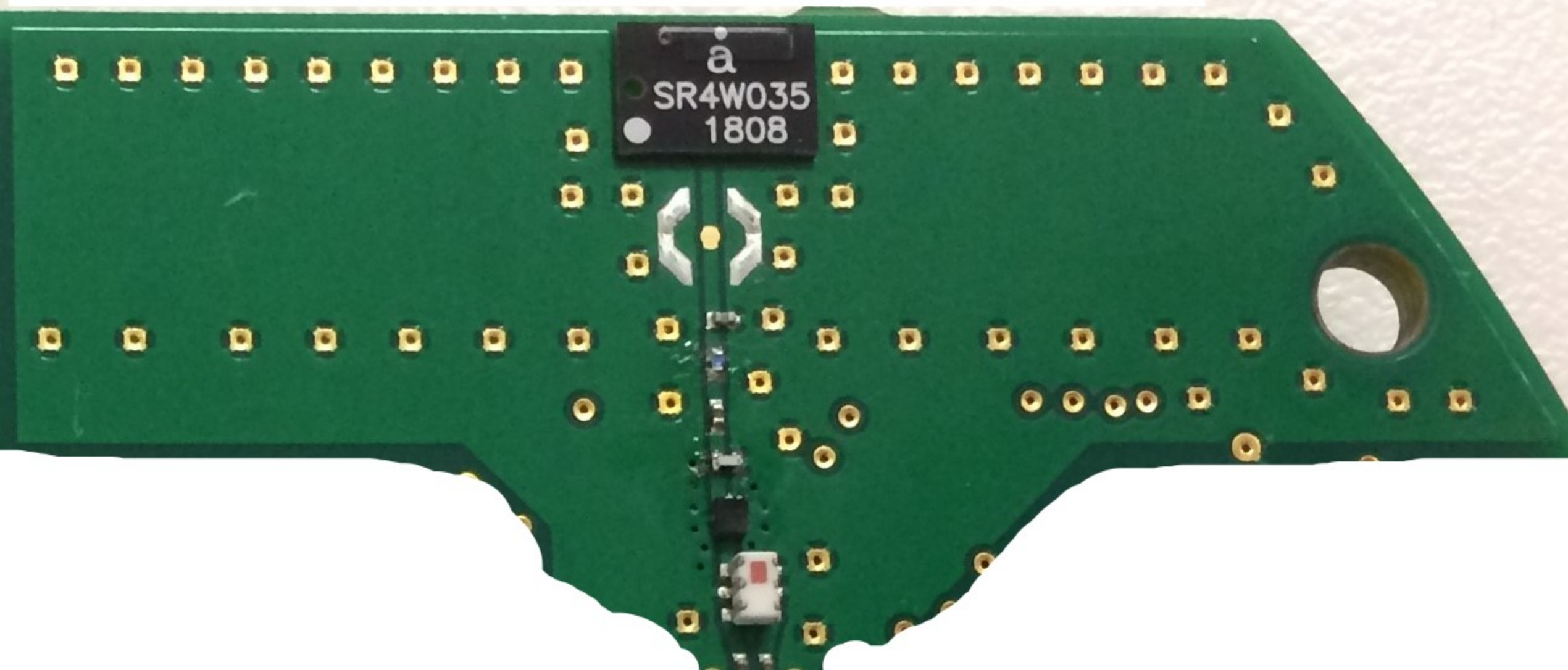


GEO20 Location Radio Antenna System with Sr4W035 Chip Antenna
TX 2405 to 2475 MHz
Gain +0.92 dBi



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch0 2405MHz

Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

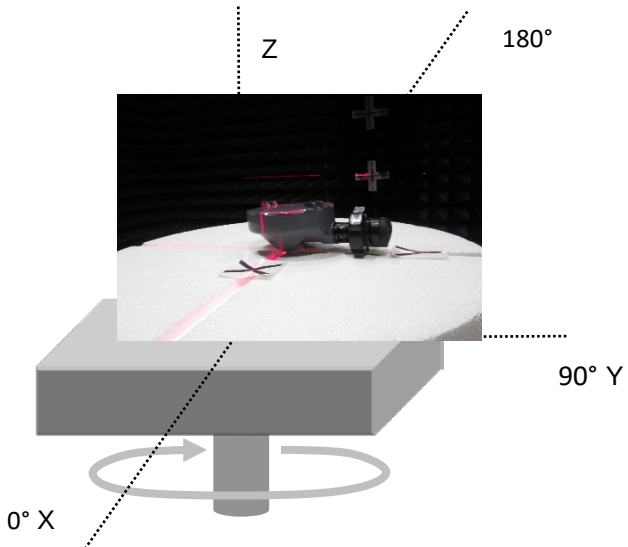
OTA 2018.01.04

COMMENTS

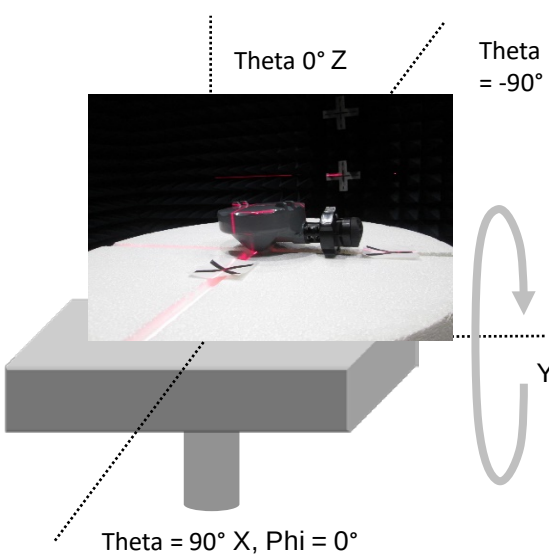
None

3D PATTERN DATA	
Frequency (MHz)	2405
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	-1.90
Peak EIRP (dBm)	3.04
Directivity (dBi)	4.95
Efficiency (dB)	-5.90
Efficiency (%)	25.69
Gain (dBi)	-0.96
Average Gain (dB)	-5.90
E-Plane 3 dB BW (°)	71.00

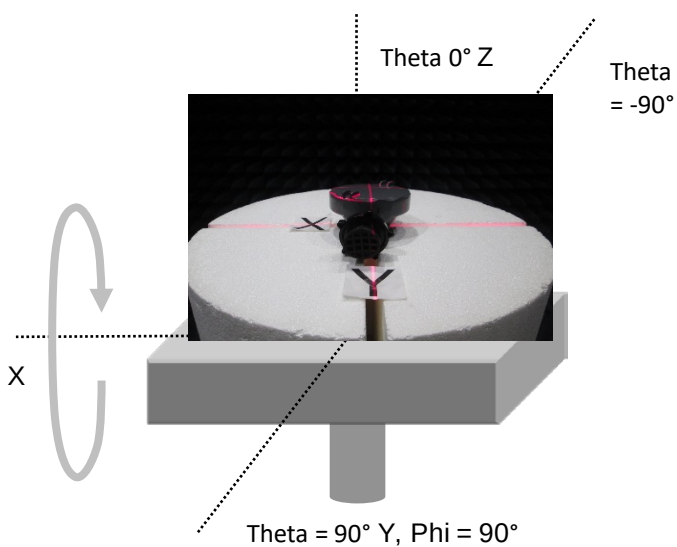
Azimuth Cut (Theta Axis = 90°)



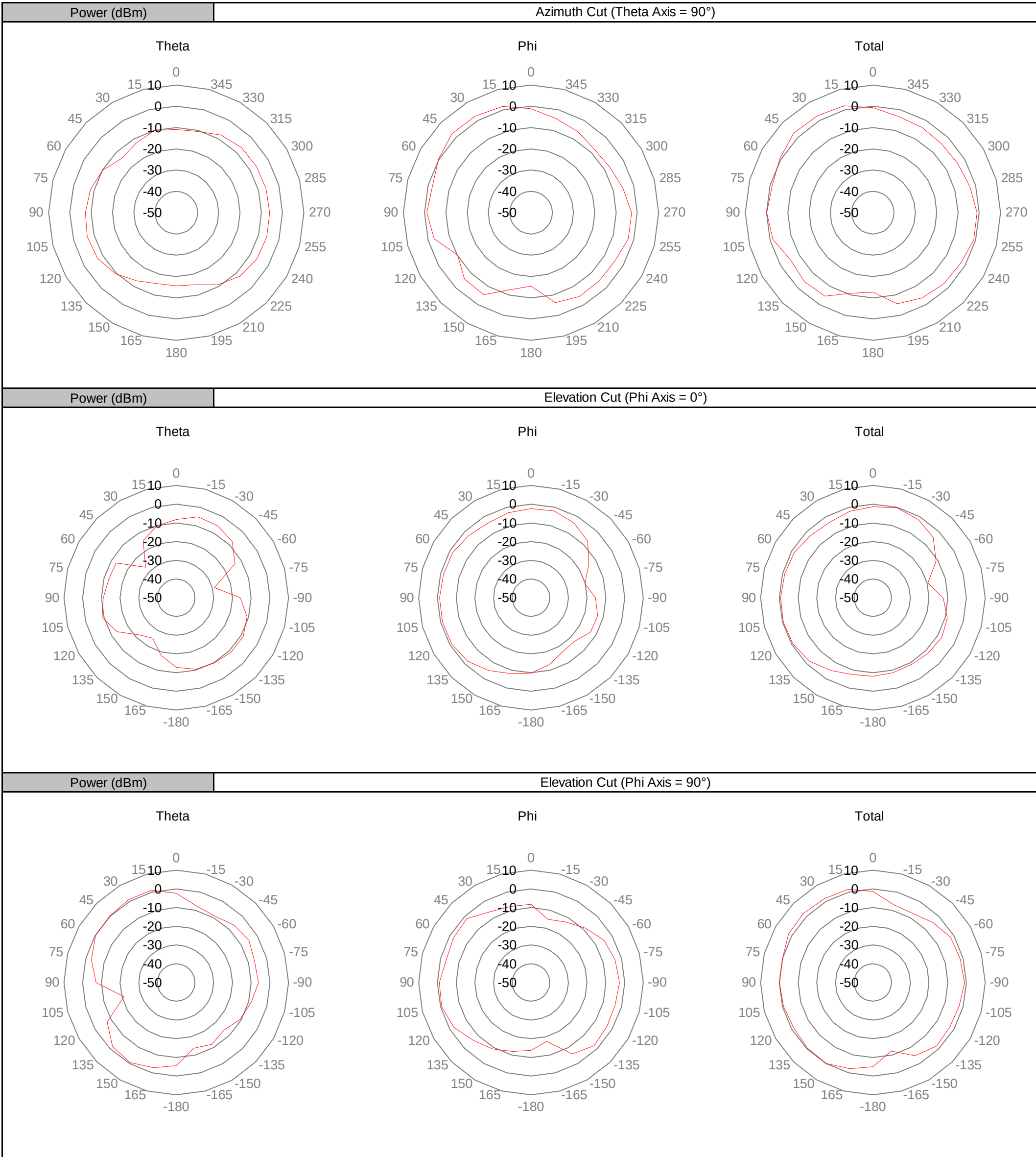
Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



POLAR PLOTS



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



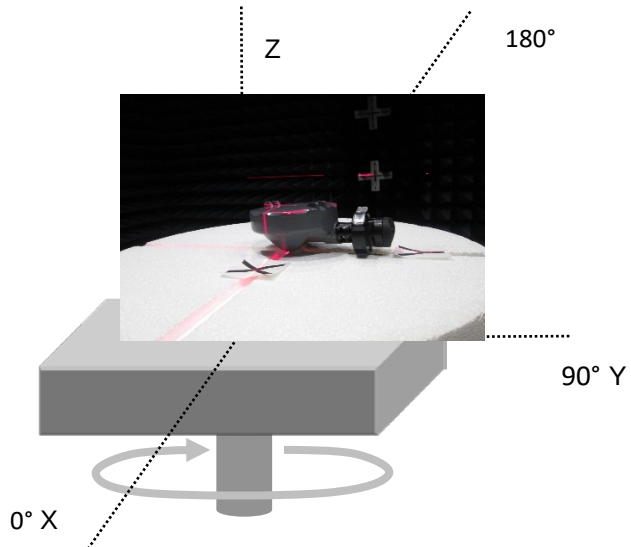
EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch1 2410MHz

Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

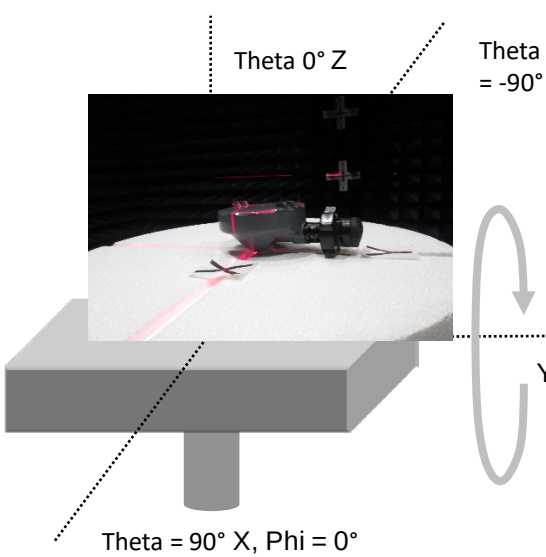
COMMENTS
None

3D PATTERN DATA	
Frequency (MHz)	2410
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	-1.54
Peak EIRP (dBm)	3.44
Directivity (dBi)	4.97
Efficiency (dB)	-5.54
Efficiency (%)	27.95
Gain (dBi)	-0.56
Average Gain (dB)	-5.54
E-Plane 3 dB BW (°)	70.00

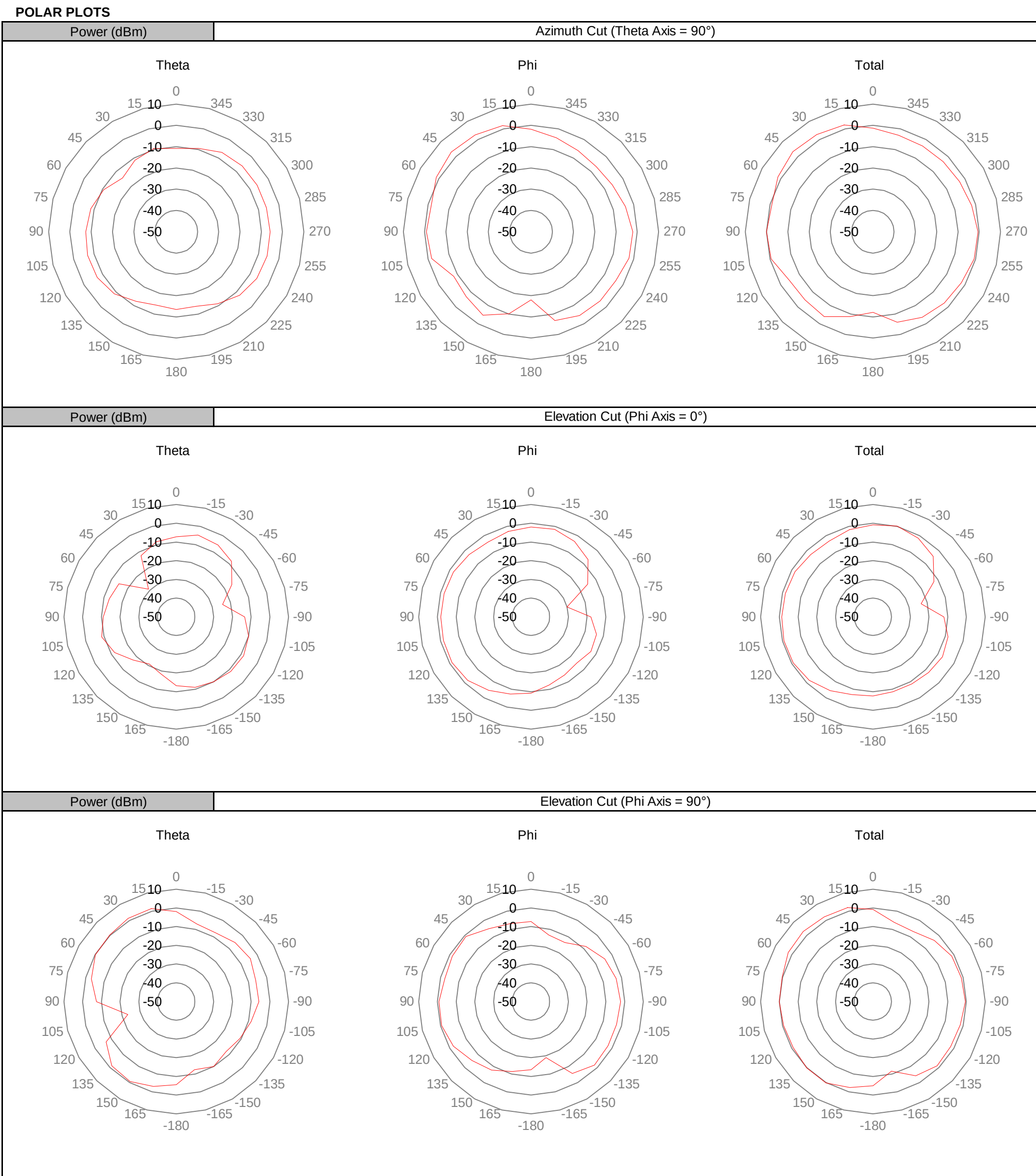
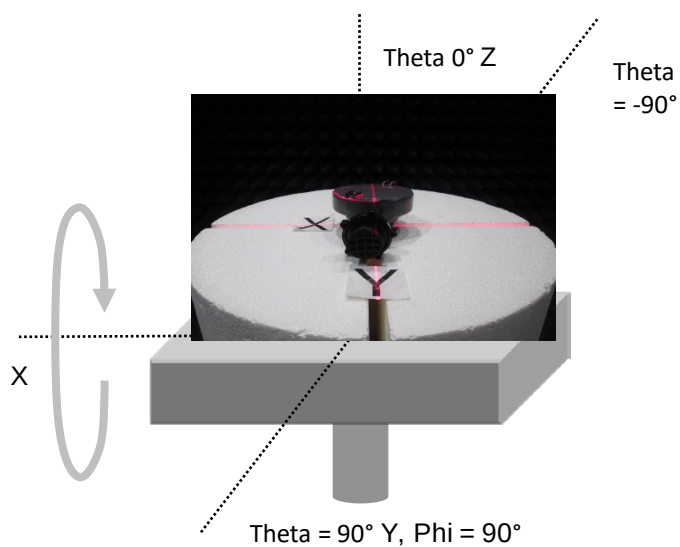
Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch2 2415MHz

Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

OTA 2018.01.04

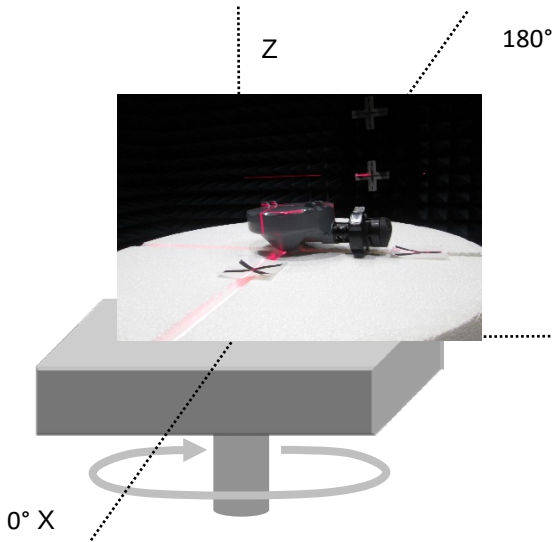
COMMENTS

None

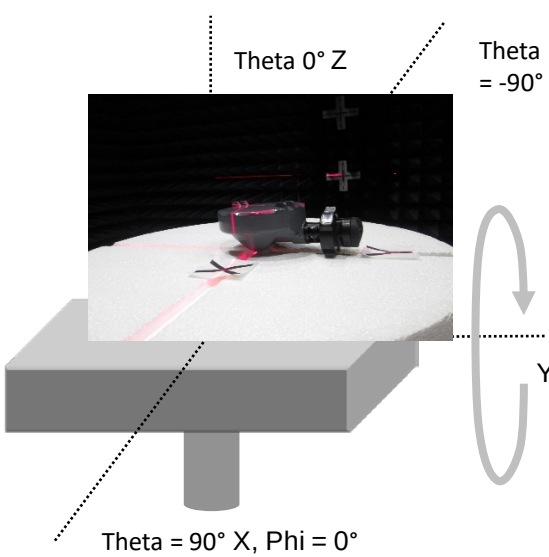
3D PATTERN DATA

Frequency (MHz)	2415
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	-1.09
Peak EIRP (dBm)	3.78
Directivity (dBi)	4.86
Efficiency (dB)	-5.09
Efficiency (%)	31.00
Gain (dBi)	-0.22
Average Gain (dB)	-5.09
E-Plane 3 dB BW (°)	69.00

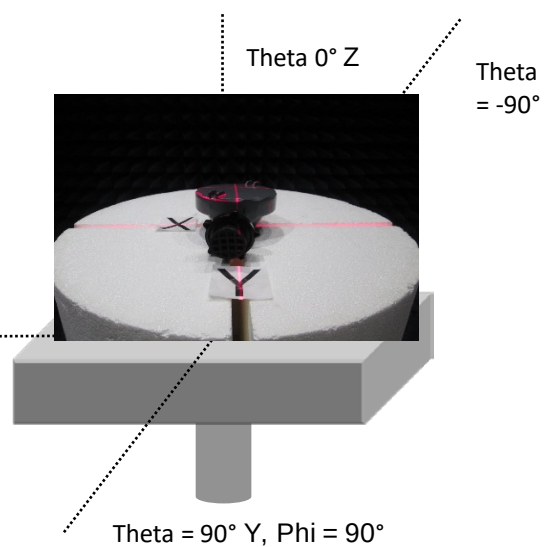
Azimuth Cut (Theta Axis = 90°)



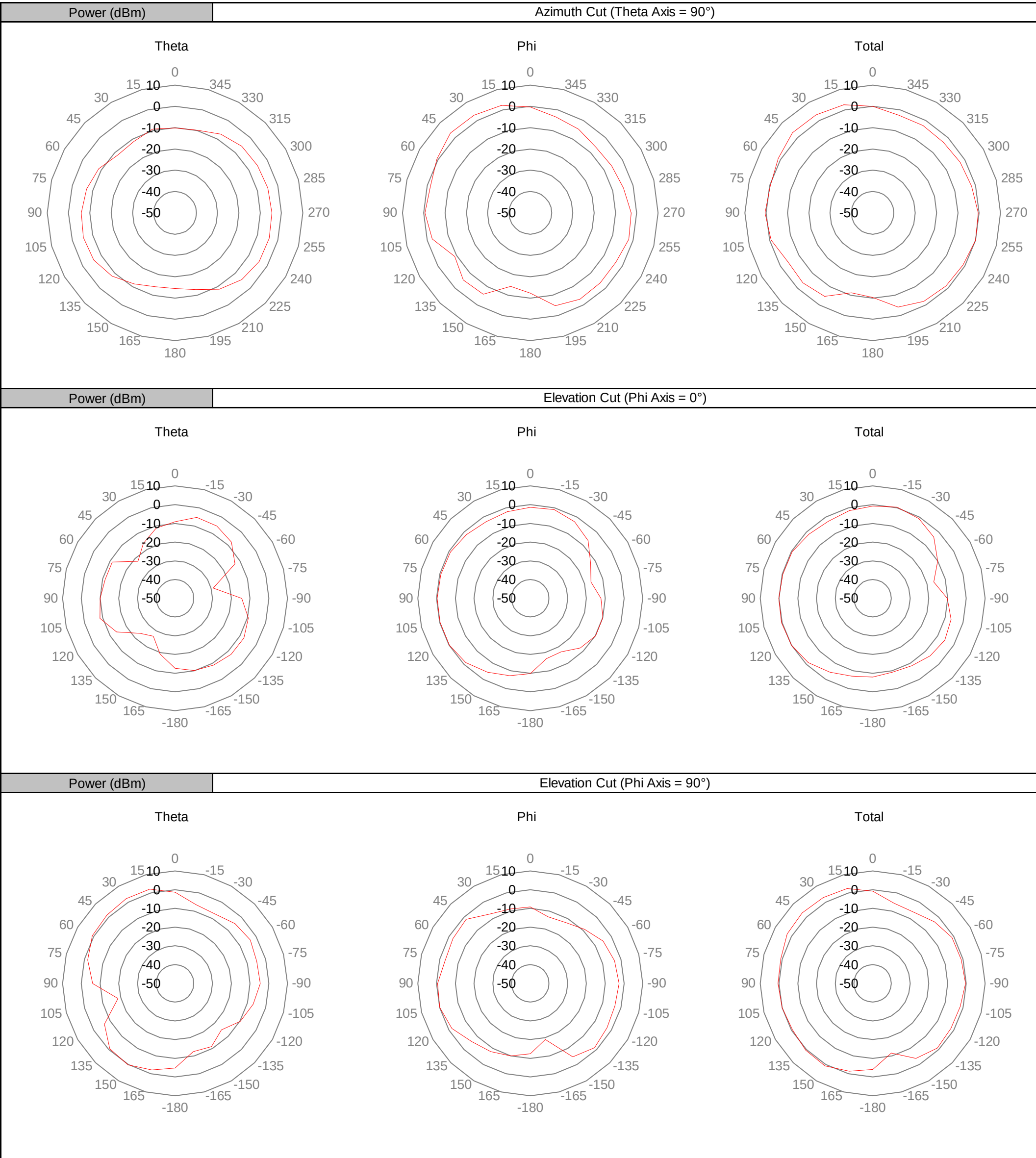
Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



POLAR PLOTS



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch3 2420MHz

Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

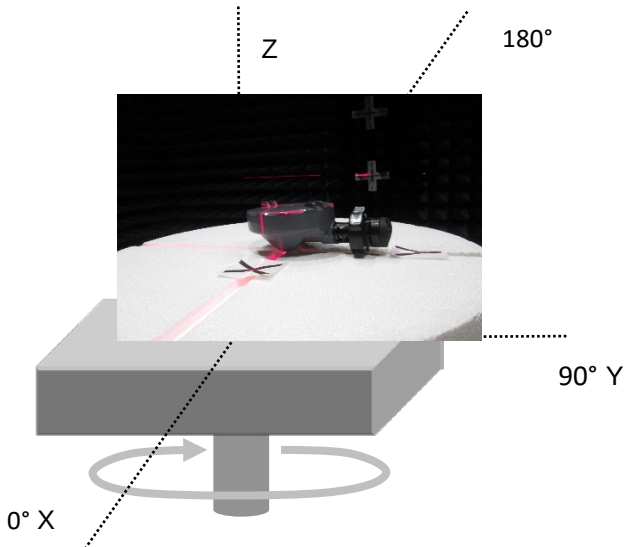
OTA 2018.01.04

COMMENTS

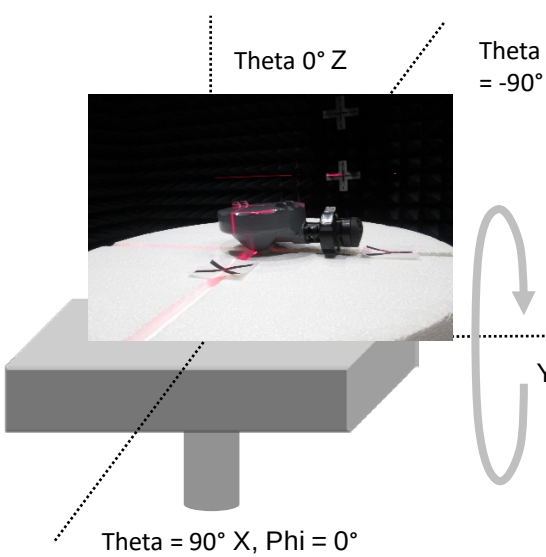
None

3D PATTERN DATA	
Frequency (MHz)	2420
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	-0.56
Peak EIRP (dBm)	4.26
Directivity (dBi)	4.82
Efficiency (dB)	-4.56
Efficiency (%)	34.98
Gain (dBi)	0.26
Average Gain (dB)	-4.56
E-Plane 3 dB BW (°)	69.00

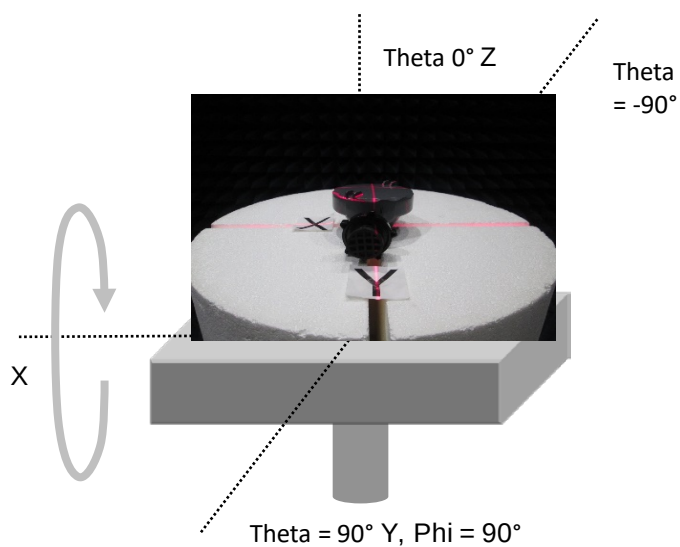
Azimuth Cut (Theta Axis = 90°)



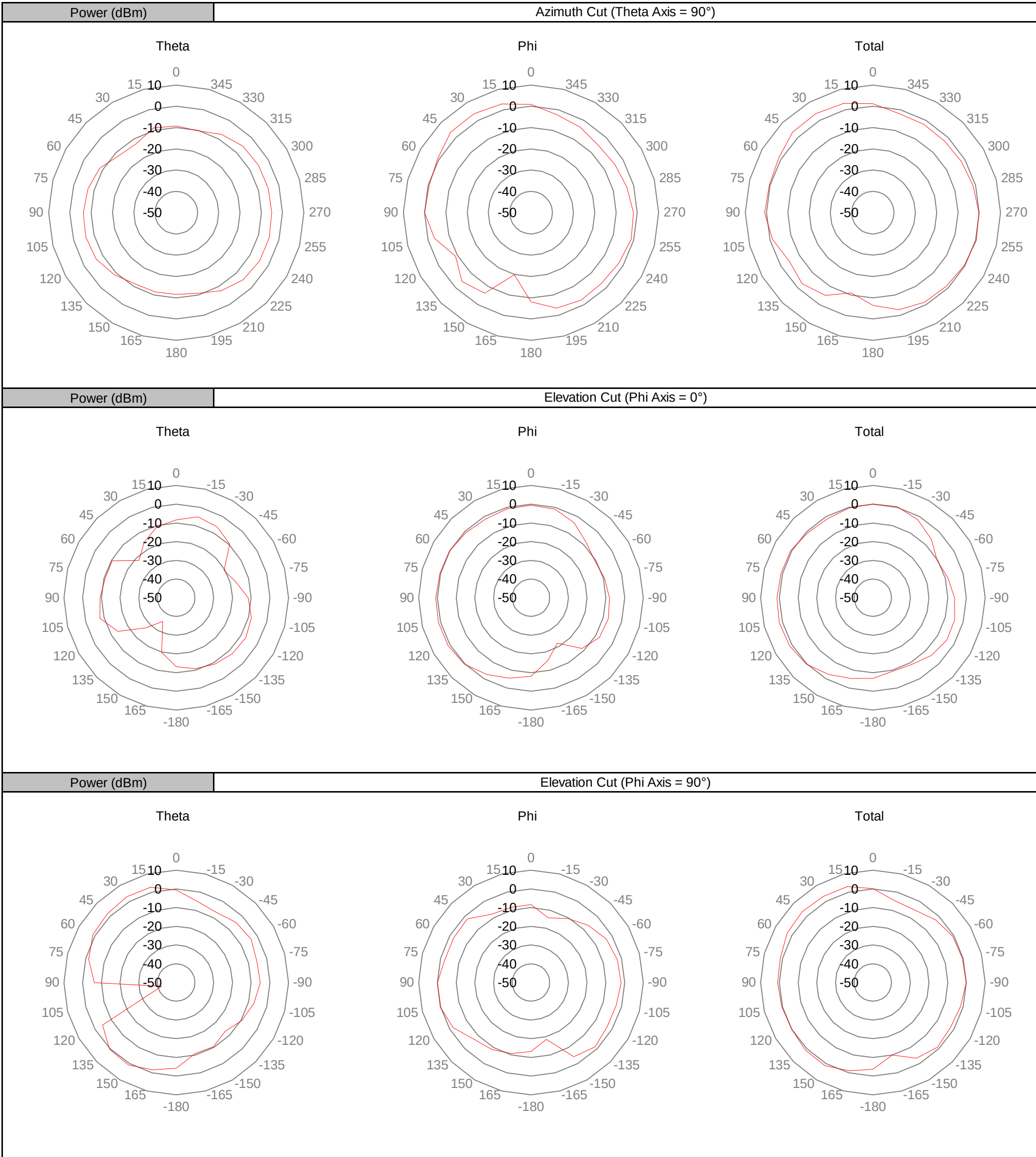
Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



POLAR PLOTS



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch4 2425MHz

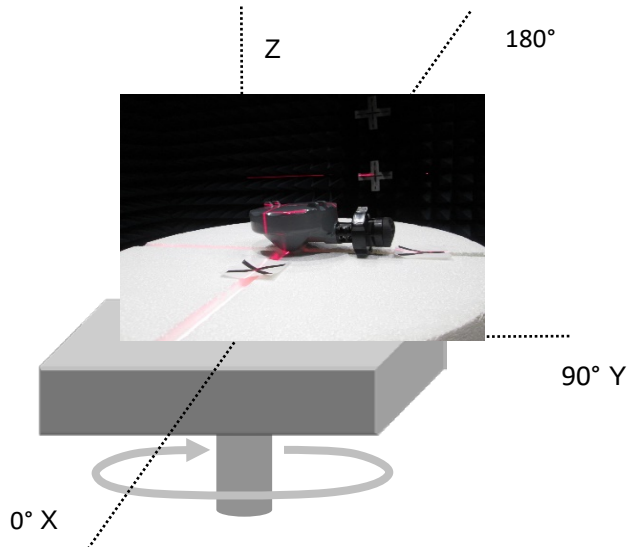
Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

OTA 2018.01.04

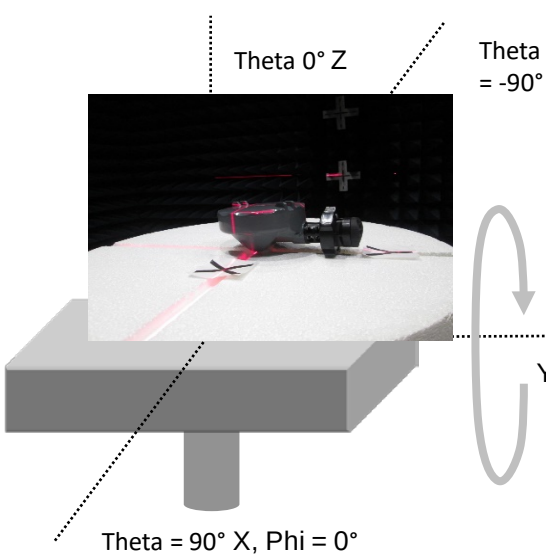
COMMENTS
None

3D PATTERN DATA	
Frequency (MHz)	2425
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	-0.07
Peak EIRP (dBm)	4.82
Directivity (dBi)	4.90
Efficiency (dB)	-4.07
Efficiency (%)	39.17
Gain (dBi)	0.82
Average Gain (dB)	-4.07
E-Plane 3 dB BW (°)	72.00

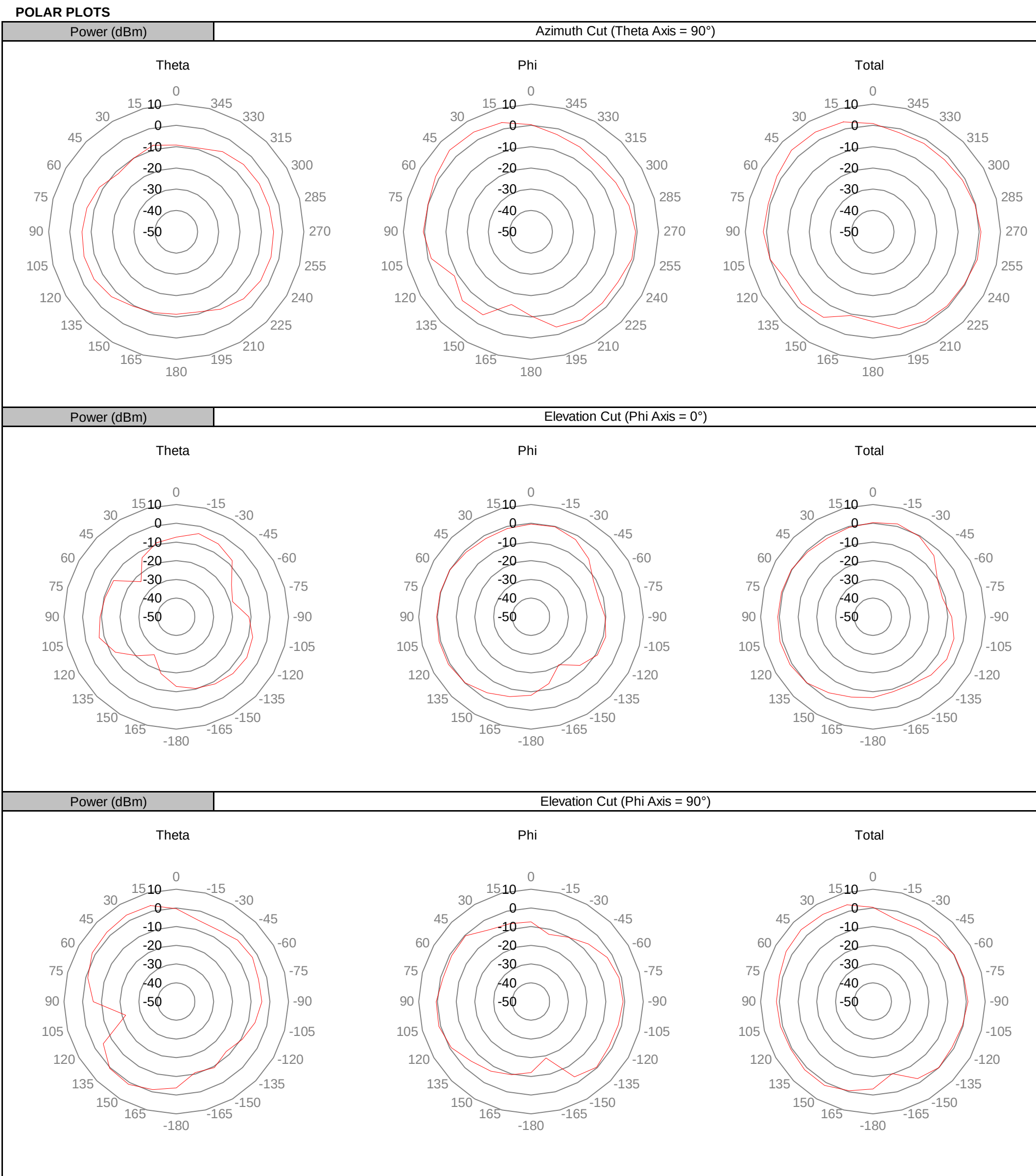
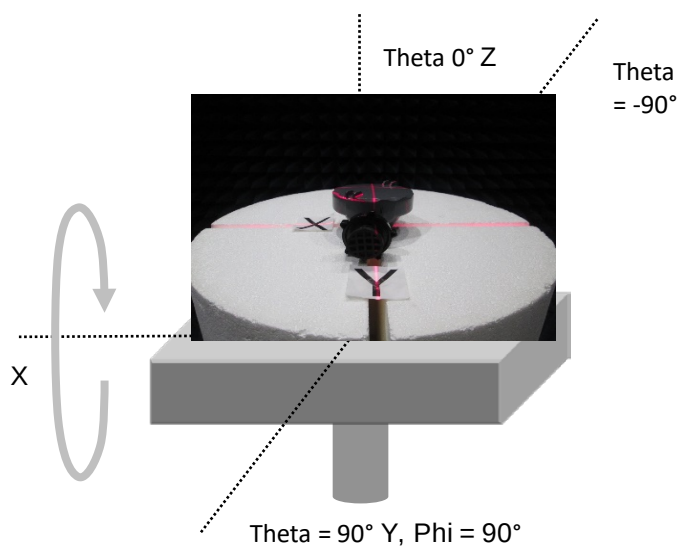
Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



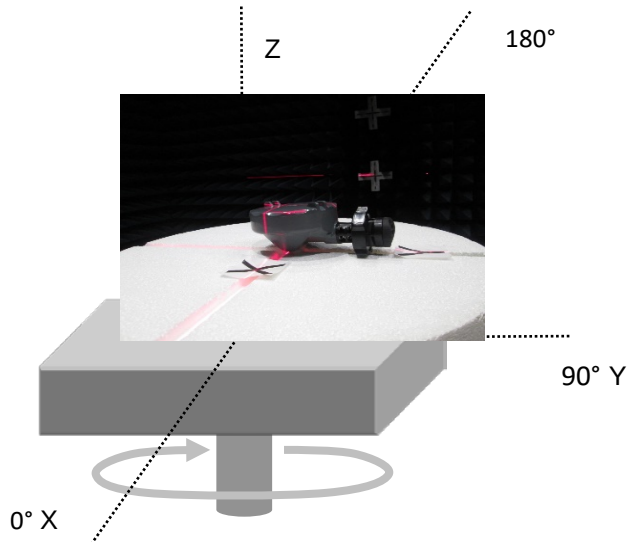
EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch5 2430MHz

Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

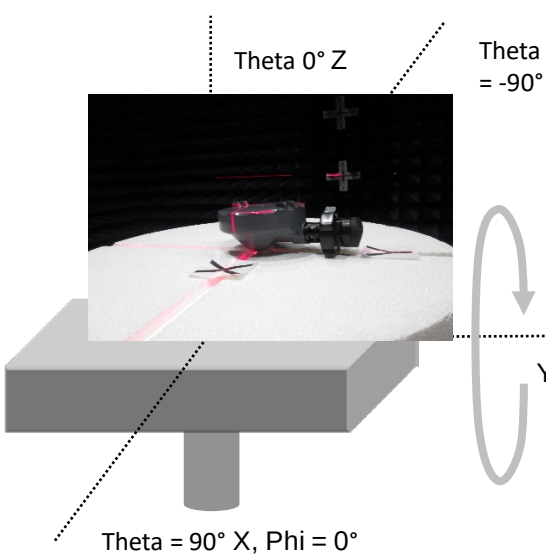
COMMENTS
None

3D PATTERN DATA	
Frequency (MHz)	2430
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	0.01
Peak EIRP (dBm)	4.92
Directivity (dBi)	4.91
Efficiency (dB)	-3.99
Efficiency (%)	39.87
Gain (dBi)	0.92
Average Gain (dB)	-3.99
E-Plane 3 dB BW (°)	71.00

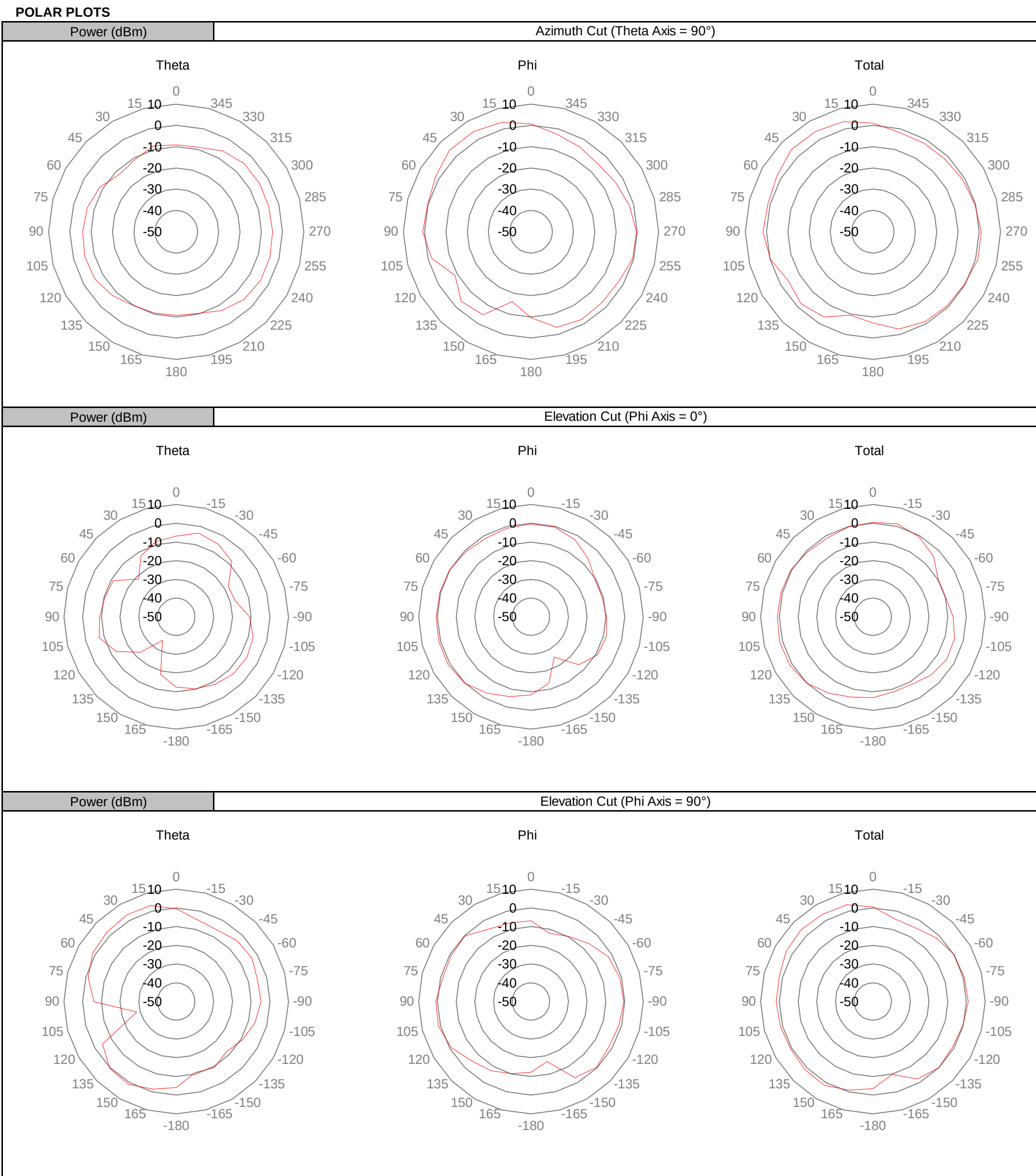
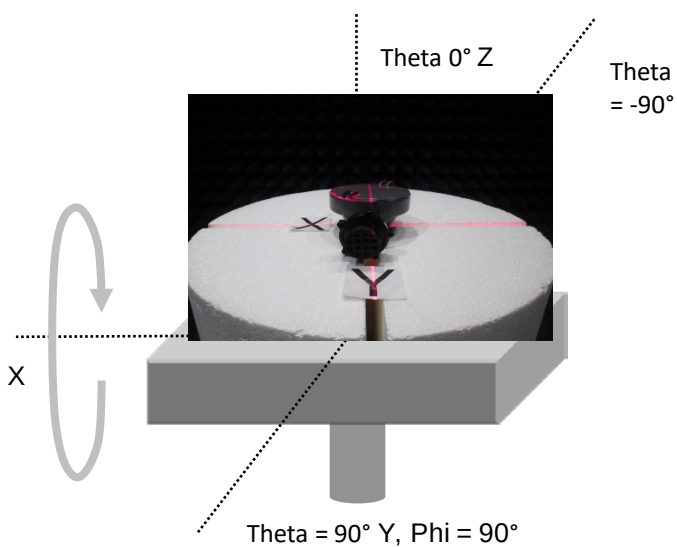
Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch6 2435MHz

OTA 2018.01.04

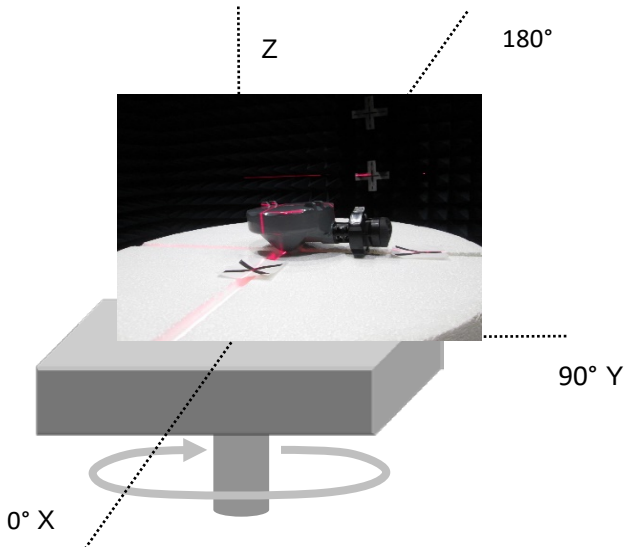
Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

COMMENTS

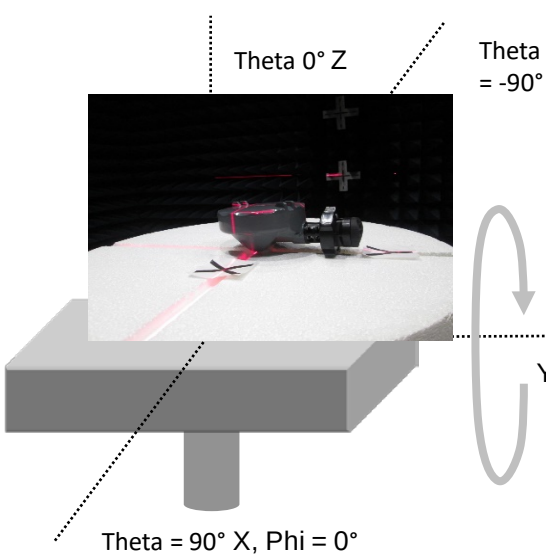
None

3D PATTERN DATA	
Frequency (MHz)	2435
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	-0.12
Peak EIRP (dBm)	4.88
Directivity (dBi)	5.01
Efficiency (dB)	-4.12
Efficiency (%)	38.68
Gain (dBi)	0.88
Average Gain (dB)	-4.12
E-Plane 3 dB BW (°)	70.00

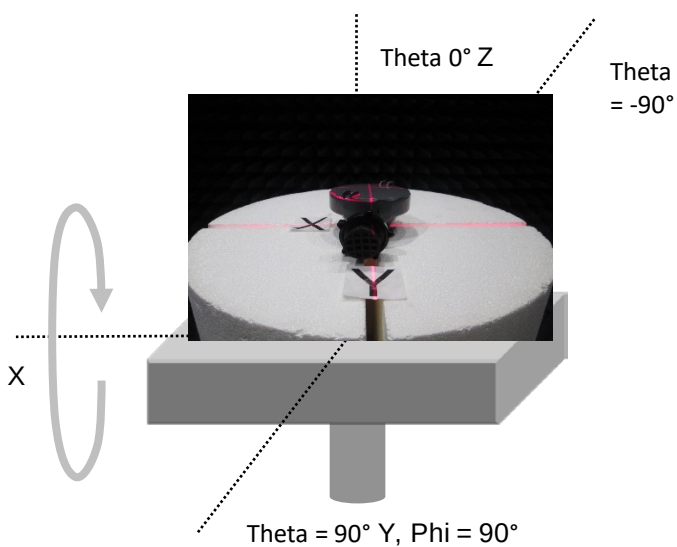
Azimuth Cut (Theta Axis = 90°)



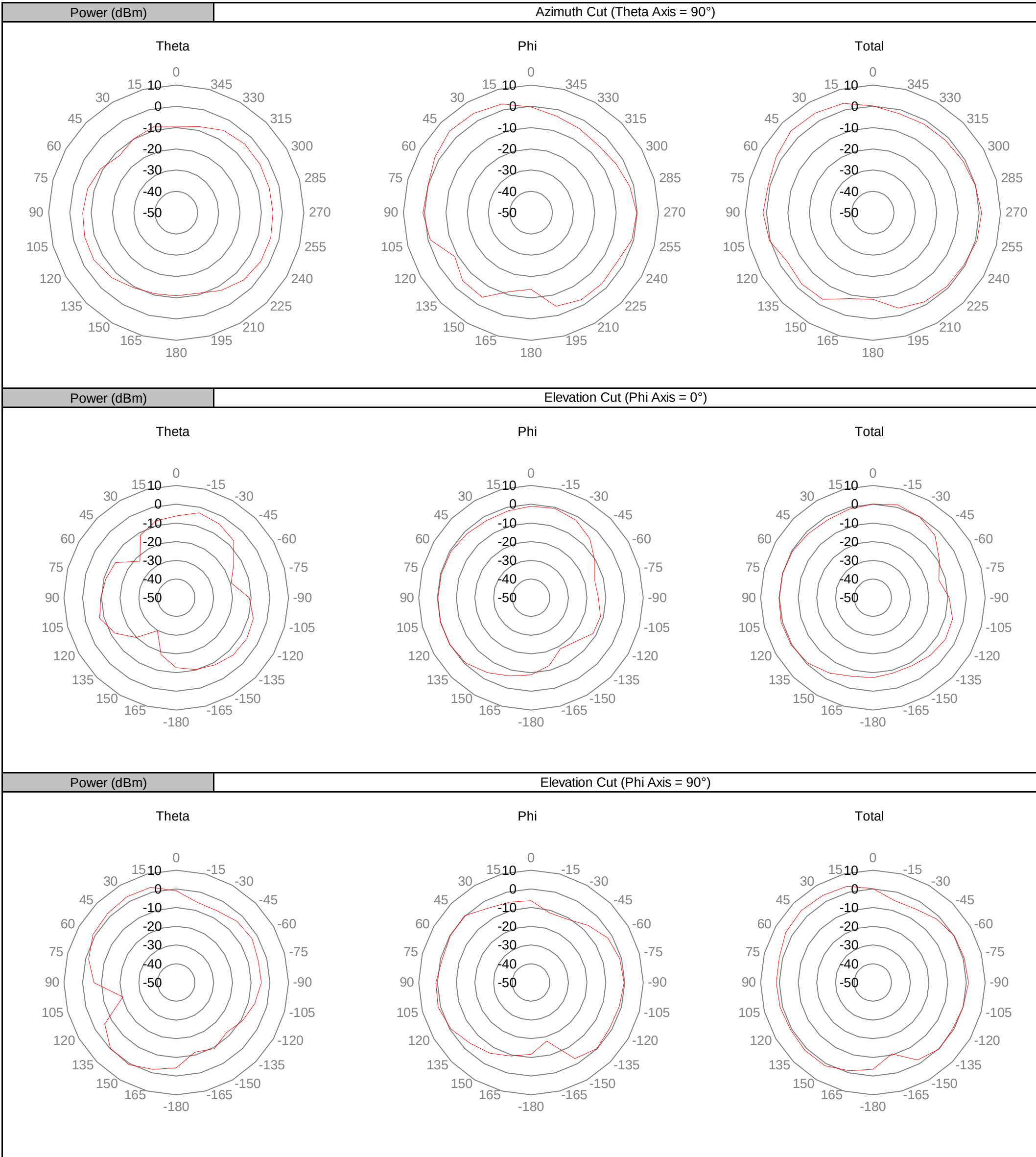
Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



POLAR PLOTS



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch7 2440MHz

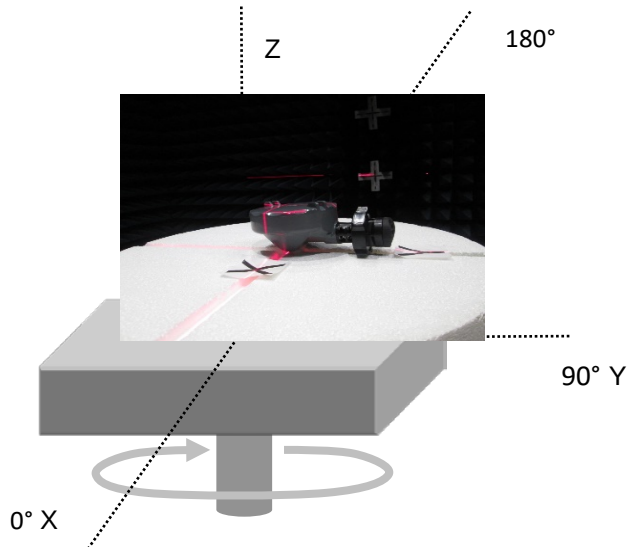
Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

OTA 2018.01.04

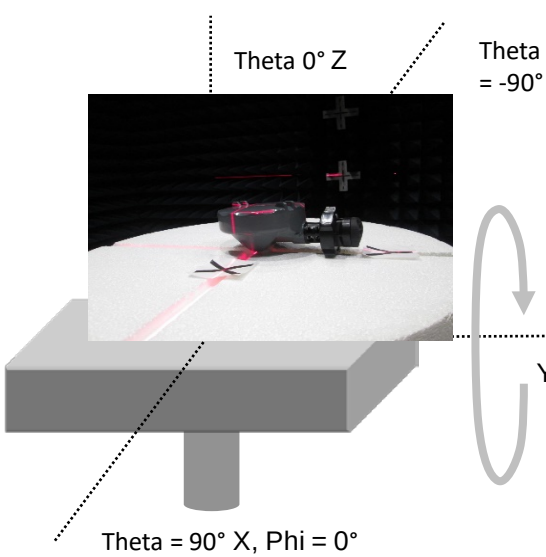
COMMENTS
None

3D PATTERN DATA	
Frequency (MHz)	2440
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	-0.27
Peak EIRP (dBm)	4.70
Directivity (dBi)	4.98
Efficiency (dB)	-4.27
Efficiency (%)	37.38
Gain (dBi)	0.70
Average Gain (dB)	-4.27
E-Plane 3 dB BW (°)	70.00

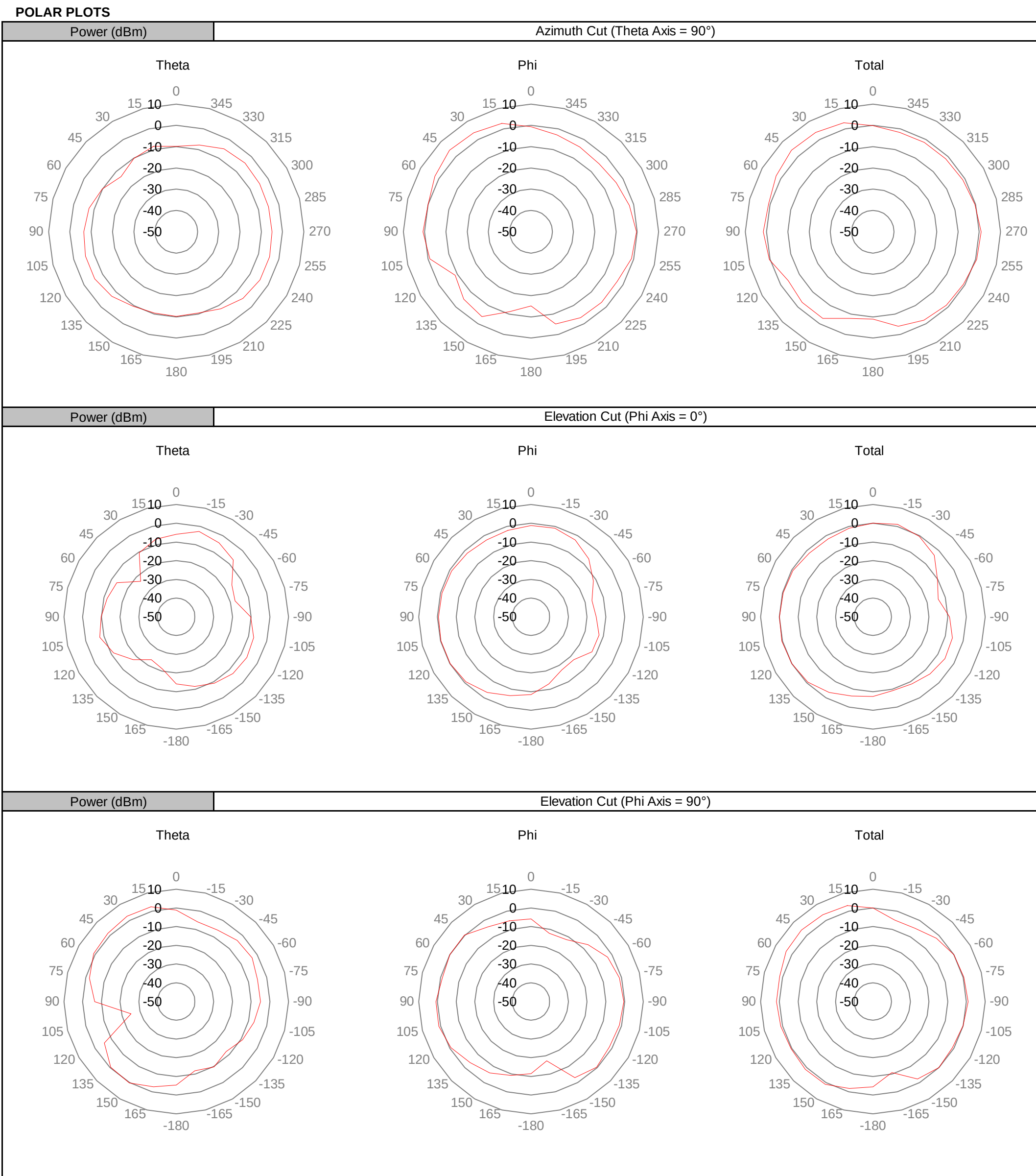
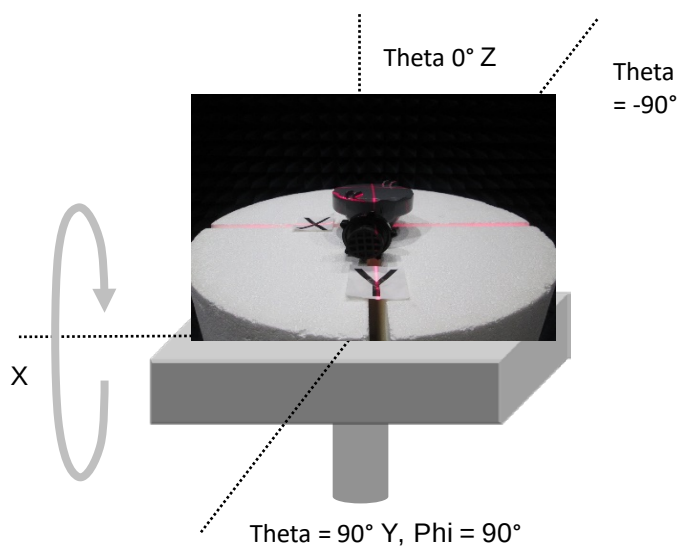
Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



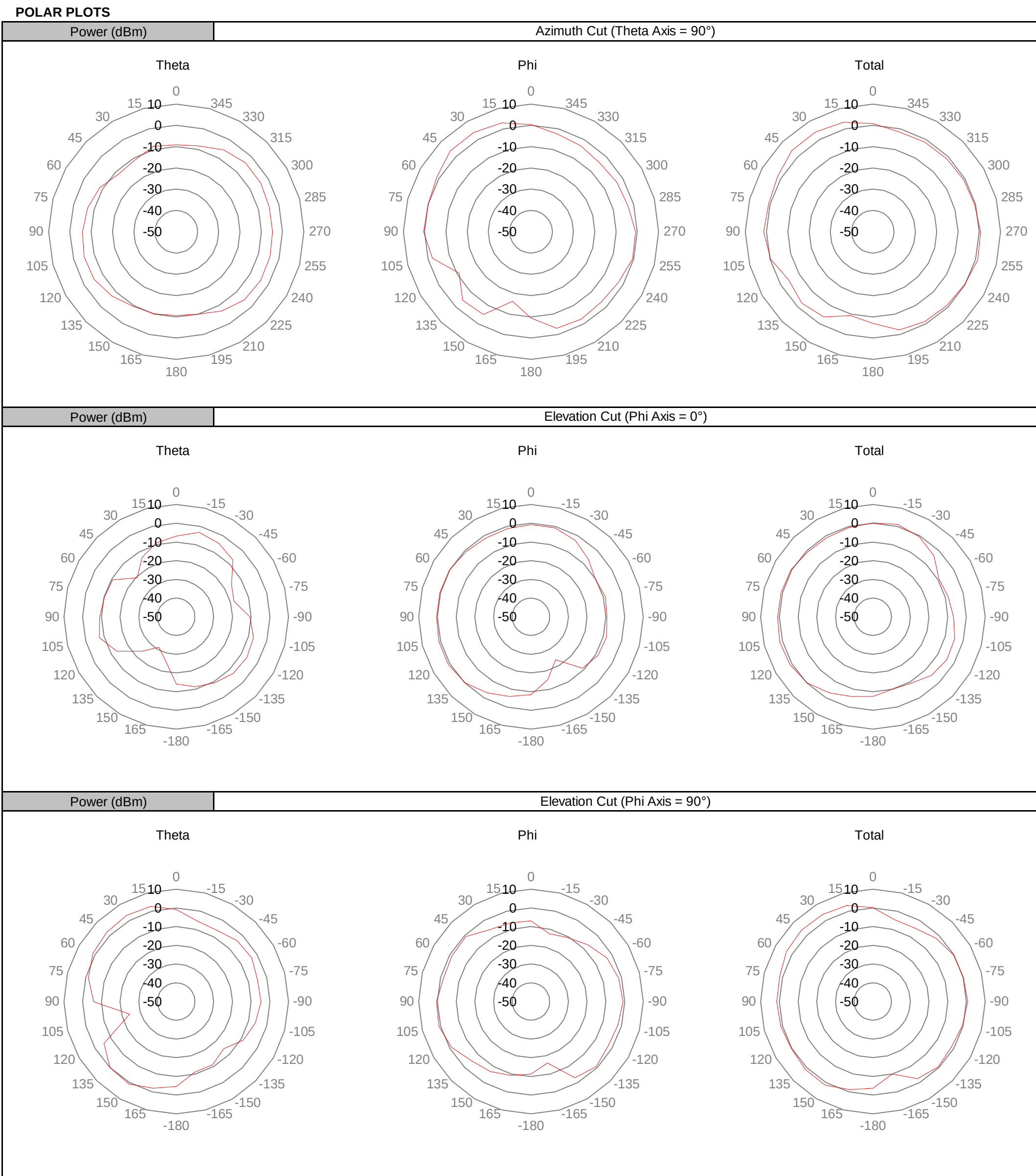
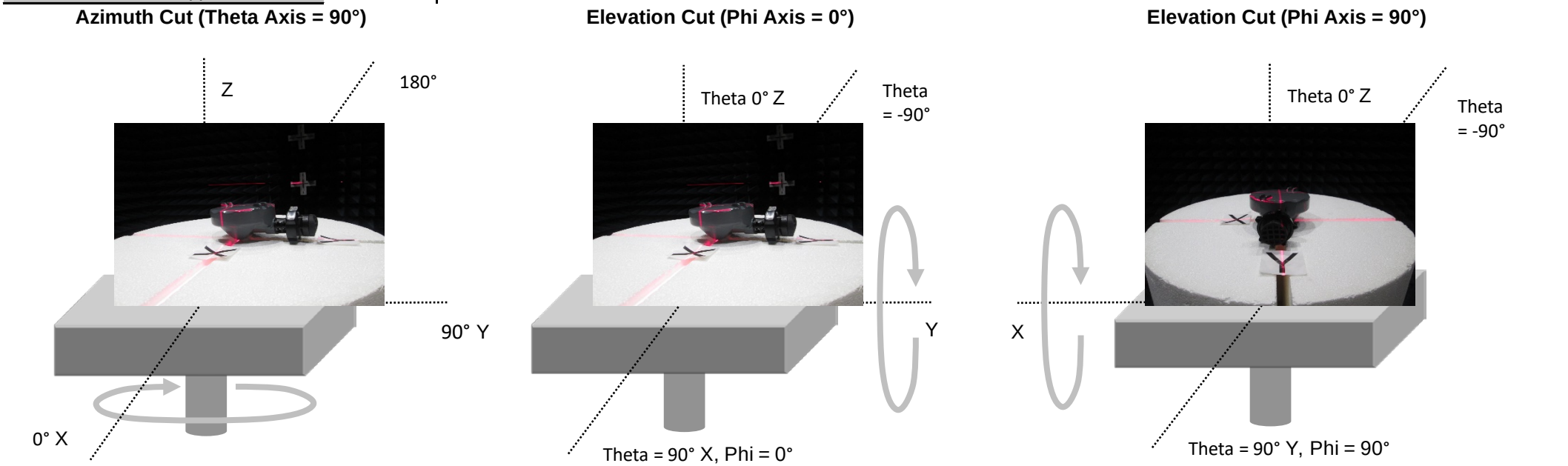
EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch8 2445MHz

Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

OTA 2018.01.04

COMMENTS
None

3D PATTERN DATA	
Frequency (MHz)	2445
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	-0.18
Peak EIRP (dBm)	4.70
Directivity (dBi)	4.88
Efficiency (dB)	-4.18
Efficiency (%)	38.21
Gain (dBi)	0.70
Average Gain (dB)	-4.18
E-Plane 3 dB BW (°)	64.00



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch9 2450MHz

Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

OTA 2018.01.04

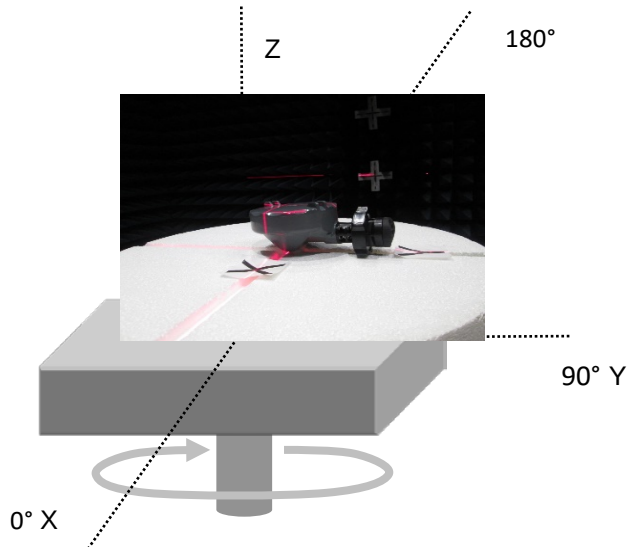
COMMENTS

None

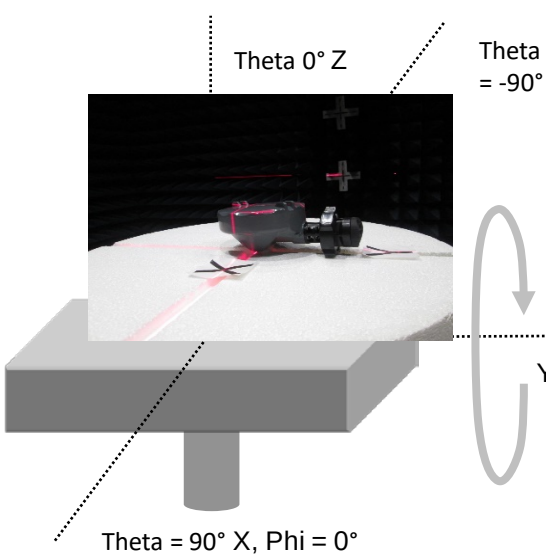
3D PATTERN DATA

Frequency (MHz)	2450
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	-0.19
Peak EIRP (dBm)	4.78
Directivity (dBi)	4.98
Efficiency (dB)	-4.19
Efficiency (%)	38.07
Gain (dBi)	0.78
Average Gain (dB)	-4.19
E-Plane 3 dB BW (°)	68.00

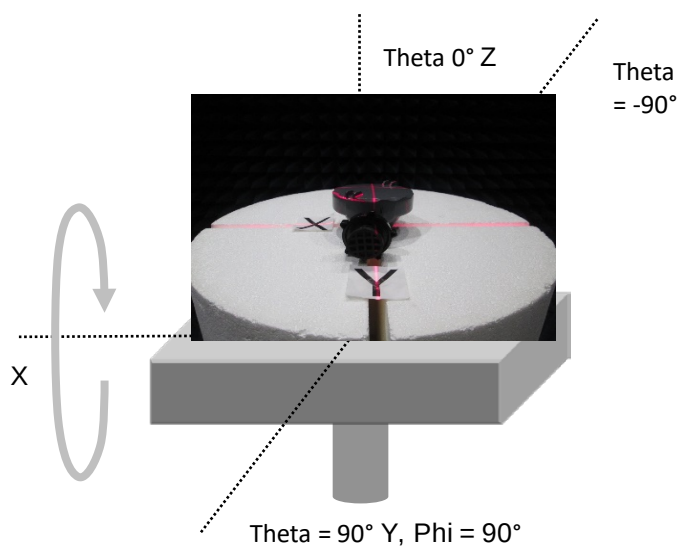
Azimuth Cut (Theta Axis = 90°)



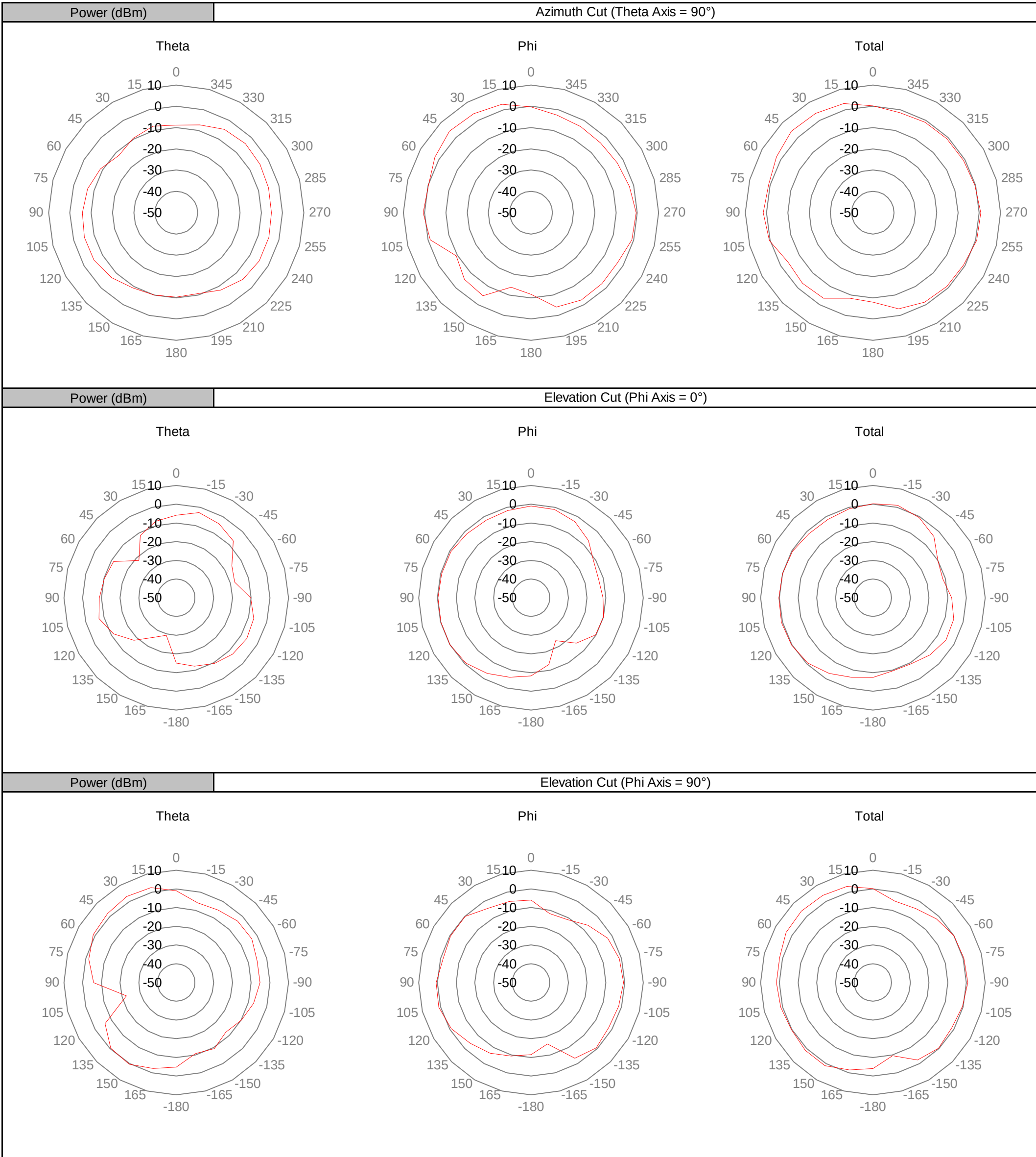
Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



POLAR PLOTS



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch10 2455MHz

OTA 2018.01.04

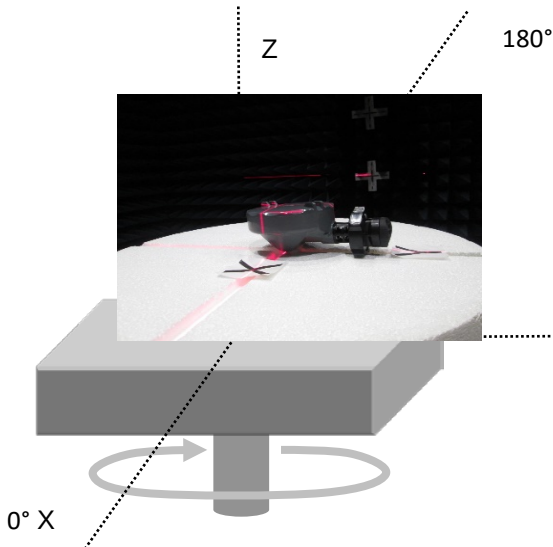
Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

COMMENTS

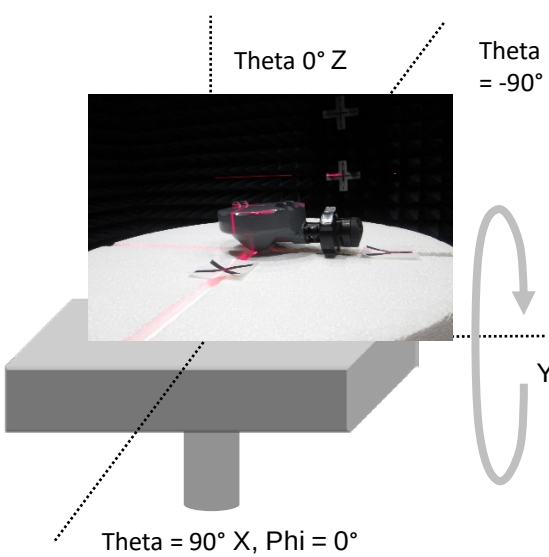
None

3D PATTERN DATA	
Frequency (MHz)	2455
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	-0.03
Peak EIRP (dBm)	4.90
Directivity (dBi)	4.93
Efficiency (dB)	-4.03
Efficiency (%)	39.52
Gain (dBi)	0.90
Average Gain (dB)	-4.03
E-Plane 3 dB BW (°)	68.00

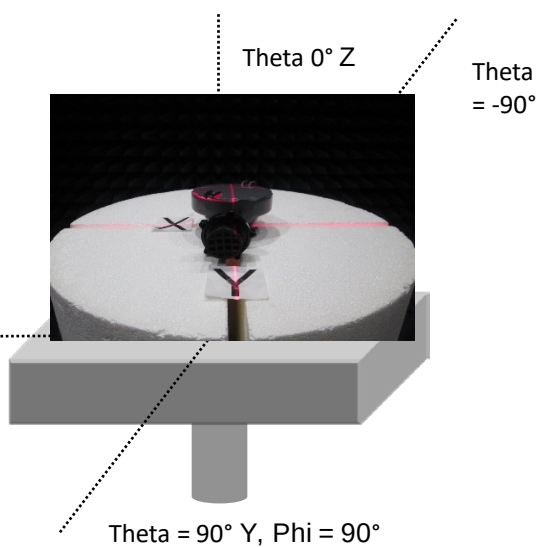
Azimuth Cut (Theta Axis = 90°)



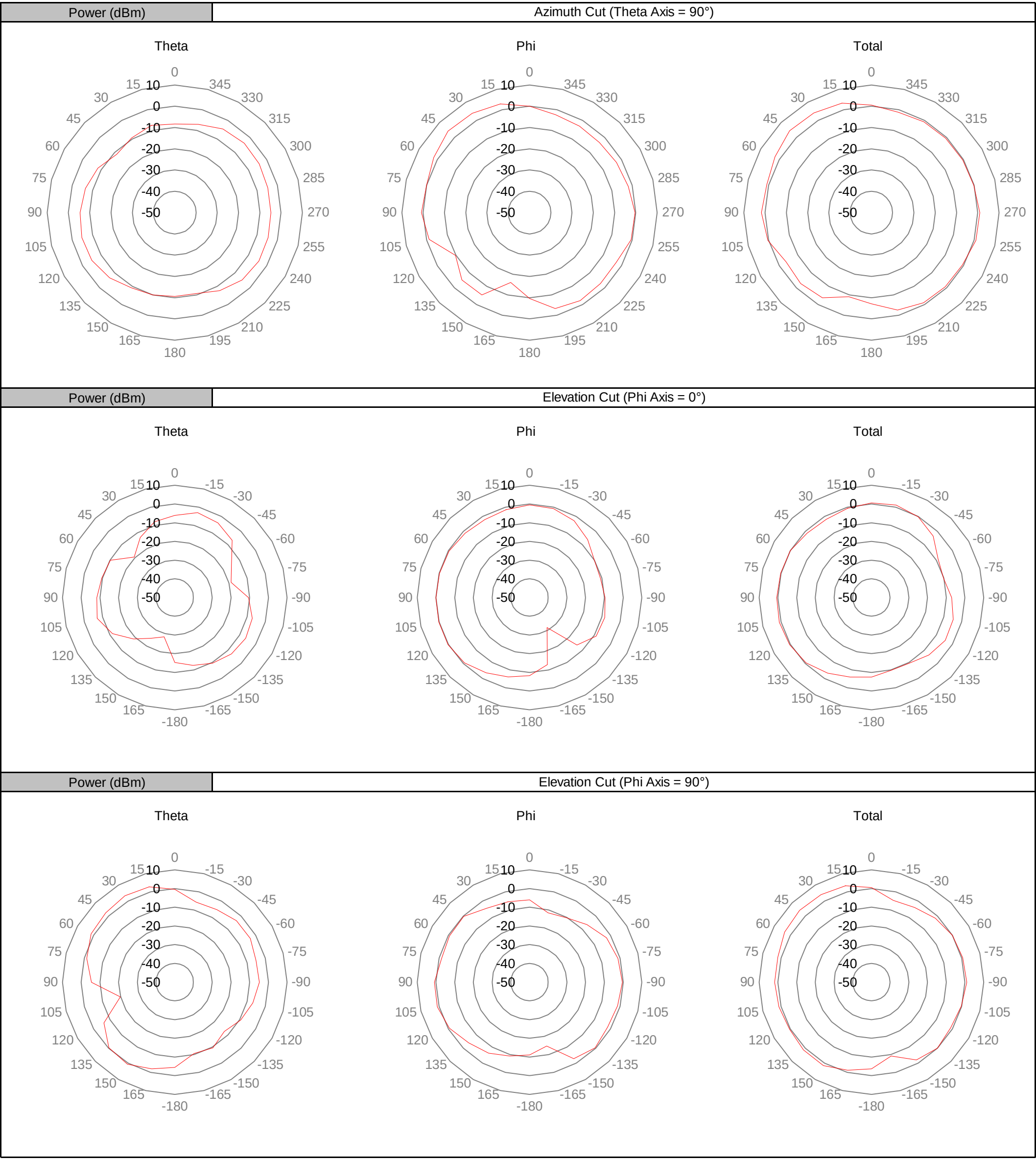
Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



POLAR PLOTS



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch11 2460MHz

Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

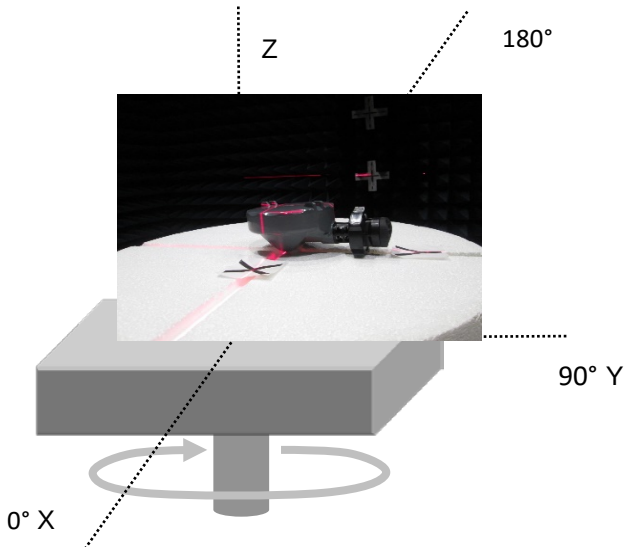
OTA 2018.01.04

COMMENTS

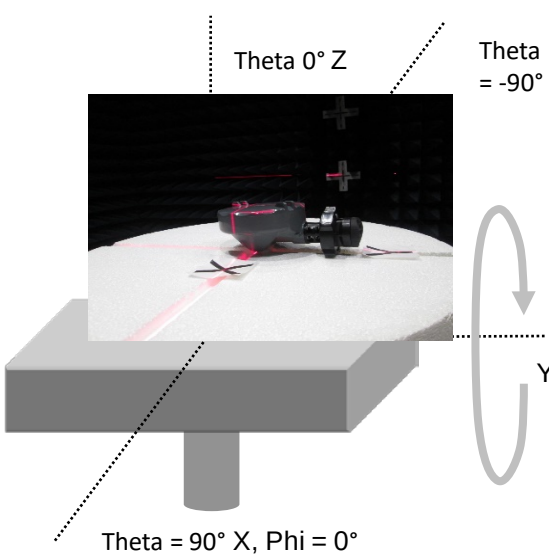
None

3D PATTERN DATA	
Frequency (MHz)	2460
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	0.03
Peak EIRP (dBm)	4.89
Directivity (dBi)	4.86
Efficiency (dB)	-3.97
Efficiency (%)	40.09
Gain (dBi)	0.89
Average Gain (dB)	-3.97
E-Plane 3 dB BW (°)	68.00

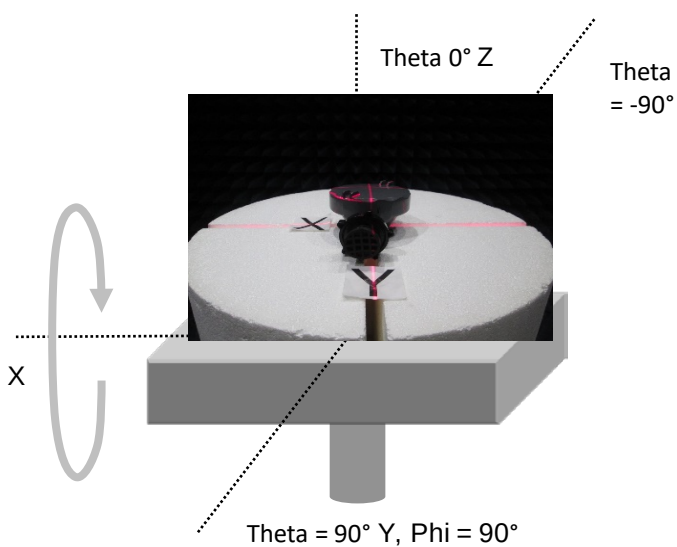
Azimuth Cut (Theta Axis = 90°)



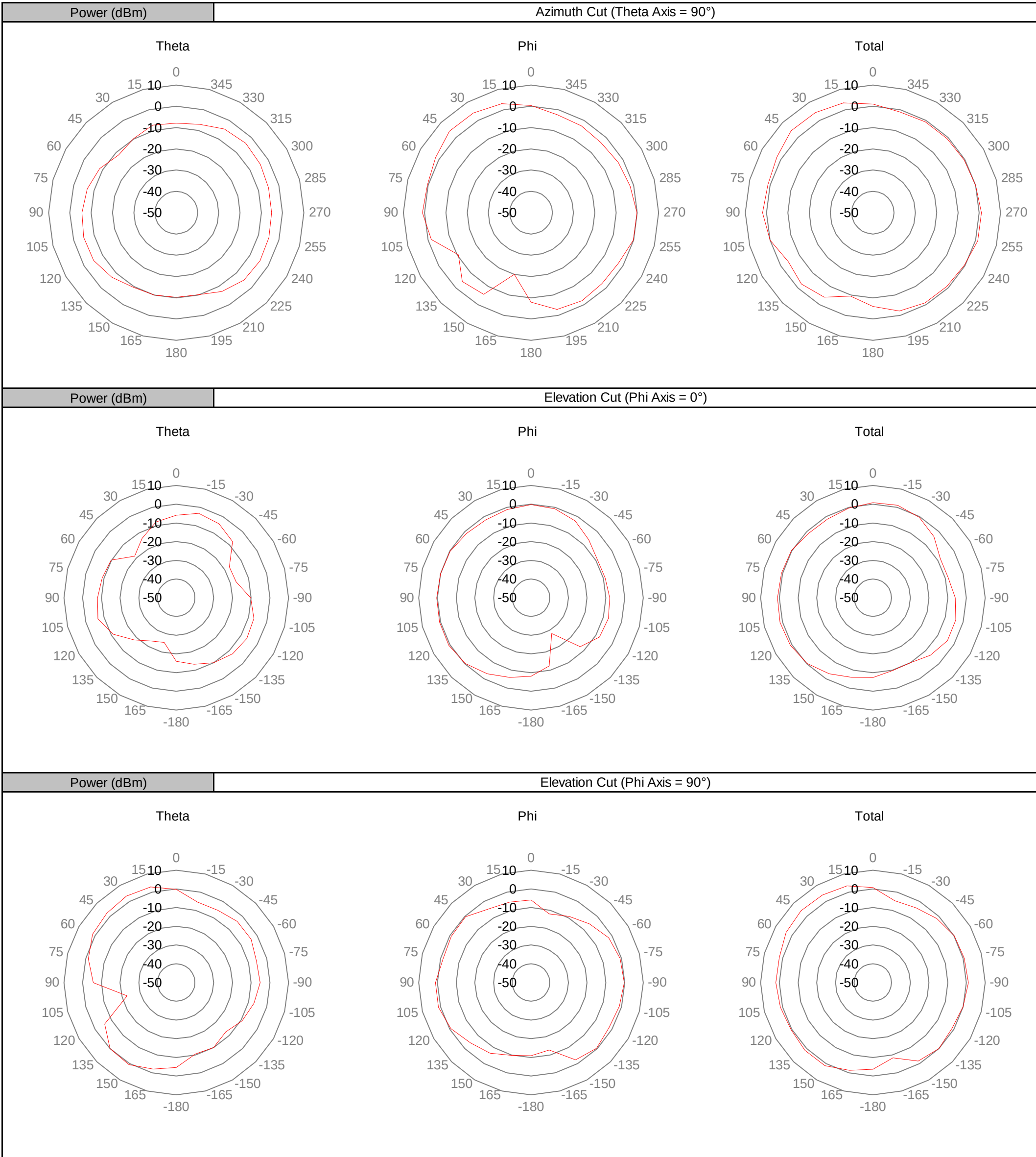
Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



POLAR PLOTS



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



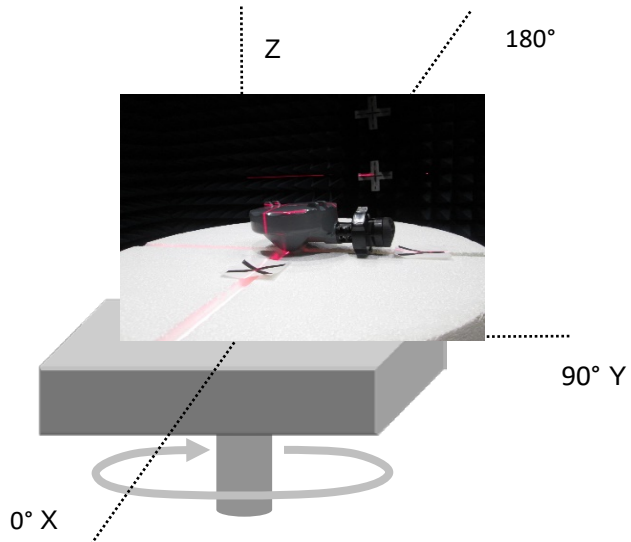
EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch12 2465MHz

Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

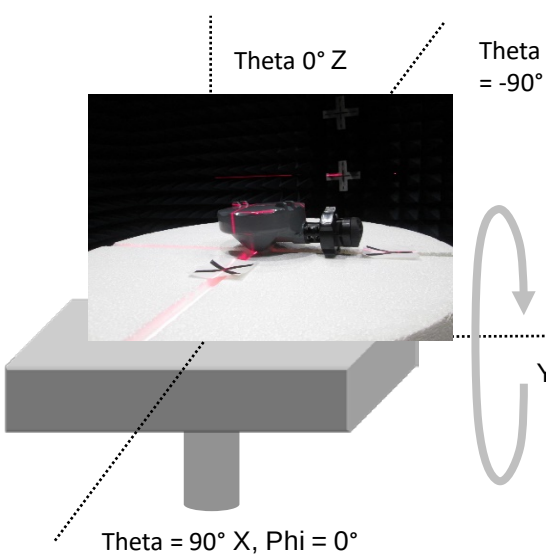
COMMENTS
None

3D PATTERN DATA	
Frequency (MHz)	2465
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	-0.07
Peak EIRP (dBm)	4.74
Directivity (dBi)	4.82
Efficiency (dB)	-4.07
Efficiency (%)	39.13
Gain (dBi)	0.74
Average Gain (dB)	-4.07
E-Plane 3 dB BW (°)	68.00

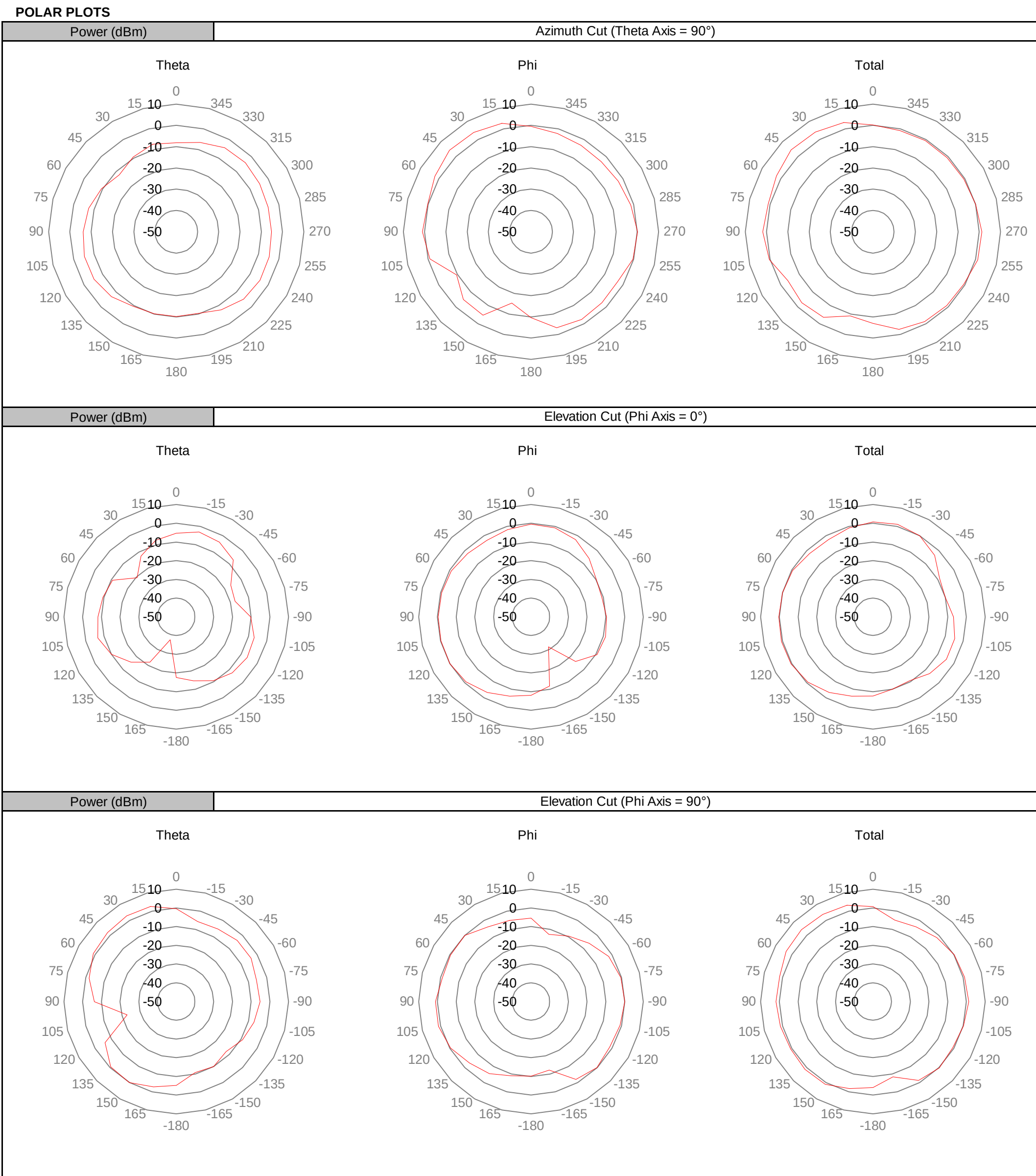
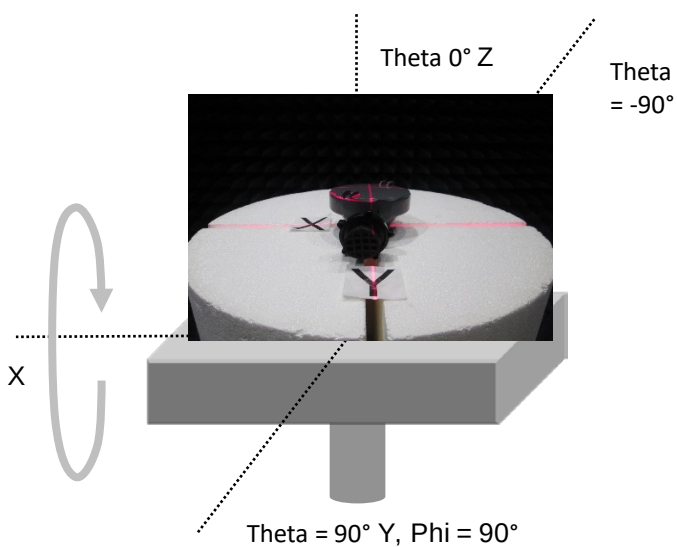
Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch13 2470MHz

Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

OTA 2018.01.04

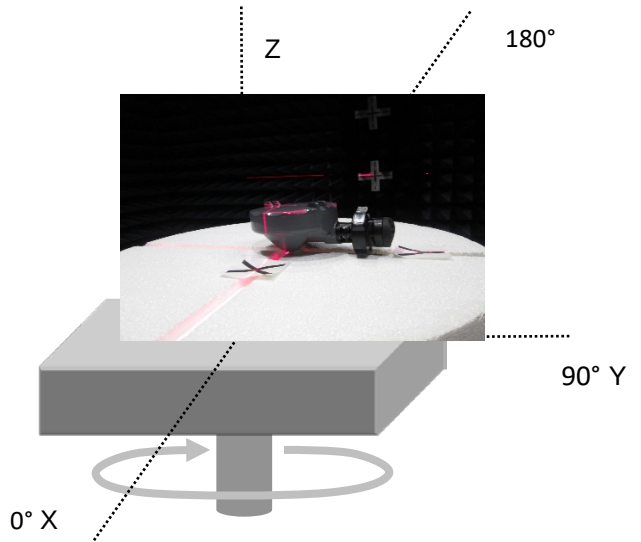
COMMENTS

None

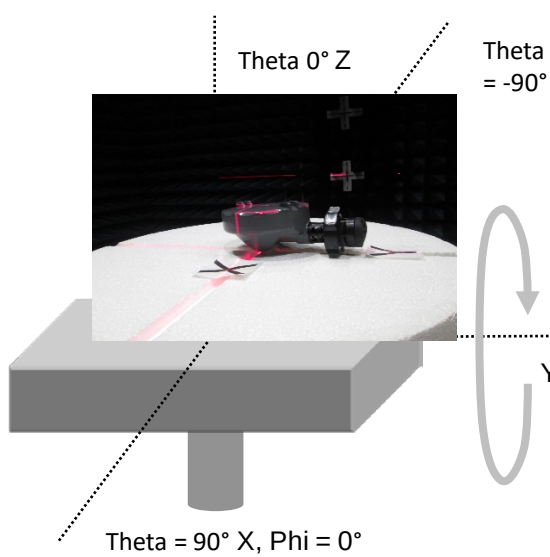
3D PATTERN DATA

Frequency (MHz)	2470
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	-0.47
Peak EIRP (dBm)	4.25
Directivity (dBi)	4.72
Efficiency (dB)	-4.47
Efficiency (%)	35.74
Gain (dBi)	0.25
Average Gain (dB)	-4.47
E-Plane 3 dB BW (°)	74.00

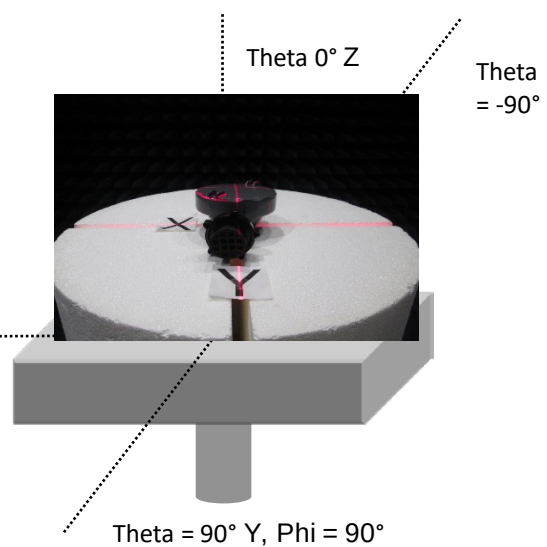
Azimuth Cut (Theta Axis = 90°)



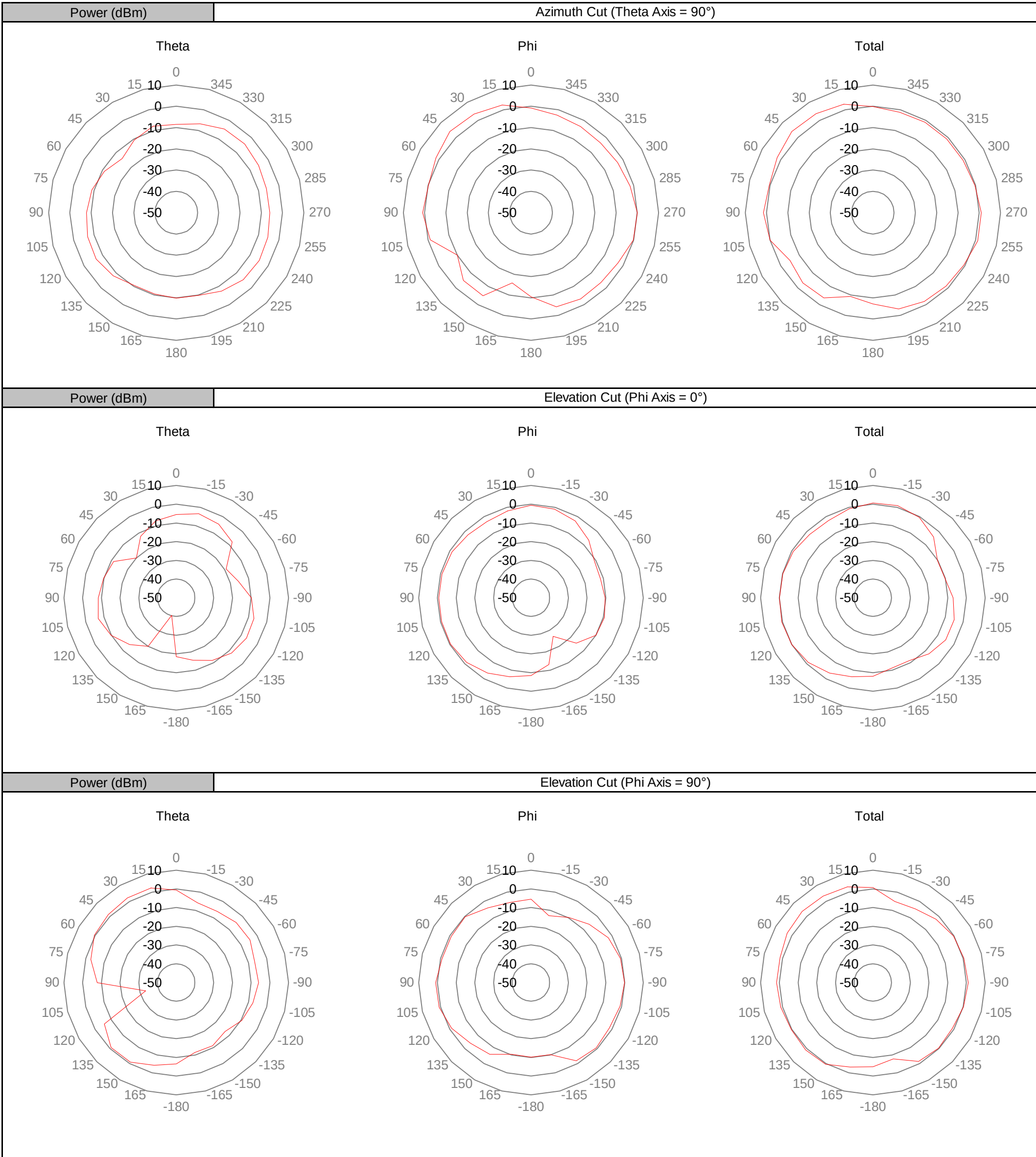
Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



POLAR PLOTS



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	Geo 20
Serial Number:	2400B
Customer:	Emerson Process Management
Attendees:	Merritt Pulkrabek
Customer Project:	None
Tested By:	Kyle McMullan
Test Run Description:	Geo Ch14 2475MHz

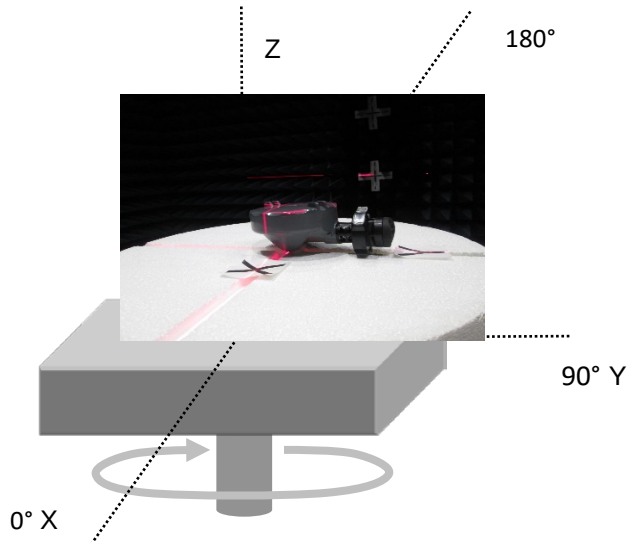
Work Order:	EMPM0079
Date:	11/12/2019
Temperature:	21.5 °C
Relative Humidity:	19.2% RH
Bar. Pressure:	1031 mbar
Job Site:	MN10

OTA 2018.01.04

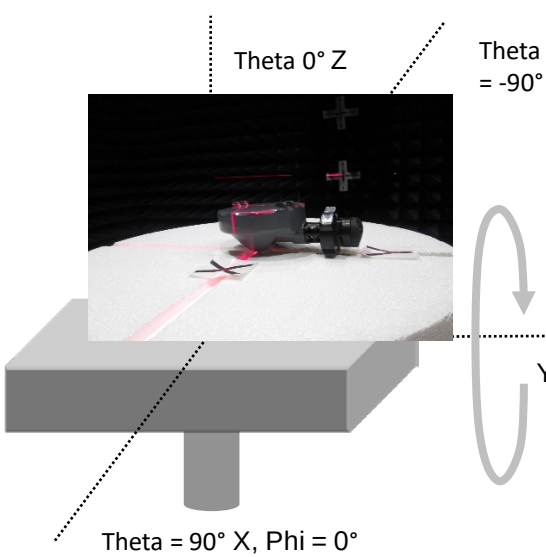
COMMENTS
None

3D PATTERN DATA	
Frequency (MHz)	2475
Ant. Port Input Pwr. (dBm)	4.00
Tot. Rad. Pwr. (dBm)	-0.75
Peak EIRP (dBm)	3.99
Directivity (dBi)	4.75
Efficiency (dB)	-4.75
Efficiency (%)	33.46
Gain (dBi)	-0.01
Average Gain (dB)	-4.75
E-Plane 3 dB BW (°)	76.00

Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)

