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Temperature Compensated Crystal Oscillator (TCXO)

TG1612SAN 26MHz

Product No : X1G004681000100

- Reflowable and high density mounting type ultra small size SMD. (1.6×1.2 mm, Height 0.65 mm Max. TBD)
- Using the heat-resisting type AT cut quartz crystal
  allows almost the same temperature soldering as universal SMD IC.
- Operating supply voltage : 1.8 V.

■ Specifications

1. Absolute maximum ratings

Parameter	Symbol	Value	Unit	Note
Supply voltage	V_{CC}-GND	-0.3 to 4.0	V	
Storage temperature range	$T_{_STG}$	-40 to +90	°C	

2. Operating range

Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power voltage		V_{CC}	1.7	1.8	1.9	V	
Power voltage		GND	0	0	0	V	
Operating temperature range		T_use	-40	+25	+85	°C	
Output load 1		Load1_R	9	10	11	kΩ	
		Load1_C	9	10	11	pF	
	DC-cut capacitor	C_C	0.01			µF	

DC-cut capacitor is not included in our TCXO. Please insert DC-cut capacitor in(0.01uF Min.) output line.

3.Frequency characteristics

1) Output frequency 26.000000 MHz

2) Frequency characteristics

(V_{CC}=1.8 V, Load 10 kΩ//10 pF(DC cut), T_use = +25°C)

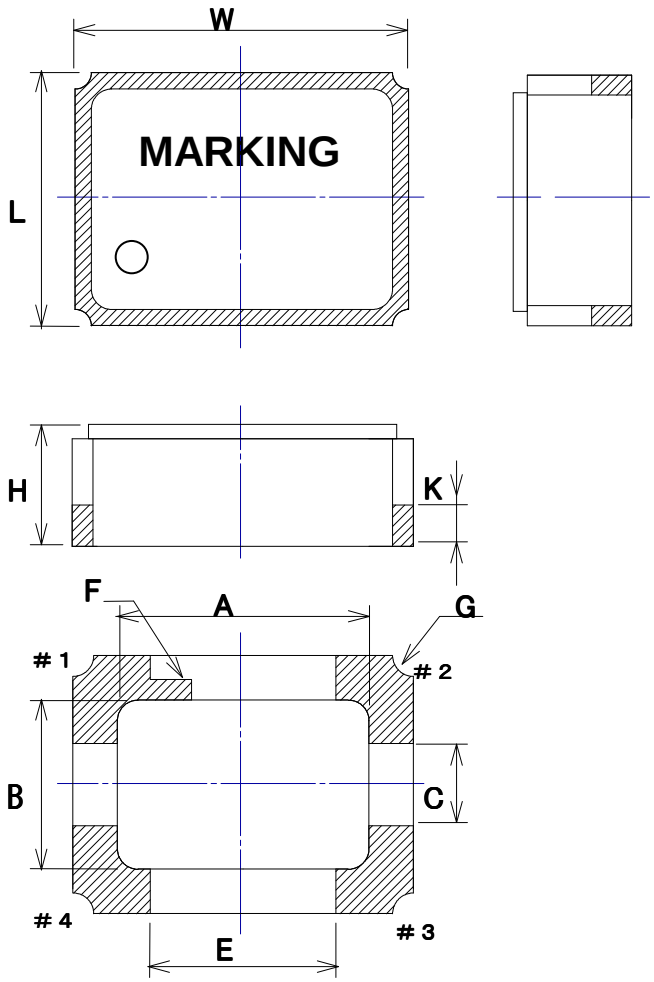
Parameter	Symbol	Value	Unit	Note
Frequency tolerance.	f_tol(OSC)	+/- 0.8 ×10^{-6} Max.	-	T_use = +25 °C +/- 2 °C Before Reflow
	f_tol	+/- 2.0 ×10^{-6} Max. *1		T_use = +25 °C +/- 2 °C Reflow cycles : 1 times.*2
Frequency / temperature characteristics (Based on frequency at +25 °C)	fo-Tc	+/- 0.5 ×10^{-6} Max.	-	T_use = -30 °C to +85 °C
		+/- 2.5 ×10^{-6} Max.		T_use = -40 °C to -30 °C
Frequency stability Slope vs Temperature	fo-Tc/°C	+/- 0.05 ×10^{-6} Max.	/°C	T_use = -10 °C to +70 °C
		+/- 0.10 ×10^{-6} Max.		T_use = -30 °C to +85 °C
		+/- 0.20 ×10^{-6} Max.		T_use = -40 °C to -30 °C
Frequency / temperature gradient (0.28°C /s rate of noise of compornent body temperature)	fo-Tc/s	+/- 0.014 ×10^{-6} Max.	/s	T_use = -10 °C to +70 °C
		+/- 0.028 ×10^{-6} Max.		T_use = -30 °C to +85 °C
		+/- 0.056 ×10^{-6} Max.		T_use = -40 °C to -30 °C
Frequency / Load coefficient	fo-Load	+/- 0.1 ×10^{-6} Max.	-	Load 1R: 10kΩ +/- 1kΩ Load 1C: 10pF +/- 1pF
Frequency / voltage coefficient	fo-Vcc	+/- 0.1 ×10^{-6} Max.	-	V_{CC} = 1.8 V +/- 0.1 V
Frequency aging	f_age	+/- 1.0 ×10^{-6} Max.	- -	First year T_use = +25°C
		+/- 3.0 ×10^{-6} Max.		5 years T_use = +25°C

*1 Include initial frequency tolerance and frequency deviation after reflow cycles.
*2 Measurement of frequency deviation is made 24h after reflow soldering.

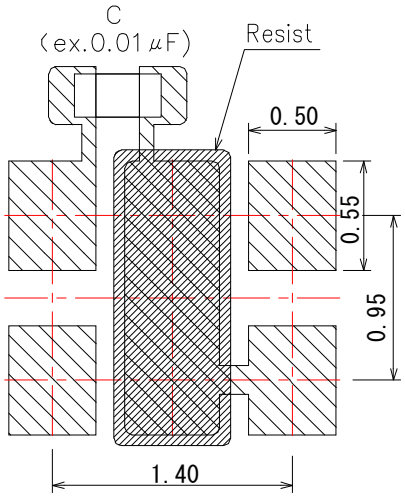
4.Electrical characteristics (V_{CC}=1.8 V, Load 10 kΩ//10 pF(DC cut), T_use = +25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Current consumption	Icc			1.5	mA	Load 1 : 10 kΩ // 10 pF
Output level (Peak to peak voltage)	Vpp	0.8		1.5	V	Load 1 : 10 kΩ // 10 pF
Start up time	tosc			0.8	ms	Output level = 350mVp-p within +/-20ppm of final freq.
				1.5		>90% of final amplitude within +/-2ppm of final freq.
				2.5		>95% of final amplitude within +/-0.1ppm of final freq.
				5.0		100% of final amplitude
				5.0	s	within +/-0.02ppm of final freq.
Frequency drift rate after DC power applied (TCXO not powered up in the 10s prior to measurement.)	-			+/- 0.050 $\times 10^{-6}$	-	from 0.1s to 0.6s
				+/- 0.014 $\times 10^{-6}$	-	from 0.6s to 1.6s
				+/- 0.005 $\times 10^{-6}$	/s	from 1.6s and up to 40s
Symmetry	SYM	45		55	%	GND Level
Harmonics	-			-10	dBc	
SSB Phase noise (T_use = +25°C)	L(f)		-62	-57	dBc/Hz	Offset:1 Hz
			-90	-83		Offset:10 Hz
			-115	-108		Offset:100 Hz
			-137	-135		Offset:1 kHz
			-151	-148		Offset:10 kHz
			-152	-149		Offset:100 kHz
			-152	-150		Offset:1 MHz
SSB Phase noise (T_use = -30°C to +85°C)	L(f)		-58	-55	dBc/z	Offset:1 Hz
			-86	-83		Offset:10 Hz
			-112	-108		Offset:100 Hz
			-133	-131		Offset:1 kHz
			-150	-146		Offset:10 kHz
			-151	-149		Offset:100 kHz
			-151	-149		Offset:1 MHz
Short term stability	-			1.0×10^{-9}		Root Allan Variance Tau=1s

■ External Dimensions



■ Recommended footprint



Please connect Cby(bypass capacitor) quite near by "Vcc" terminal.
Do not design any patterns except GND on the shaded area.

No.	Terminal
#1	N.C.
#2	GND
#3	OUT
#4	Vcc

Base : Ceramics
Terminal : Au coated

Unit : mm

DIM.	MIN.	TYP.	MAX.	DIM.	MIN.	TYP.	MAX.
W	1.50	1.60	1.70	C	---	0.40	---
L	1.10	1.20	1.30	E	---	0.90	---
H	---	---	0.65	F	---	0.20	---
A	---	1.23	---	G	---	R0.10	---
B	---	0.83	---	K	---	0.20	---