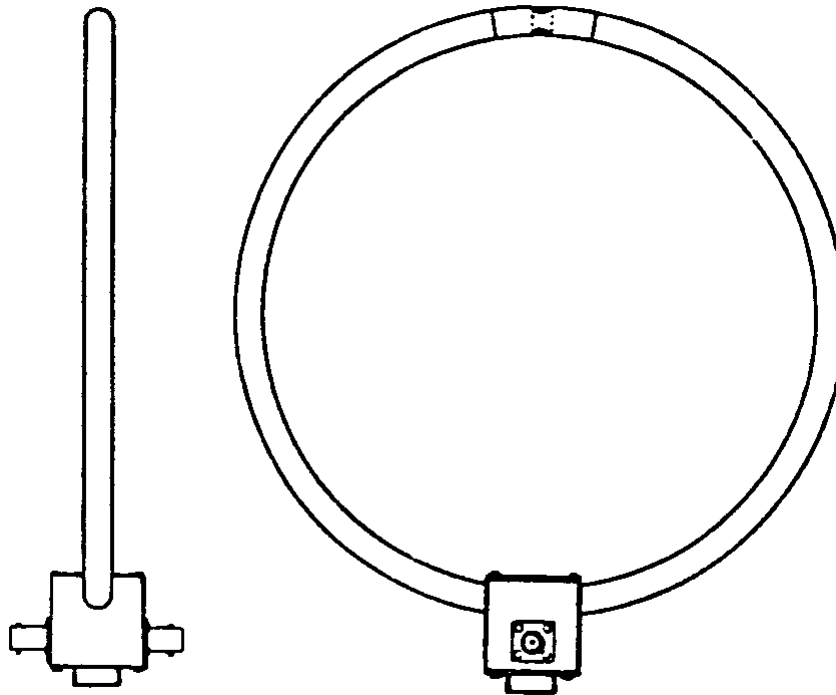


# SCHWARZBECK MESS - ELEKTRONIK

An der Klinge 29 D-69250 Schönau Tel.: 06228/1001 Fax.: (49)6228/1003

## Passive Rahmenantenne HFRA 5152 *Passive Magnetic TX Loop Antenna HFRA 5152*



Die passive Rahmenantenne HFRA 5152 ist zur Erzeugung definierter Magnetfelder im Frequenzbereich bis 3 MHz vorgesehen. Dabei wird eine Buchse mit dem Signalgenerator verbunden, während die andere Buchse zur Kontrolle des Rahmenstroms genutzt wird. Der Rahmenstrom wird als Spannungsabfall über dem eingebauten 20 Ohm Widerstand mit einem hochohmigen Spannungsmeßgerät ermittelt (z.B. Oszilloskop oder HF-Voltmeter). Eine gemessene Spannung von 50 mV am Kontrollausgang entspricht einem Rahmenstrom von 2.5 mA. Der Rahmenstrom ist streng proportional zur erzeugten Magnetfeldstärke. In einem Abstand von 1.3 m erzeugt man bei 50 mV Kontrollspannung eine fiktive elektrische Feldstärke von 0.01 V/m. Die maximal zulässige Kontrollspannung ist 630 mV, bei höheren Werten werden die eingebauten Widerstände zerstört.

Die Umrechnung von magnetischer Feldstärke in fiktive elektrische Feldstärke ist frequenzunabhängig 51.5 dB (=20 log (377  $\Omega$ ))

*The passive Loop Antenna HFRA 5152 was designed to generate well defined magnetic fields in the frequency range up to 3 MHz. The signal generator is connected to the loop antennas BNC-input, the second BNC-connector is used to monitor the RF-level using a high impedant voltmeter or an oscilloscope respectively. The loop current is measured as a voltage drop across the built-in 20 Ohm resistor. A measured voltage of 50 mV at the monitoring connector corresponds to a loop current of 2.5 mA. The loop current is strictly proportional to the generated fieldstrength. The fictious electric fieldstrength is 0.01 V/m at a distance of 1.3 m with a monitoring voltage of 50 mV. Do not exceed the max. permitted monitor voltage of 630 mV, otherwise the built-in resitors will be destroyed.*

*If FAR-FIELD measurements are intended in units of dB $\mu$ V/m, read the voltage level in dB $\mu$ V across 50  $\Omega$  and add the E field antenna factor k E from the table (it is 51.5 dB higher and provides the "fictitious E field level" in dB $\mu$ V/m).*

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### Technische Daten

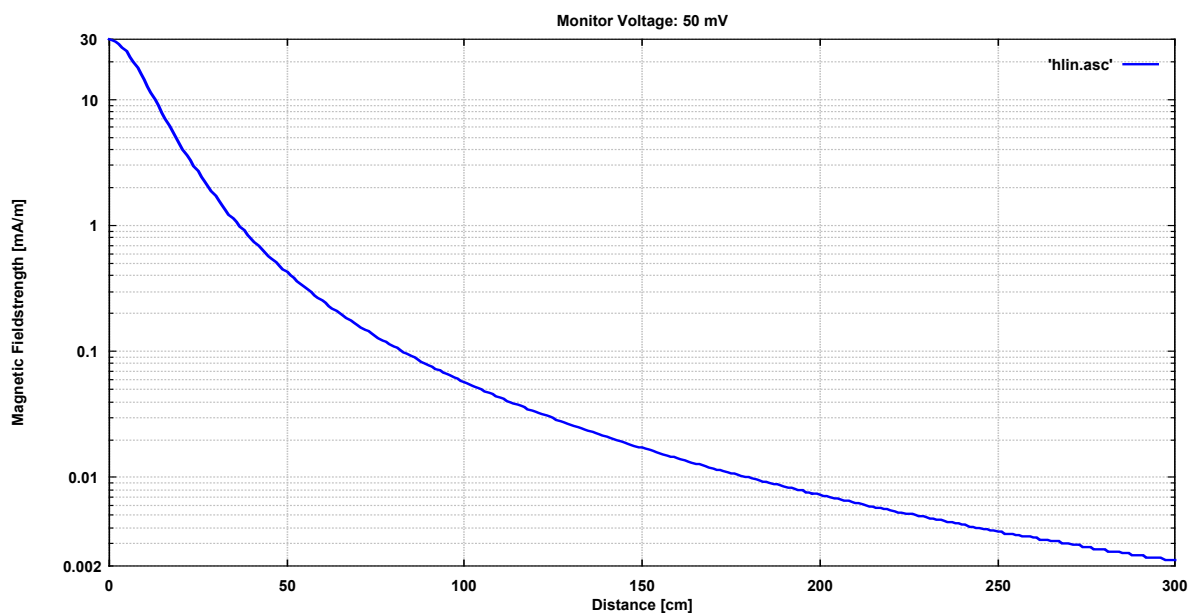
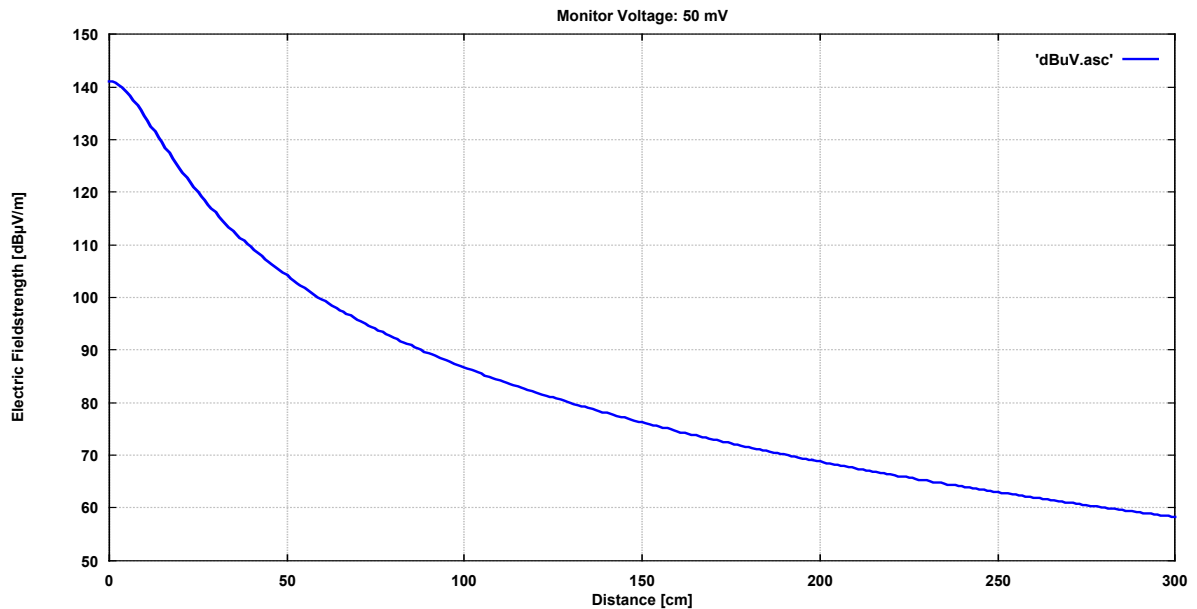
Frequenzbereich:  
Rahmendurchmesser:  
Windungszahl:  
Eingang:  
Kontrollausgang:  
Max. Kontrollspannung:  
Montage (Stativgewinde):  
Material: Messing, vernickelt  
Gewicht:

### HFRA 5152

DC ... 3 MHz  
250 mm  
3  
BNC  
BNC  
630 mV  
3/8"  
0.4 kg

### Specifications

Frequency Range:  
Loop Diameter:  
Number of Turns:  
Input-Connector:  
RF-Monitor Output:  
Max. Monitor Voltage:  
Mount (Camera Thread):  
Material: Brass, Nickel plated  
Weight:



$$1 \text{ V/m} = 2.653 \text{ mA/m} = -51.5 \text{ dBA/m} = 0 \text{ dBV/m} = 120 \text{ dBµV/m} = 68.5 \text{ dBµA/m}$$

$$1 \text{ A/m} = 377 \text{ V/m} = 0 \text{ dBA/m} = 51.5 \text{ dBV/m} = 120 \text{ dBµA/m} = 171.5 \text{ dBµV/m}$$

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## Passive Rahmenantenne HFRA 5152 Passive Magnetic TX Loop Antenna HFRA 5152

50 mV Monitoring Output Voltage Loop Current: 2.5 mA		
Distance [cm]	H [mA/m]	E [dB $\mu$ V/m]
0.0	30.0000	141.07
1.0	29.7143	140.99
2.0	28.8838	140.74
3.0	27.5828	140.34
4.0	25.9187	139.80
5.0	24.0123	139.14
6.0	21.9812	138.37
7.0	19.9263	137.52
8.0	17.9258	136.60
9.0	16.0340	135.63
10.0	14.2842	134.62
11.0	12.6924	133.60
12.0	11.2623	132.56
13.0	9.9891	131.52
14.0	8.8629	130.48
15.0	7.8711	129.45
16.0	7.0002	128.43
17.0	6.2366	127.43
18.0	5.5674	126.44
19.0	4.9808	125.47
20.0	4.4663	124.53
21.0	4.0144	123.60
22.0	3.6168	122.69
23.0	3.2665	121.81
24.0	2.9571	120.94
25.0	2.6833	120.10
26.0	2.4405	119.28
27.0	2.2246	118.47
28.0	2.0323	117.69
29.0	1.8606	116.92
30.0	1.7069	116.17
31.0	1.5690	115.44
32.0	1.4451	114.73
33.0	1.3334	114.03
34.0	1.2326	113.34
35.0	1.1414	112.68
36.0	1.0587	112.02
37.0	0.9836	111.38
38.0	0.9153	110.76
39.0	0.8530	110.15
40.0	0.7961	109.55
41.0	0.7440	108.96
42.0	0.6963	108.38
43.0	0.6525	107.82
44.0	0.6123	107.27
45.0	0.5752	106.72
46.0	0.5410	106.19
47.0	0.5094	105.67
48.0	0.4802	105.16
49.0	0.4531	104.65
50.0	0.4280	104.16

50 mV Monitoring Output Voltage Loop Current: 2.5 mA		
Distance [cm]	H [mA/m]	E [dB $\mu$ V/m]
51.0	0.4047	103.67
52.0	0.3830	103.19
53.0	0.3629	102.72
54.0	0.3441	102.26
55.0	0.3266	101.81
56.0	0.3102	101.36
57.0	0.2949	100.92
58.0	0.2805	100.49
59.0	0.2671	100.06
60.0	0.2545	99.64
61.0	0.2427	99.23
62.0	0.2316	98.82
63.0	0.2211	98.42
64.0	0.2113	98.03
65.0	0.2020	97.64
66.0	0.1933	97.25
67.0	0.1851	96.87
68.0	0.1773	96.50
69.0	0.1699	96.13
70.0	0.1630	95.77
71.0	0.1564	95.41
72.0	0.1501	95.06
73.0	0.1442	94.71
74.0	0.1386	94.36
75.0	0.1333	94.02
76.0	0.1282	93.69
77.0	0.1234	93.36
78.0	0.1189	93.03
79.0	0.1145	92.70
80.0	0.1104	92.38
81.0	0.1064	92.07
82.0	0.1027	91.76
83.0	0.0991	91.45
84.0	0.0957	91.14
85.0	0.0924	90.84
86.0	0.0893	90.54
87.0	0.0863	90.25
88.0	0.0834	89.96
89.0	0.0807	89.67
90.0	0.0781	89.38
91.0	0.0756	89.10
92.0	0.0732	88.82
93.0	0.0709	88.54
94.0	0.0687	88.27
95.0	0.0666	88.00
96.0	0.0646	87.73
97.0	0.0626	87.46
98.0	0.0608	87.20
99.0	0.0590	86.94
100.0	0.0572	86.68
101.0	0.0556	86.43

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50 mV Monitoring Output Voltage Loop Current: 2.5 mA		
Distance [cm]	H [mA/m]	E [dB $\mu$ V/m]
102.0	0.0540	86.17
103.0	0.0525	85.92
104.0	0.0510	85.68
105.0	0.0496	85.43
106.0	0.0482	85.19
107.0	0.0469	84.94
108.0	0.0456	84.71
109.0	0.0444	84.47
110.0	0.0432	84.23
111.0	0.0420	84.00
112.0	0.0409	83.77
113.0	0.0399	83.54
114.0	0.0388	83.31
115.0	0.0379	83.09
116.0	0.0369	82.87
117.0	0.0360	82.65
118.0	0.0351	82.43
119.0	0.0342	82.21
120.0	0.0334	81.99
121.0	0.0326	81.78
122.0	0.0318	81.57
123.0	0.0310	81.36
124.0	0.0303	81.15
125.0	0.0296	80.94
126.0	0.0289	80.73
127.0	0.0282	80.53
128.0	0.0275	80.33
129.0	0.0269	80.13
130.0	0.0263	79.93
131.0	0.0257	79.73
132.0	0.0251	79.53
133.0	0.0246	79.34
134.0	0.0240	79.15
135.0	0.0235	78.95
136.0	0.0230	78.76
137.0	0.0225	78.57
138.0	0.0220	78.39
139.0	0.0216	78.20
140.0	0.0211	78.01
141.0	0.0207	77.83
142.0	0.0202	77.65
143.0	0.0198	77.47
144.0	0.0194	77.29
145.0	0.0190	77.11
146.0	0.0186	76.93
147.0	0.0182	76.75
148.0	0.0179	76.58
149.0	0.0175	76.40
150.0	0.0172	76.23
151.0	0.0168	76.06
152.0	0.0165	75.89
153.0	0.0162	75.72

50 mV Monitoring Output Voltage Loop Current: 2.5 mA		
Distance [cm]	H [mA/m]	E [dB $\mu$ V/m]
154.0	0.0159	75.55
155.0	0.0156	75.38
156.0	0.0153	75.21
157.0	0.0150	75.05
158.0	0.0147	74.88
159.0	0.0144	74.72
160.0	0.0142	74.56
161.0	0.0139	74.40
162.0	0.0137	74.24
163.0	0.0134	74.08
164.0	0.0132	73.92
165.0	0.0129	73.76
166.0	0.0127	73.60
167.0	0.0125	73.45
168.0	0.0123	73.29
169.0	0.0120	73.14
170.0	0.0118	72.99
171.0	0.0116	72.84
172.0	0.0114	72.68
173.0	0.0112	72.53
174.0	0.0110	72.38
175.0	0.0108	72.24
176.0	0.0107	72.09
177.0	0.0105	71.94
178.0	0.0103	71.80
179.0	0.0101	71.65
180.0	0.0100	71.51
181.0	0.0098	71.36
182.0	0.0097	71.22
183.0	0.0095	71.08
184.0	0.0093	70.94
185.0	0.0092	70.79
186.0	0.0090	70.66
187.0	0.0089	70.52
188.0	0.0088	70.38
189.0	0.0086	70.24
190.0	0.0085	70.10
191.0	0.0084	69.97
192.0	0.0082	69.83
193.0	0.0081	69.70
194.0	0.0080	69.56
195.0	0.0079	69.43
196.0	0.0077	69.30
197.0	0.0076	69.16
198.0	0.0075	69.03
199.0	0.0074	68.90
200.0	0.0073	68.77
201.0	0.0072	68.64
202.0	0.0071	68.51
203.0	0.0070	68.39
204.0	0.0069	68.26
205.0	0.0068	68.13

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50 mV Monitoring Output Voltage Loop Current: 2.5 mA		
Distance [cm]	H [mA/m]	E [dB $\mu$ V/m]
206.0	0.0067	68.00
207.0	0.0066	67.88
208.0	0.0065	67.75
209.0	0.0064	67.63
210.0	0.0063	67.51
211.0	0.0062	67.38
212.0	0.0061	67.26
213.0	0.0060	67.14
214.0	0.0059	67.02
215.0	0.0059	66.89
216.0	0.0058	66.77
217.0	0.0057	66.65
218.0	0.0056	66.53
219.0	0.0056	66.42
220.0	0.0055	66.30
221.0	0.0054	66.18
222.0	0.0053	66.06
223.0	0.0053	65.95
224.0	0.0052	65.83
225.0	0.0051	65.71
226.0	0.0051	65.60
227.0	0.0050	65.48
228.0	0.0049	65.37
229.0	0.0049	65.26
230.0	0.0048	65.14
231.0	0.0047	65.03
232.0	0.0047	64.92
233.0	0.0046	64.81
234.0	0.0046	64.69
235.0	0.0045	64.58
236.0	0.0044	64.47
237.0	0.0044	64.36
238.0	0.0043	64.25
239.0	0.0043	64.15
240.0	0.0042	64.04
241.0	0.0042	63.93
242.0	0.0041	63.82
243.0	0.0041	63.71
244.0	0.0040	63.61
245.0	0.0040	63.50
246.0	0.0039	63.39
247.0	0.0039	63.29
248.0	0.0038	63.18
249.0	0.0038	63.08
250.0	0.0037	62.98
251.0	0.0037	62.87
252.0	0.0036	62.77
253.0	0.0036	62.67
254.0	0.0036	62.56
255.0	0.0035	62.46
256.0	0.0035	62.36
257.0	0.0034	62.26

50 mV Monitoring Output Voltage Loop Current: 2.5 mA		
Distance [cm]	H [mA/m]	E [dB $\mu$ V/m]
258.0	0.0034	62.16
259.0	0.0034	62.06
260.0	0.0033	61.96
261.0	0.0033	61.86
262.0	0.0032	61.76
263.0	0.0032	61.66
264.0	0.0032	61.56
265.0	0.0031	61.46
266.0	0.0031	61.36
267.0	0.0031	61.27
268.0	0.0030	61.17
269.0	0.0030	61.07
270.0	0.0030	60.97
271.0	0.0029	60.88
272.0	0.0029	60.78
273.0	0.0029	60.69
274.0	0.0028	60.59
275.0	0.0028	60.50
276.0	0.0028	60.40
277.0	0.0027	60.31
278.0	0.0027	60.22
279.0	0.0027	60.12
280.0	0.0027	60.03
281.0	0.0026	59.94
282.0	0.0026	59.84
283.0	0.0026	59.75
284.0	0.0026	59.66
285.0	0.0025	59.57
286.0	0.0025	59.48
287.0	0.0025	59.39
288.0	0.0024	59.30
289.0	0.0024	59.21
290.0	0.0024	59.12
291.0	0.0024	59.03
292.0	0.0023	58.94
293.0	0.0023	58.85
294.0	0.0023	58.76
295.0	0.0023	58.67
296.0	0.0023	58.58
297.0	0.0022	58.50
298.0	0.0022	58.41
299.0	0.0022	58.32
300.0	0.0022	58.23