

TEST REPORT

Reference No...... : WTD23D03056768W001
FCC ID : 2ABH3-PC3J19J359AD
Applicant..... : Furrion Ltd.
Address..... : 4/F, Flat C & D, The Grid,133 Wai Yip Street, Kwun Tong, Kowloon
999077 Hongkong
Manufacturer : DONGGUAN PROTRONIC ELECTRONICS LTD.
Address..... : No.1 Gongye Blvd, Shipai Town, Dongguan, Guangdong Province,
P.R. China.
Product..... : Wireless Camera Receiver Module
Model(s) : PC3J-19J359-AD
Standards..... : FCC 47CFR Part 15.247
Date of Receipt sample : 2023-03-21
Date of Test : 2023-03-21 to 2023-05-09
Date of Issue..... : 2023-07-04
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

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3 Revision History

Test Report No.	Date of Receipt Sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTD23D03056768W001	2023-03-21	2023-03-21 to 2023-05-09	2023-07-04	Original	-	Valid

4 General Information

4.1 General Description of E.U.T.

Product:	Wireless Camera Receiver Module
Model(s):	PC3J-19J359-AD
Model Description:	The device contains two different RF modules, module MR7916A and module WF8023.
Hardware Version:	Mainboard: FOSFDTARX_Main_V3 Keyboard: FOSFDTARX_Keys_V2
Software Version:	Vision_FMC_MONITOR_20220926_V0.30

4.2 Details of E.U.T.

Operation Frequency:	802.11b: 2412~2462MHz
Max. RF output power:	module MR7916A: 18.61dBm module WF8023: 18.22dBm
Type of Modulation:	DSSS with DBPSK, DQPSK, CCK
Antenna installation:	PIFA Antenna
Antenna Gain:	ANT1(module MR7916A): 3.84dBi ANT2(module WF8023): 3.63dBi
Ratings:	DC 12V

4.3 Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	2	2417	3	2422	4	2427
5	2432	6	2437	7	2442	8	2447
9	2452	10	2457	11	2462	-	-

4.4 Test Facility

The test facility has a test site registered with the following organizations:

ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files.

Registration number 7760A, October 15, 2016.

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.

Waltek Testing Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration number 523476, September 10, 2019.

4.5 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test Lab: N/A

Lab address: N/A

Test items: N/A

4.6 Abnormalities from Standard Conditions

None.

4.7 Test Mode

Tests Carried Out Under FCC part 15.247

Test Items	Mode	Data Rate	Channel	TX/RX
Maximum Peak Output Power	802.11b	1 Mbps	1/6/11	TX
Power Spectral Density	802.11b	1 Mbps	1/6/11	TX
6dB Bandwidth	802.11b	1 Mbps	1/6/11	TX
Band Edge	802.11b	1 Mbps	1/6/11	TX
Transmitter Spurious Emissions	802.11b	1 Mbps	1/6/11	TX

Note: Parameters set by test software during channel & power tests, the software provided by the customer was used to set the operating channels as well as the output power level. The RF output power set is the power expected by the manufacturer and is going to be fixed on the firmware of the final product.

5 Test Summary

Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.247(d) 15.205(a) 15.209(a)	PASS
Conducted Spurious Emissions	15.247(d)	N/A
Conducted Emissions	15.207(a)	N/A
6dB Bandwidth	15.247(a)(2)	PASS
Maximum Peak Output Power	15.247(b)(3), (4)	PASS
Power Spectral Density	15.247(e)	PASS
Band Edge	15.247(d)	PASS
Antenna Requirement	15.203	PASS
RF Exposure	1.1307(b)(1)	PASS
Note: PASS=Compliance; NC=Not Compliance; NT=Not Tested; N/A=Not Applicable.		

6 Equipment Used during Test

6.1 Equipments List

3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Spectrum Analyzer	R&S	FSP30	100091	2022-04-28 2023-04-24	2023-04-24 2024-04-23
2	Amplifier	Agilent	8447D	2944A10178	2022-08-01	2023-07-31
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	2022-08-07	2023-08-06
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2022-04-28 2023-04-24	2023-04-24 2024-04-23
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2022-04-28 2023-04-24	2023-04-24 2024-04-23
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2022-07-29	2023-07-28
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2022-08-08	2023-08-07
8	Coaxial Cable (above 1GHz)	ZT26-NJ-NJ-8M/FA	1GHz-18GHz	NA	2022-04-28 2023-04-24	2023-04-24 2024-04-23
9	Test software	EZ-EMC	RA-03A1-1	-	N/A	N/A
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	2022-04-28 2023-04-24	2023-04-24 2024-04-23
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2022-10-30	2023-10-29
3	Active Loop Antenna	Com-Power Corp.	AL-130R	10160007	2022-05-02 2023-04-26	2023-04-26 2024-04-25
4	Amplifier	ANRITSU	MH648A	M43381	2022-04-28 2023-04-24	2023-04-24 2024-04-23
5	Cable	HUBER+SUHNER	CBL2	525178	2022-04-28 2023-04-24	2023-04-24 2024-04-23
6	Test software	EZ-EMC	RA-03A1-1	-	N/A	N/A
RF Conducted Testing						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	Spectrum Analyzer	R&S	FSP40	100501	2022-08-01	2023-07-31
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2022-08-01	2023-07-31

6.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
DC Power Supply	LONGWEI INSTRUMENTS(HK) CO., LTD	PS-303D	WTSE1004B0-001

6.3 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)
Conducted Emissions test	± 3.64 dB (AC mains 150KHz~30MHz)
Conducted Spurious Emissions test	± 3.12 dB (150KHz~30MHz)
	± 4.21 dB (30M~1000MHz)
	± 5.14 dB (1000M~26500MHz)
Confidence interval: 95%. Confidence factor: k=2	

6.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R. China.

7 Duty Cycle

module MR7916A:

Type of Modulation	On time ms	Period ms	Duty Cycle linear	Duty Cycle %	Duty Cycle Factor(dB)	Average Factor(dB)
802.11b	100	100	1	100	0	0

module WF8023:

Type of Modulation	On time ms	Period ms	Duty Cycle linear	Duty Cycle %	Duty Cycle Factor(dB)	Average Factor(dB)
802.11b	0.32	0.64	0.5	50	3.01	-6.02

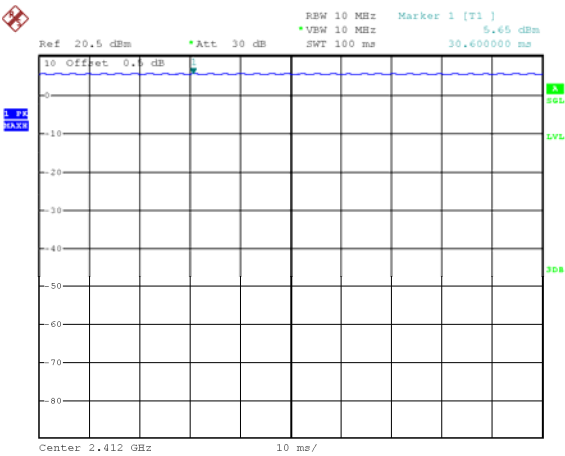
Remark:

Duty cycle=On Time/period;

Duty cycle factor= $10 \cdot \log(1/\text{Duty cycle})$;

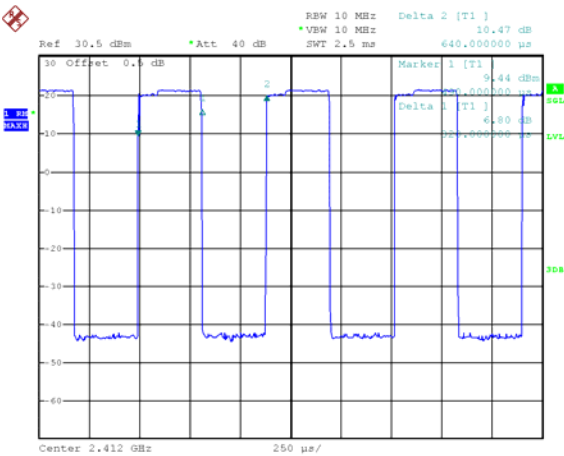
Average factor= $20 \log_{10} \text{Duty cycle}$

module MR7916A
802.11b



Date: 30.MAR.2023 17:33:26

module WF8023
802.11b



Date: 23.MAR.2023 17:13:15

8 Radiated Emissions

Test Requirement: 47CFR FCC Part15 Subpart C §15.209&15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019;
ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

8.1 EUT Operation

Operating Environment:

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

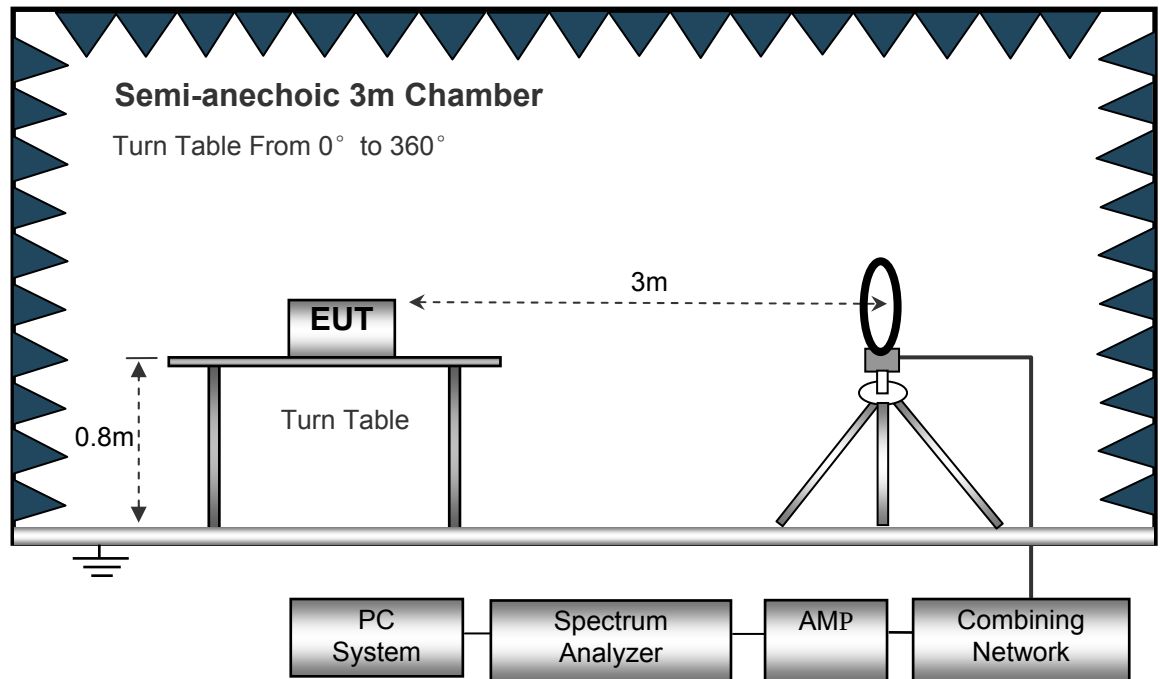
EUT Operation:

The test was performed in TX transmitting mode, the test data were shown in the report.

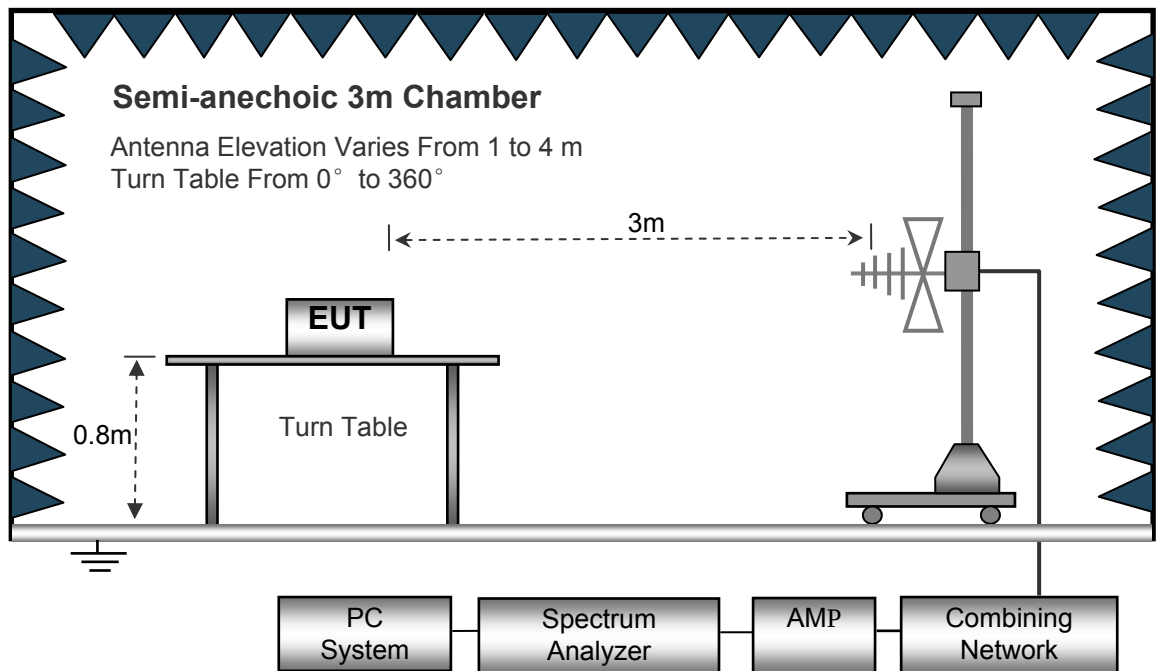
8.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10.

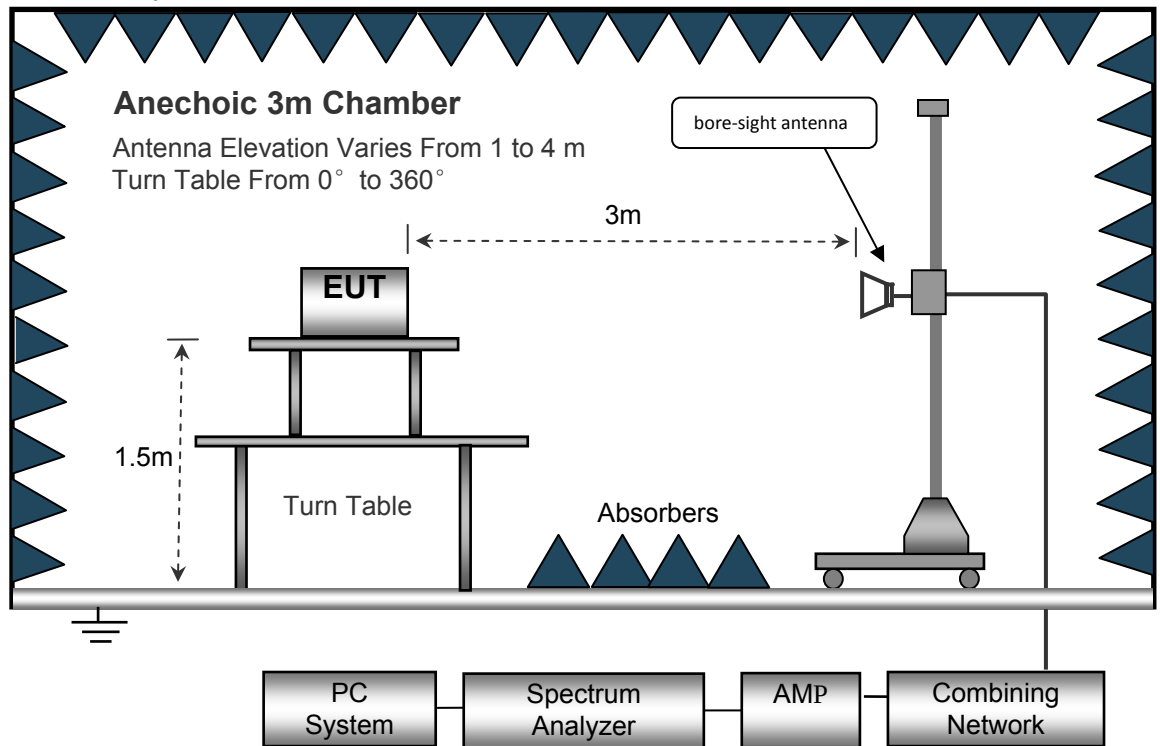
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



8.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed Auto
 IF Bandwidth..... 10kHz
 Video Bandwidth..... 10kHz
 Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed Auto
 Detector PK
 Resolution Bandwidth..... 100kHz
 Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed Auto
 Detector PK
 Resolution Bandwidth..... 1MHz
 Video Bandwidth..... 3MHz
 Detector Ave.
 Resolution Bandwidth..... 1MHz
 Video Bandwidth..... 10Hz

8.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in Z axis,so the worst data were shown as follow.
8. A 2.4GHz high –pass filter is used during radiated emissions above 1GHz measurement.

8.5 Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

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 maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

8.6 Summary of Test Results

module MR7916A:

Test Frequency: 9kHz ~ 30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency: 30MHz ~ 8GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Low Channel 2412MHz									
281.53	41.19	QP	191	1.7	H	-11.95	29.24	46.00	-16.76
281.53	46.35	QP	144	1.8	V	-11.95	34.40	46.00	-11.60
4824.00	53.80	PK	158	1.2	V	-1.06	52.74	74.00	-21.26
4824.00	42.36	Ave	158	1.2	V	-1.06	41.30	54.00	-12.70
7236.00	46.30	PK	320	1.1	H	1.33	47.63	74.00	-26.37
7236.00	36.70	Ave	320	1.1	H	1.33	38.03	54.00	-15.97
2343.86	48.53	PK	137	1.7	V	-13.19	35.34	74.00	-38.66
2343.86	39.83	Ave	137	1.7	V	-13.19	26.64	54.00	-27.36
2381.67	42.70	PK	178	1.9	H	-13.14	29.56	74.00	-44.44
2381.67	38.78	Ave	178	1.9	H	-13.14	25.64	54.00	-28.36
2487.67	44.88	PK	305	1.1	V	-13.08	31.80	74.00	-42.20
2487.67	38.30	Ave	305	1.1	V	-13.08	25.22	54.00	-28.78

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Middle Channel 2437MHz									
281.53	42.27	QP	78	2.0	H	-11.95	30.32	46.00	-15.68
281.53	45.97	QP	243	1.4	V	-11.95	34.02	46.00	-11.98
4874.00	53.81	PK	325	1.6	V	-0.62	53.19	74.00	-20.81
4874.00	41.40	Ave	325	1.6	V	-0.62	40.78	54.00	-13.22
7311.00	45.97	PK	95	1.4	H	2.21	48.18	74.00	-25.82
7311.00	36.68	Ave	95	1.4	H	2.21	38.89	54.00	-15.11
2318.89	46.23	PK	134	1.6	V	-13.19	33.04	74.00	-40.96
2318.89	37.66	Ave	134	1.6	V	-13.19	24.47	54.00	-29.53
2359.00	42.14	PK	350	1.2	H	-13.14	29.00	74.00	-45.00
2359.00	37.73	Ave	350	1.2	H	-13.14	24.59	54.00	-29.41
2495.96	44.77	PK	72	2.0	V	-13.08	31.69	74.00	-42.31
2495.96	37.87	Ave	72	2.0	V	-13.08	24.79	54.00	-29.21

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: High Channel 2462MHz									
281.53	41.02	QP	183	1.2	H	-11.95	29.07	46.00	-16.93
281.53	45.25	QP	13	1.8	V	-11.95	33.30	46.00	-12.70
4924.00	53.68	PK	67	1.4	V	-0.24	53.44	74.00	-20.56
4924.00	42.78	Ave	67	1.4	V	-0.24	42.54	54.00	-11.46
7386.00	45.32	PK	140	2.0	H	2.84	48.16	74.00	-25.84
7386.00	36.17	Ave	140	2.0	H	2.84	39.01	54.00	-14.99
2336.61	45.06	PK	339	1.4	V	-13.19	31.87	74.00	-42.13
2336.61	38.68	Ave	339	1.4	V	-13.19	25.49	54.00	-28.51
2378.84	43.09	PK	122	2.0	H	-13.14	29.95	74.00	-44.05
2378.84	36.86	Ave	122	2.0	H	-13.14	23.72	54.00	-30.28
2491.06	43.68	PK	288	1.4	V	-13.08	30.60	74.00	-43.40
2491.06	36.68	Ave	288	1.4	V	-13.08	23.60	54.00	-30.40

Test Frequency: 8GHz~25GHz

The measurements were more than 20 dB below the limit and not reported.

module WF8023:**Test Frequency: 9kHz ~ 30MHz**

The measurements were more than 20 dB below the limit and not reported.

Test Frequency: 30MHz ~ 8GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Low Channel 2412MHz									
374.48	40.36	QP	162	1.4	H	-11.95	28.41	46.00	-17.59
374.48	44.91	QP	218	1.4	V	-11.95	32.96	46.00	-13.04
4824.00	53.02	PK	154	1.3	V	-1.06	51.96	74.00	-22.04
4824.00	42.98	Ave	154	1.3	V	-1.06	41.92	54.00	-12.08
7236.00	46.60	PK	335	2.0	H	1.33	47.93	74.00	-26.07
7236.00	36.70	Ave	335	2.0	H	1.33	38.03	54.00	-15.97
2320.78	48.33	PK	118	2.0	V	-13.19	35.14	74.00	-38.86
2320.78	39.74	Ave	118	2.0	V	-13.19	26.55	54.00	-27.45
2364.23	44.57	PK	140	1.0	H	-13.14	31.43	74.00	-42.57
2364.23	38.41	Ave	140	1.0	H	-13.14	25.27	54.00	-28.73
2494.61	42.51	PK	332	1.4	V	-13.08	29.43	74.00	-44.57
2494.61	36.24	Ave	332	1.4	V	-13.08	23.16	54.00	-30.84

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Middle Channel 2437MHz									
374.48	40.91	QP	192	1.7	H	-11.95	28.96	46.00	-17.04
374.48	44.63	QP	91	1.8	V	-11.95	32.68	46.00	-13.32
4874.00	52.82	PK	149	1.0	V	-0.62	52.20	74.00	-21.80
4874.00	41.60	Ave	149	1.0	V	-0.62	40.98	54.00	-13.02
7311.00	46.46	PK	230	1.0	H	2.21	48.67	74.00	-25.33
7311.00	38.21	Ave	230	1.0	H	2.21	40.42	54.00	-13.58
2349.91	46.02	PK	106	1.7	V	-13.19	32.83	74.00	-41.17
2349.91	37.79	Ave	106	1.7	V	-13.19	24.60	54.00	-29.40
2363.50	43.76	PK	288	1.4	H	-13.14	30.62	74.00	-43.38
2363.50	38.17	Ave	288	1.4	H	-13.14	25.03	54.00	-28.97
2486.33	44.21	PK	234	1.2	V	-13.08	31.13	74.00	-42.87
2486.33	37.02	Ave	234	1.2	V	-13.08	23.94	54.00	-30.06

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: High Channel 2462MHz									
374.48	41.63	QP	306	1.6	H	-11.95	29.68	46.00	-16.32
374.48	45.68	QP	93	1.1	V	-11.95	33.73	46.00	-12.27
4924.00	53.40	PK	118	1.5	V	-0.24	53.16	74.00	-20.84
4924.00	42.89	Ave	118	1.5	V	-0.24	42.65	54.00	-11.35
7386.00	46.65	PK	149	1.3	H	2.84	49.49	74.00	-24.51
7386.00	37.53	Ave	149	1.3	H	2.84	40.37	54.00	-13.63
2345.12	46.16	PK	348	1.4	V	-13.19	32.97	74.00	-41.03
2345.12	37.17	Ave	348	1.4	V	-13.19	23.98	54.00	-30.02
2386.01	42.77	PK	112	1.9	H	-13.14	29.63	74.00	-44.37
2386.01	36.68	Ave	112	1.9	H	-13.14	23.54	54.00	-30.46
2490.40	44.98	PK	126	1.6	V	-13.08	31.90	74.00	-42.10
2490.40	38.90	Ave	126	1.6	V	-13.08	25.82	54.00	-28.18

Test Frequency: 8GHz~25GHz

The measurements were more than 20 dB below the limit and not reported.

module MR7916A+ module WF8023:**Test Frequency: 9kHz ~ 30MHz**

The measurements were more than 20 dB below the limit and not reported.

Test Frequency: 30MHz ~ 8GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Low Channel 2412MHz									
304.78	42.88	QP	254	1.0	H	-11.95	30.93	46.00	-15.07
304.78	46.33	QP	127	1.9	V	-11.95	34.38	46.00	-11.62
4824.00	56.98	PK	131	1.7	V	-1.06	55.92	74.00	-18.08
4824.00	42.11	Ave	131	1.7	V	-1.06	41.05	54.00	-12.95
7236.00	49.67	PK	186	1.1	H	1.33	51.00	74.00	-23.00
7236.00	39.18	Ave	186	1.1	H	1.33	40.51	54.00	-13.49
2326.20	48.86	PK	326	1.6	V	-13.19	35.67	74.00	-38.33
2326.20	37.54	Ave	326	1.6	V	-13.19	24.35	54.00	-29.65
2379.78	43.15	PK	215	1.4	H	-13.14	30.01	74.00	-43.99
2379.78	36.13	Ave	215	1.4	H	-13.14	22.99	54.00	-31.01
2484.78	42.32	PK	77	2.0	V	-13.08	29.24	74.00	-44.76
2484.78	37.41	Ave	77	2.0	V	-13.08	24.33	54.00	-29.67

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Middle Channel 2437MHz									
304.78	42.02	QP	300	1.2	H	-11.95	30.07	46.00	-15.93
304.78	45.36	QP	179	1.9	V	-11.95	33.41	46.00	-12.59
4874.00	57.82	PK	70	1.5	V	-0.62	57.20	74.00	-16.80
4874.00	42.09	Ave	70	1.5	V	-0.62	41.47	54.00	-12.53
7311.00	49.56	PK	333	1.6	H	2.21	51.77	74.00	-22.23
7311.00	38.61	Ave	333	1.6	H	2.21	40.82	54.00	-13.18
2324.34	46.94	PK	271	1.9	V	-13.19	33.75	74.00	-40.25
2324.34	39.49	Ave	271	1.9	V	-13.19	26.30	54.00	-27.70
2351.21	44.90	PK	22	1.1	H	-13.14	31.76	74.00	-42.24
2351.21	36.37	Ave	22	1.1	H	-13.14	23.23	54.00	-30.77
2485.67	44.24	PK	55	1.2	V	-13.08	31.16	74.00	-42.84
2485.67	38.81	Ave	55	1.2	V	-13.08	25.73	54.00	-28.27

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dB μ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
11b: High Channel 2462MHz									
304.78	43.08	QP	329	1.8	H	-11.95	31.13	46.00	-14.87
304.78	45.47	QP	175	1.2	V	-11.95	33.52	46.00	-12.48
4924.00	56.89	PK	255	1.5	V	-0.24	56.65	74.00	-17.35
4924.00	45.30	Ave	255	1.5	V	-0.24	45.06	54.00	-8.94
7386.00	49.14	PK	359	1.1	H	2.84	51.98	74.00	-22.02
7386.00	36.91	Ave	359	1.1	H	2.84	39.75	54.00	-14.25
2331.24	46.07	PK	37	1.4	V	-13.19	32.88	74.00	-41.12
2331.24	38.19	Ave	37	1.4	V	-13.19	25.00	54.00	-29.00
2356.87	43.09	PK	161	1.2	H	-13.14	29.95	74.00	-44.05
2356.87	38.03	Ave	161	1.2	H	-13.14	24.89	54.00	-29.11
2487.29	42.97	PK	187	1.5	V	-13.08	29.89	74.00	-44.11
2487.29	38.29	Ave	187	1.5	V	-13.08	25.21	54.00	-28.79

Test Frequency: 8GHz~25GHz

The measurements were more than 20 dB below the limit and not reported.

9 Band Edge Measurement

Test Requirement: 47CFR FCC Part15 Subpart C §15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019

Regulation 15.247 (d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Mode: Transmitting

9.1 Test Produce

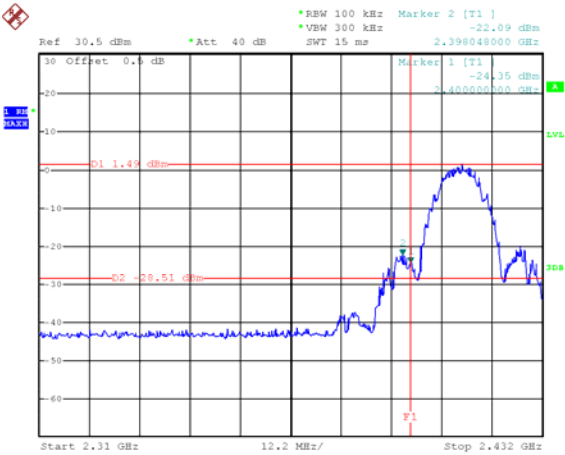
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

9.2 Test Result

Test result plots shown as follows:

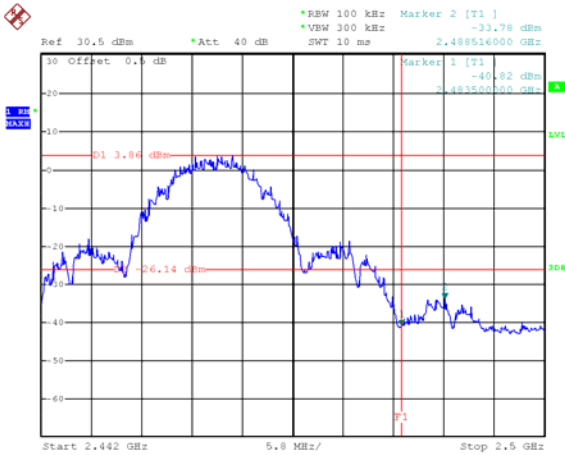
module MR7916A:

TX 11b: Band edge-left side



Date: 30.MAR.2023 18:05:02

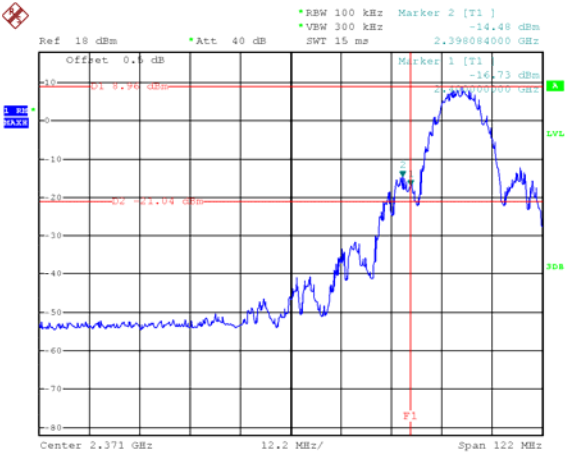
TX 11b: Band edge-right side



Date: 30.MAR.2023 18:07:10

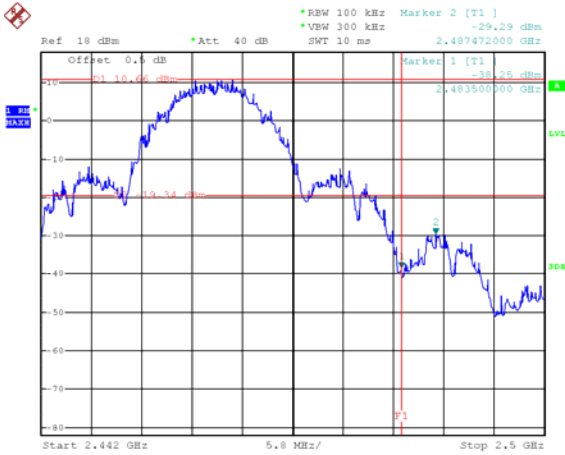
module WF8023:

TX 11b: Band edge-left side



Date: 24.MAR.2023 08:31:25

TX 11b: Band edge-right side



Date: 24.MAR.2023 08:34:02

10 6 dB Bandwidth and 99% Bandwidth Measurement

Test Requirement:	47CFR FCC Part15 Subpart C §15.247
Test Method:	ANSI C63.10:2013 KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019
Test Limit:	§15.247(a)(2) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Test Mode:	Transmitting

10.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. 6dB Bandwidth Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz.
99% Bandwidth Set the spectrum analyzer: 1~5% of the OBW, VBW = 3 times the RBW

10.2 Test Result:

module MR7916A:

Operation mode	Test Channel	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
TX 11b	Channel 1	9.96	16.68
	Channel 6	10.08	16.74
	Channel 11	9.72	16.50

module WF8023:

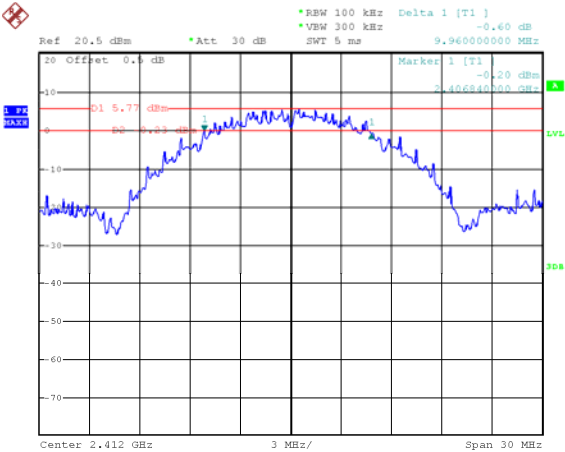
Operation mode	Test Channel	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
TX 11b	Channel 1	10.14	15.90
	Channel 6	9.84	15.84
	Channel 11	9.90	15.66

Test result plot:
module MR7916A:

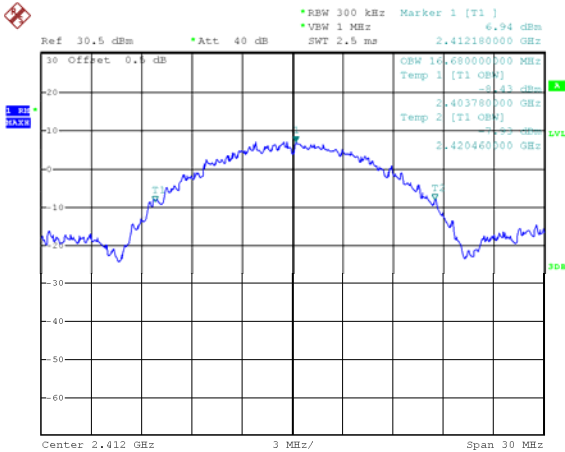
6 dB Bandwidth

99% Bandwidth

Mode: TX 11b channel 1

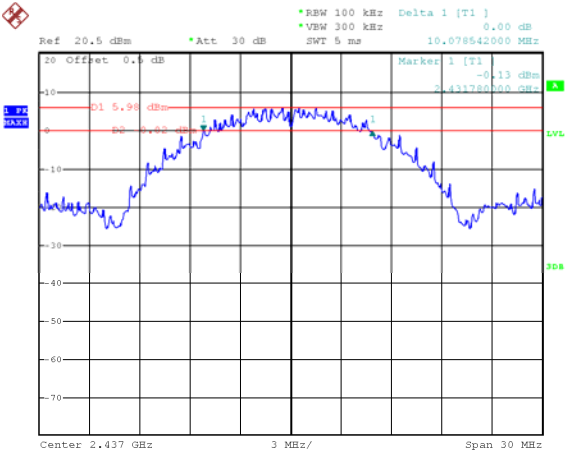


Date: 30.MAR.2023 18:22:01

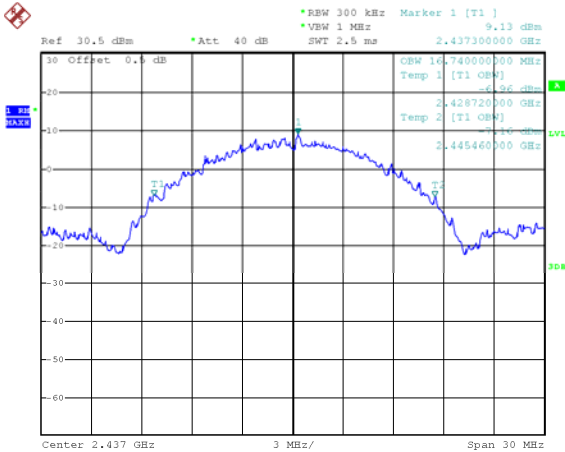


Date: 30.MAR.2023 17:55:21

Mode: TX 11b channel 6



Date: 30.MAR.2023 18:20:31

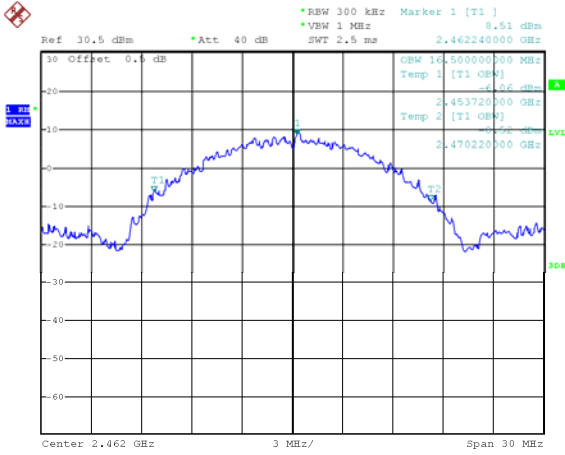
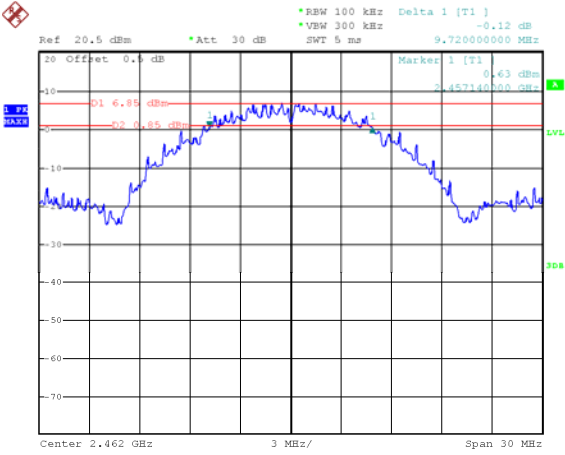


Date: 30.MAR.2023 17:56:49

6 dB Bandwidth

99% Bandwidth

Mode: TX 11b channel 11



Date: 30.MAR.2023 18:21:20

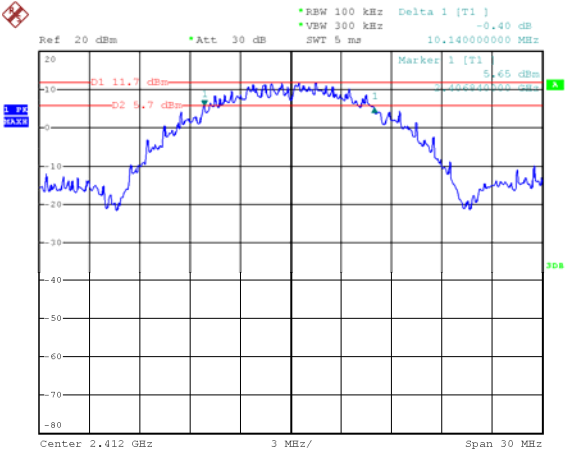
Date: 30.MAR.2023 17:57:25

module WF8023:

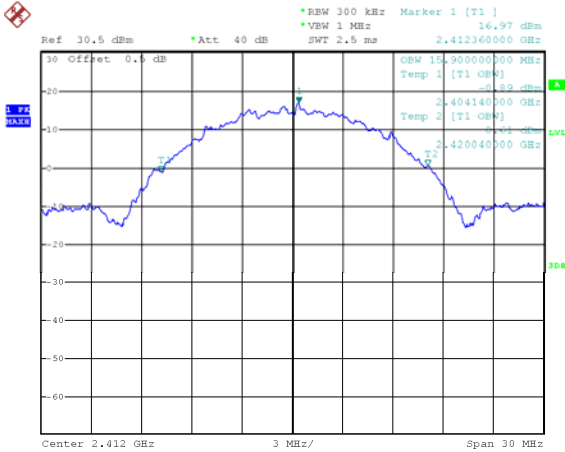
6 dB Bandwidth

99% Bandwidth

Mode: TX 11b channel 1

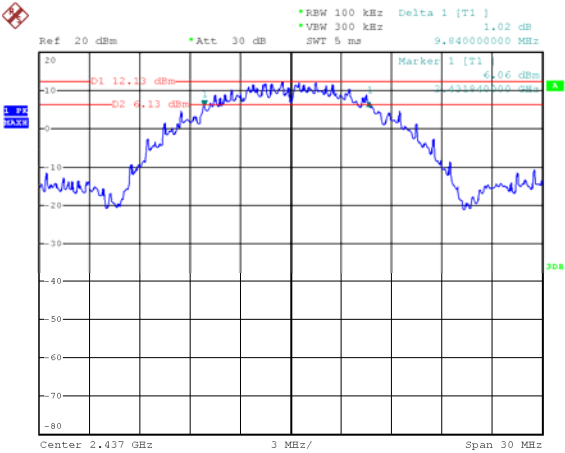


Date: 23.MAR.2023 16:22:22

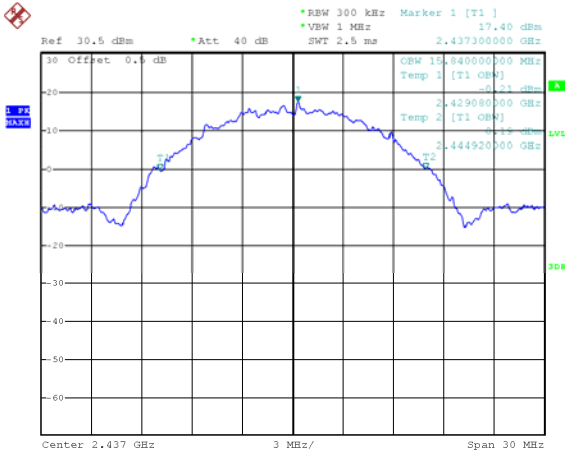


Date: 23.MAR.2023 16:31:20

Mode: TX 11b channel 6



Date: 23.MAR.2023 16:26:46

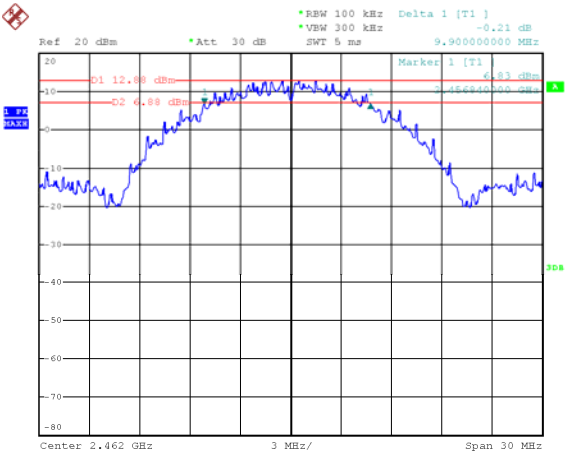


Date: 23.MAR.2023 16:31:53

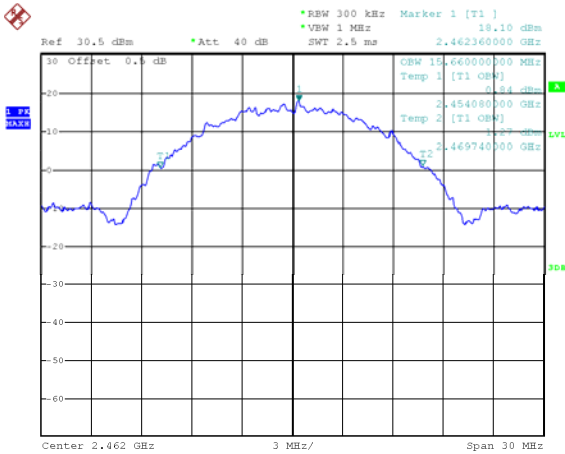
6 dB Bandwidth

99% Bandwidth

Mode: TX 11b channel 11



Date: 23.MAR.2023 16:29:22



Date: 23.MAR.2023 16:30:27

11 Maximum Peak conducted Output Power

Test Requirement:	47CFR FCC Part15 Subpart C §15.247
Test Method:	ANSI C63.10:2013 KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019
Test Limit:	§15.247(b) The maximum peak conducted output power of the intentional radiator shall not exceed 1W.
Test Mode:	Transmitting

11.1 Test Procedure:

According to KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019

Section 8.3.1.1 RBW ≥ DTS bandwidth

Subclause 11.9.1.1 of ANSI C63.10 is applicable.

Section 8.3.1.2 Integrated band power method

For measuring the output power of a device transmitting a wide-band noise-like signal where the peak power amplitude is a statistical parameter, the preferred methodology is to use an integrated average power measurement, as described in 8.3.2. The peak integrated band power method of 11.9.1 in ANSI C63.10 is not applicable.

Subclause 11.9.2 of ANSI C63.10 is applicable.

11.2 Test Result:

module MR7916A:

Operation mode	Channel Frequency (MHz)	Measurements (dBm)	Duty Cycle Factor (dB)	Conducted Output Power (dBm)	Limit
TX 11b	Low-2412	17.96	0	17.96	1W/30dBm
	Middle-2437	17.99		17.99	1W/30dBm
	High-2462	18.61		18.61	1W/30dBm

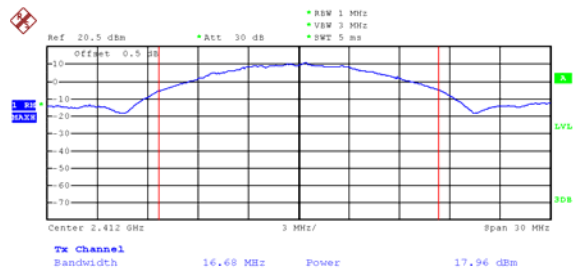
module WF8023:

Operation mode	Channel Frequency (MHz)	Measurements (dBm)	Duty Cycle Factor (dB)	Conducted Output Power (dBm)	Limit
TX 11b	Low-2412	23.62	-6.02	17.60	1W/30dBm
	Middle-2437	24.24		18.22	1W/30dBm
	High-2462	23.60		17.58	1W/30dBm

Test Plot:

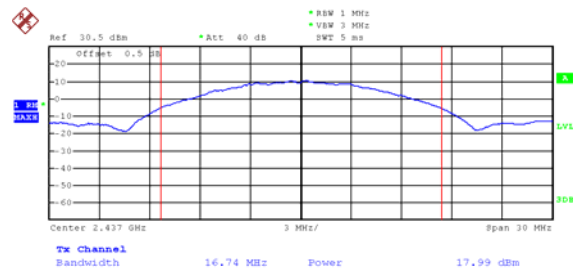
module MR7916A:

Mode: TX 11b channel 1



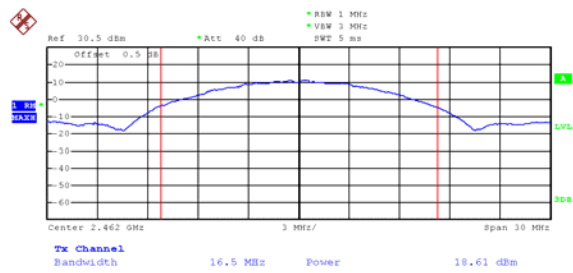
Date: 30.MAR.2023 18:46:11

Mode: TX 11b channel 6



Date: 30.MAR.2023 17:58:42

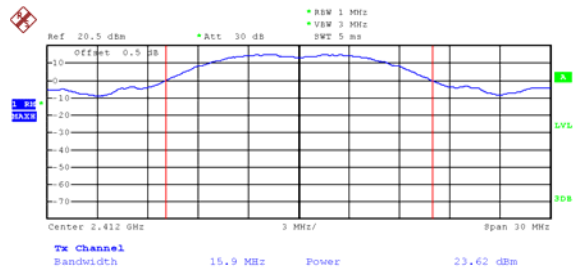
Mode: TX 11b channel 11



Date: 30.MAR.2023 17:57:52

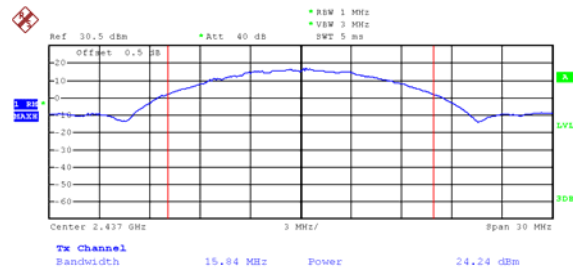
module WF8023:

Mode: TX 11b channel 1



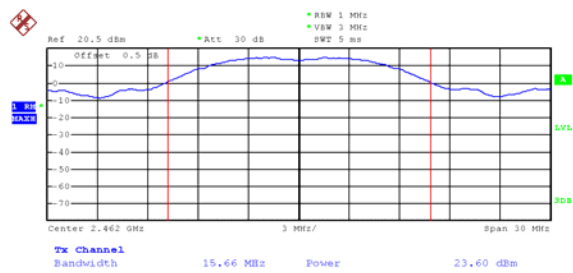
Date: 30.MAR.2023 17:28:04

Mode: TX 11b channel 6



Date: 23.MAR.2023 17:08:57

Mode: TX 11b channel 11



Date: 30.MAR.2023 17:28:46

12 Power Spectral density

Test Requirement:	47CFR FCC Part15 Subpart C §15.247
Test Method:	ANSI C63.10:2013 KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019
Test Limit:	§15.247(e) 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.
Test Mode:	Transmitting

12.1 Test Procedure:

According to KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019 section 8.4

Subclause 11.10 of ANSI C63.10 is applicable.

Choose the test procedure according to the product type

Peak PSD

Subclause 11.10.2 of ANSI C63.10 is applicable.

AVG PSD

Subclause 11.10.3/4/5/6/7/8 of ANSI C63.10 is applicable.

12.2 Test Result:

module MR7916A:

Operation mode	Channel Frequency (MHz)	Measurements (dBm per 3kHz)	Duty Cycle Factor (dB)	Power Spectral density (dBm per 3kHz)	Limit
TX 11b	Low-2412	-19.20	0	-19.20	8dBm per 3kHz
	Middle-2437	-18.68		-18.68	8dBm per 3kHz
	High-2462	-18.11		-18.11	8dBm per 3kHz

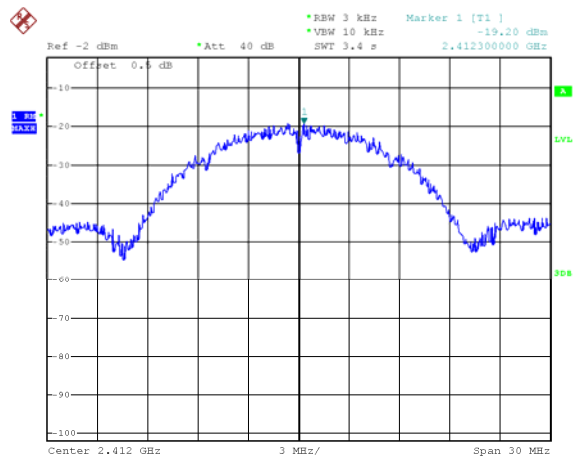
module WF8023:

Operation mode	Channel Frequency (MHz)	Measurements (dBm per 3kHz)	Duty Cycle Factor (dB)	Power Spectral density (dBm per 3kHz)	Limit
TX 11b	Low-2412	-12.56	-6.02	-18.58	8dBm per 3kHz
	Middle-2437	-12.09		-18.11	8dBm per 3kHz
	High-2462	-11.60		-17.62	8dBm per 3kHz

Test Plot:

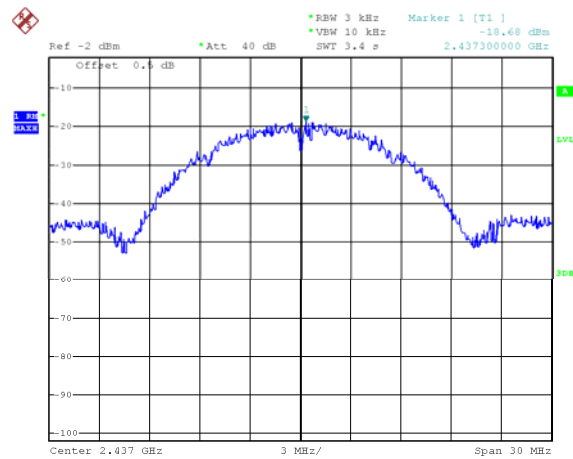
module MR7916A:

Mode: TX 11b channel 1



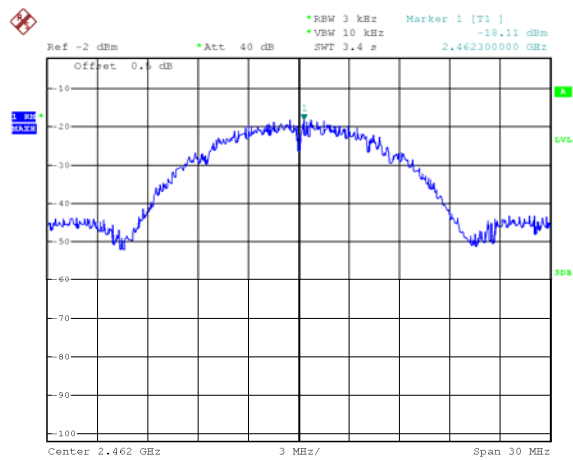
Date: 30.MAR.2023 18:02:55

Mode: TX 11b channel 6



Date: 30.MAR.2023 18:00:44

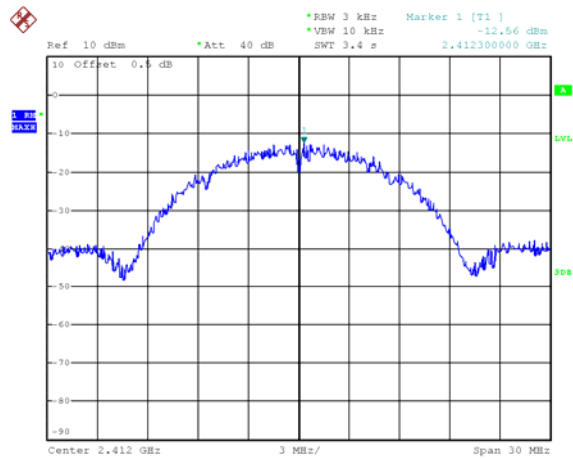
Mode: TX 11b channel 11



Date: 30.MAR.2023 18:01:19

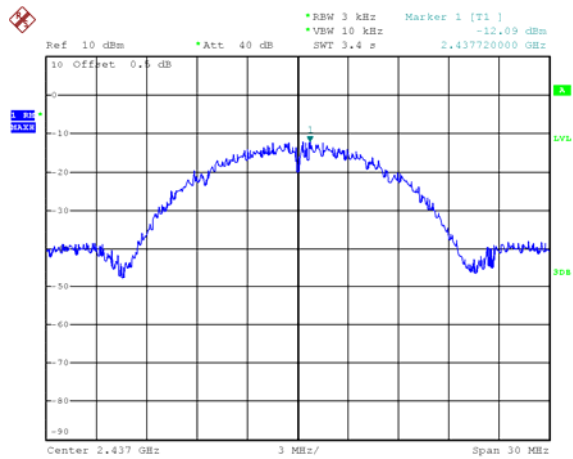
module WF8023:

Mode: TX 11b channel 1



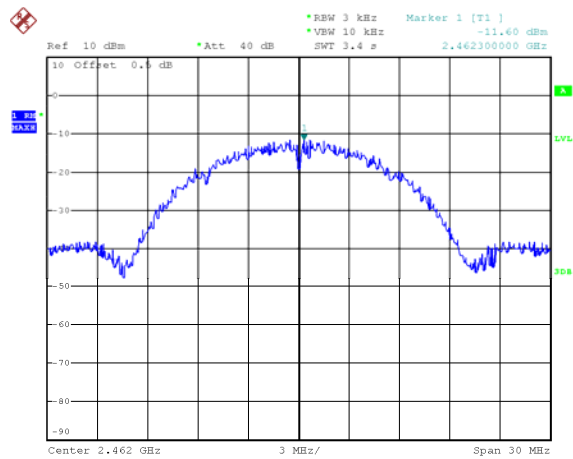
Date: 23.MAR.2023 16:58:08

Mode: TX 11b channel 6



Date: 23.MAR.2023 17:03:46

Mode: TX 11b channel 11



Date: 23.MAR.2023 17:05:07

13 Antenna Requirement

According to the FCC Part 15 Paragraph 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. This product has an integrated antenna fulfil the requirement of this section.

Note: Please refer to EUT photos for more details.

14 RF Exposure

Note: Please refer to RF Exposure Report: WTD23D03056768W002.

15 Photographs of test setup and EUT.

Note: Please refer to appendix: Appendix-PC3J-19J359-AD-Photos.

=====End of Report=====