

OA Type

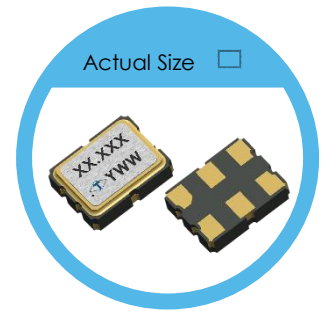
3.2 x 2.5 mm SMD Differential Output Crystal Oscillator

FEATURES

- Conforms to AEC-Q100/AEC-Q200
- Industry Standard 3.2 x 2.5 x 0.9mm Hermetically Sealed Ceramic Package
- Low Jitter Performance: Typical 0.15pS RMS from 12kHz - 20MHz
- Fundamental/3rd Overtone Crystal Design
- Output Frequency up to 220MHz
- Tri-State Enable/Disable

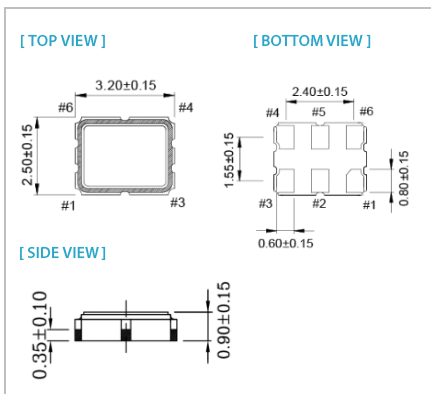
TYPICAL APPLICATION

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

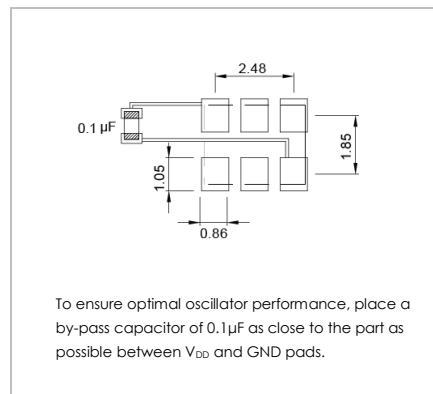


RoHS Compliant

DIMENSION (mm)



SOLDER PAD LAYOUT (mm)



PIN FUNCTION (mm)

PIN#	FUNCTION
1	Tri-State/NC
2	NC/Tri-State
3	GND
4	Output
5	Comp. Output
6	V_{DD}

ELECTRICAL SPECIFICATION

Parameter	LVPECL				Unit	Test Condition	
	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	Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position.	
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	0.88	V	
Transition Time	Rise Time		0.6		0.6	nSec	Transition times are measured between 20% and 80%
	Fall Time		0.6		0.6	nSec	
Duty Cycle	45	55	45	55	%		
Startup Time		10		10	mSec		
Tri-State	Enable	$0.7 \times V_{DD}$		$0.7 \times V_{DD}$		V	
	Disable		$0.3 \times V_{DD}$		$0.3 \times V_{DD}$	V	
Stand by Current		10		10	mA		
Output Loading	50 Ω , $V_{DD} - 2V$						
RMS Phase Jitter Integrated 12 kHz~20 MHz @ 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		
Phase Noise	Typ.	Max.	Typ.	Max.			
At $V_{DD}=3.3V$, $f_{out}=156.25MHz$	10kHz offset	-143		-145		dBc/Hz	
	100kHz offset	-151		-154		dBc/Hz	
	1MHz offset	-155		-155		dBc/Hz	

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

Specifications subject to change without notice.

Parameter	LVDS						Unit	Test Condition	
	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	Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position.	
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	Transition times are measured between 20% and 80%
	Fall Time		0.3		0.3		0.5	nSec	
Duty Cycle		45	55	45	55	45	55	%	
Startup Time			5		5		10	mSec	
Tri-State	Enable	0.7 x V _{DD}		0.7 x V _{DD}		0.7 x V _{DD}		V	
	Disable		0.3 x V _{DD}		0.3 x V _{DD}		0.3 x V _{DD}	V	
Stand by Current		10		10		10	µA		
Output Loading	100Ω (Between OUT & OUTN)						Ω		
RMS Phase Jitter Integrated 12 kHz~20 MHz @ 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	
Phase Noise		Typ.	Max.	Typ.	Max.	Typ.	Max.		
At V _{DD} =3.3V, f _{out} =156.25MHz	10kHz offset	-145		-145		-142		dBc/Hz	
	100kHz offset	-153		-153		-150		dBc/Hz	
	1MHz offset	-155		-155		-153		dBc/Hz	

Parameter	HCSL						Unit	Test Condition	
	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	Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position.	
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	0.15	V	
Transition Time	Rise Time		0.6		0.6		0.6	nSec	Transition times are measured between 20% and 80%
	Fall Time		0.6		0.6		0.6	nSec	
Duty Cycle		45	55	45	55	45	55	%	
Startup Time			10		10		10	mSec	
Tri-State	Enable	0.7 x V _{DD}		0.7 x V _{DD}		0.7 x V _{DD}		V	
	Disable		0.3 x V _{DD}		0.3 x V _{DD}		0.3 x V _{DD}	V	
Stand by Current		10		10		10	µA		
Output Loading	50 to GND						Ω		
RMS Phase Jitter Integrated 12 kHz~20 MHz @ 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	
Phase Noise		Typ.	Max.	Typ.	Max.	Typ.	Max.		
At V _{DD} =3.3V, f _{out} =156.25MHz	10kHz offset	-145		-145		-142		dBc/Hz	
	100kHz offset	-153		-153		-150		dBc/Hz	
	1MHz offset	-155		-155		-153		dBc/Hz	

FREQ. STABILITY vs. TEMP. RANGE

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

○: 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.

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