

SMD Crystal Clock Oscillator (SPXO)

Ultra-low consumption / 2.5 mm x 2.0 mm / 32.768 kHz / CMOS / 1.8 V to 3.3 V

FCXO-05D

FEATURES

- 2520 size crystal oscillator (32.768 kHz) with ultra-low current consumption of 0.01 mA Max.
- Frequency tolerance of ± 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 ± 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



(2.5 × 2.0 × 0.9 mm)



APPLICATIONS

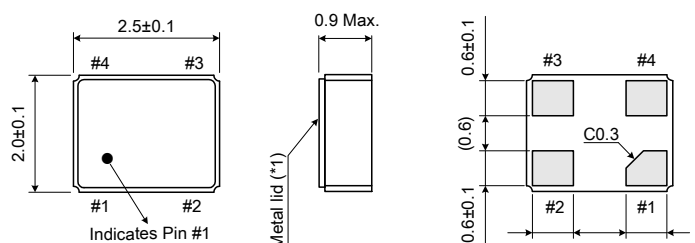
- Smart-meters / wireless-modules / replacement for tuning fork oscillators

STANDARD SPECIFICATIONS

Item	Specifications	Unit	Conditions (Remarks)
Nominal frequency	32.768	kHz	-
Frequency tolerance	± 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	± 10 (-30 °C to +85 °C) ± 15 (-40 °C to +85 °C)	ppm	Refer to 25 °C (See below for more options)
Supply voltage	1.8, 3.3	V	(See below for more options)
Current consumption (Max.)	0.01	mA	F = 32.768 kHz, V _{DD} = 3.0 V, No load
Stand-by current (Max.)	3	μA	Stand-by = "L"
Output voltage	V _{OH} (Min.)	0.9V _{DD}	V I _{OH} = -1 mA
	V _{OL} (Max.)	0.1V _{DD}	V I _{OL} = +1 mA
Output load (Max.)	15	pF	-
Output level	CMOS	-	-
Symmetry (Duty Cycle)	50 ± 5	%	V _{TH} = 0.5V _{DD}
Rise time / Fall time (Max.)	200	ns	0.1V _{DD} to 0.9V _{DD}
Start-up time (Max.)	7.0	ms	V _{DD} = 3.3 V
	10.0	ms	V _{DD} = 1.8 V
Stand-by function (Pin #1)	V _{IH} (Min.)	0.7V _{DD}	V Output (Pin #3) enabled
	V _{IL} (Max.)	0.3V _{DD}	V Output (Pin #3) disabled = High-Z
Tape and reel	3000	pcs/reel	Reel diameter : $\varnothing 180$ mm

OUTLINE DIMENSIONS

(Unit: mm)

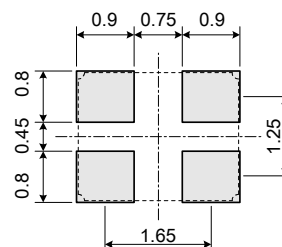


Pin	Function
#1	Stand-by
#2	Ground
#3	Output
#4	V _{DD}

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

RECOMMENDED LAND PATTERN

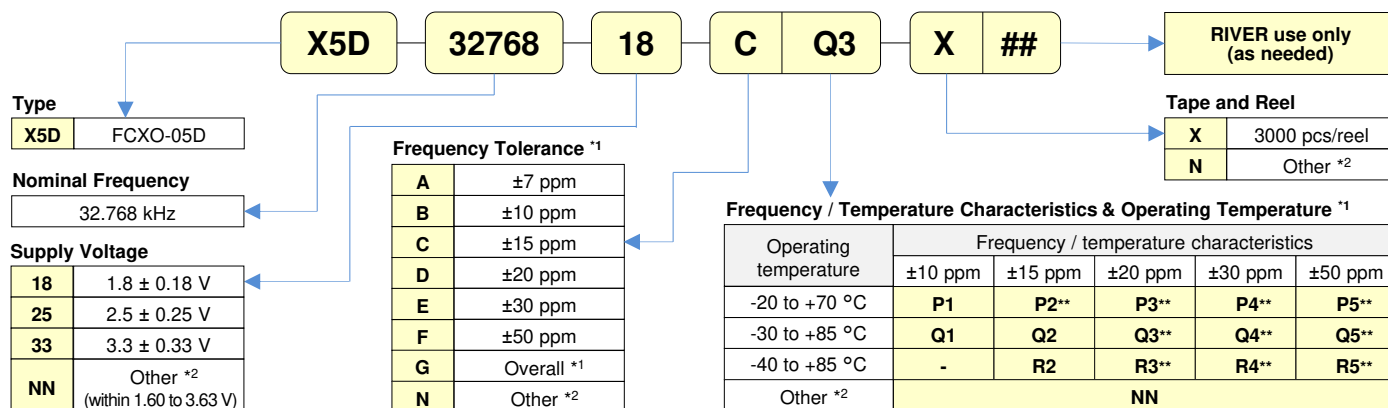
(Unit: mm)



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_{DD} (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.

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