

# Technical Specification

TM15FNNNAHD0

FCC ID: BEJTM15FNNNAHD0  
IC: 2703H-TM15FNNNAHD0  
Model Name : TM15FNNNAHD0

➤ User Manual

TM15FNNAHD0 as telematics module device equipped in the vehicles.

In charge of wireless communications in LTE/5G NR network

Platform for Telematics Virtual Machine (VM) and other VMs based on Hypervisor

TM15FNNAHD0 supports LTE B2/4(66)/5/7/12(17), 5G NR n2/5/66/77 network

Them some use-case to demonstrate LTE/5G NR performances targeted

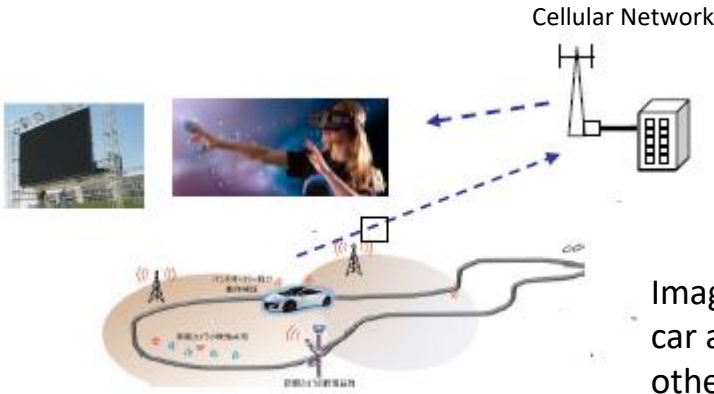
- 1. High throughput features
- 2. Low Latency features. below is just for example.

- **High throughput features**



Demonstrate high-throughput, high-quality image by hotspot.

- **Low Latency features**



Images and file uploaded from the car are displayed without delay to other devices

Frequency Band

| Item       | Uplink    | Downlink  | FDD-LTE | NR |
|------------|-----------|-----------|---------|----|
| B2(n2)     | 1850~1910 | 1930~1990 | V       | V  |
| B4/66(n66) | 1710~1755 | 2100~2155 | V       | V  |
| B5(n5)     | 824~849   | 869~894   | V       | V  |
| B12/17     | 669~716   | 729~746   | V       |    |
| B7         | 2500~2570 | 2620~2690 | V       |    |
| n77        | 3300~4200 |           |         | V  |

## 2. Notice

### ➤ Telematics NAD Module installation guide and information

NAD Module as TM15FNNAHD0 Module is mounted with solder ball on the main TSU board.

The strength of the RF field produced by the wireless module or modules embedded in the TSU is well within all international RF exposure limits known at this time. Because the wireless modules embedded in the TSU emit less than the maximum amount of energy permitted in radio frequency safety standards and recommendations, the manufacturer believes these modules are safe for use.

Regardless of the power levels, care should be taken to minimize human contact during normal operation. This module should be remain more than 20 cm (8 inches) from the body when wireless devices are on and transmitting.

This transmitter must not be collocated or operated in conjunction with any other antenna or transmitter. Operation is subject to the following two conditions: (1) this module does not cause interference , (2) this module accepts any interference that may cause undesired operation.

#### Information for the integrator

The integrator must not provide information to the end user regarding how to install or remove this RF module in the user manual of the end product. The user manual that is provided by the integrator for end users must include the following information in a prominent location. To comply with FCC RF and IC RSS-102 exposure requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be collocated or operated in conjunction with any other antenna or transmitter. The label for the end product must include FCC ID: BEJTM15FNNAHD0 or A RF transmitter inside, IC: 2703H-TM15FNNAHD0.

## 2. Notice

➤ Telematics NAD Module installation guide and information

This module complies with FCC/IC rules. FCC : Part 22, Part 24, Part 27

ISED : RSS-130, RSS-132, RSS-133, RSS-139

Furthermore, this device complies with FCC radiation exposure limits set forth for uncontrolled environments.

This module must be installed and operated with minimum distance of 20cm between the radiating element and the user. This module must not be co-located with any other transmitters or antennas. To comply with FCC regulations limiting both the maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile-only exposure condition must not exceed the values listed in the following table.

|                   |       |       |       |       |       |       |       |       |       |       |
|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Frequency [MHz]   | 699   | 716   | 729   | 734   | 746   | 748   | 758   | 791   | 803   | 814   |
| Peak Gain(dBi)    | -0.03 | 0.18  | 0.18  | 0.63  | 1.85  | 1.91  | 2.46  | 2.55  | 2.65  | 2.69  |
| Average Gain(dBi) | -5.79 | -5.51 | -5.47 | -5.25 | -4.21 | -4.14 | -3.50 | -2.67 | -2.85 | -3.53 |
| Frequency [MHz]   | 824   | 832   | 849   | 859   | 869   | 880   | 894   | 915   | 925   | 960   |
| Peak Gain(dBi)    | 2.44  | 1.85  | 1.63  | 1.68  | 1.52  | 1.32  | 0.85  | 0.02  | -0.06 | -0.54 |
| Average Gain(dBi) | -4.13 | -4.94 | -5.02 | -4.83 | -4.84 | -5.00 | -5.44 | -5.47 | -5.51 | -5.70 |
| Frequency [MHz]   | 1710  | 1755  | 1785  | 1805  | 1850  | 1880  | 1910  | 1920  | 1930  | 1980  |
| Peak Gain(dBi)    | 0.26  | 0.50  | 1.88  | 2.71  | 1.78  | 1.51  | 1.32  | 1.25  | 1.19  | 1.90  |
| Average Gain(dBi) | -4.37 | -4.15 | -2.89 | -2.09 | -2.94 | -3.37 | -3.60 | -3.75 | -3.79 | -3.16 |
| Frequency [MHz]   | 1990  | 2110  | 2155  | 2170  | 2300  | 2400  | 2500  | 2570  | 2620  | 2690  |
| Peak Gain(dBi)    | 1.78  | 1.72  | 1.25  | 1.27  | 1.30  | -0.19 | 1.36  | 0.17  | -0.12 | 0.45  |
| Average Gain(dBi) | -3.20 | -2.91 | -3.37 | -3.23 | -2.93 | -4.01 | -3.24 | -4.55 | -4.76 | -4.25 |
| Frequency [MHz]   | 3300  | 3500  | 3700  | 3900  | 4100  | 4200  |       |       |       |       |
| Peak Gain(dBi)    | 2.75  | 2.70  | 2.70  | 2.15  | 0.37  | 0.98  |       |       |       |       |
| Average Gain(dBi) | -3.60 | -3.42 | -4.35 | -3.76 | -4.35 | -4.92 |       |       |       |       |

To satisfy the FCC’s exterior labeling requirements, the following text must appear on the exterior of the end product. Contains transmitter module FCC ID: BEJTM15FNNAHD0 Contains transmitter module IC: 2703H-TM15FNNAHD0

Changes or modifications to this equipment may cause harmful interference unless the modifications are expressly approved in the instruction manual. Users may lose the authority to operate this equipment if an unauthorized change or codification is made.

Note: If this module is intended for use in a portable device, additional testing will be required to satisfy the RF exposure and SAR requirements of FCC Part 2.1093 and RSS-102.

## 2. Notice

### FCC Statement

#### Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Manufacturers integrating the Radio Module into other devices should note the following: The device is compliant with part 15.247 and 15.407 of Title 47 of the FCC rules. If the Link Module is integrated into a new host product, the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

### -Label and Compliance Information

The final end product must be labeled in a visible area with the following:

"Contains FCC ID: BEJTM15FNNAHD0"

"Contains IC: 2703H-TM15FNNAHD0"

The grantee's FCC ID can be used only when all FCC/ IC compliance requirements are met.

## 2. Notice

-RF exposure

The module will install into mobile device such as Sound Bar

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Information on test modes and additional testing requirements

-OEM integrator is still responsible for testing their end-product for any additional compliance

requirements required with this module installed (for example, digital device emissions, PC peripheral

requirements, additional transmitter in the host, etc.).

## 2. Notice

### ➤ Notice

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The OEM integrator is responsible for ensuring that the host product which is installed and operating with the module is in compliant with Part 15B unintentional Radiator requirements, please note that For a Class B digital device or peripheral, the instructions furnished the user manual of the end-user product shall include the following or similar statement, placed in a prominent location in the text of the host product manual:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. This device should be installed and operated with minimum distance 20cm between the radiating element of this device and the user.

## 2. Notice

### ➤ Notice

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) L'appareil ne doit pas produire de brouillage; (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

L'étiquette d'homologation d'un module d'Innovation, Sciences et Développement économique Canada devra être posée sur le produit hôte à un endroit bien en vue, en tout temps. En l'absence d'étiquette, le produit hôte doit porter une étiquette sur laquelle figure le numéro d'homologation du module d'Innovation, Sciences et Développement économique Canada, précédé du mot « contient », ou d'une formulation similaire allant dans le même sens et qui va comme suit : Contient IC : 2703H-TM15FNNAHDO est le numéro d'homologation du module.

Cet équipement est conforme aux limites d'exposition aux radiations IC CNR-102 établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps.

This device complies with Industry Canada license-exempt RSS standard(s).  
Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.