#### **RF Exposure / MPE Calculation**

No.	15471317S
Customer	Murata Manufacturing Co., Ltd.
Description of EUT	Communication Module
Model Number of EUT	Type1VY-002
FCC ID	VPYLB1VY002

Murata Manufacturing Co., Ltd. declares that Model: Type1VY-002 complies with FCC radiation exposure requirement specified in the FCC Rule 2.1091 (for mobile).

### **RF Exposure Calculations:**

The following information provides the minimum separation distance for the highest gain antenna provided with the "Type1VY-002" as calculated from (B) Limits for General Population / Uncontrolled Exposure of TABLE 1- LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE) of §1.1310 Radiofrequency radiation exposure limits.

### [Bluetooth Low Energy part]

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm^2 uncontrolled exposure limit. The Friis formula used was:

$$S = \frac{P \times G}{4 \times \pi \times r^2}$$
 Where 
$$P = \quad 9.20 \text{ mW (Maximum average output power)}$$
 
$$\square \text{ Time average was used for the above value in consideration of 6-minutes time-averaging}$$
 
$$\square \text{ Burst power average was used for the above value in consideration of worst condition.}$$
 
$$G = \quad 1.208 \text{ Numerical Antenna gain; equal to 0.82 dBi}$$
 
$$r = \quad 20 \text{ cm (Separation distance)}$$

Power Density Result  $S = 0.00221 \text{ mW/cm}^2$ 

# [Bluetooth (BR/EDR) part]

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm^2 uncontrolled exposure limit. The Friis formula used was:

$$S = \frac{P \times G}{4 \times \pi \times r^2}$$
Where

P = 9.76 mW (Maximum average output power)

oxdot Time average was used for the above value in consideration of 6-minutes time-averaging

 $\hfill \square$  Burst power average was used for the above value in consideration of worst condition.

G = 1.208 Numerical Antenna gain; equal to 0.82 dBi

*r* = 20 cm (Separation distance)

Power Density Result  $S = 0.00235 \text{ mW/cm}^2$ 

### [WLAN 2.4 GHz band part]

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm^2 uncontrolled exposure limit. The Friis formula used was:

$$S = \frac{P \times G}{4 \times \pi \times r^2}$$

Where

= 8.52 mW (Maximum average output power)

☐ Time average was used for the above value in consideration of 6-minutes time-averaging

Burst power average was used for the above value in consideration of worst condition.

G = 1.208 Numerical Antenna gain; equal to 0.82 dBi

r = 20 cm (Separation distance)

Power Density Result S = 0.00205 mW/cm<sup>2</sup>

# [WLAN 5 GHz band part]

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm^2 uncontrolled exposure limit. The Friis formula used was:

$$S = \frac{P \times G}{4 \times \pi \times r^2}$$

Where

P = 13.52 mW (Maximum average output power)

☐ Time average was used for the above value in consideration of 6-minutes time-averaging

Burst power average was used for the above value in consideration of worst condition.

G = 1.247 Numerical Antenna gain; equal to 0.96 dBi

*r* = 20 cm (Separation distance)

Power Density Result  $S = 0.00336 \text{ mW/cm}^2$ 

Therefore, if WLAN (5 GHz band) and Bluetooth (BTLE) transmit simultaneously,

 $S = 0.00336 \text{ mW/cm}^2 + 0.00221 \text{ mW/cm}^2$ 

 $= 0.00557 \text{ mW/cm}^2$ 

Therefore, if WLAN (5 GHz band) and Bluetooth (BR/EDR) transmit simultaneously,

 $S = 0.00336 \text{ mW/cm}^2 + 0.00235 \text{ mW/cm}^2$ 

 $= 0.00571 \text{ mW/cm}^2$