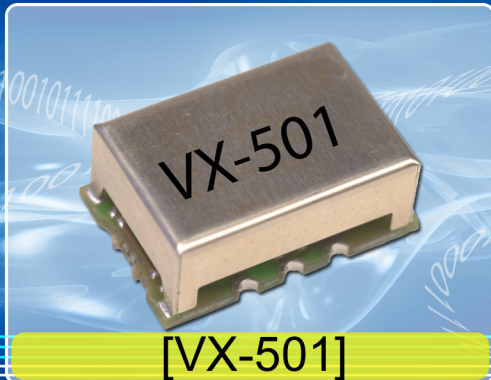


Helping Customers Innovate, Improve & Grow



[VX-501]

### Features

*Reflow Process Compatible  
AT-Cut Crystal  
Low Phase Noise  
Surface Mount Package  
Tight Stability*

### Typical Applications

*Base Stations  
Test Equipment  
Portable Equipment  
Switching*

**Previous Vectron Model Number** C5310

**Frequency Range** 1 MHz – 700 MHz

**Standard Frequencies** 2.048; 10; 13; 16.384; 30.720; 32.768; 38.880; 44.8; 51.840; 52.00MHz; 58.9824; 61.44; 68.736; 77.760; 76.8; 81.92; 92.16; 100; 112; 122.88MHz; 125; 134.4; 153.6; 155.52; 156.25; 160; 179.2; 184.32; 245.76; 312.5MHz; 320; 368.64; 400; 448; 491.52; 622.08; 672 MHz

### Frequency stabilities<sup>1</sup>

Parameter	Min	Typ	Max	Units	Operating temperature range
vs. operating temperature range (Referenced to +25°C)	-15.0		+15.0	ppm	-20 ... +70°C
Parameter	Min	Typ	Max	Units	Condition
Initial tolerance	-10.0		+10.0	ppm	@vc=Vs/2
vs. supply voltage change	-3.0		+3.0	ppm	V <sub>s</sub> ± 5%
vs. load change	-1.0		+1.0	ppm	Load ± 10%
vs. aging /1. Year	-3.0		+3.0	ppm	
vs. aging / year (following Years)	-1.0		+1.0	ppm	

## Frequency stabilities<sup>1</sup>

Parameter	Min	Typ	Max	Units	Operating temperature range
vs. operating temperature range (Referenced to +25°C)	-30.0		+30.0	ppm	-40 ... +85°C
Parameter	Min		Max	Units	Condition
Initial tolerance	-15.0		+15.0	ppm	@vc=Vs/2
vs. supply voltage change	-3.0		+3.0	ppm	V <sub>s</sub> ± 5%
vs. load change	-2.0		+2.0	ppm	Load ± 10%
vs. aging /1. Year	-3.0		+3.0	ppm	
vs. aging / year (followingYears)	-1.0		+1.0	ppm	

## Supply Voltage (Vs)

Parameter	Min	Typ	Max	Units	Condition
Supply voltage (Vs)	4.75	5.0	5.25	VDC	
Current consumption			40	mA	@ HCMOS
Current consumption			90	mA	@ PECL
Supply voltage (Vs)	3.135	3.3	3.465	VDC	
Current consumption			30	mA	@ LVHCMOS
Current consumption			80	mA	@ LVPECL
Current consumption			25	mA	@ LVDS

## RF Output

Parameter	Min	Typ	Max	Units	Condition
Signal	HCMOS				
Load		15.0		pF	@ 15 pF 10 to 90 % @ Vs/2
Rise and Fall time			5	ns	
Duty cycle	40		60	%	
Signal	PECL				
Load		50		Ω	Vs - 2V 20 to 80 %
Rise and Fall time			1	ns	
Duty cycle	45		55	%	
Signal	LVDS				
Load		100		Ω	10 to 90 %
Rise and Fall time			1	ns	
Duty cycle	40		60	%	
Signal	Sinewave				
Load		50		Ω	
Output Power	-3	0	3	dBm	

## Frequency Tuning (EFC)

Parameter	Min	Typ	Max	Units	Condition
Tuning Range	±75.0	±90.0	+200.0	ppm	Frequency > 40MHz
	±100.0	±140.0	±200.0	ppm	Frequency <40MHz
Linearity	10%				
Tuning Slope	Positive				
Control Voltage Range	0.0	1.65	3.3	VDC	with Vs=3.3VDC
	0.5	2.5	4.5	VDC	with Vs=5.0VDC
Frequency control input impedance	10 k Ω				

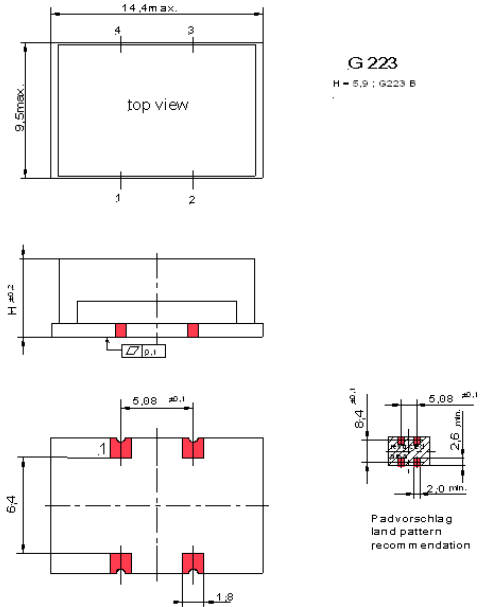
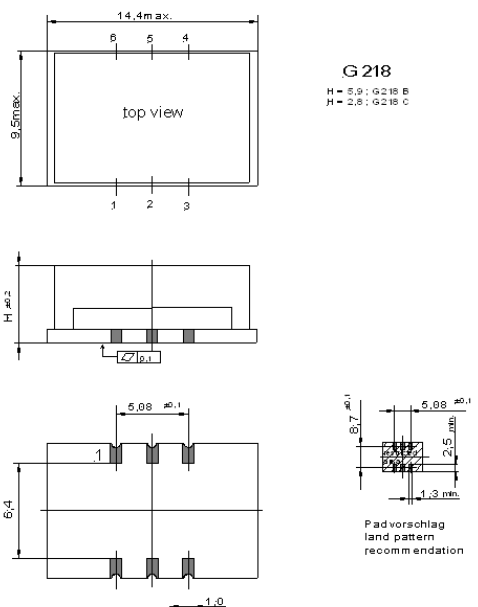
## Additional Parameters

Parameter	Min	Typ	Max	Units	Condition
Phase Noise		-85		dBc/Hz	10 Hz @52 MHz
		-115		dBc/Hz	100 Hz HCMOS
		-138		dBc/Hz	1 kHz 3,3V
		-153		dBc/Hz	10 kHz
		-155		dBc/Hz	100 kHz
Jitter		0,3		ps RMS	@ 12 kHz to 20 MHz
Phase Noise		-80		dBc/Hz	10 Hz @155,52 MHz
		-105		dBc/Hz	100 Hz PECL
		-135		dBc/Hz	1 kHz 3,3V
		-143		dBc/Hz	10 kHz
		-143		dBc/Hz	100 kHz
Jitter		0,6		ps RMS	@ 12 kHz to 20 MHz
Phase Noise		-80		dBc/Hz	10 Hz @155,52 MHz
		-112		dBc/Hz	100 Hz LVDS
		-130		dBc/Hz	1 kHz 3,3V
		-150		dBc/Hz	10 kHz
		-155		dBc/Hz	100 kHz
Jitter		0,2		ps RMS	@ 12 kHz to 20 MHz
Phase Noise		-55		dBc/Hz	10 Hz @622,08 MHz
		-85		dBc/Hz	100 Hz PECL
		-115		dBc/Hz	1 kHz 3,3V
		-140		dBc/Hz	10 kHz
		-150		dBc/Hz	100 kHz
Jitter		0,1		ps RMS	@ 12 kHz to 20 MHz
Weight		2		g	
Processing & Packing	Handling & Processing Note				

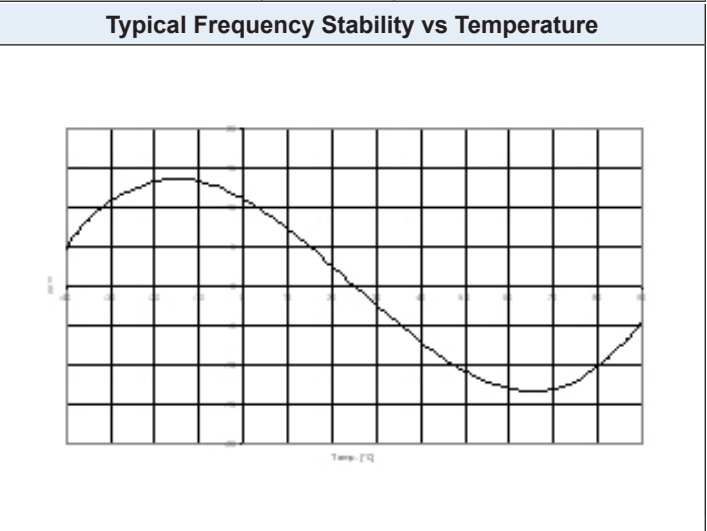
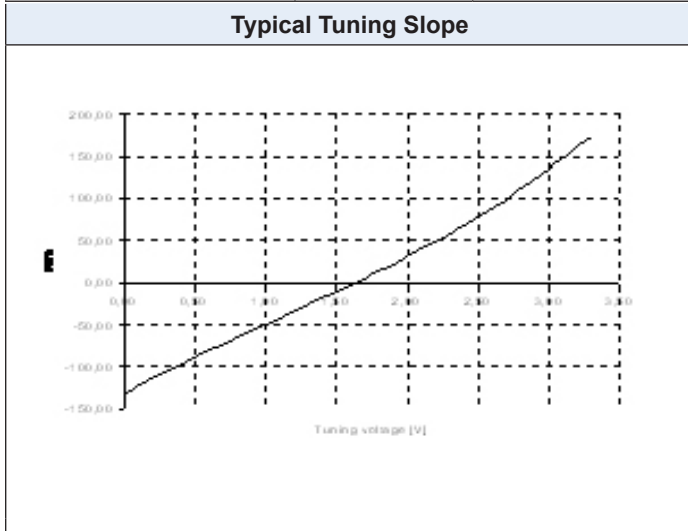
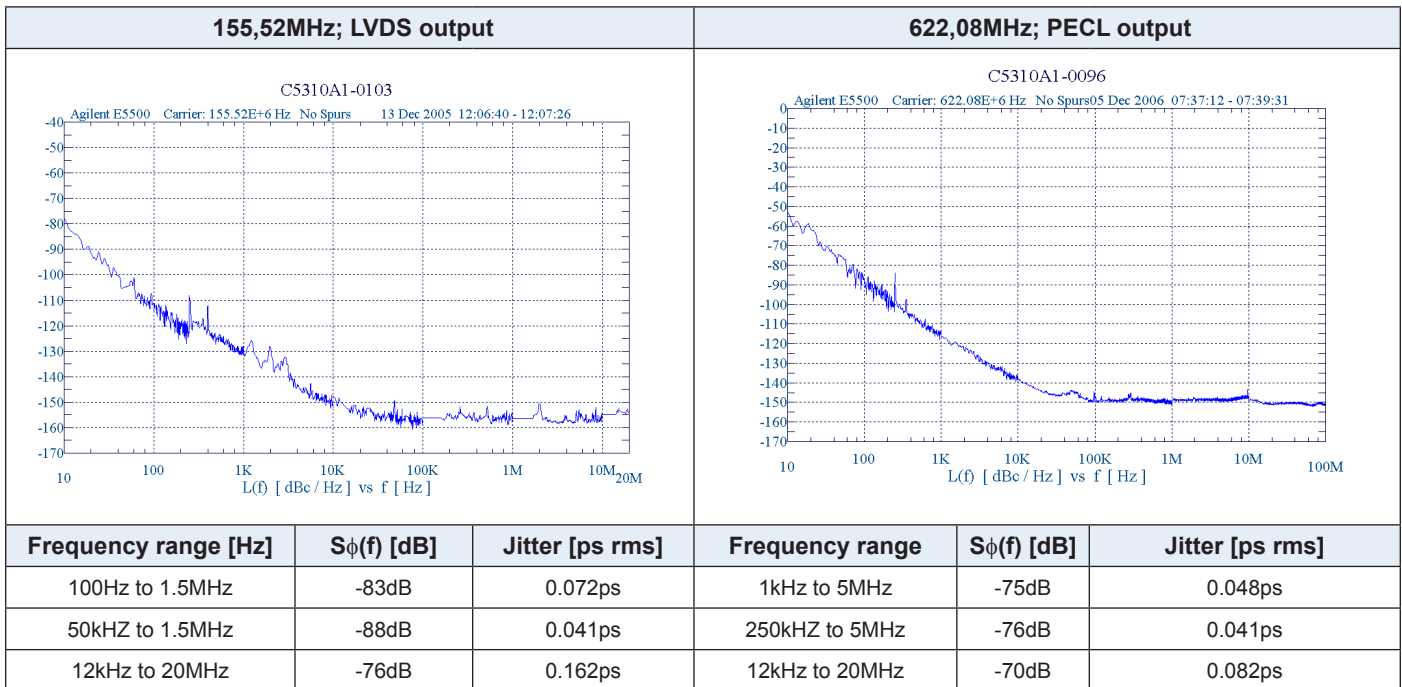
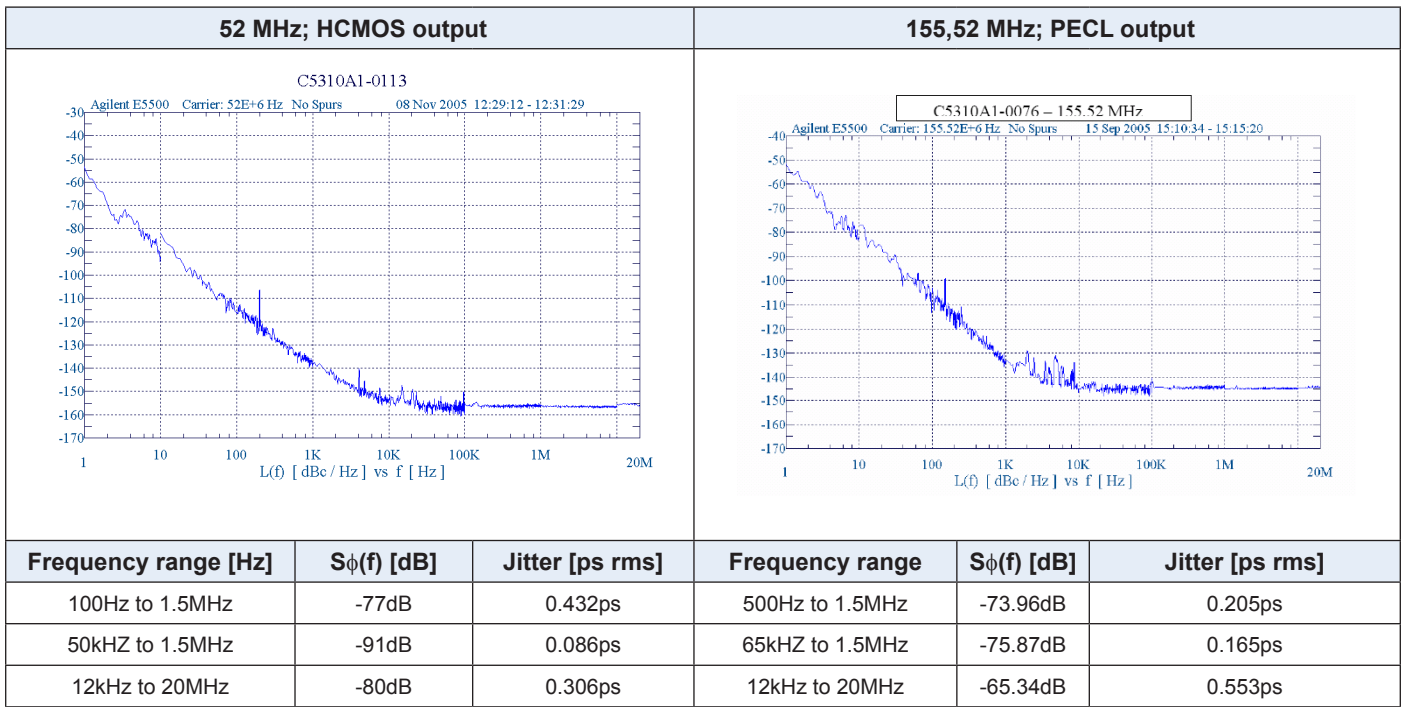
## Absolute Maximum Ratings

Parameter	Min	Typ	Max	Units	Condition
Supply voltage (Vs)			7	V	
Operable temperature range	-30		+80	°C	
Storage temperature range	-40		+90	°C	

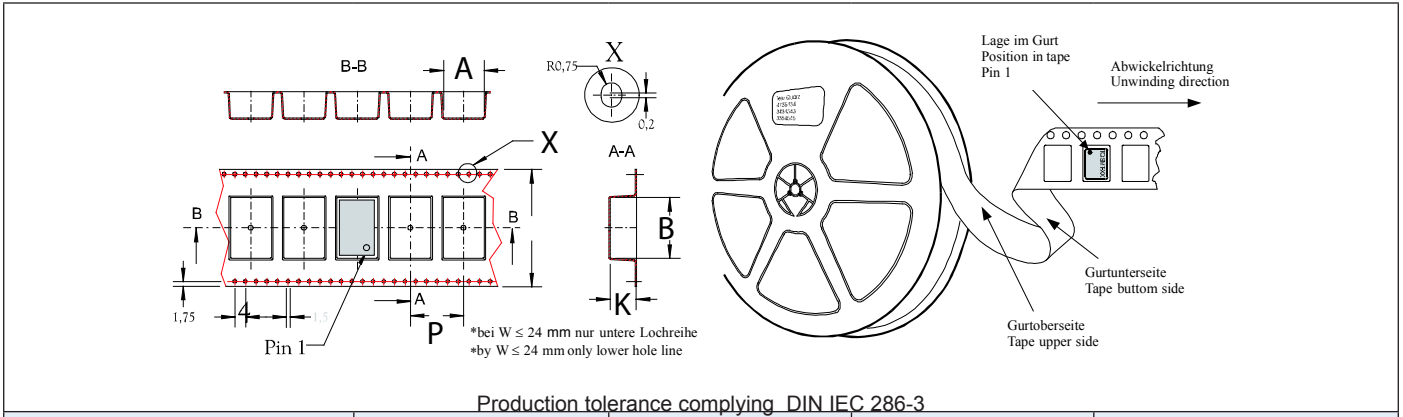
# Enclosure

Type G223B for HCMOS Version			Type G218B for HCMOS, PECL; LVPECL and LVDS Version				
Package Codes:							
Height "H" 5,9	Pin Length "L" NA	Options <sup>5)</sup>	Height "H" 5,9	Pin Length "L" NA	Options <sup>5)</sup>		
 <p style="text-align: center;">G 223 H = 5,9; G223 B</p> <p style="text-align: center;">Dimensions: mm</p>			 <p style="text-align: center;">G 218 H = 5,9; G218 B H = 2,8; G218 C</p> <p style="text-align: center;">Dimensions: mm</p>				
<b>Pin Connections</b>			<b>Pin Connections</b>				
<ol style="list-style-type: none"> <li>1 Control Voltage (Vc)</li> <li>2 Ground (Case)</li> <li>3 RF Output</li> <li>4 Supply Voltage Input (Vs)</li> </ol> <p style="text-align: center;">Outline Drawing: G223B</p>			<ol style="list-style-type: none"> <li>1 Control Voltage (Vc)</li> <li>2 N/C / Enable (optional)</li> <li>3 Ground (Case)</li> <li>4 RF Output</li> <li>5 Complementary RF Output / (N/C: HCMOS only)</li> <li>6 Supply Voltage Input (Vs)</li> </ol> <p style="text-align: center;">Outline Drawing: G218B</p>				
			Enable true table	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
<b>Marking</b>							
VX-501  Frequency  • AYYWW							

## Typical Phase Noise and Jitter



## Standard Shipping Methode (For B-Type Enclosure)

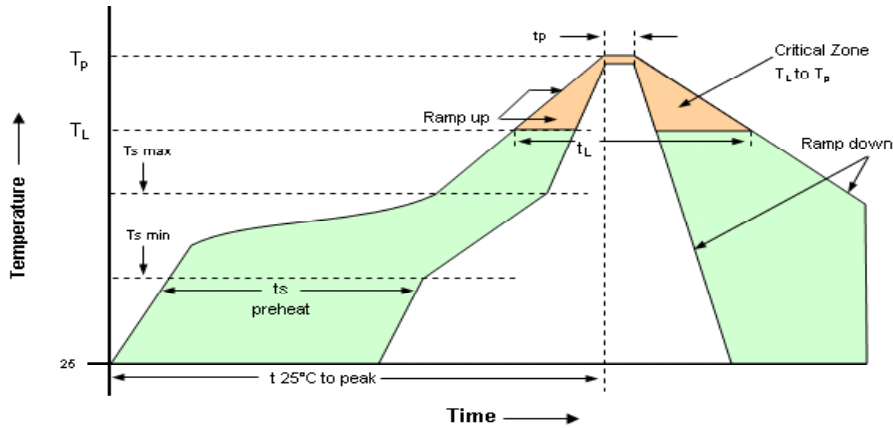


Production tolerance complying DIN IEC 286-3

Enclosure Type	Tape width W [mm]	Quantity per meter	Quantity per reel	Dimension P
G218B / G223B	24	83,3	850	12

## Recommended Reflow Profile

### Solderprofile:



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.

## How to order this product:

Use this worksheet to forward the following information to your factory representative:										
Model	Height	-	Supply Voltage Code	RF Output Code	Temperature Range	-	Stability	Frequency Control/ Enable	-	Frequency
VX-501	1	-	E	A	J	-	155	X	-	10MHz

Height:

0: G223B

1: G218B

Supply Voltage Code:

D: 5 V

E: 3,3 V

RF Output Code:

A: HCMOS

C: PECL

D: LVDS

E: Sinewave

Temperature Range/ Stability Code:

J-155: -20...+70°C ±15ppm

E-305: -40...+85°C ±30ppm

### Notes:

- 1 Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
- 2 Unless otherwise 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.