

## Typical Applications

PCS Base Stations  
 Land Mobile Radio  
 Cellular Telephony  
 Radio in the Local Loop

## Features

EFC Standard  
 Standard Surface Mount Package  
 Low Phase Noise option  
 Low Profile



## Previous Vectron Model Numbers

STO50; STO50S3; STO50S3-01

## Frequency range

6.4 MHz – 800 MHz

## Standard frequencies

10; 12.288; 12.8; 19,44 MHz,  
 20; 20,48, 77.76, 100 MHz

## Frequency stabilities<sup>1</sup> [ Standard TCXO]

Parameter	Min	Typ	Max.	Units	Operating temp range	Ordering Code <sup>5</sup>
vs. operating temperature range (Referenced to +25°C)	-2.5		+2.5	ppm	-40 ... +85°C	F256
	-1.0		+1.0	ppm	-40 ... +85°C	F106
	-2.5		+2.5	ppm	-20 ... +70°C	D256
	-1.0		+1.0	ppm	-20 ... +70°C	D106
	-1.0		+1.0	ppm	0 ... +50°C	B106
	-0.5		+0.5	ppm	0 ... +50°C	B507
Parameter	Min	Typ	Max.	Units	Condition	
Initial tolerance	- 1.5		+1.5	ppm	at time of shipment, nominal EFC	
vs. supply voltage change	- 0.2		+0.2	ppm	V <sub>s</sub> ± 5%	
vs. load change	- 0.2		+0.2	ppm	Load ± 10%	
vs aging /1. Year	- 1.0		+1.0	ppm		

## Frequency stabilities<sup>1</sup> [ Stratum 3 TCXO]

Parameter	Min	Typ	Max.	Units	Operating temp range	Ordering Code <sup>5</sup>
vs. operating temperature range (Referenced to +25°C)	-0.8		+0.8	ppm	-40 ... +85°C	F807
	-0.28		+0.28	ppm	-30 ... +85°C	G287*
	-0.8		+0.8	ppm	-20 ... +70°C	D807
	-0.28		+0.28	ppm	-20 ... +70°C	D287*
	-0.28		+0.28	ppm	0 ... +50°C	B287*
Parameter	Min	Typ	Max.	Units	Condition	
Initial tolerance	- 1.0		+1.0	ppm	at time of shipment, nominal EFC	
vs. supply voltage change	- 0.2		+0.2	ppm	V <sub>s</sub> ± 5%	
vs. load change	- 0.1		+0.1	ppm	Load ± 10%	
vs aging /15 Years	- 2.5		+2.5	ppm		
overall tolerance	-4.6		-4.6	ppm		
Note: * Stratum 3 per GR-1244-CORE: <±4.6 ppm for all causes and 20 years aging, Holdover: <±0.37 ppm over 24 hours (Code: D287 & B287)						

## Supply voltage (Vs)

Parameter	Min	Typ	Max.	Units	Condition	Ordering Code <sup>5</sup>
Supply voltage [Standard]	3.135	3.3	3.465	VDC		SV033
Supply voltage [Option]	4.75	5	5.25	VDC		SV050
Current consumption			35 35 100	mA mA mA	steady state @ +25°C & 3.3VDC steady state @ +25°C & 5.0VDC steady state @ +25°C & PECL-Output	

## RF output

Parameter	Min	Typ	Max.	Units	Condition	Ordering Code <sup>5</sup>
Signal [Standard]	HCMOS					RFH
Load	13.5	15	16.5	pF	with Vs= 5.0V and 15pF load with Vs=3.3V and 15pF load with Vs= 5.0V and 15pF load with Vs=3.3V and 15pF load	
Signal Level (Vol)			0.5	VDC		
Signal Level (Voh)	4.5		0.3	VDC		
Rise and Fall time	3.0		5	ns		
Duty cycle	40	50	60	%		
Signal [Option]	clipped Sinewave				> 12.288MHz	RFC
Load R	9	10	11	kΩ	@ 10kΩ   10pF	
C	9	10	11	pF		
Output power	0.7			V <sub>pp</sub>		
Signal [Standard]	PECL					RFP
Load		50		Ω	to Vs-2V	20 to 80%
Rise and Fall time			1	ns		
Duty cycle	45	50	55	%		

## Frequency Tuning (EFC)

Parameter	Min	Typ	Max.	Units	Condition
Tuning Range	± 8.0	±14.0	± 20.0	ppm	Standard Version
	± 5.0	±12.0	± 20.0	ppm	S3 Version
Linearity			10	%	
Tuning Slope	Positive				
Control Voltage Range	0.3	1.65	3.0	VDC	with Vs=3.3VDC
	0.5	2.5	4.5	VDC	with Vs=5.0VDC
Freq. control input impedance	10			kΩ	

## Additional parameters

Parameter	Min	Typ	Max.	Units	Condition	
Phase Noise <sup>3</sup>		-90		dBc/Hz	10 Hz	TCXO @19.44MHz
		-120		dBc/Hz	100 Hz	
		-135		dBc/Hz	1 kHz	
		-140		dBc/Hz	10 kHz	
		-145		dBc/Hz	100 kHz	
Phase Noise <sup>3</sup>		-98		dBc/Hz	10 Hz	Low Phase Noise TCXO @12.8 MHz
		-125		dBc/Hz	100 Hz	
		-147		dBc/Hz	1 kHz	
		-153		dBc/Hz	10 kHz	
		-154		dBc/Hz	100 kHz	
Weight			3	g		
Processing & Packing	Handling & processing note					

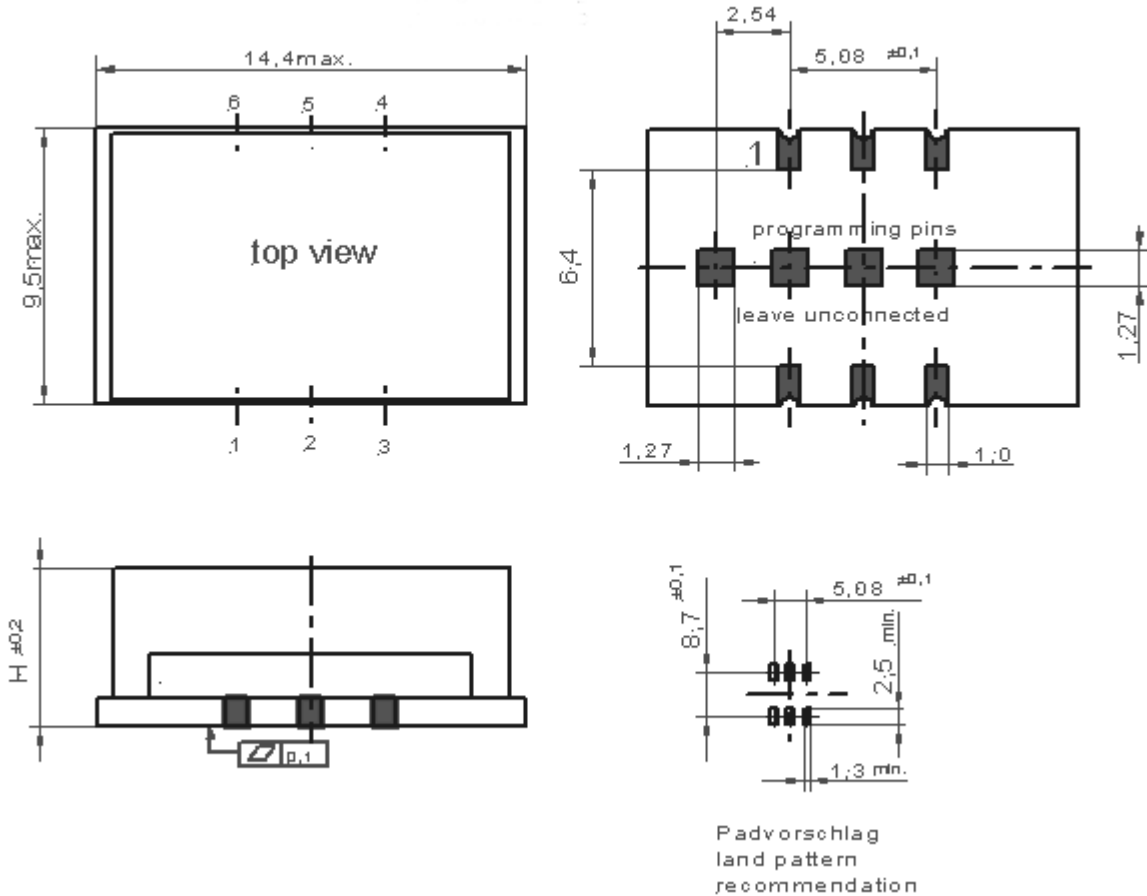
## Enclosures

### Type G214B

Package Codes:

Code A1	Height "H" 5.9	Pin Length "L" NA	
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### G214



Dimensions: mm

#### Pin Connections

#### Marking

1	Voltage Control (V <sub>c</sub> )	C2310-xxxx
2	N.C.	Frequency
3	GND, case	* C AYYWW
4	RF output	
5	N.C. / RF output compl.	
6	Supply Voltage (V <sub>s</sub> )	

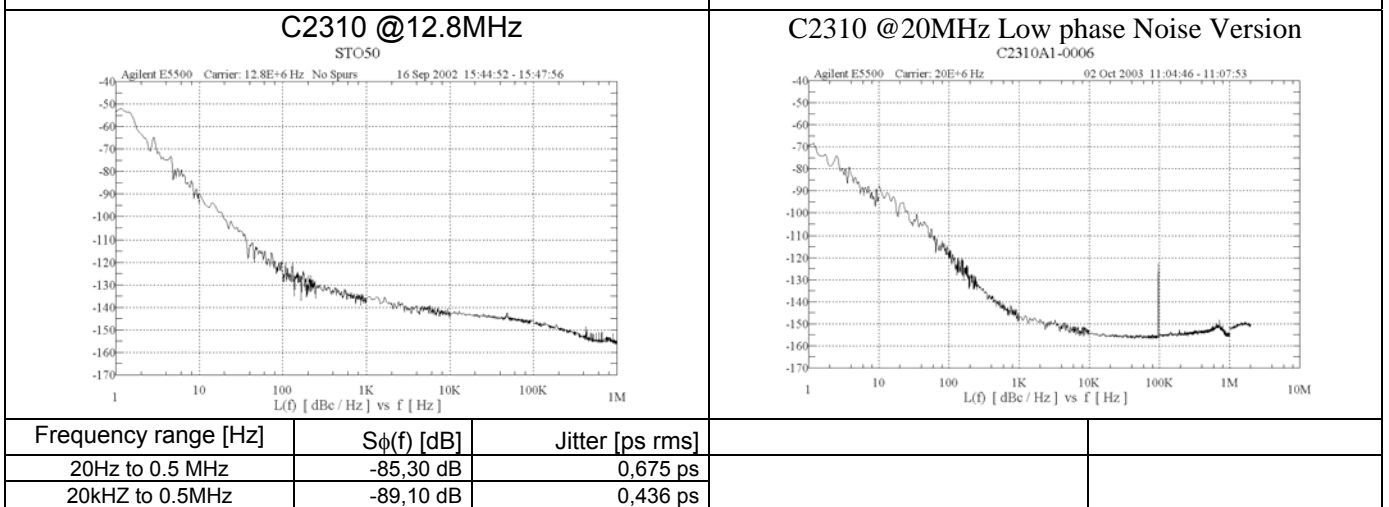
Outline Drawing: G214B

### Absolute Maximum Ratings

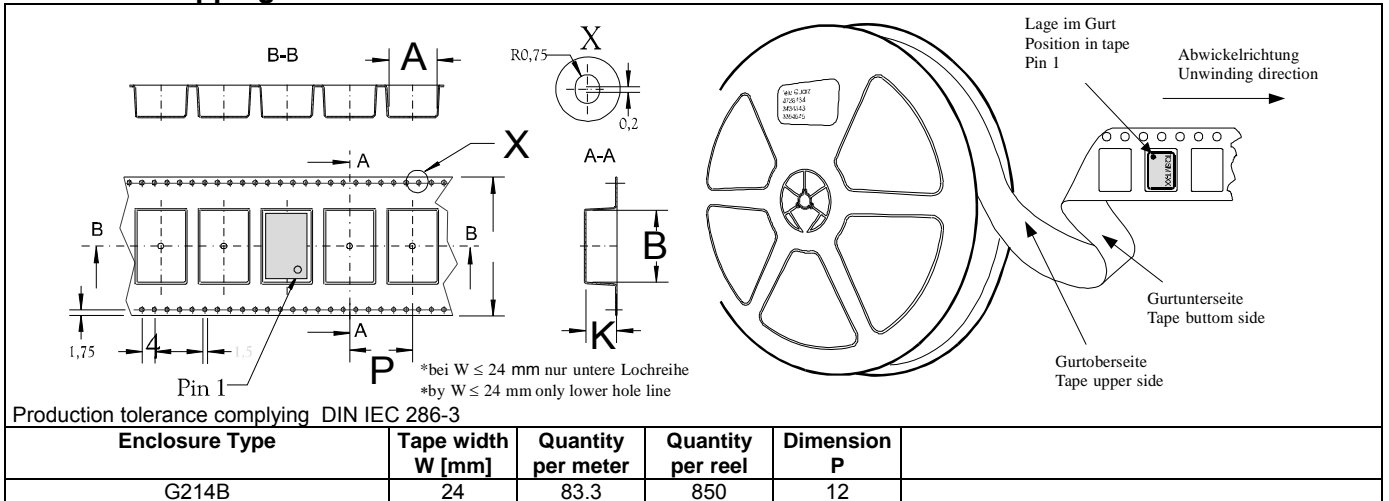
Parameter	Min	Typ	Max.	Units	Condition
Supply voltage (Vs)			6.0	V	
Control Voltage	0		Vs	V	
Maximum output load @ CMOS			40	pF	
Operable temperature range	-40		+85	°C	
Storage temperature range	-55		+125	°C	

### Typical measurement data

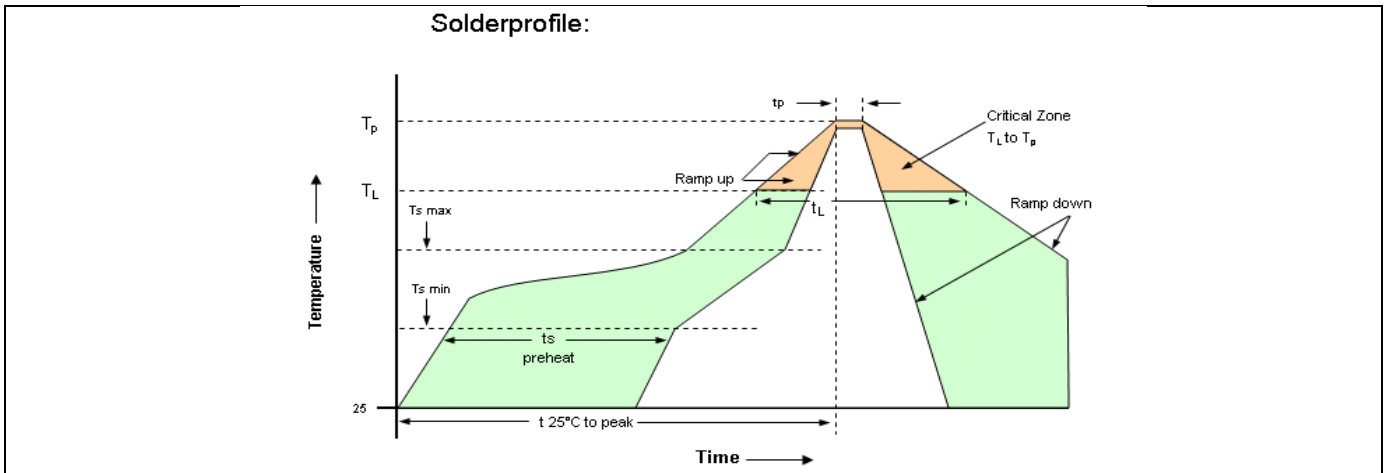
#### Phase Noise and Jitter



### Standard Shipping Method



## 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 ( $T_{s_{min}}$ ) -Temperature Min ( $T_{s_{max}}$ ) -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
$T_{s_{max}}$ 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.

### How to order this product:

Vectron International · [www.vectron.com](http://www.vectron.com)

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Model	Stability Code	Supply Voltage Code	RF Output Code	Package Code	Frequency
C2310	F256	SV033	RFP	A1	6,4MHz

**Vs.operat. Temp. Range**

F256	±2.5ppm	-40 ... +85°C
F106	±1.0ppm	-40 ... +85°C
D256	±2.5ppm	-20 ... +70°C
D106	±1.0ppm	-20 ... +70°C
B106	±1.0ppm	0 ... +50°C
B507	±0.5ppm	0 ... +50°C
F807	±0.8ppm	-40 ... +85°C
G287	±0.28ppm	-30 ... +85°C
D807	±0.8ppm	-20 ... +70°C
D287	±0.28ppm	-20 ... +70°C
B287	±0.28ppm	0 ... +50°C

**Supply:**

SV033: 3.3V  
SV050: 5V

**Enclosure:**

A1: G214B

**Signal:**

RFP: PECL  
RFC: clipped sinewave  
RFH: HCMOS

**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.