

OW Type

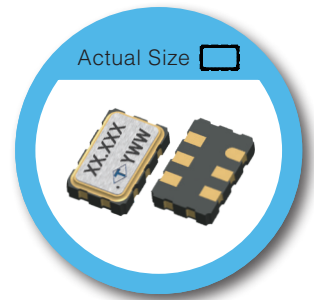
5.0 x 3.2 mm SMD LVPECL/LVDS/HCSL Crystal Oscillator

FEATURE

- Typical 5.0 x 3.2 x 1.25 mm hermetically sealed ceramic package.
- Very low jitter performance: typical 0.15 pS RMS from 12 k - 20 MHz.
- Fundamental/3rd overtone crystal design.
- Output frequency up to 220 MHz.
- Operating temperature up to 125°C
- Tri-state enable/disable

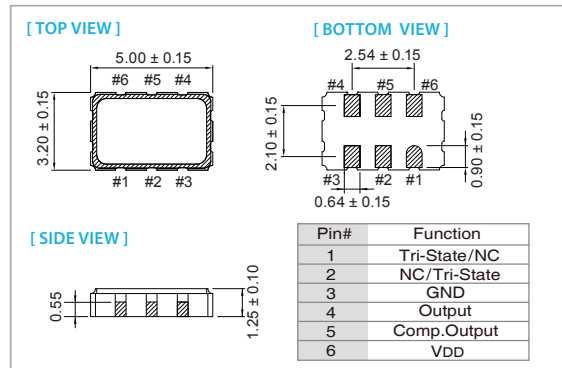
TYPICAL APPLICATION

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

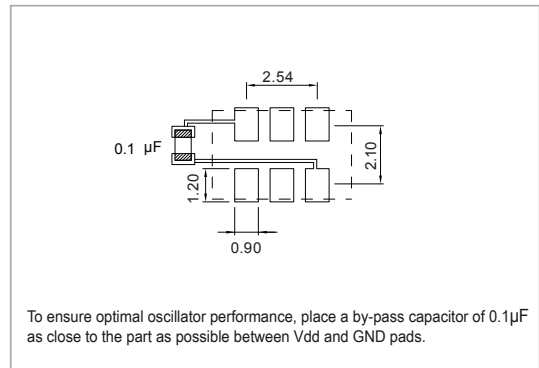


RoHS Compliant

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}	
Stand by Current	-	10	-	10	uA	
Output Loading	50 Ω, V _{DD} -2V					
Phase Noise						
@ VDD=3.3V	offset 10kHz	Typ.: -143		Typ.: -145		dBc/Hz
	offset 100kHz	Typ.: -151		Typ.: -154		
	offset 1MHz	Typ.: -155		Typ.: -155		
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.

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.

Specifications subject to change without notice.