

Test No.13

|                      |                                        |                       |                                                |
|----------------------|----------------------------------------|-----------------------|------------------------------------------------|
| <b>Name of Test:</b> | <b><i>Radio Frequency Exposure</i></b> | <b>Test Standard:</b> | <b><i>FCC OET Bulletin 65 &amp;RSS-GEN</i></b> |
| <b>Tested By:</b>    | WEI LI                                 | <b>Test Date:</b>     | 10/23/2023-11/9/2023                           |

**Minimum Standard:** Public Exposure to Radio Frequency Energy Levels (1.1307 (b)(1)) Limits:

From §1.1310 Table 1 (B),  
for Public  $S = 1.0 \text{ mW/cm}^2$   
for Professional,  $S = 5.0 \text{ mW/cm}^2$

**Method of Measurement:**

$d = 0.282 * 10^{((P + G) / 20) / \sqrt{S}}$   
 $S = 0.0795 * 10^{((P + G)/10) / d^2}$   
where  
 $d$  = MPE distance in cm  
 $P$  = Power in dBm  
 $G$  = Antenna Gain in dBi  
 $S$  = Power Density Limit in  $\text{mW/cm}^2$

Equation (1)

Equation (2)

Equation (1) and the measured peak power is used to calculate the MPE distance.  
Equation (2) and the measured peak power is used to calculate the Power density.

|                     |    |
|---------------------|----|
| <b>Test Result:</b> |    |
| <b>Test Data:</b>   | NA |

## **Calculation**

### **For GPR UWB Transmitter:**

#### ***For FCC Approval:***

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.

For this EUT, max emission level is under the 0dBm limit set in Part 15F. No RF hazard need to be concerned.

The max. power density can be obtain by using the max. P+G=0dBm and d=20cm, and plug all three items into equation (2), yielding,

| <b>Power Density Limit (mW/cm<sup>2</sup>)</b> | <b>Max. Output Power+ Antenna] Gain (dBm)</b> | <b>Calculated Power Density (mW/ cm<sup>2</sup>)</b> |
|------------------------------------------------|-----------------------------------------------|------------------------------------------------------|
| 1.0/5.0                                        | 0                                             | 0.0002                                               |

#### ***For IC Approval:***

#### **LIMITS per 2.5.2 Exemption Limits for Routine Evaluation – RF Exposure Evaluation**

**RF** exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $4.49/f^{0.5}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- **at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;**
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

*The UWB meet the most restricted EIRP limit value are 0.6W at 137.2MHz (for UWB 137.2-400.7MHz Band), by the value of max. 1mW for UWB.*