



Project No: TM-2501000072P  
Report No.: TMWK2501000073KS

FCC ID: P4Q-N738

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# RF Exposure Evaluation Report

**FCC 47 CFR § 2.1091**

for  
**TVI Castor**

**Model: N738**

Prepared for:

**Mitac Digital Technology Corporation**  
4F., No. 1, R&D Road 2, Hsinchu Science Park, Hsinchu 30076 Taiwan

Prepared by

**Compliance Certification Services Inc.**  
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New Taipei City, Taiwan  
Issued Date: March 26, 2025

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Revision History

| Rev. | Issue Date     | Revisions     | Effect Page | Revised By |
|------|----------------|---------------|-------------|------------|
| 00   | March 26, 2025 | Initial Issue | ALL         | Peggy Tsai |

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## 1 Attestation of Test Results

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Applicant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | MiTAC Digital Technology Corporation<br>4F., No. 1, R&D Road 2, Hsinchu Science Park, Hsinchu 30076 Taiwan |
| Manufacturer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | MiTAC Digital Technology Corporation<br>4F., No. 1, R&D Road 2, Hsinchu Science Park, Hsinchu 30076 Taiwan |
| Model Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | TVI Castor                                                                                                 |
| Applicable Standards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | FCC 47 CFR § 2.1091<br>FCC 47 CFR § 1.1307<br>FCC 47 CFR § 1.1310<br>Published RF exposure KDB procedures  |
| Receive EUT Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | January 11, 2025                                                                                           |
| Compliance Certification Services Inc. , tested the above equipment in accordance with the requirements set forth in the above standards. Determination of compliance is based on the results of the compliance measurement,not taking into account measurement instrumentation uncertainty.All indications of Pass/Fail in this report are opinions expressed by Compliance Certification Services Inc, based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report. |                                                                                                            |
| Approved & Released By:<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                            |
| Sky Zhou<br>Asst. Section Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                            |



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## 2 Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1091, the following FCC Published RF exposure [KDB](#) procedures:

- 447498 D04 Interim General RF Exposure Guidance v01
- 865664 D02 RF Exposure Reporting v01r02



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### 3 Device Under Test (DUT) Information

#### 3.1 DUT Description

|                   |                                                                                                |
|-------------------|------------------------------------------------------------------------------------------------|
| Product           | TVI Castor                                                                                     |
| Brand Name        | Mio / MAGELLAN / NAVMAN / MiTAC                                                                |
| Model No.         | N738                                                                                           |
| Model Discrepancy | Difference of the those brand names (list on this report) are just for marketing purpose only. |
| EUT Serial #      | 242N73800002 R00                                                                               |
| Software Version  | VT21.03.06.NN1AT.25                                                                            |
| Hardware Version  | R05                                                                                            |
| Sample Stage      | Identical prototype                                                                            |

## 3.2 Wireless Technologies

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |              |           |             |              |           |            |                    |           |            |                    |           |            |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------|-------------|--------------|-----------|------------|--------------------|-----------|------------|--------------------|-----------|------------|
| <b>Frequency bands</b>         | <input type="checkbox"/> Bluetooth: 2402MHz-2480MHz<br><input checked="" type="checkbox"/> 802.11b/g/n HT20: 2412MHz ~ 2462 MHz<br><input checked="" type="checkbox"/> 802.11n HT40: 2422MHz ~ 2452MHz<br><input type="checkbox"/> 802.11a/n HT20: 5180MHz ~ 5240MHz / 5260MHz ~ 5320MHz / 5500MHz ~ 5720MHz / 5745MHz ~ 5825MHz<br><input type="checkbox"/> 802.11ac VHT20: 5180MHz ~ 5240MHz / 5260MHz ~ 5320MHz / 5500MHz ~ 5720MHz / 5745MHz ~ 5825MHz<br><input type="checkbox"/> 802.11ax HE20: 5180MHz ~ 5240MHz / 5260MHz ~ 5320MHz / 5500MHz ~ 5720MHz / 5745MHz ~ 5825MHz<br><input type="checkbox"/> 802.11n HT40: 5190MHz ~ 5230MHz / 5270MHz ~ 5310MHz / 5510MHz ~ 5710MHz / 5755MHz ~ 5795MHz<br><input type="checkbox"/> 802.11ac VHT40: 5190MHz ~ 5230MHz / 5270MHz ~ 5310MHz / 5510MHz ~ 5710MHz / 5755MHz ~ 5795MHz<br><input type="checkbox"/> 802.11ax HE40: 5190MHz ~ 5230MHz / 5270MHz ~ 5310MHz / 5510MHz ~ 5710MHz / 5755MHz ~ 5795MHz<br><input type="checkbox"/> 802.11ac VHT80: 5210MHz / 5290MHz / 5530MHz ~ 5690MHz / 5775MHz<br><input type="checkbox"/> 802.11ax HE80: 5210MHz / 5290MHz / 5530MHz ~ 5690MHz / 5775MHz<br><input type="checkbox"/> Others |              |           |             |              |           |            |                    |           |            |                    |           |            |
| <b>Exposure classification</b> | <input type="checkbox"/> Occupational/Controlled exposure<br><input checked="" type="checkbox"/> General Population/Uncontrolled exposure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              |           |             |              |           |            |                    |           |            |                    |           |            |
| <b>Antenna Specification</b>   | <p><b>Type:</b> Chip Antenna</p> <p>WIFI 2.4G: Gain: 1.58 dBi</p> <p>2.4GHz:                      Antenna Gain:    1.58 dBi                      (Numeric gain: 1.44)    Worst</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |           |             |              |           |            |                    |           |            |                    |           |            |
| <b>Maximum Tune up power</b>   | <p><b>2.4GHz</b></p> <table border="1"> <tr> <td>IEEE 802.11b</td> <td>23.00 dBm</td> <td>(199.53 mW)</td> </tr> <tr> <td>IEEE 802.11g</td> <td>19.00 dBm</td> <td>(79.43 mW)</td> </tr> <tr> <td>IEEE 802.11n HT 20</td> <td>19.00 dBm</td> <td>(79.43 mW)</td> </tr> <tr> <td>IEEE 802.11n HT 40</td> <td>16.50 dBm</td> <td>(44.67 mW)</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | IEEE 802.11b | 23.00 dBm | (199.53 mW) | IEEE 802.11g | 19.00 dBm | (79.43 mW) | IEEE 802.11n HT 20 | 19.00 dBm | (79.43 mW) | IEEE 802.11n HT 40 | 16.50 dBm | (44.67 mW) |
| IEEE 802.11b                   | 23.00 dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (199.53 mW)  |           |             |              |           |            |                    |           |            |                    |           |            |
| IEEE 802.11g                   | 19.00 dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (79.43 mW)   |           |             |              |           |            |                    |           |            |                    |           |            |
| IEEE 802.11n HT 20             | 19.00 dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (79.43 mW)   |           |             |              |           |            |                    |           |            |                    |           |            |
| IEEE 802.11n HT 40             | 16.50 dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (44.67 mW)   |           |             |              |           |            |                    |           |            |                    |           |            |

### Notes:

- For more details, please refer to the User's manual of the EUT.
- Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.
- Disclaimer: Variant information between/among trademarks is provided by the applicant, test results of this report are applicable to the sample EUT received of main test model name.
- The power referred the Tune up power of the test report TMWK2501000072KR for RF Exposure assessment purpose.

## 4 Maximum Permissible Exposure

### 4.1 Limits for Maximum Permissible Exposure (MPE)

**Table 1 - Limits for Maximum Permissible Exposure (MPE)**

| Frequency range (MHz)                                   | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|---------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| (A) Limits for Occupational/Controlled Exposure         |                               |                               |                                     |                          |
| 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                        |
| 300-1,500                                               |                               |                               | f/300                               | 6                        |
| 1,500-100,000                                           |                               |                               | 5                                   | 6                        |
| (B) Limits for General Population/Uncontrolled Exposure |                               |                               |                                     |                          |
| 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                       |
| 300-1,500                                               |                               |                               | f/1500                              | 30                       |
| <b><u>1,500-100,000</u></b>                             |                               |                               | 1.0                                 | 30                       |

## 4.2 MPE Calculation Method

### 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:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

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

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm<sup>2</sup>

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

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

### 4.3 MPE EXEMPTION

- (A) The available maximum time-averaged power is no more than 1 mW
- (B) The available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold  $P_{th}$  (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive).  $P_{th}$  is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

$d$  = the separation distance (cm);

- (C) Using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least  $\lambda/2\pi$ , where  $\lambda$  is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of  $\lambda/4$  or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

| Single RF Sources Subject to Routine Environmental Evaluation |                       |
|---------------------------------------------------------------|-----------------------|
| RF Source frequency (MHz)                                     | Threshold ERP (watts) |
| 0.3-1.34                                                      | $1,920 R^2$ .         |
| 1.34-30                                                       | $3,450 R^2/f^2$ .     |
| 30-300                                                        | $3.83 R^2$ .          |
| 300-1,500                                                     | $0.0128 R^2 f$ .      |
| 1,500-100,000                                                 | $19.2 R^2$ .          |
| Note: R is in meters, f is in MHz.                            |                       |

#### 4.4 Multiple RF sources

In the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation),

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$



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## 5 MPE Exemption Option B

### WIFI 2.4GHz (DTS)

| Mode               | Frequency (MHz) | R(m) | Max Tune-up power (dBm) | G(dBi) | Max Tune-up EIRP (dBm) | Max Tune-up ERP (dBm) | Max Tune-up ERP (mW) | ERP Threshold (mW) | MPE Exemption |
|--------------------|-----------------|------|-------------------------|--------|------------------------|-----------------------|----------------------|--------------------|---------------|
| IEEE 802.11b       | 2412            | 0.2  | 23.0                    | 1.58   | 24.58                  | 22.43                 | 174.985              | 3060               | Complies      |
| IEEE 802.11g       | 2412            | 0.2  | 19.0                    | 1.58   | 20.58                  | 18.43                 | 69.663               | 3060               | Complies      |
| IEEE 802.11n HT 20 | 2412            | 0.2  | 19.0                    | 1.58   | 20.58                  | 18.43                 | 69.663               | 3060               | Complies      |
| IEEE 802.11n HT 40 | 2422            | 0.2  | 16.5                    | 1.58   | 18.08                  | 15.93                 | 39.174               | 3060               | Complies      |

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## 6 Facilities

All measurement facilities used to collect the measurement data are located at

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.

☐ No. 12, Ln. 116, Wugong 3rd Rd., Wugu Dist., New Taipei City, Taiwan.

**--End of Test Report--**