

## 1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

### 1.1. Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

| Frequency Range<br>(MHz)                            | Electric Field<br>Strength (V/m) | Magnetic Field<br>Strength (A/m) | Power Density<br>(mW/cm <sup>2</sup> ) | Averaging Time<br>(minute) |
|---|----------------------------------|----------------------------------|--|----------------------------|
| Limits for General Population/Uncontrolled Exposure |                                  |                                  |  |                            |
| 0.3-1.34  | 614                              | 1.63                             | *(100)                                 | 30                         |
| 1.34-30   | 824/f                            | 2.19/f                           | *(180/f <sup>2</sup> )                 | 30                         |
| 30-300  | 27.5                             | 0.073                            | 0.2                                    | 30                         |
| 300-1500  | /                                | /                                | F/1500                                 | 30                         |
| 1500-15000  | /                                | /                                | 1.0                                    | 30                         |

F = frequency in MHz

\* = Plane-wave equipment power density

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## 1.2. Maximum Permissible Exposure (MPE) Evaluation (Worst Case)

1M BR mode (Average):

| CH | Freq. (MHz) | Avg. Output Power (dBm) | Output Power (mW) | Limit (mW) |
|----|-------------|-------------------------|-------------------|------------|
| 0  | 2402        | 5.95                    | 3.936             | 125        |
| 39 | 2441        | 6.28                    | 4.246             | 125        |
| 78 | 2480        | 4.84                    | 3.048             | 125        |

### MPE Prediction (BT-BR)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4\pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

|   |           |                       |
|---|-----------|-----------------------|
| Max. output power including tune-up tolerancel:   | 6.28      | (dBm)                 |
| Max. output power including tune-up tolerancel:   | 4.2461956 | (mW)                  |
| Duty cycle:                                       | 77        | (%)                   |
| Maximum Pav :                                     | 3.2695706 | (mW)                  |
| Peak Antenna gain (Maximum):                      | 0.8       | (dBi)                 |
| Peak Antenna gain (linear):                       | 1.2022644 | (numeric)             |
| Prediction distance:                              | 20        | (cm)                  |
| Prediction frequency:                             | 2441      | (MHz)                 |
| MPE limit for uncontrolled exposure at prediction | 1         | (mW/cm <sup>2</sup> ) |
| Power density at predication frequency at 20 (cm) | 0.001     | (mW/cm <sup>2</sup> ) |

### Measurement Result

The predicted power density level at 20 cm is 0.001 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 2441MHz.

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**BLE mode:**

| CH | Frequency (MHz) | Peak Power Output (dBm) | Required Limit  |
|----|-----------------|-------------------------|-----------------|
| 0  | 2402            | 3.91                    | 1 Watt = 30 dBm |
| 19 | 2440            | <b>4.82</b>             | 1 Watt = 30 dBm |
| 39 | 2480            | 3.38                    | 1 Watt = 30 dBm |

**BLE mode:**

| CH | Frequency (MHz) | Avg. Output Power (dBm) | Required Limit  |
|----|-----------------|-------------------------|-----------------|
| 0  | 2402            | 3.00                    | 1 Watt = 30 dBm |
| 19 | 2440            | 3.96                    | 1 Watt = 30 dBm |
| 39 | 2480            | 2.38                    | 1 Watt = 30 dBm |

*\*Note: Measured by power meter, cable loss as 10.7 dB that offsets on the power meter*

*\*Note: Measured by power meter, as Duty cycle factor that offsets on the power meter in Peak.*

**MPE Prediction (BLE)**

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4\pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

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|   |           |           |
|---|-----------|-----------|
| Max. output power including tune-up tolerancel:                       | 3.96      | (dBm)     |
| Max. output power including tune-up tolerancel:                       | 2.4888573 | (mW)      |
| Duty cycle:   | 85.46     | (%)       |
| Maximum Pav :   | 2.1269775 | (mW)      |
| Peak Antenna gain (Maximum):  | 0.8       | (dBi)     |
| Peak Antenna gain (linear):   | 1.2022644 | (numeric) |
| Prediction distance:  | 20        | (cm)      |
| Prediction frequency:   | 2440      | (MHz)     |
| MPE limit for uncontrolled exposure at prediction                     | 1         | (mW/cm2)  |
| Power density at predication frequency at 20 (cm)                     | 0.001     | (mW/cm2)  |
| <b>Measurement Result</b>   |           |           |
| The predicted power density level at 20 cm is 0.001 mW/cm2.           |           |           |
| This is below the uncontrolled exposure limit of 1 mW/cm2 at 2440MHz. |           |           |

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| 802.11b Main |                 |           |                         |                        |                    |        |
|--------------|-----------------|-----------|-------------------------|------------------------|--------------------|--------|
| CH           | Frequency (MHz) | Data Rate | Peak Output Power (dBm) | Peak Output Power (mW) | Limit              | RESULT |
| 1            | 2412            | 1         | 19.00                   | 79.43                  | 1 Watt = 30.00 dBm | PASS   |
| 6            | 2437            | 1         | 19.61                   | 91.41                  | 1 Watt = 30.00 dBm | PASS   |
| 11           | 2462            | 1         | <b>19.80</b>            | <b>95.50</b>           | 1 Watt = 30.00 dBm | PASS   |
| 802.11b Main |                 |           |                         |                        |                    |        |
| CH           | Frequency (MHz) | Data Rate | Avg. Output Power (dBm) | Avg. Output Power (mW) | Limit              | RESULT |
| 1            | 2412            | 1         | 16.11                   | 40.83                  | 1 Watt = 30.00 dBm | PASS   |
| 6            | 2437            | 1         | 16.72                   | 46.99                  | 1 Watt = 30.00 dBm | PASS   |
| 11           | 2462            | 1         | <b>16.87</b>            | <b>48.64</b>           | 1 Watt = 30.00 dBm | PASS   |

### MPE Prediction (WLAN-802.11 b)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4\pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

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|   |           |           |
|---|-----------|-----------|
| Max. output power including tune-up tolerancel:   | 16.87     | (dBm)     |
| Max. output power including tune-up tolerancel:   | 48.640721 | (mW)      |
| Duty cycle:                                       | 99.54     | (%)       |
| Maximum Pav :                                     | 48.416973 | (mW)      |
| Peak Antenna gain (Maximum):                      | 0.8       | (dBi)     |
| Peak Antenna gain (linear):                       | 1.2022644 | (numeric) |
| Prediction distance:                              | 20        | (cm)      |
| Prediction frequency:                             | 2462      | (MHz)     |
| MPE limit for uncontrolled exposure at prediction | 1         | (mW/cm2)  |
| Power density at predication frequency at 20 (cm) | 0.012     | (mW/cm2)  |

### Measurement Result

The predicted power density level at 20 cm is 0.012 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 2462MHz.

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## 802.11a\_Main

| CH  | Frequency (MHz) | Data Rate | TOTAL POWER (dBm) | TOTAL POWER (mW) | REQUIRED LIMIT (dBm)            | RESULT |
|-----|-----------------|-----------|-------------------|------------------|---------------------------------|--------|
| 36  | 5180            | MCS0      | 13.64             | 23.121           | 23.98                           | PASS   |
| 44  | 5220            | MCS0      | 15.30             | 33.884           | 23.98                           | PASS   |
| 48  | 5240            | MCS0      | <b>15.33</b>      | <b>34.119</b>    | 23.98                           | PASS   |
| 52  | 5260            | MCS0      | 15.05             | 31.989           | 23.98 or $11+10\log(B) = 23.24$ | PASS   |
| 60  | 5300            | MCS0      | <b>15.12</b>      | <b>32.509</b>    | 23.98 or $11+10\log(B) = 23.22$ | PASS   |
| 64  | 5320            | MCS0      | 15.06             | 32.063           | 23.98 or $11+10\log(B) = 23.23$ | PASS   |
| 100 | 5500            | MCS0      | 14.84             | 30.479           | 23.98 or $11+10\log(B) = 23.22$ | PASS   |
| 116 | 5580            | MCS0      | <b>16.04</b>      | <b>40.179</b>    | 23.98 or $11+10\log(B) = 23.23$ | PASS   |
| 140 | 5700            | MCS0      | 15.21             | 33.189           | 23.98 or $11+10\log(B) = 23.23$ | PASS   |
| 149 | 5745            | MCS0      | <b>13.23</b>      | <b>21.038</b>    | 30                              | PASS   |
| 157 | 5785            | MCS0      | 12.97             | 19.815           | 30                              | PASS   |
| 165 | 5825            | MCS0      | 12.99             | 19.907           | 30                              | PASS   |

## MPE Prediction (WLAN-802.11 a)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

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### 5150~5250MHz

|   |           |           |
|---|-----------|-----------|
| Max. output power including tune-up tolerancel:                       | 15.33     | (dBm)     |
| Max. output power including tune-up tolerancel:                       | 34.119291 | (mW)      |
| Duty cycle:   | 99.36     | (%)       |
| Maximum Pav :   | 33.900928 | (mW)      |
| Peak Antenna gain (Maximum):  | -0.2      | (dBi)     |
| Peak Antenna gain (linear):   | 0.9549926 | (numeric) |
| Prediction distance:  | 20        | (cm)      |
| Prediction frequency:   | 5240      | (MHz)     |
| MPE limit for uncontrolled exposure at prediction                     | 1         | (mW/cm2)  |
| Power density at predication frequency at 20 (cm)                     | 0.006     | (mW/cm2)  |
| <b>Measurement Result</b>   |           |           |
| The predicted power density level at 20 cm is 0.006 mW/cm2.           |           |           |
| This is below the uncontrolled exposure limit of 1 mW/cm2 at 5240MHz. |           |           |

### 5250~5350MHz

|   |           |           |
|---|-----------|-----------|
| Max. output power including tune-up tolerancel:                       | 15.12     | (dBm)     |
| Max. output power including tune-up tolerancel:                       | 32.50873  | (mW)      |
| Duty cycle:   | 99.36     | (%)       |
| Maximum Pav :   | 32.300674 | (mW)      |
| Peak Antenna gain (Maximum):  | 2         | (dBi)     |
| Peak Antenna gain (linear):   | 1.5848932 | (numeric) |
| Prediction distance:  | 20        | (cm)      |
| Prediction frequency:   | 5300      | (MHz)     |
| MPE limit for uncontrolled exposure at prediction                     | 1         | (mW/cm2)  |
| Power density at predication frequency at 20 (cm)                     | 0.010     | (mW/cm2)  |
| <b>Measurement Result</b>   |           |           |
| The predicted power density level at 20 cm is 0.01 mW/cm2.            |           |           |
| This is below the uncontrolled exposure limit of 1 mW/cm2 at 5300MHz. |           |           |

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## 5470~5725MHz

|   |           |           |
|---|-----------|-----------|
| Max. output power including tune-up tolerancel:   | 16.04     | (dBm)     |
| Max. output power including tune-up tolerancel:   | 40.179081 | (mW)      |
| Duty cycle:                                       | 99.36     | (%)       |
| Maximum Pav :                                     | 39.921935 | (mW)      |
| Peak Antenna gain (Maximum):                      | -0.6      | (dBi)     |
| Peak Antenna gain (linear):                       | 0.8709636 | (numeric) |
| Prediction distance:                              | 20        | (cm)      |
| Prediction frequency:                             | 5580      | (MHz)     |
| MPE limit for uncontrolled exposure at prediction | 1         | (mW/cm2)  |
| Power density at predication frequency at 20 (cm) | 0.007     | (mW/cm2)  |

### Measurement Result

The predicted power density level at 20 cm is 0.007 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 5580MHz.

## 5725~5850MHz

|   |           |           |
|---|-----------|-----------|
| Max. output power including tune-up tolerancel:   | 13.23     | (dBm)     |
| Max. output power including tune-up tolerancel:   | 21.037784 | (mW)      |
| Duty cycle:                                       | 99.36     | (%)       |
| Maximum Pav :                                     | 20.903143 | (mW)      |
| Peak Antenna gain (Maximum):                      | 0.3       | (dBi)     |
| Peak Antenna gain (linear):                       | 1.0715193 | (numeric) |
| Prediction distance:                              | 20        | (cm)      |
| Prediction frequency:                             | 5745      | (MHz)     |
| MPE limit for uncontrolled exposure at prediction | 1         | (mW/cm2)  |
| Power density at predication frequency at 20 (cm) | 0.004     | (mW/cm2)  |

### Measurement Result

The predicted power density level at 20 cm is 0.004 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 5745MHz.

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### 1.3. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with § 2.1091 Radiofrequency radiation exposure evaluation: mobile devices of the FCC CFR 47 Rules, CFR 1.1310 (b) Radio frequency Radiation Exposure Requirement.

### 1.4. Special Accessories

Not available for this EUT intended for grant

### 1.5. Equipment Modifications

Not available for this EUT intended for grant.

### 1.6. Limitation

| Frequency Range (MHz)                               | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Averaging Time (minute) |
|---|-------------------------------|-------------------------------|-------------------------------------|-------------------------|
| Limits for General Population/Uncontrolled Exposure |                               |                               |                                     |                         |
| 0.3-1.34  | 614                           | 1.63                          | *(100)                              | 30                      |
| 1.34-30   | 824/f                         | 2.19/f                        | *(180/f <sup>2</sup> )              | 30                      |
| 30-300  | 27.5                          | 0.073                         | 0.2                                 | 30                      |
| 300-1500  | /                             | /                             | F/1500                              | 30                      |
| 1500-15000  | /                             | /                             | 1.0                                 | 30                      |

F = frequency in MHz

\* = Plane-wave equipment power density

### 1.7. Exposure (MPE) Evaluation

The evaluation and calculation as deduces below presents only worst-case that produces highest value of the result:

Operation Configuration of the Worst-Case picked up to evaluate:

**GPRS 850 / GSM 1900, HSDPA II / HSDPA IV / WCDMA V**

**LTE 2 (BW: 10M / QPSK / RB: 1,0), LTE 4 (BW: 3M / QPSK / RB: 1,14)**

**LTE 5 (BW: 3M / QPSK / RB: 1,14), LTE 7 (BW: 15M / QPSK / RB: 1,74)**

**LTE 12 (BW: 3M / QPSK / RB: 1,14), LTE 17 (BW: 10M / QPSK / RB: 1,49)**

**LTE 26 (BW: 3M / QPSK / RB: 1,0), LTE 41 (BW: 20M / QPSK / RB: 1,0)**

**LTE 26 for Part 90S (BW: 3M / QPSK / RB: 1,14)**

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# Operation in GPRS850 band (824.2 – 848.8 MHz)

| EUT            |                       |     | Measurement  |             |              |            |              |       |
|----------------|-----------------------|-----|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH  | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | ERP          | Limit |
|                | MHz                   |     | V/H          | dBm         | dBd          | dB         | dBm          | dBm   |
| GPRS 850       | 824.2                 | 128 | V            | 20.98       | 3.31         | -2.92      | 21.36        | 38.45 |
|                |                       |     | H            | 24.43       | 3.31         | -2.92      | 24.81        | 38.45 |
|                | 836.6                 | 190 | V            | 21.18       | 3.29         | -2.96      | 21.5         | 38.45 |
|                |                       |     | H            | 24.32       | 3.29         | -2.96      | 24.65        | 38.45 |
|                | 848.8                 | 251 | V            | 21.72       | 3.27         | -3         | 21.99        | 38.45 |
|                |                       |     | H            | 24.59       | 3.27         | -3         | <b>24.86</b> | 38.45 |

$$\text{Power Density} = \text{ERP} \times \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 0.5 for GPRS 850 band operation and R is 20cm.

|   |            |          |
|---|------------|----------|
| ERP   | 24.86      | (dBm)    |
| ERP   | 306.196    | (mW)     |
| Duty cycle:                                       | 50         | (%)      |
| Maximum Pav :                                     | 153.098172 | (mW)     |
| Prediction distance:                              | 20         | (cm)     |
| Prediction frequency:                             | 848.8      | (MHz)    |
| MPE limit for uncontrolled exposure at prediction | 0.5659     | (mW/cm2) |
| Power density at predication frequency at 20 (cm) | 0.03047    | (mW/cm2) |

## Measurement Result

The predicted power density level at 20 cm is 0.03047 mW/cm2.

This is below the uncontrolled exposure limit of 0.5659 mW/cm2 at 848.8MHz.

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# Operation in GSM1900 band (1850.2 – 1909.8 MHz)

| EUT            |                       |     | Measurement  |             |              |            |              |       |
|----------------|-----------------------|-----|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH  | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|                | MHz                   |     | V/H          | dBm         | dB           | dB         | dBm          | dBm   |
| GSM 1900       | 1850.2                | 512 | V            | 11.06       | 9.94         | -4.46      | 16.54        | 33.01 |
|                |                       |     | H            | 18.74       | 9.94         | -4.46      | 24.22        | 33.01 |
|                | 1880.0                | 661 | V            | 13.51       | 10.03        | -4.51      | 19.03        | 33.01 |
|                |                       |     | H            | 18.66       | 10.03        | -4.51      | 24.19        | 33.01 |
|                | 1909.8                | 810 | V            | 14.13       | 10.13        | -4.55      | 19.71        | 33.01 |
|                |                       |     | H            | 21.64       | 10.13        | -4.55      | <b>27.22</b> | 33.01 |

$$\text{Power Density} = \text{EIRP} \times \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 0.125 for GSM 1900 band operation and R is 20cm.

|   |            |          |
|---|------------|----------|
| EIRP  | 27.22      | (dBm)    |
| EIRP  | 527.230    | (mW)     |
| Duty cycle:                                       | 12.5       | (%)      |
| Maximum Pav :                                     | 65.9037327 | (mW)     |
| Prediction distance:                              | 20         | (cm)     |
| Prediction frequency:                             | 1909.8     | (MHz)    |
| MPE limit for uncontrolled exposure at prediction | 1.0000     | (mW/cm2) |
| Power density at predication frequency at 20 (cm) | 0.01312    | (mW/cm2) |

## Measurement Result

The predicted power density level at 20 cm is 0.01312 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 1909.8MHz.

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# Operation in HSDPA II band (1852.4 – 1907.6 MHz)

| EUT            |                       |      | Measurement  |             |              |            |              |       |
|----------------|-----------------------|------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH   | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|                | MHz                   |      | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| HSDPA Band II  | 1852.4                | 9262 | V            | 10.4        | 9.95         | -4.46      | 15.88        | 33.00 |
|                |                       |      | H            | 16.41       | 9.95         | -4.46      | 21.9         | 33.00 |
|                | 1880.0                | 9400 | V            | 11.02       | 10.03        | -4.51      | 16.55        | 33.00 |
|                |                       |      | H            | 19.42       | 10.03        | -4.51      | 24.95        | 33.00 |
|                | 1907.6                | 9538 | V            | 12.51       | 10.12        | -4.55      | 18.08        | 33.00 |
|                |                       |      | H            | 21.94       | 10.12        | -4.55      | <b>27.51</b> | 33.00 |

$$\text{Power Density} = \text{EIRP} \times \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for HSDPA II band operation and R is 20cm.

|   |               |          |
|---|---------------|----------|
| EIRP  | <b>27.51</b>  | (dBm)    |
| EIRP  | 563.638       | (mW)     |
| Duty cycle:                                       | <b>100</b>    | (%)      |
| Maximum Pav :                                     | 563.637656    | (mW)     |
| Prediction distance:                              | 20            | (cm)     |
| Prediction frequency:                             | <b>1907.6</b> | (MHz)    |
| MPE limit for uncontrolled exposure at prediction | 1.0000        | (mW/cm2) |
| Power density at predication frequency at 20 (cm) | 0.11219       | (mW/cm2) |

## Measurement Result

The predicted power density level at 20 cm is 0.11219 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 1907.6MHz.

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### Operation in HSDPA IV band (1712.4 – 1752.6 MHz)

| EUT            |                       |      | Measurement  |             |              |            |              |       |
|----------------|-----------------------|------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH   | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|                | MHz                   |      | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| HSDPA Band IV  | 1712.4                | 1312 | V            | 11.49       | 9.48         | -4.31      | 16.66        | 30.00 |
|                |                       |      | H            | 15.29       | 9.48         | -4.31      | 20.46        | 30.00 |
|                | 1732.6                | 1413 | V            | 12.1        | 9.55         | -4.31      | 17.34        | 30.00 |
|                |                       |      | H            | 14.36       | 9.55         | -4.31      | 19.6         | 30.00 |
|                | 1752.6                | 1513 | V            | 10.97       | 9.62         | -4.33      | 16.25        | 30.00 |
|                |                       |      | H            | 16.76       | 9.62         | -4.34      | <b>22.04</b> | 30.00 |

$$\text{Power Density} = \text{EIRP} \times \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for HSDPA IV band operation and R is 20cm.

|   |               |          |
|---|---------------|----------|
| EIRP  | <b>22.04</b>  | (dBm)    |
| EIRP  | 159.956       | (mW)     |
| Duty cycle:                                       | <b>100</b>    | (%)      |
| Maximum Pav :                                     | 159.955803    | (mW)     |
| Prediction distance:                              | 20            | (cm)     |
| Prediction frequency:                             | <b>1752.6</b> | (MHz)    |
| MPE limit for uncontrolled exposure at prediction | 1.0000        | (mW/cm2) |
| Power density at predication frequency at 20 (cm) | 0.03184       | (mW/cm2) |

### Measurement Result

The predicted power density level at 20 cm is 0.03184 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 1752.6MHz.

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### Operation in WCDMA V band (826.4 – 846.6 MHz)

| EUT            |                       |      | Measurement  |             |              |            |              |       |
|----------------|-----------------------|------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band | Fundamental Frequency | CH   | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | ERP          | Limit |
|                | MHz                   |      | V/H          | dBm         | dBd          | dB         | dBm          | dBm   |
| WCDMA Band V   | 826.4                 | 4132 | V            | 17.29       | 3.3          | -2.93      | 17.66        | 38.45 |
|                |                       |      | H            | 20.18       | 3.3          | -2.93      | 20.55        | 38.45 |
|                | 836.6                 | 4183 | V            | 16.42       | 3.29         | -2.96      | 16.75        | 38.45 |
|                |                       |      | H            | 19.96       | 3.29         | -2.96      | 20.28        | 38.45 |
|                | 846.6                 | 4233 | V            | 16.35       | 3.27         | -2.99      | 16.63        | 38.45 |
|                |                       |      | H            | 21.27       | 3.27         | -3         | <b>21.55</b> | 38.45 |

$$\text{Power Density} = \text{ERP} \cdot \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for WCDMA V band operation and R is 20cm.

|   |            |                       |
|---|------------|-----------------------|
| ERP   | 21.55      | (dBm)                 |
| ERP   | 142.889    | (mW)                  |
| Duty cycle:                                       | 1          | (%)                   |
| Maximum Pav :                                     | 1.42889396 | (mW)                  |
| Prediction distance:                              | 20         | (cm)                  |
| Prediction frequency:                             | 846.6      | (MHz)                 |
| MPE limit for uncontrolled exposure at prediction | 0.5644     | (mW/cm <sup>2</sup> ) |
| Power density at predication frequency at 20 (cm) | 0.00028    | (mW/cm <sup>2</sup> ) |

### Measurement Result

The predicted power density level at 20 cm is 0.00028 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 0.5644 mW/cm<sup>2</sup> at 846.6MHz.

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# Operation in LTE 2 band (1855.0 – 1905.0 MHz)

| EUT  |                       |       | Measurement  |             |              |            |              |       |
|--|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band   | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|  | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| <b>BAND 2</b><br><b>BW: 10M</b><br><b>QPSK</b><br><b>RB: 1,0</b> | 1855.0                | 18650 | V            | 10.05       | 9.95         | -4.46      | 15.54        | 33.01 |
|  |                       |       | H            | 17.56       | 9.95         | -4.46      | 23.04        | 33.01 |
|  | 1880.0                | 18900 | V            | 11          | 10.02        | -4.5       | 16.52        | 33.01 |
|  |                       |       | H            | 19.3        | 10.02        | -4.5       | 24.82        | 33.01 |
|  | 1905.0                | 19150 | V            | 11.07       | 10.09        | -4.54      | 16.63        | 33.01 |
|  |                       |       | H            | 20.01       | 10.09        | -4.54      | <b>25.57</b> | 33.01 |

$$\text{Power Density} = \text{EIRP} \times \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for LTE 2 band operation and R is 20cm.

|   |              |          |
|---|--------------|----------|
| EIRP  | <b>25.57</b> | (dBm)    |
| EIRP  | 360.579      | (mW)     |
| Duty cycle:                                       | <b>100</b>   | (%)      |
| Maximum Pav :                                     | 360.578643   | (mW)     |
| Prediction distance:                              | 20           | (cm)     |
| Prediction frequency:                             | <b>1905</b>  | (MHz)    |
| MPE limit for uncontrolled exposure at prediction | 1.0000       | (mW/cm2) |
| Power density at predication frequency at 20 (cm) | 0.07177      | (mW/cm2) |

## Measurement Result

The predicted power density level at 20 cm is 0.07177 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 1905MHz.

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### Operation in LTE 4 band (1711.5 – 1753.5 MHz)

| EUT  |                       |       | Measurement  |             |              |            |              |       |
|--|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band   | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|  | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| <b>BAND 4</b><br><b>BW: 3M QPSK</b><br><b>RB: 1,14</b> | 1711.5                | 19965 | V            | 9.42        | 9.48         | -4.31      | 14.59        | 30.00 |
|  |                       |       | H            | 13.94       | 9.48         | -4.31      | <b>19.11</b> | 30.00 |
|  | 1732.5                | 20175 | V            | 8.47        | 9.55         | -4.31      | 13.71        | 30.00 |
|  |                       |       | H            | 12.45       | 9.55         | -4.31      | 17.69        | 30.00 |
|  | 1753.5                | 20385 | V            | 7.48        | 9.62         | -4.34      | 12.76        | 30.00 |
|  |                       |       | H            | 12.74       | 9.62         | -4.34      | 18.02        | 30.00 |

$$\text{Power Density} = \text{EIRP} \times \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for LTE 4 band operation and R is 20cm.

|   |               |          |
|---|---------------|----------|
| EIRP  | <b>19.11</b>  | (dBm)    |
| EIRP  | 81.470        | (mW)     |
| Duty cycle:                                       | <b>100</b>    | (%)      |
| Maximum Pav :                                     | 81.4704284    | (mW)     |
| Prediction distance:                              | 20            | (cm)     |
| Prediction frequency:                             | <b>1711.5</b> | (MHz)    |
| MPE limit for uncontrolled exposure at prediction | 1.0000        | (mW/cm2) |
| Power density at predication frequency at 20 (cm) | 0.01622       | (mW/cm2) |

### Measurement Result

The predicted power density level at 20 cm is 0.01622 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 1711.5MHz.

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### Operation in LTE 5 band (825.5 – 847.5 MHz)

| EUT  |                       |       | Measurement  |             |              |            |              |       |
|--|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band   | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | ERP          | Limit |
|  | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| <b>BAND 5</b><br><b>BW: 3M QPSK</b><br><b>RB: 1,14</b> | 825.5                 | 20415 | V            | 23.82       | 3.3          | -2.93      | 24.19        | 38.45 |
|  |                       |       | H            | 25.79       | 3.3          | -2.93      | <b>26.17</b> | 38.45 |
|  | 836.5                 | 20525 | V            | 21.91       | 3.29         | -2.96      | 22.23        | 38.45 |
|  |                       |       | H            | 24.18       | 3.29         | -2.96      | 24.51        | 38.45 |
|  | 847.5                 | 20635 | V            | 20.37       | 3.27         | -3         | 20.64        | 38.45 |
|  |                       |       | H            | 23.77       | 3.27         | -3         | 24.04        | 38.45 |

$$\text{Power Density} = \text{ERP} \cdot \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for LTE 5 band operation and R is 20cm.

|   |            |          |
|---|------------|----------|
| ERP   | 26.17      | (dBm)    |
| ERP   | 414.000    | (mW)     |
| Duty cycle:                                       | 100        | (%)      |
| Maximum Pav :                                     | 413.999675 | (mW)     |
| Prediction distance:                              | 20         | (cm)     |
| Prediction frequency:                             | 825.5      | (MHz)    |
| MPE limit for uncontrolled exposure at prediction | 0.5503     | (mW/cm2) |
| Power density at predication frequency at 20 (cm) | 0.08240    | (mW/cm2) |

### Measurement Result

The predicted power density level at 20 cm is 0.0824 mW/cm2.

This is below the uncontrolled exposure limit of 0.5503 mW/cm2 at 825.5MHz.

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### Operation in LTE 7 band (2507.5 – 2562.5 MHz)

| EUT   |                       |       | Measurement  |             |              |            |              |       |
|---|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band  | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|   | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| <b>BAND 7</b><br><b>BW: 15M QPSK</b><br><b>RB: 1,74</b> | 2507.5                | 20825 | V            | 14          | 10.92        | -5.27      | 19.65        | 33.01 |
|   |                       |       | H            | 10.62       | 10.92        | -5.27      | 16.27        | 33.01 |
|   | 2535.0                | 21100 | V            | 16.02       | 10.95        | -5.32      | <b>21.66</b> | 33.01 |
|   |                       |       | H            | 11.15       | 10.95        | -5.32      | 16.78        | 33.01 |
|   | 2562.5                | 21375 | V            | 13.89       | 10.99        | -5.34      | 19.54        | 33.01 |
|   |                       |       | H            | 7.64        | 10.99        | -5.34      | 13.29        | 33.01 |

$$\text{Power Density} = \text{EIRP} \times \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for LTE 7 band operation and R is 20cm.

|   |              |          |
|---|--------------|----------|
| EIRP  | <b>21.66</b> | (dBm)    |
| EIRP  | 146.555      | (mW)     |
| Duty cycle:                                       | <b>100</b>   | (%)      |
| Maximum Pav :                                     | 146.554784   | (mW)     |
| Prediction distance:                              | 20           | (cm)     |
| Prediction frequency:                             | <b>2535</b>  | (MHz)    |
| MPE limit for uncontrolled exposure at prediction | 1.0000       | (mW/cm2) |
| Power density at predication frequency at 20 (cm) | 0.02917      | (mW/cm2) |

### Measurement Result

The predicted power density level at 20 cm is 0.02917 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 2535MHz.

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# Operation in LTE 12 band (700.5 – 714.5 MHz)

| EUT   |                       |       | Measurement  |             |              |            |              |       |
|---|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band  | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | ERP          | Limit |
|   | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| <b>BAND 12</b><br><b>BW: 3M QPSK</b><br><b>RB: 1,14</b> | 700.5                 | 23025 | V            | 20.6        | 3.08         | -2.98      | 20.71        | 34.77 |
|   |                       |       | H            | 25.07       | 3.08         | -2.99      | <b>25.17</b> | 34.77 |
|   | 707.5                 | 23095 | V            | 17.86       | 3.1          | -3.04      | 17.92        | 34.77 |
|   |                       |       | H            | 23.14       | 3.1          | -3.04      | 23.19        | 34.77 |
|   | 714.5                 | 23165 | V            | 17.91       | 3.11         | -3.06      | 17.96        | 34.77 |
|   |                       |       | H            | 23.96       | 3.11         | -3.06      | 24.01        | 34.77 |

$$\text{Power Density} = \text{ERP} \cdot \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for LTE 12 band operation and R is 20cm.

|   |              |          |
|---|--------------|----------|
| ERP   | <b>25.17</b> | (dBm)    |
| ERP   | 328.852      | (mW)     |
| Duty cycle:                                       | <b>100</b>   | (%)      |
| Maximum Pav :                                     | 328.851631   | (mW)     |
| Prediction distance:                              | 20           | (cm)     |
| Prediction frequency:                             | <b>700.5</b> | (MHz)    |
| MPE limit for uncontrolled exposure at prediction | 0.4670       | (mW/cm2) |
| Power density at predication frequency at 20 (cm) | 0.06546      | (mW/cm2) |

## Measurement Result

The predicted power density level at 20 cm is 0.06546 mW/cm2.

This is below the uncontrolled exposure limit of 0.467 mW/cm2 at 700.5MHz.

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# Operation in LTE 17 band (709.0 – 711.0 MHz)

| EUT                                 |                       |       | Measurement  |             |              |            |       |       |
|-------------------------------------|-----------------------|-------|--------------|-------------|--------------|------------|-------|-------|
| Operation Band                      | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | ERP   | Limit |
|                                     | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm   | dBm   |
| BAND 17<br>BW: 10M QPSK<br>RB: 1,49 | 709.0                 | 23780 | V            | 19.1        | 3.11         | -3.06      | 19.14 | 34.77 |
|                                     |                       |       | H            | 23.75       | 3.11         | -3.06      | 23.8  | 34.77 |
|                                     | 710.0                 | 23790 | V            | 18.99       | 3.11         | -3.06      | 19.03 | 34.77 |
|                                     |                       |       | H            | 23.97       | 3.11         | -3.07      | 24.01 | 34.77 |
|                                     | 711.0                 | 23800 | V            | 19.11       | 3.11         | -3.06      | 19.16 | 34.77 |
|                                     |                       |       | H            | 24.35       | 3.11         | -3.06      | 24.4  | 34.77 |

$$\text{Power Density} = \text{ERP} \cdot \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for LTE 17 band operation and R is 20cm.

|   |           |                       |
|---|-----------|-----------------------|
| ERP   | 24.40     | (dBm)                 |
| ERP   | 275.423   | (mW)                  |
| Duty cycle:                                       | 100       | (%)                   |
| Maximum Pav :                                     | 275.42287 | (mW)                  |
| Prediction distance:                              | 20        | (cm)                  |
| Prediction frequency:                             | 711       | (MHz)                 |
| MPE limit for uncontrolled exposure at prediction | 0.4740    | (mW/cm <sup>2</sup> ) |
| Power density at predication frequency at 20 (cm) | 0.05482   | (mW/cm <sup>2</sup> ) |

## Measurement Result

The predicted power density level at 20 cm is 0.05482 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 0.474 mW/cm<sup>2</sup> at 711MHz.

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# Operation in LTE 26 band (825.5 – 847.5 MHz)

| EUT                               |                       |       | Measurement  |             |              |            |              |       |
|-----------------------------------|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band                    | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | ERP          | Limit |
|                                   | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| BAND 26<br>BW: 3M QPSK<br>RB: 1,0 | 825.5                 | 26805 | V            | 15.07       | 3.31         | -2.92      | 15.45        | 38.50 |
|                                   |                       |       | H            | 17.22       | 3.31         | -2.92      | <b>17.61</b> | 38.50 |
|                                   | 836.5                 | 26915 | V            | 12.46       | 3.29         | -2.95      | 12.79        | 38.50 |
|                                   |                       |       | H            | 15.87       | 3.29         | -2.96      | 16.21        | 38.50 |
|                                   | 847.5                 | 27025 | V            | 9.69        | 3.27         | -3         | 9.96         | 38.50 |
|                                   |                       |       | H            | 14.23       | 3.28         | -2.99      | 14.52        | 38.50 |

$$\text{Power Density} = \text{ERP} \cdot \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for LTE 26 band operation and R is 20cm.

|   |            |          |
|---|------------|----------|
| ERP   | 17.61      | (dBm)    |
| ERP   | 57.677     | (mW)     |
| Duty cycle:                                       | 100        | (%)      |
| Maximum Pav :                                     | 57.6766463 | (mW)     |
| Prediction distance:                              | 20         | (cm)     |
| Prediction frequency:                             | 825.5      | (MHz)    |
| MPE limit for uncontrolled exposure at prediction | 0.5503     | (mW/cm2) |
| Power density at predication frequency at 20 (cm) | 0.01148    | (mW/cm2) |

## Measurement Result

The predicted power density level at 20 cm is 0.01148 mW/cm2.

This is below the uncontrolled exposure limit of 0.5503 mW/cm2 at 825.5MHz.

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# Operation in LTE 41 band (2506.0 – 2680.0 MHz)

| EUT   |                       |       | Measurement  |             |              |            |              |       |
|---|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band  | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | EIRP         | Limit |
|   | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| <b>BAND 41</b><br><b>BW: 20M QPSK</b><br><b>RB: 1,0</b> | 2506.0                | 39750 | V            | 16.68       | 10.9         | -5.25      | 22.33        | 33.01 |
|   |                       |       | H            | 10.81       | 10.9         | -5.25      | 16.46        | 33.01 |
|   | 2593.0                | 40620 | V            | 17.04       | 11.01        | -5.34      | <b>22.71</b> | 33.01 |
|   |                       |       | H            | 11.83       | 11.01        | -5.34      | 17.5         | 33.01 |
|   | 2680.0                | 41490 | V            | 15.9        | 11.13        | -5.48      | 21.55        | 33.01 |
|   |                       |       | H            | 10.64       | 11.13        | -5.48      | 16.29        | 33.01 |

$$\text{Power Density} = \text{EIRP} \times \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for LTE 41 band operation and R is 20cm.

|   |            |          |
|---|------------|----------|
| EIRP  | 22.71      | (dBm)    |
| EIRP  | 186.638    | (mW)     |
| Duty cycle:                                       | 100        | (%)      |
| Maximum Pav :                                     | 186.637969 | (mW)     |
| Prediction distance:                              | 20         | (cm)     |
| Prediction frequency:                             | 2593       | (MHz)    |
| MPE limit for uncontrolled exposure at prediction | 1.0000     | (mW/cm2) |
| Power density at predication frequency at 20 (cm) | 0.03715    | (mW/cm2) |

## Measurement Result

The predicted power density level at 20 cm is 0.03715 mW/cm2.

This is below the uncontrolled exposure limit of 1 mW/cm2 at 2593MHz.

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# Operation in LTE 26 band (815.5 – 822.5 MHz) for Part 90S

| EUT   |                       |       | Measurement  |             |              |            |              |       |
|---|-----------------------|-------|--------------|-------------|--------------|------------|--------------|-------|
| Operation Band  | Fundamental Frequency | CH    | Antenna Pol. | S.G. Output | Antenna Gain | Cable Loss | ERP          | Limit |
|   | MHz                   |       | V/H          | dBm         | dBi          | dB         | dBm          | dBm   |
| <b>BAND 26</b><br><b>BW: 3M QPSK</b><br><b>RB: 1,14</b> | 815.5                 | 26705 | V            | 14.05       | 3.32         | -2.89      | 14.47        | 50.00 |
|   |                       |       | H            | 18.5        | 3.32         | -2.9       | <b>18.92</b> | 50.00 |
|   | 819.0                 | 26740 | V            | 13.71       | 3.31         | -2.91      | 14.12        | 50.00 |
|   |                       |       | H            | 17.66       | 3.31         | -2.91      | 18.06        | 50.00 |
|   | 822.5                 | 26775 | V            | 13.53       | 3.31         | -2.92      | 13.92        | 50.00 |
|   |                       |       | H            | 17.14       | 3.31         | -2.92      | 17.54        | 50.00 |

$$\text{Power Density} = \text{ERP} \cdot \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for LTE 26 band operation and R is 20cm.

|   |              |          |
|---|--------------|----------|
| ERP   | <b>18.92</b> | (dBm)    |
| ERP   | 77.983       | (mW)     |
| Duty cycle:                                       | <b>100</b>   | (%)      |
| Maximum Pav :                                     | 77.9830111   | (mW)     |
| Prediction distance:                              | 20           | (cm)     |
| Prediction frequency:                             | <b>815.5</b> | (MHz)    |
| MPE limit for uncontrolled exposure at prediction | 0.5437       | (mW/cm2) |
| Power density at predication frequency at 20 (cm) | 0.01552      | (mW/cm2) |

## Measurement Result

The predicted power density level at 20 cm is 0.01552 mW/cm2.

This is below the uncontrolled exposure limit of 0.5437 mW/cm2 at 815.5MHz.

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## 2. COLLOCATED MPE ANALYSIS

The modem may transmit simultaneously with other collocated radio transmitters within a host device, provided the following conditions are met:

- Each collocated radio transmitter has been certified by FCC for mobile application (that will be met since SQNS module will have its own FCC ID and host device will have its own FCC ID)
- At least 20 cm separation distance between the antennas of the collocated transmitters and the user's body must be maintained at all times (host installation should taking care of that)

The output power and antenna gain in a collocated configuration must not exceed the limits and configurations stipulated in the following table 1. The power density calculations for the individual transmitters per wireless technology at an exposure minimum separation distance of 20cm.

### Exclusion of test condition:

*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 calculated or measured field strengths or power density, is  $\leq 1.0$ .*

$$\sum MPE\ ratio1 + MPE\ ratio2 + MPE\ ratio3 \leq 1.0$$

*The spreadsheet as FCC deduces, and releases is employed to conduct the measurement:*

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**Table 1: Collocated MPE Calculation (Worst Case Table)**

| Technology   | Frequency (MHz) | Max Conducted Power (dBm) | Max Gain (dBi) | Duty Cycle | FCC Power Density @20cm (mW/cm <sup>2</sup> ) | FCC MPE Limit (mW/cm <sup>2</sup> ) |
|--------------|-----------------|---------------------------|----------------|------------|---|-------------------------------------|
| BT-BR        | 2441            | 6.28                      | 0.80           | 77         | 0.00078                                       | 1.000                               |
| WLAN 2.4G    | 2462            | 16.87                     | 0.80           | 99.54      | 0.01159                                       | 1.000                               |
| WLAN 5G      | 5580            | 16.04                     | -0.60          | 99.36      | 0.00692                                       | 1.000                               |
| GPRS 850     | 824.2           | 32.58                     | 0.70           | 50         | 0.21180                                       | 0.549                               |
| WCDMA Band V | 826.4           | 24.46                     | 0.70           | 100        | 0.06531                                       | 0.551                               |
| LTE Band 26  | 841.5           | 23.97                     | 0              | 100        | 0.04965                                       | 0.561                               |

Scenario 1:

BT-BR+GPRS 850

| BT-BR (mW/cm <sup>2</sup> ) | FCC MPE (mW/cm <sup>2</sup> ) | BT-BR / MPE limit | GPRS 850 (mW/cm <sup>2</sup> ) | FCC MPE (mW/cm <sup>2</sup> ) | GPRS 850 / MPE limit | BT-BR+GPRS 850 | FCC Limit (mW/cm <sup>2</sup> ) |
|-----------------------------|-------------------------------|-------------------|--------------------------------|-------------------------------|----------------------|----------------|---------------------------------|
| 0.00078                     | 1                             | 0.00078           | 0.21180                        | 0.549466667                   | 0.38546              | 0.38624        | 1                               |

Scenario 2:

WLAN 2.4G+GPRS 850

| WLAN 2.4G (mW/cm <sup>2</sup> ) | FCC MPE (mW/cm <sup>2</sup> ) | WLAN / MPE limit | GPRS 850 (mW/cm <sup>2</sup> ) | FCC MPE (mW/cm <sup>2</sup> ) | GPRS 850 / MPE limit | WLAN 2.4G+GPRS 850 | FCC Limit (mW/cm <sup>2</sup> ) |
|---------------------------------|-------------------------------|------------------|--------------------------------|-------------------------------|----------------------|--------------------|---------------------------------|
| 0.01159                         | 1                             | 0.01159          | 0.21180                        | 0.549466667                   | 0.38546              | 0.39705            | 1                               |

Scenario 3:

WLAN 5G+GPRS 850

| WLAN 5G (mW/cm <sup>2</sup> ) | FCC MPE (mW/cm <sup>2</sup> ) | WLAN 5G / MPE limit | GPRS 850 (mW/cm <sup>2</sup> ) | FCC MPE (mW/cm <sup>2</sup> ) | GPRS 850 / MPE limit | WLAN 5G+GPRS 850 | FCC Limit (mW/cm <sup>2</sup> ) |
|-------------------------------|-------------------------------|---------------------|--------------------------------|-------------------------------|----------------------|------------------|---------------------------------|
| 0.00692                       | 1                             | 0.00692             | 0.21180                        | 0.549466667                   | 0.38546              | 0.39238          | 1                               |

Scenario 4:

BT-BR+WCDMA Band V

| BT-BR (mW/cm <sup>2</sup> ) | FCC MPE (mW/cm <sup>2</sup> ) | BT-BR / MPE limit | WCDMA (mW/cm <sup>2</sup> ) | FCC MPE (mW/cm <sup>2</sup> ) | WCDMA / MPE limit | BT-BR+WCDMA Band V | FCC Limit (mW/cm <sup>2</sup> ) |
|-----------------------------|-------------------------------|-------------------|-----------------------------|-------------------------------|-------------------|--------------------|---------------------------------|
| 0.00078                     | 1                             | 0.00078           | 0.06531                     | 0.550933333                   | 0.11854           | 0.11932            | 1                               |

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## Scenario 5:

WLAN 2.4G+WCDMA Band V

| WLAN 2.4G<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | WLAN<br>/ MPE<br>limit | WCDMA<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | WCDMA<br>/ MPE<br>limit | WLAN<br>2.4G+WCDMA<br>Band V | FCC Limit<br>(mW/cm <sup>2</sup> ) |
|------------------------------------|----------------------------------|------------------------|--------------------------------|----------------------------------|-------------------------|------------------------------|------------------------------------|
| 0.01159                            | 1                                | 0.01159                | 0.06531                        | 0.550933333                      | 0.11854                 | 0.13012                      | 1                                  |

## Scenario 6:

WLAN 5G+WCDMA Band V

| WLAN 5G<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | WLAN 5G<br>/ MPE<br>limit | WCDMA<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | WCDMA<br>/ MPE<br>limit | WLAN<br>5G+WCDMA<br>Band V | FCC Limit<br>(mW/cm <sup>2</sup> ) |
|----------------------------------|----------------------------------|---------------------------|--------------------------------|----------------------------------|-------------------------|----------------------------|------------------------------------|
| 0.00692                          | 1                                | 0.00692                   | 0.06531                        | 0.550933333                      | 0.11854                 | 0.12546                    | 1                                  |

## Scenario 7:

BT-BR+LTE Band 26

| BT-BR<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | BT-BR<br>/ MPE<br>limit | LTE Band 26<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | LTE Band<br>/ MPE<br>limit | BT-BR+LTE Band<br>26 | FCC Limit<br>(mW/cm <sup>2</sup> ) |
|--------------------------------|----------------------------------|-------------------------|--------------------------------------|----------------------------------|----------------------------|----------------------|------------------------------------|
| 0.00078                        | 1                                | 0.00078                 | 0.04965                              | 0.561                            | 0.08851                    | 0.08929              | 1                                  |

## Scenario 8:

WLAN 2.4G+LTE Band 26

| WLAN 2.4G<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | WLAN<br>/ MPE<br>limit | LTE Band 26<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | LTE Band<br>/ MPE<br>limit | WLAN 2.4G+LTE<br>Band 26 | FCC Limit<br>(mW/cm <sup>2</sup> ) |
|------------------------------------|----------------------------------|------------------------|--------------------------------------|----------------------------------|----------------------------|--------------------------|------------------------------------|
| 0.01159                            | 1                                | 0.01159                | 0.04965                              | 0.561                            | 0.08851                    | 0.10010                  | 1                                  |

## Scenario 9:

WLAN 5G+LTE Band 26

| WLAN 5G<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | WLAN 5G<br>/ MPE<br>limit | LTE Band 26<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | LTE Band<br>/ MPE<br>limit | WLAN 5G+LTE<br>Band 26 | FCC Limit<br>(mW/cm <sup>2</sup> ) |
|----------------------------------|----------------------------------|---------------------------|--------------------------------------|----------------------------------|----------------------------|------------------------|------------------------------------|
| 0.00692                          | 1                                | 0.00692                   | 0.04965                              | 0.561                            | 0.08851                    | 0.09543                | 1                                  |

## Scenario 10:

BT-BR+WLAN 5G

| BT-BR<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | BT-BR<br>/ MPE<br>limit | WLAN 5G<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | WLAN 5G<br>/ MPE<br>limit | BT-BR+<br>WLAN 5G | FCC Limit<br>(mW/cm <sup>2</sup> ) |
|--------------------------------|----------------------------------|-------------------------|----------------------------------|----------------------------------|---------------------------|-------------------|------------------------------------|
| 0.00078                        | 1                                | 0.00078                 | 0.00692                          | 1                                | 0.00692                   | 0.00770           | 1                                  |

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## Scenario 11:

BT-BR+WLAN 5G+GPRS 850

| BT-BR<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | BT-BR<br>/ MPE<br>limit | WLAN 5G<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | WLAN 5G<br>/ MPE<br>limit | GPRS 850<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | GPRS 850<br>/ MPE<br>limit | BT-BR+<br>WLAN 5G+<br>GPRS 850 | FCC Limit<br>(mW/cm <sup>2</sup> ) |
|--------------------------------|----------------------------------|-------------------------|----------------------------------|----------------------------------|---------------------------|-----------------------------------|----------------------------------|----------------------------|--------------------------------|------------------------------------|
| 0.00078                        | 1                                | 0.00078                 | 0.00692                          | 1                                | 0.00692                   | 0.21180                           | 0.549                            | 0.38546                    | 0.39316                        | 1                                  |

## Scenario 12:

BT-BR+WLAN 5G+WCDMA Band V

| BT-BR<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | BT-BR<br>/ MPE<br>limit | WLAN 5G<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | WLAN 5G<br>/ MPE<br>limit | WCDMA Band V<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | WCDMA<br>/ MPE<br>limit | BT-BR+<br>WLAN 5G+<br>WCDMA Band V | FCC Limit<br>(mW/cm <sup>2</sup> ) |
|--------------------------------|----------------------------------|-------------------------|----------------------------------|----------------------------------|---------------------------|---------------------------------------|----------------------------------|-------------------------|------------------------------------|------------------------------------|
| 0.00078                        | 1                                | 0.00078                 | 0.00692                          | 1                                | 0.00692                   | 0.06531                               | 0.551                            | 0.11854                 | 0.12624                            | 1                                  |

## Scenario 13:

BT-BR+WLAN 5G+LTE Band 26

| BT-BR<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | BT-BR<br>/ MPE<br>limit | WLAN 5G<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | WLAN 5G<br>/ MPE<br>limit | LTE Band 26<br>(mW/cm <sup>2</sup> ) | FCC MPE<br>(mW/cm <sup>2</sup> ) | LTE Band<br>/ MPE<br>limit | BT-BR+<br>WLAN 5G+<br>LTE Band 26 | FCC Limit<br>(mW/cm <sup>2</sup> ) |
|--------------------------------|----------------------------------|-------------------------|----------------------------------|----------------------------------|---------------------------|--------------------------------------|----------------------------------|----------------------------|-----------------------------------|------------------------------------|
| 0.00078                        | 1                                | 0.00078                 | 0.00692                          | 1                                | 0.00692                   | 0.04965                              | 0.561                            | 0.08851                    | 0.09621                           | 1                                  |

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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