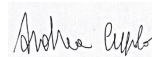


FCC Part 15C and ISED TEST REPORT

Report Number	326/24/04320/FCC	Rev. 01
Date of document	2025-08-29	
Total number of pages	Pag. 30	
OBJECT	FCC Part15C and ISED RSS-247 Issue 3	
CUSTOMER	pro-micron GmbH	
EQUIPMENT UNDER TEST - DESCRIPTION	transmitter	
MODEL	spike2	
SUMMARY		
1	OBJECT OF THE TESTS	3
2	IDENTIFICATION	3
3	EQUIPMENT UNDER TEST (EUT)	3
4	STANDARDS AND TEST METHODS	4
5	EUT OPERATING CONDITIONS DURING TESTS	5
6	TEST RESULTS	6
7	EUT MODIFICATIONS	23
Annex B	Test Instrumentations	02 pag
Annex D	Auxiliary Instrumentations	01 pag
Annex F	Judgment of compliance and measurements uncertainty	03 pag
Tested by (Name + Signature)	MARCO NICOLE' <i>Test engineer</i>	 Documento firmato da: NICOLE' MARCO 30.10.2025 14:19:18 UTC
Verified by (Name + Signature)	ANDREA CUPIDO <i>Lab Manager</i>	 Cupido Andrea 30.10.2025 15:54:29 GMT+01:00
Approved and issued by (Name + Signature)	ALESSANDRO ZUCCATO <i>Lab Director</i>	 ZUCCATO ALESSANDRO 30.10.2025 16:42:57 GMT+01:00

History sheet of test Report

Report Number	Rev.	Date	Description of modification
326/24/04320/FCC	00	2024-07-17	Initial Issue
326/24/04320/FCC	01	2025-08-29	This document replaces and revokes Kiwa Creiven document number 326/24/04320/FCC: Correction of information at paragraph 3.2.
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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
Fax: +39.049.8707037
E-mail : info.creiven@kiwa.com

FCC Designation number: IT0016

ISED CAB Identifier: IT0007

2.2 Customer

Manufacturer: pro-micron GmbH
Street: Gottlieb-Daimler Str. 6
City: 87600 Kaufbeuren
Phone: +49 8341 9560 50
Refer to: Mr Marco Lombardini

3 EQUIPMENT UNDER TEST (EUT)

3.1 EUT identification (declared under responsibility of the customer)

EUT Description: transmitter
Model: spike2
Code: 42000808
Serial N°: 0xA4CC; 0xA4CD; 0xA4CE; 0xA4CF
Software release: WEPO41120A00_sha256.hex
Size: Ø63x136mm
Manufacturer: pro-micron GmbH
Supply voltage: 5V USB loaded / battery inside
Frequency: 2,4 GHz (ZigBee)
Rated Electrical Power: 2,5W
Rated Input Current: 0,5A

3.2 EUT classifications

The manufacture declared the following classification:

Object	Descriptions
Operating frequency range	2405 MHz – 2480 MHz
Equipment type	IEEE 802.15.4 (ZigBee)
Nominal Channel Bandwidth	2 MHz
Modulation	O-QPSK
Frequency Hopping Spread Spectrum	NO
Listen Before Talk	NO
Adaptive	NO
Number of Channels	16
Antenna Type	Integrated antenna
Extreme Temperature Range	-10°C ÷ 60°C

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	2024-06-24
Date(s) of performance of tests	See the data specified in test results details

3.3 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 (used only for the recharge)	d.c. input cable	☐	☐ none ☒ ≤ 1m ☐ ≤ 3m ☐ ≤ 10m ☐ ≤ 30m	type of power source: ☐ Internal Power Supply ☐ External Power Supply or AC/DC adapter ☒ Battery ☐ Other

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 AE01

Description : AC/DC adapter
 Model: S005AYB0500100
 Manufacturer: I.T.E.

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_04290LP	Annex E customer's 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 tested as required by the customer	---
Minimum Hopping Channel	§15.247 (a)(1)(iii)	RSS-247 Issue 3	Not tested as required by the customer	---
6 dB (DTS) & 20 dB Bandwidth & 99% of power	§15.247 (a)(2) §15.215 (c)	RSS-247 Issue 3	Not tested as required by the customer	---

Dwell Time	§15.247 (a)(1)(iii)	RSS-247 Issue 3	Not tested as required by the customer	---
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	Not tested as required by the customer	---
Power spectral density	§15.247 (e)	RSS-247 Issue 3	Not tested 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

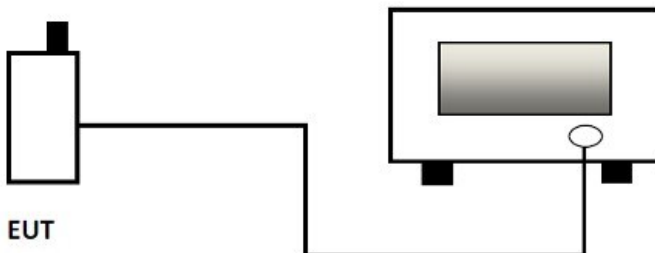
- All tests were performed with commercial device, so it was not possible to set the channel and other parameters of the radio module.

5 EUT OPERATING CONDITIONS DURING TESTS

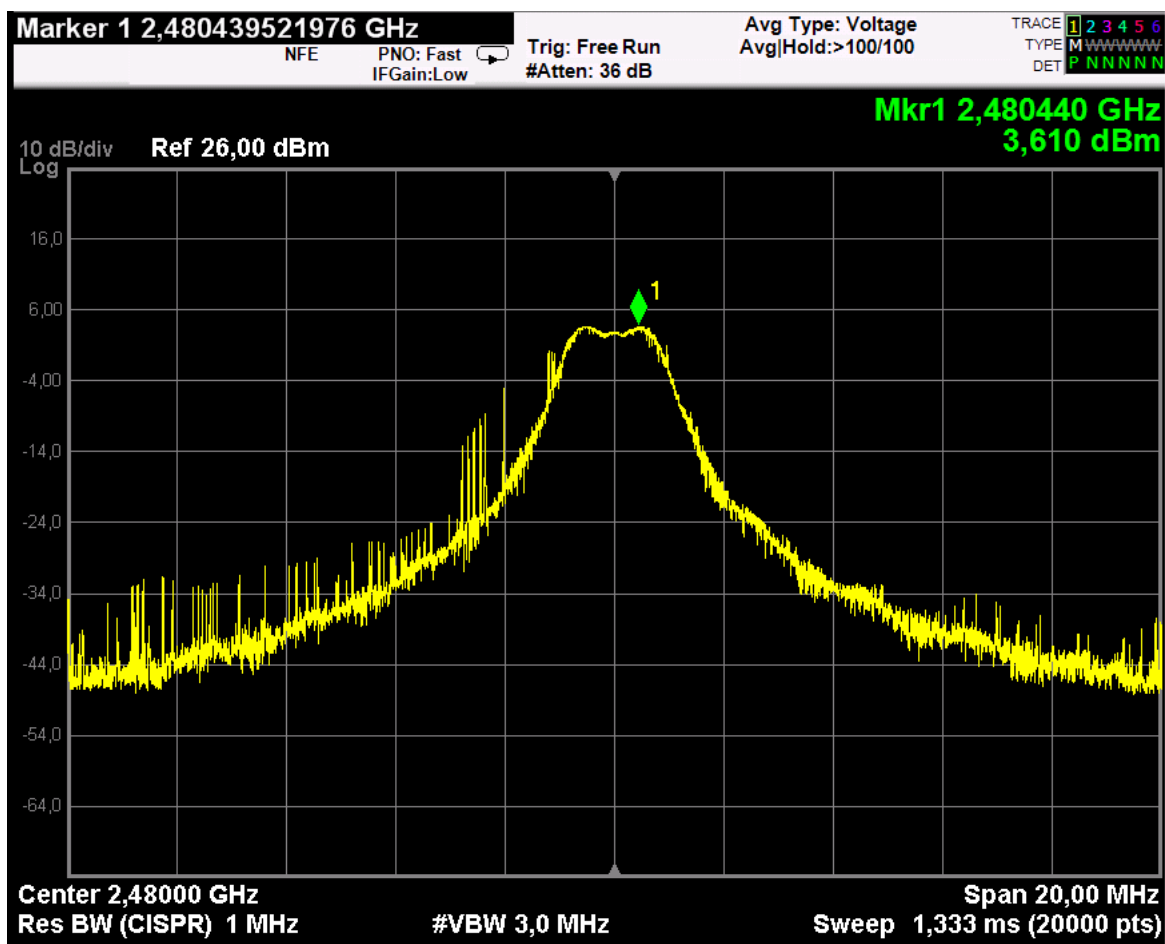
The EUT was set to function as indicated in Table 1, in compliance with the manufacturer's prescriptions and with that which is stated in the applied standards, test methods and procedures.

OPERATING CONDITION	DESCRIPTION OF FUNCTIONING
TX01	EUT details: during the test the EUT - was powered at 5 Vdc with internal battery - was in continuous working state/ Time, power, channel were not possible to modify - EUT transmitted only to Channel 0 (2404 MHz)
OC01	EUT details : during the test the EUT - was in recharge mode (AE N°01 powered with 120V @60Hz) - AE details : during the test the Auxiliary Equipment (AE), connected to EUT, was : - EUT connected via USB to AE N°01

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	2024-07-17				
Test Temperature	29 °C				
Test Humidity	39 %				
Test Pressure	1006 hPa				
Electrical wiring	Cable			Length [m]	
	---			---	
Operating conditions	TX01 See par. 5 of this report				
Auxiliary equipment (AE)	See par. 3.5 of this report				
Limits	For systems using digital modulation in the 2400–2483.5 MHz bands: - 1 Watt (for device with channels > 75) - 0.125 Watt (for device with channels < 75)				
Test set up	 The diagram shows a rectangular box labeled 'EUT' connected by a line to a larger box labeled 'Spectrum analyzer'. The 'Spectrum analyzer' box has a screen and a dial. The connection is made via a cable.				
Test instrumentations	See Annex B				
Measurement Uncertainty (k=2)	See Annex F				
ZIG BEE					
OPERATING CONDITION	FREQUENCY [MHz]	Peak Power [dBm]	LIMIT [dBm]	LIMIT [W]	RESULT
TX01	2.480	+3.610	+20.969	0.125	COMPLIES
Test Procedure	The measurement will be conducted at ONLY one channel (see deviation paragraph): Set the spectrum analyzer as RBW = 1MHz, VBW ≥ [3 × RBW], Span = >10MHz, Sweep=auto Detector = Peak, Trace mode = max hold				
EUT modification during this test	None				

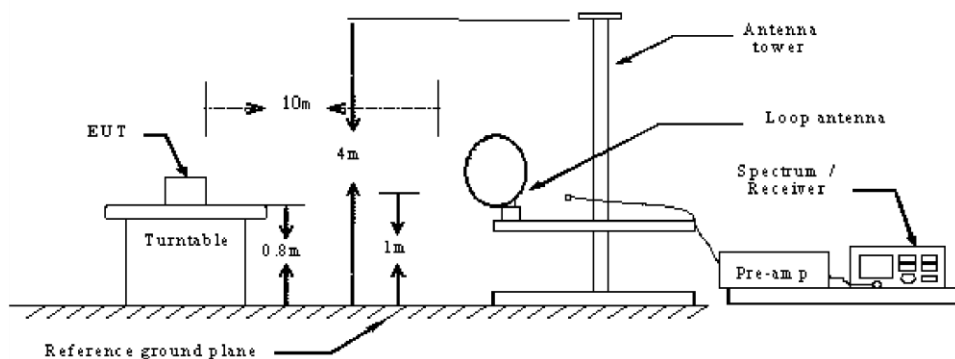
Test result TX01



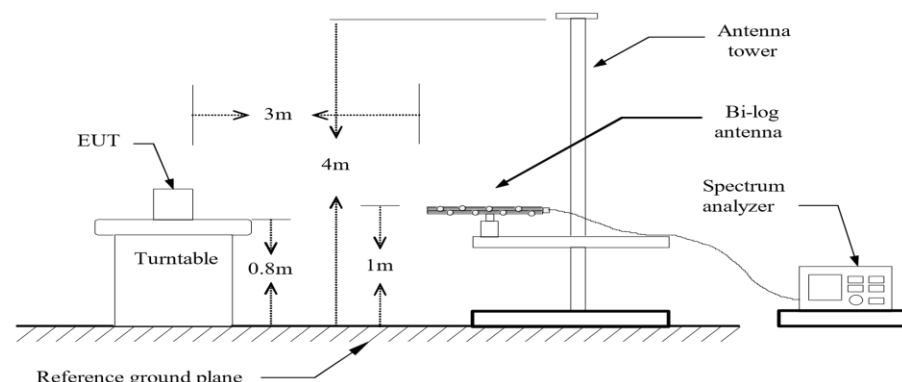
Test method:	FCC part 15 C - § 15.209 ISED RSS-247 Issue 3 Spurious Emission (Radiation) For details see par. 4 of this report			
Operator	Marco Nicolè			
Test Date	2024-07-12			
Test Temperature	25 °C			
Test Humidity	31 %			
Test Pressure	1006 hPa			
EUT Classification	None.			
Electrical wiring	Cable	Length [m]		
	---	---		
Operating conditions	TX01			
	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

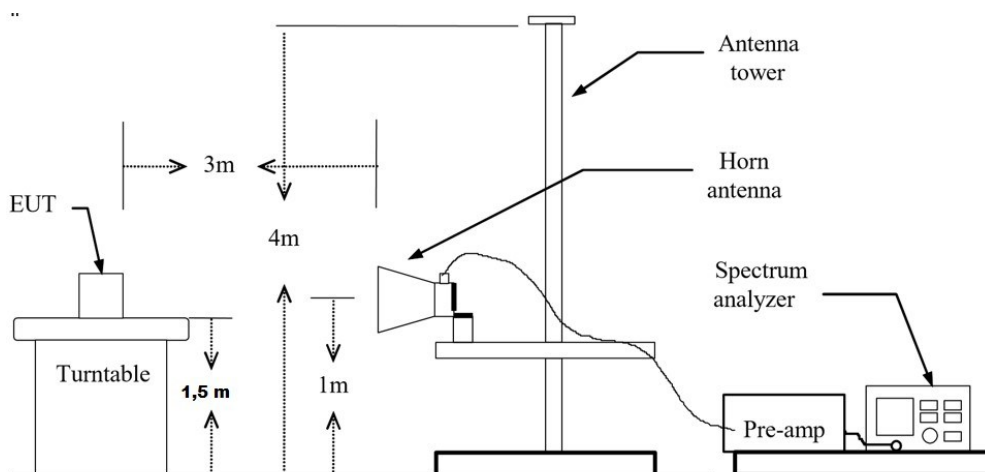
Radiated Spurious Measurement: below 30MHz



Radiated Spurious Measurement: below 1GHz



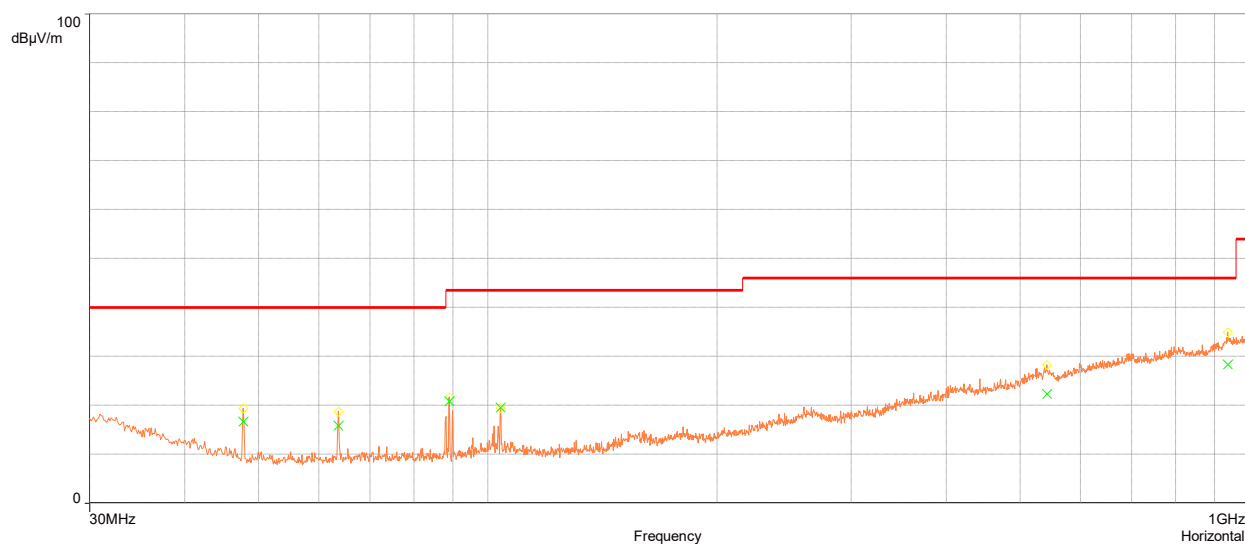
Radiated Spurious Measurement: above 1GHz



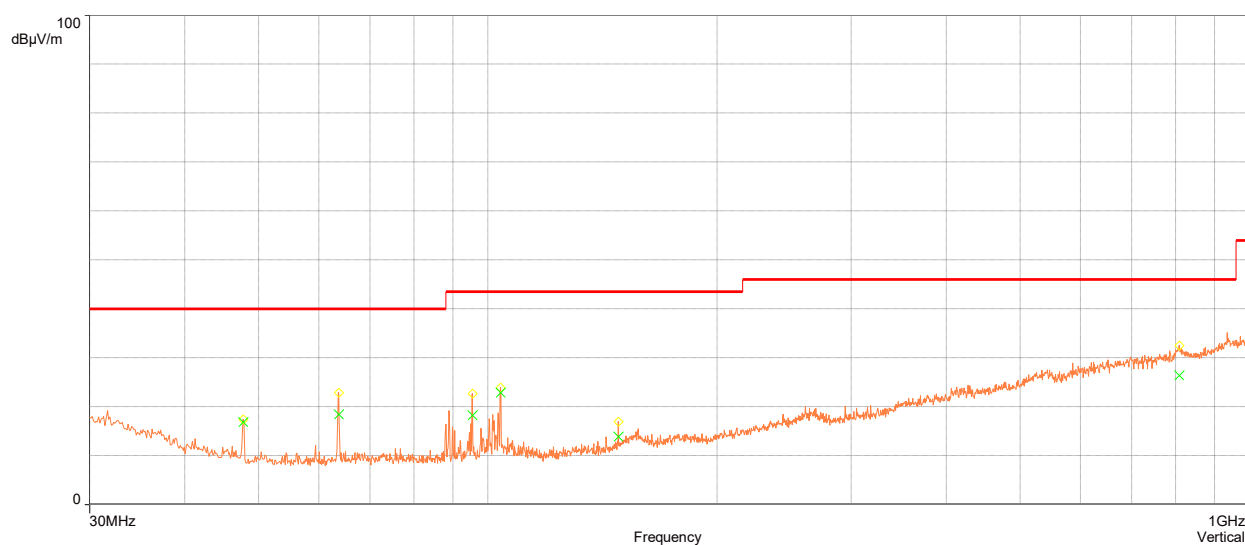
Frequency range	from 30 MHz up through the 10th harmonic
Measuring distance in the anechoic chamber	3 m
Test instrumentations	See Annex B
Measurement Uncertainty (k=2)	See Annex F

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 $\geq$ 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

**Horizontal polarization
TX01
Range 30 MHz – 1 GHz**

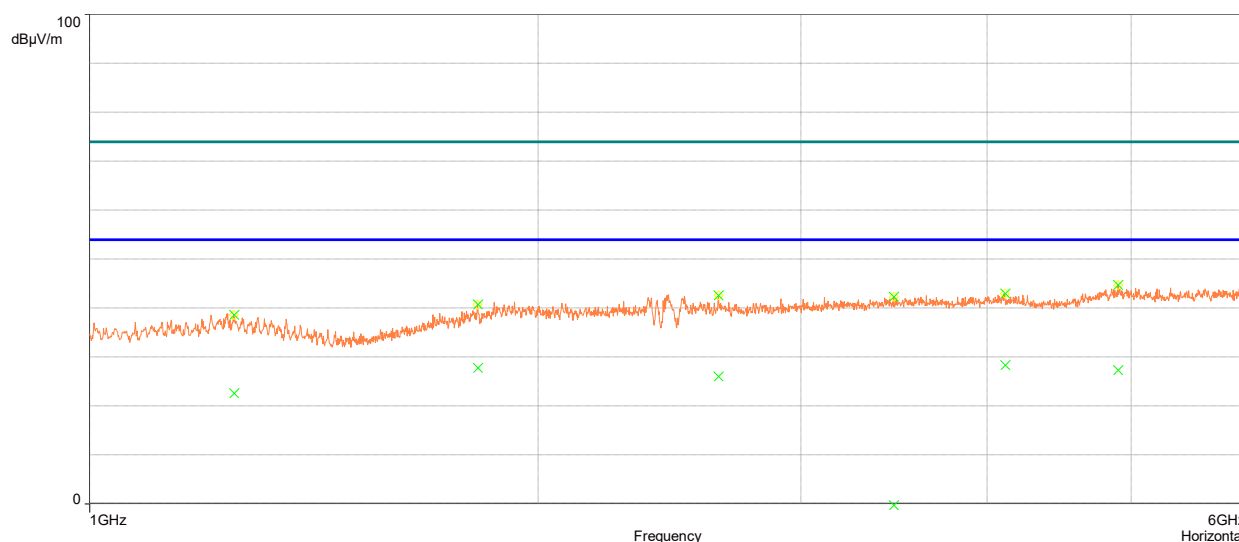


**Vertical polarization
TX01
Range 30 MHz – 1 GHz**

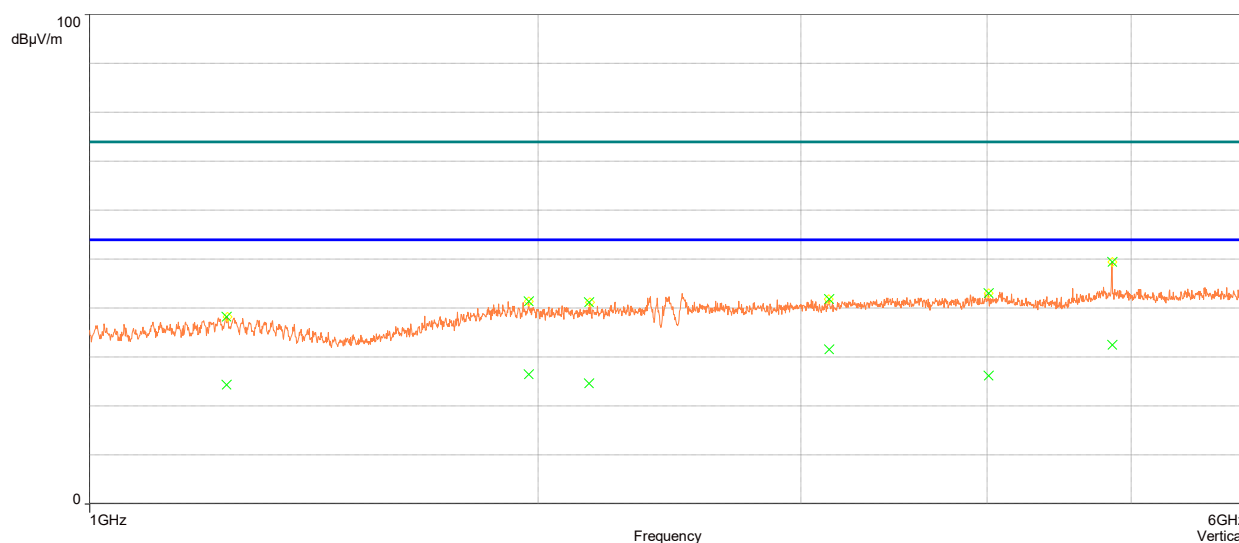


Frequency (MHz)	SR	Peak (dBμV/m)	QPeak (dBμV/m)	LimQPeak (dBμV/m)	Delta (dB)	Polarization	Height (m)	Angle (deg)	Conversion Factor
47.7559	1	19.40	16.70	40.00	-23.30	Horizontal	4.00	120.20	11.97
63.5995	1	18.69	15.82	40.00	-24.18	Horizontal	1.40	269.30	11.62
89.036	1	21.69	20.83	43.52	-22.69	Horizontal	3.63	359.60	11.81
103.9243	1	19.47	19.53	43.52	-23.99	Horizontal	4.00	330.40	13.18
542.1634	1	28.23	22.28	46.00	-23.72	Horizontal	4.00	179.80	27.93
936.2413	1	34.96	28.36	46.00	-17.64	Horizontal	1.00	299.90	33.14
47.7566	2	17.41	16.89	40.00	-23.11	Vertical	1.00	90.40	11.97
63.7186	2	22.85	18.47	40.00	-21.53	Vertical	3.39	180.70	11.63
95.3952	2	22.72	18.29	43.52	-25.23	Vertical	1.00	300.20	12.46
103.9236	2	23.86	22.90	43.52	-20.62	Vertical	1.37	60.10	13.18
148.3188	2	16.97	13.93	43.52	-29.59	Vertical	2.37	120.00	14.45
809.2787	2	32.54	26.44	46.00	-19.56	Vertical	4.00	210.50	31.65

**Horizontal polarization
TX01
Range 1 GHz – 6 GHz**

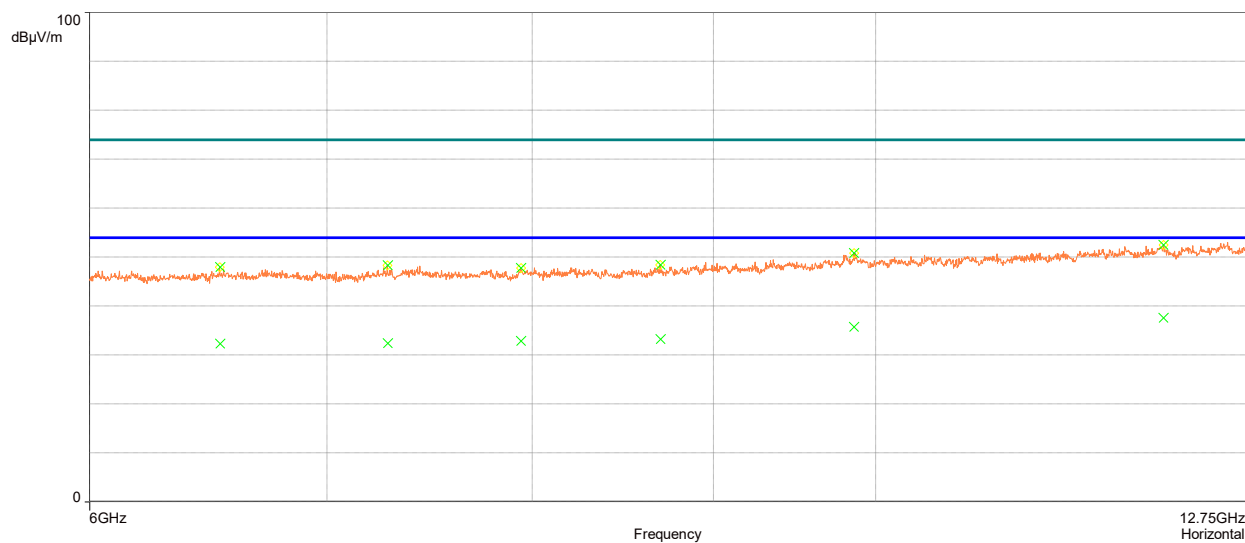


**Vertical polarization
TX01
Range 1 GHz – 6 GHz**

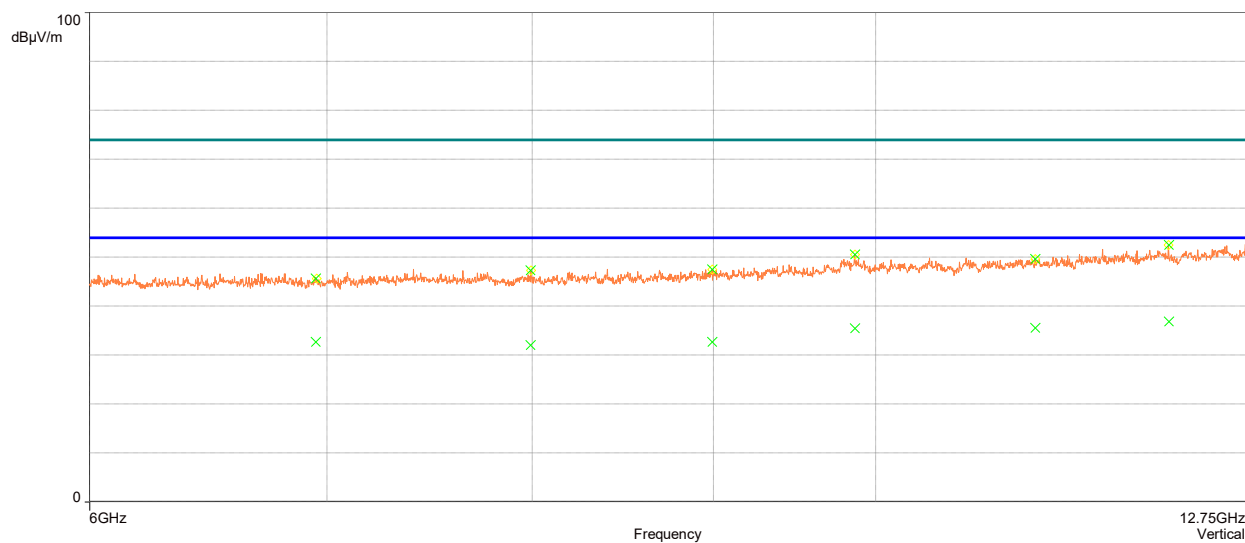


Frequency (MHz)	SR	Peak (dBμV/m)	LimPeak (dBμV/m)	Delta (dB)	CISPR AVG (dBμV/m)	Lim AVG (dBμV/m)	Delta AVG (dB)	Angle (deg)	Polarization
1250.07	1	38.63	74.00	35.37	22.61	54.00	31.39	359.80	Horizontal
1822.12	1	40.73	74.00	33.27	27.77	54.00	26.23	90.20	Horizontal
2640.67	1	42.57	74.00	31.43	26.05	54.00	27.95	90.20	Horizontal
4114.96	1	42.94	74.00	31.06	28.37	54.00	25.63	180.10	Horizontal
4897.98	1	44.75	74.00	29.25	27.35	54.00	26.65	180.10	Horizontal
1234.85	2	38.26	74.00	35.74	24.34	54.00	29.66	330.70	Vertical
1970.53	2	41.39	74.00	32.61	26.53	54.00	27.47	60.20	Vertical
2162.46	2	41.19	74.00	32.81	24.63	54.00	29.37	330.70	Vertical
3133.39	2	41.82	74.00	32.18	31.58	54.00	22.42	60.20	Vertical
4007.8	2	43.03	74.00	30.97	26.23	54.00	27.77	90.30	Vertical
4853.16	2	49.42	74.00	24.58	32.53	54.00	21.47	359.90	Vertical

**Horizontal polarization
TX01
Range 6 GHz – 12.75 GHz**

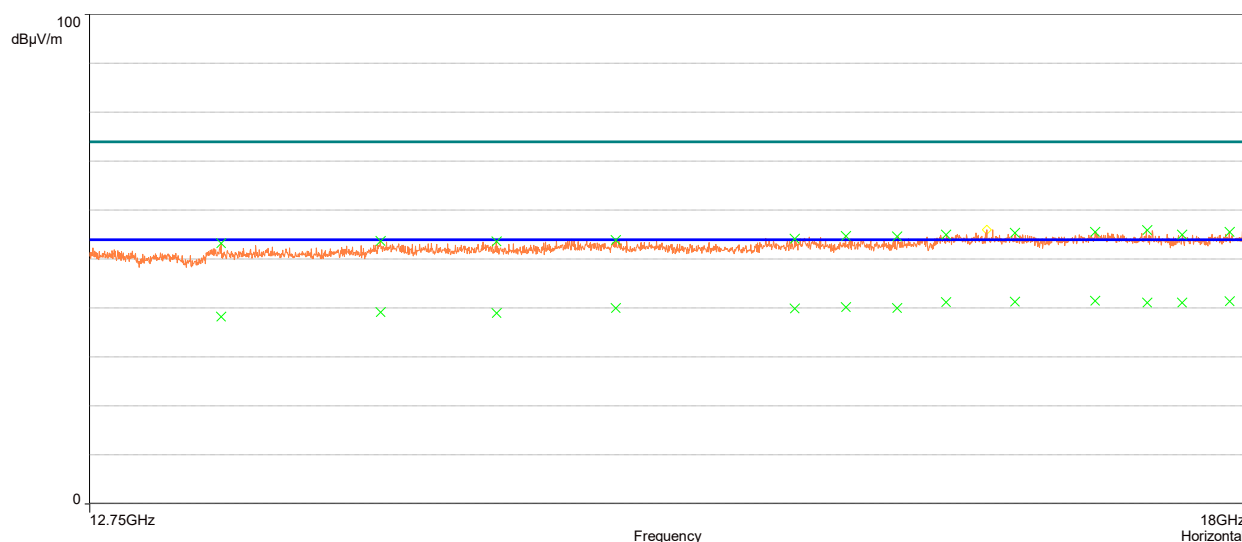


**Vertical polarization
TX01
Range 6 GHz – 12.75 GHz**

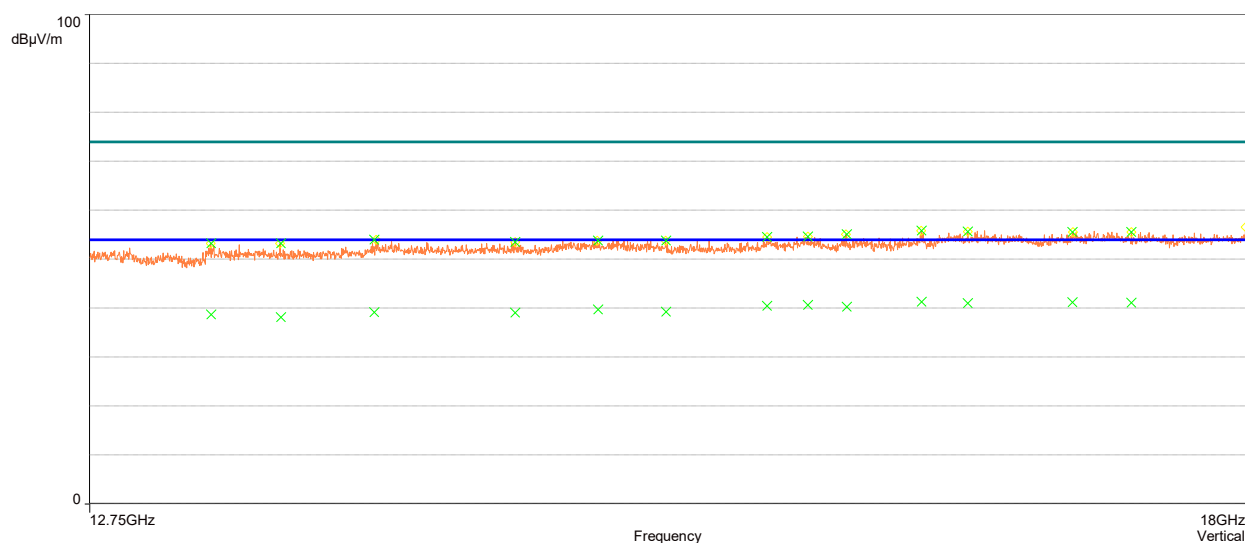


Frequency (MHz)	SR	Peak (dBμV/m)	LimPeak (dBμV/m)	Delta (dB)	CISPR AVG (dBμV/m)	Lim AVG (dBμV/m)	Delta AVG (dB)	Angle (deg)	Polarization
6530.8	1	47.95	74.00	26.05	32.32	54.00	21.68	29.90	Horizontal
7281.77	1	48.31	74.00	25.69	32.39	54.00	21.61	119.80	Horizontal
7941.93	1	47.82	74.00	26.18	32.84	54.00	21.16	150.10	Horizontal
8694.55	1	48.45	74.00	25.55	33.24	54.00	20.76	59.80	Horizontal
9859.97	1	50.81	74.00	23.19	35.77	54.00	18.23	180.00	Horizontal
12056.05	1	52.55	74.00	21.45	37.57	54.00	16.43	180.00	Horizontal
6950.48	2	45.67	74.00	28.33	32.71	54.00	21.29	30.10	Vertical
7990.46	2	47.29	74.00	26.71	32.06	54.00	21.94	90.00	Vertical
8991.66	2	47.52	74.00	26.48	32.70	54.00	21.30	60.40	Vertical
9867.03	2	50.60	74.00	23.40	35.51	54.00	18.49	180.60	Vertical
11093.26	2	49.68	74.00	24.32	35.61	54.00	18.39	120.10	Vertical
12097.39	2	52.50	74.00	21.50	36.87	54.00	17.13	330.60	Vertical

Horizontal polarization
TX01
Range 12,75 GHz – 18 GHz

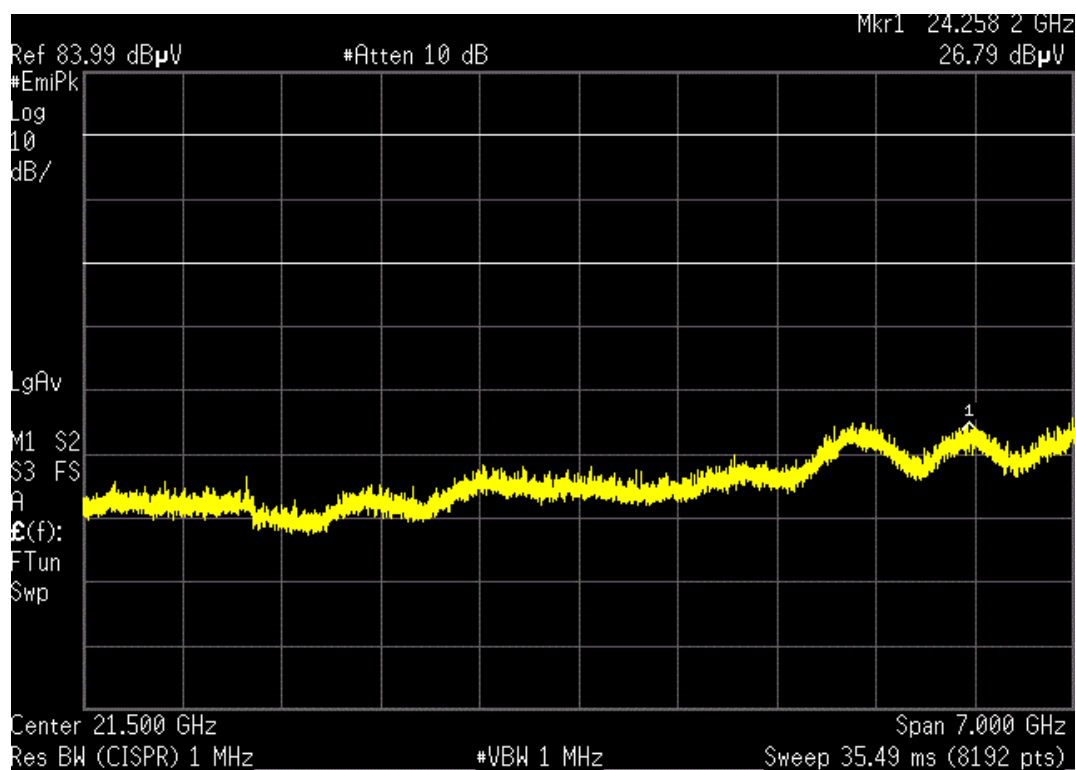


Vertical polarization
TX01
Range 12,75 GHz – 18 GHz

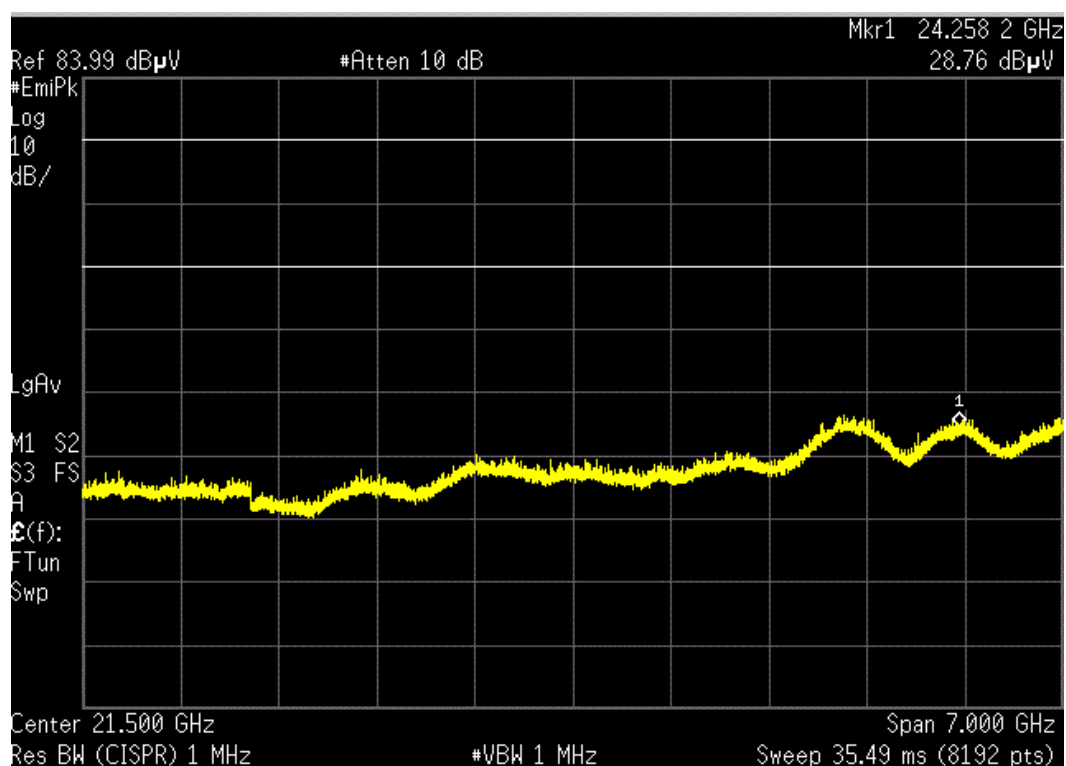


Frequency (MHz)	SR	Peak (dBμV/m)	LimPeak (dBμV/m)	Delta (dB)	CISPR AVG (dBμV/m)	Lim AVG (dBμV/m)	Delta AVG (dB)	Angle (deg)	Polarization
13258.7	1	53.29	74.00	20.71	38.23	54.00	15.77	239.80	Horizontal
13902.21	1	53.69	74.00	20.31	39.21	54.00	14.79	30.10	Horizontal
14388.8	1	53.63	74.00	20.37	38.95	54.00	15.05	210.10	Horizontal
14907.31	1	53.88	74.00	20.12	40.05	54.00	13.95	210.10	Horizontal
15724.09	1	54.18	74.00	19.82	39.93	54.00	14.07	119.90	Horizontal
15963.52	1	54.72	74.00	19.28	40.21	54.00	13.79	239.80	Horizontal
16208.71	1	54.65	74.00	19.35	39.98	54.00	14.02	300.30	Horizontal
16447.34	1	54.99	74.00	19.01	41.18	54.00	12.82	150.50	Horizontal
16786.69	1	55.41	74.00	18.59	41.33	54.00	12.67	150.50	Horizontal
17191.99	1	55.57	74.00	18.43	41.50	54.00	12.50	269.80	Horizontal
17459.33	1	55.92	74.00	18.08	41.11	54.00	12.89	150.50	Horizontal
17643.07	1	55.02	74.00	18.98	41.08	54.00	12.92	269.80	Horizontal
17893.32	1	55.59	74.00	18.41	41.36	54.00	12.64	119.90	Horizontal
13219.23	2	53.22	74.00	20.78	38.67	54.00	15.33	30.00	Vertical
13495.3	2	53.27	74.00	20.73	38.13	54.00	15.87	89.80	Vertical
13876.68	2	54.00	74.00	20.00	39.17	54.00	14.83	119.90	Vertical
14469.05	2	53.56	74.00	20.44	39.06	54.00	14.94	30.00	Vertical
14829.75	2	53.85	74.00	20.15	39.75	54.00	14.25	89.80	Vertical
15132.99	2	53.81	74.00	20.19	39.31	54.00	14.69	89.80	Vertical
15594.21	2	54.54	74.00	19.46	40.46	54.00	13.54	59.90	Vertical
15785.48	2	54.61	74.00	19.39	40.62	54.00	13.38	359.90	Vertical
15968.35	2	55.07	74.00	18.93	40.29	54.00	13.71	119.90	Vertical
16327.37	2	55.82	74.00	18.18	41.27	54.00	12.73	180.50	Vertical
16554.27	2	55.66	74.00	18.34	41.07	54.00	12.93	150.00	Vertical
17075.49	2	55.53	74.00	18.47	41.26	54.00	12.74	59.90	Vertical
17378.38	2	55.55	74.00	18.45	41.09	54.00	12.91	30.00	Vertical

**Horizontal polarization
TX01
Range 18 GHz – 25 GHz**



**Vertical polarization
TX01
Range 18 GHz – 25 GHz**



Test method:	FCC part 15, subpart B, sez. 15.207 ISED RSS-247 Issue 3 ANSI C63.4 AC Power Line conducted emissions For details see par. 5 of this report	
Operator	Marco Nicolè	
Test Date	2024-07-09	
EUT Classification	Class: B	
Electrical wiring	Cable	Length [m]
	USB cable	1.0
Operating conditions	OC01 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 - LISN measurements	
Test instrumentations	See Annex B	
Measurement Uncertainty (k=2)	See Annex F	
EUT modification during this test	None	
Result	COMPLIES	
Note	---	

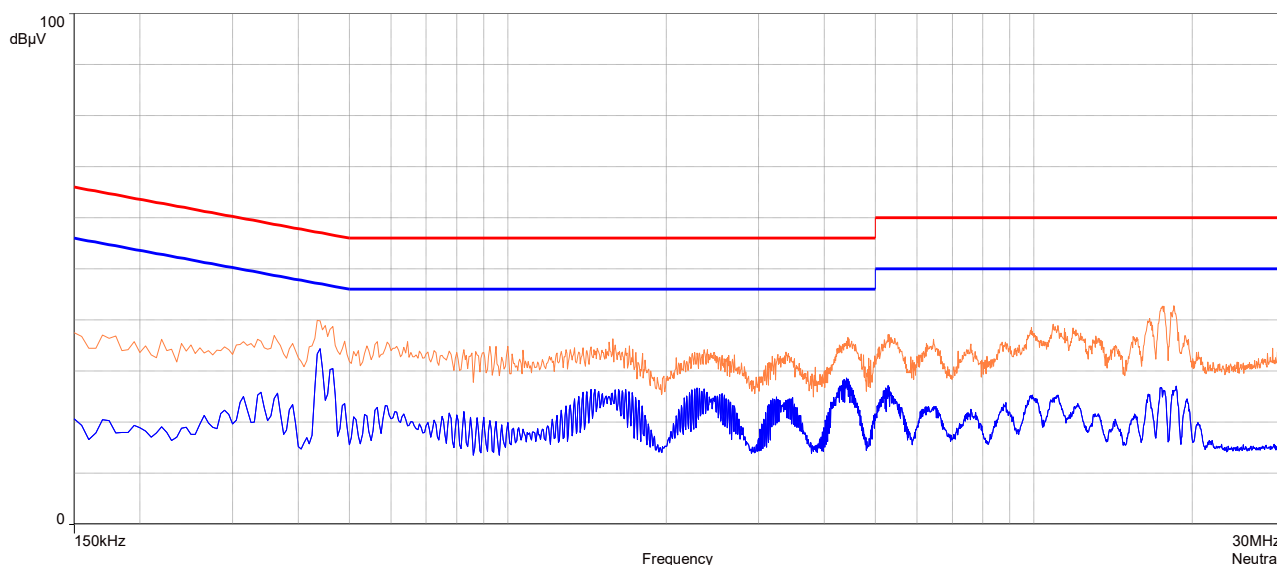
TEST GRAPHS AND MEASUREMENTS

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.

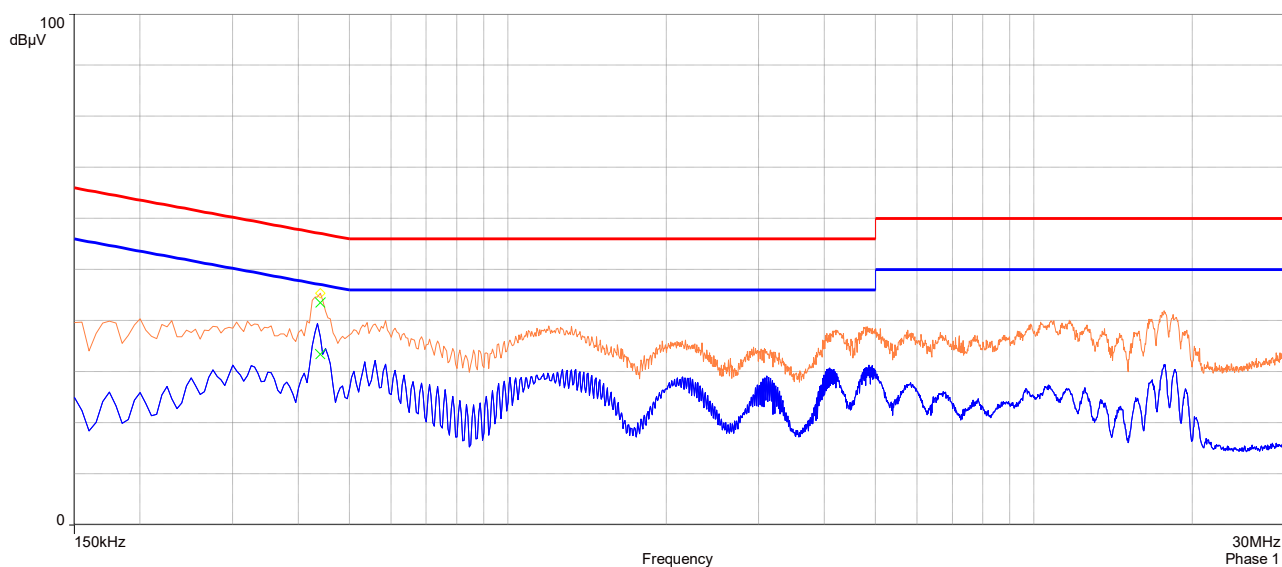
If the general level of the disturbance is not steady, also the AVG disturbance voltage level is observed for 15 s per frequency; results are reported in a specific table below the graph.

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

Measurement 01 LISN Measurement Line: Neutral Operating Condition: OC01



Measurement 02 LISN Measurement Line: Phase 1 Operating Condition: OC01



Frequency (MHz)	SR	AVG (dBμV)	QPeak (dBμV)	Lim AVG (dBμV)	Lim QPeak (dBμV)	AVG Margin (dB)	QPeak Margin (dB)	Line	Conversion Factor
0.44	2	43.51	33.48	47.06	57.06	-3.55	-23.59	Phase 1	10.52

7 EUT MODIFICATIONS

None.

End of the report.

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	2023-10-12	2026-10-11
			Rapporto 6277		
Pre-Amplifier 18 GHz ÷ 40 GHz	Spin Electronics	PRE-1840-35	759/LAB	2023-05-15	2025-05-14
			Rapporto 6091		
Signal Generator	HEWLETT PACKARD	83640B	1388/LAB	2023-05-09	2025-05-08
			Rapporto 6092		
LISN 32A	ROHDE&SCHWARZ	ESH2-Z5	033L/CS	2023-07-10	2024-07-09
			Rapporto 6122		
EMI Receiver - PSA Spectrum Analyzer	Agilent Technologies	E4446A	740/LAB	2023-09-26	2024-09-25
			Rapporto 6190		
RF Cable - N-N 5m	INTERCOND	M17/74 RG 213	225/LAB	2023-09-01	2024-08-31
			Rapporto 6259		
RF Cable - N-N 1,8m	Siva Cables Italy	RG 58A/U	243/LAB	2023-09-01	2024-08-31
			Rapporto 6260		
Pre-Amplifier 18 GHz ÷ 40 GHz	Spin Electronics	PRE-1840-35	759/LAB	2023-05-15	2025-05-14
			Rapporto 6090		
Pulse Limiter ESH3-Z2	ROHDE&SCHWARZ GmbH	ESH3-Z2	528/LAB	2023-09-01	2024-08-31
			Rapporto 6263		
Semianechoic Chamber	Albatross Projects GmbH		739/CA	2023-02-06	2025-02-05
			Rapporto 6030		

Annex B Test instrumentations

Antenna - Horn Antenna 18 GHz ÷ 40 GHz	ETS-LINDGREN	3116	779/LAB	2023-10-18	2026-10-17	Rapporto 6278
Antenna - BiConiLog Antenna 30MHz÷ 6 GHz	ETS-LINDGREN	3142E	1508/LAB	2024-01-26	2027-01-25	Rapporto 6348
EMI Receiver - MXE	Keysight Technologies	N9038A	1444/LAB	2024-02-27	2025-02-26	Rapporto 6358
RF cable - set of RF cables (771/LAB + 791/LAB + 937/LAB)			802/LAB	2024-01-26	2025-01-25	Rapporto 6441
EMI Receiver	ROHDE&SCHWARZ	ESHS10 9kHz...30MHz	030L/CS	2024-07-05	2025-07-05	Rapporto 6472
Software BAT-EMC	Nexio	BAT-EMC	1910/LAB	--	--	
Filter PB	G. De PAOLI	BPF.0.15-30MHz	268/LAB	2023-09-01	2024-08-31	Rapporto 6261



Kiwa Creiven



LAB N° 0259 L

Code 326/24/04320/FCC R01

Annex D Auxiliary instrumentations

<i>Application</i>	<i>Description</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Identifier</i>	<i>Cal. data</i>	<i>Cal. due</i>
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

Set Up N.	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
4	Power disturbance measurement
Test Uncertainty [dB]	4.5
5	Discontinuous terminal disturbance voltage measurement
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty [dB]	3.4
7	Harmonic current emission measurement
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty [%]	7.5
8	Voltage fluctuation and Flicker measurement up to 16A
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Uncertainty Dmax [%]	8.0
Uncertainty Dc [%]	8.0
Uncertainty Pst [%]	8.0
8	Voltage fluctuation and Flicker measurement up to 75A
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Uncertainty Dmax< 3% [%]	8.0
Uncertainty Dmax 3% -> 7% [%]	8.0
Uncertainty Dmax > 7% [%]	8.0
34 - LISN DC PMM	Conducted emissions from components/modules - Voltage measurements

Annex F Compliance Decision Rule and measurements uncertainty

	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty [dB]	3.2
35 – Current Probe	Conducted emissions from components/modules – Current measurements
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty [dB]	2.9
36 – Radiated emission	36 – Radiated emission from components/modules
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty [dB]	7.6
47 - LISN 32A – 200A	Terminal disturbance voltage measurements (LISN 32A – 200A)
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty [dB]	3.4
47 – VP	Terminal disturbance voltage measurements (Passive Voltage Probe)
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty [dB]	2.9
47 - ISN T2	Terminal disturbance voltage measurements (ISN T2)
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty [dB]	4.2
47 - ISN T4	Terminal disturbance voltage measurements (ISN T4)
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty [dB]	4.6
47 - ISN T8	Terminal disturbance voltage measurements (ISN T8)
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty [dB]	5.0
47 - CVP	Terminal disturbance voltage measurements (CVP)
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty [dB]	3.9
51	Emission: Radiated disturbance measurements 30-1000MHz
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty 30 MHz - 200 MHz [dB]	5.1
Test Uncertainty 200 MHz - 1 GHz [dB]	6.3
52	Emission: Radiated disturbance measurements 18-40 GHz
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty [dB]	6.5

Annex F Compliance Decision Rule and measurements uncertainty

61	Emission: Radiated disturbance measurements 1-18 GHz
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty 1 – 6 GHz [dB]	5.2
Test Uncertainty 6 - 18 GHz [dB]	5.5
64	Emission: Radiated Large Loop Antenna
	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>
Test Uncertainty [dB]	3.3

--- End of test report ---