

Clock OSC

SG-210STF

SEIKO EPSON CORPORATION

Product name SG-210STF 48.000000 MHz L

Product Number / Ordering code X1G0041710046xx

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. 12 mg

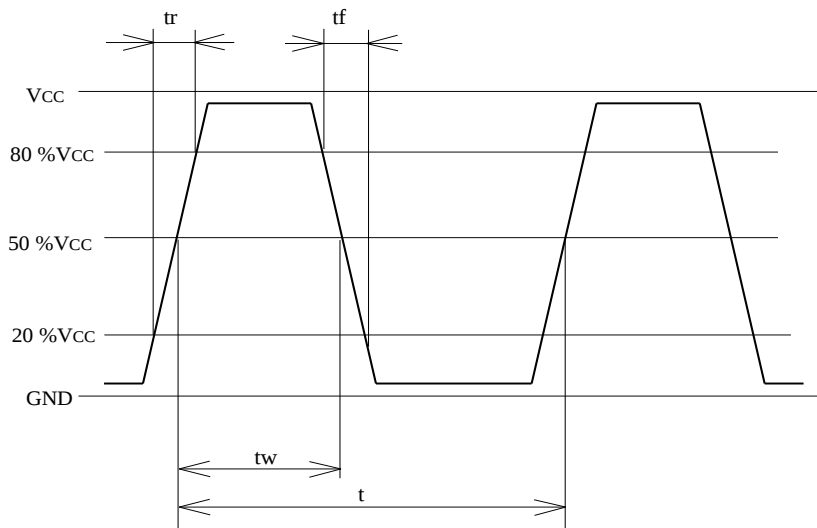
1.Absolute maximum ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Maximum supply voltage	V _{cc} -GND	-0.3	-	4	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)

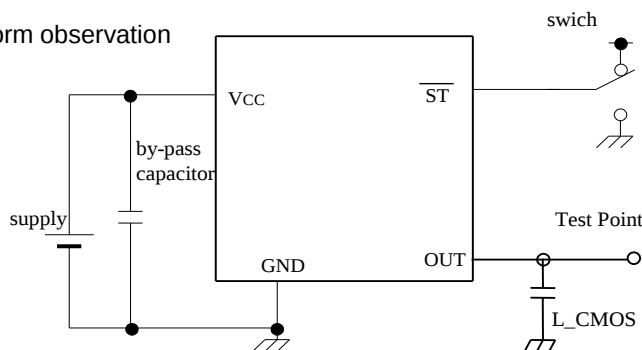
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Output frequency	f ₀		48.0000		MHz	
Supply voltage	V _{cc}	1.6	-	3.6	V	-
Operating temperature	T _{use}	-40	-	+85	°C	-
Frequency tolerance	f _{tol}	-50	-	50	x10 ⁻⁶	T _{use}
Current consumption	I _{cc}	-	-	2.6	mA	No load condition V _{cc} = 3.6V
Stand-by current	I _{std}	-	-	2.7	μA	V _{cc} = 3.6V, ST = GND
Symmetry	SYM	45	-	55	%	50% V _{cc} Level L _{CMOS} < 15pF
Output voltage	V _{OH}	V _{cc} -0.4	-	-		-
	V _{OL}	-	-	0.4		-
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	-	-	4	ns	V _{cc} 1.6V : 0.2V _{cc} to 0.8V _{cc} Level, L _{CMOS} =15pF
Fall time	t _f	-	-	4	ns	V _{cc} 1.6V : 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}	-	0	-	ps	Deterministic Jitter V _{cc} =3.3V
	t _{RJ}	-	2.4	-	ps	Random Jitter V _{cc} =3.3V
	t _{RMS}	-	2.3	-	ps	δ(RMS of total distribution) V _{cc} =3.3V
	t _{p-p}	-	20	-	ps	Peak to Peak V _{cc} =3.3V
	t _{acc}	-	2.5	-	ps	Accumulated Jitter(δ) n=2 to 50000 cycles, V _{cc} =3.3V
Phase jitter	t _{PJ}	-	0.22	-	ps	Off set Frequency: 12kHz to 20MHz, V _{cc} =3.3V
Phase noise	L(f)	-	-	-	dBc/Hz	-
		-	-91	-	dBc/Hz	Off set 10Hz V _{cc} =3.3V
		-	-120	-	dBc/Hz	Off set 100Hz V _{cc} =3.3V
		-	-143	-	dBc/Hz	Off set 1kHz V _{cc} =3.3V
		-	-154	-	dBc/Hz	Off set 10kHz V _{cc} =3.3V
		-	-158	-	dBc/Hz	Off set 100kHz V _{cc} =3.3V
		-	-158	-	dBc/Hz	Off set 1MHz V _{cc} =3.3V
Frequency aging	f _{age}	-3	-	3	x10 ⁻⁶	@+25°C first year
		-	-	-		-

3. Timing chart

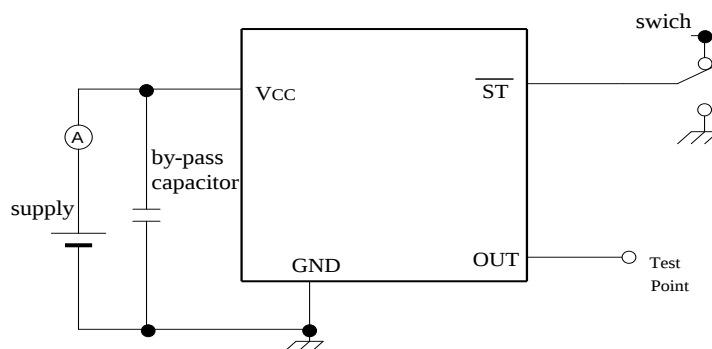


4. Test circuit

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.

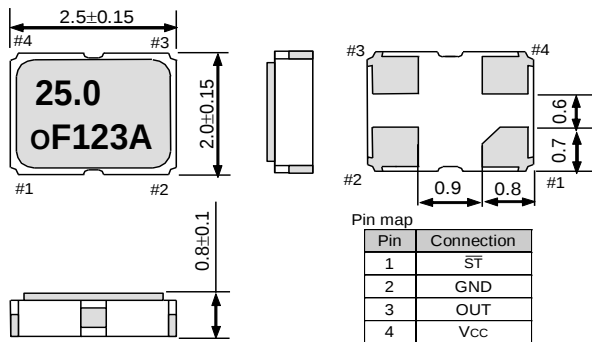
(3) By-pass capacitor (0.01 μ F to 0.1 μ F) is placed closely between VCC and GND.

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

(5) Power supply

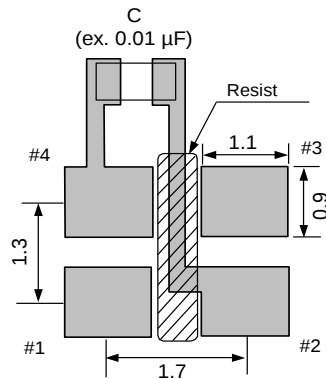
- Start up time (0 %VCC to 90 %VCC) of power source should be more than 150 μ s.
- Impedance of power supply should be as lowest as possible.

5.External dimensions (Unit: mm)



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

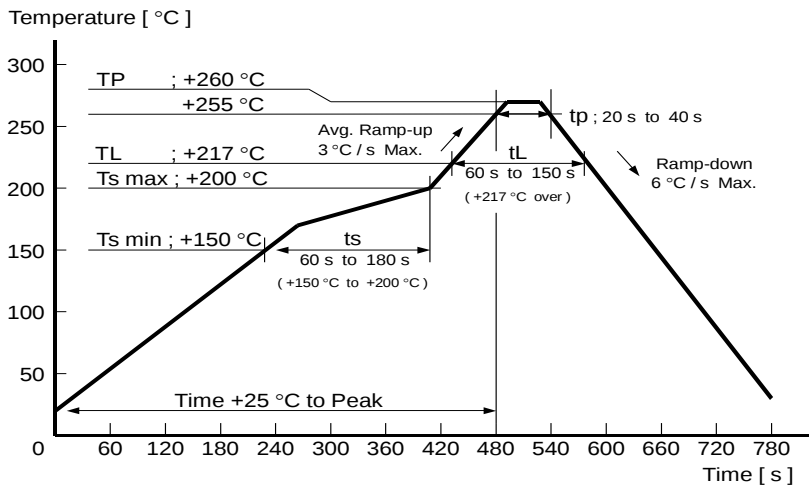
6.Footprint(Recommended) (Unit: mm)



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.01)



8.Packing information

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

The recommended code is "00"

X1G0041710046xx

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

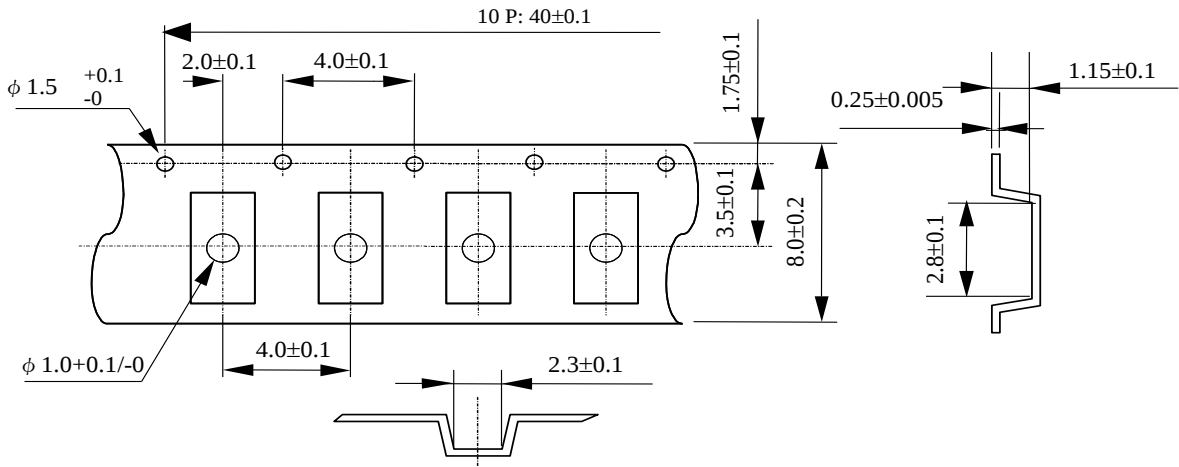
Subject to EIA-481 & IEC-60286

(1) Tape dimensions

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

Unit: mm

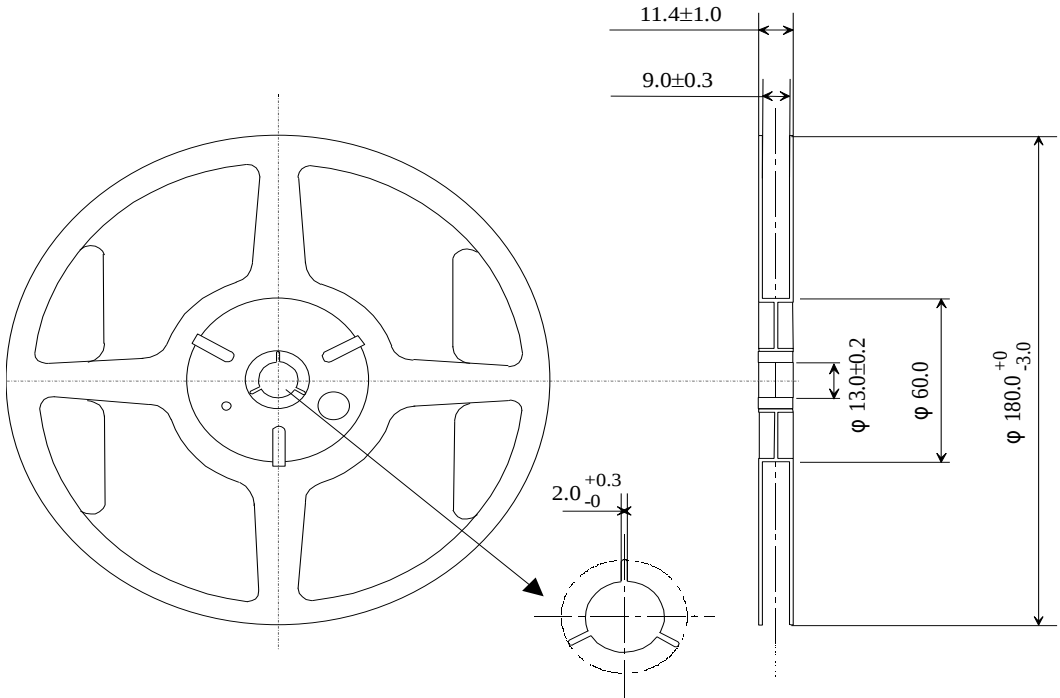


(2) Reel dimensions

Center material : PS

Material of the Reel : PS

Unit: mm



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