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## \* RF Exposure

FCC ID: TKWBBS3-DB

### 1. Regulation

**Regulation : KDB 447498 D04** (Interim General RF Exposure Guidance v01)

#### 2.1.2 1-mW Test Exemption

Per § 1.1307(b)(3)(i)(A), a single RF source is exempt RF device (from the requirement to show data demonstrating compliance to RF exposure limits, as previously mentioned) if the available maximum time-averaged power is no more than 1 mW, regardless of separation distance.

This exemption applies to all operating configurations and exposure conditions, for the frequency range 100 kHz to 100 GHz, regardless of fixed, mobile, or portable device exposure conditions. This is a standalone exemption, and it cannot be applied in conjunction with any other test exemption.

#### 2.2 RF Exposure Test Exemptions for Simultaneous Transmission Sources

##### 2.2.1 1-mW Test Exemption for Multiple Sources

As discussed in § 1.1307(b)(3)(ii)(A), the 1-mW exemption intended for single transmitters may be also applied to simultaneous transmission conditions, within the same host device, according one of the following criteria:

a) When maximum available power each individual transmitting antenna within the same time averaging period is  $\leq 1$  mW, and the nearest parts of the antenna structures of the simultaneously operating transmitters are separated by at **least 2 cm**.

**b) When the aggregate maximum available power of all transmitting antennas is  $\leq 1$  mW in the same time-averaging period.**

This exemption may not be combined with any other exemption.

## 2. Result

According to the calculation formula of power:

$$E.I.R.P.[dBm] = E[dB\mu V/m] + 20\log(d[m]) - 104.77$$

Where:

E is electric field strength in  $dB\mu V/m$ ;

d is measurement distance in meters (m);

E.I.R.P.[dBm] is the equivalent isotropically radiated power in dBm (above 1GHz);

### NFC, RFID worse case below:

| Mode | Frequency<br>(MHz) | Maximum field strength<br>@300m<br>(dB $\mu V/m$ ) | Maximum field strength<br>@30m<br>(dB $\mu V/m$ ) | Maximum field strength<br>@3m<br>(dB $\mu V/m$ ) | Calculated<br>E.I.R.P.<br>(dBm) | Maximum<br>Output power<br>(mW)        |
|------|--------------------|----------------------------------------------------|---------------------------------------------------|--------------------------------------------------|---------------------------------|----------------------------------------|
| RFID | 0.122              | -10.34                                             | -                                                 | -90.34                                           | -185.57                         | 0.000 000 000<br>000 000 000 277<br>49 |
| NFC  | 13.56              | -                                                  | 25.68                                             | -14.32                                           | -109.55                         | 0.000 000 000<br>011 097 943 499<br>06 |

### BLE worse case below:

| Mode                        | Frequency<br>(MHz) | Maximum Output power<br>(dB m) | Maximum Output power<br>(mW) |
|-----------------------------|--------------------|--------------------------------|------------------------------|
| BLE / 1 Mbps<br>/ Packet 37 | 2 402              | -1.18                          | 0.762 079 010 025 412        |

Note: Just the worst case mode was shown in report.

## 3. Conclusion

2.2.1.(b) When **the aggregate maximum available power of all transmitting antennas** is  $\leq 1$  mW in the same time-averaging period.

| NFC<br>Output power<br>(mW)         | RFID<br>Output power<br>(mW)        | BLE<br>Output power<br>(mW)         | All transmitting<br>Output power<br>(mW) | Limit for SAR test<br>exemption<br>(mW) | Result |
|-------------------------------------|-------------------------------------|-------------------------------------|------------------------------------------|-----------------------------------------|--------|
| 0.000 000 000 011<br>097 943 499 06 | 0.000 000 000 000<br>000 000 277 49 | 0.762 079 010 025<br>412 000 000 00 | 0.762 079 010 036<br>510 000 000 00      | 1                                       | Pass   |

The device is exempt from the SAR test and satisfies RF exposure evaluation.