

Antenna information ASSY SC23 RFID

Author	RH
Date	7 July 2025
Description	UHF Reader antenna for iD SCO Pro
Manufacturer	Nedap N.V.
Brand	Nedap
Model	ANT 800-SINGLE, ANT 900-SINGLE

Nedap N.V.
Parallelweg 2
7141 DC Groenlo
Netherlands

0. CONTENTS

1.	Version Control	3
2.	Introduction	4
2.1.	Antenna for 800 MHz band	5
2.2.	Antenna for 900 MHz band	6

1. Version Control

Version	Date	Comments	Author
1.0	19-03-2025	First release	RH
1.1	7-7-2025	Text update, Final	RH

2. Introduction

The ASSY SC23 RFID tag reader is equipped with 4 antenna outputs which can be selected separately. This document describes the standard patch antennas which can be connected.

2.1. Antenna for 800 MHz band

Type	: Single patch antenna
Polarization	: circular polarization
Material	: Copper on FR4 PCB material
Overall thickness	: 5.0 mm
Antenna thickness	: 1.6 mm
Patch dimensions	: 140 by 149 mm
Product no.	:
Manufacturer	: Nedap N.V., Parallelweg 2, 7141 NL, Groenlo, Netherlands
Model	: ANT 800-SINGLE
Frequency range	: 865-868MHz
Handling power	: max. 10W
Coax cable	: approx. 280mm
Connector	: 90deg SMA female

2.2. Antenna for 900 MHz band

Type	: Single patch antenna
Polarization	: circular polarization
Material	: Copper on FR4 PCB material
Overall thickness	: 5.0 mm
Antenna thickness	: 1.6 mm
Patch dimensions	: 140 by 149 mm
Product no.	:
Manufacturer	: Nedap N.V., Parallelweg 2, 7141 NL, Groenlo, Netherlands
Model	: ANT 900-SINGLE
Frequency range	: 902-928MHz
Handling power	: max. 10W
Coax cable	: approx. 280mm
Connector	: 90deg SMA female

1 Product Information

Brand	Nedap
Model name	ANT 900-SINGLE
Operating frequency	918MHz
Number / Type of Antenna(s)	Circular polarized single patch antenna
Antenna Gain (peak, max.)	-3.38 dBi (-0.38 dBic)
HPBW	90°

2 Test Environment

Date of testing:	2025/06/03
Ambient temperature:	22.4 °C
Relative humidity:	65 %
Reference standard:	ANS/IEEE Std 149, CTIA Test Plan for Wireless Device Over-the-
Air Performance	
Kind of test site:	OTA chamber WPTC-L

3 Test Results

Model name	ANT 900-SINGLE		
Postion	2D		
Test Axis	H	E1	E2
Peak Realized Gain (dBi)	-3.38	-3.43	-11.18
Note			

4. Test information

918MHz_2D-H

Test Information

Test Method:	Antenna Measurement
Test Condition:	FS: Free Space
Frequency:	918.000000 MHz
Test Time:	Start: 03/06/2025 4:37:00 PM; Stop: 03/06/2025 4:38:00 PM
Cal Data Phi:	42.18 dB (PL_Hor_Passive_1206)
Cal Data Theta:	41.00 dB (PL_Ver_Passive_1206)

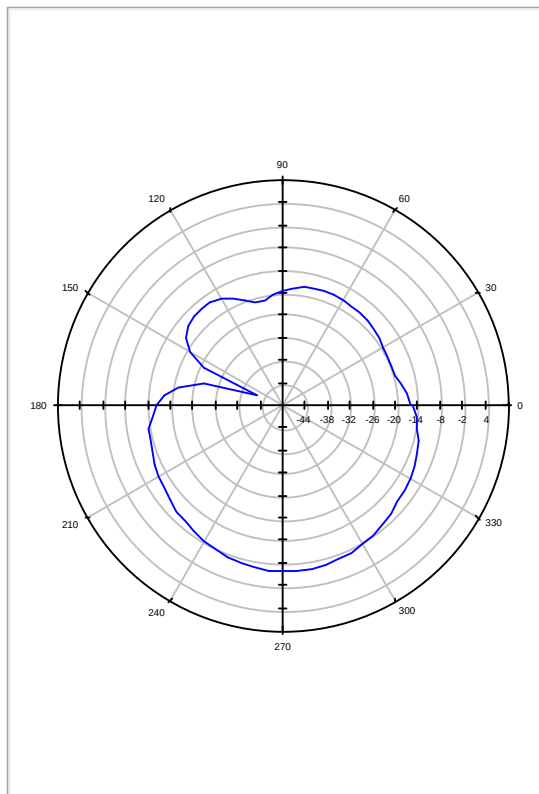
OTA Test Results for Frequency 918.000000 MHz

OTA Evaluation Results:

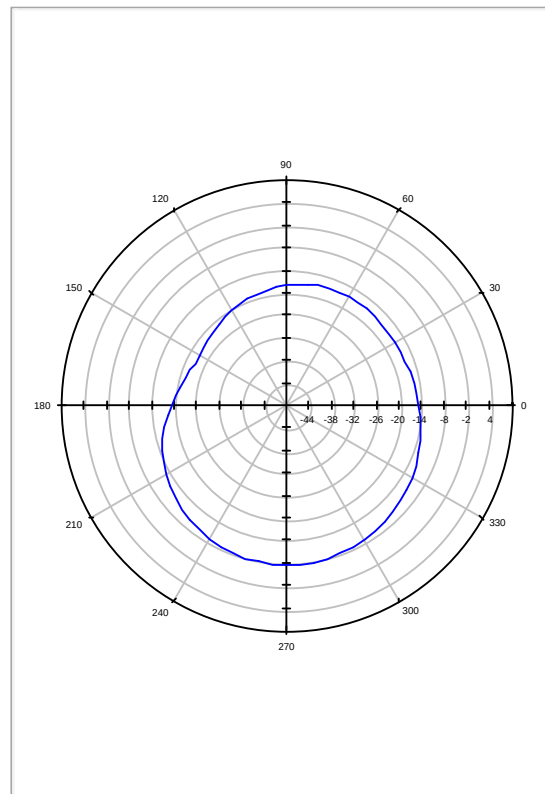
Directivity	-3.38 dBi
Total Efficiency	100.00 %
Peak Realized Gain	-3.38 dBi
NHPRP 45°X / TRP	100.00 %
NHPRP 30°X / TRP	100.00 %
NHPRP 22.5°X / TRP	100.00 %
UHRP / TRP	100.00 %
LHRP / TRP	100.00 %
Front/Back Ratio	12.22
PhiBW	82.3 deg
PhiBW Up	44.5 deg
PhiBW Down	37.8 deg
ThetaBW	88.4 deg
ThetaBW Up	44.2 deg
ThetaBW Down	44.2 deg
Boresight Phi	270 deg
Boresight Theta	90 deg
Maximum Power	-3.38 dBm
Minimum Power	-22.67 dBm
Average Power	-8.82 dBm
Max/Min Ratio	19.29 dB
Max/Avg Ratio	5.44 dB
Min/Avg Ratio	-13.85 dB
Worst Single Value	-42.46 dBm
Worst Position	Azi = 160 deg; Elev = 90 deg; Pol = Phi
Best Single Value	-5.61 dBm
Best Position	Azi = 275 deg; Elev = 90 deg; Pol = Phi

RP_918MHz_2D-H_tot				RP_918MHz_2D-H_phi				RP_918MHz_2D-H_theta			
Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg
(deg)	(dB)	(deg)	(dB)	(deg)	(dB)	(deg)	(dB)	(deg)	(dB)	(deg)	(dB)
0.00	-12.01	185.00	-13.19	0.0	-15.55	185.0	-14.92	0.0	-14.55	185.0	-18.04
5.00	-12.81	190.00	-12.17	5.0	-16.73	190.0	-13.89	5.0	-15.06	190.0	-17.03
10.00	-13.54	195.00	-11.36	10.0	-17.99	195.0	-13.28	10.0	-15.48	195.0	-15.82
15.00	-14.12	200.00	-10.65	15.0	-18.78	200.0	-12.80	15.0	-15.94	200.0	-14.74
20.00	-14.51	205.00	-10.00	20.0	-19.27	205.0	-12.35	20.0	-16.27	205.0	-13.77
25.00	-14.63	210.00	-9.38	25.0	-19.32	210.0	-12.00	25.0	-16.44	210.0	-12.81
30.00	-14.67	215.00	-8.71	30.0	-19.04	215.0	-11.49	30.0	-16.65	215.0	-11.97
35.00	-14.61	220.00	-8.08	35.0	-18.73	220.0	-10.86	35.0	-16.74	220.0	-11.33
40.00	-14.49	225.00	-7.28	40.0	-18.39	225.0	-10.16	40.0	-16.77	225.0	-10.43
45.00	-14.29	230.00	-6.67	45.0	-18.01	230.0	-9.52	45.0	-16.70	230.0	-9.84
50.00	-14.22	235.00	-6.00	50.0	-17.88	235.0	-8.72	50.0	-16.66	235.0	-9.33
55.00	-14.10	240.00	-5.37	55.0	-17.75	240.0	-8.00	55.0	-16.55	240.0	-8.79
60.00	-14.10	245.00	-4.86	60.0	-17.62	245.0	-7.43	60.0	-16.65	245.0	-8.35
65.00	-14.10	250.00	-4.40	65.0	-17.65	250.0	-6.84	65.0	-16.63	250.0	-8.07
70.00	-14.12	255.00	-4.01	70.0	-17.52	255.0	-6.42	70.0	-16.78	255.0	-7.72
75.00	-14.29	260.00	-3.72	75.0	-17.81	260.0	-6.04	75.0	-16.85	260.0	-7.54
80.00	-14.61	265.00	-3.53	80.0	-18.15	265.0	-5.82	80.0	-17.14	265.0	-7.41
85.00	-15.08	270.00	-3.38	85.0	-18.77	270.0	-5.64	85.0	-17.51	270.0	-7.30
90.00	-15.60	275.00	-3.39	90.0	-19.60	275.0	-5.61	90.0	-17.81	275.0	-7.36
95.00	-16.32	280.00	-3.50	95.0	-20.52	280.0	-5.78	95.0	-18.39	280.0	-7.39
100.00	-16.93	285.00	-3.71	100.0	-21.56	285.0	-6.02	100.0	-18.77	285.0	-7.56
105.00	-17.35	290.00	-3.97	105.0	-21.61	290.0	-6.31	105.0	-19.38	290.0	-7.76
110.00	-17.12	295.00	-4.33	110.0	-20.38	295.0	-6.68	110.0	-19.89	295.0	-8.11
115.00	-16.50	300.00	-4.81	115.0	-18.82	300.0	-7.29	115.0	-20.34	300.0	-8.42
120.00	-15.81	305.00	-5.26	120.0	-17.47	305.0	-7.84	120.0	-20.81	305.0	-8.75
125.00	-15.23	310.00	-5.82	125.0	-16.43	310.0	-8.45	125.0	-21.40	310.0	-9.26
130.00	-15.14	315.00	-6.44	130.0	-16.17	315.0	-9.16	130.0	-21.90	315.0	-9.76
135.00	-15.29	320.00	-7.04	135.0	-16.25	320.0	-9.81	135.0	-22.35	320.0	-10.29
140.00	-16.06	325.00	-7.46	140.0	-17.11	325.0	-10.19	140.0	-22.73	325.0	-10.77
145.00	-17.25	330.00	-8.04	145.0	-18.50	330.0	-10.79	145.0	-23.26	330.0	-11.33
150.00	-19.40	335.00	-8.58	150.0	-21.51	335.0	-11.29	150.0	-23.54	335.0	-11.91
155.00	-21.68	340.00	-9.17	155.0	-26.77	340.0	-11.94	155.0	-23.28	340.0	-12.43
160.00	-22.67	345.00	-9.78	160.0	-42.46	345.0	-12.62	160.0	-22.72	345.0	-12.97
165.00	-21.25	350.00	-10.46	165.0	-28.36	350.0	-13.44	165.0	-22.19	350.0	-13.49
170.00	-18.50	355.00	-11.22	170.0	-21.72	355.0	-14.33	170.0	-21.32	355.0	-14.13
175.00	-16.22	360.00	-11.96	175.0	-18.41	360.0	-15.47	175.0	-20.24	360.0	-14.52
180.00	-14.52			180.0	-16.28			180.0	-19.29		

RP_918.000000_phi



RP_918.000000_theta



918MHz_2D-E1

Test Information

Test Method:	Antenna Measurement
Test Condition:	FS: Free Space
Frequency:	918.000000 MHz
Test Time:	Start: 04/06/2025 9:50:18 AM; Stop: 04/06/2025 9:51:16 AM
Cal Data Phi:	42.18 dB (PL_Hor_Passive_1206)
Cal Data Theta:	41.00 dB (PL_Ver_Passive_1206)

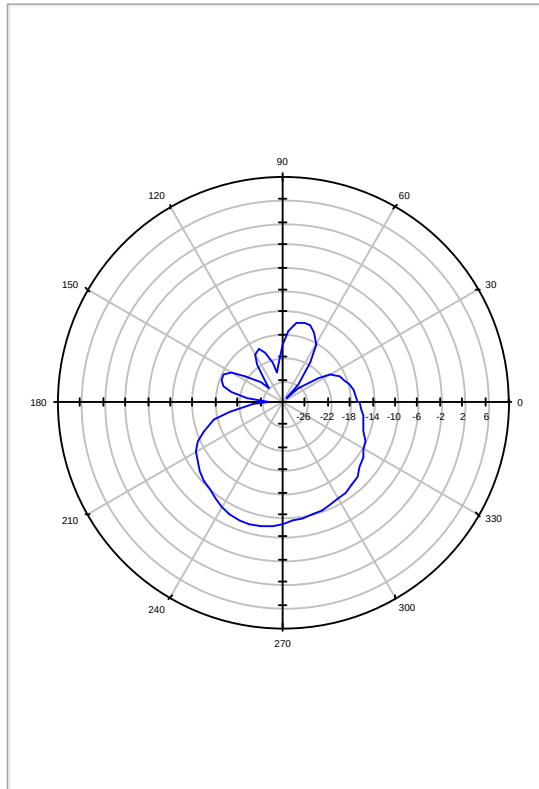
OTA Test Results for Frequency 918.000000 MHz

OTA Evaluation Results:

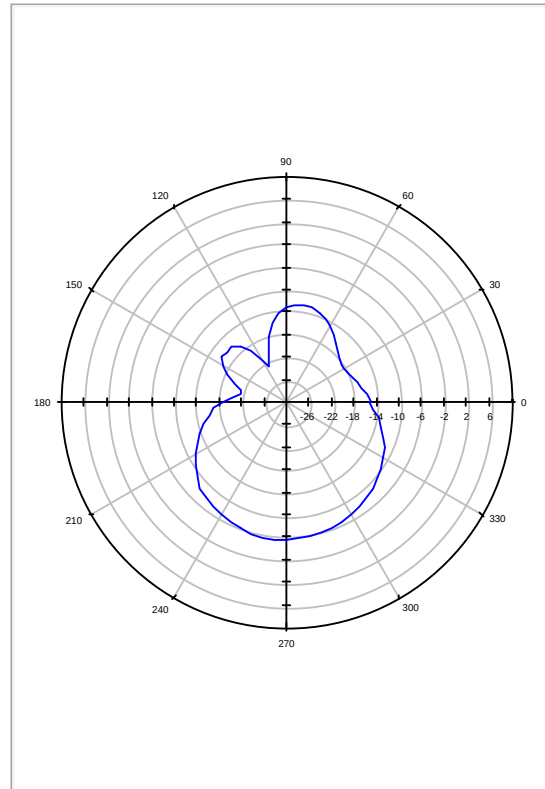
Directivity	-3.43 dBi
Total Efficiency	100.00 %
Peak Realized Gain	-3.43 dBi
NHPRP 45°X / TRP	100.00 %
NHPRP 30°X / TRP	100.00 %
NHPRP 22.5°X / TRP	100.00 %
UHRP / TRP	100.00 %
LHRP / TRP	100.00 %
Front/Back Ratio	7.93
PhiBW	90.4 deg
PhiBW Up	48.9 deg
PhiBW Down	41.5 deg
ThetaBW	136.2 deg
ThetaBW Up	68.1 deg
ThetaBW Down	68.1 deg
Boresight Phi	265 deg
Boresight Theta	90 deg
Maximum Power	-3.43 dBm
Minimum Power	-18.68 dBm
Average Power	-8.74 dBm
Max/Min Ratio	15.25 dB
Max/Avg Ratio	5.31 dB
Min/Avg Ratio	-9.94 dB
Worst Single Value	-29.17 dBm
Worst Position	Azi = 45 deg; Elev = 90 deg; Pol = Phi
Best Single Value	-5.37 dBm
Best Position	Azi = 265 deg; Elev = 90 deg; Pol = Theta

RP 918MHz 2D-E1 tot				RP 918MHz 2D-E1 phi				RP 918MHz 2D-E1 theta			
Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg
(deg)	(dB)	(deg)	(dB)	(deg)	(dB)	(deg)	(dB)	(deg)	(dB)	(deg)	(dB)
0.00	-12.67	185.00	-16.46	0.0	-16.66	185.0	-24.86	0.0	-14.88	185.0	-17.14
5.00	-13.23	190.00	-14.70	5.0	-16.88	190.0	-20.47	5.0	-15.68	190.0	-16.04
10.00	-13.74	195.00	-12.89	10.0	-17.21	195.0	-17.34	10.0	-16.34	195.0	-14.82
15.00	-14.23	200.00	-11.31	15.0	-17.56	200.0	-15.04	15.0	-16.94	200.0	-13.71
20.00	-14.83	205.00	-9.93	20.0	-18.29	205.0	-13.52	20.0	-17.43	205.0	-12.43
25.00	-15.36	210.00	-8.85	25.0	-18.97	210.0	-12.36	25.0	-17.84	210.0	-11.42
30.00	-16.08	215.00	-7.82	30.0	-20.46	215.0	-11.56	30.0	-18.06	215.0	-10.20
35.00	-16.78	220.00	-6.94	35.0	-22.45	220.0	-10.89	35.0	-18.15	220.0	-9.18
40.00	-17.20	225.00	-6.20	40.0	-26.17	225.0	-10.23	40.0	-17.79	225.0	-8.39
45.00	-16.85	230.00	-5.68	45.0	-29.17	230.0	-9.69	45.0	-17.11	230.0	-7.88
50.00	-15.78	235.00	-5.09	50.0	-25.78	235.0	-9.03	50.0	-16.24	235.0	-7.33
55.00	-14.33	240.00	-4.57	55.0	-21.57	240.0	-8.50	55.0	-15.24	240.0	-6.83
60.00	-12.93	245.00	-4.09	60.0	-18.42	245.0	-7.78	60.0	-14.38	245.0	-6.51
65.00	-11.80	250.00	-3.81	65.0	-16.56	250.0	-7.55	65.0	-13.57	250.0	-6.19
70.00	-11.08	255.00	-3.56	70.0	-15.51	255.0	-7.51	70.0	-13.03	255.0	-5.80
75.00	-10.73	260.00	-3.44	75.0	-15.31	260.0	-7.64	75.0	-12.60	260.0	-5.52
80.00	-10.83	265.00	-3.43	80.0	-15.86	265.0	-7.87	80.0	-12.47	265.0	-5.37
85.00	-11.36	270.00	-3.59	85.0	-17.35	270.0	-8.24	85.0	-12.62	270.0	-5.41
90.00	-12.22	275.00	-3.82	90.0	-19.78	275.0	-8.72	90.0	-13.06	275.0	-5.52
95.00	-13.52	280.00	-4.03	95.0	-23.07	280.0	-9.04	95.0	-14.04	280.0	-5.67
100.00	-15.09	285.00	-4.29	100.0	-24.74	285.0	-9.31	100.0	-15.58	285.0	-5.93
105.00	-16.62	290.00	-4.55	105.0	-22.72	290.0	-9.51	105.0	-17.84	290.0	-6.22
110.00	-17.67	295.00	-4.87	110.0	-20.58	295.0	-9.78	110.0	-20.79	295.0	-6.56
115.00	-17.98	300.00	-5.21	115.0	-19.70	300.0	-10.03	115.0	-22.85	300.0	-6.94
120.00	-17.80	305.00	-5.65	120.0	-20.08	305.0	-10.47	120.0	-21.68	305.0	-7.38
125.00	-17.09	310.00	-6.06	125.0	-21.76	310.0	-10.81	125.0	-18.90	310.0	-7.83
130.00	-16.50	315.00	-6.54	130.0	-24.27	315.0	-11.34	130.0	-17.30	315.0	-8.29
135.00	-15.81	320.00	-7.11	135.0	-26.65	320.0	-11.99	135.0	-16.19	320.0	-8.81
140.00	-15.56	325.00	-7.74	140.0	-24.81	325.0	-12.63	140.0	-16.11	325.0	-9.44
145.00	-15.07	330.00	-8.35	145.0	-21.93	330.0	-13.21	145.0	-16.07	330.0	-10.06
150.00	-15.14	335.00	-9.04	150.0	-19.51	335.0	-13.81	150.0	-17.12	335.0	-10.80
155.00	-15.55	340.00	-9.80	155.0	-18.58	340.0	-14.51	155.0	-18.54	340.0	-11.59
160.00	-16.32	345.00	-10.61	160.0	-18.46	345.0	-15.06	160.0	-20.41	345.0	-12.54
165.00	-17.28	350.00	-11.32	165.0	-19.17	350.0	-15.55	165.0	-21.80	350.0	-13.37
170.00	-18.32	355.00	-12.03	170.0	-20.84	355.0	-15.87	170.0	-21.89	355.0	-14.35
175.00	-18.68	360.00	-12.67	175.0	-23.80	360.0	-16.33	175.0	-20.27	360.0	-15.12
180.00	-18.22			180.0	-27.52			180.0	-18.77		

RP_918.000000_phi



RP_918.000000_theta



918MHz_2D-E2

Test Information

Test Method:	Antenna Measurement
Test Condition:	FS: Free Space
Frequency:	918.000000 MHz
Test Time:	Start: 04/06/2025 9:41:10 AM; Stop: 04/06/2025 9:42:09 AM
Cal Data Phi:	42.18 dB (PL_Hor_Passive_1206)
Cal Data Theta:	41.00 dB (PL_Ver_Passive_1206)

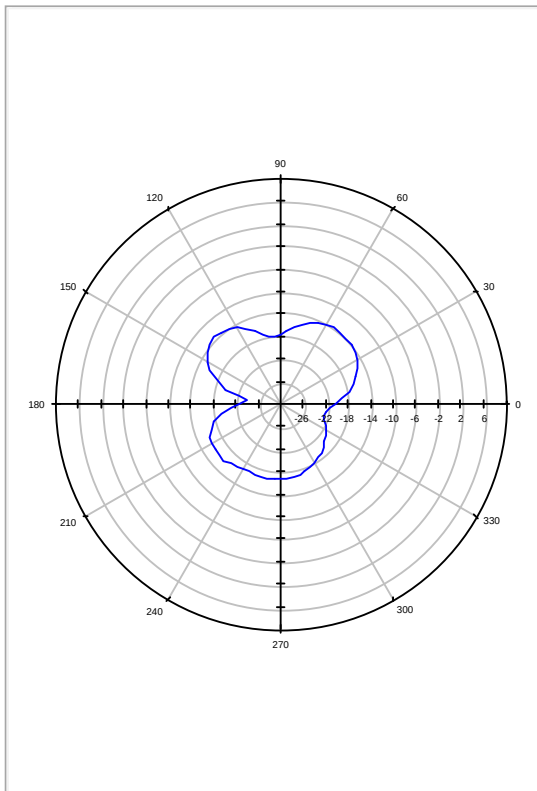
OTA Test Results for Frequency 918.000000 MHz

OTA Evaluation Results:

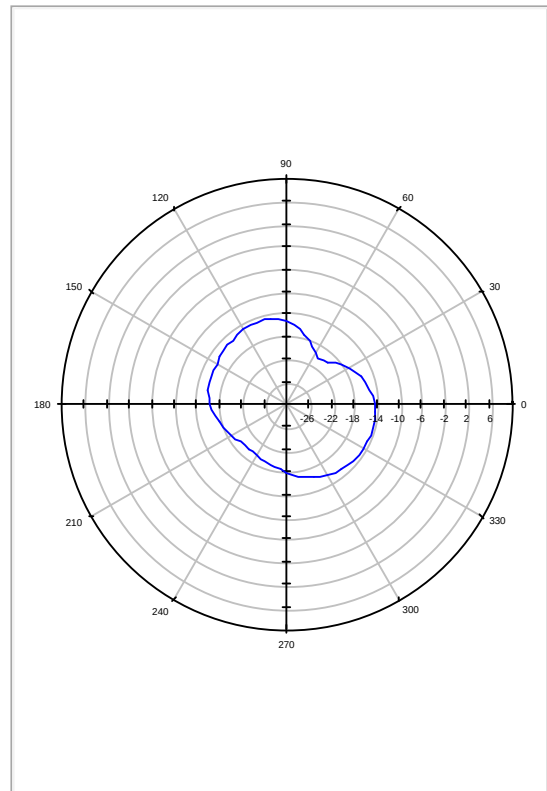
Directivity	-11.18 dBi
Total Efficiency	100.00 %
Peak Realized Gain	-11.18 dBi
NHPRP 45°X / TRP	100.00 %
NHPRP 30°X / TRP	100.00 %
NHPRP 22.5°X / TRP	100.00 %
UHRP / TRP	100.00 %
LHRP / TRP	100.00 %
Front/Back Ratio	2.07
PhiBW	255.2 deg
PhiBW Up	28.6 deg
PhiBW Down	226.6 deg
ThetaBW	180.0 deg
ThetaBW Up	180.0 deg
ThetaBW Down	180.0 deg
Boresight Phi	135 deg
Boresight Theta	90 deg
Maximum Power	-11.18 dBm
Minimum Power	-15.51 dBm
Average Power	-13.28 dBm
Max/Min Ratio	4.33 dB
Max/Avg Ratio	2.10 dB
Min/Avg Ratio	-2.23 dB
Worst Single Value	-23.96 dBm
Worst Position	Azi = 175 deg; Elev = 90 deg; Pol = Phi
Best Single Value	-13.29 dBm
Best Position	Azi = 135 deg; Elev = 90 deg; Pol = Phi

RP 918MHz 2D-E2_tot				RP 918MHz 2D-E2phi				RP 918MHz 2D-E2_theta			
Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg	Azimuth	Elevation 90 deg
(deg)	(dB)	(deg)	(dB)	(deg)	(dB)	(deg)	(dB)	(deg)	(dB)	(deg)	(dB)
0.00	-13.26	185.00	-15.36	0.0	-20.10	185.0	-21.02	0.0	-14.27	185.0	-16.73
5.00	-13.19	190.00	-14.96	5.0	-19.00	190.0	-19.16	5.0	-14.51	190.0	-17.05
10.00	-13.07	195.00	-14.70	10.0	-17.65	195.0	-17.82	10.0	-14.93	195.0	-17.60
15.00	-12.99	200.00	-14.35	15.0	-16.65	200.0	-16.82	15.0	-15.44	200.0	-17.97
20.00	-12.77	205.00	-14.21	20.0	-15.71	205.0	-16.22	20.0	-15.86	205.0	-18.51
25.00	-12.59	210.00	-14.02	25.0	-14.90	210.0	-15.82	25.0	-16.45	210.0	-18.71
30.00	-12.51	215.00	-14.07	30.0	-14.32	215.0	-15.73	30.0	-17.17	215.0	-19.04
35.00	-12.46	220.00	-14.21	35.0	-13.90	220.0	-15.78	35.0	-17.94	220.0	-19.38
40.00	-12.38	225.00	-14.28	40.0	-13.54	225.0	-15.85	40.0	-18.68	225.0	-19.44
45.00	-12.44	230.00	-14.51	45.0	-13.43	230.0	-16.13	45.0	-19.34	230.0	-19.60
50.00	-12.58	235.00	-14.62	50.0	-13.49	235.0	-16.32	50.0	-19.79	235.0	-19.51
55.00	-12.62	240.00	-14.72	55.0	-13.50	240.0	-16.57	55.0	-19.96	240.0	-19.32
60.00	-12.77	245.00	-14.73	60.0	-13.79	245.0	-16.66	60.0	-19.56	245.0	-19.20
65.00	-12.89	250.00	-14.67	65.0	-14.17	250.0	-16.66	65.0	-18.84	250.0	-19.01
70.00	-13.13	255.00	-14.56	70.0	-14.76	255.0	-16.62	70.0	-18.17	255.0	-18.80
75.00	-13.24	260.00	-14.44	75.0	-15.39	260.0	-16.62	75.0	-17.33	260.0	-18.49
80.00	-13.34	265.00	-14.29	80.0	-16.16	265.0	-16.54	80.0	-16.56	265.0	-18.23
85.00	-13.38	270.00	-14.13	85.0	-16.98	270.0	-16.59	85.0	-15.88	270.0	-17.77
90.00	-13.32	275.00	-14.00	90.0	-17.61	275.0	-16.71	90.0	-15.33	275.0	-17.34
95.00	-13.22	280.00	-13.80	95.0	-18.03	280.0	-16.67	95.0	-14.97	280.0	-16.96
100.00	-13.03	285.00	-13.71	100.0	-17.85	285.0	-17.01	100.0	-14.76	285.0	-16.45
105.00	-12.65	290.00	-13.64	105.0	-17.15	290.0	-17.32	105.0	-14.56	290.0	-16.08
110.00	-12.27	295.00	-13.53	110.0	-16.17	295.0	-17.60	110.0	-14.54	295.0	-15.69
115.00	-11.95	300.00	-13.51	115.0	-15.25	300.0	-18.01	115.0	-14.68	300.0	-15.42
120.00	-11.51	305.00	-13.39	120.0	-14.33	305.0	-18.46	120.0	-14.73	305.0	-15.01
125.00	-11.31	310.00	-13.33	125.0	-13.79	310.0	-18.77	125.0	-14.92	310.0	-14.79
130.00	-11.20	315.00	-13.25	130.0	-13.44	315.0	-19.24	130.0	-15.14	315.0	-14.51
135.00	-11.18	320.00	-13.27	135.0	-13.29	320.0	-19.76	135.0	-15.32	320.0	-14.37
140.00	-11.36	325.00	-13.20	140.0	-13.50	325.0	-20.23	140.0	-15.45	325.0	-14.16
145.00	-11.69	330.00	-13.22	145.0	-14.02	330.0	-20.79	145.0	-15.52	330.0	-14.05
150.00	-12.27	335.00	-13.19	150.0	-14.94	335.0	-21.19	150.0	-15.65	335.0	-13.94
155.00	-12.90	340.00	-13.26	155.0	-16.15	340.0	-21.75	155.0	-15.68	340.0	-13.92
160.00	-13.67	345.00	-13.33	160.0	-17.90	345.0	-22.12	160.0	-15.74	345.0	-13.95
165.00	-14.37	350.00	-13.32	165.0	-20.01	350.0	-21.95	165.0	-15.75	350.0	-13.96
170.00	-15.02	355.00	-13.33	170.0	-22.36	355.0	-21.18	170.0	-15.91	355.0	-14.11
175.00	-15.44	360.00	-13.32	175.0	-23.96	360.0	-20.17	175.0	-16.10	360.0	-14.32
180.00	-15.51			180.0	-22.81			180.0	-16.40		

RP_918.000000_phi



RP_918.000000_theta



5. PHOTO DOCUMENTATION

Test Axis : H

Test Axis : E1

Test Axis : E2