



## Maximum Permissible Exposure

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**FCC ID:** 2AHU2NCSP3DC

**APPLICANT:** ASA Electronics Shenzhen Limited

**Application Type:** Certification

**Product:** NCSP3 Display Commander

**Model No.:** NCSP3DC

**Trademark:** iN • Command

**FCC Rule Part(s):** Part 2.1091 (Mobile)

**Test Date:** September 8, 2020 ~ September 24, 2020

**Reviewed By**

: 

( Paddy Chen )

**Approved By**

: 

( Chenz Ker )



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Taiwan) Co., Ltd.

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### Revision History

| Report No.    | Version | Description     | Issue Date |
|---------------|---------|-----------------|------------|
| 2009TW5501-U4 | 1.0     | Original Report | 2020-10-05 |

## 1. PRODUCT INFORMATION

### 1.1. Equipment Description

|                       |                                                                                                              |
|-----------------------|--------------------------------------------------------------------------------------------------------------|
| Product Name          | NCSP3 Display Commander                                                                                      |
| Model No.             | NCSP3DC                                                                                                      |
| Trademark             | iN • Command                                                                                                 |
| Supports Radios Spec. | 2.4G: 802.11b/g/n-20 (1TX/1RX)<br>Bluetooth Dual Mode: V4.2                                                  |
| Operating Frequency   | <u><b>2.4GHz-WIFI:</b></u><br>For 802.11b/g/n-HT20: 2412 ~ 2462 MHz<br><u><b>BT:</b></u><br>For 2402~2480MHz |
| Type of modulation    | BT/BLE: GFSK<br>2.4G WIFI: 802.11b: DSSS, DBPSK, DQPSK, CCK<br>802.11g/n-20M: OFDM, BPSK, QPSK, 16QAM, 64QAM |

### 1.2. Antenna Description

| No. | Manufacturer                   | Part No.      | Antenna Type | Peak Gain |
|-----|--------------------------------|---------------|--------------|-----------|
| 1   | Master Wave Technology Co.,Ltd | CL-1105-03-1R | PCB          | 4.6dBi    |

## 2. Maximum Permissible Exposure(MPE)

### 2.1. 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<br>(MHz)                                  | Electric Field<br>Strength (V/m) | Magnetic Field<br>Strength (A/m) | Power Density<br>(mW/cm <sup>2</sup> ) | Average Time<br>(Minutes) |
|-----------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------------|---------------------------|
| (A) Limits for Occupational/ Control Exposures            |                                  |                                  |                                        |                           |
| 0.3-3.0                                                   | 614                              | 1.63                             | *100                                   | 6                         |
| 3.0-30                                                    | 1842/f                           | 4.89/f                           | *900/f <sup>2</sup>                    | 6                         |
| 30-300                                                    | 61.4                             | 0.163                            | 1.0                                    | 6                         |
| 300-1500                                                  | --                               | --                               | f/300                                  | 6                         |
| 1500-100,000                                              | --                               | --                               | 5                                      | 6                         |
| (B) Limits for General Population/ Uncontrolled Exposures |                                  |                                  |                                        |                           |
| 0.3-1.4                                                   | 614                              | 1.63                             | *100                                   | 30                        |
| 1.34-30                                                   | 824/f                            | 2.19/f                           | *180/f <sup>2</sup>                    | 30                        |
| 30-300                                                    | 27.5                             | 0.073                            | 0.2                                    | 30                        |
| 300-1500                                                  | --                               | --                               | f/1500                                 | 30                        |
| 1500-100,000                                              | --                               | --                               | 1.0                                    | 30                        |

Note : (1) f= Frequency in MHz , (2) \* = Plane-wave equivalent power density

Calculation Formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 3.1416

$r$  = distance between observation point and center of the radiator in cm

Under normal use condition, is at least 20cm away from the body of the user .

So, this device is classified as **Mobile Device**.

## 2.2. Test Result

| Frequency Band (MHz) | Output Power (dBm) | Output Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|----------------------|--------------------|-------------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2412 ~ 2462          | 24.13              | 258.8213          | 4.6                | 20            | 0.1485                              | 1                           |
| 2402 ~ 2480          | 3.85               | 2.4266            | 4.6                | 20            | 0.0014                              | 1                           |

### Conclusion :

$$CPD1/LPD1 + CPD2/LPD2 + \dots + CPDN/LPDN \leq 1$$

CPD : Calculation Power Density

LPD : Limit of Power Density

| Mode | Power Density | Limit | Conclusion | Result ( $\leq 1$ ) |
|------|---------------|-------|------------|---------------------|
| BT   | 0.1485        | 1     | 0.1625     | Pass                |
| WIFI | 0.0014        | 1     |            |                     |

Therefore, the maximum calculations are less than the “1” limit. Complies with FCC radiation exposure requirement specified in the FCC Rule 2.1091.

\_\_\_\_\_ The End \_\_\_\_\_