

User Manual

Model : LTD-GN3000

Product: Telematics module

FCC ID : YZP-GN3000

IC Certification : 7414C-GN3000



Summary

This document covers the technical specifications of module LTD-GN3000 (hereinafter referred to as “ module ”) designed by LG Innotek. Technical specifications include interface, mechanical specifications, Includes electrical characteristics and RF characteristics.

1. Product Introduction

(hereinafter referred to as “ module ”) designed to be mounted and used in automobiles , and supports GSM/WCDMA/LTE/5G NR. It also supports CA (Carrier Aggregatio) based on 3GPP TS 36.101 and TS 38.101 . Additionally, GNSS (Global Navigation Satellite System) such as GPS, GLONASS, Galileo and Beidou are also supported.

A total of 5 antennas are used, Each antenna supports the frequency bands shown in Table 1-1 .

Each Modem supports the bands shown Table 1-2 in each region.

See table 1-3 for a summary of module featur

Table 1-1 Support frequency bands for each antenna

Band	Ant1	Ant2	Ant3	Ant4
1	TRX	RX	RX	RX
2, 25	TRX	RX	RX	RX
3	TRX	RX	RX	RX
4, 66	TRX	RX	RX	RX
5, 18, 19, 26	TRX	RX		
7	TRX	RX	RX	RX
8	TRX	RX		
12, 17	TRX	RX		
13	TRX	RX		
14	TRX	RX		
20	TRX	RX		
28	TRX	RX		
29	RX	RX		
30	RX	RX	RX	RX
32	RX	RX		
34	TRX	RX	RX	RX
38, 41	TRX	RX	RX	RX
39	TRX	RX	RX	RX
40	TRX	RX	RX	RX
71	TRX	RX		
77, 78	RX	TRX	RX	RX
79	RX	TRX	RX	RX

Table 1-2. Available frequency bands for each SKU

SKU	LTD-GN3000
Region	North America (NA)
GSM	850, 1900
WCDMA	5
LTE	2, 4, 5, 7, 25, 26, 38, 41, 66
5G	n2, n5, n7, n25, n26, n38, n41, n66, n77, n78
GNSS	GPS, GLONASS, Galileo, Beidou / L1, L5

Table 1-3. Summary of module features

Feature	Module capabilities
General	
Frequency bands	Please refer to the Table 1-2
Output power (according to Release 99)	Class 3 (+24dBm + 1.7/-3.7dB) for WCDMA Class 4 (+33dBm ± 2dB) for GSM850 Class 1 (+30dBm +1dB/-2dB) for GSM1900
Output power (according to Release14)	Class 3 (+23dBm ± 2.7dB) for LTE Band 12/17 power level : 23dBm (Tolerance : -2.7 dB ~ +1.5dB)
Output Power (according to Release16)	Class 3 (+23dBm +2/-2dB) for 5G NR
Power supply 2G/3G/4G/5G DCDC	Operating conditions: 3.8V ~ 4.2V (Typ. 4.0V)
Operating temperature	-40°C to +85°C
Physical	Dimensions: 46mm x 50mm x 3.5mm
	Weight : 16.5g
5G NR features	
3GPP Release 16	5G NR in NSA and SA mode(Sub-6) • 100MHz Bandwidth • 4X4 DL MIMO • 256 QAM supported for uplink and downlink Waveform : DFT-s / CP
LTE features	
3GPP Release 16	UE CAT. (UL: 18, DL: 19) supported 4X4 DL MIMO, 256QAM
WCDMA features	
3GPP Release 10	WCDMA Rel-99, HSDPA, HUDPA, HSPA+, and DC-HSPA
GSM / GPRS / EGPRS features	
Data transfer	GPRS: • Multislot Class 12 / • Mobile Station Class B / • Coding Scheme 1 – 4 EGPRS: • Multislot Class 12 / • EDGE E2 power class for 8 PSK • Downlink coding schemes – CS 1-4, MCS 1-9 • Uplink coding schemes – CS 1-4, MCS 1-9 • SRB loopback and test mode B / • 8-bit, 11-bit RACH • 1 phase/2 phase access procedures / • Link adaptation and IR • NACC, extended UL TBF / • Mobile Station Class B
GNSS features	
GNSS types	GPS, GLONASS, Galileo, Beidou / L1, L5

Module environmental specifications

Parameter	Temperature range
Ambient operating temperature	From -40°C to +85 °C
Ambient storage temperature	Temperature -40°C to +95 ° C
Ambient humidity	95% or less

- **Note**

- The customer To ensure that the junction temperature of the main components within the module does not exceed 85 °C , the external board to which the module is attached must be designed so that the heat generated from the module can be well dissipated.

Mechanical Specifications

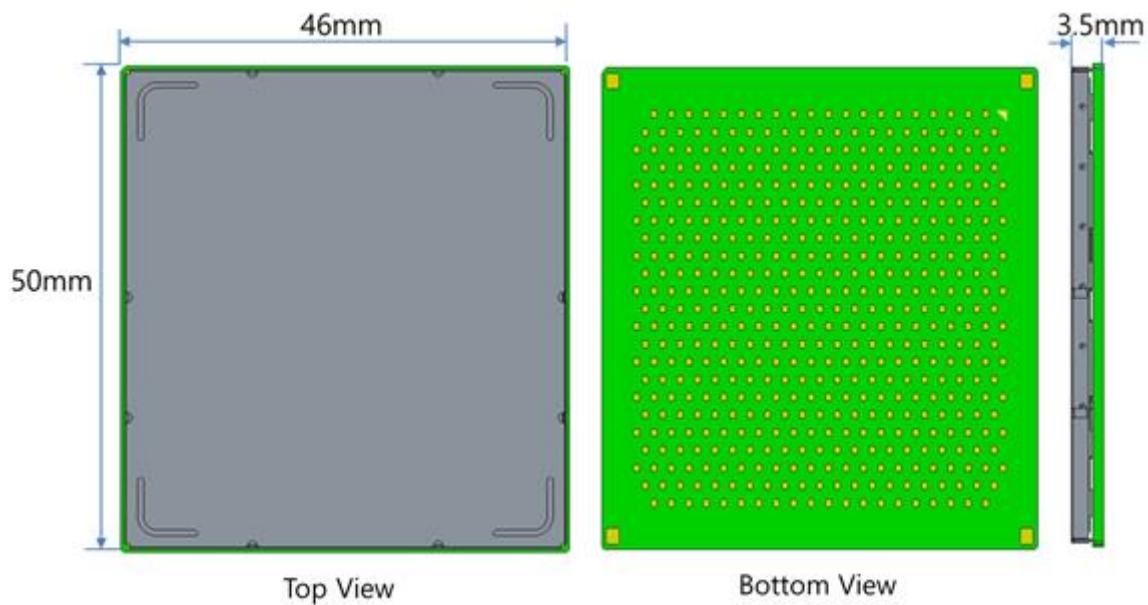
Module physical dimensions

Parameter	Nominal	Tolerance	Units
Overall dimension ¹⁾	46.0 x 50.0	± 0.15	mm
Overall module height (Excluding ball thickness)	3.5	±0.2	mm
Shield cover dimension	45.4 x 49.4	±0.1	mm
Shield fence dimension	44.9 x 48.9	±0.1	mm
Final coplanarity ²⁾ (Including warpage)	Max. 180	-	μm
Ball PAD height ²⁾	240	± 60	μm
Weight	16.5 (T BD)	± 1	g

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Mechanical Drawing



Electrical Specifications

Table. Specifications of external voltage VPH_PWR for the module operation

Pin No.	Voltage node	I/O	Status	Min	Typ	Max	Unit	
AU21, AW21 AT22, AV22	VPH_PWR_PMIC	I	On	3.8	4.0	4.2	V	
			Off	0		0.3		
A13, C13 B14, D14	VPH_PWR_CH1	I	On	Same as above specifications				
			Off					
A11, B12 C11, D12	VPH_PWR_CH2	I	On					
			Off					

This module supports GNSS (GPS, GLONASS, BeiDou, Galileo) .

Table. GNSS interface characteristics

Characteristics		Value
Frequency	GPS L1	Centered on 1575.42 MHz (BW 2.046 MHz)
	Glomass	1597.5 – 1605.8 MHz (BW 8.3 .Hz)
	Beidou	1559.05 – 1563.14 MHz (BW 4.092 MHz)
	Galileo	Centered on 1575.42 MHz (BW 4.092 MHz)
	GPS L5	Centered on 1176.45 MHz (BW 20.46MHz)
RF Impedance		50 Ω

OEM Manual

The List of applicable FCC rules

FCC : Part 22, Part 24, Part 27, Part 90

Summarize the specific operational use conditions

The module is designed for vehicle only, and has to be tested additional if insert in other host.

Limited module procedures / Trace antenna designs

N/A

RF exposure considerations

RF Exposure evaluation was performed with very specific installation condition at 20 cm. Any other installation condition may require additional test and permissive change procedure.

Antennas

Dipole Antenna is used for testing, with unique antenna connector. The maximum antenna gain including cable loss in a mobile-only exposure condition must not exceed the values listed in the following table.

Mode	Frequency (MHz)	Antenna Gain (dB i)
GSM 850	824 ~ 849	1.99
GSM 1900	1 850 ~ 1 910	1.90
WCDMA B5	824 ~ 849	1.99
LTE Band 25/2 5G NR Band 25/2	1 850 ~ 1 915	1.90
LTE Band 66/4 5G NR Band 66	1 710 ~ 1 780	4.20
LTE Band 26/5 5G NR Band 26/5	824 ~ 849	1.99
LTE Band 26 5G NR Band 26	814 ~ 824	0.72
LTE Band 7 5G NR Band 7	2 500 ~ 2 570	4.43
LTE Band 38 5G NR Band 38	2 570 ~ 2 620	3.35
LTE Band 41 5G NR Band 41	2 500 ~ 2 690	4.43
5G NR Band 77	3 450 ~ 3 550	4.69
	3 700 ~ 3 980	4.90
5G NR Band 78	3 450 ~ 3 550	4.69
	3 700 ~ 3 800	4.90

Label and compliance information

To satisfy the labeling requirements, the following text must appear on the exterior of the end product.

Contains FCC ID : YZP-GN3000

Information on test modes and additional testing requirements

If additional module is inserted in the host, test modes should take into consideration different operational conditions for a standalone modular transmitter in a host.

Additional testing, Part 15 Subpart B disclaimer

According to § 15.103 Exempted devices, (a), this module is exempted due to utilized exclusively in transportation vehicle.

User Manual Notice

FCC

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 module complies with FCC radiation exposure limits set forth for uncontrolled environments. This module must be installed and operated with minimum distance of 20 cm between the radiating element and the user. This module must not be co-located with any other transmitters or antennas.

ISED

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Ce dispositif contient des émetteurs/récepteurs exempts de licence qui sont conformes aux RSS exempts de licence d'Innovation, Sciences et Développement économique Canada. 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.

This module complies with ISED radiation exposure limits set forth for uncontrolled environments. This module must be installed and operated with minimum distance of 20 cm between the radiating element and the user. This module must not be co-located with any other transmitters or antennas.

Ce module est conforme aux limites d'exposition au rayonnement fixées par ISED pour les environnements non contrôlés. Ce module doit être installé et actionné à une distance minimale de 20 cm entre l'élément rayonnant et l'utilisateur. Ce module ne doit pas être situé avec d'autres émetteurs ou antennes.

Please notice that if the IC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains IC : 7414C-GN3000" any similar wording that expresses the same meaning may be used.

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 :7414C-GN3000 est le numéro d'homologation du module