Clock OSC   SG5032CCN   SEIKO EPSON CORPORATION

Product name   SG5032CCN   6.000000 MHz HJGA
Product Number / Ordering code   X1G0044710012xx

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. 52 mg

1.Absolute maximum ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Maximum supply voltage	Vcc-GND	-0.3	-	7	V	-
Storage temperature	T_stg	-40	-	125	ºC	Storage as single product
Input voltage	Vin	-0.5	-	Vcc+0.5	V	OE terminal

2.Specifications(characteristics)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Output frequency	f0		6.0000		MHz	
Supply voltage	Vcc	4.5	5	5.5	V	-
Operating temperature	T_use	-40	-	85	ºC	-
Frequency tolerance	f_tol	-50	-	50	$\times 10^{-6}$	T_use
Current consumption	Icc	-	-	20	mA	No load condition
Stand-by current	I_std	-	-	-	µA	-
Disable current	I_dis	-	-	10.0	mA	OE = GND
Symmetry	SYM	40	-	60	%	50% Vcc Level L_CMOS=<50pF
Output voltage	V_{OH}	Vcc-0.4	-	-		-
	V_{OL}	-	-	0.4		-
Output load condition	L_CMOS	-	-	50	pF	CMOS Load
Input voltage	V_{IH}	0.8Vcc	-	-		OE terminal
	V_{IL}	-	-	0.2Vcc		OE terminal
Rise time	t_r	-	-	5	ns	0.2Vcc to 0.8Vcc Level, L_CMOS=50pF
Fall time	tf	-	-	5	ns	0.2Vcc to 0.8Vcc Level, L_CMOS=50pF
Start-up time	t_str	-	-	5	ms	t = 0 at 0.9Vcc
Jitter	t_{DJ}	-	TBD	-	ps	Deterministic Jitter
	T_{RJ}	-	TBD	-	ps	Random Jitter
	t_{RMS}	-	TBD	-	ps	δ(RMS of total distribution)
	t_{p-p}	-	TBD	-	ps	Peak to Peak
	t_{acc}	-	TBD	-	ps	Accumulated Jitter(δ) n=2 to 50000 cycles
Phase jitter	t_{PJ}	-	TBD	-	ps	Off set Frequency: 12kHz to 20MHz
Phase noise	L(f)	-	TBD	-	dBc/Hz	Off set 1Hz
		-	TBD	-	dBc/Hz	Off set 10Hz
		-	TBD	-	dBc/Hz	Off set 100Hz
		-	TBD	-	dBc/Hz	Off set 1kHz
		-	TBD	-	dBc/Hz	Off set 10kHz
		-	TBD	-	dBc/Hz	Off set 100kHz
		-	TBD	-	dBc/Hz	Off set 1MHz
Frequency aging	f_age	-5	-	5	$\times 10^{-6}$	@+25ºC first year
		-	-	-		-

3.Timing chart
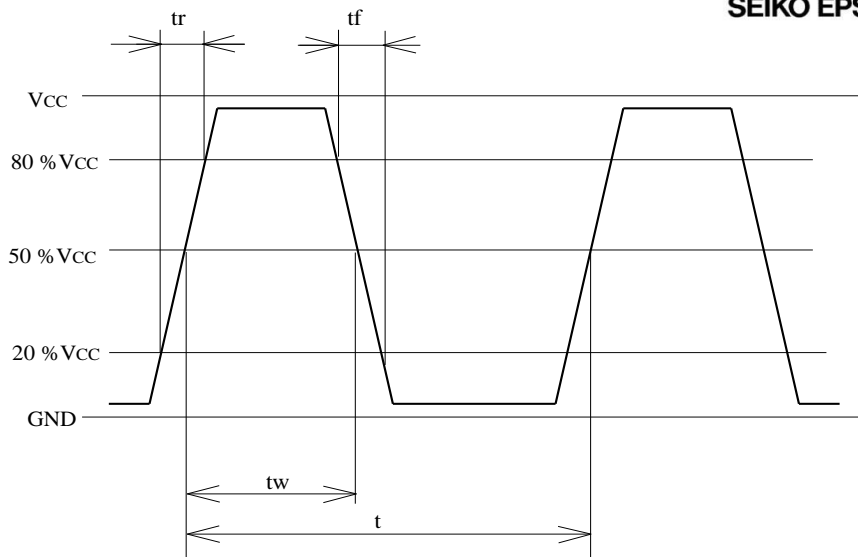
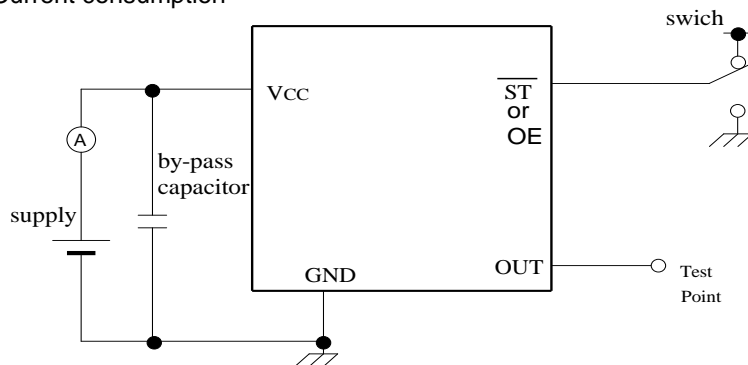**4.Test circuit**

1) Waveform observation
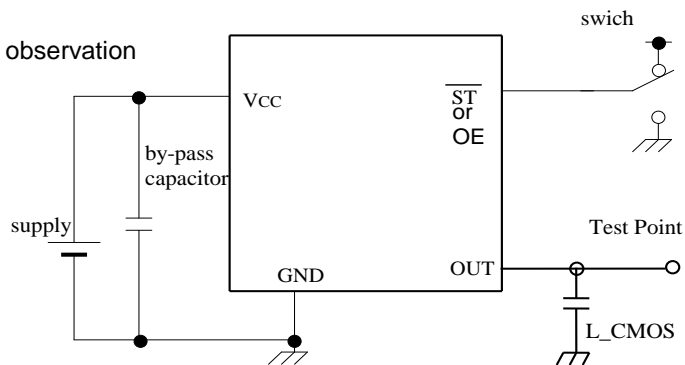
2) Current consumption

*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.

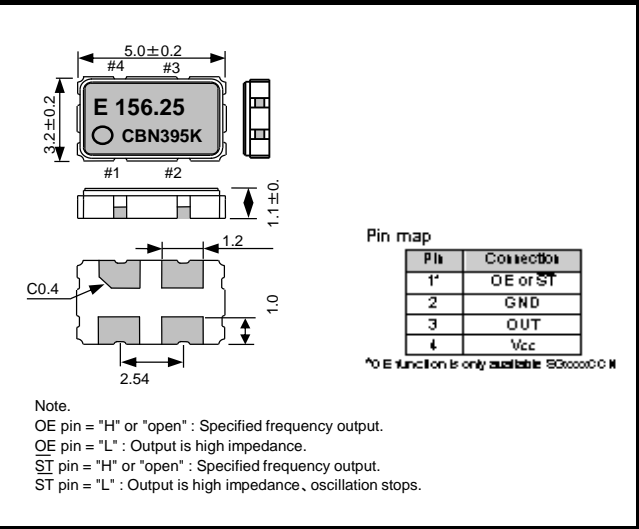(3) By-pass capacitor (0.01 mF to 0.1 mF) is placed closely between VCC and GND.

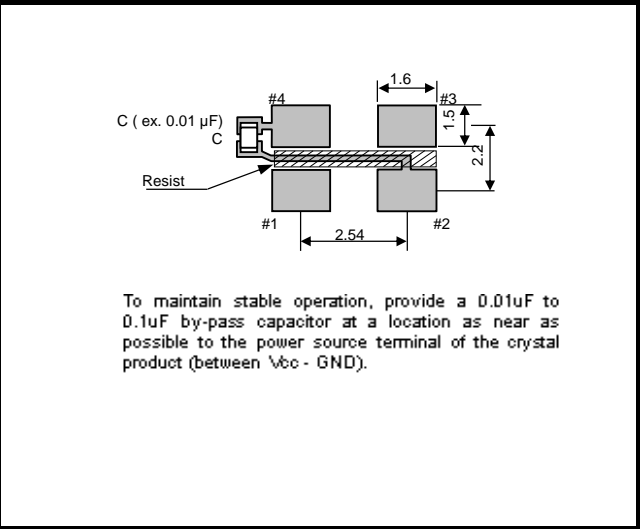(4) Use the current meter whose internal impedance value is small.

(5) Power supply

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

· Impedance of power supply should be as lowest as possible.
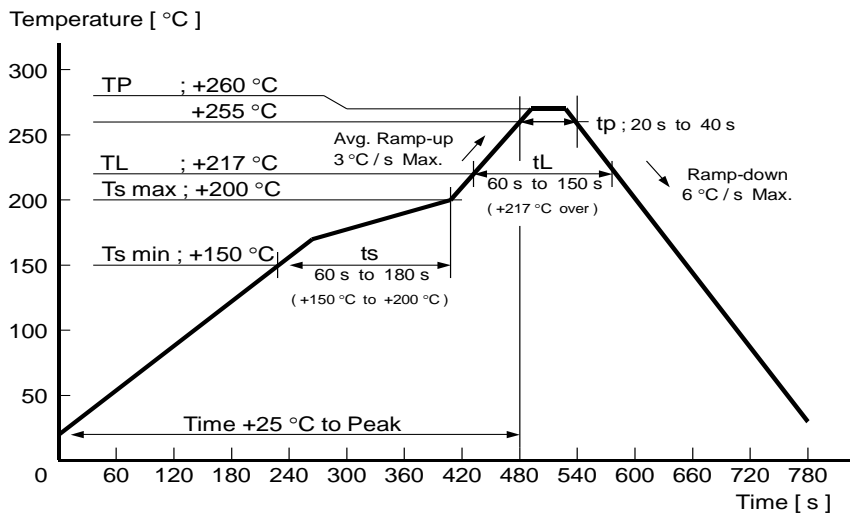
5.External dimensions　　　　(Unit: mm)

E 156.25
○ CBN395K

5.0±0.2
#4 #3
3.2±0.2
#1 #2
1.1±0.

1.2
1.0
C0.4
2.54

Pin map

Pin	Connection
1*	OE or ST
2	GND
3	OUT
4	Vcc

*OE function is only available SGxxxxCC N

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

6.Footprint(Recommended)　　　　(Unit: mm)

C (ex. 0.01 μF)
C
Resist

1.6
#4   #3
1.5
2.2
#1   #2
2.54

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)

Temperature [°C]

TP　　; +260 °C
+255 °C
tp ; 20 s to 40 s
Avg. Ramp-up
3 °C / s Max.
TL　　; +217 °C
tL
Ts max ; +200 °C
60 s to 150 s
(+217 °C over)
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

Time [s]
(vertical axis: 50, 100, 150, 200, 250, 300)
(horizontal axis: 0, 60, 120, 180, 240, 300, 360, 420, 480, 540, 600, 660, 720, 780)

8.Packing information

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

X1G0044710012xx

Code	Condition	Code	Condition
01	Any Q'ty vinyl bag(Tape cut)	13	500pcs / Reel
11	Any Q'ty / Reel	00	1000pcs / Reel
12	250pcs / Reel		

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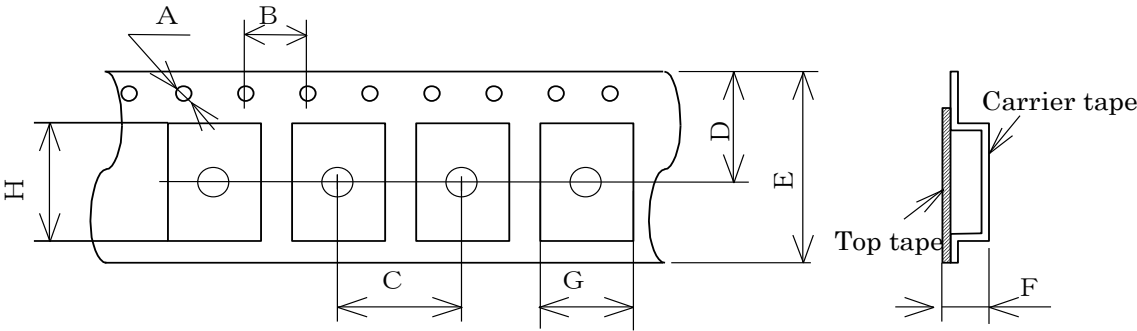Subject to EIA-481 & IEC-60286

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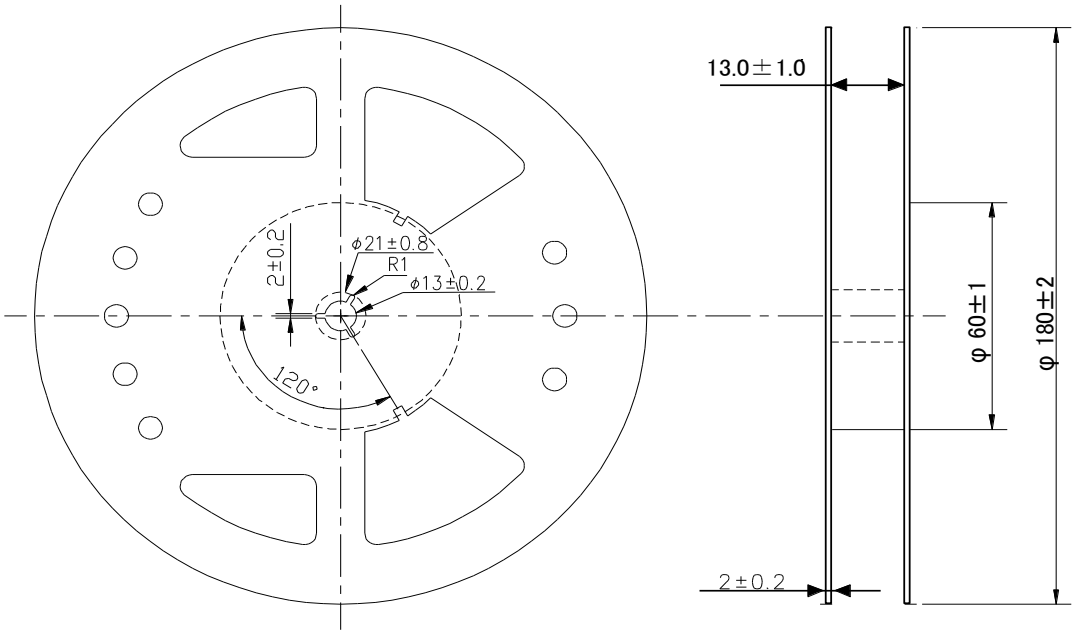Material of the Top Tape : PET+PE

Unit: mm

Symbol	A	B	C	D	E	F	G	H
Value	φ1.5 +0.1/-0	4.0±0.1	8.0±0.1	7.25±0.2	12.0±0.2	1.40±0.1	3.5±0.1	5.4±0.1

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

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