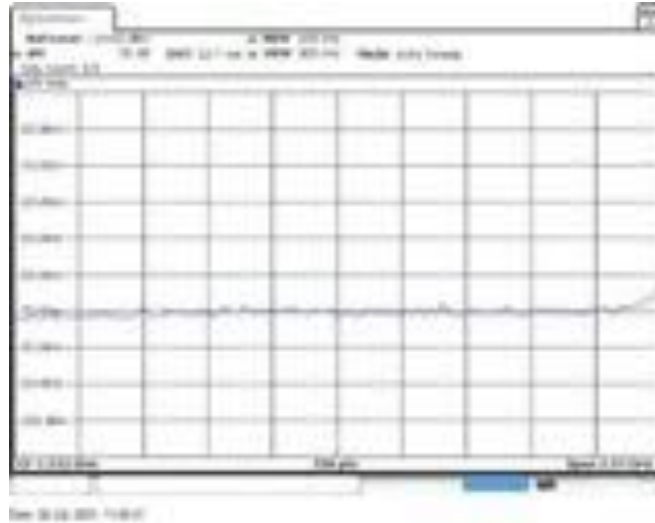
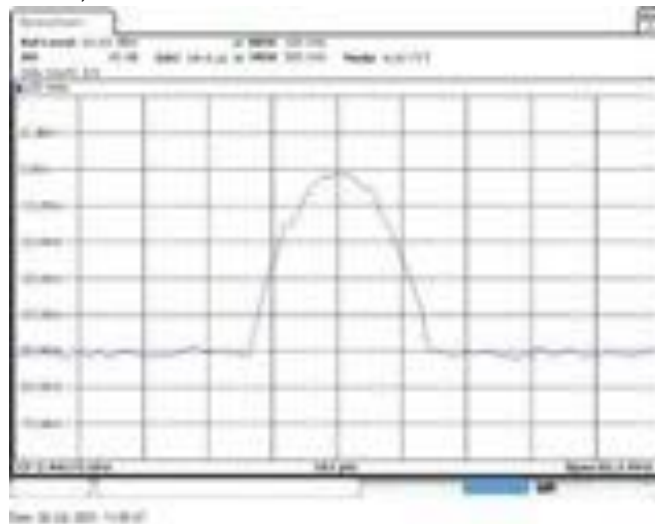


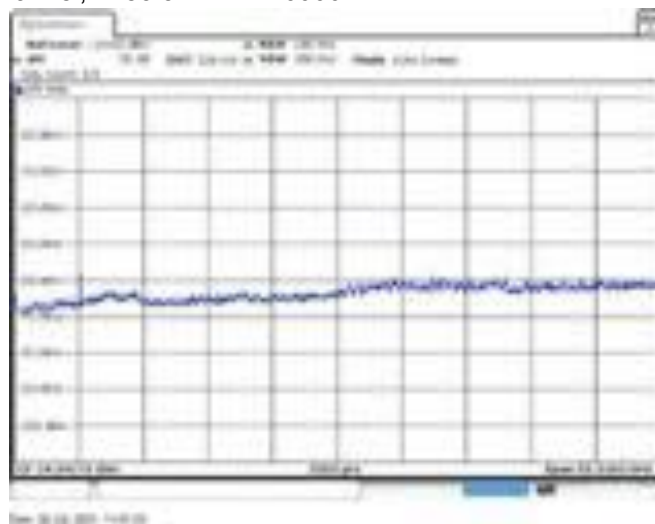
Plot 57: Mode 1, CSE, mid channel, 30 MHz – 2400 MHz



Plot 58: Mode 1, CSE, mid channel, 2400 MHz – 2483.5 MHz

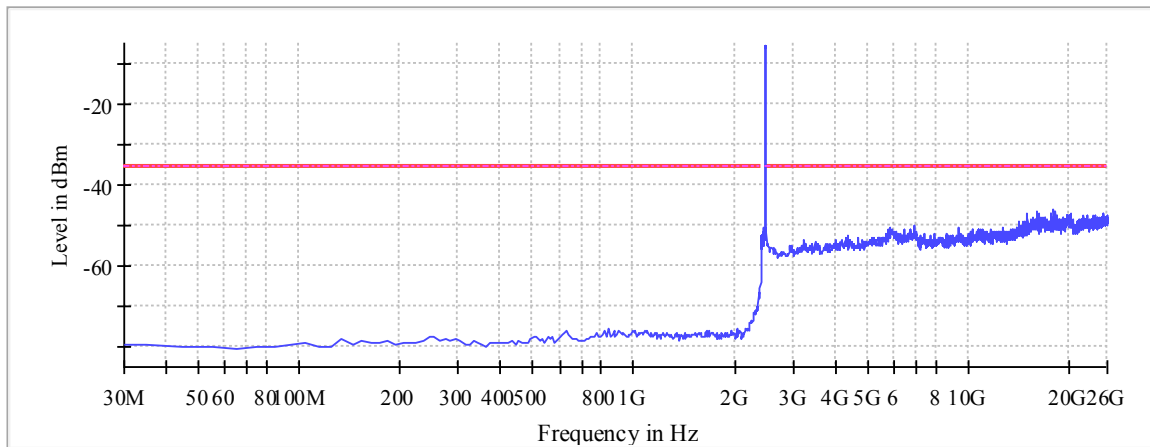


Plot 59: Mode 1, CSE, mid channel, 2483.5 MHz – 26000 MHz



Plot 60: Mode 1, CSE, high channel, 30 MHz – 26000 MHz

Spurious



— Limit — Sum Level - - - Threshold × Critical × Final Critical

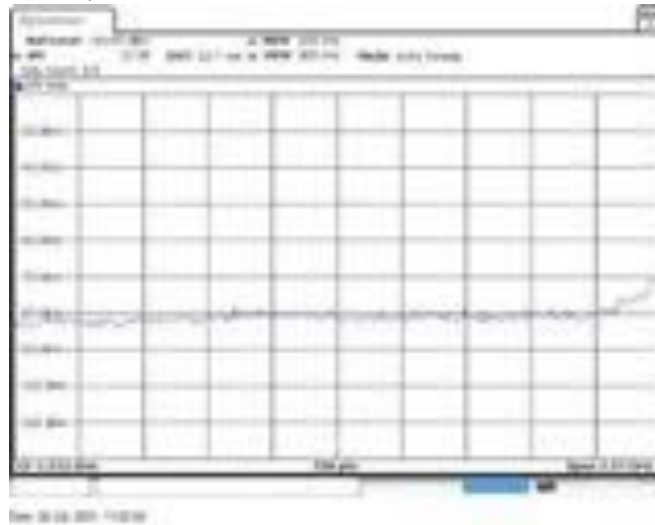
Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
18019.581279	-46.1	10.8	-35.3
18079.546855	-46.3	11.0	-35.3
15990.745963	-46.4	11.1	-35.3
25275.415958	-46.9	11.6	-35.3
25325.387272	-46.9	11.6	-35.3
16300.568105	-46.9	11.6	-35.3
18059.558330	-47.0	11.7	-35.3
18009.587017	-47.0	11.7	-35.3
17659.787824	-47.0	11.7	-35.3
15031.296749	-47.0	11.7	-35.3
20368.233000	-47.2	11.9	-35.3
17759.730450	-47.2	11.9	-35.3
20388.221526	-47.3	12.0	-35.3
22167.200276	-47.3	12.0	-35.3
17709.759137	-47.3	12.0	-35.3

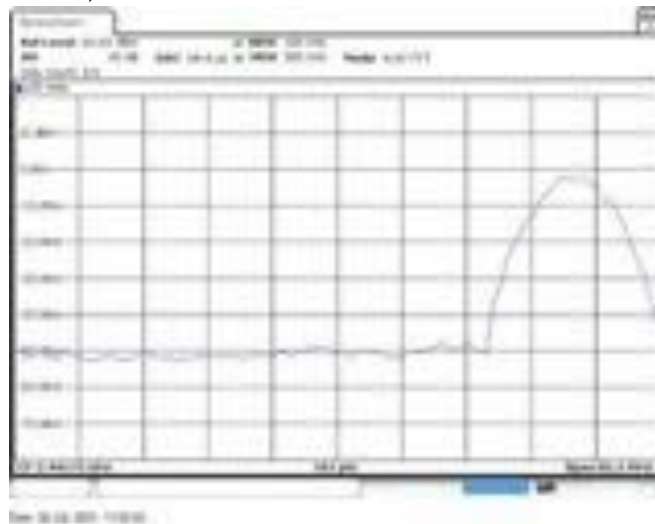
Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	2400.000000	1	1
2400.000000	2483.500000	1	1
2483.500000	26000.000000	1	1

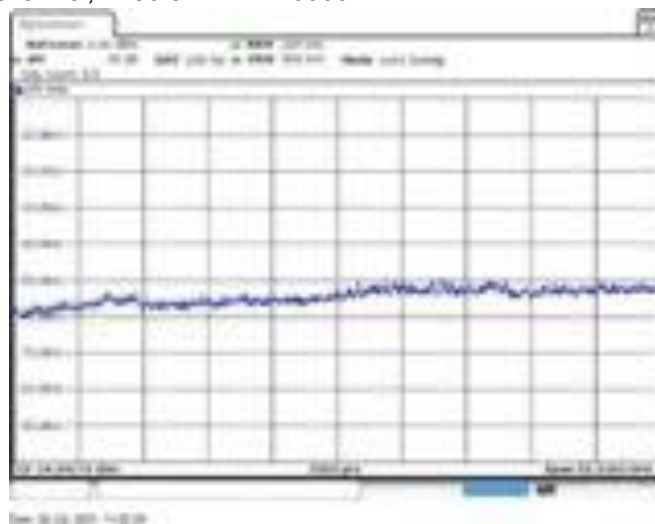
Plot 61: Mode 1, CSE, high channel, 30 MHz – 2400 MHz



Plot 62: Mode 1, CSE, high channel, 2400 MHz – 2483.5 MHz

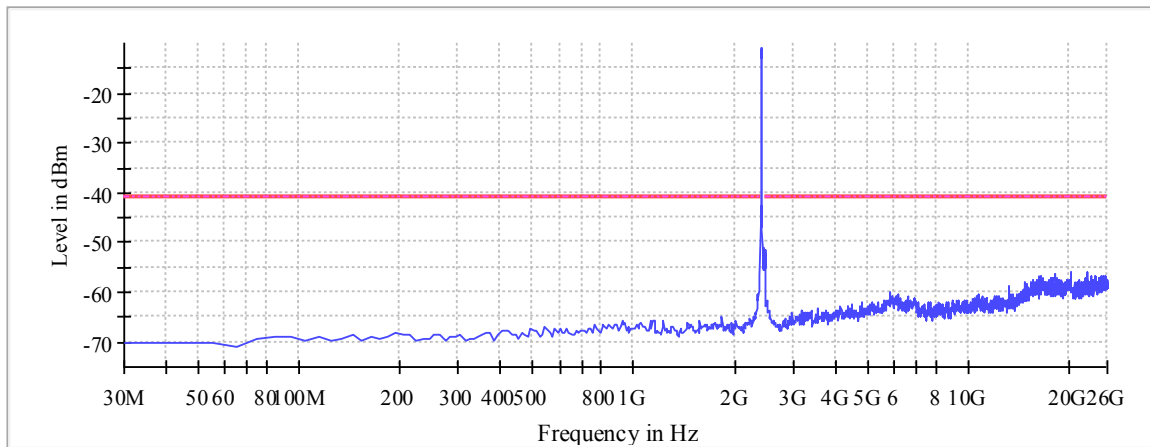


Plot 63: Mode 1, CSE, high channel, 2483.5 MHz – 26000 MHz



Plot 64: Mode 2, CSE, low channel, 30 MHz – 26000 MHz

Spurious



— Limit — Sum Level - - - Threshold × Critical × Final Critical

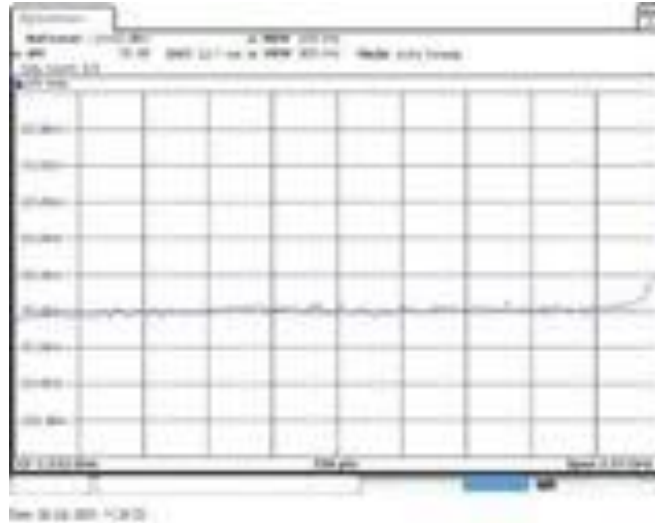
Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-42.4	1.6	-40.8
22546.982257	-55.8	15.0	-40.8
20388.221526	-56.0	15.2	-40.8
18069.552592	-56.5	15.7	-40.8
16350.539418	-56.6	15.8	-40.8
23926.190501	-56.6	15.8	-40.8
23256.574904	-56.6	15.8	-40.8
16380.522206	-56.6	15.8	-40.8
25315.393009	-56.6	15.8	-40.8
23866.224926	-56.7	15.9	-40.8
25795.117616	-56.7	15.9	-40.8
18049.564067	-56.8	15.9	-40.8
18059.558330	-56.8	15.9	-40.8
2385.063025	-56.8	16.0	-40.8
25105.513493	-56.8	16.0	-40.8

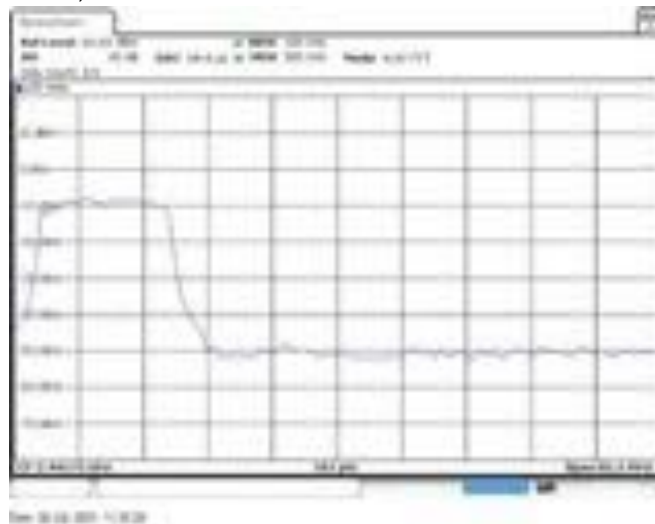
Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	2400.000000	1	1
2400.000000	2483.500000	1	1
2483.500000	26000.000000	1	1

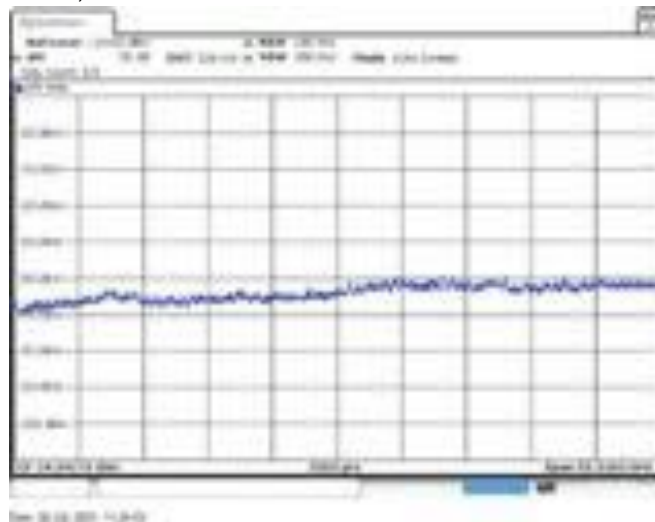
Plot 65: Mode 2, CSE, low channel, 30 MHz – 2400 MHz



Plot 66: Mode 2, CSE, low channel, 2400 MHz – 2483.5 MHz

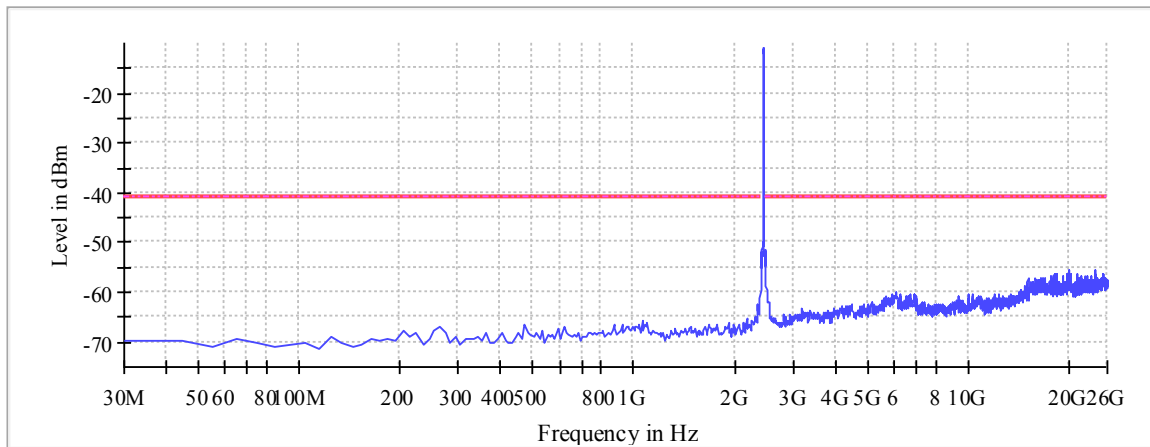


Plot 67: Mode 2, CSE, low channel, 2483.5 MHz – 26000 MHz



Plot 68: Mode 2, CSE, mid channel, 30 MHz – 26000 MHz

Spurious



— Limit — Sum Level - - - - Threshold × Critical × Final Critical

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
20068.405121	-55.4	14.4	-40.9
23886.213451	-55.7	14.8	-40.9
18029.575542	-56.2	15.3	-40.9
20028.428071	-56.2	15.3	-40.9
19738.594454	-56.2	15.3	-40.9
23786.270824	-56.3	15.4	-40.9
25305.398746	-56.3	15.4	-40.9
18059.558330	-56.3	15.4	-40.9
21117.802699	-56.3	15.4	-40.9
20108.382172	-56.5	15.6	-40.9
18369.380472	-56.5	15.6	-40.9
25435.324161	-56.5	15.6	-40.9
18379.374734	-56.5	15.6	-40.9
20318.261687	-56.5	15.6	-40.9
25455.312686	-56.5	15.6	-40.9

Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	2400.000000	1	1
2400.000000	2483.500000	1	1
2483.500000	26000.000000	1	1

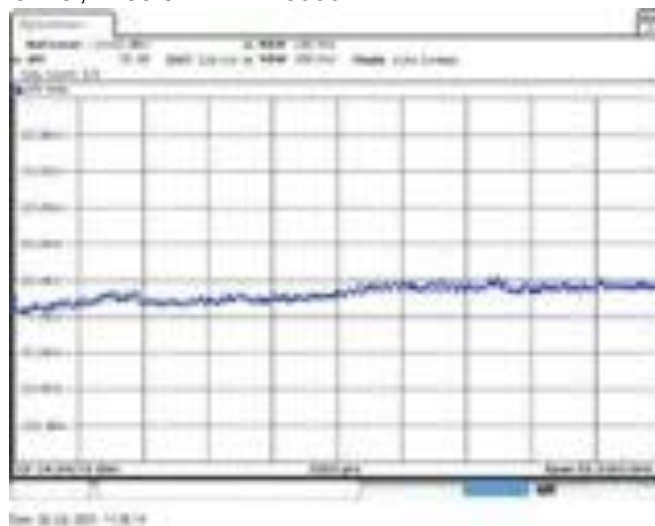
Plot 69: Mode 2, CSE, mid channel, 30 MHz – 2400 MHz



Plot 70: Mode 2, CSE, mid channel, 2400 MHz – 2483.5 MHz

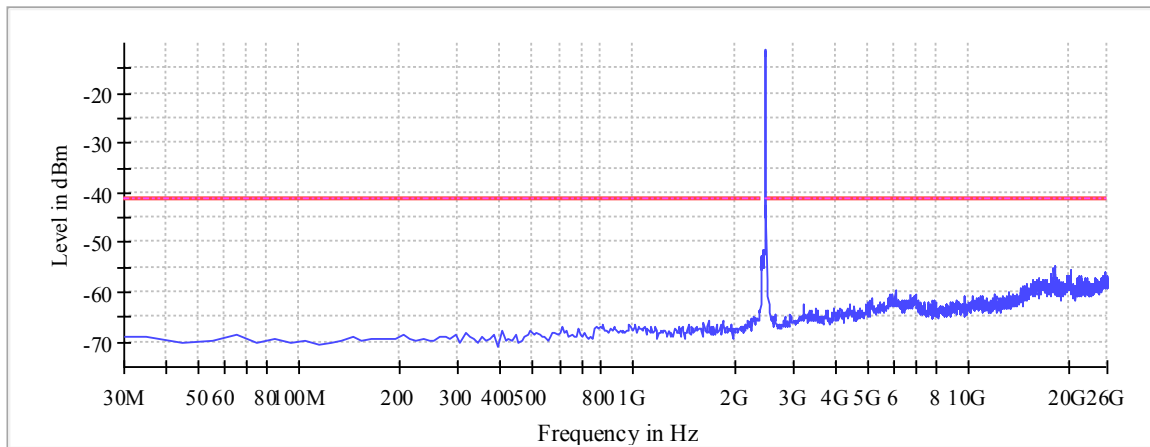


Plot 71: Mode 2, CSE, mid channel, 2483.5 MHz – 26000 MHz



Plot 72: Mode 2, CSE, high channel, 30 MHz – 26000 MHz

Spurious



— Limit — Sum Level - - - Threshold × Critical × Final Critical

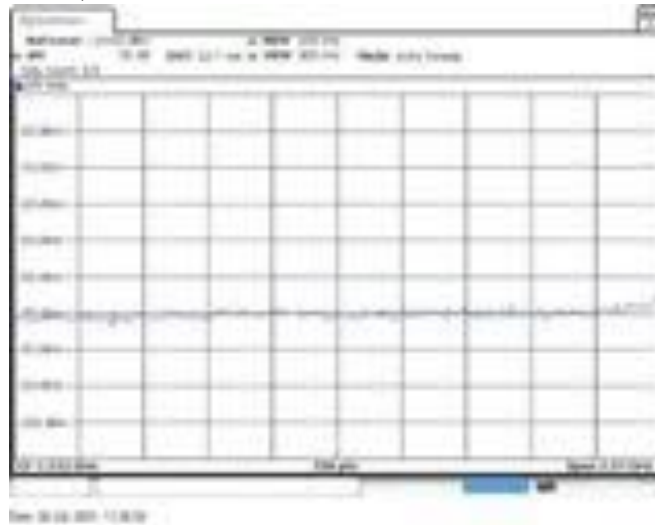
Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2488.497131	-42.7	1.5	-41.2
18039.569805	-54.9	13.7	-41.2
18019.581279	-55.2	14.1	-41.2
20388.221526	-55.3	14.2	-41.2
20358.238738	-55.9	14.8	-41.2
25565.249575	-56.1	14.9	-41.2
18079.546855	-56.3	15.2	-41.2
20398.215788	-56.4	15.3	-41.2
17689.770612	-56.5	15.3	-41.2
19708.611666	-56.6	15.4	-41.2
25935.037293	-56.7	15.6	-41.2
18059.558330	-56.7	15.6	-41.2
21457.607629	-56.8	15.6	-41.2
19968.462495	-56.8	15.6	-41.2
25585.238100	-56.8	15.7	-41.2

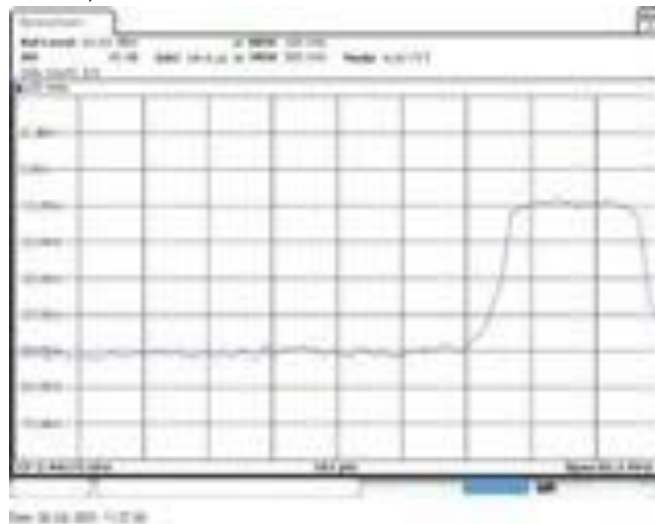
Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	2400.000000	1	1
2400.000000	2483.500000	1	1
2483.500000	26000.000000	1	1

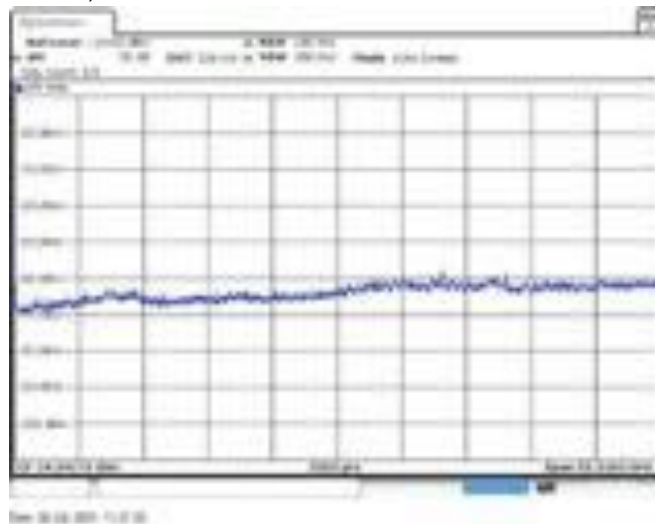
Plot 73: Mode 2 CSE, high channel, 30 MHz – 2400 MHz



Plot 74: Mode 2, CSE, high channel, 2400 MHz – 2483.5 MHz

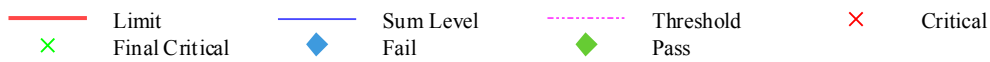
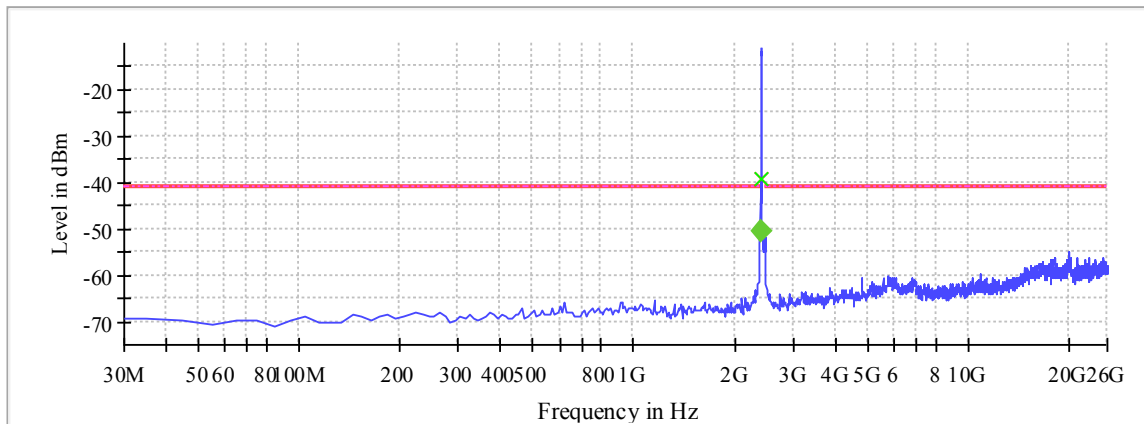


Plot 75: Mode 2, CSE, high channel, 2483.5 MHz – 26000 MHz



Plot 76: Mode 3, CSE, low channel, 30 MHz – 26000 MHz

Spurious

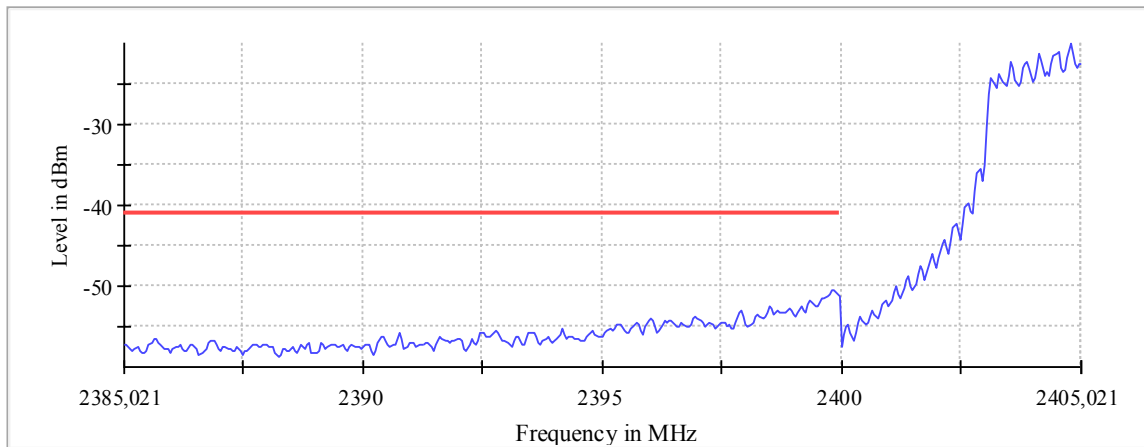


Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-39.4	-1.6	-41.0
2385.063025	-53.4	12.4	-41.0
20048.416596	-54.8	13.8	-41.0
18079.546855	-56.1	15.1	-41.0
21087.819911	-56.2	15.2	-41.0
20358.238738	-56.3	15.4	-41.0
22906.775712	-56.4	15.4	-41.0
25345.375797	-56.4	15.5	-41.0
18029.575542	-56.5	15.5	-41.0
18009.587017	-56.7	15.7	-41.0
25445.318423	-56.7	15.7	-41.0
23786.270824	-56.7	15.8	-41.0
22257.148640	-56.7	15.8	-41.0
19818.548555	-56.8	15.8	-41.0
20038.422333	-56.8	15.9	-41.0

Plot 77: Mode 3, CSE, low channel, final measurement at 2395.021008 MHz

FinalMeas_2395021008Hz



— Sum Level — Limit

Final measurements

Frequency (MHz)	Level Pre Measurement (dBm)	level (dBm)	Limit (dBm)	Margin (dB)	Result
2399.858913	-44.2	-50.6	-41.0	9.6	PASS

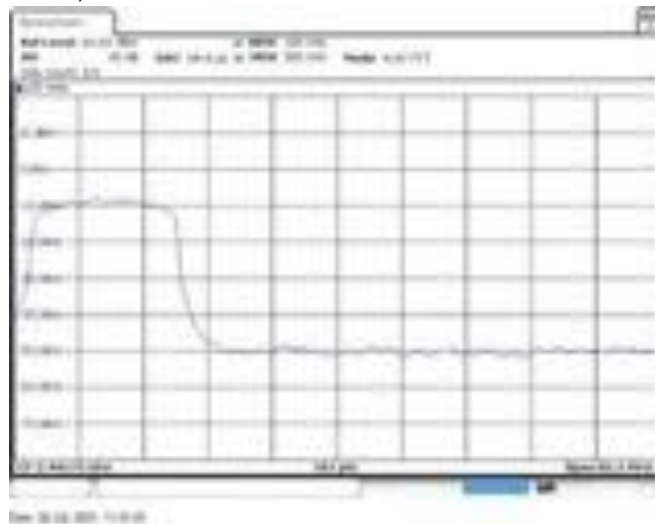
Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	2400.000000	1	1
2400.000000	2483.500000	1	1
2483.500000	26000.000000	1	1

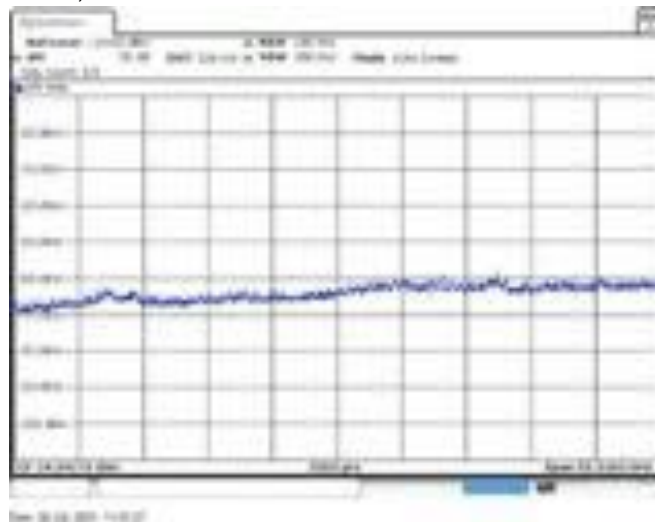
Plot 78: Mode 3, CSE, low channel, 30 MHz – 2400 MHz



Plot 79: Mode 3, CSE, low channel, 2400 MHz – 2483.5 MHz

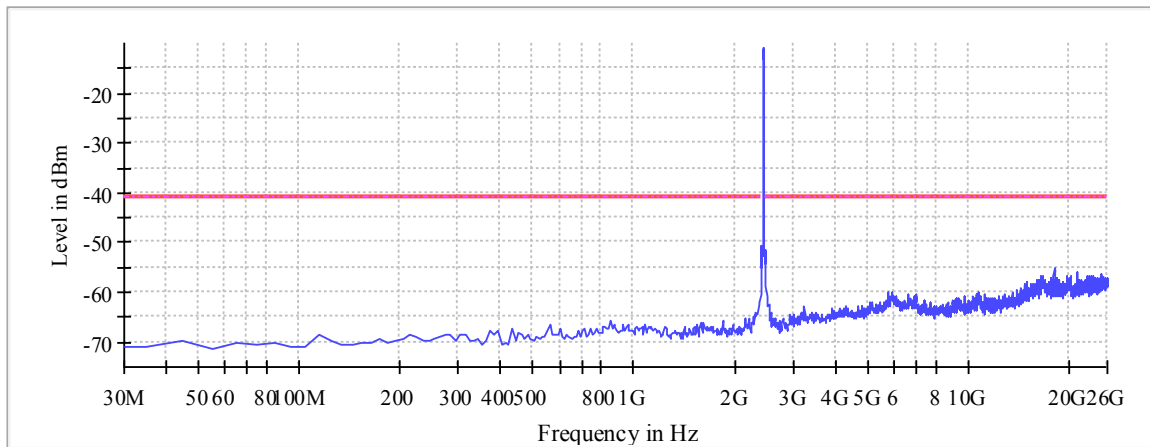


Plot 80: Mode 3, CSE, low channel, 2483.5 MHz – 26000 MHz



Plot 81: Mode 3, CSE, mid channel, 30 MHz – 26000 MHz

Spurious



— Limit — Sum Level - - - Threshold × Critical × Final Critical

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
18029.575542	-55.2	14.3	-41.0
18049.564067	-55.6	14.6	-41.0
18039.569805	-56.0	15.0	-41.0
21127.796961	-56.1	15.1	-41.0
24885.639715	-56.5	15.5	-41.0
18019.581279	-56.5	15.5	-41.0
16600.395984	-56.6	15.6	-41.0
20398.215788	-56.7	15.7	-41.0
22536.987994	-56.7	15.7	-41.0
23086.672439	-56.8	15.8	-41.0
23516.425733	-56.8	15.8	-41.0
19728.600191	-56.8	15.8	-41.0
16400.510731	-56.8	15.8	-41.0
25295.404484	-56.8	15.9	-41.0
19738.594454	-56.9	15.9	-41.0

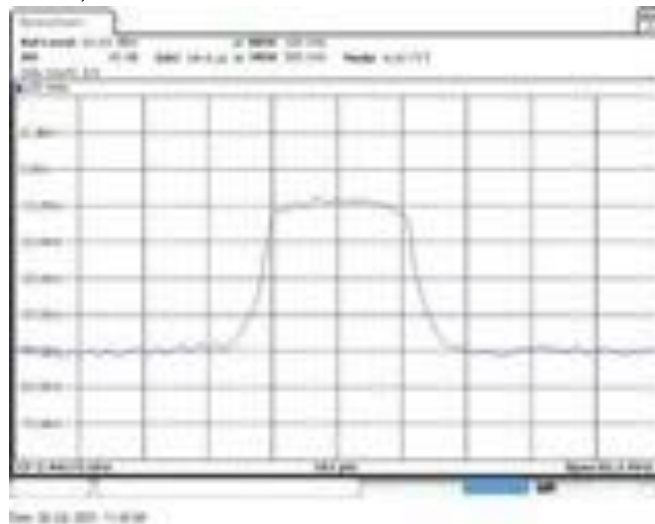
Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	2400.000000	1	1
2400.000000	2483.500000	1	1
2483.500000	26000.000000	1	1

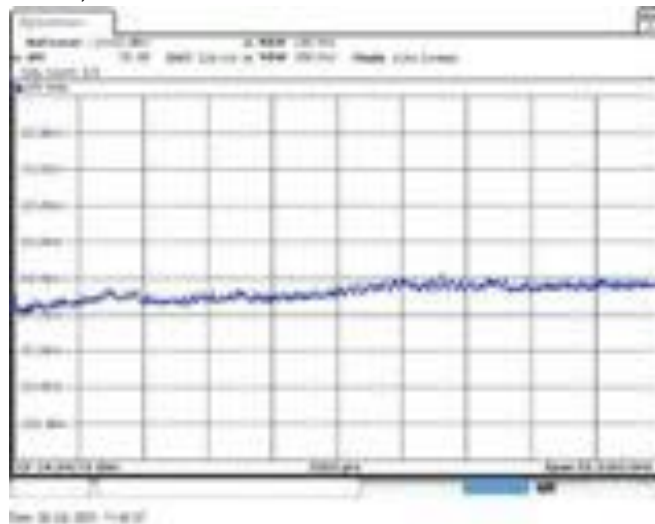
Plot 82: Mode 3, CSE, mid channel, 30 MHz – 2400 MHz



Plot 83: Mode 3, CSE, mid channel, 2400 MHz – 2483.5 MHz

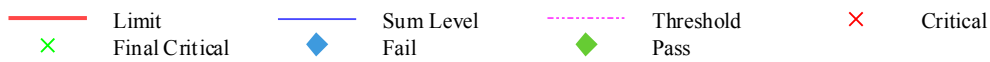
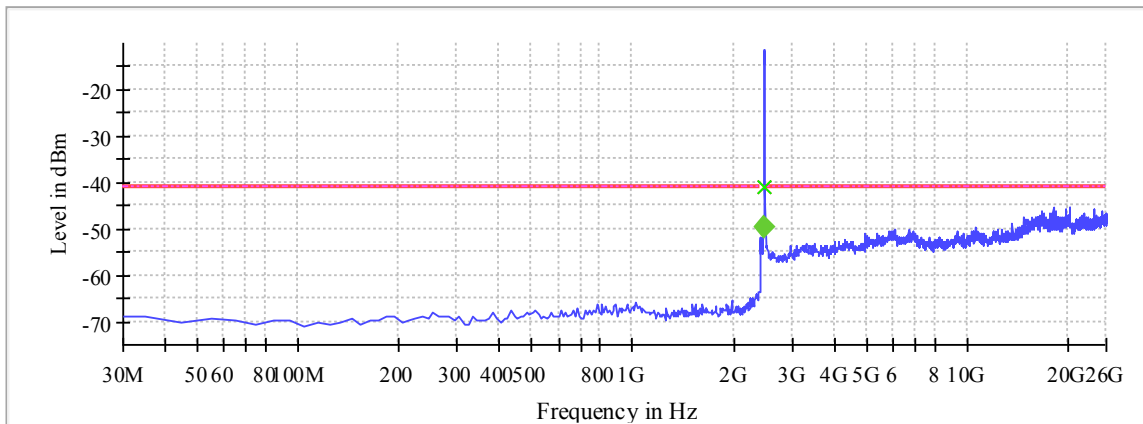


Plot 84: Mode 3, CSE, mid channel, 2483.5 MHz – 26000 MHz



Plot 85: Mode 3, CSE, high channel, 30 MHz – 26000 MHz

Spurious

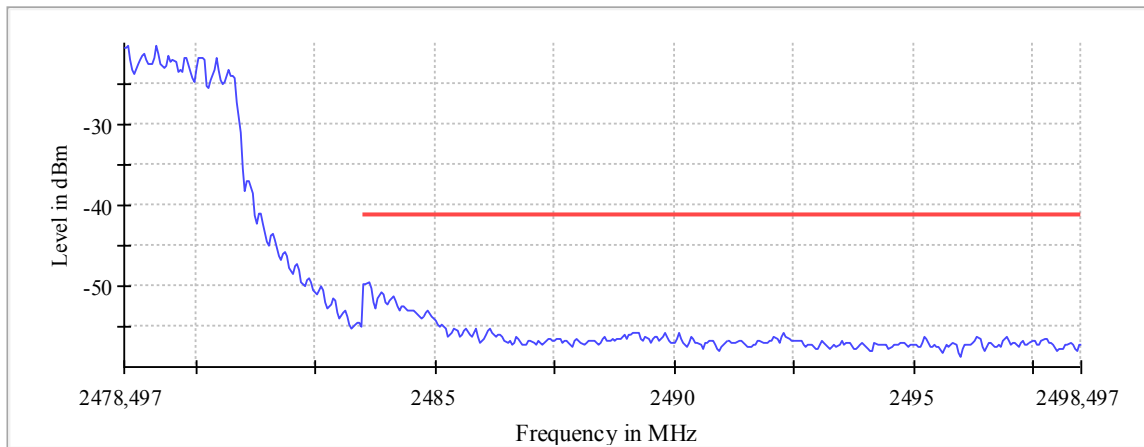


Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2488.497131	-40.9	-0.3	-41.1
20398.215788	-45.3	4.1	-41.1
18029.575542	-45.4	4.3	-41.1
19688.623141	-45.6	4.4	-41.1
23836.242138	-45.7	4.6	-41.1
18369.380472	-46.1	4.9	-41.1
25325.387272	-46.3	5.1	-41.1
16630.378772	-46.3	5.2	-41.1
18039.569805	-46.4	5.3	-41.1
18069.552592	-46.5	5.3	-41.1
17709.759137	-46.5	5.4	-41.1
16900.223863	-46.6	5.5	-41.1
19778.571504	-46.6	5.5	-41.1
20378.227263	-46.6	5.5	-41.1
20388.221526	-46.6	5.5	-41.1

Plot 86: Mode 3, CSE, high channel, final measurement at 2488.497131 MHz

FinalMeas_2488497131Hz



— Sum Level — Limit

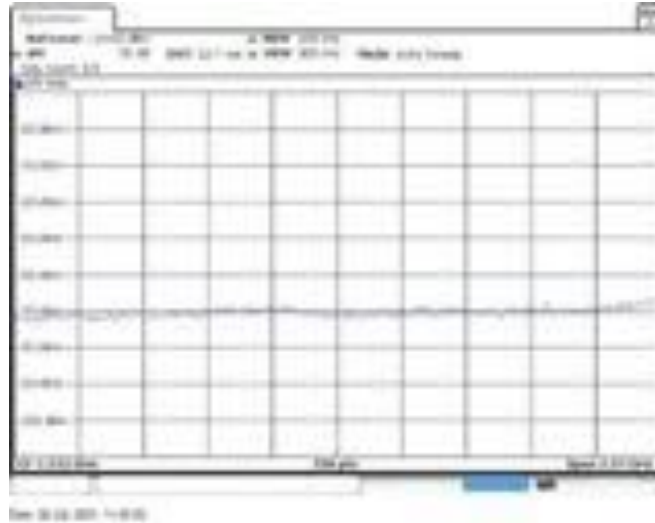
Final measurements

Frequency (MHz)	Level Pre Measurement (dBm)	level (dBm)	Limit (dBm)	Margin (dB)	Result
2483.609350	-41.5	-49.6	-41.1	8.4	PASS

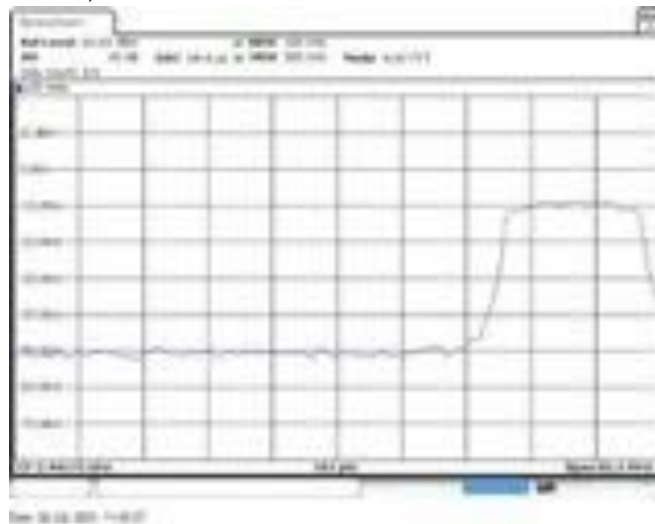
Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	2400.000000	1	1
2400.000000	2483.500000	1	1
2483.500000	26000.000000	1	1

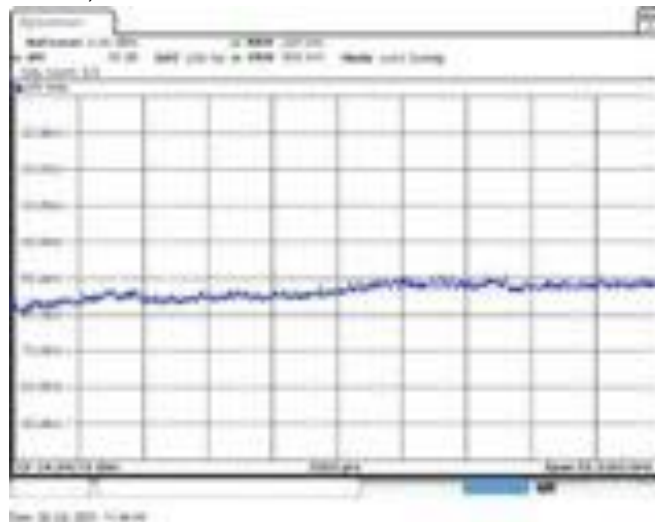
Plot 87: Mode 3 CSE, high channel, 30 MHz – 2400 MHz



Plot 88: Mode 3, CSE, high channel, 2400 MHz – 2483.5 MHz



Plot 89: Mode 3, CSE, high channel, 2483.5 MHz – 26000 MHz



7.9 Radiated Spurious Emissions (RSE)

Applicability

This requirement applies to all types of DTS equipment.

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

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Frequency [MHz]	Field Strength [$\mu\text{V}/\text{m}$] / [dB $\mu\text{V}/\text{m}$]	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

Radiated Spurious Emissions (RSE) are performed for low / high channel.

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




Test results						
EUT Mode / Channel	Test sample serial number	Frequency [MHz]	Peak/RMS Detector	Level** [dBm]	Limit [dBm]	Verdict
Mode 1 / low channel	61314	see next plots	MaxPeak	see next plots*	see next plots	- passed -
Mode 1 / high channel	61314	see next plots	MaxPeak	see next plots*	see next plots	- passed -
Mode 2 / low channel	61314	see next plots	MaxPeak	see next plots*	see next plots	- passed -
Mode 2 / high channel	61314	see next plots	MaxPeak	see next plots*	see next plots	- passed -
Mode 3 / low channel	61314	see next plots	MaxPeak	see next plots*	see next plots	- passed -
Mode 3 / high channel	61314	see next plots	MaxPeak	see next plots*	see next plots	- passed -

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

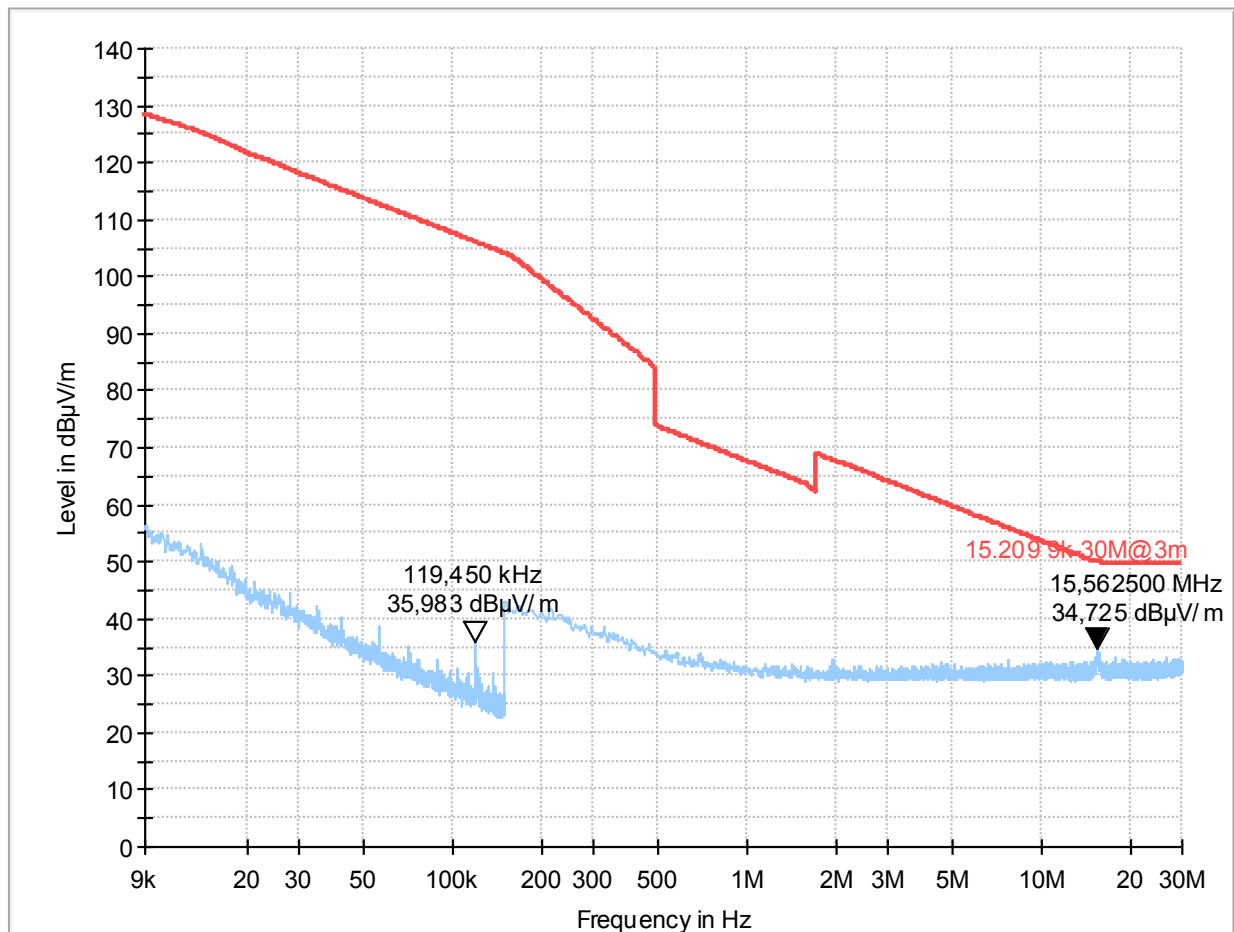
Comment:	---
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Verdict	- PASS -	<i>see next plots**</i>
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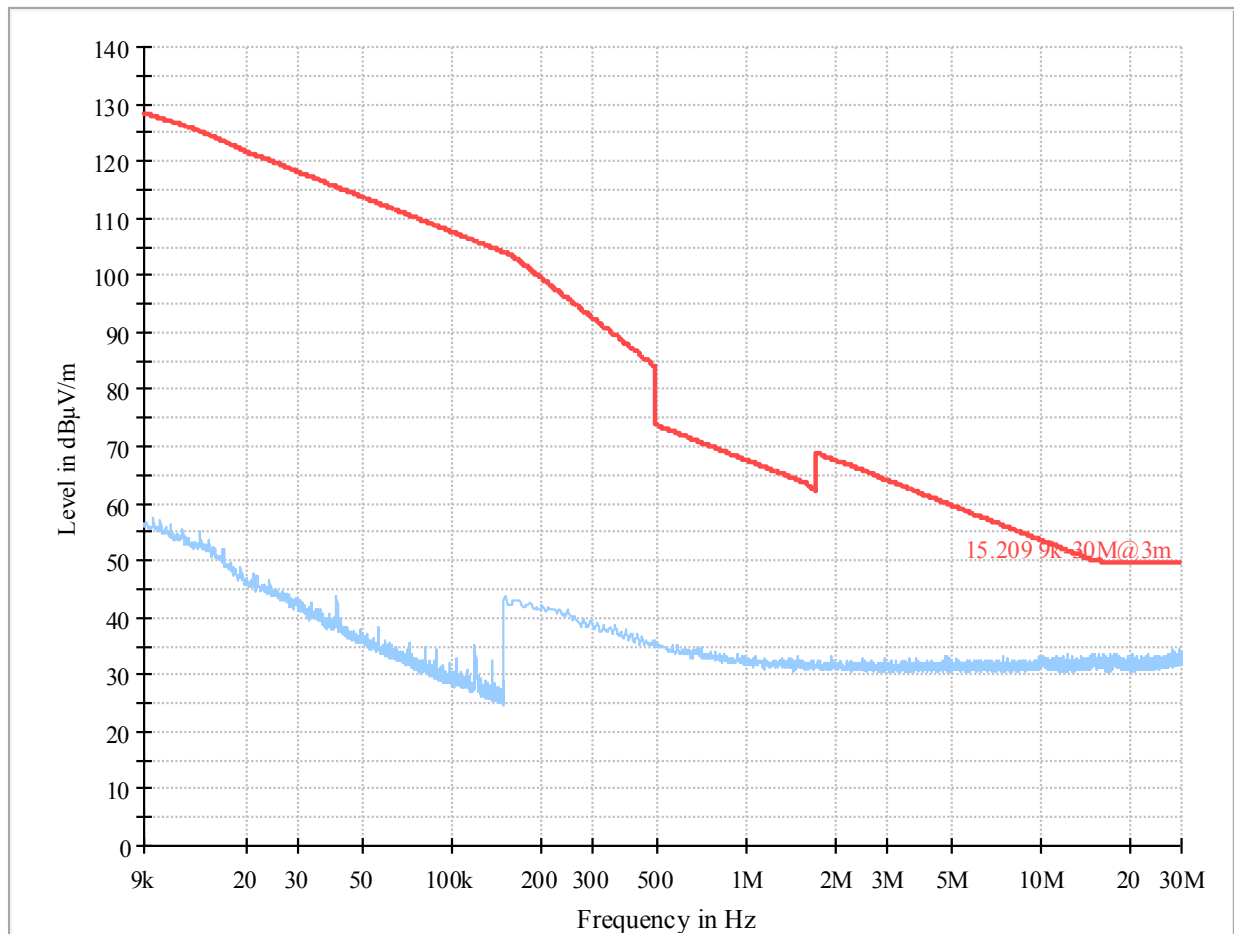
** description of line and marker for all radiated spurious emission (RSE) measurements:

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

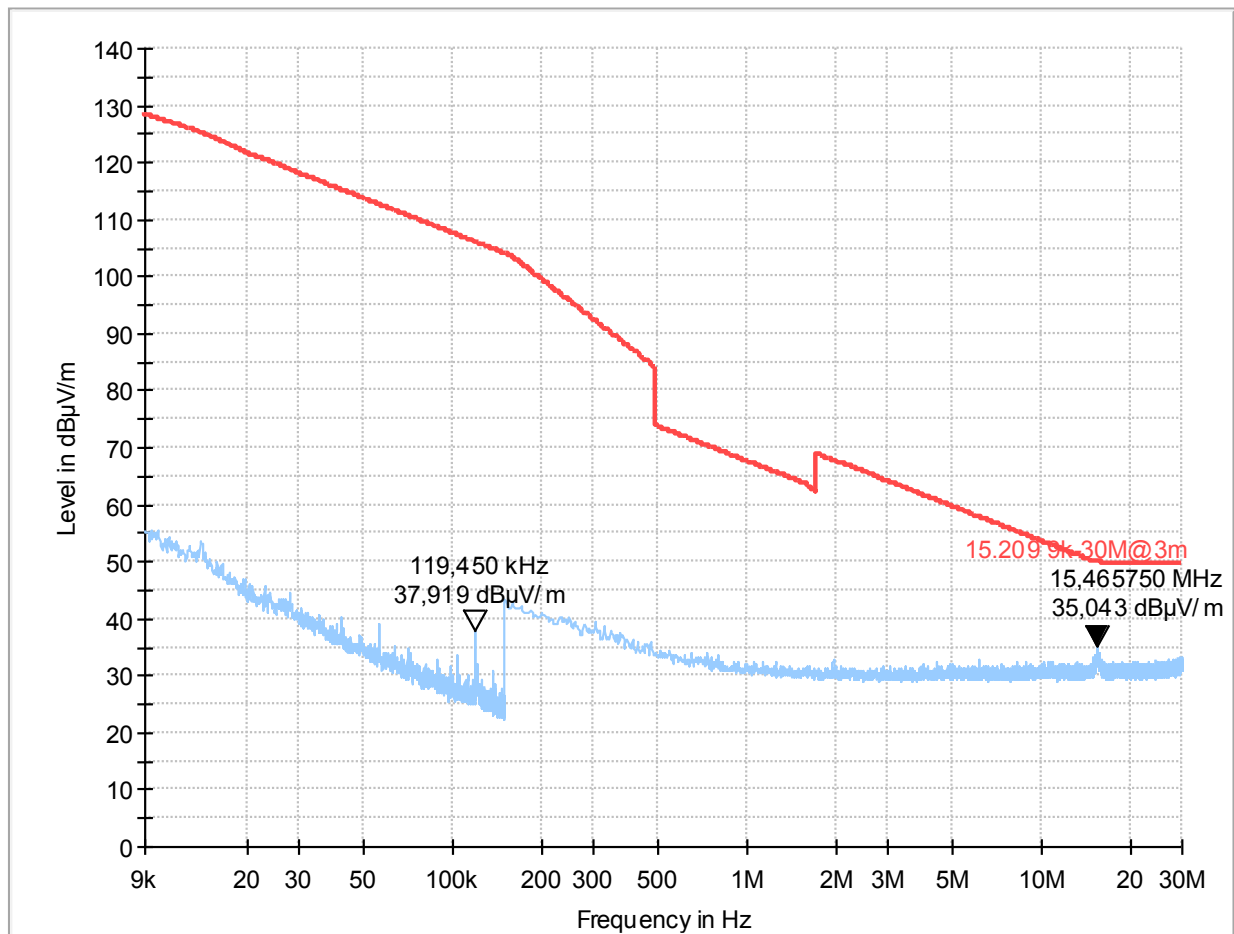
Plot 90: Mode 1, RSE, 9 kHz – 30 MHz, low channel, loop antenna (EUT laying)



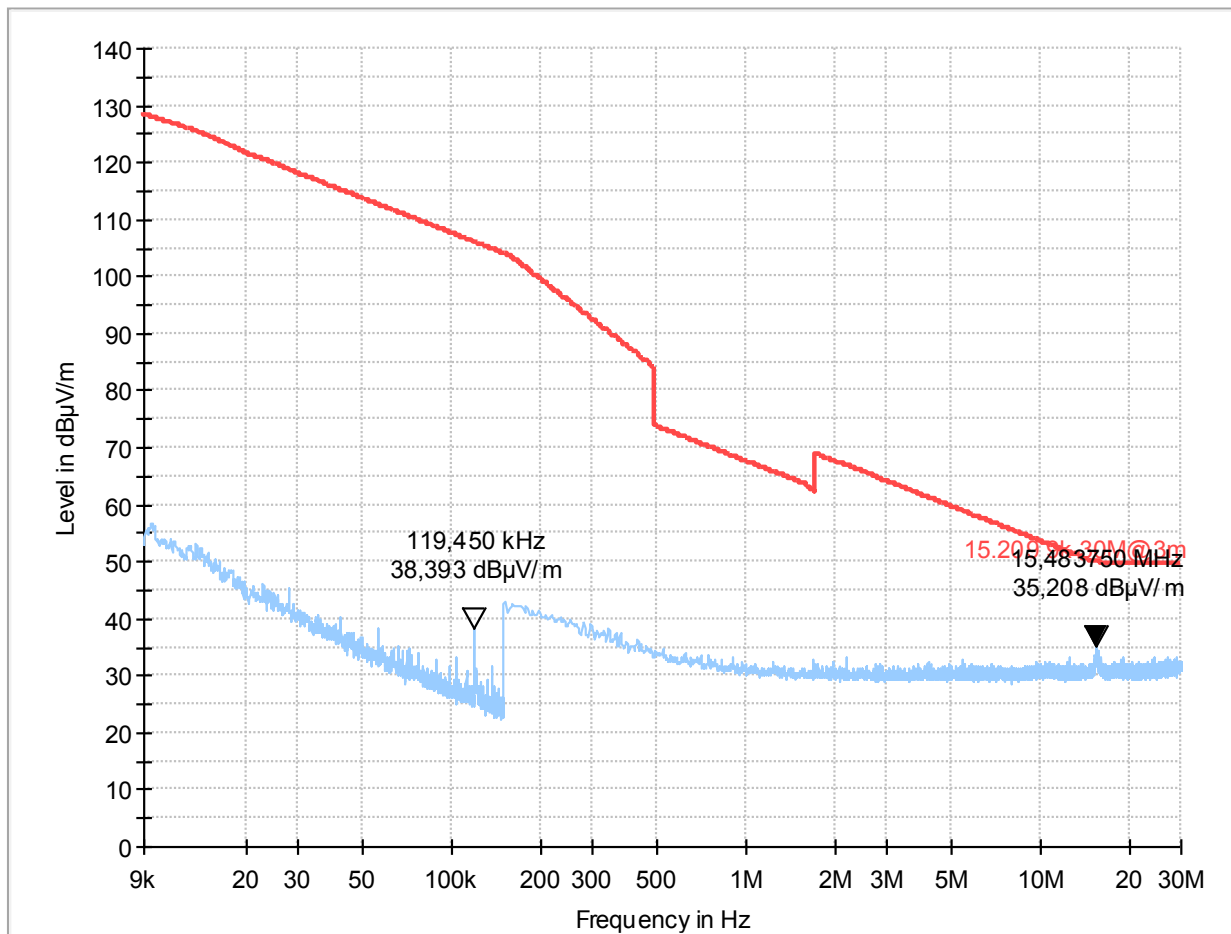
Plot 91: Mode 1, RSE, 9 kHz – 30 MHz, low channel, loop antenna (EUT standing)



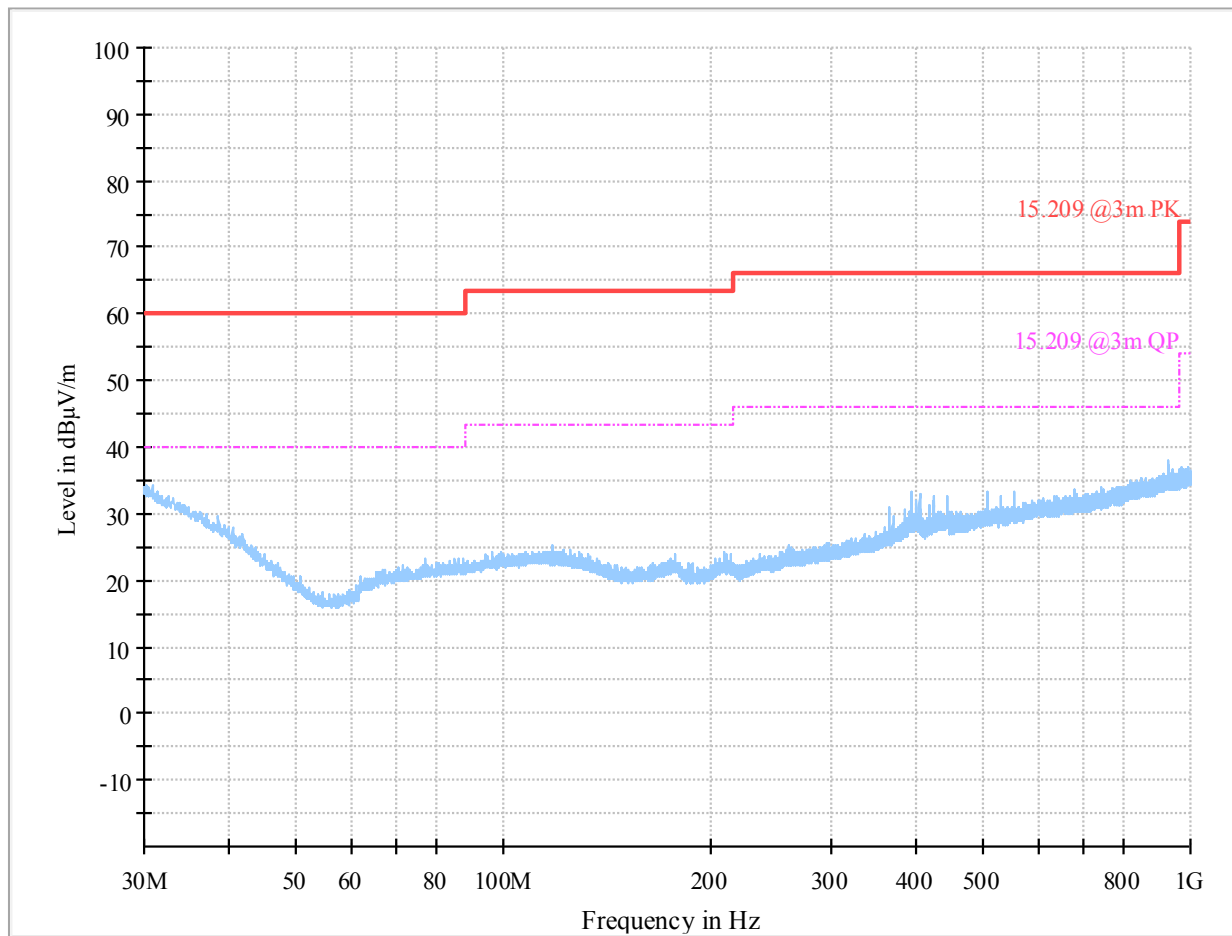
Plot 92: Mode 1, RSE, 9 kHz – 30 MHz, high channel, loop antenna (EUT laying)



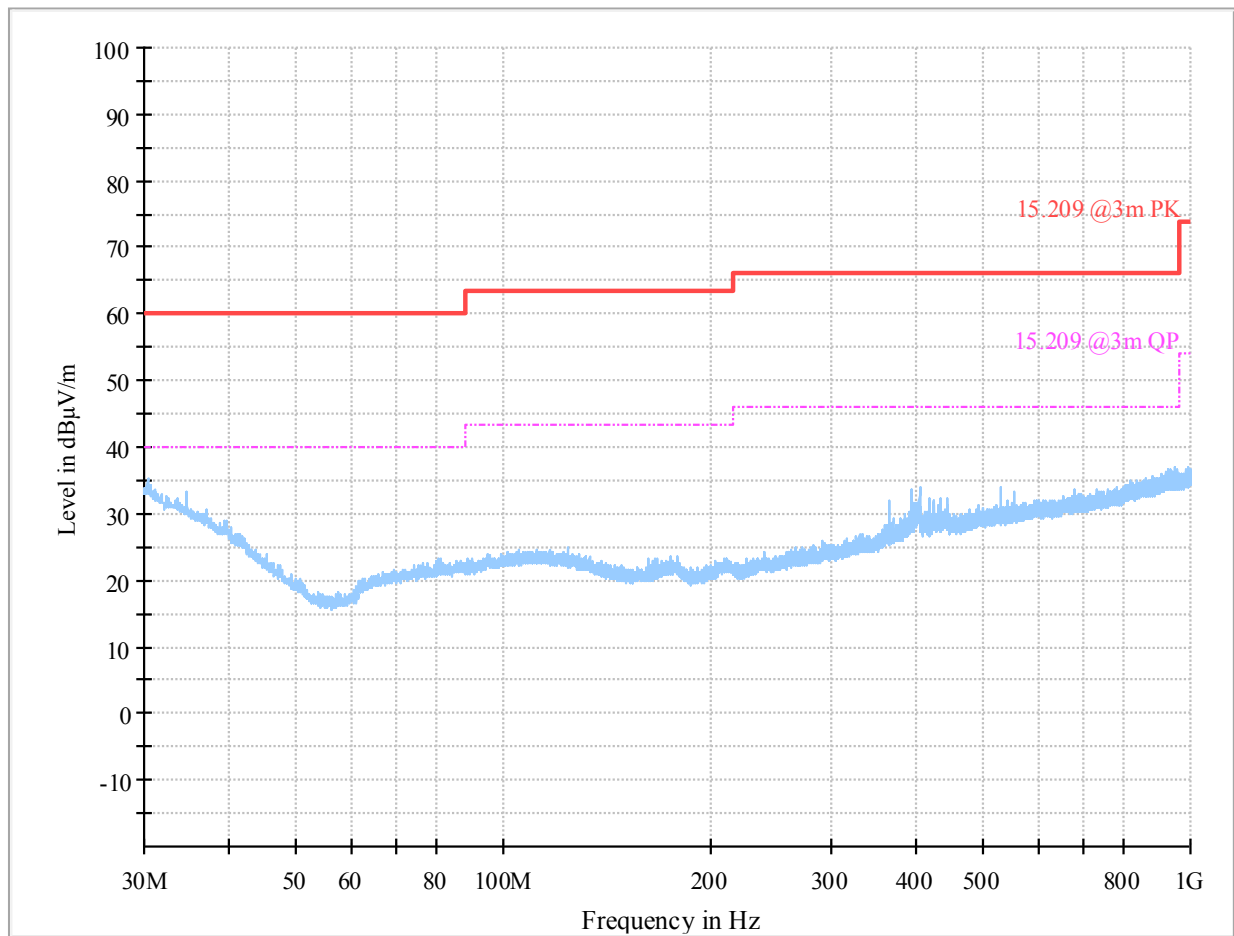
Plot 93: Mode 1, RSE, 9 kHz – 30 MHz, high channel, loop antenna (EUT standing)



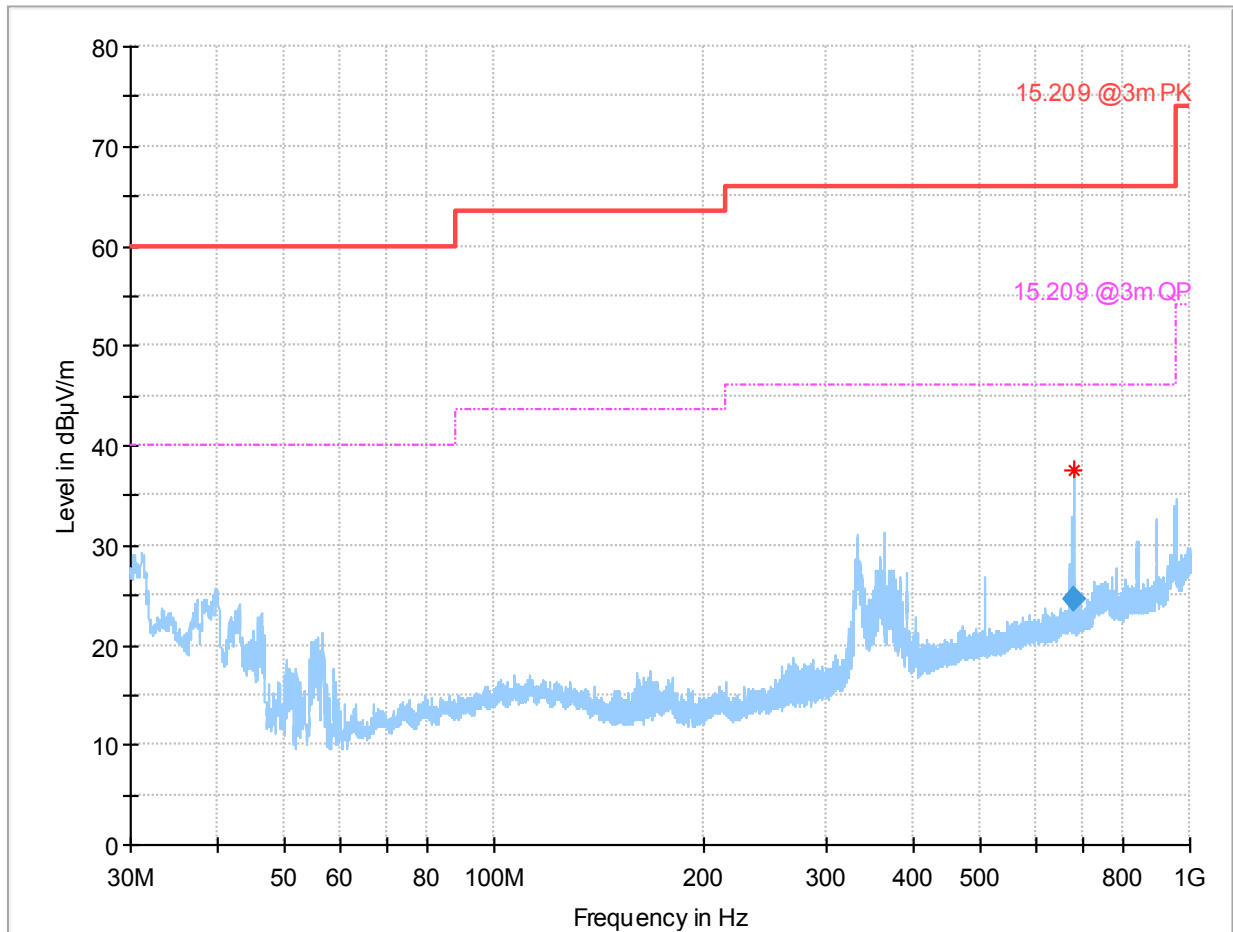
Plot 94: Mode 1, RSE, 30 MHz – 1 GHz, low channel, horizontal / vertical polarisation (EUT laying)



Plot 95: Mode 1, RSE, 30 MHz – 1 GHz, low channel, horizontal / vertical polarisation (EUT standing)



Plot 96: Mode 1, RSE, 30 MHz – 1 GHz, high channel, horizontal / vertical polarisation (EUT laying)



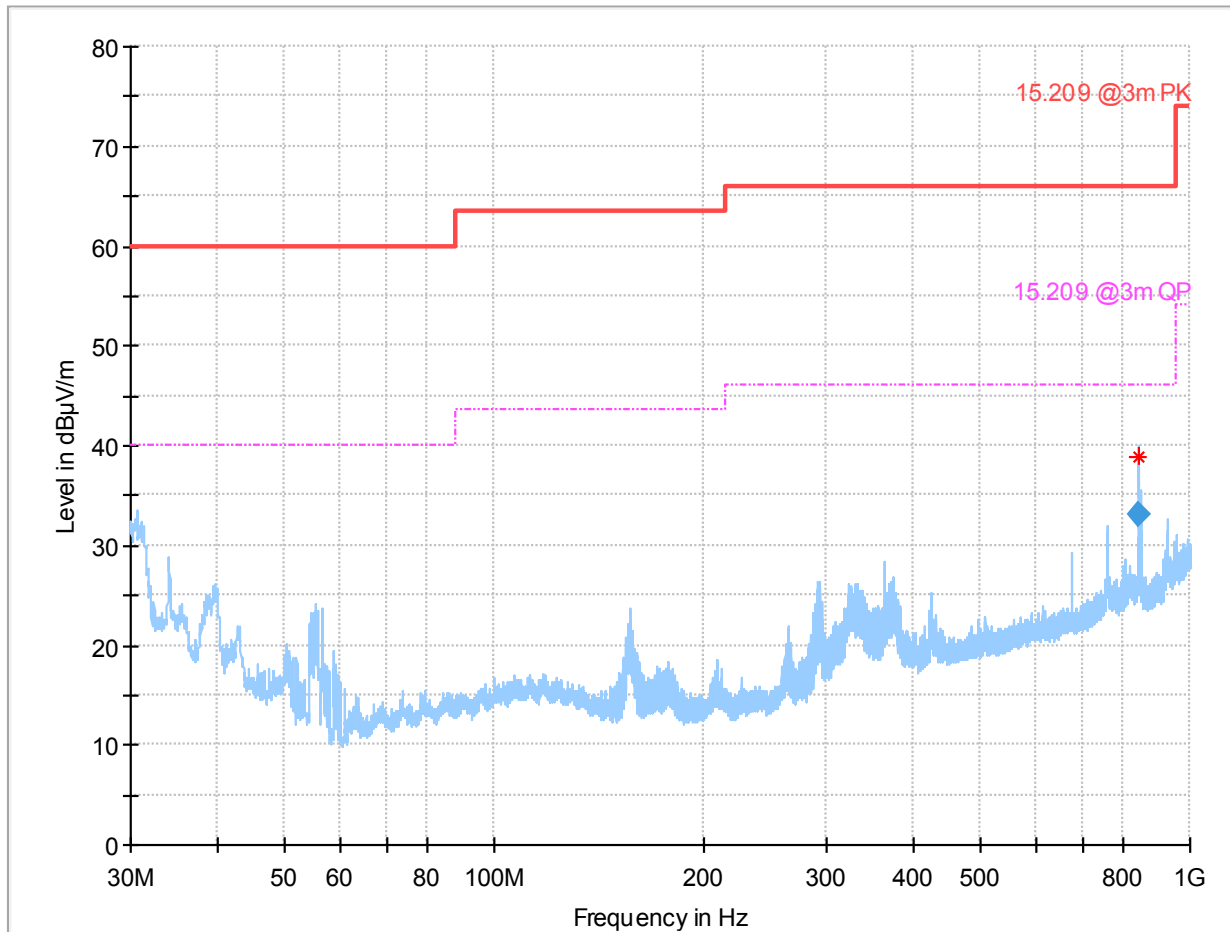
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
681.600000	24.68	66.00	41.32	100.0	120.000	131.0	V	80.0

(continuation of the "Final_Result" table from column 15 ...)

Frequency (MHz)	Corr. (dB/m)	Comment
681.600000	20.6	17:55:22 - 02.08.2021

Plot 97: Mode 1, RSE, 30 MHz – 1 GHz, high channel, horizontal / vertical polarisation (EUT standing)



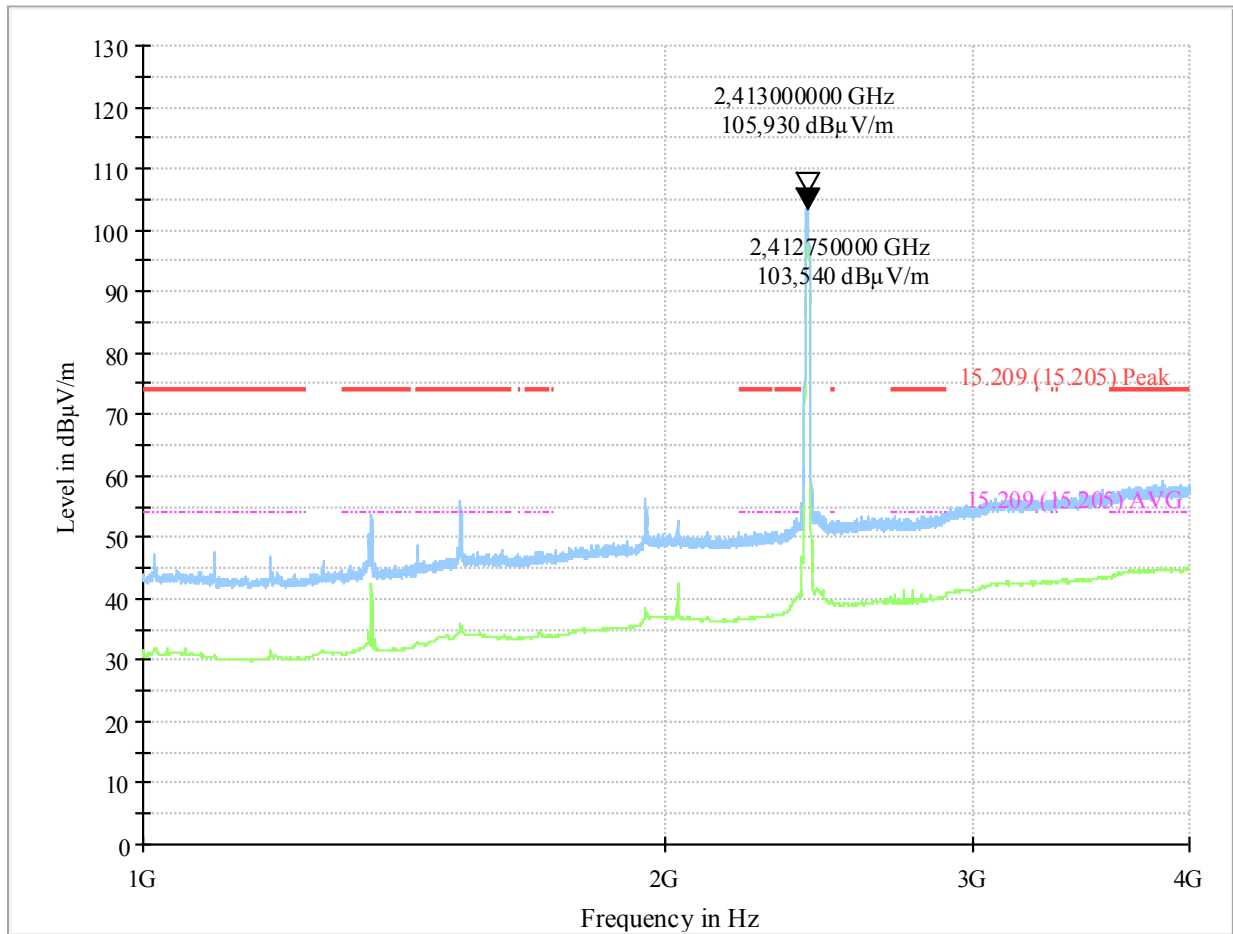
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
846.350000	33.10	66.00	32.90	100.0	120.000	103.0	V	184.0

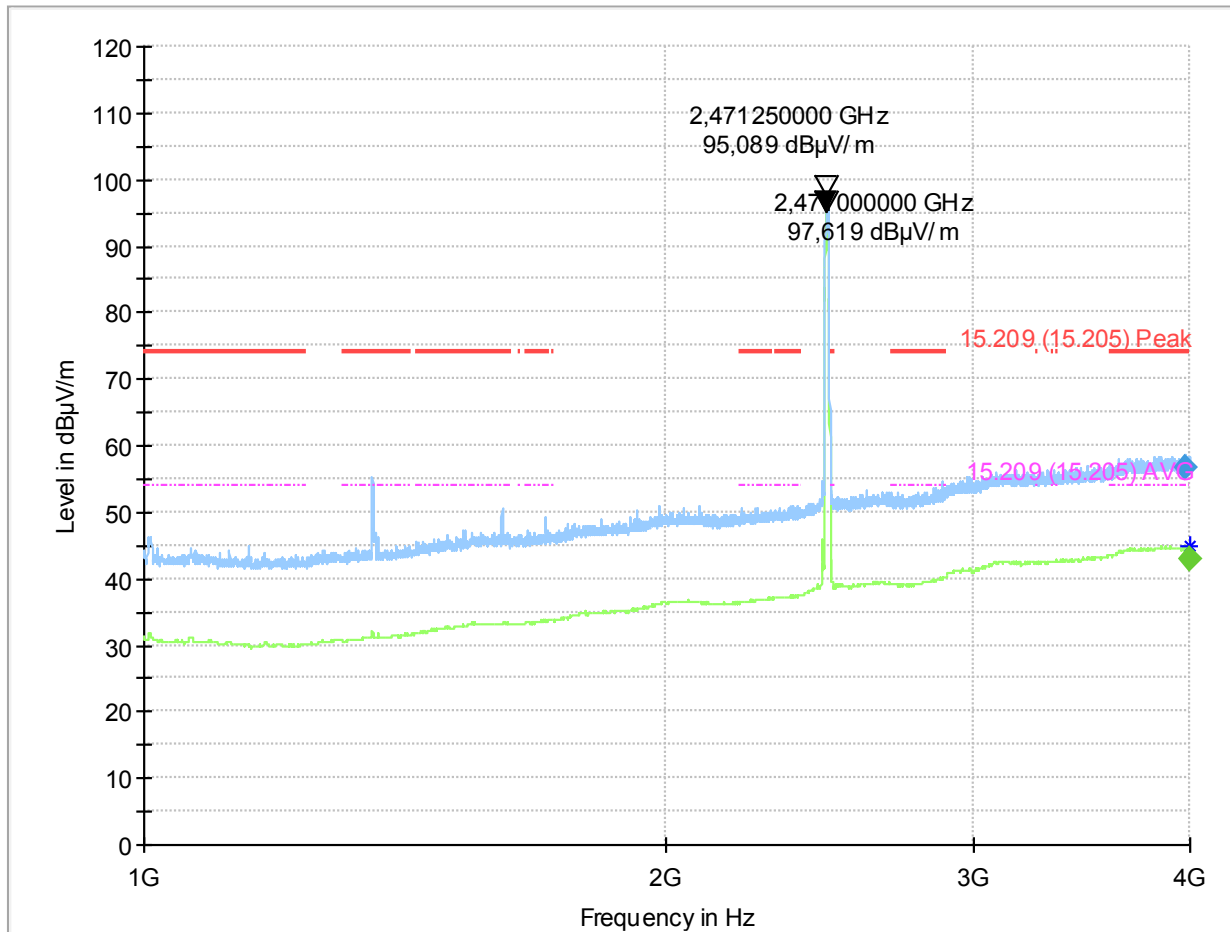
(continuation of the "Final_Result" table from column 15 ...)

Frequency (MHz)	Corr. (dB/m)	Comment
846.350000	22.5	10:10:08 - 03.08.2021

Plot 98: Mode 1, RSE, 1 GHz – 4 GHz, low channel, horizontal / vertical polarisation



Plot 99: Mode 1, RSE, 1 GHz – 4 GHz, high channel, horizontal / vertical polarisation



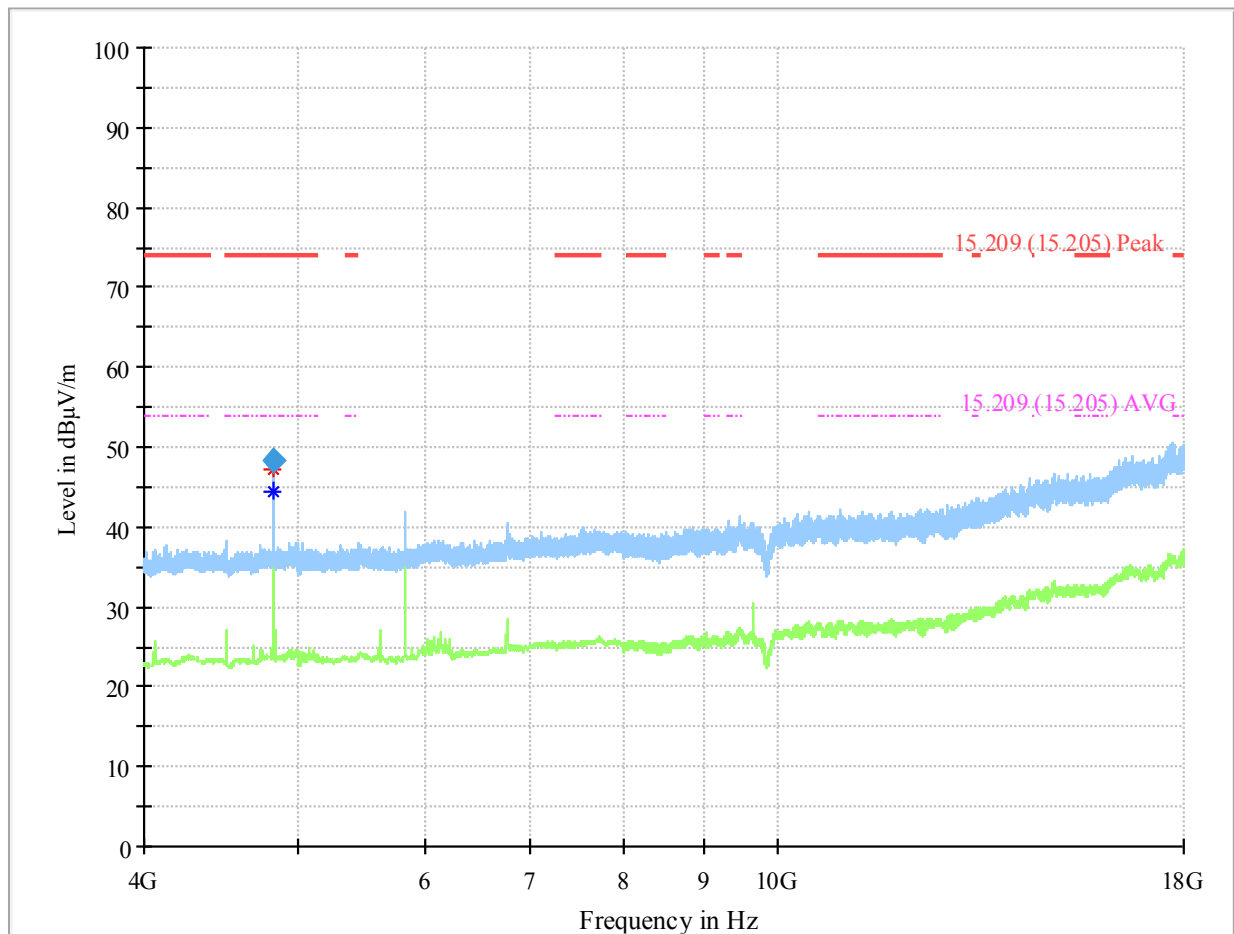
Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
3976.250000	56.53	---	74.00	17.47	100.0	1000.000	150.0	H
3996.500000	---	43.01	54.00	10.99	100.0	1000.000	150.0	H

(continuation of the "Final_Result" table from column 14 ...)

Frequency (MHz)	Azimuth (deg)	Corr. (dB/m)	Comment
3976.250000	82.0	38.5	14:49:56 - 31.07.2021
3996.500000	273.0	38.5	14:50:45 - 31.07.2021

Plot 100: Mode 1, RSE, 4 GHz – 18 GHz, low channel, horizontal / vertical polarisation



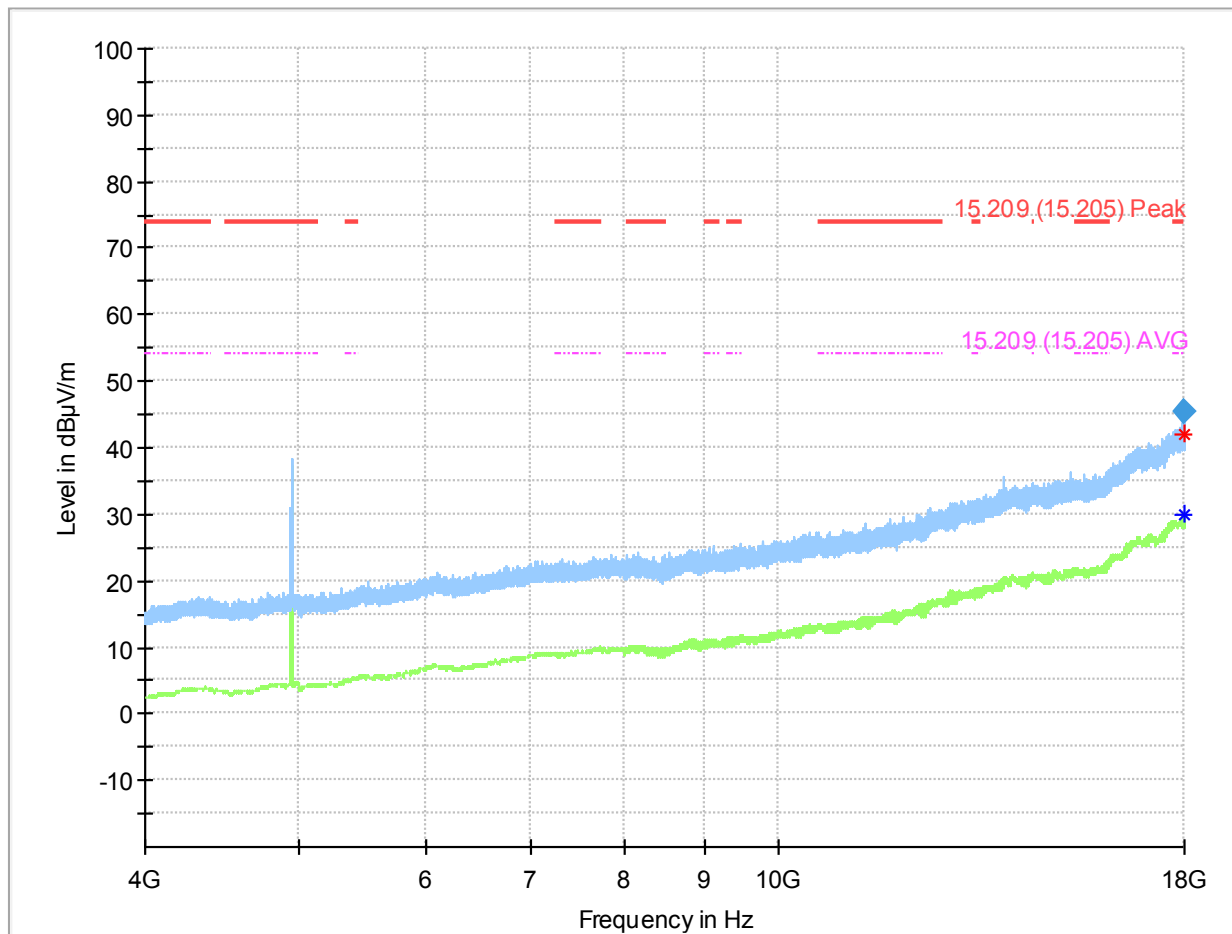
Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
4824.025000	48.22	74.00	25.78	100.0	1000.000	150.0	V	49.0

(continuation of the "Final_Result" table from column 15 ...)

Frequency (MHz)	Elevation (deg)	Corr. (dB/m)	Comment
4824.025000	90.0	7.4	19:15:28 - 26.08.2021

Plot 101: Mode 1, RSE, 4 GHz – 18 GHz, high channel, horizontal / vertical polarisation



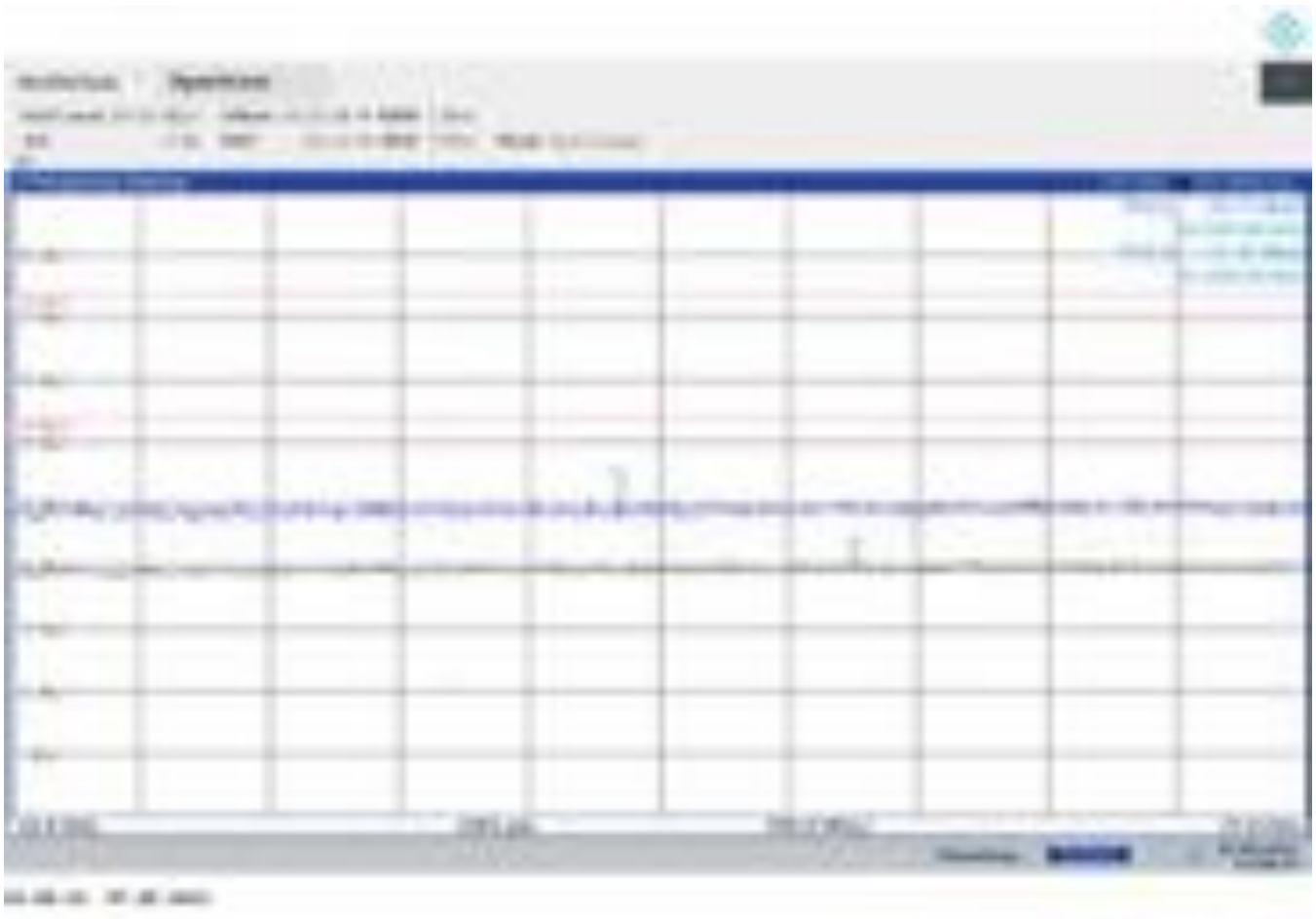
Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
17980.600000	45.44	74.00	28.56	100.0	1000.000	150.0	V	245.0

(continuation of the "Final_Result" table from column 15 ...)

Frequency (MHz)	Corr. (dB/m)	Comment
17980.600000	29.4	15:24:08 - 31.07.2021

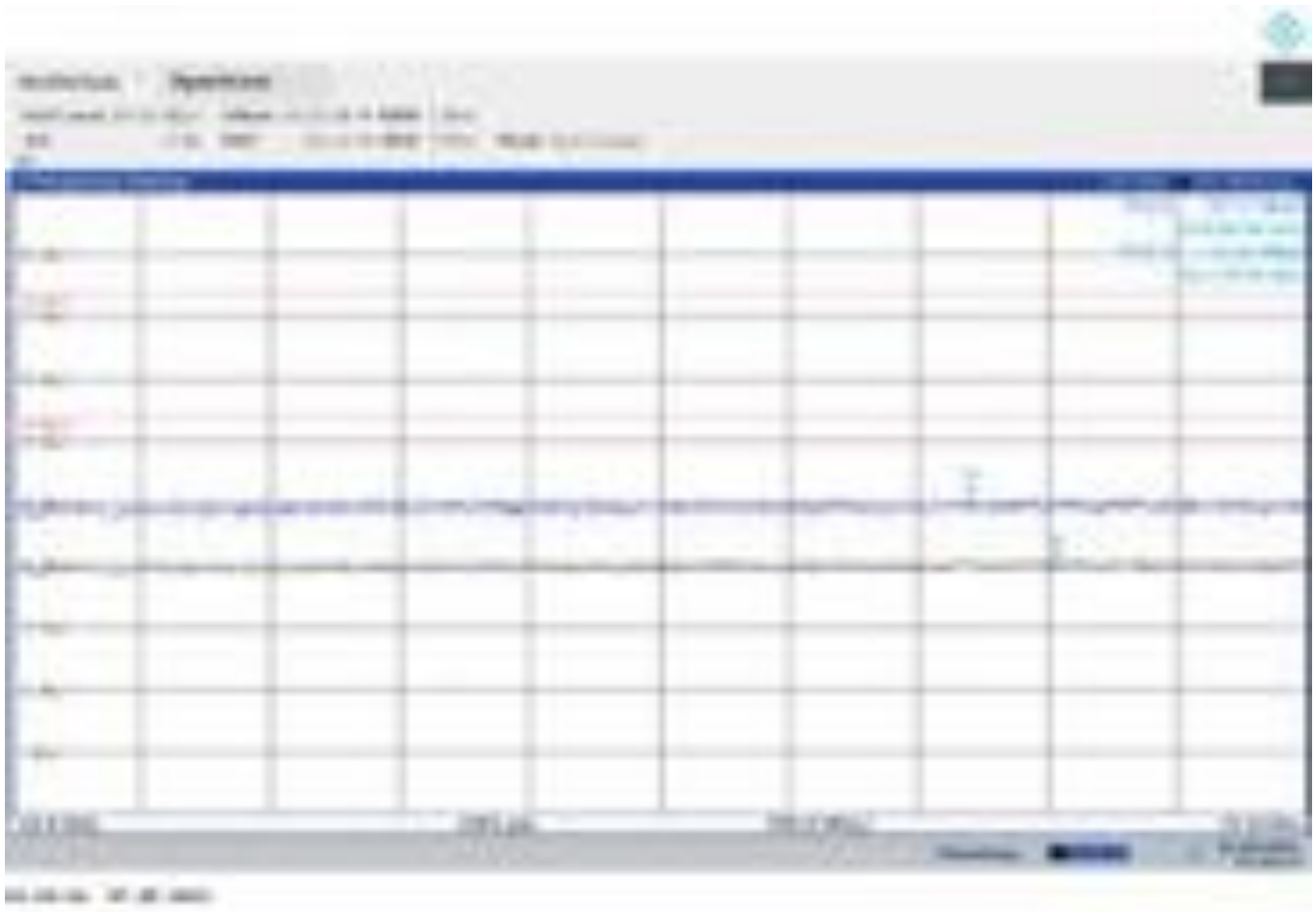
Plot 102: Mode 1, RSE, 18 GHz – 26.5 GHz, low channel, horizontal / vertical polarisation



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Plot 103: Mode 1, RSE 18 GHz – 25 GHz, high channel, horizontal / vertical polarisation



Plot 104: Mode 2, RSE, 9 kHz – 30 MHz, low channel, loop antenna (EUT laying)

