

TX-803

High Shock and Low G-sensitivity Temperature Compensated Crystal Oscillator



Introduction

The TX-803 Temperature Compensated Crystal Oscillator (TCXO) is a quartz stabilized, clipped sine wave or CMOS output, 6th order analog temperature compensated oscillator, operating off a 2.8 to 3.3 Volt supply in a 5×3.2 mm ceramic package with excellent shock and g-sensitivity behavior.

Features

- Shock Survival 20,000 g
- G-sensitivity Typically 0.3 ppb/g
- CMOS and Clipped Sinewave Output
- Low Phase Noise
- Phase Noise Filter Option
- Sn/Pb/Ag (62%/36%/2%) Solder pad coating (Optional)
- Frequency Range: 10–50 MHz
- Standard Frequencies: 10, 20, 25, 40 and 50 MHz



Applications

- Harsh Environment
- Defense
- Guidance
- Portable Radios
- GPS Telemetry

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1. Performance Specifications

Table 1-1. Frequency Stabilities^{1,2}

Parameter	Min	Typ	Max	Units	Condition
vs. operating temperature range (referenced to (dfmax+dfmin)/2)	-500	—	+500	ppb	-40 to +85 °C
	-1	—	+1	ppm	-40 to +105 °C
Initial tolerance	-1.0	—	+1.0	ppm	at time of shipment, at 25 °C and Vc = 1.5V
vs. supply voltage change	-0.2	—	+0.2	ppm	Vs ±5% static at HCMOS
	-0.1	—	+0.1	ppm	Vs = ±5% static at Clipped Sinewave
vs. load change	-0.2	—	+0.2	ppm	Load ±10% static at HCMOS
	-0.1	—	+0.1	ppm	Load ±10% static at Clipped Sinewave
vs. aging/1 st year	-2.0	—	+2.0	ppm	at 25 °C
vs. aging/10 years	-5.0	—	+5.0	ppm	at 25 °C
Acceleration stability	—	0.3	—	ppb/g	Gamma vector, 3 axes, 20–1500 Hz at 20 MHz

Table 1-2. Supply Voltage (Vs)

Parameter	Min	Typical	Max	Units	Condition
Supply voltage (standard)	3.135	3.3	3.465	VDC	(2.8 and 3.0V on request) ⁵
Current consumption	—	—	6	mA	LVC MOS at 20 MHz, steady state at +25 °C
Current consumption	—	—	9	mA	LVC MOS at 40 MHz, steady state at +25 °C
Current consumption	—	—	10	mA	LVC MOS at 50 MHz, steady state at +25 °C

Table 1-3. RF Output (Clipped Sinewave)

Parameter	Min	Typical	Max	Units	Condition
Load R	9	10	11	kΩ	—
Load C	9	10	11	pF	—
Output Power	0.8	1.2	2.0	V _{PP}	at 10 kΩ 10 pF

Table 1-4. RF Output (HCMOS)

Parameter	Min	Typical	Max	Units	Condition
Load	13.5	15	16.5	pF	—
Signal Level (Vol)	—	—	0.3	VDC	with Vs = 3.3V and 15 pF Load
Signal Level (Voh)	3.0	—	—	—	with Vs = 3.3V and 15 pF Load
Rise and Fall Time	—	—	6.5	ns	—
Duty Cycle	40	50	60	%	at (Voh-Vol)/2
Start-up Time	—	—	10	ms	90% amplitude

Table 1-5. Frequency Tuning (EFC)

Parameter	Min	Typical	Max	Units	Condition
Tuning Range	Fixed TCXO; No adjustment				Options ¹
Tuning Range	±5.0	—	±10.0	ppm	
Linearity	10%				—
Tuning Slope	Positive				—
Control Voltage Range	0.5	1.5	2.5	VDC	at Vs = 2.8 to 3.3V
Freq. Control input impedance	100	—	—	kΩ	—

Table 1-6. Additional Parameters

Parameter	Min	Typical	Max	Units	Condition
Weight	—	—	1.0	g	—
Processing and Packing	Handling and Processing Note				—
Reflow Profile	IPC/JEDEC J-STC-020 (latest version)				—

Table 1-7. Absolute Maximum Ratings

Parameter	Min	Typical	Max	Units	Condition
Supply voltage (Vs)	−0.6	—	4.6	V	—
Control voltage	0	—	Vs	V	—
Operable Temperature Range	−40	—	+105	°C	Max Temperature depending on Specification
Storage Temperature Range	−55	—	+125	°C	

Table 1-8. Phase Noise³

Parameter	Min	Typical	Max	Units	Condition	
Phase Noise	—	-100	—	dBc/Hz	10 Hz	at 20 MHz, clipped sinewave
		-130		dBc/Hz	100 Hz	
		-150		dBc/Hz	1 kHz	
		-157		dBc/Hz	10 kHz	
		-159		dBc/Hz	100 kHz	
Phase Noise	—	-92	—	dBc/Hz	10 Hz	at 40 MHz, CMOS
		-123		dBc/Hz	100 Hz	
		-146		dBc/Hz	1 kHz	
		-158		dBc/Hz	10 kHz	
		-160		dBc/Hz	100 kHz	
Additional Information	Bypass capacitor is recommended					

2. Typical Performance Data

Figure 2-1. Phase Noise: TX-803 at 20 MHz, Clipped Sinewave

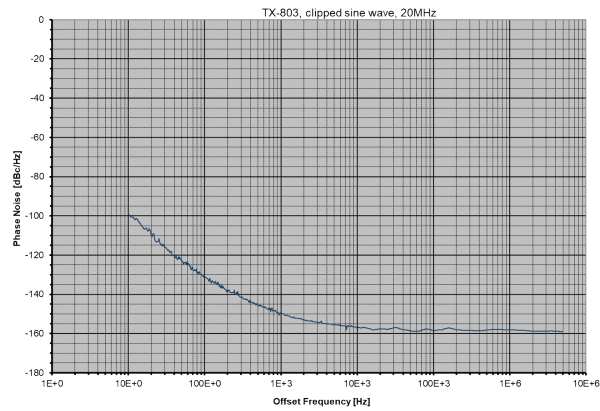
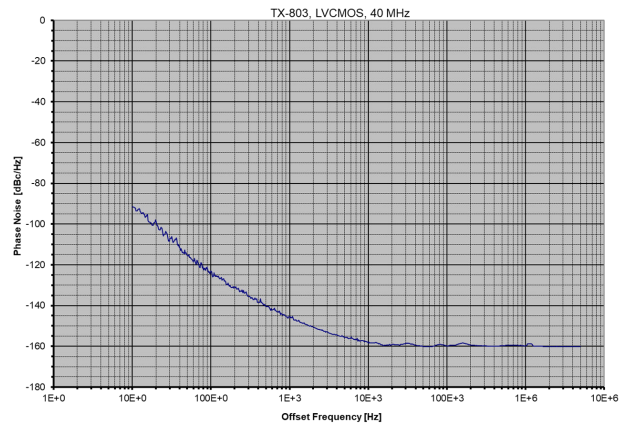
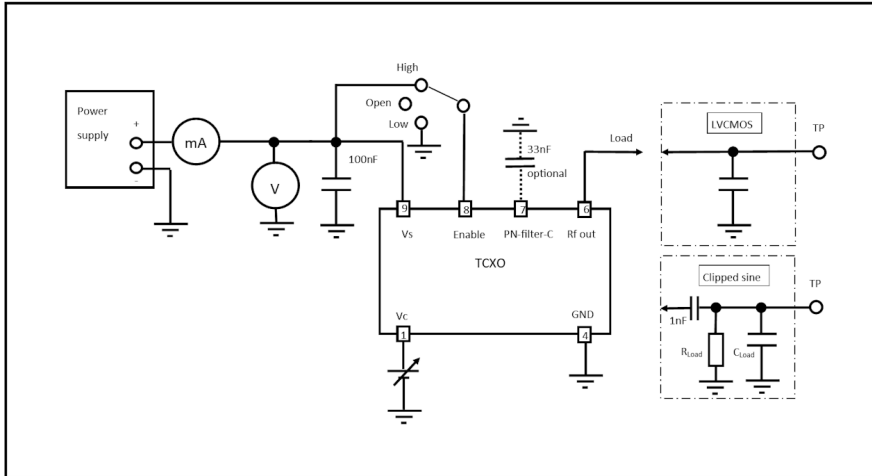


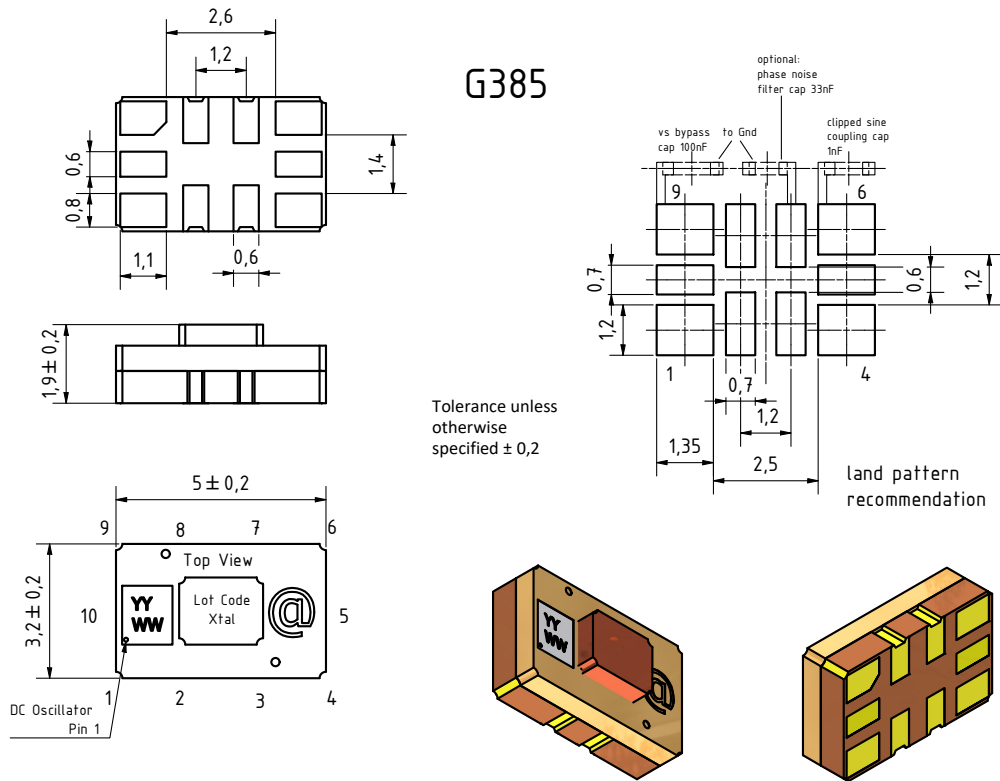
Figure 2-2. Phase Noise: TX-803 at 40 MHz, CMOS



3. Test Schematic of TX-803



4. Outline Drawing/Enclosure

**Table 4-1. Enable Pin Function: TX-803**

Pin 8 state	Pin 6 output
High >0.7 Vs	Output enabled and operating
Open	Output enabled and operating
Low < 0.3 Vs	Output disabled

Table 4-2. Package Code: TX-803

Type	Height
G385	1.9mm

Table 4-3. Marking: TX-803

Manufacturing Date Code	
-------------------------	--

Table 4-4. Pin Connections

Pin	Function
1	Voltage Control (VC) or No Connect (option)
2	Do not connect
3	Do not connect
4	Ground (GND)
5	Ground (GND)

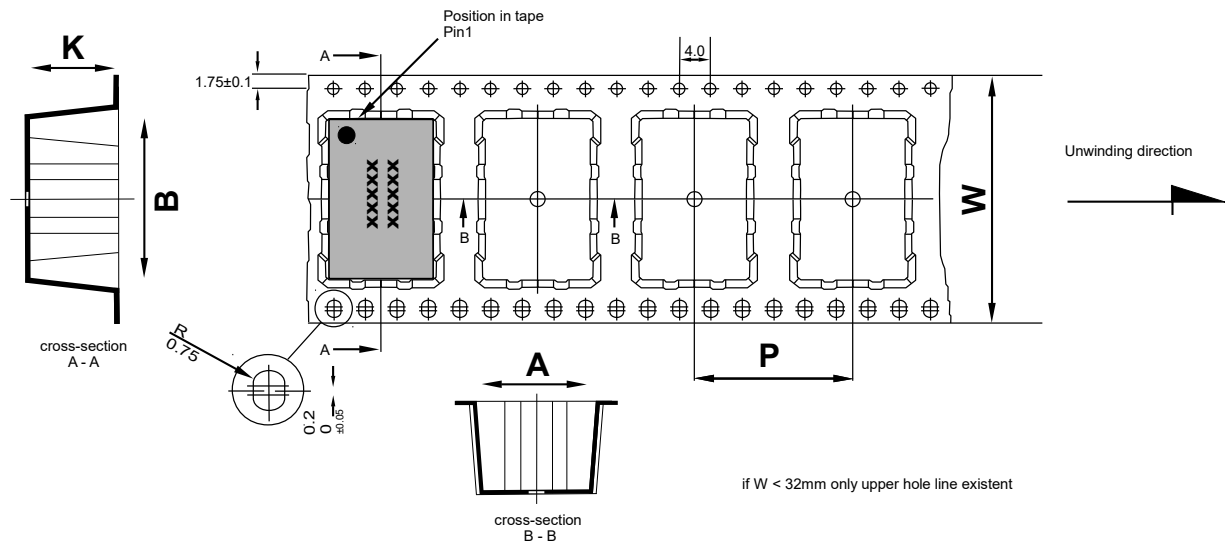
Table 4-4. Pin Connections (continued)

Pin	Function
6	RF Output
7	N.C. or Phase Noise Filter Capacitor (option)
8	Enable Control
9	Supply Voltage Input (VS)
10	Ground (GND)

5. Terminations

Termination	Package Code	10pad Ceramic Package with the Following Finish
Termination Finish	0	Gold over Nickel; Au 0.76 µm min. Ni 1.91 µm min.
Option ⁵	1	Terminations tin lead solder dipped with 6–10 µm Sn/Pb/Ag (62%/36%/2%)

6. Standard Shipping Method



Dimension in mm:

A, B and K are dependent upon component dimensions

production tolerance complying DIN IEC 286-3

All dimensions in millimeters unless otherwise stated

Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P
G385	12	150	750	8

7. Recommended Reflow Profile

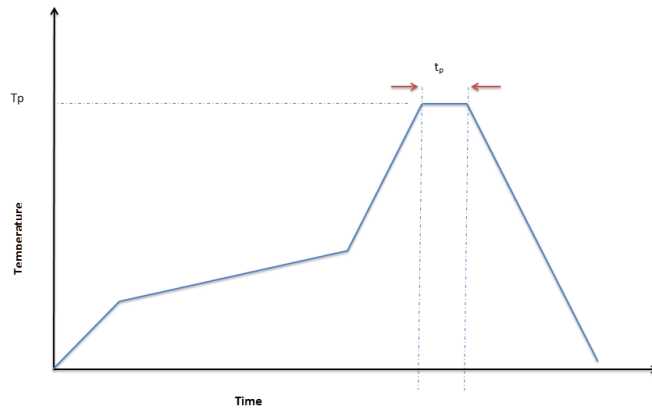
TP: max 250°C (@ solder joint,
customer board level)

T_p: max: 10...30 sec

Additional Information:

This SMD oscillator has been
designed for pick and place reflow
soldering

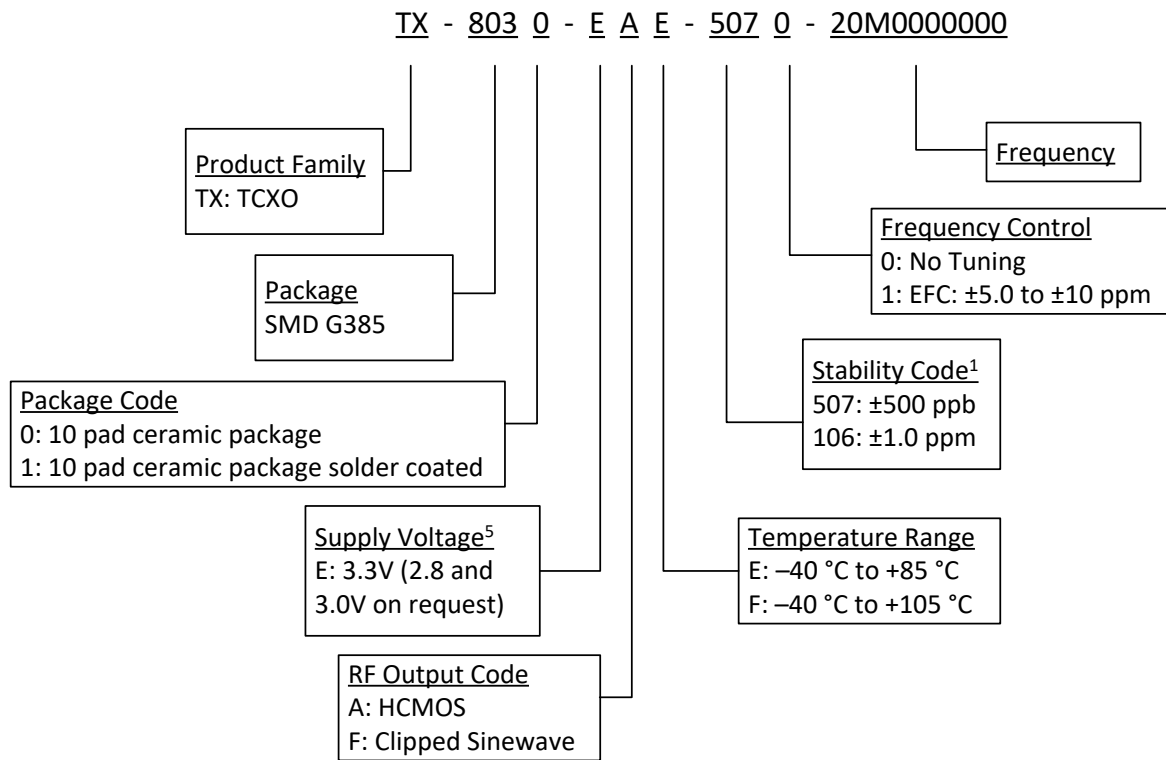
SMD oscillators must be on the top
side of the PCB during the reflow
process.



8. Environmental Conditions

Temperature Cycling	MIL-STD-883 Meth 1010.8 Cond. B 200 cycles -55/+125 °C; cycle time 30 min
Temperature Cycling	JESD22A104 Cond. G 1000 cycles -40/+125 °C; cycle time 30 min
Vibration	MIL-STD-883 Meth 2007 Cond. A 20G 20–2000 Hz 4x in each 3 axis 4 min
Shock	MIL-STD-883 Meth 2002.5 Cond. E 10 kg 0.2 ms five shocks per axis. Cond. F 20 kg 0.2 ms five shocks per axis.
Solderability	MIL-STD-002 Cond. A Through hole device; Cond. B, SMD (correspond to MIL-STD-883 Meth. 2003)
Humidity Bias Life Test	JESD22A101; 85 °C/85% RH 1008h power on
ESD HBM	JEDEC JS-001 Class 1C; 10* 1000V
Moisture Sensitivity Classification Level (MSL)	JESD22-A113
High Temp Operating Life (HTOL)	MIL-STD-202 Meth 108A Cond. C - 10000h at 105 °C power on
RoHS Compliance	100% RoHS Compliant
Reflow Simulation Test	J-STD-020D Total 3x Lead free profile (for SMD)
MSL Level	MSL 1

9. Ordering Information⁵



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 with optional Phase noise Filter Capacitor. Phase noise degrades with increasing output frequency.
4. Subject to technical modification.
5. Contact factory for availability.

10. Revision History

Revision	Date	Description
B	07/2026	• Updated Features • Updated Table 1-1 Frequency Stabilities • Updated Section 9 Ordering Information
A	04/2026	First release and converted to Microchip branding.

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