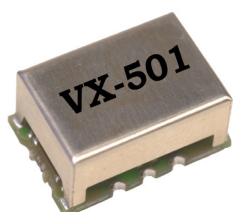


Helping Customers Innovate, Improve & Grow



VX-501

Features

- AT-Cut Crystal
- Surface Mount FR4 based package
- Reflow Process Compatible
- Low Phase Noise
- Tight Stabilities
- Frequency Range 10 - 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	-10		+10	ppm	@V _c =V _s /2 V _s ±5% Load ±10%
vs. supply voltage change	-3		+3	ppm	
vs. load change	-1		+1	ppm	
vs. aging / 1 Year	-3		+3	ppm	
vs. aging (following years)	-1		+1	ppm	
vs. operating temperature range (referenced to +25°C)	-30		+30	ppm	-40 to +85°C
Initial tolerance	-15		+15	ppm	@V _c =V _s /2 V _s ±5% Load ±10%
vs. supply voltage change	-3		+3	ppm	
vs. load change	-2		+2	ppm	
vs. aging / 1 Year	-3		+3	ppm	
vs. aging (following years)	-1		+1	ppm	

Performance Specifications

Supply Voltage (Vs)						
Parameter	Min	Typical	Max	Units	Condition ²	
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		-76 -112 -138 -153 -161 -166		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz 1 MHz	@100MHz LVCMOS 3.3V
Jitter		0.049		ps RMS	@ 12kHz .. 20MHz	
Phase Noise		-75 -105 -130 -145 -153		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz	@ 153.6 MHz PECL 3.3V
Jitter		0.1		ps RMS	@ 12kHz .. 20MHz	
Phase Noise		-59 -90 -118 -137 -144		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz	@ 300 MHz LVDS 3.3V
Jitter		0.1		ps RMS	@ 12kHz .. 20MHz	
Phase Noise		-60 -95 -121 -141 -150		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz	@ 491.52 MHz PECL 3.3V
Jitter		0.03		ps RMS	@ 12kHz .. 20MHz	

Performance Specifications

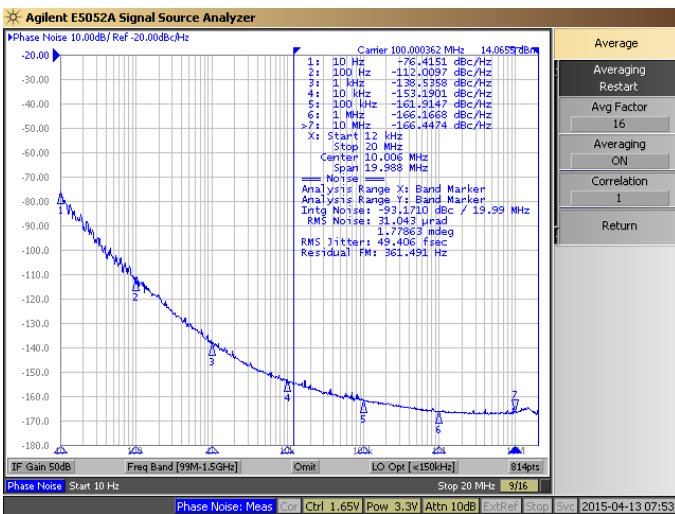
Additional Parameters

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

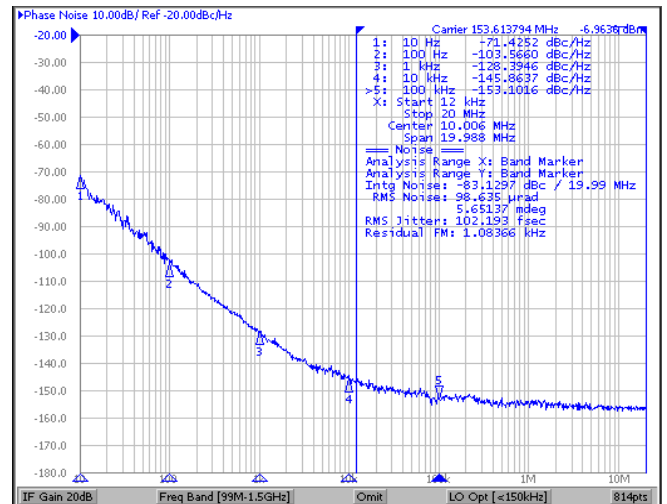
Phase Noise

VX-501 @ 100 MHz LVCMOS



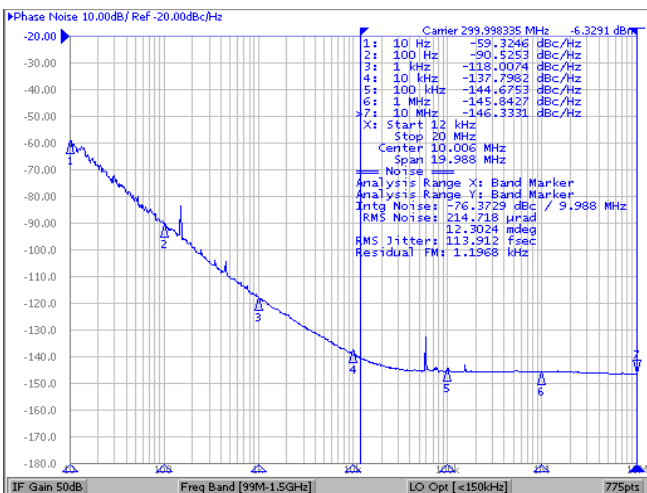
Phase Noise

VX-501 @ 153.6 MHz LVPECL



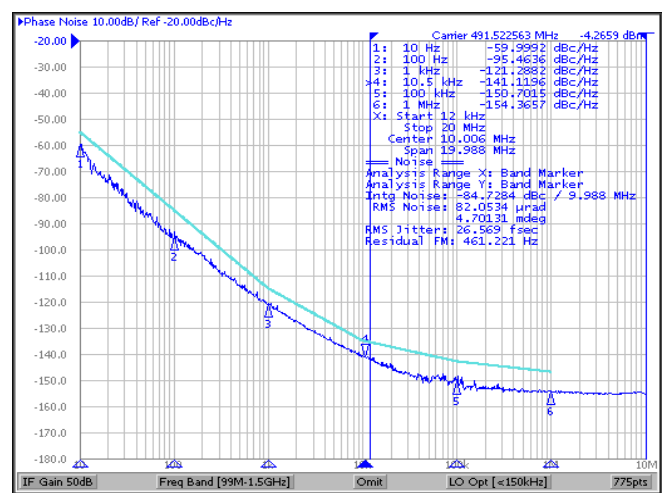
Phase Noise

VX-501 @ 300 MHz LVDS



Phase Noise

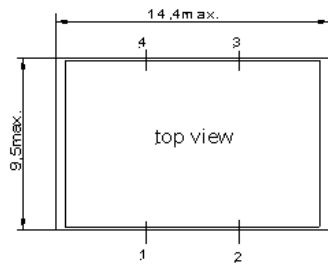
VX-501 @ 491.52 MHz LVPECL



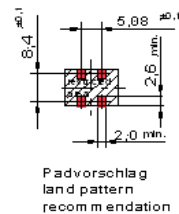
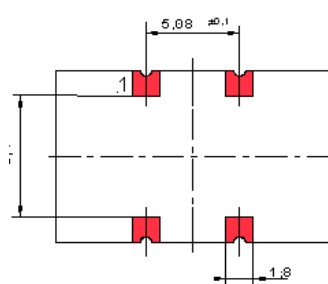
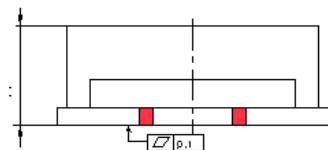
Enclosure

Package Codes

Type	Height "H"
G223B	5.9

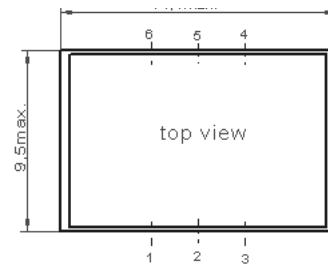


G 223

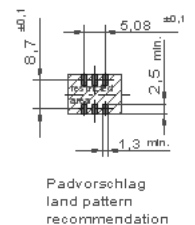
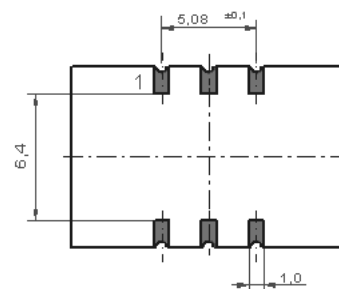
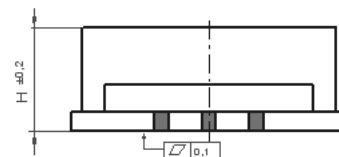


Package Codes

Type	Height "H"
G218B	5.9
G218E	4.7
G218C	2.8



G 218



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)

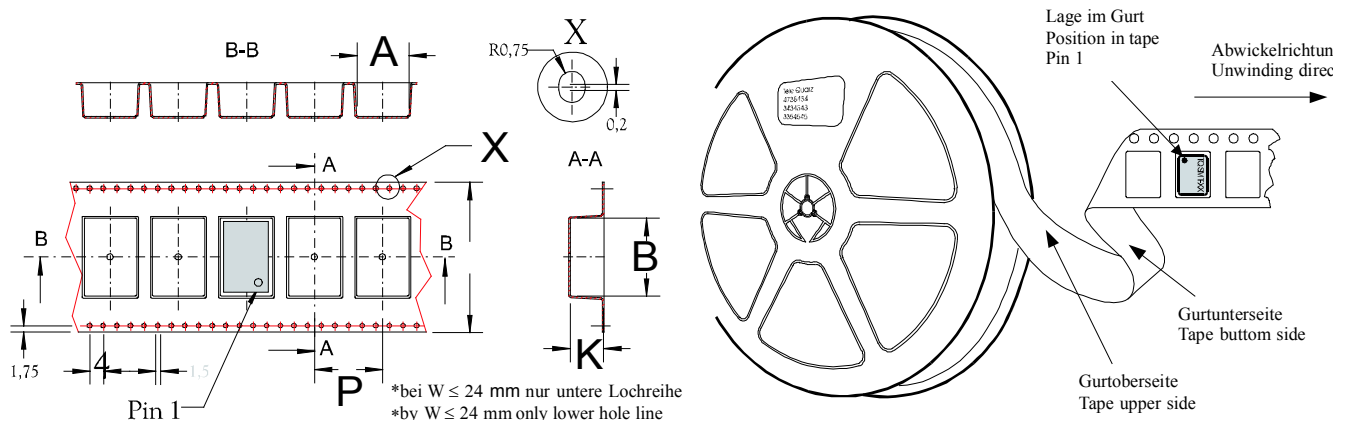
Marking

VX-501-xxxx
Frequency
● AYYWW

Enable true table (optional)

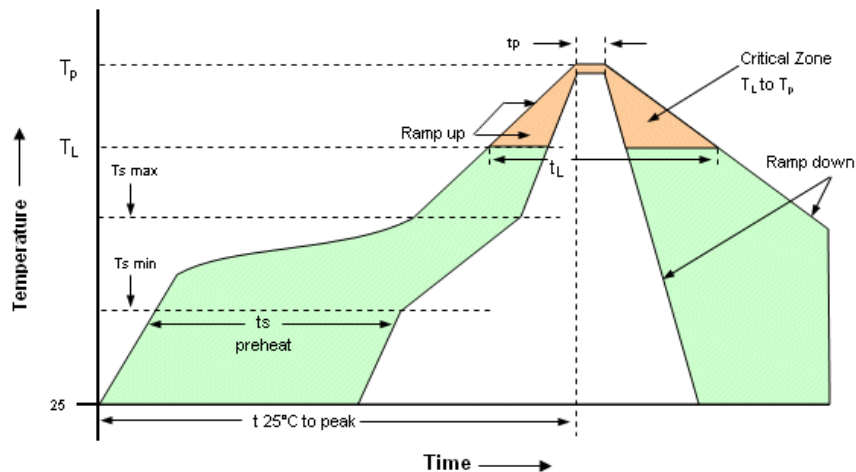
	HCMOS		LVPECL / LVDS	
Pin 2	Pin 4	Pin 5	Pin 4	Pin 5
High	Data	N.C.	No Data	No Data
Open	Data	N.C.	Data	Compl. Data
Low	High Tristate	N.C.	Data	Compl. Data

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

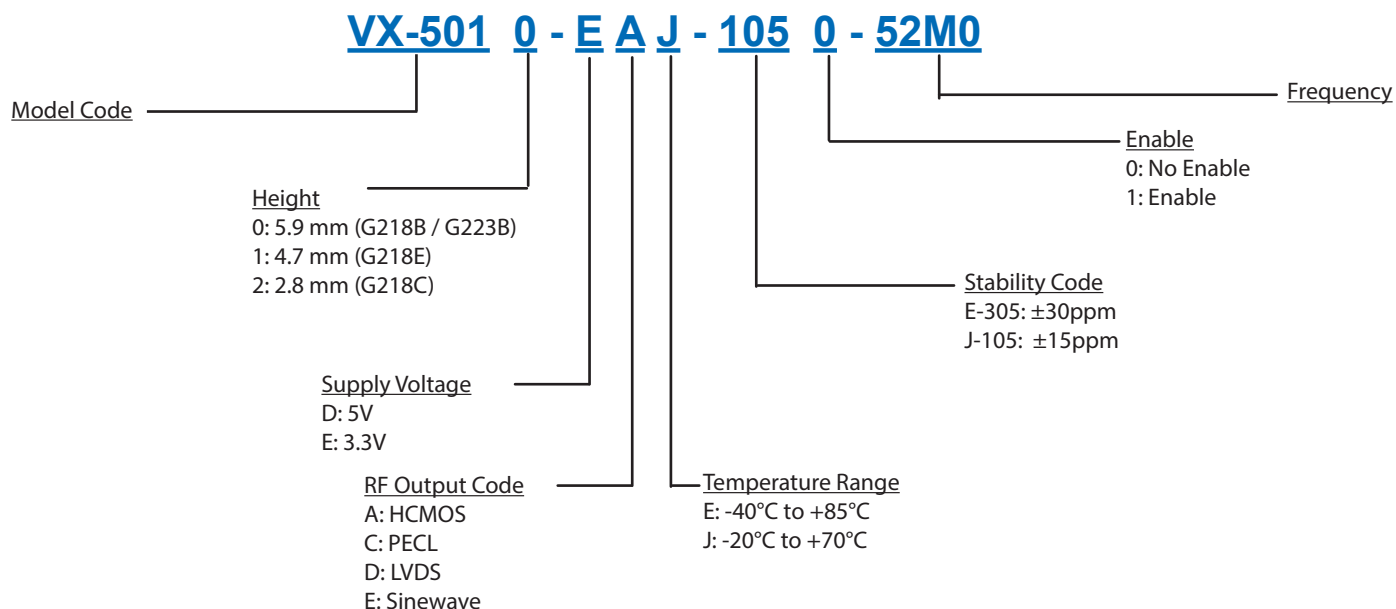
Recommended Reflow Profile



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 $T_{s \text{ min}}$ -Temperature Min $T_{s \text{ max}}$ -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
$T_{s \text{ max}}$ to T_L -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.

Ordering Information



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.

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Rev: 12/2015

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