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Mod. 0313 08/2015 Rev.4

Contents

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1.   Scope

Aim of this document is to describe suggestions and corrections that Telit advises to improve Ovoo Electronics application that integrates a Telit GE910-QUAD V3 module.

2.   Design review

Design review is based on the following received documentation:

- o   Schematic files: B106AA-R6.PDF
- o   Gerber file: B106AA-R6 Gerber.zip
- o   Other: Telit Design Review R06 (PCB).pdf
                              Stack Up (00.00.04).PDF

Summary Tables:

Schematic Review	P	F	I	MI	N/A
Power Supply	V				
SIM Pins	V				
Digital Pins	V				
Audio					V
RF	V				

PCB Layout Review	P	F	I	MI	N/A
General Placement	V				
Antenna Waveguide		V			
RF Aspects		V			
Audio Aspects					V

P: Pass; F: Fail; I: Improvements possible; MI: Missing Information; N/A: Not Applicable

The following symbols will be used throughout the Design Review to indicate:

✓   OK: No design changes are required.

🔵   Tip: information or possible improvement, not mandatory but recommended.

⚠   Warning: if you don't follow the recommendation there's a risk of malfunctioning or issues during the homologation phase, strongly recommended.

🛑   Error: it's mandatory to follow the recommendation otherwise the module could be damaged or could not work properly or there's high probability of facing issues during the homologation phase.

?   Missing Information: some relevant information is missing therefore the DR cannot be accurate on this item.

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2.1. Schematic review

2.1.1. Power supply
- ✓ Ok.

2.1.2. SIM pins

- ✓ OK

2.1.3. Digital pins

- ⓘ All signals connected to our modules must be in tristate while they are OFF and during start-up or HW_SHDN procedures.

2.1.4. Audio pins
- ✓ N.A.

2.1.5. RF aspects
- ✓ Ok.

2.2. PCB Layout review

2.2.1. General placement

- ✓ OK

2.2.2. RF aspects

- 🛑 Your Cellular is not waveguide with correct characteristic impedance of about 50 Ohms. We calculated its characteristic impedance based on the stackup provided on Stack Up (00.00.04).PDF and the CPW model with following dimensions:
Track width: 0.5 mm
Ground Gap: 0.10 mm
Dielectric thickness: 0.21 mm
The resulting impedance is around 29 Ohm, too low. A suitable waveguide can be obtained using a wider Gap:
  - Track width: 0.77 mm
  - Ground Gap on top layer: 0.15 mm
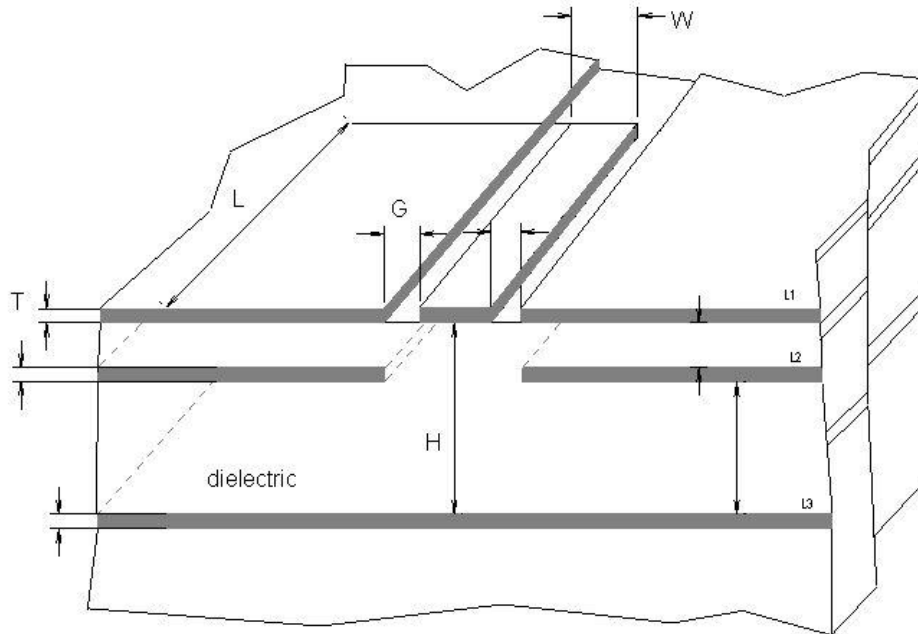 - Dielectric thickness: 1.477 mm (layer 4 to layer 1)

- ⓘ If dielectric thickness between 2 consecutive layers, as could be Layer1 and Layer2, is not enough for right impedance realization, then you can remove the copper under RF line or pad, in this case on Layer2, to have wider dielectric between Layer1 and Layer3, as example in figure below.

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Figure. RF Waveguide typical layout.

2.3. General comments

Please check and follow Telit Modem Integration Design Guide.
Review is related to received application information and the supposed use of it.

3. Quality record

This design review is registered internally in Bugzilla with ID #32846.
The customer request is registered internally in Support Center Plus with ID #00157856.