

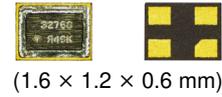
# SMD Crystal Clock Oscillator (SPXO)

Low consumption / 1.6 mm x 1.2 mm / 32.768 kHz / CMOS / 1.8 V to 3.3 V

# FCXO-07D

## FEATURES

- 1612 size, CMOS oscillator (32.768 kHz) with low current consumption of 0.03 mA Max.
- Frequency tolerance of  $\pm 7$  ppm (@25 °C) available
- Better electrical performance than oscillators using tuning fork crystals:
  - 1/100 start-up time (7.0 ms Max. @3.3 V)
  - Temperature characteristics of  $\pm 10$  ppm (-30 °C to +85 °C) available (1/10 frequency tolerance of the tuning fork oscillators)
- Robust ceramic package with metal lid sealed by electron beam



## APPLICATIONS

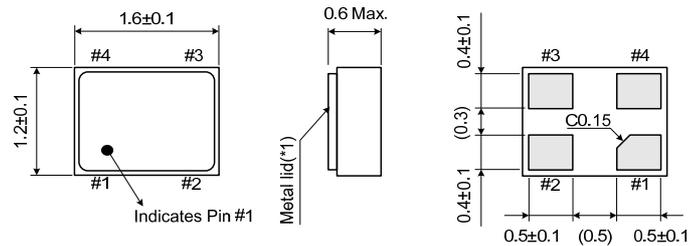
- Smart-meters / wireless-modules / replacement for tuning fork oscillators

## STANDARD SPECIFICATIONS

Item	Specifications	Unit	Conditions (Remarks)	
Nominal frequency	32.768	kHz	-	
Frequency tolerance	$\pm 7$	ppm	@25 °C (See below for more options)	
Storage temperature	-55 to +125	°C	-	
Operating temperature	-40 to +85	°C	(See below for more options)	
Frequency / temperature characteristics	(-30 to +85) °C	$\pm 10$	ppm Refer to 25 °C (See below for more options)	
	(-40 to +85) °C	$\pm 15$		
Supply voltage	1.8, 3.3	V	(See below for more options)	
Current consumption (Max.)	0.03	mA	F = 32.768 kHz, V <sub>DD</sub> = 3.0 V, No load	
Stand-by current (Max.)	3	μA	Stand-by = "L"	
Output voltage	V <sub>OH</sub> (Min.)	0.9V <sub>DD</sub>	V	I <sub>OH</sub> = -1 mA
	V <sub>OL</sub> (Max.)	0.1V <sub>DD</sub>	V	I <sub>OL</sub> = +1 mA
Output load (Max.)	15	pF	-	
Output level	CMOS	-	-	
Symmetry (Duty Cycle)	50 ± 5	%	V <sub>TH</sub> = 0.5V <sub>DD</sub>	
Rise time / Fall time (Max.)	200	ns	0.1V <sub>DD</sub> to 0.9V <sub>DD</sub>	
Start-up time (Max.)	V <sub>DD</sub> = 3.3 V	7.0	ms	-
	V <sub>DD</sub> = 1.8 V	10.0	ms	-
Stand-by function (Pin #1)	V <sub>IH</sub> (Min.)	0.7V <sub>DD</sub>	V	Output (Pin #3) enabled
	V <sub>IL</sub> (Max.)	0.3V <sub>DD</sub>	V	Output (Pin #3) disabled = High-Z
Tape and reel	3000	pcs/reel	Reel diameter : $\varnothing$ 180 mm	

## OUTLINE DIMENSIONS

(Unit: mm)

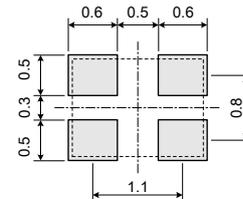


Pin	Function
#1	Stand-by
#2	Ground
#3	Output
#4	V <sub>DD</sub>

- Pin #2 is connected to the metal lid (\*1)

## RECOMMENDED LAND PATTERN

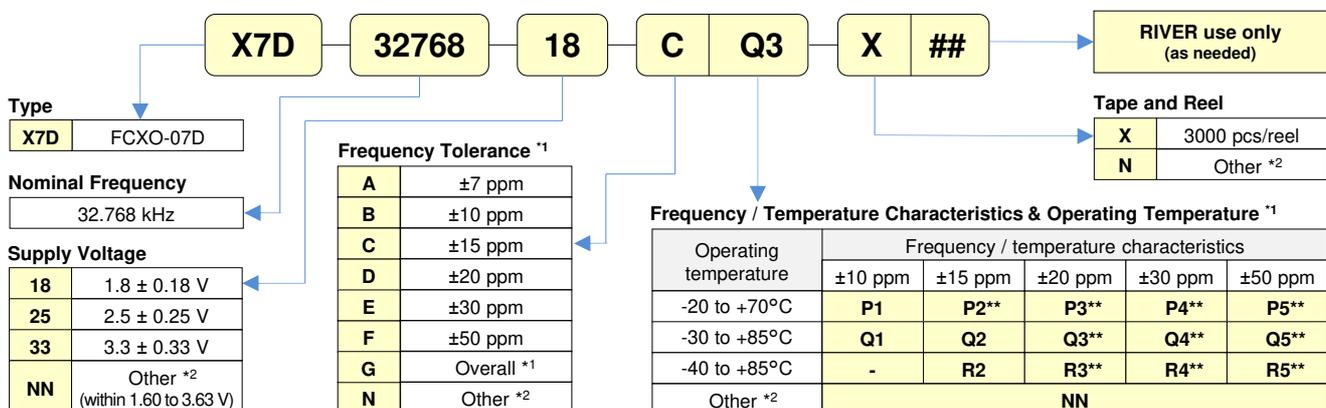
(Unit: mm)



## GENERAL NOTES

- Certain combinations of standard options may be classified as high-spec models.
- Please consult us for specifications that do not match the standard specifications.
- The information in this document is subject to change without notice.
- For operational stability, a 0.01 μF bypass capacitor should be placed between V<sub>DD</sub> (Pin #4) and Ground (Pin #2) as close as possible to the product.

## ORDERING NUMBER GUIDE



\*1. For overall frequency stability inclusive of stability at 25°C and an operating temp. range, please select "G (Overall)" from the table "Frequency Tolerance" followed by a code that is with "\*" from the table "Freq./Temp. Characteristics & Operating Temp.". (e.g. GP2 = Overall ±15 ppm (-20 to +70°C))

\*2. Please consult us for your requirements.