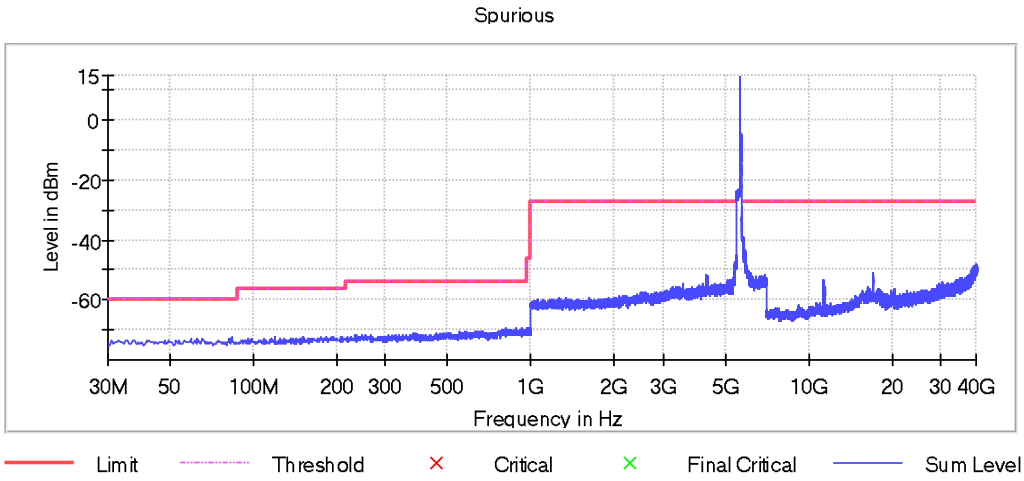
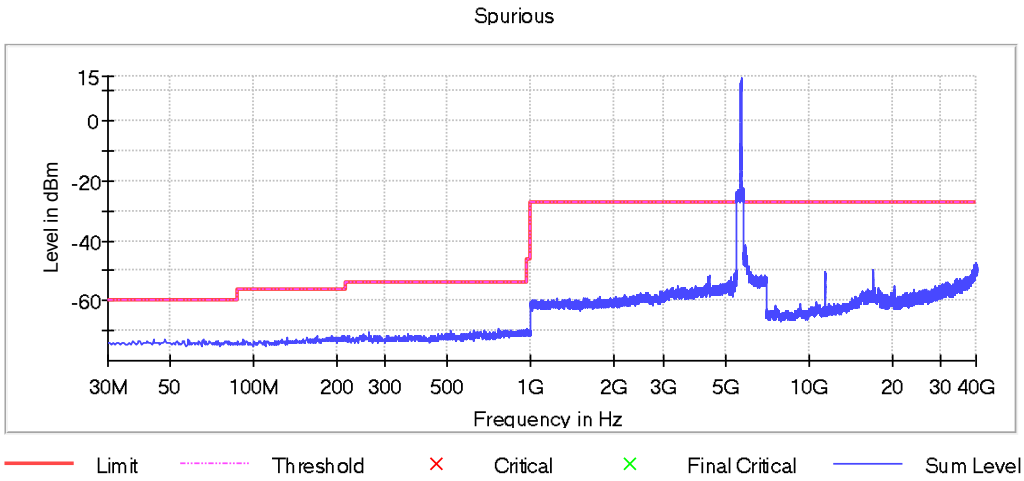
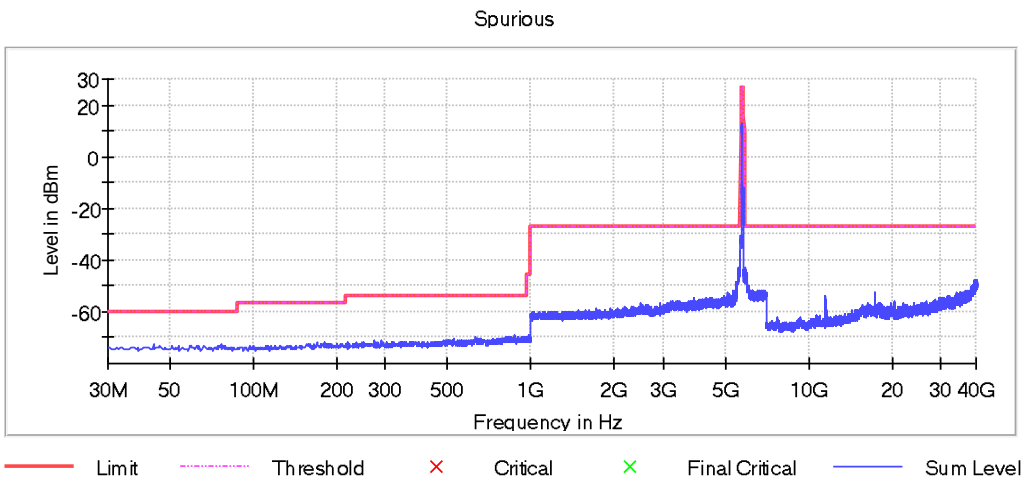
Plot 270: CSE, Mode 3, CH134



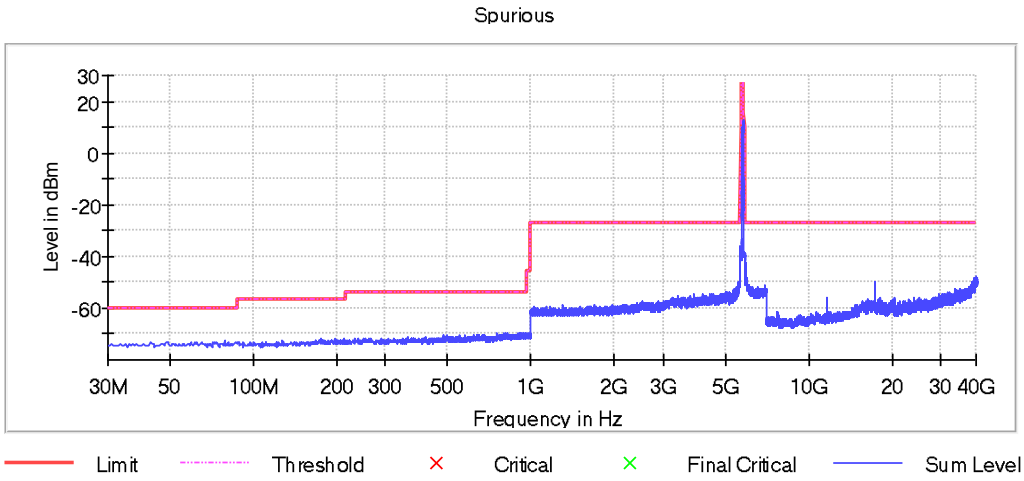
Plot 271: CSE, Mode 3, CH142



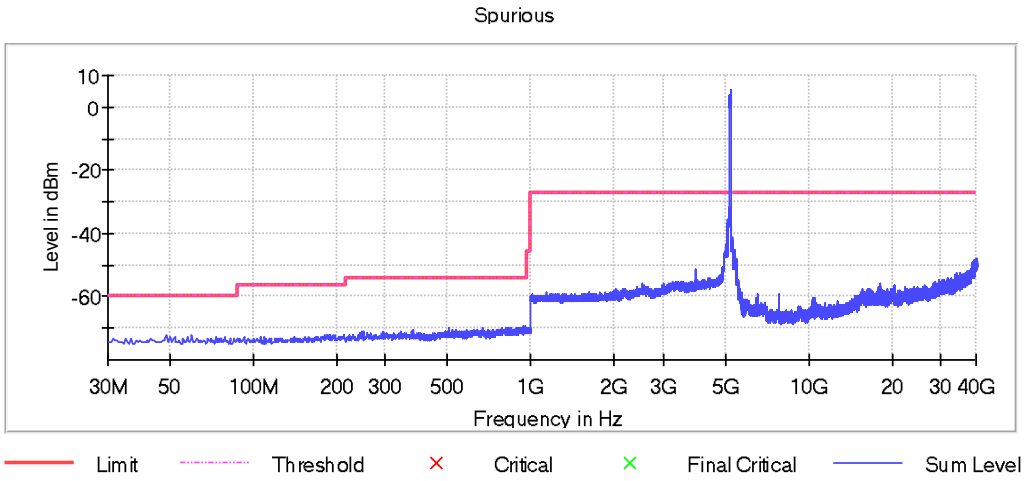
Plot 272: CSE, Mode 3, CH151



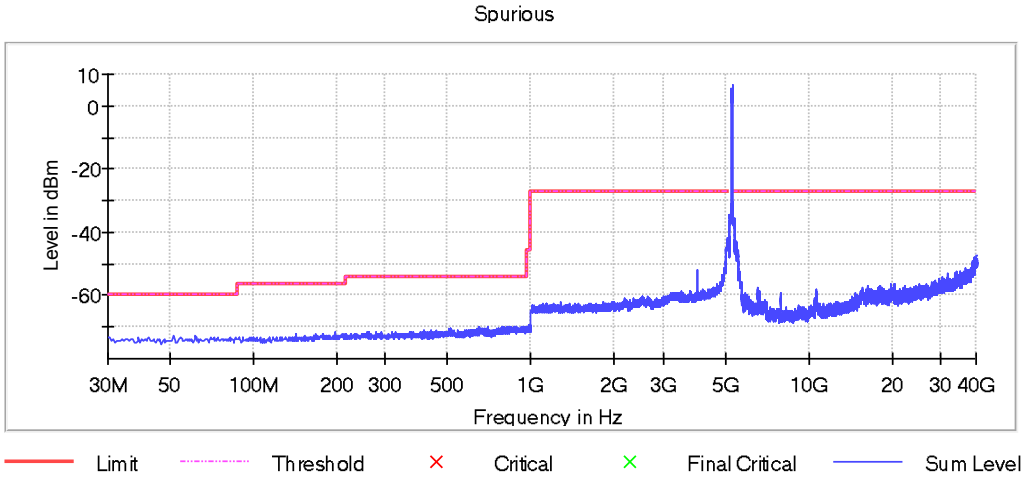
Plot 273: CSE, Mode 3, CH159



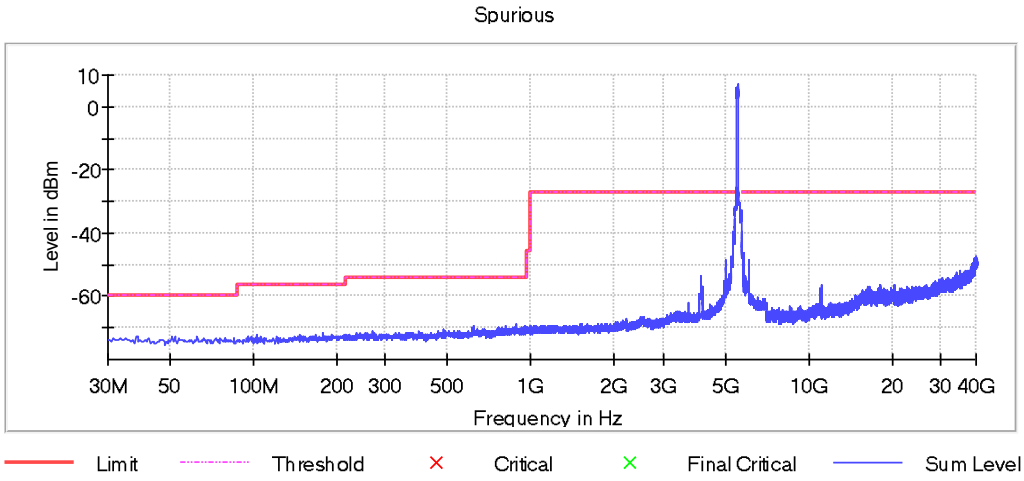
Plot 274: CSE, Mode 4, CH42



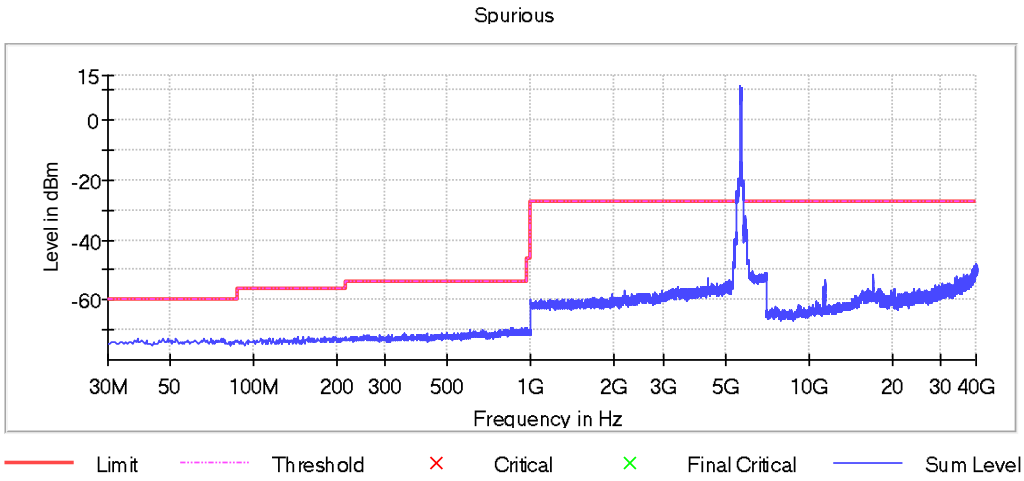
Plot 275: CSE, Mode 4, CH58



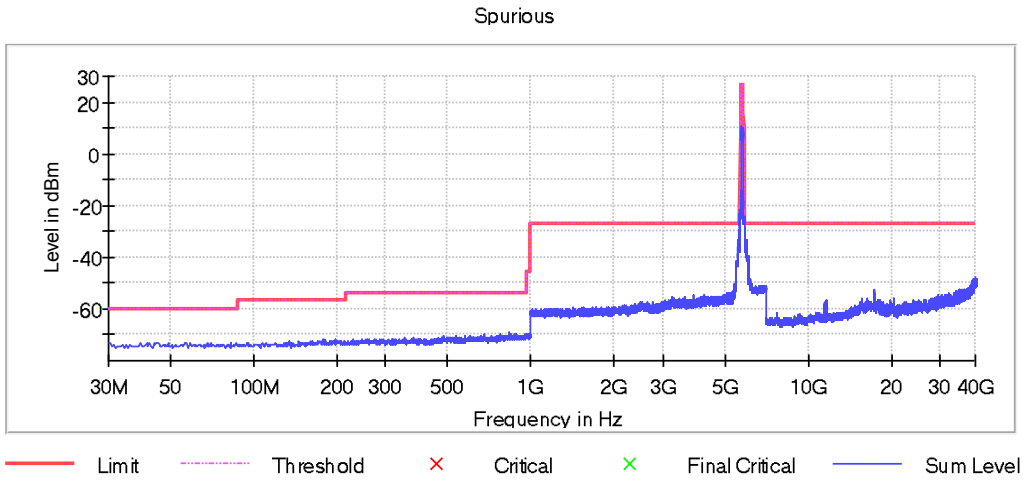
Plot 276: CSE, Mode 4, CH106



Plot 277: CSE, Mode 4, CH138



Plot 278: CSE, Mode 4, CH155



7.10 Radiated Spurious Emissions (RSE)

Applicability
This requirement applies to all unlicensed national information infrastructure (UNII) / licence-exempt local area network (LE-LAN) devices operating in the bands 5150-5250 MHz, 5250-5350 MHz, 5470-5725 MHz, 5725-5850 MHz and 5850-5895 MHz.

Description
Spurious emission / unwanted emissions are emission on a frequency or frequencies which are outside the authorized band and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products. Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation.

Limits
§15.407(b)
RSS-247, 6.2
All emissions out- side of the operational frequency band shall not exceed an e.i.r.p. of -27 dBm/MHz.
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

Frequency [MHz]	Field Strength [µV/m] / [dBµV/m]	Measurement distance [m]
0.009 – 0.490	2400/F[kHz]	300
0.490 – 1.705	24000/F[kHz]	30
1.705 – 30.0	30.0 / 29.5	30
30 – 88	100 / 40.0	3
88 – 216	150 / 43.5	3
216 – 960	200 / 46.0	3
960 – 40 000	500 / 54.0	3

Note:
Measurements are performed as field strength measurement in dBµV. -27 dBm/MHz limit value corresponds to a limit of 67.9 dBµV measured in a distance of 3.

Test procedure
Test according to FCC title 47 part 15 §15.407(b), KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 II.G.4&5 and ANSI C63.10-2013

Test setup: 8.1, 8.2, 8.3 with radiated test sample (see section 5.2)

Note concerning RSE 9 kHz – 30 MHz with loop antenna:
The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency X kHz resulted in a level of Y dBµV/m, which is equivalent to Y - 51.5 = Z dBµA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to the 15.209(a) limit. (Certification & Engineering Bureau, Q&A on Certification Procedures and Requirements, TCB Workshop April 2020, Nicolas DesMarais, 2020-04-09 - ISED Q&A - DesMarais.pdf)

Test results: Mode 1					
Channel	**Frequency [MHz]**	**Peak/RMS Detector**	**Level [dBm]**	**Limit [dBm]**	**Verdict**
36	see next plots	MaxPeak	see next plots*	see next plots	- passed -
44	see next plots	MaxPeak	see next plots*	see next plots	- passed -
48	see next plots	MaxPeak	see next plots*	see next plots	- passed -
52	see next plots	MaxPeak	see next plots*	see next plots	- passed -
60	see next plots	MaxPeak	see next plots*	see next plots	- passed -
64	see next plots	MaxPeak	see next plots*	see next plots	- passed -
100	see next plots	MaxPeak	see next plots*	see next plots	- passed -
116	see next plots	MaxPeak	see next plots*	see next plots	- passed -
140	see next plots	MaxPeak	see next plots*	see next plots	- passed -
144	see next plots	MaxPeak	see next plots*	see next plots	- passed -
149	see next plots	MaxPeak	see next plots*	see next plots	- passed -
157	see next plots	MaxPeak	see next plots*	see next plots	- passed -
165	see next plots	MaxPeak	see next plots*	see next plots	- passed -

* all detected peaks are more thean 6 dB below the limit

Test results: Mode 2					
Channel	**Frequency [MHz]**	**Peak/RMS Detector**	**Level [dBm]**	**Limit [dBm]**	**Verdict**
36	see next plots	MaxPeak	see next plots*	see next plots	- passed -
44	see next plots	MaxPeak	see next plots*	see next plots	- passed -
48	see next plots	MaxPeak	see next plots*	see next plots	- passed -
52	see next plots	MaxPeak	see next plots*	see next plots	- passed -
60	see next plots	MaxPeak	see next plots*	see next plots	- passed -
64	see next plots	MaxPeak	see next plots*	see next plots	- passed -
100	see next plots	MaxPeak	see next plots*	see next plots	- passed -
116	see next plots	MaxPeak	see next plots*	see next plots	- passed -
140	see next plots	MaxPeak	see next plots*	see next plots	- passed -
144	see next plots	MaxPeak	see next plots*	see next plots	- passed -
149	see next plots	MaxPeak	see next plots*	see next plots	- passed -
157	see next plots	MaxPeak	see next plots*	see next plots	- passed -
165	see next plots	MaxPeak	see next plots*	see next plots	- passed -

* all detected peaks are more thean 6 dB below the limit

Note:
LD = Limit Distance of 300m / 30m / 3m depending on frequency range, see limit table

Test results: Mode 3					
Channel	**Frequency [MHz]**	**Peak/RMS Detector**	**Level [dBm]**	**Limit [dBm]**	**Verdict**
38	see next plots	MaxPeak	see next plots*	see next plots	- passed -
46	see next plots	MaxPeak	see next plots*	see next plots	- passed -
54	see next plots	MaxPeak	see next plots*	see next plots	- passed -
62	see next plots	MaxPeak	see next plots*	see next plots	- passed -
102	see next plots	MaxPeak	see next plots*	see next plots	- passed -
110	see next plots	MaxPeak	see next plots*	see next plots	- passed -
134	see next plots	MaxPeak	see next plots*	see next plots	- passed -
142	see next plots	MaxPeak	see next plots*	see next plots	- passed -
151	see next plots	MaxPeak	see next plots*	see next plots	- passed -
159	see next plots	MaxPeak	see next plots*	see next plots	- passed -

* all detected peaks are more thean 6 dB below the limit

Test results: Mode 4					
Channel	**Frequency [MHz]**	**Peak/RMS Detector**	**Level [dBm]**	**Limit [dBm]**	**Verdict**
42	see next plots	MaxPeak	see next plots*	see next plots	- passed -
58	see next plots	MaxPeak	see next plots*	see next plots	- passed -
106	see next plots	MaxPeak	see next plots*	see next plots	- passed -
138	see next plots	MaxPeak	see next plots*	see next plots	- passed -
155	see next plots	MaxPeak	see next plots*	see next plots	- passed -

* all detected peaks are more thean 6 dB below the limit

Note:
LD = Limit Distance of 300m / 30m / 3m depending on frequency range, see limit table

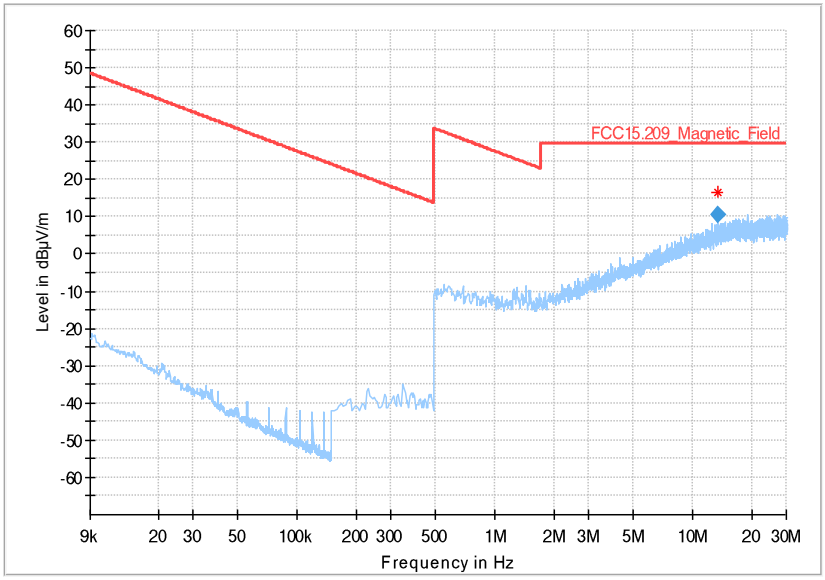
Comment:	Above tables show field strength values and field strength limits as per §15.209 resp. RSS-Gen. Measurements are performed as field strength measurements with a limit of 54 dBµV/m (AVG) and 74 dBµV (Peak) as per §15.209 resp. RSS-Gen. A field strength limit of 54 dBµV/m at 3 m corresponds to an EIRP of -41.3 dBm and is therefore more stringent than the required -27 dBm of §15.407(b) resp. RSS-247, 6.2.

Verdict	**- PASS -**	see next plots**

** description of line and marker for all radiated spurious emission (RSE) measurements:

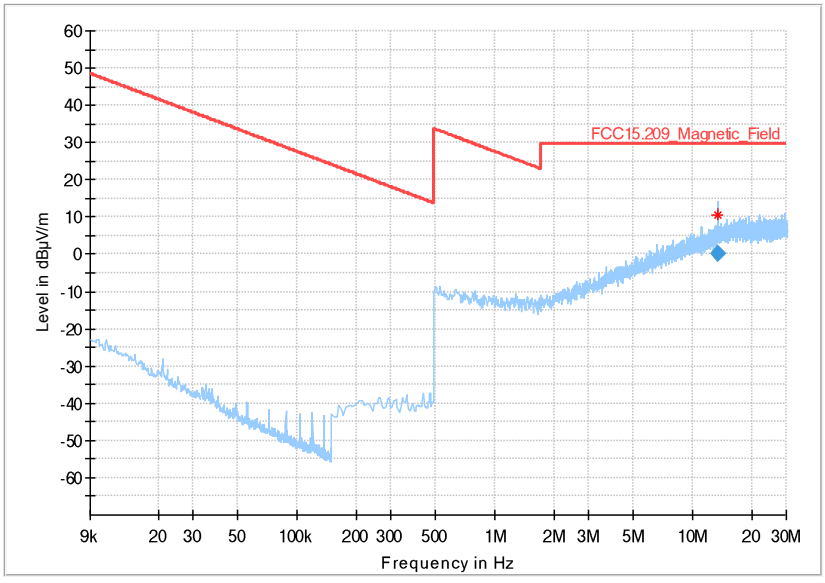
positive Peak (Max Hold) trace during pre-scan
Max Peak value
final Quasi Peak value

Plot 279: RSE 9 kHz – 30 MHz, Mode 1, CH36, loop antenna



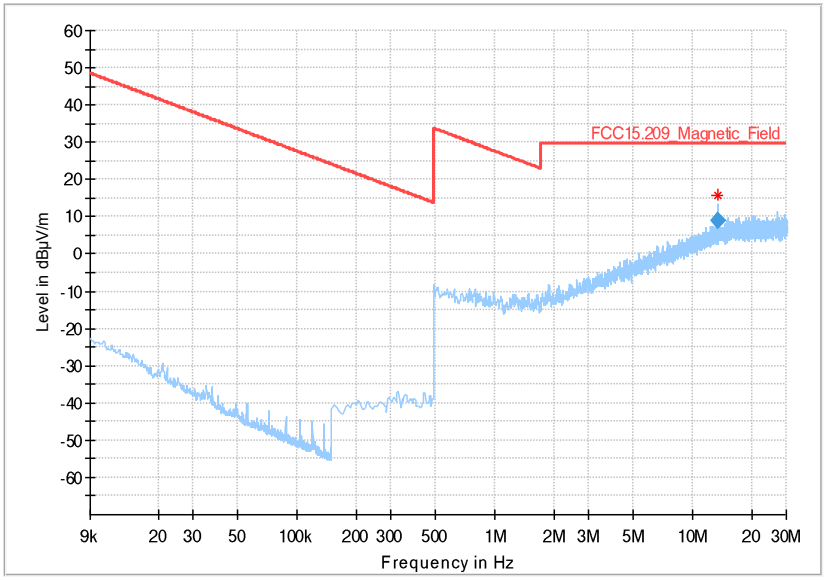
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.559886	10.65	29.54	18.89	100.0	9.000	V	65.0	-0.9

Plot 280: RSE 9 kHz – 30 MHz, Mode 1, CH44, loop antenna



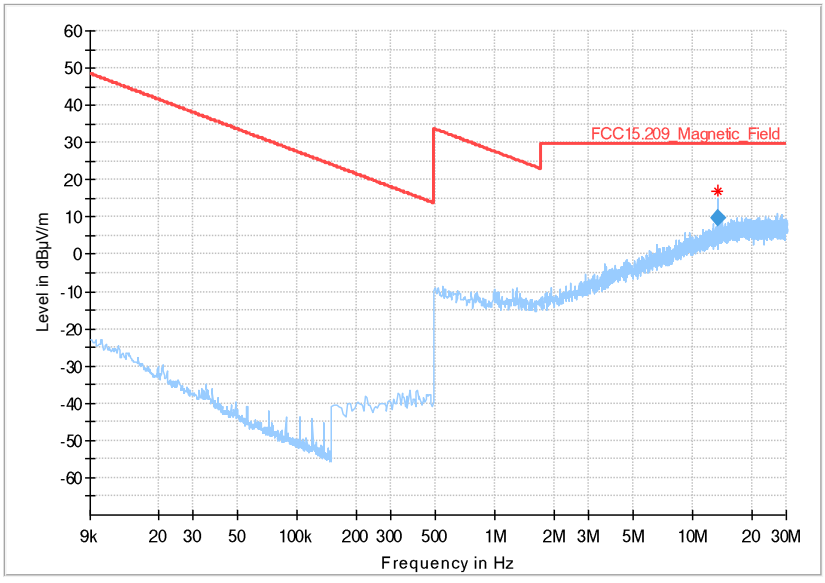
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.469886	0.34	29.54	29.20	100.0	9.000	V	246.0	-0.9

Plot 281: RSE 9 kHz – 30 MHz, Mode 1, CH48, loop antenna



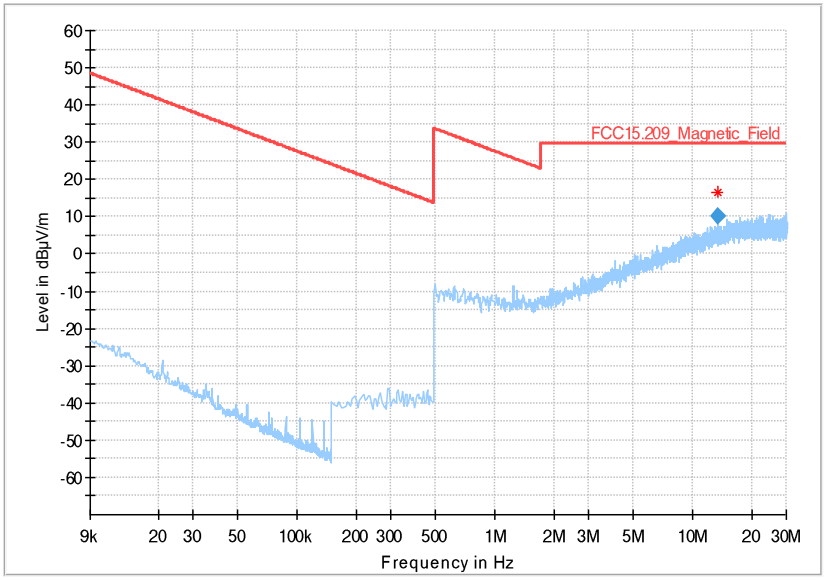
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.562136	9.12	29.54	20.42	100.0	9.000	V	120.0	-0.9

Plot 282: RSE 9 kHz – 30 MHz, Mode 1, CH52, loop antenna



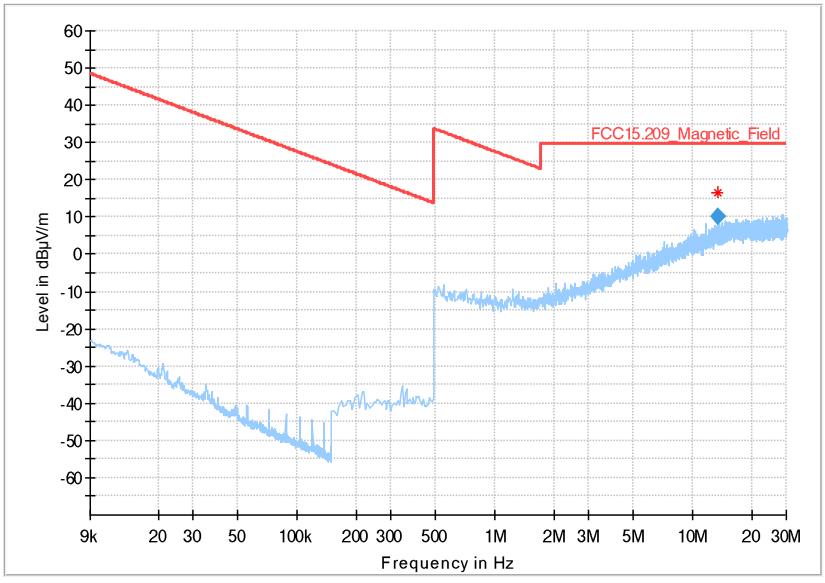
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.559886	9.75	29.54	19.79	100.0	9.000	V	279.0	-0.9

Plot 283: RSE 9 kHz – 30 MHz, Mode 1, CH60, loop antenna



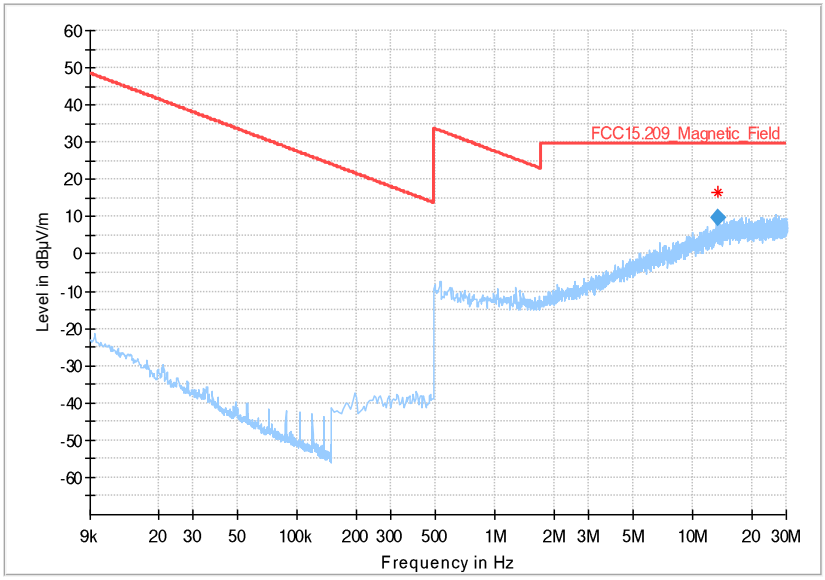
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.559886	10.10	29.54	19.44	100.0	9.000	V	-1.0	-0.9

Plot 284: RSE 9 kHz – 30 MHz, Mode 1, CH64, loop antenna



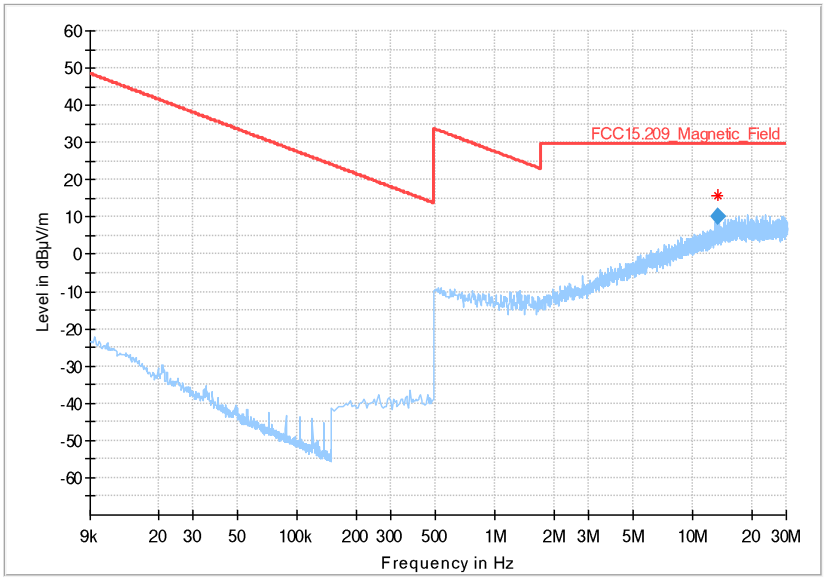
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.559886	9.99	29.54	19.55	100.0	9.000	V	155.0	-0.9

Plot 285: RSE 9 kHz – 30 MHz, Mode 1, CH100, loop antenna



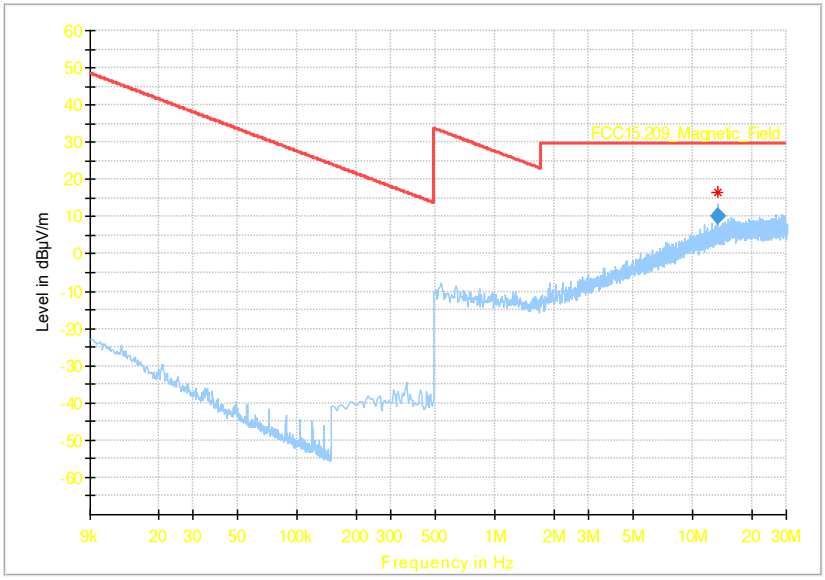
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.559886	9.87	29.54	19.67	100.0	9.000	V	329.0	-0.9

Plot 286: RSE 9 kHz – 30 MHz, Mode 1, CH116, loop antenna



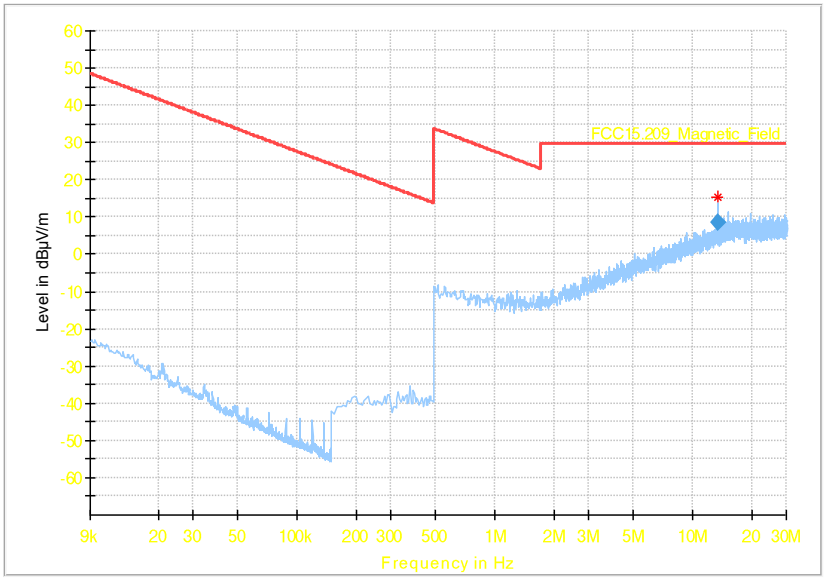
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.559886	10.31	29.54	19.23	100.0	9.000	V	284.0	-0.9

Plot 287: RSE 9 kHz – 30 MHz, Mode 1, CH140, loop antenna



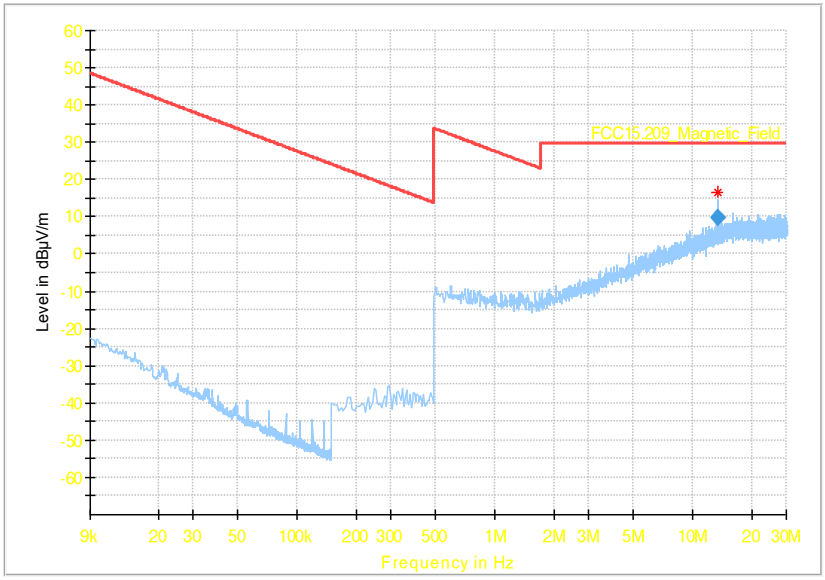
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.559886	10.35	29.54	19.19	100.0	9.000	V	66.0	-0.9

Plot 288: RSE 9 kHz – 30 MHz, Mode 1, CH144, loop antenna



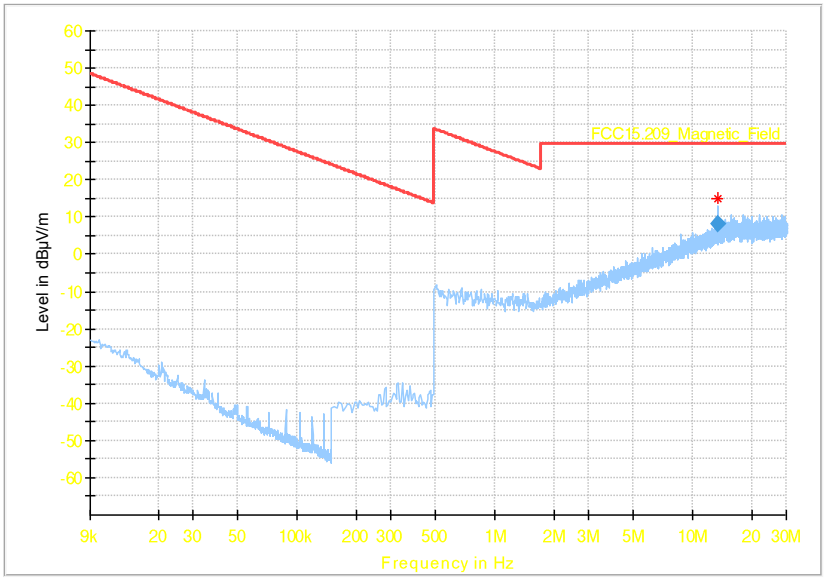
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.562136	8.58	29.54	20.96	100.0	9.000	V	141.0	-0.9

Plot 289: RSE 9 kHz – 30 MHz, Mode 1, CH149, loop antenna



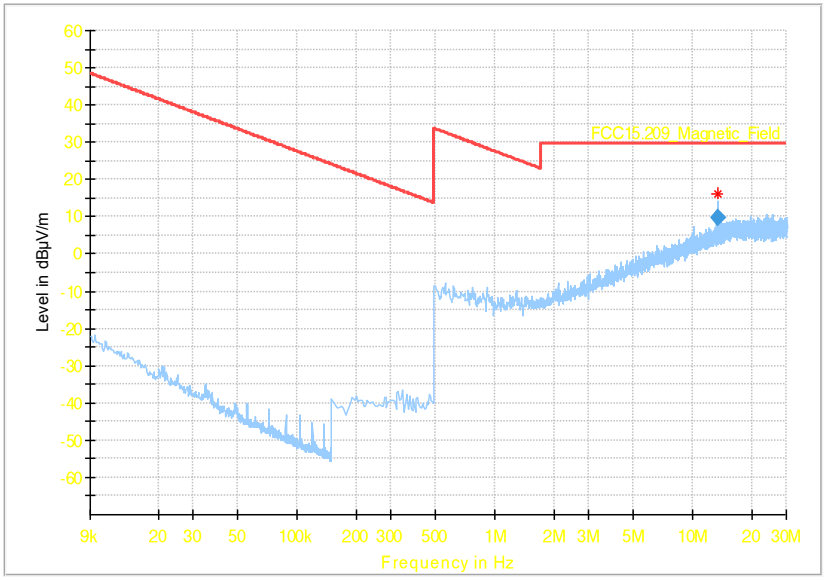
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.559886	9.91	29.54	19.63	100.0	9.000	V	236.0	-0.9

Plot 290: RSE 9 kHz – 30 MHz, Mode 1, CH157, loop antenna



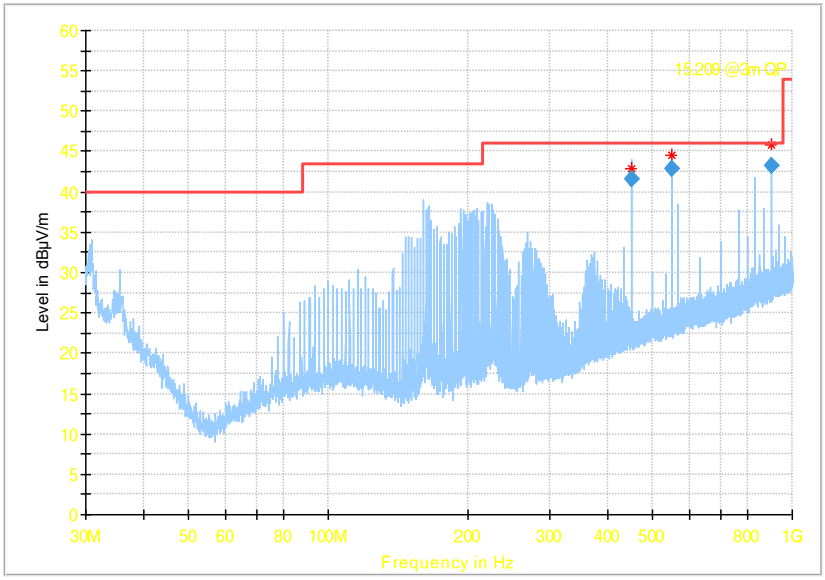
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.562136	8.29	29.54	21.25	100.0	9.000	V	131.0	-0.9

Plot 291: RSE 9 kHz – 30 MHz, Mode 1, CH165, loop antenna



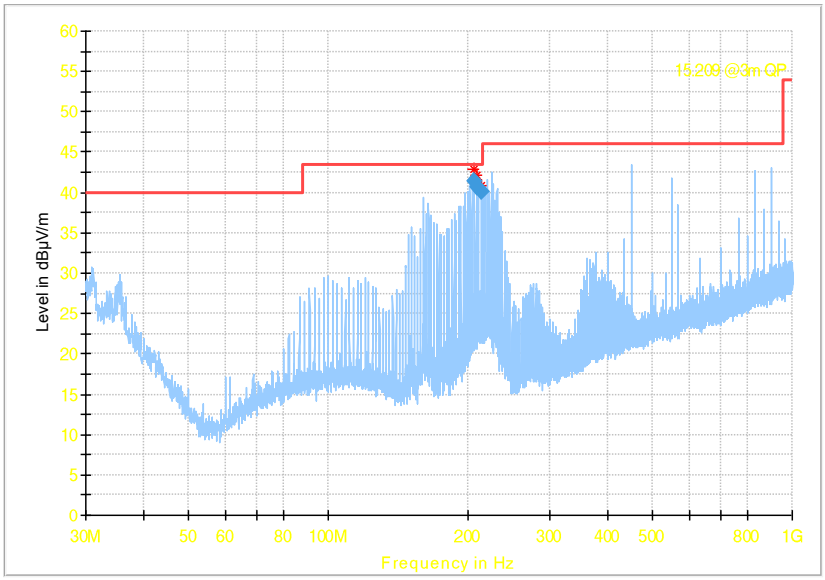
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.559886	9.74	29.54	19.80	100.0	9.000	V	153.0	-0.9

Plot 292: RSE 30 MHz – 1 GHz, Mode 1, CH36, horizontal / vertical polarisation



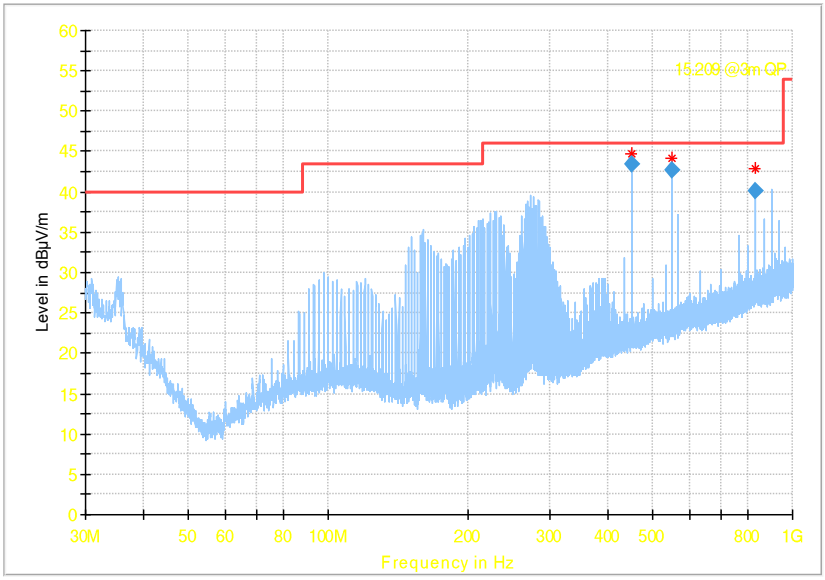
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
450.010000	41.56	46.00	4.44	100.0	120.000	103.0	V	153.0
550.017000	42.88	46.00	3.12	100.0	120.000	100.0	V	70.0
900.011500	43.24	46.00	2.76	100.0	120.000	100.0	H	109.0

Plot 293: RSE 30 MHz – 1 GHz, Mode 1, CH44, horizontal / vertical polarisation



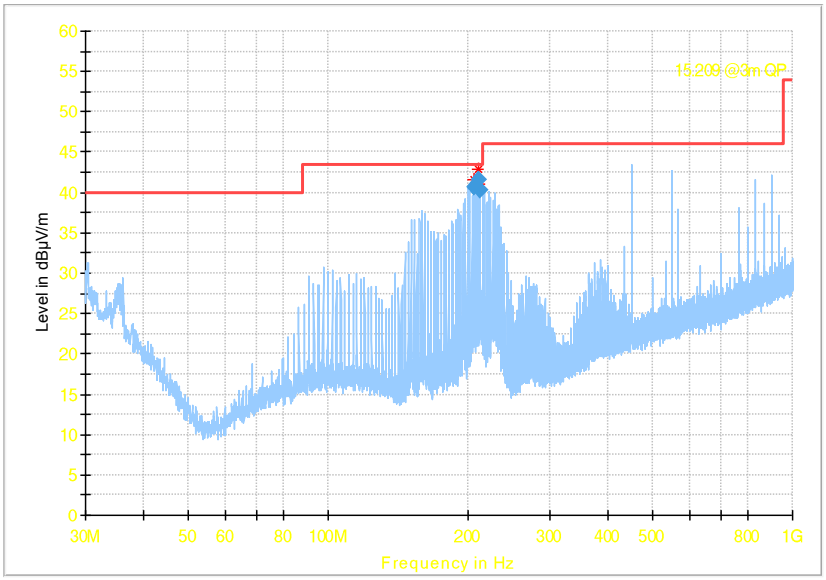
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
206.517000	41.37	43.50	2.13	100.0	120.000	100.0	V	26.0
208.748000	40.69	43.50	2.81	100.0	120.000	100.0	V	45.0
213.101500	40.05	43.50	3.45	100.0	120.000	100.0	V	262.0

Plot 294: RSE 30 MHz – 1 GHz, Mode 1, CH48, horizontal / vertical polarisation



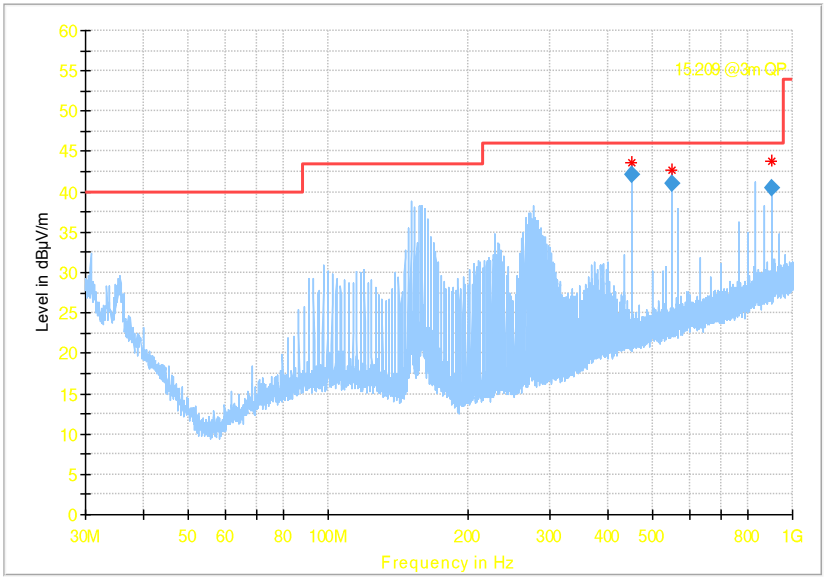
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
450.010000	43.52	46.00	2.48	100.0	120.000	119.0	V	15.0
549.987000	42.66	46.00	3.34	100.0	120.000	100.0	V	70.0
833.324000	40.11	46.00	5.89	100.0	120.000	100.0	H	110.0

Plot 295: RSE 30 MHz – 1 GHz, Mode 1, CH52, horizontal / vertical polarisation



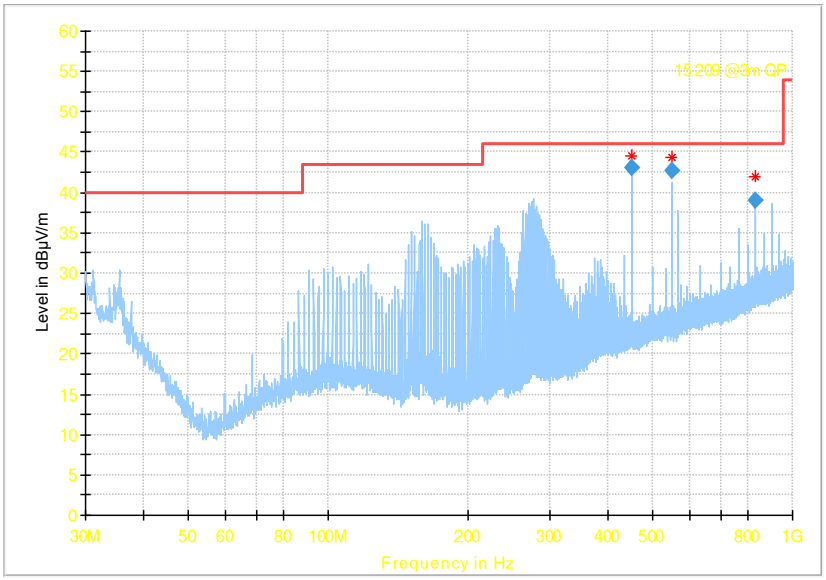
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
206.152000	40.60	43.50	2.90	100.0	120.000	104.0	V	42.0
210.565500	41.51	43.50	1.99	100.0	120.000	100.0	V	48.0
212.688000	40.30	43.50	3.20	100.0	120.000	103.0	V	60.0

Plot 296: RSE 30 MHz – 1 GHz, Mode 1, CH60, horizontal / vertical polarisation



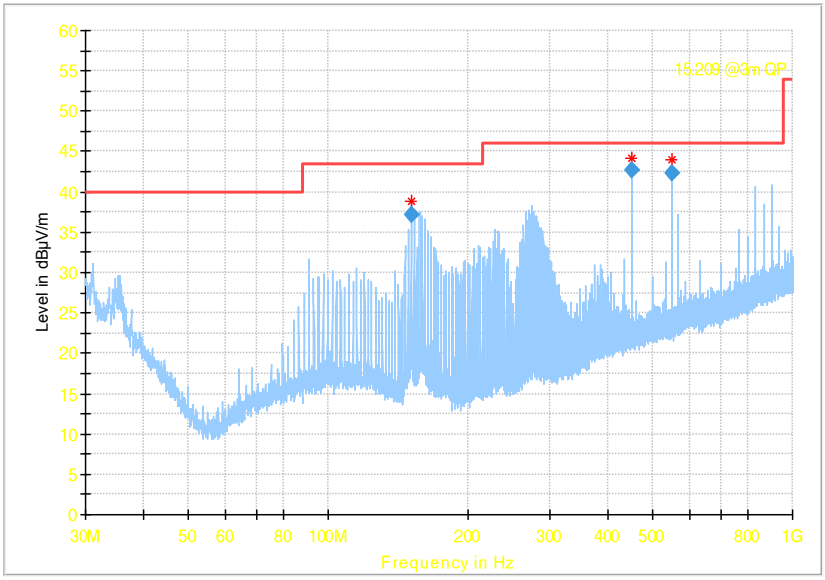
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
450.010000	42.11	46.00	3.89	100.0	120.000	121.0	V	-7.0
550.017000	40.98	46.00	5.02	100.0	120.000	100.0	V	71.0
900.011500	40.47	46.00	5.53	100.0	120.000	103.0	H	118.0

Plot 297: RSE 30 MHz – 1 GHz, Mode 1, CH64, horizontal / vertical polarisation



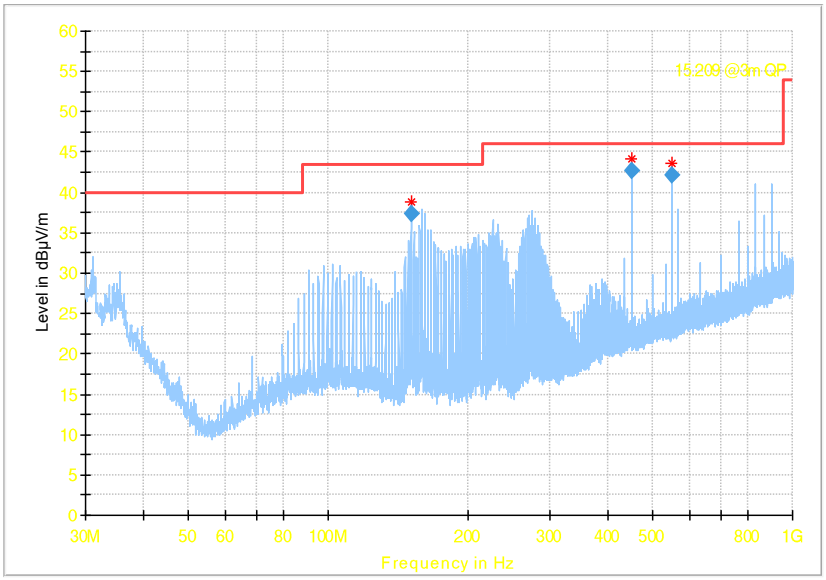
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
450.010000	43.04	46.00	2.96	100.0	120.000	103.0	V	17.0
549.998500	42.66	46.00	3.34	100.0	120.000	100.0	V	73.0
833.324000	39.10	46.00	6.90	100.0	120.000	100.0	H	113.0

Plot 298: RSE 30 MHz – 1 GHz, Mode 1, CH100, horizontal / vertical polarisation



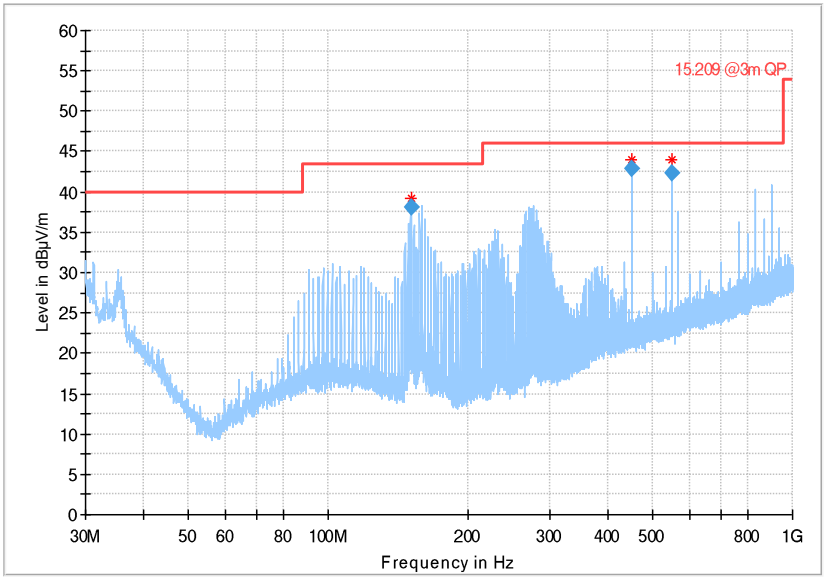
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
150.716500	37.15	43.50	6.35	100.0	120.000	119.0	V	169.0
450.010000	42.71	46.00	3.29	100.0	120.000	104.0	V	7.0
549.987000	42.36	46.00	3.64	100.0	120.000	100.0	V	76.0

Plot 299: RSE 30 MHz – 1 GHz, Mode 1, CH116, horizontal / vertical polarisation



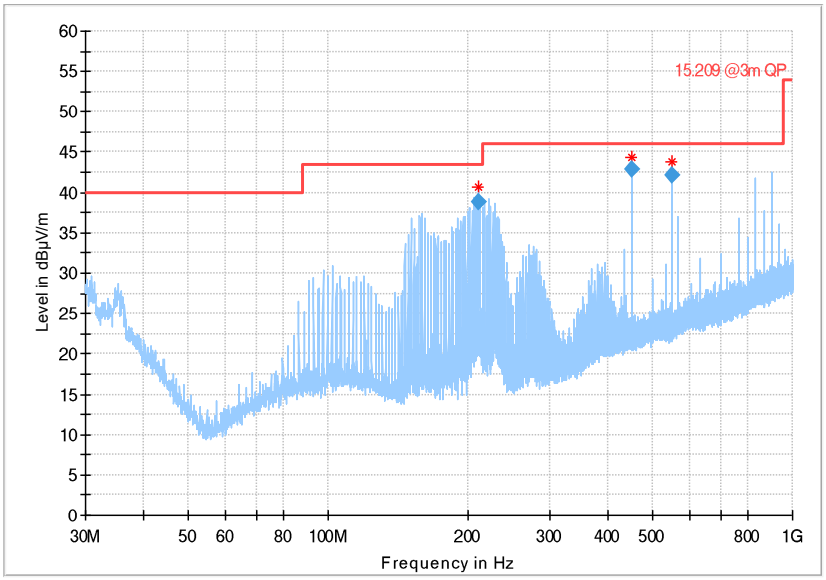
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
150.649500	37.43	43.50	6.07	100.0	120.000	100.0	V	153.0
450.010000	42.63	46.00	3.37	100.0	120.000	106.0	V	12.0
550.017000	42.09	46.00	3.91	100.0	120.000	100.0	V	79.0

Plot 300: RSE 30 MHz – 1 GHz, Mode 1, CH140, horizontal / vertical polarisation



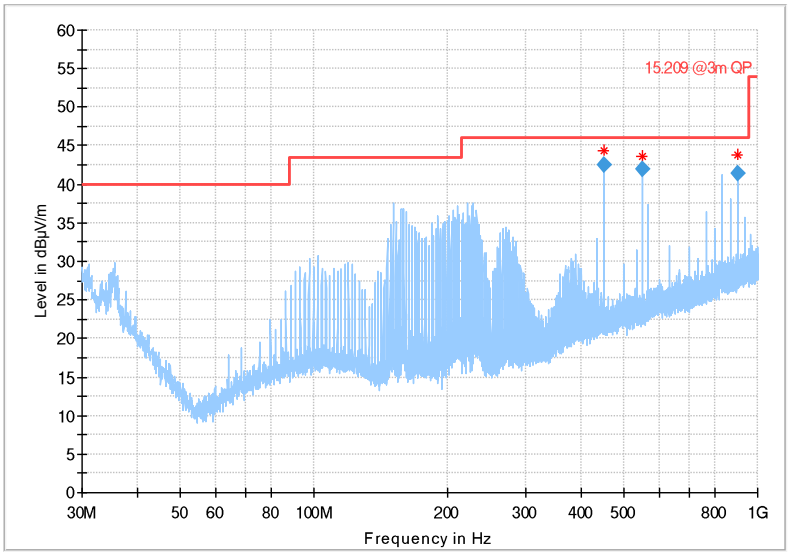
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
150.709500	38.02	43.50	5.48	100.0	120.000	100.0	V	148.0
450.010000	42.82	46.00	3.18	100.0	120.000	116.0	V	20.0
549.987000	42.25	46.00	3.75	100.0	120.000	100.0	V	70.0

Plot 301: RSE 30 MHz – 1 GHz, Mode 1, CH144, horizontal / vertical polarisation



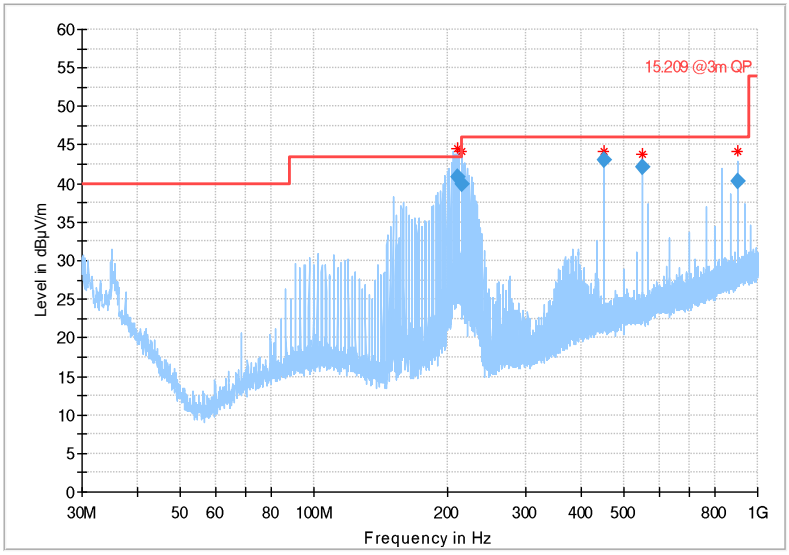
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
210.535500	38.81	43.50	4.69	100.0	120.000	100.0	V	20.0
450.010000	42.92	46.00	3.08	100.0	120.000	119.0	V	20.0
550.017000	42.14	46.00	3.86	100.0	120.000	100.0	V	77.0

Plot 302: RSE 30 MHz – 1 GHz, Mode 1, CH149, horizontal / vertical polarisation



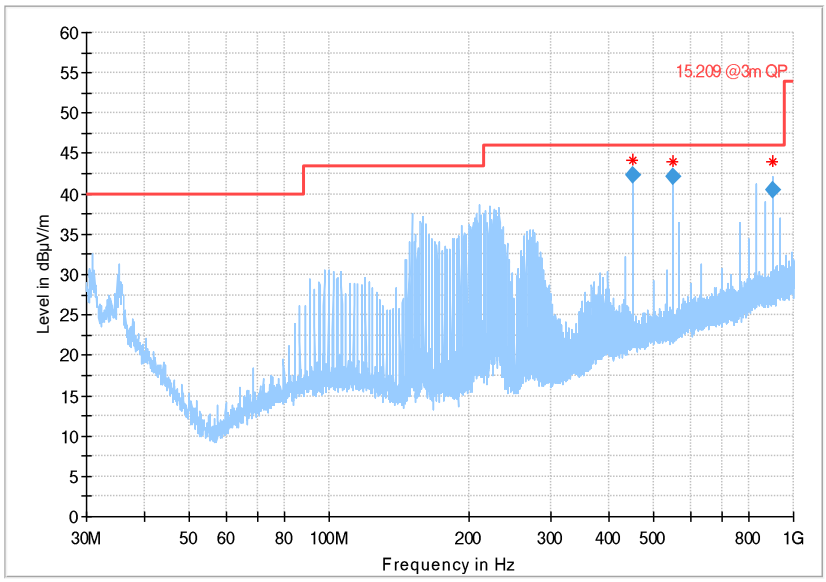
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
450.010000	42.57	46.00	3.43	100.0	120.000	103.0	V	13.0
550.017000	42.04	46.00	3.96	100.0	120.000	100.0	V	80.0
900.011500	41.44	46.00	4.56	100.0	120.000	100.0	H	101.0

Plot 303: RSE 30 MHz – 1 GHz, Mode 1, CH157, horizontal / vertical polarisation



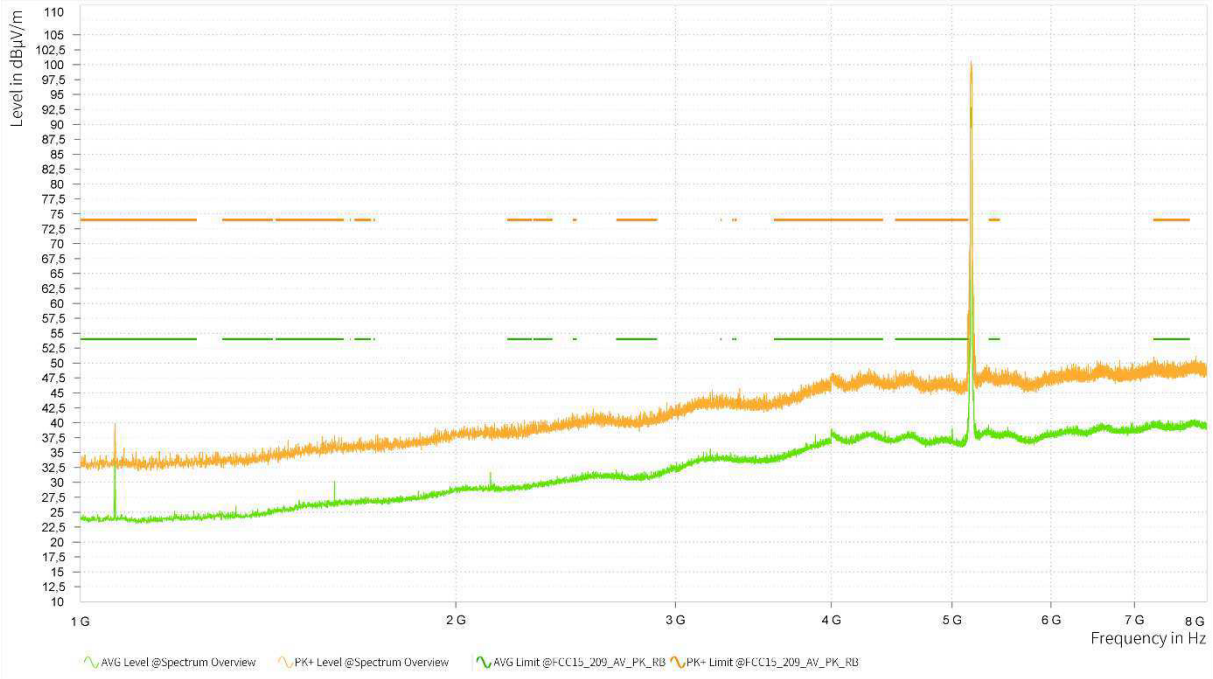
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
210.577000	40.88	43.50	2.62	100.0	120.000	100.0	V	27.0
215.002000	39.85	43.50	3.65	100.0	120.000	100.0	V	29.0
450.010000	42.99	46.00	3.01	100.0	120.000	116.0	V	20.0
549.987000	42.21	46.00	3.79	100.0	120.000	103.0	V	75.0
900.023000	40.36	46.00	5.64	100.0	120.000	104.0	H	105.0

Plot 304: RSE 30 MHz – 1 GHz, Mode 1, CH165, horizontal / vertical polarisation

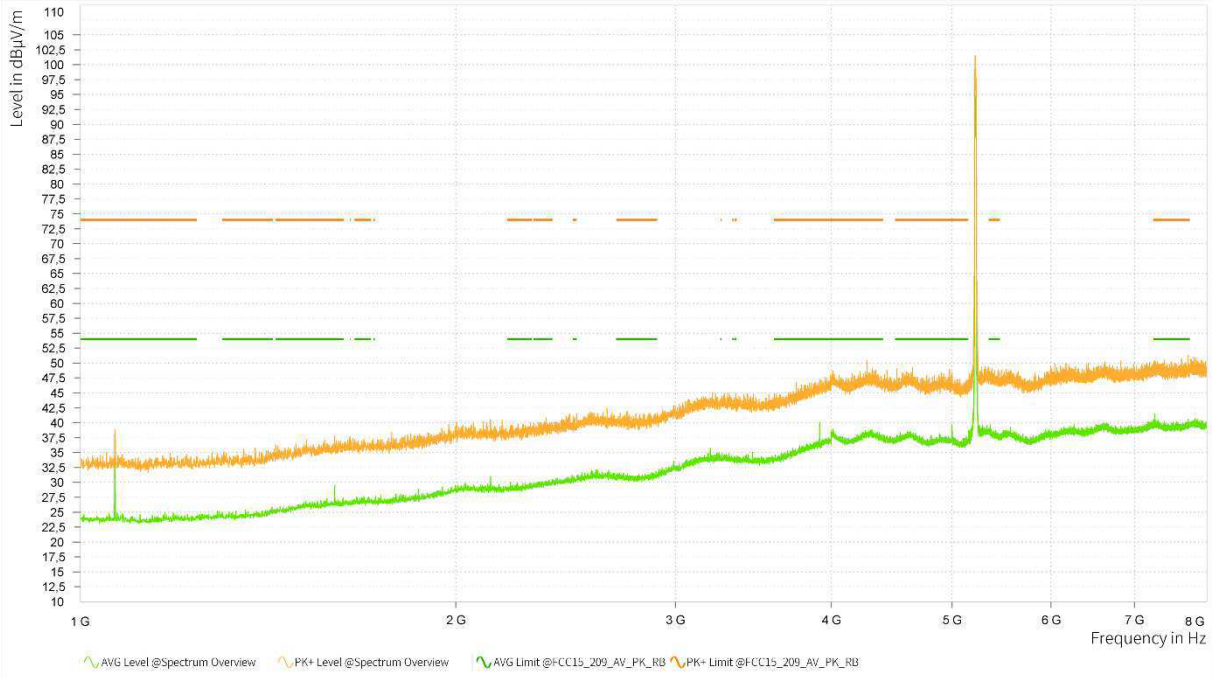


Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
450.010000	42.29	46.00	3.71	100.0	120.000	141.0	V	9.0
549.987000	42.13	46.00	3.87	100.0	120.000	100.0	V	69.0
900.011500	40.55	46.00	5.45	100.0	120.000	103.0	H	104.0

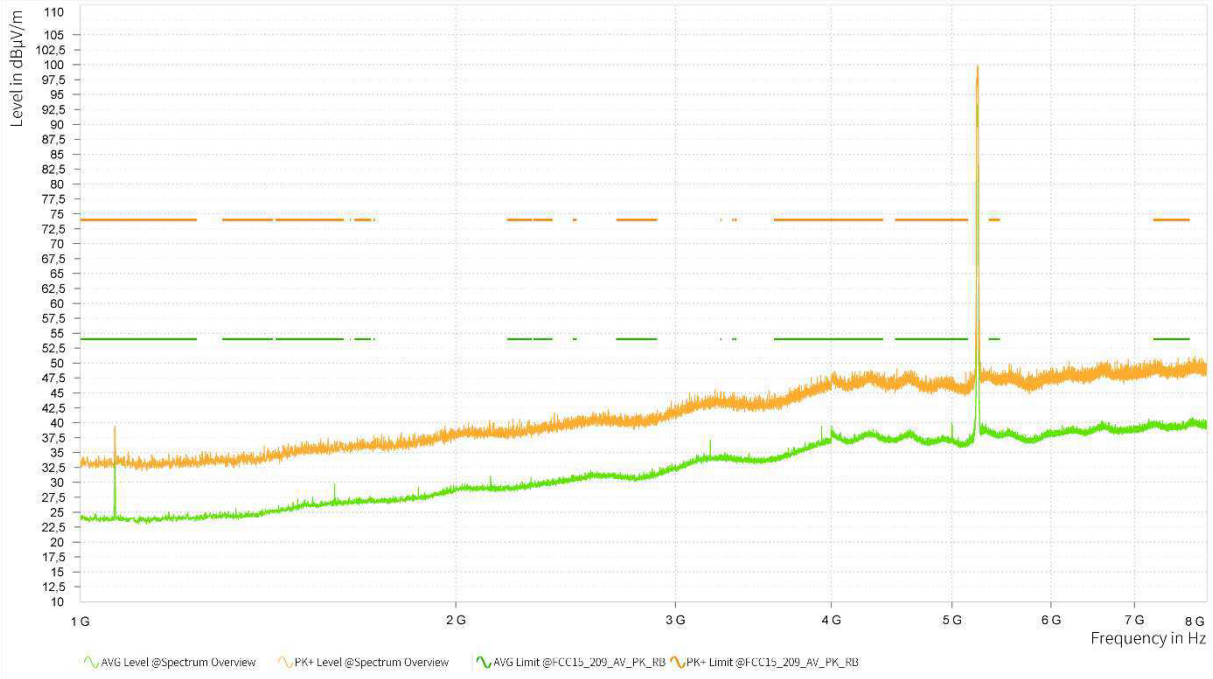
Plot 305: RSE 1 GHz – 8 GHz, Mode 1, CH36, horizontal / vertical polarisation



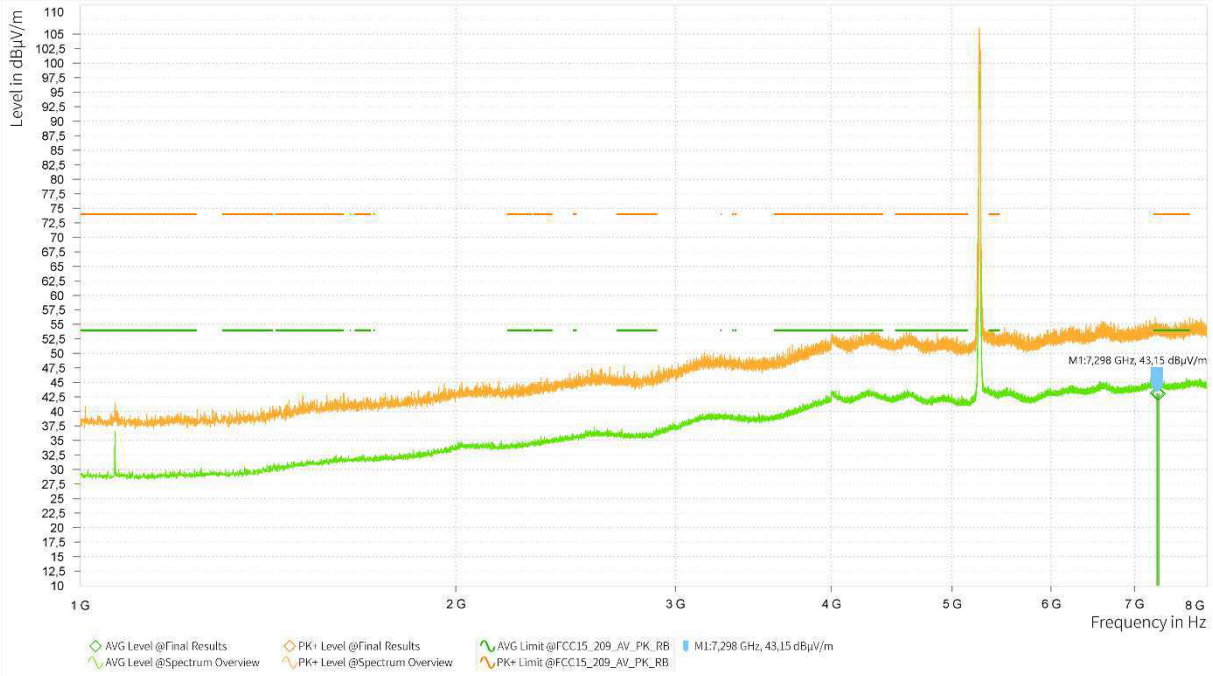
Plot 306: RSE 1 GHz – 8 GHz, Mode 1, CH44, horizontal / vertical polarisation



Plot 307: RSE 1 GHz – 8 GHz, Mode 1, CH48, horizontal / vertical polarisation



Plot 308: RSE 1 GHz – 8 GHz, Mode 1, CH52, horizontal / vertical polarisation



Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Elevation [deg]	Azimuth [deg]	Antenna Height [m]	Time of Meas.
1	7.297,725				43,15	54,00	10,85	35,98	15,1	269,9	1,50	15:42:23
1	7.319,800				43,07	54,00	10,93	35,97	82,1	106,9	1,50	15:43:50