

***Dual-Band Printed Antenna for IEEE802.11g***

***Project U59H001 Application***

***1. Electrical specification***

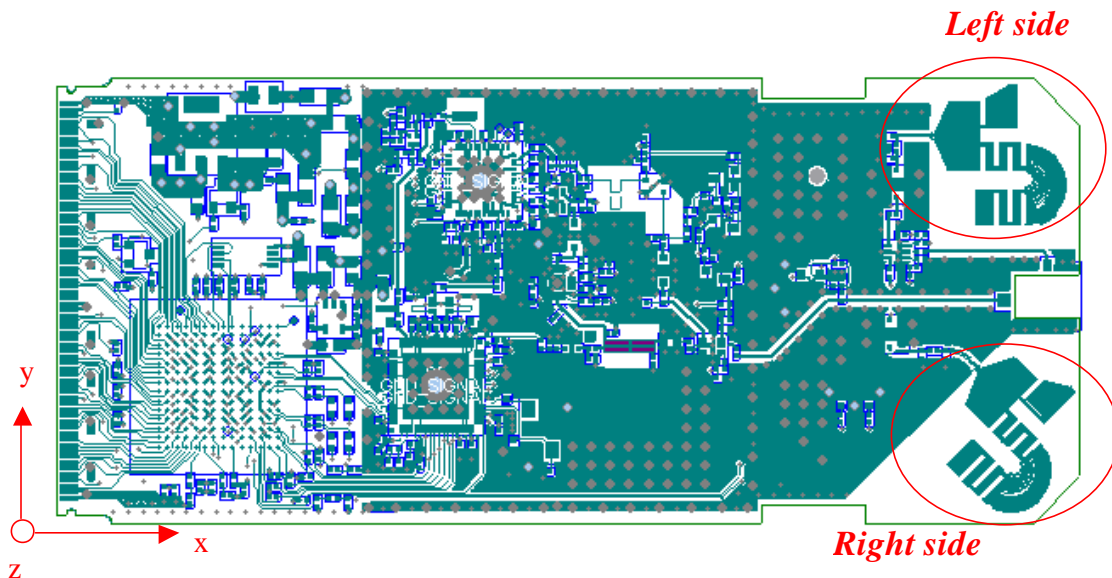
***(a) Left side***

Frequency range	2.4 GHz – 2.5 GHz
Peak Gain	0.83 dBi
VSWR	2.0 Max
Polarization	Linear
Impedance	50 ohm

***(b) Right side***

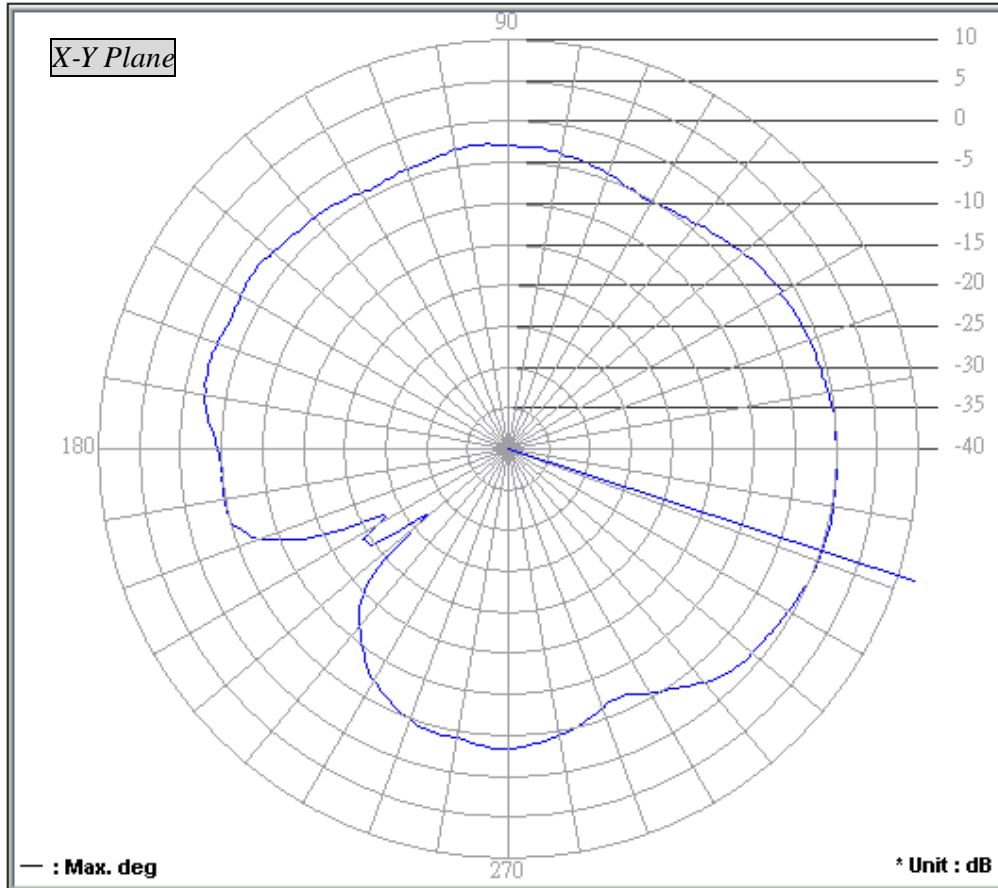
Frequency range	2.4 GHz – 2.5 GHz
Peak Gain	3.83 dBi
VSWR	2.0 Max
Polarization	Linear
Impedance	50 ohm

***2. Antenna Location***

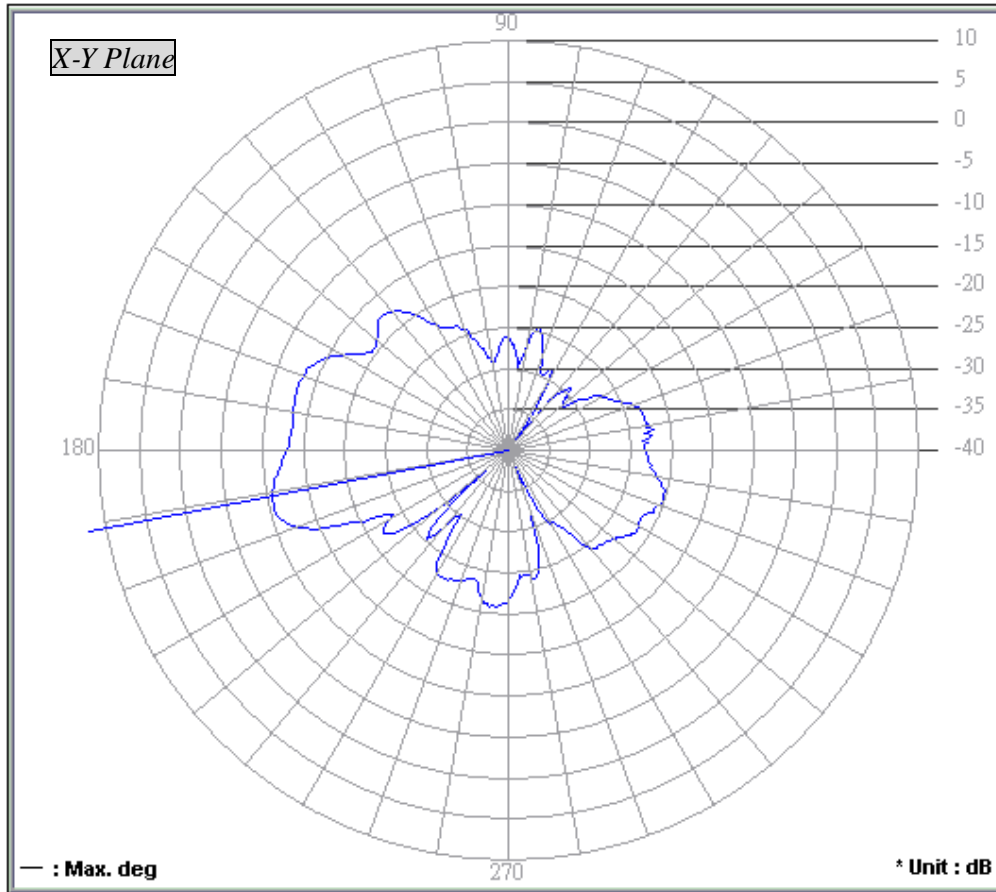


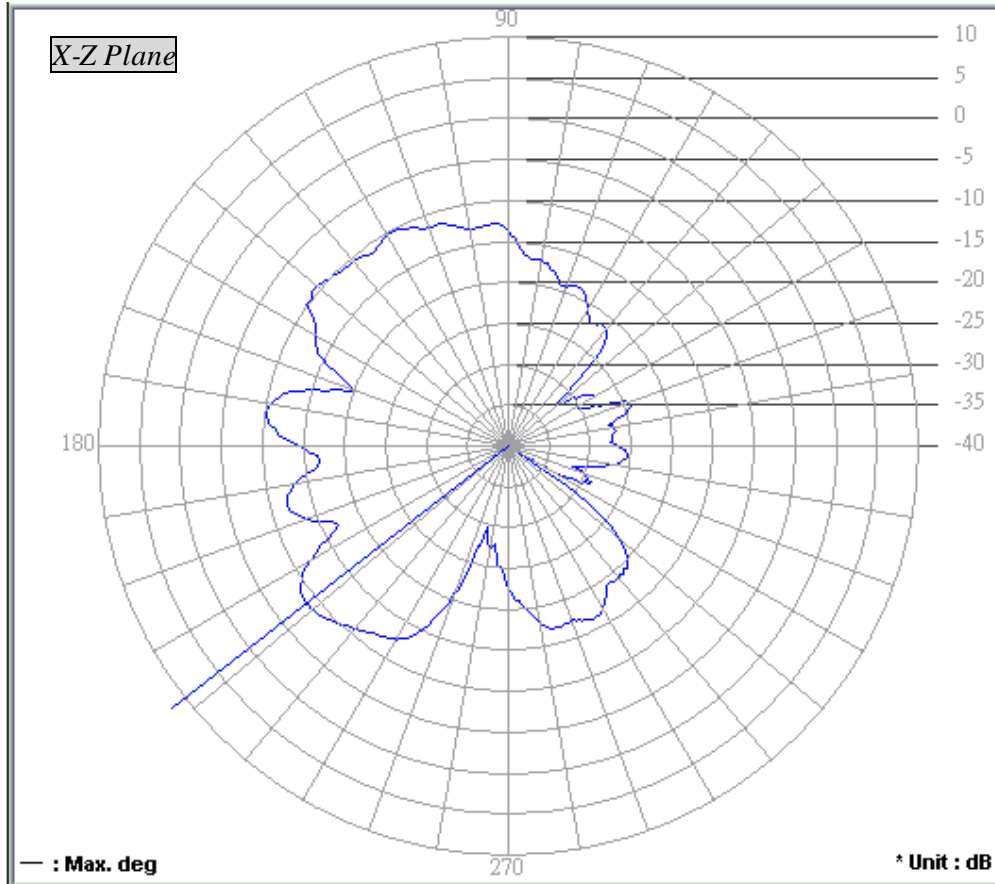
### 3. Left Side Antenna Pattern at 2.4 GHz

*Horn antenna Polarization : Horizontal*



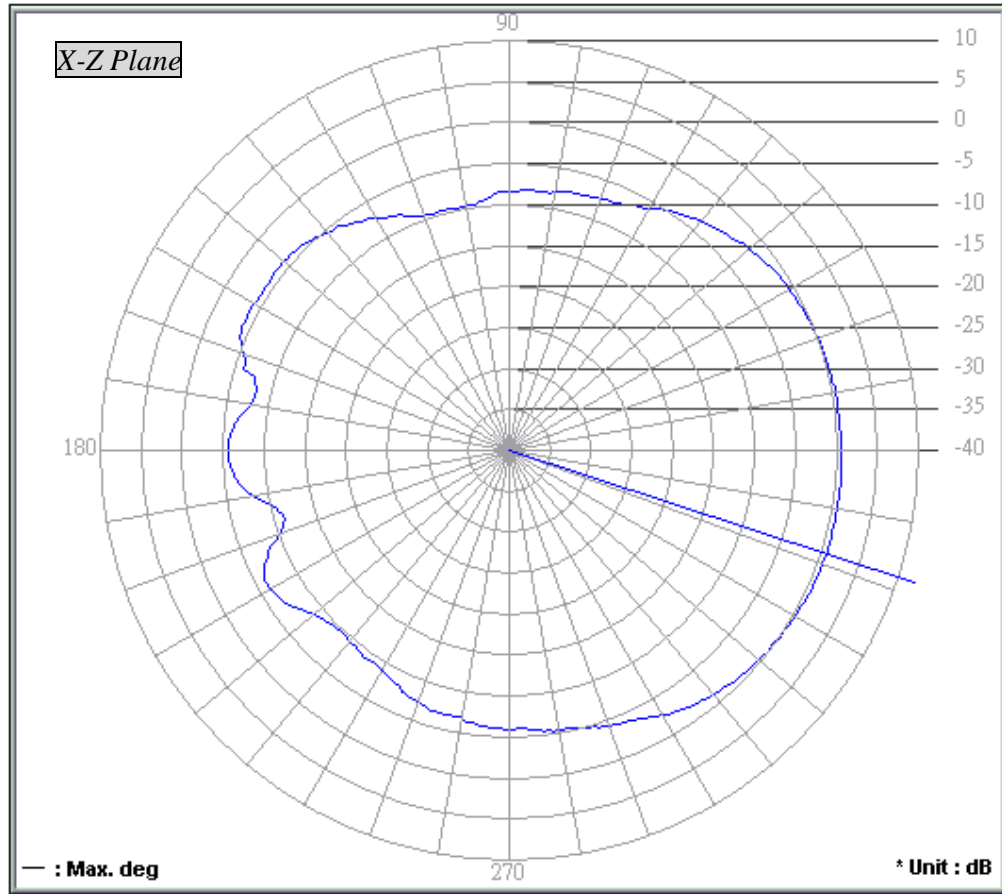
Frequency (MHz):	<b>2400.00</b>	Antenna Polarity:	<b>Horizontal</b>	Average Gain (dB):	<b>-3.10</b>
Maximum Gain (dB):	<b>0.33</b>	Maximum Gain (degree):	<b>342</b>		
Minimum Gain (dB):	<b>-27.33</b>	Minimum Gain (degree):	<b>219</b>		

***Horn antenna Polarization : Vertical***Frequency (MHz): **2400.00**Antenna Polarity : **Vertical**Average Gain (dB) : **-19.23**Maximum Gain (dB) : **-10.67**Maximum Gain (degree) : **191**Minimum Gain (dB) : **-40.67**Minimum Gain (degree) : **54**

***Horn antenna Polarization : Horizontal***

Frequency (MHz): **2400.00**      Antenna Polarity: **Horizontal**      Average Gain (dB): **-14.81**  
Maximum Gain (dB): **-8.67**      Maximum Gain (degree): **218**  
Minimum Gain (dB): **-40.00**      Minimum Gain (degree): **328**

*Horn antenna Polarization : Vertical*

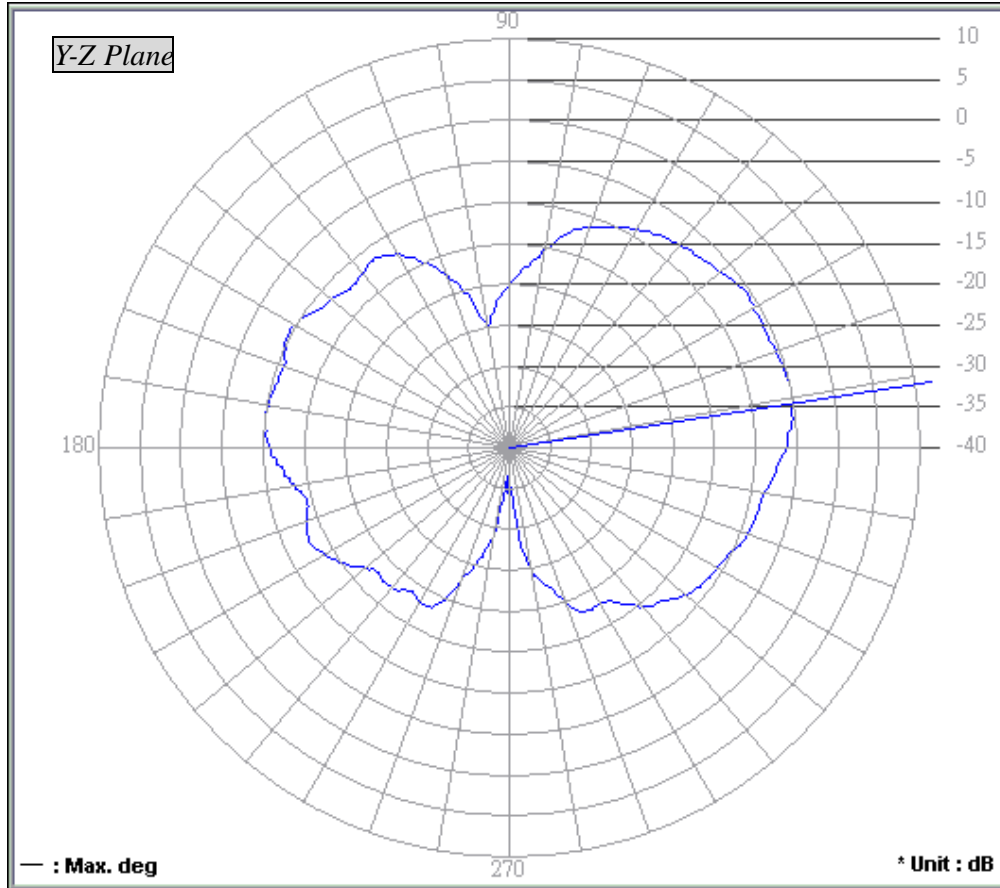


Frequency (MHz) : **2400.00**      Antenna Polarity : **Vertical**      Average Gain (dB) : **-3.47**

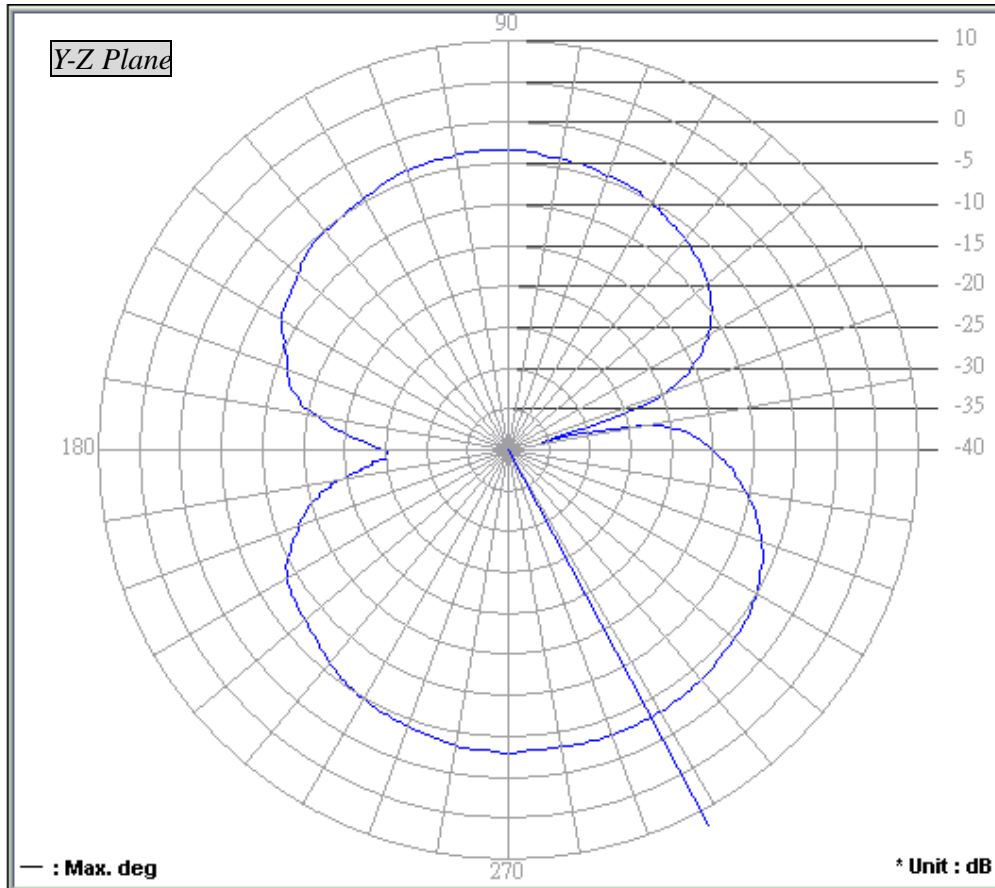
Maximum Gain (dB) : **0.83**      Maximum Gain (degree) : **342**

Minimum Gain (dB) : **-11.33**      Minimum Gain (degree) : **196**

*Horn antenna Polarization : Horizontal*

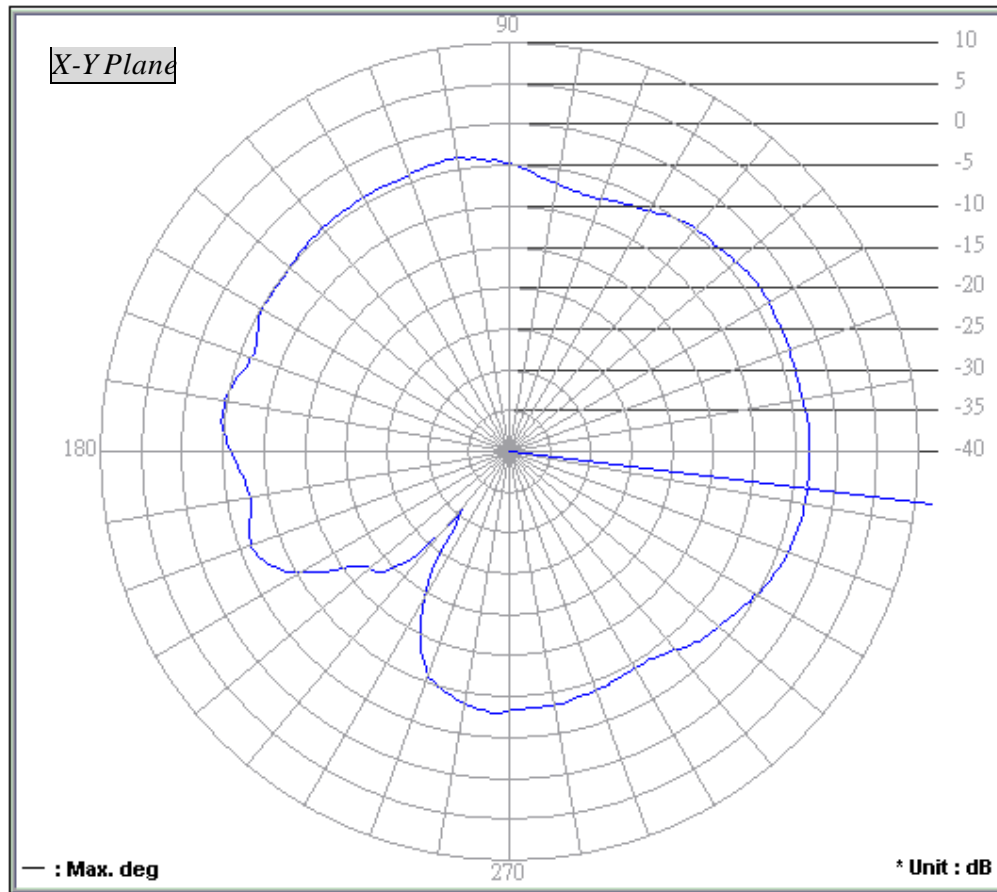


Frequency (MHz):	<b>2400.00</b>	Antenna Polarity:	<b>Horizontal</b>	Average Gain (dB):	<b>-10.81</b>
Maximum Gain (dB):	<b>-5.00</b>	Maximum Gain (degree):	<b>9</b>		
Minimum Gain (dB):	<b>-36.50</b>	Minimum Gain (degree):	<b>265</b>		

***Horn antenna Polarization : Vertical***Frequency (MHz): **2400.00**Antenna Polarity: **Vertical**Average Gain (dB): **-5.89**Maximum Gain (dB): **-2.83**Maximum Gain (degree): **298**Minimum Gain (dB): **-35.83**Minimum Gain (degree): **14**

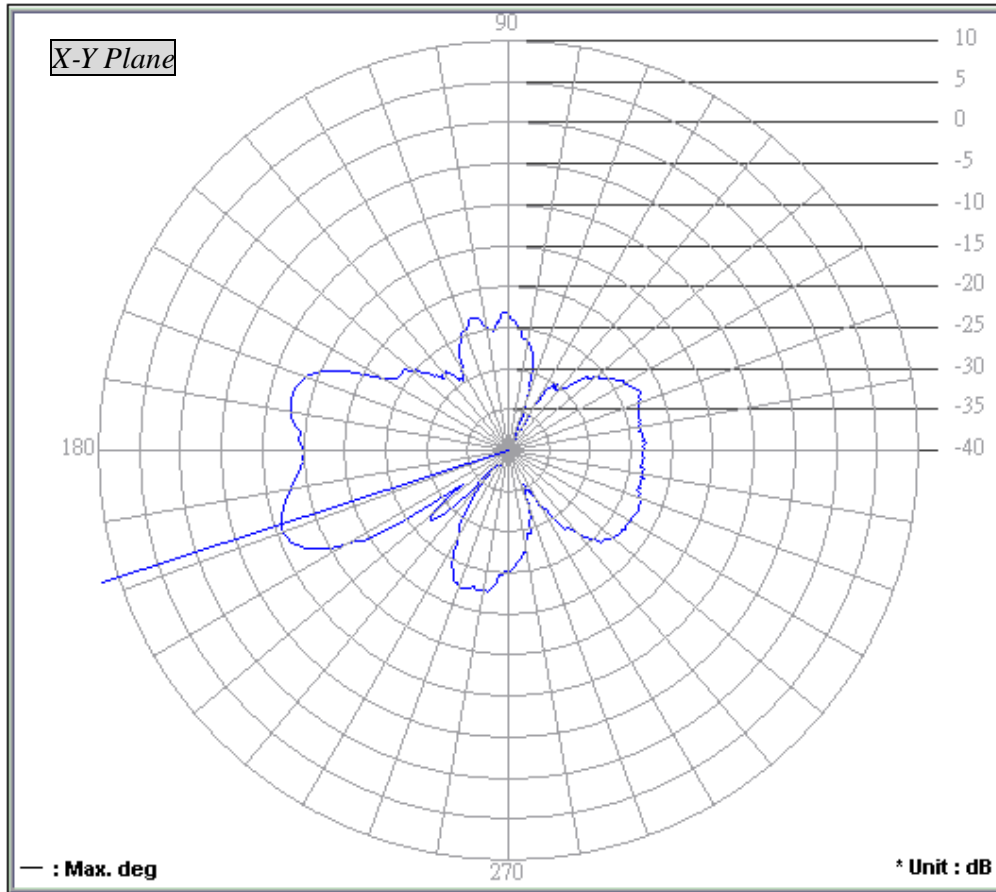
### 4. Left Side Antenna Pattern at 2.5 GHz

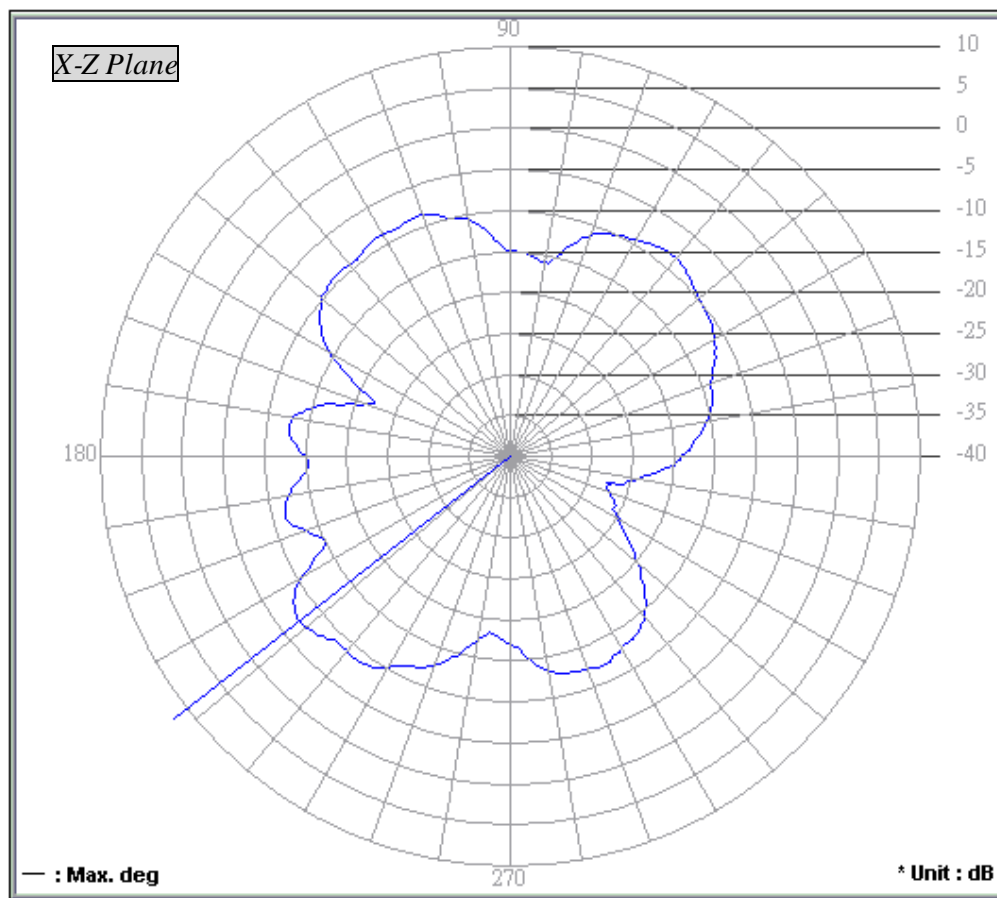
*Horn antenna Polarization : Horizontal*



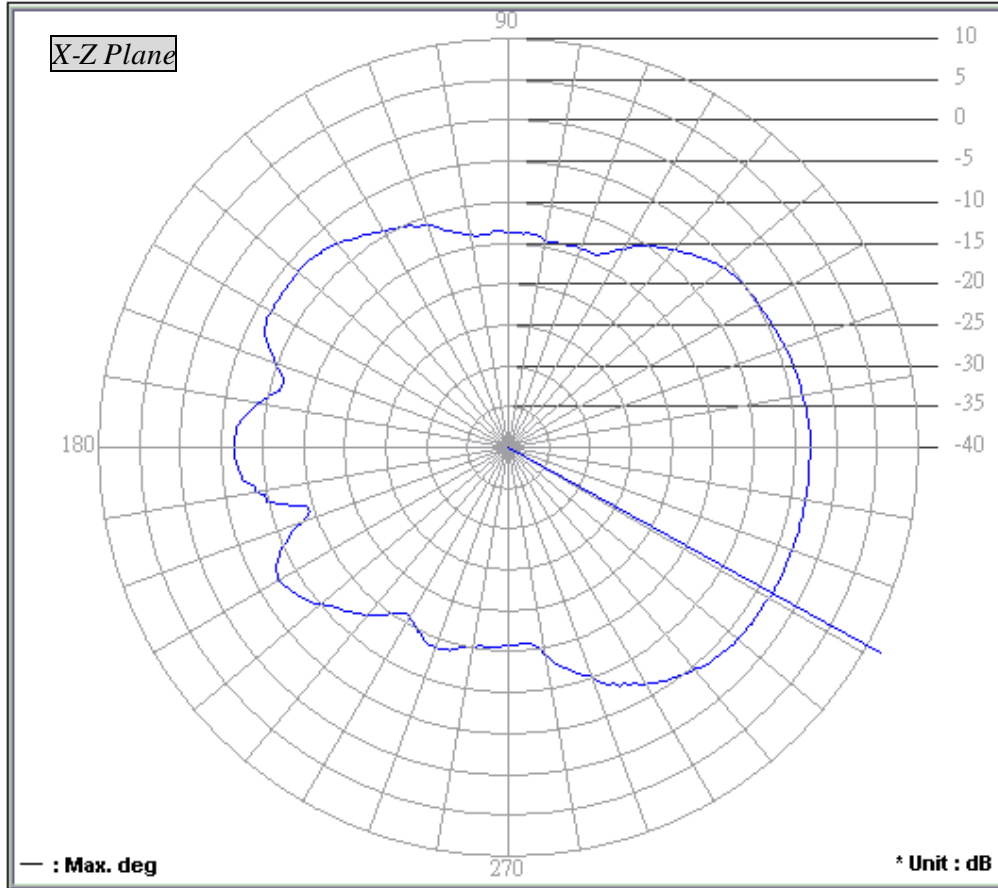
Frequency (MHz):	<b>2500.00</b>	Antenna Polarity:	<b>Horizontal</b>	Average Gain (dB):	<b>-5.83</b>
Maximum Gain (dB):	<b>-3.16</b>	Maximum Gain (degree):	<b>353</b>		
Minimum Gain (dB):	<b>-30.83</b>	Minimum Gain (degree):	<b>232</b>		



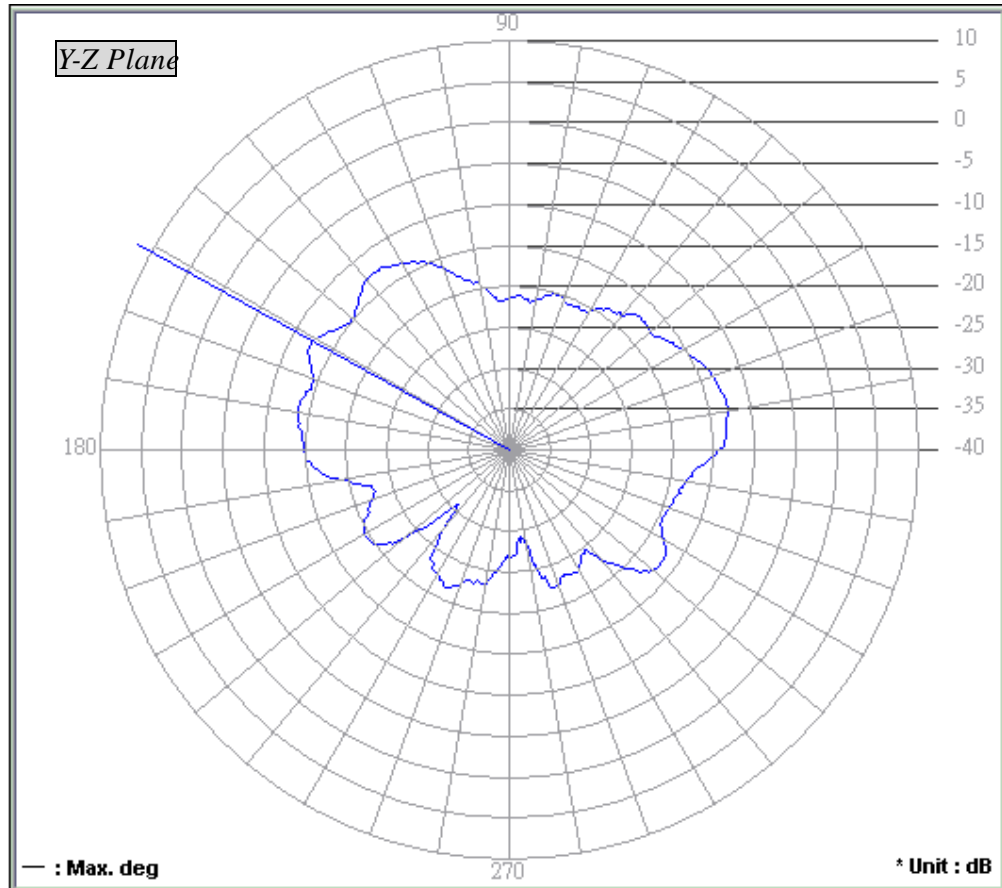
***Horn antenna Polarization : Vertical***Frequency (MHz): **2500.00**Antenna Polarity: **Vertical**Average Gain (dB): **-19.95**Maximum Gain (dB): **-10.83**Maximum Gain (degree): **198**Minimum Gain (dB): **-42.00**Minimum Gain (degree): **62**

***Horn antenna Polarization : Horizontal***Frequency (MHz): **2500.00**Antenna Polarity: **Horizontal**Average Gain (dB): **-12.11**Maximum Gain (dB): **-7.33**Maximum Gain (degree): **218**Minimum Gain (dB): **-27.83**Minimum Gain (degree): **345**

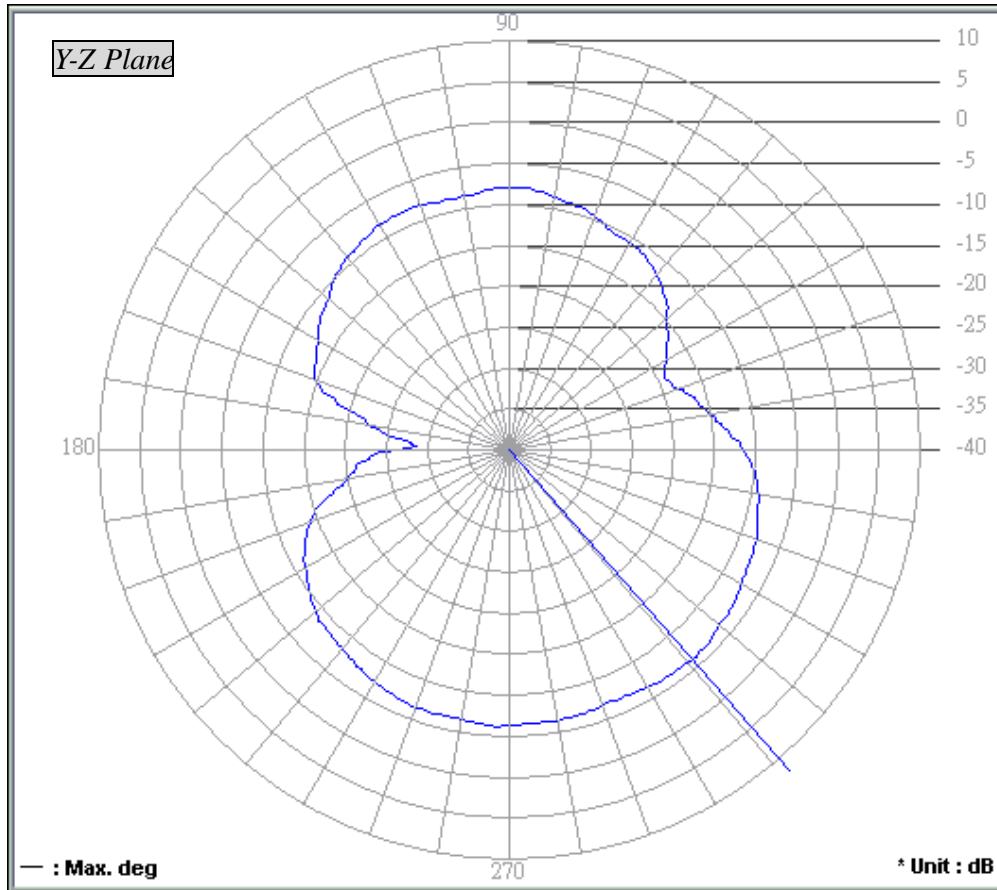
*Horn antenna Polarization : Vertical*



Frequency (MHz):	<b>2500.00</b>	Antenna Polarity:	<b>Vertical</b>	Average Gain (dB):	<b>-7.26</b>
Maximum Gain (dB):	<b>-3.16</b>	Maximum Gain (degree):	<b>331</b>		
Minimum Gain (dB):	<b>-16.16</b>	Minimum Gain (degree):	<b>239</b>		

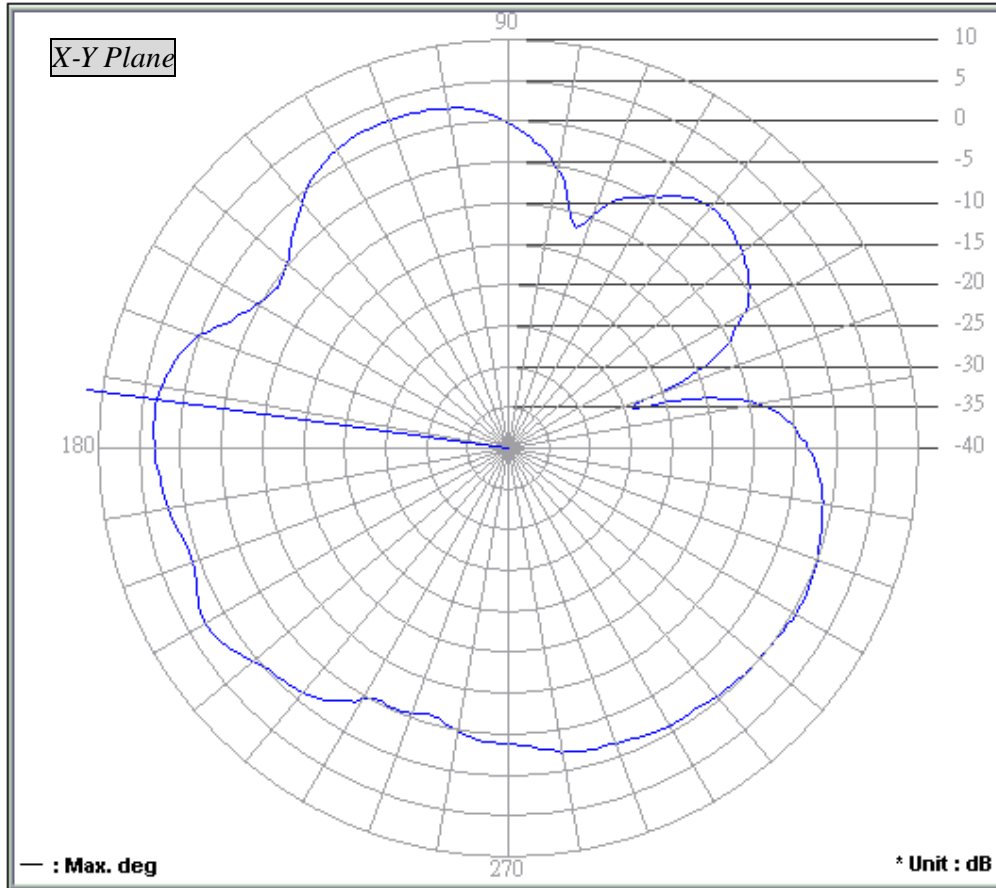
***Horn antenna Polarization : Horizontal***

Frequency (MHz):	<b>2500.00</b>	Antenna Polarity:	<b>Horizontal</b>	Average Gain (dB):	<b>-17.23</b>
Maximum Gain (dB):	<b>-12.50</b>	Maximum Gain (degree):	<b>151</b>		
Minimum Gain (dB):	<b>-30.83</b>	Minimum Gain (degree):	<b>227</b>		

***Horn antenna Polarization : Vertical***Frequency (MHz) : **2500.00**Antenna Polarity : **Vertical**Average Gain (dB) : **-9.26**Maximum Gain (dB) : **-6.00**Maximum Gain (degree) : **311**Minimum Gain (dB) : **-28.66**Minimum Gain (degree) : **178**

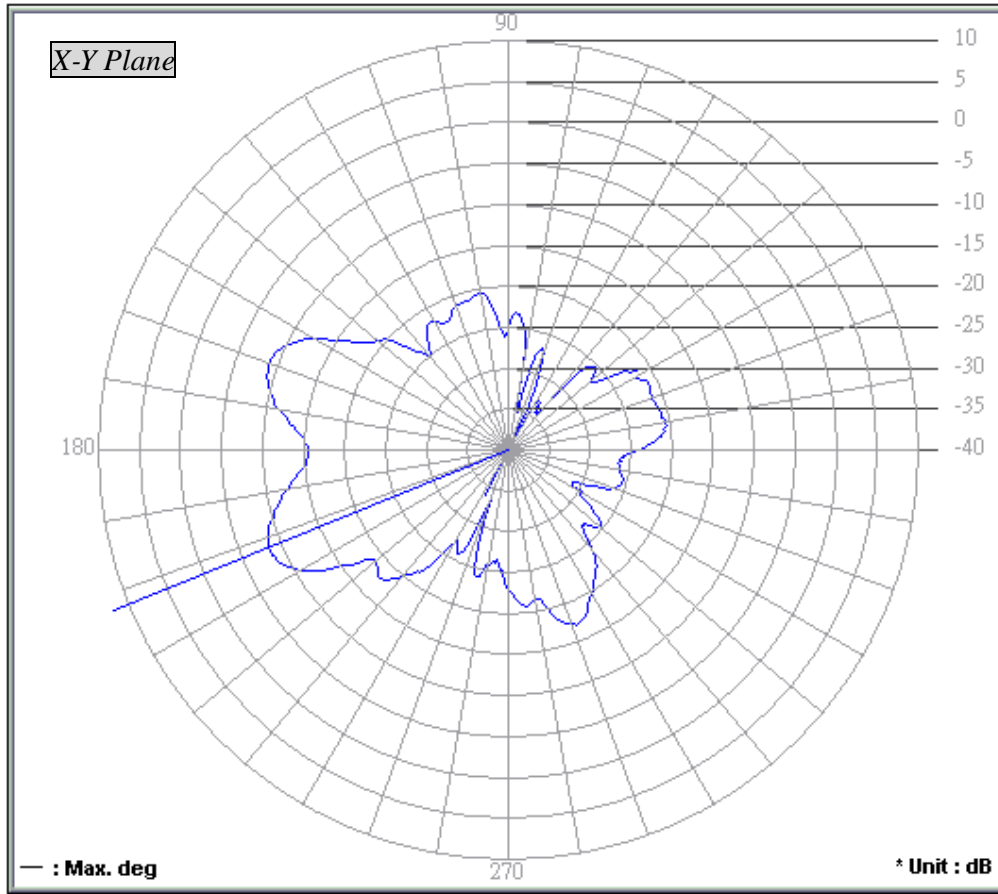
## 5. Right Side Antenna Pattern at 2.4 GHz

*Horn antenna Polarization : Horizontal*



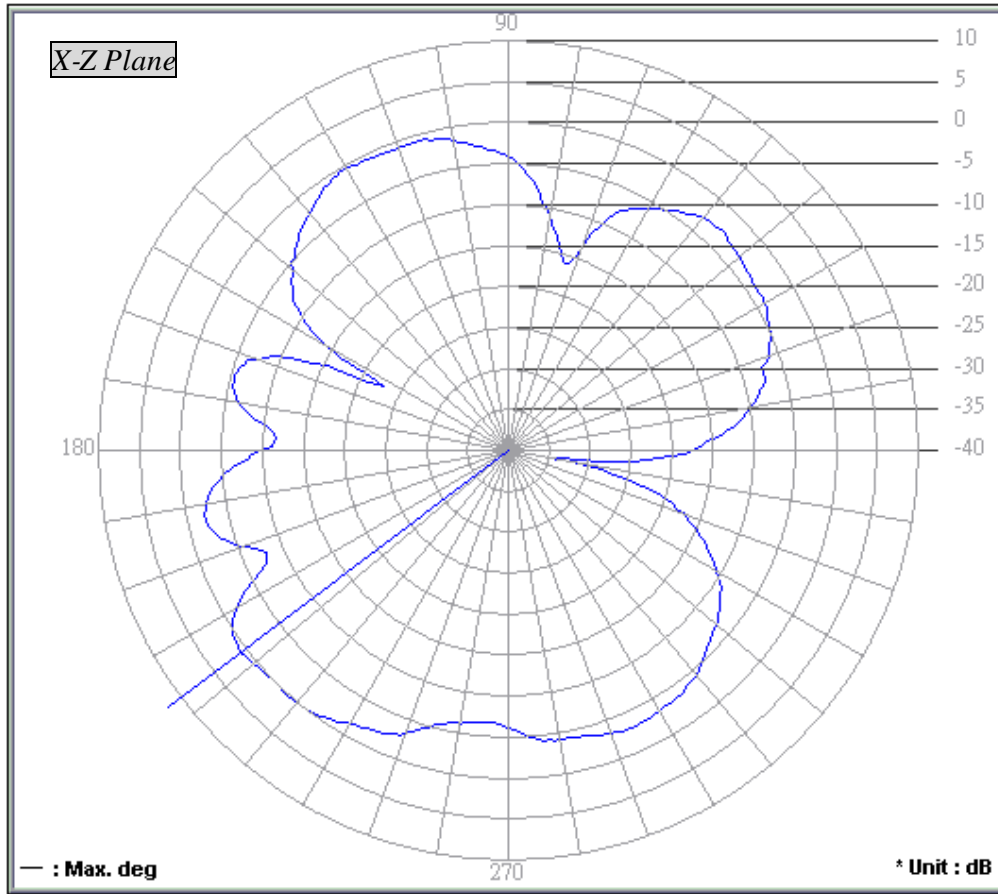
Frequency (MHz):	<b>2400.00</b>	Antenna Polarity:	<b>Horizontal</b>	Average Gain (dB):	<b>-0.73</b>
Maximum Gain (dB):	<b>3.33</b>	Maximum Gain (degree):	<b>172</b>		
Minimum Gain (dB):	<b>-24.00</b>	Minimum Gain (degree):	<b>18</b>		

*Horn antenna Polarization : Vertical*



Frequency (MHz):	<b>2400.00</b>	Antenna Polarity:	<b>Vertical</b>	Average Gain (dB):	<b>-17.09</b>
Maximum Gain (dB):	<b>-8.50</b>	Maximum Gain (degree):	<b>202</b>		
Minimum Gain (dB):	<b>-46.17</b>	Minimum Gain (degree):	<b>64</b>		

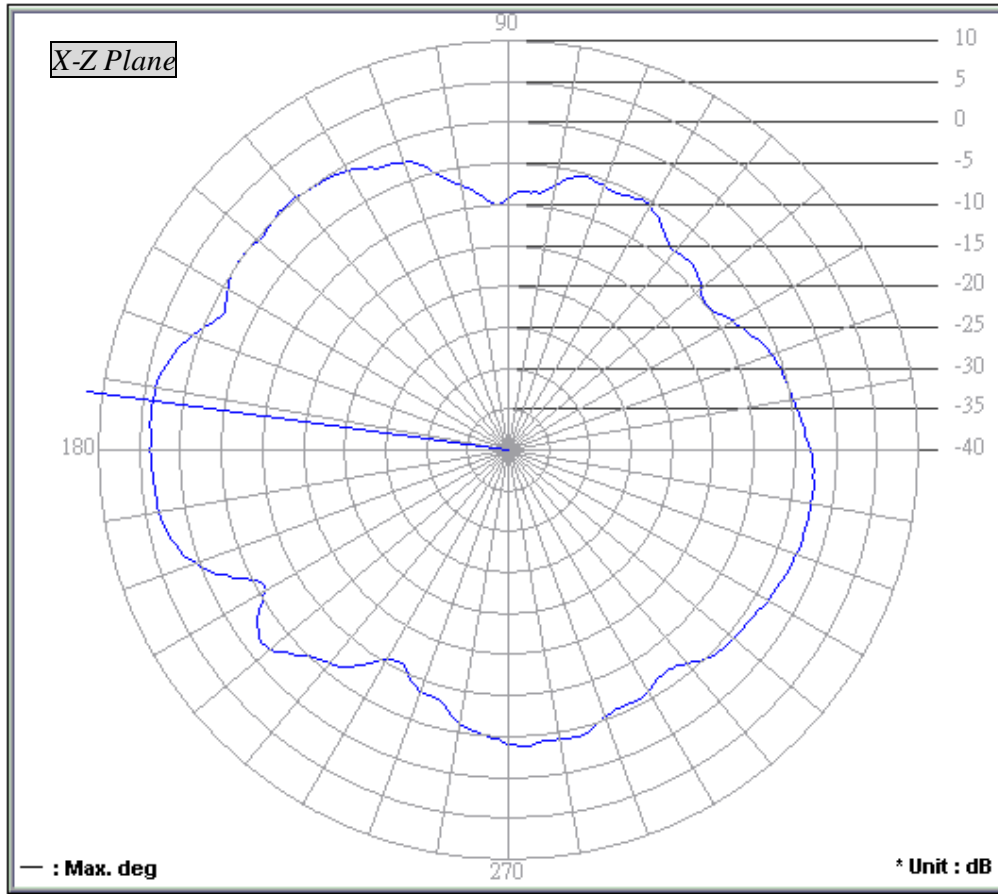
*Horn antenna Polarization : Horizontal*



Frequency (MHz):	<b>2400.00</b>	Antenna Polarity:	<b>Horizontal</b>	Average Gain (dB):	<b>-4.20</b>
Maximum Gain (dB):	<b>0.83</b>	Maximum Gain (degree):	<b>217</b>		
Minimum Gain (dB):	<b>-34.83</b>	Minimum Gain (degree):	<b>350</b>		

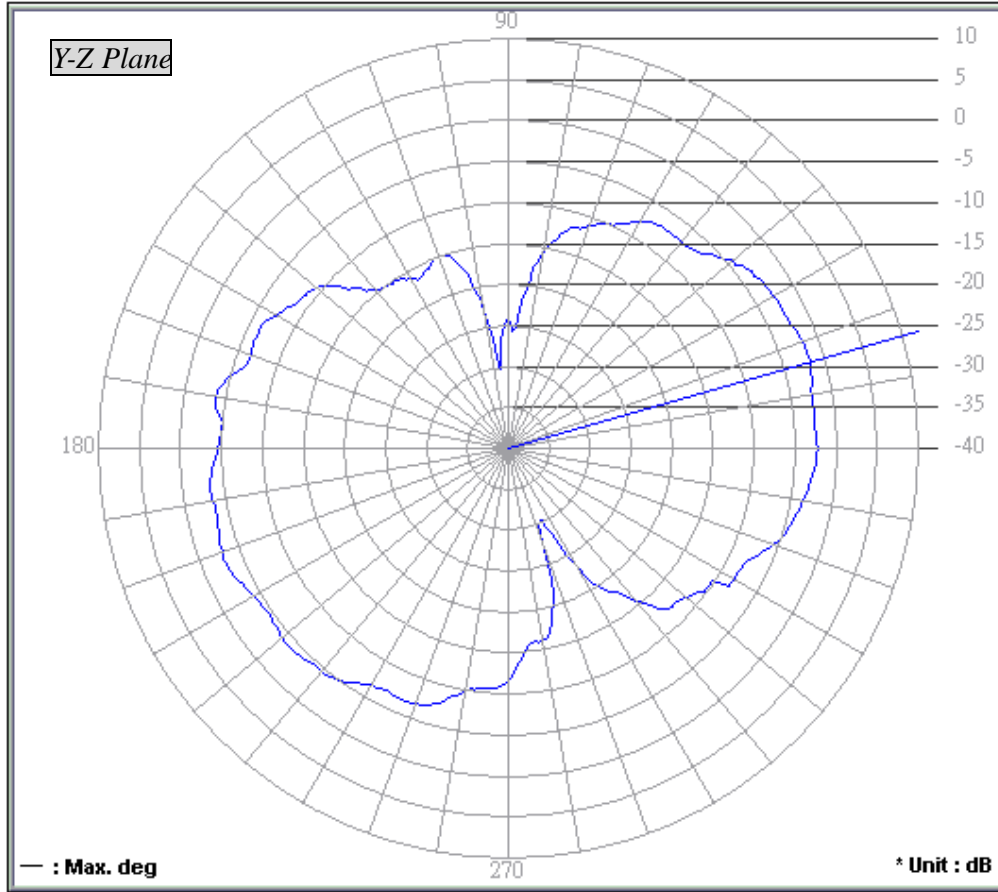


*Horn antenna Polarization : Vertical*



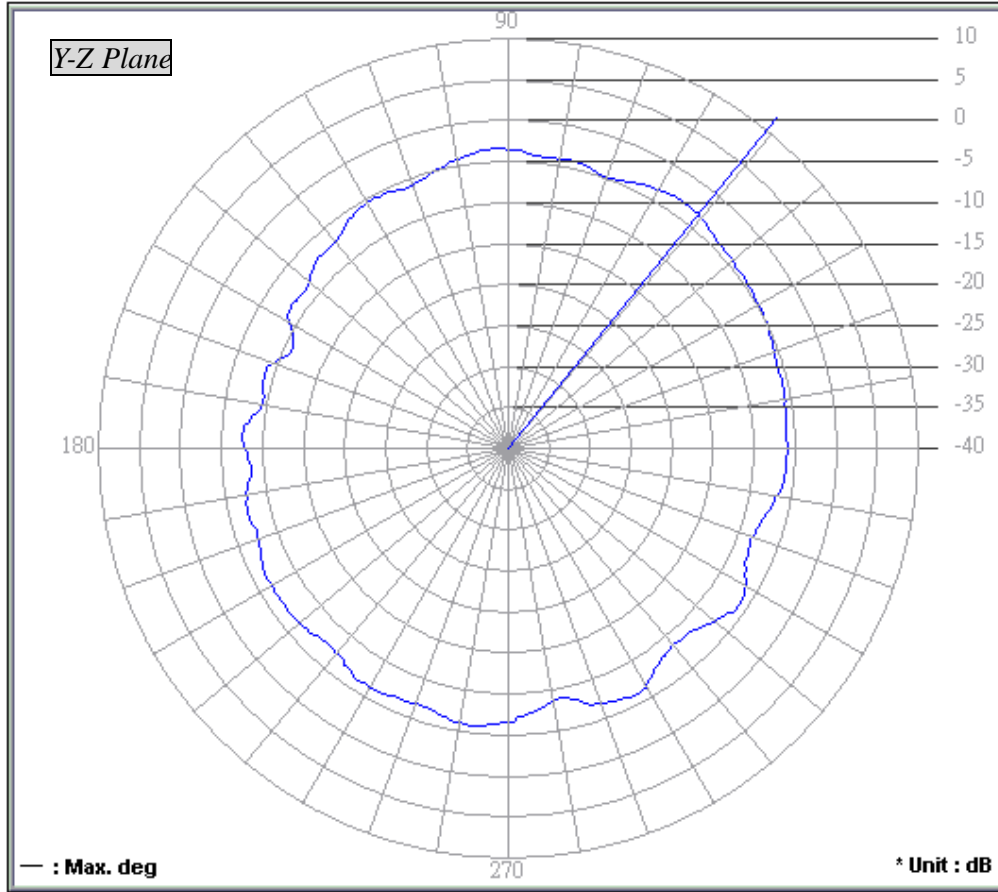
Frequency (MHz):	<b>2400.00</b>	Antenna Polarity:	<b>Vertical</b>	Average Gain (dB):	<b>-2.34</b>
Maximum Gain (dB):	<b>3.83</b>	Maximum Gain (degree):	<b>172</b>		
Minimum Gain (dB):	<b>-10.83</b>	Minimum Gain (degree):	<b>242</b>		

*Horn antenna Polarization : Horizontal*



Frequency (MHz):	<b>2400.00</b>	Antenna Polarity:	<b>Horizontal</b>	Average Gain (dB):	<b>-6.40</b>
Maximum Gain (dB):	<b>-1.67</b>	Maximum Gain (degree):	<b>16</b>		
Minimum Gain (dB):	<b>-30.33</b>	Minimum Gain (degree):	<b>294</b>		

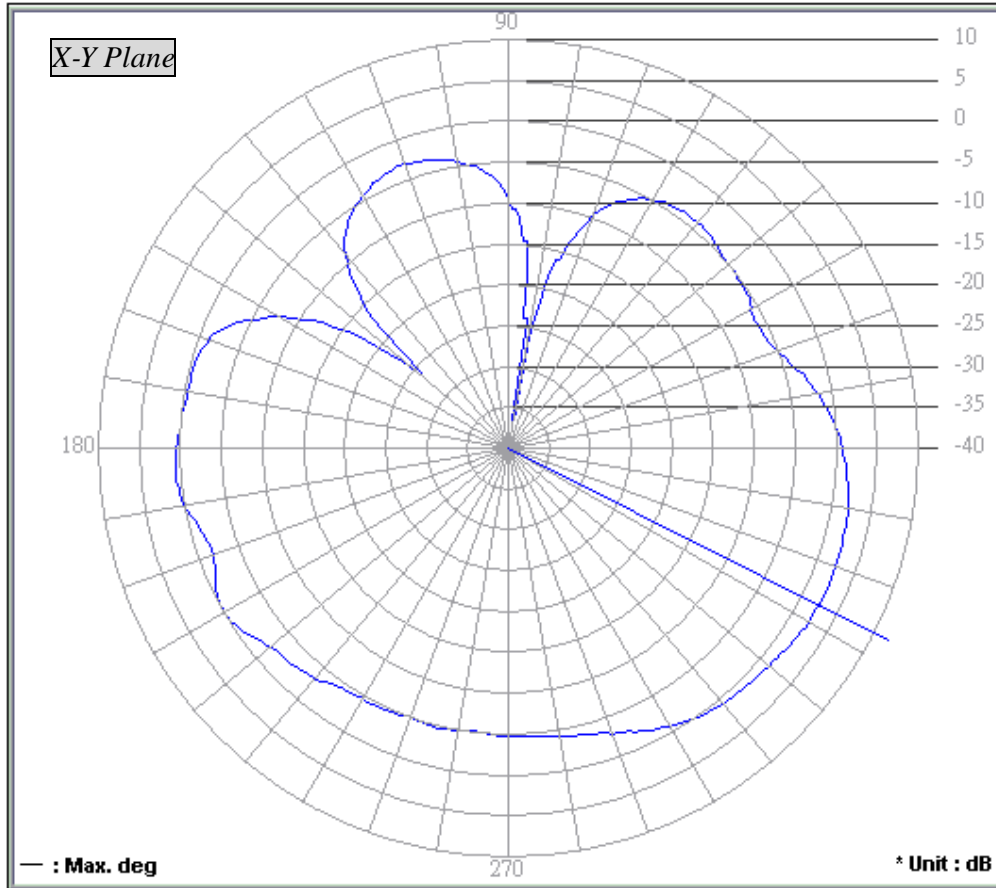
*Horn antenna Polarization : Vertical*



Frequency (MHz):	<b>2400.00</b>	Antenna Polarity:	<b>Vertical</b>	Average Gain (dB):	<b>-6.16</b>
Maximum Gain (dB):	<b>-3.17</b>	Maximum Gain (degree):	<b>51</b>		
Minimum Gain (dB):	<b>-11.00</b>	Minimum Gain (degree):	<b>155</b>		

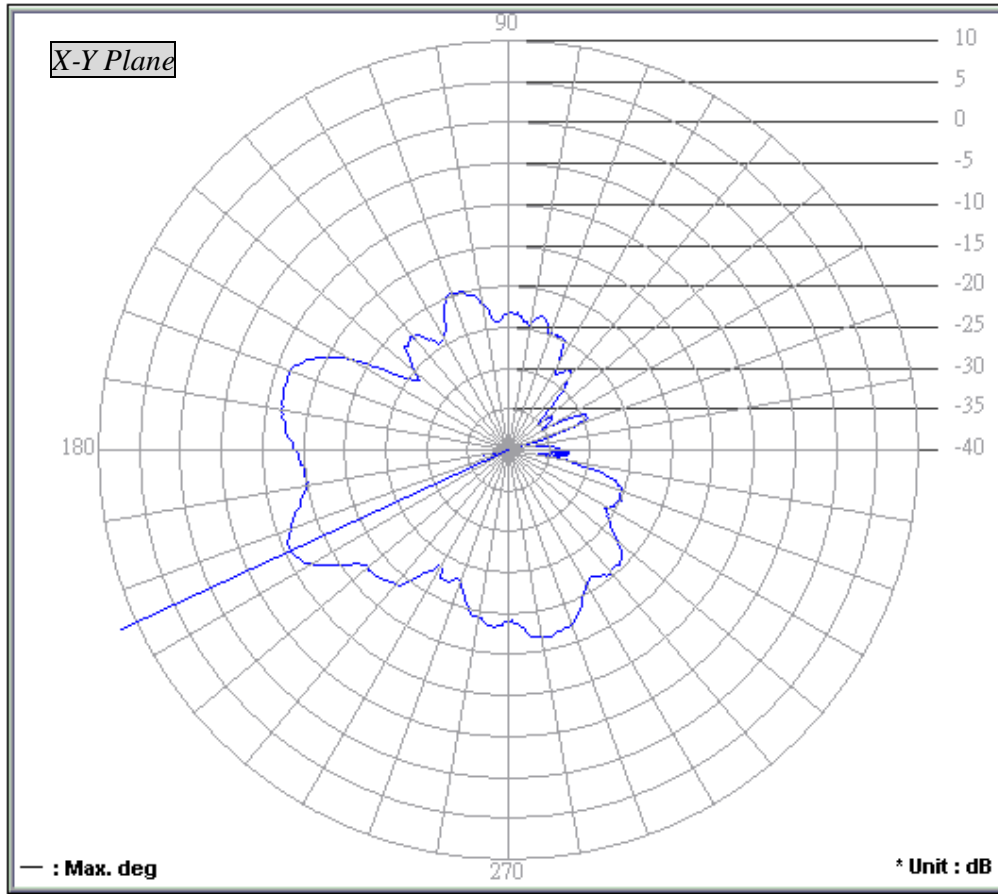
## 6. Right Side Antenna Pattern at 2.5 GHz

*Horn antenna Polarization : Horizontal*



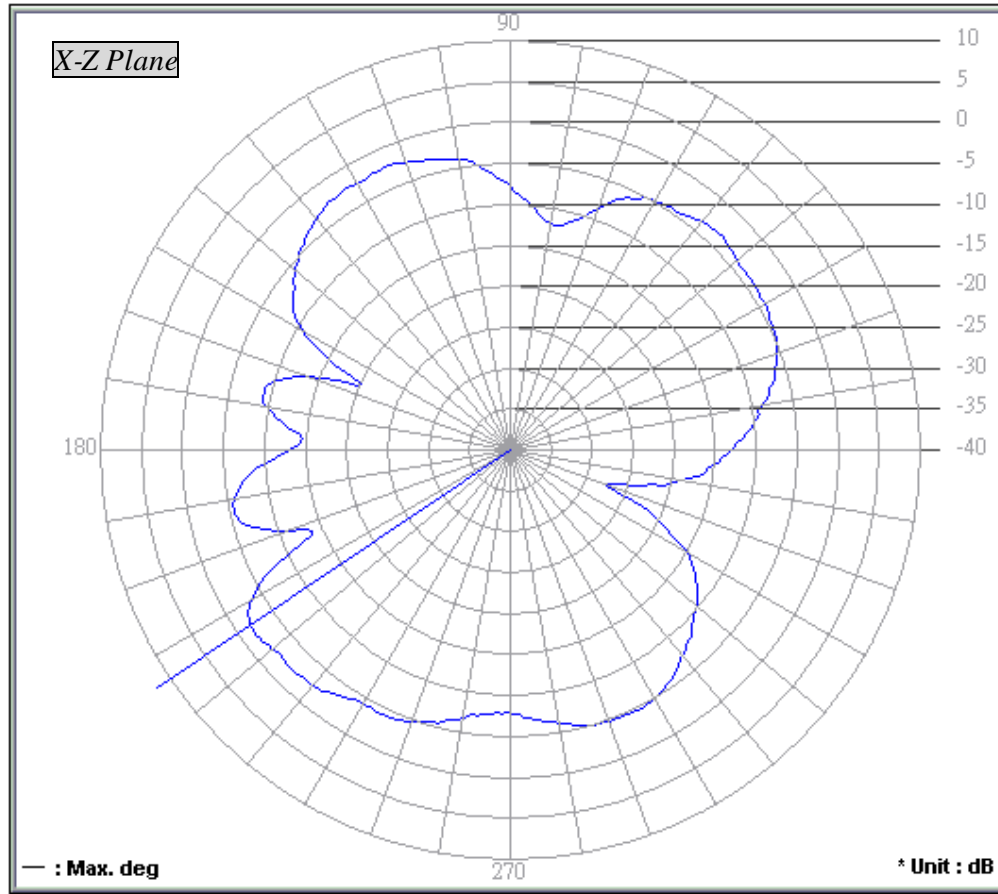
Frequency (MHz):	<b>2500.00</b>	Antenna Polarity:	<b>Horizontal</b>	Average Gain (dB):	<b>-2.03</b>
Maximum Gain (dB):	<b>2.50</b>	Maximum Gain (degree):	<b>333</b>		
Minimum Gain (dB):	<b>-36.50</b>	Minimum Gain (degree):	<b>80</b>		

*Horn antenna Polarization : Vertical*



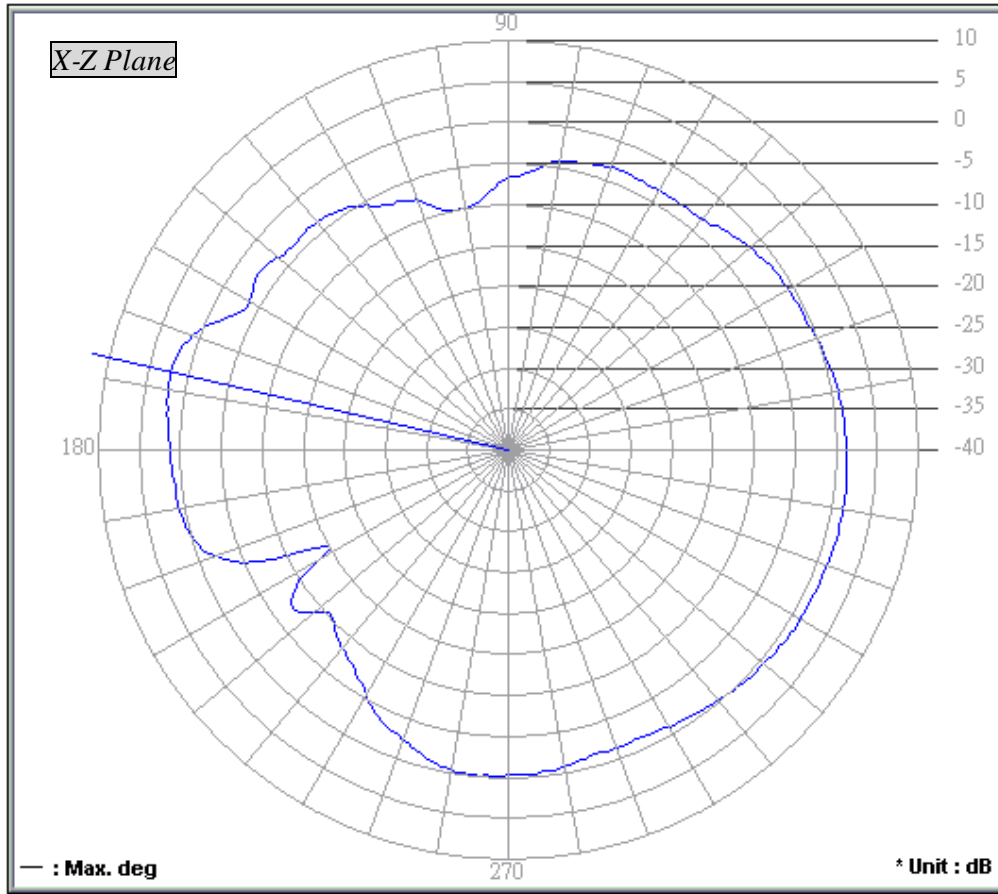
Frequency (MHz):	<b>2500.00</b>	Antenna Polarity:	<b>Vertical</b>	Average Gain (dB):	<b>-18.35</b>
Maximum Gain (dB):	<b>-10.66</b>	Maximum Gain (degree):	<b>205</b>		
Minimum Gain (dB):	<b>-43.16</b>	Minimum Gain (degree):	<b>11</b>		

*Horn antenna Polarization : Horizontal*



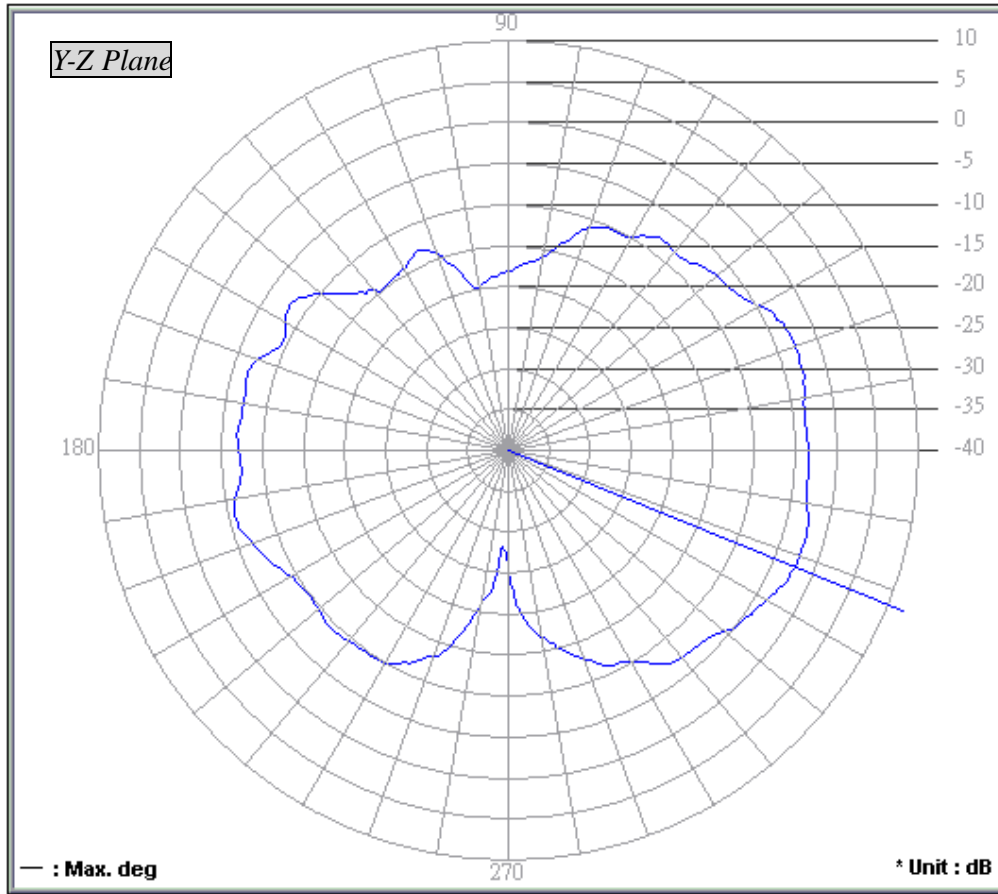
Frequency (MHz):	<b>2500.00</b>	Antenna Polarity:	<b>Horizontal</b>	Average Gain (dB):	<b>-5.90</b>
Maximum Gain (dB):	<b>-1.66</b>	Maximum Gain (degree):	<b>214</b>		
Minimum Gain (dB):	<b>-27.50</b>	Minimum Gain (degree):	<b>340</b>		

*Horn antenna Polarization : Vertical*



Frequency (MHz):	<b>2500.00</b>	Antenna Polarity:	<b>Vertical</b>	Average Gain (dB):	<b>-1.30</b>
Maximum Gain (dB):	<b>2.34</b>	Maximum Gain (degree):	<b>167</b>		
Minimum Gain (dB):	<b>-15.33</b>	Minimum Gain (degree):	<b>209</b>		

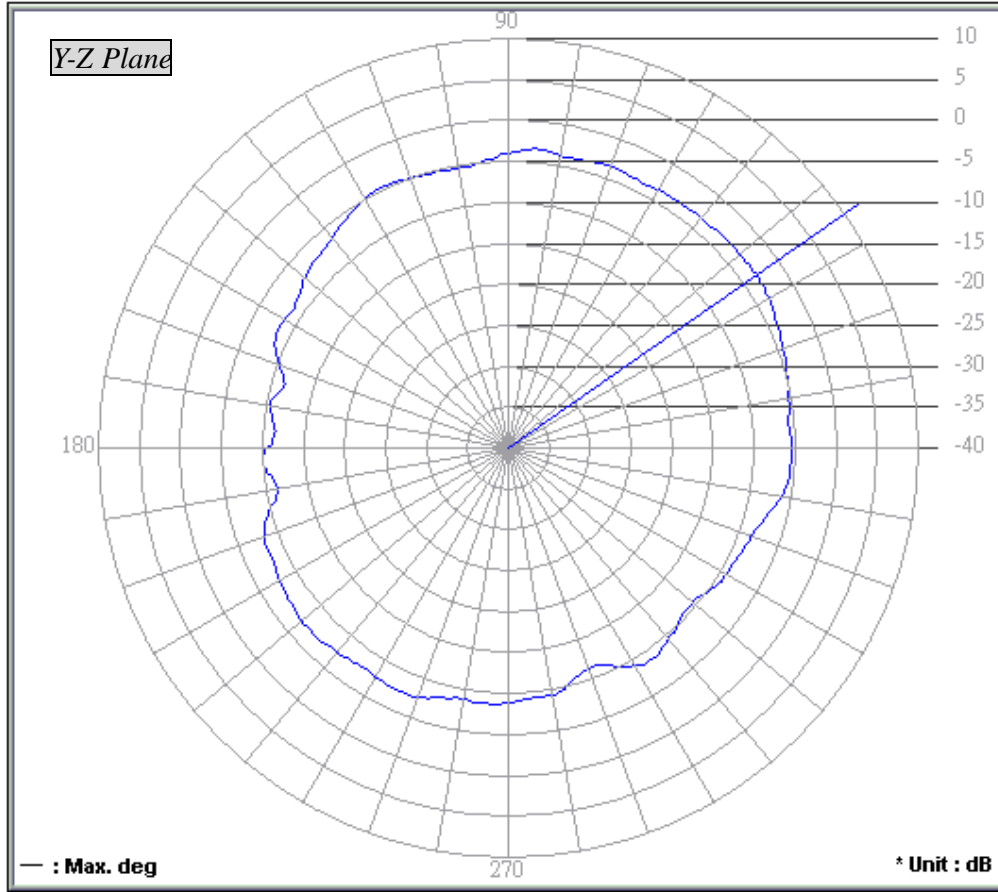
*Horn antenna Polarization : Horizontal*



Frequency (MHz):	<b>2500.00</b>	Antenna Polarity:	<b>Horizontal</b>	Average Gain (dB):	<b>-7.46</b>
Maximum Gain (dB):	<b>-2.16</b>	Maximum Gain (degree):	<b>338</b>		
Minimum Gain (dB):	<b>-28.33</b>	Minimum Gain (degree):	<b>267</b>		



*Horn antenna Polarization : Vertical*



Frequency (MHz):	<b>2500.00</b>	Antenna Polarity:	<b>Vertical</b>	Average Gain (dB):	<b>-6.42</b>
Maximum Gain (dB):	<b>-3.00</b>	Maximum Gain (degree):	<b>35</b>		
Minimum Gain (dB):	<b>-11.66</b>	Minimum Gain (degree):	<b>164</b>		

## 7. Antenna Gain

### (a) Antenna Peak Gain

Frequency range	2.4 GHz		2.5 GHz	
Antenna side	L	R	L	R
Peak Gain (dBi)	0.83	3.83	-3.16	2.50

### (b) Antenna Average Gain

<b>Y-Z Plane (dBi)</b>	2.4 GHz		2.5 GHz	
Antenna side	L	R	L	R
Vertical	-5.89	-6.16	-9.26	-6.42
Horizontal	-10.81	-6.40	-17.23	-7.46

<b>X-Y Plane (dBi)</b>	2.4 GHz		2.5 GHz	
Antenna side	L	R	L	R
Vertical	-19.23	-17.09	-19.95	-18.35
Horizontal	-3.10	-0.73	-5.83	-2.03

<b>X-Z Plane (dBi)</b>	2.4 GHz		2.5 GHz	
Antenna side	L	R	L	R
Vertical	-3.47	-2.34	-7.26	-1.30
Horizontal	-14.81	-4.20	-12.11	-5.90