


**VX-501**

### Features

- Surface Mount FR4 based package
- Reflow Process Compatible
- Low Phase Noise and Jitter
- 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

- Communication
- Test & Measurement
- Medical
- Military

## Performance Specifications

Frequency Stabilities <sup>1</sup>						
Parameter	Min	Typical	Max	Units	Condition <sup>2</sup>	
vs. operating temperature range (referenced to +25°C)	-15		+15	ppm	-20 to +70°C	
Initial tolerance	-10		+10	ppm	@V <sub>c</sub> =V <sub>s</sub> /2 V <sub>s</sub> ±5% Load ±10%	
vs. supply voltage change	-3		+3	ppm		
vs. load change	-1		+1	ppm		
vs. aging / 1st Year	-2		+2	ppm		
vs. aging (following years)	-1		+1	ppm		
vs. operating temperature range (referenced to +25°C)	-30		+30	ppm	-40 to +85°C	Options <sup>5</sup>
Initial tolerance	-15		+15	ppm	@V <sub>c</sub> =V <sub>s</sub> /2 V <sub>s</sub> ±5% Load ±10%	
vs. supply voltage change	-3		+3	ppm		
vs. load change	-2		+2	ppm		
vs. aging / 1st Year	-2		+2	ppm		
vs. aging (following years)	-1		+1	ppm		

# Performance Specifications

Supply Voltage (Vs)							
Parameter	Min	Typical	Max	Units	Condition <sup>2</sup>		
Supply voltage (standard)	3.135	3.3	3.465	VDC	Options <sup>5</sup>		
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 <sup>5</sup>		
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				Options <sup>5</sup>		
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	±65.0	±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	100			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		-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

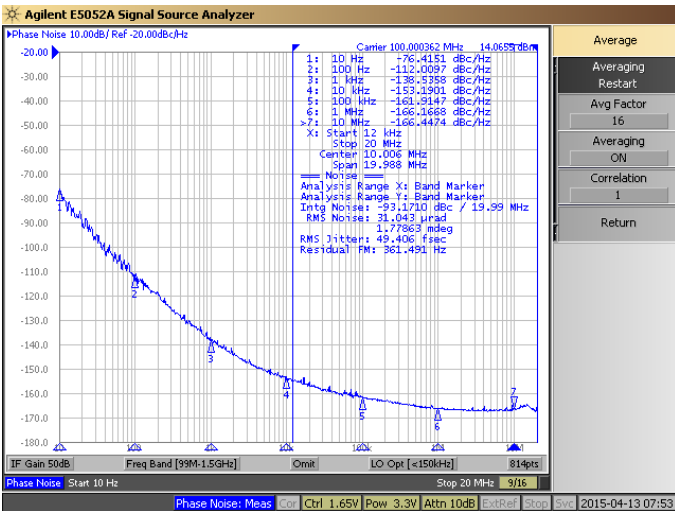
## Additional Parameters

Subharmonics		-40	dBc	For f > 200 MHz
Weight		2.0 g		
Processing & Packing	Handling & Processing Note			
<b>Absolute Maximum Ratings</b>				
Supply voltage (Vs)		6.0	V	
Operable Temperature Range	-40	+85	°C	
Storage Temperature Range	-40	+95	°C	

## Typical Phase Noise and Jitter

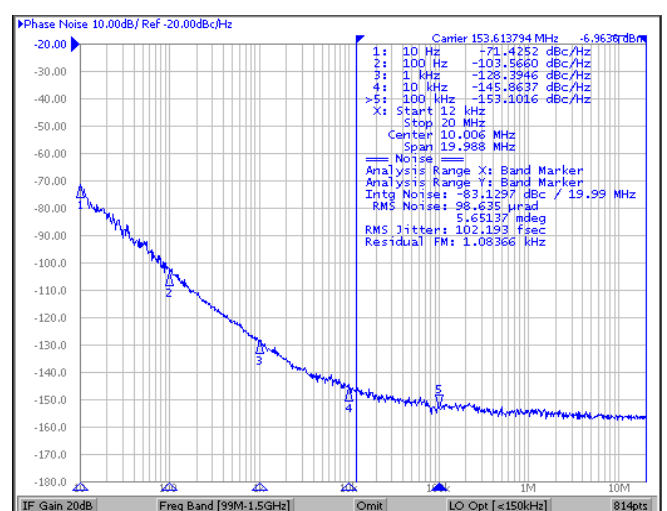
### Phase Noise

VX-501 @ 100 MHz LVCMOS



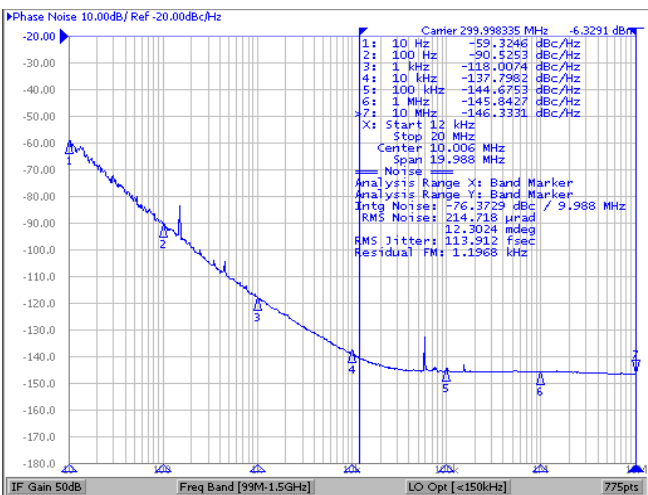
### Phase Noise

VX-501 @ 153.6 MHz LVPECL



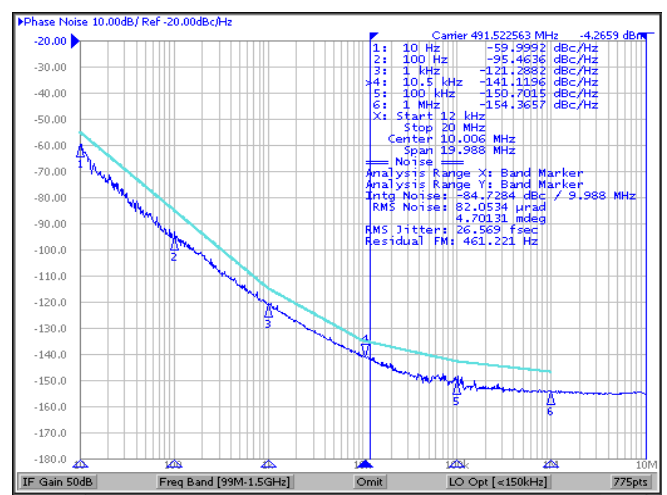
### Phase Noise

VX-501 @ 300 MHz LVDS



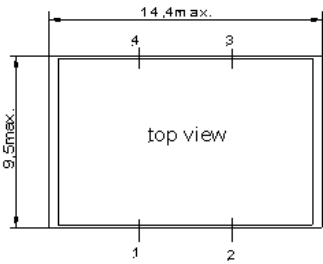
### Phase Noise

VX-501 @ 491.52 MHz LVPECL

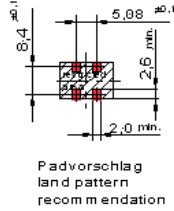
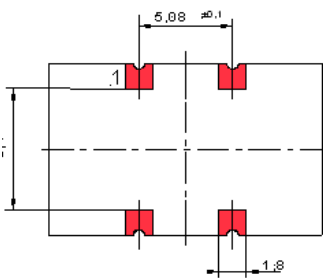
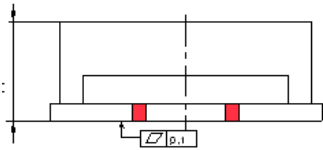


# Enclosure

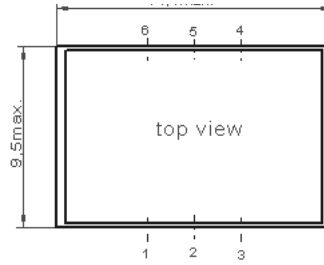
Package Codes	
Type	Height "H"
G223B	5.9



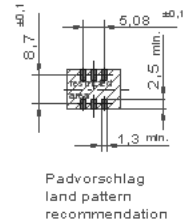
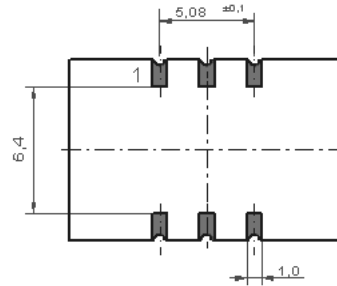
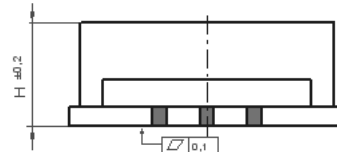
G 223



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



G 218



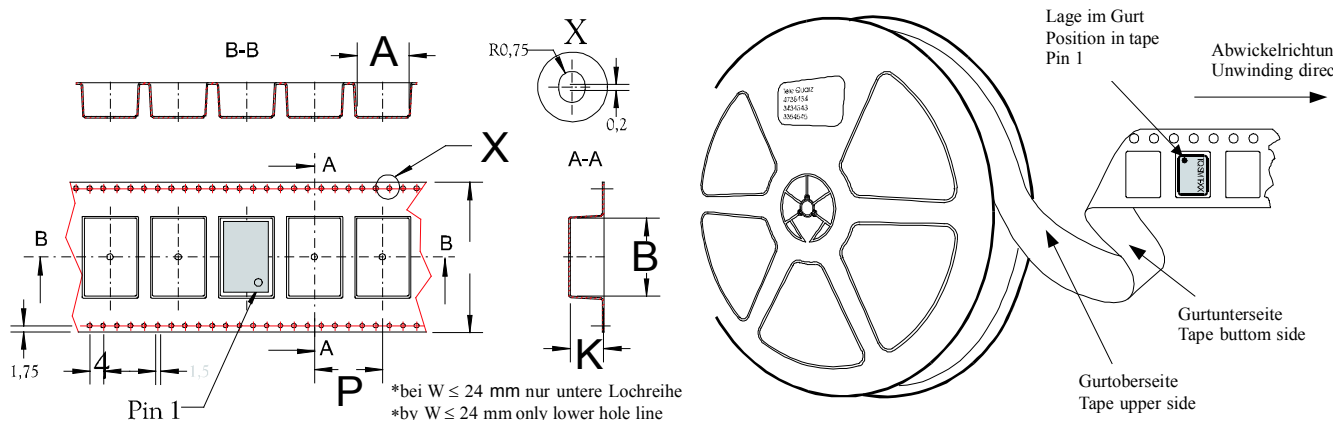
Pin Connections	
1	Control Voltage (Vc)
2	Ground
3	RF Output
4	Supply Voltage Input (Vs)

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

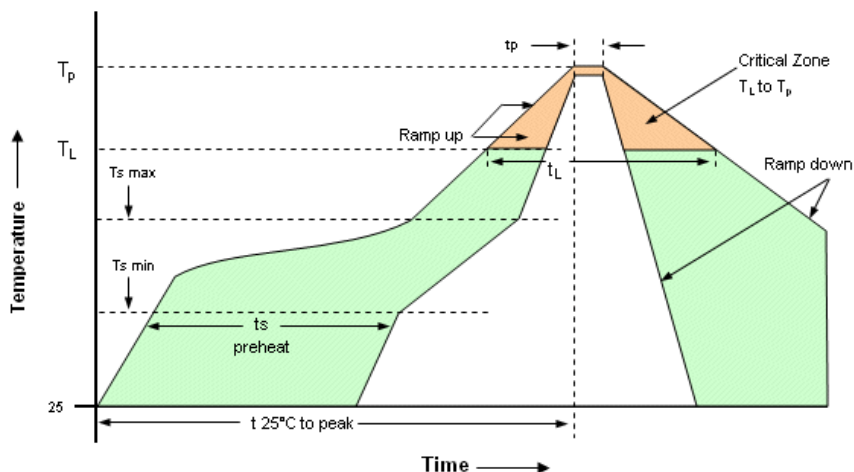
Enable true table (optional)				
	HCMOS		LVPECL / LVDS	
Pin 2	Pin 4	Pin 5	Pin 4	Pin 5
High	Data	N.C.	No Data	No Data
Open	Data	N.C.	Data	Compl. Data
Low	High Tristate	N.C.	Data	Compl. Data

## 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

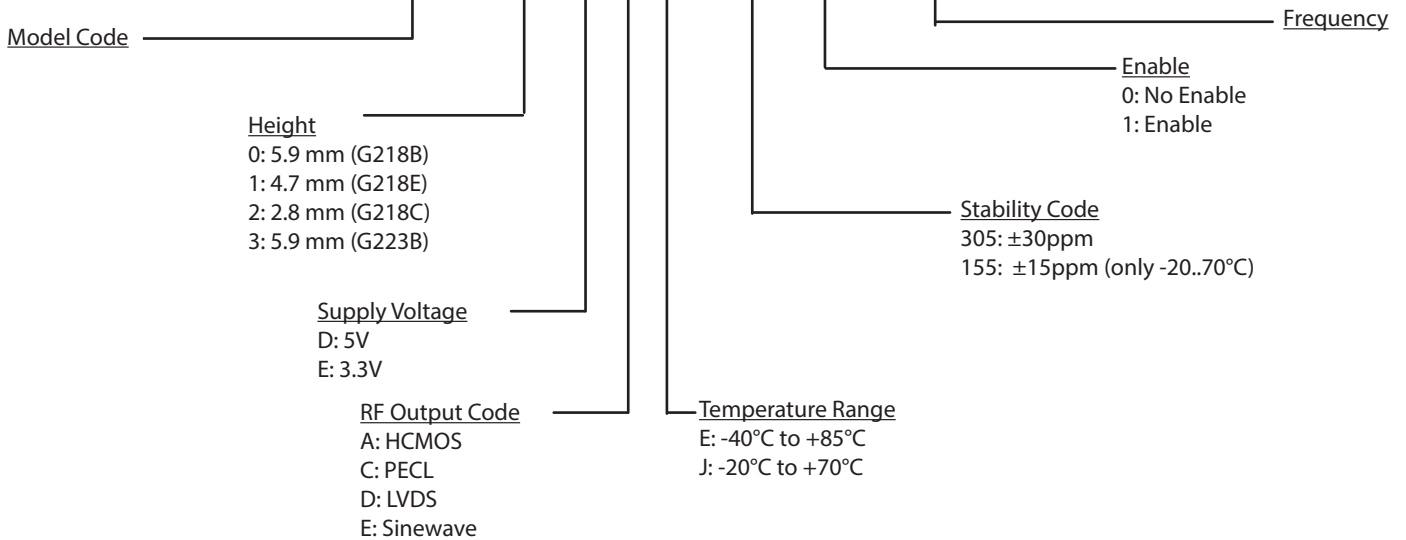


Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly	Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly
Average ramp-up rate ( $T_L$ to $T_p$ )	3°C/second max.	Time 25°C to Peak Temperature	8 minutes max.
Preheat -Temperature Min $T_{smin}$ -Temperature Min $T_{smax}$ -Time (min to max) $t_s$	150°C 200°C 60-180 seconds	Time maintained above -Temperature ( $T_L$ ) -Time ( $t_L$ )	217°C 60-150 seconds
$T_{smax}$ 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

**VX-501 0 - E A J - 105 0 - 122M88**



### 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:

Microsemi  
267 Lowell Road, Unit 102  
Hudson, NH 03051  
Tel: 1.888.328.7661  
Fax: 1.888.329.8328

### Europe:

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

### Asia:

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

### Disclaimer

Microsemi reserves the right to make changes to the product(s) and or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

Rev: 01/2018