13 RF EXPOSURE COMPLIANCE

13.1 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.

13.2 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.

13.3 MPE CALCULATION METHOD

$$\text{E (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m²)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

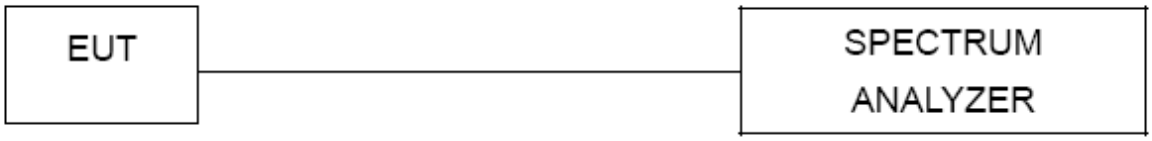
d = Separation distance between radiator and human body (m)

The formula can be changed to

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

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

13.4TEST SETUP LAYOUT



13.5DEVIATION FROM TEST STANDARD

No deviation

13.6EUT 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.

13.7TEST RESULTS - 5180 MHZ TO 5240 MHZ BAND

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/5180 MHz, 5200 MHz, 5240 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5180 MHz	4.95	3.1261	12.2000	16.5959	0.010326	1	PASS
5200 MHz	4.95	3.1261	11.3100	13.5207	0.008413	1	PASS
5240 MHz	4.95	3.1261	10.2700	10.6414	0.006621	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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.0/5180 MHz, 5200 MHz, 5240 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5180 MHz	4.29	2.6853	12.4400	17.5388	0.009375	1	PASS
5200 MHz	4.29	2.6853	12.0800	16.1436	0.008629	1	PASS
5240 MHz	4.29	2.6853	10.7200	11.8032	0.006309	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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.1/5180 MHz, 5200 MHz, 5240 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5180 MHz	4.95	3.1261	12.5500	17.9887	0.011193	1	PASS
5200 MHz	4.95	3.1261	11.9900	15.8125	0.009839	1	PASS
5240 MHz	4.95	3.1261	11.1700	13.0918	0.008146	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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/5180 MHz, 5200 MHz, 5240 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5180 MHz	9.24	8.3946	15.5056	35.5275	0.059363	1	PASS
5200 MHz	9.24	8.3946	15.0455	31.9561	0.053395	1	PASS
5240 MHz	9.24	8.3946	13.9611	24.8950	0.041597	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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.0/5190 MHz, 5230 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5190 MHz	4.29	2.6853	9.6400	9.2045	0.004920	1	PASS
5230 MHz	4.29	2.6853	8.3000	6.7608	0.003614	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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.1/5190 MHz, 5230 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5190 MHz	4.95	3.1261	9.6000	9.1201	0.005675	1	PASS
5230 MHz	4.95	3.1261	8.6400	7.3114	0.004549	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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/5190 MHz, 5230 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5190 MHz	9.24	8.3946	12.6303	18.3246	0.030619	1	PASS
5230 MHz	9.24	8.3946	11.4836	14.0722	0.023513	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

13.8TEST RESULTS - 5260 MHZ TO 5320 MHZ BAND

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/5260 MHz, 5300 MHz, 5320 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5260 MHz	4.95	3.1261	10.8200	12.0781	0.007515	1	PASS
5300 MHz	4.95	3.1261	12.0200	15.9221	0.009907	1	PASS
5320 MHz	4.95	3.1261	12.0000	15.8489	0.009862	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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.0/5260 MHz, 5300 MHz, 5320 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5260 MHz	4.29	2.6853	11.4000	13.8038	0.007378	1	PASS
5300 MHz	4.29	2.6853	11.7400	14.9279	0.007979	1	PASS
5320 MHz	4.29	2.6853	11.9500	15.6675	0.008374	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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.1/5260 MHz, 5300 MHz, 5320 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5260 MHz	4.95	3.1261	11.6100	14.4877	0.009015	1	PASS
5300 MHz	4.95	3.1261	11.5800	14.3880	0.008953	1	PASS
5320 MHz	4.95	3.1261	12.2100	16.6341	0.010350	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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/5260 MHz, 5300 MHz, 5320 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5260 MHz	9.24	8.3946	14.5166	28.2916	0.047272	1	PASS
5300 MHz	9.24	8.3946	14.6710	29.3159	0.048984	1	PASS
5320 MHz	9.24	8.3946	15.0922	32.3016	0.053973	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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.0/5270 MHz, 5310 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5270 MHz	4.29	2.6853	9.2200	8.3560	0.004466	1	PASS
5310 MHz	4.29	2.6853	9.6300	9.1833	0.004909	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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.1/5270 MHz, 5310 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5270 MHz	4.95	3.1261	9.7100	9.3541	0.005820	1	PASS
5310 MHz	4.95	3.1261	9.6100	9.1411	0.005688	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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/5270 MHz, 5310 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5270 MHz	9.24	8.3946	12.4822	17.7101	0.029592	1	PASS
5310 MHz	9.24	8.3946	12.6303	18.3245	0.030618	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

13.9TEST RESULTS - 5500 MHZ TO 5700 MHZ BAND

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/5500 MHz, 5580 MHz, 5700 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5500 MHz	4.95	3.1261	11.1100	12.9122	0.008034	1	PASS
5580 MHz	4.95	3.1261	11.0900	12.8529	0.007997	1	PASS
5700 MHz	4.95	3.1261	11.5900	14.4212	0.008973	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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.0/5500 MHz, 5580 MHz, 5700 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5500 MHz	4.29	2.6853	11.1200	12.9420	0.006918	1	PASS
5580 MHz	4.29	2.6853	10.7900	11.9950	0.006411	1	PASS
5700 MHz	4.29	2.6853	11.7900	15.1008	0.008071	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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.1/5500 MHz, 5580 MHz, 5700 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5500 MHz	4.95	3.1261	11.4500	13.9637	0.008689	1	PASS
5580 MHz	4.95	3.1261	10.8100	12.0504	0.007498	1	PASS
5700 MHz	4.95	3.1261	11.5000	14.1254	0.008789	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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/5500 MHz, 5580 MHz, 5700 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5500 MHz	9.24	8.3946	14.2984	26.9056	0.044957	1	PASS
5580 MHz	9.24	8.3946	13.8103	24.0454	0.040177	1	PASS
5700 MHz	9.24	8.3946	14.6577	29.2262	0.048834	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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.0/5510 MHz, 5550 MHz, 5670 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5510 MHz	4.29	2.6853	8.9100	7.7804	0.004159	1	PASS
5550 MHz	4.29	2.6853	8.9600	7.8705	0.004207	1	PASS
5670 MHz	4.29	2.6853	8.1700	6.5615	0.003507	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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.1/5510 MHz, 5550 MHz, 5670 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5510 MHz	4.95	3.1261	8.6400	7.3114	0.004549	1	PASS
5550 MHz	4.95	3.1261	8.9400	7.8343	0.004875	1	PASS
5670 MHz	4.95	3.1261	8.1800	6.5766	0.004092	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.

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/5510 MHz, 5550 MHz, 5670 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
5510 MHz	9.24	8.3946	11.7874	15.0918	0.025217	1	PASS
5550 MHz	9.24	8.3946	11.9603	15.7048	0.026241	1	PASS
5670 MHz	9.24	8.3946	11.1853	13.1380	0.021952	1	PASS

NOTE: The MIMO test requirement, MPE shall measure by using the total sum power of each transmitter chain.