

FCC Test Report

Product Name	MD100 Mouse
Model No.	MD100
FCC ID	MSQ-MS-MD100

Applicant	ASUSTeK Computer, Inc
Address	1F, No. 15, Lide Rd, Beitou, Taipei, 112 Taiwan

Date of Receipt	Sep. 05, 2021
Issued Date	Nov. 03, 2021
Report No.	2190164R-RFUSOTHV06-A
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF or any agency of the government.

The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Report

Issued Date: Nov. 03, 2021

Report No.: 2190164R-RFUSOTHV06-A



Product Name	MD100 Mouse
Applicant	ASUSTeK Computer, Inc
Address	1F, No. 15, Lide Rd, Beitou, Taipei, 112 Taiwan
Manufacturer	ASUSTeK Computer, Inc
Model No.	MD100
FCC ID	MSQ-MS-MD100
EUT Rated Voltage	DC 1.5V by Battery
EUT Test Voltage	DC 1.5V by Battery
Trade Name	ASUS
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By : Genie Chang
(Senior Project Specialist / Genie Chang)

Tested By : Bill Lin
(Senior Engineer / Bill Lin)

Approved By : Jack Hsu
(Senior Engineer / Jack Hsu)

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Appendix 1: EUT Test Photographs

Appendix 2: Product Photos: Please refer to the file: 2190164R-Product Photos

Revision History

Report No.	Version	Description	Issued Date
2190164R-RFUSOTHV06-A	V1.0	Initial issue of report.	2021-11-03

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	MD100 Mouse
Trade Name	ASUS
Model No.	MD100
FCC ID	MSQ-MS-MD100
Frequency Range	2403 – 2479MHz
Channel Number	16CH
Type of Modulation	GFSK
Antenna Type	PCB Antenna
Antenna Gain	Refer to the table “Antenna List”
Channel Control	Auto
Dongle	MFR: ASUS, M/N: RG56

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	BEKEN	BK3632	PCB Antenna	2.38dBi for 2.4 GHz

Note: The antenna of EUT is conform to FCC 15.203

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2403 MHz	Channel 02:	2426 MHz	Channel 03:	2441 MHz	Channel 04:	2463 MHz
Channel 05:	2407 MHz	Channel 06:	2422 MHz	Channel 07:	2445 MHz	Channel 08:	2466 MHz
Channel 09:	2414 MHz	Channel 10:	2436 MHz	Channel 11:	2459 MHz	Channel 12:	2473 MHz
Channel 13:	2419 MHz	Channel 14:	2439 MHz	Channel 15:	2453 MHz	Channel 16:	2479 MHz

Note:

1. The EUT is a MD100 Mouse with a built-in 2.4G Wireless and Bluetooth V5.0 transceiver, this report is for Bluetooth V5.0.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance of transmitter with Part 15 Subpart C Paragraph 15.249 for spread spectrum devices.
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit Mode 2: Normal mode
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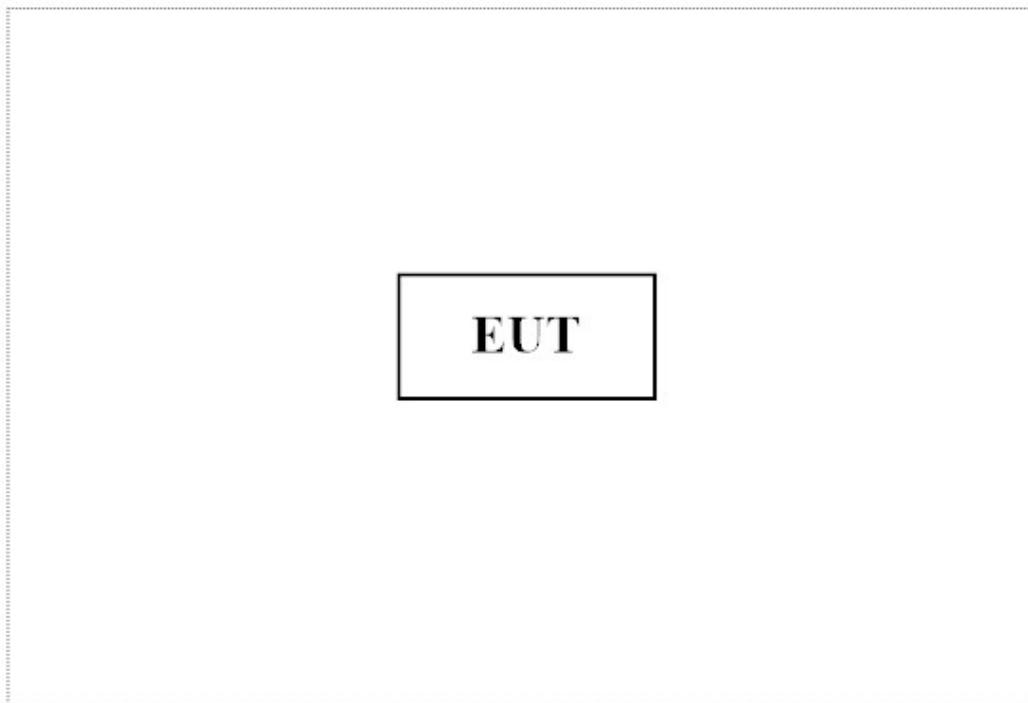
1.2. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
N/A				

Signal Cable Type	Signal cable Description
N/A	

1.3. Configuration of Test System



1.4. EUT Exercise Software

- (1) Setup the EUT as shown in section 1.4
- (2) Inserts the battery and press the button.
- (3) Start transmits continually.
- (4) Verify that the EUT works correctly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Radiated Emission	Temperature (°C)	10~40 °C	21.5°C
	Humidity (%RH)	10~90 %	68.0%
Conductive	Temperature (°C)	10~40 °C	21.5 °C
	Humidity (%RH)	10~90 %	68.0%

USA : FCC Registration Number: TW0033

Canada : IC Registration Number: 26930

Site Description : Accredited by TAF
Accredited Number: 3023

Test Laboratory : DEKRA Testing and Certification Co., Ltd
Address : No. 5-22, Ruishukeng Linkou District, New Taipei City,
24451, Taiwan

Performed Location : No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City
333411, Taiwan, R.O.C.

Phone number : +886-3-275-7255
Fax number : +866-3-327-8031
Email address : info.tw@dekra.com
Website : <http://www.dekra.com.tw>

1.6. List of Test Equipment

For Conducted measurements /SH2

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Spectrum Analyzer	R&S	FSV30	103466	2020.12.28	2021.12.27
X	Peak Power Analyzer	KEYSIGHT	8900B	MY51000539	2021.06.07	2022.06.06
X	Power Sensor	KEYSIGHT	N1923A	MY59240002	2021.05.17	2022.05.16
X	Power Sensor	KEYSIGHT	N1923A	MY59240003	2021.05.17	2022.05.16

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : DEKRA Conduction Test System V9.0.5.

For Radiated measurements /966-1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Loop Antenna	AMETEK	HLA6121	56736	2021.04.14	2022.04.13
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-678	2021.01.29	2022.01.28
X	Horn Antenna	ETS-Lindgren	3117	00203761	2020.11.23	2021.11.22
X	Horn Antenna	Com-Power	AH-840	101087	2021.06.18	2022.06.17
X	Pre-Amplifier	EMCI	EMC001330	980302	2021.07.26	2022.07.25
X	Pre-Amplifier	EMCI	EMC051835SE	980312	2021.02.24	2022.02.23
X	Pre-Amplifier	EMCI	EMC05820SE	980308	2021.09.23	2022.09.22
X	Pre-Amplifier	EMCI	EMC184045SE	980369	2021.04.27	2022.04.26
X	Filter	MICRO TRONICS	BRM50702	G251	2021.09.16	2022.09.15
	Filter	MICRO TRONICS	BRM50716	G188	2021.09.16	2022.09.15
X	EMI Test Receiver	R&S	ESR	102792	2020.12.15	2021.12.14
X	Spectrum Analyzer	R&S	FSV3044	101113	2021.02.04	2022.02.03
X	Mircoflex Cable	HUBER SUHNER	SUCOFLEX 102	MY3380/2	2021.08.30	2022.08.29
X	Coaxial Cable	SGH, EMCI, SUHNER	HA800 , SGH18, SUCOFLEX 106, EMC106	HY2108-003C	2021.03.03	2022.03.02

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : AUDIX e3 V9.

1.7. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document, and is described in each test chapter of this report.

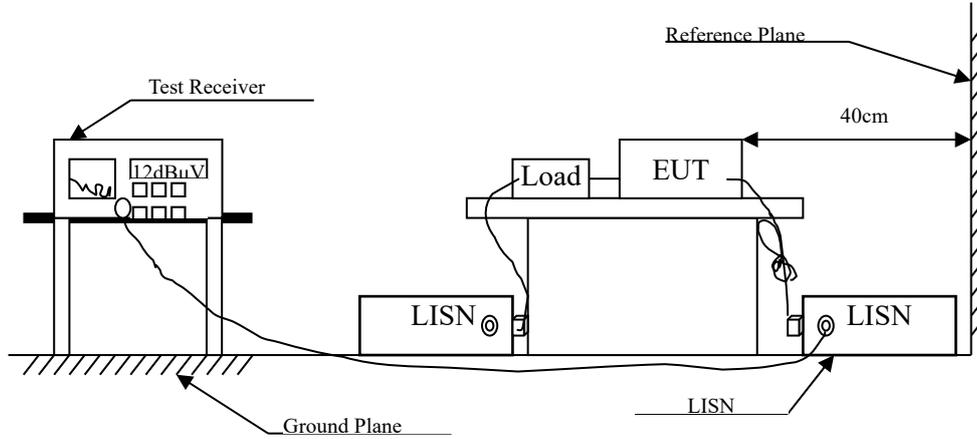
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test item	Uncertainty	
Conducted Emission	± 3.42 dB	
Radiated Emission	Under 1GHz ± 4.06 dB	Above 1GHz ± 3.73 dB
Band Edge	Under 1GHz ± 4.06 dB	Above 1GHz ± 3.73 dB
Duty Cycle	± 2.31 ms	

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dB μ V) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

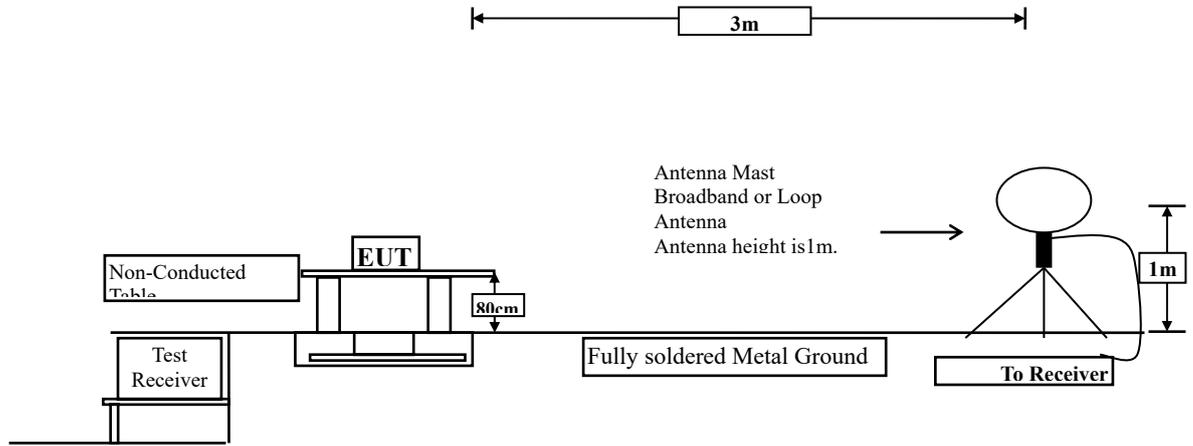
2.4. Test Result of Conducted Emission

Owing to the EUT use DC supply voltage, this test item is not performed.

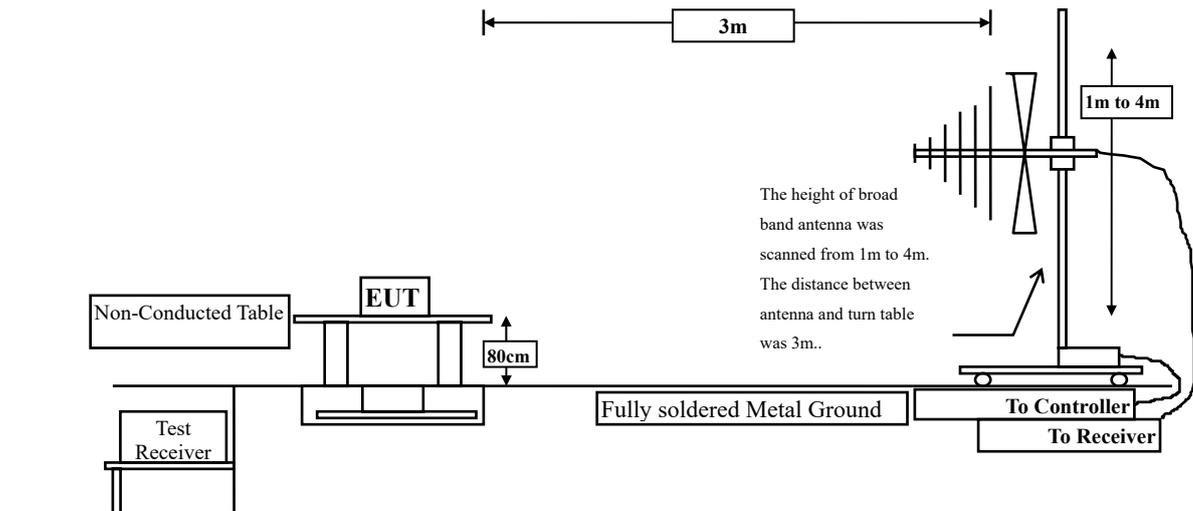
3. Radiated Emission

3.1. Test Setup

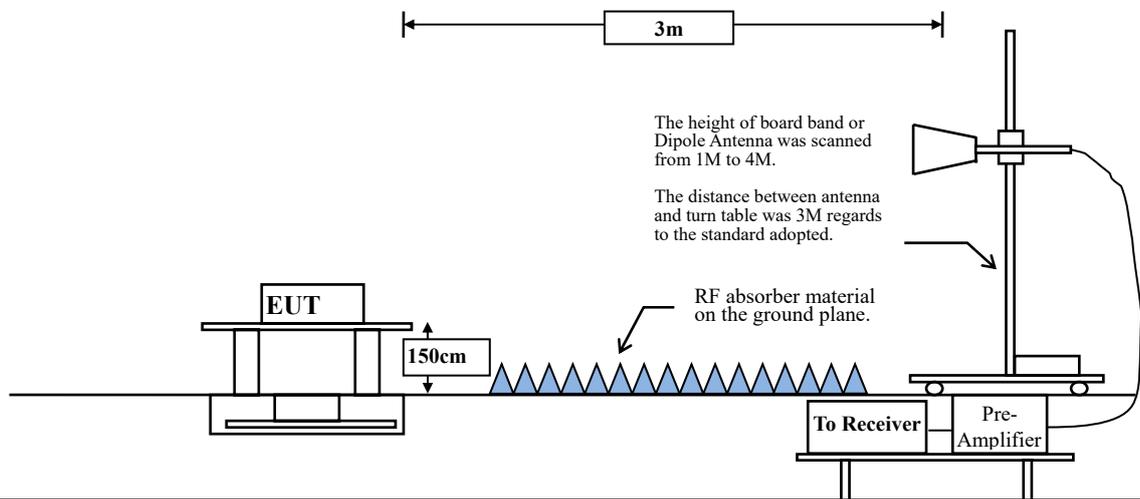
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.2. Limits

➤ Fundamental and Harmonics Emission Limits

FCC Part 15 Subpart C Paragraph 15.249 Limits				
Frequency MHz	Field Strength of Fundamental		Field Strength of Harmonics	
	(mV/m @3m)	(dB μ V /m @3m)	(uV/m @3m)	(dB μ V /m @3m)
902-928	50	94	500	54
2400-2483.5	50	94	500	54
5725-5875	50	94	500	54
24000-24250	250	108	2500	68

Remarks : 1. RF Voltage (dB μ V /m) = 20 log RF Voltage (uV/m)
 2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks: E field strength (dB μ V /m) = 20 log E field strength (uV/m)

3.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.249 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level.

This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

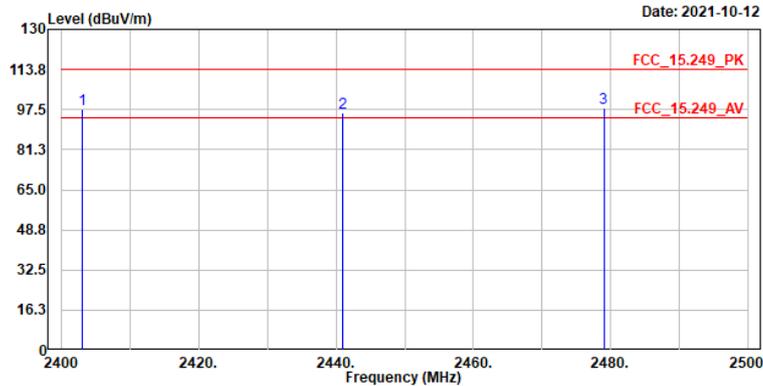
The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

3.4. Test Result of Radiated Emission

Site :966-4
 Condition :3m ,Horizontal
 EUT :TX_Fundamental_X
 Test by :Caster



No.	Frequency MHz	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Read Level dBuV	Factor dB	Remark
1	2403.000	97.79	113.97	-16.18	85.08	12.71	Peak
2	2441.000	96.22	113.97	-17.75	83.46	12.76	Peak
3	2479.000	98.00	113.97	-15.97	85.20	12.80	Peak

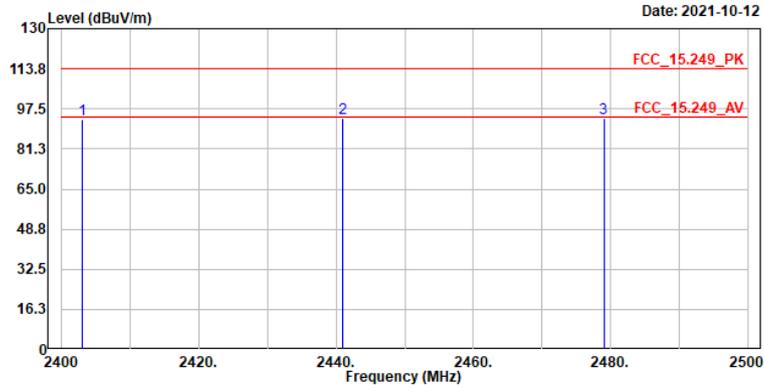
Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)
2403	97.79	-35.189	62.601	-31.369	93.970
2441	96.22	-35.189	61.031	-32.939	93.970
2479	98	-35.189	62.811	-31.159	93.970

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,Vertical
 EUT :TX_Fundamental_X
 Test by :Caster



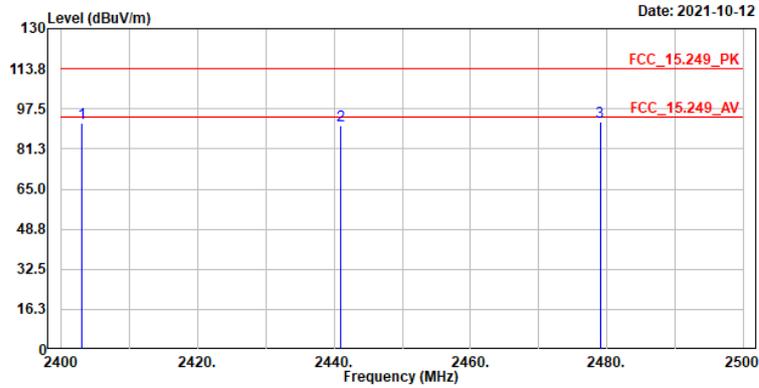
No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2403.000	93.30	113.97	-20.67	80.84	12.46	Peak
2	2441.000	93.61	113.97	-20.36	81.19	12.42	Peak
3	2479.000	93.66	113.97	-20.31	81.25	12.41	Peak

Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)
2403	93.3	-35.189	58.111	-35.859	93.970
2441	93.61	-35.189	58.421	-35.549	93.970
2479	93.66	-35.189	58.471	-35.499	93.970

Note:
 1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
 2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,Horizontal
 EUT :TX_Fundamental_Y
 Test by :Caster



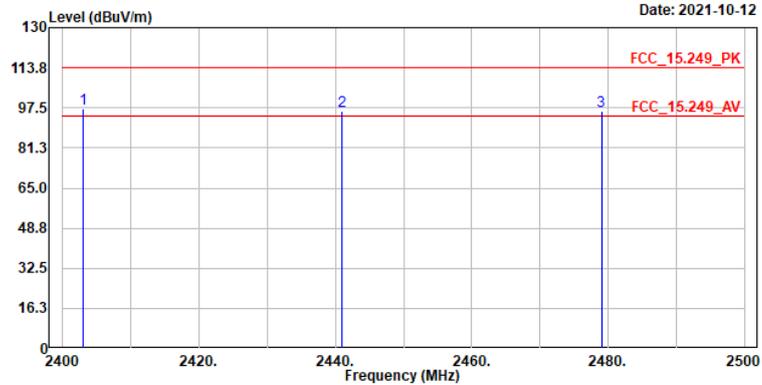
No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2403.000	91.54	113.97	-22.43	78.83	12.71	Peak
2	2441.000	90.52	113.97	-23.45	77.76	12.76	Peak
3	2479.000	92.37	113.97	-21.60	79.57	12.80	Peak

Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)
2403	91.54	-35.189	56.351	-37.619	93.970
2441	90.52	-35.189	55.331	-38.639	93.970
2479	92.37	-35.189	57.181	-36.789	93.970

Note:
 1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
 2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,Vertical
 EUT :TX_Fundamental_Y
 Test by :Caster



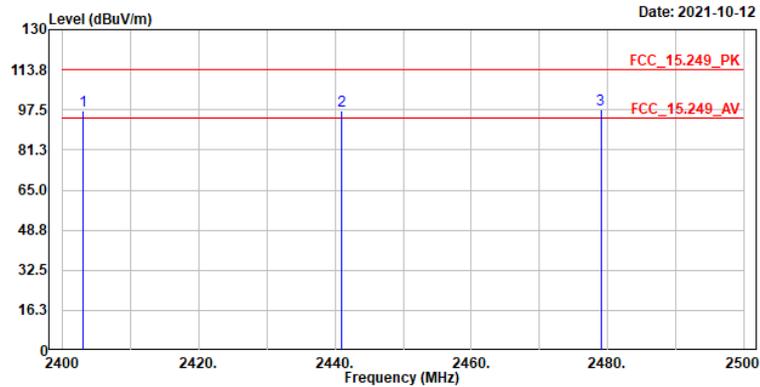
No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2403.000	97.31	113.97	-16.66	84.85	12.46	Peak
2	2441.000	96.29	113.97	-17.68	83.87	12.42	Peak
3	2479.000	95.94	113.97	-18.03	83.53	12.41	Peak

Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)
2403	97.31	-35.189	62.121	-31.849	93.970
2441	96.29	-35.189	61.101	-32.869	93.970
2479	95.94	-35.189	60.751	-33.219	93.970

Note:
 1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
 2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,Horizontal
 EUT :TX_Fundamental_Z
 Test by :Caster



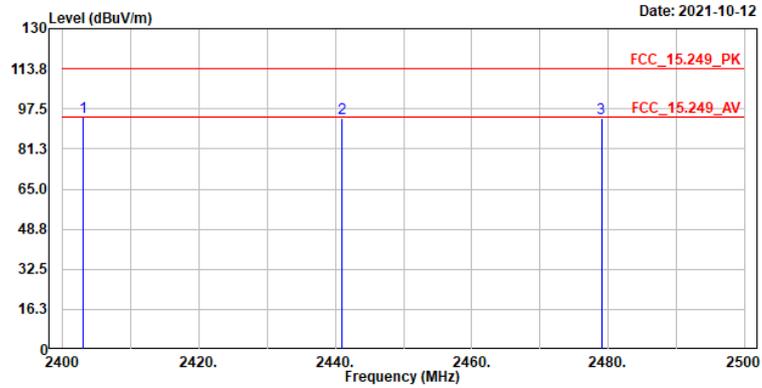
No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2403.000	97.09	113.97	-16.88	84.38	12.71	Peak
2	2441.000	97.28	113.97	-16.69	84.52	12.76	Peak
3	2479.000	97.67	113.97	-16.30	84.87	12.80	Peak

Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)
2403	97.09	-35.189	61.901	-32.069	93.970
2441	97.28	-35.189	62.091	-31.879	93.970
2479	97.67	-35.189	62.481	-31.489	93.970

Note:
 1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
 2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,Vertical
 EUT :TX_Fundamental_Z
 Test by :Caster



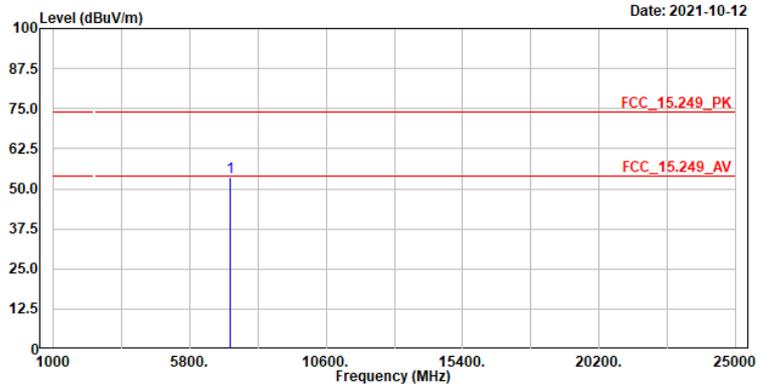
No.	Frequency MHz	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Read Level dBuV	Factor dB	Remark
1	2403.000	94.13	113.97	-19.84	81.67	12.46	Peak
2	2441.000	93.59	113.97	-20.38	81.17	12.42	Peak
3	2479.000	93.51	113.97	-20.46	81.10	12.41	Peak

Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)
2403	94.13	-35.189	58.941	-35.029	93.970
2441	93.59	-35.189	58.401	-35.569	93.970
2479	93.51	-35.189	58.321	-35.649	93.970

Note:
 1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
 2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,HORIZONTAL
 EUT :TX_2403MHz
 Test by :Caster



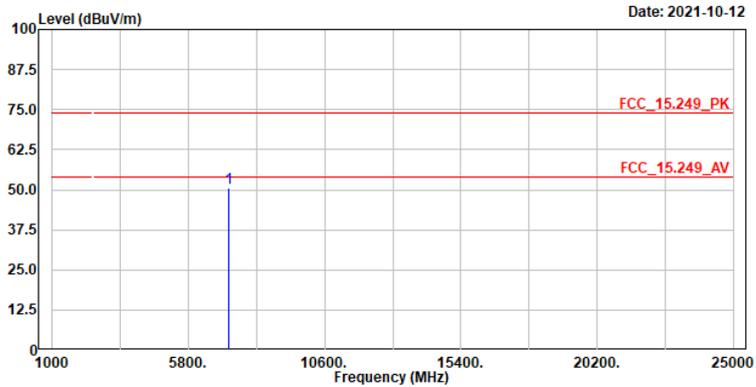
No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	Limit	Level	dB	
1	7209.000	53.51	74.00	-20.49	60.55	-7.04	Peak

Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency	Peak	Duty Cycle	Average	Margin	Peak	Average
MHz	Measurement	Factor	Measurement	dB	Limit	Limit
	dBμV/m	dB	dBμV/m		dBμV/m	dBμV/m
Average Detector:						
7209	53.51	-35.189	18.321	-35.679	74.000	54.000

Note:
 1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
 2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,VERTICAL
 EUT :TX_2403MHz
 Test by :Caster



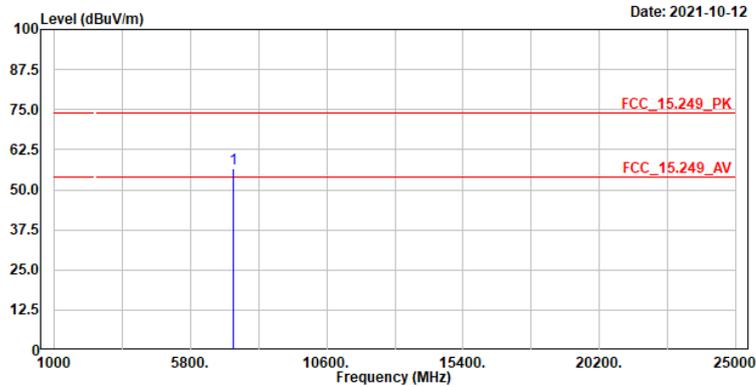
No.	Frequency MHz	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Read Level dBuV	Factor dB	Remark
1	7209.000	50.60	74.00	-23.40	58.24	-7.64	Peak

Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency MHz	Peak Measurement dBμV/m	Duty Cycle Factor dB	Average Measurement dBμV/m	Margin dB	Peak Limit dBμV/m	Average Limit dBμV/m
Average Detector: 7209	50.6	-35.189	15.411	-38.589	74.000	54.000

Note:
 1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
 2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,HORIZONTAL
 EUT :TX_2441MHz
 Test by :Caster



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	7323.000	56.44	74.00	-17.56	63.47	-7.03	Peak

Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBμV/m	dB	dBμV/m	dB	dBμV/m	dBμV/m

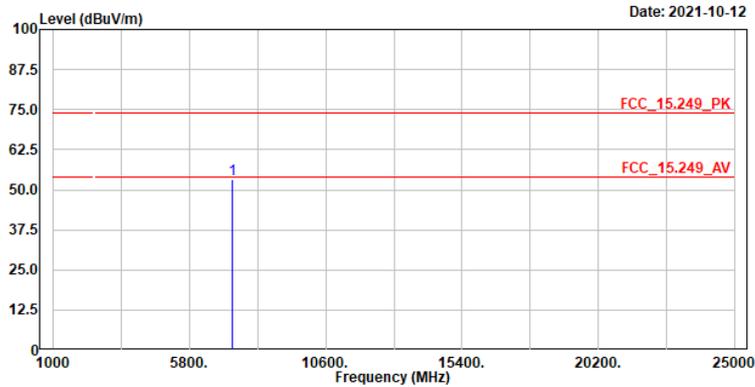
Average Detector:

7323	56.44	-35.189	21.251	-32.749	74.000	54.000
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Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,VERTICAL
 EUT :TX_2441MHz
 Test by :Caster



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	7323.000	53.15	74.00	-20.85	60.78	-7.63	Peak

Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBμV/m	dB	dBμV/m	dB	dBμV/m	dBμV/m

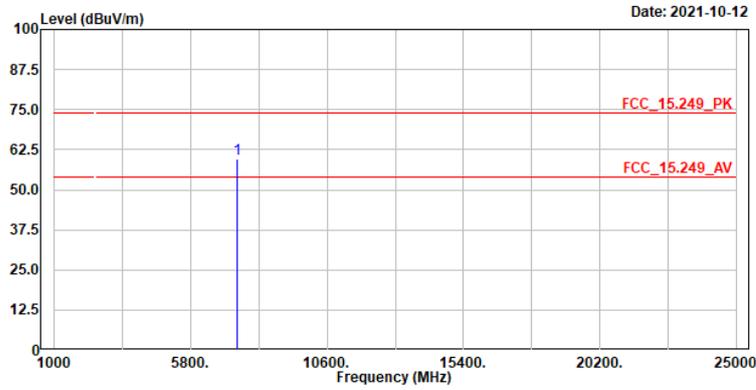
Average Detector:

7323	53.15	-35.189	17.961	-36.039	74.000	54.000
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Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,HORIZONTAL
 EUT :TX_2479MHz
 Test by :Caster



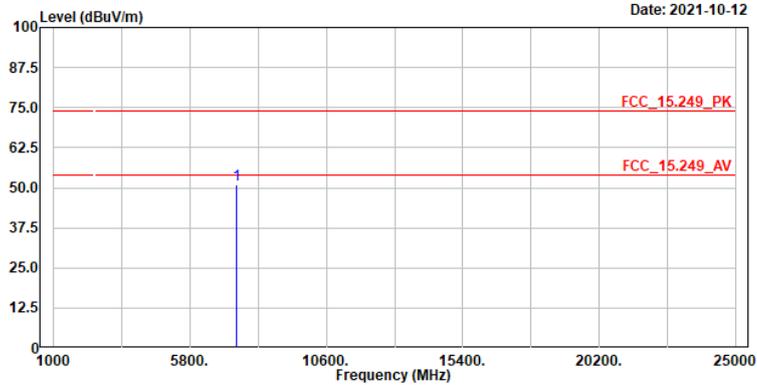
No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	7437.000	59.73	74.00	-14.27	66.71	-6.98	Peak

Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBμV/m	dB	dBμV/m	dB	dBμV/m	dBμV/m
Average Detector: 7437	59.73	-35.189	24.541	-29.459	74.000	54.000

Note:
 1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
 2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,VERTICAL
 EUT :TX_2479MHz
 Test by :Caster



No.	Frequency MHz	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Read Level dBuV	Factor dB	Remark
1	7437.000	50.81	74.00	-23.19	58.42	-7.61	Peak

Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

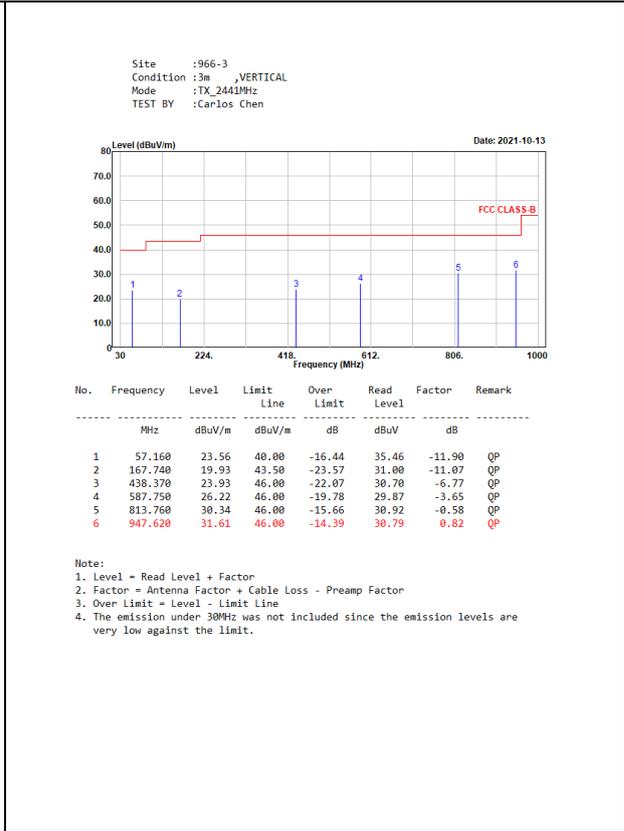
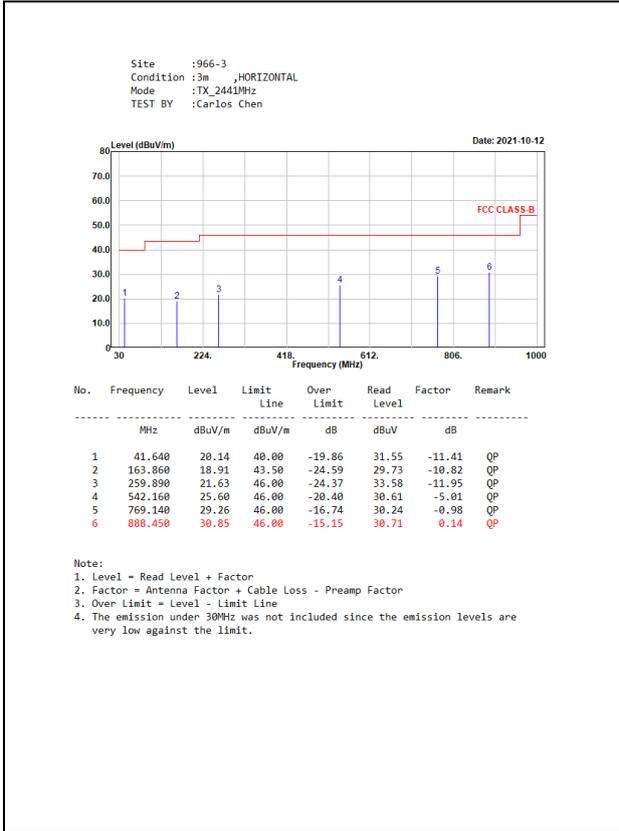
Frequency MHz	Peak Measurement dBμV/m	Duty Cycle Factor dB	Average Measurement dBμV/m	Margin dB	Peak Limit dBμV/m	Average Limit dBμV/m
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Average Detector:

7437	50.81	-35.189	15.621	-38.379	74.000	54.000
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Note:

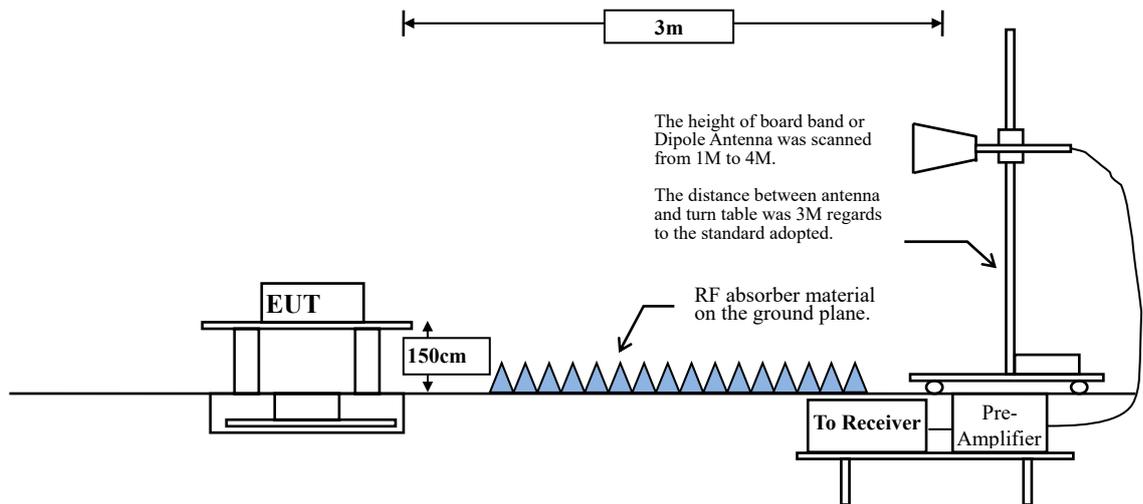
1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.



4. Band Edge

4.1. Test Setup

RF Radiated Measurement:



4.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks: E field strength (dB μ V /m) = 20 log E field strength (uV/m)

4.3. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

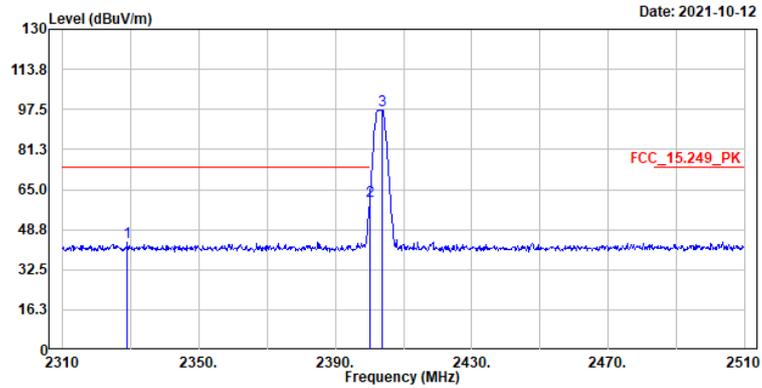
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The bandwidth setting below 1GHz and above 1GHz on the field strength meter is 120 kHz and 1MHz, respectively.

4.4. Test Result of Band Edge

Site :966-4
 Condition :3m ,HORIZONTAL
 EUT :TX_2403MHz
 Test by :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2329.000	43.75	74.00	-30.25	31.12	12.63	Peak
2	2400.000	60.14	74.00	-13.86	47.43	12.71	Peak
3	2403.800	97.37	-----	-----	84.66	12.71	Peak

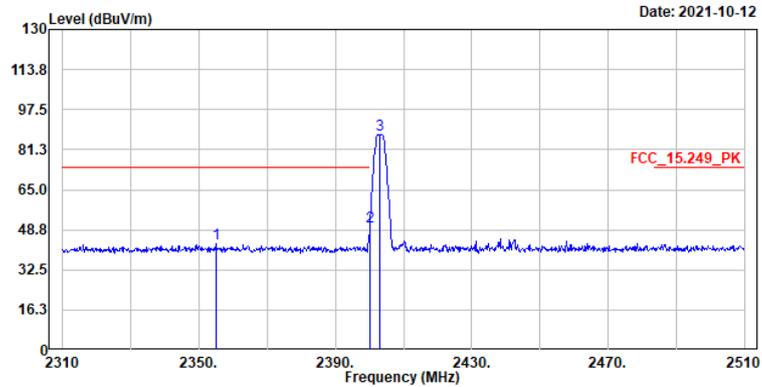
Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)	Result
2329	43.75	-35.189	8.561	-45.439	54.000	Pass
2400	60.14	-35.189	24.951	--	--	Pass
2403.8	97.37	-35.189	62.181	--	--	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,Vertical
 EUT :TX_2403MHz
 Test by :Caster



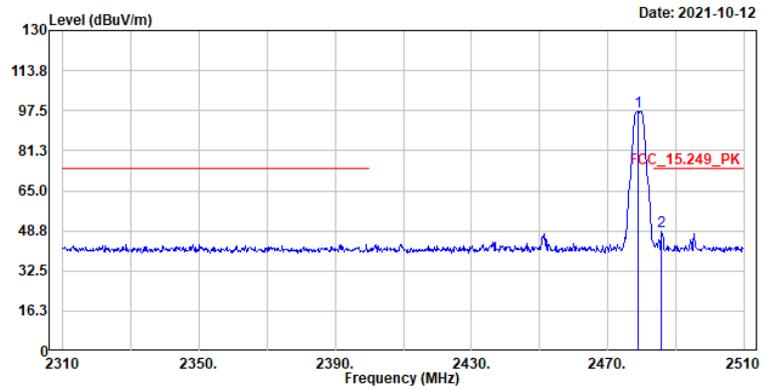
No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2355.000	42.97	74.00	-31.03	30.52	12.45	Peak
2	2400.000	50.07	74.00	-23.93	37.60	12.47	Peak
3	2403.000	87.47	-----	-----	75.01	12.46	Peak

Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)	Result
2355	42.97	-35.189	7.781	-46.219	54.000	Pass
2400	50.07	-35.189	14.881	--	--	Pass
2403	87.47	-35.189	52.281	--	--	Pass

Note:
 1. Average Measurement=Peak Measurement + Duty Cycle Factor
 2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,HORIZONTAL
 EUT :TX_2479MHz
 Test by :Caster



No.	Frequency MHz	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Read Level dBuV	Factor dB	Remark
1	2478.800	97.18	-----	-----	84.38	12.80	Peak
2	2485.600	48.68	74.00	-25.32	35.87	12.81	Peak

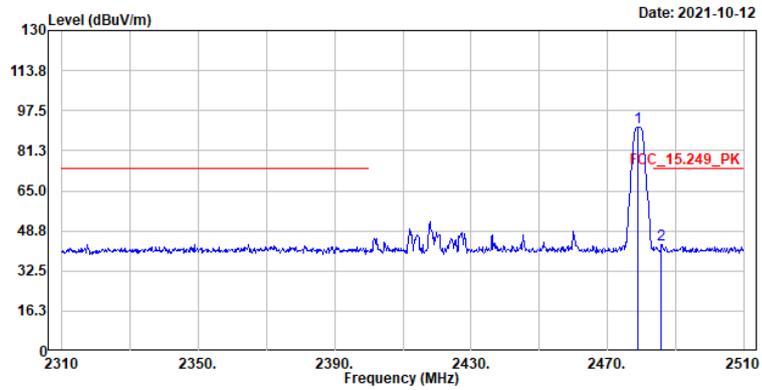
Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)	Result
2478.8	97.18	-35.189	61.991	--	--	Pass
2485.6	48.68	-35.189	13.491	-40.509	54.000	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 5.

Site :966-4
 Condition :3m ,Vertical
 EUT :TX_2479MHz
 Test by :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2479.000	90.78	-----	-----	78.37	12.41	Peak
2	2485.800	43.28	74.00	-30.72	30.86	12.42	Peak

Note:
 1. Level = Read Level + Factor
 2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
 3. Over Limit = Level - Limit Line

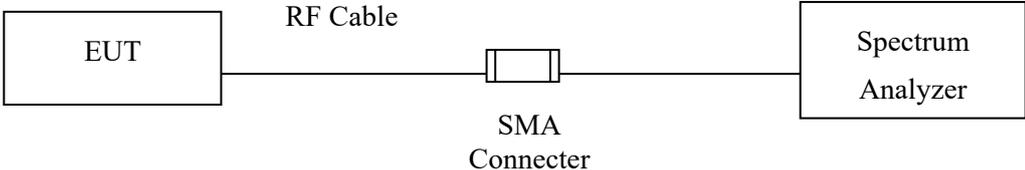
Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)	Result
2479	90.78	-35.189	55.591	--	--	Pass
2485.8	43.28	-35.189	8.091	-45.909	54.000	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 5.

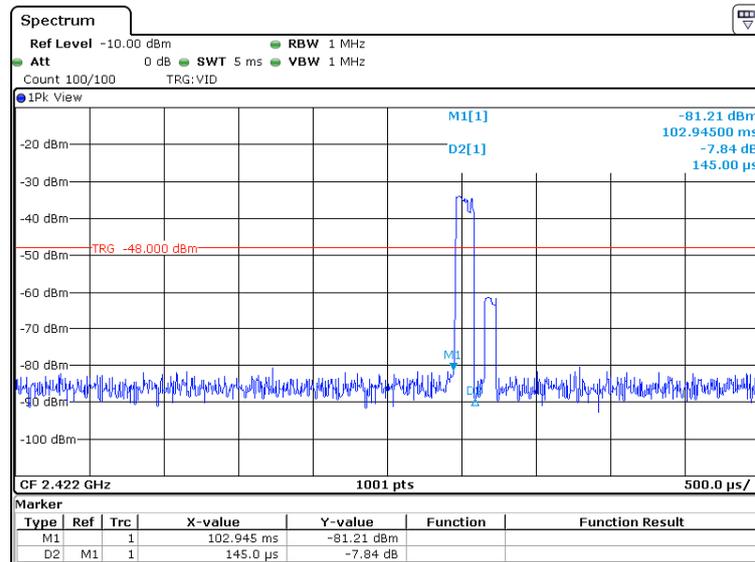
5. Duty Cycle

5.1. Test Setup

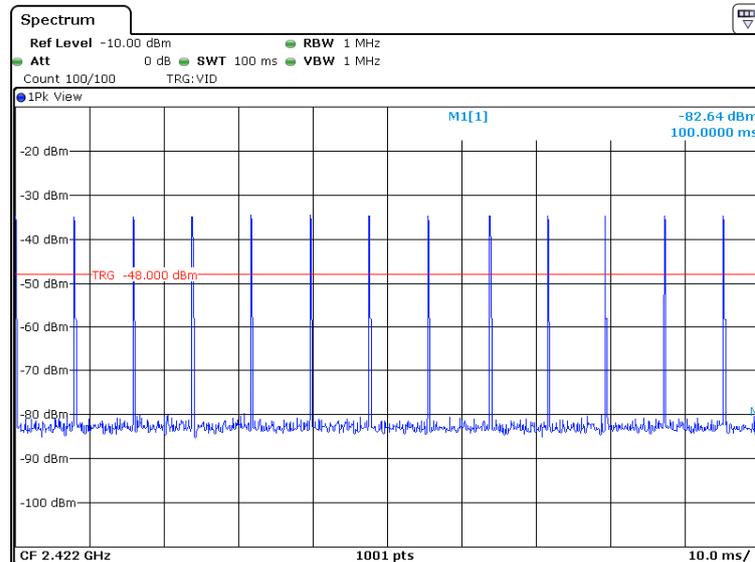


5.2. Test Result of Duty Cycle

Product : MD100 Mouse
 Test Item : Duty Cycle Data
 Test Mode : Mode 2: Normal mode



Date: 26.OCT.2021 12:47:17



Date: 26.OCT.2021 12:43:30

Time on of 100ms= 180us*12= 1.74ms

Duty Cycle=1.74ms / 100ms= 0.0174

Duty Cycle correction factor= 20 LOG 0.0174= -35.189 dB

Duty Cycle correction factor	-35.189 dB
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6. EMI Reduction Method During Compliance Testing

No modification was made during testing.