

TBCG3-RN6 Comb Generator

1 Introduction

The TBCG3-RN6 comb generator is primarily intended for testing radiated emission setups. It is a useful tool for validating the proper operation of the antenna and pre-amplifier, as well as the accurate set-up and configuration of the spectrum analyzer. It is well characterized in an anechoic chamber and the radiated emission plots can be used as a reference to compare an EUT in a non-ideal setup against the comb generator in the same location.

You can select between five fixed comb frequencies and an external comb frequency input with a range of 5 kHz to 200 MHz using a rotary switch.

The comb generator is supplied with two monopole antennas, a 30 cm monopole for frequencies below 300-500 MHz and a 10 cm monopole for frequencies above that.

The radiated comb spectrum is characterized from 5 MHz – 6 GHz.



Picture 1: TBCG3-RN6 comb generator

The TBCG3-RN6 has a 50 Ohm output with a female N-connector. The unit operates on six AA NiMH batteries and is supplied with an external charger.

The housing is machined from solid aluminium. The bottom lid is fitted with a 1/4" - 20 UNC thread that accepts regular tripod bolts.

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2 Specification

Characterized frequency range: 5 MHz - 6 GHz
Comb spectrum flatness up to 2 GHz: typically 10 dB at the RF connector
Comb spectrum flatness up to 6 GHz: typically 40 dB at the RF connector
Output impedance: 50 Ohm
Output power: 0 dBm max. @ 100 MHz f_{comb} ; decreasing 6 dB with every $f_{comb}/2$
Amplitude stability: < 0.2 dB; <0.1 dB after 15 minutes
Aging: < 0.5 dB over 12 months
Output connector: N type-female
Selectable, fixed comb frequencies: 100 MHz, 50 MHz, 25 MHz, 10 MHz, 5 MHz
Frequency stability: 50 ppm
External excitation input: 5 kHz – 200 MHz @ square input signal; 3.3 Vpp max
100 kHz – 200 MHz @ sinus input signal; 3.3 Vpp max
External input impedance: 50 Ohm
Input connector: SMA-female
Indicators: Power On LED, Low Battery LED
Power supply: 6 x AA NiMH cells (e.g. Varta Mignon 2700, **not supplied**)
Charger: external; Ansmann ACS310
Antennas: 30 cm monopole for $f < 300 \dots 500$ MHz; 10 cm monopole for $f > 300 \dots 500$ MHz
Operation time: battery capacity / 91 mA
Temperature range: -10°C to +45 °C; lower operating temperature dependent on battery type
Housing diameter: 180 mm
Housing height: 60 mm
Weight: 1250 g

Warning: the TBCG3-RN6 radiates across a wide spectrum, significantly exceeding radiated emission limits specified in any CISPR standard. Use it only in a shielded environment to avoid interference with other electronic products.

3 Characterization

The comb generator was tested in an anechoic chamber at 1 meter height and 3 meters from the antenna. The antenna was mounted at a fixed height of 1m.

The test plan, test report, and the associated CVS files contain the raw data (antenna voltage) and can be downloaded from the Tekbox website. Due to a restriction of the test tool, the amplitude axis of the charts in the test report is incorrectly labelled dB μ V/m. It is, in reality, dB μ V.

The data package also includes the data sheets and antenna factors for the measurement antennas involved. The processed raw data including conversion into electric field-strength is stored in the Excel file *TBCG3_RN6_summary.xlsx*.

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4 Spectrum plots, conducted output spectrum

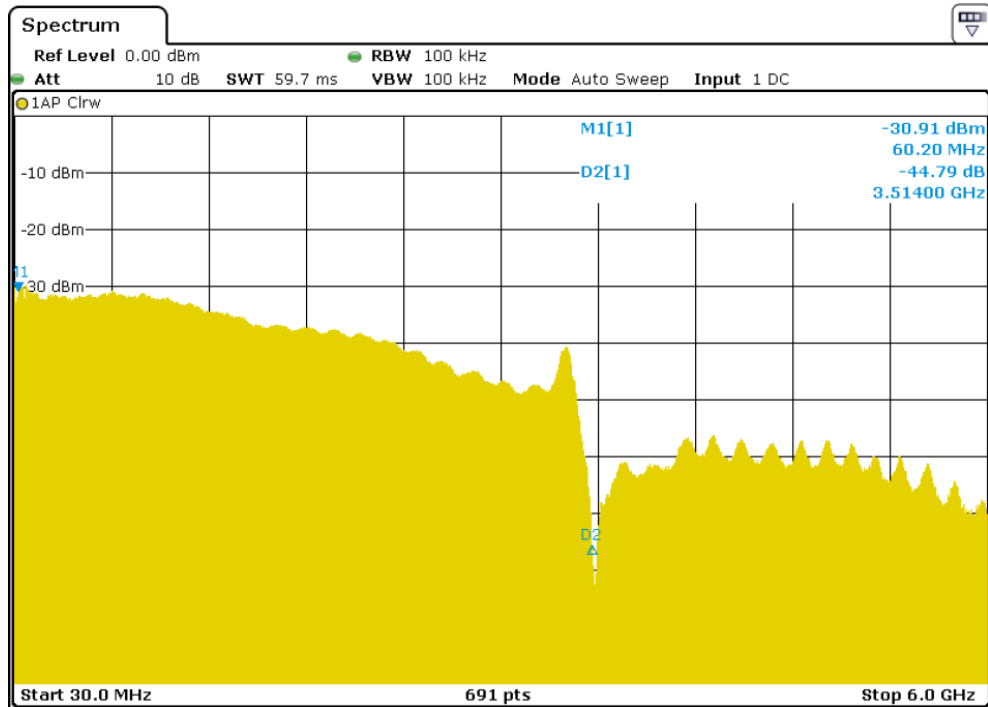


Figure 1 – 5 MHz comb frequency

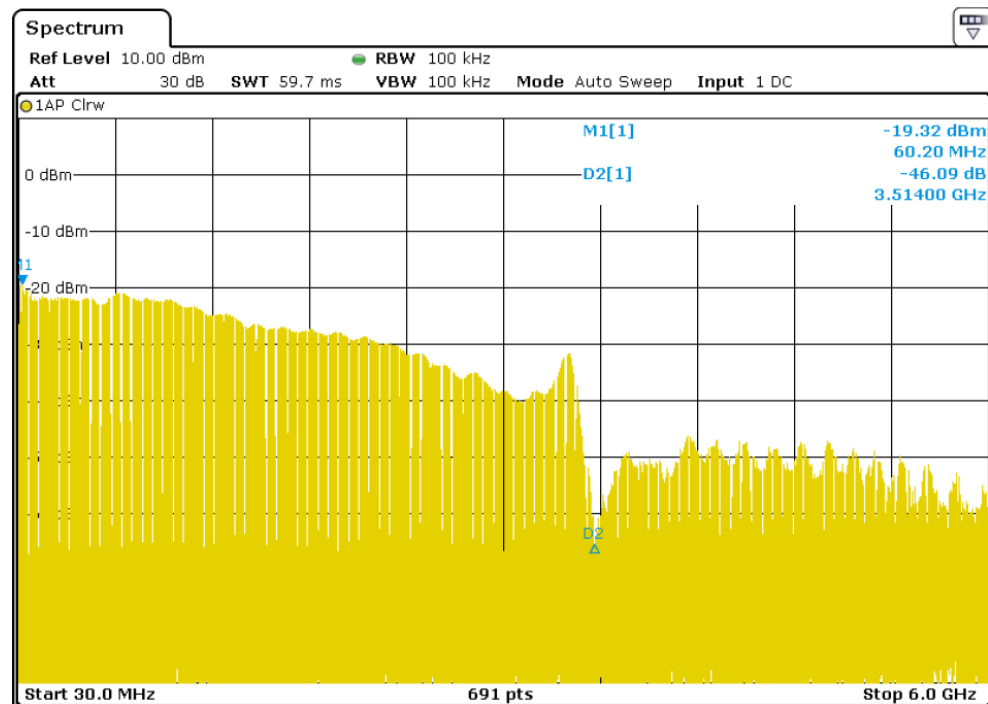


Figure 2 – 10 MHz comb frequency

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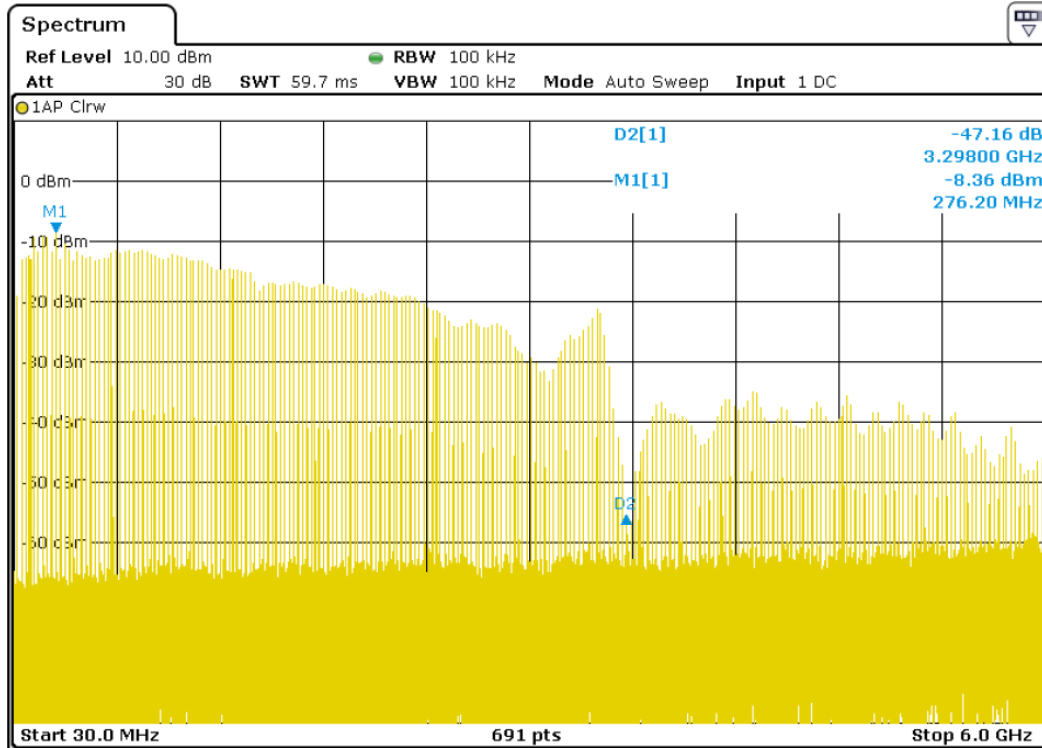


Figure 3 – 25 MHz comb frequency

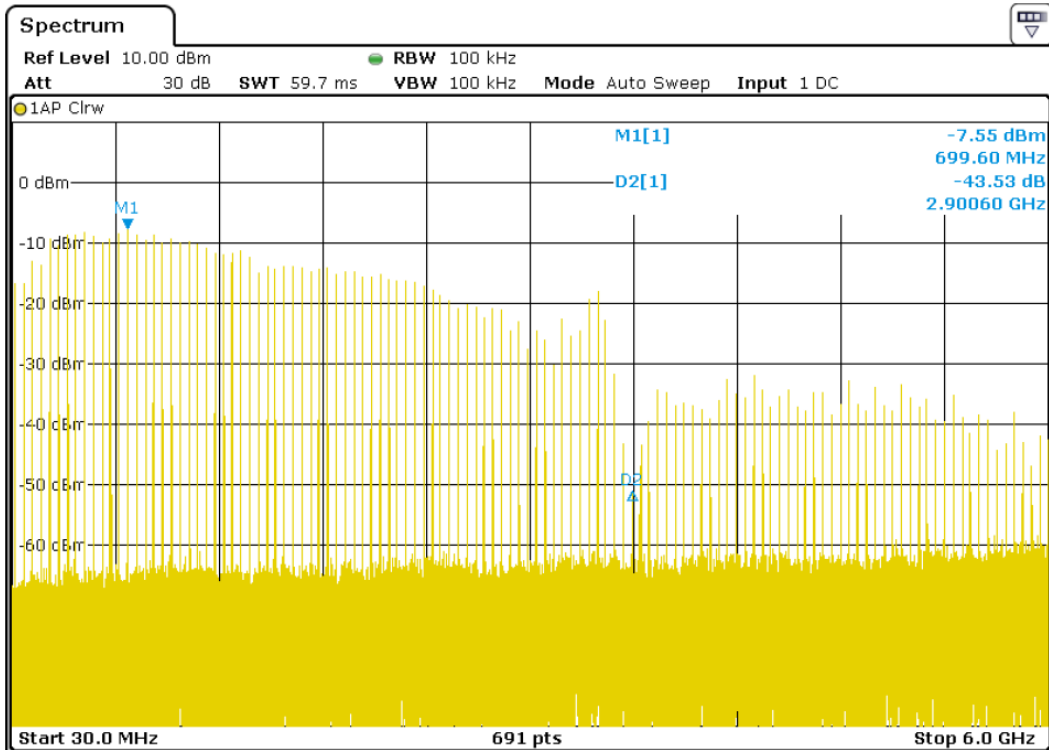


Figure 4 – 50 MHz comb frequency

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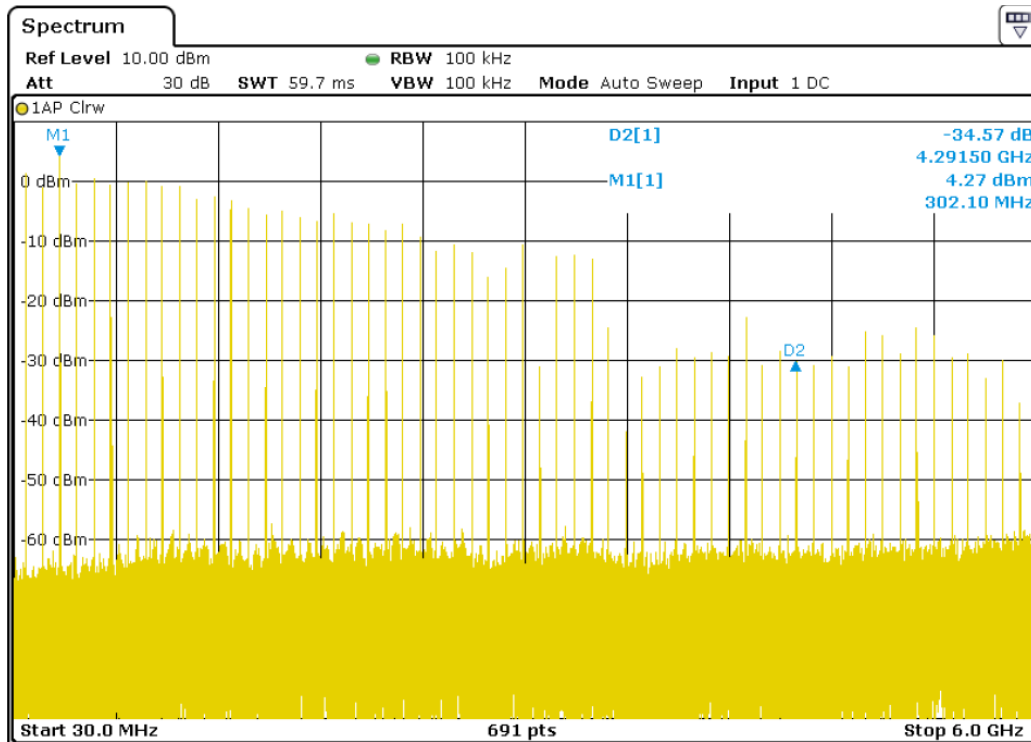


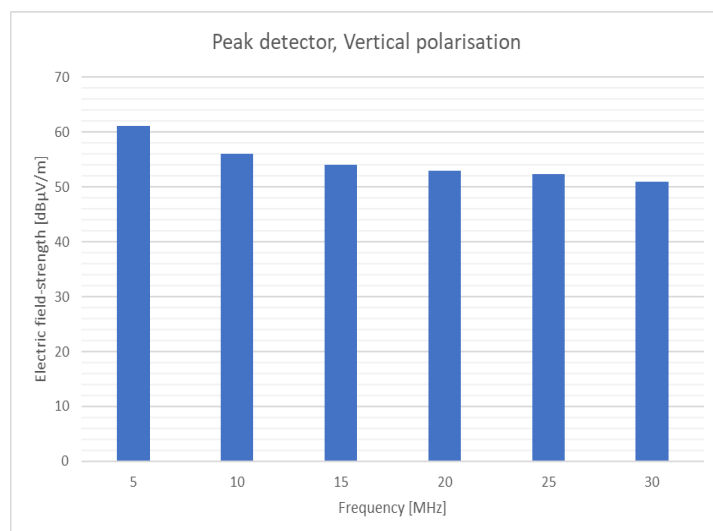
Figure 5 – 100 MHz comb frequency

5 Spectrum plots, radiated spectrum

5.1 5 MHz comb frequency, 30 cm antenna, 5 MHz – 30 MHz

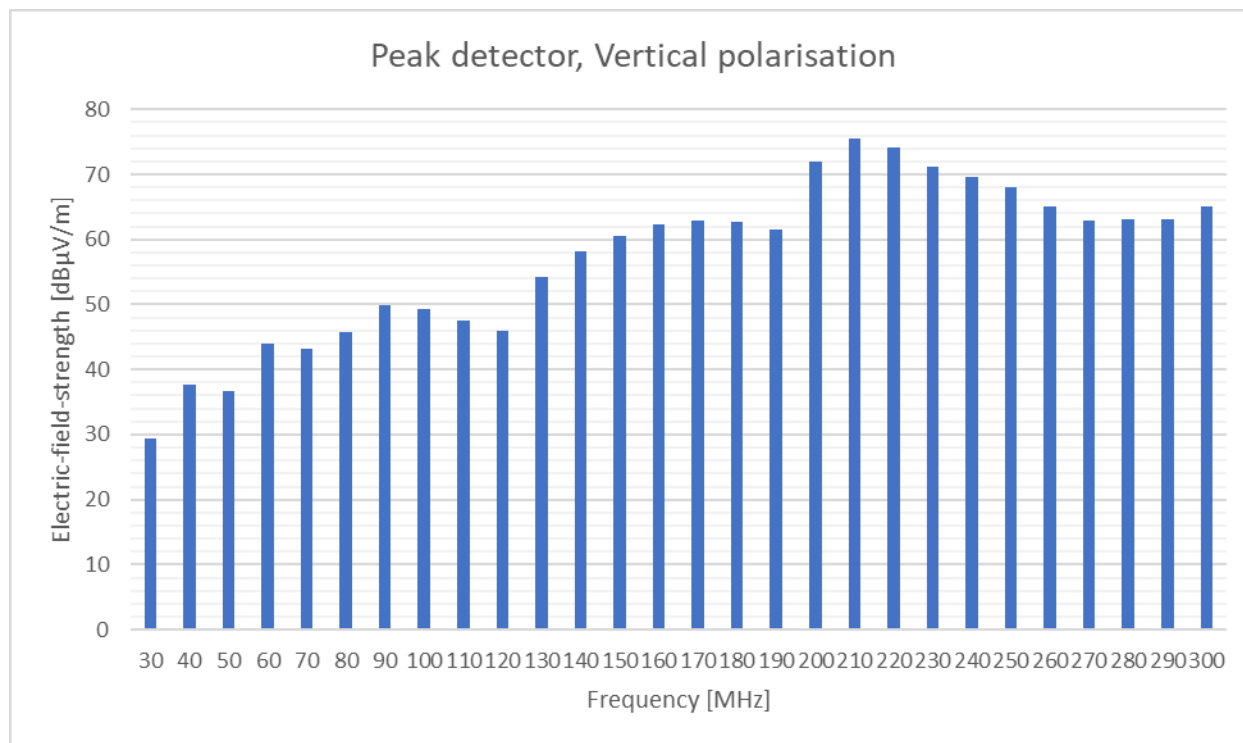
Frequency [MHz]	AVG VERT [dBμV/m]	PK VERT [dBμV/m]
5	61,00	61,04
10	55,96	56,02
15	54,01	54,08
20	52,88	52,98
25	52,20	52,30
30	50,76	50,90

Measured with monopole antenna
3m distance, 1 meter height



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5.2 10 MHz comb frequency, 30 cm antenna, 30 MHz – 200 MHz

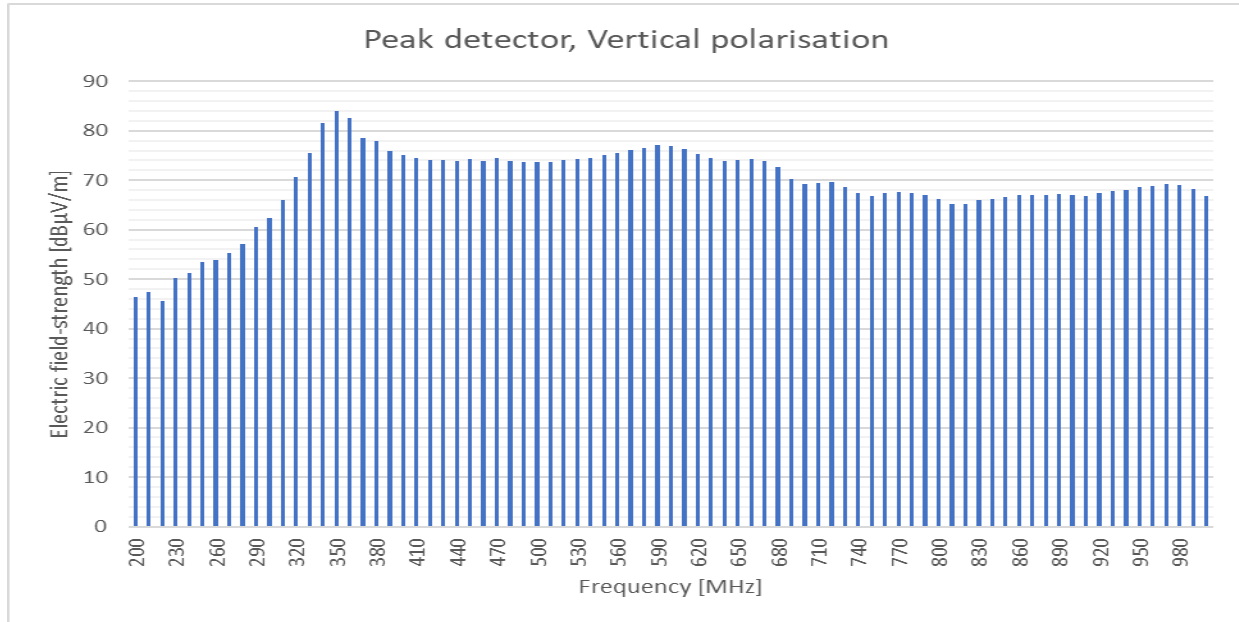


Measured with biconical antenna, 3m distance, 1 meter height

Frequency [MHz]	AVG HOR [dBμV/m]	PK HOR [dBμV/m]	AVG VERT [dBμV/m]	PK VERT [dBμV/m]	Frequency [MHz]	AVG HOR [dBμV/m]	PK HOR [dBμV/m]	AVG VERT [dBμV/m]	PK VERT [dBμV/m]
30	0,39	19,27	25,83	29,31	170	41,63	42,07	62,78	62,82
40	-1,66	15,39	37,06	37,69	180	37,90	38,63	62,72	62,77
50	0,73	13,28	36,22	36,68	190	35,13	36,12	61,51	61,57
60	12,34	16,49	43,92	44,06	200	40,62	41,21	71,94	71,97
70	4,95	11,69	43,06	43,19	210	47,25	47,57	75,59	75,61
80	10,18	14,98	45,71	45,82	220	51,04	51,27	74,18	74,21
90	14,66	18,43	49,85	49,93	230	41,90	42,51	71,05	71,09
100	18,35	21,51	49,14	49,24	240	41,62	42,23	69,60	69,63
110	18,12	21,25	47,39	47,53	250	42,99	43,48	67,92	67,96
120	14,61	19,84	45,66	45,85	260	42,07	42,66	64,97	65,02
130	19,55	23,55	54,11	54,20	270	39,08	39,90	62,85	62,91
140	29,25	30,79	58,09	58,15	280	41,02	41,75	62,96	63,03
150	35,33	36,20	60,48	60,53	290	31,02	33,40	63,03	63,10
160	39,87	40,42	62,33	62,38	300	37,53	38,97	64,87	65,08

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5.3 10 MHz comb frequency, 10 cm antenna, 200 MHz – 1 GHz

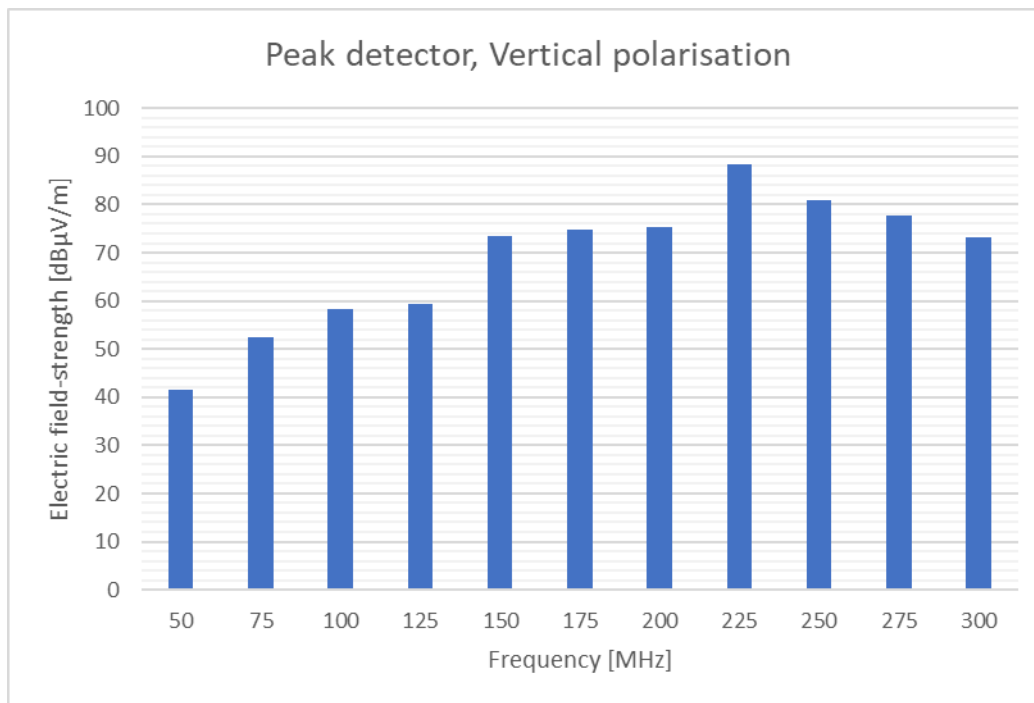


Measured with logarithmic periodic antenna, 3m distance, 1 meter height

Frequency [MHz]	AVG HOR [dBμV/m]	PK HOR [dBμV/m]	AVG VERT [dBμV/m]	PK VERT [dBμV/m]	Frequency [MHz]	AVG HOR [dBμV/m]	PK HOR [dBμV/m]	AVG VERT [dBμV/m]	PK VERT [dBμV/m]
200	24,96	26,93	46,19	46,38	610	47,52	47,94	76,24	76,27
210	28,20	29,53	47,18	47,34	620	46,27	46,77	75,36	75,40
220	26,03	27,67	45,41	45,62	630	41,70	42,64	74,49	74,52
230	17,01	21,45	50,12	50,25	640	50,43	50,77	73,85	73,89
240	20,25	23,63	51,08	51,20	650	50,15	50,48	74,04	74,07
250	22,83	25,46	53,31	53,40	660	44,08	44,72	74,24	74,28
260	28,43	29,94	53,74	53,84	670	36,95	38,44	73,87	73,91
270	30,41	31,78	55,17	55,25	680	48,45	48,86	72,68	72,72
280	31,50	32,68	57,12	57,20	690	47,98	48,41	70,22	70,26
290	42,08	42,49	60,56	60,61	700	49,34	49,72	69,14	69,19
300	40,58	41,04	62,23	62,28	710	50,16	50,52	69,47	69,52
310	43,58	43,92	65,94	65,98	720	44,74	45,43	69,51	69,56
320	44,95	45,26	70,62	70,65	730	33,72	35,96	68,65	68,70
330	44,53	44,85	75,38	75,40	740	46,46	46,97	67,41	67,46
340	50,34	50,52	81,44	81,47	750	45,07	45,75	66,79	66,86
350	61,03	61,09	84,04	84,07	760	41,47	42,58	67,26	67,32
360	57,13	57,21	82,46	82,49	770	40,36	41,41	67,57	67,63
370	45,63	45,96	78,50	78,52	780	41,59	42,52	67,35	67,40
380	51,05	51,23	77,93	77,95	790	41,85	42,83	66,99	67,05
390	51,65	51,83	75,97	76,00	800	44,20	44,92	66,12	66,18
400	49,79	50,00	75,09	75,12	810	44,20	44,93	65,02	65,09
410	42,87	43,37	74,55	74,58	820	42,30	43,23	65,18	65,26
420	44,20	44,60	73,97	74,00	830	43,93	44,74	65,86	65,92
430	45,41	45,78	73,98	74,01	840	45,17	45,90	66,23	66,30
440	42,52	43,08	73,82	73,85	850	45,56	46,26	66,47	66,54
450	35,05	36,18	74,17	74,20	860	44,69	45,44	66,89	66,95
460	33,26	34,73	73,82	73,85	870	43,48	44,39	66,91	66,98
470	44,12	44,59	74,41	74,44	880	42,37	43,44	67,02	67,09
480	45,67	46,10	73,78	73,81	890	42,74	43,72	67,18	67,26
490	43,56	44,10	73,72	73,75	900	42,09	43,22	66,90	66,98
500	49,52	49,81	73,64	73,68	910	35,56	37,71	66,83	66,90
510	51,76	51,97	73,65	73,69	920	42,91	43,93	67,30	67,36
520	51,22	51,46	74,13	74,16	930	47,07	47,71	67,65	67,72
530	46,08	46,49	74,32	74,35	940	47,30	47,93	68,05	68,11
540	43,42	44,01	74,52	74,56	950	46,60	47,25	68,58	68,64
550	35,44	36,86	75,07	75,10	960	47,66	48,28	68,80	68,86
560	44,13	44,69	75,57	75,60	970	46,13	46,91	69,07	69,14
570	49,33	49,64	75,98	76,01	980	45,63	46,45	68,93	68,99
580	47,99	48,38	76,57	76,60	990	46,46	47,22	68,17	68,24
590	49,62	49,96	77,00	77,04	1000	42,45	43,64	66,71	66,78
600	50,96	51,26	76,88	76,92					

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5.4 25 MHz comb frequency, 30 cm antenna, 30 MHz – 200 MHz

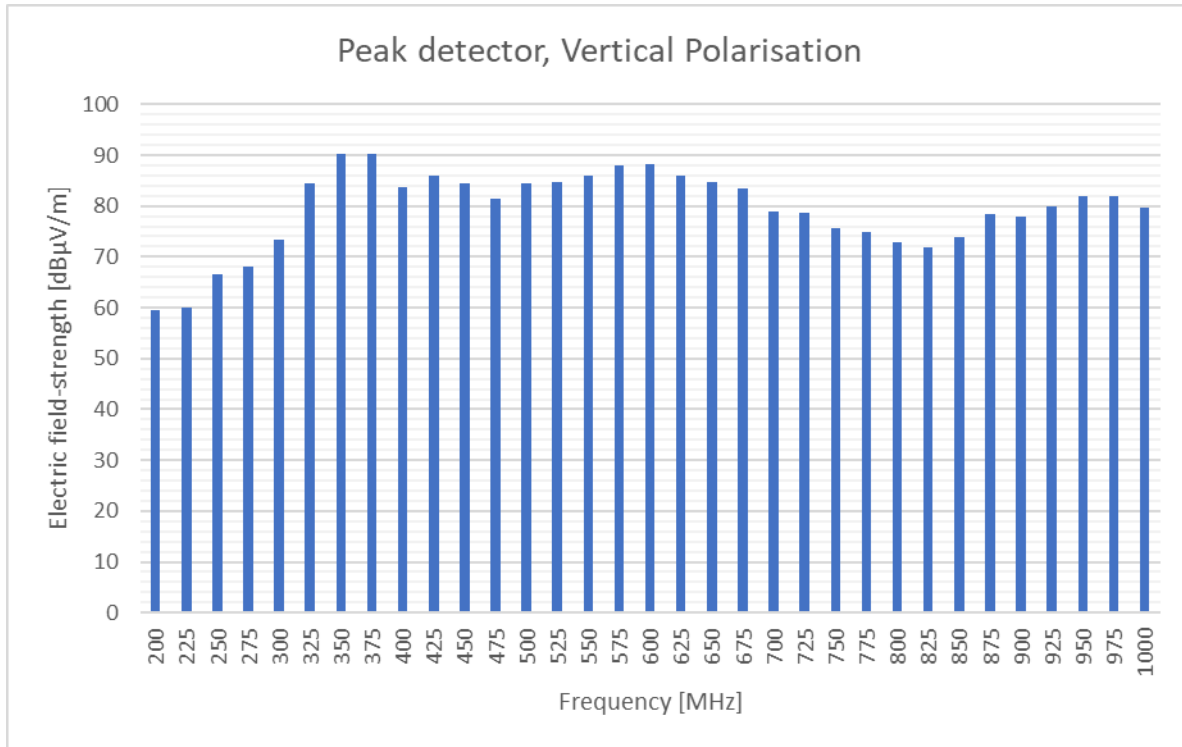


Measured with biconical antenna, 3m distance, 1 meter height

Frequency [MHz]	AVG HOR [dBμV/m]	PK HOR [dBμV/m]	AVG VERT [dBμV/m]	PK VERT [dBμV/m]
50	4,79	14,51	41,39	41,67
75	11,73	15,43	52,27	52,32
100	27,60	28,76	58,21	58,26
125	26,49	28,18	59,36	59,40
150	46,41	46,64	73,47	73,49
175	54,37	54,48	74,81	74,84
200	52,03	52,20	75,18	75,21
225	66,27	66,31	88,36	88,38
250	53,89	54,05	80,85	80,88
275	53,04	53,22	77,61	77,64
300	44,51	45,11	73,10	73,14

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5.5 25 MHz comb frequency, 10 cm antenna, 200 MHz – 1 GHz

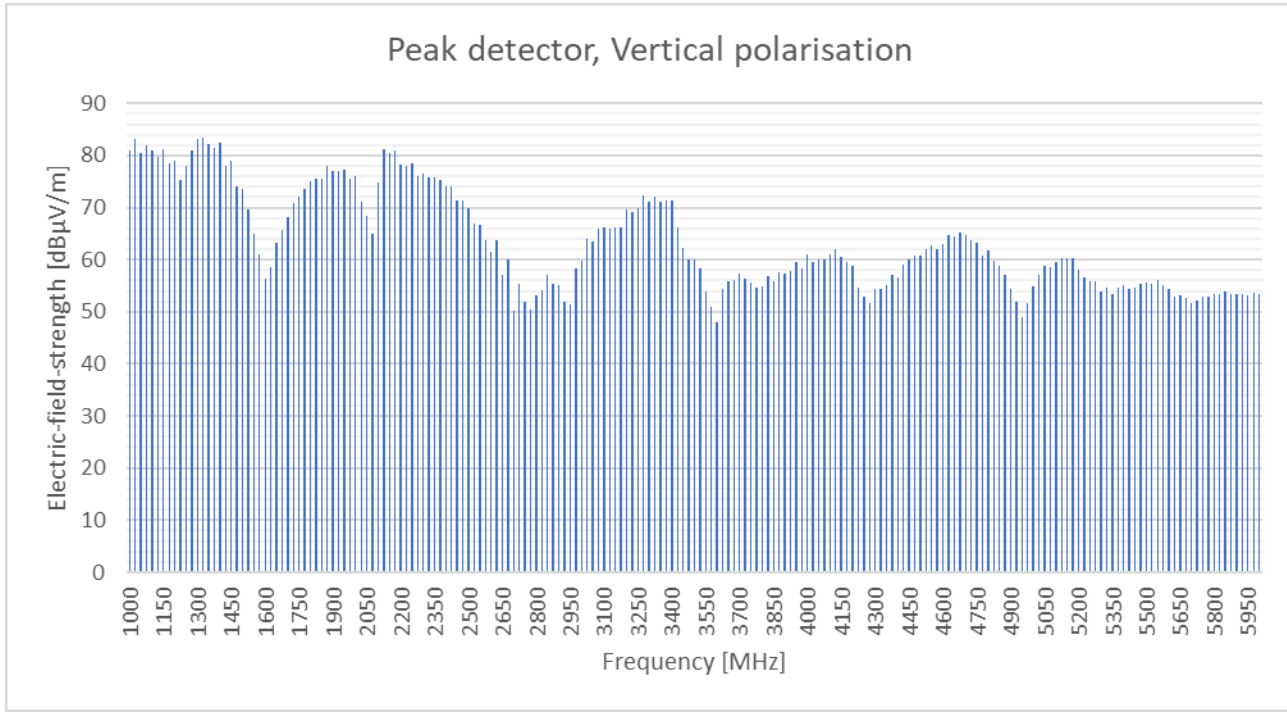


Measured with logarithmic periodic antenna, 3m distance, 1 meter height

Frequency [MHz]	AVG HOR [dBμV/m]	PK HOR [dBμV/m]	AVG VERT [dBμV/m]	PK VERT [dBμV/m]	Frequency [MHz]	AVG HOR [dBμV/m]	PK HOR [dBμV/m]	AVG VERT [dBμV/m]	PK VERT [dBμV/m]
200	37,97	38,46	59,39	59,43	625	46,71	47,24	85,99	86,02
225	29,52	30,74	59,99	60,03	650	60,33	60,43	84,70	84,73
250	36,26	36,90	66,54	66,57	675	57,59	57,74	83,47	83,50
275	37,42	38,03	68,05	68,08	700	58,79	58,93	78,87	78,90
300	52,06	52,18	73,36	73,39	725	51,61	51,92	78,58	78,61
325	56,70	56,77	84,36	84,39	750	54,27	54,51	75,62	75,65
350	67,47	67,52	90,25	90,28	775	49,03	49,43	74,89	74,92
375	55,81	55,91	90,24	90,26	800	50,67	51,06	72,90	72,93
400	57,58	57,66	83,63	83,66	825	48,76	49,22	71,76	71,80
425	55,47	55,60	85,81	85,84	850	52,49	52,80	73,86	73,89
450	45,01	45,42	84,36	84,39	875	52,62	52,94	78,34	78,36
475	54,55	54,70	81,45	81,47	900	52,37	52,71	77,99	78,02
500	60,72	60,81	84,41	84,44	925	57,63	57,82	79,80	79,82
525	60,90	60,98	84,78	84,80	950	59,78	59,93	81,87	81,90
550	47,20	47,59	86,06	86,09	975	58,82	58,99	81,78	81,81
575	59,33	59,44	88,05	88,08	1000	55,53	55,80	79,72	79,75
600	61,31	61,41	88,11	88,14					

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5.6 25 MHz comb frequency, 10 cm antenna, 1 GHz – 6 GHz



Measured with horn antenna, 3m distance, 1 meter height

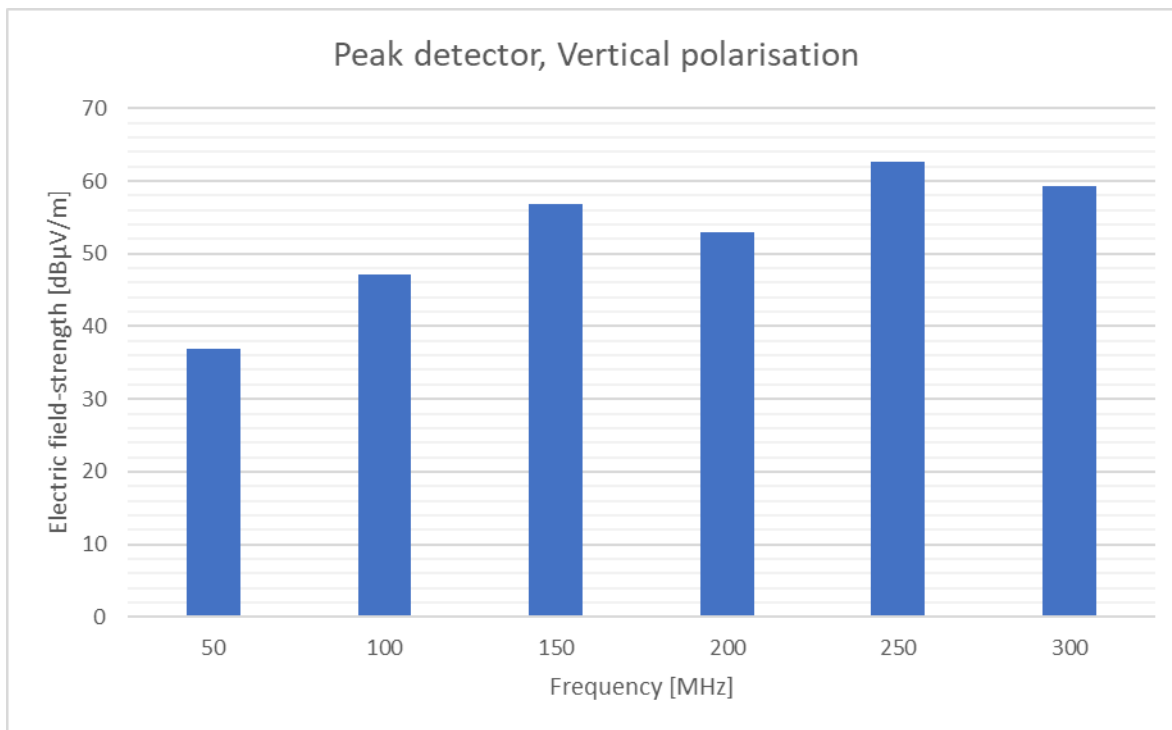
Frequency [MHz]	AVG HOR COR [dBμV/m]	PK HOR COR [dBμV/m]	AVG VERT COR [dBμV/m]	PK VERT COR [dBμV/m]	Frequency [MHz]	AVG HOR COR [dBμV/m]	PK HOR COR [dBμV/m]	AVG VERT COR [dBμV/m]	PK VERT COR [dBμV/m]
1000	51,27	53,44	80,91	80,99	3525	33,14	46,08	56,25	58,37
1025	46,31	49,79	83,19	83,26	3550	32,98	46,05	50,26	53,96
1050	47,26	49,70	80,36	80,43	3575	33,05	46,76	43,79	50,83
1075	46,93	49,79	81,90	81,95	3600	33,20	45,84	38,53	48,05
1100	45,97	48,87	80,84	80,91	3625	33,13	45,98	50,10	54,35
1125	44,06	47,66	79,71	79,79	3650	33,36	46,33	52,48	55,80
1150	45,72	48,94	81,03	81,09	3675	33,87	46,35	52,92	56,14
1175	44,35	48,18	78,34	78,43	3700	33,91	46,81	54,35	57,29
1200	36,96	44,43	78,91	79,00	3725	34,11	46,97	52,62	56,31
1225	38,78	44,87	75,19	75,32	3750	34,51	47,42	51,77	55,51
1250	40,04	45,59	77,86	77,97	3775	34,35	47,49	50,52	54,63
1275	44,00	47,76	80,84	80,92	3800	33,62	46,95	50,94	54,83
1300	40,09	45,58	83,00	83,06	3825	33,77	46,93	53,83	56,86
1325	44,96	48,51	83,43	83,49	3850	33,51	47,12	52,52	55,89
1350	39,21	44,88	82,15	82,21	3875	33,96	47,39	54,68	57,63
1375	47,92	50,45	81,43	81,49	3900	33,95	46,76	54,38	57,24
1400	40,60	45,48	82,31	82,37	3925	34,86	48,19	54,99	57,75
1425	44,90	48,61	77,86	77,95	3950	36,58	48,71	57,38	59,65
1450	41,35	46,33	78,87	78,96	3975	35,95	49,01	54,91	58,31
1475	38,04	45,08	73,90	74,06	4000	38,22	49,35	58,65	60,97
1500	39,16	45,40	73,43	73,62	4025	37,43	49,09	56,80	59,58
1525	39,90	45,45	69,31	69,59	4050	36,08	48,94	57,96	60,12
1550	31,18	42,20	64,52	65,01	4075	36,26	48,83	57,66	59,96
1575	32,45	42,62	60,37	61,12	4100	36,10	48,63	58,83	60,93
1600	29,11	41,39	54,98	56,35	4125	35,31	48,57	60,29	62,09
1625	27,89	40,80	57,60	58,64	4150	35,60	48,50	58,66	60,65
1650	29,01	40,85	62,72	63,34	4175	35,41	48,23	56,88	59,46
1675	27,98	40,81	65,39	65,82	4200	35,49	48,49	55,82	58,69
1700	37,38	44,41	67,94	68,28	4225	35,19	48,31	49,90	54,60
1725	41,75	46,82	70,54	70,79	4250	35,10	48,20	46,75	52,88
1750	43,06	47,89	71,88	72,08	4275	34,81	48,38	44,22	51,74
1775	43,12	48,13	73,35	73,53	4300	35,24	48,29	49,67	54,43
1800	40,39	46,09	74,86	75,03	4325	35,98	48,91	49,43	54,38

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Frequency [MHz]	AVG HOR COR [dBμV/m]	PK HOR COR [dBμV/m]	AVG VERT COR [dBμV/m]	PK VERT COR [dBμV/m]	Frequency [MHz]	AVG HOR COR [dBμV/m]	PK HOR COR [dBμV/m]	AVG VERT COR [dBμV/m]	PK VERT COR [dBμV/m]
1825	41,94	47,27	75,53	75,67	4350	37,09	49,68	50,65	55,05
1850	43,44	48,04	75,50	75,64	4375	37,06	49,31	53,48	57,21
1875	38,20	44,98	77,78	77,90	4400	36,16	49,36	52,30	56,48
1900	42,12	47,29	76,93	77,07	4425	38,05	50,42	56,11	59,02
1925	44,61	48,85	76,78	76,91	4450	36,42	49,35	57,46	60,03
1950	41,14	46,92	77,18	77,32	4475	38,64	50,12	58,81	60,89
1975	40,52	46,68	75,36	75,51	4500	35,71	49,03	58,37	60,71
2000	33,88	44,52	75,77	75,95	4525	39,07	49,73	59,89	61,94
2025	37,07	45,61	70,80	71,10	4550	36,37	48,78	61,03	62,67
2050	31,26	43,34	68,07	68,46	4575	38,17	49,31	60,20	61,97
2075	34,26	44,66	64,25	64,87	4600	39,61	49,76	61,58	63,11
2100	43,61	48,95	74,60	74,81	4625	37,96	49,58	63,37	64,61
2125	47,53	51,50	81,13	81,24	4650	44,09	52,36	63,23	64,50
2150	52,29	54,94	80,41	80,53	4675	40,97	50,55	63,89	65,16
2175	35,18	45,83	80,93	81,05	4700	46,23	52,96	63,20	64,63
2200	46,27	51,06	77,98	78,17	4725	43,69	52,68	62,05	63,69
2225	34,10	46,37	77,76	77,95	4750	39,73	50,89	61,26	63,16
2250	40,08	48,23	78,33	78,51	4775	38,10	50,27	58,28	60,77
2275	39,60	48,26	75,93	76,16	4800	37,76	50,08	59,59	61,72
2300	35,26	46,87	76,43	76,65	4825	37,10	49,64	56,79	59,88
2325	40,78	48,59	75,58	75,82	4850	36,99	50,14	55,58	58,74
2350	40,23	48,73	75,42	75,69	4875	36,37	49,66	53,17	57,08
2375	43,23	50,46	74,88	75,18	4900	36,08	48,96	49,49	54,41
2400	36,33	48,46	73,65	74,01	4925	35,23	48,09	45,02	51,96
2425	41,98	49,90	73,73	74,09	4950	35,25	48,88	36,44	49,07
2450	43,38	50,81	70,94	71,36	4975	35,42	48,24	43,57	51,74
2475	39,62	48,58	70,86	71,30	5000	36,00	49,19	50,11	54,76
2500	38,06	48,26	69,47	69,96	5025	36,05	48,63	53,16	57,00
2525	38,51	47,76	66,25	66,95	5050	37,14	48,93	55,86	58,85
2550	43,83	49,97	66,01	66,72	5075	38,62	49,84	55,62	58,55
2575	33,34	46,10	62,83	63,80	5100	38,41	50,53	57,15	59,58
2600	46,23	51,22	60,31	61,60	5125	41,01	50,87	58,03	60,37
2625	41,83	49,21	62,85	63,84	5150	38,15	49,95	57,93	60,24
2650	37,47	47,76	54,54	56,97	5175	39,88	51,15	57,25	60,38
2675	32,78	45,68	58,26	59,92	5200	37,57	50,08	54,51	57,97
2700	37,80	47,99	43,75	50,25	5225	39,38	50,87	52,44	56,67
2725	33,49	47,07	52,20	55,25	5250	36,55	49,95	50,85	55,77
2750	36,10	47,10	46,78	51,96	5275	37,01	50,07	50,82	55,76
2775	34,64	48,34	41,92	50,51	5300	36,33	49,55	47,82	54,00
2800	33,79	46,93	48,56	53,08	5325	36,63	49,80	48,25	54,62
2825	33,86	46,75	50,08	54,19	5350	36,80	50,42	45,19	53,48
2850	35,68	48,11	54,25	57,16	5375	37,18	51,06	47,07	54,51
2875	36,49	47,85	51,83	55,28	5400	37,71	51,13	47,43	55,06
2900	36,81	47,92	51,85	55,12	5425	37,35	50,30	46,81	54,31
2925	34,26	46,54	46,79	51,99	5450	37,26	50,13	48,22	54,66
2950	32,82	45,43	45,60	51,36	5475	37,11	49,54	49,26	55,39
2975	37,88	48,44	56,36	58,31	5500	37,25	50,14	49,83	55,64
3000	38,10	47,43	58,28	59,92	5525	37,38	51,18	49,77	55,48
3025	39,50	47,99	63,11	64,05	5550	37,61	50,49	51,06	56,23
3050	42,44	49,31	62,54	63,53	5575	37,81	50,98	47,81	55,02
3075	46,19	51,19	65,20	65,85	5600	37,74	51,74	46,99	54,35
3100	44,24	50,18	65,39	66,09	5625	37,73	51,34	43,57	52,95
3125	46,51	51,24	65,29	66,00	5650	37,77	50,80	43,25	53,21
3150	43,04	49,32	65,54	66,20	5675	38,15	51,07	41,54	52,77
3175	41,22	49,07	65,40	66,13	5700	36,41	49,35	41,50	51,73
3200	41,98	49,40	69,13	69,64	5725	36,76	50,14	42,81	52,08
3225	43,63	49,91	68,66	69,17	5750	36,92	50,44	43,69	52,89
3250	39,60	49,70	69,40	69,99	5775	36,91	50,41	44,15	52,81
3275	38,96	48,46	71,91	72,30	5800	37,03	50,30	45,59	53,31
3300	44,84	51,25	70,62	71,11	5825	36,72	50,10	45,64	53,35
3325	39,96	49,18	71,59	72,01	5850	36,66	49,65	46,82	53,78
3350	51,38	54,93	70,75	71,21	5875	36,66	49,79	45,77	53,39
3375	44,26	50,94	70,86	71,35	5900	36,77	49,92	46,52	53,48
3400	43,37	50,38	70,85	71,30	5925	36,84	50,29	45,48	53,37
3425	37,79	48,24	65,48	66,28	5950	37,47	50,06	44,33	53,09
3450	33,37	46,74	60,85	62,15	5975	37,64	50,45	44,14	53,53
3475	35,48	47,99	58,42	60,06	6000	37,87	51,16	43,42	53,43
3500	33,72	46,19	58,25	59,94					

TBCG3-RN6 Comb Generator

5.7 50 MHz comb frequency, 30 cm antenna, 30 MHz – 200 MHz

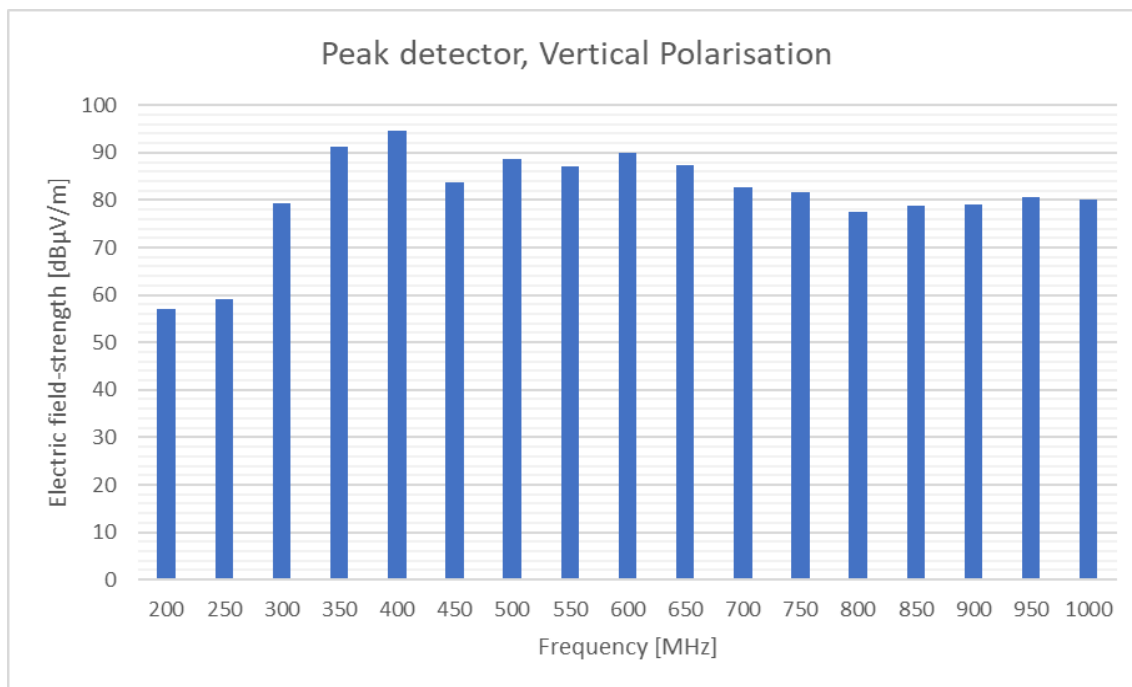


Measured with biconical antenna, 3m distance, 1 meter height

Frequency [MHz]	AVG HOR [dBμV/m]	PK HOR [dBμV/m]	AVG VERT [dBμV/m]	PK VERT [dBμV/m]
50	-0,35	13,09	36,45	36,92
100	16,00	20,18	46,90	47,05
150	29,54	31,11	56,76	56,85
200	28,24	30,42	52,72	52,88
250	35,96	37,26	62,63	62,70
300	31,69	34,17	59,21	59,34

TBCG3-RN6 Comb Generator

5.8 50 MHz comb frequency, 10 cm antenna, 200 MHz – 1 GHz

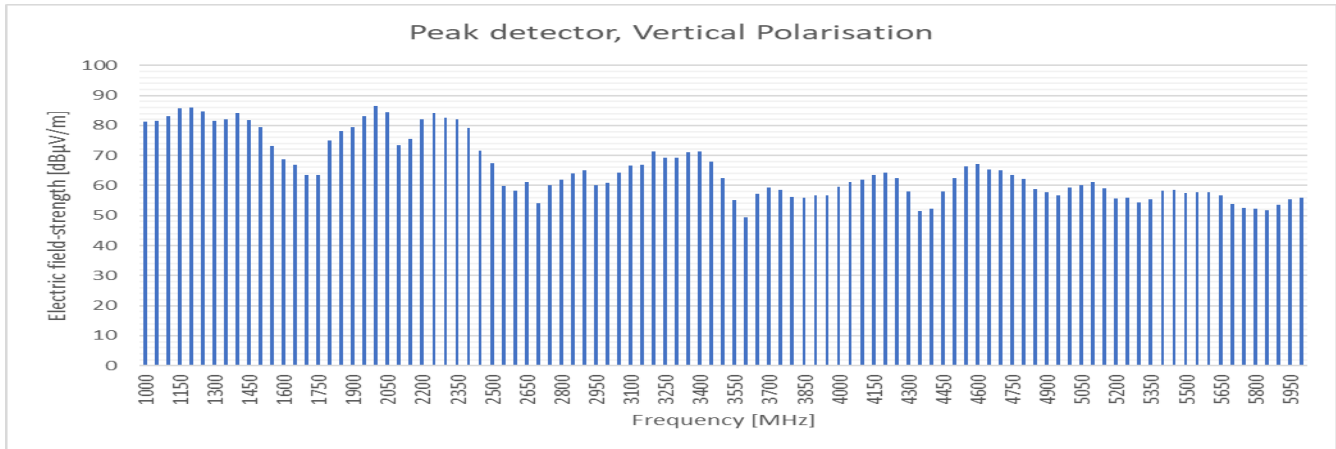


Measured with logarithmic periodic antenna, 3m distance, 1 meter height

Frequency [MHz]	AVG HOR [dBμV/m]	PK HOR [dBμV/m]	AVG VERT [dBμV/m]	PK VERT [dBμV/m]
200	35,58	36,21	57,09	57,15
250	28,96	30,37	59,09	59,14
300	58,01	58,08	79,40	79,43
350	68,54	68,58	91,29	91,32
400	68,47	68,51	94,54	94,57
450	44,62	45,14	83,72	83,74
500	64,97	65,03	88,76	88,78
550	48,36	48,69	87,08	87,11
600	63,20	63,28	90,05	90,08
650	63,07	63,16	87,27	87,30
700	62,43	62,52	82,65	82,67
750	60,77	60,88	81,63	81,66
800	55,41	55,62	77,62	77,65
850	57,55	57,73	78,85	78,88
900	53,48	53,80	79,12	79,14
950	58,48	58,65	80,51	80,53
1000	55,77	56,04	80,08	80,11

TBCG3-RN6 Comb Generator

5.9 50 MHz comb frequency, 10 cm antenna, 1 GHz – 6 GHz

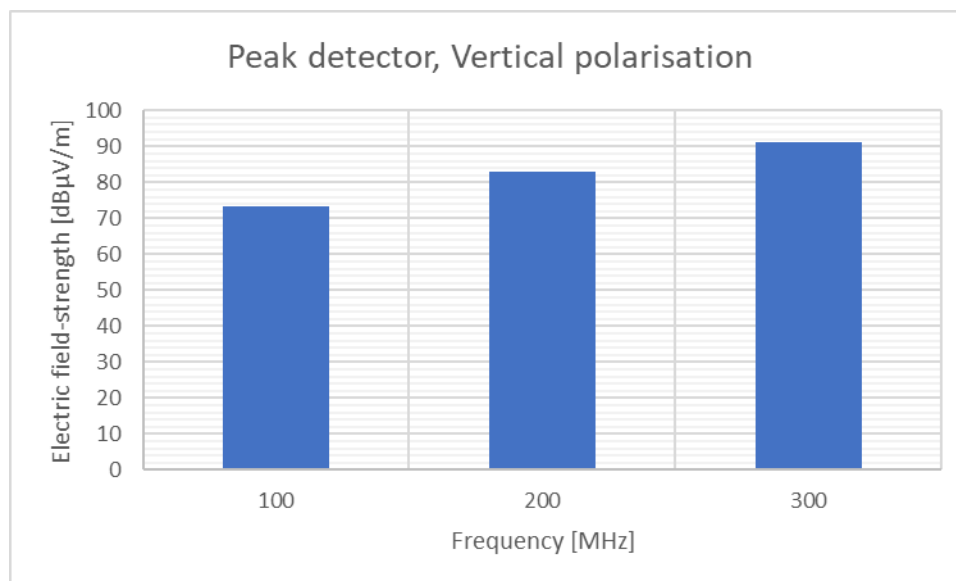


Measured with horn antenna, 3m distance, 1 meter height

Frequency [MHz]	AVG HOR COR [dBμV/m]	PK HOR COR [dBμV/m]	AVG VERT COR [dBμV/m]	PK VERT COR [dBμV/m]	Frequency [MHz]	AVG HOR COR [dBμV/m]	PK HOR COR [dBμV/m]	AVG VERT COR [dBμV/m]	PK VERT COR [dBμV/m]
1000	51,64	53,63	81,27	81,36	3550	32,83	46,12	51,97	55,12
1050	48,66	50,96	81,58	81,64	3600	33,20	45,88	40,57	49,42
1100	48,16	50,64	82,94	82,99	3650	33,71	47,01	54,55	57,37
1150	50,22	52,17	85,55	85,59	3700	33,95	46,67	57,04	59,28
1200	44,33	48,15	86,01	86,05	3750	34,47	47,28	56,35	58,61
1250	46,52	49,57	84,71	84,76	3800	33,64	46,77	52,90	56,15
1300	38,47	44,69	81,48	81,55	3850	33,52	46,36	52,84	56,03
1350	38,98	44,88	81,99	82,05	3900	34,02	46,77	53,62	56,79
1400	42,25	47,19	83,97	84,03	3950	35,15	48,21	53,53	56,78
1450	44,20	48,14	81,66	81,73	4000	37,52	50,59	57,34	59,65
1500	44,99	48,70	79,40	79,48	4050	36,61	49,19	59,16	61,09
1550	37,99	44,85	72,90	73,09	4100	36,58	48,47	60,31	62,07
1600	38,29	45,42	68,32	68,66	4150	36,28	48,56	62,02	63,39
1650	29,95	41,87	66,46	66,85	4200	37,68	49,13	62,95	64,30
1700	33,04	42,51	63,02	63,56	4250	38,04	49,39	60,86	62,47
1750	35,63	44,27	62,94	63,56	4300	35,73	49,24	55,14	58,13
1800	40,48	46,74	74,85	75,01	4350	35,67	48,88	43,79	51,53
1850	45,79	49,49	77,94	78,07	4400	35,71	48,88	43,42	52,20
1900	44,47	48,85	79,43	79,53	4450	35,51	47,95	54,86	57,95
1950	47,30	50,93	83,15	83,22	4500	36,36	48,93	60,75	62,55
2000	43,00	47,93	86,48	86,53	4550	37,31	49,00	65,35	66,36
2050	43,70	48,78	84,28	84,35	4600	43,31	51,45	66,17	67,12
2100	41,27	48,82	73,07	73,37	4650	44,93	52,14	64,34	65,42
2150	47,13	52,57	75,16	75,42	4700	47,12	53,35	63,77	65,06
2200	50,03	54,01	82,03	82,14	4750	39,88	50,85	61,96	63,55
2250	45,07	50,95	84,11	84,20	4800	37,98	50,55	60,31	62,33
2300	39,02	47,85	82,40	82,50	4850	36,02	49,46	55,90	58,75
2350	46,13	51,62	82,03	82,14	4900	37,58	49,41	54,65	57,68
2400	39,25	49,79	78,85	79,06	4950	35,88	48,97	52,96	56,84
2450	43,54	50,53	71,13	71,59	5000	37,36	49,60	56,56	59,38
2500	36,19	47,17	66,81	67,50	5050	37,97	49,76	57,89	60,17
2550	37,09	47,51	58,33	59,90	5100	39,18	49,94	59,08	61,04
2600	42,47	49,18	56,22	58,22	5150	37,75	49,80	56,18	59,01
2650	41,85	50,03	59,62	61,18	5200	36,84	49,30	50,42	55,70
2700	43,71	50,42	50,05	54,06	5250	36,61	49,26	50,81	55,96
2750	45,93	51,70	58,41	60,07	5300	36,43	49,03	48,55	54,38
2800	37,59	48,58	60,57	62,05	5350	37,04	50,38	49,93	55,38
2850	41,06	50,24	62,75	63,97	5400	38,17	51,16	53,67	58,37
2900	47,41	52,77	64,17	65,11	5450	37,58	50,89	54,19	58,53
2950	36,09	47,40	58,47	60,10	5500	37,44	50,49	53,09	57,38
3000	39,51	48,27	59,60	60,91	5550,00	37,79	50,64	53,45	57,79
3050	43,40	50,19	63,51	64,40	5600,00	38,82	51,60	53,54	57,73
3100	45,37	50,93	66,14	66,74	5650,00	38,45	51,69	52,16	56,70
3150	43,73	49,43	66,29	66,92	5700,00	36,62	49,30	47,26	53,87
3200	43,71	50,44	70,91	71,32	5750,00	36,85	50,13	42,98	52,62
3250	38,77	48,56	68,51	69,13	5800,00	36,86	50,04	42,52	52,18
3300	43,22	50,55	68,73	69,31	5850,00	36,33	49,16	41,00	51,85
3350	51,30	55,04	70,54	71,02	5900,00	36,67	49,89	46,62	53,71
3400	43,75	50,31	70,73	71,22	5950,00	37,63	51,27	49,54	55,32
3450	35,37	47,52	67,41	68,01	6000,00	38,02	51,10	50,01	56,02
3500	34,57	46,86	61,39	62,55					

TBCG3-RN6 Comb Generator

5.10 100 MHz comb frequency, 30 cm antenna, 30 MHz – 200 MHz

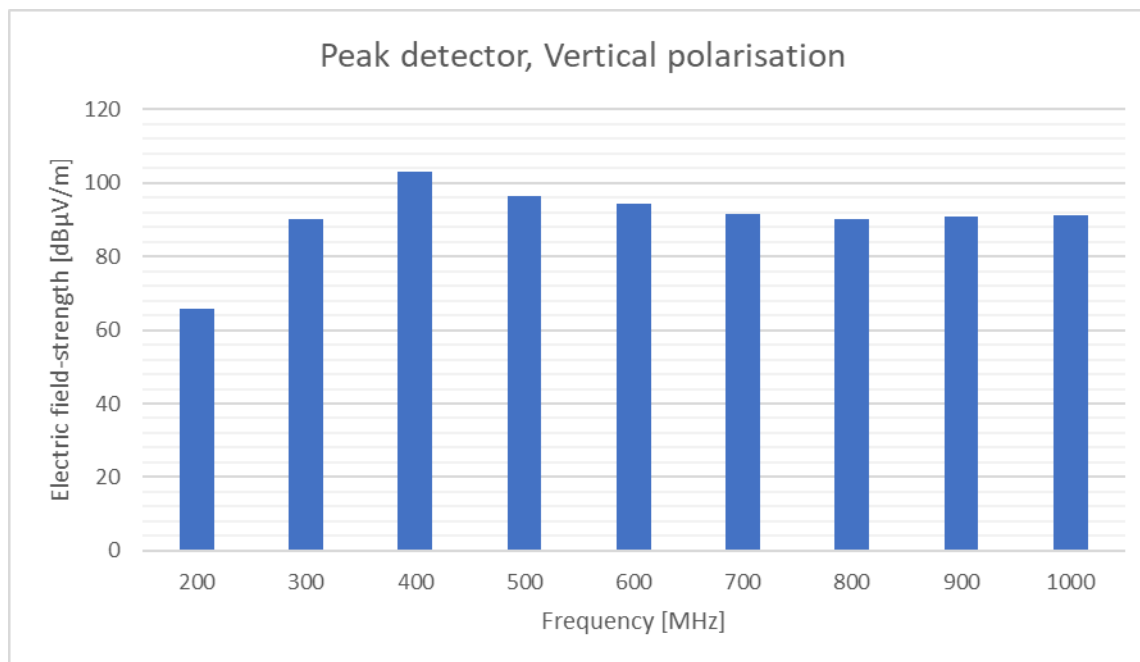


Measured with biconical antenna, 3m distance, 1 meter height

Frequency [MHz]	AVG HOR [dBμV/m]	PK HOR [dBμV/m]	AVG VERT [dBμV/m]	PK VERT [dBμV/m]
100	42,95	43,18	73,36	73,39
200	59,37	59,44	82,93	82,96
300	62,39	62,47	91,26	91,29

TBCG3-RN6 Comb Generator

5.11 100 MHz comb frequency, 10 cm antenna, 200 MHz – 1 GHz

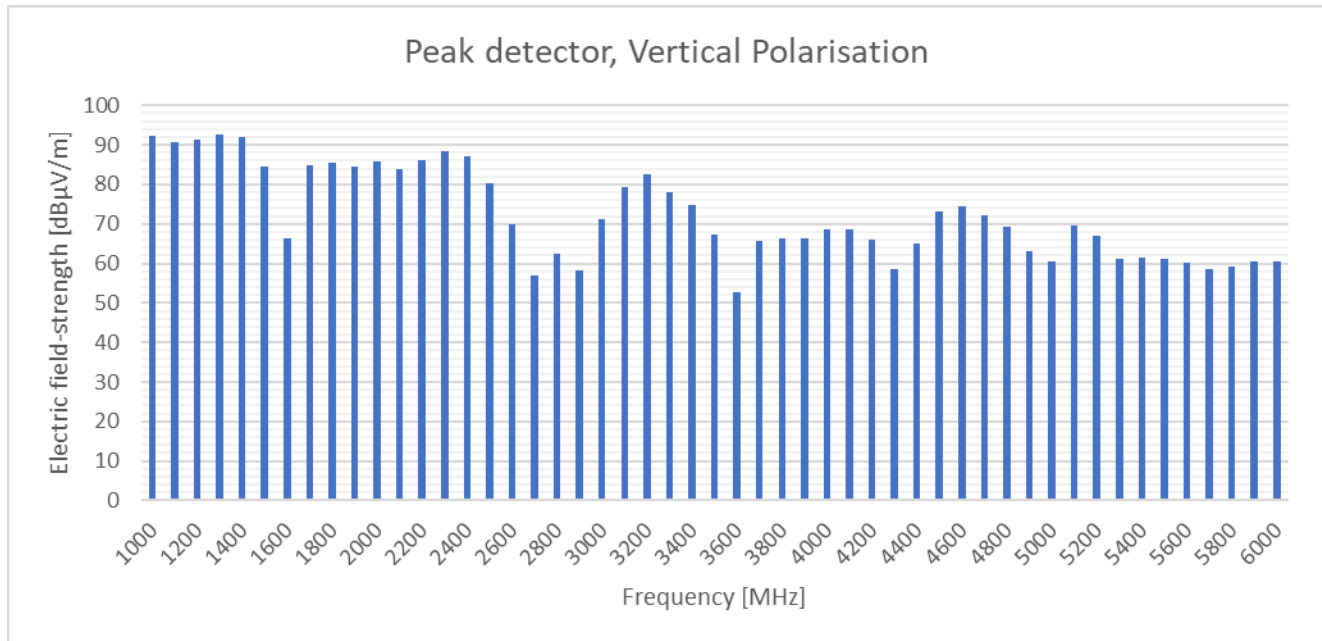


Measured with logarithmic periodic antenna, 3m distance, 1 meter height

Frequency [MHz]	AVG HOR [dBμV/m]	PK HOR [dBμV/m]	AVG VERT [dBμV/m]	PK VERT [dBμV/m]
200	44,35	44,58	65,66	65,70
300	68,47	68,50	90,14	90,17
400	77,45	77,49	102,90	102,93
500	72,25	72,28	96,40	96,43
600	68,44	68,49	94,45	94,48
700	71,51	71,55	91,40	91,43
800	68,21	68,26	90,12	90,14
900	65,81	65,88	90,77	90,80
1000	66,71	66,80	91,00	91,03

TBCG3-RN6 Comb Generator

5.12 100 MHz comb frequency, 10 cm antenna, 1 GHz – 6 GHz



Measured with logarithmic periodic antenna, 3m distance, 1 meter height

Frequency [MHz]	AVG HOR COR [dBμV/m]	PK HOR COR [dBμV/m]	AVG VERT COR [dBμV/m]	PK VERT COR [dBμV/m]	Frequency [MHz]	AVG HOR COR [dBμV/m]	PK HOR COR [dBμV/m]	AVG VERT COR [dBμV/m]	PK VERT COR [dBμV/m]
1000	62,46	63,10	92,10	92,14	3600	33,21	46,32	48,12	52,80
1100	55,84	56,94	90,59	90,62	3700	34,36	47,72	64,88	65,84
1200	49,73	51,93	91,40	91,43	3800	35,15	48,07	65,60	66,48
1300	49,74	51,90	92,64	92,68	3900	36,12	48,00	65,58	66,42
1400	50,41	52,43	92,08	92,11	4000	45,30	52,25	67,71	68,57
1500	50,00	52,21	84,31	84,37	4100	41,37	50,60	67,96	68,74
1600	36,33	43,88	66,02	66,42	4200	38,52	49,62	64,95	66,00
1700	54,75	56,05	84,63	84,68	4300	36,10	49,44	55,57	58,39
1800	51,02	53,19	85,29	85,34	4400	40,73	51,40	63,71	64,95
1900	49,59	52,18	84,36	84,41	4500	41,62	50,80	72,54	73,06
2000	42,80	47,91	85,90	85,96	4600	50,46	54,85	73,96	74,38
2100	52,94	55,38	83,90	83,98	4700	54,33	57,72	71,57	72,09
2200	54,30	56,68	85,96	86,03	4800	41,60	51,95	68,45	69,37
2300	44,74	50,48	88,39	88,44	4900	42,14	51,31	61,54	63,06
2400	46,82	52,84	87,19	87,27	5000	38,08	49,68	58,14	60,48
2500	47,85	52,85	80,00	80,14	5100	48,02	53,89	68,96	69,63
2600	55,29	57,41	69,37	69,83	5200	43,16	52,45	65,79	66,88
2700	48,05	52,67	54,62	57,05	5300	40,07	50,97	59,18	61,30
2800	37,56	48,78	60,90	62,31	5400	40,11	52,22	59,06	61,55
2900	40,31	48,75	56,06	58,31	5500	38,73	51,68	58,15	61,01
3000	50,15	53,82	70,92	71,30	5600	40,78	51,94	57,18	60,18
3100	58,32	59,81	79,19	79,33	5700	38,71	50,87	54,98	58,46
3200	55,10	57,45	82,47	82,58	5800	39,64	51,05	55,99	59,28
3300	51,97	55,39	77,71	77,93	5900	41,17	51,94	58,06	60,47
3400	47,04	52,51	74,48	74,79	6000	40,12	52,13	57,43	60,50
3500	37,43	47,74	66,47	67,17					

TBCG3-RN6 Comb Generator

6 Accessories

The TBCG3-RN6 includes a charger and two monopole antennas as standard accessories. A coaxial interfacing cable for LISN is available as optional accessory.



TBCG3-RN6 accessories

7 Inserting / replacing batteries

Due to airfreight regulations concerning batteries, the TBCG3 is not supplied with batteries. Loosen the SMA-connector nut a few turns. Remove the six screws at the bottom of the comb generator housing and take off the bottom lid.

Use a suitably large screwdriver with Pozidriv tip. Phillips screwdrivers may slip and damage the screw head.

Insert six AA rechargeable 1.2V NiMH batteries in the battery compartments taking care to follow the polarity indicated on the PCB.

Reattach the bottom lid, then tighten the screws and the SMA-connector nut as well.

Before connecting the charger plug to the unit connector, please check that the centre tip polarity is shown as (positive) “+”.

Never connect the charger to the comb generator, without batteries inserted. The universal charger is pulsing with high voltage to detect the battery pack and may damage the internal polyfuse, if no batteries are inserted. Align the charger tip as shown below.



TBCG3-RN6 Comb Generator

8 Ordering Information

Part Number	Description
TBCG3-RN6	Comb generator, Ansmann ACS310 charger, 30 cm monopole, 10 cm monopole

9 History

Version	Date	Author	Changes
V 1.0	4.2.2023	Mayerhofer	Creation
V 1.1	19.6.2023	Minh Nguyen	Update Charger part number
V 1.2	10.4.2024	Mayerhofer	Chapter 7 updated
V 1.3	13.4.2024	Mayerhofer	Chapter 7 updated