

## CRYSTAL OSCILLATOR

32.768 kHz

SG-3030LC/JF/JC  
SG-3040LC/JC

- Built-in 32.768 kHz crystal unit allows adjustment-free efficient operation.
- Use of C-MOS IC enables reduction of current consumption.
- VIO controls swing amplitude.



Product Number (please contact us)

SG-3030LC : Q3102LC0xxxxxx00

SG-3030JF : Q3102JF0xxxxxx00

SG-3030JC : Q3102JC0xxxxxx00

SG-3040LC : Q3103LC0xxxxxx00

SG-3040JC : Q3103JC0xxxxxx00

SG-3030LC  
SG-3040LC

SG-3030JF

SG-3030JC  
SG-3040JC

Actual size

LC Type.



JF Type.



JC Type.

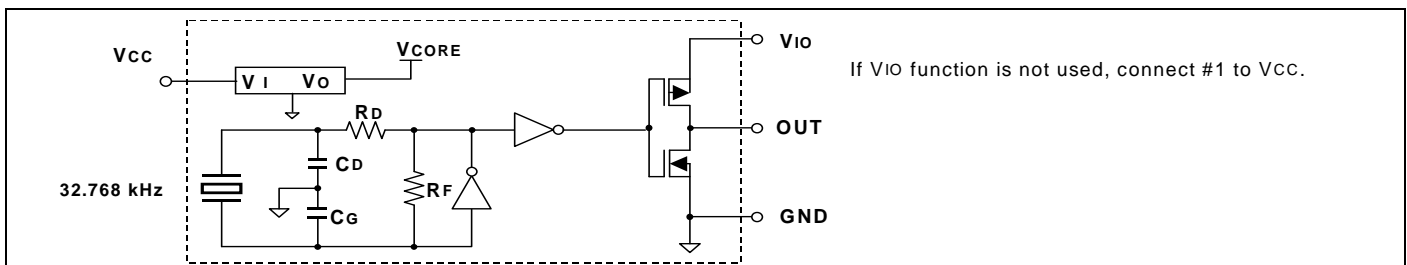


## Specifications (characteristics)

Item	Symbol	Specifications		Remarks
		SG-3030LC/JF/JC	SG-3040LC/JC	
Output frequency range	$f_0$	32.768 kHz		
Supply voltage	$V_{CC}$	1.5 V to 5.5 V	0.9 V to 3.6 V	
Interface power supply voltage	$V_{IO}$	1.5 V to 5.5 V	0.9 V to 3.6 V	
Temperature range	Storage temperature	$T_{stg}$		Store as bare product after unpacking
	Operating temperature	$T_{use}$		
Frequency tolerance	$f_{tol}$	-55 °C to +125 °C -40 °C to +85 °C		
Frequency temperature coefficient	$f_0-T_c$	$5 \pm 23 \times 10^{-6}$ $+10 \times 10^{-6} / -120 \times 10^{-6}$		+25 °C, $V_{CC}=3.3$ V (SG-3040: $V_{CC}=1.2$ V)
Frequency / voltage coefficient	$f_0-V_{CC}$	$\pm 2 \times 10^{-6} / V$ Max.	$\pm 5 \times 10^{-6} / V$ Max.	-20 °C to +70 °C (+25 °C is reference)
Current consumption	$I_{CC}$	2 $\mu$ A Max.	3.1 $\mu$ A Max.	+25 °C
Symmetry	SYM	45 % to 55 %		3.3 V, No load condition
High output voltage	$V_{OH}$	$V_{IO}-0.4$ V Min.		1/2 $V_{CC}(V_{IO})$ level (SG-3040: $V_{IO}=1.2$ V to 3.6 V)
Low output voltage	$V_{OL}$	0.4 V Max.		$I_{OH}=-0.4$ mA (SG-3040: $V_{IO}=1.2$ V to 3.6 V)
Output load condition (CMOS)	$L_{CMOS}$	15 pF Max.		$I_{OL}=0.4$ mA (SG-3040: $V_{IO}=1.2$ V to 3.6 V)
Rise time / Fall time	$t_r / t_f$	200 ns Max.	100 ns Max.	CMOS load: 20 % $V_{CC}(V_{IO})$ to 80 % $V_{CC}(V_{IO})$ level (SG-3040: $V_{IO}=1.2$ V to 3.6 V)
Start-up time	$t_{str}$	1 s Max.	3 s Max.	Time at minimum Supply voltage to be 0 s
Frequency aging	$f_{aging}$	$\pm 5 \times 10^{-6} / \text{year}$ Max.		+25 °C, $V_{CC}=3.3$ V, First year

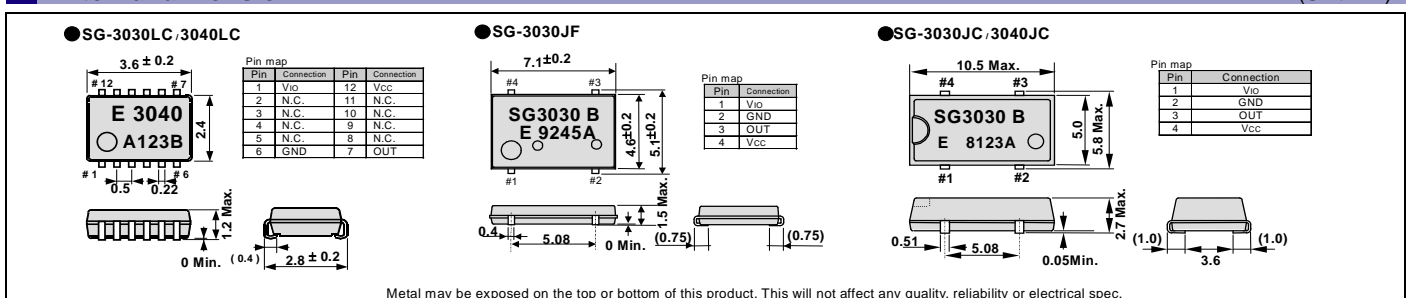
Unless otherwise stated, characteristics (specifications) shown in the above table are based on the rated operating temperature and voltage condition.

## Block diagram



## External dimension

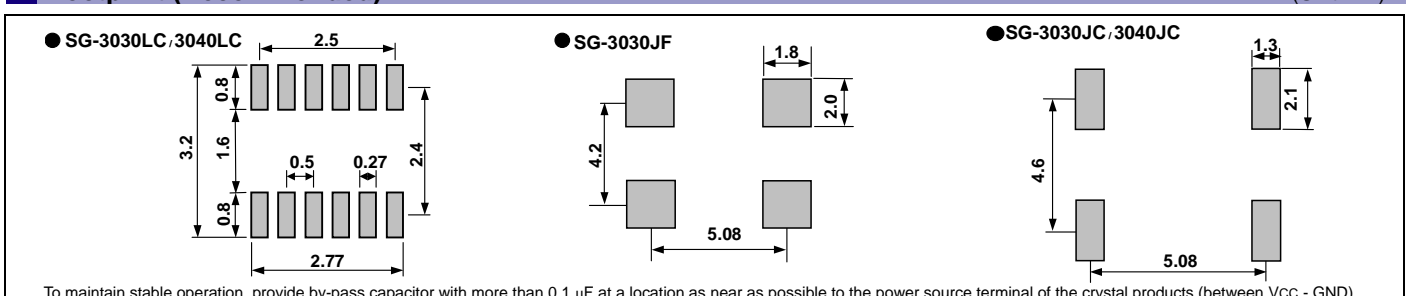
(Unit:mm)



Metal may be exposed on the top or bottom of this product. This will not affect any quality, reliability or electrical spec.

## Footprint (Recommended)

(Unit:mm)

To maintain stable operation, provide by-pass capacitor with more than 0.1  $\mu$ F at a location as near as possible to the power source terminal of the crystal products (between VCC - GND).