FCC PART 15.231

TEST REPORT

For

Rabbit-Labs

499 Ernston Road Suite A6 Parlin, New Jersey 08859 United States of America

Tested Model: E07-433M20S
FCC ID: 2BNBP-042069

Report Type:	**Product Name:**
Original Report	Wireless Module

Report Number:	RSC250120001-0
Date of Report Issue:	2025-02-07
Reviewed By:	Sula Huang
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Chengdu) No.5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China Tel: +86-28-65525123 Fax: +86-28-65525125 www.baclcorp.com

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Rabbit-Labs
Address	499 Ernston Road Suite A6 Parlin, New Jersey 08859 United States of America
Email	support@rabbit-labs.com
Product	Wireless Module
Tested Model	E07-433M20S
FCC ID	2BNBP-042069
Frequency*	425 MHz to 450.5 MHz
Modulation Type*	GFSK
Antenna Gain*	2.62dBi
Voltage*	DC 2.1V – 3.6V (Typical: 3.3V)
Measure approximately	32mm (L)×18mm (W)×3.0mm (H)
Sample serial number	250120001/01 (RF Radiated Test & RF Conducted Test) (assigned by the BACL, Chengdu)
Sample/EUT Status	The test sample was in good condition and received: 2025-01-20

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

Objective

This report is prepared on behalf of **Rabbit-Labs** in accordance according to the measurement procedure described in ANSI C63.10-2020.

The tests were performed in order to determine the compliance of the EUT with FCC Part 15, Subpart C, section, section 15.203, 15.205, 15.207, 15.209, 15.35(c) and 15.231 rules.

Measurement Uncertainty

Item			Measurement Uncertainty	U_{cispr}
AC power line conducted emission			2.79 dB	3.4 dB
Radiated Emission	9kHz-30MHz		4.48dB	-
	30MHz-200MHz	H	4.34dB	6.3dB
	30MHz-200MHz	V	4.59dB	6.3dB
	200MHz-1GHz	H	4.69dB	6.3dB
	200MHz-1GHz	V	5.79dB	6.3dB
	1GHz-6GHz		4.58dB	5.2dB

Item	Measurement Uncertainty
RF output power, conducted	±0.61dB
Occupied Bandwidth	±1.69%
Power Spectrum Density, conducted	±2.52dB
Humidity	±5%
Temperature	±1℃
Voltage(DC)	±0.4%
Voltage(AC,<10kHz)	±1%
Time	1%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the corresponding inclusion factor K when the inclusion probability is about 95%.

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.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Chengdu) to collect test data is located No.5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China.

Bay Area Compliance Laboratories Corp. (Chengdu) lab is accredited to ISO/IEC 17025 by NVLAP (Lab code: 600346-0) and the FCC designation No.: CN5056. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Description of Test Configuration*

The system was configured in testing mode, which was provided by manufacturer.

18 channels are provided for testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	**425.0**	10	438.5
2	426.5	11	440.0
3	428.0	12	441.5
4	429.5	13	443.0
5	431.0	14	444.5
6	432.5	15	446.0
7	434.0	16	447.5
8	435.5	17	449.0
9	**437.0**	18	**450.5**

The EUT was tested with channel 1, 9 and 18.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software*

The setting by the software as following table:

Test Software	fire_config		
Test Frequency (MHz)	425.0	437.0	450.5
Power Level	-30	-30	-30

Support Test Devices Description

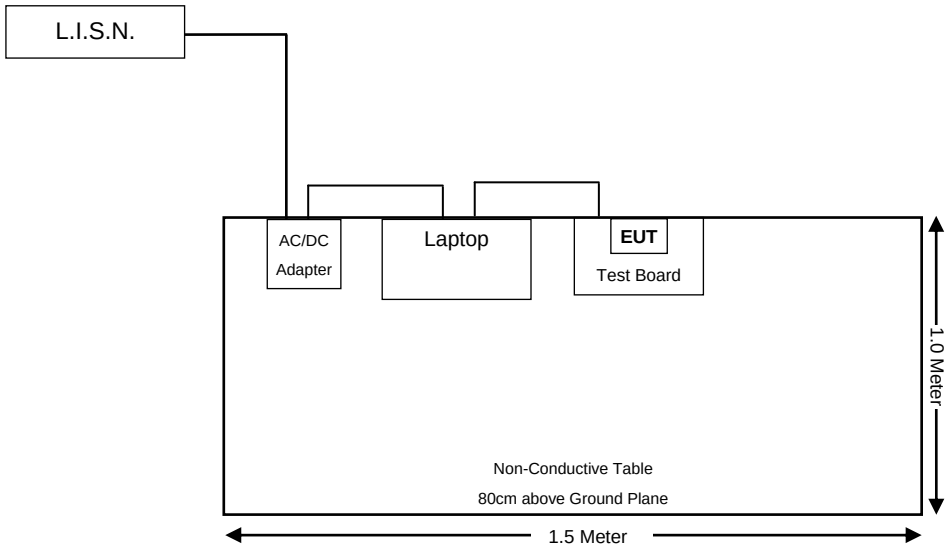
Manufacturer	Device Name	Model	Serial Number
Local			
Lenovo	Laptop	E460S	No
Lenovo	AC/DC Adapter	ADLX65NCT3A	No
Ebyte	Test Board	V1.1	10723

Support Test Cable Description

Cable Description	Length (m)	From / Port	To
Unshielded AC Power Cable	1.5	L.I.S.N.	AC/DC Adapter
Unshielded DC Power Cable	1.5	Adapter	Laptop
Unshielded USB Power Cable	0.5 or 1.5	Laptop	Test Board

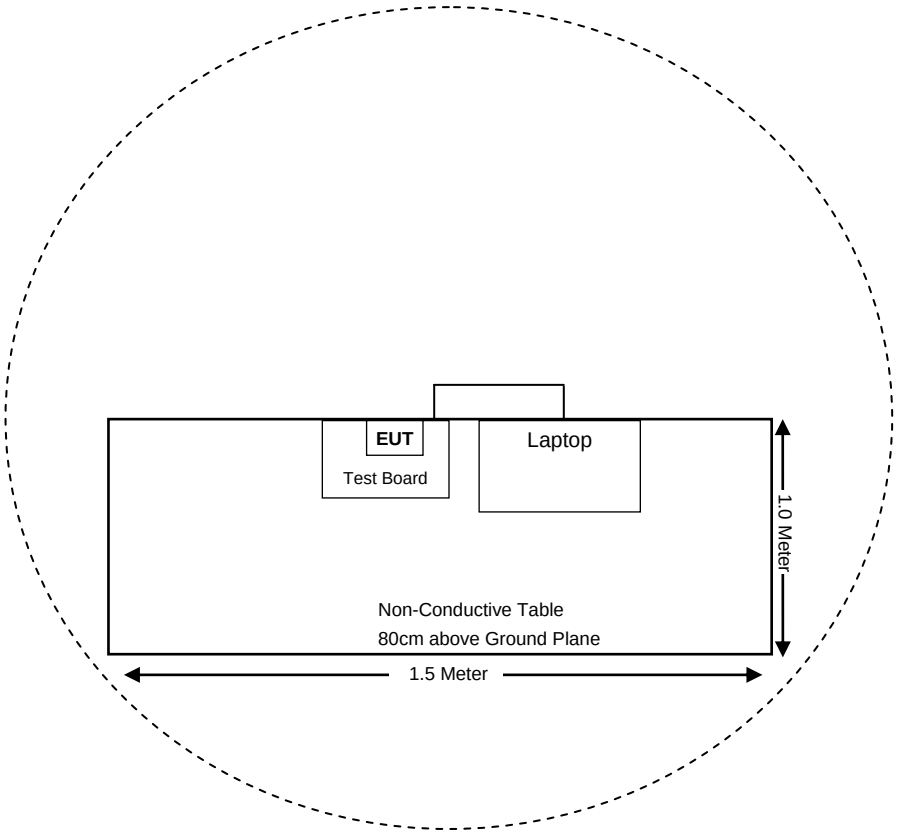
Block Diagram of Test Setup

Conducted Emissions:

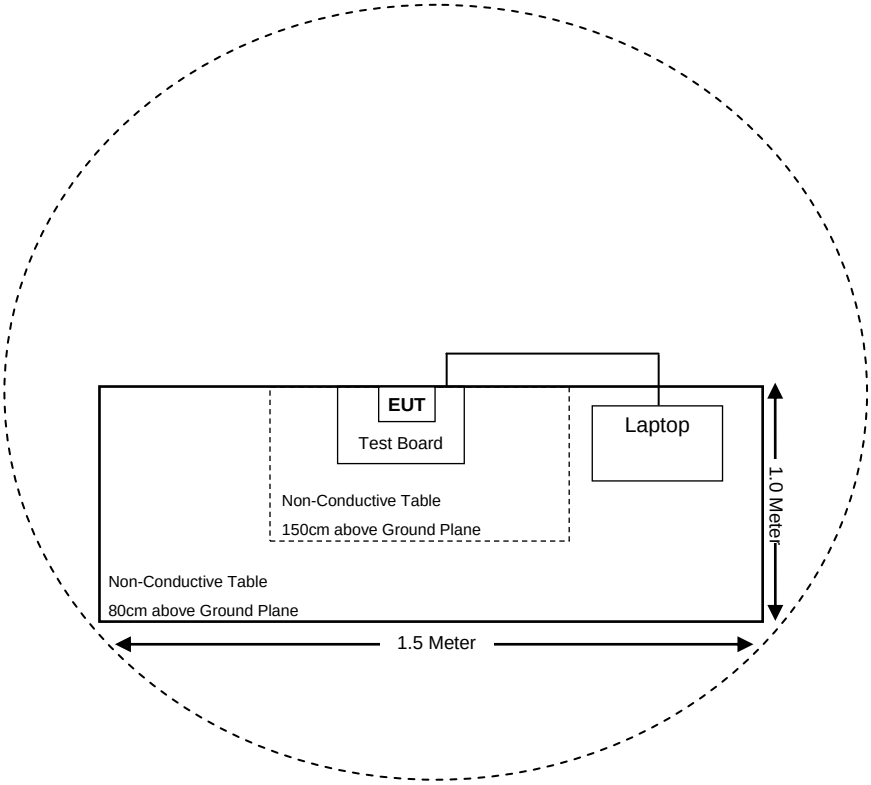


Radiated Emissions

Below 1GHz:



Above 1GHz:


EUT
Test Board
Laptop
Non-Conductive Table
150cm above Ground Plane
Non-Conductive Table
80cm above Ground Plane
1.0 Meter
1.5 Meter

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207	AC Power Line Conducted Emissions	Compliant
§15.231(b), §15.205, §15.209	Field Strength of Fundamental and Spurious Emissions	Compliant
§15.231(a)(1)	Deactivation Testing	Compliant
§15. 231(c)	20dB Emission Bandwidth	Compliant
§1.1307	RF Exposure Evaluation	Compliant

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

TEST EQUIPMENTS LIST

Manufacturer	Description	Model Number	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions					
Rohde & Schwarz	EMI Test Receiver	ESCI 3	100028	2024-04-10	2025-04-09
Rohde & Schwarz	L.I.S.N.	ENV216	3560.6550.16	2024-04-10	2025-04-09
HP	RF Limiter	11947A	3107A01270	2024-08-03	2025-08-02
UTIFLEX	Conducted Cable	L-E-003	000003	2024-08-03	2025-08-02
Rohde & Schwarz	EMC32	EMC32	V 8.52.0	NCR	NCR
Radiated Emissions (9kHz-30MHz)					
EMCT	Semi-Anechoic Chamber	966	001	2023-04-15	2028-04-14
Rohde & Schwarz	EMI Test Receiver	ESR3	102456	2024-04-11	2025-04-10
BACL CORP	Active Loop Antenna	1313-1A	4031411	2024-05-20	2025-05-19
Xin Hang Xun Wei Bo	RF Cable (Below 1GHz)	XH500A-N/J-N/J-2Mbps-A	T-E271	2024-11-18	2025-11-17
Xin Hang Xun Wei Bo	RF Cable (Below 1GHz)	XH500A-N/J-N/J-7M-A	T-E268	2024-11-18	2025-11-17
Rohde & Schwarz	EMC32	EMC32	V9.10.00	NCR	NCR
Radiated Emissions (30MHz-1GHz)					
EMCT	Semi-Anechoic Chamber	966	001	2023-04-15	2028-04-14
Sonoma Instrument	Pre-Amplifier	310 N	186684	2024-08-07	2025-08-06
Sunol Sciences Corp.	Broadband Hybrid Antenna	JB6	A082520-6	2024-10-19	2025-10-18
MIDWEST	6dB Attenuator	219	AA4305	2024-03-01	2025-03-01
Rohde & Schwarz	EMI Test Receiver	ESR3	102456	2024-04-11	2025-04-10
Huber+Suhener	RF Cable (Below 1GHz)	L-E-015	000005	2024-11-18	2025-11-17
Xin Hang Xun Wei Bo	RF Cable (Below 1GHz)	XH500A-N/J-N/J-2M-A	T-E271	2024-11-18	2025-11-17
Xin Hang Xun Wei Bo	RF Cable (Below 1GHz)	XH500A-N/J-N/J-7M-A	T-E268	2024-11-18	2025-11-17
Rohde & Schwarz	EMC32	EMC32	V9.10.00	NCR	NCR

Manufacturer	Description	Model Number	Serial Number	Calibration Date	Calibration Due Date
Radiated Emissions (1GHz-6GHz)					
EMCT	Semi-Anechoic Chamber	966	001	2023-04-15	2028-04-14
Rohde & Schwarz	Signal Analyzer	FSV40	101943	2024-04-10	2025-04-09
ETS	Horn Antenna	3115	003-6076	2024-08-16	2025-08-15
A.H. Systems, inc.	Pre-Amplifier	PAM-0118P	509	2024-08-07	2025-08-06
Xin Hang Xun Wei Bo	RF Cable (Above 1GHz)	XH500A-SMA/J -N/J-2Mbps-A	L-E-016	2024-12-12	2025-12-11
Xin Hang Xun Wei Bo	RF Cable (Above 1GHz)	XH500A-SMA/J -N/J-5M-A	L-E-017	2024-12-12	2025-12-11
Rohde & Schwarz	EMC32	EMC32	V9.10.00	NCR	NCR
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	100113	2024-04-10	2025-04-09
Mini-Circuits	6dB Attenuator	BW-S6W5+	00433	2024-09-08	2025-09-07
Astrolab	RF Coaxial Cable	MINIREND-5	1206	2024-10-18	2025-10-17

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Chengdu) 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.
c. The unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Antenna Information*

The EUT has one external monopole antenna with RP-SMA connector and the maximum antenna gain is 2.62dBi, which fulfill the requirement of this section. Please refer to the EUT photos.

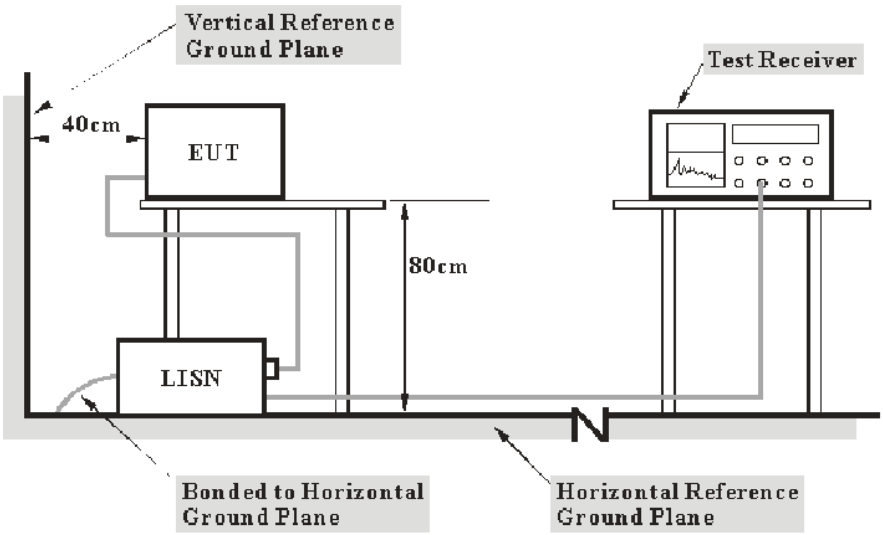
Result: Compliance

FCC §15.207 – AC POWER 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 the least 80 cm from other units and other 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	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter of laptop was connected to the first L.I.S.N.

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:

$V_C = V_R + A_C + VDF$
$C_f = A_C + VDF$

Herein,
V_C (cord. Reading): corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division factor of AMN
C_f: Correction Factor

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 – Corrected Amplitude

Test Data

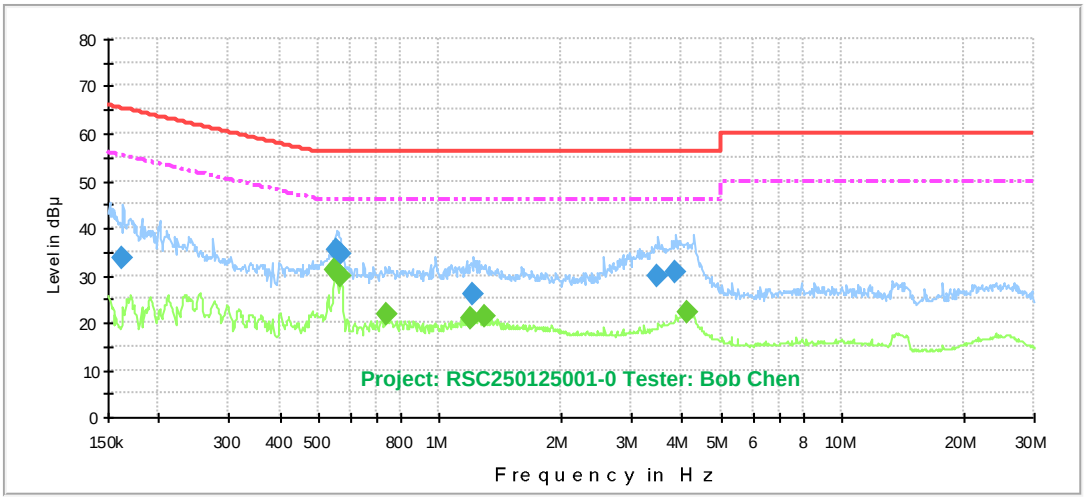
Test Environment Conditions

Temperature:	17 °C
Relative Humidity:	63 %
ATM Pressure:	96.1 kPa

The testing was performed by Bob Chen on 2025-01-23.

Test Mode: Transmitting with maximum power output

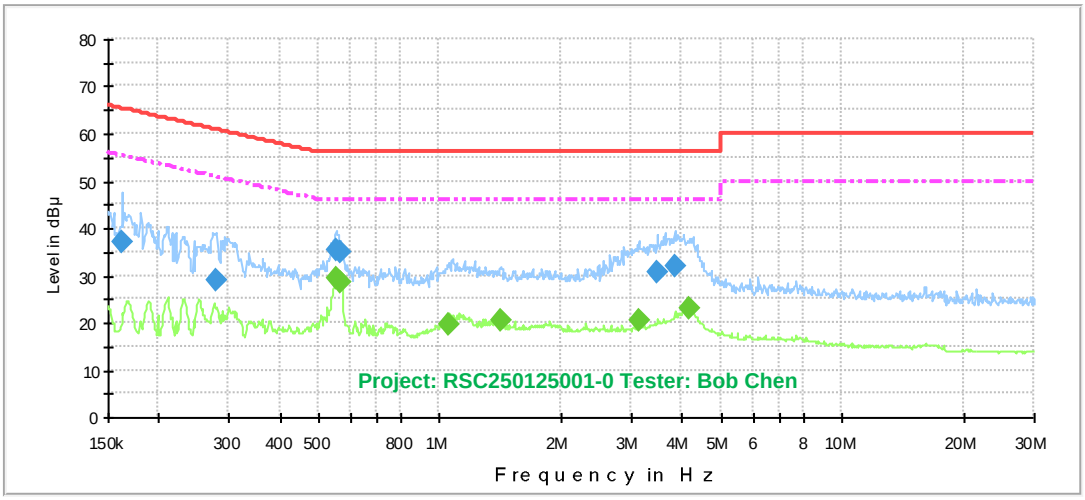
AC120V/60Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.163273	33.7	5000.0	9.000	L1	19.7	31.6	65.3
0.556885	35.1	5000.0	9.000	L1	19.6	20.9	56.0
0.565280	34.4	5000.0	9.000	L1	19.6	21.6	56.0
1.212471	26.0	5000.0	9.000	L1	19.6	30.0	56.0
3.490411	29.6	5000.0	9.000	L1	19.7	26.4	56.0
3.856539	30.5	5000.0	9.000	L1	19.7	25.5	56.0

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.548615	30.9	5000.0	9.000	L1	19.6	15.1	46.0
0.568107	29.6	5000.0	9.000	L1	19.6	16.4	46.0
0.736318	21.6	5000.0	9.000	L1	19.4	24.4	46.0
1.200437	21.1	5000.0	9.000	L1	19.6	24.9	46.0
1.300158	21.4	5000.0	9.000	L1	19.6	24.6	46.0
4.114874	22.0	5000.0	9.000	L1	19.7	24.0	46.0

AC120V/60Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.162461	37.1	5000.0	9.000	N	19.4	28.2	65.3
0.278409	29.1	5000.0	9.000	N	19.5	31.8	60.9
0.551358	35.4	5000.0	9.000	N	19.5	20.6	56.0
0.565280	34.7	5000.0	9.000	N	19.5	21.3	56.0
3.473045	30.6	5000.0	9.000	N	19.6	25.4	56.0
3.837352	31.7	5000.0	9.000	N	19.6	24.3	56.0

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.554115	29.3	5000.0	9.000	N	19.5	16.7	46.0
0.568107	28.5	5000.0	9.000	N	19.5	17.5	46.0
1.059712	19.6	5000.0	9.000	N	19.5	26.4	46.0
1.422281	20.6	5000.0	9.000	N	19.5	25.4	46.0
3.127686	20.4	5000.0	9.000	N	19.6	25.6	46.0
4.156126	22.9	5000.0	9.000	N	19.7	23.1	46.0

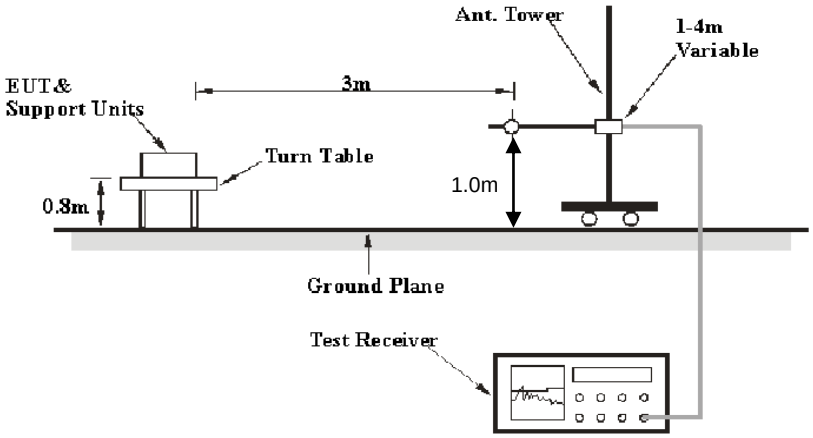
FCC §15.231(b), §15.205, §15.209 - FIELD STRENGTH OF FUNDAMENTAL AND SPURIOUS EMISSIONS

Applicable Standard

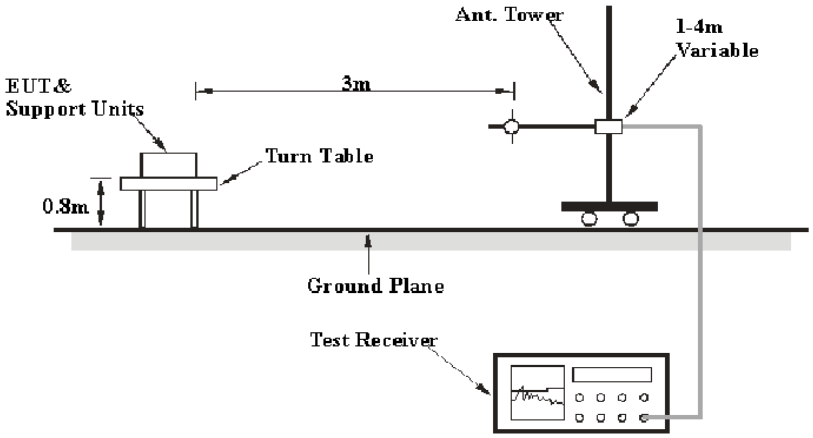
FCC §§15.231(b), §15.205, §15.209

EUT Setup

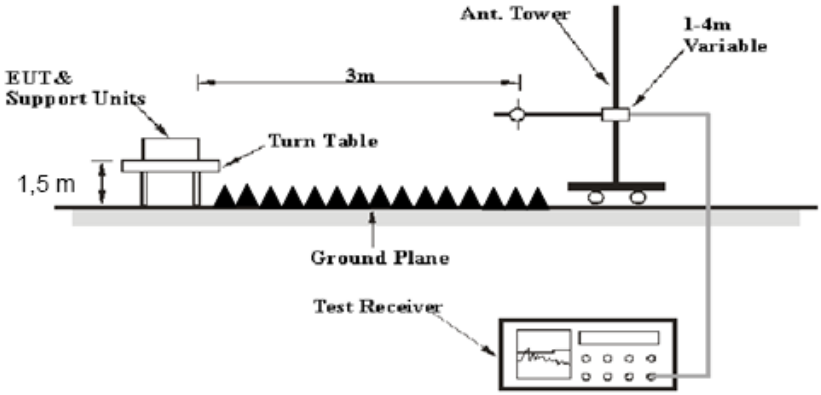
9kHz - 30MHz:



30MHz - 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2020. The specification used was the FCC 15.209, and FCC 15.231(b) limits.

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

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Signal Analyzer Setup

The system was investigated from 9 kHz to 6 GHz.

During the radiated emission test, the EMI test receiver or Signal Analyzer was set with the following configurations:

Frequency Range	RBW	Video B/W	Measurement
9 kHz – 150 kHz	200 Hz	1 kHz	PK
150 kHz – 30 MHz	9 kHz	30 kHz	PK
30 MHz – 1000 MHz	120 kHz	/	QP
	120 kHz	500 kHz	PK
Above 1 GHz	1 MHz	3 MHz	PK
	1 MHz	3 MHz	CISPR AV

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

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.

If the peak detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

Test Procedure

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude (MaxPeak or QuasiPeak)= Meter Reading + Antenna Loss + Cable Loss- 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 –Corrected Amplitude

Test Data

Test Environment Conditions

Temperature:	22 °C
Relative Humidity:	57 %
ATM Pressure:	96.2 kPa

The testing was performed by Bob Chen on 2025-01-24.

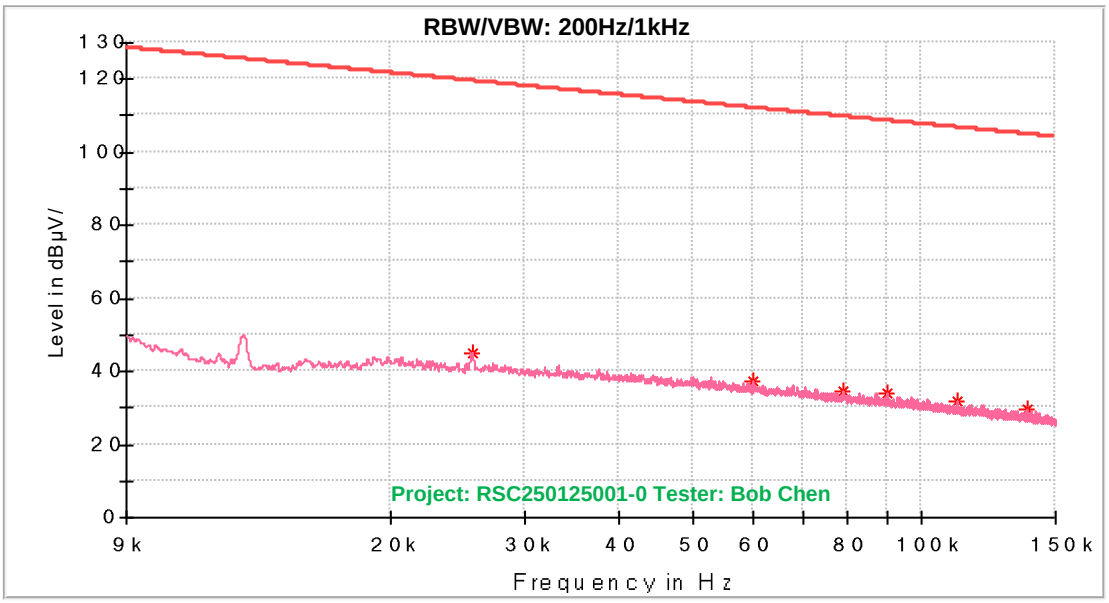
Test Mode: Transmitting

Note: 1. Pre-scan and configuration EUT with X, Y and Z-axis, the Y-axis is the worst case.
2. The field strength of spurious emissions meets 15.209 requirement.
3. If the peak detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

Radiated Spurious Emissions:

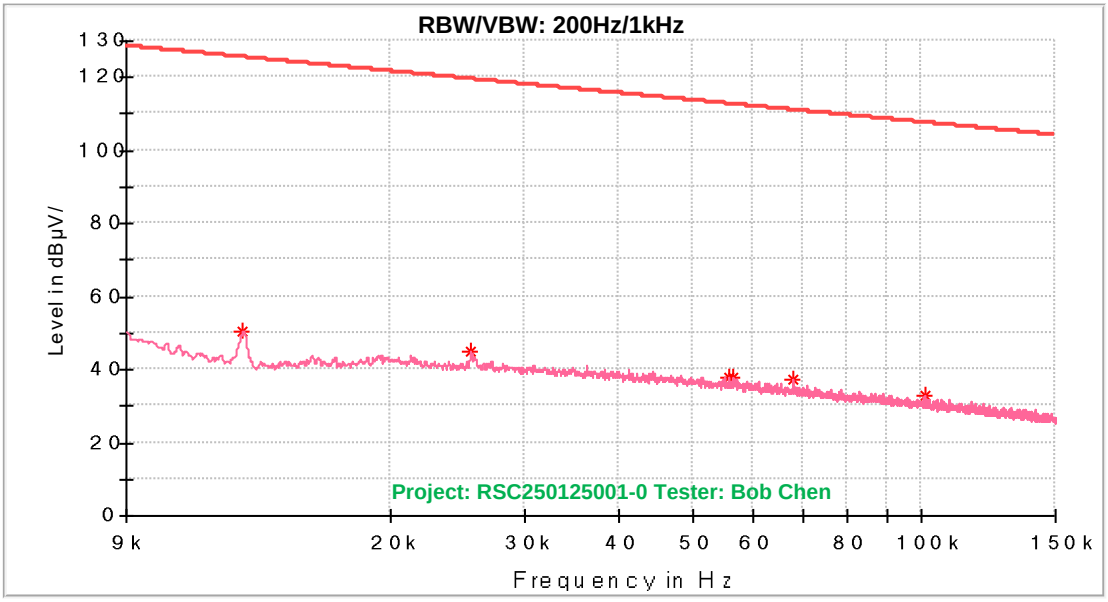
1) 9 kHz to 150 kHz_High channel_transmitting with maximum power output

Parallel



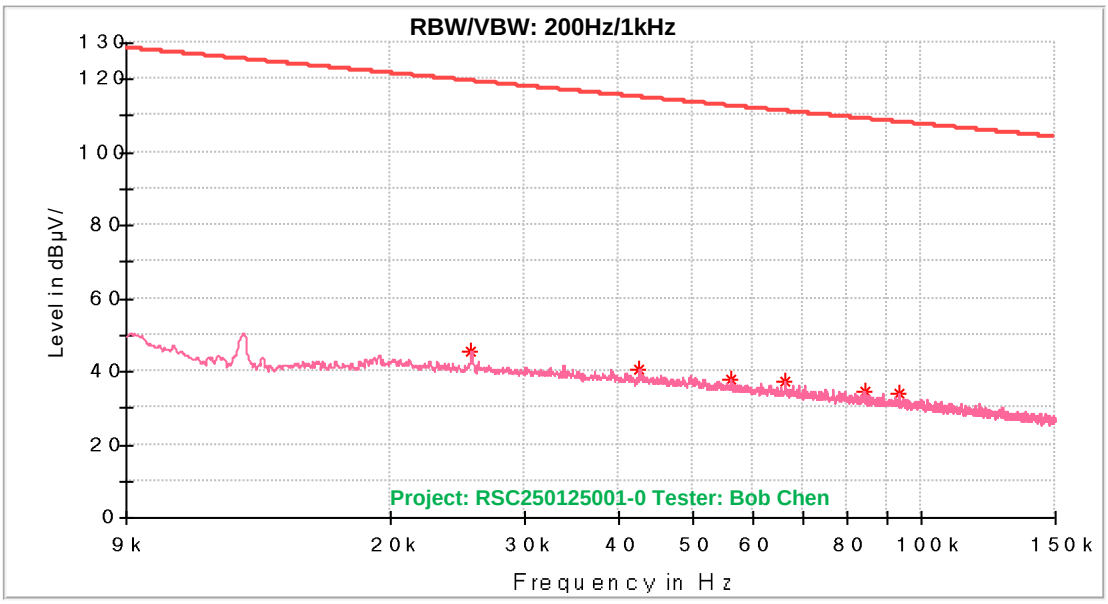
Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB)
0.025691	44.93	119.39	74.46	100.0	172.0	22.6
0.060024	37.17	112.03	74.86	100.0	288.0	17.9
0.078760	34.77	109.67	74.90	100.0	102.0	15.8
0.090004	33.94	108.51	74.57	100.0	106.0	14.8
0.111190	31.99	106.68	74.68	100.0	106.0	13.1
0.137416	29.87	104.84	74.96	100.0	254.0	11.3

Perpendicular



Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB)
0.012825	50.67	125.43	74.75	100.0	222.0	22.8
0.025568	44.89	119.44	74.55	100.0	281.0	22.6
0.055724	38.04	112.67	74.63	100.0	90.0	18.5
0.056658	37.64	112.53	74.89	100.0	137.0	18.4
0.067903	37.11	110.96	73.85	100.0	342.0	17.0
0.100862	32.84	107.52	74.69	100.0	47.0	14.0

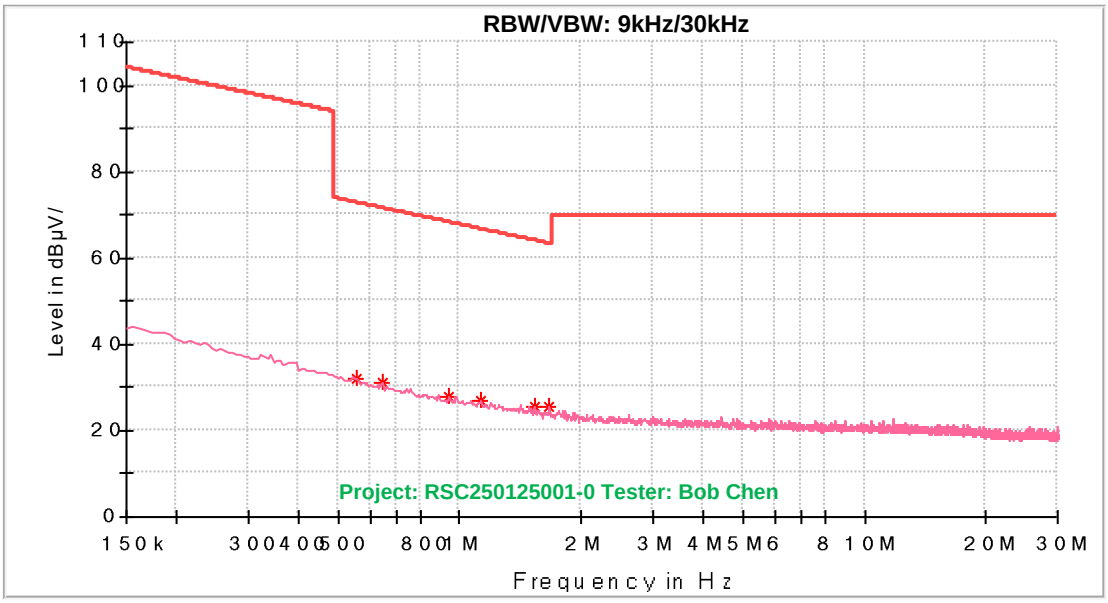
Ground Parallel



Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB)
0.025603	45.46	119.42	73.96	100.0	0.0	22.6
0.042611	40.58	115.00	74.42	100.0	334.0	20.3
0.056129	37.90	112.61	74.71	100.0	28.0	18.4
0.066123	37.14	111.19	74.05	100.0	215.0	17.2
0.084082	34.62	109.10	74.48	100.0	257.0	15.3
0.093670	33.74	108.16	74.43	100.0	359.0	14.5

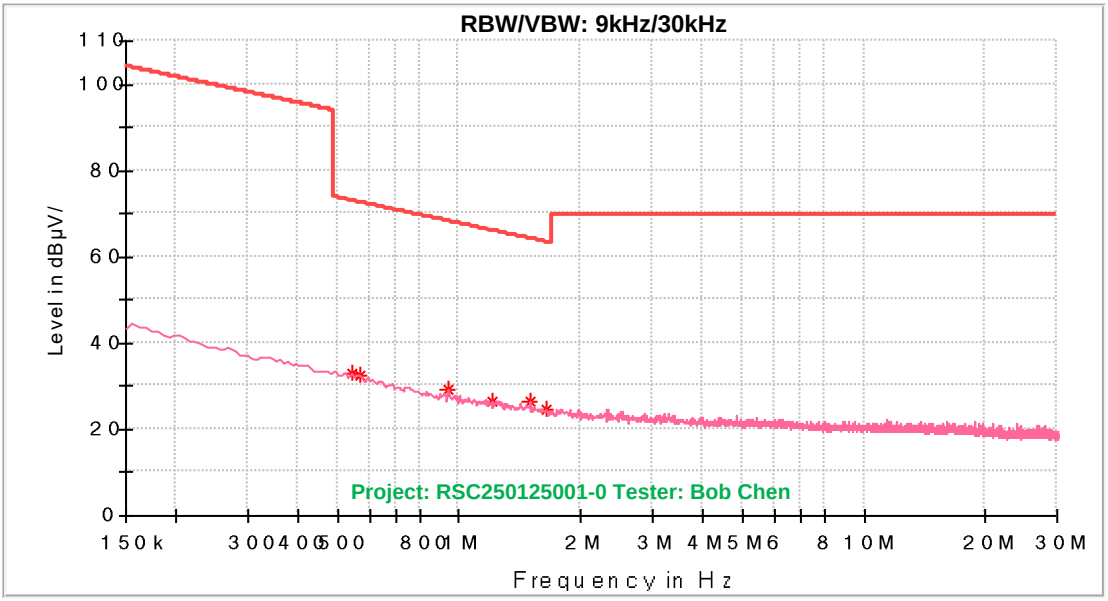
2) 150 kHz to 30 MHz_High channel _ transmitting with maximum power output

Parallel



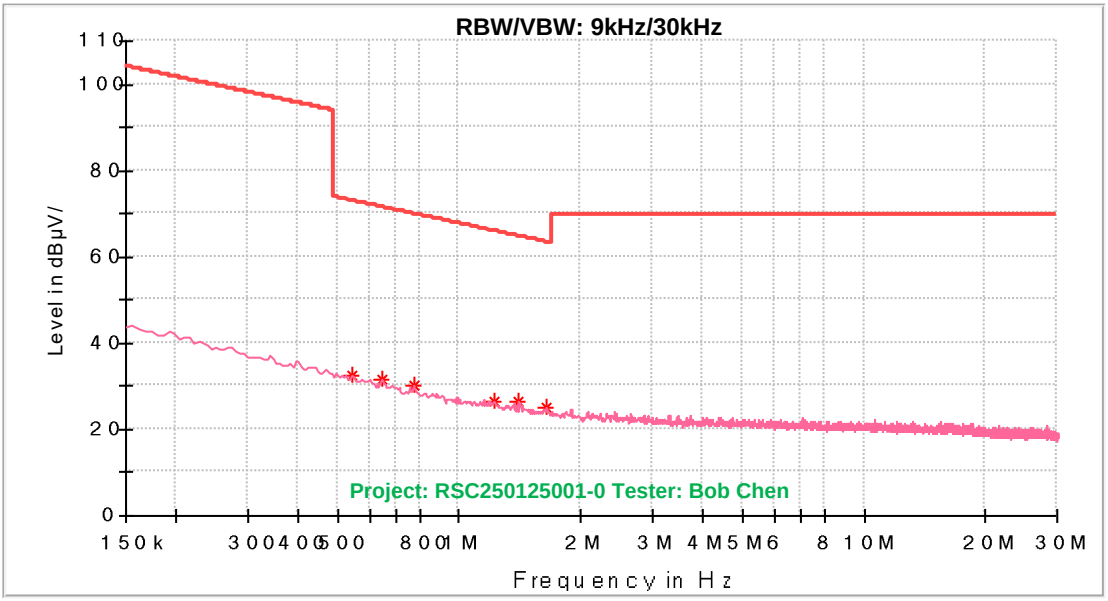
Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB)
0.555960	32.18	72.71	40.53	100.0	126.0	-0.3
0.645510	31.09	71.41	40.33	100.0	220.0	-1.4
0.944010	27.96	68.12	40.16	100.0	317.0	-4.0
1.129080	26.97	66.57	39.60	100.0	199.0	-4.9
1.529070	25.54	63.94	38.40	100.0	330.0	-6.3
1.666380	25.49	63.20	37.71	100.0	131.0	-6.7

Perpendicular



Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB)
0.544020	32.91	72.89	39.99	100.0	115.0	-0.1
0.567900	32.29	72.52	40.23	100.0	155.0	-0.4
0.944010	29.18	68.12	38.94	100.0	207.0	-4.0
1.206690	26.66	65.99	39.33	100.0	74.0	-5.2
1.499220	26.56	64.11	37.56	100.0	258.0	-6.2
1.636530	24.64	63.36	38.71	100.0	199.0	-6.6

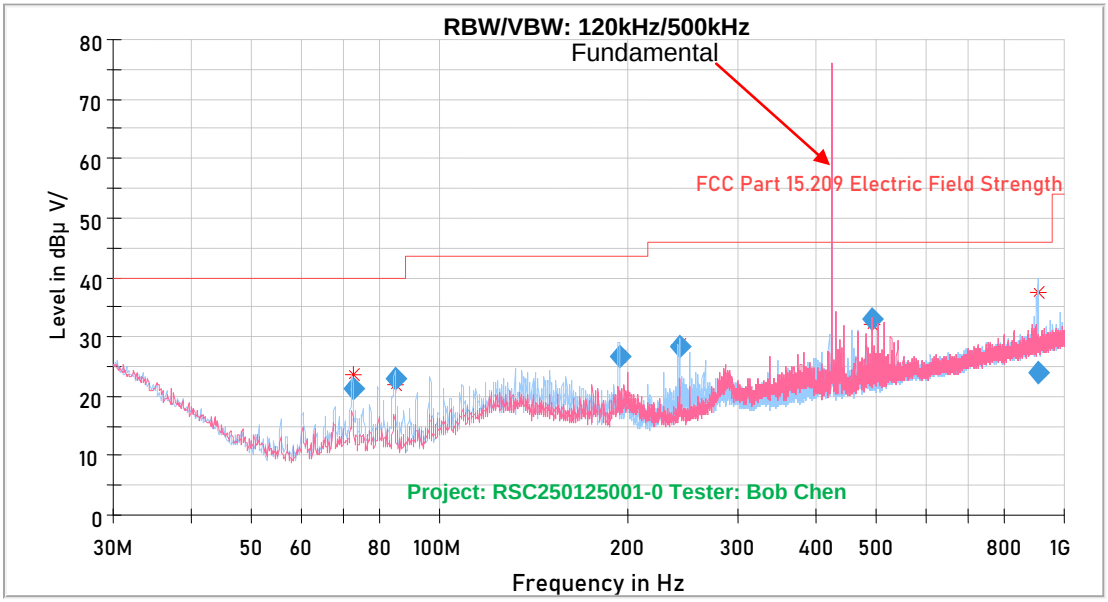
Ground Parallel



Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB)
0.544020	32.26	72.89	40.64	100.0	297.0	-0.1
0.645510	31.62	71.41	39.79	100.0	354.0	-1.4
0.770880	30.01	69.88	39.86	100.0	253.0	-2.7
1.224600	26.54	65.87	39.32	100.0	183.0	-5.3
1.403700	26.37	64.68	38.32	100.0	281.0	-5.9
1.648470	25.23	63.29	38.06	100.0	187.0	-6.7

3) 30 MHz to 1 GHz

Low Channel



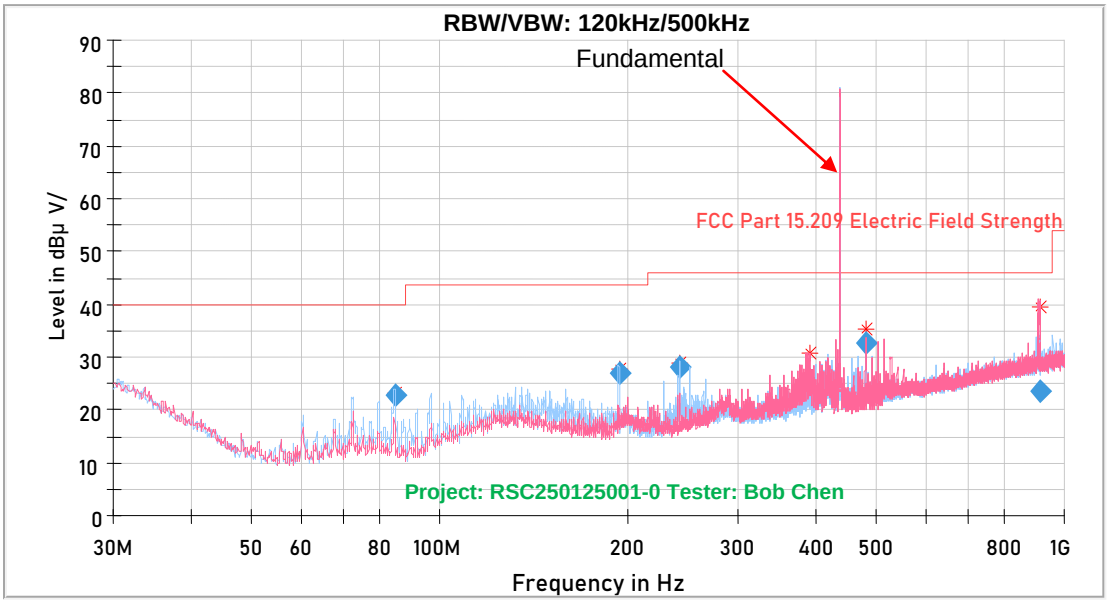
Frequency (MHz)	QuasiPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
72.518900	21.22	40.00	18.78	1000.0	120.000	224.0	H	48.0	-15.2
84.659100	22.82	40.00	17.18	1000.0	120.000	211.0	H	214.0	-16.0
193.500300	26.65	43.50	16.85	1000.0	120.000	199.0	H	29.0	-11.1
241.933950	28.22	46.00	17.78	1000.0	120.000	135.0	H	204.0	-11.1
491.966900	33.90	46.00	12.10	1000.0	120.000	111.0	V	133.0	-4.5
911.249950	23.93	46.00	22.07	1000.0	120.000	157.0	H	303.0	1.9

Fundamental

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
425.00	75.96	80.50	4.54	1000.0	120.000	103.0	V	97.0	-6.0

Note: The maximum peak level is less than the average limit, so it is not necessary to perform average measurement.

Middle Channel



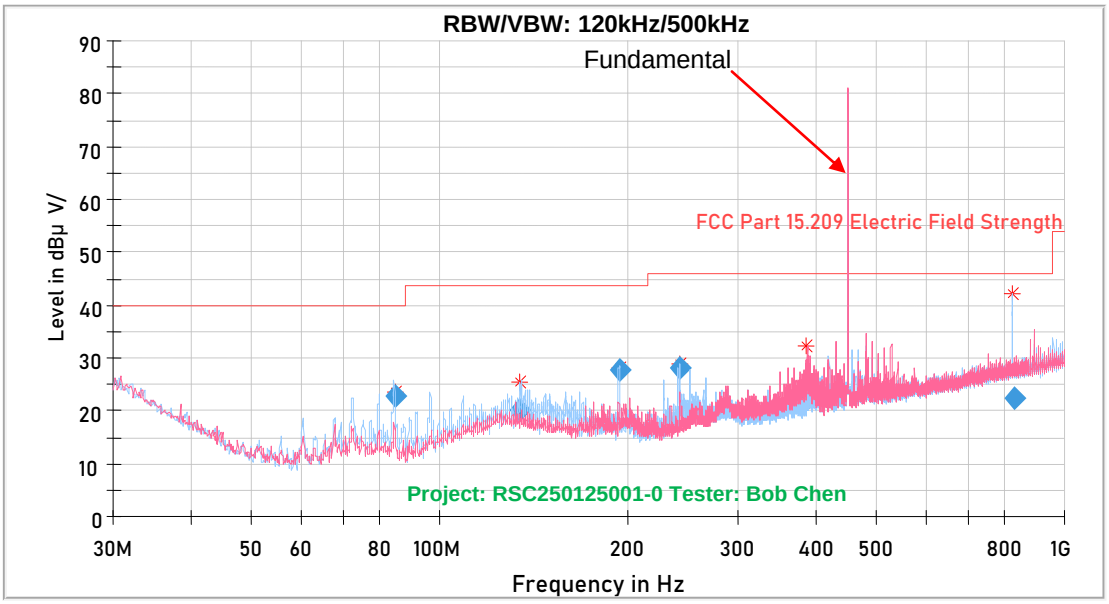
Frequency (MHz)	QuasiPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
84.707300	22.64	40.00	17.36	1000.0	120.000	214.0	H	206.0	-16.0
193.551650	26.79	43.50	16.71	1000.0	120.000	178.0	H	9.0	-11.1
241.974850	28.03	46.00	17.97	1000.0	120.000	133.0	H	211.0	-11.1
391.430450	22.61	46.00	23.39	1000.0	120.000	124.0	V	0.0	-7.0
480.014650	32.73	46.00	13.27	1000.0	120.000	134.0	V	118.0	-4.9
912.442250	23.61	46.00	22.39	1000.0	120.000	124.0	V	358.0	1.9

Fundamental

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
437.00	80.17	80.90	0.73	1000.0	120.000	104.0	V	118.0	-5.9

Note: The maximum peak level is less than the average limit, so it is not necessary to perform average measurement.

High Channel



Frequency (MHz)	QuasiPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
84.646650	22.97	40.00	17.03	1000.0	120.000	216.0	H	211.0	-16.0
134.673850	20.00	43.50	23.50	1000.0	120.000	219.0	H	49.0	-9.6
193.537050	27.80	43.50	15.70	1000.0	120.000	178.0	H	206.0	-11.1
241.862500	28.19	46.00	17.81	1000.0	120.000	123.0	H	217.0	-11.1
386.856550	21.96	46.00	24.04	1000.0	120.000	224.0	V	187.0	-7.0
828.300000	22.52	46.00	23.48	1000.0	120.000	124.0	H	32.0	0.5

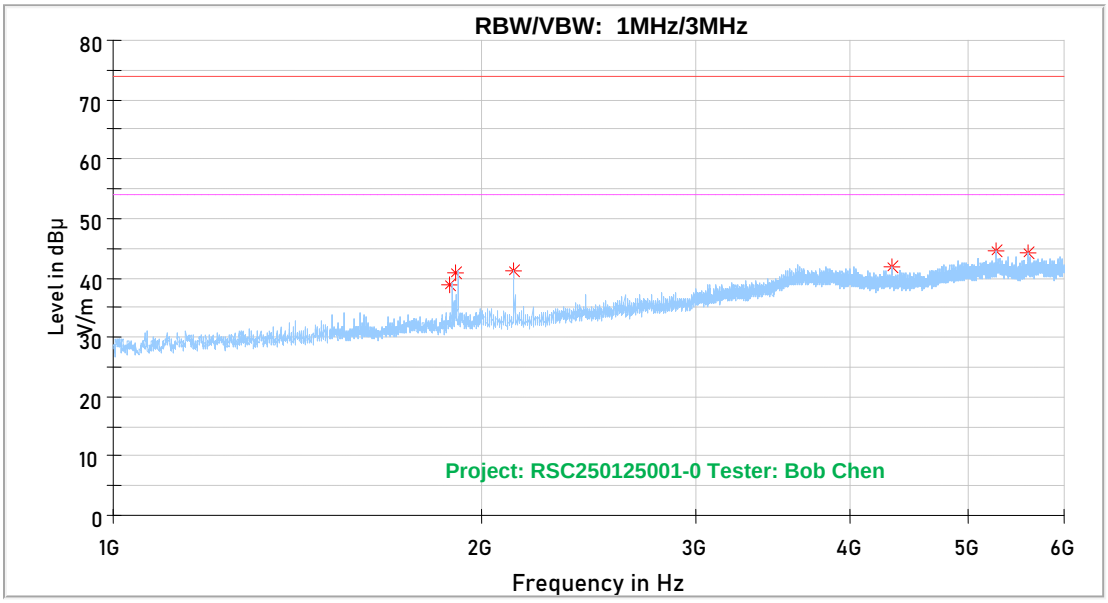
Fundamental

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
450.50	80.49	81.35	0.86	1000.0	120.000	138.0	V	116.0	-5.6

Note: The maximum peak level is less than the average limit, so it is not necessary to perform average measurement.

4) 1GHz-6GHz

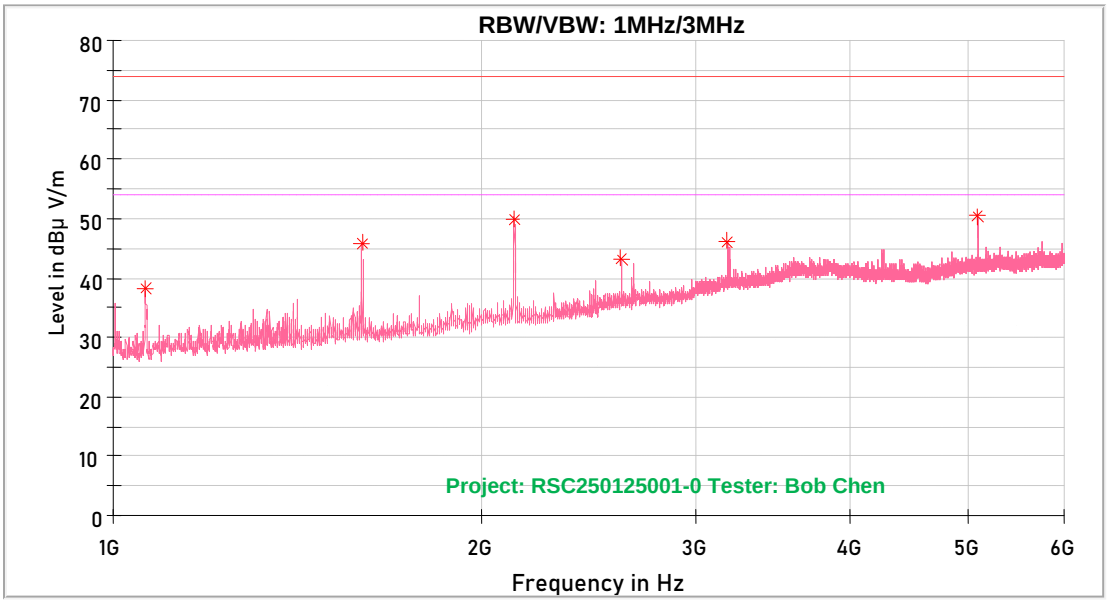
Low Channel_Horizontal



Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1886.000000	38.73	74.00	35.27	150.0	H	0.0	-14.3
1904.000000	40.79	74.00	33.21	150.0	H	0.0	-14.0
2127.500000	41.02	74.00	32.98	100.0	H	53.0	-13.7
4339.000000	41.87	74.00	32.13	150.0	H	63.0	-6.4
5278.000000	44.39	74.00	29.61	150.0	H	286.0	-4.3
5604.000000	44.24	74.00	29.76	150.0	H	176.0	-4.1

Note: The maximum peak level is less than the average limit, so it is not necessary to perform average measurement.

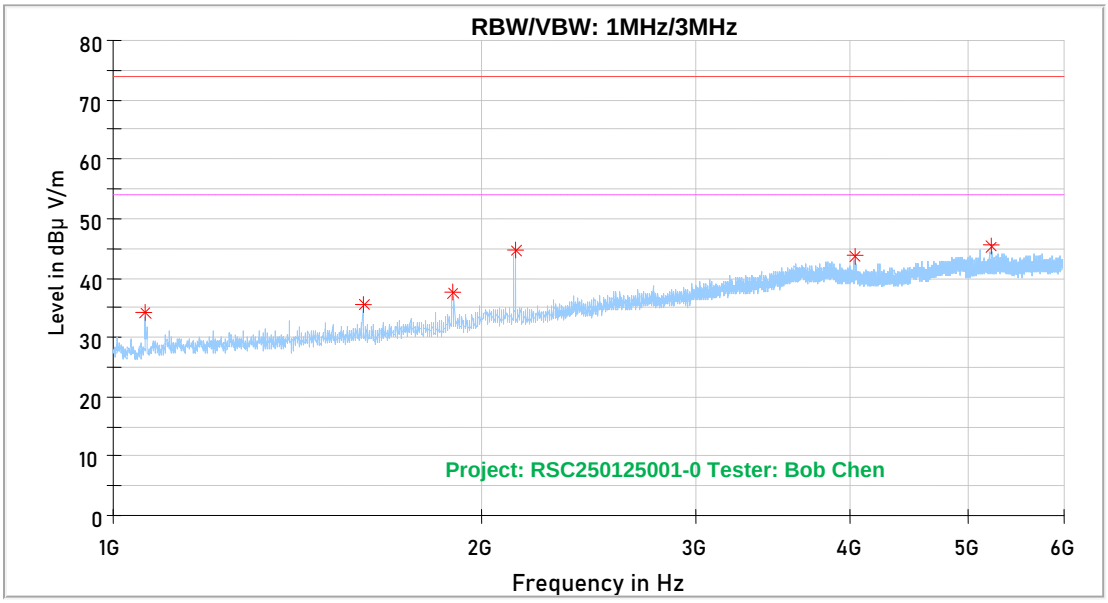
Low Channel_Vertical



Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1063.000000	38.41	74.00	35.59	150.0	V	287.0	-18.6
1597.000000	45.76	74.00	28.24	100.0	V	19.0	-16.3
2127.500000	49.77	74.00	24.23	100.0	V	148.0	-13.7
2607.500000	43.28	74.00	30.72	100.0	V	282.0	-11.6
3186.500000	44.32	74.00	29.68	100.0	V	0.0	-9.0
5101.500000	48.91	74.00	25.09	100.0	V	216.0	-4.8

Note: The maximum peak level is less than the average limit, so it is not necessary to perform average measurement.

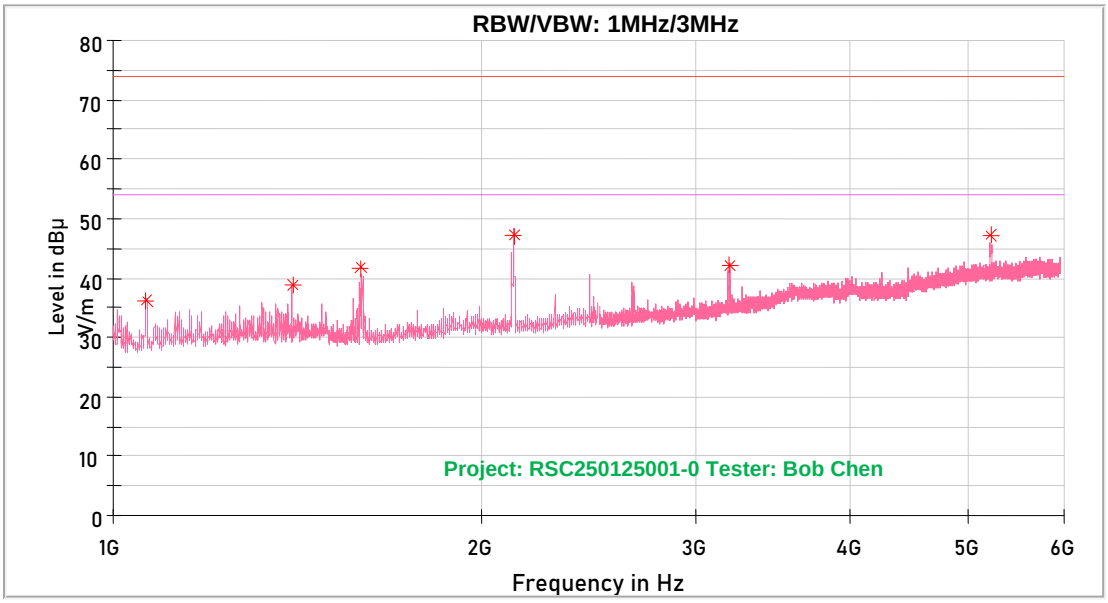
Middle Channel_Horizontal



Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1062.000000	33.70	74.00	40.30	150.0	H	282.0	-18.7
1599.500000	35.24	74.00	38.76	100.0	H	217.0	-16.3
1894.500000	36.76	74.00	37.24	150.0	H	352.0	-14.1
2133.000000	44.09	74.00	29.91	100.0	H	143.0	-13.7
4038.000000	42.24	74.00	31.76	100.0	H	124.0	-6.2
5209.000000	43.71	74.00	30.29	100.0	H	105.0	-4.5

Note: The maximum peak level is less than the average limit, so it is not necessary to perform average measurement.

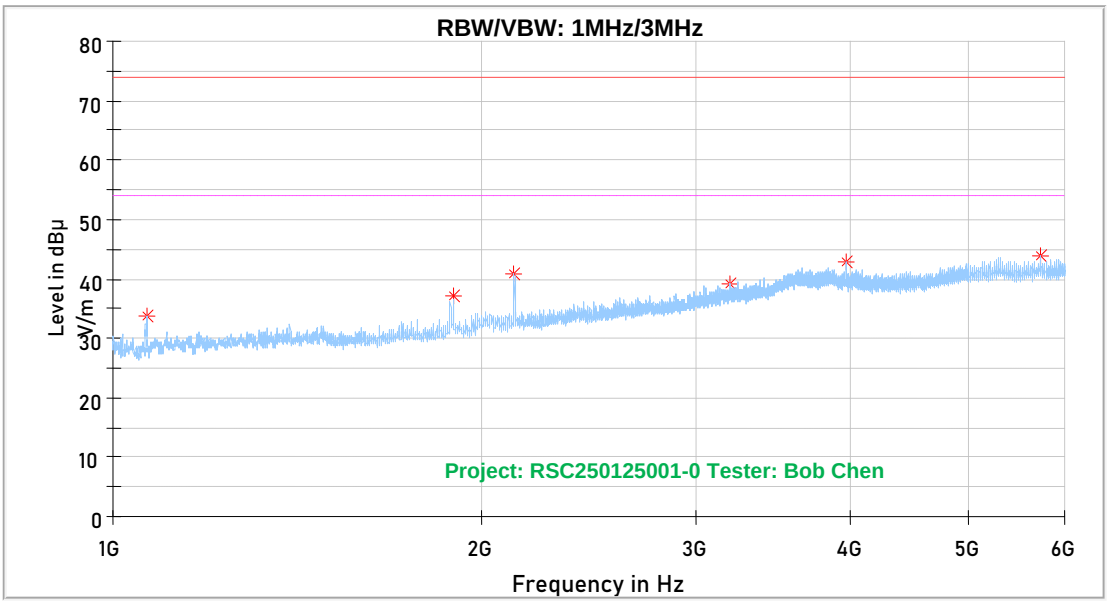
Middle Channel_Vertical



Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1064.500000	35.90	74.00	38.10	100.0	V	185.0	-18.6
1400.500000	37.65	74.00	36.35	100.0	V	14.0	-17.0
1598.500000	40.70	74.00	33.30	150.0	V	323.0	-16.3
2126.500000	46.99	74.00	27.01	100.0	V	59.0	-13.7
3187.500000	43.26	74.00	30.74	100.0	V	286.0	-9.0
5242.500000	46.11	74.00	27.89	150.0	V	160.0	-4.7

Note: The maximum peak level is less than the average limit, so it is not necessary to perform average measurement.

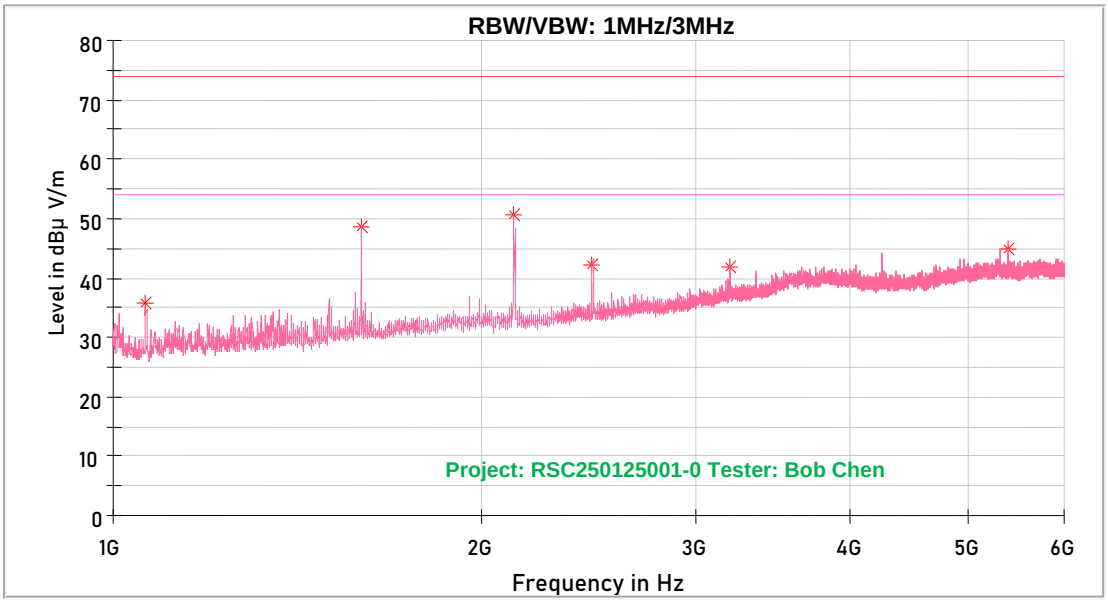
High Channel_Horizontal



Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1065.500000	33.85	74.00	40.15	150.0	H	330.0	-18.6
1900.000000	37.07	74.00	36.93	150.0	H	354.0	-14.0
2128.500000	40.95	74.00	33.05	150.0	H	82.0	-13.7
3190.500000	39.29	74.00	34.71	150.0	H	330.0	-9.0
3983.000000	42.98	74.00	31.02	100.0	H	192.0	-6.2
5730.000000	43.74	74.00	30.26	150.0	H	287.0	-3.9

Note: The maximum peak level is less than the average limit, so it is not necessary to perform average measurement.

High Channel_Vertical



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1381.500000	38.52	74.00	35.48	150.0	V	287.0	-17.1
1600.000000	44.57	74.00	29.43	150.0	V	81.0	-16.3
2125.000000	48.93	74.00	25.07	150.0	V	329.0	-13.8
2299.000000	41.68	74.00	32.32	150.0	V	242.0	-13.0
2663.000000	43.11	74.00	30.89	150.0	V	236.0	-11.6
4265.500000	44.80	74.00	29.20	150.0	V	161.0	-6.7

Note: The maximum peak level is less than the average limit, so it is not necessary to perform average measurement.

FCC §15.231(a) (1) - DEACTIVATION TESTING

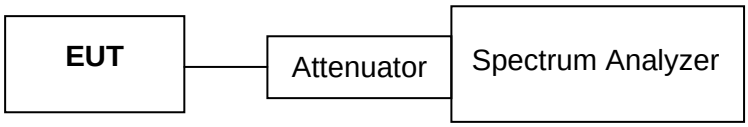
Applicable Standard

Per FCC §15.231(a) (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set center frequency of spectrum analyzer=operating frequency.
3. Set the spectrum analyzer as RBW=100k VBW=100k Span=0Hz.
4. Repeat above procedures until all frequency measured was complete.

Test Setup Block



Note: Offset (6.5dB) = 6dB Attenuator(6dB) + RF cable loss(0.5dB)

Test Data

Environmental Conditions

Temperature:	16 ℃
Relative Humidity:	61 %
ATM Pressure:	96.2 kPa

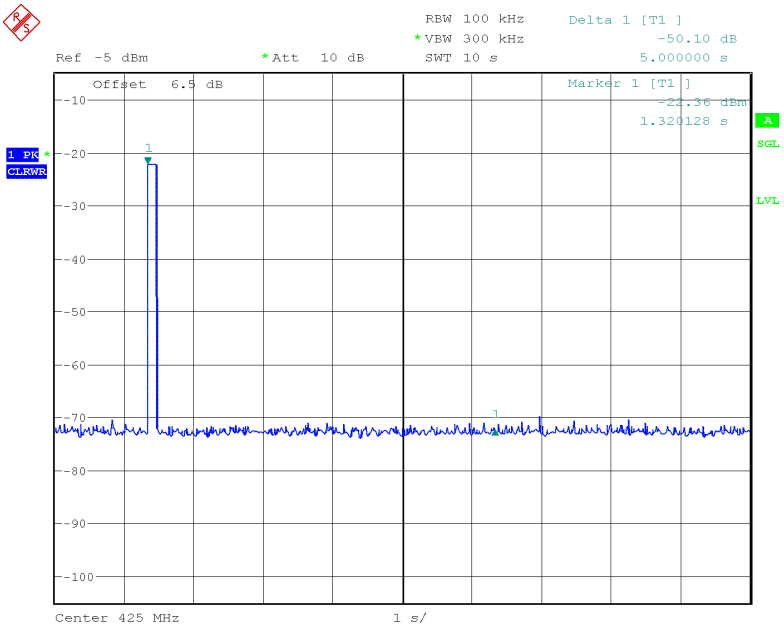
The testing was performed by Bob Chen on 2025-01-21.

Test mode: Transmitting

Test Result: Compliance. Please refer to the following table and plots.

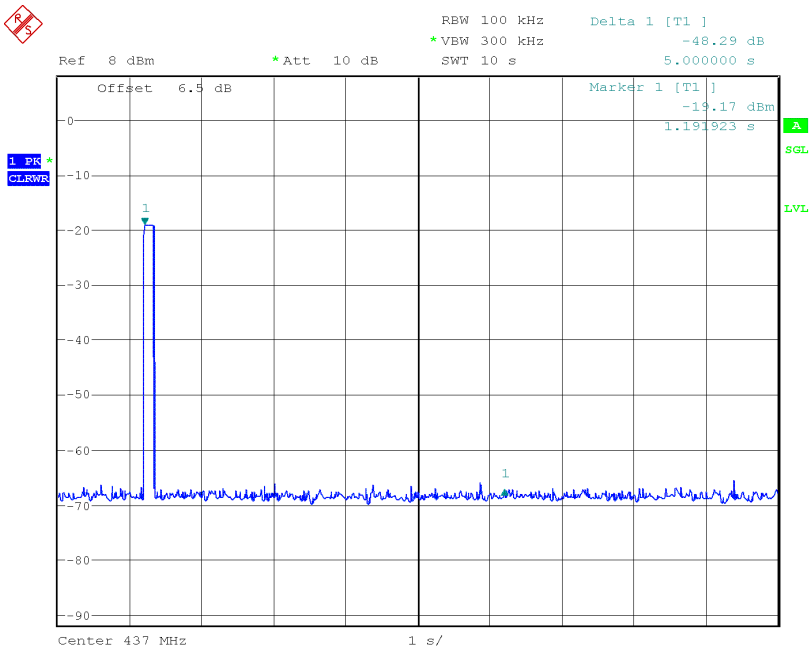
Channel	Frequency (MHz)	Limit （S）	Result
Low	425.0	＜5	Pass
Middle	437.0	＜5	Pass
High	450.5	＜5	Pass

Low Channel



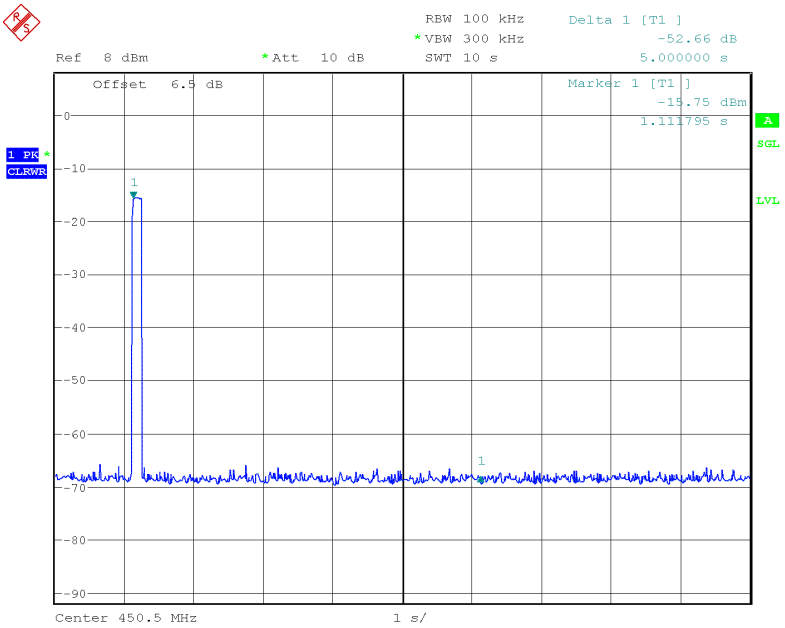
Comment: Project:RSC250125001-0 Tester:Bob Chen
Date: 21.JAN.2025 13:36:49

Middle Channel



Comment: Project:RSC250125001-0 Tester:Bob Chen
Date: 21.JAN.2025 13:38:38

High Channel



Comment: Project:RSC250125001-0 Tester:Bob Chen
Date: 21.JAN.2025 13:39:29

FCC §15.231(c) – 20dB EMISSION BANDWIDTH

Applicable Standard

Per 15.231(c), the bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

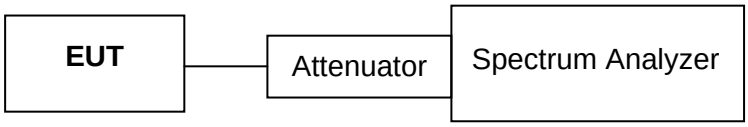
The 99% bandwidth of momentarily operated devices shall be less or equal to 0.25% of the centre frequency of devices operating between 70 MHz and 900 MHz. For devices operating above 900 MHz, the 99% bandwidth shall be less or equal to 0.5% of the centre frequency.

Test Procedure

ANSI C63.10-2020 Clause 6.9.2

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.
b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be at least three times RBW, unless otherwise specified by the applicable requirement.
c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level.
d) Steps a) through c) might require iteration to adjust within the specified tolerances.
e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target "−xx dB down" requirement; that is, if the requirement calls for measuring the −20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value.
f) Set detection mode to peak and trace mode to max-hold.
g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
h)Determine the "−xx dB down amplitude" using [(reference value) - xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument.

Test Setup Block



Note: Offset (6.5dB) = 6dB Attenuator(6dB) + RF cable loss(0.5dB)

Test Data

Environmental Conditions

Temperature:	16 ℃
Relative Humidity:	61 %
ATM Pressure:	96.2 kPa

The testing was performed by Bob Chen on 2025-01-21.

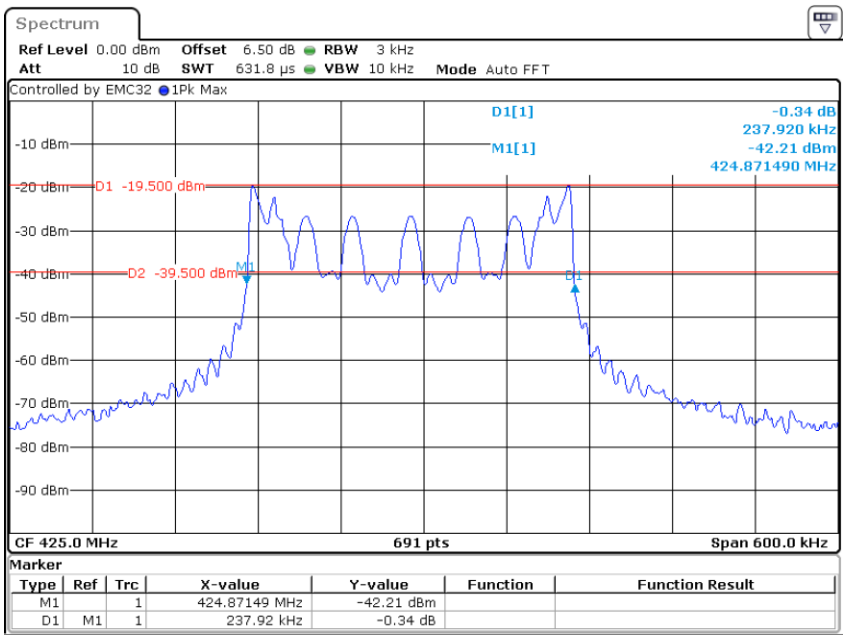
Test Mode: Transmitting

Test Result: Compliance. Please refer to the following table and plots.

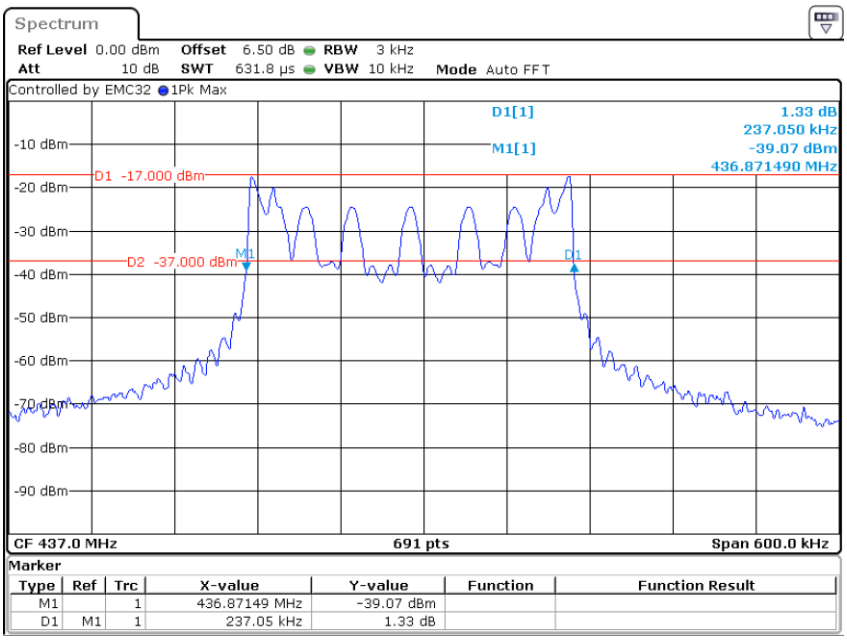
Channel	Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)
Low	425.0	237.92	1062.5
Middle	437.0	237.05	1092.5
High	450.5	237.05	1126.25

Note: Limit = 0.25% x Center Frequency

20dB Bandwidth, Low Channel



20dB Bandwidth, Middle Channel



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	436.87149 MHz	-39.07 dBm		
D1	M1	1	237.05 kHz	1.33 dB		

Project: RSC250125001-0 Tester: Bob Chen

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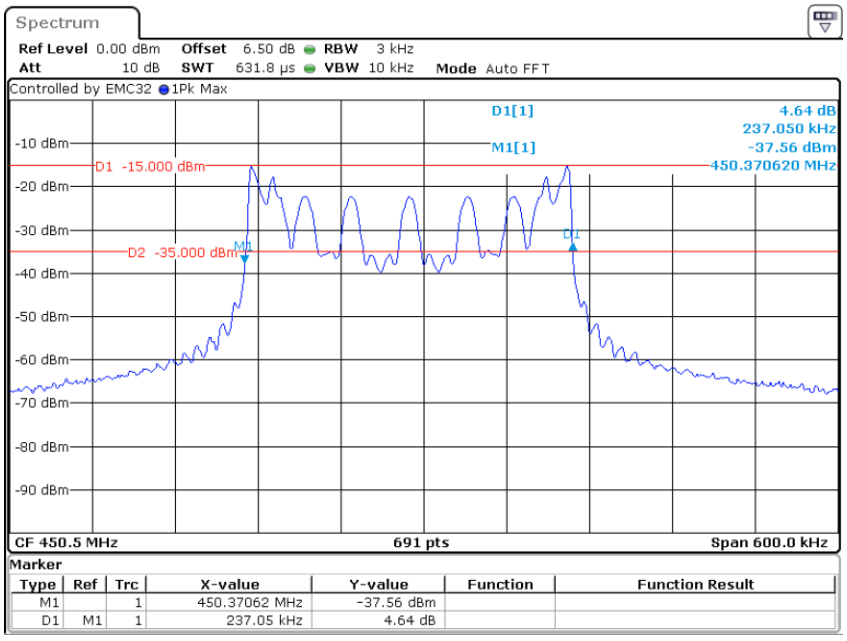
20dB Bandwidth, High Channel



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	450.37062 MHz	-37.56 dBm		
D1	M1	1	237.05 kHz	4.64 dB		

Project: RSC250125001-0 Tester: Bob Chen

Date: 21.JAN.2025 10:42:02

FCC §1.1307 – RF EXPOSURE EVALUATION

Applicable Standard

According to §1.1307(b)(3)(i), 447498 D04 Interim General RF Exposure Guidance v01

1-mW Test Exemption

Per § 1.1307(b)(3)(i)(A), a single RF source is exempt RF device (from the requirement to show data demonstrating compliance to RF exposure limits, as previously mentioned) if the available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption applies to all operating configurations and exposure conditions, for the frequency range 100 kHz to 100 GHz, regardless of fixed, mobile, or portable device exposure conditions. This is a standalone exemption, and it cannot be applied in conjunction with any other test exemption.

RF EXPOSURE EVALUATION

Frequency (MHz)	Maximum EIRP (dBm)	Maximum ERP		1-mW Test Exemption
		dBm	mW	
450.50	-14.71	-16.86	0.021	Compliant

Note:

1. The maximum power was chose to evaluate.
2. The device maximum fundamental E-field level is 80.49 dBμV/m @3m, so the EIRP is -14.71dBm.
3. E[dBμV/m] = EIRP[dBm] + 95.2, for d = 3 m.
4. EIRP=ERP+2.15

END OF REPORT