

NCC RADIO TEST REPORT

Product name	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter
Applicant	LM TECHNOLOGIES LIMITED
Manufacture	LM TECHNOLOGIES LIMITED
Rating(s)	DC 5V
Trademark	LM Technologies
Model and/or type reference	LM842
Standard	LP0002:2020
Test Result	PASS

Date of receipt : 12-31-2021

Date of Issue : 02-14-2022

signature :



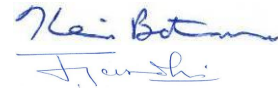
NCC RADIO TEST REPORT

Report Reference No.: M220216N2-01

Compiled by (+ signature).....: Kevin Bothmann

Approved by (+ signature): Jay Gandhi

Date of issue: 2022-02-14



Applicant's name.....: LM TECHNOLOGIES LIMITED

Address: Camrose House, 2A Camrose Avenue, Edgware, London, HA8 6EG, United Kingdom

Manufacture's Name.....: LM TECHNOLOGIES LIMITED

Address: Camrose House, 2A Camrose Avenue, Edgware, London, HA8 6EG, United Kingdom

Test specification:

Standard.....: LP0002: 2020

Test procedure: EIA 603 、ANSI 、FCC/47 CFR/2.1046 、 2.1047 、 2.1049 、 2.1051 、 2.1053 and 2.1055

Non-standard test method.....: N/A

Test item description

Product name.....: LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter

Trademark.....: LM Technologies

Model and/or type reference: LM842

Rating(s): DC 5V

Testing Laboratory information:

Testing Laboratory Name: Electro Magnetic Test, Inc.

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Testing:

Date of receipt of test item: Dec. 31, 2021

Date (s) of performance of tests: Dec. 31, 2021~ Feb. 14, 2022

Date of Issue: Feb. 14, 2022

Test Result.....: **Pass**

GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Electro Magnetic Test, Inc., which is an independent testing and consulting firm. The test report is based on testing performed Electro Magnetic Test, Inc. personnel according to the measurement procedure described in the test specification given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form unless done so in full.

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Federal Government.

Electro Magnetic Test, Inc. is recognized by the following agencies for performing EMI/EMC testing:

COUNTRY	AGENCY	IDENTIFYING #
USA	Federal Communications Commission (FCC) (EMT's test site is recognized by the FCC)	Registration Number: 90576
USA, Canada, Taiwan, Australia/New Zealand, European Community	National Voluntary Lab Accreditation Program (NVLAP) (EMT is accredited by NVLAP. A copy of the NVLAP Scope Of Accreditation is available upon request.)	Lab Code: 200147-0
Canada	Industry Canada	File No.: IC 2804
Japan	Voluntary Control Council For Interference (VCCI)	See Below
	Open Field Test Site "A"	R-589
	Mains Conducted Emissions Test Site "A"	C-604
	Telecom Conducted Emissions Test Site "A"	T-1655
	3 Meter Semi-Anechoic Chamber Site "E"	R-3227
	3 Meter Semi-Anechoic Chamber Site "E" (1GHz – 6GHz)	G-219
	Mains Conducted Emissions Test Site "E"	C-35793
	Telecom Conducted Emissions Test Site "E"	T-1715
Korea	Ministry of Information and Communication's Radio Research Laboratory (RRL) under the Asia Pacific Economic Cooperation (APEC) Mutual Recognition Arrangement (A copy of the Scope Of Accreditation is available upon request)	US0036
Taiwan	Bureau Of Standards, Metrology and Inspection (BSMI)	Reference Number: SL2-IN-E-1024
Australia / New Zealand	Australian Communications Authority (AUSTEL)	*

***THESE AGENCIES DO NOT ISSUE AN IDENTIFYING NUMBER TO TEST LABS.**

Table of Contents	Page
GENERAL REPORT SUMMARY	3
1 . SUMMARY OF TEST RESULTS	6
1.1 MEASUREMENT UNCERTAINTY	7
2 . GENERAL INFORMATION	8
2.1 GENERAL DESCRIPTION OF EUT	8
2.2 DESCRIPTION OF TEST MODES	10
2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING	10
2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	11
2.5 DESCRIPTION OF SUPPORT UNITS	14
3 . ON TIME, DUTY CYCLE AND MEASUREMENT METHODS	17
3.1 LIMITS	17
3.2 ON TIME AND DUTY CYCLE RESULTS	17
4 . EMC EMISSION TEST	20
4.1 CONDUCTED EMISSION MEASUREMENT	20
4.1.1 POWER LINE CONDUCTED EMISSION LIMITS	20
4.1.2 TEST PROCEDURE	21
4.1.3 DEVIATION FROM TEST STANDARD	21
4.1.4 TEST SETUP	21
4.1.5 TEST RESULTS	22
4.2 RADIATED EMISSION MEASUREMENT	26
4.2.1 RADIATED EMISSION LIMITS	26
4.2.2 TEST PROCEDURE	27
4.2.3 TEST SETUP	27
4.2.4 EUT OPERATING CONDITIONS	28
4.2.5 TEST RESULTS	29
4.2.6 TEST RESULTS (ABOVE 1000 MHZ)	36
4.2.7 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)	44
5 . OCCUPIED BANDWIDTH TEST	46
5.1 APPLIED PROCEDURES / LIMIT	46
5.1.1 TEST PROCEDURE	46
5.1.2 TEST SETUP	46
5.1.3 EUT OPERATION CONDITIONS	46
5.1.4 TEST RESULTS	47
6 . POWER DENSITY	55
6.1 APPLIED PROCEDURES / LIMIT	55
6.1.1 TEST PROCEDURE	55

Table of Contents	Page
6.1.2 TEST SETUP	55
6.1.3 EUT OPERATION CONDITIONS	55
6.1.4 TEST RESULTS	56
7 . PEAK OUTPUT POWER TEST	72
7.1 APPLIED PROCEDURES / LIMIT	72
7.1.1 TEST PROCEDURE	72
7.1.2 DEVIATION FROM STANDARD	72
7.1.3 TEST SETUP	72
7.1.4 EUT OPERATION CONDITIONS	72
7.1.5 TEST RESULTS	73
8 . ANTENNA CONDUCTED SPURIOUS EMISSION	74
8.1 APPLIED PROCEDURES / LIMIT	74
8.1.1 TEST PROCEDURE	74
8.1.2 TEST SETUP	74
8.1.3 EUT OPERATION CONDITIONS	74
8.1.4 TEST RESULTS	75
9. ANTENNA REQUIREMENT	91
9.1 STANDARD REQUIREMENT	91
9.2 EUT ANTENNA	91
10. EUT TEST PHOTO	92
11 . APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS	95

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

LP0002 : 2020			
Standard Section	Test Item	Judgment	Remark
3.3	Conducted Emission	PASS	None
4.10.1.5/3.6	Radiated Spurious Emission	PASS	None
4.10.1.2	Peak Output Power	PASS	None
4.10.1.6	6dB Occupied Bandwidth	PASS	None
4.10.1.6	Power Density	PASS	None
4.10.1.5/3.6	Restricted Bands	PASS	None
4.10.1.5/3.6	Antenna Conducted Spurious Emission	PASS	None
4.10.1.3	Antenna Requirement	PASS	None
4.10.1.5/3.3/3.6	Receiver Emissions	PASS	None

NOTE:

(1) "N/A" denotes test is not applicable in this test report.

1.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95** %.

No.	Item	Uncertainty
1	Conducted Emission Test	1.38dB
2	Radiated Emission Test	3.17dB
3	RF power,conducted	0.16dB
4	Spurious emissions,conducted	0.21dB
5	All emissions,radiated(<1G)	4.68dB
6	All emissions,radiated(>1G)	4.89dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	
Trade Name	LM Technologies	
Model Name	LM842	
Serial Model Name	N/A	
Product Description	The EUT is a LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	
	Operation Frequency:	802.11b/g/n (20MHz): 2412~2462MHz 802.11n (40MHz):2422~2452MHz
	Modulation Type:	802.11b(DSSS):CCK,DQPSK,DBPSK 802.11g(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM): BPSK,QPSK,16-QAM,64-QAM
	Bit Rate of Transmitter	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 75Mbps
	Number Of Channel	Please see Note 2.
	Antenna Designation:	Please see Note 3.
	Antenna Gain(Peak)	Please see Note 3.
	Output Power:	802.11b: 12.44dBm 802.11g: 13.88Bm 802.11n20: 14.92dBm 802.11n40: 14.86dBm
Channel List	Please refer to the Note 2.	
Rating	Input: DC 5V	
Connecting I/O Port(s)	Please refer to the User's Manual	
Products Covered	N/A	
EUT Modification(s)	N/A	
Model difference	N/A	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.

Operation Frequency of channel			
802.11b/g/n(20MHz)		Channel List for 802.11n(40MHz)	
Channel	Frequency	Channel	Frequency
01	2412	03	2422
02	2417	04	2427
03	2422	05	2432
04	2427	06	2437
05	2432	07	2442
06	2437	08	2447
07	2442	09	2452
08	2447		
09	2452		
10	2457		
11	2462		

3.
Table for Filed Antenna

Ant	Trade Name	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	LM Technologies	LM842	PIFA antenna	N/A	ANT A: -0.17dBi	MIMO: 2.62dBi
2		LM842	PIFA antenna	N/A	ANT B: -0.61dBi	

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	802.11b: All Rate
Mode 2	802.11g: All Rate
Mode 3	802.11n(20MHz): All Rate
Mode 4	802.11n(40MHz): All Rate
Mode 5	Working
Mode 6	RX

For Conducted Emission	
Final Test Mode	Description
Mode 3	TX(worst case)
Mode 5	Working

For Radiated Emission	
Final Test Mode	Description
Mode 3	TX(worst case)
Mode 5	Working
Mode 6	RX

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The highest frequency of the internal sources of the EUT is less than 108MHz, Working mode measurement shall only be made up to 1GHz.

2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters.

RF Function	Type	Mode Or Modulation type	ANT Gain(dBi)	ANT_A Power Class	ANT_B Power Class	Test Software
WIFI(2.4G)	2.4G WIFI	802.11b	ANT A : -0.17 ANT B : -0.61 MIMO A+B : 2.62	60	60	RTL11ac_8822CU Version: v2.00
		802.11g		25	25	
		802.11n(HT20)		25	25	
		802.11n(HT40)		25	25	

1. Connect the computer with USB ports.
2. Open the "RTL11ac_8822CU" test software.
3. Set the commands and click "ENTER" transmitter.

2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Block diagram of EUT configuration

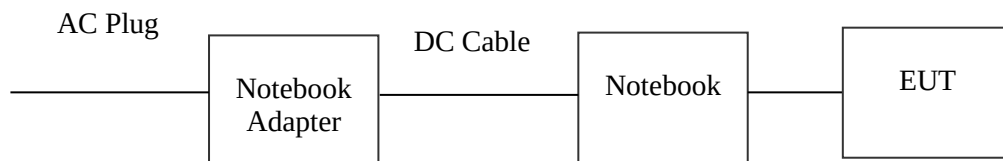
CONDUCTED EMISSION

Test mode: mode 3

Non-Conductive Table

80 cm above Ground Plane

CONDUCTED EMISSION Test Set



Block diagram of EUT configuration

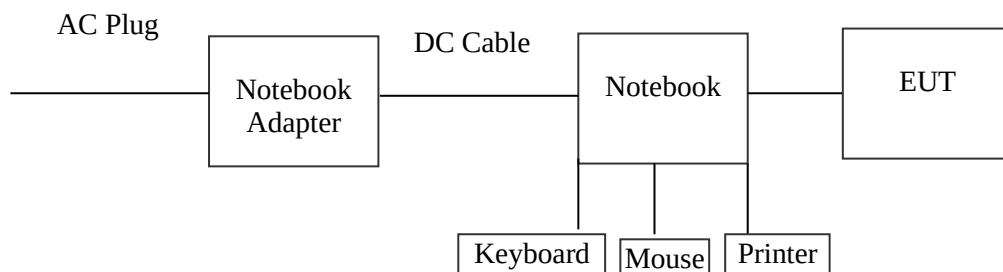
CONDUCTED EMISSION

Test mode: mode 5

Non-Conductive Table

80 cm above Ground Plane

CONDUCTED EMISSION Test Set



Block diagram of EUT configuration

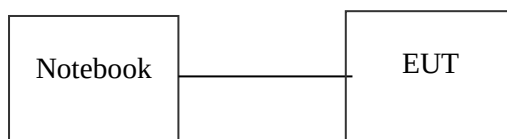
RADIATED EMISSION

Test mode: mode 3, 6

Non-Conductive Table

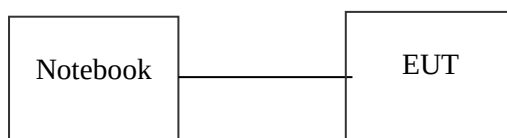
80 cm above Ground Plane

Below 1 GHz Radiation Test Set



150 cm above Ground Plane

Above 1 GHz Radiation Test Set



Block diagram of EUT configuration

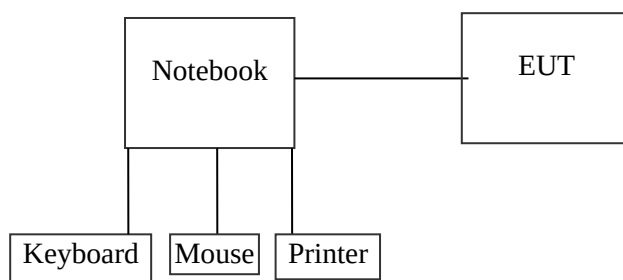
RADIATED EMISSION

Test mode: mode 5

Non-Conductive Table

80 cm above Ground Plane

Below 1 GHz Radiation Test Set



2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
/	Notebook Adapter	LENOVO	ADLX45DLC3A	N/A	N/A	support units.*
/	Notebook	LENOVO	ThinkPad E470	N/A	N/A	
/	DC Cable	LENOVO	ADLX45DLC3A	N/A	N/A	
/	Keyboard	Acer	SK-9624	N/A	N/A	
/	Mouse	HP	MODGUO	N/A	N/A	
/	Printer	HP	HP1020	N/A	N/A	

Item	Equipment	Mfr/Brand	Model/Type No.	Note
N/A	N/A	N/A	N/A	N/A

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” means “shielded” or “with ferrite core”; “NO” means “unshielded” or “without ferrite core”
- (4) “*”: In this report, the applicant did not provide the accompanying accessories with the equipment. The accessories were provided by the laboratory (or the applicant) and inspected simultaneously.

2.5.1 EQUIPMENTS LIST FOR ALL TEST ITEMS

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. CYCLE
Spectrum Analyzer	Keysight	N9020A	MY53300466	April 29, 2021	1 Year
RF Preselector	Hewlett Packard	85685A	3010A01157	April 29, 2021	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650	2521A00584	April 29, 2021	1 Year
Preamplifier	Com Power	PA-102	1482	April 29, 2021	1 Year
RF Attenuator	Mini-Circuits	CAT-10	Asset #1000	December 07, 2021	1 Year
LISN	Com Power	LI-200	12012	September 09, 2021	1 Year
LISN	Com Power	LI-200	12214	September 09, 2021	1 Year
LISN	Com Power	LI-200	1767	September 09, 2021	1 Year
LISN	Com Power	LI-200	1768	September 09, 2021	1 Year
Biconical Antenna	Com Power	AB-100	01557	December 29, 2021	1 Year
Log Periodic Antenna	Com Power	AL-100	16037	December 22, 2021	1 Year
Horn Antenna	Com Power	AHA-118	711054	December 22, 2021	1 Year
Antenna Mast	Com Power	AM-400	N/A	N/A	N/A
Turntable	Com Power	TT-100	N/A	N/A	N/A
Computer	Dell, Inc.	DHS	DNSV641	N/A	N/A

EMI Test Equipment (Continued)

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. CYCLE
EMI Receiver	Rohde & Schwarz	ESU40	100127	June 12, 2021	1 Year
BiConiLog Antenna	ETS-Lindgren	3142D	00102183	August 13, 2021	1 Year
Horn Antenna (1GHz-18GHz)	ETS-Lindgren	3117	00109294	May 6, 2021	1 Year
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170242	May 6, 2021	1 Year
Preamplifier	Rohde & Schwarz	TS-PR18	100056	June 12, 2021	1 Year
Pre-Amplifier	Agilent	8449B	3008A00409	June 12, 2021	1 Year
Antenna Mast	ETS-Lindgren	2175	00095727	N/A	N/A
Turntable	ETS-Lindgren	2187-3.0	00118231	N/A	N/A
Computer	Acer	Aspire 8930	85100050123	N/A	N/A
Multi-Function Controller	ETS-Lindgren	2090	00102270	N/A	N/A
Loop Antenna	ARA	PLA-1030/B	1029	May 19, 2021	1 Year

3. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

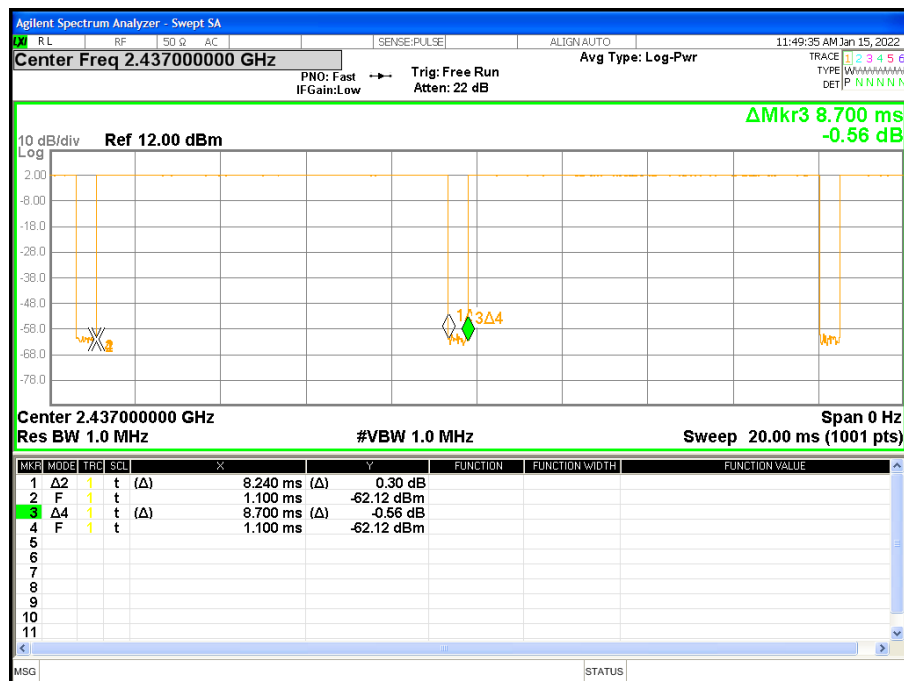
3.1 LIMITS

None; for reporting purposes only.

3.2 ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	10log(1/x)Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11B	8.2400	8.7000	0.947	94.71%	0.24	0.121
802.11G	1.3720	1.8600	0.738	73.76%	1.32	0.729
802.11N20(MHz)	1.2840	1.7760	0.723	72.30%	1.41	0.779
802.11N40(MHz)	0.6380	1.1340	0.563	56.26%	2.50	1.567

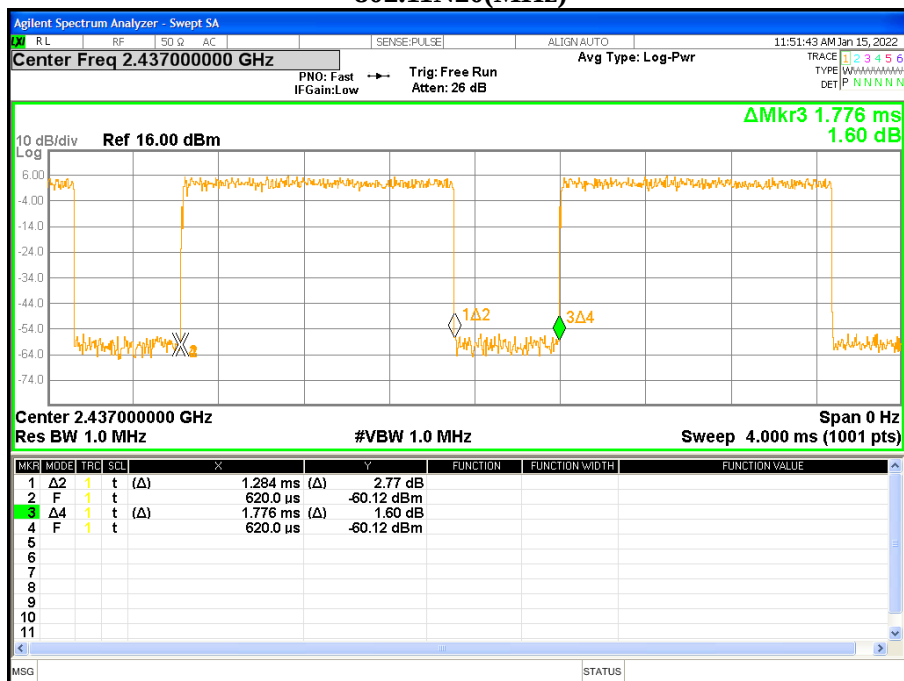
802.11B



802.11G



802.11N20(MHz)



Agilent Spectrum Analyzer - Swept SA

Center Freq 2.43700000 GHz

PNO: Fast IF Gain: Low Trig: Free Run Atten: 12 dB Avg Type: Log-Pwr

Ref 1.00 dBm

ΔMkr3 1.134 ms
2.64 dB

Mkrs	Δ2	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	t	(Δ)	638.0 us	-2.14 dB			
2	F	t		104.0 us	-77.84 dBm			
3	Δ4	t	(Δ)	1.134 ms	2.64 dB			
4	F	t		104.0 us	-77.84 dBm			

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150kHz-30MHz)

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	LP0002
0.50 -5.0	56.00	46.00	LP0002
5.0 -30.0	60.00	50.00	LP0002

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

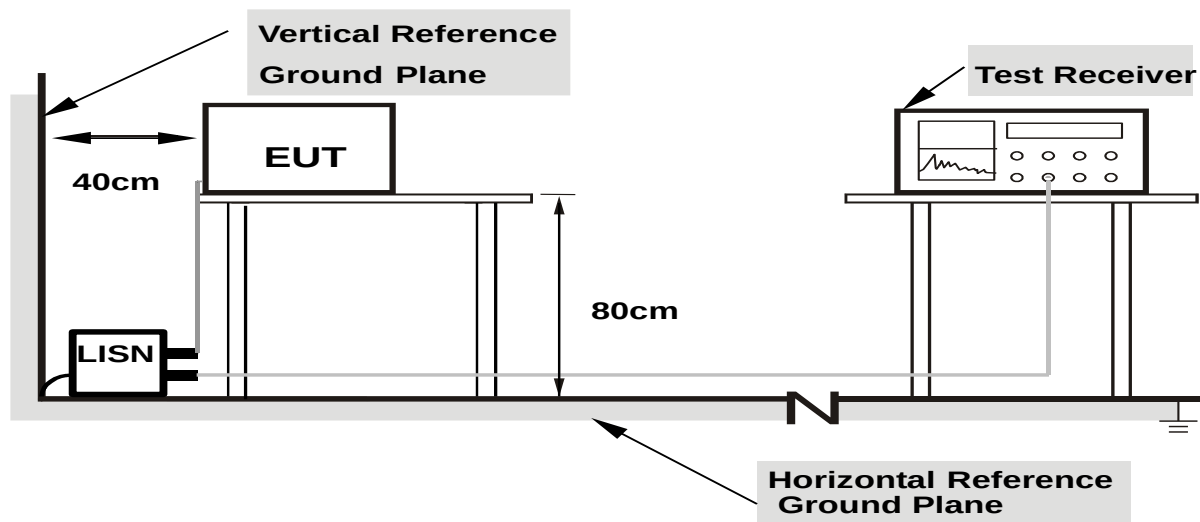
4.1.2 TEST PROCEDURE

- The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

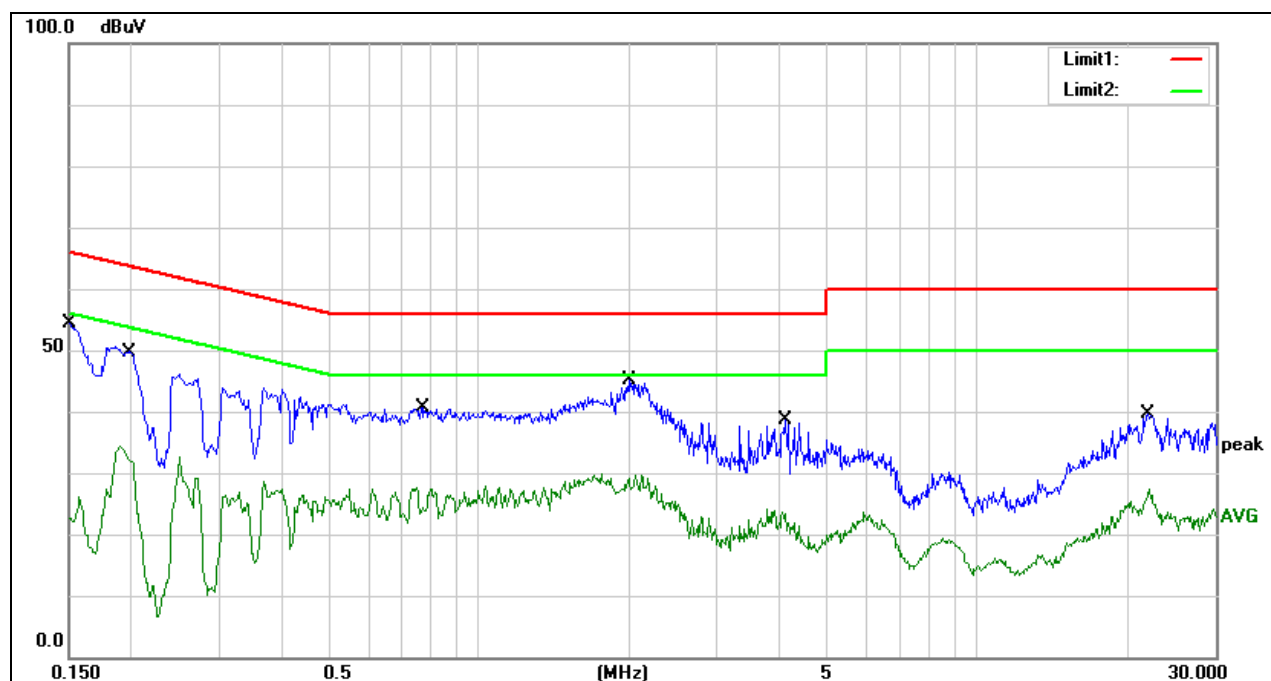
4.1.4 TEST SETUP



- Note: 1.**Support units were connected to second LISN.
- 2.**Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.1.5 TEST RESULTS

EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name. :	LM842
Temperature :	24.1 °C	Relative Humidity :	41%
Pressure :	1010hPa	Test Date :	2022-01-10
Test Mode :	TX(worst case)	Phase :	L
Test Voltage :	AC 110V/60Hz		

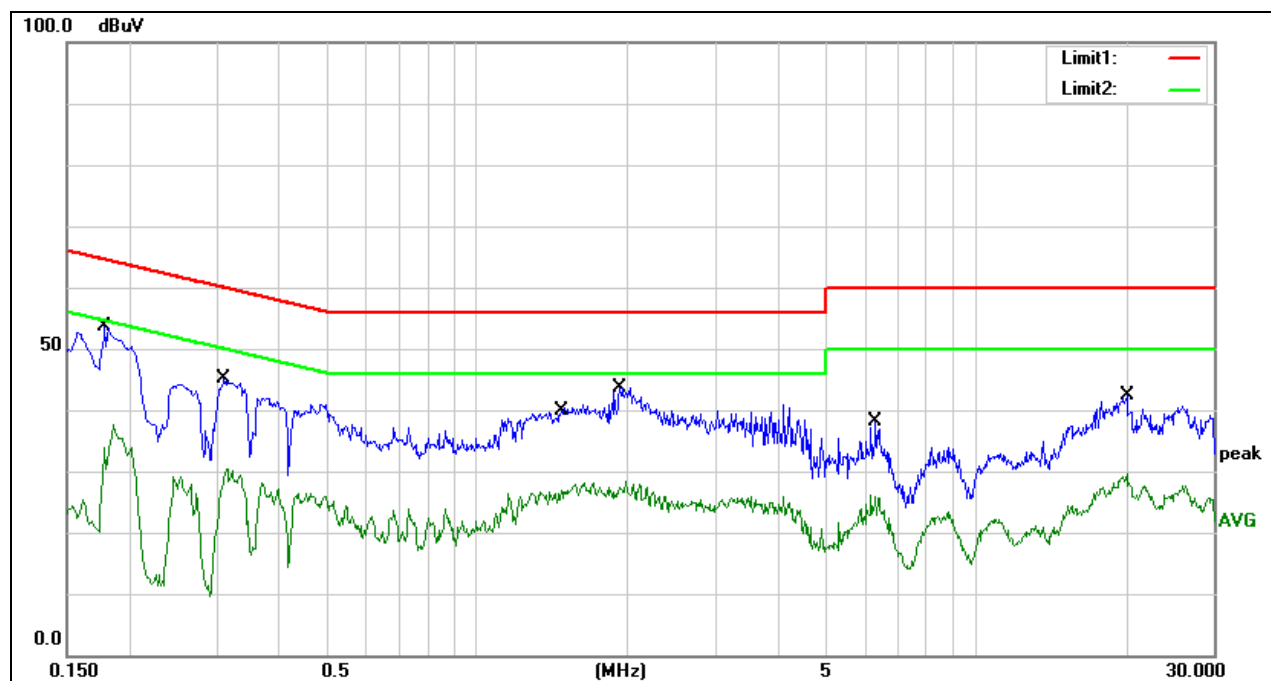


Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = LISN factor + Cable Loss + Pulse limiter.

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1500	34.12	20.33	54.45	66.00	-11.55	QP
2	0.1500	7.11	20.33	27.44	56.00	-28.56	AVG
3	0.2006	29.09	20.31	49.40	63.59	-14.19	QP
4	0.2006	13.57	20.31	33.88	53.59	-19.71	AVG
5	0.7700	20.25	20.34	40.59	56.00	-15.41	QP
6	0.7700	7.20	20.34	27.54	46.00	-18.46	AVG
7	1.9980	24.80	20.30	45.10	56.00	-10.90	QP
8	1.9980	9.25	20.30	29.55	46.00	-16.45	AVG
9	4.1060	18.30	20.41	38.71	56.00	-17.29	QP
10	4.1060	3.63	20.41	24.04	46.00	-21.96	AVG
11	21.9540	16.90	22.78	39.68	60.00	-20.32	QP
12	21.9540	4.48	22.78	27.26	50.00	-22.74	AVG

EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name. :	LM842
Temperature :	24.1 °C	Relative Humidity :	41%
Pressure :	1010hPa	Test Date :	2022-01-10
Test Mode :	TX(worst case)	Phase :	N
Test Voltage :	AC 110V/60Hz		

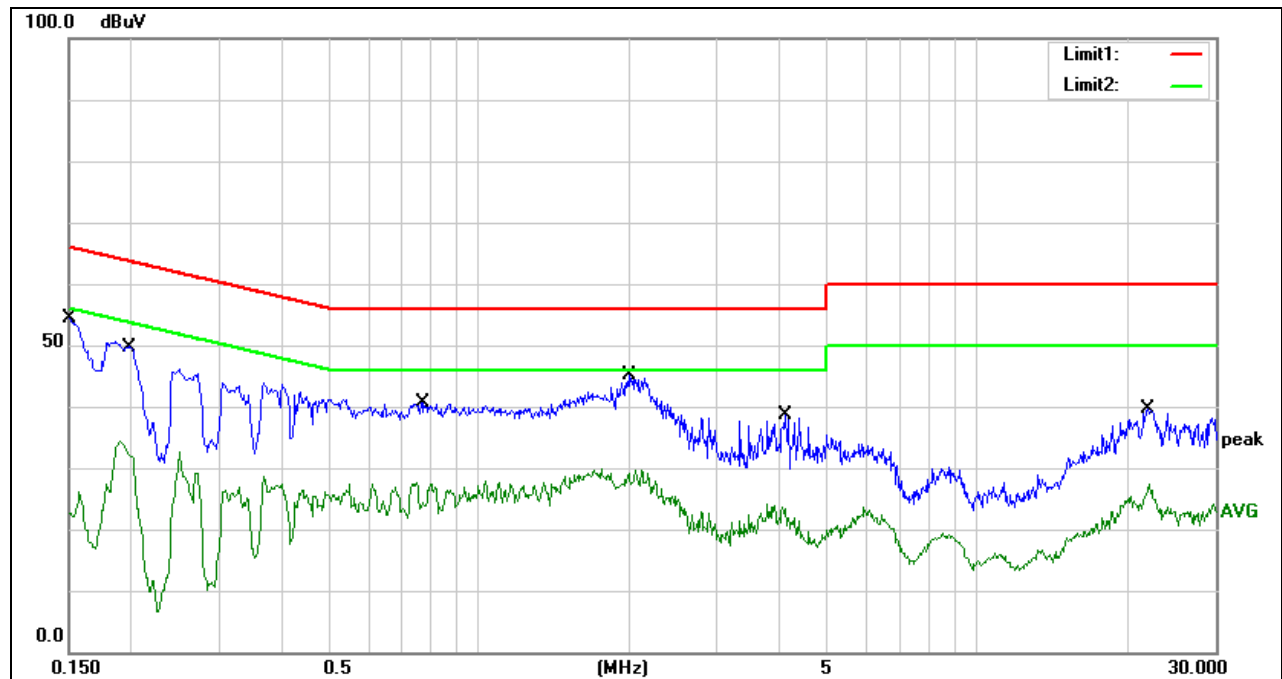


Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = LISN factor + Cable Loss + Pulse limiter.

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1785	33.20	20.31	53.51	64.56	-11.05	QP
2	0.1785	17.22	20.31	37.53	54.56	-17.03	AVG
3	0.3100	24.30	20.73	45.03	59.97	-14.94	QP
4	0.3100	9.65	20.73	30.38	49.97	-19.59	AVG
5	1.4780	19.63	20.30	39.93	56.00	-16.07	QP
6	1.4780	7.72	20.30	28.02	46.00	-17.98	AVG
7	1.9300	23.30	20.30	43.60	56.00	-12.40	QP
8	1.9300	8.04	20.30	28.34	46.00	-17.66	AVG
9	6.2940	17.65	20.53	38.18	60.00	-21.82	QP
10	6.2940	5.67	20.53	26.20	50.00	-23.80	AVG
11	20.1420	19.57	22.89	42.46	60.00	-17.54	QP
12	20.1420	6.84	22.89	29.73	50.00	-20.27	AVG

EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name. :	LM842
Temperature :	24.1 °C	Relative Humidity :	41%
Pressure :	1010hPa	Test Date :	2022-01-10
Test Mode :	Working	Phase :	L
Test Voltage :	AC 110V/60Hz		

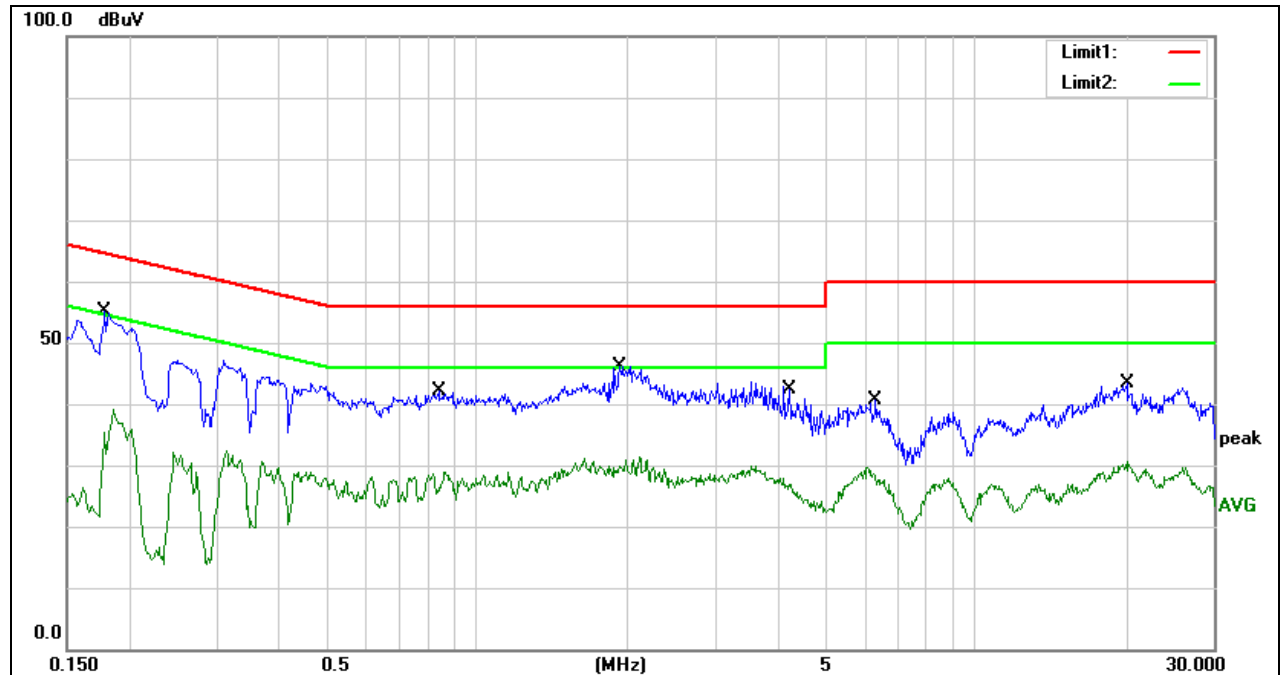


Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = LISN factor + Cable Loss + Pulse limiter.

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1860	34.24	20.31	54.55	64.21	-9.66	QP
2	0.1860	18.04	20.31	38.35	54.21	-15.86	AVG
3	0.4020	25.11	20.54	45.65	57.81	-12.16	QP
4	0.4020	9.52	20.54	30.06	47.81	-17.75	AVG
5	1.9980	25.80	20.30	46.10	56.00	-9.90	QP
6	1.9980	10.57	20.30	30.87	46.00	-15.13	AVG
7	4.3940	20.31	20.42	40.73	56.00	-15.27	QP
8	4.3940	5.72	20.42	26.14	46.00	-19.86	AVG
9	6.1260	17.73	20.53	38.26	60.00	-21.74	QP
10	6.1260	6.99	20.53	27.52	50.00	-22.48	AVG
11	21.7540	17.51	22.79	40.30	60.00	-19.70	QP
12	21.7540	4.97	22.79	27.76	50.00	-22.24	AVG

EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name. :	LM842
Temperature :	24.1 °C	Relative Humidity :	41%
Pressure :	1010hPa	Test Date :	2022-01-10
Test Mode :	Working	Phase :	N
Test Voltage :	AC 110V/60Hz		



Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = LISN factor + Cable Loss + Pulse limiter.

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1785	34.70	20.31	55.01	64.56	-9.55	QP
2	0.1785	18.72	20.31	39.03	54.56	-15.53	AVG
3	0.8380	21.70	20.33	42.03	56.00	-13.97	QP
4	0.8380	8.56	20.33	28.89	46.00	-17.11	AVG
5	1.9300	25.80	20.30	46.10	56.00	-9.90	QP
6	1.9300	10.96	20.30	31.26	46.00	-14.74	AVG
7	4.2460	22.06	20.41	42.47	56.00	-13.53	QP
8	4.2460	9.58	20.41	29.99	46.00	-16.01	AVG
9	6.2940	20.15	20.53	40.68	60.00	-19.32	QP
10	6.2940	9.22	20.53	29.75	50.00	-20.25	AVG
11	20.1420	20.57	22.89	43.46	60.00	-16.54	QP
12	20.1420	7.84	22.89	30.73	50.00	-19.27	AVG

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 3.5, then the 3.6 limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to LP0002.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Frequency measurement range:

1 The spectrum shall be measured from the lowest radio frequency signal generated in the device (without going below 9 kHz), and the upper limit of the measurement range shall be decided according to the maximum operating frequency.

1.1 Maximum operating frequency less than 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

1.2 Maximum operating frequency between 10 GHz~30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

1.3 Maximum operating frequency over 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower.

2 Particular attention should be paid to harmonics and subharmonics of the carrier frequency as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked.

Spectrum Parameter		Setting	
Attenuation		Auto	
Start Frequency		1000 MHz	
Stop Frequency		10th carrier harmonic	
Measurement	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3MHz
AV	$\geq 98\%$	1MHz	10Hz
	$< 98\%$	1MHz	1/T

NOTE: KDB 558074 Zero-Span Spectrum Analyzer Method.

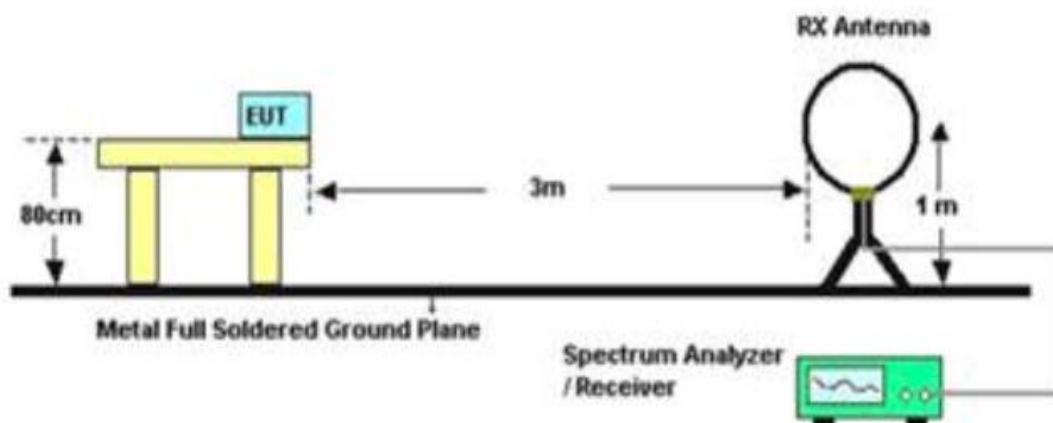
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.2.2 TEST PROCEDURE

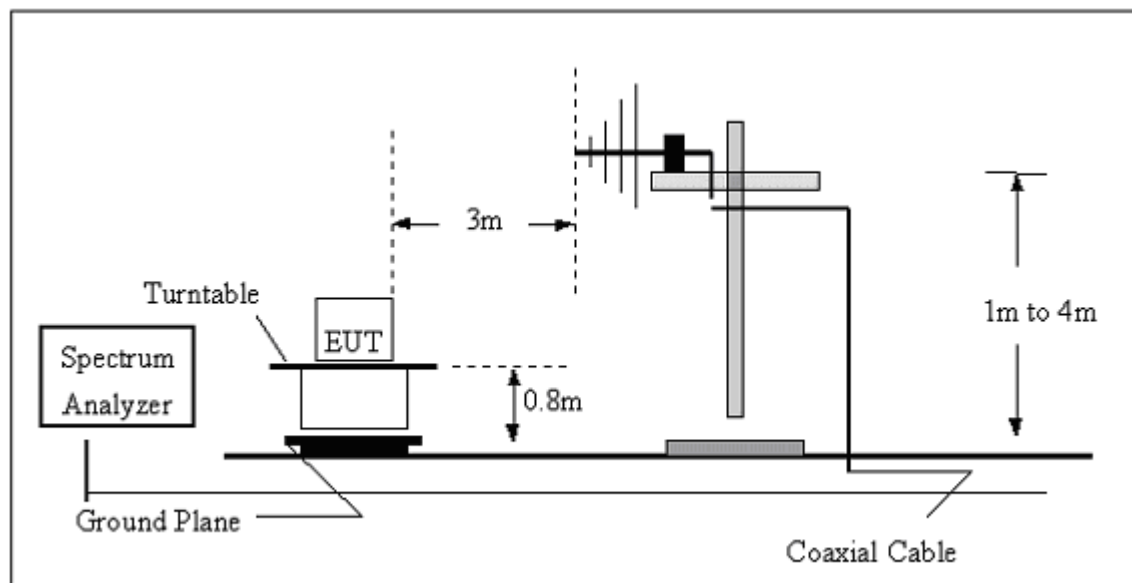
- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.3 TEST SETUP

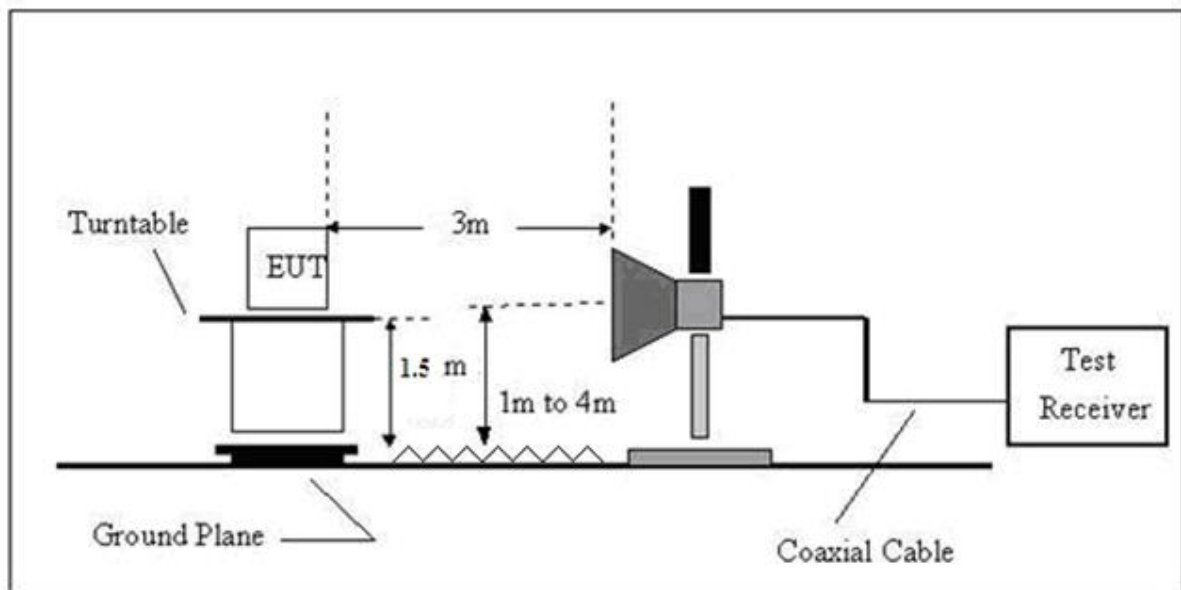
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



4.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

4.2.5 TEST RESULTS

Between 9KHz – 30 MHz

EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name. :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-10
Test Mode :	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	N/A
--	--	--	--	N/A

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

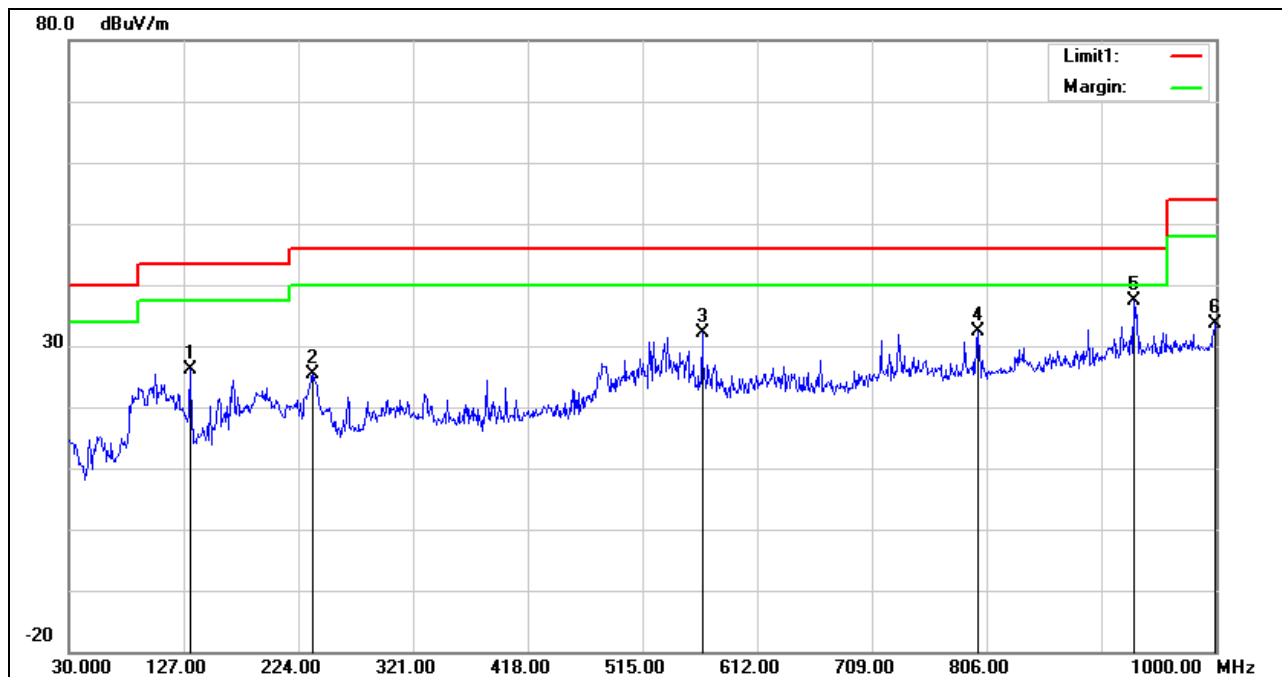
Distance extrapolation factor = $40 \log (\text{specific distance/test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

BETWEEN 30 – 1000 MHZ

Note: Pre-scan both the SISO and MIMO mode, only the worst-case results were reported.

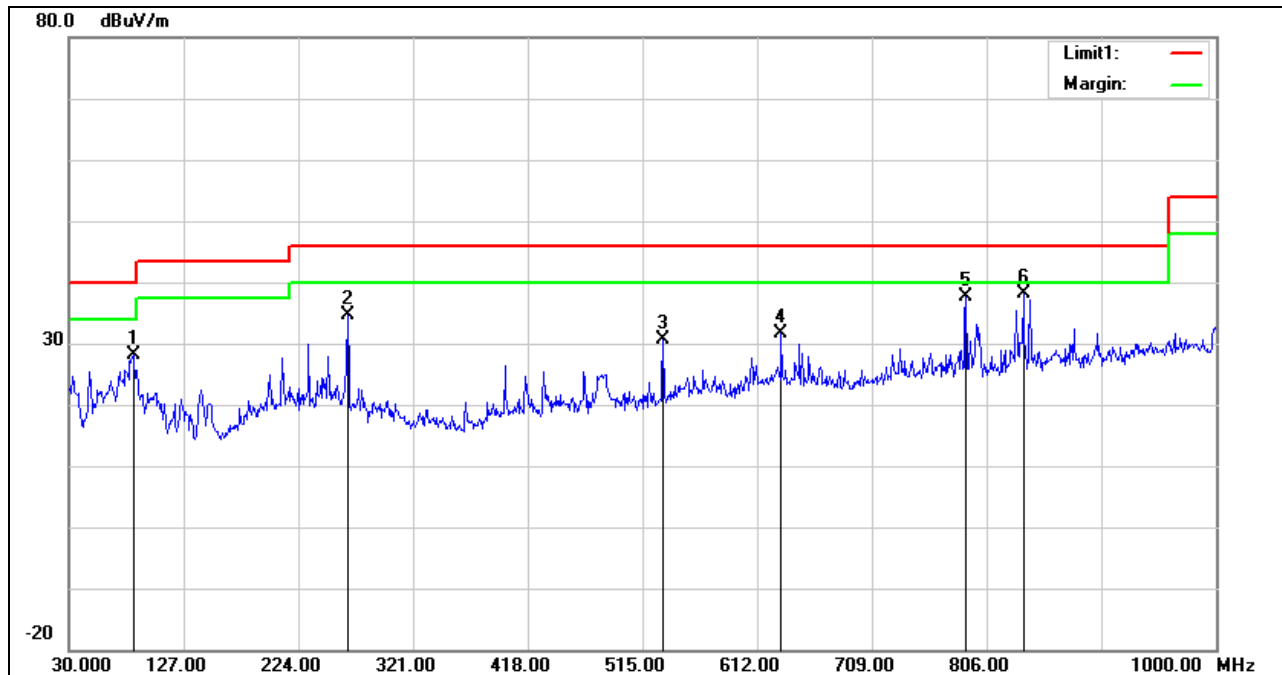
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name. :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-10
Test Mode :	TX 802.11n20/MIMO(Worst Case)	Polarization :	Horizontal
Test Power :	DC 5V		



Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	132.8200	44.19	-18.17	26.02	43.50	-17.48	peak
2	235.6400	44.10	-18.62	25.48	46.00	-20.52	peak
3	565.4400	37.77	-5.55	32.22	46.00	-13.78	peak
4	798.2400	34.34	-2.03	32.31	46.00	-13.69	peak
5	930.1600	36.74	0.56	37.30	46.00	-8.70	peak
6	999.0300	31.62	2.04	33.66	54.00	-20.34	peak

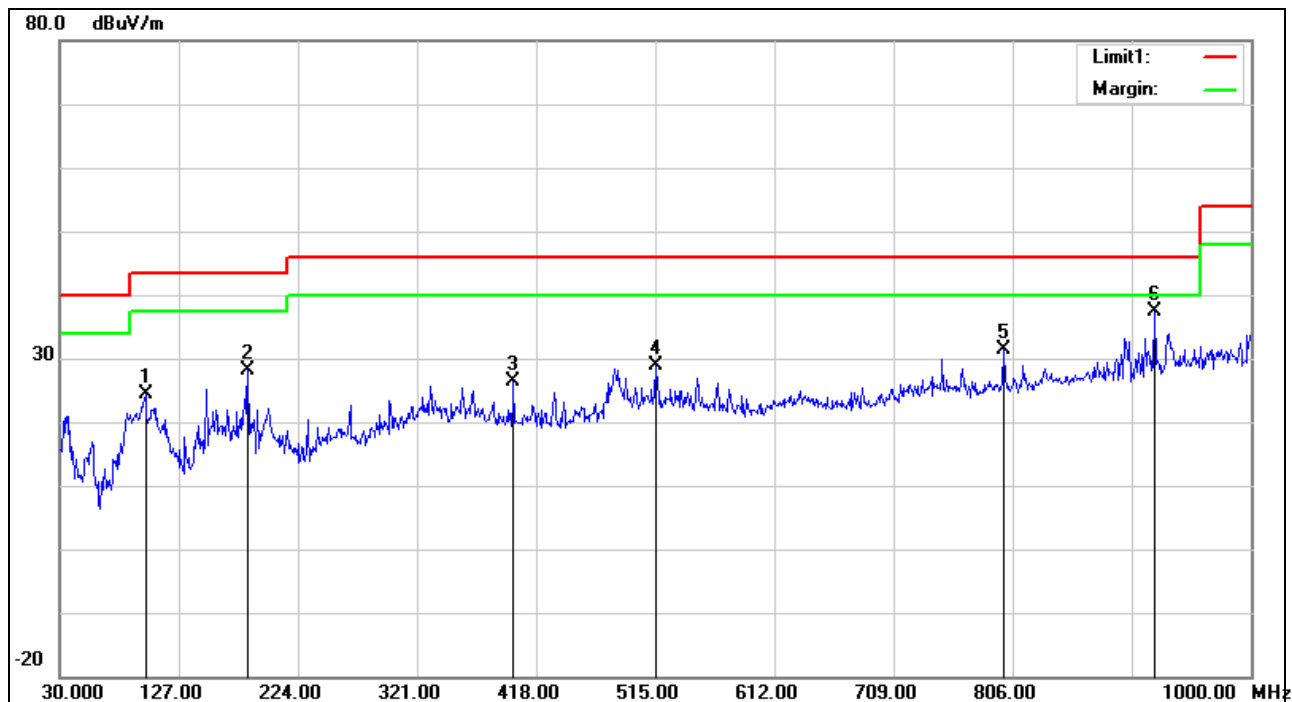
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name. :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-10
Test Mode :	TX 802.11n20/MIMO(Worst Case)	Polarization :	Vertical
Test Power :	DC 5V		



Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	84.3200	50.48	-22.35	28.13	40.00	-11.87	peak
2	265.7100	49.49	-14.83	34.66	46.00	-11.34	peak
3	532.4600	37.95	-7.31	30.64	46.00	-15.36	peak
4	632.3700	36.52	-5.00	31.52	46.00	-14.48	peak
5	788.5400	39.54	-2.00	37.54	46.00	-8.46	peak
6	837.0400	38.57	-0.46	38.11	46.00	-7.89	peak

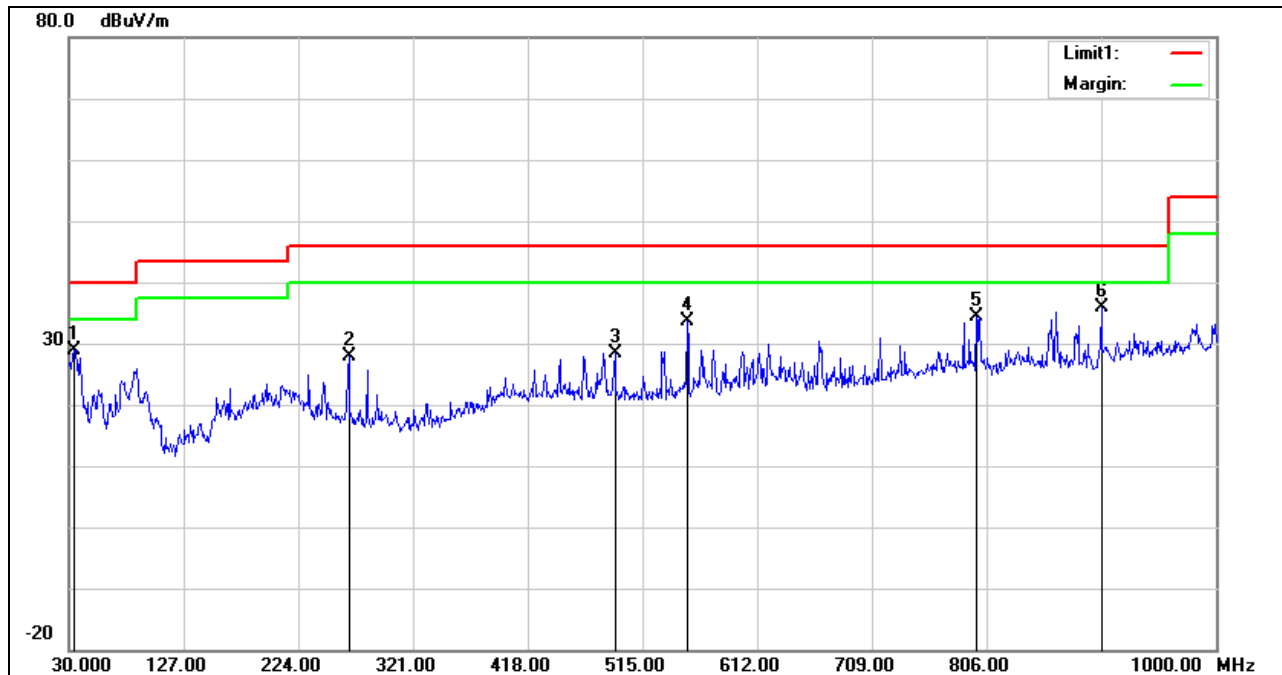
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name. :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-14
Test Mode :	Working	Polarization :	Horizontal
Test Power :	DC 5V		



Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	99.8400	44.64	-20.15	24.49	43.50	-19.01	peak
2	183.2600	48.51	-20.26	28.25	43.50	-15.25	peak
3	399.5700	37.55	-11.16	26.39	46.00	-19.61	peak
4	515.0000	36.77	-7.88	28.89	46.00	-17.11	peak
5	798.2400	33.38	-2.03	31.35	46.00	-14.65	peak
6	921.4300	37.20	0.06	37.26	46.00	-8.74	peak

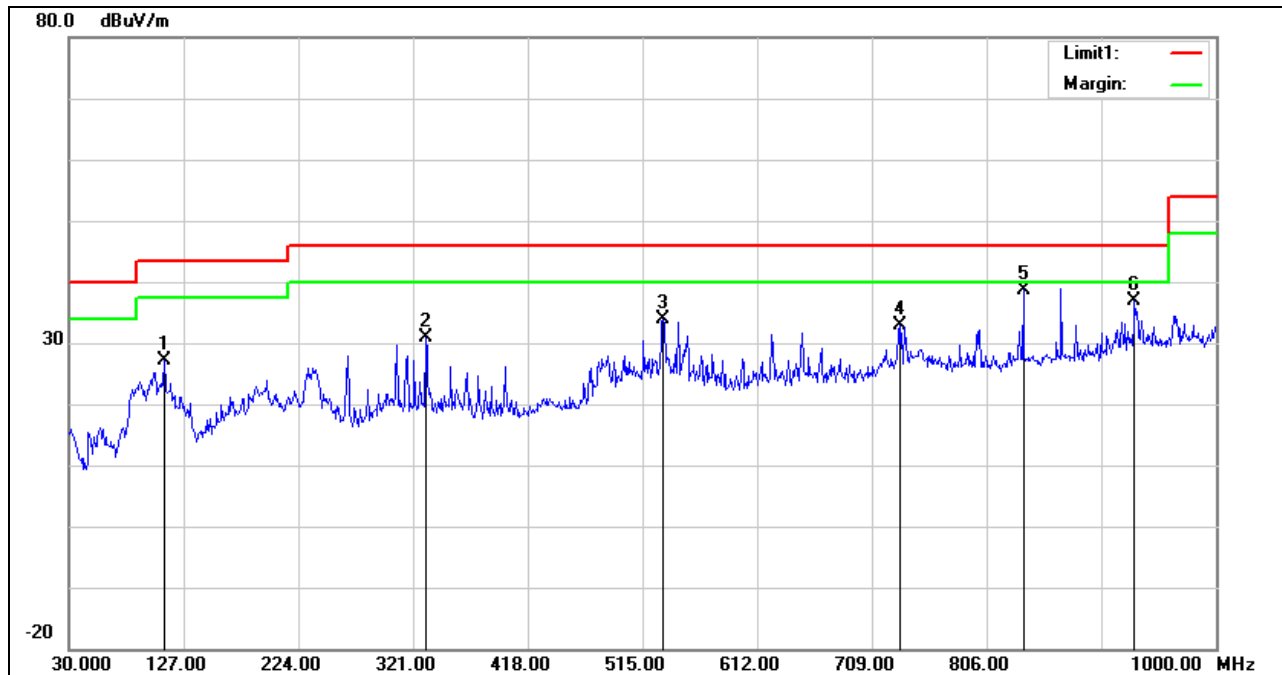
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name. :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-14
Test Mode :	Working	Polarization :	Vertical
Test Power :	DC 5V		



Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	34.8500	44.21	-15.34	28.87	40.00	-11.13	peak
2	266.6800	42.87	-14.94	27.93	46.00	-18.07	peak
3	491.7200	36.64	-8.18	28.46	46.00	-17.54	peak
4	552.8300	39.32	-5.69	33.63	46.00	-12.37	peak
5	797.2700	36.47	-2.03	34.44	46.00	-11.56	peak
6	903.0000	36.29	-0.37	35.92	46.00	-10.08	peak

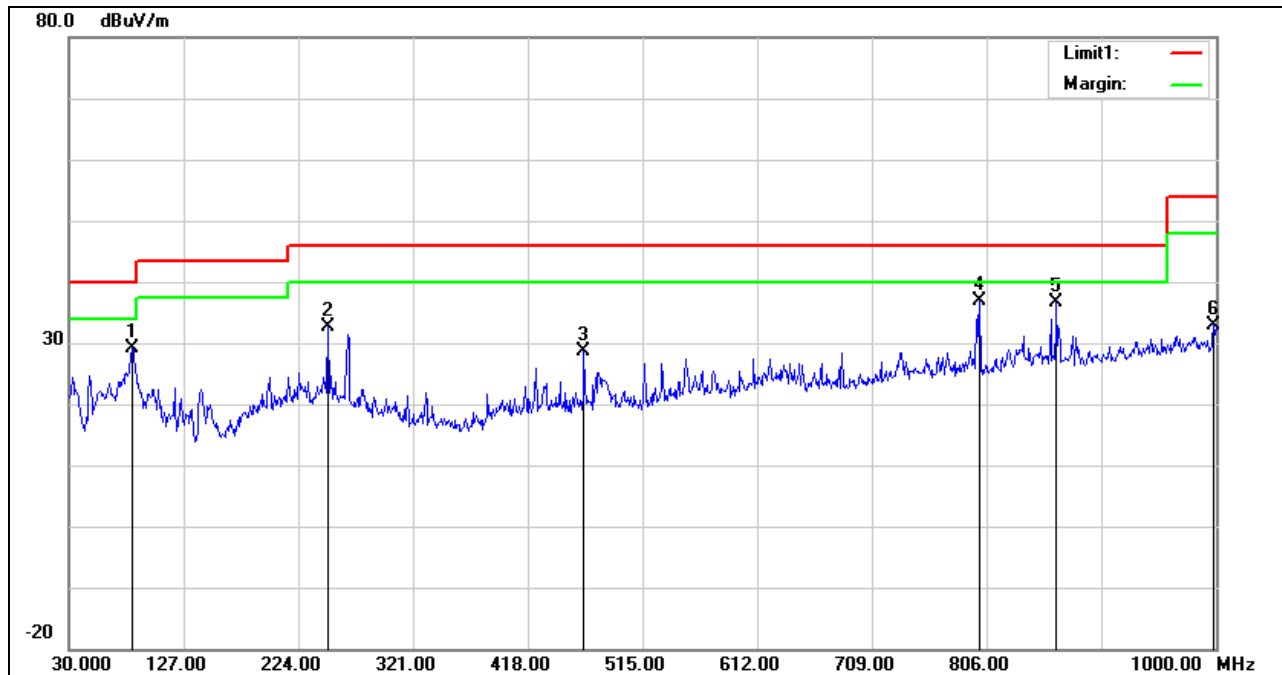
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name. :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-10
Test Mode :	RX	Polarization :	Horizontal
Test Power :	DC 5V		



Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	110.5100	46.14	-19.01	27.13	43.50	-16.37	peak
2	331.6700	44.58	-13.65	30.93	46.00	-15.07	peak
3	532.4600	41.28	-7.31	33.97	46.00	-12.03	peak
4	732.2800	35.36	-2.39	32.97	46.00	-13.03	peak
5	837.0400	39.19	-0.46	38.73	46.00	-7.27	peak
6	931.1300	36.36	0.64	37.00	46.00	-9.00	peak

EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name. :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-10
Test Mode :	RX	Polarization :	Vertical
Test Power :	DC 5V		



Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	83.3500	51.60	-22.52	29.08	40.00	-10.92	peak
2	249.2200	49.02	-16.27	32.75	46.00	-13.25	peak
3	465.5300	37.90	-9.21	28.69	46.00	-17.31	peak
4	800.1800	38.81	-2.05	36.76	46.00	-9.24	peak
5	865.1700	37.00	-0.48	36.52	46.00	-9.48	peak
6	998.0600	30.96	2.04	33.00	54.00	-21.00	peak

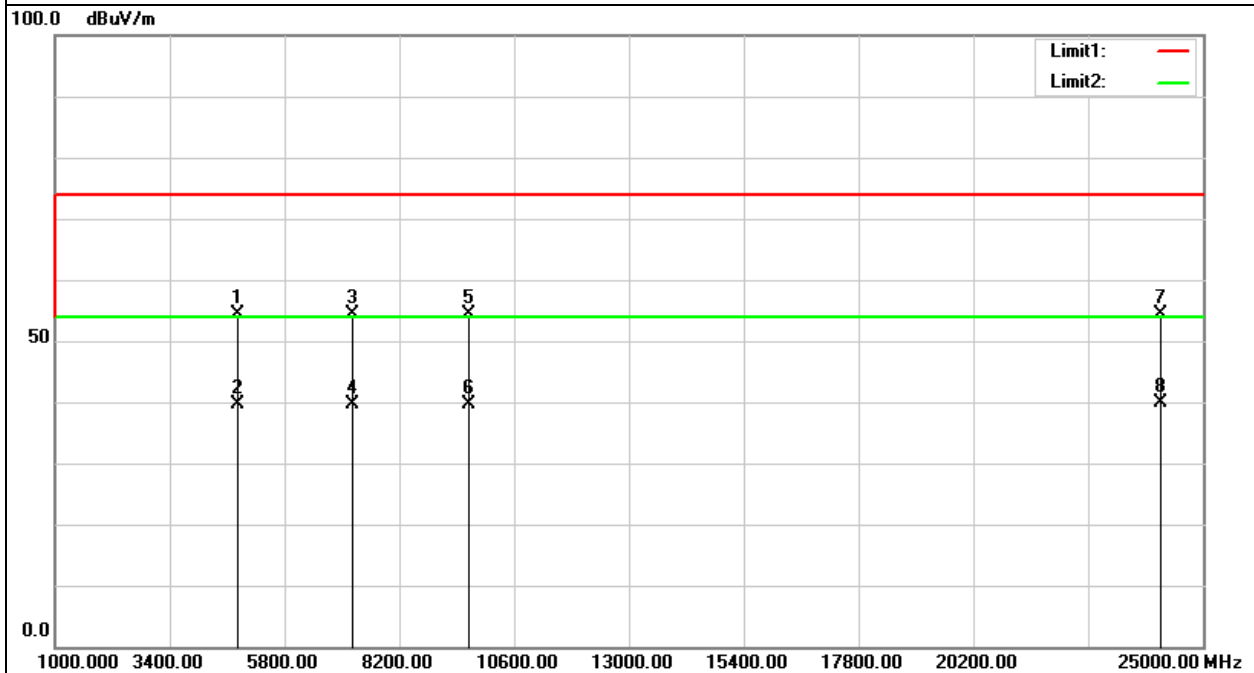
4.2.6 TEST RESULTS (ABOVE 1000 MHZ)

Note: Pre-scan both the SISO and MIMO mode, only the worst-case results were reported

EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-10
Test Mode :	TX CH01 (802.11n20 : Rate 6.5Mbps)	Polarization :	Horizontal
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4823.000	61.48	-7.13	54.35	74.00	-19.65	peak
4823.000	46.69	-7.13	39.56	54.00	-14.44	AVG
7234.000	53.82	0.66	54.48	74.00	-19.52	peak
7234.000	38.88	0.66	39.54	54.00	-14.46	AVG
9649.000	51.13	3.20	54.33	74.00	-19.67	peak
9649.000	36.55	3.20	39.75	54.00	-14.25	AVG
24122.000	26.17	28.22	54.39	74.00	-19.61	peak
24122.000	11.64	28.22	39.86	54.00	-14.14	AVG

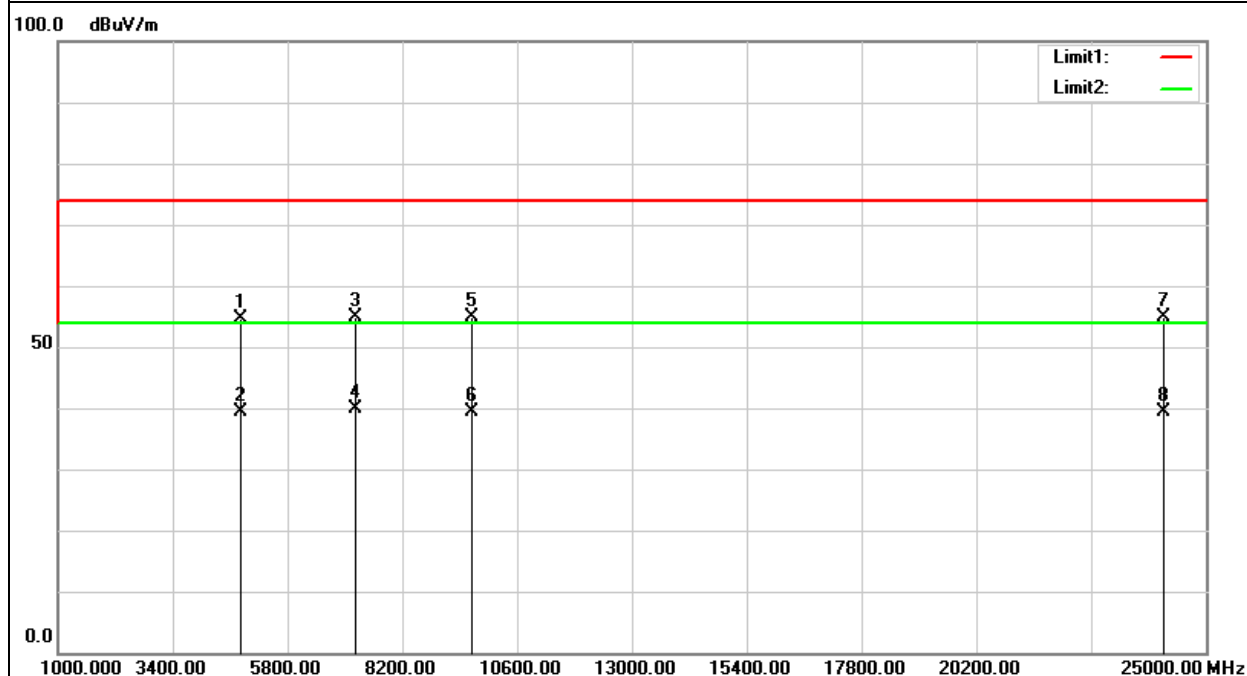
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-10
Test Mode :	TX CH01 (802.11n20 : Rate 6.5Mbps)	Polarization :	Vertical
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4821.000	61.67	-7.14	54.53	74.00	-19.47	peak
4821.000	46.59	-7.14	39.45	54.00	-14.55	AVG
7233.000	54.18	0.65	54.83	74.00	-19.17	peak
7233.000	39.17	0.65	39.82	54.00	-14.18	AVG
9645.000	51.69	3.20	54.89	74.00	-19.11	peak
9645.000	36.28	3.20	39.48	54.00	-14.52	AVG
24125.000	26.69	28.23	54.92	74.00	-19.08	peak
24125.000	11.15	28.23	39.38	54.00	-14.62	AVG

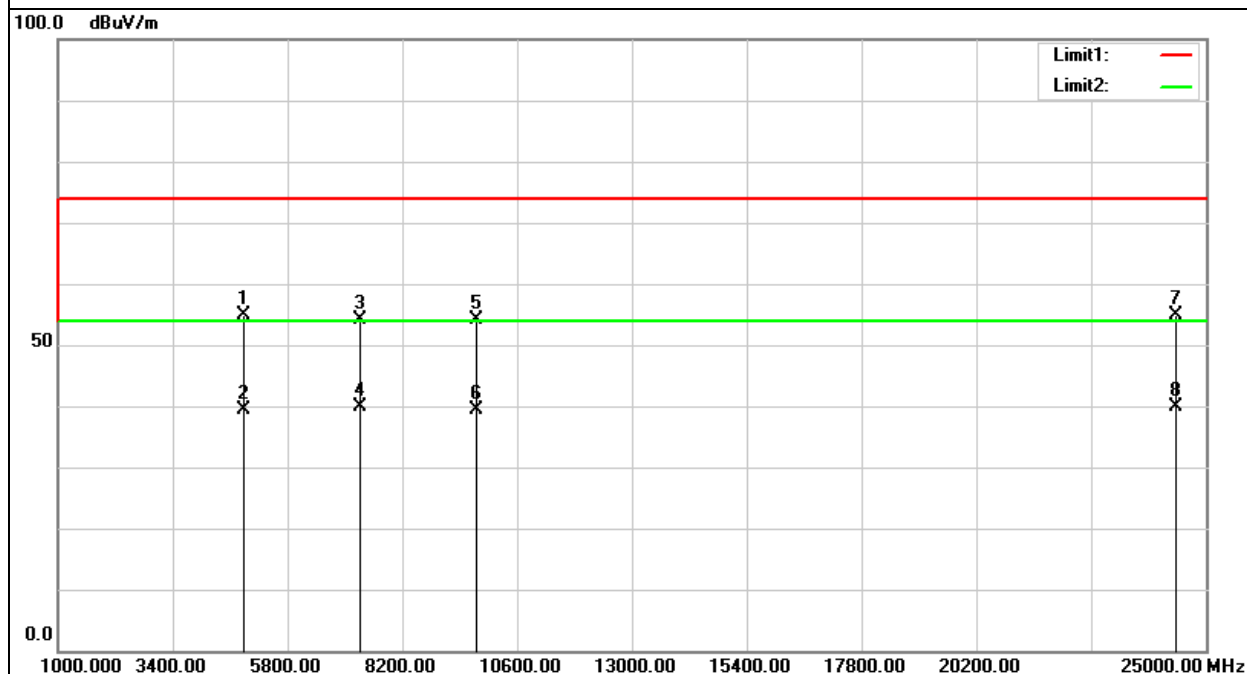
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-10
Test Mode :	TX CH06 (802.11n20 : Rate 6.5Mbps)	Polarization :	Horizontal
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4875.000	61.78	-6.94	54.84	74.00	-19.16	peak
4875.000	46.39	-6.94	39.45	54.00	-14.55	AVG
7313.000	53.20	0.95	54.15	74.00	-19.85	peak
7313.000	38.87	0.95	39.82	54.00	-14.18	AVG
9749.000	50.86	3.25	54.11	74.00	-19.89	peak
9749.000	36.09	3.25	39.34	54.00	-14.66	AVG
24372.000	26.50	28.44	54.94	74.00	-19.06	peak
24372.000	11.54	28.44	39.98	54.00	-14.02	AVG

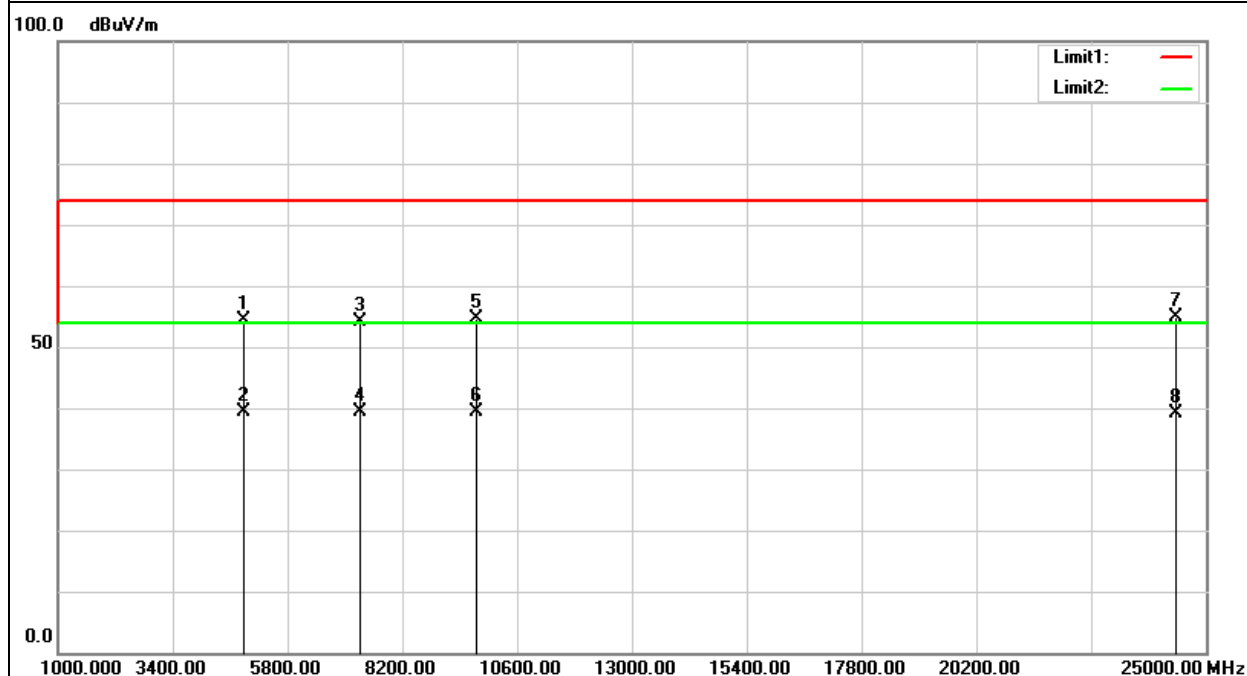
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-10
Test Mode :	TX CH06 (802.11n20 : Rate 6.5Mbps)	Polarization :	Vertical
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4876.000	61.39	-6.93	54.46	74.00	-19.54	peak
4876.000	46.38	-6.93	39.45	54.00	-14.55	AVG
7314.000	53.20	0.95	54.15	74.00	-19.85	peak
7314.000	38.52	0.95	39.47	54.00	-14.53	AVG
9750.000	51.28	3.25	54.53	74.00	-19.47	peak
9750.000	36.13	3.25	39.38	54.00	-14.62	AVG
24373.000	26.54	28.44	54.98	74.00	-19.02	peak
24373.000	10.71	28.44	39.15	54.00	-14.85	AVG

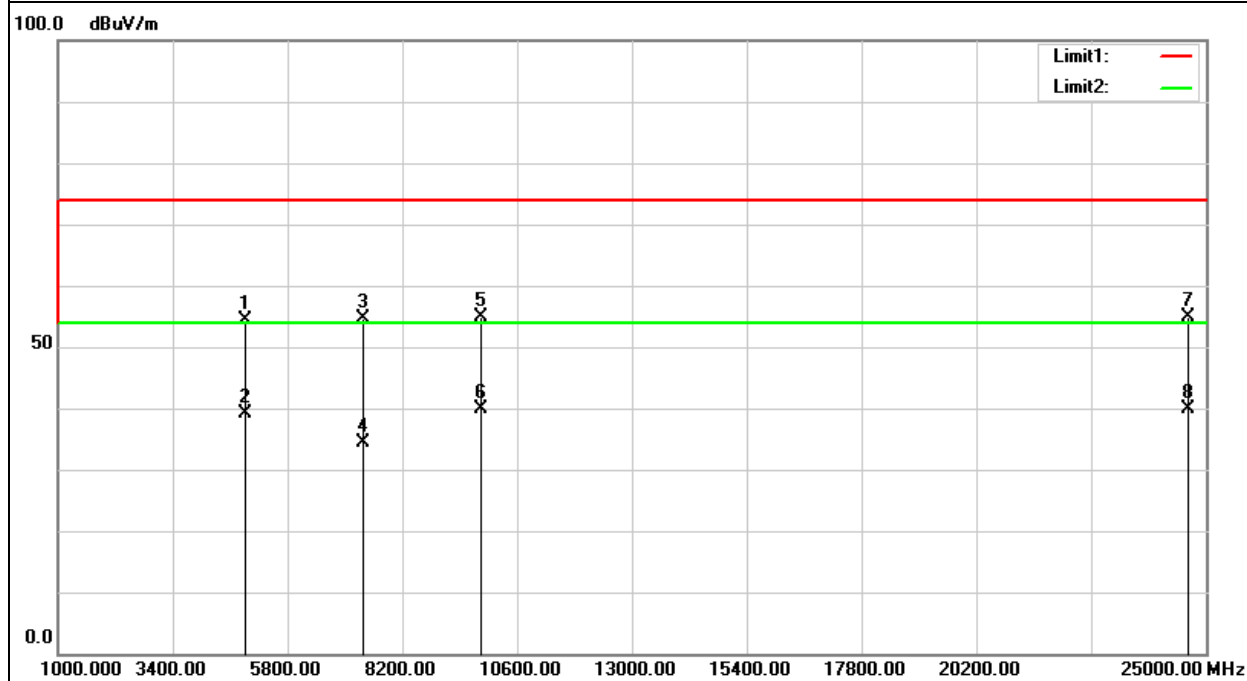
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-10
Test Mode :	TX CH11 (802.11n20 : Rate 6.5Mbps)	Polarization :	Horizontal
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4925.000	61.16	-6.68	54.48	74.00	-19.52	peak
4925.000	45.84	-6.68	39.16	54.00	-14.84	AVG
7388.000	53.34	1.22	54.56	74.00	-19.44	peak
7388.000	33.10	1.22	34.32	54.00	-19.68	AVG
9849.000	51.50	3.29	54.79	74.00	-19.21	peak
9849.000	36.54	3.29	39.83	54.00	-14.17	AVG
24622.000	26.12	28.65	54.77	74.00	-19.23	peak
24622.000	11.34	28.65	39.99	54.00	-14.01	AVG

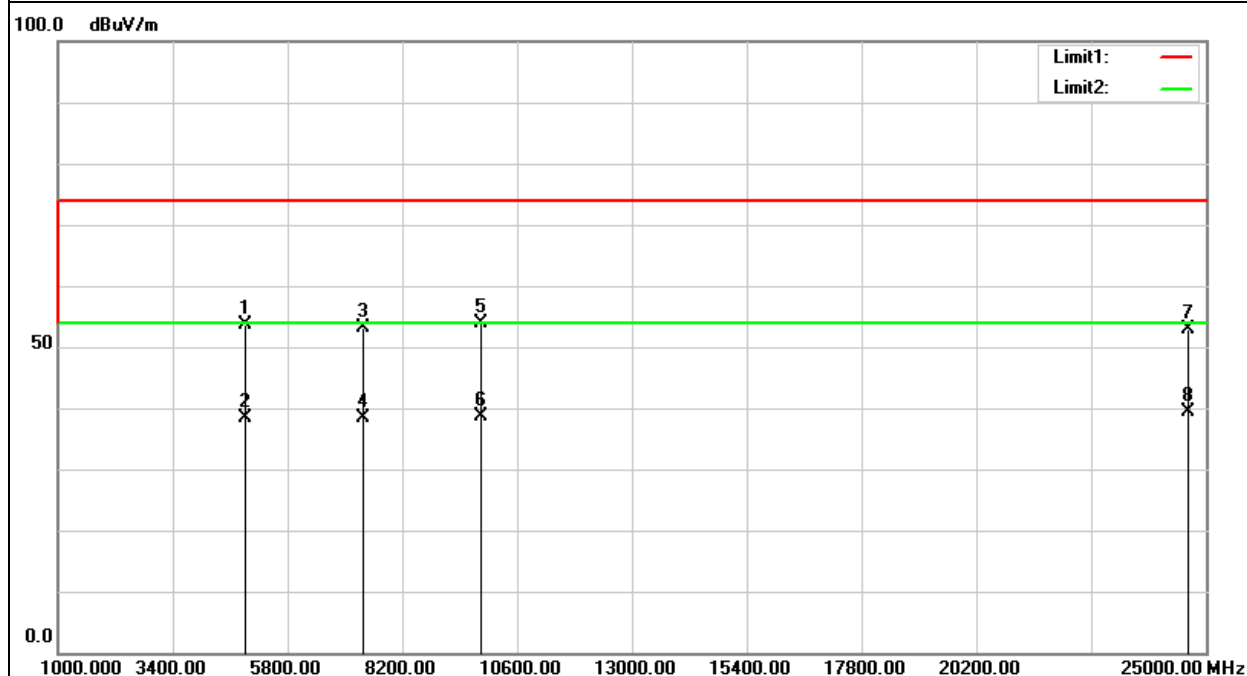
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-10
Test Mode :	TX CH11 (802.11n20 : Rate 6.5Mbps)	Polarization :	Vertical
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4925.000	60.24	-6.68	53.56	74.00	-20.44	peak
4925.000	45.17	-6.68	38.49	54.00	-15.51	AVG
7384.000	51.95	1.21	53.16	74.00	-20.84	peak
7384.000	37.21	1.21	38.42	54.00	-15.58	AVG
9849.000	50.55	3.29	53.84	74.00	-20.16	peak
9849.000	35.25	3.29	38.54	54.00	-15.46	AVG
24623.000	24.13	28.66	52.79	74.00	-21.21	peak
24623.000	10.80	28.66	39.46	54.00	-14.54	AVG

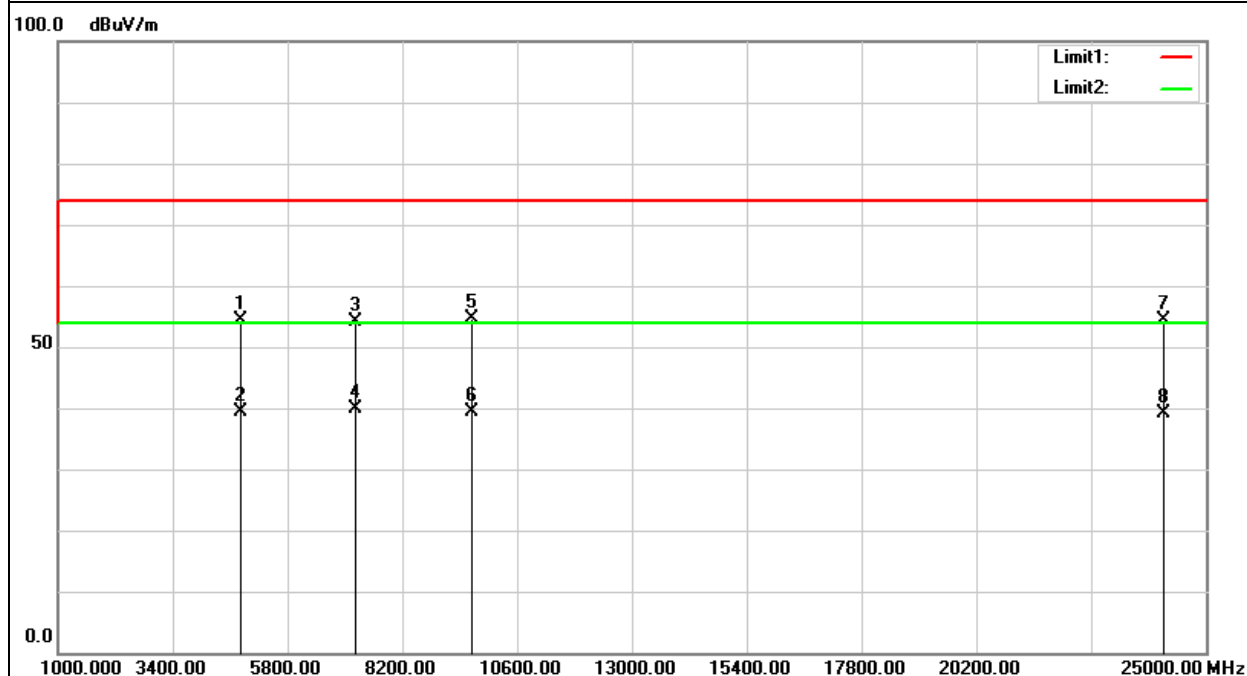
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-10
Test Mode :	RX	Polarization :	Horizontal
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824.000	61.59	-7.13	54.46	74.00	-19.54	peak
4824.000	46.61	-7.13	39.48	54.00	-14.52	AVG
7238.000	53.58	0.67	54.25	74.00	-19.75	peak
7238.000	39.15	0.67	39.82	54.00	-14.18	AVG
9650.000	51.43	3.21	54.64	74.00	-19.36	peak
9650.000	36.24	3.21	39.45	54.00	-14.55	AVG
24121.000	26.13	28.22	54.35	74.00	-19.65	peak
24121.000	10.96	28.22	39.18	54.00	-14.82	AVG

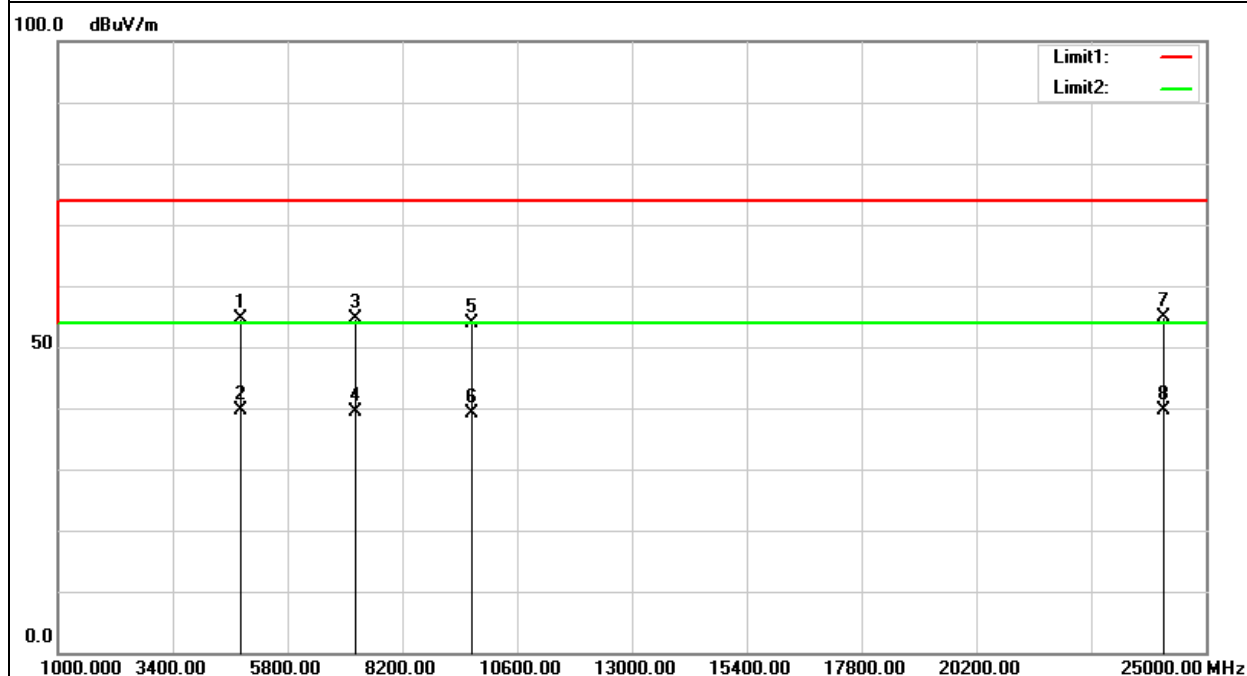
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2022-02-10
Test Mode :	RX	Polarization :	Vertical
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz
Test Power :	DC 5V		

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4823.000	61.79	-7.13	54.66	74.00	-19.34	peak
4823.000	46.78	-7.13	39.65	54.00	-14.35	AVG
7238.000	54.07	0.67	54.74	74.00	-19.26	peak
7238.000	38.77	0.67	39.44	54.00	-14.56	AVG
9647.000	50.66	3.20	53.86	74.00	-20.14	peak
9647.000	36.01	3.20	39.21	54.00	-14.79	AVG
24123.000	26.57	28.23	54.80	74.00	-19.20	peak
24123.000	11.31	28.23	39.54	54.00	-14.46	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

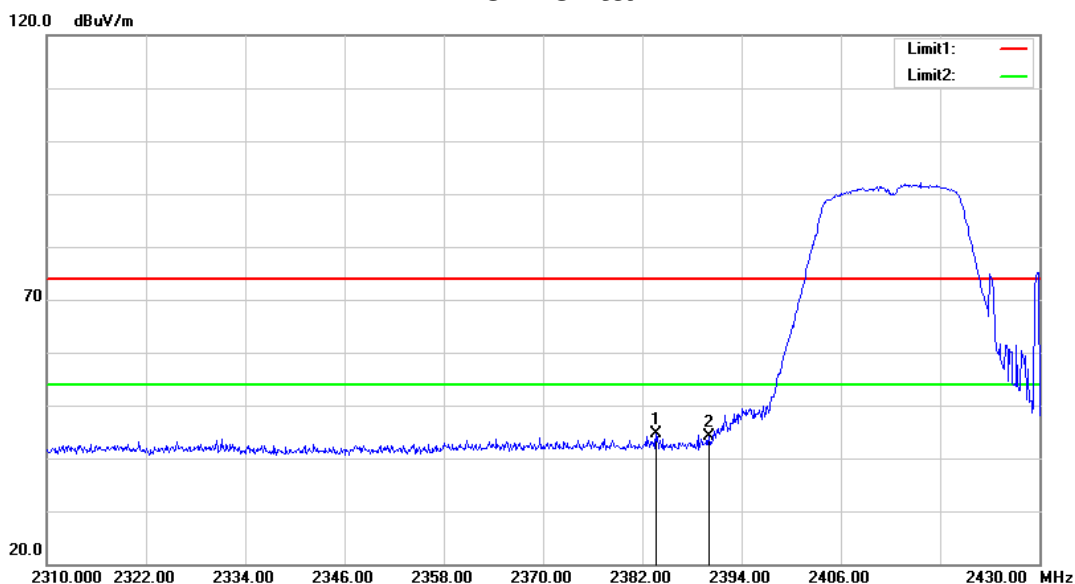


4.2.7 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)

Note: Pre-scan both the SISO and MIMO mode, only the worst-case results were reported.

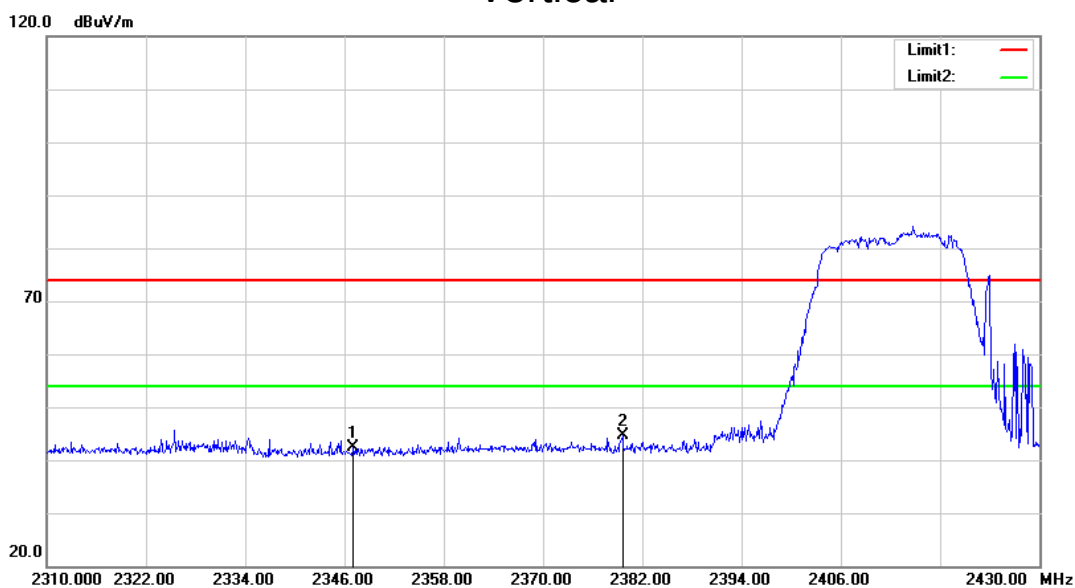
Temperature :	23.1 °C	Relative Humidity :	60%
Test Mode :	TX	Test Date :	2022-02-11

MIMO 802.11n20 Low channel Horizontal



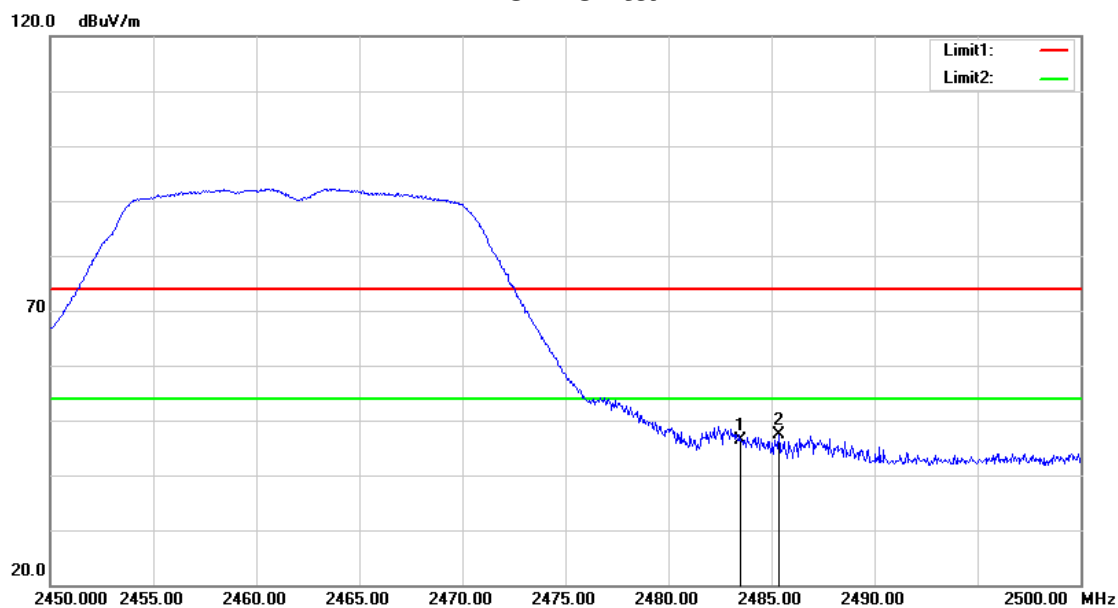
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2383.680	40.31	4.24	44.55	74.00	-29.45	peak
2	2390.000	39.77	4.34	44.11	74.00	-29.89	peak

Vertical



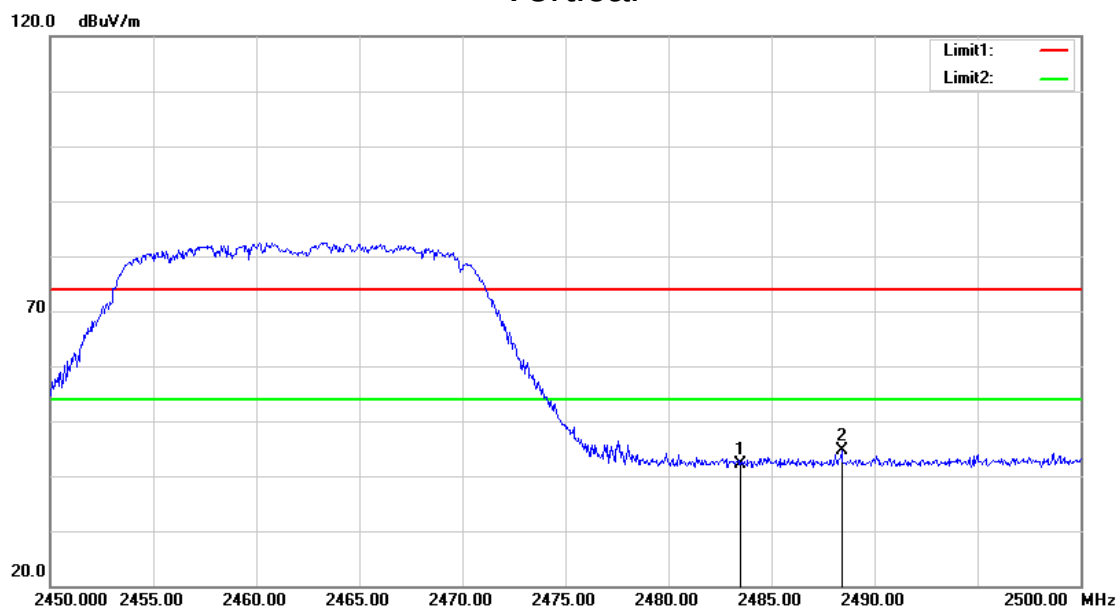
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2347.080	38.62	3.72	42.34	74.00	-31.66	peak
2	2379.600	40.33	4.18	44.51	74.00	-29.49	peak

802.11n20 High channel Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	41.81	4.60	46.41	74.00	-27.59	peak
2	2485.350	42.76	4.61	47.37	74.00	-26.63	peak

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	37.46	4.60	42.06	74.00	-31.94	peak
2	2488.400	40.04	4.62	44.66	74.00	-29.34	peak

5. OCCUPIED BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

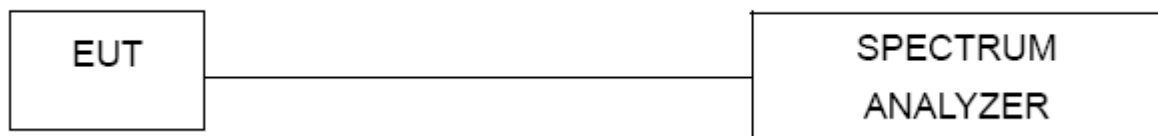
LP0002				
Section	Test Item	Limit	Frequency Range (MHz)	Result
4.10.1(6.2.1)	Bandwidth	$\geq 500\text{kHz}$ (6dB bandwidth)	2400-2483.5	PASS

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	$>$ Measurement Bandwidth or Channel Separation
RB	100 kHz (6dB Bandwidth) / 100 kHz (Channel Separation)
VB	300 kHz (6dB Bandwidth) / 300 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

5.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 100kHz, VBW=300kHz, Sweep time = Auto.

5.1.2 TEST SETUP



5.1.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

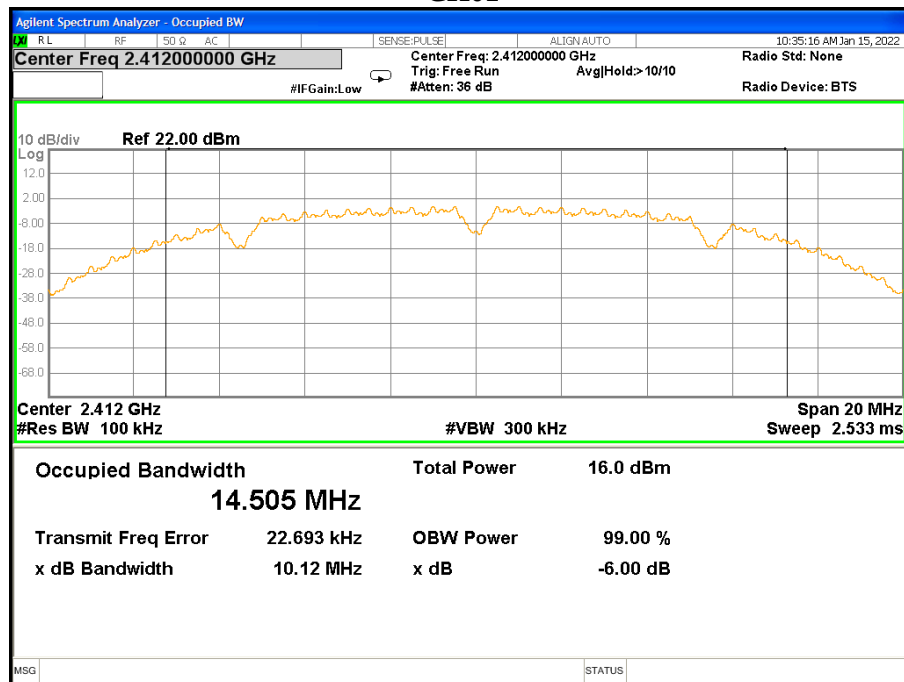
5.1.4 TEST RESULTS

Note: ANT A Power> ANT B Power, Both ANT A and B have been test, Only show the worst data of ANT A

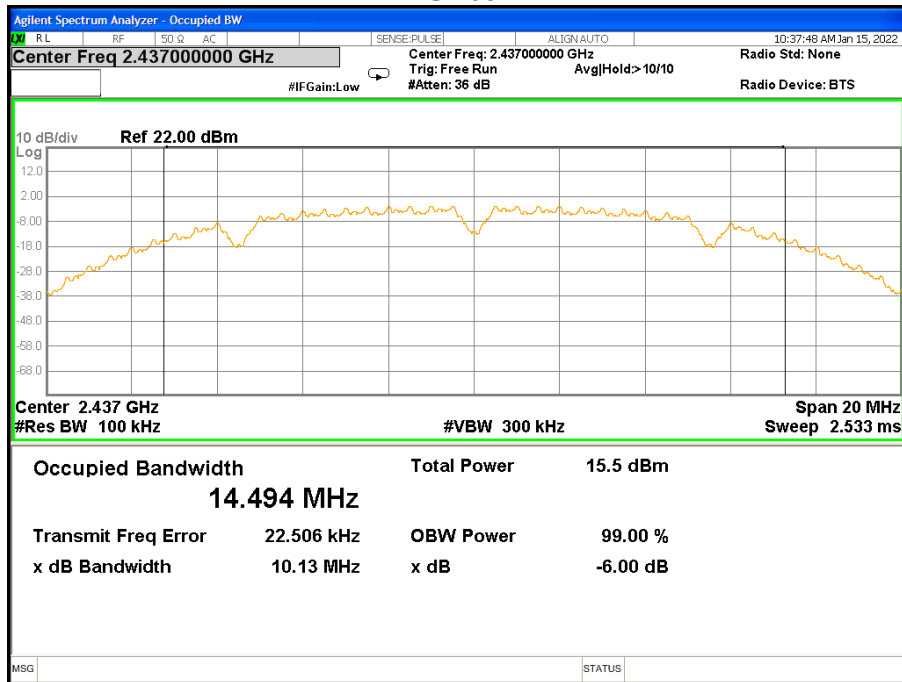
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	25.1 °C	Relative Humidity :	52%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	CH01 / CH06 /CH11(802.11b Data rate 1Mbps)		
Test Date :	2022-01-15		

Frequency	6dB Bandwidth (MHz)	Limit (kHz)	Result
2412 MHz	10.120	≥ 500	Pass
2437 MHz	10.130	≥ 500	Pass
2462 MHz	10.120	≥ 500	Pass

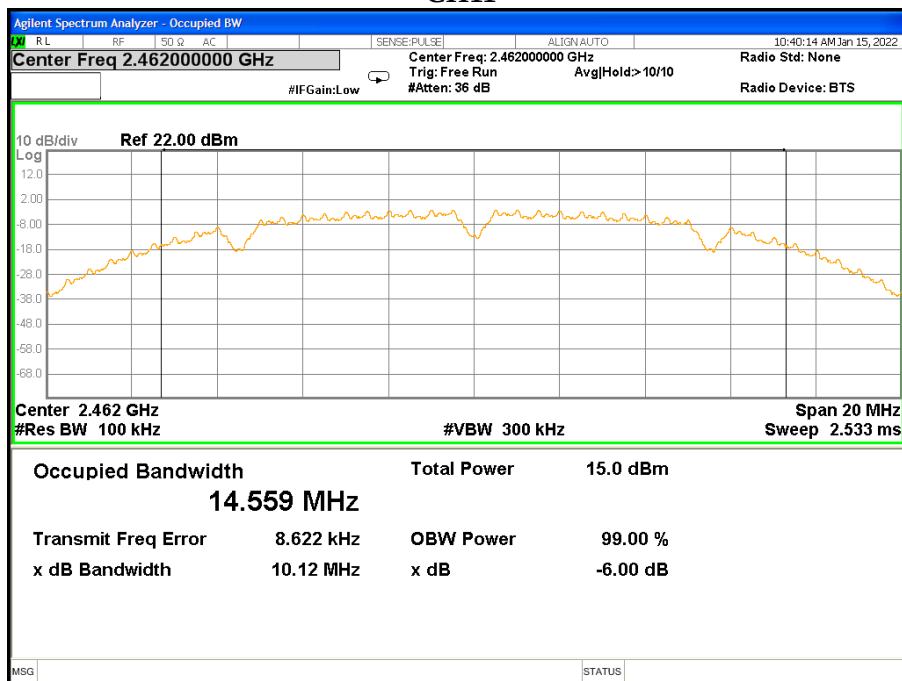
CH01



CH06



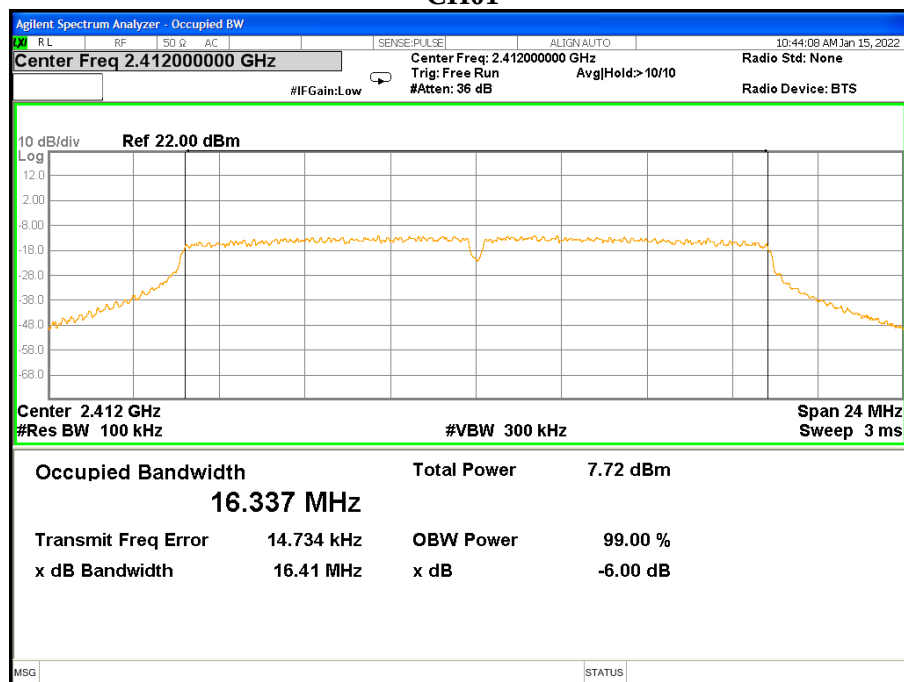
CH11



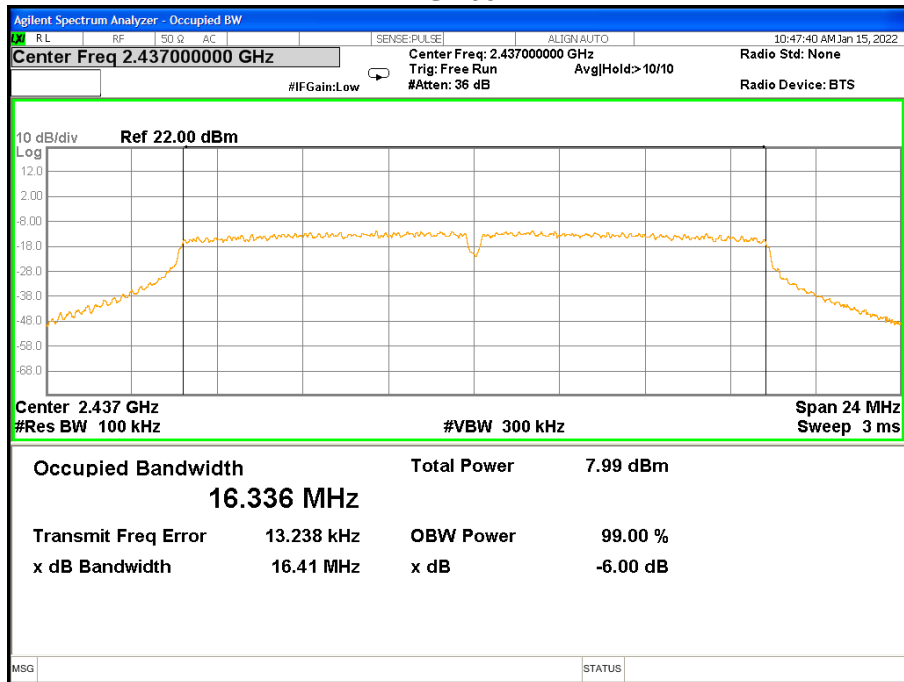
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	25.1 °C	Relative Humidity :	52%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	CH01 / CH06 / CH11(802.11g Data rate 6Mbps)		
Test Date :	2022-01-15		

Frequency	6dB Bandwidth (MHz)	Limit (kHz)	Result
2412 MHz	16.41	≥ 500	Pass
2437 MHz	16.41	≥ 500	Pass
2462 MHz	16.41	≥ 500	Pass

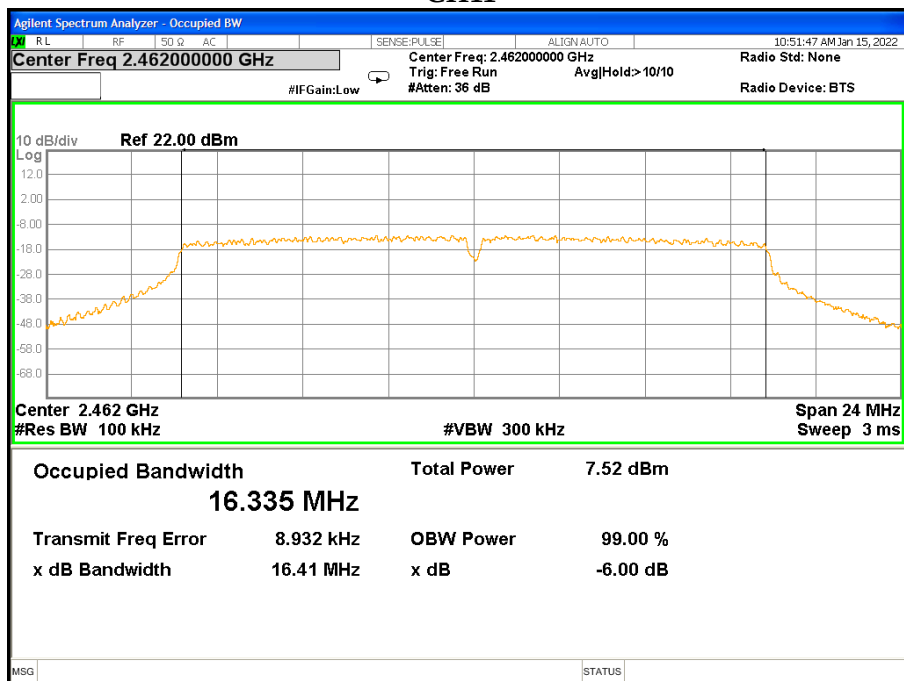
CH01



CH06



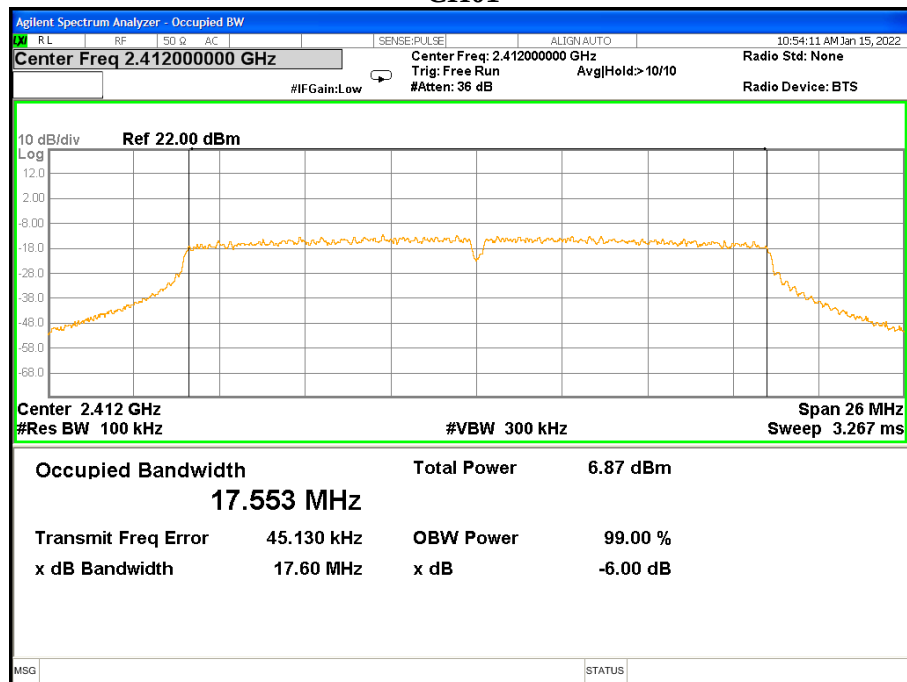
CH11



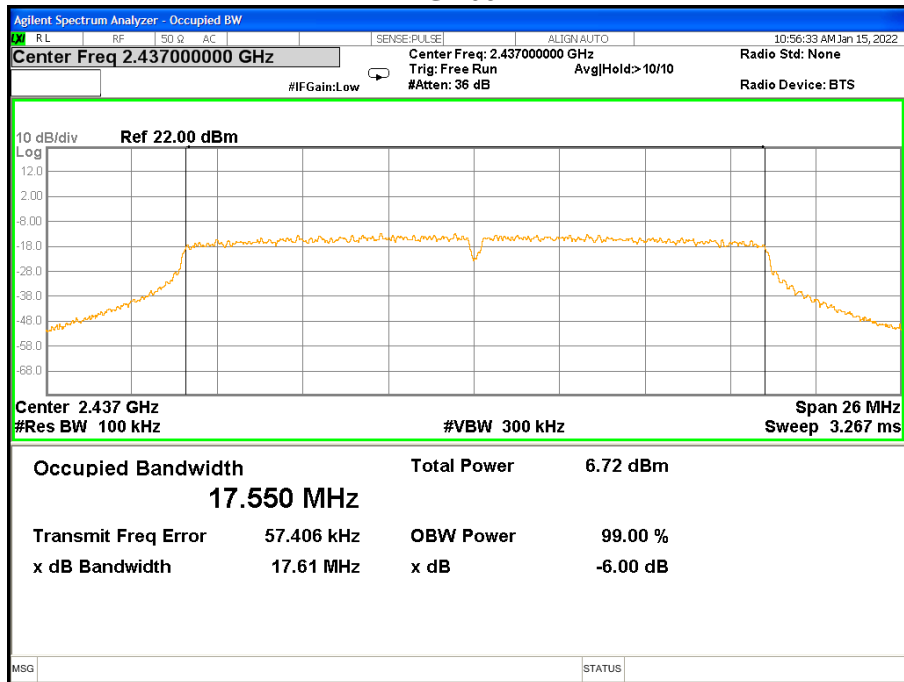
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	25.1 °C	Relative Humidity :	52%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	CH01 / CH06/ CH11(802.11n20 Data rate 6.5Mbps)		
Test Date :	2022-01-15		

Frequency	6dB Bandwidth (MHz)	Limit (kHz)	Result
2412 MHz	17.60	≥ 500	Pass
2437 MHz	17.61	≥ 500	Pass
2462 MHz	17.60	≥ 500	Pass

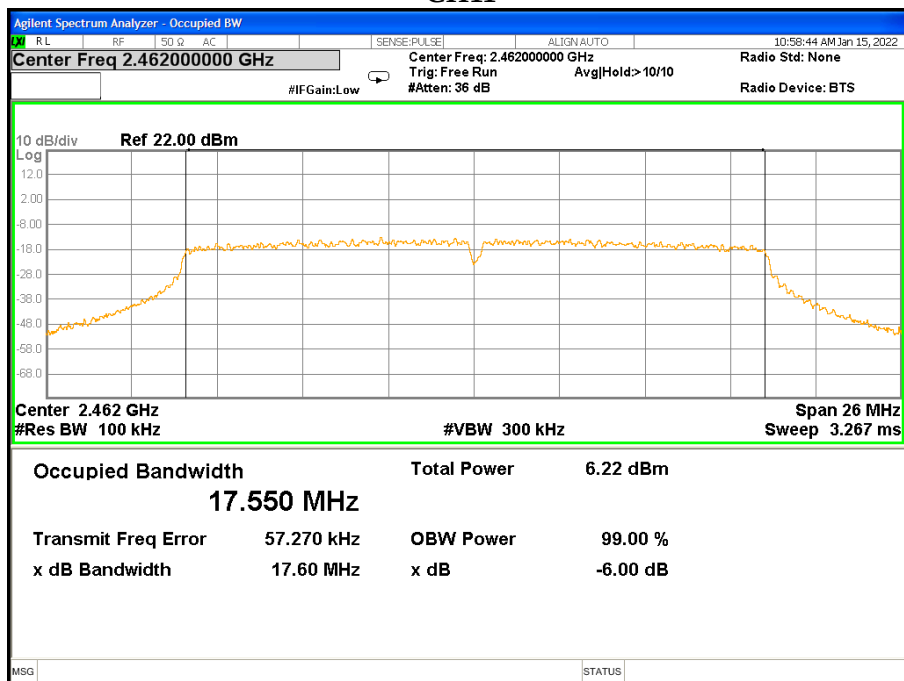
CH01



CH06



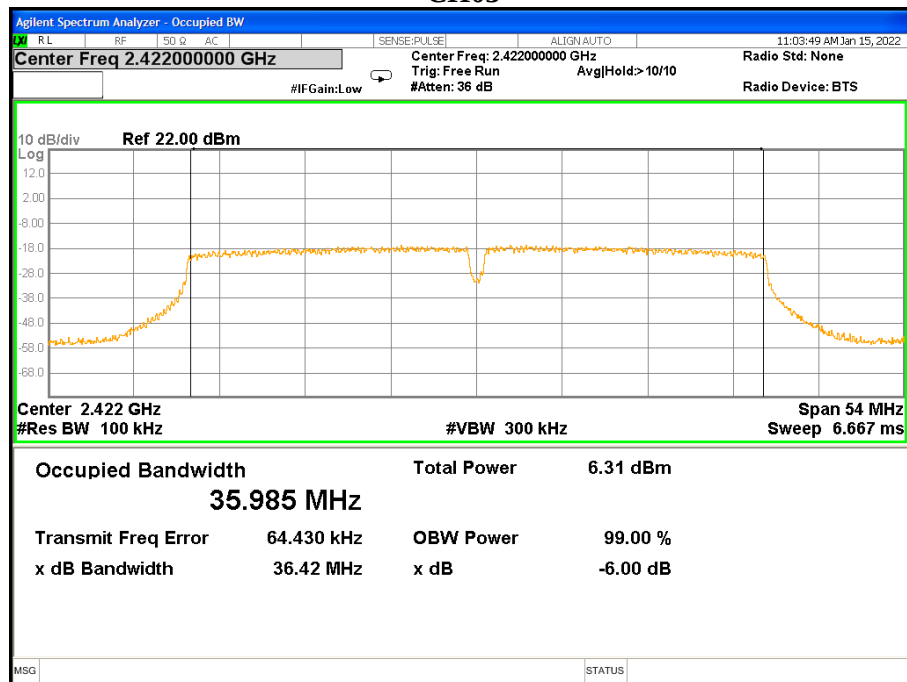
CH11



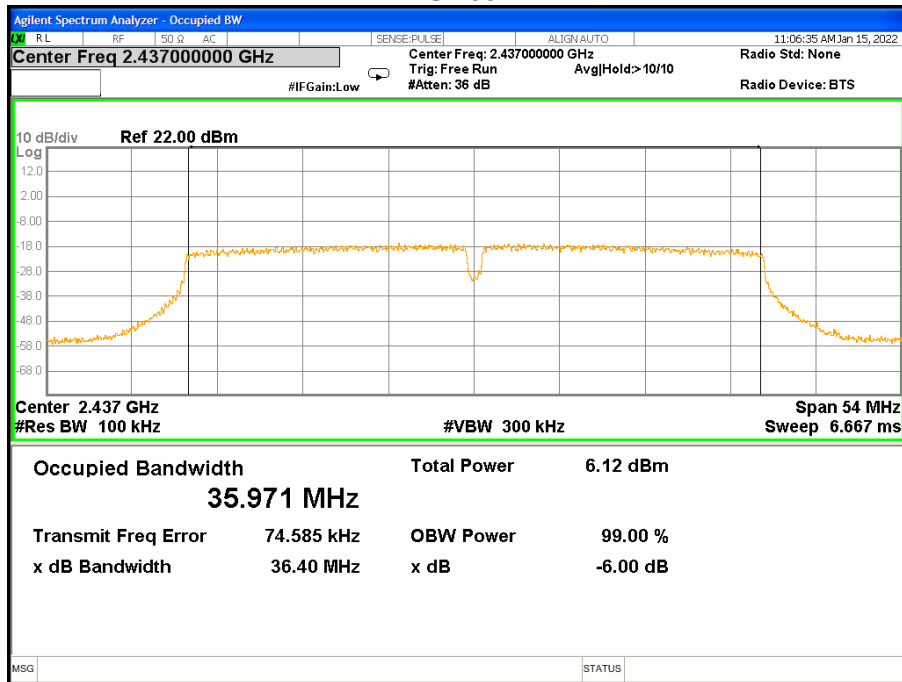
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	25.1 °C	Relative Humidity :	52%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	CH03 / CH06/ CH09(802.11n40 Data rate 6.5Mbps)		
Test Date :	2022-01-15		

Frequency	6dB Bandwidth (MHz)	Limit (kHz)	Result
2422 MHz	36.42	≥ 500	Pass
2437 MHz	36.40	≥ 500	Pass
2452 MHz	36.40	≥ 500	Pass

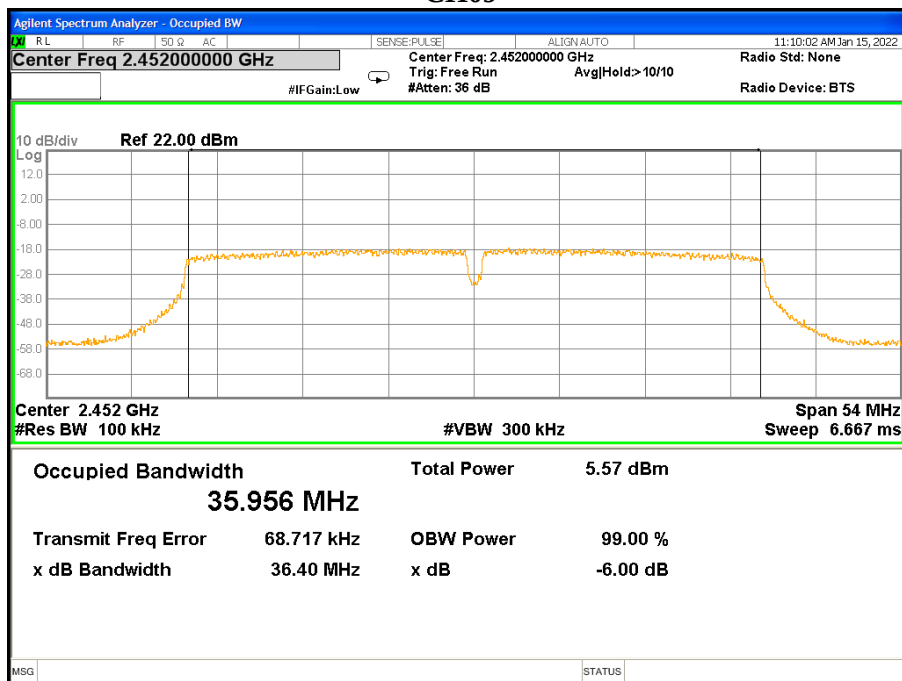
CH03



CH06



CH09



6. POWER DENSITY

6.1 APPLIED PROCEDURES / LIMIT

LP0002				
Section	Test Item	Limit	Frequency Range (MHz)	Result
4.10.1(6.2.2)	Power density	8dBm	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS bandwidth.
RB	3 kHz
VB	10 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

6.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 3kHz, VBW=10kHz, Detector= Peak, Trace=Max Hold.

6.1.2 TEST SETUP



6.1.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

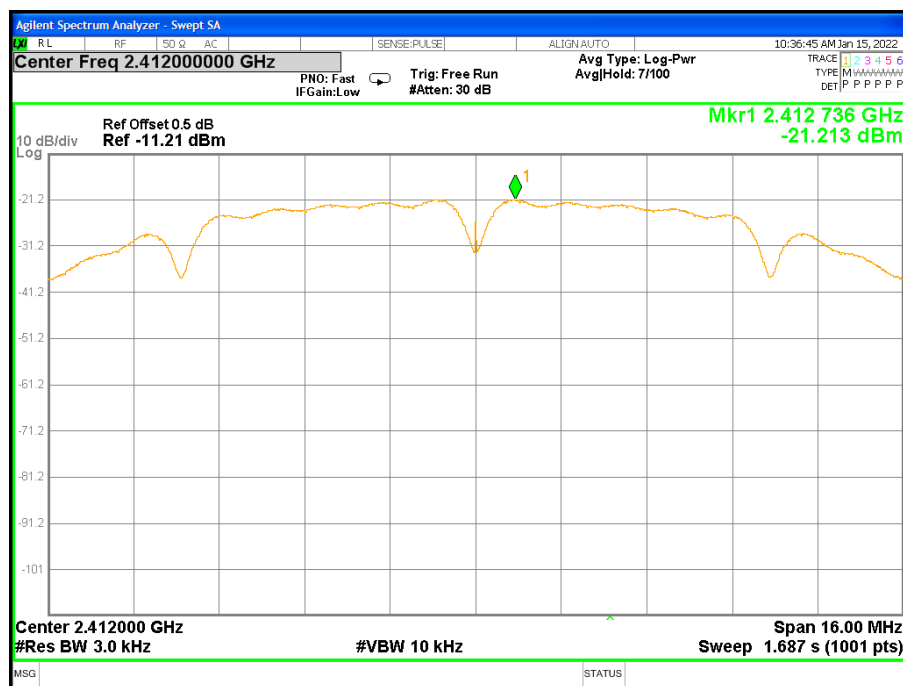
6.1.4 TEST RESULTS

EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	CH01 /CH06 /CH11 (802.11b Data rate 1Mbps)		
Test Date :	2022-01-15		

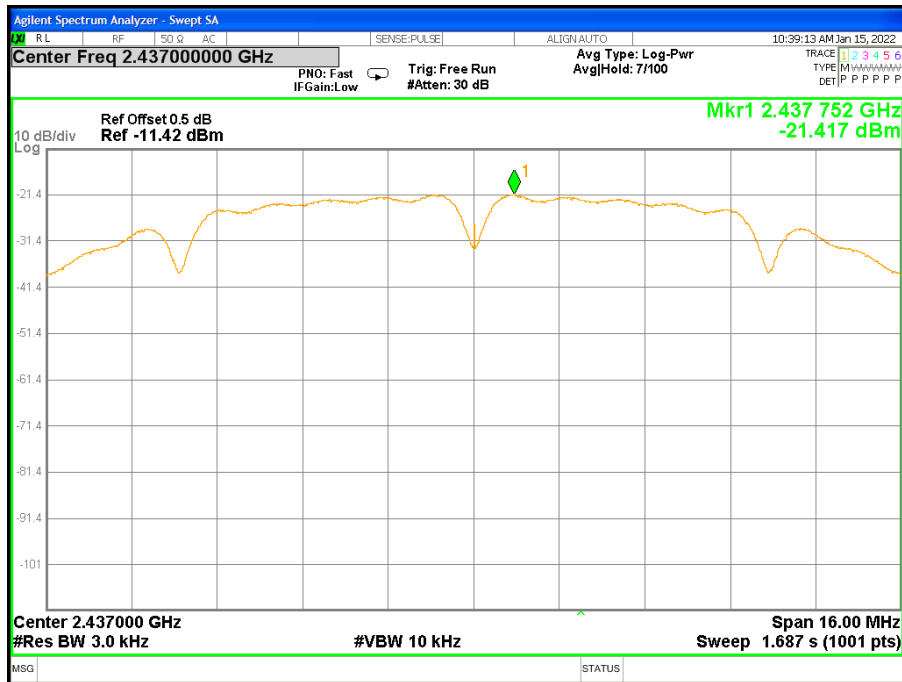
Frequency	Power Density			Limit (dBm/3KHz)	Result
	ANT A (dBm)	ANT B (dBm)	TOTAL (dBm)		
2412	-21.21	-14.20	--	8	PASS
2437	-21.42	-15.31	--	8	PASS
2462	-21.75	-16.41	--	8	PASS

ANT A

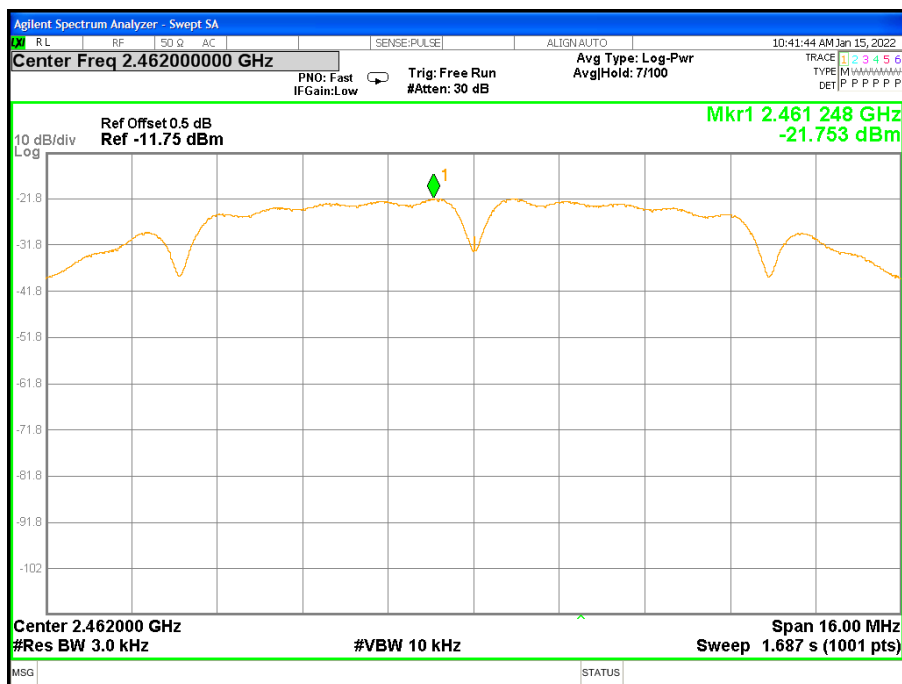
CH01



CH06

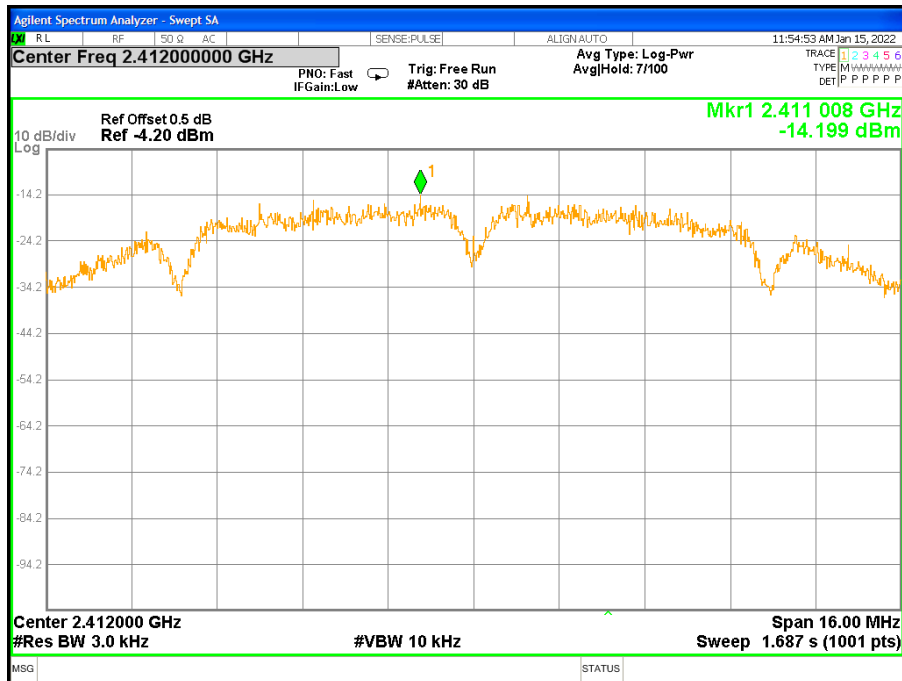


CH11

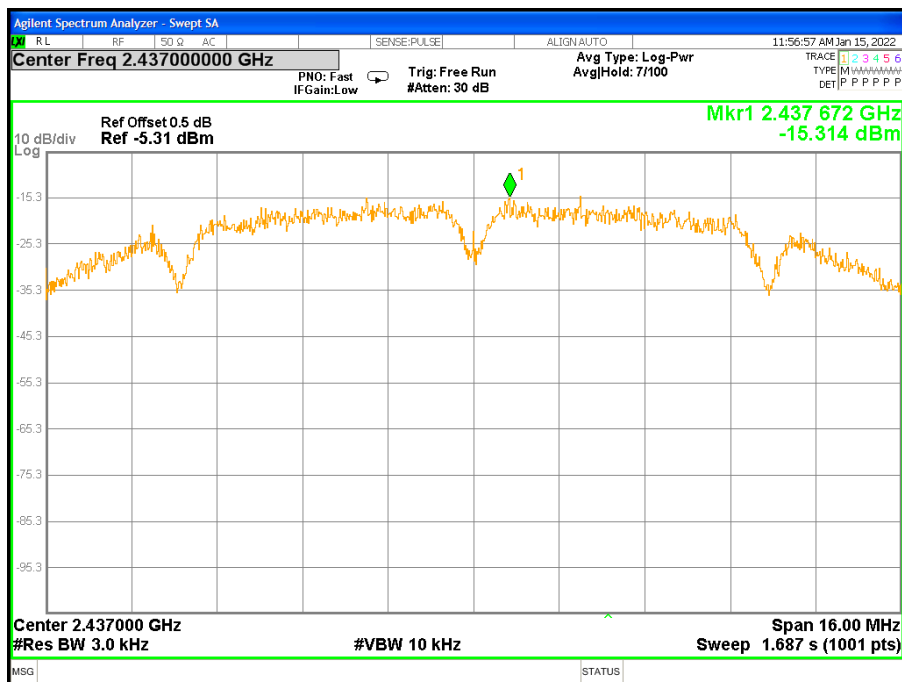


ANT B

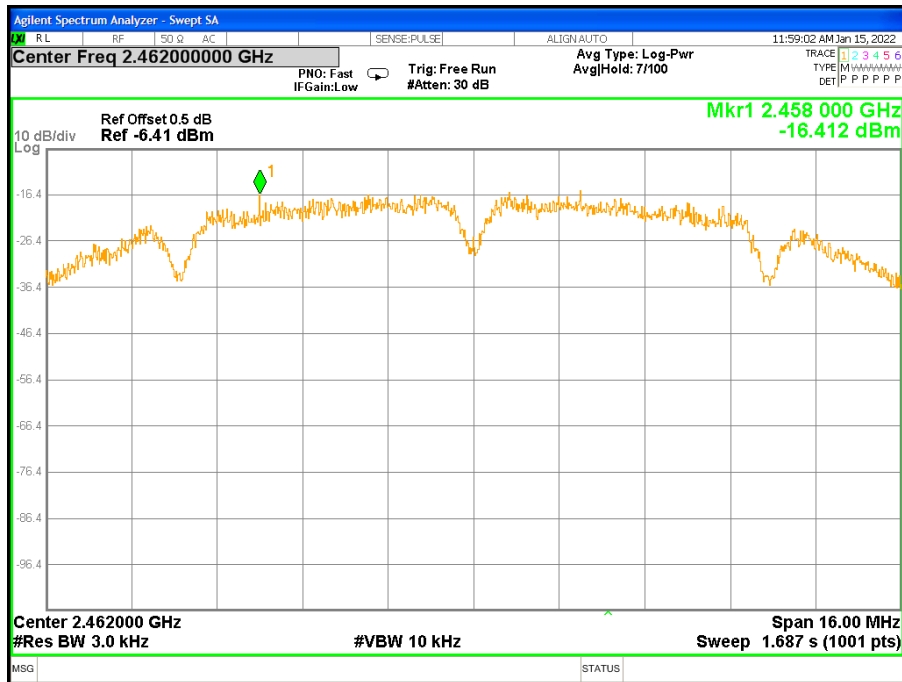
CH01



CH06



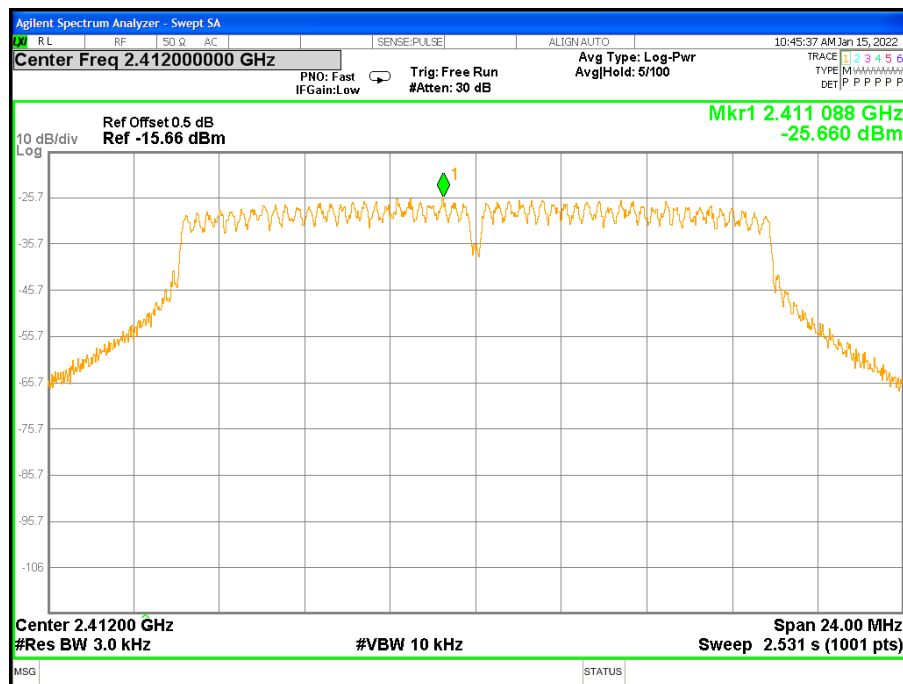
CH11



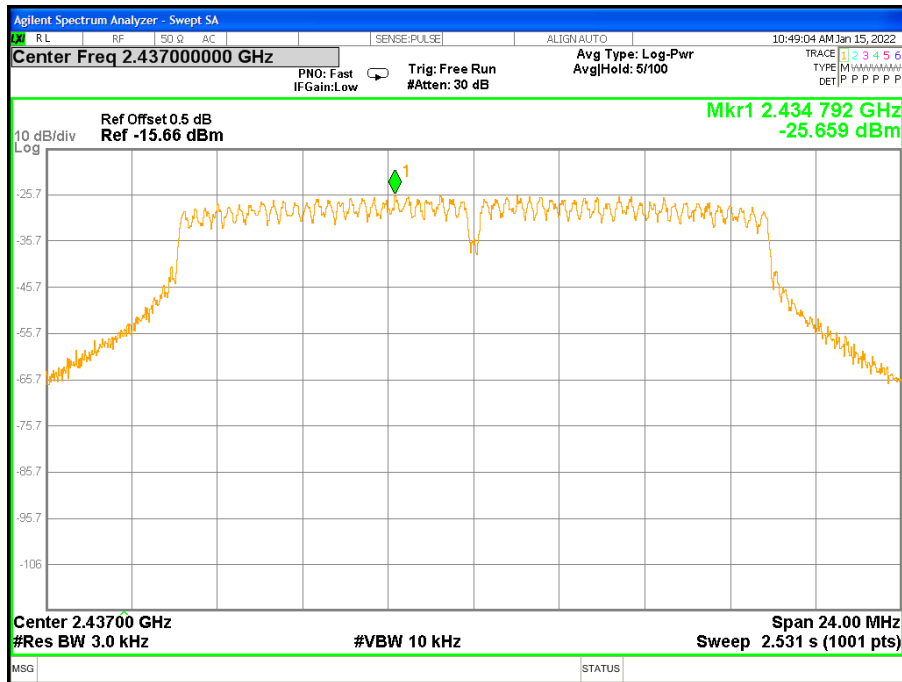
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	CH01 / CH06/CH11 (802.11g Data rate 6Mbps)		
Test Date :	2022-01-15		

Frequency	Power Density			Limit	Result
	ANT A (dBm)	ANT B (dBm)	TOTAL (dBm)	(dBm/3KHz)	
2412	-25.66	-22.57	--	8	PASS
2437	-25.66	-22.65	--	8	PASS
2462	-25.69	-23.77	--	8	PASS

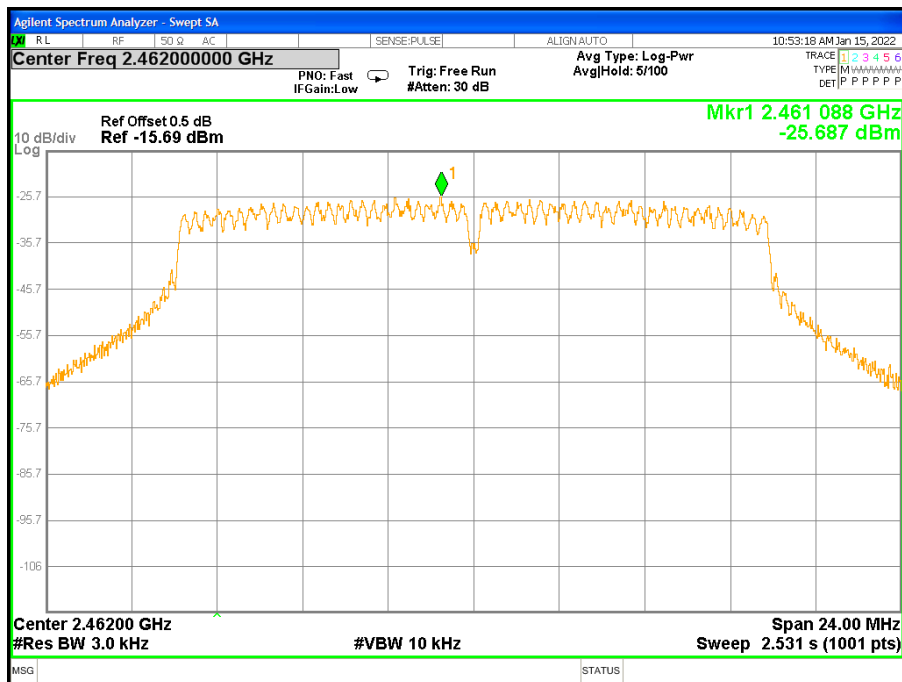
ANT A CH01



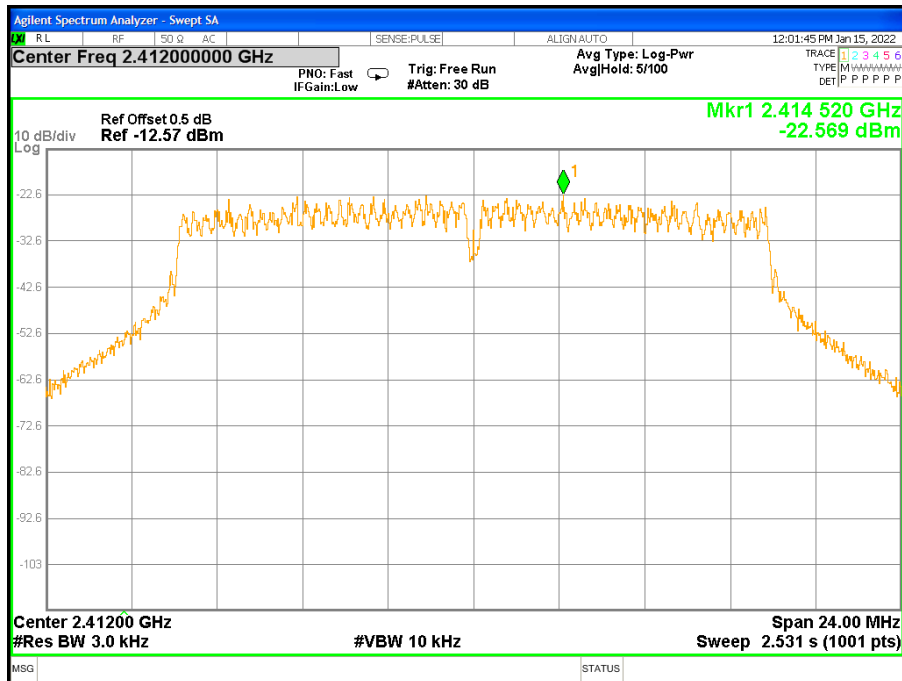
CH06



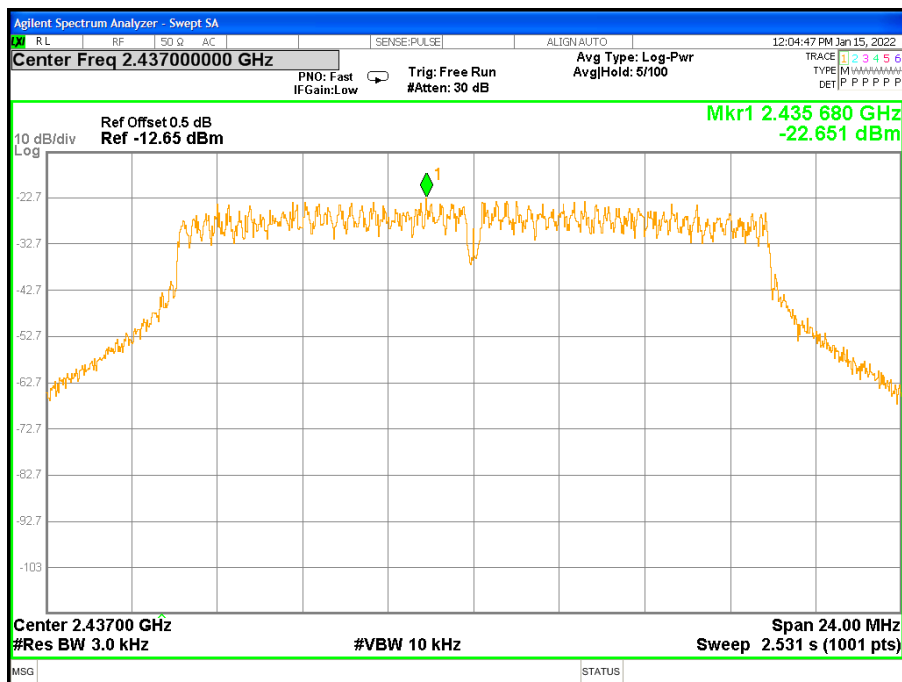
CH11



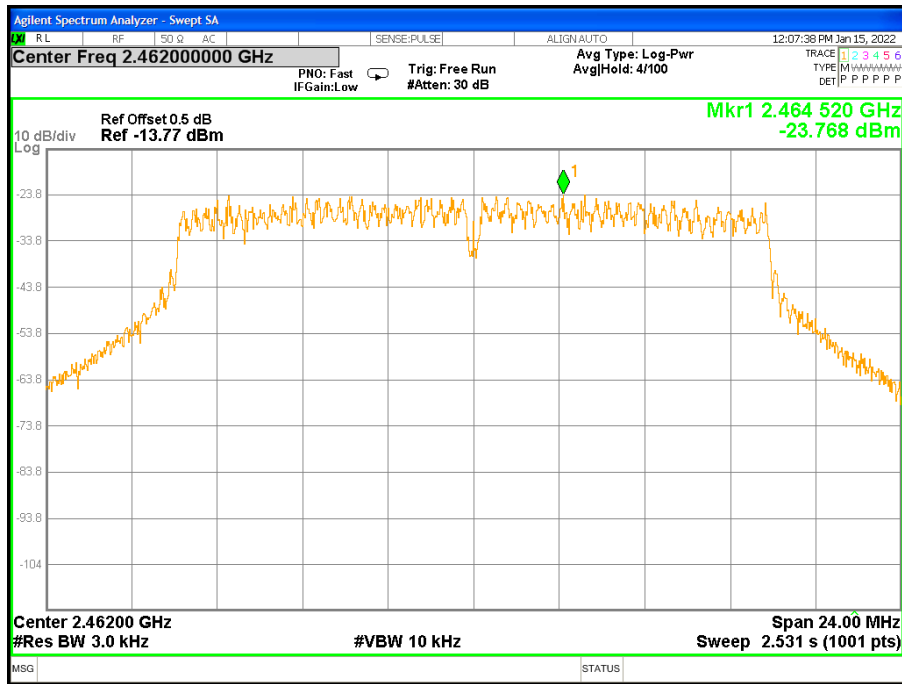
ANT B CH01



CH06



CH11

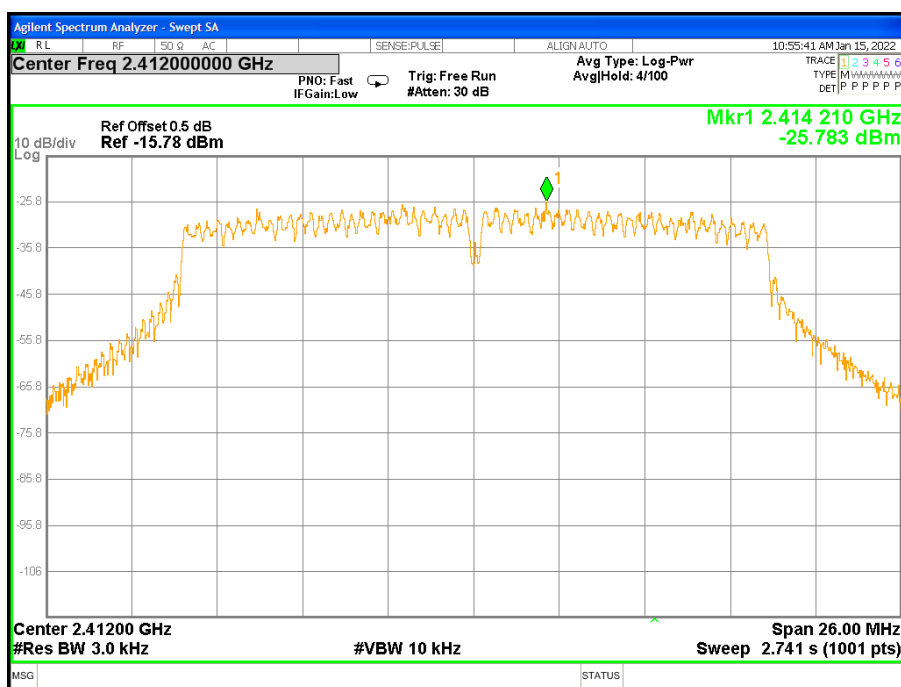


EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	CH01 / CH06/ CH11 (802.11n20 Data rate 6.5Mbps)		
Test Date :	2022-01-15		

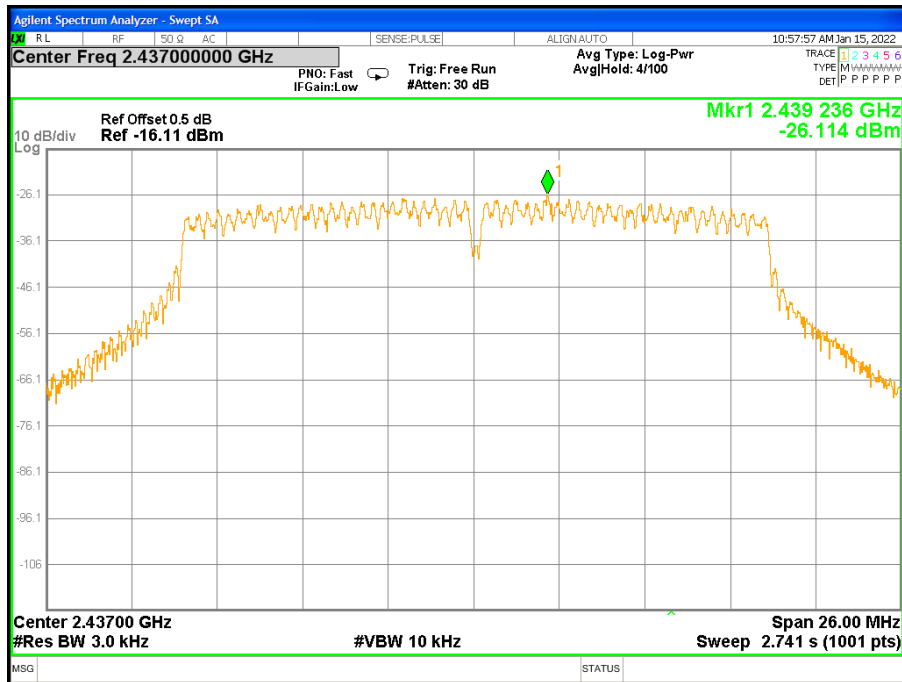
Frequency	Power Density			Limit	Result
	ANT A (dBm)	ANT B (dBm)	TOTAL (dBm)	(dBm/3KHz)	
2412	-25.78	-22.51	-20.84	8	PASS
2437	-26.11	-24.27	-22.08	8	PASS
2462	-26.49	-23.92	-22.01	8	PASS

ANT A

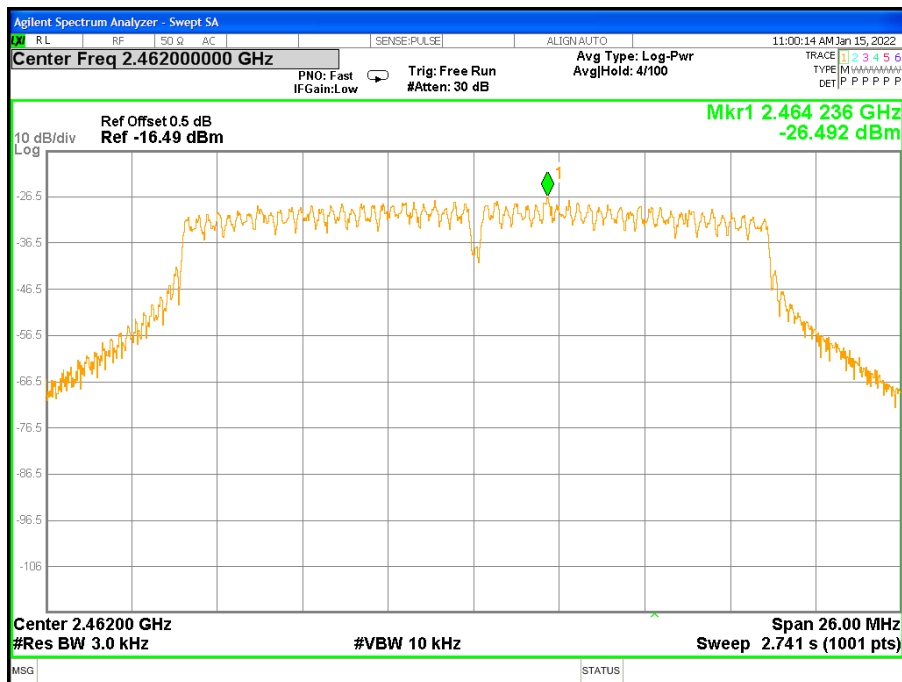
CH01



CH06

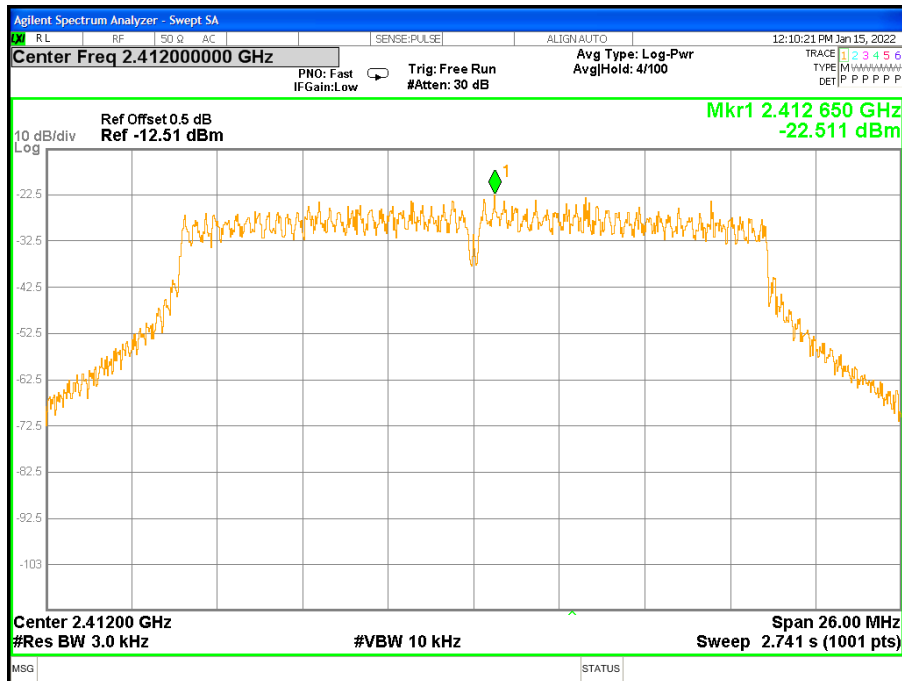


CH11

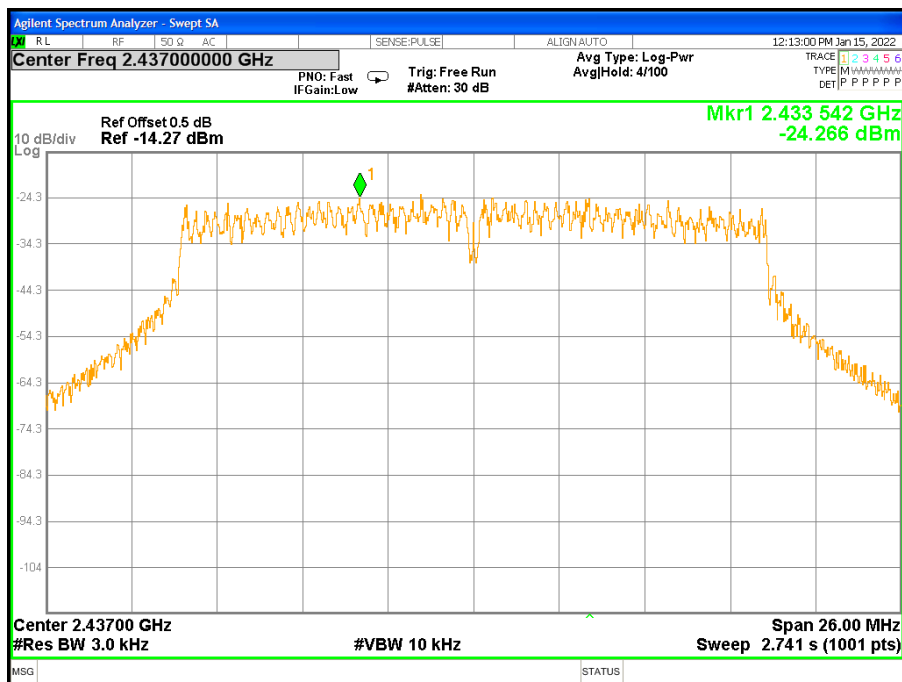


ANT B

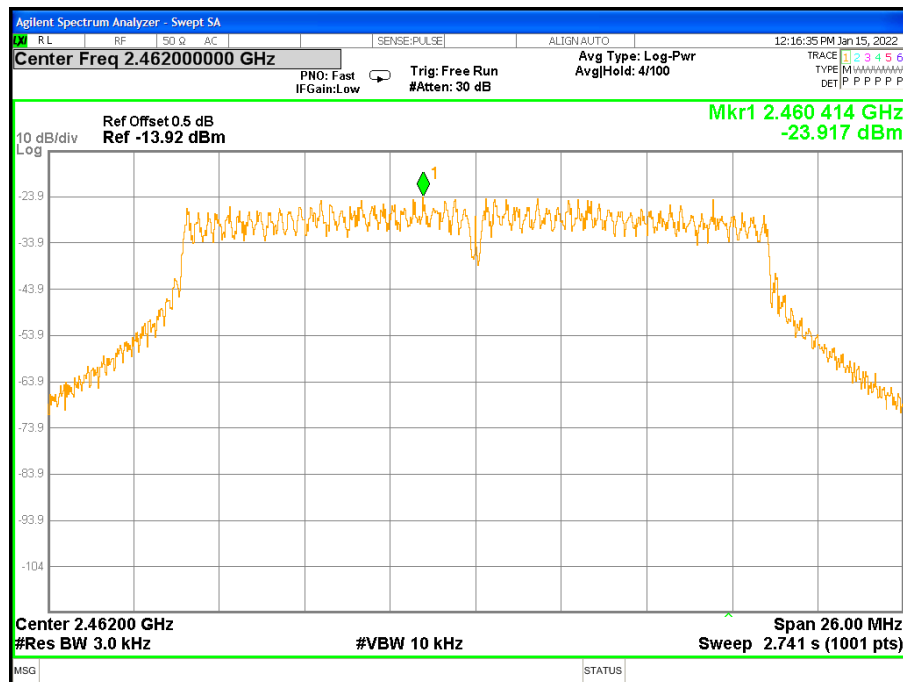
CH01



CH06



CH11

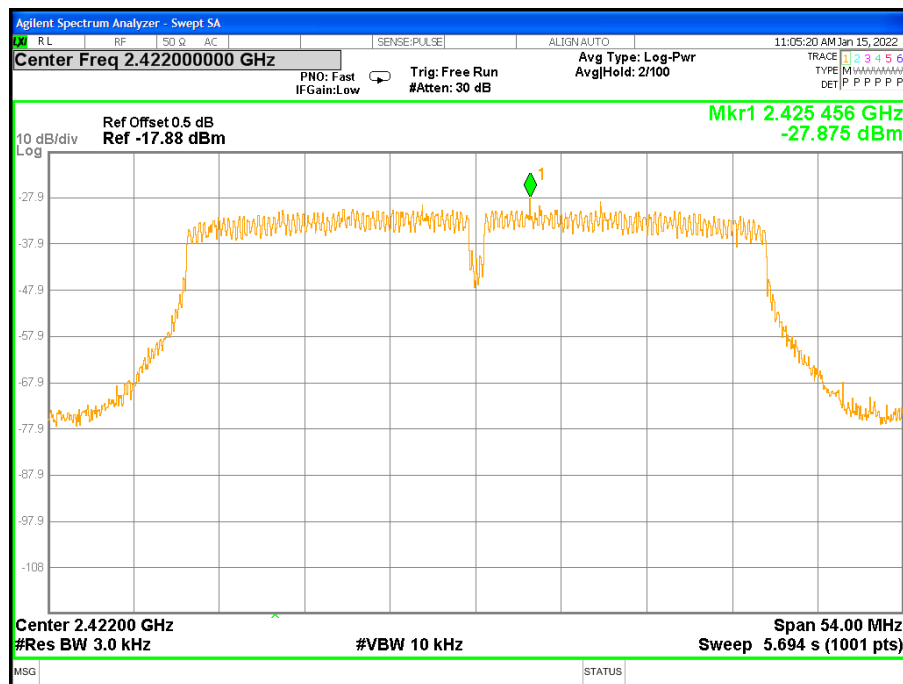


EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	CH03 / CH06/ CH09 (802.11n40 Data rate 6.5Mbps)		
Test Date :	2022-01-15		

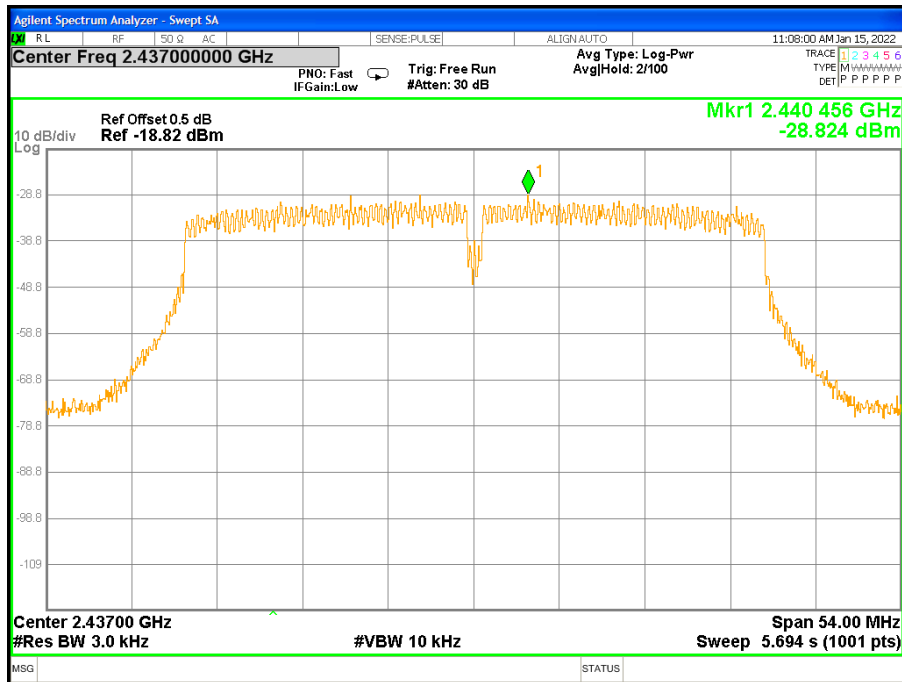
Frequency	Power Density			Limit	Result
	ANT A (dBm)	ANT B (dBm)	TOTAL (dBm)	(dBm/3KHz)	
2422	-27.88	-25.34	-23.41	8	PASS
2437	-28.82	-25.72	-23.99	8	PASS
2452	-29.22	-26.66	-24.74	8	PASS

ANT A

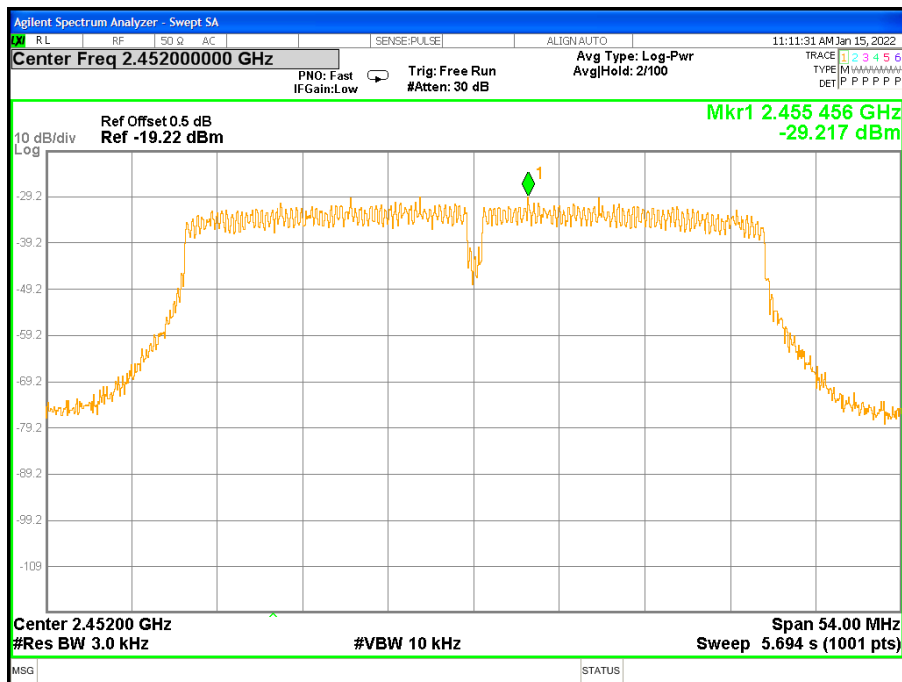
CH03



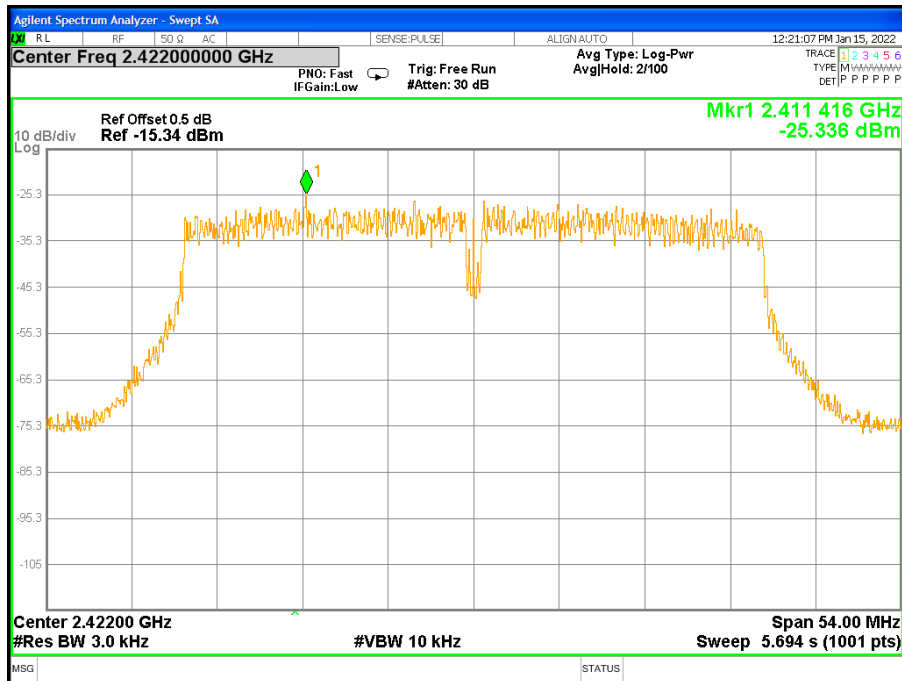
CH06



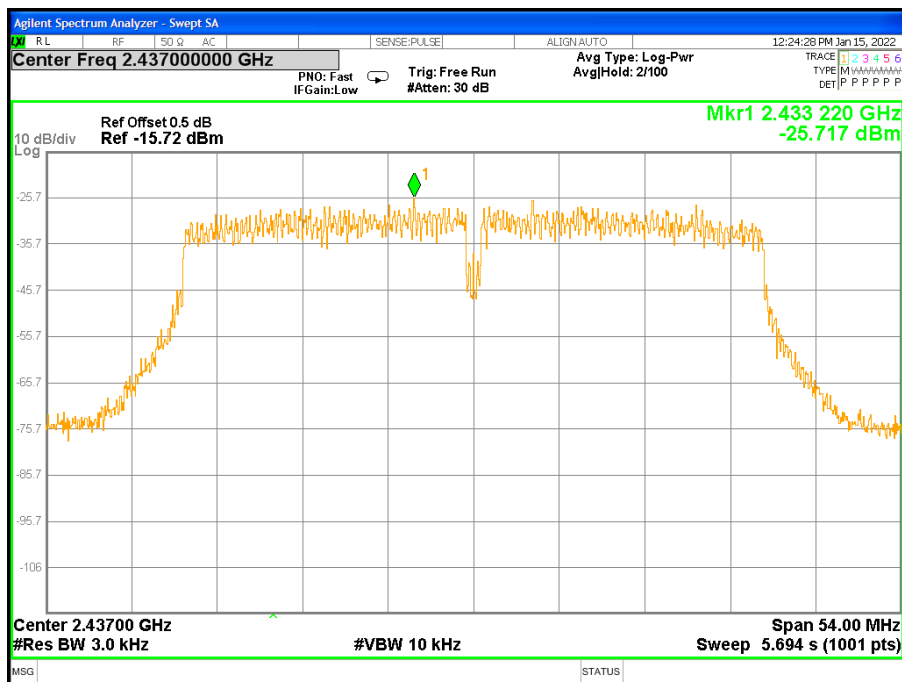
CH09



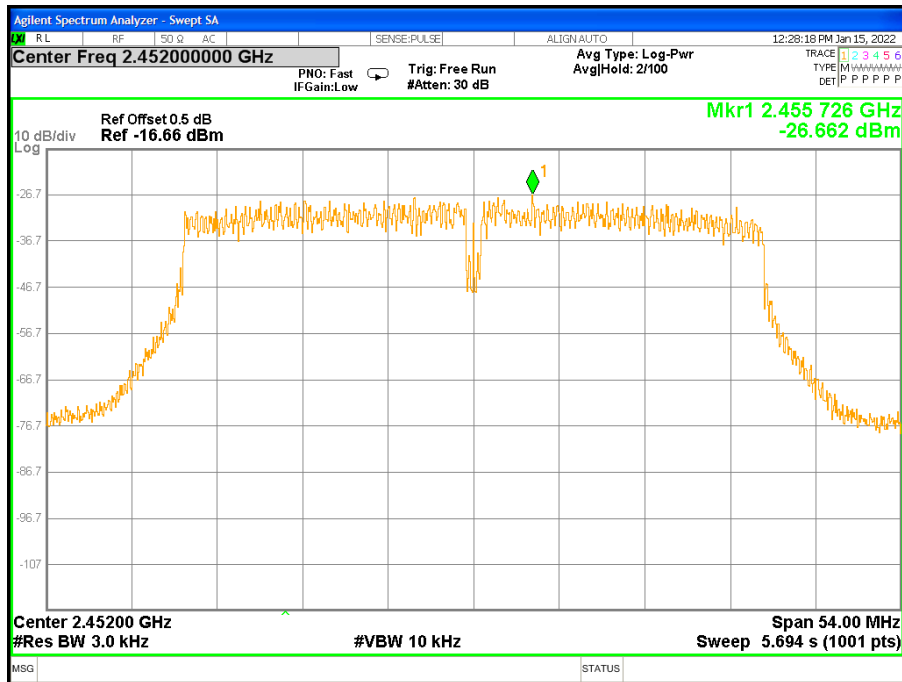
ANT B CH03



CH06



CH09



7. PEAK OUTPUT POWER TEST

7.1 APPLIED PROCEDURES / LIMIT

LP0002				
Section	Test Item	Limit	Frequency Range (MHz)	Result
4.10.1(2)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

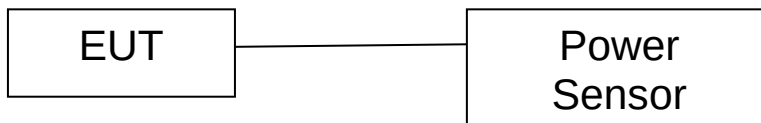
7.1.1 TEST PROCEDURE

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.1.5 TEST RESULTS

Temperature :	25.1 °C	Relative Humidity :	52%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	802.11b/g/n20/n40	Test Date :	2022-01-15

Modulation	Frequency (MHz)	Ant_A Peak Output Power (dBm)	Ant_B Peak Output Power (dBm)	ANT A+B Peak Output Power (dBm)	Ant_A Average Reading Power (dBm)	Ant_B Average Reading Power (dBm)	Duty Cycle Factor (dB)	Ant_A Final Average Output Power (dBm)	Ant_B Final Average Output Power (dBm)	Ant_A+B Final Average Output Power (dBm)	Limit (dBm)	Result
802.11b	2412	12.44	11.32	N/A	10.26	8.94	0.24	10.50	9.18	N/A	30	Pass
	2437	12.36	10.82	N/A	10.22	8.59	0.24	10.46	8.83	N/A	30	Pass
	2462	12.11	10.63	N/A	10.02	8.44	0.24	10.26	8.68	N/A	30	Pass
802.11g	2412	13.69	13.22	N/A	3.76	3.08	1.32	5.08	4.40	N/A	30	Pass
	2437	13.88	12.97	N/A	0.94	2.80	1.32	2.26	4.12	N/A	30	Pass
	2462	13.28	12.50	N/A	3.49	2.36	1.32	4.81	3.68	N/A	30	Pass
802.11n(HT20)	2412	12.05	11.76	14.92	3.04	2.55	1.41	4.45	3.96	7.22	30	Pass
	2437	12.33	11.22	14.82	3.15	2.03	1.41	4.56	3.44	7.05	30	Pass
	2462	11.60	10.75	14.21	2.72	1.52	1.41	4.13	2.93	6.58	30	Pass
802.11n(HT40)	2422	12.26	11.40	14.86	3.03	2.17	2.50	5.53	4.67	8.13	30	Pass
	2437	12.16	10.93	14.60	2.98	1.83	2.50	5.48	4.33	7.95	30	Pass
	2452	11.54	10.80	14.20	2.61	1.62	2.50	5.11	4.12	7.65	30	Pass

8. ANTENNA CONDUCTED SPURIOUS EMISSION

8.1 APPLIED PROCEDURES / LIMIT

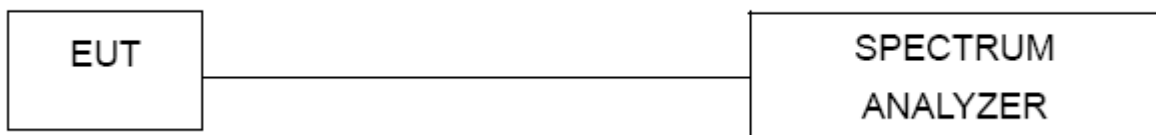
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified in Section 3.6.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

8.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 100kHz, VBW=300kHz, Sweep time = Auto.

8.1.2 TEST SETUP



8.1.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

8.1.4 TEST RESULTS

Note: ANT A Power> ANT B Power, Both ANT A and B have been test, Only show the worst data of ANT A

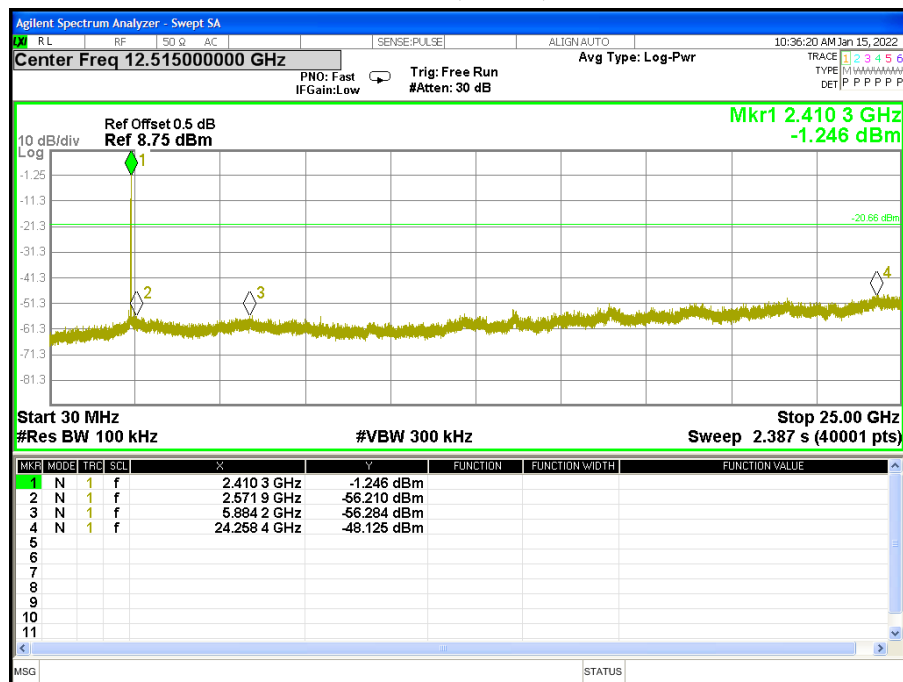
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	25.1 °C	Relative Humidity :	52%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	CH01/ CH/06/CH11 (802.11b Data rate 1Mbps)		
Test Date :	2022-01-15		

in any 100kHz bandwidth outside the low frequency band	in any 100 kHz bandwidth outside the high frequency band
Pass	Pass

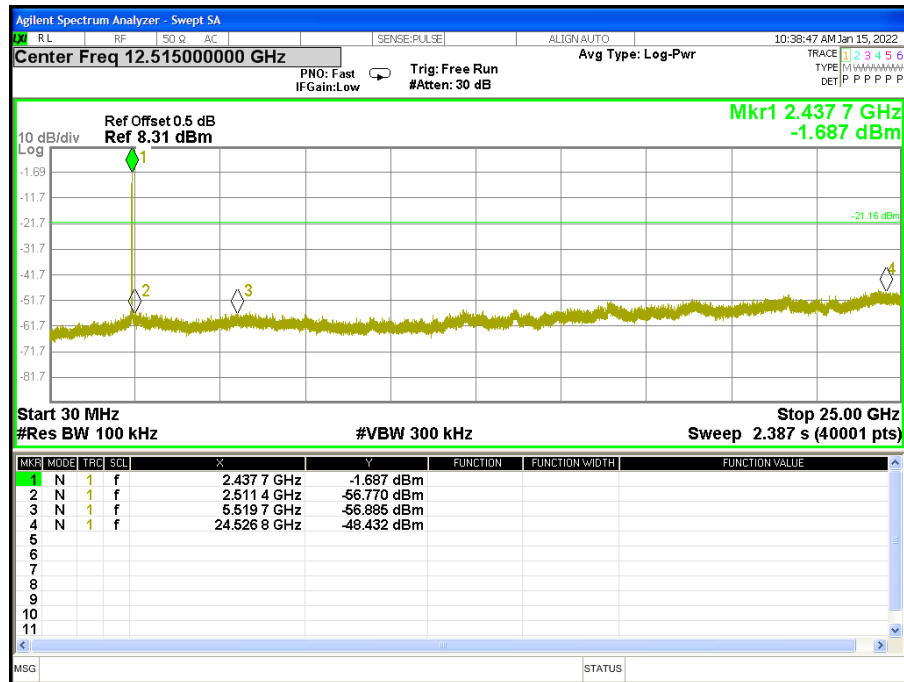
Result

In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

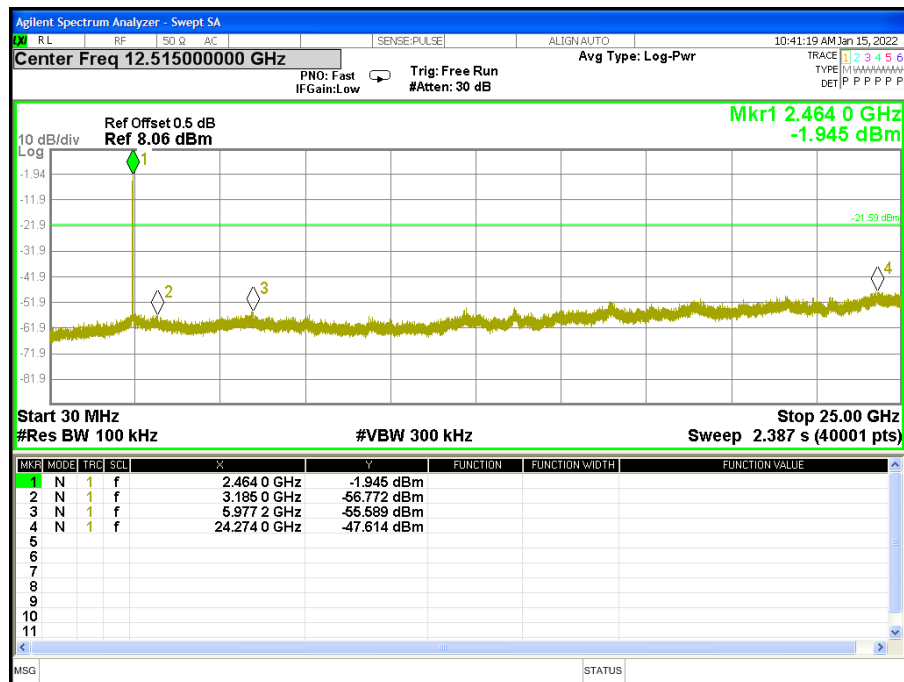
CH01 (Lower)



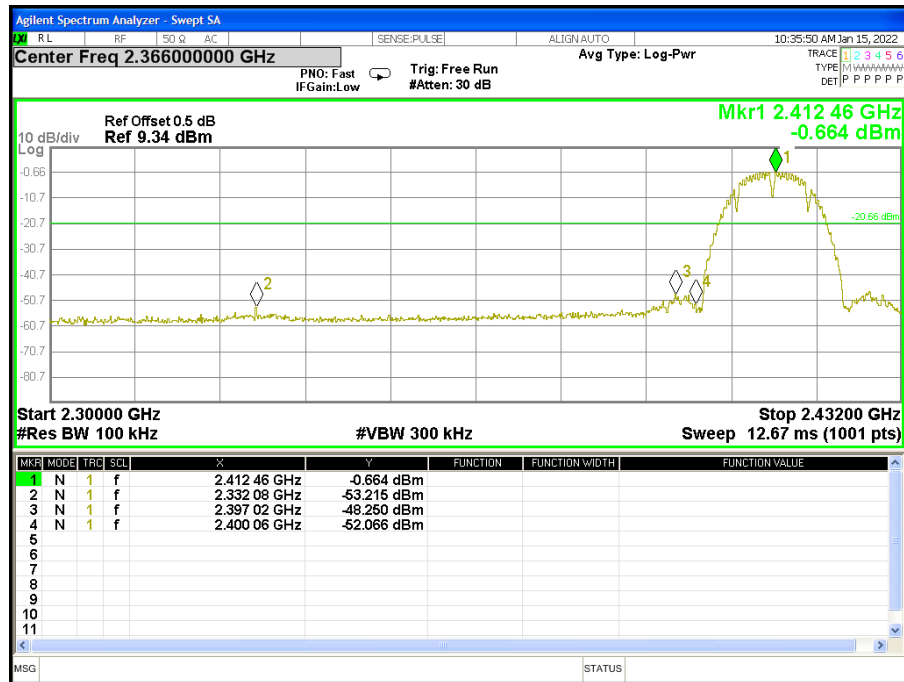
CH 06(Middle)



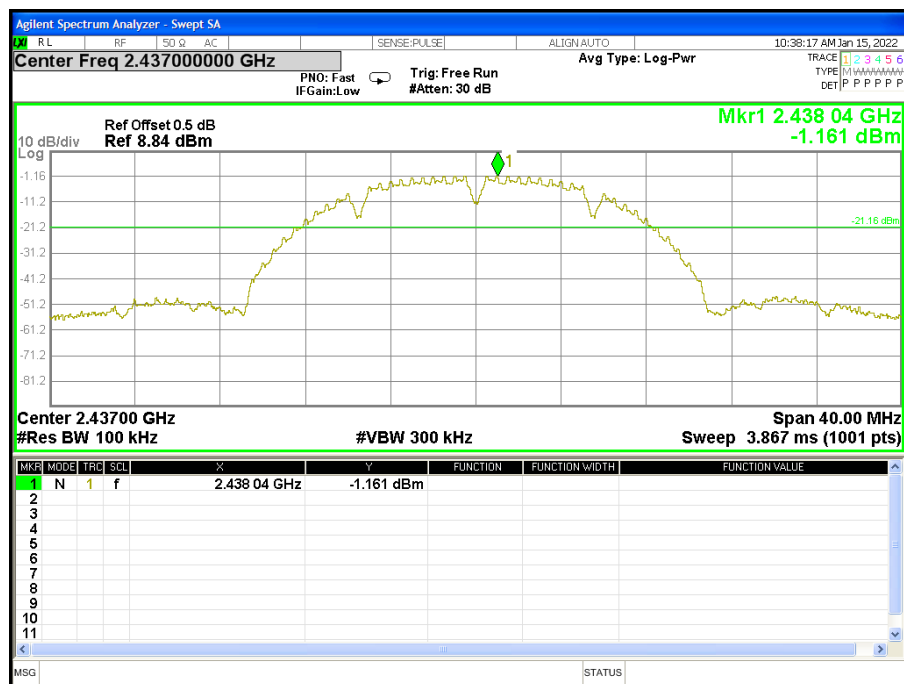
CH 11(Upper)



CH01



CH06



Agilent Spectrum Analyzer - Swept SA

RL RF SO Q AC SENSE:PULSE ALIGN:AUTO 10:40:49 AM Jan 15, 2022

Center Freq 2.471000000 GHz

PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr

TRACE 1 2 3 4 5 6
TYPE M I A V W X Y Z
DET P P P P P P

Ref Offset 0.5 dB Ref 8.41 dBm

Mkr1 2.462996 GHz -1.592 dBm

-21.59 dBm

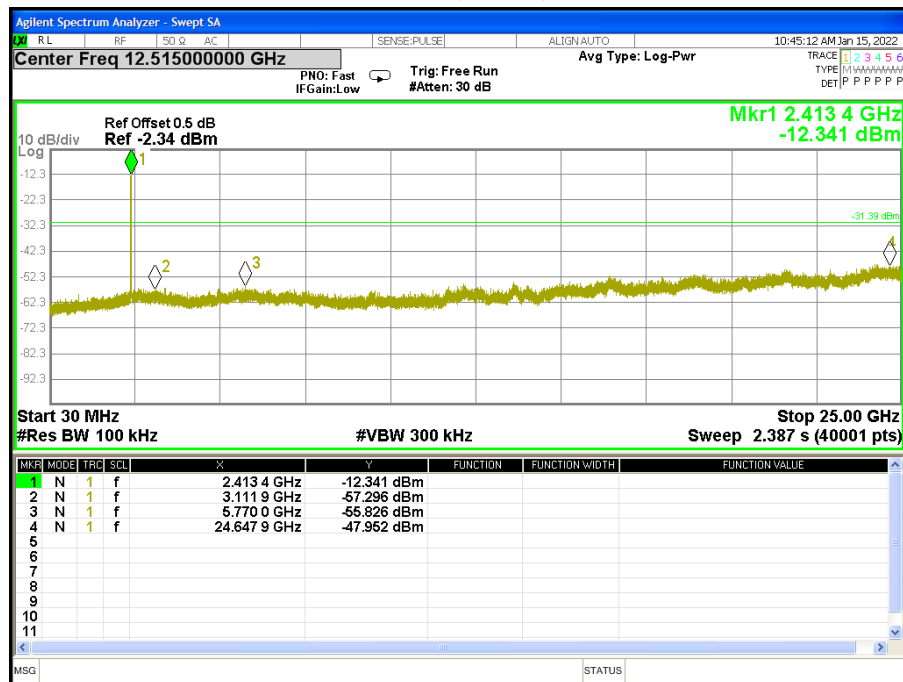
Start 2.44200 GHz Stop 2.50000 GHz
#Res BW 100 kHz #VBW 300 kHz Sweep 5.600 ms (1001 pts)

MkP	MODE	FREQ	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	2.462996 GHz	f		-1.592 dBm			
2	N	2.483528 GHz	f		-56.253 dBm			
3	N	2.485790 GHz	f		-54.918 dBm			
4	N	2.491184 GHz	f		-55.446 dBm			

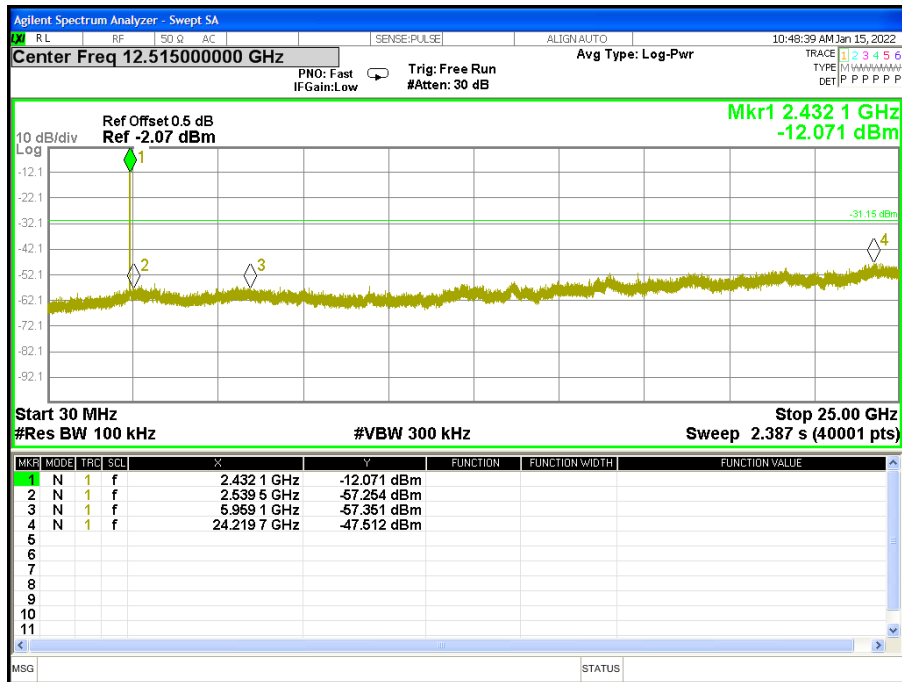
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	25.1 °C	Relative Humidity :	52%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	CH01/ CH/06/CH11 (802.11g Data rate 6Mbps)		
Test Date :	2022-01-15		

in any 100kHz bandwidth outside the low frequency band	in any 100 kHz bandwidth outside the high frequency band
Pass	Pass
Result	
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.	

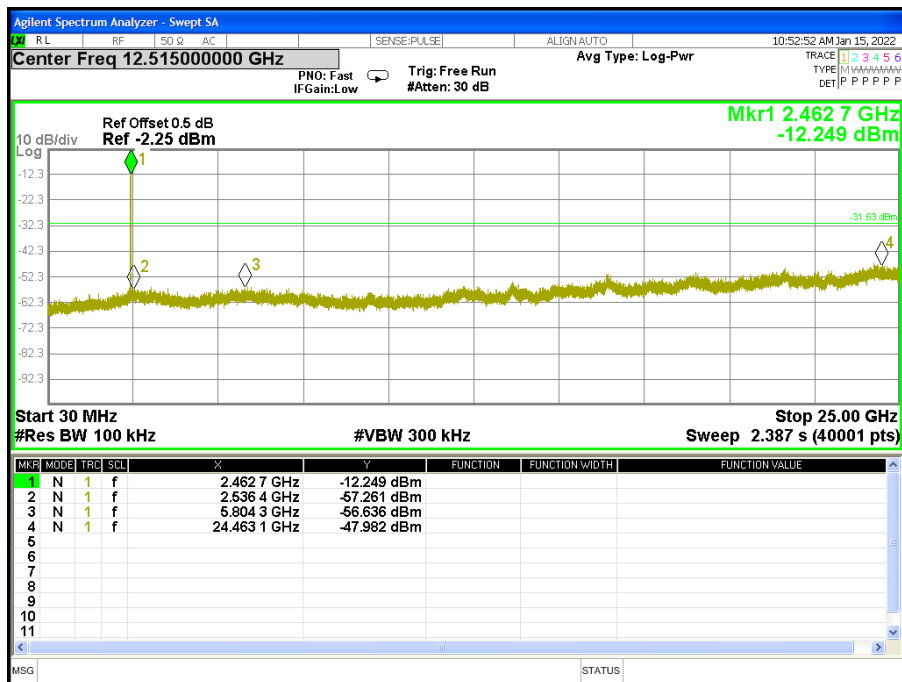
CH01 (Lower)



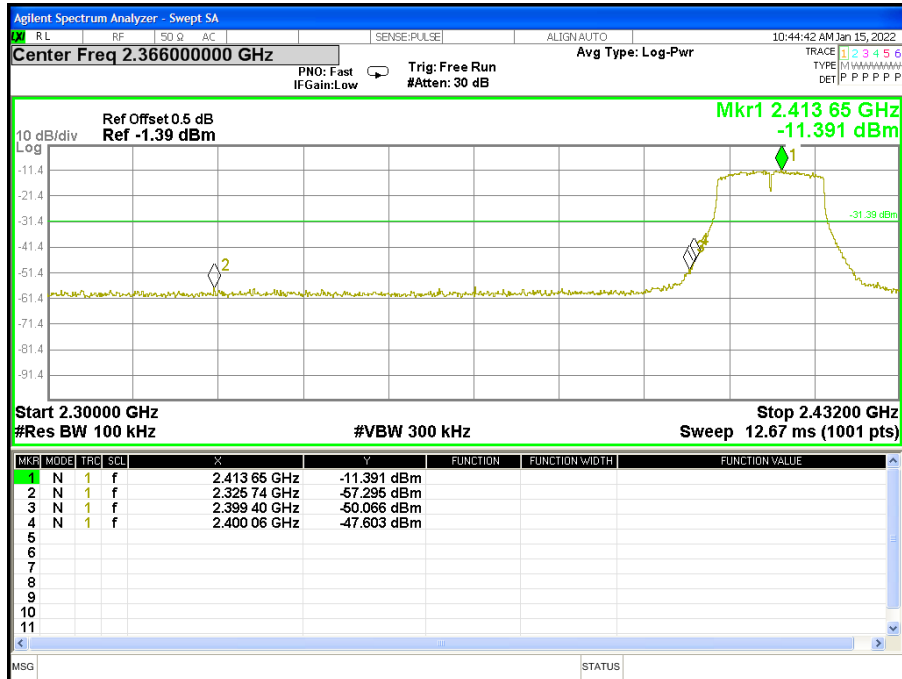
CH 06(Middle)



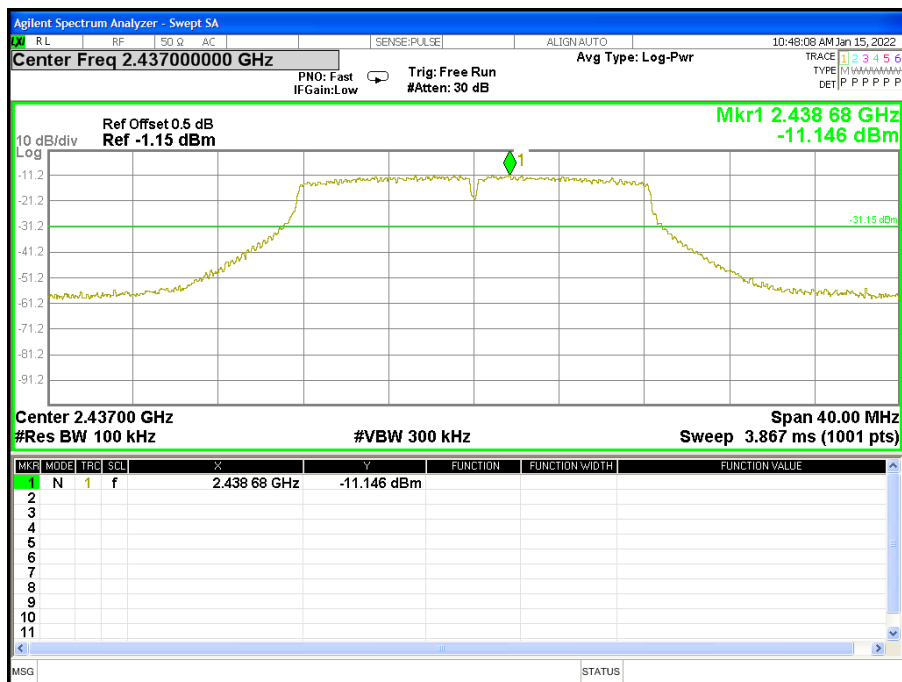
CH 11(Upper)



CH01



CH06



Agilent Spectrum Analyzer - Swept SA

RL RF SO Q AC SENSE:PULSE ALIGN: AUTO 10:52:22 AM Jan 15, 2022

Center Freq 2.471000000 GHz Avg Type: Log-Pwr

PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB

TYPE: [1] [2] [3] [4] [5] [6]
DET: P P P P P P

Ref Offset 0.5 dB
Ref -1.63 dBm

Mkr1 2.463 692 GHz
-11.632 dBm

10 dB/div
Log

-11.6
-21.6
-31.6
-41.6
-51.6
-61.6
-71.6
-81.6
-91.6

-31.63 dBm

2
3
4

Start 2.44200 GHz Stop 2.50000 GHz
#Res BW 100 kHz #VBW 300 kHz Sweep 5.600 ms (1001 pts)

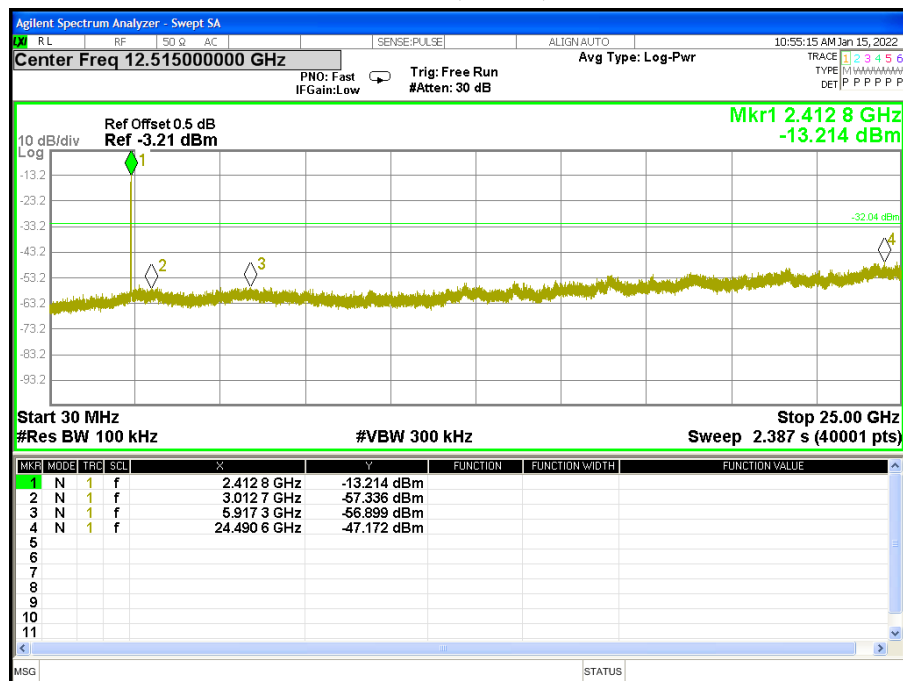
MARK	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.463 692 GHz	-11.632 dBm			
2	N	1	f	2.483 528 GHz	-58.451 dBm			
3	N	1	f	2.489 096 GHz	-57.937 dBm			
4	N	1	f	2.491 184 GHz	-57.505 dBm			

MSG STATUS

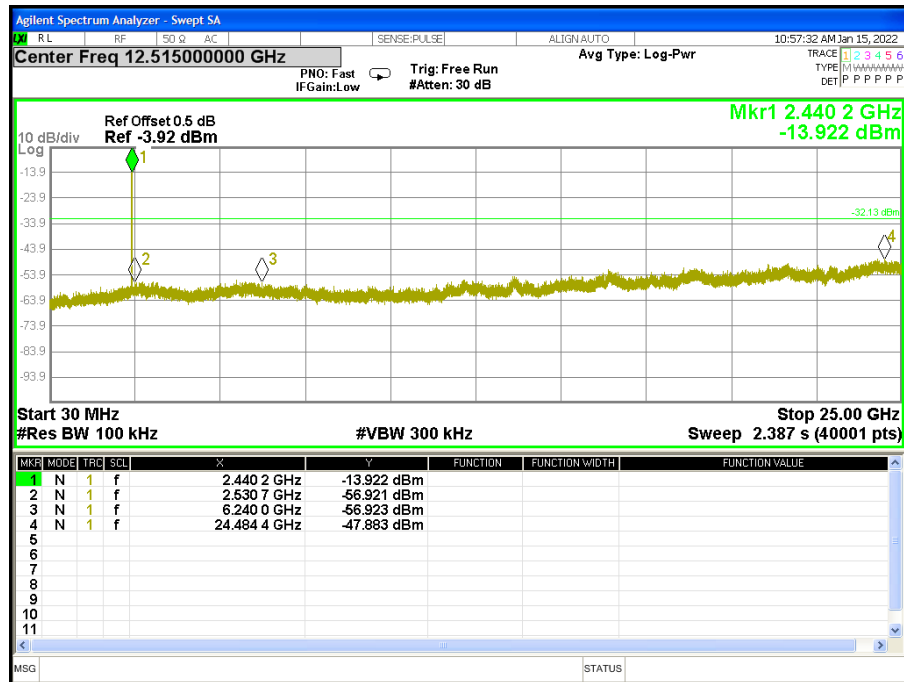
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	25.1 °C	Relative Humidity :	52%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	CH01/ CH/06/CH11 (802.11n20 Data rate 6.5Mbps)		
Test Date :	2022-01-15		

in any 100kHz bandwidth outside the low frequency band	in any 100 kHz bandwidth outside the high frequency band
Pass	Pass
Result	
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.	

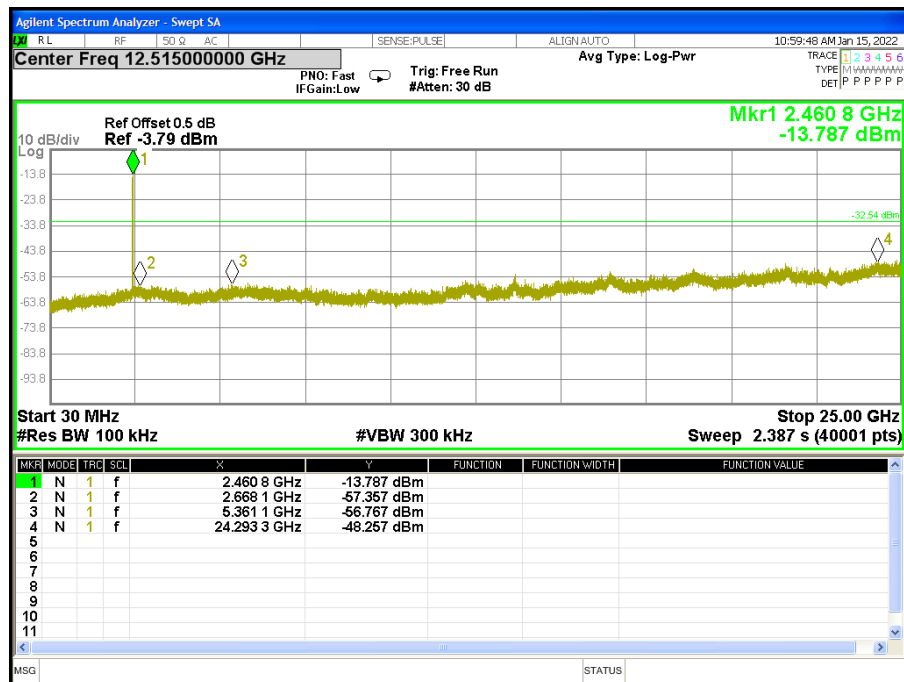
CH01 (Lower)



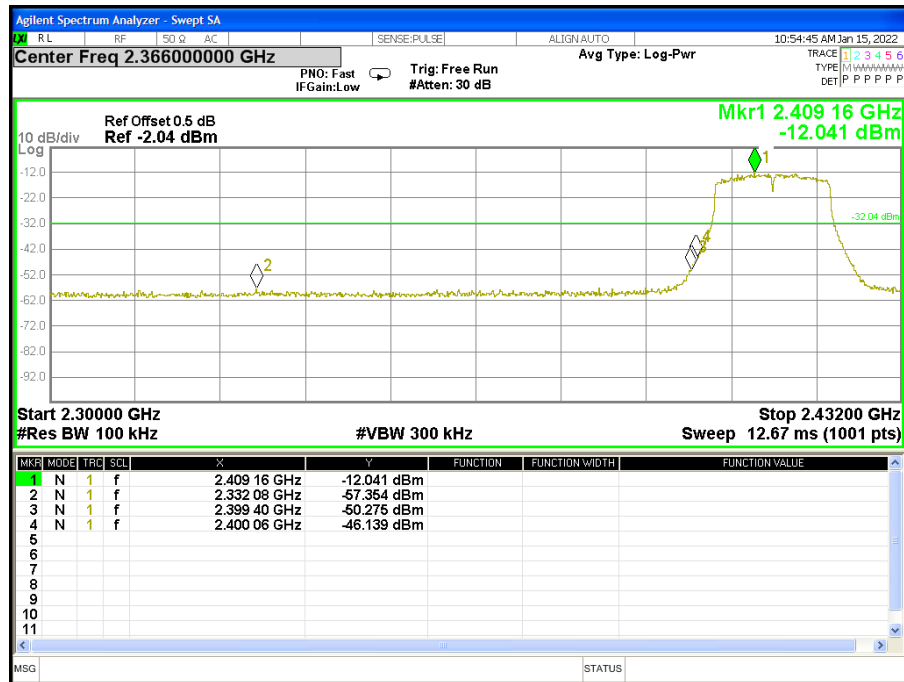
CH 06(Middle)



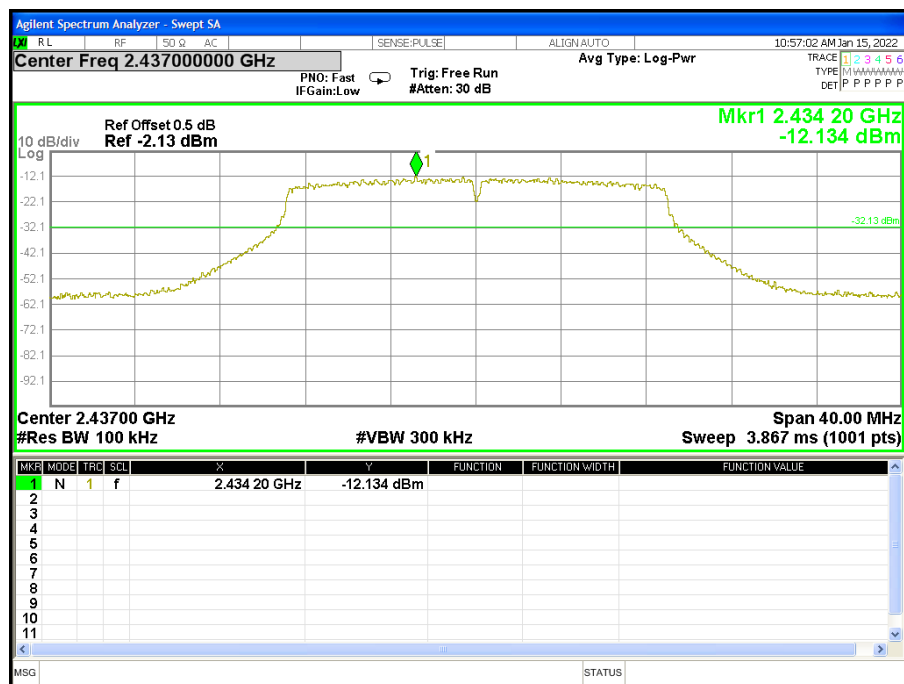
CH 11(Upper)



CH01



CH06



Agilent Spectrum Analyzer - Swept SA

RL RF SO Q AC SENSE:PULSE ALIGN: AUTO 10:59:18 AM Jan 15, 2022

Center Freq 2.471000000 GHz Avg Type: Log-Pwr

PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB

TYPE 1 2 3 4 5 6
DET P P P P P P

Ref Offset 0.5 dB
Ref -2.54 dBm

Mkr1 2.459 168 GHz
-12.539 dBm

-32.54 dBm

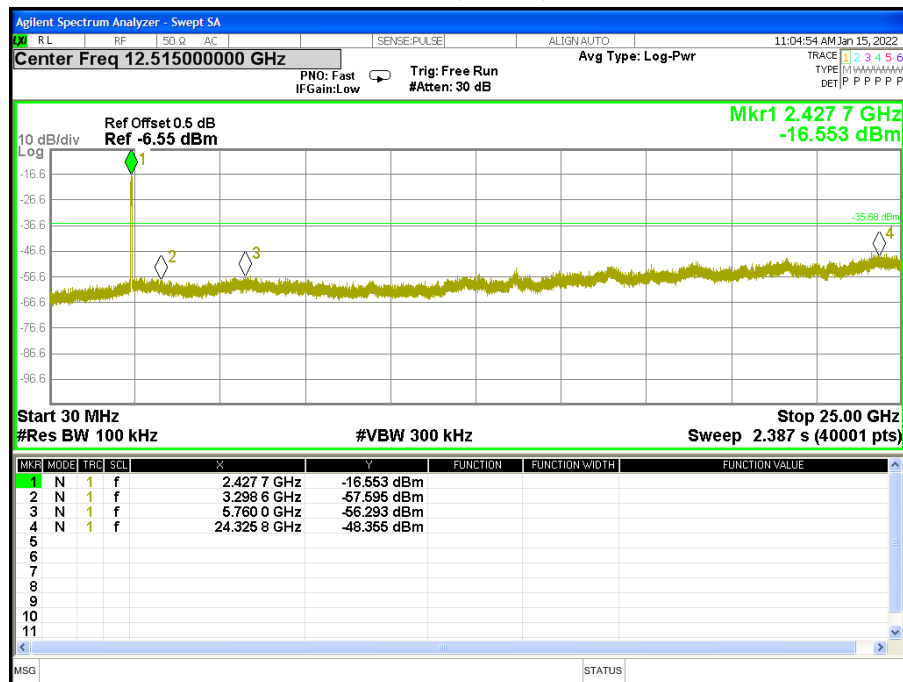
Start 2.44200 GHz Stop 2.50000 GHz
#Res BW 100 kHz #VBW 300 kHz Sweep 5.600 ms (1001 pts)

Mkr	MODE	TRG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.459 168 GHz	-12.539 dBm			
2	N	1	f	2.483 528 GHz	-59.950 dBm			
3	N	1	f	2.488 168 GHz	-57.503 dBm			
4	N	1	f	2.493 562 GHz	-57.656 dBm			

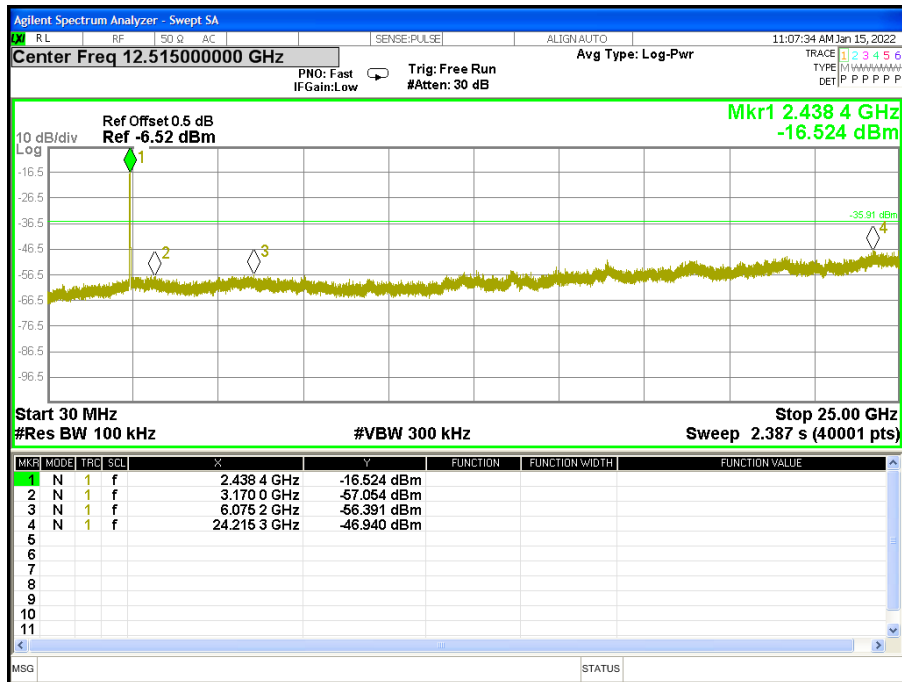
EUT :	LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter	Model Name :	LM842
Temperature :	25.1 °C	Relative Humidity :	52%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	CH03/ CH/06/CH09 (802.11n40 Data rate 6.5Mbps)		
Test Date :	2022-01-15		

in any 100kHz bandwidth outside the low frequency band	in any 100 kHz bandwidth outside the high frequency band
Pass	Pass
Result	
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.	

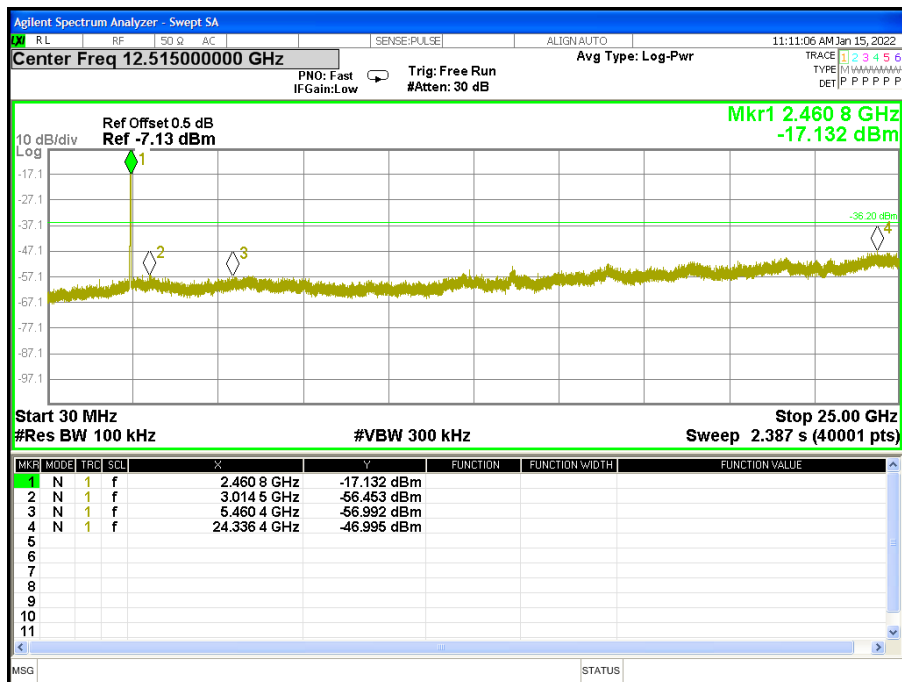
CH03 (Lower)



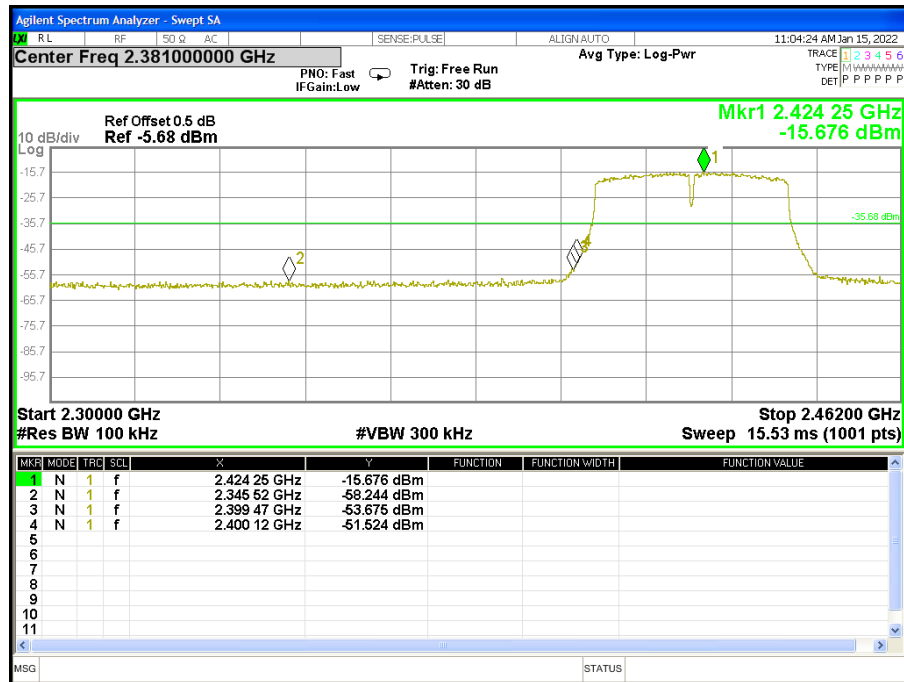
CH 06(Middle)



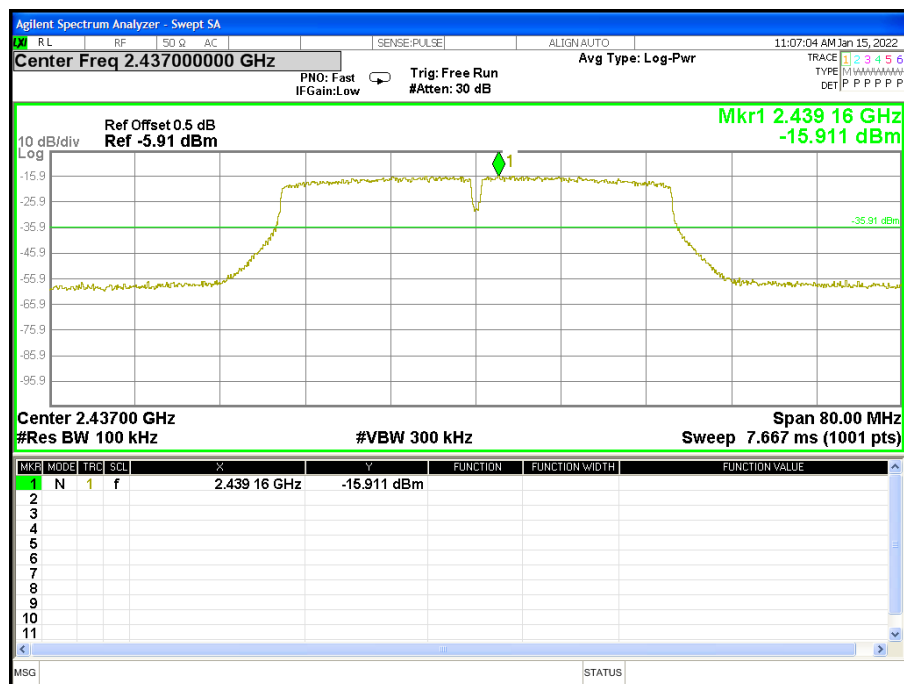
CH 09(Upper)



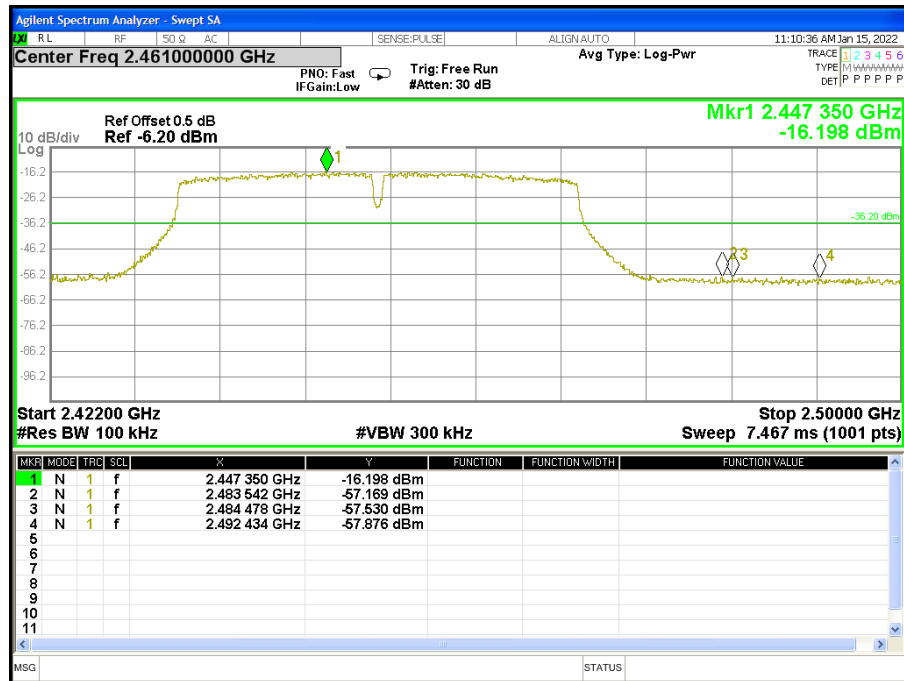
CH03



CH06



CH09



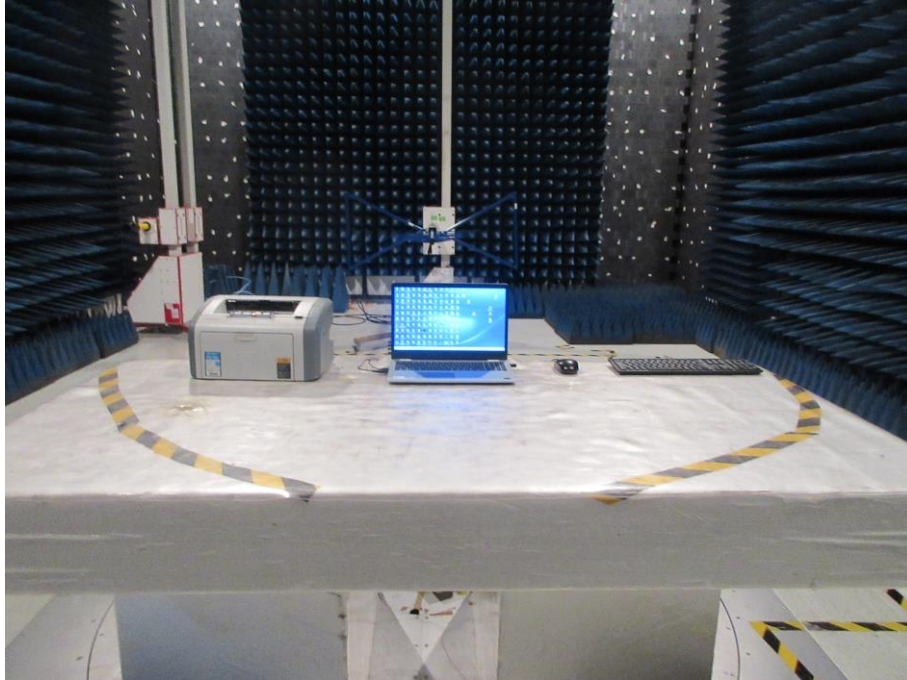
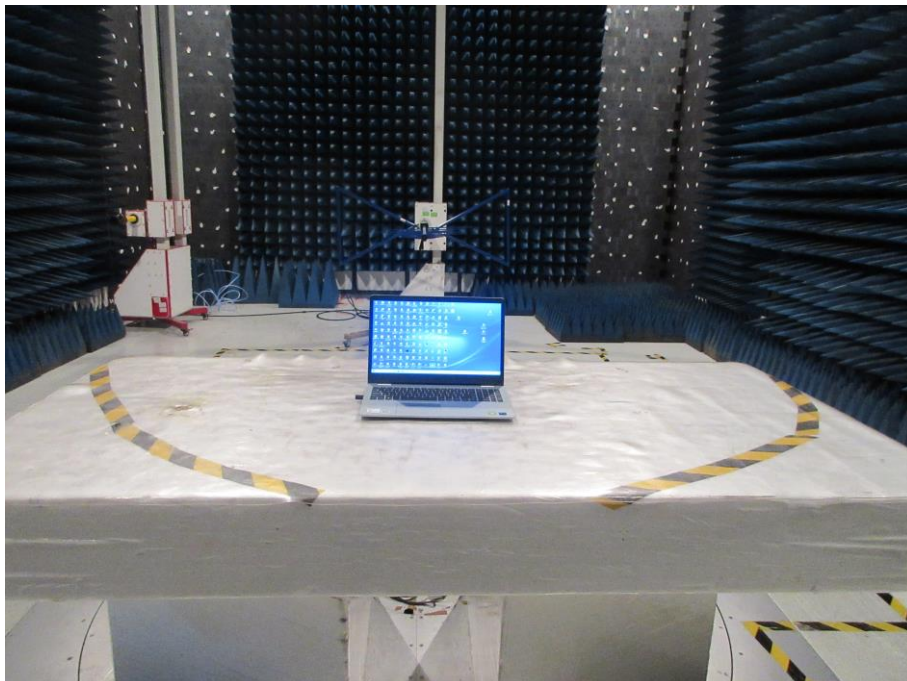
9. ANTENNA REQUIREMENT

9.1 STANDARD REQUIREMENT

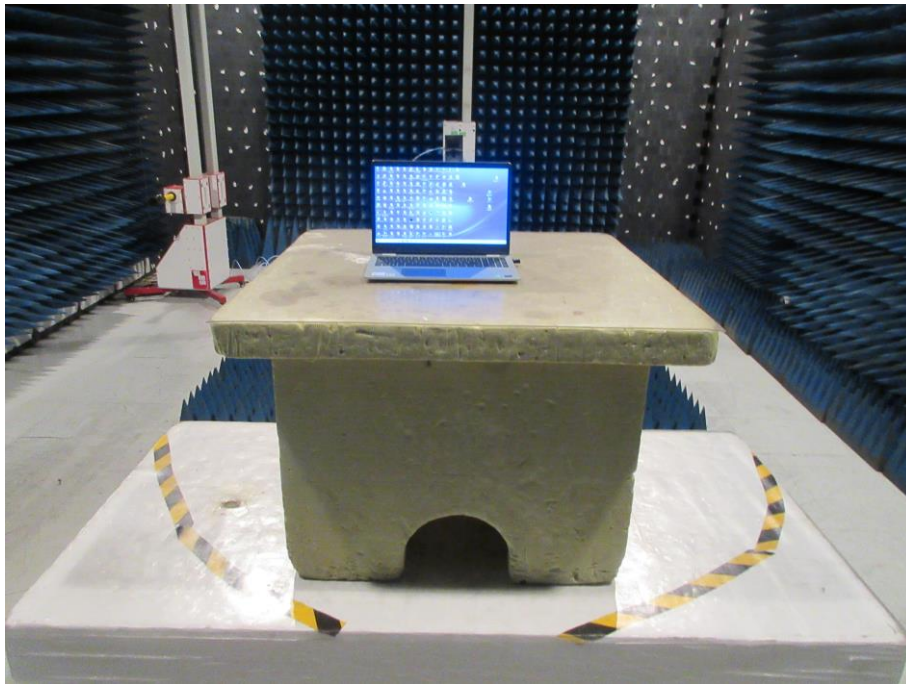
4.10.3.1.1 requirement: Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

9.2 EUT ANTENNA

The antenna is a PIFA antenna and no consideration of replacement. Antenna max gain is ANT A: -0.17dBi, ANT B: -0.61dBi, MIMO:2.62dB from 2.4GHz to 2.5GHz.

10. EUT TEST PHOTO**Radiated Measurement Photos
30MHz-1GHz
Working mode****TX mode**

**Radiated Measurement Photos
Above 1GHz
TX mode**



**Conducted Measurement Photos
Working mode**



Conducted Measurement Photos
TX mode



11 . APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix-photographs.

**** End of Report ****