TX-500

Temperature Compensated Crystal Oscillator

Features

- Low Phase Noise
- Low power consumption
- Output: HCMOS, Clipped Sinewave, PECL, True Sinewave
- Tight Tolerances
- Frequency range [1] 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[1] (Standard TCXO)

Parameter	Min	Typical	Max	Units	Condition	
vs. operating temperature range (referenced to +25°C)	-1 -0.5 -1 -0.28		+1 +0.5 +1 -0.28	ppm ppm ppm ppm	-40 to +85°C -40 to +85°C -20 to +70°C -20 to +70°C	Options[3]
Initial tolerance vs. supply voltage change vs. load change vs. aging / year	-1 -0.2 -0.1 -1		+1 +0.2 +0.1 +1	ppm ppm ppm ppm	at time of shipment, nominal EFC V_S ±5% static Load ±10% static after 30 days of operation	

Frequency Stabilities[1] (Stratum 3 TCXO)

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

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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_{PP}	@ 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[5]
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[2]		-87 -119 -138 -151 -155 -155		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz 1 MHz	@ 12.8 MHz HCMOS 3.3 V
Jitter		0.2		ps RMS	@ 12 kHz to 20 MHz	
Phase Noise		-73 -102 -132 -150 -158 -160		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 HCMOS 3.3V
Jitter		0.1		ps RMS	@ 12 kHz to 20 MHz	
Weight			2.0	g		
Processing & Packing	Handling & Processing Note					

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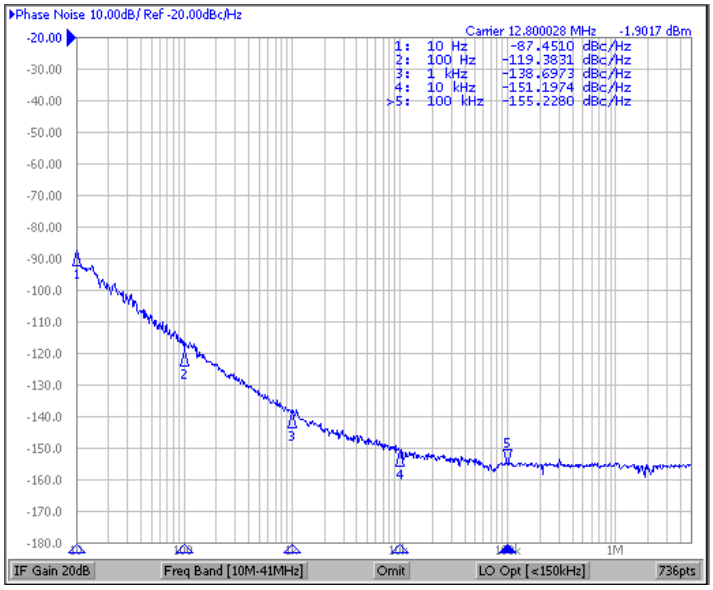
Absolute Maximum Ratings					
supply voltage (Vs)			6.0	V	with Vs=3.3 VDC
Output Load			50	pF	
Operable Temperature Range	-40		+85	°C	
Storage Temperature Range	-40		+105	°C	

Typical Performance

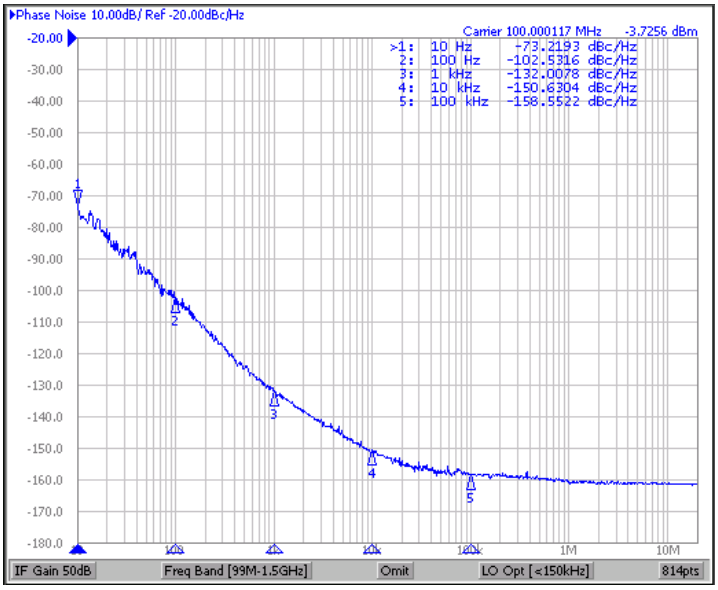
Phase Noise

TX-500 @ 12.8MHz HCMOS



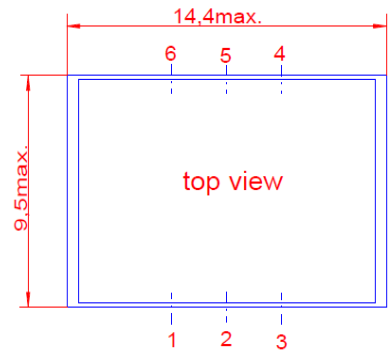
Phase Noise

TX-500 @ 100MHz HCMOS

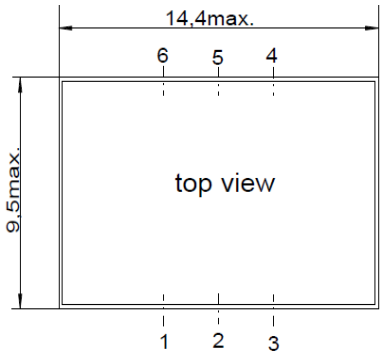


Outline Drawing / Enclosure

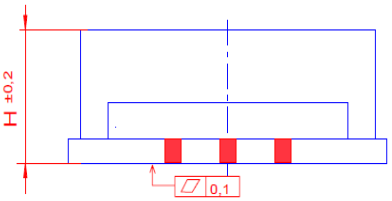
TX-500	
Type	Height "H"
G214B [Standard]	5.9
G214C [Option]	2.8
G286C [Option]	6.1

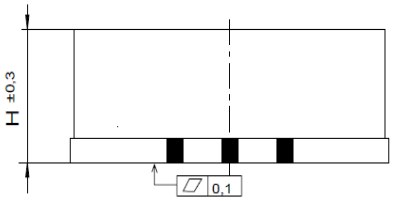


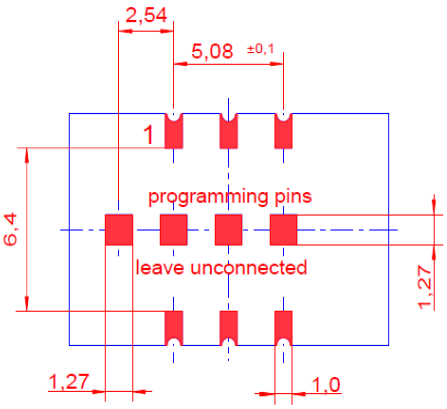
G 214
H = 5,9 ; G 214 B
H = 2,8 ; G 214 C
H = 4,0 ; G 214 D

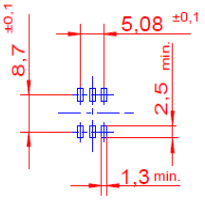


G 286
H = 5,9 ; G 286 B
H = 6,1 ; G 286 C

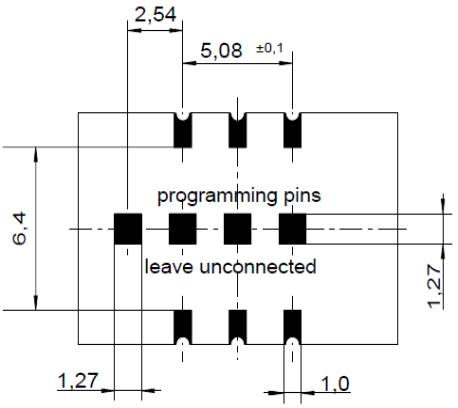


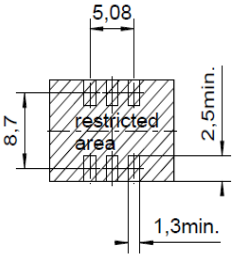






Padvorschlag
land pattern
recommendation





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)

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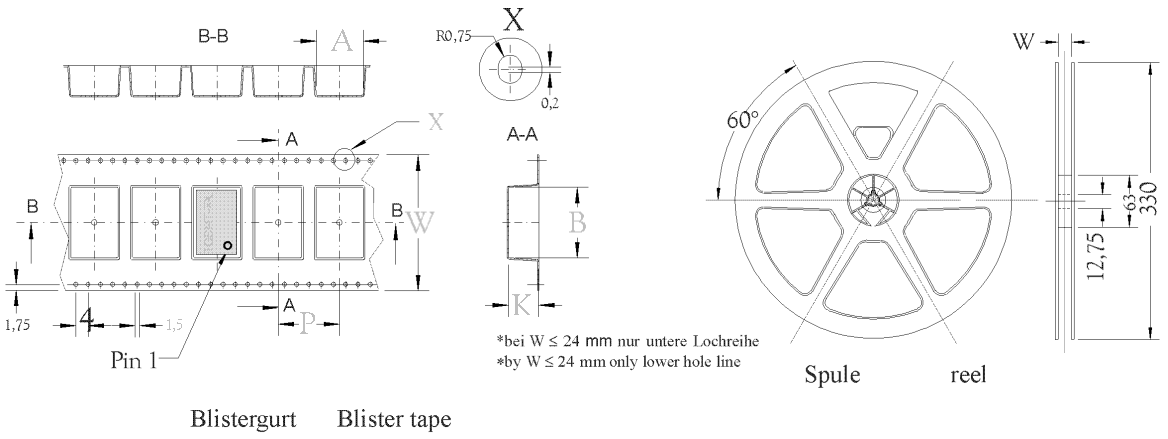
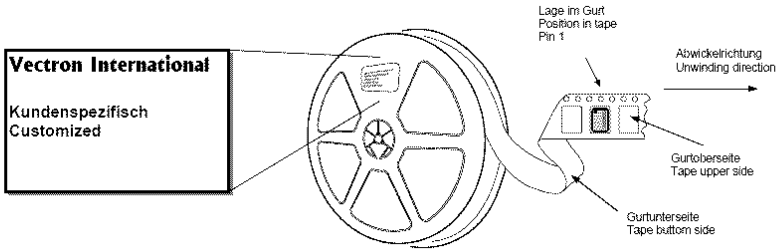
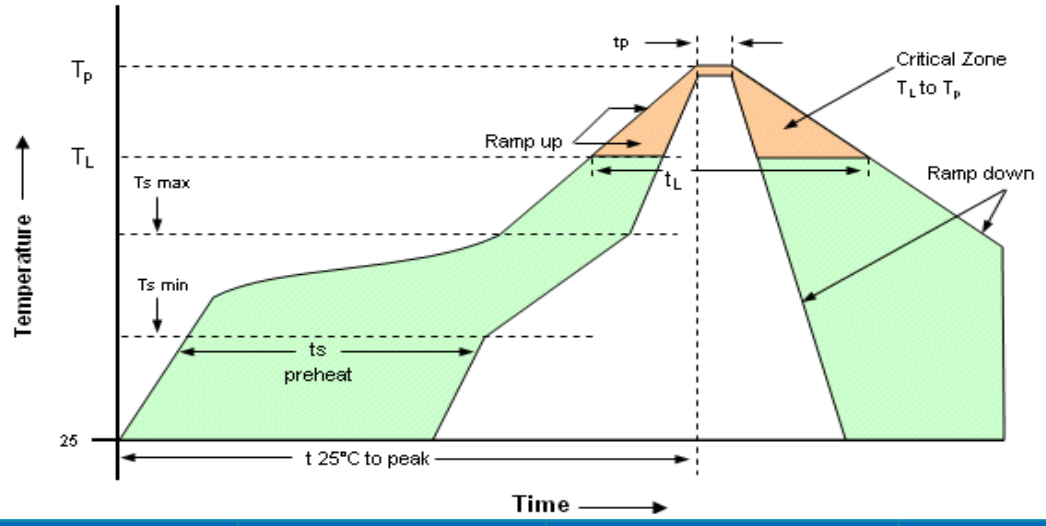
Standard Shipping Method (TX-500)





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
TSmax to TL -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.

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Ordering Information

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

Product Family
TX: TCXO

Package
PrecisionTCXO SMD

Height
0: G214B / 5.9 mm
1: G214C / 2.8 mm (<40MHz, CMOS, Clipped sinewave, standard frequencies only)
2: G286C / 6.1 mm (CMOS, standard frequencies only

Supply Voltage
D: 5.0V
E: 3.3V

RF Output Code
A: HCMOS
C: PECL
E: Sinewave
F: Clipped Sinewave (<40MHz only)

Temperature Range
J: -20°C to +70°C
E: -40°C to +85°C

Stability Code
256: ±2.50 ppm
106: ±1.00 ppm
807: ±0.80 ppm
507: ±0.50 ppm
287: ±0.28 ppm

Frequency Control
0: No Tuning
1: > ±5.0 ppm
2: > ±8.0 ppm

Frequency

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

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Rev: 12/2015