

OA Type

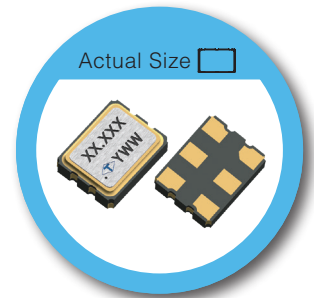
3.2 x 2.5 mm SMD LVPECL/LVDS/ HCSL Crystal Oscillator

FEATURE

- Conforms to AEC-Q200
- Industry Standard 3.2 x 2.5 x 0.9 hermetically sealed ceramic package.
- Very low jitter performance: typical 0.15 pS RMS from 12 kHz - 20 MHz.
- Fundamental/3rd overtone crystal design.
- Output frequency up to 220 MHz.
- Tri-state enable/disable
- Up to 125°C operating temperature range.

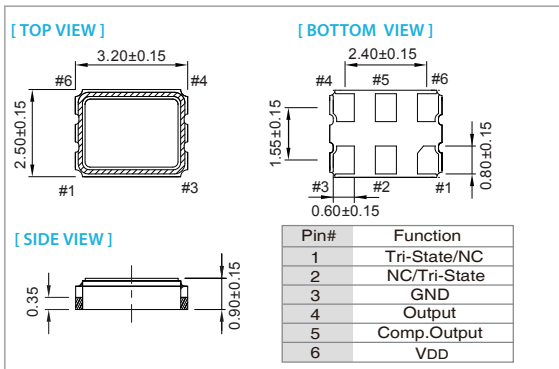
TYPICAL APPLICATION

- 10Gbit Ethernet, Fiber Channel, Storage Area Network, SONET
- Enterprise Servers, Reference clocks for ADC and DAC
- Telecom

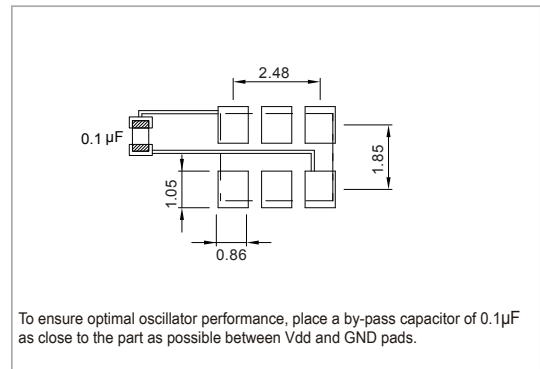


RoHS Compliant

DIMENSION (mm)



SOLDER PAD LAYOUT (mm)



ELECTRICAL SPECIFICATION

Parameter	LVPECL				Unit	
	3.3V		2.5V			
	Min.	Max.	Min.	Max.		
Supply Voltage Variation (V _{DD})	V _{DD} -10%	V _{DD} +10%	V _{DD} -5%	V _{DD} +5%	V	
Frequency range	13.5	220	13.5	220	MHz	
Standard frequency	100, 125, 156.25				MHz	
Power current consumption:	-	55	-	55	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	-	0.6	-	0.6	nSec
	Fall Time	-	0.6	-	0.6	nSec
Duty Cycle		45	55	45	55	%
Start-up Time		-	10	-	10	mSec
Tri-State	Output Enable	0.7 x V _{DD}	-	0.7 x V _{DD}	-	V
	Output Disable	-	0.3 x V _{DD}	-	0.3 x V _{DD}	V
Stand by Current		-	10	-	10	µA
Output Loading	50 Ω, V _{DD} -2V					
Phase Noise						
@ VDD=3.3V 156.25MHz	offset 10kHz	Typ.: -143		Typ.: -145		dBc/Hz
	offset 100kHz	Typ.: -151		Typ.: -154		dBc/Hz
	offset 1MHz	Typ.: -155		Typ.: -155		dBc/Hz
RMS Phase Jitter						
Integrated 12KHz to 20MHz @3.3V						
	13.5MHz ~ 80MHz	-	1	-	1	pSec
	80MHz ~ 220MHz	-	0.3	-	0.3	pSec
Aging (@ 25°C, First Year)		±3		±3		ppm
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 _{DD})	V _{DD} -10%	V _{DD} +10%	V _{DD} -5%	V _{DD} +5%	V _{DD} -5%	V _{DD} +5%	V	
Frequency range	13.5	220	13.5	220	13.5	220	MHz	
Standard frequency	100, 125, 156.25						MHz	
Power current consumption:	-	35	-	30	-	20	mA	
Output Level								
Differential output (V _{OD} , 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	-	0.5	nSec
	Fall Time	-	0.3	-	0.3	-	0.5	nSec
Duty Cycle	45	55	45	55	45	55	%	
Start-up Time	-	5	-	5	-	10	mSec	
Tri-State	Output Enable	0.7 x V _{DD}	-	0.7 x V _{DD}	-	0.7 x V _{DD}	-	V
	Output Disable	-	0.3 x V _{DD}	-	0.3 x V _{DD}	-	0.3 x V _{DD}	
Stand by Current	-	10	-	10	-	10	uA	
Output Loading	100 Ω (Between OUT & OUTN)						Ω	
Phase Noise								
@ VDD=3.3V	offset 10kHz	Typ.: -145		Typ.: -145		Typ.: -142	dBc/Hz	
156.25MHz	offset 100kHz	Typ.: -153		Typ.: -153		Typ.: -150	dBc/Hz	
	offset 1MHz	Typ.: -155		Typ.: -155		Typ.: -153	dBc/Hz	
RMS Phase Jitter								
Integrated 12KHz to 20MHz @3.3V	-	0.3	-	0.3	-	0.3	pSec	
Aging (@ 25°C, First Year)	±3		±3		±3		ppm	
Storage Temp. Range	-55	125	-55	125	-55	125	°C	

Parameter	HCSSL						Unit	
	3.3V		2.5V		1.8V			
	Min.	Max.	Min.	Max.	Min.	Max.		
Supply Voltage Variation (V _{DD})	V _{DD} -10%	V _{DD} +10%	V _{DD} -5%	V _{DD} +5%	V _{DD} -5%	V _{DD} +5%	V	
Frequency range	100	135	100	135	100	135	MHz	
Standard frequency	100, 125, 156.25						MHz	
Power current consumption:	-	42	-	42	-	30	mA	
Output Level								
Output High	0.6	0.9	0.6	0.9	0.55	1.0	V	
Output Low	-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	-	10	-	10	-	10	mSec	
Tri-State	Output Enable	0.7 x V _{DD}	-	0.7 x V _{DD}	-	0.7 x V _{DD}	-	V
	Output Disable	-	0.3 x V _{DD}	-	0.3 x V _{DD}	-	0.3 x V _{DD}	
Stand by Current	-	10	-	10	-	10	uA	
Output Loading	50 to GND						Ω	
Phase Noise								
@ VDD=3.3V	offset 10kHz	Typ.: -145		Typ.: -145		Typ.: -142	dBc/Hz	
156.25MHz	offset 100kHz	Typ.: -153		Typ.: -153		Typ.: -150	dBc/Hz	
	offset 1MHz	Typ.: -155		Typ.: -155		Typ.: -153	dBc/Hz	
RMS Phase Jitter								
Integrated 12KHz to 20MHz @3.3V	-	0.3	-	0.3	-	0.3	pSec	
Aging (@ 25°C, First Year)	±3		±3		±3		ppm	
Storage Temp. Range	-55	125	-55	125	-55	125	°C	

Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position.
 + Transition times are measured between 20% and 80%

FREQ. STABILITY vs. TEMP. RANGE

Temp. (°C)	ppm	
	±25	±50
-20 ~ +70	○	○
-40 ~ +85	○	○
-40 ~ +105	×	○
-40 ~ +125	×	△

* ○: Available △: Conditional X: Not available

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

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