

SPXO

SG-3040LC

SEIKO EPSON CORPORATION

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

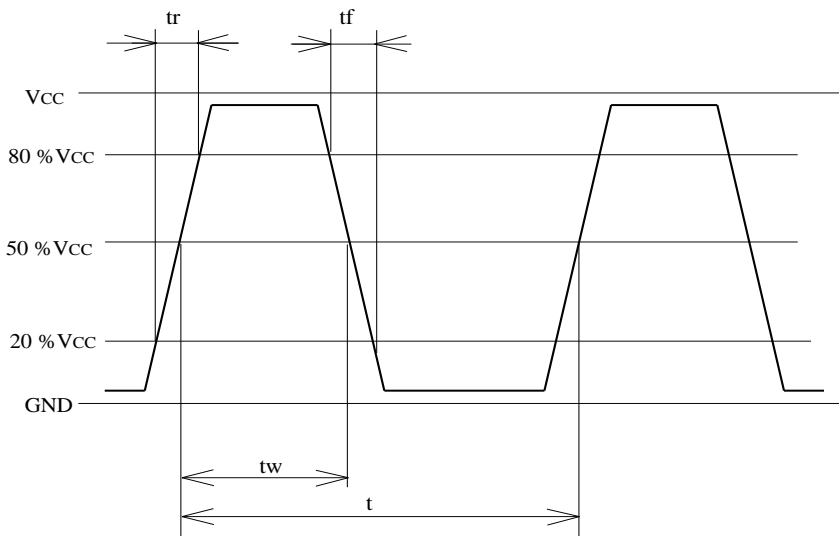
1.Absolute maximum ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Maximum supply voltage	V _{cc-GND}	-0.3	-	7	V	V _{cc} Pin
Storage temperature	T _{stg}	-55	-	125	°C	Storage as single product

2.Specifications(characteristics)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Output frequency	f ₀	-	32.7680	-	kHz	
Supply voltage	V _{cc}	0.9	-	3.6	V	V _{cc} Pin
Interface power supply voltage	V _{IO}	0.9	-	3.6		V _{IO} Pin
Operating temperature	T _{use}	-40	-	85	°C	No condensation
Frequency tolerance	f _{tol}	-18	-	28	x10 ⁻⁶	@+25°C, V _{cc} =3.3V, 5+/-23x10 ⁻⁶
Frequency temperature coefficient	f _{0-Tc}	-120	-	10	x10 ⁻⁶	-20°C to 70°C (+25°C is reference)
Frequency voltage coefficient	f _{0-Vcc}	-5	-	5	x10 ⁻⁶ /V	@+25°C V _{cc} =0.9 to 3.6V
Current consumption	I _{cc}	-	-	3.1	µA	V _{cc} =3.3V No load condition
Symmetry	SYM	45	50	55	%	1/2V _{cc} (V _{IO}) Level V _{cc} ,V _{IO} =1.2V to 3.6V
Output voltage	V _{OH}	V _{IO} -0.4	-	-		I _{OH} =-400µA; V _{IO} =1.2V to 3.6V
	V _{OL}	-	-	GND+0.4		I _{OL} =400µA, V _{IO} =1.2v to 3.6V
Output load condition	L _{CMOS}	-	-	15	pF	CMOS Load
Input voltage	V _{IH}	80%V _{cc}	-	-		-
	V _{IL}	-	-	20%V _{cc}		-
Rise time	t _r	-	-	150	ns	20%V _{IO} ⇄ 80%V _{IO} 15pF V _{IO} =1.5V to 5.5V
Fall time	t _f	-	-	150	ns	20%V _{IO} ⇄ 80%V _{IO} 15pF V _{IO} =1.8V to 5.5V
Start-up time	t _{str}	-	-	3	ms	V _{cc} =0.9V to 3.6V
Frequency aging	f _{age}	-5	-	5	x10 ⁻⁶	@+25°C V _{cc} =3.3V First year

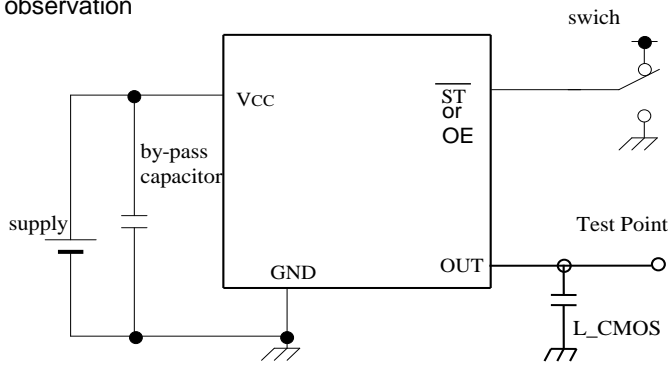
3.Timing chart



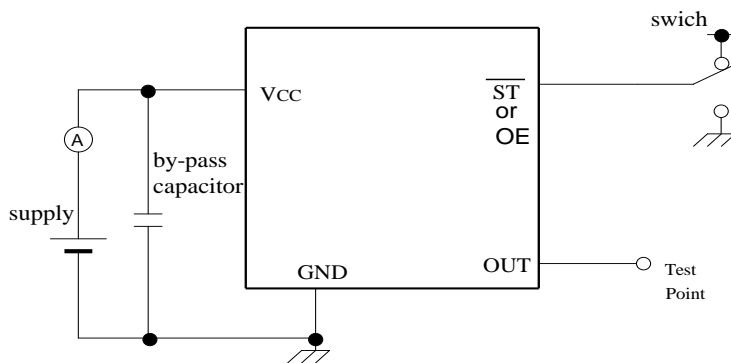
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4. Test circuit

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.

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5.External dimensions (Unit: mm)

Pin map

Pin	Connection	Pin	Connection
1	V _{IO}	12	V _{CC}
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 V_{CC} - GND).

7.Reflow profile

Pre Heating Temperature
Tp1 ~ Tp2 = + 170 °C

Heating Temperature
T_{Mlt} = + 220 °C

Peek Temperature
T_{Max.} = + 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

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