**Report No.:** T181016E01-MF

# IEEE C95.1 2005
# KDB 447498 D01 V06
# 47 C.F.R. Part 1, Subpart I, Section 1.1310
# 47 C.F.R. Part 2, Subpart J, Section 2.1091

# RF EXPOSURE REPORT

## For

## NearSky 360

## Model: NS360V2

## Trade Name: CIMCON

*Issued to*

**CIMCON Lighting, Inc.**
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*Issued by*

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**Issue Date: April 23, 2019**

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# Revision History

| Rev. | Issue Date | Revisions | Effect Page | Revised By |
|---|---|---|---|---|
| 00 | April 9, 2019 | Initial Issue | ALL | Becca Chen |
| 01 | April 23, 2019 | Added BT function. | P4, P5, P7 | Becca Chen |

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# 1. LIMIT

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

# 2. EUT SPECIFICATION

| | |
|---|---|
| **EUT** | NearSky 360 |
| **Model** | NS360V2 |
| **Model Discrepancy** | N/A |
| **RF Module** | TIWI-BLE |
| **Frequency band (Operating)** | ☒ 802.11b/g/n HT 20: 2.412GHz ~ 2.462GHz<br>☒ Bluetooth 2.1 + EDR: 2402 ~ 2480 MHz<br>☒ Bluetooth 4.0: 2402 ~ 2480 MHz<br>☐ Others |
| **Device category** | ☐ Portable (<20cm separation)<br>☒ Mobile (>20cm separation)<br>☐ Others |
| **Exposure classification** | ☐ Occupational/Controlled exposure (S = 5mW/cm$^2$)<br>☒ General Population/Uncontrolled exposure (S=1mW/cm$^2$) |
| **Antenna Specification** | Dipole Antenna：taoglas / FXP.830.07.0100C<br>2.4GHz:<br>Antenna Gain : 3.32 dBi (Numeric gain: 2.15) |
| **Tune-up max. average power** | IEEE 802.11b Mode: 18.13 dBm (65.013 mW)<br>IEEE 802.11g Mode: 16.37 dBm (43.351 mW)<br>IEEE 802.11n HT 20 Mode: 12.20 dBm (16.596 mW)<br>Bluetooth 2.1 + EDR: 8.25 dBm (6.683 mW)<br>Bluetooth 4.0: 8.35 dBm (6.839 mW) |

| | |
|---|---|
| **Maximum Tune up Power** | IEEE 802.11b Mode: 19.00 dBm (79.433 mW)<br>IEEE 802.11g Mode: 17.00 dBm (50.119 mW)<br>IEEE 802.11n HT 20 Mode: 13.00 dBm (19.953 mW)<br>Bluetooth 2.1 + EDR: 9.00 dBm (7.943 mW)<br>Bluetooth 4.0: 9.00 dBm (7.943 mW) |
| **Evaluation applied** | ☒ MPE Evaluation*<br>☐ SAR Evaluation<br>☐ N/A |

# 3. TEST RESULTS

## No non-compliance noted.

**Calculation**

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

*Where E = Field strength in Volts / meter*
*P = Power in Watts*
*G = Numeric antenna gain*
*d = Distance in meters*
*S = Power density in milliwatts / square centimeter*

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377 d^2}$$

Changing to units of mW and cm, using:

*P (mW) = P (W) / 1000 and*

*d (cm) = d(m) / 100*

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***Equation 1***

*Where d = Distance in cm*
*P = Power in mW*
*G = Numeric antenna gain*
*S = Power density in mW / cm²*

# 4. MAXIMUM PERMISSIBLE EXPOSURE

Substituting the MPE safe distance using d = 20 cm into Equation 1:

$$S = 0.000199 \times P \times G$$

*Where* *P = Power in mW*

*G = Numeric antenna gain*

*S = Power density in mW / cm²*

**IEEE 802.11b mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / $cm^2$ | Limit (mW/cm2) |
|---|---|---|---|---|---|---|
| 1 | 2412 | 79.433 | 2.15 | 20 | 0.0340 | 1 |

**IEEE 802.11g mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / $cm^2$ | Limit (mW/cm2) |
|---|---|---|---|---|---|---|
| 6 | 2437 | 50.119 | 2.15 | 20 | 0.0214 | 1 |

**IEEE 802.11n HT 20 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / $cm^2$ | Limit (mW/cm2) |
|---|---|---|---|---|---|---|
| 11 | 2462 | 19.953 | 2.15 | 20 | 0.0085 | 1 |

**Bluetooth 2.1 + EDR:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / $cm^2$ | Limit (mW/cm2) |
|---|---|---|---|---|---|---|
| 0 | 2402 | 7.943 | 2.15 | 20 | 0.0034 | 1 |

**Bluetooth 4.0 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / $cm^2$ | Limit (mW/cm2) |
|---|---|---|---|---|---|---|
| 0 | 2402 | 7.943 | 2.15 | 20 | 0.0034 | 1 |