SiTime SiT8021 µPower Oscillator
Frequently Asked Questions

1) What is the SiT8021 oscillator?
    a. The SiT8021 is the first device in SiTime's new µPower family of ultra-low-power, ultra-small MHz oscillators targeted at wearables, IoT and mobile products.

2) Who needs an ultra low power, ultra-small oscillator?
    a. The SiT8021 is ideal for battery-operated products where low power and small size are absolutely critical. Examples include fitness bands, health monitoring devices, smart watches, tablets, portable audio players, portable speakers, and wireless IP cameras.

3) What does the SiT8021 drive in a system?
    a. Examples include low power microcontroller, audio interface, glue logic (CPLD), SoC and USB charging.

4) Is the SiT8021 used to replace an XTAL or XO or both?
    a. The SiT8021 is primarily used to replace a quartz-based XO by offering 90% lower power consumption and 40% smaller footprint.
    b. The SiT8021 can also be used to replace an XTAL for size reduction. Wearable products use low frequency clocks which are not available in very small sizes. The SiT8021 enables very small size at low frequencies ranging from 1 to 26 MHz.

5) How does the SiT8021 achieve such low power?
    a. To generate a MHz frequency from an oscillator, one can use a kHz reference or a MHz reference. The benefit of using a kHz reference is that it consumes much lower power.
    b. The SiT8021 uses a 524 kHz MEMS resonator and utilizes a highly optimized PLL to attain excellent performance.

6) Is the resonator in the SiT8021 based on TempFlat MEMS™ technology?
    a. Yes

7) How did you achieve such small size?
    a. Small size is an inherent advantage of MEMS-based oscillators. In quartz crystal technology, physics dictates that the lower the frequency, the larger the crystal resonator. MEMS resonators do not have the same constraint; they are 1000 to 3000 times smaller than typical quartz resonators.
    b. Because SiTime's MEMS resonators are fully encapsulated in silicon and manufactured in CMOS fabs, they can be packaged using modern IC packaging technologies including WLCSP (wafer-level chip scale packaging). The SiT8021 is available in a CSP measuring 1.5 x 0.8 mm which is the industry's smallest oscillator package.

8) Can this CSP package be integrated into a SIP module?
    a. Yes! Because the SiT8021 is composed of all-silicon die packaged in plastic, it can be integrated into a SIP module. SiTime can work closely with module manufacturers to ensure that performance meets expectations.

9) Is the weight of components important?
    a. Many wearable products have a specific weight budget for better user experience. The SiT8021, at 1.28 mg, is 70% lighter than the lightest quartz-based oscillator. This gives designers of wearable devices a new way to reduce the overall product weight.

10) Is SiT8021 price competitive?
    a. Yes, as with all SiTime products, pricing is very competitive. SiTime can offer excellent pricing because we manufacture our devices in silicon and use a fabless semiconductor model, benefiting from the entire semiconductor infrastructure. Reference pricing is available in the press release.