Design Review request form

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1. SCOPE

Aim of this document is to collect basic information on the customer application that will help the Telit Design Review team in having a clear understanding of the application constraints and requirements of the whole application environment. This information together with the information provided for the Design Review (Schematic, PCB Gerber, PCB layup) will assist Telit Design Review team in providing customer with a tailored Design Review Report.

2. INSTRUCTIONS

Please fill this document in all the parts either checking the options or adding text description. For your convenience we repeat here the list of files required for a complete Design Review.

Please check the correctness of the documents before sending.

We need the following information:

1. Schematic files:
   - 1.1. PDF with searchable names of components and signals.
   - 1.2. Part name and description or BOM file.
2. CAD files:
   - 2.1. Gerber files in format RS247X
   - 2.2. Drill files in excellon format with preferred separate files for plated and non plated vias.
   - 2.3. Netlist file in format IPC-356A.
   - 2.4. PCB layout description with copper and dielectric width, dielectric constant.
   - 2.5. PCB stack-up, description and gerber filename correspondences organized from top to bottom: layers, silkscreens, pastes and solder masks.
   - 2.6. In alternative to gerbers files, the full single ODB++ zip file.

In order to speed up the Design Review for subsequent DR revisions:

The subsequent design review revisions requests must come with a change log description and Review ID.

3. CUSTOMER İNFORMATİON

Company name :	Ovoo Electronics
Country :	Turkey
Address :	Necip Fazıl Mah. Ortaırmak Sok. Birgül Apt. No:19/6 42090 Meram / Konya
Contact Name :	Mehmet Günce Akkoyun
Contact e-mail :	akkoyun@me.com

4. GENERAL İNFORMATİON

Application name :	B100AA : GSM IoT MicroController Board
Telit module integrated in the application :	GE910-QUAD V3 - (SimWise or External SIM)
Field of application :	All kind of measurement for agriculture.
Installation description :	Module is installed in a weather station (or agriculture filter station, irrigation pump electric power measurement station) enclosure which placed on agriculture fields. Device works on open air conditions.
Other radio device integrated in the application :	-
Other useful information :	Device is used with PCB antenna that sticks inside of enclosure. Device have multiple sensors (air temperature, air humidity, air pressure, rain sensor, soil temperature sensor etc) or I/O devices. Device have 2 microcontroller; one is main microcontroller that measurements and IoT functions run. Second is FOTA microcontroller which is update the main microcontroller. GSM modem runs as null modem (we don't use microcontroller inside the modem). Device is powered via battery and solar cell.
Design Review already done on this application	Yes
Previous Design Review ID	AE-33285
Non Disclosure Agreement Signed :	Yes

5. GENERAL VIEW

Scope of operation – main purpose of product

-	Asset Tracking
-	Automated Meter Reading / Management
-	Automotive - Car Makers & Tier1 Supplier
-	Fleet Management - Tolling - PAYD
-	GSM Gateway
-	GSM Railway
-	Industrial Automation
-	Information & Displays
-	Mobile Computing
-	Navigation
-	POS - Point Of Sales Terminals
-	Public Transportation
-	Security - Alarm - Surveillance
-	Sub-System & Terminals based on Telit modules
-	Telemedicine / Medical
X	Telemetry
-	Telephony
-	V24 to GPS converter
-	Vending
-	Wearable Electronics
-	Other :

6. LOCATION, AMBIENT, CONDITIONS

Location :	
-	Indoor
X	Outdoor
-	Automotive
X	Other : Placed on agriculture fields.

Ambient :	
X	Countryside
-	Urban

Conditions :	
-	Explosive Atmosphere
X	Extreme Conditions (specify) : Windy and rainy air conditions. High temperature and moisture conditions. Enclosure is designed for IP65 conditions.

Installations :	
X	Fixed
-	Mobile
-	Portable

7. BANDS OF OPERATION

Required Bands :	
-	CDMA 450
-	CDMA 800
-	CDMA 1900
-	GSM 850/1900
X	GSM 900/1800
-	UMTS B1
-	UMTS B2
-	UMTS B3
-	UMTS B4
-	UMTS B5
-	UMTS B8
-	LTE I (2100)
-	LTE II (1900)
-	LTE III (1800)
-	LTE IV (1700-2100)
-	LTE V (850)
-	LTE VII (2600)
-	LTE XIII (700)
-	LTE XX (800)
X	Others : All operators in Turkey and all 2G compatible countries.

8. APPROVALS REQUIRED

Regulatory Approvals :	
X	CE Mark
X	GCF
X	FCC/IC
X	PTCRB
-	Other : _____

Carrier Approvals :	
-	AT&T
-	Verizon
-	Vodafone
X	Other : Tele2 with rooming in Turkey (all operators in Turkey) and local operator (SIM card)

Other Approvals :	
-	ATEX/IECEx (specify) : _____
-	Other : _____

9. ADDITIONAL RADIOS

Additional Radio Technology :	
-	WiFi
-	GPS
-	Bluetooth / BLE
-	Short Range (specify) _____

Coexistence Management :	
-	None
-	No Simultaneous Operation
-	Other : _____

10.GNSS

-	GPS
-	GLONASS
-	Galileo
-	QZSS
-	Beidou
-	Other : _____

11.ANTENNAS

-	Embedded
X	Internal : PCB antenna which sticked in the enclosure.
-	External, Placed directly on connector or close to application
-	External, Connected with long coax cable and placed away
-	GNSS antenna passive
-	GNSS antenna active

12.POWER

Type of power supply / battery (specify)	Li-Ion (3v8 - 4v2) 2500 mAh (planned 2x)
Modem RTC hold time requirement (specify)	We use onboard RTC ic for system wakeup and time stamp. So we don't plan to use modem RTC (there is no RTC backup need for modem)

13.SIM

-	Standard SIM Holder
X	Standard SIM Holder / SIM on Chip Mount Alternative
-	SIM on Chip Only
-	Dual SIM
-	Telit IoT Connectivity
X	SimWise (SIM profile embedded in Module)

14.MODULE CONTROL

-	Embedded Telit Python Script
-	Embedded Telit IoT AppZone
X	External Microcontroller or Interface

15.DOCUMENTATION FILES TABLE

Schematic Files			
File Type	File Name	Format	Note
Schematic	B100AA-R5.pdf	PDF	
BOM		PDF or Excel	
Custom Components Datasheet		PDF	Antennas, custom components etc.

PCB Stack-up [6 Layer]				
Layer	File Name	POS/NEG	Dielectric Constant	Thickness [µm]
Top Overlay			-	
Top Solder			-	10
Top Surface Finish			-	20
Top Layer			-	40
Prepreg				100
Mid Layer 1			-	20
FR4 Core				560
Mid Layer 2			-	20
Prepreg				130
Mid Layer 3			-	20
FR4 Core				560
Mid Layer 4			-	20
Prepreg				100
Bottom Layer			-	40
Bottom Surface Finish			-	20
Bottom Solder			-	10
Bottom Overlay			-	

PCB Extra Files				
File Type	File Name	Format	From Layer	To Layer
Silkscreen Top				
Paste Mask Top				
Solder Mask Top				
Copper 1 [Top]				
Dielectric 1				
Copper 2 [Inner 1]				
Dielectric 2				
Copper 3 [Inner 2]				
Dielectric 3				
Copper 4 [Bottom]				
Solder Mask Bottom				
Paste Mask Bottom				
Silkscreen Bottom				

16.COMMENTS & PICTURES

System is powered via battery which charged from solar cell. Battery power is boost up to 3V8 voltage level with at least 2A power. if a new firmware is arrived device starts run the FOTA microcontroller. if there is no new firmware system measure parameters and send to customer database. System also have SD module for firmware update.

16.1. Design Review AE-33285 Update Notes

R2 Updates

* GSM IoT signal bidirectional voltage translator structure is updated. SN74AVCH4T245 IC is used on new update according your advice.
* SIM Vcc decoupling capacitor is changed from 470 nF to 100 nF according your advice (but on SIM integration guide official Telit document advice 470 nF).
* 33 pF filter capacitors are controlled according your advice and noted on J2 and J3 socket page.
* On your review you write “Missing Information” so we add B151BA board (B100 module is plugged over B151BA board). Power supply layer of B100 is on B151BA. Please control power section.
* On B151BA board we use Telit BlueMod S50 bluetooth module. Please review B151BA also.

R3 Updates

* 33 pF capacitor added to VAUX pin on GE910. (B100AA)
* 33 pF filter capacitors added to (all) J2 and J3 socket outputs. (B100AA)
* We update BlueMod+S50 hardware flow control. (B151BA)
* We update BlueMod+S50 BOOT0 and TESTMODE selection. (B151BA)
* We add BlueMod+S50 HANGUP pin to microcontroller. (B151BA)
* We add BlueMod+S50 test points on BOOT0, UART-RXD, UART-TXD, UART-RTS and UART-CTS. (B151BA)
* We use BlueMod+S50 with external antenna so part number will be updated.

R4 Updates

* GSM IoT LED resistors are calculated and updated.
* GSM IoT LED power enable transistor changed to NPN.
* Filter capacitors updated. (please recheck).

R4 (PCB) Updates

* PCB Design generated. (6 layer stack-up)

R5 (PCB) Updates

* At B100AA PCB design, we add inhibit regions (remove copper and via zones behind GE910).
* At B100AA PCB design, we re route outer layers (powers and others)
* At B100AA PCB design, we re route GSM power tracks.
* At B100AA PCB design, we correct RF lines according your advice.
* B151BA PCB design is generated. (4 layer stack-up)

R6 (PCB) Updates

* B151BA Bluetooth module PN number update.
* Solder resist updated.
* B151BA antenna line impedance update.
* B100AA antenna line filter pads update.
* B100AA power lines under antenna zone is re-routed.

17.CHANGE LOG

Change Log	
Revision	Description
00.00.01	Schematic creation.
00.00.02	Design review AE-33285 11.01.2021 updates.
00.00.03	Design review AE-33285 18.01.2021 updates.
00.00.04	Design review AE-33285 21.01.2021 updates.
00.00.05	B100AA PCB creation.
00.00.06	Design review AE-33285 01.02.2021 updates. B151BA PCB creation.
00.00.07	Design review AE-33285 11.02.2021 updates.