

Temperature Compensated Crystal Oscillator (TCXO)

TG-5021CE 16.369MHz

- Reflowable and high density mounting type ultra small size SMD (3.2×2.5×0.9 mm).
- Using the heat-resisting type AT cut quartz crystal
allows almost the same temperature soldering as universal SMD IC
- Operating supply voltage : 3.0 V.

■ Specifications

1. Absolute maximum ratings

Parameter	Symbol	Value	Unit	Note
Supply voltage	V_{CC-GND}	-0.3 to 4.5	V	
Storage temperature range	T_{stg}	-40 to +85	°C	

2. Operating range

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Supply voltage	V_{CC}	2.85	3.00	3.15	V	$V_{CC}=3.0\text{ V}$ +/- 5%
Operating temperature range	T_{use}	-30	+25	+85	°C	
Output load	Load_R	9	10	11	k Ω	
	Load_C	9	10	11	pF	
DC-cut capacitor	C_C	0.01 μ			F	

DC-cut capacitor is not included in our TCXO. Please insert DC-cut capacitor in output line.

3. Frequency characteristics

1) Output frequency 16.369 MHz

2) Frequency characteristics

($V_{CC}=3.0\text{ V}$, Load=10kOhm//10pF(DC cut), $T_{use}=+25\text{ }^{\circ}\text{C}$)

Parameter	Symbol	Value	Unit	Note
Frequency tolerance	f_tol	+/- 2.0×10 ⁻⁶ Max.	-	$T_{use}=+25\text{ }^{\circ}\text{C}$ +/-2 $^{\circ}\text{C}$ Reflow cycles : 2 times.*1
Frequency / temperature characteristics	fo-Tc	+/- 2.5×10 ⁻⁶ Max.	-	$T_{use}=-30\text{ }^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$ Based on frequency at +25 $^{\circ}\text{C}$
Frequency slope vs. Temp.	-	± 0.15×10 ⁻⁶ /°C Max.		$T_{use}=-10\text{ }^{\circ}\text{C}$ to +60 $^{\circ}\text{C}$
		± 0.30×10 ⁻⁶ /°C Max.		$T_{use}=-30\text{ }^{\circ}\text{C}$ to -10 $^{\circ}\text{C}$ +60 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$
Frequency drift	-	± 10 × 10 ⁻⁹ /sec Max.		$T_{use}=-10\text{ }^{\circ}\text{C}$ to +60 $^{\circ}\text{C}$ *2 *3
		± 20 × 10 ⁻⁹ /sec Max.		$T_{use}=-30\text{ }^{\circ}\text{C}$ to -10 $^{\circ}\text{C}$ +60 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$ *2 *3
Frequency / Load coefficient	fo-Load	+/- 0.2×10 ⁻⁶ Max.	-	Load :10 kΩ//10 pF +/-10 % each
Frequency / voltage coefficient	fo-Vcc	+/- 0.2×10 ⁻⁶ Max.	-	$V_{CC}=3.0\text{ V}$ +/- 5%
Frequency ageing	f_age	+/- 1.0×10 ⁻⁶ Max.	-	$T_{use}=+25\text{ }^{\circ}\text{C}$ First year

*1 Measurement of frequency deviation is made 1h after reflow soldering.

*2 measured from stabilization.

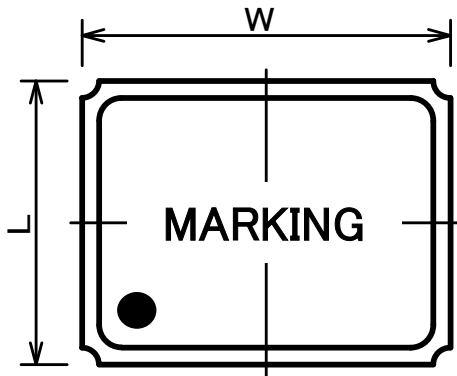
*3 Temperature slope is below 2 $^{\circ}\text{C}/\text{min}$

4. Electrical characteristics

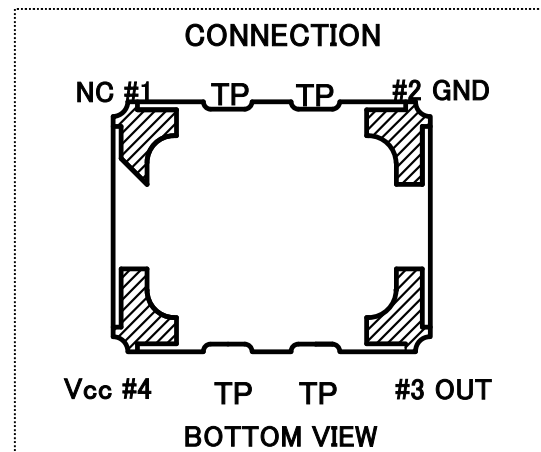
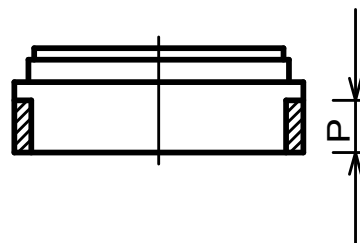
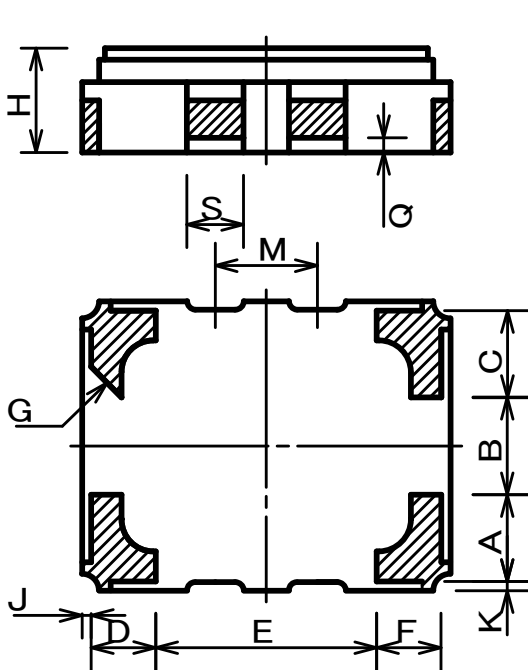
($V_{CC}=3.0\text{ V}$, Load 10 kΩ//10pF(DC cut) , $T_{use}=+25\text{ }^{\circ}\text{C}$)

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Current consumption	Icc			2.0	mA	
Output level	Vpp	0.8			V	Peak to peak voltage
Start-up time	T_str			2.0	ms	to 90% of final amplitude
Short term stability	-			±1.0×10 ⁻⁹		$\tau=1\text{ s}$, 10s
SSB Phase noise	L(f)			-50	dBc/Hz	Offset:1 Hz
				-80		Offset:10 Hz
				-100		Offset:100 Hz
				-130		Offset:1 kHz
				-140		Offset:10 kHz

•OUTLINE DRAWING



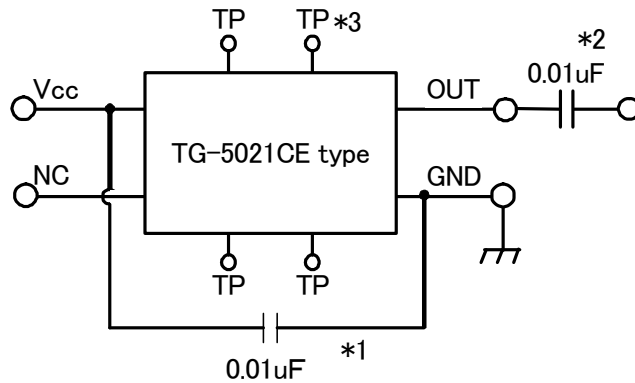
Material
Ceramics(base)
Au coated nickel(terminal)
Fe-Ni-Co(lid)



(unit : mm)

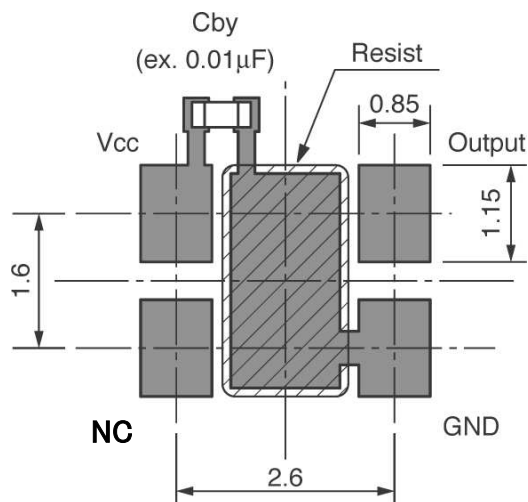
DIM.	MIN.	TYP.	MAX.	DIM.	MIN.	TYP.	MAX.
W	3.00	3.20	3.40	F	—	0.57	—
L	2.30	2.50	2.70	G	—	C 0.27	—
H	0.80	0.90	1.00	J	—	0.08	—
A	—	0.765	—	K	—	0.08	—
B	0.76	0.86	0.96	M	0.80	0.90	1.00
C	—	0.765	—	P	0.41	0.46	0.51
D	—	0.57	—	Q	—	0.13	—
E	1.85	1.95	2.05	S	0.40	0.50	0.60

• CONNECTION



- *1 Please connect capacitor(recommendation:0.01 μ F) between "Vcc" and "GND" terminal.
- *2 Please connect capacitor(recommendation:0.01 μ F) between "OUT" terminal and load.
- *3 Do not connect "TP" terminal.
- *4 This product has one chip LSI. Do not supply over +6V or negative voltage under -0.3V to "Vcc" terminal. Do not supply over Vcc+0.3V or negative voltage under -0.3V to "NC" terminal. Do not supply any voltages to "OUT" terminal.
- *5 Do not supply any voltages in any way which differs from the above connection figure.
- *6 Please make the NC pin GND connection or OPEN connection.

• Recommended soldering pattern



Except for this recommended soldering pattern, please contact us for inquiries.

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