

## FCC 47 CFR PART 15 SUBPART C

## **CERTIFICATION TEST REPORT**

For

## **CONSUMER CAMERA**

MODEL NUMBER: DH-IPC-C12P, IPC-C12P, IPC-C22P, IPC-C12N, IPC-C22N, DH-IPC-C12P, DH-IPC-C22P, DH-IPC-C12N, DH-IPC-C22N, TC7, TC7C, IPC-C12, IPC-C22, DH-IPC-C12, DH-IPC-C22 PROJECT NUMBER: 4788141105

**REPORT NUMBER: 4788141105-5** 

FCC ID: SVNDH-IPC-CX2Y

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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	

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# **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: Address:	ZHEJIANG DAHUA ZHILIAN CO.,LTD. No.28, Dongqiao Road, Dongzhou Street, Fuyang District, Hangzhou,P.R.China.
EUT Description	
Product Name	CONSUMER CAMERA
Model Name	DH-IPC-C12P
Additional No.	IPC-C12P, IPC-C22P, IPC-C12N, IPC-C22N, DH-IPC-C12P, DH-
	IPC-C22P, DH-IPC-C12N, DH-IPC-C22N, TC7, TC7C, IPC-C12,
	IPC-C22, DH-IPC-C12, DH-IPC-C22
Sample Number	1142351-001
Data of Receipt Sample	Sep 8, 2017
Date Tested	Sep 8, 2017 ~ Dec. 14, 2017
	APPLICABLE STANDARDS

APPLICABLE STANDARDS							
STA	NDARD	TEST RESULTS					
CFR 47 Pa	rt 15 Subpart C	PASS					

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	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					

Tested By:

Venn Bucur

Denny Huang Engineer Project Associate Approved By:

ephenbus

Stephen Guo Laboratory Manage Check By:

Sheming lies

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	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. 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. 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).

Note: 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.

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# 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	5.04dB(1-6GHz)				
(1GHz to 26GHz)( include Fundamental	5.30dB (6GHz-18Gz)				
emission)	5.23dB (18GHz-26Gz)				
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$ .					

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# 5. EQUIPMENT UNDER TEST

# 5.1. DESCRIPTION OF EUT

CONSUMER CAMERA					
DH-IPC-C12P					
-	n(HT20): 2412MHz to 2462MHz				
IEEE 802.11n(H	T40): 2422MHz to 2452MHz				
	D: DSSS (CCK, DQPSK, DBPSK)				
IEEE for 802.11g	g: OFDM (64QAM, 16QAM, QPSK, BPSK)				
IEEE for 802.11r	n (HT20 and HT40): OFDM (64QAM, 16QAM, QPSK, BPSK)				
IEEE 802.11b/g,	IEEE 802.11n(HT20): 11 Channels				
IEEE 802.11n(H	T40): 7 Channels				
Channels with 5MHz step					
Fixed production					
44 (manufacturer declare)					
Secure CRT (ma	anufacturer declare)				
Internal Antenna					
3dBi					
Adapter 1 Model:NBS05B050100VUU					
	INPUT:100-240V~, 50/60Hz, 0.2A				
OUTPUT:5.0V1.0A					
Adapter 2	Model:ED1-050100UA				
	INPUT:100-240V~50/60Hz, 0.2A				
	OUTPUT:5.0V				
	DH-IPC-C12P IEEE 802.11b/g/ IEEE 802.11n(H IEEE for 802.11t IEEE for 802.11t IEEE for 802.11t IEEE 802.11b/g, IEEE 802.11b/g, IEEE 802.11n(H Channels with 5t Fixed production 44 (manufacture Secure CRT (ma Internal Antenna 3dBi Adapter 1				

### Remark:

Model No.:

Number:	Name:	Number:	Name:	Number:	Name:
1	DH-IPC-C12P	2	IPC-C12P	3	IPC-C22P
4	IPC-C12N	5	IPC-C22N	6	DH-IPC-C12P
7	DH-IPC-C22P	8	DH-IPC-C12N	9	DH-IPC-C22N
10	TC7	11	TC7C	12	IPC-C12
13	IPC-C22	14	DH-IPC-C12	15	DH-IPC-C22

Only the main model **DH-IPC-C12P** 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, with difference being of **only the sales area**.

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			-		
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]	18.69
2400-2483.5	1	IEEE 802.11g	2412-2462	1-11[11]	17.15
2400-2483.5	1	IEEE 802.11nHT20	2412-2462	1-11[11]	17.33
2400-2483.5	1	IEEE 802.11nHT40	2422-2452	3-7	17.50

# 5.2. MAXIMUM OUTPUT POWER

# 5.3. CHANNEL LIST

	Channel List for 802.11b/g/n (20 MHz)								
Channel	Frequency (MHz)	Channel	Frequenc y(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 Channel Channel 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)
	LCH :CH01 2412
IEEE 802.11b	MCH: CH06 2437
	HCH: CH11 2462
	LCH :CH01 2412
IEEE 802.11g	MCH: CH06 2437
	HCH: CH11 2462
	LCH :CH01 2412
IEEE 802.11n HT20	MCH: CH06 2437
	HCH: CH11 2462
	LCH :CH03 2422
IEEE 802.11n HT40	MCH: CH06 2437
	HCH: CH09 2452

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

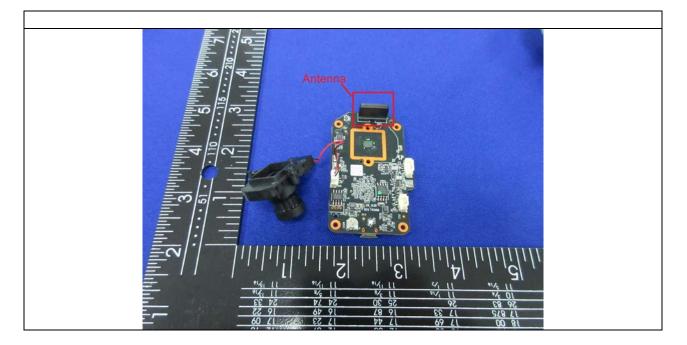
## 5.5. THE WORSE CASE POWER SETTING PARAMETER

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# 5.6. DESCRIPTION OF AVAILABLE ANTENNAS

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

Test Mode	Transmit and Receive Mode	Description
WIFI	⊠1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.



# 5.7. TEST ENVIRONMENT

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

Note: VL= Lower Extreme Test Voltage

VN= Nominal Voltage

VH= Upper Extreme Test Voltage

TN= Normal Temperature

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# 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

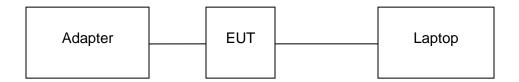
#### ACCESSORY

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



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☑         Two-Line V- Network         R&S         ENV216         101983         Dec.20, 2016         Dec.19, 2017           ☑         Artificial Mains Networks         Schwarzbeck         NSLK 8126         8126465         Feb.10, 2017         Feb.10, 2018           ☑         Artificial Mains Networks         Schwarzbeck         NSLK 8126         8126465         Feb.10, 2017         Feb.10, 2018           Used         Description         Manufacturer         Name         Version           ☑         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.           ☑         MXE EMI Receiver         KESIGHT         N9038A         MY56400 036         Feb. 24, 2017         Feb. 24, 2018           ☑         Hybrid Log Periodic Antenna         TDK         HLP-3003C         130960         Jan.09, 2016         Jan.09, 2019           ☑         Preamplifier         HP         8447D         2944A090 99         Feb. 13, 2017         Feb. 13, 2017           ☑         MI Measurement Receiver         R&S         ESR26         101377         Dec. 20, 2016	5.9. MEASURING INSTRUMENT AND SOFTWARE USED								
Image: Constraint of the constrai			Conducted	l Emiss	sions(Ir	strume	ent)		
Image: Market in the second	Used	Equipment	Manufacturer	Mod	el No.	Serial	No.	Last Cal.	Next Cal.
WetworkR&SENV216101983Dec.20, 2016Dec.19, 2017✓Artificial Mains NetworksSchwarzbeckNSLK 81268126465Feb.10, 2017Feb.10, 2018✓Test Software for Conducted disturbanceULAntenna portVersion✓Test Software for Conducted disturbanceULAntenna portVer. 7.2✓Test Software for Conducted disturbanceULAntenna portVer. 7.2✓MXE EMI ReceiverKESIGHTN9038AMY56400 036Feb. 24, 2017Feb. 24, 2018✓MXE EMI ReceiverKESIGHTN9038AMY56400 036Jan.09, 2016Jan.09, 2019✓Hybrid Log Periodic AntennaTDKHLP-3003C130960 130960Jan.09, 2016Jan.09, 2019✓PreamplifierHP8447D2944A090 99Feb. 13, 2017Feb. 13, 2017Feb. 13, 2016✓PreamplifierR&SESR26101377Dec. 20, 2016Dec. 20, 2016Dec. 20, 2016✓High Gain Horn AntennaSchwarzbeckBBHA-9170691Jan.06, 2016Jan.06, 2019✓PreamplifierTDKPA-02-0118TRS-305- 00006Jan. 14, 2017Jan. 14, 2017✓Loop antennaSchwarzbeck1519E00008Mar. 26, 2016Dec. 20, 2016✓PreamplifierTDKPA-02-2TRS-307- 00003Dec. 20, 2016Dec. 20, 2017✓Loop antennaSchwarzbeck1519E00008Mar. 26, 2016Dec. 20, 2017 <td><math>\checkmark</math></td> <td></td> <td>R&amp;S</td> <td>ES</td> <td>SR3</td> <td>1019</td> <td>61</td> <td>Dec.20, 2016</td> <td>Dec.19, 2017</td>	$\checkmark$		R&S	ES	SR3	1019	61	Dec.20, 2016	Dec.19, 2017
NetworksSchwarzbeckNSLR 81268126465Feb. 10, 2017Feb. 10, 2018Software for Conducted disturbanceManufacturerNameVersionTest Software for Conducted disturbanceULAntenna portVer. 7.2Radiated Emission-S(Instrument)Used EquipmentManufacturerModel No.Serial No.Last Cal.Next Cal.MXE EMI ReceiverKESIGHTN9038AMY56400Feb. 24, 2017Feb. 24, 2018MXE EMI ReceiverKESIGHTN9038AMY56400Feb. 13, 2017Feb. 13, 2018ManufacturerHP8447D2944A090Feb. 13, 2017Feb. 13, 2017Feb. 13, 2018PreamplifierHP8447D2944A090Feb. 13, 2017Feb. 13, 2017Feb. 13, 2019PreamplifierR&SESR26101377Dec. 20, 2016Dec. 20, 2017Horn AntennaTDKHRN-0118130939Jan. 09, 2016Jan. 09, 2019High Gain Horn AntennaSchwarzbeckBBHA-9170691Jan. 06, 2016Dec. 20, 2017PreamplifierTDKPA-02-0118TRS-305- 00006Jan. 14, 2017Jan. 14, 2018PreamplifierTDKPA-02-2TRS-307- 00006Dec. 20, 2016Dec. 20, 2017PreamplifierTDKPA-02-2TRS-307- 00006Dec. 20, 2016Dec. 20, 2017PreamplifierTDKPA-02-2TRS-307- 243.5-45SSDec. 20, 2016Dec. 20, 2017Band Reject FilterWainwrightSci-240		Network	R&S	ENV216		1019	83	Dec.20, 2016	Dec.19, 2017
Used       Description       Manufacturer       Name       Version         ✓       Test Software for Conducted disturbance       UL       Antenna port       Ver. 7.2         Radiated Emissions(Instrument)         ✓       MXE EMI Receiver       KESIGHT       N9038A       MY56400 036       Feb. 24, 2017       Feb. 24, 2018         ✓       MXE EMI Receiver       KESIGHT       N9038A       MY56400 036       Feb. 24, 2017       Feb. 24, 2018         ✓       Hybrid Log Periodic Antenna       TDK       HLP-303C       130960       Jan.09, 2016       Jan.09, 2019         ✓       Preamplifier       HP       8447D       2944A090       Feb. 13, 2017       Feb. 13, 2017       Feb. 13, 2018         ✓       Preamplifier       HP       8447D       2944A090       Feb. 13, 2017       Feb. 13, 2018         ✓       Preamplifier       HP       8447D       2944A090       Feb. 13, 2017       Feb. 13, 2017       Feb. 13, 2018         ✓       Horn Antenna       TDK       HRN-0118       130939       Jan.09, 2016       Jan. 09, 2019       Jan.06, 2019       Jan.06, 2019       Jan.06, 2019       Jan.06, 2019       Jan. 14, 2018       Jan.06, 2019       Jan. 14, 2018       Jan.06, 2016       Jan. 14, 2018       Jan.06,	$\checkmark$		Schwarzbeck	NSLK 8126		81264	465	Feb.10, 2017	Feb.10, 2018
☑Test Software for Conducted disturbanceULAntenna portVer. 7.2Radiated Emission-s(Instrument)UsedEquipmentManufacturerModel No.Serial No.Last Cal.Next Cal.☑MXE EMI ReceiverKESIGHTN9036MY56400 036Feb. 24, 2017Feb. 24, 2017Feb. 24, 2018☑Hybrid Log Periodic AntennaTDKHLP-3003C130960Jan.09, 2016Jan.09, 2019☑PreamplifierHP8447D2944A090 99Feb. 13, 2017Feb. 13, 2018☑EMI Measurement ReceiverR&SESR2101377Dec. 20, 2016Dec. 20, 2017☑Horn AntennaTDKHRN-0118130939Jan.09, 2016Jan.09, 2019☑High Gain Horn AntennaSchwarzbeckBBHA-9170691Jan.06, 2016Jan.06, 2019☑PreamplifierTDKPA-02-0118TRS-305- 00066Jan. 14, 2017Jan. 14, 2018☑PreamplifierTDKPA-02-0118TRS-305- 00003Jan. 14, 2017Jan. 26, 2016☑Loop antennaSchwarzbeck1519E00008Mar. 26, 2016Dec. 20, 2017☑Band Reject FilterWainwright $\frac{WRCJVs}{2350-2400-2483,5-2533,5-40SS}$ Jan. 26, 2016Dec. 20, 2017☑Band Reject FilterWainwrightMarufacturerMarufacturerNo.Last Cal.Next Cal.UsedDescriptionMarufacturerFaradEZ-EMCVer.UL-3A1UsedEquipmen				Softv	vare				
Radiated Emissions(Instrument)UsedEquipmentManufacturerModel No.Serial No.Last Cal.Next Cal. $\square$ MXE EMI ReceiverKESIGHTN9038A $\frac{MY56400}{036}$ Feb. 24, 2017Feb. 24, 2018 $\square$ Hybrid Log Periodic AntennaTDKHLP-3003C130960Jan.09, 2016Jan.09, 2019 $\square$ PreamplifierHP $\$447D$ $2944A090$ 99Feb. 13, 2017Feb. 13, 2018 $\square$ EMI Measurement ReceiverR&SESR26 $101377$ Dec. 20, 2016Dec. 20, 2017 $\square$ Horn AntennaTDKHRN-0118 $130939$ Jan. 09, 2016Jan. 09, 2019 $\square$ Horn AntennaTDKHRN-0118 $130939$ Jan. 09, 2016Jan. 09, 2019 $\square$ Horn AntennaSchwarzbeckBBHA-9170691Jan.06, 2016Jan.06, 2019 $\square$ PreamplifierTDKPA-02-0118TRS-305- 00066Jan. 14, 2017Jan. 14, 2018 $\square$ PreamplifierTDKPA-02-21TRS-307- 00003Dec. 20, 2016Dec. 20, 2017 $\square$ Loop antennaSchwarzbeck1519B00008Mar. 26, 2016Mar. 26, 2019 $\square$ Band Reject FilterWainwright $\frac{WRCJV8-}{2350-2400-2483.5-}$ 2533.5-40SS $4$ Dec. 20, 2016Dec. 20, 2017 $\square$ DescriptionManufacturerManufacturerNameVersion $\square$ Test Software for Radiated disturbanceFaradEZ-EMCVer. UL-3A1UsedEquip	Used	Des	cription Manu			ufacture	ər	Name	Version
Used         Equipment         Manufacturer         Model No.         Serial No.         Last Cal.         Next Cal.           ☑         MXE EMI Receiver         KESIGHT         N9038A         MY56400 036         Feb. 24, 2017         Feb. 24, 2017         Feb. 24, 2018           ☑         Hybrid Log Periodic Antenna         TDK         HLP-3003C         130960         Jan.09, 2016         Jan.09, 2019           ☑         Preamplifier         HP         8447D         2944A090 99         Feb. 13, 2017         Feb. 13, 2017         Feb. 13, 2018           ☑         Preamplifier         HP         8447D         2944A090 99         Feb. 13, 2017         Feb. 13, 2017         Feb. 13, 2018           ☑         Horn Antenna         TDK         HRN-0118         130939         Jan. 09, 2016         Jan. 09, 2019         Jan. 09, 2016         Jan. 09, 2019           ☑         Horn Antenna         TDK         HRN-0118         TRS-305- 00066         Jan. 06, 2016         Jan. 06, 2019         Jan. 14, 2017         Jan. 14, 2018           ☑         Preamplifier         TDK         PA-02-21         TRS-305- 00003         Jan. 14, 2017         Jan. 14, 2017         Jan. 14, 2017           ☑         Loop antenna         Schwarzbeck         1519B         00008	$\checkmark$	Test Software for C	Conducted distu	rbance		UL		Antenna port	Ver. 7.2
☑         MXE EMI Receiver Antenna         KESIGHT         N9038A         MY56400 036         Feb. 24, 2017         Feb. 24, 2018           ☑         Hybrid Log Periodic Antenna         TDK         HLP-3003C         130960         Jan.09, 2016         Jan.09, 2019           ☑         Preamplifier         HP         8447D         2944A090 99         Feb. 13, 2017         Feb. 13, 2017           ☑         Preamplifier         HP         8447D         2944A090 99         Feb. 13, 2017         Feb. 13, 2017           ☑         Horn Antenna         TDK         HRN-0118         130939         Jan.09, 2016         Jan.09, 2019           ☑         Horn Antenna         TDK         HRN-0118         130939         Jan. 09, 2016         Jan. 09, 2019           ☑         Horn Antenna         TDK         PR-02-0118         TRS-305- 00003         Jan. 14, 2017         Jan. 14, 2018           ☑         Preamplifier         TDK         PA-02-2         TRS-305- 00003         Jan. 14, 2017         Jan. 14, 2018           ☑         Preamplifier         TDK         PA-02-2         TRS-305- 2533.5-4005         Jan. 14, 2017         Jan. 14, 2017           ☑         Loop antenna         Schwarzbeck         1519B         00008         Mar. 26, 2016			Radiated	Emissi	ions(Ins	strumer	nt <b>)</b>		
Image: Model of the second	Used	Equipment	Manufacturer	Mod	el No.	Serial	No.	Last Cal.	Next Cal.
Image: Constraint of the second s			KESIGHT	N9(	)38A			Feb. 24, 2017	Feb. 24, 2018
Image: Preamplifier         HP         8447D         99         Feb. 13, 2017			TDK	HLP-	3003C			Jan.09, 2016	Jan.09, 2019
Image: Marce intermediate intermedintermedinte intermediate intermediate intermediate intermediate	$\checkmark$	-	HP	84	47D			Feb. 13, 2017	Feb. 13, 2018
Image: Migh Gain Horn Antenna         Schwarzbeck         BBHA-9170         691         Jan.06, 2016         Jan.06, 2019           Image: Preamplifier         TDK         PA-02-0118         TRS-305- 00066         Jan. 14, 2017         Jan. 14, 2018           Image: Preamplifier         TDK         PA-02-0118         TRS-307- 00003         Dec. 20, 2016         Dec. 20, 2017           Image: Preamplifier         TDK         PA-02-2         TRS-307- 00003         Dec. 20, 2016         Dec. 20, 2017           Image: Preamplifier         TDK         PA-02-2         TRS-307- 00003         Dec. 20, 2016         Dec. 20, 2017           Image: Preamplifier         TDK         PA-02-2         TRS-307- 00003         Dec. 20, 2016         Dec. 20, 2017           Image: Preamplifier         Schwarzbeck         1519B         00008         Mar. 26, 2016         Dec. 20, 2017           Image: Preamplifier         Wainwright         WRCJV8- 2350-2400- 2483.5- 2533.5-40SS         4         Dec. 20, 2016         Dec. 20, 2017           Image: Preamplifier         Wainwright         WRCJV8- 2350-2400- 2483.5- 2533.5-40SS         4         Dec. 20, 2016         Dec. 20, 2017           Image: Preamplifier         Manufacturer         Manufacturer         Name         Version           Image: Preamplifier <t< td=""><td></td><td></td><td>R&amp;S</td><td>ES</td><td>R26</td><td>1013</td><td>77</td><td>Dec. 20, 2016</td><td>Dec. 20, 2017</td></t<>			R&S	ES	R26	1013	77	Dec. 20, 2016	Dec. 20, 2017
☑       Antenna       Schwarzbeck       BBHA-9170       691       Jah. 06, 2016       Jah. 06, 2016       Jah. 06, 2019         ☑       Preamplifier       TDK       PA-02-0118       TRS-305- 00066       Jan. 14, 2017       Jan. 14, 2018         ☑       Preamplifier       TDK       PA-02-2       TRS-307- 00003       Dec. 20, 2016       Dec. 20, 2017         ☑       Loop antenna       Schwarzbeck       1519B       00008       Mar. 26, 2016       Mar. 26, 2019         ☑       Band Reject Filter       Wainwright       WRCJV8- 2350-2400- 2483.5- 2533.5-40SS       4       Dec. 20, 2016       Dec. 20, 2017         ☑       Band Reject Filter       Wainwright       WRCJV8- 2350-2400- 2483.5- 2533.5-40SS       4       Dec. 20, 2016       Dec. 20, 2017         ☑       Band Reject Filter       Wainwright       Manufacturer       Manufacturer       Version         ☑       Description       Manufacturer       Farad       EZ-EMC       Ver. UL-3A1         ☑       Test Software for Ratiated disturbance       Farad       EZ-EMC       Ver. UL-3A1         Used       Equipment       Manufacturer       Model No.       Serial No.       Last Cal.       Next Cal.         ☑       Spectrum Analyzer       Keysight       N9	$\checkmark$	Horn Antenna	TDK	HRN	-0118	1309	39	Jan. 09, 2016	Jan. 09, 2019
Image: Market PreamplifierTDK $PA-02-0118$ $00066$ Jan. 14, 2017Jan. 14, 2017Jan. 14, 2017Image: Market PreamplifierTDK $PA-02-2$ $TRS-307$ 00003Dec. 20, 2016Dec. 20, 2017Image: Market PreamplifierSchwarzbeck1519B00008Mar. 26, 2016Mar. 26, 2019Image: Market PreamplifierWainwright $VRCJV8-2350-2400-2483.5-2533.5-40SS$ 4Dec. 20, 2016Dec. 20, 2017Image: Market PreamplifierWainwright $VRCJV8-2350-2400-2483.5-2533.5-40SS$ 4Dec. 20, 2016Dec. 20, 2017Image: Market PreamplifierWainwrightManufacturerManufacturerNameVersionImage: VersionImage: Market PreamplifierManufacturerFaradEZ-EMCVer. UL-3A1Image: VersionImage: VersionImage: VersionImage: VersionImage: VersionVersionImage: VersionImage: VersionImage: VersionImage: VersionImage: VersionVersionImage: VersionImage: VersionImage: VersionImage: VersionImage: VersionVersionImage: VersionImage: Version<		U U	Schwarzbeck	BBH/	A-9170	69 <sup>-</sup>	1	Jan.06, 2016	Jan.06, 2019
Image: PreamplifierTDKPA-02-2 $00003$ Dec. 20, 2016Dec. 20, 2016Dec. 20, 2016Image: PreamplifierLoop antennaSchwarzbeck1519B00008Mar. 26, 2016Mar. 26, 2019Image: PreamplifierWainwright $WRCJV8-2350-2400-2483.5-2533.5-40SS$ 4Dec. 20, 2016Dec. 20, 2016Image: PreamplifierWainwright $2350-2400-2483.5-2533.5-40SS$ 4Dec. 20, 2016Dec. 20, 2017Image: PreamplifierWainwright $2350-2400-2483.5-2533.5-40SS$ 4Dec. 20, 2016Dec. 20, 2017Image: PreamplifierDescriptionManufacturerNameVersionImage: PreamplifierDescriptionManufacturerNameVersionImage: PreamplifierManufacturerFaradEZ-EMCVer. UL-3A1Image: PreamplifierManufacturerModel No.Serial No.Last Cal.Next Cal.Image: PreamplifierManufacturerModel No.Serial No.Last Cal.Next Cal.Image: PreamplifierKeysightN9030AMY55410 024Dec. 20, 2016Dec. 20, 2017Image: PreamplifierKeysightN9031AMY55440 024Feb. 13, 2017Feb. 13, 2018Image: PreamplifierKeysightN9323AMY55440 024Feb. 13, 2017Feb. 13, 2018		Preamplifier	TDK	PA-02	2-0118	0006	66	Jan. 14, 2017	Jan. 14, 2018
☑       Band Reject Filter       Wainwright       WRCJV8- 2350-2400- 2483.5- 2533.5-40SS       4       Dec. 20, 2016       Dec. 20, 2017         Used       Description       Manufacturer       Name       Version         ☑       Test Software for Radiated disturbance       Farad       EZ-EMC       Ver. UL-3A1         Used       Equipment       Manufacturer       Model No.       Serial No.       Last Cal.       Next Cal.         ☑       Spectrum Analyzer       Keysight       N9030A       MY55410 512       Dec. 20, 2016       Dec. 20, 2017         ☑       Power Meter       Keysight       N9031A       MY55416 024       Feb. 13, 2017       Feb. 13, 2017         ☑       Power Sensor       Keysight       N90323A       MY55440       Feb. 13, 2017       Feb. 13, 2017		Preamplifier	TDK	PA-	02-2			Dec. 20, 2016	Dec. 20, 2017
Image: Section of the section of t	$\checkmark$	Loop antenna	Schwarzbeck			0000	30	Mar. 26, 2016	Mar. 26, 2019
Used       Description       Manufacturer       Name       Version         ☑       Test Software for Radiated disturbance       Farad       EZ-EMC       Ver. UL-3A1         Other instruments         Used       Equipment       Manufacturer       Model No.       Serial No.       Last Cal.       Next Cal.         ☑       Spectrum Analyzer       Keysight       N9030A       MY55410 512       Dec. 20, 2016       Dec. 20, 2017         ☑       Power Meter       Keysight       N9031A       MY55416 024       Feb. 13, 2017       Feb. 13, 2017	V	Band Reject Filter	Wainwright	2350 248	-2400- 33.5-	4		Dec. 20, 2016	Dec. 20, 2017
☑       Test Software for Radiated disturbance       Farad       EZ-EMC       Ver. UL-3A1         Other instruments         Used       Equipment       Manufacturer       Model No.       Serial No.       Last Cal.       Next Cal.         ☑       Spectrum Analyzer       Keysight       N9030A       MY55410 512       Dec. 20, 2016       Dec. 20, 2017         ☑       Power Meter       Keysight       N9031A       MY55416 024       Feb. 13, 2017       Feb. 13, 2017         ☑       Power Sensor       Keysight       N9323A       MY55440       Feb. 13, 2017       Feb. 13, 2017				Softv	vare				
Other instruments         Used       Equipment       Manufacturer       Model No.       Serial No.       Last Cal.       Next Cal.         Image: Spectrum Analyzer       Keysight       N9030A       MY55410 512       Dec. 20, 2016       Dec. 20, 2017         Image: Spectrum Analyzer       Keysight       N9031A       MY55416 024       Feb. 13, 2017       Feb. 13, 2017         Image: Spectrum Analyzer       Keysight       N9031A       MY55440 024       Feb. 13, 2017       Feb. 13, 2017	Used	Descr	iption	N	lanufact	urer		Name	Version
Used       Equipment       Manufacturer       Model No.       Serial No.       Last Cal.       Next Cal.         Image: Spectrum Analyzer       Keysight       N9030A       MY55410 512       Dec. 20, 2016       Dec. 20, 2017         Image: Spectrum Analyzer       Keysight       N9031A       MY55416 024       Dec. 13, 2017       Feb. 13, 2017         Image: Spectrum Analyzer       Keysight       N9031A       MY55440 024       Feb. 13, 2017       Feb. 13, 2017	$\checkmark$	Test Software for R	adiated disturba	ince	Farac	k		EZ-EMC	Ver. UL-3A1
Image: Spectrum Analyzer       Keysight       N9030A       MY55410 512       Dec. 20, 2016       Dec. 20, 2017         Image: Spectrum Analyzer       Keysight       N9031A       MY55416 024       Dec. 20, 2017       Dec. 20, 2017         Image: Spectrum Analyzer       Keysight       N9031A       MY55416 024       Dec. 13, 2017       Feb. 13, 2017         Image: Spectrum Analyzer       Keysight       N9323A       MY55440       Feb. 13, 2017       Feb. 13, 2017			Oth	ner ins	trumen	ts			
☑         Spectrum Analyzer         Keysight         N9030A         512         Dec. 20, 2016         Dec. 20, 2017           ☑         Power Meter         Keysight         N9031A         MY55416 024         Feb. 13, 2017         Feb. 13, 2017         Feb. 13, 2017         Feb. 13, 2017         Feb. 13, 2018           ☑         Power Sensor         Keysight         N9323A         MY55440         Feb. 13, 2017         Feb. 13, 2018	Used	Equipment	Manufacturer	Mod	el No.	Serial	No.	Last Cal.	Next Cal.
Power Meter         Keysight         N9031A         024         Feb. 13, 2017         F		Spectrum Analyzer	Keysight	N90	)30A			Dec. 20, 2016	Dec. 20, 2017
V    POWAr Sansor   KAVSIANT   NU3730      EAD 13 7017 EAD 13 7018		Power Meter	Keysight	N90	)31A	024	4	Feb. 13, 2017	Feb. 13, 2018
		Power Sensor	Keysight	N93	323A			Feb. 13, 2017	Feb. 13, 2018

## 5.9. MEASURING INSTRUMENT AND SOFTWARE USED

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# 6. ANTENNA PORT TEST RESULTS

# 6.1. ON TIME AND DUTY CYCLE

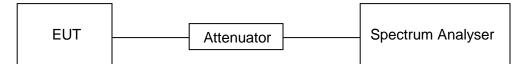
#### <u>LIMITS</u>

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)

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### DATE: Dec. 15, 2017

#### ON TIME AND DUTY CYCLE MID CH

11B						
Spectrum Analyzer 1					Frequency	<b>→</b>
KEYSIGHT       Input: RF       Input: S0 Ω         RL       ←       Coupling: DC       Corrections: Off         Align: Auto/No RF       Freq Ref: Int (S)	#Atten: 40 dB Preamp: Off	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	#Avg Type: Power (Rt Trig: Free Run	MS <mark>1</mark> 23456 WWWWWW AAAAAA	Center Frequency 2.437000000 GHz	Settings
1 Spectrum v Scale/Div 10 dB	Ref Level 23.00 d	Bm			Span 0.00000000 Hz	
	Rei Levei 23.00 d				Swept Span Zero Span	
-7.00					Full Span	
-17.0 -27.0 -37.0					Start Freq 2.437000000 GHz	
-37.0 -47.0 -57.0					Stop Freq 2.437000000 GHz	
-67.0	#Video BW 8.0 M	H7*		Span 0 Hz	AUTO TUNE	
Res BW 8 MHz 5 Marker Table			Sweep 20.27	'ms (8001 pts)	CF Step 8.000000 MHz	
Mode Trace Scale X	Y	Function F	unction Width Fur	nction Value	Auto Man	
					Freq Offset 0 Hz	
4 5 6					X Axis Scale Log	
<b>1 5 7 5 2 7 2 0 1</b>	$ \frown \land $				Lin Signal Track	
11:57:12 AM					(Span Zoom)	
Swept SA	#Atten: 40 dB	PNO: Fast	#Avg Type: Power (RI	MS <mark>123456</mark>	Frequency Center Frequency	
RL + Coupling: DC Corrections: Off Align: Auto/No RF Freq Ref: Int (S)	Preamp: Off	Gate: Off IF Gain: Low Sig Track: Off	Trig: Free Run		2.437000000 GHz	Settings
1 Spectrum V					Span 0.00000000 Hz	
Scale/Div 10 dB Log 13.0	Ref Level 23.00 d	Bm			Swept Span Zero Span	
-7.00					Full Span	
-17.0 -27.0 -37.0					Start Freq 2.437000000 GHz	
-47.0 -57.0					Stop Freq 2.437000000 GHz	
-67.0 Center 2.437000000 GHz	#Video BW 8.0 M	Hz*		Span 0 Hz	AUTO TUNE	
Res BW 8 MHz 5 Marker Table			Sweep 20.27	′ ms (8001 pts)	CF Step 8.000000 MHz	
Mode Trace Scale X	Y	Function F	unction Width Fur	nction Value	Auto Man	
1 2 3					Freq Offset 0 Hz	
4 5 6					X Axis Scale Log	
E 5 C 27.2017 12:03:43 PM	$\frown$				Lin Signal Track	
	$\frown$				Lin	

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11NSISO20						
Spectrum Analyzer 1					Frequency	· · · 👯
KEYSIGHT         Input: RF         Input 2: 50 Ω           R L         ⊷         Coupling: DC         Corrections: Off           Align: Auto/No RF         Freq Ref: Int (S)         Freq Ref: Int (S)	#Atten: 40 dB Preamp: Off	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	#Avg Type: Power (RM Trig: Free Run	IS <mark>1</mark> 23456 WWWWWW AAAAAA	Center Frequency 2.437000000 GHz	Settings
1 Spectrum v Scale/Div 10 dB Log 13.0	Ref Level 23.00 d	Bm			Span 0.00000000 Hz Swept Span Zero Span	
3.00 -7.00 -17.0 -27.0					Full Span Start Freq 2.437000000 GHz	
-37.0 -47.0 -57.0 -67.0				Crop 0 Ha	Stop Freq 2.437000000 GHz AUTO TUNE	
Center 2.437000000 GHz Res BW 8 MHz 5 Marker Table v	#Video BW 8.0 M		Sweep 20.27	Span 0 Hz ms (8001 pts)	CF Step 8.000000 MHz Auto	
Mode     Trace     Scale     X       1	Y	Function Fu	unction Width Fund	ction Value	Man Freq Offset 0 Hz	
5 6 Sep 27, 2017					X Axis Scale Log Lin Signal Track	
11NSISO40					(Span Zoom)	
Spectrum Analyzer 1					Frequency	· · *
KEYSIGHT       Input: RF       Input: Z: 50 Ω         R L       ←       Coupling: DC       Corrections: Off         Align: Auto/No RF       Freq Ref: Int (S)	#Atten: 40 dB Preamp: Off	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	#Avg Type: Power (RM Trig: Free Run	IS <mark>123456</mark> WWWWWW	Center Frequency 2.437000000 GHz	Settings
1 Spectrum v				A A A A A A	Span	
Scale/Div 10 dB	Ref Level 23.00 d	Bm			Span 0.00000000 Hz Swept Span Zero Span	
Log 13.0 -7.00 -7.00 -7.0 -7.0 -7.0	Ref Level 23.00 d	IBM			0.00000000 Hz Swept Span	
Log 13.0 3.00 -7.00 -17.0	Ref Level 23.00 d	Bm			0.00000000 Hz Swept Span Zero Span Full Span Start Freq 2.437000000 GHz Stop Freq 2.437000000 GHz	
Log 13.0 3.00 -7.00 -7.00 -27.0 -27.0 -37.0 -47.0 -57.0 -57.0 -67.0 -67.0 -67.0 -67.0 -67.0 -7.00	Ref Level 23.00 d		Sweep 20.27	A A A A A A A	0.00000000 Hz Swept Span Zero Span Start Freq 2.437000000 GHz Stop Freq 2.437000000 GHz AUTO TUNE CF Step	
Log 13.0 3.00 -7.00		Hz*		Span 0 Hz	0.00000000 Hz Swept Span Zero Span Start Freq 2.437000000 GHz Stop Freq 2.437000000 GHz CF Step 8.000000 MHz Auto Man	
Log 13.0 3.00 -7.00 -7.00 -7.00 -7.00 -7.0 -27.0 -27.0 -37.0 -37.0 -37.0 -57.0 -67.0 -67.0 -67.0 -57.0	#Video BW 8.0 M	Hz*		Span 0 Hz ms (8001 pts)	0.00000000 Hz Swept Span Zero Span Full Span Start Freq 2.437000000 GHz Stop Freq 2.437000000 GHz CF Step 8.000000 MHz Auto	

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## 6.2. 6 dB BANDWIDTH

#### <u>LIMITS</u>

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

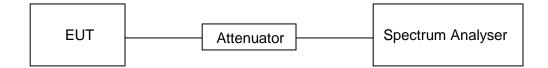
#### TEST PROCEDURE

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
IBBW/	For 6 dB Bandwidth :100K For 99% Bandwidth :1% to 5% of the occupied bandwidth
VBW	For 6dB Bandwidth : ≥3 × RBW For 99% Bandwidth : approximately 3×RBW
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



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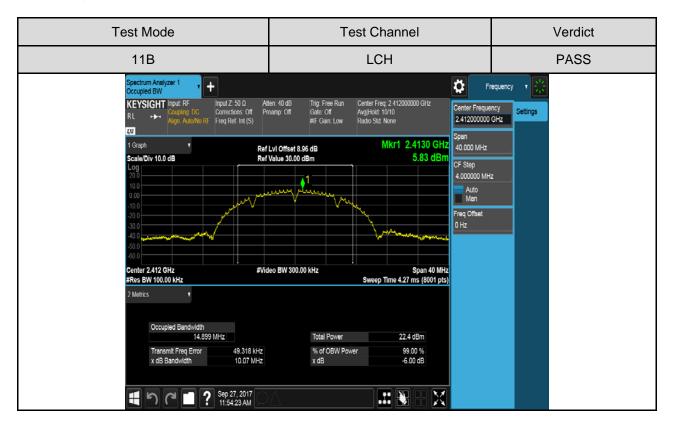
### **RESULTS**

Test Mode	Test Channel	6dB bandwidth (MHz)	Result
11B	LCH	10.07	Pass
	MCH	10.05	Pass
	HCH	10.05	Pass
11G	LCH	16.57	Pass
	MCH	16.57	Pass
	НСН	16.57	Pass
11N20SISO	LCH	17.79	Pass
	MCH	17.80	Pass
	НСН	17.81	Pass
11N40SISO	LCH	36.34	Pass
	MCH	36.36	Pass
	НСН	36.36	Pass

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### Test Graphs

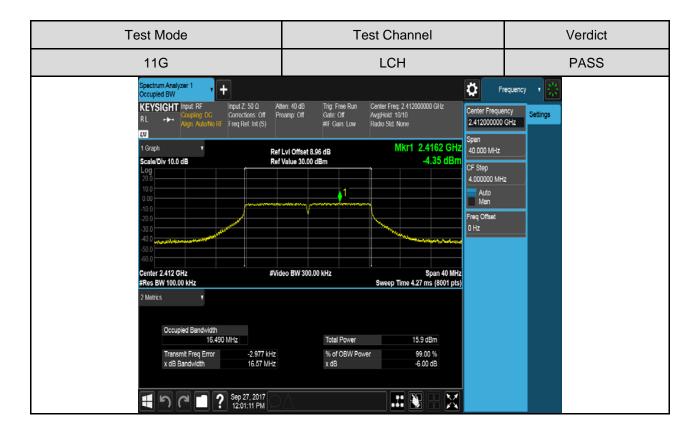




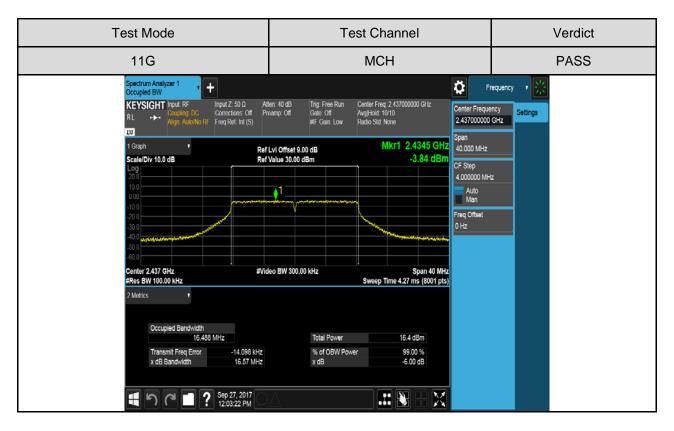
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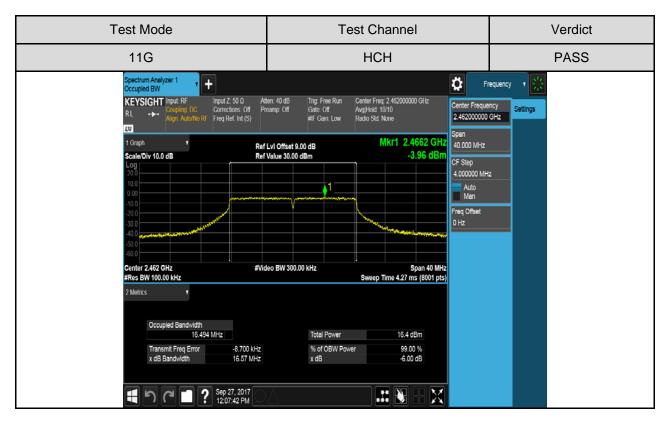
### DATE: Dec. 15, 2017



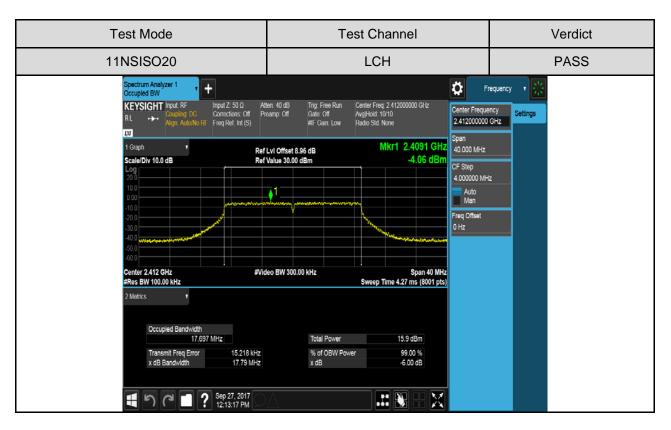


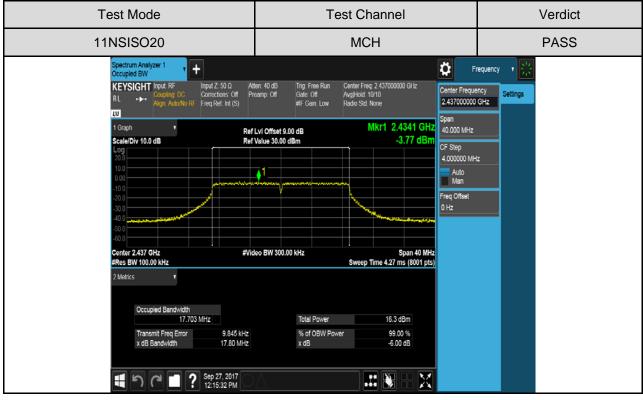
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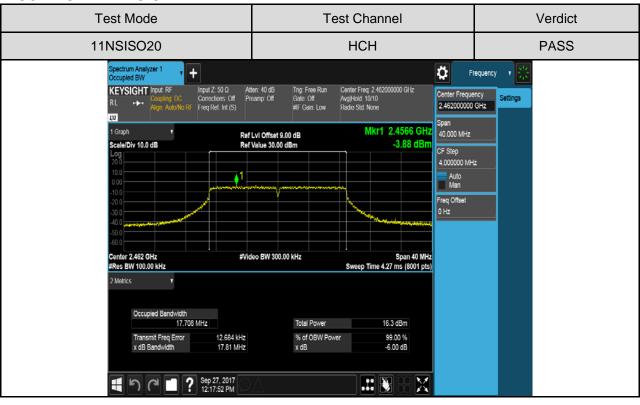
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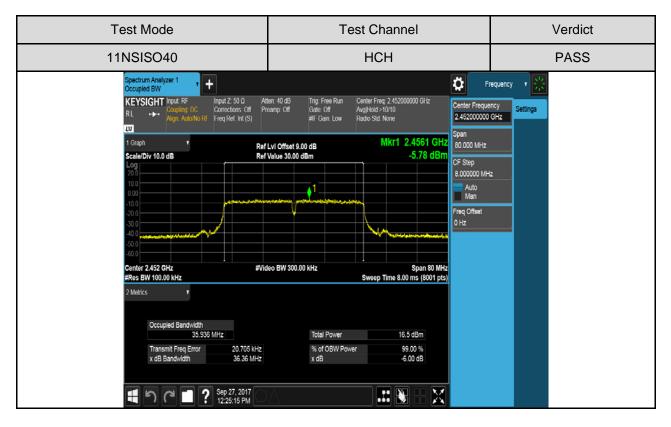
### DATE: Dec. 15, 2017





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# 6.3. PEAK CONDUCTED OUTPUT POWER

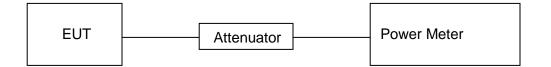
#### LIMITS

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



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<b>RESULTS</b>				
Test Mode	Test Channel	Maximum Peak Conducted Output Power(dBm)	EIRP (dBm)	Result
11B	LCH	18.24	21.24	Pass
	MCH	18.69	21.69	Pass
	HCH	18.62	21.62	Pass
11G	LCH	16.67	19.67	Pass
	MCH	17.15	20.15	Pass
	HCH	17.07	20.07	Pass
11N20SISO	LCH	16.9	19.9	Pass
	MCH	17.33	20.33	Pass
	HCH	17.31	20.31	Pass
11N40SISO	LCH	17.36	20.36	Pass
	MCH	17.46	20.46	Pass
	HCH	17.5	20.5	Pass

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# 6.4. POWER SPECTRAL DENSITY

#### <u>LIMITS</u>

FCC Part15 (15.247) , Subpart C					
Section Test Item Limit Frequency Range (MHz)					
FCC §15.247 (e)Power Spectral Density8 dBm in any 3 kHz band2400-2483.5					

#### TEST PROCEDURE

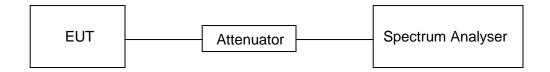
Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test	
Detector	Peak	
RBW	3 kHz ≤ RBW ≤100 kHz	
VBW	≥3 × RBW	
Span	1.5 x 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



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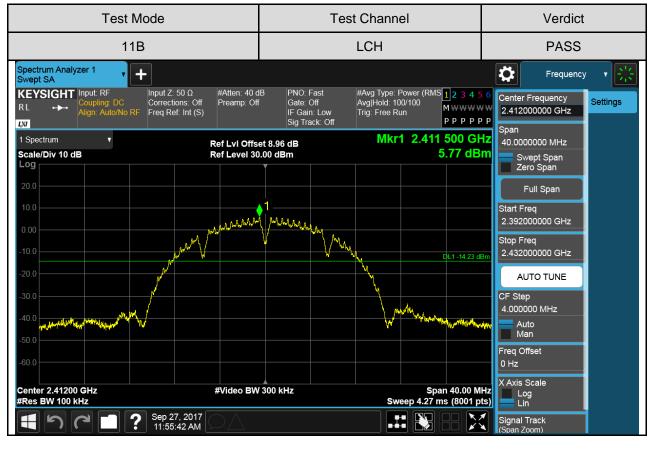
### **RESULTS**

Test Mode	Test Channel	Maximum Peak power spectral density (dBm)	Result
11B	LCH	5.77	Pass
	MCH	6.23	Pass
	HCH	6.23	Pass
11G	LCH	-4.29	Pass
	MCH	-3.86	Pass
	HCH	-3.93	Pass
11N20SISO	LCH	-4.13	Pass
	MCH	-3.58	Pass
	НСН	-3.54	Pass
11N40SISO	LCH	-6.02	Pass
	MCH	-5.95	Pass
	НСН	-6.05	Pass

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### Test Graphs:

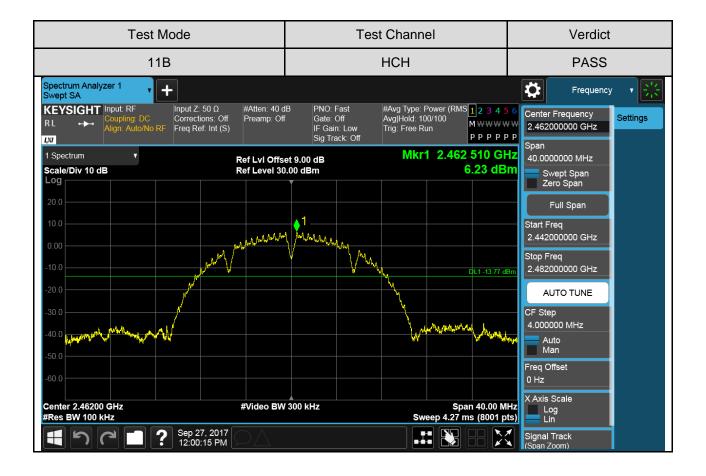


Test Mode	Test Channel	Verdict
11B	MCH	PASS

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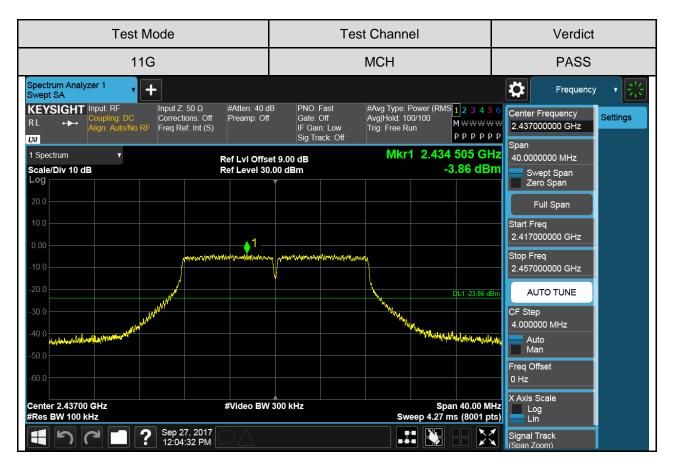
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### DATE: Dec. 15, 2017

Test Mode		Tes	t Channel	Verdict
11G			LCH	PASS
Spectrum Analyzer 1				Frequency v 🔆
KEYSIGHT         Input: RF         Input: Z: 50 Ω           R L         →         Coupling: DC         Corrections:           Align: Auto/No RF         Freq Ref: Int	Off Preamp: Off	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	#Avg Type: Power (RMS 1 2 3 4           Avg]Hold: 100/100           Trig: Free Run           P P P P	2.412000000 GHz
1 Spectrum   Scale/Div 10 dB Log	Ref LvI Offset Ref Level 30.0		Mkr1 2.416 145 G -4.29 dE	HZ 40.0000000 MHz
20.0				Full Span
0.00		1		Start Freq 2.392000000 GHz
-10.0	an a		/my	Stop Freq 2.432000000 GHz
-20.0			DL1-24.29 (	IBm AUTO TUNE
-30.0			Mining and a second and a secon	4.000000 MHz
-50.0			a state of the second sec	Man
-60.0				Freq Offset 0 Hz
Center 2.41200 GHz #Res BW 100 kHz	#Video BW 3	800 kHz	Span 40.00 M Sweep 4.27 ms (8001 )	
E 5 C 5 Sep 27, 20 12:02:29 F				Signal Track (Span Zoom)

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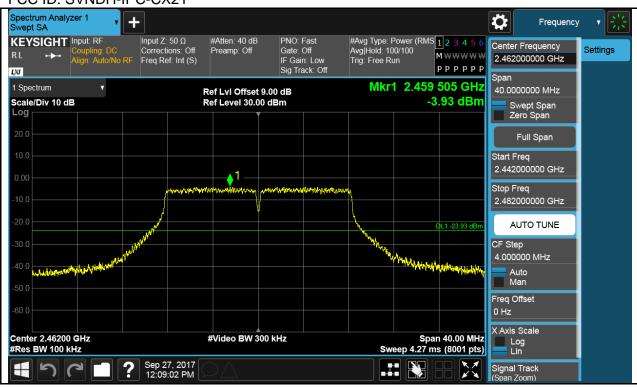
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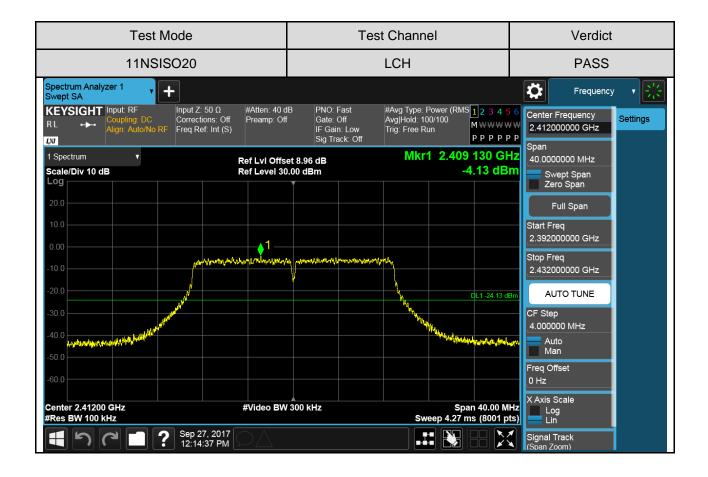


Test Mode	Test Channel	Verdict	
11G	НСН	PASS	

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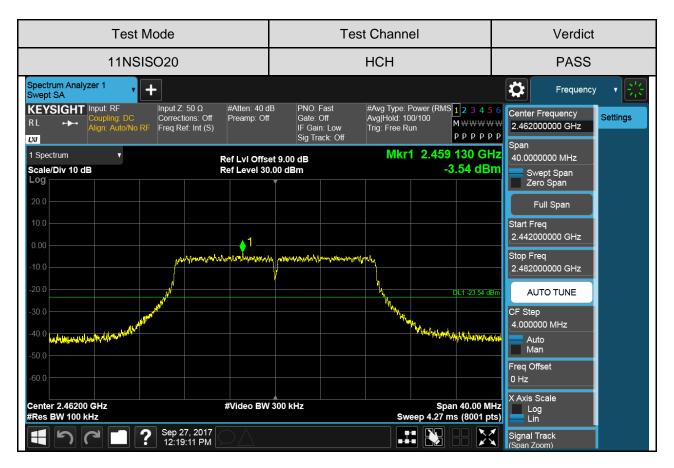
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### DATE: Dec. 15, 2017

Test M	lode	Tes	st Channel	Verdict
11NSIS	SO20		MCH	PASS
Spectrum Analyzer 1 Swept SA	+			Frequency v 🔆
KEYSIGHT       Input: RF         R L       ↔         Align: Auto/No RF	Input Z: 50 Ω #Atten: 40 c Corrections: Off Preamp: Of Freq Ref: Int (S)		#Avg Type: Power (RMS 1 2 3 4 5 Avg Hold: 100/100 Trig: Free Run P P P P F	W 2.437000000 GHz
1 Spectrum v Scale/Div 10 dB Log	Ref LvI Offs Ref Level 30		Mkr1 2.434 120 GH -3.58 dB	Z 40.0000000 MHz
20.0				Full Span Start Freq
-10.0		by whiteways and a second	here	2.417000000 GHz Stop Freq 2.457000000 GHz
-20.0			DL1-23.58 dl	
-30.0 -40.0			The second	CF Step 4.000000 MHz 4.000000 MHz Man
-50.0				Freq Offset 0 Hz
Center 2.43700 GHz #Res BW 100 kHz	#Video BW	/ 300 kHz	Span 40.00 M Sweep 4.27 ms (8001 p	
4 h C l ?	Sep 27, 2017 12:16:42 PM			Signal Track (Span Zoom)

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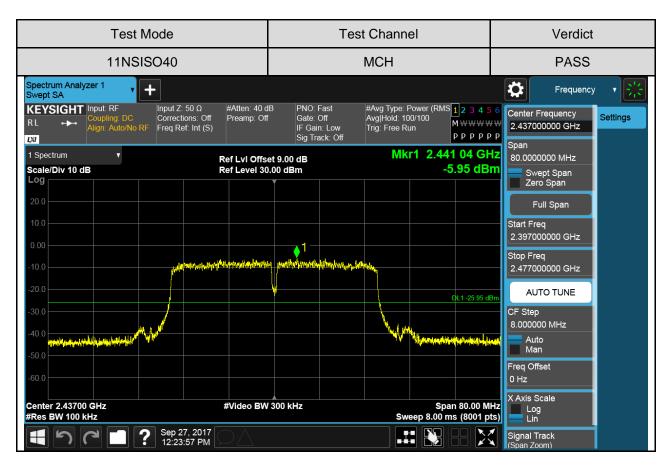
Test Mode	Test Channel	Verdict
11NSISO40	LCH	PASS

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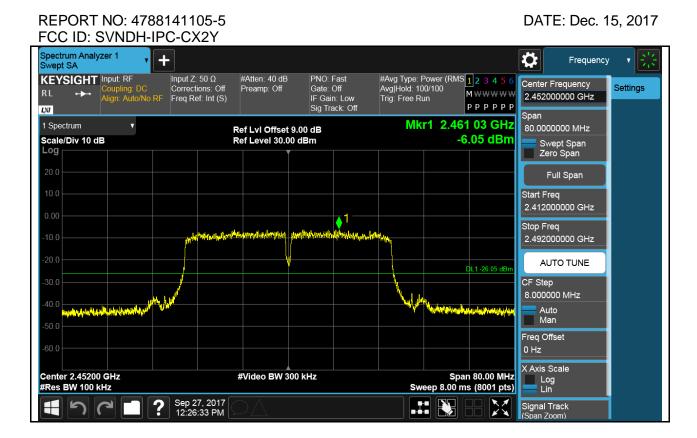
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Test Mode	Test Channel	Verdict
11NSISO40	НСН	PASS

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# 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	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

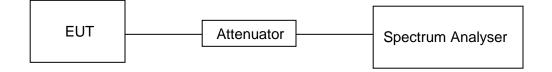
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Use the peak marker function to determine the maximum PSD level.

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

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

#### TEST SETUP



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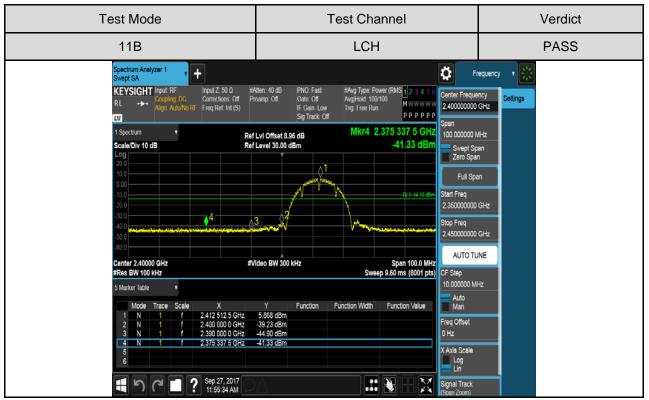
#### Part I :Conducted Bandedge

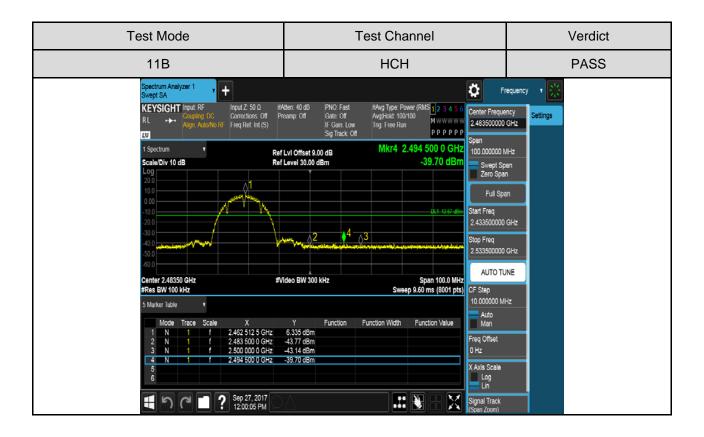
#### RESULTS TABLE

Test Mode	Test Channel	Carrier Power[dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Verdict
11B	2412	5.868	-41.325	-14.13	PASS
11B	2462	6.335	-39.697	-13.67	PASS
11G	2412	-4.311	-41.731	-24.31	PASS
11G	2462	-3.966	-40.988	-23.97	PASS
11N20SISO	2412	-4.461	-41.233	-24.46	PASS
11N20SISO	2462	-3.471	-40.712	-23.47	PASS
11N40SISO	2422	-5.882	-41.199	-25.88	PASS
11N40SISO	2452	-5.982	-39.779	-25.98	PASS

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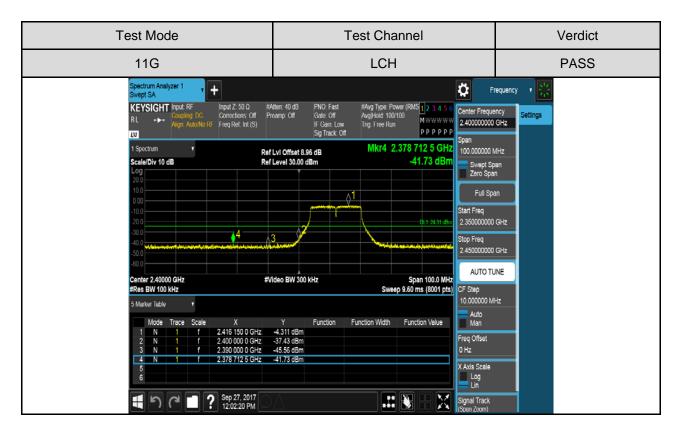
#### **TEST GRAPHS**

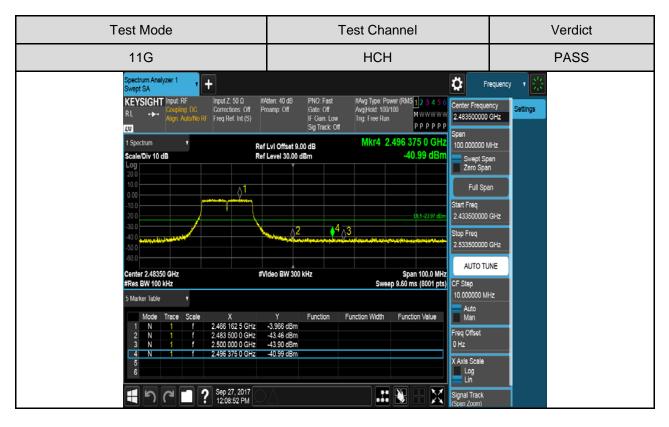




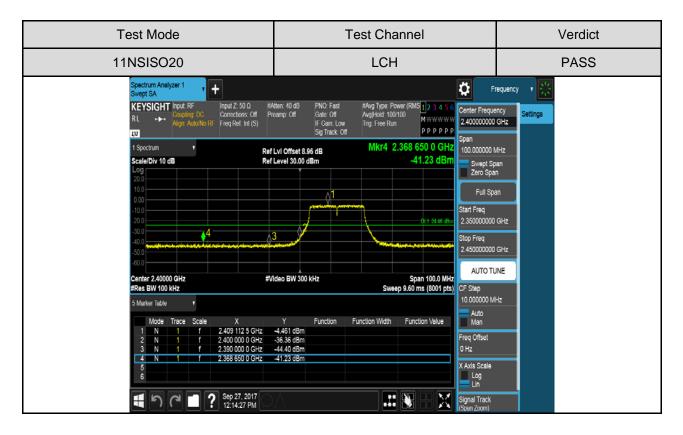
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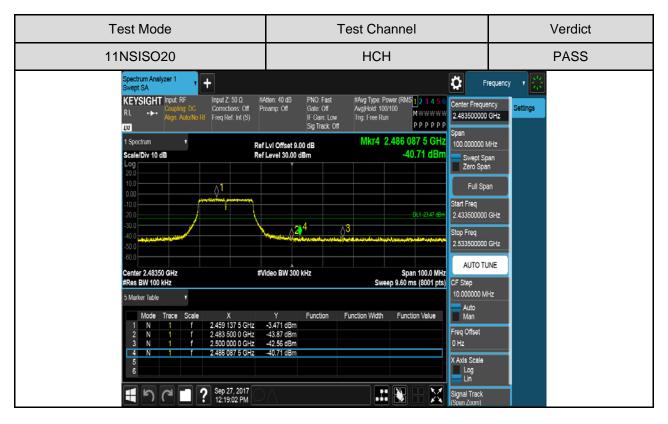
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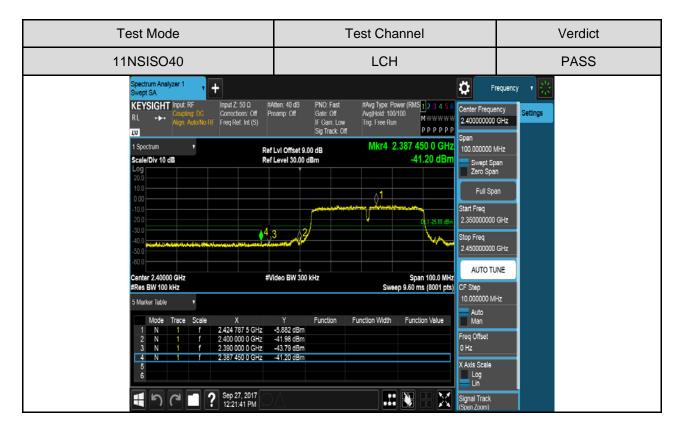


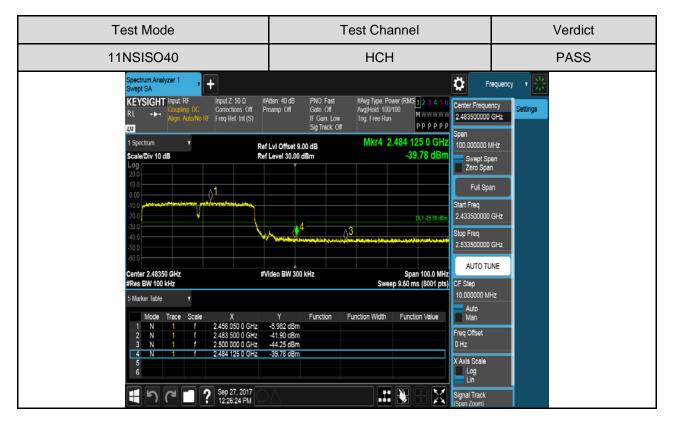
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## Part II :Conducted Emission

Test Re	sult T	able
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Test Mode	Channel	Pref(dBm)	Puw(dBm)	Verdict
11B	LCH	5.77	<limit< td=""><td>PASS</td></limit<>	PASS
	MCH	6.234	<limit< td=""><td>PASS</td></limit<>	PASS
	НСН	6.229	<limit< td=""><td>PASS</td></limit<>	PASS
11G	LCH	-4.292	<limit< td=""><td>PASS</td></limit<>	PASS
	MCH	-3.858	<limit< td=""><td>PASS</td></limit<>	PASS
	HCH	-3.93	<limit< td=""><td>PASS</td></limit<>	PASS
11NSISO20	LCH	-4.126	<limit< td=""><td>PASS</td></limit<>	PASS
	MCH	-3.576	<limit< td=""><td>PASS</td></limit<>	PASS
	HCH	-3.543	<limit< td=""><td>PASS</td></limit<>	PASS
11NSISO40	LCH	-6.016	<limit< td=""><td>PASS</td></limit<>	PASS
	MCH	-5.953	<limit< td=""><td>PASS</td></limit<>	PASS
	HCH	-6.05	<limit< td=""><td>PASS</td></limit<>	PASS

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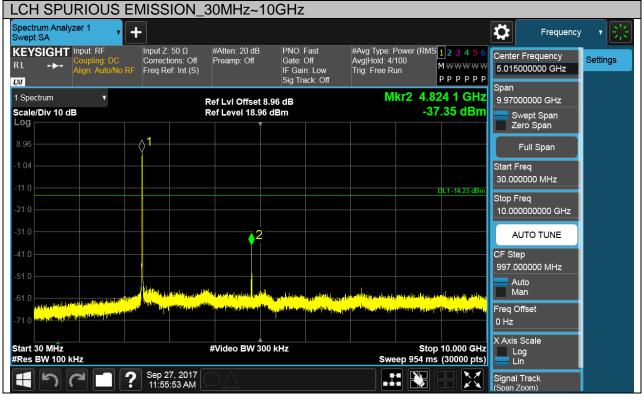
Test Mode	Channel	Verdict	
11B	LCH	PASS	

Pref test Plot



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Puw test Plot



# DATE: Dec. 15, 2017

#### LCH SPURIOUS EMISSION\_10GHz~26GHz Spectrum Analyzer 1 Swept SA + Ö Frequency #Avg Type: Power (RMS 1 2 3 4 5 6 Avg|Hold: 2/100 Input Z: 50 Ω #Atten: 20 dB PNO: Fast KEYSIGHT Input: RF Center Frequency Corrections: Off Preamp: Off Gate: Off Settings RL M₩₩₩₩₩ 18.000000000 GHz Align: Auto/No RF Freq Ref: Int (S) IF Gain: Low Trig: Free Run рррррр L)XI Sig Track: Off Span Mkr1 25.917 3 GHz 1 Spectrum 16.0000000 GHz Ref LvI Offset 8.96 dB -53.37 dBm Scale/Div 10 dB Ref Level 18.96 dBm Swept Span Zero Span Log 8.96 Full Span Start Freq 10.00000000 GHz DL1 -14.23 dBr Stop Freq 26.000000000 GHz AUTO TUNE CF Step 1.600000000 GHz Auto Man Freq Offset 0 Hz X Axis Scale #Video BW 300 kHz Start 10.000 GHz Stop 26.000 GHz Log Lin #Res BW 100 kHz Sweep 1.53 s (30000 pts) C ? Sep 27, 2017 11:56:02 AM 5 Signal Track

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Test Mode	Channel	Verdict
11B	MCH	PASS

Pref test Plot



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Puw test Plot



#### MCH SPURIOUS EMISSION\_10GHz~26GHz Spectrum Analyzer 1 Swept SA + Ö Frequency #Avg Type: Power (RMS 1 2 3 4 5 6 Avg|Hold: 2/100 Input Z: 50 Ω #Atten: 20 dB PNO: Fast KEYSIGHT Input: RF Center Frequency Corrections: Off Preamp: Off Gate: Off Settings RL M₩₩₩₩₩ 18.000000000 GHz Align: Auto/No RF Freq Ref: Int (S) IF Gain: Low Trig: Free Run рррррр L)XI Sig Track: Off Span Mkr1 25.788 8 GHz 1 Spectrum 16.0000000 GHz Ref LvI Offset 9.00 dB -54.86 dBm Scale/Div 10 dB Ref Level 19.00 dBm Swept Span Zero Span Log Full Span Start Freq 10.00000000 GHz L1 -13.77 dB Stop Freq 26.000000000 GHz AUTO TUNE CF Step 1.600000000 GHz Auto Man Freq Offset 0 Hz X Axis Scale Start 10.000 GHz #Video BW 300 kHz Stop 26.000 GHz Log Lin #Res BW 100 kHz Sweep 1.53 s (30000 pts) P ? Sep 27, 2017 11:58:20 AM 5 Signal Track

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Test Mode	Channel	Verdict
11B	HCH	PASS

Pref test Plot



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