TCXO　　　　TG-5006CJ

Product name　　　　TG-5006CJ-47L 32.000000 MHz
Product Number / Ordering code　　　　X1G0041310042xx
　　　　　　　　　　　Please refer to the 10.Packing information about xx (last 2 digits)

Output waveform　　　　Clipped sine wave
Pb free / Complies with EU RoHS directive
Reference weight Typ.9.1mg

1.Absolute maximum ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Maximum supply voltage	V_{CC}-GND	-0.3	-	4	V	Vcc terminal
Storage temperature	T_stg	-40	-	90	ºC	Storage as single product

2.Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Supply voltage	Vcc	1.7	-	3.6	V	GND = 0V
			-	-		-
Operating temperature	T_use	-30	25	85	ºC	-
Output load condition	Load_R	9	10	11	kΩ	-
	Load_C	9	10	11	pF	DC cut capacitor=0.01µF

DC-cut capacitor is not included in this TCXO. Please attach an external DC-cut capacitor (0.01 µF Min.) to the out pin.

(Vcc=1.8, 2.8, 3.0, 3.3 V, Vc=1.65 V, GND=0.0 V, Load 10 kΩ//10 pF(DC cut), T_use=+25ºC)

3.Frequency Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Output frequency	f0	-	32.0000	-	MHz	
Frequency tolerance	f_tol	-2.0	-	2.0	$\times 10^{-6}$	T_use = +25ºC, Reflow 2 times
		-	-	-		
Frequency / temperature characteristics	f0-Tc	-2	-	2	$\times 10^{-6}$	T_use = -30 ºC to +85 ºC
		-	-	-		-
Frequency / load coefficient	f0-Load	-0.2	-	0.2	$\times 10^{-6}$	10 kΩ // 10 pF +/- 10%
Frequency / voltage coefficient	f0-Vcc	-0.2	-	0.2	$\times 10^{-6}$	Vcc +/- 5 %
Frequency slope	-	-	-	-	$\times 10^{-6}$/ ºC	-
		-	-	-		-
		-	-	-		-
Frequency aging	f_age	-1.0	-	1.0	$\times 10^{-6}$	1st year, T_use=25degC
		-	-	-		-
		-	-	-		-

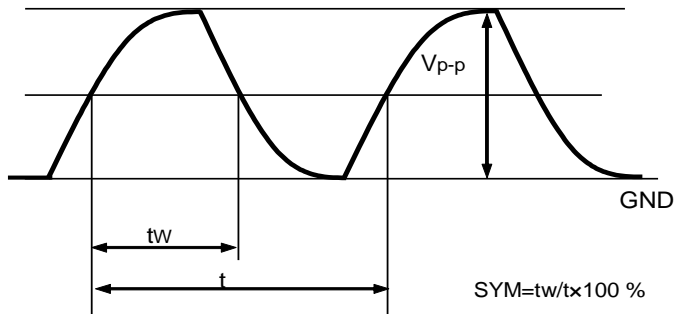*1 Include initial frequency tolerance and frequency deviation after reflow cycles.

*2 Measured in the elapse of 24 hours after reflow soldering.

*3 Vcc +/- 5% must be in operating supply voltage range (1.7 V to 3.47 V)

(Vcc=1.8, 2.8, 3.0, 3.3 V, Vc=1.65 V, GND=0.0 V, Load 10 kΩ//10 pF(DC cut), T_use=+25ºC)

4.Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Current consumption	Icc	-	-	2	mA	T_Use = +25ºC , 10 kΩ//10pF
Symmetry	SYM	40	-	60	%	GND Level
Output voltage	Vp-p	0.8	-	1.5	V	Peak to peak 10 kΩ//10pF +/- 10%
Harmonics	-	-	-	-8	dBc	-
		-	-	-		-
start up time	tosc	-	-	2.0	ms	Within 90% of final amp.
		-	-	2.0	ms	ΔF = +/- 1.0 x 10-6
Phase noise	L(f)	-	-	-82	dBc/Hz	Offset:10 Hz
		-	-	-108	dBc/Hz	Offset:100 Hz
		-	-	-130	dBc/Hz	Offset:1 kHz
		-	-	-145	dBc/Hz	Offset:10 kHz
		-	-	-148	dBc/Hz	Offset:100 kHz
		-	-	-148	dBc/Hz	Offset:1 MHz

—

5.Timing chart

Output waveform (Clipped sine wave output)

V_{p-p}

GND

tw

t

SYM=tw/t×100 %

6.Test circuit for TCXO

1) Output Load : 10 kΩ//10 pF

V_{CC}	OUT
N.C	GND

0.01

Test Point

Supply Voltage

By-pass Capacitor 0.01 mF

10 pF

10 kΩ

2) Current consumption

A

V_{CC}	OUT
N.C	GND

0.01

Supply Voltage

By-pass Capacitor 0.01 mF

10 pF

10 kΩ
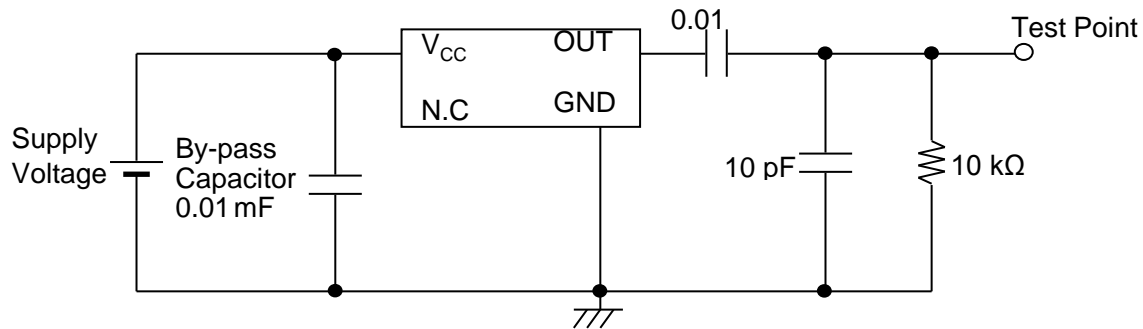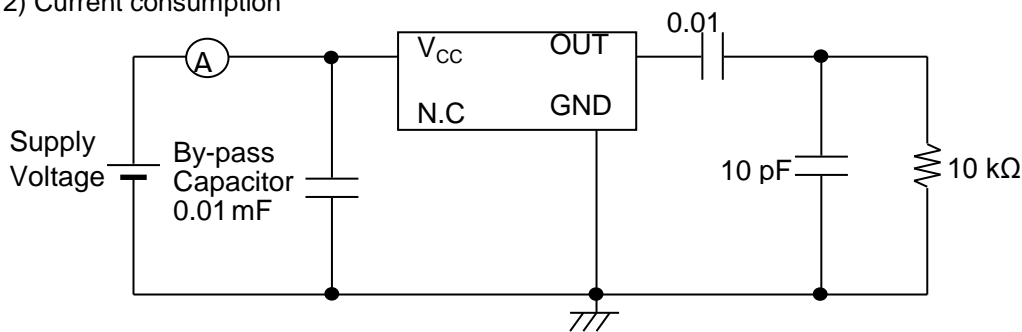
3) Conditions

  1. Oscilloscope: Impedance   Min. 1 MΩ
                       Input capacitance   Max. 10 pF
                       Band width   Min. 300 MHz
       Impossible to measure both frequency and wave form at the same time.(In case of using
       oscilloscope's amplifier output, possible to measure both at the same time.)
  2. Load_C includes probe capacitance.
  3. A capacitor (By-pass:0.01 to 0.1 uF) is placed between V_{CC} and GND,and closely to TCXO.
  4. Use the current meter whose internal impedance value is small.
  5. Power Supply
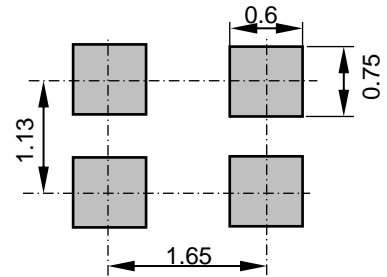   Impedance of power supply should be as low as possible.
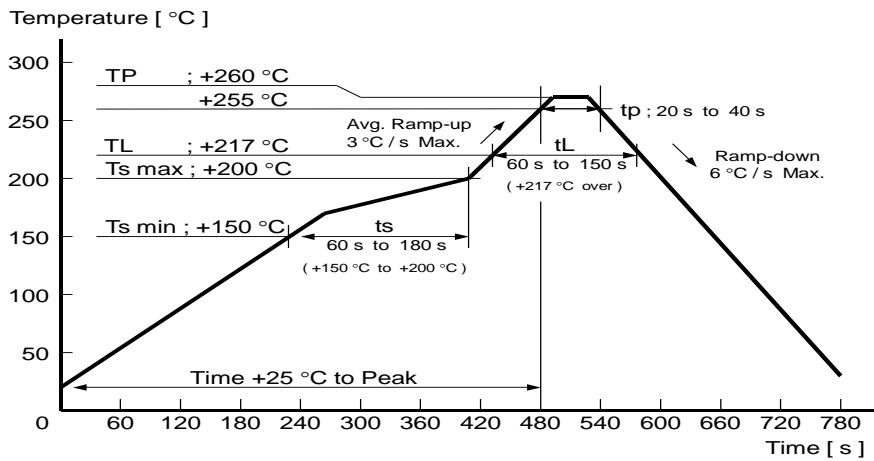
7.External dimensions　　　　　(Unit: mm)

2.0±0

1.6±0.1

0.73±0.07

<Bottom View>

#1　　1.58　　#2

1.18

C0.15

0.40

#4　　1.2　　#3

0.27
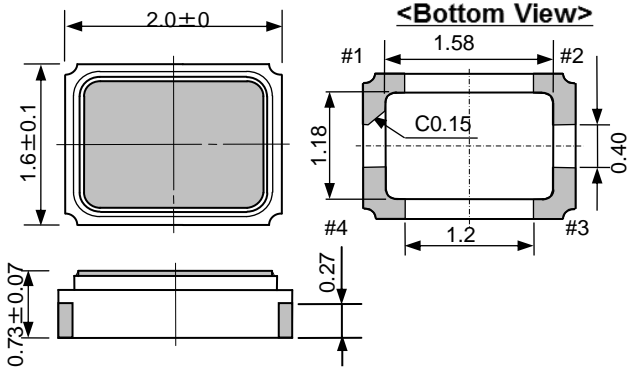
Pin map

Pin	Connection	
	VC-TCXO	TCXO
1	Vc	N.C.
2	GND	
3	OUT	
4	Vcc	

8.Footprint(Recommended)　　　(Unit: mm)

0.6

0.75

1.13

1.65

To maintain stable operation, provide a 0.01uF to 0.1uF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between Vcc - GND).

9.Reflow profile

Temperature [°C]

TP　　; +260 °C
+255 °C

TL　　; +217 °C
Ts max ; +200 °C

Avg. Ramp-up
3 °C / s　Max.

tL
60 s　to　150 s
(+217 °C over)

tp ; 20 s　to　40 s

Ramp-down
6 °C / s　Max.

Ts min ; +150 °C

ts
60 s　to　180 s
(+150 °C to +200 °C)

Time +25 °C to Peak

0　60　120　180　240　300　360　420　480　540　600　660　720　780

Time [s]

10.Packing information

[1]Product number last 2 digits code(xx) description　　　The recommended code is "00"

X1G0041310042xx

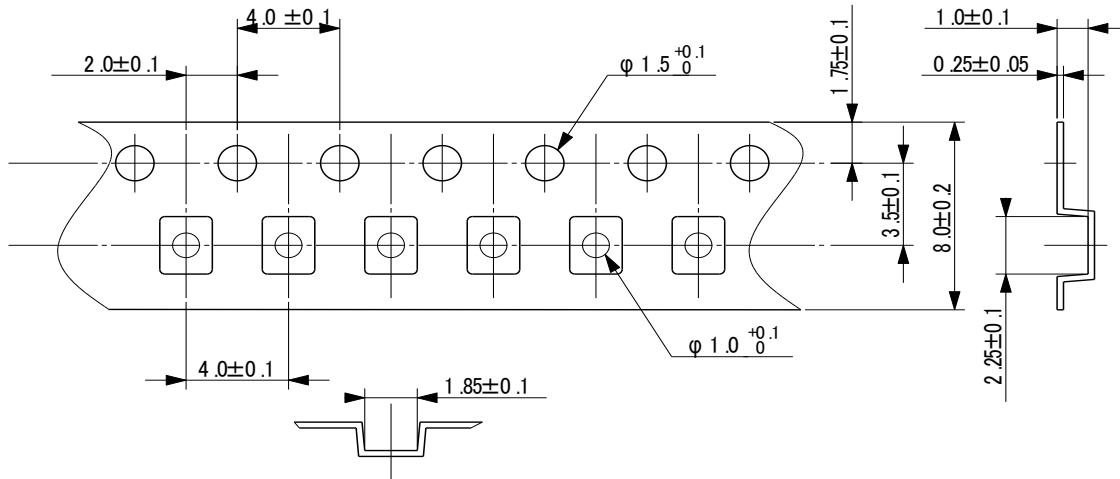| Code	Condition	Code	Condition
00	12000pcs / Reel	14	1000pcs / Reel
01	Any Q'ty vinyl bag(Tape cut)	15	2000pcs / Reel
11	Any Q'ty / Reel	16	3000pcs / Reel

[2] Taping specification
Subject to EIA-481 & IEC-60286

(1) Tape dimensions   TE0804L
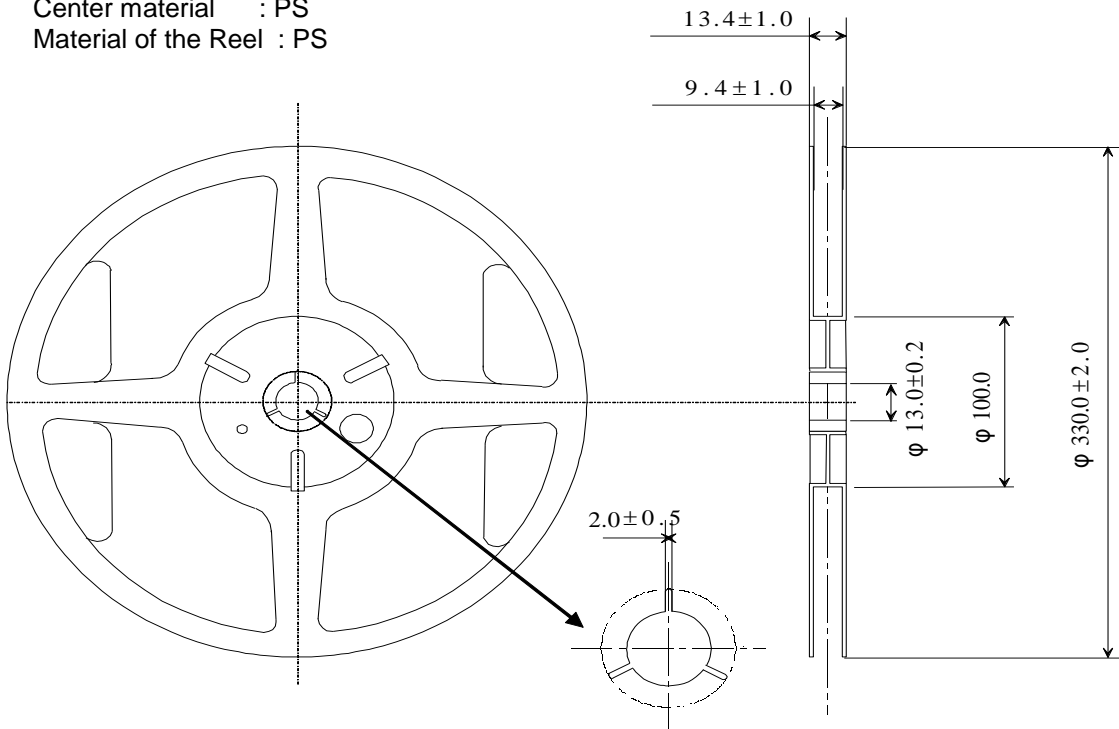Material of the Carrier Tape : PS
Material of the Top Tape   : PET+PE   Unit: mm

4.0 ± 0.1

2.0 ± 0.1

$\phi\ 1.5\ ^{+0.1}_{0}$

1.75 ± 0.1

1.0 ± 0.1

0.25 ± 0.05

3.5 ± 0.1

8.0 ± 0.2

2.25 ± 0.1

4.0 ± 0.1

1.85 ± 0.1

$\phi\ 1.0\ ^{+0.1}_{0}$

(2) Reel dimensions
Center material   : PS
Material of the Reel : PS

13.4 ± 1.0

9.4 ± 1.0

$\phi\ 13.0 \pm 0.2$

$\phi\ 100.0$

$\phi\ 330.0 \pm 2.0$

2.0 ± 0.5

11.Handling precautions

Prior to using this product, please carefully read the section entitled "Precautions" on our Web site (http://www5.epsondevice.com/en/quartz/tech/precaution/) for instructions on how to handle and use the product properly to ensure optimal performance of the product in your equipment. Before using the product under any conditions other than those specified therein, please consult with us to verify and confirm that the performance of the product will not be negatively affected by use under such conditions.

In addition to the foregoing precautions, in order to avoid the deteriorating performance of the product, we strongly recommend that you DO NOT use the product under ANY of the following conditions:

(1) Mounting the product on a board using water-soluble solder flux and using the product without removing the residue of the flux completely from the board. The residue of such flux that is soluble in water or water-soluble cleaning agent, especially the residues which contains active halogens, will negatively affect the performance and reliability of the product.
(2) Using the product in any manner that will result in any shock or impact to the product.
(3) Using the product in places where the product is exposed to water, chemicals, organic solvent, sunlight, dust, corrosive gasses, or other materials.
(4) Using the product in places where the product is exposed to static electricity or electromagnetic waves.
(5) Applying ultrasonic cleaning without advance verification and confirmation that the product will not be affected by such a cleaning process, because it may damage the crystal, IC and/or metal line of the product.
(6) Touching the IC surface with tweezers or other hard materials directly.
(7) Using the product under any other conditions that may negatively affect the performance and/or reliability of the product.
(8) Using the product with power line ripple exceeding 50 mV(p-p) level.

Should any customer use the product in any manner contrary to the precautions and/or advice herein, such use

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