

Technical Specification (TM15FNNATY0)

FCC ID: BEJTM15FNNATY0
IC: 2703H-TM15FNNATY0
Model Name : TM15FNNATY0

History

Ver.	Date	Contents	Written by	Checked by	Approved by	Note
1.0	2022.12.02					

Contents

1. Product Introduction	4
1.2 Environmental Specifications	4
1.3 Electrical Specifications	5
1.3.1 Absolute Maximum Rating and ESD Ratings	5
1.3.2 Current Consumption	5
1.4 Mechanical Specifications	5
1.4.1 Physical Dimensions and Connection Interface	5
1.4.2 Mechanical Drawing	5
2. RF Specification	7
2.1 5G NR Specification	7
2.2 LTE Specification	8

1. Product Introduction

The **TM15FNNATY0** are designed for the automotive industry. They support 5G NR, LTE and WCDMA air Interface standards. The **TM15FNNATY0** are based on the Qualcomm SA515M wireless chipsets and support the following bands.

- Only 5G NR and LTE will be supported in USA

Table 1. Supported Band

Region		NA (North America)
Band	NR	n2/n5/n12/n66/n77
	LTE	B2/4/5/12/14/66
	WCDMA	-

1.1 Block Diagram

- Confidential

1.2 Environmental Specifications

The environmental specification for operating and storage of the **TM15FNNATY0** are defined in the the table below.

Table 2. Environmental Specifications

Parameter	Temperature Range	
Operating Temperature	Excluding the ME	-30°C to 95°C -20°C to 95°C (BUB Discharge)
	ME	-30°C to 100°C -20°C to 100°C (BUB Discharge)
Storage Temperature	Excluding the ME	-40°C to 95°C
	ME	-40°C to 100°C
Humidity	95% or less	

1.3 Electrical Specifications

This section provides details for some of the key electrical specifications of the **TM15FNNATY0** embedded modules.

1.3.1 Absolute Maximum Rating

This section defines the Absolute Maximum Ratings of the **TM15FNNATY0** embedded modules.

Warning: If these parameters are exceeded, even momentarily, damage may occur to the device.

1.3.2 Current Consumption

Table 4. **TM15FNNATY0** Current Consumption (@3.9V)

Mode	Parameter	Typical	Max	Units
LTE	Max TX Output /Full RB	550	TBD	mA
WCDMA	Max TX Output /Full RB	550	TBD	mA
LTE	Idle, Registered	2	-	mA
WCDMA	Idle, Registered	2	-	mA

1.4 Mechanical Specifications

1.4.1 Physical Dimensions and Connection Interface

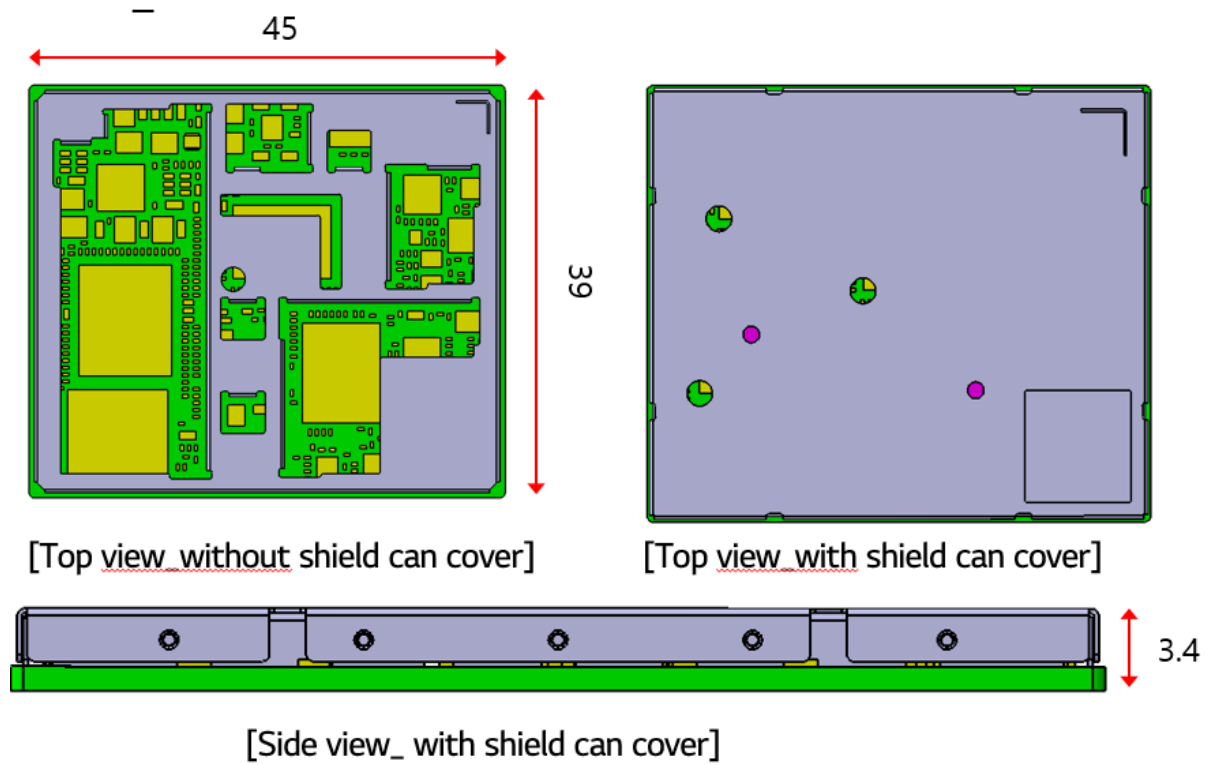
The **TM15FNNATY0** embedded modules are a Land Grid Array(LGA) form factor device. The device does not have a System or RF connectors. All electrical and mechanical connections are made via the LGA pad on the underside of the PCB.

Table5. **TM15FNNATY0** Embedded Module Dimensions

Parameter	Nominal	Max	Units
Overall Dimension	45 x 39	45.35 x 39.35	mm
Overall Module Height	3.4	3.6	mm
PCB Thickness	1.0	1.1	mm
Flatness Specification		0.15	mm
Weight	TBD		g

1.4.2 Mechanical Drawing

1.4.2.1 NAD PCB



2. RF Specification

The specifications for the 5G NR & LTE interfaces are defined.

TM15FNNATY0 is designed to be compliant with the standard shown in the table below.

Table6. Standards Compliance

Technology	Standards
5G NR	• 3GPP Release 15
LTE	• 3GPP Release 15

2.1 5G NR Specification

2.1.1 NR RX Sensitivity

The Receiver Sensitivity of the **TM15FNNATY0** are specified in the following table.

Table7. Conducted RX (Receive) Sensitivity – NR Bands

BAND	Method (DL CH)	Specification
n2 Reference sensitivity level	Measure BLER of Mid Channel (392000) in Band2	sensitivity : ≤ -94.1 BLER : $\leq 5\%$ (SCS:15 kHz / BW:10 MHz)
n5 Reference sensitivity level	Measure BLER of Mid Channel (176300) in Band5	sensitivity : ≤ -94.1 BLER : $\leq 5\%$ (SCS:15 kHz / BW:10 MHz)
n12 Reference sensitivity level	Measure BLER of Mid Channel (147500) in Band12	sensitivity : ≤ -93.1 BLER : $\leq 5\%$ (SCS:15 kHz / BW:10 MHz)
n66 Reference sensitivity level	Measure BLER of Mid Channel (431000) in Band66	sensitivity : ≤ -95.6 BLER : $\leq 5\%$ (SCS:15 kHz / BW:10 MHz)
n77 Reference sensitivity level	Measure BLER of Mid Channel (650000) in Band77	sensitivity : ≤ -84.1 BLER : $\leq 5\%$ (SCS:30 kHz / BW:100 MHz)

2.2 LTE Specification

2.2.1 LTE RX Sensitivity

The Receiver Sensitivity of the **TM15FNNATY0** are specified in the following table.

Table7. Conducted RX (Receive) Sensitivity – LTE Bands

BAND	Method (DL CH)	Specification
BAND 2 Reference sensitivity level	Measure BLER of Mid Channel (900) in Band2	sensitivity : ≤ -94.3 BLER : $\leq 5\%$
BAND 4 Reference sensitivity level	Measure BLER of Mid Channel (2175) in Band4	sensitivity : ≤ -96.3 BLER : $\leq 5\%$
BAND 5 Reference sensitivity level	Measure BLER of Mid Channel (2525) in Band5	sensitivity : ≤ -94.3 BLER : $\leq 5\%$
BAND 12 Reference sensitivity level	Measure BLER of Mid Channel (5095) in Band12	sensitivity : ≤ -93.3 BLER : $\leq 5\%$
BAND 14 Reference sensitivity level	Measure BLER of Mid Channel (5330) in Band14	sensitivity : ≤ -93.3 BLER : $\leq 5\%$
BAND 66 Reference sensitivity level	Measure BLER of Mid Channel (66886) in Band66	sensitivity : ≤ -95.8 BLER : $\leq 5\%$

Notice

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

This device complies with FCC/IC 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.

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.

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.