

## 2J4H86PGFf

4× 5GNR MIMO, 4× 2.4/5.0/6.0 GHz ISM MIMO and GNSS  
Adhesive Mount

### Key Features

#### Cable 1 - 4: 5GNR

- 617-960 MHz
- 1427-2690 MHz
- 3300-5000 MHz
- 5150-5925 MHz

#### Cable 5 - 8: 2.4/5.0/6.0 GHz ISM

- 2410-2490 MHz
- 4920-7125 MHz

#### Cable 9: GPS/GLONASS/QZSS/Galileo

- 1575-1606 MHz

Adhesive Mount

High Performance

Low Profile

Ground Plane Independent

Customizable Cable and Connector

Dimensions: 198 x 127 x 15.7 mm

Certificates: IP67, IP69



## 1. Antenna and electrical specifications

Cable 1

Parameters	5G NR Antenna			
Technologies	5G, 4G, 3G and 2G			
Standards	5G NR/4GLTE/FirstNet/CBRS/LPWA/CAT-X/CAT-Mx/CAT-NBx/NB-IoT/3G/2G			
Frequency (MHz)	617-960	1427-2690	3300-5000	5150-5925
Band (MHz)	600, 700, 850, 900	1500, 1600, 1700, 1800, 1900, 2000, 2100, 2300, 2500, 2600	3300, 3500, 3600, 3700, 4500	5200, 5500, 5800
5G NR Bands	n5, n8, 12, n20, n28, n71, n81, n82, n83,	n1, n2, n3, n7, n25, n34, n38, n39, n40, n41, n50, n51, n66, n70, n74, n75, n76, n80, n84, n86	n77, n78, n79	
4GLTE Bands	B5, B6, B8, B12, B13, B14, B17, B18, B19, B20, B26, B27, B28, B29, B44, B67, B68, B71, B85	B1, B2, B3, B4, B7, B9, B10, B11, B21, B23, B24, B25, B30, B32, B33, B34, B35, B36, B37, B38, B39, B40, B41, B45, B50, B51, B65, B66, B69, B70, B74, B75, B76	B22, B42, B43, B48, B49, B52	B46, B47, B252, B255
3GCELL Bands	B5, B6, B8, B12, B13, B14, B19, B20, B26	B1, B2, B3, B4, B7, B9, B10, B11, B21, B25, B32, B33, B34, B35, B36, B37, B38, B39, B40	B22	
2GCELL Bands	710, 750, 810T, 850, 900P, 900E, 900R	1800DCS, 1900PCS		
CDMA CELL Bands	BC0, BC2, BC3, BC7, BC9, BC10, BC12, BC18, BC19	BC1, BC4, BC6, BC8, BC13, BC14, BC15, BC16, BC20, BC21		
Return Loss (dB)	~-13.2	~-15.7	~-12.6	~-11.6
VSWR	~1.6:1	~1.6:1	~1.7:1	~1.8:1
Efficiency (%)	~55.2	~46.9	~30.4	~26.3
Peak Gain (dBi)	~3.1	~4.5	~2.0	~0.9
Average Gain (dB)	~-2.6	~-3.3	~-5.2	~-5.8
Impedance (Ohm)	50			
Polarisation	Linear			
Radiation Pattern	Omni-Directional			
Max. Input Power (W)	25			
Connector Type	SMA-Male Standard (Other Connectors Available)			
Cable Length	300 cm Standard (Any Cable Length Available)			
Cable Type	D302 Standard (Other Cables Available)			

Cable 2

Parameters	5GNR Antenna			
Technologies	5G, 4G, 3G and 2G			
Standards	5GNR/4GLTE/FirstNet/CBRS/LPWA/CAT-X/CAT-Mx/CAT-NBx/NB-IoT/3G/2G			
Frequency (MHz)	617-960	1427-2690	3300-5000	5150-5925
Band (MHz)	600, 700, 850, 900	1500, 1600, 1700, 1800, 1900, 2000, 2100, 2300, 2500, 2600	3300, 3500, 3600, 3700, 4500	5200, 5500, 5800
5GNR Bands	n5, n8, 12, n20, n28, n71, n81, n82, n83,	n1, n2, n3, n7, n25, n34, n38, n39, n40, n41, n50, n51, n66, n70, n74, n75, n76, n80, n84, n86	n77, n78, n79	
4GLTE Bands	B5, B6, B8, B12, B13, B14, B17, B18, B19, B20, B26, B27, B28, B29, B44, B67, B68, B71, B85	B1, B2, B3, B4, B7, B9, B10, B11, B21, B23, B24, B25, B30, B32, B33, B34, B35, B36, B37, B38, B39, B40, B41, B45, B50, B51, B65, B66, B69, B70, B74, B75, B76	B22, B42, B43, B48, B49, B52	B46, B47, B252, B255
3GCELL Bands	B5, B6, B8, B12, B13, B14, B19, B20, B26	B1, B2, B3, B4, B7, B9, B10, B11, B21, B25, B32, B33, B34, B35, B36, B37, B38, B39, B40	B22	
2GCELL Bands	710, 750, 810T, 850, 900P, 900E, 900R	1800DCS, 1900PCS		
CDMACELL Bands	BC0, BC2, BC3, BC7, BC9, BC10, BC12, BC18, BC19	BC1, BC4, BC6, BC8, BC13, BC14, BC15, BC16, BC20, BC21		
Return Loss (dB)	~-14.6	~-15.4	~-15.6	~-15.7
VSWR	~1.5:1	~1.5:1	~1.5:1	~1.4:1
Efficiency (%)	~55.1	~46.9	~35.5	~34.0
Peak Gain (dBi)	~3.3	~4.1	~3.2	~2.9
Average Gain (dB)	~-2.6	~-3.3	~-4.6	~-4.7
Impedance (Ohm)	50			
Polarisation	Linear			
Radiation Pattern	Omni-Directional			
Max. Input Power (W)	25			
Connector Type	SMA-Male Standard (Other Connectors Available)			
Cable Length	300 cm Standard (Any Cable Length Available)			
Cable Type	D302 Standard (Other Cables Available)			

Cable 3

Parameters	5GNR Antenna			
Technologies	5G, 4G, 3G and 2G			
Standards	5GNR/4GLTE/FirstNet/CBRS/LPWA/CAT-X/CAT-Mx/CAT-NBx/NB-IoT/3G/2G			
Frequency (MHz)	617-960	1427-2690	3300-5000	5150-5925
Band (MHz)	600, 700, 850, 900	1500, 1600, 1700, 1800, 1900, 2000, 2100, 2300, 2500, 2600	3300, 3500, 3600, 3700, 4500	5200, 5500, 5800
5GNR Bands	n5, n8, 12, n20, n28, n71, n81, n82, n83,	n1, n2, n3, n7, n25, n34, n38, n39, n40, n41, n50, n51, n66, n70, n74, n75, n76, n80, n84, n86	n77, n78, n79	
4GLTE Bands	B5, B6, B8, B12, B13, B14, B17, B18, B19, B20, B26, B27, B28, B29, B44, B67, B68, B71, B85	B1, B2, B3, B4, B7, B9, B10, B11, B21, B23, B24, B25, B30, B32, B33, B34, B35, B36, B37, B38, B39, B40, B41, B45, B50, B51, B65, B66, B69, B70, B74, B75, B76	B22, B42, B43, B48, B49, B52	B46, B47, B252, B255
3GCELL Bands	B5, B6, B8, B12, B13, B14, B19, B20, B26	B1, B2, B3, B4, B7, B9, B10, B11, B21, B25, B32, B33, B34, B35, B36, B37, B38, B39, B40	B22	
2GCELL Bands	710, 750, 810T, 850, 900P, 900E, 900R	1800DCS, 1900PCS		
CDMACELL Bands	BC0, BC2, BC3, BC7, BC9, BC10, BC12, BC18, BC19	BC1, BC4, BC6, BC8, BC13, BC14, BC15, BC16, BC20, BC21		
Return Loss (dB)	~-15.4	~-14.3	~-13.7	~-13.0
VSWR	~1.5:1	~1.6:1	~1.7:1	~1.7:1
Efficiency (%)	~55.3	~44.0	~29.7	~27.5
Peak Gain (dBi)	~3.5	~3.4	~2.6	~3.1
Average Gain (dB)	~-2.6	~-3.6	~-5.4	~-5.6
Impedance (Ohm)	50			
Polarisation	Linear			
Radiation Pattern	Omni-Directional			
Max. Input Power (W)	25			
Connector Type	SMA-Male Standard (Other Connectors Available)			
Cable Length	300 cm Standard (Any Cable Length Available)			
Cable Type	D302 Standard (Other Cables Available)			

**Cable 4**

Parameters	5GNR Antenna			
<b>Technologies</b>	5G, 4G, 3G and 2G			
<b>Standards</b>	5GNR/4GLTE/FirstNet/CBRS/LPWA/CAT-X/CAT-Mx/CAT-NBx/NB-IoT/3G/2G			
<b>Frequency (MHz)</b>	617-960	1427-2690	3300-5000	5150-5925
<b>Band (MHz)</b>	600, 700, 850, 900	1500, 1600, 1700, 1800, 1900, 2000, 2100, 2300, 2500, 2600	3300, 3500, 3600, 3700, 4500	5200, 5500, 5800
<b>5GNR Bands</b>	n5, n8 ,12, n20, n28, n71, n81, n82, n83,	n1, n2, n3, n7, n25, n34, n38, n39, n40, n41, n50, n51, n66, n70, n74, n75, n76, n80, n84, n86	n77, n78, n79	
<b>4GLTE Bands</b>	B5, B6, B8, B12, B13, B14, B17, B18, B19, B20, B26, B27, B28, B29, B44, B67, B68, B71, B85	B1, B2, B3, B4, B7, B9, B10, B11, B21, B23, B24, B25, B30, B32, B33, B34, B35, B36, B37, B38, B39, B40, B41, B45, B50, B51, B65, B66, B69, B70, B74, B75, B76	B22, B42, B43, B48, B49, B52	B46, B47, B252, B255
<b>3GCELL Bands</b>	B5, B6, B8, B12, B13, B14, B19, B20, B26	B1, B2, B3, B4, B7, B9, B10, B11, B21, B25, B32, B33, B34, B35, B36, B37, B38, B39, B40	B22	
<b>2GCELL Bands</b>	710, 750, 810T, 850, 900P, 900E, 900R	1800DCS, 1900PCS		
<b>CDMACELL Bands</b>	BC0, BC2, BC3, BC7, BC9, BC10, BC12, BC18, BC19	BC1, BC4, BC6, BC8, BC13, BC14, BC15, BC16, BC20, BC21		
<b>Return Loss (dB)</b>	~-15.2	~-16.8	~-13.9	~-12.5
<b>VSWR</b>	~1.5:1	~1.4:1	~1.6:1	~1.7:1
<b>Efficiency (%)</b>	~57.1	~48.4	~30.4	~25.1
<b>Peak Gain (dBi)</b>	~3.4	~4.5	~2.5	~1.2
<b>Average Gain (dB)</b>	~-2.4	~-3.2	~-5.4	~-6.2
<b>Impedance (Ohm)</b>	50			
<b>Polarisation</b>	Linear			
<b>Radiation Pattern</b>	Omni-Directional			
<b>Max. Input Power (W)</b>	25			
<b>Connector Type</b>	SMA-Male Standard (Other Connectors Available)			
<b>Cable Length</b>	300 cm Standard (Any Cable Length Available)			
<b>Cable Type</b>	D302 Standard (Other Cables Available)			

**Antenna Measurement Conditions:**

Mounted on Plastic Plate of 30 x 30 x 0.25 cm

100 cm of Cable D302

Measured in Certified CTIA 3D Anechoic Chamber

Cable 5

Parameters	2.4/5.0/6.0 GHz ISM Antenna		
<b>Standards</b>	WiFi, BT, ZigBee, ISM, <b>Sigfox, LoRa</b>		
<b>Band (MHz)</b>	2.4GHz	5.0 GHz	6.0GHz
<b>Frequency (MHz)</b>	2410-2490	4920-5925	5925-7125
<b>Return Loss (dB)</b>	~-13.5	~-15.8	~-14.2
<b>VSWR</b>	~1.6:1	~1.5:1	~1.6:1
<b>Efficiency (%)</b>	~30.8	~20.2	~47.2
<b>Peak Gain (dBi)</b>	~-4.5	~-3.1	~-3.8
<b>Average Gain (dB)</b>	~-5.1	~-7.1	~-3.3
<b>Impedance (Ohm)</b>	50		
<b>Polarisation</b>	Linear		
<b>Radiation Pattern</b>	Omni-Directional		
<b>Max. Input Power (W)</b>	25		
<b>Connector Type</b>	SMA-Male-RP Standard (Other Connectors Available)		
<b>Cable Length</b>	300 cm Standard (Any Cable Length Available)		
<b>Cable Type</b>	D302 Standard (Other Cables Available)		

Cable 6

Parameters	2.4/5.0/6.0 GHz ISM Antenna		
<b>Standards</b>	WiFi, BT, ZigBee, ISM, <b>Sigfox, LoRa</b>		
<b>Band (MHz)</b>	2.4 GHz	5.0 GHz	6.0 GHz
<b>Frequency (MHz)</b>	2410-2490	4920-5925	5925-7125
<b>Return Loss (dB)</b>	~-11.9	~-13.2	~-11.8
<b>VSWR</b>	~1.9:1	~1.7:1	~1.9:1
<b>Efficiency (%)</b>	~37.6	~23.0	~42.3
<b>Peak Gain (dBi)</b>	~-6.0	~-5.0	~-3.0
<b>Average Gain (dB)</b>	~-4.3	~-6.5	~-3.8
<b>Impedance (Ohm)</b>	50		
<b>Polarisation</b>	Linear		
<b>Radiation Pattern</b>	Omni-Directional		
<b>Max. Input Power (W)</b>	25		
<b>Connector Type</b>	SMA-Male-RP Standard (Other Connectors Available)		
<b>Cable Length</b>	300 cm Standard (Any Cable Length Available)		
<b>Cable Type</b>	D302 Standard (Other Cables Available)		

**Cable 7**

Parameters	2.4/5.0/6.0 GHz ISM Antenna		
<b>Standards</b>	WiFi, BT, ZigBee, ISM, <b>Sigfox, LoRa</b>		
<b>Band (MHz)</b>	2.4GHz	5.0 GHz	6.0GHz
<b>Frequency (MHz)</b>	2410-2490	4920-5925	5925-7125
<b>Return Loss (dB)</b>	~-19.2	~-14.8	~-13.4
<b>VSWR</b>	~1.3:1	~1.6:1	~1.6:1
<b>Efficiency (%)</b>	~38.2	~34.3	~44.4
<b>Peak Gain (dBi)</b>	~3.7	~2.3	~3.1
<b>Average Gain (dB)</b>	~-4.2	~-4.7	~-3.5
<b>Impedance (Ohm)</b>	50		
<b>Polarisation</b>	Linear		
<b>Radiation Pattern</b>	Omni-Directional		
<b>Max. Input Power (W)</b>	25		
<b>Connector Type</b>	SMA-Male-RP Standard (Other Connectors Available)		
<b>Cable Length</b>	300 cm Standard (Any Cable Length Available)		
<b>Cable Type</b>	D302 Standard (Other Cables Available)		

**Cable 8**

Parameters	2.4/5.0/6.0 GHz ISM Antenna		
<b>Standards</b>	WiFi, BT, ZigBee, ISM, <b>Sigfox, LoRa</b>		
<b>Band (MHz)</b>	2.4 GHz	5.0 GHz	6.0 GHz
<b>Frequency (MHz)</b>	2410-2490	4920-5925	5925-7125
<b>Return Loss (dB)</b>	~-16.5	~-15.5	~-7.9
<b>VSWR</b>	~1.4:1	~1.5:1	~1.5:1
<b>Efficiency (%)</b>	~36.3	~28.4	~39.4
<b>Peak Gain (dBi)</b>	~4.4	~2.6	~3.1
<b>Average Gain (dB)</b>	~-4.4	~-5.5	~-4.0
<b>Impedance (Ohm)</b>	50		
<b>Polarisation</b>	Linear		
<b>Radiation Pattern</b>	Omni-Directional		
<b>Max. Input Power (W)</b>	25		
<b>Connector Type</b>	SMA-Male-RP Standard (Other Connectors Available)		
<b>Cable Length</b>	300 cm Standard (Any Cable Length Available)		
<b>Cable Type</b>	D302 Standard (Other Cables Available)		

**Antenna Measurement Conditions:**

Mounted on Plastic Plate of 30 x 30 x 0.25 cm

100 cm of Cable D302

Measured in Certified CTIA 3D Anechoic Chamber

Cable 9

Parameters	GPS/GLONASS Antenna	
	GPS/QZSS/Galileo	GLONASS
<b>Standards</b>	GPS/QZSS/Galileo	GLONASS
<b>Bands (MHz)</b>	1575	1602
<b>Frequency (MHz)</b>	1575.42	1598-1606
<b>Passive Gain (dBi)</b>	~4.5	~5.0
<b>Impedance (Ohms)</b>	50	
<b>Radiation Pattern</b>	Hemispherical	
<b>Voltage Range (V)</b>	1.5 - 3.6	
<b>Active Gain (dB)</b>	28 @ 2.7 V	
<b>Noise Figure (dB)</b>	1.8 @ 2.7 V	
<b>Current Consumption (mA)</b>	9 @ 2.7 V	
<b>Power Consumption (mW)</b>	24.3 @ 2.7 V	
<b>Saw Filter Type</b>	Pre-Filter	
<b>Out of Band Rejection (dB)</b>	~43	
<b>ESD Protection (kV)</b>	6	
<b>Connector Type</b>	SMA-Male Standard (Other Connectors Available)	
<b>Cable Length</b>	300 cm Standard (Any Cable Length Available)	
<b>Cable Type</b>	LL100 Standard (Other Cables Available)	

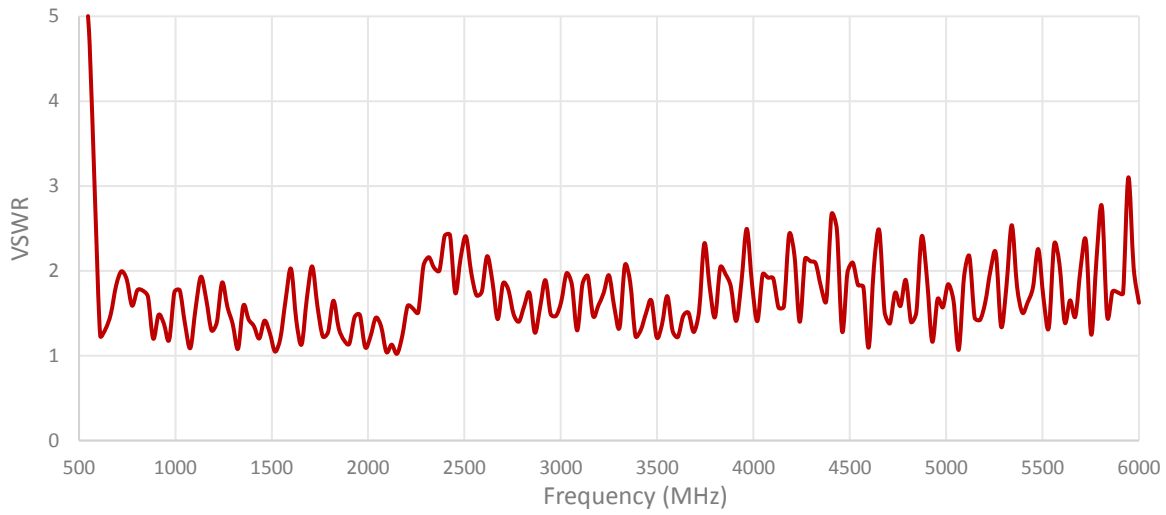
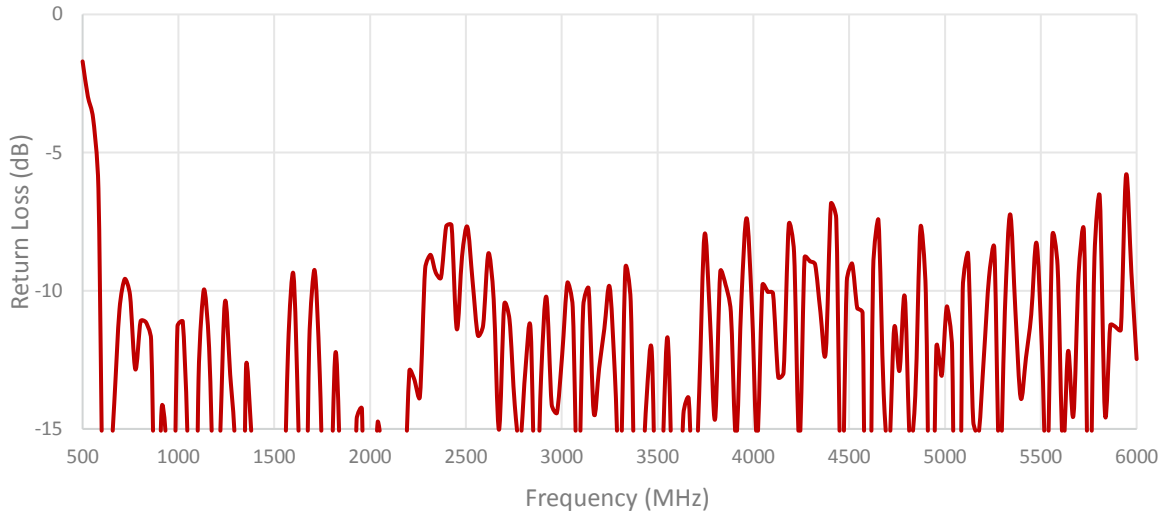
## 2. Mechanical and environmental specifications

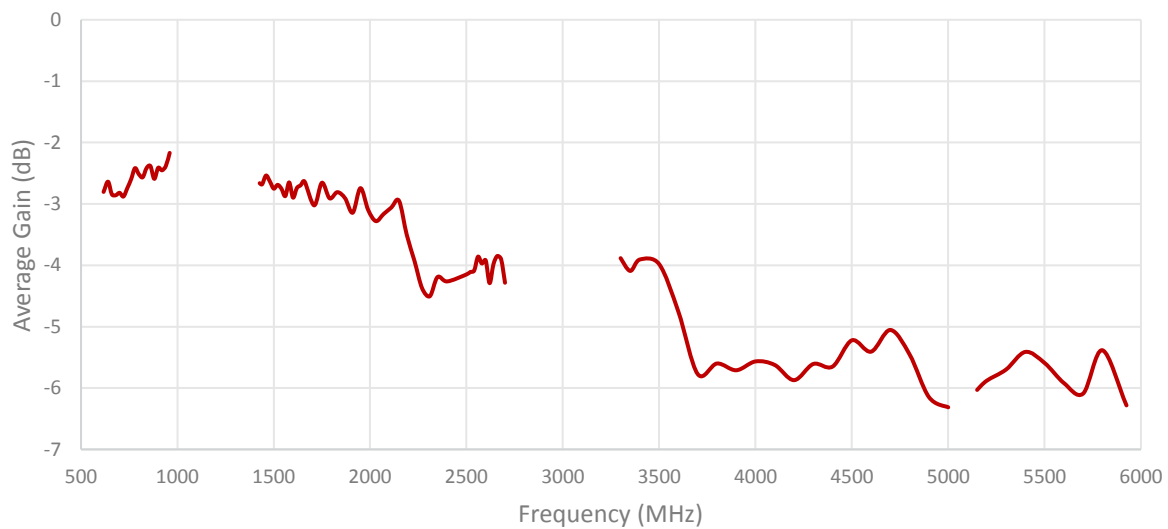
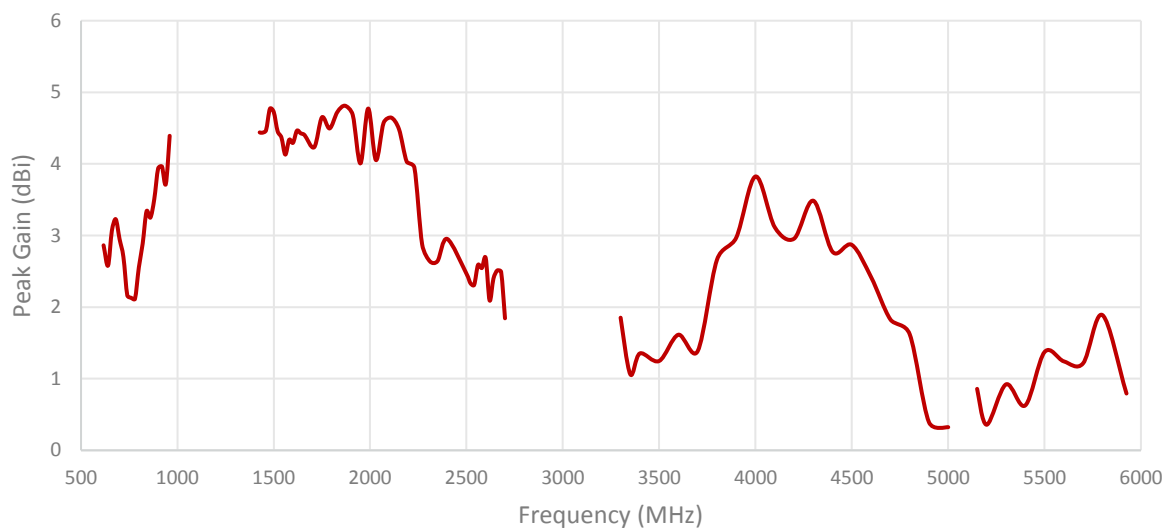
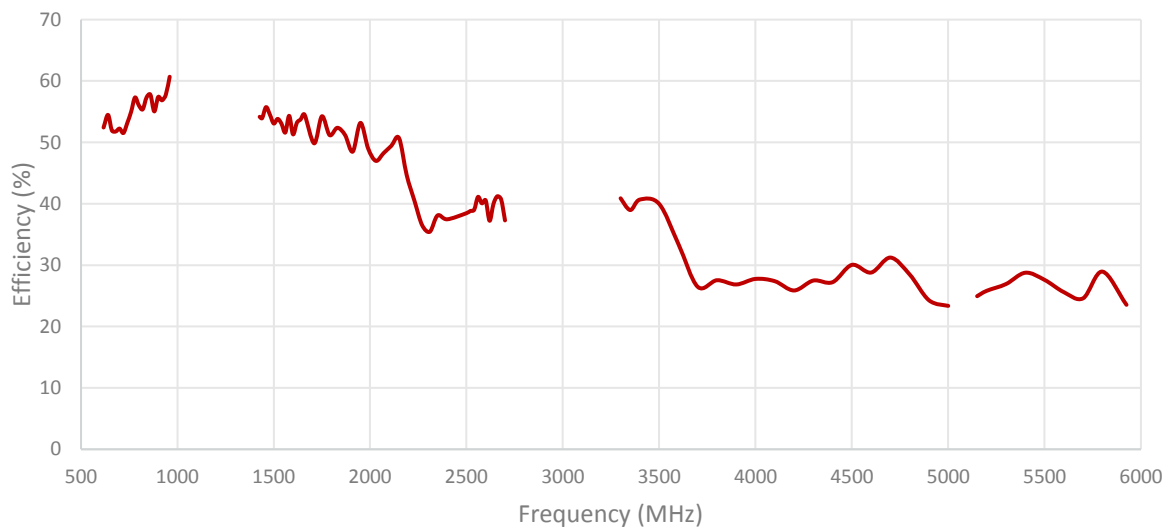
Specifications	2J4H86PGFf
<b>Mounting Type</b>	Adhesive Mount
<b>Dimensions (mm)</b>	198 x 127 x 15.7
<b>Radome Type</b>	ASA
<b>Radome color</b>	Black
<b>Operating Temperature (C)</b>	-40 to +85
<b>Storage Temperature (C)</b>	-40 to +85
<b>Substance Compliance</b>	RoHS
<b>Certificates</b>	IP67, IP69, CE



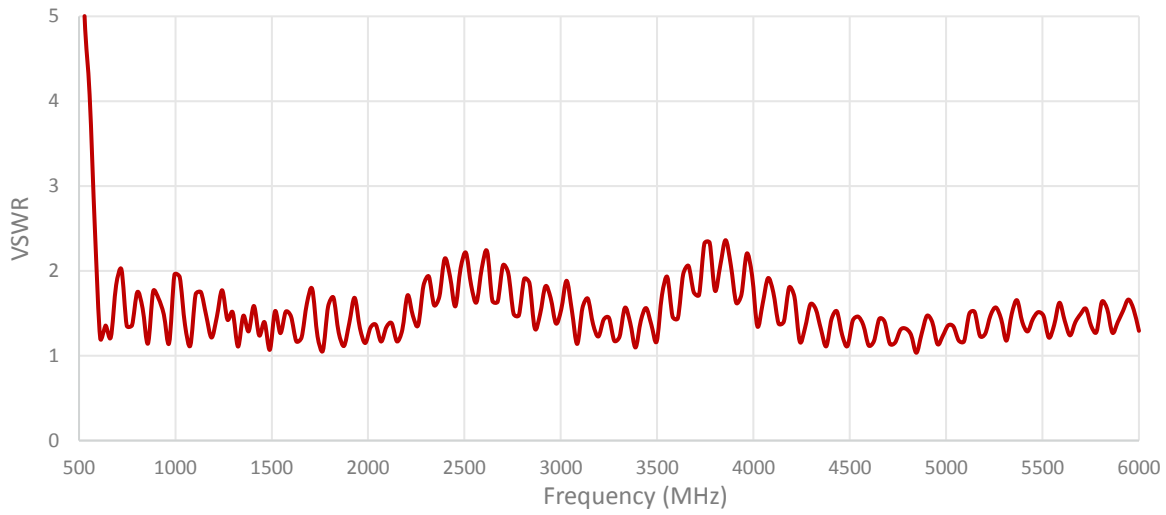
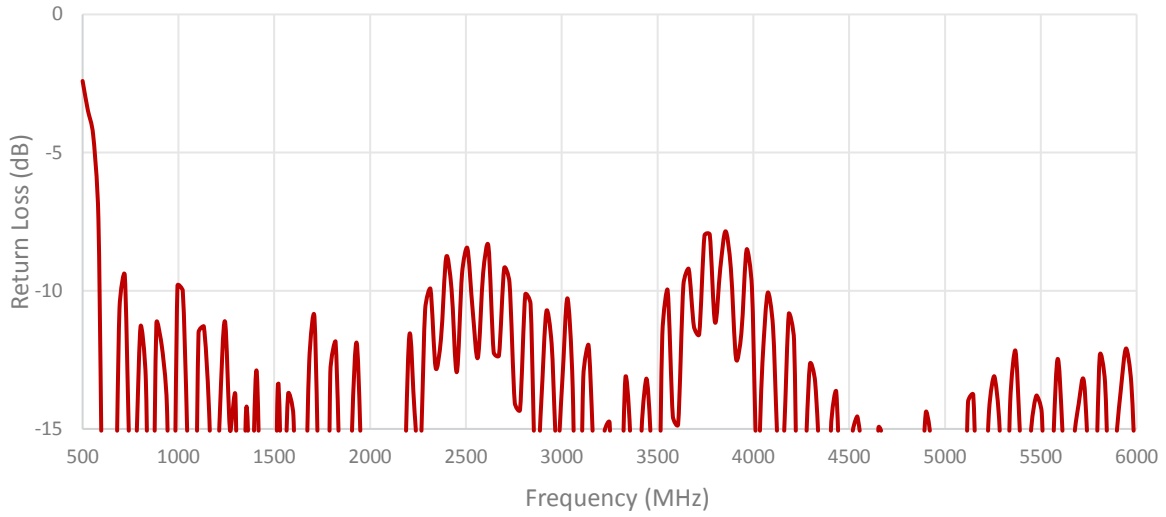
### 3. Antenna parameters

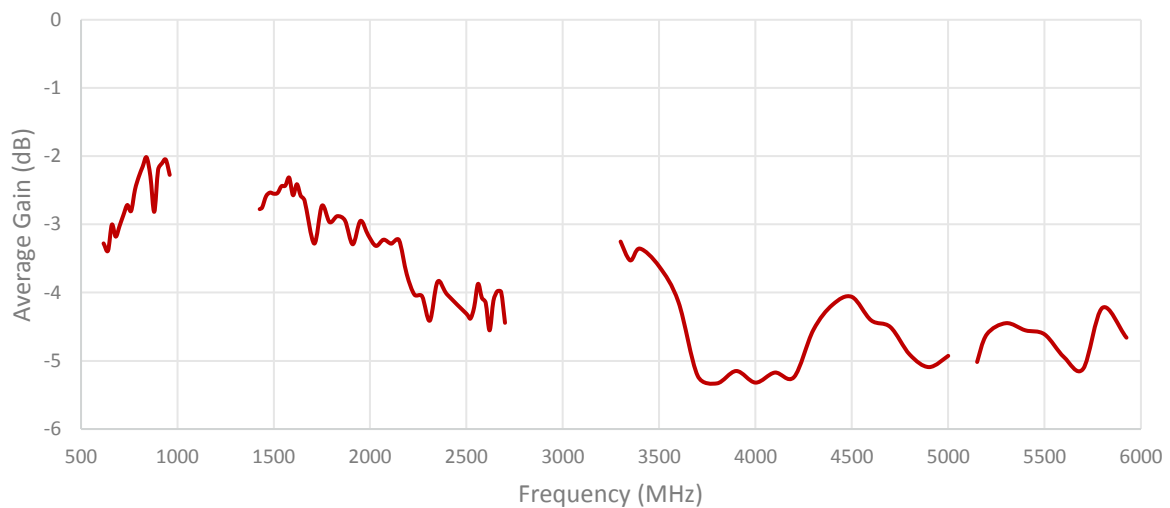
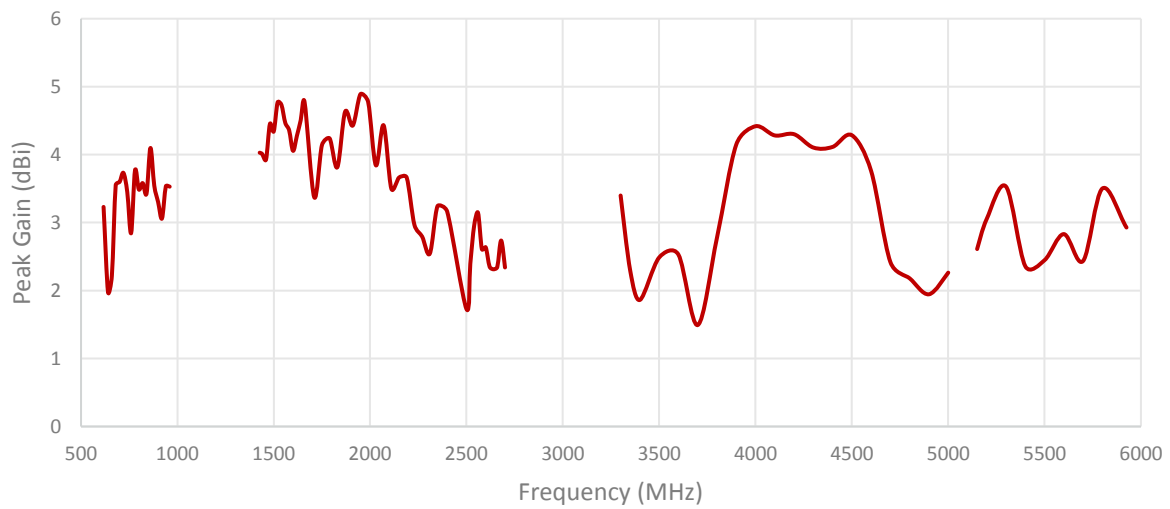
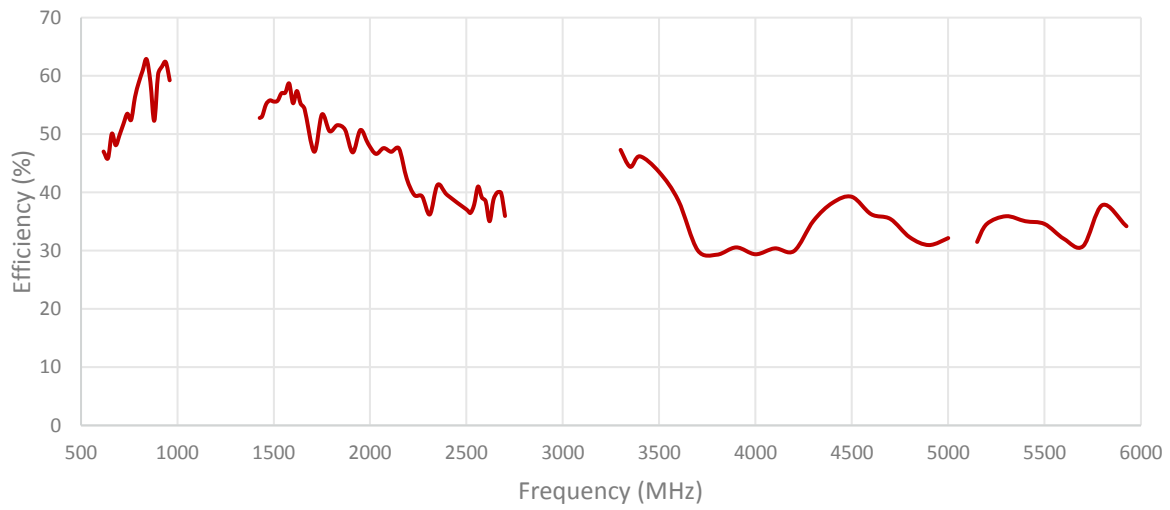
Cable 1: 5GNR



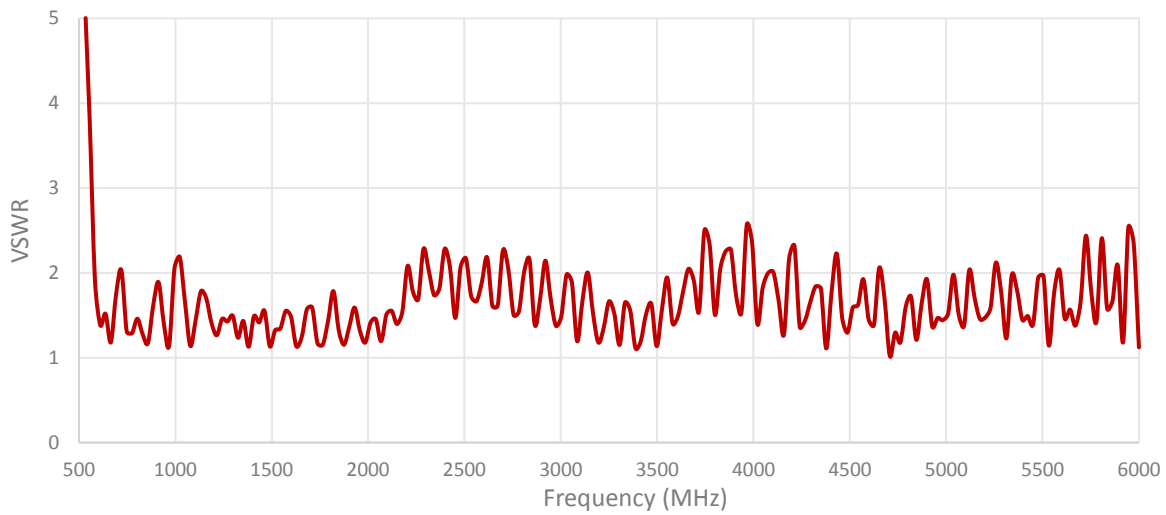
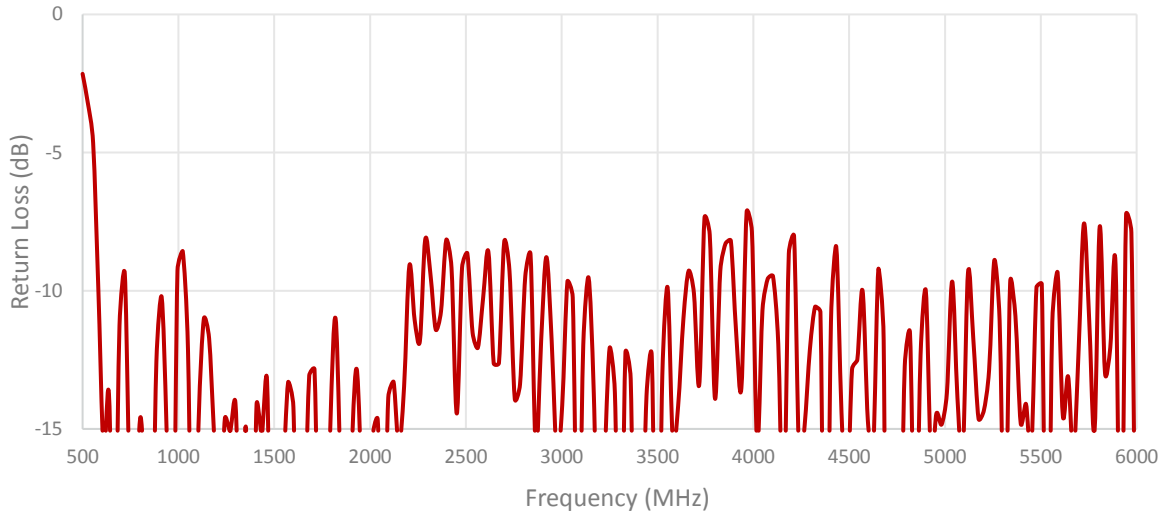


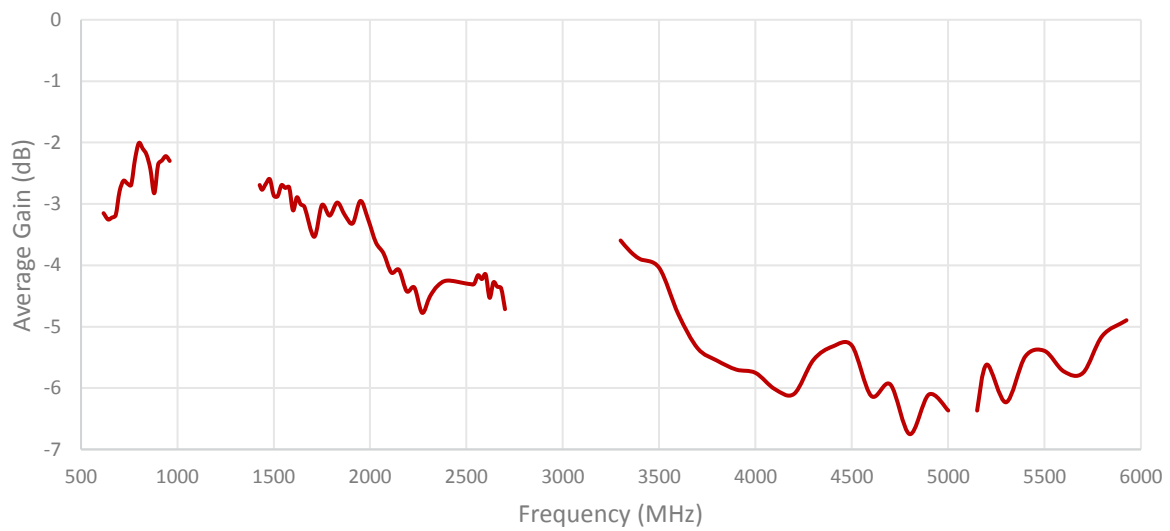
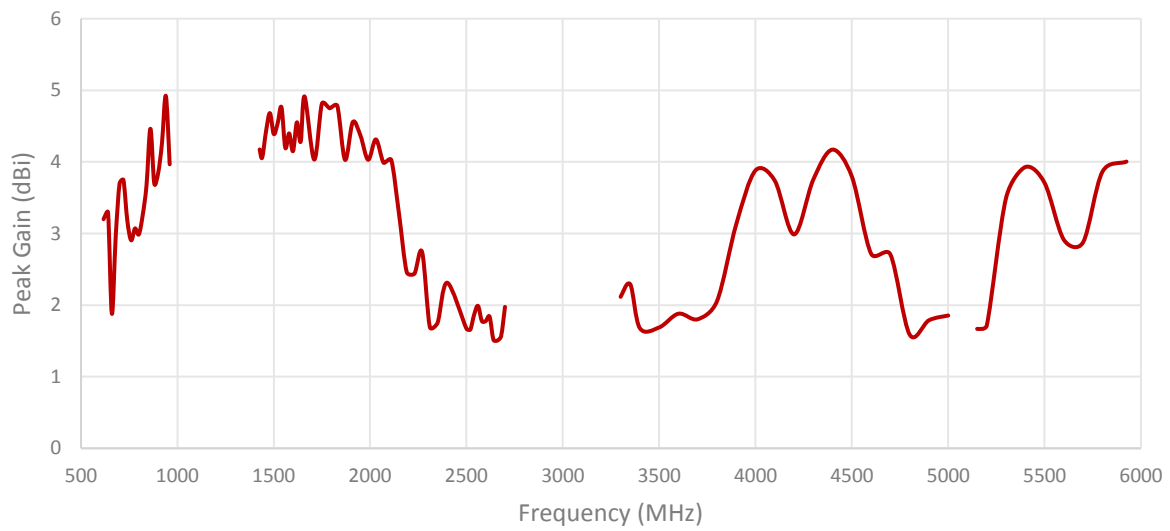
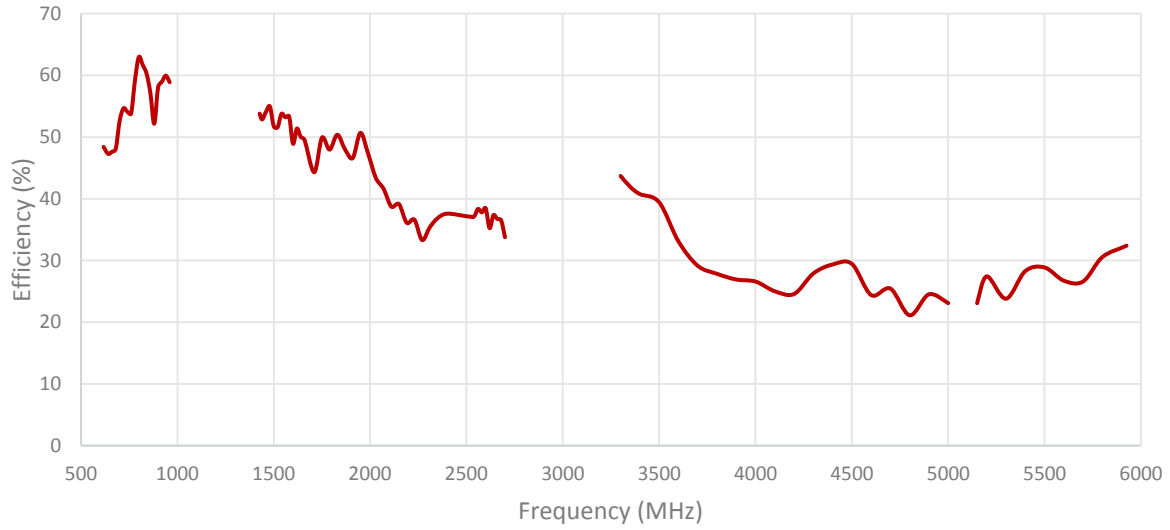
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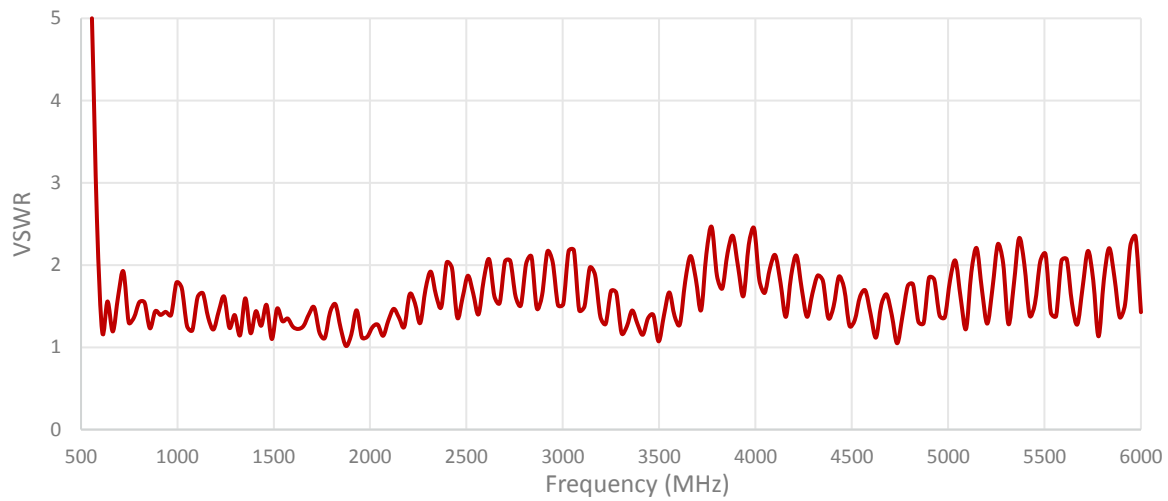
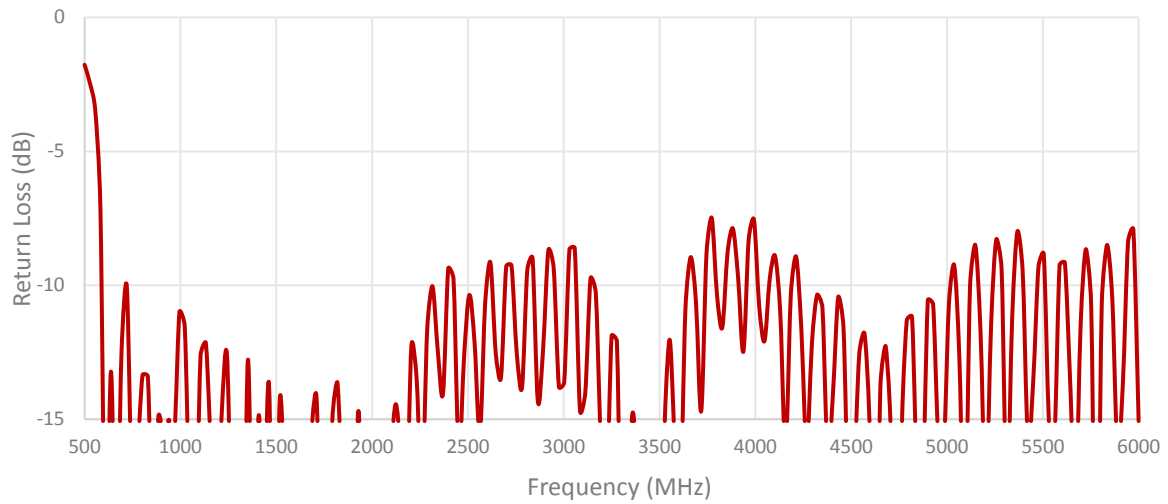


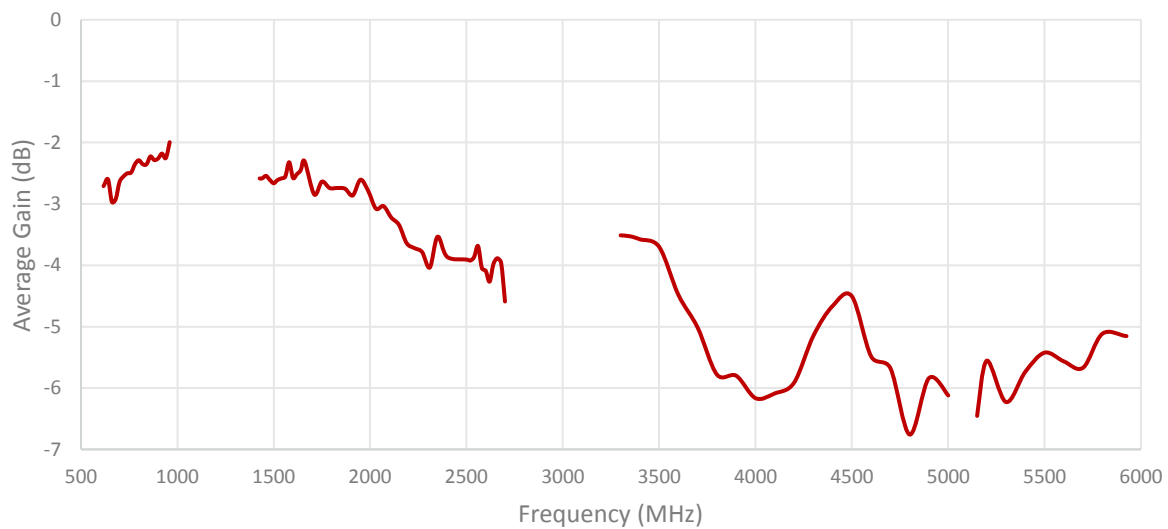
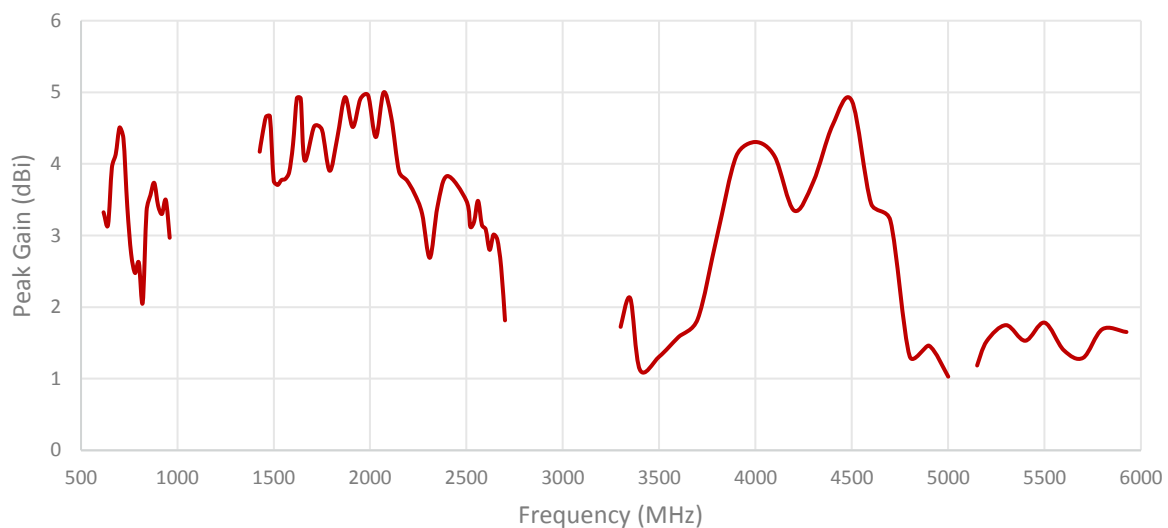
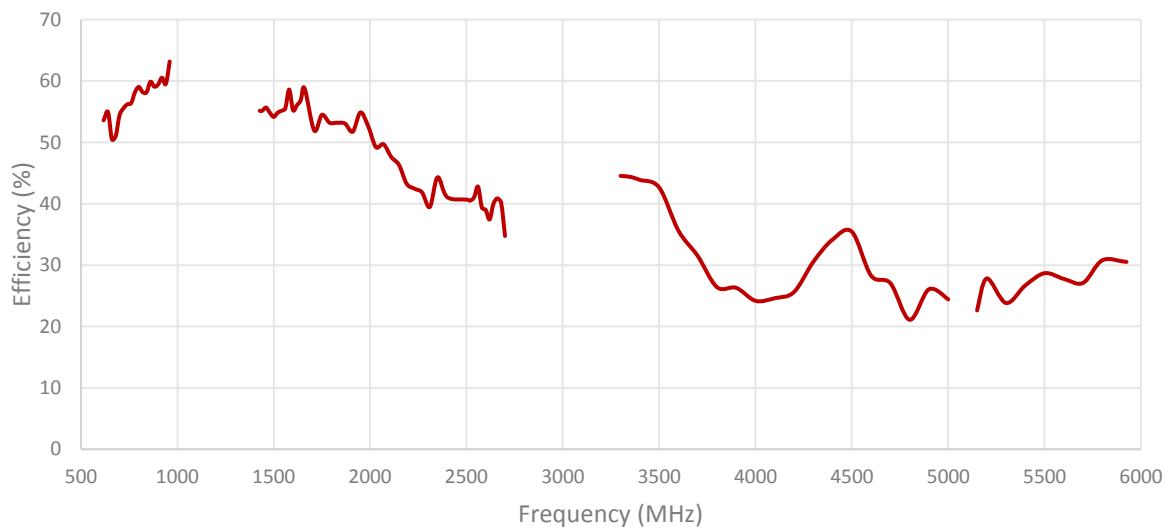
**Cable 3: 5GNR**





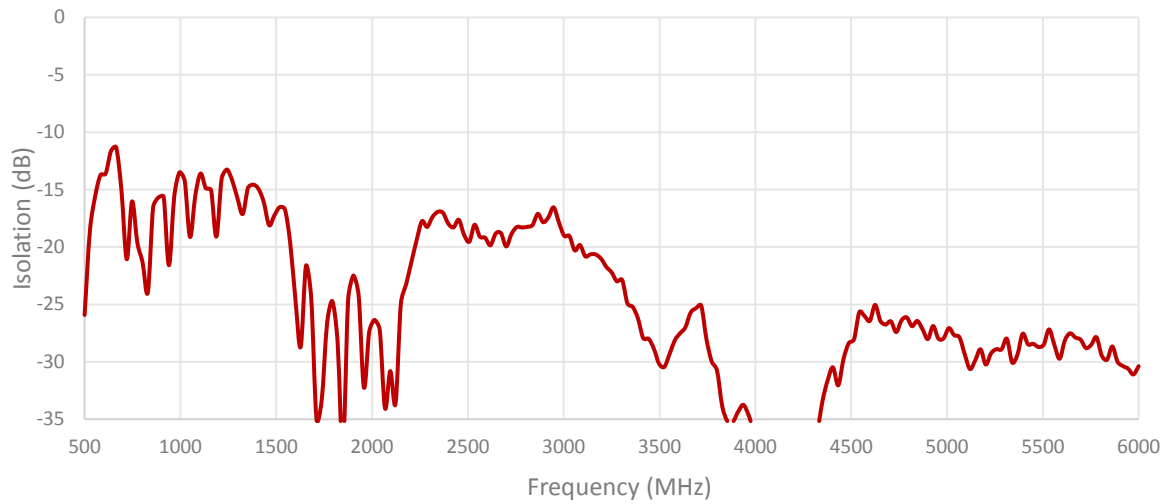
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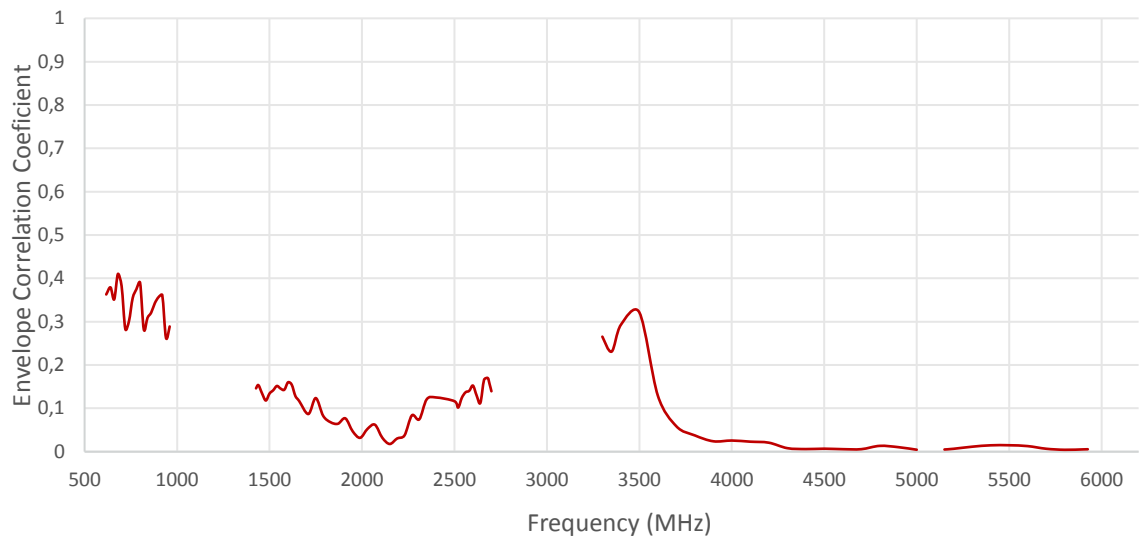




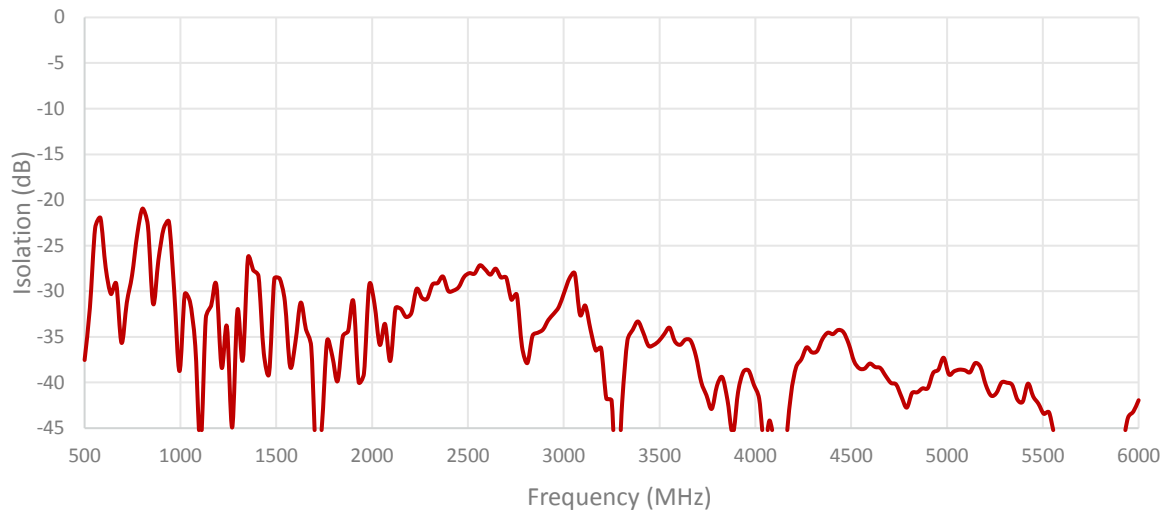
**ISOLATION FOR CABLES 1 AND 2**



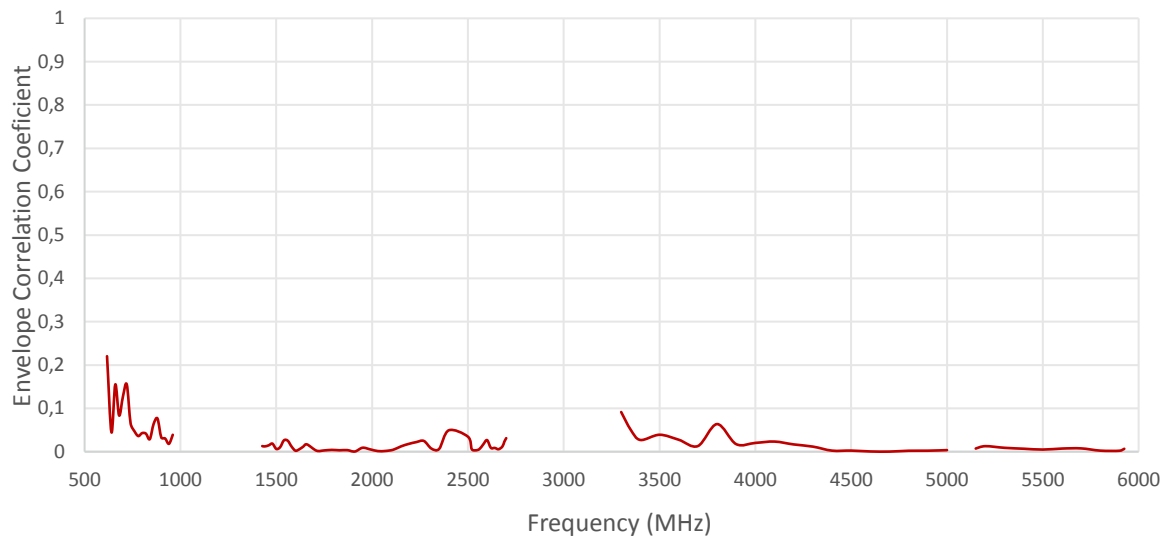
**ENVELOPE CORRELATION COEFFICIENT FOR CABLES 1 AND 2**



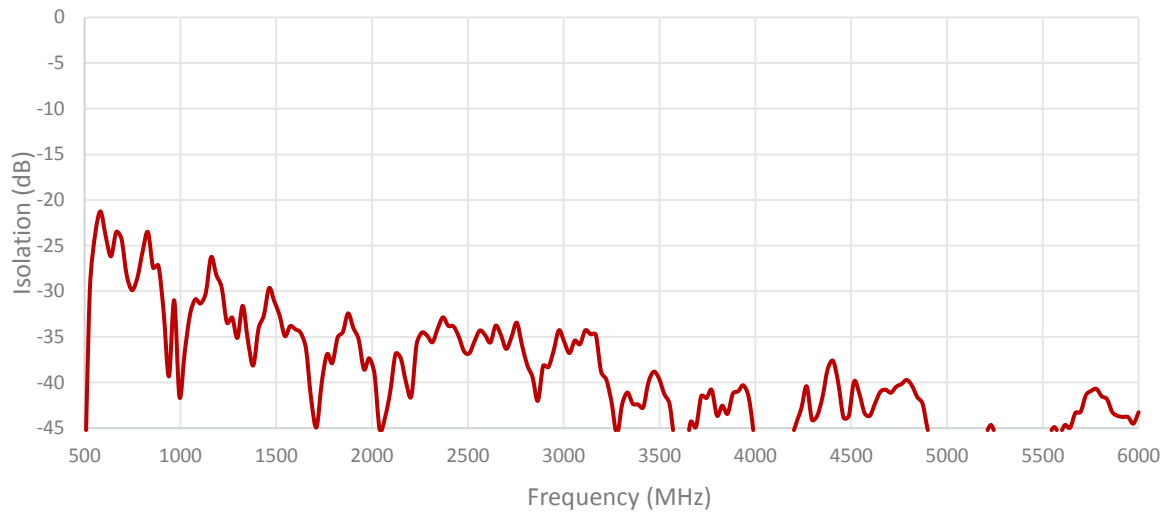
**ISOLATION FOR CABLES 1 AND 3**



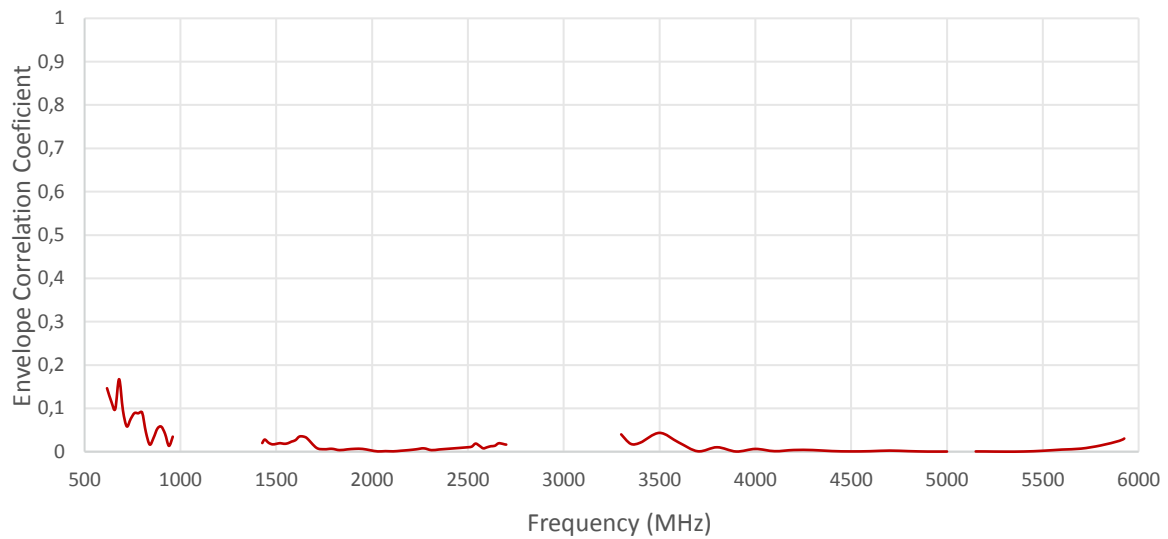
**ENVELOPE CORRELATION COEFFICIENT FOR CABLES 1 AND 3**



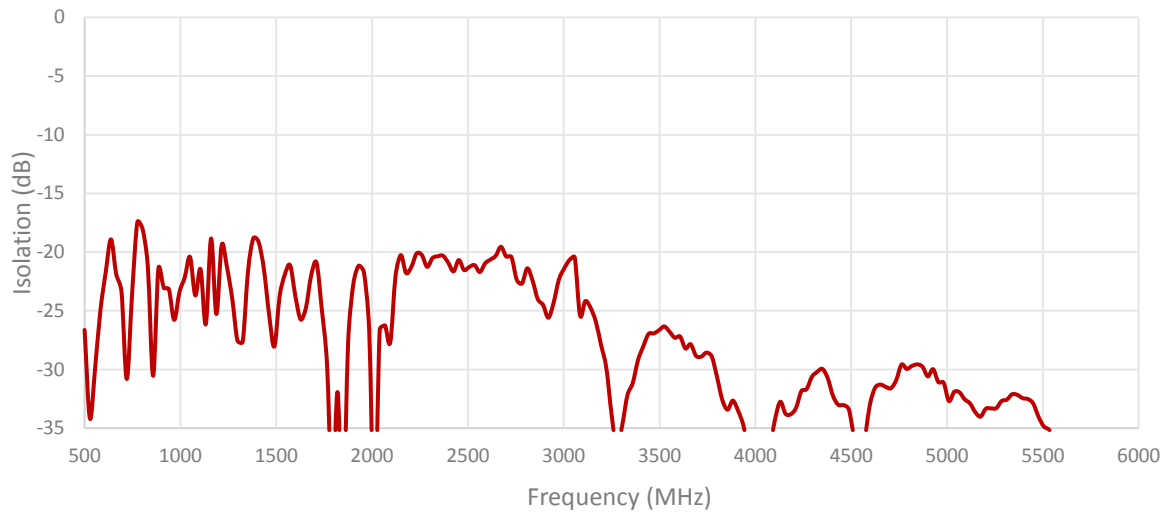
**ISOLATION FOR CABLES 1 AND 4**



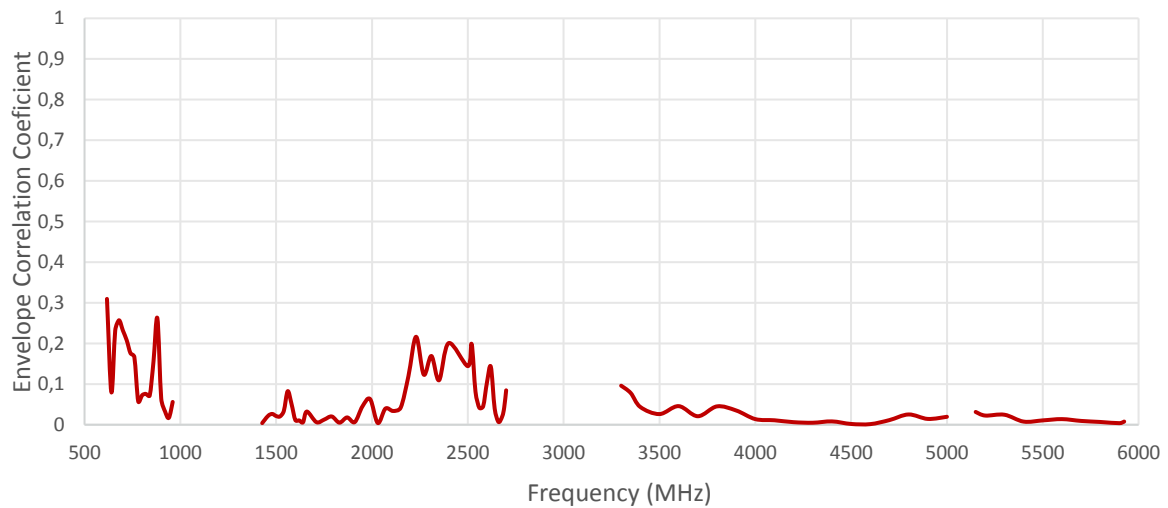
**ENVELOPE CORRELATION COEFFICIENT FOR CABLES 1 AND 4**



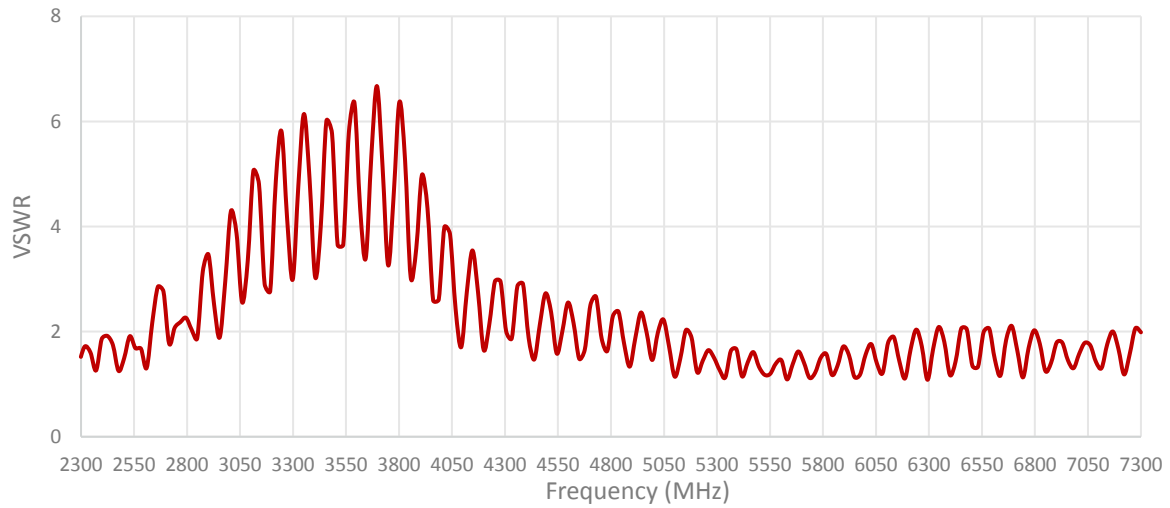
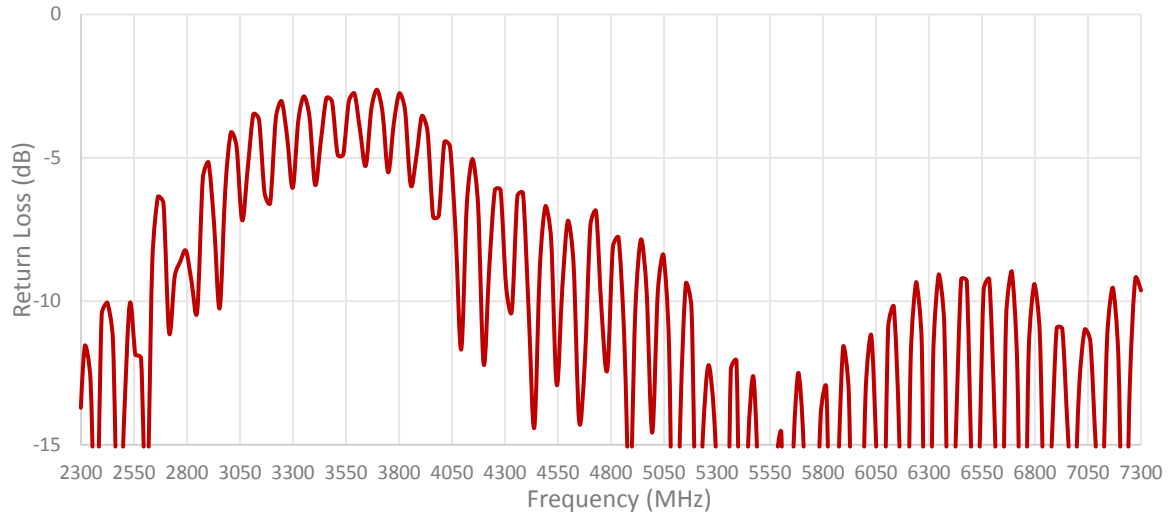
**ISOLATION FOR CABLES 2 AND 3**

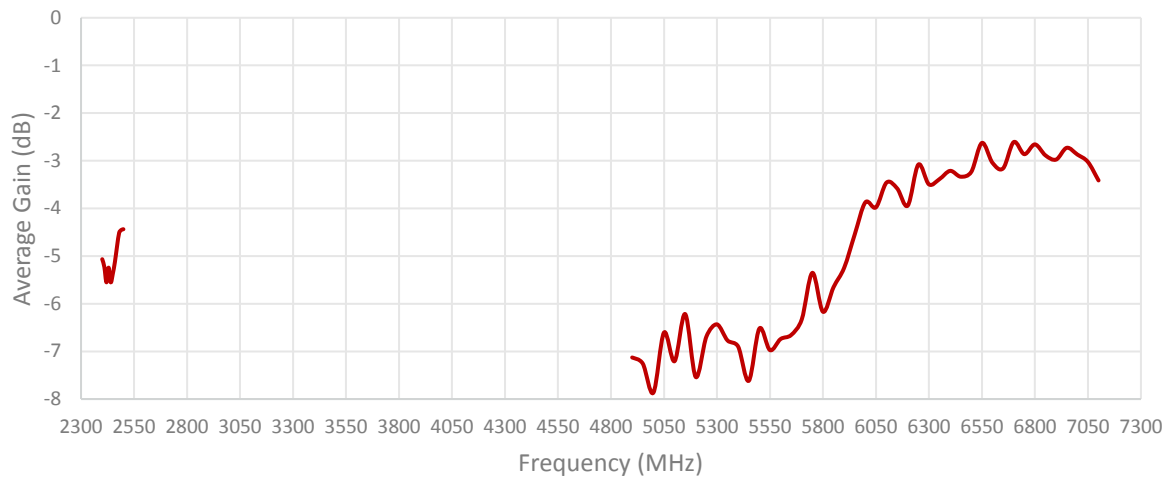
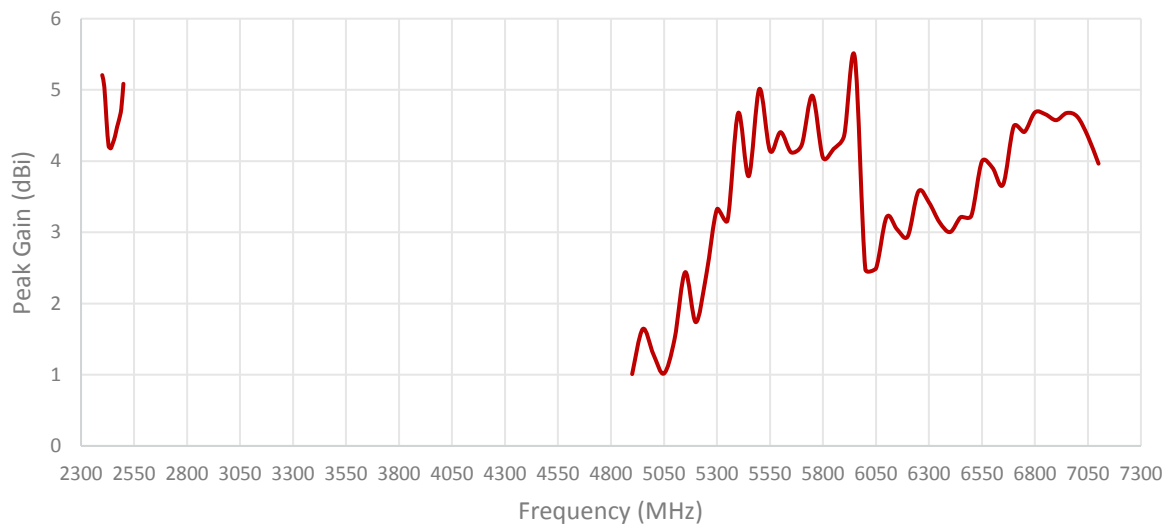
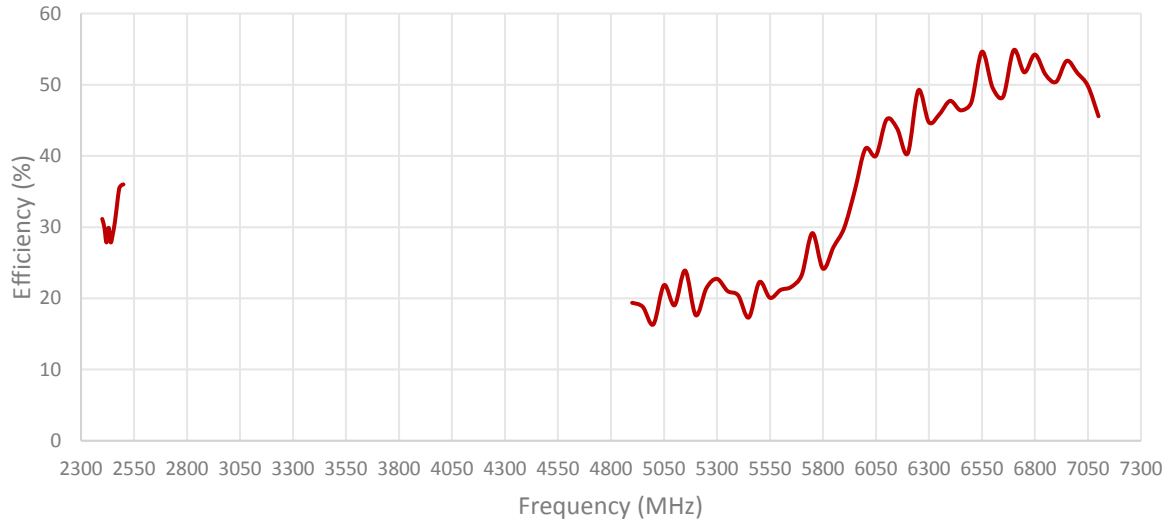


**ENVELOPE CORRELATION COEFFICIENT FOR CABLES 2 AND 3**

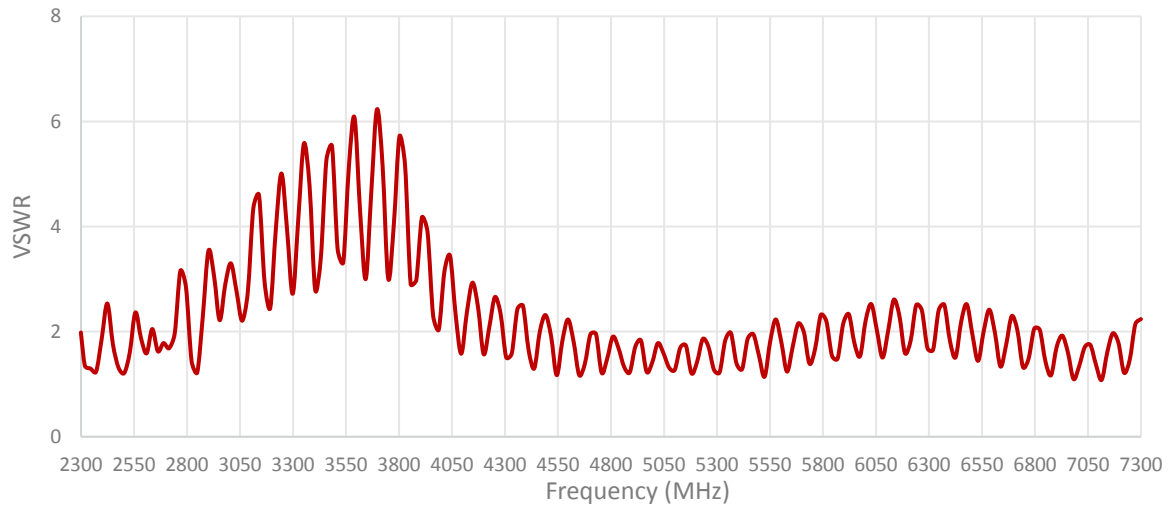
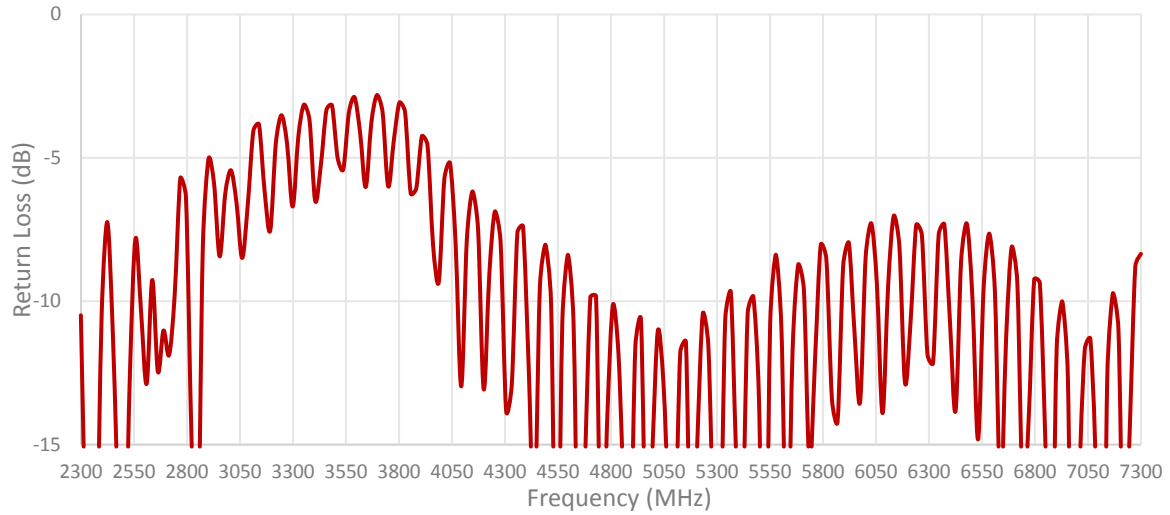


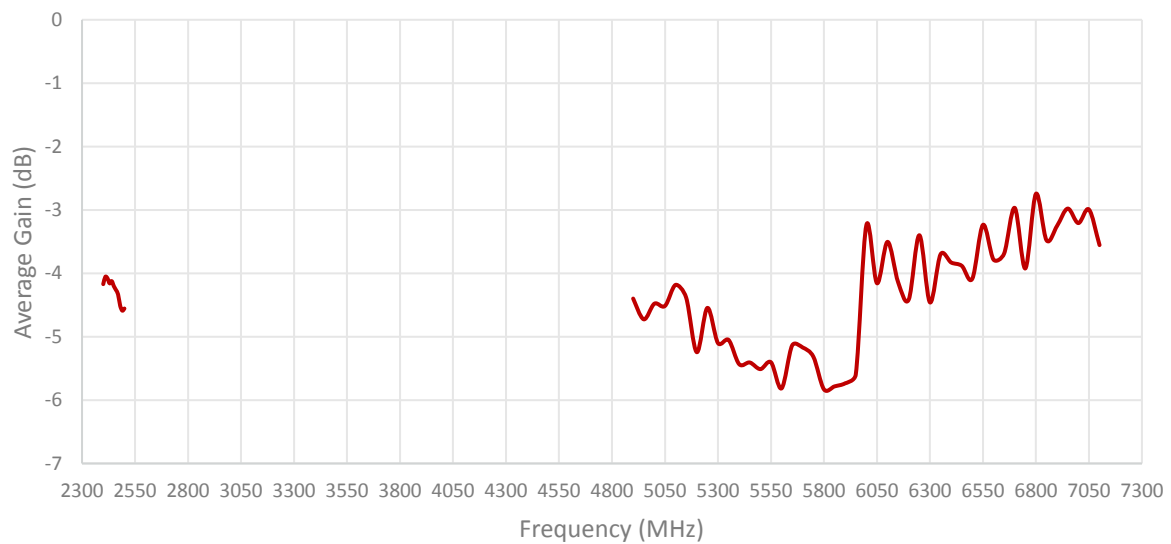
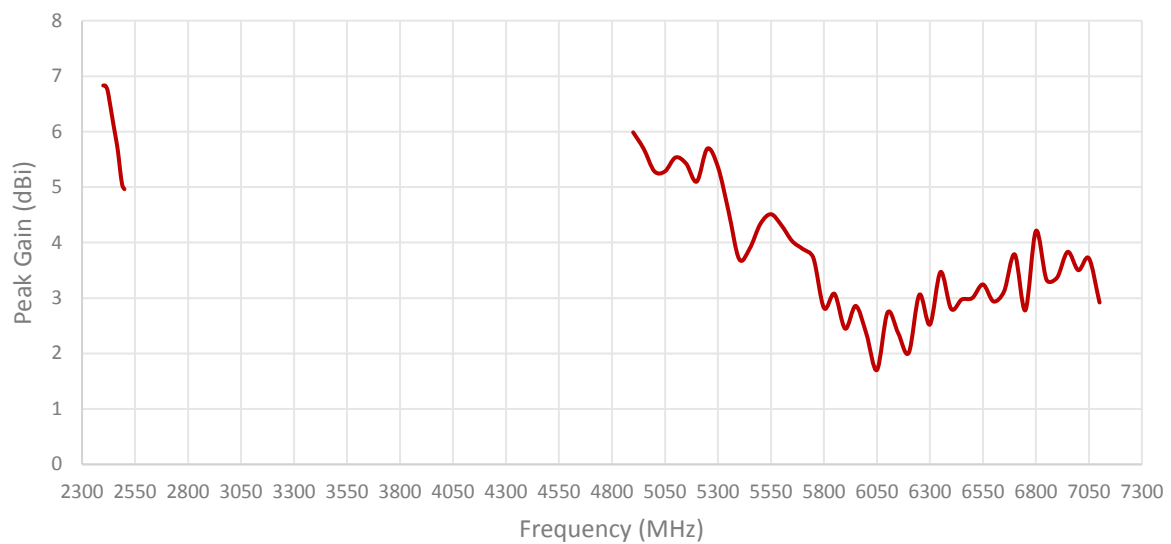
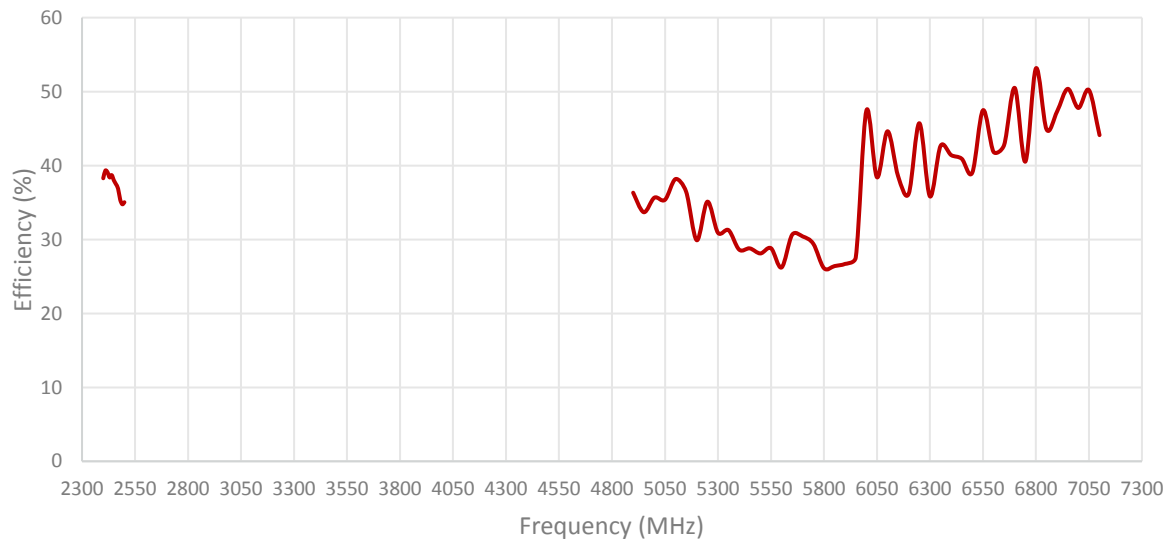
**Cable 5: 2.4/5.0/6.0 GHz ISM**





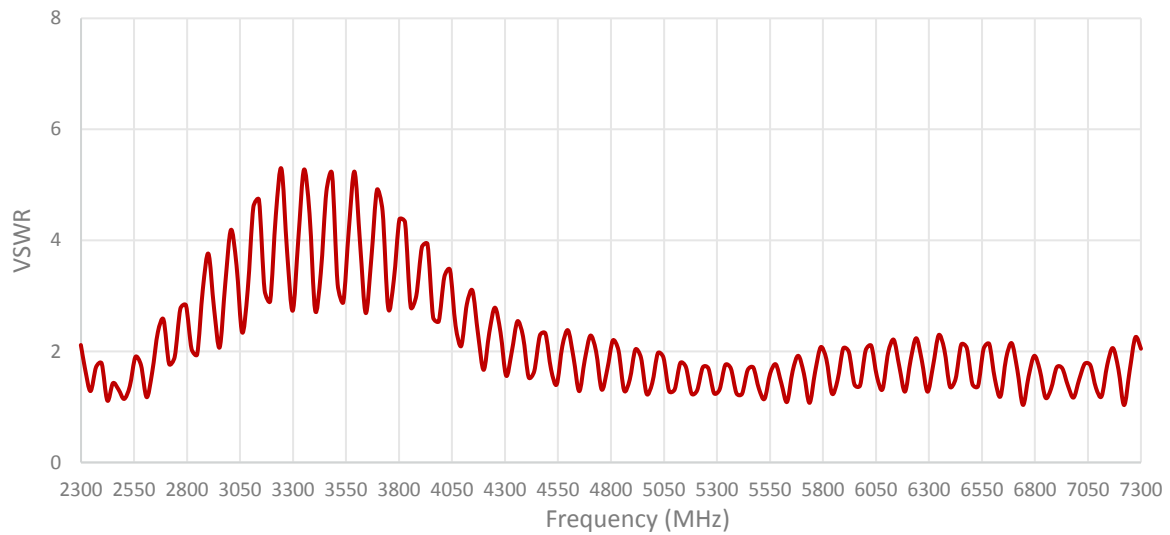
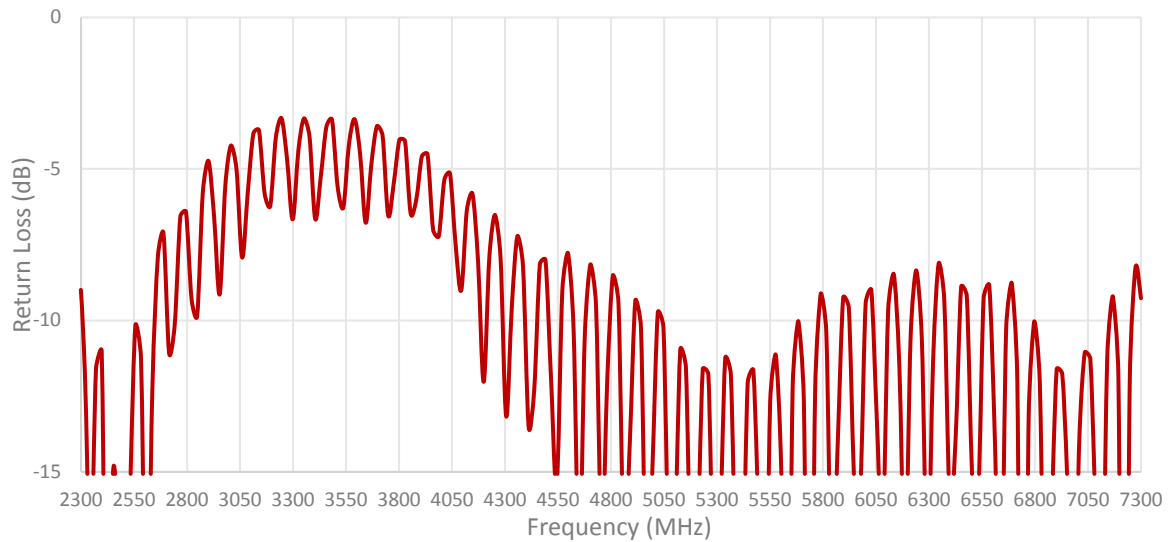
**Cable 6: 2.4/5.0/6.0 GHz ISM**

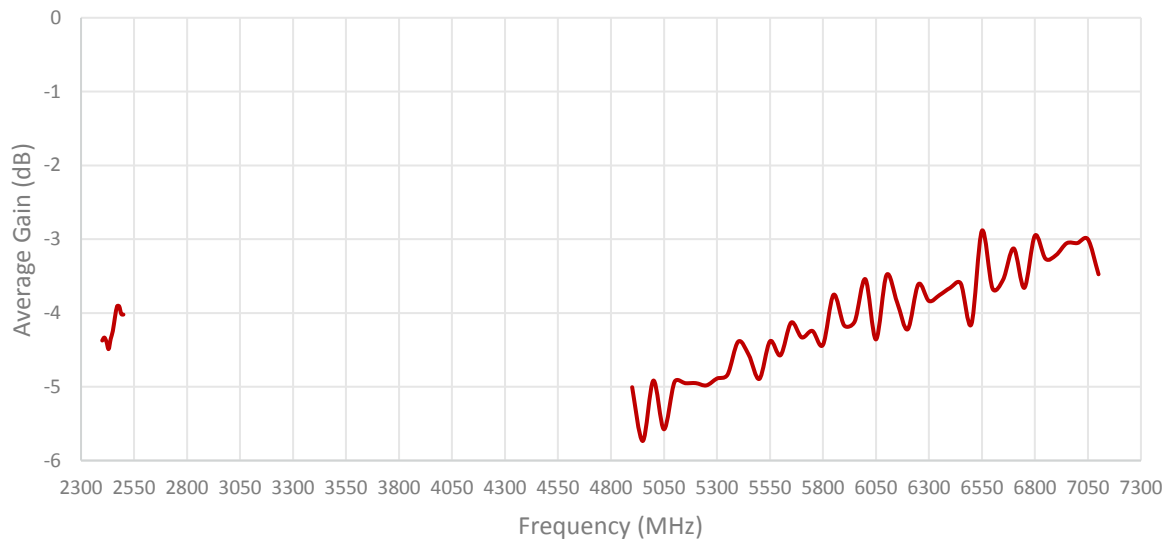
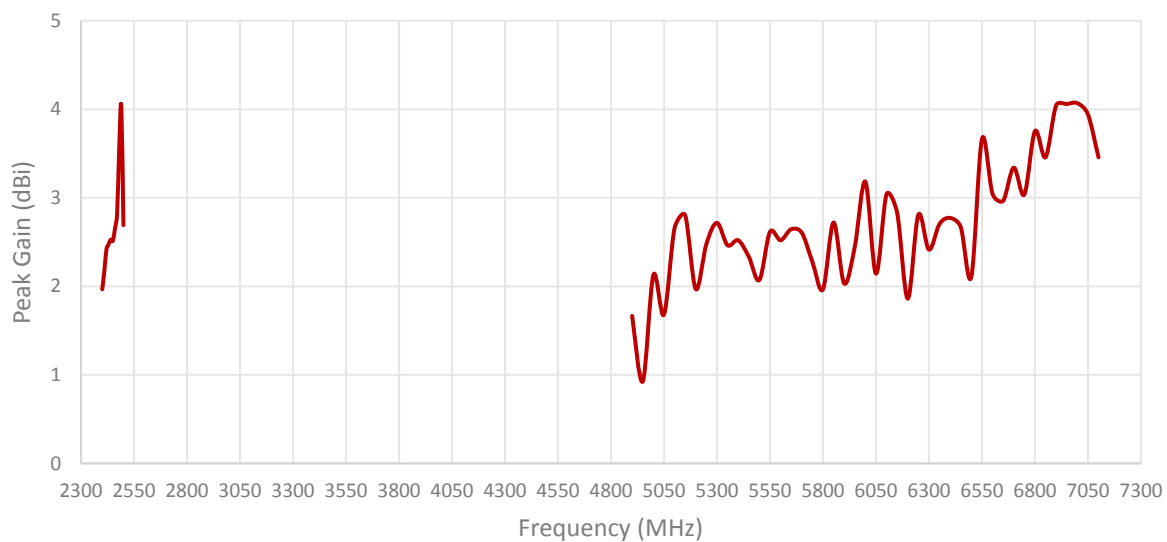
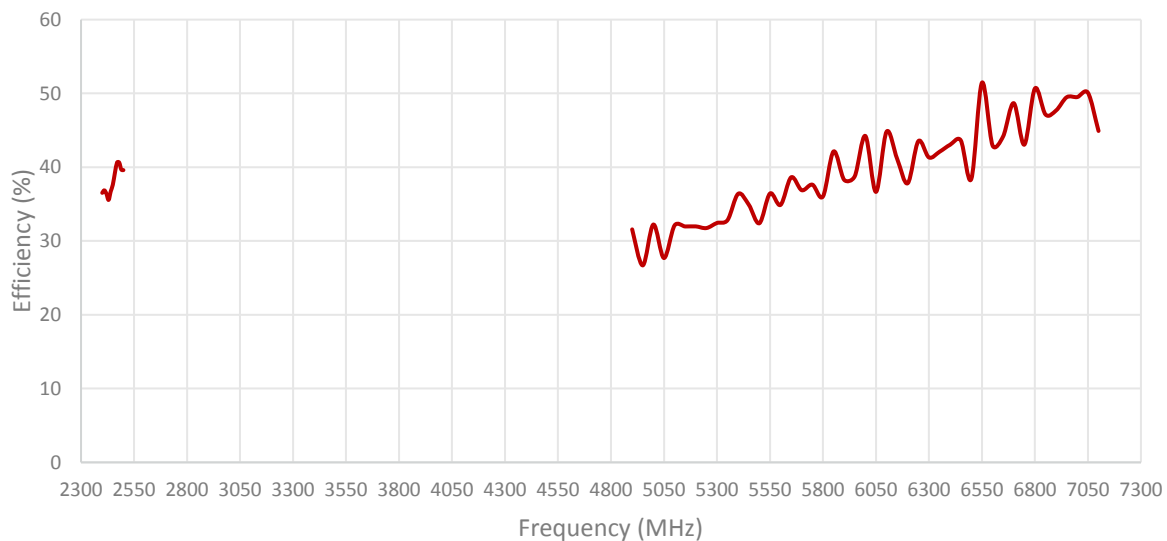




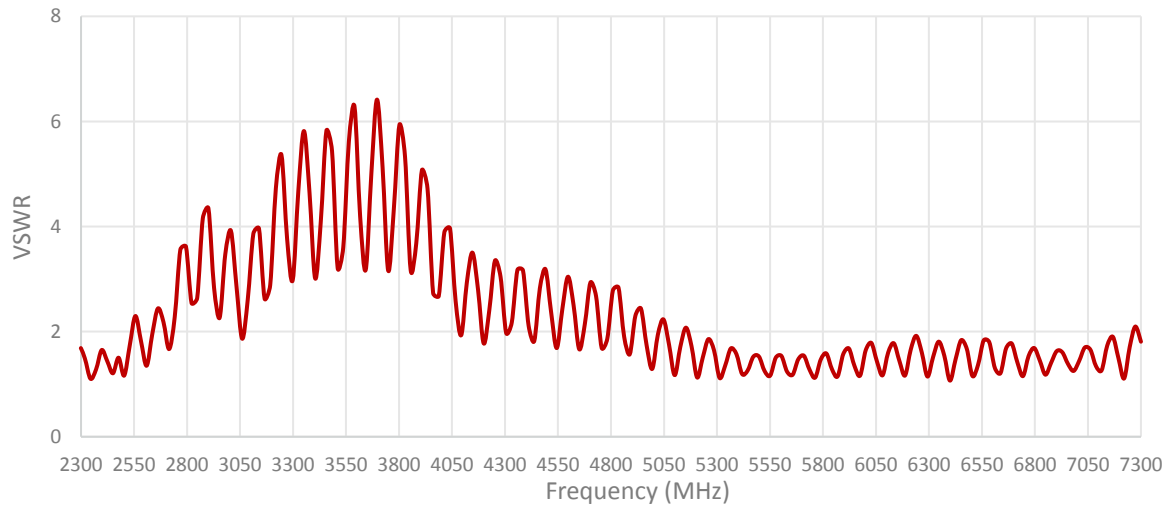
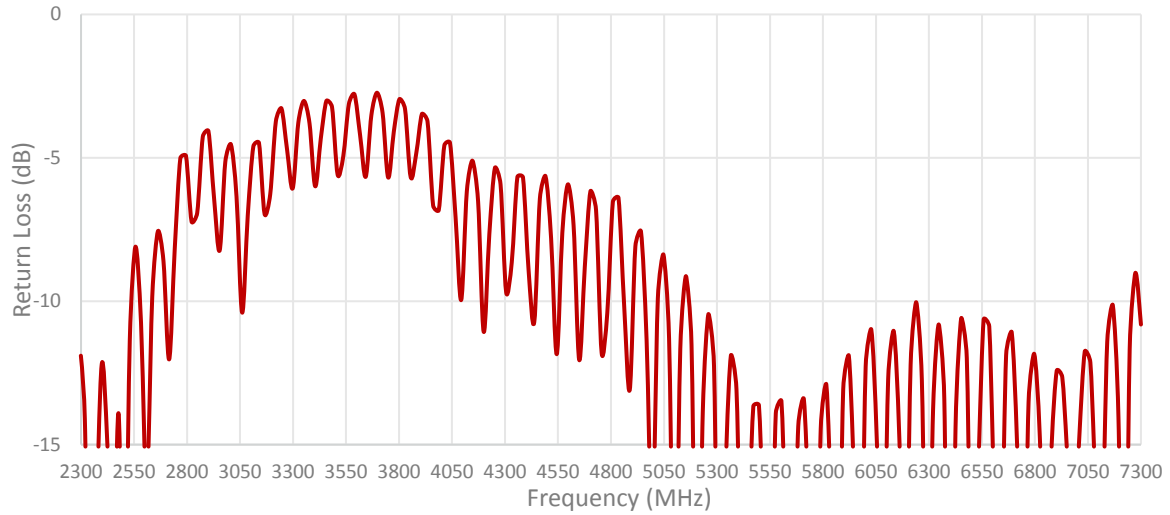


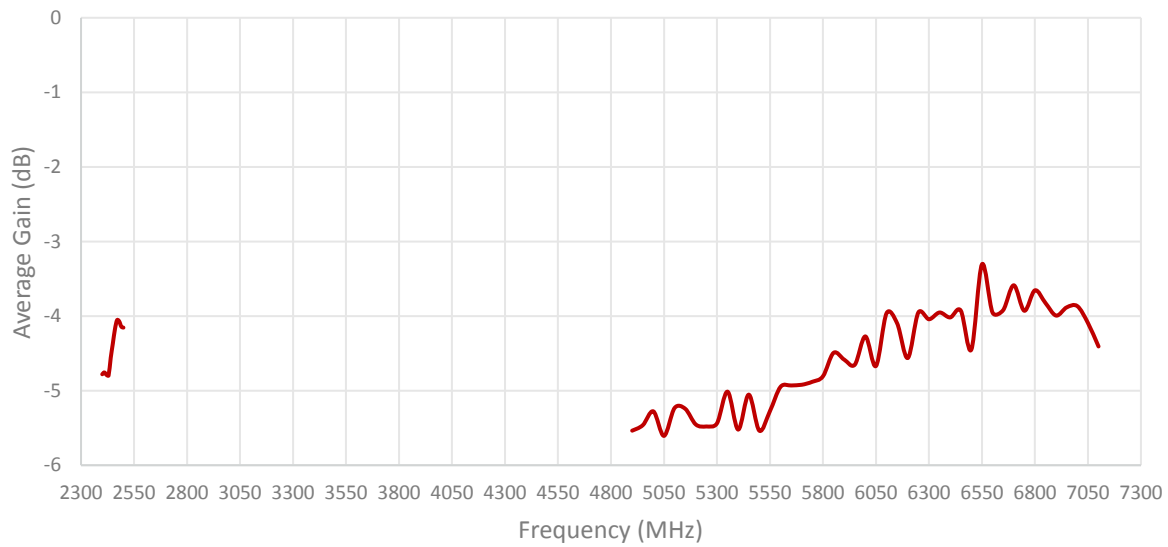
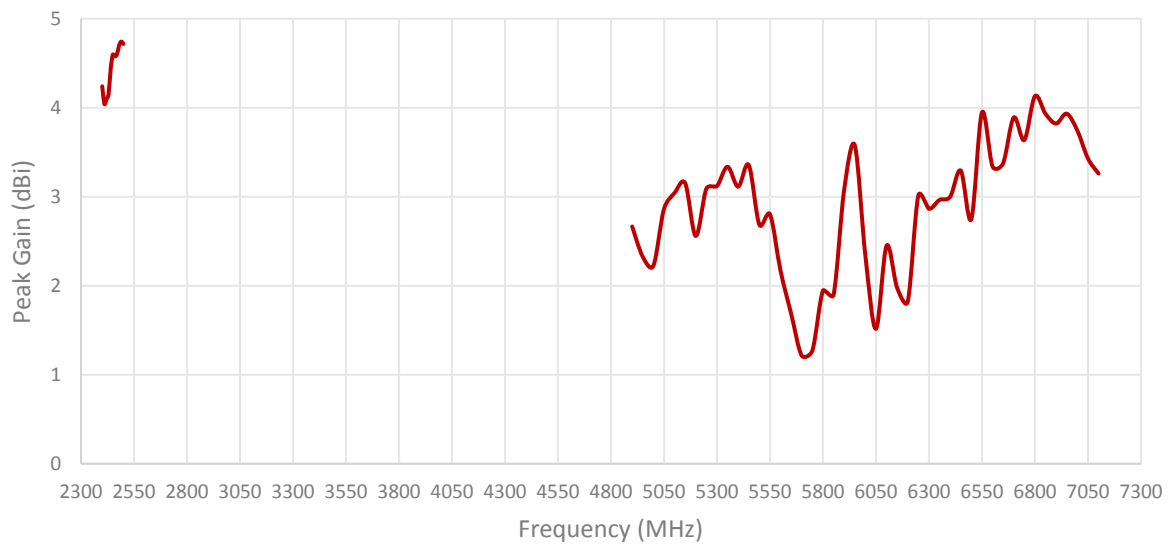
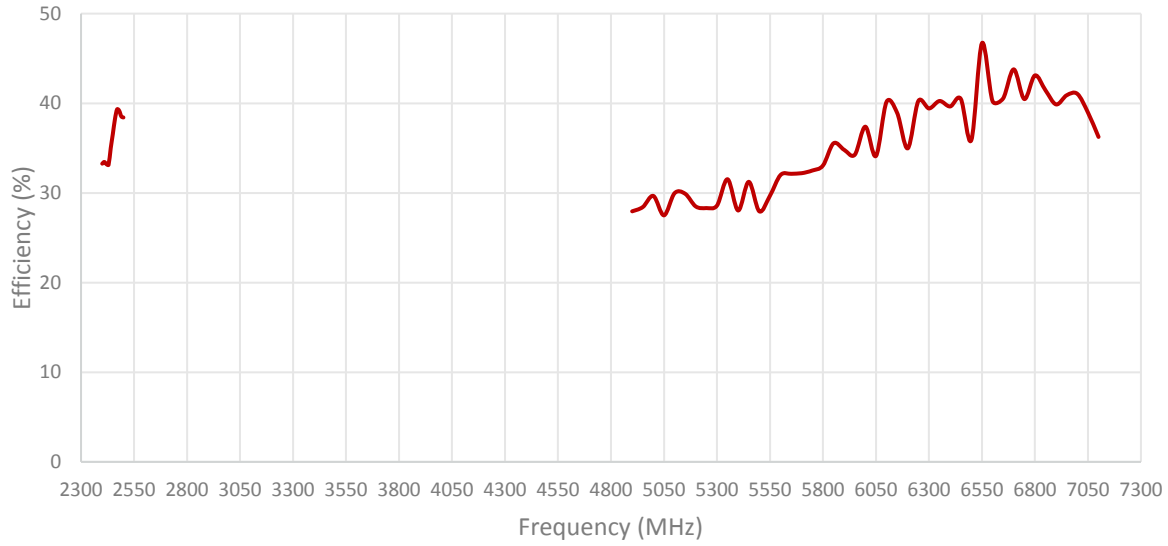
**Table 7: 2.4/5.0/6.0 GHz ISM**



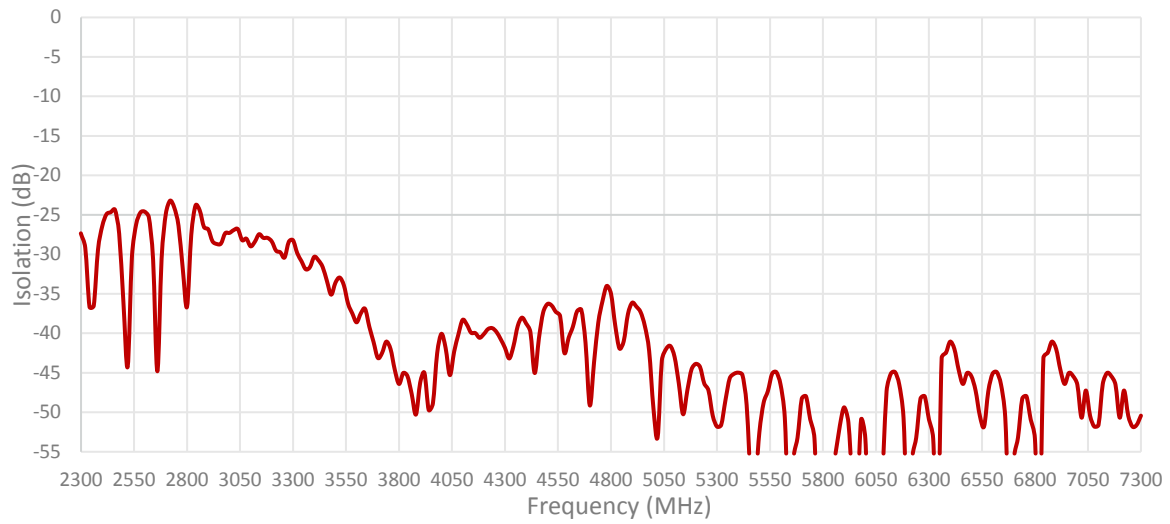


**Cable 8: 2.4/5.0/6.0 GHz ISM**

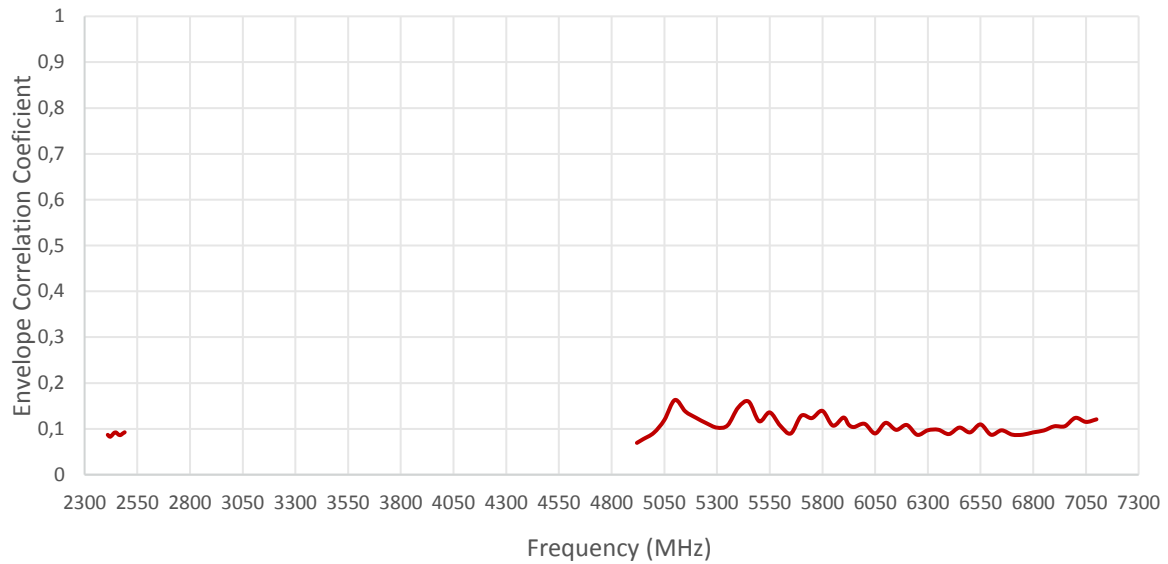




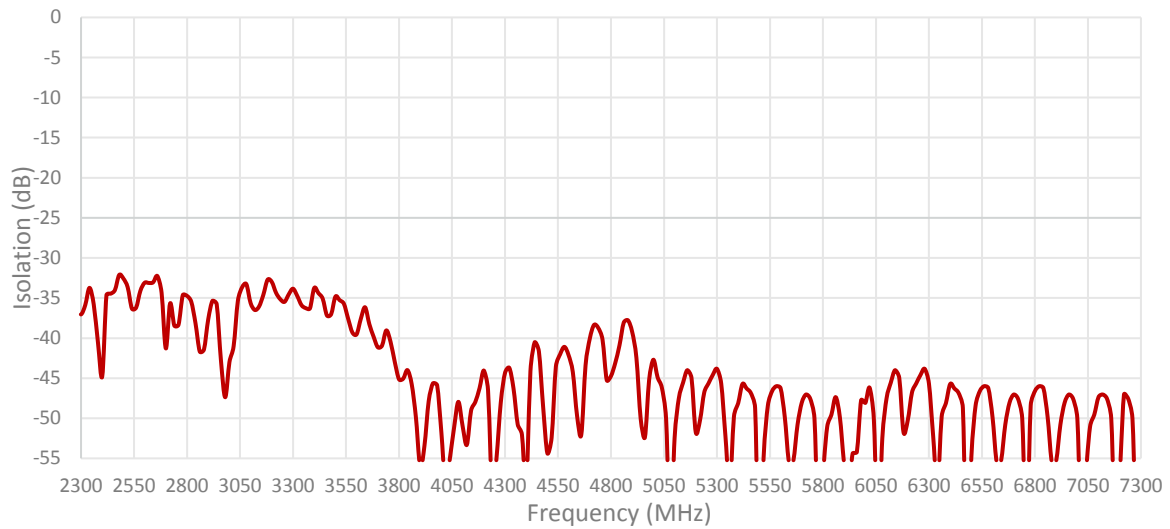
**ISOLATION FOR CABLES 5 AND 6**



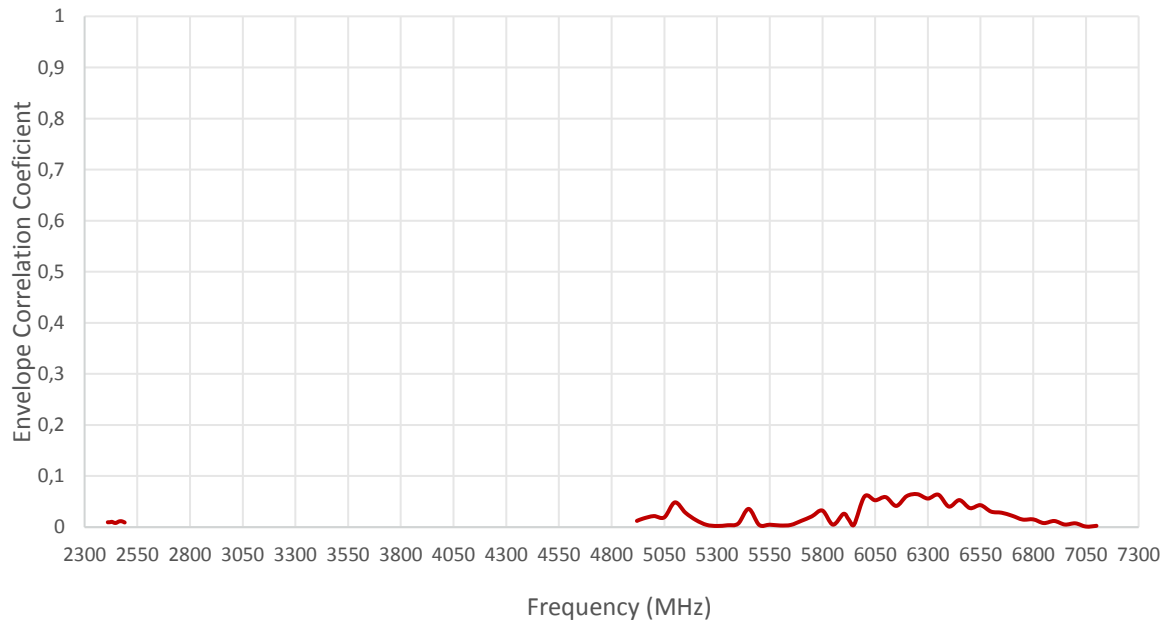
**ENVELOPE CORRELATION COEFFICIENT FOR CABLES 5 AND 6**



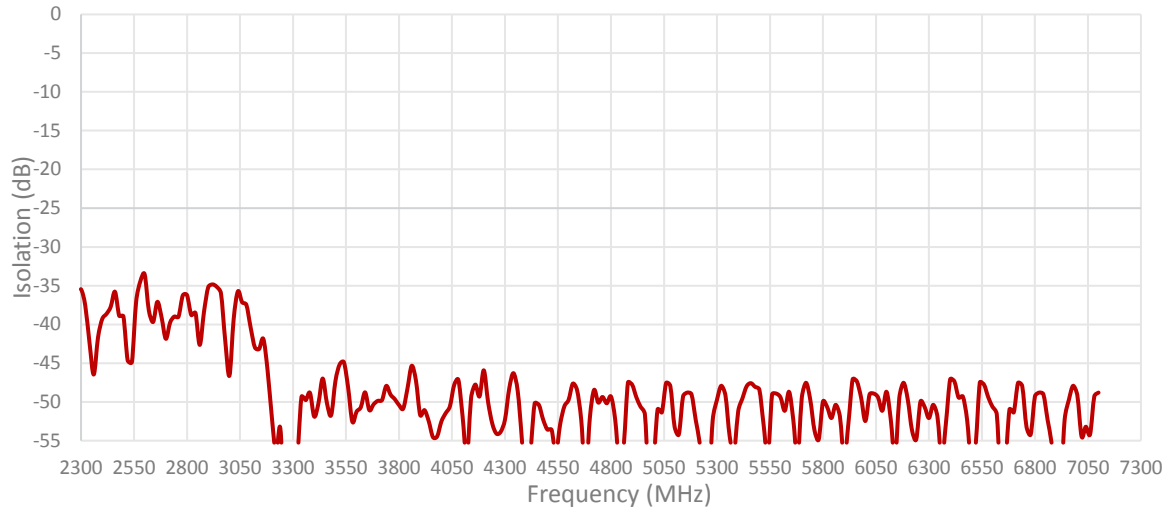
**ISOLATION FOR CABLES 5 AND 7**



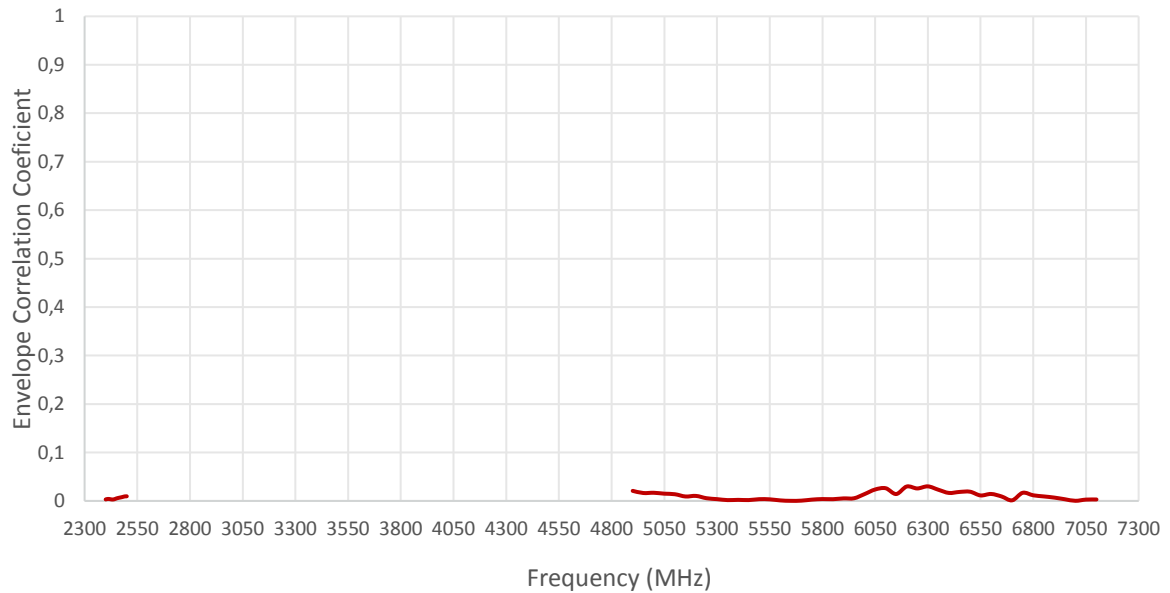
**ENVELOPE CORRELATION COEFFICIENT FOR CABLES 5 AND 7**



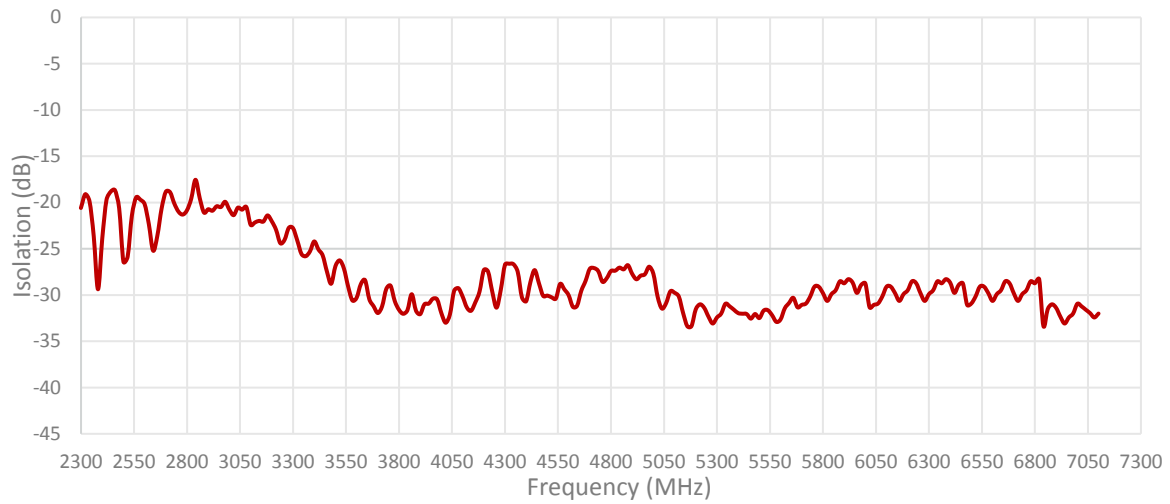
**ISOLATION FOR CABLES 5 AND 8**



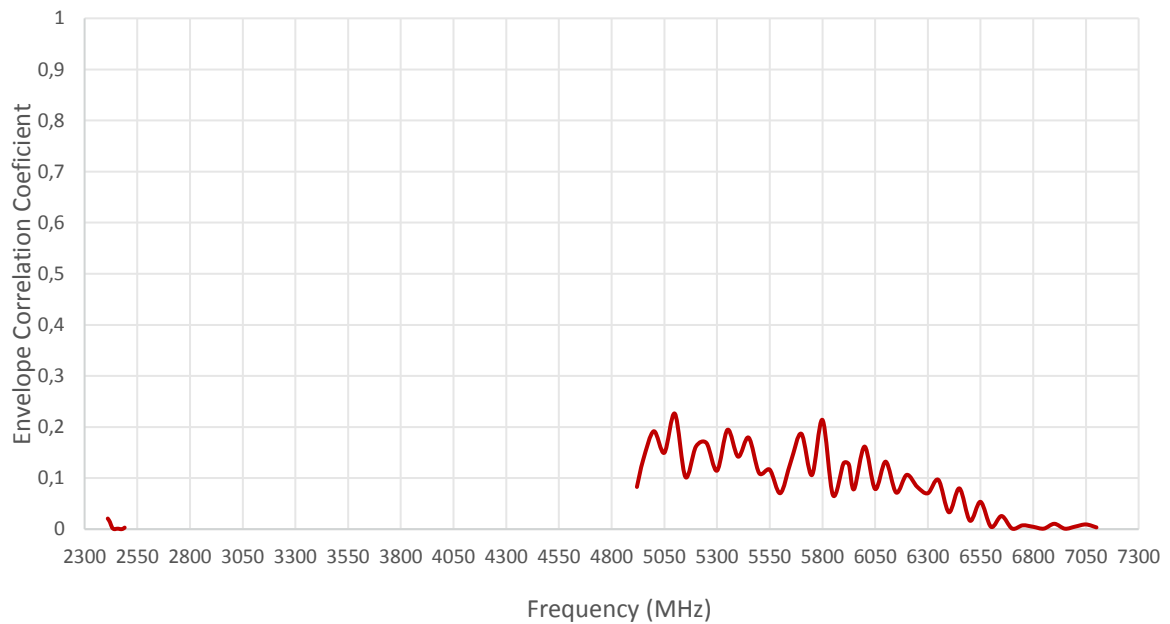
**ENVELOPE CORRELATION COEFFICIENT FOR CABLES 5 AND 8**



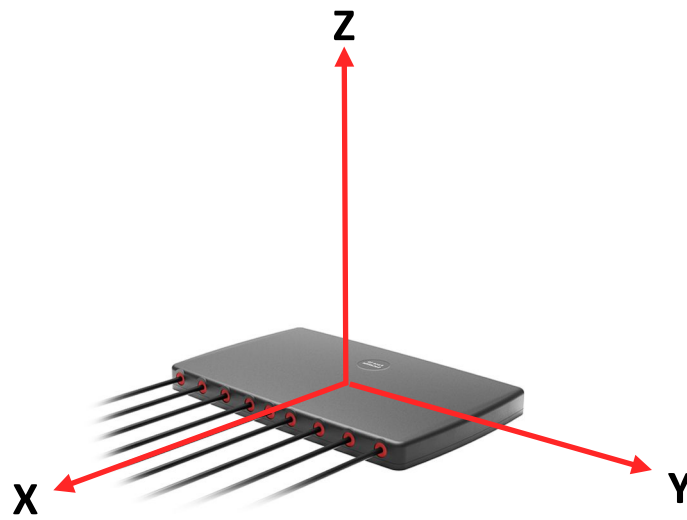
**ISOLATION FOR CABLES 6 AND 7**



**ENVELOPE CORRELATION COEFFICIENT FOR CABLES 6 AND 7**

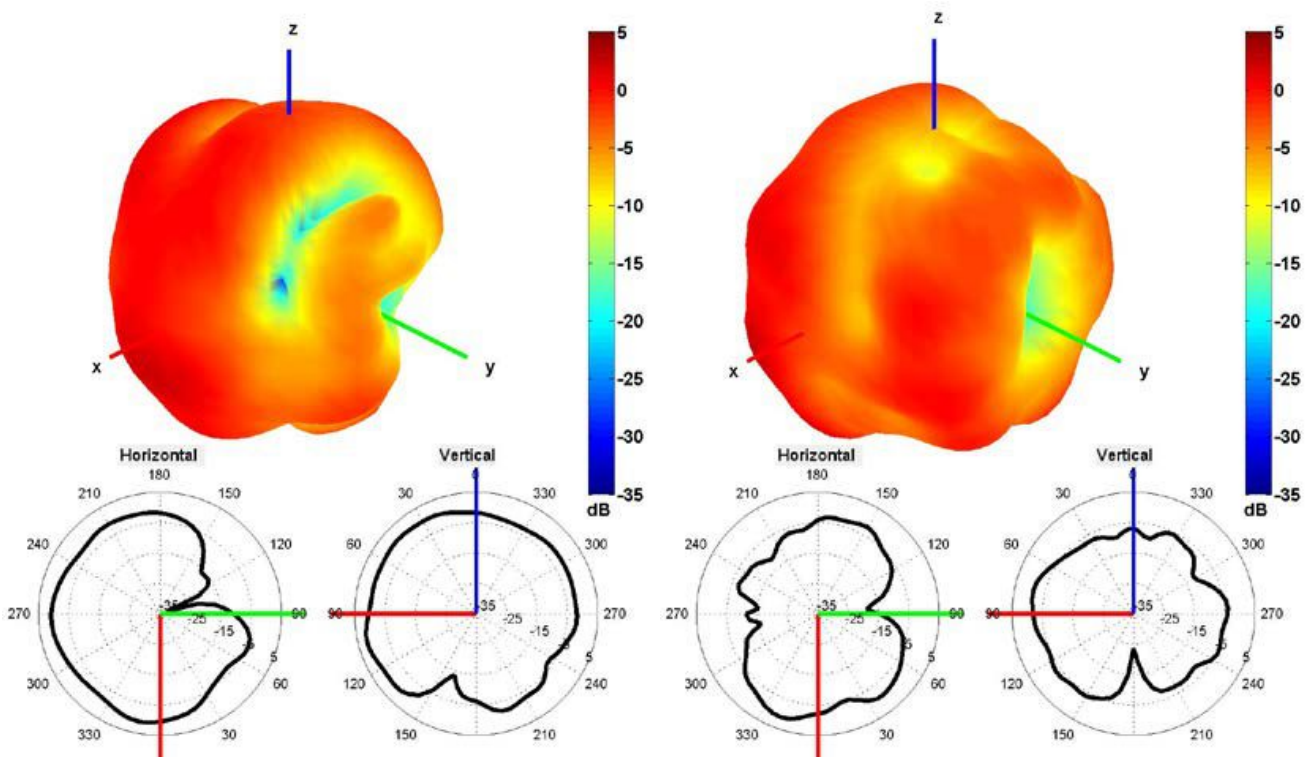




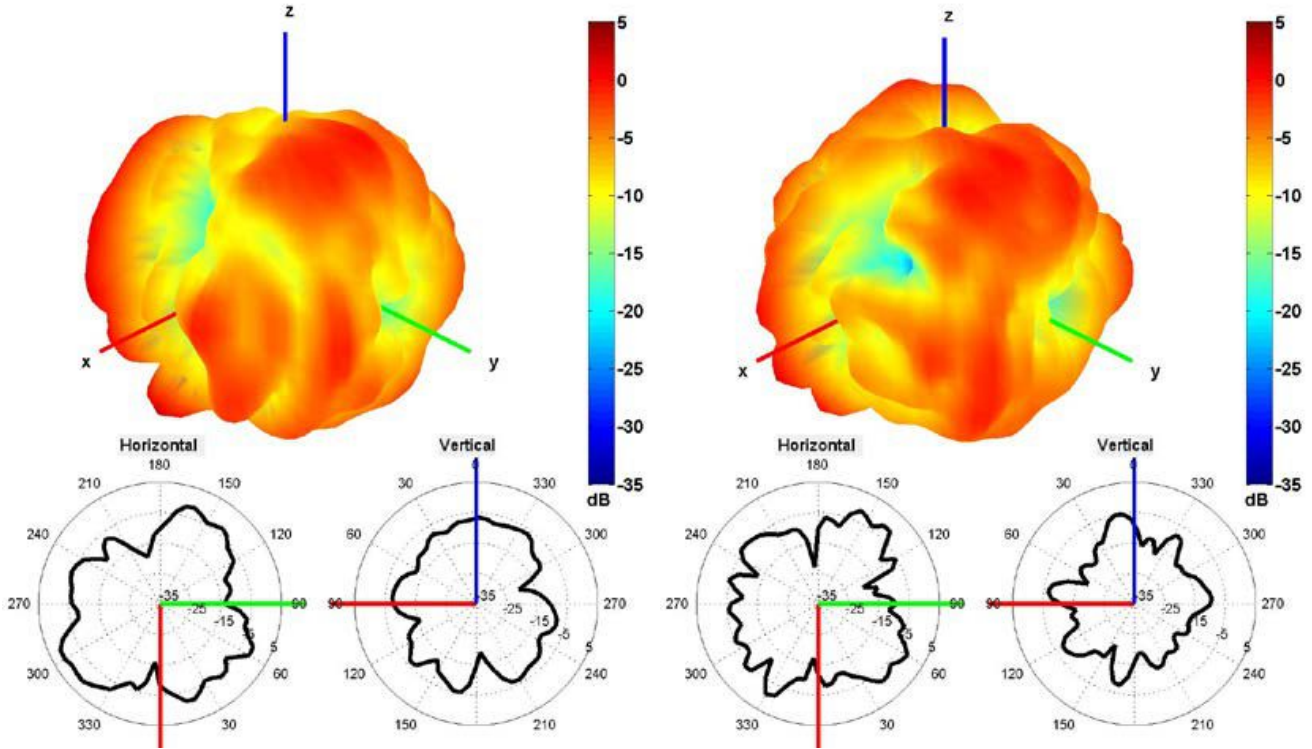


Radiation pattern reference

Cable 1: 5GNR

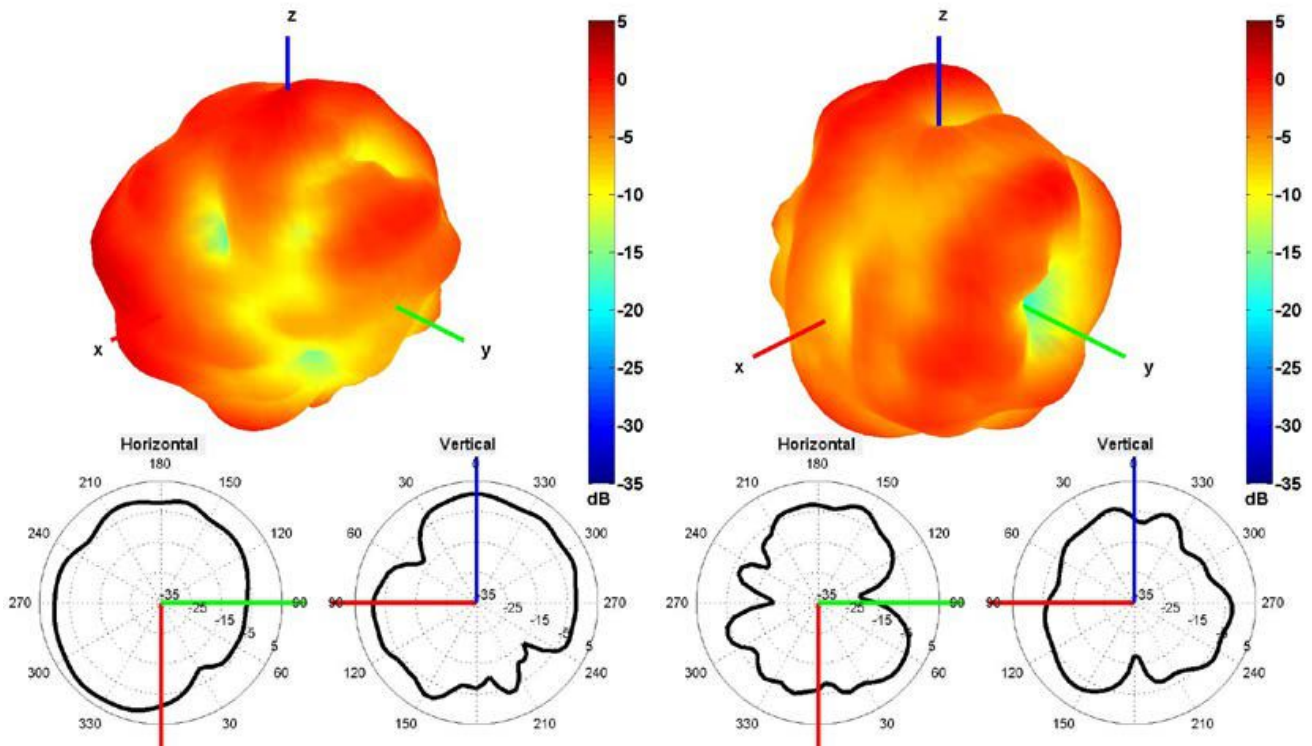


750 and 2500 MHz Radiation pattern

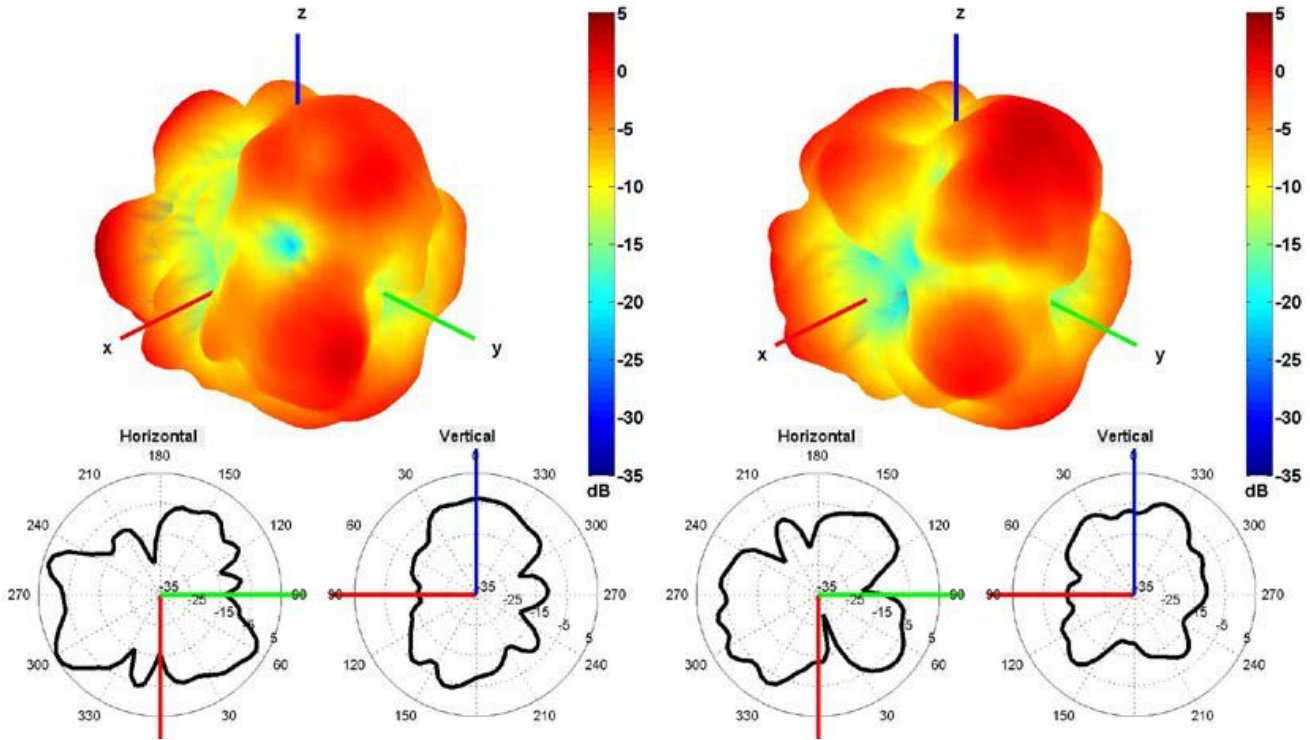


4500 and 5500 MHz Radiation pattern

Cable 2: 5GNR

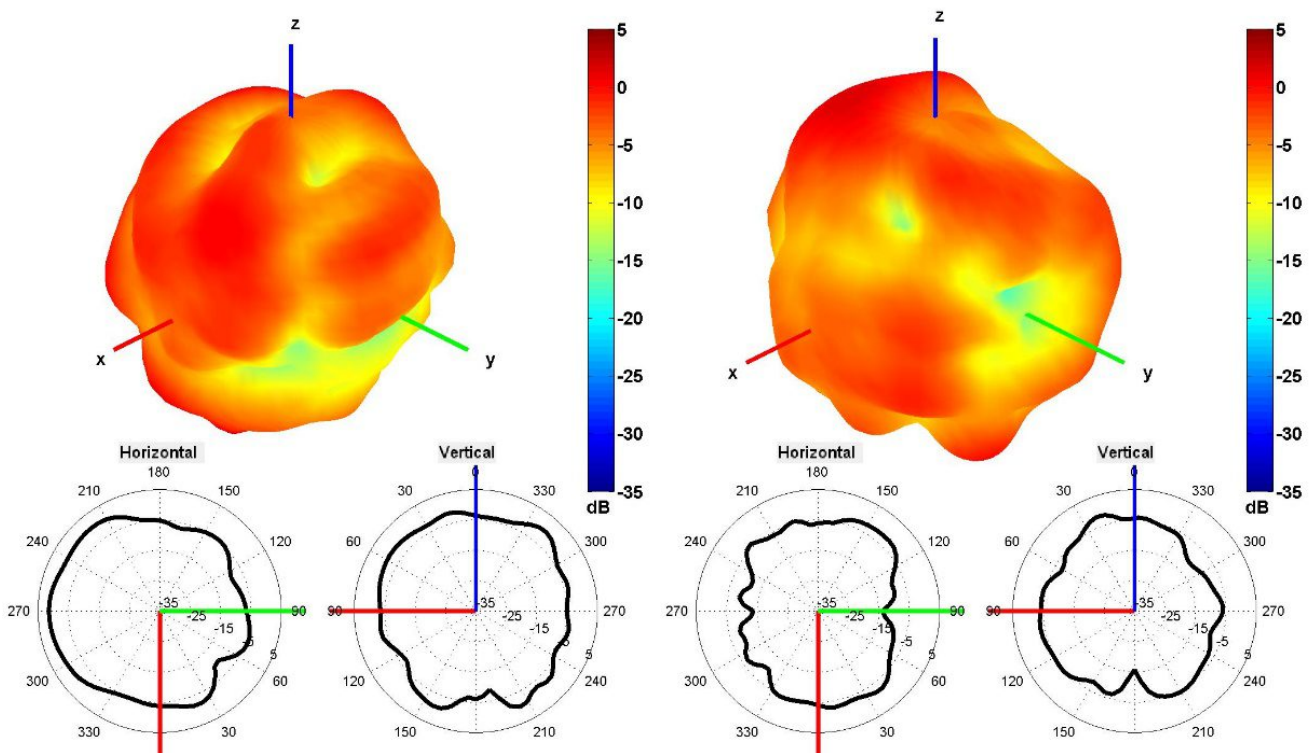


750 and 2500 MHz Radiation pattern

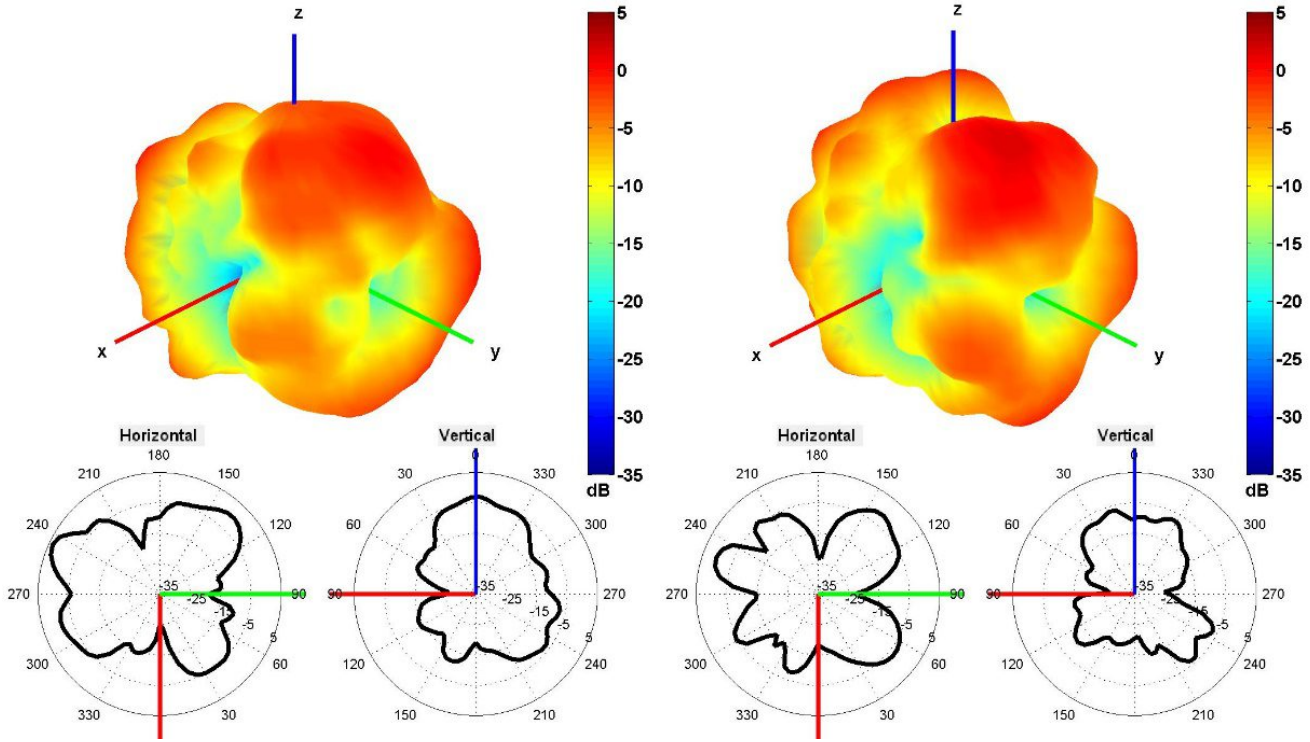


450 and 550 MHz Radiation pattern

Cable 3: 5GNR

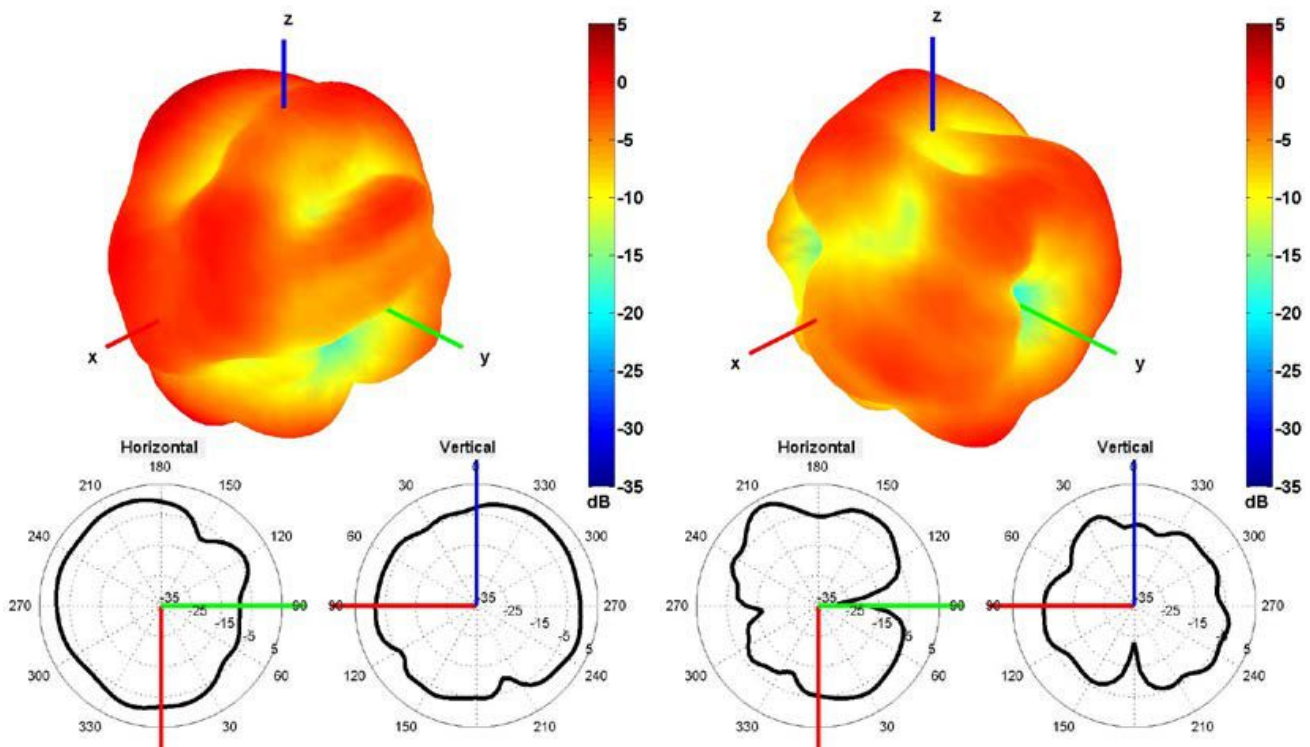


750 and 2500 MHz Radiation pattern

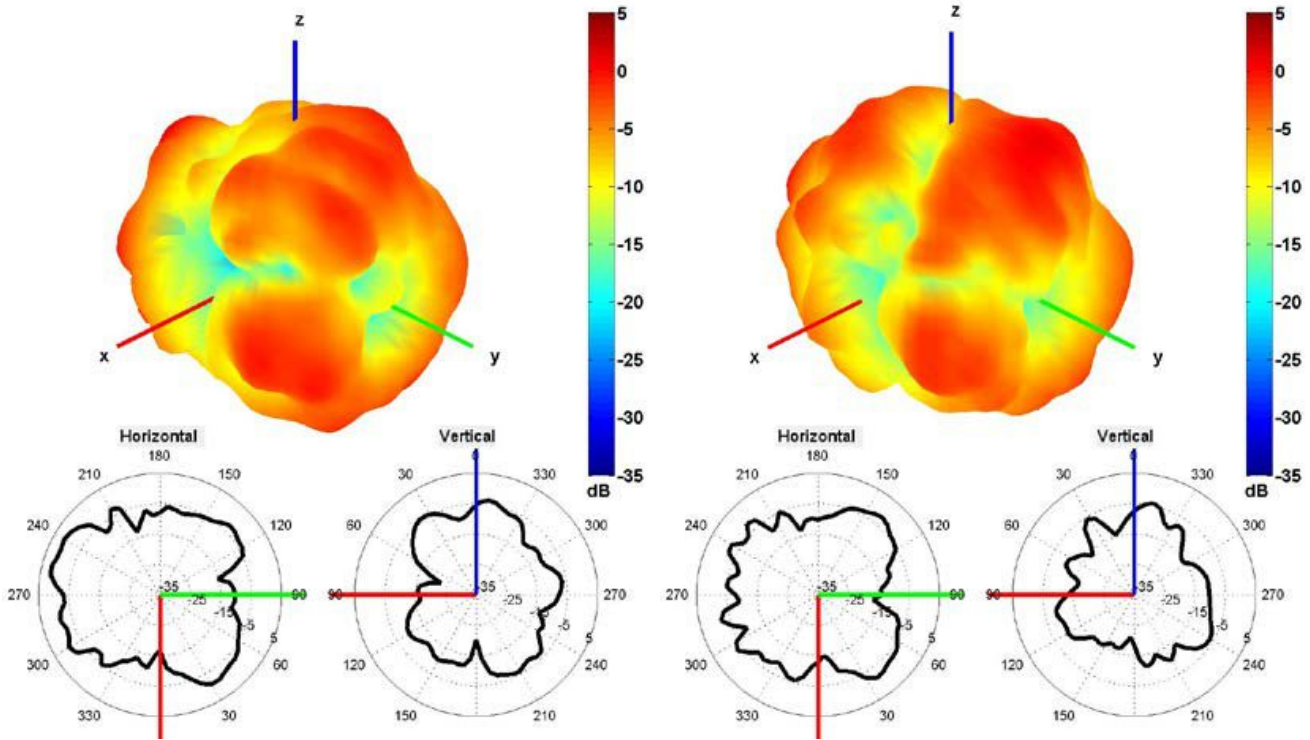


4500 and 5500 MHz Radiation pattern

Table 4: 5GNR

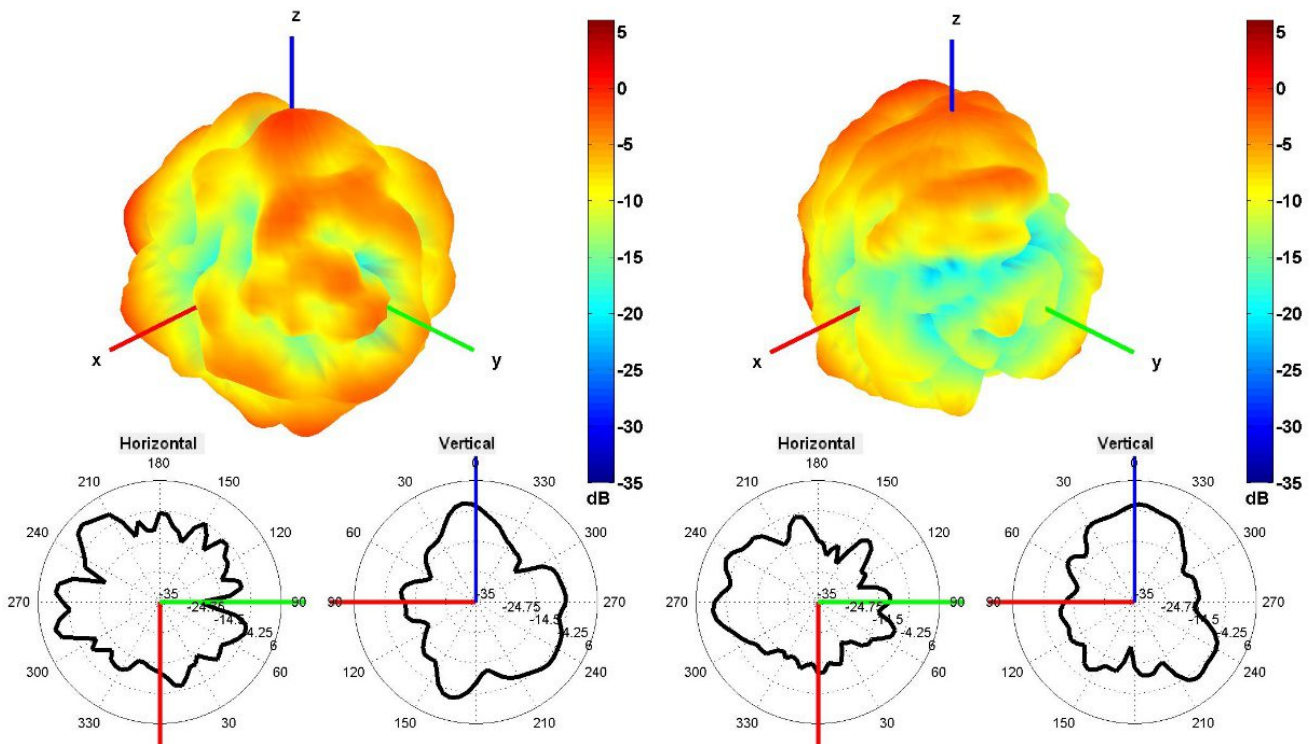


750 and 2500 MHz Radiation pattern

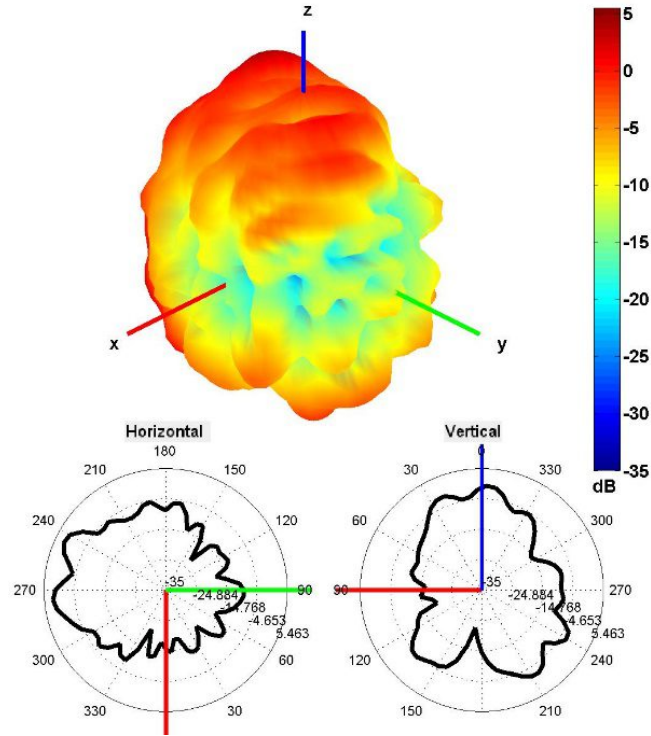


4500 and 5500 MHz Radiation pattern

Cable 5: 2.4/5.0/6.0 GHz ISM

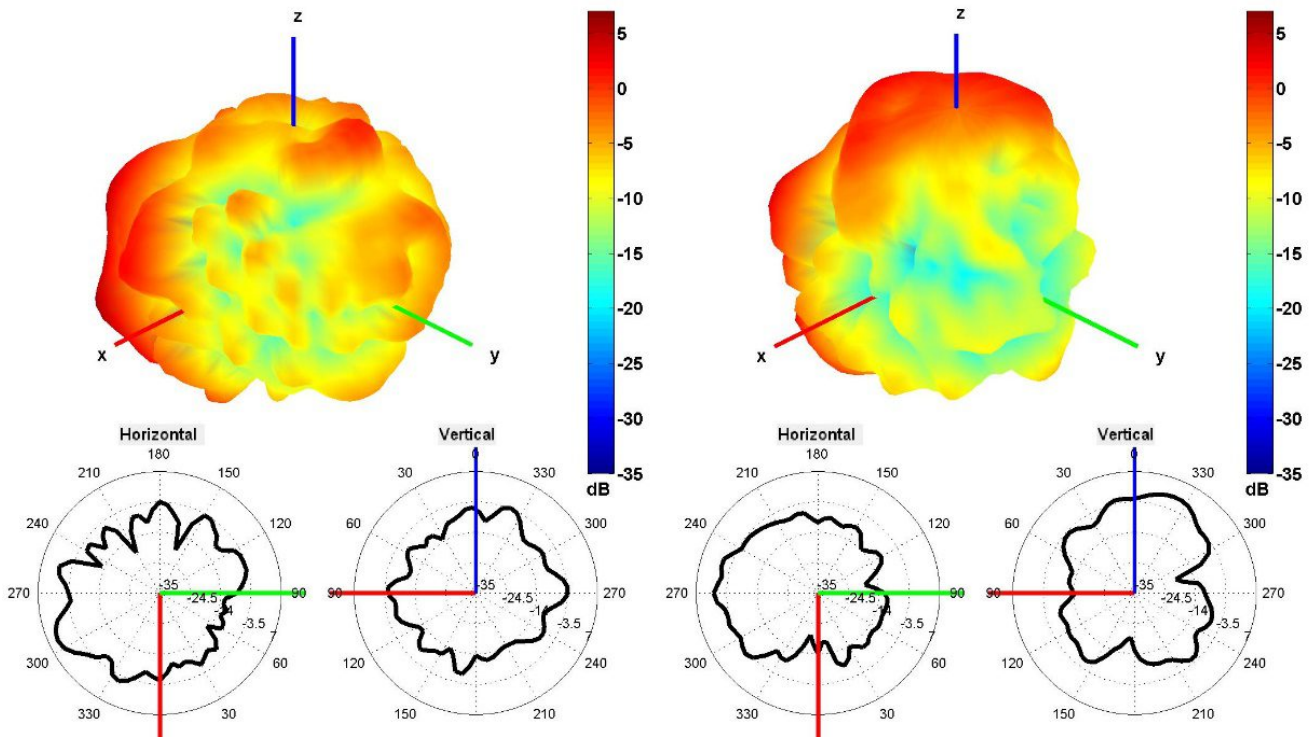


2450 and 5500 MHz Radiation pattern

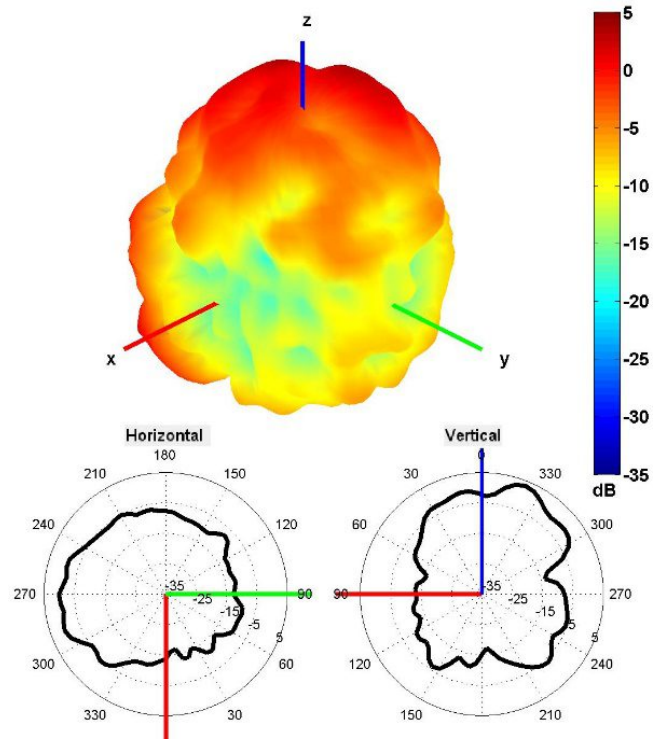


6500 MHz Radiation pattern

Cable 6: 2.4/5.0/6.0 GHz ISM

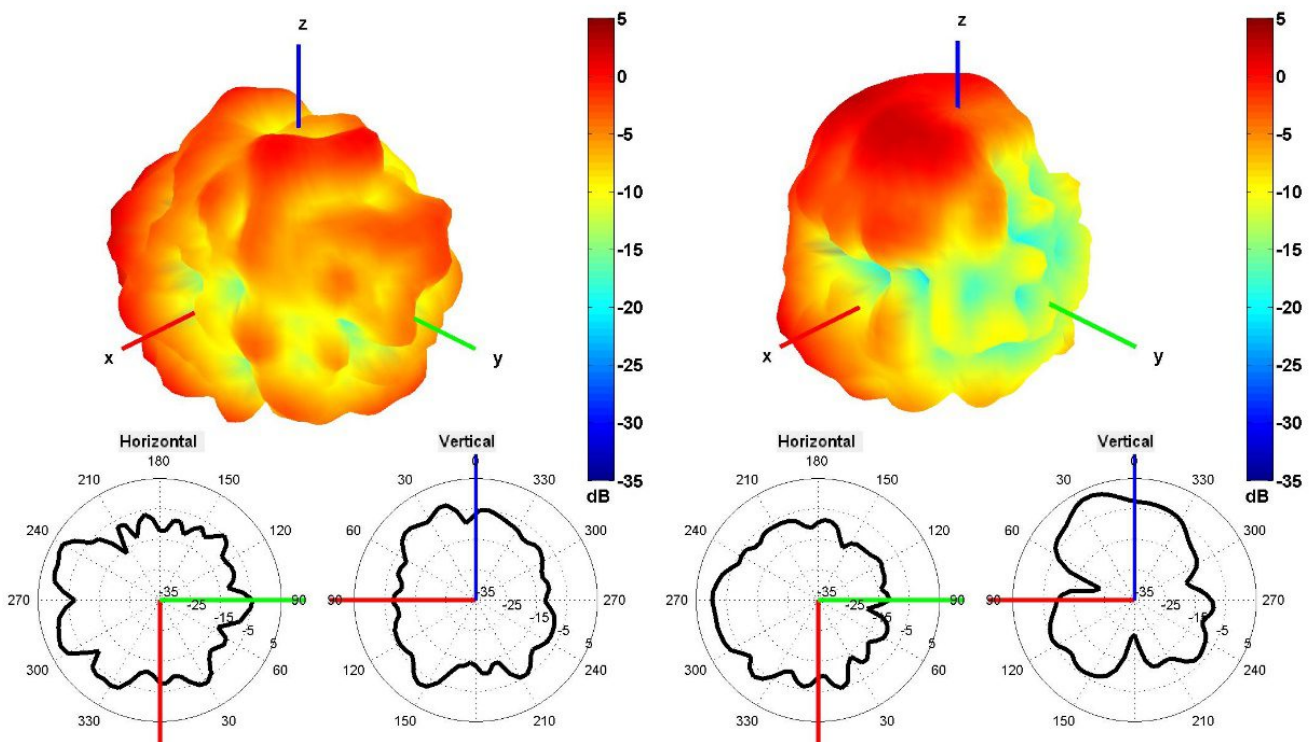


2450 and 5500 MHz Radiation pattern

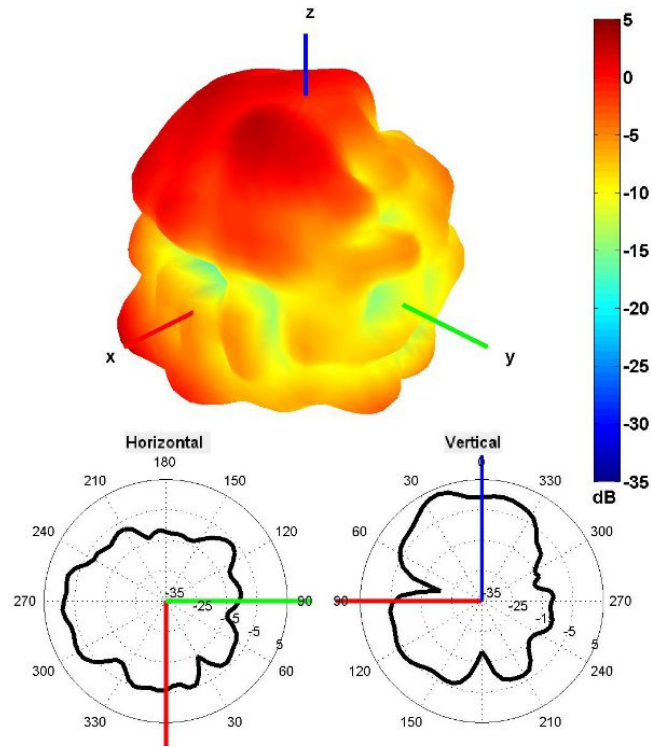


6500 MHz Radiation pattern

Cable 7: 2.4/5.0/6.0 GHz ISM

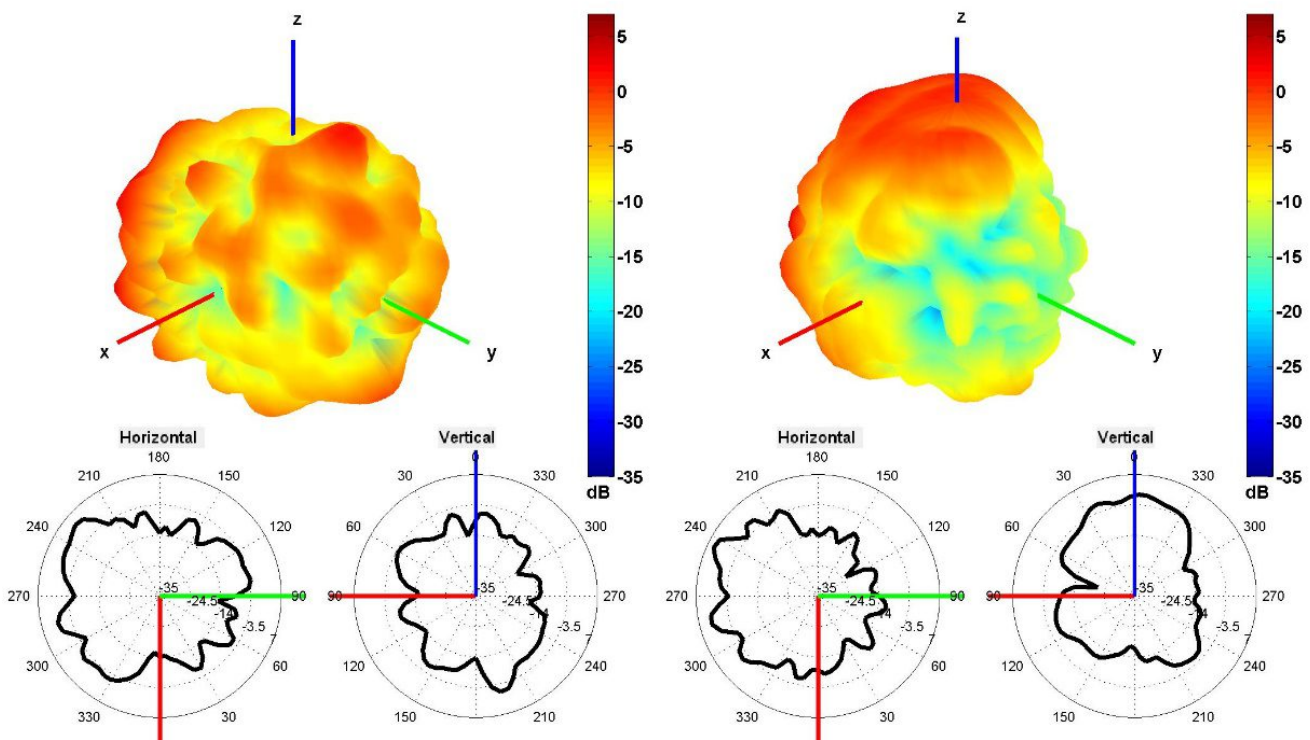


2450 and 5500 MHz Radiation pattern



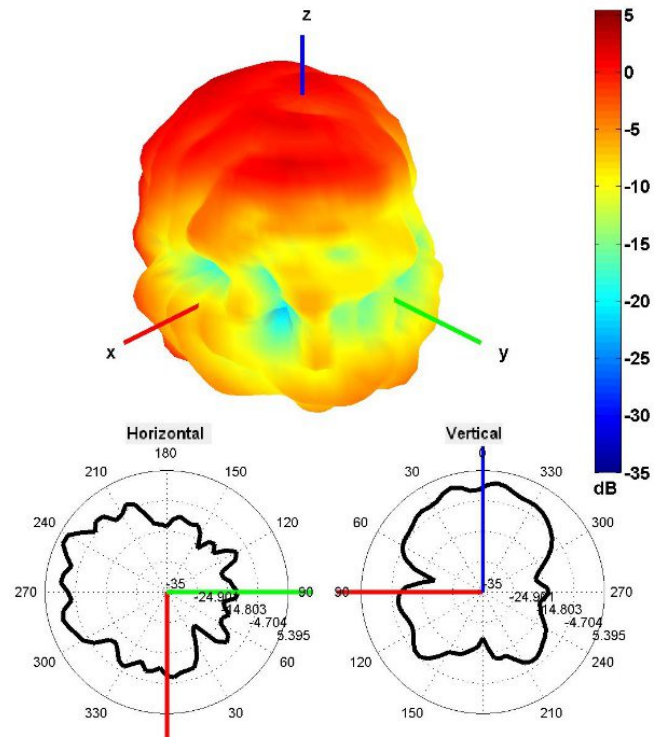
6500 MHz Radiation pattern

Cable 8: 2.4/5.0/6.0 GHz ISM



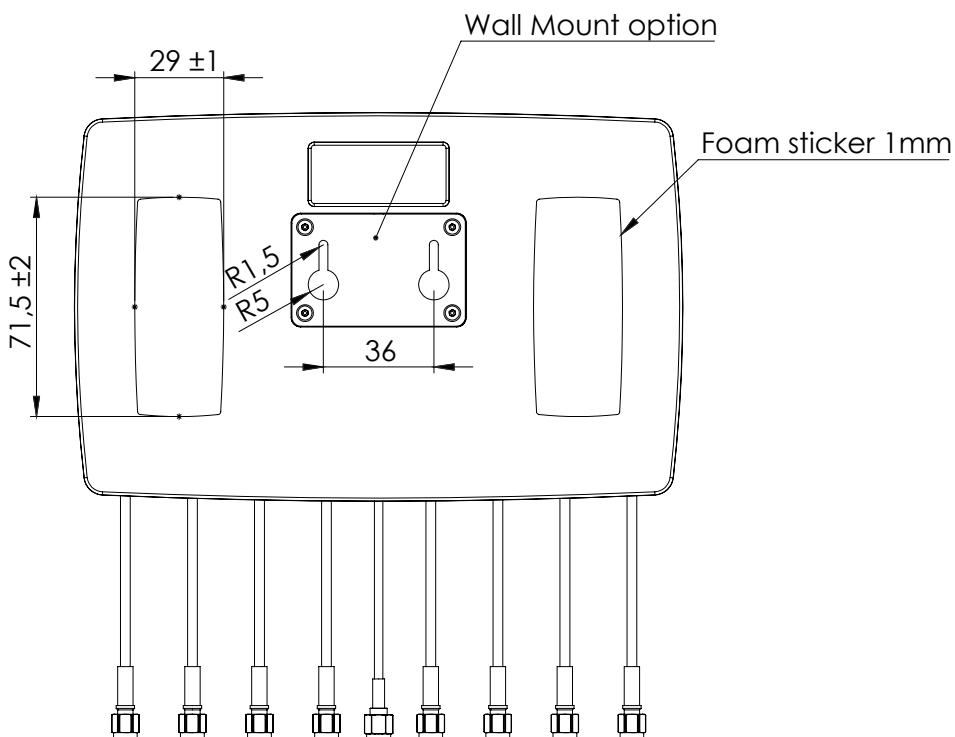
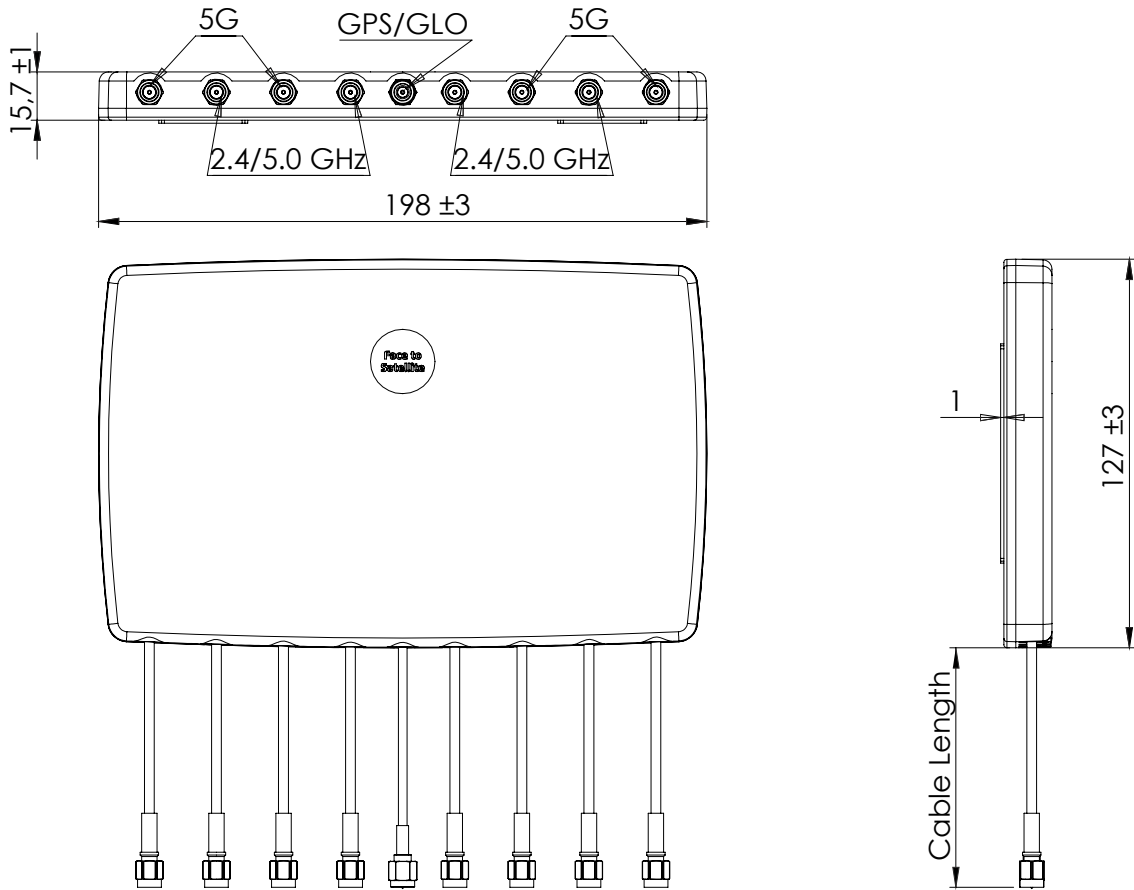
2450 and 5500 MHz Radiation pattern





6500 MHz Radiation pattern

#### 4. Antenna drawings



## 5. Antenna Images

