

# SMD Crystal Clock Oscillator (SPXO)

2.5 x 2.0 mm / 1 to 80 MHz / CMOS / 1.8 to 3.3 V

# FCXO-05/FCXO-05W

Standard type

Operating temp. 105°C type

## FEATURES

- 2520 size CMOS crystal clock oscillator (1 to 80 MHz) with 2 types:
  - FCXO-05 (Standard type)
  - FCXO-05W (105°C type): wide operating temperature range of -40 to +105°C available
- Frequency tolerance of ±7 ppm (@25°C) available
- Robust ceramic package with metal lid sealed by electron beam
- Specifications in conformity with AEC-Q200 available on request (for FCXO-05W)



(2.5 × 2.0 × 0.9 mm)



## APPLICATIONS

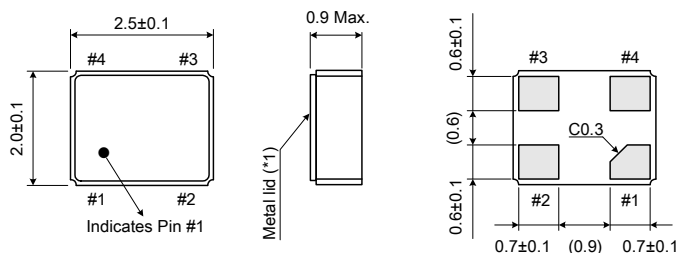
- Car audio systems / car GPS units / remote keyless entry / dash cameras
- Mobile communication / wireless modules

## STANDARD SPECIFICATIONS

Item	Specifications	Conditions (Remarks)
Nominal frequency	1 to 80 MHz	-
Frequency tolerance	±7 ppm	@25°C (See below for more options)
Storage temperature	-55 to +125°C	-
Operating temperature	-40 to +85°C	FCXO-05
	-40 to +105°C	FCXO-05W
Frequency/temperature characteristics	±10 ppm (-30 to +85°C)	Refer to 25°C (See below for more options)
	±15 ppm (-40 to +85°C)	
Supply voltage	1.8 V, 3.3 V	(See below for more options)
Current consumption	3.0 mA Max.	F = 40 MHz, V <sub>DD</sub> = 3.0 V, No load
Stand-by current	10 µA Max.	Stand-by = "L"
Output voltage	V <sub>OH</sub> : V <sub>DD</sub> 0.9 V Min.	I <sub>OH</sub> = -4 mA
	V <sub>OL</sub> : 0.1 V Max.	I <sub>OL</sub> = +4 mA
Output load	15 pF Max.	-
Output level	CMOS	-
Symmetry (Duty Cycle)	50±5%	-
Rise time / Fall time	5.0 ns Max.	0.1 · V <sub>DD</sub> to 0.9 · V <sub>DD</sub>
Start-up time	2.0 ms Max.	V <sub>DD</sub> = 3.3 V
	5.0 ms Max.	V <sub>DD</sub> = 1.8 V
Random jitter (RJ)	3.7 ps Typ.	V <sub>DD</sub> = 3.3 V, Measured on Wave Crest 3100C
Total jitter (TJ)	51 ps Typ.	V <sub>DD</sub> = 3.3 V, T <sub>J</sub> = n <sup>2</sup> RJ (n ≅ 14.1, BER = 10 <sup>-12</sup> ) Measured on Wave Crest 3100C
Phase jitter	1.0 ps Max.	V <sub>DD</sub> = 3.3 V Offset frequency = 12 kHz to 5 MHz
Stand-by function (Pin #1)	V <sub>IH</sub> : 0.7V <sub>DD</sub> Min.	Output (Pin #3) enabled
	V <sub>IL</sub> : 0.3V <sub>DD</sub> Max.	Output (Pin #3) disabled = High-Z
Tape and reel	3000 pcs/reel	Reel diameter : ∅180 mm

## OUTLINE DIMENSIONS

(Unit: mm)

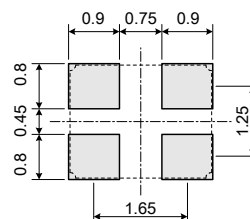


Pin	Function
#1	Stand-by
#2	Ground
#3	Output
#4	V <sub>DD</sub>

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

## RECOMMENDED LAND PATTERN

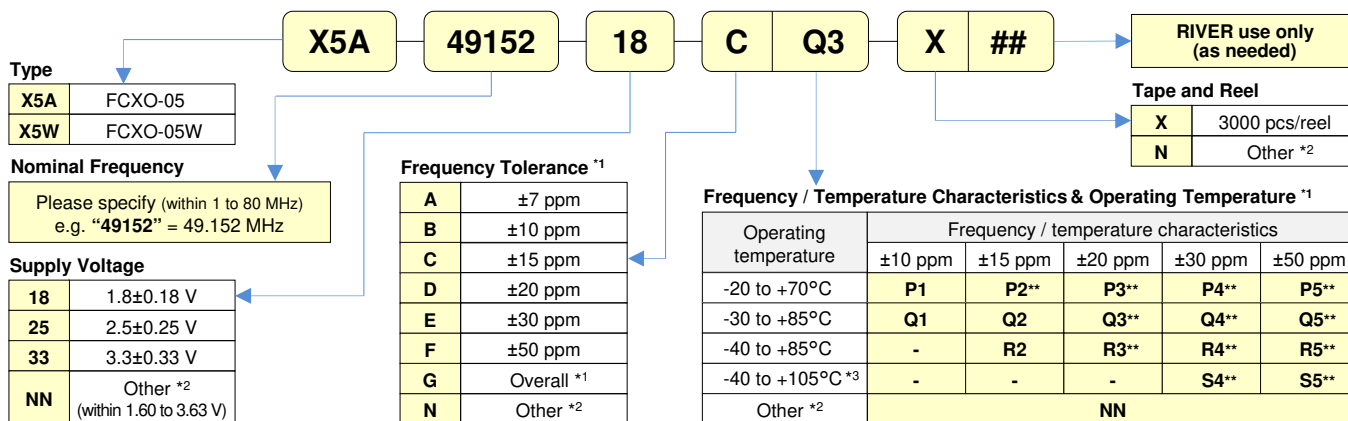
(Unit: mm)



## 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.  
\*3. This option is only available for FCXO-05W.



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