

RF Exposure Evaluation declaration

Product Name : 802.11 a/b/g/n, 2.4G/5G 3T3R Wireless Module

Model No. : WN6508A

FCC ID : PPQ-WN6508A

Applicant : LITE-ON TECHNOLOGY CORP.

Address : 4F, 90, Chien 1 Road, Chung Ho, Taipei Hsien 235, Taiwan, R.O.C.

Date of Receipt : June 01., 2012

Date of Declaration : June 14, 2012

Report No. : 126112R-RFUSP42V01

The declaration results relate only to the samples calculated.

The declaration shall not be reproduced except in full without the written approval of Quietek Corporation.

This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

1. RF Exposure Evaluation

1.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

Product : 802.11 a/b/g/n, 2.4G/5G 3T3R Wireless Module
 Test Item : RF Exposure Evaluation
 Test Site : No.3 OATS

802.11b (1Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance_20cm (2.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1	2412.00	190.9853	0.062335
6	2437.00	185.7804	0.060636
11	2462.00	170.2159	0.055556

The RF exposure at 20 cm is below limit.

802.11g (6Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance_20cm (2.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1	2412.00	307.6097	0.100399
6	2437.00	368.1290	0.120152
11	2462.00	265.4606	0.086642

The RF exposure at 20 cm is below limit.

802.11a (6Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance_20cm (3dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
149	5745.00	208.4491	0.082743
157	5785.00	196.7886	0.078114
165	5825.00	183.6538	0.072901

The RF exposure at 20 cm is below limit.

802.11n-20MHz_21.7Mbps - 2.4G Band
Output Power Into Antenna & RF Exposure Evaluation Distance_20cm (2.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
01	2412.00	625.1727	0.204047
06	2437.00	719.4490	0.234818
11	2462.00	532.1083	0.173672

The RF exposure at 20 cm is below limit.

802.11n-40MHz_45Mbps - 2.4G Band
Output Power Into Antenna & RF Exposure Evaluation Distance_20cm (2.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
03	2422.00	538.2698	0.175683
06	2437.00	724.4360	0.236445
09	2452.00	409.2607	0.133577

The RF exposure at 20 cm is below limit.

802.11n-20MHz_21.7Mbps - 5G Band
Output Power Into Antenna & RF Exposure Evaluation Distance_20cm (3dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
149	5745.00	534.5644	0.212193
157	5785.00	503.5006	0.199862
165	5825.00	511.6818	0.203110

The RF exposure at 20 cm is below limit.

802.11n-40MHz_45Mbps - 5G Band
Output Power Into Antenna & RF Exposure Evaluation Distance_20cm (3dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
151	5755.00	524.8075	0.208320
159	5795.00	503.5006	0.199862

The RF exposure at 20 cm is below limit.

802.11a (6Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance_20cm (3dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
36	5180.00	23.0144	0.009135
44	5220.00	26.4241	0.010489
48	5240.00	27.6058	0.010958
52	5260.00	66.0693	0.026226
60	5300.00	68.0769	0.027023
64	5320.00	63.5331	0.025219
100	5500.00	44.5656	0.017690
120	5600.00	51.5229	0.020452
140	5700.00	47.2063	0.018738

The RF exposure at 20 cm is below limit.

802.11n-20MHz_21.7Mbps
Output Power Into Antenna & RF Exposure Evaluation Distance_20cm (3dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
36	5180.00	36.4754	0.014479
44	5220.00	37.0681	0.014714
48	5240.00	34.6737	0.013764
52	5260.00	161.0646	0.063934
60	5300.00	158.4893	0.062912
64	5320.00	89.5365	0.035541
100	5500.00	103.2761	0.040995
120	5600.00	142.5608	0.056589
140	5700.00	146.8926	0.058308

The RF exposure at 20 cm is below limit.

802.11n-40MHz_45Mbps**Output Power Into Antenna & RF Exposure Evaluation Distance_20cm (3dBi):**

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
38	5190.00	30.8319	0.012239
46	5230.00	34.6737	0.013764
54	5270.00	135.2073	0.053670
62	5310.00	37.2392	0.014782
102	5510.00	40.7380	0.016171
118	5590.00	110.4079	0.043826
134	5670.00	122.4616	0.048611

The RF exposure at 20 cm is below limit.