# Exhibit: RF Exposure – FCC Colocated Transmitters

FCC ID: 2ADCB-RMODIT3

Report File #: 7169009761R-000

## *RF Exposure – FCC*

The device is a mobile device containing a 902 – 928 MHz proprietary transmitter and a 2400 – 2483.5 MHz BLE transmitter. It is intended to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure and the body of the user or nearby persons.

### Radiofrequency Radiation Exposure Evaluation: Mobile Devices

Mobile devices shall be evaluated for RF radiation exposure according to the provisions of FCC §2.1091 and the MPE guidelines identified in FCC §1.1310.

As per FCC §1.1310 Table 1(B), the limit for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields for General Population/Uncontrolled Exposure in the frequency range of 300 MHz to 1.5 GHz is f/1500 $mW/cm^2$ and in the frequency range of 1.5GHz to 100GHz is 1.0 $mW/cm^2$. Where f = frequency in MHz.

The power density formula is given by:

$$P_d = (P_{out}*G) / (4*pi*R^2)$$

Where,
$P_d$ = Power density in $mW/cm^2$
$P_{out}$ = Conducted output power to antenna in mW
G = Numeric Antenna Gain
Pi = 3.1416
R = Separation distance in cm

## MPE Calculation: 904 – 926 MHz transmitter

Output power was not part of this test program. The output power was from the original test report (RD72161058.202 915MHz 15.247 Test Report).

The DTS transmitter has a maximum conducted output power of 19.38 dBm or 86.70 mW and the antenna gain is 0 dBi or 1 numerically.

For a distance of 20cm, the power density is:

$$P_d = (86.70\ mW * 1) / (4 * 3.1416 * (20cm)^2)$$
$$\mathbf{P_d = 0.0172\ mW/cm^2}$$

The device passes the requirement. The calculated power density of $0.0172 mW/cm^2$ is below the (904/1500) = 0.6 $mW/cm^2$ limit.

## MPE Calculation: 2402 – 2480 MHz transmitter

The new antenna is a dual band antenna with gain of 2.4 dBi for the 2.4 GHz band. The output power in the original report 9.98 dBm.

For a separation distance of 20 cm, the power density is:

$$P_d = (9.95\ mW * 1.7) / (4 * 3.1416 * (20cm)^2)$$
$$\mathbf{P_d = 0.003\ mW/cm^2}$$

The device passes the requirement. The calculated power density of 0.003mW/cm$^2$ is below the 1 mW/cm$^2$ limit.

## Calculations for Simultaneous Transmission

As per FCC KDB447498 7.2:

> *Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0.*

MPE ratio = Ratio of power density to MPE limit, at the test frequency = $P_d$ / (MPE limit)

Max MPE ratio for 915MHz = 0.0172 mW/cm$^2$ / 0.60 mW/cm$^2$ = **0.0287**
Max MPE ratio for 2.4GHz = 0.004 mW/cm$^2$ / 1.0 mW/cm$^2$ (worst case) = **0.003**
0.004 + 0.0287 = **0.0321 < 1.0**

The EUT passed the requirements. Sum of power density ratio is < 1.0.