ISSUED BY Shenzhen BALUN Technology Co., Ltd.

RF

TEST

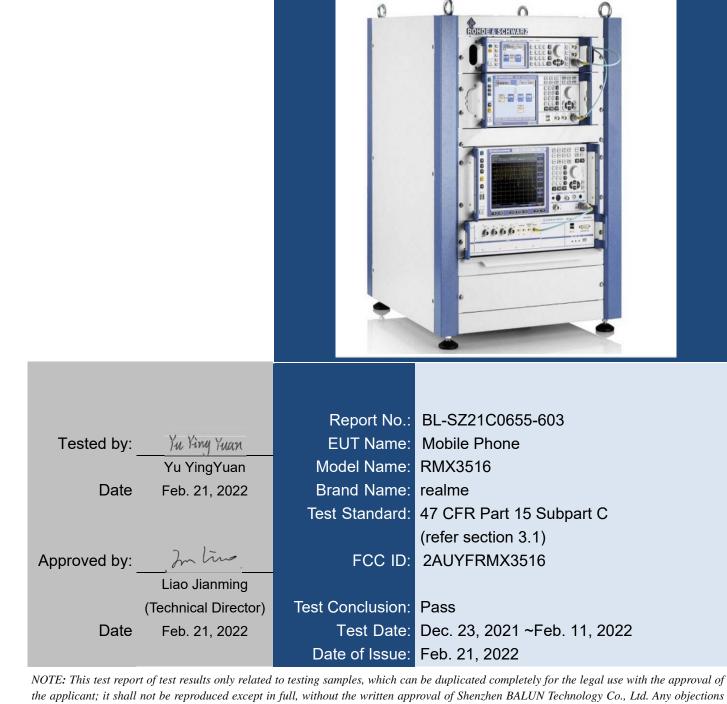


FOR

Mobile Phone

ISSUED TO Realme Chongqing Mobile Telecommunications Corp., Ltd.

No.178 Yulong Avenue, Yufengshan, Yubei District, Chongqing, China



should be raised within thirty days from the date of issue. To validate the report, please contact us.

Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong, P. R. China 518055 TEL: +86-755-66850100, FAX: +86-755-61824271 Email: qc@baluntek.com www.baluntek.com



Revision History

Version <u>Rev. 01</u> Issue Date Feb. 21, 2022 **Revisions Content**

Initial Issue

TABLE OF CONTENTS

1	ADMINISTRATIVE DATA (GENERAL INFORMATION)		
	1.1	Identification of the Testing Laboratory	.5
	1.2	Identification of the Responsible Testing Location	.5
	1.3	Laboratory Condition	.5
	1.4	Announce	.5
2	PRODL	JCT INFORMATION	.6
	2.1	Applicant Information	.6
	2.2	Manufacturer Information	.6
	2.3	Factory Information	.6
	2.4	General Description for Equipment under Test (EUT)	.6
	2.5	Technical Information	.7
	2.6	Additional Instructions	.9
3	SUMM	ARY OF TEST RESULTS	11
	3.1	Test Standards	11
	3.2	Verdict	11
4	GENEF	RAL TEST CONFIGURATIONS	12
	4.1	Test Environments	12
	4.2	Test Equipment List	12
	4.3	Test Software List	12
	4.4	Measurement Uncertainty	13
	4.5	Description of Test Setup	13
	4.5.1	For Antenna Port Test	13
	4.5.2	For AC Power Supply Port Test	14
	4.5.3	For Radiated Test (Below 30 MHz)	14
	4.5.4	For Radiated Test (30 MHz-1 GHz)	15
	4.5.5	For Radiated Test (Above 1 GHz)	15



4	1.6	Measurement Results Explanation Example	16
	4.6.1	For conducted test items:	16
	4.6.2	For radiated band edges and spurious emission test:	16
5	5 TEST ITEMS		
Ę	5.1	Antenna Requirements	17
	5.1.1	Relevant Standards	17
	5.1.2	Antenna Anti-Replacement Construction	17
	5.1.3	Antenna Gain	17
Ę	5.2	Output Power	18
	5.2.1	Test Limit	18
	5.2.2	Test Setup	18
	5.2.3	Test Procedure	18
	5.2.4	Test Result	19
Ę	5.3	6dB Bandwidth	20
	5.3.1	Limit	20
	5.3.2	Test Setup	20
	5.3.3	Test Procedure	20
	5.3.4	Test Result	20
Ę	5.4	Conducted Spurious Emission	21
	5.4.1	Limit	21
	5.4.2	Test Setup	21
	5.4.3	Test Procedure	21
	5.4.4	Test Result	22
Ę	5.5	Band Edge (Authorized-band band-edge)	23
	5.5.1	Limit	23
	5.5.2	Test Setup	23
	5.5.3	Test Procedure	23
	5.5.4	Test Result	24
Ę	5.6	Conducted Emission	25
	5.6.1	Limit	25
	5.6.2	Test Setup	25
	5.6.3	Test Procedure	25



5.6.4	4 Test Result	
5.7	Radiated Spurious Emission	26
5.7.1	Limit	26
5.7.2	Test Setup	26
5.7.3	Test Procedure	26
5.7.4	Test Result	29
5.8	Band Edge (Restricted-band band-edge)	30
5.8.1	Limit	30
5.8.2	Test Setup	30
5.8.3	Test Procedure	30
5.8.4	Test Result	30
5.9	Power Spectral density (PSD)	31
5.9.1	Limit	31
5.9.2	Test Setup	31
5.9.3	Test Procedure	31
5.9.4	Test Result	31
ANNEX A	TEST RESULT	32
A.1	Output Power	32
A.2	Bandwidth	36
A.3	Conducted Spurious Emissions	41
A.4	Band Edge (Authorized-band band-edge)	67
A.5	Conducted Emissions	93
A.6	Radiated Emission	95
A.7	Band Edge (Restricted-band band-edge)	133
A.8	Power Spectral Density (PSD)	163
ANNEX B TEST SETUP PHOTOS		171
ANNEX C EUT EXTERNAL PHOTOS		171
ANNEX D	EUT INTERNAL PHOTOS	171



1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road,
Address	Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road,
Address	Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation	The laboratory is a testing organization accredited by FCC as a
Certificate	accredited testing laboratory. The designation number is CN1196.
	All measurement facilities used to collect the measurement data are
Description	located at Block B, FL 1, Baisha Science and Technology Park, Shahe
Description	Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R.
	China 518055

1.3 Laboratory Condition

Ambient Temperature	20°⊂ to 25°⊂
Ambient Relative Humidity	45% to 55%
Ambient Pressure	100 kPa to 102 kPa

1.4Announce

- (1) The test report reference to the report template version v6.6.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
- (5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.
- (6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (7) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.



2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Realme Chongqing Mobile Telecommunications Corp., Ltd.
Address	No.178 Yulong Avenue, Yufengshan, Yubei District, Chongqing, China

2.2 Manufacturer Information

Manufacturer	Realme Chongqing Mobile Telecommunications Corp., Ltd.
Address	No.178 Yulong Avenue, Yufengshan, Yubei District, Chongqing, China

2.3 Factory Information

Factory	Realme Chongqing Mobile Telecommunications Corp., Ltd.
Address	No.178 Yulong Avenue, Yufengshan, Yubei District, Chongqing, China

2.4 General Description for Equipment under Test (EUT)

EUT Name	Mobile Phone	
Model Name Under Test	RMX3516	
Series Model Name	N/A	
Description of Model	N/A	
name differentiation	N/A	
Hardware Version	11	
Software Version	Android 11	
Dimensions (Approx.)	164.30*75.60*8.15(mm)	
Weight (Approx.)	193.00g (with battery)	



2.5 Technical Information

	2G Network GSM/GPRS/EGPRS 850/1900 MHz
	3G Network WCDMA/HSDPA/HSUPA Band 2/4/5
Network and Wireless	4G Network FDD LTE Band 2/4/5/7/12/17/26/66
Network and Wireless	TDD LTE Band 38/41
connectivity	2.4G WIFI 802.11b, 802.11g, 802.11n(HT20/40)
	5G WIFI 802.11a, 802.11n(HT20/40), 802.11ac(VHT20/40/80)
	U-NII-1/2A/2C/3, GPS, GLONASS, BDS, SBAS, FM Receiver

The requirement for the following technical information of the EUT was tested in this report:

		•
		802.11b/g/n/ac(20 MHz): 2.412 GHz - 2.462 GHz
		$f_c = 2412 \text{ MHz} + (N-1)*5 \text{ MHz}$, where
		- fc = "Operating Frequency" in MHz,
		- N = "Channel Number" with the range from 1 to 11.
Frequency R	ange	802.11n/ac(40 MHz): 2.422 GHz - 2.452 GHz
		$f_c = 2412 \text{ MHz} + (N-1)*5 \text{ MHz}$, where
		- fc = "Operating Frequency" in MHz,
		- N = "Channel Number" with the range from 3 to 9.
Modulation T	уре	DSSS, OFDM
		Mobile
Product Type	e	⊠ Portable
		Fix Location
Antenna Sys	tem (eg., MIMO,	N/A
Smart Anten	na)	
Categorizatio	on as Correlated	N/A
or Complete	y Uncorrelated	
Antenna	Main Antenna	PIFA Antenna
Туре	Aux. Antenna	FIFAAntenna
Antenna	Main Antenna	0.9 dBi (In test items related to antenna gain, the final results
Gain	Aux. Antenna	reflect this figure. This value is provided by the applicant.)
About the Product		Only the WIFI 802.11b, 802.11g, 802.11n (HT20/40) was
		tested in this report.



Modulation technology	Modulation Type	Transfer Rate (Mbps)
	DBPSK	1
DSSS (802.11b)	DQPSK	2
	ССК	5.5/11
	BPSK	6/9
	QPSK	12/18
OFDM (802.11g)	16QAM	24/36
	64QAM	48/54
	BPSK	6.5/7.2
OFDM	QPSK	13/19.5/14.4/21.7
(802.11n-20MHz)	16QAM	26/39/28.9/43.3
	64QAM	52/58.5/65/57.8/65/72.2
	BPSK	13.5/15
OFDM	QPSK	27/40.5/30/45
(802.11n-40MHz)	16QAM	54/81/60/90
	64QAM	108/121.5/135/120/150

Note: Preliminary tests were performed in different data rate in above table to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	
Output Power	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
6dB Bandwidth	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Conducted Spurious Emission	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Conducted Emission	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Radiated Spurious Emission	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Band Edge	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Power spectral density (PSD)	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9

Note: The above EUT information in section 2.4 and 2.6 was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.



2.6 Additional Instructions

EUT Software Settings:

		\boxtimes	Special software is used.
	Mode		The software provided by client to enable the EUT under
			transmission condition continuously at specific channel
			frequencies individually.

During testing, Channel and 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 level setup in so	Power level setup in software					
Test Software Version	*#*#83781#*#*					
Support Units	Description	Manufacturer	Model			
(Software installation media)	N/A	N/A	N/A			
Mode	Channel	Soft S	Set			
	1	16				
	2	18				
	3	17				
	4	15				
	5	14				
802.11 b	6	15				
	7	18				
	8	18				
	9	18				
	10	15				
	11	14				
	1	13				
	2	17				
	5	17				
	6	15				
802.11 g	7	14				
	8	13				
	9	14				
	10	15				
	11	13				
	1	10				
	2	17				
	5	17				
	6	14				
802.11 n20	7	14				
	8	13				
	9	13				
	10	13				
	11	10				



	3	15
	4	16
	5	16
802.11 n40	6	15
	7	13
	8	12
	9	9

Run software:

Pkt length	1024		
Pkt cnt	0		
Power level	18		~
RF Standard	802.11b		*
CBW	20MHz		-
SBW	20MHz		Ŧ
Offset	0MHz		Ŧ
Channel	CH2[2417M]		-
Rate	1M_Long		-
Preamble	Normal		-
Mode	802.11 pkt		*
Guard interval	800ns		-
START	г	STOP	





3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title	
1	47 CFR Part 15, Subpart C	Miscellaneous Wireless Communications Services	
		GUIDANCE FOR COMPLIANCE MEASUREMENTS ON	
2	KDB Publication 558074	DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING	
2	D01v05r02	SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES	
		OPERATING UNDER SECTION 15.247 OF THE FCC RULES	
3	ANGL C62 10 2012	American National Standard of Procedures for Compliance Testing of	
3	ANSI C63.10-2013	Unlicensed Wireless Devices	

3.2 Verdict

No.	Description	FCC PART No.	Test Result	Verdict
1	Antenna Requirement	15.203	N/A	Pass ^{Note 1}
2	Output Power	15.247 (b)	ANNEX A.1	Pass
3	6dB Bandwidth	15.247 (a)	ANNEX A.2	Pass
4	Conducted Spurious Emission	15.247 (d)	ANNEX A.3	Pass
5	Band Edge(Authorized-band band-edge)	15.247 (d)	ANNEX A.4	Pass
6	Conducted Emission	15.207	ANNEX A.5	Pass
7	Radiated Spurious Emission	15.209; 15.247 (d)	ANNEX A.6	Pass
8	Band Edge(Restricted-band band-edge)	15.209; 15.247 (d)	ANNEX A.7	Pass
9	Power spectral density (PSD)	15.247 (e)	ANNEX A.8	Pass
10	Receiver Spurious Emissions	N/A	N/A	N/A Note 2
Note ¹ : Please refer to section 5.1.				

Note ²: Only radio communication receivers operating in stand-alone mode within the band 30-960 MHz, as well as scanner receivers, are subject to Industry Canada requirements, so this test is not applicable.



4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

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

Relative Humidity	45% - 55%		
Atmospheric Pressure	100 kPa - 102 kPa		
Temperature	NT (Normal Temperature)	+22℃ to +25℃	
Working Voltage of the EUT	NV (Normal Voltage)	3.87 V	

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-40	101544	2022.01.04	2023.01.03
Bluetooth Signaling Unit	ROHDE&SCHWARZ	CMW500	142028	2021.06.01	2022.05.31
Power Sensor	KEYSIGHT	U2063XA	MY58000247	2021.05.08	2022.05.07
EMI Receiver	KEYSIGHT	N9038A	MY53220118	2021.09.13	2022.09.12
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2021.10.10	2022.10.09
LISN	SCHWARZBECK	NSLK 8127	8127-687	2021.06.08	2022.06.07
Test Antenna- Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2021.04.16	2024.04.15
Test Antenna- Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2021.08.20	2024.08.19
Test Antenna- Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1917	2019.07.02	2022.07.01
Test Antenna- Horn (18-40 GHz)	A-INFO	LB- 180400KF	J211060273	2021.07.02	2024.07.01
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2021.09.04	2024.09.09
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60 *7.35m	N/A	2021.08.15	2024.08.14
Shielded Enclosure	ChangNing	CN-130701	130703		

4.3 Test Software List

Description	Manufacturer	Software Version	Serial No.	Applicable test Setup
BL410R	BALUN	V2.1.1.488	N/A	The section 4.5.1
BL410E	BALUN	V19.8.28.435	N/A	The section 4.5.2&4.5.3&4.5.4&4.5.5



4.4 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

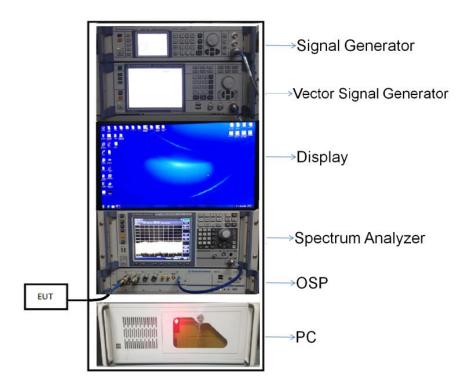
Parameters	Uncertainty
Occupied Channel Bandwidth	2.8%
RF output power, conducted	1.28 dB
Power Spectral Density, conducted	1.30 dB
Unwanted Emissions, conducted	1.84 dB
All emissions, radiated	5.36 dB
Temperature	0.82°C
Humidity	4.1%

4.5 Description of Test Setup

4.5.1 For Antenna Port Test

Conducted value (dBm) = Measurement value (dBm) + cable loss (dB)

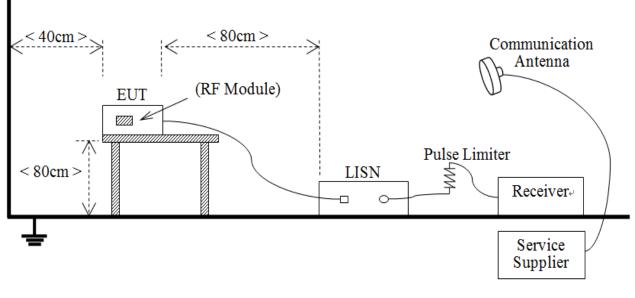
For example: the measurement value is 10 dBm and the cable 0.5dBm used, then the final result of EUT: Conducted value (dBm) = 10 dBm + 0.5 dB = 10.5 dBm



(Diagram 1)

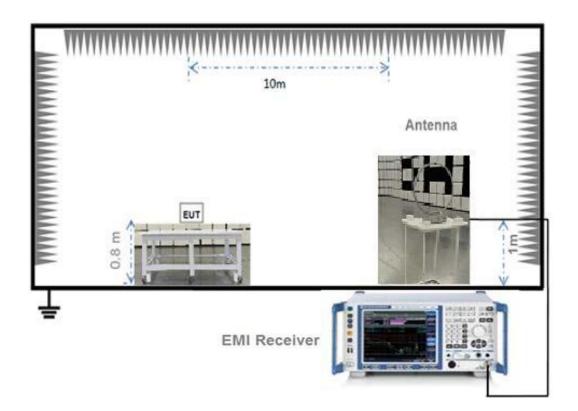


4.5.2 For AC Power Supply Port Test





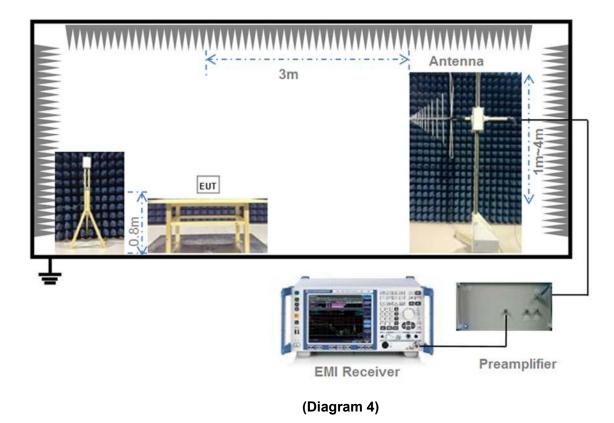
4.5.3 For Radiated Test (Below 30 MHz)



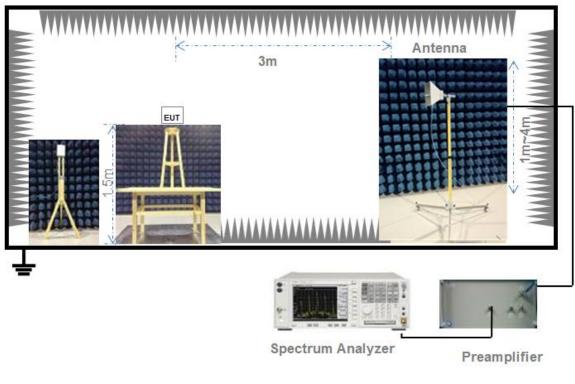
(Diagram 3)



4.5.4 For Radiated Test (30 MHz-1 GHz)



4.5.5 For Radiated Test (Above 1 GHz)







4.6 Measurement Results Explanation Example

4.6.1 For conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

4.6.2 For radiated band edges and spurious emission test:

E = EIRP - 20log D + 104.8

where:

E = electric field strength in $dB\mu V/m$,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

EIRP= Measure Conducted output power Value (dBm) + Maximum transmit antenna gain (dBi) + the appropriate maximum ground reflection factor (dB)



5 TEST ITEMS

5.1 Antenna Requirements

5.1.1 Relevant Standards

FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

5.1.2 Antenna Anti-Replacement Construction

The Antenna Anti-Replacement as following method:

Protected Method	Description
The antenna is embedded in the	An embedded-in antenna design is used.
product.	

Reference Documents	Item
Photo	Please refer to the EUT Photo documents.

5.1.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



5.2 Output Power

5.2.1 Test Limit

FCC § 15.247(b)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antennas and antennas and antennas and antennas elements.

5.2.2 Test Setup

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

Maximum peak conducted output power

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 utilize a fast-responding diode detector.

Maximum conducted (average) output power (Reporting Only)

a) As an alternative to spectrum analyzer or EMI receiver measurements, measurements may be performed

using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.

1) The EUT is configured to transmit continuously, or to transmit with a constant duty factor.

2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.

3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a

factor of five.

b) If the transmitter does not transmit continuously, measure the duty cycle (x) of the transmitter output signal as

described in Section 6.0.

c) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

d) Adjust the measurement in dBm by adding 10log (1/x), where x is the duty cycle to the measurement result.

Measurements of duty cycle

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal.

Set the center frequency of the instrument to the center frequency of the transmission.



Set RBW \geq OBW if possible; otherwise, set RBW to the largest available value.

Set VBW \geq RBW. Set detector = peak or average.

The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T \leq 16.7 microseconds.)

5.2.4 Test Result

Please refer to ANNEX A.1.



5.3 6dB Bandwidth

5.3.1 Limit

FCC §15.247(a)

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.

5.3.2 Test Setup

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.3.3 Test Procedure

Use the following spectrum analyzer settings:

Set RBW = 100 kHz.

Set the video bandwidth (VBW) \geq 3 RBW.

Detector = Peak.

Trace mode = max hold.

Sweep = auto couple.

Allow the trace to stabilize.

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.3.4 Test Result

Please refer to ANNEX A.2.



5.4 Conducted Spurious Emission

5.4.1 Limit

FCC §15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.4.2 Test Setup

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

The DTS rules specify that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

a) If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

b) If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).

c) In either case, attenuation to levels below the 15.209 general radiated emissions limits is not required.

The following procedures shall be used to demonstrate compliance to these limits. Note that these procedures can be used in either an antenna-port conducted or radiated test set-up. Radiated tests must conform to the test site requirements and utilize maximization procedures defined herein.

Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DTS channel center frequency.

Set the span to \geq 1.5 times the DTS bandwidth.

Set the RBW = 100 kHz.

Set the VBW \geq 3 x RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum PSD level.



Emission level measurement

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

Set the RBW = 100 kHz.

Set the VBW \geq 3 x RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in 11.1 a) or 11.1 b). Report the three highest emissions relative to the limit.

5.4.4 Test Result

Please refer to ANNEX A.3.



5.5 Band Edge (Authorized-band band-edge)

5.5.1 Limit

FCC §15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.5.2 Test Setup

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

The following procedures may be used to determine the peak or average field strength or power of an unwanted emission that is within 2 MHz of the authorized band edge. If a peak detector is utilized, use the procedure described in 13.2.1. Use the procedure described in 13.2.2 when using an average detector and the EUT can be configured to transmit continuously (i.e., duty cycle \geq 98%). Use the procedure described in 13.2.3 when using an average detector and the EUT cannot be configured to transmit continuously but the duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent). Use the procedure described in 13.2.4 when using an average detector for those cases where the EUT cannot be configured to transmit continuously and the duty cycle is not constant (duty cycle variations equal or exceed 2 percent).

When using a peak detector to measure unwanted emissions at or near the band edge (within 2 MHz of the authorized band), the following integration procedure can be used.

Set instrument center frequency to the frequency of the emission to be measured (must be within 2 MHz of the authorized band edge).

Set span to 2 MHz

RBW = 100 kHz.

VBW \geq 3 x RBW.

Detector = peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweep to continue until the trace stabilizes (required measurement time may increase for low duty cycle applications)

Compute the power by integrating the spectrum over 1 MHz using the analyzer's band power measurement function with band limits set equal to the emission frequency (femission) \pm 0.5 MHz. If the instrument does not have a band power function, then sum the amplitude levels (in power units) at 100 kHz intervals extending across the 1 MHz spectrum defined by femission \pm 0.5 MHz.

Standard method(The 99% OBW of the fundamental emission is without 2 MHz of the authorized band):

Span: Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products that fall outside of the authorized band of operation.



Reference level: As required to keep the signal from exceeding the maximum instrument input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.

Attenuation: Auto (at least 10 dB preferred).

Sweep time: Coupled.

Resolution bandwidth: 100 kHz.

Video bandwidth: 300 kHz.

Detector: Peak.

Trace: Max hold.

5.5.4 Test Result

Please refer to ANNEX A.4.



5.6 Conducted Emission

5.6.1 Limit

FCC §15.207

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50μ H/ 50Ω line impedance stabilization network (LISN).

Frequency range	Conducted Limit (dBµV)			
(MHz)	Quai-peak	Average		
0.15 - 0.50	66 to 56	56 to 46		
0.50 - 5	56	46		
0.50 - 30	60	50		

5.6.2 Test Setup

See section 4.5.2 for test setup description for the AC power supply port. The photo of test setup please refer to ANNEX B.

5.6.3 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

5.6.4 Test Result

Please refer to ANNEX A.5.



5.7 Radiated Spurious Emission

5.7.1 Limit

FCC §15.209&15.247(d)

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
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:

- 1. For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
- 2. For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).

5.7.2 Test Setup

See section 4.5.3 to 4.5.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.7.3 Test Procedure

Since the emission limits are specified in terms of radiated field strength levels, measurements performed to demonstrate compliance have traditionally relied on a radiated test configuration. Radiated measurements remain the principal method for demonstrating compliance to the specified limits; however antenna-port conducted measurements are also now acceptable to demonstrate compliance (see below for details). When radiated measurements are utilized, test site requirements and procedures for maximizing and measuring radiated emissions that are described in ANSI C63.10 shall be followed.

Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious emissions is required.

General Procedure for conducted measurements in restricted bands

a) Measure the conducted output power (in dBm) using the detector specified (see guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).



b) Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see guidance on determining the applicable antenna gain)

c) Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies \leq 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).

d) For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).

e) Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

E = EIRP - 20log D + 104.8

where:

E = electric field strength in $dB\mu V/m$,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

f) Compare the resultant electric field strength level to the applicable limit.

g) Perform radiated spurious emission test.

Quasi-Peak measurement procedure

The specifications for measurements using the CISPR quasi-peak detector can be found in Publication 16 of the International Special Committee on Radio Frequency Interference (CISPR) of the International Electrotechnical Commission.

As an alternative to CISPR quasi-peak measurement, compliance can be demonstrated to the applicable emission limits using a peak detector.

Peak power measurement procedure

Peak emission levels are measured by setting the instrument as follows:

a) RBW = as specified in Table 1.

b) VBW \geq 3 x RBW.

- c) Detector = Peak.
- d) Sweep time = auto.

e) Trace mode = max hold.

f) Allow sweeps to continue until the trace stabilizes. (Note that the required measurement time may be longer for low duty cycle applications).

Table 1—RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz



> 1000 MHz 1 MHz

If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

Trace averaging across on and off times of the EUT transmissions followed by duty cycle correction

If continuous transmission of the EUT (i.e., duty cycle \ge 98 percent) cannot be achieved and the duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent), then the following procedure shall be used:

a) The EUT shall be configured to operate at the maximum achievable duty cycle.

b) Measure the duty cycle, x, of the transmitter output signal as described in section 6.0.

c) RBW = 1 MHz (unless otherwise specified).

d) VBW \geq 3 x RBW.

e) Detector = RMS, if span/(# of points in sweep) \leq (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.

f) Averaging type = power (i.e., RMS).

1) As an alternative, the detector and averaging type may be set for linear voltage averaging.

2) Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.

g) Sweep time = auto.

h) Perform a trace average of at least 100 traces.

i) A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:

1) If power averaging (RMS) mode was used in step f), then the applicable correction factor is $10 \log(1/x)$, where x is the duty cycle.

2) If linear voltage averaging mode was used in step f), then the applicable correction factor is $20 \log(1/x)$, where x is the duty cycle.

3) If a specific emission is demonstrated to be continuous (\geq 98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

NOTE: Reduction of the measured emission amplitude levels to account for operational duty factor is not permitted. Compliance is based on emission levels occurring during transmission - not on an average across on and off times of the transmitter.

Determining the applicable transmit antenna gain

A conducted power measurement will determine the maximum output power associated with a restricted band emission; however, in order to determine the associated EIRP level, the gain of the transmitting antenna (in dBi) must be added to the measured output power (in dBm).



Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.

See KDB 662911 for guidance on calculating the additional array gain term when determining the effective antenna gain for a EUT with multiple outputs occupying the same or overlapping frequency ranges in the same band.

Radiated spurious emission test

An additional consideration when performing conducted measurements of restricted band emissions is that unwanted emissions radiating from the EUT cabinet, control circuits, power leads, or intermediate circuit elements will likely go undetected in a conducted measurement configuration. To address this concern, a radiated test shall be performed to ensure that emissions emanating from the EUT cabinet (rather than the antenna port) also comply with the applicable limits.

For these cabinet radiated spurious emission measurements the EUT transmit antenna may be replaced with a termination matching the nominal impedance of the antenna. Procedures for performing radiated measurements are specified in ANSI C63.10. All detected emissions shall comply with the applicable limits.

The measurement frequency range is from 30 MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured RBW = 1 MHz for $f \ge 1$ GHz, 100 kHz for f < 1 GHz VBW \ge RBW Sweep = auto Detector function = peak Trace = max hold

5.7.4 Test Result

Please refer to ANNEX A.6.



5.8 Band Edge (Restricted-band band-edge)

5.8.1 Limit

FCC §15.209&15.247(d)

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

5.8.2 Test Setup

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.8.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured RBW = 1 MHz for $f \ge 1$ GHz, 100 kHz for f < 1 GHz VBW \ge RBW Sweep = auto Detector function = peak Trace = max hold

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

For transmitters operating above 1 GHz repeat the measurement with an average detector.

5.8.4 Test Result

Please refer to ANNEX A.7.



5.9 Power Spectral density (PSD)

5.9.1 Limit

FCC §15.247(e)

The same method of determining the conducted output power shall be used to determine the power spectral density. If a peak output power is measured, then a peak power spectral density measurement is required. If an average output power is measured, then an average power spectral density measurement should be used.

5.9.2 Test Setup

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.9.3 Test Procedure

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to: 3 kHz \leq RBW \leq 100 kHz.

Set the VBW \geq 3 RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level within the RBW.

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

5.9.4 Test Result

Please refer to ANNEX A.8.



ANNEX A TEST RESULT

A.1 Output Power

Duty Cycle

Test Mode	On Time (ms)	On+Off time (ms)	Duty Cycle
802.11b	8.400	8.480	99.06%
802.11g	1.392	1.460	95.34%
802.11n-20 MHz	1.306	1.372	95.19%
802.11n-40 MHz	0.647	0.711	91.00%

Peak Power Test Data

802.11b Mode:

Channel	Measured Out	put Peak Power	Limit		Vardiat	
Channel	dBm	mW	dBm	mW	Verdict	
1	20.42	110.15			Pass	
2	22.65	184.08			Pass	
3	21.82	152.05			Pass	
4	19.55	90.16			Pass	
5	18.94	78.34			Pass	
6	19.84	96.38	30	1000	Pass	
7	22.39	173.38			Pass	
8	22.78	189.67				Pass
9	22.78	189.67			Pass	
10	20.25	105.93				Pass
11	19.07	80.72			Pass	

802.11g Mode:

Channal	Measured Out	put Peak Power	Limit		Verdict		
Channel	dBm	mW	dBm	mW	verdict		
1	19.49	88.92			Pass		
2	22.72	187.07					Pass
5	22.83	191.87				Pass	
6	21.13	129.72			Pass		
7	20.55	113.50	30	0 1000	Pass		
8	19.87	97.05			Pass		
9	20.91	123.31			Pass		
10	21.51	141.58			Pass		
11	19.31	85.31			Pass		



802.11n-20 MHz Mode:

Channel	Measured Out	put Peak Power	Limit		Verdict	
Channel	dBm	mW	mW dBm mW	mW	verdict	
1	17.29	53.58			Pass	
2	22.89	194.54			Pass	
5	23.03	200.91				Pass
6	20.70	117.49			Pass	
7	20.88	122.46	30	30 1000	1000	Pass
8	20.15	103.51			Pass	
9	20.24	105.68				Pass
10	19.99	99.77			Pass	
11	16.45	44.16			Pass	

802.11n-40 MHz Mode:

Channel	Channel Measured Output Pe		Lir	nit	Verdict			
Channel	dBm	mW	dBm	mW	verdict			
3	20.29	106.91						Pass
4	21.69	147.57				Pass		
5	21.32	135.52			Pass			
6	20.55	113.50	30	1000	Pass			
7	18.83	76.38				Pass		
8	18.36	68.55			Pass			
9	15.56	35.97			Pass			





Average Power Test Data

802.11b Mode:

Channel	Measured Outp	ut Average Power	Limit		Verdict							
Channel	dBm	mW	dBm	mW	Verdict							
1	17.88	61.38									Pass	
2	19.51	89.33			Pass							
3	18.66	73.45			Pass							
4	16.45	44.16										Pass
5	15.53	35.73		1000	Pass							
6	16.02	39.99	30		Pass							
7	19.82	95.94				Pass						
8	19.85	96.61			Pass							
9	19.89	97.50					Pass					
10	16.92	49.20			Pass							
11	15.21	33.19			Pass							

802.11g Mode:

Channel	Measured Outp	ut Average Power	Limit		Verdict	
Channel	dBm	mW	dBm	dBm mW	Verdict	
1	13.32	21.48			Pass	
2	17.23	52.84			Pass	
5	17.35	54.33		1000	Pass	
6	15.36	34.36			Pass	
7	14.65	29.17	30		Pass	
8	14.00	25.12			Pass	
9	15.27	33.65				Pass
10	15.60	36.31			Pass	
11	13.19	20.84			Pass	



802.11n-20 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
Channel	dBm	mW	dBm	mW	verdict
1	10.80	12.02			Pass
2	17.06	50.82			Pass
5	17.14	51.76		Pass Pass 1000 Pass Pass Pass	Pass
6	14.83	30.41			Pass
7	14.91	30.97	30		Pass
8	14.39	27.48			Pass
9	14.59	28.77			Pass
10	14.32	27.04			Pass
11	10.72	11.80			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict	
	dBm	mW	dBm	mW	verdict	
3	14.43	27.73				Pass
4	15.80	38.02			Pass	
5	15.89	38.82	30 1000	1000 F F F	Pass	
6	14.48	28.05			Pass	
7	12.98	19.86			Pass	
8	12.48	17.70			Pass	
9	9.57	9.06			Pass	



A.2 Bandwidth

<u>Test Data</u>

802.11b Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
1	9.100000	11.979000	≥500
6	9.100000	11.976000	≥500
11	9.100000	11.963000	≥500

802.11g Mode:

Channel	6 dB Bandwidth	99% Bandwidth	6 dB Bandwidth
	(MHz)	(MHz)	Limits (kHz)
1	16.150000	17.053000	≥500
6	16.150000	17.107000	≥500
11	15.900000	16.950000	≥500

802.11n-20MHz Mode:

Channel	6 dB Bandwidth	99% Bandwidth	6 dB Bandwidth
Channel	(MHz)	(MHz)	Limits (kHz)
1	15.200000	17.512000	≥500
6	17.100000	17.963000	≥500
11	15.400000	17.508000	≥500

802.11n-40MHz Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
3	35.150000	36.869000	≥500
6	35.150000	35.831000	≥500
9	23.900000	34.849000	≥500



Test Plots

6 dB Bandwidth



802.11b CHANNEL 6



802.11b CHANNEL 11



802.11g CHANNEL 1 Freq 2.412000000 GHz PNO: Fast --- Trig: Free Run #Atten: 36 dB Frequency Avg Type: Log-Pwr Avg[Hold: 50/50 Auto Tun ΔMkr2 16.15 N Ref Offset 1.08 dB Ref 25.00 dBm Center Fred 2.412000000 GHz **≬**¹ 243 Χ. Start Free 2.392000000 GH Stop Free 2.432000000 GH Center 2.41200 GHz Res BW 100 kHz Span 40.00 MHz 100.0 ms (801 pts) CF Ste VBW 300 kHz uto 2 414 50 GHz 2 950 dBn 16,15 MHz (Δ) - 0,685 dB 2.404 05 GHz - 4.046 dBn (Δ) Freq Offsel +

802.11g CHANNEL 6



802.11g CHANNEL 11





802.11n-20 MHz CHANNEL 1



02.11 n-20 MHz CHANNEL 6



802.11 n-40 MHz CHANNEL 3



802.11n-40 MHz CHANNEL 6

802.11n-20 MHz CHANNEL 11





802.11n-40 MHz CHANNEL 9





99% Bandwidth





802.11b CHANNEL 6



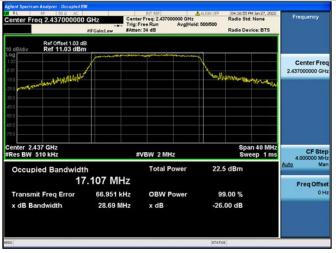
802.11b CHANNEL 11



802.11g CHANNEL 1



802.11g CHANNEL 6



802.11g CHANNEL 11

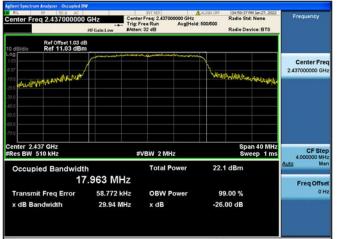




802.11n-20 MHz CHANNEL



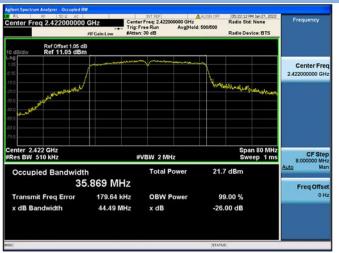
802.11 n-20 MHz CHANNEL 6



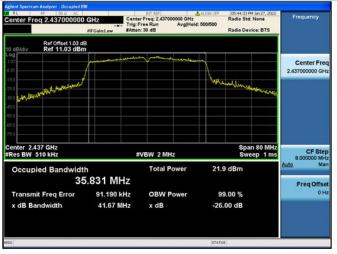
802.11n-20 MHz CHANNEL 11



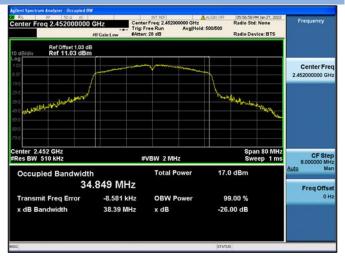
802.11 n-40 MHz CHANNEL 3



802.11n-40 MHz CHANNEL 6



802.11n-40 MHz CHANNEL 9





A.3 Conducted Spurious Emissions

<u>Test Data</u>

802.11b Mode:

	Measured Max. Out of	Limit (dBm)	
Channel	Band Emission (dBm)	Carrier Level	Calculated 20 dBc Limit	Verdict
1	-50.38	8.97	-11.03	Pass
2	-51.77	11.35	-8.65	Pass
3	-49.24	10.36	-9.64	Pass
4	-49.15	7.97	-12.03	Pass
5	-50.37	7.36	-12.64	Pass
6	-49.66	8.36	-11.64	Pass
7	-46.37	12.05	-7.95	Pass
8	-45.85	12.35	-7.65	Pass
9	-46.23	12.45	-7.55	Pass
10	-49.48	8.66	-11.34	Pass
11	-50.60	7.67	-12.33	Pass

802.11g Mode:

	Maggurad May, Out of	Limit (dBm)	
Channel	Measured Max. Out of Band Emission (dBm)	Carrier Level	Calculated 20 dBc Limit	Verdict
1	-48.05	2.50	-17.50	Pass
2	-49.66	5.79	-14.21	Pass
5	-49.90	7.54	-12.46	Pass
6	-50.12	5.14	-14.86	Pass
7	-51.59	4.23	-15.77	Pass
8	-48.79	3.46	-16.54	Pass
9	-51.00	4.29	-15.71	Pass
10	-49.54	5.63	-14.37	Pass
11	-51.65	3.21	-16.79	Pass

802.11n-20MHz Mode:

	Measured Max. Out of	Limit (dBm)	
Channel	Band Emission (dBm)	Carrier Level	Calculated 20 dBc Limit	Verdict
1	-49.46	1.72	-18.28	Pass
2	-48.92	7.33	-12.67	Pass
5	-49.55	7.56	-12.44	Pass
6	-49.35	3.59	-16.41	Pass
7	-48.51	3.73	-16.27	Pass
8	-51.19	3.68	-16.32	Pass
9	-51.81	3.27	-16.73	Pass
10	-52.11	3.36	-16.64	Pass



	Measured Max. Out of	Limit (dBm)	
Channel	Band Emission (dBm)	Carrier Level	Calculated 20 dBc Limit	Verdict
11	-51.52	-0.33	-20.33	Pass

802.11n-40MHz Mode:

	Measured Max. Out of	Limit (dBm)	
Channel	Band Emission (dBm)	Carrier Level	Calculated 20 dBc Limit	Verdict
3	-48.44	1.19	-18.81	Pass
4	-49.71	4.04	-15.96	Pass
5	-49.55	4.45	-15.55	Pass
6	-51.15	1.85	-18.15	Pass
7	-49.02	1.07	-18.93	Pass
8	-51.70	0.32	-19.68	Pass
9	-48.72	-1.83	-21.83	Pass



Test Plots



802.11b CHANNEL 1, SPURIOUS 30 MHz ~ 3 GHz

arker 1 2.68624000		Trig: Free Run	Avg Type: Log-Pwr Avg[Hold>1/1	11:15:32 AM Feb 11, 2022 TRACE 2 2 3 4 5 TYPE	Marker
	PNO: Fast 0 IFGain:Low	#Atten: 26 dB	Striggerond > 1/1	DET CANNER	Select Marker
o dB/div Ref 16.00 c	IBm		Mk	r1 2.686 2 GHz -58.026 dBm	1
600					Norma
14.0				.11.03.dBm	
34 0					Delta
54.0				Lana Martin	
64.0	مير المربوع بالمترحانية المالية المربوع ال				Fixed
tart 30 MHz Res BW 100 kHz	#VB	W 300 kHz	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts)	or
NR MODE TRC SCL	x 2.586 2.GHz	Y P. -58.026 dBm	INCTION FUNCTION WIDTH	FUNCTION VALUE	
					Properties
6 7 8 9					Mon
					1 of 3
				1.00	

802.11b CHANNEL 1, SPURIOUS 2 GHz ~ 25 GHz

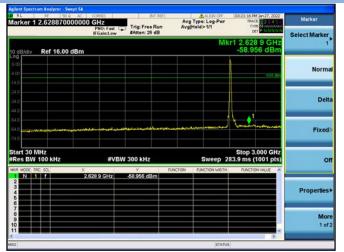
Peak Search	11:15:50.4M Feb 11, 2022 TRACE 12 2 4 5 TYPE MONITOR	Ancient Off Type: Log-Pwr fold>1/1	Avg	Trig: Free Rur #Atten: 26 dB	PNO: Fast C Galect.ew	00000 G		1 4.8
NextPea	4.823 25 GHz -50.380 dBm	Mkrt				dBm	f 16.00	Re
Next Pk Rig	.11.02.dBm							
Next Pk Le							<u>, 1</u>	
Marker Del	~~~~~		منعويديميه			-	Lum	
Mkr→C	Stop 25.00 GHz 2.198 s (4001 pts)	Sweep	FUNCTION	V 300 kHz Y	11	×	kHz	00 GH W 100
Mkr→RefL				-50.390 dBm	25 GHz	4.823 :		1 1
Mor 1 of								
	2	STATUS					_	_

802.11b CHANNEL 2 CARRIER LEVEL





802.11b CHANNEL 2, SPURIOUS 30 MHz ~ 3 GHz



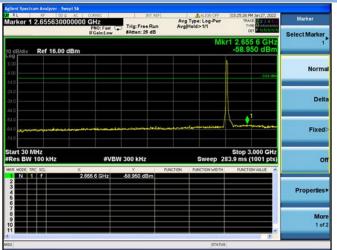
Peak Search	PM Jan 27, 2022 ACE 2 2 3 4 5 YPE 2 3 4 5 CET 2 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	TRA	▲ ACION OFF be: Log-Pwr d>1/1	Avg	Trig: Free Rur #Atten: 26 dB	CORREC GHZ PNO: Fast IFGain:Low		4.834750	arker 1
NextPea	75 GHz 65 dBm	1 4.834 -51.7	Mkr				0 dBm	Ref 16.00	dB/div
Next Pk Righ									2 20 20 20
Next Pk Let								.1	0
	main	Num	www	_	mum			- 1	.0
Marker Delt						-	-	under	0
Marker Delt Mkr→Cl	25.00 GHz (4001 pts)	Stop 2 2.198 s			300 kHz	#VBI	X	100 kHz	art 2.00 tes BW
	(4001 pts)	Stop 2 2.198 s	Sweep	FUNCTION		#VBI		100 kHz	art 2.00

802.11b CHANNEL 2, SPURIOUS 2 GHz ~ 25 GHz

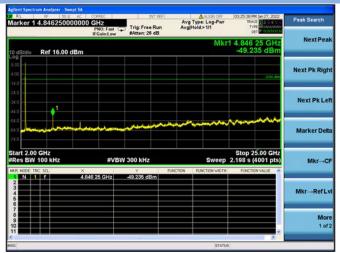
802.11b CHANNEL 3 CARRIER LEVE



802.11b CHANNEL 3, SPURIOUS 30 MHz ~ 3 GHz



802.11b CHANNEL 3, SPURIOUS 2 GHz ~ 25 GHz





802.11b CHANNEL 4 CARRIER LEVE



802.11b CHANNEL 4, SPURIOUS 30 MHz ~ 3 GHz



802.11b CHANNEL 4, SPURIOUS 2 GHz ~ 25 GHz

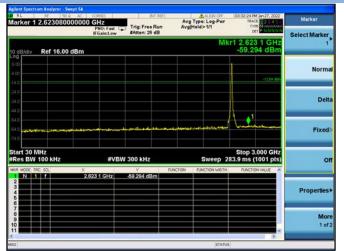
Peak Search	03:29:26 PM Jan 27, 2022 TRACE 12 2 3 4 5 TYPE MONOTONIC DET 2 111111	Auton off Type: Log-Pwr fold>1/1	Avg	Trig: Free Run #Atten: 26 dB	CORREC GHZ PNO: Fast C IFGaincLow	0000000		rker 1 4
Next Peak	4.852 00 GHz -49.145 dBm	Mkrt				00 dBm	Ref 16.0	dB/div
Next Pk Rig	-12.03 (6%)							
Next Pk Le							.1	
Marker Del	m		مسم	~~~~~			sala.	
Mkr→C	Stop 25.00 GHz 2.198 s (4001 pts)	Sweep FUNCTION WIDTH	PUNCTION	V 300 kHz	#VB	X	100 kHz	nt 2.00 es BW 1
Mkr→RefL				-49.145 dBm	2 00 GHz	4.852		N 1
Moi 1 of								
	2	STATUS						

802.11b CHANNEL 5 CARRIER LEVEL





802.11b CHANNEL 5, SPURIOUS 30 MHz ~ 3 GHz



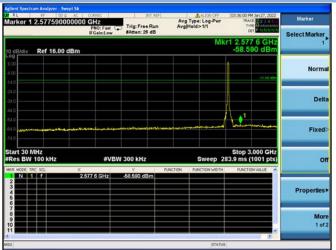
Peak Search	PM 3in 27, 2022 Not 12 14 5 VPE NUNNIN CET P.N.N.N.N.N	TRA	▲ ACION OFF pe: Log-Pwr id>1/1	Avg	Trig: Free Run #Atten: 26 dB		5350000000	er 1 4.8	rke
NextPea	50 GHz 370 dBm	1 4.863 -50.3	Mkr				f 16.00 dBm	Idiv R	3B/c
Next Pk Righ	-12 (4 (0)-								
Next Pk Le							41		
Marker Delt		~~			مدين المدين المدين الم		Inner	-	
Mkr→C	25.00 GHz (4001 pts)	2.198 s			300 kHz	#VBW	kHz	2.00 GH BW 100	as l
	ION VALUE	PUNCT	UNCTION WIDTH	FUNCTION	7 50.370 dBm			DE TRC SO	
MkrRef L								\pm	

802.11b CHANNEL 5, SPURIOUS 2 GHz ~ 25 GHz

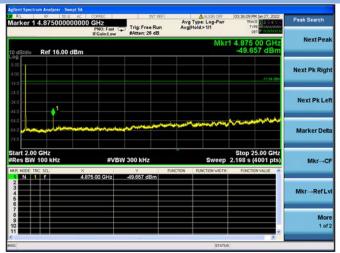
802.11b CHANNEL 6 CARRIER LEVE



802.11b CHANNEL 6, SPURIOUS 30 MHz ~ 3 GHz



802.11b CHANNEL 6, SPURIOUS 2 GHz ~ 25 GHz





802.11b CHANNEL 7 CARRIER LEVE



802.11b CHANNEL 7, SPURIOUS 30 MHz ~ 3 GHz



802.11b CHANNEL 7, SPURIOUS 2 GHz ~ 25 GHz

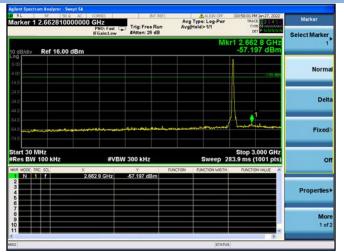
RL 00 000 irker 1 4.8865000		Trig: Free Run	Avg Type: Log-Pwr Avg[Hold>1/1	03:43:39 PM Jan 27, 2022 TRACE 224 C TYPE MUNICIPAL	Peak Search
dB/div Ref 16.00	dBm		Mkr	1 4.886 50 GHz -46.368 dBm	NextPeak
				-735 239	Next Pk Right
					Next Pk Lef
		موجوم من من من المراجع	www.energym	~~~~~	Marker Delta
art 2.00 GHz es BW 100 kHz	×	BW 300 kHz	Sweep	Stop 25.00 GHz 2.198 s (4001 pts)	Mkr→CF
N 1 f	4.886 50 GHz	-46.368 dBm			Mkr→RefLv
					More 1 of 2
			STATU	2	

802.11b CHANNEL 8 CARRIER LEVEL





802.11b CHANNEL 8, SPURIOUS 30 MHz ~ 3 GHz



Peak Search	PM Jan 27, 2022 RACE 2 2 4 5 TYPE 2 1 4 5 DET 2 1 1 1 1 1	TR/	ACON OF e: Log-Pwr i>1/1	Avg	Trig: Free Run #Atten: 26 dB			8922500	(er 14
Next Peal	2 25 GHz 845 dBm	1 4.892 -45.8	Mkr				dBm	Ref 16.00	Udiv
Next Pk Righ	.718 250								
Next Pk Lef								1	
Marker Delt		~~~	marino	جميريني معامدي	معنيهمسيدي		mdra	Jun	
Marker Delt Mkr→Cl	25.00 GHz (4001 pts)	Stop 2 2.198 s	Sweep		300 kHz	#VB\	- J	00 kHz	
- Constantine Constantine		Stop 2 2.198 s		FUNCTION		#VB\ 25 GHz	× 4.897	SCL	

802.11b CHANNEL 8, SPURIOUS 2 GHz ~ 25 GHz

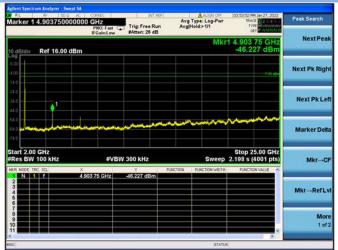
802.11b CHANNEL 9 CARRIER LEVE



802.11b CHANNEL 9, SPURIOUS 30 MHz ~ 3 GHz



802.11b CHANNEL 9, SPURIOUS 2 GHz ~ 25 GHz

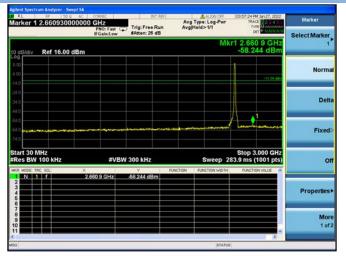




802.11b CHANNEL 10 CARRIER LEVE



802.11b CHANNEL 10, SPURIOUS 30 MHz ~ 3 GHz



802.11b CHANNEL 10, SPURIOUS 2 GHz ~ 25 GHz

Peak Search	03:57:43 PM 3in 27, 2022 TRACE 2 2 4 4 5 TYPE CET P ALMANIA	Ancion off Type: Log-Pwr fold>1/1	Ar Run An	Trig: Free Ru		5250000000	rker 1 4.91
Next Pea	4.915 25 GHz -49.479 dBm	Mkrt			and the second second	16.00 dBm	dB/div Ref
Next Pk Righ	-11.54 dbs						
Next Pk Le						▲ 1	0 0 0
Marker Delt	vann		مرجودي	~~~~	honoraliseda.	Lanna	
Mkr⊸C	Stop 25.00 GHz 2.198 s (4001 pts) FUNCTION VALUE	Sweep FUNCTION WIDTH	FUNCTION	V 300 kHz Y	×	×	es BW 100 F
Mkr→RefL			n	-49.479 dBm	4 915 25 GHz	49	N 1 f
Mor 1 of							
		STATUS			_		

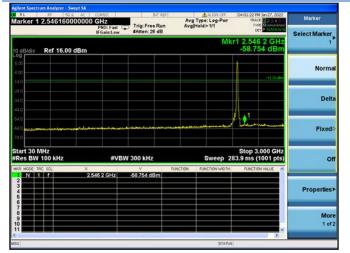
802.11b CHANNEL 11 CARRIER LEVEL





802.11b CHANNEL 11, SPURIOUS 30 MHz ~ 3 GHz

802.11b CHANNEL 11, SPURIOUS 2 GHz ~ 25 GHz

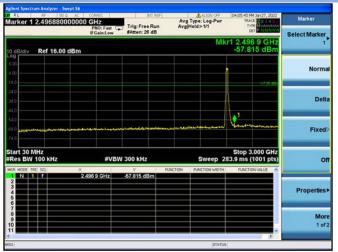


Peak Search	04:01:31 PM Jan 27, 2022 TRACE 1 2 3 4 5 TYPE MONITORING DIT P MONITORING	Type: Log-Pwr Hold>1/1	Avg Avg	Trig: Free Rur #Atten: 26 dB	PNO: Fast G GalacLow	00000 G	1.9267500	rker 1
NextPeal	4.926 75 GHz -50.595 dBm	Mkrt				dBm	Ref 16.00	dB/div
Next Pk Righ								
Next Pk Let							1	a a
Marker Delt	and the second sec			maner		-		
	Stop 25.00 GHz 2.198 s (4001 pts)	Sween		/ 300 kHz	#VBV		00 kHz	art 2.00 es BW
Mkr→C	FUNCTION VALUE	FUNCTION WIDTH	FUNCTION	Y		×		
Mkr→Cl Mkr→RefLv			FUNCTION	Y -50.595 dBm	75 GHz			N 1

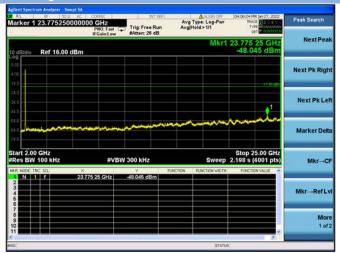
802.11g CHANNEL 1 CARRIER LEVEL



802.11g CHANNEL 1, SPURIOUS 30 MHz ~ 3 GHz



802.11g CHANNEL 1, SPURIOUS 2 GHz ~ 25 GHz





802.11g CHANNEL 2 CARRIER LEVE



802.11g CHANNEL 2, SPURIOUS 30 MHz ~ 3 GHz

arker 1 2.65257000000		Trig: Free Run	Avg Type: L AvgIHold>1/	og-Pwr	TRACE DEDAS	Marker
	PNO: Fast C IFGain:Low	#Atten: 26 dB	Avginoid>1/	1	DET ZUUUUUU	Select Marker
dB/div Ref 16.00 dBm				Mkr1 2	2.652 6 GHz 58.724 dBm	1
00 00				1		Norma
4.0					.4424 (Br	
4.0 4.0				A		Delt
		a contraction of the sector		man	and manage	Fixed
¢.0						Fixed
tart 30 MHz Res BW 100 kHz	#VB	W 300 kHz		reep 283.9	top 3.000 GHz ms (1001 pts)	or
2 1992 199 199 199	.652 6 GHz	Y -58.724 dBm	FUNCTION FUNCTI	ON WIDTH	FUNCTION VALUE	
						Properties
						Mon
						1 of :

802.11g CHANNEL 2, SPURIOUS 2 GHz ~ 25 GHz

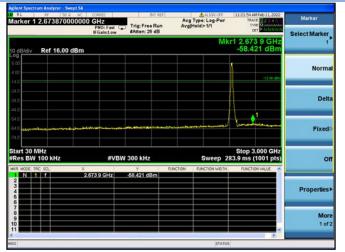
Peak Search	DH:13:54 PM Jan 27, 2022 TRACE 12 2 4 5 TYPE MONITORING DET PLUNNERN	Action off Type: Log-Pwr fold>1/1	Av	Trig: Free Run #Atten: 26 dB	AC CORREC 000000 GHZ PNO: Fast C IFGaincl.ow	1 23.78100
Next Pea	23.781 00 GHz -49.658 dBm	Mkr1			Bm	Ref 16.0
Next Pk Righ	4.2 0					
Next Pk Le						
Marker Del	munedan		مسترية مساوري	,	adait and at a set	and the second
Mkr→C	Stop 25.00 GHz 2.198 s (4001 pts)	Sweep FUNCTION WIDTH	FUNCTION	W 300 kHz Y	#VB	00 GHz W 100 kHz
Mkr→RefL				-49.658 dBm	23.781 00 GHz	1 f
Mor 1 of						
		STATUS				

802.11g CHANNEL 5 CARRIER LEVEL





802.11g CHANNEL 5, SPURIOUS 30 MHz ~ 3 GHz

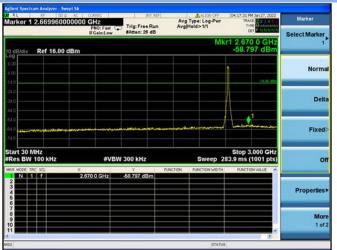




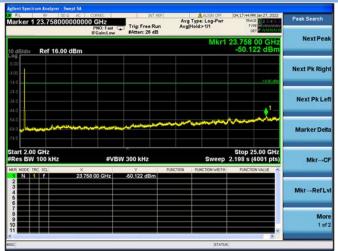
802.11g CHANNEL 6 CARRIER LEVEL



802.11g CHANNEL 6, SPURIOUS 30 MHz ~ 3 GHz



802.11g CHANNEL 6, SPURIOUS 2 GHz ~ 25 GHz





802.11g CHANNEL 7 CARRIER LEVEL

enter Freq 2.44200000	PNO: Fast C	Trig: Free Run #Atten: 26 dB	Avg Type: Lo Avg[Hold>1/1	TYP	P UNINNN
o dBJdly Ref 16.00 dBm				Mkr1 2.445 4.23	75 GHz Auto 1 11 dBm
•g •00 •00 •00 •00	h	rhaadhaa yaadhaan	low month and	-ly	Center 2.442000000
				Monardy	14401/d/Wy Start 2.427000000
54.0 					Stop 2.457000000
Renter 2.44200 GHz Res BW 100 kHz	11		INCTION FUNCTIO	veep 2.880 ms	Auto
N 1 7 2: 3 4 5 5 6 7 7 9 9 0	445 75 GHz	4.231 dBm			FreqO

802.11g CHANNEL 7, SPURIOUS 30 MHz ~ 3 GHz 802.11g CHANNEL 7, SPURIOUS 2 GHz ~ 25 GHz

00000 GHz		Avg Type: Log-Pwr Avg Hold>1/1	TRACE	Marker
IFGain:Low	#Atten: 26 dB	Mk	r1 2.683 4 GHz	Select Marker
dBm			-57.581 dBm	Norma
			.15.77.45%	
				Delta
	an the constant of the second	nahiran kanalan kanan di	1 million and	Fixed
				or
× 2.683 4 GHz	Y R -57.581 dBm	UNCTION FUNCTION WIDTH	FUNCTION VALUE	Properties
				More
	#GaleLow dBm #VE	00000 GHZ PHO: Fast ← IF Gain Low Trig: Free Run IF Gain Low FAtten: 28 dB dBm IF WW 300 kHz X Y N R	00000 GHZ PHO: Fast IFGsincLow Trig: Free Run Acten: 26 dB Avg Type: Log-Per Avg[Hold>1/1 dBm Mit #VBW 300 kHz Sweep 2 X Y Raction	O0000 GHz PRO: Fait Trig: Free Run Addres: 26 dB Avg Type: Leg-Pur MigHeid>1/1 Trig: Run Type: Leg-Pur MigHeid>1/1 Bm 1 Trig: Stop 3.000 GHz Mkr1 2.583 4 GHz dBm -57.581 dBm -3000 GHz -3000 GHz #VBW 3000 kHz Stop 3.000 GHz Stop 3.000 GHz #VBW 3000 kHz Sweep 283.9 ms (1001 pts) X Y RacTork With RacTork Watks

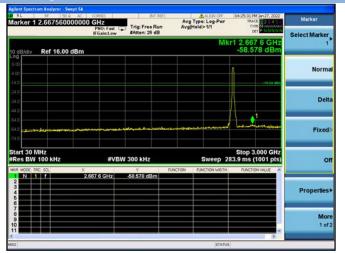
Peak Search	04:21:41 PM 3in 27, 2022 TRACE 2 2 4 5 TYPE 00000000 DET P 51 N 51 N 51	Action off Type: Log-Pwr Hold>1/1	A	Trig: Free Ru #Atten: 26 dB		250000000		
Next Pea	21.176 25 GHz -51.587 dBm	Mkr1				i.00 dBm	Ref 16.	B/div
Next Pk Rig								
Next Pk Le								
Marker Del	imm		~~~~	, second	and much as	***	www	-
Mkr→C	Stop 25.00 GHz 2.198 s (4001 pts) PUNCTION VALUE	Sweep FUNCTION WIDTH	FUNCTION	300 kHz Y	#VBV	z ×	100 kHz	nt 2.00 IS BW
Mkr→RefL				-51.587 dBm	6 25 GHz	21.17	f	N 1
Mor 1 of								
	8	STATUS						

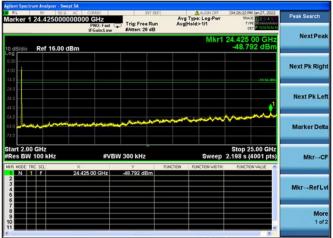
802.11g CHANNEL 8 CARRIER LEVEL





802.11g CHANNEL 8, SPURIOUS 30 MHz ~ 3 GHz

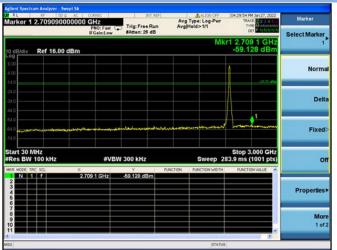




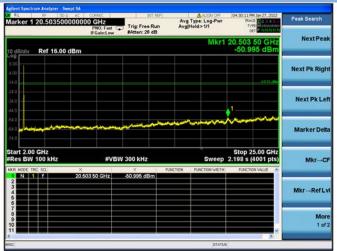
802.11g CHANNEL 9 CARRIER LEVEL



802.11g CHANNEL 9, SPURIOUS 30 MHz ~ 3 GHz



802.11g CHANNEL 9, SPURIOUS 2 GHz ~ 25 GHz



802.11g CHANNEL 8, SPURIOUS 2 GHz ~ 25 GHz



802.11g CHANNEL 10 CARRIER LEVEL

enter Freq 2.457000000	GHZ PNO: Fast G	Trig: Free Run #Atten: 25 dB	Avg Type: Log-Pwr Avg[Hold>1/1	04:32:56 PM Jan 27, 2022 TRACE 2 2 4 5 TYPE MONTON D	Frequency
o dB/div Ref 16.00 dBm			Mkr	1 2.458 25 GHz 5.626 dBm	Auto Tune
1.00	agullagalkianghag	-trustra partier	harman		Center Fred 2.457000000 GHz
140 040 040 040				monorm	Start Free 2.442000000 GHz
54.0					Stop Free 2.472000000 GH
enter 2.45700 GHz Res BW 100 kHz	#VBW	300 kHz	Sweep	Span 30.00 MHz 2.880 ms (601 pts)	CF Step 3.000000 MH Auto Mar
	58 25 GHz	5.626 dBm			Freq Offse 0 H

arker 1 2.7225800	000000 GHz PNO: Fast	Trig: Free Run	Avg Type: Log-Pwr Avg[Hold>1/1	04:35:20 PM Jan 27, 2022 TRACE 12:34 5 TYPE	Marker
dBJdly Ref 16.00	IFGain:Low	#Atten: 26 dB	Mi	cr1 2.722 6 GHz -58.854 dBm	Select Marker
00 500 1.00				4.27 (5%)	Norma
40					Deita
4.0		(e. j.e., et., et.) (1990)		Anna 1	Fixed
tart 30 MHz Res BW 100 kHz	#VB	W 300 kHz Y R	Sweep 2	Stop 3.000 GHz 83.9 ms (1001 pts) FUNCTION VALUE	or
N 1 F 2 3 4 5	2.722 6 GHz	-58.854 dBm			Properties
6 7 8 9 0 1					Mor 1 of:
1			STATU	*	

802.11g CHANNEL 10, SPURIOUS 30 MHz ~ 3 GHz 802.11g CHANNEL 10, SPURIOUS 2 GHz ~ 25 GHz

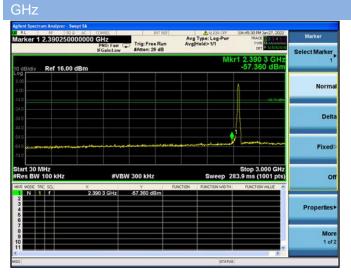
Peak Search	D4:35:32 PM Jan 27, 2022 TRACE 12 2 4 5 TYPE DET PLANALINA	Action Off Type: Log-Pwr Hold>1/1	Free Run in: 26 dB		781000000000	arker 1 23.781
Next Pea	23.781 00 GHz -49.536 dBm	Mkr1			f 16.00 dBm	0 dB/div Ref 16
Next Pk Rigt	(14.77 dBm)					00
Next Pk Le						4.0
Marker Del	munde			und stig at the local	بيحيامون تصفيا ولان	4.0 4.0 4.0
Mkr→C	Stop 25.00 GHz 2.198 s (4001 pts)	Sweep FUNCTION WIDTH	FUNCT	#VBW	kHz ×	tart 2.00 GHz Res BW 100 kHz
Mkr→RefL			l6 dBm	00 GHz	23.781	1 N 1 F 2 3 4 5
Mor 1 of						6 7 8 9 10
		STATUS				0

802.11g CHANNEL 11 CARRIER LEVEL





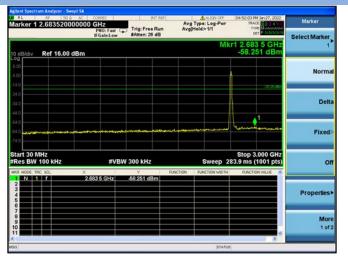
802.11n-20 CHANNEL 11, SPURIOUS 30 MHz ~ 3



802.11n-20 CHANNEL 1 CARRIER LEVEL



802.11n-20 CHANNEL 1, SPURIOUS 30 MHz ~ 3 GHz

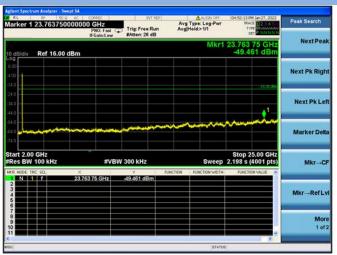


802.11n-20 CHANNEL 11, SPURIOUS 2 GHz ~ 25

GHz



802.11n-20 CHANNEL 1, SPURIOUS 2 GHz ~ 25 GHz





802.11n-20 CHANNEL 2 CARRIER LEVE

PNO: Fast IFGaln:Low	Trig: Free Run #Atten: 26 dB	Avg Type: Log-Pwr Avg[Hold>1/1	D4:54:57 PM Jan 27, 2022 TRACE 2 2 4 5 TYPE MONOTONIC DET PILLINININ	Frequency
		Mkr	1 2.418 25 GHz 7.330 dBm	Auto Tune
Mar Mar Marine	vourtery and und	- monter my		Center Free 2.417000000 GHz
			mannan	Start Free 2.402000000 GHz
				Stop Free 2.432000000 GH:
	Y RJ		Span 30.00 MHz 2.880 ms (601 pts)	CF Step 3.000000 MH Auto Mar
418 25 GHz	7.330 dBm			Freq Offse 0 H;
	#VBW	#Coluctory AAtten: 28 48	#Count ow #Atten: 28 dB Mkr 1 1	Production Addres: 2d dB Magnetic bit Composition Production Mixed Composition Composit

802.11n-20 CHANNEL 2, SPURIOUS 30 MHz ~ 3 GHz

lar			000000 GHz			Avg Type:	Log-Pwr	TR/	PM 3an 27, 2022	Marker
			PNO: Fi IFGainct		: Free Run en: 26 dB	Avg Hold>	1/1		Select Marker	
	B/div	Ref 16.00	dBm				Mk	r1 2.77 -58.5	1 7 GHz 56 dBm	1
og 500										
									-12.67 dbm	Norma
										Delt
								1	.1	
		an na an a			ومنفونه ومناط	and the second street street street street	mun	hum		Fixed
										Fixed
ta	t 30 M	Hz						Stop	3.000 GHz	
		00 kHz	-	#VBW 300	kHz	S	weep 2	83.9 ms	(1001 pts)	0
9R	NODE TRO		× 2.771 7 GH	y -58.5	R 56 dBm	INCTION FUNC	TION WIDTH	FUNCT	ION VALUE	
23		مر من من من مر من								Properties
4	==									Propences
5										
67										Mor
6										1 of

802.11n-20 CHANNEL 2, SPURIOUS 2 GHz ~ 25 GHz

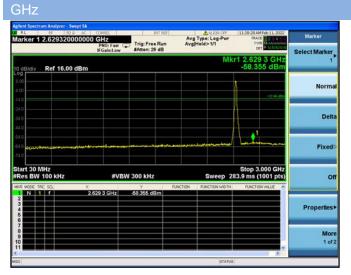


802.11n-20 CHANNEL 5 CARRIER LEVEL





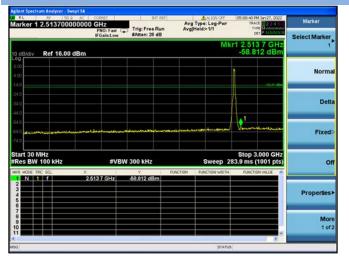
802.11n-20 CHANNEL 5, SPURIOUS 30 MHz ~ 3



802.11n-20 CHANNEL 6 CARRIER LEVEL



802.11n-20 CHANNEL 6, SPURIOUS 30 MHz ~ 3 GHz

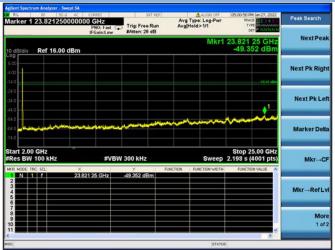


802.11n-20 CHANNEL 5, SPURIOUS 2 GHz ~ 25

GHz

Peak Search	TRACE 2245 TRACE 2245 TYPE MUNICIPAL	-Pwr	g Type: Log-Pwr Hold>1/1	in A	Trig: Free Ri #Atten: 26 dl		90 a AC 8675000000	
Next Pea	.786 75 GHz 49.549 dBm	1kr1 23	Mkr1			a dance a	16.00 dBm	
Next Pk Righ	-12.44 (5)							
Next Pk Le								
Marker Del	mantin	~~~~		na inana a	مسسم	ter interest	man	human
Marker Dell Mkr→C	Stop 25.00 GHz 98 s (4001 pts)	eep 2.1	Sweep		300 kHz	#VB	kHz	rt 2.00 GHz es BW 100 kH
	Stop 25.00 GHz	eep 2.1		FUNCTION		#VB	kHz ×	rt 2.00 GHz

802.11n-20 CHANNEL 6, SPURIOUS 2 GHz ~ 25 GHz

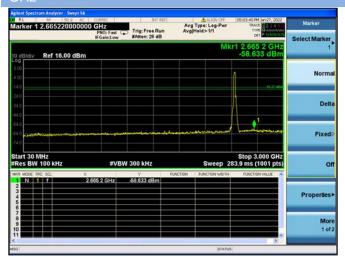




802.11n-20 CHANNEL 7 CARRIER LEVE



802.11n-20 CHANNEL 7, SPURIOUS 30 MHz ~ 3 GHz



802.11n-20 CHANNEL 7, SPURIOUS 2 GHz ~ 25 GHz

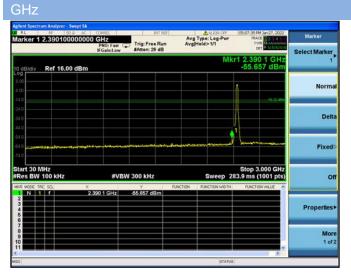
RL NF 90.9 AC arker 1 23.7982500000			Avg n Avgl	Action off Type: Log-Pwr Hold>1/1	TYPE	in 27, 2022	Peak Search
dB/div Ref 16.00 dBm				Mkr1	23.798 2		NextPea
						-15 23 effe	Next Pk Righ
						1	Next Pk Le
0 James were and		Auran	الترجيب ويستعريهم	ma	m	~~	Marker Del
and and a second	#VBW	300 kHz	FUNCTION		Stop 25. 2.198 s (40	001 pts)	Marker Dell Mkr→C
art 2.00 GHz tes BW 100 kHz	#VBW	300 kHz		Sweep	Stop 25. 2.198 s (40	001 pts)	

802.11n-20 CHANNEL 8 CARRIER LEVEL





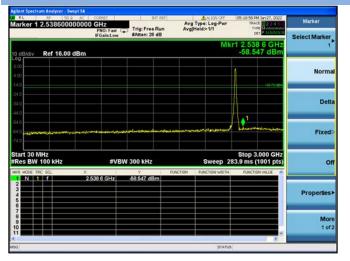
802.11n-20 CHANNEL 8, SPURIOUS 30 MHz ~ 3



802.11n-20 CHANNEL 9 CARRIER LEVEL

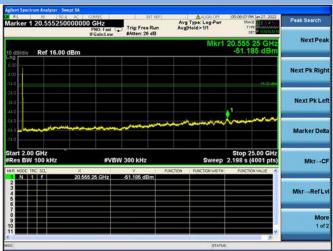


802.11n-20 CHANNEL 9, SPURIOUS 30 MHz ~ 3 GHz

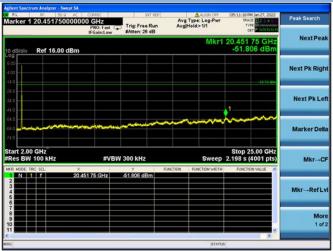


802.11n-20 CHANNEL 8, SPURIOUS 2 GHz ~ 25

GHz



802.11n-20 CHANNEL 9, SPURIOUS 2 GHz ~ 25 GHz

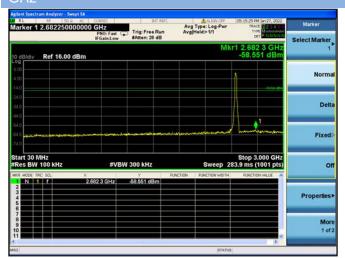




802.11n-20 CHANNEL 10 CARRIER LEVE



802.11n-20 CHANNEL 10, SPURIOUS 30 MHz ~ 3 GHz



802.11n-20 CHANNEL 10, SPURIOUS 2 GHz ~ 25 GHz

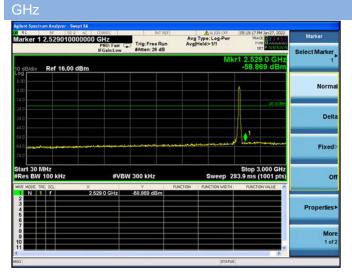
RL 90 9 90 9 1 20.5207500	AC CORREC 0000000 GHz PNO: Fast IFGain:Low	Trig: Free Rus #Atten: 26 dB	Ave	Action Off Type: Log-Pwr Hold>1/1	TVP	1 Jan 27, 2022	Peak Search
o dB/div Ref 16.00 c	dBm			Mkr1	20.520	75 GHz I0 dBm	NextPeak
500 600 840							Next Pk Righ
					.1		Next Pk Le
54.0			مسلم	m	-	m	
	and a second second						Marker Dell
tart 2.00 GHz Res BW 100 kHz	المثلق المثلق المثلق	BW 300 kHz		Sweep	Stop 25 2.198 s (4		Marker Dell Mkr→C
tart 2.00 GHz	#VI	BW 300 kHz	FUNCTION		Stop 25	001 pts)	

802.11n-20 CHANNEL 11 CARRIER LEVEL





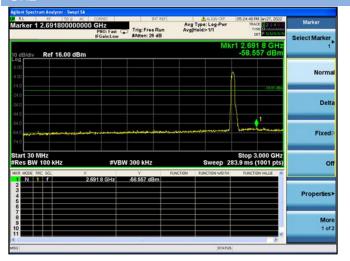
802.11n-20 CHANNEL 11, SPURIOUS 30 MHz ~ 3



802.11n-40 CHANNEL 3 CARRIER LEVEL

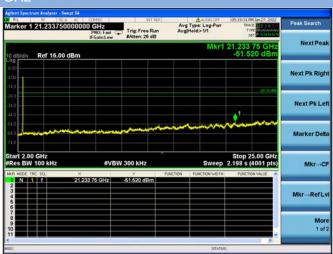


802.11n-40 CHANNEL 3, SPURIOUS 30 MHz ~ 3 GHz



802.11n-20 CHANNEL 11, SPURIOUS 2 GHz ~ 25

GHz



802.11n-40 CHANNEL 3, SPURIOUS 2 GHz ~ 25 GHz

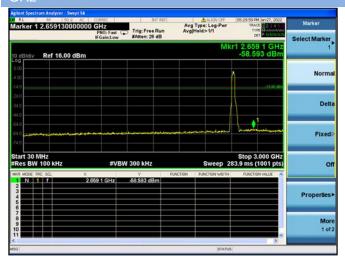




802.11n-40 CHANNEL 4 CARRIER LEVE



802.11n-40 CHANNEL 4, SPURIOUS 30 MHz ~ 3 GHz



802.11n-40 CHANNEL 4, SPURIOUS 2 GHz ~ 25 GHz

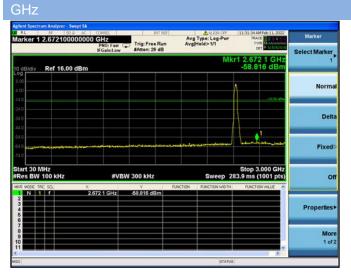


802.11n-40 CHANNEL 5 CARRIER LEVEL

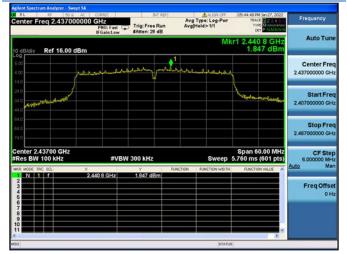




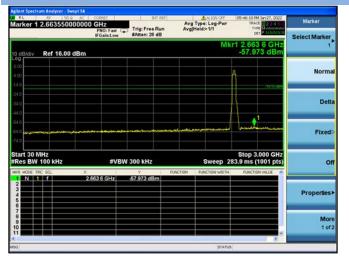
802.11n-40 CHANNEL 5, SPURIOUS 30 MHz ~ 3



802.11n-40 CHANNEL 6 CARRIER LEVEL

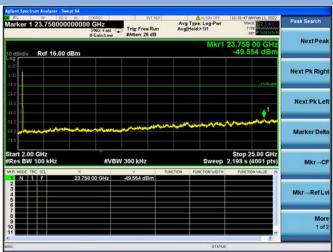


802.11n-40 CHANNEL 6, SPURIOUS 30 MHz ~ 3 GHz

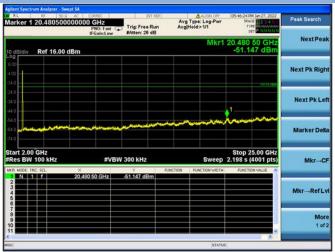


802.11n-40 CHANNEL 5, SPURIOUS 2 GHz ~ 25

GHz

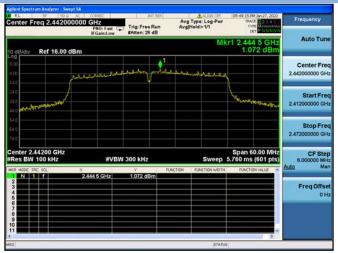


802.11n-40 CHANNEL 6, SPURIOUS 2 GHz ~ 25 GHz

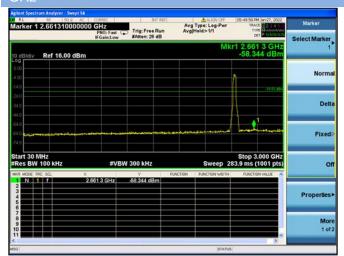




802.11n-40 CHANNEL 7 CARRIER LEVE



802.11n-40 CHANNEL 7, SPURIOUS 30 MHz ~ 3 GHz



802.11n-40 CHANNEL 7, SPURIOUS 2 GHz ~ 25 GHz

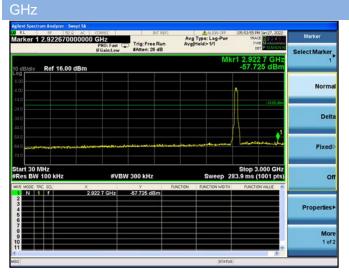
RL ₩ 50 2 arker 1 23.7637500		Trig: Free Ru #Atten: 26 dB	Avg	Arction off Type: Log-Pwr Hold>1/1	05:50:00 PM Jan 27, 2 TRACE 2 2 TYPE 0	Peak Search
dB/div Ref 16.00 d	Bm			Mkr1	23.763 75 GI -49.024 dB	lz NextPeal m
						Next Pk Righ
						Next Pk Le
0	uter and were		-	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mann	Marker Dell
a ware and the second	#VI	300 kHz	FUNCTION		Stop 25.00 G 2.198 s (4001 p Punction value	Hz (S) Marker Delt
art 2.00 GHz es BW 100 kHz		300 kHz		Sweep	Stop 25.00 G 2.198 s (4001 p	Hz

802.11n-40 CHANNEL 8 CARRIER LEVEL





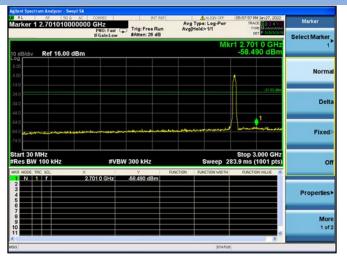
802.11n-40 CHANNEL 8, SPURIOUS 30 MHz ~ 3



802.11n-40 CHANNEL 9 CARRIER LEVEL

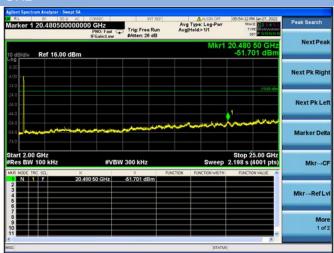


802.11n-40 CHANNEL 9, SPURIOUS 30 MHz ~ 3 GHz

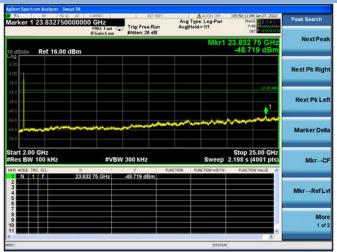


802.11n-40 CHANNEL 8, SPURIOUS 2 GHz ~ 25

GHz



802.11n-40 CHANNEL 9, SPURIOUS 2 GHz ~ 25 GHz





A.4 Band Edge (Authorized-band band-edge)

<u>Test Data</u>

Note: The 99% OBW of the fundamental emission is without 2 MHz of the authorized band.

802.11b Mode:

	Measured Max. Band	Limit		
Channel	Edge Emission (dBm)	Carrier Level	Calculated 20 dBc Limit	Verdict
1	-43.77	8.97	-11.03	Pass
2	-46.97	11.35	-8.65	Pass
3	-50.96	10.36	-9.64	Pass
4	-53.97	7.97	-12.03	Pass
5	-55.28	7.36	-12.64	Pass
7	-57.15	12.05	-7.95	Pass
8	-53.91	12.35	-7.65	Pass
9	-50.85	12.45	-7.55	Pass
10	-49.18	8.66	-11.34	Pass
11	-55.09	7.67	-12.33	Pass

802.11g Mode:

	Measured Max Band	Limit		
Channel		Carrier Level	Calculated 20	Verdict
	Edge Emission (dBm)	Camer Lever	dBc Limit	
1	-37.38	2.50	-17.50	Pass
2	-32.38	5.79	-14.21	Pass
5	-57.28	7.54	-12.46	Pass
6	-57.40	5.14	-14.86	Pass
7	-57.93	4.23	-15.77	Pass
8	-56.84	3.46	-16.54	Pass
9	-55.32	4.29	-15.71	Pass
10	-50.32	5.63	-14.37	Pass
11	-46.72	3.21	-16.79	Pass

802.11n-20 MHz Mode:

	Measured Max. Band	Limit		
Channel	Edge Emission (dBm)	Carrier Level	Calculated 20	Verdict
		Camer Lever	dBc Limit	
1	-40.66	1.72	-18.28	Pass
2	-30.89	7.33	-12.67	Pass
5	-56.77	7.56	-12.44	Pass
6	-58.22	3.59	-16.41	Pass
7	-57.76	3.73	-16.27	Pass
8	-56.87	3.68	-16.32	Pass
9	-54.88	3.27	-16.73	Pass



	Measured Max. Band	Limit		
Channel	Edge Emission (dBm)	Carrier Level	Calculated 20 dBc Limit	Verdict
10	-51.92	3.36	-16.64	Pass
11	-52.59	-0.33	-20.33	Pass

802.11n-40 MHz Mode:

	Measured Max. Band	Limit	(dBm)	
Channel	Edge Emission (dBm)	Carrier Level	Calculated 20	Verdict
			dBc Limit	
3	-38.73	1.19	-18.81	Pass
4	-39.03	4.04	-15.96	Pass
5	-56.17	4.45	-15.55	Pass
6	-52.97	1.85	-18.15	Pass
7	-50.87	1.07	-18.93	Pass
8	-48.56	0.32	-19.68	Pass
9	-53.61	-1.83	-21.83	Pass



Test Plots

802.11b CHANNEL 1, Carrier level



802.11b CHANNEL 1, Reference lev



802.11b CHANNEL 1, Band Edge



802.11b CHANNEL 2, Carrier level

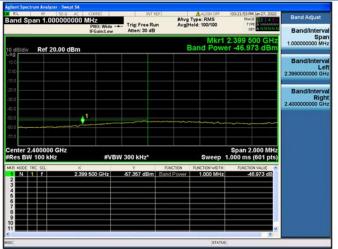




802.11b CHANNEL 2, Reference leve



802.11b CHANNEL 2, Band Edg



802.11b CHANNEL 3, Carrier level



802.11b CHANNEL 3, Reference level



802.11b CHANNEL 3, Band Edge

