

### Part No: PCS.55.M

Description

Small OTS LTE Antenna 600-3000 MH:

#### Features:

Small form factor SMD Dielectric Antenna 5G/4G/LTE: 600-3000MHz GPS / GLONASS / Galileo / BeiDou (1561-1602MHz) Available in North America (NA), European Union (EMEA), and World Wide (WW) configurations Dimensions: 27\*10\*1.6mm RoHS & REACH Compliant

84 85.55.M

SPE-23-8-281-A

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Introduction	2
Specifications	3
Antenna Characteristics	6
Radiation Patterns	9
Mechanical Drawing	46
Packaging	47
Antenna Integration Guide	48
Application Note	59
Solder Reflow Profile	69
	Specifications Antenna Characteristics Radiation Patterns Mechanical Drawing Packaging Antenna Integration Guide Application Note

Changelog

70

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# Introduction

1.



The PCS.55.M, is a patent pending compact cellular antenna designed specifically for IoT devices with small ground planes. It combines revolutionary antenna design techniques with the antenna integration experience of Taoglas to provide a solution for wideband coverage of both 5G/4G LTE and GNSS bands, including the most challenging 600-700MHz bands.

The PCS.55.M provides a simple off-the-shelf solution for LTE, LTE CAT-M, NB-IoT, & GNSS applications. At only 27x10x1.6mm, this compact cellular antenna is the perfect antenna for small IoT devices, where requirements for smaller PCB design are becoming more dependent on the antenna size. This antenna also has a relatively small keepout area compared to most other compact cellular antennas that are on the market, owing to Taoglas' years of antenna design expertise.

Typical Applications include: - Handheld IoT Devices- Handsets and Tablets - Compact Asset Trackers

The PCS.55.M is available in three matching configurations. The optimum components for North America (NA), European Union (EU), and World Wide (WW) have been determined to allow designers to easily integrate the PCS.55.M to get the best performance for any particular deployment scenario. The PCS.55.M is easy to integrate using standard SMD technologies and the matching circuits for each deployment (NA, EMEA, or WW) have been simplified to a 3 component configuration to allow for greater flexibility on the user side.

Many antennas advertise a small form factor but with the hidden cost of implementing a large PCB ground plane. At Taoglas, we believe that the whole antenna system (antenna + ground plane) needs to be small to meet the evolving demands of the IoT market. As a result, we have performed experimental ground plane studies in order to be fully transparent on the effect of small ground planes on antenna performance. This allows our customers to have full visibility on how our antennas will perform on various different ground plane sizes. The data for these studies is shown in the Application Note on page 59. For further information or, integration and matching guidelines contact your regional Taoglas customer support team.



# Specifications

2.

Electrical										
Band	Frequency (MHz)	Measurement	Efficiency (%)	Average Gain (dB)	Peak Gain (dBi)	Return Loss (dB)	Impedance	Polarization	Radiation Pattern	Max Input Power
5GNR Band71		NA	17.9	-7.5	-4.4	-2.5		Linear	Omni	2W
	617-698	EMEA	9.1	-10.4	-7.3	-2.5				
		WW	23.9	-6.2	-3.3	-4.7				
		NA	47.4	-3.2	0.2	-8.5				
5GNR/4G Band 12,17,28,29,85	698-746	EMEA	23.3	-6.3	-2.7	-4.1				
		WW	31.2	-5.1	-1.6	-3.7				
		NA	41.7	-3.8	-0.3	-5.1				
5GNR/4G Band 13,14,20,28	746-800	EMEA	31.1	-5.1	-1.5	-4.4				
		WW	31.7	-5.0	-1.5	-3.3				
5GNR/4G		NA	27.4	-5.6	-2.2	-3.1	50 Ω			
Band	800-880	EMEA	35.6	-4.5	-1.0	-5.0				
5,18,19,20,26,27		WW	32.6	-4.9	-1.6	-4.1				
5GNR/4G Band 5,8,19,26	880-960	NA	16.1	-7.9	-4.4	-2.6				
		EMEA	26.6	-5.7	-1.8	-5.6				
		WW	23.6	-6.3	-2.6	-4.3				
	1427-1518	NA	32.9	-4.8	0.4	-4.7				
5GNR/4G Band 74,75,76		EMEA	24.8	-6.1	-1.0	-3.1				
		WW	31.9	-5.0	0.4	-5.0				
	1560-1602	NA	43.3	-3.6	1.2	-5.9				
GNSS		EMEA	35.2	-4.5	0.7	-4.7				
		WW	43.3	-3.6	1.6	-6.3				
4G/3G Band 1,2,3,4,25,39,66	1710-2155	NA	46.6	-3.3	3.7	-6.3				
		EMEA	47.4	-3.2	3.3	-6.6				
		WW	43.0	-3.7	3.5	-5.9				
4G/3G		NA	14.7	-8.3	-2.0	-1.8				
Band 7, 38, 41, 69	2500-2690	EMEA	20.9	-6.8	-0.4	-2.2				
		WW	18.6	-7.3	0.0	-2.2				

The PCS.55.M antenna performance was measured with Taoglas PCSD.55.A EVB.



Mechanical					
Antenna Dimensions	27 x 10 x 1.6mm				
Material	FR4				
Weight	0.9g				
Soldering Type	SMD				

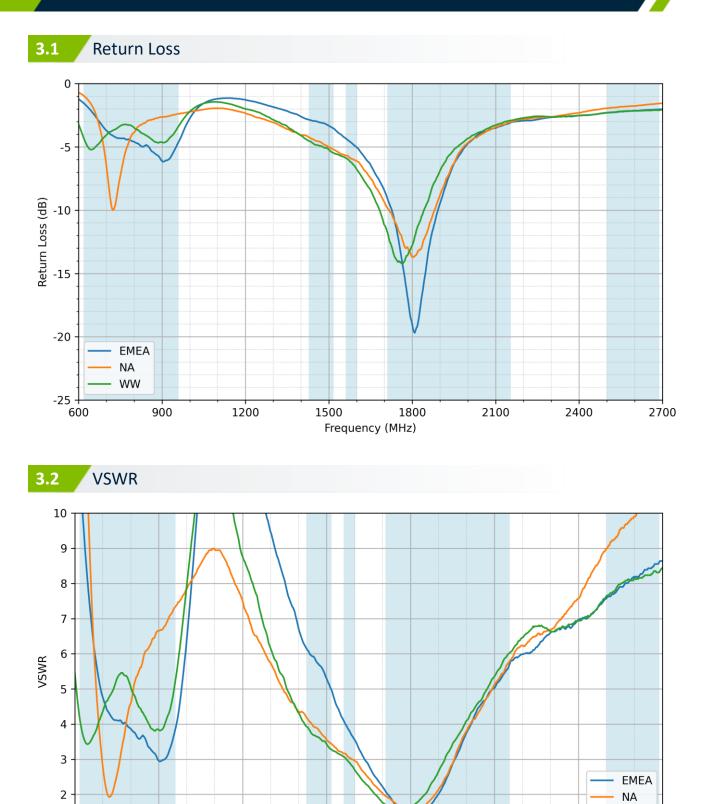
Environmental				
Operation Temperature	-40°C ~ +85°C			
Storage Temperature	-40°C ~ +85°C			
Moisture Sensitivity Level	3			



Back Number         Uper bounds         MAA         NA         WW           B1         190110 186         2110 10 707         A         A         WW           B2         190110 186         2110 10 707         A         A         C           B3         127010 178         1305 10 380         -         -         -           B4         127010 178         1305 10 380         -         -         -           B4         830 0 515         851 080         -         -         -         -           B4         830 0515         851 080         -         -         -         -         -           B4         830 0515         851 080         -         -         -         -         -           B4         830 0515         851 080         - <td< th=""><th colspan="9">5G/4G Bands</th></td<>	5G/4G Bands								
Bit     1276 b 1360     2116 b 270     ✓     ✓     ✓       Bit     1276 b 1276     1005 b 1360     ✓     ✓     ✓       Bit     1276 b 1276     1005 b 1255     ✓     ✓     ✓       Bit     124 b 246     146 b 244     ✓     ✓     ✓       Bit     124 b 257     121 b 2125     ✓     ✓     ✓       Bit     124 b 257     121 c 25 a 26     ✓     ✓     ✓       Bit     1274 b 1274     1375 b 156 0     ✓     ✓     ✓       Bit     1274 b 1274     1375 b 156 0     ✓     ✓     ✓       Bit     1274 b 1274     1375 b 156 0     ✓     ✓     ✓       Bit     1274 b 1274     1375 b 156 0     ✓     ✓     ✓       Bit     1371 b 127     131 b 127 b 127 b 128     ✓     ✓     ✓       Bit     138 b 128 0     131 b 128 b 128 0     ✓     ✓     ✓       Bit     1374 b 128     131 b 128 b 128 0     ✓     ✓     ✓       Bit     1374 b 128 b 128 0     131 b 128 b 128 0     ✓     ✓     ✓       Bit     1374 b 128 b 128 0     131 b 128 b 128 0     ✓     ✓     ✓       Bit     1374 b 128 b 128 b 128 b 128 0     ✓     ✓ <th>Band Number</th> <th colspan="7"></th>	Band Number								
B2     MSC10:900     MSC10:900     P       B4     1700:375     1300:255     P       B5     Akt 649     4kl 8184     P       B7     2000:757     1200:255     P       B6     680:051     922:1900     P       B6     120:515     22:1900     P       B7     2000:778.5     1364.50:1979     P       B1     122:52:1900     P     P       B1     122:52:1900     P     P       B1     122:52:1900     P     P       B2     MST0:178.7     744.578.51:450     P     P       B2     MST0:178.7     744.578.51:450     P     P       B2     MST0:630     P     P     P       B2     MST0:630		Uplink	Downlink	EMEA	NA	ww			
B1J200 b J28J200 b J28J40 b J28JB2J24 b J28J44 b J28JJJB3J24 b J27 b J27 b J20 b J4JJJJB4J27 b J27 b	B1	1920 to 1980	2110 to 2170	4	✓	✓			
94120 u375210 u 27597230 u 370220 u 360 </th <th>B2</th> <th>1850 to 1910</th> <th>1930 to 1990</th> <th>4</th> <th>√</th> <th>✓</th>	B2	1850 to 1910	1930 to 1990	4	√	✓			
B5B24 LessingB40 bitCCCB8B80 bitsB75 bits <th>B3</th> <th>1710 to 1785</th> <th>1805 to 1880</th> <th></th> <th>√</th> <th>✓</th>	B3	1710 to 1785	1805 to 1880		√	✓			
972000 p.3702000 p.3702000 p.3712000	B4	1710 to 1755	2110 to 2155	1	√	✓			
BD000 bitsD050	B5	824 to 849	869 to 894						
matrixmatrixmatrix121401214112141121411214112141121411214112141121411111211417112141111112114171121411111112114171121411111111211210112101111111111211417112111 </th <th>B7</th> <th>2500 to 2570</th> <th>2620 to 2690</th> <th>✓</th> <th></th> <th></th>	B7	2500 to 2570	2620 to 2690	✓					
B11142/3 to 345/4✓✓✓✓✓B137710 797740 796✓✓✓✓B147780 798740 796✓✓✓✓B157710 797740 796✓✓✓✓✓B177740 7977740 796✓✓<	B8	880 to 915	925 to 960	1	✓	✓			
B2B3P3 <th>B9</th> <th>1749.9 to 1784.9</th> <th>1844.9 to 1879.9</th> <th></th> <th></th> <th></th>	B9	1749.9 to 1784.9	1844.9 to 1879.9						
N3771 to 787740 r 786✓✓✓	B11	1427.9 to 1447.9	1475.9 to 1495.9	√	√	√			
B4795 078795 078B17736 0716734 0746B18835 0.850860 0.875B20837 0.862871 0.803B211447 30 1.862.9191 0.811B22340 0.862.7191 0.820B232000 0.32201160 0.200 </th <th>B12</th> <th>699 to 716</th> <th>729 to 746</th> <th></th> <th>√</th> <th>√</th>	B12	699 to 716	729 to 746		√	√			
B17774 to 716774 to 76444B18651 to 503851 to 500B19800 to 55971 to 801B211447 to 1462.01455 to 151.0.9B213410 to 34003310 to 3300 </th <th>B13</th> <th>777 to 787</th> <th>746 to 756</th> <th>√</th> <th>✓</th> <th>✓</th>	B13	777 to 787	746 to 756	√	✓	✓			
13       85 0.850       87 0.895 $\checkmark$ $\checkmark$ $\checkmark$ 133       837 0.862       97 3.0921 $\checkmark$ $\checkmark$ $\checkmark$ 140       842 0.862       73 0.9021 $\checkmark$ $\checkmark$ $\checkmark$ 141       1447 3 0.162,3       1493 50 1.150.9 $\checkmark$ $\checkmark$ $\checkmark$ 182       300 0.8200       2160 0.200       2160 0.200 $\sim$ $\checkmark$ $\checkmark$ 182       300 0.8200       2160 0.200 $\sim$ $\sim$ $\sim$ $\sim$ 182       1860 0.10 8.30       350 0.350 $\sim$ $\sim$ $\sim$ $\sim$ 182       180 0.10 8.30       350 0.350 $\sim$ $\sim$ $\sim$ $\sim$ 182       78 0.02 $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ 183       120 $\sim$ 123 $\sim$ 202 $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ 184       202 $\sim$ 123 $\sim$ 202 $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ 183       180 $\sim$ 120 $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ </th <th>B14</th> <th>788 to 798</th> <th>758 to 768</th> <th>√</th> <th>✓</th> <th></th>	B14	788 to 798	758 to 768	√	✓				
B13B30 Lo B42B71 Lo B21✓✓✓✓B2114473 to 1462.91495 to 1510.9✓✓✓✓B22340 to 3430350 to 390✓✓✓✓B23200 to 2002180 to 200✓✓✓✓B24106/5 to 160.5155 to 1595✓✓✓✓B251850 to 19151390 to 1995✓✓✓✓B26814 to 84989 to 894✓✓✓✓B27907 to 24452 to 807.5✓✓✓✓B28703 to 748728 to 803✓✓✓✓B292295 to 215340 to 180✓✓✓✓B3142.5 to 457.546.2 to 1467.5✓✓✓✓B321405 to 180✓✓✓✓✓B331290 to 20.5✓✓✓✓✓B3420.10 to 20.5✓✓✓✓✓B3511.50 to 50.9✓✓✓✓✓B4613.90 to 1980✓✓✓✓✓B4713.90 to 1980✓✓✓✓✓B4813.60 to 209✓✓✓✓✓B4913.90 to 200✓✓✓✓✓B4120.90 to 201✓✓✓✓✓B4213.90 to 200✓✓✓✓✓ </th <th>B17</th> <th>704 to 716</th> <th>734 to 746</th> <th></th> <th>✓</th> <th>√</th>	B17	704 to 716	734 to 746		✓	√			
920       832 to 862       79 to 82.1 $\checkmark$ $\checkmark$ $\checkmark$ 821       1447 90 148.29       1455 90 150.50 $\checkmark$ $\checkmark$ $\checkmark$ 823       2000 to 2000       2180 to 2000 $\sim$ $\checkmark$ $\checkmark$ 823       2000 to 2000       2180 to 1995 $\checkmark$ $\checkmark$ $\checkmark$ 825       1850 to 1915       1990 to 1995 $\checkmark$ $\checkmark$ $\checkmark$ 826       834 to 848 $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ 826       834 to 848 $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ 827       807 to 834       854 to 849 $\checkmark$ $\checkmark$ $\checkmark$ 828       735 to 748       734 to 854 $\checkmark$ $\checkmark$ $\checkmark$ 829       735 to 875 $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ 830       1205 to 10.0 $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ 833       1205 to 10.0 $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ 834       2000 to 20.0 $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ 835       1200 to 20.0 $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ </th <th>B18</th> <th>815 to 830</th> <th></th> <th></th> <th>✓</th> <th>√</th>	B18	815 to 830			✓	√			
B21     1447 90 1462.9     1965 60 150.0     ✓     ✓     ✓       B22     3410 to 3450     3510 to 3530     ✓     ✓     ✓       B23     200 to 2020     2146 to 2200     ✓     ✓     ✓       B24     15245 to 160.0     1325 to 1595     ✓     ✓     ✓       B25     1860 to 1515     1396 to 1995     ✓     ✓     ✓       B26     814 to 849     856 to 844     ✓     ✓     ✓       B27     807 to 224     825 to 859     ✓     ✓     ✓       B28     703 to 7.8     758 to 83     ✓     ✓     ✓       B39     2205 to 235     230 to 2305     ✓     ✓     ✓       B31     462.5 to 467.5     ✓     ✓     ✓     ✓       B31     1650 to 10.0     ✓     ✓     ✓     ✓       B34     1300 to 1990     ✓     ✓     ✓     ✓       B35     1200 to 200     ✓     ✓     ✓     ✓       B36     1230 to 1900     ✓     ✓     ✓     ✓       B36     1230 to 1900     ✓     ✓     ✓     ✓       B37     1300 to 1900     ✓     ✓     ✓     ✓       B38     1247 to 1467     ✓	B19	830 to 845	875 to 890			√			
N22         3410 to 3400         3510 to 3500         *         *         *           B23         2000 to 2020         123 to 1539         ·         ·         ·           B24         125 to 1600.5         123 to 1539         ·         ·         ·         ·           B25         1350 to 1915         1390 to 1995         ·         ·         ·         ·           B26         341 to 340         852 to 869         ·         ·         ·         ·           B27         380 to 235         750 to 803         ·         ·         ·         ·         ·           B28         731 to 738         ·         ·         ·         ·         ·         ·           B31         452 5 to 457.5         462 5 to 47.5         ·         ·         ·         ·         ·         ·           B32         1380 to 1910         ·									
P232000 b 0200218 b b 2200B24158 b b 1680.5155 b b 1595 </th <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>									
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NB35         1850 to 1915         1930 to 1925									
B26B34 to R49B59 to 894 82 to 669✓✓✓✓B27B07 to 284 738 to 803✓✓✓✓✓B29727 to 728 728 to 803✓✓✓✓✓B30205 to 2315 2250 to 28052250 to 2805 2250 to 2805✓✓✓✓✓B31452 to 457.5 452 to 457.5467.5 452 to 457.5✓✓✓✓✓B321452 to 457.5 158 to 1910462.5 to 467.5 452 to 457.5✓✓✓✓✓B342001 to 205✓✓ <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th></td<>									
B27B07 to 224B52 to 669✓✓✓✓B28703 to 78728 to 803✓✓✓✓B302305 to 235250 to 2360✓✓✓✓B31452 to 435462 5 to 47.5462 5 to 47.5✓✓✓B321452 to 148✓✓✓✓✓B342010 to 2025✓✓✓✓✓B351580 to 1930✓✓✓✓✓B361330 to 1930✓✓✓✓✓B382570 to 260✓✓✓✓✓B382570 to 260✓✓✓✓✓B412460 to 2800✓✓✓✓✓B433600 to 3800✓✓✓✓✓B443560 to 3700✓✓✓✓✓B451447 to 1467✓✓✓✓✓B463550 to 3700✓✓✓✓✓B473560 to 3700✓✓✓✓✓B483500 to 3700✓✓✓✓✓B451472 to 1432✓✓✓✓✓B461520 to 2700✓✓✓✓✓B473500 to 3700✓✓✓✓✓B481472 to 1472✓✓✓✓✓B491320 to 320✓✓✓ <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>									
B28733 to 748758 to 803✓✓ <th< th=""><th></th><th></th><th></th><th></th><th></th><th></th></th<>									
B291.71 to 728✓✓✓✓B302.205 to 313.52.250 to 23.60✓✓✓✓B3145.25 to 457.546.67.5✓✓✓✓B3214.52 to 456.5✓✓✓✓✓B342010 to 20.5✓✓✓✓✓B3515.50 to 37.5✓✓✓✓✓B3619.30 to 20.5✓✓✓✓✓B3719.10 to 37.0✓✓✓✓✓B382.570 to 70.0✓✓✓✓✓B402.200 to 37.0✓✓✓✓✓B412.466 to 55.00 to 37.0✓✓✓✓✓B4336.00 to 36.0✓✓✓✓✓✓B4336.00 to 36.0✓✓✓✓✓✓B4336.00 to 36.0✓✓✓✓✓✓B4435.50 to 37.0✓✓✓✓✓✓B4514.47 to 146.7✓✓✓✓✓✓✓B4651.50 to 37.0✓✓✓ <t< th=""><th></th><th></th><th>852 to 869</th><th></th><th></th><th></th></t<>			852 to 869						
B802305 to 23152350 to 2360✓✓✓✓B81423.5 to 457.5462.5 to 467.5462.5 to 467.5 to 467.5462.5 to 467.5 to 467.5462.5 to 467.5 to 467.5462.5 to 467.5 to 467.5 to 467.5463.5 to 467.5									
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B842010 ▷ 2025✓✓✓✓B351380 ▷ 1910✓✓✓✓B4613910 ▷ 1930✓✓✓✓B371310 ▷ 1930✓✓✓✓B382570 ▷ 2620✓✓✓✓B402300 ▷ 2400✓✓✓✓B412496 ▷ 2600✓✓✓✓B423300 ▷ 300✓✓✓✓B433600 ▷ 300✓✓✓✓B451447 ▷ 1467✓✓✓✓B465150 ▷ 5925✓✓✓✓B475855 ▷ 5925✓✓✓✓B483550 ▷ 3700✓✓✓✓B493550 ▷ 3700✓✓✓✓B493550 ▷ 3700✓✓✓✓B493550 ▷ 3700✓✓✓✓B49350 ▷ 3700✓✓✓✓B4014210 142✓✓✓✓B5114320 1517✓✓✓✓B522300 ▷ 2407✓✓✓✓B661710 17802110 to 2200✓✓✓B701695 to 17101995 to 2020✓✓✓B71631 to 652✓✓✓✓B721432 ▷ 1577✓✓✓✓B73450 to 455460 to 455✓✓					**	*			
BBS185 b 1910✓✓✓✓B61930 to 1930✓✓✓✓B371910 to 1930✓✓✓✓B382570 to 260✓✓✓✓B402300 to 2400✓✓✓✓B412496 to 269✓✓✓✓B423400 to 3600××××B433000 to 3800××××B451447 to 1467✓✓✓✓B465150 to 5925××××B475855 to 5925××××B48350 to 3700××××B493550 to 3700××××B493550 to 3700××××B501432 to 1517✓✓××B511427 to 1432✓✓××B532920 to 200✓✓××B651920 to 200✓✓××B661710 to 7802110 to 2200✓✓×B701695 to 17101995 to 220✓✓×B71663 to 698617 to 652××××B73450 to 455460 to 465××××B741427 to 1470147 to 1518✓✓××B741427 to 1432××××× <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>									
B861930 to 199∪✓✓✓✓B371910 to 1930✓✓✓✓B382750 to 260✓✓✓✓B402300 to 2400✓✓✓✓B412304 to 2200✓✓✓✓B423400 to 3600✓✓✓✓B433600 to 3800▲▲▲▲B441447✓✓✓✓B451447 to 1477✓✓✓✓B465150 to 5925▲▲▲▲B475855 to 925▲▲▲▲B4833500 to 3700▲▲▲▲B4833500 to 3700▲▲▲▲B493550 to 3700▲▲▲▲B481432 to 1517✓✓✓✓B511432 to 1517✓✓✓✓B532483 to 2485✓✓✓✓B661710 to 17802110 to 2200✓✓✓B671492 to 507 to 220✓✓✓✓B701695 to 17101995 to 2020✓✓✓B71661 682▲▲▲▲B73450 to 455460 to 465▲▲▲B741427 to 1432✓✓✓✓B751432 to 157✓✓✓✓B761427 to 151 B✓									
B371910 t J3∪ t J3∪✓✓✓✓B382570 t 262✓✓✓✓B391880 t J20✓✓✓✓B402300 t 240✓✓✓✓B41246 t 260✓✓✓✓B423400 t 360SO✓✓✓B433600 t 360✓✓✓✓B451447 t 347✓✓✓✓B465150 t 57✓✓✓✓B475855 t 370✓✓✓✓B483550 t 370✓✓✓✓B483550 t 370✓✓✓✓B511427 t 342✓✓✓✓B532435 t 370✓✓✓✓B531920 to 20102110 t 2200✓✓✓B661700 to 17002110 to 2200✓✓✓B671695 to 1710199 to 220✓✓✓B701695 to 1710199 to 220✓✓✓B71663 to 658617 to 652<✓✓B72451 to 456461 to 466%%✓B741427 to 1470147 to 151 8✓✓B751432 t 351 T✓✓✓B761437 to 151 8✓✓✓B761437 t 351 S 18✓✓✓B761437 t 351 S 18✓✓									
B382570 to 2620✓✓✓✓B391880 to 1920✓✓✓✓B412300 to 2600✓✓✓✓B423400 to 3600✓✓✓✓B433600 to 3920✓✓✓✓B445100 to 925✓✓✓✓B455130 to 925✓✓✓✓B465150 to 925✓✓✓✓B473550 to 925✓✓✓✓B483550 to 700✓✓✓✓B493550 to 700✓✓✓✓B493550 to 700✓✓✓✓B511427 to 142✓✓✓✓B523300 to 20102110 to 200✓✓✓B651920 to 20102110 to 200✓✓✓B661710 to 17802110 to 200✓✓✓B701695 to 1710199 to 200✓✓✓B71663 to 698617 to 652✓✓✓B72451 to 456461 to 466×××B73450 to 455460 to 455×✓✓B741427 to 14701475 to 1518✓✓✓B751437 to 1427 to 1470✓✓✓✓B761437 to 1427 to 1470✓✓✓✓B761437 to 1427 to 1470✓✓✓ </th <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>									
Hand									
B402300 ≥ JOUIIIB412390 ≥ JOUIIIB423300 ≥ JOUIIIB433600 ≥ 380IIIB441447 ≥ IIIIB451447 ≥ IIIIB465155 ≥ JIIIB47555 ≥ JIIIB483550 ≥ JOUIIIB493550 ≥ JOUIIIB493550 ≥ JOUIIIB493550 ≥ JOUIIIB41142 ≥ IIIIB51142 ≥ I <i< td="">IIIB531920 ≥ JOUIIIB641910 17802110 ≥ 200IIB651920 ≥ JOUIIIB661710 17802110 ≥ 200IIB671695 to 17101995 to 200IIB701695 to 17101995 to 200IIB71663 to 598617 to 52IIB7234 50 to 455IIIB73142 ≥ I 1/7IIB741427 to 1432IIB751432 ≥ JTIIB761427 to 1432IIB71663 to 598617 to 528IIB721432 to 14701475 to 1518IIB741432 to 1470II<!--</th--><th></th><th></th><th></th><th></th><th></th><th></th></i<>									
B41 $249 \pm 289$ $\checkmark$ $\ast$ $\checkmark$ B42 $3400 \pm 380$ $\approx$ $\ast$ $\ast$ B43 $3600 \pm 380$ $\ast$ $\ast$ $\ast$ B43 $3600 \pm 380$ $\ast$ $\ast$ $\ast$ B44 $1447 \pm 1467$ $\checkmark$ $\checkmark$ $\ast$ B46 $5150 \pm 925$ $\ast$ $\ast$ $\ast$ B47 $8550 \pm 3700$ $\ast$ $\ast$ $\ast$ B48 $3550 \pm 3700$ $\ast$ $\ast$ $\ast$ B49 $3550 \pm 3700$ $\ast$ $\ast$ $\ast$ B51 $1427 \pm 132$ $\checkmark$ $\checkmark$ $\checkmark$ B52 $3300 \pm 3400$ $\ast$ $\ast$ $\checkmark$ B65 $1202 to 2010$ $2110 to 2200$ $\checkmark$ $\checkmark$ $\checkmark$ B66 $1710 to 1780$ $2110 to 2200$ $\checkmark$ $\checkmark$									
B423400 ∪ 500%%%%B433600 ∪ 3800800%%%%B431447 ∪ 147 </th <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>									
B433600 ∪ 300 ∪****B451447 ∪ 1467 ∪✓✓✓✓B46S150 ∪ 592 Ø%%%B47S585 ⊵92 Ø%%%B483550 ∪ 700 ∪Ø%%%B493550 ∪ 700 ∪Ø%%%B493550 ∪ 700 ∪Ø%%%B5014427 ∪ 142 ∪✓✓✓B523300 ∪ 100 ∪Ø%%%B651920 to 2010 ∪2110 to 2200 ∪✓✓✓B66698 to 728 ∪ 726 ∪Ø✓✓✓B68698 to 728 ∪ 726 ∪Ø✓✓✓B701695 to 1710 1995 to 2020 ∪Ø✓✓✓B71663 to 698 ∪110 to 522 ∪Ø✓✓✓B72450 to 455 ∪460 to 456<%%✓✓B73450 to 455 ∪147 to 1518 ∪✓✓✓✓B751427 ∪ 1470 ∪147 to 1518 ∪✓✓✓✓B751427 ∪ 143ØØ✓✓✓B761427 ∪ 143%%%%%B773300 ∪ □%%%%%B78698 to 716728 to 746%%%B79410 to 15420 to 425%%%B78698 to 716728 to 746%%% <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>									
B451447 □ IIIIIIB46S150 □ S70SSSSSB47S855 □ S70SSSSSB49S350 □ S70SSSSSB49S350 □ S70SSSSSB50S1432 □ S70SSSSSB511432 □ S70SSSSSB511102 □ S10SSSSSB532483 □ S10 □ S10SSSSSB651920 to 20102110 to 2200SSSSB661920 to 20102110 to 2200SSSSB68698 to 728753 to 783SSSSB701695 to 17101995 to 2020SSSSB71663 to 698661 to 665SSSSB73450 to 455460 to 465SSSSB73450 to 455460 to 465SSSSB751427 to 14701475 to 1518SSSSB761427 to 14701475 to 1518SSSSB77SSSSSSSSB761427 to 14701475 to 1518SSSSSB77SSSSSSSS<					×	*			
B46S150 ⊍ 52S****B47S550 ∪ 570SSSSB48G3550 ∪ 570SSSSB49G350 ∪ 570SSSSB49G350 ∪ 570SSSSB49G1422 ∪ 517SSSSB511427 ∪ 432SSSSB52G330 ∪ 340SSSSSB532435 ∪ 570SSSSSB651920 to 20102110 to 2200SSSSB661710 to 7802110 to 2200SSSSB68698 to 728753 to 783SSSSB701695 to 17101995 to 2020SSSSB71663 to 698617 to 652SSSSB73450 to 455460 to 465SSSSB741427 to 14701475 to 1518SSSSB751432 ∪ 142SSSSSSB761432 ∪ 142SSSSSSB77S300 ∪ 300SSSSSSB78698 to 715728 to 746SSSSB78698 to 716728 to 746SSSSB78698 to 716728 to 746SSSS				1	✓	√			
B47S855 ⇒25 (Second second secon				×	*	*			
B483550 → 3700××××B493550 → 3700××××B501432 → 1517✓✓✓✓B511432 → 1432 → 243✓✓✓✓B523300 → 300✓✓×✓✓B651920 to 20102110 to 2200✓×✓✓B661710 to 17802110 to 2200✓✓✓✓B68098 to 728753 to 783✓✓✓✓B68098 to 728753 to 783✓✓✓✓B701695 to 17101995 to 2020✓✓✓✓B71663 to 698617 to 652×××✓B72451 to 456461 to 466××××B73450 to 455460 to 465××××B741427 to 14701475 to 1518✓✓✓✓B751432 → 157✓✓✓✓✓B761432 → 1300 → 200×××××B751432 → 157 to 158✓✓✓✓✓B761432 → 157 to 158×××××B773300 → 200××××××B783300 → 300 + 200××××××B761432 → 157 to 158×××××B775300 +				*	*	*			
B49355∪J1111B501432∪JT√√√B511412/J2√√√B52330∪J40√11B53248J/J2✓11B651920 to 20102110 to 2200√√B661710 to 17802110 to 2200√√B661710 to 17802110 to 2200√√B67698 to 728753 to 783√√B68698 to 728753 to 783√√B69257/J2√√√B69663 to 698617 to 652√√B71663 to 698617 to 652××√B73450 to 455460 to 465×××B741427 to 14701475 to 1518√√√B751432/J2√×√√B76330∪/J2×√×√B77330∪/J2×××××B78698 to 716728 to 746×××B76698 to 716728 to 746×××B76698 to 716728 to 746×××B77698 to 716728 to 746×××B78698 to 716728 to 746×××B79410 to 415728 to 746×××B70698 to 716728 to 746××× <td< th=""><th></th><th></th><th></th><th>*</th><th>*</th><th>*</th></td<>				*	*	*			
B511427 ∪ 1432✓✓✓B523300 ∪ 3400××××B532483.5 ∪ 2495✓✓×✓B651920 to 20102110 to 2200✓✓✓B661710 to 17802110 to 2200✓✓✓B68698 to 728753 to 783✓✓✓B692570 ∪ 2620✓✓✓✓B701695 to 17101995 to 2020✓✓✓B71663 to 698617 to 552××✓B72451 to 456461 to 466×××B73450 to 455460 to 465×××B741427 to 14701475 to 1518✓✓✓B751432 ∪ 517✓✓✓✓B761427 to 14701475 to 1518✓✓✓B761427 to 14701475 to 1518✓✓✓B773300 ∪ 200×××××B783300 ∪ 3800×××××B794400 ∑×××××B85698 to 716728 to 746×✓✓B87410 to 415420 to 425×××				*	×	*			
B511427 ∪ 1432 ∨IIIB523300 ∪ 3400\$\$\$\$\$B532483.5 ∪ 495 ∨IIIIB651920 to 20102110 to 2200IIIB661710 to 17802110 to 2200IIIB68698 to 728750 ∨IIIB692500 ∨IIIIB692500 ∨IIIIB701695 to 17101995 to 2200IIIB71663 to 698617 to 652IIIB72451 to 456461 to 466IIIB73450 to 455460 to 465IIIB741427 to 14701475 to 1518IIIB751432 ∨ 517IIIIB761432 ∨ 517IIIIB761432 ∨ 517IIIIB773300 ∨ 200IIIIB783300 ∨ 200IIIIB794400 ∨ 300IIIIB87410 to 150128 to 746IIB87410 to 150				1	✓	✓			
B532483.5 2495IIIIB651920 to 20102110 to 2200IIIB661710 to 17802110 to 2200IIIB68698 to 728753 to 783IIIB692570 E20IIIIB701695 to 17101995 to 2020IIIB71663 to 698617 to 652IIIB72451 to 456461 to 466IIIB73450 to 455460 to 465IIIB741427 to 14701475 to 1518IIIB751432 To 14701475 to 1518IIIB761432 To 14701475 to 1518IIIB761432 To 14701475 to 1518IIIB761432 To 1432IIIIB773300 ± 200IIIIB78698 to 716728 to 746IIIB87410 to 415420 to 425IIIB87410 to 415420 to 425III	B51	1427 t	:0 1432	✓	✓	✓			
B651920 to 20102110 to 2200✓✓✓B661710 to 17802110 to 2200✓✓✓✓B68698 to 728753 to 783✓✓✓✓B69257753 to 783✓✓✓✓✓B701695 to 17101995 to 2020✓✓✓✓✓B71663 to 698617 to 652✓✓✓✓✓B72451 to 456461 to 466×××✓✓B73450 to 455460 to 465×××××B741427 to 14701475 to 1518✓✓✓✓✓B751432 to 7470470 to 1470✓✓✓✓✓B761427 to 13300 to 1470 to 1518×××××B77533530 to 550 to 5	B52	3300 t	o 3400	*	*	*			
B661710 to 17802110 to 2200IIIB68698 to 728753 to 783IIIB692570 :>2620IIIIB701695 to 17101995 to 2020IIIB71663 to 698617 to 652IIIB72451 to 456461 to 466IIIIB73450 to 455460 to 465IIIIB741427 to 14701475 to 1518IIIIB751432 to 14701475 to 1518IIIIB761432 to 14701475 to 1518IIIIB761432 to 14701475 to 1518IIIIB761432 to 14701475 to 1518IIIIB77300 to 2800	B53	2483.5	to 2495	1	*	✓			
B68698 to 728753 to 783✓✓✓B692570 - 220✓✓✓✓B701695 to 17101995 to 2020✓✓✓B71663 to 698617 to 652✗✗✓B72451 to 456461 to 466¾¾¾B73450 to 455460 to 465¾¾¾B741427 to 14701475 to 1518✓✓✓B751427 to 14701475 to 1518✓✓✓B761427 to 14701475 to 1518✓✓✓B763300 - 1432 - 1432 - 1432✓✓✓✓B773303 - 1432 - 1432 - 1432143¾¾¾B783303 - 14330 - 14330¾¾¾¾¾B78698 to 716728 to 746¾¾¾¾B87410 to 415420 to 425¾¾¾¾	B65	1920 to 2010	2110 to 2200	1	✓	✓			
B692570 U ≥ 200✓¥✓B701695 to 17101995 to 2020✓✓✓B71663 to 698617 to 652×××✓B72451 to 456461 to 466××××B73450 to 455460 to 465××××B741427 to 14701475 to 1518✓✓✓B751432 U 1432✓✓✓✓B761437 to 14701475 to 1518✓✓✓B761432 U 1432✓✓✓✓B773300 U 1432××××B783300 U 100	B66	1710 to 1780	2110 to 2200	1	✓	✓			
BroLoss of LossArrowArrowBro1695 to 17101995 to 2020IIIBr1663 to 698617 to 652IIIBr2451 to 456461 to 466IIIBr3450 to 455460 to 465IIIBr41427 to 14701475 to 1518IIIBr51432 to 1432IIIIBr61427 to 14701475 to 1518IIIBr61427 to 14701475 to 1518IIIBr61427 to 14701475 to 1518IIIBr73300 to 1432 to 1432IIIIBr73300 to 3300 to 1402IIIIBr8698 to 716728 to 746IIIBr7410 to 415420 to 425IIIBr7598 to 716728 to 746IIIBr7410 to 415420 to 425III	B68	698 to 728	753 to 783	1	✓	✓			
B71663 to 698617 to 652**·B72451 to 456461 to 466***B73450 to 455460 to 465***B741427 to 14701475 to 1518···B75-1427 to 14701475 to 1518···B76-1427 to 1422····B773300 ···***B78-3300 ··****B79-440 ··****B85698 to 716728 to 746*···B87410 to 415420 to 425****	B69	2570 t	to 2620	1	*	√			
B72451 to 456461 to 466 $x$ $x$ $x$ B73450 to 455460 to 455 $x$ $x$ $x$ B741427 to 14701475 to 1518 $\checkmark$ $\checkmark$ $\checkmark$ B75 $-1427$ to 14701475 to 1518 $\checkmark$ $\checkmark$ $\checkmark$ B76 $-1427$ to 1470 $477$ to 1518 $\checkmark$ $\checkmark$ $\checkmark$ B76 $-1427$ to 1432 $-1427$ $-1427$ $-1427$ $-1427$ B76 $-1427$ to 1432 $-1427$ $-1427$ $-1427$ $-1427$ B77 $-1423$ to 13300 $-1427$ $-1427$ $-1427$ $-1427$ B78 $-1427$ to 2300 $-1427$ $-1427$ $-1427$ $-1427$ B79 $-1420$ to 2017 $-1427$ $-1427$ $-1427$ $-1427$ B85 $-688$ to 716 $-728$ to 746 $x$ $x$ $x$ $x$ B87 $-140$ to 415 $-1420$ to 425 $x$ $x$ $x$ $x$	B70	1695 to 1710	1995 to 2020	√	✓	√			
B73450 to 455460 to 465%%%B741427 to 14701475 to 1518 $\checkmark$ $\checkmark$ $\checkmark$ B75 $-1427$ to 1518 $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ B76 $-1427$ to 122 $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ B77 $-3300 + 200$ $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ B78 $-3300 + 300$ $\checkmark$ $\%$ $\%$ $\%$ B79 $-4400 + 300 + 300$ $\%$ $\%$ $\%$ $\%$ B85 $-698$ to 716 $728$ to 746 $\%$ $\checkmark$ $\checkmark$ B87 $410$ to 415 $420$ to 425 $\%$ $\%$ $\%$	B71	663 to 698	617 to 652	×	*	✓			
B74       1427 to 1470       1475 to 1518       Image: Marcine Marc	B72	451 to 456	461 to 466	*	*	*			
B75 $1432  orbits 1517$ $\checkmark$ $\checkmark$ $\checkmark$ B76 $1427  orbits 1432$ $\checkmark$ $\checkmark$ $\checkmark$ B77 $3300  orbits 420$ $x$ $x$ $x$ B78 $3300  orbits 380$ $x$ $x$ $x$ B79 $4400  orbits 00$ $x$ $x$ $x$ $x$ B85 $698  orbits 716$ $728  orbits 746$ $x$ $x$ $x$ B87 $410  orbits 045$ $420  orbits 025$ $x$ $x$ $x$	B73	450 to 455 460 to 465		*	*	*			
B76 $1427  ext{ 142}$ $\checkmark$ $\checkmark$ $\checkmark$ B77 $3300  ext{ 420}$ $\pounds$ $\pounds$ $\pounds$ $\pounds$ B78 $3300  ext{ 3300}$ $\pounds$ $\pounds$ $\pounds$ $\pounds$ B79 $4400  ext{ 500}$ $\pounds$ $\pounds$ $\pounds$ $\pounds$ B85 $698  ext{ 6716}$ $728  ext{ 6746}$ $\pounds$ $\checkmark$ $\checkmark$ B87 $410  ext{ 0415}$ $420  ext{ 0425}$ $\pounds$ $\pounds$ $\pounds$	B74	1427 to 1470 1475 to 1518		1	✓	✓			
B77         3300 to 4200         %         %         %         %           B78         3300 to 3800         %       %         %         %         %         %         %         %         %         %         %         %         %         % </th <th>B75</th> <th>1432 t</th> <th>:0 1517</th> <th>1</th> <th>✓</th> <th>✓</th>	B75	1432 t	:0 1517	1	✓	✓			
B78         3300 to 3800         %         %         %           B79         4400 to 500         %         %         %         %           B85         698 to 716         728 to 746         %         √         √         √           B87         410 to 415         420 to 425         %         %         %         %	B76	1427 t	to 1432	4	✓	✓			
B79         4400 to 5000         %         %         %           B85         698 to 716         728 to 746         %         √         √           B87         410 to 415         420 to 425         %         %         %         %	B77	3300 t	to 4200	*	*	*			
B85         698 to 716         728 to 746         *         ✓         ✓           B87         410 to 415         420 to 425         *         *         *	B78	3300 t	to 3800	*	*	*			
<b>B87</b> 410 to 415 420 to 425 <b>* *</b>	B79	4400 t	o 5000						
					√	✓			
B88         412 to 417         422 to 427         #         #         #									
	B88	412 to 417	422 to 427	×	×	*			





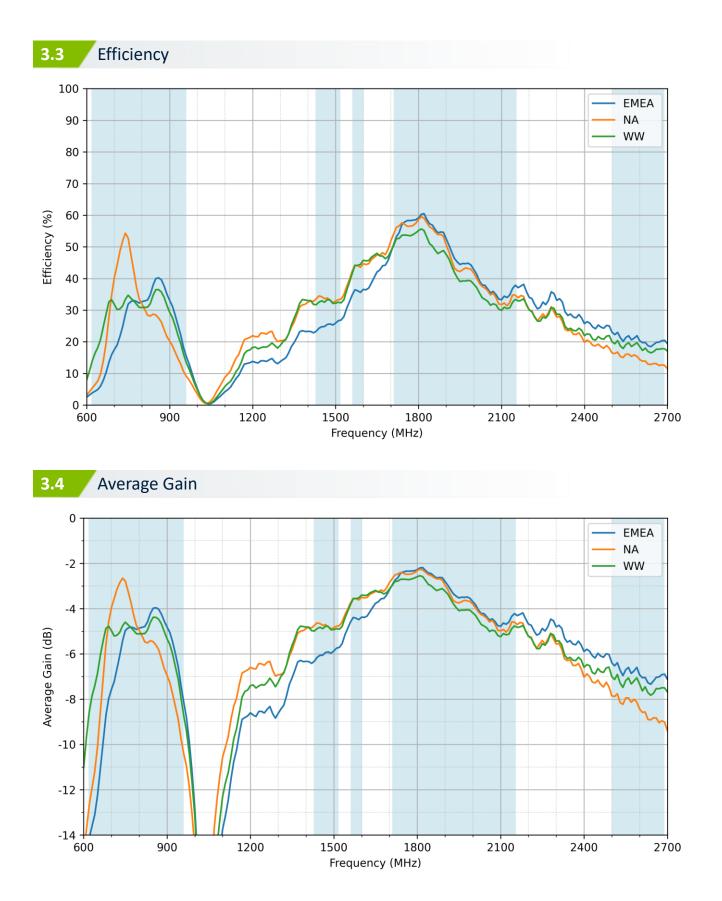


1 <del>|</del> 

Frequency (MHz)

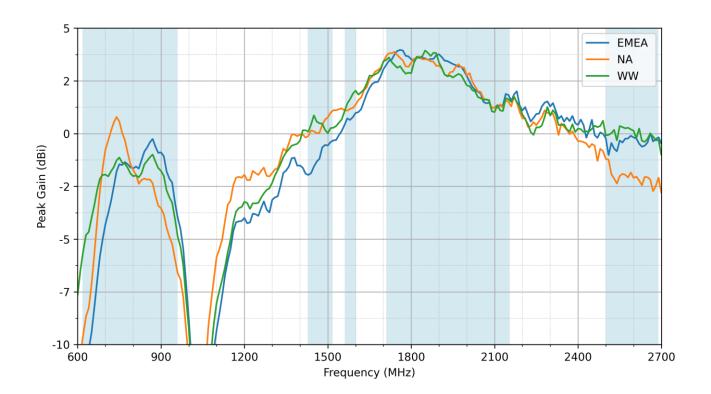
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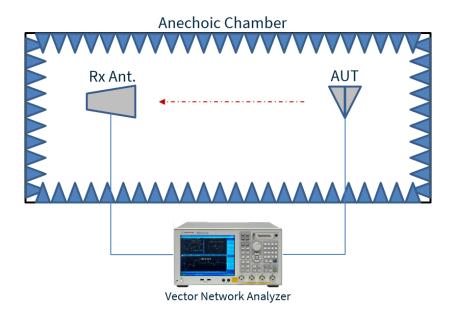
## 3.5 Peak Gain

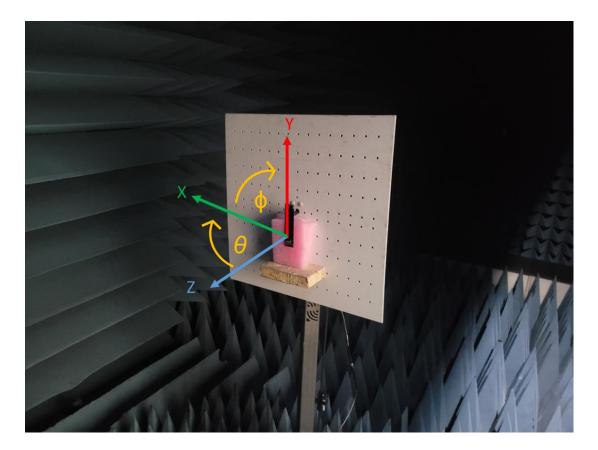




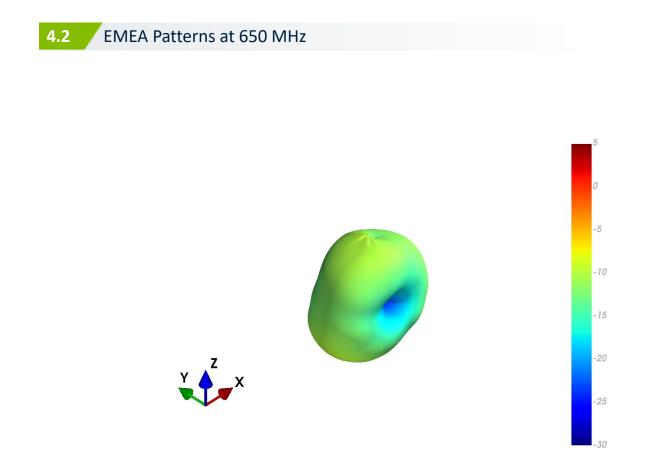


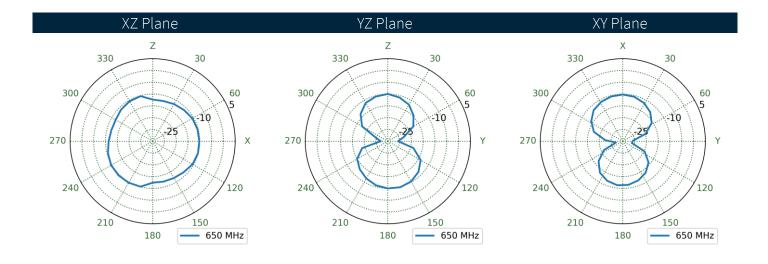
## 4.1 Test Setup



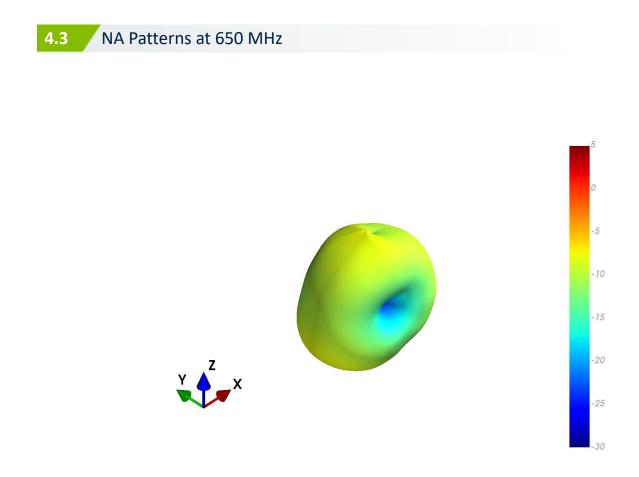


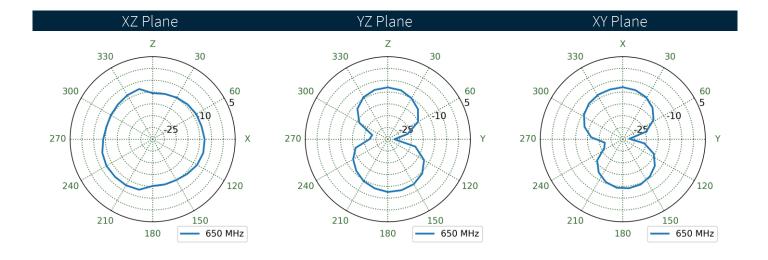




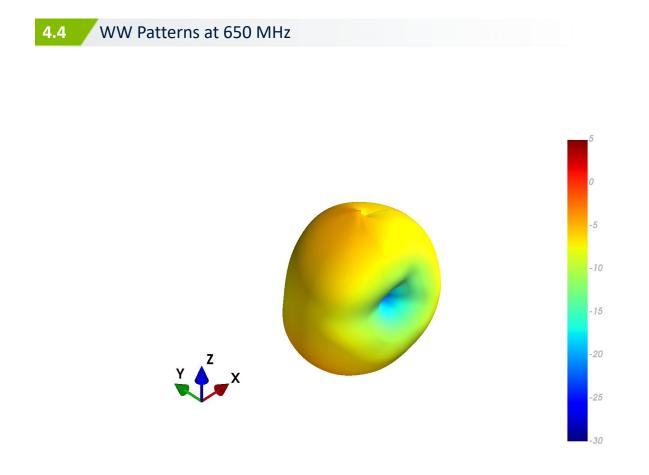


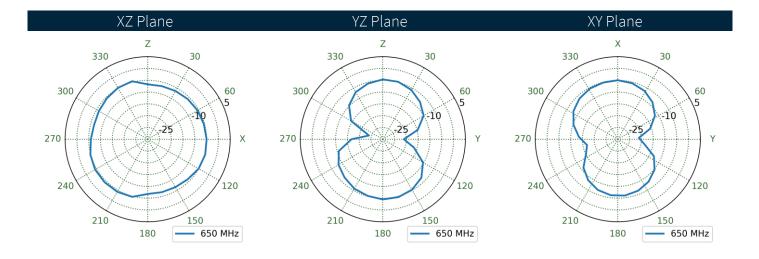




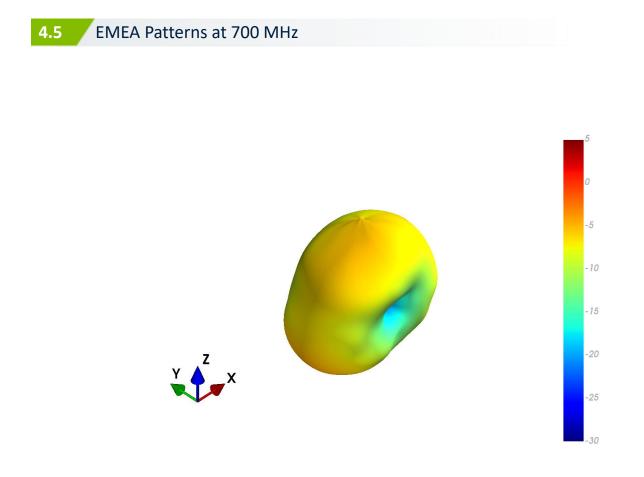


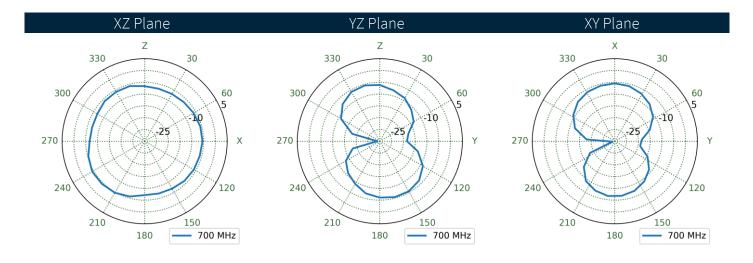




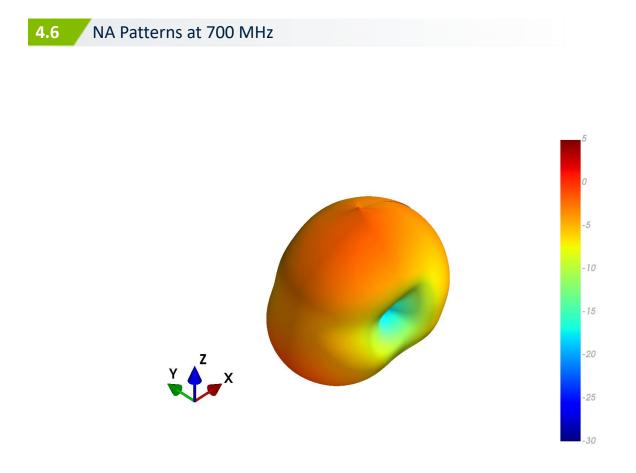


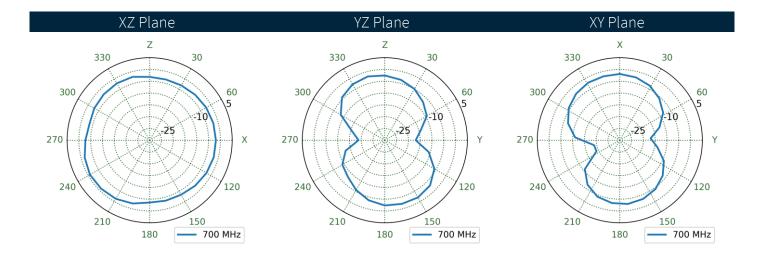




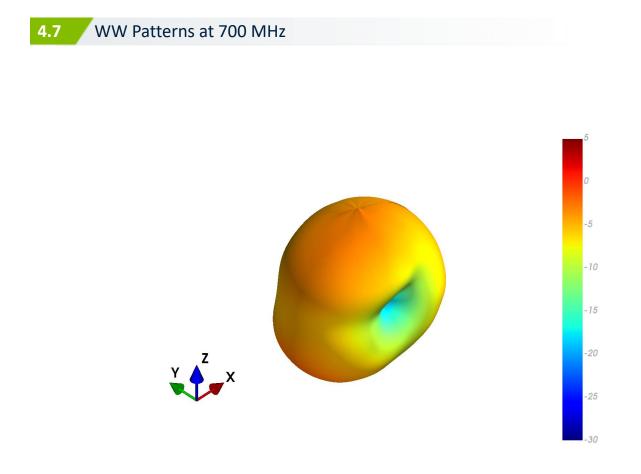


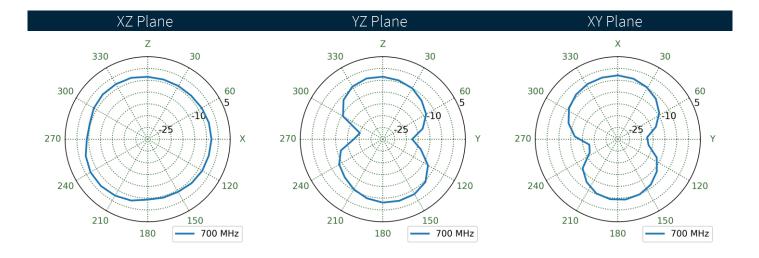




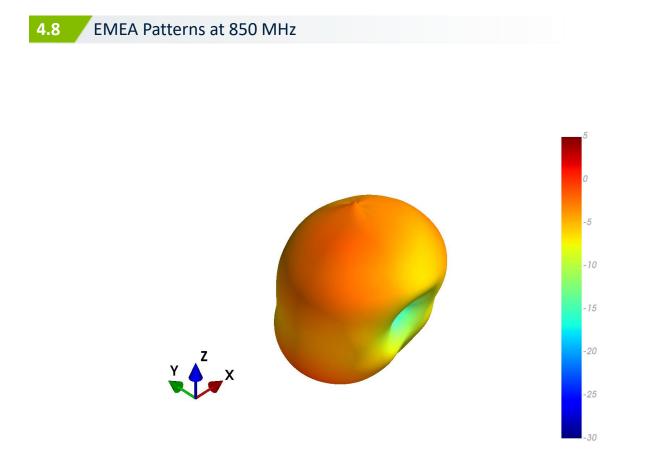


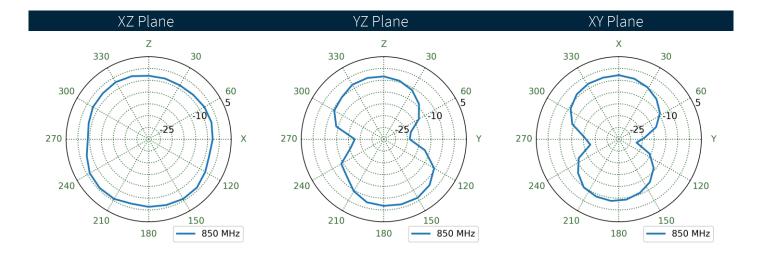




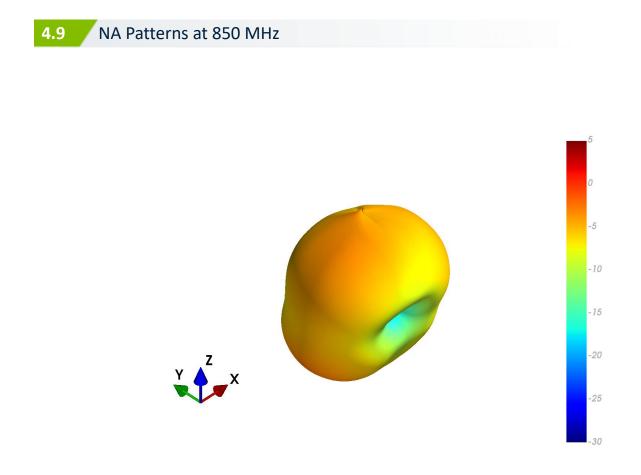


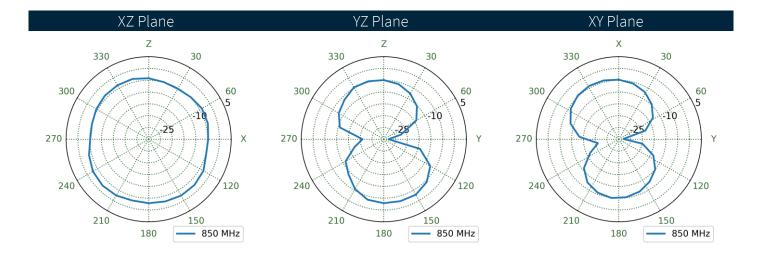




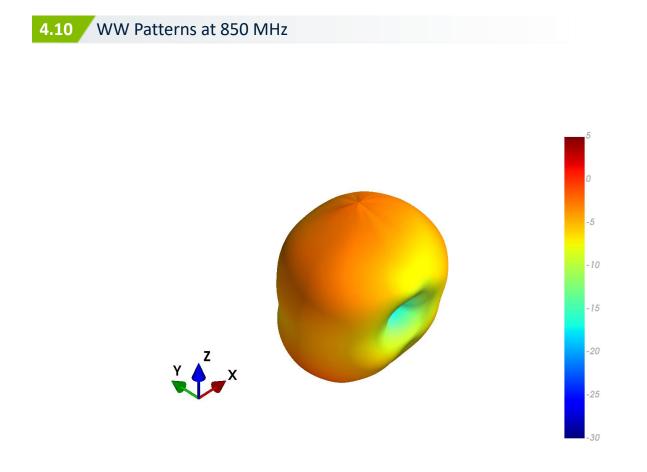


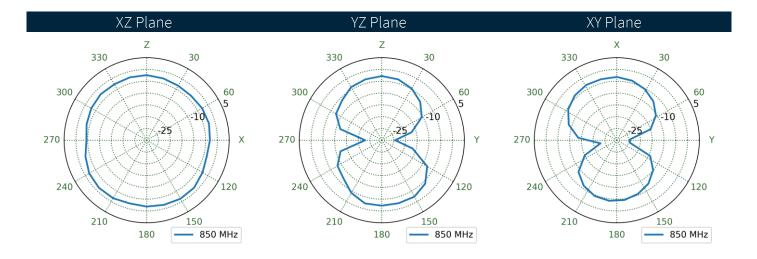




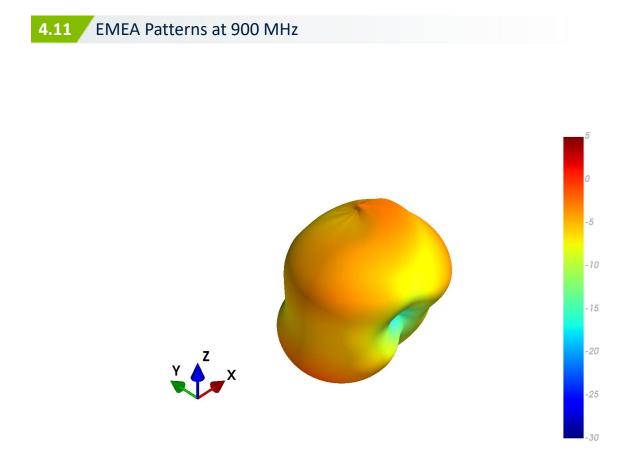


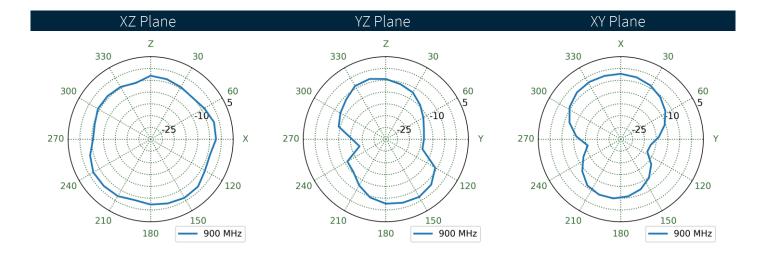




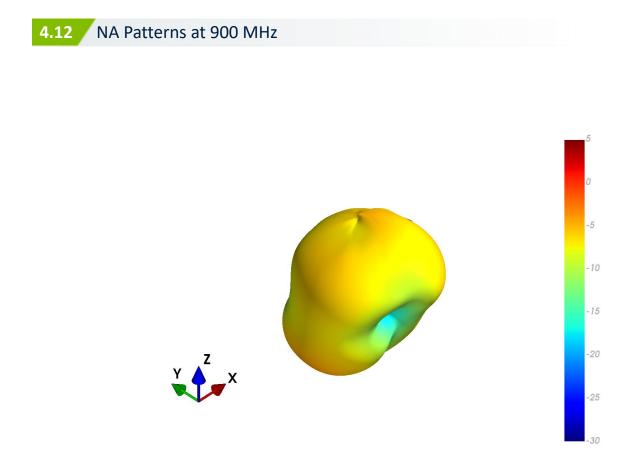


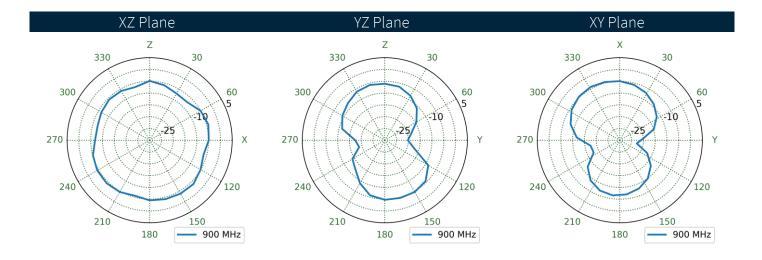




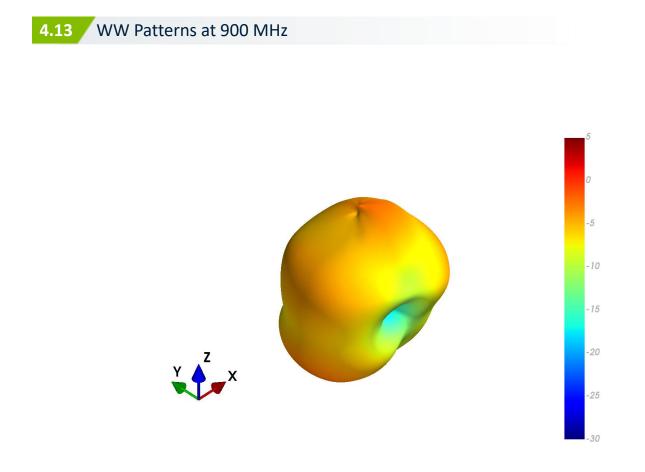


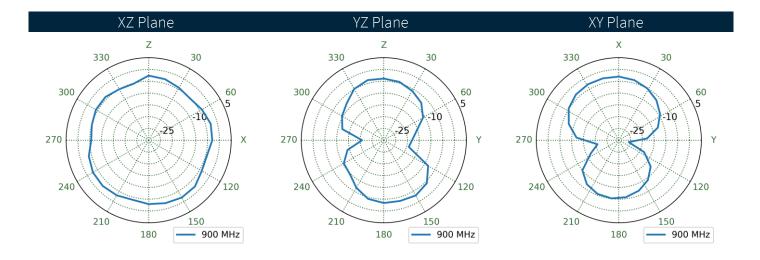




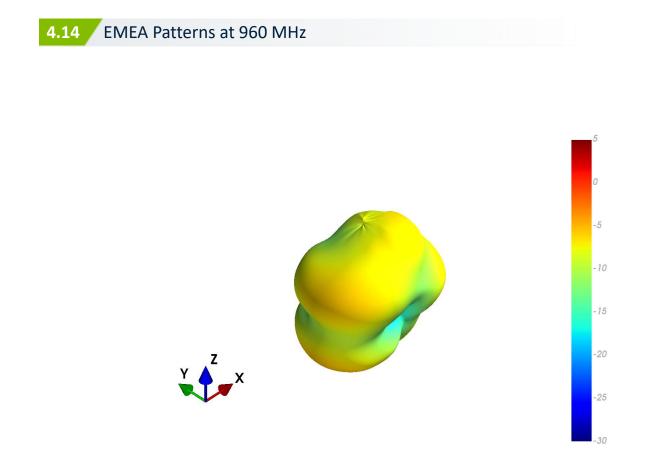


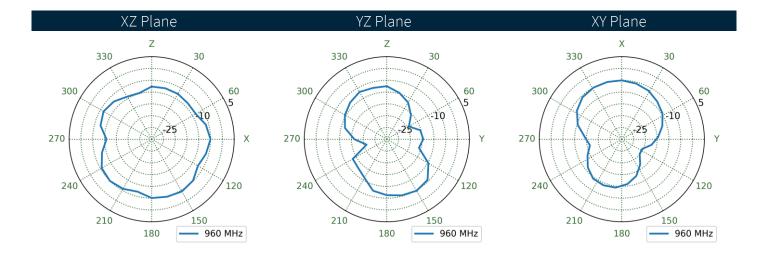




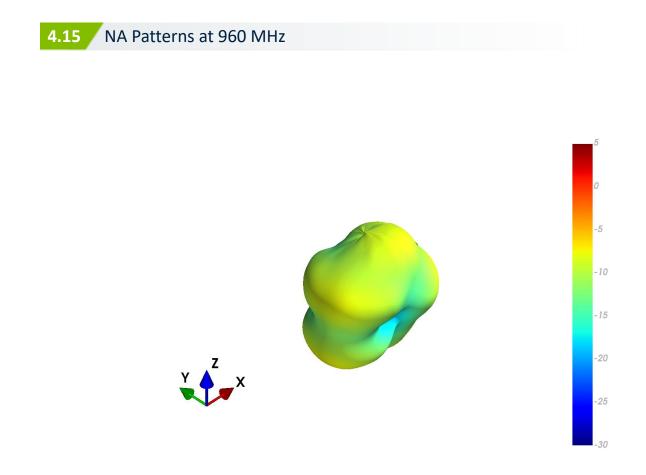


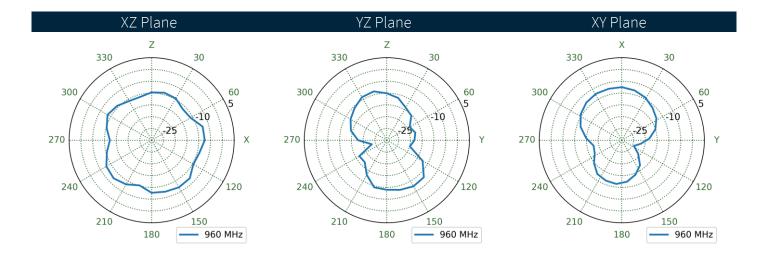




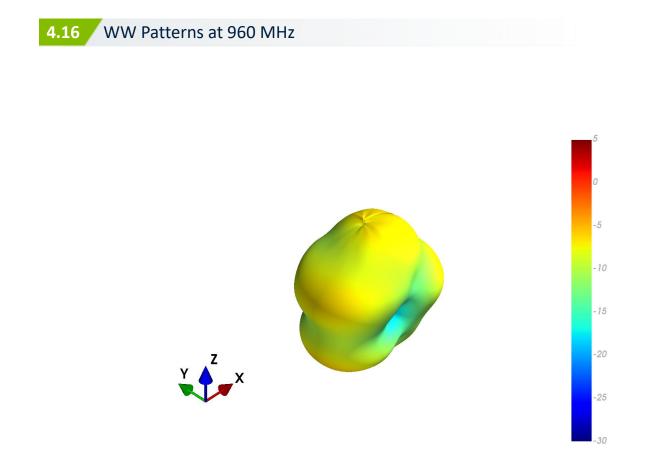


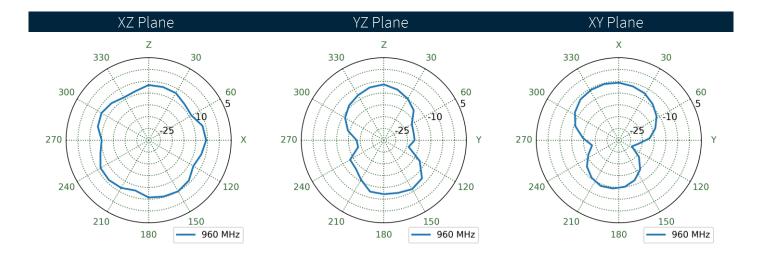




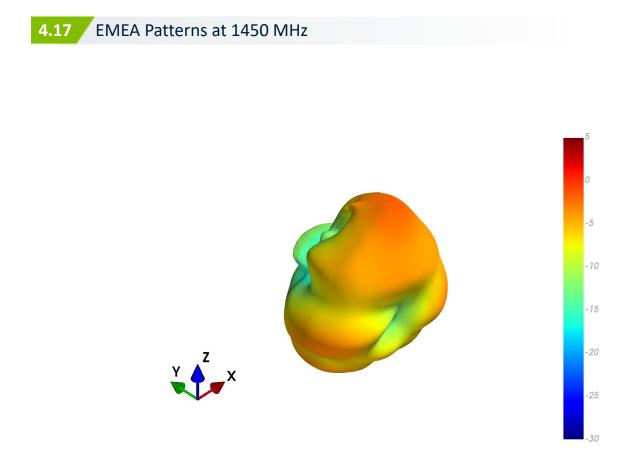


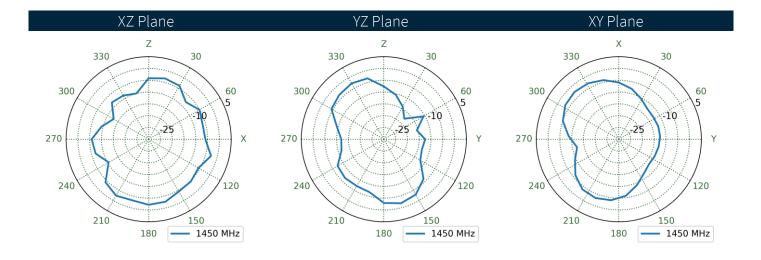




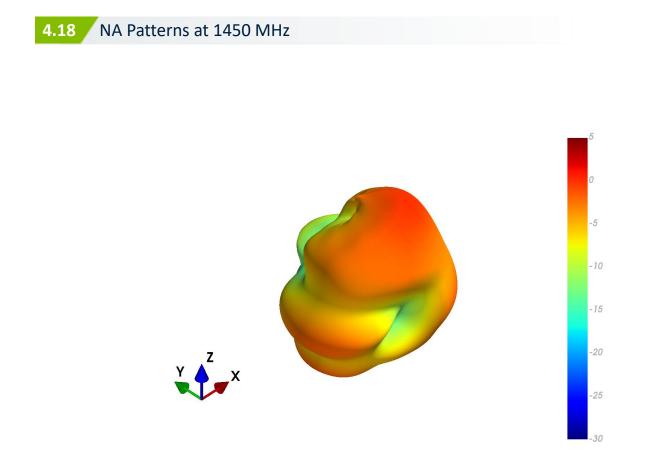


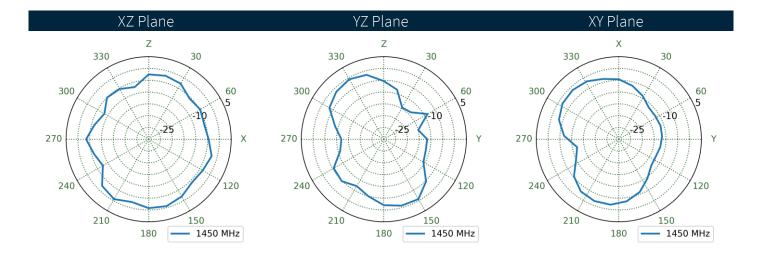




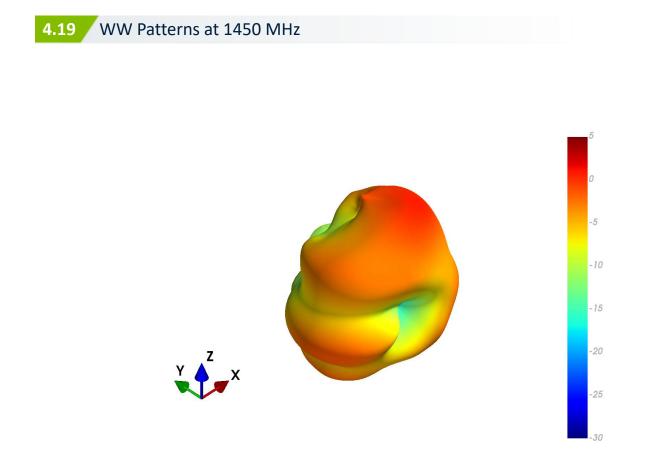


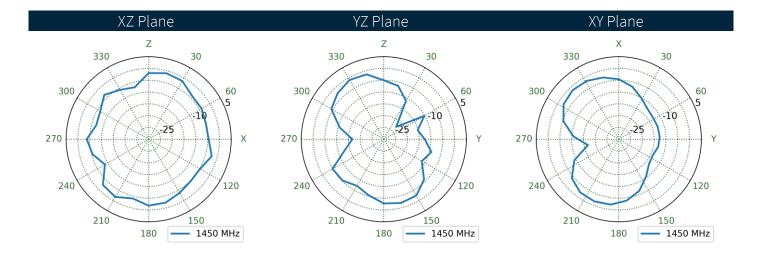




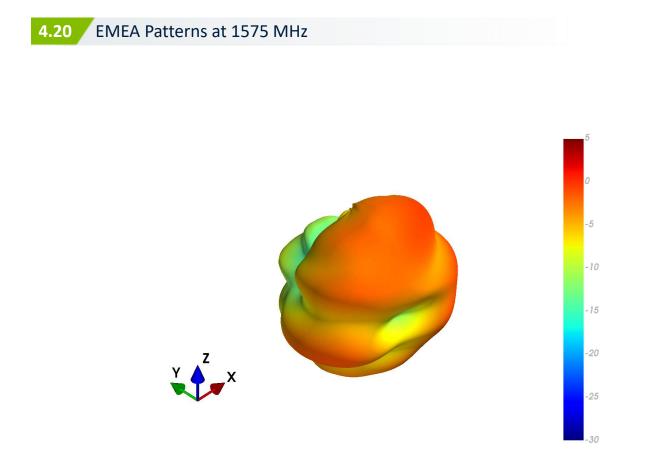


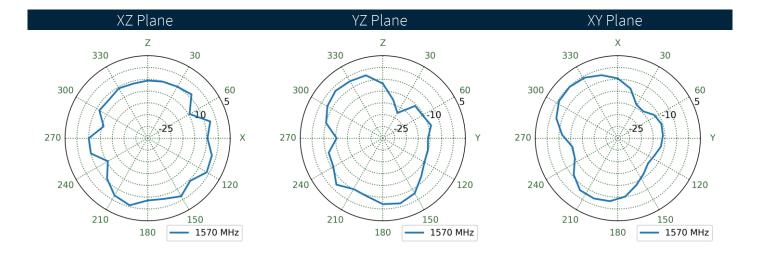




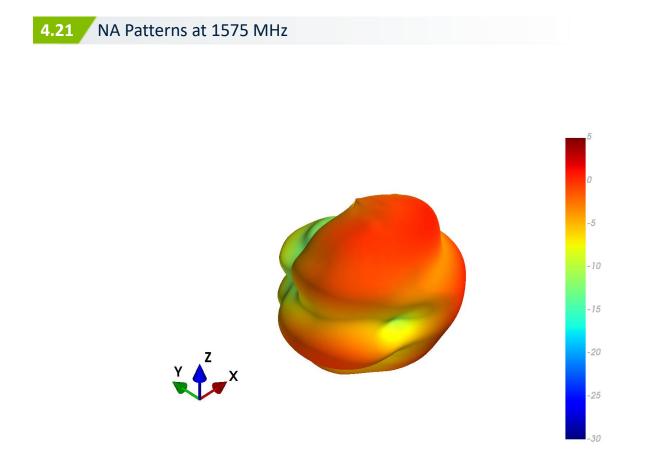


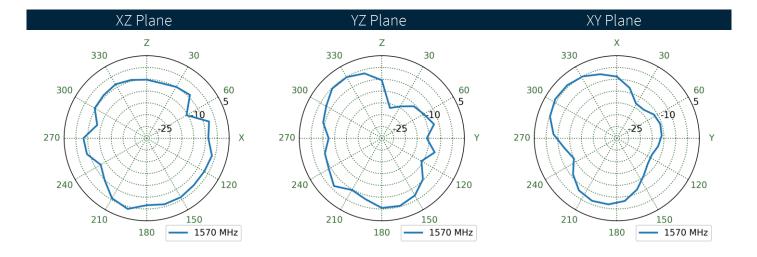




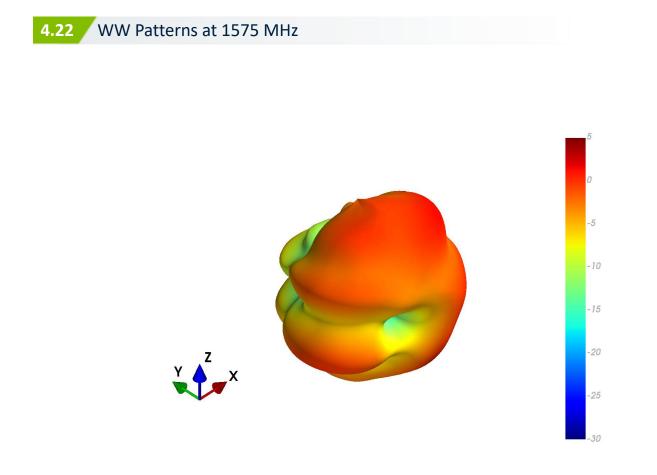


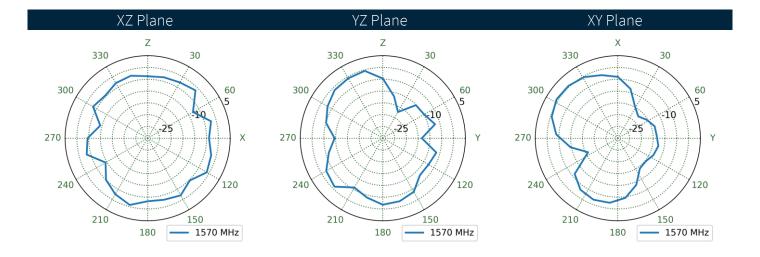




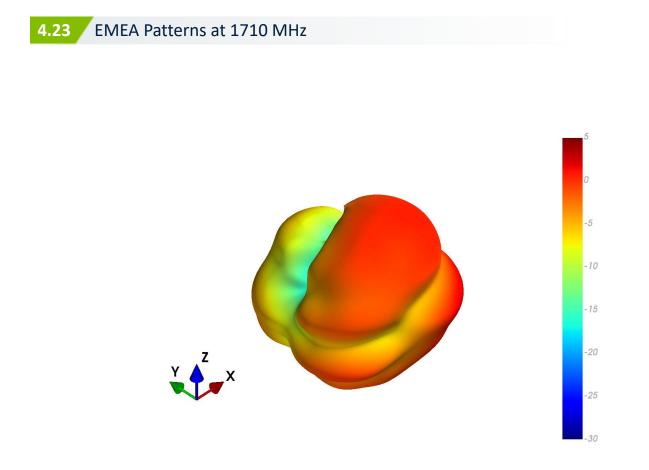


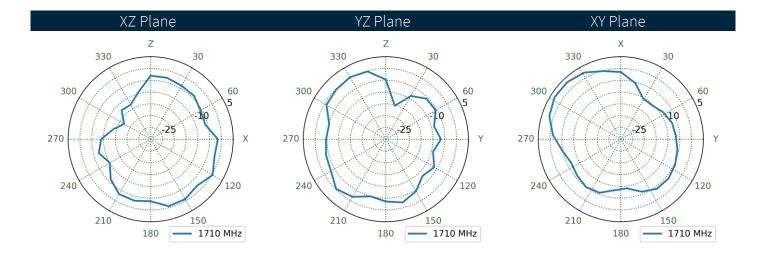




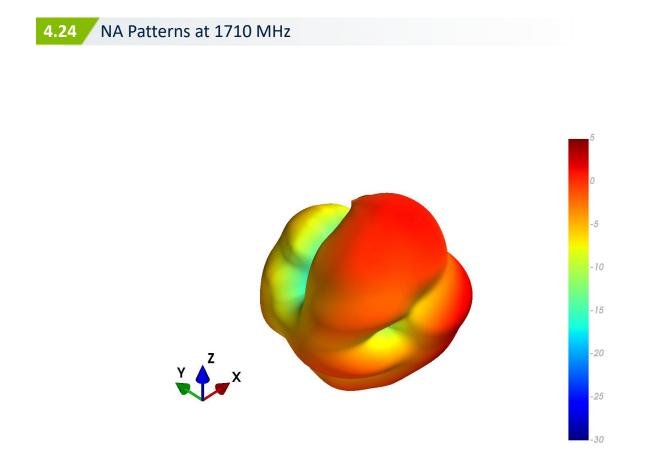


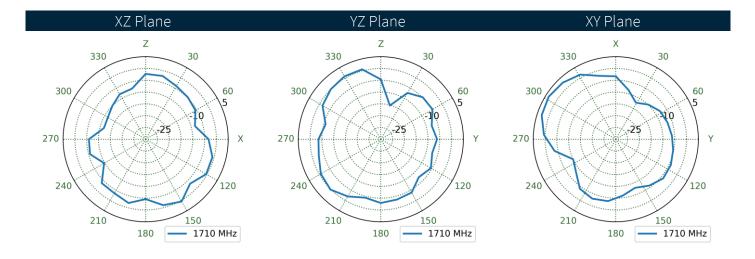




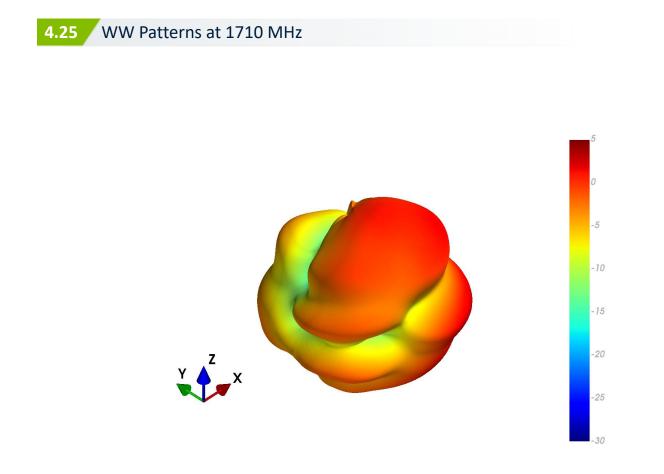


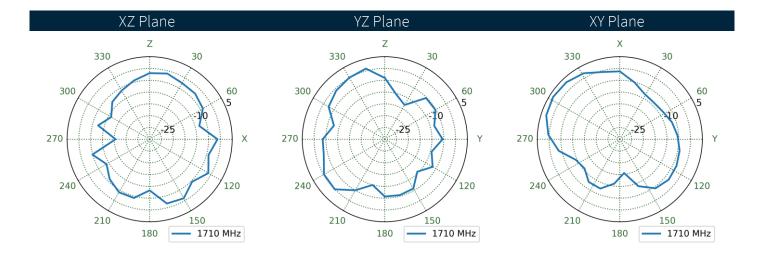




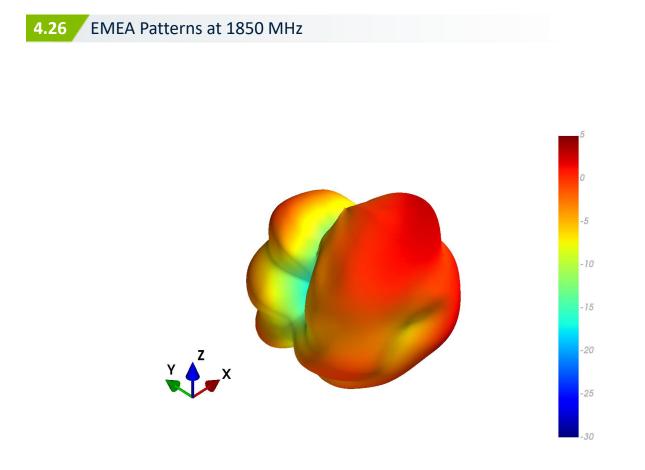


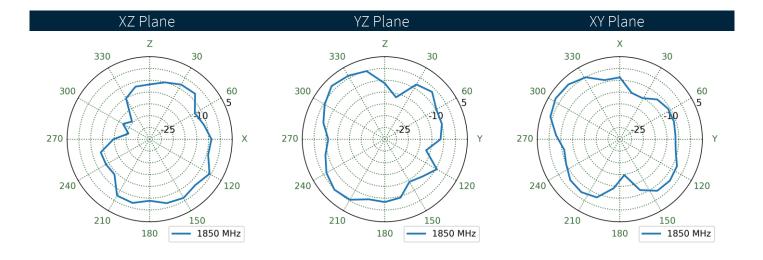




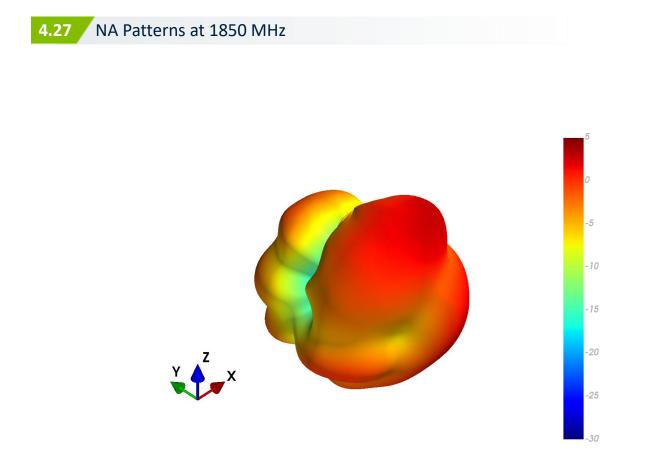


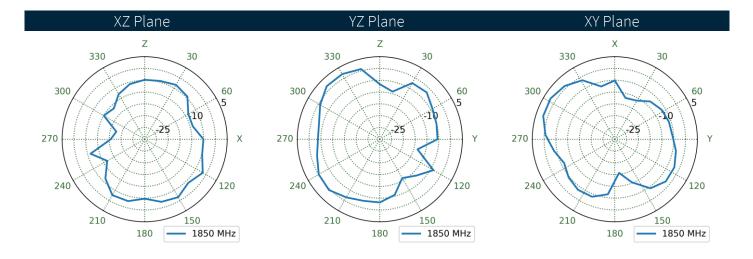




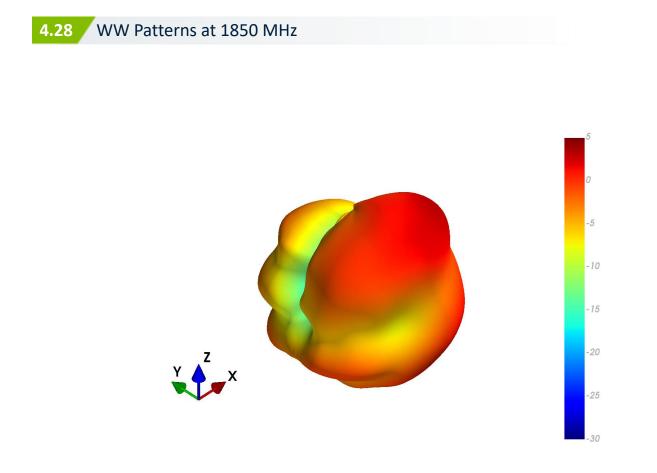


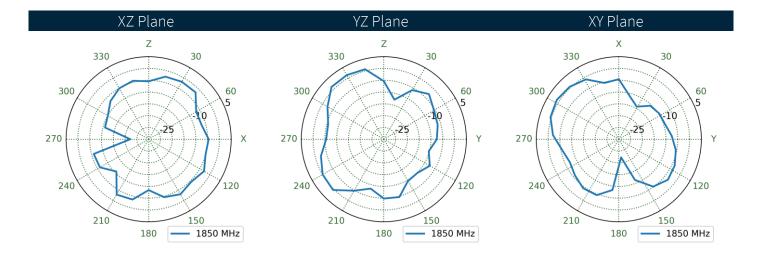




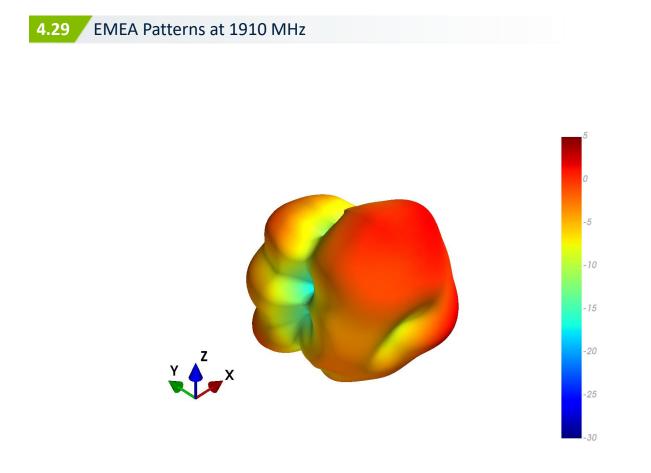


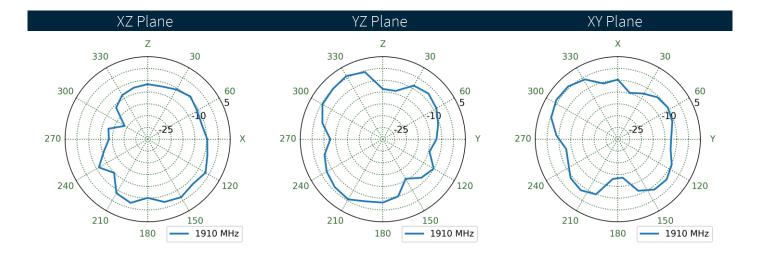




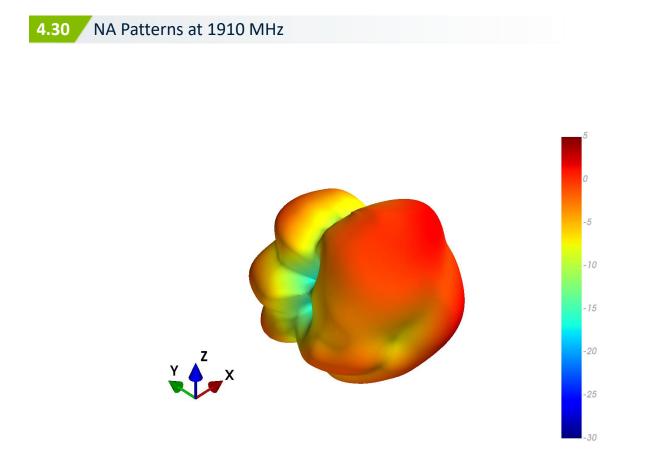


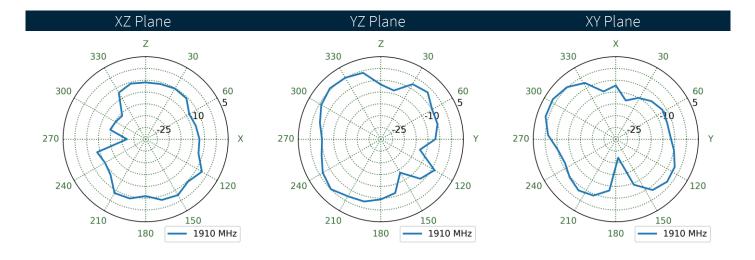




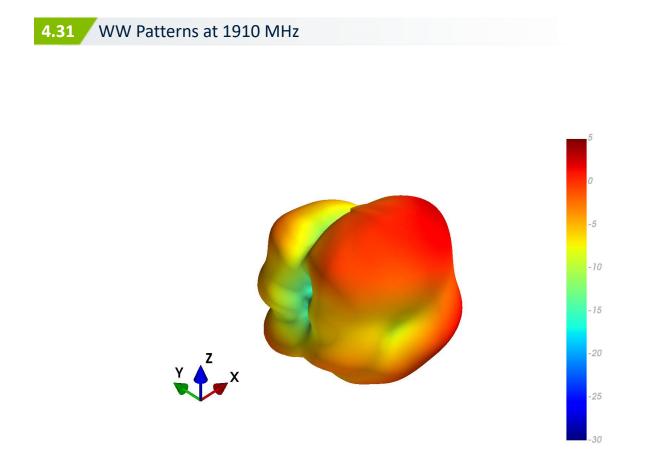


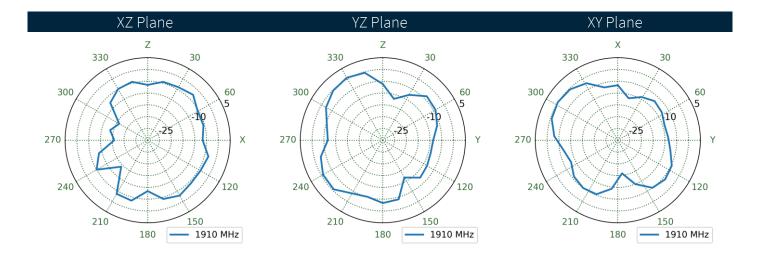




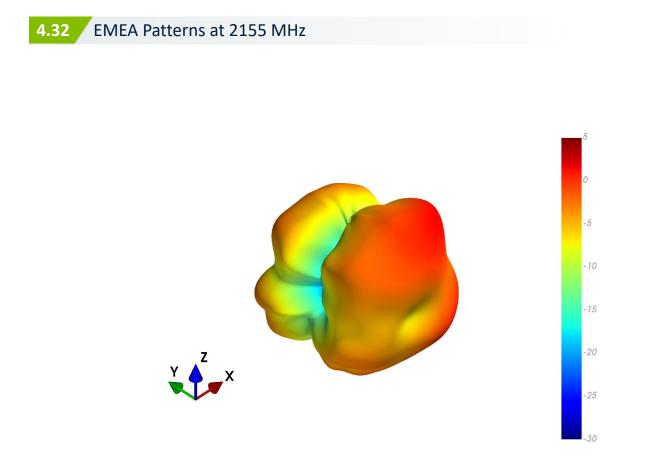


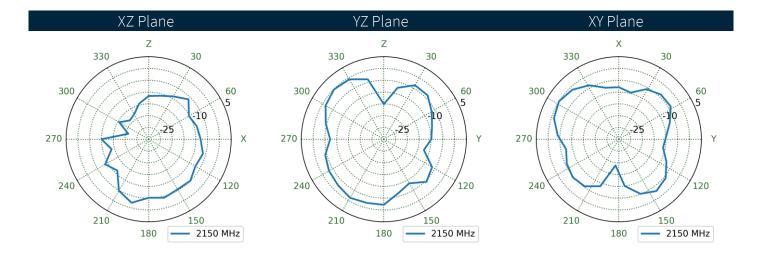




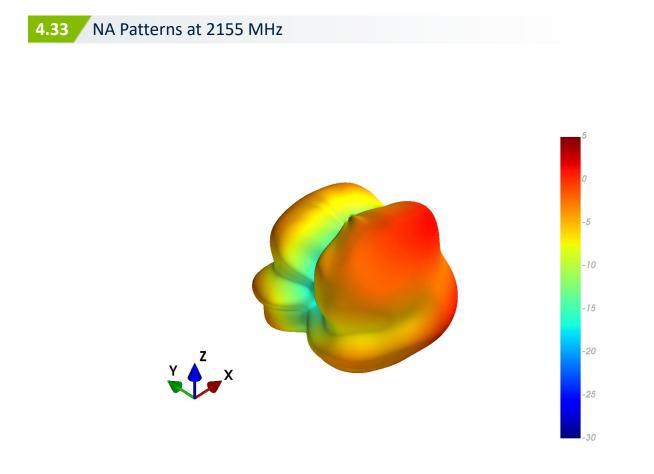


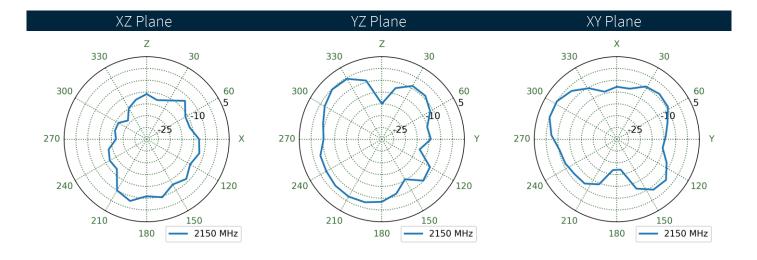




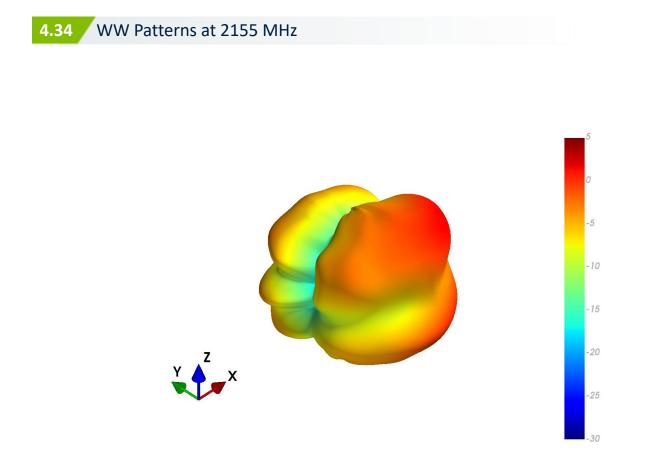


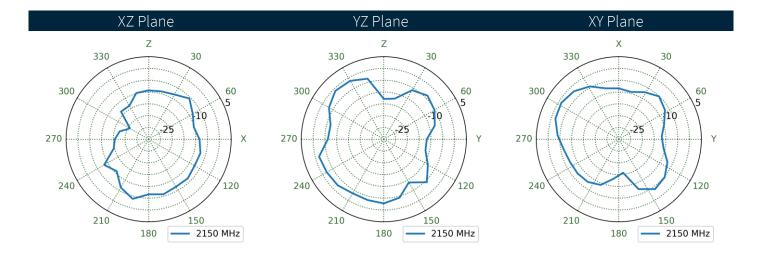




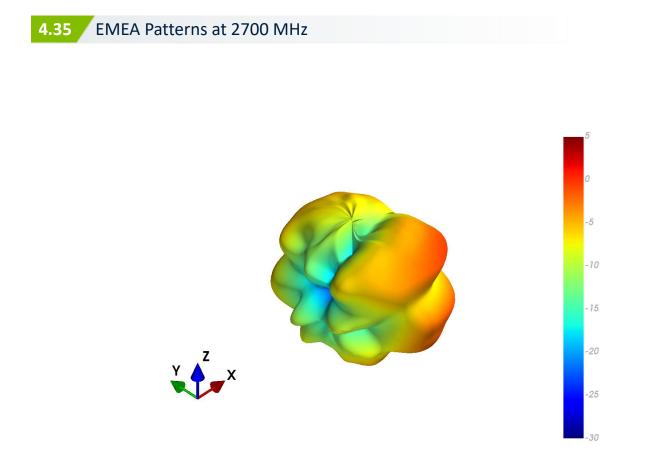


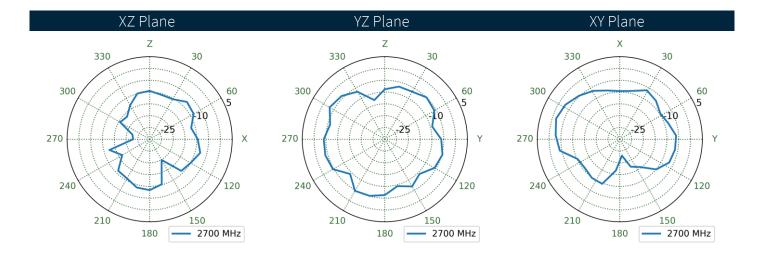




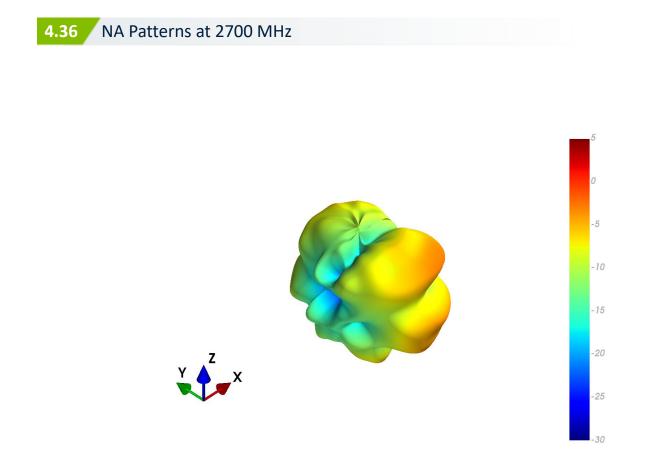


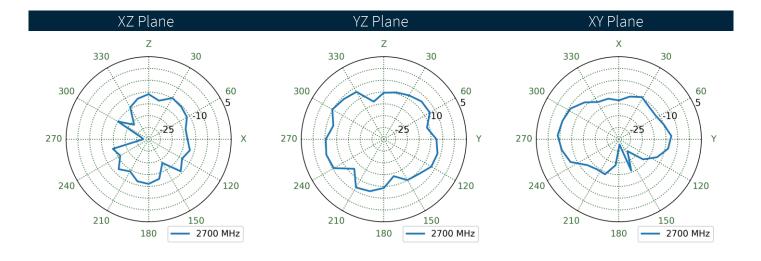




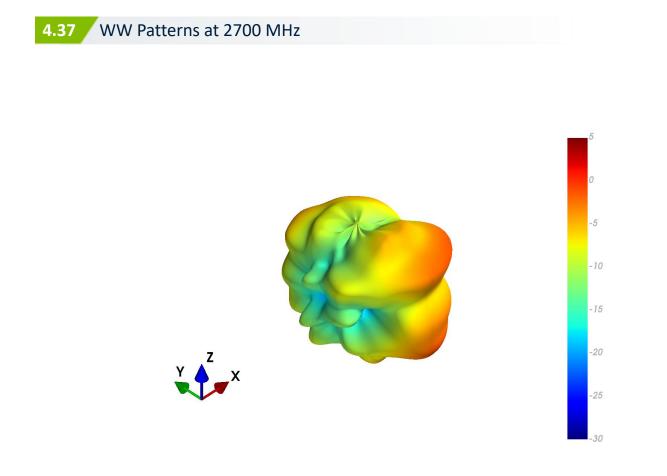


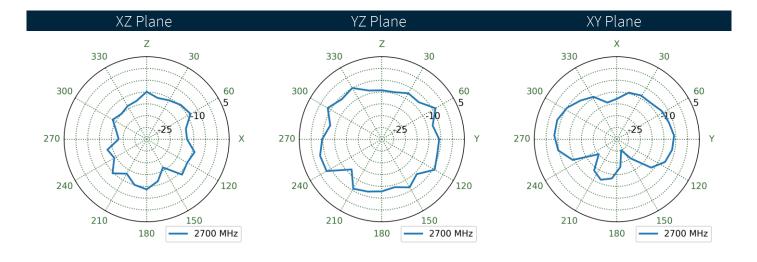








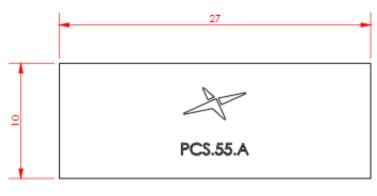






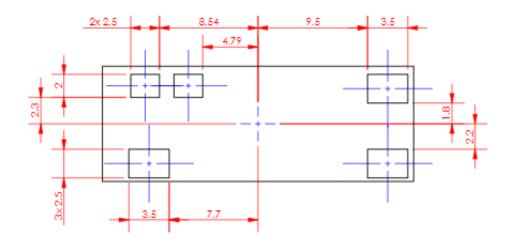
# Mechanical Drawing

5.









BOTTOM VIEW



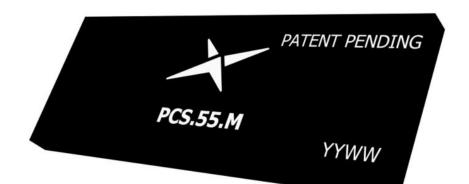
1000 pc PCS.55.A per reel Dimensions – Ø330\*60 Weight – 1630g

1000 pc PCS.55.A / 1 reel in small box Dimensions – Ø335\*335\*85mm Weight – 1.9Kg 85mm 335mm 335mm 335mm 335mm

3 reels, 3000 pcs in one carton Carton dimensions – 370\*360\*275mm Weight – 6.5Kg







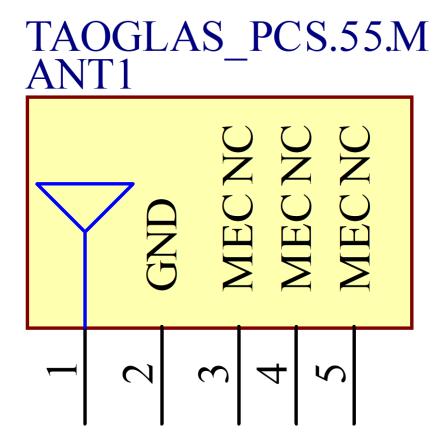




#### 7.1 Schematic and Symbol Definition

The circuit symbol for the antenna is shown below. The antenna has 5 pins with only two pins (Pin 1 and Pin 2) as functional. Pins 3, 4 and 5 are for mechanical strength.

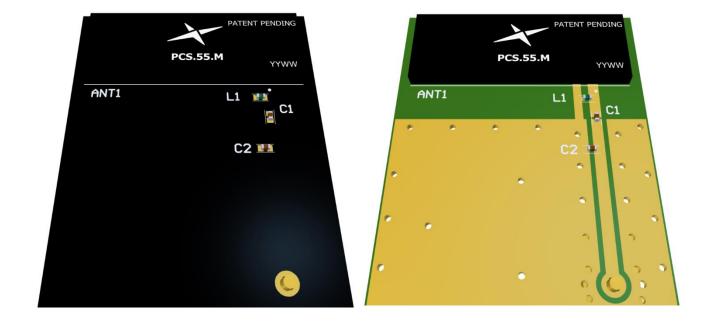
Pin	Description
1	RF Feed
2	Ground
3, 4, 5	Mechanical, Not Connected





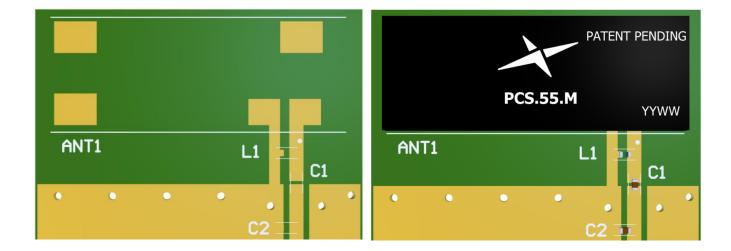
#### 7.2 Antenna Integration

For any given PCB size, the antenna should ideally be placed on the PCB's shortest side, to take advantage of the ground plane. Optimized matching components can be placed as shown.





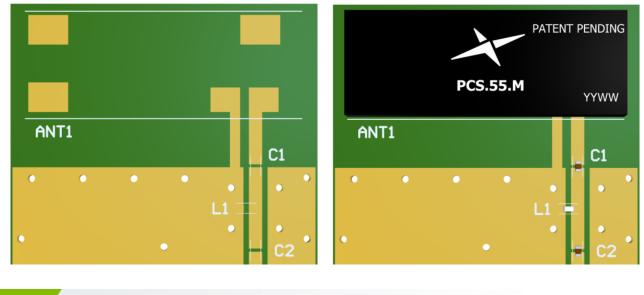
The footprint and clearance on the PCB must meet the layout drawing in section (Footprint Drawing). Note the placement of the optimized components. L1 is placed as close as possible to the RF feed (pad 1) within the copper keep out area. C1 is then placed tightly in series with C2 placed in parallel after that.





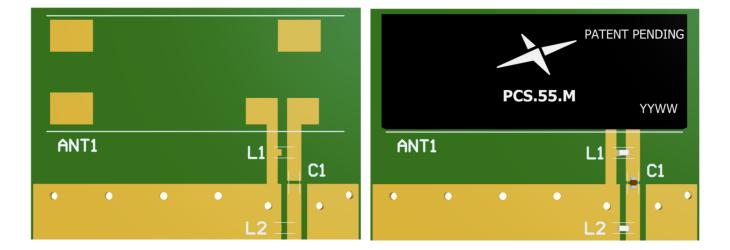
#### 7.4 PCB Layout - EMEA

The footprint and clearance on the PCB must meet the layout drawing in section (Footprint Drawing). Note the placement of the optimized components. C1 is placed as close as possible to the RF feed (pad 1) across the copper keep out area. L1 is then placed tightly in parallel with C2 placed in series after that.



## 7.5 PCB Layout - WW

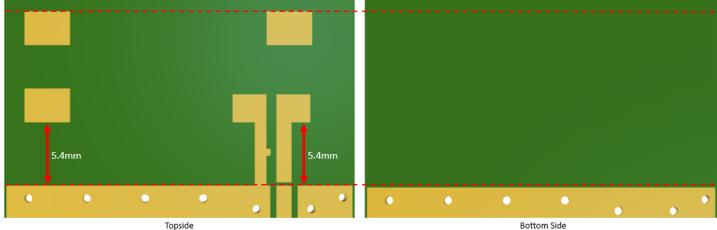
The footprint and clearance on the PCB must meet the layout drawing in section (Footprint Drawing). Note the placement of the optimized components. L1 is placed as close as possible to the RF feed (pad 1) within the copper keep out area. C1 is then placed tightly in series with L2 placed in parallel after that.





#### 7.6 **PCB** Clearance

Below shows the antenna footprint and clearance through ALL layers on the PCB. Only the antenna pads and connections to feed and GND are present within this clearance area (marked RED). The clearance area extends to 5.4mm from the antenna pads to the ground area. This clearance area includes the bottom side and ALL internal layers on the PCB.



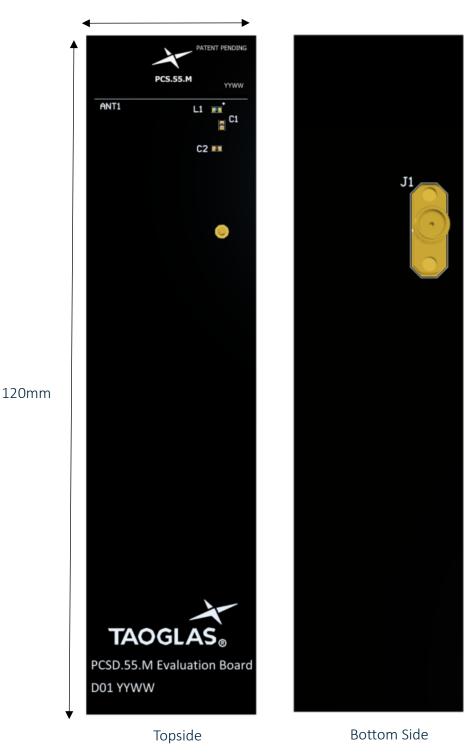
Topside



### 7.7 Evaluation Board

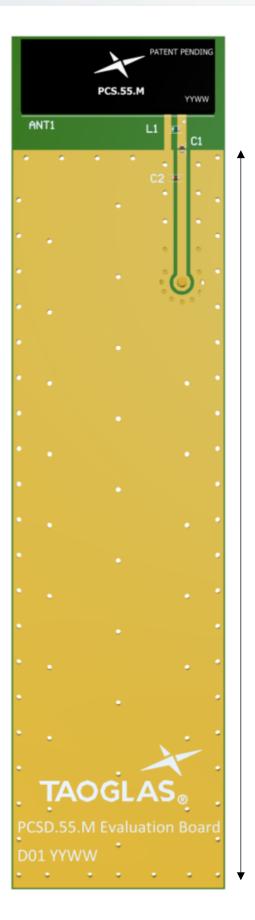
.

#### 30mm





# 7.8 Evaluation Board Ground Plane Length



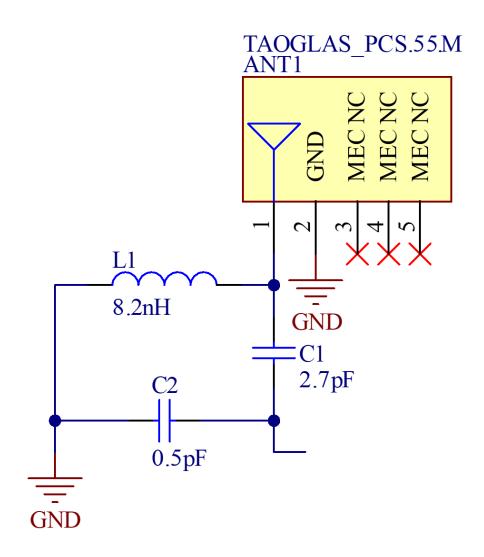
Ground Plane Length: 103.8mm



#### 7.9 Matching Circuit - NA

Matching components with the PCS.55.M are recommended for the antenna to have optimal performance on the evaluation board, located in the spaces specified in the above images. Additional matching components may be necessary for your device, so we recommend incorporating extra component footprints, forming a "pi" network, between the cellular module and the edge of the ground plane.

Designator	Туре	Value	Manufacturer	Manufacturer Part Number
L1	Inductor	8.2nH	Murata	LQG15HS8N2G02D
C1	Capacitor	2.7pF	Murata	GCM1555C1H2R7BA16D
C2	Capacitor	0.5pF	Murata	GRM1555C1HR50CA01D

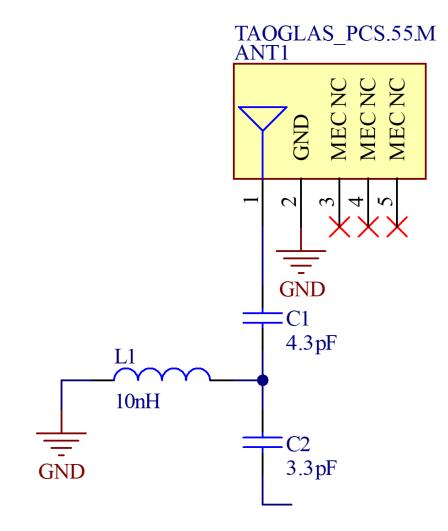




#### 7.10 Matching Circuit - EMEA

Matching components with the PCS.55.M are recommended for the antenna to have optimal performance on the evaluation board, located in the spaces specified in the above images. Additional matching components may be necessary for your device, so we recommend incorporating extra component footprints, forming a "pi" network, between the cellular module and the edge of the ground plane.

Designator	Туре	Value	Manufacturer	Manufacturer Part Number
L1	Inductor	10nH	TDK	MLK1005S10NJT000
C1	Capacitor	4.3pF	Murata	GJM1555C1H4R3BB01D
C2	Capacitor	3.3pF	Murata	GJM1555C1H3R3BB01D

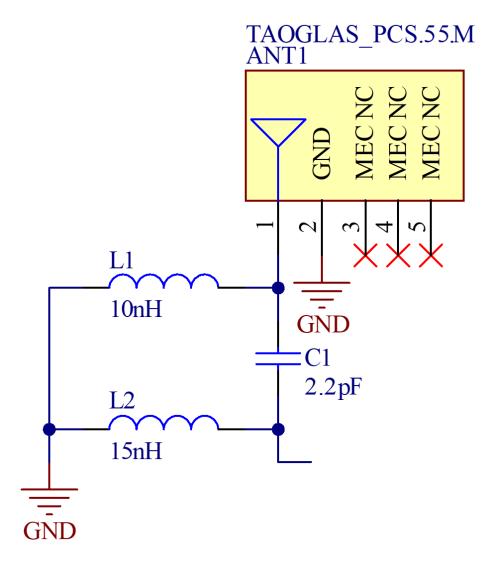




#### 7.11 Matching Circuit - WW

Matching components with the PCS.55.M are recommended for the antenna to have optimal performance on the evaluation board, located in the spaces specified in the above images. Additional matching components may be necessary for your device, so we recommend incorporating extra component footprints, forming a "pi" network, between the cellular module and the edge of the ground plane.

Designator	Туре	Value	Manufacturer	Manufacturer Part Number
L1	Inductor	10nH	Murata	MLK1005S10NJT000
L2	Inductor	15nH	Murata	MLK1005S15NJT000
C1	Capacitor	2.2pF	Murata	GRM1555C1H2R2CA01D





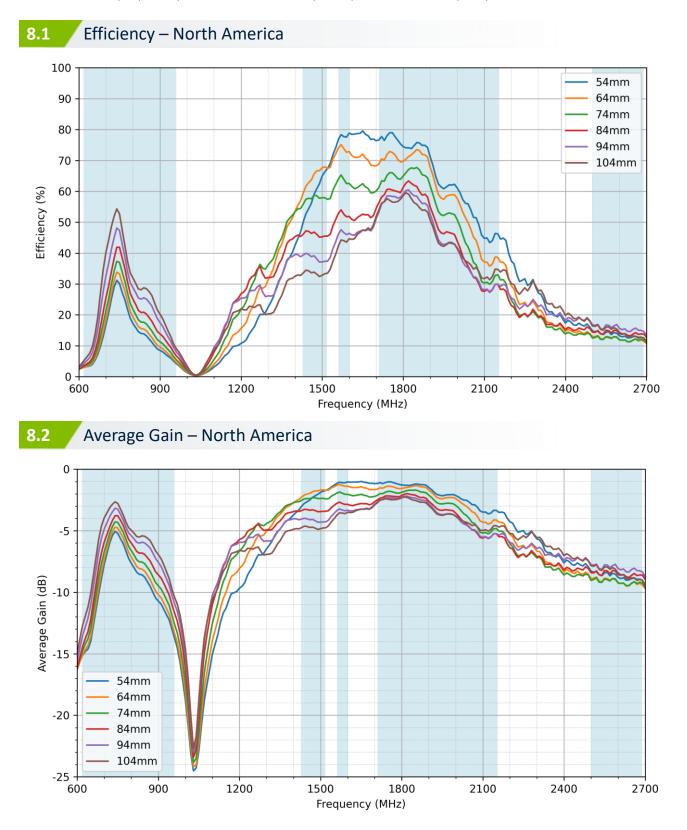
# 7.12 Footprint



# Application Note

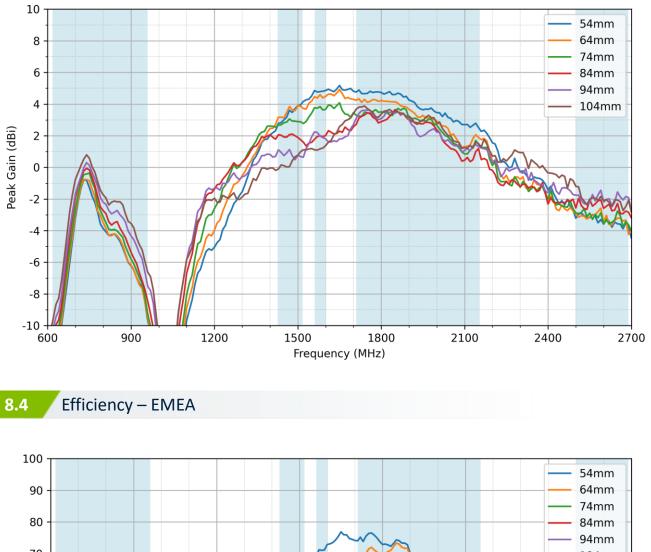
8.

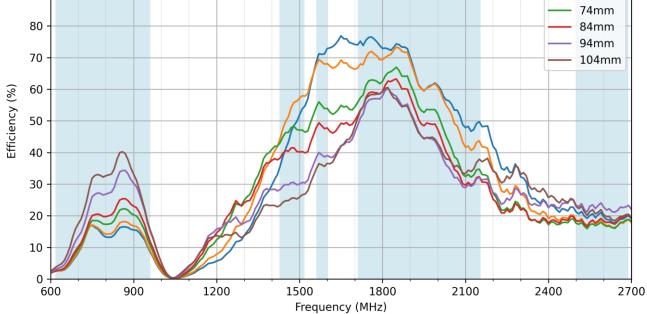
The effect of shortening the ground plane on antenna performance was evaluated. Using the evaluation board of the PCS.55.M, the PCB was cut back 10mm at a time and tested in an anechoic chamber. The results for North America (NA), Europe, Middle East, Africa (EMEA), and Worldwide (WW) are shown here:





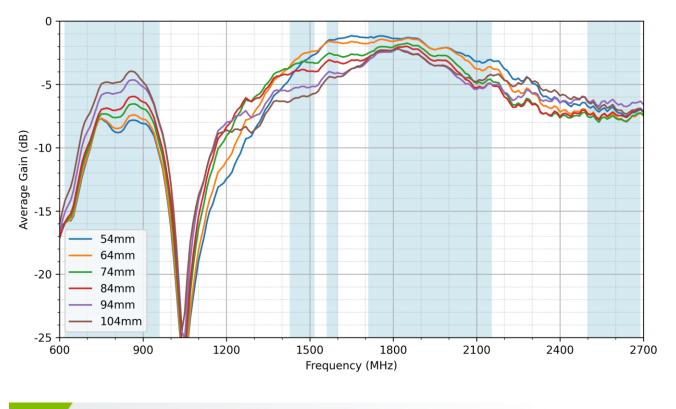




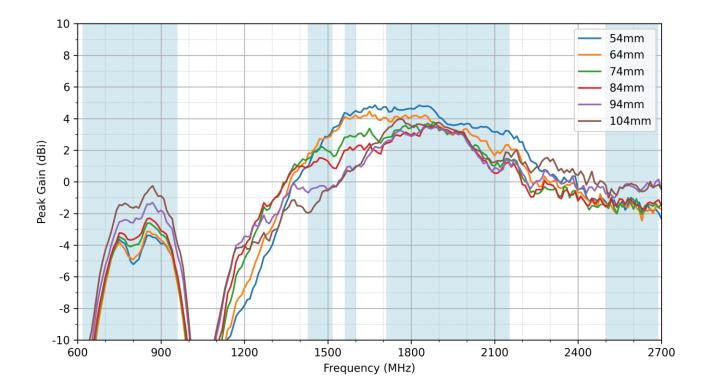






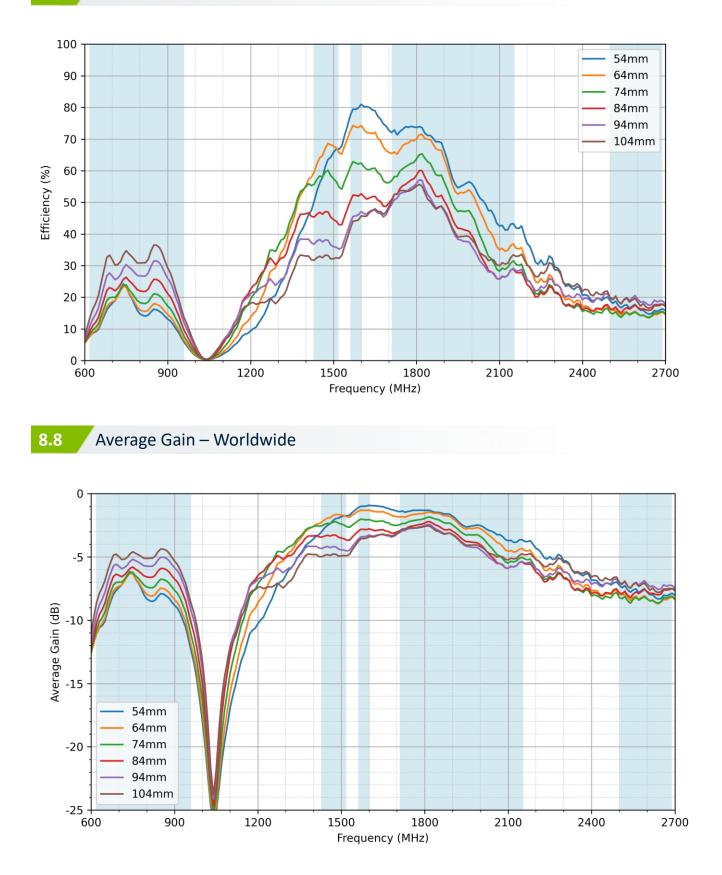






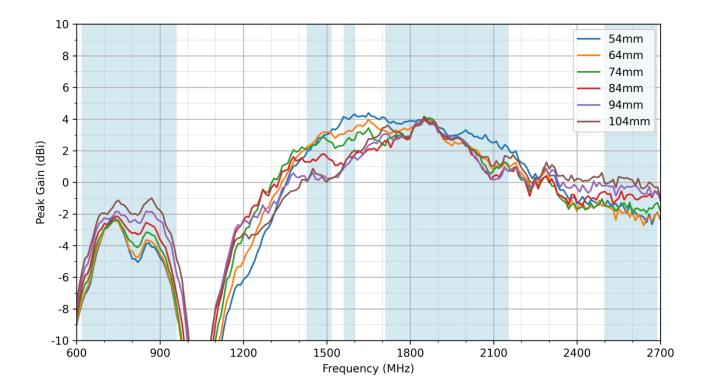


## 8.7 Efficiency – Worldwide





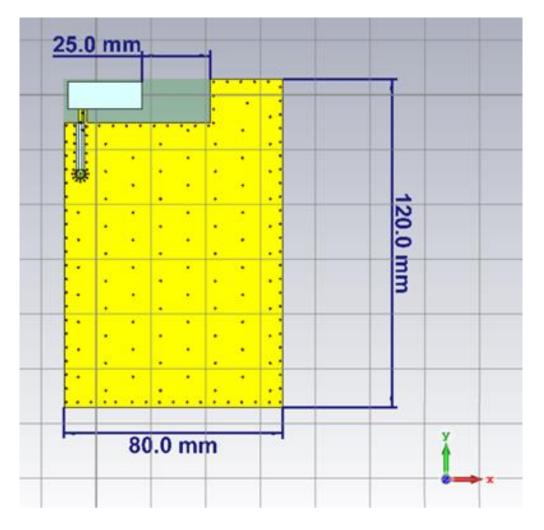






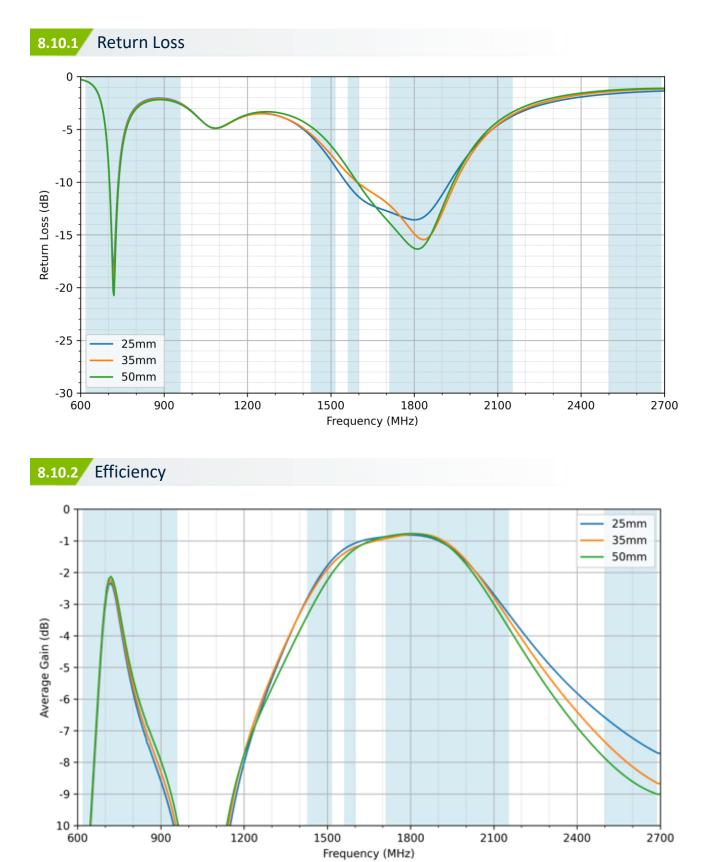
#### 8.10 Effects of Right Side PCB Ground on Antenna Performance

The PCS.55.M antenna was tuned for a 120x80mm ground plane and the distance between the PCB ground on the right side of the antenna was parameterized and swept from 0 to 50 mm. The minimum condition, or 0mm, has the ground right up against the antenna and the maximum condition, or 50mm, has no ground on the right side of the antenna (i.e. a full 80x16mm keep out area). This was done in order to determine the minimum distance that the ground can be placed next to the antenna without affecting performance. The configuration with 25mm is shown below.



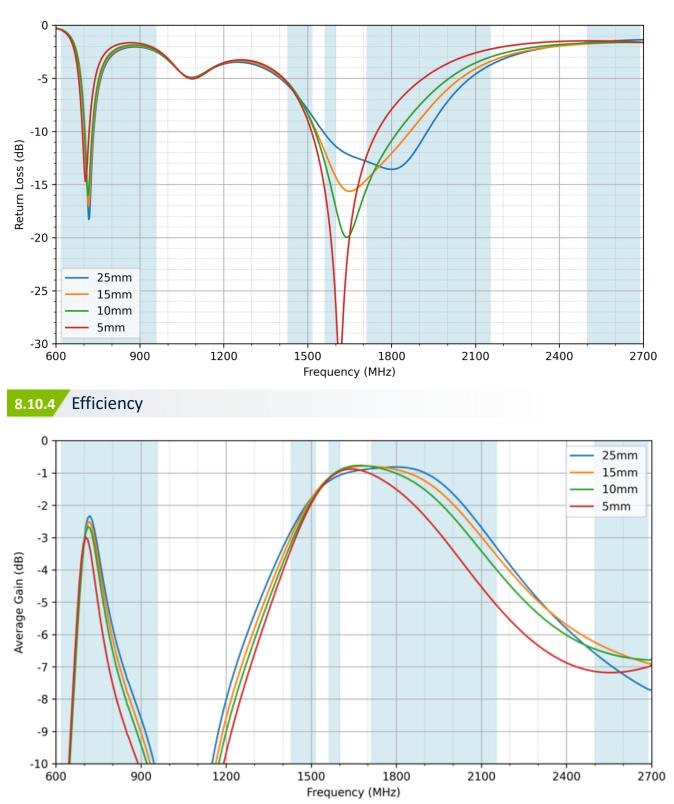
For minimal (0.2 dB) performance impact, a clearance of 25mm is recommended. Return loss and efficiency 25, 35 and 50mm clearance are shown below:







#### 8.10.3 Return Loss



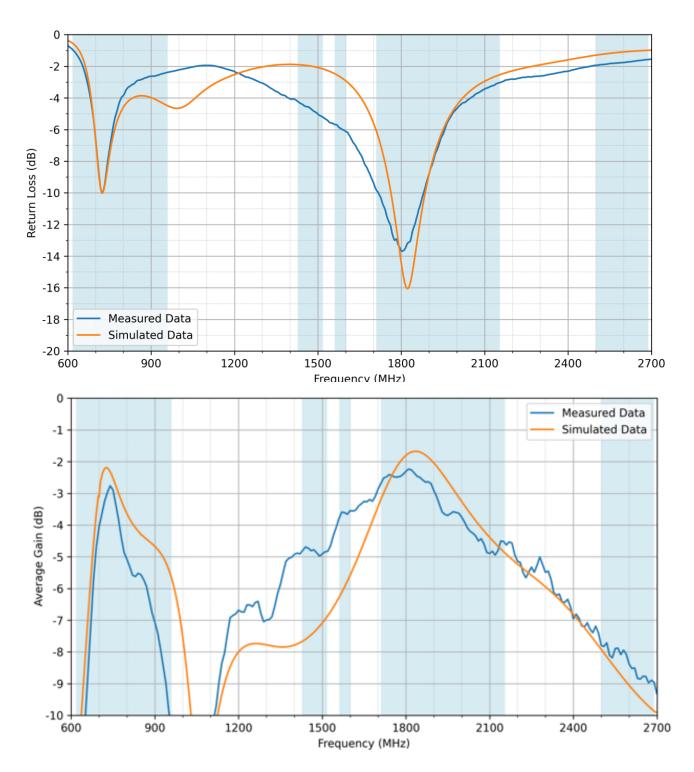
For more compact designs, a distance of 5 or 10mm can be implemented at the cost of efficiency and bandwidth as shown below:



#### 8.11 Correlation of CST Blackbox Model to Measured Results

To evaluate the accuracy of the CST Blackbox Model available to all customers, the following comparisons of return loss and efficiency have been made:

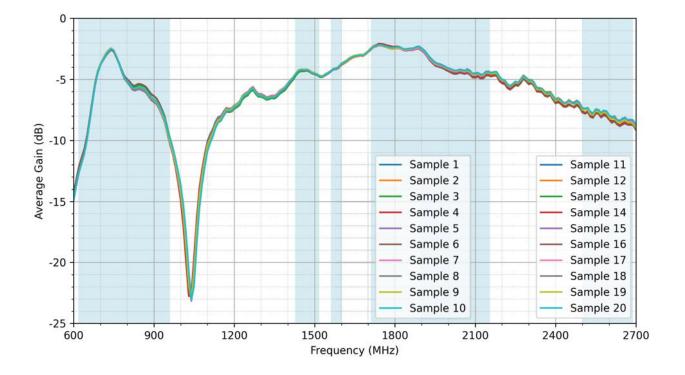
Please note the following simulated results were run at 18 cells/wavelength and with a -80 dB accuracy criterion. The measured results are for the PCS.55.M evaluation board with the NA tuning in place.





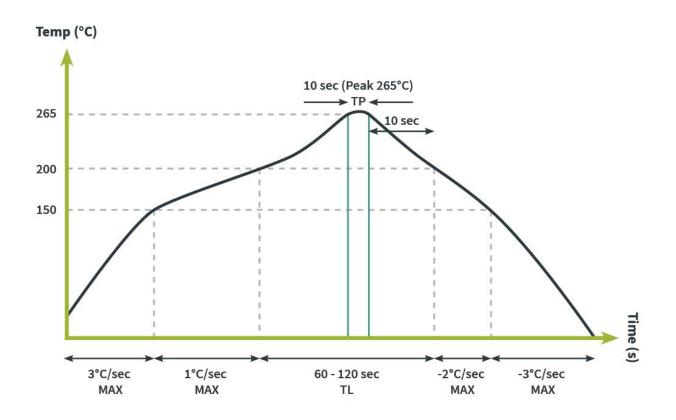
### 8.12 Repeatability Study

In order to verify the repeatability of the design, 20 production samples of the evaluation board for the PCS.55.M were tested in an anechoic chamber on the same day with standard SMA torque of 1 N·m





The PCS.55.M can be assembled by following the recommended soldering temperatures are as follows:



\*Temperatures listed within a tolerance of +/- 10º C

The PCS.55.M is not limited to the number of passes through the reflow process. Smaller components are typically mounted on the first pass, however, we do advise mounting the PCS.55.M when placing larger components on the board during subsequent reflows.



Changelog for the datasheet

SPE-23-8-281 - PCS.55.M

Revision: A (First Release)		
Date:	2023-09-28	
Changes:	Initial Release	
Changes Made by:	Gary West	

#### **Previous Revisions**





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