLICATION

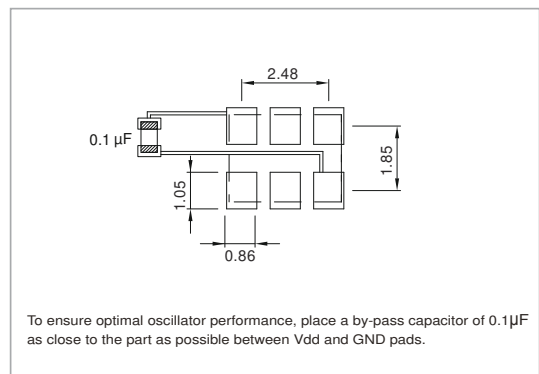
- 40Gbit/100Gbit Ethernet, MAN, SONET
- Fiber Channel
- Test Instrumentation

**RoHS Compliant**

### DIMENSION (mm)



### SOLDER PAD LAYOUT (mm)



### ELECTRICAL SPECIFICATION

Parameter	LVPECL				Unit	
	3.3V		2.5V			
	Min.	Max.	Min.	Max.		
Supply Voltage Variation (V <sub>DD</sub> )	V <sub>DD</sub> -10%	V <sub>DD</sub> +10%	V <sub>DD</sub> -5%	V <sub>DD</sub> +5%	V	
Frequency range	100	220	100	220	MHz	
Standard frequency	100, 125, 156.25				MHz	
Power current consumption:	-	65	-	65	mA	
Output Level	Output High	2.215	2.42	1.415	1.64	V
	Output Low	1.49	1.68	0.69	1.88	V
Transition Time	Rise Time	-	0.4	-	0.4	nSec
	Fall Time	-	0.4	-	0.4	nSec
Duty Cycle	45	55	45	55	%	
Start-up Time	-	5	-	5	mSec	
Tri-State	Output Enable	0.7 x V <sub>DD</sub>	-	0.7 x V <sub>DD</sub>	-	V
	Output Disable	-	0.3 x V <sub>DD</sub>	-	0.3 x V <sub>DD</sub>	
Stand by Current	-	30	-	30	µA	
Output Loading	50Ω, V <sub>DD</sub> -2V					
Phase Noise						
@ V <sub>DD</sub> =3.3V 156.25MHz	offset 10kHz	Typ.: -150		Typ.: -150		dBc/Hz
	offset 100kHz	Typ.: -155		Typ.: -155		dBc/Hz
	offset 1MHz	Typ.: -160		Typ.: -160		dBc/Hz
RMS Phase Jitter Integrated 12KHz to 20MHz @156.25MHz	-	0.1	-	0.1	pSec	
Aging (@ 25°C, First Year)	±3		±3		°C	
Storage Temp. Range	-55	125	-55	125	°C	

**Note: not all combination of options are available. Other specifications may be available upon request.**

Specifications subject to change without notice.

Parameters		LVDS						Unit
		3.3V		2.5V		1.8V		
		Min.	Max.	Min.	Max.	Min.	Max.	
Supply Voltage Variation (V <sub>DD</sub> )		V <sub>DD</sub> -10%	V <sub>DD</sub> +10%	V <sub>DD</sub> -5%	V <sub>DD</sub> +5%	V <sub>DD</sub> -5%	V <sub>DD</sub> +5%	V
Frequency range		100	175	100	175	100	175	MHz
Standard frequency		100, 125, 156.25						MHz
Power current consumption:		-	35	-	35	-	25	mA
Output Level								
Differential output (V <sub>OD</sub> , OUT-OUTN)		0.24	0.45	0.24	0.45	0.24	0.45	V
Output High		-	1.6	-	1.6	-	1.6	V
Output Low		0.9	-	0.9	-	0.9	-	V
Transition Time	Rise Time	-	0.3	-	0.3	-	0.4	nSec
	Fall Time	-	0.3	-	0.3	-	0.4	nSec
Duty Cycle		45	55	45	55	45	55	%
Start-up Time		-	5	-	5	-	5	mSec
Tri-State	Output Enable	0.7 x V <sub>DD</sub>	-	0.7 x V <sub>DD</sub>	-	0.7 x V <sub>DD</sub>	-	V
	Output Disable	-	0.3 x V <sub>DD</sub>	-	0.3 x V <sub>DD</sub>	-	0.3 x V <sub>DD</sub>	
Stand by Current		-	30	-	30	-	30	uA
Output Loading		100						Ω
Phase Noise								
@ V <sub>DD</sub> =3.3V 156.25MHz	offset 10kHz	Typ.: -150		Typ.: -150		Typ.: -150		dBc/Hz
	offset 100kHz	Typ.: -155		Typ.: -155		Typ.: -155		dBc/Hz
	offset 1MHz	Typ.: -160		Typ.: -160		Typ.: -160		dBc/Hz
RMS Phase Jitter Integrated 12KHz to 20MHz @156.25MHz		-	0.1	-	0.1	-	0.1	pSec
Aging (@ 25°C, First Year)		±3		±3		±3		ppm
Storage Temp. Range		-55	125	-55	125	-55	125	°C

Parameter		HCSL						Unit
		3.3V		2.5V		1.8V		
		Min.	Max.	Min.	Max.	Min.	Max.	
Supply Voltage Variation (V <sub>DD</sub> )		V <sub>DD</sub> -10%	V <sub>DD</sub> +10%	V <sub>DD</sub> -5%	V <sub>DD</sub> +5%	V <sub>DD</sub> -5%	V <sub>DD</sub> +5%	V
Frequency range		100	135	100	135	100	135	MHz
Standard frequency		100, 125, 156.25						MHz
Power current consumption:		-	46	-	46	-	46	mA
Output Level								
Output High		0.6	0.9	0.6	0.9	0.5	1.0	V
Output Low		-0.15	0.15	-0.15	0.15	-0.15	0.15	V
Transition Time	Rise Time	-	0.6	-	0.6	-	0.6	nSec
	Fall Time	-	0.6	-	0.6	-	0.6	nSec
Duty Cycle		45	55	45	55	45	55	%
Start-up Time		-	5	-	5	-	5	mSec
Tri-State	Output Enable	0.7 x V <sub>DD</sub>	-	0.7 x V <sub>DD</sub>	-	0.7 x V <sub>DD</sub>	-	V
	Output Disable	-	0.3 x V <sub>DD</sub>	-	0.3 x V <sub>DD</sub>	-	0.3 x V <sub>DD</sub>	
Stand by Current		-	30	-	30	-	30	uA
Output Loading		50 (To GND)						Ω
Phase Noise								
offset 10kHz		Typ.: -150		Typ.: -150		Typ.: -150		dBc/Hz
offset 100kHz		Typ.: -155		Typ.: -155		Typ.: -155		dBc/Hz
offset 1MHz		Typ.: -160		Typ.: -160		Typ.: -160		dBc/Hz
RMS Phase Jitter Integrated 12KHz to 20MHz @156.25MHz		-	0.1	-	0.1	-	0.1	pSec
Aging (@ 25°C, First Year)		±3		±3		±3		ppm
Storage Temp. Range		-55	125	-55	125	-55	125	°C

**Note: not all combination of options are available. Other specifications may be available upon request.**

### FREQ. STABILITY vs. TEMP. RANGE

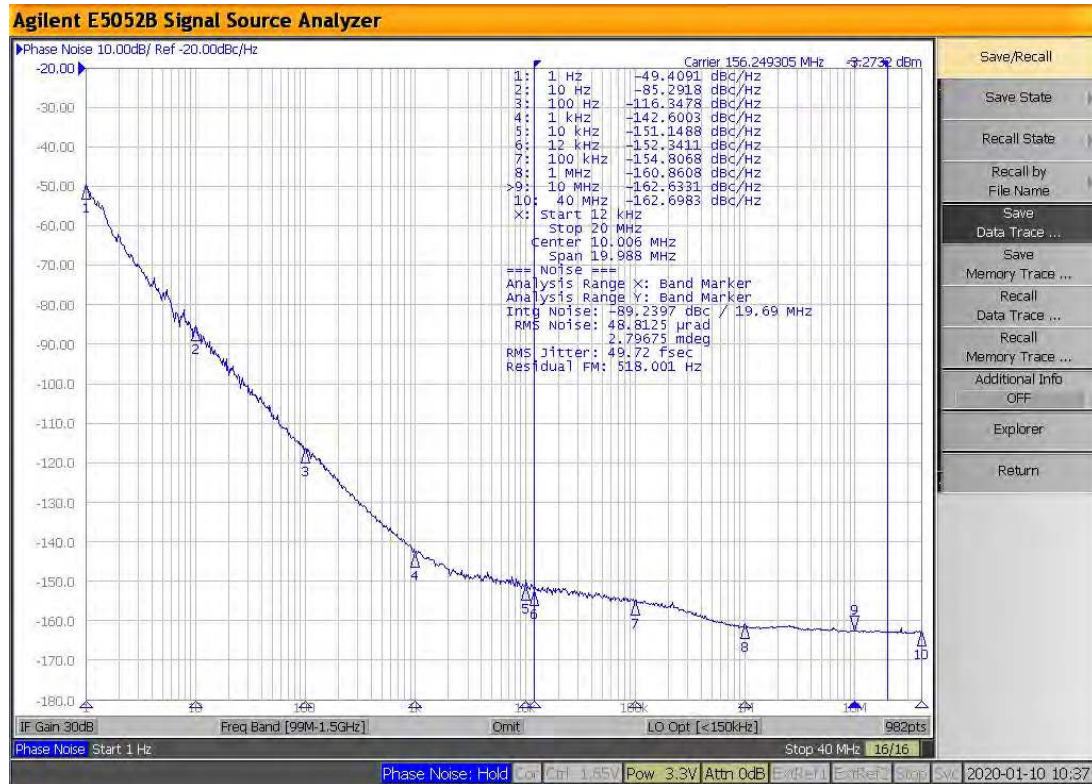
Temp. (°C) \ ppm	± 20	± 25	± 50
-10 ~ +60	O	O	O
-20 ~ +70	O	O	O
-40 ~ +85	Δ	O	O
-40 ~ +105	X	X	O
-40 ~ +125	X	X	Δ

\* O : Available Δ: Conditional X: Not available

\* Inclusive of calibration @ 25 °C, operating temperature range, input voltage variation, load variation, aging (1<sup>st</sup> year), shock, and vibration

### Phase Noise Test Data

Output level: LVPECL, Fout=156.25MHz, VDD=3.3V, Ta=25°C



**Note: not all combination of options are available. Other specifications may be available upon request.**

Specifications subject to change without notice.