

FCC CERTIFICATION TEST REPORT

FOR

Applicant	:	FIRST TECHNOLOGY GROUP, LLC
Address	:	401 Hawthorne Ln, Suite 110-185 c/o Tedesco JSN, Charlotte North Carolina, United State
Equipment under Test	:	Multimedia
Model No.	:	Kansas City 100
Trade Mark	:	Blaupunkt
FCC ID	:	2BCRZ-KANSAS100
Manufacturer	:	Huizhou Foryou General Electronics Co., Ltd.
Address	:	No.2 District A, Foryou Industry Park, No. 1 North Shangxia Road, Dongjiang Hi tech Industry Park, 516005 Huizhou city, Guangdong Province, China (PROC)

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park,
Dongguan City, Guangdong Province, China, 523808

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REPORT

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Test Report Declare

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Address	:	No.2 District A, Foryou Industry Park, No. 1 North Shangxia Road, Dongjiang Hi tech Industry Park, 516005 Huizhou city, Guangdong Province, China (PROC)

Test Standard Used: FCC Rules and Regulations Part 15 Subpart C.

Test procedure used: ANSI C63.10:2013, 558074 D01 15.247 Meas Guidance v05r02

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No.:	DDT-RE23082411-2E02		
Date of Receipt:	Aug. 31, 2023	Date of Test:	Aug. 31, 2023~ Sep. 26, 2023

Prepared By:

Jacky Huang

Jacky Huang/Engineer

Approved By:

Damon Hu

Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Sep. 27, 2023	

1. Summary of Test Results

The EUT have been tested according to the applicable standards as referenced below.		
Description of Test Item	Standard	Results
6dB Bandwidth and 99% Bandwidth	FCC Part 15: 15.247 ANSI C63.10:2013	Pass
Conducted Peak Output Power	FCC Part 15: 15.247 ANSI C63.10:2013	Pass
Power Spectral Density	FCC Part 15:15.247 ANSI C63.10:2013	Pass
Band-edge and Spurious Emissions (Conducted)	FCC Part 15: 15.209 FCC Part 15: 15.247 ANSI C63.10: 2013	Pass
Radiated Spurious Emissions	FCC Part 15: 15.247 ANSI C63.10:2013	Pass
Radiated Band Edge Compliance	FCC Part 15: 15.209 FCC Part 15: 15.247 ANSI C63.10: 2013	Pass
Power Line Conducted Emission	FCC Part 15: 15.207 ANSI C63.10:2013	N/A
Antenna requirement	FCC Part 15: 15.203	Pass

Note: N/A means not applicable.

2. General Test Information

2.1. Description of EUT

EUT Name	: Multimedia
Model Number	: Kansas City 100
EUT function description	: Please reference user manual of this device
Power supply	: DC 12V
Radio Technology	: IEEE 802.11b/g/n
Operation frequency	: IEEE 802.11b: 2412MHz-2462MHz IEEE 802.11g: 2412MHz-2462MHz IEEE 802.11n HT20: 2412MHz-2462MHz IEEE 802.11n HT40: 2422MHz-2452MHz
Modulation	: IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK)
Transmitter rate	: IEEE 802.11b: up to 11 Mbps IEEE 802.11g: up to 54 Mbps IEEE 802.11n HT20: up to 72.2 Mbps IEEE 802.11n HT40: up to 150 Mbps
Antenna	: External antenna, maximum PK gain: 0.75dBi
Sample Number	: S23082411-03 for conducted, S23082411-02 for radiated.

Note 1: EUT is the abbreviation of equipment under test.

Note 2: EUT does not support beamforming and Simultaneous emission with 5G RLAN.

Channel information					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447	/	/

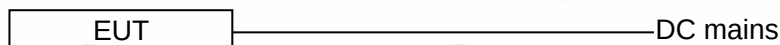
2.2. Accessories of EUT

Accessories	Manufacturer	Model number	Description
USB Cable	/	/	EMIFIL
RCA Cable	/	/	EMIFIL
DC Cable	/	/	EMIFIL
Speaker out Cable	/	/	EMIFIL

2.3. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	EMC Compliance	SN
N/A	N/A	N/A	N/A	N/A

2.4. Block diagram of EUT configuration for test



Test software: Built-in software (engineer mode)

The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode as below table.

The pathloss of external cable: 0.5dB (According to the manufacturer's claims).

Tested mode, channel, and data rate information				
Mode	Setting Tx Power	data rate (Mbps) (see Note)	Channel	Frequency (MHz)
IEEE 802.11b	12	1	LCH: CH1	2412
	12	1	MCH: CH6	2437
	12	1	HCH: CH11	2462
IEEE 802.11g	12	6	LCH: CH1	2412
	12	6	MCH: CH6	2437
	12	6	HCH: CH11	2462
IEEE 802.11n HT20	12	MCS 0	LCH: CH1	2412
	12	MCS 0	MCH: CH6	2437
	12	MCS 0	HCH: CH11	2462
IEEE 802.11n HT40	12	MCS 0	LCH: CH3	2422
	12	MCS 0	MCH: CH6	2437
	12	MCS 0	HCH: CH9	2452

Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.

2.5. Deviations of test standard

No Deviation

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	+15 °C to +35 °C
Humidity range:	20% to 75%
Pressure range:	86 kPa to 106 kPa

2.7. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808.

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

2.8. Measurement uncertainty

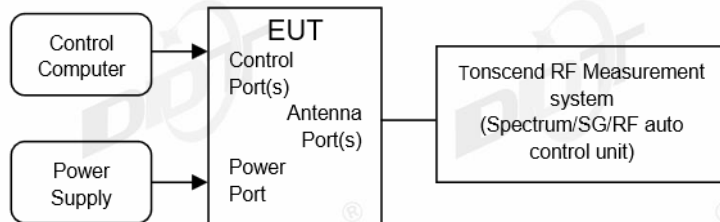
Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum Analyzer)	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$);
	1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$);
	1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Frequencies Stability	6.7×10^{-8} (Antenna couple method)
	5.5×10^{-8} (Conducted method)
Conducted Spurious Emissions	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$);
	1.40 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
	1.66 dB ($8 \text{ GHz} \leq f < 26.5 \text{ GHz}$)
Uncertainty for Radio Frequency (RBW<20 KHz)	3×10^{-8}
Temperature	0.4 °C
Humidity	2 %
Uncertainty for Radiation Emission Test (9kHz -30 Mhz)	3.44 dB
Uncertainty for Radiation Emission Test (30 Mhz-1 Ghz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission Test (1 Ghz-40 Ghz)	4.10 dB (1-6 GHz)
	4.40 dB (6 GHz-18 GHz)
	3.54 dB (18 GHz-26 GHz)
	4.30 dB (26 GHz-40 GHz)
Uncertainty for Power Line Conduction Emission Test	3.32 dB (150 kHz-30 MHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3. Equipment Used During Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑RF Connected Test (Tonscend RF Measurement System 3#)					
Signal & Spectrum analyzer	R&S	FSV40	101407	Jun. 12, 2023	1 Year
Wideband Radio Communication tester	R&S	CMW500	117491	Apr. 27, 2023	1 Year
Vector Signal Generator	Agilent	N5182A	MY48180912	Apr. 23, 2023	1 Year
RF Control Unit	Tonscend	JS0806-2	20C8060230	Apr. 27, 2023	1 Year
Temp&Humi Programmable	ZHIXIANG	ZXGDJS-150L	ZX170110-A	May 15, 2023	1 Year
Test Software	JS Tonscend	JS1120-3	Ver.3.2.22	N/A	N/A
☑Radiation 3#chamber					
EMI Test Receiver	R&S	ESU26	100472	Apr. 23, 2023	1 Year
Spectrum analyzer	Agilent	E4447A	MY50180031	Apr. 23, 2023	1 Year
Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	Sep. 29, 2022	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	01429	Jul. 12, 2023	2 Year
Double Ridged Horn Antenna	Schwarzbeck	BBHA9120 D	02468	Sep. 29, 2022	1 Year
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	Apr. 26, 2023	1 Year
Pre-amplifier	COM-POWER	PAM-118A	18040084	Jul. 15, 2023	1 Year
Pre-amplifier	COM-POWER	PAM-840A	461369	Apr. 27, 2023	1 Year
RE Cable	N/A	W23.02 CP1-X2 + W23.09 AP1-X8+ JCT26S-NJ-NJ-1.5M	4.5M+8M+1.5M	Apr. 21, 2023	1 Year
RF Cable	Yuhu Technology	JCTB810-NJ-NJ-9M+ ZT26S-SMAJ-SMAJ-1M	21123964	Apr. 23, 2023	1 Year
Micro-Tronics filters	REBES	BRM50702	G555	N/A	N/A
Micro-Tronics filters	REBES	BRM50716	G392	N/A	N/A
High Pass filter	XB	XBLBQ-GTA67	210820-2-3	N/A	N/A
Test software	Tonscend	JS32-RE	V 5.0.0.1	N/A	N/A

4. 6dB Bandwidth

4.1. Block diagram of test setup



4.2. Limits

For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz

4.3. Test procedure

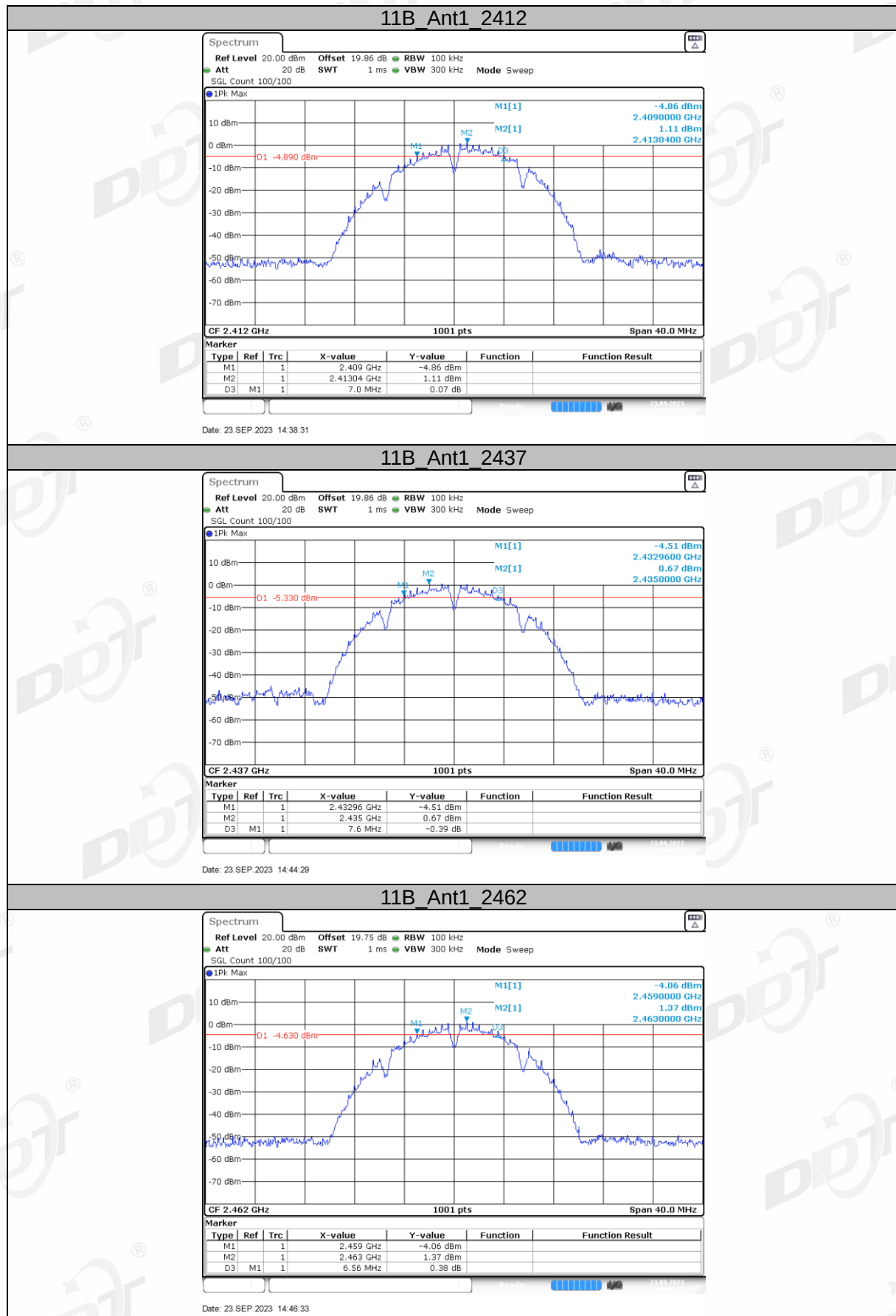
- (1) The test according to ANSI C63.10-2013 clause 11.8.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for 6 dB Bandwidth:

RBW:	100 kHz
VBW:	$\geq [3 \times \text{RBW}]$
Detector Mode:	peak
Sweep time:	auto
Trace mode	max hold
- (5) Allow the trace to stabilize, measure the 6 dB bandwidth of signal, and record the results in the report.

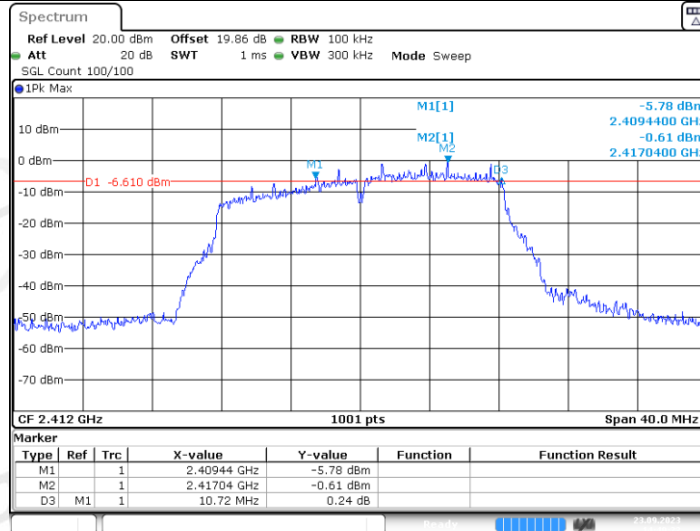
4.4. Test result

Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	7.00	2409.00	2416.00	0.5	PASS
		2437	7.60	2432.96	2440.56	0.5	PASS
		2462	6.56	2459.00	2465.56	0.5	PASS
11G	Ant1	2412	10.72	2409.44	2420.16	0.5	PASS
		2437	15.44	2428.84	2444.28	0.5	PASS
		2462	9.44	2458.20	2467.64	0.5	PASS
11N20SISO	Ant1	2412	12.92	2407.00	2419.92	0.5	PASS
		2437	16.32	2428.24	2444.56	0.5	PASS
		2462	13.84	2455.72	2469.56	0.5	PASS
11N40SISO	Ant1	2422	17.60	2410.72	2428.32	0.5	PASS
		2437	35.76	2418.84	2454.60	0.5	PASS
		2452	26.32	2443.28	2469.60	0.5	PASS

4.5. Test graphs

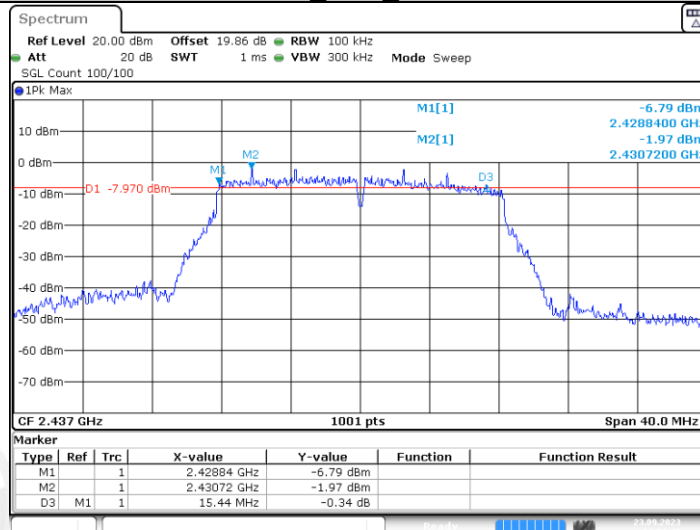


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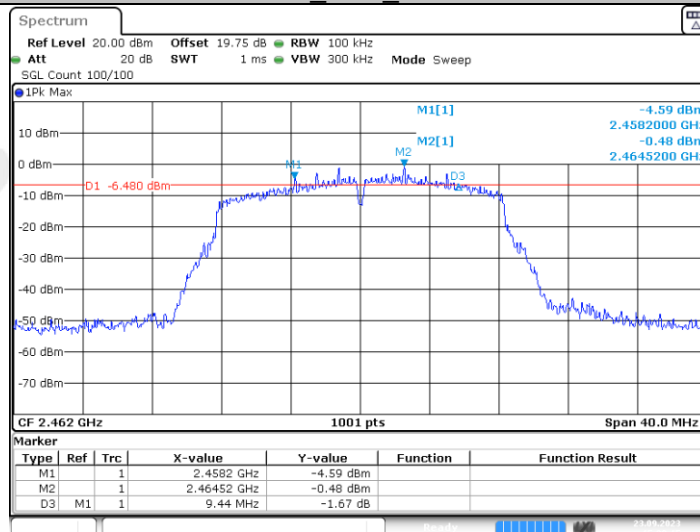
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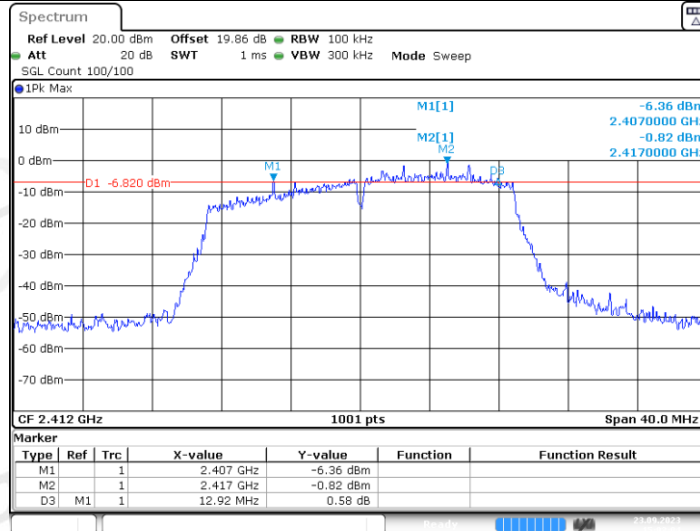
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11G_Ant1_2462



Date: 23 SEP.2023 15:00:16

11N20SISO_Ant1_2412



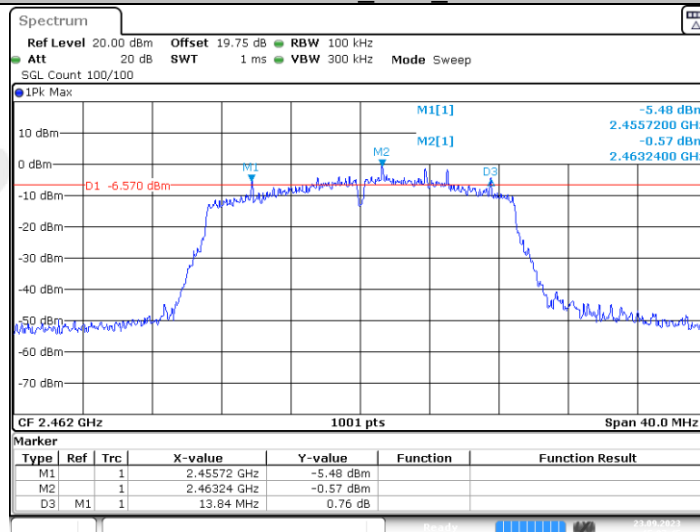
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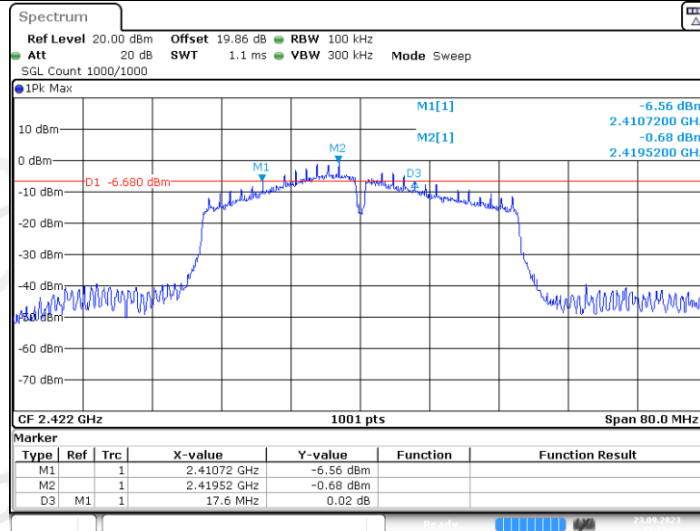
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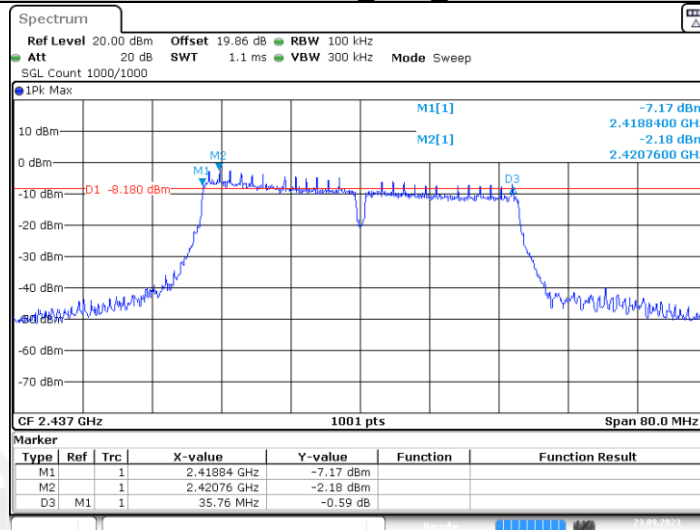
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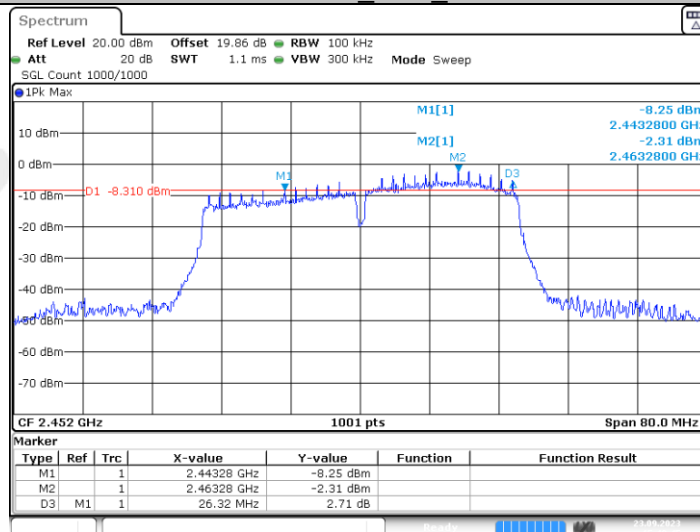
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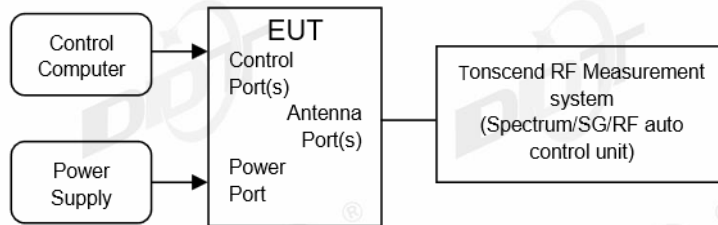
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5. 99% Bandwidth

5.1. Block diagram of test setup



5.2. Limits

Just for Report.

5.3. Test procedure

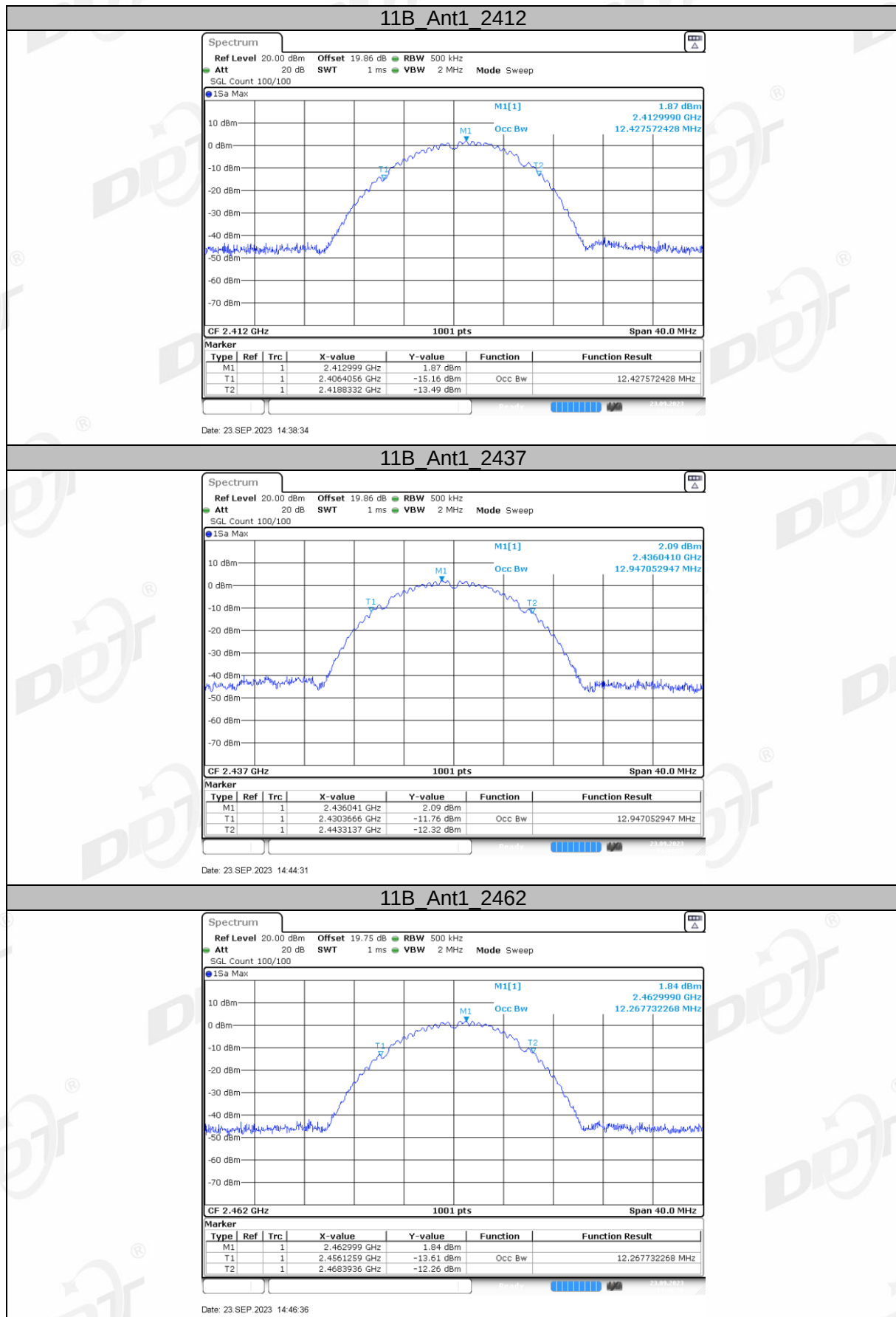
- (1) The test according to ANSI C63.10-2013 clause 6.9.3.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for the 99% Bandwidth:

RBW:	1% to 5% of the OBW
VBW:	approximately three times RBW
Span:	between 1.5 times and 5.0 times the OBW
Detector Mode:	peak
Sweep time:	auto
Trace mode	max hold
- (5) Allow the trace to stabilize, measure the 99% bandwidth of signal, and record the results in the report.

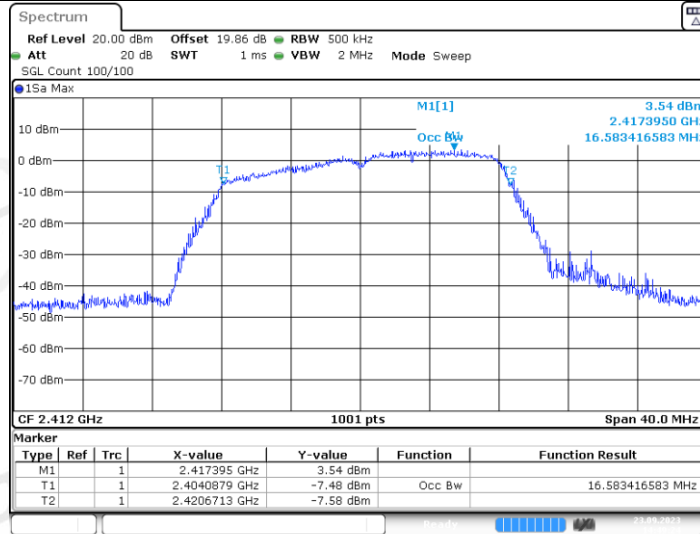
5.4. Test result

Test Mode	Antenna	Channel Frequency [MHz]	OCB [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	12.428	2406.4056	2418.8332	---	---
		2437	12.947	2430.3666	2443.3137	---	---
		2462	12.268	2456.1259	2468.3936	---	---
11G	Ant1	2412	16.583	2404.0879	2420.6713	---	---
		2437	17.023	2428.3686	2445.3916	---	---
		2462	16.344	2453.9281	2470.2717	---	---
11N20SISO	Ant1	2412	17.502	2403.5684	2421.0709	---	---
		2437	17.982	2427.8891	2445.8711	---	---
		2462	17.423	2453.4086	2470.8312	---	---
11N40SISO	Ant1	2422	34.845	2404.5774	2439.4226	---	---
		2437	36.763	2418.3786	2455.1419	---	---
		2452	36.044	2434.1778	2470.2218	---	---

5.5. Test graphs

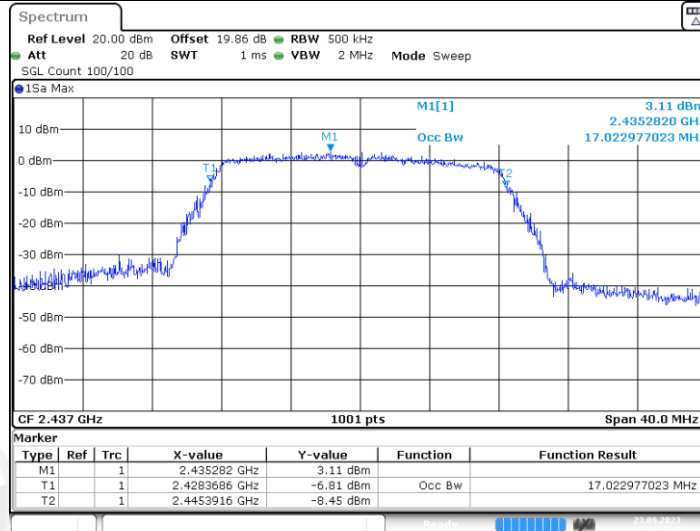


11G_Ant1_2412



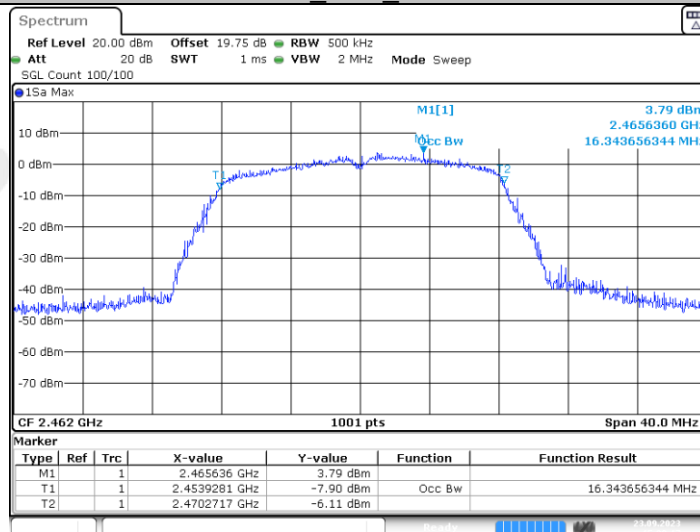
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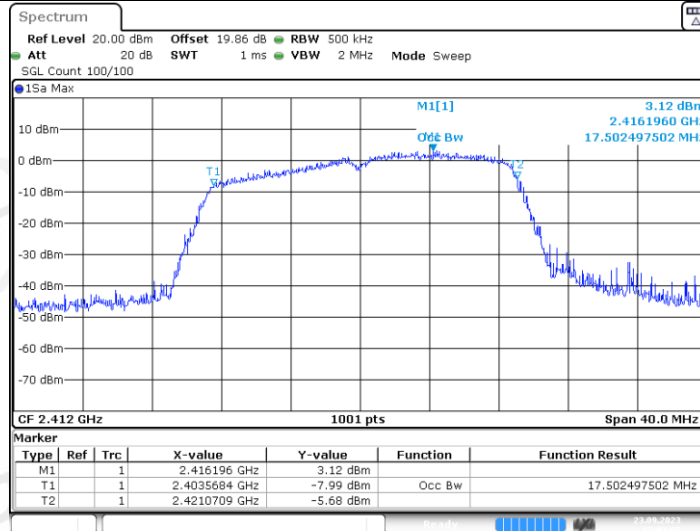
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11G_Ant1_2462



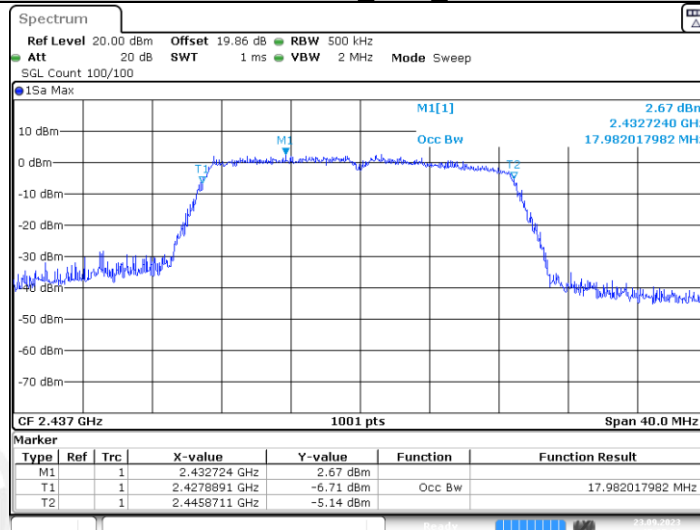
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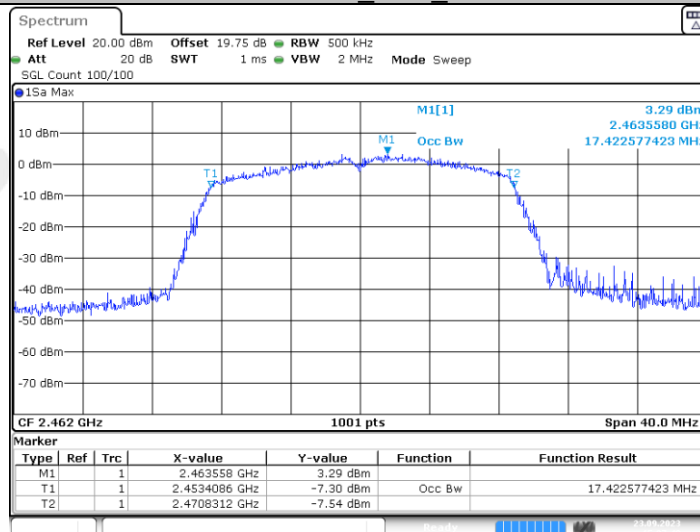
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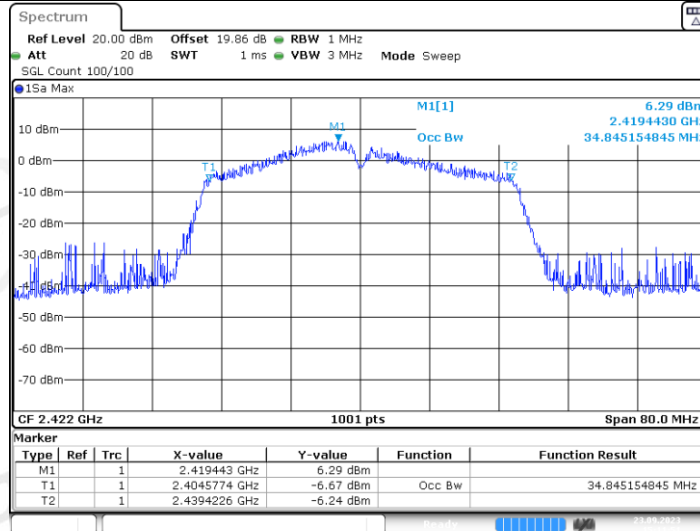
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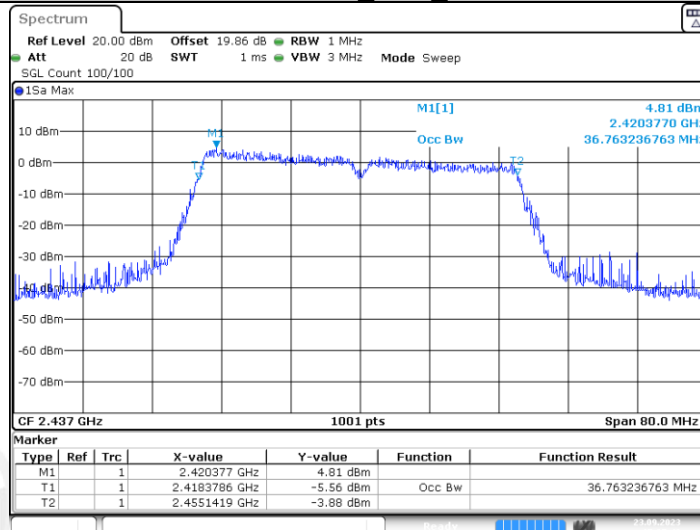
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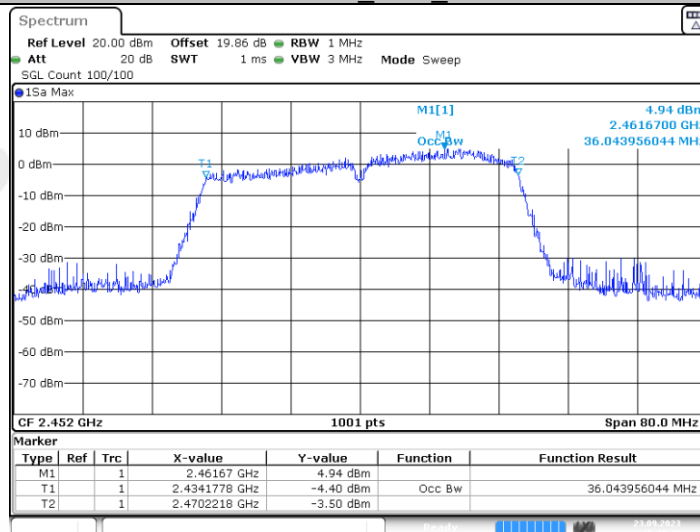
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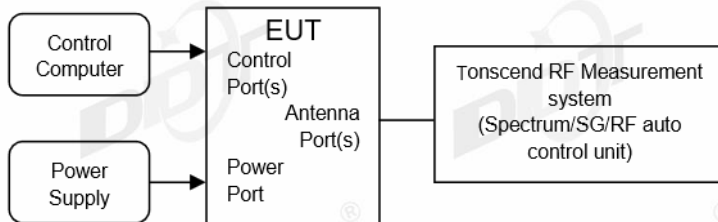
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6. Conducted Output Power

6.1. Block diagram of test setup



6.2. Limits

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 11.9.2.3.
- (2) Connect EUT's antenna output to RF power meter by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously, If the transmitter does not transmit continuously, measure the duty cycle, D, of the transmitter output signal.
- (4) Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.
- (5) Adjust the measurement in dBm by adding $[10 \log (1 / D)]$, where D is the duty cycle.
- (6) Record the RF average power of each antenna port.

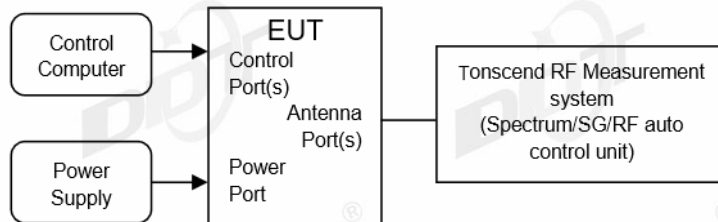
6.4. Test result average

Test Mode	Antenna	Frequency [MHz]	Average power [dBm]	Duty Cycle [%]	DC Factor [dBm]	Result [dBm]	Limit [dBm]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
11B	Ant1	2412	10.00	99.41	0.03	10.03	≤30.00	10.78	≤36.00	PASS
		2437	10.16	99.53	0.02	10.18	≤30.00	10.93	≤36.00	PASS
		2462	9.89	99.53	0.02	9.91	≤30.00	10.66	≤36.00	PASS
11G	Ant1	2412	9.98	96.53	0.15	10.13	≤30.00	10.88	≤36.00	PASS
		2437	10.08	96.53	0.15	10.23	≤30.00	10.98	≤36.00	PASS
		2462	9.87	97.22	0.12	9.99	≤30.00	10.74	≤36.00	PASS
11N20 SISO	Ant1	2412	9.52	97.01	0.13	9.65	≤30.00	10.40	≤36.00	PASS
		2437	10.14	96.30	0.16	10.30	≤30.00	11.05	≤36.00	PASS
		2462	9.68	96.30	0.16	9.84	≤30.00	10.59	≤36.00	PASS
11N40 SISO	Ant1	2422	10.04	94.20	0.26	10.30	≤30.00	11.05	≤36.00	PASS
		2437	10.07	92.75	0.33	10.40	≤30.00	11.15	≤36.00	PASS
		2452	10.13	92.75	0.33	10.46	≤30.00	11.21	≤36.00	PASS

Note: EIRP (dBm)=Conducted Output Power (dBm)+ Antenna Gain (dBi)

7. Power Spectral Density

7.1. Block diagram of test setup



7.2. Limits

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.

7.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 11.10.5.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously.
- (4) Use the following spectrum analyzer settings for Power Spectral Density measurement:

Center frequency	DTS Channel center frequency
RBW:	$3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
VBW:	$\geq 3\text{RBW}$
Span	1.5 times the DTS bandwidth
Detector Mode:	RMS
Sweep time:	auto
Trace mode	max hold
Trace	Employ trace averaging (rms) mode over a minimum of 100 traces.

- (5) Add $[10 \log (1 / D)]$, where D is the duty cycle measured in step a), to the measured PSD to compute the average PSD during the actual transmission time.

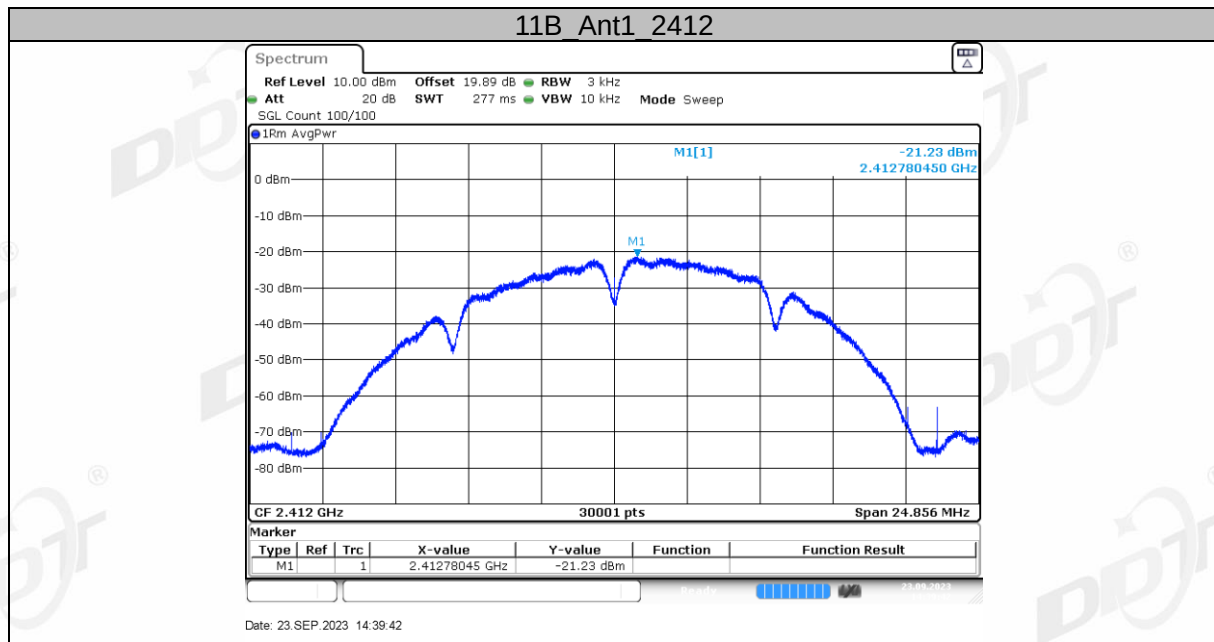
Note: If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

7.4. Test result

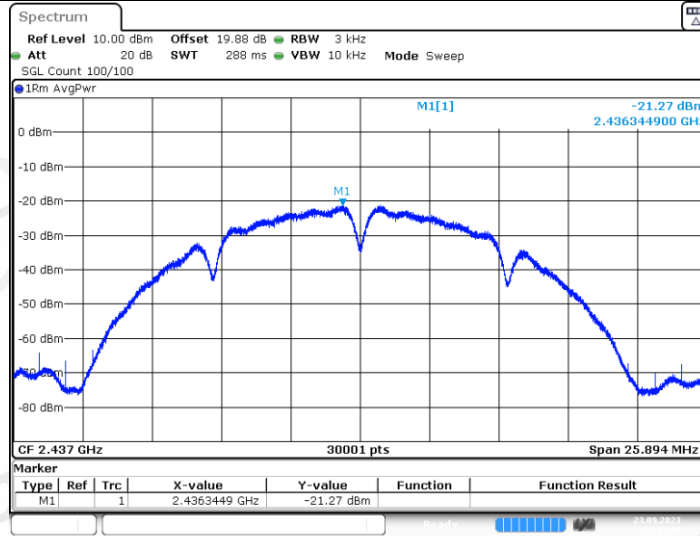
Test Mode	Antenna	Frequency [MHz]	Result [dBm/3-100kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-21.23	≤8.00	PASS
		2437	-21.27	≤8.00	PASS
		2462	-21.17	≤8.00	PASS
11G	Ant1	2412	-23.02	≤8.00	PASS
		2437	-23.49	≤8.00	PASS
		2462	-23.08	≤8.00	PASS
11N20SISO	Ant1	2412	-23.30	≤8.00	PASS
		2437	-23.86	≤8.00	PASS
		2462	-22.98	≤8.00	PASS
11N40SISO	Ant1	2422	-22.12	≤8.00	PASS
		2437	-23.76	≤8.00	PASS
		2452	-24.12	≤8.00	PASS

Note: The Duty Cycle Factor is compensated in the graph.

7.5. Test graphs

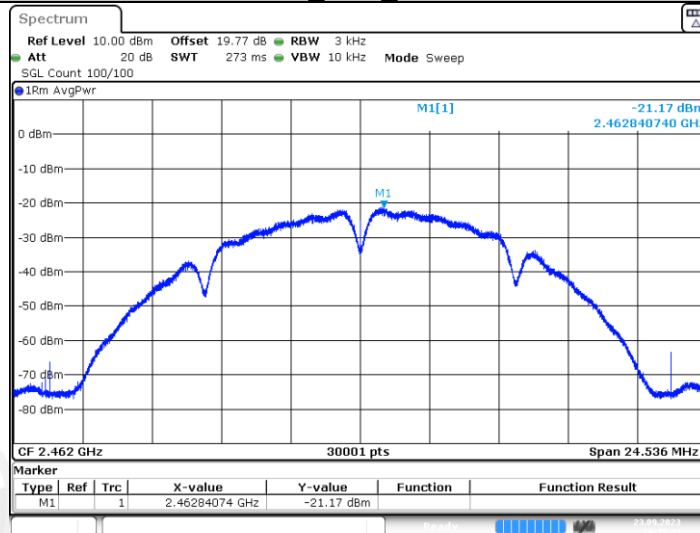


11B_Ant1_2437



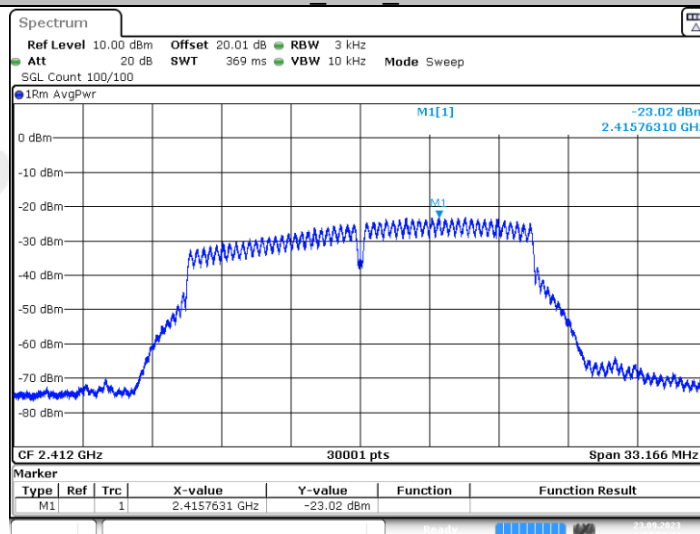
Date: 23 SEP.2023 14:45:41

11B_Ant1_2462



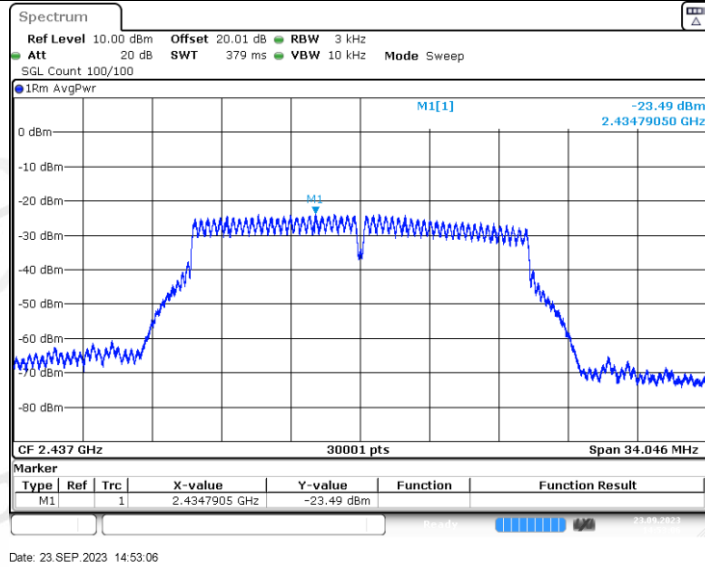
Date: 23 SEP.2023 14:47:45

11G_Ant1_2412

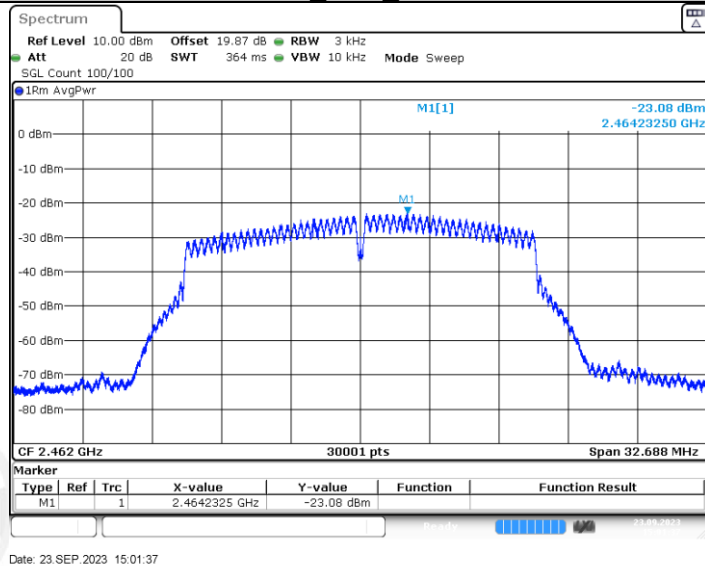


Date: 23 SEP.2023 14:50:45

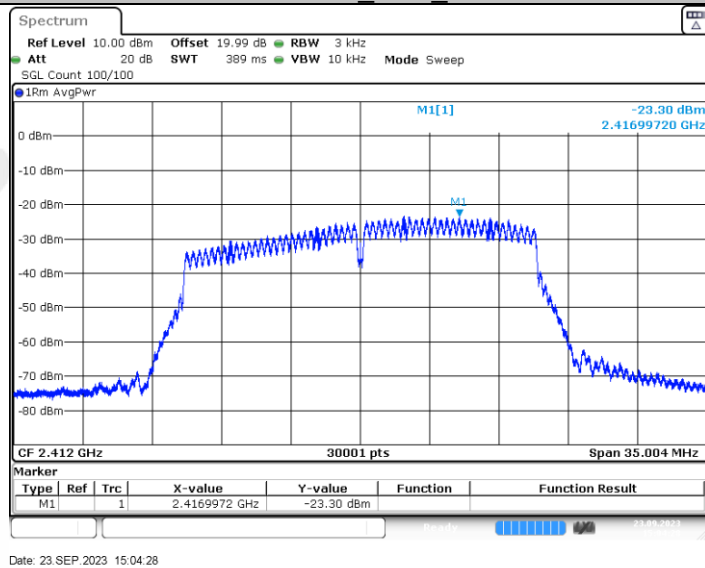
11G_Ant1_2437



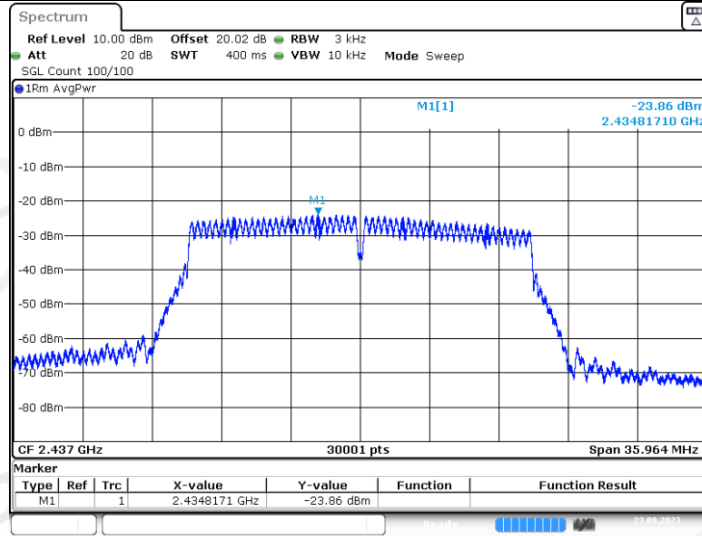
11G_Ant1_2462



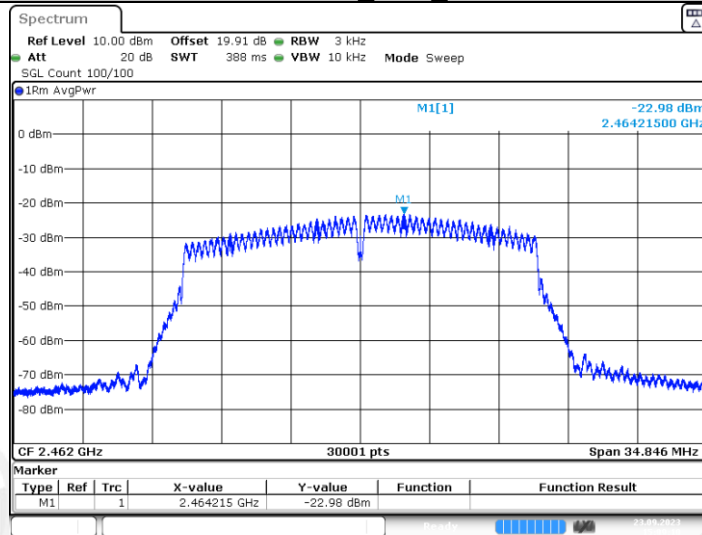
11N20SISO_Ant1_2412



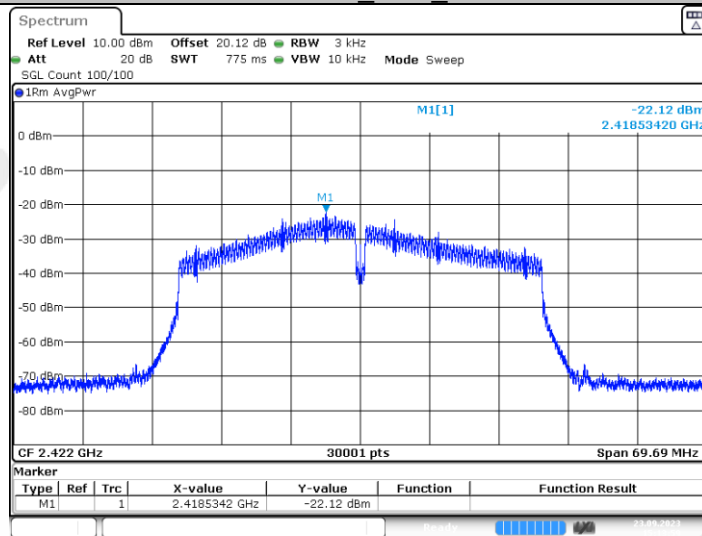
11N20SISO_Ant1_2437

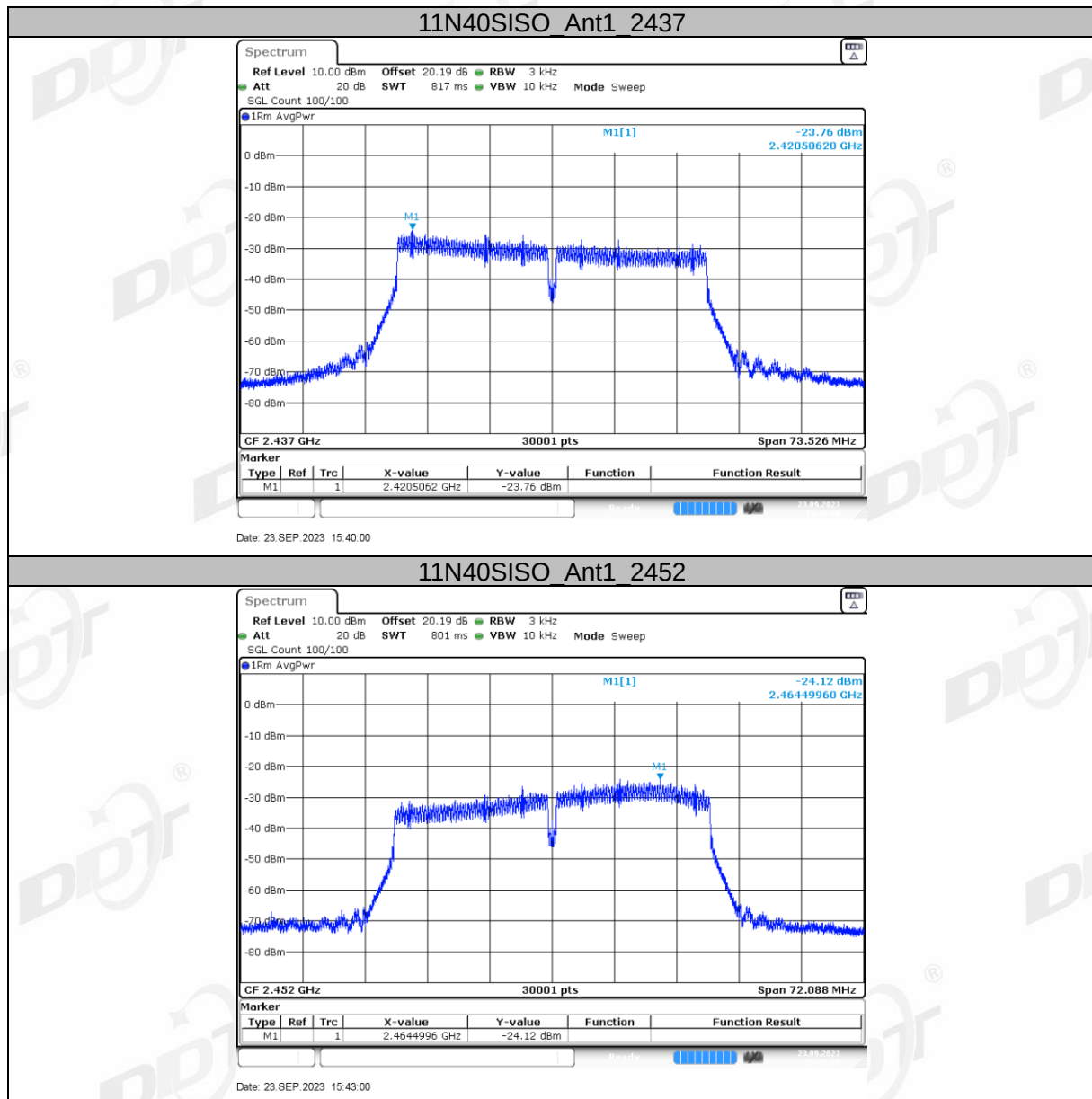


11N20SISO_Ant1_2462



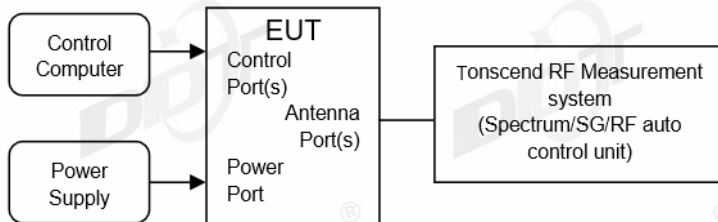
11N40SISO_Ant1_2422





8. Band Edge Compliance (Conducted Method)

8.1. Block diagram of test setup



8.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum 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. 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.

8.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Establish a reference level by using the following procedure:

RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.

(4) Then mark the maximum amplitude of all unwanted emissions outside of the authorized frequency band.

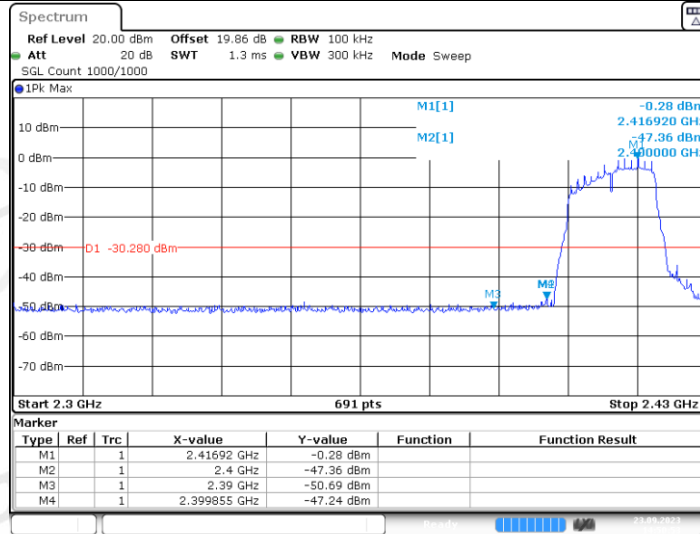
8.4. Test result

EUT Set Mode	Channel or Frequency	Result (dBm)	EUT Set Mode	Channel or Frequency	Result Result (dBm)
11b	CH1	Pass	11g	CH1	Pass
	CH6	Pass		CH6	Pass
	CH11	Pass		CH11	Pass
11n HT 20	CH1	Pass	11n HT 40	CH3	Pass
	CH6	Pass		CH6	Pass
	CH11	Pass		CH9	Pass

8.5. Test graphs

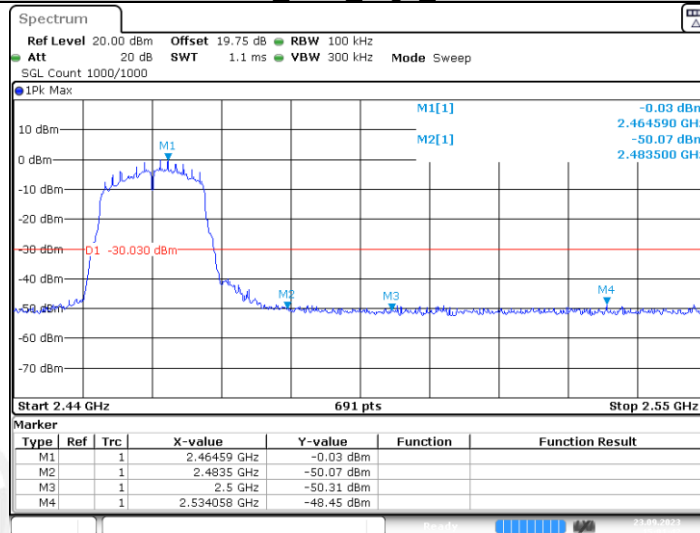


11G Ant1 Low 2412



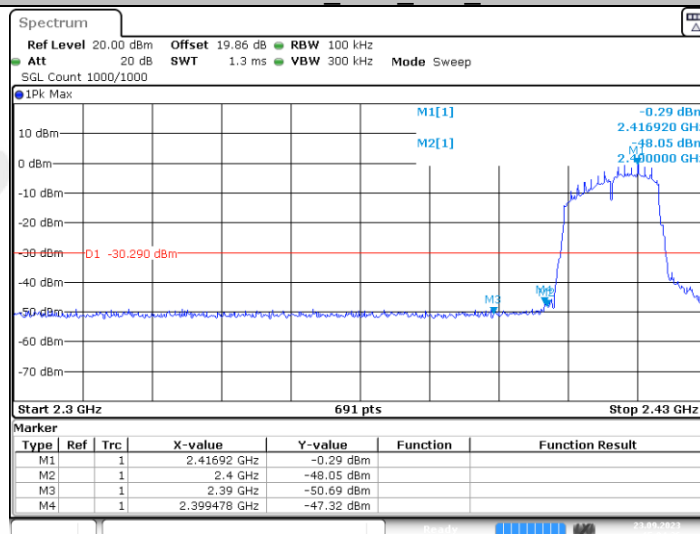
Date: 23 SEP.2023 14:50:53

11G Ant1 High 2462



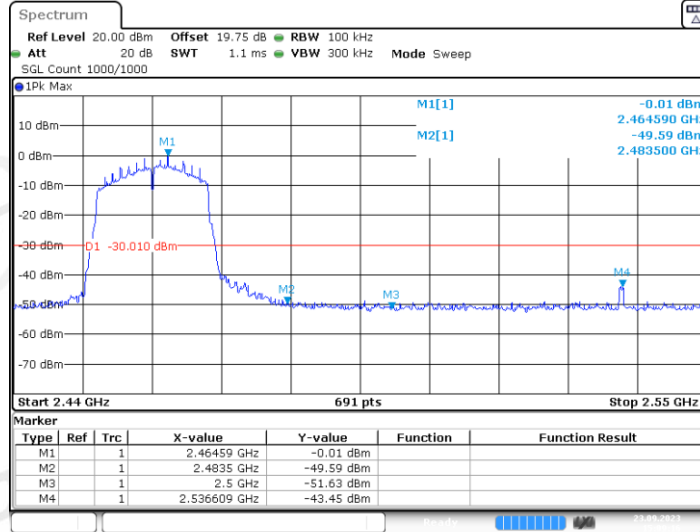
Date: 23 SEP.2023 15:01:42

11N20SISO Ant1 Low 2412



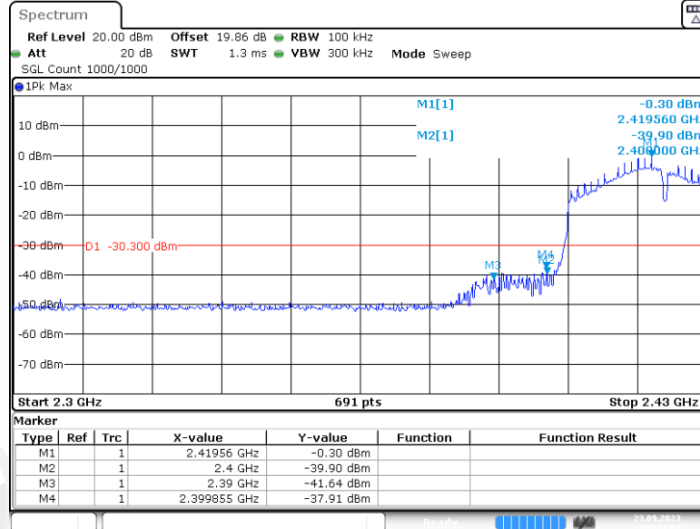
Date: 23 SEP.2023 15:04:36

11N20SISO_Ant1_High_2462



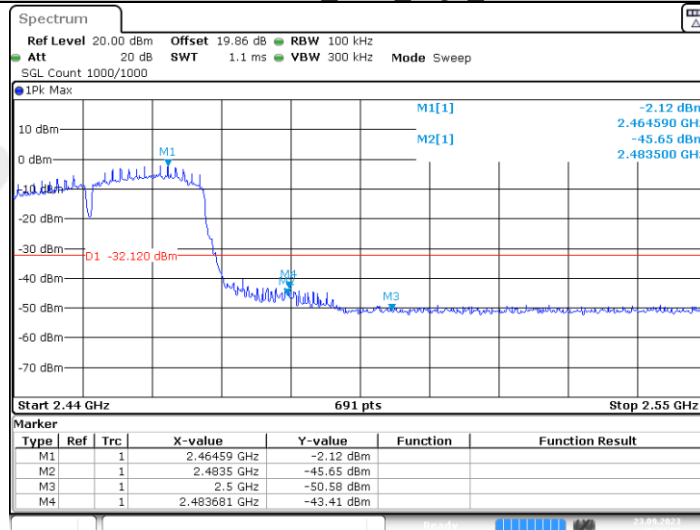
Date: 23 SEP.2023 15:09:16

11N40SISO_Ant1_Low_2422



Date: 23 SEP.2023 15:14:08

11N40SISO_Ant1_High_2452

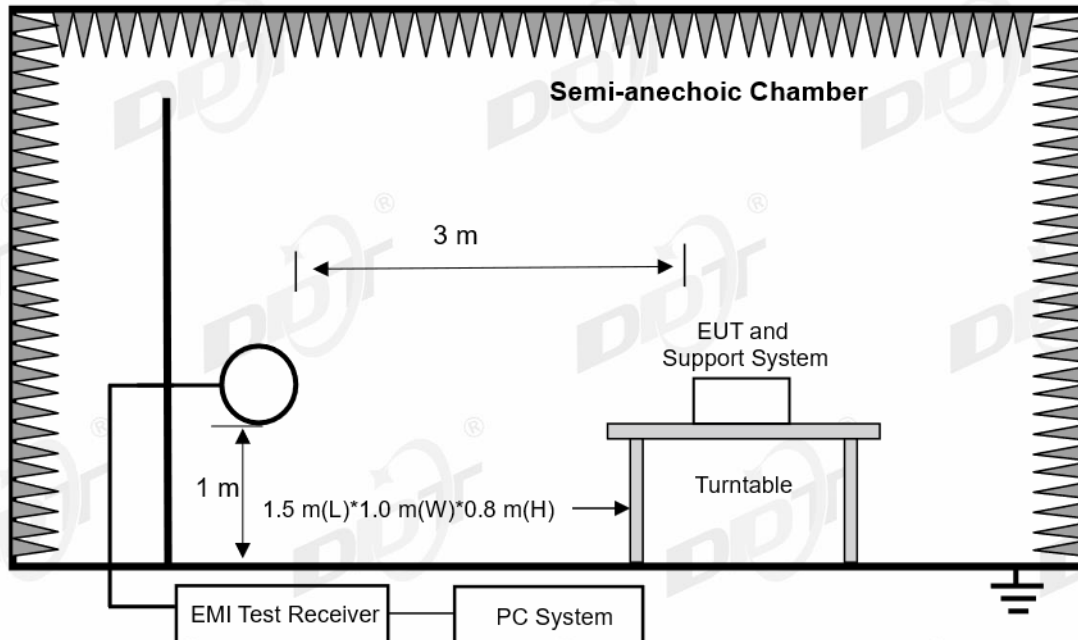


Date: 23 SEP.2023 15:43:06

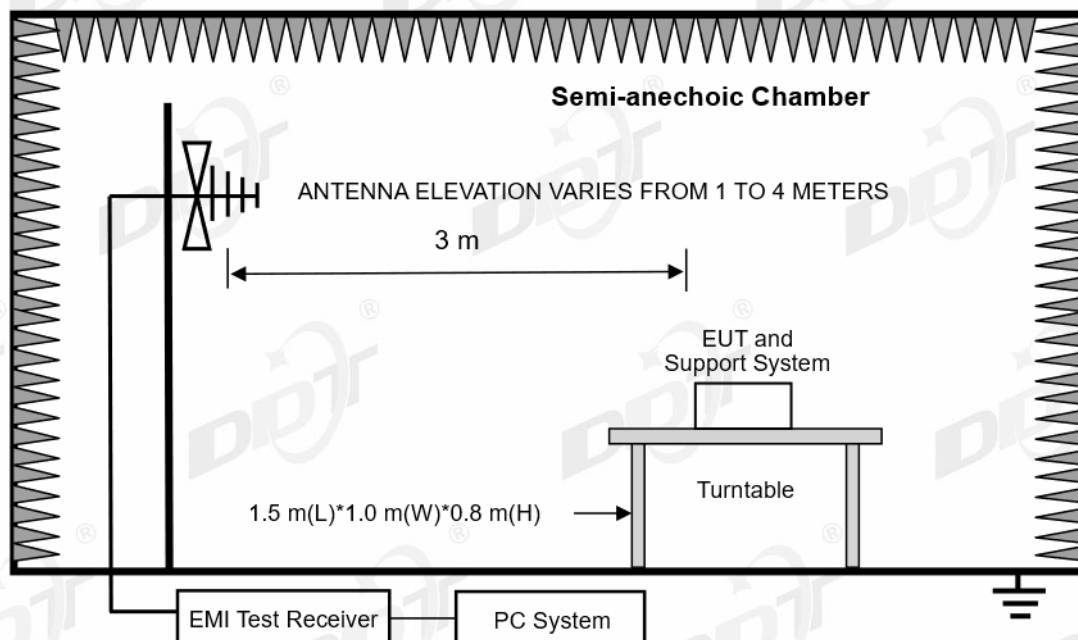
9. Radiated Spurious Emissions

9.1. Block diagram of test setup

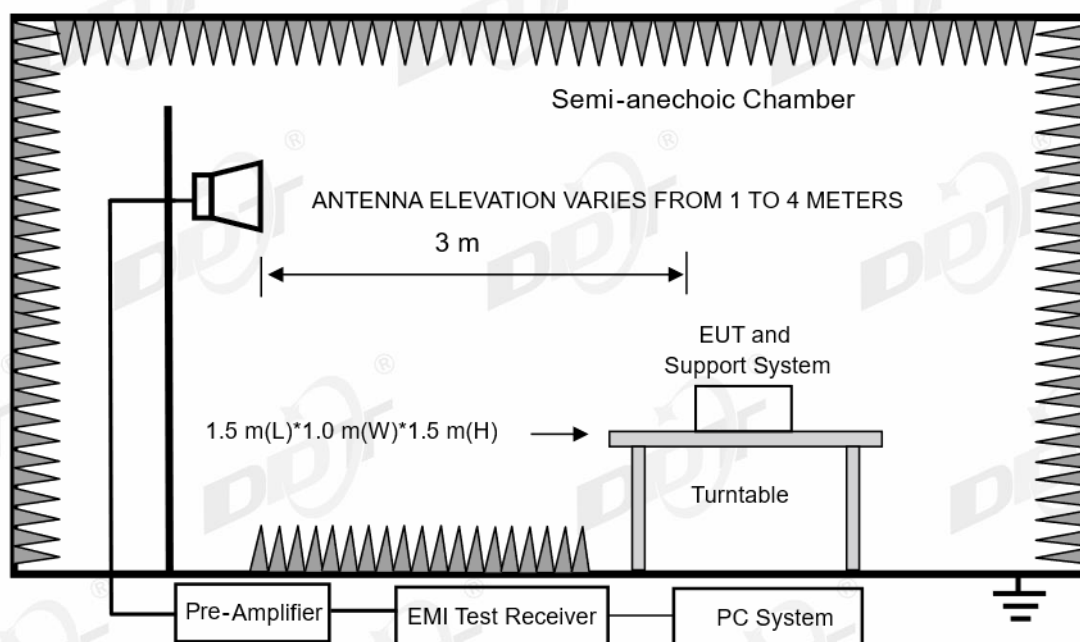
In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz - 1 GHz:



In 3 m Anechoic Chamber, test setup diagram for frequency above 1 GHz:



Note: For harmonic emissions test an appropriate high pass filter was inserted in the input port of AMP.

9.2. Limit

(1) FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.1772&4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.2072&4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

²Above 38.6

RSS-Gen section 8.10 Restricted frequency bands*

MHz	MHz	MHz	GHz
0.090-0.110	12.51975-12.52025	240-285	3.5-4.4
0.495-0.505	12.57675-12.57725	322-335.4	4.5-5.15
2.1735-2.1905	13.36-13.41	399.9-410	5.35-5.46
3.020-3.026	16.42-16.423	608-614	7.25-7.75
4.125-4.128	16.69475-16.69525	960-1427	8.025-8.5
4.1772&4.17775	16.80425-16.80475	1435-1626.5	9.0-9.2
4.2072&4.20775	25.5-25.67	1645.5-1646.5	9.3-9.5
5.677-5.683	37.5-38.25	1660-1710	10.6-12.7
6.215-6.218	73-74.6	1718.8-1722.2	13.25-13.4
6.26775-6.26825	74.8-75.2	2200-2300	14.47-14.5
6.31175-6.31225	108-138	2310-2390	15.35-16.2
8.291-8.294	149.9-150.05	2483.5-2500	17.7-21.4
8.362-8.366	156.52475-156.52525	2655-2900	22.01-23.12
8.37625-8.38675	156.7-156.9	3260-3267	23.6-24.0
8.41425-8.41475	162.0125-167.17	3332-3339	31.2-31.8
12.29-12.293	167.72-173.2	3345.8-3358	36.43-36.5
			Above 38.6

* Certain frequency bands listed in table and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

(2) FCC 15.209 Limit & RSS-Gen section 8.9 Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 ~ 0.490	300	2400/F(kHz)	67.6-20log(F)
0.490 ~ 1.705	30	24000/F(kHz)	87.6-20log(F)
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Note: (1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30 MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3\text{m}}(\text{dB}\mu\text{V}/\text{m}) = \text{Limit}_{30\text{m}}(\text{dB}\mu\text{V}/\text{m}) + 40\text{Log}(30\text{m}/3\text{m})$$

(3) Limit for this EUT

The emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, and the emissions appearing within RSS-Gen section 8.10 Restricted frequency bands shall not exceed the limits shown in RSS-Gen section 8.9, all the other emissions shall be at least 20 dB below the fundamental emissions or comply with 15.209 limits and RSS-Gen section 8.9 limits.

9.3. Test procedure

(1) EUT height should be 0.8 m for below 1 GHz at a semi-anechoic chamber while EUT height should be 1.5 m for above 1 GHz at full chamber or semi-anechoic chamber ground with absorbers.

(2) The antenna used as below table.

Test frequency range	Test antenna used	Measuring distance
9 kHz-30 MHz	Active Loop antenna	3 m
30 MHz-1 GHz	Trilog Broadband Antenna	3 m
1 GHz-18 GHz	Double Ridged Horn Antenna(1GHz-18GHz)	3 m
18 GHz-40 GHz	Horn Antenna(18GHz-40GHz)	1 m

According ANSI C63.10:2013 clause 6.4.4.2 and 6.5.3, for measurements below 30 MHz, the loop antenna was positioned with its plane vertical from the EUT and rotated about its vertical axis for maximum response at each azimuth position around the EUT. And the loop antenna also be positioned with its plane horizontal at the specified distance from the EUT. The center of the loop is 1 m above the ground. for measurement above 30 MHz, the Trilog Broadband Antenna or Horn Antenna was located 3 m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 25 GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1m above ground.)

(b) Change work frequency or channel of device if practicable.

(c) Change modulation type of device if practicable.

(d) Change power supply range from 85% to 115% of the rated supply voltage

(e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9 kHz to 25 GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 18GHz to 25GHz, so below final test was performed with frequency range from 9kHz to 18GHz.

- (4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 2013 on Radiated Emission test.
- (5) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9-90 kHz, 110-490 kHz, for emissions from 9 kHz-90 kHz, 110 kHz-490 kHz and above 1 GHz were measured based on average detector, for emissions above 1 GHz, peak emissions also be measured and need comply with Peak limit.
- (6) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW

Frequency band	RBW
9 kHz-150 kHz	200 Hz
150 kHz-30 MHz	9 kHz
30 MHz-1 GHz	120 kHz

- (7) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1 MHz, VBW is set at 3 MHz for Peak measure; according ANSI C63.10:2013 clause 4.2.3.2.3 procedure for average measure.

9.4. Test result

Pass. (See below detailed test result)

All the emissions except fundamental emission from 9 kHz to 25 GHz were comply with 15.209 limits and RSS-Gen section 8.9 limits.

Note1: According exploratory test, the emission levels are 20 dB below the limit detected from 9 kHz to 30 MHz and 18 GHz to 25 GHz, so the final test was performed with frequency range from 30 MHz to 18 GHz and recorded in below.

Note2: 30 MHz ~ 25 GHz: (Scan with all mode, the worst case is 802.11b mode)

Note3: For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with EUT working in 802.11b Tx mode.

Note4: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit. Only recorded the worst case in this report. and the EUT does not support Simultaneous emission with 2.4G WIFI and 5G WIFI.

Radiated Emission test (below 1 GHz)

TR-4-E-009 Radiated Emission Test Result

Test Date: 2023-09-13

Tested By: Bairong

EUT: Multimedia

Model Number: Kansas City 100

Test Mode: 2.4GWIFI

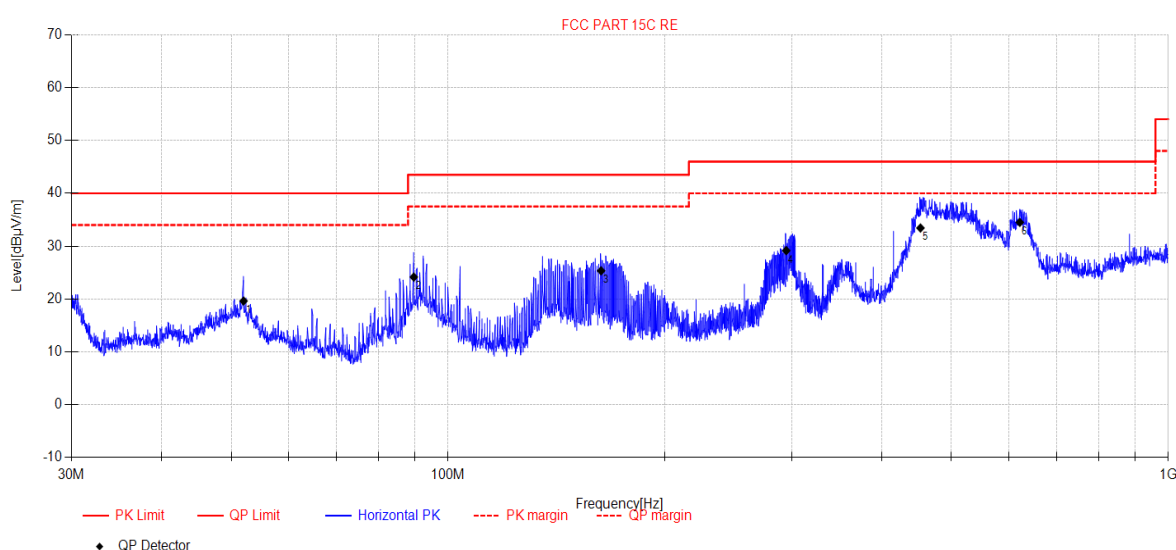
Power Supply: DC 12V

Condition: Temp:20.7°C;Humi:60.5%

Test Site: DDT 3# Chamber

File Path: d:\ts\2023 report data\Q23082411-2E\FCC BELOW 1G\20230913-040438_H

Memo: Sample Number:S23082411-02



Final Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	AMP [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	52.02	32.57	13.00	4.74	-30.69	19.62	40.00	20.38	QP	Horizontal
2	89.63	40.61	9.29	4.94	-30.69	24.15	43.50	19.35	QP	Horizontal
3	163.13	42.51	8.11	5.43	-30.71	25.34	43.50	18.16	QP	Horizontal
4	294.81	40.25	13.10	6.13	-30.32	29.16	46.00	16.84	QP	Horizontal
5	452.79	40.44	16.16	6.82	-29.99	33.43	46.00	12.57	QP	Horizontal
6	622.08	38.04	18.94	7.42	-29.90	34.50	46.00	11.50	QP	Horizontal

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2023-09-13

Tested By: Bairong

EUT: Multimedia

Model Number: Kansas City 100

Test Mode: 2.4GWIFI

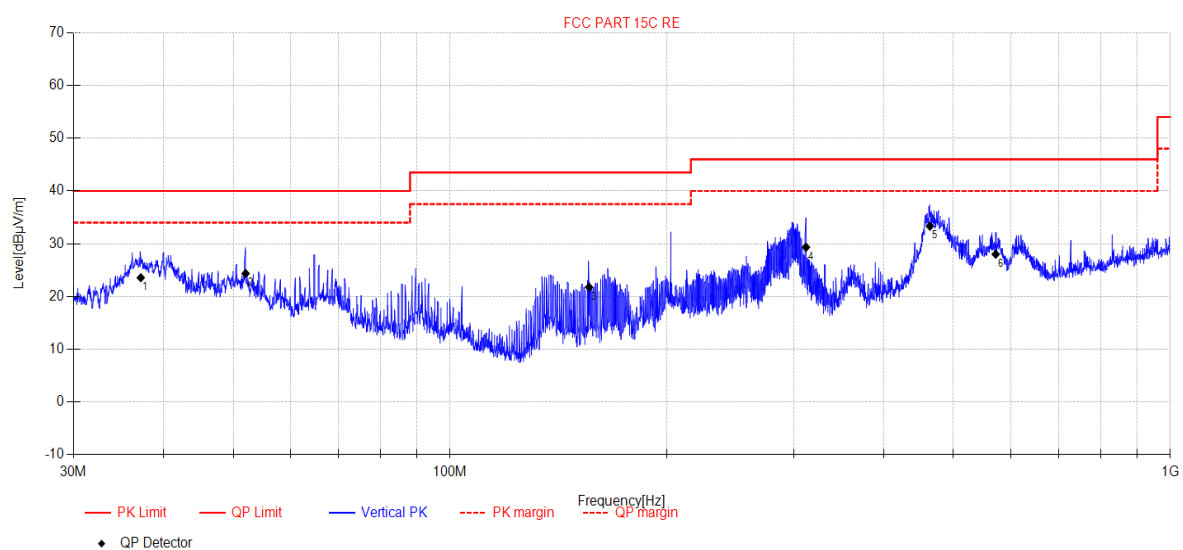
Power Supply: DC 12V

Condition: Temp:20.7°C;Humi:60.5%

Test Site: DDT 3# Chamber

File Path: d:\ts\2023 report data\Q23082411-2E\FCC BELOW 1G\20230913-040519_V

Memo: Sample Number:S23082411-02



Final Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	AMP [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	37.21	38.35	11.54	4.56	-30.89	23.56	40.00	16.44	QP	Vertical
2	52.02	37.3	13.00	4.74	-30.69	24.35	40.00	15.65	QP	Vertical
3	155.97	39.32	7.80	5.37	-30.73	21.76	43.50	21.74	QP	Vertical
4	312.03	39.81	13.58	6.22	-30.28	29.33	46.00	16.67	QP	Vertical
5	463.72	40.13	16.30	6.85	-29.97	33.31	46.00	12.69	QP	Vertical
6	572.28	32.49	18.20	7.22	-29.90	28.01	46.00	17.99	QP	Vertical

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

Radiated Emission test (above 1GHz)

TR-4-E-009 Radiated Emission Test Result

Test Date: 2023-09-13

Tested By: Bairong

EUT: Multimedia

Model Number: Kansas City 100

Test Mode: 11B TX 2412MHz

Power Supply: DC 12V

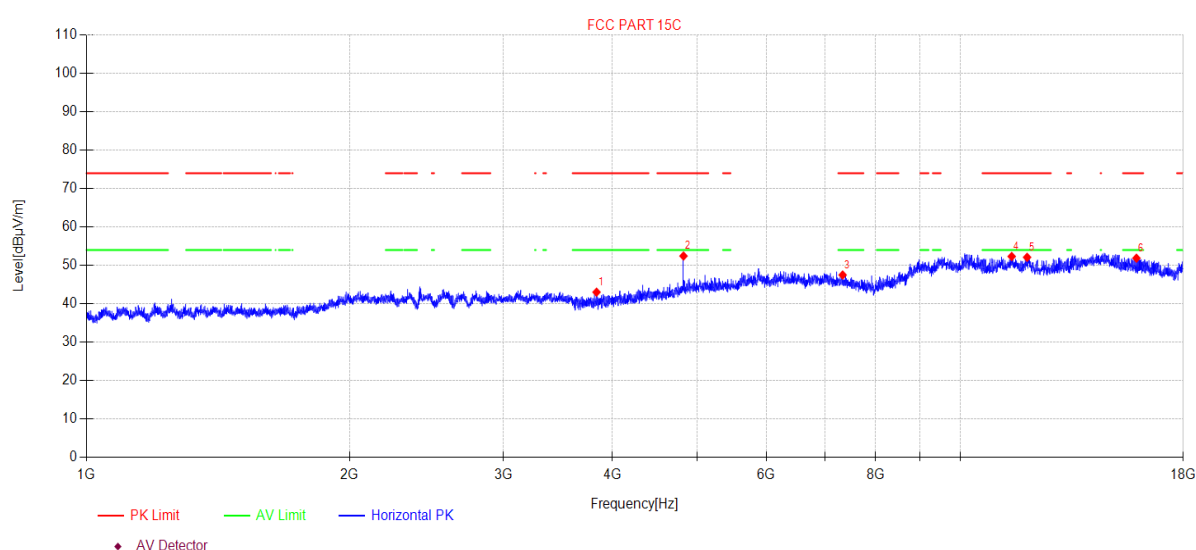
Condition: Temp:20.7°C;Humi:60.5%

Test Site: DDT 3# Chamber

File Path: d:\ts\2023 report data\Q23082411-2E\FCC ABOVE 1G 2.4GWIFI\5

Memo: Sample Number:S23082411-02 Power Setting:12

Test Graph



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Cable loss [dB]	Antenna Factor [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	3835.03	47.21	5.81	30.37	-40.35	43.04	74.00	30.96	PK	Horizontal
2	4822.83	52.69	7.51	32.39	-40.15	52.44	74.00	21.56	PK	Horizontal
3	7335.40	44.91	7.63	36.50	-41.54	47.50	74.00	26.50	PK	Horizontal
4	11450.96	42.52	10.05	39.05	-39.30	52.32	74.00	21.68	PK	Horizontal
5	11927.23	42.32	10.48	38.83	-39.53	52.10	74.00	21.90	PK	Horizontal
6	15910.28	37.64	15.47	38.08	-39.31	51.88	74.00	22.12	PK	Horizontal

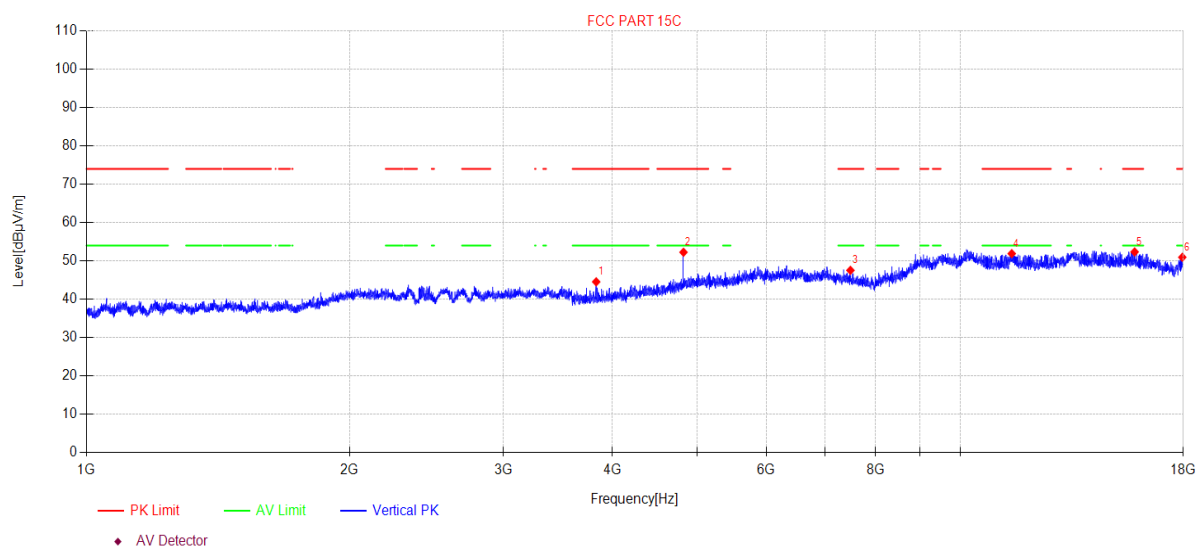
Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2023-09-13 **Tested By:** Bairong
EUT: Multimedia **Model Number:** Kansas City 100
Test Mode: 11B TX 2412MHz **Power Supply:** DC 12V
Condition: Temp:20.7°C;Humi:60.5% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2023 report data\Q23082411-2E\FCC ABOVE 1G 2.4GWIFI\6
Memo: Sample Number:S23082411-02 Power Setting:12

Test Graph



Suspected Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Cable loss [dB]	Antenna Factor [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	3831.71	48.74	5.81	30.36	-40.35	44.56	74.00	29.44	PK	Vertical
2	4822.83	52.51	7.51	32.39	-40.15	52.26	74.00	21.74	PK	Vertical
3	7487.48	45.39	7.64	36.43	-41.92	47.54	74.00	26.46	PK	Vertical
4	11454.27	42.10	10.05	39.05	-39.30	51.90	74.00	22.10	PK	Vertical
5	15832.30	38.32	15.12	38.17	-39.26	52.35	74.00	21.65	PK	Vertical
6	17953.24	38.66	13.07	41.52	-42.30	50.95	74.00	23.05	PK	Vertical

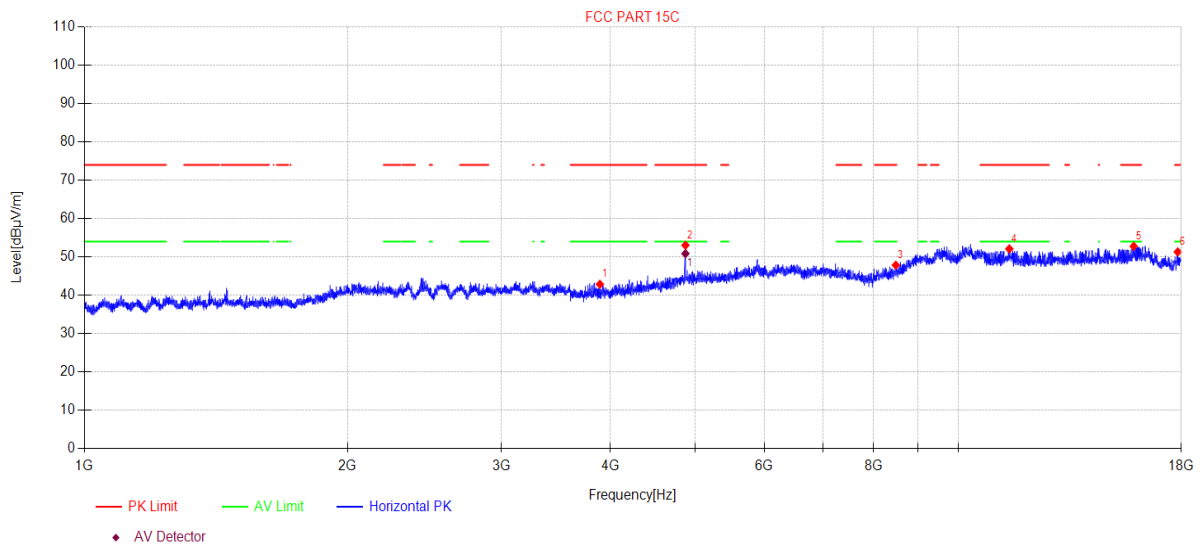
Note:

- Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2023-09-13 **Tested By:** Bairong
EUT: Multimedia **Model Number:** Kansas City 100
Test Mode: 11B TX 2437MHz **Power Supply:** DC 12V
Condition: Temp:20.7°C;Humi:60.5% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2023 report data\Q23082411-2E\FCC ABOVE 1G 2.4GWIFI\7
Memo: Sample Number:S23082411-02 Power Setting:12

Test Graph



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Cable loss [dB]	Antenna Factor [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	3889.73	46.94	5.83	30.48	-40.38	42.87	74.00	31.13	PK	Horizontal
2	4873.27	53.01	7.61	32.55	-40.13	53.04	74.00	20.96	PK	Horizontal
3	8483.16	43.27	8.19	37.47	-41.07	47.86	74.00	26.14	PK	Horizontal
4	11441.04	42.30	10.04	39.06	-39.30	52.10	74.00	21.90	PK	Horizontal
5	15878.12	38.62	15.33	38.12	-39.29	52.78	74.00	21.22	PK	Horizontal
6	17834.30	39.67	12.93	40.74	-42.03	51.31	74.00	22.69	PK	Horizontal

Final Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Cable loss [dB]	Antenna Factor [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	4873.27	50.83	7.61	32.55	-40.13	50.86	54.00	3.14	AV	Horizontal

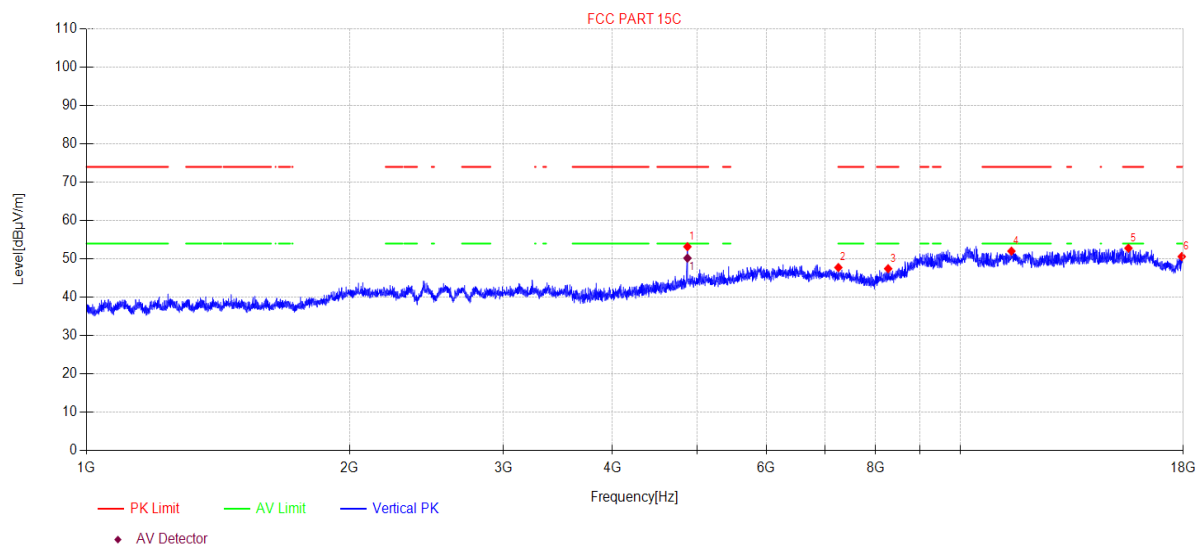
Note:

- Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2023-09-13 **Tested By:** Bairong
EUT: Multimedia **Model Number:** Kansas City 100
Test Mode: 11B TX 2437MHz **Power Supply:** DC 12V
Condition: Temp:20.7°C;Humi:60.5% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2023 report data\Q23082411-2E\FCC ABOVE 1G 2.4GWIFI\8
Memo: Sample Number:S23082411-02 Power Setting:12

Test Graph



Suspected Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Cable loss [dB]	Antenna Factor [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	4873.27	53.15	7.61	32.55	-40.13	53.18	74.00	20.82	PK	Vertical
2	7253.19	44.96	7.63	36.50	-41.33	47.76	74.00	26.24	PK	Vertical
3	8270.13	44.36	7.96	37.14	-42.01	47.45	74.00	26.55	PK	Vertical
4	11444.35	42.22	10.05	39.06	-39.30	52.03	74.00	21.97	PK	Vertical
5	15578.12	39.49	13.97	38.44	-39.11	52.79	74.00	21.21	PK	Vertical
6	17927.32	38.44	13.04	41.36	-42.24	50.60	74.00	23.40	PK	Vertical

Final Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Cable loss [dB]	Antenna Factor [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	4873.27	50.17	7.61	32.55	-40.13	50.20	54.00	3.80	AV	Vertical

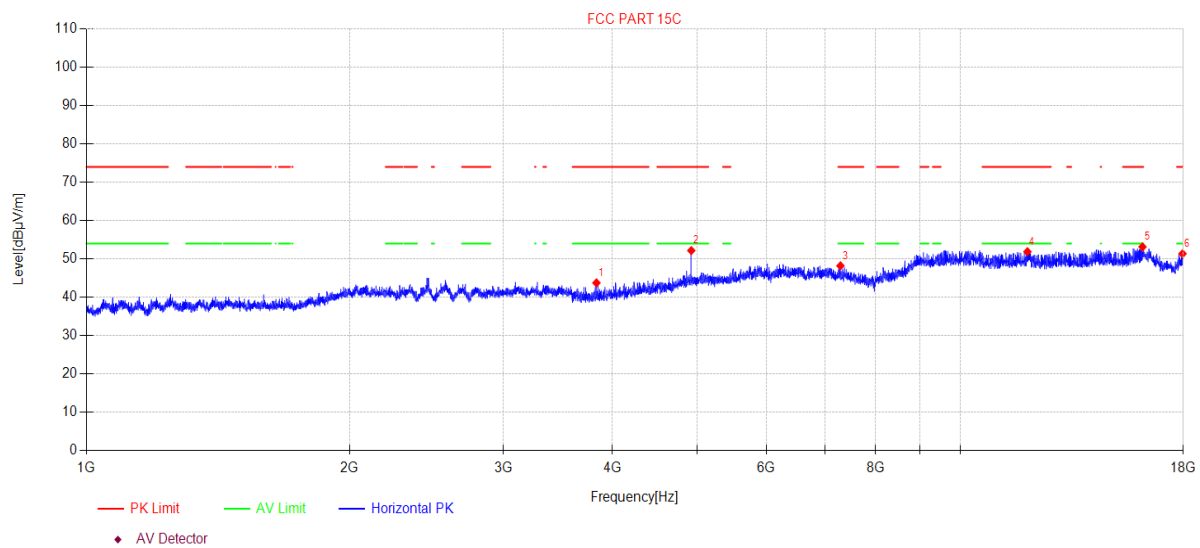
Note:

- Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2023-09-13 **Tested By:** Bairong
EUT: Multimedia **Model Number:** Kansas City 100
Test Mode: 11B TX 2462MHz **Power Supply:** DC 12V
Condition: Temp:20.7°C;Humi:60.5% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2023 report data\Q23082411-2E\FCC ABOVE 1G 2.4GWIFI\9
Memo: Sample Number:S23082411-02 Power Setting:12

Test Graph



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Cable loss [dB]	Antenna Factor [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	3833.92	47.93	5.81	30.37	-40.35	43.76	74.00	30.24	PK	Horizontal
2	4922.82	51.88	7.71	32.69	-40.11	52.17	74.00	21.83	PK	Horizontal
3	7293.12	45.50	7.63	36.50	-41.43	48.20	74.00	25.80	PK	Horizontal
4	11937.58	42.09	10.48	38.84	-39.53	51.88	74.00	22.12	PK	Horizontal
5	16165.20	39.67	15.23	37.73	-39.49	53.14	74.00	20.86	PK	Horizontal
6	17963.62	39.00	13.09	41.58	-42.32	51.35	74.00	22.65	PK	Horizontal

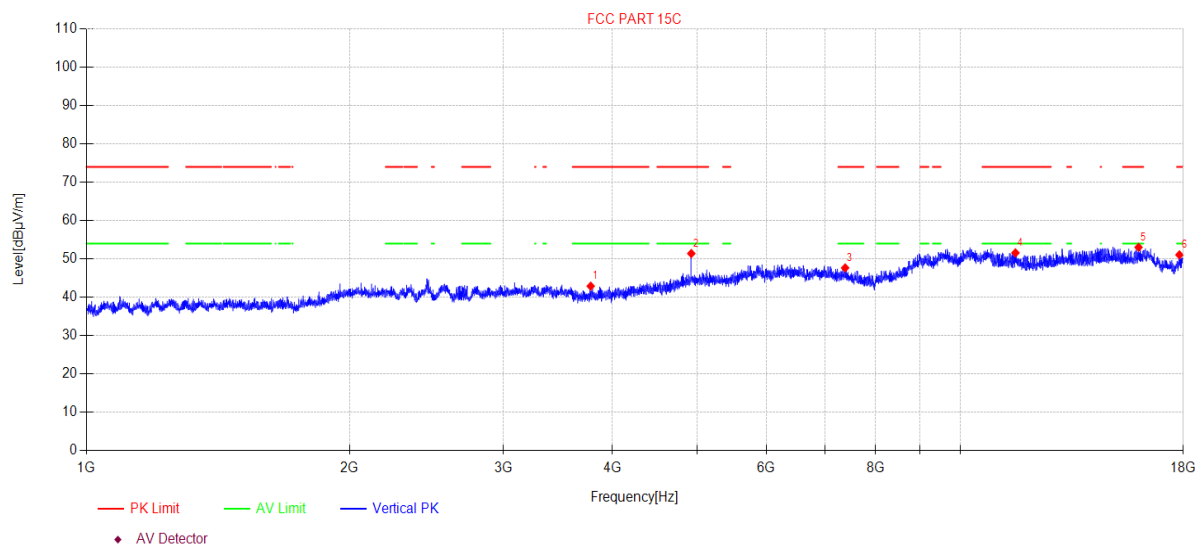
Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2023-09-13 **Tested By:** Bairong
EUT: Multimedia **Model Number:** Kansas City 100
Test Mode: 11B TX 2462MHz **Power Supply:** DC 12V
Condition: Temp:20.7°C;Humi:60.5% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2023 report data\Q23082411-2E\FCC ABOVE 1G 2.4GWIFI\10
Memo: Sample Number:S23082411-02 Power Setting:12

Test Graph



Suspected Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Cable loss [dB]	Antenna Factor [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	3776.74	47.21	5.80	30.21	-40.31	42.91	74.00	31.09	PK	Vertical
2	4922.82	51.11	7.71	32.69	-40.11	51.40	74.00	22.60	PK	Vertical
3	7384.32	45.19	7.64	36.50	-41.66	47.67	74.00	26.33	PK	Vertical
4	11567.38	41.86	10.15	38.93	-39.36	51.58	74.00	22.42	PK	Vertical
5	15997.88	38.62	15.87	37.90	-39.36	53.03	74.00	20.97	PK	Vertical
6	17818.84	39.52	12.91	40.63	-42.00	51.06	74.00	22.94	PK	Vertical

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.