SPXO SG-3040LC

Product name SG-3040LC 32.768000 kHz B
Product Number / Ordering code Q3103LC020001xx
Please refer to the 8.Packing information about xx (last 2 digits)

Output waveform CMOS
Complies with EU RoHS directive
Reference weight Typ. 25 mg

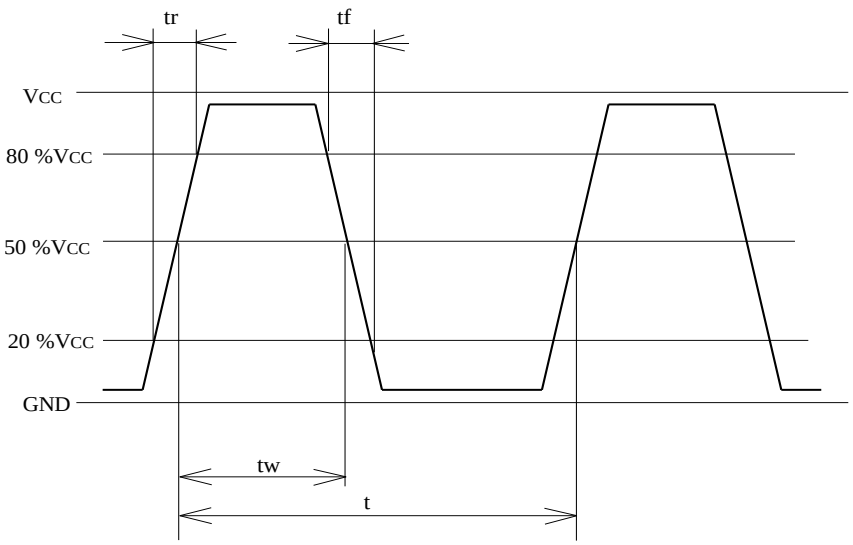
1.Absolute maximum ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Maximum supply voltage	Vcc-GND	-0.3	-	7	V	Vcc Pin
Storage temperature	T_stg	-55	-	125	ºC	Storage as single product

2.Specifications(characteristics)

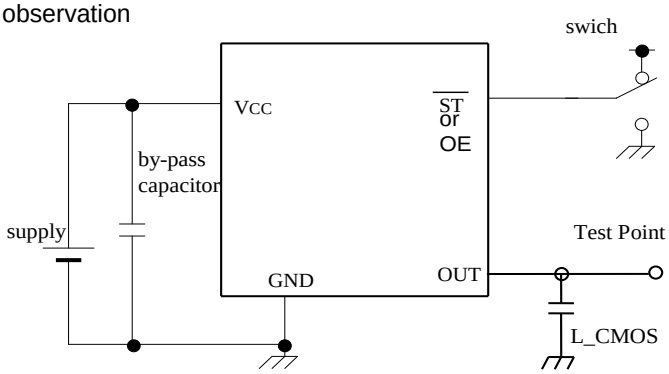
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Output frequency	f0	-	32.7680	-	kHz	
Supply voltage	Vcc	0.9	-	3.6	V	Vcc Pin
Interface power supply voltage	V_{IO}	0.9	-	3.6		VIO Pin
Operating temperature	T_use	-40	-	85	ºC	No condensation
Frequency tolerance	f_tol	-18	-	28	$x10^{-6}$	@+25℃, Vcc=3.3V , 5+/-23x10^-6
Frequency temperature coefficient	f0-Tc	-120	-	10	$x10^{-6}$	-20℃ to 70℃ (+25℃ is reference)
Frequency voltage coefficient	f0-Vcc	-5	-	5	$x10^{-6}$ /V	@+25℃ Vcc=0.9 to 3.6V
Current consumption	Icc	-	-	3.1	µA	Vcc=3.3V No load condition
Symmetry	SYM	45	50	55	%	1/2Vcc(VIO） Level Vcc,VIO=1.2V to 3.6V
Output voltage	V_{OH}	VIO-0.4	-	-		IOH=-400µA; VIO=1.2V to 3.6V
	V_{OL}	-	-	GND+0.4		IOL=400µA, VIO=1.2v to 3.6V
Output load condition	L_CMOS	-	-	15	pF	CMOS Load
Input voltage	V_{IH}	80%Vcc	-	-		-
	V_{IL}	-	-	20%Vcc		-
Rise time	t_r	-	-	150	ns	20%VIO ⇔ 80%VIO 15pF VIO=1.5V to 5.5V
Fall time	tf	-	-	150	ns	20%VIO ⇔ 80%VIO 15pF VIO=1.8V to 5.5V
Start-up time	t_str	-	-	3	s	Vcc=0.9V to 3.6V
Frequency aging	f_age	-5	-	5	$x10^{-6}$	@+25℃ Vcc=3.3V First year

3.Timing chart

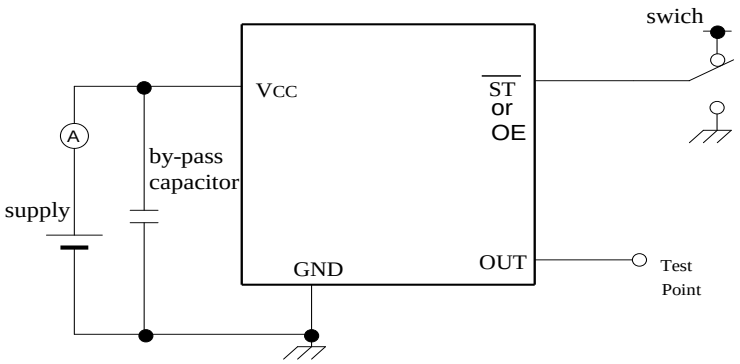


4.Test circuit

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.

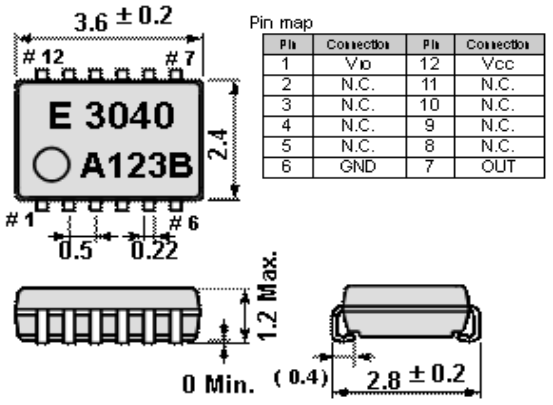
(4) Use the current meter whose internal impedance value is small.

(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.

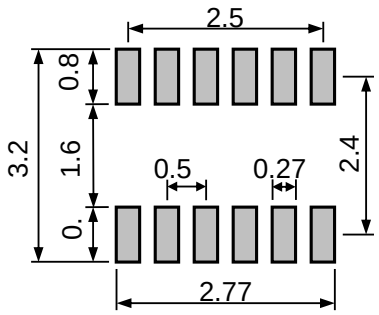
5.External dimensions (Unit: mm)



Pin map

Pin	Connection	Pin	Connection
1	Vio	12	Vcc
2	N.C.	11	N.C.
3	N.C.	10	N.C.
4	N.C.	9	N.C.
5	N.C.	8	N.C.
6	GND	7	OUT

6.Footprint(Recommended) (Unit: mm)

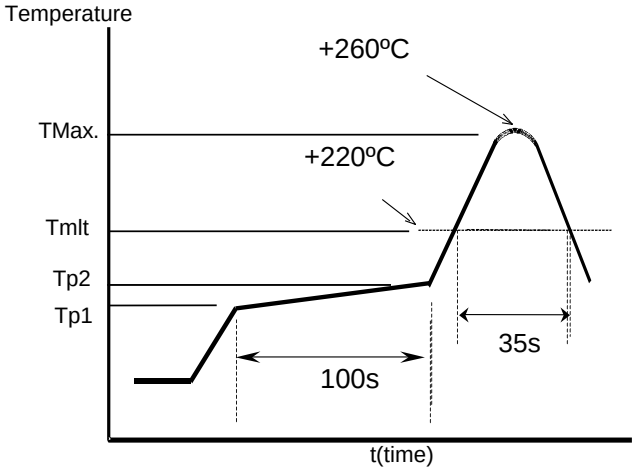


To maintain stable operation, provide a 0.01uF to 0.1uF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between Vcc - GND).

7.Reflow profile

Pre Heating Temperature
Tp1 ~ Tp2 = + 170 °C
Heating Temperature
TMlt = + 220 °C
Peek Temperature
TMax. = + 260 °C

Point of measuring
In case of Solder ability
Terminal.
In case of Resistance to soldering heat
Surface.



8.Packing information

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

Q3103LC020001xx

Code	Condition	Code	Condition
01	Any Q'ty vinyl bag(Tape cut)	13	500pcs / Reel
11	Any Q'ty / Reel	14	1000pcs / Reel
12	250pcs / Reel	00	2000pcs / Reel

[2] Taping specification

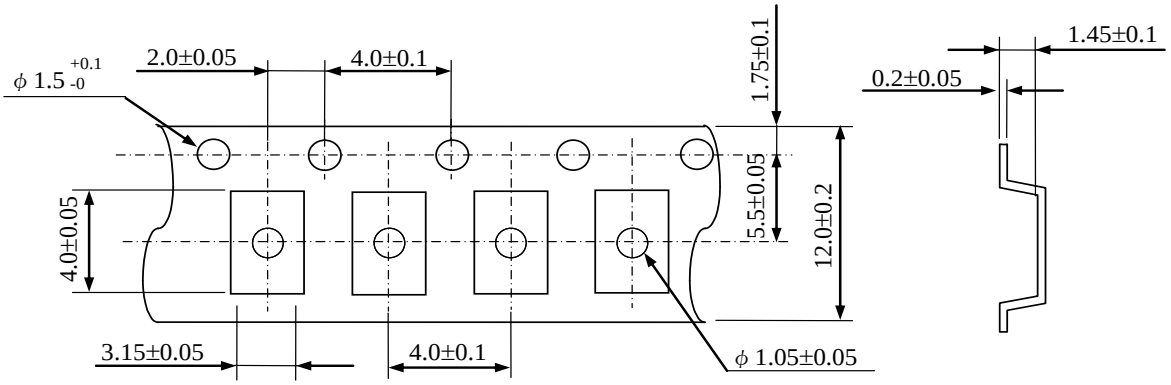
Subject to EIA-481 & IEC-60286

(1) Tape dimensions

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

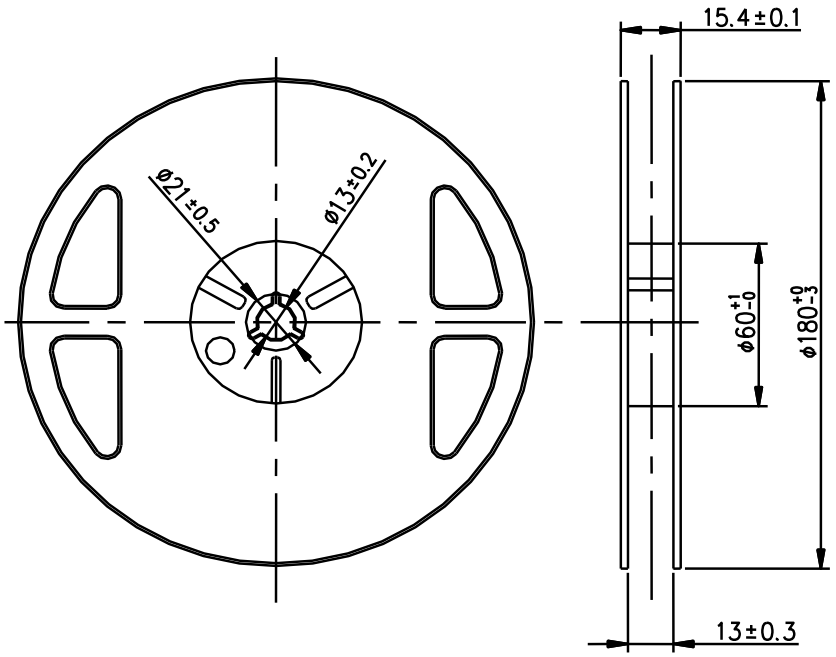
Unit: mm



(2) Reel dimensions

Center material : PS

Material of the Reel : PS



9.Notice

- This material is subject to change without notice.
- Any part of this material may not be reproduced or duplicated in any form or any means without the written permission of Seiko Epson.
- The information about applied data,circuitry, software, usage, etc. written in this material is intended for reference only.
  Seiko Epson does not assume any liability for the occurrence of customer damage or infringing on any patent or copyright of a third party.
  This material does not authorize the licensing for any patent or intellectual copyrights.
- When exporting the products or technology described in this material, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations.
- You are requested not to use the products (and any technical information furnished, if any) for the development and/or manufacture of weapon of mass destruction or for other military purposes. You are also requested that you
  would not make the products available to any third party who may use the products for such prohibited purposes.
- These products are intended for general use in electronic equipment. When using them in specific applications that require
  extremely high reliability, such as the applications stated below, you must obtain permission from Seiko Epson in advance.
  / Space equipment (artificial satellites, rockets, etc.)
  / Transportation vehicles and related (automobiles, aircraft, trains, vessels, etc.)
  / Medical instruments to sustain life
  / Submarine transmitters
  / Power stations and related
  / Fire work equipment and security equipment
  / Traffic control equipment
  / And others requiring equivalent reliability.

10.Contact us

http://www5.epsondevice.com/en/contact/