11 RF EXPOSURE COMPLIANCE

11.1LIMIT

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.

11.2MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Feb,20,2013
2	Power Meter Sensor	Anritsu	MA2411B	1126001	Feb,20,2013

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

11.3MPE CALCULATION METHOD

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

E = Electric field (V/m)

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

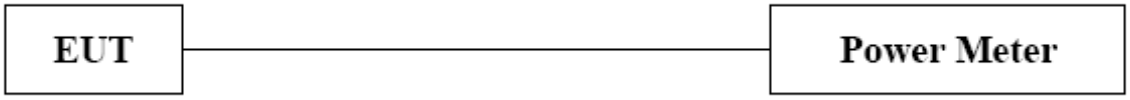
d = Separation distance between radiator and human body (m)

The formula can be changed to

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

11.4TEST SETUP LAYOUT



11.5DEVIATION FROM TEST STANDARD

No deviation

11.6EUT 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.

11.7TEST RESULTS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
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)	Limit of Power Density (S)	Result
2412 MHz	5.00	3.1623	19.7100	93.5406	0.058878	1	PASS
2437 MHz	5.00	3.1623	19.7500	94.4061	0.059422	1	PASS
2462 MHz	5.00	3.1623	19.9900	99.7700	0.062799	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
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)	Limit of Power Density (S)	Result
2412 MHz	5.00	3.1623	24.3000	269.1535	0.169414	1	PASS
2437 MHz	5.00	3.1623	23.4500	221.3095	0.139300	1	PASS
2462 MHz	5.00	3.1623	21.7000	147.9108	0.093100	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
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)	Limit of Power Density (S)	Result
2412 MHz	5.00	3.1623	23.6700	232.8091	0.146538	1	PASS
2437 MHz	5.00	3.1623	22.8200	191.4256	0.120490	1	PASS
2462 MHz	5.00	3.1623	21.8300	152.4053	0.095929	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.2/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S)	Limit of Power Density (S)	Result
2412 MHz	5.00	3.1623	23.6600	232.2737	0.146201	1	PASS
2437 MHz	5.00	3.1623	22.8700	193.6422	0.121885	1	PASS
2462 MHz	5.00	3.1623	21.3200	135.5189	0.085300	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
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)	Limit of Power Density (S)	Result
2412 MHz	10.00	10.0000	26.6753	465.0828	0.925722	1	PASS
2437 MHz	10.00	10.0000	25.8554	385.0678	0.766457	1	PASS
2462 MHz	10.00	10.0000	24.5928	287.9242	0.573098	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
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)	Limit of Power Density (S)	Result
2422 MHz	5.00	3.1623	21.4000	138.0384	0.086886	1	PASS
2437 MHz	5.00	3.1623	21.8700	153.8155	0.096817	1	PASS
2452 MHz	5.00	3.1623	19.2000	83.1764	0.052354	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.2/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S)	Limit of Power Density (S)	Result
2422 MHz	5.00	3.1623	20.9900	125.6030	0.079059	1	PASS
2437 MHz	5.00	3.1623	21.5700	143.5489	0.090355	1	PASS
2452 MHz	5.00	3.1623	19.0000	79.4328	0.049998	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
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)	Limit of Power Density (S)	Result
2422 MHz	10.00	10.0000	24.2101	263.6414	0.524764	1	PASS
2437 MHz	10.00	10.0000	24.7329	297.3644	0.591888	1	PASS
2452 MHz	10.00	10.0000	22.1115	162.6092	0.323665	1	PASS