

TEST REPORT

Report No.: SHE24090019-02DE

Date: 2024-10-29

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Applicant : PETKIT Network Technology (Shanghai) Co., Ltd.
Address of Applicant : Room 4139, Building 2, 588 Zixing Road, Minhang District, Shanghai

Product Name : PETKIT PURA MAX 2 SELF-CLEANING CAT LITTER BOX
Brand Name : PETKIT
Model Name : P9902
Sample Acquisition Method : Sent by Client

Sample No. : E24090019-01#02
E24090019-01#05

FCC ID : 2A72N-P9902

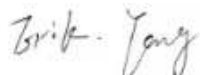
Standards : FCC CFR47 Part 15.247, Subpart C

Date of Receipt : 2024-09-10
Date of Test : 2024-10-09~ 2024-10-28
Date of Issue : 2024-10-29

Remark:

This report details the results of the testing carried out on one sample, the results contained in this report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

Prepared by:



(Erik Yang)

Reviewed by:



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Approved by:



(Authorized signatory: Echo Mu)

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1 General Information

1.1 Testing Laboratory

Company Name	ICAS Testing Technology Service (Shanghai) Co., Ltd.
Address	No.1298 Pingan Road, Minhang District, Shanghai, China
Telephone	0086 21-51682999
Fax	0086 21-54711112
Homepage	www.icasiso.com

1.2 Details of Application

Applicant Company Name	PETKIT Network Technology (Shanghai) Co., Ltd.
Address	Room 4139, Building 2, 588 Zixing Road, Minhang District, Shanghai
Contact Person	TingHe
Telephone	+86 13916991059
Email	ting.he@petkit.com
Manufacturer Company Name	Dongguan Zhihang Electronic Technology Co., LTD.
Address	Room 701, Building 15, No.1, Pushi Road I, Qiaotou Town, Dongguan City,Guangdong Province, China.
Factory Company Name	Dongguan Zhihang Electronic Technology Co., LTD.
Address	Room 701, Building 15, No.1, Pushi Road I, Qiaotou Town, Dongguan City,Guangdong Province, China.

1.3 Details of EUT

Product Name	PETKIT PURA MAX 2 SELF-CLEANING CAT LITTER BOX
Brand Name	PETKIT
Test Model Name	P9902
FCC ID	2A72N-P9902
Mode of Operation	Bluetooth LE Version 5.0
Frequency Range	2402MHz ~ 2480MHz
Number of Channels	40(at intervals of 2 MHz)
Modulation Type	Bluetooth LE ☒ GFSK 1Mbps ☐ GFSK 2Mbps
RF Output Power	1.17dBm
Antenna Type	PCB Antenna
Antenna Gain	3.71dBi
Extreme Temperature Range	0°C~ +40°C
Test Voltage	DC 12V 2A by Adapter (Model:TEKA-TD120200US)
Hardware Version	V2.3
Software Version	1.614

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RF power setting in TEST SW	Esp_RF_Test_Tool_v3.6_Manual_Power level setting_4dBm
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- Note:
- The above information was declared by the manufacture.
 - For more details, please refer to the User's manual of the EUT.

Channel List

Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2.402GHz	14	2.430GHz	28	2.458GHz
1	2.404GHz	15	2.432GHz	29	2.460GHz
2	2.406GHz	16	2.434GHz	30	2.462GHz
3	2.408GHz	17	2.436GHz	31	2.464GHz
4	2.410GHz	18	2.438GHz	32	2.466GHz
5	2.412GHz	19	2.440GHz	33	2.468GHz
6	2.414GHz	20	2.442GHz	34	2.470GHz
7	2.416GHz	21	2.444GHz	35	2.472GHz
8	2.418GHz	22	2.446GHz	36	2.474GHz
9	2.420GHz	23	2.448GHz	37	2.476GHz
10	2.422GHz	24	2.450GHz	38	2.478GHz
11	2.424GHz	25	2.452GHz	39	2.480GHz
12	2.426GHz	26	2.454GHz		
13	2.428GHz	27	2.456GHz		

1.4 Test Methodology

47 CFR Part 15, Subpart C	Telecommunication-Radio Frequency Devices-Intentional Radiators
KDB Publication 558074 D01 v05r02	15.247 Meas Guidance.
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Note(s):

All test items were verified and recorded according to the standards and without any addition/deviation/exclusion during the test.

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1.5 Test Summary

Test Item	FCC Rules	Result
Antenna Requirement	FCC Part 15.247(b)(4), Part 15.203	PASS
Maximum peak conducted output power	FCC Part 15.247(b)(3)	PASS
6dB Bandwidth	FCC Part 15.247(a)(2)	PASS
Maximum conducted output power spectral density	FCC Part 15.247(e)	PASS
Conducted Spurious Emission & Authorized-band band-edge	FCC Part 15.247(d)	PASS
Radiated Emission	FCC Part 15.247(d), 15.205, 15.209	PASS
Band Edge (Restricted-band band-edge)	FCC Part 15.247(d), 15.205, 15.209	PASS
Conducted Emission on AC Mains	FCC Part 15.207(a)	PASS

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2 Test Condition

2.1 Environmental conditions

Temperature (°C)	18-25
Humidity (%RH)	40-65
Barometric Pressure (mbar)	960-1060

2.2 Equipment List

Name of Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	Keysight	N9020B	MY59260184	2024-06-26	2025-06-25
Spectrum Analyzer	Rohde & Schwarz	FSV40N	101450	2024-06-04	2025-06-03
Signal Generator	Rohde & Schwarz	SMR27	100184	2024-06-26	2025-06-25
EMI Test Receiver	Rohde & Schwarz	ESPI3	100173	2024-06-05	2025-06-04
EMI Test Receiver	Rohde & Schwarz	ESR 7	101911	2024-06-04	2025-06-03
V-network	SCHWARZBECK	NSLK 8127	8127-902	2024-06-05	2025-06-04
Attenuator	SCHWARZBECK	VTSD 9561-FN	/	2024-06-05	2025-06-04
Broadband Antenna	SCHWARZBECK	VULB9163	9163-1037	2023-03-22	2025-03-21
Horn Antenna-18G	SCHWARZBECK	BBHA9120D	9120D-1775	2023-06-13	2025-06-12
Loop Antenna	SCHWARZBECK	FMZB 1513	/	2023-06-09	2025-06-08
Horn Antenna-40G	YINGLIAN	LB-180400-KF	N/A	2023-06-18	2025-06-17
Broadband Preamplifier	SCHWARZBECK	BBV 9718	346	2024-06-04	2025-06-03
EMC chamber 9*6*6(L*W*H)	CHANGNING	966	N/A	2023-06-09	2025-06-08
Shielded Enclosure 8*5*4(L*W*H)	CHANGNING	854	N/A	2023-06-09	2025-06-08
Test Software	BL	BL410_E	Version:2.1.1.436	N/A	N/A
Test Software	BL	BL410_R	Version:2.1.1.409	N/A	N/A

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2.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI. The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95.45%.

Parameter		Uncertainty
Antenna Port Conducted Emission		$\pm 1.04\text{dB}$
Radiated Emission	< 1GHz	$\pm 5.00\text{dB}$
	> 1GHz	$\pm 5.46\text{dB}$
Conducted Emission on AC Mains	150KHz-30MHz	$\pm 3.36\text{dB}$
Occupied Channel Bandwidth		$\pm 39.26\text{KHz}$
Maximum Conducted Output Power		$\pm 1.06\text{dB}$
Maximum Conducted Output Power Spectral Density		$\pm 1.12\text{dB}$

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3 Test Set-up and Operation Modes

3.1 Details of Test Mode

Using test software (ESP_RF_test_tool_v3.6_Manual) was control EUT work in continuous transmitter and receiver mode. Select test channel as below:

Channel	Frequency
The lowest channel(CH00)	2402MHz
The middle channel(CH19)	2440MHz
The Highest channel(CH39)	2480MHz

The basic operation modes are:

- A. On
1. BLE mode

a. Transmitting

i. Low Channel

ii. Middle Channel

iii. High Channel

b. Receiving
2. Normal working with Bluetooth on

B. Standby

C. Off

3.2 Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model Name	Serial No.
ADAPTER	SHENZHEN TEKA TECHNOLOGY CO., LTD.	TEKA-TD120200US	Input: AC 100-240V 50/60Hz 0.7A Max; Output: DC 12V 2A
Laptop 1	HP	HP ZHAN 66 Pro G1	5CD7438R1J
Laptop 2	Lenovo	TP00083A	PF-0PRDGN
USB Cable	N/A	N/A	1.00m Unshielded

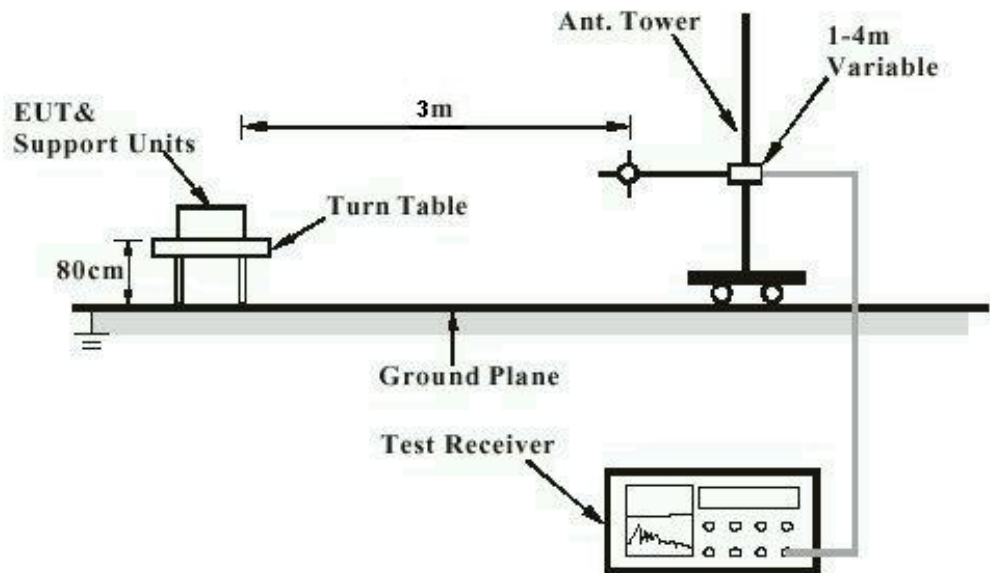
3.3 Support Software

Description	Manufacturer	Software Name
Software	ESPRESSIF	ESP_RF_test_tool_v3.6

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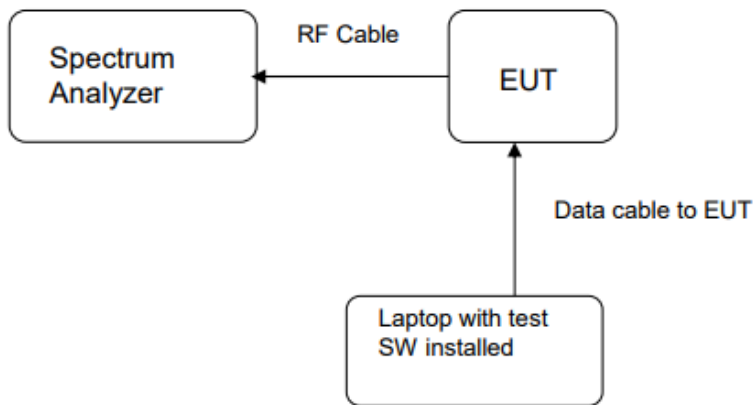
3.4 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

Diagram of Measurement Equipment Configuration for Transmitter Test



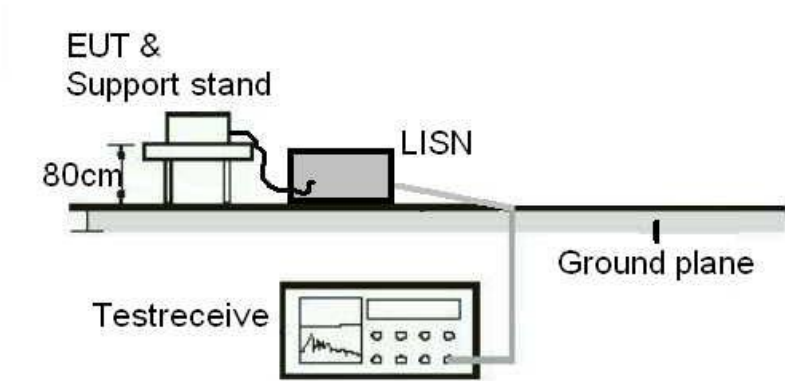
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Diagram of Measurement Configuration for Conduction Test



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4 Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Antenna Requirement

RESULT:

PASS

Test standard	: FCC Part 15.247(b)(4), Part 15.203
Requirement	: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. In addition, If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

According to the manufacturer declaration, an antenna with a directional gain of 3.71dBi. The antenna is PCB antenna with no possibility of replacement with a non-approved antenna by the end-user.

Therefore, the EUT is considered to comply with this provision.

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4.1.2 Maximum peak conducted output power

RESULT:

PASS

Test standard : FCC Part 15.247(b)(3)

Requirement : ANSI C63.10-2013 clause 11.9.1.1,
KDB 558074 D01 v05r02, Clause 8.3.1

Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 23.8°C

Relative humidity : 46%

Table 1: Maximum peak conducted output power

Test Mode	Test Channel (MHz)	Maximum peak conducted output power		Limit (W)
		(dBm)	(mW)	
BLE	2402	0.97	1.25	< 1
	2440	1.15	1.30	
	2480	1.17	1.31	

Figure 1: Peak Output Power, 2402MHz



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Figure 2: Peak Output Power, 2440MHz



Figure 3: Peak Output Power, 2480MHz



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4.1.3 6dB Bandwidth

RESULT:

PASS

Test standard : FCC Part 15.247(a)(2)

Requirement : ANSI C63.10-2013 clause 11.8.1,
KDB 558074 D01 v05r02, Clause 8.2

Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 23.8°C

Relative humidity : 46%

Table 2: 6dB Bandwidth

Test Mode	Test Channel (MHz)	6dB Bandwidth (MHz)	Limit
BLE	2402	0.6377	≥0.5 MHz
	2440	0.6380	
	2480	0.6183	

Figure 4: 6dB Bandwidth, 2402MHz



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Figure 5: 6dB Bandwidth, 2440MHz



Figure 6: 6dB Bandwidth, 2480MHz



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4.1.4 Maximum conducted output power spectral density

RESULT:

PASS

Test standard : FCC Part 15.247(e)

Requirement : ANSI C63.10-2013 clause 11.10.2,
KDB 558074 D01 v05r02, Clause 8.4

Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

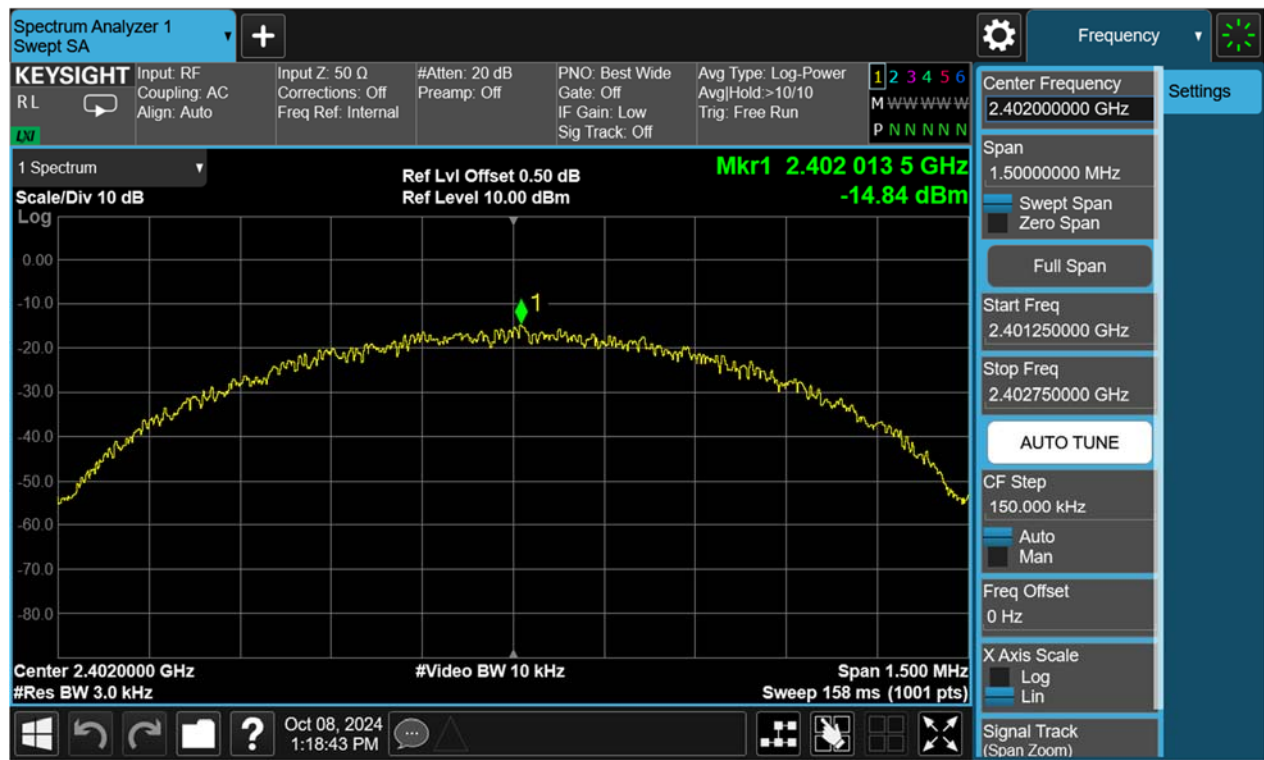
Ambient temperature : 23.8°C

Relative humidity : 46%

Table 3: Maximum conducted output power spectral density

Test Mode	Test Channel (MHz)	Measured Result (dBm/3kHz)	Limit (dBm/3kHz)
BLE	2402	-14.84	8
	2440	-14.41	
	2480	-14.65	

Figure 7: Power Spectral Density, 2402MHz



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Figure 8: Power Spectral Density, 2440MHz



Figure 9: Power Spectral Density, 2480MHz



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4.1.5 Conducted Spurious Emission & Authorized-band band-edge

RESULT: PASS

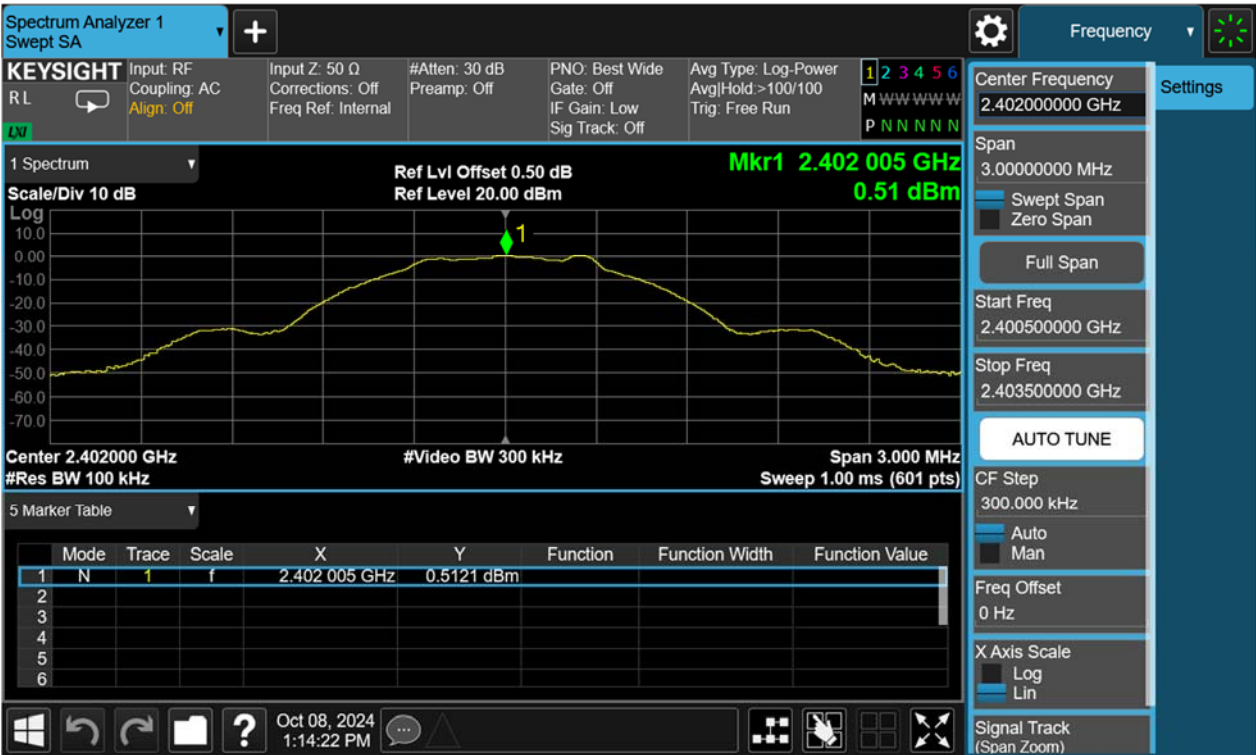
Test standard : FCC Part 15.247(d)
Requirement : ANSI C63.10-2013, Clause 11.11.1(a)
KDB 558074 D01 v05r02, Clause 8.5
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High for spurious, Low/High for Band Edge
Operation Mode : A.1.a
Ambient temperature : 23.8C
Relative humidity : 46%

For details refer to following test plot.

Figure 10: Conducted Spurious Emission & Authorized-band band-edge, 2402MHz, BLE Carrier Level



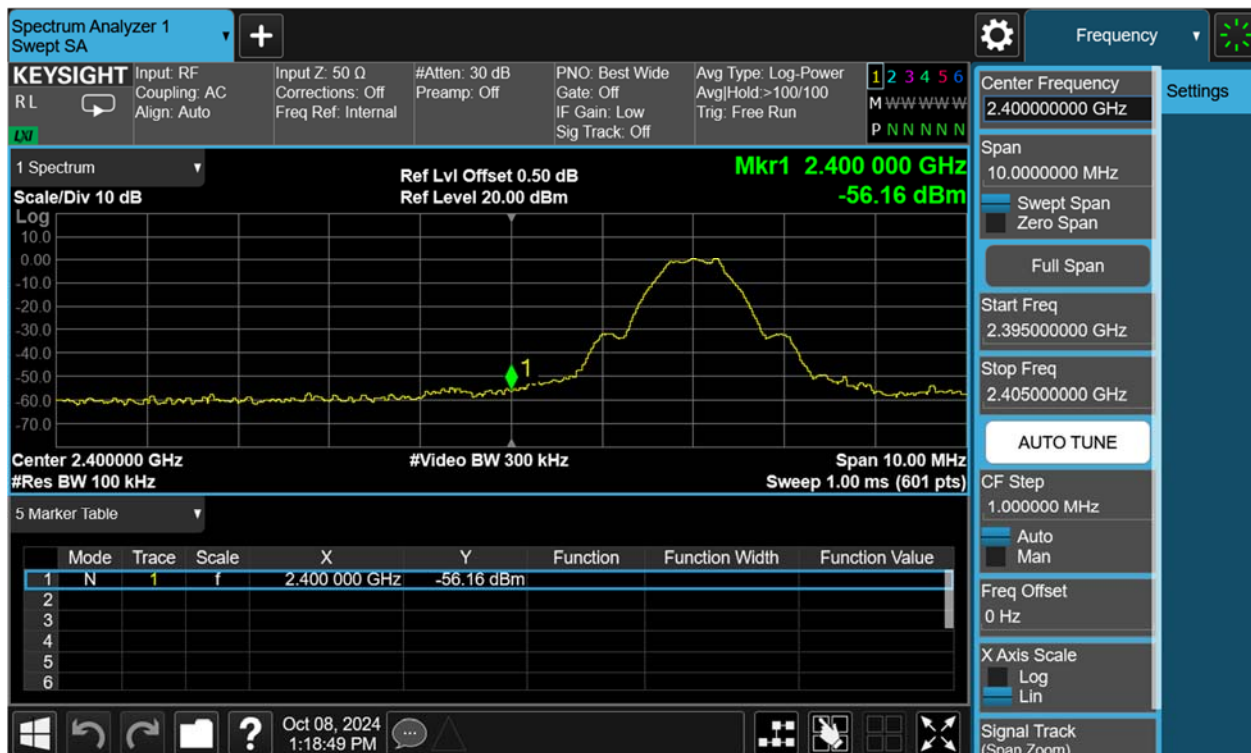
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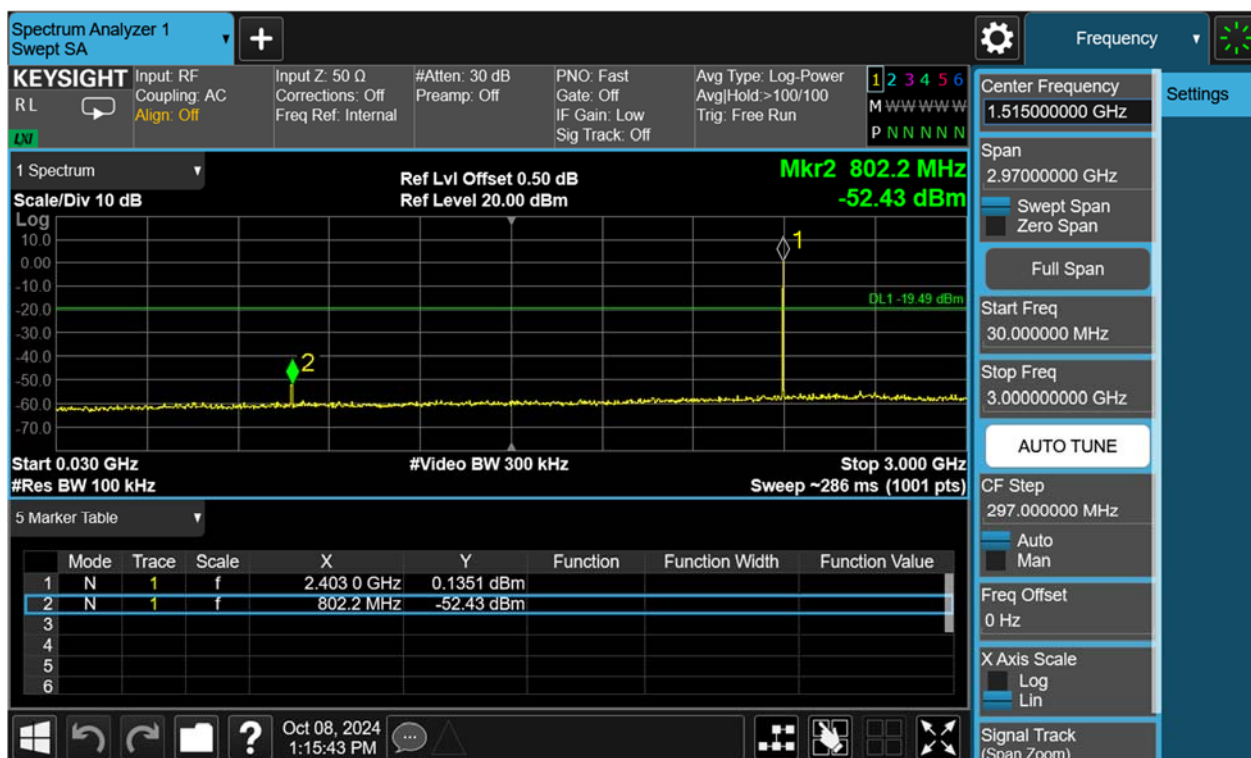
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Band Edge



Conducted spurious emissions 30MHz-25GHz

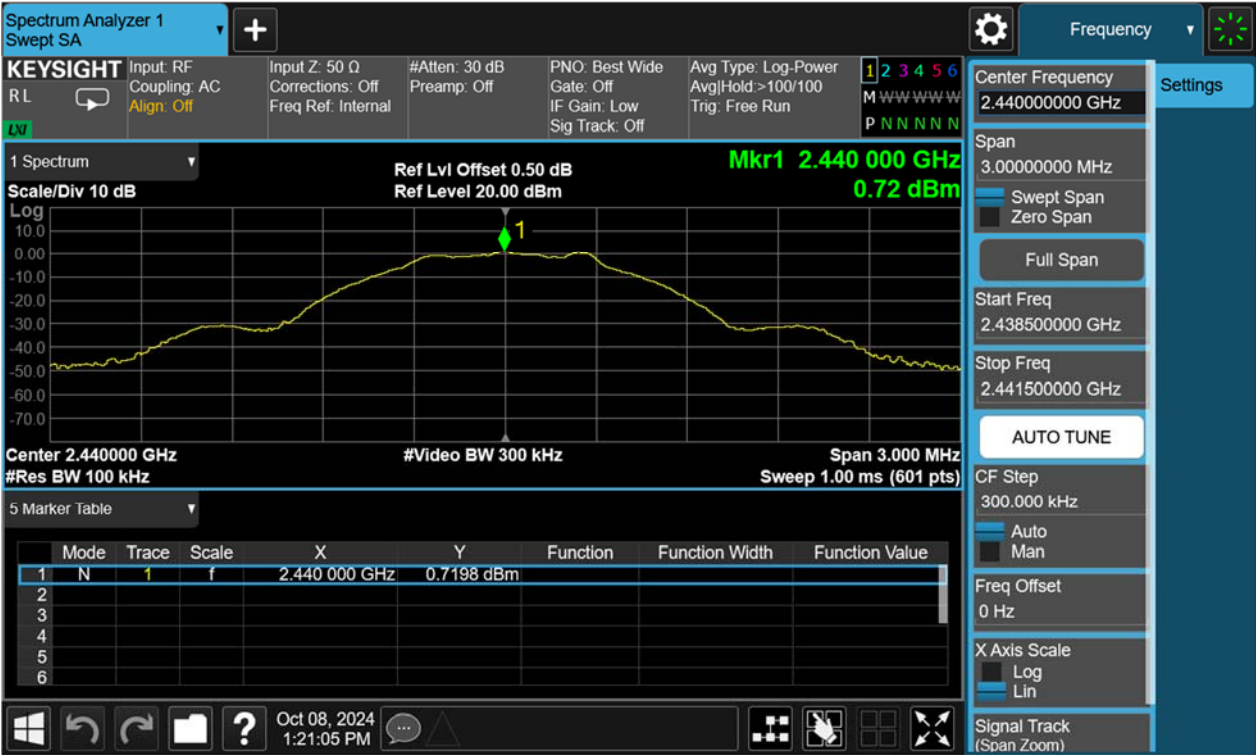


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Figure 11: Conducted Spurious Emission & Authorized-band band-edge, 2440MHz, BLE Carrier Level



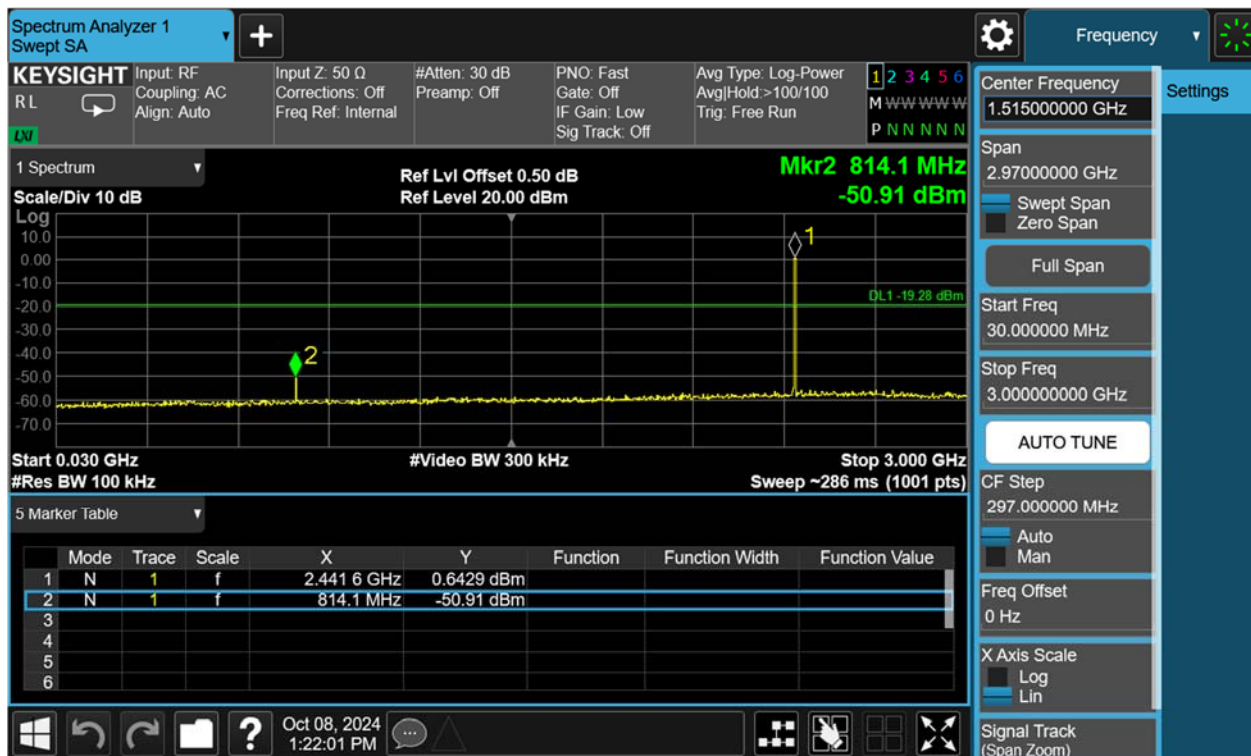
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Conducted spurious emissions 30MHz-25GHz



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Figure 12: Conducted Spurious Emission & Authorized-band band-edge, 2480MHz, BLE Carrier Level



Band Edge



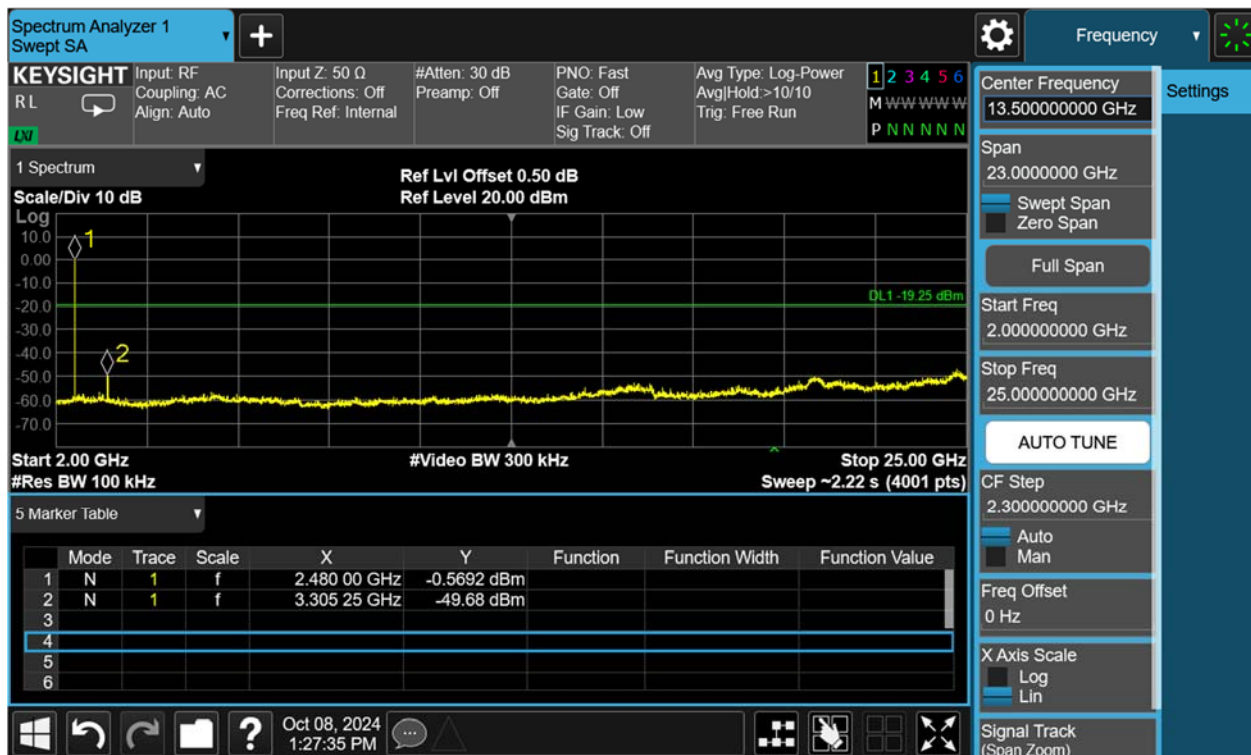
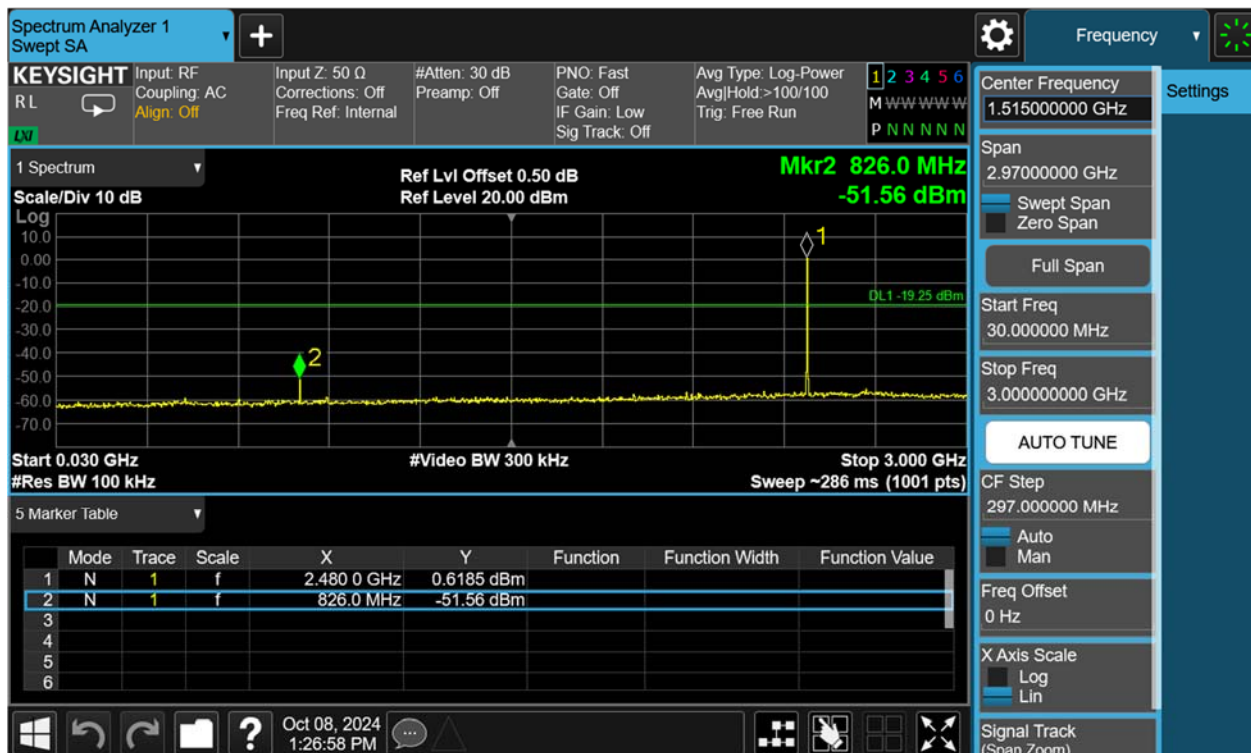
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Conducted spurious emissions 30MHz-25GHz



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4.1.6 Radiated Emission

RESULT: PASS

Test standard	: FCC Part 15.247(d), 15.205, 15.209
Requirement	: ANSI C63.10-2013 clause 11.12, KDB 558074 D01 v05r02, Clause 8.6
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/Middle/High
Operation Mode	: A
Ambient temperature	: 23.6°C
Relative humidity	: 44%

Notes

Test plots please refer to the annex document “SHE24090019-02DE DATA BLE-TX EXHIBIT A”.

1. For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.
2. The spurious above 18GHz is noise only and 20dB below the limit. The value has no need to be reported.
3. All test modes had been pre-tested, but only the BLE at low channel of below 1 GHz is the worst case and recorded in the report.
4. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

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4.1.7 Band Edge (Restricted-band band-edge)

RESULT:

PASS

Test standard : FCC Part 15.247(d), 15.205, 15.209

Requirement : ANSI C63.10-2013 clause 11.13,
KDB 558074 D01 v05r02, Clause 8.7

Kind of test site : 3m Semi-Anechoic Chamber

Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1

Ambient temperature : 23.6°C

Relative humidity : 44%

Notes

Test plots please refer to the annex document "SHE24090019-02DE DATA BLE-TX EXHIBIT A".

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4.2 Mains Emissions

4.2.1 Conducted Emission on AC Mains

RESULT:

PASS

Test standard	: FCC Part 15.207(a)
Requirement	: ANSI C63.10-2013, Clause 6.2
Kind of test site	: Shielded room

Test setup

Input Voltage	: DC 12V supply by AC adapter (which received AC 120V, 60Hz)
Operation Mode	: A.1.a
Earthing	: Disconnected to GND
Ambient temperature	: 22.9°C
Relative humidity	: 53%

For details refer to following test plot.

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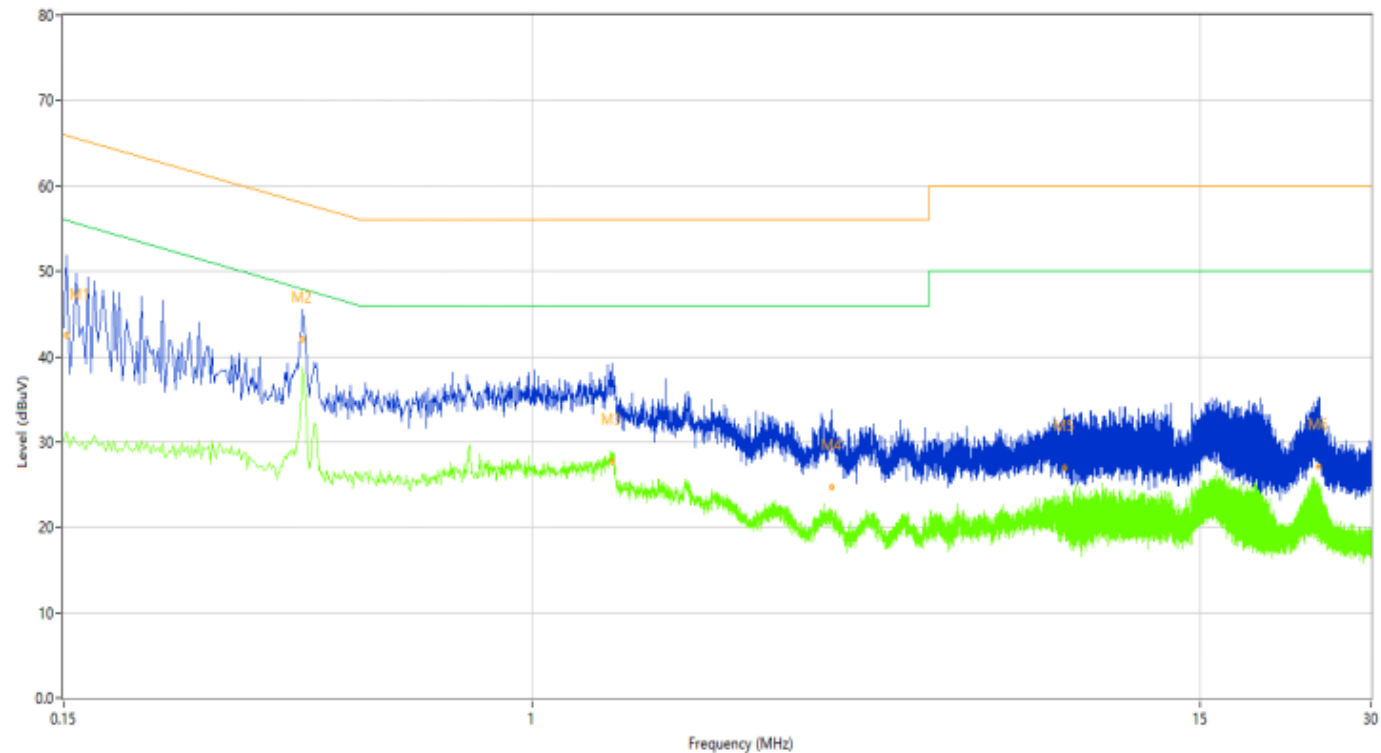
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Note: The all configurations were tested respectively, but only the worst data (at low channel) shown here.

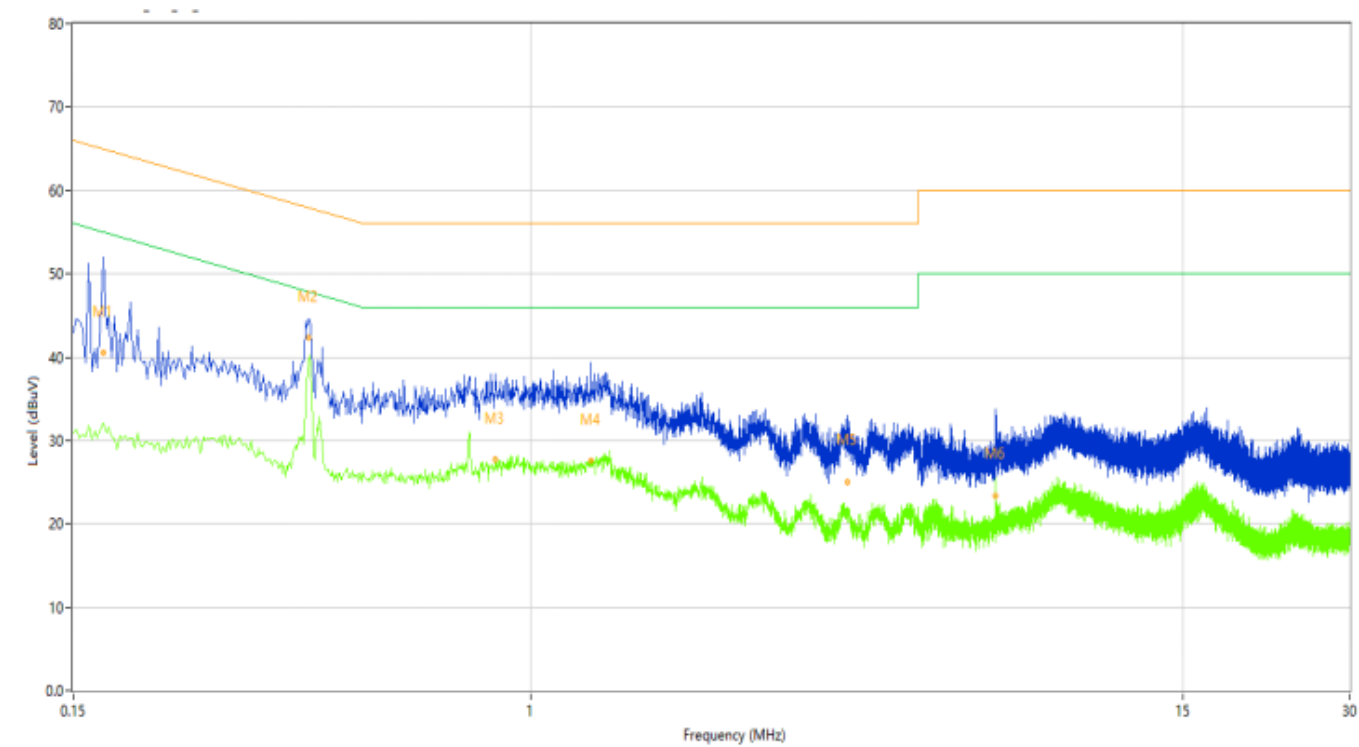
Figure 13: Conducted Emission on AC Mains, L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.152	57.45	10.25	65.89	8.44	Peak	L	Pass
1*	0.152	42.54	10.25	65.89	23.35	QP	L	Pass
1**	0.152	31.26	10.25	55.89	24.63	AV	L	Pass
2	0.396	46.15	10.24	57.94	11.79	Peak	L	Pass
2*	0.396	41.98	10.24	57.94	15.96	QP	L	Pass
2**	0.396	38.68	10.24	47.94	9.26	AV	L	Pass
3	1.386	34.82	10.19	56.00	21.18	Peak	L	Pass
3*	1.386	27.78	10.19	56.00	28.22	QP	L	Pass
3**	1.386	27.21	10.19	46.00	18.79	AV	L	Pass
4	3.374	30.77	10.20	56.00	25.23	Peak	L	Pass
4*	3.374	24.73	10.20	56.00	31.27	QP	L	Pass
4**	3.374	21.55	10.20	46.00	24.45	AV	L	Pass
5	8.670	35.36	10.41	60.00	24.64	Peak	L	Pass
5*	8.670	27.00	10.41	60.00	33.00	QP	L	Pass
5**	8.670	24.21	10.41	50.00	25.79	AV	L	Pass
6	24.276	36.64	11.15	60.00	23.36	Peak	L	Pass
6*	24.276	27.14	11.15	60.00	32.86	QP	L	Pass
6**	24.276	22.98	11.15	50.00	27.02	AV	L	Pass

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Figure 14: Conducted Emission on AC Mains, N Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.170	58.71	10.15	64.96	6.25	Peak	N	Pass
1*	0.170	40.48	10.15	64.96	24.48	QP	N	Pass
1**	0.170	32.12	10.15	54.96	22.84	AV	N	Pass
2	0.398	44.67	10.13	57.90	13.23	Peak	N	Pass
2*	0.398	42.38	10.13	57.90	15.52	QP	N	Pass
2**	0.398	39.54	10.13	47.90	8.36	AV	N	Pass
3	0.866	37.29	10.13	56.00	18.71	Peak	N	Pass
3*	0.866	27.71	10.13	56.00	28.29	QP	N	Pass
3**	0.866	27.81	10.13	46.00	18.19	AV	N	Pass
4	1.290	34.12	10.03	56.00	21.88	Peak	N	Pass
4*	1.290	27.53	10.03	56.00	28.47	QP	N	Pass
4**	1.290	26.89	10.03	46.00	19.11	AV	N	Pass
5	3.732	33.43	10.15	56.00	22.57	Peak	N	Pass
5*	3.732	24.94	10.15	56.00	31.06	QP	N	Pass
5**	3.732	21.98	10.15	46.00	24.02	AV	N	Pass
6	6.904	32.82	10.26	60.00	27.18	Peak	N	Pass
6*	6.904	23.32	10.26	60.00	36.68	QP	N	Pass
6**	6.904	25.49	10.26	50.00	24.51	AV	N	Pass