

IQD targets low-cost MEMS oscillators at mass-market XO and VCXO applications

By IQD Frequency Products Ltd

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Silicon-based devices halve the price of oscillators for high-volume automotive, consumer and telecommunications systems

IQD Frequency Products has launched its first oscillator families based on MEMS (microelectromechanical systems) technology at Electronica 2009. Designed to replace standard XOs (crystal oscillators) and VCXOs (voltage controlled crystal oscillators) in mass-market applications, the new IQMS-100, IQMS-200, IQMV-300 and IQMV-400 ranges offer cost savings of up to 50%, depending on volume, at comparable levels of performance to conventional quartz-based devices.

While conventional XOs require their quartz resonators to be hermetically sealed in a metal-capped package, MEMS resonators can be encapsulated directly within a silicon substrate. MEMS oscillators therefore have a number of advantages over their quartz crystal counterparts, including:

§ smaller package size

§ reliability, due to inherent shock and vibration resistance

§ low prices at high volumes, due to the low manufacturing cost of CMOS wafers.

The IQMS-100 and -200 are SPMO (simple packaged MEMS oscillator) product ranges, designed to replace XOs in automotive applications such as airbag sensors and under-bonnet systems — which require good resistance to shock and vibration — and in portable consumer applications like camcorders — where small size is important. They provide CMOS output with optional tristate or standby function, and are Mil-Std-883F qualified for shock, vibration and solderability.

The IQMS-100 is a standard-specification range with frequency stabilities of 50 to 100ppm over operating temperature ranges of -40° to $+85^{\circ}\text{C}$ or -10° to $+70^{\circ}\text{C}$. Output frequencies from 1 to 125MHz are available. The IQMS-200 range offers tighter frequency stabilities down to 25ppm, and output frequencies up to 200MHz. Both SPMOs come as 2.5 x 2mm, 3.2 x 2.5mm, 5 x 3.2mm or 7 x 5mm SMDs, with supply options of 1.8, 2.5 and 3.3V.

The IQMV-300 and -400 are VCMO (voltage controlled MEMS oscillator) families, intended to replace VCXOs in high-volume, low-cost telecommunications applications including wireless equipment and set-top boxes. Both offer voltage controlled “frequency pulling” options of ± 60 or ± 240 ppm, are stable to 50 or 100ppm over -40° to $+85^{\circ}\text{C}$ or -10° to $+70^{\circ}\text{C}$ temperature ranges, and provide CMOS output.

Output frequency ranges are 1–125MHz for the IQMV-300 and 1–200MHz for the IQMV-400. Supply voltage options are 1.8, 2.5 or 3.3V, and package size options 2.5 x 2mm, 3.2 x 2.5mm or 5 x 3.2mm.

All IQD MEMS oscillators are factory programmable, and can be ordered to meet tight delivery schedules. They are available bulk packed or on tape and reel.

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IQD produces frequency control components, from low-cost commercial devices to those for stringent military and professional applications. Products include quartz crystals, SPXOs, programmable oscillators, VCXOs, TCXOs, OCXOs and rubidium standards.

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