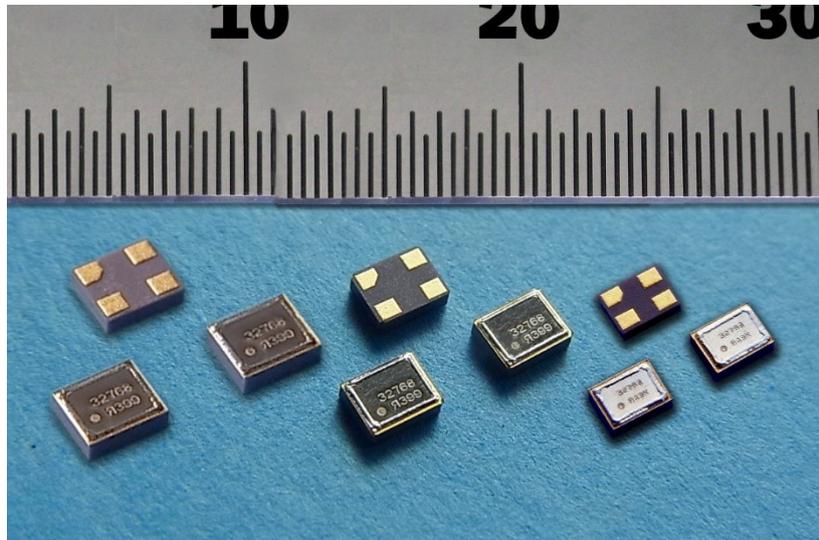


# PRESS RELEASE

Newly Developed 32.768 kHz Crystal Clock Oscillators with Ultra-Low Current Consumption and Excellent Temperature Characteristics

*Ideal for smart meters, wearable devices, IoT sensors, industrial controllers, and in-car devices.*



**Japan, Dec. 4, 2014:** RIVER ELETEC (headquartered in Nirasaki, Yamanashi, Japan) developed new crystal oscillators, "FCXO-05D" (2520 size), "FCXO-06D" (2016 size), and "FCXO-07D" (1612 size: the smallest crystal oscillator in the world). These new 32.768 kHz clock oscillators can not only operate at ultra-low current-consumption rivaling typical tuning fork crystal oscillators, but also have better frequency-temperature characteristics than those of tuning fork crystal oscillators over a wide temperature range.

Electric devices nowadays, such as next-generation smartphones, wearable devices, and smart meters require clock sources that can provide precise and stable oscillations at less current-consumption. Responding such needs, RIVER ELETEC had previously launched two clock crystal oscillators, "FCXO-05C" and "FCXO-06C" (hereinafter called "C-series"), on Dec. 2013. The "C-series" supports tight frequency-tolerance at kHz-range frequencies, including 32.768 kHz, by dividing the frequency of an AT-cut crystal blank through an oscillator circuit.

In addition to this "C-series", RIVER ELETEC has now developed new 32.768 kHz crystal clock oscillators, "FCXO-05D", "FCXO-06D", and "FCXO-07D" to meet increasing needs for less current-consumption. They reduced the current consumption of these new oscillators to equal or less than 1/5 of the "C-series", achieving ultra-low current-consumption rivaling tuning fork crystal oscillators. Furthermore, "FCXO-07D" being the world's smallest crystal oscillator, these new oscillators will contribute to the miniaturization as well as the multifunctioning of future electric devices.

With ceramic packages and metal lids sealed with RIVER ELETEC's proprietary "Electron Beam Sealing" technique, the new oscillators ensures high basic-performances and excellent reliability. In addition to that, these oscillators are all environment-friendly as they are RoHS-compliant and support reflow-profiles for lead-free solders.

The trial samples of the new products are already available, and their mass-production will start by the end of 2014.

·Product Type

SMD crystal oscillator

·Product Name (size)

FCXO-05D (2.5×2.0×0.9 mm)

FCXO-06D (2.0×1.6×0.8 mm)

FCXO-07D (1.6×1.2×0.7 mm: the smallest oscillator in the world)

·Features

1. 32.768 kHz crystal clock oscillator
2. Using an AT-cut crystal blank enabled excellent frequency-temperature characteristics over a wide temperature range
3. Ultra-low current-consumption rivaling tuning-fork crystal oscillators (0.01mA Max.: equal or less than 1/5 of the "C-series")
4. Ideal as a clock source in harsh temperature-environment, such as outdoor devices and car clocks (With their ultra-low current-consumption, they are also usable for battery-powered devices)
5. Wide range of operation voltage (+1.6 to +3.63 V)
6. CMOS(square-wave) output
7. Ceramic package and metal lid ensure high-reliability
8. Lead-free reflow soldering
9. RoHS-compliant, all lead-free

Standard Specifications	FCXO-05D	FCXO-06D	FCXO-07D
Size	2.5×2.0×0.9 mm	2.0×1.6×0.8 mm	1.6×1.2×0.7 mm
Nominal Frequency (Typ.)	32.768 kHz		
Current Consumption	0.01 mA Max.	0.03 mA Max.	0.03 mA Max.
Frequency Tolerance	Available from ±7 ppm		
Operating Temperature Range	-40 to +85°C		
Frequency vs. Temperature Characteristics (Refer to +25°C)	Available from ±15 ppm (over -40 to +85°C)		

Custom specifications, such as frequencies other than 32.768 kHz and wider temperature ranges, are available upon request.

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