

Sequans Communications  
15-55 Boulevard Charles de Gaulle  
Colombes  
92700 France

## **Declaration for KDB 996369 D02 Module Q&A**

Date: 2019-06-12

To whom it may concern,

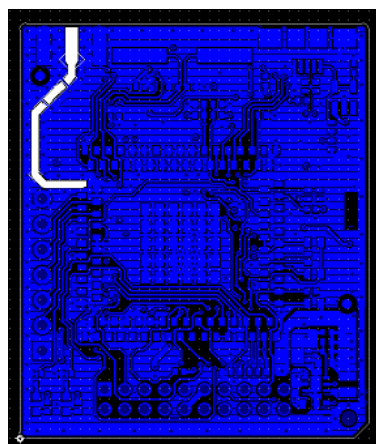
This declaration concerns GM01Q-STMOD host board which uses certified module GM01Q with FCC ID: 2AAGMGM01QA

Question 1. Layout of trace design, parts, antenna, connectors, and isolation requirements.

### **Description:**

#### **Layout of trace design:**

**GM01Q module is connected to GM01Q-STMOD SMA external antenna connector with track highlighted below and referred after as antenna trace:**



**top view |(layer1)**

#### **Antenna trace:**

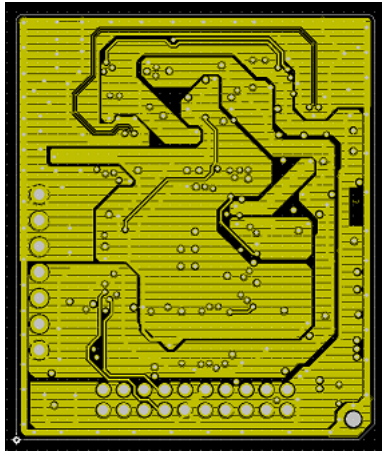
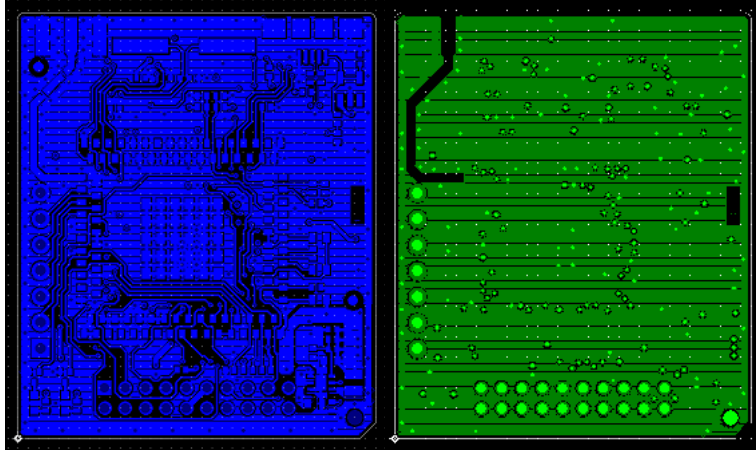
- No ground on Layer2 under track
- Thickness L1 to L3 =  $95+35+1130=1260\mu\text{m}$
- Co-planar waveguide design

Sequans Communications  
15-55 Boulevard Charles de Gaulle  
Colombes  
92700 France

L1

L2

L3

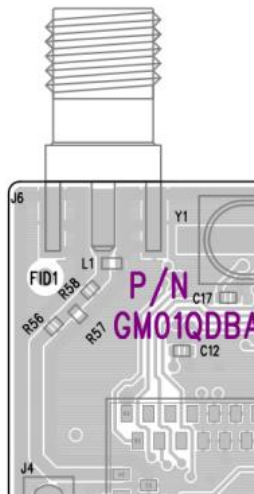


**Parts:** Passive Antenna RF matching circuit by passed:

R56=R58=0R0

L1=R57=NO FIT

Sequans Communications  
 15-55 Boulevard Charles de Gaulle  
 Colombes  
 92700 France



**Antenna:** is external component to GM01Q-STMOD, it is fitted on SMA connector

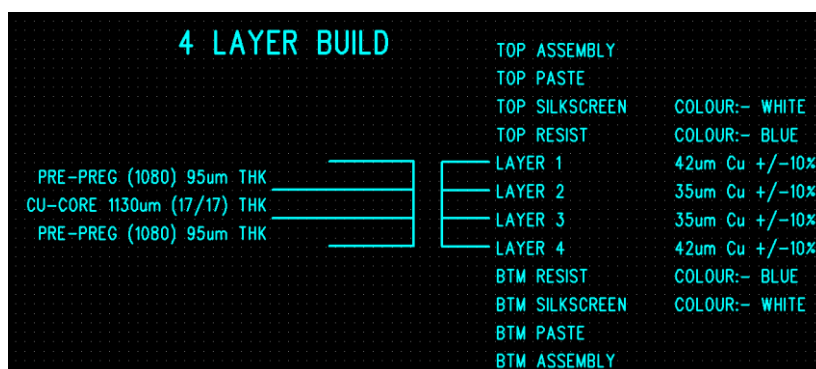
**Connectors:** SMA

**Isolation requirements:** None

Question 2. Boundary limits of size, thickness, length, width, shape(s), dielectric constant, and impedance must be clearly described for each type of antenna.

**Description:**

Antenna track on GM01Q-STMOD is  
 Co-planar waveguide  
 routed on Layer1  
 with ground plane on Layer3,  
 no copper on Layer2 below Antenna track



Sequans Communications  
15-55 Boulevard Charles de Gaulle  
Colombes  
92700 France

**Thickness:**

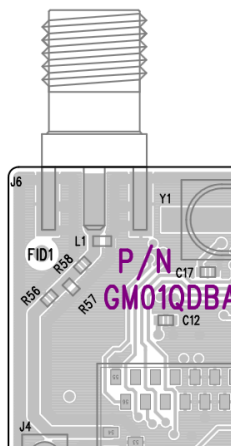
- copper thickness 42um
- dielectric thickness between ground plane (Layer3) and track (layer1) is 1260um,

**Length:**

- Track length from GM01Q to Passive antenna RF matching network: 12.22241 mm
- Track length in Passive antenna RF matching network 1.93246 mm
- Track length From Passive antenna matching network to SMA connector including SMA pad 3.9003 mm

**Width:** 0.7mm wide

**Shape(s):** see picture, kind of hook shape (L shape from GM01Q to passive Antenna RF matching network)



**Dielectric constant:**  $\epsilon_r=3.8$

**Impedance:** 50R

Question 3. Different antenna length and shapes affect radiated emissions, and each design shall be considered a different type; e.g., antenna length in multiple(s) of frequency wavelength and antenna shape (traces in phase) can affect antenna gain and must be considered.

**Description:**

STM0D uses external antenna

Sequans Communications  
15-55 Boulevard Charles de Gaulle  
Colombes  
92700 France

Effect of track on STMOD between GM01Q and SMA connector is a power loss. This effect is negligible.

Question 4. The above data is to be provided by a Gerber file (or equivalent) for PC layout.

**Description:**

Gerber provided in file

ENG.PLT.HW-DP-00X-R01\_GM01Q-DB-A1\_0-2019-01-07.zip

Question 5. Appropriate parts by manufacturer and specifications.

**Description:**

See BOM file in ENG.PLT.HW-DP-00X-R01\_GM01Q-DB-A1\_0-2019-01-07.zip

R56=R58=0R0 5% rated 0.063W, 0402, any vendor

Question 6. Test procedures for design verification.

**Description:**

- CATM1 5MHz QPSK 6RB0 UL QPSK 4RB0 DL
- 17 bands 3GPP Low/Mid/High frequencies
- Check TX power at 23dBm requested is within [-1.5,+1.0] dB Error at ambient
- Check RX sensitivity in 17 bands
- Verify antenna test report from vendor

Question 7. Production test procedures for ensuring compliance.

**Description:**

UE generates tone and tone is measured by test equipment. Tone power shall be within acceptable limits

Thank you for your attention.

Sequans Communications  
15-55 Boulevard Charles de Gaulle  
Colombes  
92700 France  
Sincerely yours,



---

**Sebastien Falgayrettes / PLM senior director**

**Sequans Communications**

Tel: 0033627991534

Fax: 0033170721609

E-mail: [sfalgayrettes@sequans.com](mailto:sfalgayrettes@sequans.com)