

RF Exposure Evaluation declaration

Product Name	Intel® Centrino® Ultimate-N 6300
Model No.	633ANHMW
FCC ID	PD9633ANH

Applicant	Intel Corporation
Address	100 Center Point Circle Suite 200 Columbia, SC 29210

Date of Receipt	Oct. 13, 2011
Date of Declaration	Dec. 15, 2011
Report No.	11A219R-RFUSP42V01

The declaration results relate only to the samples calculated.

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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: 23°C and 65% RH.

1.3. Test Result of RF Exposure Evaluation

Product : Intel® Centrino® Ultimate-N 6300
 Test Item : RF Exposure Evaluation
 Test Site : No.3 OATS

802.11b (1Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (-1.65Bi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1	2412.00	76.2079	0.010369
6	2437.00	73.4514	0.009994
11	2462.00	73.9605	0.010063

The RF exposure at 20 cm is below limit.

802.11g (6Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (-1.65dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1	2412.00	304.7895	0.041470
6	2437.00	169.4338	0.023053
11	2462.00	142.2329	0.019352

The RF exposure at 20 cm is below limit.

802.11a (6Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (-0.8dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
149	5745.00	135.8313	0.022477
157	5785.00	132.1296	0.021864
165	5825.00	133.6596	0.022117

The RF exposure at 20 cm is below limit.

802.11n-20MHz_14.4Mbps - 2.4G Band
Output Power Into Antenna & RF Exposure Evaluation Distance (-1.65 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1	2412.00	247.7422	0.033708
6	2437.00	348.3373	0.047395
11	2462.00	260.0160	0.035378

The RF exposure at 20 cm is below limit.

802.11n-40MHz_30Mbps - 2.4G Band
Output Power Into Antenna & RF Exposure Evaluation Distance (-1.65 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
03	2422.00	138.3566	0.018825
06	2437.00	338.0648	0.045997
09	2452.00	146.2177	0.019894

The RF exposure at 20 cm is below limit.

802.11n-20MHz_14.4Mbps - 5G Band
Output Power Into Antenna & RF Exposure Evaluation Distance (-0.8 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
149	5745.00	267.3006	0.044231
157	5785.00	249.4595	0.041279
165	5825.00	248.8857	0.041184

The RF exposure at 20 cm is below limit.

802.11n-40MHz_30Mbps - 5G Band
Output Power Into Antenna & RF Exposure Evaluation Distance (-0.8 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
151	5755.00	280.5434	0.046423
159	5795.00	277.9713	0.045997

The RF exposure at 20 cm is below limit.

802.11a (6Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (0.25 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
36	5180.00	43.8531	0.009241
44	5220.00	45.0817	0.009500
48	5240.00	47.6431	0.010040

The RF exposure at 20 cm is below limit.

802.11a (6Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (0.25dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
52	5260.00	44.7713	0.009435
60	5300.00	46.0257	0.009699
64	5320.00	47.0977	0.009925

The RF exposure at 20 cm is below limit.

802.11a (6Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (0.12 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
100	5500.00	45.6037	0.009327
120	5600.00	45.1856	0.009241
140	5700.00	45.0817	0.009220

The RF exposure at 20 cm is below limit.

802.11n-20MHz_14.4Mbps
Output Power Into Antenna & RF Exposure Evaluation Distance (0.25 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
36	5180.00	44.0555	0.009284
44	5220.00	44.7713	0.009435
48	5240.00	45.6037	0.009610

The RF exposure at 20 cm is below limit.

802.11n-20MHz_14.4Mbps
Output Power Into Antenna & RF Exposure Evaluation Distance (0.25 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
52	5260.00	46.2381	0.009744
60	5300.00	44.4631	0.009370
64	5320.00	43.3511	0.009135

The RF exposure at 20 cm is below limit.

802.11n-20MHz_14.4Mbps
802.11a (6Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (0.12 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
100	5500.00	44.0555	0.009010
120	5600.00	44.7713	0.009157
140	5700.00	45.7088	0.009348

The RF exposure at 20 cm is below limit.

802.11n-40MHz_30Mbps
Output Power Into Antenna & RF Exposure Evaluation Distance (0.25 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
38	5190.00	45.0817	0.009500
46	5230.00	44.9780	0.009478

The RF exposure at 20 cm is below limit.

802.11n-40MHz_30Mbps
Output Power Into Antenna & RF Exposure Evaluation Distance (0.25 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
54	5270.00	44.8745	0.009457
62	5310.00	46.3447	0.009766

The RF exposure at 20 cm is below limit.

802.11n-40MHz_30Mbps**802.11a (6Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (0.12 dBi):**

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
102	5510.00	45.0817	0.009220
118	5590.00	45.0817	0.009220
134	5670.00	44.8745	0.009178

The RF exposure at 20 cm is below limit.