Excellence in Compliance Testing

Certification Exhibit

FCC ID: UIDTG1672
IC: 6670A-TG1672

FCC Rule Part: 15.247
IC Radio Standards Specification: RSS-210

ACS Project Number: 12-0355

Manufacturer: Arris International, Inc.
Model: TG1672G & TG1662G

Theory of Operation

2.4 and 5GHz WIFI Radio description

There are two Wifi Radios in TG1672G and TG1662G (2.4GHz and 5GHz Radios), both models use a common pcb and housing where TG1662G is a stuffing option of TG1672G without MoCA 1.1.

Both radios comply with the 802.11n protocol and support 3x3 MIMO.

2.4GHz Radio

Digital interface is PCIe to the Puma6. A 40 MHz crystal provides the reference clock for the radio The CLR260 converts the transmit data to WIFI frequencies. On the receive side the WiFi data is converted back to digital.

The CLR260 supports 802.11n 3x3 MIMO protocol.

The transmit output of the CLR260 is filtered amplified by a discrete pre-amp and further amplified in the Skyworks SE2620T front end module. The SE2620T also contains a T/R switch that is controlled by the CLR260. The output of the SE2620T is filtered to ensure compliance to FCC and fed to an on board PCB antenna.

On the receive side the signal is amplified in the SE2620T by the LNA and this signal is fed to the CLR260.

Three separate WiFi chains each with its own pcb antenna provide the 3x3 MIMO.

5 GHz Radio

Digital interface is PCIe to the Puma6. A 40 MHz crystal provides the reference clock for the radio The CLR260 converts the transmit data to WIFI frequencies. On the receive side the WiFi data is converted back to digital.

The CLR260 supports 802.11n 3x3 MIMO protocol.

The transmit output of the CLR260 is filtered and amplified in the Skyworks SE5012T front end module. The SE5012T also contains a T/R switch that is controlled by the CLR260. The output of the SE5012TT is filtered to ensure compliance to FCC and fed to an on board PCB antenna.

On the receive side the signal is amplified in the SE5012T by the LNA and this signal is fed to the CLR260.

Three separate WiFi chains each with its own pcb antenna provide the 3x3 MIMO

Application

- IEEE802.11 a/b/g/n Wireless Local Area Networks
- PCI Express 1.1 Half-Size Mini Card, Mini Card, Express Card.

The RT3593 is a highly integrated MAC/BBP and 2.4/5 GHz RF single chip with 450Mbps PHY rate supporting. It fully complies with IEEE 802.11n and IEEE 802.11 a/b/g standards, delivers reliable, cost-effective, feature rich wireless connectivity at high throughput from an extended distance. Optimized RF architecture and baseband algorithms provide superb performance and low power consumption. Intelligent MAC design deploys a high efficient DMA engine and hardware data processing accelerators without overloading the host processor. The RT3593 is designed to support standard based features in the areas of security, quality of service and international regulation, giving end users the greatest performance anytime in any circumstance.

Features

- CMOS Technology with RF, Baseband, and MAC Integrated.
- 3T3R Mode with 450Mbps PHY Rate for Both Transmit and Receiving.
- Legacy and High Throughput Modes
- 20MHz/40MHz Bandwidth
- Reverse Direction Data Flow and Frame Aggregation
- WEP 64/128, WPA, WPA2, WAPI
- Tx Beam Forming
- QoS-WMM, WMM-PS
- Multiple BSSID Support
- PCI Express 1.1
- International Regulation - 802.11d + h
- Cisco CCX Support
- Bluetooth Co-existence
- Low Power with Advanced Power Management
- Operating Systems - Windows XP, 2000, ME, 98SE, Vista, Linux, MAC

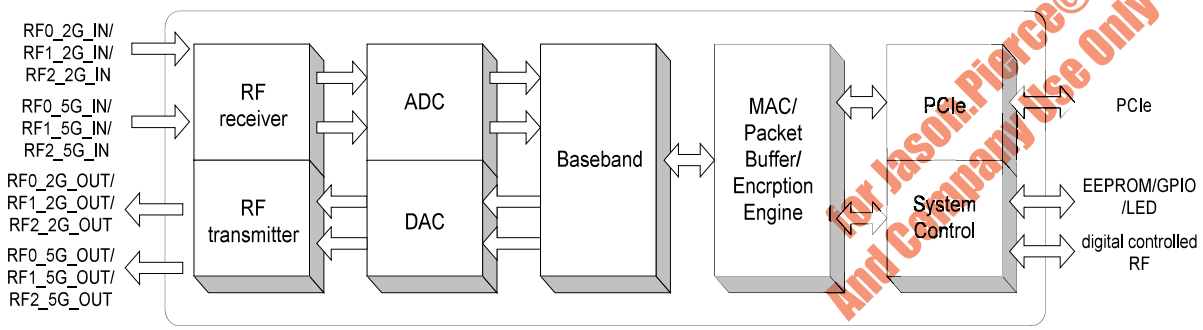
Order Information

Part Number	Temp Range	Package
RT3593L	-10~70 ^{0}C	Green/RoHS Compliant 88LD QFN (10mmx10mm)

Ralink Technology, Corp. (Taiwan)
5th F. No. 36,Taiyuan St, Jhubei City, Hsin-Chu, Taiwan, R.O.C.
Tel: 886-3-560-0868 Fax: 886-3-560-0818

Ralink Technology, Corp. (USA)
20833 Stevens Creek Blvd., Suite 200 Cupertino, CA95014
Tel: (408) 725-8070 Fax: (408)725-8069
http://www.ralinktech.com

Functional Block Diagram



Celeno

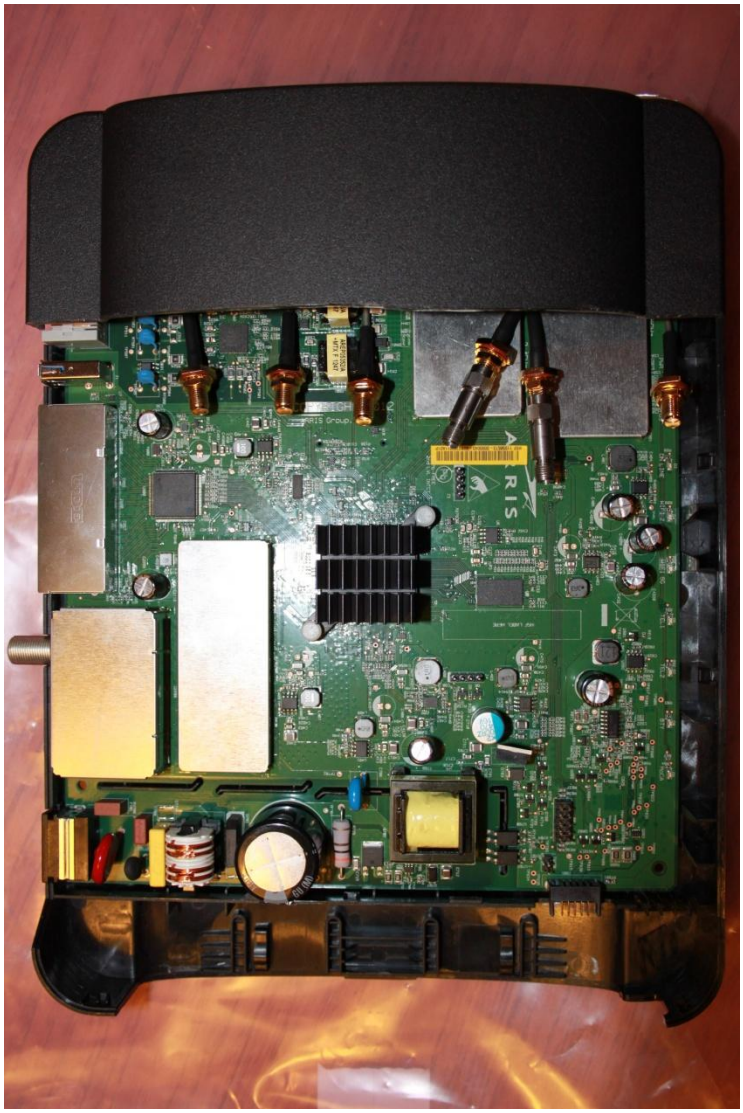
1672
SR2 Antenna Measurements

February 15, 2013

1. Following report presents the measurements of the optimized 1672 SR2 antennas.
   Antennas were slightly tuned to their required frequency. This involved minor dimensions changes of the antennas' layout.
   All measurements were made on assembled PCB and with the housing.
   Due to the large amount of data, S11, Coupling, Azimuth patterns (both polarizations) and Elevation patterns (both polarizations) are given for each antenna in typical frequency rather than its entire frequency band.

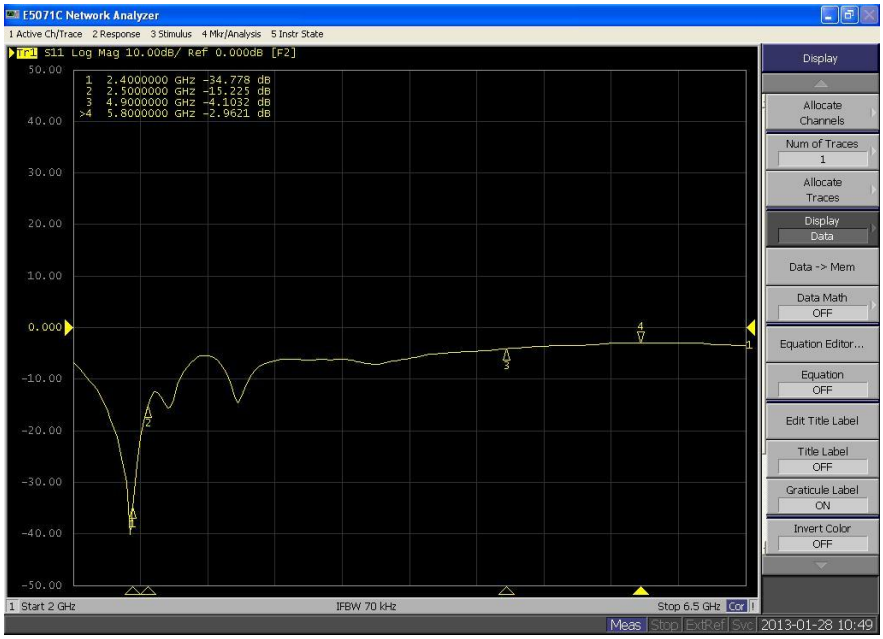
2. Below picture present the Antennas' numbers:

All measurements were taken with "cover":

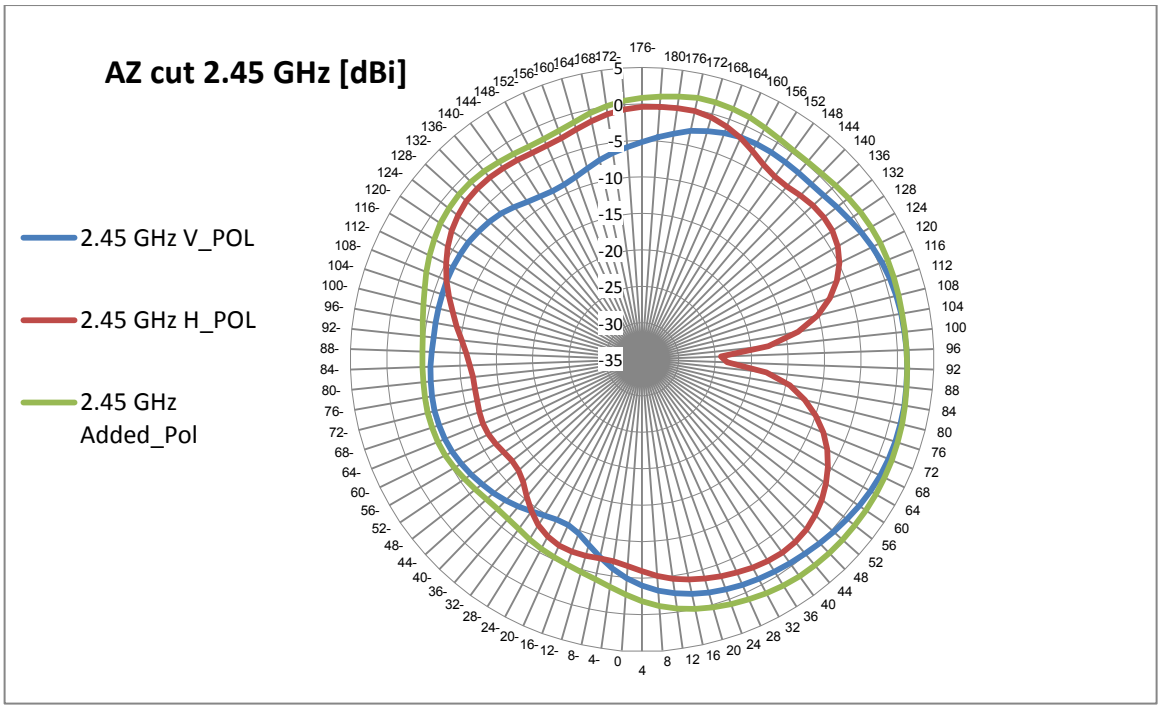


3. Antenna 2400

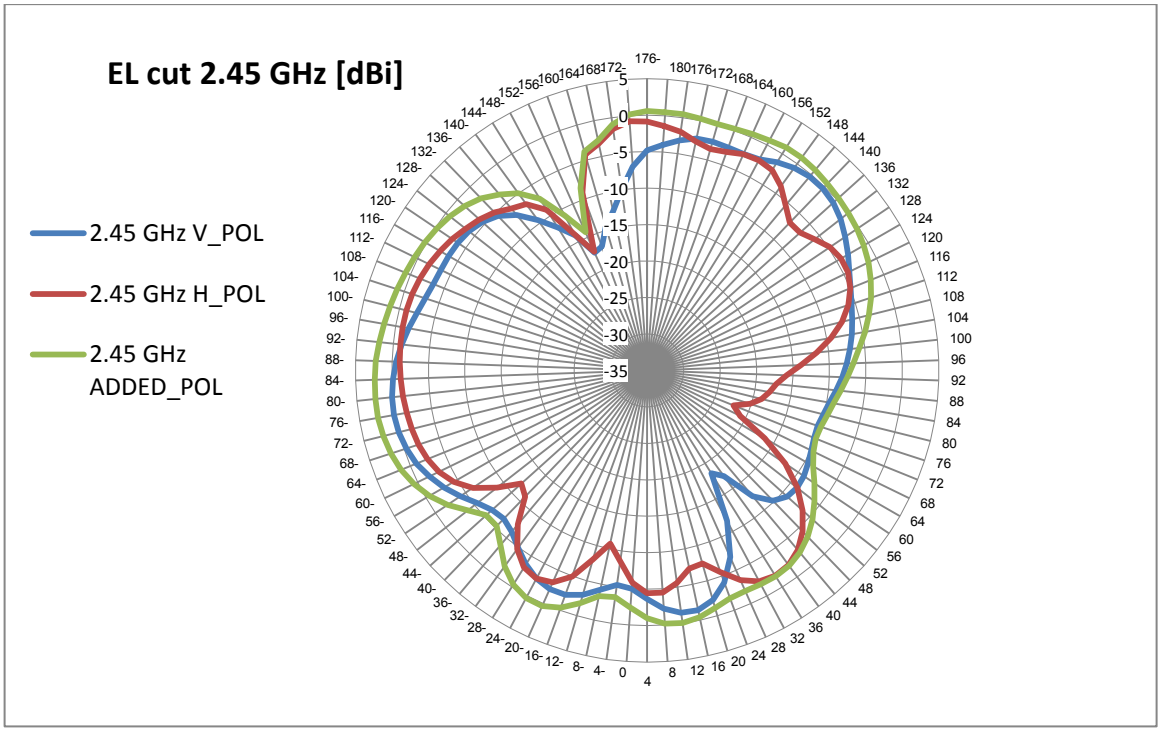
S11



Azimuth Pattern

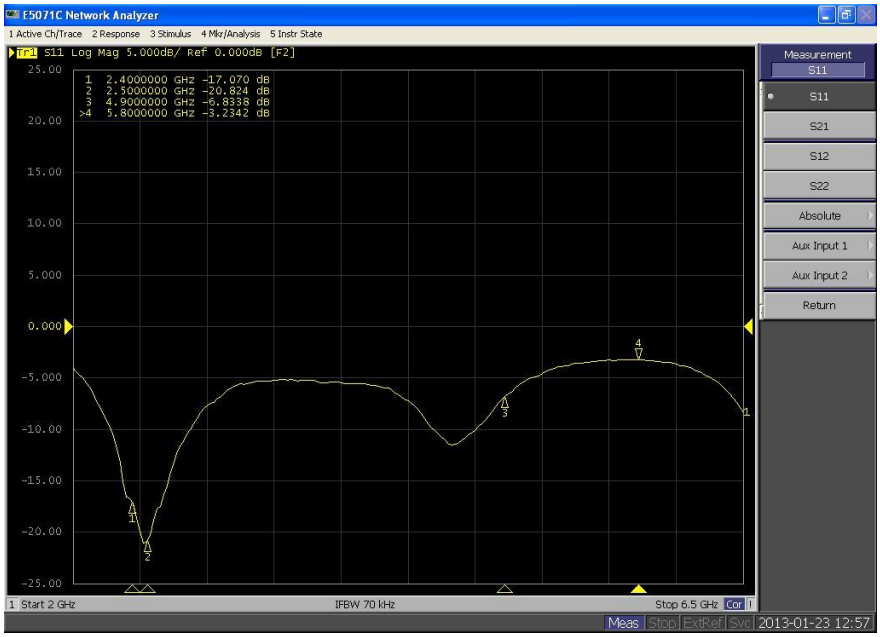


Elevation Pattern

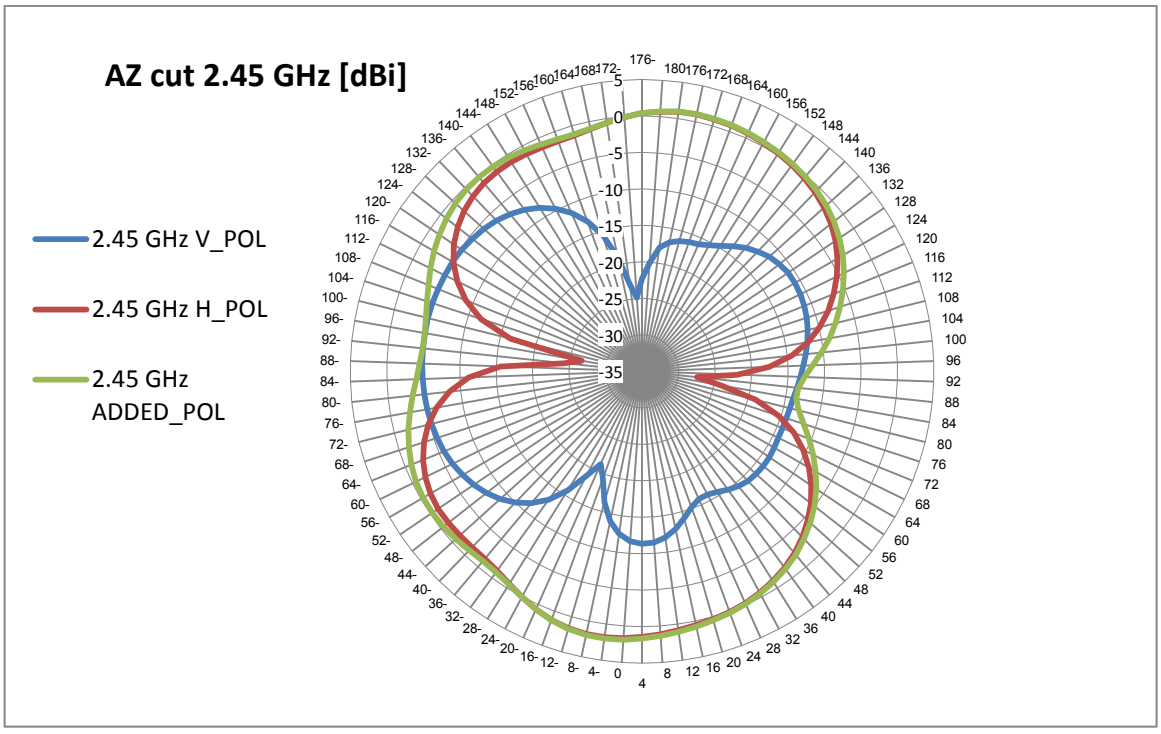


4. Antenna 2401

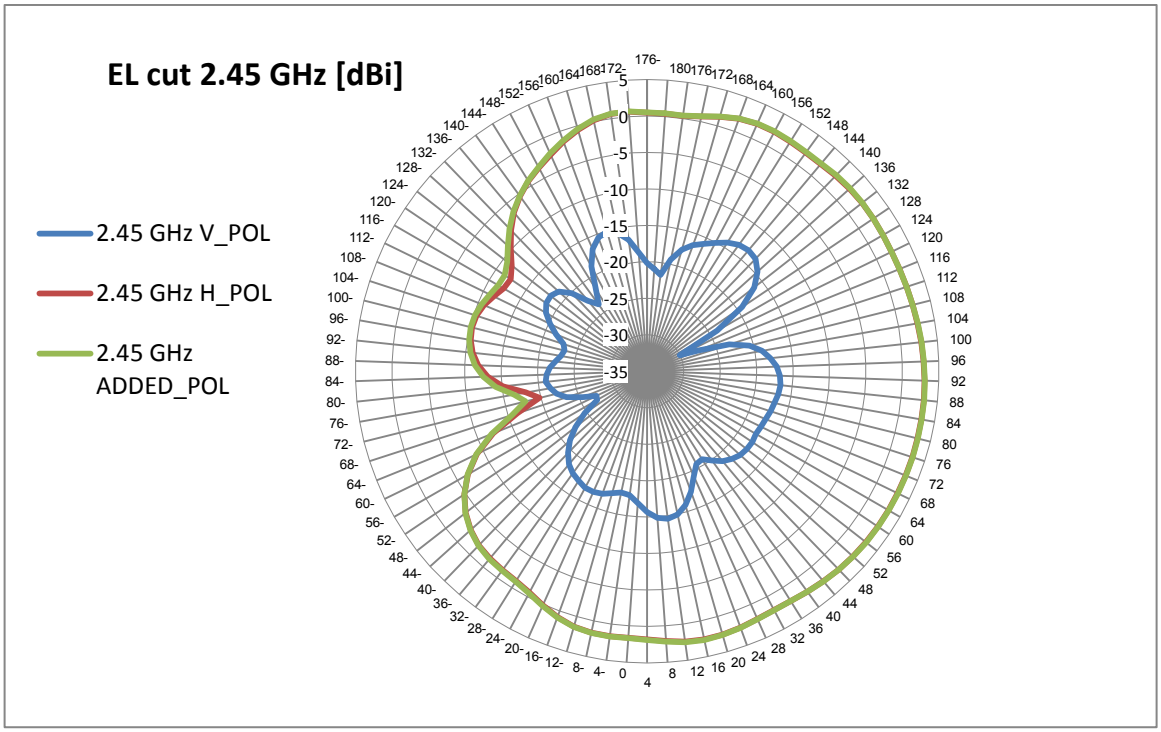
S11



Azimuth Pattern

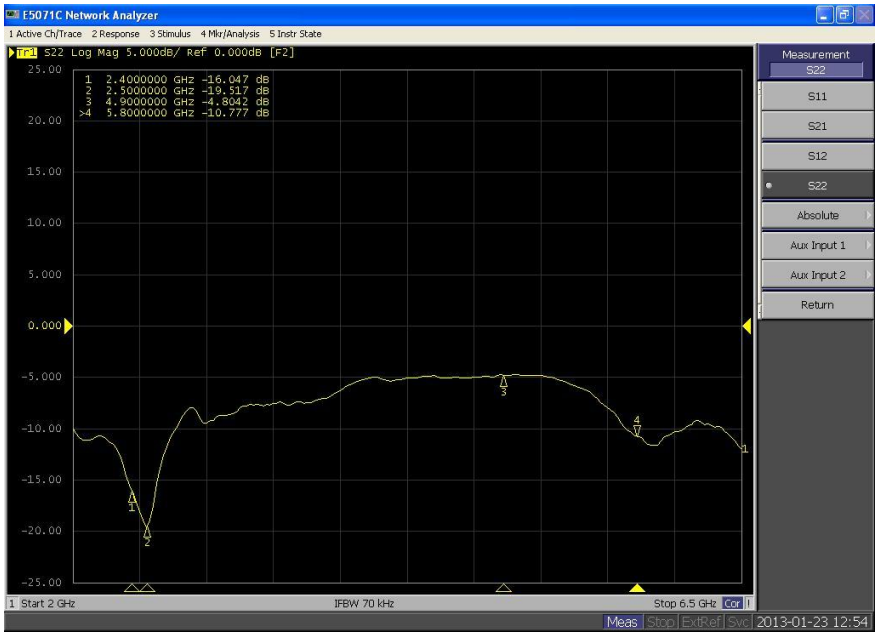


Elevation Pattern

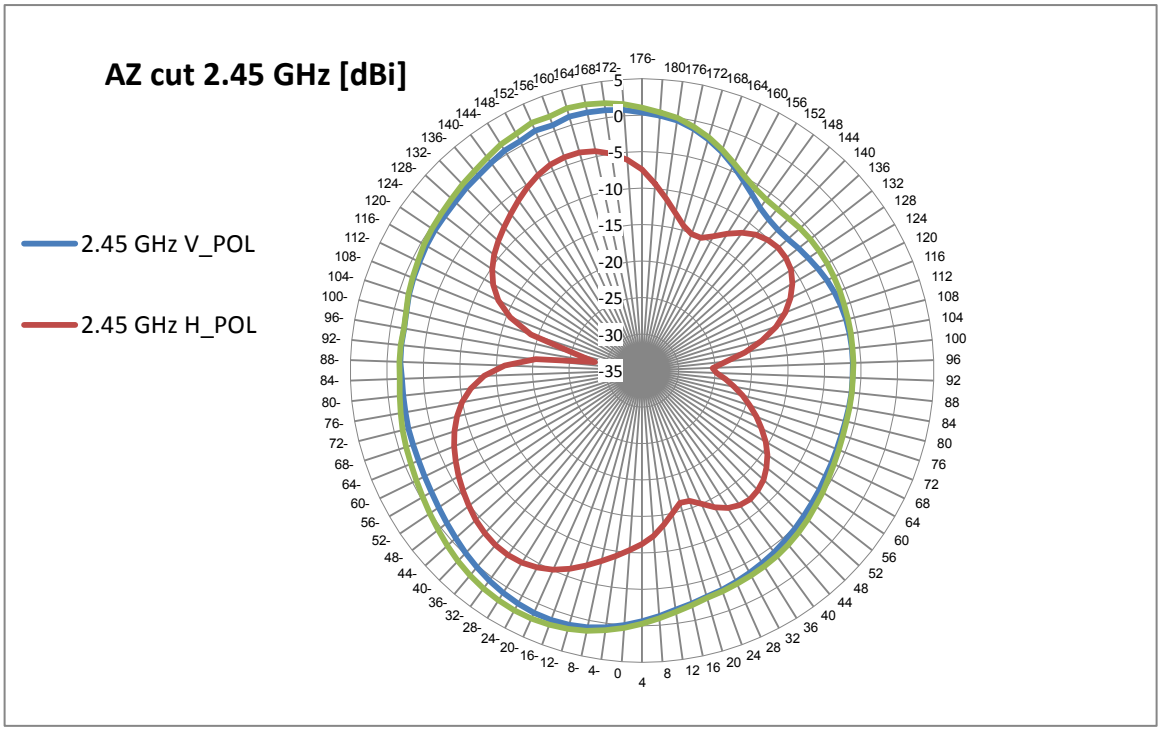


5. Antenna 2402

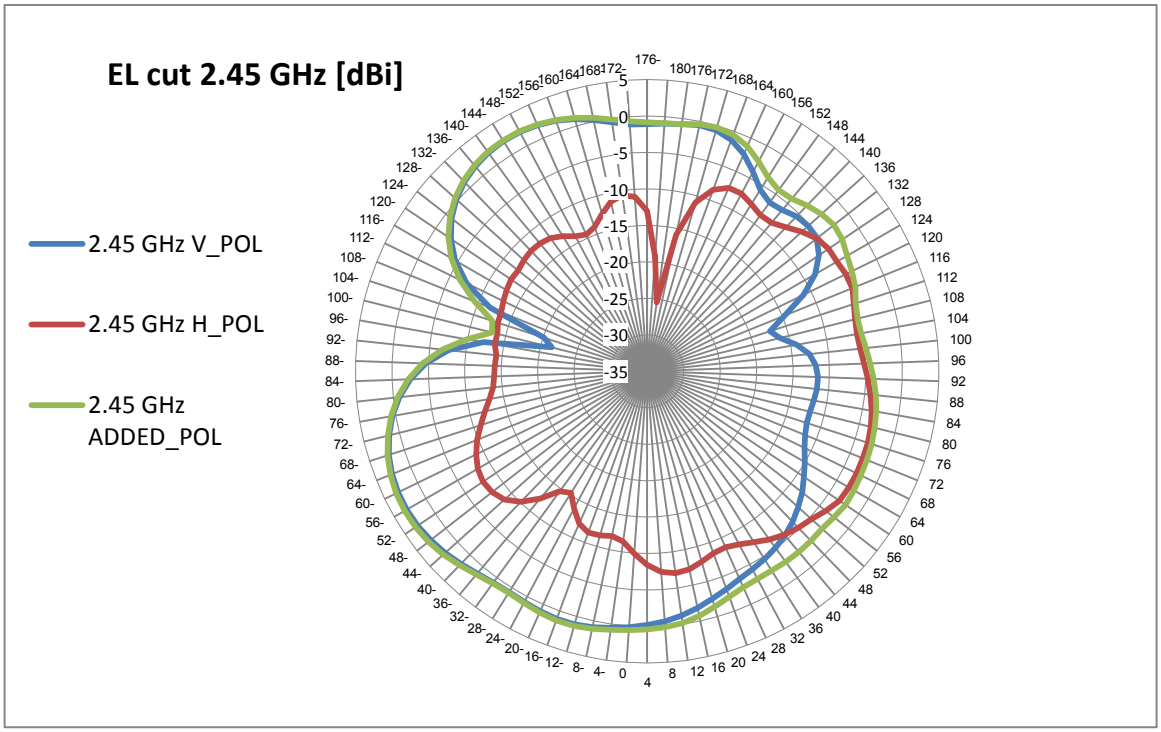
S11



Azimuth Pattern



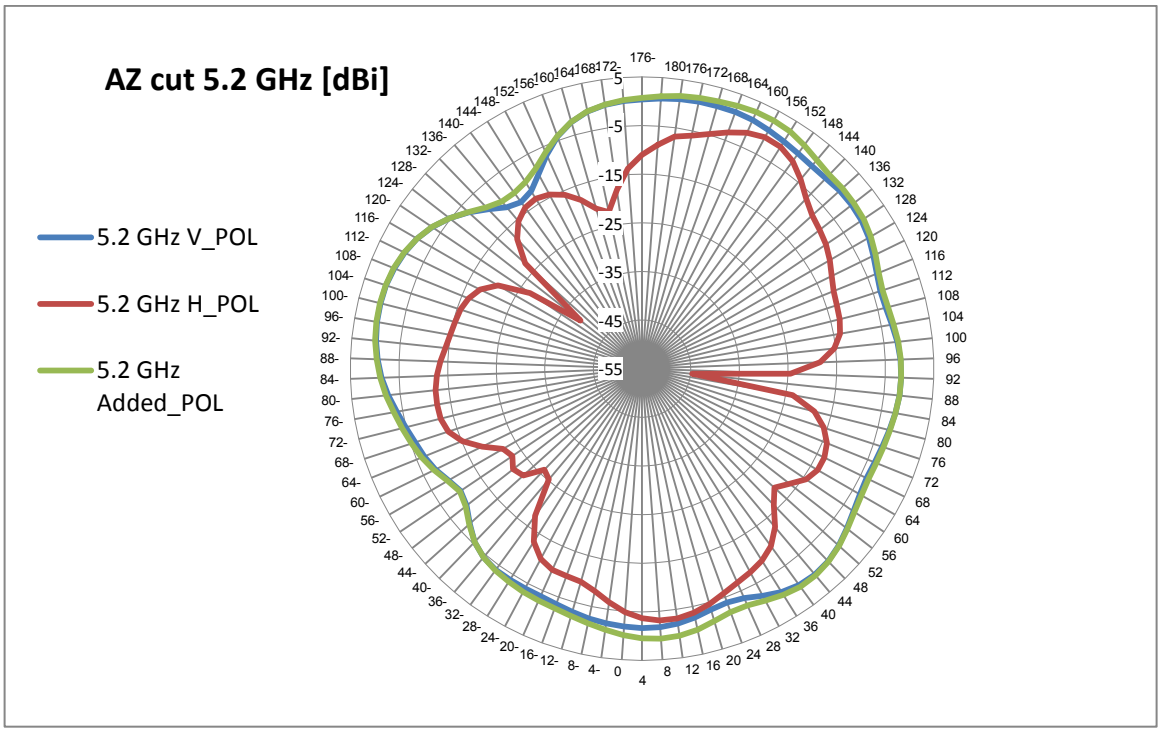
Elevation Pattern



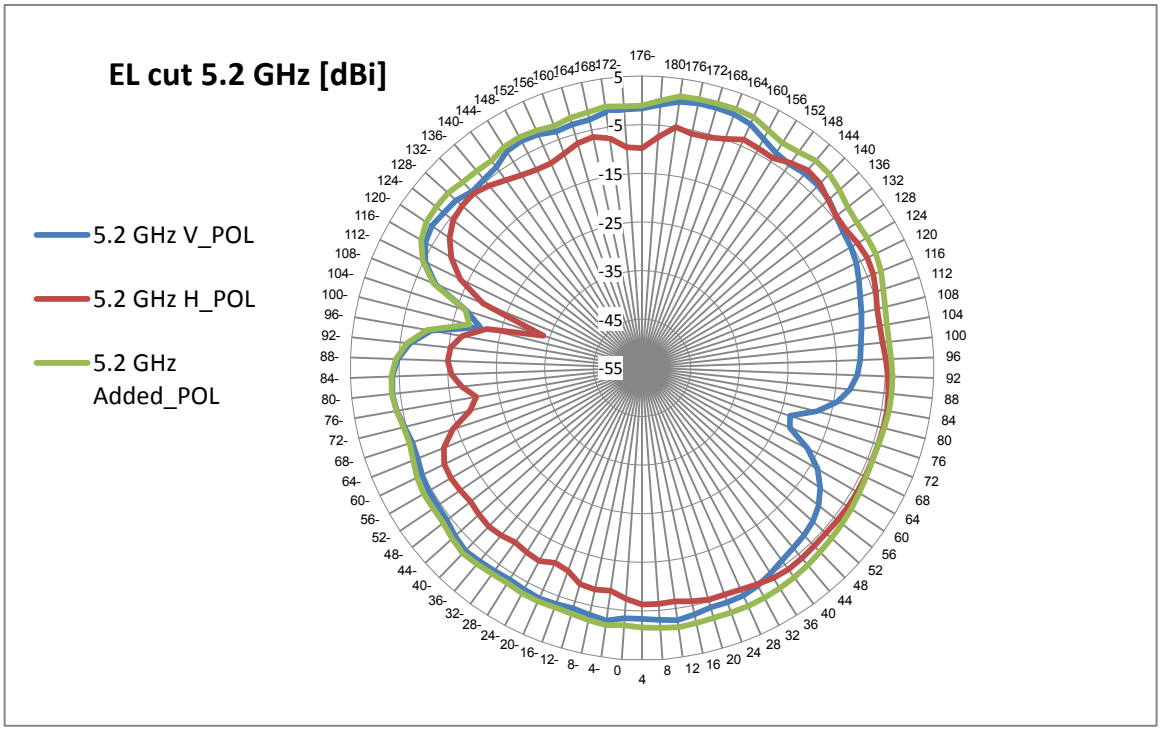
6. Antenna 5000

S11

Azimuth Pattern

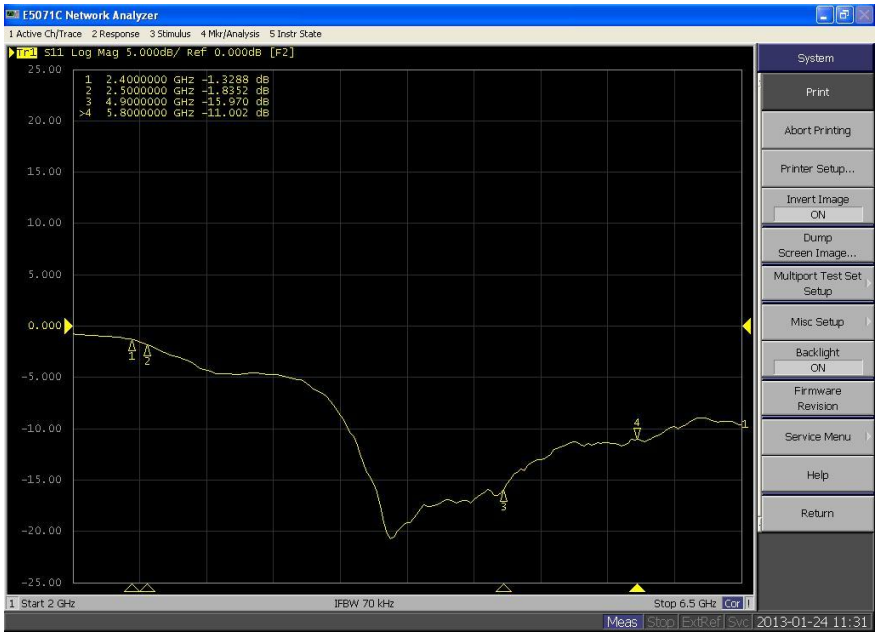


Elevation Pattern

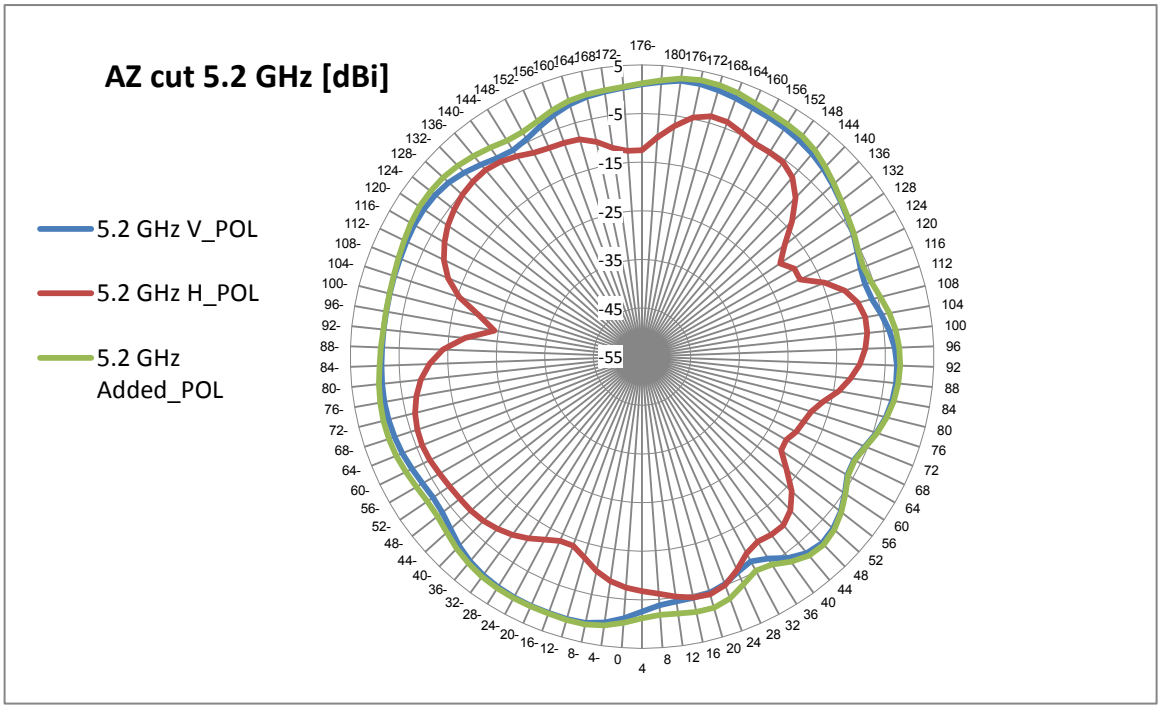


7. Antenna 5001

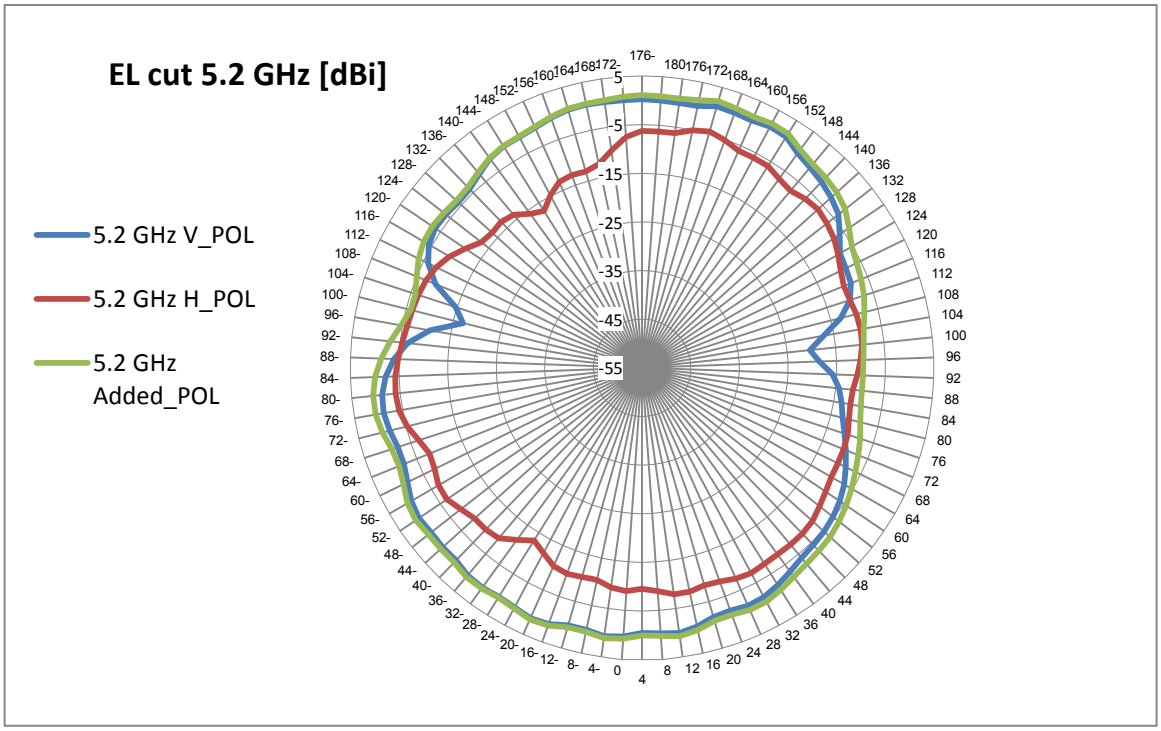
S11



Azimuth Pattern



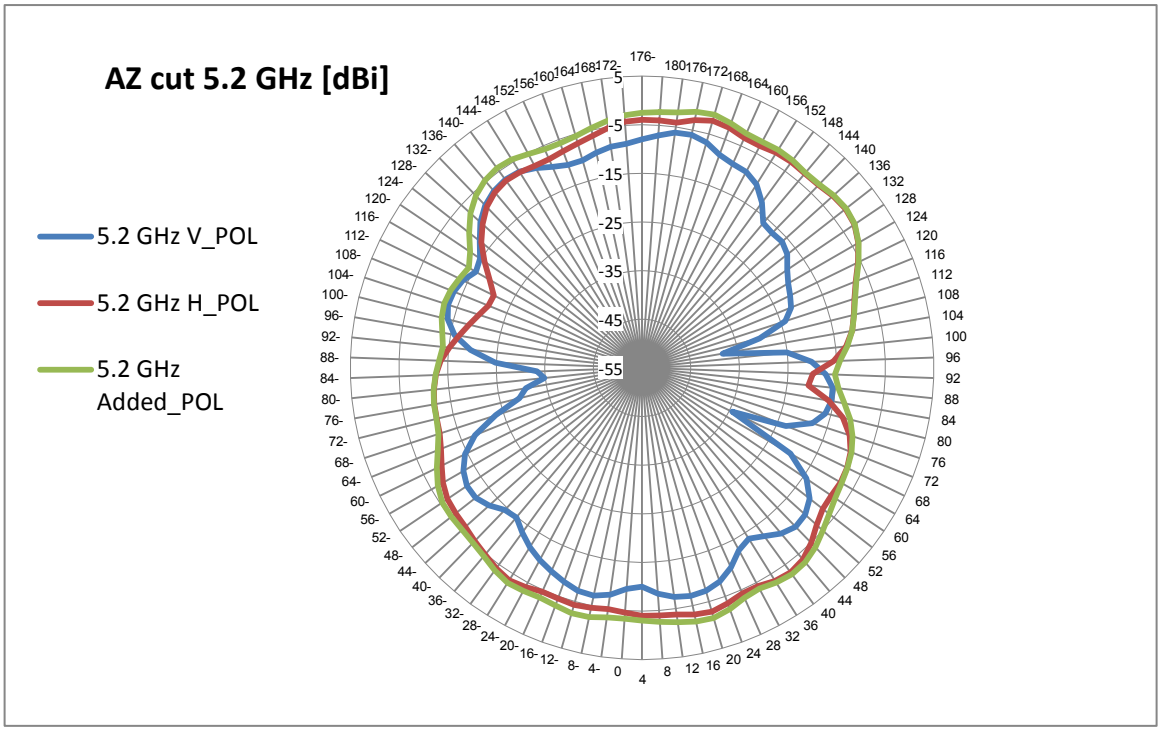
Elevation Pattern



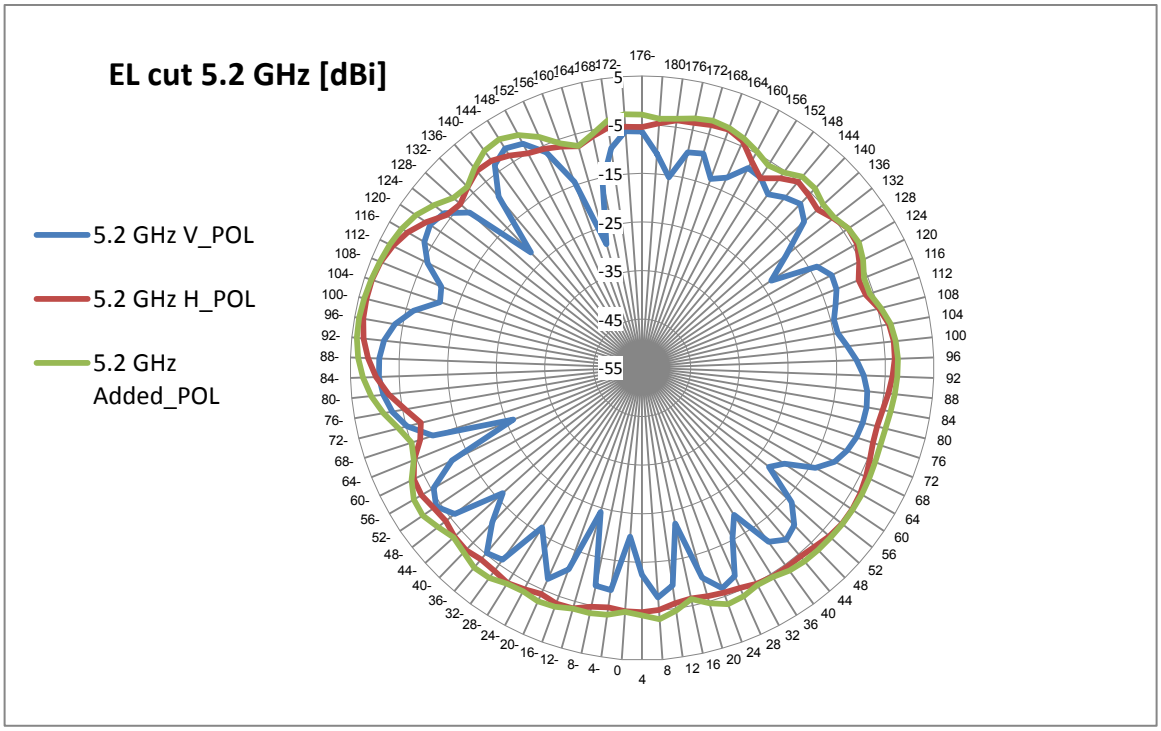
8. Antenna 5002

S11

Azimuth Pattern

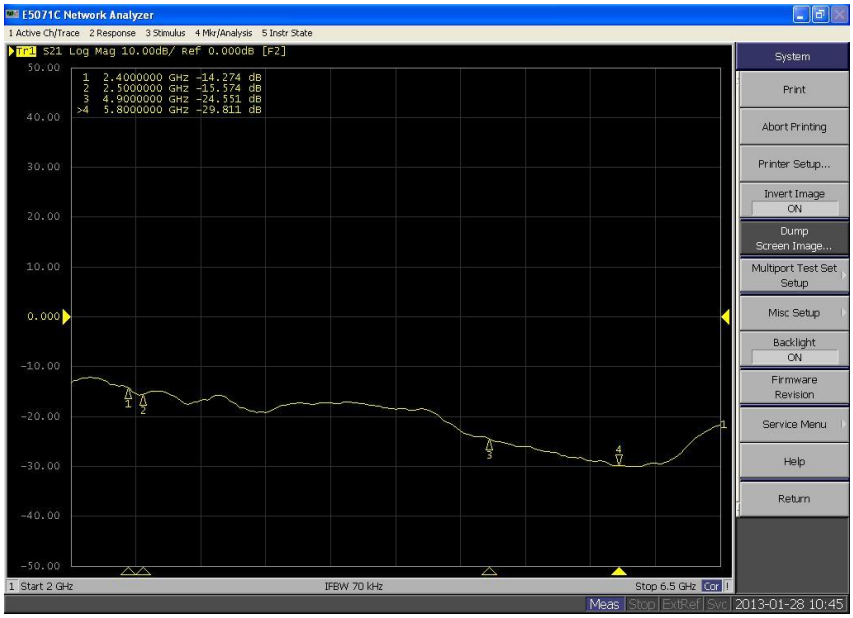


Elevation Pattern

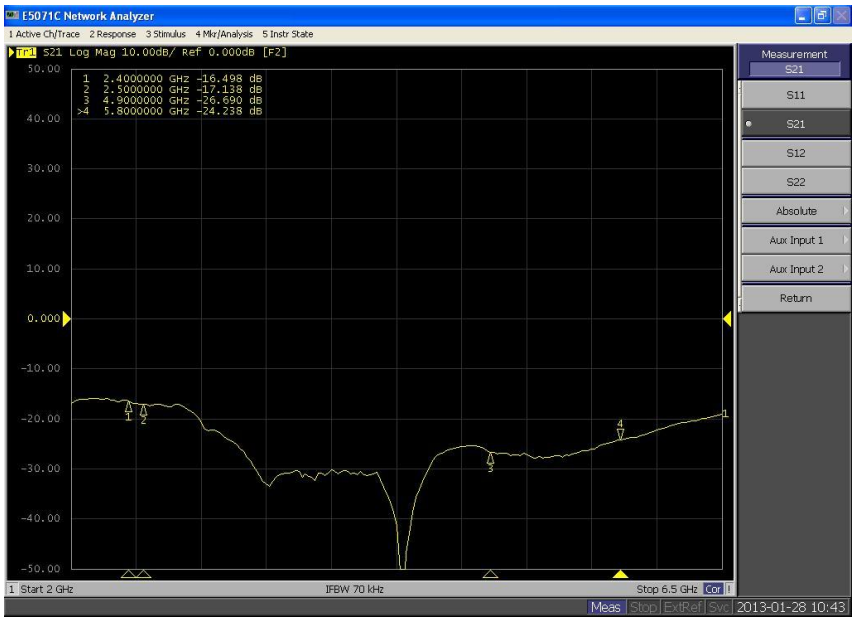


9. Coupling

Ant2400-Ant2401

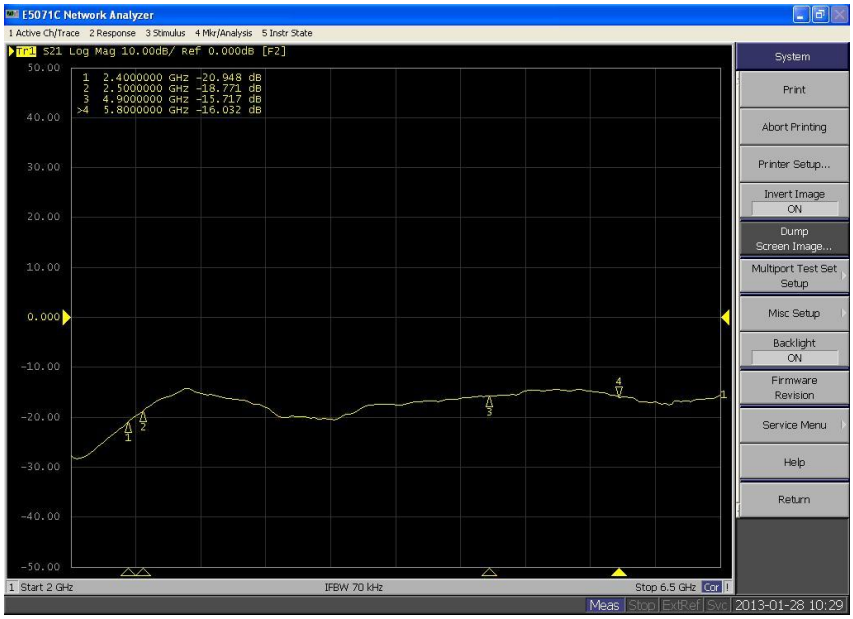


Ant2401-Ant2402

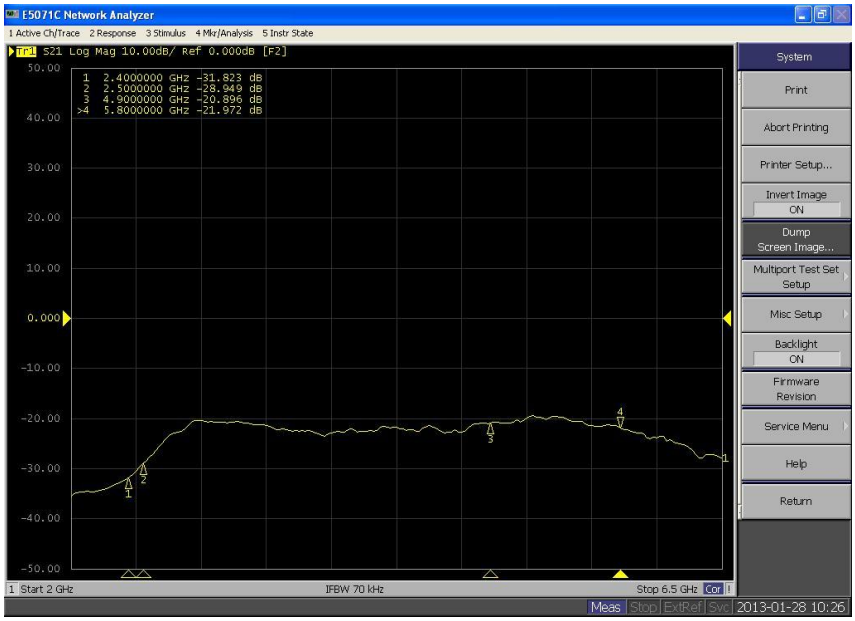


Ant2400-Ant2402

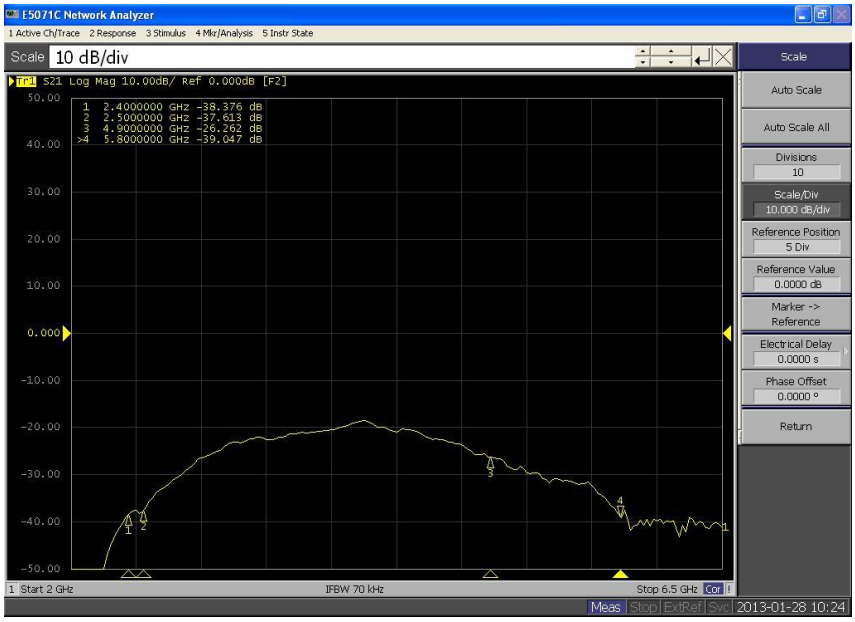
Ant2402-Ant5000



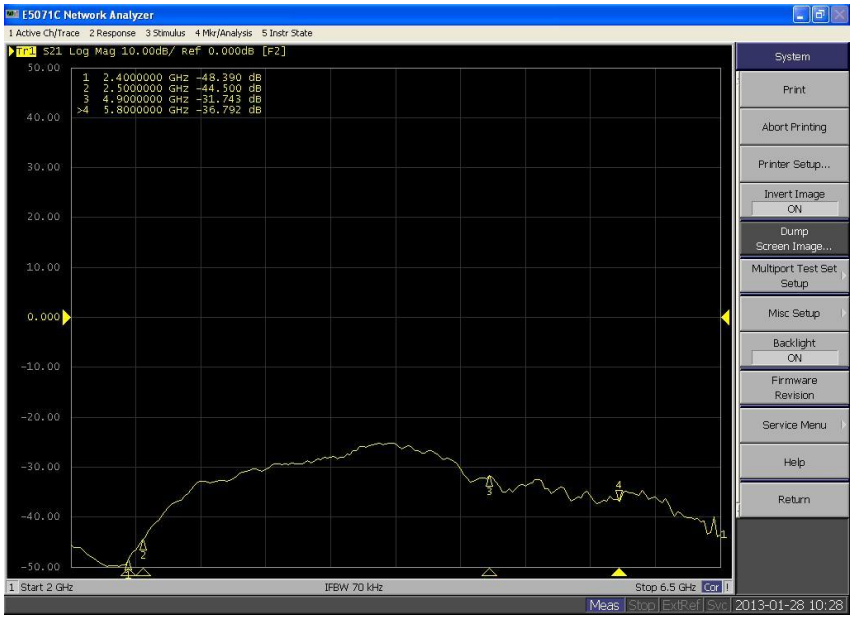
Ant5000-Ant5001



Ant5001-Ant5002



Ant5000-Ant5002



10. Analysis and Conclusions

a. All antennas are very well matched over their band. They minor layout adjustment especially in the 5G band.
b. Gain of all antennas are similar to previous measurement (see *1672 _ Optimized SR1 Antenna Report_120807* report); Typical Gain of all antennas: ~(+)3.0 dBi.
c. Minor differences in Radiation Patterns compare to previous measurement were recorded (probably due to measurements accuracy and manufacturing tolerances).
d. In general there is good isolation between antennas. Coupling between 5G antennas is better than coupling between 2.4G antennas due to the relative wavelength.