

RF Exposure Evaluation Report

Equipment : Wireless Gateway
Brand Name : ufiSpace
Model No. : GML820U-915U
FCC ID : MCLGML820U-915U
Standard : 47 CFR Part 2.1091
Applicant : Hon Hai Precision Ind. Co., Ltd.
5F-1, 5, Hsin-An Road Hsinchu Science-Based
Industrial Park Hsinchu, Taiwan
Manufacturer : Hon Hai Precision Ind. Co., Ltd.
5F-1, 5, Hsin-An Road Hsinchu Science-Based
Industrial Park Hsinchu, Taiwan

The product sample received on Dec. 09, 2016 and completely tested on Mar. 28, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit.

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Cliff Chang
SPORTON INTERNATIONAL INC.





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PHOTOGRAPHS OF EUT V01		

REVISION HISTORY

[illegible]

1 General Description

EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
LoRa	902-928	923.3-927.5	LORA: uses Chirp Spread Spectrum (CSS)

The EUT can collocate with WWAN module as additional function.

The WWAN module (FCC ID: QISME906S-158) functions as below:

WWAN Antenna Gain: 2.50dBi

Evaluation Mode	Uplink Frequency Range (MHz)	Downlink Frequency Range (MHz)	Modulation Type
LTE	B2: 1850~1910 B5: 824~849	B2: 1930~1990 B5: 869~894	QPSK / 16QAM

Testing Location

Testing Location		
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

2 Maximum Permissible Exposure

Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Simultaneous Transmission Analysis Mode: Lora+WLAN 2.4GHz+GPS+LTE

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G	2.75	15.84	18.59	0.07228	20	0.14379	1	0.01438
LoRa	6.50	26.85	33.35	2.16272	20	4.30249	6.17	0.43025
LTE	2.50	24.00	26.50	0.44668	20	0.88863	5.49	0.08886
							Sum Ratio	0.53349
							Ratio Limit	1

Note: 1. WWAN Module (FCC ID: QISME906S-158)

2. The EUT WWAN function only support LTE Band 2 and Band 5; after evaluating, the worst case is found at LTE Band 5 (Uplink: 824-849 MHz / Downlink: 869-894MHz) thus it is recorded in the report.