RF EXPOSURE EVALUATION

EUT Specification

EUT	LED Desktop Whiteboard
Model Number	NTR180-1
FCC ID	2BCD4-NTR180
Antenna gain (Max)	2dBi
Operation Frequency	2412 MHz to 2462 MHz
Input Rating	DC 5V
Max. output power	IEEE 802.11b: 15.43dBm IEEE 802.11g: 13.59dBm IEEE 802.11n-HT20: 13.48dBm IEEE 802.11n-HT40: 13.22dBm

Test Requirement:

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
(A) Limits for Occupational/Control Exposures				
300-1500	**--**	**--**	**F/300**	**6**
1500-100000	**--**	**--**	**5**	**6**
(B) Limits for General Population/Uncontrol Exposures				
300-1500	**--**	**--**	**F/1500**	**6**
1500-100000	**--**	**--**	**1**	**30**

11.1 Friis transmission formula: $Pd= (Pout*G)\ (4*pi*R^2)$

Where

Pd= Power density in mW/cm^2

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.1416

R= distance between observation point and center of the radiator in cm=20cm

Pd the limit of MPE, 1mW/cm^2. If we know the maximum gain of the nd total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

11.2 Measurement Result

Antenna gain: 2dBi

WIFI:

Mode	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain （Numeric）	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
802.11b	2412	15.43	15±1	16	1.585	0.012553	1
	2437	14.96	15±1	16	1.585	0.012553	1
	2462	14.4	14±1	15	1.585	0.009972	1
802.11g	2412	13.59	14±1	15	1.585	0.009972	1
	2437	13.31	13±1	14	1.585	0.007921	1
	2462	12.52	13±1	14	1.585	0.007921	1
802.11n HT20	2412	13.48	13±1	14	1.585	0.007921	1
	2437	13.35	13±1	14	1.585	0.007921	1
	2462	12.49	12±1	13	1.585	0.006292	1
802.11n HT40	2422	13.22	13±1	14	1.585	0.007921	1
	2437	12.66	13±1	14	1.585	0.007921	1
	2452	11.93	12±1	13	1.585	0.006292	1

Signature:

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