MPE CALCULATION

FCC ID: UZ7211486030B / IC ID: 109AN-211486030B

RF Exposure Requirements:	47 CFR §1. 1307(b)
RF Radiation Exposure Limits:	47 CFR §1. 1310
RF Radiation Exposure Guidelines:	FCC OST/OET Bulletin Number 65
EUT Frequency Band:	2402MHz-2480MHz, 2412-2462 MHz, 5180-5825MHz
Limits for General Population/Uncontrolled Exposure in the band of:	1500 - 100,000 MHz
Power Density Limit:	1 mW / cm^2

Equation: $S = PG / 4\pi R^2$ or $R = \sqrt{PG / 4\pi S}$

Where, S = Power Density

P = Power Input to Antenna

G = Antenna Gain

R = distance to the center of radiated antenna

LMA UZ7211486030B Module

PiFA antenna

Prediction distance 20cm

(Bluetooth LE): Power = 4.57e-7W, Antenna Gain = -0.55dBi,Apparent Gain = -0.55dBi, Power density =8.01e-8mW/cm^2

(Bluetooth): Power=0.015, Antenna Gain = -0.55dBi,Apparent Gain = -0.55dBi, Power density =0.00263mW/cm^2

(WLan 2.4GHz): Power = 0.257W, Antenna Gain = 2.25dBi,Apparent Gain = 2.25dBi, Power density =0.0858 mW/cm^2

(WLan 5GHz): Power = 0.159W, Antenna Gain = 3.7dBi, Apparent Gain = 3.47 dBi, Power density = 0.0742 mW/cm^2

Type	CH Freq (MHz)	Conducted Power (W)	Antenna Gain (dBi)	Apparent Gain (dBi)	Measurement Distance (cm)	Calculated MPE (mW/cm^2)	MPE Limit (mW/cm^2)	Pass/Fail
Bluetooth LE	2480	4.57e-7	-0.55	-0.55	20	8.01e-8	1	Pass
Bluetooth	2402	0.015	-0.55	-0.55	20	0.00263	1	Pass
2.4 GHz WLAN	2437	0.257	2.25	2.25	20	0.0858	1	Pass
5 GHz WLAN	5825	0.159	3.7	3.7	20	0.0742	1	Pass

Bluetooth, 2.4GHz and 5GHz do not transmit simultaneously.

I28MD-RFIDM6EMTT Module

Loop/Coil

Prediction distance 20cm

UHF RFID (902.75-927.25MHz): Power = 28.11dBm, Antenna gain= -36dBi, Power density=0.000032 mW/cm2

FMA ZBR7BTLE Module

Loop/Coil

Prediction distance 20cm

(Bluetooth LE): Power =

Type	CH Freq (MHz)	Conducted Power (W)	Antenna Gain (dBi)	Apparent Gain (dBi)	Measurement Distance (cm)	Calculated MPE (mW/cm^2)	MPE Limit (mW/cm^2)	Pass/Fail
Bluetooth LE	2402	0.0081	2.8	2.8	20	0.00307	1	Pass

If three modules transmit transmit simultaneously.

Total MPE=8.01e-8+ 0.00263 + 0.0858+ 0.0742 + 0.000032 +0.00307 =0.165732 mW/cm^2

The Above Result had shown that the Device complied with MPE requirement.

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