# SMD Crystal Clock Oscillator (SPXO)

Low phase noise / 2.0 mm x 1.6 mm / 22.5792 MHz to 50 MHz / CMOS / 1.8 V to 3.3 V

## FCXO-06E

#### **FEATURES**

- 2016 size CMOS oscillator (22.5792 MHz to 50 MHz) with ultra-low phase noise for audio systems :
  - → -157 dBc/Hz typical @offset 1 kHz
  - → -165 dBc/Hz typical @offset 100 kHz
- Frequency tolerance of ±7 ppm (@25 °C) available
- Wide operating temperature range of -40 °C to +105 °C available
- · Robust ceramic package with metal lid sealed by electron beam
- · Specifications in conformity with AEC-Q200 available on request









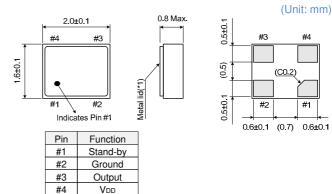
### **APPLICATIONS**

- · Hi-Fi audio / video systems, mobile communication, wireless-modules
- · Car audio systems, car GPS units, remote keyless entry, dash cameras

#### STANDARD SPECIFICATIONS

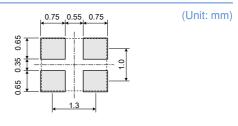
Item		Specifications	Unit	Conditions / Remarks
Nominal frequency		22.5792 to 50	MHz	-
Frequency tolerance		±7	ppm	@25 °C (See below for more options)
Storage temperature		-55 to +125	°C	-
Operating temperature		-40 to +85 , -40 to +105	°C	(See below for more options)
Frequency / temperature characteristics		$\pm$ 10 (-20 °C to +70 °C) $\pm$ 30 (-40 °C to +105 °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.)		10	mA	$V_{DD} = 3.0 \text{ V}$ , No load
Stand-by current (Max.)		35	μА	Stand-by = " L "
Output voltage	V <sub>OH</sub> (Min.)	0.9V <sub>DD</sub>	٧	-
	V <sub>OL</sub> (Max.)	0.1V <sub>DD</sub>	٧	-
Drivability		±2	mA	-
Output load (Max.)		15	pF	-
Output level		CMOS	-	-
Symmetry (Duty Cycle)		50 ± 5	%	$V_{TH} = 0.5V_{DD}$
Rise time / Fall time (Max.)		4.7	ns	0.1V <sub>DD</sub> to 0.9V <sub>DD</sub>
Start-up time (Max.)		2.0	ms	V <sub>DD</sub> = 3.3 V
		5.0	ms	V <sub>DD</sub> = 1.8 V
Random Jitter (Typ.)		3.5	ps	V <sub>DD</sub> = 3.3 V Measured on WaveCrest 3100C
Total Jitter (Typ.)		47	ps	V <sub>DD</sub> = 3.3 V , TJ = n*RJ (n ≒ 14.1 , BER = 10-12) Measured on WaveCrest 3100C
Phase Noise (Max.)		-157	dBc/Hz	Offset 1 kHz (V <sub>DD</sub> = 1.8 V)
		-165	dBc/Hz	Offset 100 kHz (V <sub>DD</sub> = 1.8 V)
Stand-by function (Pin #1)	V <sub>IH</sub> (Min.)	0.7V <sub>DD</sub>	٧	Output (Pin #3) enabled
	V <sub>IL</sub> (Max.)	0.3V <sub>DD</sub>	٧	Output (Pin #3) disabled = High-
Tape and reel		3000	pcs/reel	Reel diameter: Ø180 mm

#### **OUTLINE DIMENSIONS**



<sup>·</sup> Pin #2 is connected to the metal lid (\*1)

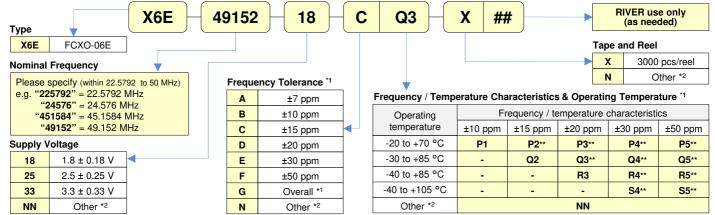
#### RECOMMENDED LAND PATTERN



#### **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 VDD (Pin #4) and Ground (Pin #2) as close as possible to the product.

#### ORDERING NUMBER GUIDE



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)) Please consult us for your requirements.



#### RIVER ELETEC CORPORATION

E-mail: river\_sales@river-ele.co.jp River Electronics (Singapore) Pte.Ltd. Taiwan River Co.,Ltd. Xi'an River Electronics Corporation (China)

TFI: +65-6258-7874 TEL: +886-2-8988-2811 TEL: +86-755-86528590

FAX: +886-2-2983-4785 FAX: +86-755-86528590 https://www.river-ele.co.jp