FCC Test Report

Report No.: AGC00742191201FE05

FCC ID	:	2AU6EDNS-6B06
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Dual Band Wireless USB Adapter
BRAND NAME	:	Techkey
MODEL NAME	:	Techkey-6B06, Techkey-6B08
APPLICANT	:	Shenzhen Denos Trade Co., Ltd.
DATE OF ISSUE	:	Dec. 24, 2019
STANDARD(S) TEST PROCEDURE(S)	:	FCC Part 15.247
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec. 24, 2019	Valid	Initial Release

REPORT REVISE RECORD

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Applicant	Shenzhen Denos Trade Co., Ltd.	
Address	Room 610, Shibida Building, No. 55 ZhenHua Rd, Futian District, Shen Zhen, GuangDong, China	
Manufacturer	SHEN ZHEN SHI XIN HUA TIAN TECHNOLOGY CO., LTD	
Address	3Foor, B Buliding, DaHong Industrial Park, GuangMin District, Shenzhen City, China	
Factory	SHEN ZHEN SHI XIN HUA TIAN TECHNOLOGY CO., LTD	
Address	Foor, B Buliding, DaHong Industrial Park, GuangMin District, Shenzhen City, hina	
Product Designation	Dual Band Wireless USB Adapter	
Brand Name	Fechkey	
Test Model	Techkey-6B06	
Series Model	Techkey-6B08	
Difference Description	All the same except for the model name and color of appearance	
Date of test	Dec. 16, 2019 to Dec. 24, 2019	
Deviation	No any deviation from the test method	
Condition of Test Sample	est Sample Normal	
Test Result	Pass	
Report Template	AGCRT-US-BGN/RF	

1. VERIFICATION OF CONFORMITY

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.247.

Prepared By	3 vv K. Jang	
	Erik Yang (Project Engineer)	Dec. 24, 2019
Reviewed By	Mays Zhang	
	Max Zhang (Reviewer)	Dec. 24, 2019
Approved By	Formestics	
	Forrest Lei (Authorized Officer)	Dec. 24, 2019

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as "Dual Band Wireless USB Adapter". It is designed by way of utilizing the DSSS and OFDM technology to achieve the system operation.

rinajer teerimear accomption t	A major technical description of EOT is described as following		
Operation Frequency	2.412 GHz~2.462GHz		
Output Power(Average)	IEEE 802.11b:9.84dBm; IEEE 802.11g:9.64dBm;		
	IEEE 802.11n(20):9.36dBm; IEEE 802.11n(40):9.37dBm		
Modulation	DSSS(DBPSK/DQPSK/CCK);OFDM(BPSK/QPSK/16-QAM/64-QAM)		
Number of channels	11		
Hardware Version	V1.0		
Software Version	V1.0		
	antenna 0: External antenna(Use of reverse SMA connector)		
Antenna Designation	antenna 1: Internal antenna		
(802.11b/g used antenna 0, 802.11n20/n40 used two antennas)			
Antenna Gain	antenna 0: 5.0dBi		
Antenna Gain	antenna 1: 5.0dBi		
Power Supply	DC 5V		

A major technical description of EUT is described as following

Note: For more details, refer to the user's manual of the EUT.

2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
	1	2412 MHZ
	2	2417 MHZ
	3	2422 MHZ
	4	2427 MHZ
	5	2432 MHZ
2400~2483.5MHZ	6	2437 MHZ
	7	2442 MHZ
	8	2447 MHZ
	9	2452 MHZ
	10	2457 MHZ
	11	2462 MHZ

Note: For 20MHZ bandwidth system use Channel 1 to Channel 11, For 40MHZ bandwidth system use Channel 3 to Channel 9

MCS Index	Nss	Modulation	R	NBPSC	NBPSC NCBPS		NDI	BPS	rate(N	ata Mbps) nsGl
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0
6	1	64-QAM	3/4	6	312	648	234	489	58.5	121.5
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0

2.3. IEEE 802.11N MODULATION SCHEME

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPSC	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	Guard interval

2.4. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AU6EDNS-6B06** filing to comply with the FCC Part 15 requirements.

2.5. TEST METHODOLOGY

KDB 558074 D01 15.247 Meas Guidance v05: Guidance for compliance measurements on Digital transmissio n system, frequency hopping spread spectrum system, and hybrid system devices operating under section 15.247 of the FCC rules ANSI C63.10:2013 : American National Standard for Testing Unlicensed Wireless Devices

2.6. SPECIAL ACCESSORIES

Refer to section 5.2.

2.7. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in measurement" (GUM) published by CISPR and ANSI.

- Uncertainty of Conducted Emission, $Uc = \pm 3.2 \text{ dB}$
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB

4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION				
1	Low channel TX				
2	Middle channel TX				
3	High channel TX				
4	Normal operating				
Note:					
	Transmit by 802.11b with Date rate (1/2/5.5/11)				
Transm	Transmit by 802.11g with Date rate (6/9/12/18/24/36/48/54)				
Transm	Transmit by 802.11n (20MHz) with Date rate (6.5/13/19.5/26/39/52/58.5/65)				
Transm	Transmit by 802.11n (40MHz) with Date rate (13.5/27/40.5/54/81/108/121.5/135)				

Note:

1. The EUT has been set to operate continuously on the lowest, middle and highest operation frequency Individually, and the EUT is operating at its maximum duty cycle>or equal 98%

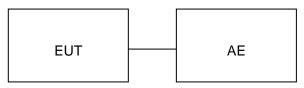
2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.

3. The test software is the RtkTestAPP-v2.0.0_20170425 which can set the EUT into the individual test modes

5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Radiated Emission Configure :



Conducted Emission Configure :

EUT	AE

5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Dual Band Wireless USB Adapter	Techkey-6B06	2AU6EDNS-6B06	EUT
2	PC	XIAOMI	N/A	Support
3	PC adapter	XIAOMI ADC6501TM	DC5V/2A,9V/2A,12V/2A, 15V/3A,20V/3.25A, 65W Max	Support

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.247	Output Power	Compliant
§15.247	6 dB Bandwidth	Compliant
§15.247	Conducted Spurious Emission	Compliant
§15.247	Maximum Conducted Output Power SPECTRAL Density	Compliant
§15.209	Radiated Emission	Compliant
§15.247	Band Edges	Compliant
§15.207	Line Conduction Emission	Compliant

6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Jun. 12, 2019	Jun. 11, 2020
LISN	R&S	ESH2-Z5	100086	Aug. 26, 2019	Aug. 25, 2020
Test software	R&S	ES-K1 (Ver. V1.71)	N/A	N/A	N/A

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun.12, 2019	Jun. 11, 2020
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 12, 2019	Dec.11, 2020
Power sensor	Aglient	U2021XA	MY54110007	Sep. 09, 2019	Sep. 08, 2020
2.4GHz Fliter	EM Electronics	2400-2500	N/A	Feb. 27, 2019	Feb. 26, 2020
Attenuator	Wariors	W13	11324	Sep. 09, 2019	Sep. 08, 2020
Horn antenna	ETS-LINDGREN	3117	00154520	Oct. 26, 2019	Oct. 25, 2021
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Jun. 14, 2018	Jun. 13, 2020
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 17, 2019	May 16, 2021
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Oct. 15, 2019	Oct. 14, 2020
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 09, 2019	Jan. 08, 2021
Test software	FARA	EZ_EMC (Ver. RA-03A)	N/A	N/A	N/A

7. OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

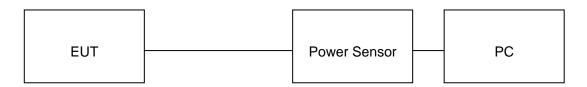
For average power test:

- 1. Connect EUT RF output port to power sensor through an RF attenuator.
- 2. Connect the power sensor to the PC.
- 3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 4. Record the maximum power from the software.

Note : The EUT was tested according to ANSI C63.10 (2013) for compliance to FCC 47CFR 15.247 requirements.

7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

AVERAGE POWER SETUP



7.3. LIMITS AND MEASUREMENT RESULT

TEST ITEM	OUTPUT POWER
TEST MODE	802.11b with data rate 1

Frequency (GHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	9.84	30	Pass
2.437	9.38	30	Pass
2.462	9.45	30	Pass

TEST ITEM	OUTPUT POWER
TEST MODE	802.11g with data rate 6

Frequency (GHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	9.64	30	Pass
2.437	9.08	30	Pass
2.462	8.65	30	Pass

TEST ITEM	OUTPUT POWER
TEST MODE	802.11n 20 with data rate 6.5

Frequency (GHz)	Average Power Chain 0 (dBm)	Average Power Chain 1 (dBm)	Average Power Total (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	6.41	6.29	9.36	30	Pass
2.437	5.88	5.80	8.85	30	Pass
2.462	5.59	5.47	8.54	30	Pass

TEST ITEM	OUTPUT POWER
TEST MODE	802.11n 40 with data rate 13.5

Frequency (GHz)	Average Power Chain 0 (dBm)	Average Power Chain 1 (dBm)	Average Power Total (dBm)	Applicable Limits (dBm)	Pass or Fail
2.422	6.39	6.32	9.37	30	Pass
2.437	6.38	6.27	9.34	30	Pass
2.452	6.20	6.14	9.18	30	Pass

8.6 DB BANDWIDTH

8.1. MEASUREMENT PROCEDURE

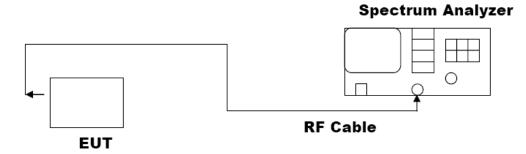
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator

2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.

- 3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW \ge 3×RBW.
- 4. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to ANSI C63.10 (2013) for compliance to FCC 47CFR 15.247 requirements.

8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



8.3. LIMITS AND MEASUREMENT RESULTS

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11b with data rate 11

	LIMITS AND MEAS	UREMENT RESULT			
Annlinghin Limite	Applicable Limits				
Applicable Limits	Test Da	ta (MHz)	Criteria		
	Low Channel	9.070	PASS		
>500KHZ	Middle Channel	9.069	PASS		
	High Channel	9.064	PASS		

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11g with data rate 54

	LIMITS AND MEAS	UREMENT RESULT	
Annlinghle Limite		Applicable Limits	
Applicable Limits	Test Da	ta (MHz)	Criteria
	Low Channel	16.34	PASS
>500KHZ	Middle Channel	16.33	PASS
	High Channel	16.34	PASS

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11n 20 with data rate 65

	LIMITS AND MEAS	UREMENT RESULT			
Applicable Limite	Applicable Limits				
Applicable Limits	Test Data (MHz) (Criteria		
	Low Channel	17.14	PASS		
>500KHZ	Middle Channel	17.28	PASS		
	High Channel	17.28	PASS		

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11n 40 with data rate 135

	LIMITS AND MEAS	UREMENT RESULT	
Annlinghla Limita			
Applicable Limits	Test Data (MHz)		Criteria
	Low Channel	36.30	PASS
>500KHZ	Middle Channel	36.31	PASS
	High Channel	36.30	PASS



802.11b TEST RESULT TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

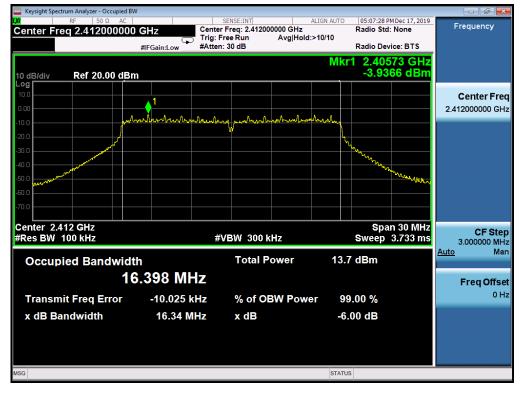


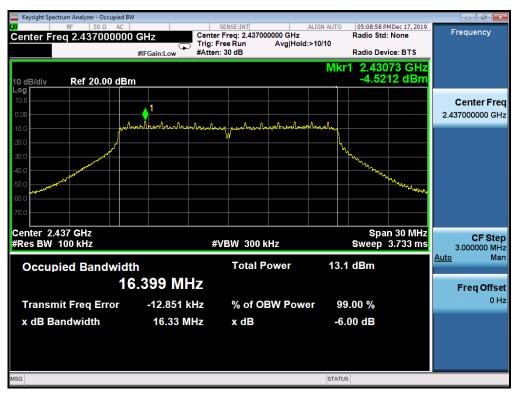


TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

802.11g TEST RESULT

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL





TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



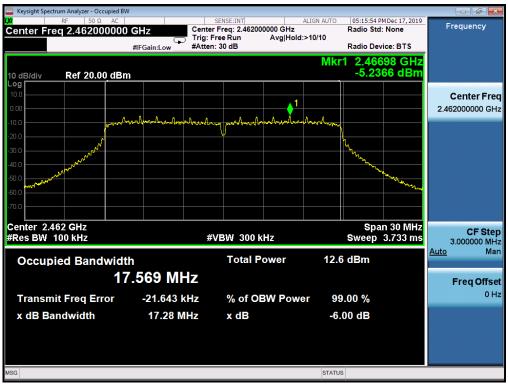


802.11n (20) TEST RESULT

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

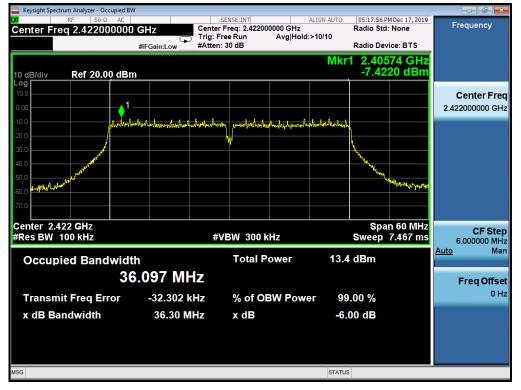


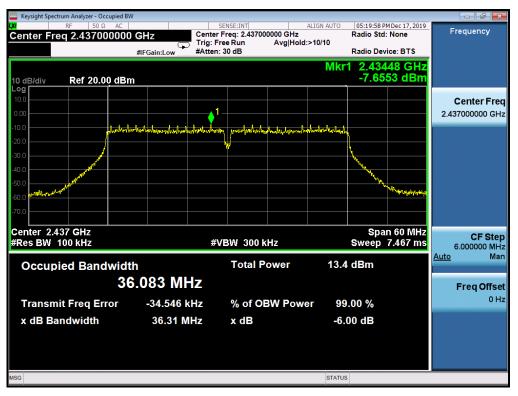


TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

802.11n (40) TEST RESULT

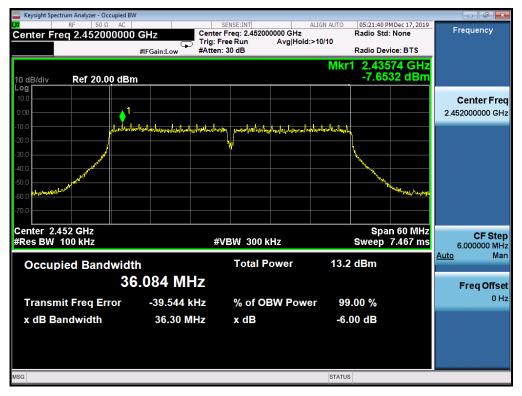
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL





TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



9. CONDUCTED SPURIOUS EMISSION

9.1. MEASUREMENT PROCEDURE

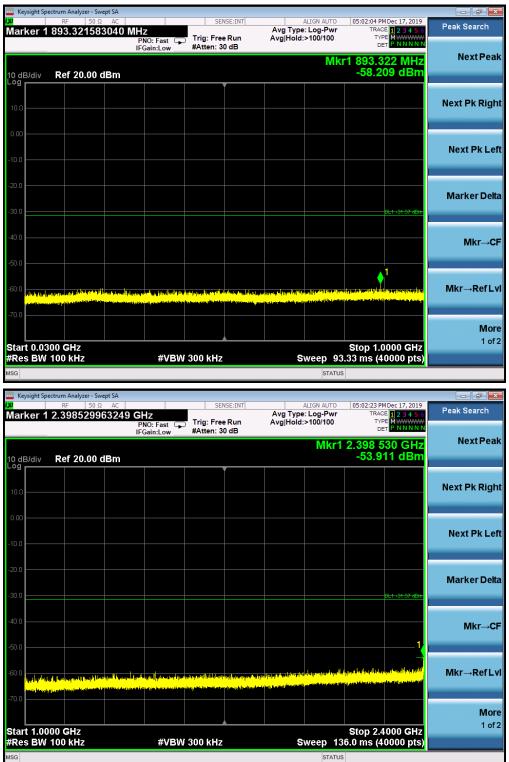
- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set SPA Trace 1 Max hold, then View.
- **Note:** The EUT was tested according to ANSI C63.10 (2013) for compliance to FCC 47CFR 15.247 requirements. Owing to satisfy the requirements of the number of measurement points, we set the RBW=1MHz, VBW>RBW, scan up through 10th harmonic, and consider the tested results as the worst case, if the tested results conform to the requirement, we can deem that the real tested results(set the RBW=100KHz, VBW>RBW) are conform to the requirement.

9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 4.2.

9.3. LIMITS AND MEASUREMENT RESULT

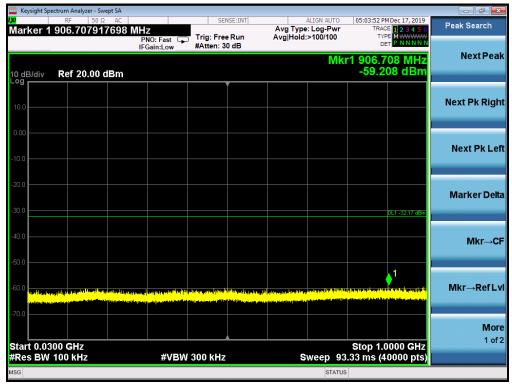
LIMITS AND MEA	SUREMENT RESULT	
Angliachta Limite	Measurement Re	sult
Applicable Limits	Test Data	Criteria
In any 100 KHz Bandwidth Outside the	At least -30dBc than the limit	
frequency band in which the spread spectrum	Specified on the BOTTOM	PASS
intentional radiator is operating, the radio frequency	Channel	
power that is produce by the intentional radiator shall be at least 30 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power. In addition, radiation 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))	At least -30dBc than the limit Specified on the TOP Channel	PASS



TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE OF 802.11b FOR MODULATION IN LOW CHANNEL

🔤 Keysight Spectrum An								
₩ RF Marker 1 3.215		PNO: Fast	Trig: Free		ALIGN AUTO : Log-Pwr :>100/100	TRAC TYP	Dec 17, 2019	Peak Search
10 dB/div Ref 2	20.00 dBm	IFGain:Low	#Atten: 30) dB	Mk	r1 3.215		Next Peak
10.0								Next Pk Right
-10.0								Next Pk Left
-20.0							DL 1 -31.57 dBm	Marker Delta
-40.0								Mkr→CF
-50.0 1 -60.0 1		the state of the s	a dala dala analah Managara dalam d		الدينة أن روي بالانتاع والي معالمي روي يتقد روي .		e hereite sie hereite Auferte sie geheren en eine Auferte sie geheren en einer	Mkr→RefLv
-70.0 Start 2.48 GHz #Res BW 100 kl	Hz	#VBW	300 kHz		Sweep 2	Stop 2: 2.152 s (4	5.00 GHz 0000 pts)	More 1 of 2
MSG					STATUS			

TEST PLOT OF OUT OF BAND EMISSIONS THE WORST CASE OF 802.11b FOR MODULATION IN MIDDLE CHANNEL



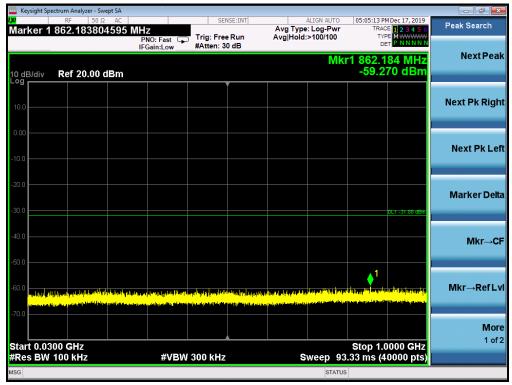
Metricer 1 2.207 / 510323/2 / Children III Trip: Free Run Arginold:>10010 Trip: Free Run Arginold:>10010 Trip: Free Run Next Pk 0 dB/div Ref 20.00 dBm -57.033 dBm -57.033 dBm Next Pk 0 00 -57.033 dBm -57.033 dBm Marker D	Keysight Spectrum Analyzer - Swept SA RF 50 Ω AC	SEI	NSE:INT	ALIGN AUTO	05:04:12 PM Dec 17	,2019																																			
Incluition Mikri 2:267 732 GHz Next Pice 00 GB/div Ref 20.00 dBm -57.083 dBm Next Pice 00 GB/div Ref 20.00 dBm -57.083 dBm Next Pice 00 GB/div Ref 20.00 dBm -57.083 dBm Next Pice 00 GB/div Ref 20.00 dBm -57.083 dBm Next Pice 00 GB/div Ref 20.00 dBm -57.083 dBm Next Pice 00 GB/div Ref 20.00 dBm -57.083 dBm Next Pice 00 GB/div Ref 20.00 dBm -57.083 dBm Next Pice 00 GB/div Ref 20.00 dBm -57.083 dBm Next Pice 00 GB/div Ref 20.00 dBm -59.2400 dV/div Next Pice 00 GB/div -59.2400 dV/div -59.2400 dV/div Next Pice 00 GB/div -59.2400 dV/div -59.2400 dV/div Next Pice 100 GV/div -59.2400 dV/div -59.2400 dV/div Next Pice 100 GV/div -59.2400 dV/div -59.2400 dV/div Next Pice 100 GV/div -59.2400 dV/div -59.2400 dV/div Next Pice 100 GV/div <th>larker 1 2.267731693292</th> <th></th> <th>Avg Typ e Run Avg Hol</th> <th>be: Log-Pwr</th> <th>TRACE 1 2 3</th> <th>4 5 6 Peak Search</th>	larker 1 2.267731693292		Avg Typ e Run Avg Hol	be: Log-Pwr	TRACE 1 2 3	4 5 6 Peak Search																																			
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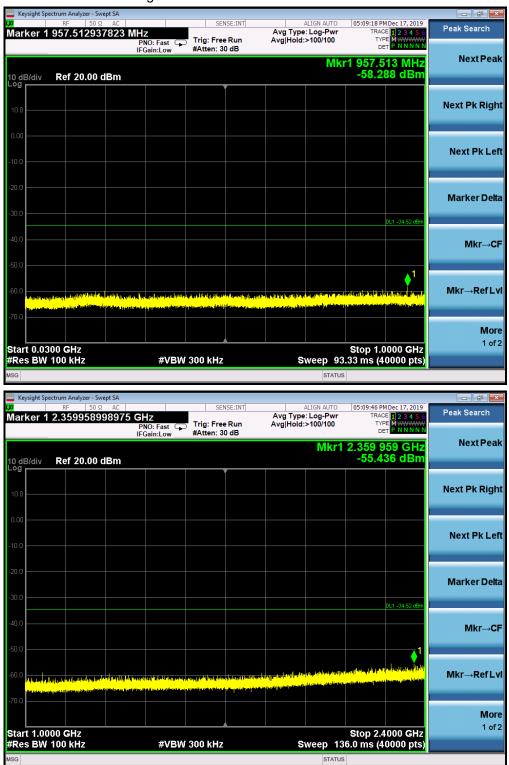
TEST PLOT OF OUT OF BAND EMISSIONS THE WORST CASE OF 802.11b FOR MODULATION IN HIGH CHANNEL

								m Analyzer - Swi	ysight Spectr	
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TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE OF 802.11g FOR MODULATION IN LOW CHANNEL



	RF 50 Ω			SEI	NSE:INT		ALIGN AUTO		M Dec 17, 2019	Peak Search
larker 1 2.3	3599589	P	NO: Fast Gain:Low	Trig: Free #Atten: 3		Avg Type Avg Hold	e: Log-Pwr :>100/100	TYF	CE 1 2 3 4 5 6 PE M T P N N N N N	r out oouron
			Guineow				Mkr1	2.359 9	59 GHz	NextPe
0 dB/div R ^{og}	ef 20.00 (dBm		,,	•			-57.5	96 dBm	
10.0										Next Pk Rig
10.0										-
0.00										
10.0										Next Pk Lo
20.0										
.0.0										Marker De
0.0									DL1-31.88rdBm	
40.0										Mkr→0
50.0										
									♦ ¹	
60.0 <mark>With and to pade</mark>	l <mark>hite de la complete de la complete La complete de la comp</mark>				a a segura de la se Terra de la segura d		anten etallen etal Anten etallen e	at a second set the second	and a state of the second	Mkr→RefL
70.0	an and a state of the Sel Sel Sel Sel Sel Sel Sel Sel Sel Se		n se configheringel		and the second of					
										Mo 1 o
								Oton 97		10
			#VBW	V 300 kHz		s	weep 13	6.0 ms (4	4000 GHz 0000 pts)	
tart 1.0000 Res BW 10			#VBW	/ 300 kHz		9	Sweep 13	6.0 ms (4	0000 GHz 0000 pts)	
Res BW 100	0 KHZ		#VBW			5	STATUS	6.0 ms (4	0000 pts)	
Res BW 100	0 kHz m Analyzer - Sw RF 50 Ω	AC 307883 0	GHz	SEI	NSE:INT	Avg Type	STATUS	6.0 ms (4	0000 pts) MDec 17, 2019 ≅ 112 3 4 5 6	Peak Search
Res BW 100	0 kHz m Analyzer - Sw RF 50 Ω	AC 307883 (P		SEI	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	MDec 17, 2019 E 1 2 3 4 5 6 M WWWWW T P N N N N	Peak Search
Res BW 100 G Keysight Spectrum arker 1 17 0 dB/div R	0 kHz m Analyzer - Sw RF 50 Ω	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	0000 pts) MDec 17, 2019 ≅ 112 3 4 5 6	Peak Search
Res BW 100	0 kHz m Analyzer - Sw RF 50 Ω .085815	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	MDec 17, 2019 E 12 3 4 5 6 MMDec 17, 2019 E 12 3 4 5 6 MMMMM S 8 GHz	Peak Search Next Pe
Res BW 100 G Keysight Spectrum larker 1 17 O dB/div R	0 kHz m Analyzer - Sw RF 50 Ω .085815	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	MDec 17, 2019 E 12 3 4 5 6 MMDec 17, 2019 E 12 3 4 5 6 MMMMM S 8 GHz	Peak Search Next Pe
Res BW 100 G A Constraints of the sector of	0 kHz m Analyzer - Sw RF 50 Ω .085815	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	MDec 17, 2019 E 12 3 4 5 6 MMDec 17, 2019 E 12 3 4 5 6 MMMMM S 8 GHz	Peak Search Next Pe
Res BW 100 G A Constraints of the sector of	0 kHz m Analyzer - Sw RF 50 Ω .085815	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	MDec 17, 2019 E 12 3 4 5 6 MMDec 17, 2019 E 12 3 4 5 6 MMMMM S 8 GHz	Peak Search Next Pe Next Pk Rig
Res BW 100 G A Constraints of the sector of	0 kHz m Analyzer - Sw RF 50 Ω .085815	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	MDec 17, 2019 E 12 3 4 5 6 MMDec 17, 2019 E 12 3 4 5 6 MMMMM S 8 GHz	Peak Search Next Pe Next Pk Rig
Res BW 100 G Keysight Spectrum arker 1 17 0 dB/div R 0 0 0 0 0 0 0 0 0 0	0 kHz m Analyzer - Sw RF 50 Ω .085815	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	MDec 17, 2019 E 12 3 4 5 6 MMDec 17, 2019 E 12 3 4 5 6 MMMMM S 8 GHz	Peak Search Next Pe Next Pk Rig Next Pk L
Res BW 100 G A Constraints of the sector of	0 kHz m Analyzer - Sw RF 50 Ω .085815	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	MDec 17, 2019 E 12 3 4 5 6 MMDec 17, 2019 E 12 3 4 5 6 MMMMM S 8 GHz	Peak Search Next Pe Next Pk Rig Next Pk L
Res BW 100 G Keysight Spectrum Iarker 1 17 O dB/div R O dB/div R O dB/div R O dB/div R O dB/div R	0 kHz m Analyzer - Sw RF 50 Ω .085815	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	0000 pts) MDec 17, 2019 E 123 4 5 6 E 1 23 4 5 6 E 1 2 3 4 5 6	Peak Search Next Pe Next Pk Rig Next Pk L Marker De
Res BW 100 G Keysight Spectrum Iarker 1 17 O dB/div R O dB/div R O dB/div R O dB/div R O dB/div R	0 kHz m Analyzer - Sw RF 50 Ω .085815	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	0000 pts) MDec 17, 2019 E 123 4 5 6 E 1 23 4 5 6 E 1 2 3 4 5 6	Peak Search Next Pe Next Pk Rig Next Pk L Marker De
Res BW 100 Ig Ig Iarker 1 17	0 kHz m Analyzer - Sw RF 50 Ω .085815	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	0000 pts)	Peak Search Next Pe Next Pk Rig Next Pk L Marker De
Res BW 100 GG Keysight Spectrur larker 1 17	0 kHz m Analyzer - Sw RF 50 Ω .085815	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	0000 pts)	Peak Search Next Pe Next Pk Rig Next Pk L Marker De
Res BW 100 sq	0 kHz m Analyzer - Sw RF 50 Ω .085815	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	0000 pts)	Peak Search Next Pe Next Pk Rig Next Pk L Marker De
Res BW 100 s G Keysight Spectrum larker 1 17 0 dB/div R 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 kHz m Analyzer - Sw RF 50 Ω .085815	AC 307883 (P IF	GHz PNO: Fast) Trig: Free	NSE:INT	Avg Type	ALIGN AUTO e: Log-Pwr I:>100/100	6.0 ms (4	0000 pts)	Peak Search Next Pe Next Pk Rig Next Pk L Marker De Mkr→Ref I
Res BW 100 Is Keysight Spectrum larker 1 17 O dB/div R 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 kHz	AC 307883 (P IF	CHZ Constant Gain:Low) Trig: Free	vsE:INT e Run 0 dB	Avg Type	ALIGN AUTO E: Log-Pwr :>100/100 MKr	6.0 ms (4	0000 pts)	



TEST PLOT OF OUT OF BAND EMISSIONS THE WORST CASE OF 802.11g FOR MODULATION IN MIDDLE CHANNEL

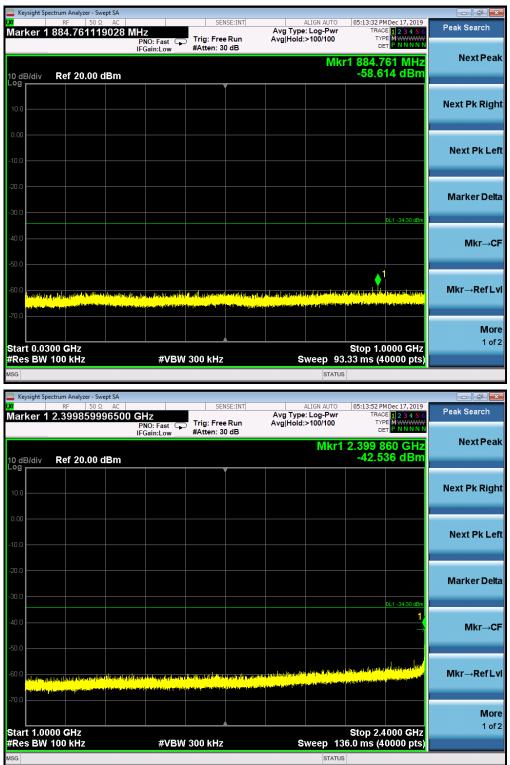
						1		n Analyzer - Sw		Key
Peak Search	05:10:34 PM Dec 17, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	ALIGN AUTO e: Log-Pwr :>100/100				NO: Fast 🛛 🖵				lar
Next Pea	r1 4.873 7 GHz -35.686 dBm	Mk		U dB	#Atten: 3	Gain:Low		ef 20.00 d	3/div Re	0 dB og r
Next Pk Rig										0 g
Next Pk Le).00 0.0
Marker De								1		D.O -
Mkr→	DL1 -34.52 dBm).O).O
Mkr→RefL	and ¹⁹ 19 bei general general die ¹⁹¹ 9 bei die 191 <mark>9 bei die park die besteren die state die beiden die beide Beiden die beiden die beiden Beiden die beiden die beiden Beiden die beiden die beid</mark>	landar fillefilligen og h Render som en s	le l	ili, oshqatiman 1979-tari	antifactoria da la composicia da la compo	l ⁱ nte tribund dans ^M intel ^{an} yang ya	and and a standard of the second s	a paladhili dhada a p		0.0
M o 1 o	Stop 25.00 GHz 2.152 s (40000 pts)	Sween			300 kHz				t 2.48 GH s BW 100	
		STATUS			300 KHZ	# V D V V		7 MH2		G

TEST PLOT OF OUT OF BAND EMISSIONS THE WORST CASE

OF 802.11g FOR MODULATION IN HIGH CHANNEL



ALIGN AUTO 05:11:37 PM Dec 17, 2019 Peak Search Avg Type: Log-Pwr TRACE 2:3:4:5:6 Peak Search un Avg[Hold:>100/100 TVPE March 100/100 TVPE
B DET P NN NN N
Mkr1 2.359 994 GHz -54.476 dBm
Next Pk Rig
Next Pk L
Marker De
DL1 -35 02 dBm
Mir
Mkr→
1 d
Stop 2.4000 GHz Sweep 136.0 ms (40000 pts)
STATUS
INT ALIGN AUTO 05:12:35 PM Dec 17, 2019 Aver Turne Log Pure TRACE Descrete
Avg Type: Log-Pwr TRACE 12 3 4 5 un Avg Hold:>100/100 TYPE MWWWW B
Mkr1 4.923 8 GHz Next Pe
-42.557 dBm
Next Pk Rig
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TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE OF 802.11n20 FOR MODULATION IN LOW CHANNEL

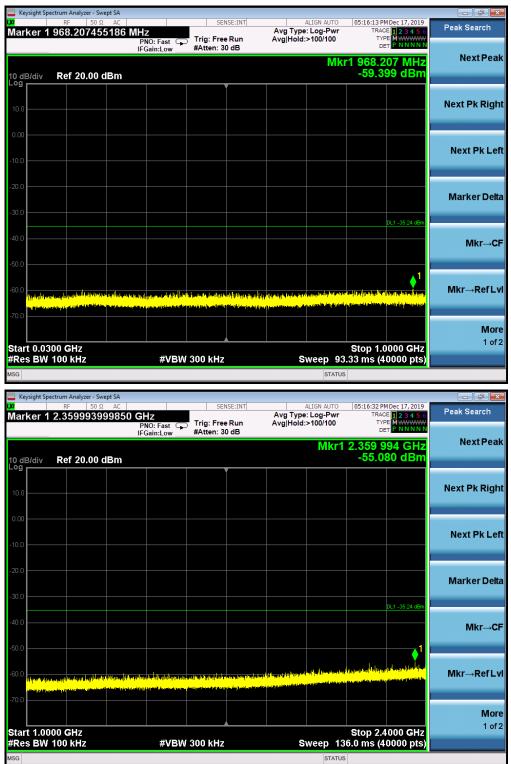
Keysight Spectr	rum Analyzer - Swept S					-	
larker 1 4	RF 50 Ω A .824148691	AC 217 GHz PNO: Fast	Trig: Free Ru	Avg Typ n Avg Holo	ALIGN AUTO be: Log-Pwr d:>100/100	05:14:01 PM Dec 17, 203 TRACE 1 2 3 4 5 TYPE M WWWW	Peak Search
0 dB/div	Ref 20.00 dBi	IFGain:Low	#Atten: 30 dB		Mk	ст1 4.824 1 GH -36.234 dBr	Next Pea
10.0							Next Pk Righ
10.00							Next Pk Le
80.0						DL1 -34.30 dt	Marker Del
						UL1 -34,30 tb	Mkr→C
50.0 ^{II} John Marthann Marthan III		ll ^{ite} n al de _{la d} e la del de la de la desarra de la desarra de la del de La del de la	un antibalistati alla di anti-	, porte ten de latinadadese Recentration de latinadadese Recentration de la ten de la ten de la ten de la ten de	adaret bedaathe aaret poligie a	a ti ^{bi} leti te di ang pang da pang da pang bang bang bang bang bang bang bang b	Mkr→RefL
itart 2.48 G	GHz ^		V 300 kHz			Stop 25.00 GH	Mo 1 of
	OU KHZ	#VBV	9 300 KHZ		Sweep	2.152 s (40000 pt	2

TEST PLOT OF OUT OF BAND EMISSIONS THE WORST CASE

OF 802.11n20 FOR MODULATION IN MIDDLE CHANNEL



Keysight Spectrum Ana KI RF	alyzer - Swept SA 50 Ω AC		SENSE:INT	ALIGN AUTO	05:15:13 PM Dec 17, 2019	
larker 1 2.360	029000725	GHZ PNO: Fast 😱	Trig: Free Run	Avg Type: Log-Pwr Avg Hold:>100/100	TRACE 1 2 3 4 5 6	Peak Search
		IFGain:Low	#Atten: 30 dB			NextPea
0 dB/div Ref 2	20.00 dBm			INIKI"	1 2.360 029 GHz -56.152 dBm	
og						
10.0						Next Pk Rigl
0.00						
10.0						Next Pk Le
20.0						Marker Del
0.0						
					DL1 -35.06 dBm	
40.0						Mkr→C
50.0					1	
					en per se per si da se la se de se per si da se per si da se per si da se per si da se per se per se per se pe	
60.0 <mark>Addadaandhaa</mark>	energie de la seconda de la	la financia più analista	na dia dia 1914 mandri mpika mpika mpikami Mala amin'ny kaodim-paositra dia mpikamina mpikamina mpikamina mpikamina mpikamina mpikamina mpikamina mpikamin	The product of the second s		Mkr→RefL
70.0						
						Мо
						1 of
					Stop 2.4000 GHz	101
Start 1.0000 GH #Res BW 100 kl		#VBW	300 kHz		36.0 ms (40000 pts)	
Res BW 100 ki	Hz	#VBW	300 kHz	Sweep 1	36.0 ms (40000 pts)	
Res BW 100 Kl	Hz alyzer - Swept SA 50 Ω AC		300 KHz	STATU ALIGN AUTO	36.0 ms (40000 pts) IS 05:15:24 PM Dec 17, 2019	
Res BW 100 Kl	Hz alyzer - Swept SA 50 Ω AC 1249156229 (GHZ PNO: Fast G	SENSE:INT	STATU	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 1 234 5 6 TRACE 234 5 6	
Res BW 100 Kl	Hz alyzer - Swept SA 50 Ω AC 1249156229 (GHz	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 1 2 3 4 5 6 TYPE MUNICIPAL DET P.NNNNN	Peak Search
Res BW 100 kl	Hz alyzer - Swept SA 50 Ω AC 1249156229 (GHZ PNO: Fast G	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 1 234 5 6 TRACE 234 5 6	Peak Search
Res BW 100 kl	Hz alyzer - Swept SA 50 Ω AC 1249156229 (GHZ PNO: Fast G	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 234 5 6 TYPE 05:15:24 PMDec 17, 2019 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE	Peak Search Next Pea
Res BW 100 kl	Hz alyzer - Swept SA 50 Ω AC 1249156229 (GHZ PNO: Fast G	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 234 5 6 TYPE 05:15:24 PMDec 17, 2019 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE	Peak Search Next Pea
Res BW 100 kl sa keysight Spectrum An d RF Aarker 1 4.874	Hz alyzer - Swept SA 50 Ω AC 1249156229 (GHZ PNO: Fast G	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 234 5 6 TYPE 05:15:24 PMDec 17, 2019 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE	Peak Search Next Pea
Res BW 100 kl sa keysight Spectrum An d RF Aarker 1 4.874	Hz alyzer - Swept SA 50 Ω AC 1249156229 (GHZ PNO: Fast G	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 234 5 6 TYPE 05:15:24 PMDec 17, 2019 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE	Peak Search Next Pea Next Pk Rig
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Res BW 100 kl sa keysight Spectrum An RF Aarker 1 4.874 0 dB/div Ref 2 0	Hz alyzer - Swept SA 50 Ω AC 1249156229 (GHZ PNO: Fast G	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 234 5 6 TYPE 05:15:24 PMDec 17, 2019 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE	Peak Search Next Pea Next Pk Rig Next Pk Le
Res BW 100 kl	Hz alyzer - Swept SA 50 Ω AC 1249156229 (GHZ PNO: Fast G	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 2 3 4 5 6 TYPE WWWWW kr1 4.874 2 GHz -36.522 dBm	Peak Search Next Pea Next Pk Rig Next Pk Le
Res BW 100 kl 3G Keysight Spectrum An RE 1arker 1 4.874 0 dB/div Ref 2 9 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10	Hz alyzer - Swept SA 50 Ω AC 1249156229 (GHZ PNO: Fast G	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 234 5 6 TYPE 05:15:24 PMDec 17, 2019 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE 05:15 TYPE	Peak Search Next Pea Next Pk Rig Next Pk Le
Res BW 100 kl sq RF RF Narker 1 4.874 Ref 2 RF 0 dB/div Ref 2 RF 10 0 10.0 10.0 10.0 20 0 10.0 10.0 10.0 10 0 10.0 10.0 10.0	Hz alyzer - Swept SA 50 Ω AC 1249156229 (GHZ PNO: Fast G	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 2 3 4 5 6 TYPE WWWWW kr1 4.874 2 GHz -36.522 dBm	Peak Search Next Pea Next Pk Rig Next Pk Le
Res BW 100 kl sq RE RE Marker 1 4.874 RE RE 0 dB/div Ref 2 RE 00 dB/div Ref 3 RE 10 du RE RE	Hz alyzer - Swept SA 50 Ω AC 1249156229 (GHZ PNO: Fast G	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100 M	36.0 ms (40000 pts) IS OS:15:24 PM Dec 17, 2019 TRACE 12 23 4 5 G TYPE 12 NNNNN Kr1 4.874 2 GHz -36.522 dBm OL1-35.06 dBm	Peak Search Next Pea Next Pk Rig Next Pk Le
Res BW 100 kl sa RE RE Arker 1 4.874 RE RE 0 dB/div Ref 2 RE 10 0	Hz alyzer - Swept SA 50 Ω AC 1249156229 (GHZ PNO: Fast G	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100 M	36.0 ms (40000 pts) IS 05:15:24 PM Dec 17, 2019 TRACE 2 3 4 5 6 TYPE WWWWWW kr1 4.874 2 GHz -36.522 dBm 0.1 -35 06 dBm 0.1 -35 06 dBm	Peak Search Next Pea Next Pk Rig Next Pk Le Marker De
Res BW 100 kl sa Keysight Spectrum An RF Aarker 1 4.874 0 dB/div Ref 0 dB/div Ref 0 dB/div Ref 0 dB/div 0 dB/div <t< td=""><td>Hz alyzer - Swept SA 50 Ω AC 249156229 (20.00 dBm 20.00 dBm</td><td>CHZ PNO: Fast IFGain:Low</td><td>SENSE:INT</td><td>ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100 M</td><td>36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 1 2 3 4 5 0 TYPE DET PINNINN kr1 4.874 2 GHz -36.522 dBm DL1-35.06 dem</td><td>Peak Search Next Pea Next Pk Rig Next Pk Le Marker Del</td></t<>	Hz alyzer - Swept SA 50 Ω AC 249156229 (20.00 dBm 20.00 dBm	CHZ PNO: Fast IFGain:Low	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100 M	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 1 2 3 4 5 0 TYPE DET PINNINN kr1 4.874 2 GHz -36.522 dBm DL1-35.06 dem	Peak Search Next Pea Next Pk Rig Next Pk Le Marker Del
Res BW 100 kl sa keysight Spectrum An d RE Aarker 1 4.874 0 RE	Hz alyzer - Swept SA 50 Ω AC 249156229 (20.00 dBm 20.00 dBm	GHZ PNO: Fast G	SENSE:INT Trig: Free Run #Atten: 30 dB	STATU	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 1 2 3 4 5 0 TYPE DET PINNINN kr1 4.874 2 GHz -36.522 dBm DL1-35.06 dem	Peak Search Next Pea Next Pk Rig Next Pk Le Marker Del Mkr→Ref L
Res BW 100 kl sa RE keysight Spectrum An RE Marker 1 4.874 RE 0 dlB/div Ref 2 0 dlB/div Ref 3 0 dlB/div Ref 4	Hz alyzer - Swept SA 50 Ω AC 249156229 (20.00 dBm 20.00 dBm	CHZ PNO: Fast IFGain:Low	SENSE:INT Trig: Free Run #Atten: 30 dB	STATU	36.0 ms (40000 pts) IS IS IS IS IS IS IS IS IS IS	Peak Search Next Pea Next Pk Rig Next Pk Le Marker Del Mkr→Cel
Res BW 100 kl SG Keysight Spectrum And RE Aarker 1 4.874 RE RE 0 08/div Ref 2 RE 0 000 RE RE 10 0 RE <td>Hz</td> <td>CHZ PNO: Fast IFGain:Low</td> <td>SENSE:INT Trig: Free Run #Atten: 30 dB</td> <td>ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100</td> <td>36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 1 2 3 4 5 0 TYPE DET PINNINN kr1 4.874 2 GHz -36.522 dBm DL1-35.06 dem</td> <td></td>	Hz	CHZ PNO: Fast IFGain:Low	SENSE:INT Trig: Free Run #Atten: 30 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	36.0 ms (40000 pts) IS 05:15:24 PMDec 17, 2019 TRACE 1 2 3 4 5 0 TYPE DET PINNINN kr1 4.874 2 GHz -36.522 dBm DL1-35.06 dem	



TEST PLOT OF OUT OF BAND EMISSIONS THE WORST CASE OF 802.11n20 FOR MODULATION IN HIGH CHANNEL

Keysight Spectrum									
arker 1 4.9		Р	Hz NO:Fast ⊂ Gain:Low			ALIGN AUTO : Log-Pwr :>100/100	TRACE	Dec 17, 2019 1 2 3 4 5 6 M P NNNNN	Peak Search
0 dB/div Re	f 20.00 df		Galli.Low	, then o		Mk	r1 4.923 -39.01	8 GHz 1 dBm	Next Peal
10.0									Next Pk Righ
0.00									Next Pk Le
80.0									Marker Del
0.0	1							0L1 -35.24 dBm	Mkr→C
0.0 (an all all a parties of the second s			al and the file of the state	a shi ka ti ka	ha an tha shaft and a shaft and a shaft and a shaft a s	e dan disederative Renard Contraction	an an an an Anna an An An Anna an Anna		Mkr→RefL
tart 2.48 ĜH Res BW 100			#\/B\A	/ 300 kHz		Swaan	Stop 25 2.152 s (40	5.00 GHz	Mor 1 of
G	MI12		# V D V	r JUU KHZ		STATUS		noo proj	

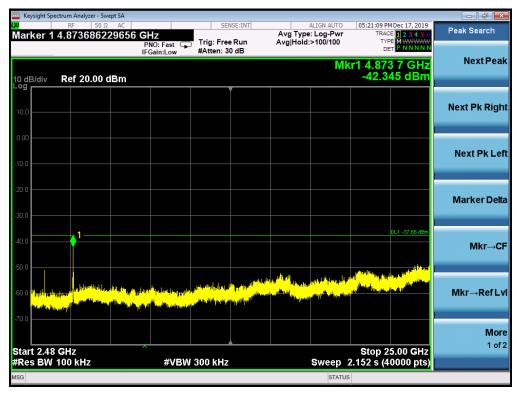
TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE OF 802.11n40 FOR MODULATION IN LOW CHANNEL



Keysight Spectrum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	ALIGN AUTO	05:18:34 PM Dec 17, 2019	
Aarker 1 2.39971999300	PNO: Fast	Trig: Free Run	Avg Type: Log-Pwr Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	Peak Search
0 dB/div Ref 20.00 dBm	IFGain:Low	#Atten: 30 dB	Mkr1	2.399 720 GHz -42.365 dBm	NextPea
og		Ĭ			
10.0					Next Pk Rig
3.00					
					Next Pk L
0.0					
20.0					Marker De
0.0					Warker De
10.0				DL1 -37.42 d 1	
0.0					Mkr→
0.0					
0.0 <mark>meeting gebre het die stimpter seiden bester</mark>	When the second second second second	and a land is a life and a state of	n problem in the stand of the balance of the		Mkr→RefL
	15 pilos piel de la subre participation de la subre	and in the second s			
					Mo
				Stop 2.4000 GHz	1 0
	-41 (P314) (6		
Start 1.0000 GHz Res BW 100 kHz sg	#VBW 3	800 kHz	Sweep 13	6.0 ms (40000 pts)	
Res BW 100 kHz	#VBW 3	800 kHz		6.0 ms (40000 pts)	
Res BW 100 kHz GG Keysight Spectrum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	6.0 ms (40000 pts)	Peak Search
Res BW 100 kHz GG Keysight Spectrum Analyzer - Swept SA RF 50 Ω AC			ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	05:19:22 PM Dec 17, 2019 TRACE 2 34 5 6 TYPE MUMUM DET P NNNNN	Peak Search
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Res BW 100 kHz 3G	8 GHz PNO: Fast 🔾	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	05:19:22 PMDec 17, 2019 TRACE 12:34 5 6 TYPE MWMMM DET PUNNNN (r1 4.843 9 GHz	Peak Search Next Pe Next Pk Rig
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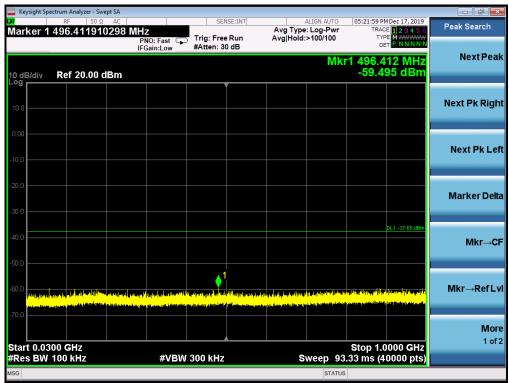
Keysight Spectrum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	ALIGN AUTO	05:20:18 PM Dec 17, 2019	Peak Search
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dB/div Ref 20.00 dBm)			-59.535 dBm	
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art 0.0300 GHz				Stop 1.0000 GHz	1 01
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Res BW 100 kHz	#VBW	300 kHz	Sweep 93	.33 ms (40000 pts)	
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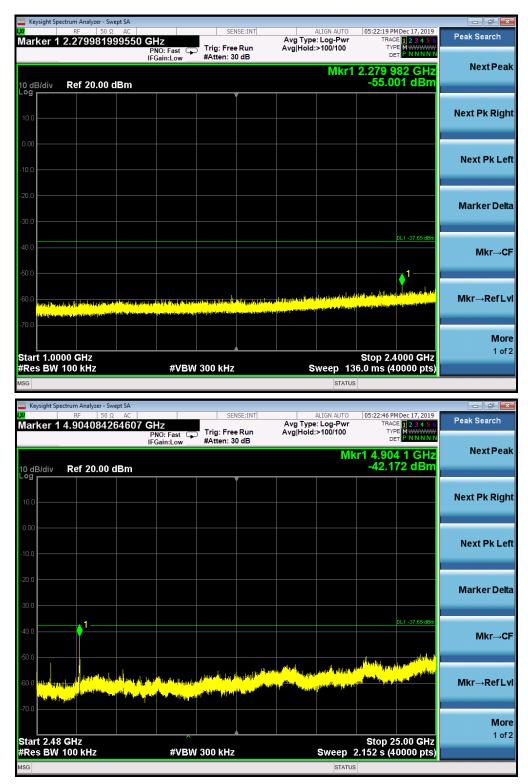
TEST PLOT OF OUT OF BAND EMISSIONS THE WORST CASE OF 802.11n40 FOR MODULATION IN MIDDLE CHANNEL



TEST PLOT OF OUT OF BAND EMISSIONS THE WORST CASE

OF 802.11n40 FOR MODULATION IN HIGH CHANNEL





Note: Two transmit chains had been tested, the chain 0 was the worst case and record in the test report.

10. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY

10.1 MEASUREMENT PROCEDURE

- (1). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- (2). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- (3). Set SPA Trace 1 Max hold, then View.

Note: The method of AVGPSD-1 in the ANSI C63.10 (2013) item 11.10 was used in this testing.

10.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

Refer To Section 4.2.

10.3 LIMITS AND MEASUREMENT RESULT

TEST ITEM	POWER SPECTRAL DENSITY
TEST MODE	802.11b with data rate 1

Channel No.	Power density (dBm/20kHz)	Limit (dBm/3kHz)	Result
Low Channel	-5.410	8	Pass
Middle Channel	-5.508	8	Pass
High Channel	-5.934	8	Pass

TEST ITEM	POWER SPECTRAL DENSITY
TEST MODE	802.11g with data rate 6

Channel No.	Power density (dBm/20kHz)	Limit (dBm/3kHz)	Result
Low Channel	-9.785	8	Pass
Middle Channel	-10.178	8	Pass
High Channel	-10.565	8	Pass

TEST ITEM	POWER SPECTRAL DENSITY
TEST MODE	802.11n 20 with data rate 6.5

Frequency (GHz)	Power density Chain 0 (dBm/20kHz)	Power density Chain 1 (dBm/20kHz)	Power density Total (dBm/20kHz)	Limit (dBm/ 3kHz)	Pass or Fail
2.412	-9.857	-9.480	-6.78	8	Pass
2.437	-10.266	-9.802	-7.21	8	Pass
2.462	-10.965	-9.653	-7.21	8	Pass

TEST ITEM	POWER SPECTRAL DENSITY
TEST MODE	802.11n 40 with data rate 13.5

Frequency (GHz)	Power density Chain 0 (dBm/20kHz)	Power density Chain 1 (dBm/20kHz)	Power density Total (dBm/20kHz)	Limit (dBm/ 3kHz)	Pass or Fail
2.422	-12.891	-11.998	-9.59	8	Pass
2.437	-12.911	-11.500	-9.21	8	Pass
2.452	-12.776	-12.047	-9.59	8	Pass



802.11b TEST RESULT TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL

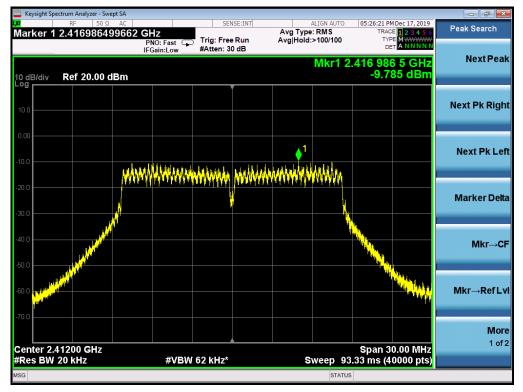


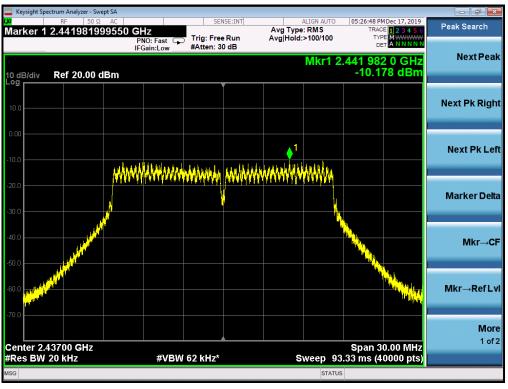


TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

802.11g TEST RESULT

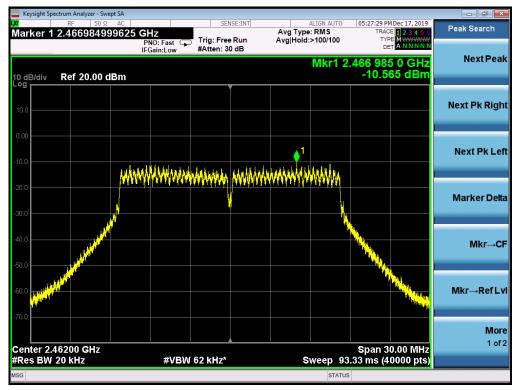
TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

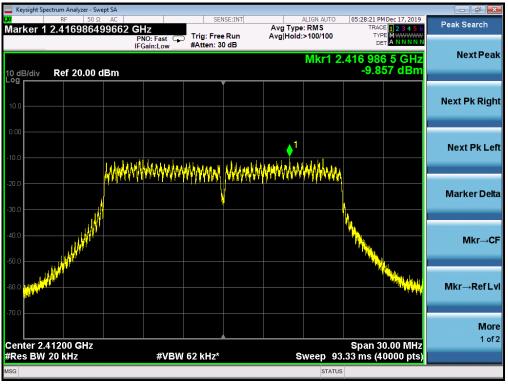




TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL

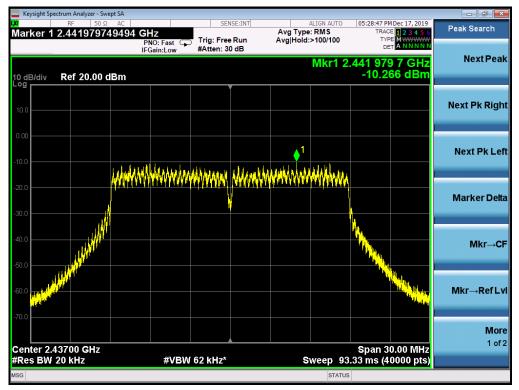
TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

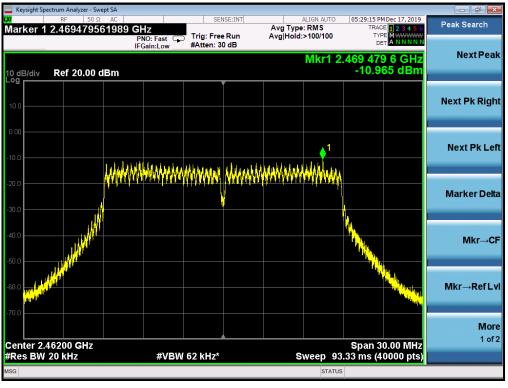




802.11n 20 TEST RESULT AT CHAIN 0 TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

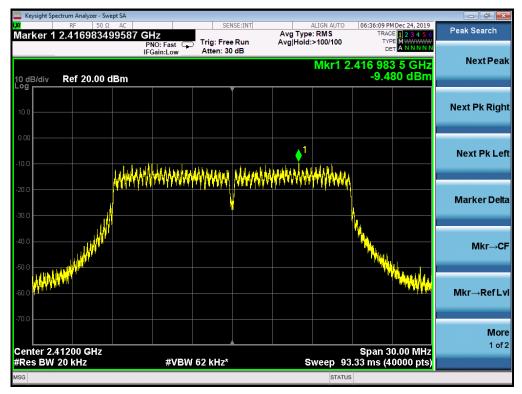
TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL

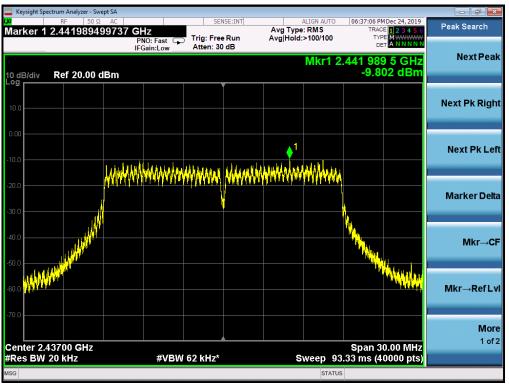




TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

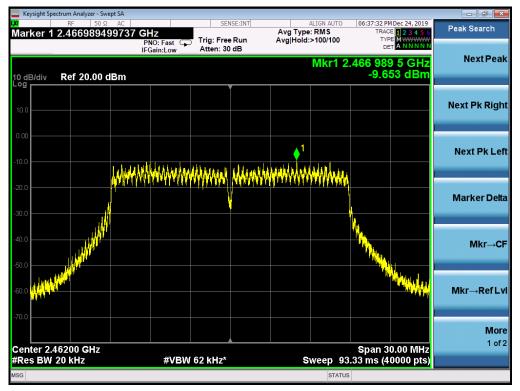
802.11n 20 TEST RESULT AT CHAIN 1 TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

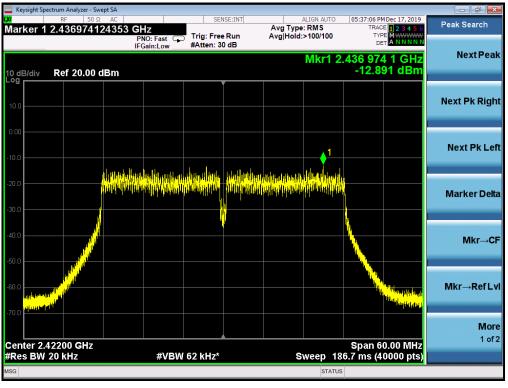




TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL

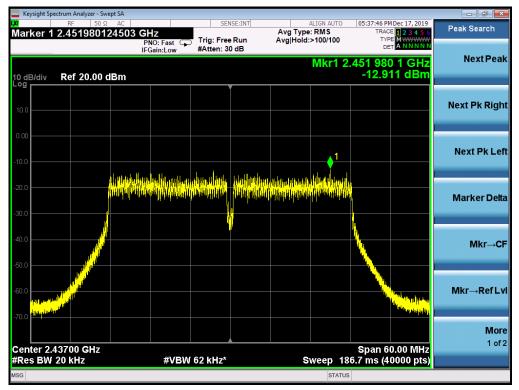
TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

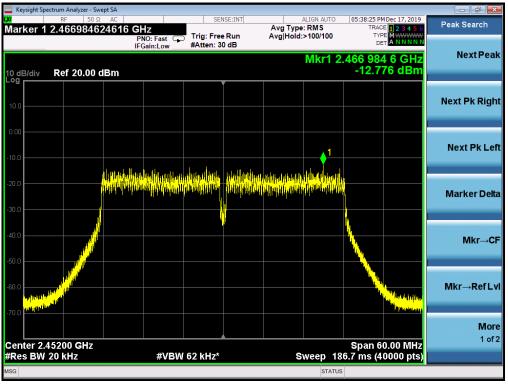




802.11n 40 TEST RESULT AT CHAIN 0 TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

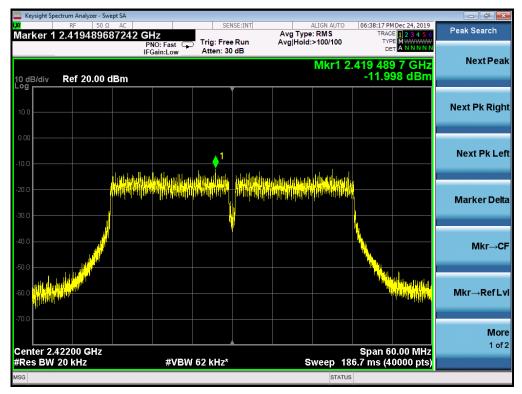
TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL

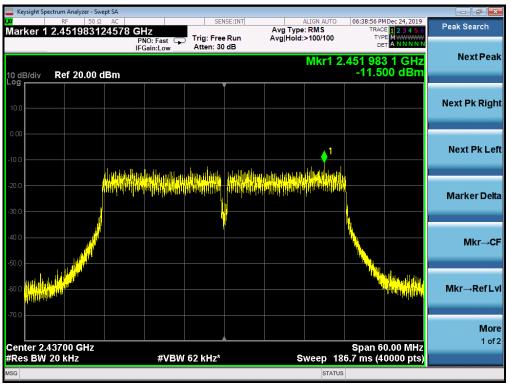




TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

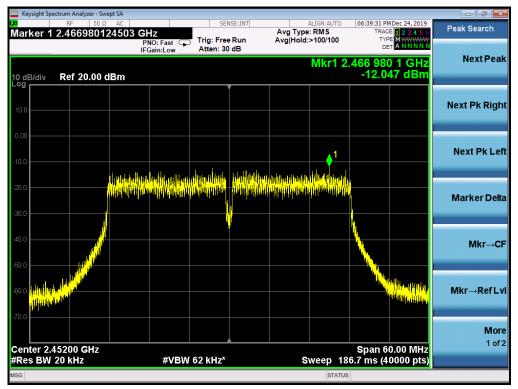
802.11n 40 TEST RESULT AT CHAIN 1 TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL





TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL

TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL



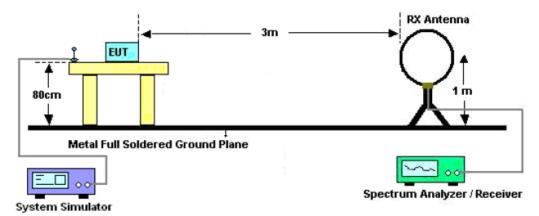
11. RADIATED EMISSION

11.1. MEASUREMENT PROCEDURE

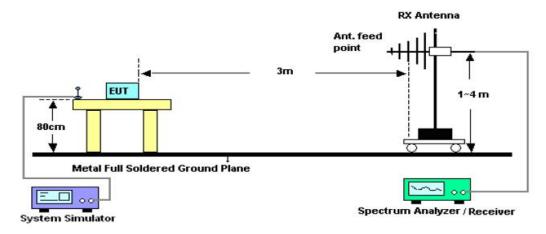
- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, 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 values.
- 8.If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

11.2. TEST SETUP

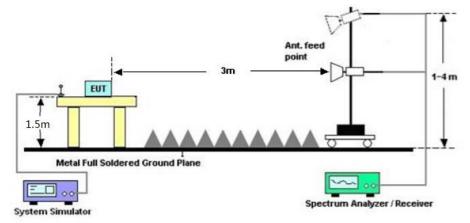
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



11.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table 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

Note: All modes were tested For restricted band radiated emission,

the test records reported below are the worst result compared to other modes.

11.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.