Clock OSC　　　　SG2016CAN

Product name　　　SG2016CAN　　25.000000 MHz TDBA
Product Number / Ordering code　　　X1G0048010024xx

Please refer to the 8.Packing information about xx (last 2 digits)

Output waveform　CMOS
Pb free / Complies with EU RoHS directive
Reference weight Typ. 9.9 mg

1.Absolute maximum ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Maximum supply voltage	Vcc-GND	-0.3	-	+4	V	-
Storage temperature	T_stg	-55	-	+125	ºC	Storage as single product
Input voltage	Vin	-0.3	-	Vcc+0.3	V	ST terminal

2.Specifications(characteristics)

| Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Output frequency	f0		25.000000		MHz	
Supply voltage	Vcc	1.6	-	3.63	V	-
Operating temperature	T_use	-20	-	+70	ºC	-
Frequency tolerance	f_tol	-25		25	$\times 10^{-6}$	T_use
Current consumption	Icc	-	-	2.2	mA	No load condition Vcc = 3.3V
Stand-by current	I_std	-	-	2.7	µA	Vcc = 3.3V , ST = GND
Symmetry	SYM	45	-	55	%	50% Vcc Level L_CMOS=<15pF
Output voltage	V_{OH}	Vcc-0.4	-	-		-
	V_{OL}	-	-	0.4		-
Output load condition	L_CMOS	-	-	15	pF	CMOS Load
Input voltage	V_{IH}	0.8Vcc	-	-		ST terminal
	V_{IL}	-	-	0.2Vcc		ST terminal
Rise time	t_r	-	-	3.5	ns	Vcc1.8V±10% : 0.2Vcc to 0.8Vcc Level, L_CMOS=15pF
Fall time	tf	-	-	3.5	ns	Vcc1.8V±10% : 0.2Vcc to 0.8Vcc Level, L_CMOS=15pF
Start-up time	t_str	-	-	3	ms	t = 0 at 0.9Vcc
Jitter	t_{DJ}	-	0	-	ps	Deterministic Jitter Vcc=3.3V
	t_{RJ}	-	2.4	-	ps	Random Jitter Vcc=3.3V
	t_{RMS}	-	2.3	-	ps	δ(RMS of total distribution) Vcc=3.3V
	t_{p-p}	-	20	-	ps	Peak to Peak Vcc=3.3V
	t_{acc}	-	2.5	-	ps	Accumulated Jitter(δ) n=2 to 50000 cycles
Phase jitter	t_{PJ}	-	0.4	-	ps	Off set Frequency: 12kHz to 20MHz, Vcc=3.3V
Phase noise	L(f)	-	-	-	dBc/Hz	-
		-	-95	-	dBc/Hz	Off set 10Hz Vcc=3.3V
		-	-124	-	dBc/Hz	Off set 100Hz Vcc=3.3V
		-	-146	-	dBc/Hz	Off set 1kHz Vcc=3.3V
		-	-155	-	dBc/Hz	Off set 10kHz Vcc=3.3V
		-	-158	-	dBc/Hz	Off set 100kHz Vcc=3.3V
		-	-159	-	dBc/Hz	Off set 1MHz Vcc=3.3V
Frequency aging	f_age	-3	-	3	$\times 10^{-6}$	@+25ºC first year
		-	-	-		-

3.Timing chart
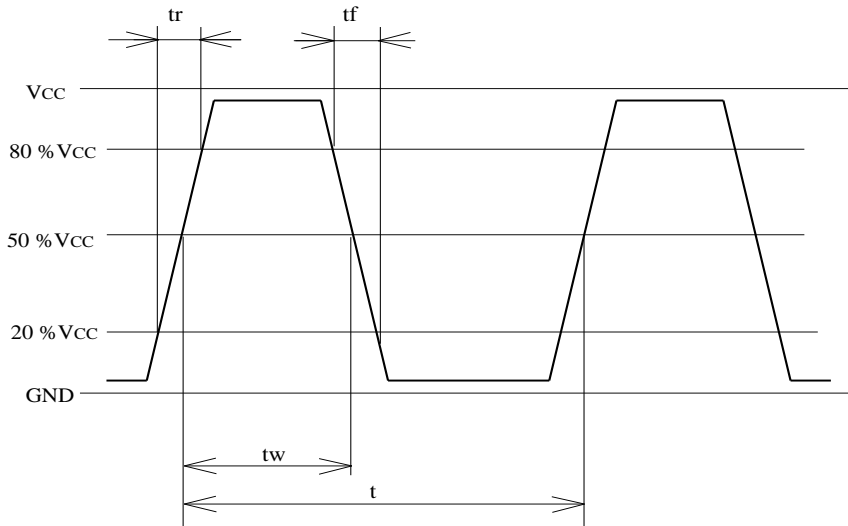
4.Test circuit

1) Waveform observation
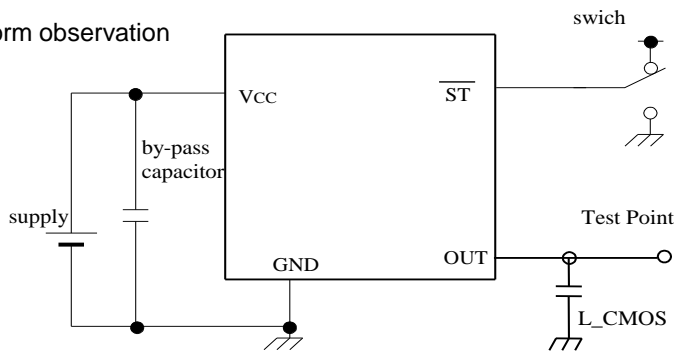
2) Current consumption
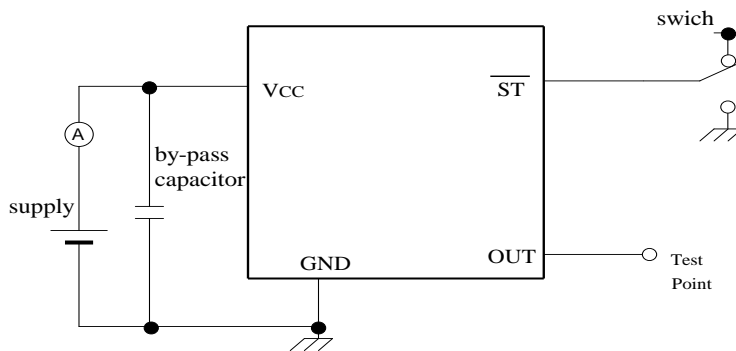
*Current consumption under the disable function should be = GND.

3) Condition

(1) Oscilloscope

· Band width should be minimum 5 times higher (wider) than measurement frequency.

· Probe earth should be placed closely from test point and lead length should be as short as possible

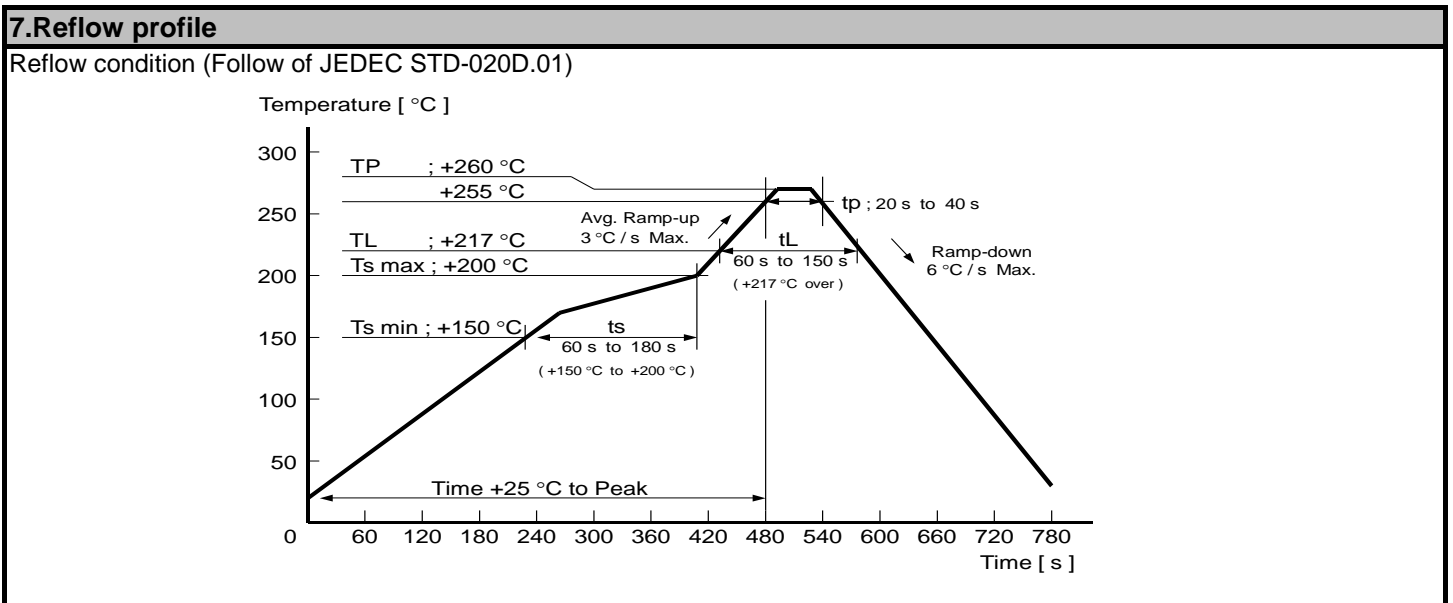* Recommendable to use miniature socket. (Don't use earth lead.)
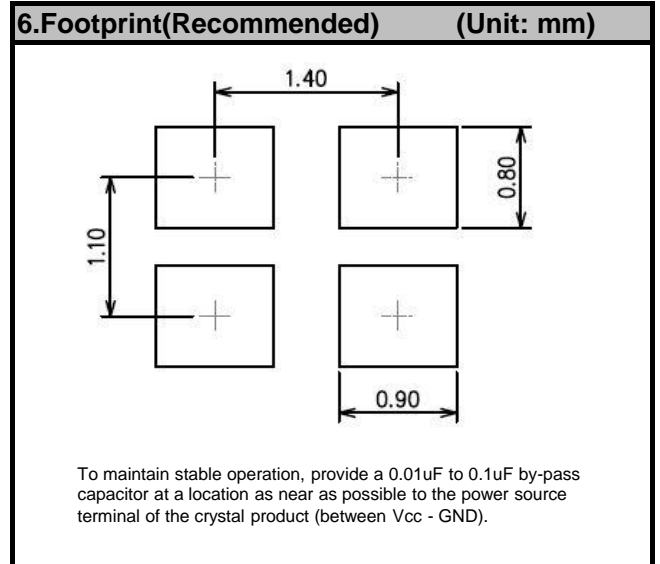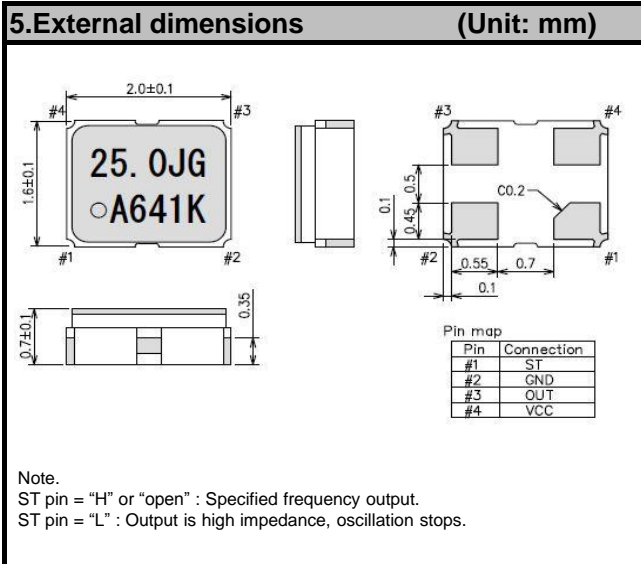
(2) L_CMOS also includes probe capacitance.

(3) By-pass capacitor (0.01 μF to 0.1 μF) is placed closely between VCC and GND.

(4) Use the current meter whose internal impedance value is small.

(5) Power supply

· Start up time (0 %VCC to 90 %VCC) of power source should be more than 150 μs.

· Impedance of power supply should be as lowest as possible.

5.External dimensions (Unit: mm)

Pin	Connection
#1	ST
#2	GND
#3	OUT
#4	VCC

Note.
ST pin = "H" or "open" : Specified frequency output.
ST pin = "L" : Output is high impedance, oscillation stops.

6.Footprint(Recommended) (Unit: mm)

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).

7.Reflow profile

Reflow condition (Follow of JEDEC STD-020D.01)

TP ; +260 °C
+255 °C
TL ; +217 °C
Ts max ; +200 °C
Ts min ; +150 °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 60 s to 180 s (+150 °C to +200 °C)
Time +25 °C to Peak

8.Packing information

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

X1G0048010024xx

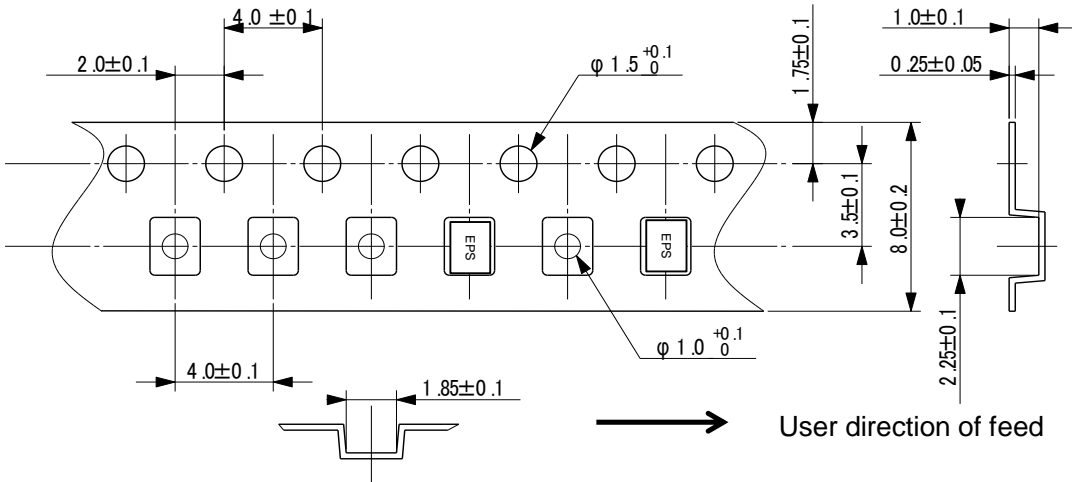| Code	Condition	Code	Condition
01	Any Q'ty vinyl bag(Tape cut)	14	1000pcs / Reel
11	Any Q'ty / Reel	15	2000pcs / Reel
12	250pcs / Reel	00	3000pcs / Reel

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

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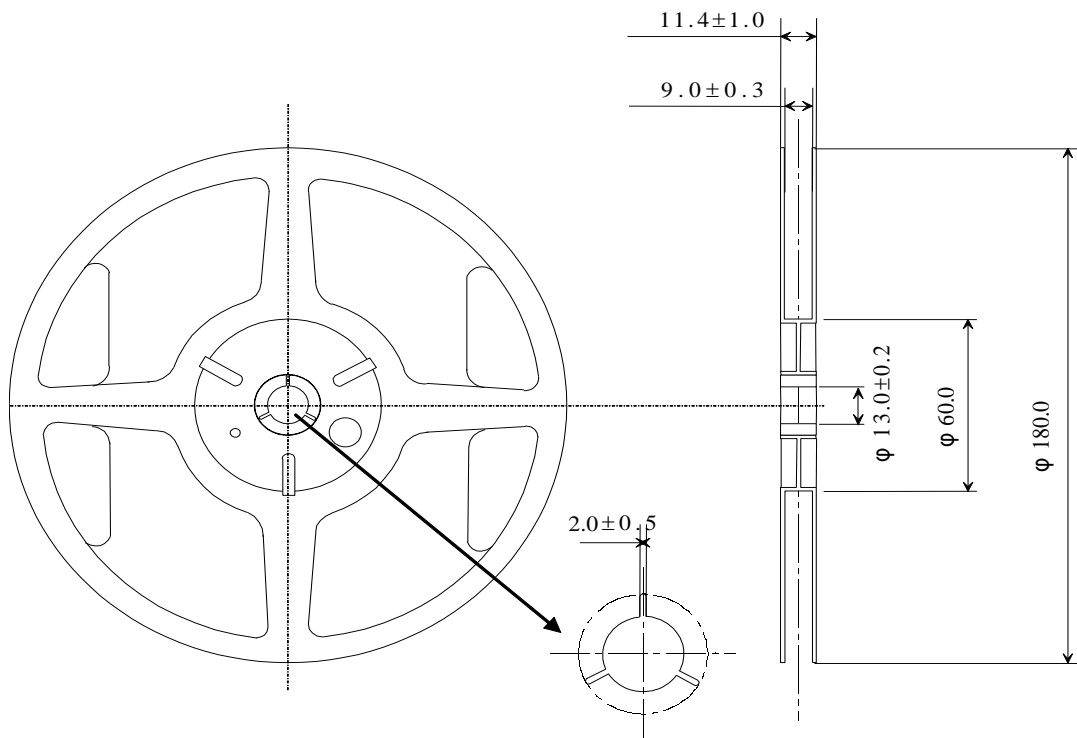Material of the Top Tape   : PET+PE

Unit: mm

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

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

4.0 ±0.1

2.0±0.1

1.75±0.1

3.5±0.1

8.0±0.2

1.0±0.1

0.25±0.05

2.25±0.1

4.0±0.1

1.85±0.1

User direction of feed

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

Unit: mm

11.4±1.0

9.0±0.3

$\phi 13.0±0.2$

$\phi 60.0$

$\phi 180.0$

2.0±0.5

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