Analysis Report

The Equipment Under Test (EUT) is a 2.4GHz Bluetooth 2.1 + EDR transceiver. The EUT is powered by a 3.7V rechargeable battery which can be charged with a USB cable. The Bluetooth module in the EUT is operating in the frequency range from 2402MHz to 2480MHz (79 channels with 1MHz channel spacing). Plug the EUT's build-in cable into a audio device's 3.5mm headphone jack and pair with a Bluetooth device (ie Bluetooth speaker), the audio signal can be fed to the speaker through the EUT.

Antenna Type: Internal antenna
Antenna Gain: 0dBi
Field strength of production range: 100 to 103.8 dBµV/m at 3m

For Stand Alone SAR information;

According to the KDB 447498:

Based on the Maximum allowed field strength of production tolerance was 103.8dBµV/m at 3m in frequency 2.4GHz, thus;

The EIRP = [(FS*D) ^2*1000 / 30] = 7.196mW

Conducted power = Radiated Power (EIRP) – Antenna Gain
So;

Conducted Power =7.196mW.

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 above conducted output power is well below the SAR Exclusion threshold level, so the EUT is considered to comply with SAR requirement without testing.

INTERTEK TESTING SERVICES

Simultaneous Tranmission SAR exclusion considerations

Since the tested model DA-8350BK / 1201669 may operate simultaneously with host device (e.g. mobile, Latop e.t.c.) simultaneous transmission analysis is required. Per KDB 447498, SAR test exclusion can be determined by the SAR to peak location separation ratio.

The simultaneous transmitting antennas in each operating mode and exposure condition combination must be considered one pair at a time to determine the SAR to peak location separation ratio to qualify for test exclusion. Simultaneous SAR test exclusion can be applied when the SAR to peak location separation ratio ≤ 0.04 for all antenna pairs.

The SAR to peak location separation ratio is determined by the following equation for 1-g SAR test exclusion,

$$[(SAR1 + SAR2)^{\wedge}1.5] / Ri$$

where

SAR1 and SAR2 are the highest reported or estimated SAR for each antenna in the pair
Ri is the separation distance between the peak SAR locations for the antenna pair, in mm

For standalone Blutooth operation,

Maximum Conducted Power of this device = **7.196 mW**

Therefore, the Estimated 1-g SAR will be determined as follow,

$$\text{Estimated 1-g SAR} = (\sqrt{F(GHz)}/7.5)x(P\max/TD)$$
$$= \textbf{0.3 W/kg}$$

where *Pmax* = 7.196 mW, *TD* = 5 mm and *F(GHz)* = 2.480 GHz

For connecting host device configuration,

Estimated standalone SAR for bluetooth = **0.3 W/kg**

Worst case SAR for the host devise = 1-g general SAR limit = **1.6 W/kg**

Separation distance between the bluetooth antenna to host enclosure = **110 mm**

Therefore, the SAR to peak location separation ratio will be determined as follow,

$$\text{SAR to peak location separation ratio} = [(SAR1 + SAR2)^{\wedge}1.5]/Ri$$
$$= \textbf{0.0238}$$

where *SAR1* = 0.3 W/kg, *SAR2* = 1.6 W/kg and *Ri* = 110 mm

Conclusion
Since the above SAR to peak location separation ratio ≤ 0.04, SAR evaluation for simultaneous transmission for host device connecting configuration is not required.