

# RF Exposure Evaluation

Report No. : ESTRGC2311-007

IC ID : 2703H-TM15FNNAHD0

FCC ID : BEJTM15FNNAHD0

Product name : NAD Module

Model name : TM15FNNAHD0

Date of Test : 2023, 11, 23

|                              |                                                      |             |
|------------------------------|------------------------------------------------------|-------------|
| Tested by                    | Engineer H.G. Lee                                    | (Signature) |
| Reviewed by                  | Engineering Manager I.K. Hong                        | (Signature) |
| Test Items                   | Result (Pass / Fail)                                 | Remark      |
| Maximum Permissible Exposure | Pass                                                 | -           |
| Abbreviation                 | Pass = Complied, Fail = Failed, N/A = not applicable |             |

## Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with regulation limits or requirements declared by manufacturers.

## Comments and Explanations:

None

# 1 Human Exposure Assessment

## 1.1 Maximum Permissible Exposure

### 1.1.1 Limit of Maximum Permissible Exposure

Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength(A/m) | Power Density (mW/cm <sup>2</sup> ) | Average Time (minutes) |
|-----------------------|-------------------------------|------------------------------|-------------------------------------|------------------------|
| 0.3 – 1.34            | 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                     |

Limits for RF Field Strength Limits for Controlled Use Devices (Controlled Environment)

| Frequency Range (MHz)    | Electric Field Strength (V/m)(RMS) | Magnetic Field Strength(A/m)            | Power Density (W/m <sup>2</sup> ) | Reference Period (minutes) |
|--------------------------|------------------------------------|-----------------------------------------|-----------------------------------|----------------------------|
| 0.003 – 10 <sup>23</sup> | 170                                | 180                                     | –                                 | Instantaneous<br>*         |
| 0.1–10                   | –                                  | 1.6/ f                                  | –                                 | 6**                        |
| 1.1–10                   | 193/ f <sup>0.5</sup>              | –                                       | –                                 | 6**                        |
| 10 – 20                  | 61.4                               | 0.163                                   | 10.0                              | 6                          |
| 20 – 48                  | 129.8/ f <sup>0.25</sup>           | 0.3444/ f <sup>0.25</sup>               | 44.72/ f <sup>0.5</sup>           | 6                          |
| 48 – 300                 | 49.33                              | 0.1309                                  | 6.455                             | 6                          |
| 300 – 6000               | 15.6 f <sup>0.25</sup>             | 0.04138 f <sup>0.25</sup>               | 0.6455f <sup>0.5</sup>            | 6                          |
| 6000 – 15000             | 137                                | 0.364                                   | 50                                | 6                          |
| 15000 – 150000           | 137                                | 0.364                                   | 50                                | 616000/ f <sup>1.2</sup>   |
| 150000 – 300000          | 0.354 f <sup>0.5</sup>             | 9.4 x 10 <sup>-4</sup> f <sup>0.5</sup> | 3.33 x 10 <sup>-4</sup> f         | 616000/ f <sup>1.2</sup>   |

| band           | Channel Frequency (MHz) | max output power (dBm) | Ant gain (dBi) | EIRP (dBm) | EIRP (mW) | Power Density (mW/cm <sup>2</sup> ) | Power Density Limit (mW/cm <sup>2</sup> ) |
|----------------|-------------------------|------------------------|----------------|------------|-----------|-------------------------------------|-------------------------------------------|
| Band 2         | 1850.00 ~ 1910.00       | 23.60                  | 1.78           | 27.68      | 586       | 0.117                               | 1                                         |
| band 5         | 824.00 ~ 849.00         | 23.68                  | 2.44           | 23.39      | 218       | 0.043                               | 1                                         |
| band 66        | 1710.00 ~ 1780.00       | 23.83                  | 1.88           | 27.90      | 617       | 0.123                               | 1                                         |
| band 77 (FCC)  | 3450.00 ~ 3550.00       | 24.08                  | 2.75           | 21.19      | 132       | 0.026                               | 1                                         |
| band 77 (FCC)  | 3700.00 ~ 3980.00       | 24.03                  | 2.75           | 20.13      | 103       | 0.021                               | 1                                         |
| band 77 (ISED) | 3450.00 ~ 3900.00       | 23.87                  | 2.75           | 22.05      | 160       | 0.032                               | 1                                         |
| LTE Band 2     | 1850.00 ~ 1910.00       | 23.28                  | 0.92           | 26.22      | 419       | 0.083                               | 1                                         |
| LTE band 5     | 824.00 ~ 849.00         | 23.28                  | 0.49           | 22.20      | 166       | 0.033                               | 1                                         |
| LTE band 7     | 2500.00 ~ 2570.00       | 23.69                  | 2.27           | 25.13      | 326       | 0.065                               | 1                                         |
| LTE band 12    | 699.00 ~ 716.00         | 23.38                  | -1.52          | 22.30      | 170       | 0.034                               | 1                                         |
| LTE band 66(4) | 1710.00 ~ 1780.00       | 23.50                  | 1.10           | 27.31      | 538       | 0.107                               | 1                                         |

\* FCC limit is worst case

$$R = \sqrt{\frac{EIRP}{4 \pi S}}$$

EIRP = Equivalent Isotropic Radiated Power(mW)

S = Distance (20 cm)

Pi = 3.14