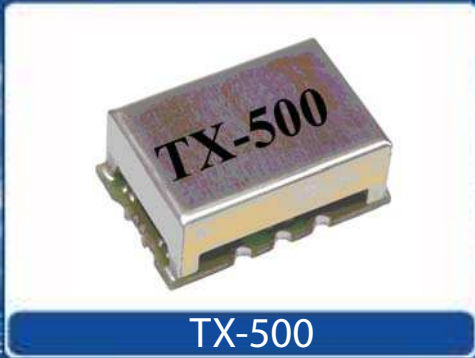




Helping Customers Innovate, Improve & Grow



TX-500

**Features**

- Low Phase Noise
- Low power consumption
- Output: HCMOS, Clipped Sinewave, PECL, True Sinewave
- Tight Tolerances
- Frequency range <sup>1</sup> of 6.4 - 160 MHz
- Standard Frequencies : 10, 12.8, 16.384, 19.44, 19.2, 20, 26 50, 77.76, 100, 122.88, 125, 155.52 MHz

**Applications**

- Base Station
- Test Equipment
- Communication Equipment
- Digital Switching
- Military

**Performance Specifications**

Frequency Stabilities <sup>1</sup> (Standard TCXO)						
Parameter	Min	Typical	Max	Units	Condition	
vs. operating temperature range (referenced to +25°C)	-2.5		+2.5	ppm	-40 to +85°C	Options <sup>3</sup>
	-1		+1	ppm	-40 to +85°C	
	-1		+1	ppm	-20 to +70°C	
	-0.5		-0.5	ppm	-20 to +70°C	
Initial tolerance	-1		+1	ppm	at time of shipment, nominal EFC	
vs. supply voltage change	-0.2		+0.2	ppm	V <sub>s</sub> ±5% static	
vs. load change	-0.1		+0.1	ppm	Load ±10% static	
vs. aging / year	-1		+1	ppm	after 30 days of operation	

Frequency Stabilities <sup>1</sup> (Stratum 3 TCXO)						
Parameter	Min	Typical	Max	Units	Condition	
vs. operating temperature range (referenced to +25°C)	-0.8		+0.8	ppm	-40 to +85°C	Options <sup>3</sup>
	-0.28		+0.28	ppm	-40 to +85°C	
	-0.8		+0.8	ppm	-20 to +70°C	
	-0.28		-0.28	ppm	-20 to +70°C	
Initial tolerance	-1		+1	ppm	at time of shipment, nominal EFC	
vs. supply voltage change	-0.2		+0.2	ppm	V <sub>s</sub> ±5% static	
vs. load change	-0.1		+0.1	ppm	Load ±10% static	
vs. aging / year	-1		+1	ppm	after 30 days of operation	
vs. aging / 20 years	-2.5		+2.5	ppm		
Over all tolerance	-4.6		+4.6	ppm		
Note: Stratum 3 per GR-1244-CORE: <±4.6ppm for all causes and 20years aging Holdover: <±0.37ppm over 24 hours						

## Performance Specifications

Supply Voltage (Vs)						
Parameter	Min	Typical	Max	Units	Condition	
Supply voltage (standard)	3.135	3.3	3.465	VDC		
Supply voltage (Option)	4.75	5	5.25	VDC		
Current consumption			35 100	mA mA	steady state @25°C, HCMOS, Clipped sinewave steady state @25°C, PECL	
RF Output						
Signal [standard]	HCMOS					
Load	13.5	15	16.5	pF		
Signal Level (Vol)			0.3	VDC	with Vs=3.3V and 15pF Load	
Signal Level (Voh)	2.6				with Vs=3.3V and 15pF Load	
Duty Cycle	40		60	%	@ (Voh-Vol)/2	
Rise and Fall time			5	ns	@15 pF 10 to 90 %	
Signal [Option]	Clipped Sinewave				Available < 40MHz only	
Load R	9	10	11	kOhm		
Load // C	9	10	11	pF		
Output power	0.7			V <sub>pp</sub>	@ 10kOhm // 10pF	
Signal [Option]	PECL				Available > 40MHz only	
Load	45	50	55	Ohm	to Vs - 2V	
Rise and Fall time			1	ns	20 to 80%	
Duty Cycle	45		55	%		
Signal [Option]	True Sinewave					
Load	45	50	55	Ohm		
Output power	0	3	6	dBm		
Frequency Tuning (EFC) 6.4 to 26 MHz						
Tuning Range	Fixed TCXO; No adjust				Option <sup>5</sup>	
Tuning Range	±8 ±5			ppm ppm		Standard Version Stratum 3 Version
Linearity	<10%					
Tuning Slope	Positive					
Control Input Impedance	10			kOhm		
Control Voltage Range	0.3	1.65	3.0	VDC	with Vs=3.3V	
Additional Parameters						
Phase Noise <sup>2</sup>		-87		dBc/Hz	10 Hz	@ 12.8 MHz HCMOS 3.3 V
		-119		dBc/Hz	100 Hz	
		-138		dBc/Hz	1 kHz	
		-151		dBc/Hz	10 kHz	
		-155		dBc/Hz	100 kHz	
		-155		dBc/Hz	1 MHz	
Jitter		0.2		ps RMS	@ 12 kHz to 20 MHz	
Phase Noise		-73		dBc/Hz	10 Hz	@ 100MHz HCMOS 3.3V
		-102		dBc/Hz	100 Hz	
		-132		dBc/Hz	1 kHz	
		-150		dBc/Hz	10 kHz	
		-158		dBc/Hz	100 kHz	
		-160		dBc/Hz	1 MHz	
Jitter		0.1		ps RMS	@ 12 kHz to 20 MHz	
Weight			2.0	g		
Processing & Packing	Handling & Processing Note					

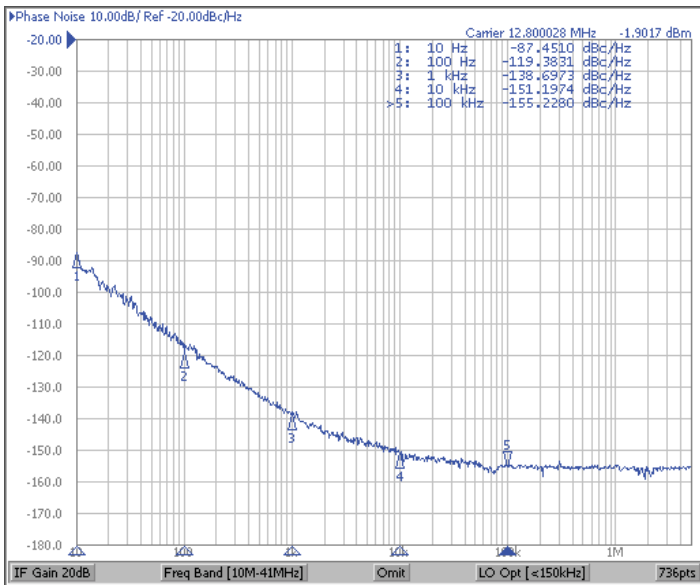
## Absolute Maximum Ratings

supply voltage (Vs)			6.0	V	with Vs=3.3 VDC
Output Load			50	pF	
Operable Temperature Range	-40		+85	°C	
Storage Temperature Range	-55		+105	°C	

## Typical Performance

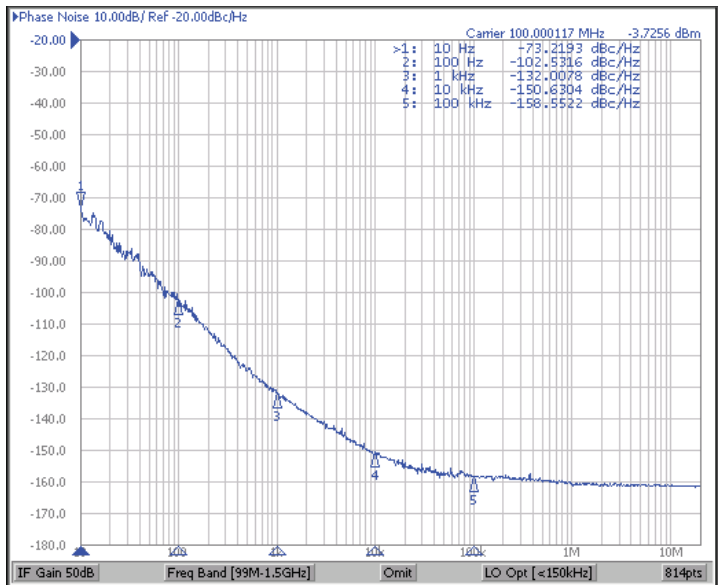
### Phase Noise

TX-500 @ 12.8MHz HCMOS



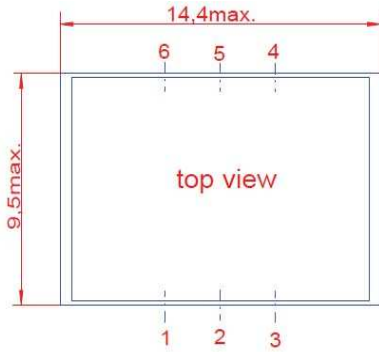
### Phase Noise

TX-500 @ 100MHz HCMOS

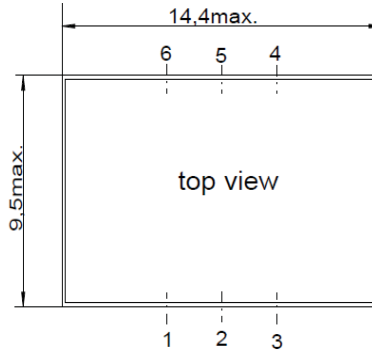


# Outline Drawing / Enclosure

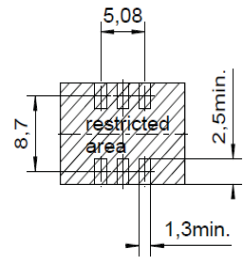
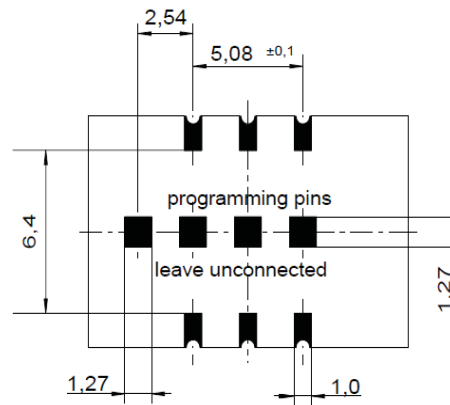
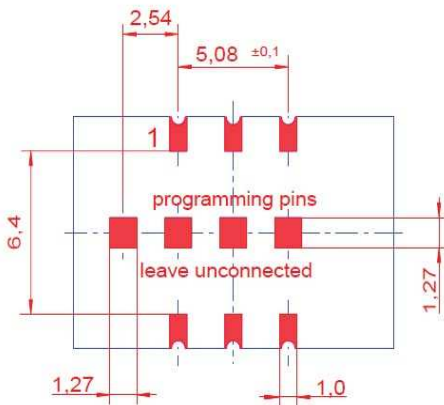
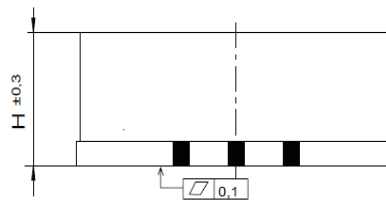
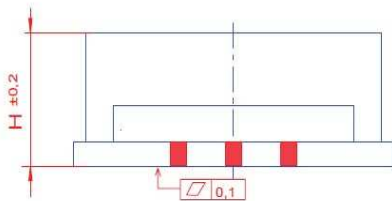
TX-500	
Type	Height "H"
G214B [Standard]	5.9
G214C [Option]	2.8
G286C [Option]	6.1



**G 214**  
 H = 5,9 ; G 214 B  
 H = 2,8 ; G 214 C  
 H = 4,0 ; G 214 D



**G 286**  
 H = 5,9 ; G 286 B  
 H = 6,1 ; G 286 C

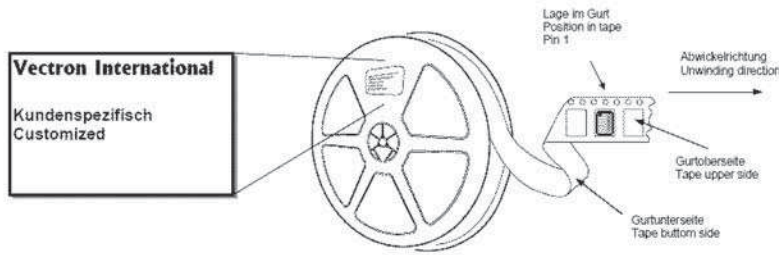
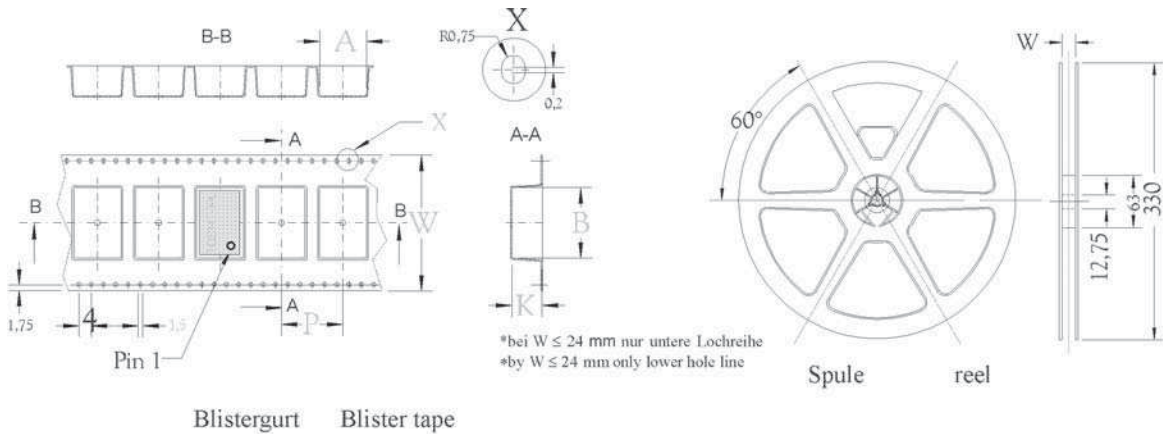


**Padvorschlag  
land pattern  
recommendation**

Pin Connections (CMOS, Clipped Sinewave, True Sinewave)	
1	Control Voltage Input (Vc) / N.C.
2	N.C.
3	Ground (Case)
4	RF-Output
5	N.C.
6	Supply Voltage Input (Vs)

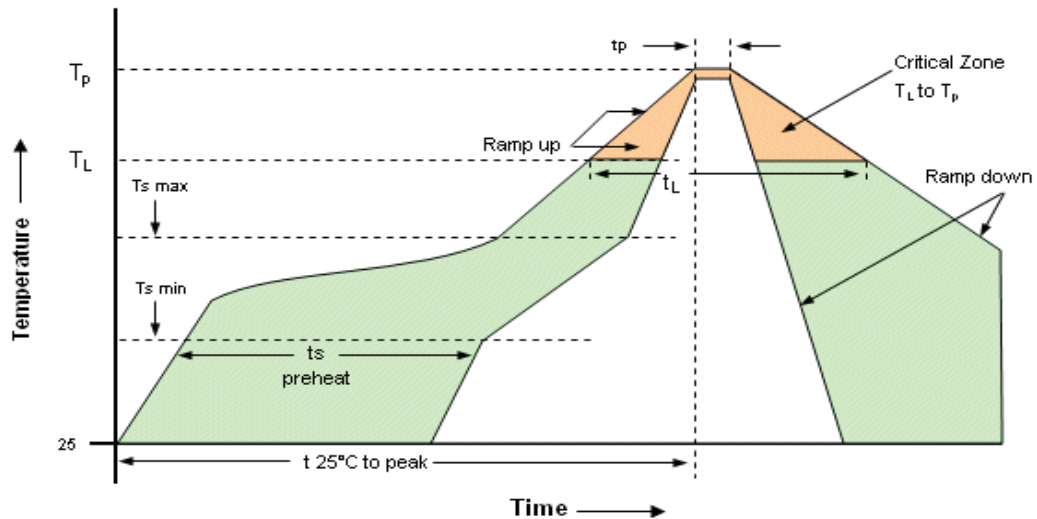
Pin Connections (PECL)	
1	Control Voltage Input (Vc) / N.C.
2	N.C.
3	Ground (Case)
4	RF-Output
5	RF-Output_complementary
6	Supply Voltage Input (Vs)

## Standard Shipping Method (TX-500)



Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P
G214B / G286C	24	83.3	850	12
G214C	24	83.3	1700	12

## Recommended Reflow Profile

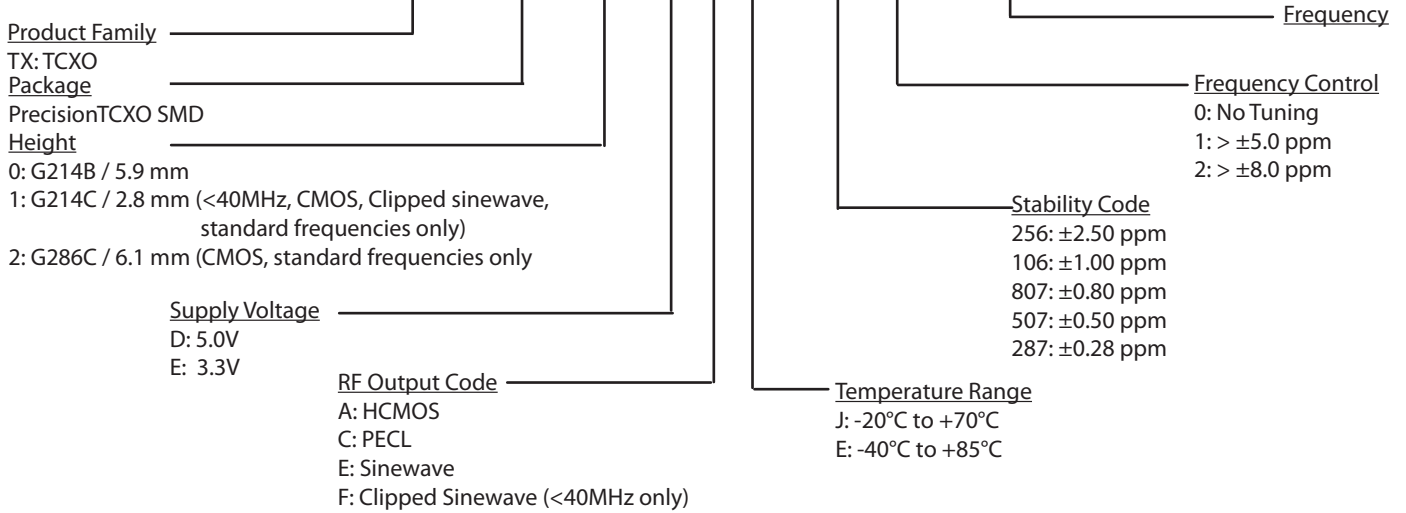


Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly	Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly
Average ramp-up rate ( $T_L$ to $T_p$ )	3°C/second max.	Time 25°C to Peak Temperature	8 minutes max.
Preheat -Temperature Min $T_{Smin}$ -Temperature Min $T_{Smax}$ -Time (min to max) $t_s$	150°C 200°C 60-180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

## Ordering Information

**TX - 500   0 - E A J - 107   0 - 10M0000000**



**Notes:**

1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. Phase noise degrades with increasing output frequency.
3. Contact factory for availability.

Unless other stated all values are valid at typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).

Subject to technical modification.

## For Additional Information, Please Contact

**USA:**

Vectron International  
267 Lowell Road  
Hudson, NH 03051  
Tel: 1.888.328.7661  
Fax: 1.888.329.8328

**Europe:**

Vectron International  
Landstrasse, D-74924  
Neckarbischofsheim, Germany  
Tel: +49 (0) 7268.801.100  
Fax: +49 (0) 7268.801.282

**Asia:**

Vectron International  
1589 Century Avenue, the 19th Floor  
Chamtime International Financial Center  
Shanghai, China  
Tel: 86.21.6081.2888  
Fax: 86.21.6163.3598

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