FCC Part 15C TEST REPORT

Report Number	487/24/04634/FCC	Rev. 00
Date of document	2024-11-14	
Total number of pages	Pag. 41	
OBJECT	FCC Part15C	
CUSTOMER	TMS Products BV	
EQUIPMENT UNDER TEST - DESCRIPTION	Motorsport Display	
MODEL	T DASH XL	

SUMMARY

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Approved and issued by *(Name + Signature)*	ALESSANDRO ZUCCATO *Lab Director*	

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History sheet of test Report			
Report Number	**Rev.**	**Date**	**Description of modification**
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1 OBJECT OF THE TESTS

The objective of the tests is the evaluation of the conformity of the EUT to the requirements of the standards and test methods specified on par. 4 of present Test Report.

2 IDENTIFICATION

2.1 Laboratory

Name : Kiwa Creiven S.r.l.
Street: Corso Spagna, 12
City : 35127 Padova - ITALY
Phone : +39.049.8704036
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2.2 Customer

Manufacturer: TMS Products BV
Street: 2e Havenstraat 3
City: Ijmuiden – The Netherlands
Phone: +31 654680808
Refer to: Mr M. Schaap

3 EQUIPMENT UNDER TEST (EUT)

3.1 EUT identification (declared under responsibility of the customer)

EUT Description: Motorsport Display
Model: T DASH XL
Code: N.A.
Serial N°: 21444
Software release: 1.34
Size: 78.5*49*16 (mm)
Manufacturer: TMS Products BV
Supply voltage: Typical 12VDC
Rated Electrical Power: 1 W
Rated Input Current: 80 mA
FCC ID: 2BLBWTDSH

3.2 EUT classifications

The manufacture declared the following classification:

Object	Descriptions
Operating frequency range	2400-2480 MHz
Equipment type	BLE – Bluetooth Low Energy
Nominal Channel Bandwidth	1 MHz
Frequency Hopping Spread Spectrum	YES
Listen Before Talk	NO
Adaptive	NO
Number of Channels	80
Antenna Type	Embedded Ceramic SMT
Extreme Temperature Range	-20°C ÷ +85°C
Manufacturer declaration	Annex E _04638LP

3.3 EUT additional information

Object	Descriptions
Classification of installation and use	☐ Stand-alone ☒ Combined Equipment (Equipment where the radio part is fully integrated within another type of equipment) ☐ Plug-in radio device (Equipment intended for a variety of host systems) ☐ Other
Means for connection to the supply:	☐ Supply cord fitted with a plug ☒ Supply cord without plug (for permanently connection to fixed wiring) ☐ Battery ☐ Appliance provided with a set of terminals allowing the connection of cables or fixed wiring
Date of receipt of test item	2024-10-31
Date(s) of performance of tests	See the data specified in test results details

3.4 EUT cables

The EUT has been configured by the manufacturer with the following input / output cables:

Classification	Description	Cable		note
		Shielded	Specified max. length	
DC power port	d.c. input cable	☐	☒ none ☐ ≤ 1m ☐ ≤ 3m ☐ ≤ 10m ☐ ≤ 30m	

3.5 EUT Auxiliary Equipments (AEs)

None.

3.6 Sampling and adopted criteria

Equipment used for testing was selected by the customer. Sampling criteria adopted by the customer is unknown to Kiwa Creiven laboratory.

3.7 EUT documents

The following documentations have been provided by the customer

Kiwa Creiven document reference	Descriptions
Annex E_04638LP	Manufacturer declaration

4 STANDARDS AND TEST METHODS

4.1 Reference standards

DOCUMENT	DATE	OBJECT
ANSI C63.10	2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

4.1.1 Test summary

The following table specifies the tests required by the reference standard and test performed on EUT.

TEST	FCC Rule	Note	Results
Channel Separation	***§15.247 (a)(1)***	Not tested as required by the customer	---
Minimum Hopping Channel	***§15.247 (a)(1)(iii)***	Not tested as required by the customer	---
6 dB (DTS) & 20 dB Bandwidth & 99% of power	***§15.247 (a)(2) §15.215 (c)***	Not tested as required by the customer	---
Dwell Time	***§15.247 (a)(1)(iii)***	Not tested as required by the customer	---
Peak Output Power (Conducted)	***§15.247 (b)(3)***	Not tested as required by the customer	---
AC Power Line Conducted Emissions	***§15.207***	Not applicable	---

Spurious Emissions (Radiation)	***§15.209***	---	***Complies***
Band edge measurement	***§15.247 (d)***	Not tested as required by the customer	**---**
Power spectral density	***§15.247 (e)***	Not tested as required by the customer	**---**

4.2 Test methods

DOCUMENT	DATE	METHOD	ACCREDIA accreditation	Test Sequence (See Note 1)
C63.10	2013	Spurious Emissions (Radiation)	Yes	01
Note : 1) The tests have been carried out in the order specified in this column				

4.3 Deviation from test methods

None.

5 EUT OPERATING CONDITIONS DURING TESTS

The EUT was set to function as indicated in Table 1, in compliance with the manufacturer's prescriptions and with that which is stated in the applied standards, test methods and procedures.

OPERATING CONDITION	DESCRIPTION OF FUNCTIONING
TX01	EUT details: during the test the EUT • was powered at 12 Vdc • was in continuous working state/ Device operated in standard continuous transmit mode (Cont TX function) • Lowest channel was activated (2404 MHz) • Channel was set to 0 dBm as power level
TX02	EUT details: during the test the EUT • was powered at 12 Vdc • was in continuous working state/ Device operated in standard continuous transmit mode (Cont TX function) • Medium channel was activated (2442 MHz) • Channel was set to 0 dBm as power level
TX03	EUT details: during the test the EUT • was powered at 12 Vdc • was in continuous working state/ Device operated in standard continuous transmit mode (Cont TX function) • Highest channel was activated (2480 MHz) • Channel was set to 0 dBm as power level

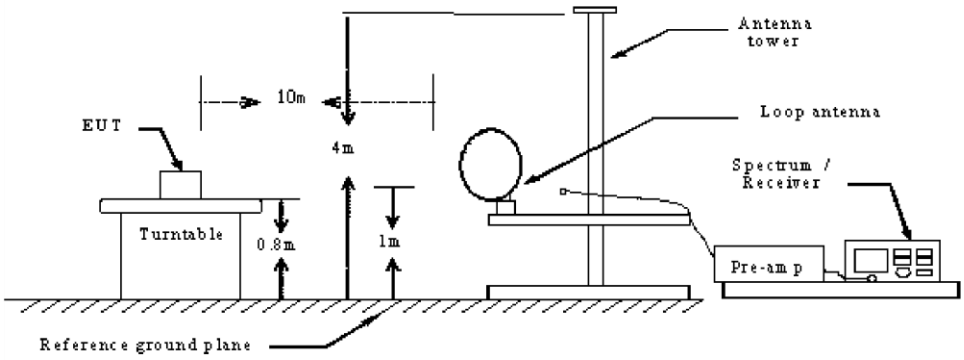
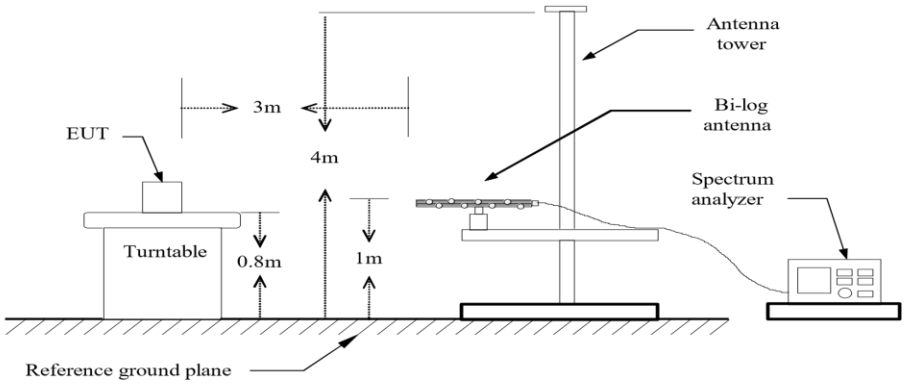
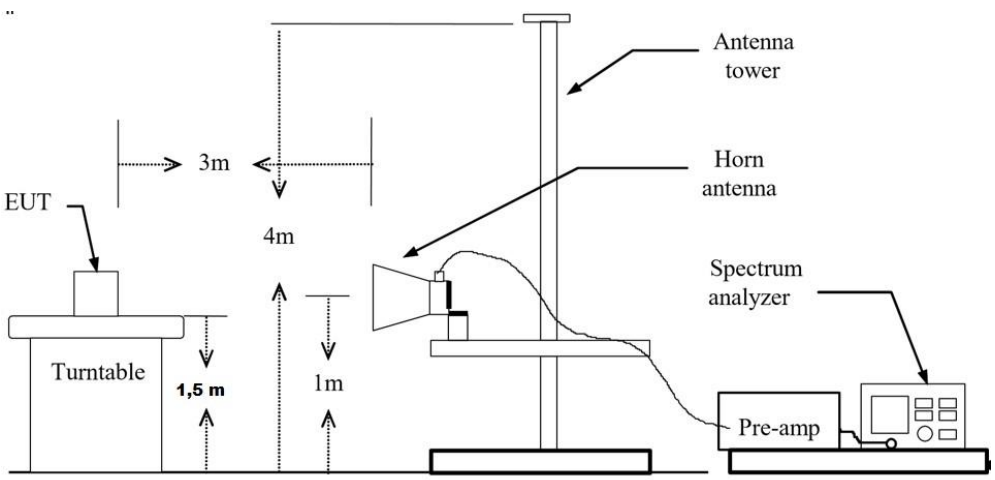
6 TEST RESULTS

Test method:	**FCC part 15 C - § 15.209** **Spurious Emission (Radiation)** For details see par. 4 of this report	
Operator	Marco Nicolè	
Test Date	2024-11-12	
Test Temperature	21 °C	
Test Humidity	57 %	
Test Pressure	1021 hPa	
EUT Classification	None.	
Electrical wiring	*Cable*	*Length [m]*
	Dc input cable	2.0
Operating conditions	TX01; TX02; TX03 See par. 5 of this report	
Auxiliary equipment (AE)	See par. 3.5 of this report	

Limits

Frequency (MHz)	Limits (dBuV/m)	Detector	Measured distance (m)
30~88	40	PK	3
88~216	43.5	PK	
216-960	46	PK	
Above 960	54	PK	

Frequency (GHz)	Limits (dBuV/m)	Detector	Measured distance (m)
1 - 40	54	AVG	3
1-40	74	PK	3

Test set up	Radiated Spurious Measurement: below 30MHz  Radiated Spurious Measurement: below 1GHz  Radiated Spurious Measurement: above 1GHz 
Frequency range	from 30 MHz up through the 10th harmonic
Measuring distance in the anechoic chamber	3 m
Test instrumentations	See Annex B
Measurement Uncertainty (k=2)	See Annex F

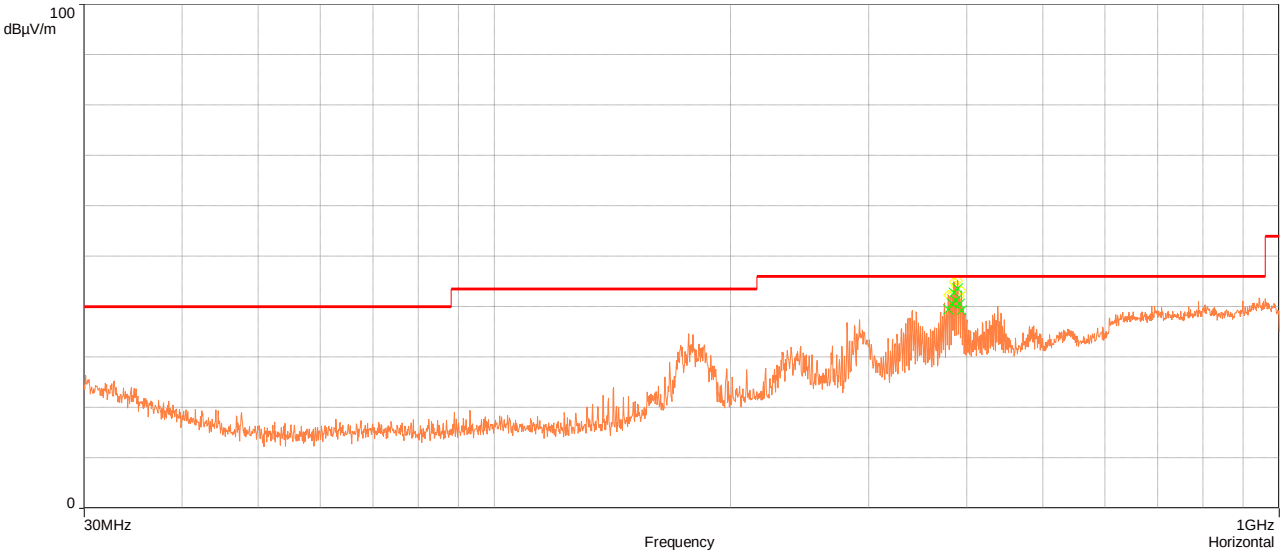
Test Procedure	**Radiated Emission (30 MHz – 1000 MHz) :** The preliminary radiated emissions measurement were carried out. The preliminary radiated measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT. The EUT configuration (in X, Y and Z axis), cable configuration and mode of operation were determined for producing the maximum level of emissions. These configurations were used for the final radiated emissions measurements. The measurement is carried out using a spectrum analyser or receiver. The Quasi-peak detector is used and RBW is set to 120kHz .The antenna height and turn table rotation is adjusted until the maximum power value is founded on spectrum analyser or receiver. **Radiated Emission (Above 1 GHz) :** The preliminary radiated emissions measurement were carried out. The preliminary radiated measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT. The EUT configuration (in X, Y and Z axis), cable configuration and mode of operation were determined for producing the maximum level of emissions. These configurations were used for the final radiated emissions measurements. The measurement is carried out using a spectrum analyser or receiver. The spectrum analyser scans from 1GHz to 25GHz (higher than the 10th harmonic of the carrier). The peak detector is used for Peak limit and RBW is set to 1MHz ,VBW ≥ 3RBW. The peak detector is used for Average limit and RBW is set to 1MHz ,VBW is not smaller than 1/T, T = to the shortest pulse width. The antenna height and turn table rotation is adjusted until the maximum power value is founded on spectrum analyser or receiver.
Note	---
EUT modification during this test	#01 See par. 10 of this report

TEST GRAPHS AND MEASUREMENTS

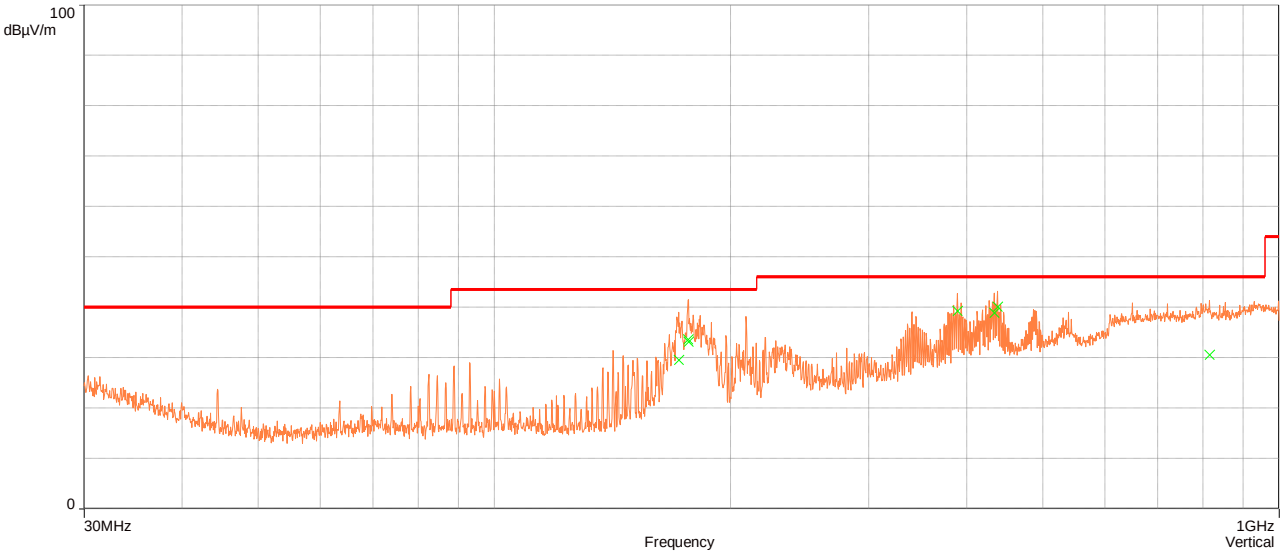
All traces have been acquired with Peak detector in Max-Hold mode (Maximum-Hold allows to record the maximum values of the spectra)

The final measurements are obtain consider the value read in the receiver minus the value of the column “Conversion Factor”.

Measurement 01 Horizontal
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 30MHz÷ 1GHz
Operating Condition: TX01

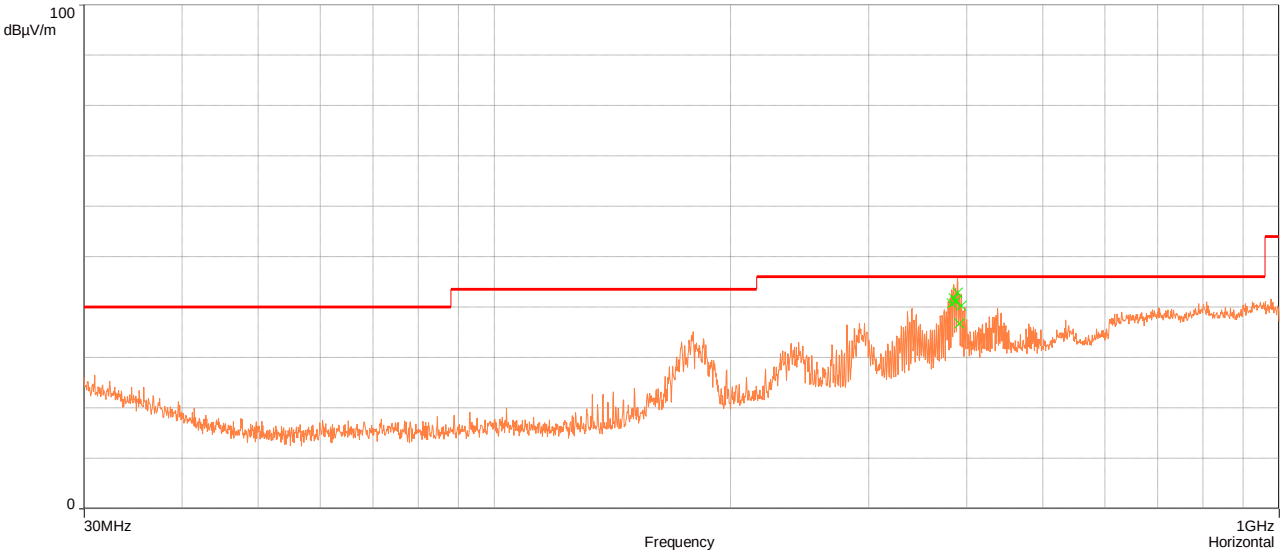


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 30MHz÷ 1GHz
Operating Condition: TX01

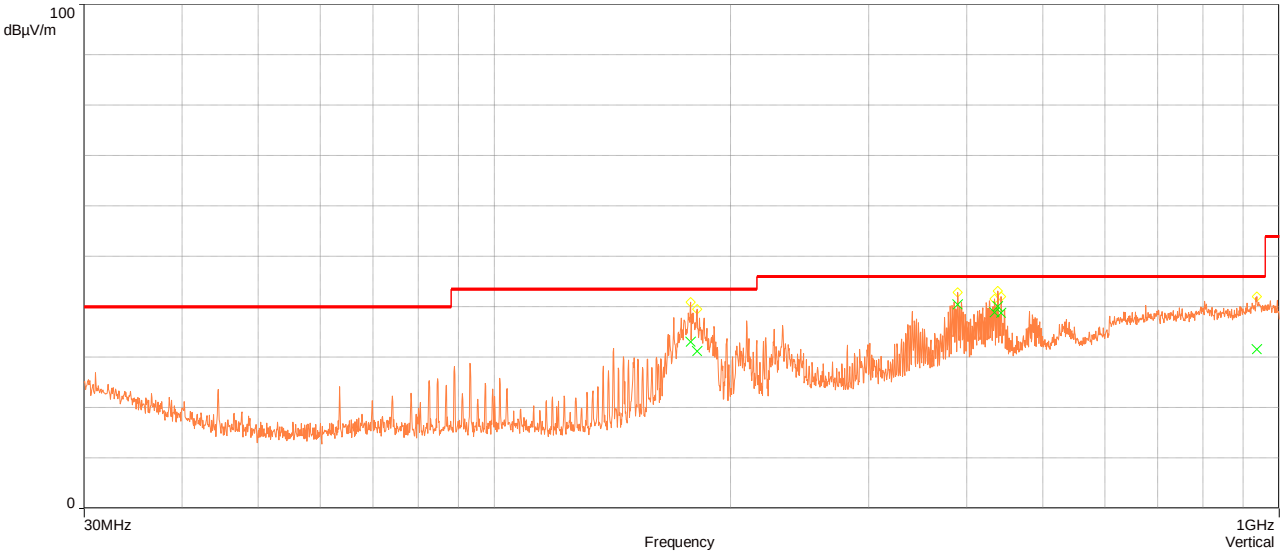


Frequency (MHz)	SR	Peak (dBµV/m)	QPeak (dBµV/m)	LimQPeak (dBµV/m)	Delta (dB)	Polarization	Height (m)	Angle (deg)	Conversion Factor
378.715	1	42.35	39.41	46.00	-6.59	Horizontal	1.00	359.90	22.62
382.9155	1	42.46	40.69	46.00	-5.31	Horizontal	1.00	359.90	22.73
385.015	1	44.91	42.74	46.00	-3.26	Horizontal	1.00	359.90	22.79
387.1155	1	44.16	41.25	46.00	-4.75	Horizontal	1.00	359.90	22.83
389.3355	1	45.21	43.66	46.00	-2.34	Horizontal	1.00	359.90	22.83
391.315	1	42.15	40.55	46.00	-5.45	Horizontal	1.00	359.90	22.84
393.535	1	43.19	39.28	46.00	-6.72	Horizontal	1.00	359.90	22.91
171.7755	2	39.00	29.51	43.52	-14.01	Vertical	1.00	149.70	15.21
176.4555	2	41.41	33.62	43.52	-9.90	Vertical	1.00	180.80	15.71
176.815	2	41.49	33.13	43.52	-10.39	Vertical	1.00	149.70	15.77
389.275	2	42.65	39.23	46.00	-6.77	Vertical	1.00	270.30	22.83
433.615	2	42.80	38.88	46.00	-7.12	Vertical	1.00	120.00	23.90
437.815	2	43.12	40.10	46.00	-5.90	Vertical	1.00	120.00	23.87
815.8755	2	41.32	30.53	46.00	-15.47	Vertical	3.93	359.90	31.54

Measurement 01 Horizontal
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 30MHz÷ 1GHz
Operating Condition: TX02

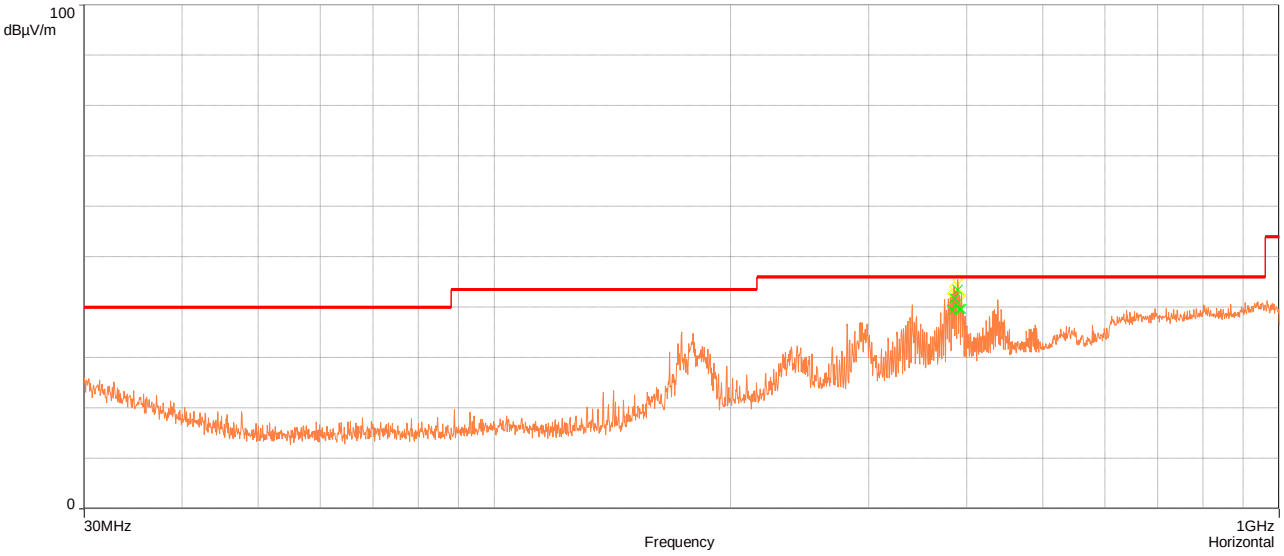


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 30MHz÷ 1GHz
Operating Condition: TX02

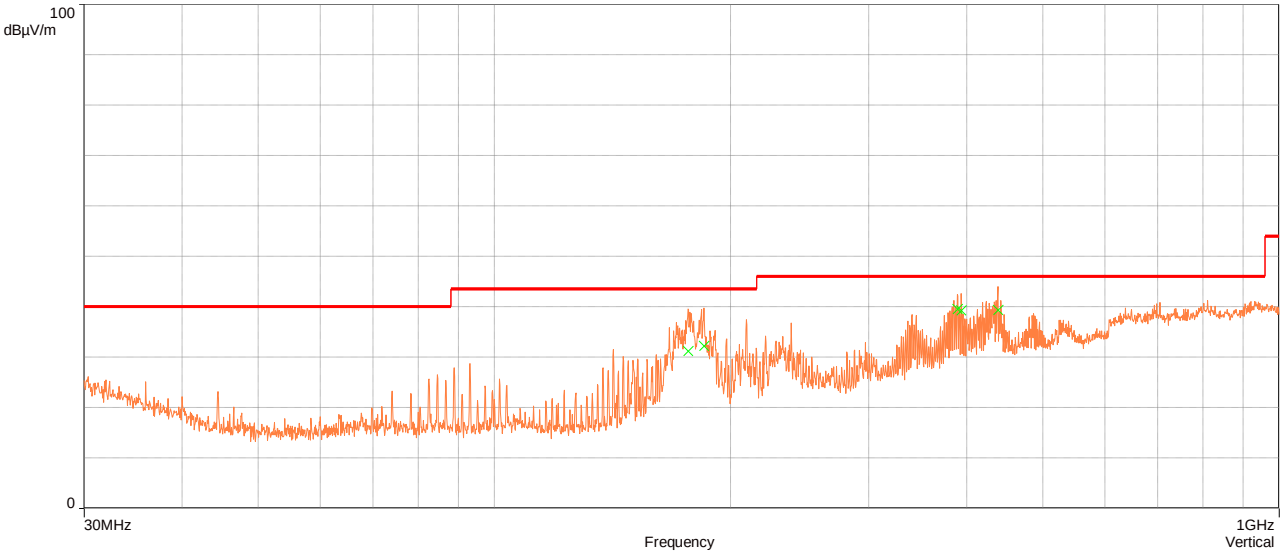


Frequency (MHz)	SR	Peak (dBµV/m)	QPeak (dBµV/m)	LimQPeak (dBµV/m)	Delta (dB)	Polarization	Height (m)	Angle (deg)	Conversion Factor
383.035	1	43.39	40.72	46.00	-5.28	Horizontal	1.00	359.90	22.73
385.135	1	44.49	41.81	46.00	-4.19	Horizontal	1.07	330.30	22.79
387.175	1	43.68	41.15	46.00	-4.85	Horizontal	1.00	330.30	22.83
389.335	1	45.73	42.89	46.00	-3.11	Horizontal	1.07	330.30	22.83
391.0755	1	42.59	36.73	46.00	-9.27	Horizontal	1.00	359.90	22.84
393.595	1	42.63	40.29	46.00	-5.71	Horizontal	1.00	330.30	22.91
177.7155	2	40.92	33.07	43.52	-10.45	Vertical	1.00	180.80	15.77
181.135	2	39.58	31.24	43.52	-12.28	Vertical	1.00	150.30	15.71
389.3355	2	42.83	40.48	46.00	-5.52	Vertical	1.07	270.00	22.83
433.735	2	41.56	38.85	46.00	-7.15	Vertical	1.00	120.00	23.90
437.995	2	43.13	40.11	46.00	-5.89	Vertical	1.00	120.00	23.87
442.315	2	42.09	38.85	46.00	-7.15	Vertical	1.00	120.00	23.92
935.9955	2	42.04	31.60	46.00	-14.40	Vertical	1.00	59.80	33.22

Measurement 01 Horizontal
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 30MHz÷ 1GHz
Operating Condition: TX03



Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 30MHz÷ 1GHz
Operating Condition: TX03



Frequency (MHz)	SR	Peak (dBµV/m)	QPeak (dBµV/m)	LimQPeak (dBµV/m)	Delta (dB)	Polarization	Height (m)	Angle (deg)	Conversion Factor
382.7955	1	42.65	39.47	46.00	-6.53	Horizontal	1.00	330.00	22.73
385.255	1	44.10	41.80	46.00	-4.20	Horizontal	1.00	330.00	22.79
387.055	1	43.24	40.48	46.00	-5.52	Horizontal	1.00	330.00	22.82

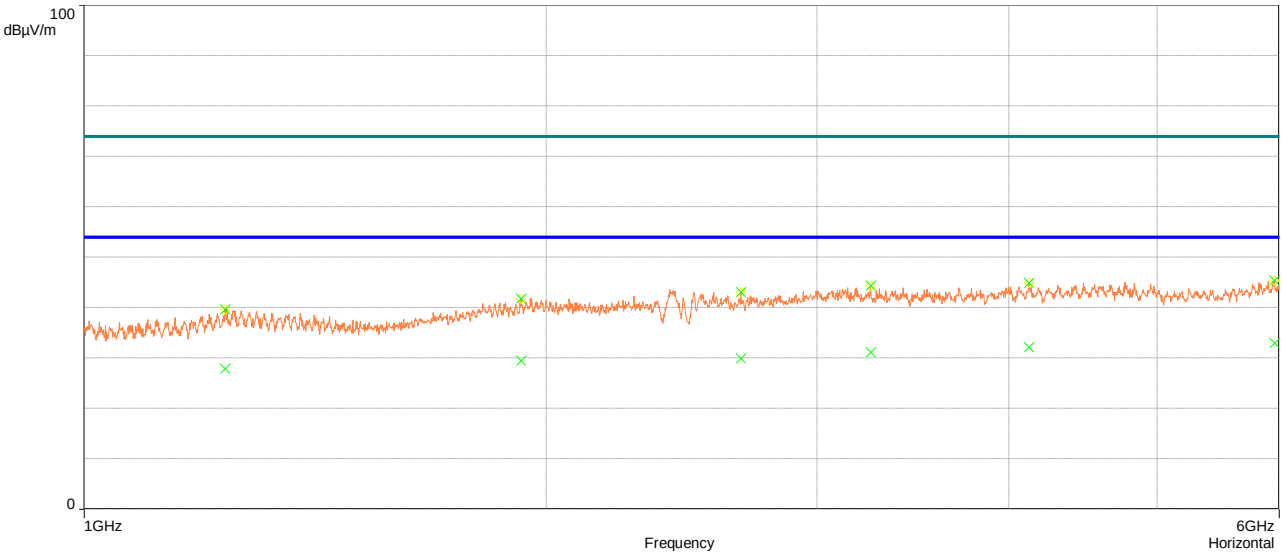
389.395	1	45.48	43.45	46.00	-2.55	Horizontal	1.00	330.00	22.83
391.435	1	42.35	39.61	46.00	-6.39	Horizontal	1.00	330.00	22.84
393.715	1	42.32	39.67	46.00	-6.33	Horizontal	1.00	359.90	22.91
176.515	2	39.55	31.18	43.52	-12.34	Vertical	1.00	209.80	15.72
184.9155	2	39.71	32.23	43.52	-11.29	Vertical	1.00	150.30	15.51
389.395	2	42.46	39.57	46.00	-6.43	Vertical	1.59	300.00	22.83
393.535	2	42.64	39.23	46.00	-6.77	Vertical	1.07	269.90	22.91
438.1755	2	43.96	39.34	46.00	-6.66	Vertical	1.00	120.00	23.87

TEST GRAPHS AND MEASUREMENTS

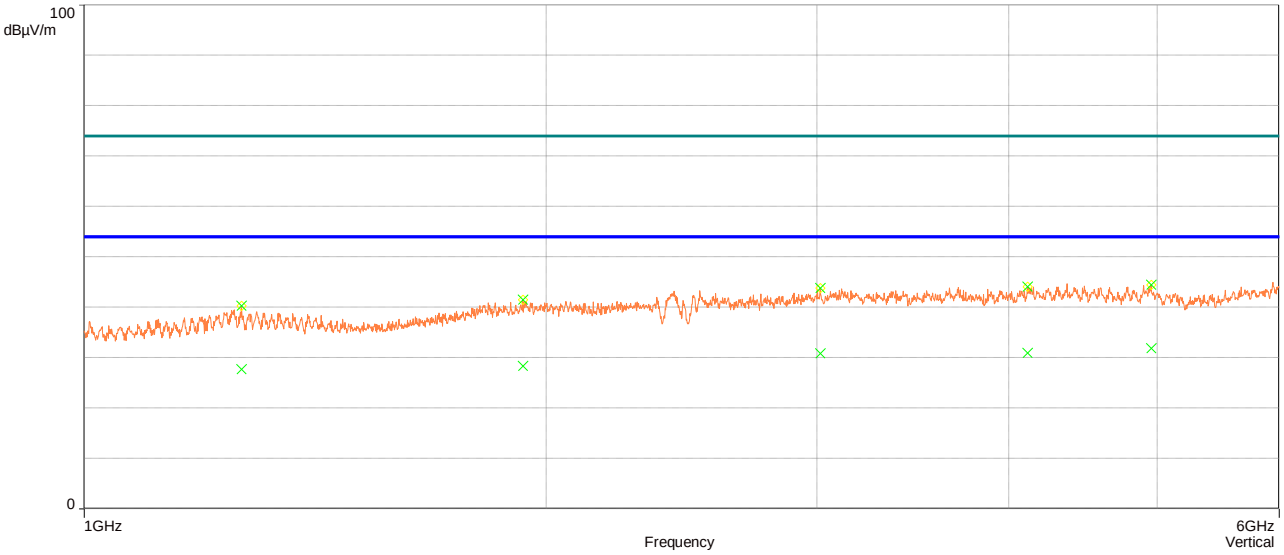
All traces have been acquired with Peak detector in Max-Hold mode (Maximum-Hold allows to record the maximum values of the spectra)

The final measurements are obtain consider the value read in the receiver minus the value of the column “Conversion Factor”.

Measurement 01 Horizontal
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 1GHz÷ 6GHz
Operating Condition: TX01

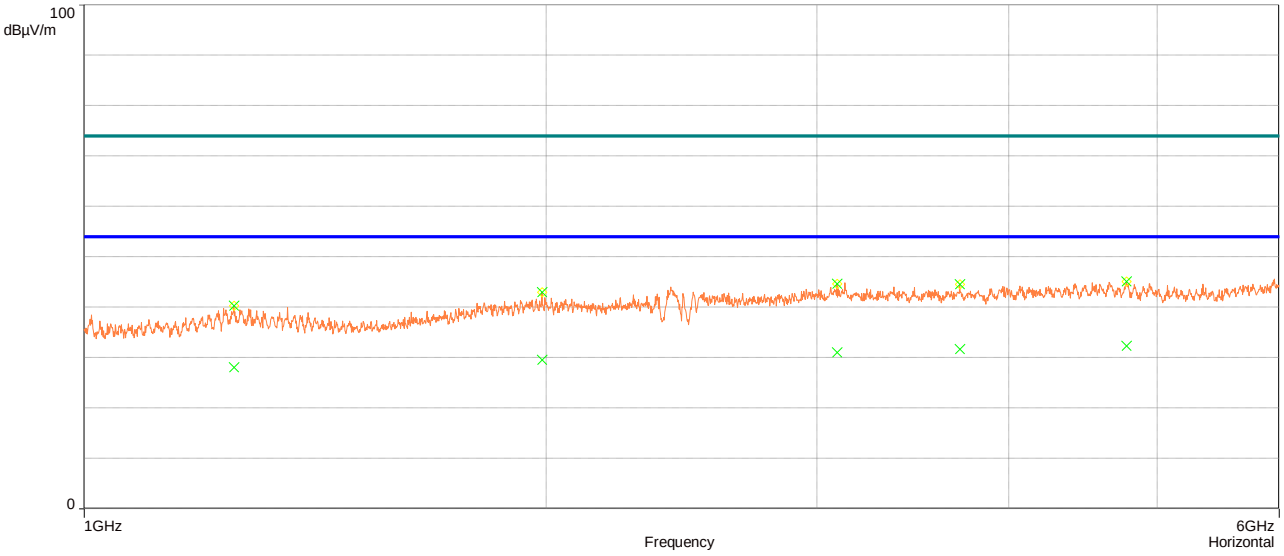


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 1GHz÷ 6GHz
Operating Condition: TX01

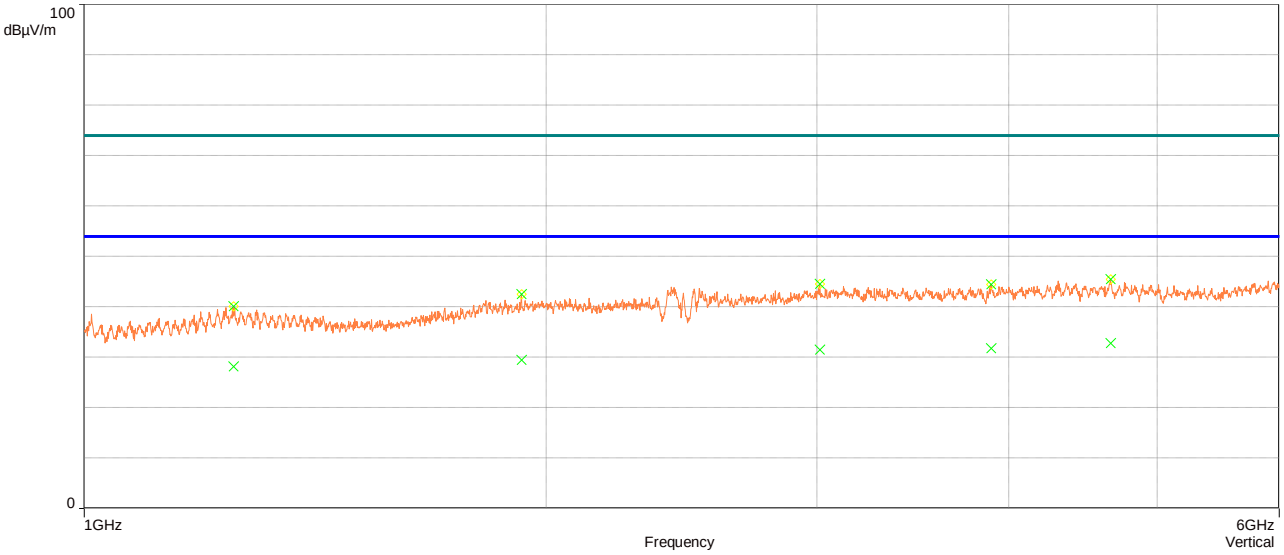


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
1234.9775	1	39.67	74.00	33.06	27.87	54.00	26.13	240.10	Horizontal
1925.975	1	41.75	74.00	31.26	29.49	54.00	24.51	330.40	Horizontal
2676.975	1	43.08	74.00	30.98	29.89	54.00	24.11	119.90	Horizontal
3251.975	1	44.34	74.00	29.35	31.10	54.00	22.90	180.00	Horizontal
4122.975	1	44.93	74.00	28.10	32.11	54.00	21.89	300.20	Horizontal
5958.475	1	45.39	74.00	26.70	32.93	54.00	21.07	89.70	Horizontal
1265.975	2	40.25	74.00	32.81	27.69	54.00	26.31	120.10	Vertical
1930.475	2	41.46	74.00	32.62	28.33	54.00	25.67	239.80	Vertical
3014.975	2	43.82	74.00	30.17	30.84	54.00	23.16	60.10	Vertical
4115.475	2	44.12	74.00	29.96	30.90	54.00	23.10	180.30	Vertical
4952.475	2	44.44	74.00	28.80	31.89	54.00	22.11	239.80	Vertical

Measurement 01 Horizontal
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 1GHz÷ 6GHz
Operating Condition: TX02

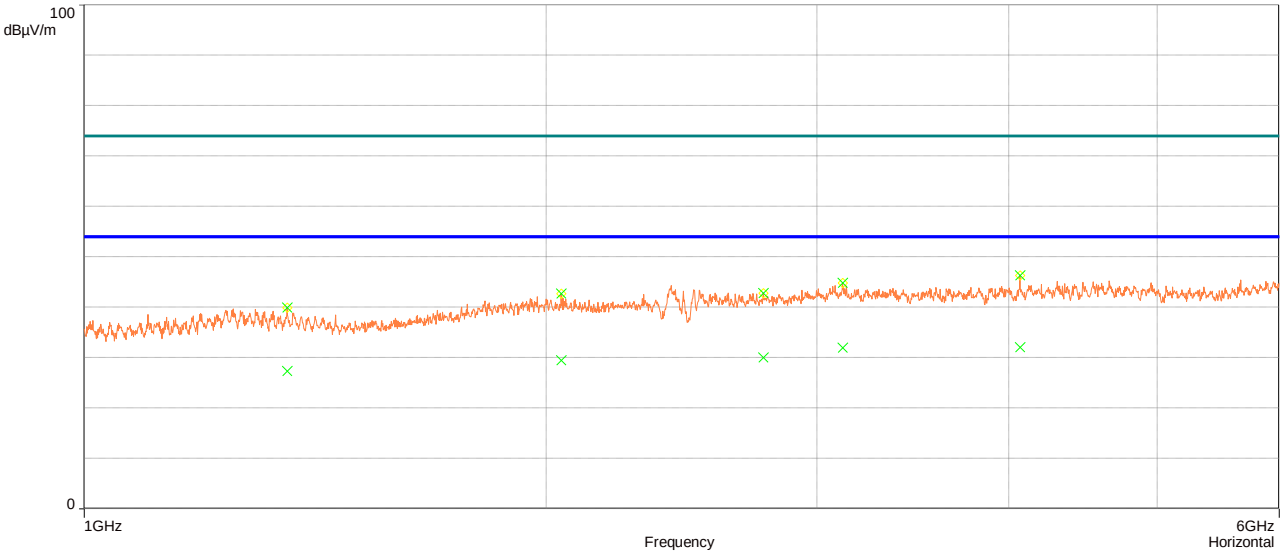


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 1GHz÷ 6GHz
Operating Condition: TX02

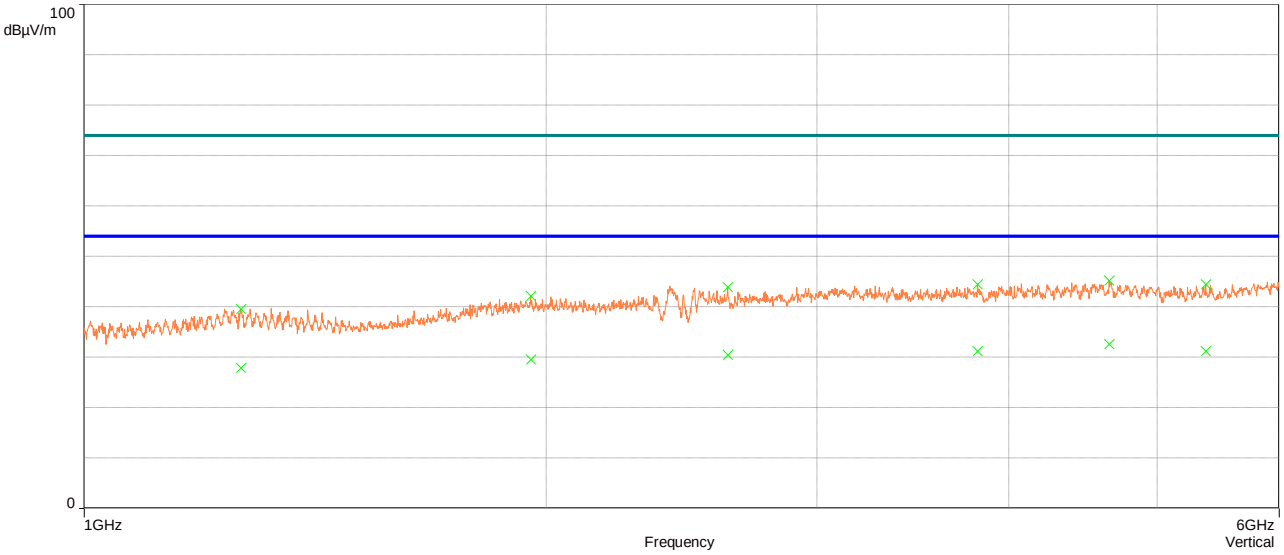


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
1251.975	1	40.32	74.00	32.65	28.07	54.00	25.93	89.80	Horizontal
1986.4775	1	42.96	74.00	30.11	29.51	54.00	24.49	210.10	Horizontal
3091.475	1	44.63	74.00	29.55	31.01	54.00	22.99	89.80	Horizontal
3716.475	1	44.58	74.00	28.25	31.68	54.00	22.32	29.90	Horizontal
4773.4775	1	45.10	74.00	27.91	32.33	54.00	21.67	89.80	Horizontal
1251.475	2	40.13	74.00	33.06	28.11	54.00	25.89	300.30	Vertical
1926.975	2	42.53	74.00	31.48	29.46	54.00	24.54	59.80	Vertical
3012.9775	2	44.56	74.00	28.64	31.44	54.00	22.56	180.20	Vertical
3896.975	2	44.42	74.00	29.02	31.77	54.00	22.23	300.30	Vertical
4661.475	2	45.50	74.00	27.80	32.74	54.00	21.26	330.70	Vertical

Measurement 01 Horizontal
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 1GHz÷ 6GHz
Operating Condition: TX03



Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 1GHz÷ 6GHz
Operating Condition: TX03



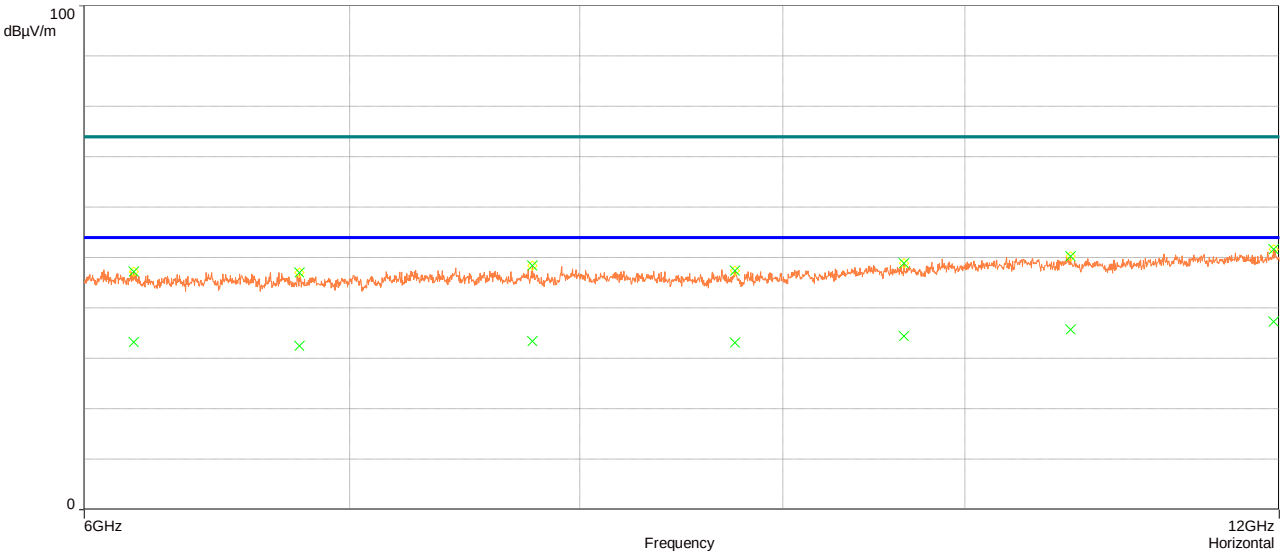
Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
1355.475	1	39.94	74.00	33.48	27.29	54.00	26.71	150.60	Horizontal
2044.475	1	42.70	74.00	30.98	29.47	54.00	24.53	119.90	Horizontal
2767.9775	1	42.78	74.00	30.11	29.97	54.00	24.03	359.80	Horizontal
3117.975	1	44.78	74.00	28.50	31.97	54.00	22.03	180.70	Horizontal
4068.975	1	46.26	74.00	28.78	32.07	54.00	21.93	89.80	Horizontal
1265.475	2	39.55	74.00	32.57	27.91	54.00	26.09	60.10	Vertical
1953.475	2	42.12	74.00	31.25	29.53	54.00	24.47	239.80	Vertical
2624.975	2	43.91	74.00	30.30	30.47	54.00	23.53	300.70	Vertical
3816.975	2	44.49	74.00	29.65	31.25	54.00	22.75	300.70	Vertical
4649.475	2	45.16	74.00	28.30	32.58	54.00	21.42	60.10	Vertical
5374.975	2	44.45	74.00	29.61	31.22	54.00	22.78	359.90	Vertical

TEST GRAPHS AND MEASUREMENTS

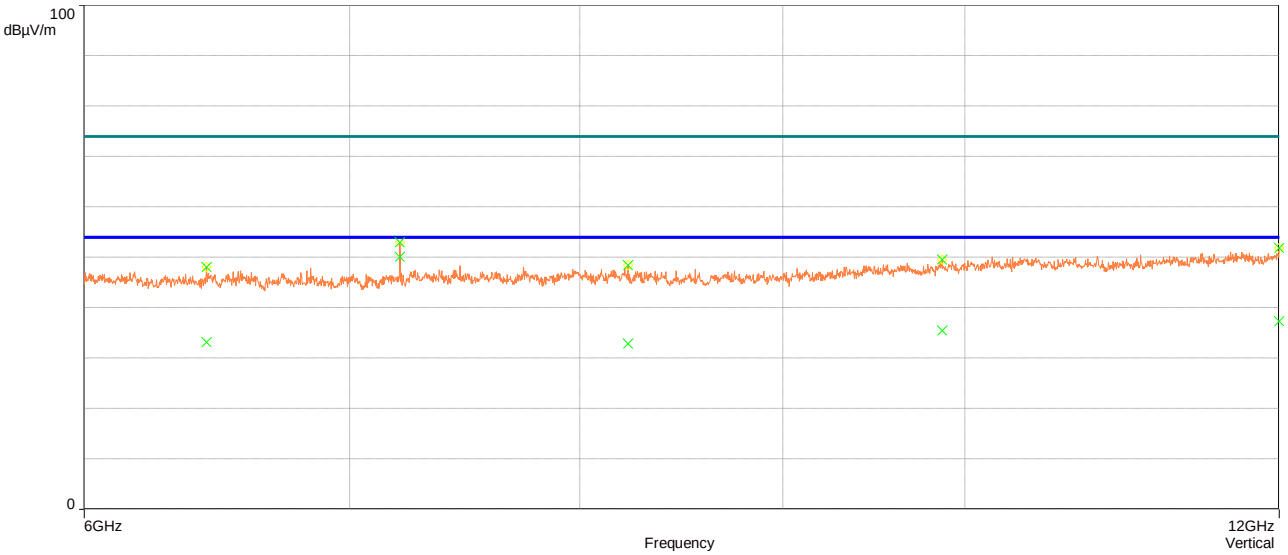
All traces have been acquired with Peak detector in Max-Hold mode (Maximum-Hold allows to record the maximum values of the spectra)

The final measurements are obtain consider the value read in the receiver minus the value of the column “Conversion Factor”.

Measurement 01 Horizontal
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 6GHz÷ 12GHz
Operating Condition: TX01

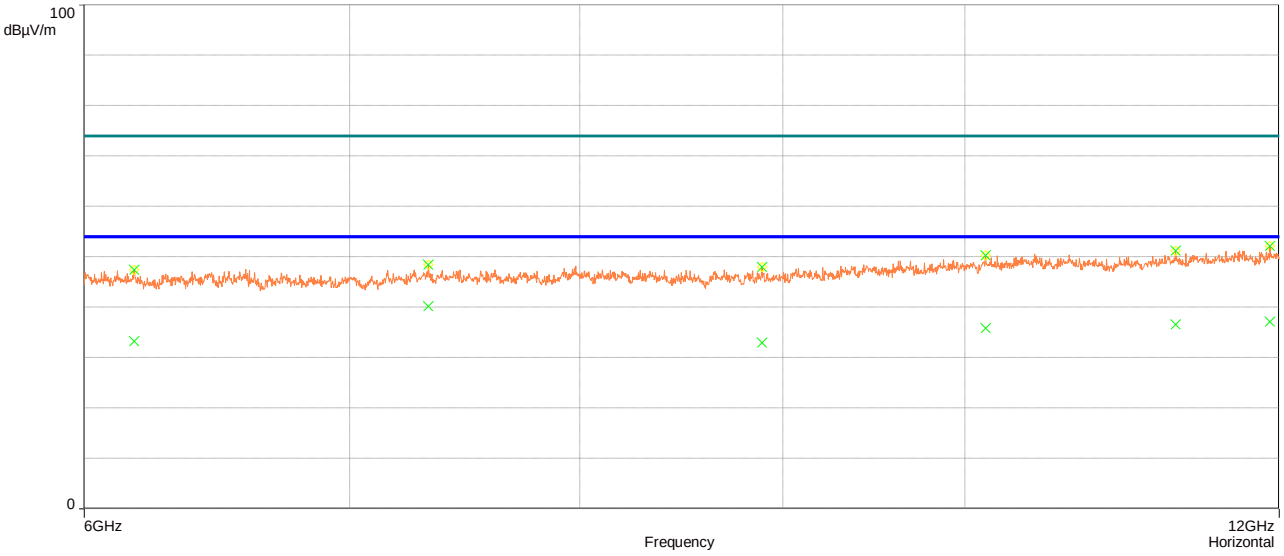


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 6GHz÷ 12GHz
Operating Condition: TX01

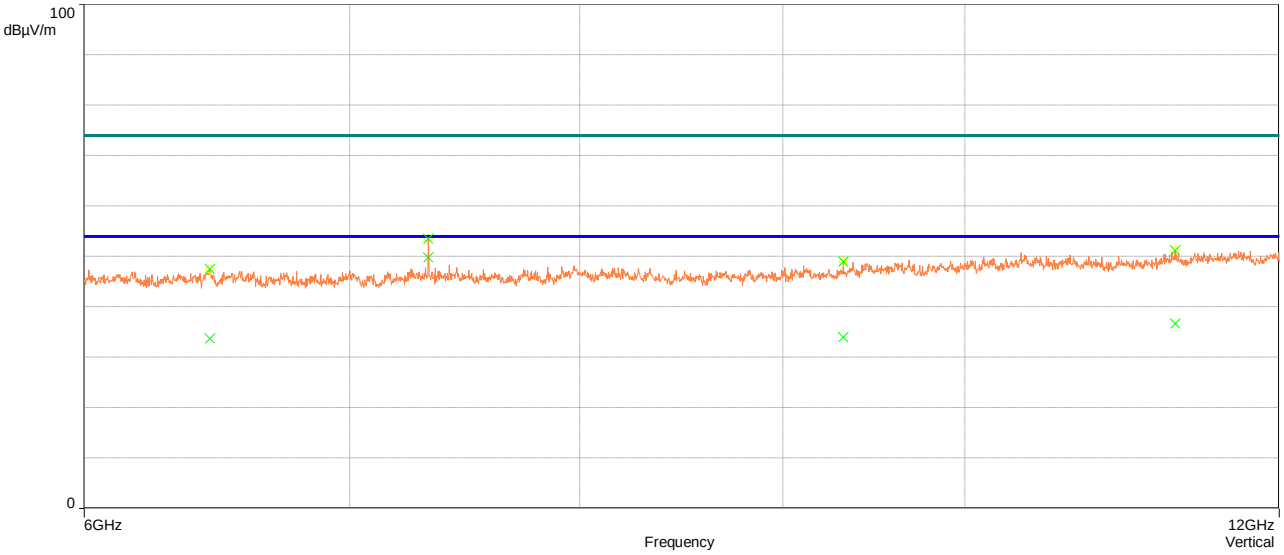


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
6175.0155	1	47.26	74.00	40.71	33.29	54.00	20.71	270.80	Horizontal
6796.9835	1	47.02	74.00	41.51	32.49	54.00	21.51	30.00	Horizontal
7782.0175	1	48.46	74.00	40.55	33.45	54.00	20.55	180.30	Horizontal
8752.009	1	47.45	74.00	40.87	33.13	54.00	20.87	330.30	Horizontal
9651.998	1	48.88	74.00	39.54	34.46	54.00	19.54	240.30	Horizontal
10633.0185	1	50.25	74.00	38.25	35.75	54.00	18.25	180.30	Horizontal
11961.0125	1	51.63	74.00	36.68	37.32	54.00	16.68	270.80	Horizontal
6441.0095	2	48.03	74.00	40.81	33.19	54.00	20.81	270.20	Vertical
7206.0165	2	52.99	74.00	23.45	50.08	54.00	3.92	150.20	Vertical
8224.9945	2	48.46	74.00	41.15	32.85	54.00	21.15	180.80	Vertical
9868.9755	2	49.56	74.00	38.55	35.45	54.00	18.55	240.20	Vertical
11999.9735	2	51.86	74.00	36.66	37.34	54.00	16.66	120.80	Vertical

Measurement 01 Horizontal
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 6GHz÷ 12GHz
Operating Condition: TX02

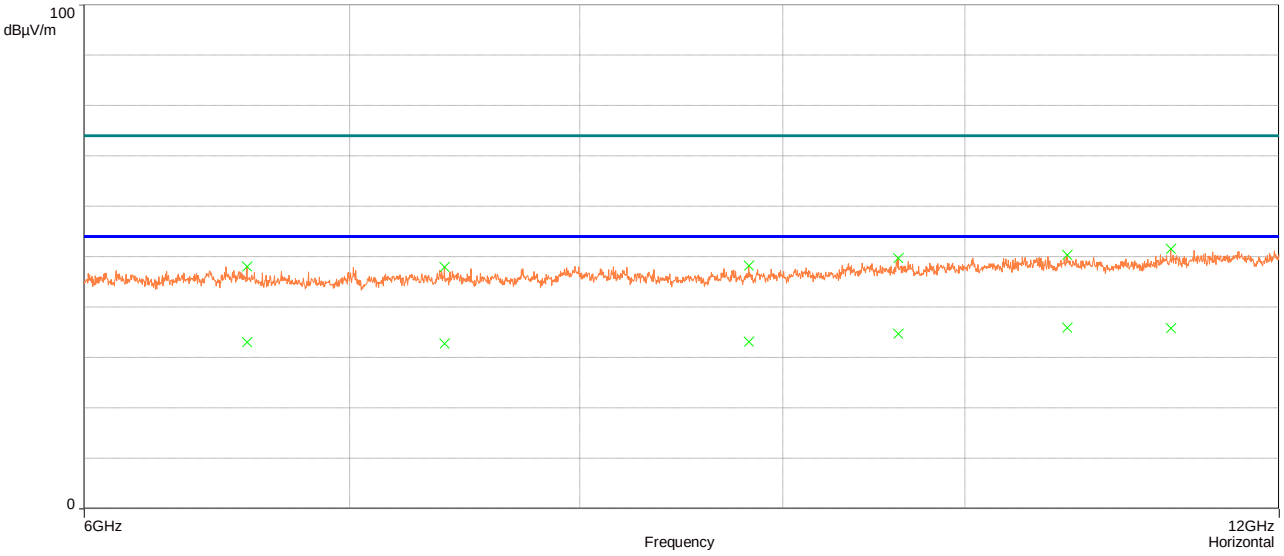


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 6GHz÷ 12GHz
Operating Condition: TX02

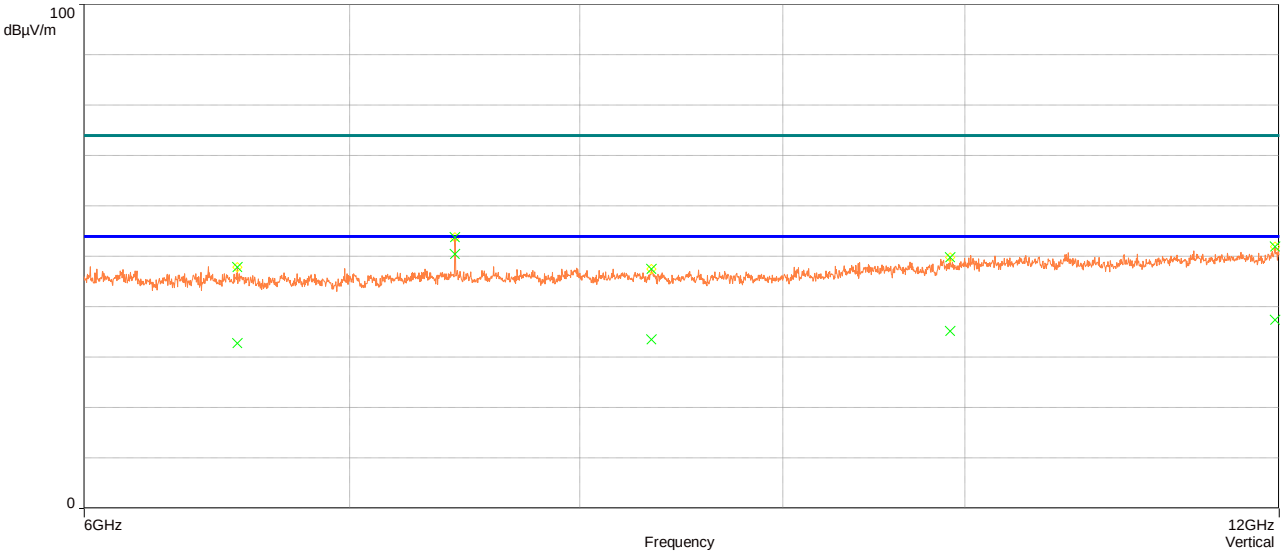


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
6175.999	1	47.42	74.00	40.78	33.22	54.00	20.78	59.90	Horizontal
7326.024	1	48.46	74.00	33.76	40.24	54.00	13.76	89.80	Horizontal
8890.024	1	47.94	74.00	40.99	33.01	54.00	20.99	240.30	Horizontal
10121.0215	1	50.29	74.00	38.14	35.86	54.00	18.14	180.80	Horizontal
11298.995	1	51.18	74.00	37.44	36.56	54.00	17.44	59.90	Horizontal
11936.9985	1	52.14	74.00	36.83	37.17	54.00	16.83	300.20	Horizontal
6453.975	2	47.49	74.00	40.32	33.68	54.00	20.32	240.10	Vertical
7326.0195	2	53.53	74.00	23.74	49.82	54.00	4.18	149.70	Vertical
9319.014	2	48.99	74.00	40.02	33.98	54.00	20.02	180.80	Vertical
11295.9855	2	51.23	74.00	37.35	36.65	54.00	17.35	149.70	Vertical

Measurement 01 Horizontal
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 6GHz÷ 12GHz
Operating Condition: TX03



Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 6GHz÷ 12GHz
Operating Condition: TX03



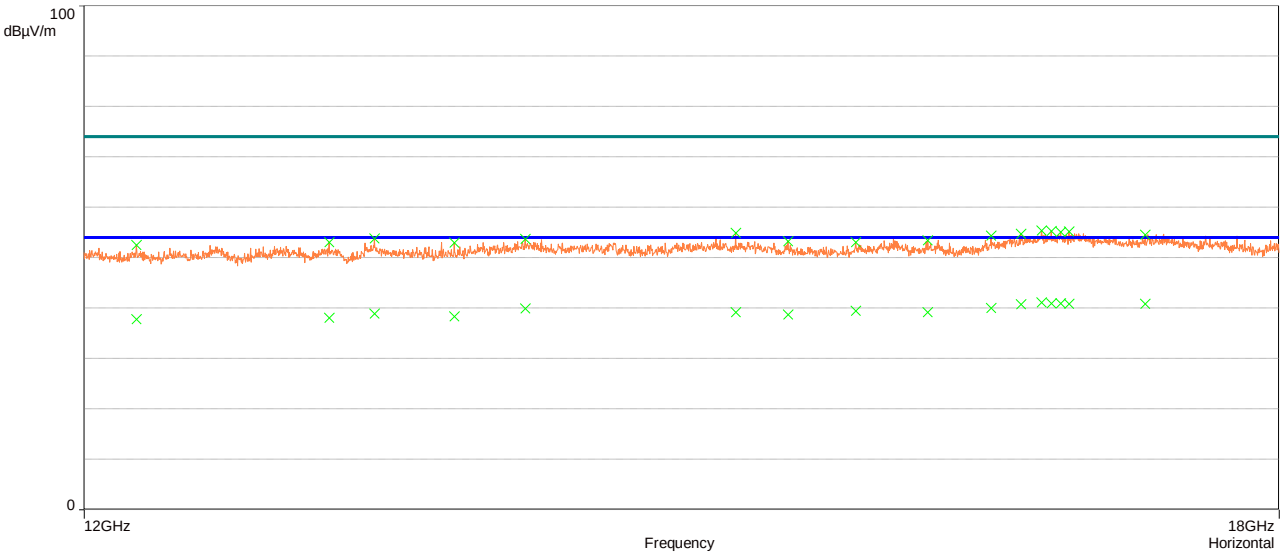
Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
6594.015	1	48.02	74.00	40.92	33.08	54.00	20.92	120.80	Horizontal
7394.0085	1	47.94	74.00	41.19	32.81	54.00	21.19	300.60	Horizontal
8821.975	1	48.27	74.00	40.81	33.18	54.00	20.82	150.70	Horizontal
9620.9965	1	49.69	74.00	39.28	34.72	54.00	19.28	60.10	Horizontal
10613.0085	1	50.37	74.00	38.06	35.94	54.00	18.06	270.40	Horizontal
11267.9755	1	51.57	74.00	38.16	35.84	54.00	18.16	29.90	Horizontal
6557.007	2	47.84	74.00	41.17	32.83	54.00	21.17	300.10	Vertical
7440.024	2	53.81	74.00	22.99	50.50	54.00	3.50	150.30	Vertical
8337.0235	2	47.48	74.00	40.46	33.54	54.00	20.46	150.30	Vertical
9915.979	2	49.84	74.00	38.76	35.24	54.00	18.76	90.60	Vertical
11970.012	2	51.94	74.00	36.61	37.39	54.00	16.61	300.10	Vertical

TEST GRAPHS AND MEASUREMENTS

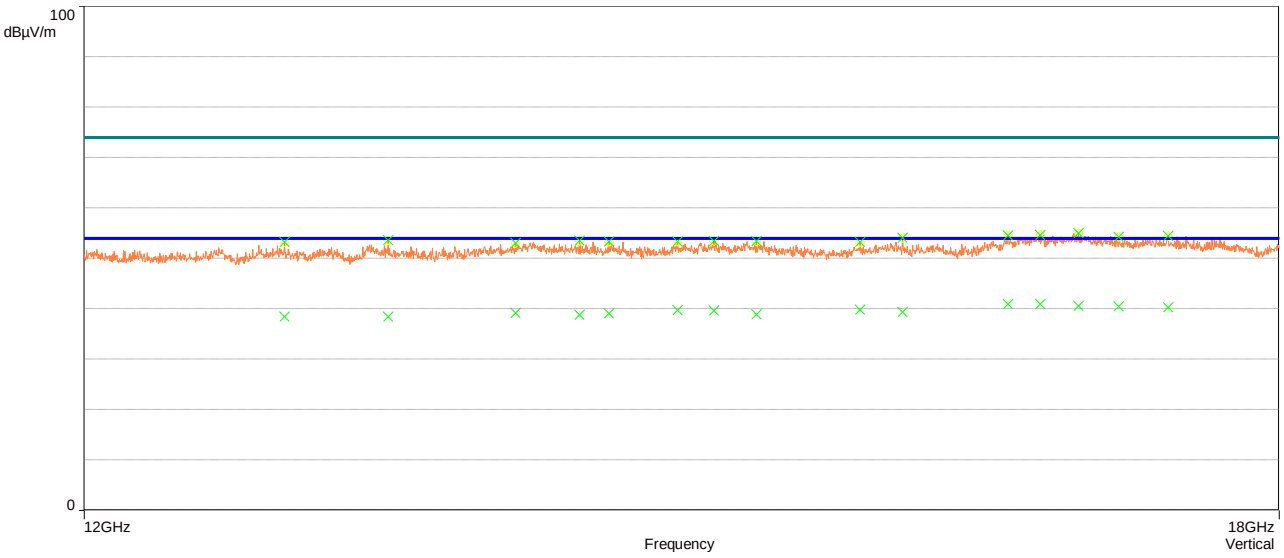
All traces have been acquired with Peak detector in Max-Hold mode (Maximum-Hold allows to record the maximum values of the spectra)

The final measurements are obtain consider the value read in the receiver minus the value of the column “Conversion Factor”.

Measurement 01 Horizontal
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 12GHz÷ 18GHz
Operating Condition: TX01

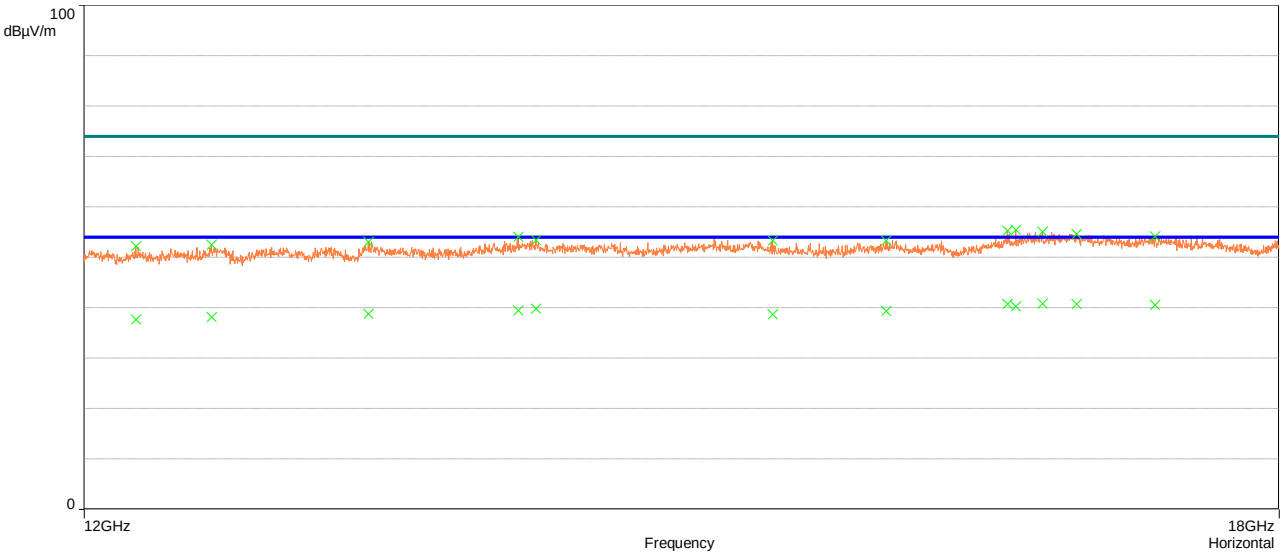


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 12GHz÷ 18GHz
Operating Condition: TX01

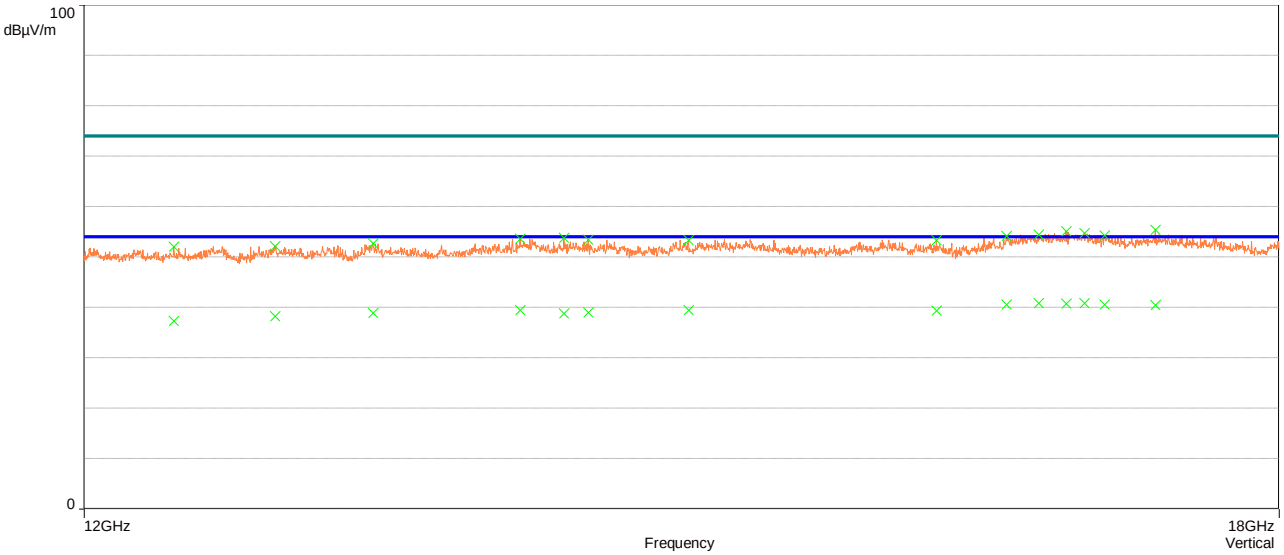


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
12215.0025	1	52.52	74.00	36.26	37.74	54.00	16.26	120.20	Horizontal
13041.0155	1	53.06	74.00	35.94	38.06	54.00	15.94	330.40	Horizontal
13243.019	1	53.76	74.00	35.15	38.85	54.00	15.15	89.70	Horizontal
13607.016	1	52.99	74.00	35.70	38.30	54.00	15.70	149.70	Horizontal
13937.002	1	53.75	74.00	34.13	39.87	54.00	14.13	180.10	Horizontal
14969.9995	1	54.95	74.00	34.83	39.17	54.00	14.83	300.20	Horizontal
15236.992	1	53.20	74.00	35.27	38.73	54.00	15.27	240.10	Horizontal
15591.9785	1	53.02	74.00	34.59	39.41	54.00	14.59	59.80	Horizontal
15975.976	1	53.47	74.00	34.84	39.16	54.00	14.84	269.90	Horizontal
16323.9815	1	54.40	74.00	34.00	40.00	54.00	14.00	240.10	Horizontal
16490.0245	1	54.76	74.00	33.29	40.71	54.00	13.29	269.90	Horizontal
16605	1	55.34	74.00	32.91	41.09	54.00	12.91	59.80	Horizontal
16660.0195	1	55.29	74.00	33.07	40.92	54.00	13.08	59.80	Horizontal
16712.9935	1	55.06	74.00	33.11	40.89	54.00	13.11	149.70	Horizontal
16762.0095	1	55.16	74.00	33.19	40.81	54.00	13.19	59.80	Horizontal
17201.0245	1	54.58	74.00	33.20	40.80	54.00	13.20	29.90	Horizontal
12843.0155	2	53.22	74.00	35.56	38.44	54.00	15.56	270.30	Vertical
13303.0065	2	53.57	74.00	35.59	38.41	54.00	15.59	89.80	Vertical
13890.9875	2	53.10	74.00	34.85	39.15	54.00	14.85	29.80	Vertical
14197.0145	2	53.51	74.00	35.18	38.82	54.00	15.18	150.30	Vertical
14337.976	2	53.30	74.00	34.93	39.07	54.00	14.93	240.20	Vertical
14674.992	2	53.30	74.00	34.30	39.70	54.00	14.30	330.40	Vertical
14857.9755	2	53.47	74.00	34.34	39.66	54.00	14.34	210.50	Vertical
15074.0225	2	53.41	74.00	35.11	38.89	54.00	15.11	89.80	Vertical
15614.0245	2	53.26	74.00	34.21	39.79	54.00	14.21	270.30	Vertical
15839.979	2	54.07	74.00	34.65	39.35	54.00	14.65	210.50	Vertical
16418.0105	2	54.58	74.00	33.04	40.95	54.00	13.05	60.70	Vertical
16597.9825	2	54.68	74.00	33.03	40.97	54.00	13.03	89.80	Vertical
16815	2	55.05	74.00	33.40	40.60	54.00	13.40	270.30	Vertical
17047.025	2	54.24	74.00	33.52	40.48	54.00	13.52	150.30	Vertical
17334.009	2	54.45	74.00	33.73	40.27	54.00	13.73	300.30	Vertical

Measurement 01 Horizontal
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 12GHz÷ 18GHz
Operating Condition: TX02

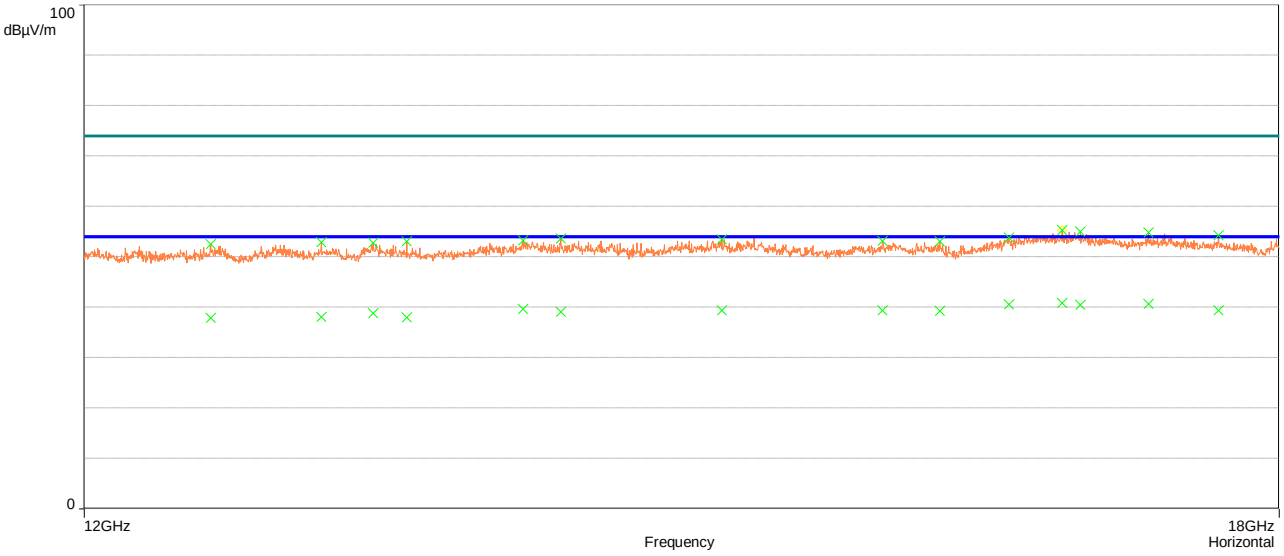


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 12GHz÷ 18GHz
Operating Condition: TX02

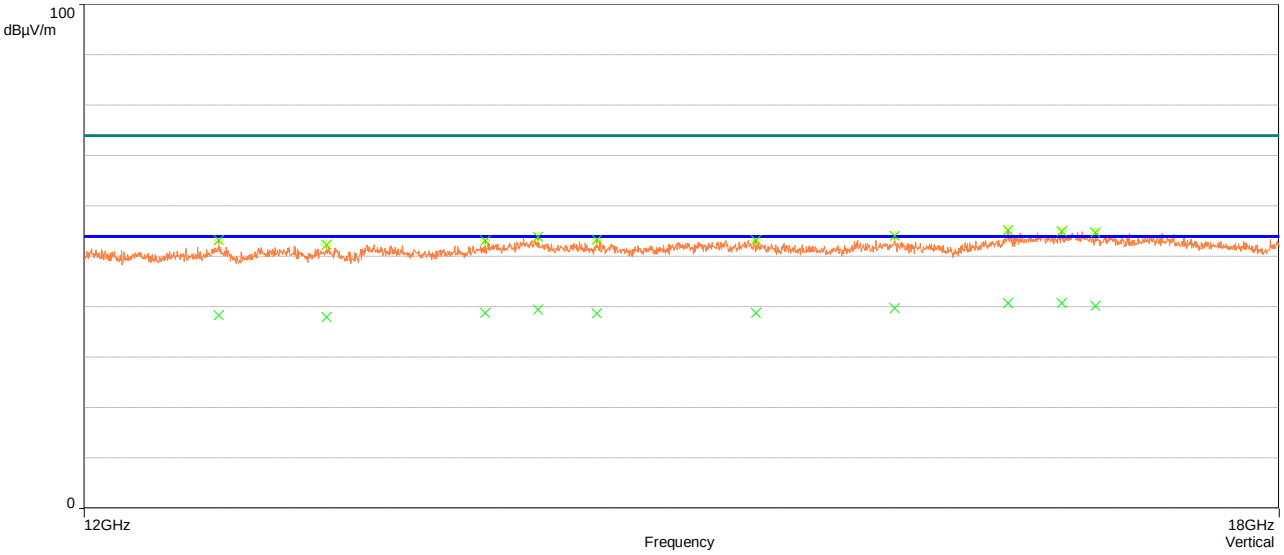


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
12212.9935	1	52.26	74.00	36.32	37.68	54.00	16.32	180.30	Horizontal
12530.9945	1	52.48	74.00	35.83	38.17	54.00	15.83	209.70	Horizontal
13214.9955	1	53.06	74.00	35.17	38.83	54.00	15.17	120.80	Horizontal
13904	1	54.12	74.00	34.54	39.46	54.00	14.54	120.80	Horizontal
13988.0025	1	53.46	74.00	34.18	39.82	54.00	14.18	180.30	Horizontal
15156.9975	1	53.30	74.00	35.25	38.75	54.00	15.25	240.20	Horizontal
15753.015	1	53.37	74.00	34.66	39.34	54.00	14.66	120.80	Horizontal
16414.02	1	55.26	74.00	33.22	40.78	54.00	13.22	300.10	Horizontal
16461.9945	1	55.45	74.00	33.70	40.30	54.00	13.70	300.10	Horizontal
16611.0245	1	55.07	74.00	33.13	40.87	54.00	13.13	359.90	Horizontal
16804.002	1	54.63	74.00	33.23	40.77	54.00	13.23	180.30	Horizontal
17258.0175	1	54.17	74.00	33.46	40.53	54.00	13.47	150.30	Horizontal
12371.016	2	52.05	74.00	36.65	37.35	54.00	16.65	90.00	Vertical
12802.975	2	52.18	74.00	35.72	38.28	54.00	15.72	359.90	Vertical
13236.9975	2	52.69	74.00	35.07	38.93	54.00	15.07	180.70	Vertical
13913.0155	2	53.64	74.00	34.54	39.46	54.00	14.54	300.70	Vertical
14121.98	2	53.82	74.00	35.20	38.80	54.00	15.20	240.40	Vertical
14238.9885	2	53.41	74.00	34.99	39.01	54.00	14.99	90.00	Vertical
14733.0125	2	53.34	74.00	34.58	39.42	54.00	14.58	330.40	Vertical
16024.017	2	53.31	74.00	34.68	39.32	54.00	14.68	150.20	Vertical
16408.9825	2	54.15	74.00	33.39	40.61	54.00	13.39	60.50	Vertical
16589.021	2	54.42	74.00	33.16	40.84	54.00	13.16	269.90	Vertical
16747.0245	2	55.06	74.00	33.25	40.75	54.00	13.25	60.50	Vertical
16850.0165	2	54.73	74.00	33.19	40.81	54.00	13.19	300.70	Vertical
16965.0235	2	54.24	74.00	33.43	40.57	54.00	13.43	300.70	Vertical
17259.989	2	55.40	74.00	33.57	40.43	54.00	13.57	300.70	Vertical

Measurement 01 Horizontal
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 12GHz÷ 18GHz
Operating Condition: TX03

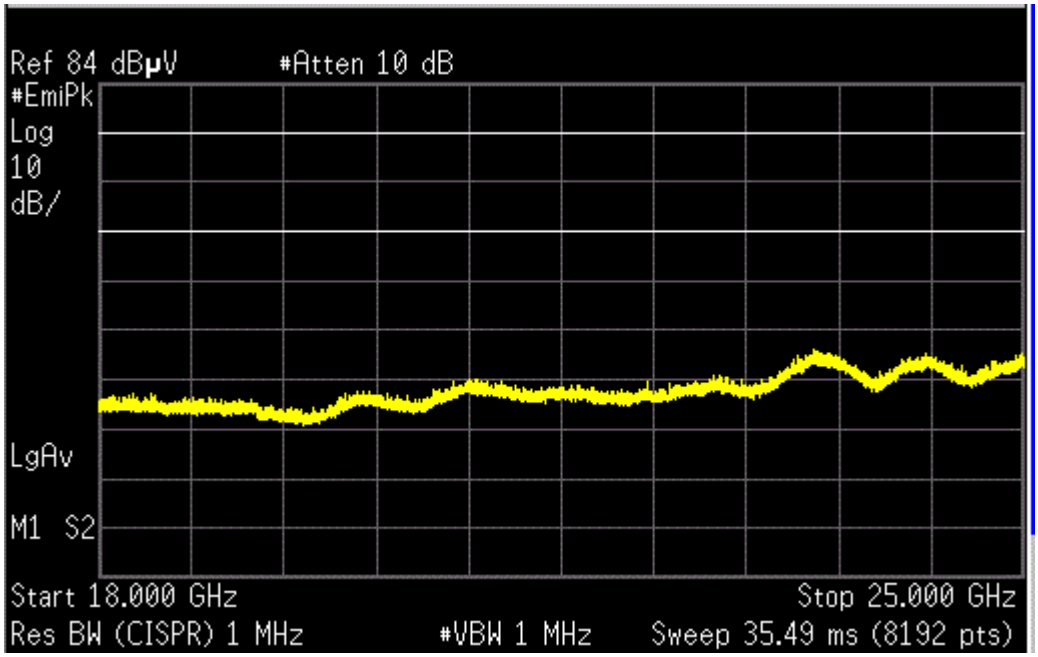


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 12GHz÷ 18GHz
Operating Condition: TX03

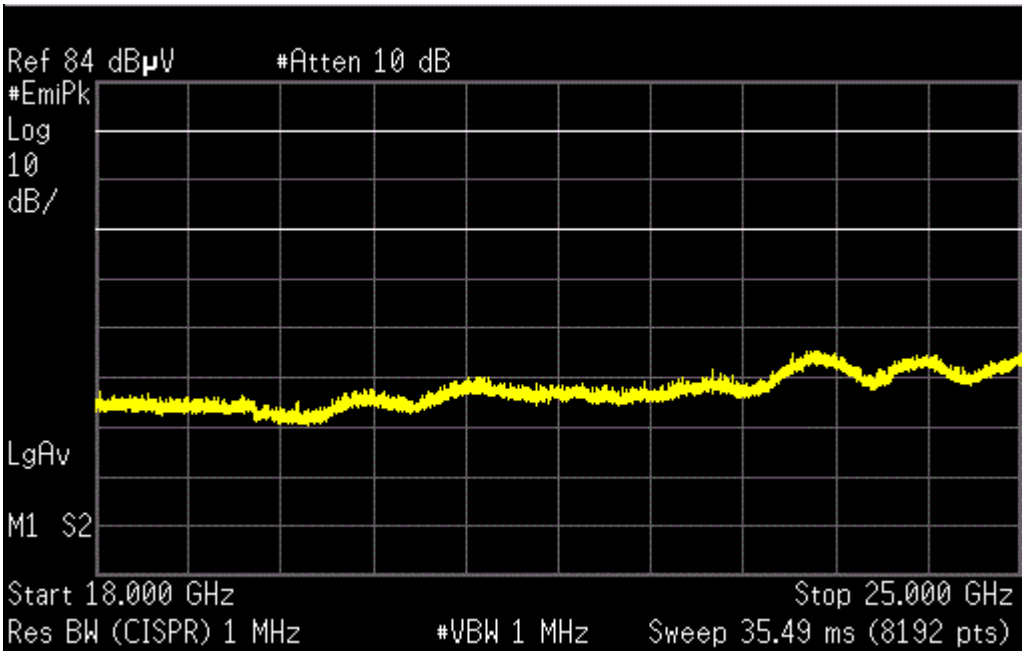


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
12525.9915	1	52.51	74.00	36.14	37.86	54.00	16.14	270.80	Horizontal
13006.0225	1	52.86	74.00	35.96	38.04	54.00	15.96	240.20	Horizontal
13236.019	1	52.82	74.00	35.19	38.80	54.00	15.20	210.10	Horizontal
13386.999	1	53.09	74.00	36.03	37.97	54.00	16.03	270.80	Horizontal
13926.0235	1	53.22	74.00	34.36	39.64	54.00	14.36	59.80	Horizontal
14105.9895	1	53.66	74.00	34.90	39.10	54.00	14.90	210.10	Horizontal
14898.9935	1	53.42	74.00	34.63	39.37	54.00	14.63	330.30	Horizontal
15733.9815	1	53.11	74.00	34.66	39.34	54.00	14.66	240.20	Horizontal
16043.017	1	53.04	74.00	34.74	39.26	54.00	14.74	89.80	Horizontal
16423.0235	1	53.77	74.00	33.48	40.52	54.00	13.48	89.80	Horizontal
16721.0035	1	55.31	74.00	33.19	40.81	54.00	13.19	59.80	Horizontal
16825.005	1	55.01	74.00	33.50	40.50	54.00	13.50	120.00	Horizontal
17218.0035	1	54.78	74.00	33.38	40.62	54.00	13.38	270.80	Horizontal
17633.001	1	54.23	74.00	34.64	39.36	54.00	14.64	29.80	Horizontal
12560.998	2	53.29	74.00	35.61	38.39	54.00	15.61	180.80	Vertical
13029.0045	2	52.28	74.00	36.01	37.99	54.00	16.01	210.40	Vertical
13748.987	2	53.19	74.00	35.24	38.76	54.00	15.24	210.40	Vertical
13997.99	2	53.94	74.00	34.52	39.48	54.00	14.52	90.70	Vertical
14280.008	2	53.34	74.00	35.25	38.75	54.00	15.25	120.80	Vertical
15071.9815	2	53.28	74.00	35.18	38.82	54.00	15.18	330.70	Vertical
15798.0205	2	54.10	74.00	34.24	39.76	54.00	14.24	120.80	Vertical
16416.976	2	55.19	74.00	33.25	40.75	54.00	13.25	240.20	Vertical
16718.9765	2	54.98	74.00	33.24	40.76	54.00	13.24	359.90	Vertical
16911.009	2	54.76	74.00	33.81	40.19	54.00	13.81	90.70	Vertical

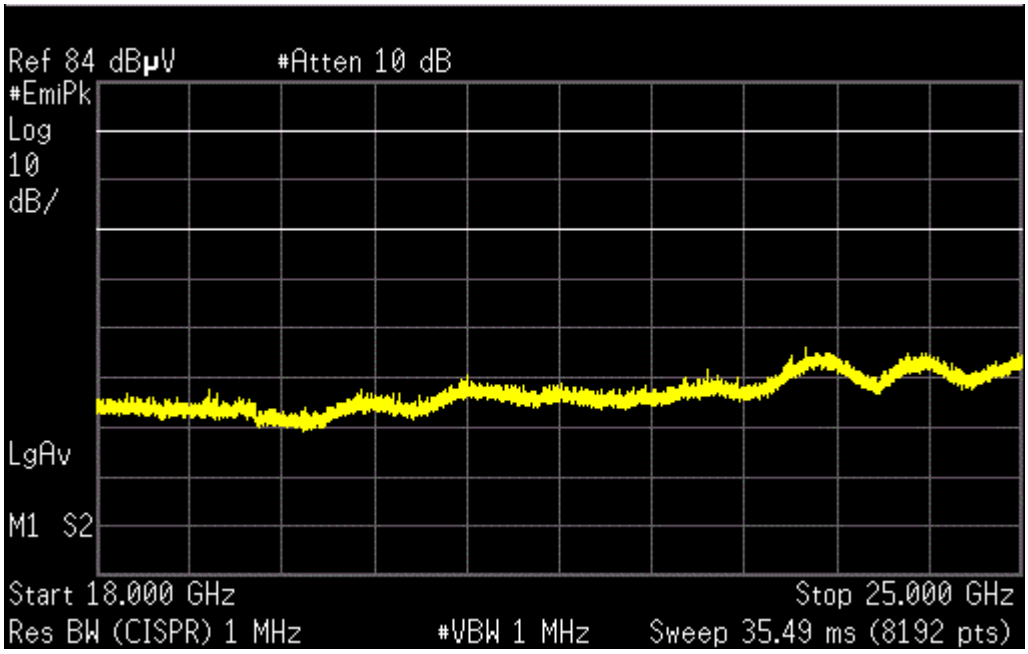
Measurement 01 Vertical_LOW
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 18GHz÷ 25GHz
Operating Condition: TX01



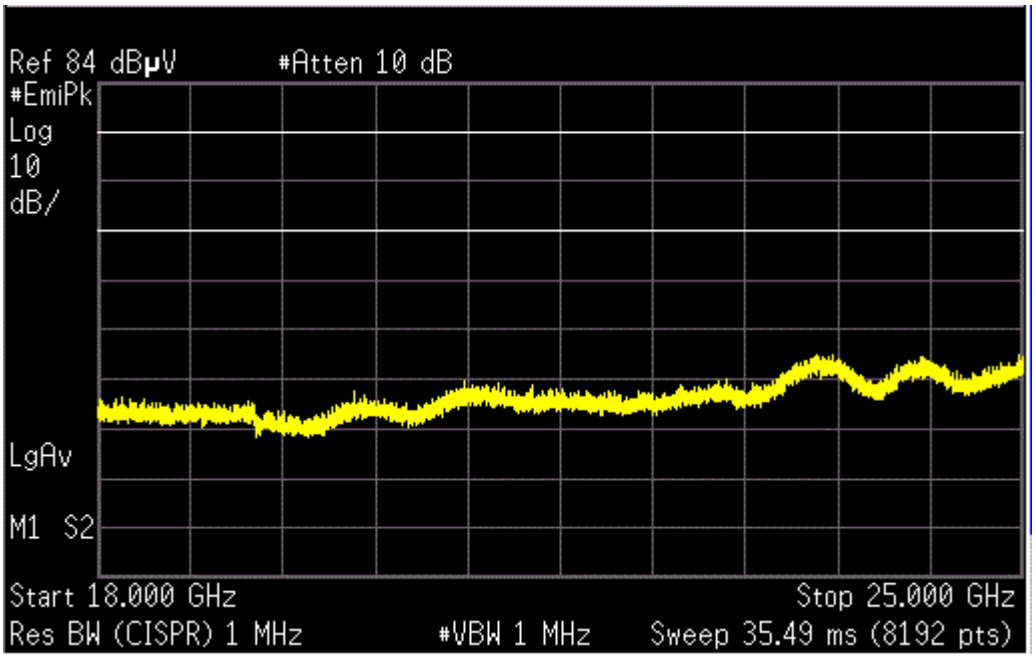
Measurement 02 Horizontal_LOW
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 18GHz÷ 25GHz
Operating Condition: TX01



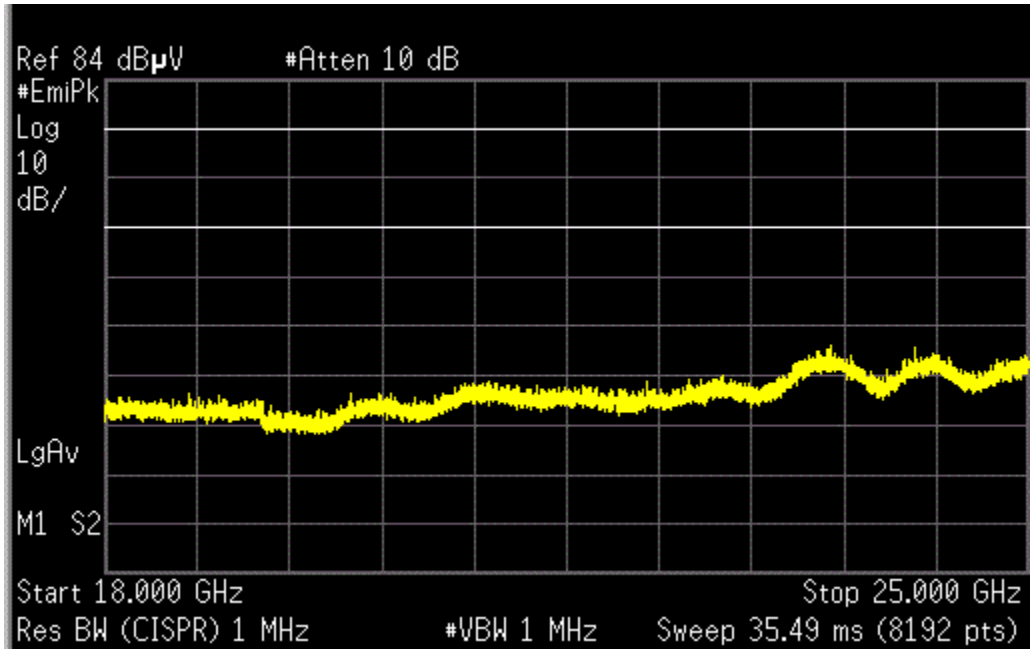
Measurement 03 Vertical_MID
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 18GHz÷ 25GHz
Operating Condition: TX02



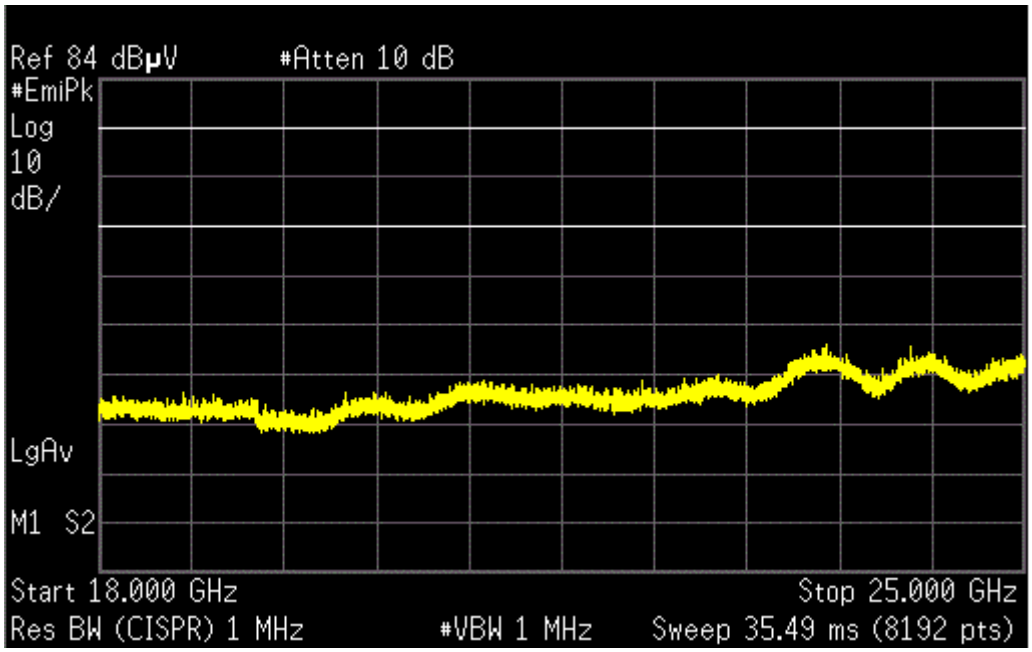
Measurement 04 Horizontal_MID
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 18GHz÷ 25GHz
Operating Condition: TX02



Measurement 05 Vertical_HIGH
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 18GHz÷ 25GHz
Operating Condition: TX03



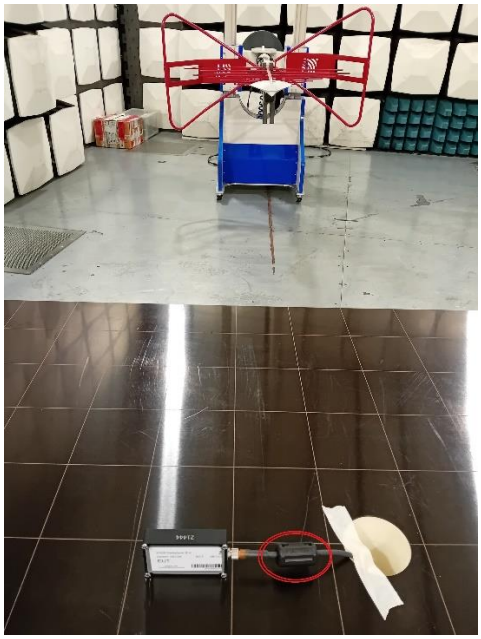
Measurement 06 Horizontal_HIGH
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Horizontal
Range: 18GHz÷ 25GHz
Operating Condition: TX03



7 EUT MODIFICATIONS

The customer has done the following EUT modifications:

MODIFICATION	DESCRIPTION
#01	Added a ferrite FAIR RITE mod. 0431164281 on the DC input cable, as shown in the photos



End of the report.

Annex B Test instrumentations

FCC Part15

Description	Manufacturer	Model	Identifier	Cal data	Cal due
Antenna - Horn Antenna 18 GHz ÷ 40 GHz	ETS-LINDGREN	3116	779/LAB Rapporto 6278	2023-10-18	2026-10-17
RF Cable - N-N 1,8m	Siva Cables Italy	RG 58A/U	243/LAB Rapporto 6600	2024-08-26	2025-08-26
Filter PB	G. De PAOLI	BPF.0.15-30MHz	268/LAB Rapporto 6601	2024-08-26	2025-08-26
Pulse Limiter ESH3-Z2	ROHDE&SCHWARZ Gmbh	ESH3-Z2	528/LAB Rapporto 6602	2024-08-26	2025-08-26
Semianechoic Chamber	Albatross Projects GmbH		739/CA Rapporto 6030	2023-02-06	2025-02-05
EMI Receiver - PSA Spectrum Analyzer	Agilent Technologies	E4446A	740/LAB Rapporto 6622	2024-09-16	2025-09-16
Pre-Amplifier 18 GHz ÷ 40 GHz	Spin Electronics	PRE-1840-35	759/LAB Rapporto 6091	2023-05-15	2025-05-14
RF Cable - N-N 5m	INTERCOND	M17/74 RG 213	225/LAB Rapporto 6599	2024-08-26	2025-08-26
Antenna - Horn Antenna 1 GHz ÷ 18 GHz	ETS-LINDGREN	3117	778/LAB Rapporto 6277	2023-10-12	2026-10-11
Software BAT-EMC	Nexio	BAT-EMC	1910/LAB	--	--

Annex B Test instrumentations

RF cable - set of RF cables (771/LAB + 791/LAB + 937/LAB)			802/LAB Rapporto 6441	2024-01-26	2025-01-25
RF Cable - set of RF cables 769/LAB + 791/LAB + 938/LAB + Pre-Amplifier 758/LAB with cables			803/LAB Rapporto 6498	2024-04-05	2025-04-05
RF cable - set of RF cables (760/LAB + 804/LAB + 805/LAB)			806/LAB Rapporto 6606	2024-04-05	2025-04-05
Signal Generator	HEWLETT PACKARD	83640B	1388/LAB Rapporto 6092	2023-05-09	2025-05-08
EMI Receiver - MXE	Keysight Technologies	N9038A	1444/LAB Rapporto 6358	2024-02-27	2025-02-26
Antenna - BiConiLog Antenna 30MHz÷ 6 GHz	ETS-LINDGREN	3142E	1508/LAB Rapporto 6348	2024-01-26	2027-01-25
Pre-Amplifier 18 GHz ÷ 40 GHz	Spin Electronics	PRE-1840-35	759/LAB Rapporto 6090	2023-05-15	2025-05-14

Annex D Auxiliary instrumentations

Application	*Description*	*Manufacturer*	*Model*	*Identifier*	*Cal. data*	*Cal. due*
Monitoring of environmental conditions	Climatic Sensor (pri site) - 739/LAB Emission Anec	HW group	HWg-STE	1299/LAB	2023-08-10	2025-08-09
Monitoring of environmental conditions	Pressure Transducer	COMET	T7410	1530/LAB	2023-10-06	2025-10-05
Distance monitoring	Metro Laser	Leica	DISTO A2	1094/LAB	2023-11-10	2025-11-09

Annex F Compliance Decision Rule and measurements uncertainty

F1: Decision Rule

- A decision rule defines the role of uncertainty in assessing the conformity of measured values with respect to specification limits.
- The KIWA Creiven decision uses the “simple acceptance” rule, then the measure is assessed compliant with specifications if it is less or equal to the specification limit.
- The rule of simple acceptance is also called “shared risk” because the probability to be over the tolerance limit may be as high as 50% in the case when a measurement result is exactly on the tolerance limit (assuming a symmetric normal distribution of the measurements).
- This rule results in accordance with :
  - IEC Guide 115 Application of uncertainty of measurement to conformity assessment activities in the electrotechnical sector
  - ILAC-G8 Guidelines on the Reporting of Compliance with Specification
  - JGCM guide 106

F.2 Measurements uncertainty

Frequency Readout – Conducted Test	*Uncertainty (k=2)*
Test Uncertainty [kHz]	10.3
Frequency Readout – Radiated Test	
Test Uncertainty [kHz]	10.6
Effective radiated power ERP (30 MHz to 1000 MHz)	
Test Uncertainty [dB]	6.4
Effective radiated power EIRP (above 1 GHz)	
Test Uncertainty [dB]	6.6
Radiated receiver blocking tests (above 1 GHz)	
Test Uncertainty [dB]	4.9
Conducted spurious emissions	
Test Uncertainty [dB]	3.3
Radiated spurious emissions	
Test Uncertainty [dB]	5.8
Channel power	
Test Uncertainty [dB]	2.6
Adjacent channel power	
Test Uncertainty [dB]	2.2
RF Output power (EIRP)	
Test Uncertainty [dB]	2.3
Occupied Channel Bandwidth	
Test Uncertainty [Hz]	[span/600]

--- End of test report ---