RF Exposure

The equipment under test (EUT) is a Charging Stand Wireless with Bluetooth Speaker 4inch with Bluetooth 5.0 (Dual Mode) function operating in 2402-2480MHz and WPT function operating in 110-215kHz. The EUT is powered by DC 9V/3A through adapter. For more detail information pls. refer to the user manual.

Bluetooth Version: 5.0 BLE
Modulation Type: GFSK
Antenna Type: Integral antenna.
Antenna Gain: 0.68dBi.
The nominal conducted output power specified: 0.32dBm (+/-3dB).
The nominal radiated output power (e.i.r.p) specified: 1dBm (+/- 3dB).

According to the KDB 447498:

The maximun peak radiated emission for the EUT is 98.7dBμV/m at 3m in the frequency 2402MHz
The EIRP = [(FS*D) ^2 / 30] mW = 3.47dBm
which is within the production variation.

The minimum peak radiated emission for the EUT is 96.2dBμV/m at 3m in the frequency 2480MHz
The EIRP = [(FS*D) ^2 / 30] mW = 0.97dBm
which is within the production variation.

The maximun conducted output power specified is 3.32dBm = 2.1mW
The source- based time-averaging conducted output power
= 2.1 * Duty factor mW (where Duty Factor≤1)
= 2.1 mW

The SAR Exclusion Threshold Level:
= 3.0 * (min. test separation distance, mm) / sqrt(freq. in GHz)
= 3.0 * 5 / sqrt (2.480) mW
= 9.53 mW

Since the source-based time-averaging conducted output power is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.

Bluetooth Version: 5.0 BR/EDR
Modulation Type: GFSK, π/4-DQPSK and 8-DPSK
Antenna Type: Integral antenna.
Antenna Gain: 0.68dBi.
The nominal conducted output power specified: 4.32dBm (+/-3dB).
The nominal radiated output power (e.i.r.p) specified: 5dBm (+/- 3dB).

According to the KDB 447498:

The maximun peak radiated emission for the EUT is 102.9dBµV/m at 3m in the frequency 2441MHz
The EIRP = [(FS*D) ^2 / 30] mW = 7.67dBm
which is within the production variation.

The minimum peak radiated emission for the EUT is 99.7dBµV/m at 3m in the frequency 2480MHz
The EIRP = [(FS*D) ^2 / 30] mW = 4.47dBm
which is within the production variation.

The maximun conducted output power specified is 7.32dBm = 5.4mW
The source- based time-averaging conducted output power
= 5.4 * Duty factor mW (where Duty Factor$\leqslant$1)
= 5.4 mW

The SAR Exclusion Threshold Level:
= 3.0 * (min. test separation distance, mm) / sqrt(freq. in GHz)
= 3.0 * 5 / sqrt (2.480) mW
= 9.53 mW

Since the source-based time-averaging conducted output power is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.

For the simultaneous RF exposure:

When an antenna qualifies for the standalone SAR test exclusion of 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[$\sqrt{f(GHz)}/x$] W/kg, for test separation distances ≤ 50 mm; where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.

The maximun conducted output power specified of Bluetooth
=4.32dBm + 3dBi = 7.32dBm = 5.4mW

The estimated 1-g SAR value of the Bluetooth transmitter function
=[5.4mW/5mm]* [2.48^0.5/7.5] W/kg
=0.2268W/kg

If the sum of ratios for all simultaneously transmitting antennas incorporated in a host device is less than 1, this device fulfils the simultaneous RF exposure of FCC requirement.

For E-field case:
(SAR value of Bluetooth/SAR limit) + (Maximum E-field value of WPT/E field limit)^2 = (0.2268/1.6) + (5.5/614) ^2 $\approx$ 0.1418< 1

For H-field case:
(SAR value of Bluetooth/SAR limit) + (Maximum H-field value of WPT/H field limit)^2 = (0.2268/1.6) + (0.412/1.63) ^2 $\approx$ 0.2056 < 1

Note: A separation distance of 20 cm between the user and the Antenna should be maintained.