

FCC ID: 2AFQA-DB410C
IC: 20763-DB410C
Model: DragonBoard 410c

DragonBoard™ 410c

Operational Description

DragonBoard™ 410c is based on the 96Boards™ specification featuring the Qualcomm® Snapdragon™ 410 processor, a Quad-core ARM® Cortex™ A53 at up to 1.2GHz clock speed per core, capable of 32-bit and 64-bit operations, in addition, a Qualcomm® Adreno™ 306 400MHz GPU for PC-class graphics, which supports advanced APIs, including OpenGL ES 3.0, OpenCL, DirectX, content security, and integrated ISP with support for image sensors up to 13 MP and 1080p HD video playback and capture with H.264 AVC.

This device supports Android 5.1, Windows 10 IoT, and Linux based operating systems.

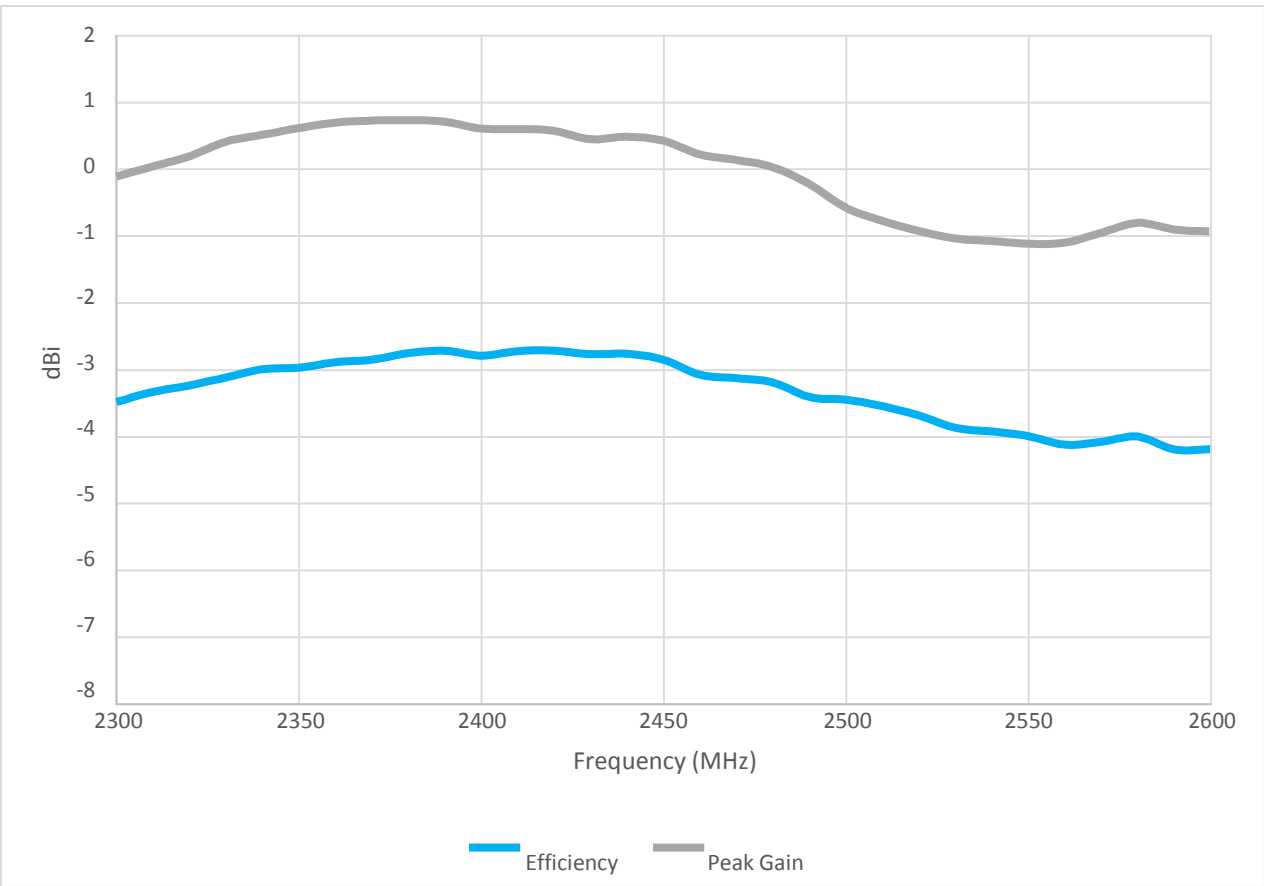
Connectivity is provided through USB 2.0 micro B, two USB 2.0, WLAN 802.11b/g/n 2.4GHz , Bluetooth 4.1, and GPS. Extensible with a 40-pin Low Speed (LS) expansion connector which outputs GPIO signals at +1.8V, 60-pin High Speed (HS) expansion connector, and external micro SD card slot. The user interface consists of power/reset button, and volume up and down buttons, 6 LED indicators, 4 are user controllable, and 2 are used for Bluetooth and WLAN activity. Power consumption ranges from +6.5V to +18V and should be paired with a power supply capable of 12V 2A, operates at 0°C to +70°C, and is RoHS and Reach compliant.

96Boards (<http://www.96Boards.org>) is a 32-bit and 64-bit ARM® Open Platform hosted by Linaro™ intended to foster software developers, the maker, higher education, and embedded OEM communities.

For other information, please have a look at the hardware manual.

Internal PCB antenna specification

Freq MHz	Efficiency	Peak Gain
2300	-3.5	-0.1
2310	-3.3	0.0
2320	-3.2	0.2
2330	-3.1	0.4
2340	-3.0	0.5
2350	-3.0	0.6
2360	-2.9	0.7
2370	-2.8	0.7
2380	-2.7	0.7
2390	-2.7	0.7
2400	-2.8	0.6
2410	-2.7	0.6
2420	-2.7	0.6
2430	-2.8	0.5
2440	-2.8	0.5
2450	-2.8	0.4
2460	-3.1	0.2
2470	-3.1	0.1
2480	-3.2	0.0
2490	-3.4	-0.2
2500	-3.4	-0.6
2510	-3.5	-0.8
2520	-3.7	-0.9
2530	-3.9	-1.0
2540	-3.9	-1.1
2550	-4.0	-1.1
2560	-4.1	-1.1
2570	-4.1	-0.9
2580	-4.0	-0.8
2590	-4.2	-0.9
2600	-4.2	-0.9



Regulatory WLAN Antenna Information

	Vendor Name	Project Code
OEM	Acer Incorporated	
ODM	Quanta / Compal / Wistron	
Antenna	Wistron Neweb Corporation	EBJ

Provided By Wistron NeWeb Corp	Reviewed By Wistron NeWeb Corp
Sophia Lin	Eric Fang

Wistron NeWeb Corporation
No.10-1, Li-hsin Road I,
Hsinchu Science Park,
Hsinchu 300, Taiwan, R.O.C.
Telephone: 886-3-666-7799
Facsimile: 886-3-666-7323
[http: www.wneweb.com](http://www.wneweb.com)

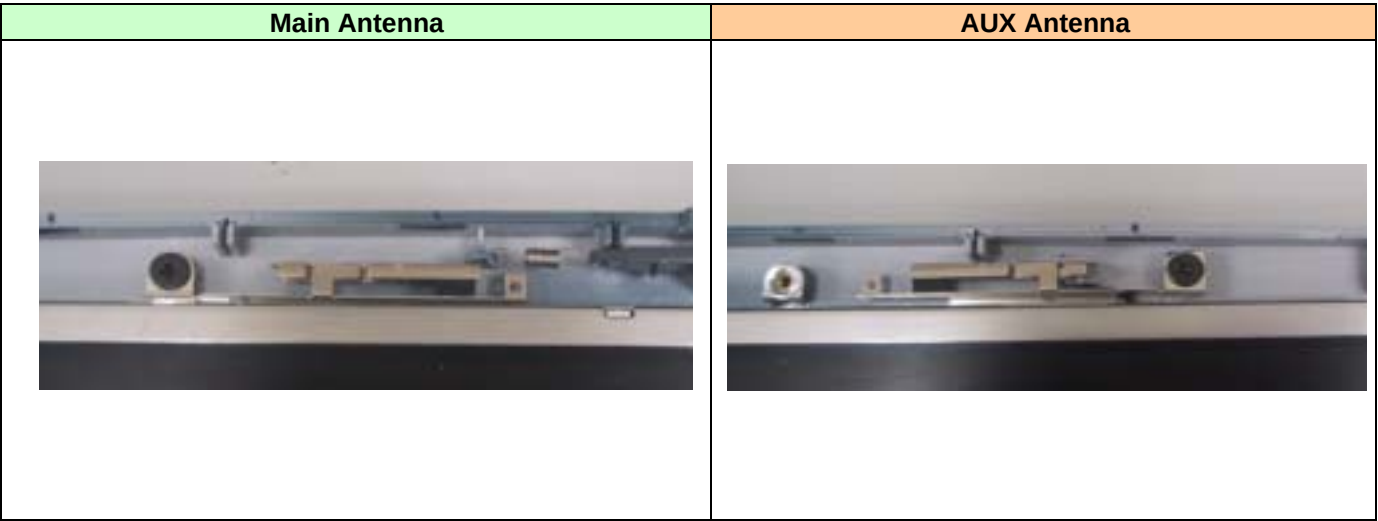
Antenna Information

Section 1. Antenna Assembly Specifications

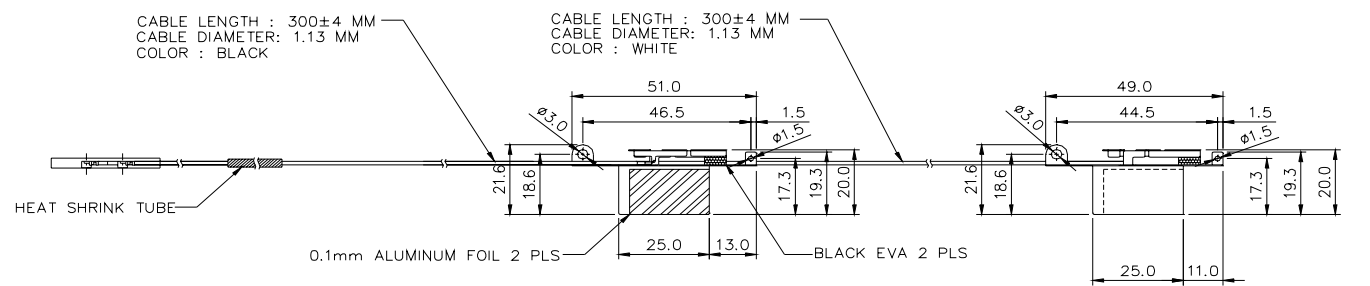
Antenna Assembly Summary:

1A Antenna Part Number	1B Manufacture	1C Antenna Type	1D Cable Assembly Part Number and Information	1E Peak Gain W/ Cable loss (dBi)	1F Peak Gain w/o Cable Loss (dBi)	1G VSWR	1H Cable Loss (dBi)
Main Antenna (WNC P/N: 81.EBJ15.005)	Wistron Newweb Corporation	PIFA	P/N: WN-S-1.13-300W-(2-2-1)&300B-(2-2-1) 50 ohm Coaxial. length: 300 mm diameter: 1.13 mm Connector: IPEX	2400-2500MHz 3.00 dBi (peak)	2400-2500MHz 4.15 dBi (peak)	2400-2500MHz 2.0 max	2400-2500MHz 1.15 dBi (peak)
				5150-5350MHz 2.56 dBi (peak)	5150-5350MHz 4.26 dBi (peak)	5150-5350MHz 2.5 max	5150-5350MHz 1.70 dBi (peak)
				5470-5725MHz 4.76 dBi (peak)	5470-5725MHz 6.50 dBi (peak)	5470-5725MHz 2.5 max	5470-5725MHz 1.74 dBi (peak)
				5725-5825MHz 4.76 dBi (peak)	5725-5825MHz 6.55 dBi (peak)	5725-5825MHz 2.5 max	5725-5825MHz 1.79 dBi (peak)
AUX Antenna (WNC P/N: 81.EBJ15.005)	Wistron Newweb Corporation	PIFA	P/N: WN-S-1.13-300W-(2-2-1)&300B-(2-2-1) 50 ohm Coaxial. length: 300 mm diameter: 1.13 mm Connector: IPEX	2400-2500MHz 3.62 dBi (peak)	2400-2500MHz 4.78 dBi (peak)	2400-2500MHz 2.0 max	2400-2500MHz 1.15 dBi (peak)
				5150-5350MHz 3.08 dBi (peak)	5150-5350MHz 4.78 dBi (peak)	5150-5350MHz 2.5 max	5150-5350MHz 1.70 dBi (peak)
				5470-5725MHz 3.31 dBi (peak)	5470-5725MHz 5.05 dBi (peak)	5470-5725MHz 2.5 max	5470-5725MHz 1.74 dBi (peak)
				5725-5825MHz 2.42 dBi (peak)	5725-5825MHz 4.21 dBi (peak)	5725-5825MHz 2.5 max	5725-5825MHz 1.79 dBi (peak)

Section 2.1 Antenna Photos

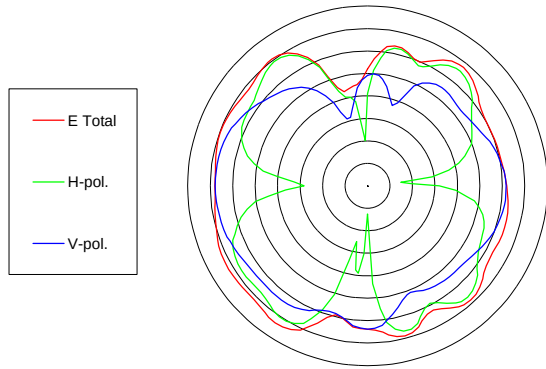


Section 2.2 Dimensioned Drawings of Antennas



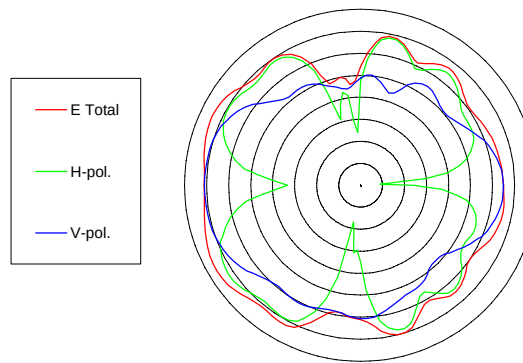
2G4 ISM (2.400 GHz - 2.4835 GHz) Antenna Radiation Patterns

Main antenna @2.40 GHz



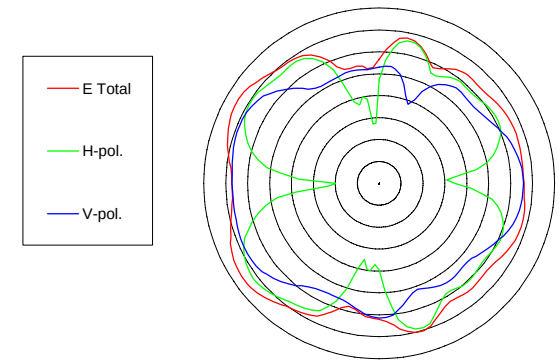
	Total	H-pol	V pol
Peak Gain	1.74	0.09	-1.12
Average Gain	-2.15	-5.59	-5.65

Main antenna @2.45 GHz



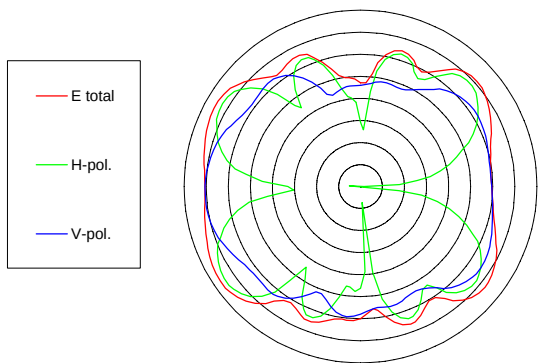
	Total	H-pol	V pol
Peak Gain	3.00	1.21	0.48
Average Gain	-1.47	-4.75	-5.16

Main antenna @2.50 GHz



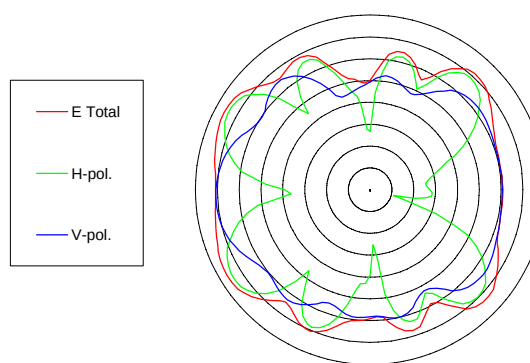
	Total	H-pol	V pol
Peak Gain	2.90	0.97	-0.53
Average Gain	-1.50	-4.90	-4.88

Aux antenna @2.40 GHz



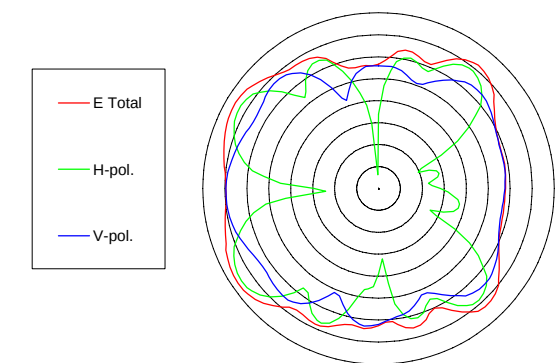
	Total	H-pol	V pol
Peak Gain	3.35	2.30	0.30
Average Gain	-1.53	-5.12	-4.76

Aux antenna @2.45 GHz



	Total	H-pol	V pol
Peak Gain	3.19	2.24	0.39
Average Gain	-1.39	-5.06	-4.67

Aux antenna @2.50 GHz

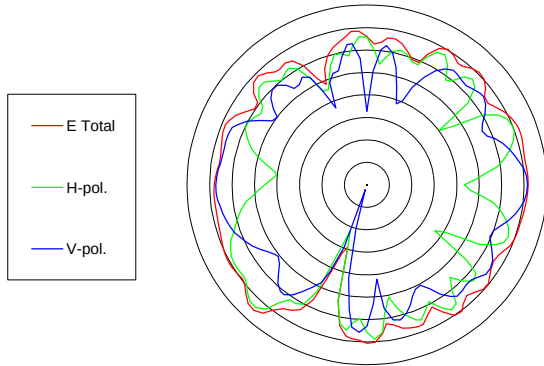


	Total	H-pol	V pol
Peak Gain	3.62	2.60	-0.25
Average Gain	-1.35	-5.28	-4.34

Note: The outer circle approximately represents the 5 dBi gain circle.
Each circle with 5 dBi difference (Max=5 dBi and Min=-35 dBi)

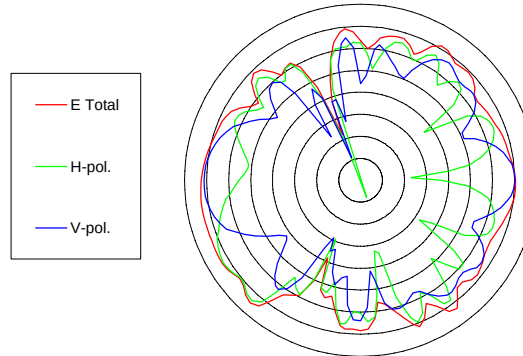
UII Band (5.150 GHz - 5.350 GHz) Antenna Radiation Patterns

Main antenna @5.15 GHz



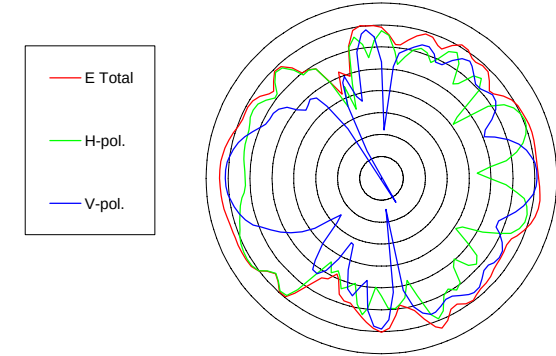
	Total	H-pol	V pol
Peak Gain	2.56	1.82	0.70
Average Gain	-1.44	-4.68	-4.99

Main antenna @5.25 GHz



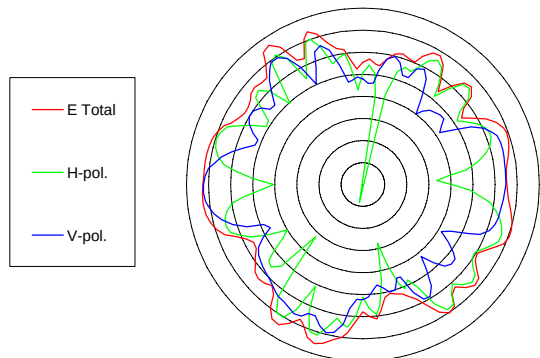
	Total	H-pol	V pol
Peak Gain	2.52	1.84	0.59
Average Gain	-1.49	-4.88	-5.06

Main antenna @5.35 GHz



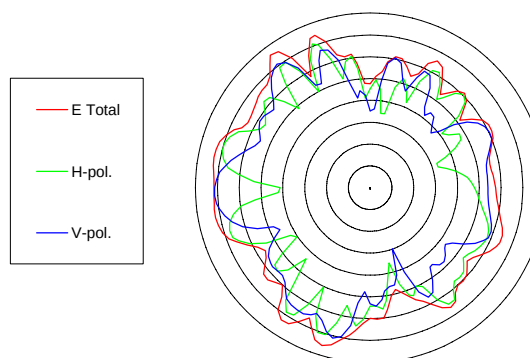
	Total	H-pol	V pol
Peak Gain	1.95	0.79	0.63
Average Gain	-1.14	-4.22	-4.98

Aux antenna @5.15 GHz



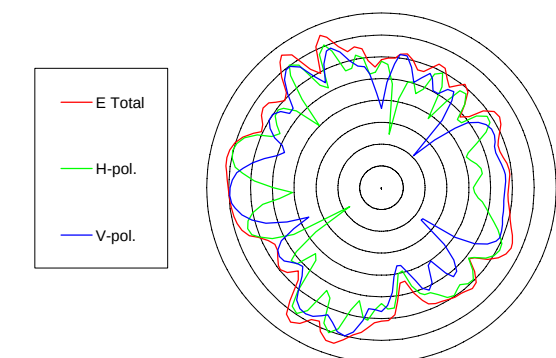
	Total	H-pol	V pol
Peak Gain	3.08	0.78	1.21
Average Gain	-1.97	-5.25	-5.44

Aux antenna @5.25 GHz



	Total	H-pol	V pol
Peak Gain	2.96	0.43	0.65
Average Gain	-2.97	-6.43	-6.17

Aux antenna @5.35 GHz

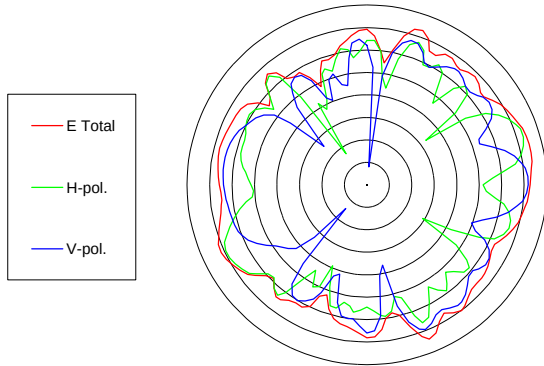


	Total	H-pol	V pol
Peak Gain	2.96	0.31	-0.05
Average Gain	-3.31	-6.76	-6.51

Note: The outer circle approximately represents the 5 dBi gain circle.
Each circle with 5 dBi difference (Max=5 dBi and Min=-35 dBi)

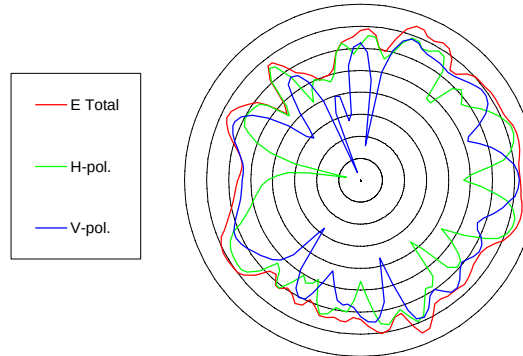
HyperLAN (5.470 GHz - 5.825 GHz) Antenna Radiation Patterns

Main antenna @5.47 GHz



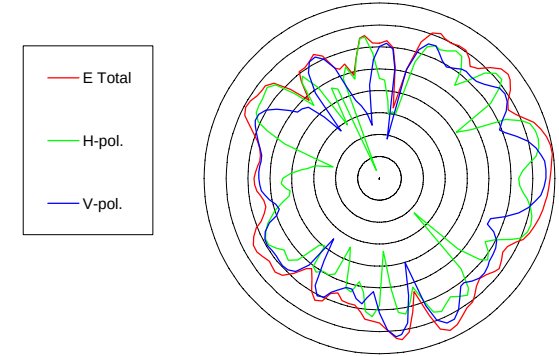
	Total	H-pol	V pol
Peak Gain	2.26	1.37	0.88
Average Gain	-1.84	-5.46	-5.01

Main antenna @5.6475 GHz



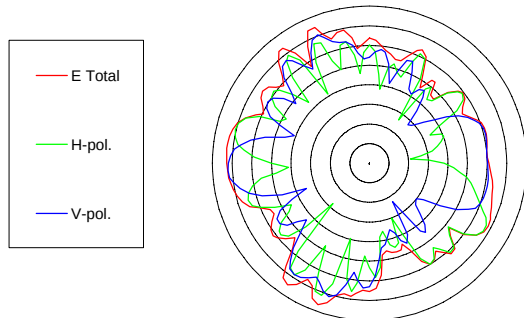
	Total	H-pol	V pol
Peak Gain	2.36	1.34	1.09
Average Gain	-1.85	-5.05	-5.44

Main antenna @5.825 GHz



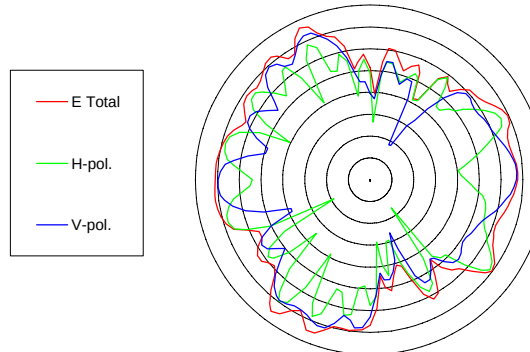
	Total	H-pol	V pol
Peak Gain	4.76	2.28	3.05
Average Gain	-1.73	-5.59	-4.63

Aux antenna @5.47 GHz



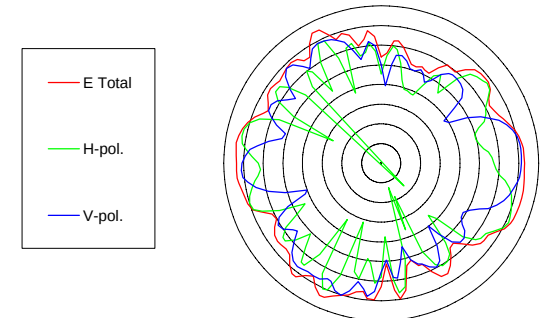
	Total	H-pol	V pol
Peak Gain	3.31	0.87	1.05
Average Gain	-3.10	-6.83	-6.39

Aux antenna @5.6475 GHz



	Total	H-pol	V pol
Peak Gain	3.28	-0.20	1.25
Average Gain	-2.58	-6.68	-5.33

Aux antenna @5.825 GHz



	Total	H-pol	V pol
Peak Gain	2.42	1.03	0.65
Average Gain	-1.44	-5.22	-4.55

Note: The outer circle approximately represents the 5 dBi gain circle.
Each circle with 5 dBi difference (Max=5 dBi and Min=-35 dBi)