FCC Part 15C and ISED TEST REPORT

Report Number	031/25/04805/FCC	Rev. 00
Date of document	2025-01-27	
Total number of pages	Pag. 48	
OBJECT	FCC Part15C and ISED RSS-247 Issue 3	
CUSTOMER	Stoerk-Tronic, Stoerk GmbH & Co. KG	
EQUIPMENT UNDER TEST - DESCRIPTION	Wireless communication bridge with mesh functionality, where serial communication is transferred between Air Connect devices (2.4 GHz)	
MODEL	Air Connect Commander Air Connect Unit	

SUMMARY

1	OBJECT OF THE TESTS	3
2	IDENTIFICATION	3
3	EQUIPMENT UNDER TEST (EUT)	3
4	STANDARDS AND TEST METHODS	5
5	EUT OPERATING CONDITIONS DURING TESTS	6
6	TEST RESULTS	7
7	EUT MODIFICATIONS	44
Annex B	Test Instrumentations	02 pag
Annex D	Auxiliary Instrumentations	01 pag
Annex F	Judgment of compliance and measurements uncertainty	01 pag

Tested by *(Name + Signature)*	MARCO NICOLE' *Test engineer*	Documento firmato da: NICOLE' MARCO 21.02.2025 13:54:40 UTC
Verified by *(Name + Signature)*	ANDREA CUPIDO *Lab Manager*	Documento firmato da: CUPIDO ANDREA 21.02.2025 14:10:02 UTC
Approved and issued by *(Name + Signature)*	ALESSANDRO ZUCCATO *Lab Director*	Documento firmato da: ZUCCATO ALESSANDRO 25.02.2025 22:12:49 UTC

The test results in this Test Report are exclusively referred to the tested samples
Without the written authorization of Kiwa Creiven, this document can be reproduced only integrally.

I risultati del rapporto di prova si riferiscono esclusivamente ai campioni sotto test
Senza l'autorizzazione scritta di Kiwa Creiven, questo documento può essere riprodotto solo integralmente.

History sheet of test Report			
Report Number	**Rev.**	**Date**	**Description of modification**
--	--	--	--
--	--	--	--
--	--	--	--
--	--	--	--

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
Fax: +39.049.8707037
E-mail : info.creiven@kiwa.com
FCC Designation number: IT0016
ISED CAB Identifier: IT0007

2.2 Customer

Customer: Stoerk-Tronic, Stoerk GmbH & Co. KG
Street: Untere Waldplaetze 6
City: Stuttgart
Phone: +(49) 711 68661 54
Refer to : M. Wróblewski (technical Director)

3 EQUIPMENT UNDER TEST (EUT)

3.1 EUT identification (declared under responsibility of the customer)

EUT Description: Wireless communication bridge with mesh functionality, where serial communication is transferred between Air Connect devices (2.4 GHz)
Model: Air Connect Commander
Air Connect Unit
Code: 900229.001 - Air Connect Unit
900229.002 - Air Connect Commander
Serial N°: 250117-00001
Software release: V1.0
Size: 80 x55 x 34 [mm] excluding flanges and antenna
Manufacturer: Stoerk-Tronic, Stoerk GmbH & Co. KG
Supply voltage: 12 Vdc
Rated Electrical Power: 0.6 W
Rated input current: 50 mA
FCC ID: 2BNLE-AIRCONNECT Contains FCC ID: 2AC7Z-ESPS3WROOM1U

Note: Air Connect Commander and Air Connect Unit have the same PCB and the same components (see pics for details)

3.2 EUT classifications

The manufacturer declared the following classification:

Object	Descriptions
Operating Frequency	Channel 1: 2412 MHz Channel 2: 2417 MHz Channel 3: 2422 MHz Channel 4: 2427 MHz Channel 5: 2432 MHz Channel 6: 2437 MHz Channel 7: 2442 MHz Channel 8: 2447 MHz Channel 9: 2452 MHz Channel 10: 2457 MHz
Equipment type	Based on WIFI running ESP_NOW protocol (by Espressif Systems)
Channel spacing	5 MHz
Number of Channels	10 (1-10)
Antenna Type	Monopole antenna 2.4-2.5 GHz
Antenna Peak Gain	1 dBi

Frequency Hopping Spread Spectrum	NO
Listen Before Talk	NO
Extreme Temperature Range	-40°C ÷ +85°C
Manufacturer declaration	04818LP
The type of modulation used by the equipment	☐ FHSS ☒ other forms of modulation (ESP-NOW uses OFDM modulation)
Adaptive / non-adaptive equipment	☒ non-adaptive Equipment ☐ adaptive Equipment without the possibility to switch to a non-adaptive mode ☐ adaptive Equipment which can also operate in a non-adaptive mode

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) ☒ Appliance inlet ☐ Appliance provided with a set of terminals allowing the connection of cables or fixed wiring
Date of receipt of test item	2025-01-20
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. EUT can works by either by connection cable or Ethernet cable.

Classification	Description	Cable		note
		Shielded	Specified max. length	
DC power port	Dc input cable with external power supply (**not used during the tests**)	☐	☒ none ☐ ≤ 1m ☐ ≤ 3m ☐ ≤ 10m ☐ ≤ 30m	type of power source: ☐ Internal Power Supply ☒ External Power Supply or AC/DC adapter ☐ Battery ☐ Other: __
Telecommunication port	Ethernet cable contains power supply and serial communication (**used during the test**)	☒	☐ none ☐ ≤ 1m ☒ ≤ 3m ☐ ≤ 10m ☐ ≤ 30m	RJ45 connector Cable connected to Commander box (AE01)

3.5 EUT Auxiliary Equipments (AEs)

To ensure the correct functioning of the EUT, it has been necessary to make use of the following auxiliary equipment (AE):

Auxiliary Equipment AE N°01

Description : Commander Box
Model: 900333.0XX
Manufacturer: Stoerk-Tronic, Stoerk GmbH & Co. KG

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
04818LP	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	ISED Rule	Note	Results
Channel Separation	***§15.247 (a)(1)***	***RSS-247 Issue 3***	NOT APPLICABLE (NO FHSS device)	**---**
Minimum Hopping Channel	***§15.247 (a)(1)(iii)***	***RSS-247 Issue 3***	NOT APPLICABLE (NO FHSS device)	**---**
6 dB (DTS) & 20 dB Bandwidth & 99% of power	***§15.247 (a)(2) §15.215 (c)***	***RSS-247 Issue 3***	NO as required by the customer	**---**
Dwell Time	***§15.247 (a)(1)(iii)***	***RSS-247 Issue 3***	NOT APPLICABLE (NO FHSS device)	**---**
Peak Output Power (Conduction)	***§15.247 (b)(3)***	***RSS-247 Issue 3***	---	***Complies***
AC Power Line Conducted Emissions	***§15.207***	***RSS-247 Issue 3***	---	***Complies***
Spurious Emissions (Radiation)	***§15.209***	***RSS-247 Issue 3***	---	***Complies***
Band edge measurement	***§15.247 (d)***	***RSS-247 Issue 3***	NO as required by the customer	**---**
Power spectral density	***§15.247 (e)***	***RSS-247 Issue 3***	NO as required by the customer	**---**

4.2 Test methods

DOCUMENT	DATE	METHOD	ACCREDIA accreditation	Test Sequence (See Note 1)
C63.10	2013	Peak Output Power (Conduction)	Yes	02
C63.10	2013	Spurious Emissions (Radiation)	Yes	01
C63.10	2013	AC Power Line Conducted Emissions	Yes	03
Note : 1) The tests have been carried out in the order specified in this column				

4.3 Deviation from test methods

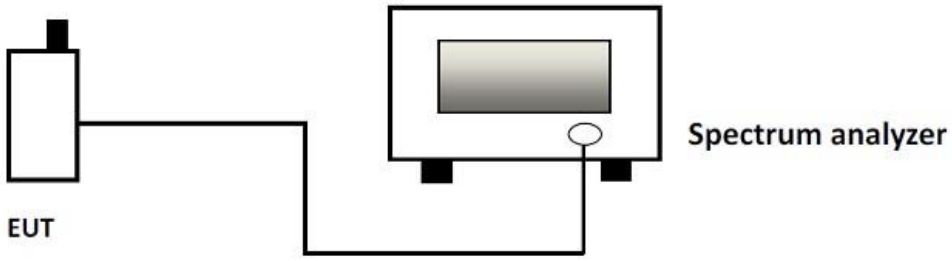
None.

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 with AE01 (connected via RJ45 cable) • was in continuous working state/ Device operated in standard continuous transmit mode (Cont TX function) • **Lowest** frequency activated (2412 MHz) – WIFI • **Was set TX power to +20 dBm** • Was settled the transmitting modulated →OFDM modulation
TX02	EUT details : during the test the EUT • was powered at 12 Vdc with AE01 (connected via RJ45 cable) • was in continuous working state/ Device operated in standard continuous transmit mode (Cont TX function) • **Medium** frequency activated (2431 MHz) – WIFI • **Was set TX power to +20 dBm** • Was settled the transmitting modulated →OFDM modulation
TX03	EUT details : during the test the EUT • was powered at 12 Vdc with AE01 (connected via RJ45 cable) • was in continuous working state/ Device operated in standard continuous transmit mode (Cont TX function) • **Highest** frequency activated (2451 MHz) – WIFI • **Was set TX power to +20 dBm** • Was settled the transmitting modulated →OFDM modulation
OC01	EUT details : during the test the EUT • Was not powered from AE01 (but AE N°01 was powered with 120V @60Hz)
OC02	EUT details : during the test the EUT • was powered at 12 Vdc with AE01 (AE N°01 was powered with 120V @60Hz) • was in continuous working state/ Device operated in standard continuous transmit mode (Cont TX function) • **Lowest** frequency activated (2431 MHz) – WIFI • **Was set TX power to +20 dBm** • Was settled the transmitting modulated →OFDM modulation

6 TEST RESULTS

Test method:	**FCC part 15 C - §15.247 (b)(3)** **ISED RSS-247 Issue 3** **Peak Output Power** For details see par. 4 of this report	
Operator	Marco Nicolè	
Test Date	2025-01-21	
Test Temperature	23 °C	
Test Humidity	32 %	
Test Pressure	1016 hPa	
Electrical wiring	*Cable*	*Length [m]*
	Ethernet cable (that included power supply cables)	3.0
Operating conditions	TX01; TX02; TX03 See par. 5 of this report	
Auxiliary equipment (AE)	See par. 3.5 of this report	
Limits	For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt	
Test set up		
Test instrumentations	See Annex B	
Measurement Uncertainty (k=2)	See Annex F	

FCC part 15 C

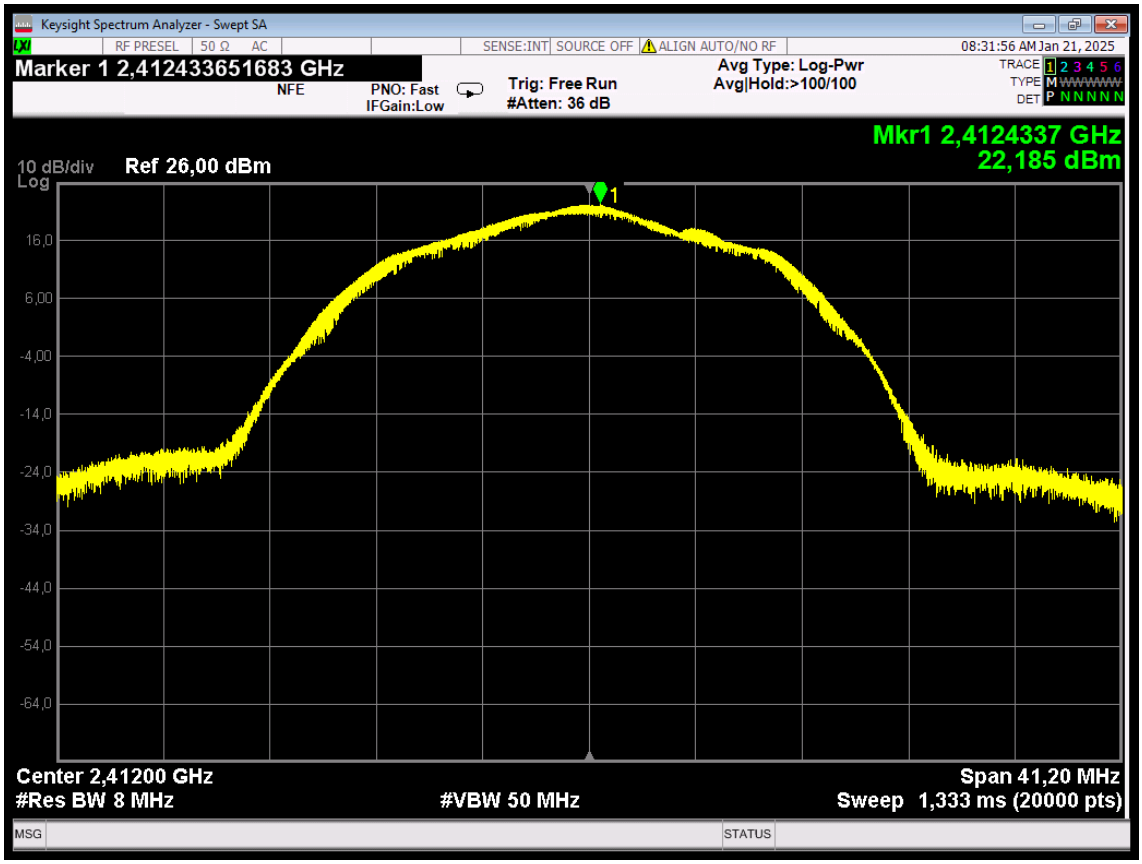
OPERATING CONDITION	FREQUENCY [MHz]	Peak Power measured [dBm]	Antenna Gain [dBi]	Total Peak Power [dBm]	LIMIT [dBm]	LIMIT [W]	RESULT
TX01	2412	+22.185	1	+23.185	+30	1	**COMPLIES**
TX02	2431	+22.439	1	+23.439	+30	1	**COMPLIES**
TX03	2451	+22.763	1	+23.763	+30	1	**COMPLIES**

ISED RSS-247 Issue 3

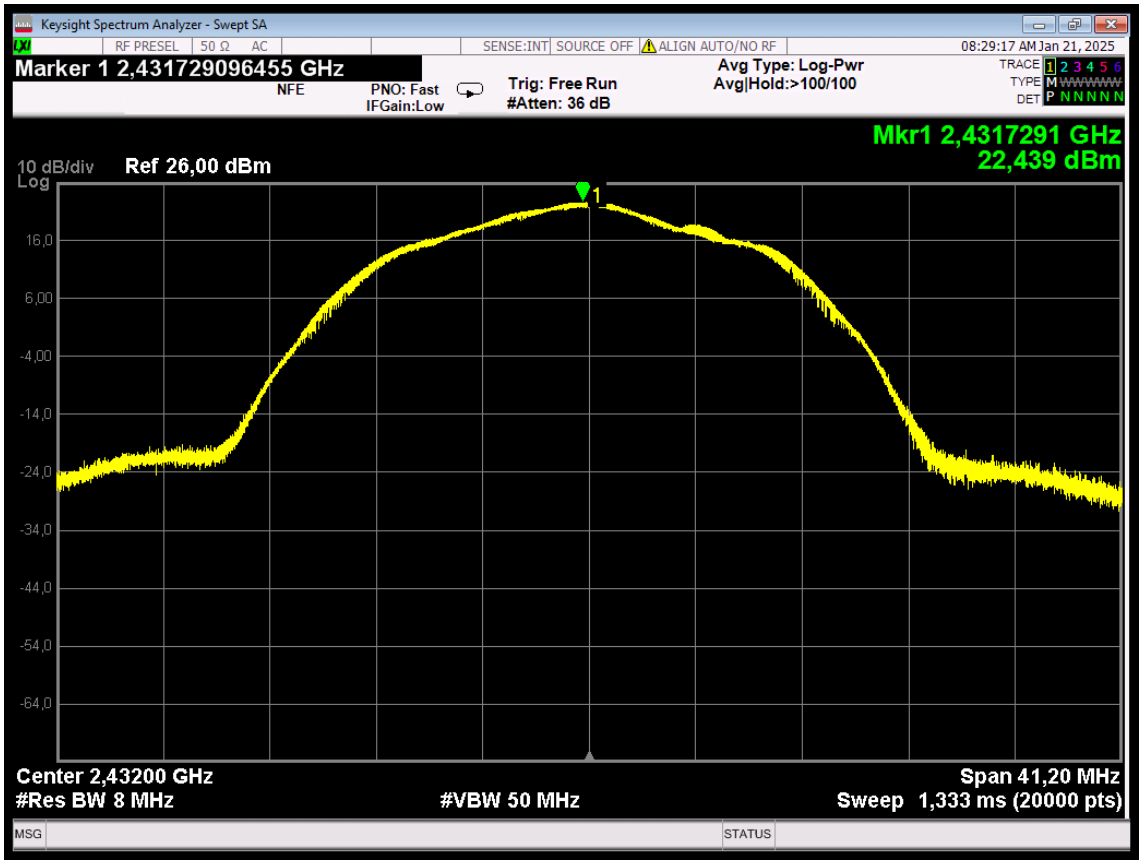
OPERATING CONDITION	FREQUENCY [MHz]	Peak Power [dBm]	Antenna Gain [dBi]	EIRP [dBm]	EIRP [W]	LIMIT [W]	RESULT
TX01	2412	+22.185	1	+23.185	0.208	4	**COMPLIES**
TX02	2431	+22.439	1	+23.439	0.221	4	**COMPLIES**
TX03	2451	+22.763	1	+23.763	0.238	4	**COMPLIES**

Test Procedure	The measurement will be conducted at three channels: DTS device: Low, middle and High, Set the spectrum analyzer with Sweep time = auto couple, Detector = Peak, Trace mode = max hold
EUT modification during this test	None

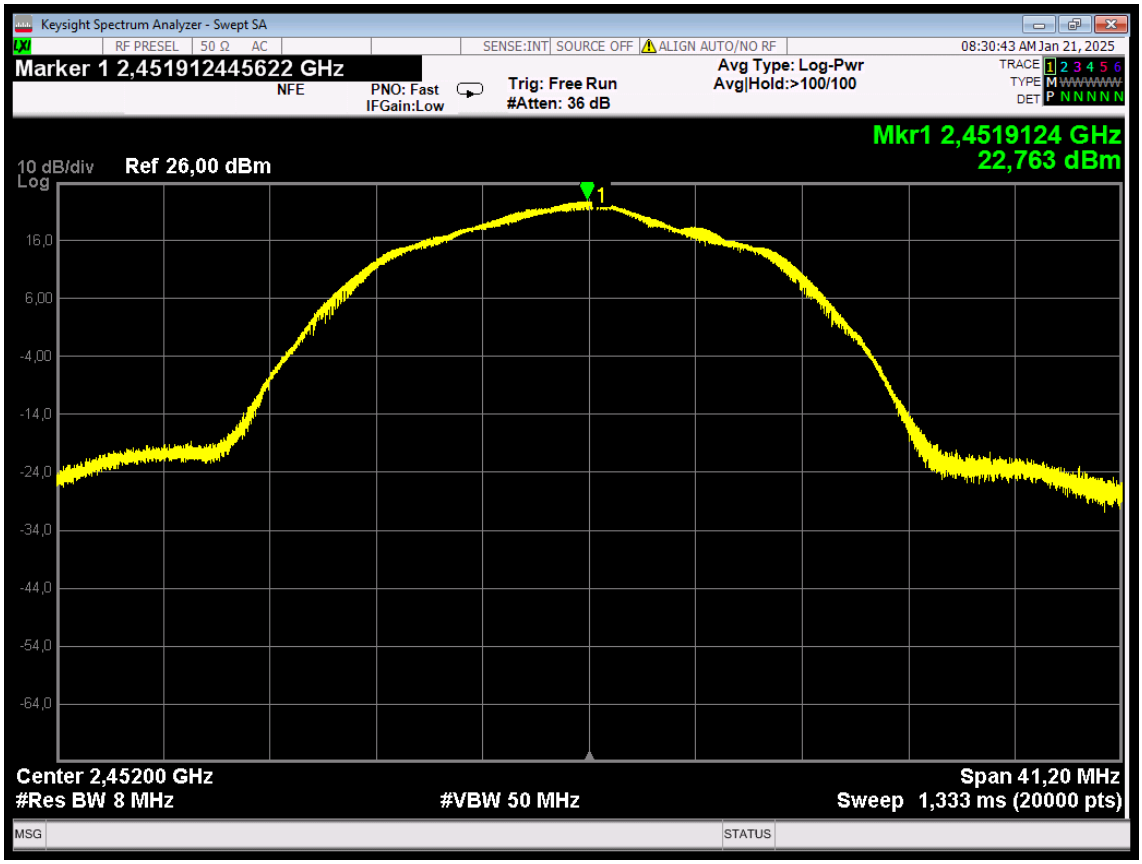
Test result TX01



Test result TX02



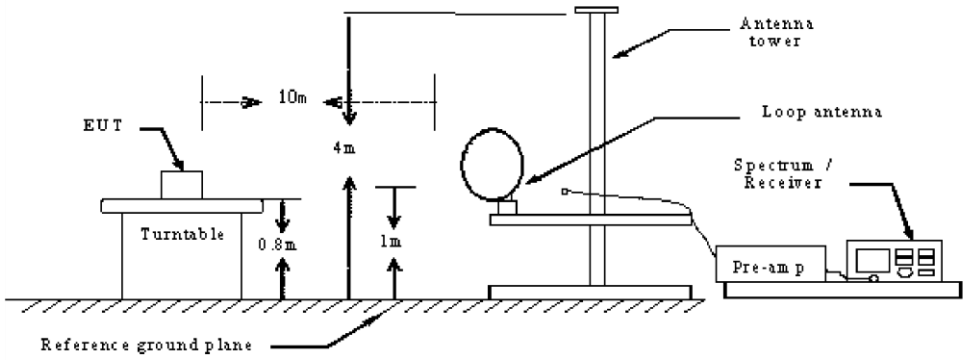
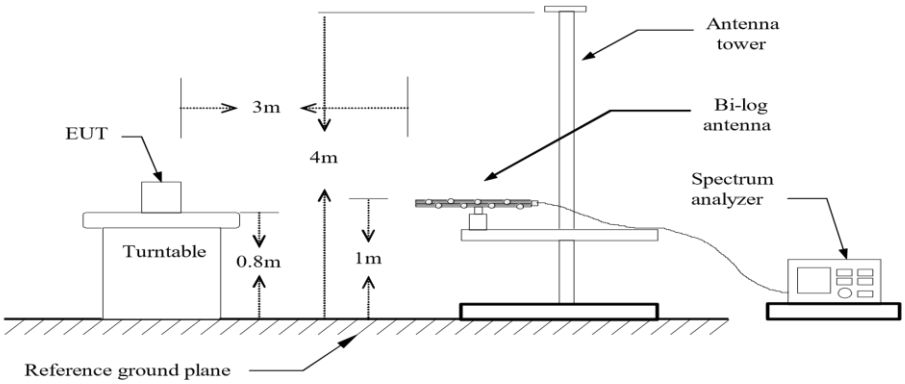
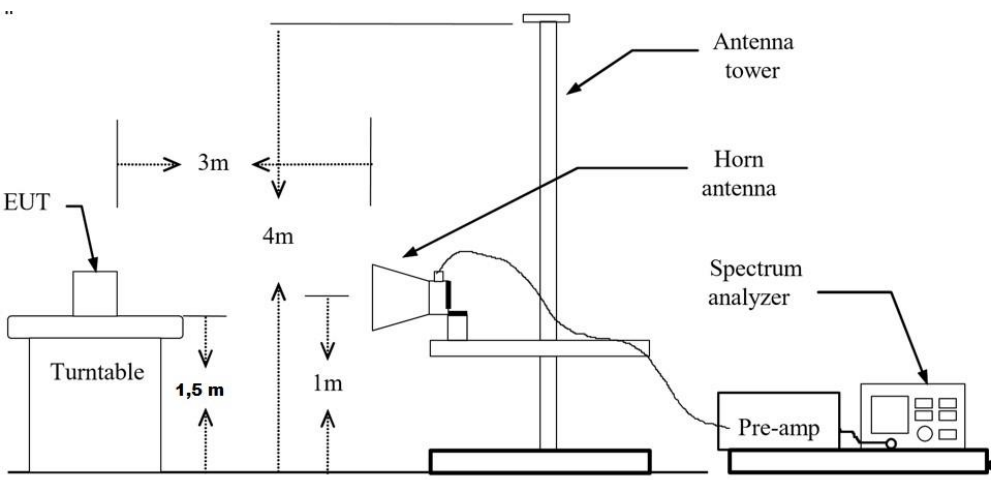
Test result TX03



Test method:	**FCC part 15 C - § 15.209** **ISED RSS-247 Issue 3** **Spurious Emission (Radiation)** For details see par. 4 of this report
Operator	Marco Nicolè
Test Date	2025-01-20
Test Temperature	22 °C
Test Humidity	32 %
Test Pressure	1016 hPa
EUT Classification	None
Electrical wiring	*Cable* — *Length [m]* Ethernet cable (that included power supply cables) — 3.0
Operating conditions	TX01; TX02; TX03 See par. 5 of this report
Auxiliary equipment (AE)	See par. 3.5 of this report
Limits	

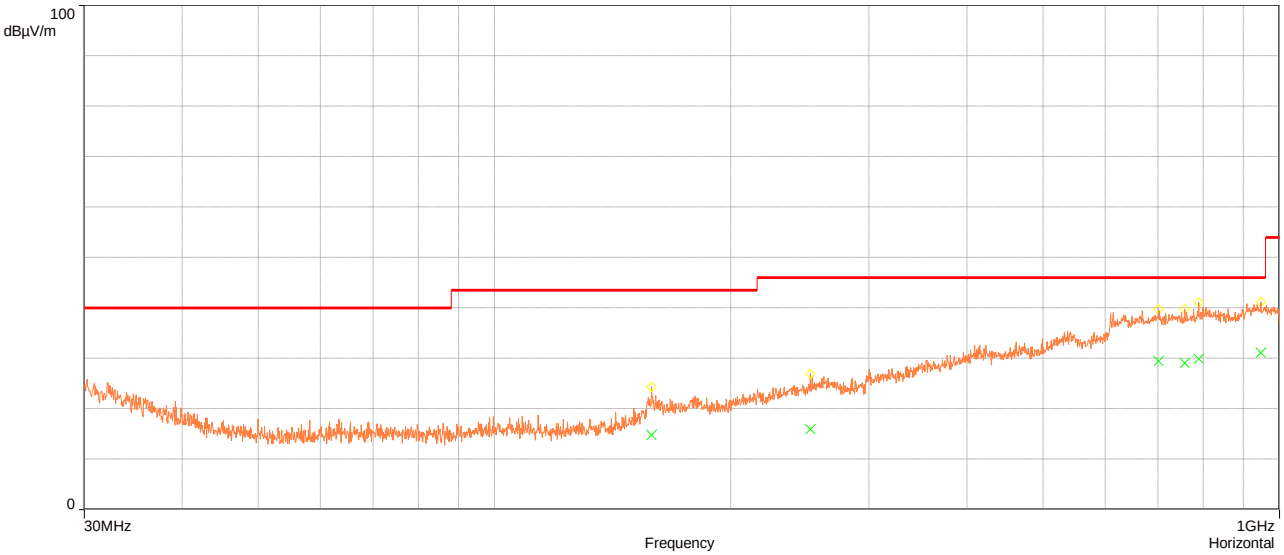
Frequency (MHz)	Limits (dBuV/m)	Detector	Measured distance (m)
30~88	40	PK	3
88~216	43.5	PK	
216-960	46	PK	
Above 960	54	PK	

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

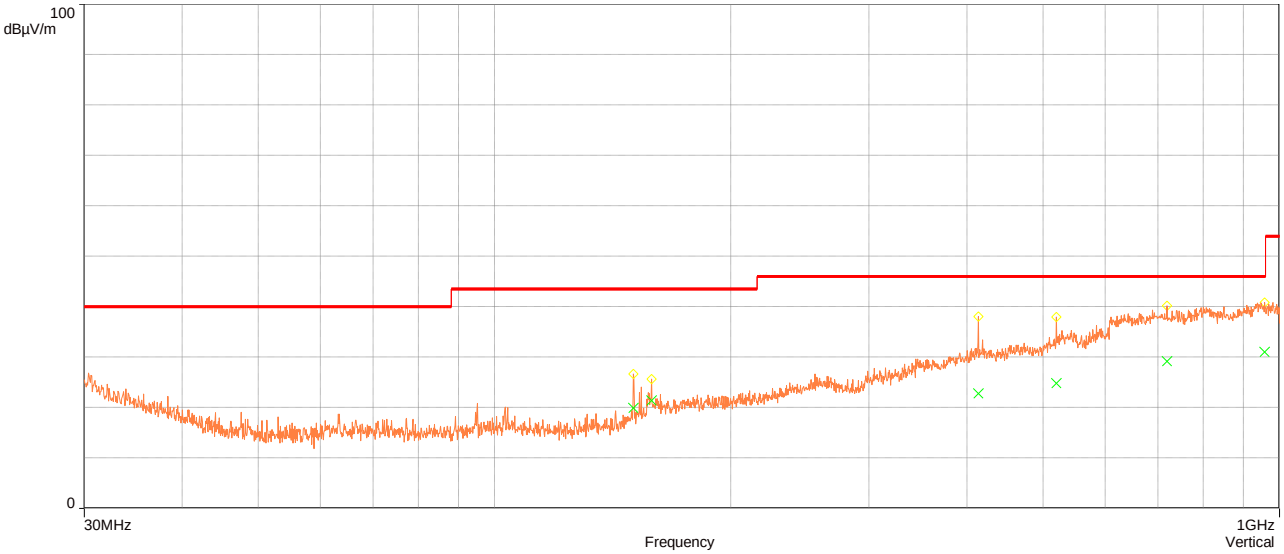
Test set up	Radiated Spurious Measurement: below 30MHz  Radiated Spurious Measurement: below 1GHz  Radiated Spurious Measurement: above 1GHz 
Frequency range	from 30 MHz up through the 10th harmonic
Measuring distance in the anechoic chamber	3 m
Test instrumentations	See Annex B
Measurement Uncertainty (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	None

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



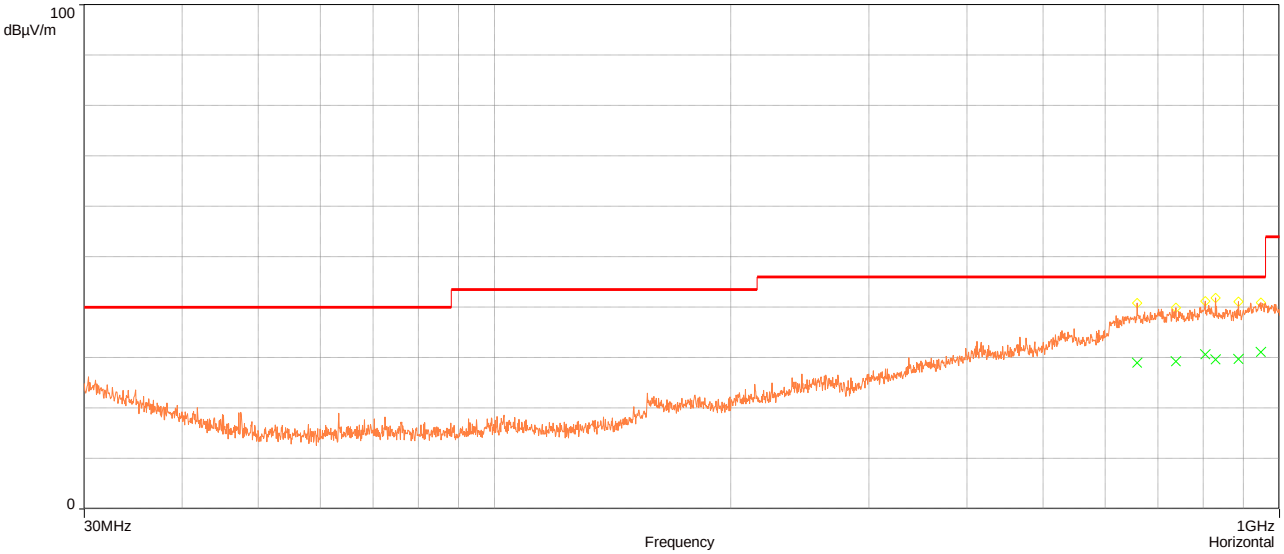
Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 30MHz÷ 1GHz
Operating Condition: TX01



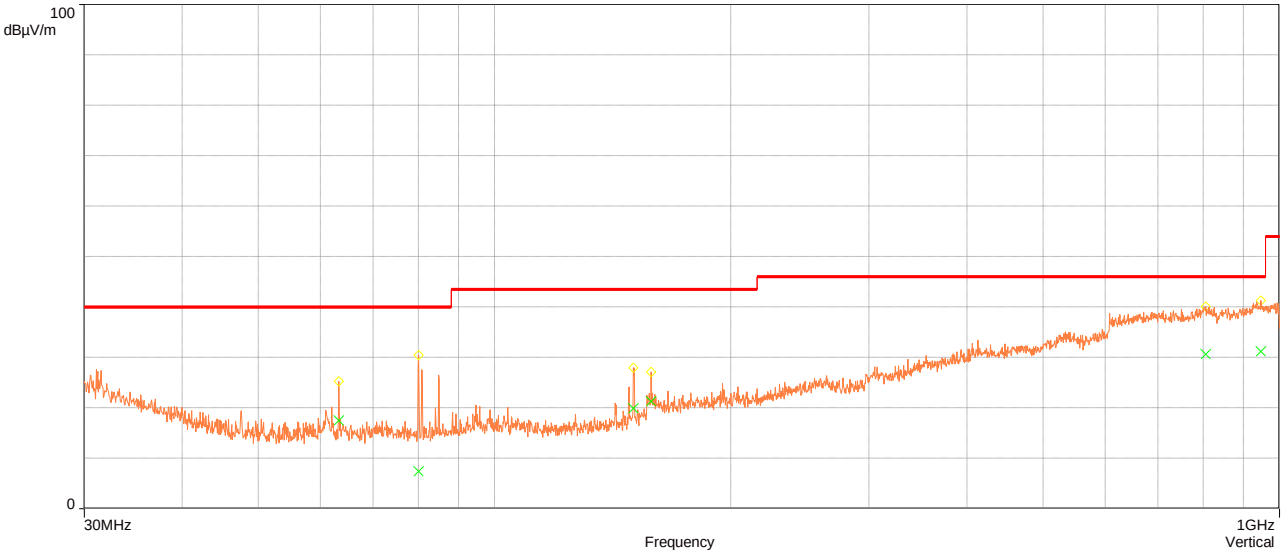
Frequency (MHz)	SR	Peak (dBµV/m)	QPeak (dBµV/m)	LimQPeak (dBµV/m)	Delta (dB)	Polarization	Height (m)	Angle (deg)	Conversion Factor
158.515	1	24.38	14.82	43.52	-28.70	Horizontal	2.56	369.90	15.83
252.475	1	26.97	15.91	46.00	-30.09	Horizontal	1.05	170.80	19.18

701.3955	1	39.73	29.46	46.00	-16.54	Horizontal	3.96	20.40	30.35
756.8955	1	39.75	29.08	46.00	-16.92	Horizontal	3.36	220.70	30.09
788.875	1	41.09	29.92	46.00	-16.08	Horizontal	3.95	20.40	31.03
947.395	1	41.21	31.09	46.00	-14.91	Horizontal	1.45	220.70	33.17
150.2955	2	26.66	19.92	43.52	-23.60	Vertical	1.05	50.80	14.97
158.395	2	25.64	21.37	43.52	-22.15	Vertical	1.23	20.10	15.85
413.1555	2	38.03	22.76	46.00	-23.24	Vertical	1.12	369.80	24.29
519.415	2	37.93	24.82	46.00	-21.18	Vertical	1.96	80.40	26.75
719.215	2	40.23	29.19	46.00	-16.81	Vertical	3.13	170.30	29.95
957.1155	2	40.84	31.04	46.00	-14.96	Vertical	3.86	50.80	32.98

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



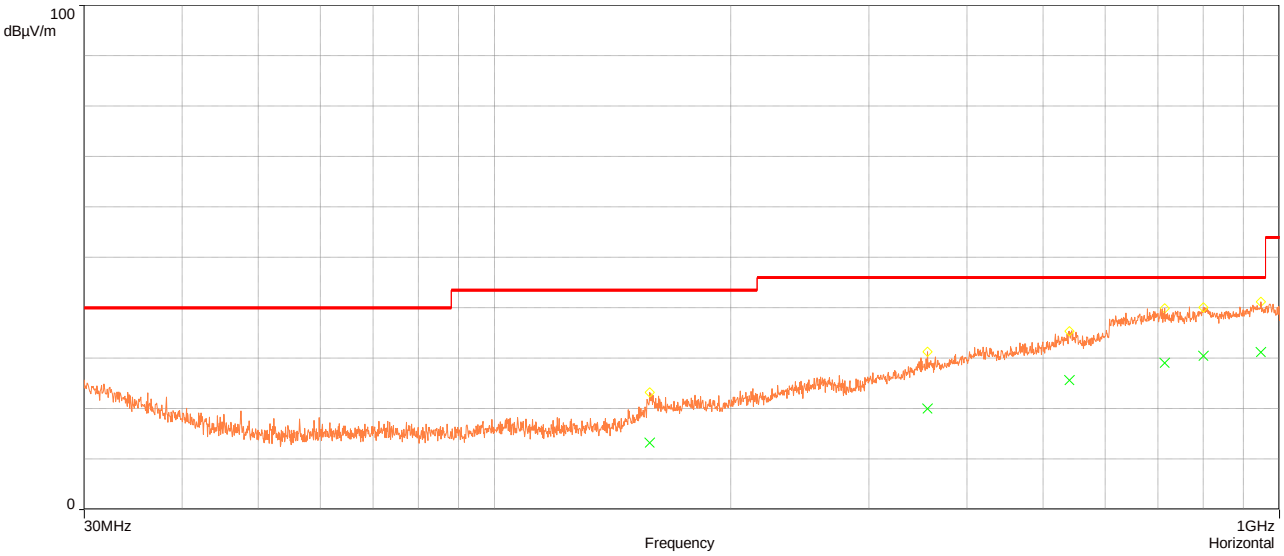
Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 30MHz÷ 1GHz
Operating Condition: TX02



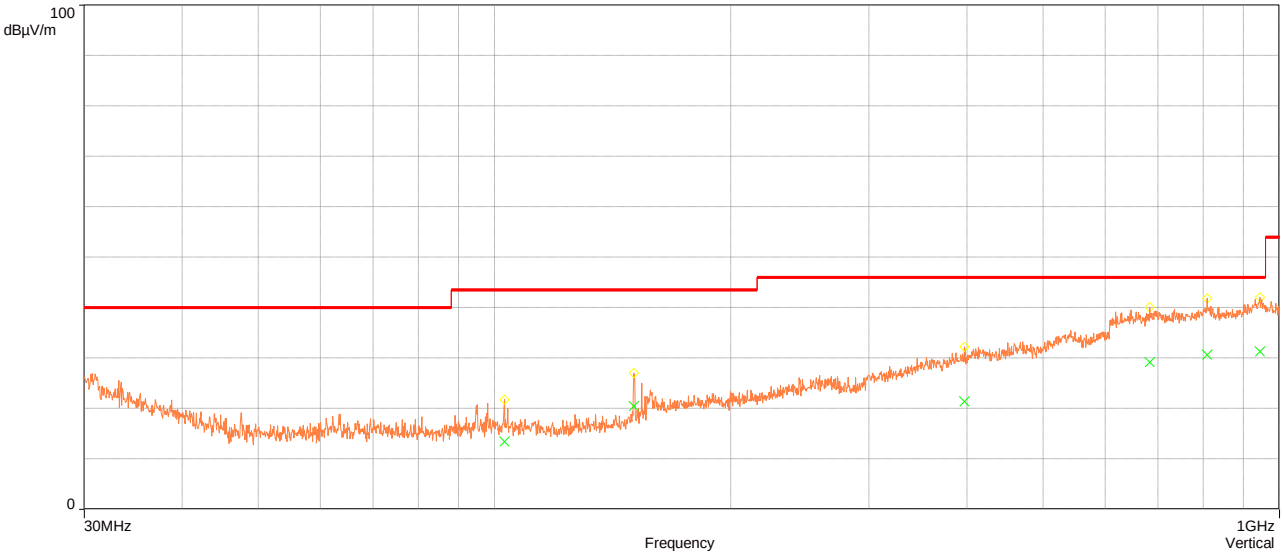
Frequency (MHz)	SR	Peak (dBµV/m)	QPeak (dBµV/m)	LimQPeak (dBµV/m)	Delta (dB)	Polarization	Height (m)	Angle (deg)	Conversion Factor
658.9155	1	40.85	28.95	46.00	-17.05	Horizontal	1.27	349.90	29.25
737.5155	1	39.96	29.29	46.00	-16.71	Horizontal	2.80	170.10	30.22
804.715	1	41.18	30.63	46.00	-15.37	Horizontal	3.23	49.90	31.78

829.135	1	41.86	29.65	46.00	-16.35	Horizontal	1.13	220.80	30.96
886.8555	1	41.16	29.74	46.00	-16.26	Horizontal	4.00	170.10	31.31
946.4955	1	40.93	31.15	46.00	-14.85	Horizontal	3.86	110.30	33.20
63.2955	2	25.30	17.54	40.00	-22.46	Vertical	1.01	279.90	11.63
79.9755	2	30.46	7.39	40.00	-32.61	Vertical	2.93	230.70	11.81
150.295	2	27.99	19.90	43.52	-23.62	Vertical	1.05	140.10	14.97
158.215	2	27.12	21.35	43.52	-22.17	Vertical	1.14	70.10	15.89
805.375	2	40.13	30.68	46.00	-15.32	Vertical	1.00	170.80	31.79
947.335	2	41.28	31.18	46.00	-14.82	Vertical	3.13	20.80	33.18

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



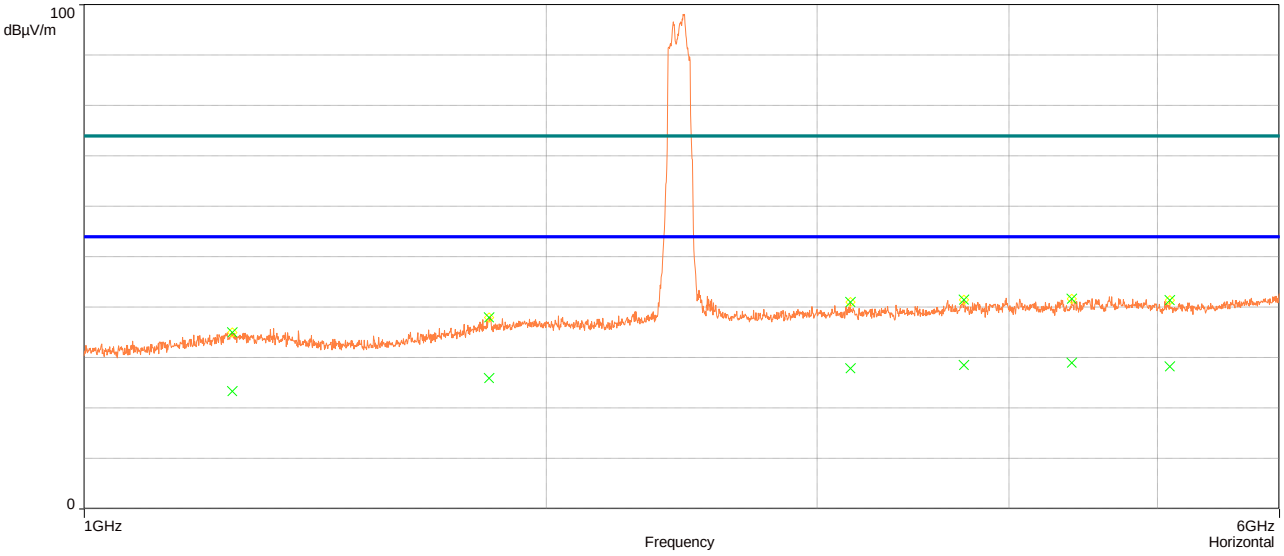
Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 30MHz÷ 1GHz
Operating Condition: TX03



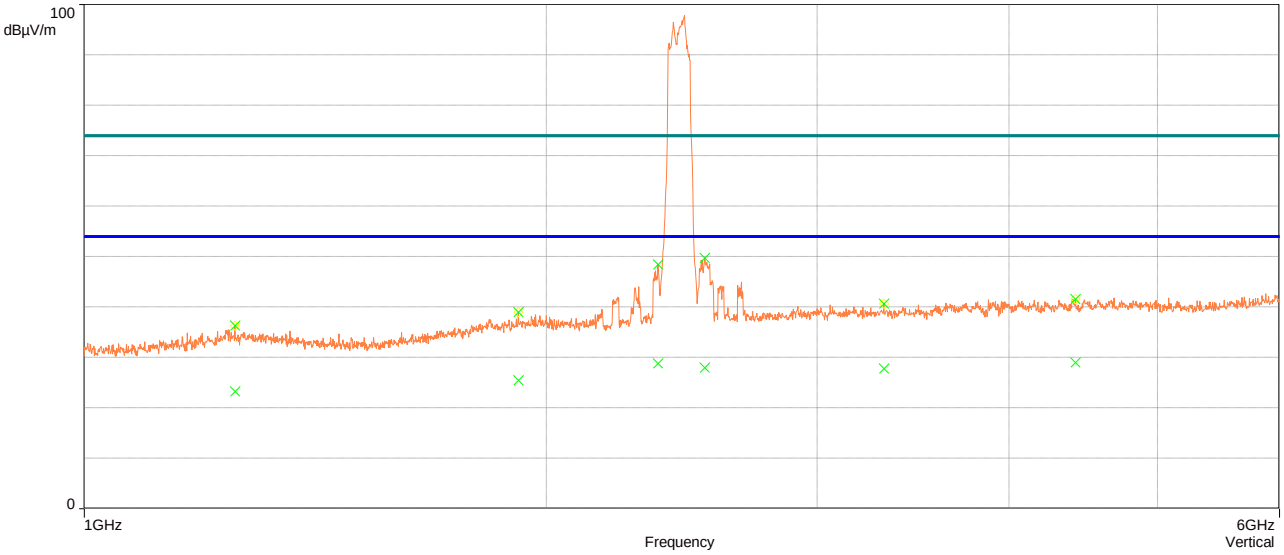
Frequency (MHz)	SR	Peak (dBµV/m)	QPeak (dBµV/m)	LimQPeak (dBµV/m)	Delta (dB)	Polarization	Height (m)	Angle (deg)	Conversion Factor
157.6155	1	23.29	13.25	43.52	-30.27	Horizontal	3.10	130.80	15.91
356.2755	1	31.31	20.02	46.00	-25.98	Horizontal	1.01	340.80	21.94

540.2355	1	35.42	25.65	46.00	-20.35	Horizontal	3.99	200.70	27.94
713.5155	1	39.93	29.04	46.00	-16.96	Horizontal	3.86	260.30	30.00
799.495	1	40.10	30.49	46.00	-15.51	Horizontal	3.95	260.30	31.60
946.555	1	41.17	31.23	46.00	-14.77	Horizontal	3.26	110.80	33.20
102.895	2	21.80	13.44	43.52	-30.08	Vertical	1.01	280.30	13.31
150.4155	2	27.02	20.47	43.52	-23.05	Vertical	1.15	110.80	14.98
396.8955	2	32.20	21.36	46.00	-24.64	Vertical	3.21	250.60	23.07
683.8155	2	40.07	29.14	46.00	-16.86	Vertical	2.41	20.00	29.76
808.7955	2	41.91	30.68	46.00	-15.32	Vertical	2.93	310.50	31.80
943.555	2	42.00	31.30	46.00	-14.70	Vertical	3.95	230.60	33.25

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

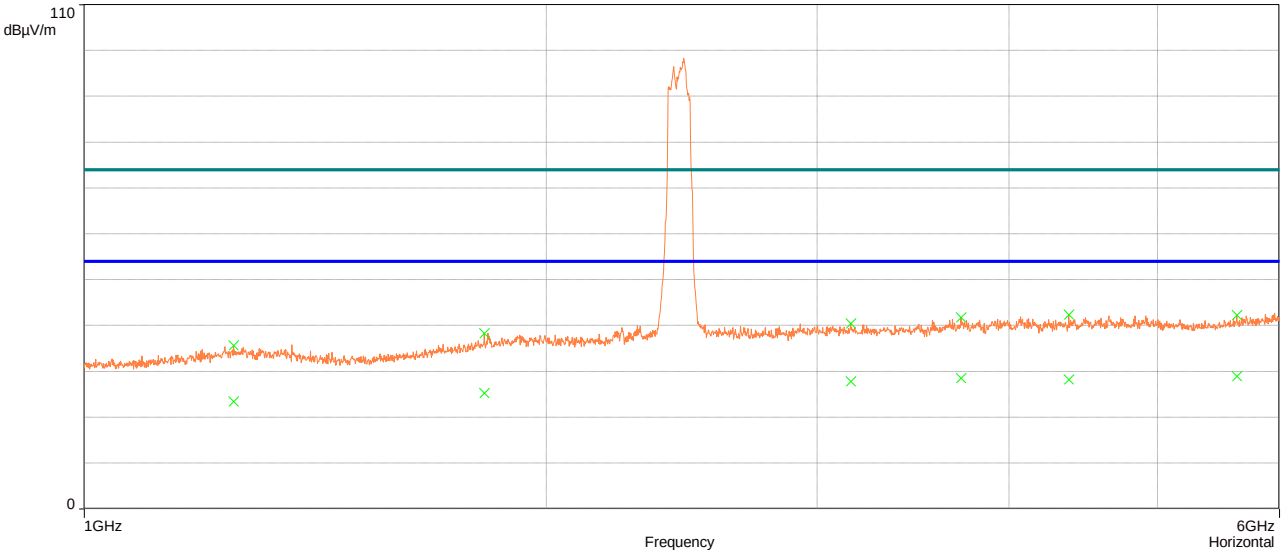


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 1GHz÷ 6GHz
Operating Condition: TX01

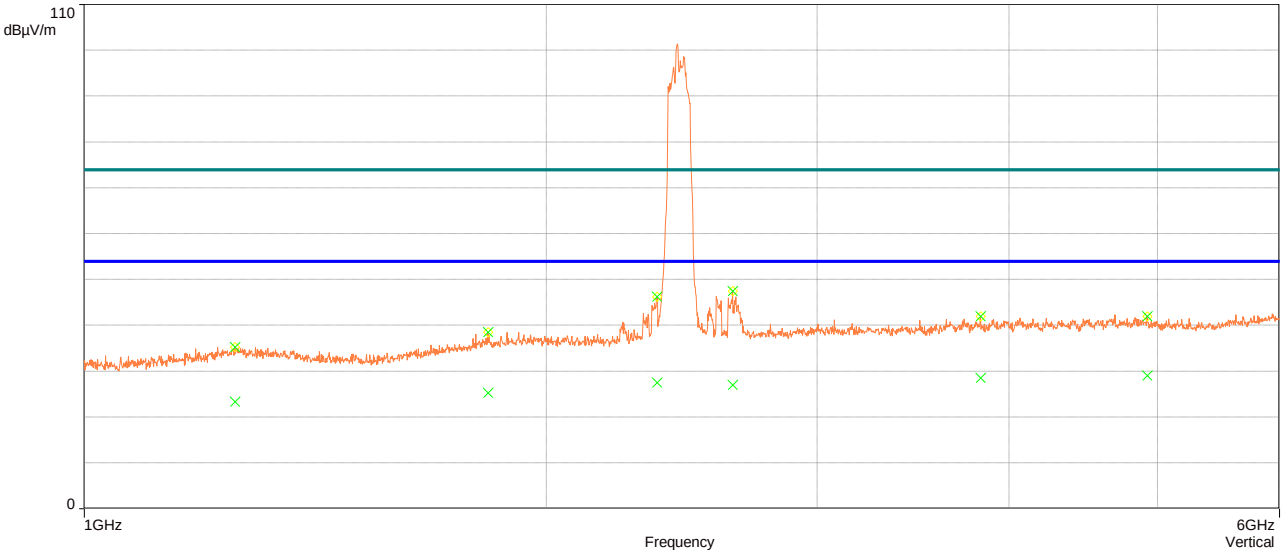


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
1248.475	1	35.01	74.00	36.89	23.30	54.00	30.70	180.30	Horizontal
1834.4775	1	37.93	74.00	33.30	25.94	54.00	28.06	150.30	Horizontal
3153.975	1	41.00	74.00	32.99	27.84	54.00	26.16	300.20	Horizontal
3737.475	1	41.47	74.00	31.24	28.56	54.00	25.44	270.80	Horizontal
4393.975	1	41.70	74.00	31.96	28.97	54.00	25.03	180.30	Horizontal
5089.4775	1	41.36	74.00	32.39	28.29	54.00	25.71	150.30	Horizontal
1253.975	2	36.27	74.00	37.85	23.29	54.00	30.71	60.80	Vertical
1916.9775	2	38.97	74.00	35.00	25.46	54.00	28.54	300.70	Vertical
2363.975	2	48.44	74.00	23.43	28.76	54.00	25.24	300.70	Vertical
2534.975	2	49.72	74.00	23.28	27.95	54.00	26.05	90.60	Vertical
3315.975	2	40.64	74.00	32.53	27.83	54.00	26.17	270.30	Vertical
4418.475	2	41.62	74.00	31.67	28.96	54.00	25.04	330.40	Vertical

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

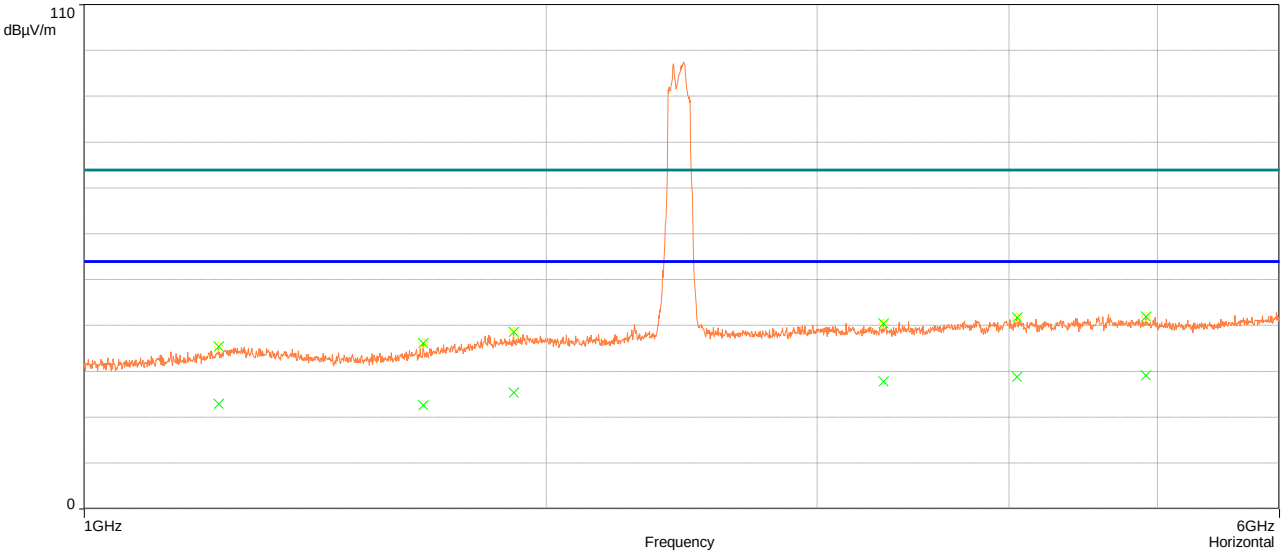


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 1GHz÷ 6GHz
Operating Condition: TX02

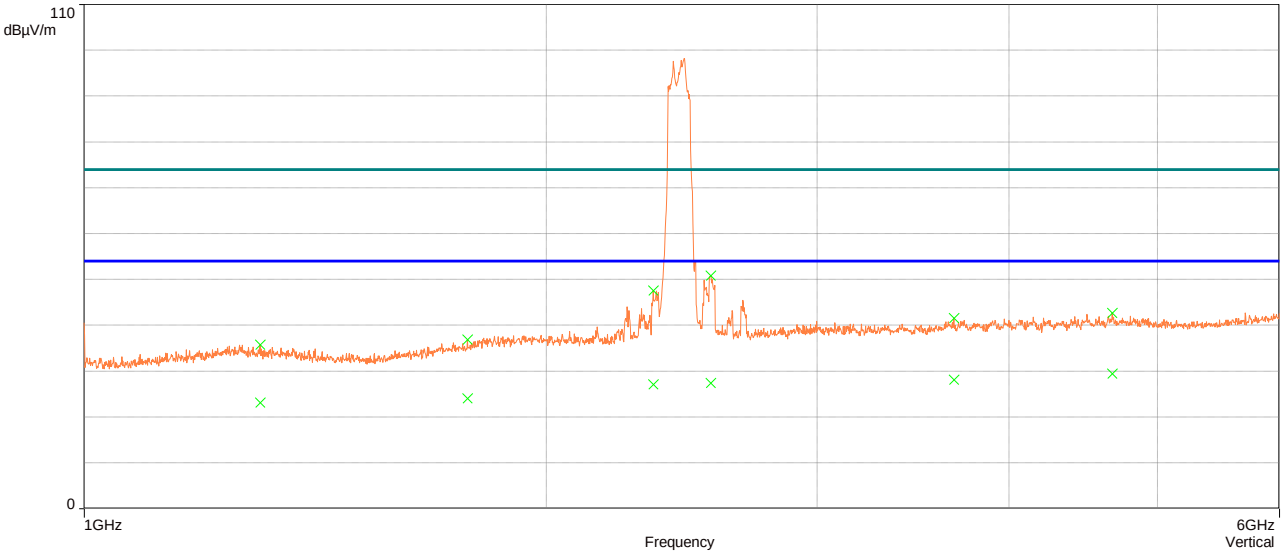


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
1251.475	1	35.66	74.00	36.92	23.44	54.00	30.56	120.30	Horizontal
1821.975	1	38.26	74.00	35.50	25.29	54.00	28.71	210.20	Horizontal
3156.975	1	40.49	74.00	32.80	27.79	54.00	26.21	300.70	Horizontal
3721.975	1	41.79	74.00	31.89	28.51	54.00	25.49	30.70	Horizontal
4375.975	1	42.40	74.00	32.28	28.21	54.00	25.79	300.70	Horizontal
5629.475	1	42.29	74.00	31.69	28.92	54.00	25.08	359.90	Horizontal
1253.475	2	35.20	74.00	26.84	23.32	54.00	30.68	240.30	Vertical
1831.975	2	38.48	74.00	34.32	25.30	54.00	28.70	300.20	Vertical
2360.4775	2	46.29	74.00	26.66	27.51	54.00	26.49	240.30	Vertical
2642.9775	2	47.43	74.00	28.87	26.98	54.00	27.02	30.10	Vertical
3833.975	2	41.95	74.00	32.14	28.53	54.00	25.47	330.30	Vertical
4922.9775	2	42.00	74.00	32.00	29.04	54.00	24.96	180.40	Vertical

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

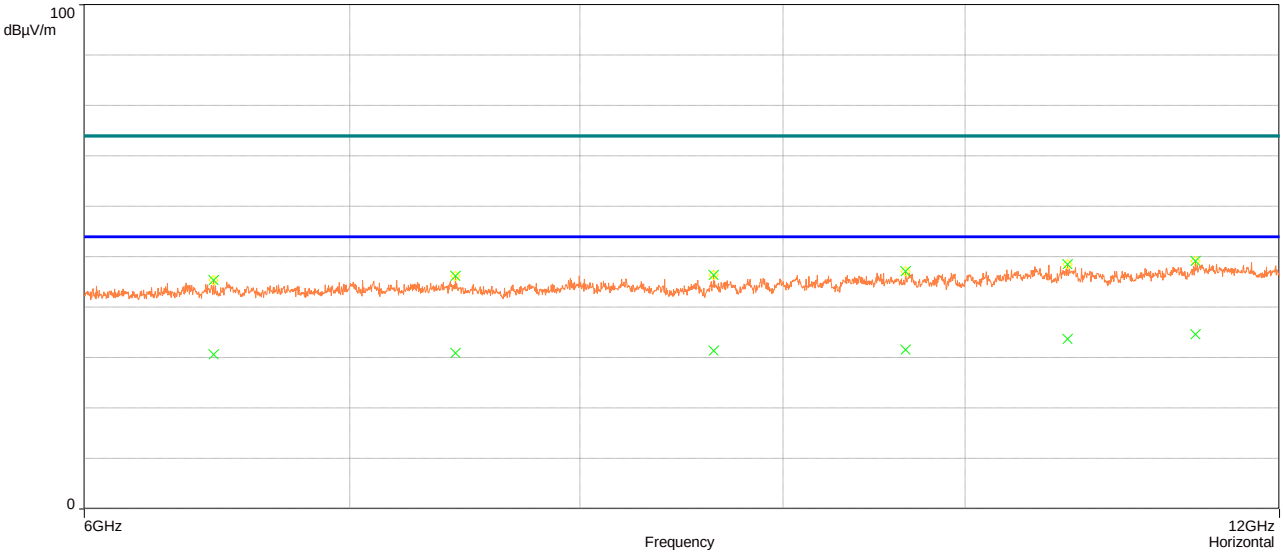


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 1GHz÷ 6GHz
Operating Condition: TX03

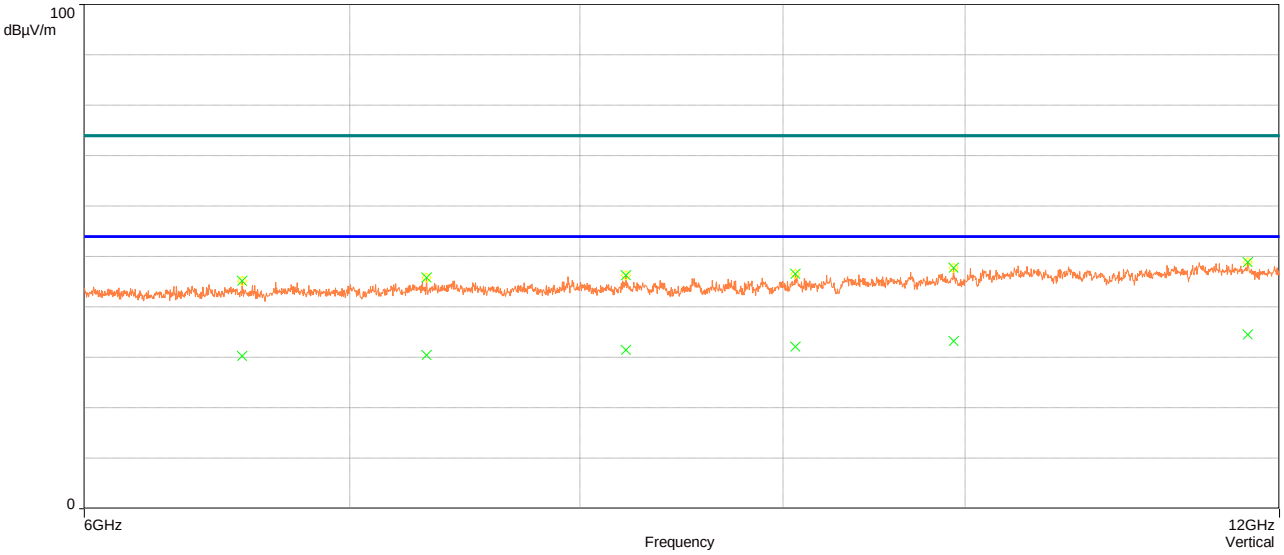


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
1223.475	1	35.40	74.00	34.34	22.91	54.00	31.09	210.20	Horizontal
1662.475	1	36.14	74.00	38.30	22.60	54.00	31.40	359.90	Horizontal
1904.475	1	38.56	74.00	34.92	25.34	54.00	28.66	90.00	Horizontal
3313.4775	1	40.42	74.00	33.12	27.79	54.00	26.21	330.30	Horizontal
4047.4775	1	41.79	74.00	32.36	28.81	54.00	25.19	149.90	Horizontal
4911.475	1	41.92	74.00	31.70	29.16	54.00	24.84	149.90	Horizontal
1301.9775	2	35.76	74.00	37.41	23.09	54.00	30.91	180.40	Vertical
1775.975	2	36.86	74.00	37.11	24.07	54.00	29.93	180.40	Vertical
2346.475	2	47.55	74.00	26.23	27.13	54.00	26.87	300.50	Vertical
2557.475	2	50.85	74.00	21.89	27.40	54.00	26.60	120.30	Vertical
3683.975	2	41.56	74.00	31.71	28.10	54.00	25.90	210.20	Vertical
4670.4775	2	42.65	74.00	30.58	29.45	54.00	24.55	270.00	Vertical

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

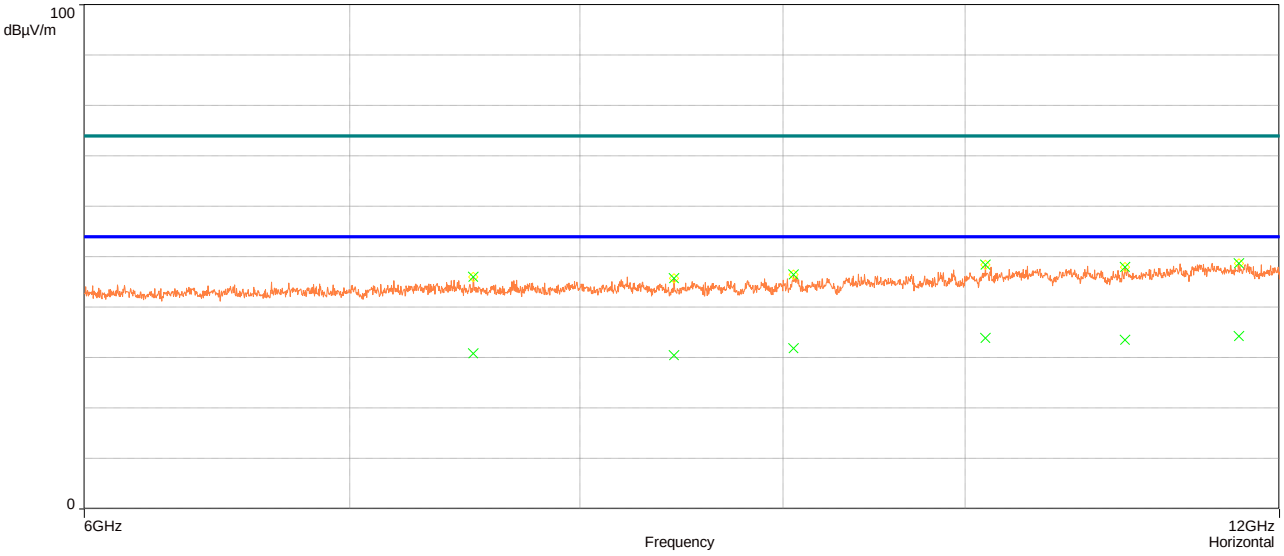


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 6GHz÷ 12GHz
Operating Condition: TX01

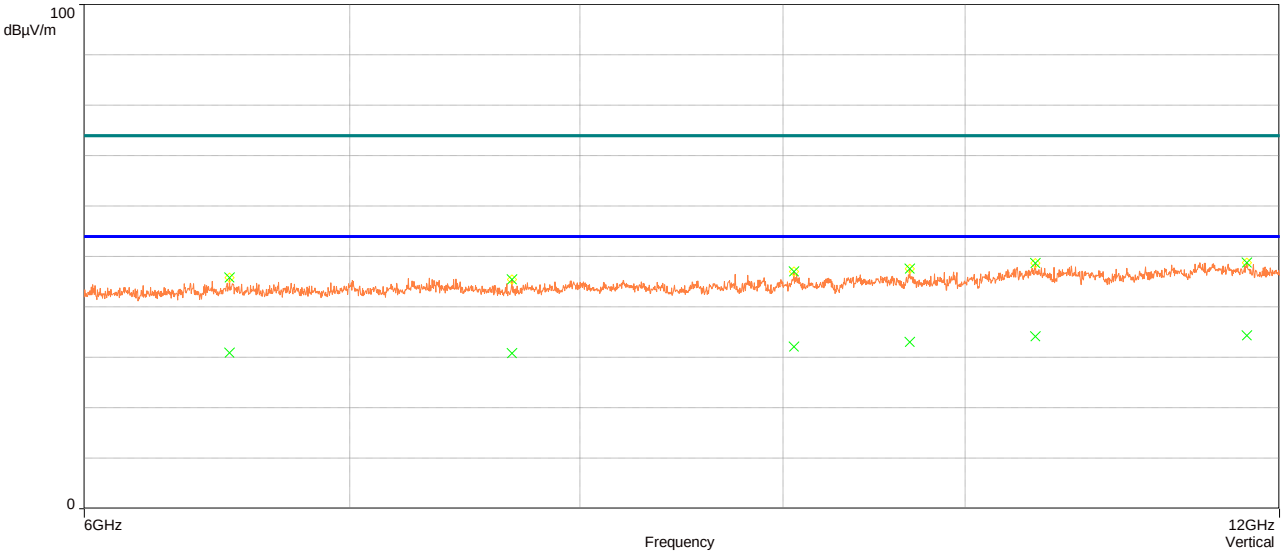


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
6468	1	45.34	74.00	43.34	30.66	54.00	23.34	90.70	Horizontal
7441.005	1	46.18	74.00	43.07	30.93	54.00	23.07	210.00	Horizontal
8641.9995	1	46.42	74.00	42.61	31.38	54.00	22.62	150.70	Horizontal
9660.003	1	47.16	74.00	42.42	31.58	54.00	22.42	359.90	Horizontal
10612.017	1	48.56	74.00	40.32	33.68	54.00	20.32	30.80	Horizontal
11428.024	1	49.19	74.00	39.37	34.63	54.00	19.37	210.00	Horizontal
6576.0185	2	45.15	74.00	43.71	30.29	54.00	23.71	180.30	Vertical
7316.9835	2	45.85	74.00	43.55	30.45	54.00	23.55	150.30	Vertical
8215.0175	2	46.31	74.00	42.51	31.49	54.00	22.51	150.30	Vertical
9061.9995	2	46.63	74.00	41.88	32.12	54.00	21.88	90.40	Vertical
9933.025	2	47.77	74.00	40.77	33.23	54.00	20.77	150.30	Vertical
11781.02	2	48.88	74.00	39.47	34.53	54.00	19.47	300.20	Vertical

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

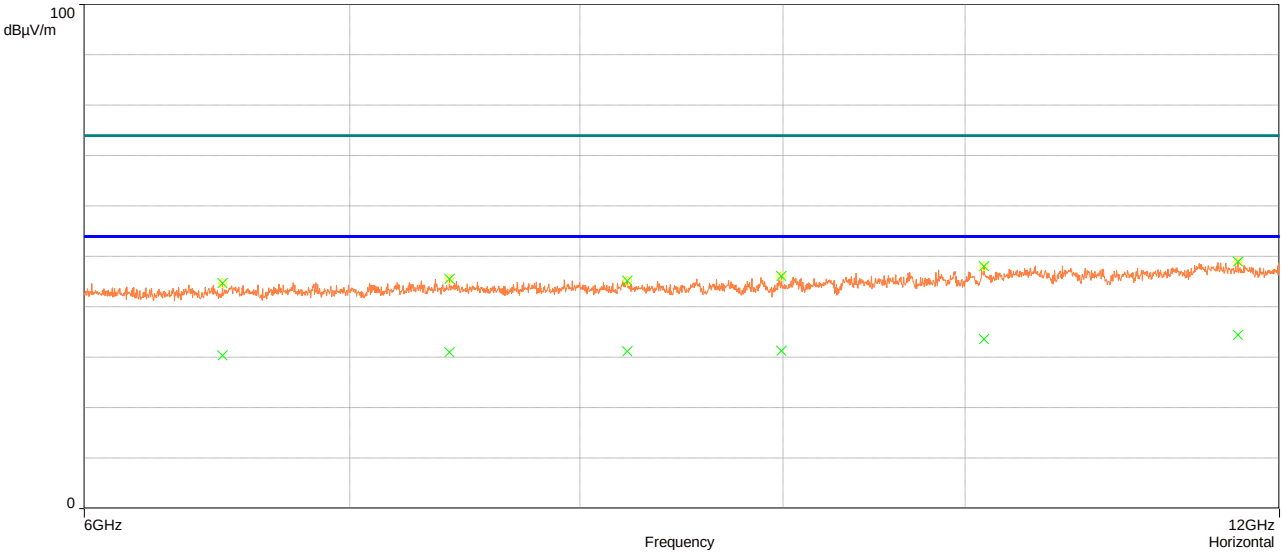


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 6GHz÷ 12GHz
Operating Condition: TX02

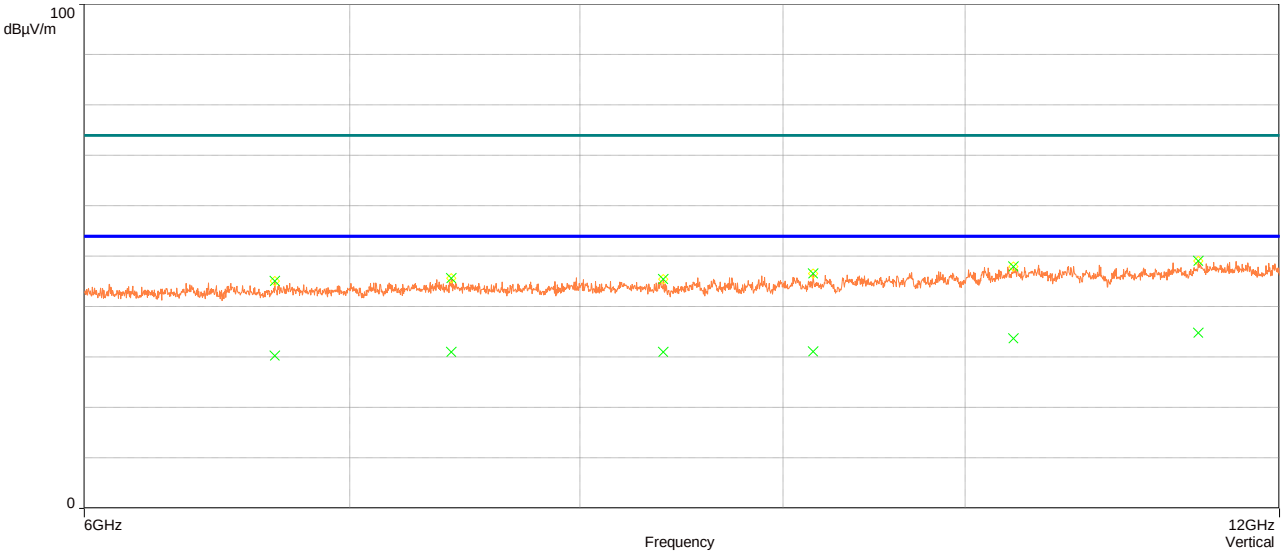


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
7518.0005	1	46.01	74.00	43.15	30.85	54.00	23.15	180.30	Horizontal
8447.0235	1	45.79	74.00	43.49	30.51	54.00	23.49	359.90	Horizontal
9053.0225	1	46.49	74.00	42.16	31.84	54.00	22.16	150.30	Horizontal
10117.9835	1	48.39	74.00	40.10	33.90	54.00	20.10	240.60	Horizontal
10971.0175	1	47.93	74.00	40.44	33.56	54.00	20.44	240.60	Horizontal
11721.9865	1	48.76	74.00	39.70	34.30	54.00	19.70	210.30	Horizontal
6526.999	2	45.82	74.00	43.11	30.89	54.00	23.11	150.20	Vertical
7687.9965	2	45.48	74.00	43.16	30.83	54.00	23.17	270.80	Vertical
9054.9845	2	47.01	74.00	41.91	32.09	54.00	21.91	300.50	Vertical
9683.9835	2	47.55	74.00	40.95	33.05	54.00	20.95	240.70	Vertical
10415.017	2	48.67	74.00	39.81	34.19	54.00	19.81	180.30	Vertical
11774.9995	2	48.85	74.00	39.61	34.39	54.00	19.61	90.50	Vertical

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

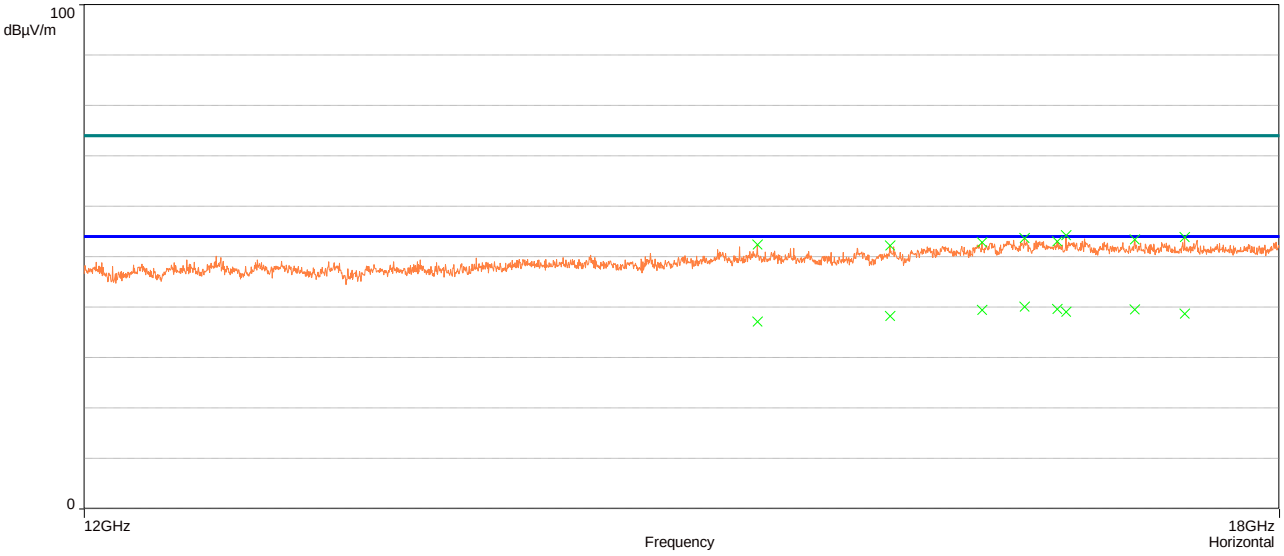


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 6GHz÷ 12GHz
Operating Condition: TX03

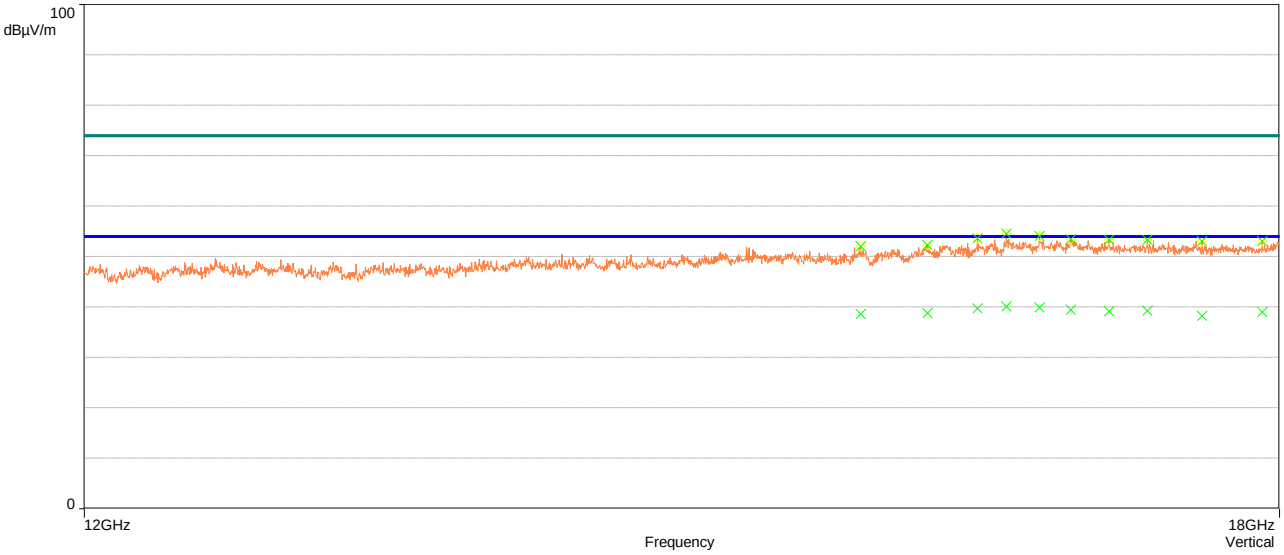


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
6500.989	1	44.77	74.00	43.67	30.33	54.00	23.67	120.20	Horizontal
7414.001	1	45.54	74.00	42.98	31.02	54.00	22.98	180.30	Horizontal
8220.002	1	45.23	74.00	42.80	31.20	54.00	22.80	359.90	Horizontal
8989.9945	1	46.16	74.00	42.68	31.32	54.00	22.68	60.30	Horizontal
10111.024	1	48.06	74.00	40.38	33.62	54.00	20.38	270.10	Horizontal
11715.0235	1	48.97	74.00	39.57	34.43	54.00	19.57	300.60	Horizontal
6701.013	2	45.10	74.00	43.74	30.26	54.00	23.74	60.70	Vertical
7422.0175	2	45.66	74.00	42.97	31.03	54.00	22.97	180.10	Vertical
8394.011	2	45.51	74.00	42.95	31.05	54.00	22.95	330.70	Vertical
9157.004	2	46.57	74.00	42.84	31.16	54.00	22.84	150.70	Vertical
10284.985	2	48.00	74.00	40.32	33.68	54.00	20.32	270.00	Vertical
11448.9765	2	49.05	74.00	39.18	34.81	54.00	19.19	180.10	Vertical

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

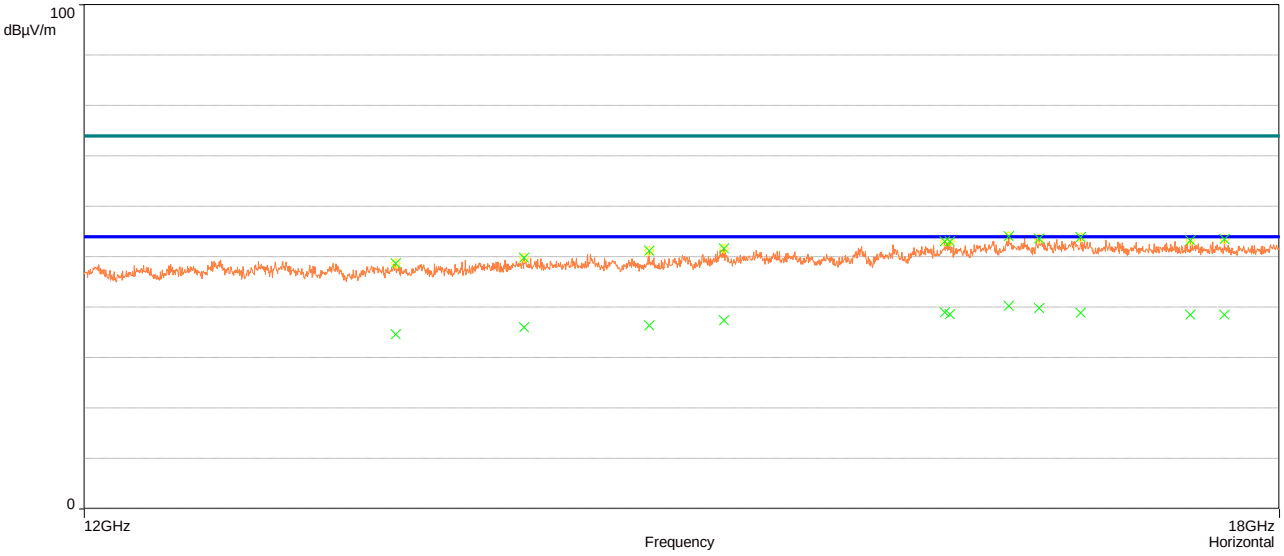


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 12GHz÷ 18GHz
Operating Condition: TX01

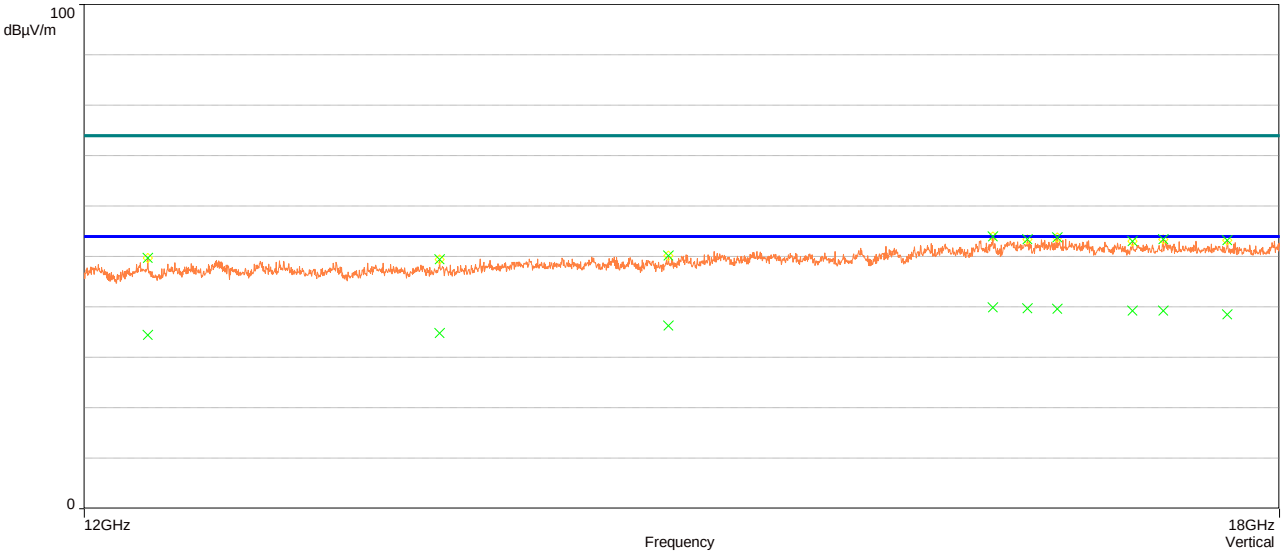


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
15077.977	1	52.42	74.00	36.86	37.14	54.00	16.86	300.50	Horizontal
15772.014	1	52.19	74.00	35.76	38.24	54.00	15.76	359.90	Horizontal
16272.9835	1	52.86	74.00	34.57	39.43	54.00	14.57	210.80	Horizontal
16508.022	1	53.74	74.00	33.93	40.07	54.00	13.93	60.30	Horizontal
16693.9845	1	53.08	74.00	34.40	39.60	54.00	14.40	240.30	Horizontal
16743.014	1	54.28	74.00	34.87	39.13	54.00	14.87	120.80	Horizontal
17138.0035	1	53.44	74.00	34.41	39.59	54.00	14.41	330.40	Horizontal
17431.0235	1	53.90	74.00	35.29	38.71	54.00	15.29	60.30	Horizontal
15614.994	2	52.01	74.00	35.35	38.63	54.00	15.37	269.90	Vertical
15975.007	2	52.28	74.00	35.16	38.84	54.00	15.16	180.20	Vertical
16246.025	2	53.59	74.00	34.32	39.68	54.00	14.32	240.40	Vertical
16406.9835	2	54.55	74.00	33.94	40.06	54.00	13.94	210.60	Vertical
16592.989	2	54.07	74.00	34.07	39.93	54.00	14.07	210.60	Vertical
16771.0085	2	53.46	74.00	34.53	39.47	54.00	14.53	329.90	Vertical
16988.003	2	53.37	74.00	34.78	39.21	54.00	14.79	240.40	Vertical
17211.9775	2	53.38	74.00	34.76	39.24	54.00	14.76	89.80	Vertical
17533.021	2	53.08	74.00	35.77	38.23	54.00	15.77	180.20	Vertical
17893.986	2	53.08	74.00	35.05	38.95	54.00	15.05	359.80	Vertical

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

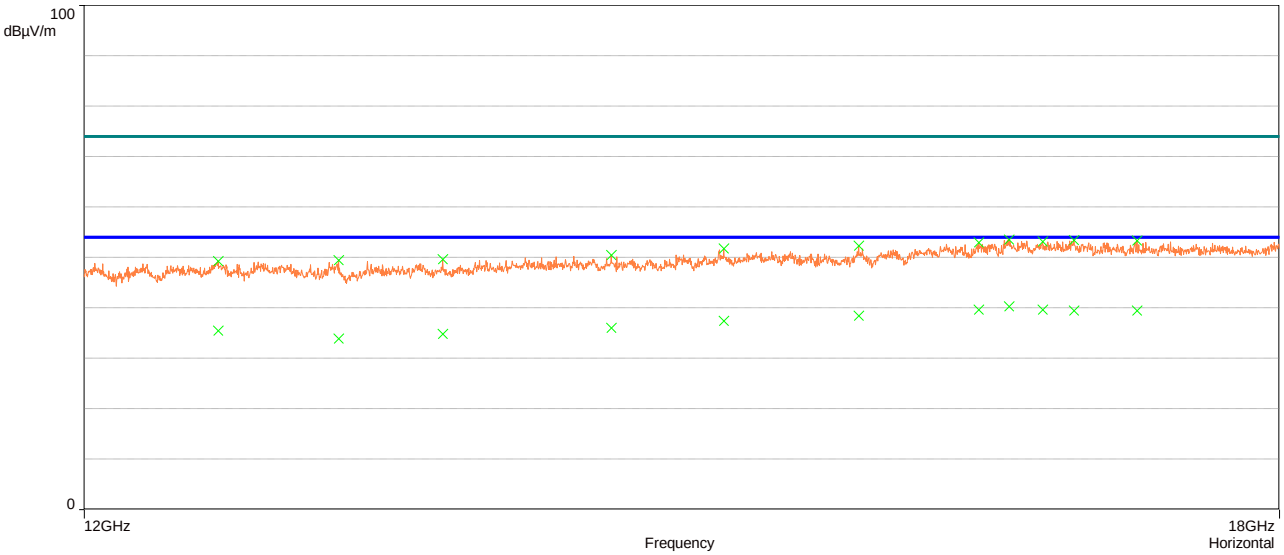


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 12GHz÷ 18GHz
Operating Condition: TX02

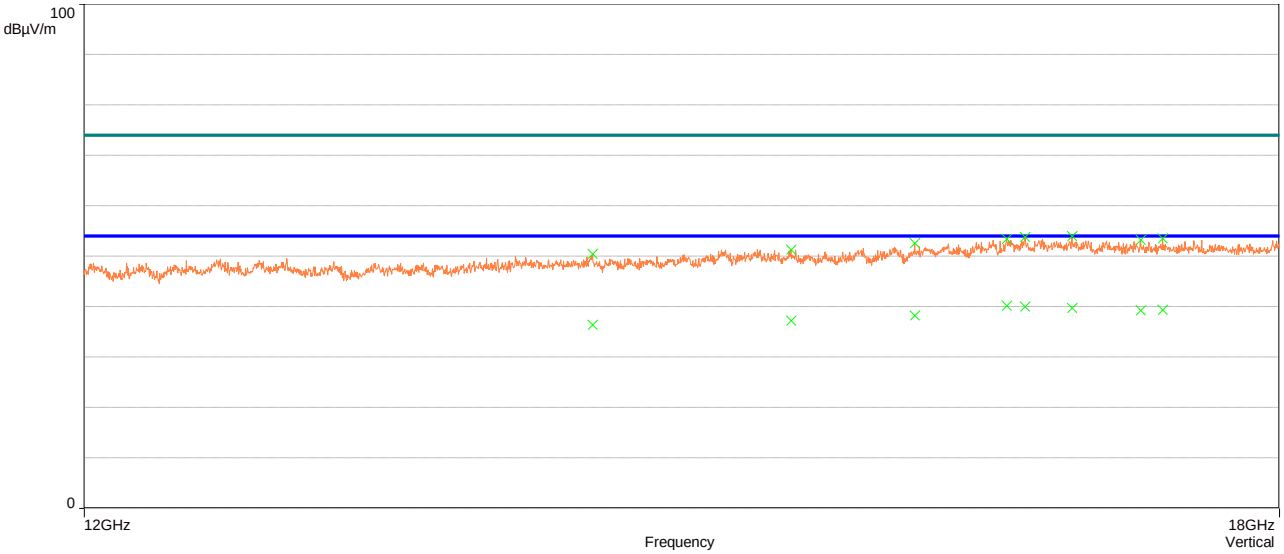


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
13337.0105	1	48.69	74.00	39.34	34.66	54.00	19.34	359.90	Horizontal
13929.987	1	49.85	74.00	37.98	36.02	54.00	17.98	60.70	Horizontal
14535.0155	1	51.22	74.00	37.61	36.39	54.00	17.61	60.70	Horizontal
14907.0145	1	51.67	74.00	36.62	37.38	54.00	16.62	300.30	Horizontal
16067.0195	1	53.09	74.00	35.00	39.00	54.00	15.00	300.30	Horizontal
16097.008	1	53.03	74.00	35.36	38.64	54.00	15.36	359.90	Horizontal
16420.992	1	54.11	74.00	33.74	40.26	54.00	13.74	270.10	Horizontal
16589.0205	1	53.61	74.00	34.20	39.80	54.00	14.20	60.70	Horizontal
16826.997	1	53.90	74.00	35.12	38.88	54.00	15.12	330.40	Horizontal
17463.9985	1	53.27	74.00	35.46	38.54	54.00	15.46	270.10	Horizontal
17665.9965	1	53.55	74.00	35.48	38.51	54.00	15.49	180.40	Horizontal
12261.9825	2	49.69	74.00	39.58	34.42	54.00	19.58	120.30	Vertical
13538.0215	2	49.47	74.00	39.16	34.84	54.00	19.16	30.10	Vertical
14629.0045	2	50.17	74.00	37.67	36.33	54.00	17.67	60.70	Vertical
16330.995	2	53.99	74.00	34.09	39.91	54.00	14.09	30.10	Vertical
16523.993	2	53.41	74.00	34.28	39.72	54.00	14.28	330.40	Vertical
16693.0035	2	53.80	74.00	34.38	39.62	54.00	14.38	30.10	Vertical
17124.98	2	53.03	74.00	34.70	39.30	54.00	14.70	30.10	Vertical
17302.9815	2	53.44	74.00	34.76	39.22	54.00	14.78	359.90	Vertical
17684.02	2	53.29	74.00	35.50	38.50	54.00	15.50	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

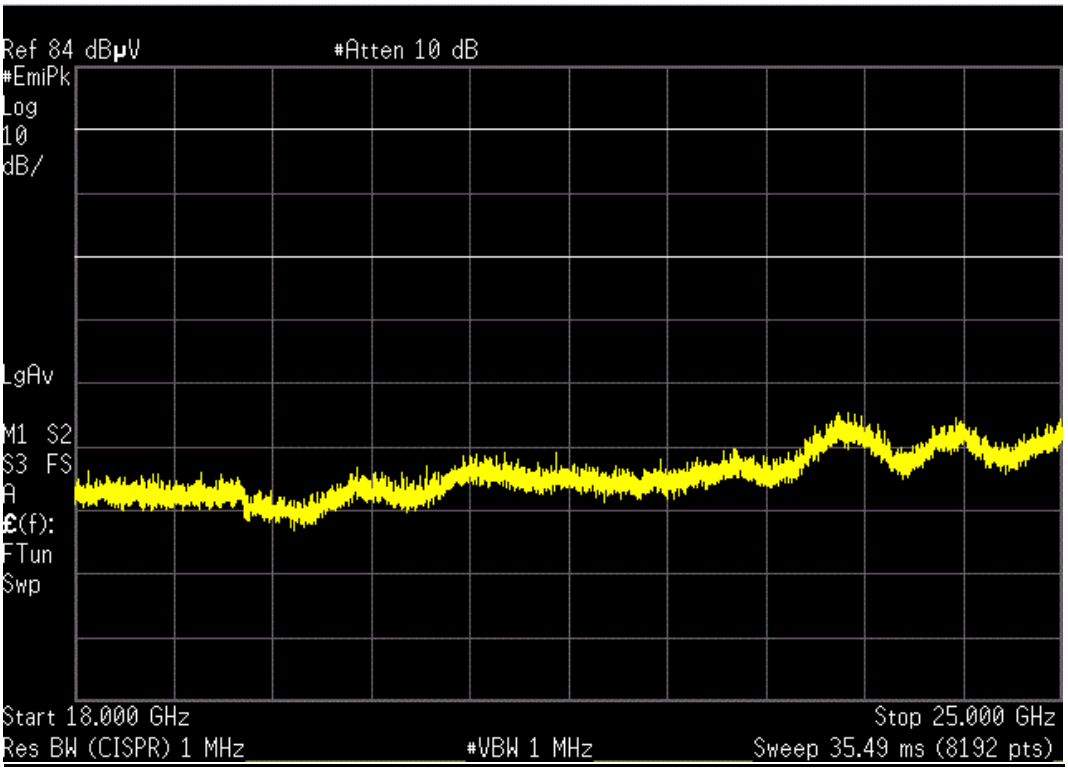


Measurement 02 Vertical
EUT disposal: Complete rotation (360°) – **Antenna height:** 1 ÷ 4 m – **Antenna Pol.:** Vertical
Range: 12GHz÷ 18GHz
Operating Condition: TX03

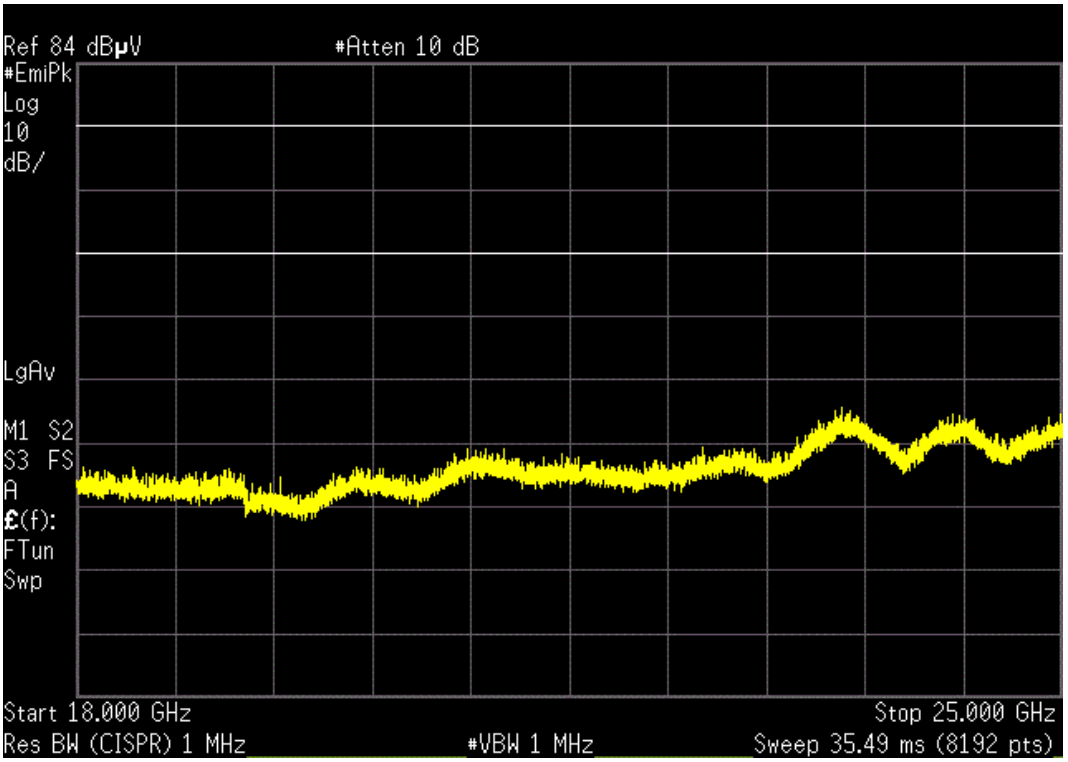


Frequency (MHz)	SR	Peak (dBµV/m)	LimPeak (dBµV/m)	Delta (dB)	CISPR AVG (dBµV/m)	Lim AVG (dBµV/m)	Delta AVG (dB)	Angle (deg)	Polarization
12558.9985	1	49.28	74.00	38.52	35.48	54.00	18.52	60.40	Horizontal
13082.006	1	49.47	74.00	40.10	33.90	54.00	20.10	180.30	Horizontal
13552.002	1	49.63	74.00	39.13	34.87	54.00	19.13	270.80	Horizontal
14349.017	1	50.49	74.00	37.94	36.06	54.00	17.94	180.30	Horizontal
14908.017	1	51.74	74.00	36.63	37.37	54.00	16.63	0.10	Horizontal
15605.9875	1	52.36	74.00	35.53	38.47	54.00	15.53	300.30	Horizontal
16253.9955	1	52.98	74.00	34.40	39.60	54.00	14.40	0.10	Horizontal
16423.998	1	53.53	74.00	33.72	40.28	54.00	13.72	330.20	Horizontal
16611.984	1	53.14	74.00	34.40	39.60	54.00	14.40	180.30	Horizontal
16788.9895	1	53.44	74.00	34.53	39.47	54.00	14.53	60.40	Horizontal
17152.025	1	53.37	74.00	34.55	39.45	54.00	14.55	240.70	Horizontal
14258.9845	2	50.43	74.00	37.63	36.37	54.00	17.63	240.30	Vertical
15252.0075	2	51.31	74.00	36.78	37.22	54.00	16.78	149.90	Vertical
15906.025	2	52.57	74.00	35.71	38.29	54.00	15.71	270.30	Vertical
16411.005	2	53.45	74.00	33.78	40.22	54.00	13.78	90.10	Vertical
16511.0075	2	53.81	74.00	33.98	40.02	54.00	13.98	149.90	Vertical
16776.9905	2	54.03	74.00	34.30	39.70	54.00	14.30	240.30	Vertical
17173.024	2	53.28	74.00	34.71	39.29	54.00	14.71	180.10	Vertical
17300.0125	2	53.54	74.00	34.61	39.39	54.00	14.61	120.40	Vertical

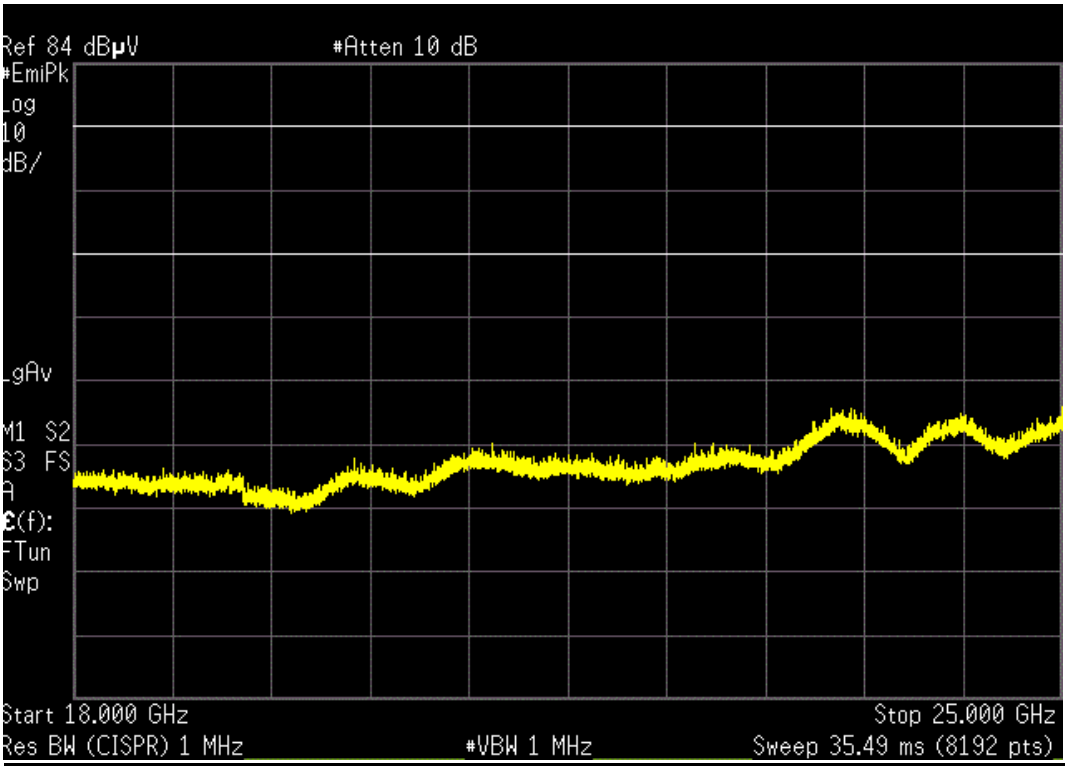
Horizontal polarization
TX01
Range 18 GHz – 25 GHz



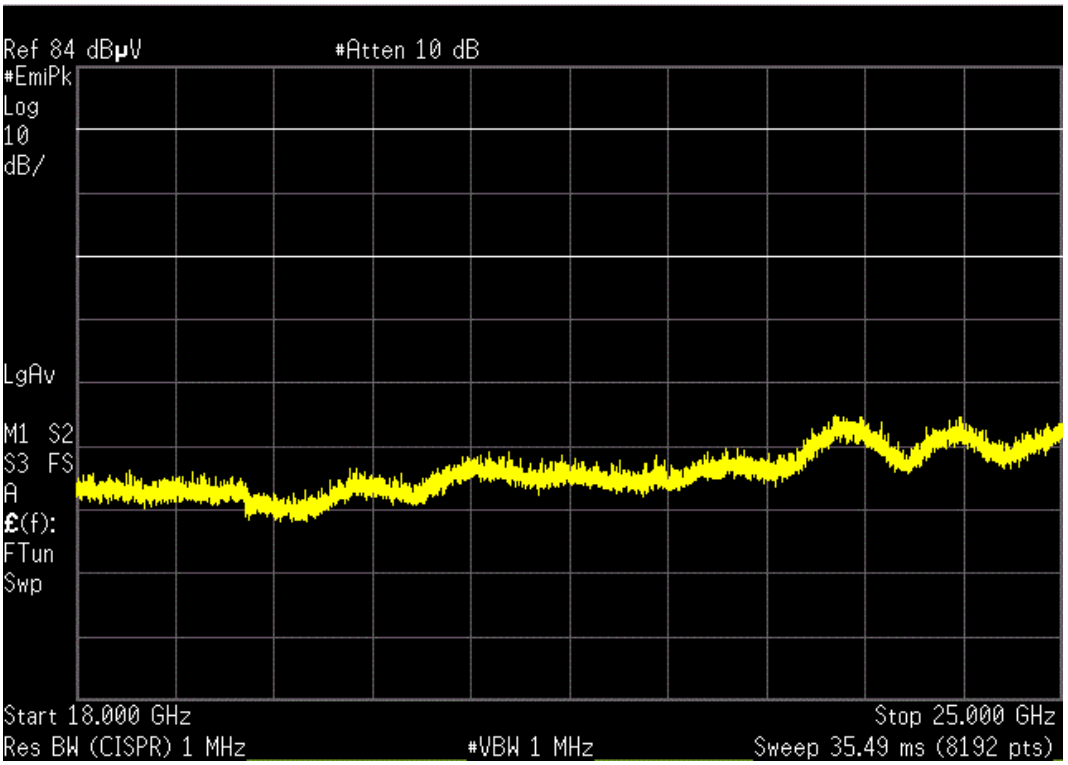
Vertical polarization
TX01
Range 18 GHz – 25 GHz



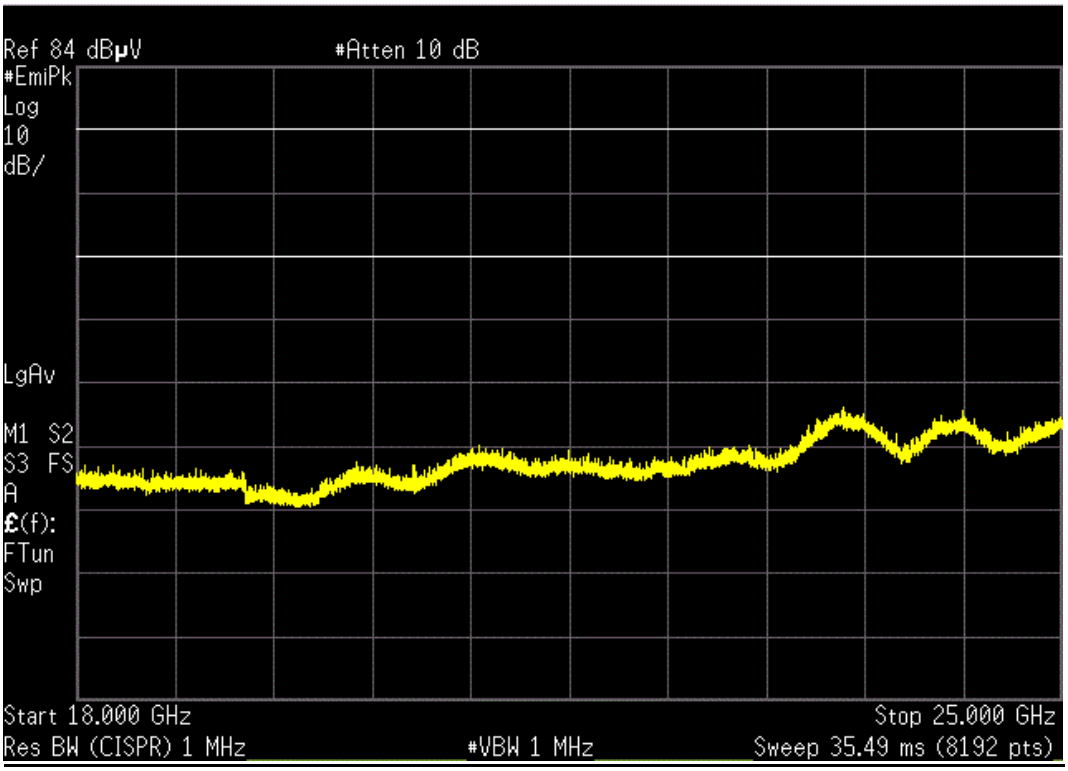
Horizontal polarization
TX02
Range 18 GHz – 25 GHz



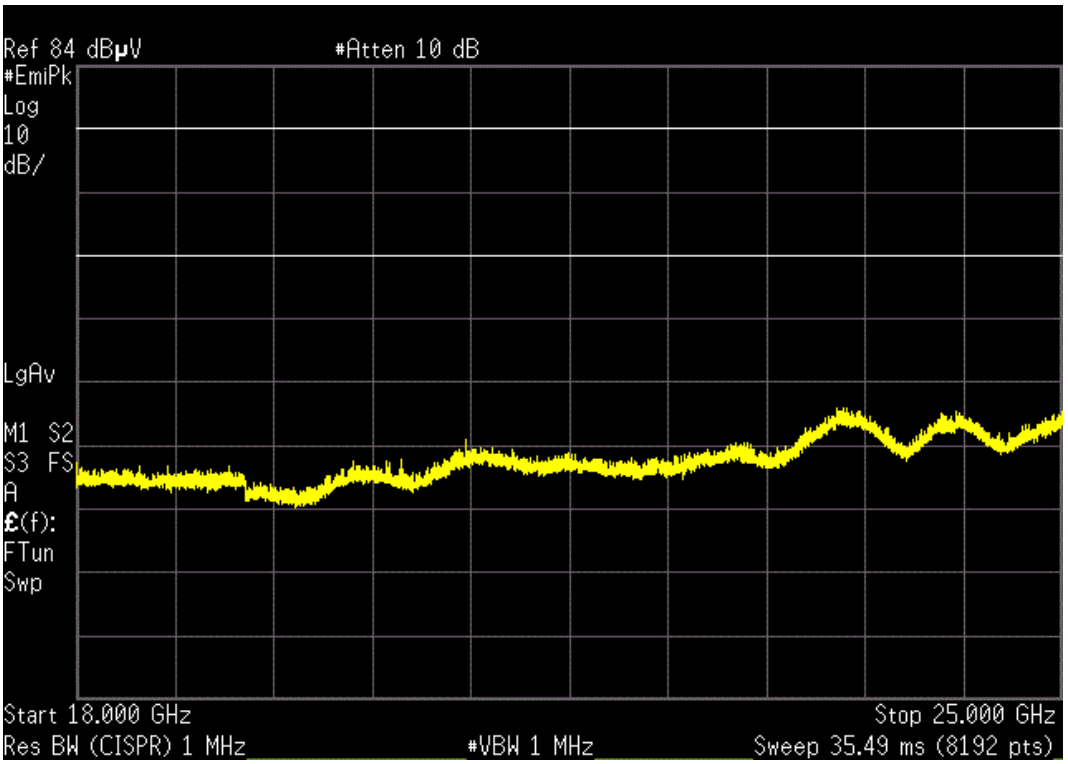
Vertical polarization
TX02
Range 18 GHz – 25 GHz



Horizontal polarization
TX03
Range 18 GHz – 25 GHz



Vertical polarization
TX03
Range 18 GHz – 25 GHz



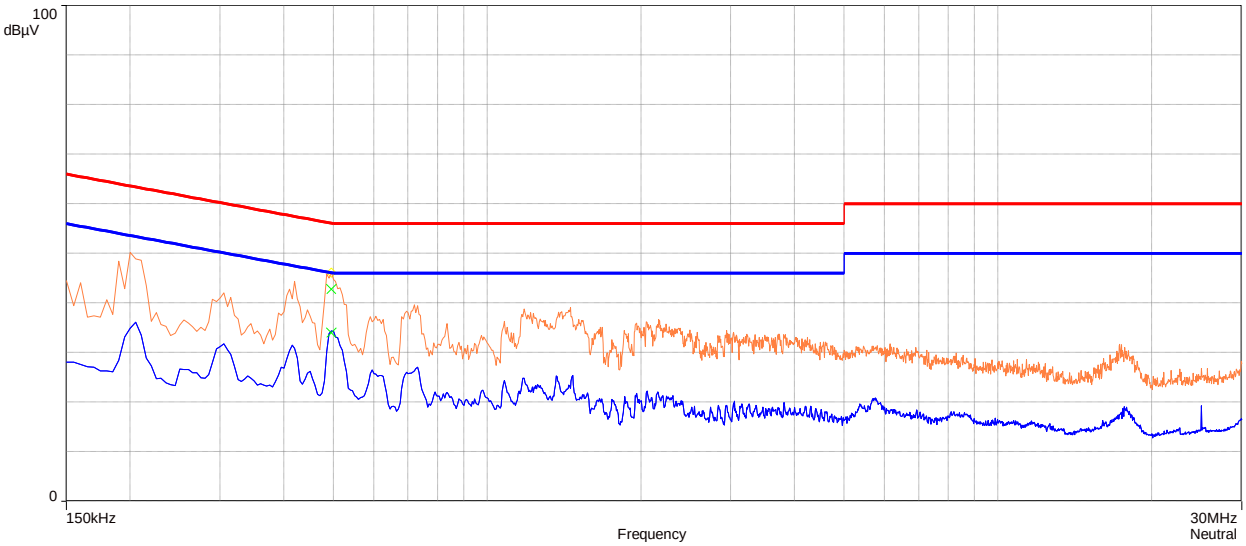
Test method:	**FCC part 15, subpart B, sez. 15.207** **ISED RSS-247 Issue 3** **ANSI C63.4** **Measurement of disturbance voltage** For details see par. 5 of this report	
Operator	Marco Nicolè	
Test Date	2025-01-21	
EUT Classification	Class: **B**	
Electrical wiring	*Cable*	*Length [m]*
	AC input cable (AE01)	1.5
	Ethernet cable (that included power supply cables)	3.0
Operating conditions	OC01; OC02 See par. 6 of this report	
Additional information	None	
Auxiliary equipment (AE)	See par. 3.4 of this report	
Frequency range	150 kHz ÷ 30 MHz	
Test set up	☐ Floor standing set up ☒ Table top set up	
Limits	In compliance with reference standard	
Port	AC. Input (AE01) - LISN measurements	
Test instrumentations	See Annex B	
Measurement Uncertainty (k=2)	See Annex F	
EUT modification during this test	None	
Result	**COMPLIES**	
Note	The difference between the emission of AE01 with and without the EUT connected, is not relevant.	

TEST GRAPHS AND MEASUREMENTS

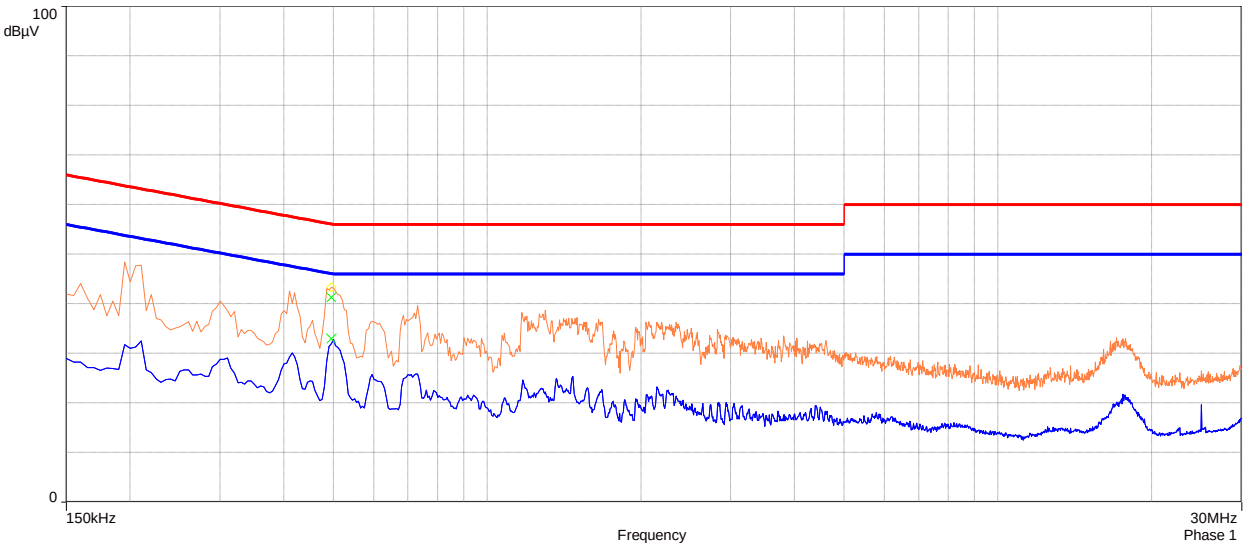
All traces have been acquired with PK Peak detector (orange trace) and AVG Average detector (blue trace)
If PK trace exceeds QP Quasi-Peak limit, QP measurements are performed at discrete frequencies where the limit is exceeded. Measurement time for QP measurements is 15 s.
If the general level of the disturbance is not steady, also the AVG disturbance voltage level is observed for 15 s per frequency; results are reported in a specific table below the graph.

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

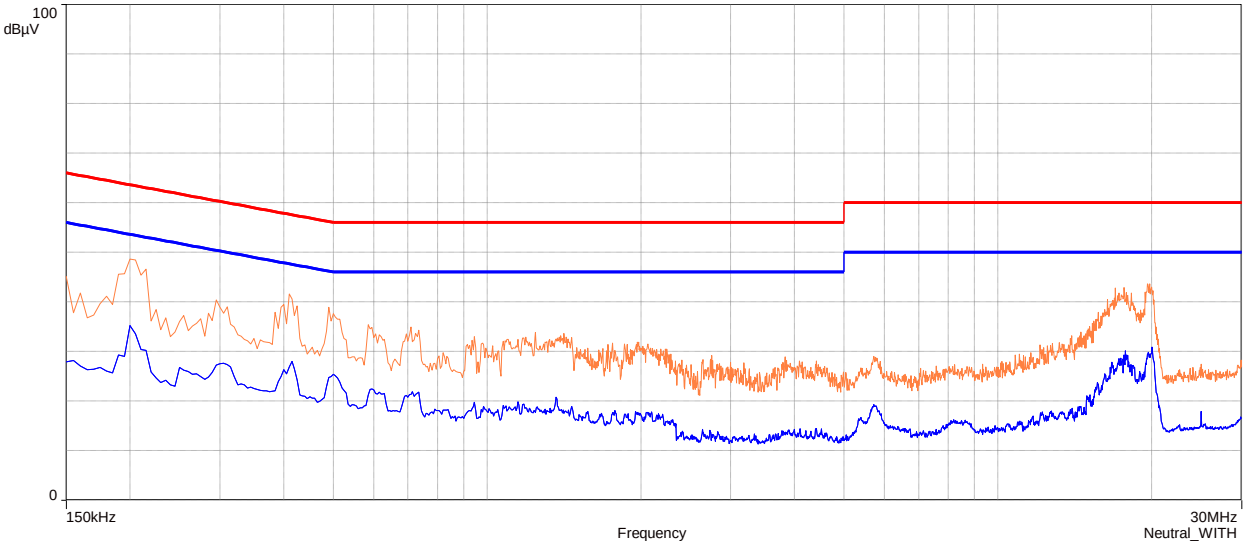
Measurement 01
A.C. Input (AE01) - LISN measurements
Line: Neutral
Operating Condition: OC01



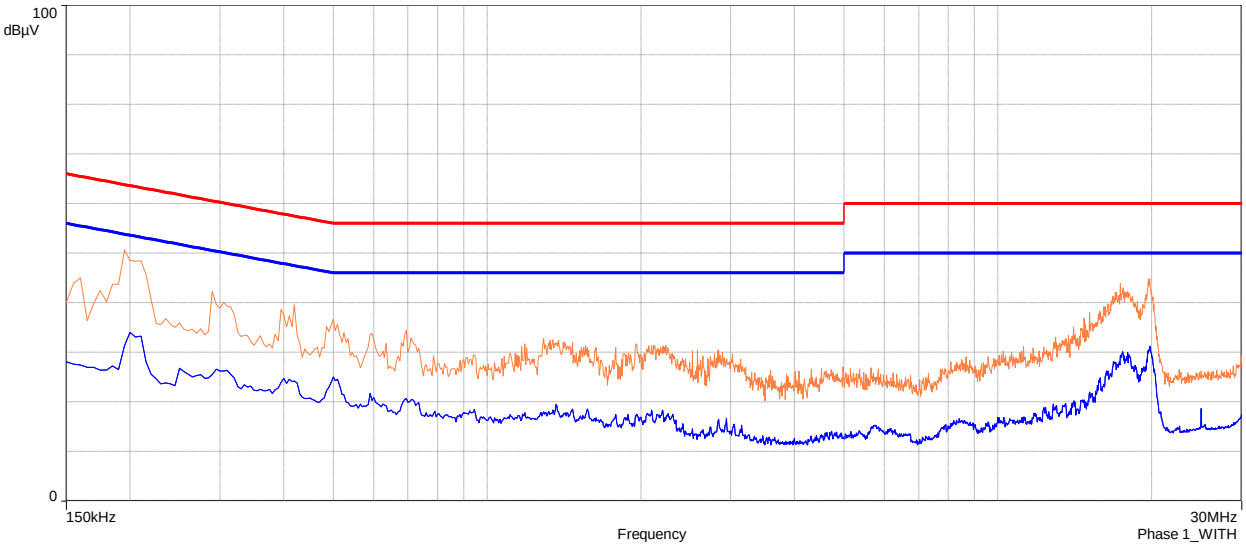
Measurement 02
A.C. Input (AE01) - LISN measurements
Line: Phase 1
Operating Condition: OC01



Measurement 03
A.C. Input (AE01) - LISN measurements
Line: Neutral
Operating Condition: OC02



Measurement 04
A.C. Input (AE01) - LISN measurements
Line: Phase 1
Operating Condition: OC02



Frequency (MHz)	SR	AVG (dBµV)	QPeak (dBµV)	Lim AVG (dBµV)	Lim QPeak (dBµV)	AVG Margin (dB)	QPeak Margin (dB)	Line	Conversion Factor
0.4945	1	34.00	42.79	46.08	56.08	-12.08	-13.29	Neutral	10.38
0.4945	2	33.01	41.32	46.08	56.08	-13.08	-14.76	Phase 1	10.38

7 EUT MODIFICATIONS

None.

Annex B Test instrumentations

FCC Part15

Description	Manufacturer	Model	Identifier	Cal data	Cal due
Antenna - Horn Antenna 1 GHz ÷ 18 GHz	ETS-LINDGREN	3117	778/LAB Rapporto 6277	2023-10-12	2026-10-11
RF Cable - N-N 5m	INTERCOND	M17/74 RG 213	225/LAB Rapporto 6599	2024-08-26	2025-08-26
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 6029	2023-02-02	2025-02-01
EMI Receiver - PSA Spectrum Analyzer	Agilent Technologies	E4446A	740/LAB Rapporto 6622	2024-09-16	2025-09-16
LISN 32A	ROHDE&SCHWARZ	ESH2-Z5	033L/CS Rapporto 6609	2024-09-09	2025-09-09
Pre-Amplifier 18 GHz ÷ 40 GHz	Spin Electronics	PRE-1840-35	759/LAB Rapporto 6090	2023-05-15	2025-05-14
Software BAT-EMC	Nexio	BAT-EMC	1910/LAB	--	--

Annex B Test instrumentations

Antenna - Horn Antenna 18 GHz ÷ 40 GHz	ETS-LINDGREN	3116	779/LAB Rapporto 6278	2023-10-18	2026-10-17
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 6091	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	Climatic Sensor (pri site) - 051L/CS Shielded Cham	HW group	HWg-STE	1300/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 ---