



# CALIBRATION CERTIFICATE



Deutsche  
Akkreditierungsstelle  
D-K-15195-01-00

## Kalibrierschein

Certificate Number  
Zertifikatsnummer

**1020A300772945**

General Data	
<b>Item</b> Gegenstand	HL562E ULTRALOG
<b>Manufacturer</b> Hersteller	ROHDE & SCHWARZ
<b>Type</b> Typ	HL562E
<b>Material Number</b> Materialnummer	4100.0007.03
<b>Serial Number</b> Seriennummer	102019
<b>Order Number</b> Bestellnummer	8800067239 10, 312025506
<b>Asset Number</b> Inventarnummer	
<b>Customer</b> Auftraggeber	Exporta s.r.o.  Patockova 1434/51 160 00 Praha 6 CZ
Performance	
<b>Place and Date of Calibration</b> Ort und Datum der Kalibrierung	87700 Memmingen, Rohde-und-Schwarz-Str. 1 2024-12-16
<b>Statement of Compliance (Incoming)</b> Konformitätsaussage (Anlieferung)	All measured values are within the data sheet specifications.
<b>Statement of Compliance (Outgoing)</b> Konformitätsaussage (Auslieferung)	All measured values are within the data sheet specifications.
<b>Customers due Interval</b> Kalibrierintervall des Kunden	
<b>Extent of Calibration Document</b> Umfang des Kalibrierdokuments	3 Pages Certificate 17 Pages Outgoing Results
<b>Date of Issue</b> Ausstellungsdatum	<b>Approval of the certificate by</b> Freigabe des Kalibrierscheins durch
2024-12-18	Dr. Gerhard Rösel Florian Haack
<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">   <b>Laboratory Management</b>              Labormanagement         </div> <div style="text-align: center;">   <b>Person in Charge</b>              Bearbeiter         </div> </div>	

## Calibration Mark Kalibrierzeichen

300772945
D-K- 15195-01-00
2024-12

Member of Deutscher Kalibrierdienst  
Mitglied im Deutschen Kalibrierdienst



This calibration certificate documents the metrological traceability to national standards, which realize the units of measurement according to the International System of Units (SI). The DAkkS is signatory to the multilateral agreements of the European co-operation for Accreditation (EA) and of the International Laboratory Accreditation Cooperation (ILAC) for the mutual recognition of calibration certificates. The user is obliged to have the object recalibrated at appropriate intervals. This calibration certificate may not be reproduced other than in full except with the permission of the issuing laboratory. Calibration certificates with the full name of the approval responsible person are valid without signature.

Dieser Kalibrierschein dokumentiert die metrologische Rückführbarkeit auf nationale Normale zur Darstellung der Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI). Die DAkkS ist Unterzeichner der multilateralen Übereinkommen der European cooperation for Accreditation (EA) und der International Laboratory Accreditation Cooperation (ILAC) zur gegenseitigen Anerkennung der Kalibrierscheine. Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich. Dieser Kalibrierschein darf nur vollständig weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung des ausstellenden Kalibrierlaboratoriums. Kalibrierscheine sind bei Nennung des für die Freigabe Verantwortlichen in Klarschrift auch ohne Unterschrift gültig.



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Calibration Procedure
All calibrations are carried out on an Open-Area Test Site. All measurements are performed with a network analyser. The traceability is represented in the table Working Standards used. Free-Space Antenna Factor and Gain according to CISPR 16-1-6 Edition 1.2 2022-03 and ANSI C63.5-2017.

Working Standards used				
Item	Type	Serial Number	Calibration Certificate Number	Cal. Due
Vector Network Analyzer 4-Port	ZNB20	101857	0001A300750000	2025-06-30
Calibration Kit 18GHz N-Typ	ZV-Z270	101299	0001A300732852	2025-02-28

Remarks
The instrument was not adjusted, therefore only outgoing results are available.



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Environmental Conditions			
Ambient Temperature	(23 ± 4) °C	Relative Humidity	10%-70%

Comments on Measurement Results
<p>The reported results apply only to those items specifically listed on this calibration certificate and have been tested for compliance with the specifications. The associated uncertainty of measurement has been taken into account if not otherwise stated.</p> <p>The non-binary decision rule with guard band is used according to ILAC G8:09/2019 'Guidelines on Decision Rules and Statements of Conformity'. Pass is normally not marked. Conditional Pass is marked with UGB1, Conditional Fail with UGB2 and Fail with Fail.</p> <p>The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor (k=2) such that the coverage probability corresponds to approximately 95 %. It is consistent with the EA-4/02 M:2022.</p> <p>In addition to the calibration results, the calibration certificate includes functional measurements that might have an influence on the measurement uncertainty of the calibration results.</p> <p>The functional measurement results are marked and are not intended to be used to support the further dissemination of metrological traceability. They are intended to verify the requirements on the measurement object according to manufacturer specifications and technical standards.</p>

# Outgoing Results

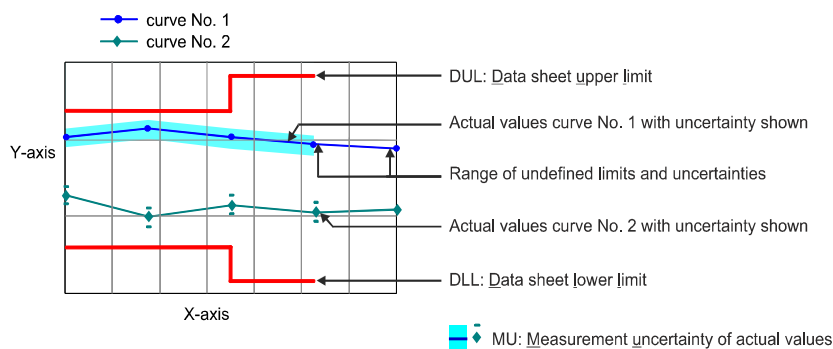
Designation:	ULTRALOG Antenna
Type:	HL562E
Material No.:	4100.0007.03
Serial No.:	102019
Certificate No.:	1020A300772945
Referring to Test Documentation:	HL562E-03.04

Test Department:	3MP1A
Name:	Haack
Date:	2024-12-16

## The following abbreviations may be used in this document

{a}	No measurement uncertainty stated because the errors always add together. So it is sure that a measurement result evaluated as "PASS" is pass.
{b}	The measurement uncertainty depends on the measurement result. The stated measurement uncertainty is valid for the close area around the specification. Measurement results outside the close area have a higher measurement uncertainty but are within the specification.
{c}	Functional test, therefore no measurement uncertainty is stated.
{d}	Typical value, refer to performance test.
{e}	The measurement uncertainty is taken into account when setting the measuring system.
{g}	Verification of specified requirements, non-accredited measurements. Technical operations that consist of the determination of one or more characteristics to a specified procedure (formerly {f}).
DL or DT	Data Limit for symmetrical tolerance limits
DLL	Datasheet Lower Limit
DUL	Datasheet Upper Limit
MU	Symmetrical Measurement Uncertainty
MLL or MLV	Measurement Uncertainty Lower Value
MUL or MUV	Measurement Uncertainty Upper Value
Nom.	Nominal Value
Dev.	Deviation
Act.	Actual Value
UGB	Uncertainty Guard Band: Measuring uncertainty violates the data (spec.) limit.
UGB1	A compliance statement may be possible where a confidence level of less than 95 % is acceptable.
UGB2	A non-compliance statement may be possible where a confidence level of less than 95 % is acceptable.
DU	Datasheet Uncertainty

## Explanation of charts



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## 1. Calibration Standard: CISPR 16-1-6 / ANSI C63.5

### Calibration Procedure:

The following calibrations are carried out using the Standard-Site-Method (SSM) in the lower frequency range and the Three-Antenna-Method (TAM) in the higher frequency range.

### Measurement Conditions:

Frequency  $\leq$  1000.00 MHz (SSM):

- Transmit antenna height: 2.00 m
- Receive antenna height: 1.00 - 4.00 m
- Distance: 10.00 m  
(referring to the geometrical middle of the biconical element)
- Polarisation: horizontal

Frequency  $>$  1000.00 MHz (TAM):

- Height: 5.00 m
- Distance: 3.00 m (referring to the tip of the antenna)
- Polarisation: vertical

In an EMC disturbance measurement the electric field strength is required at a given distance from the front face of the Equipment Under Test (EUT). Field strength corrections for radiated disturbance measurements at specific distances are provided as part of the report (see 'Correction Values for Antenna Factor'). These corrections accounts for the phase centre of the antenna. Additionally, antenna factor and gain are provided at specific distances (see 'Antenna Factor and Realized Gain for defined distances'). The corrections are outside of the scope of accreditation.

### Environmental Conditions:

- Actual Test site temperature: 6 - 9 °C / Humidity: 68 - 73 %rH
- Acceptable Test equipment temperature: 19 - 27 °C / Humidity: 10 - 70 %rH

### Measurement Uncertainty:

Reference impedance for all measurements is 50 Ohm.  
VSWR is stated as conversion of reflection coefficient without MU.

Antenna Factor and Realized Gain:

30.0 - 181.0 MHz:  $\pm$  1.00 dB  
182.0 - 1000.0 MHz:  $\pm$  1.50 dB  
1001.0 - 6000.0 MHz:  $\pm$  1.00 dB

Reflection Coefficient:

30.0 - 50.0 MHz:  $\pm$  0.040  
51.0 - 3000.0 MHz:  $\pm$  0.030  
3002.0 - 6000.0 MHz:  $\pm$  0.050

## 1.1. Calibration Results (Free-Space)

(Hint: Reduced number of frequency steps, full amount available on data file)

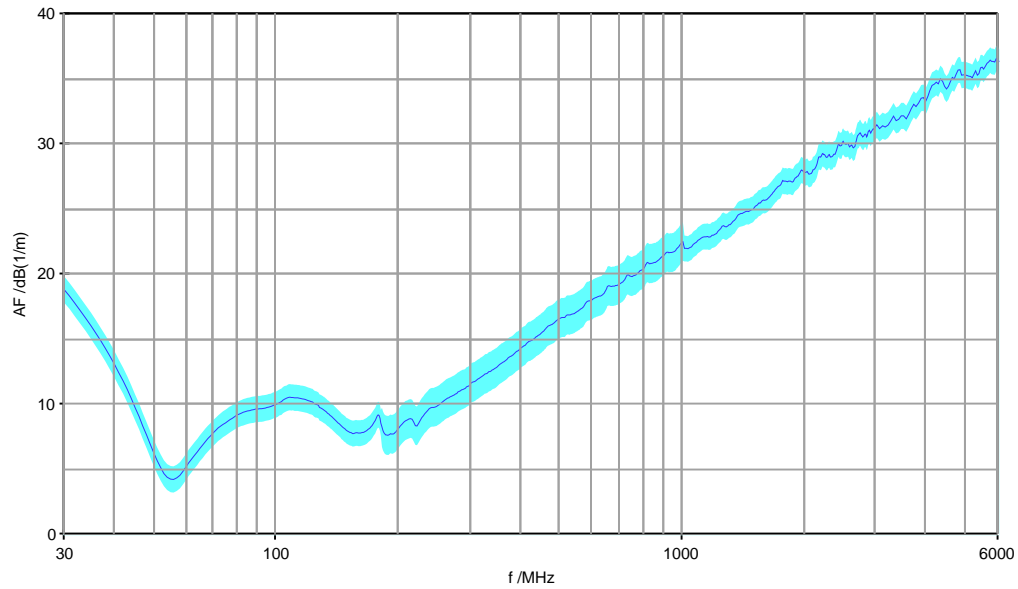
Frequency in MHz	Antenna Factor in dB(1/m)	Realized Gain in dBi	Reflection Coefficient
30	18.89	-19.12	0.942
50	6.32	-2.12	0.719
100	10.03	0.19	0.485
150	7.96	5.78	0.179
200	8.18	8.06	0.237
250	9.94	8.23	0.083
300	11.55	8.21	0.061
350	12.93	8.17	0.100
400	14.35	7.91	0.202
450	15.52	7.76	0.151
500	16.63	7.57	0.202
550	17.13	7.89	0.105
600	18.06	7.73	0.153
650	18.91	7.56	0.096
700	19.25	7.87	0.188
750	19.82	7.90	0.072
800	20.41	7.88	0.131
850	20.89	7.92	0.169
900	21.45	7.85	0.118
950	21.70	8.08	0.090
1000	22.52	7.70	0.122
1050	22.09	8.56	0.183
1100	22.69	8.36	0.240
1150	22.90	8.53	0.135
1200	23.07	8.74	0.123
1250	23.68	8.48	0.153
1300	23.80	8.70	0.138
1350	24.28	8.54	0.214
1400	24.67	8.47	0.165
1450	24.82	8.63	0.149
1500	25.11	8.63	0.149
1550	25.46	8.57	0.173
1600	25.69	8.61	0.116
1650	26.09	8.48	0.220
1700	26.60	8.22	0.319
1750	27.05	8.03	0.250
1800	27.12	8.21	0.243
1850	27.09	8.47	0.275
1900	27.44	8.36	0.341
1950	27.92	8.10	0.286
2000	27.79	8.45	0.237
2050	27.67	8.78	0.235
2100	28.03	8.64	0.319
2150	28.80	8.06	0.325
2200	29.23	7.84	0.291
2250	28.99	8.28	0.266
2300	29.05	8.41	0.311
2350	29.21	8.44	0.310
2400	29.70	8.12	0.320
2450	29.86	8.15	0.250



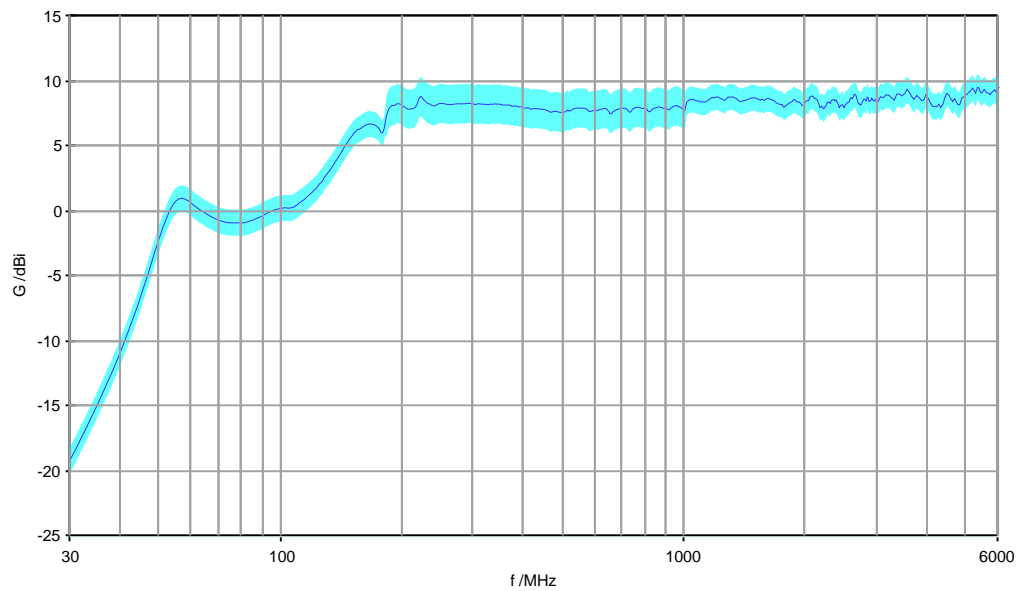
Frequency in MHz	Antenna Factor in dB(1/m)	Realized Gain in dBi	Reflection Coefficient
2500	30.01	8.17	0.295
2550	30.00	8.35	0.303
2600	29.92	8.60	0.311
2650	29.80	8.88	0.217
2700	30.67	8.18	0.221
2750	30.64	8.37	0.248
2800	30.72	8.44	0.330
2850	30.79	8.52	0.295
2900	30.82	8.65	0.290
2950	31.12	8.49	0.276
3000	31.45	8.31	0.325
3050	31.15	8.76	0.264
3100	31.37	8.68	0.233
3150	31.29	8.90	0.221
3200	31.44	8.88	0.328
3250	31.77	8.69	0.320
3300	32.11	8.48	0.296
3350	31.78	8.94	0.199
3400	31.87	8.98	0.214
3450	32.14	8.84	0.199
3500	32.14	8.96	0.173
3550	31.92	9.31	0.116
3600	32.28	9.07	0.261
3650	32.68	8.79	0.319
3700	33.02	8.56	0.352
3750	32.85	8.85	0.278
3800	33.13	8.69	0.279
3850	33.48	8.45	0.307
3900	33.53	8.51	0.352
3950	33.24	8.91	0.279
4000	33.63	8.63	0.268
4050	34.06	8.31	0.327
4100	34.46	8.01	0.424
4150	34.57	8.01	0.391
4200	34.70	7.99	0.342
4250	34.59	8.19	0.310
4300	34.97	7.91	0.390
4350	34.79	8.20	0.373
4400	34.39	8.69	0.305
4450	34.19	9.00	0.223
4500	34.39	8.89	0.317
4550	34.77	8.61	0.350
4600	35.08	8.40	0.327
4650	34.97	8.59	0.235
4700	35.32	8.34	0.284
4750	35.63	8.12	0.332
4800	35.66	8.18	0.329
4850	35.25	8.68	0.214
4900	35.27	8.75	0.166
4950	35.27	8.84	0.218

Frequency in MHz	Antenna Factor in dB(1/m)	Realized Gain in dBi	Reflection Coefficient
5000	35.23	8.97	0.253
5050	35.18	9.11	0.175
5100	35.14	9.23	0.089
5150	35.05	9.41	0.166
5200	35.30	9.24	0.242
5250	35.59	9.03	0.205
5300	35.24	9.46	0.118
5350	35.37	9.41	0.135
5400	35.82	9.05	0.226
5450	35.85	9.10	0.231
5500	35.71	9.32	0.162
5550	35.93	9.17	0.050
5600	36.14	9.04	0.119
5650	36.25	9.01	0.154
5700	36.41	8.93	0.156
5750	36.31	9.10	0.111
5800	36.31	9.18	0.080
5850	36.26	9.30	0.044
5900	36.53	9.11	0.061
5950	36.48	9.23	0.169
6000	36.28	9.51	0.219

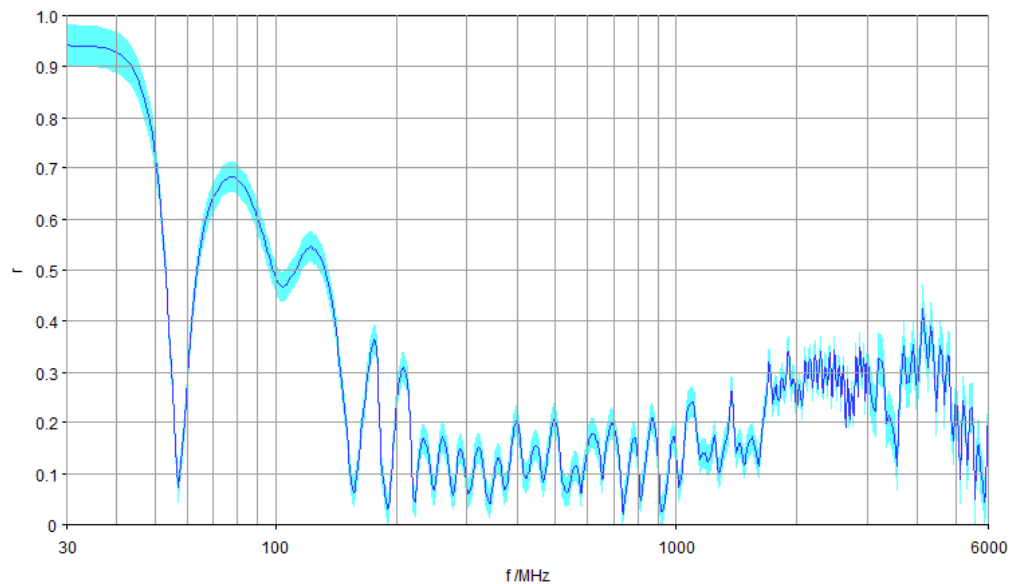
### 1.1.1 Antenna Factor



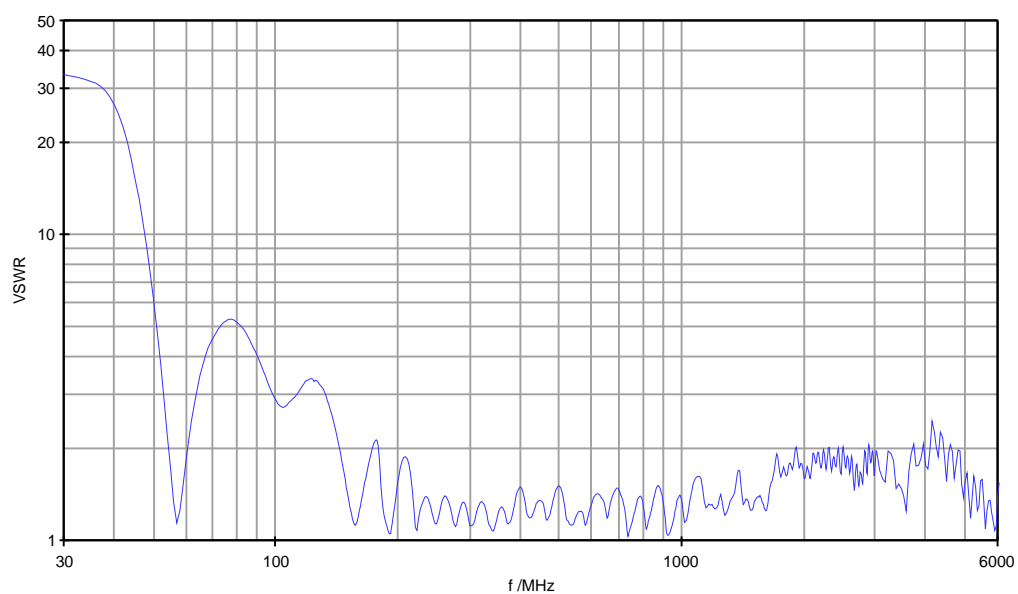
### 1.1.2 Realized Gain



### 1.1.3 Reflection Coefficient



### 1.1.4 VSWR



## 1.2. Antenna Factor and Realized Gain for defined distances

### 1.2.1 Reference Point is the Antenna Tip

(Hint: Reduced number of frequency steps, full amount available on data file)

Frequency in MHz	AF(3m) in dB(1/m)	G(3m) in dBi	AF(5m) in dB(1/m)	G(5m) in dBi	AF(10m) in dB(1/m)	G(10m) in dBi
30	21.35	-21.59	20.45	-20.68	19.70	-19.94
50	8.78	-4.59	7.88	-3.68	7.14	-2.94
100	12.50	-2.28	11.59	-1.37	10.85	-0.63
150	10.36	3.38	9.48	4.26	8.76	4.99
200	10.51	5.73	9.65	6.59	8.95	7.29
250	11.87	6.31	11.15	7.03	10.57	7.61
300	13.18	6.58	12.57	7.20	12.07	7.69
350	14.36	6.74	13.82	7.29	13.39	7.72
400	15.62	6.65	15.13	7.13	14.75	7.51
450	16.66	6.63	16.22	7.06	15.88	7.41
500	17.66	6.54	17.26	6.94	16.95	7.25
550	18.08	6.95	17.71	7.31	17.43	7.60
600	18.93	6.85	18.59	7.19	18.33	7.45
650	19.73	6.75	19.41	7.07	19.17	7.31
700	20.01	7.11	19.72	7.40	19.49	7.63
750	20.53	7.19	20.25	7.47	20.04	7.68
800	21.08	7.20	20.81	7.47	20.61	7.67
850	21.52	7.29	21.27	7.53	21.08	7.73
900	22.06	7.25	21.82	7.48	21.64	7.67
950	22.27	7.50	22.05	7.73	21.88	7.90
1000	23.06	7.16	22.85	7.37	22.68	7.54
1050	22.61	8.03	22.41	8.24	22.25	8.40
1100	23.19	7.86	22.99	8.06	22.84	8.21
1150	23.39	8.05	23.20	8.24	23.05	8.38
1200	23.53	8.27	23.35	8.45	23.21	8.59
1250	24.13	8.03	23.95	8.20	23.82	8.34
1300	24.23	8.26	24.06	8.43	23.93	8.56
1350	24.70	8.12	24.54	8.29	24.41	8.41
1400	25.08	8.06	24.92	8.22	24.80	8.34
1450	25.21	8.23	25.06	8.39	24.94	8.51
1500	25.49	8.25	25.34	8.40	25.23	8.51
1550	25.83	8.20	25.68	8.34	25.57	8.45
1600	26.05	8.25	25.91	8.39	25.80	8.50
1650	26.44	8.13	26.31	8.26	26.20	8.37
1700	26.95	7.88	26.81	8.02	26.71	8.12
1750	27.39	7.70	27.25	7.83	27.15	7.93
1800	27.44	7.88	27.32	8.01	27.22	8.11
1850	27.41	8.16	27.28	8.28	27.19	8.38
1900	27.75	8.05	27.62	8.17	27.53	8.26
1950	28.22	7.80	28.10	7.92	28.01	8.01
2000	28.09	8.15	27.97	8.27	27.88	8.36
2050	27.96	8.49	27.85	8.61	27.76	8.69
2100	28.31	8.35	28.20	8.47	28.11	8.55
2150	29.08	7.79	28.97	7.90	28.89	7.98
2200	29.50	7.57	29.39	7.68	29.31	7.76
2250	29.26	8.01	29.15	8.11	29.07	8.20
2300	29.31	8.15	29.20	8.25	29.13	8.33
2350	29.46	8.18	29.36	8.28	29.28	8.36
2400	29.96	7.87	29.86	7.97	29.78	8.04
2450	30.11	7.90	30.01	8.00	29.93	8.07

Frequency in MHz	AF(3m) in dB(1/m)	G(3m) in dBi	AF(5m) in dB(1/m)	G(5m) in dBi	AF(10m) in dB(1/m)	G(10m) in dBi
2500	30.25	7.93	30.15	8.02	30.08	8.10
2550	30.24	8.11	30.14	8.21	30.07	8.28
2600	30.15	8.36	30.06	8.46	29.99	8.53
2650	30.04	8.65	29.94	8.74	29.87	8.81
2700	30.90	7.95	30.80	8.04	30.74	8.11
2750	30.86	8.14	30.77	8.23	30.71	8.30
2800	30.94	8.22	30.85	8.31	30.79	8.38
2850	31.01	8.30	30.93	8.39	30.86	8.46
2900	31.04	8.43	30.95	8.52	30.89	8.58
2950	31.34	8.28	31.25	8.36	31.19	8.43
3000	31.66	8.10	31.58	8.19	31.51	8.25
3050	31.36	8.55	31.27	8.63	31.21	8.69
3100	31.58	8.47	31.49	8.55	31.43	8.61
3150	31.49	8.69	31.41	8.77	31.35	8.83
3200	31.64	8.68	31.56	8.76	31.50	8.82
3250	31.97	8.49	31.89	8.57	31.83	8.63
3300	32.31	8.28	32.23	8.36	32.17	8.42
3350	31.97	8.75	31.90	8.82	31.84	8.88
3400	32.07	8.78	31.99	8.86	31.93	8.92
3450	32.33	8.65	32.25	8.72	32.19	8.78
3500	32.32	8.78	32.25	8.85	32.19	8.91
3550	32.10	9.12	32.03	9.20	31.97	9.25
3600	32.46	8.88	32.39	8.96	32.33	9.01
3650	32.86	8.61	32.79	8.68	32.73	8.73
3700	33.20	8.39	33.13	8.46	33.07	8.51
3750	33.03	8.67	32.96	8.74	32.90	8.80
3800	33.30	8.51	33.23	8.58	33.18	8.64
3850	33.65	8.28	33.58	8.35	33.53	8.40
3900	33.71	8.34	33.64	8.40	33.59	8.46
3950	33.41	8.75	33.34	8.81	33.29	8.86
4000	33.80	8.46	33.73	8.53	33.68	8.58
4050	34.23	8.14	34.16	8.21	34.11	8.26
4100	34.63	7.85	34.56	7.92	34.51	7.96
4150	34.74	7.84	34.67	7.91	34.62	7.96
4200	34.86	7.82	34.80	7.89	34.75	7.94
4250	34.75	8.03	34.69	8.10	34.64	8.15
4300	35.13	7.76	35.07	7.82	35.02	7.87
4350	34.95	8.04	34.89	8.10	34.84	8.15
4400	34.55	8.54	34.49	8.60	34.44	8.65
4450	34.34	8.85	34.28	8.91	34.23	8.95
4500	34.55	8.74	34.49	8.80	34.44	8.85
4550	34.92	8.46	34.86	8.52	34.82	8.56
4600	35.23	8.25	35.17	8.31	35.12	8.35
4650	35.12	8.44	35.06	8.50	35.02	8.55
4700	35.47	8.19	35.41	8.25	35.37	8.29
4750	35.78	7.98	35.72	8.03	35.68	8.08
4800	35.81	8.04	35.75	8.10	35.70	8.14
4850	35.40	8.54	35.34	8.60	35.29	8.64
4900	35.42	8.61	35.36	8.66	35.32	8.71
4950	35.42	8.70	35.36	8.75	35.32	8.80

Frequency in MHz	AF(3m) in dB(1/m)	G(3m) in dBi	AF(5m) in dB(1/m)	G(5m) in dBi	AF(10m) in dB(1/m)	G(10m) in dBi
5000	35.37	8.83	35.31	8.89	35.27	8.93
5050	35.32	8.97	35.26	9.02	35.22	9.07
5100	35.28	9.09	35.23	9.15	35.18	9.19
5150	35.19	9.27	35.13	9.32	35.09	9.36
5200	35.44	9.10	35.38	9.16	35.34	9.20
5250	35.73	8.89	35.68	8.95	35.64	8.99
5300	35.38	9.33	35.32	9.38	35.28	9.42
5350	35.51	9.28	35.45	9.33	35.41	9.37
5400	35.95	8.92	35.90	8.97	35.86	9.01
5450	35.99	8.96	35.93	9.02	35.89	9.06
5500	35.84	9.18	35.79	9.24	35.75	9.28
5550	36.06	9.04	36.01	9.09	35.97	9.13
5600	36.28	8.91	36.22	8.96	36.18	9.00
5650	36.38	8.88	36.33	8.94	36.29	8.97
5700	36.54	8.80	36.49	8.85	36.45	8.89
5750	36.44	8.98	36.39	9.03	36.35	9.06
5800	36.44	9.05	36.38	9.10	36.35	9.14
5850	36.39	9.17	36.34	9.22	36.30	9.26
5900	36.66	8.98	36.61	9.03	36.57	9.07
5950	36.60	9.11	36.55	9.16	36.51	9.20
6000	36.40	9.38	36.35	9.43	36.31	9.47

## 1.2.2 Reference Point is the Marking

(Hint: Reduced number of frequency steps, full amount available on data file)

Frequency in MHz	AF(3m) in dB(1/m)	G(3m) in dBi	AF(5m) in dB(1/m)	G(5m) in dBi	AF(10m) in dB(1/m)	G(10m) in dBi
30	20.06	-20.30	19.61	-19.85	19.26	-19.49
50	7.50	-3.30	7.05	-2.85	6.69	-2.49
100	11.21	-0.99	10.76	-0.54	10.40	-0.18
150	9.06	4.68	8.64	5.10	8.31	5.43
200	9.20	7.04	8.81	7.43	8.50	7.74
250	10.49	7.69	10.28	7.90	10.11	8.07
300	11.76	8.00	11.67	8.09	11.61	8.15
350	12.89	8.21	12.91	8.19	12.92	8.18
400	14.12	8.14	14.21	8.05	14.28	7.98
450	15.14	8.15	15.29	7.99	15.41	7.88
500	16.12	8.08	16.33	7.87	16.48	7.72
550	16.53	8.50	16.77	8.25	16.96	8.07
600	17.36	8.42	17.65	8.14	17.85	7.93
650	18.15	8.33	18.46	8.02	18.69	7.79
700	18.42	8.70	18.76	8.36	19.01	8.11
750	18.93	8.79	19.30	8.43	19.56	8.16
800	19.47	8.81	19.86	8.43	20.13	8.15
850	19.91	8.90	20.31	8.50	20.60	8.20
900	20.43	8.87	20.86	8.45	21.16	8.14
950	20.64	9.13	21.08	8.69	21.40	8.38
1000	21.43	8.79	21.88	8.34	22.20	8.02
1050	20.97	9.67	21.44	9.21	21.77	8.88
1100	21.55	9.50	22.02	9.03	22.36	8.69
1150	21.74	9.70	22.22	9.21	22.57	8.87
1200	21.88	9.92	22.38	9.43	22.73	9.08
1250	22.48	9.68	22.98	9.18	23.34	8.82
1300	22.58	9.92	23.09	9.41	23.45	9.05
1350	23.04	9.78	23.56	9.27	23.93	8.90
1400	23.42	9.73	23.94	9.20	24.32	8.83
1450	23.55	9.90	24.08	9.37	24.46	8.99
1500	23.82	9.92	24.36	9.38	24.74	9.00
1550	24.16	9.87	24.70	9.32	25.09	8.94
1600	24.38	9.92	24.93	9.37	25.32	8.98
1650	24.77	9.80	25.32	9.25	25.72	8.85
1700	25.27	9.56	25.83	9.00	26.22	8.60
1750	25.71	9.38	26.27	8.81	26.67	8.41
1800	25.76	9.56	26.33	8.99	26.73	8.59
1850	25.73	9.84	26.30	9.27	26.70	8.86
1900	26.06	9.73	26.64	9.16	27.05	8.75
1950	26.53	9.49	27.11	8.91	27.52	8.50
2000	26.40	9.84	26.99	9.25	27.40	8.84
2050	26.28	10.18	26.86	9.59	27.28	9.18
2100	26.62	10.04	27.21	9.45	27.63	9.04
2150	27.39	9.48	27.99	8.88	28.40	8.46
2200	27.81	9.26	28.40	8.67	28.82	8.24
2250	27.56	9.70	28.16	9.10	28.58	8.68
2300	27.61	9.84	28.22	9.24	28.64	8.81
2350	27.77	9.87	28.37	9.27	28.80	8.84
2400	28.26	9.56	28.87	8.96	29.29	8.53
2450	28.41	9.59	29.02	8.99	29.45	8.56

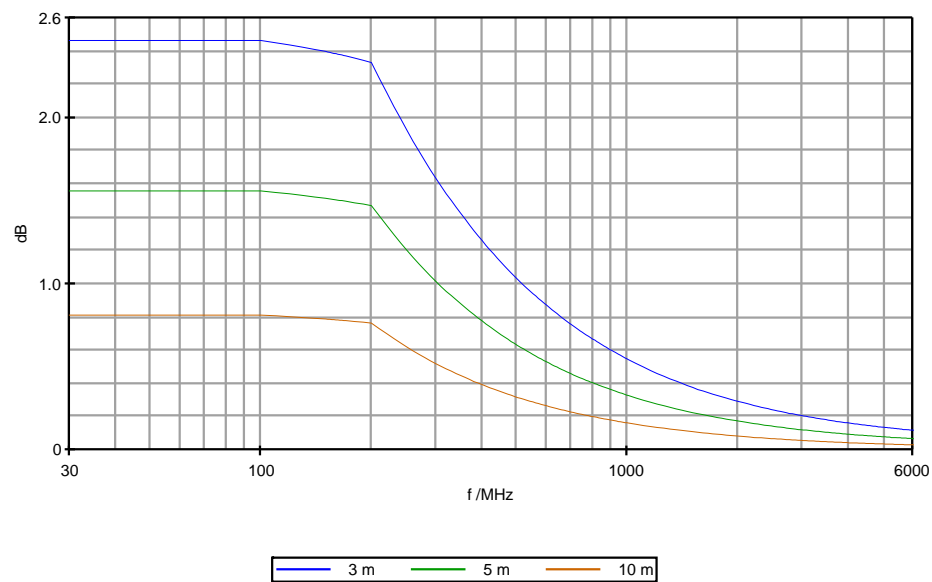


Frequency in MHz	AF(3m) in dB(1/m)	G(3m) in dBi	AF(5m) in dB(1/m)	G(5m) in dBi	AF(10m) in dB(1/m)	G(10m) in dBi
2500	28.55	9.62	29.16	9.01	29.60	8.58
2550	28.54	9.81	29.15	9.20	29.58	8.77
2600	28.46	10.06	29.07	9.45	29.50	9.02
2650	28.34	10.35	28.95	9.73	29.39	9.30
2700	29.19	9.65	29.81	9.03	30.25	8.60
2750	29.16	9.85	29.78	9.23	30.22	8.79
2800	29.24	9.92	29.86	9.30	30.30	8.86
2850	29.31	10.01	29.93	9.38	30.38	8.94
2900	29.33	10.13	29.96	9.51	30.40	9.07
2950	29.63	9.98	30.26	9.36	30.70	8.91
3000	29.95	9.81	30.58	9.18	31.03	8.74
3050	29.65	10.26	30.28	9.63	30.73	9.18
3100	29.87	10.18	30.50	9.55	30.95	9.10
3150	29.79	10.40	30.42	9.77	30.87	9.32
3200	29.93	10.39	30.57	9.76	31.01	9.31
3250	30.26	10.20	30.90	9.56	31.34	9.11
3300	30.60	9.99	31.24	9.35	31.69	8.90
3350	30.26	10.46	30.90	9.82	31.35	9.37
3400	30.36	10.49	31.00	9.85	31.45	9.40
3450	30.62	10.36	31.26	9.72	31.71	9.27
3500	30.61	10.49	31.26	9.85	31.71	9.39
3550	30.39	10.83	31.03	10.19	31.49	9.74
3600	30.75	10.60	31.39	9.95	31.85	9.50
3650	31.15	10.32	31.79	9.67	32.25	9.22
3700	31.49	10.10	32.13	9.45	32.59	9.00
3750	31.31	10.39	31.96	9.74	32.42	9.28
3800	31.59	10.23	32.24	9.58	32.69	9.12
3850	31.94	9.99	32.59	9.34	33.05	8.88
3900	31.99	10.05	32.64	9.40	33.10	8.94
3950	31.69	10.46	32.34	9.81	32.80	9.35
4000	32.09	10.18	32.74	9.52	33.20	9.06
4050	32.51	9.86	33.17	9.20	33.63	8.74
4100	32.91	9.57	33.56	8.91	34.02	8.45
4150	33.02	9.56	33.68	8.90	34.14	8.44
4200	33.15	9.54	33.80	8.88	34.26	8.42
4250	33.04	9.75	33.69	9.09	34.16	8.63
4300	33.42	9.47	34.07	8.82	34.54	8.35
4350	33.23	9.76	33.89	9.10	34.35	8.64
4400	32.83	10.26	33.49	9.60	33.96	9.13
4450	32.62	10.56	33.28	9.90	33.75	9.44
4500	32.83	10.46	33.49	9.80	33.95	9.33
4550	33.20	10.18	33.87	9.52	34.33	9.05
4600	33.51	9.96	34.17	9.30	34.64	8.84
4650	33.41	10.16	34.07	9.50	34.53	9.04
4700	33.75	9.91	34.41	9.25	34.88	8.78
4750	34.06	9.69	34.72	9.03	35.19	8.57
4800	34.09	9.76	34.75	9.09	35.22	8.63
4850	33.68	10.26	34.34	9.59	34.81	9.13
4900	33.70	10.33	34.36	9.66	34.83	9.19
4950	33.70	10.42	34.36	9.75	34.83	9.28

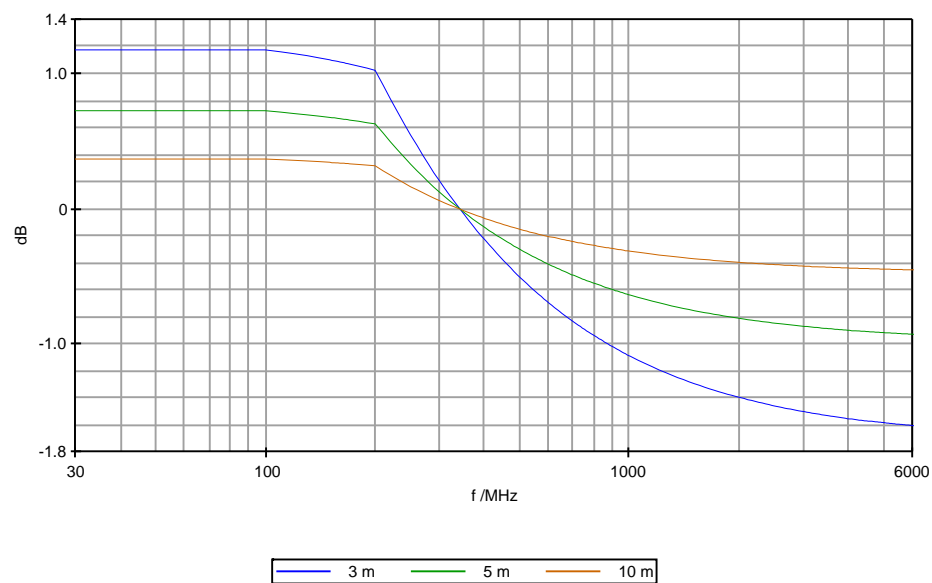
Frequency in MHz	AF(3m) in dB(1/m)	G(3m) in dBi	AF(5m) in dB(1/m)	G(5m) in dBi	AF(10m) in dB(1/m)	G(10m) in dBi
5000	33.65	10.55	34.32	9.88	34.78	9.42
5050	33.60	10.69	34.26	10.02	34.73	9.55
5100	33.56	10.81	34.23	10.14	34.70	9.68
5150	33.47	10.99	34.14	10.32	34.60	9.85
5200	33.72	10.82	34.39	10.15	34.86	9.68
5250	34.01	10.61	34.68	9.94	35.15	9.47
5300	33.66	11.05	34.33	10.38	34.80	9.91
5350	33.79	11.00	34.46	10.33	34.93	9.86
5400	34.23	10.64	34.90	9.97	35.37	9.50
5450	34.26	10.69	34.93	10.01	35.40	9.54
5500	34.12	10.91	34.79	10.23	35.26	9.76
5550	34.34	10.76	35.01	10.09	35.49	9.62
5600	34.55	10.63	35.23	9.96	35.70	9.49
5650	34.65	10.61	35.33	9.93	35.80	9.46
5700	34.82	10.52	35.49	9.85	35.96	9.38
5750	34.71	10.70	35.39	10.03	35.86	9.55
5800	34.71	10.78	35.39	10.10	35.86	9.63
5850	34.67	10.90	35.34	10.22	35.81	9.75
5900	34.93	10.70	35.61	10.03	36.08	9.56
5950	34.88	10.83	35.55	10.16	36.03	9.68
6000	34.68	11.11	35.35	10.43	35.83	9.96

### 1.3. Correction Values for Antenna Factor

#### 1.3.1 Reference Point is the Antenna Tip



#### 1.3.2 Reference Point is the Marking



## 2. Electronic Data File

The calibration data are additionally supplied in electronic data files.