

## BluKey Modem Operational Description

The BLE radio is a System on a Chip (SoC) CSR1010 which handles all Bluetooth 4.0 RF interface functions. It interfaces to the host through a UART interface.

All frequencies generated, synthesized and are phase locked to the 16.000 MHz crystal with 25ppm accuracy. Spurious frequencies are controlled with baseband filtering within the SoC.

Power control is variable by software control from 9 dBm max to -16 dBm. This control is not changeable except with factory tools. All tests were performed at maximum output power.

The CSR1010 has internal voltage regulation of the supply for the transmitter, and low-voltage detection forcing a reset, thus preventing improper transmission.

Spectrum: 2.400 GHz-2.4835 GHz ISM band

Channels: 40 2-MHz channels.

Modulation: Gaussian frequency shift keying

Modulation Rate: 1Mbit/s

Maximum transmit power: 10 mW (further details are given in Volume 6 Part A (Physical Layer Specification) of the Bluetooth Core Specification V4.0)

Bluetooth Smart is classified as a system using digital modulation techniques or a direct-sequence spread spectrum.

Per the BLE protocol restrictions, the maximum duty cycle of the transmitter is 30.1%, based on the limit of 6 packets of 376uS each in a 7.5mS second interval.

However, for compatibility with a majority of devices, we have further restricted this to 4 packets in a 7.5mS period. Therefore the actual maximum duty cycle is 20.1%.

