

RF Exposure Report

FCC ID: X3X-MAO2

Applicant: ELMO COMPANY, LIMITED

Exposure category: General population/uncontrolled environment

EUT Type: Stand alone

Device Type: OverHeadProjector

Refer Standard: FCC Part 2.1091: Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands)

FCC MPE Limited:

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm2)	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

Test Data

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Antenna Gain information

2.4GHz Antenna Max. Gain0: 5.22dBi

5GHz Antenna Max. Gain1: 5.41dBi

Conducted Output Power (dBm)

U-NII-1 AVGSA Output Power			
Mode	Test Frequency (MHz)	Max Conducted Output Power (dBm)	Maximum Tune Up tolerance
802.11n (20MHz)	5180	11.82	12±1dBm
802.11n (20MHz)	5220	11.43	12±1dBm
802.11n (20MHz)	5240	11.77	12±1dBm
802.11n (40MHz)	5190	11.50	12±1dBm
802.11n (40MHz)	5230	12.31	12±1dBm
802.11a (20MHz)	5180	12.92	12±1dBm
802.11a (20MHz)	5220	12.24	12±1dBm
802.11a (20MHz)	5240	12.13	12±1dBm

U-NII-2a AVGSA Output Power			
Mode	Test Frequency (MHz)	Max Conducted Output Power (dBm)	Maximum Tune Up tolerance
802.11n (20MHz)	5260	12.80	12±1dBm
802.11n (20MHz)	5300	12.93	12±1dBm
802.11n (20MHz)	5320	12.81	12±1dBm
802.11n (40MHz)	5270	16.08	16±1dBm
802.11n (40MHz)	5310	15.80	16±1dBm
802.11a (20MHz)	5260	12.85	13±1dBm
802.11a (20MHz)	5300	13.18	13±1dBm
802.11a (20MHz)	5320	13.14	13±1dBm

U-NII-2c AVGSA Output Power			
Mode	Test Frequency (MHz)	Max Conducted Output Power (dBm)	Maximum Tune Up tolarence
802.11n (20MHz)	5500	11.21	12±1dBm
802.11n (20MHz)	5600	12.55	12±1dBm
802.11n (20MHz)	5700	12.71	12±1dBm
802.11n (40MHz)	5510	10.78	11±1dBm
802.11n (40MHz)	5590	12.58	12±1dBm
802.11n (40MHz)	5670	12.58	12±1dBm
802.11a (20MHz)	5500	11.15	11±1dBm
802.11a (20MHz)	5600	12.43	12±1dBm
802.11a (20MHz)	5700	12.69	12±1dBm

Conducted Output Peak Power			
Mode	Test Frequency (MHz)	Max Conducted Output Power (dBm)	Maximum Tune Up tolerance
802.11b	2412	15.87	16±1dBm
802.11b	2437	15.91	16±1dBm
802.11b	2462	16.37	16±1dBm
802.11g	2412	13.79	14±1dBm
802.11g	2437	14.00	14±1dBm
802.11g	2462	13.76	14±1dBm
802.11n (HT20)	2412	13.73	14±1dBm
802.11n (HT20)	2437	14.06	14±1dBm
802.11n (HT20)	2462	14.08	14±1dBm
802.11n (HT40)	2422	13.59	13±1dBm
802.11n (HT40)	2437	13.35	13±1dBm
802.11n (HT40)	2452	13.73	13±1dBm

Calculation results (for 2.4G WIFI): Worst-case mode

Frequency (MHz)	Maximum tune up power(dBm)	RF distance(cm)	Result (mW/cm2)	Limit (mW/cm2)
2412	17	20	0.033	1.0
2437	17	20	0.033	
2462	17	20	0.033	

Calculation results (for 5.2G WIFI band U-NII-1): Worst-Case mode

Mode	Frequency (MHz)	Maximum tune up power(dBm)	RF distance(cm)	Result (mW/cm2)	Limit (mW/cm2)
20MHz	5180	13	20	0.014	1.0
	5220	13	20	0.014	
	5240	13	20	0.014	
40MHz	5190	13	20	0.014	
	5230	13	20	0.014	

Calculation results (for 5.3G WIFI band U-NII-2A): Worst-Case mode

Mode	Frequency (MHz)	Maximum tune up power(dBm)	RF distance(cm)	Result (mW/cm2)	Limit (mW/cm2)
20MHz	5260	14	20	0.017	1.0
	5300	14	20	0.017	
	5320	14	20	0.017	
40MHz	5270	17	20	0.035	
	5310	17	20	0.035	

Calculation results (for 5.6G WIFI band U-NII-2C): Worst-Case mode

Mode	Frequency (MHz)	Maximum tune up power(dBm)	RF distance(cm)	Result (mW/cm2)	Limit (mW/cm2)
20MHz	5500	13	20	0.014	1.0
	5600	13	20	0.014	
	5700	13	20	0.014	
40MHz	5510	12	20	0.011	
	5590	13	20	0.014	
	5670	13	20	0.014	

Note: 2.4GHz WLAN and 5GHz WLAN cannot transmit at the same time.

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