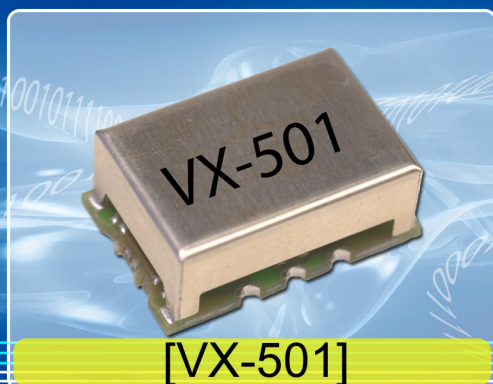


Helping Customers Innovate, Improve & Grow



[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 stabilities¹

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 _s ± 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 stabilities¹

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	@ $V_c=V_s/2$
vs. supply voltage change	-3.0		+3.0	ppm	$V_s \pm 5\%$
vs. load change	-2.0		+2.0	ppm	Load $\pm 10\%$
vs. aging /1. Year	-3.0		+3.0	ppm	
vs. aging / year (following Years)	-1.0		+1.0	ppm	

Supply Voltage (Vs)

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

RF Output

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

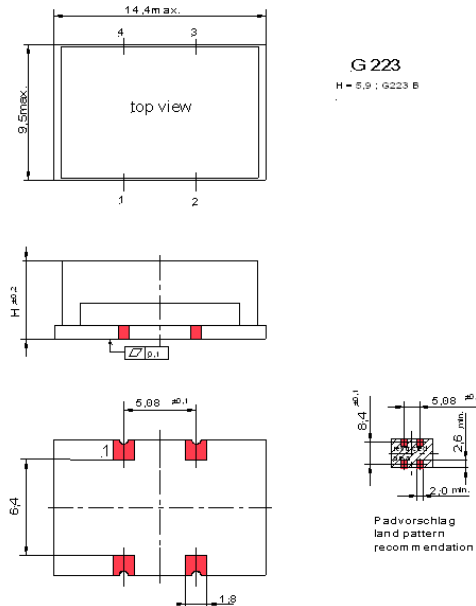
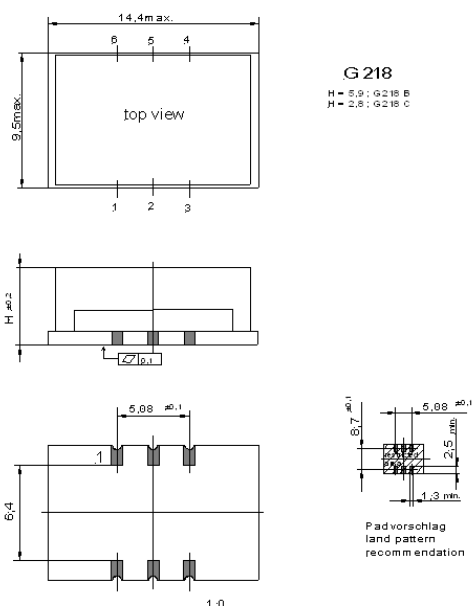
Additional Parameters

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

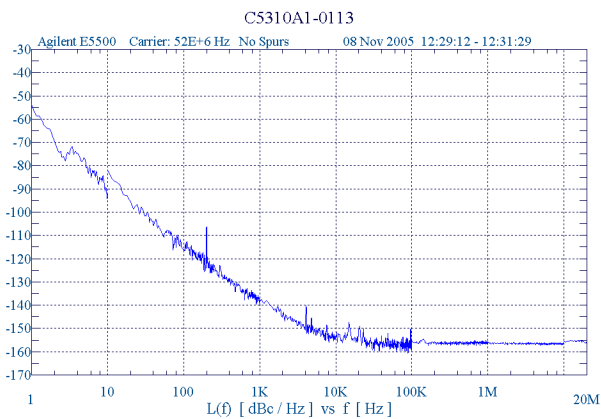
Parameter	Min	Typ	Max	Units	Condition
Supply voltage (Vs)			7	V	
Operable temperature range	-30		+80	°C	
Storage temperature range	-40		+90	°C	

Enclosure

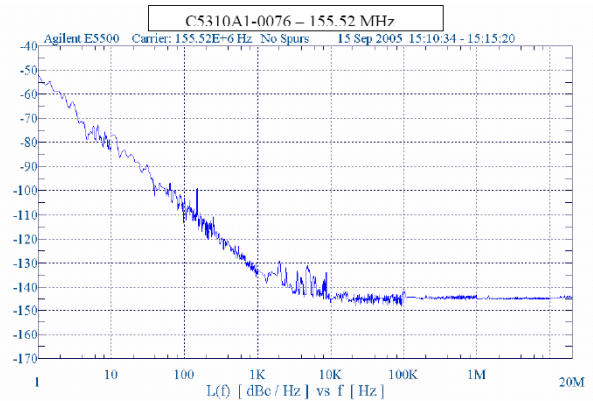
Type G223B for HCMOS Version			Type G218B for HCMOS, PECL; LVPECL and LVDS Version				
Package Codes:							
Height "H" 5,9	Pin Length "L" NA	Options ⁵	Height "H" 5,9	Pin Length "L" NA	Options ⁵		
 G 223 H = 5,9 ; G223 B Dimensions: mm			 G 218 H = 5,9 ; G218 B H = 2,8 ; G218 C Dimensions: mm				
Pin Connections			Pin Connections				
1 Control Voltage (Vc) 2 Ground (Case) 3 RF Output 4 Supply Voltage Input (Vs) Outline Drawing: G223B			1 Control Voltage (Vc) 2 N/C / Enable (optional) 3 Ground (Case) 4 RF Output 5 Complementary RF Output / (N/C: HCMOS only) 6 Supply Voltage Input (Vs) Outline Drawing: G218B				
			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
Marking							
VX-501 Frequency • AYYWW							

Typical Phase Noise and Jitter

52 MHz; HCMOS output

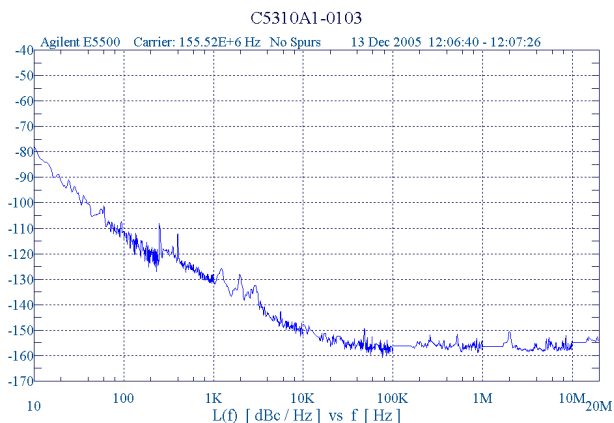


155,52 MHz; PECL output

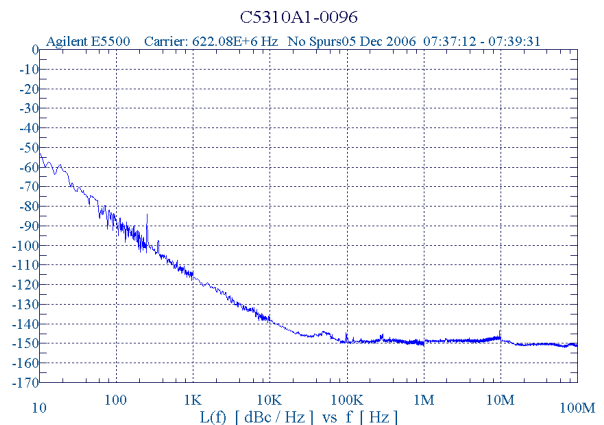


Frequency range [Hz]	$S_{\phi}(f)$ [dB]	Jitter [ps rms]	Frequency range	$S_{\phi}(f)$ [dB]	Jitter [ps rms]
100Hz to 1.5MHz	-77dB	0.432ps	500Hz to 1.5MHz	-73.96dB	0.205ps
50kHz to 1.5MHz	-91dB	0.086ps	65kHz to 1.5MHz	-75.87dB	0.165ps
12kHz to 20MHz	-80dB	0.306ps	12kHz to 20MHz	-65.34dB	0.553ps

155,52MHz; LVDS output

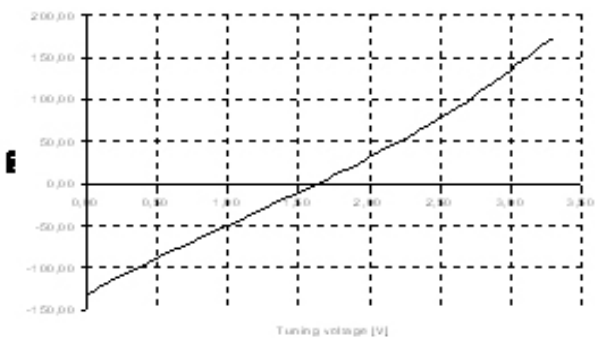


622,08MHz; PECL output

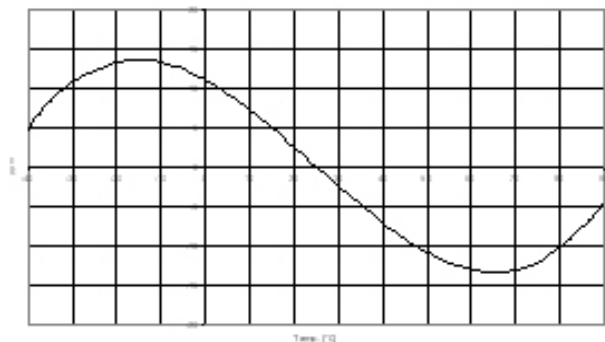


Frequency range [Hz]	$S_{\phi}(f)$ [dB]	Jitter [ps rms]	Frequency range	$S_{\phi}(f)$ [dB]	Jitter [ps rms]
100Hz to 1.5MHz	-83dB	0.072ps	1kHz to 5MHz	-75dB	0.048ps
50kHz to 1.5MHz	-88dB	0.041ps	250kHz to 5MHz	-76dB	0.041ps
12kHz to 20MHz	-76dB	0.162ps	12kHz to 20MHz	-70dB	0.082ps

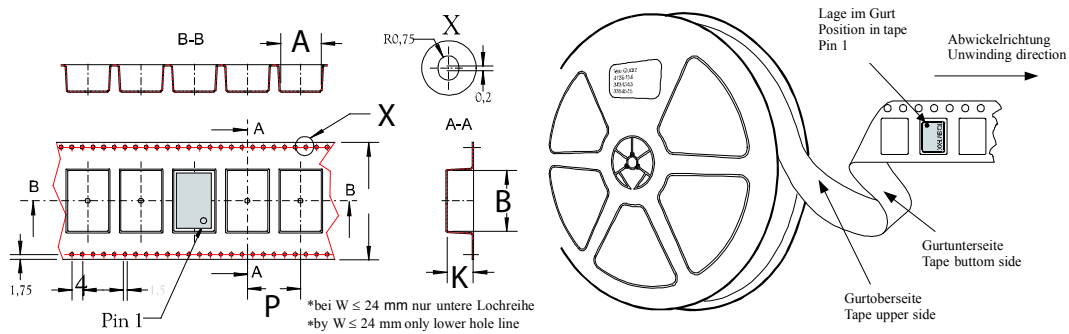
Typical Tuning Slope



Typical Frequency Stability vs Temperature



Standard Shipping Methode (For B-Type Enclosure)

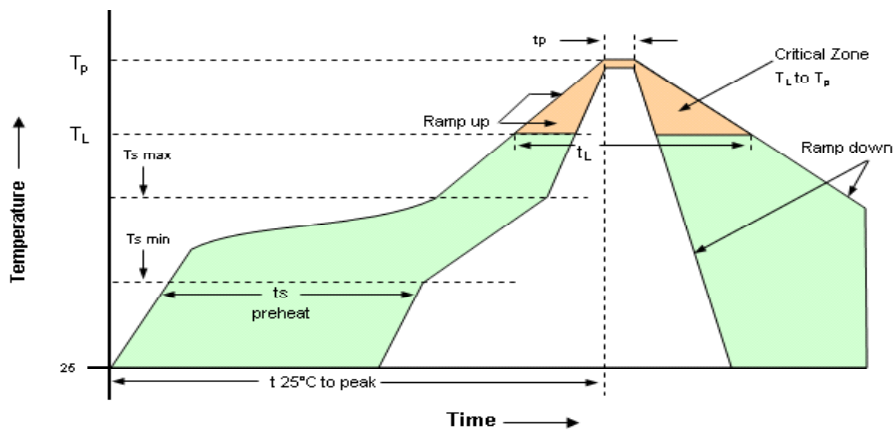


Production tolerance complying DIN IEC 286-3

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.