

Product Training

2-port LTE MIMO Phantom

P/N: MTRA61274Cx2-001

Ted Hebron (5/17/2019)



Laird[™]
CONNECTIVITY

Antenna Specification: MTRA61274Cx2-001

ELECTRICAL SPECIFICATIONS

Antenna Model	MTRA61274Cx2									
Number of Ports	2 (2 ports LTE)									
Operating Frequency (MHz)	617-698	698-824	824-894	880-960	1350-1550	1690-1880	1850-1990	1910-2180	2300-2500	2500-2700
Peak Gain – Average (dBi)**	2.4	3.1	2.8	2.7	2.7	3.6	3.9	3.5	3.6	2.9
Peak Gain – Max (dBi)**	3.2	4.0	4.0	3.4	4.7	4.1	4.1	4.2	4.0	3.4
VSWR – Max*	2.5									
VSWR – Average*										
Port 1	1.4	1.8	1.9	1.9	1.5	1.3	1.4	1.8	1.8	1.9
Port 2	1.4	1.8	1.9	1.9	1.5	1.3	1.4	1.8	1.8	1.8
Port-to-Port Isolation LET1-to-LTE2	-8	-10	-10	-10	-15	-17	-18	-18	-18	-25
Nominal Impedance (Ohms)	50									
Polarization	Linear vertical									
Azimuth Beamwidth (°)	360, Omnidirectional									
Max Power - Ambient 25°C (W)	50									

*/** - Measured on a one-foot ground plane.

Antenna Specification: MTRA61274Cx2-001

MECHANICAL SPECIFICATIONS

Dimensions – L x W x H – mm (inches)	130 x 84 x 95 (5.12 x 3.31 x 3.74)
Weight – g (oz.)	343 (12.1)
Radome/Baseplate Material	PC, UL94 V0 Rating, UV Stable

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature – °C (°F)	-30 to +70°C (-22 to +158°F)
Storage Temperature – °C (°F)	-40 to +85°C (-40 to +185°F)
Material Substance Compliance	RoHS
Ingress Protection	IP67 (when installed on a hard, flat surface)

CONFIGURATION

PART NUMBER	CABLE TYPE	CABLE LENGTH	CONNECTOR	COLOR
MTRA61274CB2-001	LMR195M	610 mm (24 in.)	SMA- male	Black
MTRA61274CW2-001	LMR195M	610 mm (24 in.)	SMA- male	White

Note: Specifications vary with different types of cable, different lengths of cables and connectors. Contact Laird for detailed specifications.

Product Image: MTRA61274Cx2-001



MTRA61274CB2-001



MTRA61274CW2-001

CONFIGURATION

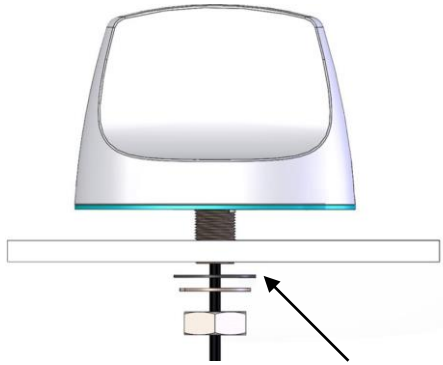
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Note: Specifications vary with different types of cable, different lengths of cables and connectors. Contact Laird for detailed specifications.

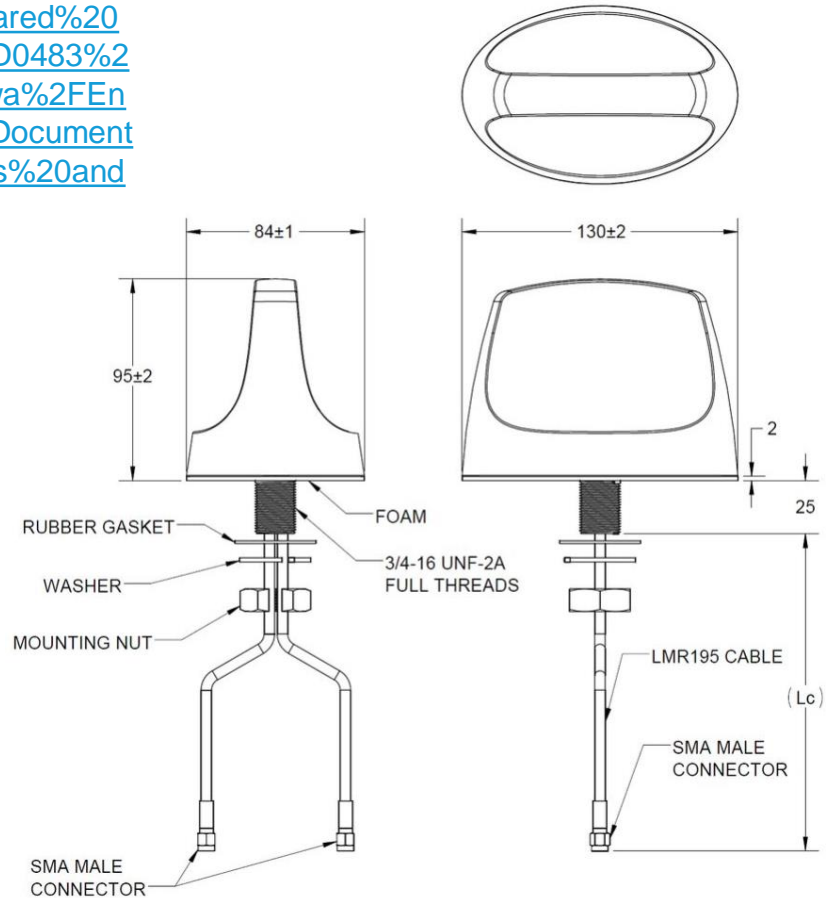
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Product Details: MTRA61274Cx2-001

<https://rfpros.sharepoint.com/sites/pwa/Engineering/Shared%20Documents/Forms/AllItems.aspx?viewid=0507bb99%2D0483%2D40ac%2Da5d0%2D5cfc3e0bfbf5&id=%2Fsites%2Fpwa%2FEngineering%2FShared%20Documents%2FAntenna%20Documents%2FK%20%2D%20O%2FMTRA61274Cx2%2FPhotos%20and%20Graphics%2FGraphics>



Rubber gasket must be on this side of the mating surface to achieve IP67 rating



Competitive Comparison: VFH69383B23JW



Competitive Strength



Competitive Weakness



Competitor	Antenna Plus (Airgain)	Panorama	Taoglass	PCTel	Laird
Part Number	AP-M2M3-CC-Q-S22-BL-6	CP-1010-1-PAN	MA741.B.BI.001	PCTHPDLTE-SF	MTRA61274Cx2-001
Number of Ports	2	2	2	2	2
Port Configuration	2x LTE	2x LTE	2x LTE	2x LTE	2x LTE
Frequency, MHz	698-960/1710-2700 ●	698-960/1710-2700 ●	698-960/1710-2700 ●	698-960/1710-2700 ●	617-960/1350-1550/1690-2700 ●
Max Gain, dBi	3.5/5.0 ●	2.3/5.0	4.1/3.4	2.5/2.5 ●	4.0/4.2 ●
Max VSWR	Unknown ●	<2.0:1 ●	<3.0:1 ●	<2.0:1 ●	<2.0:1 ●
Isolation, dB	> 10	> 15	> 10 / > 17 ●	Unknown ●	> 10/ > 17 ●
Power, Watts	Unknown ●	50 ●	Unknown ●	50 ●	50 ●
Size (L x W x H), mm	63.3 (dia) x 92(ht) ●	175.3 (dia) x 61 (ht) ●	146 (dia) x 86 (ht)	132 (dia) x 94 (ht)	130 x 84 x 95
Mounting	Stud	Stud	Stud	Stud	Stud
MSRP, List	\$99.00	\$146.99 ●	\$177.86 ●	\$108.55	\$82.04 ●
Warranty, yrs	1	1	1	1	5 ●

Product Differentiation



talkingpoints

MTRA61274Cx2-001

- Low Profile
- Broadest frequency coverage
- Excellent Pattern performance/Coverage
- Excellent Isolation performance
- Lowest MSRP
- 5 year Product Warranty

Marketing Plan: Product Launch 4/30/2019

Marketing



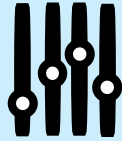
- Press Release
- Social Media- Twitter, LinkedIn, Facebook
- Blog Post
- Salesforce/Pardot Blast
- Internal Employee Communication- Laird Corporate
- Sales/Support Training Material
- Datasheet and product information can be found in two website locations:

<https://www.lairdconnect.com/rf-antennas/lpwanismm2m/low-profile-antennas>

<https://www.lairdconnect.com/rf-antennas/land-mobile-radio-antennas/vehicular-antennas/multi-port-antennas>

Product Stocking

Stocking



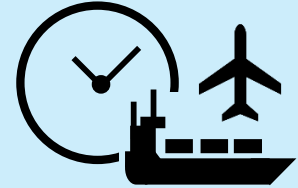
SCH

- MTRA61274CB2-001 = 1,150 units
- MTRA61274CW2-001 = 0 units

PEN (EMEA)

- MTRA61274CB2-001 = 70 units
- MTRA61274CW2-001 = 0 units

Leadtimes



Forecasted = 8 weeks
Unforecasted = 10 weeks



Forecasted = 10 weeks
Unforecasted = 12 weeks

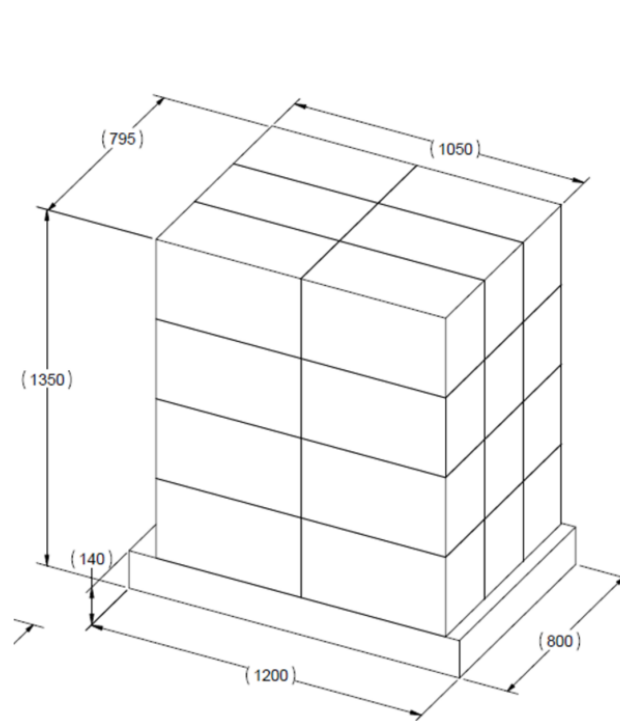
Product Shipping Information: Standard Packaging

Standard Configuration Information:

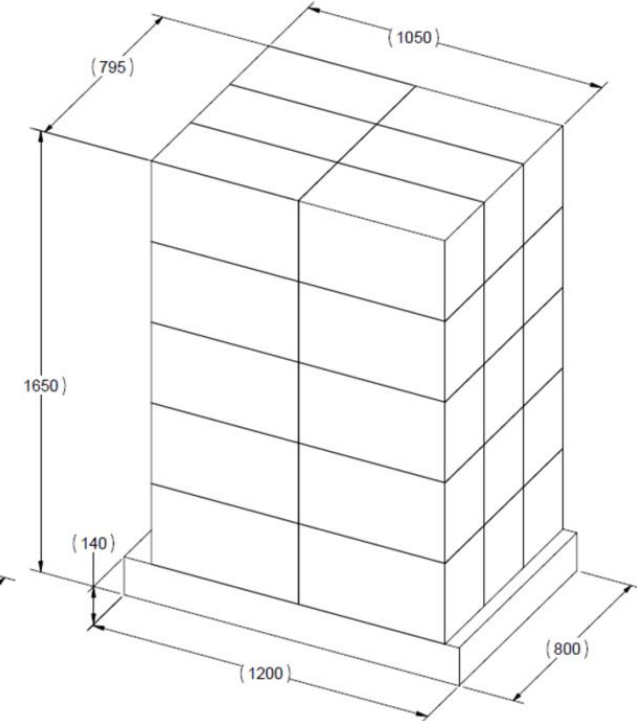
- Pallet: 120 x 80 cm
- Air Shipments (per pallet)
 - 4 master cartons high
 - Dimensions: 120 x 80 x 135 cm
 - Total units/pallet: 480
 - Total Wt.: 190 kg
- Sea Shipments (per pallet)
 - 5 master cartons high
 - Dimensions: 120 x 80 x 165 cm
 - Total units/pallet: 600
 - Total Wt.: 230 kg
- Master Carton:
 - Dimensions: 52.5 x 26.5 x 30 cm
 - Total units/carton: 20
 - Total Wt.: 7.4 kg



ANTENNA, HARDWARE KIT &
MANUAL TO PLASTIC BAG



**Palletized for
Air Shipment**



**Palletized for
Ocean Shipment**

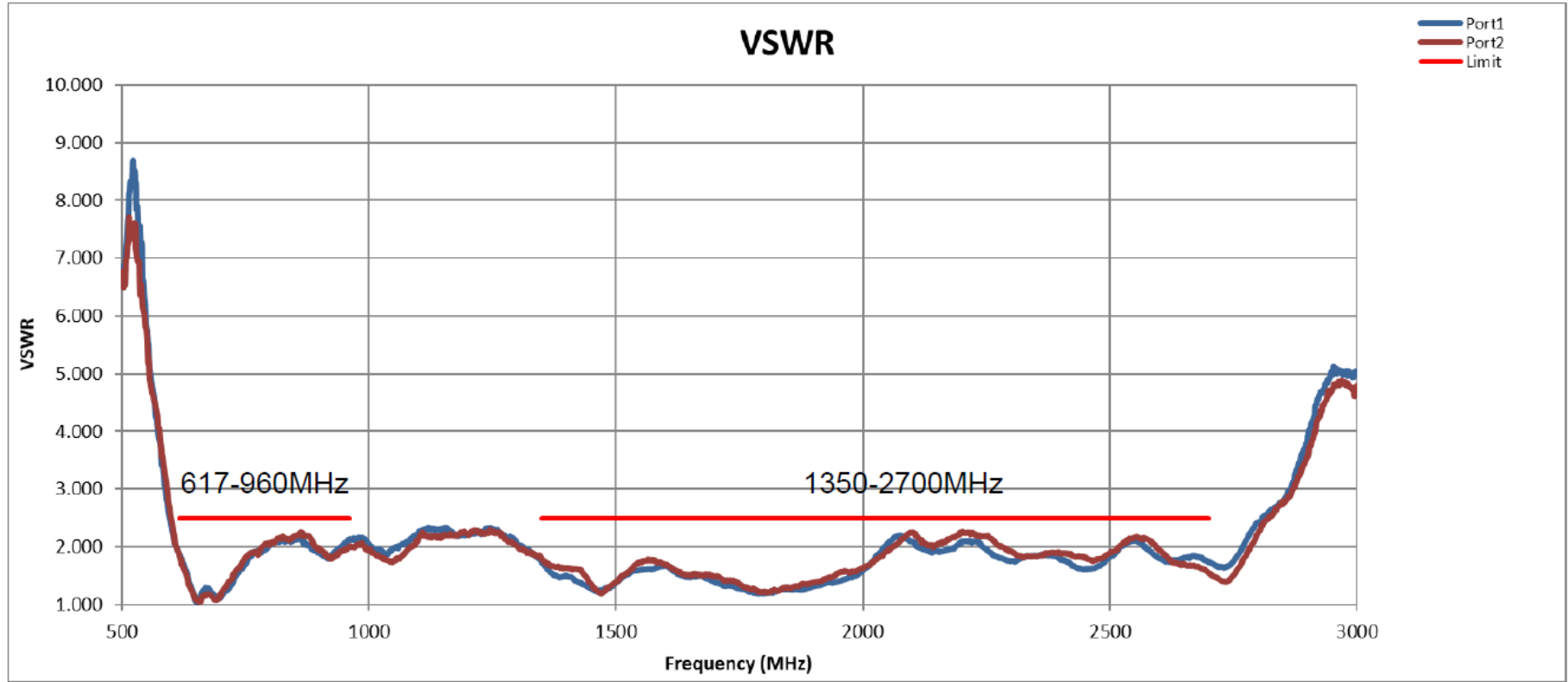
Appendix:

Antenna Measurement Data: MTRA61274Cx2

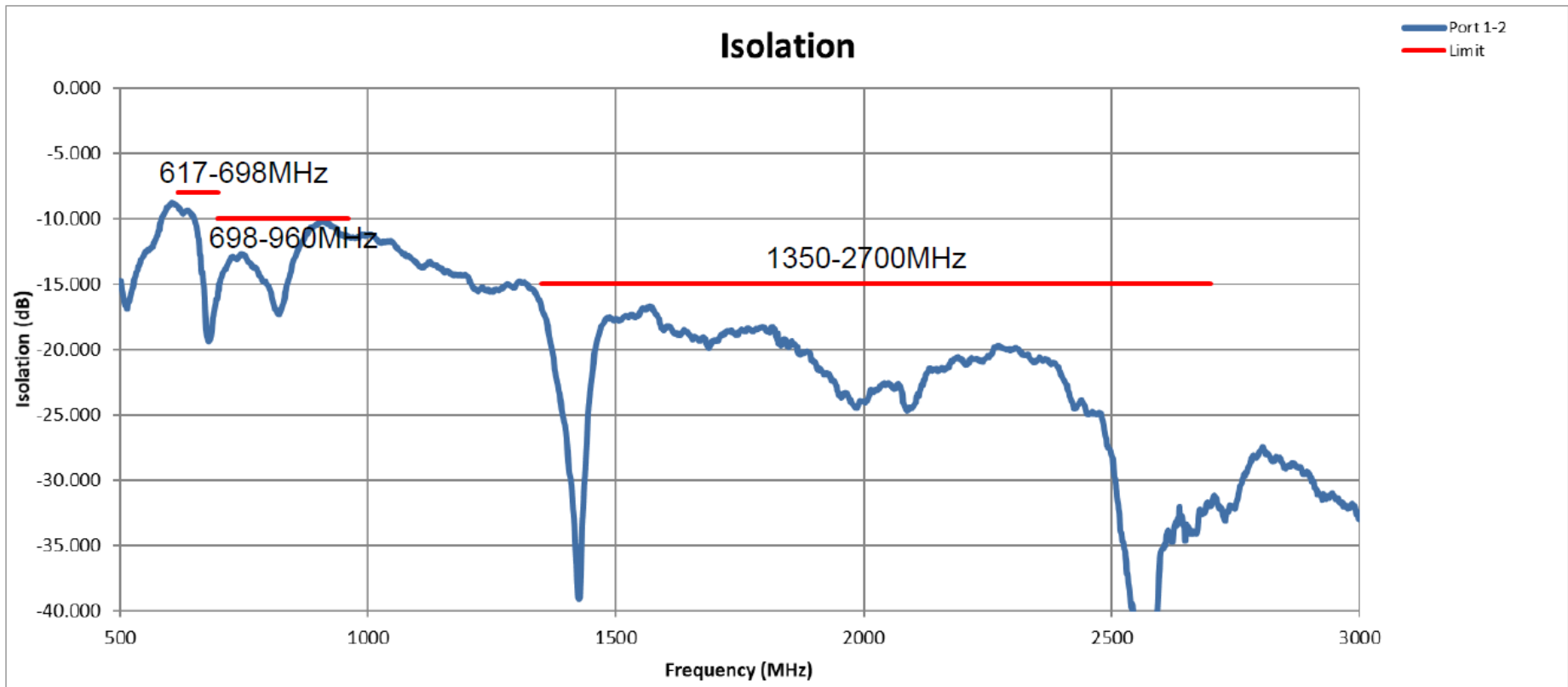
VSWR
Isolation
Gain



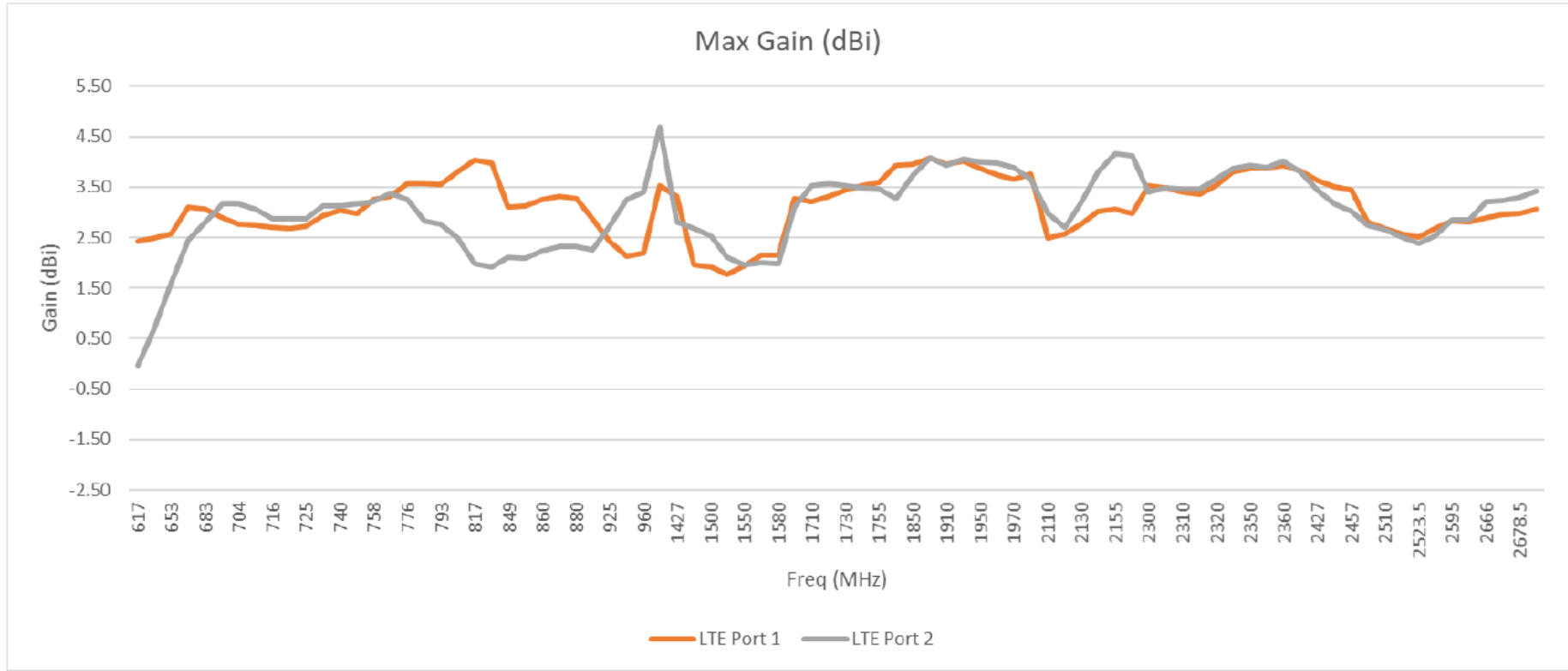
MTRA61274Cx2-001: VSWR



MTRA61274Cx2-001: Port-to-Port Isolation



MTRA61274Cx2-001: 3D- Max Gain



3D Gain & Total Efficiency Measurement Summary

LTE – Port 1

Frequency (MHz)	3D		Azimuth			Elevation 0°		Elevation 90°	
	Efficiency	Max Gain	Max Gain	Average Gain	Ripple	Max Gain	Average Gain	Max Gain	Average Gain
617	50%	2.43	1.65	-1.66	28.64	1.85	-3.49	0.88	-4.23
633	53%	2.49	0.93	-1.78	13.66	2.18	-3.16	0.93	-3.56
653	61%	2.57	0.46	-1.74	7.80	2.00	-2.55	2.20	-2.63
668	67%	3.10	0.79	-1.57	6.84	1.87	-2.06	3.07	-2.11
683	67%	3.07	1.02	-1.53	7.25	1.33	-2.06	3.05	-2.06
698	67%	2.89	1.45	-1.41	8.41	1.25	-2.01	2.82	-2.11
704	67%	2.76	1.58	-1.38	8.72	1.28	-1.99	2.64	-2.17
710	67%	2.75	1.61	-1.36	8.48	1.29	-1.99	2.69	-2.25
716	66%	2.69	1.65	-1.41	8.49	1.29	-2.03	2.65	-2.33
722	65%	2.68	1.63	-1.40	8.50	1.29	-2.02	2.64	-2.39
725	65%	2.72	1.60	-1.42	8.49	1.30	-2.02	2.68	-2.40
734	66%	2.94	1.58	-1.39	8.58	1.44	-1.93	2.87	-2.36
740	65%	3.04	1.47	-1.47	8.72	1.41	-1.96	2.95	-2.39
746	66%	2.97	1.04	-1.34	10.71	1.76	-1.87	2.79	-2.36
758	65%	3.25	1.13	-1.36	11.53	1.94	-1.89	3.00	-2.30
763	64%	3.32	1.02	-1.43	11.58	1.89	-1.91	3.06	-2.32
776	60%	3.56	0.51	-1.96	11.91	1.65	-2.25	3.23	-2.50
788	56%	3.56	-0.02	-2.49	13.01	1.33	-2.59	3.29	-2.68
793	55%	3.55	-0.28	-2.69	13.64	1.16	-2.73	3.19	-2.75
806	53%	3.80	-1.29	-3.34	15.54	0.62	-3.08	3.42	-2.78
817	52%	4.04	-1.70	-4.03	13.46	0.95	-3.38	3.68	-2.88
824	52%	3.98	-1.82	-4.26	11.09	1.36	-3.35	3.66	-2.89
849	51%	3.10	-1.88	-4.56	7.51	1.90	-3.13	3.05	-2.85
850	51%	3.11	-1.91	-4.59	7.52	1.85	-3.16	3.07	-2.86
860	48%	3.24	-2.45	-4.86	7.19	1.29	-3.28	3.24	-2.93
869	46%	3.32	-2.98	-5.19	7.94	0.69	-3.41	3.32	-2.95
880	43%	3.28	-3.54	-5.54	8.95	0.14	-3.56	3.27	-3.01
894	41%	2.88	-3.16	-5.26	9.67	-0.06	-3.66	2.85	-3.16
925	47%	2.43	-0.55	-3.25	10.67	0.88	-3.00	2.14	-3.22
948	50%	2.12	0.60	-2.50	11.88	1.02	-2.53	2.04	-3.28
960	50%	2.19	0.89	-2.48	13.48	1.24	-2.59	1.95	-3.55

Frequency (MHz)	3D		Azimuth		Elevation 0°		Elevation 90°		
	Efficiency	Max Gain	Max Gain	Average Gain	Ripple	Max Gain	Average Gain	Max Gain	Average Gain
1350	73%	3.54	-0.01	-2.23	7.16	3.15	-0.46	1.72	-2.75
1427	68%	3.31	0.75	-1.00	5.47	2.73	-1.64	1.86	-3.02
1448	71%	1.96	0.81	-0.15	3.99	1.61	-1.56	0.81	-2.78
1500	74%	1.91	0.50	-0.73	2.76	1.67	-0.96	0.97	-2.86
1525	71%	1.77	0.62	-1.11	3.64	1.73	-1.18	1.33	-3.02
1550	76%	1.94	1.33	-0.27	3.42	1.83	-0.96	1.93	-2.68
1575	79%	2.14	1.31	-0.14	3.25	1.87	-0.91	1.97	-2.50
1580	78%	2.15	1.25	-0.26	3.36	1.82	-0.98	1.93	-2.54
1690	79%	3.27	1.96	0.17	3.38	2.72	-1.15	1.81	-2.23
1710	79%	3.21	1.90	0.25	3.01	2.75	-1.17	1.62	-2.27
1720	79%	3.31	1.98	0.24	3.16	2.84	-1.13	1.75	-2.29
1730	79%	3.45	2.05	0.18	3.38	2.97	-1.11	1.89	-2.34
1740	78%	3.52	2.08	0.10	3.48	3.08	-1.13	1.82	-2.42
1755	77%	3.60	2.23	0.15	3.71	3.19	-1.13	1.55	-2.45
1785	78%	3.92	2.70	0.24	4.50	3.50	-0.93	1.39	-2.49
1850	76%	3.96	2.62	0.46	3.78	3.78	-0.67	1.28	-2.68
1880	74%	4.07	2.63	0.15	4.26	3.99	-0.62	1.64	-2.92
1910	75%	3.96	2.56	0.46	3.99	3.95	-0.42	1.30	-2.87
1930	78%	4.02	2.73	0.74	3.59	4.02	-0.24	1.20	-2.77
1950	76%	3.86	2.60	0.54	3.77	3.86	-0.20	0.59	-3.04
1960	75%	3.73	2.46	0.50	3.64	3.73	-0.15	0.20	-3.14
1970	73%	3.65	2.25	0.46	3.41	3.49	-0.17	0.00	-3.25
1990	71%	3.76	1.99	0.46	2.87	3.72	-0.19	0.58	-3.34
2110	59%	2.48	0.76	-0.45	3.21	2.31	-1.65	0.25	-3.72
2120	59%	2.58	0.95	-0.40	3.25	2.33	-1.67	-0.04	-3.88
2130	61%	2.75	1.11	-0.31	3.25	2.50	-1.57	0.20	-3.74
2140	63%	3.03	1.20	-0.18	3.29	2.67	-1.39	0.32	-3.44
2155	66%	3.05	1.16	-0.07	3.00	2.56	-1.29	0.53	-3.14
2170	64%	2.97	0.97	-0.22	2.62	2.51	-1.31	0.93	-3.04
2300	67%	3.52	2.44	0.51	3.65	3.44	-0.79	2.47	-2.78
2305	67%	3.49	2.43	0.51	3.54	3.43	-0.78	2.56	-2.78
2310	66%	3.41	2.39	0.50	3.56	3.35	-0.83	2.53	-2.83
2315	65%	3.35	2.33	0.45	3.66	3.23	-0.87	2.56	-2.89
2320	65%	3.53	2.41	0.52	3.67	3.28	-0.79	2.74	-2.84
2345	63%	3.81	2.55	0.45	3.55	3.18	-0.80	2.81	-3.02
2350	64%	3.86	2.66	0.49	3.66	3.23	-0.74	2.85	-3.03
2355	64%	3.86	2.79	0.52	3.93	3.28	-0.75	2.49	-3.09
2360	65%	3.94	2.91	0.60	4.08	3.36	-0.64	2.57	-3.04
2412	64%	3.82	2.57	0.16	4.51	3.23	-0.90	2.09	-3.11
2427	65%	3.64	2.44	0.16	4.53	3.19	-1.02	2.18	-3.13
2442	64%	3.50	2.15	0.06	4.19	3.08	-1.12	2.06	-3.27
2457	64%	3.43	1.97	0.02	4.56	3.07	-1.15	1.95	-3.31
2507	62%	2.82	1.36	-0.32	4.33	2.78	-1.44	2.36	-3.12
2510	61%	2.68	1.21	-0.43	4.36	2.64	-1.56	2.35	-3.19
2514	60%	2.56	1.09	-0.54	4.50	2.50	-1.69	2.33	-3.28
2524	59%	2.51	1.00	-0.65	4.77	2.38	-1.80	2.51	-3.26
2583	58%	2.69	0.87	-0.81	4.14	2.68	-2.28	2.50	-3.28
2595	60%	2.83	0.98	-0.67	4.11	2.82	-2.18	2.63	-3.12
2600	60%	2.80	0.92	-0.71	4.14	2.80	-2.22	2.62	-3.12
2666	58%	2.88	0.67	-0.59	3.30	2.85	-2.62	1.95	-3.29
2676	57%	2.95	0.59	-0.71	2.95	2.93	-2.67	1.63	-3.39
2679	57%	2.98	0.62	-0.71	2.98	2.95	-2.67	1.62	-3.38
2700	57%	3.05	0.70	-0.81	3.22	2.86	-2.86	1.51	-3.41

3D Gain & Total Efficiency Measurement Summary

LTE – Port 2

Frequency (MHz)	3D		Azimuth			Elevation 0°		Elevation 90°	
	Efficiency	Max Gain	Max Gain	Average Gain	Ripple	Max Gain	Average Gain	Max Gain	Average Gain
617	42%	-0.03	-0.16	-3.18	6.90	-0.87	-4.41	-0.11	-3.97
633	52%	0.68	-0.03	-2.95	5.34	-0.35	-3.32	0.33	-3.00
653	62%	1.61	0.32	-2.05	4.68	0.22	-2.30	1.57	-2.23
668	69%	2.46	0.74	-1.30	4.12	1.02	-1.79	2.43	-1.69
683	70%	2.81	0.98	-1.01	4.09	1.01	-1.71	2.77	-1.57
698	71%	3.17	1.07	-0.92	4.44	1.25	-1.69	3.06	-1.51
704	71%	3.16	1.12	-0.96	4.87	1.36	-1.71	3.05	-1.52
710	69%	3.05	1.20	-1.06	5.41	1.37	-1.75	2.94	-1.58
716	68%	2.87	1.29	-1.23	6.19	1.29	-1.83	2.79	-1.69
722	68%	2.86	1.78	-1.08	7.34	1.24	-1.86	2.85	-1.66
725	67%	2.88	1.92	-1.10	7.87	1.27	-1.86	2.82	-1.67
734	69%	3.13	2.44	-1.04	9.31	1.38	-1.80	3.05	-1.61
740	68%	3.13	2.54	-1.17	9.85	1.27	-1.85	3.07	-1.70
746	68%	3.17	2.24	-1.15	9.65	1.24	-1.75	3.17	-1.77
758	67%	3.20	2.24	-1.36	9.51	0.91	-1.80	3.17	-1.88
763	68%	3.38	2.42	-1.32	9.87	0.91	-1.79	3.34	-1.84
776	65%	3.25	1.91	-1.84	9.76	0.83	-1.97	3.23	-2.01
788	62%	2.83	1.36	-2.25	8.86	0.73	-2.23	2.81	-2.30
793	60%	2.76	1.17	-2.37	8.58	0.68	-2.33	2.69	-2.40
806	58%	2.48	0.87	-2.53	8.24	0.48	-2.45	2.46	-2.48
817	54%	1.99	0.15	-3.07	7.79	0.42	-2.67	1.95	-2.79
824	52%	1.91	-0.21	-3.31	7.59	0.48	-2.75	1.82	-2.88
849	48%	2.11	-1.38	-4.28	6.85	0.65	-3.09	2.07	-2.96
850	48%	2.08	-1.45	-4.36	6.99	0.64	-3.13	2.05	-2.99
860	47%	2.23	-1.90	-4.91	8.10	0.77	-3.26	2.21	-3.10
869	46%	2.31	-2.14	-5.18	8.59	1.00	-3.33	2.27	-3.21
880	44%	2.31	-2.35	-5.64	8.10	0.99	-3.42	2.24	-3.38
894	43%	2.25	-2.53	-5.80	7.49	0.79	-3.38	2.25	-3.42
925	49%	2.72	-1.78	-4.86	13.13	1.21	-2.72	2.52	-3.27
948	53%	3.25	-1.02	-4.17	28.69	1.62	-2.45	3.07	-3.08
960	54%	3.40	-0.85	-3.93	19.02	1.70	-2.52	3.28	-3.02

Frequency (MHz)	3D		Azimuth		Elevation 0°		Elevation 90°		
	Efficiency	Max Gain	Max Gain	Average Gain	Ripple	Max Gain	Average Gain	Max Gain	Average Gain
1350	70%	4.70	0.02	-2.14	5.67	4.04	-0.47	2.64	-2.95
1427	64%	2.81	-0.65	-1.69	3.31	2.18	-1.66	1.69	-2.99
1448	67%	2.69	1.68	-0.87	7.13	1.71	-1.40	1.94	-2.83
1500	73%	2.54	1.63	-0.85	5.36	2.49	-1.01	1.72	-2.77
1525	71%	2.11	0.58	-1.08	3.64	1.92	-1.35	1.85	-2.88
1550	75%	1.95	0.98	-0.41	3.28	1.55	-1.36	1.85	-2.67
1575	77%	2.00	1.01	-0.20	2.54	1.45	-1.33	1.95	-2.44
1580	76%	1.99	0.91	-0.27	2.49	1.38	-1.41	1.91	-2.49
1690	78%	3.11	1.74	0.13	3.65	2.23	-1.56	2.04	-2.24
1710	79%	3.53	1.72	0.26	3.90	2.60	-1.39	1.90	-2.24
1720	80%	3.57	1.73	0.33	3.69	2.78	-1.34	1.83	-2.28
1730	79%	3.54	1.83	0.38	3.44	2.88	-1.36	1.71	-2.33
1740	78%	3.48	1.85	0.38	3.12	2.92	-1.44	1.54	-2.41
1755	76%	3.45	1.81	0.33	2.86	3.00	-1.49	1.48	-2.46
1785	77%	3.28	1.87	0.25	3.39	3.05	-1.44	1.67	-2.36
1850	76%	3.75	1.55	0.38	2.62	3.44	-1.18	1.69	-2.63
1880	74%	4.09	1.97	0.22	4.01	4.00	-0.83	1.95	-2.97
1910	75%	3.92	2.17	0.35	4.38	3.92	-0.68	1.99	-2.85
1930	78%	4.07	2.45	0.64	3.83	4.05	-0.39	1.98	-2.66
1950	76%	3.99	2.07	0.55	3.70	3.99	-0.41	1.88	-2.85
1960	75%	3.98	1.97	0.51	3.75	3.98	-0.43	1.76	-2.94
1970	73%	3.88	1.90	0.41	3.67	3.88	-0.54	1.45	-3.07
1990	70%	3.65	1.75	0.25	2.91	3.63	-0.72	0.52	-3.23
2110	53%	2.97	1.08	-0.71	3.47	2.43	-1.96	-0.91	-4.78
2120	54%	2.70	1.28	-0.61	3.69	2.47	-1.87	-0.85	-4.67
2130	57%	3.19	1.40	-0.43	3.40	2.50	-1.62	-0.17	-4.28
2140	59%	3.80	1.44	-0.25	3.00	3.08	-1.39	0.63	-3.87
2155	61%	4.17	1.40	-0.19	2.75	3.40	-1.25	1.43	-3.49
2170	60%	4.12	1.14	-0.45	2.62	3.36	-1.34	1.76	-3.41
2300	64%	3.39	1.93	0.23	3.02	2.89	-1.04	2.35	-3.12
2305	63%	3.48	1.89	0.20	2.95	2.93	-1.04	2.47	-3.12
2310	62%	3.47	1.79	0.16	2.80	2.90	-1.10	2.46	-3.17
2315	61%	3.46	1.68	0.10	2.69	2.87	-1.16	2.49	-3.21
2320	62%	3.65	1.72	0.19	2.69	3.03	-1.08	2.69	-3.13
2345	61%	3.86	1.95	0.16	3.34	3.09	-1.09	2.62	-3.24
2350	62%	3.93	2.10	0.21	3.52	3.14	-1.01	2.63	-3.22
2355	62%	3.89	2.26	0.21	3.66	3.11	-0.92	2.60	-3.20
2360	63%	4.02	2.40	0.35	3.71	3.17	-0.83	2.63	-3.13
2412	62%	3.80	2.28	0.14	4.64	2.78	-0.96	2.34	-3.31
2427	62%	3.43	2.06	-0.02	4.72	2.47	-1.08	2.04	-3.41
2442	62%	3.17	1.98	-0.15	4.82	2.46	-1.18	1.95	-3.49
2457	62%	3.01	1.85	-0.23	4.81	2.43	-1.27	1.84	-3.53
2507	60%	2.74	1.58	-0.43	5.93	2.57	-1.60	1.80	-3.49
2510	59%	2.66	1.45	-0.57	5.98	2.46	-1.75	1.69	-3.57
2514	57%	2.52	1.28	-0.72	5.99	2.29	-1.90	1.58	-3.67
2524	56%	2.39	1.03	-0.89	6.21	2.02	-2.13	1.43	-3.78
2583	56%	2.53	0.59	-1.02	5.45	2.52	-2.54	1.65	-3.70
2595	57%	2.85	0.71	-0.89	5.27	2.82	-2.49	1.71	-3.54
2600	57%	2.85	0.67	-0.90	5.16	2.83	-2.54	1.72	-3.54
2666	58%	3.22	0.75	-0.72	4.64	2.93	-2.82	1.18	-3.44
2676	58%	3.23	0.72	-0.72	4.27	2.81	-2.92	1.16	-3.45
2679	58%	3.29	0.75	-0.69	4.19	2.82	-2.91	1.19	-3.43
2700	59%	3.43	0.97	-0.59	3.83	2.74	-3.04	1.20	-3.41

LTE/Cellular Radiation Pattern

The radiation pattern is the total field gain measurement data

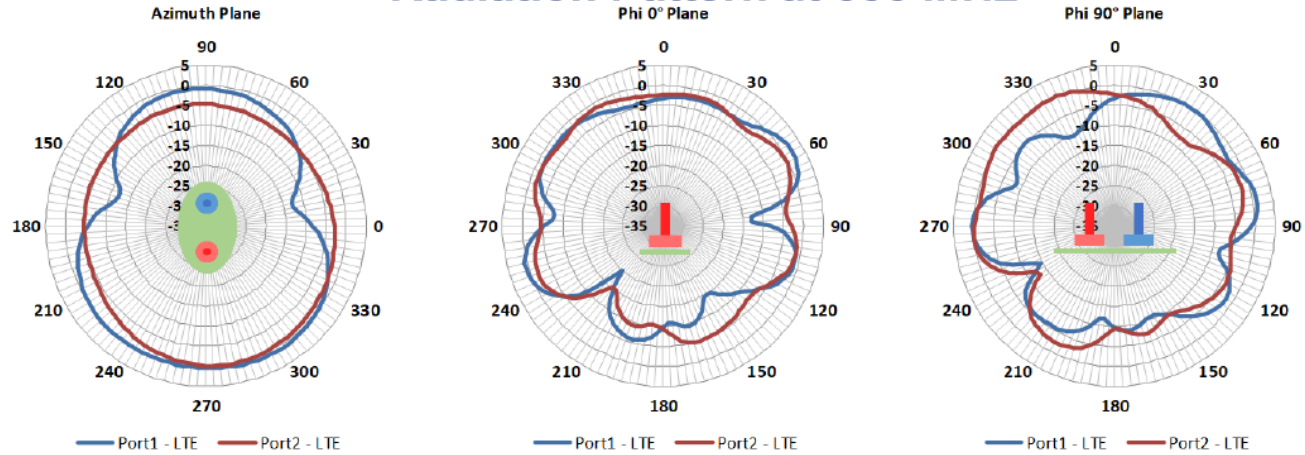
The 3D data is attached as OGL file for below frequency points:

633 MHz; 725 MHz; 849 MHz; 925 MHz

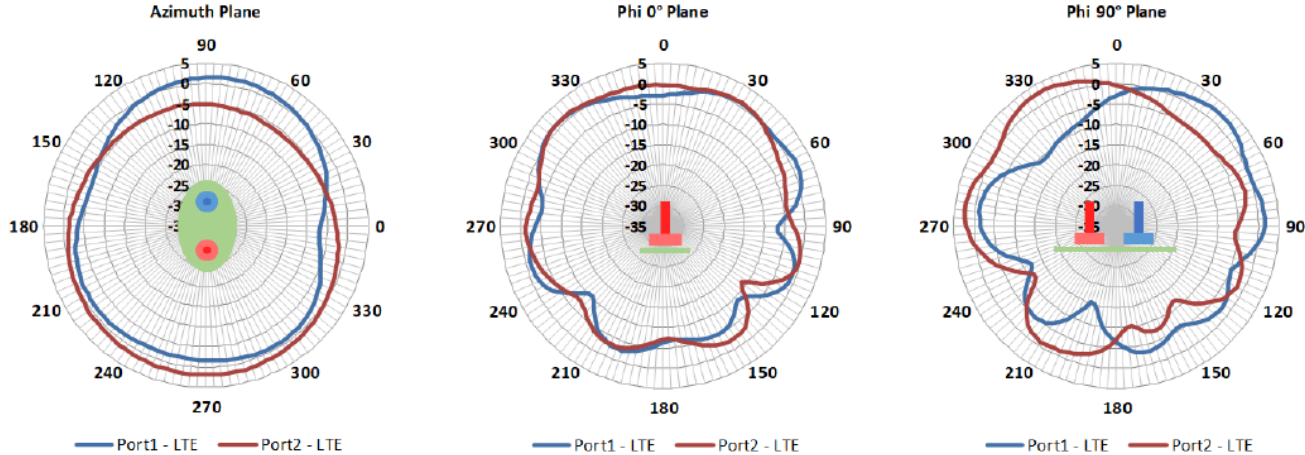
1448 MHz; 1730 MHz; 1930 MHz; 2140 MHz;
2300 MHz; 2595 MHz



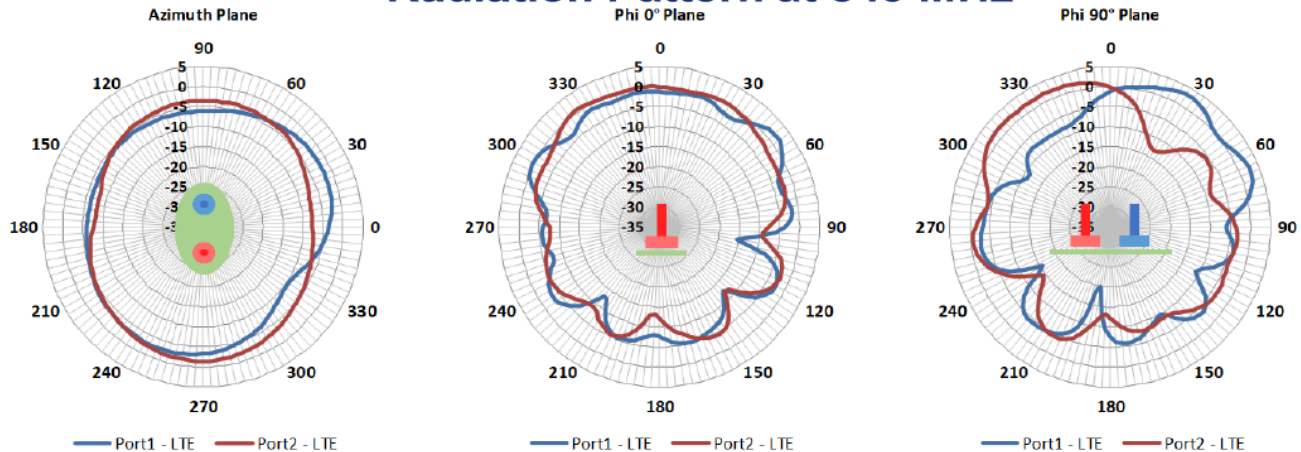
Radiation Pattern at 633 MHz



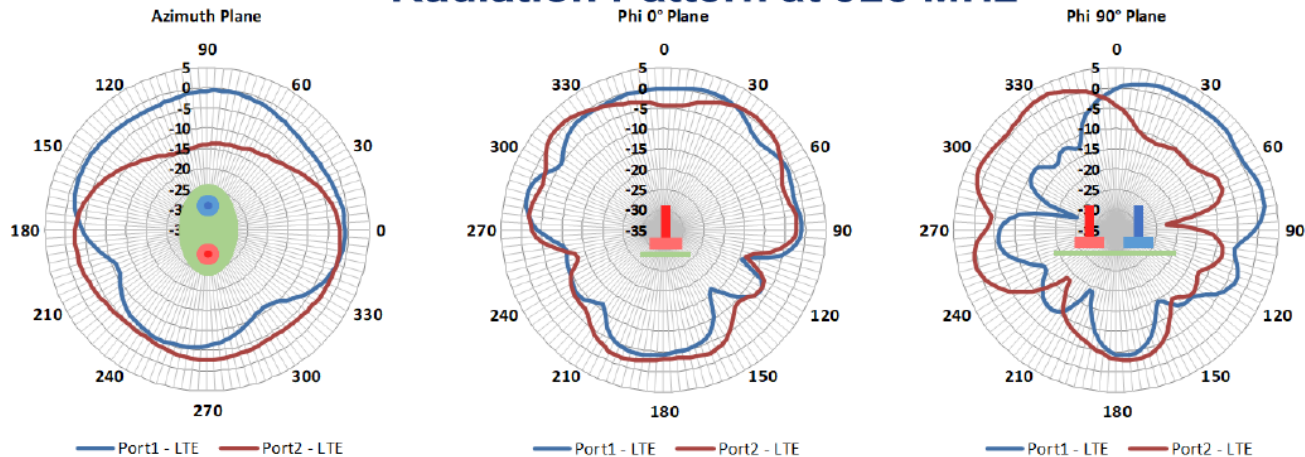
Radiation Pattern at 725 MHz



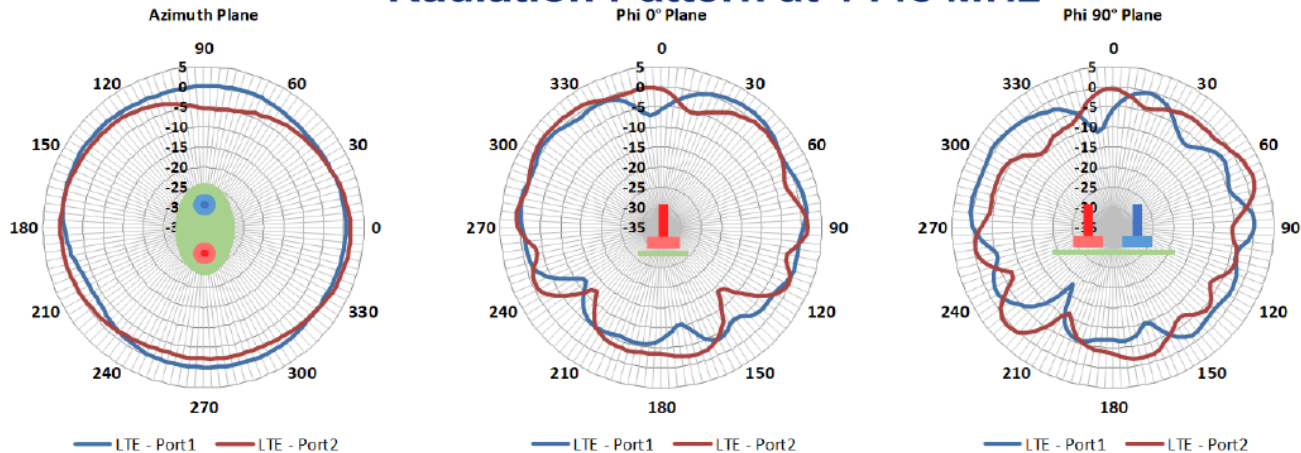
Radiation Pattern at 849 MHz



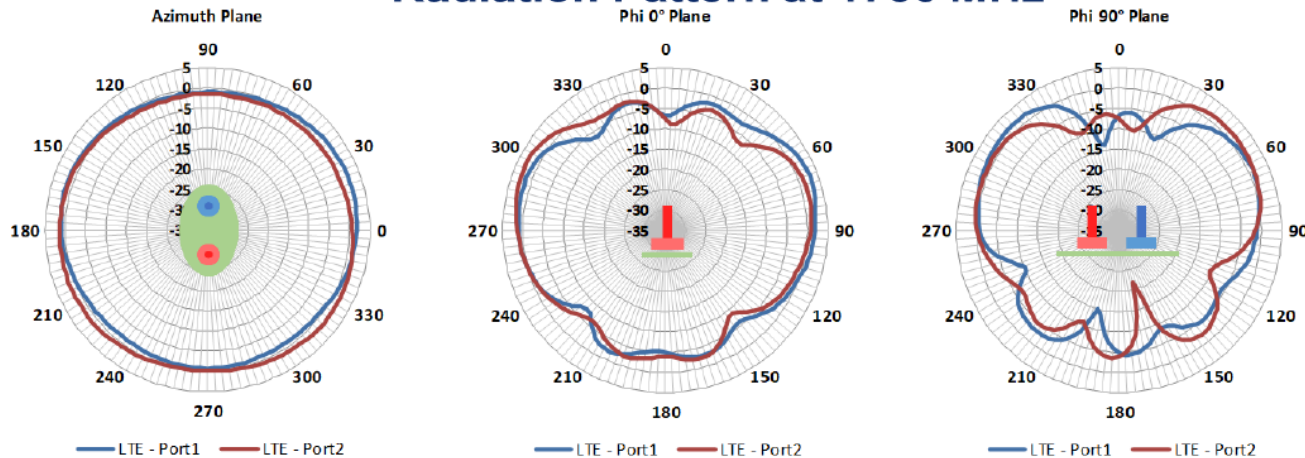
Radiation Pattern at 925 MHz



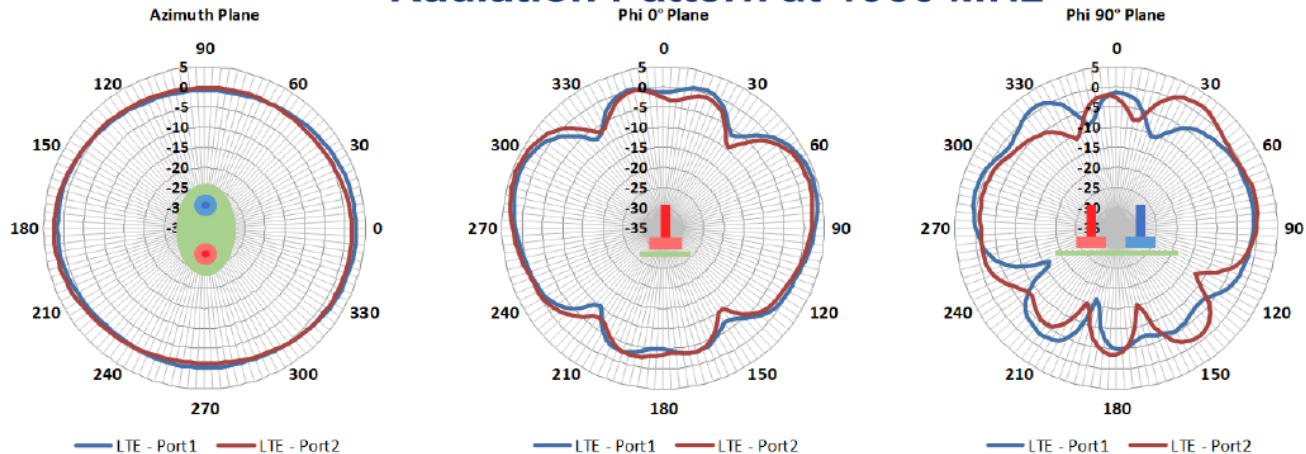
Radiation Pattern at 1448 MHz



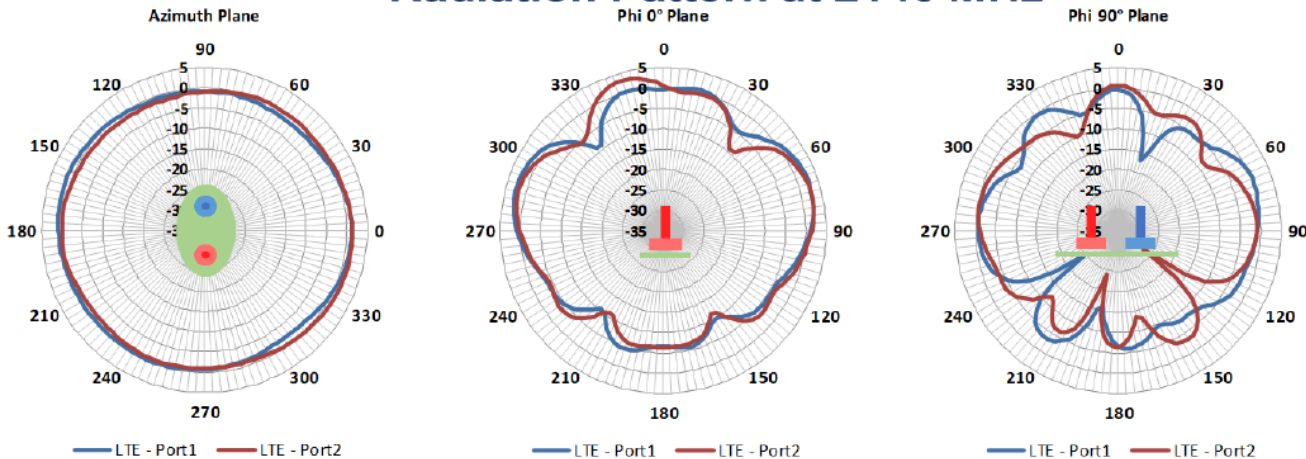
Radiation Pattern at 1730 MHz



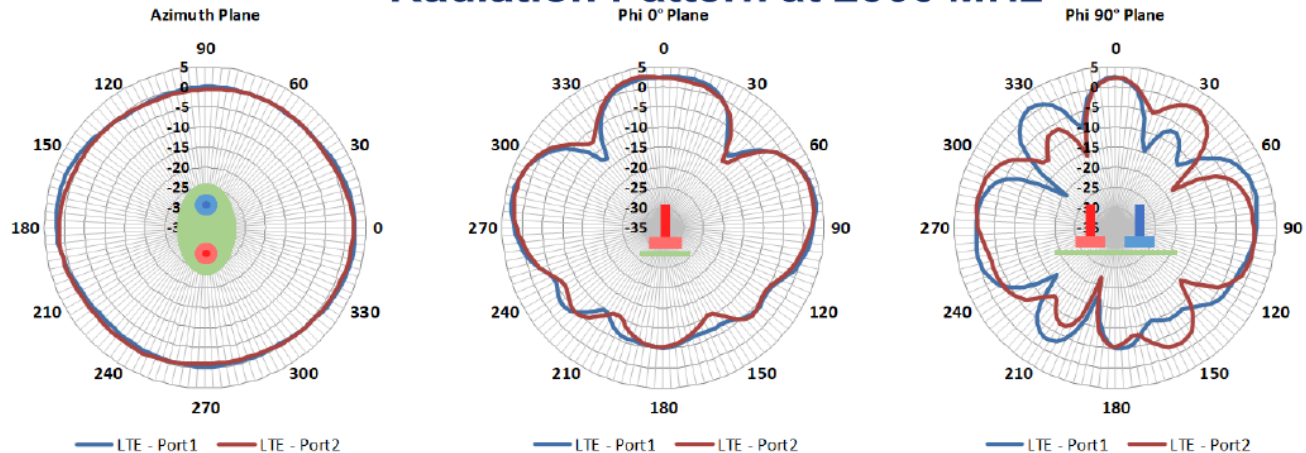
Radiation Pattern at 1930 MHz



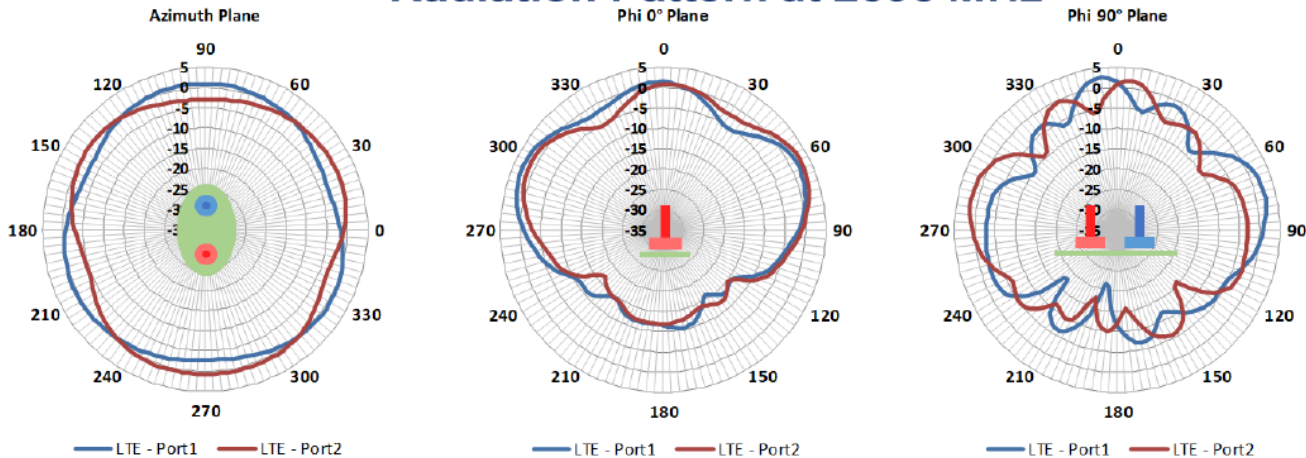
Radiation Pattern at 2140 MHz



Radiation Pattern at 2300 MHz



Radiation Pattern at 2595 MHz



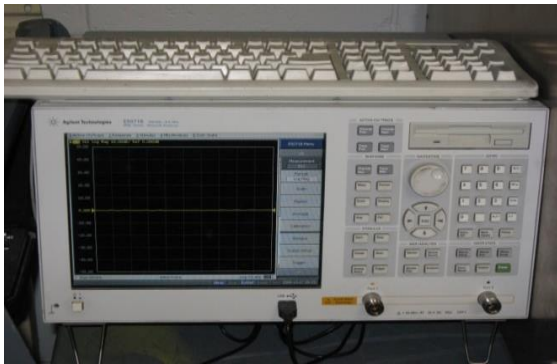


Appendix:

Measurement Setup



Test Setup



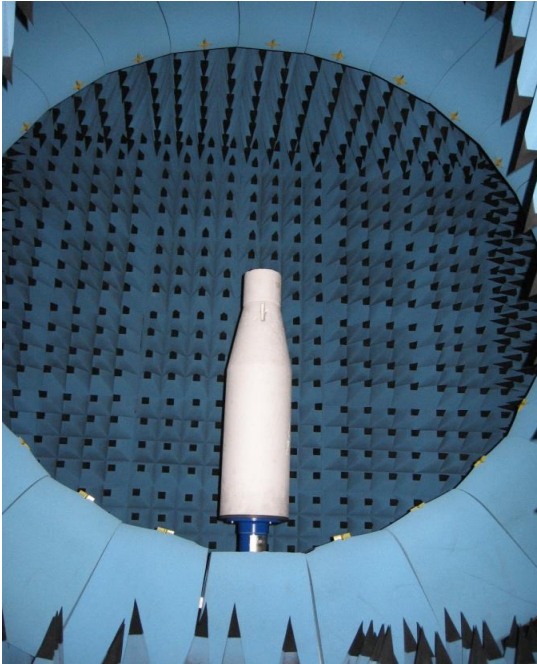
Agilent E5071C Network Analyzer

- Agilent, E5071C network analyzer
- Maximum frequency range: 100kHz –8.5GHz
- Calibration certified annually (system)
- Calibrated per OSL standard (test)



- VSWR and Isolation tested with the VNA E5071C
- VNA is calibrated with the Copper Mountain (S2611) 3.5mm Calibration Kit
- Test with 1ft metal ground plane.
- Antennas terminate with 50 Ω load when not in used.

Radiation Pattern Test in Satimo 3D Chamber SG 24



- SG24 has 23 probes, spaced at 15° in elevation, with an internal arch diameter of 2.4 meters.
- Passive antenna measurements are performed using a Vector Network Analyzer and software

OTA Performance Measurements

Typical Measurement Uncertainty (handset in free space)

Total Radiated Power (TRP) $< \pm 1.15$ dB

Total Isotropic Sensitivity (TIS) $< \pm 1.40$ dB

Dynamic Range > 25 dB

SG24 Anechoic Chamber Specifications

External dimensions

4.0 x 4.0 x 4.0 m

Shielding effectiveness, plane wave 800 MHz – 6 GHz

100 dB

Pyramid absorber reflectivity

-30 dB @ 800 MHz

Measurement Coordinate System

