



FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

For

CONSUMER CAMERA

MODEL NUMBER:

IPC-A12N-Crystal, IPC-A12P-Crystal, IPC-A22P-Crystal, IPC-A22N-Crystal, M1B,
M1W, M2B, M2W, TP6, TP6C

PROJECT NUMBER: 4788141068

REPORT NUMBER: 4788141068-5

FCC ID: SVNIPC-AX2

ISSUE DATE: Dec. 15, 2017

Prepared for

Zhejiang Dahua Vision Technology Co., Ltd.

Prepared by

UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch
Room 101, Building 10, Innovation Technology Park,
Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Tel: +86 769 33817100

Fax: +86 769 33244054

Website: www.ul.com

Revision History

Rev.	Issue Date	Revisions	Revised By
--	12/15/2017	Initial Issue	

Summary of Test Results			
Clause	Test Items	FCC/IC Rules	Test Results
1	6db DTS Bandwidth	FCC 15.247 (a) (2)	Complied
2	Peak Conducted Power	FCC 15.247 (b) (3)	Complied
3	Power Spectral Density	FCC 15.247 (e)	Complied
4	Conducted Band edge And Spurious emission	FCC 15.247 (d)	Complied
5	Radiated Band edges and Spurious emission	FCC 15.247 (d) FCC 15.209 FCC 15.205	Complied
6	Conducted Emission Test For AC Power Port	FCC 15.207	Complied
7	Antenna Requirement	FCC 15.203	Complied

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	7
3. FACILITIES AND ACCREDITATION	7
4. CALIBRATION AND UNCERTAINTY	8
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	8
4.2. <i>MEASUREMENT UNCERTAINTY</i>	8
5. EQUIPMENT UNDER TEST	9
5.1. <i>DESCRIPTION OF EUT</i>	9
5.2. <i>MAXIMUM OUTPUT POWER</i>	10
5.3. <i>CHANNEL LIST</i>	10
5.4. <i>TEST CHANNEL CONFIGURATION</i>	10
5.5. <i>THE WORSE CASE POWER SETTING PARAMETER</i>	11
5.6. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i>	12
5.7. <i>TEST ENVIRONMENT</i>	12
5.8. <i>DESCRIPTION OF TEST SETUP</i>	13
5.9. <i>MEASURING INSTRUMENT AND SOFTWARE USED</i>	14
6. ANTENNA PORT TEST RESULTS	15
6.1. <i>ON TIME AND DUTY CYCLE</i>	15
6.2. <i>6 dB BANDWIDTH</i>	18
6.3. <i>PEAK CONDUCTED OUTPUT POWER</i>	26
6.4. <i>POWER SPECTRAL DENSITY</i>	28
6.5. <i>CONDUCTED BANDEdge AND SPURIOUS EMISSIONS</i>	36
6.6. <i>RADIATED TEST RESULTS</i>	67
6.6.1. <i>LIMITS AND PROCEDURE</i>	67
6.6.2. <i>RESTRICTED BANDEdge</i>	72
6.6.3. <i>SPURIOUS EMISSIONS</i>	89
6.6.4. <i>SPURIOUS EMISSIONS 18G ~ 26GHz</i>	113
6.6.5. <i>SPURIOUS EMISSIONS 30M ~ 1GHz</i>	119
6.6.6. <i>SPURIOUS EMISSIONS BELOW 30M</i>	125
7. AC POWER LINE CONDUCTED EMISSIONS	127
8. ANTENNA REQUIREMENTS.....	129

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Zhejiang Dahua Vision Technology Co., Ltd.

Address: No.1199, Bin'an road, Binjiang District, Hangzhou, P.R.China.

Manufacturer Information

Company Name: Zhejiang Dahua Vision Technology Co., Ltd.

Address: No.1199, Bin'an road, Binjiang District, Hangzhou, P.R.China.

Factory Information

Company Name: ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD

Address: No.1199, Bin'an road, Binjiang District, Hangzhou, P.R.China.

Company Name:

ZHEJIANG DAHUA ZHILIAN CO.,LTD.

Address:

No.28, Dongqiao Road, Dongzhou Street, Fuyang District, Hangzhou,P.R.China.

EUT Description

Product Name CONSUMER CAMERA

Model Name IPC-A12N-Crystal

Additional No. IPC-A12P-Crystal, IPC-A22P-Crystal, IPC-A22N-Crystal, M1B, M1W, M2B, M2W, TP6, TP6C

Sample Number 1142351-001

Date of Receipt Sample Sep 8, 2017

Date Tested Sep 8, 2017 ~ Dec. 14, 2017

APPLICABLE STANDARDS

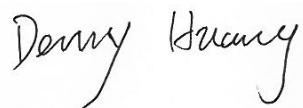
STANDARD

TEST RESULTS

CFR 47 Part 15 Subpart C

PASS

Tested By:



Denny Huang
Engineer Project Associate
Approved By:



Stephen Guo
Laboratory Manage

Check By:



Shawn Wen
Laboratory Leader

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC KDB 558074 D01 DTS Meas Guidance v04, 414788 D01 Radiated Test Site v01, ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

Test Location	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
Address	Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China
Accreditation Certificate	<p>UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. The Certificate Registration Number is 4102.01.</p> <p>UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The Designation Number is CN1187.</p> <p>UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. EMC Laboratory has been registered and fully described in a report filed with Industry Canada. The Company Number is 21320.</p>

Note:

- 1) The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worse case from the open field site.
- 2) For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30MHz had been correlated to measurements performed on an OATS.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.90dB
Uncertainty for Radiation Emission test(include Fundamental emission) (9KHz-30MHz)	2.00dB
Uncertainty for Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.52dB
Uncertainty for Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	5.04dB(1-6GHz) 5.30dB (6GHz-18Gz) 5.23dB (18GHz-26Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Product Name:	CONSUMER CAMERA		
Model No.:	IPC-A12N-Crystal		
Operating Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz		
Type of Modulation:	IEEE for 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE for 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n (HT20 and HT40): OFDM (64QAM, 16QAM, QPSK, BPSK)		
Channel Number:	IEEE 802.11b/g, IEEE 802.11n(HT20): 11 Channels IEEE 802.11n(HT40): 7 Channels		
Channels Step:	Channels with 5MHz step		
Sample Type:	Fixed production		
Test power grade:	44 (manufacturer declare)		
Test software of EUT:	Secure CRT (manufacturer declare)		
Antenna Type	Chip Antenna		
Antenna Gain:	3dBi		
Power Supply	Adapter	Model:NBS10B050200VUU INPUT:100-240V~50/60Hz Max.0.3A OUTPUT:5.0V 2.0A 2.0A	

Remark:

Model No.:

Number:	Name:	Number:	Name:	Number:	Name:
1	IPC-A12P-Crystal	2	IPC-A22P-Crystal	3	IPC-A12N-Crystal
4	IPC-A22N-Crystal	5	M1B	6	M1W
7	M2B	8	M2W	9	TP6
10	TP6C				

Only the main model **IPC-A12N-Crystal** was tested and only the data of this model is shown in this test report. Since the electrical circuit design, layout, components used and internal wiring were identical for the above models are the same, the difference is the number of the models.

5.2. MAXIMUM OUTPUT POWER

Frequency Range (MHz)	Number of Transmit Chains (NTX)	IEE Std. 802.11	Frequency (MHz)	Channel Number	Max PK Conducted Power (dBm)
2400-2483.5	1	IEEE 802.11b	2412-2462	1-11[11]	16.88
2400-2483.5	1	IEEE 802.11g	2412-2462	1-11[11]	14.94
2400-2483.5	1	IEEE 802.11nHT20	2412-2462	1-11[11]	15.01
2400-2483.5	1	IEEE 802.11nHT40	2422-2452	3-7[7]	14.97

5.3. CHANNEL LIST

Channel List for 802.11b/g/n (20 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452		
2	2417	6	2437	10	2457		
3	2422	7	2442	11	2462		
4	2427	8	2447				

Channel List for 802.11n (40 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	5	2432	7	2442	9	2452
4	2427	6	2437	8	2447		

5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel (MHz)
IEEE 802.11b	LCH :CH01 2412
	MCH: CH06 2437
	HCH: CH11 2462
IEEE 802.11g	LCH :CH01 2412
	MCH: CH06 2437
	HCH: CH11 2462
IEEE 802.11n HT20	LCH :CH01 2412
	MCH: CH06 2437
	HCH: CH11 2462
IEEE 802.11n HT40	LCH :CH03 2422
	MCH: CH06 2437
	HCH: CH09 2452

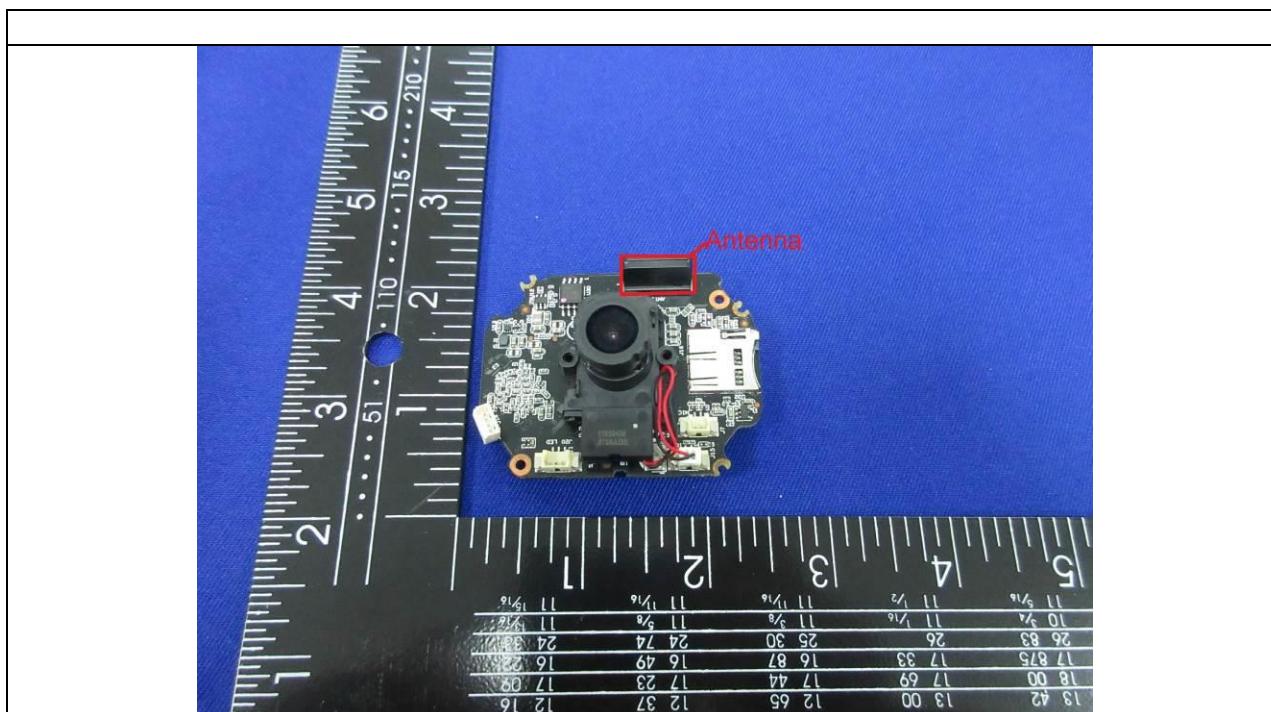
5.5. THE WORSE CASE POWER SETTING PARAMETER

Test Software Version	SecureCRT8.1		
Test Mode	Test Channel	Setting TX Power	Setting data rate (Mbps)
IEEE 802.11b	LCH	44	CCK_1Mbps
	MCH	44	CCK_1Mbps
	HCH	44	CCK_1Mbps
IEEE 802.11g	LCH	44	NO HT_6Mbps
	MCH	44	NO HT_6Mbps
	HCH	44	NO HT_6Mbps
IEEE 802.11n HT20	LCH	44	HT20_MCS_0_20
	MCH	44	HT20_MCS_0_20
	HCH	44	HT20_MCS_0_20
IEEE 802.11n HT40	LCH	44	HT40+MCS_0_40
	MCH	44	HT40+MCS_0_40
	HCH	44	HT40+MCS_0_40

5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2400-2483.5	Internal Antenna	3.0

Test Mode	Transmit and Receive Mode	Description
WIFI	<input checked="" type="checkbox"/> 1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.



5.7. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	55 ~ 65%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	23 ~ 28°C
Voltage :	VL	N/A
	VN	DC 5.0V
	VH	N/A

Note: VL= Lower Extreme Test Voltage

VN= Nominal Voltage

VH= Upper Extreme Test Voltage

TN= Normal Temperature

5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	FCC ID
1	Laptop	ThinkPad	T410	N/A

I/O PORT

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	LAN	LAN	N/A	N/A	N/A

ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	N/A	N/A	N/A	N/A

TEST SETUP

The EUT can work in an engineer mode with a software through a table PC.

SETUP DIAGRAM FOR TESTS



5.9. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions(Instrument)						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	EMI Test Receiver	R&S	ESR3	101961	Dec.20, 2016	Dec.19, 2017
<input checked="" type="checkbox"/>	Two-Line V-Network	R&S	ENV216	101983	Dec.20, 2016	Dec.19, 2017
<input checked="" type="checkbox"/>	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Feb.10, 2017	Feb.10, 2018
Software						
Used	Description		Manufacturer	Name		Version
<input checked="" type="checkbox"/>	Test Software for Conducted disturbance		UL	Antenna port		Ver. 7.2
Radiated Emissions(Instrument)						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	MXE EMI Receiver	KESIGHT	N9038A	MY56400 036	Feb. 24, 2017	Feb. 24, 2018
<input checked="" type="checkbox"/>	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Jan.09, 2016	Jan.09, 2019
<input checked="" type="checkbox"/>	Preamplifier	HP	8447D	2944A090 99	Feb. 13, 2017	Feb. 13, 2018
<input checked="" type="checkbox"/>	EMI Measurement Receiver	R&S	ESR26	101377	Dec. 20, 2016	Dec. 20, 2017
<input checked="" type="checkbox"/>	Horn Antenna	TDK	HRN-0118	130939	Jan. 09, 2016	Jan. 09, 2019
<input checked="" type="checkbox"/>	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Jan.06, 2016	Jan.06, 2019
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Jan. 14, 2017	Jan. 14, 2018
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec. 20, 2016	Dec. 20, 2017
<input checked="" type="checkbox"/>	Loop antenna	Schwarzbeck	1519B	00008	Mar. 26, 2016	Mar. 26, 2019
<input checked="" type="checkbox"/>	Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	4	Dec. 20, 2016	Dec. 20, 2017
Software						
Used	Description		Manufacturer	Name		Version
<input checked="" type="checkbox"/>	Test Software for Radiated disturbance		Farad	EZ-EMC		Ver. UL-3A1
Other instruments						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	Spectrum Analyzer	Keysight	N9030A	MY55410 512	Dec. 20, 2016	Dec. 20, 2017
<input checked="" type="checkbox"/>	Power Meter	Keysight	N9031A	MY55416 024	Feb. 13, 2017	Feb. 13, 2018
<input checked="" type="checkbox"/>	Power Sensor	Keysight	N9323A	MY55440 013	Feb. 13, 2017	Feb. 13, 2018

6. ANTENNA PORT TEST RESULTS

6.1. ON TIME AND DUTY CYCLE

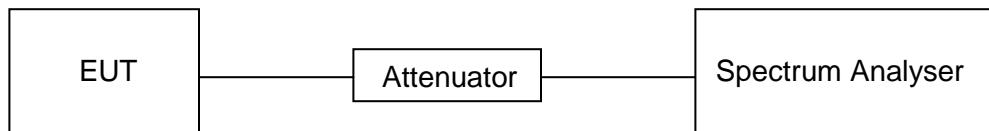
LIMITS

None; for reporting purposes only

PROCEDURE

FCC KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



RESULTS

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	1/T Minimum VBW (KHz)
11B	100	100	1	100	0	0.01
11G	100	100	1	100	0	0.01
11NSISO20	100	100	1	100	0	0.01
11NSISO40	100	100	1	100	0	0.01

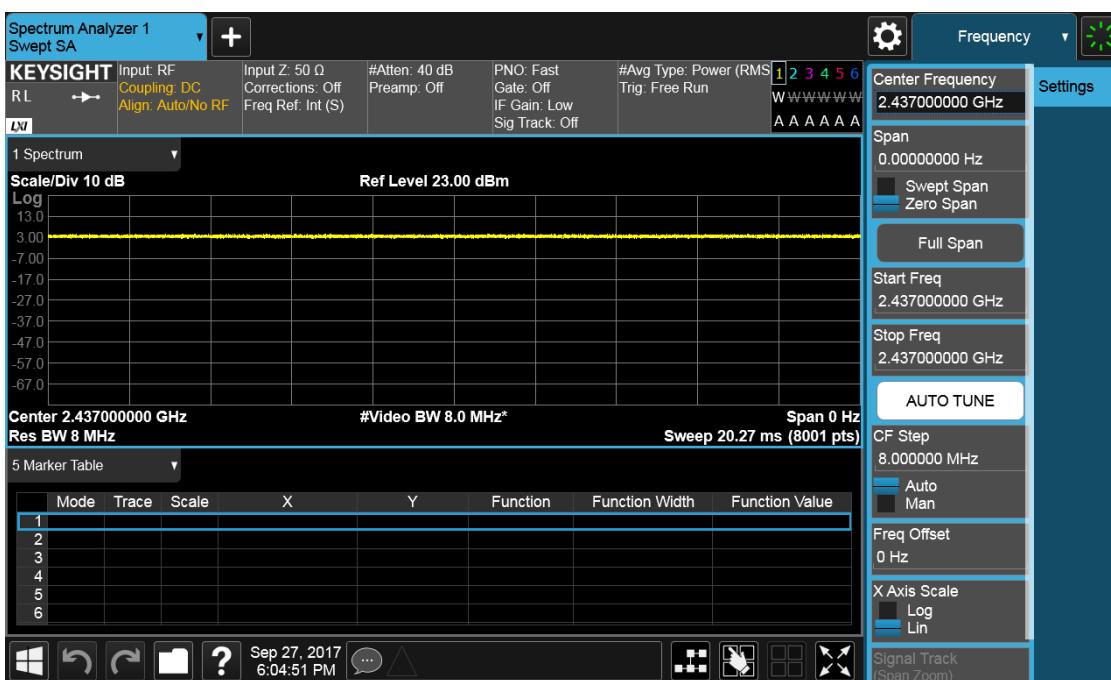
Note: Duty Cycle Correction Factor=10log(1/x).

Where: x is Duty Cycle(Linear)

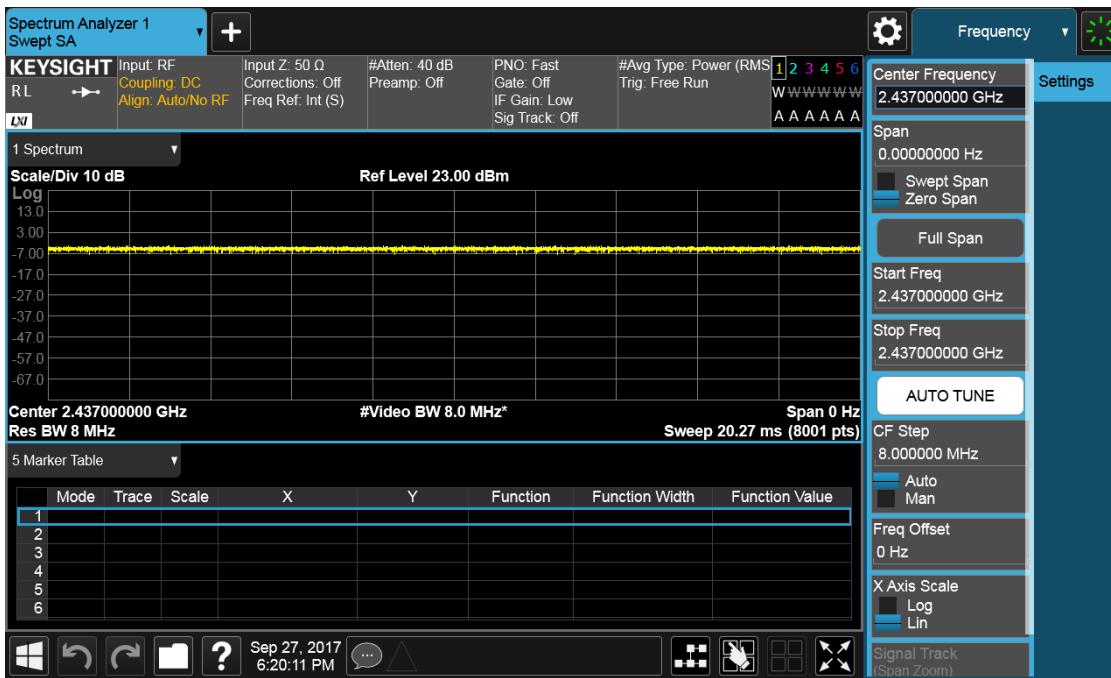
Where: T is On Time (transmit duration)

ON TIME AND DUTY CYCLE MID CH

11B



11G



11NSISO20



11NSISO40



6.2. 6 dB BANDWIDTH

LIMITS

FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(a)(2)	6dB Bandwidth	>= 500KHz	2400-2483.5

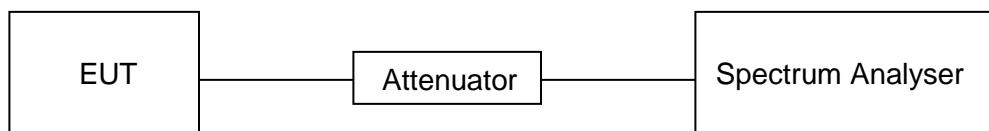
TEST PROCEDURE

Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	For 6 dB Bandwidth :100K For 99% Bandwidth :1% to 5% of the occupied bandwidth
VBW	For 6dB Bandwidth : $\geq 3 \times$ RBW For 99% Bandwidth : approximately 3xRBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and 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.

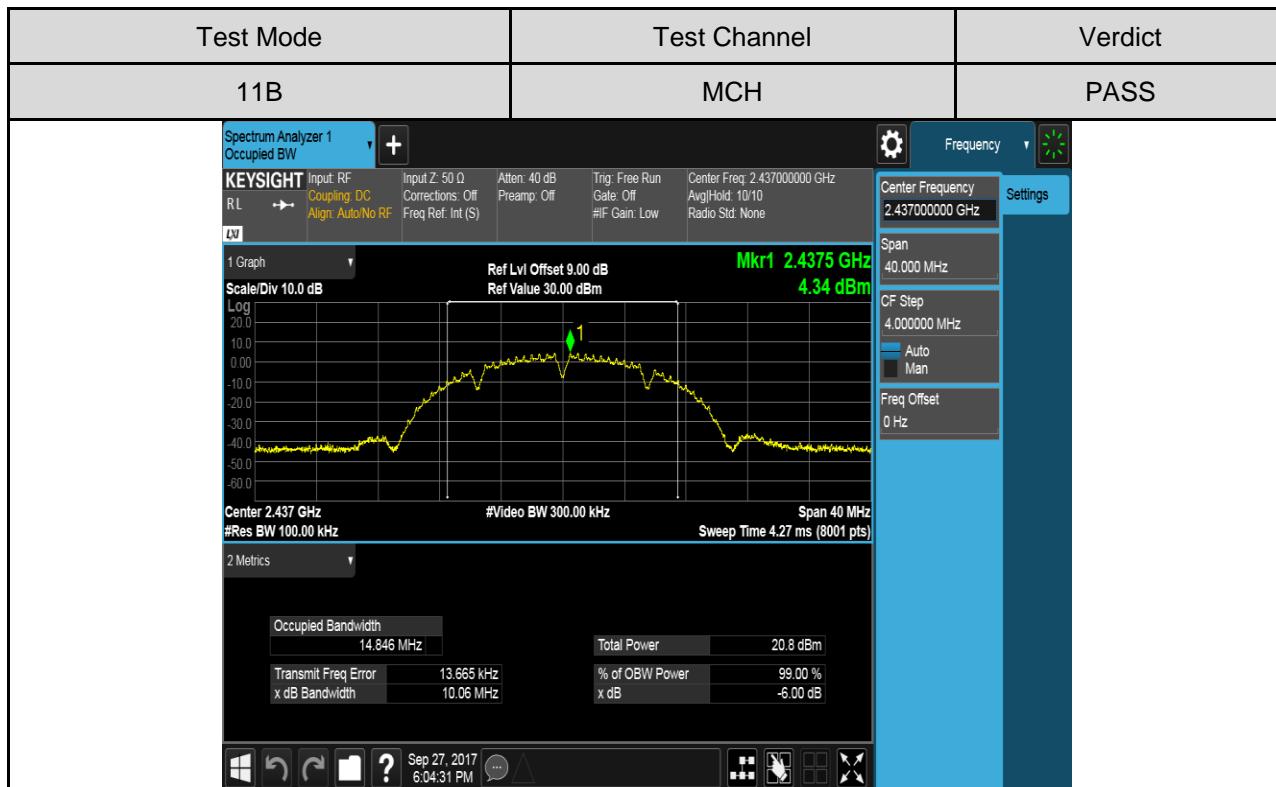
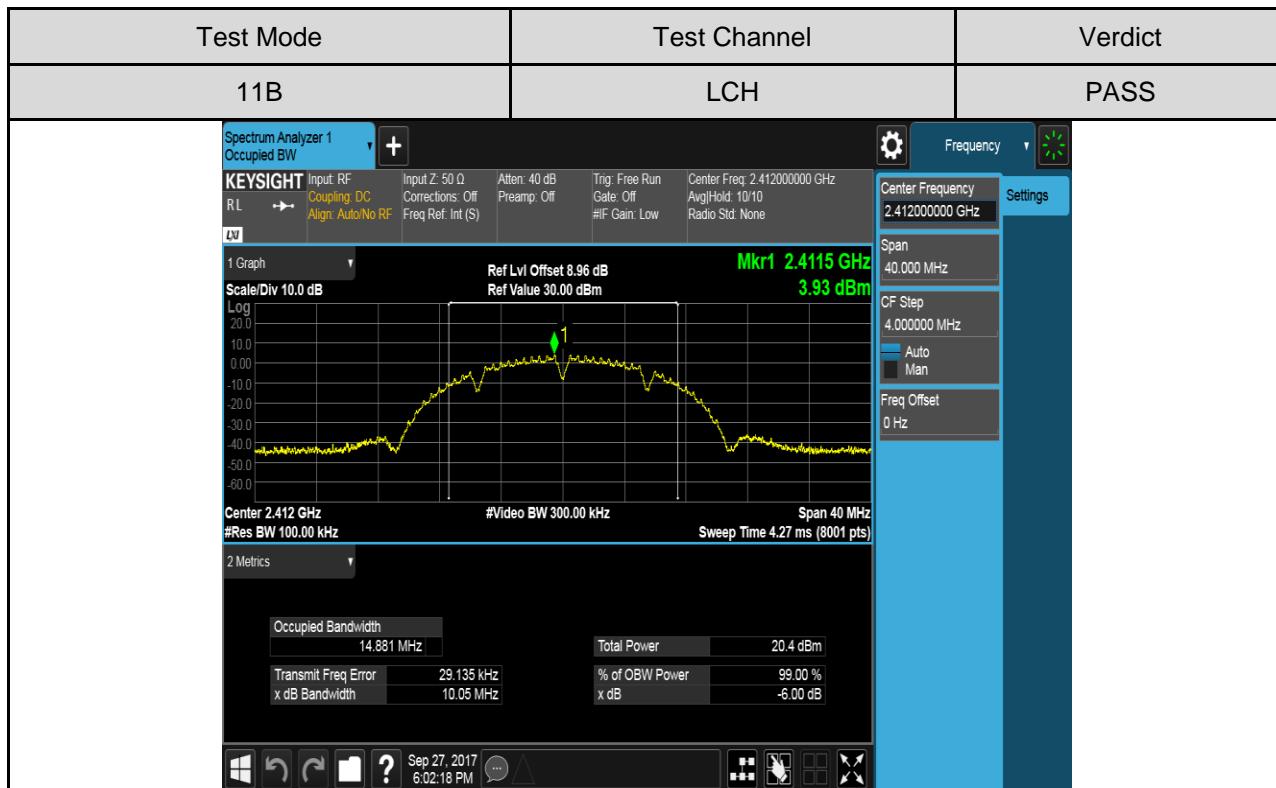
TEST SETUP

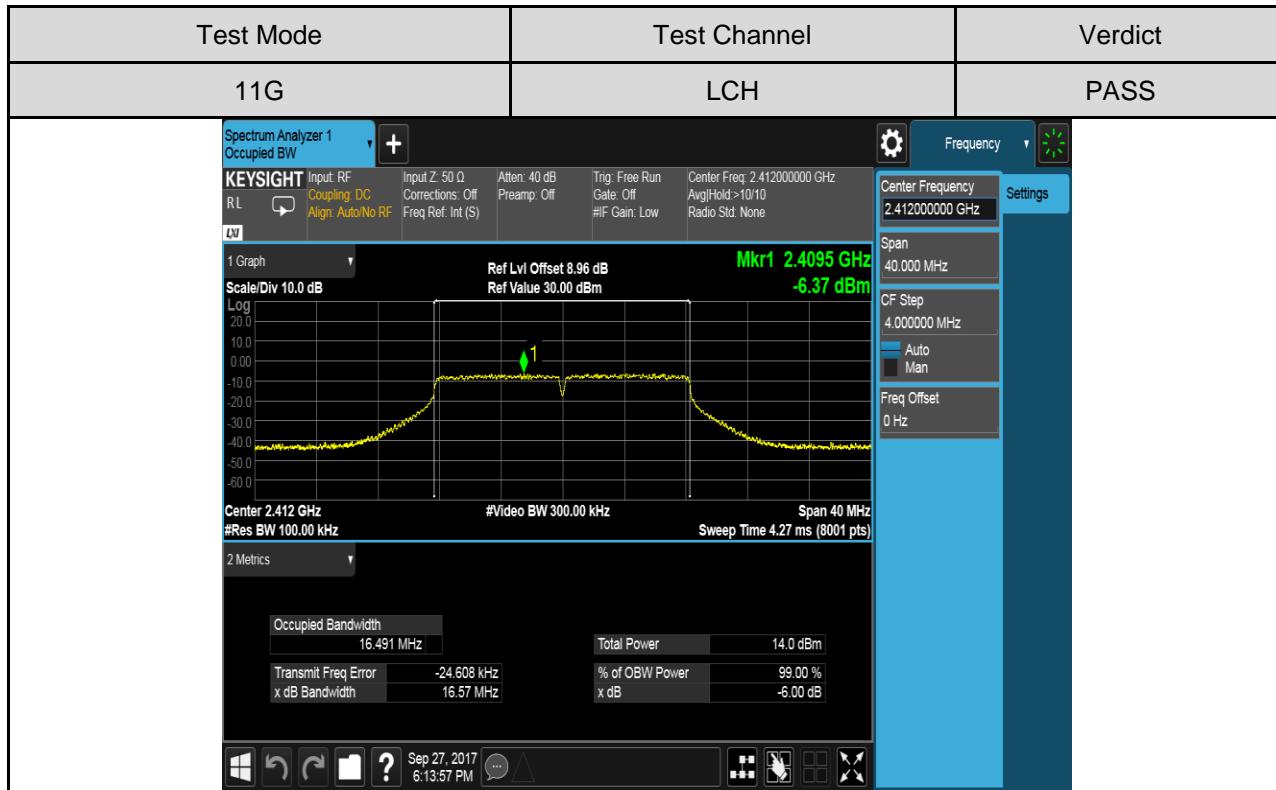
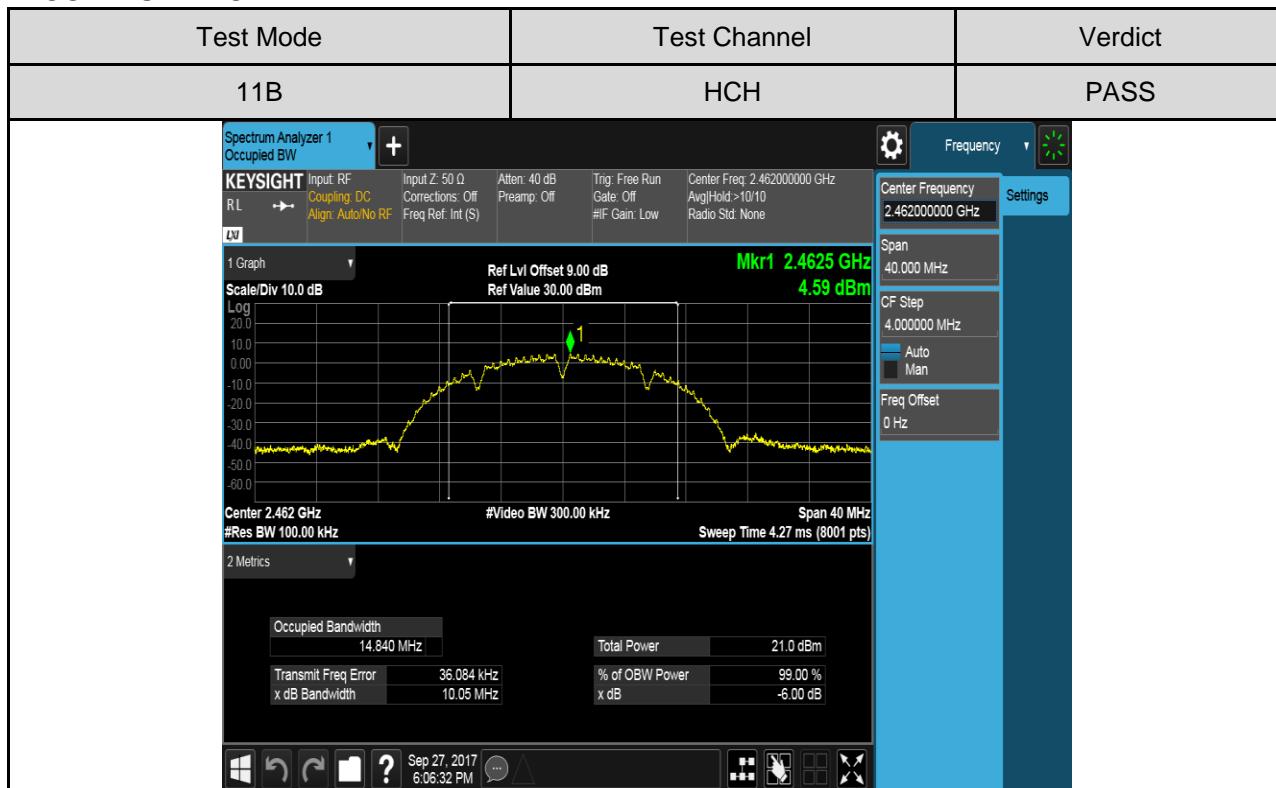


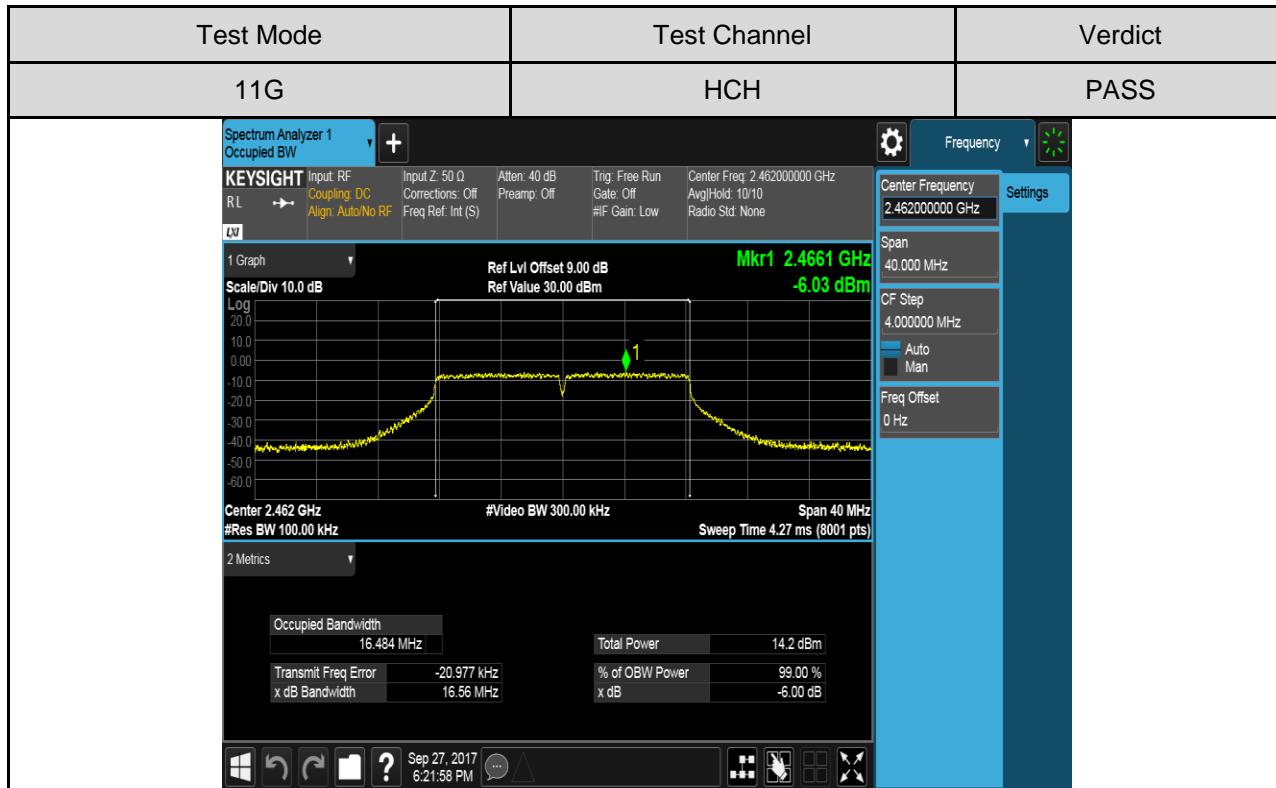
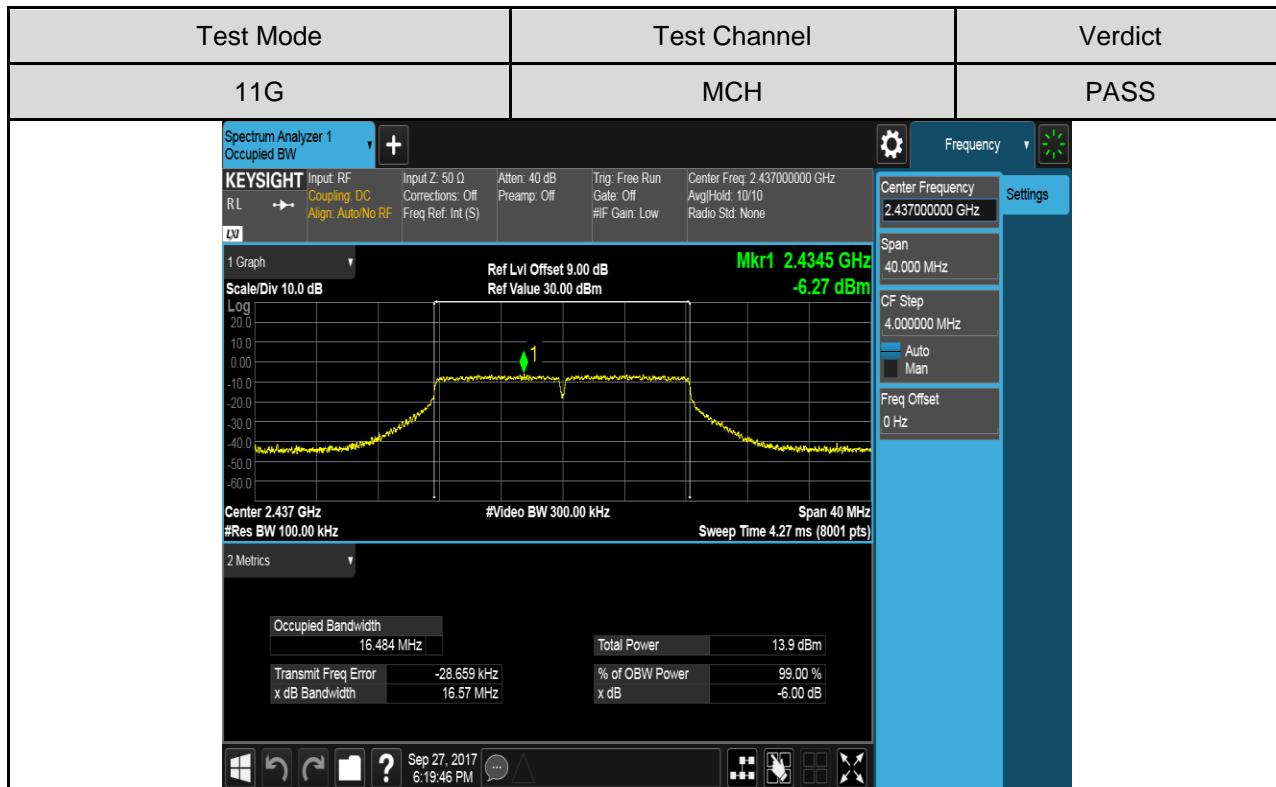
RESULTS

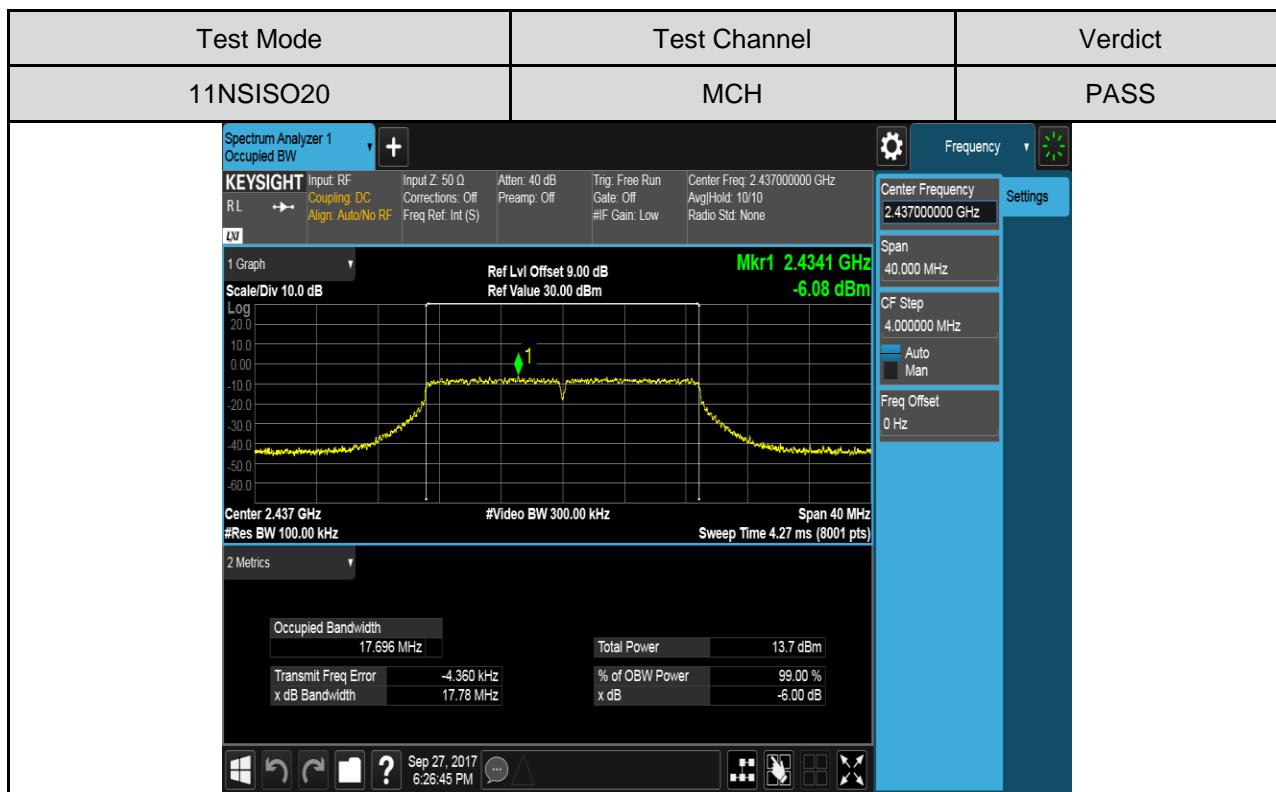
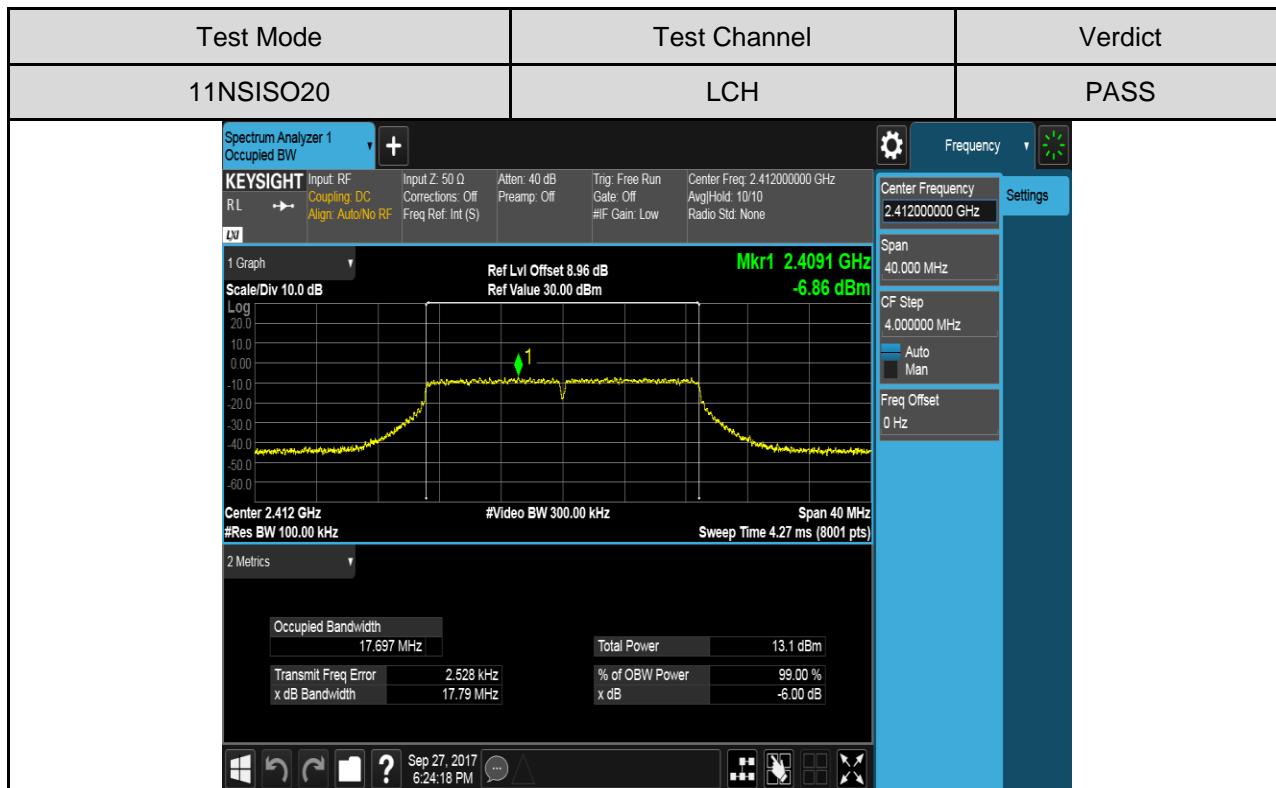
Test Mode	Test Channel	6dB bandwidth (MHz)	Result
11B	LCH	10.05	Pass
	MCH	10.06	Pass
	HCH	10.05	Pass
11G	LCH	16.57	Pass
	MCH	16.57	Pass
	HCH	16.56	Pass
11N20SISO	LCH	17.79	Pass
	MCH	17.78	Pass
	HCH	17.79	Pass
11N40SISO	LCH	36.34	Pass
	MCH	36.34	Pass
	HCH	36.31	Pass

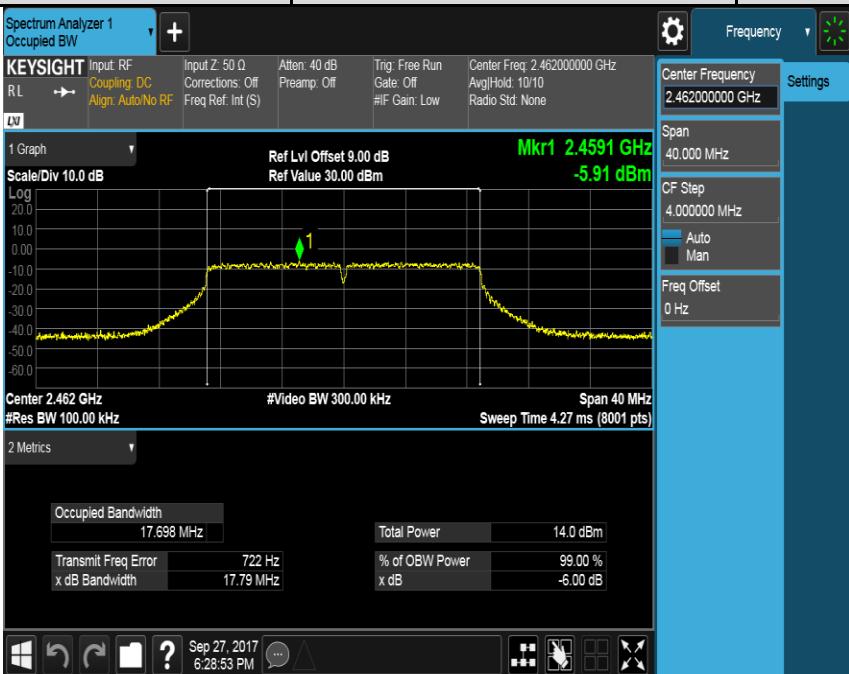
Test Graphs

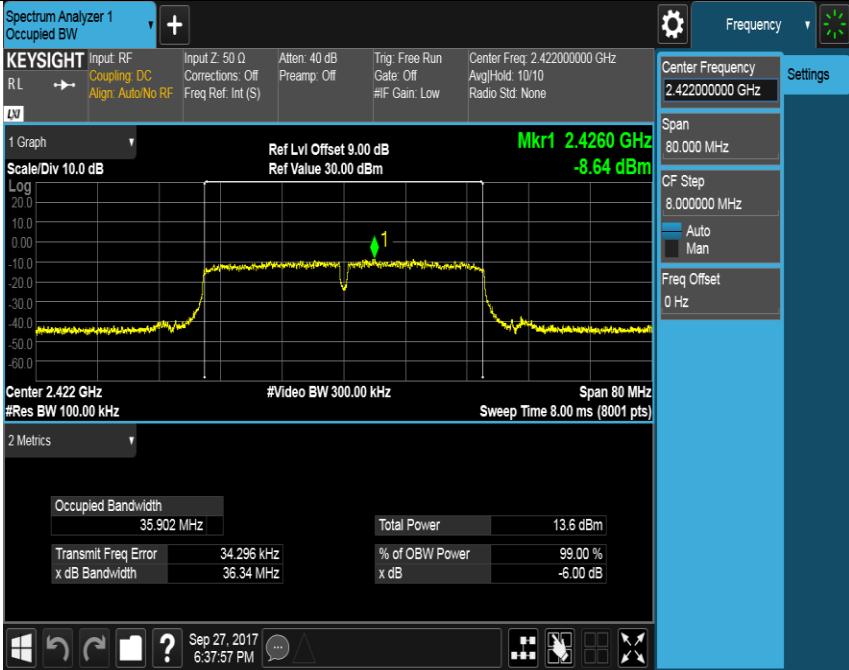


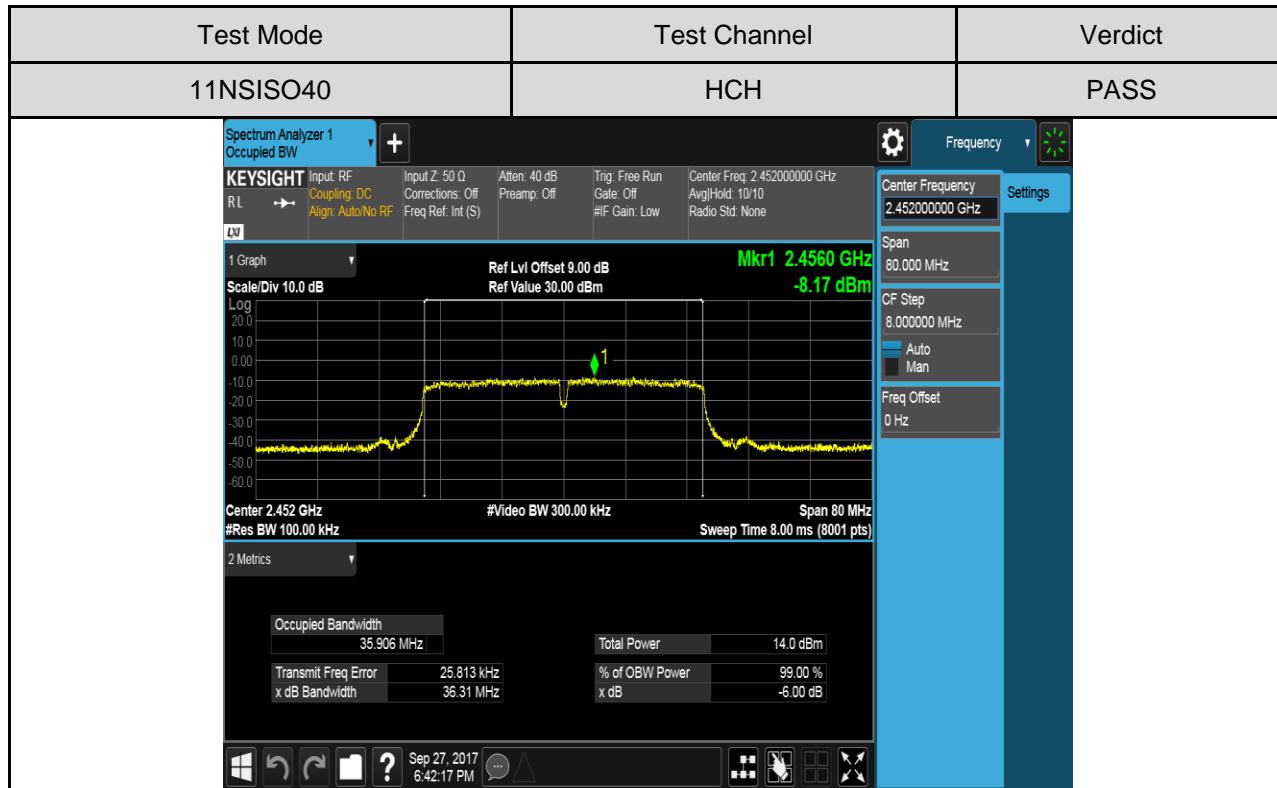
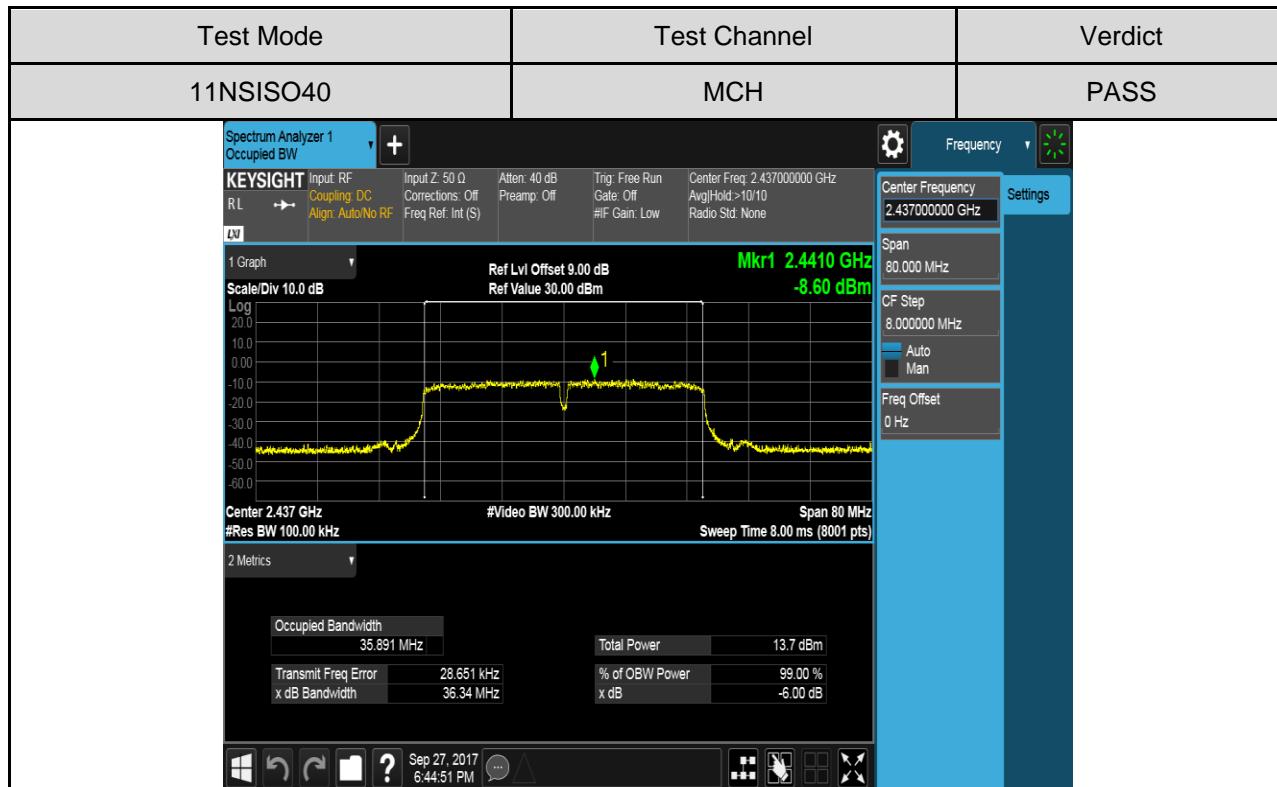






Test Mode	Test Channel	Verdict
11NSISO20	HCH	PASS
		

Test Mode	Test Channel	Verdict
11NSISO40	LCH	PASS
		



6.3. PEAK CONDUCTED OUTPUT POWER

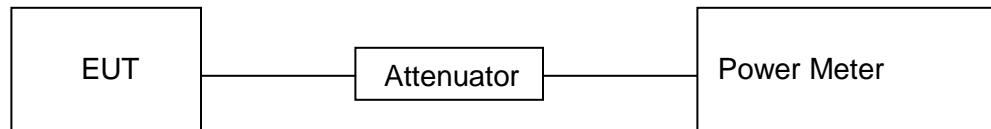
LIMITS

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5

TEST PROCEDURE

Refer to FCC KDB 558074

TEST SETUP



RESULTS

Part 1: Maximum Peak Conducted Output Power

Test Mode	Test Channel	Maximum Peak Conducted Output Power(dBm)	EIRP (dBm)	Result
11B	LCH	16.24	19.24	Pass
	MCH	16.66	19.66	Pass
	HCH	16.88	19.88	Pass
11G	LCH	14.37	17.37	Pass
	MCH	14.63	17.63	Pass
	HCH	14.94	17.94	Pass
11N20SISO	LCH	14.17	17.17	Pass
	MCH	14.71	17.71	Pass
	HCH	15.01	18.01	Pass
11N40SISO	LCH	14.58	17.58	Pass
	MCH	14.74	17.74	Pass
	HCH	14.97	17.97	Pass

Part 2: Maximum Average Conducted Output Power

Test Mode	Test Channel	Maximum Average Conducted Output Power(dBm)	Result
11B	LCH	14.54	Pass
	MCH	15.24	Pass
	HCH	15.38	Pass
11G	LCH	8.75	Pass
	MCH	7.76	Pass
	HCH	9.46	Pass
11N20SISO	LCH	8.69	Pass
	MCH	9.18	Pass
	HCH	9.43	Pass
11N40SISO	LCH	8.65	Pass
	MCH	8.86	Pass
	HCH	8.98	Pass

6.4. POWER SPECTRAL DENSITY

LIMITS

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC §15.247 (e)	Power Spectral Density	8 dBm in any 3 kHz band	2400-2483.5

TEST PROCEDURE

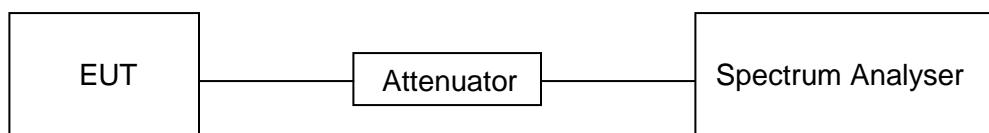
Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	$3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
VBW	$\geq 3 \times \text{RBW}$
Span	$1.5 \times \text{DTS bandwidth}$
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and 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.

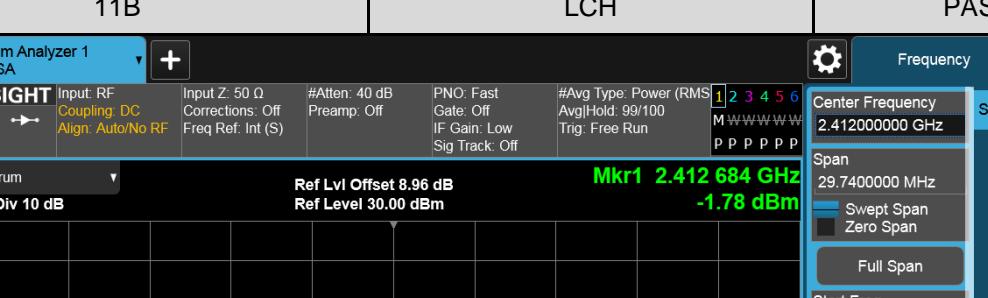
TEST SETUP



RESULTS

Test Mode	Test Channel	Maximum Peak power spectral density (dBm)	Result
11B	LCH	-1.78	Pass
	MCH	-1.35	Pass
	HCH	-1.02	Pass
11G	LCH	-10.09	Pass
	MCH	-9.86	Pass
	HCH	-9.49	Pass
11N20SISO	LCH	-10.10	Pass
	MCH	-9.76	Pass
	HCH	-9.21	Pass
11N40SISO	LCH	-13.20	Pass
	MCH	-12.58	Pass
	HCH	-12.84	Pass

Test Graphs:

Test Mode		Test Channel		Verdict	
11B		LCH		PASS	
 A screenshot of a Keysight N9320A spectrum analyzer interface. The main display shows a yellow spectrum line with a green arrow pointing to a peak at 2.412684 GHz. The left panel displays various measurement parameters: Input: RF, Coupling: DC, Input Z: 50 Ω, Corrections: Off, #Atten: 40 dB, Preamp: Off, PNO: Fast, Gate: Off, IF Gain: Low, and Sig Track: Off. The right panel shows the frequency set to 2.41200000 GHz, span to 29.740000 MHz, and an AUTO TUNE button. The bottom status bar indicates a center frequency of 2.41200 GHz, video bandwidth of 100 kHz, span of 29.74 MHz, and a 40.5 ms sweep time with 8001 points. The bottom navigation bar includes icons for Windows, back, forward, file, help, and search.					

Test Mode	Test Channel	Verdict
11B	MCH	PASS

Spectrum Analyzer 1
Swept SA

KEYSIGHT Input: RF
Coupling: DC
Align/Auto/No RF

Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)

#Atten: 40 dB
Preamp: Off

PNO: Fast
Gate: Off
IF Gain: Low
Sig Track: Off

#Avg Type: Power (RMS)
1 2 3 4 5 6
Avg/Hold: 99/100
Trig: Free Run
M W W W W W
P P P P P P

1 Spectrum
Scale/Div 10 dB
Ref Lvl Offset 9.00 dB
Ref Level 30.00 dBm
Mkr1 2.437 682 64 GHz
-1.35 dBm

Center Frequency 2.43700000 GHz
Span 29.680000 MHz
Swept Span
Zero Span
Full Span
Start Freq 2.42216000 GHz
Stop Freq 2.45184000 GHz
AUTO TUNE
CF Step 2.968000 MHz
Auto Man
Freq Offset 0 Hz
X Axis Scale Log Lin
Signal Track (Span Zoom)

2.43700000 GHz
29.680000 MHz
2.42216000 GHz
2.45184000 GHz
0 Hz
Log Lin
Span 40.5 ms (8001 pts)



Test Mode	Test Channel	Verdict
11B	HCH	PASS

Spectrum Analyzer 1 Swept SA +

KEYSIGHT Input: RF
Coupling: DC
Align. Auto/No RF

Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)

#Atten: 40 dB
Preamp: Off

PNO: Fast
Gate: Off
IF Gain: Low
Sig Track: Off

#Avg Type: Power (RMS)
Avg/Hold: 99/100
Trig: Free Run

1 2 3 4 5 6
M W W W W W
P P P P P P

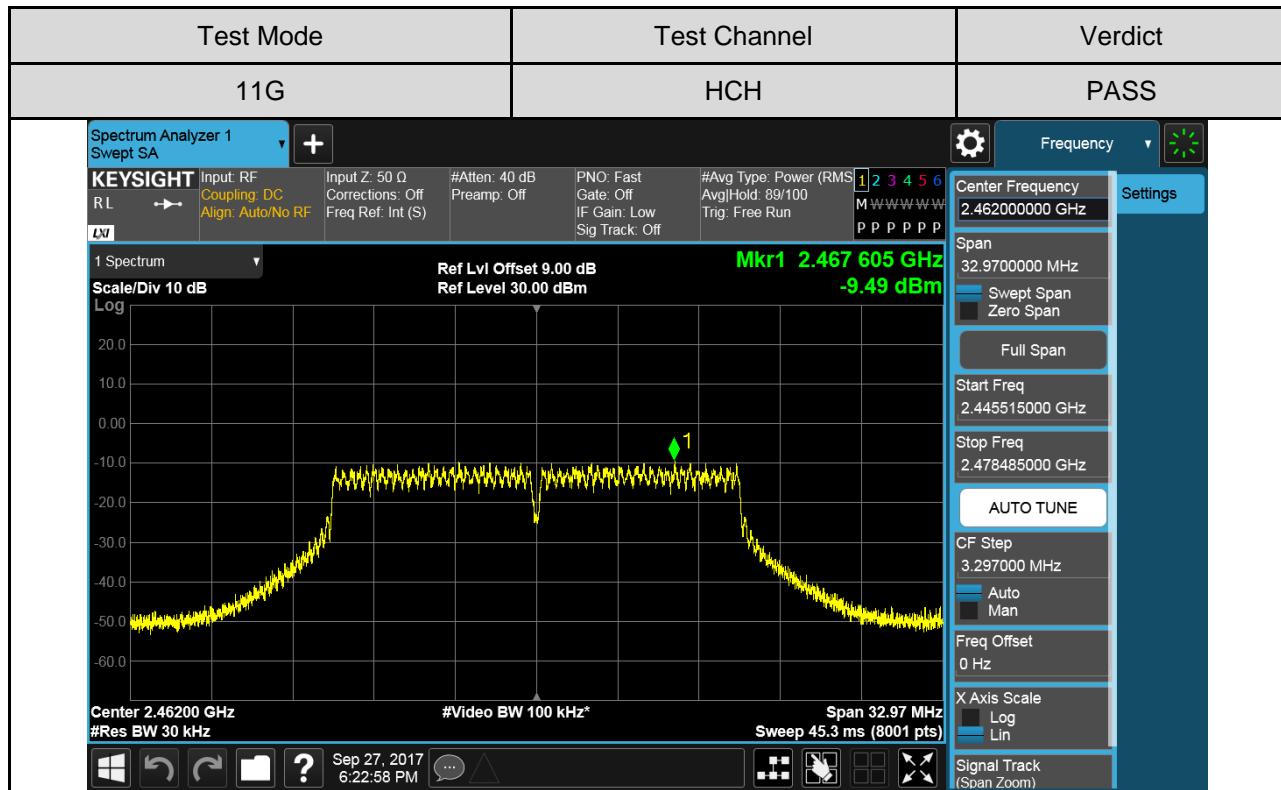
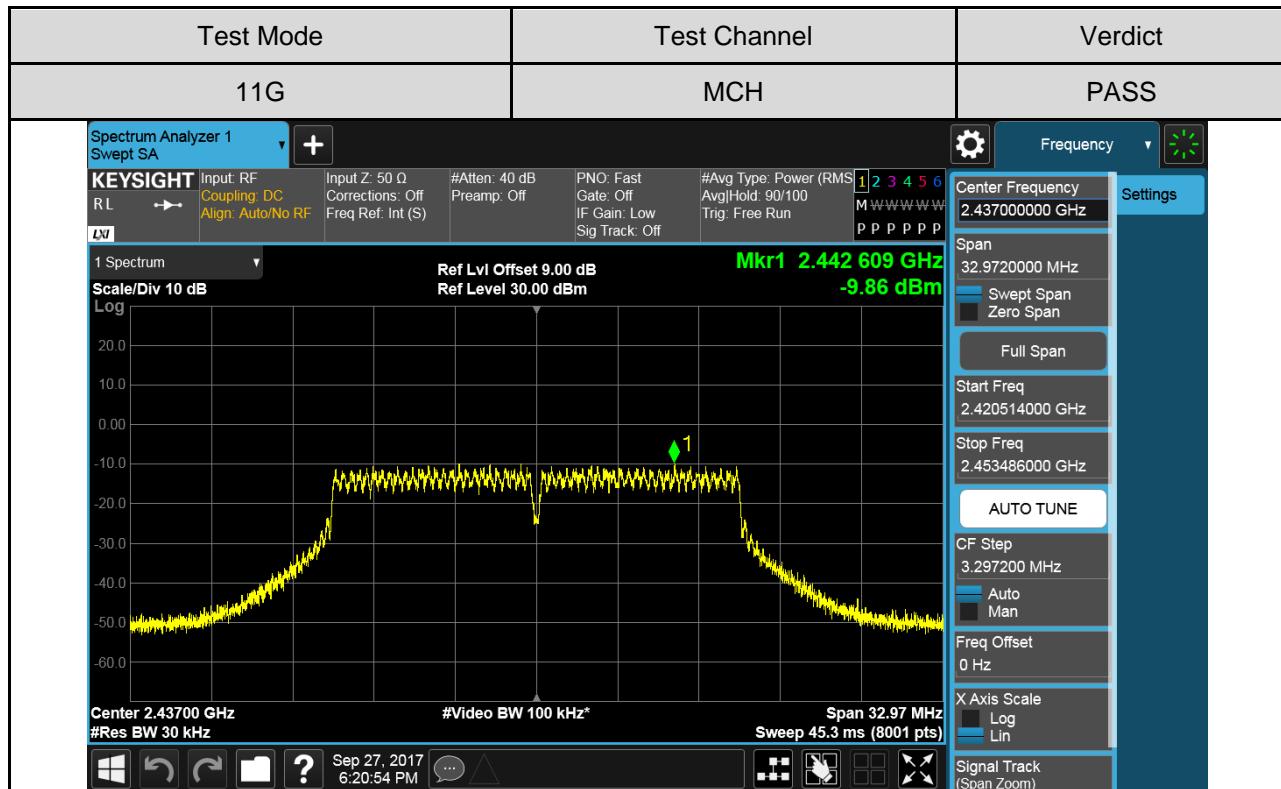
1 Spectrum Ref Lvl Offset 9.00 dB Mkr1 2.462 682 GHz
Scale/Div 10 dB Ref Level 30.00 dBm -1.02 dBm

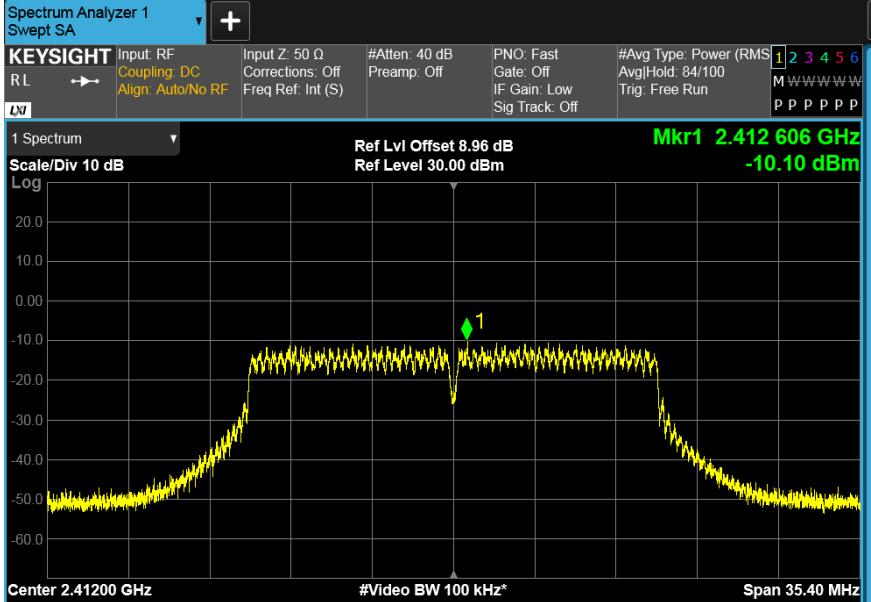
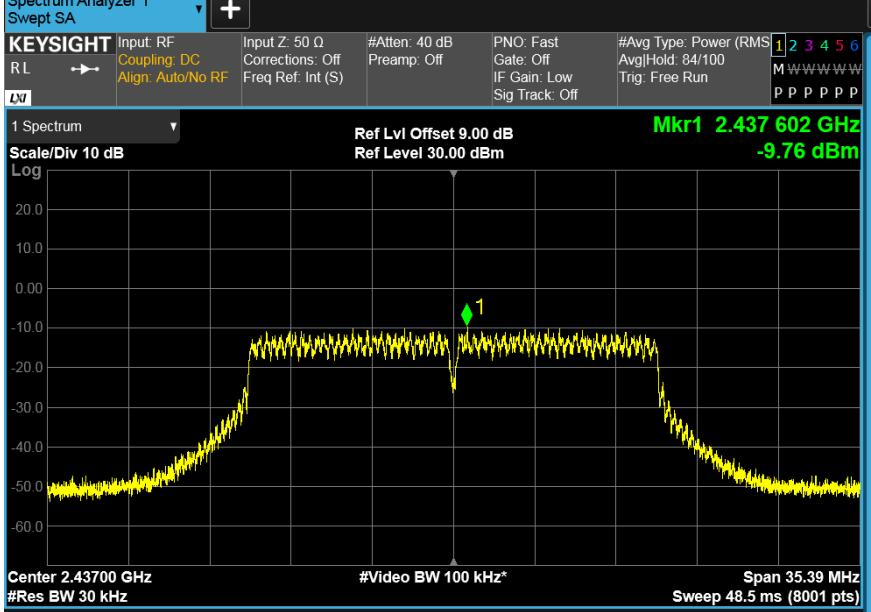
Log
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0

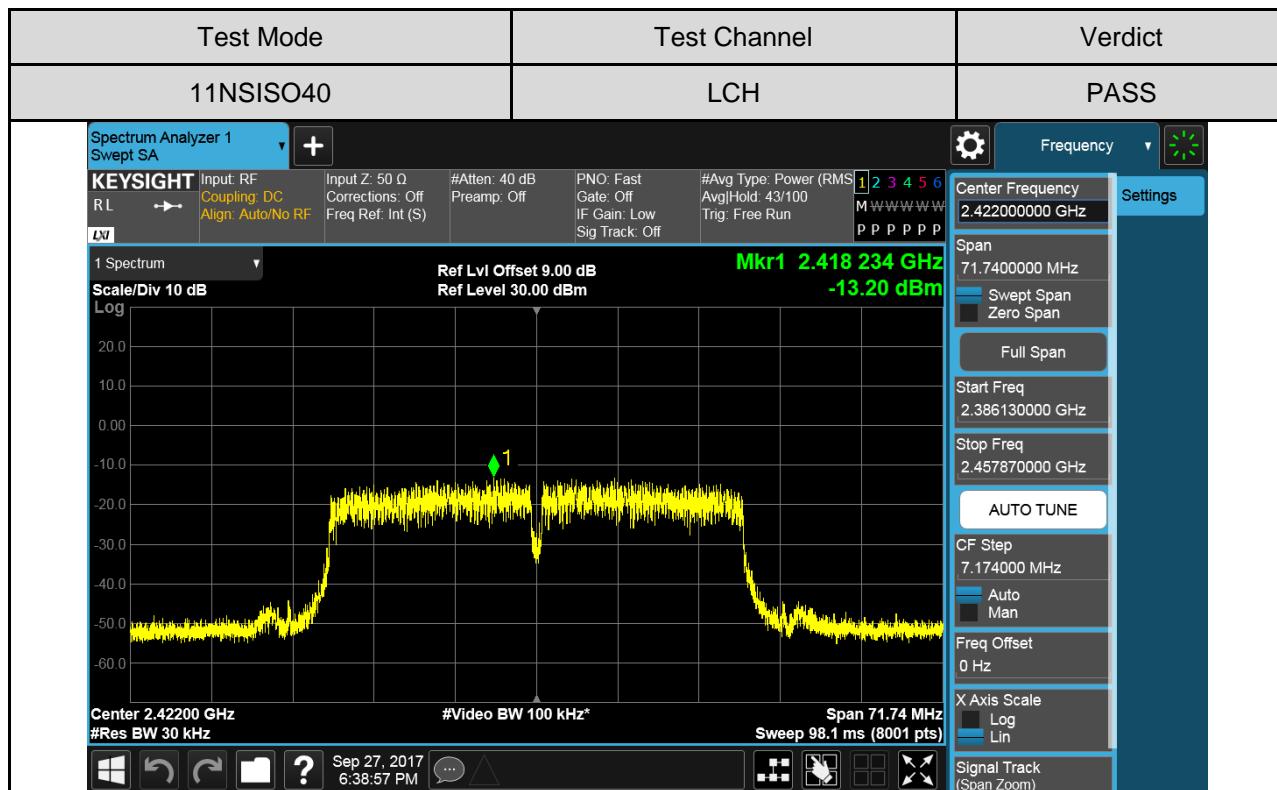
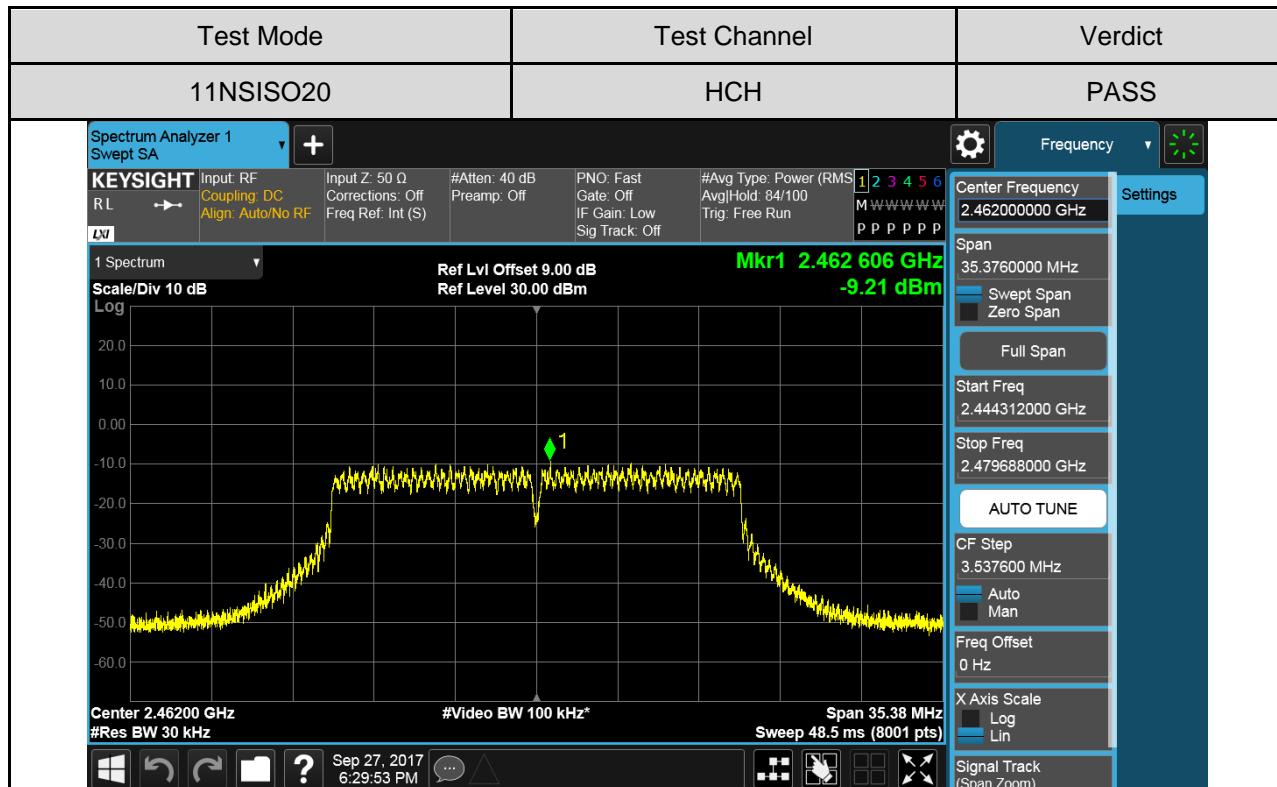
Center 2.46200 GHz #Video BW 100 kHz* Span 29.67 MHz
#Res BW 30 kHz Sweep 40.5 ms (8001 pts)

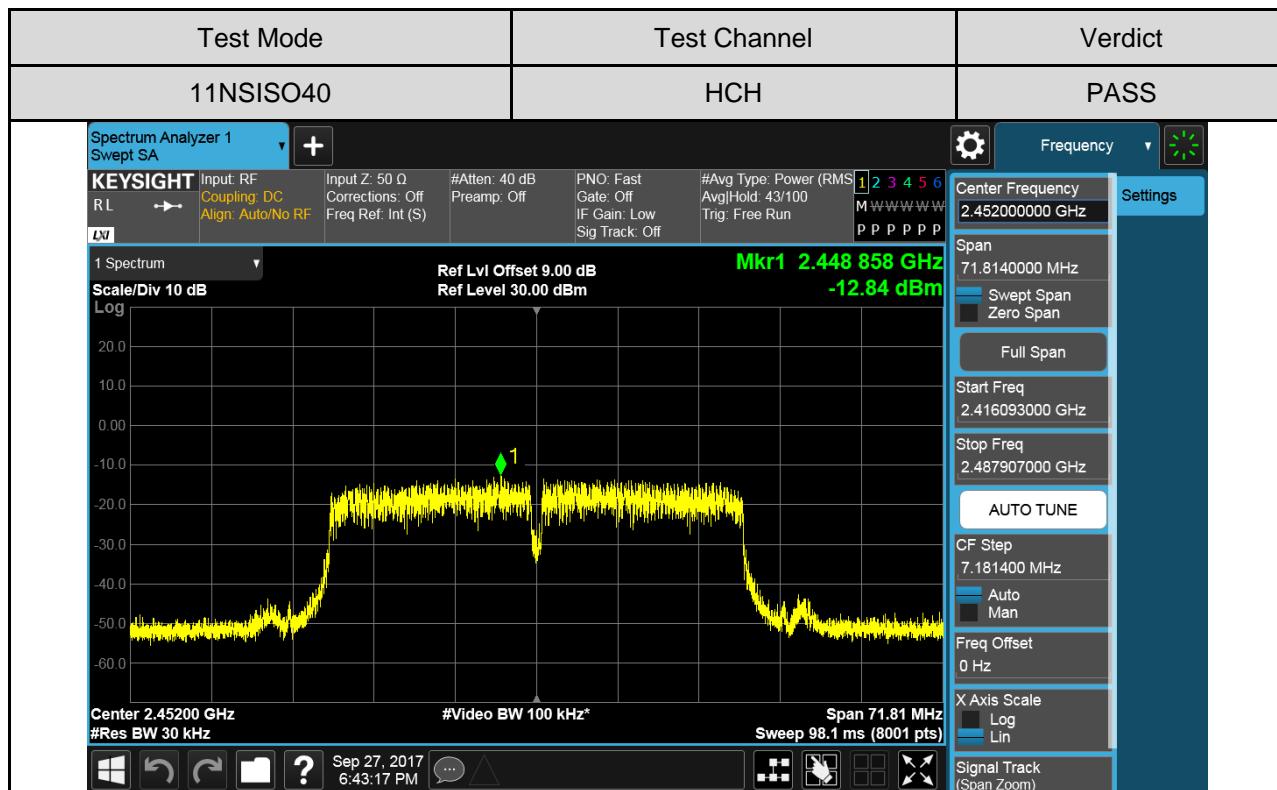
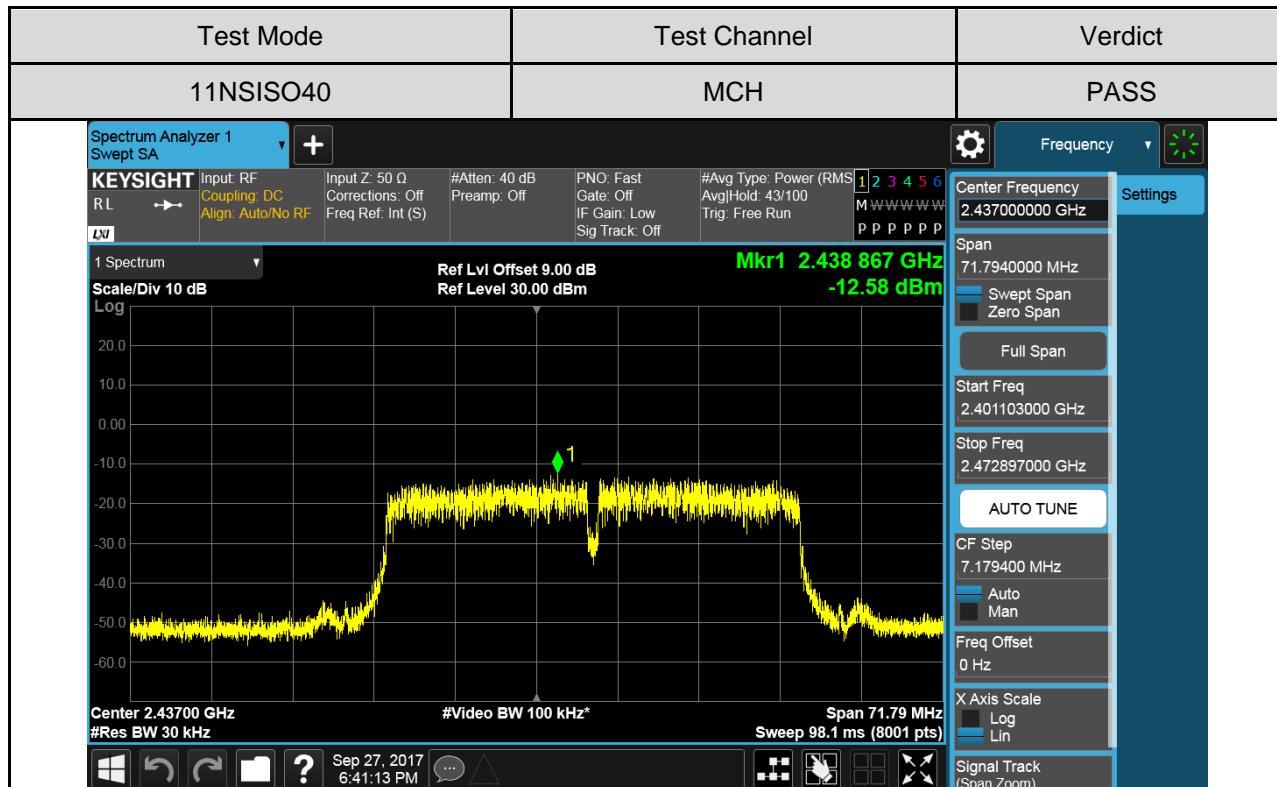
Frequency 2.46200000 GHz
Span 29.670000 MHz
Swept Span
Zero Span
Full Span
Start Freq 2.447164000 GHz
Stop Freq 2.476836000 GHz
AUTO TUNE
CF Step 2.967200 MHz
Auto Man
Freq Offset 0 Hz
X Axis Scale Log Lin
Signal Track (Span Zoom)

Test Mode		Test Channel		Verdict
11G		LCH		PASS
<p>Spectrum Analyzer 1 Swept SA</p> <p>KEYSIGHT Input: RF Coupling: DC Align: Auto/No RF</p> <p>Input Z: 50 Ω Corrections: Off Freq Ref: Int (S)</p> <p>#Atten: 40 dB Preamp: Off</p> <p>PNO: Fast Gate: Off IF Gain: Low Sig Track: Off</p> <p>#Avg Type: Power (RMS) AvgHold: 89/100 Trig: Free Run</p> <p>1 2 3 4 5 6 M W W W W W P P P P P P</p> <p>1 Spectrum Ref Lvl Offset 8.96 dB Ref Level 30.00 dBm</p> <p>Mkr1 2.417 605 GHz -10.09 dBm</p> <p>Scale/Div 10 dB Log</p> <p>20.00 10.00 0.00 -10.00 -20.00 -30.00 -40.00 -50.00 -60.00</p> <p>Center 2.41200 GHz #Video BW 100 kHz* Span 32.97 MHz #Res BW 30 kHz Sweep 45.3 ms (8001 pts)</p> <p>Frequency 2.41200000 GHz</p> <p>Span 32.970000 MHz</p> <p>Full Span</p> <p>Start Freq 2.395514000 GHz</p> <p>Stop Freq 2.428486000 GHz</p> <p>AUTO TUNE</p> <p>CF Step 3.297200 MHz</p> <p>Auto Man</p> <p>Freq Offset 0 Hz</p> <p>X Axis Scale Log Lin</p> <p>Signal Track (Span Zoom)</p>				



Test Mode	Test Channel	Verdict
11NSISO20	LCH	PASS
		
11NSISO20	MCH	PASS
		





6.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

FCC Part15 (15.247) , Subpart C		
Section	Test Item	Limit
FCC §15.247 (d)	Conducted Bandedge and Spurious Emissions	at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

TEST PROCEDURE

Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	100K
VBW	$\geq 3 \times$ RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

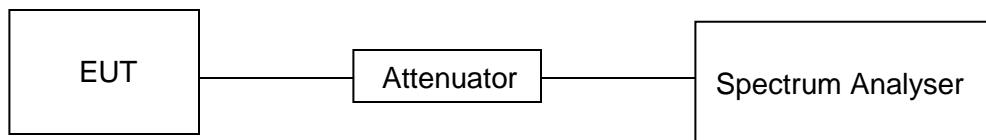
settings:

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

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100K
VBW	$\geq 3 \times$ RBW
measurement points	\geq span/RBW
Trace	Max hold
Sweep time	Auto couple.

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

TEST SETUP



Part I :Conducted Bandedge

RESULTS TABLE

Test Mode	Test Channel	Carrier Power[dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Verdict
11B	2412	3.821	-40.580	-16.18	PASS
11B	2462	4.590	-41.040	-15.41	PASS
11G	2412	-6.634	-41.553	-26.63	PASS
11G	2462	-6.149	-41.078	-26.15	PASS
11N20SISO	2412	-7.437	-40.752	-27.44	PASS
11N20SISO	2462	-5.998	-40.404	-26	PASS
11N40SISO	2422	-8.683	-40.835	-28.68	PASS
11N40SISO	2452	-8.143	-41.180	-28.14	PASS

TEST GRAPHS

