

FCC RF EXPOSURE REPORT

FCC ID: SI5VRE3000

Project No. : 1807T004A
Equipment : Verizon 5G Home Wi-Fi Extender
Test Model : VRE3000
Series Model : N/A
Applicant : U-MEDIA Communications, Inc.
Address : 9F, No.1, Jin-shan 7th St. Hsinchu Taiwan

According : FCC Part 2, Subpart J (§2.1093)
KDB 447498 D01 General RF Exposure Guidance v06
IEEE Std C95.1-2005

Authorized Signatory

: 
(Herbert Liu)

B T L I N C .

No.18, Ln. 171, Sec. 2, Jiuzong Rd.,
Neihu Dist., Taipei City, Taiwan (R.O.C.)
TEL:+886-2-2657-3299 FAX: +886-2-2657-3331

MPE CALCULATION METHOD:

**Table 4: RF Field Strength Limits for Devices Used by the General Public
(Uncontrolled Environment)**

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-10 ²¹	83	90	-	Instantaneous*
0.1-10	-	0.73/ f	-	6**
1.1-10	87/ $f^{0.5}$	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ $f^{0.25}$	0.1540/ $f^{0.25}$	8.944/ $f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 $f^{0.3417}$	0.008335 $f^{0.3417}$	0.02619 $f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ $f^{1.2}$
150000-300000	0.158 $f^{0.5}$	4.21 x 10 ⁻⁴ $f^{0.5}$	6.67 x 10 ⁻⁵ f	616000/ $f^{1.2}$

Note: f is frequency in MHz.
 *Based on nerve stimulation (NS).
 ** Based on specific absorption rate (SAR).

Table for Filed Antenna:

For WLAN

Group 1:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC6	Galtronics	02102140-06808Ax	PCB	iPEX	2.9
JC7	Galtronics	02102140-06808Ax	PCB	iPEX	2.9

Group 2:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC6	Galtronics	02102140-06808Bx	PCB	iPEX	1.1
JC7	Galtronics	02102140-06808Bx	PCB	iPEX	1.1

For RLAN

Group 1:

UNII-1:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC1	Galtronics	02102142-06808Ax	PCB	iPEX	3.4
JC3	Galtronics	02102142-06808Ax	PCB	iPEX	3.4
JC4	Galtronics	02102142-06808Ax	PCB	iPEX	3.4
JC5	Galtronics	02102142-06808Ax	PCB	iPEX	3.4

UNII-2A:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC1	Galtronics	02102142-06808Ax	PCB	iPEX	3.4
JC3	Galtronics	02102142-06808Ax	PCB	iPEX	3.4
JC4	Galtronics	02102142-06808Ax	PCB	iPEX	3.4
JC5	Galtronics	02102142-06808Ax	PCB	iPEX	3.4

UNII-2C:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC6	Galtronics	02102140-06808Ax	PCB	iPEX	3.5
JC7	Galtronics	02102140-06808Ax	PCB	iPEX	3.5

UNII-3:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC6	Galtronics	02102140-06808Ax	PCB	iPEX	3.8
JC7	Galtronics	02102140-06808Ax	PCB	iPEX	3.8

Group 2:

UNII-1:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC1	Galtronics	02102142-06808Cx	PCB	iPEX	3.1
JC3	Galtronics	02102142-06808Cx	PCB	iPEX	3.1
JC4	Galtronics	02102142-06808Cx	PCB	iPEX	3.1
JC5	Galtronics	02102142-06808Cx	PCB	iPEX	3.1

UNII-2A:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC1	Galtronics	02102142-06808Cx	PCB	iPEX	3.1
JC3	Galtronics	02102142-06808Cx	PCB	iPEX	3.1
JC4	Galtronics	02102142-06808Cx	PCB	iPEX	3.1
JC5	Galtronics	02102142-06808Cx	PCB	iPEX	3.1

UNII-2C:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC6	Galtronics	02102140-06808Bx	PCB	iPEX	2.8
JC7	Galtronics	02102140-06808Bx	PCB	iPEX	2.8

UNII-3:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC6	Galtronics	02102140-06808Bx	PCB	iPEX	3.0
JC7	Galtronics	02102140-06808Bx	PCB	iPEX	3.0

NOTE:

- (1) This EUT supports 4T4R for RLAN 5 GHz UNII-1and UNII-2A, but 2T2R for WLAN 2.4 GHz & RLAN 5 GHz UNII-2C and UNII-3 (WLAN 2.4 GHz & RLAN 5 GHz UNII-2C and UNII-3 use the same two antennas).

Test Result

For WLAN 2.4 GHz:

Frequency (MHz)	Average Power (dBm)	Average Power (W)	Antenna Gain (dBi)	Distance (cm)	Power Density (W/m ²)	Power Density Limit(W/m ²)
2412-2462	27.08	0.5108	5.91	20	0.3960	1

For RLAN 5 GHz:

Frequency (MHz)	Average Power (dBm)	Average Power (W)	Antenna Gain (dBi)	Distance (cm)	Power Density (W/m ²)	Power Density Limit(W/m ²)
5180-5240 (CDD mode)	23.18	0.2080	3.4	20	0.0905	1
5180-5240 (beamforming mode)	21.88	0.1541	9.42	20	0.2684	1
5260-5320 (CDD mode)	17.82	0.0606	3.4	20	0.0263	1
5260-5320 (beamforming mode)	13.09	0.0204	9.42	20	0.0355	1
5500-5700	21.67	0.1469	3.5	20	0.0654	1
5745-5825	22.12	0.1628	3.8	20	0.0778	1

NOTE:

- WLAN 2.4GHz:
Directional Gain = $10\log [(10^{G1/20} + 10^{G2/20} + \dots + 10^{Gn/20})^2 / N_{ANT}] = 5.91 \text{ dBi}$
- For RLAN 5GHz UNII-1 and UNII-2A:
IEEE 802.11a mode (CDD mode):
For $N_{ANT} = 4 < 5$,
Direction gain = $G_{ANT} + 0 = 3.4 + 0 = 3.4 \text{ dBi}$.
IEEE 802.11n/ac mode (beamforming mode):
Directional Gain = $G_{ANT} + 10\log (N_{ANT}/N_{SS}) = 3.4 \text{ dBi} + 10\log (4/1) = 9.42 \text{ dBi}$.
- For RLAN 5GHz UNII-2C (CDD mode):
For $N_{ANT} = 2 < 5$,
Direction gain = $G_{ANT} + 0 = 3.5 + 0 = 3.5 \text{ dBi}$.
- For RLAN 5GHz UNII-3 (CDD mode):
For $N_{ANT} = 2 < 5$,
Direction gain = $G_{ANT} + 0 = 3.8 + 0 = 3.8 \text{ dBi}$.

Conclusion:

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4 GHz + RLAN 5 GHz (UNII-1 & UNII-2A) + RLAN 5GHz (UNII-2C & UNII-3)

$= 0.3960 / 1 + 0.2684 / 1 + 0.0778 / 1 = 0.7422$

Therefore the maximum calculations of above situations are less than the "1" limit.