FCC PART 15.247

TEST REPORT

For

AKUVOX (XIAMEN) NETWORKS CO., LTD.

10/F, No.56 Guanri Road, Software Park II, Xiamen 361009, China

FCC ID: 2AHCR-S532V1

Report Type:	**Product Name:**
Original Report	Door Phone

Report Number:	2407T77479E-RF-02
Report Date:	2024-12-13
Reviewed By:	Ash Lin
Approves By:	Miles Chen
Prepared By:	Bay Area Compliance Laboratories Corp. (Xiamen) Unit 102, No. 902 Meifeng South Road, Binhai West Avenue, Science and Technology Innovation Park, Torch High tech Zone XiaMen Tel: +86-592-3200111 www.baclcorp.com.cn

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REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	2407T77479E-RF-02	R1V1	2024-12-13	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	AKUVOX (XIAMEN) NETWORKS CO., LTD.
Product Name:	Door Phone
Tested Model:	S532
Firmware version:	V1.00
Software version:	532.30.1.19
Power Supply:	DC 12V from Adapter or DC 48V from PoE
Maximum Conducted Output Peak Power:	BLE: 9.17dBm
Frequency Range:	BLE: 2402~2480MHz
Modulation Technique:	BLE: GFSK
Antenna Type:	FPC
★Maximum Antenna Gain:	2dBi
EUT Received Status:	Good
Note: *1. The Maximum Antenna Gain was declared by manufacturer.* *2. All measurement and test data in this report was gathered from production sample serial number: 2LWH-1. (Assigned by the BACL(Xiamen). The EUT supplied by the applicant was received on 2024-05-23)*	

Objective

This report is prepared on behalf of *AKUVOX (XIAMEN) NETWORKS CO., LTD.* in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission's rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2020, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

And KDB 558074 D01 15.247 Meas Guidance v05r02.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Xiamen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Xiamen) to collect test data is located on the Unit 102, No. 902 Meifeng South Road, Binhai West Avenue, Science and Technology Innovation Park, Torch High tech Zone XiaMen.

Bay Area Compliance Laboratories Corp. (Xiamen) Lab is accredited to ISO/IEC 17025 by A2LA (Certificate Number: 7134.01) and the lab has been recognized as the FCC accredited lab under the KDB 974614 D01, the FCC Designation No. : CN1384.

Measurement Uncertainty

Item		U_{lab}
Conducted Emission	150kHz-30MHz	2.33 dB
Radiated Emission	9kHz-30MHz	2.59 dB
	30MHz~200MHz	4.38dB
	200MHz~1GHz	4.50dB
	1GHz~6GHz	4.58dB
	6GHz-18GHz	5.43dB
	18GHz~26.5GHz	5.47dB
Occupied Channel Bandwidth		0.053kHz
Transmitter Conducted Power(Conducted RF power)		0.624 dB
Conducted Spurious Emission		2.52 dB
Power Spectral Density		0.61dB
Duty Cycle		1%
Temperature		1℃
Humidity		5%
Supply voltages		0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

SYSTEM TEST CONFIGURATION

Test Mode and Voltage

The system was configured for testing in a typical mode (as normally used by a typical user).	
Test mode:	Transmitting
Test voltage:	DC 12V from adapter(AC 120V/60Hz) or DC 48V from PoE(AC 120V/60Hz)
Remark:	During all emission tests, the EUT was configured to measure its highest possible emission level and the worst case's test data was presented in this test report.

Description of Test Configuration

For BLE mode, 40 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

EUT was tested with Channel 0, 19 and 39.

Equipment Modifications

No modification was made to the EUT tested.

★EUT Exercise Software

RF Test Tool: EMI_Tool

Mode	Power level		
	Low channel	Middle channel	High channel
BLE 1Mbps	10	10	10

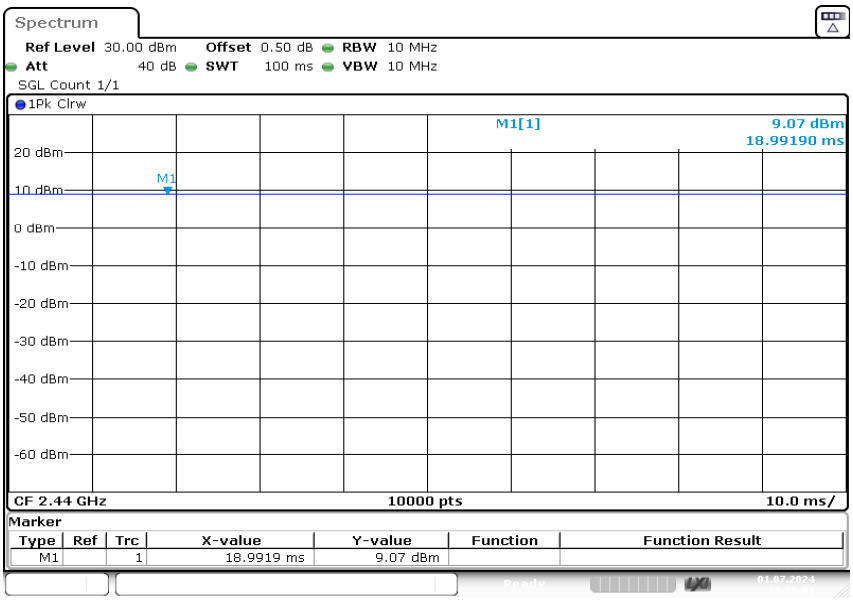
Note: the applicant declared the power level.

Duty cycle

Test Mode:	Transmitting	Test Engineer:	Stein Peng
Test Date:	2024-07-01	Environment:	Temp.: 23.6℃ Humi.: 60% Atm :100.2 kPa

Test Modes	Test Frequency (MHz)	Ton (ms)	Ton+off (ms)	Duty cycle (%)	1/T (Hz)	VBW Setting (KHz)
BLE 1Mbps	2440	100	100	100.00	10	0.01

BLE 1Mbps: Middle Channel



Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
NETGEAR	POE	MSIP-REN-NGR-GS108Ev3	3UJD1756006EB
SWITCHING ADAPTER	Adapter	FJ-SW126K1201000DU	Unknown
Router	Router	WS831	W6E7S15B09001200
BACL	Relay Load	Unknown	Unknown
BACL	RS 485 Load	Unknown	Unknown
BACL	Relay Load	Unknown	Unknown
Unknown	Exit Button	Unknown	Unknown
Unknown	Exit Button	Unknown	Unknown
Unknown	Exit Button	Unknown	Unknown
Unknown	Exit Button	Unknown	Unknown

External I/O Cable

For Adapter

Cable Description	Length (m)	From Port	To
Power cable	2	EUT	Adapter
Load cable	10	EUT	Relay Load
Load cable	10	EUT	RS 485 Load
Load cable	10	EUT	Relay Load
Network cable	10	EUT	Router
Load cable	10	EUT	Exit Button
Load cable	10	EUT	Exit Button
Load cable	10	EUT	Exit Button
Load cable	10	EUT	Exit Button

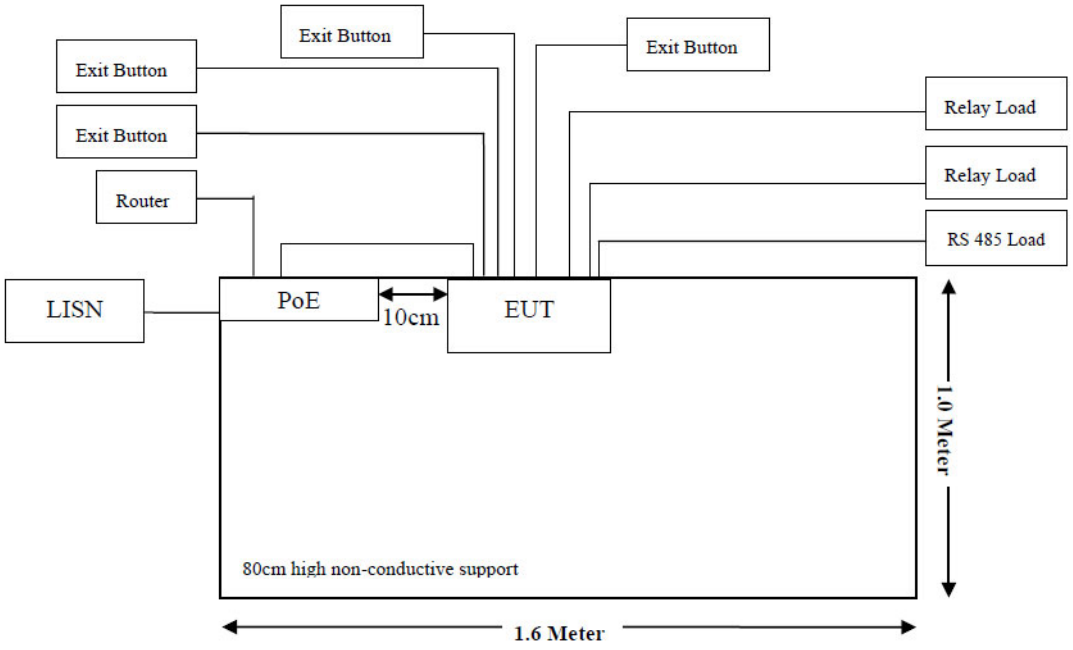
For PoE

Cable Description	Length (m)	From Port	To
Network cable	1	EUT	POE
Load cable	10	EUT	Relay Load
Load cable	10	EUT	RS 485 Load
Load cable	10	EUT	Relay Load
Network cable	10	POE	Router
Load cable	10	EUT	Exit Button
Load cable	10	EUT	Exit Button
Load cable	10	EUT	Exit Button
Load cable	10	EUT	Exit Button

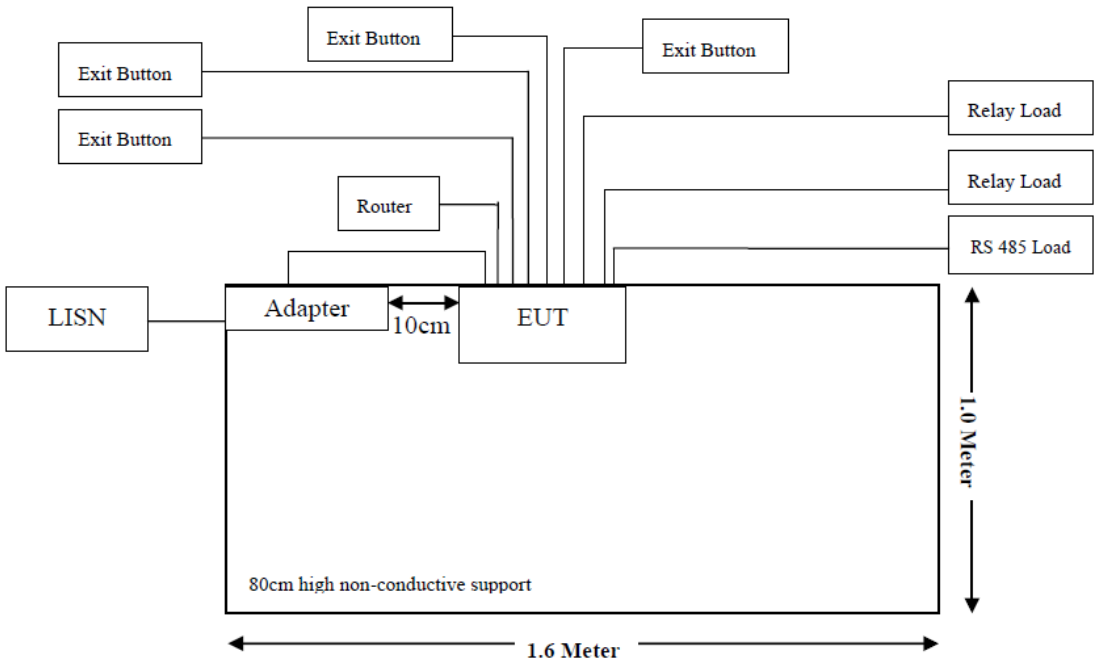
Block Diagram of Test Setup

Conducted Emission:

Powered by PoE

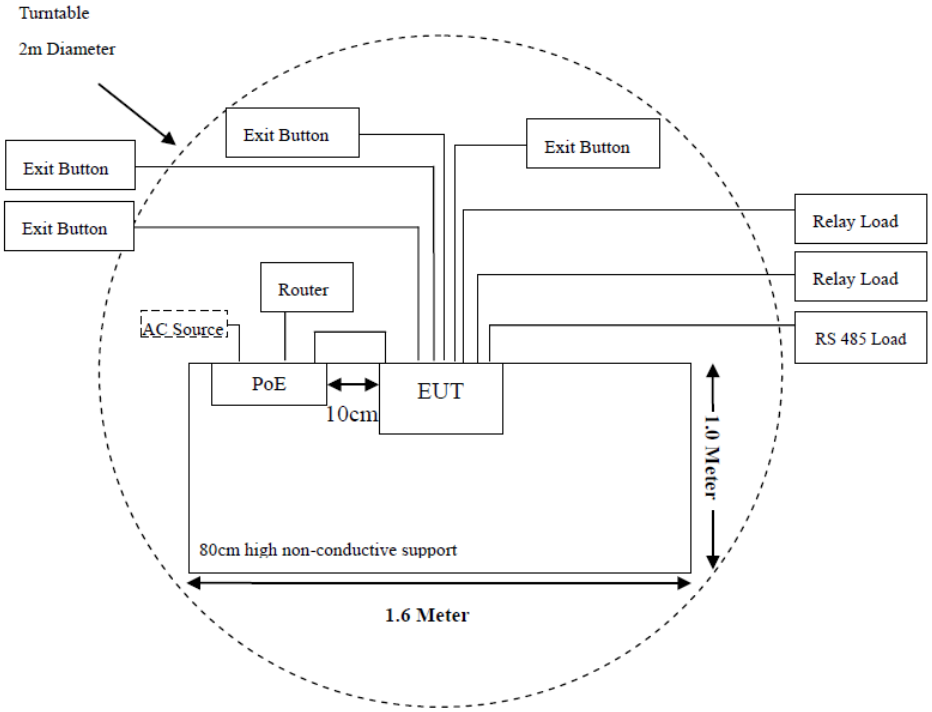


Powered by Adapter

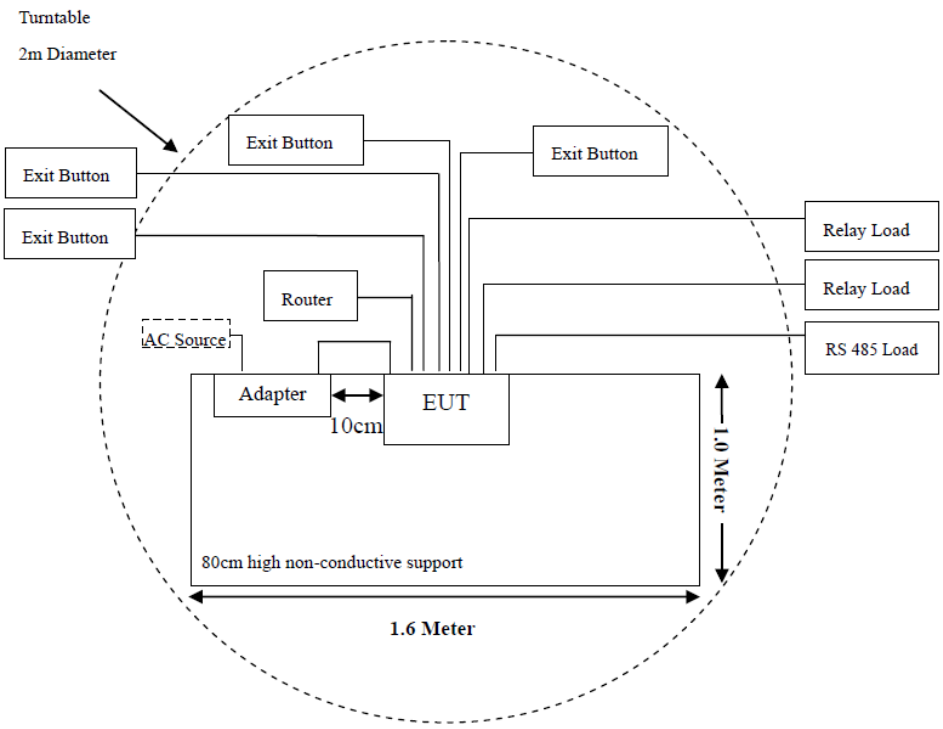


Radiated Emission
Below 1GHz

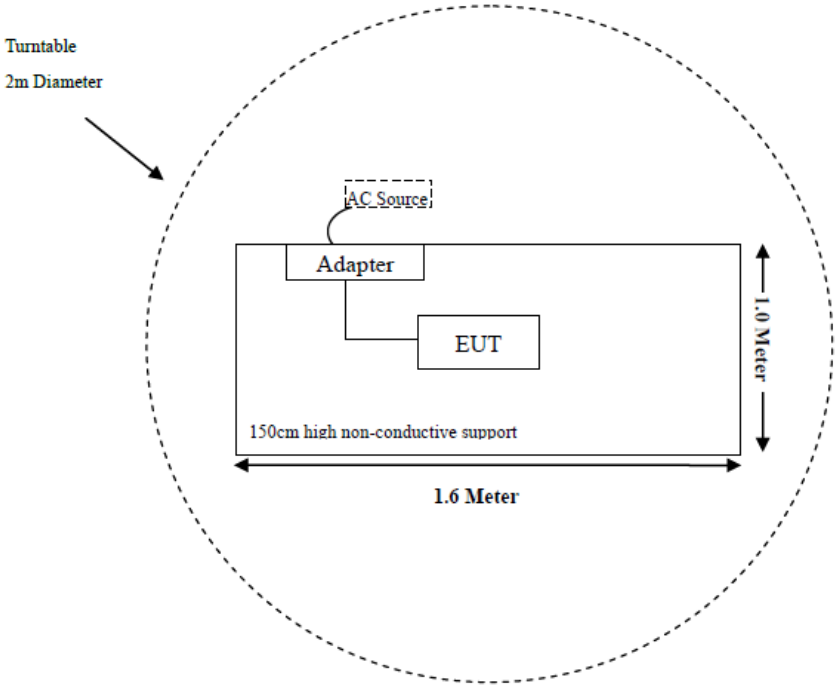
Powered by PoE



Powered by Adapter



Above 1GHz
Powered by Adpater



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207(a)	AC Line Conducted Emissions	Compliant
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliant
§15.247(a)(2)	6 dB Emission Bandwidth	Compliant
§15.247(b)(3)	Maximum Conducted Output Power	Compliant
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliant
§15.247(e)	Power Spectral Density	Compliant

TEST EQUIPMENT LIST

Test Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions					
EMI Test Receiver	Rohde & Schwarz	ESR3	103105	2024/03/29	2025/03/28
LISN	Rohde & Schwarz	ENV216	100129	2024/03/29	2025/03/28
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	0357.8810.54	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC001	2024/03/29	2025/03/28
Test Software	Audix	E3	18621a	N/A	N/A
Radiated Emissions Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESR3	103103	2024/03/29	2025/03/28
Loop Antenna	Rohde & Schwarz	HFH2-Z2	830749/001	2023/07/27	2026/07/26
Antenna	Sunol Sciences	JB6	A122022-5	2023/07/27	2026/07/26
Amplifier	Sonoma	310B	120903	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC002	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH460B-N-2M	CC006	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH460B-N-12M	CC007	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	HFH2-CC	335.3609	2024/03/29	2025/03/28
Test Software	Audix	E3	18621a	N/A	N/A
Radiated Emissions Above 1 GHz					
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102051	2024/03/29	2025/03/28
Double Ridge Guide Horn Antenna	A.H.Systems	SAS-571	1980	2023/07/28	2026/07/27
Horn Aantenna	EMCO	3115	9002-3355	2024/11/19	2027/11/18
Horn Antenna	EMCO	3116	9407-2232	2023/07/31	2026/07/30
Preamplifier	A.H.Systems	PAM-0118P	489	2024/03/29	2025/03/28
Preamplifier	A.H.Systems	PAM-1840	200	2024/03/29	2025/03/28
Multiplex Switch Test Control Set	Decentest	DT7220SCU	DS79901	2024/02/23	2025/02/22
Filter Switch Unit	Decentest	DT7220FSU	DS79904	2024/02/23	2025/02/22
Coaxial Cable	XINHANGWEIBO	XH800A-N-6M	CC003	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH800A-N-1M	CC005	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH360A-2.92-3M	CC008	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH360A-2.92-1M	CC009	2024/03/29	2025/03/28
Test Software	Audix	E3	18621a	N/A	N/A
RF Conducted Test					
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102051	2024/03/29	2025/03/28
Coaxial Cable	N/A	N/A	N/A	Each time	N/A

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

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, 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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.
And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has one FPC antenna arrangement for BLE, which was permanently attached and the antenna gain is 2 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

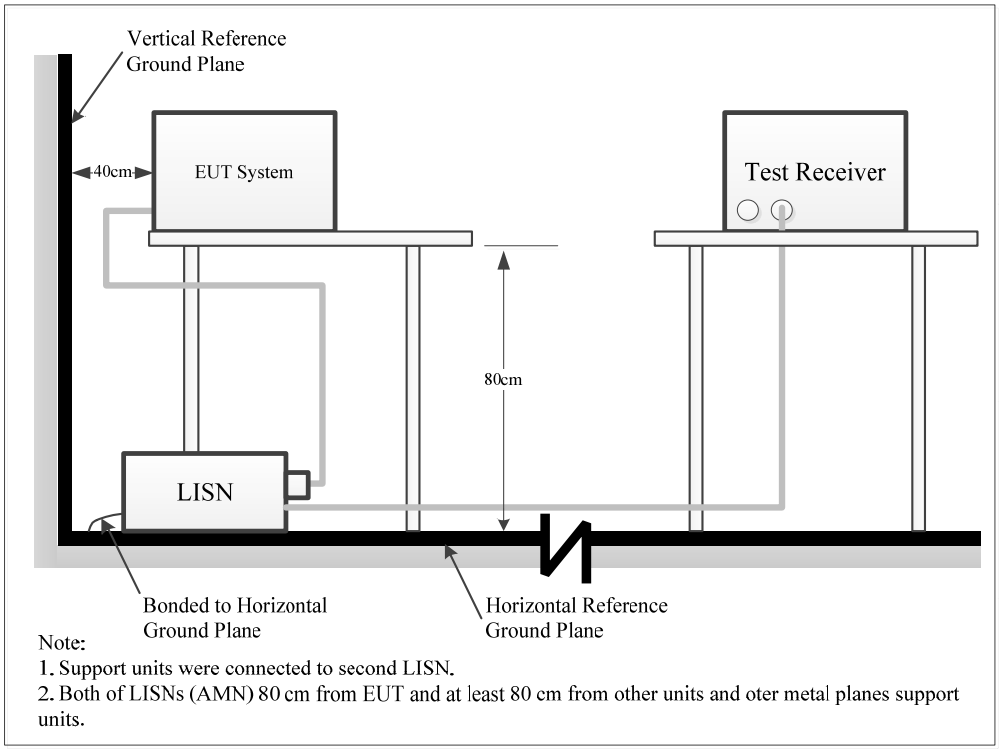
Result: Compliant

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

EUT Setup



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

The setup of EUT is according with per ANSI C63.10-2020 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

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

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

Frequency Range	RBW	VBW	Detector
150 kHz – 30 MHz	9 kHz	30 kHz	QP/AV

Test Procedure

ANSI C63.10-2020 clause 6.2

During the conducted emission test, the adapter was connected to the outlet of the LISN.

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

If the maximum peak value of the emissions is below the average limit, the QP value and average value measurement will not need to be performed and only record the maximum peak measured value to meet the requirements.

Result &Margin Calculation

The Result is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation from the Meter Reading. The basic equation is as follows:

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
Result (dBμV) = Reading (dBμV) + Factor (dB)

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 (dB) = Limit (dBμV) –Result (dBμV)

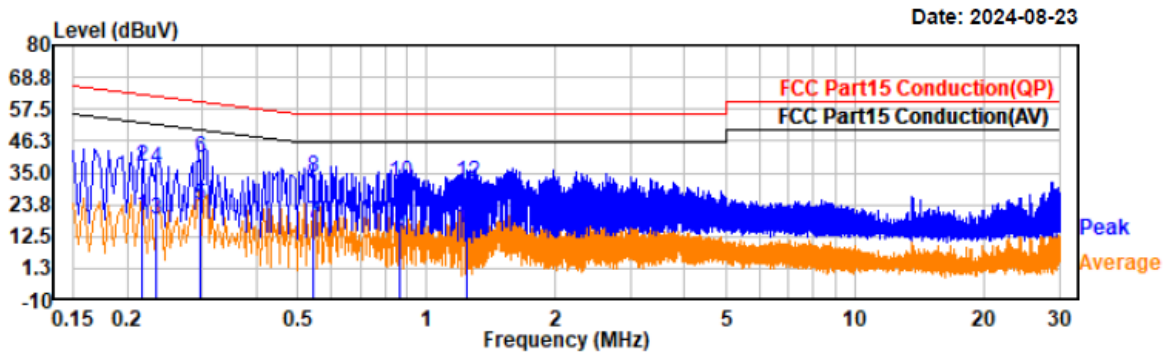
Test Data

Test Frequency:	150kHz~30MHz
Temperature:	23.7℃
Relative Humidity:	57%
ATM Pressure:	100.1kPa
Test Date:	2024-08-23
Test Engineer:	Spike Gao

EUT operation mode: Transmitting in lowest channel of BLE 1Mbps (worst case)

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532

Temp/Humi/ATM: 23.7℃/57%/100.1kPa
Tested by: Spike Gao
Power Source: DC 12V from Adapter

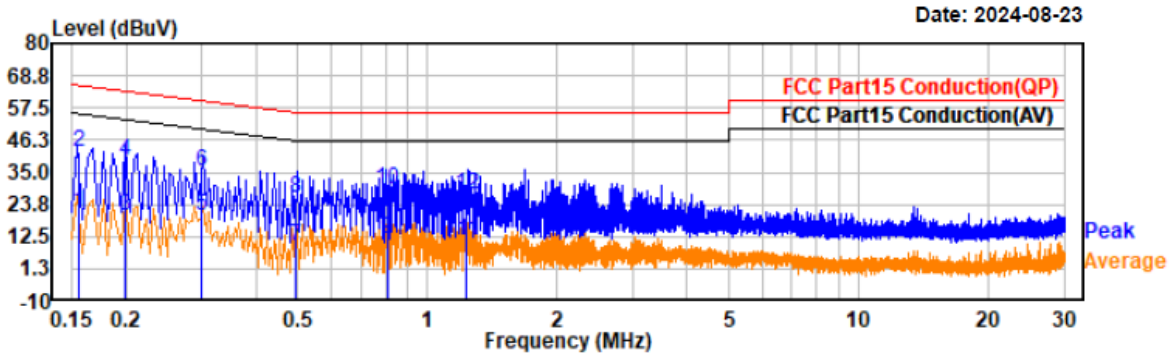


Trace: 1

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.22	-1.25	21.18	19.93	52.91	32.98	Line	Average
0.22	16.29	21.18	37.47	62.91	25.44	Line	QP
0.23	-2.52	21.10	18.58	52.32	33.74	Line	Average
0.23	15.25	21.10	36.35	62.32	25.97	Line	QP
0.30	2.73	20.85	23.58	50.35	26.77	Line	Average
0.30	19.45	20.85	40.30	60.35	20.05	Line	QP
0.55	-3.31	20.37	17.06	46.00	28.94	Line	Average
0.55	12.98	20.37	33.35	56.00	22.65	Line	QP
0.87	-6.30	20.61	14.31	46.00	31.69	Line	Average
0.87	10.98	20.61	31.59	56.00	24.41	Line	QP
1.24	-5.58	20.74	15.16	46.00	30.84	Line	Average
1.24	10.87	20.74	31.61	56.00	24.39	Line	QP

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532

Temp/Humi/ATM: 23.7℃/57%/100.1kPa
Tested by: Spike Gao
Power Source: DC 12V from Adapter

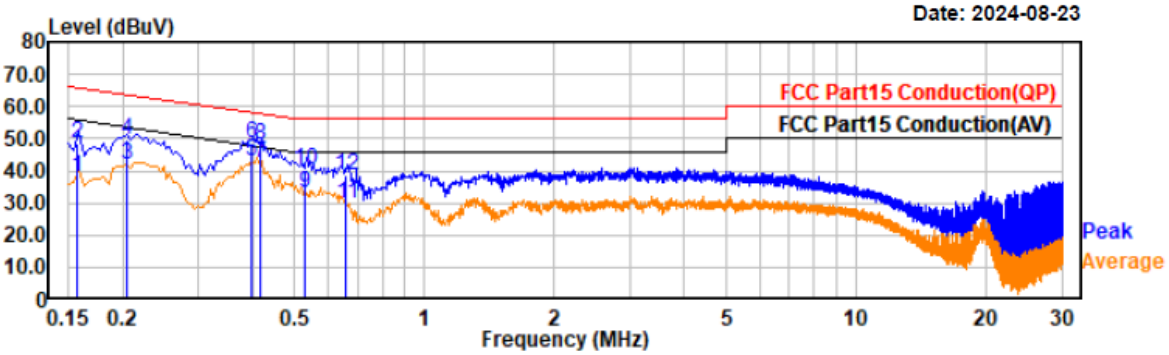


Trace: 1

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.16	0.28	20.87	21.15	55.69	34.54	Neutral	Average
0.16	21.20	20.87	42.07	65.69	23.62	Neutral	QP
0.20	-1.49	21.07	19.58	53.62	34.04	Neutral	Average
0.20	17.68	21.07	38.75	63.62	24.87	Neutral	QP
0.30	-0.80	20.72	19.92	50.23	30.31	Neutral	Average
0.30	14.53	20.72	35.25	60.23	24.98	Neutral	QP
0.50	-11.35	20.30	8.95	46.06	37.11	Neutral	Average
0.50	5.77	20.30	26.07	56.06	29.99	Neutral	QP
0.81	-9.05	20.53	11.48	46.00	34.52	Neutral	Average
0.81	8.83	20.53	29.36	56.00	26.64	Neutral	QP
1.23	-9.95	20.84	10.89	46.00	35.11	Neutral	Average
1.23	6.10	20.84	26.94	56.00	29.06	Neutral	QP

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532

Temp/Humi/ATM: 23.7℃/57%/100.1kPa
Tested by: Spike Gao
Power Source: DC 48V from PoE

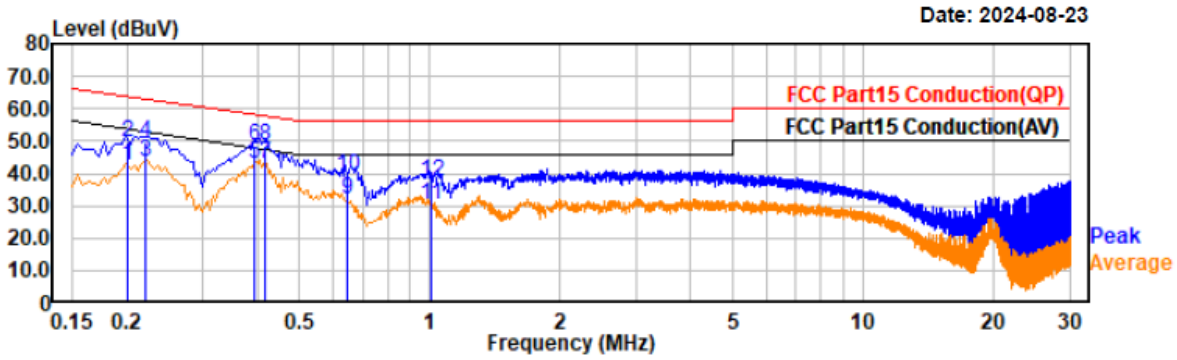


Trace: 1

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.16	16.80	21.08	37.88	55.59	17.71	Line	Average
0.16	27.39	21.08	48.47	65.59	17.12	Line	QP
0.21	20.91	21.24	42.15	53.40	11.25	Line	Average
0.21	28.22	21.24	49.46	63.40	13.94	Line	QP
0.40	22.52	20.54	43.06	47.92	4.86	Line	Average
0.40	27.82	20.54	48.36	57.92	9.56	Line	QP
0.42	22.03	20.48	42.51	47.48	4.97	Line	Average
0.42	27.47	20.48	47.95	57.48	9.53	Line	QP
0.53	12.84	20.34	33.18	46.00	12.82	Line	Average
0.53	19.69	20.34	40.03	56.00	15.97	Line	QP
0.66	9.42	20.55	29.97	46.00	16.03	Line	Average
0.66	17.93	20.55	38.48	56.00	17.52	Line	QP

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532

Temp/Humi/ATM: 23.7℃/57%/100.1kPa
Tested by: Spike Gao
Power Source: DC 48V from PoE



Trace: 1

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.20	21.41	21.07	42.48	53.58	11.10	Neutral	Average
0.20	28.42	21.07	49.49	63.58	14.09	Neutral	QP
0.22	22.32	20.99	43.31	52.82	9.51	Neutral	Average
0.22	28.78	20.99	49.77	62.82	13.05	Neutral	QP
0.39	22.68	20.50	43.18	47.98	4.80	Neutral	Average
0.39	28.00	20.50	48.50	57.98	9.48	Neutral	QP
0.42	22.66	20.45	43.11	47.50	4.39	Neutral	Average
0.42	28.04	20.45	48.49	57.50	9.01	Neutral	QP
0.64	11.35	20.38	31.73	46.00	14.27	Neutral	Average
0.64	18.64	20.38	39.02	56.00	16.98	Neutral	QP
1.00	9.83	20.72	30.55	46.00	15.45	Neutral	Average
1.00	16.61	20.72	37.33	56.00	18.67	Neutral	QP

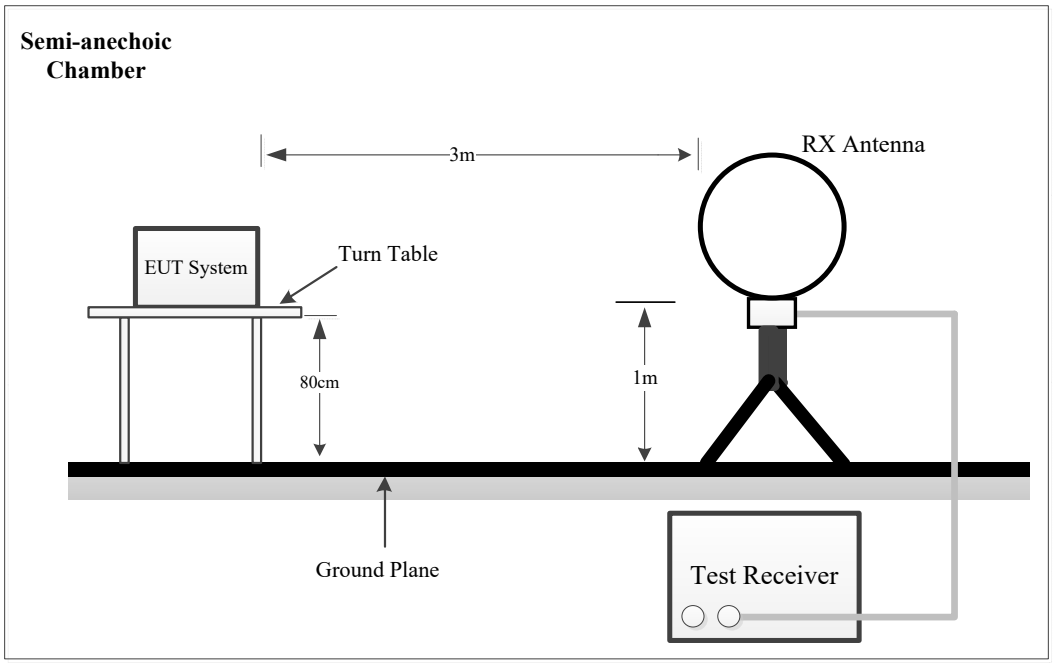
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

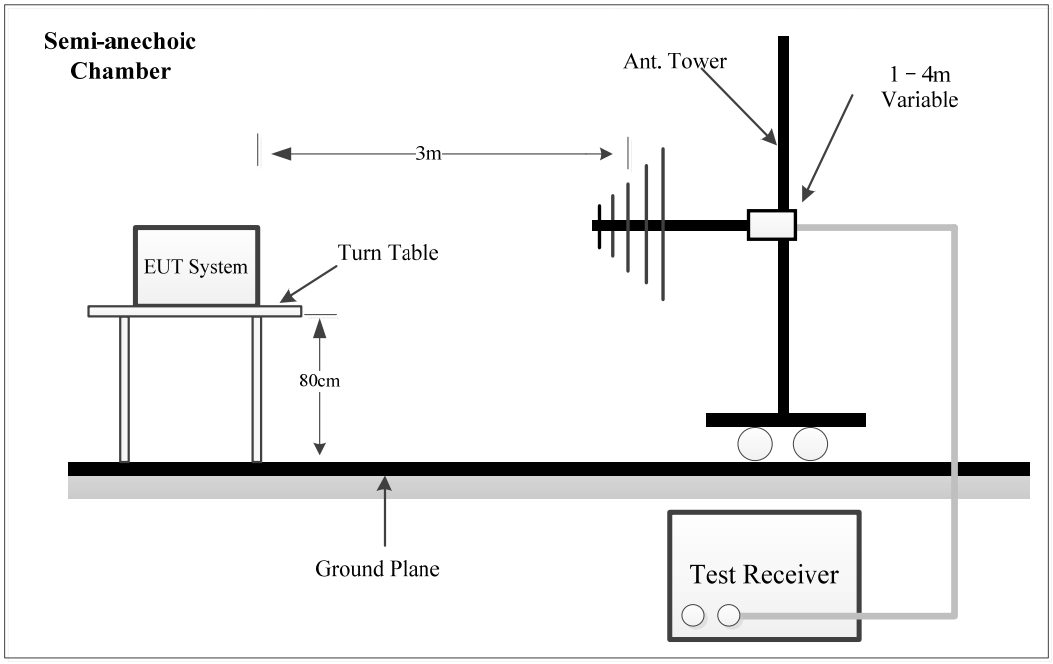
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

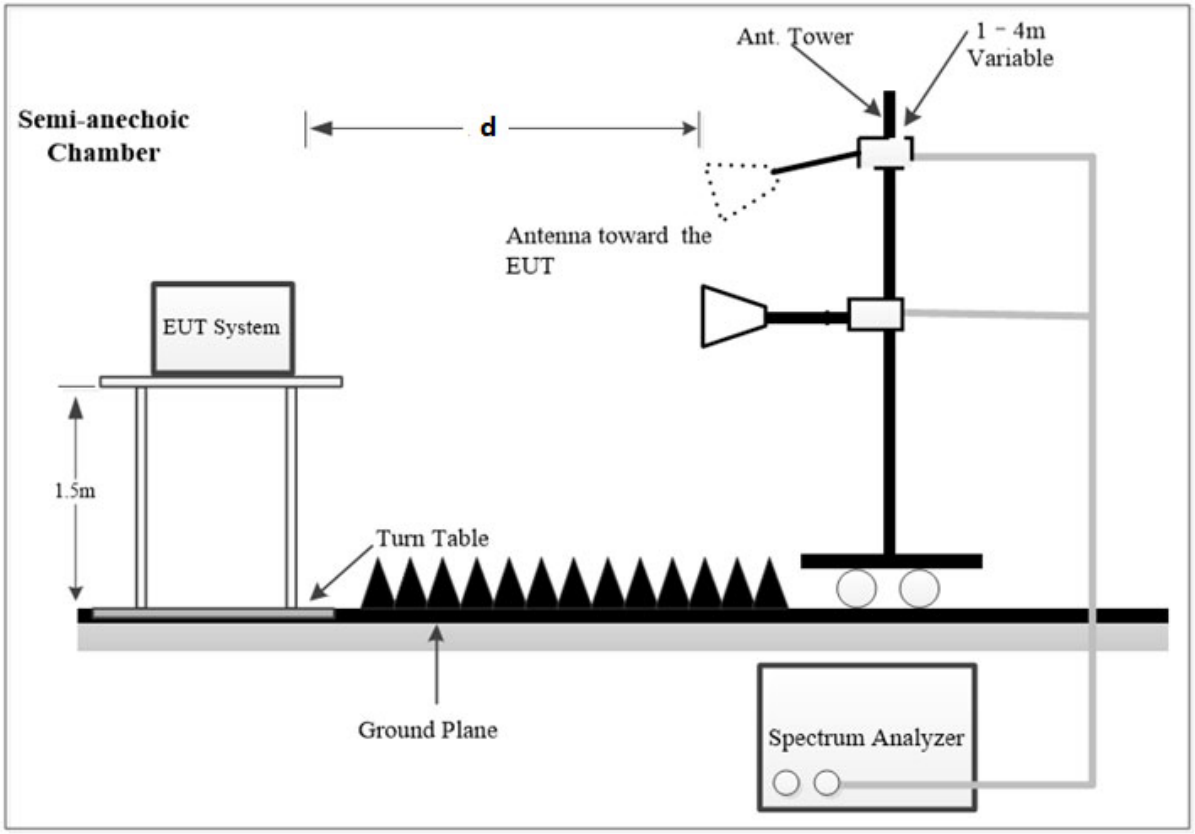
9 kHz-30MHz:



30MHz -1 GHz:



Above 1GHz:



The radiated emission tests using the setup accordance with the ANSI C63.10-2020. The specification used was the FCC 15.209, and FCC 15.247 limits.

NOTE: d is testing distance;
For Radiated Emission test (1GHz-18GHz) and Bandedge Emission test, which was performed at 3 m distance.

For Radiated Emission test (18GHz-25GHz), which was performed at 1.0 m distance, according to ANSI C63.10-2020, the test result shall be extrapolated to the specified distance using an extrapolation Factor of 20dB/decade from 3m to 1.0m.
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [1.0m]) dB= 9.54 dB

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Below 1GHz:

Frequency Range	RBW	VBW	Measurement
9 kHz – 150 kHz	200Hz	1 kHz	PK
	200Hz	/	QP
150 kHz – 30 MHz	10 kHz	30 kHz	PK
	9kHz	/	QP
30 MHz – 1000 MHz	100 kHz	300 kHz	PK
	120kHz	/	QP

Above 1GHz:
Pre-scan:

Duty Cycle	RBW	VBW	Measurement
Any	1MHz	3MHz	PK
＞98%	1MHz	5kHz	AV
＜98%	1MHz	1/T, not less than 5kHz	AV

Final measurement for emission identified during the pre-scan:

Duty Cycle	RBW	VBW	Measurement
Any	1MHz	3MHz	PK
＞98%	1MHz	10Hz	AV
＜98%	1MHz	1/T	AV

Note: T is minimum transmission duration

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

If the maximized peak measured value complies with under the Average limit, then it is unnecessary to perform an Average measurement.

Test Procedure

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

For each measurement antenna alignment, the EUT shall be rotated through 0°to 360°on a turntable. The report shall list the six emissions with the smallest margin relative to the limit, for each of the three antenna orientations (parallel, perpendicular, and ground parallel) unless the margin is greater than 20 dB, then the following statement shall be made: “all emissions were greater than 20 dB below the limit.”

Below 1GHz, if the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is at least 6 dB below the QP emission limit, there's no need to record the measured QP level of the emissions in the report.

Above 1GHz, if the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is below the AV emission limit, there's no need to record the measured AV level of the emissions in the report.

Result &Margin Calculation

The Result is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

For 9 kHz to 18GHz Radiated emission test
Factor (dB/m) =Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)

For 18GHz to 25GHz Radiated emission test and Bandedge emissions test
Factor (dB/m) =Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB) - Extrapolation factor (dB)

Extrapolation factor=9.54dB (distance=1m)

Result (dBμV/m) = Reading (dBμV) + Factor (dB/m)

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 (dB) = Limit (dBμV/m) –Result (dBμV/m)

Test Data

Please refer to the below table and plots.

Frequency Range:	Below 1 GHz	Above 1 GHz
Temperature:	23.5℃	21.3℃~24.3℃
Relative Humidity:	55 %	51%~52%
ATM Pressure:	100.1kPa	100.1 kPa~100.4 kPa
Test Date:	2024-07-19	2024-08-06~2024-12-12
Test Engineer:	Wlif Wu	Wlif Wu

Note: Pre-scan in the X, Y and Z axes of orientation, the worst case Z-axis of orientation was recorded.

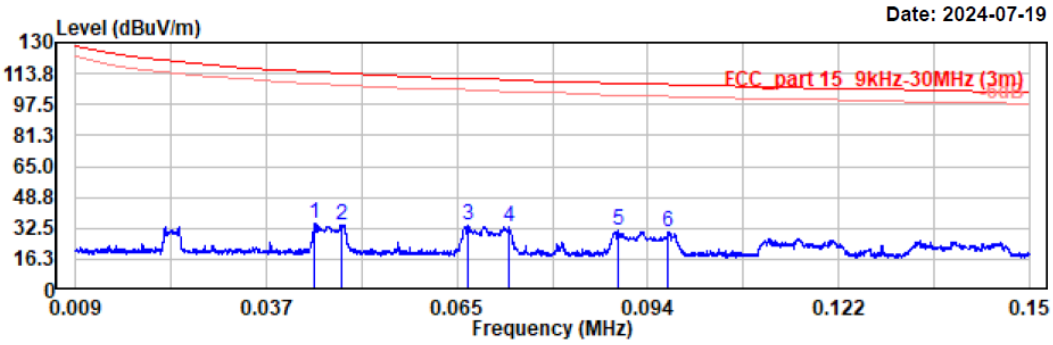
1) 9 kHz~30MHz

Pre-scan in parallel, ground-parallel and perpendicular of orientation of loop antenna, ground-parallel is worst case

EUT operation mode: Transmitting in Low channel of BLE 1Mbps in parallel (worst case)

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 3m

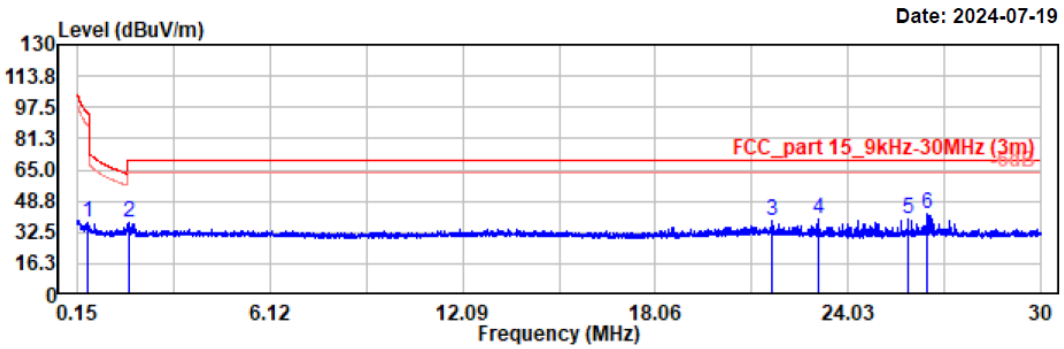
Temp/Humi/ATM: 23.5℃/55%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 12V from adapter



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
0.044	14.83	19.91	34.74	114.66	79.92	Peak
0.048	14.32	19.91	34.23	113.94	79.71	Peak
0.067	13.82	19.84	33.66	111.08	77.42	Peak
0.073	13.01	19.78	32.79	110.33	77.54	Peak
0.089	11.27	19.80	31.07	108.59	77.52	Peak
0.097	10.85	19.75	30.60	107.90	77.30	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 3m

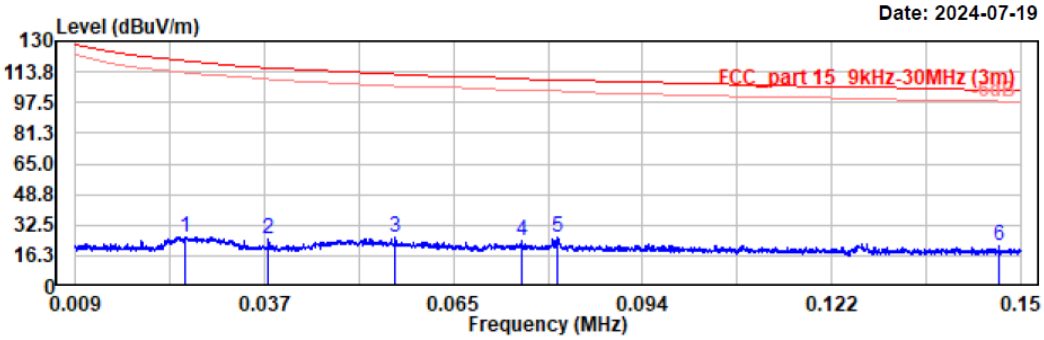
Temp/Humi/ATM: 23.5℃/55%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 12V from adapter



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
0.454	18.13	19.79	37.92	94.45	56.53	Peak
1.735	17.71	19.62	37.33	69.54	32.21	Peak
21.663	18.86	20.13	38.99	69.54	30.55	Peak
23.132	19.13	20.17	39.30	69.54	30.24	Peak
25.878	19.27	20.17	39.44	69.54	30.10	Peak
26.490	21.58	20.14	41.72	69.54	27.82	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 3m

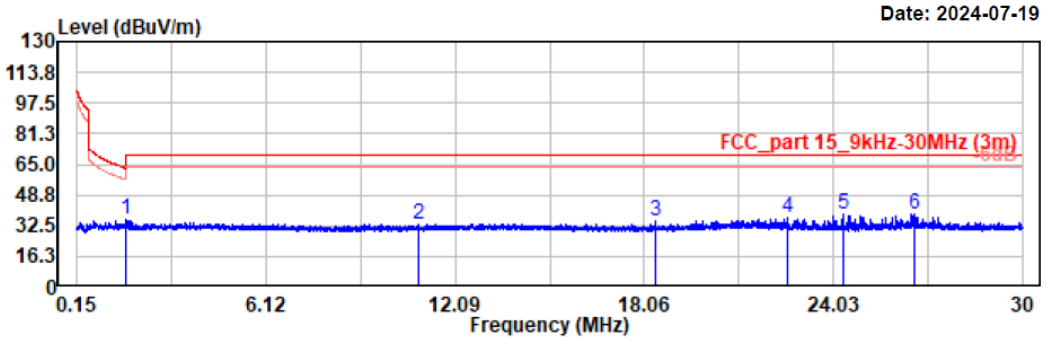
Temp/Humi/ATM: 23.5℃/55%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
0.025	6.46	19.86	26.32	119.58	93.26	Peak
0.038	4.89	19.91	24.80	116.07	91.27	Peak
0.057	6.14	19.91	26.05	112.55	86.50	Peak
0.076	4.54	19.75	24.29	110.04	85.75	Peak
0.081	5.89	19.72	25.61	109.44	83.83	Peak
0.147	1.72	19.73	21.45	104.27	82.82	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 23.5℃/55%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
1.702	16.29	19.62	35.91	62.98	27.07	Peak
10.929	13.85	19.71	33.56	69.54	35.98	Peak
18.421	15.04	19.99	35.03	69.54	34.51	Peak
22.579	16.26	20.16	36.42	69.54	33.12	Peak
24.352	18.06	20.21	38.27	69.54	31.27	Peak
26.612	18.45	20.14	38.59	69.54	30.95	Peak

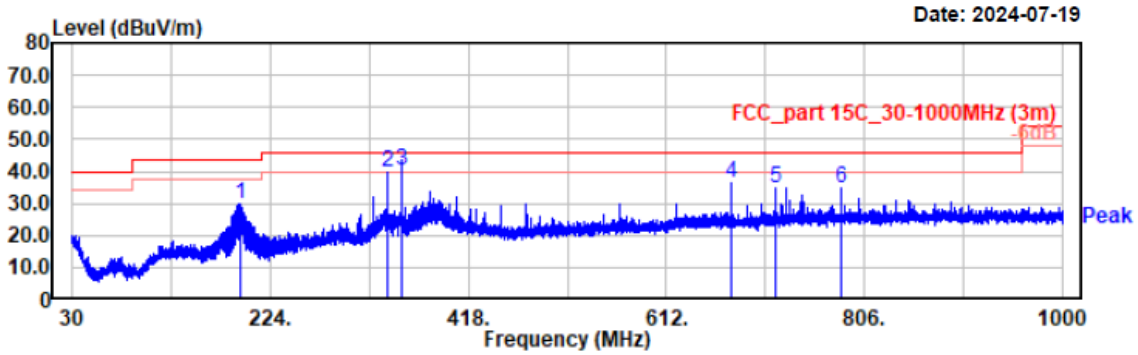
2) 30MHz-1GHz

EUT operation mode: Transmitting in Low channel of BLE 1Mbps (worst case)

Powered by adapter

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 3m

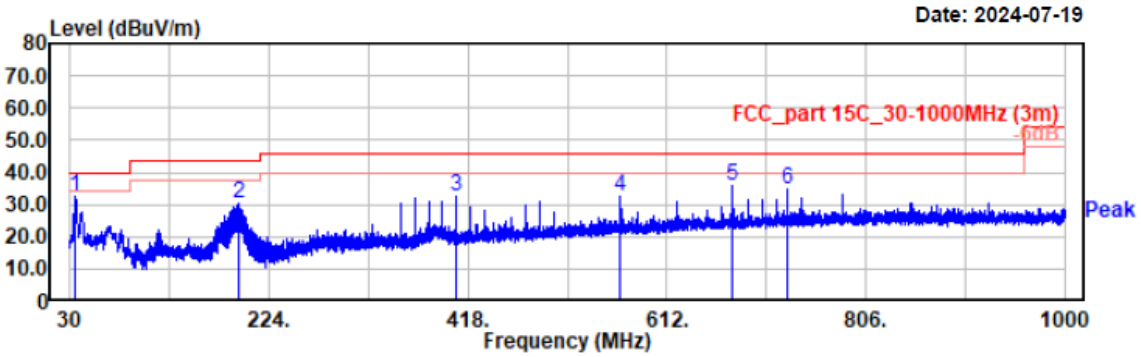
Temp/Humi/ATM: 23.5℃/55%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 12V from adapter



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
194.80	41.74	-11.98	29.76	43.50	13.74	Horizontal	Peak
339.04	47.84	-8.37	39.47	46.00	6.53	Horizontal	Peak
352.57	48.27	-7.99	40.28	46.00	5.72	Horizontal	QP
675.05	37.09	-0.61	36.48	46.00	9.52	Horizontal	Peak
718.70	34.53	0.01	34.54	46.00	11.46	Horizontal	Peak
783.11	33.57	1.08	34.65	46.00	11.35	Horizontal	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 23.5℃/55%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 12V from adapter

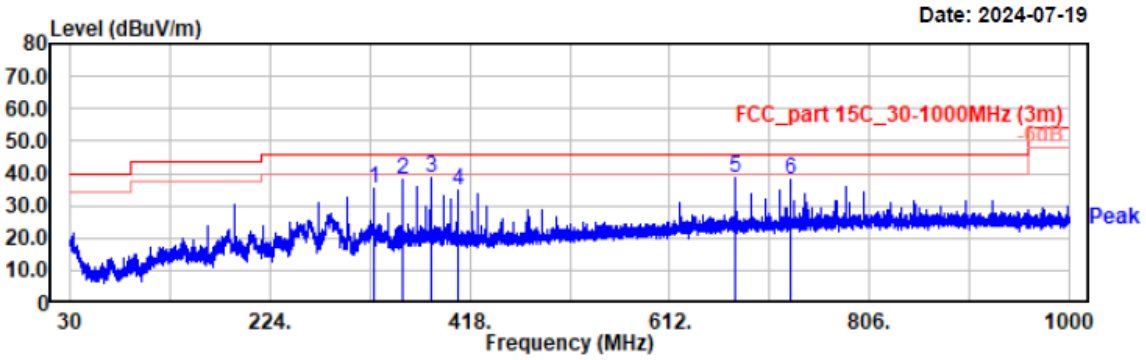


Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
35.04	40.43	-8.08	32.35	40.00	7.65	Vertical	Peak
194.42	42.13	-12.02	30.11	43.50	13.39	Vertical	Peak
406.85	38.83	-6.07	32.76	46.00	13.24	Vertical	Peak
566.99	35.03	-2.46	32.57	46.00	13.43	Vertical	Peak
675.05	36.24	-0.61	35.63	46.00	10.37	Vertical	Peak
729.08	34.58	0.09	34.67	46.00	11.33	Vertical	Peak

Powered by PoE

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 3m

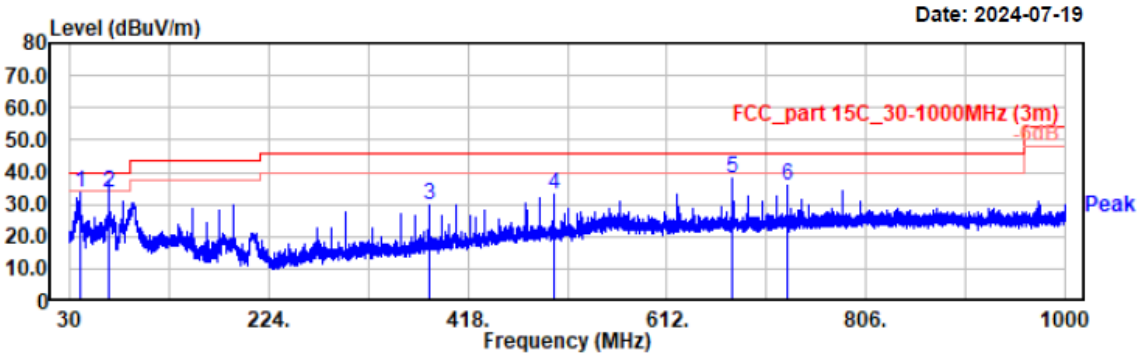
Temp/Humi/ATM: 23.5℃/55%/100.1kPa
Tested by: Wlif Wu
Power Source: DC48V from PoE



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
325.46	43.76	-8.64	35.12	46.00	10.88	Horizontal	Peak
352.53	46.11	-7.99	38.12	46.00	7.88	Horizontal	Peak
379.69	45.84	-7.13	38.71	46.00	7.29	Horizontal	Peak
406.85	40.97	-6.07	34.90	46.00	11.10	Horizontal	Peak
675.05	39.05	-0.61	38.44	46.00	7.56	Horizontal	Peak
729.08	37.91	0.09	38.00	46.00	8.00	Horizontal	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 23.5℃/55%/100.1kPa
Tested by: Wlif Wu
Power Source: DC48V from PoE



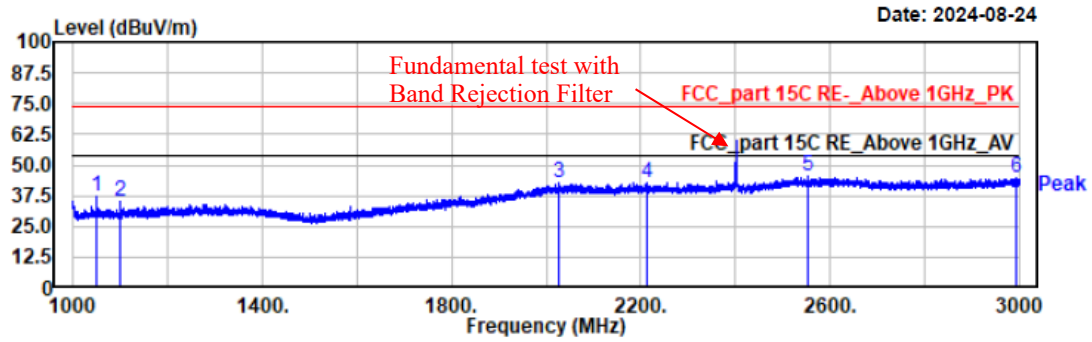
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
40.67	45.72	-12.12	33.60	40.00	6.40	Vertical	Peak
67.80	50.80	-17.11	33.69	40.00	6.31	Vertical	QP
379.69	37.10	-7.13	29.97	46.00	16.03	Vertical	Peak
501.71	36.28	-3.39	32.89	46.00	13.11	Vertical	Peak
675.05	38.52	-0.61	37.91	46.00	8.09	Vertical	Peak
729.08	35.73	0.09	35.82	46.00	10.18	Vertical	Peak

3) 1GHz~3GHz

Note: Both Adapter and POE have been tested the worst Adapter data were recorded in this report.

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 3m

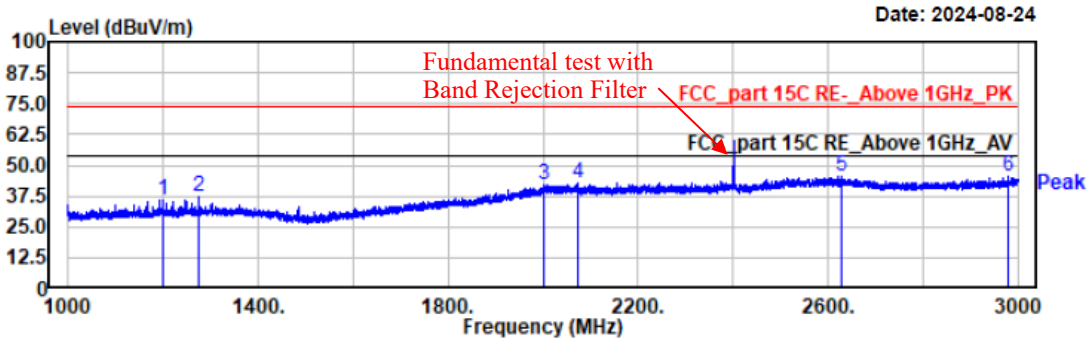
Temp/Humi/ATM: 24.2℃/59%/101kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
1050.00	54.22	-17.04	37.18	74.00	36.82	horizontal	Peak
1100.00	51.71	-16.53	35.18	74.00	38.82	horizontal	Peak
2026.00	48.82	-6.36	42.46	74.00	31.54	horizontal	Peak
2213.40	48.82	-6.25	42.57	74.00	31.43	horizontal	Peak
2554.60	48.75	-3.45	45.30	74.00	28.70	horizontal	Peak
2994.20	49.13	-4.04	45.09	74.00	28.91	horizontal	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 3m

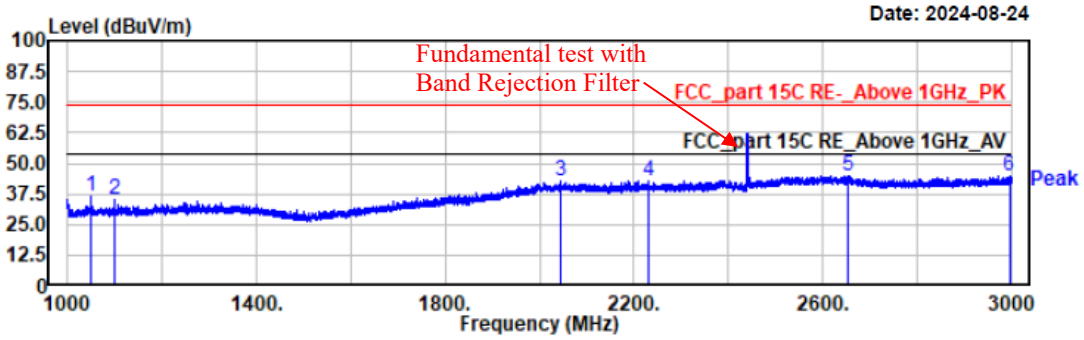
Temp/Humi/ATM: 24.2℃/59%/101kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
1200.00	52.17	-16.05	36.12	74.00	37.88	vertical	Peak
1275.00	52.67	-15.51	37.16	74.00	36.84	vertical	Peak
2000.60	48.79	-6.74	42.05	74.00	31.95	vertical	Peak
2073.20	49.23	-6.32	42.91	74.00	31.09	vertical	Peak
2629.40	48.73	-3.34	45.39	74.00	28.61	vertical	Peak
2979.20	49.85	-4.09	45.76	74.00	28.24	vertical	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2440
EUT Model: S532
Test distance: 3m

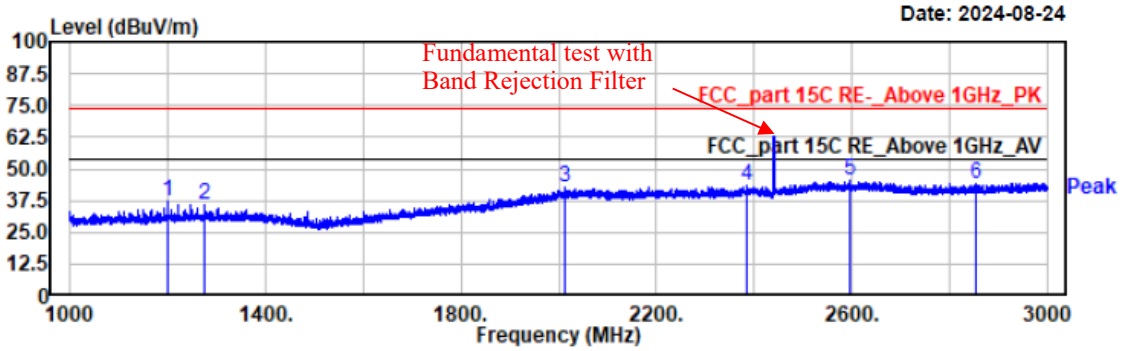
Temp/Humi/ATM: 24.2℃/59%/101kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
1050.00	53.88	-17.04	36.84	74.00	37.16	horizontal	Peak
1100.40	51.85	-16.53	35.32	74.00	38.68	horizontal	Peak
2045.80	48.72	-6.05	42.67	74.00	31.33	horizontal	Peak
2230.60	49.02	-6.25	42.77	74.00	31.23	horizontal	Peak
2655.00	48.42	-3.50	44.92	74.00	29.08	horizontal	Peak
2995.40	48.96	-4.04	44.92	74.00	29.08	horizontal	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2440
EUT Model: S532
Test distance: 3m

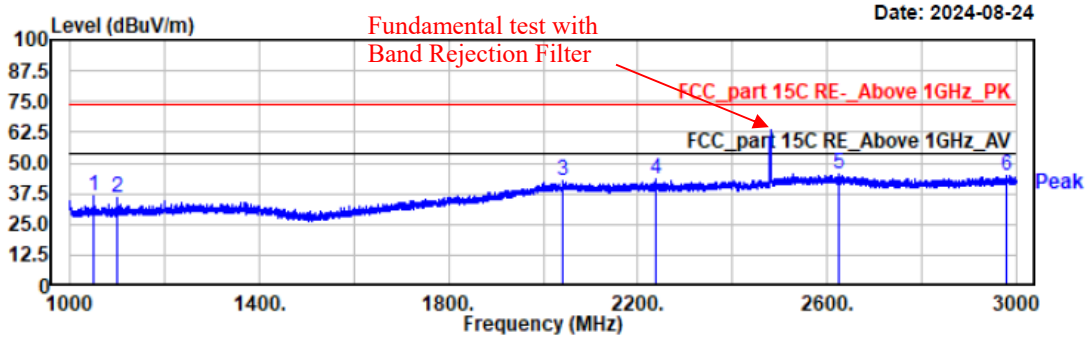
Temp/Humi/ATM: 24.2℃/59%/101kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
1200.40	53.22	-16.05	37.17	74.00	36.83	vertical	Peak
1274.80	51.70	-15.51	36.19	74.00	37.81	vertical	Peak
2011.60	49.60	-6.57	43.03	74.00	30.97	vertical	Peak
2383.60	48.82	-5.41	43.41	74.00	30.59	vertical	Peak
2597.00	48.53	-3.31	45.22	74.00	28.78	vertical	Peak
2854.40	48.96	-4.53	44.43	74.00	29.57	vertical	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2480
EUT Model: S532
Test distance: 3m

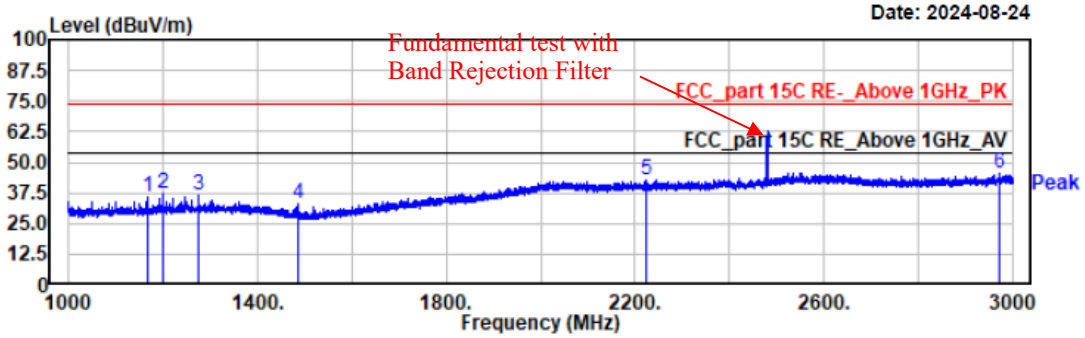
Temp/Humi/ATM: 24.2℃/59%/101kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
1050.20	53.76	-17.04	36.72	74.00	37.28	horizontal	Peak
1100.20	52.17	-16.53	35.64	74.00	38.36	horizontal	Peak
2041.80	49.08	-6.10	42.98	74.00	31.02	horizontal	Peak
2238.00	49.42	-6.24	43.18	74.00	30.82	horizontal	Peak
2625.00	49.06	-3.33	45.73	74.00	28.27	horizontal	Peak
2978.80	48.94	-4.09	44.85	74.00	29.15	horizontal	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2480
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 24.2℃/59%/101kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter

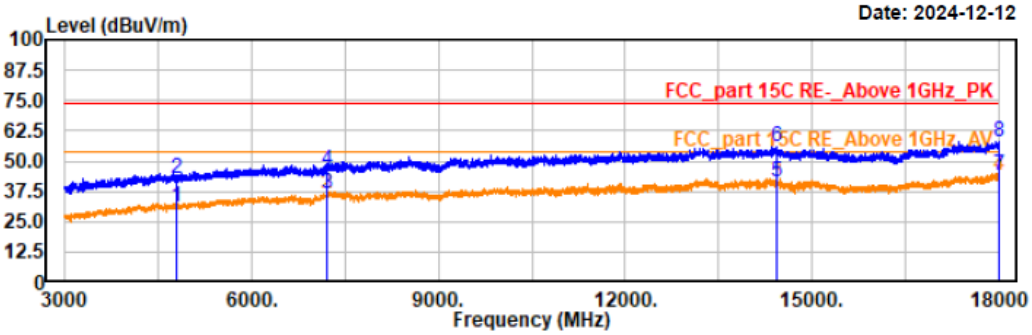


Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
1166.40	52.27	-16.28	35.99	74.00	38.01	vertical	Peak
1200.20	53.04	-16.05	36.99	74.00	37.01	vertical	Peak
1274.60	52.27	-15.51	36.76	74.00	37.24	vertical	Peak
1485.20	51.57	-18.19	33.38	74.00	40.62	vertical	Peak
2224.80	49.29	-6.25	43.04	74.00	30.96	vertical	Peak
2971.00	49.46	-4.14	45.32	74.00	28.68	vertical	Peak

4) 3 GHz ~18 GHz

Project No.: 2407T77479E-RF
Test Mode: BLE-2402
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 24.3℃/52%/100.4kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter

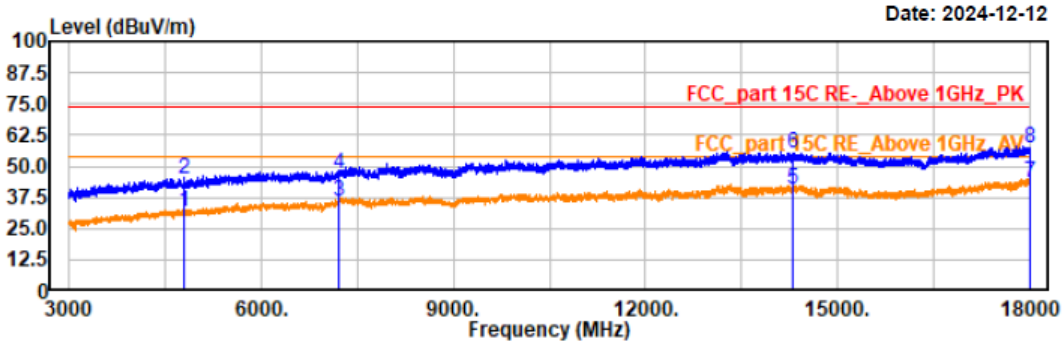


Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4804.00	35.62	-4.45	31.17	54.00	22.83	horizontal	Average
4804.00	47.11	-4.45	42.66	74.00	31.34	horizontal	Peak
7206.00	38.18	-1.73	36.45	54.00	17.55	horizontal	Average
7206.00	47.92	-1.73	46.19	74.00	27.81	horizontal	Peak
14427.00	36.48	5.10	41.58	54.00	12.42	horizontal	Average
14427.00	50.86	5.10	55.96	74.00	18.04	horizontal	Peak
17998.50	36.49	7.74	44.23	54.00	9.77	horizontal	Average
17998.50	50.27	7.74	58.01	74.00	15.99	horizontal	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE-2402
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 24.3℃/52%/100.4kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter

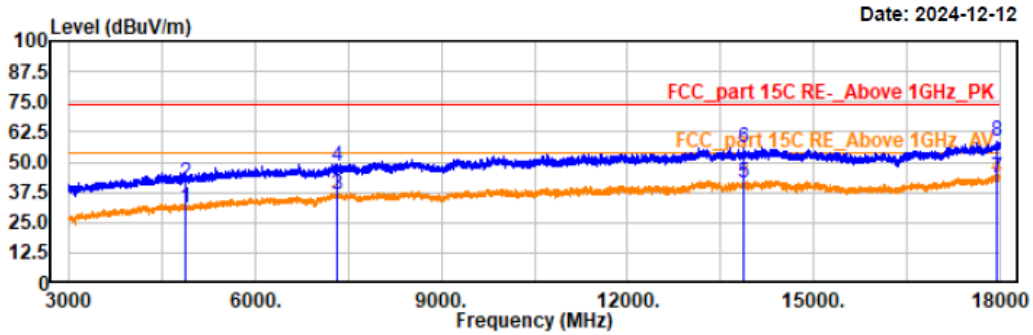


Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4804.50	36.45	-4.45	32.00	54.00	22.00	vertical	Average
4804.50	49.03	-4.45	44.58	74.00	29.42	vertical	Peak
7206.00	37.41	-1.73	35.68	54.00	18.32	vertical	Average
7206.00	48.47	-1.73	46.74	74.00	27.26	vertical	Peak
14302.50	35.26	5.20	40.46	54.00	13.54	vertical	Average
14302.50	49.89	5.20	55.09	74.00	18.91	vertical	Peak
17995.50	35.45	7.74	43.19	54.00	10.81	vertical	Average
17995.50	49.78	7.74	57.52	74.00	16.48	vertical	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE-2440
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 24.3℃/52%/100.4kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter

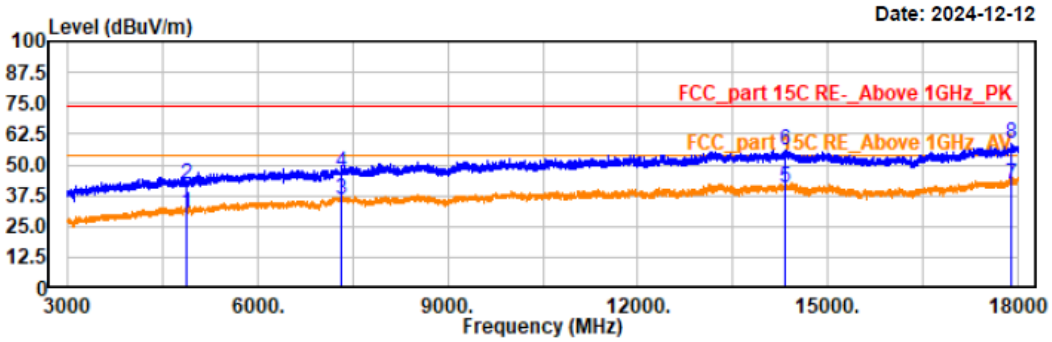


Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4880.00	35.47	-4.25	31.22	54.00	22.78	horizontal	Average
4880.00	45.65	-4.25	41.40	74.00	32.60	horizontal	Peak
7320.00	37.87	-1.61	36.26	54.00	17.74	horizontal	Average
7320.00	49.85	-1.61	48.24	74.00	25.76	horizontal	Peak
13870.50	36.42	5.09	41.51	54.00	12.49	horizontal	Average
13870.50	50.54	5.09	55.63	74.00	18.37	horizontal	Peak
17943.00	35.80	7.65	43.45	54.00	10.55	horizontal	Average
17943.00	51.13	7.65	58.78	74.00	15.22	horizontal	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE-2440
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 24.3℃/52%/100.4kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter

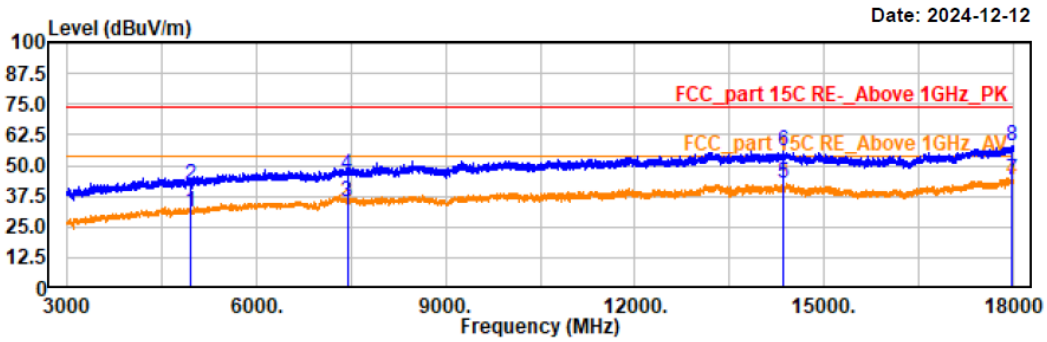


Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4879.50	34.43	-4.25	30.18	54.00	23.82	vertical	Average
4879.50	46.18	-4.25	41.93	74.00	32.07	vertical	Peak
7320.00	37.76	-1.61	36.15	54.00	17.85	vertical	Average
7320.00	48.27	-1.61	46.66	74.00	27.34	vertical	Peak
14319.00	35.30	5.20	40.50	54.00	13.50	vertical	Average
14319.00	50.86	5.20	56.06	74.00	17.94	vertical	Peak
17904.00	34.73	7.59	42.32	54.00	11.68	vertical	Average
17904.00	51.18	7.59	58.77	74.00	15.23	vertical	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE-2480
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 24.3℃/52%/100.4kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter

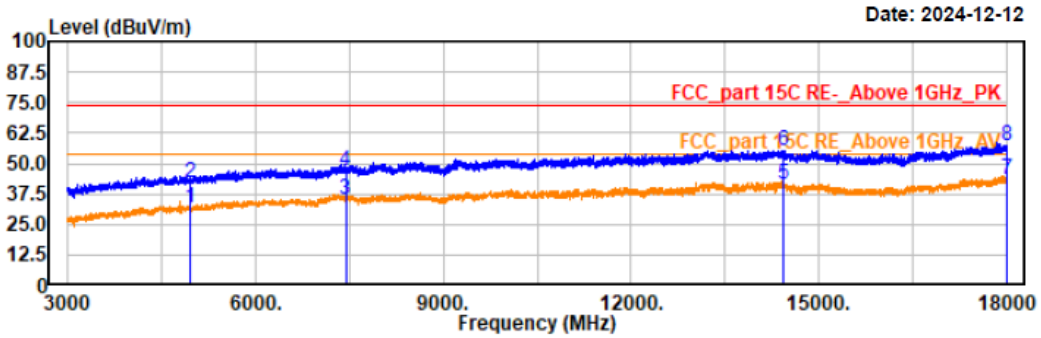


Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4960.00	35.05	-4.01	31.04	54.00	22.96	horizontal	Average
4960.50	46.31	-4.01	42.30	74.00	31.70	horizontal	Peak
7440.00	36.86	-1.59	35.27	54.00	18.73	horizontal	Average
7440.00	47.65	-1.59	46.06	74.00	27.94	horizontal	Peak
14359.50	37.37	5.17	42.54	54.00	11.46	horizontal	Average
14359.50	50.61	5.17	55.78	74.00	18.22	horizontal	Peak
17991.00	36.59	7.72	44.31	54.00	9.69	horizontal	Average
17991.00	50.32	7.72	58.04	74.00	15.96	horizontal	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE-2480
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 24.3℃/52%/100.4kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter



Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

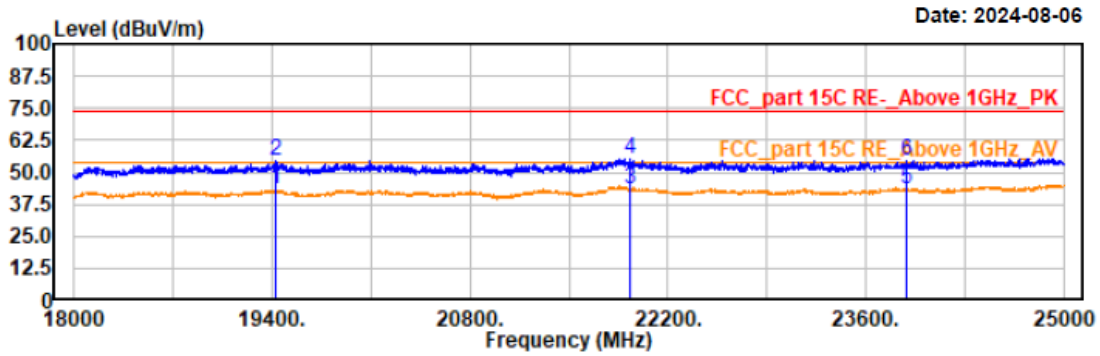
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4960.50	35.51	-4.01	31.50	54.00	22.50	vertical	Average
4960.50	46.20	-4.01	42.19	74.00	31.81	vertical	Peak
7440.00	36.56	-1.59	34.97	54.00	19.03	vertical	Average
7440.00	48.45	-1.59	46.86	74.00	27.14	vertical	Peak
14434.50	36.01	5.09	41.10	54.00	12.90	vertical	Average
14434.50	50.16	5.09	55.25	74.00	18.75	vertical	Peak
17997.00	35.65	7.74	43.39	54.00	10.61	vertical	Average
17997.00	49.74	7.74	57.48	74.00	16.52	vertical	Peak

5) 18 GHz ~25 GHz

EUT operation mode: Transmitting in Low channel of BLE 1Mbps (worst case)

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 1m

Temp/Humi/ATM: 21.3℃/51%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter

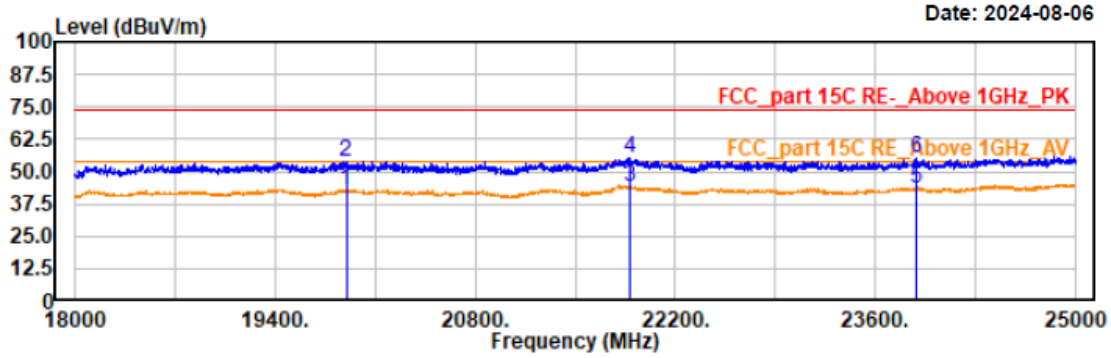


Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
19430.00	28.33	15.06	43.39	54.00	10.61	horizontal	Average
19430.00	39.33	15.06	54.39	74.00	19.61	horizontal	Peak
21929.20	26.81	16.53	43.34	54.00	10.66	horizontal	Average
21929.20	38.81	16.53	55.34	74.00	18.66	horizontal	Peak
23885.00	25.50	17.92	43.42	54.00	10.58	horizontal	Average
23885.00	36.50	17.92	54.42	74.00	19.58	horizontal	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 1m

Temp/Humi/ATM: 21.3℃/51%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter



Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
19896.40	27.43	15.11	42.54	54.00	11.46	vertical	Average
19896.40	38.71	15.11	53.82	74.00	20.18	vertical	Peak
21878.60	27.66	16.58	44.24	54.00	9.76	vertical	Average
21878.60	38.86	16.58	55.44	74.00	18.56	vertical	Peak
23889.40	25.52	17.92	43.44	54.00	10.56	vertical	Average
23889.40	37.05	17.92	54.97	74.00	19.03	vertical	Peak

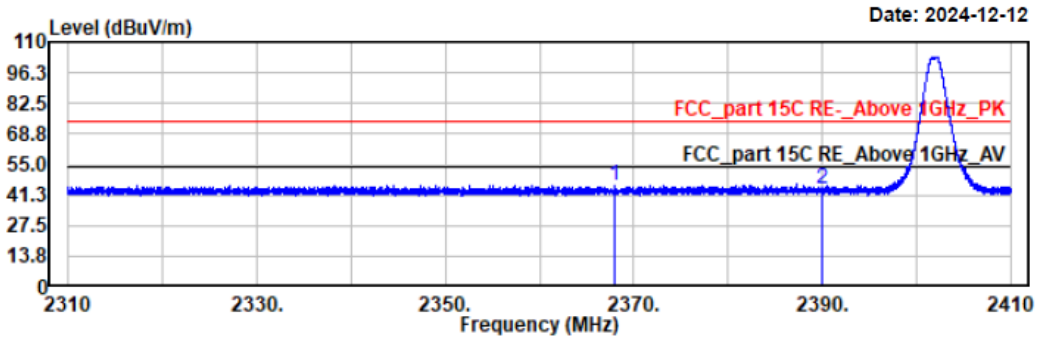
Restricted Bands Emissions:

Pre-Scan the X, Y and Z axes of orientation, the worst case in Z-axis of orientation was recorded

Note:
Factor (dB/m) =Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)
Result (dBμV/m) = Reading (dBμV) + Factor (dB/m)
Margin (dB) = Limit (dBμV/m) –Result (dBμV/m)

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 24.3℃/52%/100.4kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter

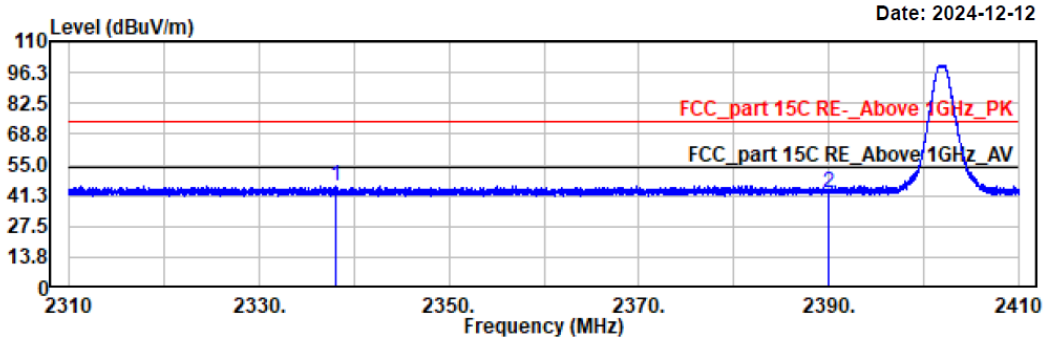


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2368.01	46.47	-0.74	45.73	74.00	28.27	horizontal	Peak
2390.00	44.51	-0.63	43.88	74.00	30.12	horizontal	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2402
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 24.3℃/52%/100.4kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter

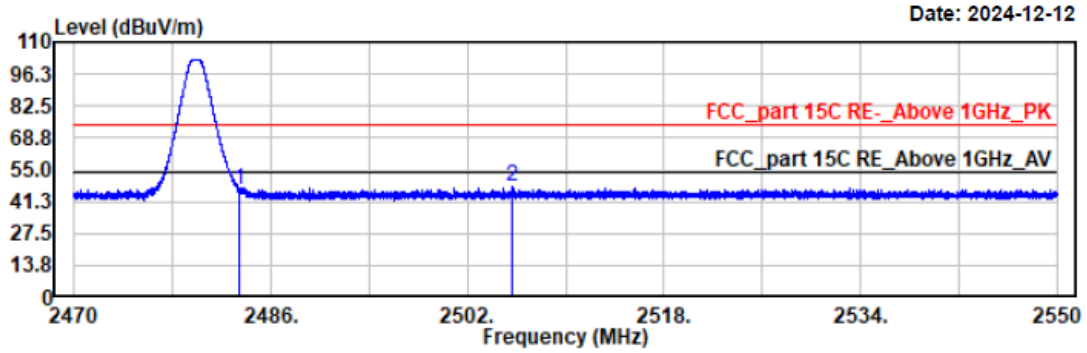


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2338.05	46.56	-0.86	45.70	74.00	28.30	vertical	Peak
2390.00	43.47	-0.63	42.84	74.00	31.16	vertical	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2480
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 24.3℃/52%/100.4kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter

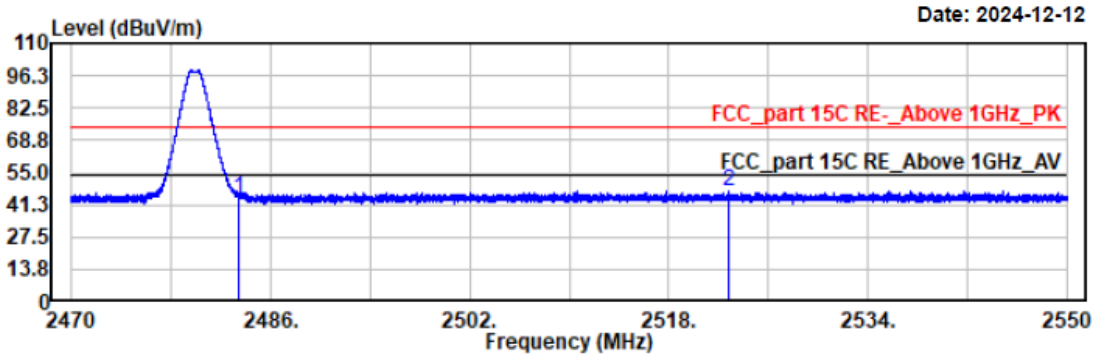


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2483.50	46.22	-0.17	46.05	74.00	27.95	horizontal	Peak
2505.66	47.57	-0.08	47.49	74.00	26.51	horizontal	Peak

Project No.: 2407T77479E-RF
Test Mode: BLE 2480
EUT Model: S532
Test distance: 3m

Temp/Humi/ATM: 24.3℃/52%/100.4kPa
Tested by: Wlif Wu
Power Source: DC 12V from Adapter



Condition: PK RBW:1MHz VBW:3MHz SWT:auto

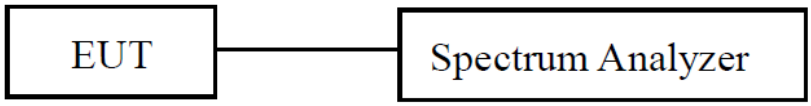
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2483.50	44.49	-0.17	44.32	74.00	29.68	vertical	Peak
2522.83	47.06	-0.06	47.00	74.00	27.00	vertical	Peak

FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

EUT Setup



Test Procedure

According to ANSI C63.10-2020 Section 11.8

a) Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz.
b) Set the VBW ≥ [3 × RBW].
c) Detector = peak.
d) Trace mode = max-hold.
e) Sweep = No faster than coupled (auto) time.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission by placing two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the "−6 dB down amplitude". If a marker is below this "−6 dB down amplitude" value, then it shall be as close as possible to this value.

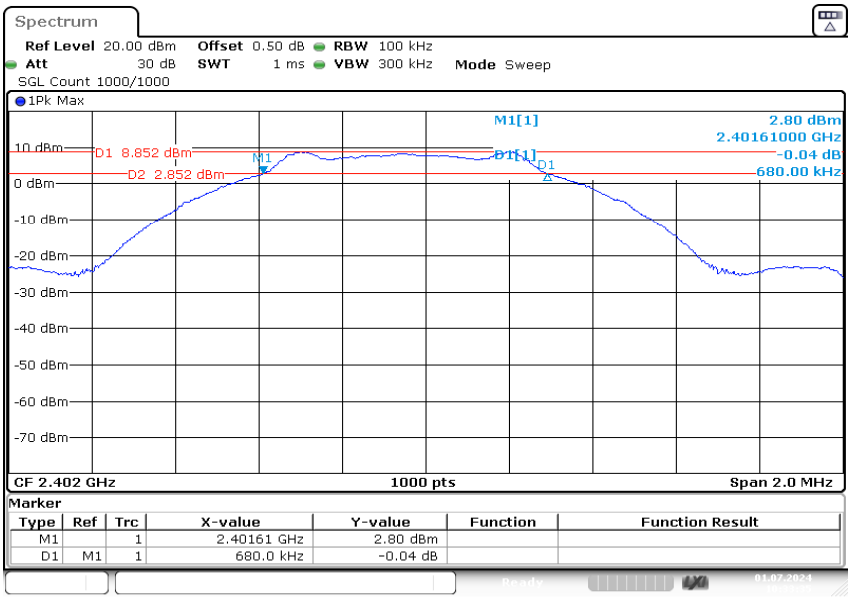
Test Data

Test Mode:	Transmitting	**Test Engineer:**	Stein Peng
Test Date:	2024-07-01	**Environment:**	Temp.: 23.6℃ Humi.: 60% Atm :100.2 kPa

Test Result: Compliant

Test Modes	Test Channel	Test Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
BLE 1Mbps	Lowest	2402	0.680	⩾0.5
	Middle	2440	0.682	⩾0.5
	Highest	2480	0.672	⩾0.5

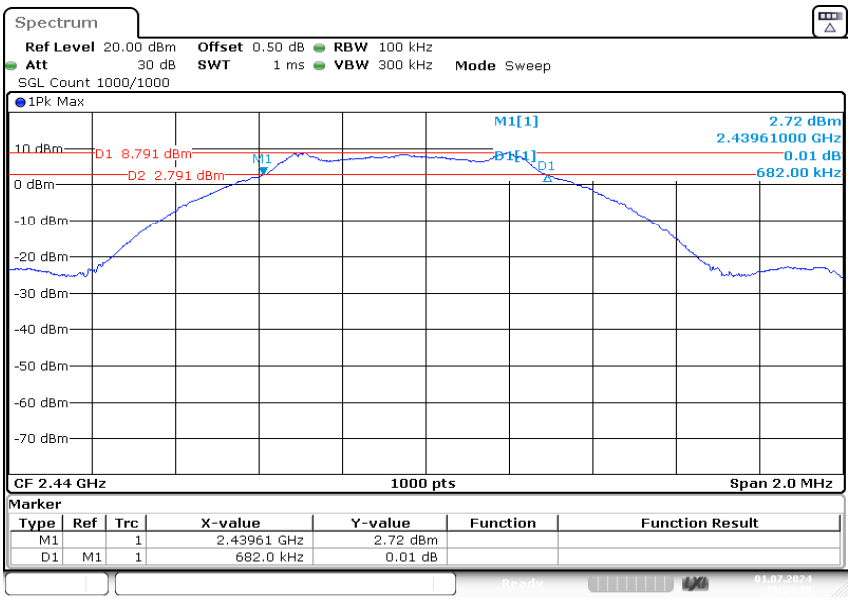
1Mbps_Lowest



ProjectNo.:2407T77479E-RF Tester:Stein Peng

Date: 1.JUL.2024 10:33:35

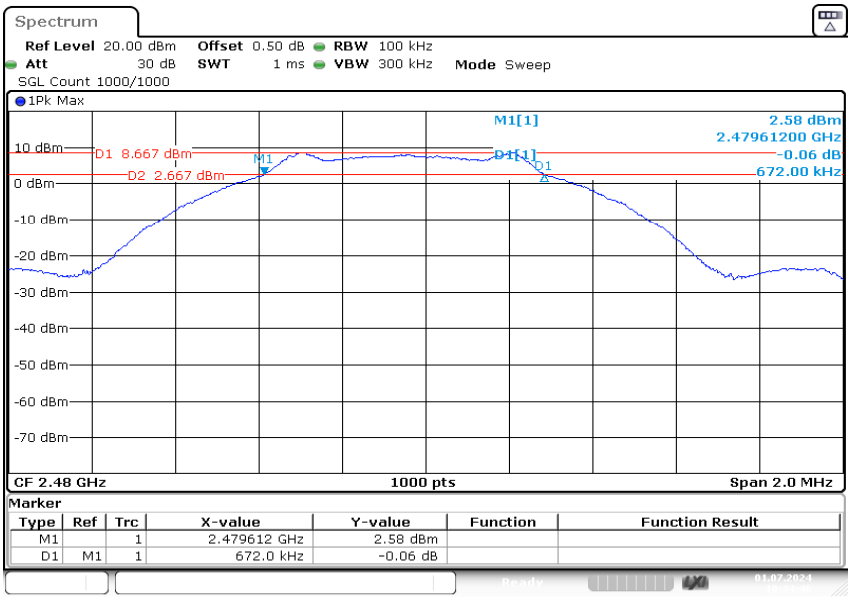
1Mbps_Middle



ProjectNo.:2407T77479E-RF Tester:Stein Peng

Date: 1.JUL.2024 10:34:10

1Mbps_Highest



ProjectNo.:2407T77479E-RF Tester:Stein Peng

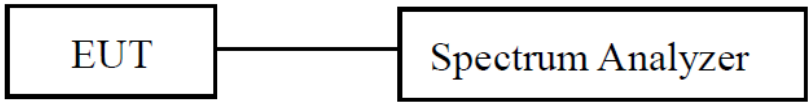
Date: 1.JUL.2024 10:34:46

FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

EUT Setup



Test Procedure

According to ANSI C63.10-2020 Section 11.9.1.1

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:
a) Set the RBW ≥ DTS bandwidth.
b) Set VBW ≥ [3 × RBW].
c) Set span ≥ [3 × RBW].
d) Sweep time = No faster than coupled (auto) time.
e) Detector = peak.
f) Trace mode = max-hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

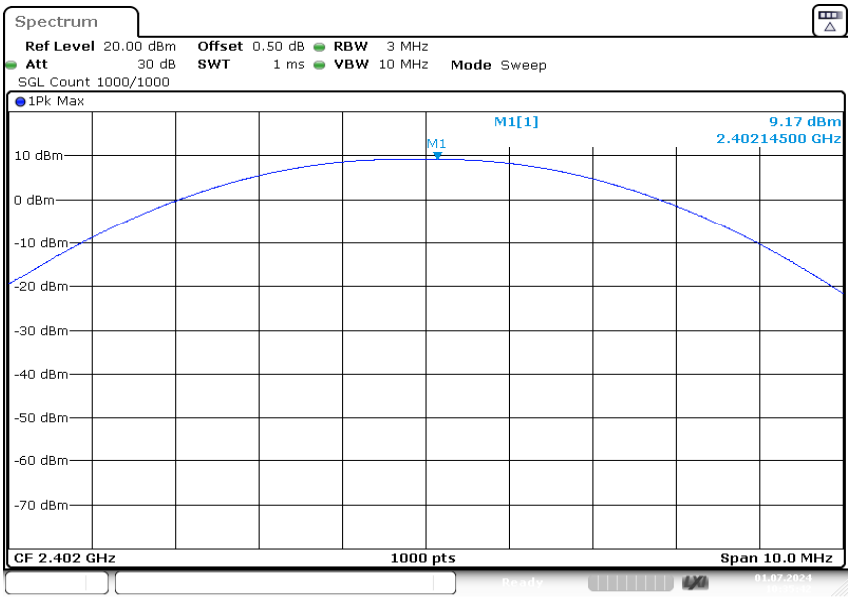
Test Data

Test Mode:	Transmitting	**Test Engineer:**	Stein Peng
Test Date:	2024-07-01	**Environment:**	Temp.: 23.6℃ Humi.: 60% Atm : 100.2kPa

Test Result: Compliant

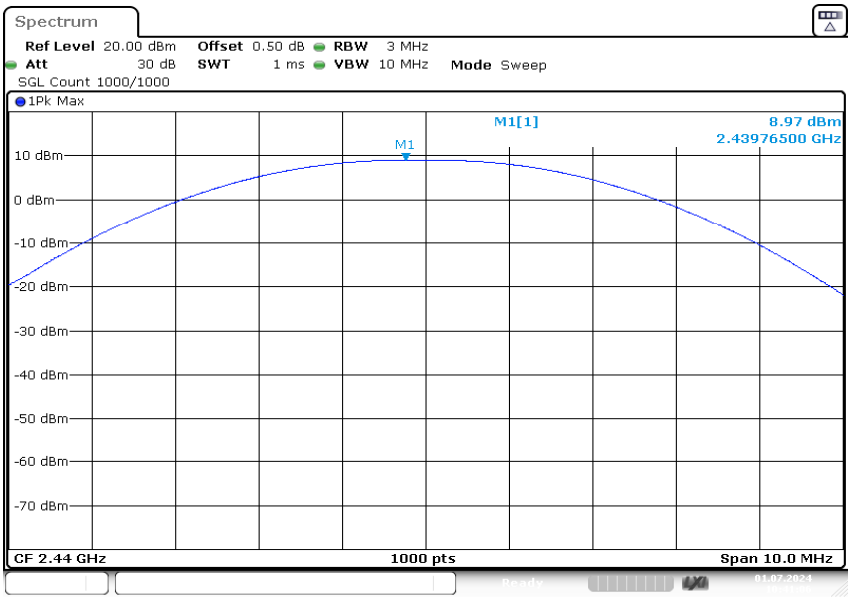
Test Modes	Test Channel	Test Frequency (MHz)	Maximum Conducted Peak Output Power(dBm)	Limit (dBm)
BLE 1Mbps	Lowest	2402	9.17	⩽30
	Middle	2440	8.97	⩽30
	Highest	2480	8.81	⩽30

1Mbps_Lowest



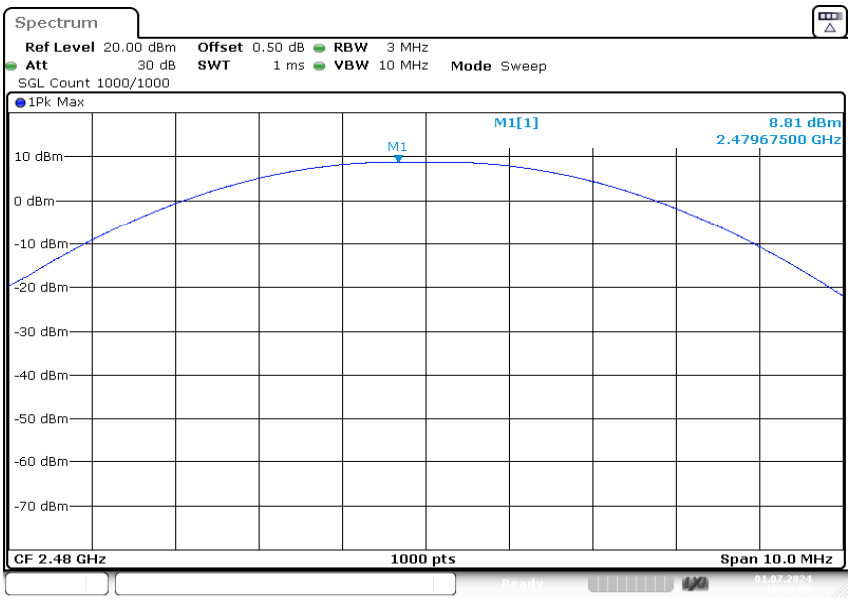
ProjectNo.:2407T77479E-RF Tester:Stein Peng
Date: 1.JUL.2024 10:35:41

1Mbps_Middle



ProjectNo.:2407T77479E-RF Tester:Stein Peng
Date: 1.JUL.2024 10:41:05

1Mbps_Highest



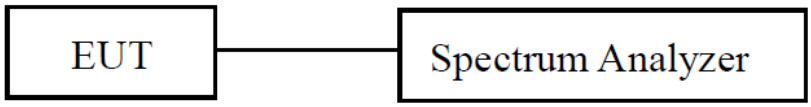
ProjectNo.:2407T77479E-RF Tester:Stein Peng
Date: 1.JUL.2024 10:43:05

FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

EUT Setup



Test Procedure

According to ANSI C63.10-2020 Section 11.11

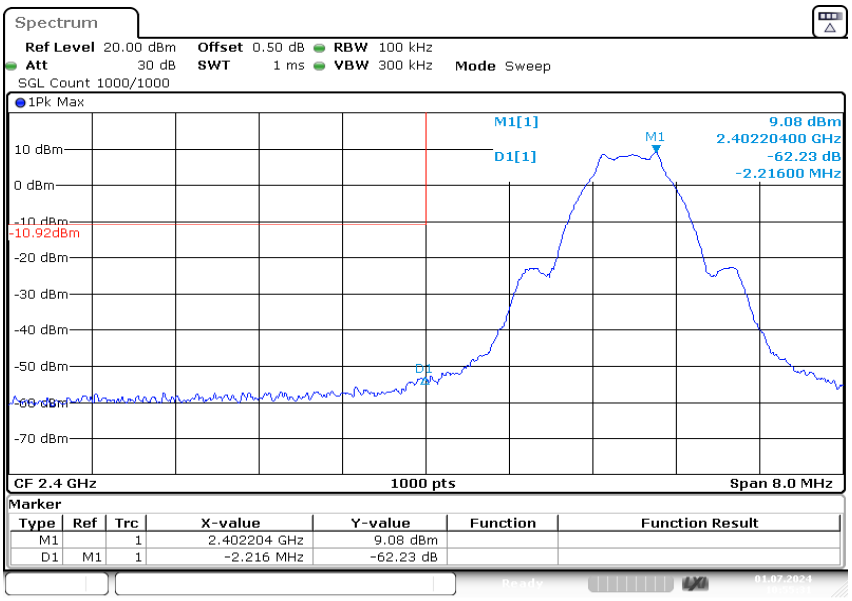
a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW ≥ [3 × RBW].
d) Detector = peak.
e) Sweep time = No faster than coupled (auto) time.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the peak marker function to determine the maximum amplitude level.
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

Test Data

Test Mode:	Transmitting	**Test Engineer:**	Stein Peng
Test Date:	2024-07-01	**Environment:**	Temp.: 23.6℃ Humi.:60% Atm:100.2kPa

Test Result: Compliant

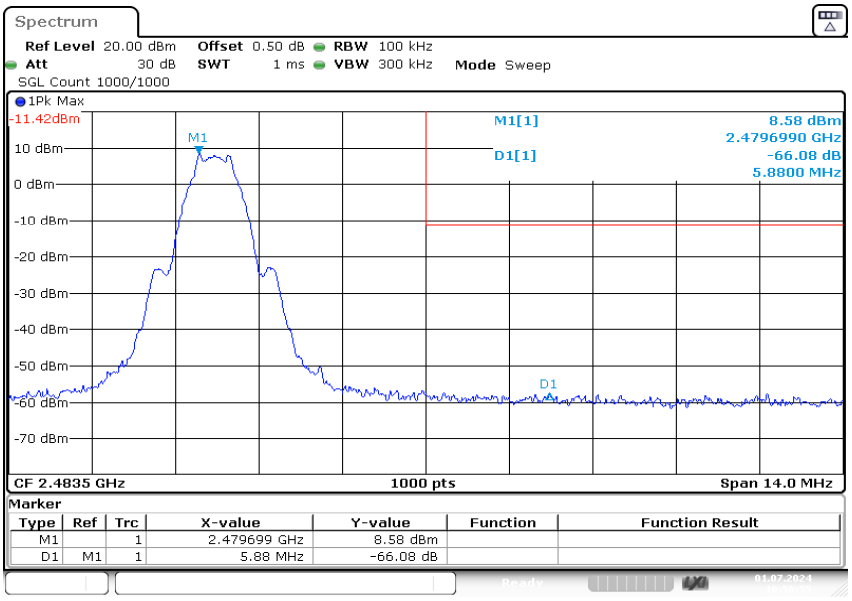
BLE 1Mbps_Lowest



ProjectNo.:2407T77479E-RF Tester:Stein Peng

Date: 1.JUL.2024 10:55:31

BLE 1Mbps_Highest



ProjectNo.:2407T77479E-RF Tester:Stein Peng

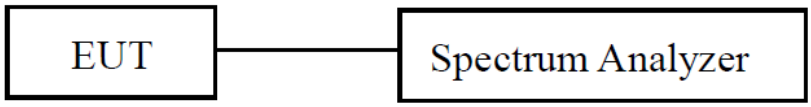
Date: 1.JUL.2024 10:56:54

FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

EUT Setup



Test Procedure

According to ANSI C63.10-2020 Section 11.10.2

a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span >1.5 times the DTS bandwidth.
c) Set the RBW to 3 kHz ≤ RBW ≤ 100 kHz.
d) Set the VBW ≥ [3 × RBW].
e) Detector = peak.
f) Sweep time = No faster than coupled (auto) time.
g) Trace mode = max-hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat

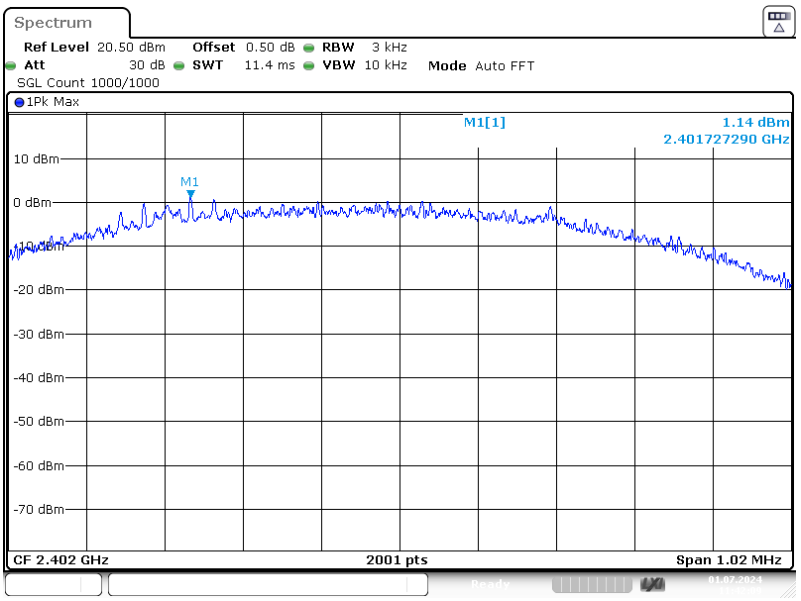
Test Data

Test Mode:	Transmitting	**Test Engineer:**	Stein Peng
Test Date:	2024-07-01	**Environment:**	Temp.: 23.6℃ Humi.: 60% Atm :100.2kPa

Test Result: Compliant

Test Modes	Test Channel	Test Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
BLE 1Mbps	Lowest	2402	1.14	≤8.00
	Middle	2440	0.85	≤8.00
	Highest	2480	0.59	≤8.00

BLE 1Mbps_Lowest



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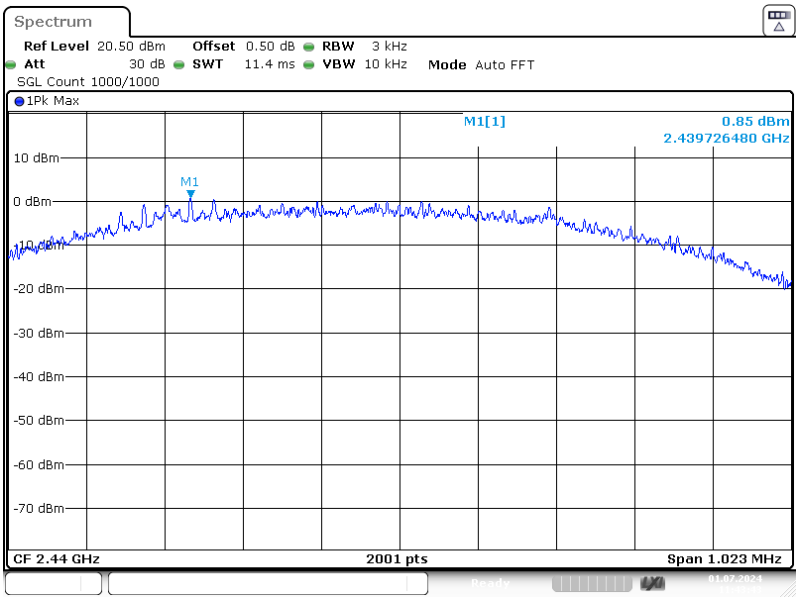
BLE 1Mbps_Middle



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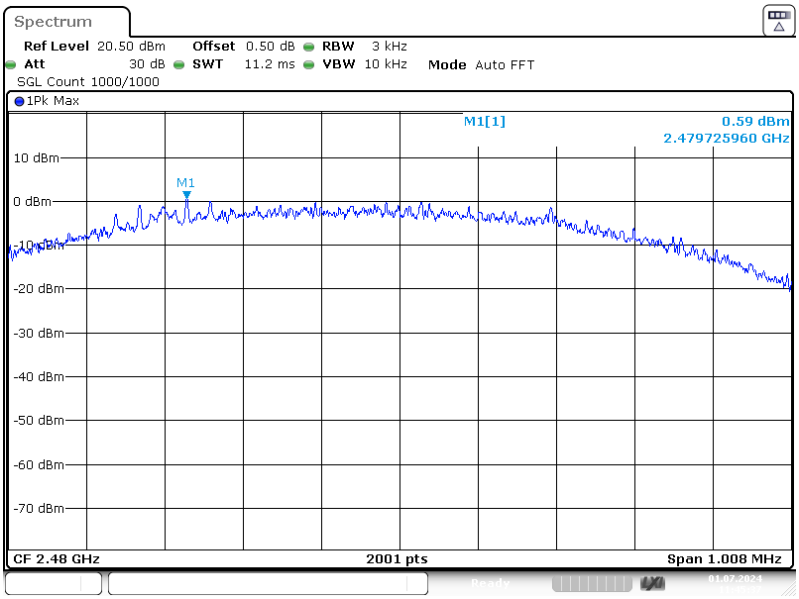
BLE 1Mbps_Highest



ProjectNo.:2407T77479E-RF Tester:Stein Peng

Date: 1.JUL.2024 11:45:38

EUT PHOTOGRAPHS

Please refer to the attachment 2407T77479E-RF-EXP EUT EXTERNAL PHOTOGRAPHS and 2407T77479E-RF-INP EUT INTERNAL PHOTOGRAPHS.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2407T77479E-RF-TSP-01 SETUP PHOTOGRAPHS.

Declarations

1. Bay Area Compliance Laboratories Corp. (Xiamen) is not responsible for authenticity of any information provided by the applicant. Information from the applicant that may affect test results are marked with an asterisk "★".

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

3. Unless required by the rule provided by the applicant or product regulations, then decision rule in this report did not consider the uncertainty.

4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor k=2 with the 95.45% confidence interval.

5. This report cannot be reproduced except in full, without prior written approval of Bay Area Compliance Laboratories Corp. (Xiamen).

6. This report is valid only with a valid digital signature. The digital signature may be available only under the adobe software above version 7.0.

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