# RF Exposure Report

**FCC ID**: X3XL-12W

**Applicant:** ELMO Company, Limited

Exposure category: General population/uncontrolled environment

EUT Type: Stand alone

Device Type: Overhead projector

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/f2) | 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 tolorence |
| 802.11n (20MHz) | 5180 | 12.34 | 12±1dBm |
| 802.11n (20MHz) | 5220 | 12.31 | 12±1dBm |
| 802.11n (20MHz) | 5240 | 12.17 | 12±1dBm |
| 802.11n (40MHz) | 5190 | 12.07 | 12±1dBm |
| 802.11n (40MHz) | 5230 | 12.40 | 12±1dBm |
| 802.11a (20MHz) | 5180 | 15.93 | 16±1dBm |
| 802.11a (20MHz) | 5220 | 16.29 | 16±1dBm |
| 802.11a (20MHz) | 5240 | 16.50 | 16±1dBm |

| U-NII-2a AVGSA Output Power | | | |
|---|---|---|---|
| Mode | Test Frequency (MHz) | Max Conducted Output Power (dBm) | Maximum Tune Up tolorence |
| 802.11n (20MHz) | 5260 | 12.25 | 12±1dBm |
| 802.11n (20MHz) | 5300 | 11.83 | 12±1dBm |
| 802.11n (20MHz) | 5320 | 11.30 | 12±1dBm |
| 802.11n (40MHz) | 5270 | 11.95 | 12±1dBm |
| 802.11n (40MHz) | 5310 | 11.49 | 12±1dBm |
| 802.11a (20MHz) | 5260 | 16.31 | 16±1dBm |
| 802.11a (20MHz) | 5300 | 16.01 | 16±1dBm |
| 802.11a (20MHz) | 5320 | 15.37 | 16±1dBm |

| U-NII-2c AVGSA Output Power | | | |
|---|---|---|---|
| Mode | Test Frequency (MHz) | Max Conducted Output Power (dBm) | Maximum Tune Up tolorence |
| 802.11n (20MHz) | 5500 | 11.86 | 12±1dBm |
| 802.11n (20MHz) | 5600 | 12.72 | 12±1dBm |
| 802.11n (20MHz) | 5700 | 12.87 | 12±1dBm |
| 802.11n (40MHz) | 5510 | 11.24 | 12±1dBm |
| 802.11n (40MHz) | 5590 | 12.28 | 12±1dBm |
| 802.11n (40MHz) | 5670 | 12.77 | 16±1dBm |
| 802.11a (20MHz) | 5500 | 15.83 | 16±1dBm |
| 802.11a (20MHz) | 5600 | 16.35 | 16±1dBm |
| 802.11a (20MHz) | 5700 | 16.25 | 16±1dBm |

| 2.4G Conducted Output Peak Power | | | |
|---|---|---|---|
| Mode | Test Frequency (MHz) | Max Conducted Output Power (dBm) | Maximum Tune Up tolorence |
| 802.11b | 2412 | 15.97 | 16±1dBm |
| 802.11b | 2437 | 16.20 | 16±1dBm |
| 802.11b | 2462 | 16.48 | 16±1dBm |
| 802.11g | 2412 | 12.81 | 13±1dBm |
| 802.11g | 2437 | 13.98 | 13±1dBm |
| 802.11g | 2462 | 13.23 | 13±1dBm |
| 802.11n (HT20) | 2412 | 12.88 | 13±1dBm |
| 802.11n (HT20) | 2437 | 13.26 | 13±1dBm |
| 802.11n (HT20) | 2462 | 13.28 | 13±1dBm |
| 802.11n (HT40) | 2422 | 10.51 | 10±1dBm |
| 802.11n (HT40) | 2437 | 10.06 | 10±1dBm |
| 802.11n (HT40) | 2452 | 10.66 | 10±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 | 17 | 20 | 0.035 | 1.0 |
| | 5220 | 17 | 20 | 0.035 | |
| | 5240 | 17 | 20 | 0.035 | |
| 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 | 17 | 20 | 0.035 | 1.0 |
| | 5300 | 17 | 20 | 0.035 | |
| | 5320 | 17 | 20 | 0.035 | |
| 40MHz | 5270 | 13 | 20 | 0.014 | |
| | 5310 | 13 | 20 | 0.014 | |

**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 | 17 | 20 | 0.035 | 1.0 |
| | 5600 | 17 | 20 | 0.035 | |
| | 5700 | 17 | 20 | 0.035 | |
| 40MHz | 5510 | 13 | 20 | 0.014 | |
| | 5590 | 13 | 20 | 0.014 | |
| | 5670 | 13 | 20 | 0.014 | |

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

2.4GHz Antenna Max. Gain0: 5.22dBi

5GHz Antenna Max. Gain1: 5.41dBi