

ETSI EN 301 489-1 V2.2.3 (2019-11)
ETSI EN 301 489-17 V3.2.4 (2020-09)

TEST REPORT

For

Shenzhen Sonoff Technologies Co.,Ltd.

3F & 6F, Bldg A, No. 663, Bulong Rd, Shenzhen, Guangdong, China

Tested Model: AIBridge, AIBridge-26

Report Type: Original Report	Product Type: Smart Home Hub
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	DG1221220-62768E-02	Original Report	2023/2/20

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product Name:	Smart Home Hub
Test Model:	AlBridge, AlBridge-26
Model Difference:	Refer to Dos
Rated Input Voltage:	5Vdc from USB
Serial Number:	Sample 1#_AlBridge(RV1109): 1W5O-1 Sample 2#_AlBridge-26(RV1126): 1WYF-2
EUT Received Date:	2023/1/3
EUT Received Status:	Good

Objective

This report is prepared on behalf of **Shenzhen Sonoff Technologies Co.,Ltd.** in accordance with ETSI EN 301 489-1 V2.2.3 (2019-11) ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility;

ETSI EN 301 489-17 V3.2.4 (2020-09) ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems;

The objective is to determine the compliance of EUT with: ETSI EN 301 489-1 V2.2.3 (2019-11), ETSI EN 301 489-17 V3.2.4 (2020-09).

Test Methodology

All measurements contained in this report were conducted with ETSI EN 301 489-1 V2.2.3 (2019-11) ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

Test mode:

M1: Operating & Wireless Linking

M2: Operating Wired Linking & TF Card Working

M3: Operating & Wired Linking & USB flash disk Working

Note: The chipset RTL8201F works as MCU, the wireless function not used.

Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

No software was used.

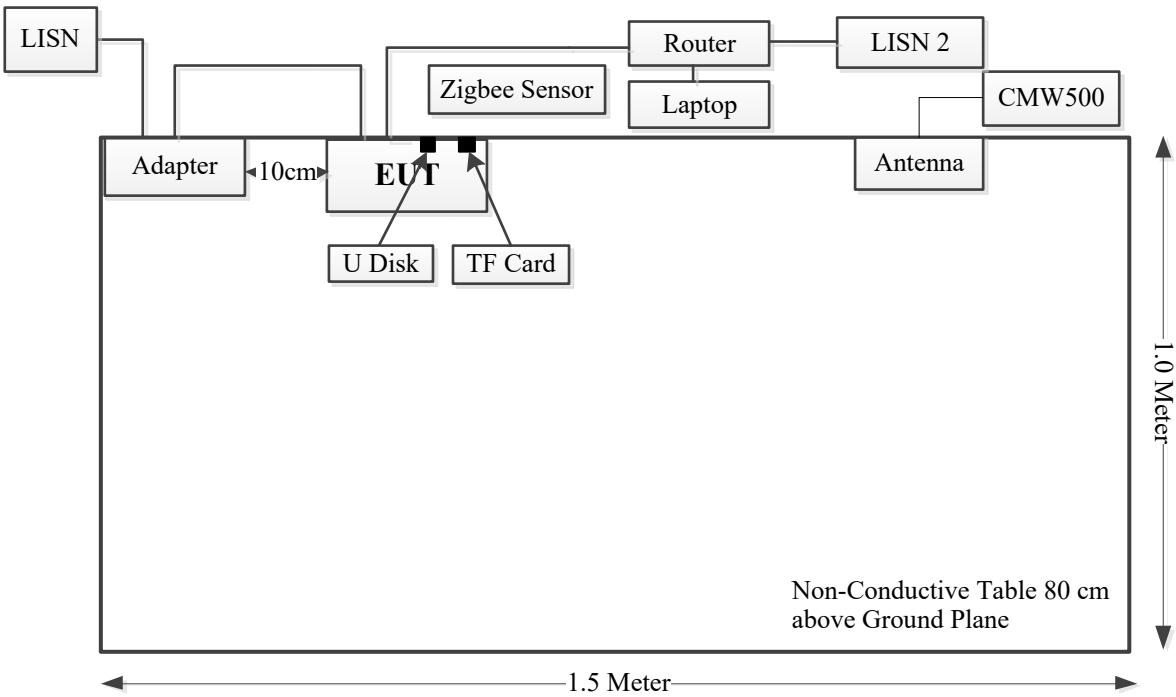
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
SANDisk	USB Flash Disk	16G	BL201026115 B
SanDisk	Micro TF Card	UHS-I-16G	9292DVDSV0XZ
/	Antenna	/	/
Lenovo	Laptop	E480	PF-1QQYYP 19/06
ZIONCOM	Wireless Router	MB-R210-00	EMZBWR21103004
R&S	Wideband Radio Communication Tester	CMW500	149216
Heiman	Zigbee sensor	/	/

Support Cable List and Details

Cable Description	Shielding Cable	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	Yes	No	10	EUT	Wireless Router
RJ45 Cable	No	No	1	Wireless Router	Laptop
Antenna Cable	Yes	No	10	CMW500	Antenna

Block Diagram of Test Setup



Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emission					
R&S	LISN	ENV 216	101614	2022/10/24	2023/10/23
TESEQ	ISN	T800	34379	2022/10/24	2023/10/23
R&S	EMI Test Receiver	ESCI	100035	2022/10/24	2023/10/23
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2022/9/5	2023/9/4
R&S	Test Software	EMC32	Version 9.10.00	N/A	N/A
Radiated emissions below 1GHz					
Sunol Sciences	Antenna	JB3	A060611-1	2020/11/10	2023/11/9
R&S	EMI Test Receiver	ESR3	102453	2022/10/24	2023/10/23
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2022/7/19	2023/7/18
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2022/7/19	2023/7/18
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2022/7/19	2023/7/18
Sonoma	Amplifier	310N	372193	2022/7/18	2023/7/17
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Radiated emissions above 1GHz					
ETS-Lindgren	Horn Antenna	3115	000 527 35	2021/10/12	2024/10/11
Agilent	Spectrum Analyzer	E4440A	SG43360054	2022/7/15	2023/7/14
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2022/9/4	2023/9/3
AH	Preamplifier	PAM-0118	469	2022/10/13	2023/10/12
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
E-Microwave	Band-stop Filters	OBSF-2400-2483.5-S	OE01601525	2022/6/16	2023/6/15
Flicker					
EVERFINE	Harmonic & Flicker TEST ING Power Source	HFS-4000	P624486CD1411122	2022/4/1	2023/3/31
EVERFINE	Harmonic & Flicker Measurement System	HFM3000	P630850CD1411115	2022/11/16	2023/11/15
CS					
HP	Signal Generator	8648A	3246A00831	2022/10/24	2023/10/23
R&S	Power Amplifier	15A250	12934	N/A	N/A
Werlatone	Dual Directional Coupler	C5091-10	113192	2022/2/9	2023/2/8
				2023/2/9	2024/2/8
HP	Power Meter	HP EPM-441A	GB37481494	2022/7/15	2023/7/14
Agilent	8482A Power sensor	8482A	US37296108	2022/11/18	2023/11/17
NARDA	Attenuator	769-6	2754	N/A	N/A
COM-POWER	CDN	M325E	521064	2022/7/15	2023/7/14
COM-POWER	CDN	T8E	581607	2022/7/15	2023/7/14
EFT & Surge & Dips					
EM TEST	Ultra Compact Generator	UCS 500N5	P1406130994	2022/4/1	2023/3/31
EM TEST	Autotransformer	MV2616	P1450144859	N/A	N/A
EM TEST	CDN	CNV508 S1	311137	2022/11/22	2023/11/21
EM TEST	EFT Clamp	N/A	300886	2022/7/15	2023/7/14
ESD					
HAEFELY	Electrostatic Discharge Simulator	ONYX	180786	2022/10/27	2023/10/26
RS					

AR	Antenna	ATL80M1G	0351400	N/A	N/A
AR	Antenna	ATT700M12G	0349410	N/A	N/A
HP	Signal Generator	8665B	3438a00584	2022/11/18	2023/11/17
AR	Power Amplifier	500W1000C	0353561	N/A	N/A
AR	Power Amplifier	60S1G6	0348711	N/A	N/A
PASTERNAK	Dual Directional Coupler	PE2239-30	1711	2022/7/15	2023/7/14
Agilent	EPM Series Power Meter	E4419B	MY45103907	2022/11/18	2023/11/17
Agilent	E-Series Avg Power Sensor	E9301A	MY41497625	2022/7/15	2023/7/14
Agilent	E-Series Avg Power Sensor	E9301A	MY41497628	2022/7/15	2023/7/14

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Environmental Conditions

Test Item:	Conducted emission	Radiated emissions below 1GHz	Radiated emissions above 1GHz	EMS & Flicker
Temperature:	17.3~20.3°C	19.5~20.1°C	17.1~21.2°C	18.1~23.2°C
Relative Humidity:	36~38%	52~63%	37~44%	40~51%
ATM Pressure:	101.9~102.1kPa	101.8~102.5kPa	101.9~102.3kPa	101.3~101.7kPa
Tester:	Walker Chen	Leo Yuan	Alan Xie	Lane Sun
Test Date:	2023/1/30~2023/2/16	2023/1/17~2023/2/15	2023/1/29~2023/2/17	2023/1/31~2023/2/14

SUMMARY OF TEST RESULTS

SN	Rule and Clause	Description of Test	Test Result
1	EN 301 489 Clause 8.2	Enclosure of ancillary equipment measured on a stand alone basis	Compliant
2	EN 301 489 Clause 8.3	DC power input/output ports	Not applicable
3	EN 301 489 Clause 8.4	AC mains power input/output ports	Compliant
4	EN 301 489 Clause 8.5	Harmonic current emissions (AC mains input port)	Not applicable
5	EN 301 489 Clause 8.6	Voltage fluctuations and flicker (AC mains input port)	Compliant
6	EN 301 489 Clause 8.7	Wired network ports	Compliant
7	EN 301 489 Clause 9.2	Radio frequency electromagnetic fields (80 MHz to 6 000 MHz)	Compliant
8	EN 301 489 Clause 9.3	Electrostatic discharges	Compliant
9	EN 301 489 Clause 9.4	Fast transients, common mode	Compliant
10	EN 301 489 Clause 9.5	Radio frequency, common mode	Compliant
11	EN 301 489 Clause 9.6	Transients and surges in the vehicular environment	Not applicable
12	EN 301 489 Clause 9.7	Voltage dips and short interruptions	Compliant
13	EN 301 489 Clause 9.8	Surges	Compliant

Note:

Not Applicable: Please refer to Applicability overview tables in sections 7.1 and 7.2 of EN 301 489-1 requirements for Radio and ancillary equipment.

1 - ENCLOSURE OF ANCILLARY EQUIPMENT MEASURED ON A STAND ALONE BASIS

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

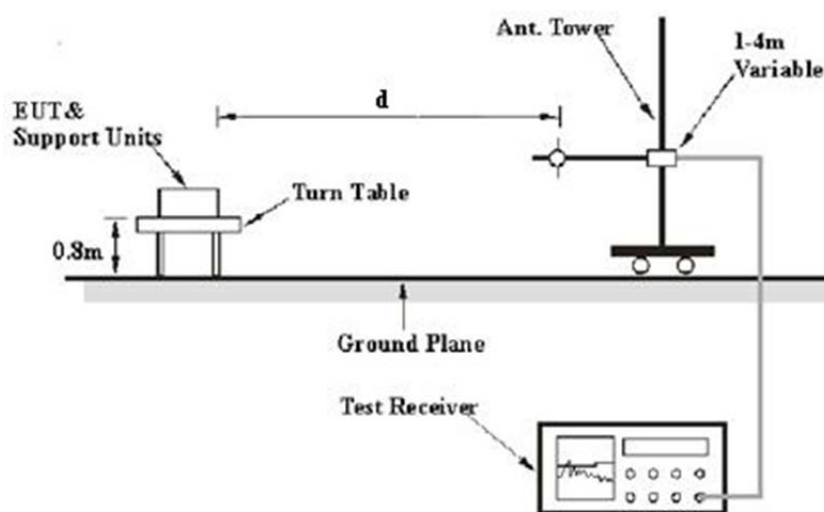
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 10m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.55 dB for Horizontal, 4.57 dB for Vertical; 200M~1GHz: 4.66 dB for Horizontal, 4.56 dB for Vertical; measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical; 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB

Table 1 - Values of U_{cispr}

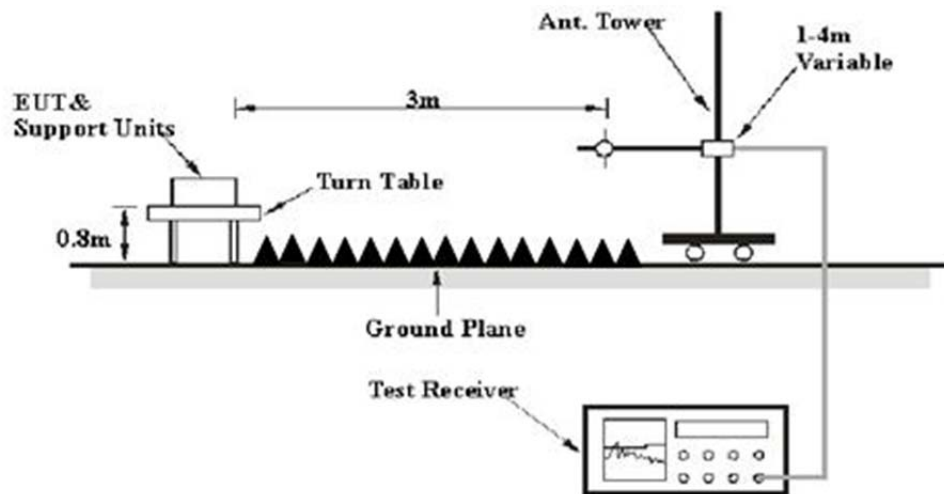
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC)(30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR)(1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR)(6 GHz to 18 GHz)	5.5 dB

Test System Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests below 1GHz were performed in 3 meters, above 1GHz were performed in the 3 meters. The specification used was EN 55032 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

EMI Test Receiver and Spectrum Analyzer Setup

The system was investigated from 30 MHz to 6 GHz.

During the radiated emission test, the EMI test receiver(Below 1GHz) and Spectrum Analyzer(Above 1GHz) were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz - 1000 MHz	120 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	3 MHz	/	Peak
	1MHz	10Hz	/	Average

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode from 30MHz to 1GHz, Peak and average detection mode above 1GHz.

Corrected Amplitude & Margin Calculation

The basic equation is as follows: Result = Meter Reading+ Corrected

Note:

Corrected = Antenna Factor + Cable Loss - Amplifier Gain, or

Corrected = Antenna Factor + Cable Loss + Insertion loss of attenuator - Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows: Margin = Limit-Result

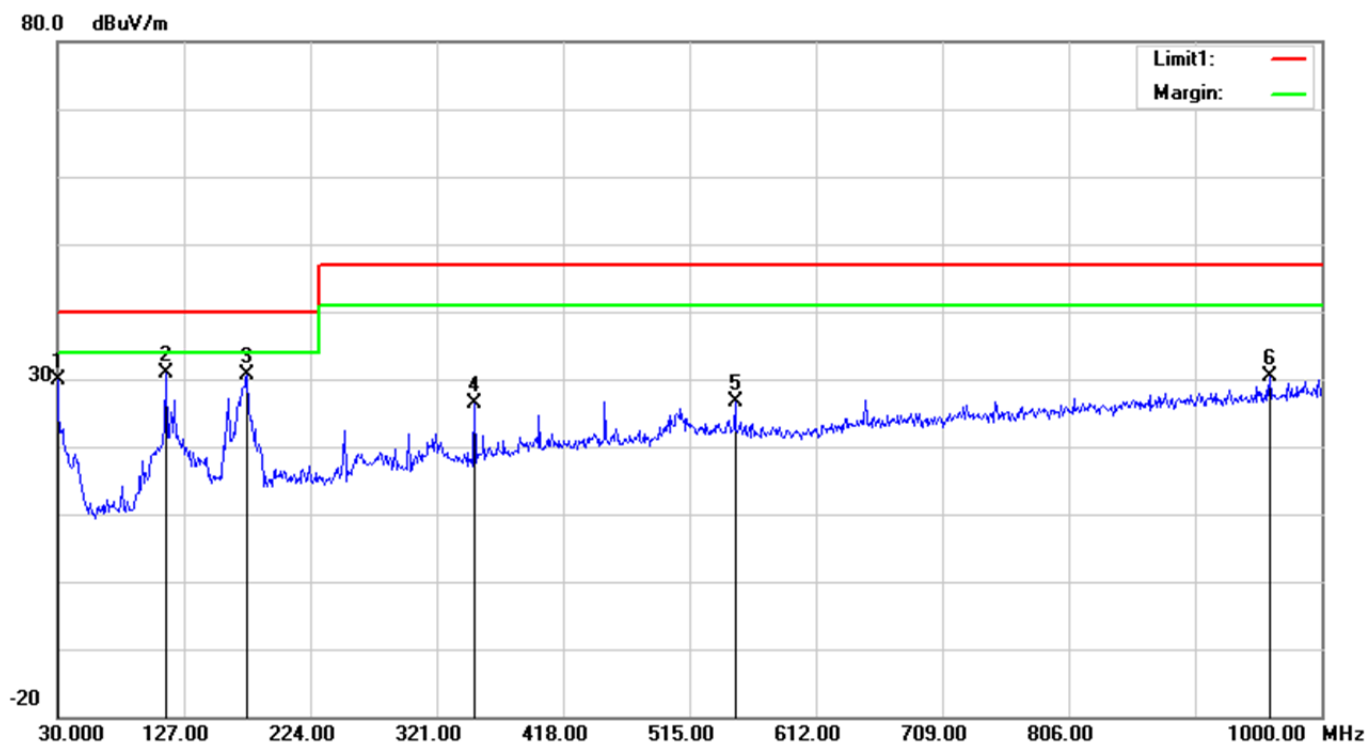
Test Data

Please refer to following table and plots:

Below 1G

Condition: EN 301 489 Class B
Test Mode: M1: Operating & Wireless Linking
Note: RV1109

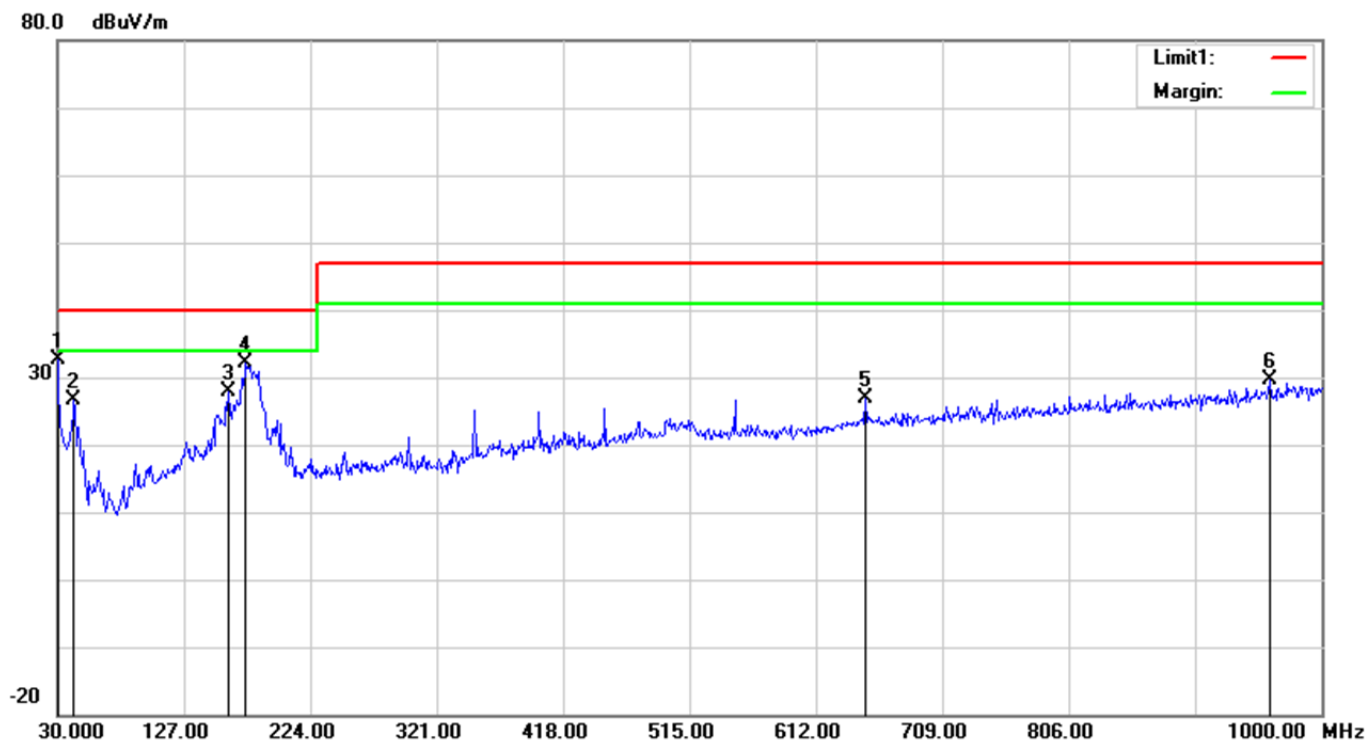
Polarization: Horizontal
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	30.0000	33.13	peak	-3.34	29.79	40.00	10.21
2	113.4200	42.19	peak	-11.38	30.81	40.00	9.19
3	175.5000	43.66	peak	-13.03	30.63	40.00	9.37
4	350.1000	35.84	peak	-9.52	26.32	47.00	20.68
5	549.9200	31.68	peak	-5.00	26.68	47.00	20.32
6	960.2300	28.75	peak	1.57	30.32	47.00	16.68

Condition: EN 301 489 Class B
Test Mode: M1: Operating & Wireless Linking
Note: RV1109

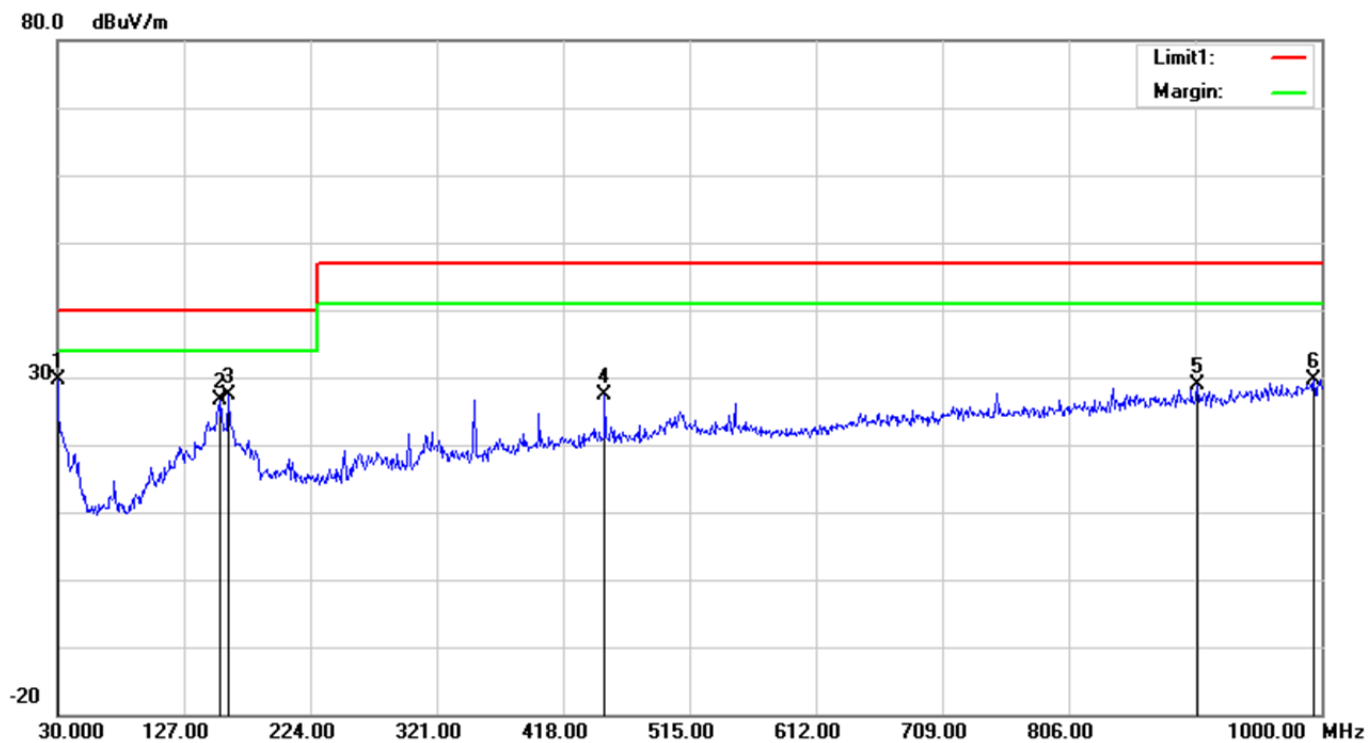
Polarization: Vertical
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	30.0000	35.89	peak	-3.34	32.55	40.00	7.45
2	42.6100	38.64	peak	-12.00	26.64	40.00	13.36
3	160.9500	40.04	peak	-12.26	27.78	40.00	12.22
4	174.5300	45.00	peak	-12.97	32.03	40.00	7.97
5	649.8300	30.07	peak	-3.10	26.97	47.00	20.03
6	960.2300	27.97	peak	1.57	29.54	47.00	17.46

Condition: EN 301 489 Class B
Test Mode: M2:Operating&Wired Linking&TF Card Working
Note: RV1109

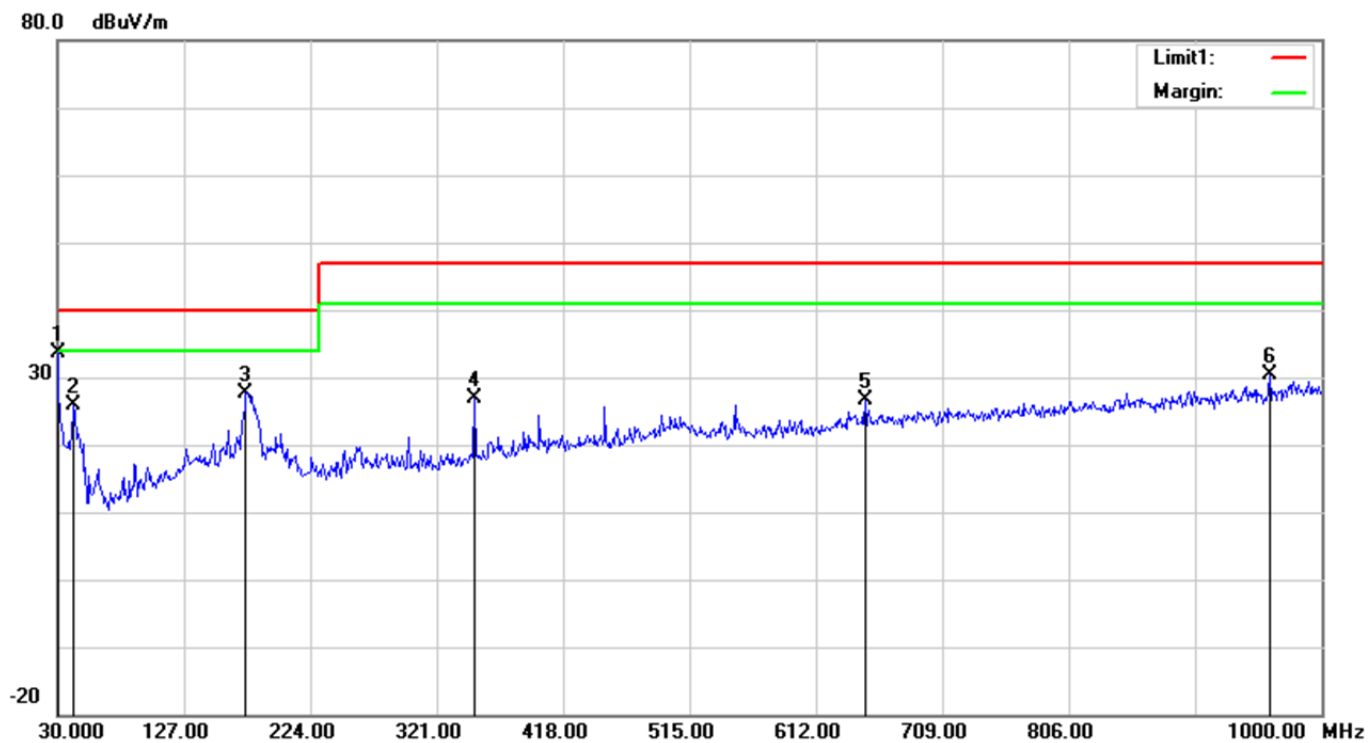
Polarization: Horizontal
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dB μ V)		(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB)
1	30.0000	32.85	peak	-3.34	29.51	40.00	10.49
2	155.1300	38.58	peak	-11.97	26.61	40.00	13.39
3	160.9500	39.64	peak	-12.26	27.38	40.00	12.62
4	450.0100	34.03	peak	-6.65	27.38	47.00	19.62
5	904.9400	28.31	peak	0.68	28.99	47.00	18.01
6	994.1800	27.14	peak	2.49	29.63	47.00	17.37

Condition: EN 301 489 Class B
Test Mode: M2:Operating&Wired Linking&TF Card Working
Note: RV1109

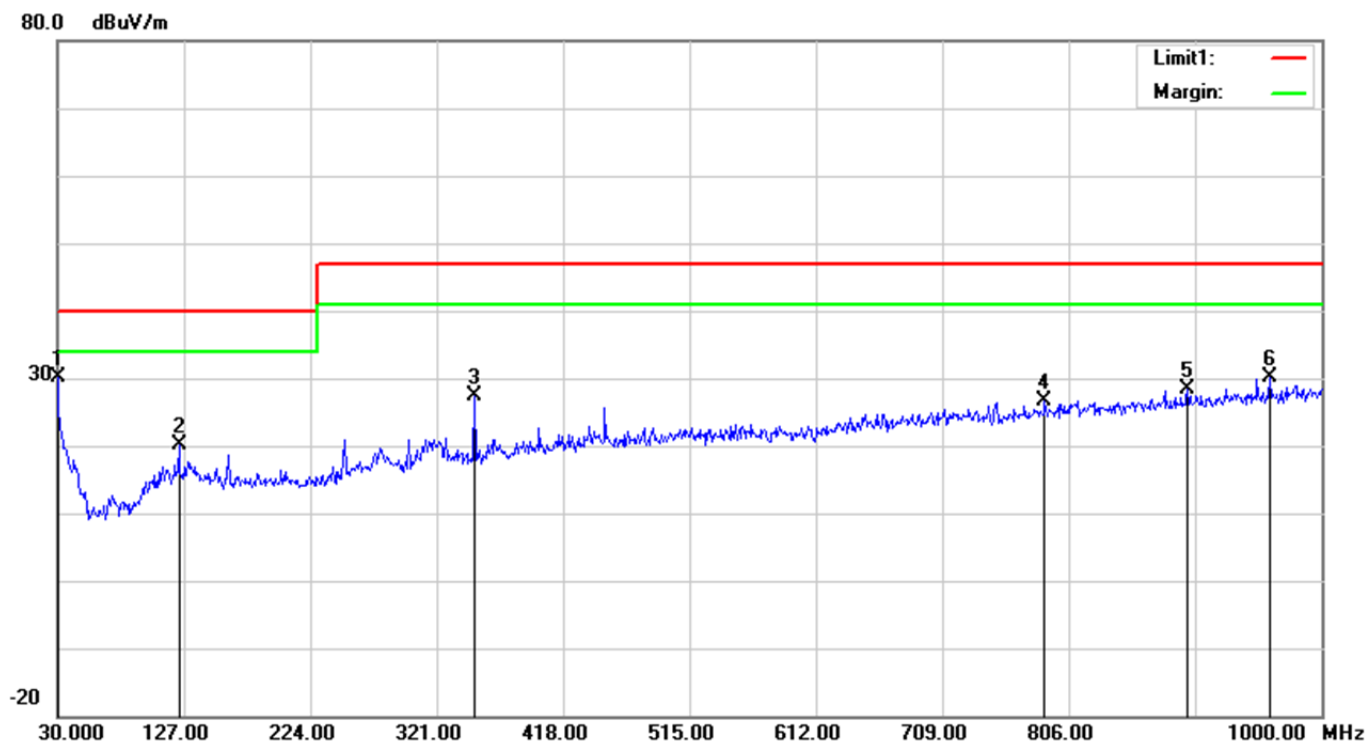
Polarization: Vertical
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	30.0000	36.88	peak	-3.34	33.54	40.00	6.46
2	42.6100	37.83	peak	-12.00	25.83	40.00	14.17
3	174.5300	40.57	peak	-12.97	27.60	40.00	12.40
4	350.1000	36.48	peak	-9.52	26.96	47.00	20.04
5	649.8300	29.80	peak	-3.10	26.70	47.00	20.30
6	960.2300	28.79	peak	1.57	30.36	47.00	16.64

Condition: EN 301 489 Class B
Test Mode: M3:Operating&Wired Linking&USB flash disk Working
Note: RV1109

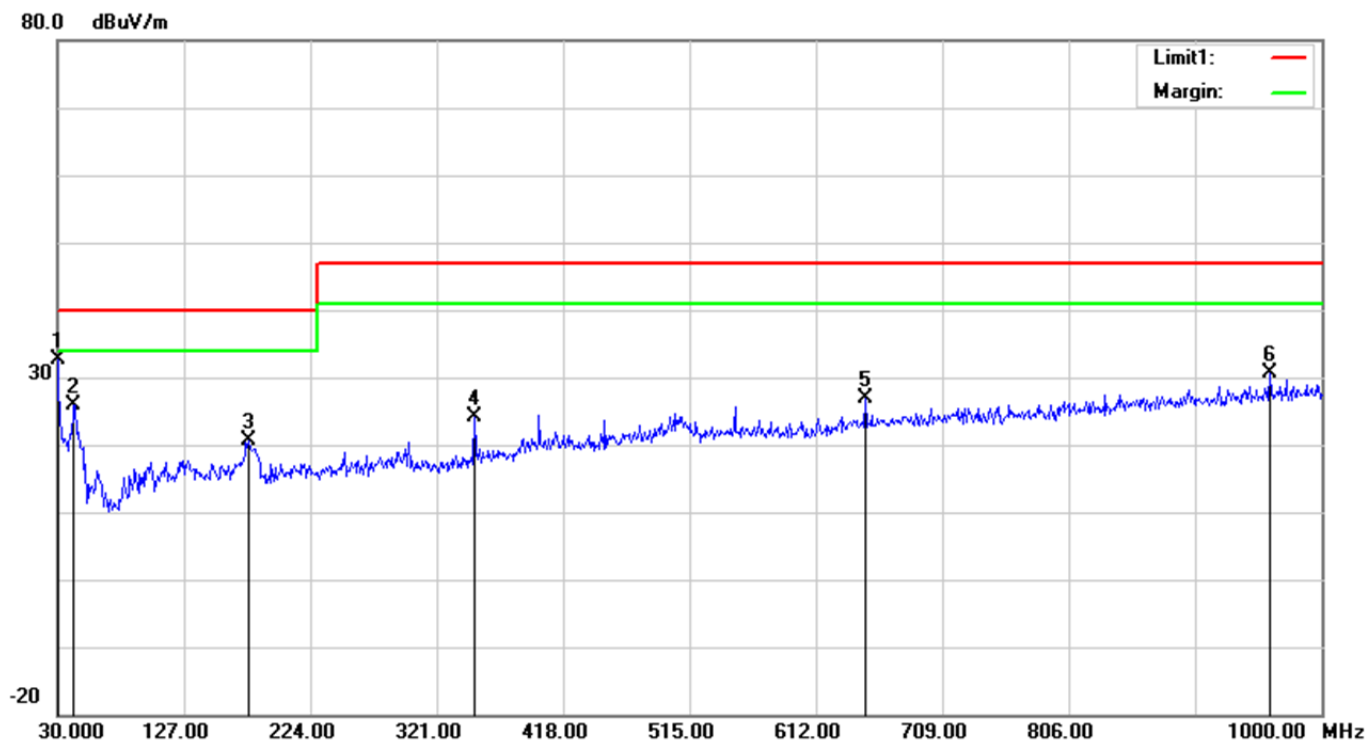
Polarization: Horizontal
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dB μ V)		(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB)
1	30.0000	33.56	peak	-3.34	30.22	40.00	9.78
2	123.1200	31.09	peak	-10.84	20.25	40.00	19.75
3	350.1000	36.91	peak	-9.52	27.39	47.00	19.61
4	787.5700	27.94	peak	-1.40	26.54	47.00	20.46
5	897.1800	27.75	peak	0.63	28.38	47.00	18.62
6	960.2300	28.66	peak	1.57	30.23	47.00	16.77

Condition: EN 301 489 Class B
Test Mode: M3:Operating&Wired Linking&USB flash disk
Working
Note: RV1109

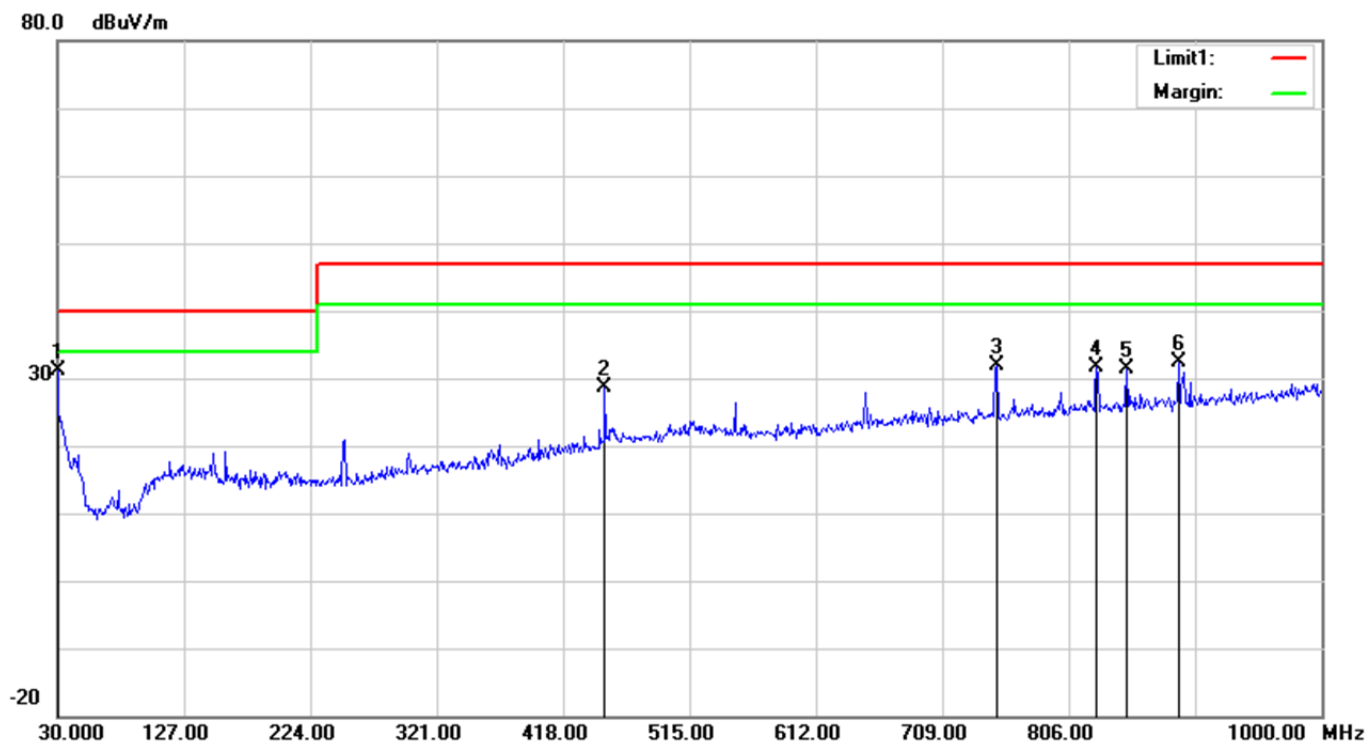
Polarization: Vertical
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dB μ V)		(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB)
1	30.0000	36.00	peak	-3.34	32.66	40.00	7.34
2	42.6100	37.88	peak	-12.00	25.88	40.00	14.12
3	176.4700	33.76	peak	-13.08	20.68	40.00	19.32
4	350.1000	33.55	peak	-9.52	24.03	47.00	22.97
5	649.8300	30.04	peak	-3.10	26.94	47.00	20.06
6	960.2300	28.97	peak	1.57	30.54	47.00	16.46

Condition: EN 301 489 Class B
Test Mode: M1: Operating & Wireless Linking
Note: RV1126

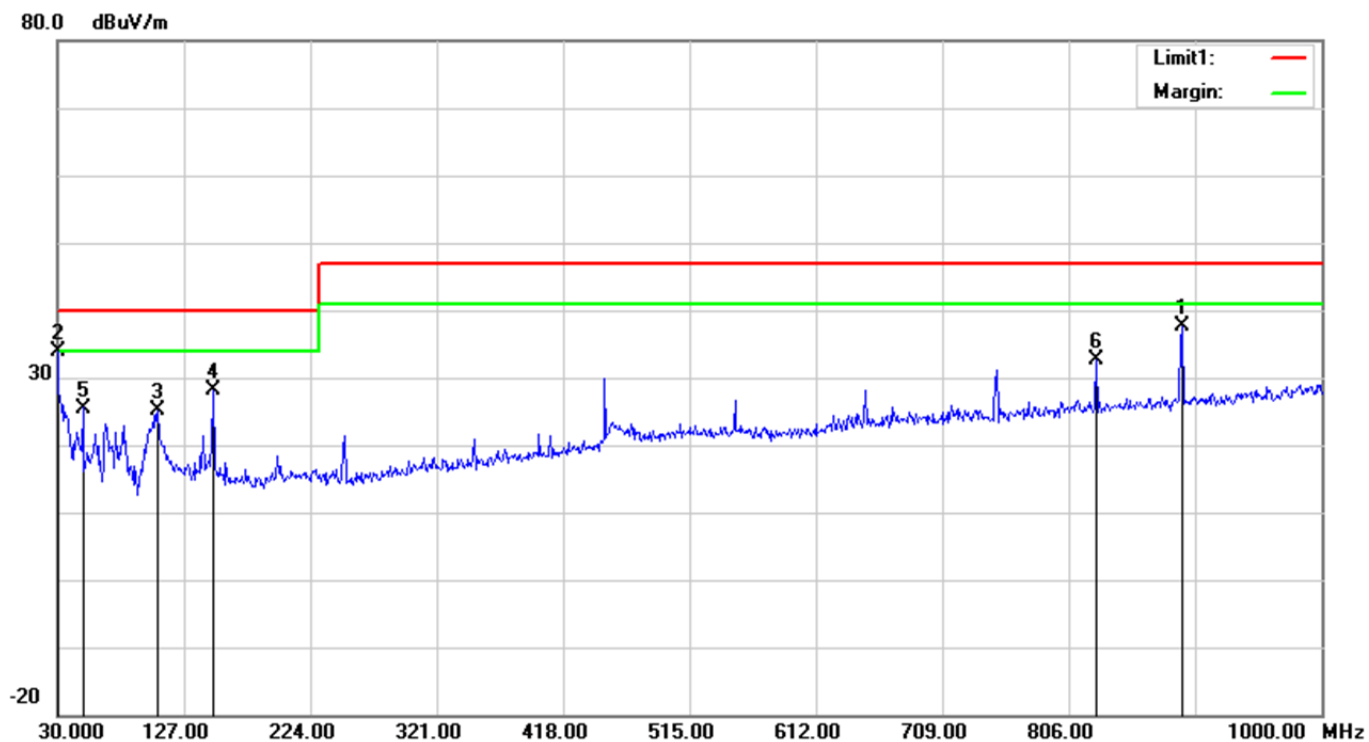
Polarization: Horizontal
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dB μ V)		(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB)
1	30.0000	34.37	peak	-3.34	31.03	40.00	8.97
2	450.0100	35.35	peak	-6.65	28.70	47.00	18.30
3	750.7100	33.84	peak	-1.99	31.85	47.00	15.15
4	827.3400	32.26	peak	-0.66	31.60	47.00	15.40
5	850.6200	31.70	peak	-0.24	31.46	47.00	15.54
6	890.3900	31.82	peak	0.45	32.27	47.00	14.73

Condition: EN 301 489 Class B
Test Mode: M1: Operating & Wireless Linking
Note: RV1126

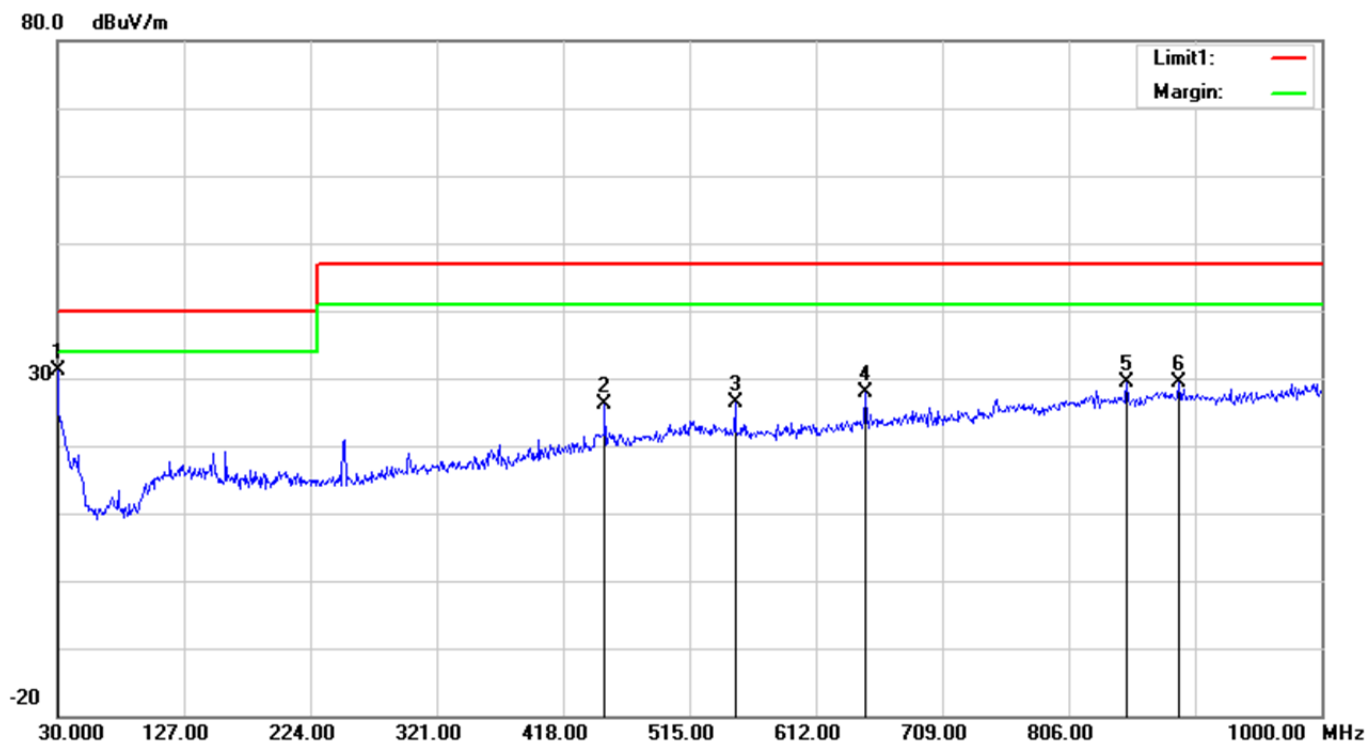
Polarization: Vertical
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	893.3000	37.18	peak	0.54	37.72	47.00	9.28
2	30.0000	37.16	peak	-3.34	33.82	40.00	6.18
3	106.6300	37.67	peak	-12.48	25.19	40.00	14.81
4	149.3100	39.82	peak	-11.74	28.08	40.00	11.92
5	49.4000	41.84	peak	-16.34	25.50	40.00	14.50
6	827.3400	33.22	peak	-0.66	32.56	47.00	14.44

Condition: EN 301 489 Class B
Test Mode: M2:Operating&Wired Linking&TF Card Working
Note: RV1126

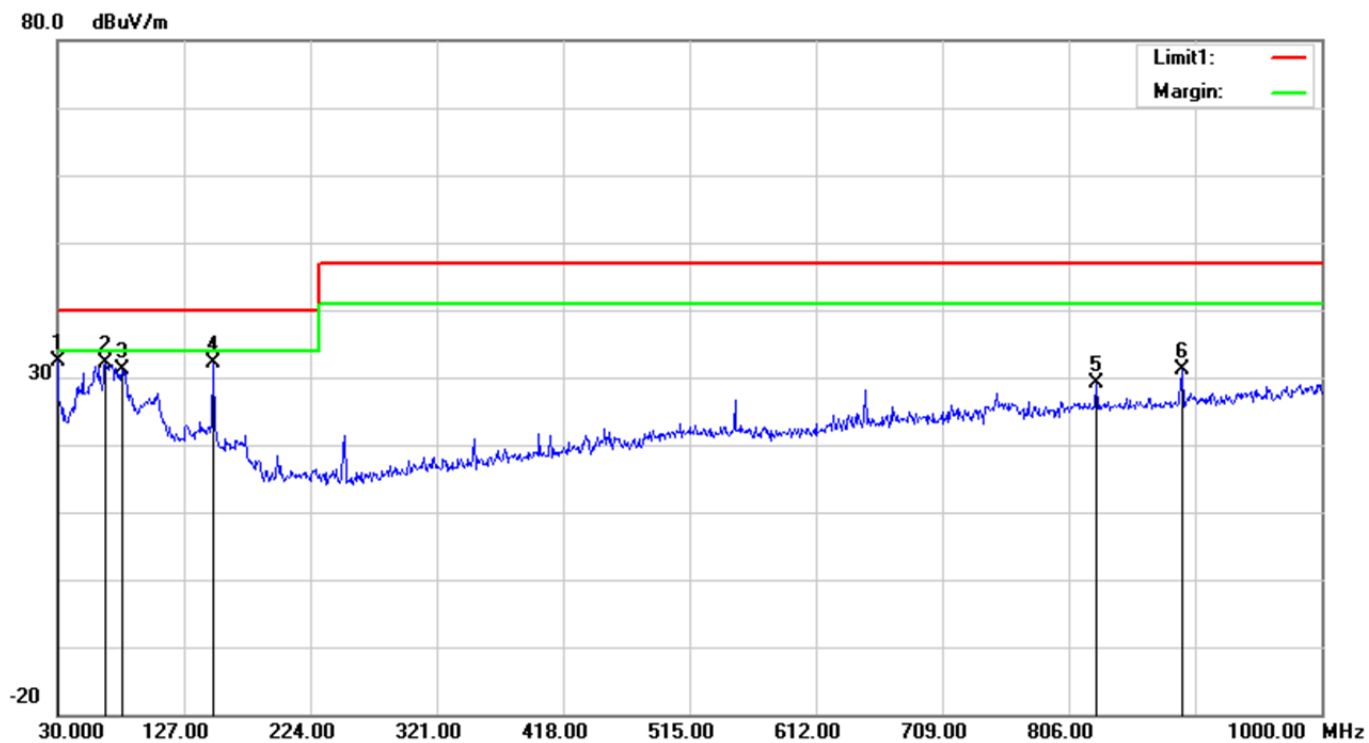
Polarization: Horizontal
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dB μ V)		(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB)
1	30.0000	34.37	peak	-3.34	31.03	40.00	8.97
2	450.0100	32.85	peak	-6.65	26.20	47.00	20.80
3	549.9200	31.39	peak	-5.00	26.39	47.00	20.61
4	649.8300	30.98	peak	-3.10	27.88	47.00	19.12
5	850.6200	29.70	peak	-0.24	29.46	47.00	17.54
6	890.3900	28.82	peak	0.45	29.27	47.00	17.73

Condition: EN 301 489 Class B
Test Mode: M2:Operating&Wired Linking&TF Card
Working
Note: RV1126

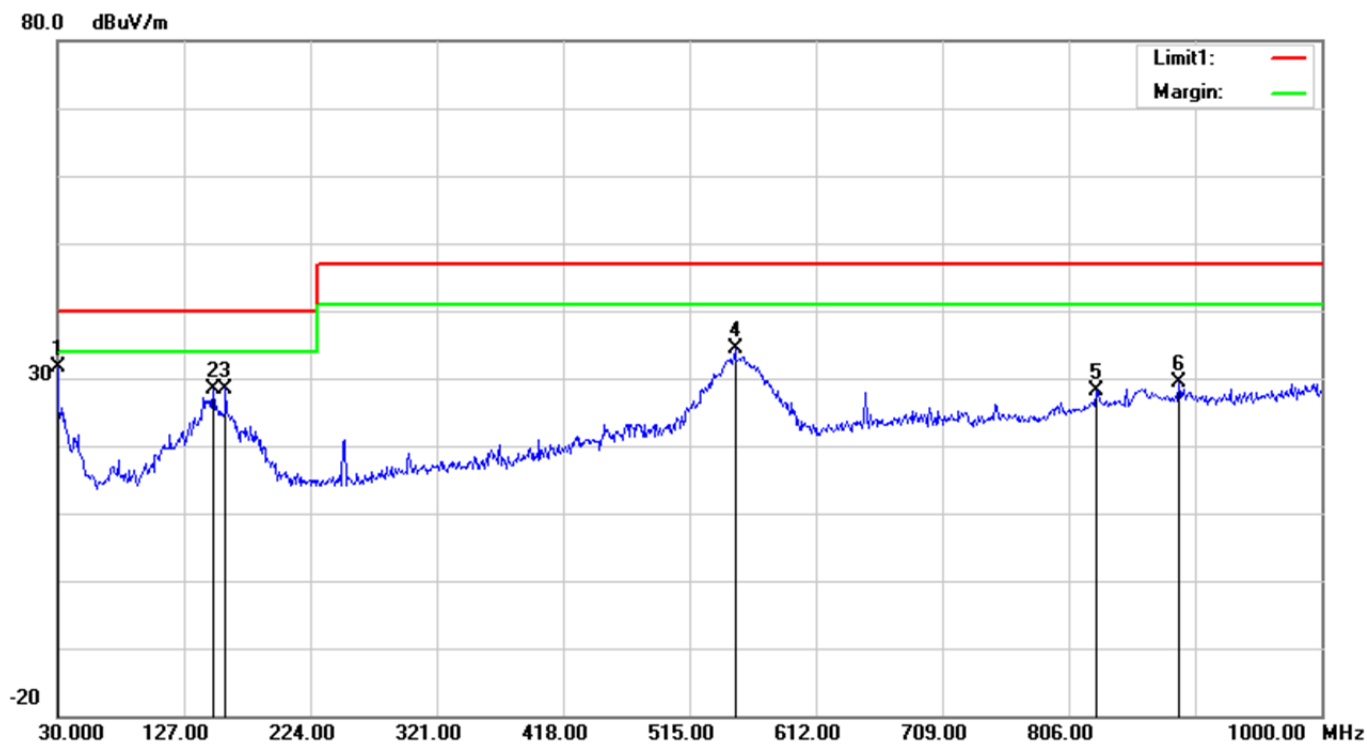
Polarization: Vertical
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	30.0000	35.66	peak	-3.34	32.32	40.00	7.68
2	66.8600	48.67	peak	-16.59	32.08	40.00	7.92
3	79.4700	47.88	peak	-16.68	31.20	40.00	8.80
4	149.3100	43.82	peak	-11.74	32.08	40.00	7.92
5	827.3400	29.71	peak	-0.66	29.05	47.00	17.95
6	893.3000	30.68	peak	0.54	31.22	47.00	15.78

Condition: EN 301 489 Class B
Test Mode: M3:Operating&Wired Linking&USB flash disk Working
Note: RV1126

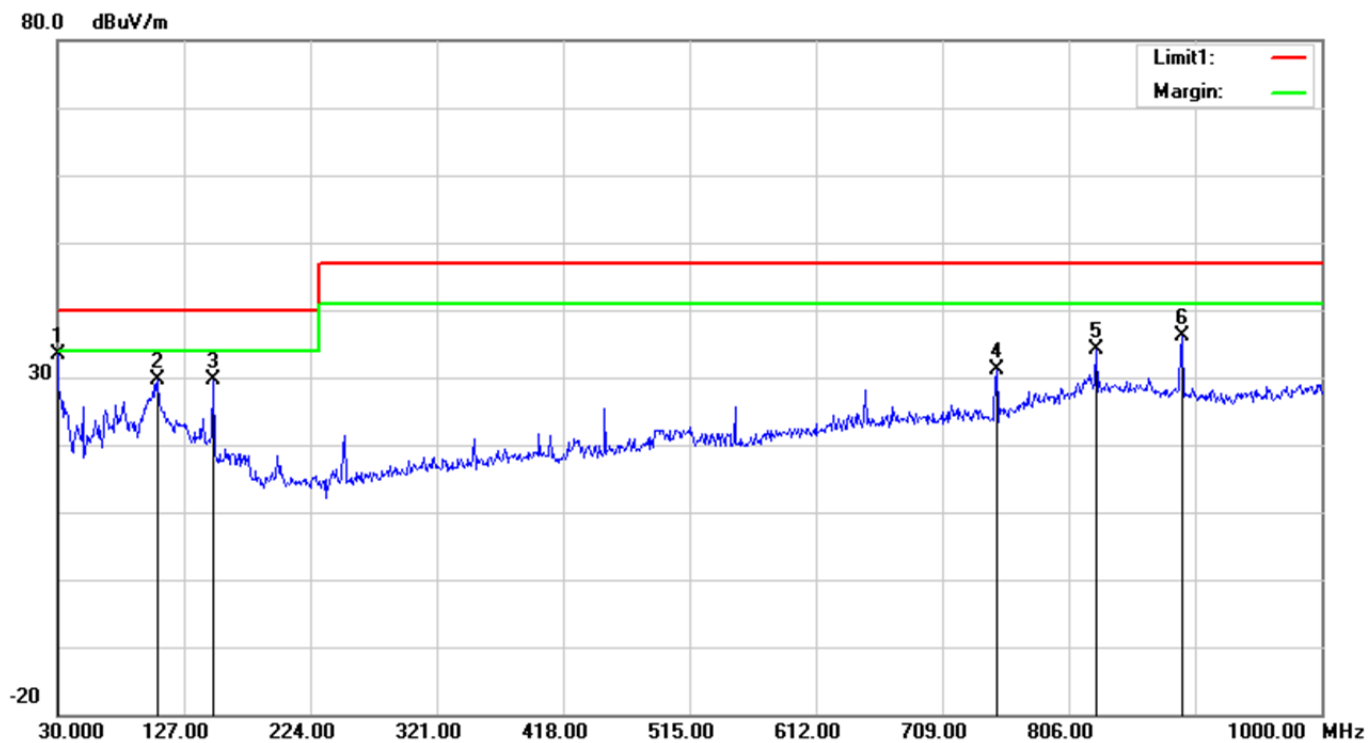
Polarization: Horizontal
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dB μ V)		(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB)
1	30.0000	34.87	peak	-3.34	31.53	40.00	8.47
2	149.3100	40.15	peak	-11.74	28.41	40.00	11.59
3	159.0100	40.65	peak	-12.15	28.50	40.00	11.50
4	549.9200	39.39	peak	-5.00	34.39	47.00	12.61
5	827.3400	28.76	peak	-0.66	28.10	47.00	18.90
6	890.3900	28.82	peak	0.45	29.27	47.00	17.73

Condition: EN 301 489 Class B
Test Mode: M3:Operating&Wired Linking&USB flash disk
Working
Note: RV1126

Polarization: Vertical
Distance: 3m

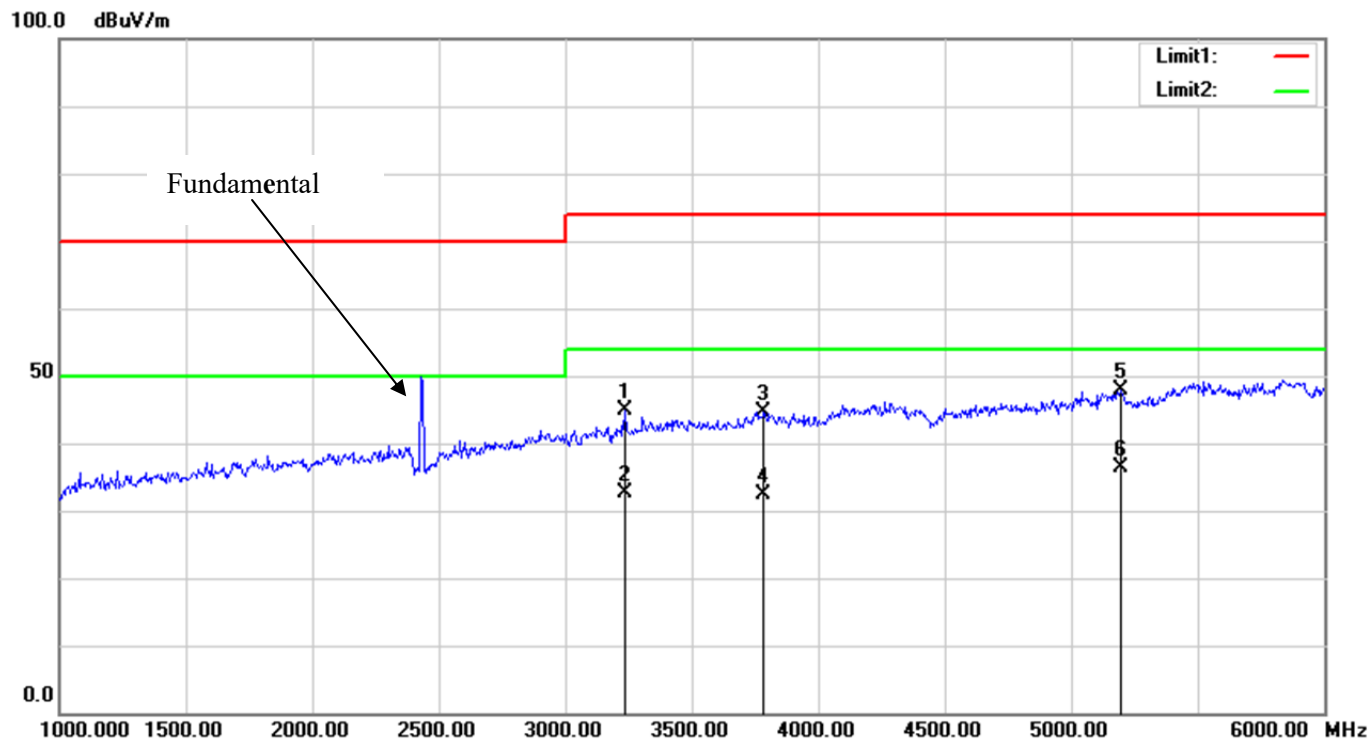


No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	30.0000	36.66	peak	-3.34	33.32	40.00	6.68
2	106.6300	42.17	peak	-12.48	29.69	40.00	10.31
3	149.3100	41.32	peak	-11.74	29.58	40.00	10.42
4	750.7100	33.02	peak	-1.99	31.03	47.00	15.97
5	827.3400	34.71	peak	-0.66	34.05	47.00	12.95
6	893.3000	35.68	peak	0.54	36.22	47.00	10.78

Above 1G

Condition: EN 301 489 Class B
Test Mode: M1: Operating & Wireless Linking
Note: RV1109

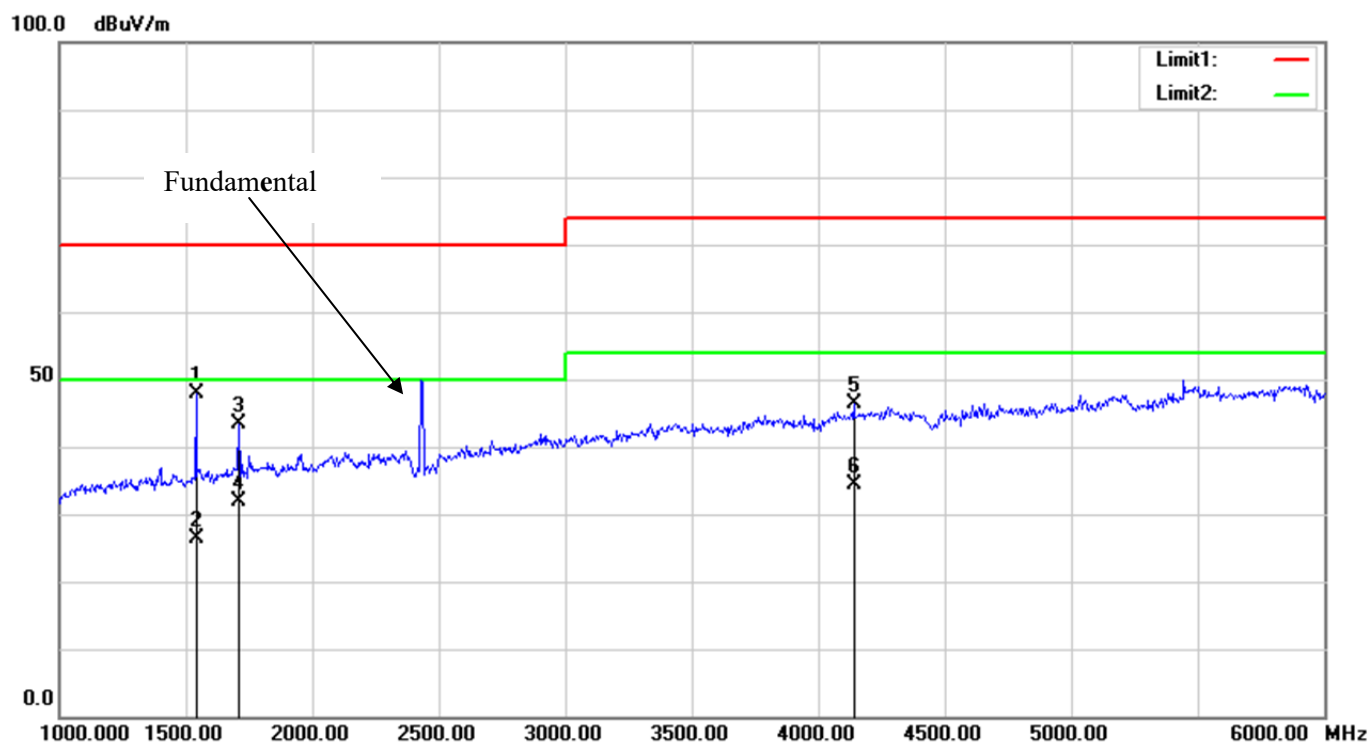
Polarization: Horizontal
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	3235.000	51.36	peak	-6.59	44.77	74.00	29.23
2	3235.000	39.25	AVG	-6.59	32.66	54.00	21.34
3	3787.500	49.56	peak	-5.01	44.55	74.00	29.45
4	3787.500	37.46	AVG	-5.01	32.45	54.00	21.55
5	5197.500	49.26	peak	-1.30	47.96	74.00	26.04
6	5197.500	37.57	AVG	-1.30	36.27	54.00	17.73

Condition: EN 301 489 Class B
Test Mode: M1: Operating & Wireless Linking
Note: RV1109

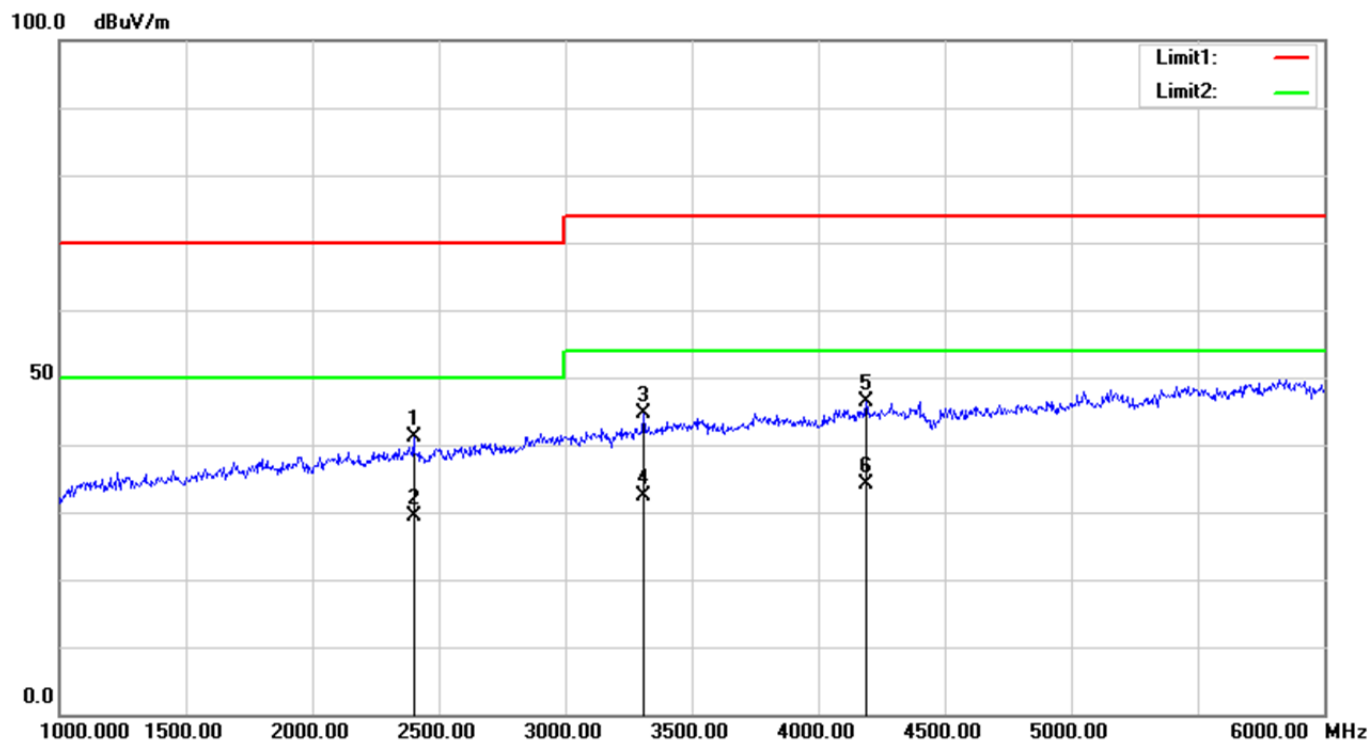
Polarization: Vertical
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dB μ V)		(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB)
1	1542.500	60.68	peak	-12.76	47.92	70.00	22.08
2	1542.500	39.21	AVG	-12.76	26.45	50.00	23.55
3	1710.000	55.22	peak	-11.80	43.42	70.00	26.58
4	1710.000	43.68	AVG	-11.80	31.88	50.00	18.12
5	4140.000	50.42	peak	-4.12	46.30	74.00	27.70
6	4140.000	38.52	AVG	-4.12	34.40	54.00	19.60

Condition: EN 301 489 Class B
Test Mode: M2:Operating&Wired Linking&TF Card Working
Note: RV1109

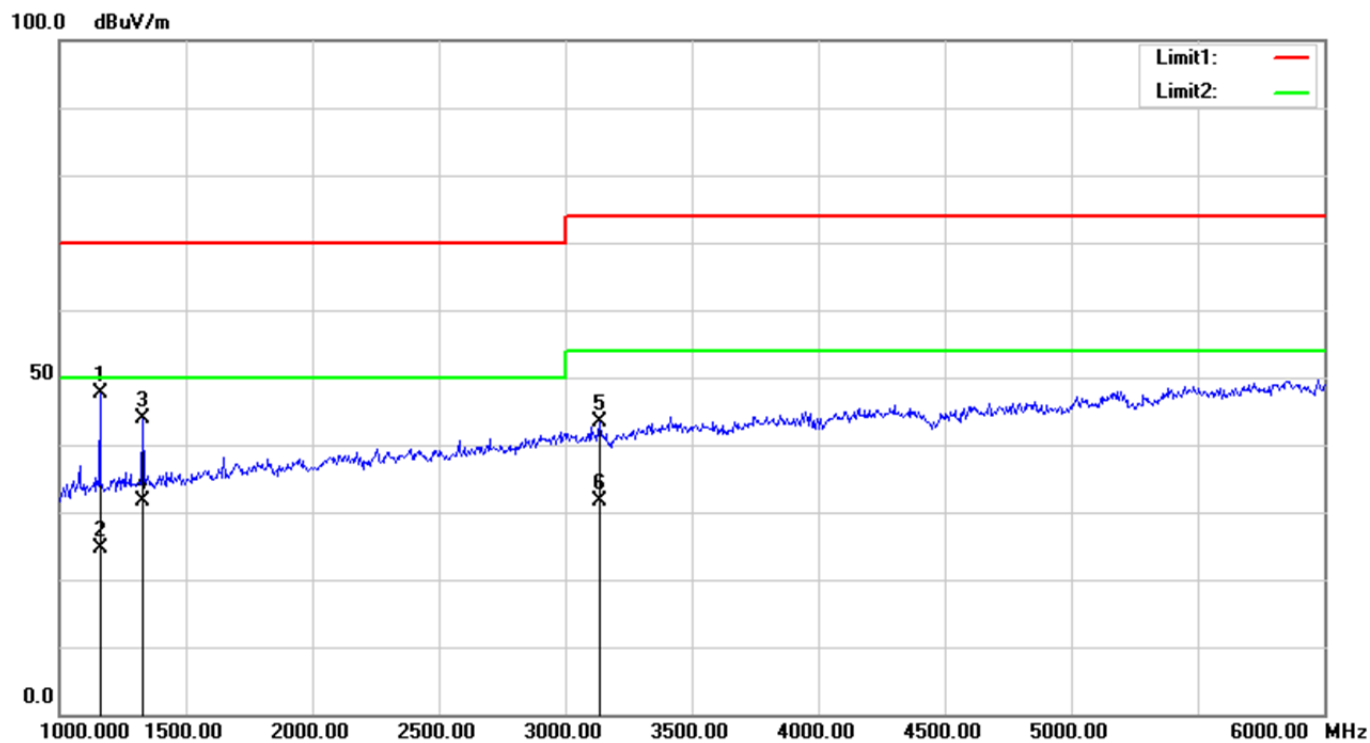
Polarization: Horizontal
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	2402.500	50.85	peak	-9.65	41.20	70.00	28.80
2	2402.500	38.94	AVG	-9.65	29.29	50.00	20.71
3	3310.000	50.87	peak	-6.16	44.71	74.00	29.29
4	3310.000	38.63	AVG	-6.16	32.47	54.00	21.53
5	4190.000	50.78	peak	-4.32	46.46	74.00	27.54
6	4190.000	38.44	AVG	-4.32	34.12	54.00	19.88

Condition: EN 301 489 Class B
Test Mode: M2:Operating&Wired Linking&TF Card Working
Note: RV1109

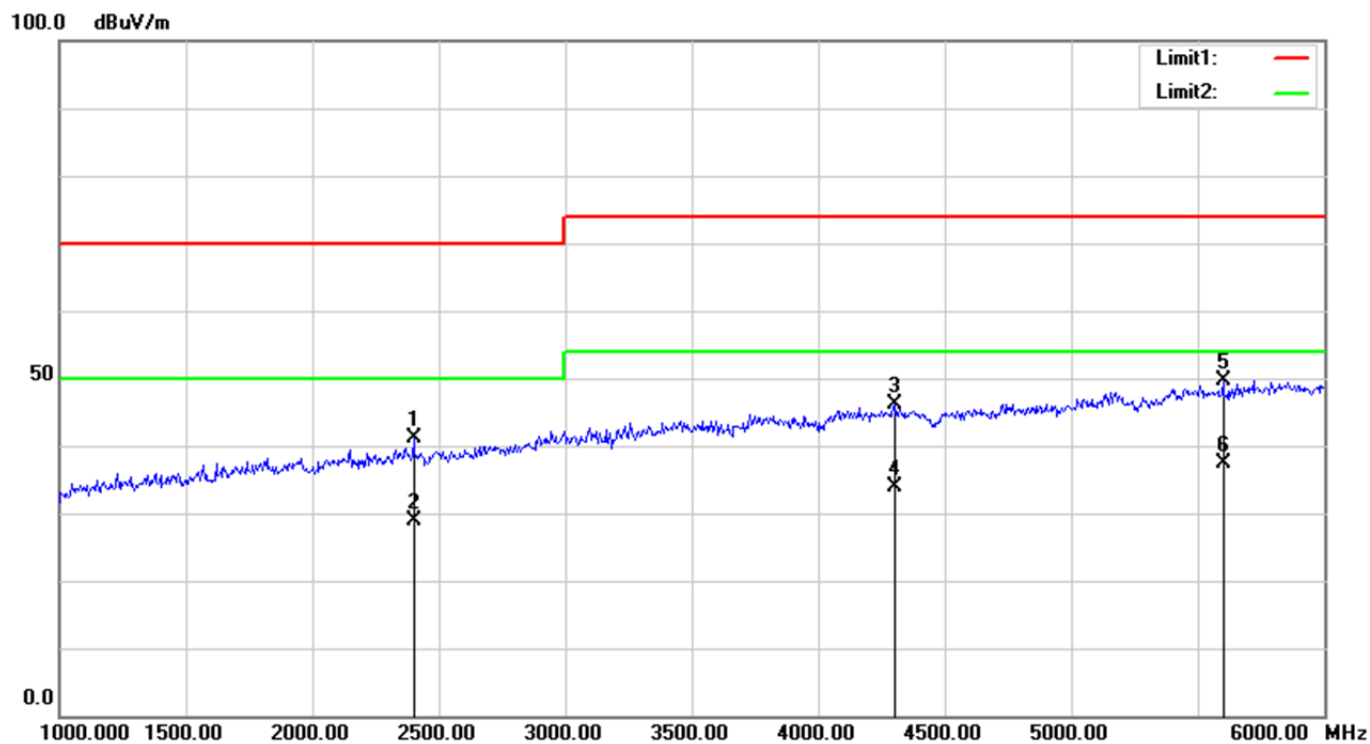
Polarization: Vertical
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	1162.500	61.83	peak	-14.21	47.62	70.00	22.38
2	1162.500	38.85	AVG	-14.21	24.64	50.00	25.36
3	1332.500	57.60	peak	-13.61	43.99	70.00	26.01
4	1332.500	45.26	AVG	-13.61	31.65	50.00	18.35
5	3135.000	50.06	peak	-6.80	43.26	74.00	30.74
6	3135.000	38.41	AVG	-6.80	31.61	54.00	22.39

Condition: EN 301 489 Class B
Test Mode: M3:Operating&Wired Linking&USB flash disk Working
Note: RV1109

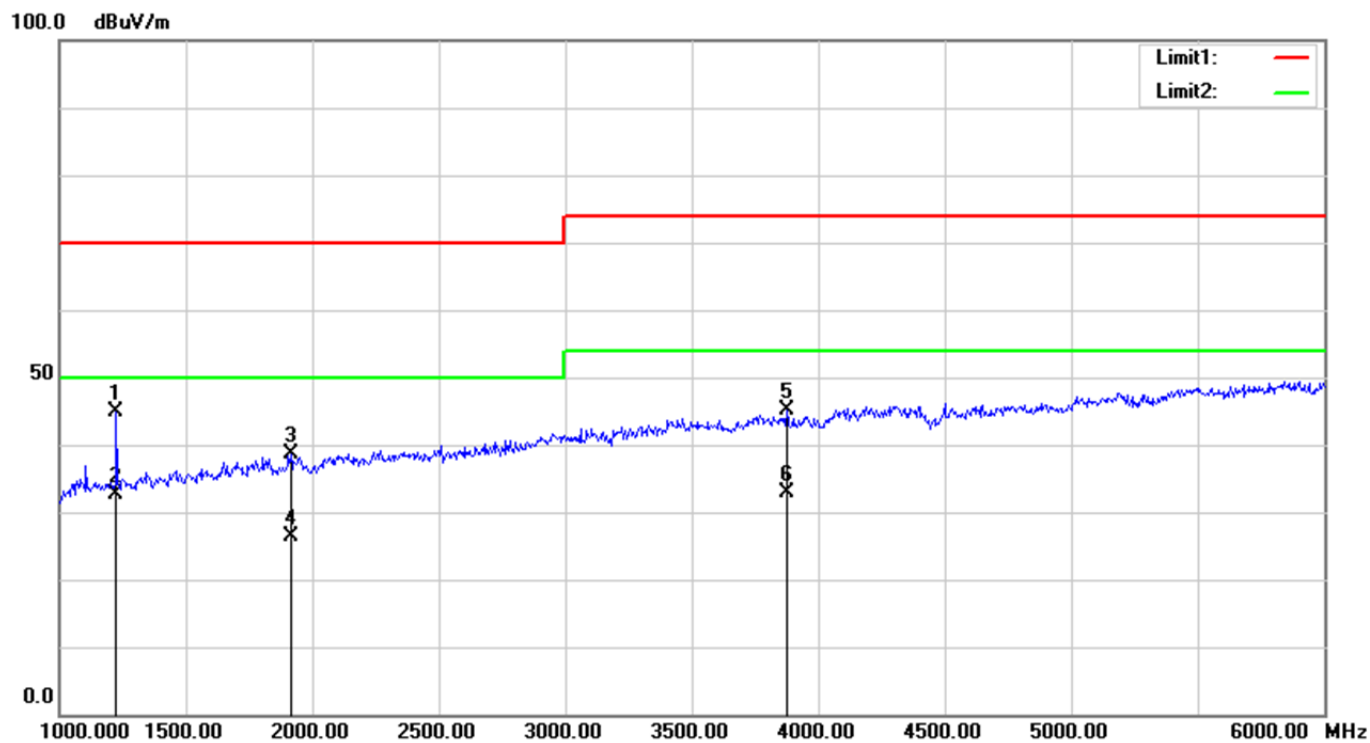
Polarization: Horizontal
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	2402.500	50.74	peak	-9.65	41.09	70.00	28.91
2	2402.500	38.47	AVG	-9.65	28.82	50.00	21.18
3	4305.000	49.79	peak	-3.76	46.03	74.00	27.97
4	4305.000	37.59	AVG	-3.76	33.83	54.00	20.17
5	5600.000	50.78	peak	-1.26	49.52	74.00	24.48
6	5600.000	38.66	AVG	-1.26	37.40	54.00	16.60

Condition: EN 301 489 Class B
Test Mode: M3:Operating&Wired Linking&USB flash disk Working
Note: RV1109

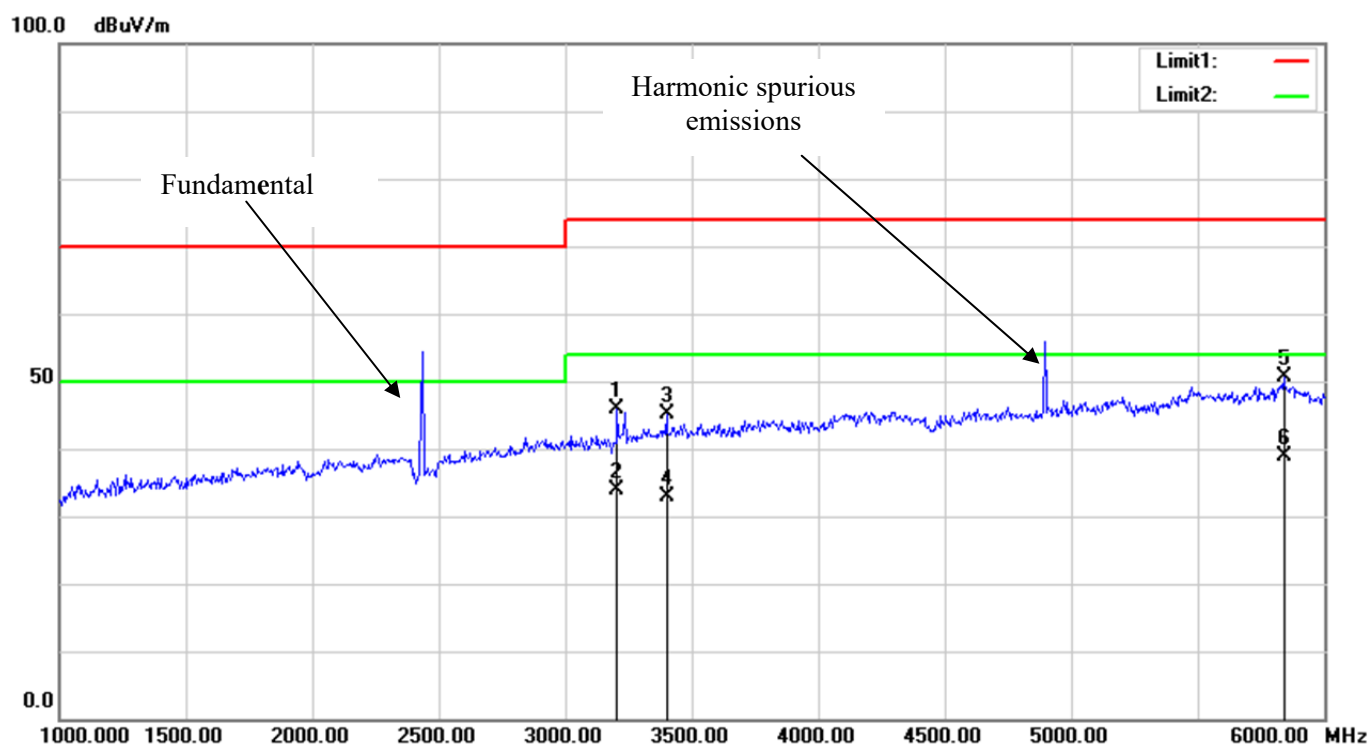
Polarization: Vertical
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	1225.000	58.89	peak	-14.01	44.88	70.00	25.12
2	1225.000	46.55	AVG	-14.01	32.54	50.00	17.46
3	1917.500	49.77	peak	-11.17	38.60	70.00	31.40
4	1917.500	37.64	AVG	-11.17	26.47	50.00	23.53
5	3875.000	49.95	peak	-4.94	45.01	74.00	28.99
6	3875.000	37.83	AVG	-4.94	32.89	54.00	21.11

Condition: EN 301 489 Class B
Test Mode: M1: Operating & Wireless Linking
Note: RV1126

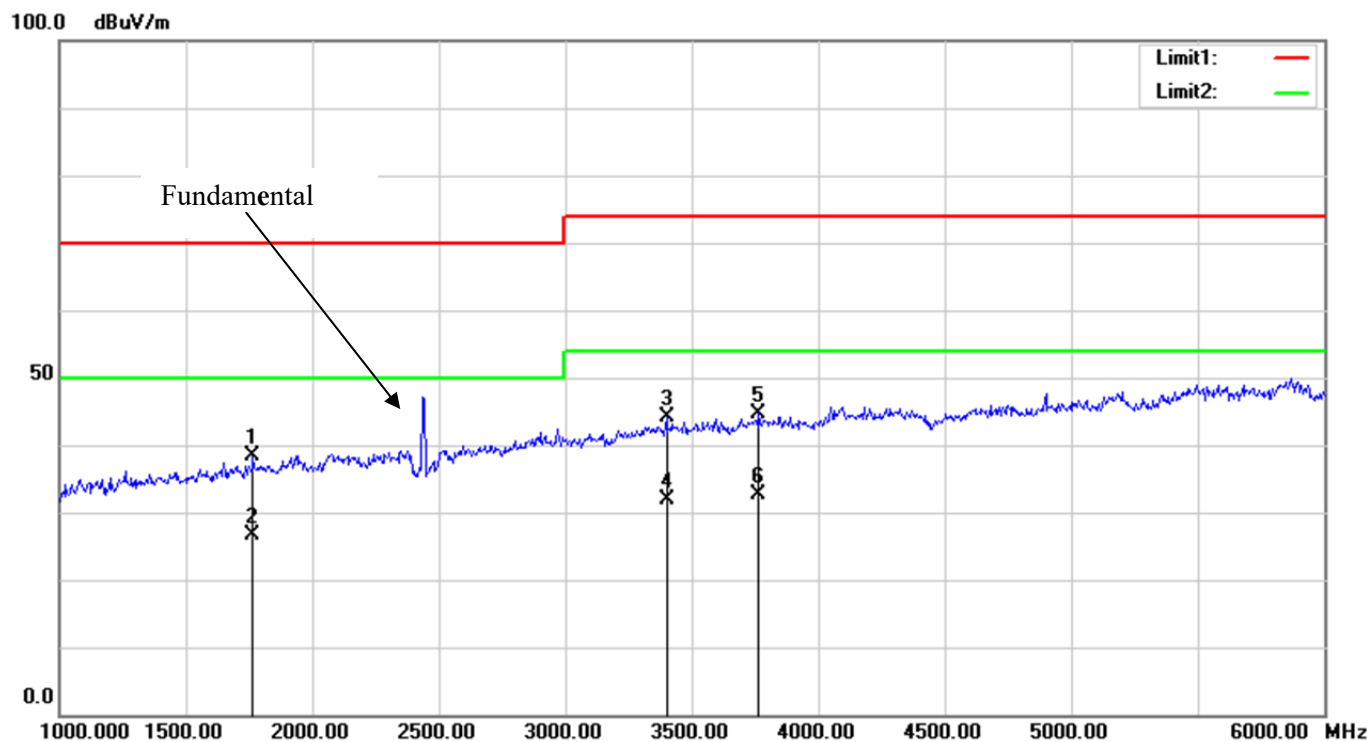
Polarization: Horizontal
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dB μ V)		(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB)
1	3205.000	52.35	peak	-6.58	45.77	74.00	28.23
2	3205.000	40.57	AVG	-6.58	33.99	54.00	20.01
3	3400.000	50.69	peak	-5.63	45.06	74.00	28.94
4	3400.000	38.49	AVG	-5.63	32.86	54.00	21.14
5	5842.500	50.64	peak	0.11	50.75	74.00	23.25
6	5842.500	38.86	AVG	0.11	38.97	54.00	15.03

Condition: EN 301 489 Class B
Test Mode: M1: Operating & Wireless Linking
Note: RV1126

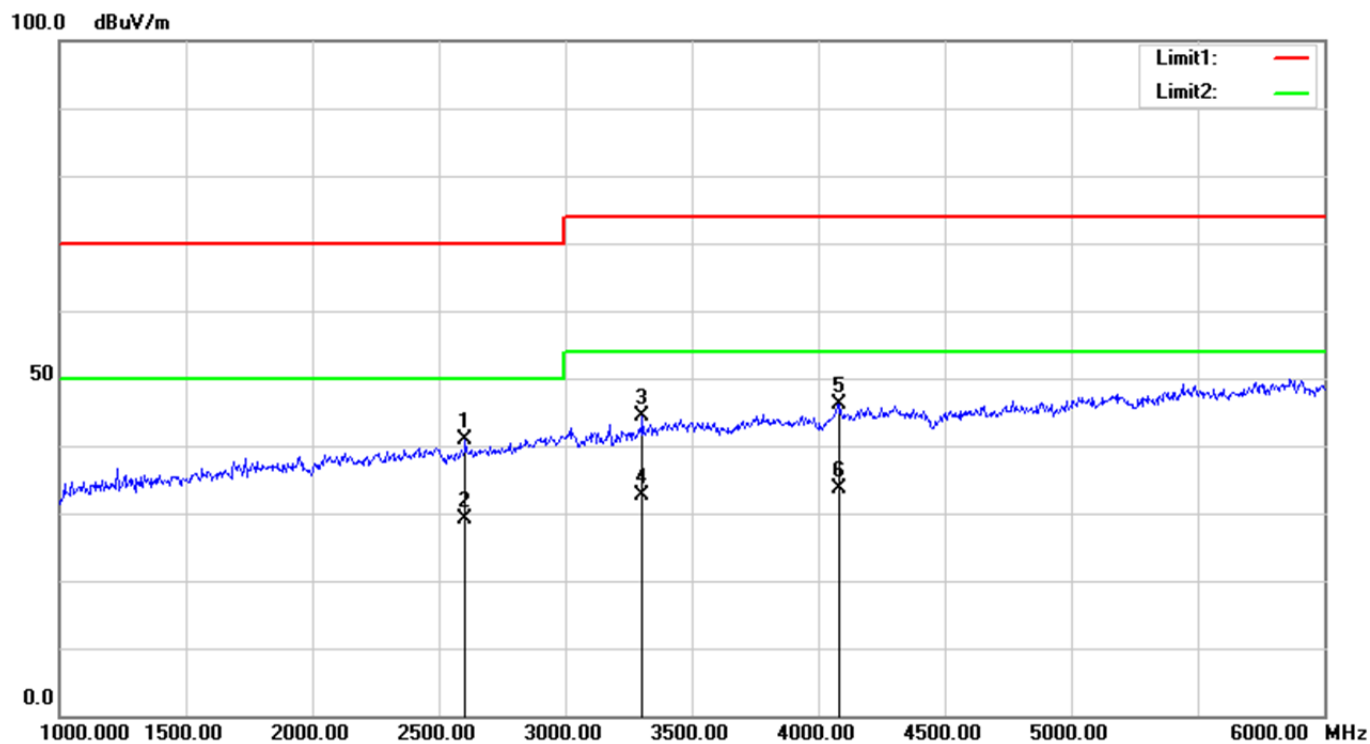
Polarization: Vertical
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	1767.500	50.00	peak	-11.55	38.45	70.00	31.55
2	1767.500	38.25	AVG	-11.55	26.70	50.00	23.30
3	3400.000	49.75	peak	-5.63	44.12	74.00	29.88
4	3400.000	37.48	AVG	-5.63	31.85	54.00	22.15
5	3767.500	49.82	peak	-5.07	44.75	74.00	29.25
6	3767.500	37.63	AVG	-5.07	32.56	54.00	21.44

Condition: EN 301 489 Class B
Test Mode: M2:Operating&Wired Linking&TF Card Working
Note: RV1126

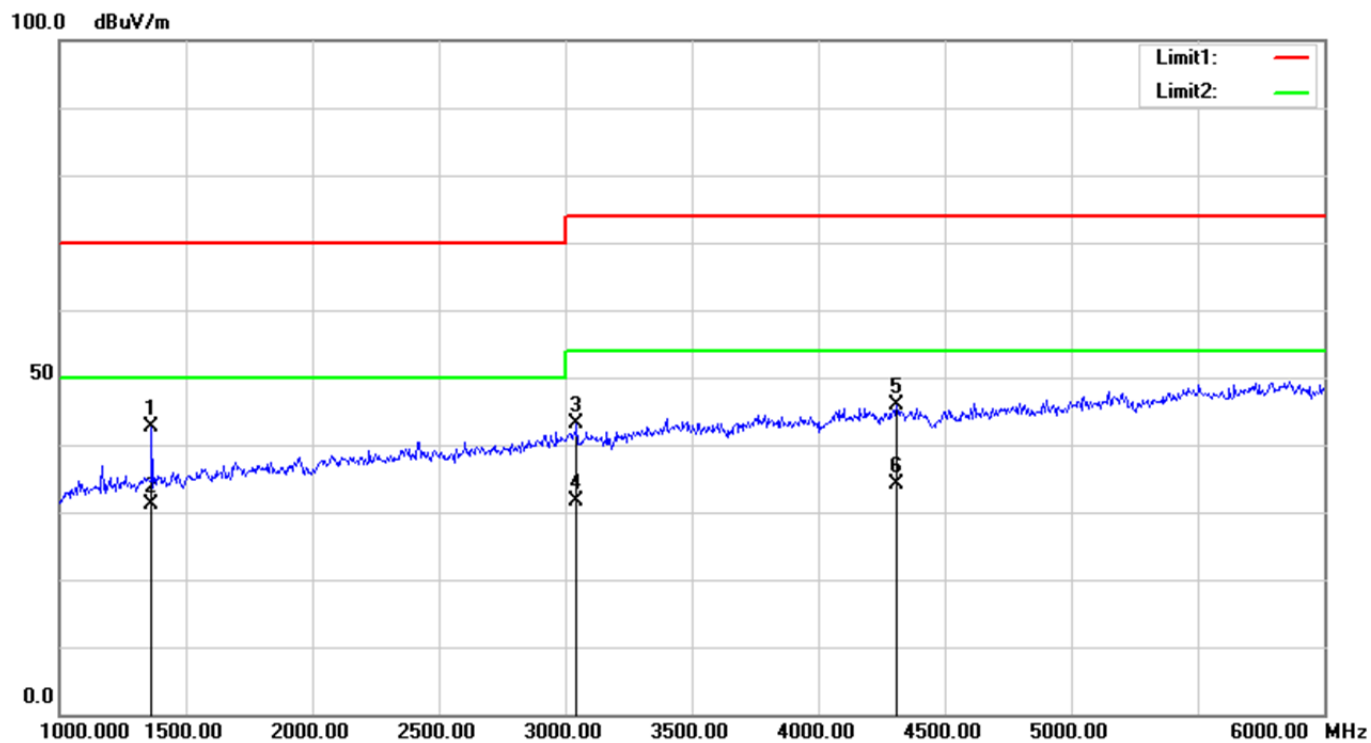
Polarization: Horizontal
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dB μ V)		(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB)
1	2607.500	50.05	peak	-9.28	40.77	70.00	29.23
2	2607.500	38.46	AVG	-9.28	29.18	50.00	20.82
3	3307.500	50.43	peak	-6.14	44.29	74.00	29.71
4	3307.500	38.73	AVG	-6.14	32.59	54.00	21.41
5	4087.500	50.19	peak	-3.98	46.21	74.00	27.79
6	4087.500	37.51	AVG	-3.98	33.53	54.00	20.47

Condition: EN 301 489 Class B
Test Mode: M2:Operating&Wired Linking&TF Card Working
Note: RV1126

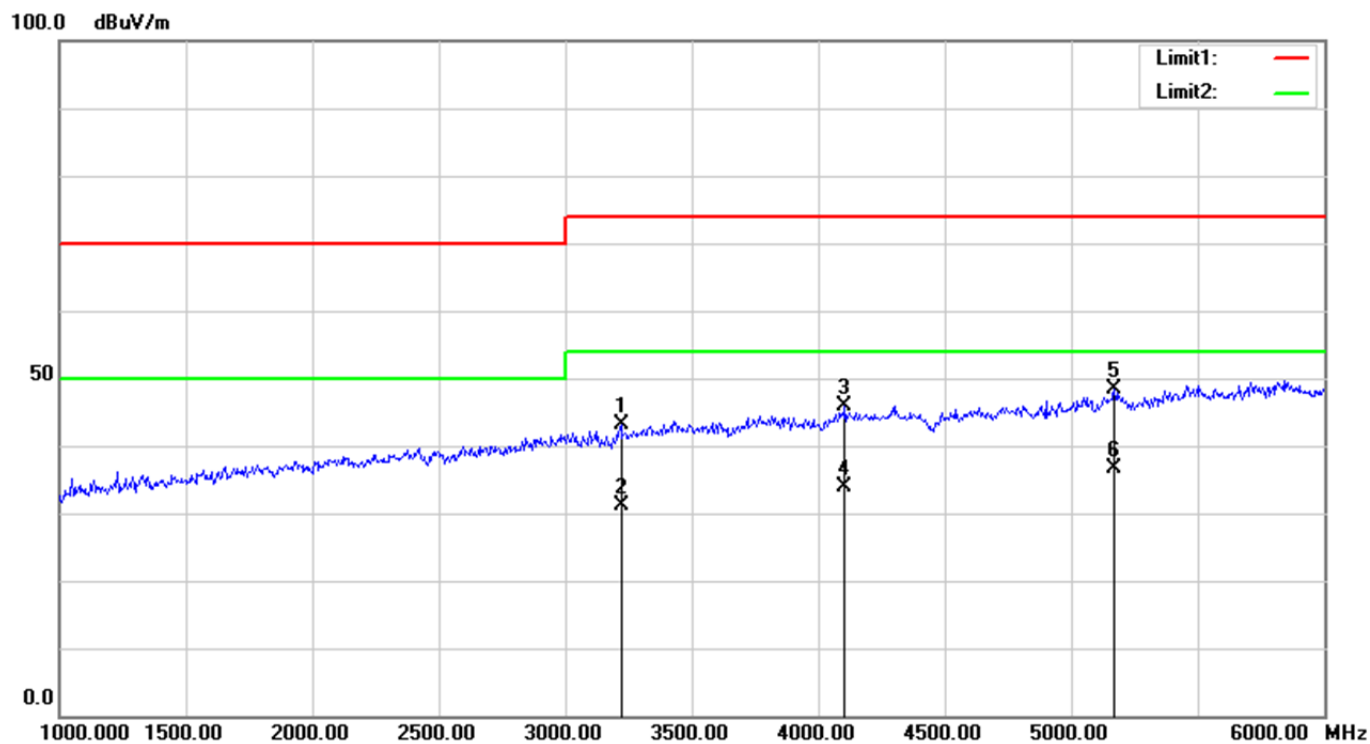
Polarization: Vertical
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	1365.000	56.18	peak	-13.53	42.65	70.00	27.35
2	1365.000	44.74	AVG	-13.53	31.21	50.00	18.79
3	3045.000	50.43	peak	-7.21	43.22	74.00	30.78
4	3045.000	38.82	AVG	-7.21	31.61	54.00	22.39
5	4310.000	49.53	peak	-3.77	45.76	74.00	28.24
6	4310.000	37.94	AVG	-3.77	34.17	54.00	19.83

Condition: EN 301 489 Class B
Test Mode: M3:Operating&Wired Linking&USB flash disk Working
Note: RV1126

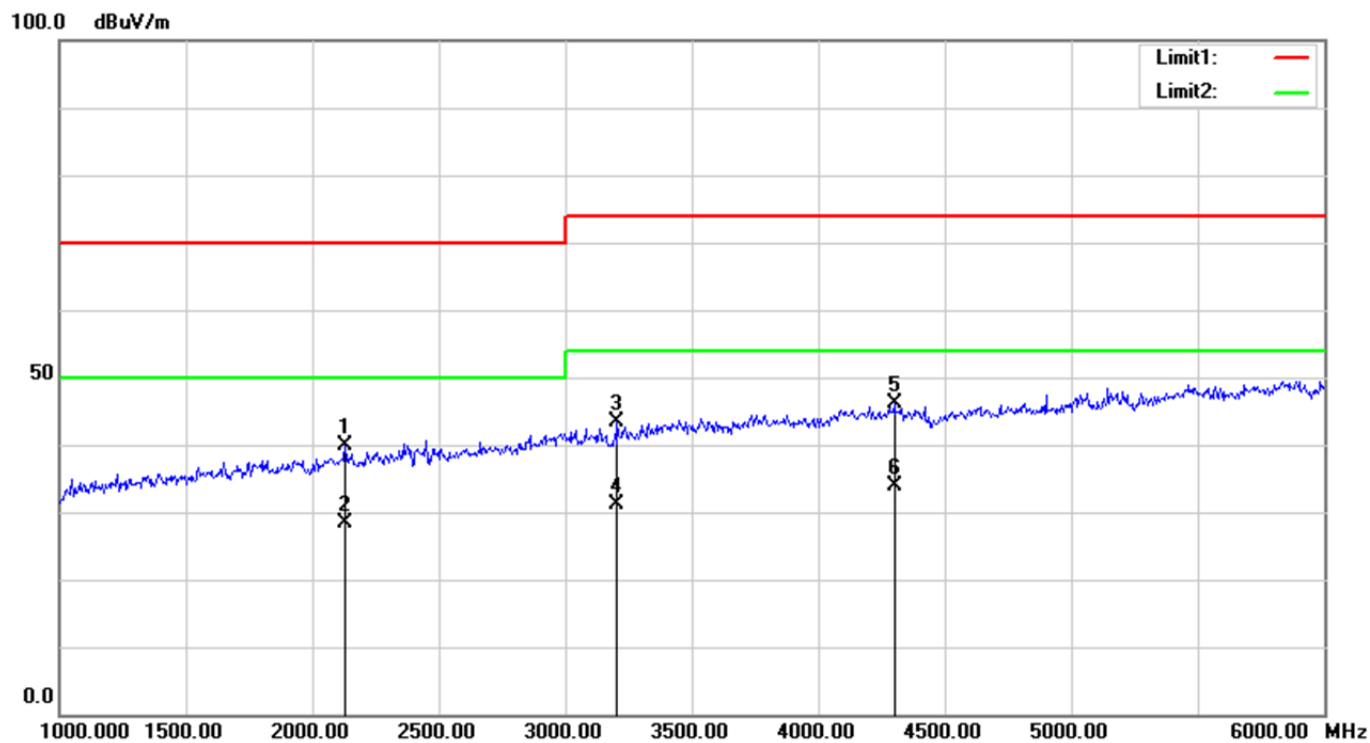
Polarization: Horizontal
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dB μ V)		(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB)
1	3220.000	49.78	peak	-6.58	43.20	74.00	30.80
2	3220.000	37.59	AVG	-6.58	31.01	54.00	22.99
3	4107.500	49.64	peak	-3.88	45.76	74.00	28.24
4	4107.500	37.72	AVG	-3.88	33.84	54.00	20.16
5	5170.000	50.17	peak	-1.73	48.44	74.00	25.56
6	5170.000	38.42	AVG	-1.73	36.69	54.00	17.31

Condition: EN 301 489 Class B
Test Mode: M3:Operating&Wired Linking&USB flash disk Working
Note: RV1126

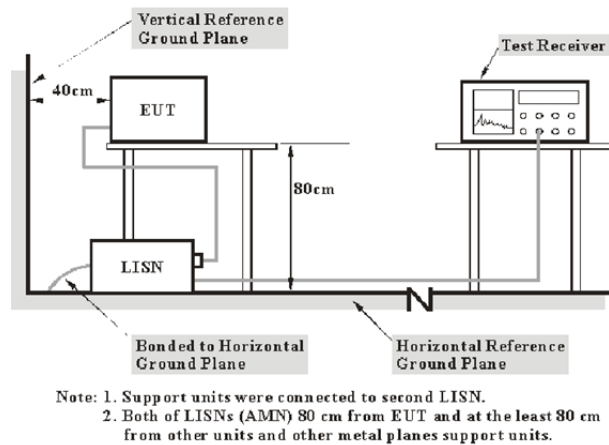
Polarization: Vertical
Distance: 3m



No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBμV)		(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
1	2130.000	50.43	peak	-10.47	39.96	70.00	30.04
2	2130.000	38.77	AVG	-10.47	28.30	50.00	21.70
3	3205.000	49.99	peak	-6.58	43.41	74.00	30.59
4	3205.000	37.68	AVG	-6.58	31.10	54.00	22.90
5	4302.500	49.83	peak	-3.76	46.07	74.00	27.93
6	4302.500	37.54	AVG	-3.76	33.78	54.00	20.22

3 - AC MAINS POWER INPUT/OUTPUT PORTS

Test System Setup



The setup of EUT is according with per EN 301 489-1 measurement procedures. The specification used was with the EN 301 489-1 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

The adapter was connected to AC230V/50Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz - 30 MHz	9 kHz

Test Procedure

During the conducted emissions test, the adapter was connected to the main outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Amplitude & Margin Calculation

The basic equation is as follows: Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:

Corr. = Cable loss + Factor of coupling device

The “Margin” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows: Margin = Limit -Result

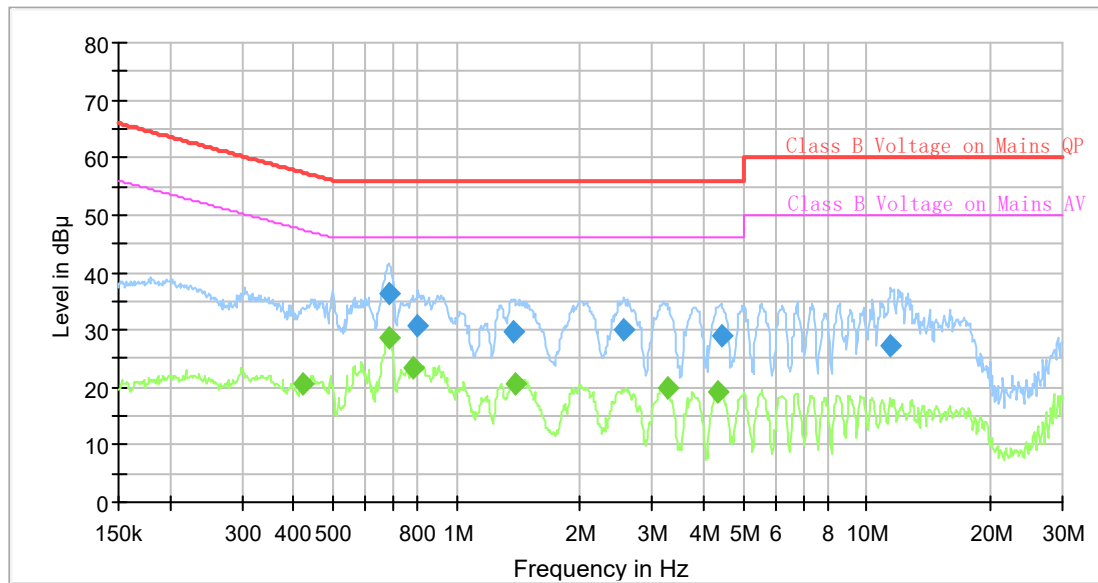
Test Data

Please refer to following table and plots:

RV1109

Port: L
Test Mode: M1: Operating & Wireless Linking

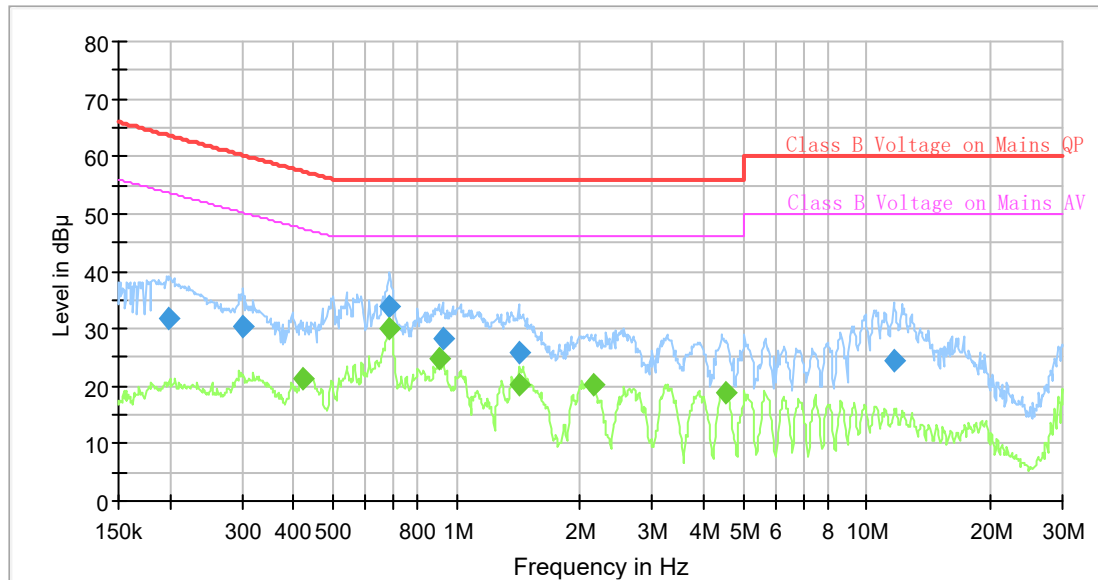
Power Source: AC 230V/50Hz
Note:



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.421178	---	20.77	47.42	26.65	9.000	L1	9.6
0.683241	36.36	---	56.00	19.64	9.000	L1	9.6
0.686657	---	28.78	46.00	17.22	9.000	L1	9.6
0.781732	---	23.43	46.00	22.57	9.000	L1	9.7
0.805479	30.79	---	56.00	25.21	9.000	L1	9.7
1.373481	29.60	---	56.00	26.40	9.000	L1	9.7
1.387250	---	20.73	46.00	25.27	9.000	L1	9.7
2.562008	30.06	---	56.00	25.94	9.000	L1	9.7
3.255003	---	19.83	46.00	26.17	9.000	L1	9.7
4.346933	---	19.14	46.00	26.86	9.000	L1	9.7
4.412464	28.94	---	56.00	27.06	9.000	L1	9.7
11.439286	27.20	---	60.00	32.80	9.000	L1	10.0

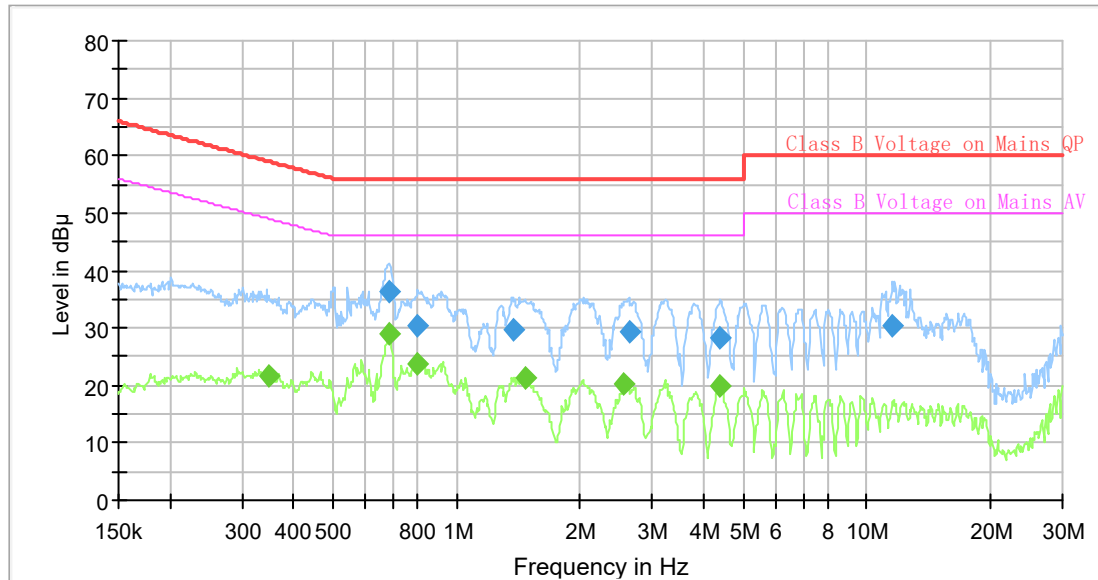
Port: N
Test Mode: M1: Operating & Wireless Linking
Power Source: AC 230V/50Hz
Note:



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.199323	31.68	---	63.64	31.96	9.000	N	9.6
0.301537	30.34	---	60.20	29.86	9.000	N	9.6
0.421178	---	21.32	47.42	26.10	9.000	N	9.6
0.686657	---	29.89	46.00	16.11	9.000	N	9.6
0.686657	33.72	---	56.00	22.28	9.000	N	9.6
0.903386	---	24.63	46.00	21.37	9.000	N	9.6
0.926198	28.41	---	56.00	27.59	9.000	N	9.6
1.415204	---	20.38	46.00	25.62	9.000	N	9.6
1.415204	25.68	---	56.00	30.32	9.000	N	9.6
2.151633	---	20.33	46.00	25.67	9.000	N	9.6
4.523884	---	18.81	46.00	27.19	9.000	N	9.6
11.611735	24.58	---	60.00	35.42	9.000	N	9.8

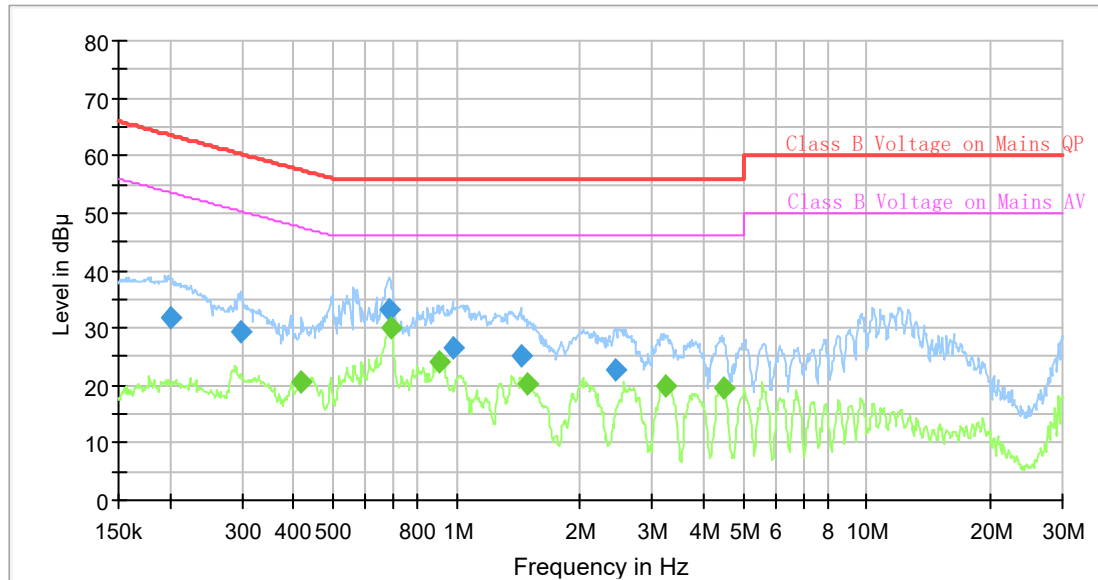
Port: L
 Test Mode: M2: Operating Wired Linking&TF Card Working
 Power Source: AC 230V/50Hz
 Note:



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.350205	---	21.80	48.96	27.16	9.000	L1	9.6
0.683241	---	28.84	46.00	17.16	9.000	L1	9.6
0.686657	36.36	---	56.00	19.64	9.000	L1	9.6
0.805479	---	23.66	46.00	22.34	9.000	L1	9.7
0.805479	30.39	---	56.00	25.61	9.000	L1	9.7
1.373481	29.76	---	56.00	26.24	9.000	L1	9.7
1.472813	---	21.22	46.00	24.78	9.000	L1	9.7
2.562008	---	20.18	46.00	25.82	9.000	L1	9.7
2.639835	29.32	---	56.00	26.68	9.000	L1	9.7
4.368668	---	19.93	46.00	26.07	9.000	L1	9.7
4.390511	28.35	---	56.00	27.65	9.000	L1	9.7
11.553965	30.52	---	60.00	29.48	9.000	L1	10.0

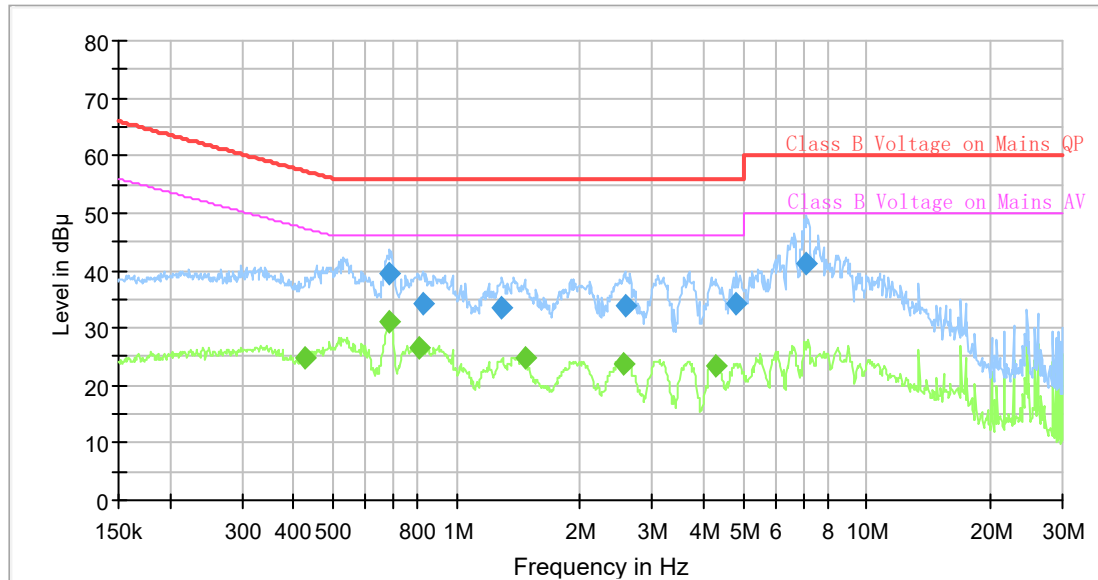
Port: N
 Test Mode: M2: Operating Wired Linking&TF Card Working
 Power Source: AC 230V/50Hz
 Note:



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.200319	31.95	---	63.60	31.65	9.000	N	9.6
0.298544	29.30	---	60.28	30.98	9.000	N	9.6
0.416998	---	20.63	47.51	26.88	9.000	N	9.6
0.683241	33.36	---	56.00	22.64	9.000	N	9.6
0.690091	---	29.92	46.00	16.08	9.000	N	9.6
0.903386	---	24.12	46.00	21.88	9.000	N	9.6
0.978432	26.50	---	56.00	29.50	9.000	N	9.6
1.436538	25.00	---	56.00	31.00	9.000	N	9.6
1.480177	---	20.38	46.00	25.62	9.000	N	9.6
2.437361	22.81	---	56.00	33.19	9.000	N	9.6
3.222695	---	19.80	46.00	26.20	9.000	N	9.6
4.478982	---	19.42	46.00	26.58	9.000	N	9.6

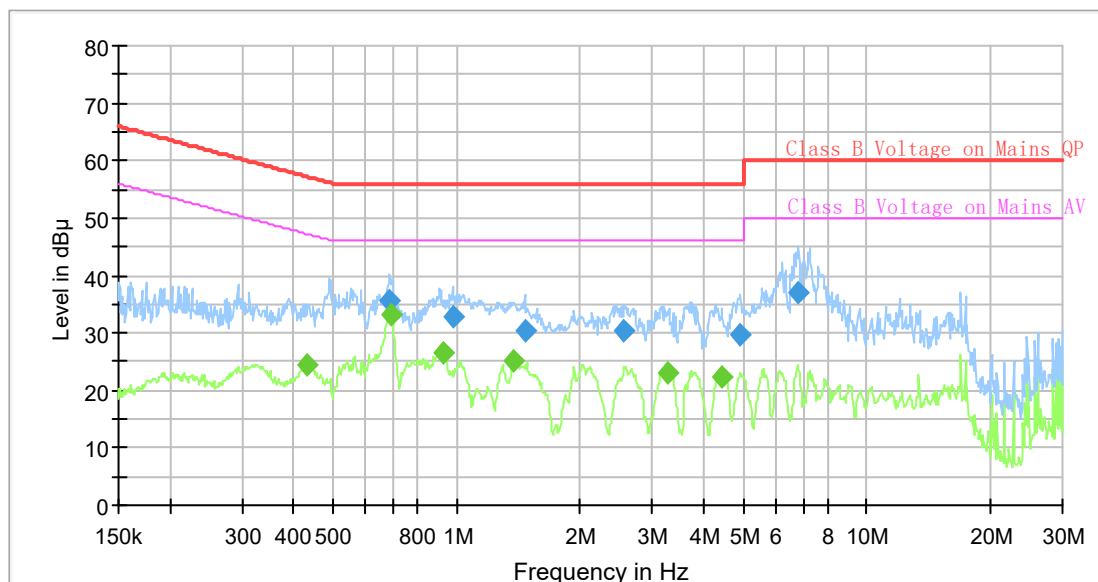
Port: L
 Test Mode: M3: Operating & USB flash disk Working
 Power Source: AC 230V/50Hz
 Note:



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.427528	---	24.65	47.30	22.65	9.000	L1	9.6
0.686657	---	31.15	46.00	14.85	9.000	L1	9.6
0.686657	39.46	---	56.00	16.54	9.000	L1	9.6
0.809506	---	26.47	46.00	19.53	9.000	L1	9.7
0.829947	34.31	---	56.00	21.69	9.000	L1	9.7
1.287253	33.62	---	56.00	22.38	9.000	L1	9.7
1.465485	---	24.80	46.00	21.20	9.000	L1	9.7
2.562008	---	23.79	46.00	22.21	9.000	L1	9.7
2.574818	34.06	---	56.00	21.94	9.000	L1	9.7
4.282376	---	23.42	46.00	22.58	9.000	L1	9.7
4.802907	34.23	---	56.00	21.77	9.000	L1	9.7
7.122346	41.38	---	60.00	18.62	9.000	L1	9.8

Port: N
Test Mode: M3: Operating & USB flash disk Working
Power Source: AC 230V/50Hz
Note:



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.429665	---	24.42	47.26	22.84	9.000	N	9.6
0.686657	35.77	---	56.00	20.23	9.000	N	9.6
0.693541	---	33.24	46.00	12.76	9.000	N	9.6
0.926198	---	26.72	46.00	19.28	9.000	N	9.6
0.978432	32.79	---	56.00	23.21	9.000	N	9.6
1.380348	---	25.15	46.00	20.85	9.000	N	9.6
1.465485	30.37	---	56.00	25.63	9.000	N	9.6
2.562008	30.51	---	56.00	25.49	9.000	N	9.6
3.255003	---	23.19	46.00	22.81	9.000	N	9.6
4.456698	---	22.40	46.00	23.60	9.000	N	9.6
4.924186	29.63	---	56.00	26.37	9.000	N	9.6
6.809708	37.06	---	60.00	22.94	9.000	N	9.6

RV1126

Port:

L

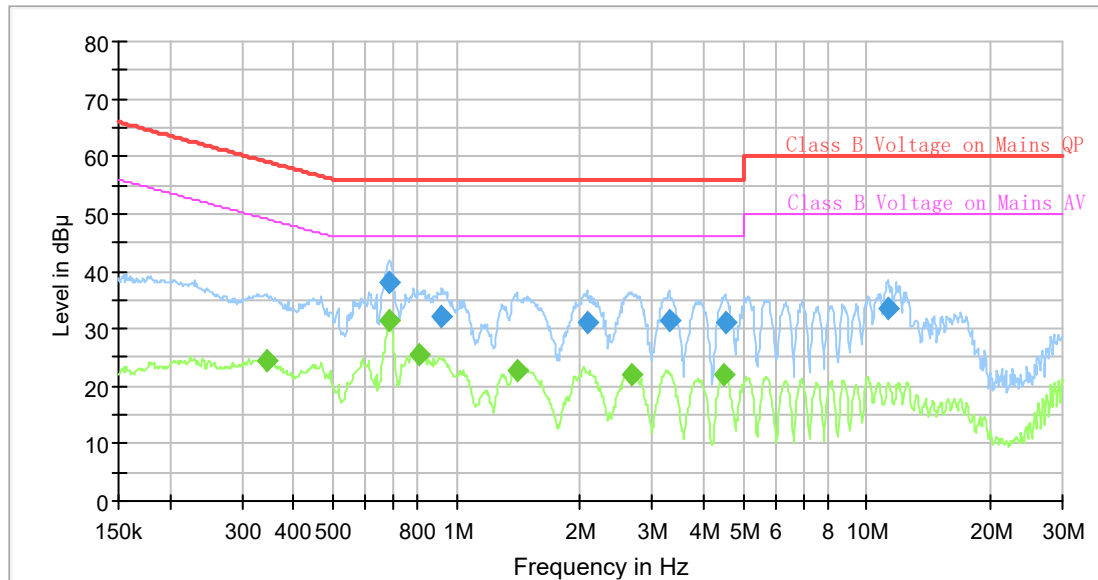
Test Mode:

M1: Operating & Wireless Linking

Power Source:

AC 230V/50Hz

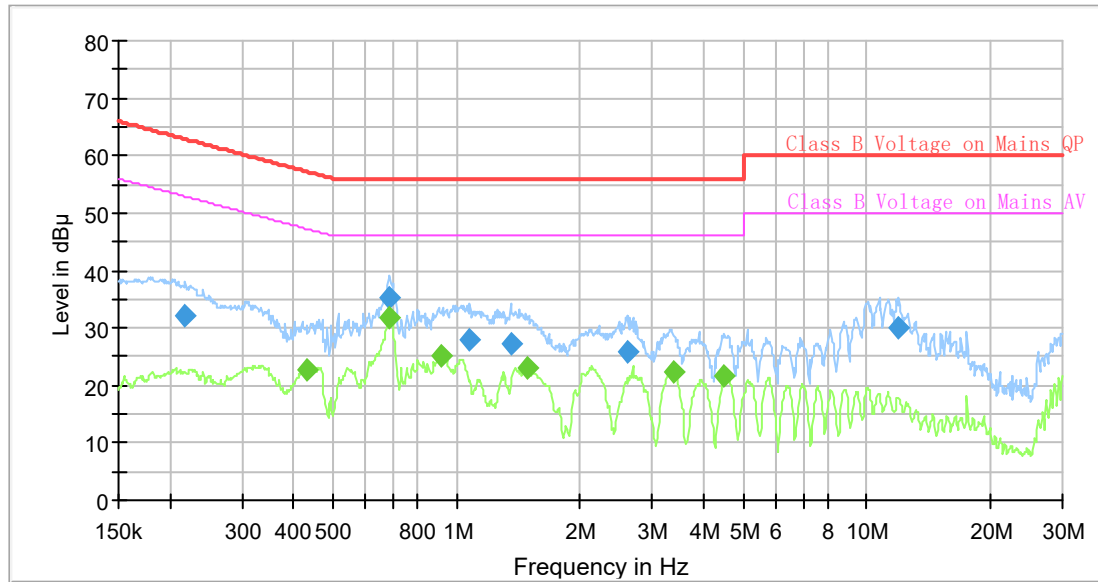
Note:



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.343287	---	24.43	49.12	24.69	9.000	L1	9.6
0.683241	37.97	---	56.00	18.03	9.000	L1	9.6
0.686657	---	31.32	46.00	14.68	9.000	L1	9.6
0.809506	---	25.37	46.00	20.63	9.000	L1	9.7
0.921590	32.21	---	56.00	23.79	9.000	L1	9.7
1.401157	---	22.72	46.00	23.28	9.000	L1	9.7
2.077810	31.00	---	56.00	25.00	9.000	L1	9.7
2.679631	---	22.18	46.00	23.82	9.000	L1	9.7
3.304072	31.33	---	56.00	24.67	9.000	L1	9.7
4.501377	---	22.05	46.00	23.95	9.000	L1	9.7
4.523884	30.96	---	56.00	25.04	9.000	L1	9.7
11.269399	33.37	---	60.00	26.63	9.000	L1	10.0

Port: N
 Test Mode: M1: Operating & Wireless Linking
 Power Source: AC 230V/50Hz
 Note:

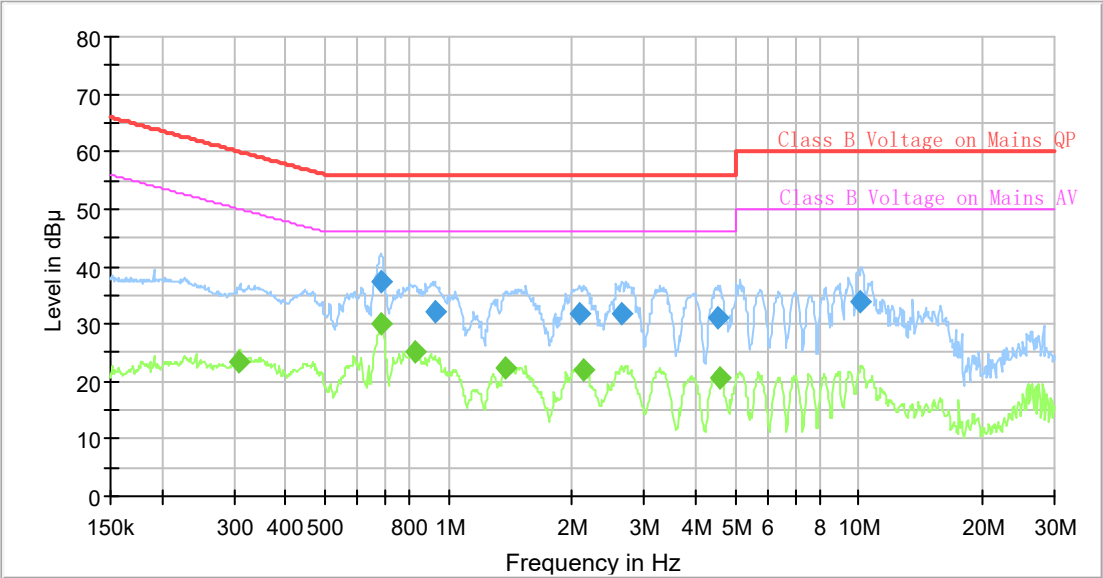


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.218045	32.02	---	62.89	30.87	9.000	N	9.6
0.431814	---	22.77	47.22	24.45	9.000	N	9.6
0.686657	---	31.87	46.00	14.13	9.000	N	9.6
0.686657	35.18	---	56.00	20.82	9.000	N	9.6
0.912443	---	25.25	46.00	20.75	9.000	N	9.6
1.075686	27.92	---	56.00	28.08	9.000	N	9.6
1.353083	27.37	---	56.00	28.63	9.000	N	9.6
1.487578	---	23.00	46.00	23.00	9.000	N	9.6
2.613633	25.80	---	56.00	30.20	9.000	N	9.6
3.387504	---	22.38	46.00	23.62	9.000	N	9.6
4.501377	---	21.63	46.00	24.37	9.000	N	9.6
11.964470	29.87	---	60.00	30.13	9.000	N	9.8

Port:
Test Mode:
Power Source:
Note:

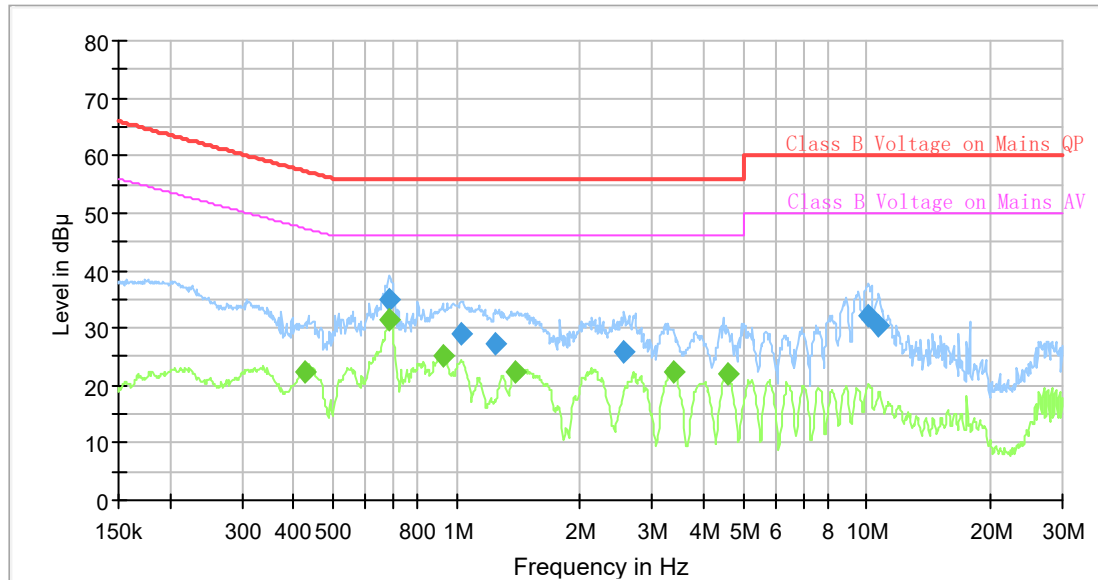
L
M2:Operating&Wired Linking&TF Card Working
AC 230V/50Hz



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.309151	---	23.34	49.99	26.65	9.000	L1	9.6
0.683241	---	30.08	46.00	15.92	9.000	L1	9.6
0.683241	37.53	---	56.00	18.47	9.000	L1	9.6
0.829947	---	24.98	46.00	21.02	9.000	L1	9.7
0.926198	32.06	---	56.00	23.94	9.000	L1	9.7
1.380348	---	22.29	46.00	23.71	9.000	L1	9.7
2.077810	31.82	---	56.00	24.18	9.000	L1	9.7
2.140929	---	21.93	46.00	24.07	9.000	L1	9.7
2.653034	31.79	---	56.00	24.21	9.000	L1	9.7
4.546503	31.15	---	56.00	24.85	9.000	L1	9.7
4.569236	---	20.45	46.00	25.55	9.000	L1	9.7
10.098279	33.97	---	60.00	26.03	9.000	L1	9.9

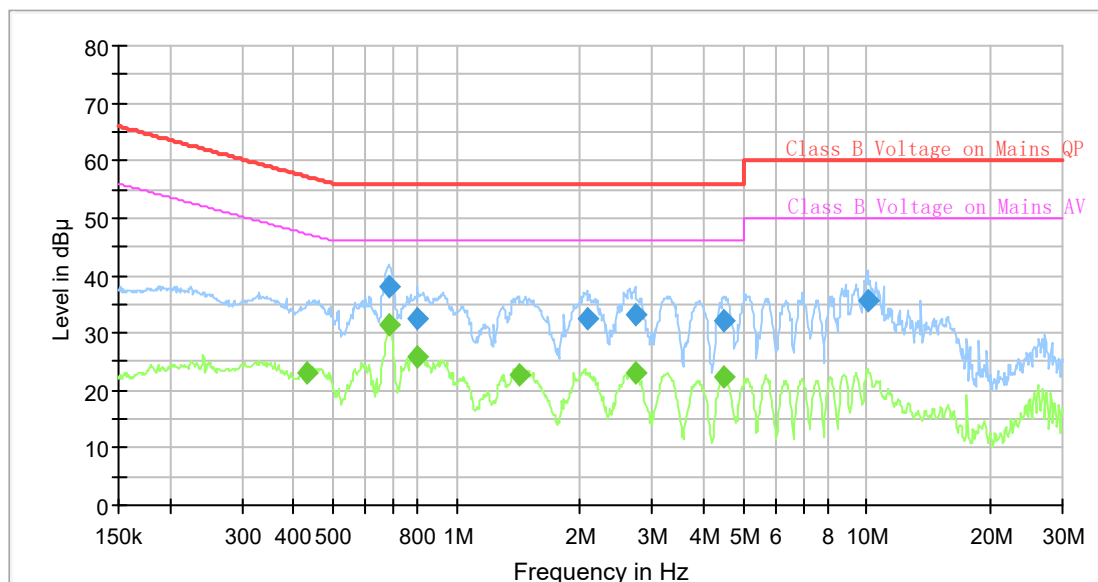
Port: N
 Test Mode: M2:Operating&Wired Linking&TF Card Working
 Power Source: AC 230V/50Hz
 Note:



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.427528	---	22.38	47.30	24.92	9.000	N	9.6
0.683241	---	31.28	46.00	14.72	9.000	N	9.6
0.686657	34.77	---	56.00	21.23	9.000	N	9.6
0.930829	---	25.13	46.00	20.87	9.000	N	9.6
1.023352	28.94	---	56.00	27.06	9.000	N	9.6
1.249302	27.20	---	56.00	28.80	9.000	N	9.6
1.387250	---	22.37	46.00	23.63	9.000	N	9.6
2.562008	25.95	---	56.00	30.05	9.000	N	9.6
3.370651	---	22.29	46.00	23.71	9.000	N	9.6
4.592082	---	22.13	46.00	23.87	9.000	N	9.6
10.098279	32.26	---	60.00	27.74	9.000	N	9.7
10.667780	30.56	---	60.00	29.44	9.000	N	9.7

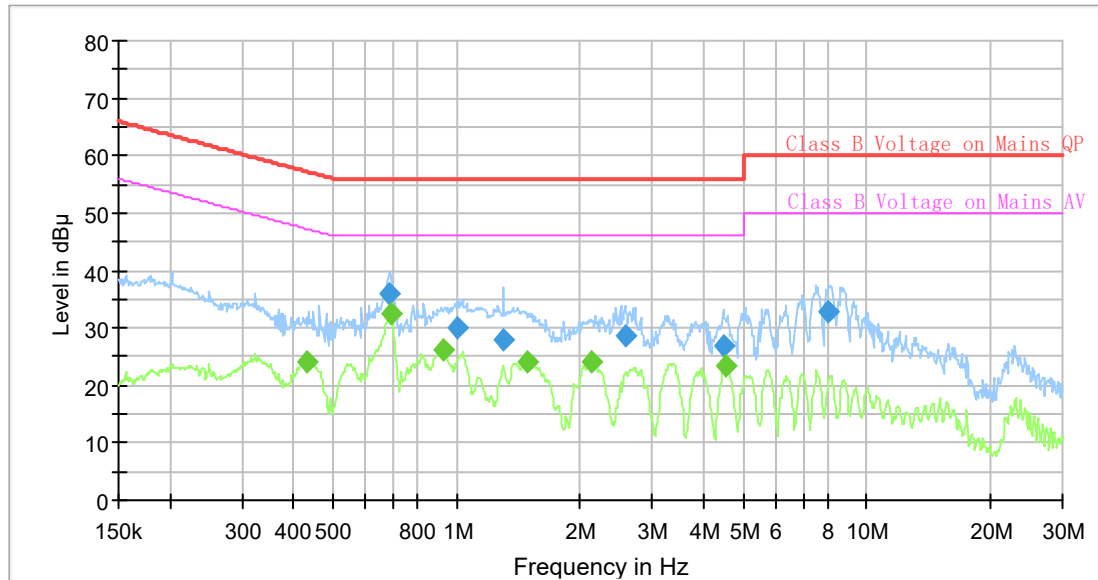
Port: L
Test Mode: M3:Operating&Wired Linking&USB flash disk Working
Power Source: AC 230V/50Hz
Note:



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.431814	---	22.99	47.22	24.23	9.000	L1	9.6
0.683241	38.09	---	56.00	17.91	9.000	L1	9.6
0.686657	---	31.33	46.00	14.67	9.000	L1	9.6
0.801471	32.37	---	56.00	23.63	9.000	L1	9.7
0.805479	---	26.02	46.00	19.98	9.000	L1	9.7
1.415204	---	22.85	46.00	23.15	9.000	L1	9.7
2.077810	32.34	---	56.00	23.66	9.000	L1	9.7
2.720027	33.36	---	56.00	22.64	9.000	L1	9.7
2.720027	---	23.17	46.00	22.83	9.000	L1	9.7
4.478982	32.20	---	56.00	23.80	9.000	L1	9.7
4.478982	---	22.50	46.00	23.50	9.000	L1	9.7
10.048039	35.59	---	60.00	24.41	9.000	L1	9.9

Port: N
 Test Mode: M3:Operating&Wired Linking&USB flash disk Working
 Power Source: AC 230V/50Hz
 Note:

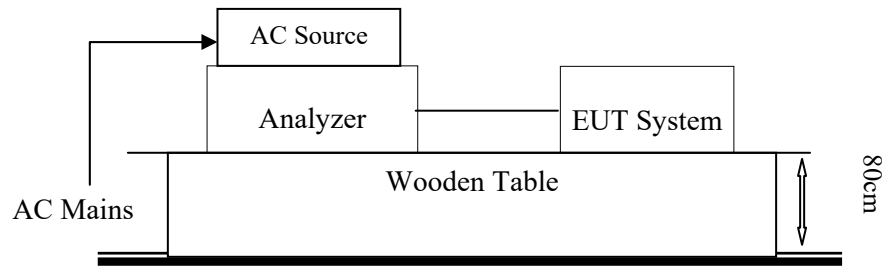


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.431814	---	24.16	47.22	23.06	9.000	N	9.6
0.686657	35.98	---	56.00	20.02	9.000	N	9.6
0.690091	---	32.65	46.00	13.35	9.000	N	9.6
0.926198	---	26.34	46.00	19.66	9.000	N	9.6
1.008154	29.95	---	56.00	26.05	9.000	N	9.6
1.300158	27.96	---	56.00	28.04	9.000	N	9.6
1.487578	---	24.03	46.00	21.97	9.000	N	9.6
2.140929	---	23.95	46.00	22.05	9.000	N	9.6
2.574818	28.52	---	56.00	27.48	9.000	N	9.6
4.478982	26.77	---	56.00	29.23	9.000	N	9.6
4.546503	---	23.47	46.00	22.53	9.000	N	9.6
8.068162	32.97	---	60.00	27.03	9.000	N	9.7

5 - VOLTAGE FLUCTUATIONS AND FLICKER (AC MAINS INPUT PORT)

Test System Setup



Test Standard

EN 61000-3-3:2013+A1:2019+A2:2021

Flicker Test Limits:

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, measured or calculated according to clause 4 under test conditions described in clause 6 and annex A. Tests made to prove compliance with the limits are considered to be type tests.

The following limits apply:

- the value of Pst shall not be greater than 1,0;
- the value of Plt shall not be greater than 0,65;
- the value of d(t) during a voltage change shall not exceed 3,3 % for more than 500 ms;
- the relative steady-state voltage change, dc, shall not exceed 3,3 %;
- the maximum relative voltage change dmax, shall not exceed
 - a) 4 % without additional conditions;
 - b) 6 % for equipment which is:
 - switched manually, or
 - switched automatically more frequently than twice per day, and also has either adelayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

Note: The cycling frequency will be further limited by the Pst and Plt limit. For example: a dmax of 6 % producing a rectangular voltage change characteristic twice per hour will give a Plt of about 0,65.

- c) 7 % for equipment which is
 - attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
 - switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

In the case of equipment having several separately controlled circuits in accordance with 6.6, limits b) and c) shall apply only if there is delayed or manual restart after a power supply interruption; for all equipment with automatic switching which is energized immediately on restoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply depending on the rate of switching. Pst and Plt requirements shall not be applied to voltage changes caused by manual switching. The limits shall not be applied to voltage changes associated with emergency switching or emergency interruptions.

Test Data*Please refer to following tables:*

RV1109

Short time (Pst): 10 min
 Observation time: 120 min (12 Flicker measurement)
 Test Mode: M1: Operating & Wireless Linking
 M2: Operating Wired Linking&TF Card Working
 M3: Operating & USB flash disk Working
 Power Source: AC 230V/50Hz
 Test Result: PASS

Maximum Flicker results (M1)

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.012	3.30	PASS
dmax [%]	0.253	4.00	PASS
dt [s]	0.000	0.50	PASS

Maximum Flicker results (M2)

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.016	3.30	PASS
dmax [%]	0.224	4.00	PASS
dt [s]	0.000	0.50	PASS

Maximum Flicker results (M3)

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.015	3.30	PASS
dmax [%]	0.213	4.00	PASS
dt [s]	0.000	0.50	PASS

RV1126

Short time (Pst): 10 min
Observation time: 120 min (12 Flicker measurement)
Test Mode: M1: Operating & Wireless Linking
M2: Operating & TF Card Working
M3: Operating & USB flash disk Working

Power Source: AC 230V/50Hz

Test Result PASS

Maximum Flicker results (M1)

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.013	3.30	PASS
dmax [%]	0.221	4.00	PASS
dt [s]	0.000	0.50	PASS

Maximum Flicker results (M2)

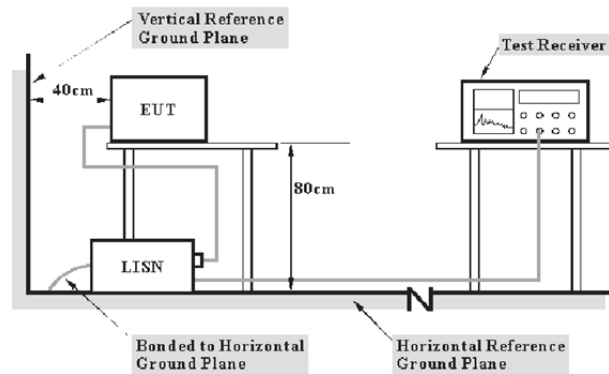
	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.015	3.30	PASS
dmax [%]	0.236	4.00	PASS
dt [s]	0.000	0.50	PASS

Maximum Flicker results (M3)

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.015	3.30	PASS
dmax [%]	0.241	4.00	PASS
dt [s]	0.000	0.50	PASS

6 - WIRED NETWORK PORTS

Test System Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 30 cm from other units and other metal planes support units.

The setup of EUT is according with per EN 301 489-1 measurement procedures. The specification used was with the EN 301 489-1 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30MHz

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz - 30 MHz	9 kHz

Test Procedure

During the conducted emissions test, the adapter was connected to the main outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Amplitude & Margin Calculation

The basic equation is as follows: Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:

Corr. = Cable loss + Factor of coupling device

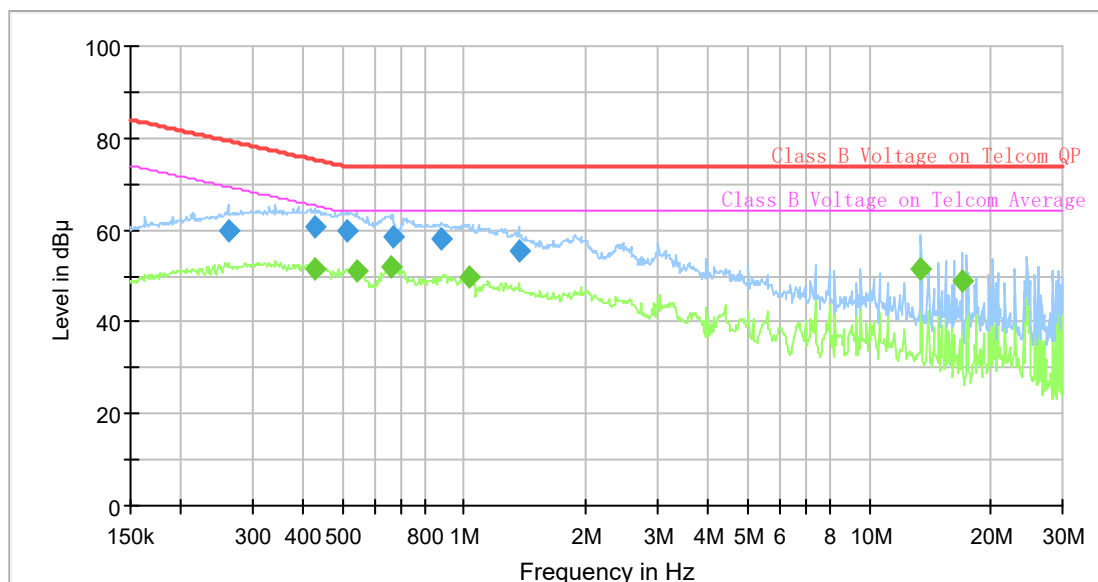
The “Margin” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows: Margin = Limit -Result

Test Data

Please refer to following table and plots:

RV1109

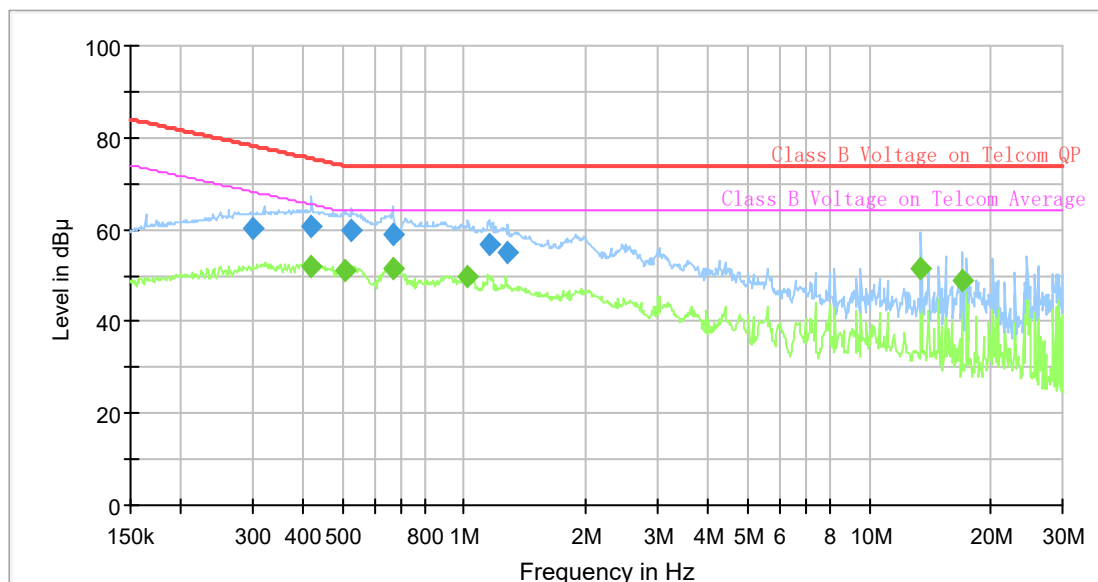
Port: RJ45
 Test Mode: 10Mbps
 Power Source: AC 230V/50Hz
 Note: M2: Operating Wired Linking&TF Card Working



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.260930	59.65	---	79.40	19.75	9.000	Signal	9.9
0.429665	---	51.60	65.26	13.66	9.000	Signal	9.8
0.429665	60.74	---	75.26	14.52	9.000	Signal	9.8
0.511614	59.88	---	74.00	14.12	9.000	Signal	9.8
0.543169	---	51.30	64.00	12.70	9.000	Signal	9.8
0.663098	---	51.76	64.00	12.24	9.000	Signal	9.7
0.666413	58.33	---	74.00	15.67	9.000	Signal	9.7
0.881136	57.88	---	74.00	16.12	9.000	Signal	9.7
1.023352	---	49.57	64.00	14.43	9.000	Signal	9.7
1.366648	55.34	---	74.00	18.66	9.000	Signal	9.7
13.418776	---	51.48	64.00	12.52	9.000	Signal	9.6
16.963591	---	48.85	64.00	15.15	9.000	Signal	9.6

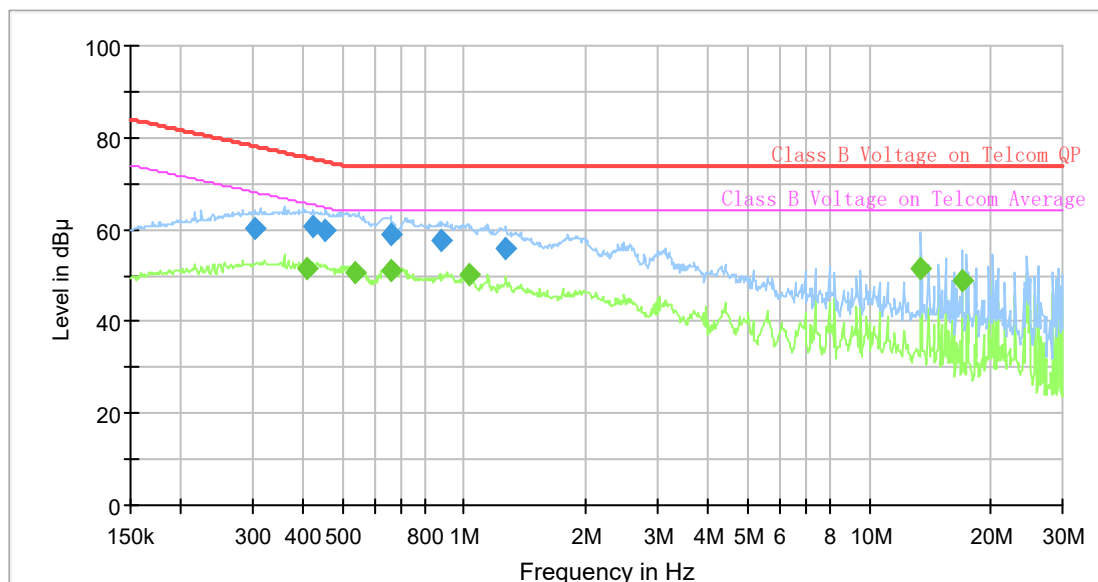
Port: RJ45
Test Mode: 100Mbps
Power Source: AC 230V/50Hz
Note: M2: Operating Wired Linking&TF Card Working



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.301537	60.40	---	78.20	17.80	9.000	Signal	9.9
0.419083	---	51.88	65.47	13.59	9.000	Signal	9.8
0.419083	60.63	---	75.47	14.84	9.000	Signal	9.8
0.509069	---	51.00	64.00	13.00	9.000	Signal	9.8
0.527156	59.91	---	74.00	14.09	9.000	Signal	9.8
0.666413	58.98	---	74.00	15.02	9.000	Signal	9.7
0.666413	---	51.67	64.00	12.33	9.000	Signal	9.7
1.018261	---	49.86	64.00	14.14	9.000	Signal	9.7
1.153481	56.79	---	74.00	17.21	9.000	Signal	9.7
1.280849	55.21	---	74.00	18.79	9.000	Signal	9.7
13.418776	---	51.46	64.00	12.54	9.000	Signal	9.6
16.963591	---	48.74	64.00	15.26	9.000	Signal	9.6

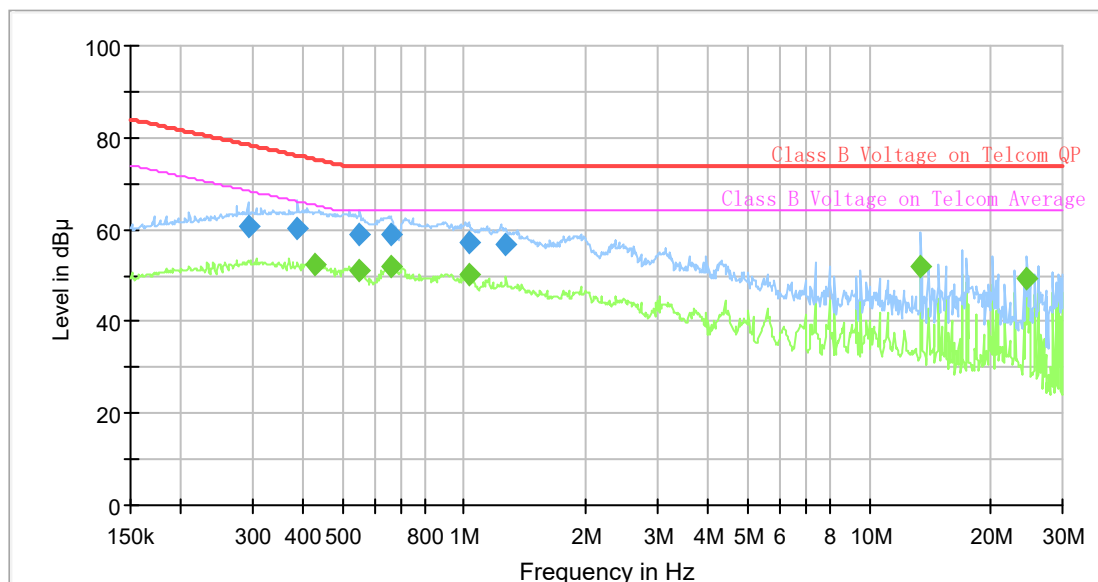
Port: RJ45
Test Mode: 10Mbps
Power Source: AC 230V/50Hz
Note: M3: Operating & USB flash disk Working



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.303044	60.30	---	78.16	17.86	9.000	Signal	9.9
0.406728	---	51.45	65.71	14.26	9.000	Signal	9.8
0.423284	60.59	---	75.38	14.79	9.000	Signal	9.8
0.453897	59.71	---	74.80	15.09	9.000	Signal	9.8
0.537778	---	50.45	64.00	13.55	9.000	Signal	9.8
0.659799	58.75	---	74.00	15.25	9.000	Signal	9.7
0.663098	---	50.98	64.00	13.02	9.000	Signal	9.7
0.881136	57.79	---	74.00	16.21	9.000	Signal	9.7
1.023352	---	50.14	64.00	13.86	9.000	Signal	9.7
1.268136	56.10	---	74.00	17.90	9.000	Signal	9.7
13.418776	---	51.40	64.00	12.60	9.000	Signal	9.6
16.963591	---	48.98	64.00	15.02	9.000	Signal	9.6

Port: RJ45
 Test Mode: 100Mbps
 Power Source: AC 230V/50Hz
 Note: M3: Operating & USB flash disk Working



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.292647	60.73	---	78.45	17.72	9.000	Signal	9.9
0.386939	60.35	---	76.13	15.78	9.000	Signal	9.8
0.429665	---	52.26	65.26	13.00	9.000	Signal	9.8
0.551358	---	51.08	64.00	12.92	9.000	Signal	9.8
0.551358	58.99	---	74.00	15.01	9.000	Signal	9.8
0.656516	59.04	---	74.00	14.96	9.000	Signal	9.7
0.663098	---	52.10	64.00	11.90	9.000	Signal	9.7
1.023352	57.31	---	74.00	16.69	9.000	Signal	9.7
1.023352	---	50.43	64.00	13.57	9.000	Signal	9.7
1.268136	56.59	---	74.00	17.41	9.000	Signal	9.7
13.418776	---	51.78	64.00	12.22	9.000	Signal	9.6
24.536148	---	49.14	64.00	14.86	9.000	Signal	9.8

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Port:

RJ45

Test Mode:

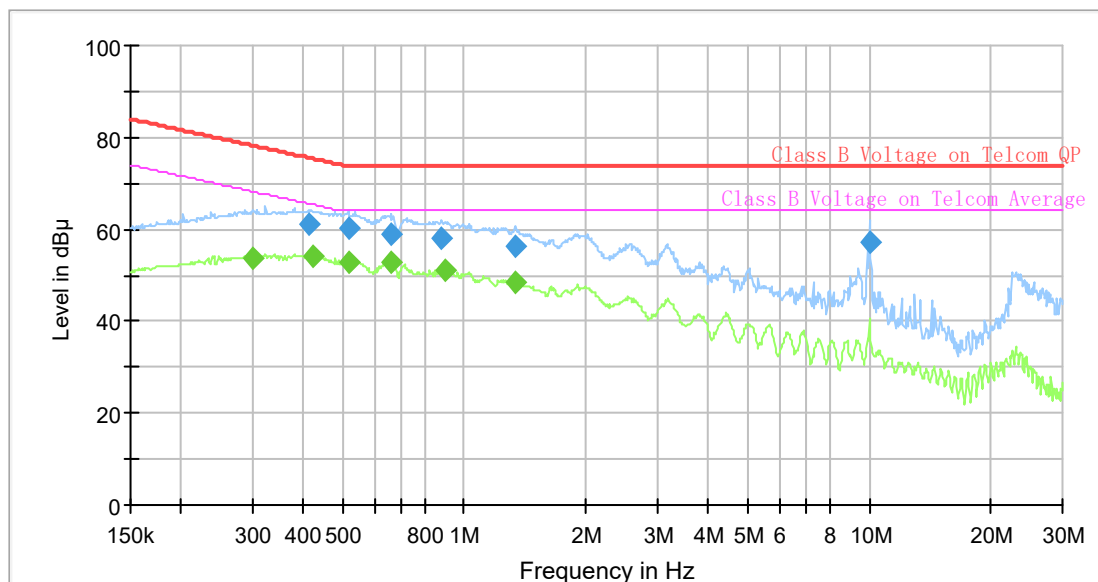
10Mbps

Power Source:

AC 230V/50Hz

Note:

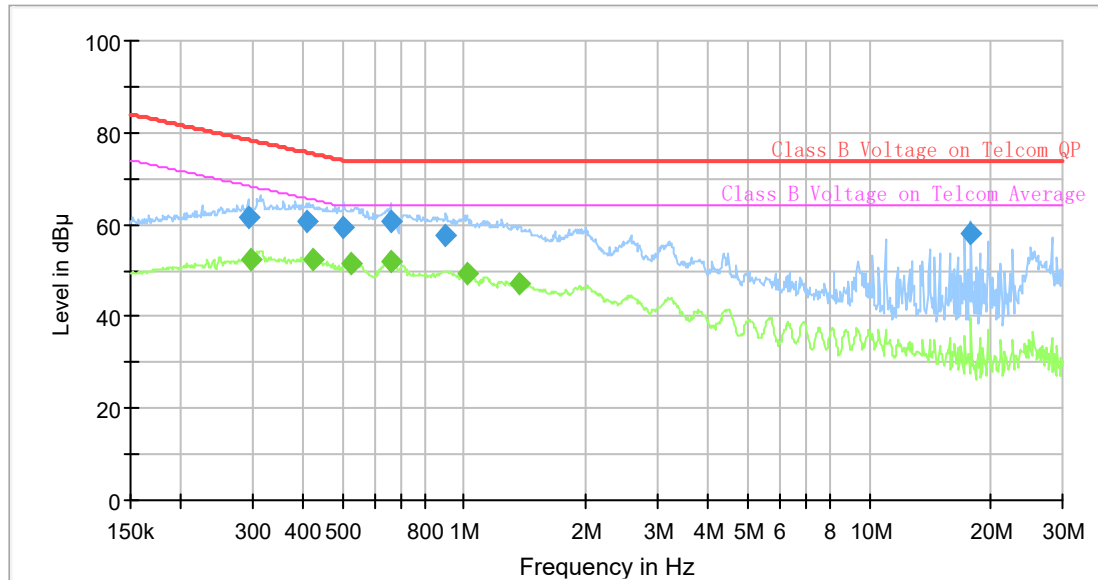
M2:Operating&Wired Linking&TF Card Working



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.301537	---	53.89	68.20	14.31	9.000	Signal	9.9
0.412859	60.94	---	75.59	14.65	9.000	Signal	9.8
0.423284	---	54.28	65.38	11.10	9.000	Signal	9.8
0.516743	60.12	---	74.00	13.88	9.000	Signal	9.8
0.516743	---	52.92	64.00	11.08	9.000	Signal	9.8
0.659799	59.11	---	74.00	14.89	9.000	Signal	9.7
0.659799	---	52.82	64.00	11.18	9.000	Signal	9.7
0.881136	57.89	---	74.00	16.11	9.000	Signal	9.7
0.894420	---	50.94	64.00	13.06	9.000	Signal	9.7
1.332988	56.12	---	74.00	17.88	9.000	Signal	9.7
1.332988	---	48.66	64.00	15.34	9.000	Signal	9.7
9.998049	57.31	---	74.00	16.69	9.000	Signal	9.6

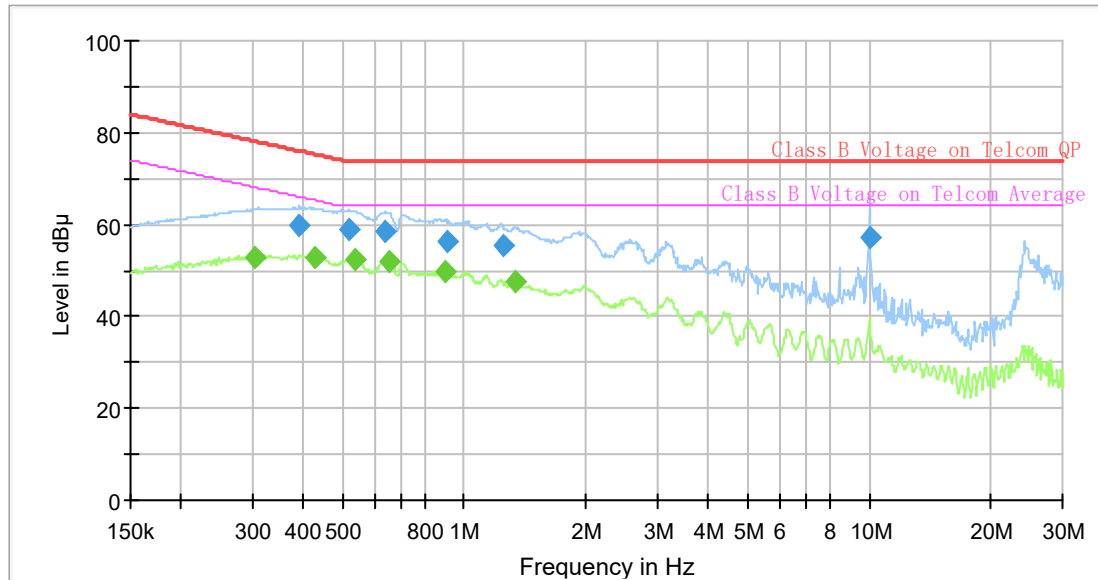
Port: RJ45
 Test Mode: 100Mbps
 Power Source: AC 230V/50Hz
 Note: M2:Operating&Wired Linking&TF Card Working



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.292647	61.40	---	78.45	17.05	9.000	Signal	9.9
0.297058	---	52.32	68.32	16.00	9.000	Signal	9.9
0.406728	60.75	---	75.71	14.96	9.000	Signal	9.8
0.421178	---	52.41	65.42	13.01	9.000	Signal	9.8
0.504016	59.60	---	74.00	14.40	9.000	Signal	9.8
0.527156	---	51.45	64.00	12.55	9.000	Signal	9.8
0.656516	60.84	---	74.00	13.16	9.000	Signal	9.7
0.659799	---	52.04	64.00	11.96	9.000	Signal	9.7
0.898892	57.76	---	74.00	16.24	9.000	Signal	9.7
1.013195	---	49.23	64.00	14.77	9.000	Signal	9.7
1.373481	---	47.18	64.00	16.82	9.000	Signal	9.7
17.831112	58.20	---	74.00	15.80	9.000	Signal	9.6

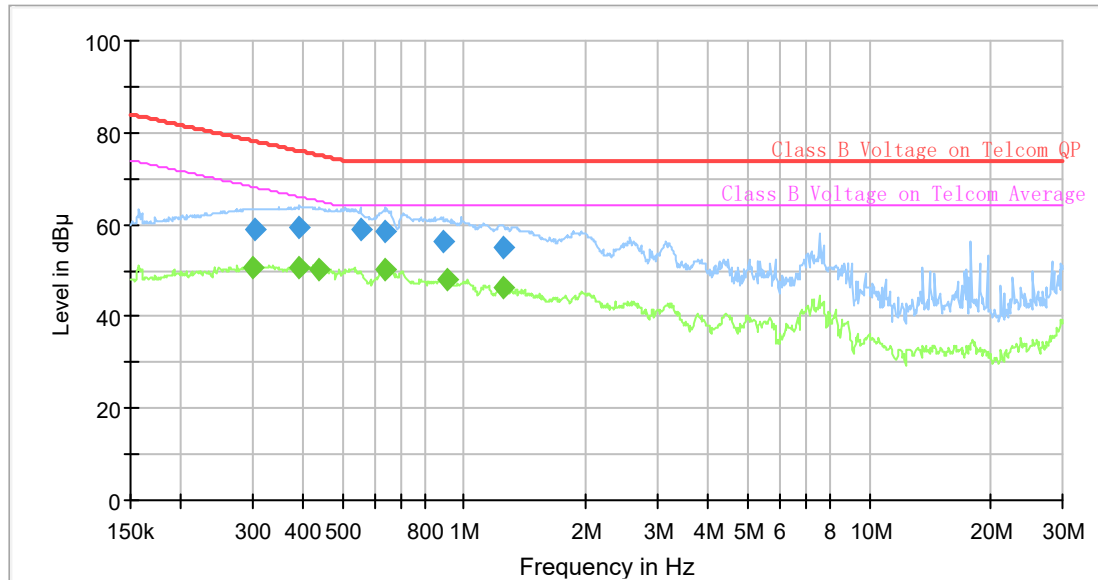
Port: RJ45
 Test Mode: 10Mbps
 Power Source: AC 230V/50Hz
 Note: M3:Operating&Wired Linking&USB flash disk Working



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.303044	---	52.80	68.16	15.36	9.000	Signal	9.9
0.392773	59.77	---	76.00	16.23	9.000	Signal	9.8
0.429665	---	53.00	65.26	12.26	9.000	Signal	9.8
0.516743	58.89	---	74.00	15.11	9.000	Signal	9.8
0.537778	---	52.27	64.00	11.73	9.000	Signal	9.8
0.640347	58.57	---	74.00	15.43	9.000	Signal	9.8
0.650000	---	52.07	64.00	11.93	9.000	Signal	9.8
0.894420	---	49.67	64.00	14.33	9.000	Signal	9.7
0.903386	56.22	---	74.00	17.78	9.000	Signal	9.7
1.249302	55.42	---	74.00	18.58	9.000	Signal	9.7
1.339653	---	47.41	64.00	16.59	9.000	Signal	9.7
9.998049	57.18	---	74.00	16.82	9.000	Signal	9.6

Port: RJ45
 Test Mode: 100Mbps
 Power Source: AC 230V/50Hz
 Note: M3:Operating&Wired Linking&USB flash disk Working

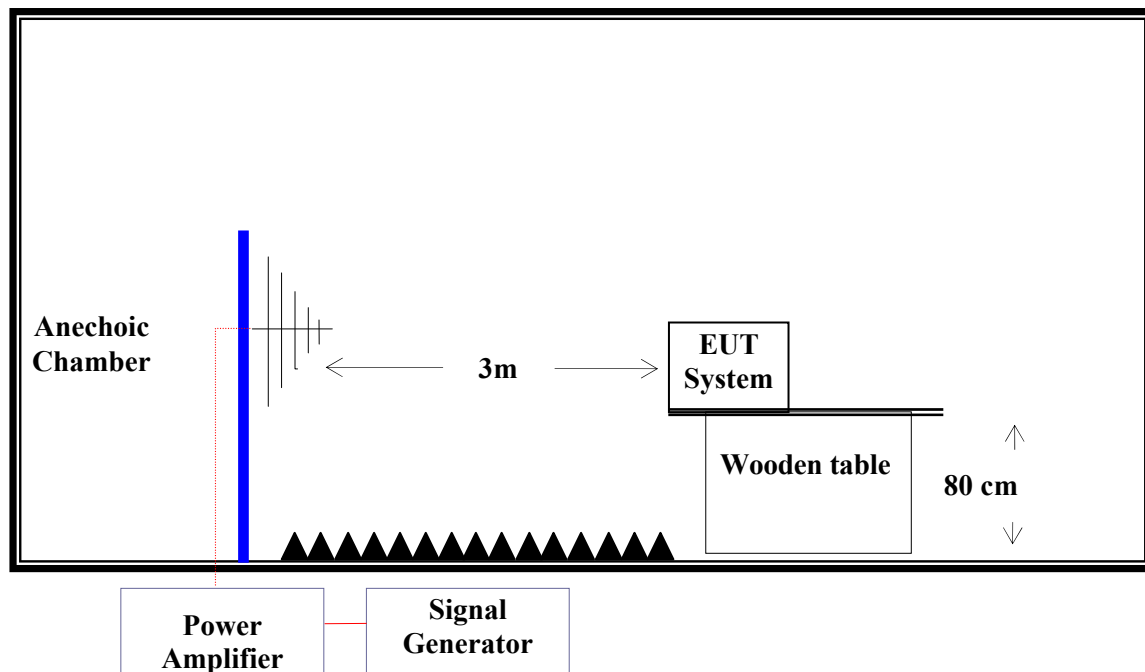


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.300036	---	50.62	68.24	17.62	9.000	Signal	9.9
0.303044	59.06	---	78.16	19.10	9.000	Signal	9.9
0.390819	---	50.60	66.05	15.45	9.000	Signal	9.8
0.390819	59.49	---	76.05	16.56	9.000	Signal	9.8
0.438323	---	50.36	65.09	14.73	9.000	Signal	9.8
0.554114	58.75	---	74.00	15.25	9.000	Signal	9.8
0.633991	---	50.13	64.00	13.87	9.000	Signal	9.8
0.640347	58.51	---	74.00	15.49	9.000	Signal	9.8
0.885542	56.49	---	74.00	17.51	9.000	Signal	9.7
0.903386	---	48.24	64.00	15.76	9.000	Signal	9.7
1.249302	---	46.18	64.00	17.82	9.000	Signal	9.7
1.255549	54.89	---	74.00	19.11	9.000	Signal	9.7

7 - RADIO FREQUENCY ELECTROMAGNETIC FIELDS (80 MHZ TO 6 000 MHZ)

Test System Setup



Test Level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

Performance Criterion: A

General Performance Criteria:

- The apparatus shall continue to operate as intended during and after the test. The manufacturer specifies some minimum performance level. The performance level may be specified by the manufacture as a permissible loss of performance.
- The apparatus shall continue to operate as intended after the test. This indicates that the EUT does not need to function at normal performance levels during the test, but must recover. Again some minimal performance is defined by the manufacture. No change in operating state or loss or data is permitted.
- Temporary loss of function is allowed. Operation of the EUT may stop as long as it is either automatically reset or can be manually restored by operation of the controls.
- The apparatus is broken, cannot be normal operated.

Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this antenna and measured individually.

Test Data

Please refer to following tables:

Test Mode: M1: Operating & Wireless Linking
M2: Operating Wired Linking&TF Card Working
M3: Operating & USB flash disk Working

Note:

Condition of Test	Remarks
Field Strength	3 V/m (Test Level 2)
RF Signal	1 kHz, 80% AM, sine wave
Sweep Frequency Step	1%, logarithmic
Dwell Time	1 Sec

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Frequency Range (MHz)	Front Side		Rear Side		Left Side		Right Side	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A
1000-6000	A	A	A	A	A	A	A	A

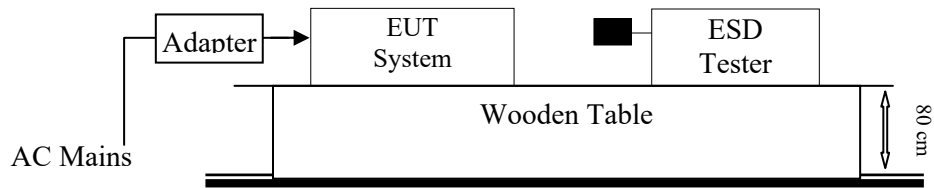
RV1126

Frequency Range (MHz)	Front Side		Rear Side		Left Side		Right Side	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A
1000-6000	A	A	A	A	A	A	A	A

Note: "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

8 - ELECTROSTATIC DISCHARGES

Test System Setup



Remark: ■ is the tip of the electrode

EN61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on a insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.6 by 0.8-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by 0.5-millimeter thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

Test Level

Level	Test Voltage Contact Discharge (±kV)	Test Voltage Air Discharge (±kV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X.	Special	Special

Test Level 3 for Air Discharge at ±8 kV

Test Level 2 for Direct Discharge at ±4 kV

Performance criterion: B

Test Procedure

Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT.

The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point.

This procedure shall be repeated until all the air discharge completed.

Contact Discharge:

All the procedure shall be same as Section 8.3.1 of EN 61000-4-2, except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

Indirect discharge for horizontal coupling plane

At least 50 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

Indirect discharge for vertical coupling plane

At least 50 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT.

Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

Test Data

Please refer to following tables:

RV1109

Test Mode: M1: Operating & Wireless Linking
M2: Operating Wired Linking&TF Card Working
M3: Operating & USB flash disk Working

Note:

Table 1: Electrostatic Discharge Immunity (Air Discharge)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV
Non-metallic Shell	A	A	A	A	A	A	/	/
USB Port	A	A	A	A	A	A	/	/
TF card Port	A	A	A	A	A	A	/	/
RJ45	A	A	A	A	A	A	/	/
USB Cable	A	A	A	A	A	A	/	/
Reticle	A	A	A	A	A	A	/	/
Button	A	A	A	A	A	A	/	/
Seam	A	A	A	A	A	A	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
/	/	/	/	/	/	/	/	/

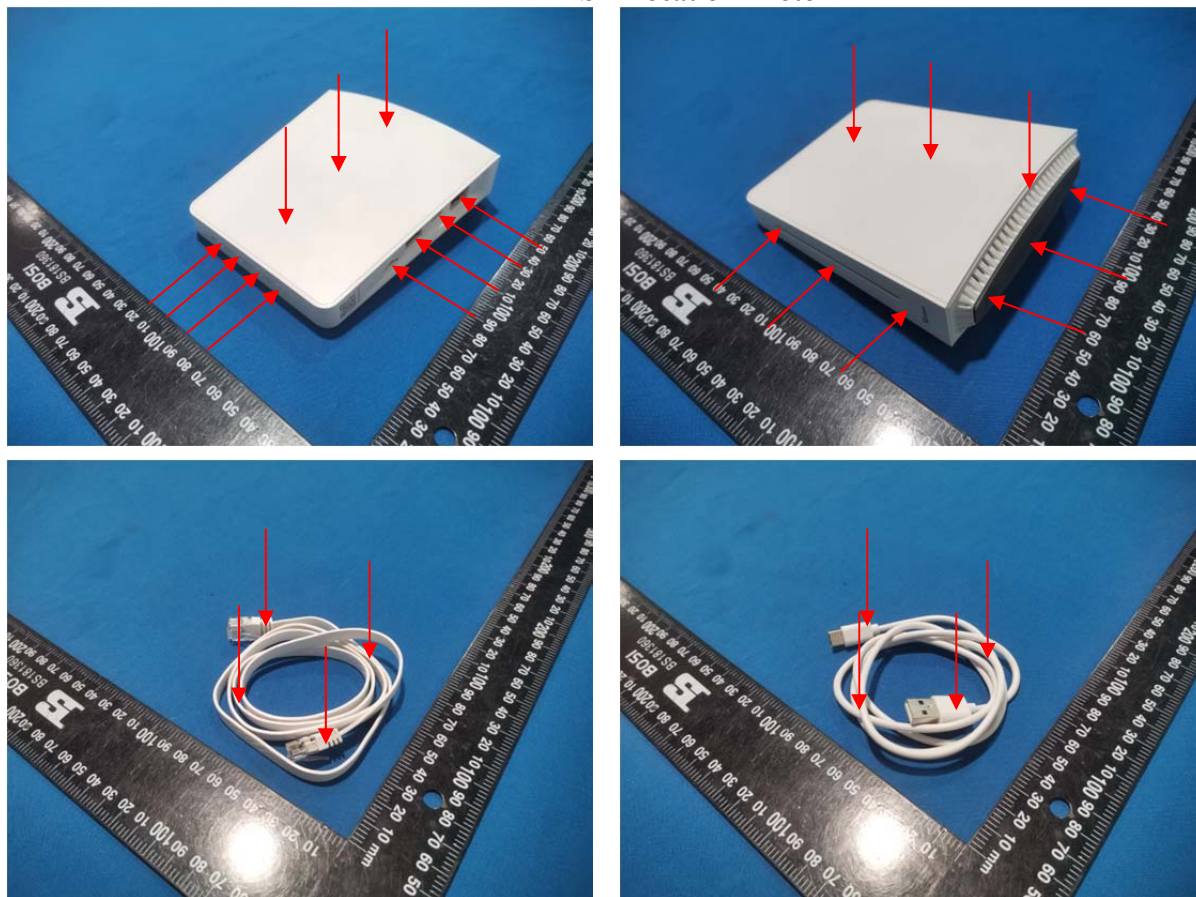
Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

ESD Location Photo



Air Discharge:



Direct Contact:



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Test Mode: M1: Operating & Wireless Linking
M2: Operating & TF Card Working
M3: Operating & USB flash disk Working

Note:

Table 1: Electrostatic Discharge Immunity (Air Discharge)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV
Non-metallic Shell	A	A	A	A	A	A	/	/
USB Port	A	A	A	A	A	A	/	/
TF card Port	A	A	A	A	A	A	/	/
RJ45	A	A	A	A	A	A	/	/
USB Cable	A	A	A	A	A	A	/	/
Reticle	A	A	A	A	A	A	/	/
Button	A	A	A	A	A	A	/	/
Seam	A	A	A	A	A	A	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
/	/	/	/	/	/	/	/	/

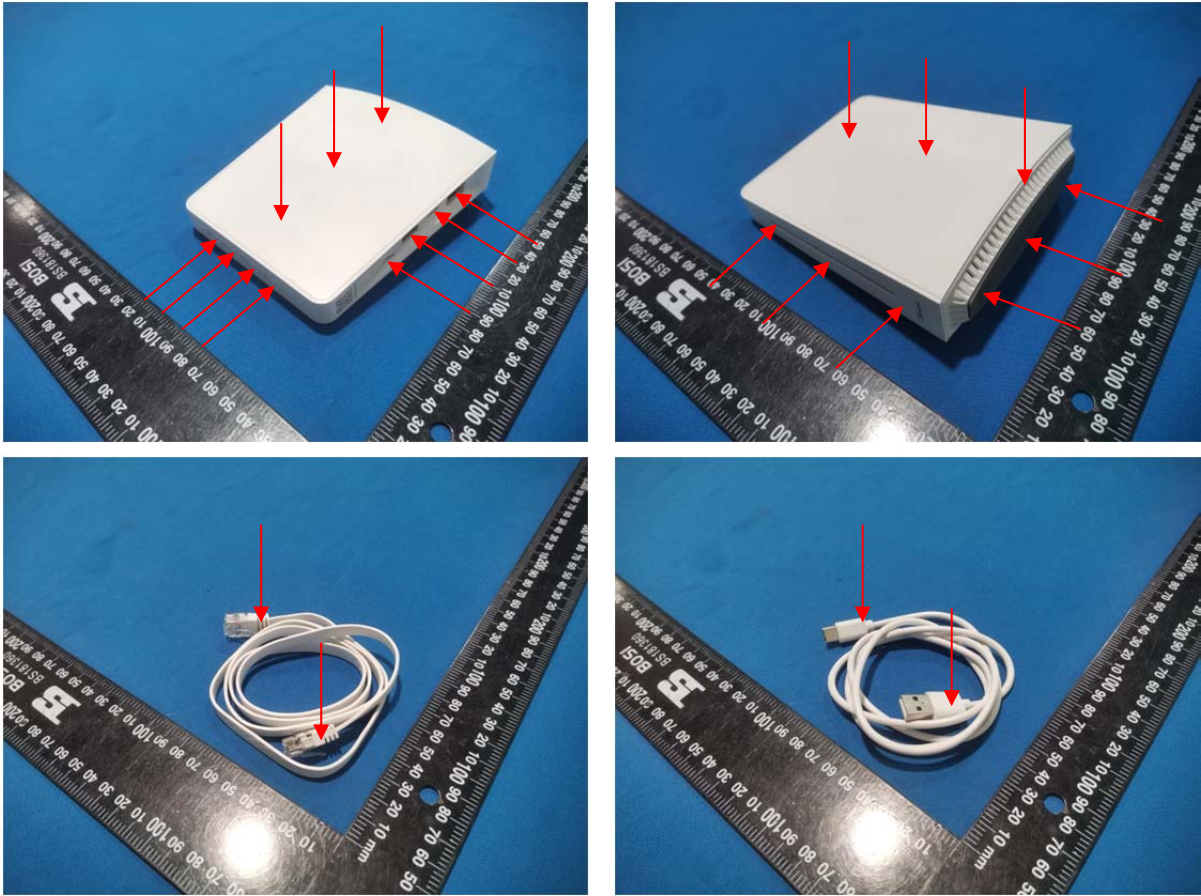
Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

ESD Location Photo



Air Discharge:

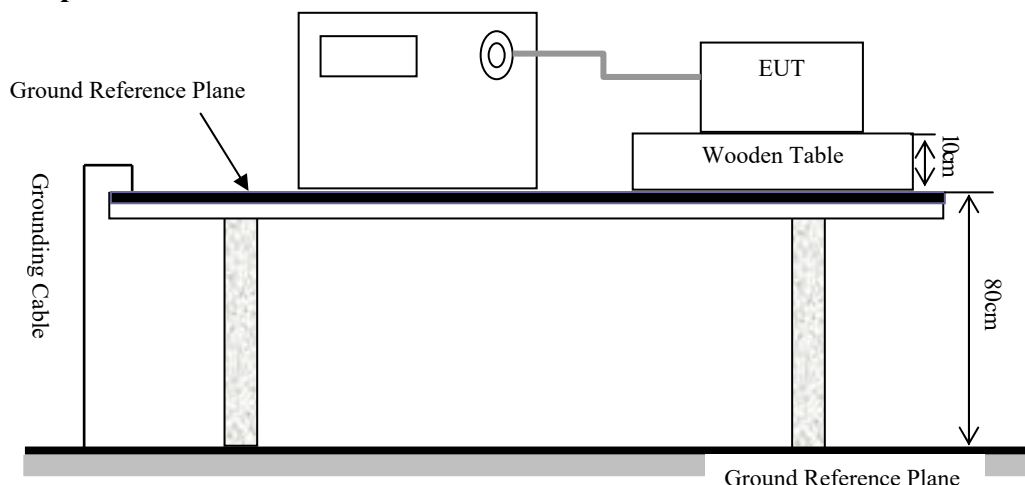
→

Direct Contact:

→

9 - FAST TRANSIENTS, COMMON MODE

Test System Setup



Test Level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special

Performance Criterion: B

Test Procedure

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane 2.4 meter by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0 meter ground rod. The ground rod is connected to the test facility's electrical earth.

Test Data

Please refer to following tables:

RV1109

Test Mode: M1: Operating & Wireless Linking
M2: Operating Wired Linking&TF Card Working
M3: Operating & USB flash disk Working

Note:

Test Points		Test Level (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC mains power input ports	L	A	A	A	A	/	/	/	/
	N	A	A	A	A	/	/	/	/
	Earth	/	/	/	/	/	/	/	/
	L+N	A	A	A	A	/	/	/	/
	L + Earth	/	/	/	/	/	/	/	/
	N + Earth	/	/	/	/	/	/	/	/
	L+N+Earth	/	/	/	/	/	/	/	/
Signal ports	RJ45	A	A	/	/	/	/	/	/

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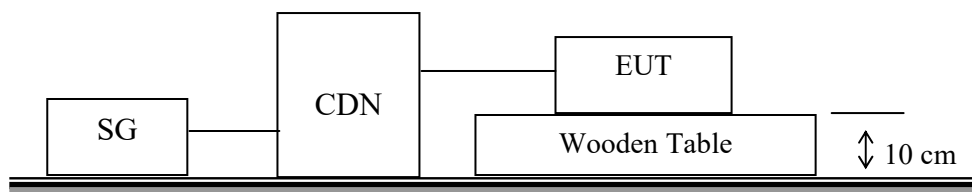
Test Mode: M1: Operating & Wireless Linking
M2: Operating & TF Card Working
M3: Operating & USB flash disk Working

Note:

Test Points		Test Level (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC mains power input ports	L	A	A	A	A	/	/	/	/
	N	A	A	A	A	/	/	/	/
	Earth	/	/	/	/	/	/	/	/
	L+N	A	A	A	A	/	/	/	/
	L + Earth	/	/	/	/	/	/	/	/
	N + Earth	/	/	/	/	/	/	/	/
	L+N+Earth	/	/	/	/	/	/	/	/
Signal ports	RJ45	A	A	/	/	/	/	/	/

10 - RADIO FREQUENCY, COMMON MODE

Test System Setup



Test Level

Level	Voltage Level (r.m.s.) (U_0)
1	1
2	3
3	10
X	Special

Performance Criterion: A

Test Procedure

- 1) Let the EUT work in test mode and test it.
- 2) The EUT are placed on an insulating support 0.1 m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3 m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 3) The disturbance signal described below is injected to EUT through CDN.
- 4) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5) The frequency range is swept from 150 kHz to 80 MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
- 6) Where the frequency is swept incrementally, the step size shall not exceed 1 % of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5 s.
- 7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

Test Data

Please refer to following tables:

RV1109

Test Mode: M1: Operating & Wireless Linking
M2: Operating Wired Linking&TF Card Working
M3: Operating & USB flash disk Working

Note:

Table 1: AC mains power input port

Frequency range: 150kHz to 80MHz

■ Modulated: Amplitude 80%, 1kHz sine wave □ Unmodulated □ Other:
Severity Level: 3V Unmodulated, r.m.s

Level	Voltage Level (e.m.f.) U_0	Pass	Fail
1	1	/	/
2	3	A	/
3	10	/	/
X	Special	/	/

Table 2: Signal Port : RJ45

Frequency range: 150 kHz to 80MHz

■ Modulated: Amplitude 80%, 1kHz sine wave □ Unmodulated □ Other:
Severity Level: 3 V Unmodulated, r.m.s

Level	Voltage Level (e.m.f.) U_0	Pass	Fail
1	1	/	/
2	3	A	/
3	10	/	/
X	Special	/	/

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Test Mode: M1: Operating & Wireless Linking
 M2: Operating & TF Card Working
 M3: Operating & USB flash disk Working

Note:**Table 1: AC mains power input port**

Frequency range: 150kHz to 80MHz

■ Modulated: Amplitude 80%, 1kHz sine wave □ Unmodulated □ Other:
 Severity Level: 3V Unmodulated, r.m.s

Level	Voltage Level (e.m.f.) U_0	Pass	Fail
1	1	/	/
2	3	A	/
3	10	/	/
X	Special	/	/

Table 2: Signal Port : RJ45

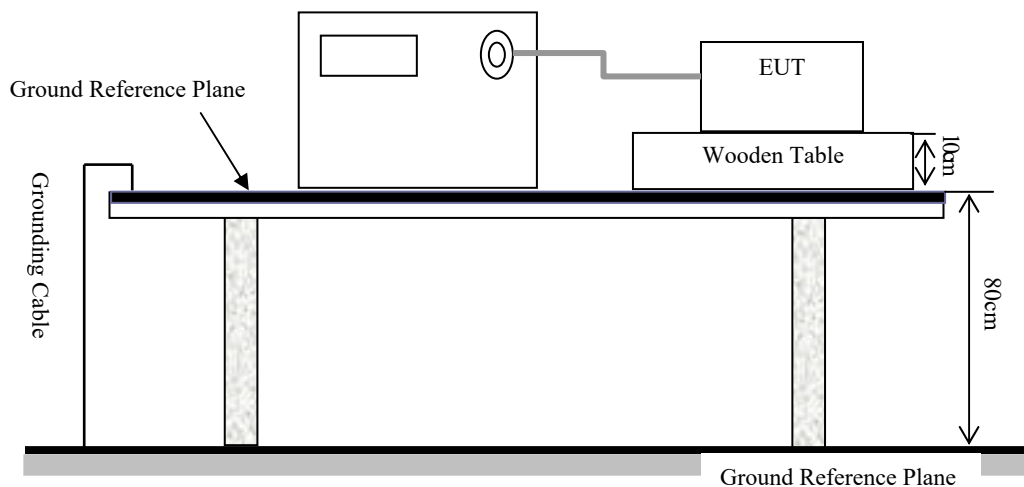
Frequency range: 150 kHz to 80MHz

■ Modulated: Amplitude 80%, 1kHz sine wave □ Unmodulated □ Other:
 Severity Level: 3 V Unmodulated, r.m.s

Level	Voltage Level (e.m.f.) U_0	Pass	Fail
1	1	/	/
2	3	A	/
3	10	/	/
X	Special	/	/

12 - VOLTAGE DIPS AND SHORT INTERRUPTIONS

Test System Setup



Test Level and Performance Criterion

Test Level	Voltage dip and short interruptions (%) Residual	Duration (in period)	Performance criterion
1	0	0.5	B
2	0	1	B
3	70	25	C
4	0	250	C

Test Procedure

- 1) The interruption is introduced at selected phase angles with specified duration.
- 2) Record any degradation of performance.

Test Data

Please refer to following tables:

RV1109

Test Mode: M1: Operating & Wireless Linking
M2: Operating Wired Linking&TF Card Working
M3: Operating & USB flash disk Working

Note: B indicates that the power supply of the EUT was interrupted during the test, and the EUT was restarted. After the test, it can automatically return to normal use.

Table 1: Voltage Dips/Interruptions Test

U2 (% Reduction)	Td (Periods)	Phase Angle	N	Result
100	0.5	0/90/180/270	3	A
100	1	0/90/180/270	3	A
30	25	0/90/180/270	3	A
100	250	0/90/180/270	3	B

RV1126

Test Mode: M1: Operating & Wireless Linking
M2: Operating & TF Card Working
M3: Operating & USB flash disk Working

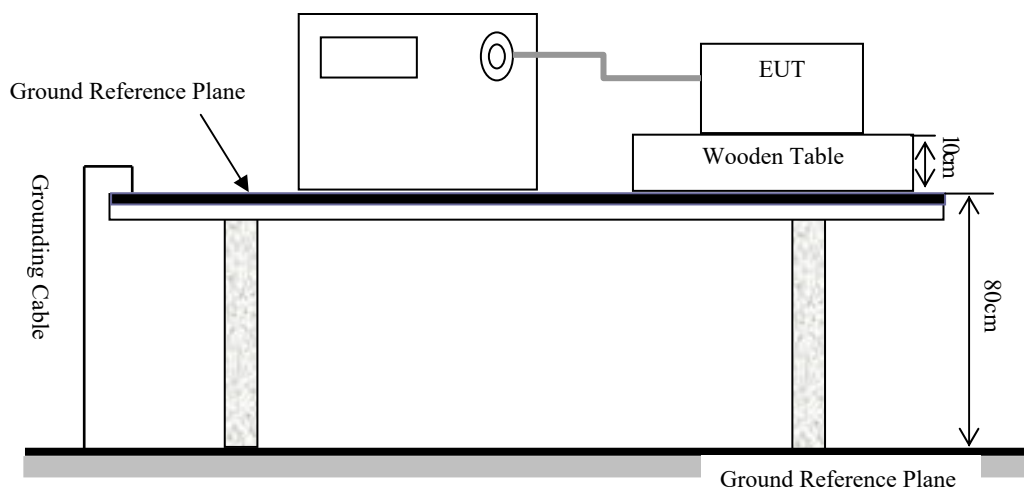
Note: B indicates that the power supply of the EUT was interrupted during the test, and the EUT was restarted. After the test, it can automatically return to normal use.

Table 1: Voltage Dips/Interruptions Test

U2 (% Reduction)	Td (Periods)	Phase Angle	N	Result
100	0.5	0/90/180/270	3	A
100	1	0/90/180/270	3	A
30	25	0/90/180/270	3	A
100	250	0/90/180/270	3	B

13 - SURGES

Test System Setup



Test Level

Level	Open Circuit Output Test Voltage $\pm 10\%$
1	0.5 kV
2	1 kV
3	2 kV
4	4 kV
X	Special

Performance Criterion: B

Test Procedure

- 1) For line to line coupling mode, provide a 0.5 kV 1.2/50us voltage surge (at open-circuit condition).
- 2) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 3) Different phase angles are done individually.
- 4) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

Test Data

Please refer to following tables:

RV1109

Test Mode: M1: Operating & Wireless Linking
M2: Operating Wired Linking&TF Card Working
M3: Operating & USB flash disk Working

Note:

Table 1:AC mains power input port

Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	Line-Line	A	/
2	1kV	±	Line-Line	A	/
3	2kV	±	/	/	/
4	4kV	±	/	/	/

Table 2: RJ45 I/O Circuit and Lines

Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	Line-Ground	A	/
2	1kV	±	Line-Ground	/	/
3	2kV	±	Line-Ground	/	/

RV1126

Test Mode: M1: Operating & Wireless Linking
M2: Operating & TF Card Working
M3: Operating & USB flash disk Working

Note:

Table 1: AC mains power input port

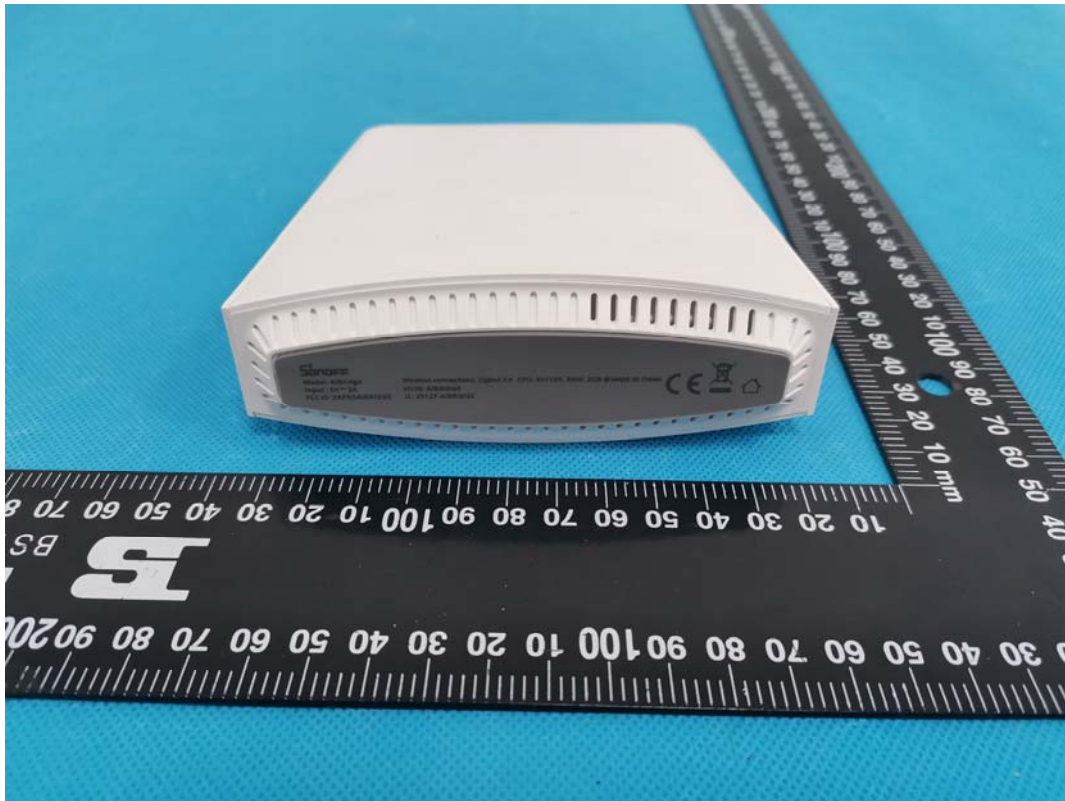
Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	Line-Line	A	/
2	1kV	±	Line-Line	A	/
3	2kV	±	/	/	/
4	4kV	±	/	/	/

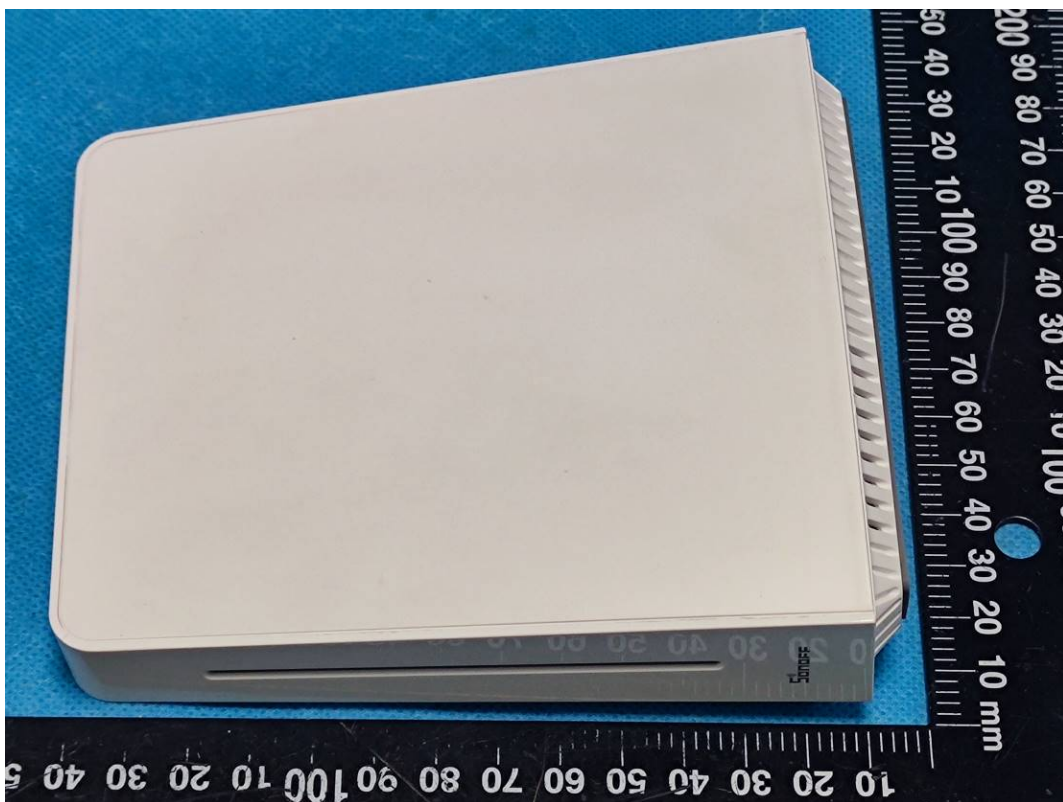
Table 2: RJ45 I/O Circuit and Lines

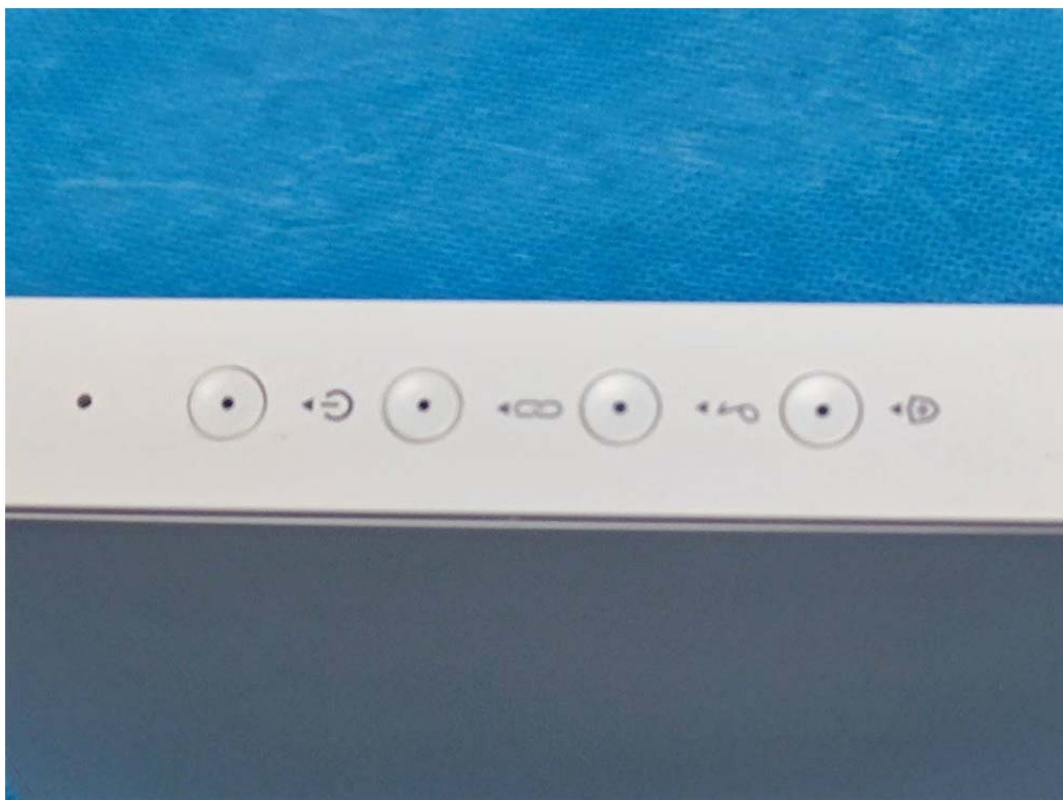
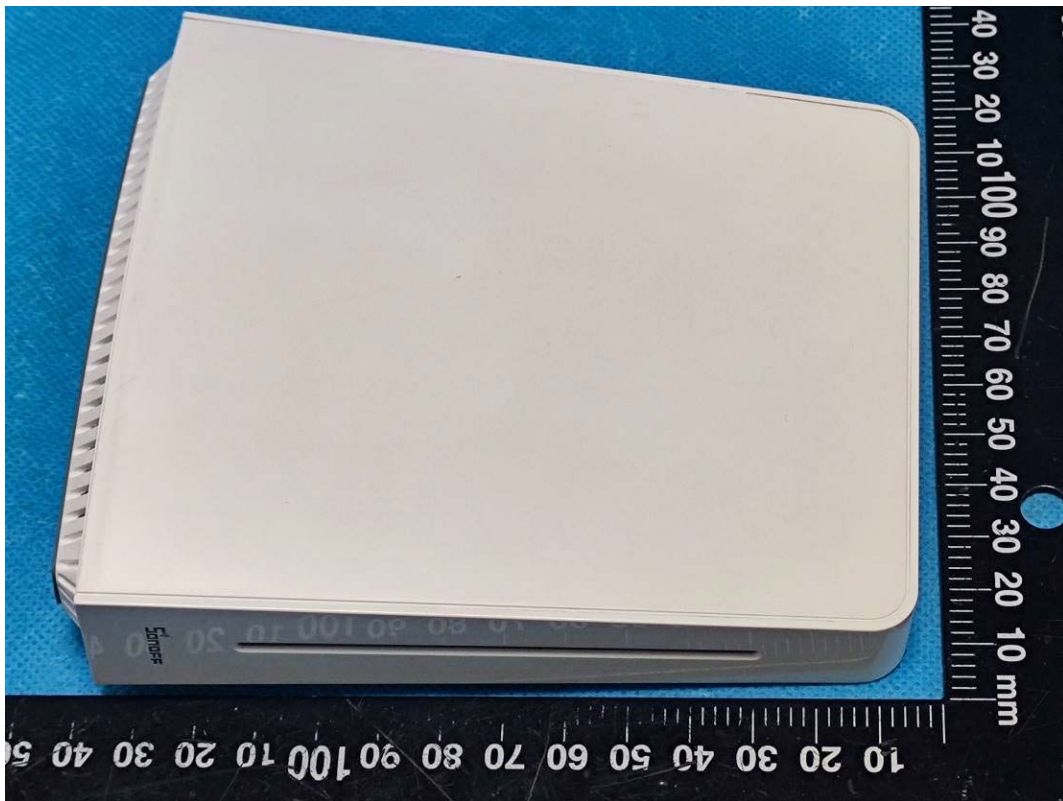
Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	Line-Ground	A	/
2	1kV	±	/	/	/
3	2kV	±	/	/	/

EXHIBITA - EUT PHOTOGRAPHS









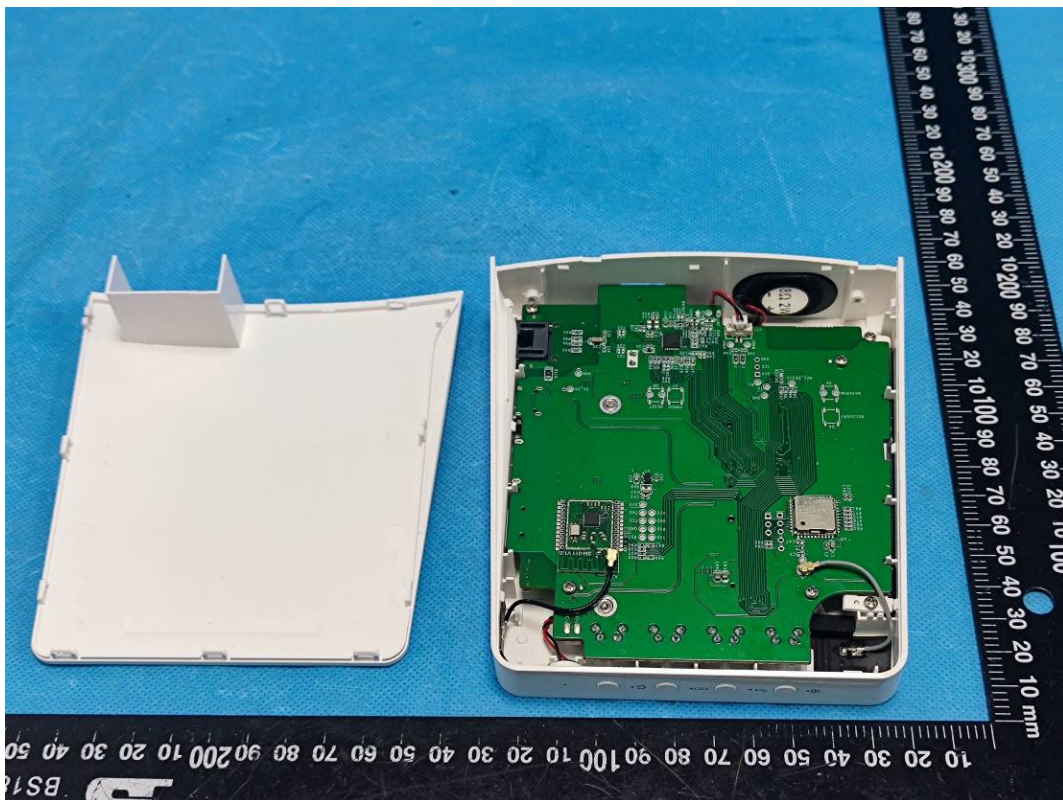
Port

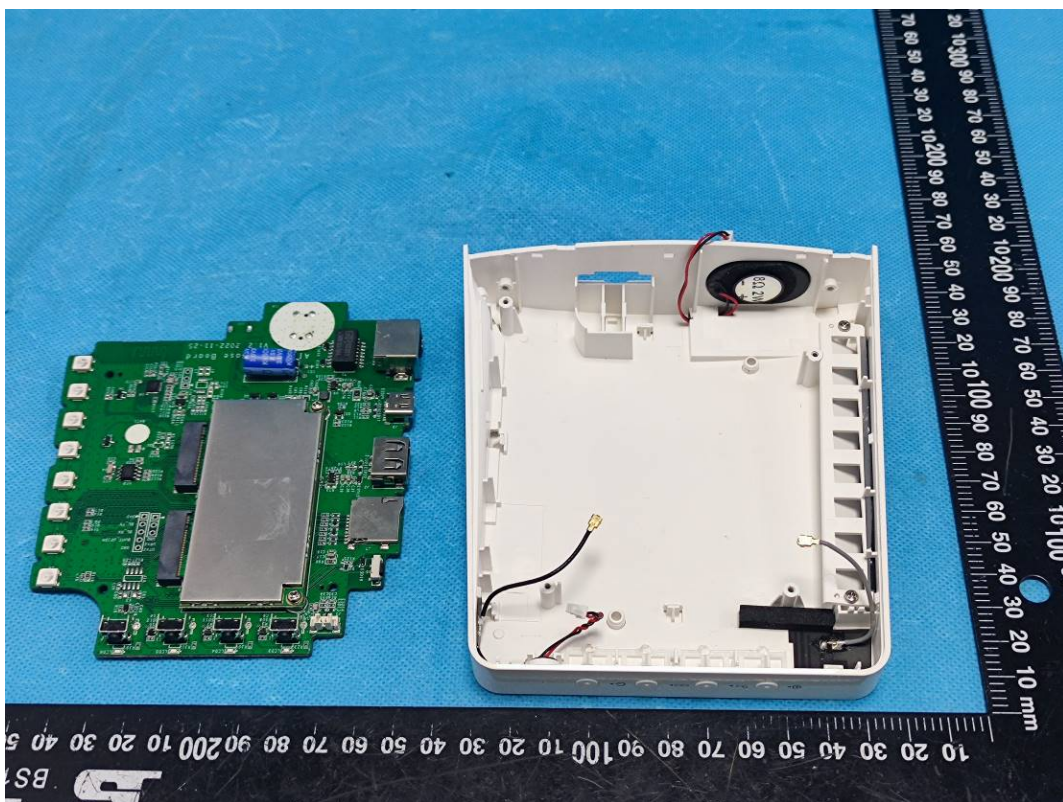
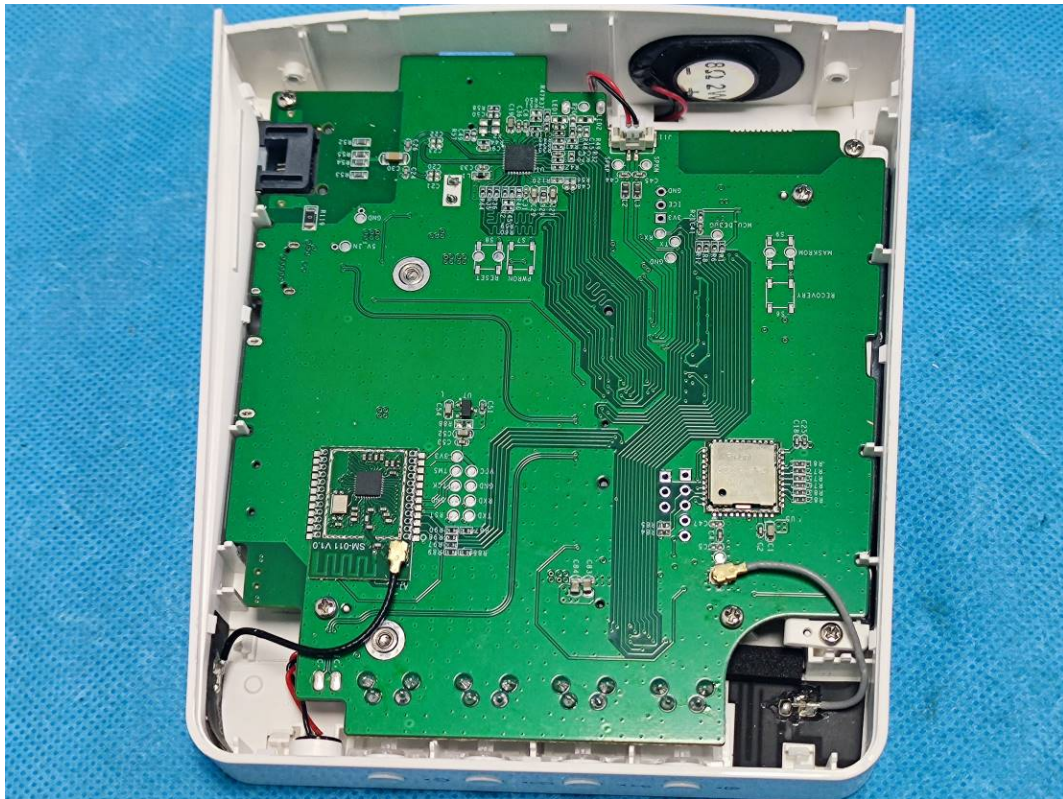


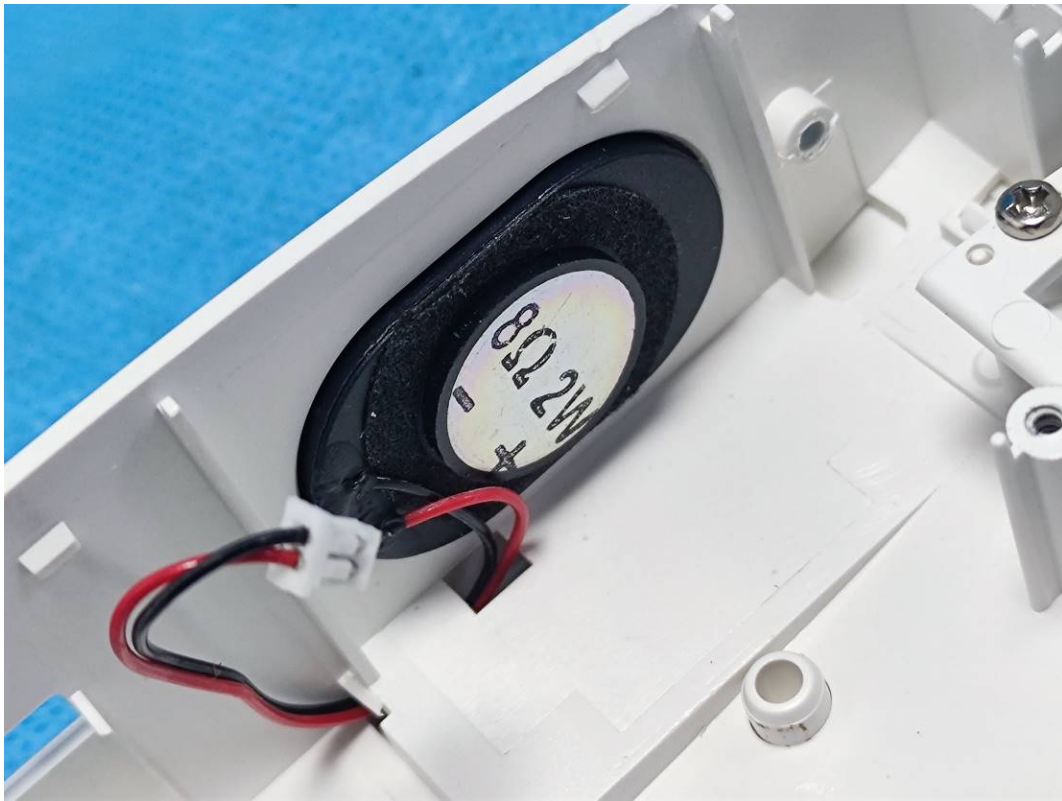
Port



Uncover





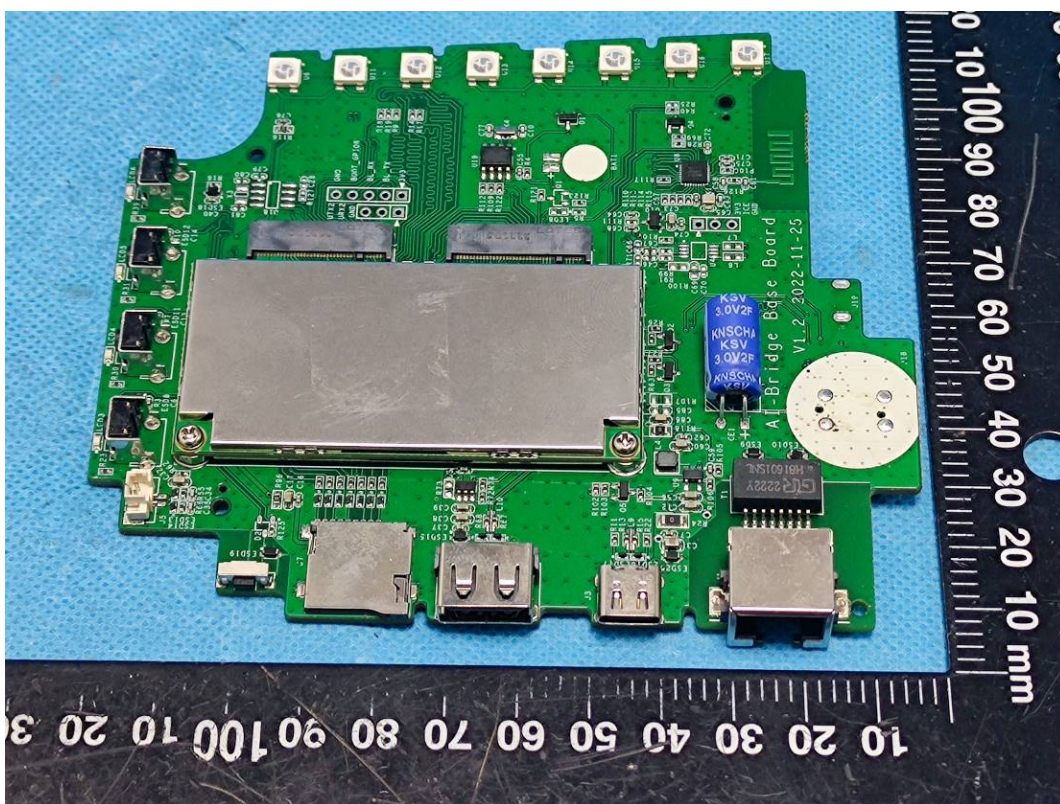
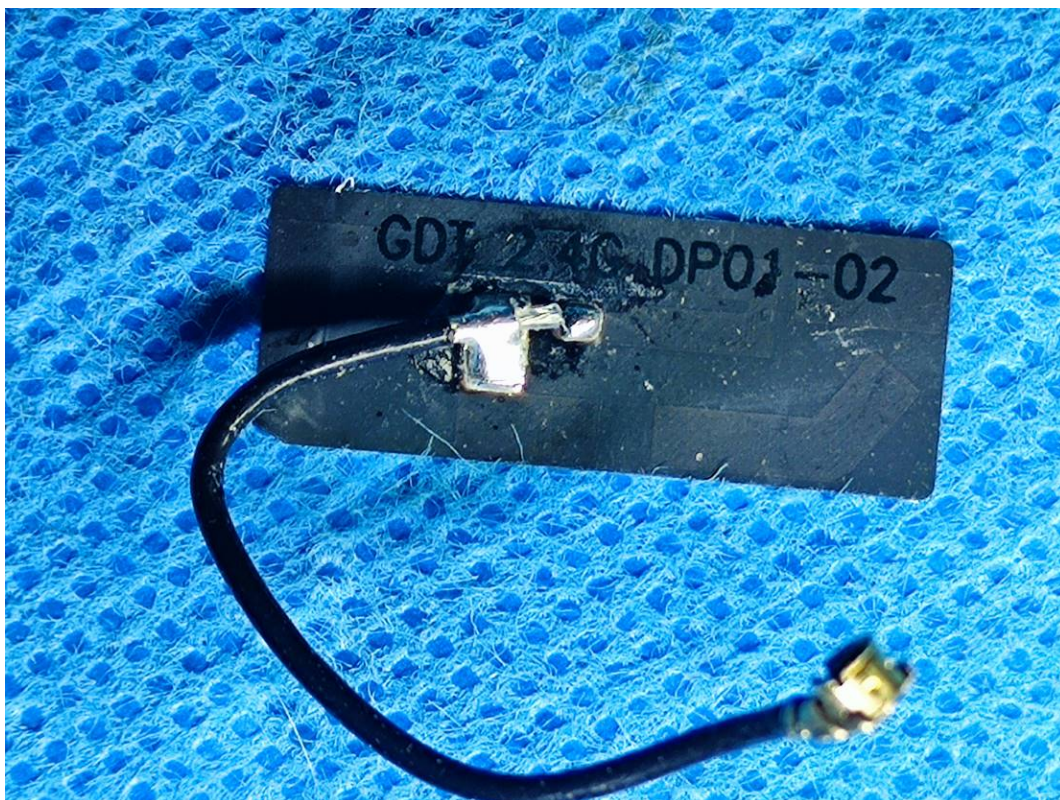


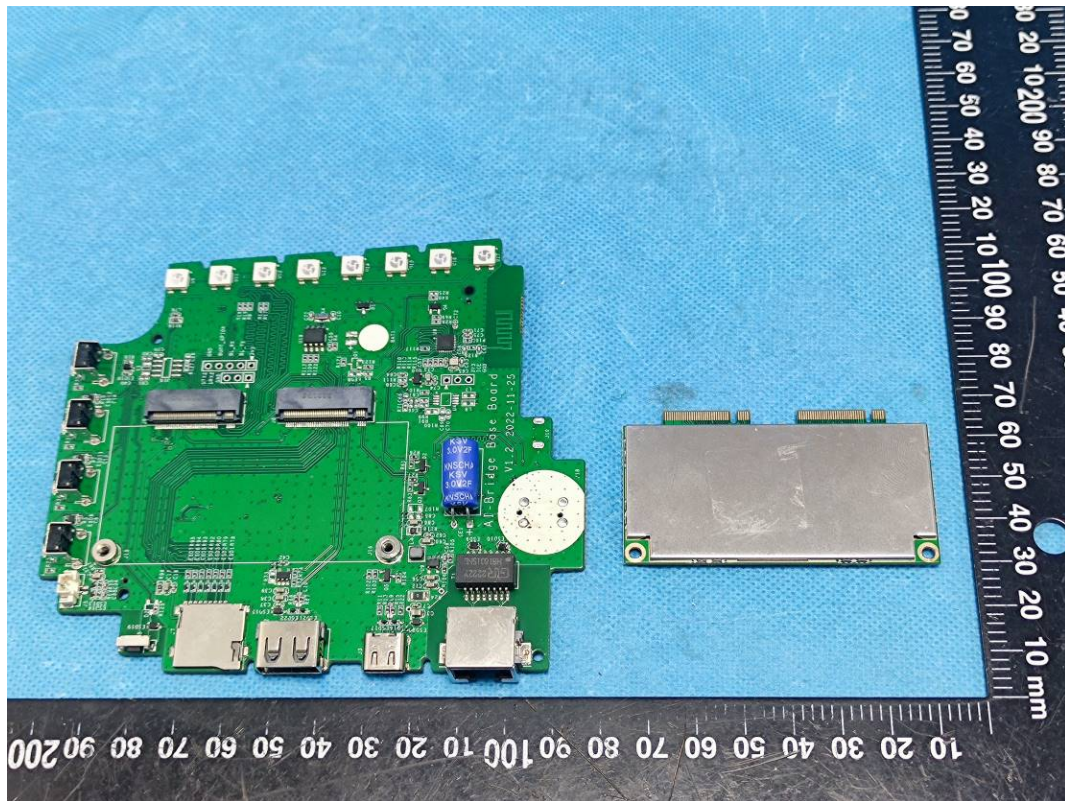
Zigbee Antenna



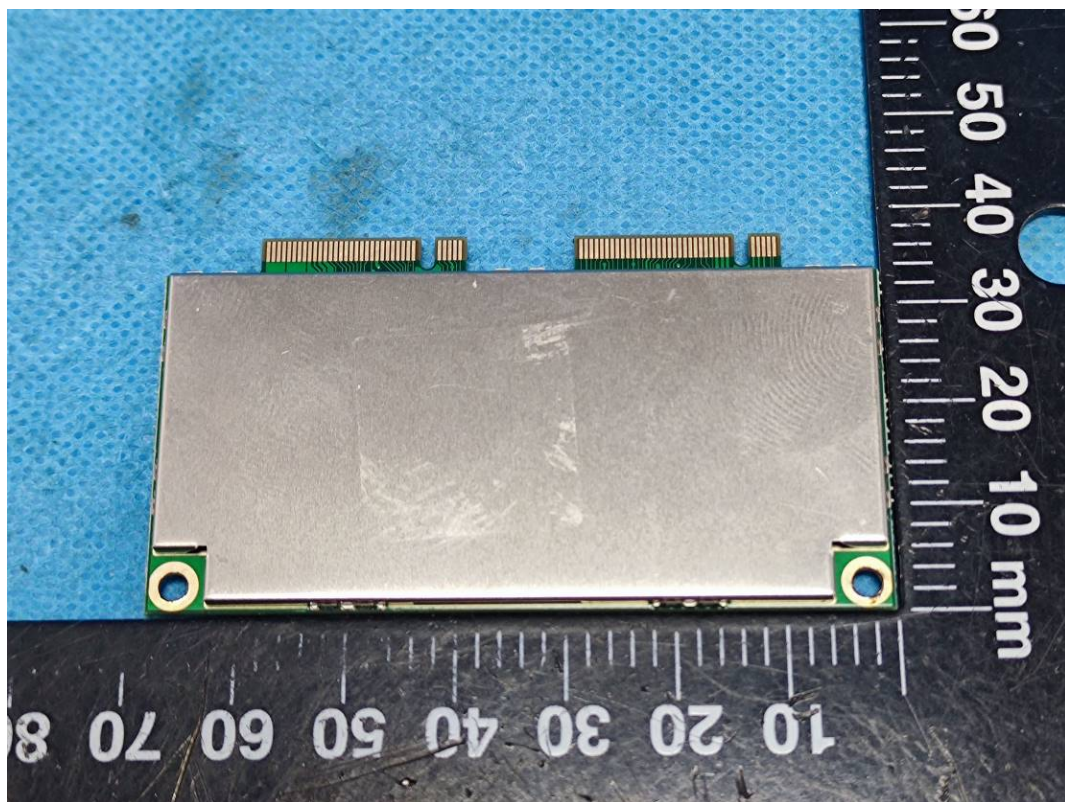
BLE&WiFi Antenna

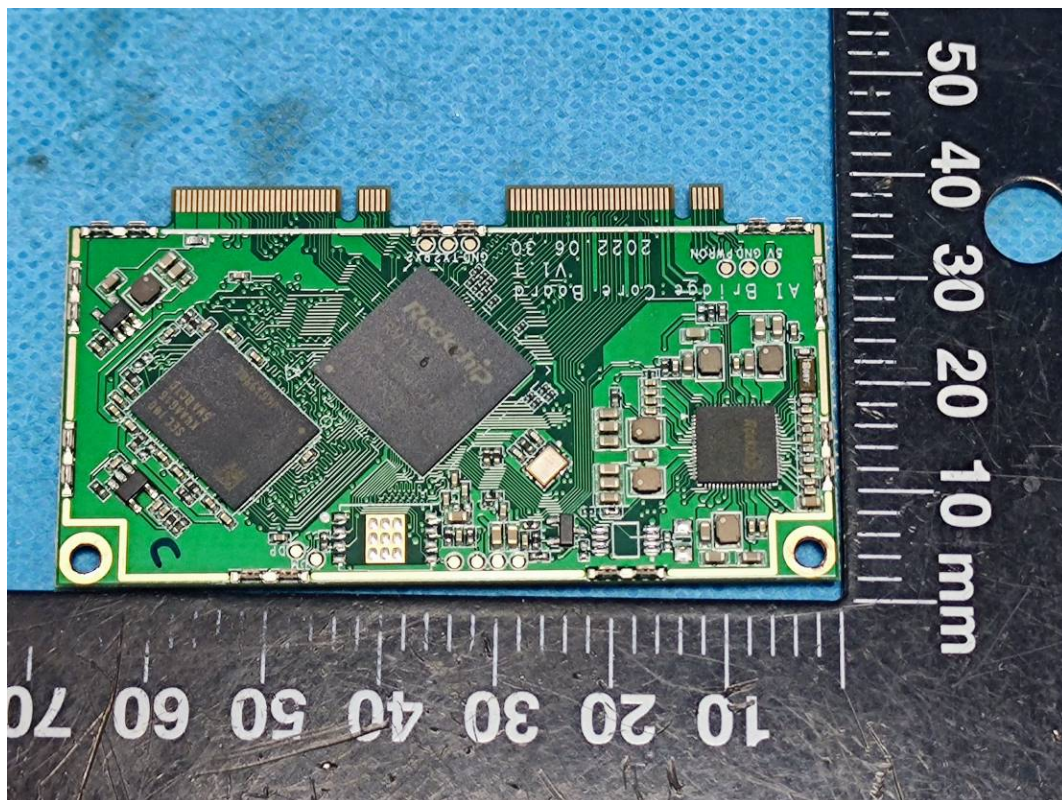






RV1126

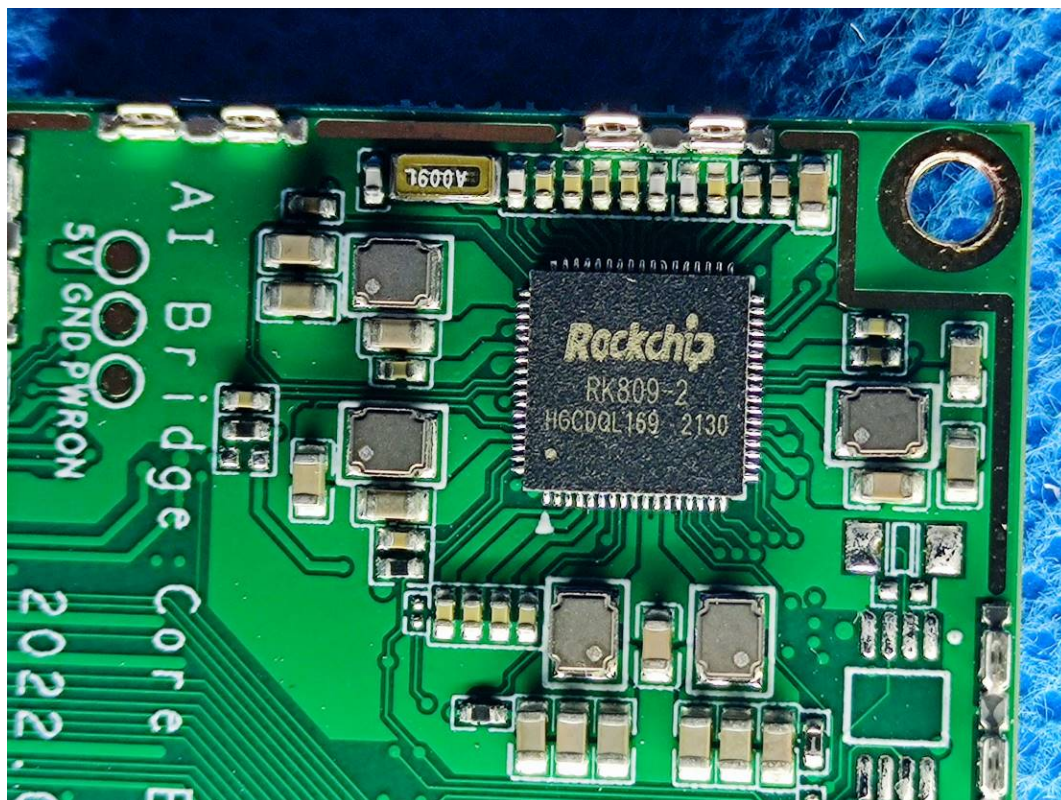




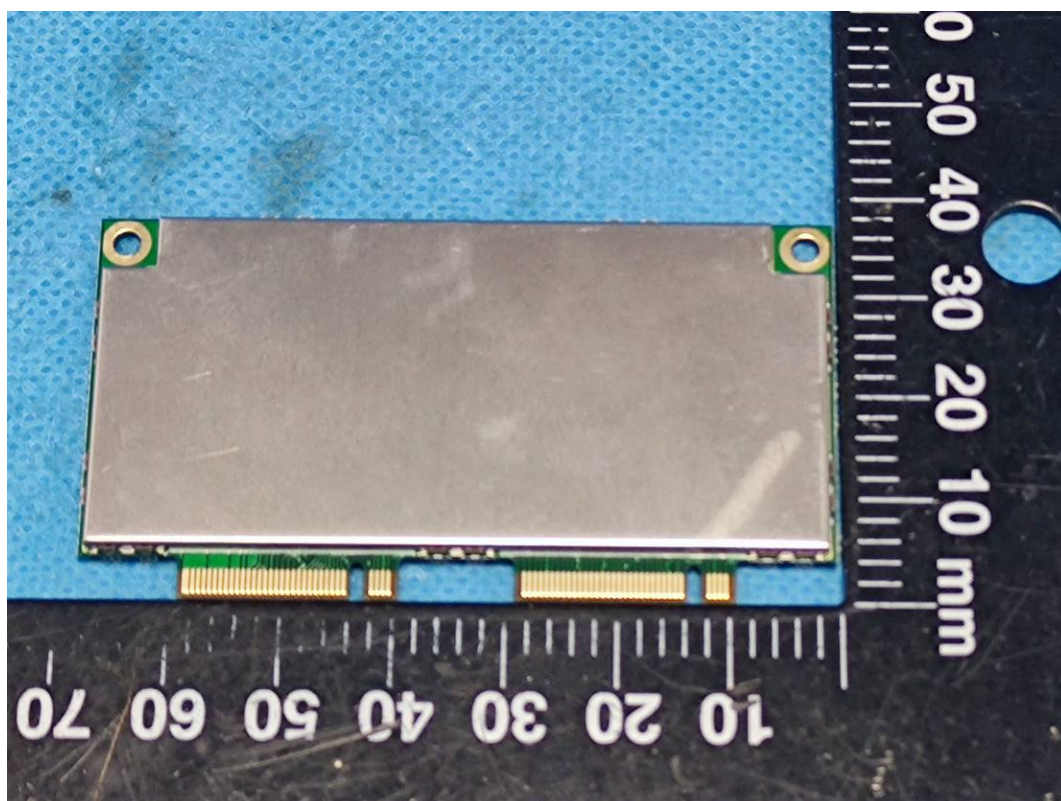
Chip

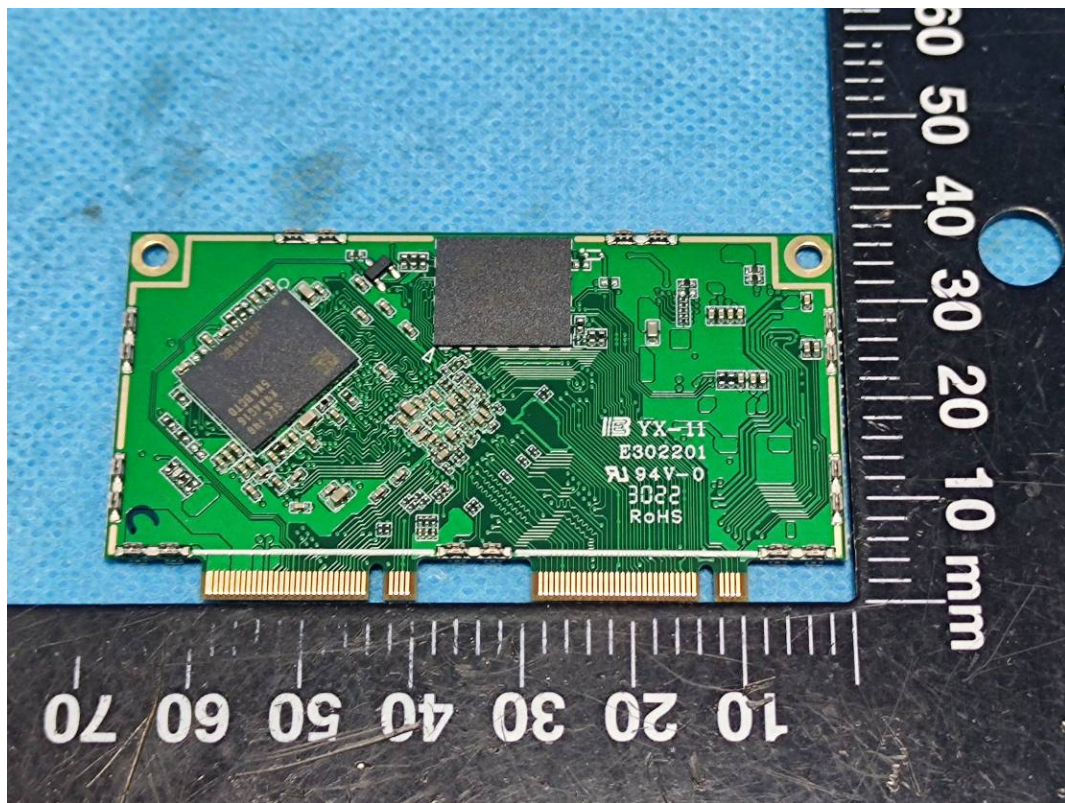


Chip

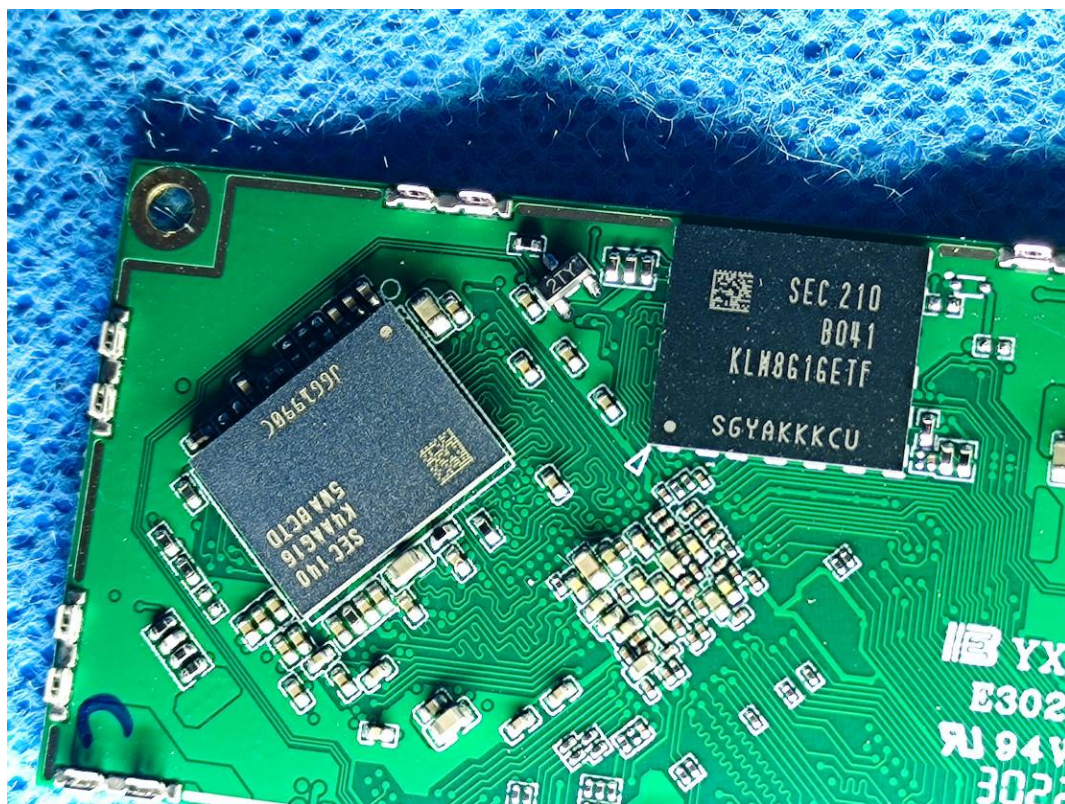


CPU Board (RV1126)

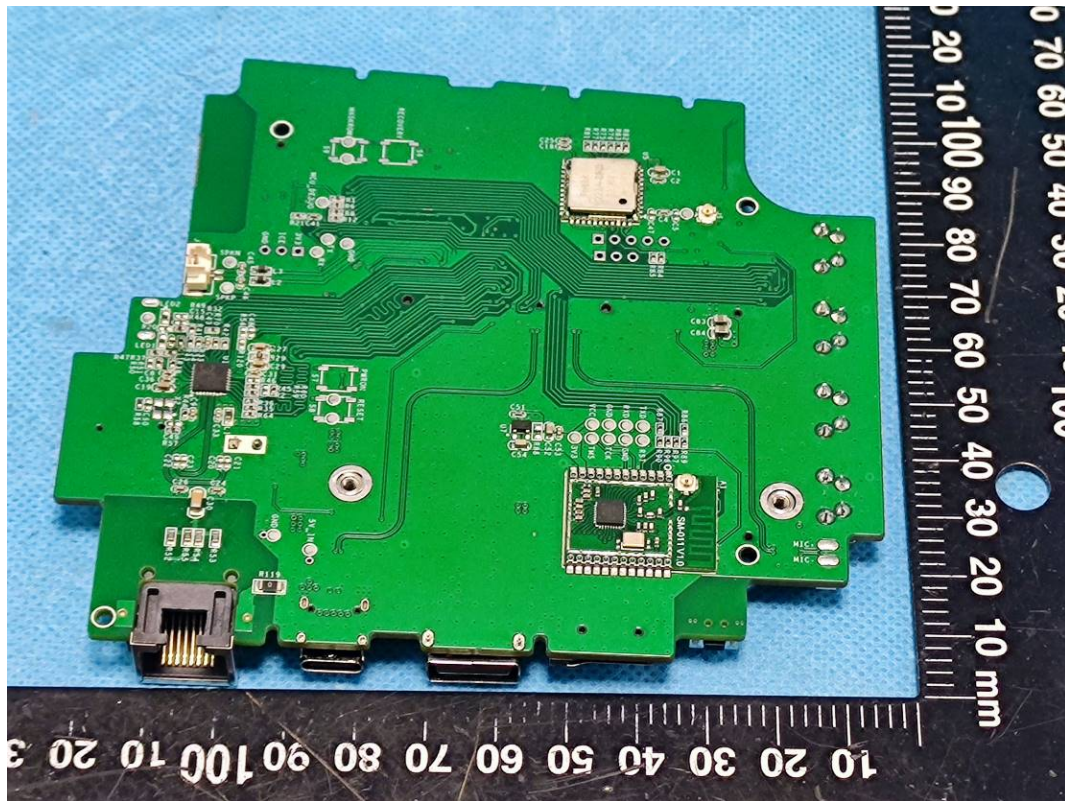




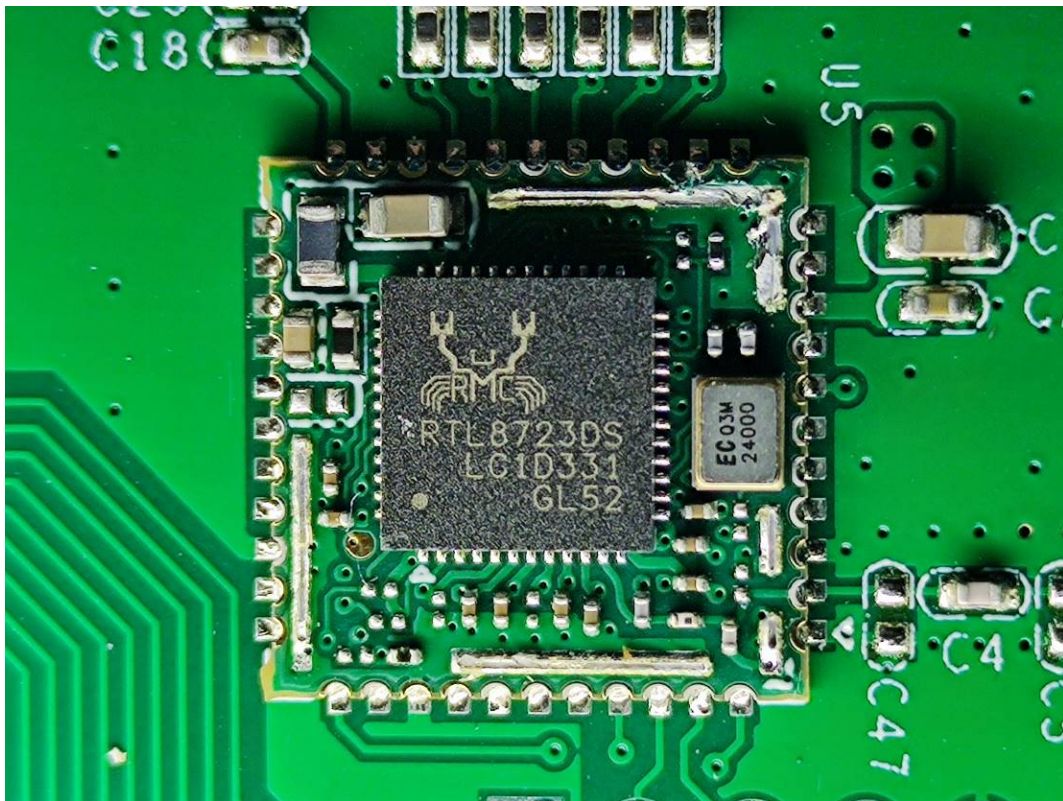
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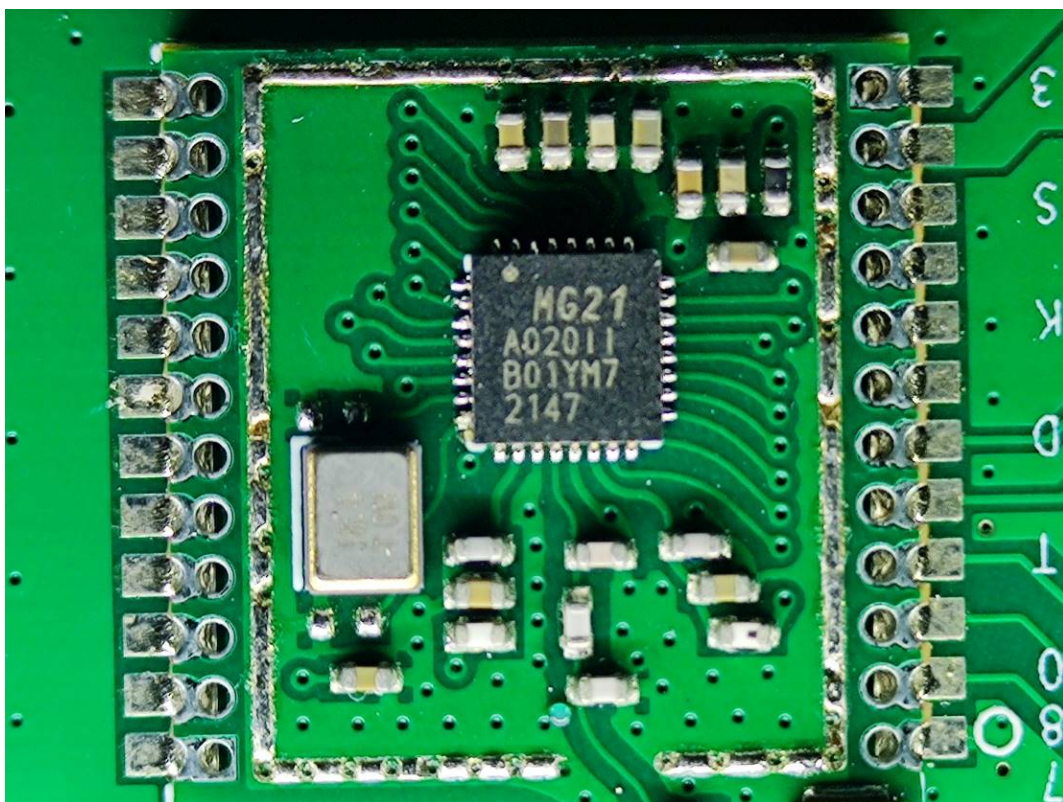


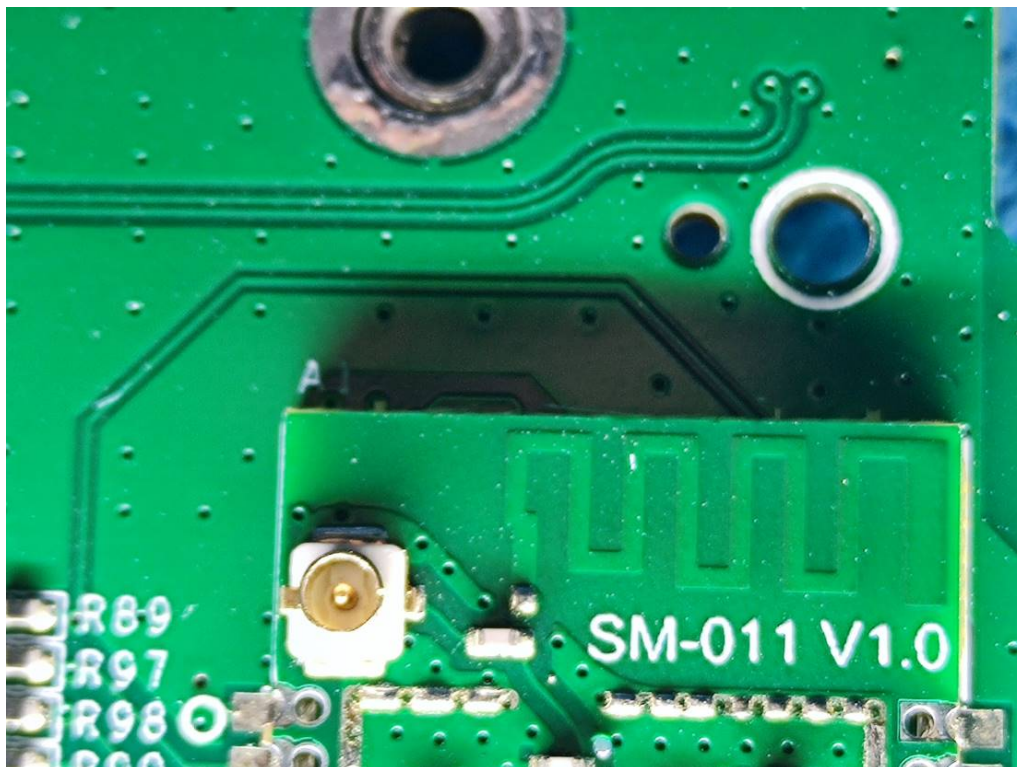


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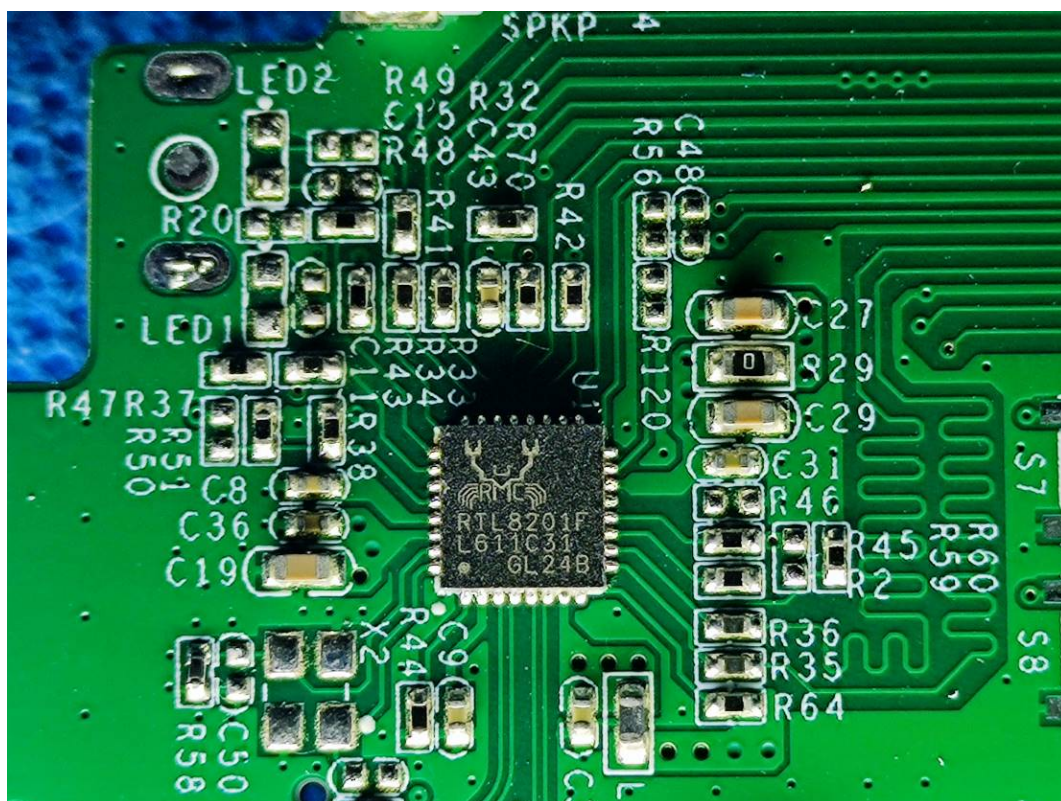
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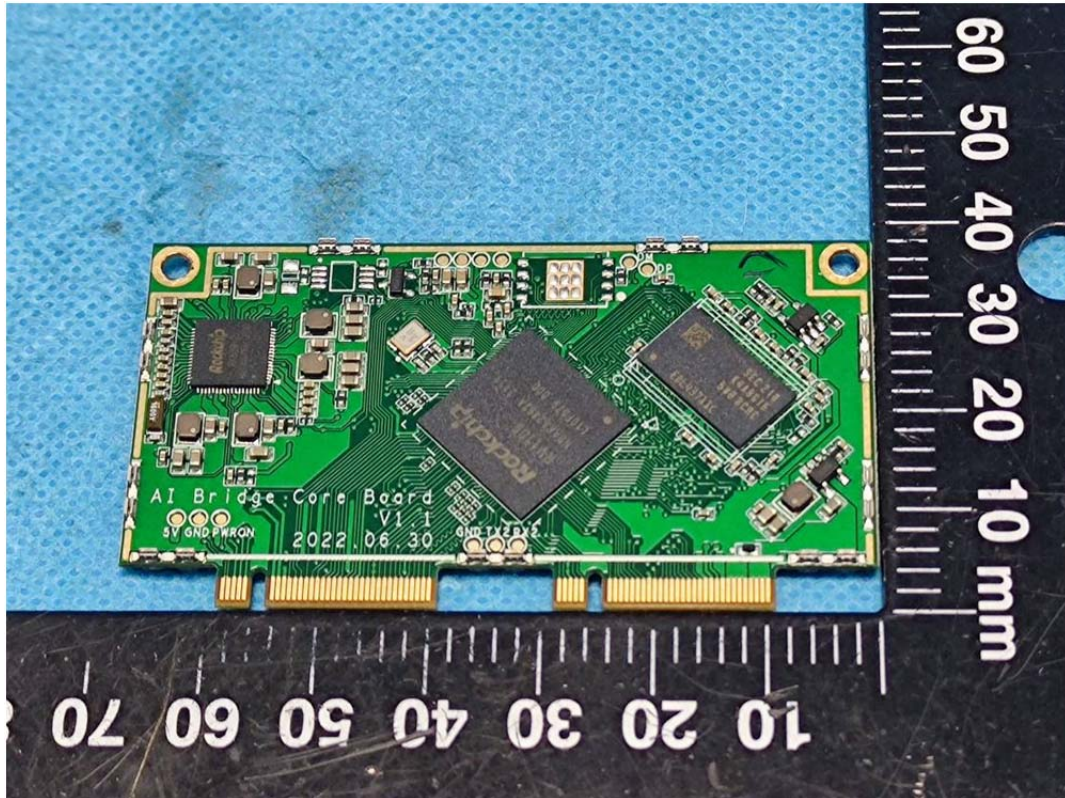
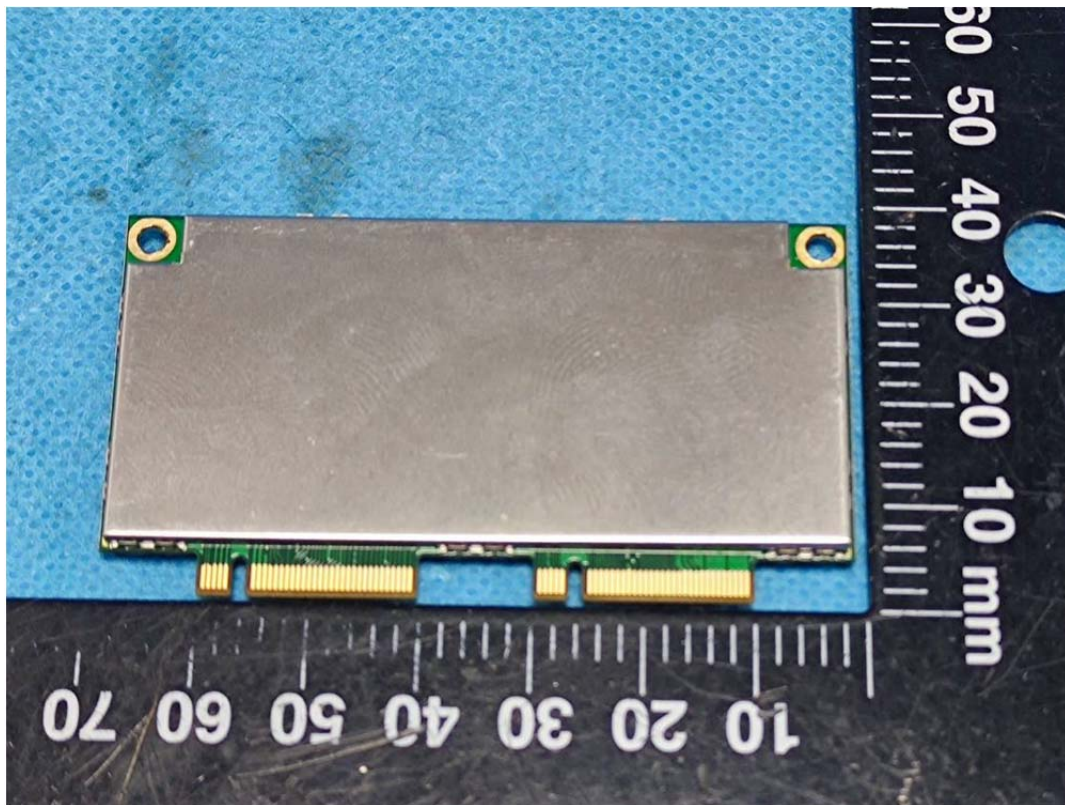


Note: The onboard antenna is not used.

Chip



CPU Board (RV1109)

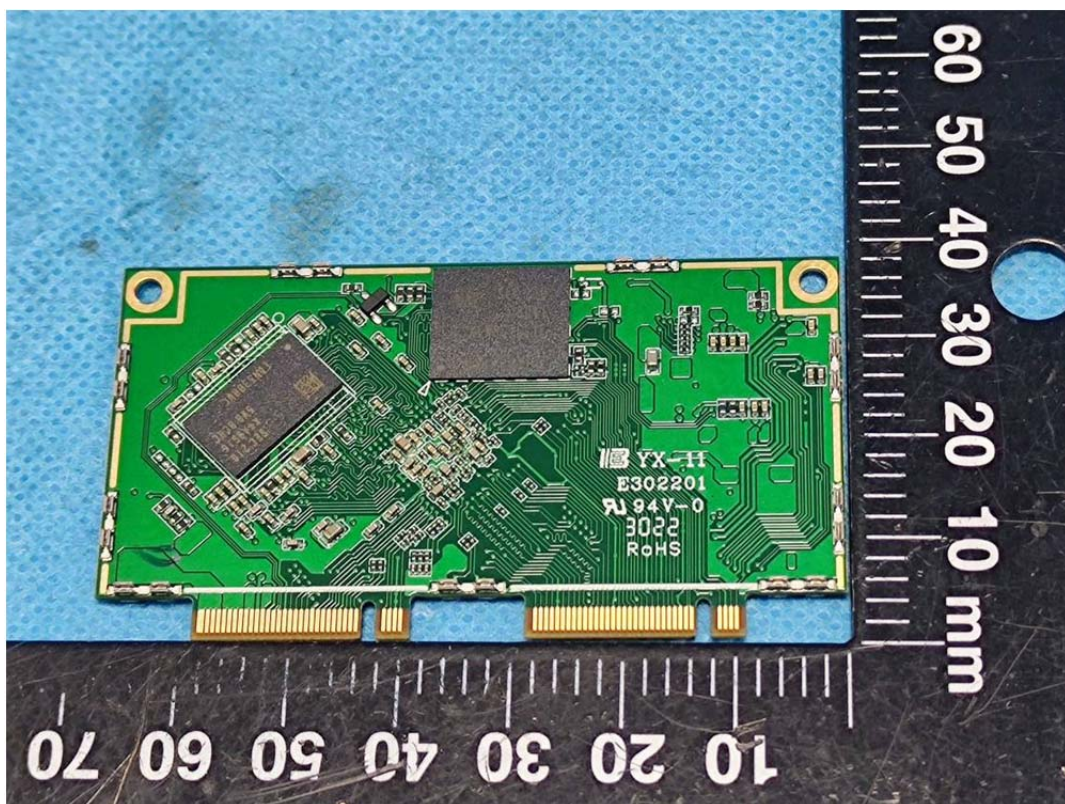
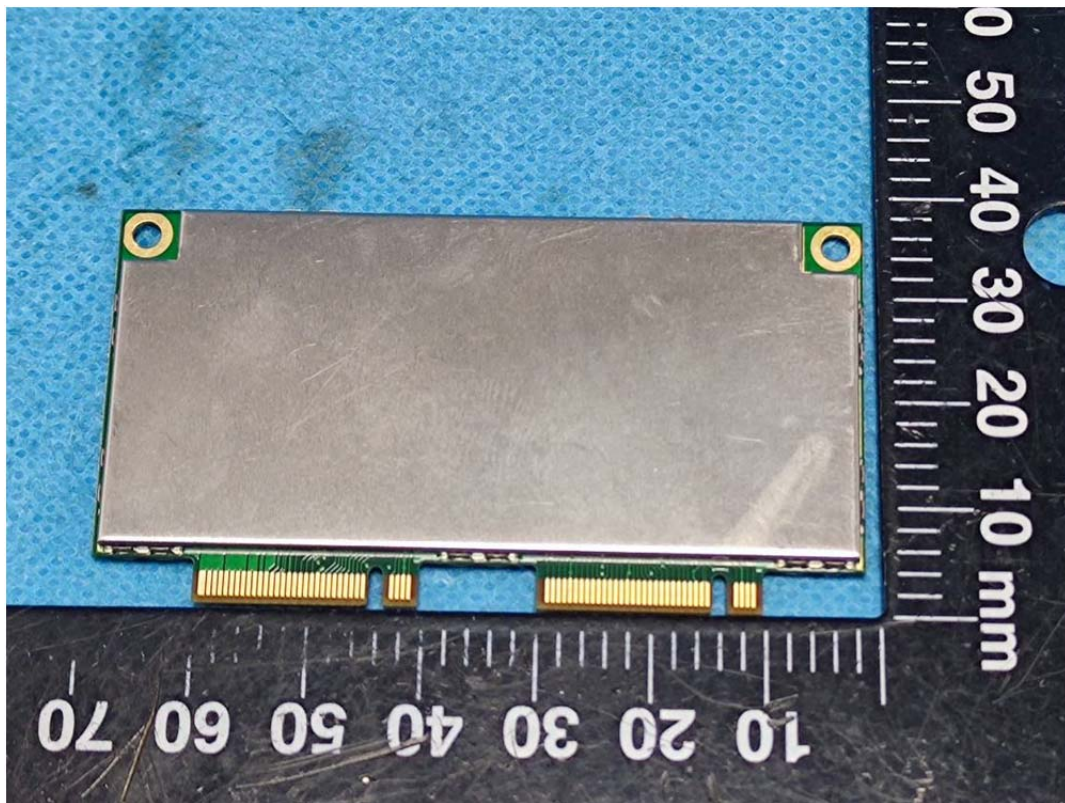


Chip



Chip





Chip





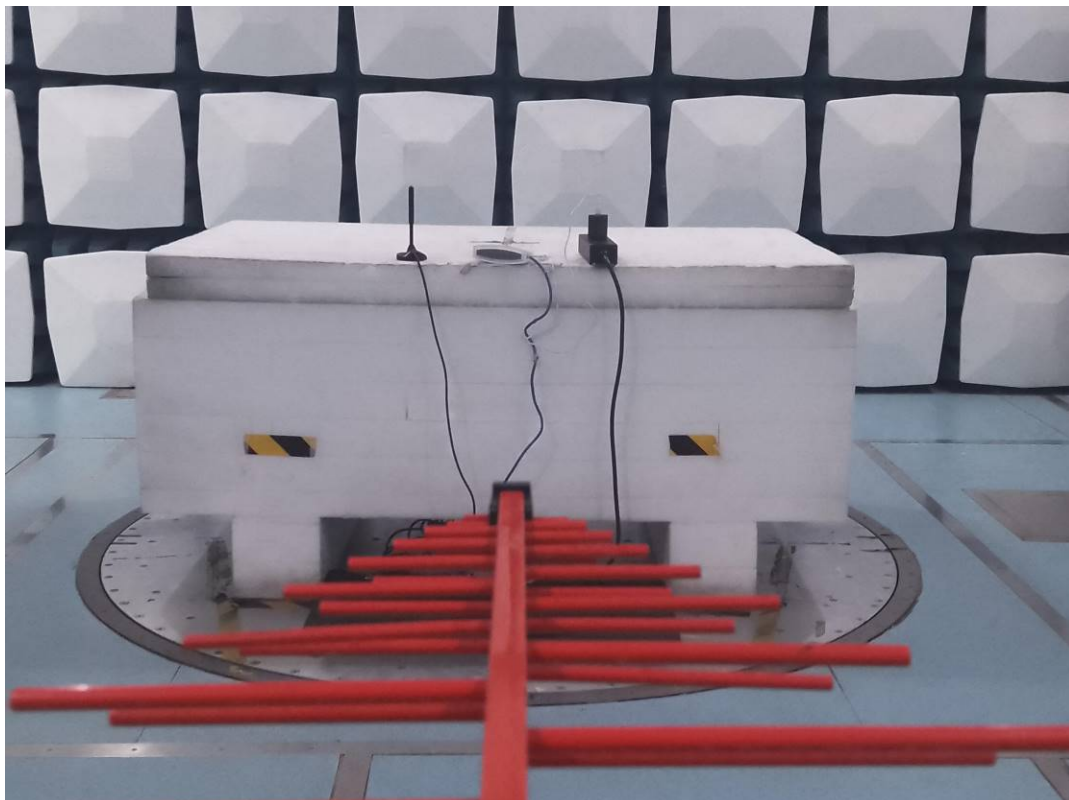
EXHIBITB - TEST SETUP PHOTOGRAPHS

RE

RE Below 1GHz front View



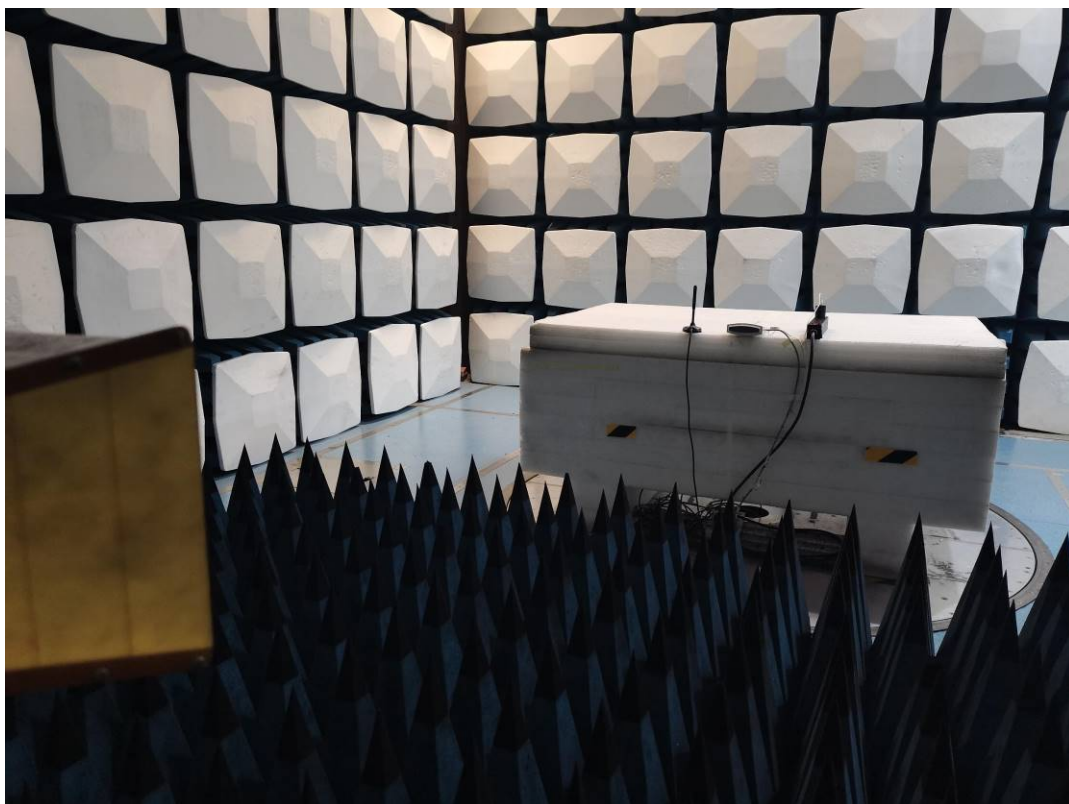
RE Below 1GHz rear View



RE Above 1GHz front View



RE Above 1GHz rear View



CE_AC

CE front View



CE side View

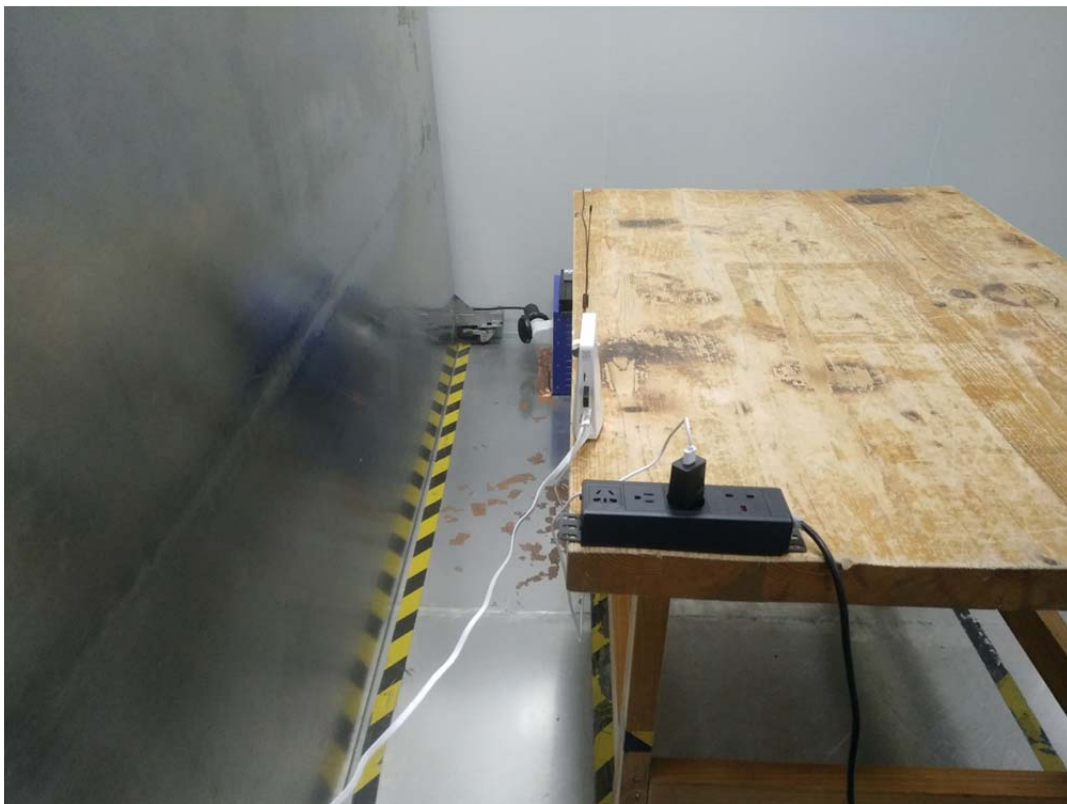


CE_ISN

CE front View



CE side View



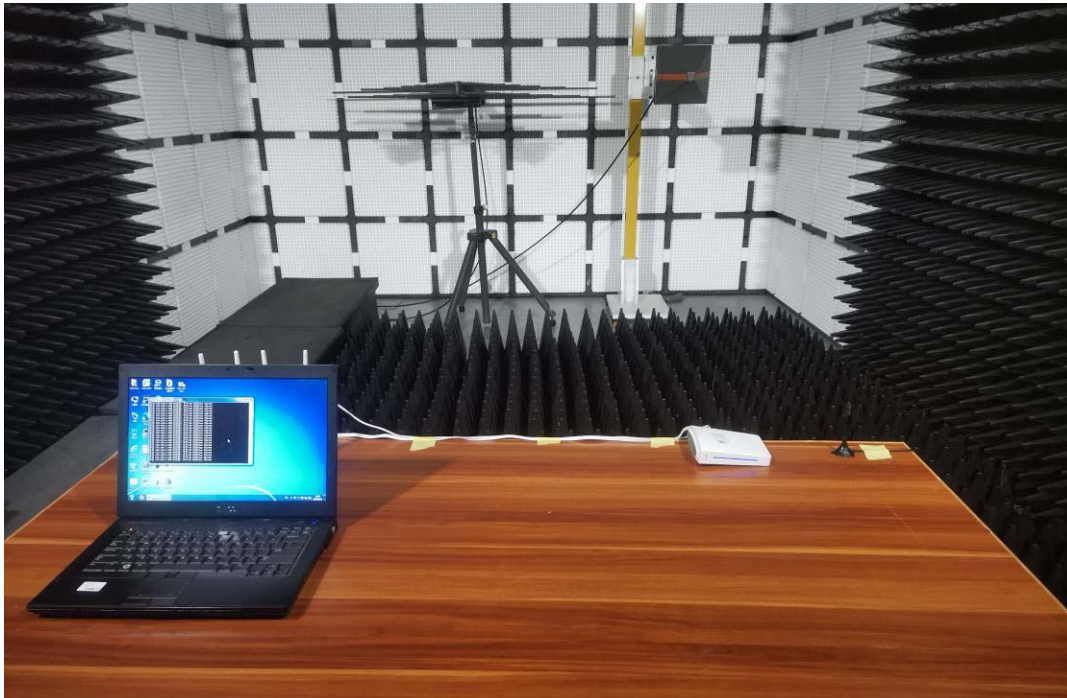
Flicker

Test Setup Photo View M1



RS

Test Setup Photo View



ESD

Test Setup Photo View



EFT

Test Setup Photo View



Signal Port Test Setup Photo



Dips

Test Setup Photo View



Surge

Test Setup Photo View



Signal Port Test Setup Photo

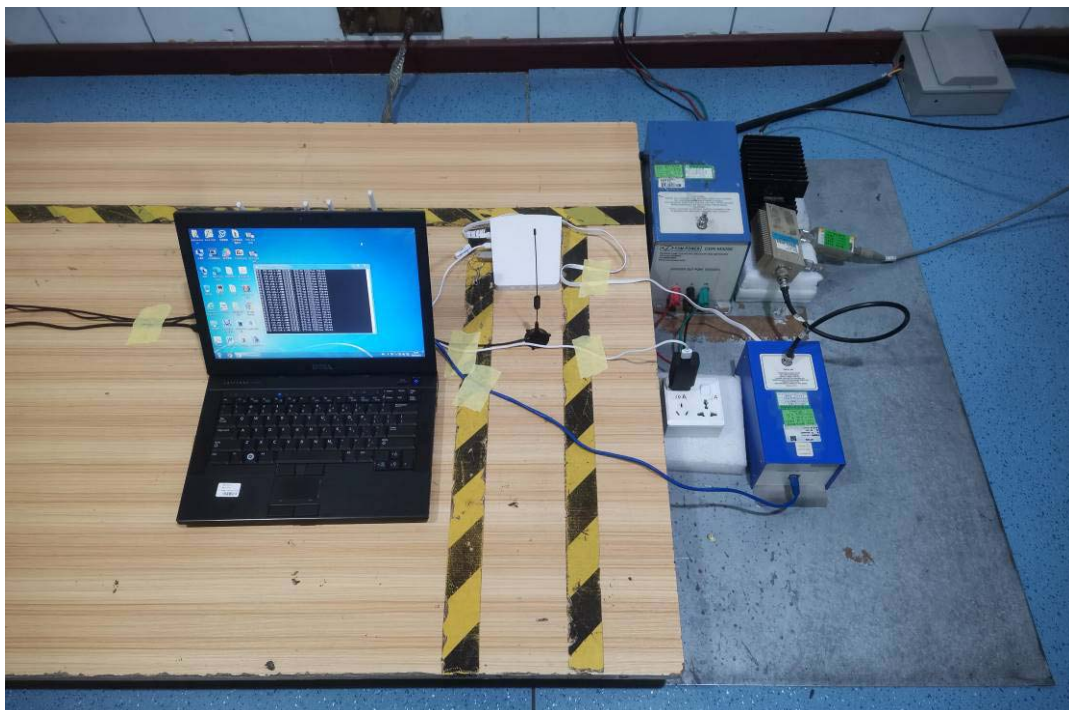


CS

Test Setup Photo View



Signal Port Test Setup Photo



*****END OF REPORT*****