

Clock OSC

SG-210SCBA

Product name SG-210SCBA 12.288000 MHz L Conforms to AEC-Q200

Product Number / Ordering code X1G004591A078xx

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. 15 mg

1.Absolute maximum ratings

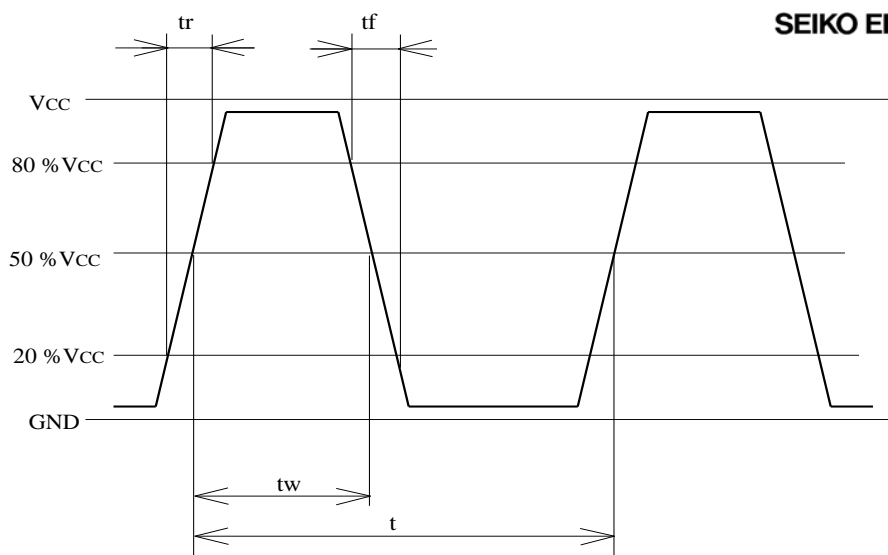
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Maximum supply voltage	V _{cc-GND}	-0.3	-	+5	V	-
Storage temperature	T _{stg}	-40	-	+125	°C	Storage as single product
Input voltage	V _{in}	-0.3	-	V _{cc} +0.3	V	ST terminal

2.Specifications(characteristics)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Output frequency	f ₀		12.288000		MHz	
Supply voltage	V _{cc}	2.7	3.3	3.6	V	-
Operating temperature	T _{use}	-40	-	+85	°C	-
Frequency tolerance	f _{tol}	-50	-	50	x10 ⁻⁶	T _{use}
Current consumption	I _{cc}	-	-	3	mA	No load condition
Stand-by current	I _{std}	-	-	1.0	μA	ST = GND
Symmetry	SYM	45	-	55	%	50% V _{cc} Level L _{CMOS} ≤15pF
Output voltage	V _{OH}	0.9V _{cc}	-	-		I _{OH} =-1mA
	V _{OL}	-	-	0.1V _{cc}		I _{OL} =1mA
Output load condition	L _{CMOS}	-	-	15	pF	CMOS Load
Input voltage	V _{IH}	0.8V _{cc}	-	-		ST terminal
	V _{IL}	-	-	0.2V _{cc}		ST terminal
Rise time	t _r	-	-	3	ns	0.2V _{cc} to 0.8V _{cc} Level, L _{CMOS} =15pF
Fall time	t _f	-	-	3	ns	0.2V _{cc} to 0.8V _{cc} Level, L _{CMOS} =15pF
Start-up time	t _{str}	-	-	3	ms	t = 0 at 0.9V _{cc}
Jitter	t _{DJ}	-	3.4	-	ps	Deterministic Jitter, V _{cc} = 3.3 V
	t _{RJ}	-	2.3	-	ps	Random Jitter, V _{cc} = 3.3 V
	t _{RMS}	-	1.7	-	ps	σ(RMS of total distribution), V _{cc} = 3.3 V
	t _{p-p}	-	16.4	-	ps	Peak to Peak, V _{cc} = 3.3 V
	t _{acc}	-	1.8	-	ps	Accumulated Jitter(σ), n = 2 to 50 000 cycles
Phase jitter	t _{PJ}	-	0.27	-	ps	Offset Frequency: 12 kHz to 5 MHz, V _{cc} = 3.3 V
Phase noise	L(f)	-	-	-	dBc/Hz	-
		-	-109.8	-	dBc/Hz	Offset 10 Hz, V _{cc} =3.3 V
		-	-134.6	-	dBc/Hz	Offset 100 Hz, V _{cc} = 3.3 V
		-	-146	-	dBc/Hz	Offset 1 kHz, V _{cc} = 3.3 V
		-	-153.1	-	dBc/Hz	Offset 10 kHz, V _{cc} = 3.3 V
		-	-158.7	-	dBc/Hz	Offset 100 kHz, V _{cc} = 3.3 V
		-	-164	-	dBc/Hz	Offset 1 MHz, V _{cc} = 3.3 V
Frequency aging	f _{age}	-3	-	3	x10 ⁻⁶	@+25°C first year
		-	-	-		-

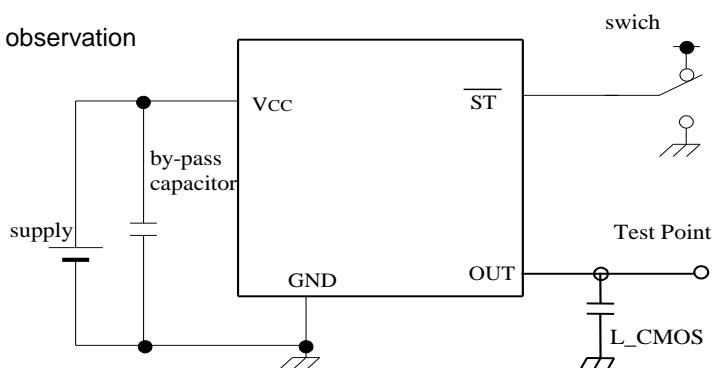
3. Timing chart

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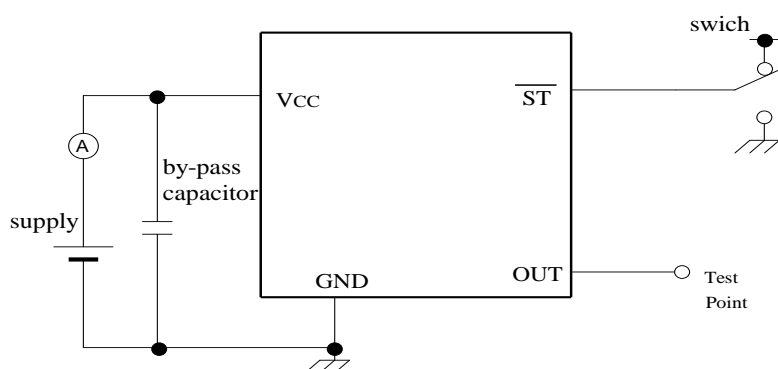


4. Test circuit

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.)

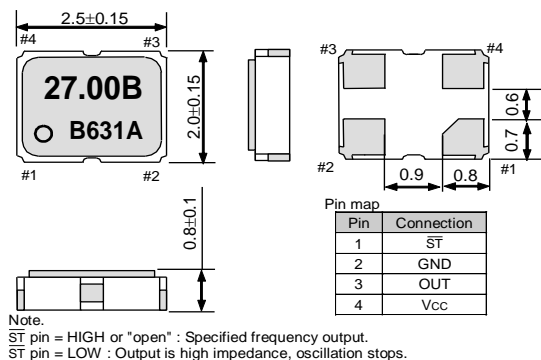
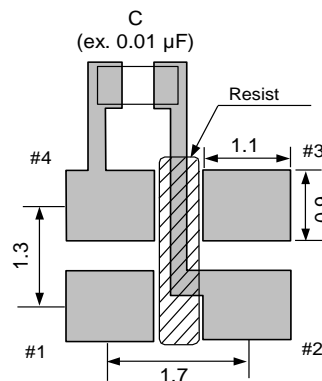
(2) L_CMOS also includes probe capacitance.

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

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

(5) Power supply

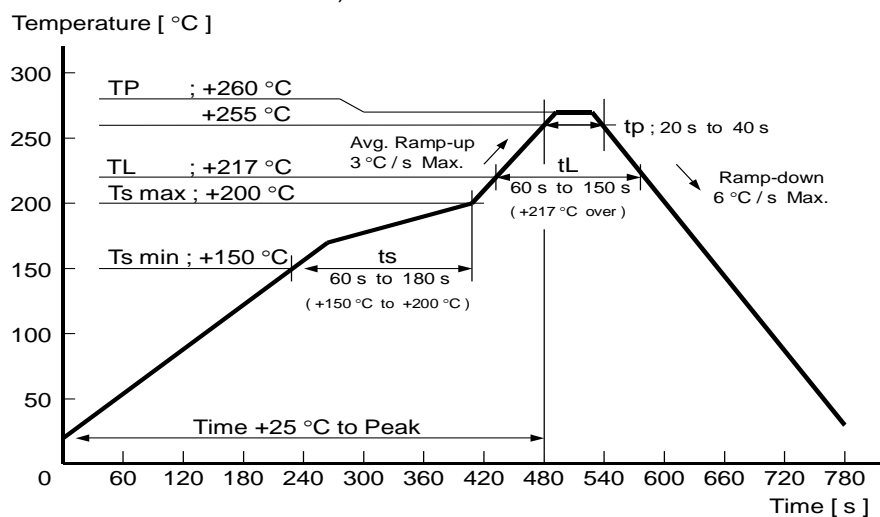
- Start up time (0 %VCC to 90 %VCC) of power source should be more than 150 μ s.
- Impedance of power supply should be as lowest as possible.

5.External dimensions (Unit: mm)**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.01)

**8.Packing information**

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

The recommended code is "00"

X1G004591A078xx

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

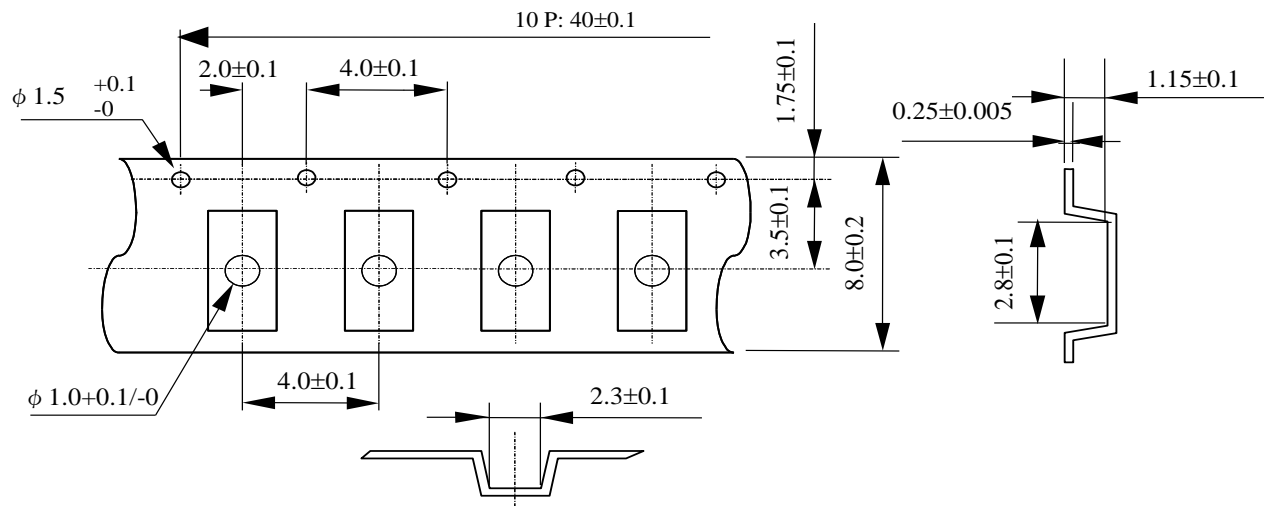
Subject to EIA-481 & IEC-60286

(1) Tape dimensions

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

Unit: mm

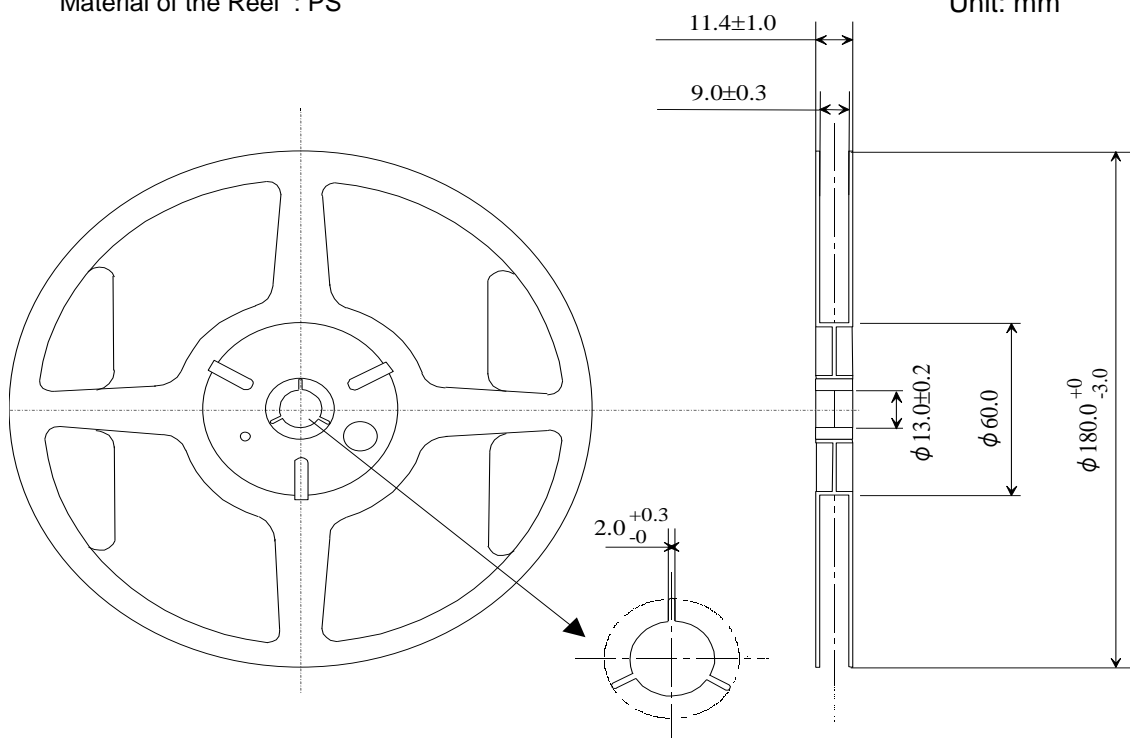


(2) Reel dimensions

Center material : PS

Material of the Reel : PS

Unit: mm



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