



Product Number
SG-3031CM : X1B000391000116

CRYSTAL OSCILLATOR (SPXO)

32.768 kHz

SG-3031CM



- Built-in 32.768 kHz crystal unit allows adjustment-free efficient operation.
- Operation temperature -40 °C to +105 °C
- Use of CMOS IC enables reduction of current consumption.
- V_{IO} controls swing amplitude.

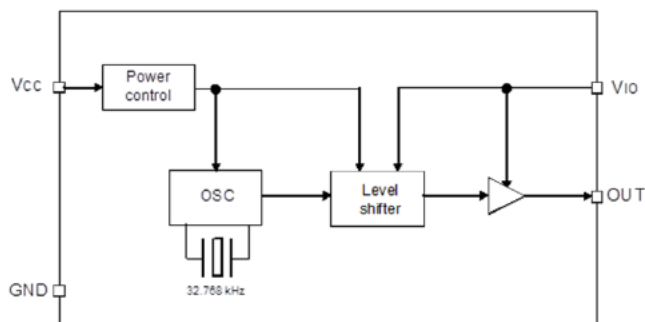
- Applications
Industrial, Security, Smart Meter,
Clock for Time counting and Sleep function

仕様 (特性)

Item	Symbol	Specifications	Remarks
Output frequency range	f _o	32.768 kHz	
Supply voltage	V _{CC}	1.2 V to 5.5 V	V _{CC} < 1.5 V, V _{IO} = V _{CC}
Interface power supply voltage	V _{IO}	1.2 V to 5.5 V	
Temperature range	T _{stg}	-55 °C to +125 °C	Store as bare product after unpacking
Operating temperature	T _{use}	-40 °C to +105 °C	
Frequency tolerance	f _{tol}	+5 ± 23 × 10 ⁻⁶	+25 °C, V _{CC} =3.3 V
Frequency temperature coefficient	fo-Tc	-120 × 10 ⁻⁶ to +10 × 10 ⁻⁶	-20 °C to +70 °C (+25 °C is reference)
		-0.035 × (T _{use} - 25) ² × 10 ⁻⁶ Typ.	Typ. Value Calculation from -40 °C to +105 °C
Frequency voltage coefficient	fo-Vcc	±1 × 10 ⁻⁶ / V Max	V _{CC} =1.5 V to 5.5 V
		±5 × 10 ⁻⁶ / V Max	V _{CC} =1.2 V to 1.5 V
Current consumption (V _{CC} Pin)	I _{CC}	0.30 μA Typ. / 0.65 μA Max.	V _{CC} =1.2 V ~ 5.5 V
Current consumption (V _{CC} +V _{IO} Pin)	I _{CC} +I _{IO}	0.38 μA Typ.	V _{CC} =V _{IO} =1.2 V, No load condition
		0.65 μA Typ. / 1.3 μA Max. (+105 °C)	V _{CC} =V _{IO} =3.3 V, No load condition
Symmetry	SYM	45 % to 55 %	1/2V _{CC} (V _{IO}) level, 1.5 V to 5.5 V
		40 % to 60 %	1/2V _{CC} (V _{IO}) level, V _{CC} < 1.5 V
Output voltage	V _{OH} / V _{OL}	V _{IO} -0.4V Min / 0.4V Max.	I _{OH} =-0.4mA / I _{OL} = 0.4mA, V _{IO} =1.5 V to 5.5 V
		V _{IO} -0.2V Min / 0.2V Max.	I _{OH} =-0.1mA / I _{OL} = 0.1mA, V _{IO} =1.2 V to 1.5 V
Output load condition (CMOS)	L _{CMOS}	15 pF Max.	CMOS load
Rise time / Fall time	tr / tr	200 ns Max.	20 % V _{IO} to 80 % V _{IO} level, V _{IO} =1.2 V to 5.5 V
		100 ns Max.	20 % V _{IO} to 80 % V _{IO} level, V _{IO} =1.8 V to 5.5 V
Start-up time	t _{str}	0.15 s Typ / 0.45 s Max.	V _{CC} =1.5 V to 5.5 V
		1.0 s Max	V _{CC} =1.2 V to 1.5 V
Frequency aging	f _{aging}	±5 × 10 ⁻⁶ / 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



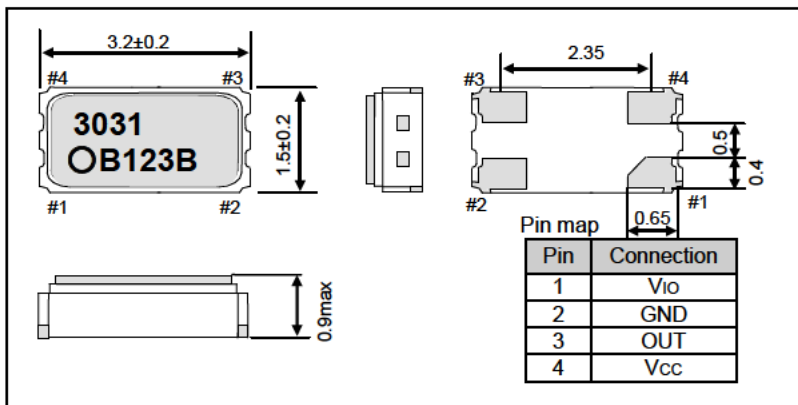
V_{IO} is a power supply pin for OUT output and can also be used as an OE pin. Set V_{IO} to 0 V when setting Disable.

V_{CC} is a power supply pin for operating the 32.768 kHz oscillation.

Power consumption can be minimized by minimizing the applied voltage of both power supplies. However, when V_{CC} < 1.5 V, V_{IO} = V_{CC}.

External dimension

(Unit:mm)



Footprint(ference)

(Unit:mm)

