JLR TCU3 Overview for FCC

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LG Electronics Inc.

Contents

1. Introduction of TCU

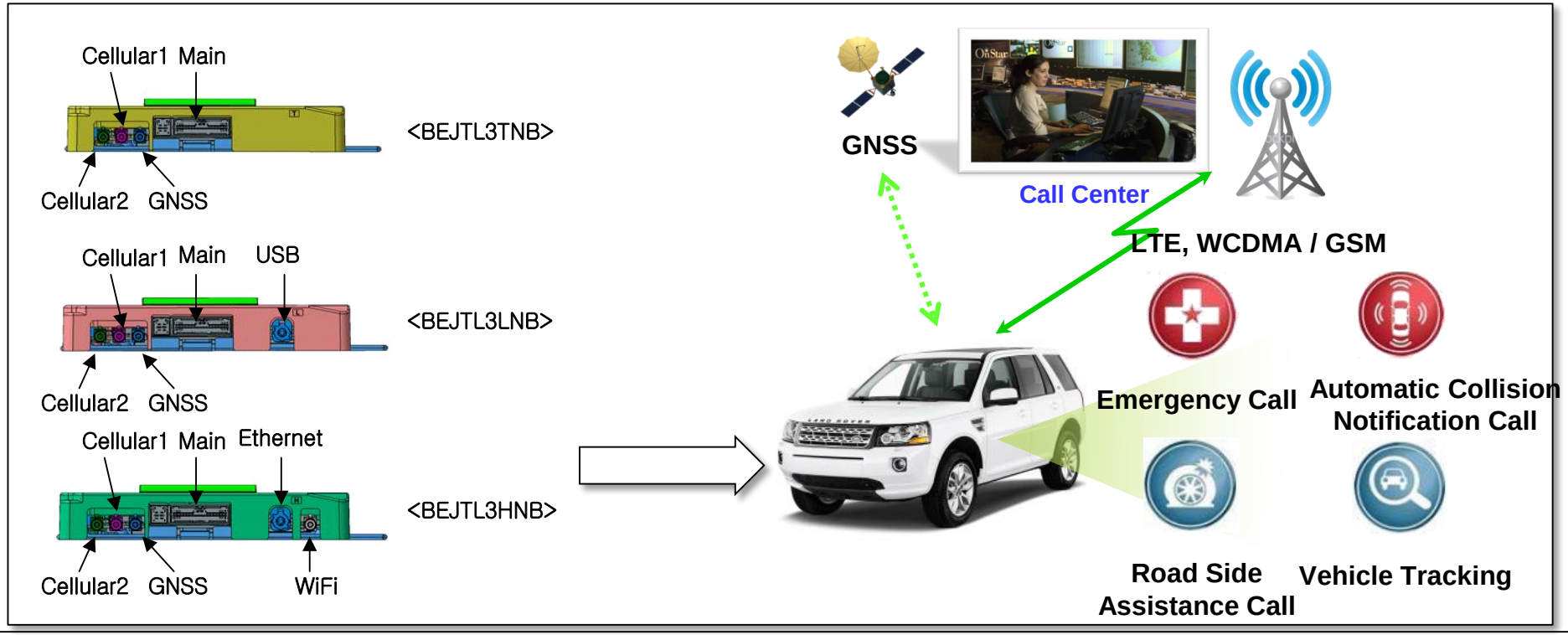
❑ TCU (Telematics Control Unit)

- Telematics device that LGE is developing for the JLR(Jaguar Land Rover) vehicles.
- Small box installed deep inside passenger cars
- In charge of wireless communications in LTE/WCDMA/GSM network

❑ Services provided by TCU

- Voice service : eCall, bCall[1)] and ERA GLONASS
- Packet data service : Wi-Fi hot-spot and TSP[2)] service
- SMS service : TSP service

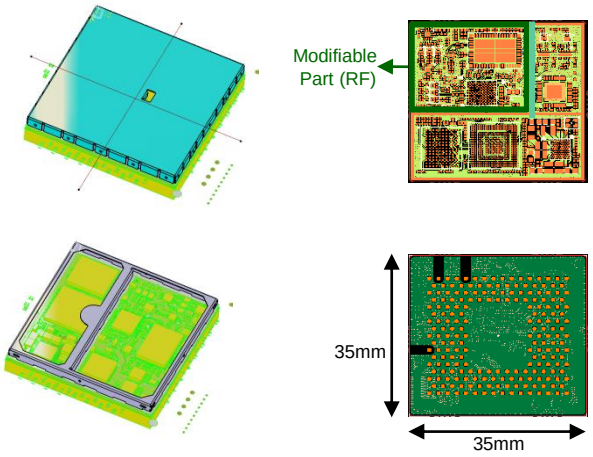
1) bCall : breakdown call
2) TSP: Telematics Service Provider (Wireless Car for JLR)



2. Modularization of NAD

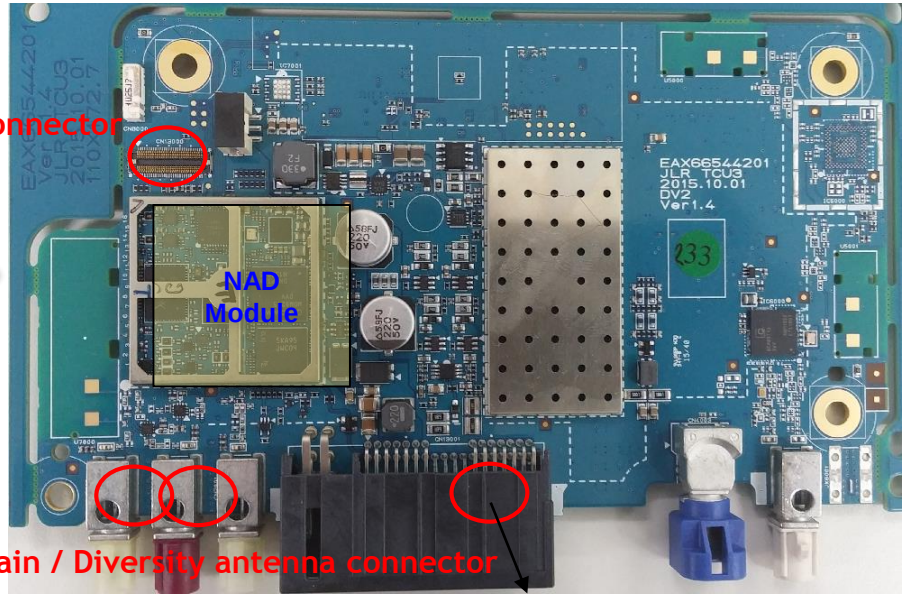
❑ NAD Module

< H/W Design >



Item	Description
Dimension	35mm x 35mm x 3mm
Package	LGA, 206 pin
Baseband Chip	MDM9215 (Qualcomm)
Power Management Chip	PM8018 (Qualcomm)
RF Chip	WTR1605L (Qualcomm)
GNSS	GPS + GLONASS
Application Processor	Cortex-A5 (550MHz)
Memory	4Gbit NAND + 2Gbit LPDDR
Audio DSP	AK7758 (CS Voice, VoLTE)
Radio Technology	GSM/GPRS/EDGE UMTS/HSPA+ FDD/TDD-LTE (Release9 Cat3)

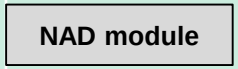
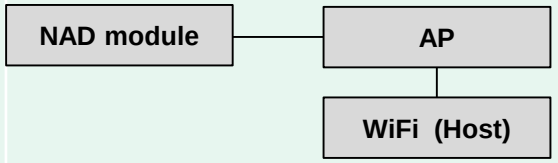
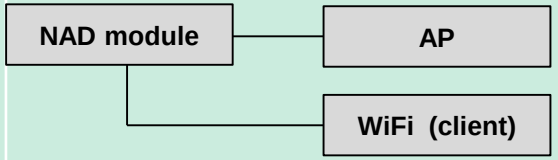
❑ Integrated device (BEJTL3HNB)



Item	Description
Network carriers	AT&T (Vodafone roaming)
Positioning	Yes
Emergency	Private eCall, (the support of E911 is TBD)
VoLTE	Yes (but, do not have specific use case)
RF band	LTE – B2,4,5,7,17 WCDMA – B2,4,5 GSM – 850, 1900
Sourcing countries	NA, EU, CN, ROW (total 86 countries) Refer to appendix

3. Hardware Block Diagram

- ❑ **NAD module is based on MDM9215 and it includes modem baseband, RF and GNSS**
- ❑ **NAD module is used as common platform for three type of variants**
- ❑ **Certification is focused on NAD module**

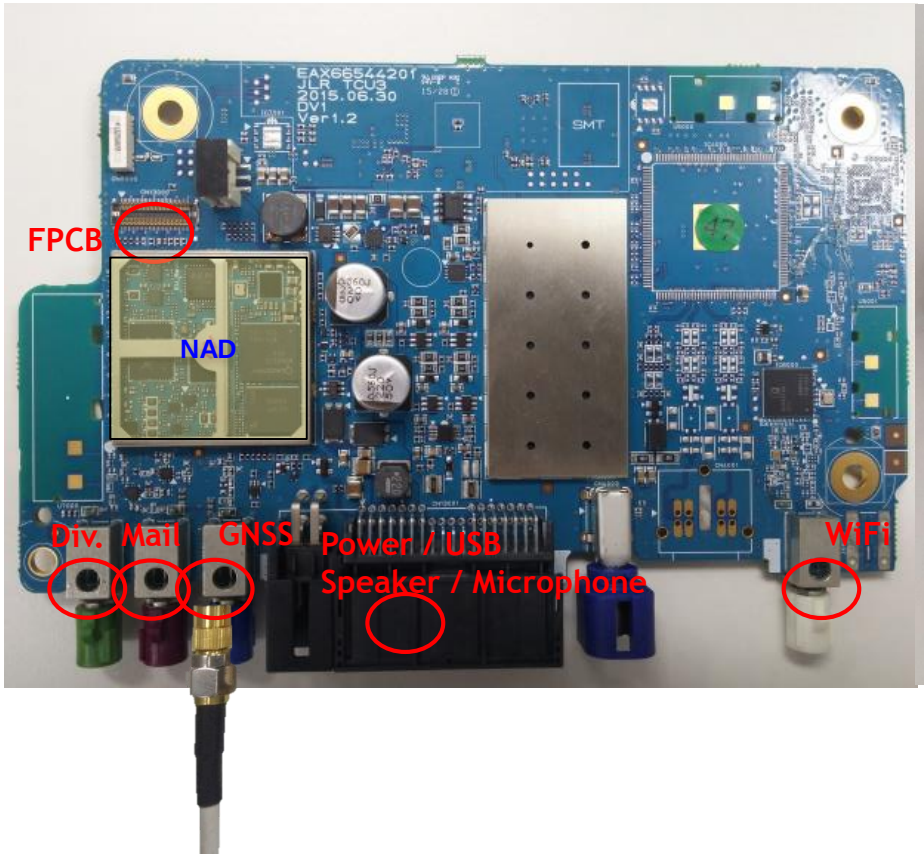
Devices	Difference
BEJTL3TNB-N	NAD module only 
BEJTL3LNB-N	NAD module + External AP with WiFi host 
BEJTL3HNB-N	NAD module + External AP + WiFi Client 

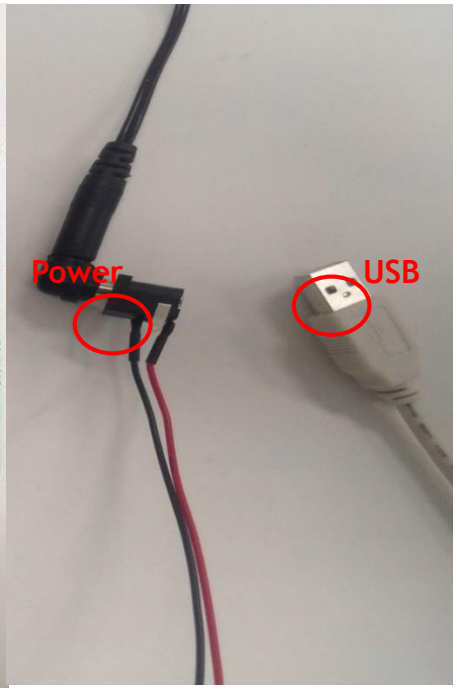
4. JLR TCU3 Specification

DUT	BEJTL3TNB-N	BEJTL3LNB-N	BEJTL3HNB-N
RF variants	GSM850 and 1900 WCDMA B2, B4, and B5 LTE B2, B4, B5, B7 and B17	GSM850 and 1900 WCDMA B2, B4, and B5 LTE B2, B4, B5, B7 and B17	GSM850 and 1900 WCDMA B2, B4, and B5 LTE B2, B4, B5, B7 and B17
External AP	X	O	O
Ethernet (BCBR)	X	X	O
WiFi Host	X	O	X
WFi Client	X	X	O
USB (Remote SIM)	X	O	X
Bluetooth Smart Node	O	O	O
CAN	HSCAN1, 2	HSCAN1, 2	HSCAN1, 2
Audio (Mic. Input, Spk Output)	O	O	O
BUB	O	O	O

5. Test Environment

- This is picture of telematics box inside. Refer to connector information in page 2





- **RF Exposure Statement (MPE)**
  - The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is maintained between the radiator (antenna) and all persons at all times. This device must not be co-located or operating in conjunction with any other antenna or transmitter.

- **FCC Part 15.19 Statements**
  - 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.

- **FCC Part 15.21 statement**
  - Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

l'exposition aux RF

L’antenne (ou les antennes) doit être installée de façon à maintenir à tout instant une distance minimum de au moins 20 cm entre la source de radiation (l’antenne) et toute personne physique.

RSS-GEN, Sec.8.3

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s’il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d’antenne énumérés ci-dessous et ayant un gain admissible maximal et l’impédance requise pour chaque type d’antenne. Les types d’antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l’exploitation de l’émetteur.

RSS-GEN, Sec. 8.4

Le présent appareil est conforme aux CNR d’Industrie 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, et

(2) l’utilisateur de l’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.