

Clock OSC

SG7050CCN

Product name SG7050CCN 33.333000 MHz HJGA

Product Number / Ordering code X1G0045010092xx

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. 147 mg

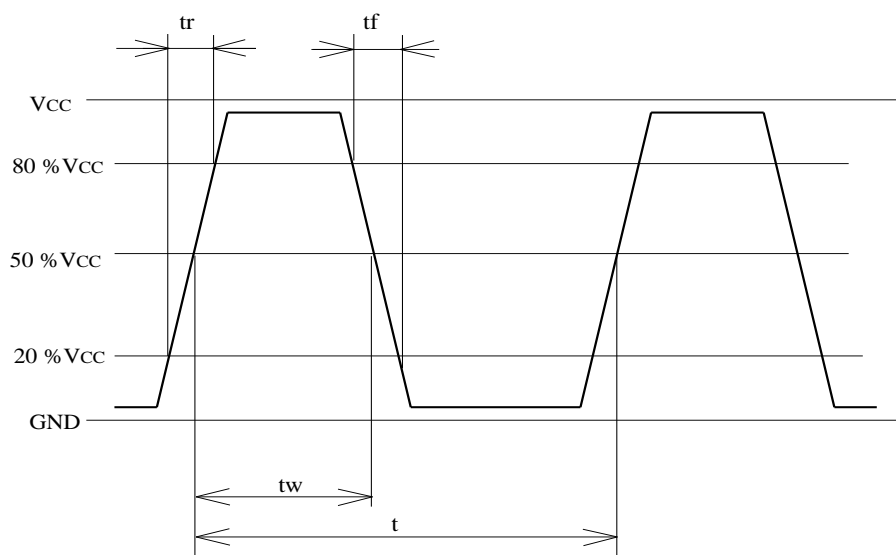
**1.Absolute maximum ratings**

| Parameter              | Symbol              | Min. | Typ. | Max.                 | Unit | Conditions / Remarks      |
|------------------------|---------------------|------|------|----------------------|------|---------------------------|
| Maximum supply voltage | V <sub>cc-GND</sub> | -0.3 | -    | +7                   | V    | -                         |
| Storage temperature    | T <sub>stg</sub>    | -40  | -    | +125                 | °C   | Storage as single product |
| Input voltage          | V <sub>in</sub>     | -0.5 | -    | V <sub>cc</sub> +0.5 | V    | OE terminal               |

**2.Specifications(characteristics)**

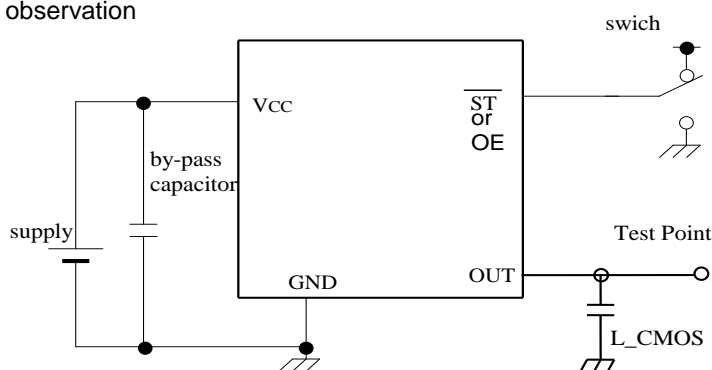
| Parameter             | Symbol            | Min.                 | Typ.      | Max.               | Unit              | Conditions / Remarks  |
|-----------------------|-------------------|----------------------|-----------|--------------------|-------------------|---|
| Output frequency      | f <sub>0</sub>    |                      | 33.333000 |                    | MHz               |   |
| Supply voltage        | V <sub>cc</sub>   | 4.5                  | 5         | 5.5                | V                 | -   |
| Operating temperature | T <sub>use</sub>  | -40                  | -         | +85                | °C                | -   |
| Frequency tolerance   | f <sub>tol</sub>  | -50                  | -         | 50                 | x10 <sup>-6</sup> | T <sub>use</sub>  |
| Current consumption   | I <sub>cc</sub>   | -                    | -         | 20                 | mA                | No load condition   |
| Stand-by current      | I <sub>std</sub>  | -                    | -         | -                  | μA                | -   |
| Disable current       | I <sub>dis</sub>  | -                    | -         | 10.0               | mA                | OE = GND  |
| Symmetry              | SYM               | 40                   | -         | 60                 | %                 | 50% V <sub>cc</sub> Level L <sub>CMOS</sub> ≤50pF                       |
| Output voltage        | V <sub>OH</sub>   | V <sub>cc</sub> -0.4 | -         | -                  |                   | -   |
|                       | V <sub>OL</sub>   | -                    | -         | 0.4                |                   | -   |
| Output load condition | L <sub>CMOS</sub> | -                    | -         | 50                 | pF                | CMOS Load   |
| Input voltage         | V <sub>IH</sub>   | 0.8V <sub>cc</sub>   | -         | -                  |                   | OE terminal   |
|                       | V <sub>IL</sub>   | -                    | -         | 0.2V <sub>cc</sub> |                   | OE terminal   |
| Rise time             | t <sub>r</sub>    | -                    | -         | 5                  | ns                | 0.2V <sub>cc</sub> to 0.8V <sub>cc</sub> Level, L <sub>CMOS</sub> =50pF |
| Fall time             | t <sub>f</sub>    | -                    | -         | 5                  | ns                | 0.2V <sub>cc</sub> to 0.8V <sub>cc</sub> Level, L <sub>CMOS</sub> =50pF |
| Start-up time         | t <sub>str</sub>  | -                    | -         | 5                  | ms                | t = 0 at 0.9V <sub>cc</sub>   |
| Jitter                | t <sub>DJ</sub>   | -                    | -         | -                  | ps                | Deterministic Jitter  |
|                       | t <sub>RJ</sub>   | -                    | -         | -                  | ps                | Random Jitter   |
|                       | t <sub>RMS</sub>  | -                    | -         | -                  | ps                | σ(RMS of total distribution)  |
|                       | t <sub>p-p</sub>  | -                    | -         | -                  | ps                | Peak to Peak  |
|                       | t <sub>acc</sub>  | -                    | -         | -                  | ps                | Accumulated Jitter(σ), n = 2 to 50 000 cycles                           |
| Phase jitter          | t <sub>PJ</sub>   | -                    | -         | -                  | ps                | Offset Frequency: 12 kHz to 20 MHz                                      |
| Phase noise           | L(f)              | -                    | -         | -                  | dBc/Hz            | Offset 1 Hz   |
|                       |                   | -                    | -         | -                  | dBc/Hz            | Offset 10 Hz  |
|                       |                   | -                    | -         | -                  | dBc/Hz            | Offset 100 Hz   |
|                       |                   | -                    | -         | -                  | dBc/Hz            | Offset 1 kHz  |
|                       |                   | -                    | -         | -                  | dBc/Hz            | Offset 10 kHz, V <sub>cc</sub> = 3.3 V                                  |
|                       |                   | -                    | -         | -                  | dBc/Hz            | Offset 100 kHz  |
|                       |                   | -                    | -         | -                  | dBc/Hz            | Offset 1 MHz  |
| Frequency aging       | f <sub>age</sub>  | -5                   | -         | 5                  | x10 <sup>-6</sup> | @+25°C first year   |
|                       |                   | -                    | -         | -                  |                   | -   |

### 3. Timing chart

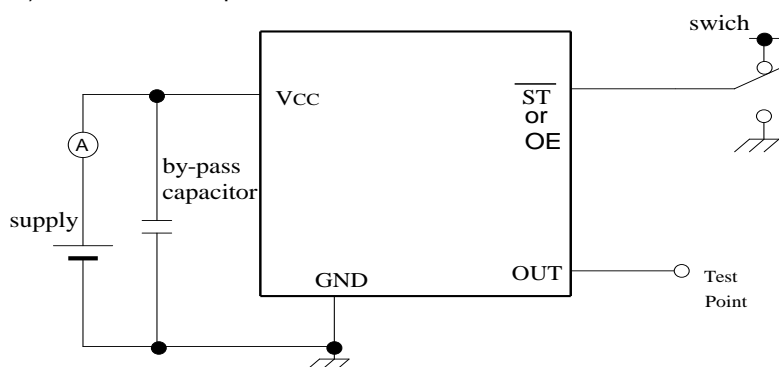


### 4. Test circuit

#### 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.)

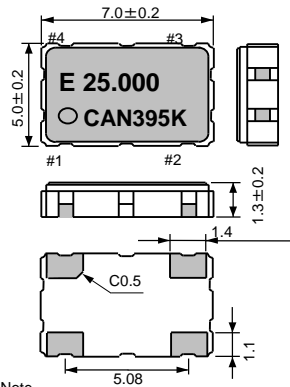
##### (2) L\_CMOS also includes probe capacitance.

(3) By-pass capacitor (0.01  $\mu$ F to 0.1  $\mu$ F) 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  $\mu$ s.
- Impedance of power supply should be as lowest as possible.

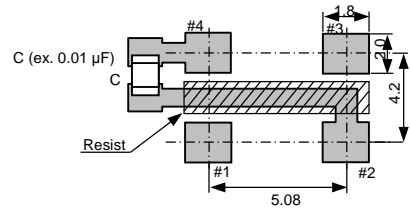
**5.External dimensions (Unit: mm)**

Pin map

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

\*OE function is only available SOxxxxxCN

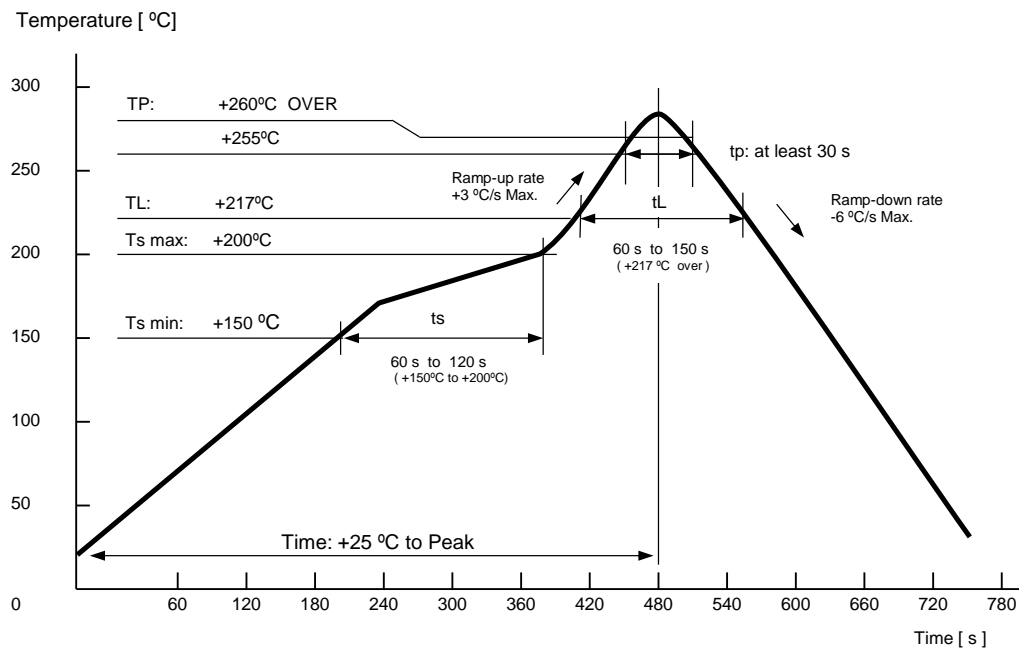
Note.  
 OE pin = "H" or "open" : Specified frequency output.  
 OE pin = "L" : Output is high impedance.  
 ST pin = "H" or "open" : Specified frequency output.  
 ST pin = "L" : Output is high impedance, oscillation stops.

**6.Footprint(Recommended) (Unit: mm)**

To maintain stable operation, provide a 0.01µF to 0.1µF 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.1)

**8.Packing information**

[ 1 ] Product number last 2 digits code(xx) description

The recommended code is "00"

X1G0045010092xx

| 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

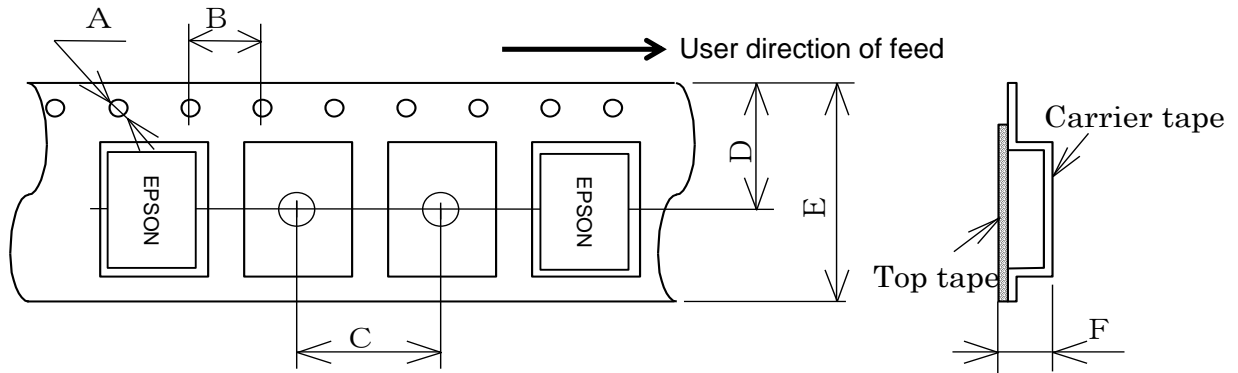
Subject to EIA-481 &amp; IEC-60286

## (1) Tape dimensions

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

Unit: mm

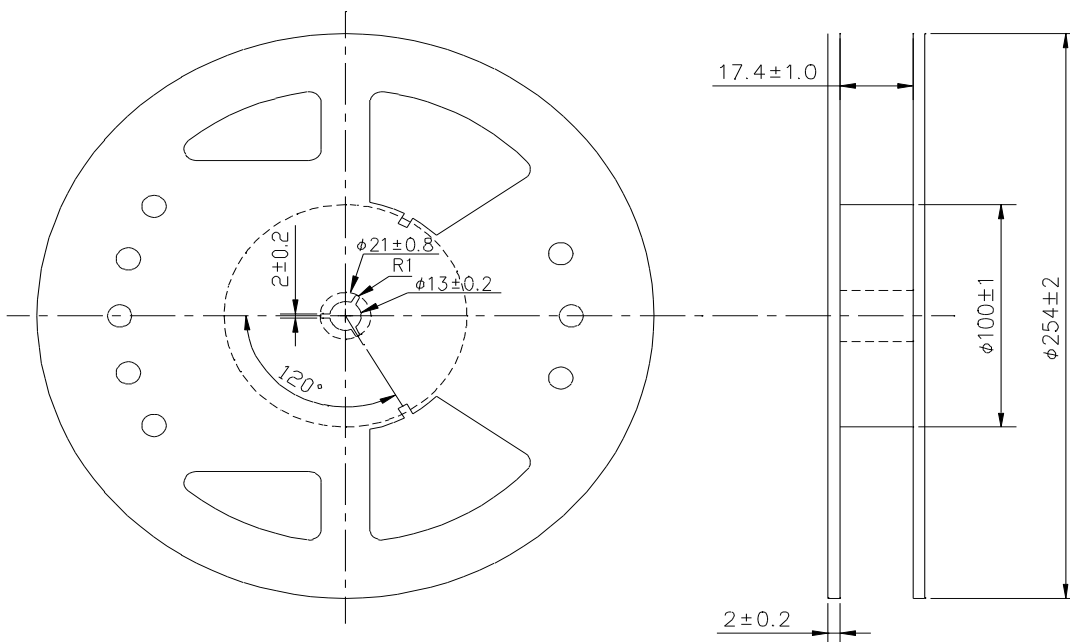


| Symbol | A          | B | C | D    | E  | F   |
|--------|------------|---|---|------|----|-----|
| Value  | $\phi 1.5$ | 4 | 8 | 9.25 | 16 | 2.3 |

## (2) Reel dimensions

Center material : PS

Material of the Reel : PS



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