



11 RF EXPOSURE COMPLIANCE

11.1 LIMIT

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

(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.

11.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Jul. 22, 2013
2	Power Meter Sensor	Anritsu	MA2411B	1126001	Jul. 22, 2013

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

11.3 MPE CALCULATION METHOD

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

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

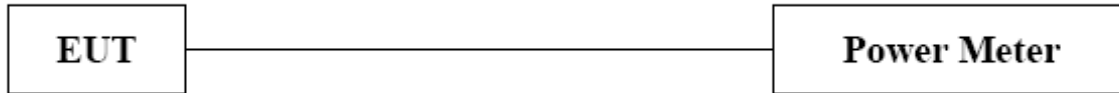
The formula can be changed to

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

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained



11.4 TEST SETUP LAYOUT



11.5 DEVIATION FROM TEST STANDARD

No deviation

11.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

**11.7 TEST RESULTS - 2412-2462 MHZ**

E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11b/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
2412 MHz	2.26	1.6827	16.6400	46.1318	0.015451	1	PASS
2437 MHz	2.26	1.6827	16.2200	41.8794	0.014027	1	PASS
2462 MHz	2.26	1.6827	16.0400	40.1791	0.013457	1	PASS



E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11g/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
2412 MHz	2.26	1.6827	21.3500	136.4583	0.045704	1	PASS
2437 MHz	2.26	1.6827	21.2300	132.7394	0.044458	1	PASS
2462 MHz	2.26	1.6827	20.9800	125.3141	0.041971	1	PASS

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E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11n (20 MHz)/ANT.0/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
2412 MHz	2.26	1.6827	20.0200	100.4616	0.033647	1	PASS
2437 MHz	2.26	1.6827	19.2600	84.3335	0.028246	1	PASS
2462 MHz	2.26	1.6827	19.4500	88.1049	0.029509	1	PASS

**Neutron Engineering Inc.**

E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11n (20 MHz)/ANT.1/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
2412 MHz	1.70	1.4791	20.0500	101.1579	0.029782	1	PASS
2437 MHz	1.70	1.4791	19.3700	86.4968	0.025465	1	PASS
2462 MHz	1.70	1.4791	19.0700	80.7235	0.023766	1	PASS

**Neutron Engineering Inc.**

E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11n (20 MHz)/ANT.Total/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
2412 MHz	3.96	2.4889	23.0453	201.6195	0.099881	1	PASS
2437 MHz	3.96	2.4889	22.3256	170.8303	0.084628	1	PASS
2462 MHz	3.96	2.4889	22.2745	168.8284	0.083636	1	PASS

**Neutron Engineering Inc.**

E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11n (40 MHz)/ANT.0/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
2422 MHz	2.26	1.6827	16.7900	47.7529	0.015994	1	PASS
2437 MHz	2.26	1.6827	16.3200	42.8549	0.014353	1	PASS
2452 MHz	2.26	1.6827	16.4000	43.6516	0.014620	1	PASS



E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11n (40 MHz)/ANT.1/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
2422 MHz	1.70	1.4791	17.1600	51.9996	0.015309	1	PASS
2437 MHz	1.70	1.4791	16.5200	44.8745	0.013211	1	PASS
2452 MHz	1.70	1.4791	16.4700	44.3609	0.013060	1	PASS

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E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11n (40 MHz)/ANT.Total/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
2422 MHz	3.96	2.4889	19.9892	99.7525	0.049417	1	PASS
2437 MHz	3.96	2.4889	19.4315	87.7294	0.043461	1	PASS
2452 MHz	3.96	2.4889	19.4454	88.0124	0.043601	1	PASS

**11.8 TEST RESULTS - 5745-5825 MHZ**

E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11a/5745 MHz, 5785 MHz, 5825 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
5745 MHz	4.95	3.1261	21.0900	128.5287	0.079974	1	PASS
5785 MHz	4.95	3.1261	20.7600	119.1242	0.074123	1	PASS
5825 MHz	4.95	3.1261	20.6500	116.1449	0.072269	1	PASS

**Neutron Engineering Inc.**

E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11n (20 MHz)/ANT.0/5745 MHz, 5785 MHz, 5825 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
5745 MHz	4.29	2.6853	20.9100	123.3105	0.065910	1	PASS
5785 MHz	4.29	2.6853	20.9800	125.3141	0.066981	1	PASS
5825 MHz	4.29	2.6853	20.7000	117.4898	0.062799	1	PASS



E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11n (20 MHz)/ANT.1/5745 MHz, 5785 MHz, 5825 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
5745 MHz	4.95	3.1261	21.3300	135.8313	0.084518	1	PASS
5785 MHz	4.95	3.1261	20.6500	116.1449	0.072269	1	PASS
5825 MHz	4.95	3.1261	20.9500	124.4515	0.077437	1	PASS

**Neutron Engineering Inc.**

E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11n (20 MHz)/ANT.Total/5745 MHz, 5785 MHz, 5825 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
5745 MHz	9.24	8.3946	24.1354	259.1418	0.433000	1	PASS
5785 MHz	9.24	8.3946	23.8284	241.4590	0.403454	1	PASS
5825 MHz	9.24	8.3946	23.8371	241.9412	0.404259	1	PASS



E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11n (40 MHz)/ANT.0/5755 MHz, 5795 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
5755 MHz	4.29	2.6853	20.6600	116.4126	0.062223	1	PASS
5795 MHz	4.29	2.6853	20.4800	111.6863	0.059697	1	PASS



E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11n (40 MHz)/ANT.1/5755 MHz, 5795 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
5755 MHz	4.95	3.1261	20.7600	119.1242	0.074123	1	PASS
5795 MHz	4.95	3.1261	20.2200	105.1962	0.065456	1	PASS

**Neutron Engineering Inc.**

E.U.T	IEEE 802.11a/b/g/n 2x2 Wireless LAN USB Client	Model Name	AP-3001g
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	IEEE 802.11n (40 MHz)/ANT.Total/5755 MHz, 5795 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Result
5755 MHz	9.24	8.3946	23.7206	235.5368	0.393558	1	PASS
5795 MHz	9.24	8.3946	23.3622	216.8825	0.362389	1	PASS