

# External Antenna

## BTEA Series

Prepared: Chris Chai		Approved: Adam Chen	
Checked: Feidi Pei		Customer:	
Version	Changed Reason	Changed by	Date
01	Original version	Chris	20191117

Address (India): H-601, Officer City2, Rajnagar Extension, Ghaziabad

Address (TW): 2F., NO 3, Gongye 4th RD., Hukou Shiang Hsinchu County 303-51, Taiwan



## Features

- Easy installation low cost and light-weight type
- Wide bandwidth and Omni-directional
- Customized

## Applications

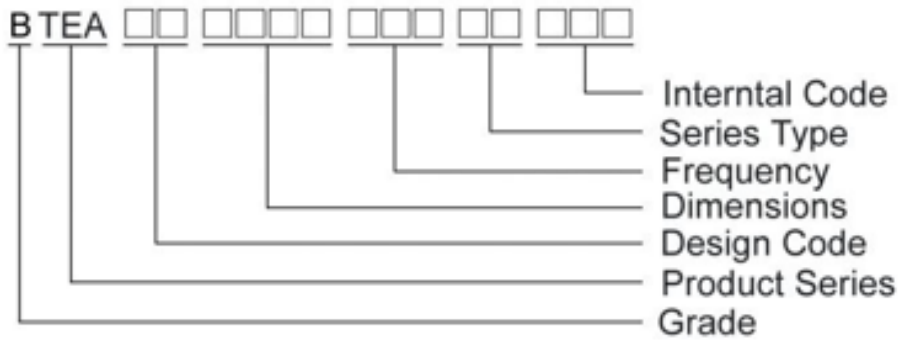
- Bluetooth, Wireless Router, Set Top Box and Home digital
- ISM band, Lora, Sigfox, LTE, NB-IOT, GPS, WiFi and Car use.

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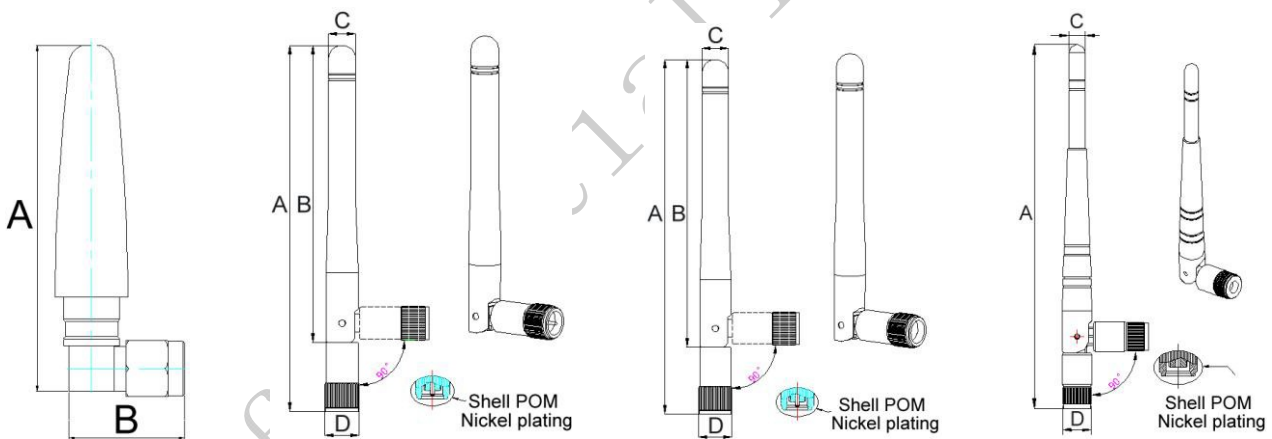
<https://www.psgtek.com>

## Product Identification



## Shape and Dimensions

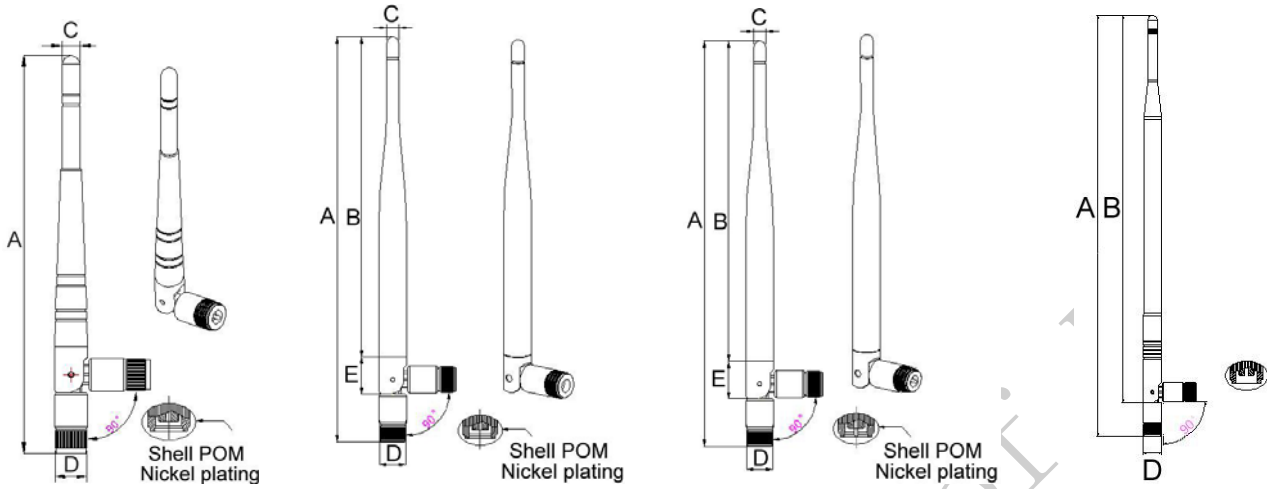
- Config1
- Config2
- Config3
- Config4



Dimensions in mm

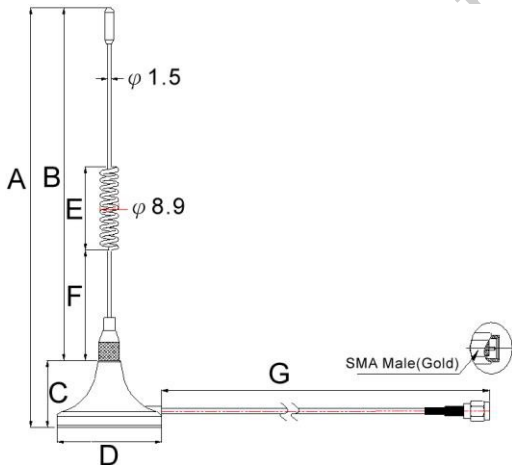
TYPE	FIG	A	B	C	D
BTEA0050160G8R2A01	1	50±2	16.6±0.3	-	-
BTEA0087090G8R2A07	3	108±5	86.7±5	7.9	9.4±0.5
BTEA0087092G4R2B02	2	108±5	86.7±5	7.9	9.95±0.5
BTEA00870925GR2A07	2	108.5±5	87±5	7.8	10±0.5
BTEA0087095G0R2A03	3	108±5	86.7±5	7.8	9.95±0.5
BTEA00151325GR2A07	4	157.5±5	-	7.2	13
BTEA0015132G4R2A08	4	157.5±5	-	7.2	13

- Config5
- Config6
- Config7
- Config8



TYPE	FIG	A	B	C	D	E
BTEA0015135G0R2A01	5	157.5±5	-	7.2	13	-
BTEA0017132G4R2A31	6	196±5	154±3	6	13	18
BTEA00171325GR2A05	7	196±5	154±3	6	13	18
BTEA0017135G0R2A07	6	196±5	154±3	6	13	18
BTEA00271325GR2A03	8	293±5	270±5	-	13	-

- Config9



TYPE	FIG	A	B	C	D	E	F	G
BTEA0027300G8R1A01	9	278.2±5	250±2	28.2	φ 30	24	51.3	1000±30

## Electrical Characteristics

Part Number	Frequency Range (GHz)	Impedance ( $\Omega$ )	Return Loss dB(Max)	VSWR (Max)	Radiation	Peak Gain (dBi)	Polarization	Admitted Power (W)
BTEA0050160G8R2A01	824~915 1725~1880	50	-2.5	-	Omni-directional	2.56	Linear Vertical	1
BTEA0087090G8R2A07	824~960 1710~2170	50	-4	-	Omni-directional	-0.88 2.03	Linear Vertical	-
BTEA0087092G4R2B02	2.4~2.5	50	-10	2	Omni-directional	2.54	Linear	1
BTEA00870925GR2A07	2.4~2.5 5.15~5.85	50	-10	-	Omni-directional	2	Linear Vertical	1
BTEA0087095G0R2A03	5.15~5.85	50	-10	-	Omni-directional	2.36	Linear Vertical	1
BTEA00151325GR2A07	2.4~2.5 5.15~5.85	50	-10	2	Omni-directional	3 $\pm$ 0.5	Linear	-
BTEA0015132G4R2A08	2.4~2.5	50	-10	2	Omni-directional	3	Linear	-
BTEA0015135G0R2A01	5.1~5.9	50	-10	2	Omni-directional	3 $\pm$ 1	Linear	-
BTEA0017132G4R2A31	2.4~2.5	50	-10	-	Omni-directional	4.93	Linear Vertical	1
BTEA00171325GR2A05	2.4~2.5 5.15~5.85	50	-10	-	Omni-directional	5 $\pm$ 1	Linear Vertical	1
BTEA0017135G0R2A07	5.15~5.85	50	-10	-	Omni-directional	5 $\pm$ 1	Linear Vertical	1
BTEA00271325GR2A03	2.4~2.5 5.15~5.85	50	-10	-	Omni-directional	7 $\pm$ 0.5	Linear Vertical	-
BTEA0027300G8R1A01	800~900 1800~1900 2100	50	-10	2	Omni-directional	-	Linear Vertical	-

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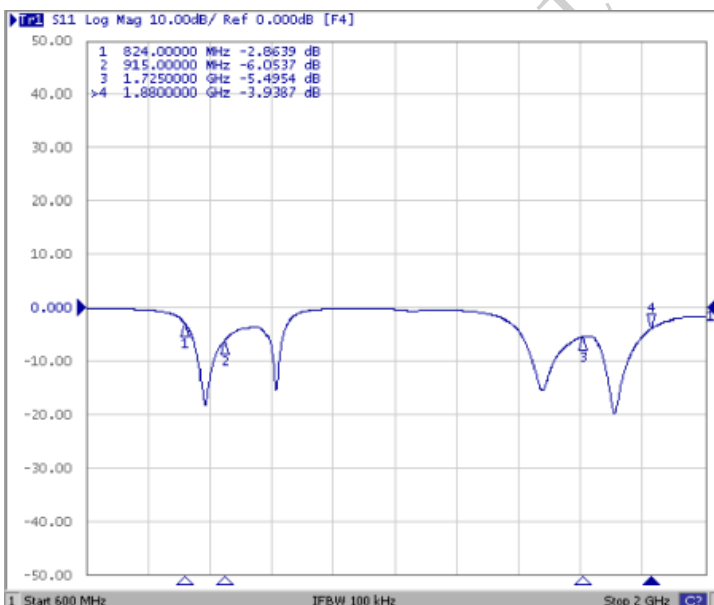
## Physical Properties

Part Number	Cable	Antenna Cover	Antenna Base	Operating Temp	Storage Temp	Color	Connector
BTEA0050160G8R2A01	RG-178	TPEE	PC/PBT	-20°C~+65°C	-30°C~+75°C	Black	SMA-Male 90°
BTEA0087090G8R2A07	RG-178	TPEE	PC/PBT	-20°C~+65°C	-30°C~+75°C	Black	SMA-Male-RP
BTEA0087092G4R2B02	RG-178	TPEE	PC/PBT	-20°C~+65°C	-30°C~+75°C	Black	-
BTEA00870925GR2A07	RG-178	TPEE	PC/PBT	-20°C~+65°C	-30°C~+75°C	Black	SMA-Male
BTEA0087095G0R2A03	RG-178	TPEE	PC/PBT	-20°C~+65°C	-30°C~+75°C	Black	-
BTEA00151325GR2A07	RG-178	TPEE	PC/PBT	-20°C~+65°C	-30°C~+75°C	Black	SMA-Male-RP
BTEA0015132G4R2A08	RG-178	TPEE	PC/PBT	-20°C~+65°C	-30°C~+75°C	Black	SMA-Male-RP
BTEA0015135G0R2A01	RG-178	TPEE	PC/PBT	-20°C~+65°C	-30°C~+75°C	Black	SMA-Male
BTEA0017132G4R2A31	RG-178	TPEE	PC/PBT	-20°C~+65°C	-30°C~+75°C	Black	SMA-Male-Reverse
BTEA00171325GR2A05	RG-178	TPEE	PC/PBT	-20°C~+65°C	-30°C~+75°C	Black	SMA-Male
BTEA0017135G0R2A07	RG-178	TPEE	PC/PBT	-20°C~+65°C	-30°C~+75°C	Black	SMA-Male-Reverse
BTEA00271325GR2A03	RG-178	ABS	PC/PBT	-20°C~+65°C	-30°C~+75°C	Black	RP-SMA-Male
BTEA0027300G8R1A01	RG-174	ABS	PVC/SPRING	-10°C~+70°C	+40°C~+80°C	Black	SMA-PLUG

## RF performance

### BTEA0050160G8R2A01

#### Return Loss S11

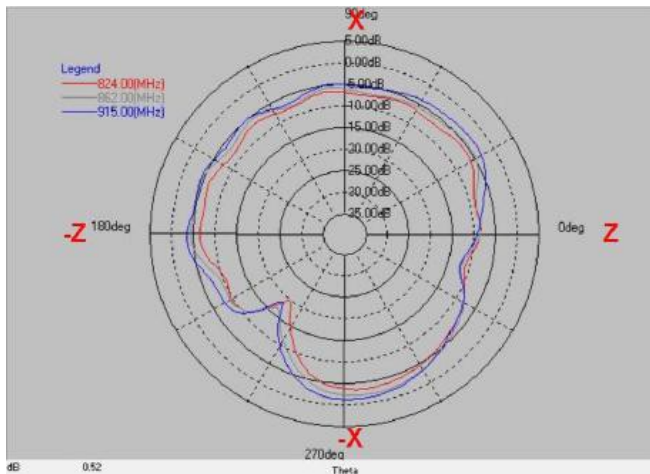


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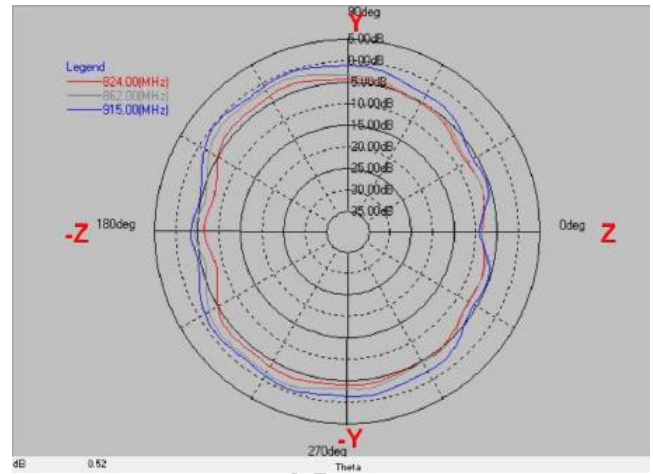
<https://www.psgtek.com>

Frequency (MHz) : 824~915. Pattern Field : X-Z plane



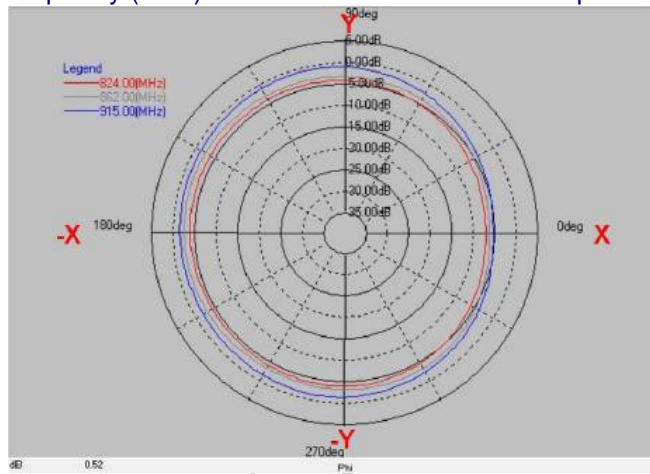
Frequency	Max value	Min value	Average
824(MHz)	-3.68 dB	-19.80 dB	-7.22 dB
862(MHz)	-2.31 dB	-16.80 dB	-6.07 dB
915(MHz)	-1.52 dB	-18.72 dB	-5.13 dB

Frequency (MHz) : 824~915. Pattern Field : Y-Z plane



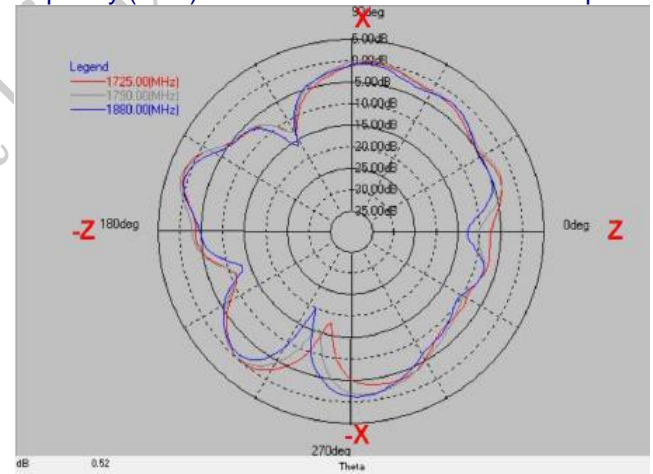
Frequency	Max value	Min value	Average
824(MHz)	-3.26 dB	-8.39 dB	-5.27 dB
862(MHz)	-1.60 dB	-8.61 dB	-4.02 dB
915(MHz)	-0.37 dB	-9.12 dB	-2.62 dB

Frequency (MHz) : 824~915. Pattern Field : Y-X plane



Frequency	Max value	Min value	Average
824(MHz)	-3.85 dB	-7.08 dB	-4.79 dB
862(MHz)	-2.50 dB	-6.26 dB	-3.66 dB
915(MHz)	-1.06 dB	-5.29 dB	-2.22 dB

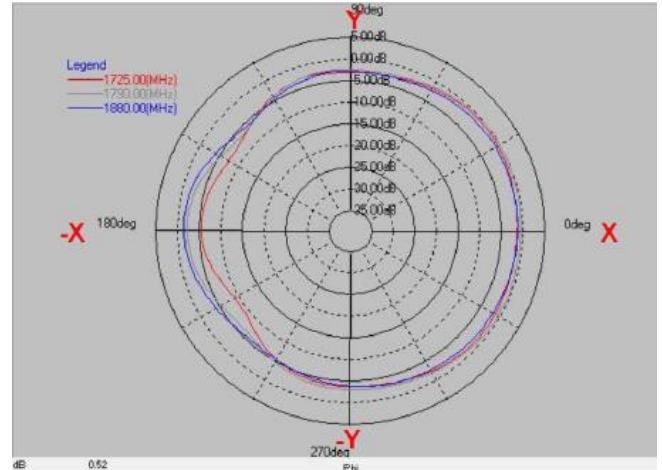
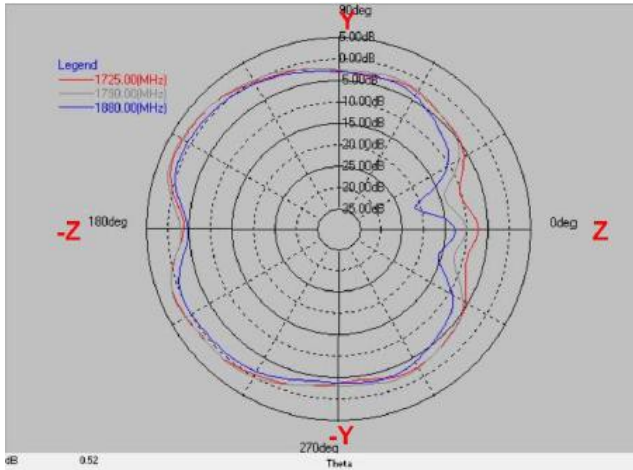
Frequency (MHz) : 1725~1880. Pattern Field : X-Z plane



Frequency	Max value	Min value	Average
1725 (MHz)	1.20 dB	-17.94 dB	-4.00 dB
1790(MHz)	1.73 dB	-15.77 dB	-3.52 dB
1880(MHz)	0.74 dB	-20.26 dB	-4.27 dB

Frequency (MHz) : 1725~1880. Pattern Field : Y-Z plane

Frequency (MHz) : 1725~1880. Pattern Field : X-Y plane

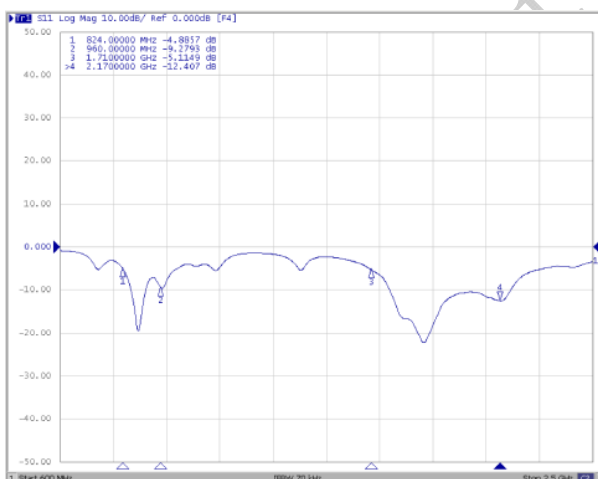


Frequency	Max value	Min value	Average
1725 (MHz)	2.15 dB	-10.24 dB	-1.80 dB
1790(MHz)	2.56 dB	-14.06 dB	-1.55 dB
1880(MHz)	0.74 dB	-21.26 dB	-3.03 dB

Frequency	Max value	Min value	Average
1725 (MHz)	-0.49 dB	-9.26 dB	-3.20 dB
1790(MHz)	0.01 dB	-6.67 dB	-2.35 dB
1880(MHz)	-1.09 dB	-5.91 dB	-2.84 dB

### BTEA0087090G8R2A07

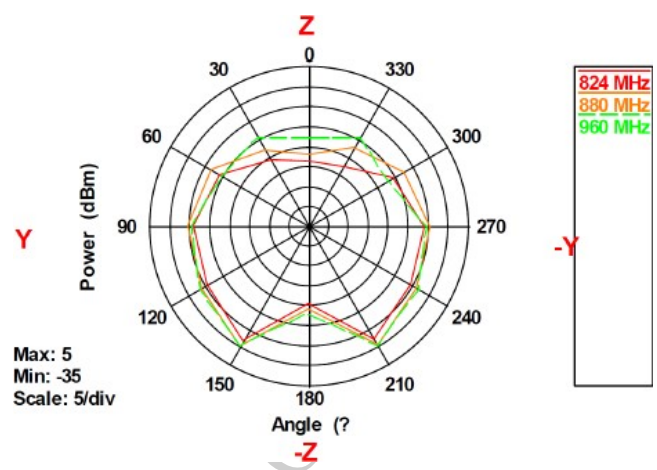
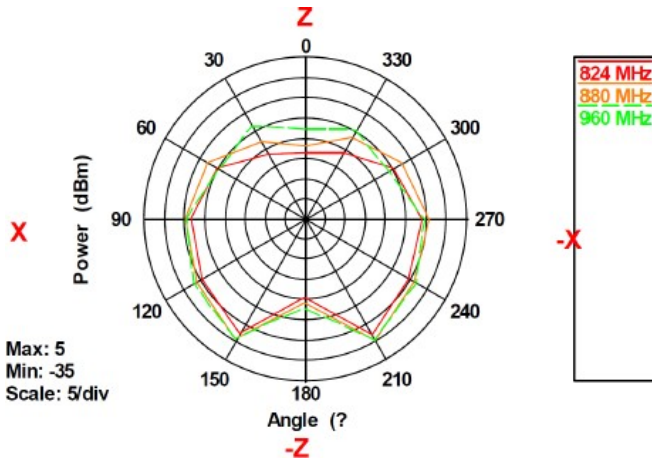
#### Return Loss S11





Frequency(MHz) : 824~960. Pattern Field : X-Z plane

Frequency(MHz) : 824~960. Pattern Field : Y-Z plane

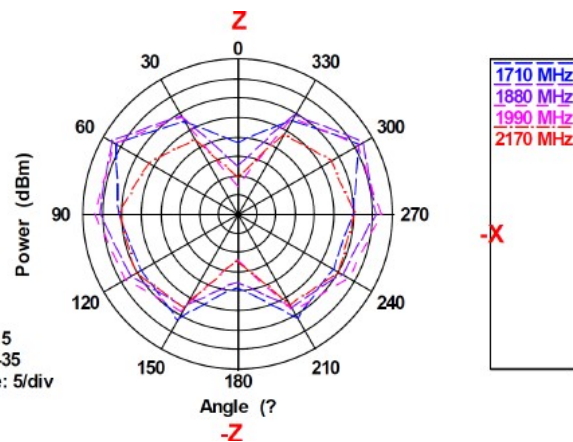
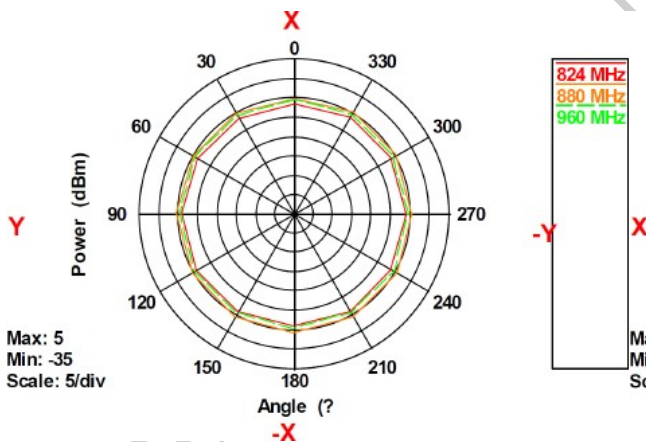


Frequency	Max value	Min value	Average
824(MHz)	-2.29 dB	-18.85 dB	-7.31 dB
880(MHz)	-0.73 dB	-17.10 dB	-5.59 dB
960(MHz)	-0.65 dB	-13.27 dB	-5.52 dB

Frequency	Max value	Min value	Average
824(MHz)	-2.27 dB	-18.85 dB	-7.29 dB
880(MHz)	-0.78 dB	-17.10 dB	-5.57 dB
960(MHz)	-0.66 dB	-13.27 dB	-5.51 dB

Frequency (MHz) : 824~960. Pattern Field : Y-X plane

Frequency (MHz) : 1710~2170. Pattern Field : X-Z plane

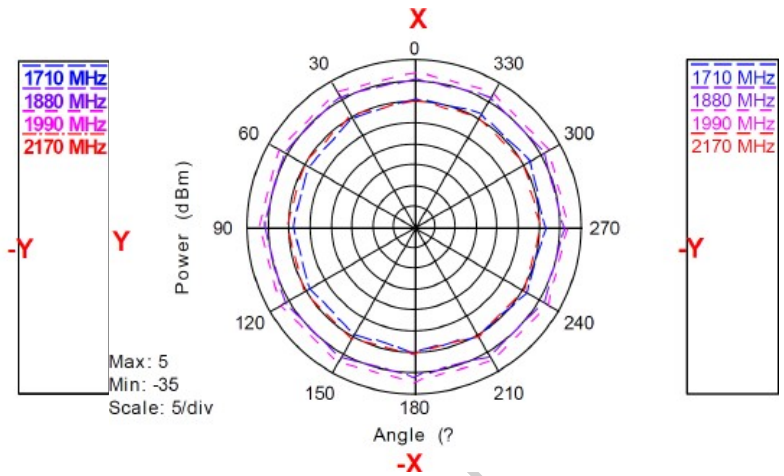
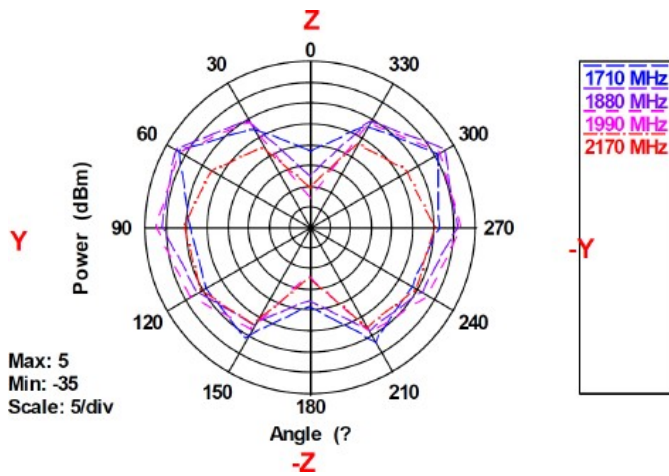


Frequency	Max value	Min value	Average
824(MHz)	-6.15 dB	-7.09 dB	-6.48 dB
880(MHz)	-4.59 dB	-5.46 dB	-4.93 dB
960(MHz)	-5.45 dB	-6.01 dB	-5.71 dB

Frequency	Max value	Min value	Average
1710(MHz)	0.82 dB	-17.00 dB	-4.42 dB
1880(MHz)	2.25 dB	-22.99 dB	-2.49 dB
1990(MHz)	1.93 dB	-28.26 dB	-2.27 dB
2170(MHz)	-4.89 dB	-25.83 dB	-8.01 dB

Frequency (MHz) : 1710~2170. Pattern Field : Y-Z plane

Frequency (MHz) : 1710~2170. Pattern Field : Y-X plane



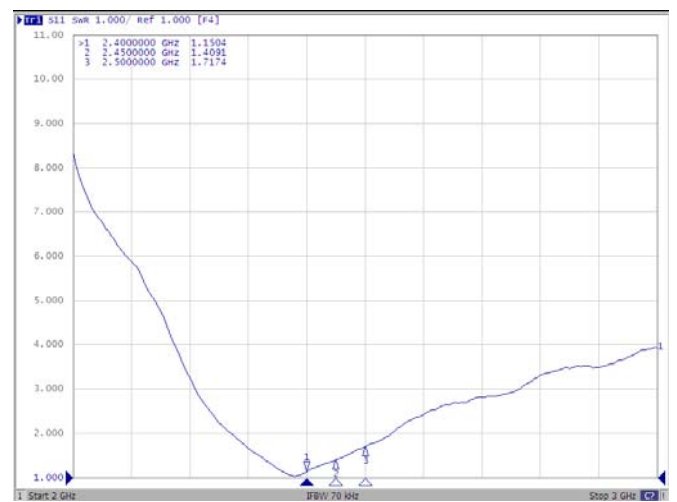
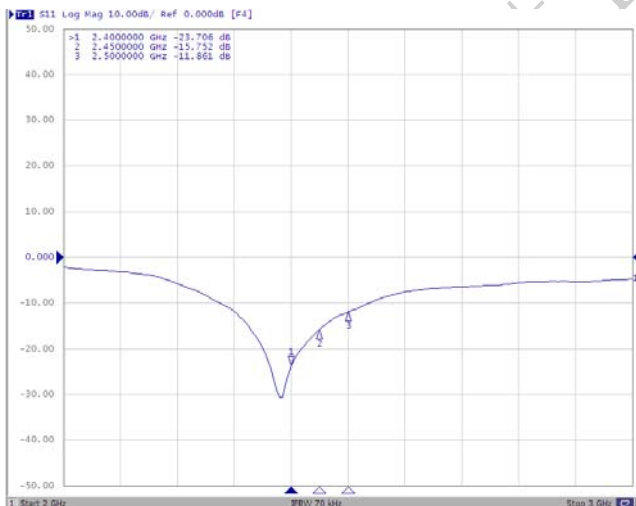
Frequency	Max value	Min value	Average
1710(MHz)	1.39 dB	-17.00 dB	-4.31 dB
1880(MHz)	2.34 dB	-22.99 dB	-2.42 dB
1990(MHz)	1.76 dB	-28.26 dB	-2.31 dB
2170(MHz)	-4.76 dB	-25.83 dB	-8.05 dB

Frequency	Max value	Min value	Average
1710(MHz)	-3.50 dB	-6.20 dB	-4.87 dB
1880(MHz)	0.73 dB	0.38 dB	0.57 dB
1990(MHz)	1.93 dB	1.73 dB	1.83 dB
2170(MHz)	-4.70 dB	-5.03 dB	-4.86 dB

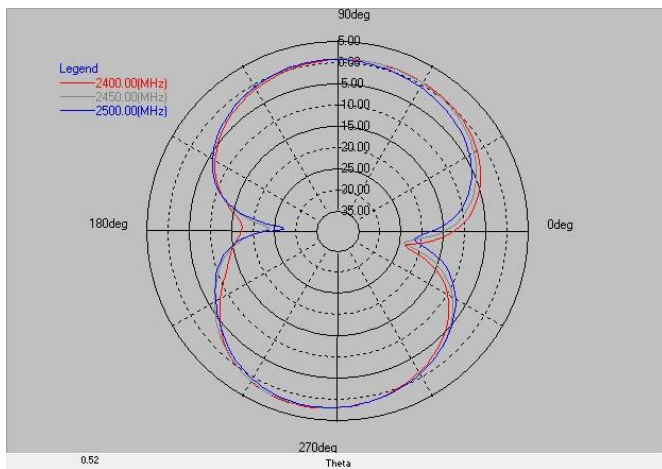
### BTEA0087092G4R2B02

Return Loss

VSWR

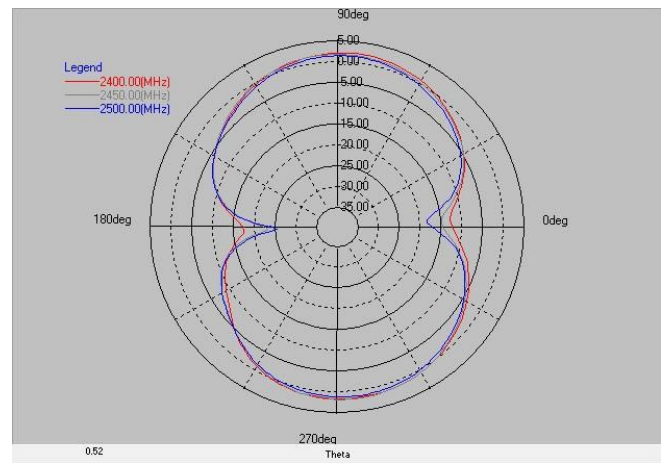


Pattern Field : Z-X plane, Phi=0.00deg



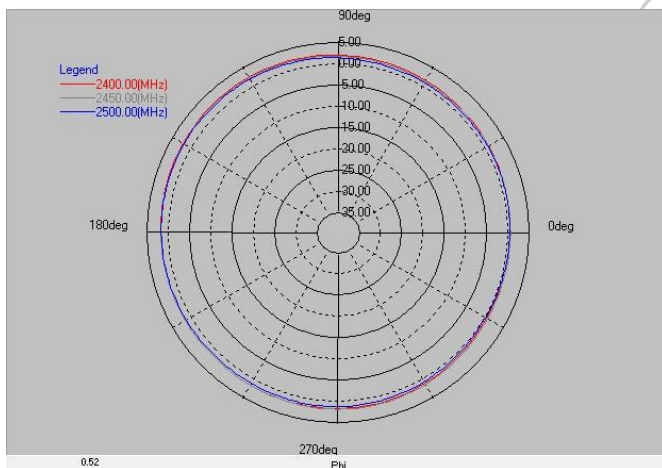
Layer	Max value	Min value	Average
2400(MHz)	2.15	-23.78	-1.96
2450(MHz)	2.04	-24.00	-1.90
2500(MHz)	1.89	-27.29	-2.22

Pattern Field : Z-Y plane, Phi=90.00deg



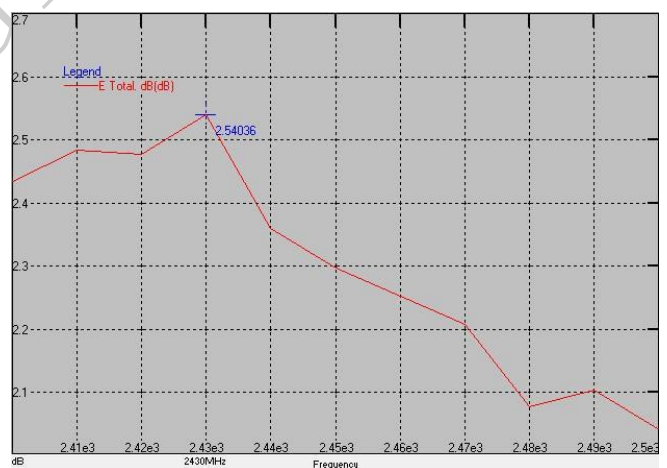
Layer	Max value	Min value	Average
2400(MHz)	1.94	-17.61	-1.74
2450(MHz)	1.73	-23.26	-1.88
2500(MHz)	1.23	-25.61	-2.37

Pattern Field : X-Y plane, Theta=90.00deg



Layer	Max value	Min value	Average
2400(MHz)	2.28	0.36	1.46
2450(MHz)	2.04	0.62	1.42
2500(MHz)	1.91	0.21	1.11

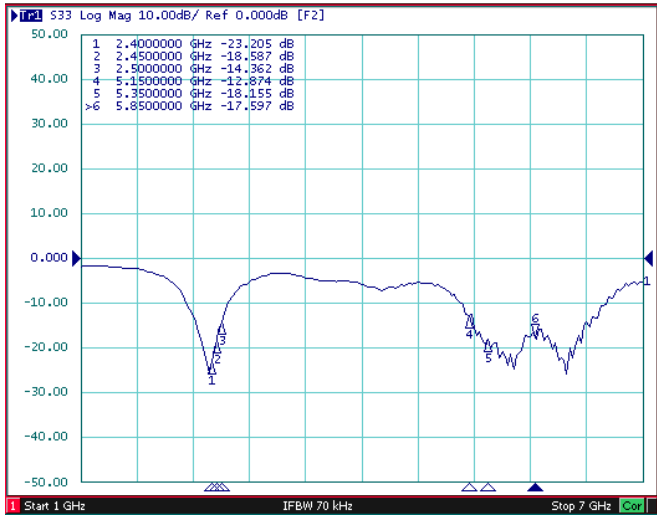
Peak Gain



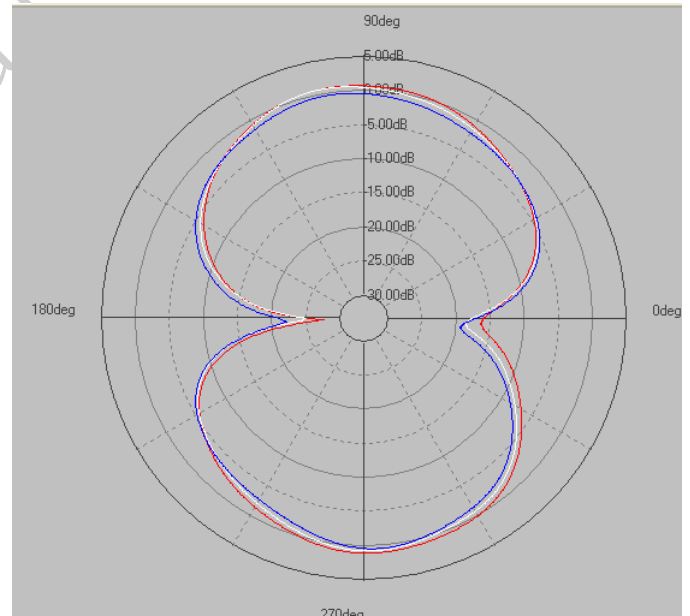
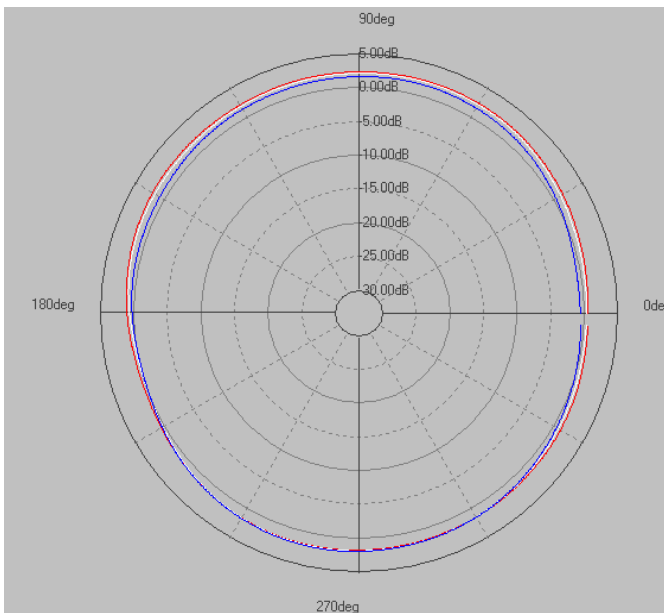
Peak Gain : Max 2.54 dBi

**BTEA00870925GR2A07**

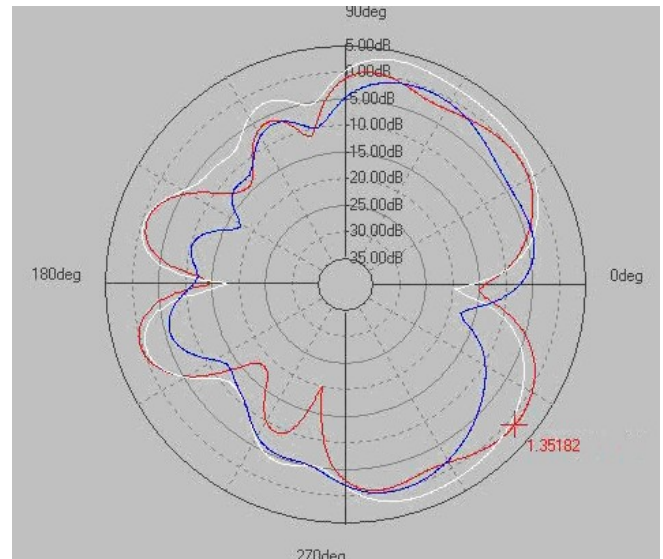
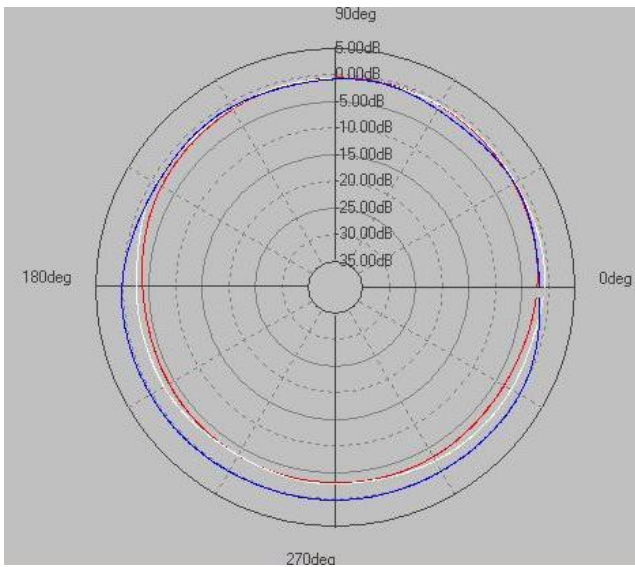
Return Loss S33



Frequency(MHz) : 2400~2500. Pattern Field : H plane      Frequency(MHz) : 2400~2500. Pattern Field : E plane



Frequency(MHz) : 5150-5850. Pattern Field : H plane      Frequency(MHz) : 5150-5850. Pattern Field : E plane

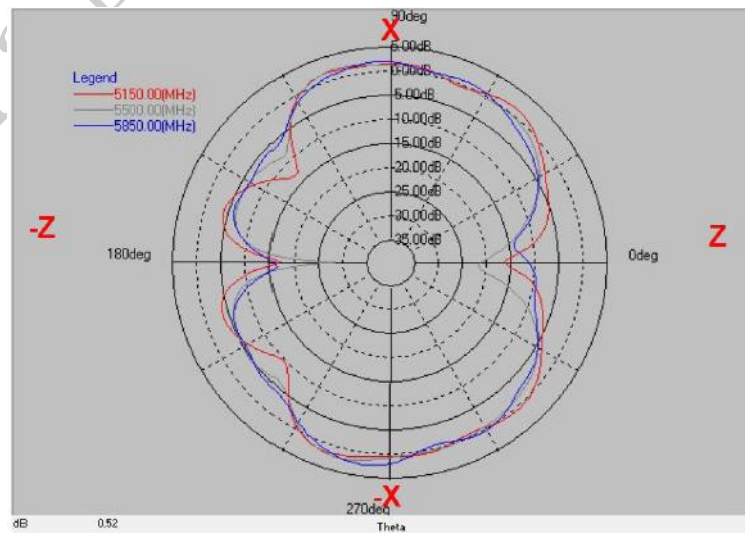


**BTEA0087095G0R2A03**

Return Loss S11



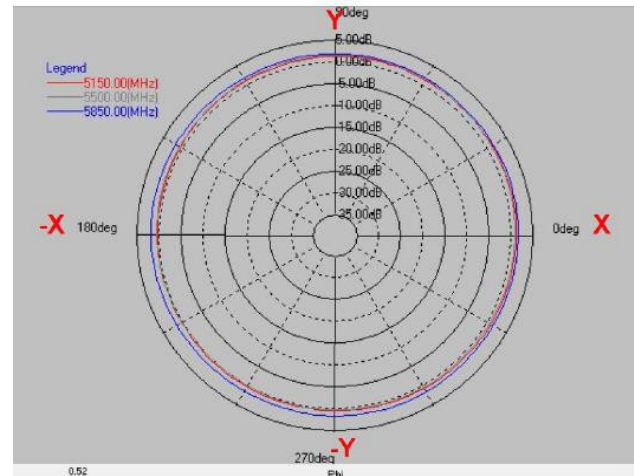
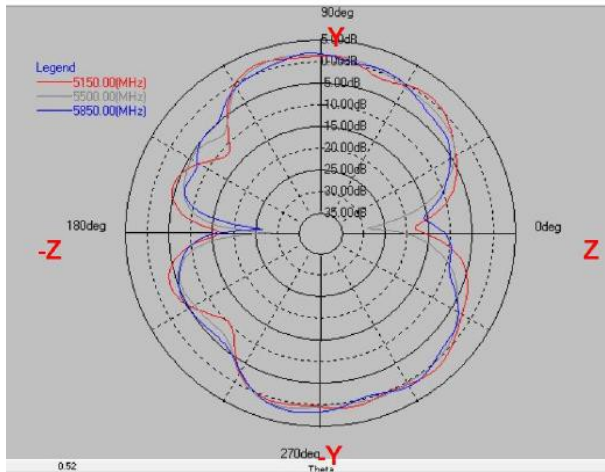
Frequency(MHz) : 5150~5850. Pattern Field : Z-X plane



Layer	Max value	Min value	Average
5150(MHz)	1.52 dB	-17.32 dB	-1.78 dB
5550(MHz)	2.01 dB	-28.64 dB	-2.18 dB
5850(MHz)	2.36 dB	-16.51 dB	-2.06 dB

Frequency(MHz) : 5150~5850. PatternField : Z-Y plane

Frequency (MHz) : 5150~5850. Pattern Field : X-Y plane



Layer	Max value	Min value	Average
5150(MHz)	1.79 dB	-18.10 dB	-1.89 dB
5550(MHz)	1.71 dB	-29.01 dB	-2.17 dB
5850(MHz)	1.86 dB	-26.43 dB	-2.14 dB

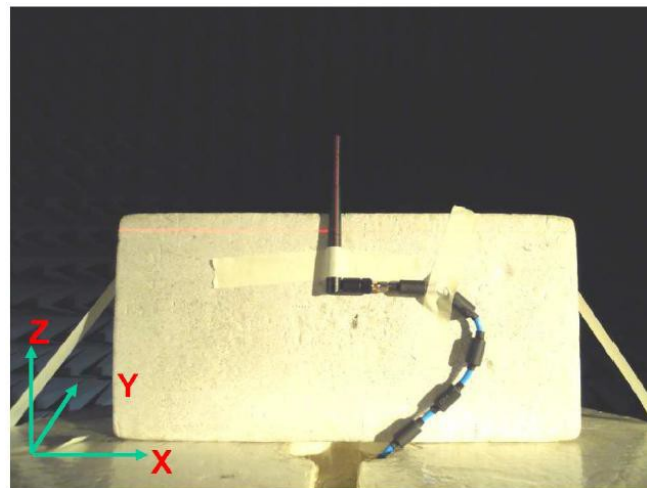
Layer	Max value	Min value	Average
5150(MHz)	1.44 dB	0.15 dB	0.77 dB
5550(MHz)	1.46 dB	-0.10 dB	0.73 dB
5850(MHz)	1.87 dB	1.29 dB	1.61 dB

### BTEA00151325GR2A07

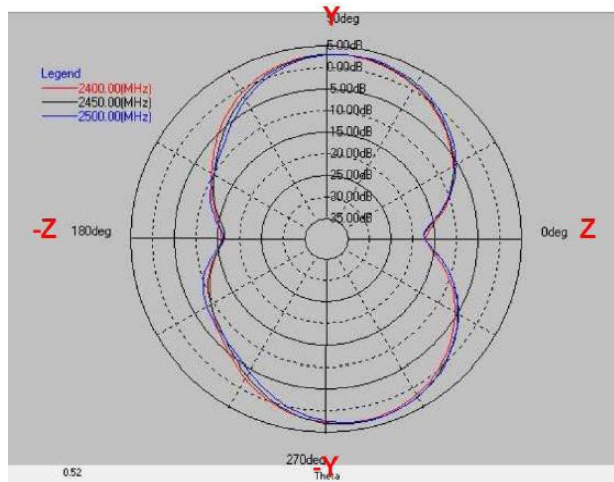
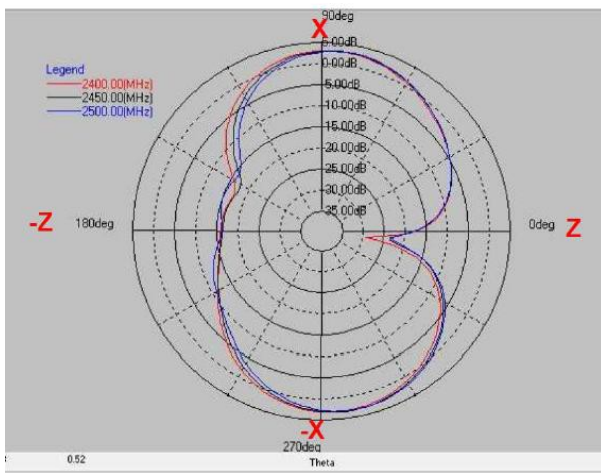
#### Return Loss



#### Experimental Setup



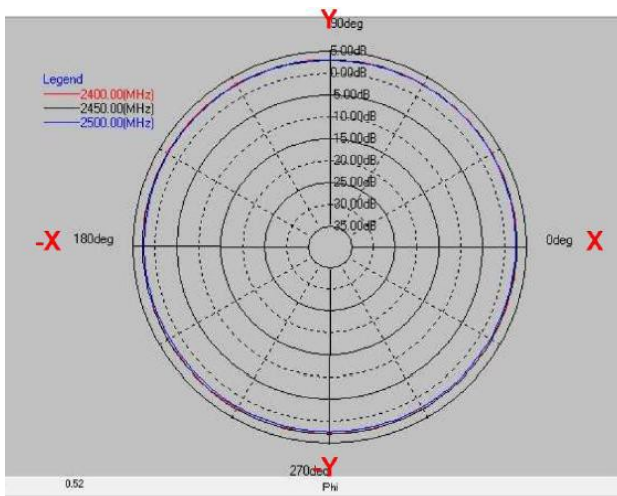
Frequency(MHz) : 2400~2500. Pattern Field : X-Z plane



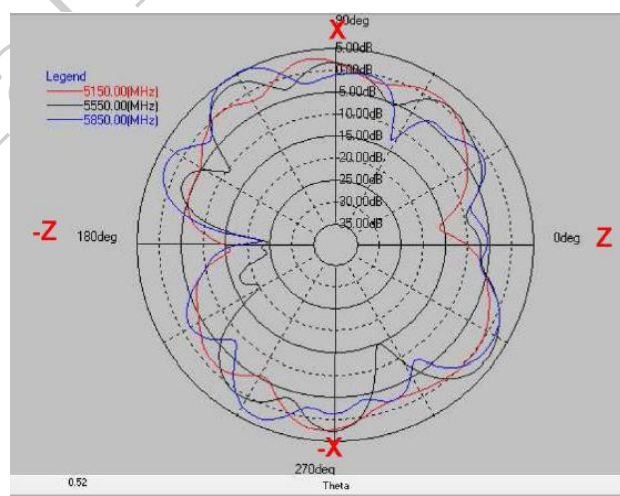
Layer	Max value	Average
2400(MHz)	2.96 dB	-1.69 dB
2450(MHz)	3.14 dB	-1.70 dB
2500(MHz)	3.05 dB	-1.84 dB

Layer	Max value	Average
2400(MHz)	3.03 dB	-1.49 dB
2450(MHz)	3.10 dB	-1.45 dB
2500(MHz)	3.09 dB	-1.54 dB

Frequency(MHz) : 2400~2500. Pattern Field : X-Y plane



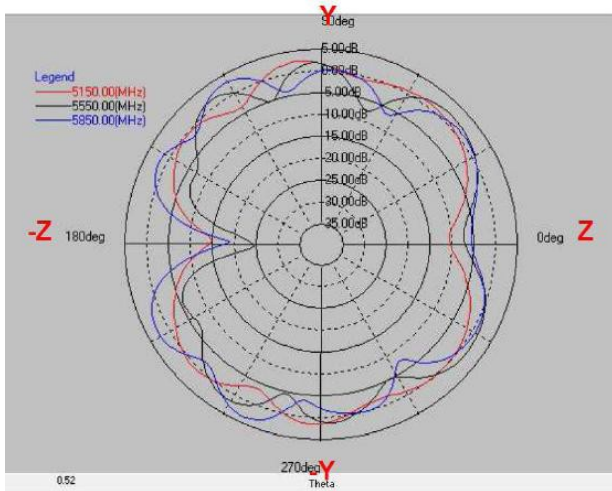
Frequency(MHz) : 5150~5850. Pattern Field : X-Z plane



Layer	Max value	Average
2400(MHz)	2.96 dB	2.81 dB
2450(MHz)	2.91 dB	2.81 dB
2500(MHz)	2.80 dB	2.53 dB

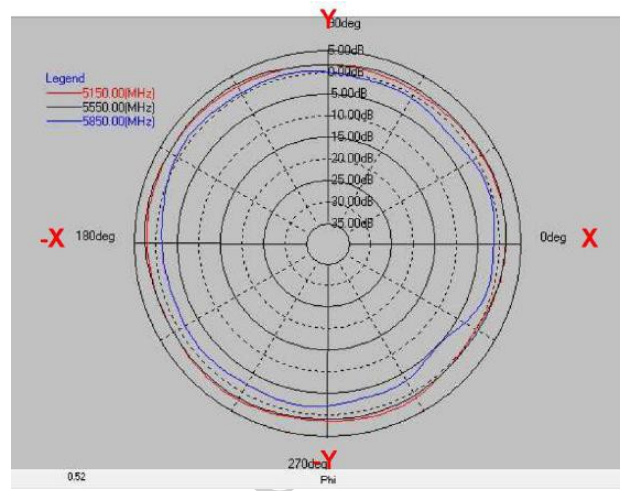
Layer	Max value	Average
5150(MHz)	2.72 dB	-1.71 dB
5550(MHz)	3.45 dB	-1.53 dB
5850(MHz)	5.63 dB	-1.05 dB

Frequency(MHz) : 5150~5850. Pattern Field : Y-Z plane



Layer	Max value	Average
5150(MHz)	2.36 dB	-1.38 dB
5550(MHz)	2.03 dB	-1.48 dB
5850(MHz)	3.44 dB	-0.63 dB

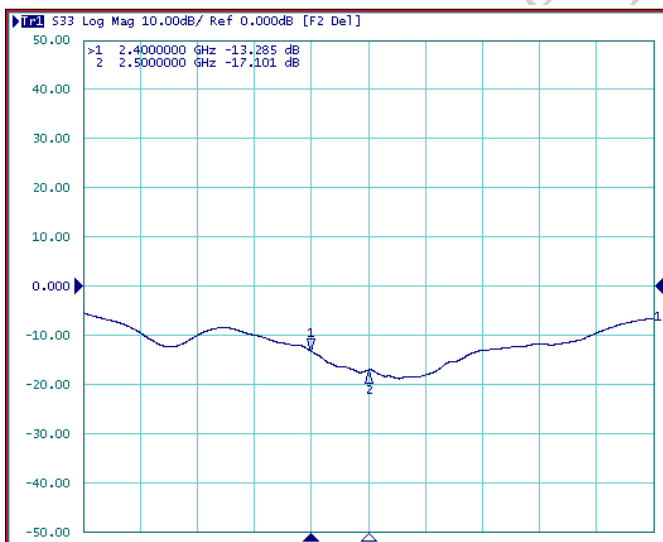
Frequency(MHz) : 5150~5850. Pattern Field : X-Y plane



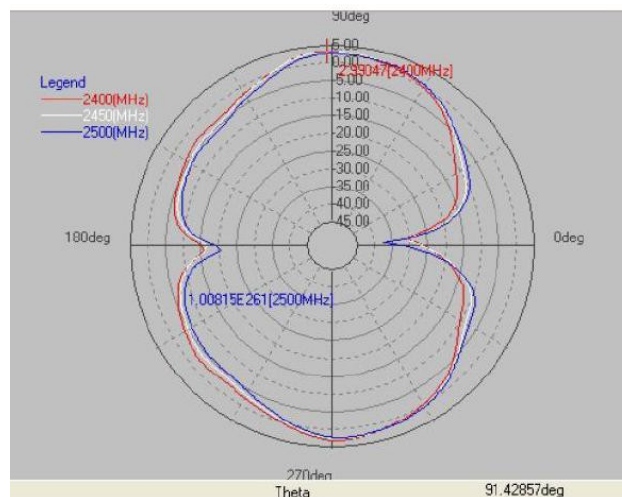
Layer	Max value	Average
5150(MHz)	2.52 dB	1.54 dB
5550(MHz)	2.82 dB	1.63 dB
5850(MHz)	0.83 dB	-1.21 dB

### BTEA0015132G4R2A08

Return Loss S33



Frequency(MHz) : 2400~2500. Pattern Field : X-Z plane

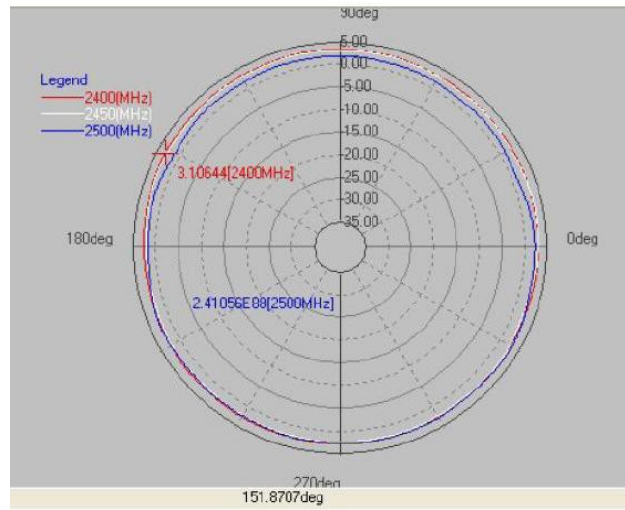
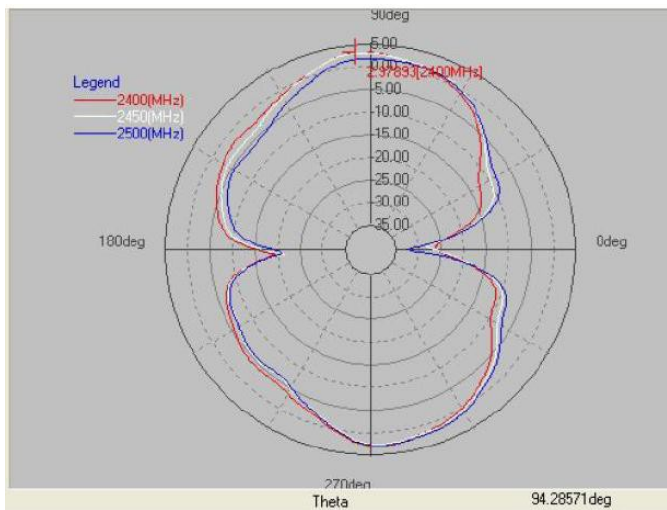


Layer	Max value	Average
2400(MHz)	2.99 dB	-2.07 dB
2450(MHz)	2.93 dB	-2.15 dB
2500(MHz)	2.30 dB	-2.51 dB



Frequency(MHz) : 2400~2500. Pattern Field : Y-Z plane

Frequency(MHz) : 2400~2500. Pattern Field : X-Y plane



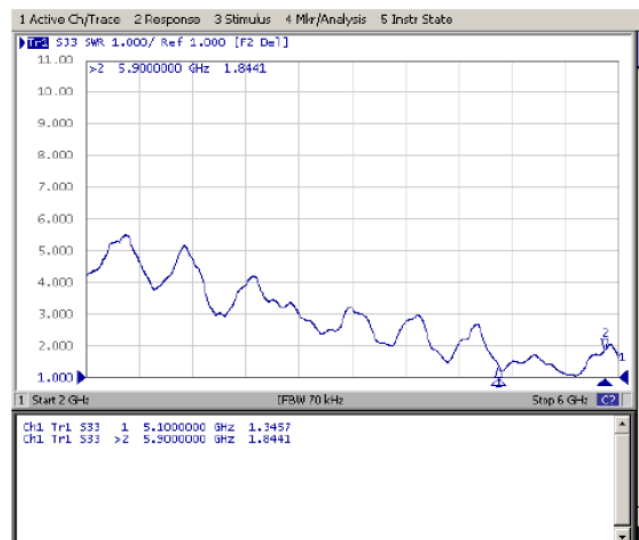
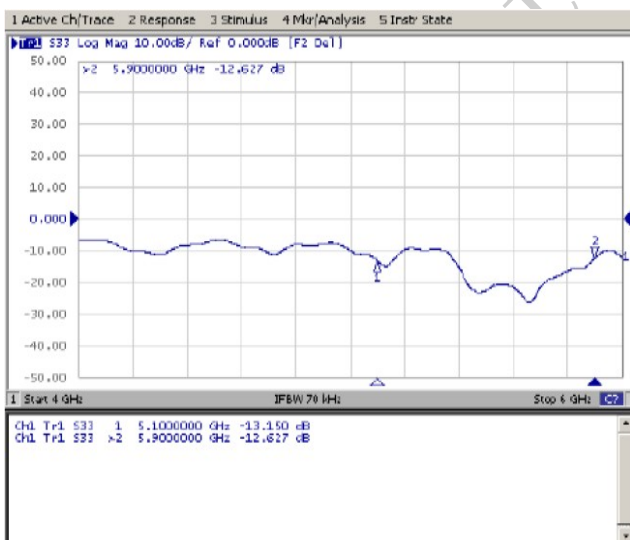
Layer	Max value	Average
2400(MHz)	2.98 dB	-2.08 dB
2450(MHz)	2.86 dB	-2.19 dB
2500(MHz)	2.77 dB	-2.50 dB

Layer	Max value	Average
2400(MHz)	3.11 dB	2.79 dB
2450(MHz)	3.15 dB	2.54 dB
2500(MHz)	3.17 dB	2.06 dB

### BTEA0015135G0R2A01

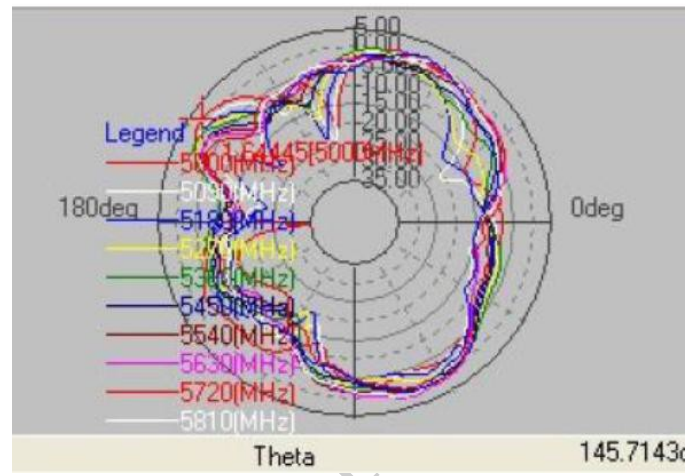
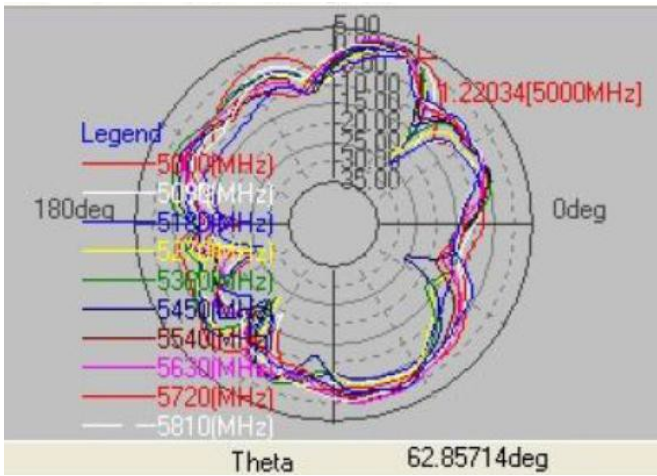
Return Loss S33

VSWR



Frequency(MHz) : 5000~5900. Pattern Field : X-Z plane

Frequency(MHz) : 5000~5900. Pattern Field : Y-Z plane

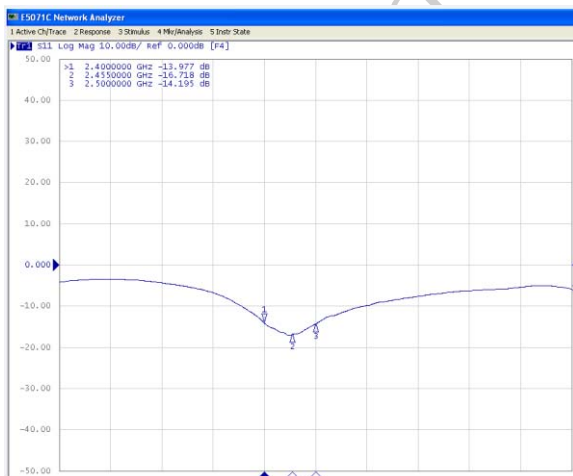


Layer	Max value	Average
5000(MHz)	1.22 dB	-4.52 dB
5090(MHz)	1.08 dB	-5.81 dB
5180(MHz)	0.11 dB	-6.54 dB
5270(MHz)	1.34 dB	-5.93 dB
5360(MHz)	2.54 dB	-4.58 dB
5450(MHz)	1.62 dB	-5.76 dB
5540(MHz)	2.56 dB	-4.93 dB
5630(MHz)	2.45 dB	-4.49 dB
5720(MHz)	0.74 dB	-5.92 dB
5810(MHz)	0.73 dB	-5.11 dB
5900(MHz)	0.55 dB	-6.18 dB

Layer	Max value	Average
5000(MHz)	1.64dB	-4.60 dB
5090(MHz)	0.16 dB	-6.00 dB
5180(MHz)	-0.22 dB	-6.52 dB
5270(MHz)	-0.47 dB	-6.00 dB
5360(MHz)	0.36 dB	-4.84 dB
5450(MHz)	0.43 dB	-5.51 dB
5540(MHz)	0.77 dB	-4.84 dB
5630(MHz)	1.71 dB	-4.24 dB
5720(MHz)	-0.36 dB	-5.59 dB
5810(MHz)	1.26 dB	-4.95 dB
5900(MHz)	0.55 dB	-5.85 dB

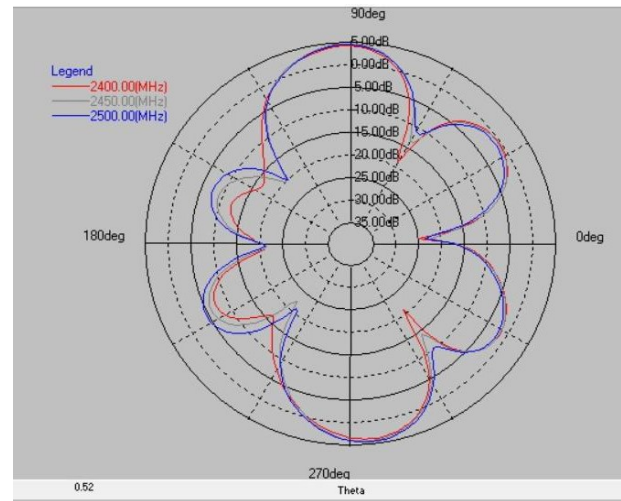
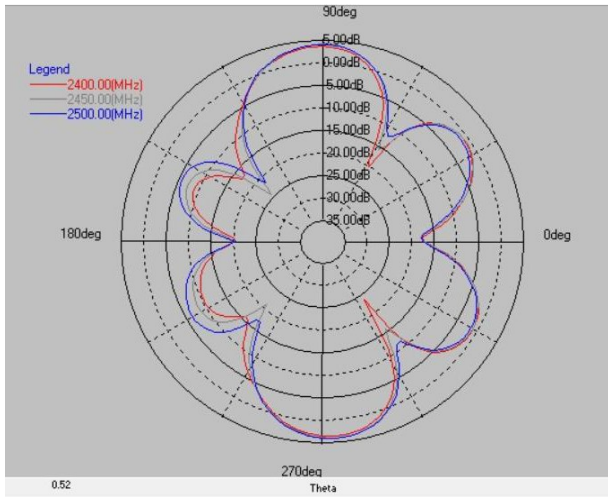
### BTEA0017132G4R2A31

Return Loss S11



Frequency(MHz) : 2400~2500. PatternField : Z-Xplane

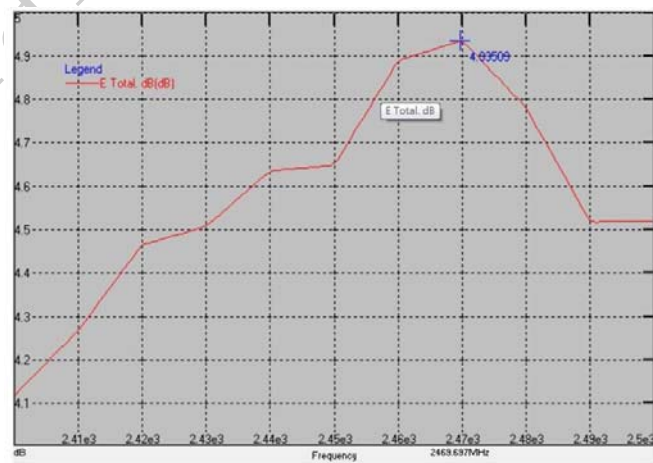
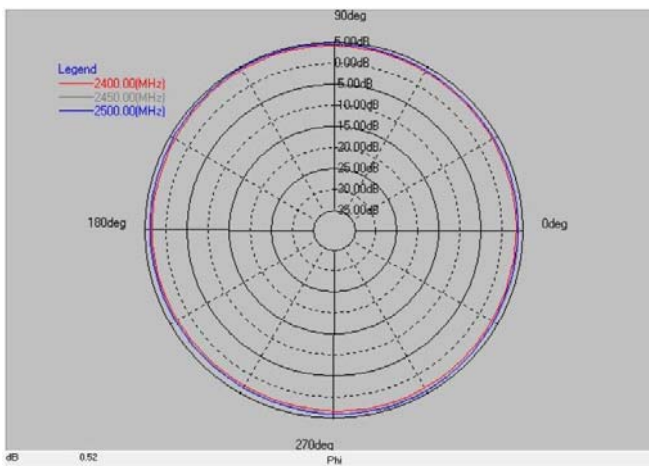
Frequency(MHz) : 2400~2500. Pattern Field : Z-Yplane



Layer	Max value	Position	Min value
2400(MHz)	3.46 dB	-86.00 deg	-23.93 dB
2450(MHz)	3.96 dB	90.00 deg	-24.55 dB
2500(MHz)	3.95 dB	-86.00 deg	-21.86 dB

Layer	Max value	Position	Min value
2400(MHz)	4.00 dB	92.00 deg	-24.97 dB
2450(MHz)	4.46 dB	92.00 deg	-22.51 dB
2500(MHz)	4.35 dB	92.00 deg	-23.53 dB

Frequency(MHz) : 2400~2500. PatternField : X-Y plane Peak Gain

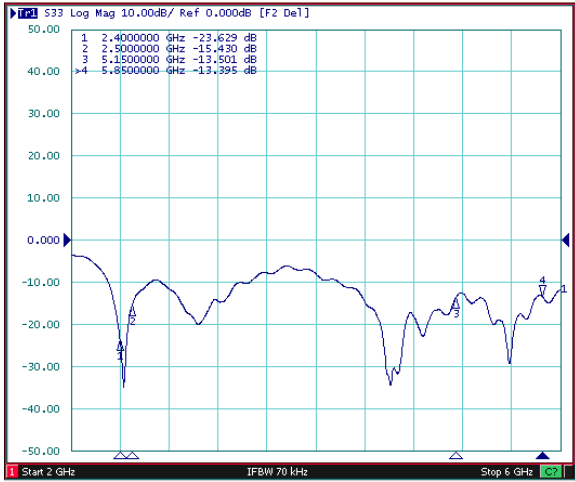


Layer	Max value	Position	Min value
2400(MHz)	4.12 dB	108.00 deg	2.80 dB
2450(MHz)	4.65 dB	112.00 deg	3.21 dB
2500(MHz)	4.52 dB	110.00 deg	3.29 dB

peak Gain : Max 4.93 dBi

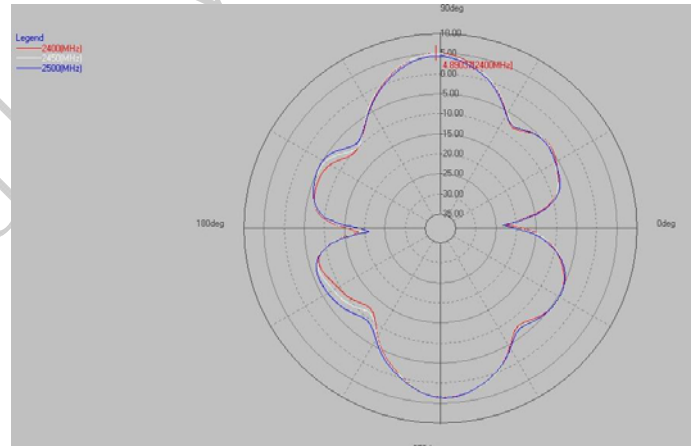
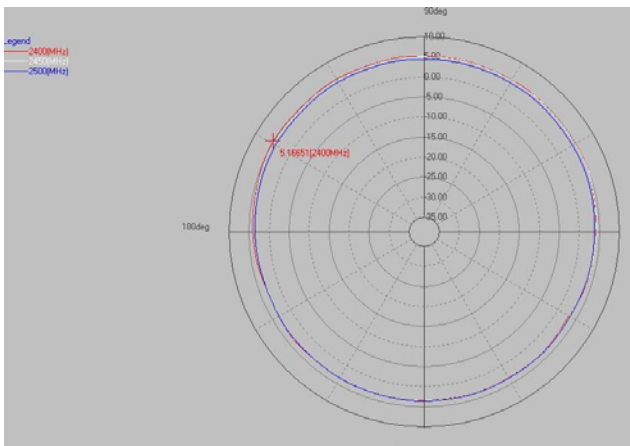
**BTEA00171325GR2A05**

**Return Loss S33**

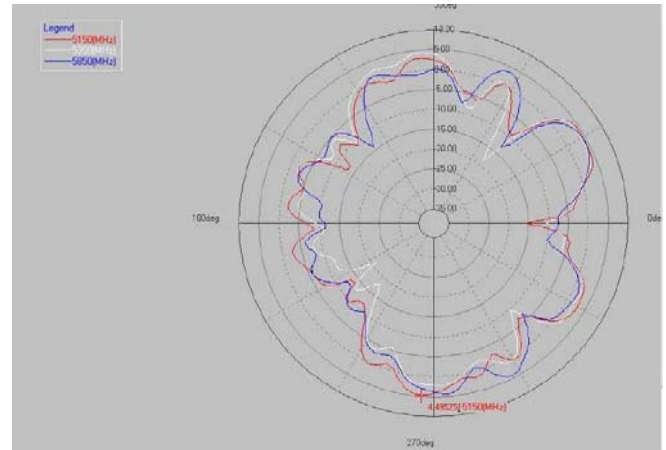
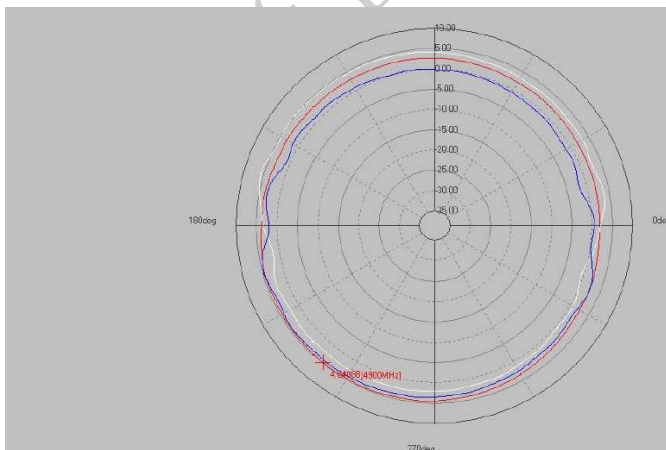


of PSG

**Frequency(MHz) : 2400~2500. Pattern Field : H plane      Frequency(MHz) : 2400~2500. Pattern Field : E plane**

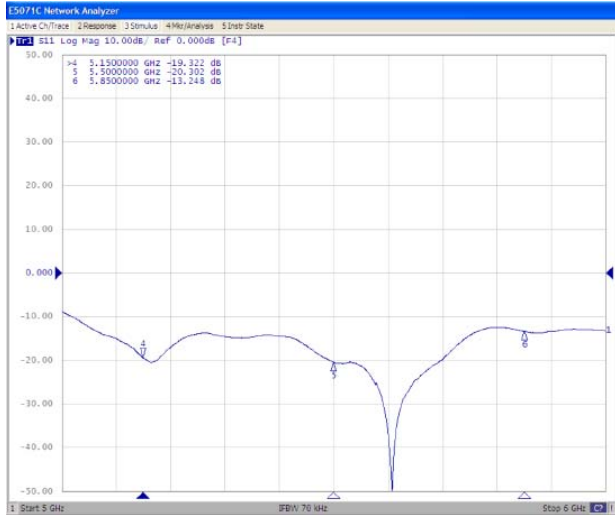


**Frequency(MHz) : 5150-5850. Pattern Field : H plane      Frequency(MHz) : 5150-5850. Pattern Field : H plane**



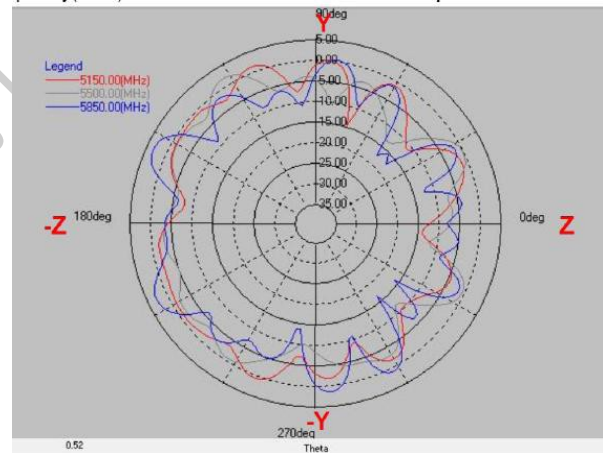
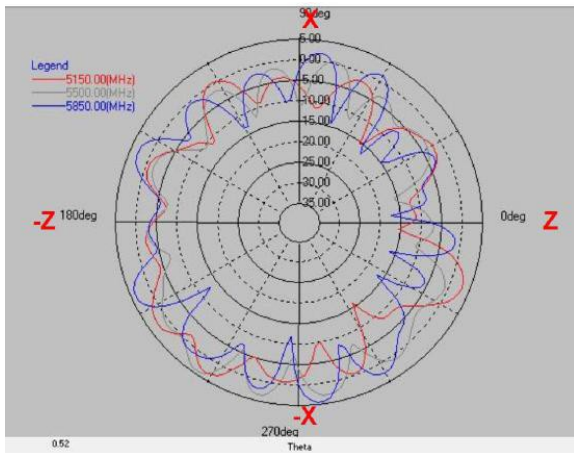
**BTEA0017135G0R2A07**

Return Loss S11



Frequency(MHz) : 5150~5850. PatternField : Z-Xplane

Frequency(MHz) : 2400~2500. Pattern Field : Z-Yplane

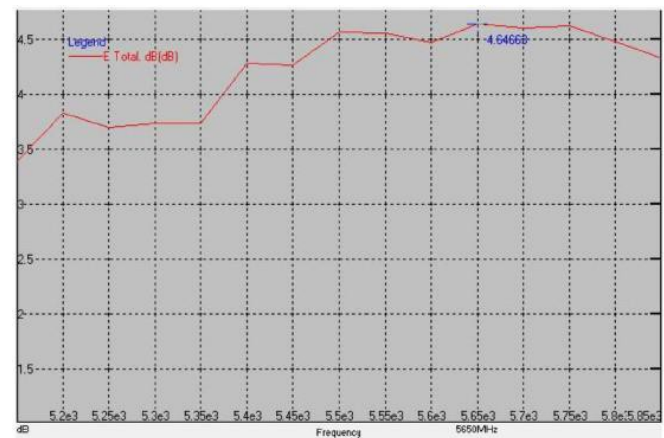
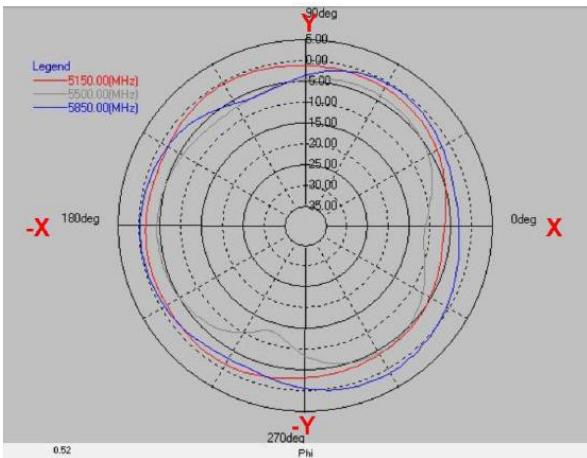


Layer	Max value	Min value	Average
5150(MHz)	3.34 dB	-16.23 dB	-2.61 dB
5500(MHz)	4.16 dB	-15.79 dB	-2.21 dB
5850(MHz)	4.32 dB	-17.42 dB	-1.71 dB

Layer	Max value	Min value	Average
5150(MHz)	1.29 dB	-14.92 dB	-3.08 dB
5500(MHz)	1.91 dB	-13.64 dB	-3.70 dB
5850(MHz)	3.34 dB	-17.69 dB	-3.01 dB

Frequency(MHz) : 2400~2500. PatternField : X-Y plane

Peak Gain

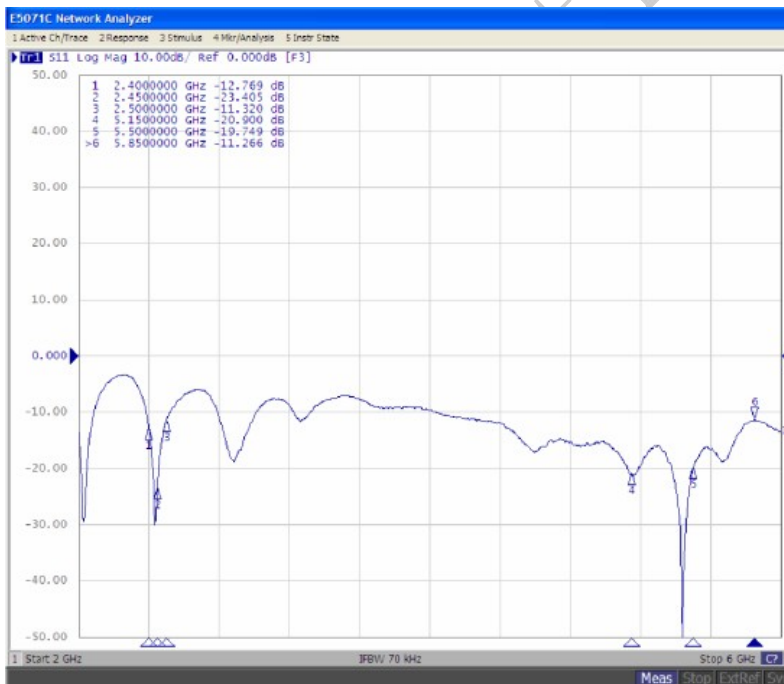


Peak Gain : Max 4.64 dBi

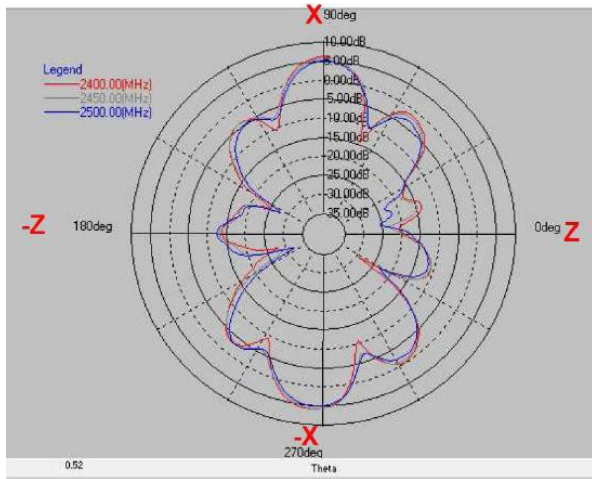
Layer	Max value	Min value	Average
5150(MHz)	-0.60 dB	-6.57 dB	-2.41 dB
5500(MHz)	-3.85 dB	-13.30 dB	-6.05 dB
5850(MHz)	-0.98 dB	-6.75 dB	-1.47 dB

### BTEA00271325GR2A03

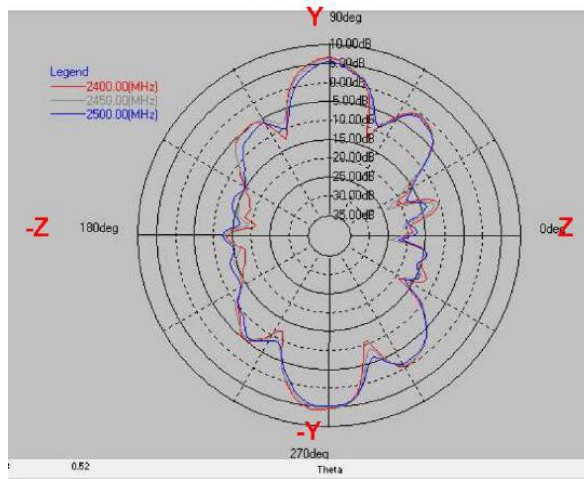
Return Loss S11



Frequency(MHz) : 2400~2500. PatternField : X-Z plane



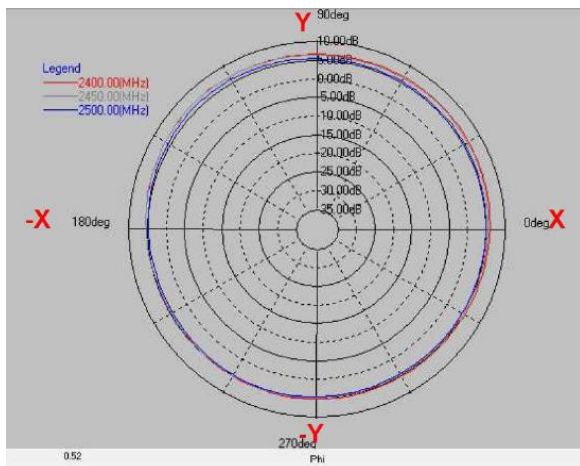
Frequency(MHz) : 2400~2500. Pattern Field : Y-Z plane



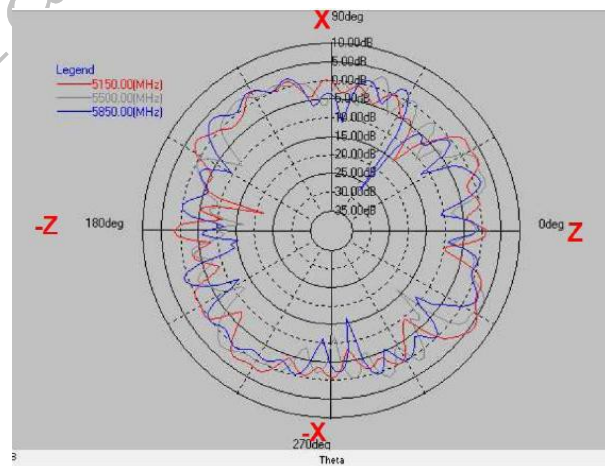
Layer	Max value	Min value	Average
2400(MHz)	6.00 dB	-29.73 dB	-2.29 dB
2450(MHz)	5.65 dB	-29.37 dB	-2.39 dB
2500(MHz)	4.97 dB	-32.12 dB	-3.07 dB

Layer	Max value	Min value	Average
2400(MHz)	6.34 dB	-21.38 dB	-2.36 dB
2450(MHz)	6.10 dB	-24.27 dB	-2.51 dB
2500(MHz)	5.19 dB	-22.16 dB	-3.04 dB

Frequency(MHz) : 2400~2500. PatternField : X-Y plane



Frequency(MHz) : 5150~5850. Pattern Field : X-Z plane

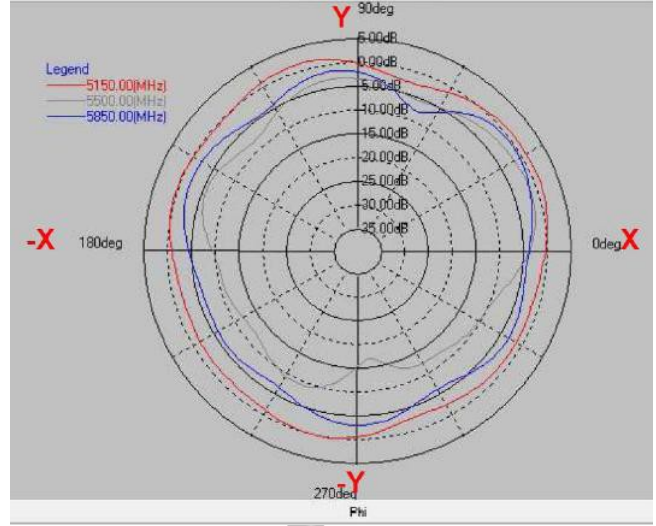
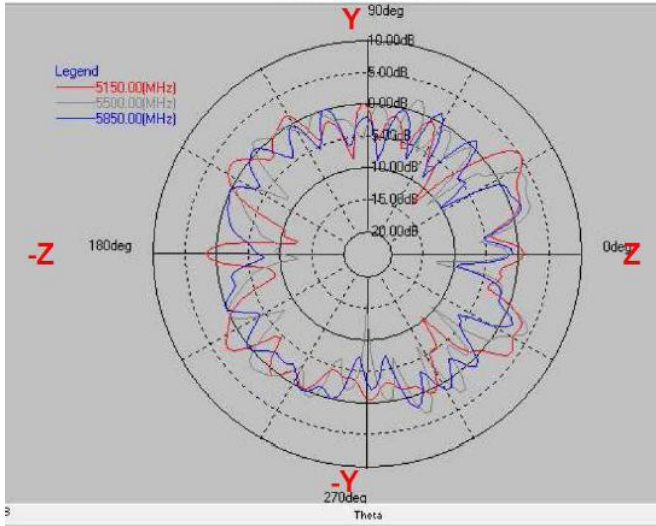


Layer	Max value	Min value	Average
2400(MHz)	6.71 dB	4.62 dB	5.79 dB
2450(MHz)	6.70 dB	4.43 dB	5.57 dB
2500(MHz)	5.84 dB	4.20 dB	4.92 dB

Layer	Max value	Min value	Average
5150(MHz)	5.91 dB	-21.93 dB	-0.60 dB
5500(MHz)	4.90 dB	-17.01 dB	-1.14 dB
5850(MHz)	3.15 dB	-27.21 dB	-1.72 dB

Frequency(MHz) : 5150~5850. PatternField : Y-Z plane

Frequency(MHz) : 5150~5850. PatternField : X-Y plane

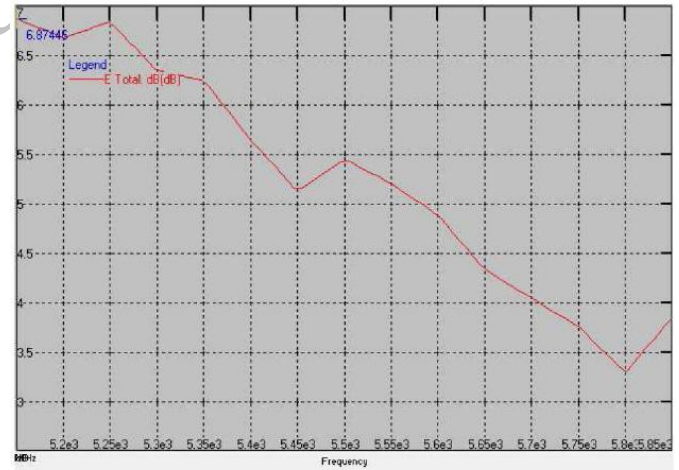
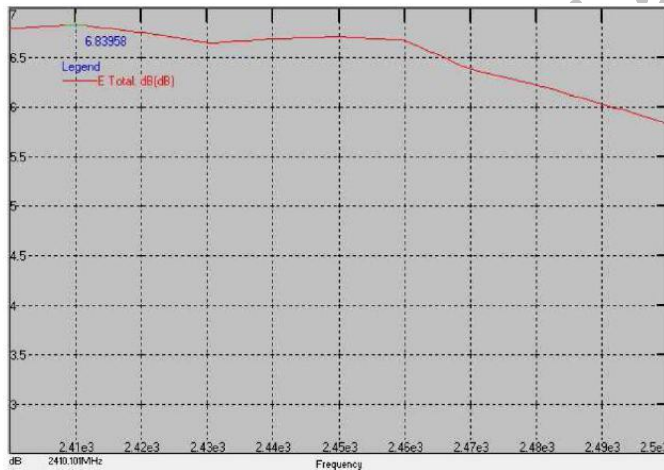


Layer	Max value	Min value	Average
5150(MHz)	5.02 dB	-13.25 dB	-0.85 dB
5500(MHz)	4.44 dB	-15.62 dB	-1.14 dB
5850(MHz)	1.87 dB	-10.07 dB	-1.75 dB

Layer	Max value	Min value	Average
5150(MHz)	1.32 dB	-2.94 dB	-0.60 dB
5500(MHz)	-1.36 dB	-17.19 dB	-6.32 dB
5850(MHz)	-0.40 dB	-7.88 dB	-3.67 dB

2.4G / Peak Gain

5G / Peak Gain



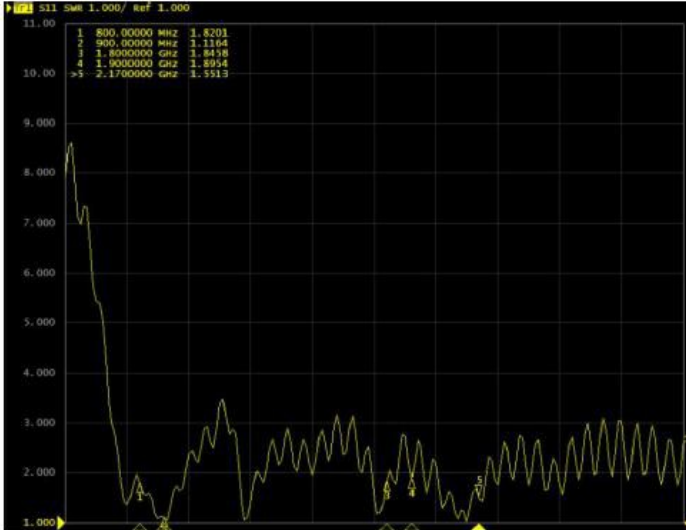
Peak Gain : Max 6.83 dBi

Peak Gain : Max 6.87 dBi



BTEA0027300G8R1A01

Return Loss S11



Confidentiality of PSG