VX-501

Voltage Controlled Crystal Oscillator

Features

- AT-Cut Crystal
- Surface Mount FR4 based package
- Reflow Process Compatible
- Low Phase Noise
- Tight Stabilities
- Frequency Range 1 - 1200MHz
- Standard Frequencies 10; 16,384; 30,72; 32,768; 38,88; 44.8; 52; 61.44; 68.736; 76.8; 77.76; 81.92; 92.16;100; 112; 122.88; 125; 134.4; 153.6; 155.52; 160; 179.2; 184.32; 195; 208; 245.76; 320; 368.64; 400; 448; 471.8592; 491.52; 622.08; 640
- 672; 737.28; 800; 832; 1000; 1040; 1200.1MHz
- Previous Model Number: C5310

Applications

- Base Stations
- Test Equipment
- Synthesizers
- Switching

Performance Specifications

Frequency Stabilities[1]						
Parameter	Min	Typical	Max	Units	Condition[2]	
vs. operating temperature range (referenced to +25°C)	-15		+15	ppm	-20 to +70°C	
Initial tolerance vs. supply voltage change vs. load change vs. aging / 1 Year vs. aging (following years)	-10 -3 -1 -3 -1		+10 +3 +1 +3 +1	ppm ppm ppm ppm ppm	@Vc=Vs/2 V_S ±5% Load ±10%	
vs. operating temperature range (referenced to +25°C)	-30		+30	ppm	-40 to +85°C	Options[5]
Initial tolerance vs. supply voltage change vs. load change vs. aging / 1 Year vs. aging (following years)	-15 -3 -2 -3 -1		+15 +3 +2 +3 +1	ppm ppm ppm ppm ppm	@Vc=Vs/2 V_S ±5% Load ±10%	

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Performance Specifications

Parameter	Min	Typical	Max	Units	Condition[2]	
Supply Voltage (Vs)						
Supply voltage (standard)	3.135	3.3	3.465	VDC		Options[5]
Current consumption			40	mA	@ HCMOS, Sinewave	
Current consumption			90	mA	@ PECL, LVDS	
Supply voltage	4.75	5	5.25	VDC		
Current consumption			30	mA	@ HCMOS, Sinewave	
Current consumption			80	mA	@ PECL, LVDS	
RF Output						
Signal	HCMOS					Options[5]
Load		15		pF		
Rise and Fall time			5	ns	@ 15 pF 10 to 90%	
Duty cycle	40		60	%	@ Vs / 2	
Signal	PECL					
Load		50		Ω		
Rise and Fall time			1	ns	20 to 80%	
Duty cycle	45		55	%		
Signal	LVDS					
Load		100		Ω		
Rise and Fall time			1	ns	10 to 90%	
Duty cycle	40		60	%		
Signal	Sinewave					
Load		50		Ω		
Output Power	-3	0	3	dBm		
Frequency Tuning (EFC)						
Tuning Range	±75.0	±90	±200.0	ppm		
Linearity	10 %					
Tuning Slope	Positive					
Control Voltage Range	0 0.5	1.65 2.5	3.3 4.5	VDC VDC	with Vs = 3.3V with Vs = 5V	
Frequency Control Input Impedance	10			kΩ		
Additional Parameters						
Phase Noise Jitter		-78 -110 -138 -155 -161 0.2		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz ps RMS	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz @ 12kHz .. 20MHz	@100MHz LVCMOS 3.3V
Phase Noise Jitter		-75 -105 -130 -145 -153 0.1		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz ps RMS	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz @ 12kHz .. 20MHz	@ 153.6 MHz PECL 3.3V
Phase Noise Jitter		-59 -90 -118 -137 -144 0.1		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz ps RMS	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz @ 12kHz .. 20MHz	@ 300 MHz LVDS 3.3V
Phase Noise Jitter		-60 -95 -121 -141 -150 0.03		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz ps RMS	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz @ 12kHz .. 20MHz	@ 491.52 MHz PECL 3.3V

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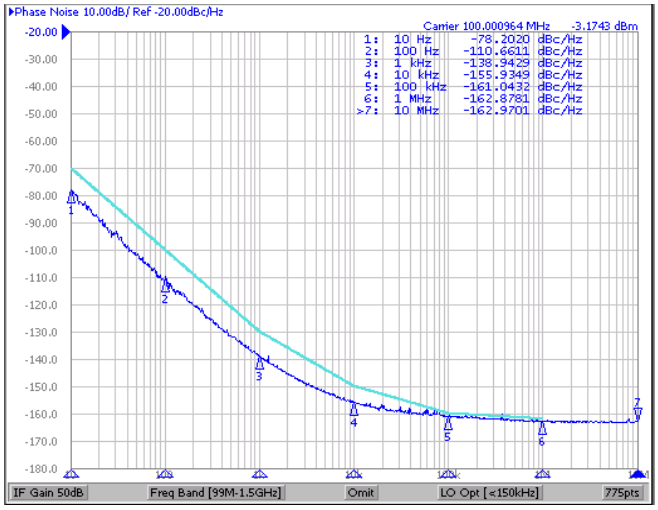
Performance Specifications

Additional Parameters					
Subharmonics			-40	dBc	For f > 160 MHz
Weight			2.0 g		
Processing & Packing	Handling & Processing Note				
Absolute Maximum Ratings					
Supply voltage (Vs)			6.0	V	
Operable Temperature Range	-40		+85	°C	
Storage Temperature Range	-40		+95	°C	

Typical Phase Noise and Jitter

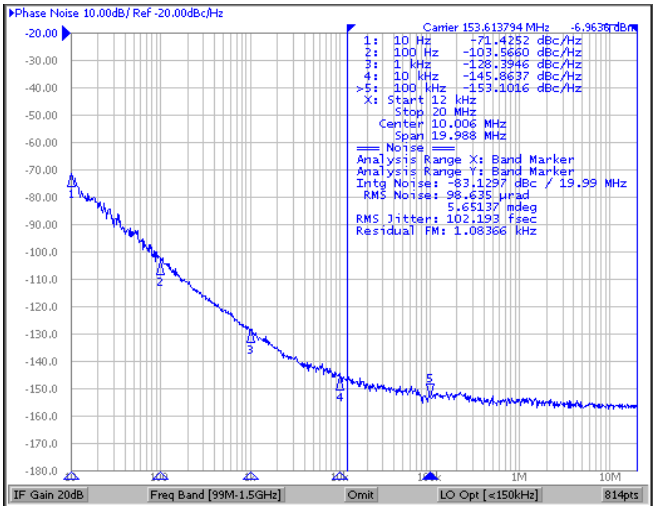
Phase Noise

VX-501 @ 100 MHz LVCMOS



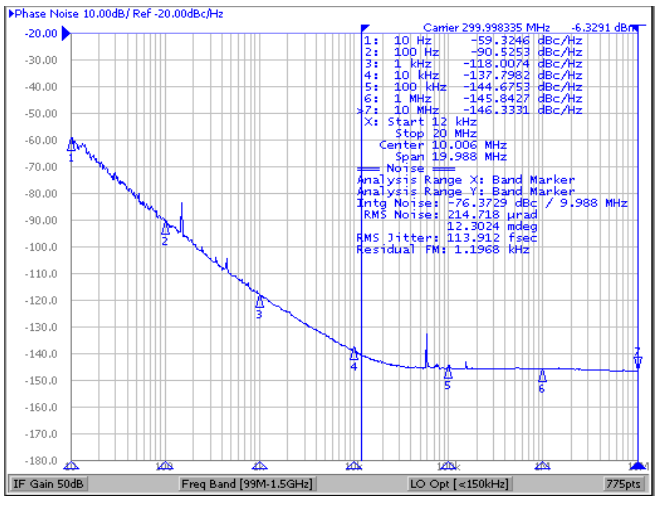
Phase Noise

VX-501 @ 153.6 MHz LVPECL



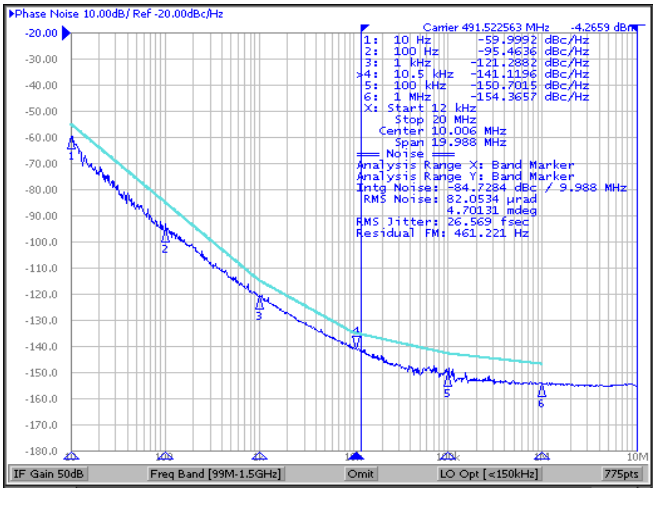
Phase Noise

VX-501 @ 300 MHz LVDS



Phase Noise

VX-501 @ 491.52 MHz LVPECL



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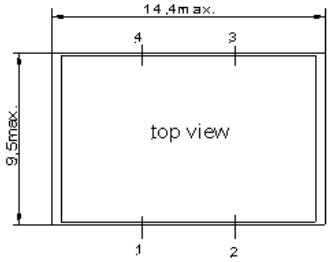
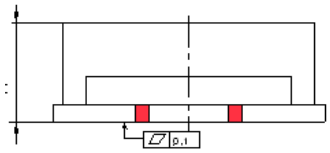
Enclosure

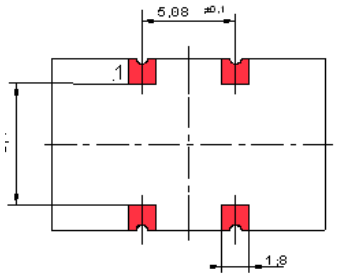
Package Codes	
Type	Height "H"
G223B	5.9

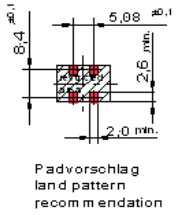
Package Codes	
Type	Height "H"
G218B	5.9
G218E	4.7
G218C	2.8



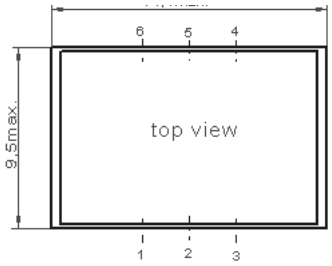
G 223



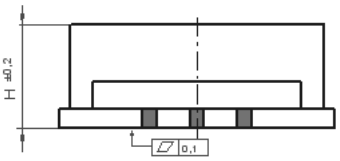


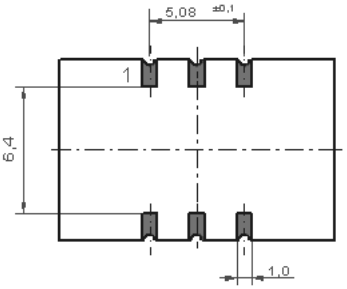


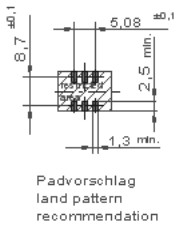
Padvorschlag
land pattern
recommendation



G 218







Padvorschlag
land pattern
recommendation

Pin Connections	
1	Control Voltage (Vc)
2	Ground
3	RF Output
4	Supply Voltage Input (Vs)

Pin Connections	
1	Control Voltage (Vc)
2	N.C. / Enable (Option)
3	Ground
4	RF Output
5	RF Output complementary (PECL / LVDS) N.C. (CMOS)
6	Supply Voltage Input (Vs)

Marking
VX-501-xxxx
Frequency
● AYYWW

Enable true table (optional)				
	HCMOS		LVPECL / LVDS	
Pin 2	Pin 4	Pin 5	Pin 4	Pin 5
High	Data	N.C.	No Data	No Data
Open	Data	N.C.	Data	Compl. Data
Low	High Tristate	N.C.	Data	Compl. Data

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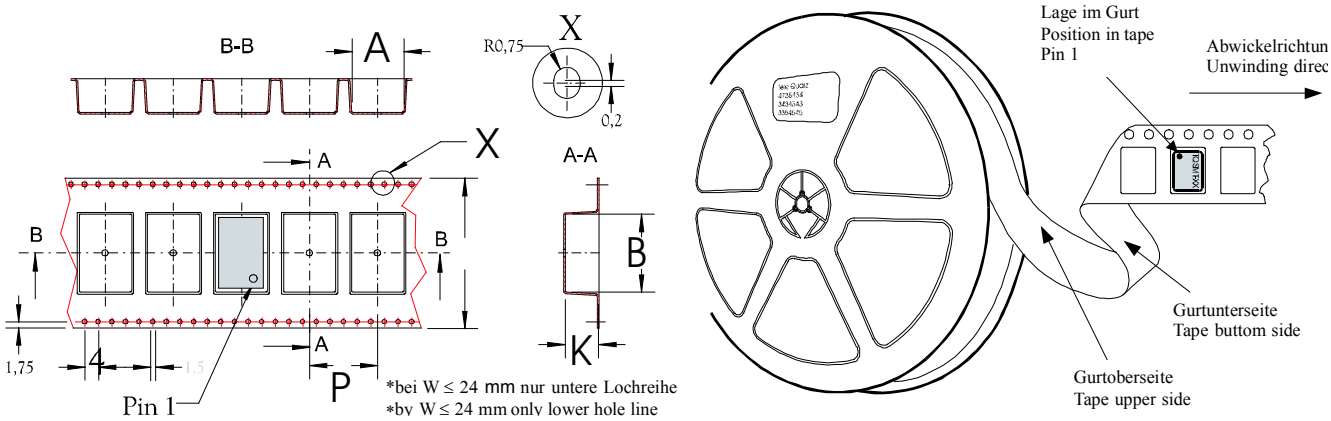
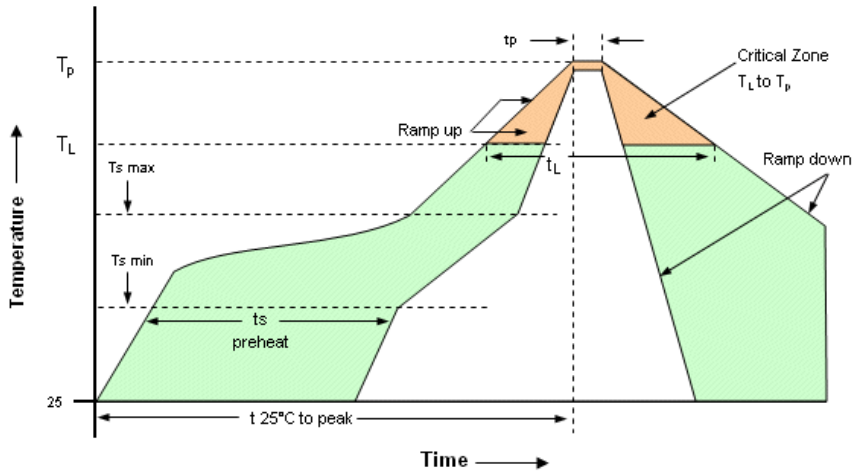
Standard Shipping Method



Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P
G218B/G218E/G223B	24	83.3	850	12
G218C	24	83.3	1700	12

Recommended Reflow Profile



Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly	Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.	Time 25°C to Peak Temperature	8 minutes max.
Preheat -Temperature Min T_{Smin} -Temperature Min T_{Smax} -Time (min to max) t_S	150°C 200°C 60-180 seconds	Time maintained above -Temperature (T_L) -Time (t_L)	 217°C 60-150 seconds
TSmax to TL -Ramp-up Rate	3°C/second max		
Time maintained above -Temperature (T_L) -Time (t_L)	 217°C 60-150 seconds	Time within 5°C of actual Peak Temperature (t_p)	20-40 seconds
Peak Temperature (T_P)	max 260°C	Ramp-down Rate	6°C/ second max

Note: All temperatures refer to topside of the package, measured on the package body surface.
SMD oscillators must be on the top side of the PCB during the reflow process.

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Ordering Information

VX-501 0 - E A J - 105 0 - 52M0

Model Code

Height
0: 5.9 mm (G218B / G223B)
1: 4.7 mm (G218E)
2: 2.8 mm (G218C)

Supply Voltage
D: 5V
E: 3.3V

RF Output Code
A: HCMOS
C: PECL
D: LVDS
E: Sinewave

Temperature Range
E: -40°C to +85°C
J: -20°C to +70°C

Stability Code
E-305: ±30ppm
J-105: ±15ppm

Enable
0: No Enable
1: Enable

Frequency

Notes:

1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. Unless other stated all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).
3. Phase noise degrades with increasing output frequency.
4. Subject to technical modification.
5. Contact factory for availability.

For Additional Information, Please Contact

USA:
Vectron International
267 Lowell Road, Unit 102
Hudson, NH 03051
Tel: 1.888.328.7661
Fax: 1.888.329.8328

Europe:
Vectron International
Landstrasse, D-74924
Neckarbischofsheim, Germany
Tel: +49 (0) 7268-801-0
Fax: +49 (0) 7268-801-281

Asia:
Vectron International
68 Yin Cheng Road(C), 22nd Floor
One LuJiaZui
Pudong, Shanghai 200120, China
Tel: +86 21 6194 6886
Fax: +86 21 6194 6699

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