

Clock OSC

SG-210SEB

Product name SG-210SEB 24.000000 MHz B

Product Number / Ordering code Q33210BE00012xx

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

Output waveform CMOS

Pb free / Complies with EU RoHS directive

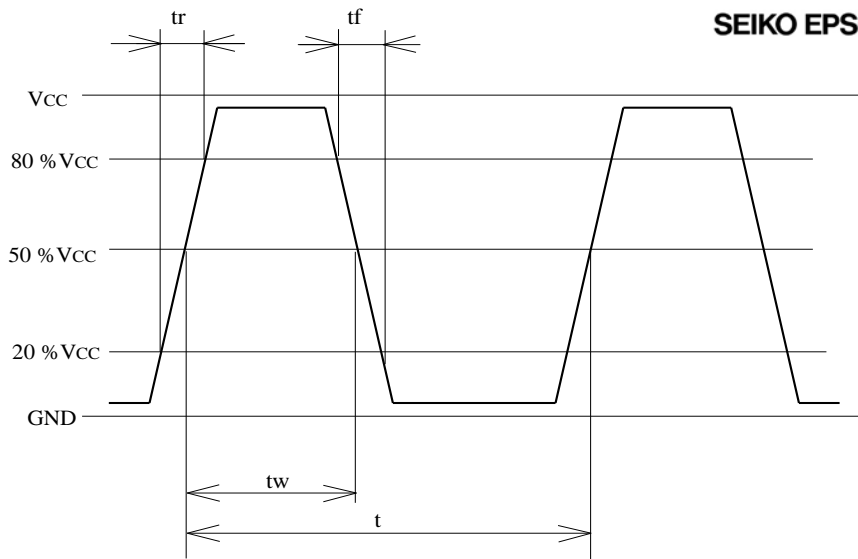
Reference weight Typ. 15 mg

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		24.0000		MHz	
Supply voltage	V _{cc}	1.6	1.8	2.2	V	-
Operating temperature	T _{use}	-20	-	70	°C	-
Frequency tolerance	f _{tol}	-50	-	50	x10 ⁻⁶	T _{use}
Current consumption	I _{cc}	-	-	1.6	mA	No load condition
Stand-by current	I _{std}	-	-	0.5	μA	ST = GND
Symmetry	SYM	45	-	55	%	50% V _{cc} Level L _{CMOS} <=15pF
Output voltage	V _{OH}	0.9V _{cc}	-	-		IOH=-1mA
	V _{OL}	-	-	0.1V _{cc}		IOL=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	-	-	4	ns	0.2V _{cc} to 0.8V _{cc} Level, L _{CMOS} =15pF
Fall time	t _f	-	-	4	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}	-	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}	-3	-	3	x10 ⁻⁶	@+25°C first year
		-	-	-		-

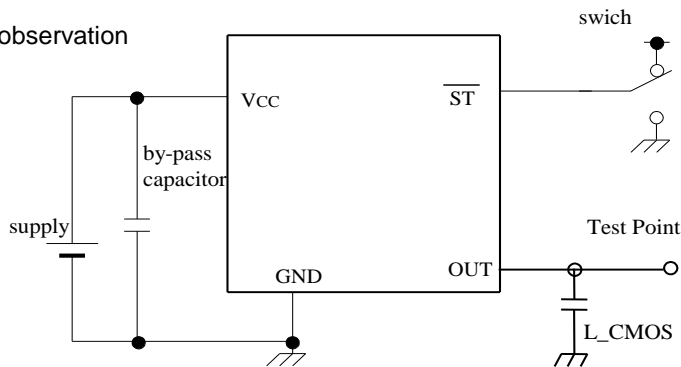
3. Timing chart

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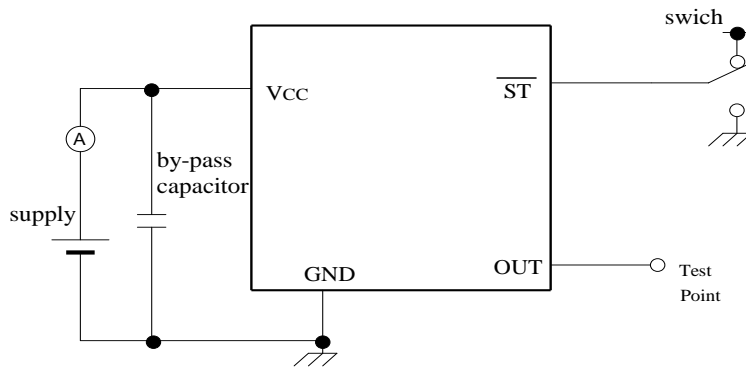


4. Test circuit

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.)

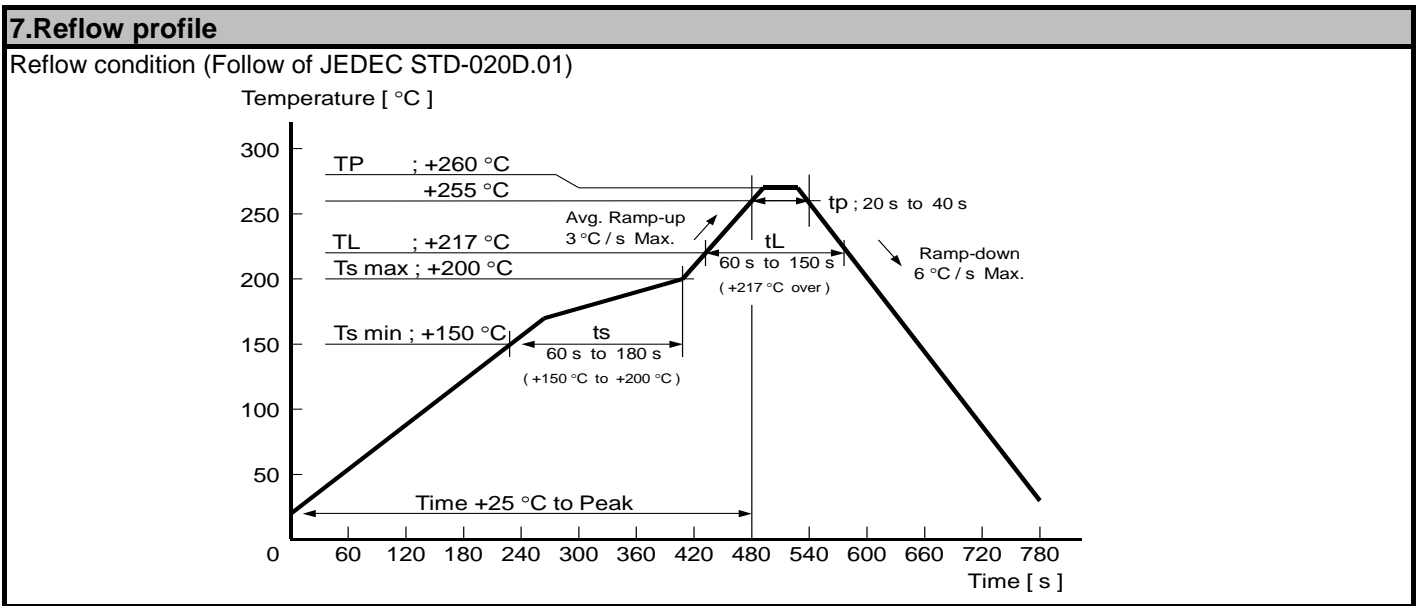
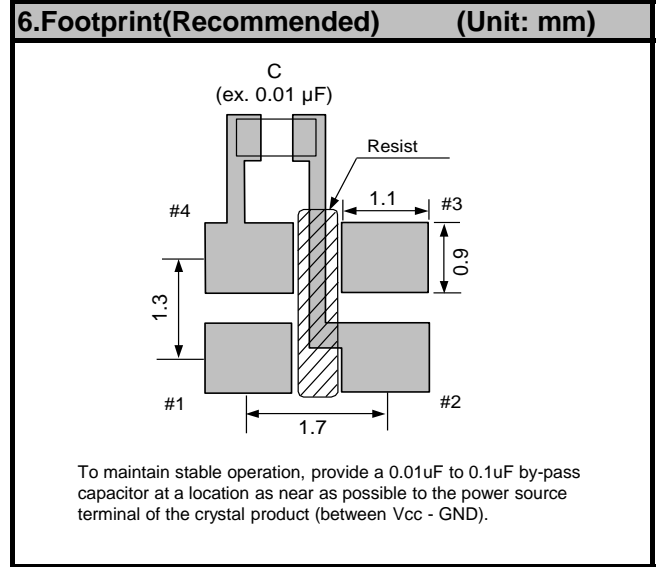
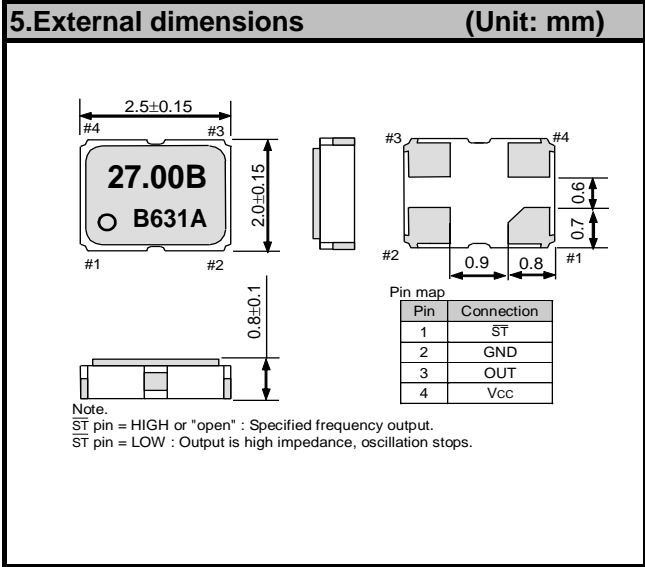
(2) L_CMOS also includes probe capacitance.

(3) By-pass capacitor (0.01 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.



8.Packing information

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

Q33210BE00012xx

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

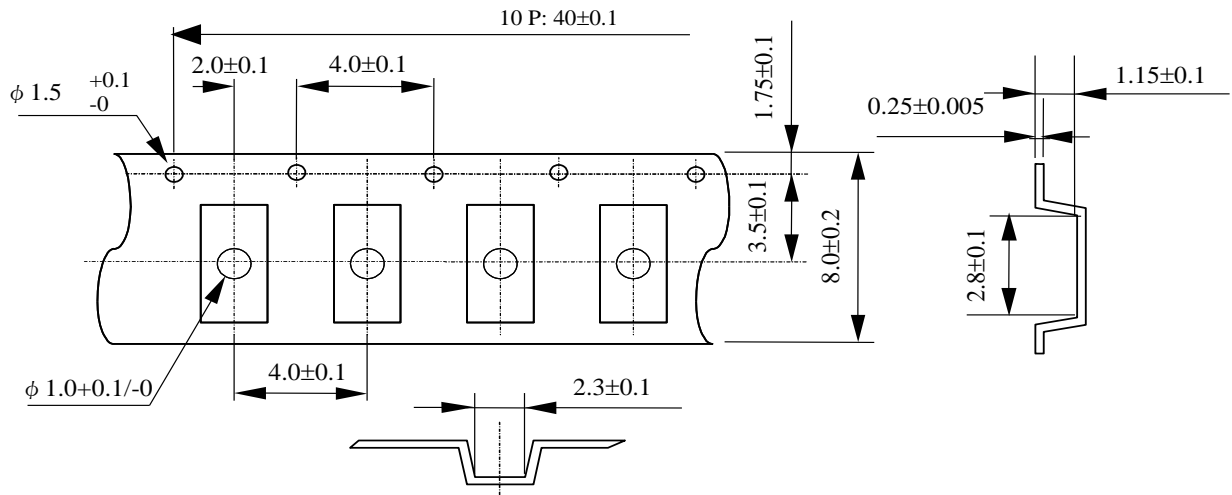
Subject to EIA-481 & IEC-60286

(1) Tape dimensions

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

Unit: mm

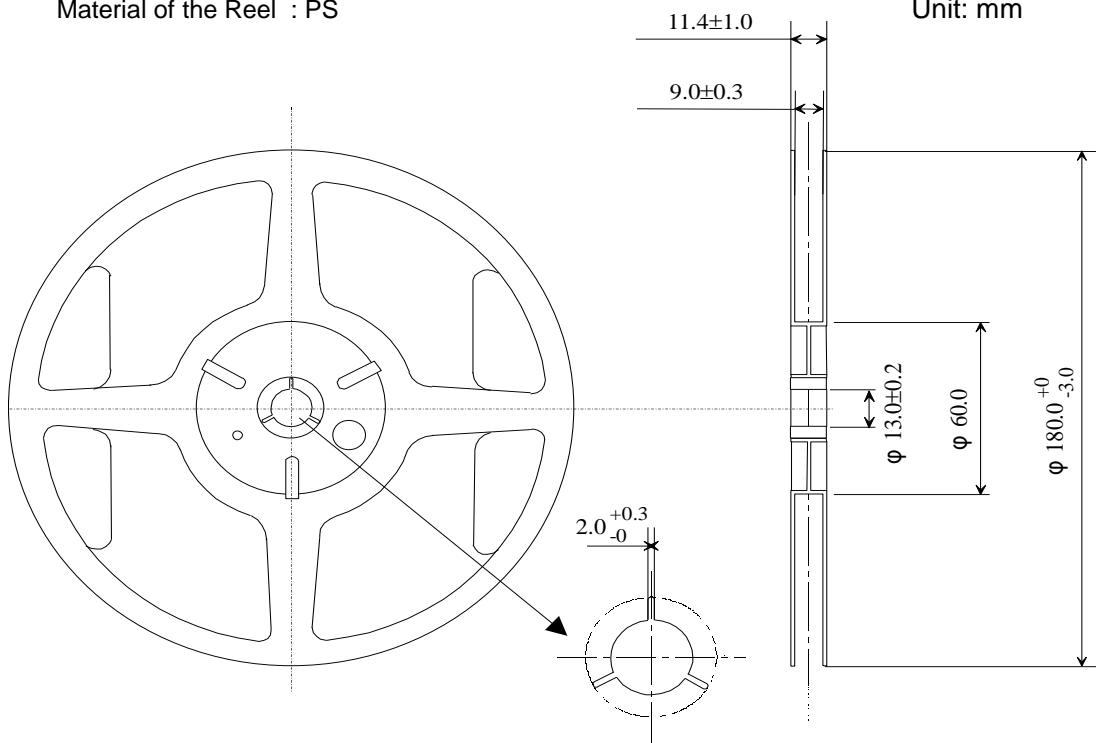


(2) Reel dimensions

Center material : PS

Material of the Reel : PS

Unit: mm



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