

# RF Exposure evaluation

|                      |   |                                               |
|----------------------|---|-----------------------------------------------|
| <b>Product Name</b>  | : | Motorcycle Smart System                       |
| <b>FCC ID</b>        | : | 2BMPPM-ARMSS03                                |
| <b>Test Standard</b> | : | KDB447498D04 General RF Exposure Guidance v01 |

According to 447498 D04 Interim General RF Exposure Guidance v01

Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B. 1})$$

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B. 2})$$

where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and  $f$  is in GHz,  $d$  is the separation distance (cm), and  $ERP_{20 \text{ cm}}$  is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

| Frequency (MHz) | Distance (mm) |    |    |     |     |     |     |     |     |     |
|-----------------|---------------|----|----|-----|-----|-----|-----|-----|-----|-----|
|                 | 5             | 10 | 15 | 20  | 25  | 30  | 35  | 40  | 45  | 50  |
| 300             | 39            | 65 | 88 | 110 | 129 | 148 | 166 | 184 | 201 | 217 |
| 450             | 22            | 44 | 67 | 89  | 112 | 135 | 158 | 180 | 203 | 226 |
| 835             | 9             | 25 | 44 | 66  | 90  | 116 | 145 | 175 | 207 | 240 |
| 1900            | 3             | 12 | 26 | 44  | 66  | 92  | 122 | 157 | 195 | 236 |
| 2450            | 3             | 10 | 22 | 38  | 59  | 83  | 111 | 143 | 179 | 219 |
| 3600            | 2             | 8  | 18 | 32  | 49  | 71  | 96  | 125 | 158 | 195 |
| 5800            | 1             | 6  | 14 | 25  | 40  | 58  | 80  | 106 | 136 | 169 |

Calculated Result and Limit (WORSE CASE IS AS BELOW)

| Mode                             | Frequency (MHz ) | Max Output power(dBm) | Max Output power(mW) | Ant gain (dBi) | Evaluation ERP(dBm) | Evaluation ERP(mW) | Limit of Pth (mW) | Result |
|----------------------------------|------------------|-----------------------|----------------------|----------------|---------------------|--------------------|-------------------|--------|
| BT1:3-DH1                        | 2402             | 9.087                 | 8.10                 | 2.98           | 9.917               | 9.81               | 3060.00           | Pass   |
| BT2:BLE 2M                       | 2480             | 4.244                 | 2.66                 | 2.98           | 5.074               | 3.22               | 3060.00           | Pass   |
| 2.4G WIFI:N20                    | 2462             | 12.946                | 19.71                | 2.98           | 13.776              | 23.86              | 3060.00           | Pass   |
| LTE Band 2:<br>QPSK/20MBandwidth | 1900             | 22.82                 | 191.43               | 1.55           | 22.22               | 166.72             | 3060.00           | Pass   |
| LTE Band 5:<br>QPSK/5MBandwidth  | 836.5            | 22.6                  | 181.97               | 0.42           | 20.87               | 122.18             | 1706.46           | Pass   |
| LTE Band 7:<br>QPSK/15MBandwidth | 2507.5           | 20.65                 | 116.14               | 0.68           | 19.18               | 82.79              | 3060.00           | Pass   |

ERP=Max Output power+Ant gain-2.15

Simultaneous emission:

|                                     |                                                          |
|-------------------------------------|----------------------------------------------------------|
| $\sum_{i=1}^a \frac{P_i}{P_{th,i}}$ | $=(8.10+2.66+19.71+191.43+181.97+116.14)/3060=0.16994<1$ |
|-------------------------------------|----------------------------------------------------------|

|                                         |                                                          |
|-----------------------------------------|----------------------------------------------------------|
| $\sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}}$ | $=(9.81+3.22+23.86+166.72+122.18+82.79)/3060 =0.13352<1$ |
|-----------------------------------------|----------------------------------------------------------|

Comply with RF exposure exemption limit.