

# **Technical Specification (TM01LA-9)**

## 1. Product Introduction

The TM01LA-E is designed for the automotive industry. They support LTE, WCDMA and GSM air Interface standards. They also have Global Navigation satellite system (GNSS) capabilities including GPS and GLONASS.

The TM01LA-E are based on the Qualcomm MDM9215 wireless chipsets and support the following bands.

Table 1. Supported Band

Region		FCK		
Band	LTE	B7		
	WCDMA	B5		
	GSM	GSM 850		
GNSS		O		
Voice		O		

## 1.2 Environmental Specifications

The environmental specification for operating and storage of the TM01LA-E are defined in the the table below.

LGE guarantee the automotive operation by internal reliability verification

Table 2. Environmental Specifications

Parameter	Temperature Range
Operating Temperature	1) -40 °C to 85 °C
Storage Temperature	2) -40 °C to +105 °C
Humidity	95% or less

1) At 90 °C operating, there is some deviation, but a module can meet 3GPP RF HW Spec

2) A module can accept over 105 °C storage temperature without packing

A module was guaranteed 34.2 MTTF in worst case at least

## 1.3 Electrical Specifications

This section provides details for some of the key electrical specifications of the TM01LA-E embedded modules.

### 1.3.1 Absolute Maximum Rating and ESD Ratings

This section defines the Absolute Maximum and Electrostatic Discharge (ESD) Ratings of the TM01LA-E embedded modules.

## 1.4 Mechanical Specifications

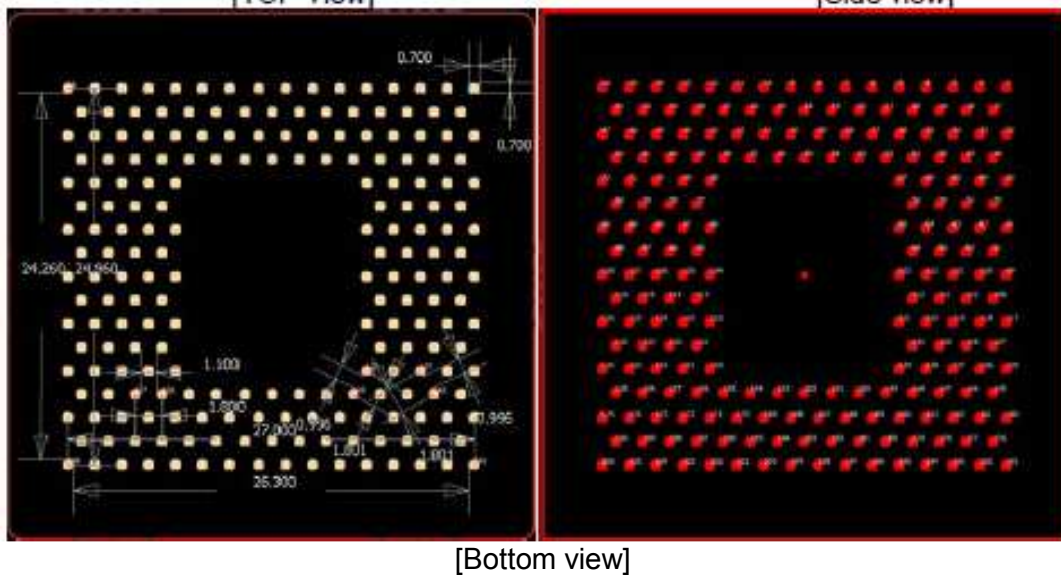
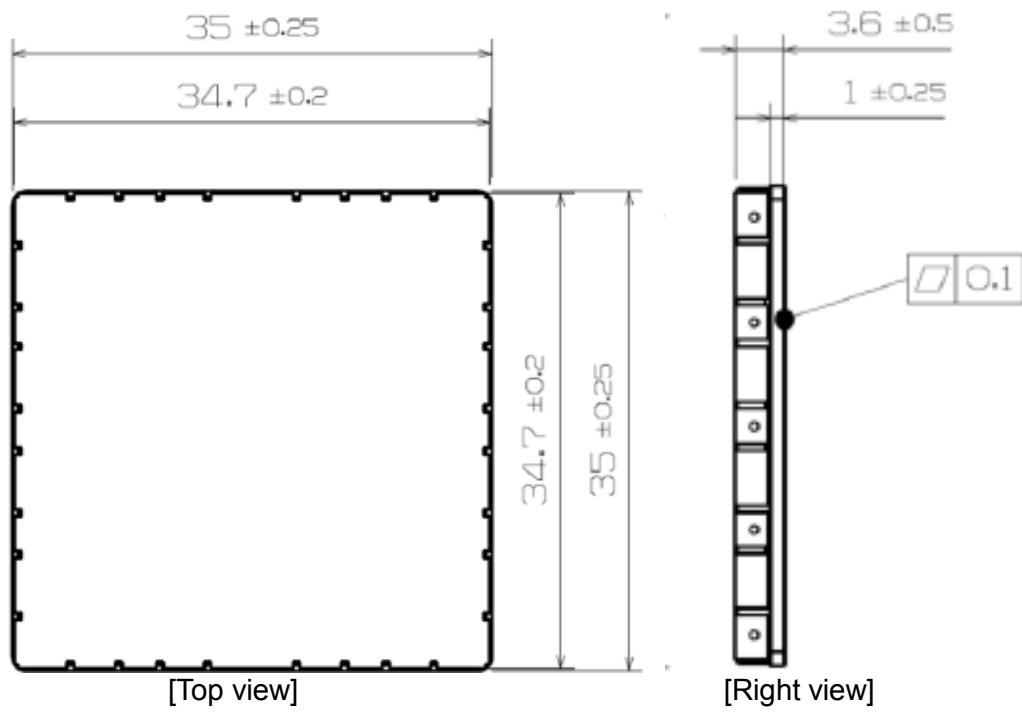
### 1.4.1 Physical Dimensions and Connection Interface

The TM01LA-E 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 206 pad TM01LA-E on the underside of the PCB.

Table5. TM01LA-E Embedded Module Dimensions

<b>Parameter</b>	<b>Nominal</b>	<b>Max</b>	<b>Units</b>
Overall Dimension	35 x 35	35.35 x 35.35	mm
Overall Module Height	3.5	3.85	mm
PCB Thickness	1.0	1.1	mm
Flatness Specification		0.1	mm
Weight	tbd		g

### 1.4.2 Mechanical Drawing



### 1.4.3 Footprint

## <FCC Warning Statements>

### **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.

### **RF Exposure Statement**

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.

The highest permitted antenna gains including cable loss for use with this device are: GSM850 / WCDMA850 : 0.46 dBi, LTE7: 3.29 dBi

### **End Product Labeling**

The module is labeled with its own FCC ID. If the FCC ID 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. In that case, the final end product must be labeled in a visible area with the following:

“Contains FCC ID: BEJTM01LA-E

### **OEM Responsibilities to comply with FCC Regulations**

The module has been certified for integration into products only by OEM integrators under the following condition:

- 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.
- The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

As long as the two condition above is met, further transmitter testing will not be required. However, the 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, etc.).

**IMPORTANT NOTE:** In the event that these conditions can't be met (for certain configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can't be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

### **Manual Information To the End User**

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module or change RF related parameters in the user manual of the end product.