47 CFR PART 15 SUBPART C TEST REPORT

for

Notebook Computer

Model No.: RK15

FCC ID: IR5RK15

of

Applicant: MilDef Crete Inc.
Address: 7F, No. 250, Sec.3, Pei Shen Rd., Shen Keng District, New Taipei City Taiwan R.O.C.

Tested and Prepared

by

Worldwide Testing Services (Taiwan) Co., Ltd.

FCC Registration No.: TW1477, TW1072

Industry Canada filed test laboratory Reg. No.: 20037, 5107A

Report No.: W6M22307-22823-C-1

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.
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TABLE OF CONTENTS

1 General Information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.
The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.
Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.
Neither is there any guarantee that such a test sample will interwork with other genuinely open systems.
The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that is performance generally conforms to representative cases of communications equipment.

Laboratory disclaimer-
1. The test results of this test report relate exclusively to the item tested as specified in 1.5.
2. The test report may only be reproduced or published in full.
3. Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services(Taiwan) Co., Ltd.
4. Antenna gain is provided by applicant and laboratory issue relevant data and results.

Specific Conditions:
Usage of the hereunder tested device in combination with other integrated or external antennas requires at least additional output power measurements, spurious emission measurements, conducted emission measurements (AC supply lines) and radio frequency exposure evaluations for each individual configuration performed, for certification by FCC.

Tester:

September 13, 2023		Sora Kuo	Sora
Date	WTS-Lab.	Name	Signature

Technical responsibility for area of testing:

September 13, 2023		Kevin Wang	Kevin Wang
Date	WTS	Name	Signature

1.2 Testing laboratory

1.2.1 Location

10m OATS
No.5-1, Lishui, Shuang Sing Village, Wanli Dist.,
New Taipei City 207, Taiwan (R.O.C.)

3 meter semi-anechoic chamber
No.35, Aly. 21, Ln. 228, Ankang Rd., Neihu Dist.,
Taipei City 114, Taiwan (R.O.C.)
Tel: 886-2-6613-0228

Worldwide Testing Services (Taiwan) Co., Ltd.
6F., No. 58, Ln. 188, Ruiguang Rd., Neihu Dist.,
Taipei City 114 , Taiwan (R.O.C.)
Tel: 886-2-6606-8877

1.2.2 Details of accreditation status

Accredited testing laboratory

FCC filed test laboratory Reg. No.: TW1477, TW1072

Industry Canada filed test laboratory Reg. No.: 20037, 5107A

Test location, where different from Worldwide Testing Services (Taiwan) Co., Ltd. :

Name:	./.
Accredited number:	./.
Street:	./.
Town:	./.
Country:	./.

1.3 Details of approval holder

Name:	MilDef Crete Inc.
Street:	7F, No. 250, Sec.3, Pei Shen Rd., Shen Keng District,
Town:	New Taipei City
Country:	Taiwan R.O.C.

1.4 Application details

Date of receipt of test item: July 11, 2023
Date of test: from July 12, 2023 to September 13, 2023

1.5 General information of Test item

Type of test item: Notebook Computer
Model number: RK15
Brand name: MilDef Crete
Multi-listing model number: ./.
Sample no.: #01

Technical data

WLAN

Band	Mode	Channel	Conducted Power (dBm)
2.4GHz	802.11b	Ch 1 : 2412 MHz	13.09
		Ch 6 : 2437 MHz	13.33
		Ch 11 : 2462 MHz	13.02
	802.11g	Ch 1 : 2412 MHz	12.54
		Ch 6 : 2437 MHz	12.83
		Ch 11 : 2462 MHz	12.52
	802.11ax 20M	Ch 1 : 2412 MHz	15.74
		Ch 6 : 2437 MHz	15.17
		Ch 11 : 2462 MHz	15.18
	802.11ax 40M	Ch 1 : 2422 MHz	15.29
		Ch 4 : 2437 MHz	15.33
		Ch 7 : 2452 MHz	15.45

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

Bluetooth
Normal & EDR

Band	Mode	Channel	Conducted Power (dBm)
2.4GHz	BR	Ch 0 : 2402 MHz	7.90
		Ch 39 : 2441 MHz	8.23
		Ch 78 : 2480 MHz	7.73
	EDR	Ch 0 : 2402 MHz	5.95
		Ch 39 : 2441 MHz	6.29
		Ch 78 : 2480 MHz	5.82

Low Energy

Band	Mode	Channel	Power (dBm)
2.4GHz	BLE 1M	Ch 0 : 2402 MHz	4.29
		Ch 19 : 2440 MHz	3.83
		Ch 39 : 2480 MHz	3.24
	BLE 2M	Ch 0 : 2402 MHz	4.36
		Ch 19 : 2440 MHz	3.91
		Ch 39 : 2480 MHz	3.29

Frequency band:	2.4 GHz – 2.4835 GHz
Number of channels:	802.11b, g, ax 20MHz: 11 channels, 11ax 40MHz: 7 channels Bluetooth: 79 channels(Normal & EDR), 40 channels(LE)
Operation modes:	Duplex
Modulation type:	DSSS/OFDM、GFSK、π/4DQPSK、8DPSK
Fixed point-to-point operation:	☐ Yes / ☒ No
Type of antenna:	PIFA antenna
Antenna gain:	Main antenna: -1.97 dBi AUX antenna: -0.72 dBi
Directional gain:	1.69 dBi

According to KDB 662911, Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dBi. If transmit signals are correlated, then Directional gain $=10\log[(10^{G1/20}+10^{G2/20}+\ldots+10^{GN/20})^2/N]$ dBi [Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]
Each with the same directional gain G_{ANT} dBi, being driven by N_{ANT} transmitter outputs of equal power. Directional gain is to be computed as follows:

If any transmit signals are correlated with each other, Direction gain= G_{ANT} + 10 log(N_{ANT}) dBi

Power supply:	Adapter (I/P: 100-240V~50-60Hz, 1.2A MAX. O/P: 19.0V⎓4.74A, 90.06W) Battery 10.8Vd.c.⎓7500mAh/81Wh
Emission designator:	MAIN antenna 802.11b: DSSS: 13M5G1D 802.11g: OFDM: 16M6D1D 802.11ax 20MHz: OFDM: 19M0D1D 802.11ax 40MHz: OFDM: 38M0D1D AUX antenna 802.11b: DSSS: 13M5G1D 802.11g: OFDM: 16M6D1D 802.11ax 20MHz: OFDM: 18M9D1D 802.11ax 40MHz: OFDM: 37M8D1D
Host device:	none

Manufacturer: (if applicable)

Name:	./.
Street:	./.
Town:	./.
Country:	./.

1.5 Duty cycle and factor

WLAN 2.4G

Mode	T_{on} (ms)	$T_{on}+T_{off}$ (ms)	Duty cycle (%)	Duty Factor (dB)	1/T - VBW (kHz)
802.11b	8.397	8.413	99.81%	0.01	0.12
802.11g	0.204	0.244	83.61%	0.78	4.90
802.11ax 20MHz	0.296	0.352	84.09%	0.75	3.38
802.11ax 40MHz	0.532	0.588	90.48%	0.43	1.88

BLE

Mode	T_{on} (ms)	$T_{on}+T_{off}$ (ms)	Duty cycle (%)	1/T - VBW (kHz)
BLE 1M	0.404	0.629	64.23%	2.48
BLE 2M	0.216	0.625	34.56%	4.63

1.6 Test standards

47 CFR PART 15 SUBPART C § 15.247 (2021-10)

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed. ☒

or

The deviations were ascertained in the course of the tests performed. ☐

2.2 Test environment

Relative humidity content: 20 ... 75 %
Air pressure: 86 ... 103 kPa
Power supply: Adapter (I/P: 100-240V~50-60Hz, 1.2A MAX.
O/P: 19.0V⎓4.74A, 90.06W)
Battery 10.8Vd.c.⎓7500mAh/81Wh

Extreme conditions parameters: ./.

Test item Name	Uncertainty
Estimation Result of Uncertainty of Conducted Emission (Power Line Conducted Emission)	Expanded Uncertainty： AMN：0.94 dB Voltage probe：0.96 dB Include Pulse Limiter：1.52 dB
Estimation Result of Uncertainty of Radiated Emission(3M) (Transmitter Radiated Emissions in Restricted Bands, Spurious Emissions (tx), Radiated Emission from Digital Part)	Expanded Uncertainty： 0.009-30 MHz：1.92 dB 30-1000 MHz：3.96 dB 1-18 GHz：2.46 dB 18-40 GHz：2.44 dB
Estimation Result of Uncertainty of Bandwidth Measurement (20 dB Bandwidth, Minimum 6 dB Bandwidth)	Expanded Uncertainty：0.45 kHz
Estimation Result of Uncertainty of Conducted Output Power Measurement (Peak Output Power (transmitter))	Expanded Uncertainty：1.48 dB
Estimation Result of Uncertainty of Power Density Measurement (Peak Power Spectral Density)	Expanded Uncertainty：1.48 dB
Estimation Result of Uncertainty of Band Edge Measurement (Radiated Emission on the band edge)	Expanded Uncertainty：0.67 dBc
Estimation Result of Uncertainty of Frequency Separation Measurement (Carrier Frequency Separation, Number of Hopping Frequencies)	Expanded Uncertainty：554.14 Hz
Estimation Result of Uncertainty of Duty Cycle Measurement (Time of Occupancy (Dwell Time))	Expanded Uncertainty：0.1 ms

The decision rule is: Measurement uncertainty is not included in the calculation of test results.

2.3 Test Equipment List

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2023/6/12	2024/6/11
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2022/10/24	2023/10/23
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2022/10/24	2023/10/23
ETSTW-CE 008	HF-EICHLEITUNG RF STEP ATTENUATOR 139dB DPSP	334.6010.02	844581/024	R&S	Function Test	
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2023/7/24	2024/7/23
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2022/11/9	2023/11/8
ETSTW-CE 028	MXE EMI Receiver	N9038A	MY53220110	Agilent	2023/7/17	2024/7/16
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2023/6/12	2024/6/11
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2022/10/17	2023/10/16
ETSTW-RE 012	TUNABLE BANDREJECT FILTER	D.C 0309	146	K&L	Function Test	
ETSTW-RE 013	TUNABLE BANDREJECT FILTER	D.C 0336	397	K&L	Function Test	
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2023/7/21	2024/7/20
ETSTW-RE 019	MICROWAVE HORN ANTENNA	22240-25	121074	FM	2023/6/9	2024/6/8
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	ETS-Lindgren	2023/6/28	2024/6/27
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	ETS-Lindgren	2023/5/5	2024/5/4
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2023/3/2	2024/3/1
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	2023/7/28	2024/7/27
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2023/7/31	2024/7/30
ETSTW-RE 045	ESA-E SERIES SPECTRUM ANALYZER	E4404B	MY45111242	Agilent	Pre-test Use	
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2023/2/17	2024/2/16
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2023/2/17	2024/2/16
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2023/2/17	2024/2/16
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2023/3/22	2024/3/21
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	2023/2/17	2024/2/16
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2023/2/20	2024/2/19
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 069	Double-Ridged Guide Horn Antenna	3117	00069377	ETS-Lindgren	Function Test	
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2022/11/5	2023/11/4
ETSTW-RE 088	SOLID STATE AMPLIFIER	KMA180265A01	99057	KMIC	2023/9/15	2024/9/14
ETSTW-RE 091	Match Pad	MDCS1500	None	WOKEN	2023/5/25	2024/5/24
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2023/2/17	2024/2/16
ETSTW-RE 112	AC POWER SOURCE	TFC-1005	T-0A023536	T-Power	Function test	

ETSTW-RE 115	2.4GHz Notch Filter	N0124411	473874	MICROWAVE CIRCUITS	2023/1/4	2024/1/3
ETSTW-RE 120	RF Player	MP9200	MP9210-111022	ADIVIC	2022/11/8	2023/11/7
ETSTW-RE 122	SIGNAL GENERATOR	SMF100A	102149	R&S	2023/6/7	2024/6/6
ETSTW-RE 125	5GHz Notch filter	5NSL11-5200/E221.3-O/O	1	K&L Microwave	2023/8/4	2024/8/3
ETSTW-RE 126	5GHz Notch filter	5NSL12-5800/E221.3-O/O	1	K&L Microwave	2023/8/4	2024/8/3
ETSTW-RE 127	RF Switch Box	RFS-01	None	WTS	2023/2/17	2024/2/16
ETSTW-RE 128	5.3GHz Notch filter	N0153001	SN487233	Microwave Circuits	2023/8/4	2024/8/3
ETSTW-RE 129	5.5GHz Notch filter	N0555984	SN487234	Microwave Circuits	2023/8/4	2024/8/3
ETSTW-RE 130	Handheld RF Spectrum Analyzer	N9340A	CN0147000204	Agilent	Pre-test Use	
ETSTW-RE 142	Amplifier	8447D	2805A03378	Agilent	2023/2/20	2024/2/19
ETSTW-RE 146	Preamplifier	JPA-10M1G	15090004	JPT	2023/5/26	2024/5/25
ETSTW-RE 152	Bi-log Hybrid Antenna	MCTD 2786B	BLB20J04029	ETC	2023/3/21	2024/3/20
ETSTW-RE 153	Signal Analyzer	FSV40	101929	R&S	2022/10/3	2023/10/2
ETSTW-RE 159	Bi-log Hybrid Antenna (30M~1000 MHz)	MCTD 2786B	BLB21N04035	ETC	2022/12/22	2023/12/21
ETSTW-RE 177	TRILOG Broadband Antenna	VULB 9168& EMCI-N-6-06	01380& AT-06007	SCHWARZBECK& EMC	2023/8/24	2024/8/23
ETSTW-RF 002	Electromagnetic field probe	LF-30	K-0007	STT	2023/6/13	2024/6/12
ETSTW-EMI 011	USB Compact Modulator	SFC-U	101689	R&S	2023/5/28	2024/5/27
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2023/3/22	2024/3/21
ETSTW-GSM 003	Radio Communication Analyzer	MT8820C	6201342073	Anritsu	2023/5/10	2024/5/9
ETSTW-GSM 004	Wideband Radio Communication Tester	CMW500	128092	R&S	2022/10/24	2023/10/23
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40 /12+9SS	3	WI	2023/1/4	2024/1/3
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	2023/1/4	2024/1/3
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	2023/1/4	2024/1/3
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	2023/1/4	2024/1/3
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2023/8/28	2024/8/27
ETSTW-GSM 024	Radio Communication Analyzer	MT8821C	None	Anritsu	2023/4/24	2024/4/23
ETSTW-GSM 025	Band Reject Filter	BRM19835	001	Micro-Tronics	2023/8/4	2024/8/3
ETSTW-Cable 016	BNC Cable	Switch Box	B Cable 1	Schwarz beck	2023/2/4	2024/2/3
ETSTW-Cable 017	BNC Cable	X Cable	B Cable 2	Schwarz beck	2023/2/4	2024/2/3
ETSTW-Cable 018	BNC Cable	Y Cable	B Cable 3	Schwarz beck	2023/2/4	2024/2/3
ETSTW-Cable 019	BNC Cable	Z Cable	B Cable 4	Schwarz beck	2023/2/4	2024/2/3
ETSTW-Cable 020	N TYPE Cable	OATS Cable 1	N30N30-L335-15M	JYE BAO CO.,LTD.	2023/6/26	2024/6/25
ETSTW-Cable 027	Microwave Cable	SUCOFLEX 104	279083	HUBER+SUHNER	2023/4/27	2024/4/26
ETSTW-Cable 028	Microwave Cable	FA147A0015M2020	30064-2	UTIFLEX	2023/9/15	2024/9/14
ETSTW-Cable 029	Microwave Cable	FA147A0015M2020	30064-3	UTIFLEX	2023/9/15	2024/9/14
ETSTW-Cable 030	Microwave Cable	SUCOFLEX 104 （S_Cable 9）	279067	HUBER+SUHNER	2023/02/17	2024/2/16

ETSTW-Cable 045	Microwave Cable	SUCOFLEX 104	325536	HUBER+SUHNER	2022/10/21	2023/10/20
ETSTW-Cable 058	Microwave Cable	SUCOFLEX 104	none	HUBER+SUHNER	2023/5/26	2024/5/25
ETSTW-Cable 064	Microwave Cable	SUCOFLEX 104	MY28891	HUBER+SUHNER	2023/2/20	2024/2/19
ETSTW-Cable 071	N TYPE CABLE	EMCCFD400-NM-NM-25000	170239	EMCI	2022/10/21	2023/10/20
ETSTW-Cable 072	SMA type cable (8m)	SUCOFLEX 104	805800/4	HUBER+SUHNER	2023/2/20	2024/2/19
ETSTW-Cable 074	SMA type cable (2m)	SUCOFLEX 104	802563/4	HUBER+SUHNER	2023/2/20	2024/2/19
ETSTW-Cable 076	SMA type cable (1m)	N/A	812652/4	HUBER+SUHNER	2023/2/20	2024/2/19
WTSTW-SW 002	EMI TEST SOFTWARE	EZ_EMC	None	Farad	Version ETS-03A1 Version EMEC-3A1+	
WTSTW-SW 006	EMI TEST SOFTWARE	e3	None	AUDIX	Version 9.161014	
WTSTW-SW 008	Signal studio	Agilent	None	AUDIX	Version 2.0.0.1	
ETSTW-TH 002	Thermohygrometer	608-H1	45204317	Testo	2023/7/21	2024/7/20
ETSTW-TH 003	Wireless weather station	GAIA	N/A	TFA	2022/10/28	2023/10/27

2.4 General Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.10-2013 6.2 using a 50µH LISN (if necessary). Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

RADIATION INTERFERENCE: The test procedure used was according to ANSI STANDARD C63.10-2013 6.3 employing a spectrum analyzer. For investigated frequency is equal to or below 1GHz, the RBW and VBW of the spectrum analyzer was 100 kHz and 100kHz respectively with an appropriate sweep speed. For investigated frequency is above 1GHz, both of RBW and VBW of the spectrum analyzer were 1 MHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBµV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

Freq (MHz)	METER READING + ACF + CABLE LOSS (to the receiver) = FS
33	20 dBµV + 10.36 dB + 6 dB = 36.36 dBµV/m @3m

The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table) and arranged according to ANSI C63.10-2013 6.2.2. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to the frequency specified as follows:

(1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
(2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
(3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.
(4) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a)(1)-(a)(3) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this Section, whichever is the higher frequency range of investigation.

For hand-held devices, a exploratory test was performed with three (3) orthogonal planes to determine the highest emissions.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

The formula is as follows:
Average = Peak + Duty Factor
Duty Factor = 20 log (dwell time/T)
T = 100ms when the pulse train period is over 100 ms or the period of the pulse train.

Modified Limits for peak according to 15.35 (b) = Max Permitted average Limits + 20dB

ANSI STANDARD C63.10-2013 B.2.7: Any measurements that utilize special test software shall be indicated and referenced in the test report. During testing, test software ’EZ EMC’ was used for setting up different operation modes.

3 Test results (enclosure)

TEST CASE	Para. Number	Required	Test passed	Test failed
Peak Output Power	15.247(b)	☒	☒	☐
Equivalent isotropically radiated Power	15.247(b)	☒	☒	☐
Spurious Emissions radiated – Transmitter operating	15.247(d):15.209	☒	☒	☐
Spurious Emissions conducted – Transmitter operating	15.247	☐	☐	☐
Carrier Frequency Separation	15.247(a) (1)	☒	☒	☐
Number of Hopping Frequencies	15.247(a) (1)(i)	☒	☒	☐
Time of Occupancy (Dwell Time)	15.247(a) (1)(i)	☒	☒	☐
20 dB Bandwidth	15.247(a) (1)(i)	☒	☒	☐
Minimum 6 dB Bandwidth	15.247(a)(2)	☒	☒	☐
Band-edge Compliance of RF Emission	15.247(d)	☒	☒	☐
Peak Power Spectral Density	15.247(e)	☒	☒	☐
Radiated Emission from Digital Part	15.109	☐	☐	☐
Power Line Conducted Emission	15.207(a)	☒	☒	☐

Note:

1. This EUT incorporates a MIMO function with IEEE 802.11b, 802.11g, and 802.11n. Physically, this EUT includes two transmitters and two receivers with two incoherent streams. This device uses multiplexing and also employ cyclic delay diversity to improve range and throughput, and this device simultaneously operates on two adjacent channels.
2. This EUT is 2*2 spatial MIMO (2Tx&2Rx) without beam forming function. That operates dual chain configuration. The Pre-test was performed to determine the worst case mode from all possible combinations between all available modulations, data rates, bandwidths, and spatial stream modes.
3. The detail of chosen mode for full testing are as below:

Mode	Available channel	Chosen Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1,6,11	DSSS	DBPSK, DQPSK, CCK	1
802.11g	1 to 11	1,6,11	OFDM	BPSK, QPSK, 16QAM, 64QAM	6
802.11n (20MHz)	1 to 11	1,6,11	OFDM	BPSK, QPSK, 16QAM, 64QAM	6.5
802.11n (40MHz)	1 to 7	1,4,7	OFDM	BPSK, QPSK, 16QAM, 64QAM	13.5

3.1 Peak Output Power (transmitter)

FCC Rule: 15.247(b)(3)

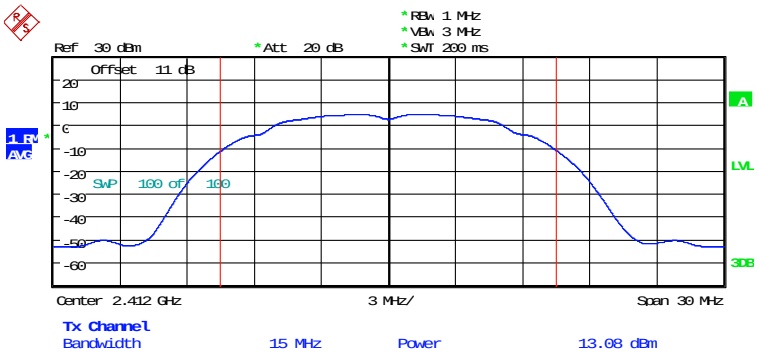
This measurement applies to equipment with an integral antenna and to equipment with an antenna connector and equipped with an antenna as declared by the applicant.
The power was measured with modulation (declared by the applicant).

Test date: August 01, 2023-August 05, 2023
Temperature: 26.7 ˚C
Humidity: 57.0%
Tester: Brian

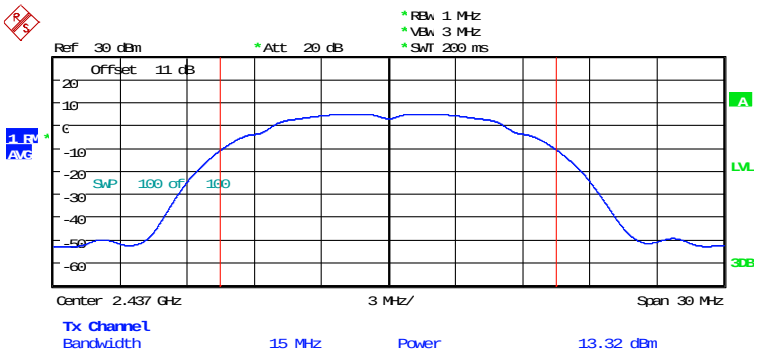
Band	Mode	Channel	RU(AX)	Conducted power with DF		Combine (dBm)	DF (dB)	Limit (dBm)
				Antenna 1 (dBm)	Antenna 2 (dBm)			
2.4GHz	802.11b	Ch 1 : 2412 MHz	-	13.09	11.39	-	0.01	30.00
		Ch 6 : 2437 MHz	-	13.33	11.31	-	0.01	30.00
		Ch 11 : 2462 MHz	-	13.02	11.73	-	0.01	30.00
	802.11g	Ch 1 : 2412 MHz	-	12.54	10.54	-	0.78	30.00
		Ch 6 : 2437 MHz	-	12.83	10.31	-	0.78	30.00
		Ch 11 : 2462 MHz	-	12.52	10.81	-	0.78	30.00
	802.11ax 20M	Ch 1 : 2412 MHz	26RU1	7.60	6.19	9.96	0.75	30.00
			26RU9	7.96	5.52	9.92	0.75	30.00
			52RU1	11.03	9.32	13.27	0.75	30.00
			52RU4	11.24	8.77	13.19	0.75	30.00
			106RU1	12.69	12.77	15.74	0.75	30.00
			106RU2	12.88	10.71	14.94	0.75	30.00
			242RU1	12.75	11.28	15.09	0.75	30.00
		Ch 6 : 2437 MHz	26RU1	7.94	5.01	9.73	0.75	30.00
			26RU9	8.01	6.05	10.15	0.75	30.00
			52RU1	11.33	8.42	13.13	0.75	30.00
			52RU4	11.32	9.32	13.45	0.75	30.00
			106RU1	13.00	10.45	14.92	0.75	30.00
			106RU2	13.04	11.06	15.17	0.75	30.00
			242RU1	12.97	11.15	15.17	0.75	30.00
		Ch 11 : 2462 MHz	26RU1	7.98	5.36	9.88	0.75	30.00
			26RU9	7.46	6.50	10.02	0.75	30.00
			52RU1	11.26	8.68	13.17	0.75	30.00
			52RU4	10.83	9.76	13.34	0.75	30.00
			106RU1	12.88	10.77	14.96	0.75	30.00
			106RU2	12.58	11.50	15.09	0.75	30.00
			242RU1	12.69	11.58	15.18	0.75	30.00
	802.11ax 40M	Ch 1 : 2422 MHz	26RU1	7.73	5.20	9.66	0.75	30.00
			26RU18	7.82	6.55	10.24	0.75	30.00
			52RU1	11.10	8.65	13.06	0.75	30.00
			52RU8	11.29	9.69	13.58	0.75	30.00
			106RU1	12.78	10.52	14.81	0.75	30.00
			106RU4	12.99	11.26	15.22	0.75	30.00
			242RU1	12.73	11.26	15.07	0.75	30.00
			242RU2	13.00	11.14	15.18	0.75	30.00
			484RU1	13.16	11.16	15.29	0.75	30.00
		Ch 4 : 2437 MHz	26RU1	7.75	5.58	9.81	0.75	30.00
			26RU18	7.79	6.04	10.02	0.75	30.00
			52RU1	11.19	9.00	13.24	0.75	30.00
			52RU8	11.23	9.50	13.46	0.75	30.00
			106RU1	12.87	10.73	14.94	0.75	30.00
			106RU4	12.97	11.18	15.18	0.75	30.00
			242RU1	12.93	11.15	15.14	0.75	30.00
			242RU2	13.01	11.42	15.30	0.75	30.00
			484RU1	13.17	11.26	15.33	0.75	30.00
		Ch 7 : 2452 MHz	26RU1	7.76	6.05	10.00	0.75	30.00
			26RU18	7.52	5.49	9.64	0.75	30.00
			52RU1	11.22	9.38	13.41	0.75	30.00
			52RU8	10.94	9.08	13.12	0.75	30.00
			106RU1	13.01	11.06	15.16	0.75	30.00
			106RU4	12.66	11.03	14.93	0.75	30.00
			242RU1	13.04	11.31	15.27	0.75	30.00
			242RU2	12.76	11.62	15.24	0.75	30.00
			484RU1	13.15	11.59	15.45	0.75	30.00

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

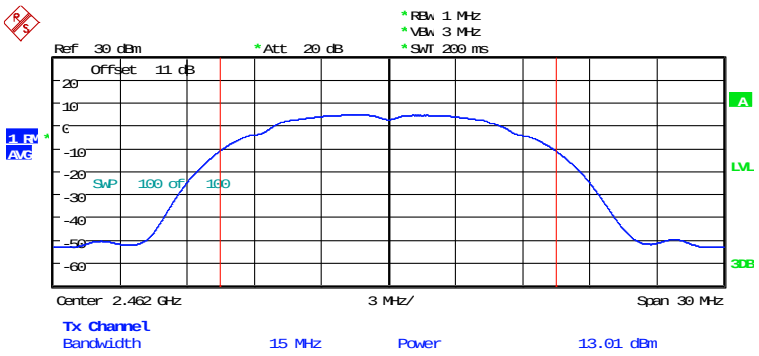
MAIN antenna
802.11b



MAX OUTPUT POWER 802.11B CH01
Date: 5.AUG.2023 15:39:33

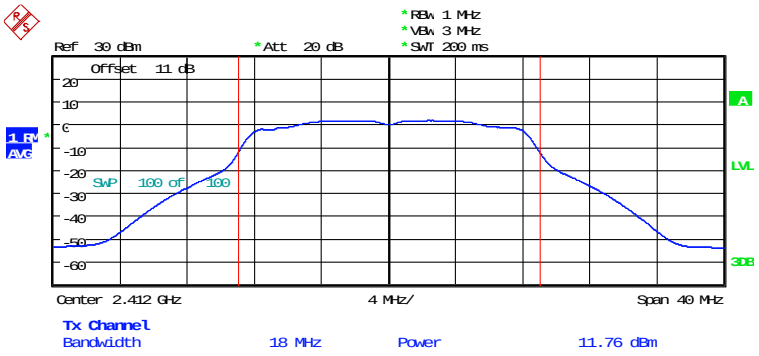


MAX OUTPUT POWER 802.11B CH06
Date: 5.AUG.2023 15:40:07



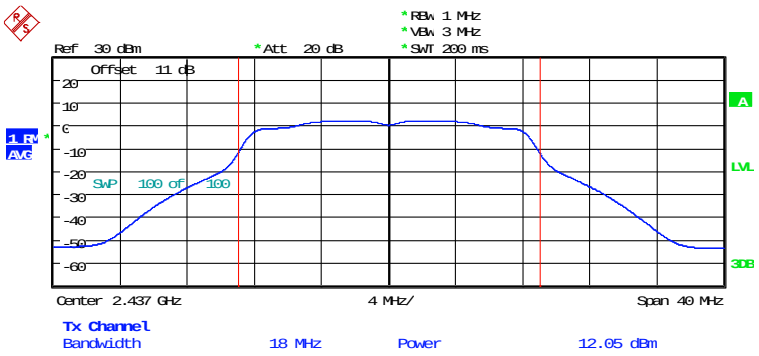
MAX OUTPUT POWER 802.11B CH11
Date: 5.AUG.2023 15:41:08

802.11g

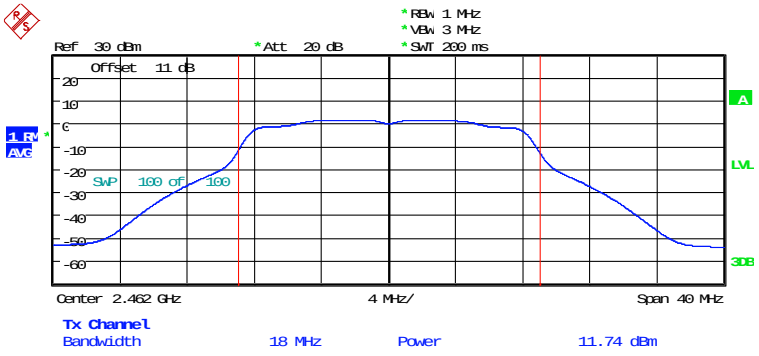


MAX OUTPUT POWER 802.11G CH01
Date: 5.AUG.2023 15:42:00

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



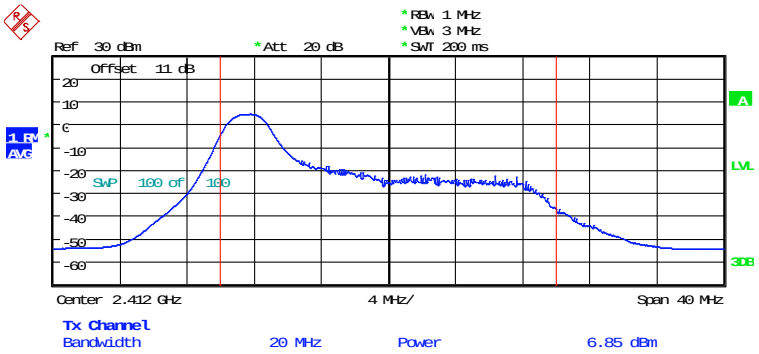
MAX OUTPUT POWER 802.11G CH06
Date: 5.AUG.2023 15:42:35



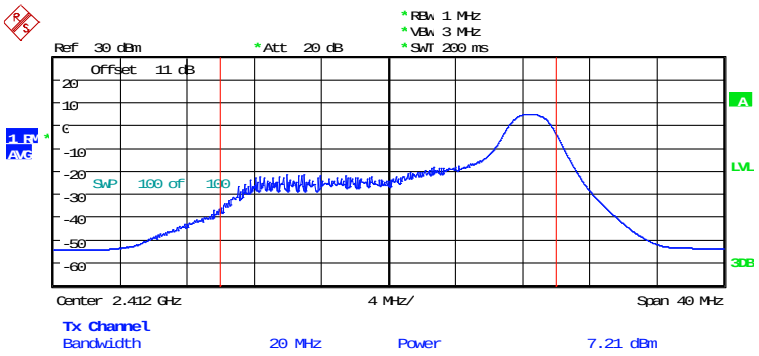
MAX OUTPUT POWER 802.11G CH11
Date: 5.AUG.2023 15:43:22

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

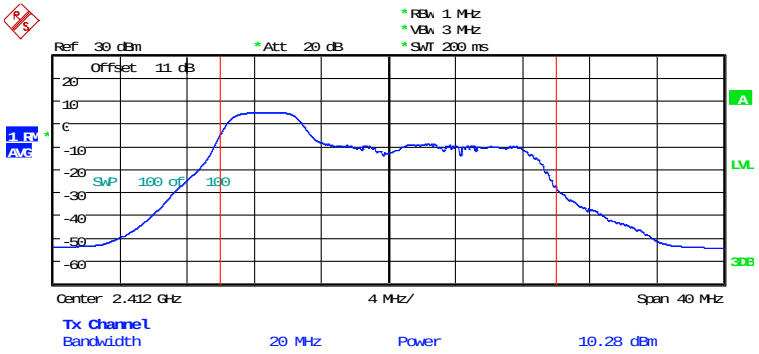
802.11ax 20MHz



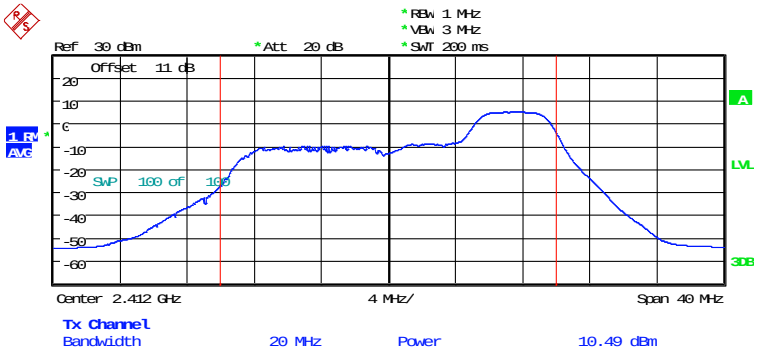
MAX OUTPUT POWER 802.11AX 20MHZ CH01 26RU1
Date: 5.AUG.2023 16:13:15



MAX OUTPUT POWER 802.11AX 20MHZ CH01 26RU9
Date: 5.AUG.2023 16:13:48

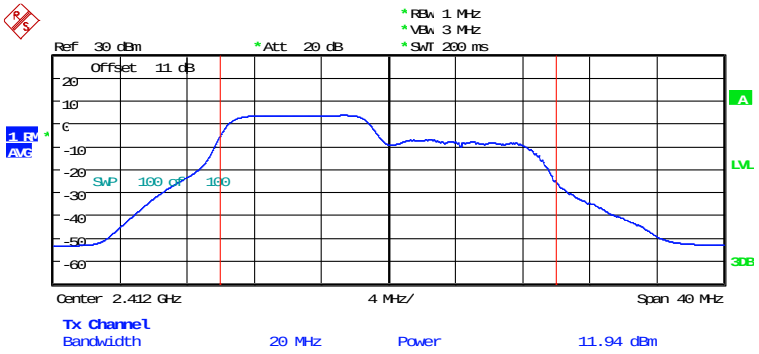


MAX OUTPUT POWER 802.11AX 20MHZ CH01 52RU1
Date: 5.AUG.2023 16:14:20

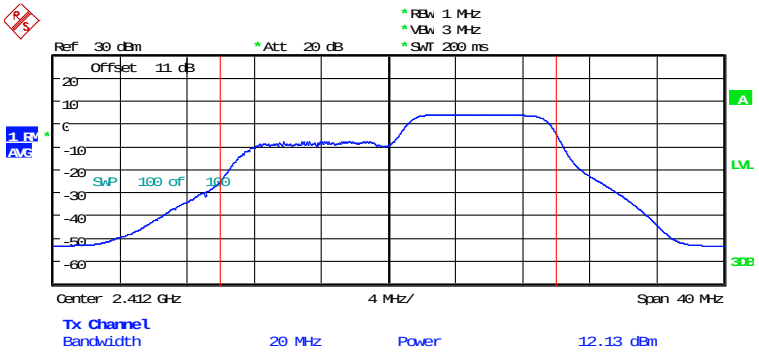


MAX OUTPUT POWER 802.11AX 20MHZ CH01 52RU4
Date: 5.AUG.2023 16:14:53

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

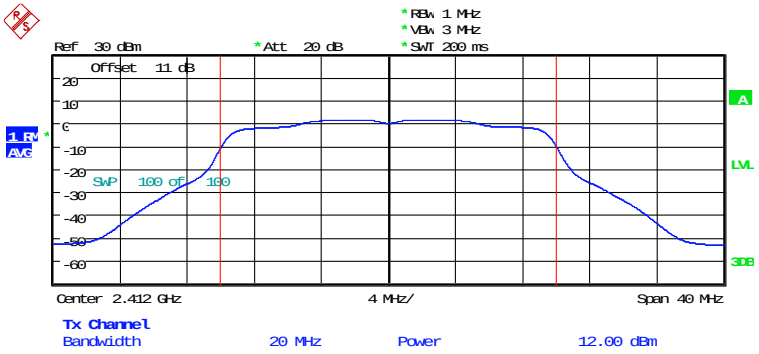


MAX OUTPUT POWER 802.11AX 20MHZ CH01 106RU1
Date: 5.AUG.2023 16:15:27

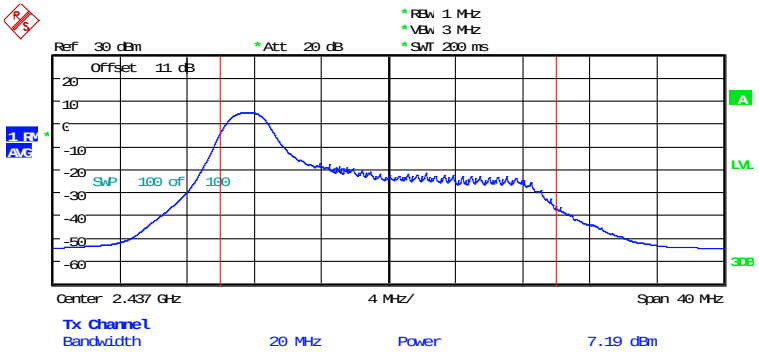


MAX OUTPUT POWER 802.11AX 20MHZ CH01 106RU2
Date: 5.AUG.2023 16:15:58

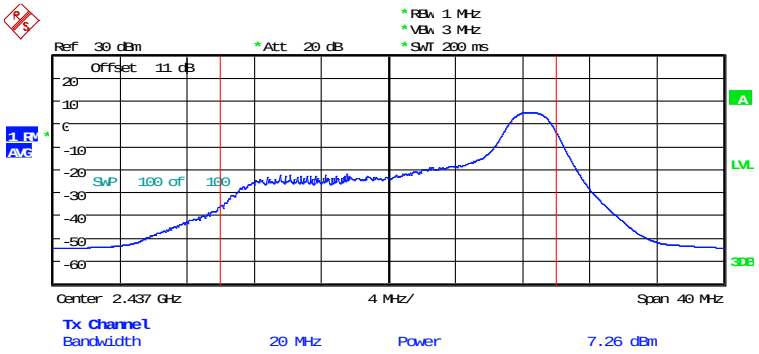
Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



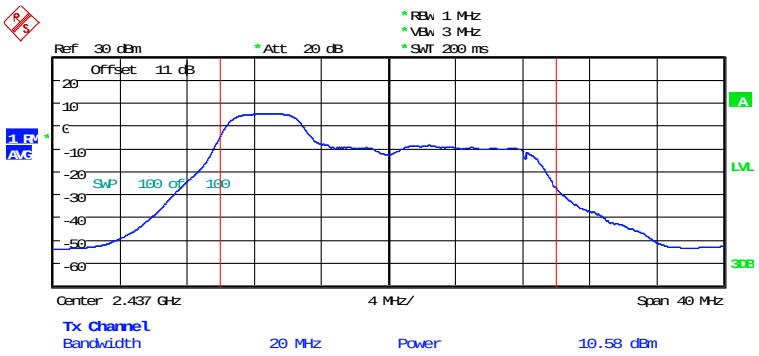
MAX OUTPUT POWER 802.11AX 20MHZ CH01 242RU1
Date: 5.AUG.2023 16:16:31



MAX OUTPUT POWER 802.11AX 20MHZ CH06 26RU1
Date: 5.AUG.2023 16:17:20

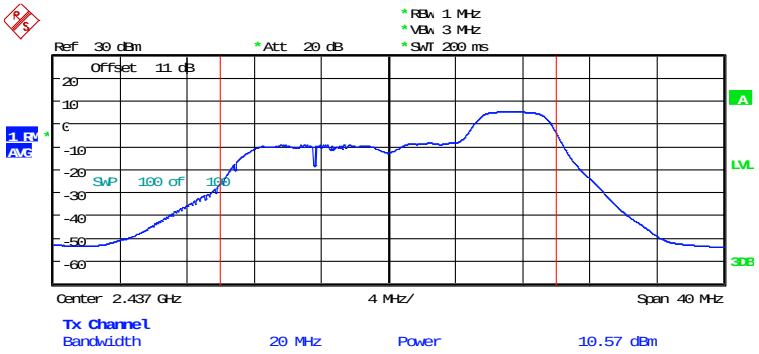


MAX OUTPUT POWER 802.11AX 20MHZ CH06 26RU9
Date: 5.AUG.2023 16:17:46

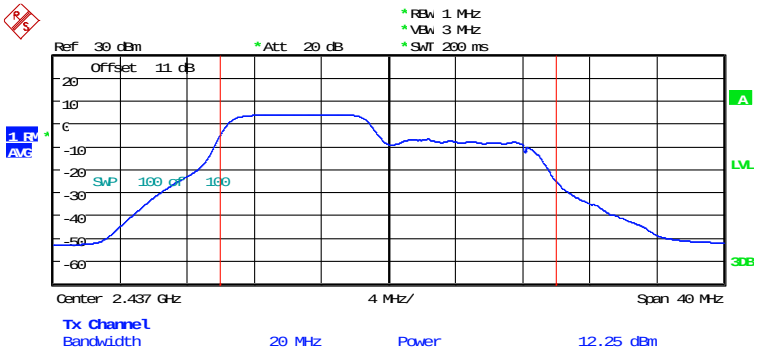


MAX OUTPUT POWER 802.11AX 20MHZ CH06 52RU1
Date: 5.AUG.2023 16:18:14

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

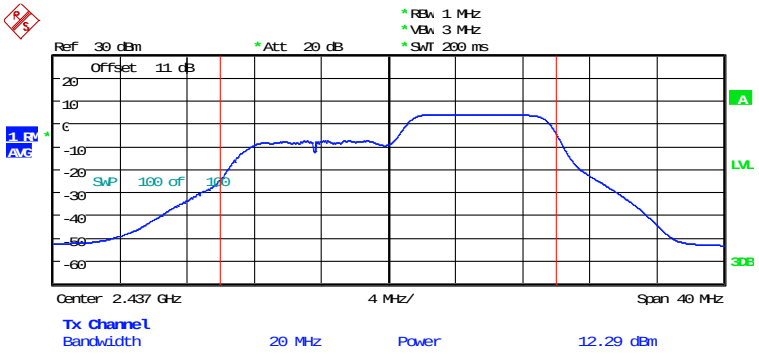


MAX OUTPUT POWER 802.11AX 20MHZ CH06 52RU4
Date: 5.AUG.2023 16:19:02

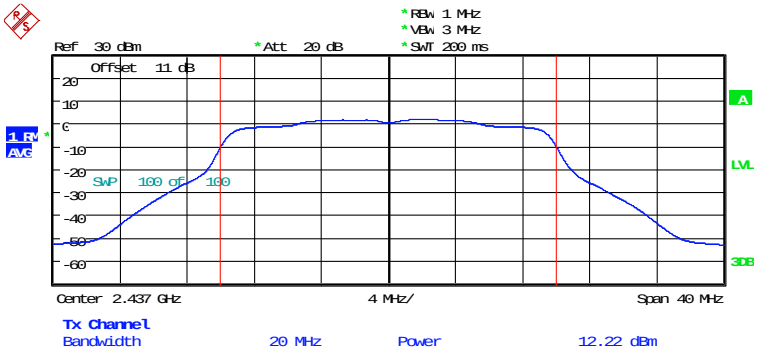


MAX OUTPUT POWER 802.11AX 20MHZ CH06 106RU1
Date: 5.AUG.2023 16:19:42

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

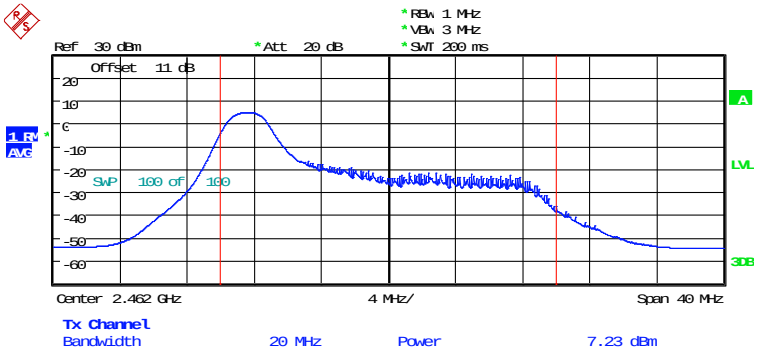


MAX OUTPUT POWER 802.11AX 20MHZ CH06 106RU2
Date: 5.AUG.2023 16:20:14

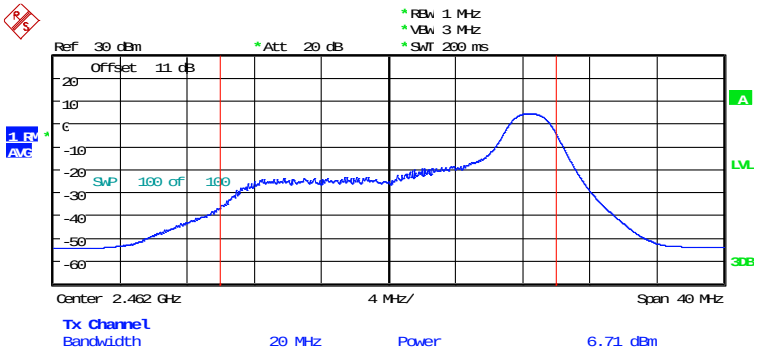


MAX OUTPUT POWER 802.11AX 20MHZ CH06 242RU1
Date: 5.AUG.2023 16:21:00

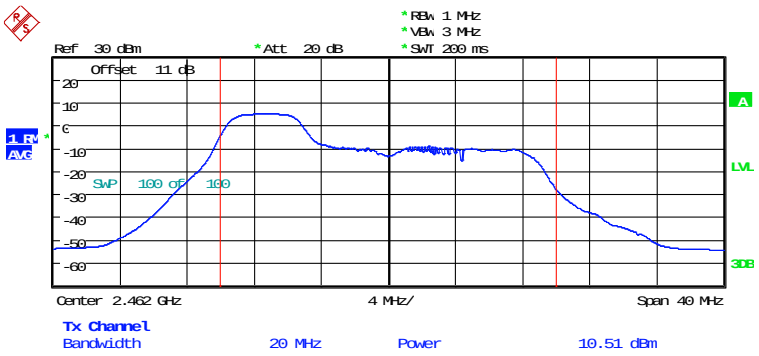
Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



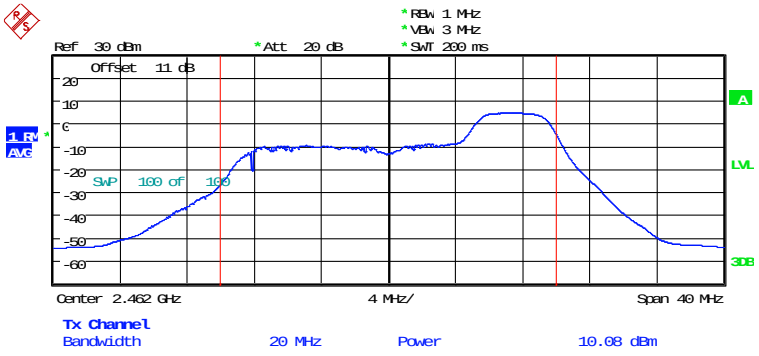
MAX OUTPUT POWER 802.11AX 20MHZ CH11 26RU1
Date: 5.AUG.2023 16:21:53



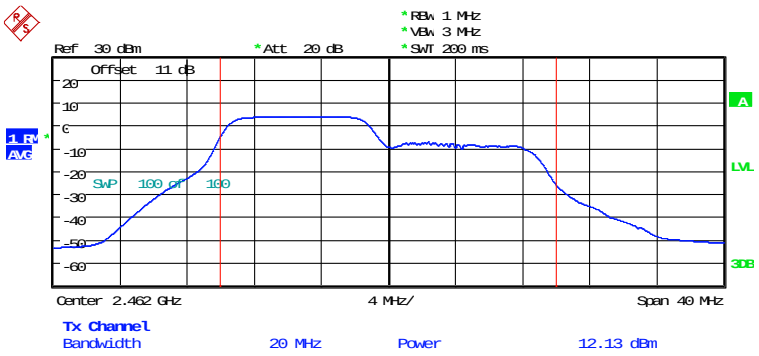
MAX OUTPUT POWER 802.11AX 20MHZ CH11 26RU9
Date: 5.AUG.2023 16:22:28



MAX OUTPUT POWER 802.11AX 20MHZ CH11 52RU1
Date: 5.AUG.2023 16:23:03

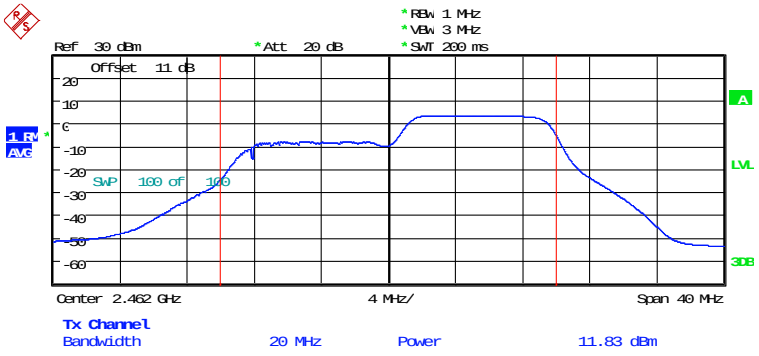


MAX OUTPUT POWER 802.11AX 20MHZ CH11 52RU4
Date: 5.AUG.2023 16:23:41



MAX OUTPUT POWER 802.11AX 20MHZ CH11 106RU1

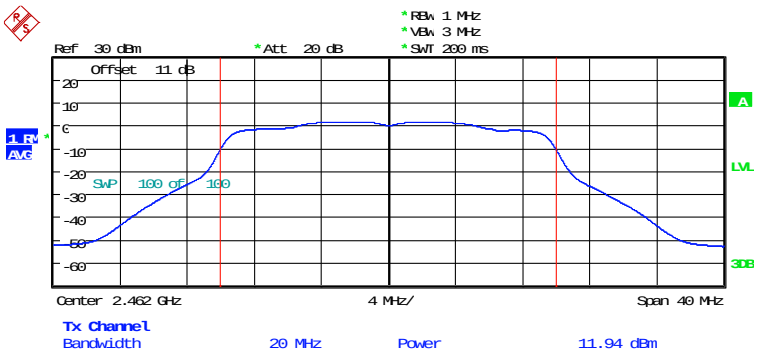
Date: 5.AUG.2023 16:24:15



MAX OUTPUT POWER 802.11AX 20MHZ CH11 106RU2

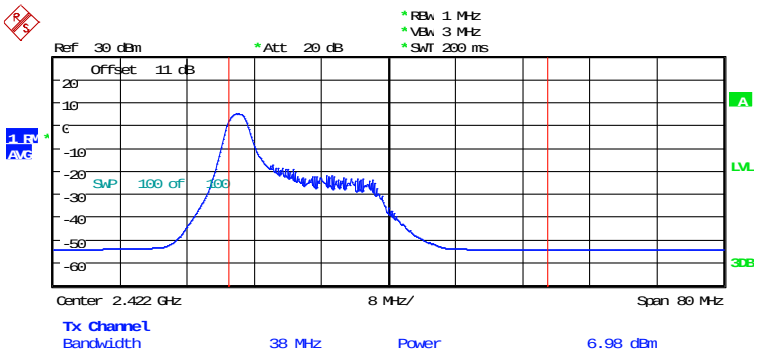
Date: 5.AUG.2023 16:24:54

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



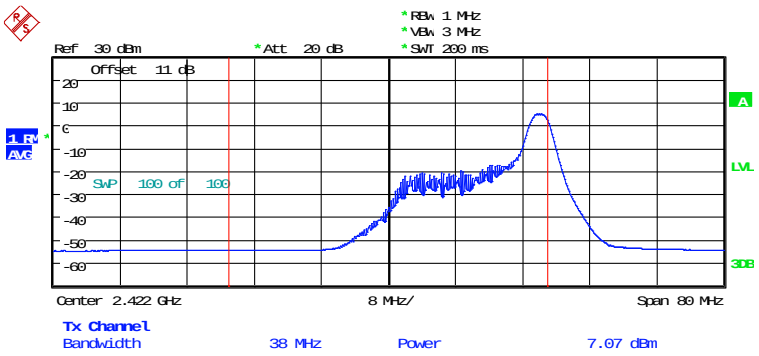
MAX OUTPUT POWER 802.11AX 20MHZ CH11 242RU1
Date: 5.AUG.2023 16:25:33

802.11ax 40MHz

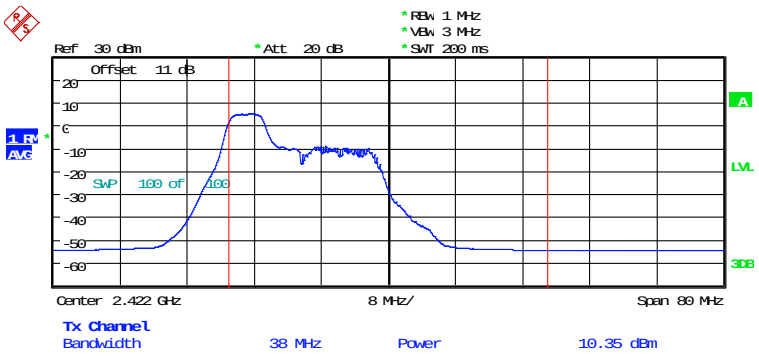


MAX OUTPUT POWER 802.11AX 40MHZ CH01 26RU1
Date: 5.AUG.2023 16:26:47

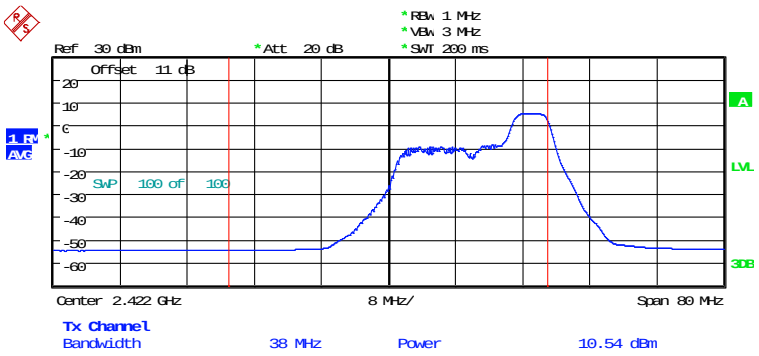
Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



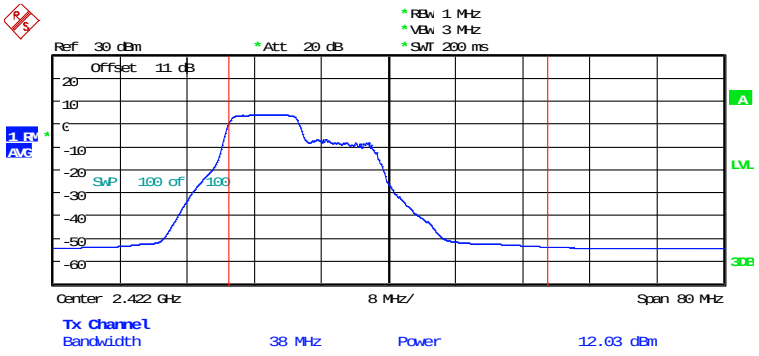
MAX OUTPUT POWER 802.11AX 40MHZ CH01 26RU18
Date: 5.AUG.2023 16:27:29



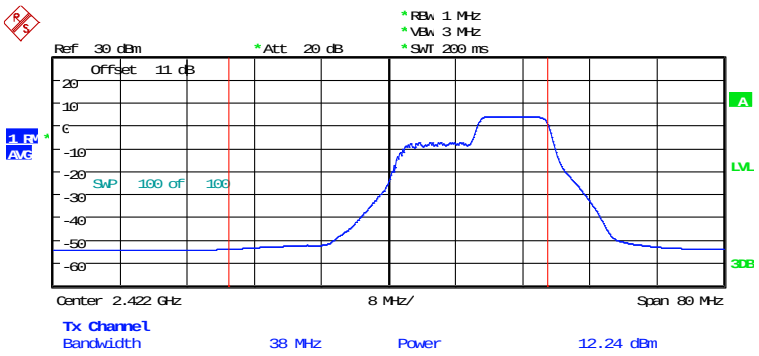
MAX OUTPUT POWER 802.11AX 40MHZ CH01 52RU1
Date: 5.AUG.2023 16:28:11



MAX OUTPUT POWER 802.11AX 40MHZ CH01 52RU8
Date: 5.AUG.2023 16:28:41

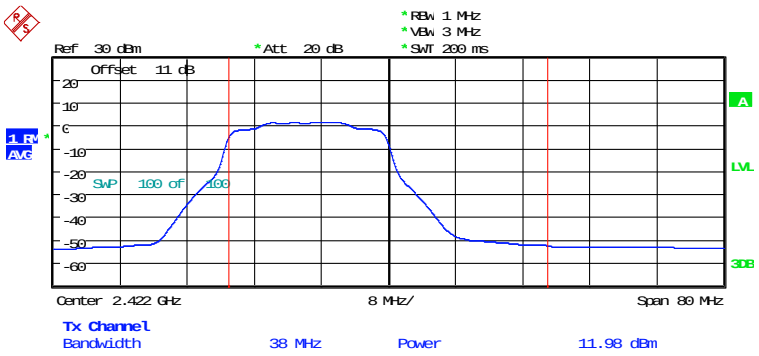


MAX OUTPUT POWER 802.11AX 40MHZ CH01 106RU1
Date: 5.AUG.2023 16:29:18



MAX OUTPUT POWER 802.11AX 40MHZ CH01 106RU4

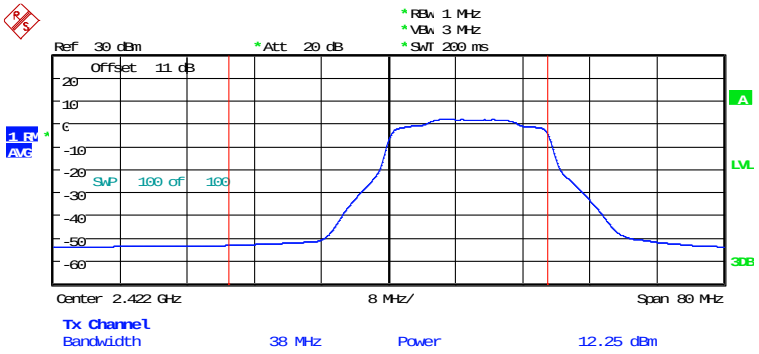
Date: 5.AUG.2023 16:30:59



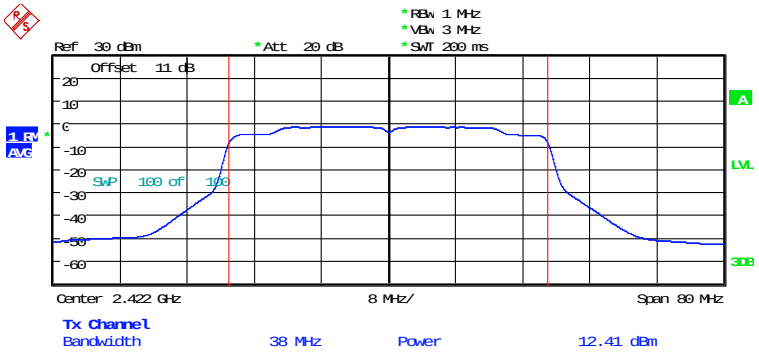
MAX OUTPUT POWER 802.11AX 40MHZ CH01 242RU1

Date: 5.AUG.2023 16:32:25

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

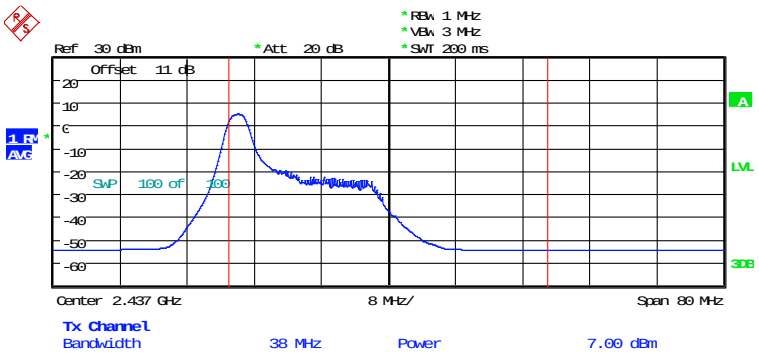


MAX OUTPUT POWER 802.11AX 40MHZ CH01 242RU2
Date: 5.AUG.2023 16:33:19

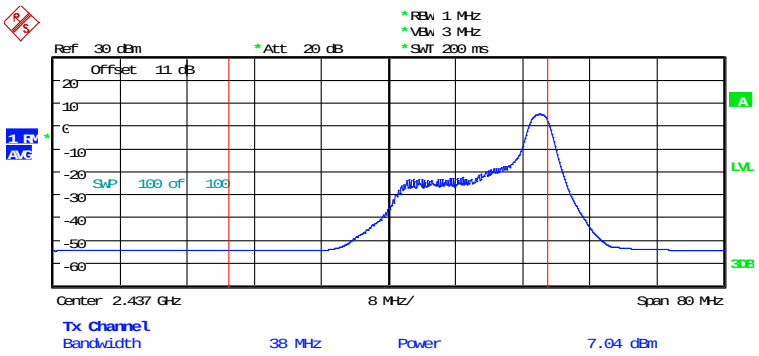


MAX OUTPUT POWER 802.11AX 40MHZ CH01 484RU1
Date: 5.AUG.2023 16:33:53

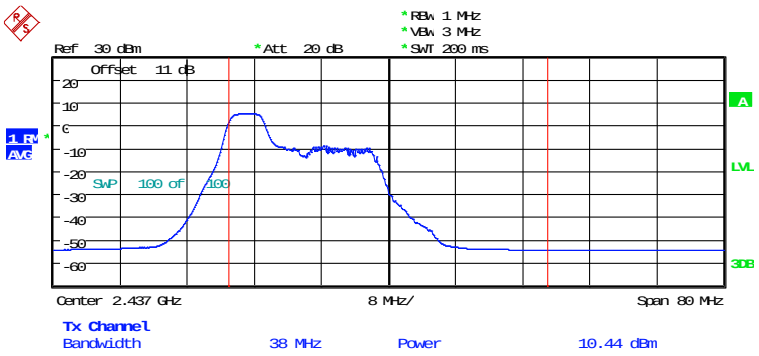
Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



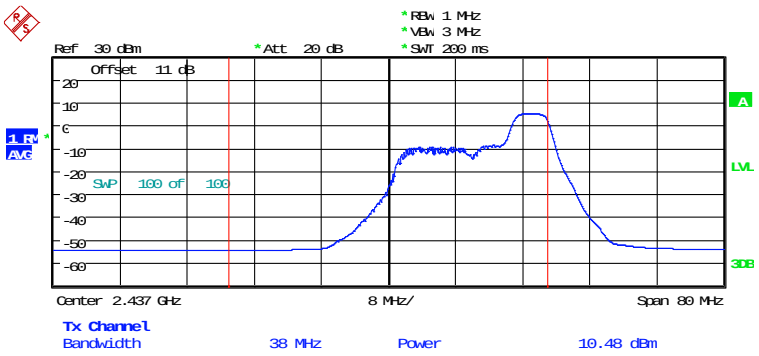
MAX OUTPUT POWER 802.11AX 40MHZ CH04 26RU1
Date: 5.AUG.2023 16:34:59



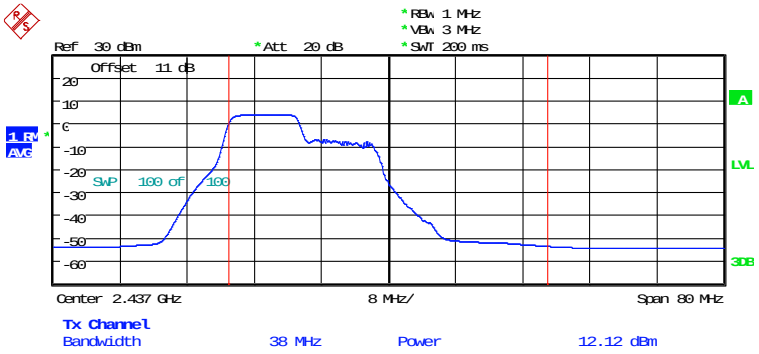
MAX OUTPUT POWER 802.11AX 40MHZ CH04 26RU18
Date: 5.AUG.2023 16:36:07



MAX OUTPUT POWER 802.11AX 40MHZ CH04 52RU1
Date: 5.AUG.2023 16:36:49

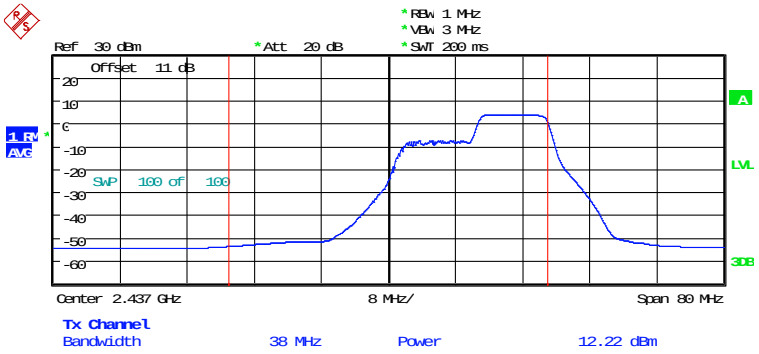


MAX OUTPUT POWER 802.11AX 40MHZ CH04 52RU8
Date: 5.AUG.2023 16:37:22



MAX OUTPUT POWER 802.11AX 40MHZ CH04 106RU1

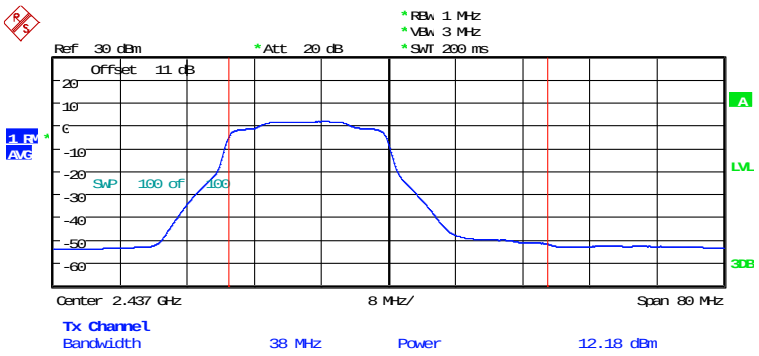
Date: 5.AUG.2023 16:38:00



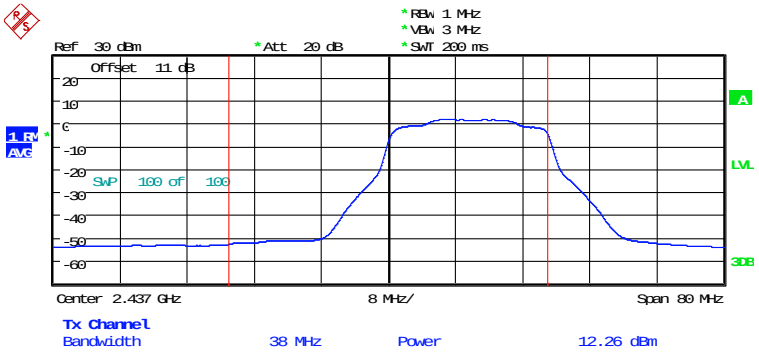
MAX OUTPUT POWER 802.11AX 40MHZ CH04 106RU4

Date: 5.AUG.2023 16:38:28

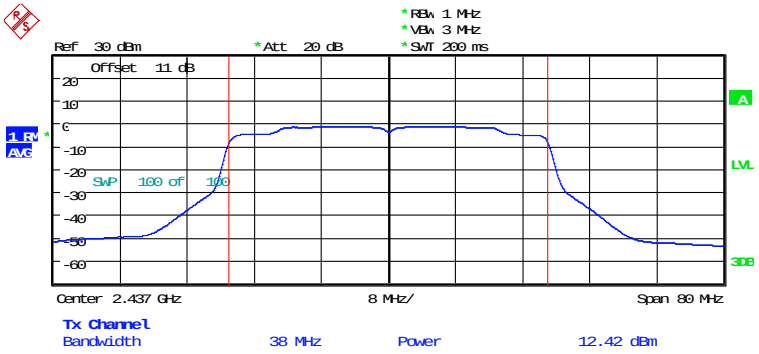
Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



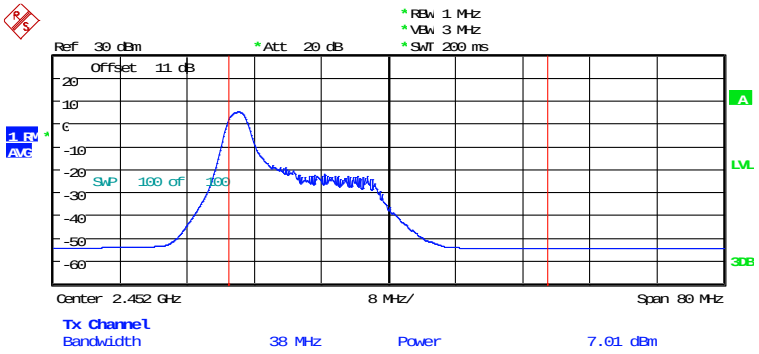
MAX OUTPUT POWER 802.11AX 40MHZ CH04 242RU1
Date: 5.AUG.2023 16:38:58



MAX OUTPUT POWER 802.11AX 40MHZ CH04 242RU2
Date: 5.AUG.2023 16:39:27

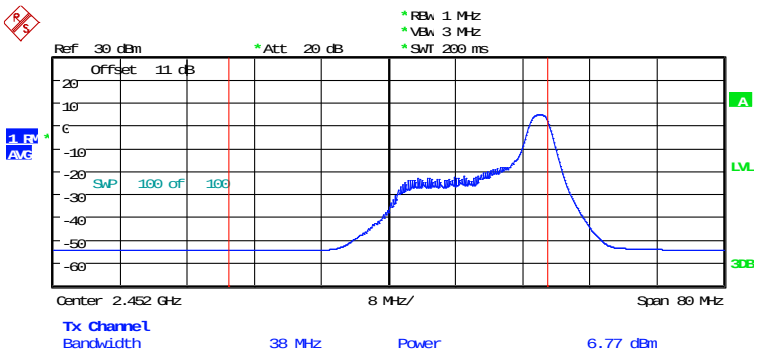


MAX OUTPUT POWER 802.11AX 40MHZ CH04 484RU1
Date: 5.AUG.2023 16:40:04

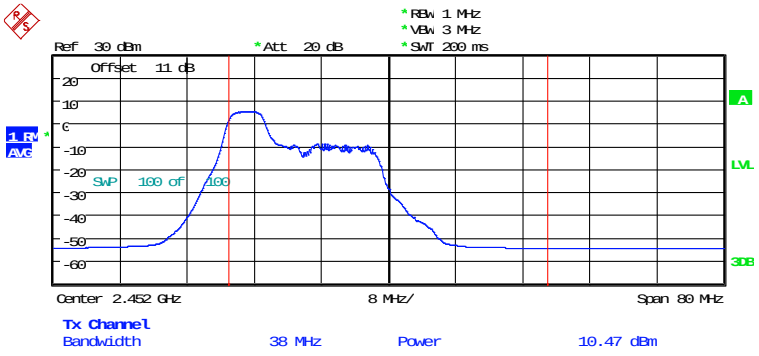


MAX OUTPUT POWER 802.11AX 40MHZ CH07 26RU1
Date: 5.AUG.2023 16:40:54

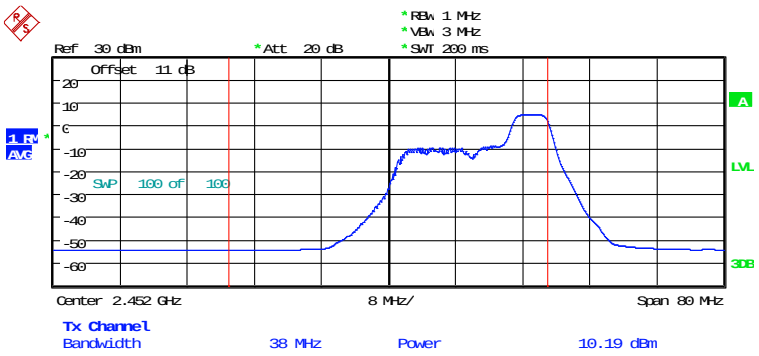
Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



MAX OUTPUT POWER 802.11AX 40MHZ CH07 26RU18
Date: 5.AUG.2023 16:41:28

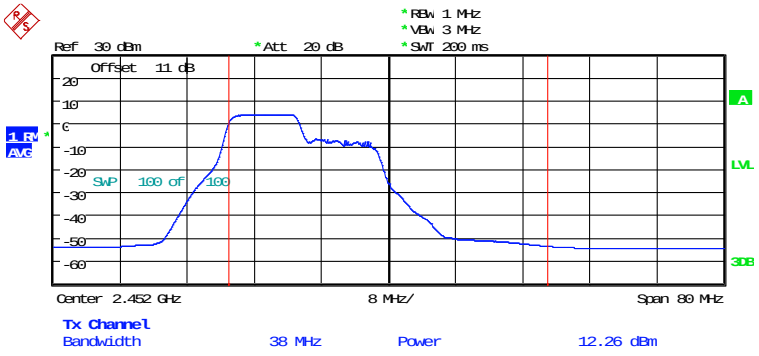


MAX OUTPUT POWER 802.11AX 40MHZ CH07 52RU1
Date: 5.AUG.2023 16:41:58



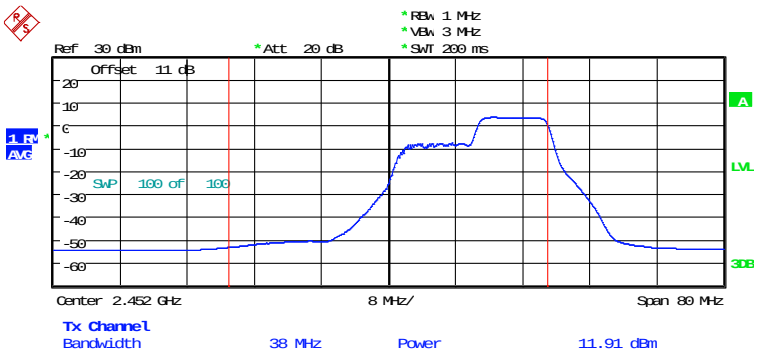
MAX OUTPUT POWER 802.11AX 40MHZ CH07 52RU8

Date: 5.AUG.2023 16:42:24



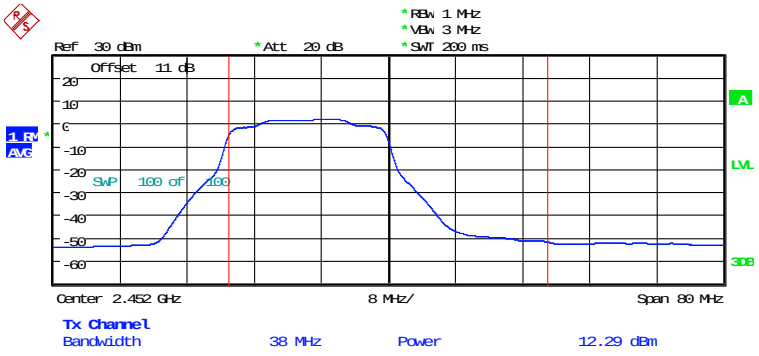
MAX OUTPUT POWER 802.11AX 40MHZ CH07 106RU1

Date: 5.AUG.2023 16:42:54



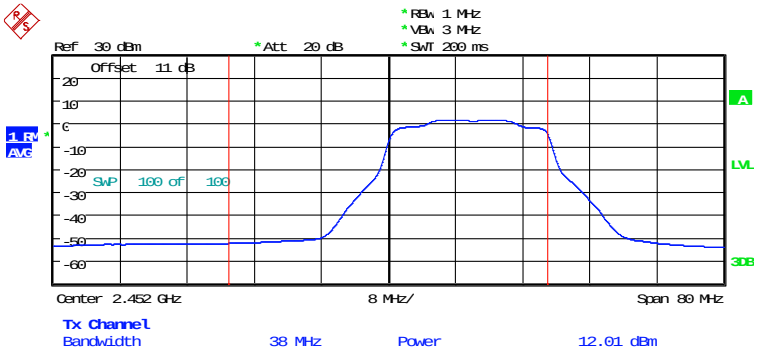
MAX OUTPUT POWER 802.11AX 40MHZ CH07 106RU4

Date: 5.AUG.2023 16:43:20



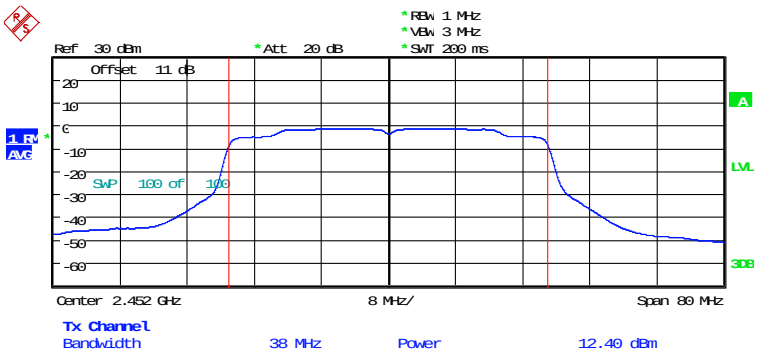
MAX OUTPUT POWER 802.11AX 40MHZ CH07 242RU1

Date: 5.AUG.2023 16:43:49



MAX OUTPUT POWER 802.11AX 40MHZ CH07 242RU2

Date: 5.AUG.2023 16:44:26

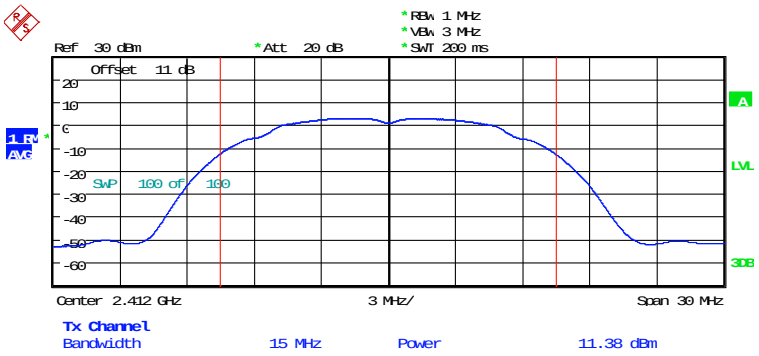


MAX OUTPUT POWER 802.11AX 40MHZ CH07 484RU1

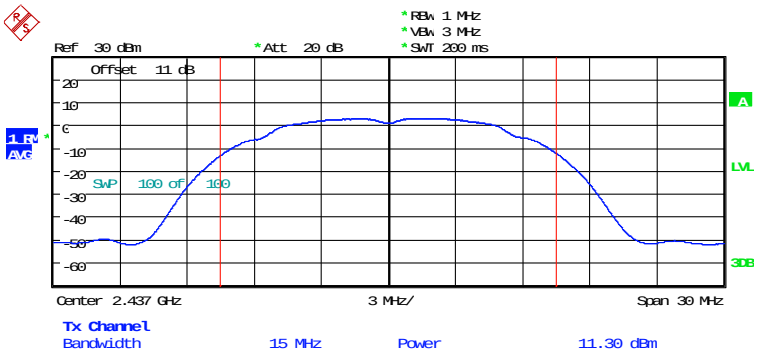
Date: 5.AUG.2023 16:45:15

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

AUX antenna
802.11b

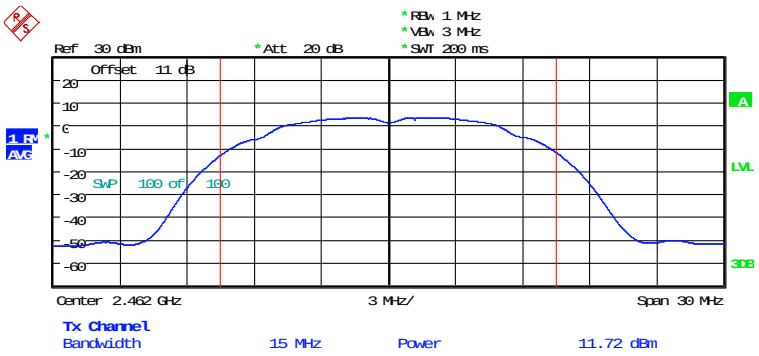


MAX OUTPUT POWER 802.11B CH01
Date: 1.AUG.2023 16:39:55



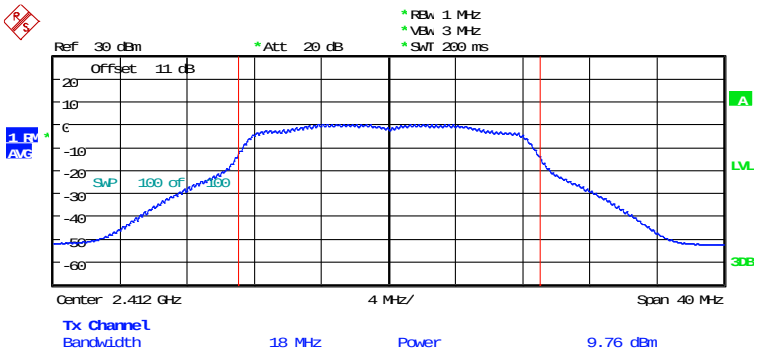
MAX OUTPUT POWER 802.11B CH06
Date: 1.AUG.2023 16:41:35

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

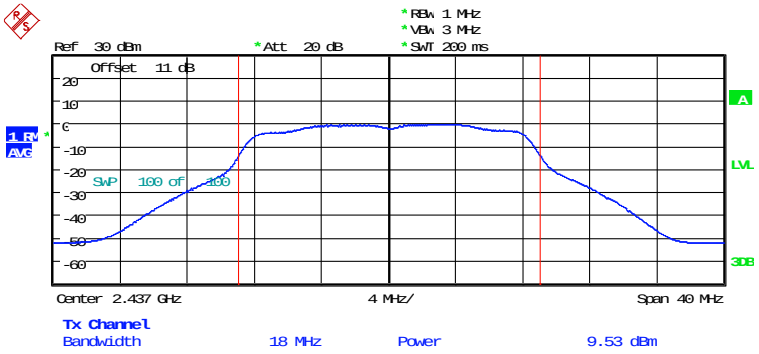


MAX OUTPUT POWER 802.11B CH11
Date: 1.AUG.2023 16:45:32

802.11g

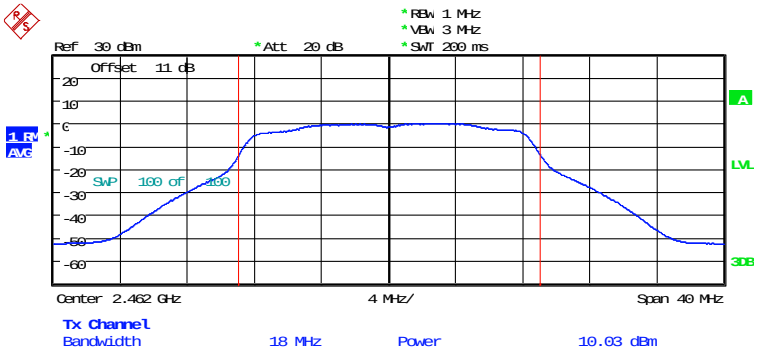


MAX OUTPUT POWER 802.11G CH01
Date: 1.AUG.2023 16:48:14



MAX OUTPUT POWER 802.11G CH06

Date: 1.AUG.2023 16:49:46

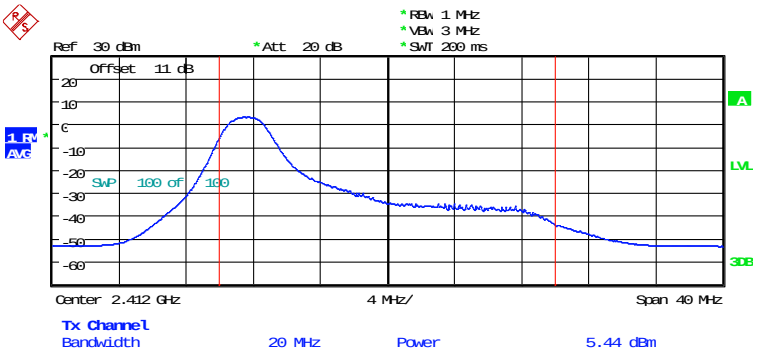


MAX OUTPUT POWER 802.11G CH11

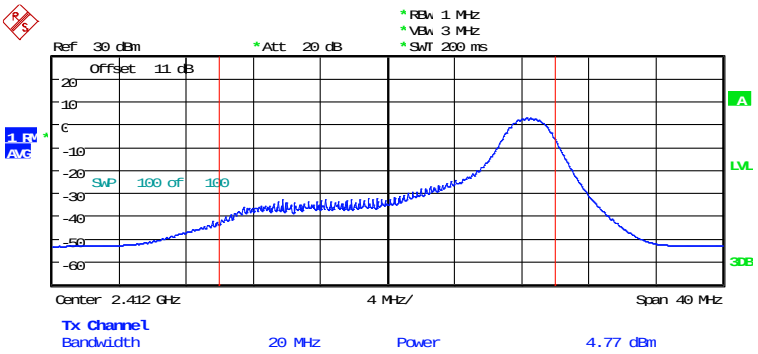
Date: 1.AUG.2023 16:51:22

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

802.11ax 20MHz

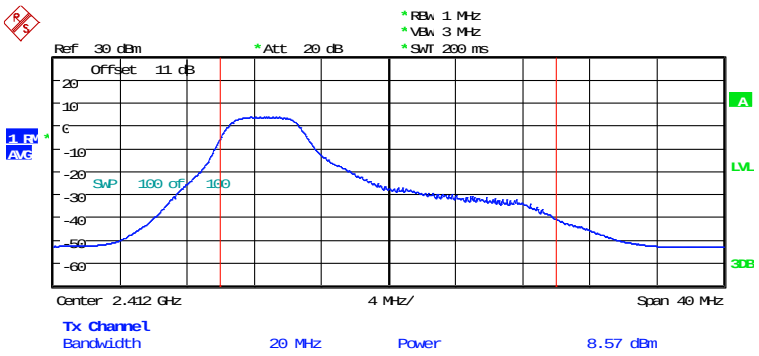


MAX OUTPUT POWER 802.11AX 20MHZ CH01 26RU1
Date: 1.AUG.2023 17:13:05

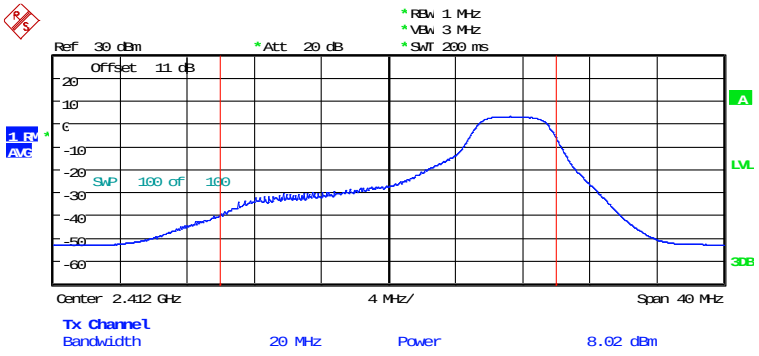


MAX OUTPUT POWER 802.11AX 20MHZ CH01 26RU9
Date: 1.AUG.2023 17:14:02

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

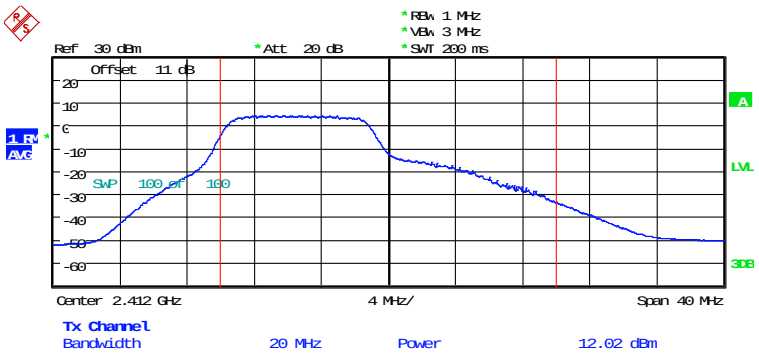


MAX OUTPUT POWER 802.11AX 20MHZ CH01 52RU1
Date: 1.AUG.2023 17:14:48

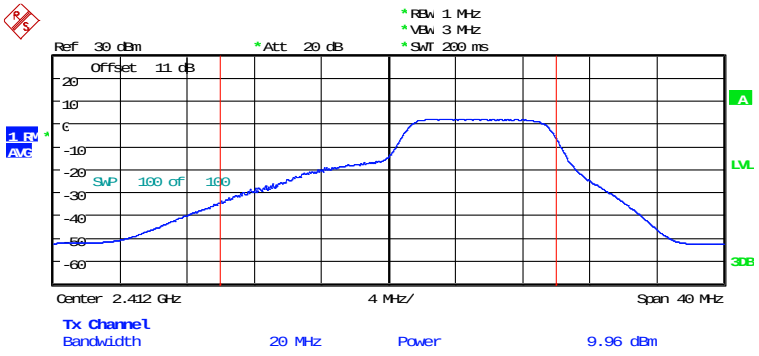


MAX OUTPUT POWER 802.11AX 20MHZ CH01 52RU4
Date: 1.AUG.2023 17:15:38

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

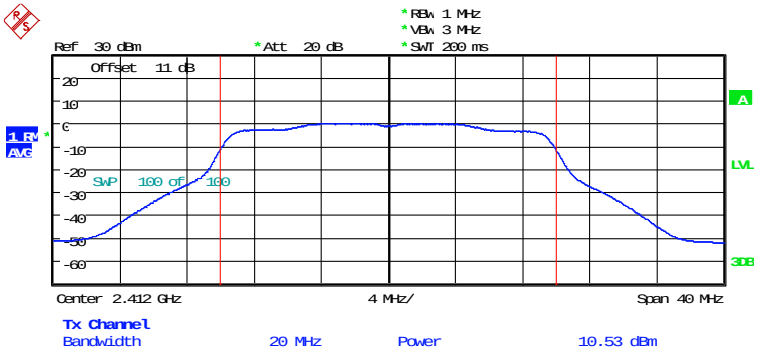


MAX OUTPUT POWER 802.11AX 20MHZ CH01 106RU1
Date: 1.AUG.2023 17:16:25

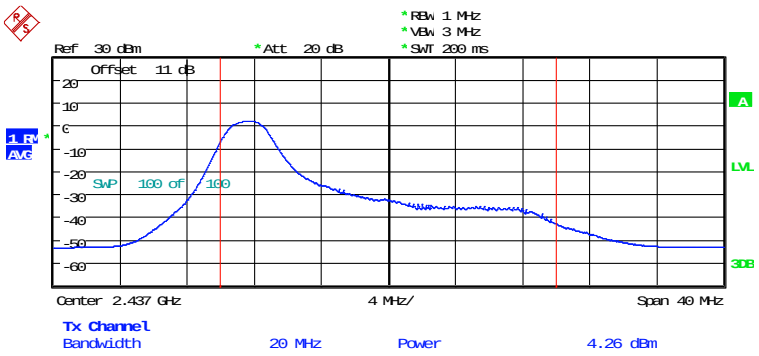


MAX OUTPUT POWER 802.11AX 20MHZ CH01 106RU2
Date: 1.AUG.2023 17:17:36

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

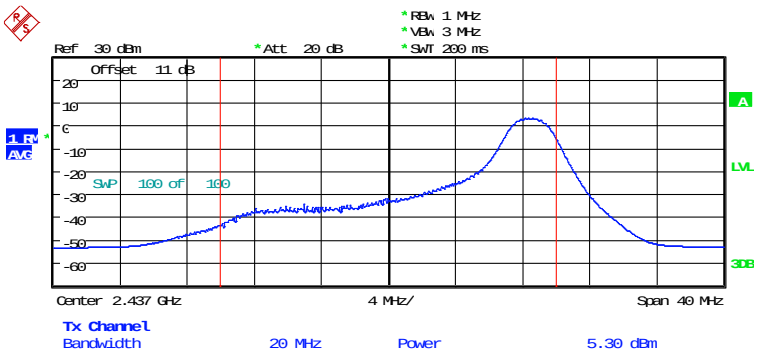


MAX OUTPUT POWER 802.11AX 20MHZ CH01 242RU1
Date: 1.AUG.2023 17:18:15

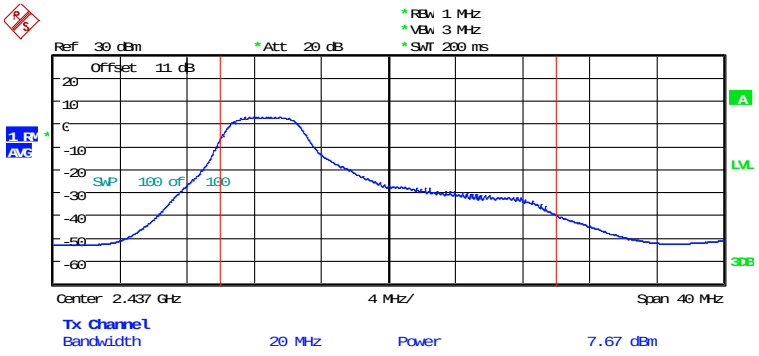


MAX OUTPUT POWER 802.11AX 20MHZ CH06 26RU1
Date: 1.AUG.2023 17:19:55

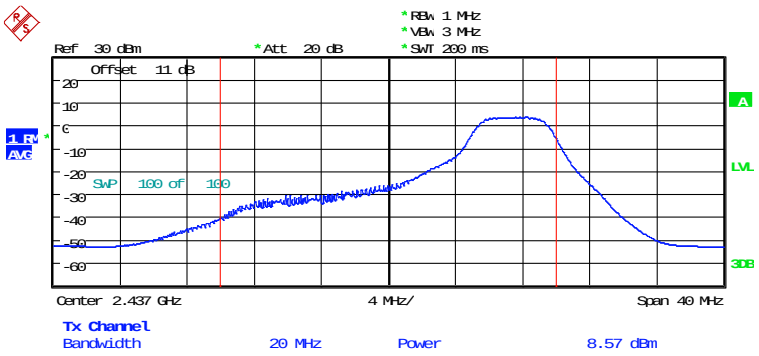
Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



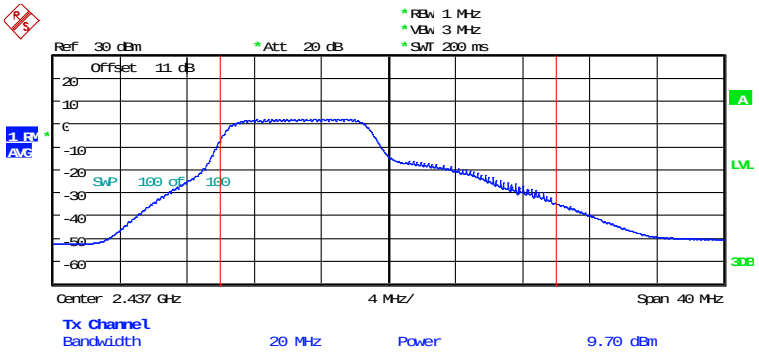
MAX OUTPUT POWER 802.11AX 20MHZ CH06 26RU9
Date: 1.AUG.2023 17:20:31



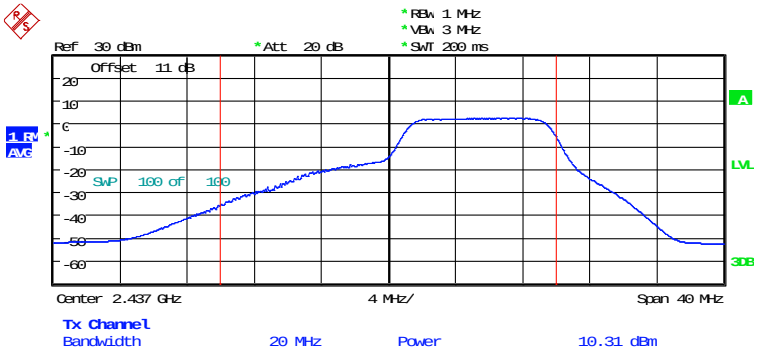
MAX OUTPUT POWER 802.11AX 20MHZ CH06 52RU1
Date: 1.AUG.2023 17:21:05



MAX OUTPUT POWER 802.11AX 20MHZ CH06 52RU4
Date: 1.AUG.2023 17:21:37

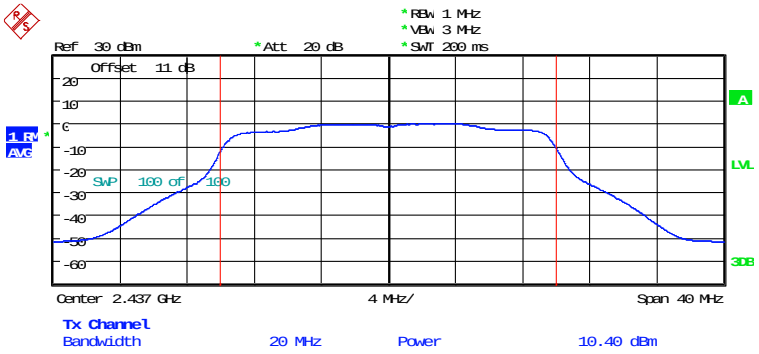


MAX OUTPUT POWER 802.11AX 20MHZ CH06 106RU1
Date: 1.AUG.2023 17:22:17



MAX OUTPUT POWER 802.11AX 20MHZ CH06 106RU2

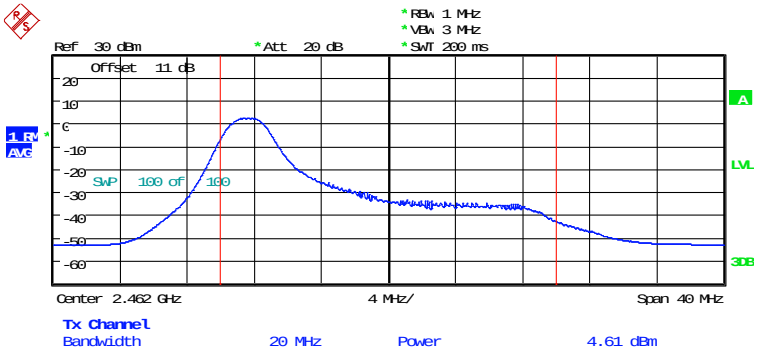
Date: 1.AUG.2023 17:22:48



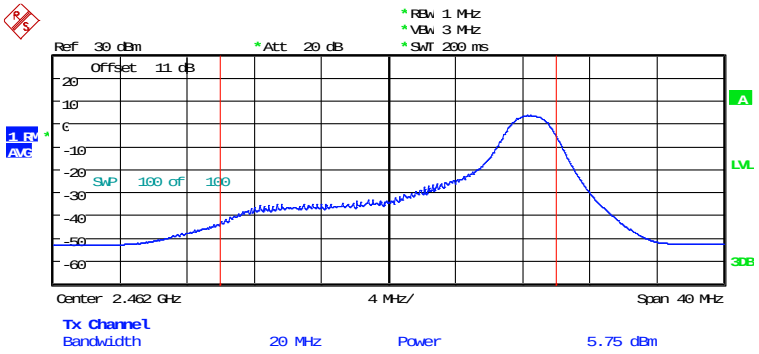
MAX OUTPUT POWER 802.11AX 20MHZ CH06 242RU1

Date: 1.AUG.2023 17:23:27

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

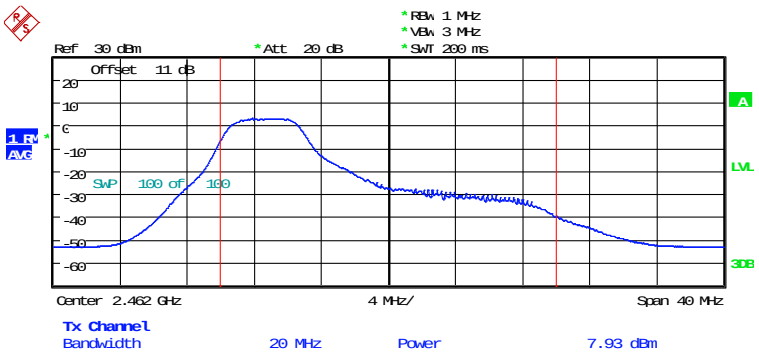


MAX OUTPUT POWER 802.11AX 20MHZ CH11 26RU1
Date: 1.AUG.2023 17:24:28

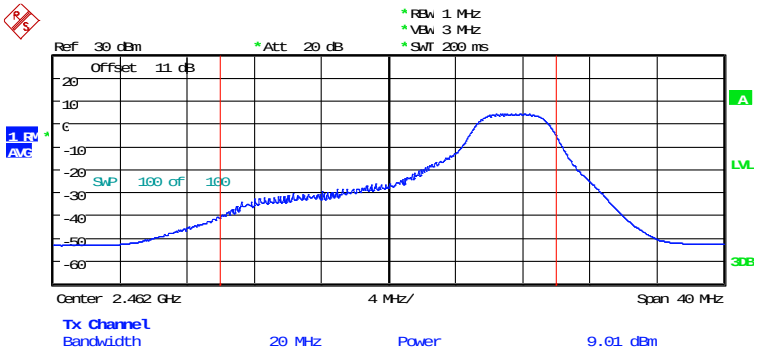


MAX OUTPUT POWER 802.11AX 20MHZ CH11 26RU9
Date: 1.AUG.2023 17:25:05

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

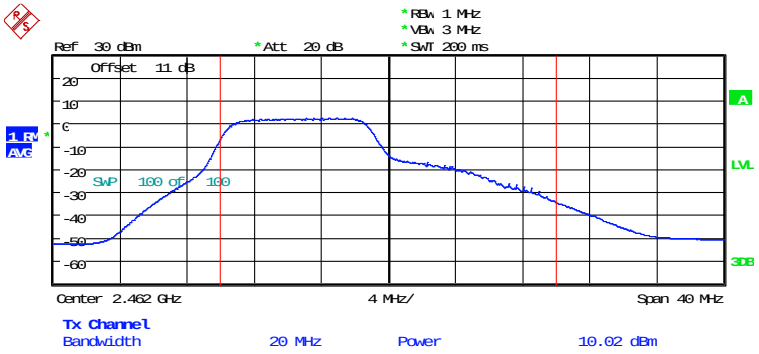


MAX OUTPUT POWER 802.11AX 20MHZ CH11 52RU1
Date: 1.AUG.2023 17:25:51

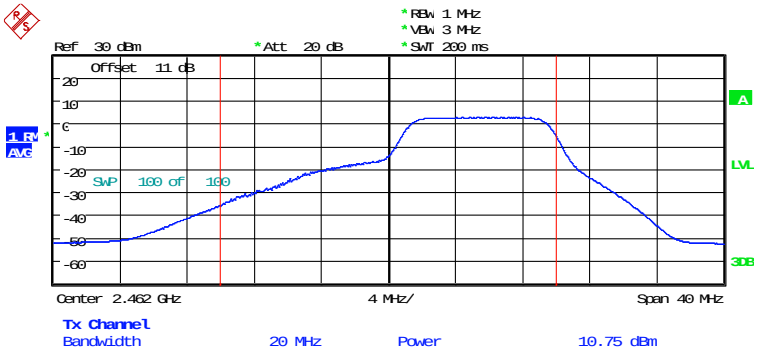


MAX OUTPUT POWER 802.11AX 20MHZ CH11 52RU4
Date: 1.AUG.2023 17:26:24

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

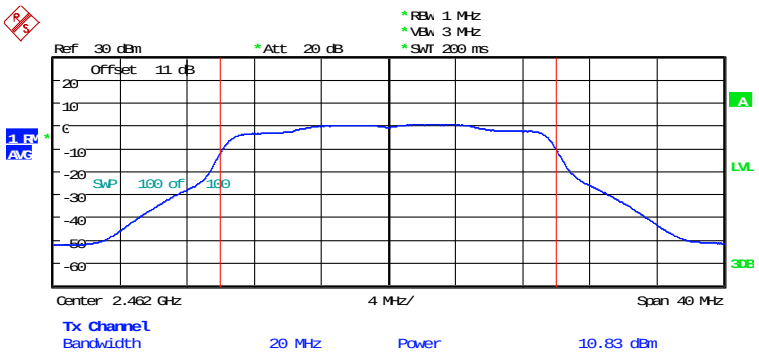


MAX OUTPUT POWER 802.11AX 20MHZ CH11 106RU1
Date: 1.AUG.2023 17:27:04



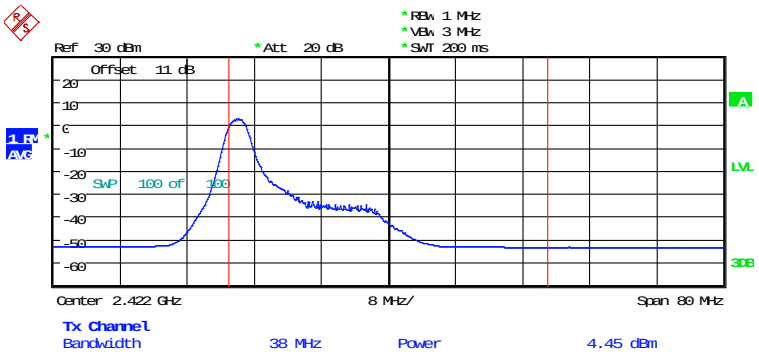
MAX OUTPUT POWER 802.11AX 20MHZ CH11 106RU2
Date: 1.AUG.2023 17:27:41

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

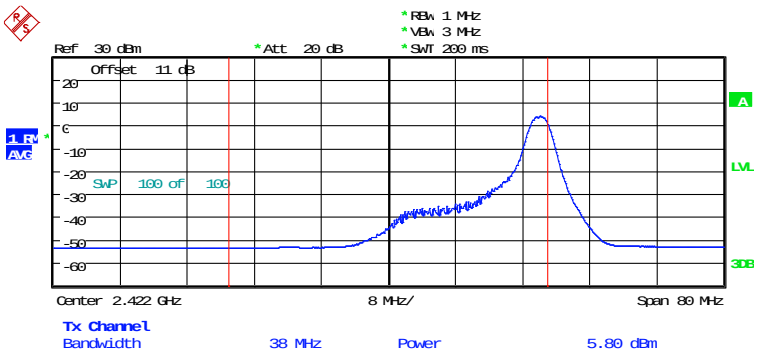


MAX OUTPUT POWER 802.11AX 20MHZ CH11 242RU1
Date: 1.AUG.2023 17:28:35

802.11ax 40MHz

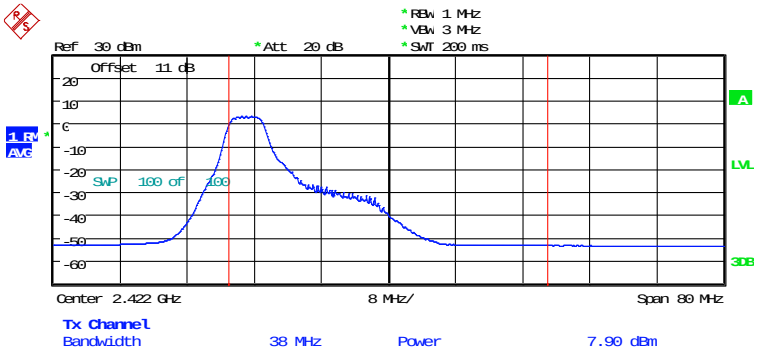


MAX OUTPUT POWER 802.11AX 40MHZ CH01 26RU1
Date: 1.AUG.2023 17:31:28



MAX OUTPUT POWER 802.11AX 40MHZ CH01 26RU18

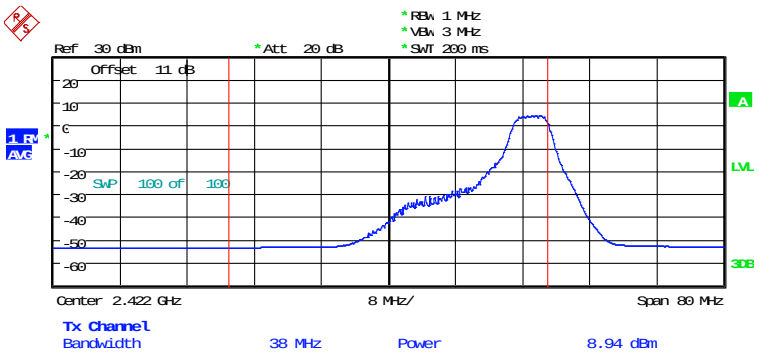
Date: 1.AUG.2023 17:32:01



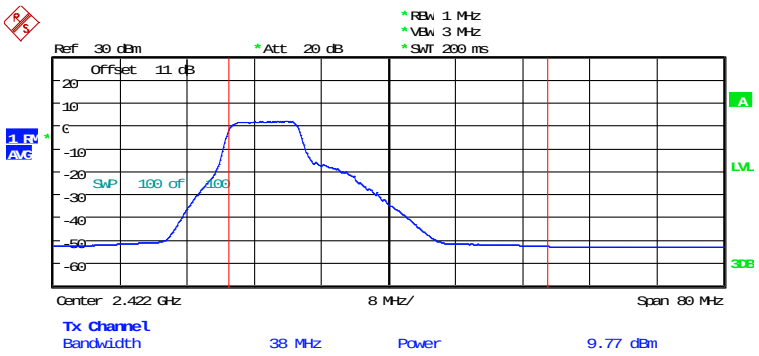
MAX OUTPUT POWER 802.11AX 40MHZ CH01 52RU1

Date: 1.AUG.2023 17:32:47

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

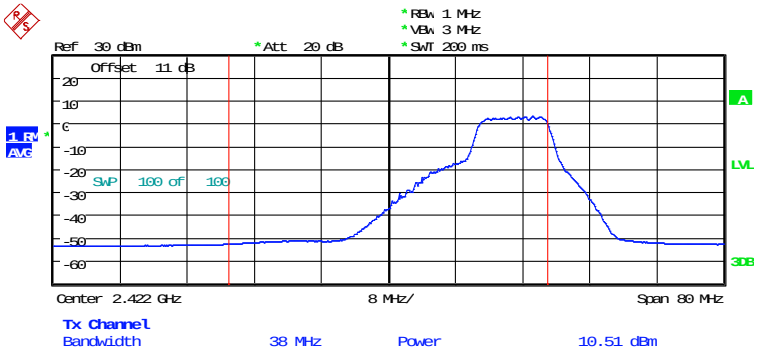


MAX OUTPUT POWER 802.11AX 40MHZ CH01 52RU8
Date: 1.AUG.2023 17:33:15

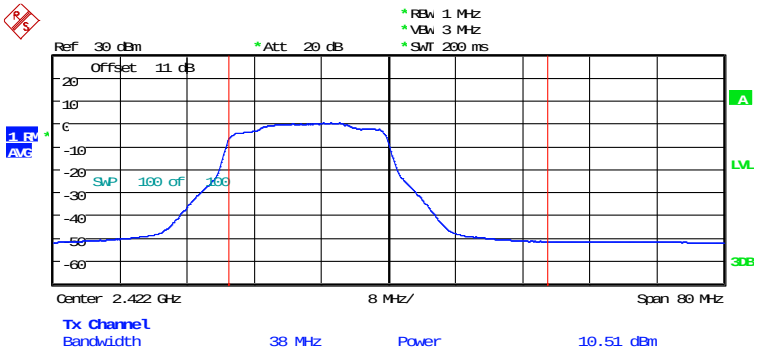


MAX OUTPUT POWER 802.11AX 40MHZ CH01 106RU1
Date: 1.AUG.2023 17:33:56

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

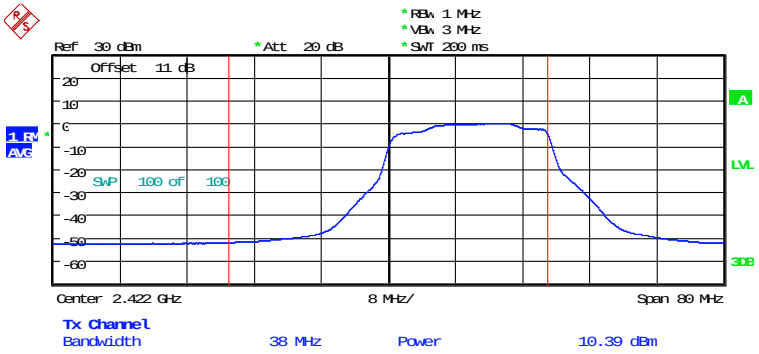


MAX OUTPUT POWER 802.11AX 40MHZ CH01 106RU4
Date: 1.AUG.2023 17:34:24

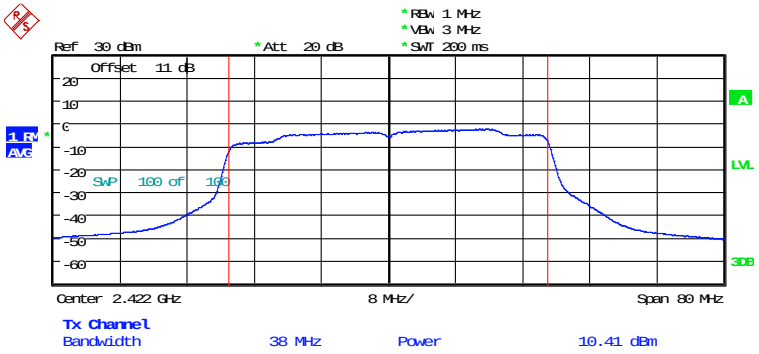


MAX OUTPUT POWER 802.11AX 40MHZ CH01 242RU1
Date: 1.AUG.2023 17:34:57

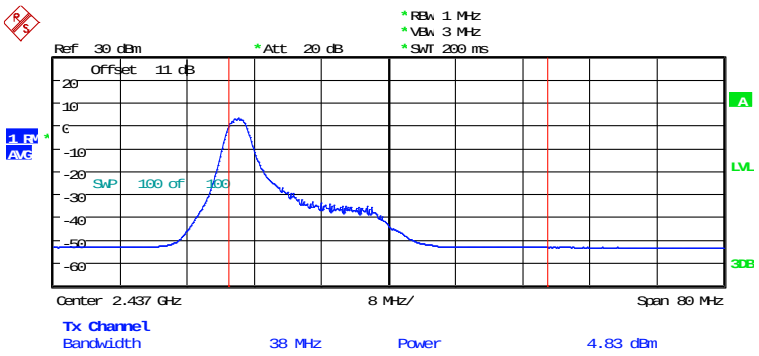
Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



MAX OUTPUT POWER 802.11AX 40MHZ CH01 242RU2
Date: 1.AUG.2023 17:35:36

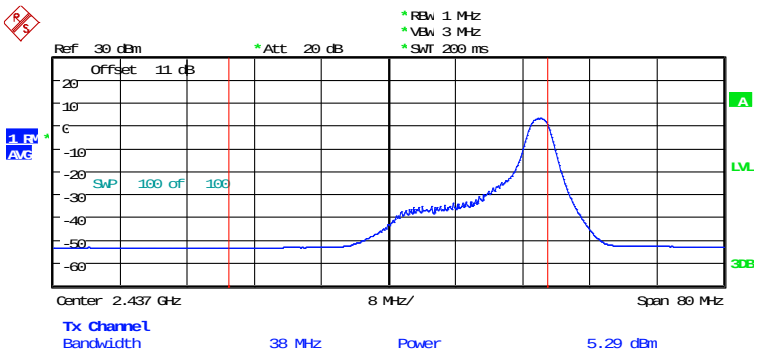


MAX OUTPUT POWER 802.11AX 40MHZ CH01 484RU1
Date: 1.AUG.2023 17:36:11



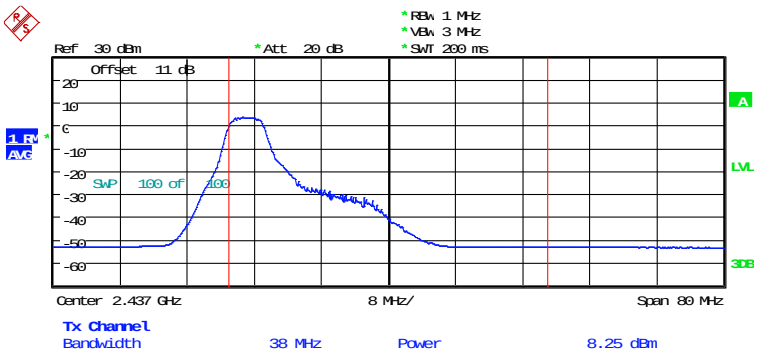
MAX OUTPUT POWER 802.11AX 40MHZ CH04 26RU1

Date: 1.AUG.2023 17:37:25



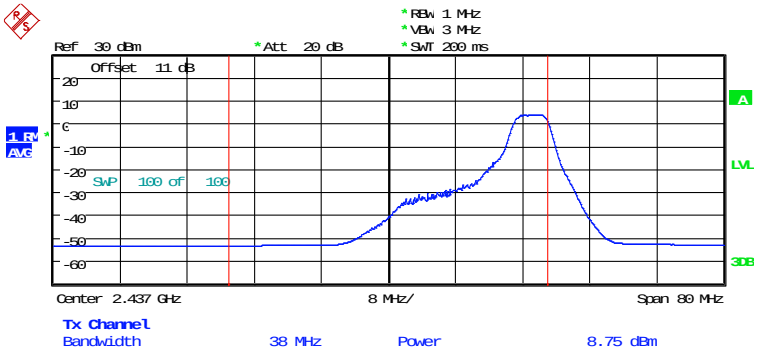
MAX OUTPUT POWER 802.11AX 40MHZ CH04 26RU18

Date: 1.AUG.2023 17:38:08



MAX OUTPUT POWER 802.11AX 40MHZ CH04 52RU1

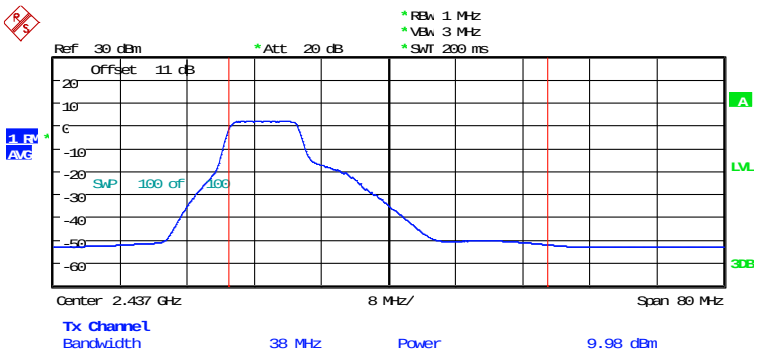
Date: 1.AUG.2023 17:38:40



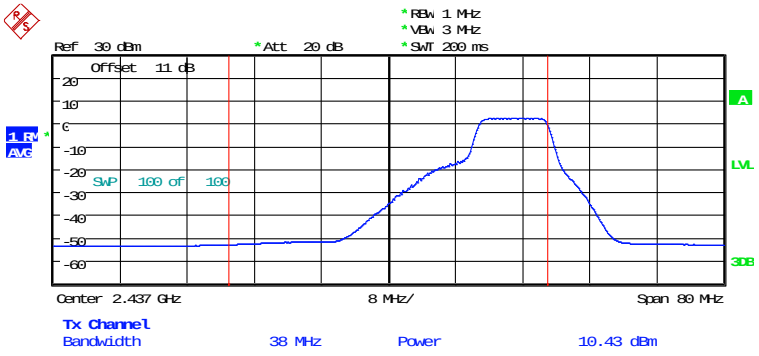
MAX OUTPUT POWER 802.11AX 40MHZ CH04 52RU8

Date: 1.AUG.2023 17:39:14

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

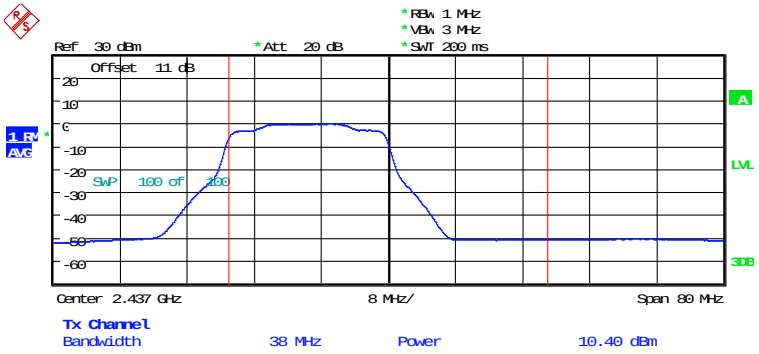


MAX OUTPUT POWER 802.11AX 40MHZ CH04 106RU1
Date: 1.AUG.2023 17:40:02

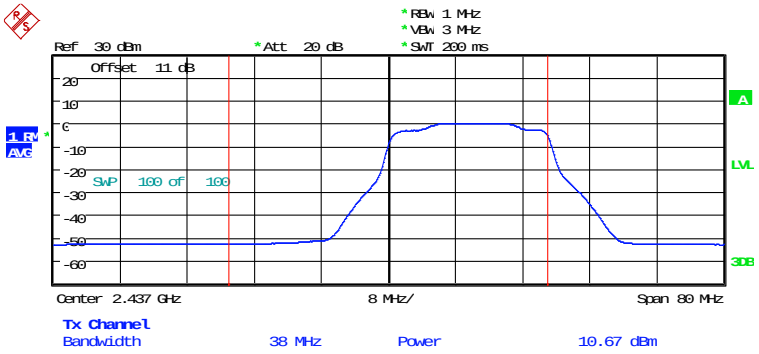


MAX OUTPUT POWER 802.11AX 40MHZ CH04 106RU4
Date: 1.AUG.2023 17:40:36

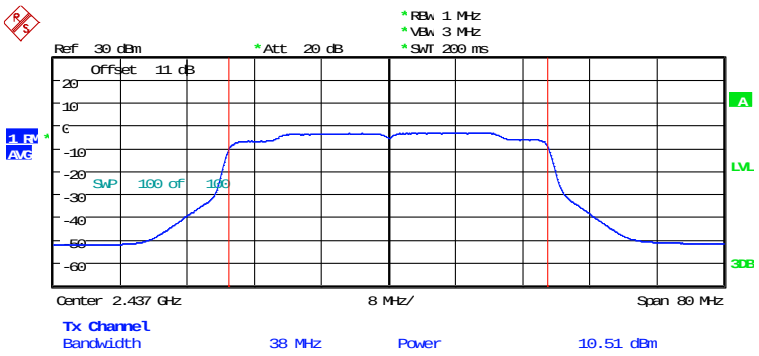
Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



MAX OUTPUT POWER 802.11AX 40MHZ CH04 242RU1
Date: 1.AUG.2023 17:41:09

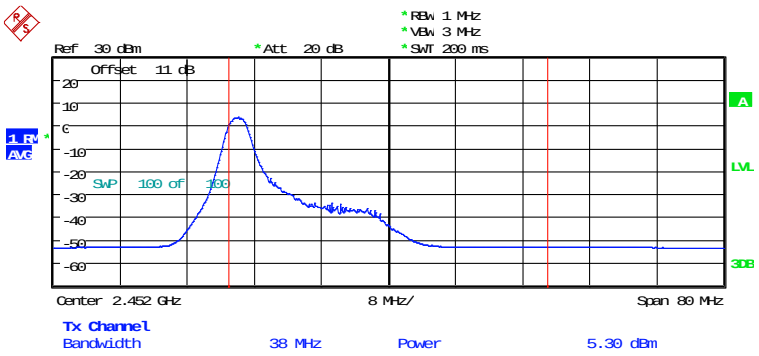


MAX OUTPUT POWER 802.11AX 40MHZ CH04 242RU2
Date: 1.AUG.2023 17:41:37



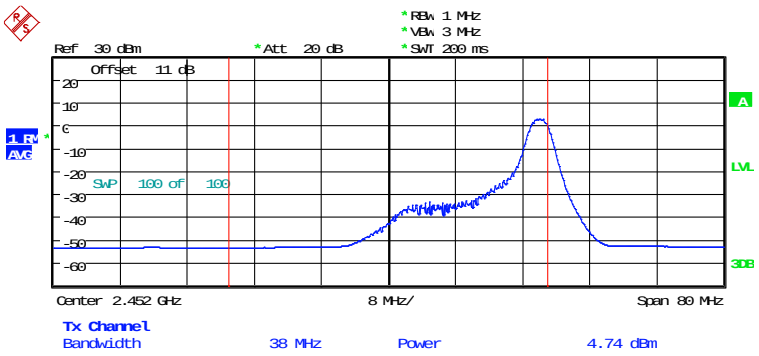
MAX OUTPUT POWER 802.11AX 40MHZ CH04 484RU1

Date: 1.AUG.2023 17:42:12

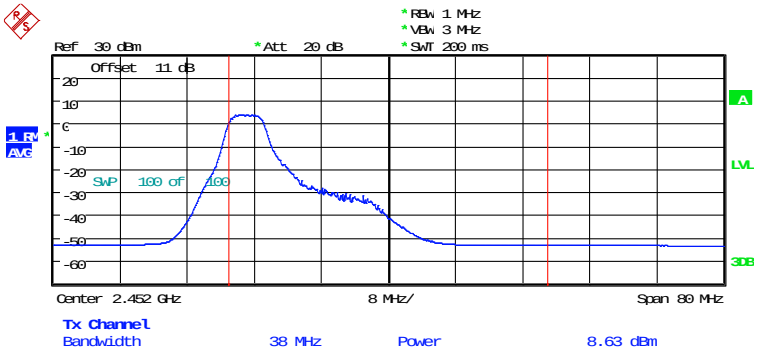


MAX OUTPUT POWER 802.11AX 40MHZ CH07 26RU1

Date: 1.AUG.2023 17:43:08

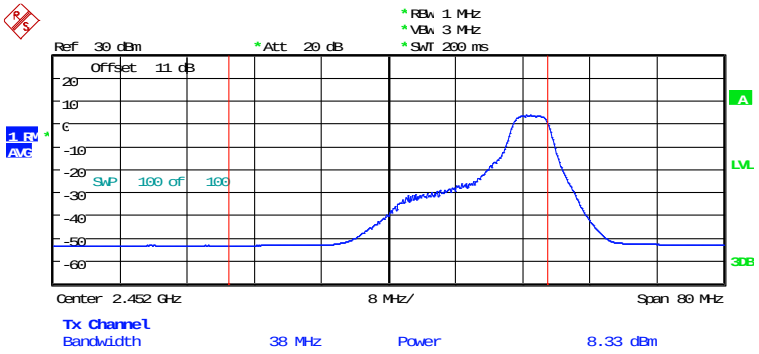


MAX OUTPUT POWER 802.11AX 40MHZ CH07 26RU18
Date: 1.AUG.2023 17:43:38

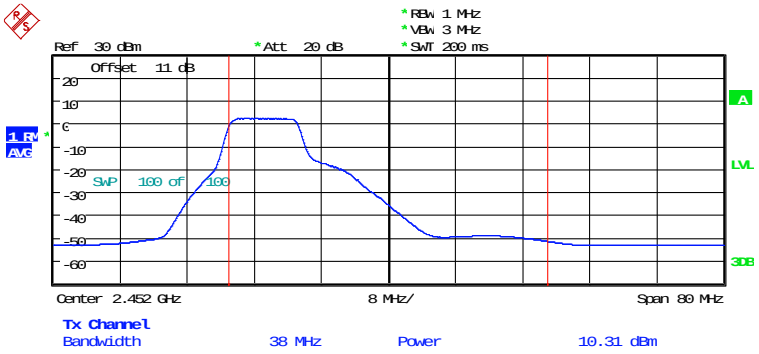


MAX OUTPUT POWER 802.11AX 40MHZ CH07 52RU1
Date: 1.AUG.2023 17:44:09

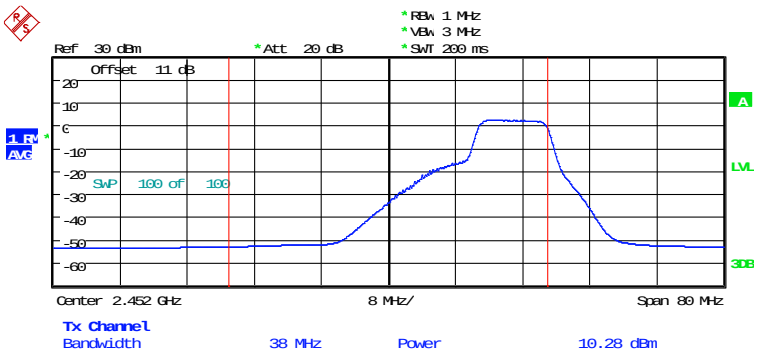
Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



MAX OUTPUT POWER 802.11AX 40MHZ CH07 52RU8
Date: 1.AUG.2023 17:44:39

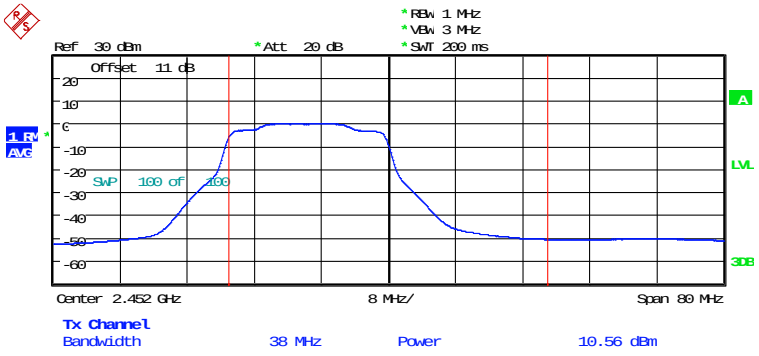


MAX OUTPUT POWER 802.11AX 40MHZ CH07 106RU1
Date: 1.AUG.2023 17:45:54



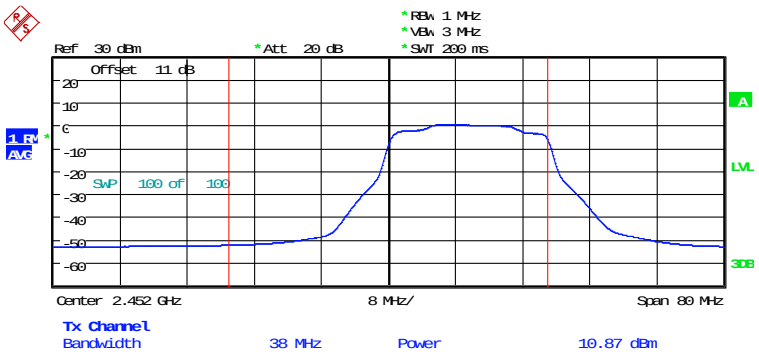
MAX OUTPUT POWER 802.11AX 40MHZ CH07 106RU4

Date: 1.AUG.2023 17:46:25



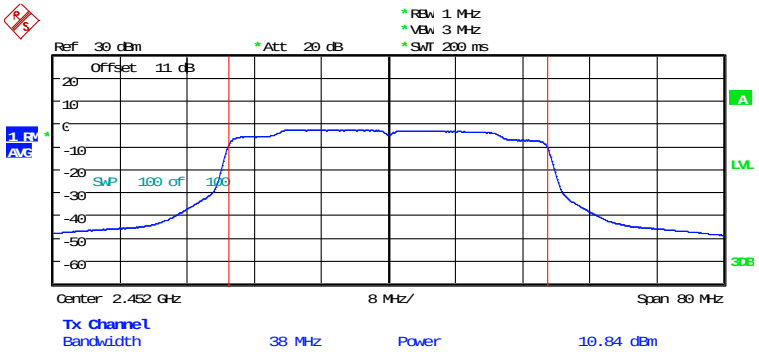
MAX OUTPUT POWER 802.11AX 40MHZ CH07 242RU1

Date: 1.AUG.2023 17:47:06



MAX OUTPUT POWER 802.11AX 40MHZ CH07 242RU2

Date: 1.AUG.2023 17:47:57



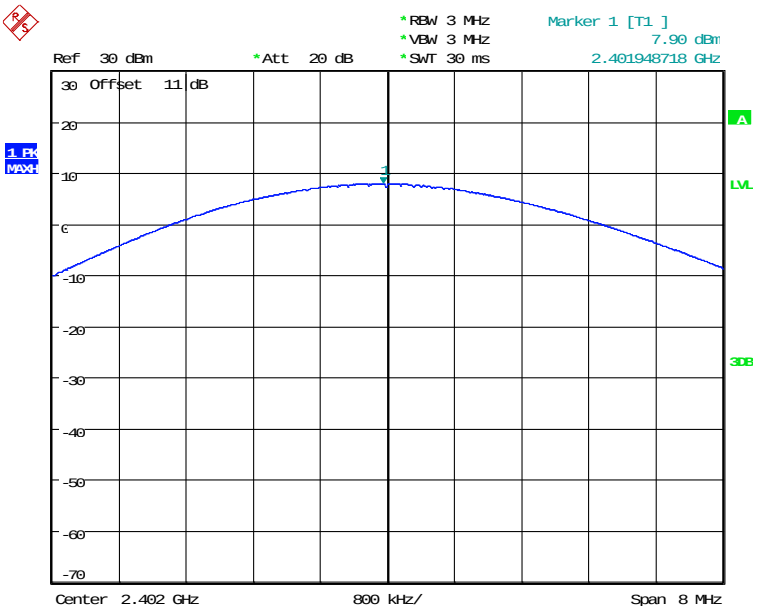
MAX OUTPUT POWER 802.11AX 40MHZ CH07 484RU1

Date: 1.AUG.2023 17:48:36

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

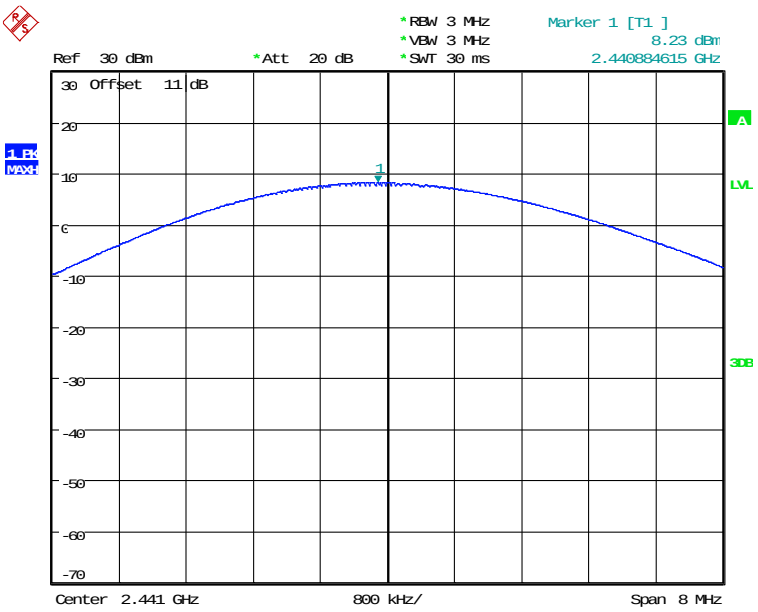
Normal & EDR

Band	Mode	Channel	Power (dBm)	Limit (dBm)
2.4GHz	BR	Ch 0 : 2402 MHz	7.90	21
		Ch 39 : 2441 MHz	8.23	21
		Ch 78 : 2480 MHz	7.73	21
	EDR	Ch 0 : 2402 MHz	5.95	21
		Ch 39 : 2441 MHz	6.29	21
		Ch 78 : 2480 MHz	5.82	21

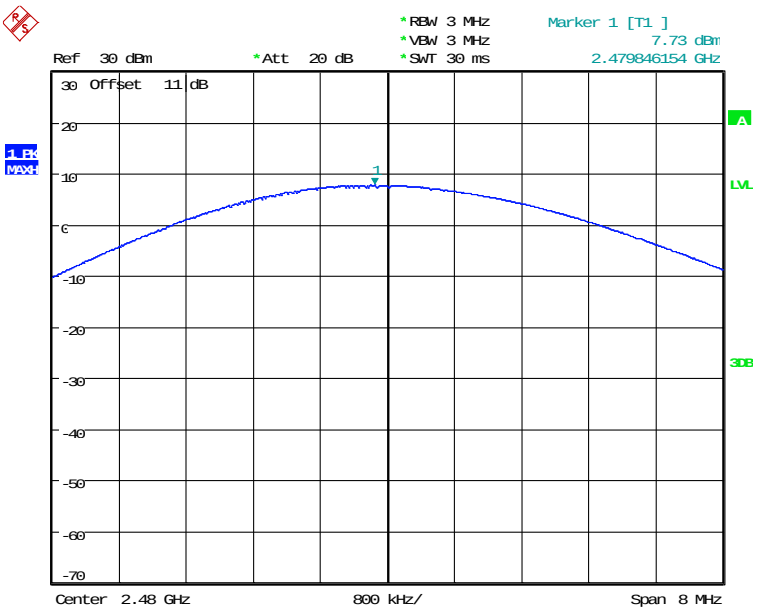


MAX OUTPUT POWER CH0
Date: 5.AUG.2023 17:43:12

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

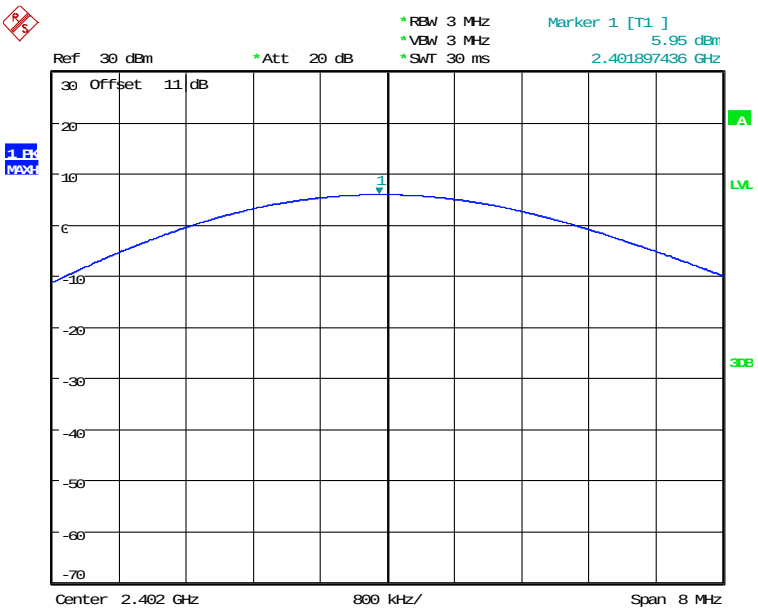


MAX OUTPUT POWER CH39
Date: 5.AUG.2023 17:44:00

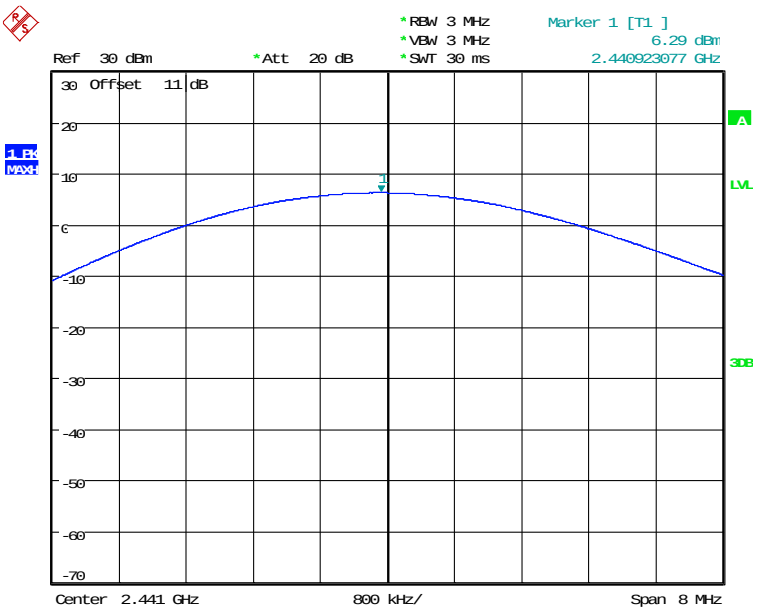


MAX OUTPUT POWER CH78
Date: 5.AUG.2023 17:44:44

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

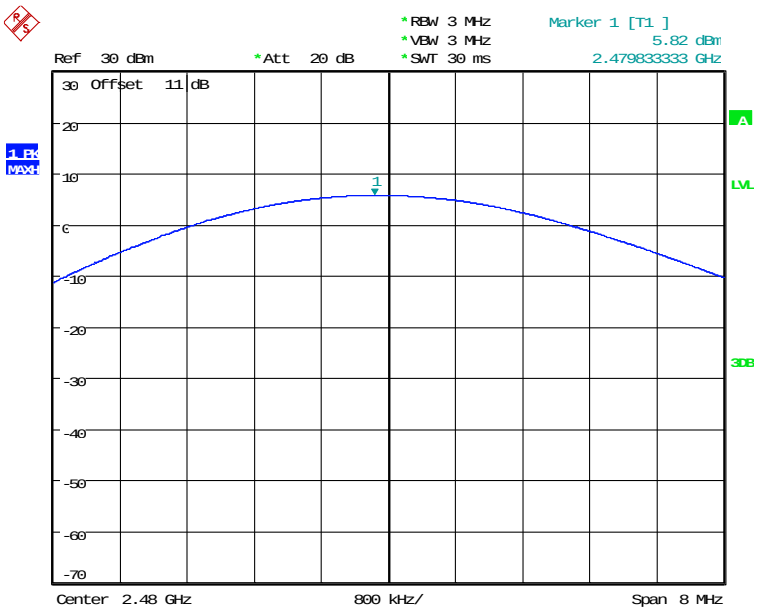


MAX OUTPUT POWER CH0 EDR MODE
Date: 5.AUG.2023 17:51:24



MAX OUTPUT POWER CH39 EDR MODE
Date: 5.AUG.2023 17:52:08

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



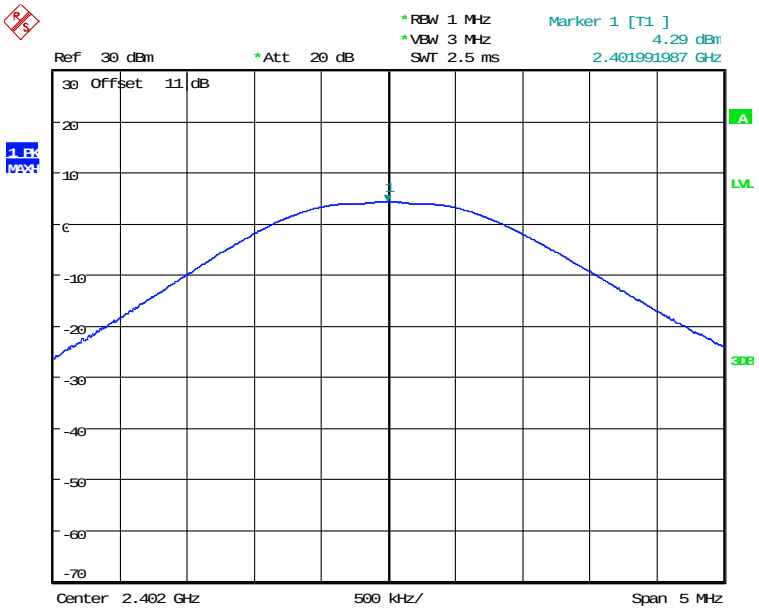
MAX OUTPUT POWER CH78 EDR MODE
Date: 5.AUG.2023 17:52:32

Low energy

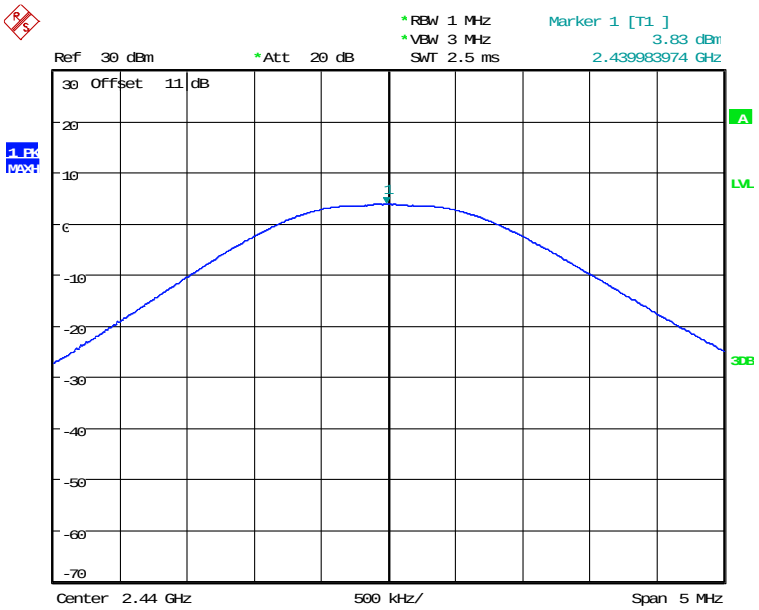
Band	Mode	Channel	Power (dBm)	Limit (dBm)
2.4GHz	BLE 1M	Ch 0 : 2402 MHz	4.29	30
		Ch 19 : 2440 MHz	3.83	30
		Ch 39 : 2480 MHz	3.24	30
2.4GHz	BLE 2M	Ch 0 : 2402 MHz	4.36	30
		Ch 19 : 2440 MHz	3.91	30
		Ch 39 : 2480 MHz	3.29	30

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

1M

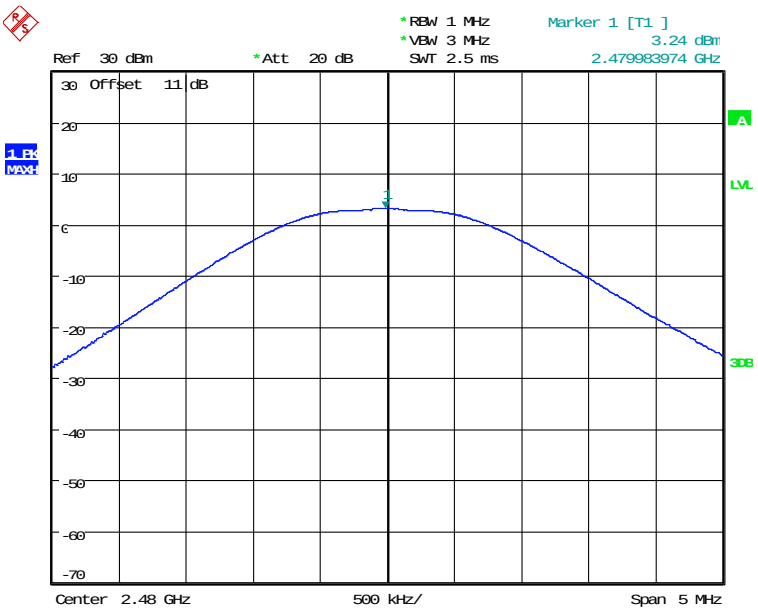


MAX OUTPUT POWER BLE 1M CH00
Date: 5.AUG.2023 18:03:02



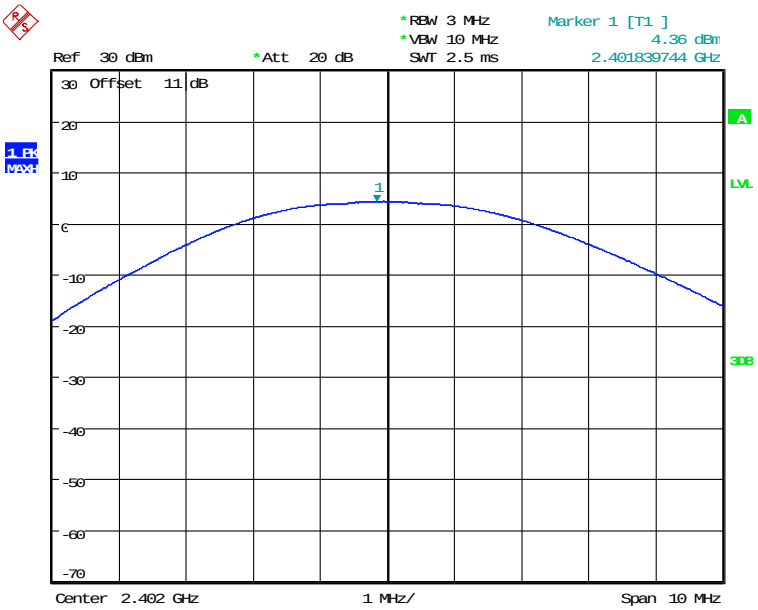
MAX OUTPUT POWER BLE 1M CH19
Date: 5.AUG.2023 18:05:04

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



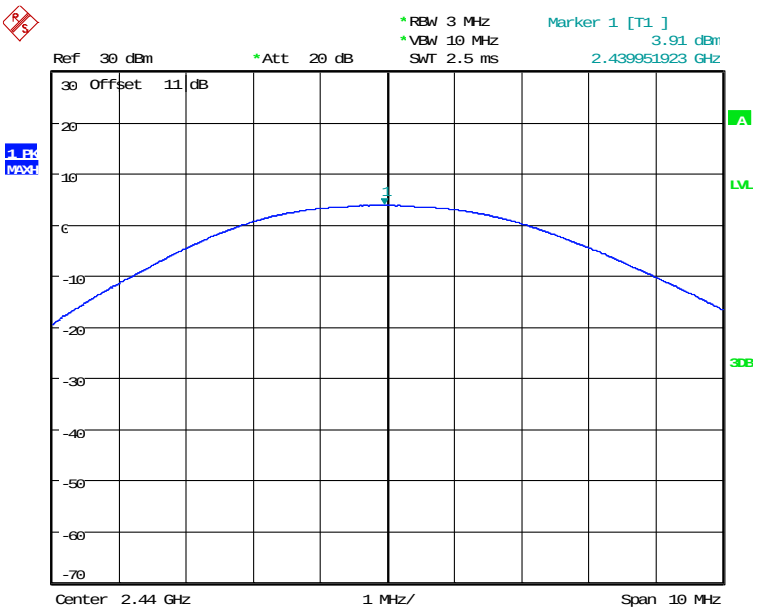
MAX OUTPUT POWER BLE 1M CH39
Date: 5.AUG.2023 18:05:40

2M

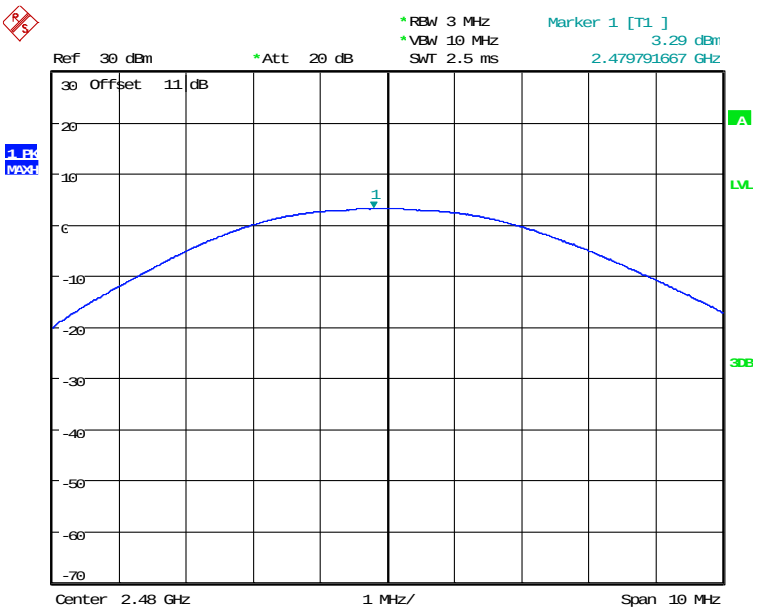


MAX OUTPUT POWER BLE 2M CH00
Date: 5.AUG.2023 18:06:38

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



MAX OUTPUT POWER BLE 2M CH19
Date: 5.AUG.2023 18:08:48



MAX OUTPUT POWER BLE 2M CH39
Date: 5.AUG.2023 18:11:18

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

Limits:

Frequency MHz	Power dBm
902 - 928	30
2400 – 2483.5	30
5725 – 5850	30

In case of employing transmitter antennas having antenna gain ＞ 6 dBi and using fixed point-to point operation consider §15.247 (b)(4)

Test equipment used: ETSTW-RE 055, ETSTW-RE 050,
ETSTW-RE 064

3.2 Transmitter Radiated Emissions in Restricted Bands

FCC Rules: 15.247 (c), 15.205, 15.209, 15.35
Radiated emission measurements were performed from 30 MHz to 26500 MHz.
For radiated emission tests, the analyzer setting was as followings:

Frequency ≦ 1 GHz, RBW:100 kHz, VBW: 100 kHz (Peak measurements)
Frequency ＞1 GHz, RBW: 1 MHz, VBW: 1 MHz (Peak measurements)
Frequency ＞1 GHz , RBW:1 MHz , VBW: 10 Hz (Average measurements)

Limits.

For frequencies below 1GHz:

Frequency of Emission (MHz)	Field strength (microvolts/meter)	Field Strength (dB microvolts/meter)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above	500	54.0

For frequencies above 1GHz (Average measurements).

Guidance on Measurement of Digit Transmission Systems:
“If the emission is pulsed, modify the unit for continuous operation, use the setting shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.”

The correction factor, based on the total channel dwell time in a 100 ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the value.

Duty cycle correction = 20 log (dwell time/ 100ms)

Note: No duty cycle correction was added to the reading of this EUT.

Explanation: See attached diagrams in Appendix.

3.3 Spurious Emissions (tx)

Spurious emission was measured with modulation (declared by manufacturer).

In any 100 kHz bandwidth outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB 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. 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))

FCC Rule: 15.247(d), 15.35
For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at a 3 m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Limits:

For frequencies above 1GHz (Peak measurements).
Modified Limit for peak according to 15.35 (b) = Max Permitted average Limits + 20dB

For frequencies above 1GHz (Average measurements).
Max. reading – 20dB

Max. reading – 20 dB
Guidance on Measurement of Digit Transmission Systems:
“If the emission is pulsed, modify the unit for continuous operation, use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.”

The correction factor, based on the total channel dwell time in a 100 ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the value.

Duty Cycle correction = 20 log (dwell time/100ms)

Test equipment used: ETSTW-RE 030, ETSTW-RE 111, ETSTW-RE 088, ETSTW-RE 018, ETSTW-RE 064

Note: No duty cycle correction was added to the reading of EUT.

SAMPLE CALCULATION OF LIMIT. All results will be updated by an automatic measuring system in accordance with point 2.3.

Calculation of test results:
Such factors like antenna correction, cable loss, external attenuation etc. are already included in the provided measurement results. This is done by using validated test software and calibrated test system according the accreditation requirements.

The peak and average spurious emission plots was measured with the average limits.
In the Table being listed the critical peak and average value and exhibit the compliance with the above calculated Limits.

If in the column's correction factor states a value then the max. Field strength in the same row is corrected by a value gained from the "Correction Factor".

Summary table with radiated data of the test plots

Model:	RK15	Date:	--		
Mode:	--	Temperature:	--	°C	Engineer: --
Polarization:	--	Humidity:	--	%	

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--

Note

1. **Correction Factor = Antenna factor + Cable loss - Preamplifier**
2. **The formula of measured value as: Test Result = Reading + Correction Factor**
3. **Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
4. **All not in the table noted test results are more than 20 dB below the relevant limits.**
5. **After evaluated, the test result in this report adopt the worst case to measure, please see attached diagrams in appendix.**

TEST RESULT (Transmitter): The unit DOES meet the FCC requirements.

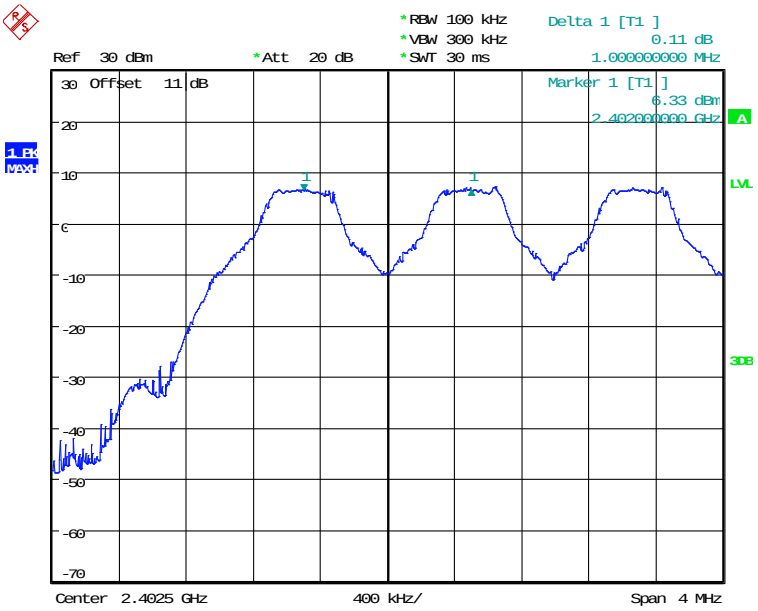
Test equipment used: ETSTW-RE 030, ETSTW-RE 111, ETSTW-RE 088, ETSTW-RE 018, ETSTW-RE 064

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15

3.4 Carrier Frequency Separation

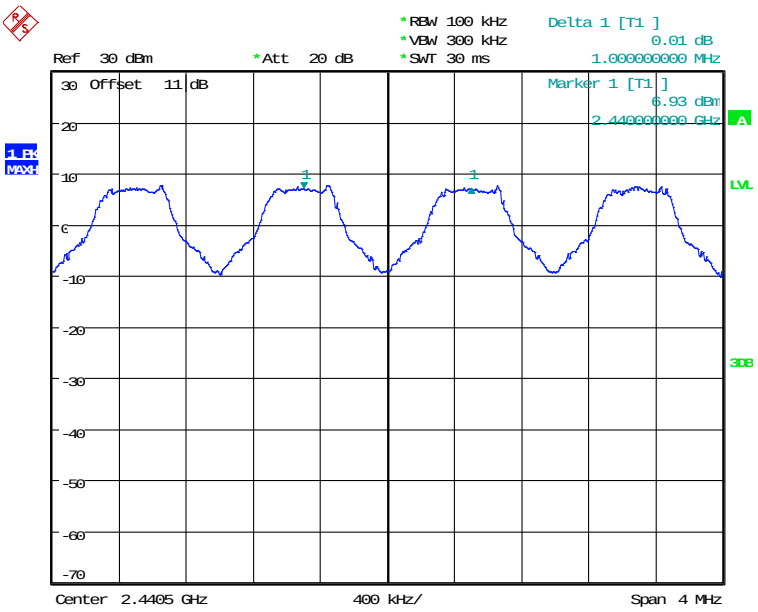
Carrier Frequency Separation was measured with modulation (declared by manufacturer).
According to FCC rules part 15 subpart C §15.247 frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or 20 dB bandwidth of the hopping channel, whichever is greater.

Test date: August 05, 2023
Temperature: 26.7°C
Humidity: 57.0 %
Tester: Brain

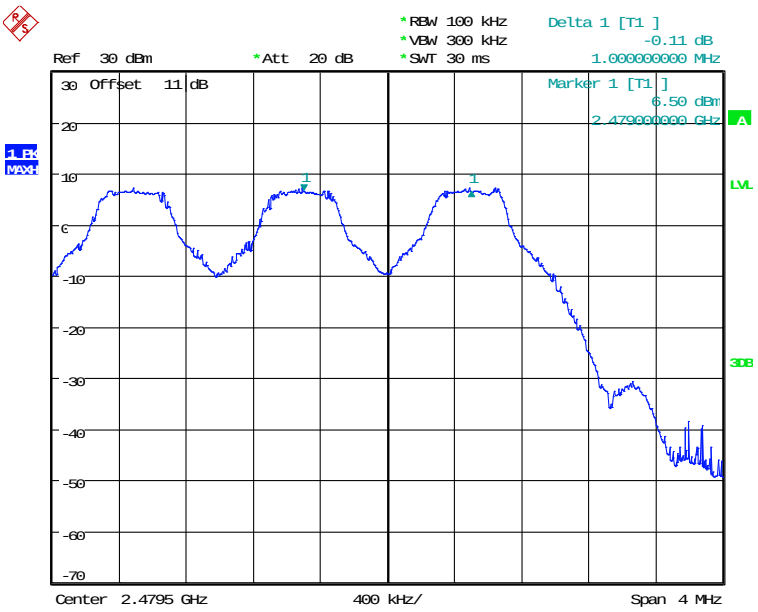


FREQUENCY SEPARATION CH0
Date: 5.AUG.2023 17:49:04

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



FREQUENCY SEPARATION CH39
Date: 5.AUG.2023 17:49:56



FREQUENCY SEPARATION CH78
Date: 5.AUG.2023 17:50:52

Limits:

Frequency Range MHz	Limits	
	20 dB bandwidth < 25 kHz	20 dB bandwidth > 25 kHz
902-928	25 kHz	20 dB bandwidth
2400-2483.5 5725-5850.0	25 kHz	20 dB bandwidth

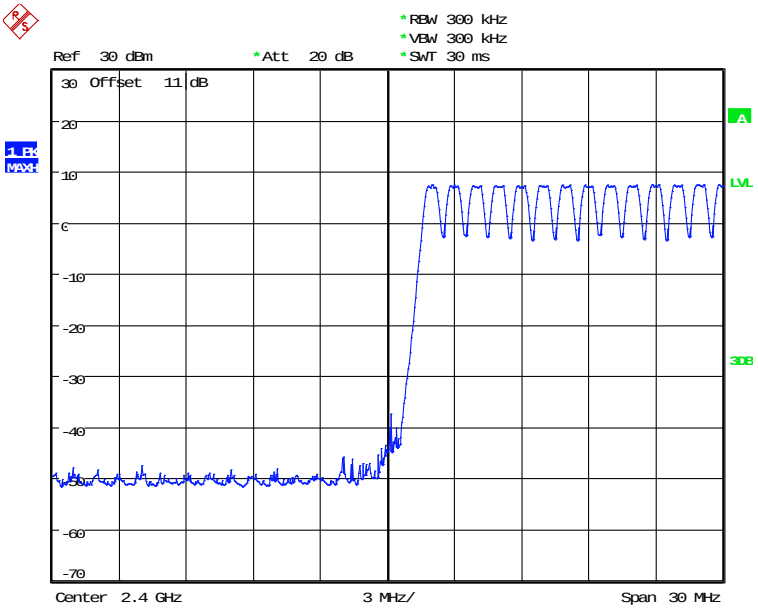
Test equipment used: ETSTW-RE 055, ETSTW-RE 064

3.5 Number of Hopping Frequencies

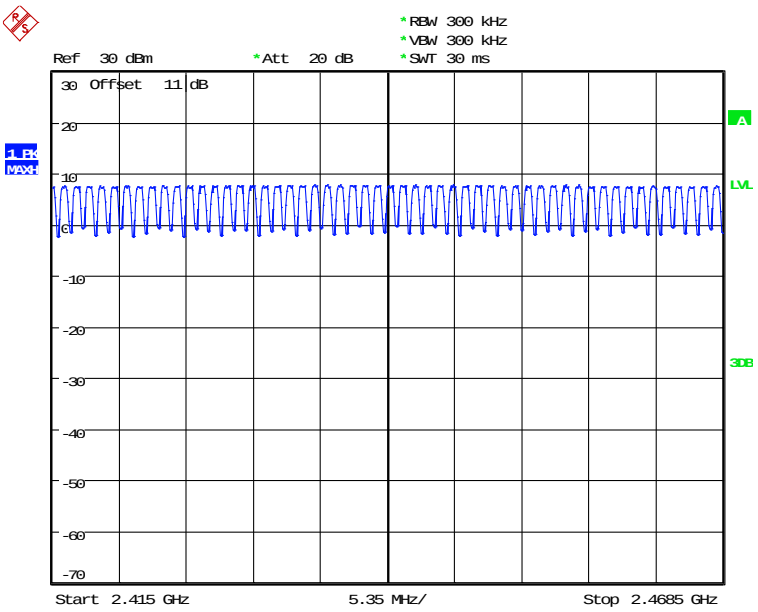
According to FCC rules part 15 subpart C §15.247 frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 hopping frequencies. Frequency hopping systems in 5725-5850 MHz bands shall use least 75 hopping frequencies.

For frequency hopping systems operating in the 902-928 MHz band: if the 20dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies; if the 20dB bandwidth of the hopping channel 250 kHz or greater, the system shall use at least 25 hopping frequencies.

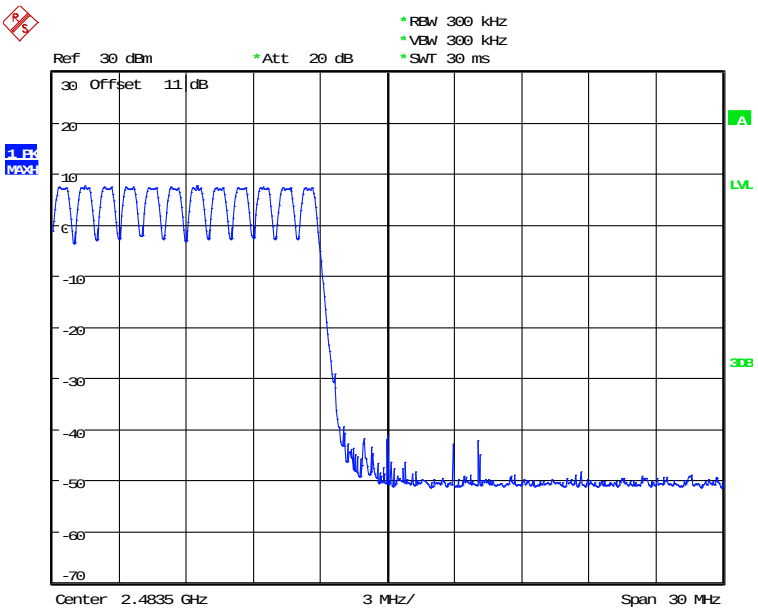
Test date: August 05, 2023
Temperature: 26.7˚C
Humidity: 57.0 %
Tester: Brain



NUMBER OF HOPPING CH0-13
Date: 5.AUG.2023 17:46:00



NUMBER OF HOPPING CH14-66
Date: 5.AUG.2023 17:48:04



NUMBER OF HOPPING CH67-78
Date: 5.AUG.2023 17:46:48

Limits:

Frequency Range MHz	Limit	
	20dB Bandwidth	Number of Channels
902-928 MHz	Bandwidth < 250 kHz	≥ 50
	Bandwidth ≥ 250 kHz	≥ 25
2400-2483.5	not defined	15
5725-5850.0 MHz	1 MHz	75

Test equipment used: ETSTW-RE 055, ETSTW-RE 064

3.6.1 Pseudorandom Frequency Hopping Sequence

The generation of the hopping sequence is determined by the Bluetooth core specification and complies with the FCC requirements.

3.6.2 Coordination of hopping sequences to other transmitters

According to the Bluetooth core specification such a coordination is not possible. During scatternet function only one of the two hopping sequences will be used at a definite moment.

3.6.3 System Receiver Hopping Capability

According to the Bluetooth core specification. The system receivers shift frequencies in synchronization with the transmitted signals.

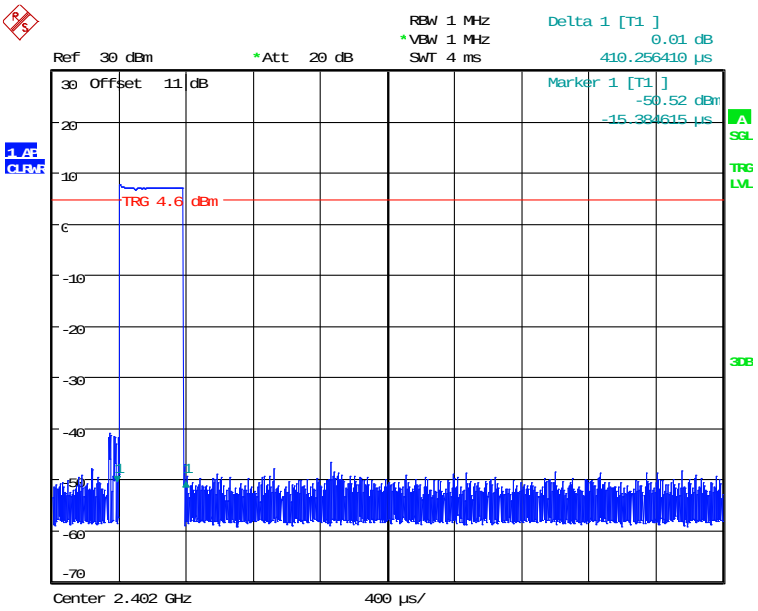
3.6 Time of Occupancy (Dwell Time)

Frequency hopping systems operating in the 5725-5850 MHz band shall use an average time of occupancy on any frequency not greater than 0.4 seconds within a 30 second period.

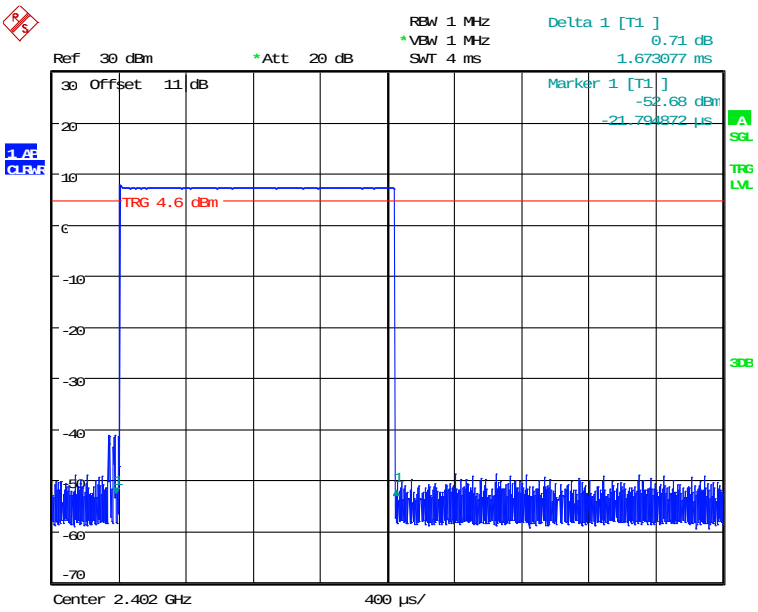
In 2400-2483.5 MHz band the average time of occupancy on any channel shall not be greater than 0.4 seconds multiplied by the number of hopping channels employed.

For frequency hopping systems operating in the 902-928 MHz band: if the 20dB bandwidth of the hopping channel is less than 250 kHz, the average time of occupancy on any frequency shall not greater than 0.4 seconds within a 20 second period; if the 20dB bandwidth of the hopping channel is 250 kHz or greater, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

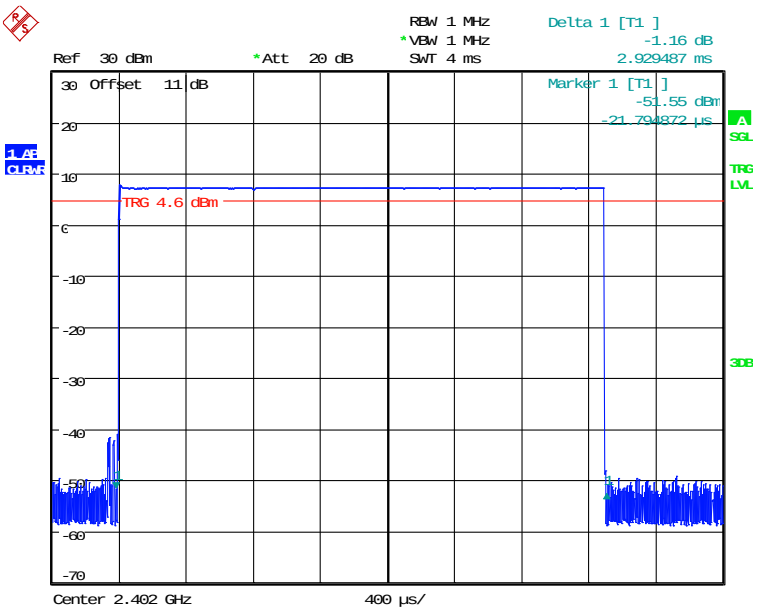
Test date: August 05, 2023
Temperature: 26.7°C
Humidity: 57.0 %
Tester: Brain



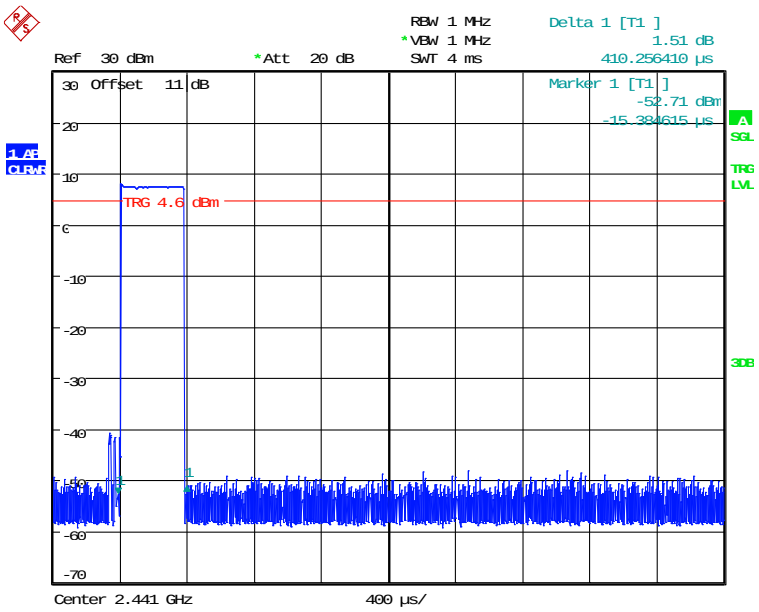
DWELL TIME CH0 DH1 (0.41ms * 320events = 131.2ms)
Date: 5.AUG.2023 17:35:36



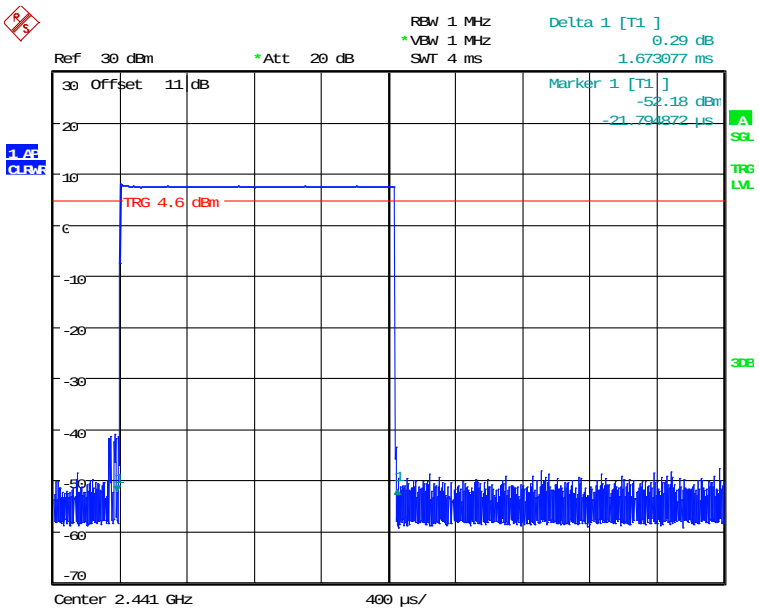
DWELL TIME CH0 DH3 (1.673ms * 160events = 267.68ms)
Date: 5.AUG.2023 17:39:54



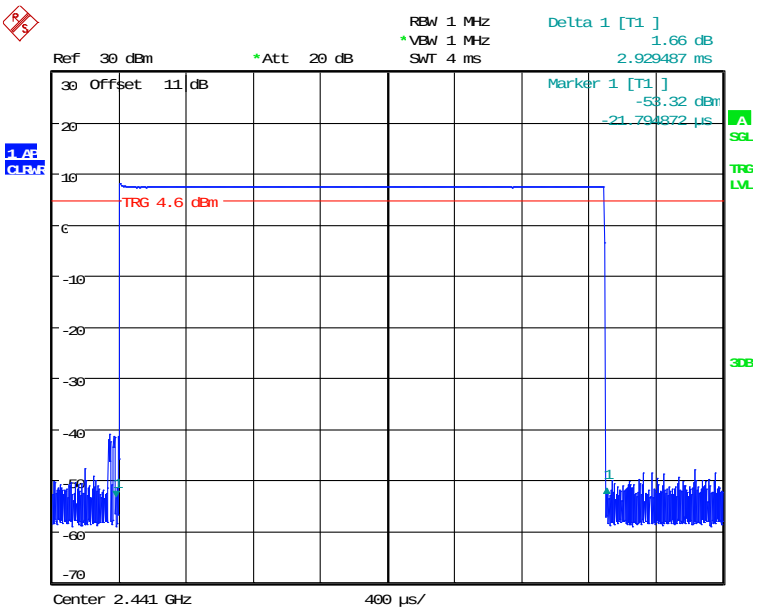
DWELL TIME CH0 DH5 (2.929ms * 106events = 310.474ms)
Date: 5.AUG.2023 17:41:08



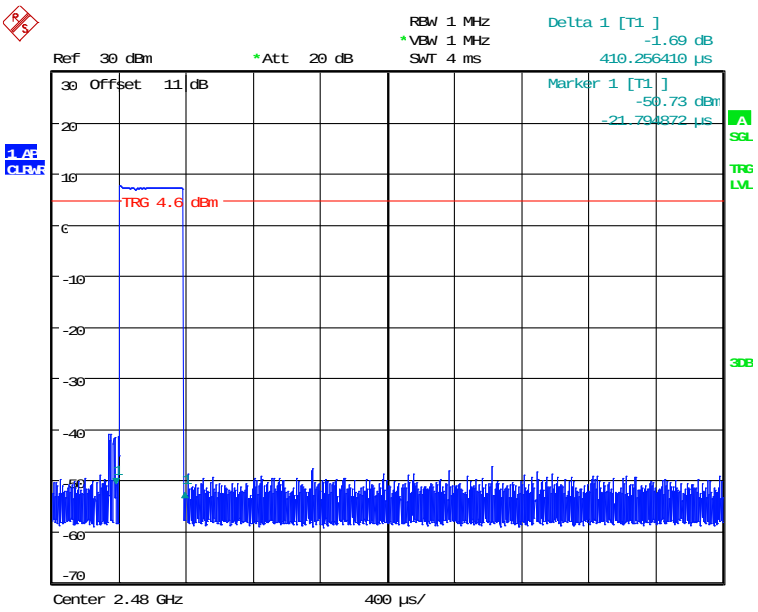
DWELL TIME CH39 DH1 (0.41ms * 320events = 131.2ms)
Date: 5.AUG.2023 17:36:07



DWELL TIME CH39 DH3 (1.673ms * 160events = 267.68ms)
Date: 5.AUG.2023 17:39:28

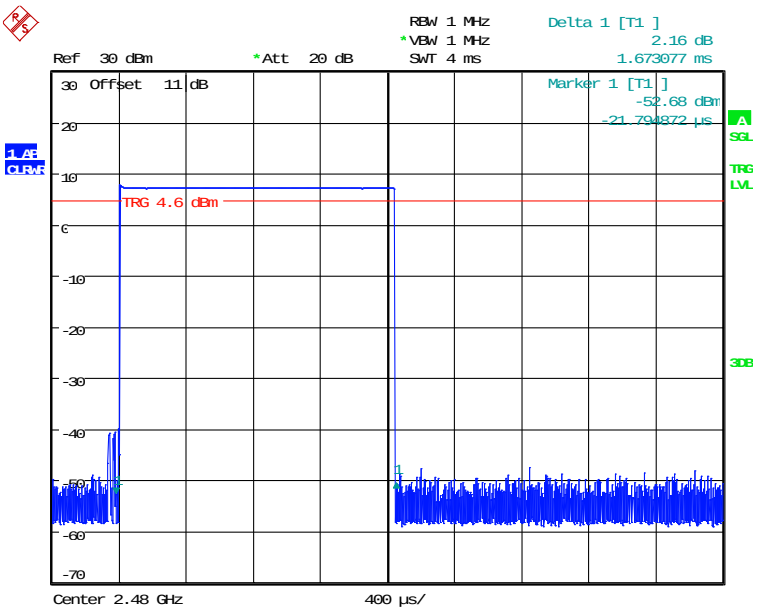


DWELL TIME CH39 DH5 (2.929ms * 106events = 310.474ms)
Date: 5.AUG.2023 17:41:41

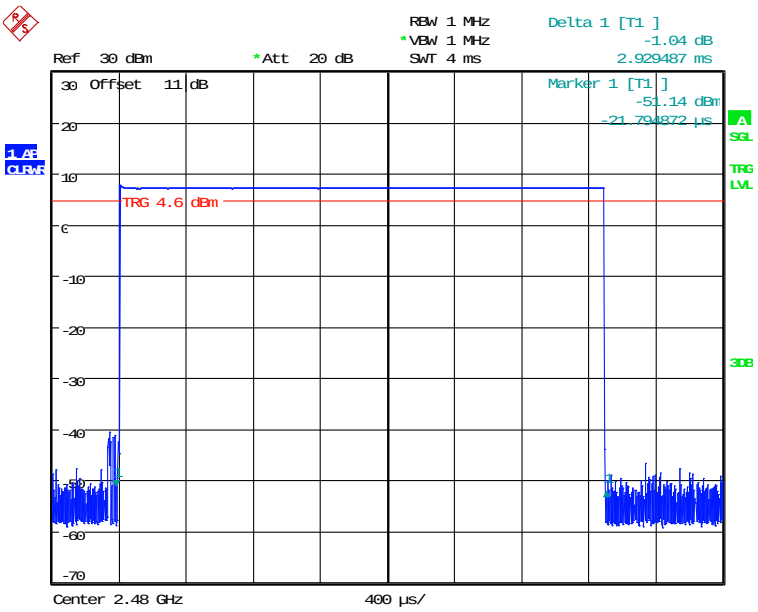


DWELL TIME CH78 DH1 (0.41ms * 320events = 131.2ms)
Date: 5.AUG.2023 17:37:57

Registration number: W6M22307-22823-C-1
FCC ID: IR5RK15



DWELL TIME CH78 DH3 (1.673ms * 160events = 267.68ms)
Date: 5.AUG.2023 17:39:00



DWELL TIME CH78 DH5 (2.929ms * 106events = 310.474ms)
Date: 5.AUG.2023 17:42:02