

## FCC 47 CFR PART 15 SUBPART C

## **CERTIFICATION TEST REPORT**

For

## **CONSUMER CAMERA**

## MODEL NUMBER: IPC-F46FEP-D

### ADDITIONAL MODEL NUMBER: IPC-F46FEP-0280B-imou; IPC-F46FEP-0360B-imou; IPC-F46FEN-0280B-imou; IPC-F46FEN-0360B-imou; IPC-F46FEP-imou; IPC-F46FEN-imou; IPC-F46FEP; IPC-F46FEN

## PROJECT NUMBER: 4790350226-3

### REPORT NUMBER: 4790350226-3-1

## FCC ID: 2AVYF-IPC-F46FE-D

## **ISSUE DATE: May. 18, 2022**

Prepared for

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Prepared by

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### **Revision History**

Rev.	Issue Date	Revisions	Revised By
V0	05/18/2022	Initial Issue	



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# **1. ATTESTATION OF TEST RESULTS**

### **Applicant Information**

Company Name: Address:	Hangzhou Huacheng Network Technology Co., Ltd No.2930, Nanhuan Road, Binjiang District, Hangzhou, China
Manufacturer Information	No.2000, Numitan Koad, Dinjiang District, Hangzhou, Omna
Company Name:	Hangzhou Huacheng Network Technology Co., Ltd
Address:	No.2930, Nanhuan Road, Binjiang District, Hangzhou, China
EUT Description	
Product Name:	CONSUMER CAMERA
Model Name:	IPC-F46FEP-D
Additional No.:	IPC-F46FEP-0280B-imou; IPC-F46FEP-0360B-imou;
	IPC-F46FEN-0280B-imou; IPC-F46FEN-0360B-imou;
	IPC-F46FEP-imou; IPC-F46FEN-imou; IPC-F46FEP; IPC-F46FEN
Model Difference:	Their electrical circuit design, layout, components used and internal
	wiring are identical, only the color and model name is different.
	The model IPC-F46FEP-D was selected as the representative
	model for compliance test.
Sample Number:	4807748
Data of Receipt Sample:	Mar. 29, 2022
Date Tested:	Mar. 29, 2022 ~ May. 17, 2022

### APPLICABLE STANDARDS

STANDARD	TEST RESULTS				
CFR 47 Part 15 Subpart C	PASS				



Summary of Test Results						
Clause	Test Items	FCC Rules	Test Results			
1	6db DTS Bandwidth	FCC 15.247 (a) (2)	Complied			
2	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 FCC 15.247 (d) Emission FCC 15.209 FCC 15.205						
6	Conducted Emission Test for AC Power Port	FCC 15.207	Complied			
7	Antenna Requirement	FCC 15.203	Complied			
Remark: The measurement result for the sample received is <pass> according to &lt; ANSI C63.10-2013,</pass>						

FCC CFR 47 Part 2, FCC CFR 47 Part 15C > when <Accuracy Method> decision rule is applied.

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# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

# 3. FACILITIES AND ACCREDITATION

Test Location	UL-CCIC Company Limited, EMC&RF Lab
Address	No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, China
Accreditation Certificate	A2LA (Certificate No.: 4829.01) UL-CCIC COMPANY LIMITED has been assessed and proved to be in compliance with A2LA. FCC (FCC Designation No.: CN1247) UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules. IC (IC Designation No.: 25056; CAB No.: CN0073) UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.

Note 1: All tests measurement facilities use to collect the measurement data are located at No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, People's Republic of China

Note 2: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. These measurements below 30MHz had been correlated to measurements performed on an OFS based on KDB 414788.

Note 3: The test anechoic chamber in UL-CCIC COMPANY LIMITED had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.



# 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		
Conduction emission	3.1dB		
Radiation Emission test (include Fundamental emission) (9kHz-30MHz)	3.4dB		
Radiation Emission test (include Fundamental emission) (30MHz-1GHz)	3.4dB		
Radiation Emission test (1GHz to 26GHz) (include Fundamental emission)	3.9dB (1GHz-18Gz)		
	4.2dB (18GHz-26.5Gz)		
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-F46FEP-D
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 (BPSK, QPSK, 16QAM, 64QAM)) IEEE for 802.11N(HT20 and HT40): OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channels Step:	Channels with 5MHz step
Test software of EUT:	SecureCRT (manufacturer declare)
Antenna Type:	Rod Antenna
Antenna Gain:	Antenna1: 1.79 dBi Antenna2: 1.79 dBi
	Remark: This data is provided by customer and our lab isn't responsible for this data



## 5.2. MAXIMUM OUTPUT POWER

Number of Transmit Chains	IEE Std. 802.11	Channel Number	Max AV Conducted Power (dBm)			
(NTX)			Ant 1	Ant2	Total	
1	IEEE 802.11b	1-11[11]	13.09	/	/	
1	IEEE 802.11g	1-11[11]	13.43	/	/	
1/2	IEEE 802.11n HT20	1-11[11]	12.68	12.57	15.64	
1/2	IEEE 802.11n HT40	3-9[7]	12.94	12.93	15.95	

## 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	4	2427	7	2442	10	2457	
2	2417	5	2432	8	2447	11	2462	
3	2422	6	2437	9	2452			

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	
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Test Mode	Test Channel	Frequency
WiFi TX (802.11b)	CH1, CH6, CH11	2412MHz, 2437MHz, 2462MHz
WiFi TX (802.11g)	CH1, CH6, CH11	2412MHz, 2437MHz, 2462MHz
WiFi TX (802.11n HT20)	CH1, CH6, CH11	2412MHz, 2437MHz, 2462MHz
WiFi TX (802.11n HT40)	CH3, CH6, CH9	2422MHz, 2437MHz, 2452MHz

## 5.5. THE WORSE CASE POWER SETTING PARAMETER

The V	The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band							
Test Softw	Test Software Secure				re CRT			
	Transmit			Test C	Channel			
Modulation Mode	Antenna	1	NCB: 20MH	lz	NCB: 40MHz			
Mode	Number	CH 1	CH 6	CH 11	CH 3	CH 6	CH 9	
802.11b	1	default	default	default				
802.11g	1	default	default	default	] /			
802.11n HT20	1/2	default	default	default				
802.11n HT40	1/2		/ default default default				default	



## 5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)	Directional gain(dBi)
1	2400-2483.5	Rod Antenna	1.79	4.9
2	2400-2483.5	Rod Antenna	1.79	4.8

Note:

1) Directional gain=  $10\log [(10^{G1/20} + 10^{G2/20})^2/N_{ANT}] = 4.8 \text{ dBi}$ 

2)  $N_{ANT}$ : the number of Antenna

3) For this product, it has two antennas, antenna1 and antenna2, but only the 802.11N HT20 and 802.11N HT40 modes can support both the SISO and MIMO technical. For the modes of 11B&11G only the antenna1 is working.

Test Mode	Transmit and Receive Mode	Description
IEEE 802.11b	⊠1TX, 1RX	Antenna1 can be used as transmitting/receiving antenna independently.
IEEE 802.11g	⊠1TX, 1RX	Antenna1 can be used as transmitting/receiving antenna independently.
IEEE 802.11N (HT20) MIMO	⊠2TX, 2RX	Antenna1 or Antenna2 can be used as transmitting/receiving antenna independently.
IEEE 802.11N (HT20) MIMO	⊠2TX, 2RX	Antenna1 or Antenna2 can be used as transmitting/receiving antenna independently.

Remark:

- For this product, it has two antennas, antenna1 and antenna2, only the 802.11N HT20 and 802.11N HT40 modes can support both the SISO and MIMO technical. For the modes of 11B&11G only the antenna1 is working.
- 2) For the 11N mode (including the 11N HT20 SISO,11N HT20 MIMO,11N HT40 SISO,11N HT40 MIMO), pre-testing all test modes, only the worst case modes is included in this report.

## 5.7. THE WORSE CASE CONFIGURATIONS

For the product, there two transmission antennas, and pre-testing both of them, only the worse data for the antenna is recorded in the report.

Worst-case data rates as provided by the client were:

802.11b mode: 1 Mbps 802.11g mode: 6 Mbps 802.11n HT20 mode: MCS0 802.11n HT40 mode: MCS0



## 5.8. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests		
Relative Humidity	55 ~ 65%		
Atmospheric Pressure:	101kPa		
Temperature	TN	21 ~ 28°C	
	VL	N/A	
Voltage:	VN	AC 120V	
	VH	N/A	

Note: VL= Lower Extreme Test Voltage VN= Nominal Voltage VH= Upper Extreme Test Voltage TN= Normal Temperature



# 5.9. DESCRIPTION OF TEST SETUP

#### SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Description
1	Laptop	ThinkPad	E550c	N/A
2	Fixed Frequency Board	N/A	N/A	Supply by UL Lab
3	Adaptor	HONOTO	ADS-12AM-12 12012EPCU	INPUT: 100-240V~50/60Hz Max. 0.3A OUTPUT: 12.0V-1.0A

### I/O PORT

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	USB	USB to TTL	100cm Length (Supply by UL Lab)	/
2	RJ45	RJ45	LAN Cable	100cm Length (Supply by UL Lab)	/

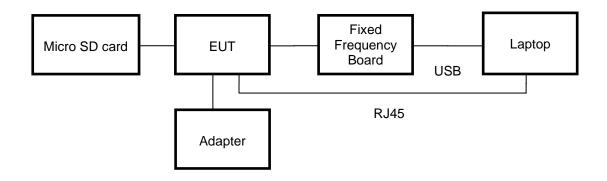
### ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	Micro SD card	Sandisk	A1	32GB

### TEST SETUP

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

### SETUP DIAGRAM FOR TESTS





## 5.10. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions (Instrument)									
Used	Equipment	Manufacturer	Mo	del No.	Seri	al No.	Upper Last Cal.	Last Cal.	Next Cal.
$\checkmark$	EMI Test Receiver	R&S	E	ESR3		6700	2020-12-05	2021-12-04	2022-12-03
$\checkmark$	Two-Line V-Network	R&S	E١	V216	12	6701	2020-12-05	2021-12-04	2022-12-03
V	Artificial Mains Networks	R&S	E	NY81	12	6711	2020-10-13	2021-10-12	2022-10-11
				Soft	ware				
Used	Des	cription		Ma	inufac	turer	Name	Version	
$\checkmark$	Test Software for (	Conducted distur	bance		R&S	5	EMC32	Ver. 9.25	
		Ra	diate	d Emissi	ions (	Instrum	nent)		
Used	Equipment	Manufacturer	Mo	del No.	Seri	al No.	Upper Last Cal.	Last Cal.	Next Cal.
$\checkmark$	Spectrum Analyzer	Keysight	NS	9010B	15	5727	2021-05-09	2022-04-09	2023-04-08
$\checkmark$	EMI test receiver	R&S	E	SR26	12	6703	2020-12-05	2021-12-04	2022-12-03
$\checkmark$	Receiver Antenna (9kHz-30MHz)	Schwarzbeck	FMZ	ZB 1513	15	5456	2018-06-15	2021-06-03	2022-06-02
$\checkmark$	Receiver Antenna (30MHz-1GHz)	SunAR RF Motion		JB1	17	7821	2019-01-19	2022-01-18	2025-01-17
$\checkmark$	Receiver Antenna (1GHz-18GHz)	R&S	Н	F907	12	6705	2019-01-27	2022-02-28	2025-02-27
$\checkmark$	Receiver Antenna (18GHz-26.5GHz)	Schwarzbeck	BBHA9170		12	6706	2019-02-29	2022-02-28	2025-02-27
	Pre-amplification (To 18GHz)	Compliance Direction System Inc.	PAP-1G18-50		17	7825	2021-03-26	2022-03-01	2023-02-28
$\checkmark$	Pre-amplification (To 26.5GHz)	R&S	SC	U-26D	13	5391	2020-12-05	2021-12-04	2022-12-03
	Band Reject Filter	Wainwright	235 2483.	RCJV8- 0-2400- 5-2533.5- I0SS		1	2021-05-09	2022-05-08	2023-05-07
V	Highpass Filter	Wainwright	270	IKX10- 0-3000- 00-40SS		2	2021-05-09	2022-05-08	2023-05-07
				Soft	ware				
Used		ription		Manufac			Name	Version	
$\checkmark$	Test Software for R	adiated disturbar		Tonsce			TS+	Ver. 2.5	
	Other instruments								
Used	Equipment	Manufacturer	Model No.		Seri	al No.	Upper Last Cal.	Last Cal.	Next Cal.
$\checkmark$	Spectrum Analyzer	Keysight	NS	9010B	15	5368	2021-05-09	2022-04-09	2023-04-08
$\checkmark$	Power Meter	Keysight	U2	021XA	15	5370	2021-05-09	2022-04-09	2023-04-08



# 6. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6dB Bandwidth and 99% Bandwidth	KDB 558074 D01 15.247 Meas Guidance v05r02	8.2
2	Conducted Output Power	KDB 558074 D01 15.247 Meas Guidance v05r02	8.3.2.3 (Method AVG PM)
3	Power Spectral Density	KDB 558074 D01 15.247 Meas Guidance v05r02	8.4 (Method PK PSD)
4	Out-of-band emissions in non-restricted bands	KDB 558074 D01 15.247 Meas Guidance v05r02	8.5
5	Out-of-band emissions in restricted bands	KDB 558074 D01 15.247 Meas Guidance v05r02	8.6
6	Band-edge	KDB 558074 D01 15.247 Meas Guidance v05r02	8.7
7	Conducted Emission Test for AC Power Port	ANSI C63.10-2013	6.2



# 7. ANTENNA PORT TEST RESULTS

## 7.1. ON TIME AND DUTY CYCLE

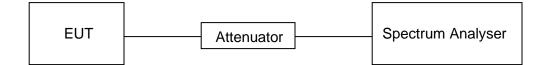
### <u>LIMITS</u>

None; for reporting purposes only

### PROCEDURE

FCC KDB 558074 Zero-Span Spectrum Analyzer Method

#### TEST SETUP



#### TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

#### **RESULTS**

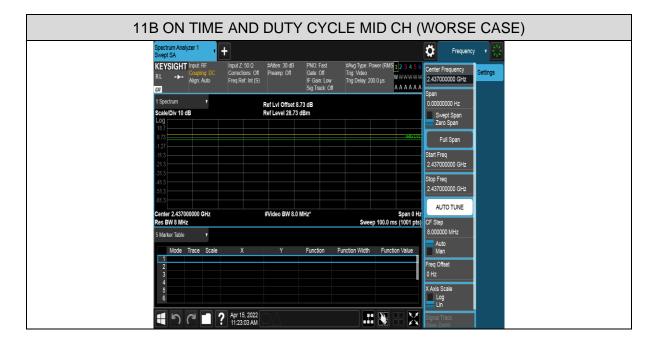
Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	1/T Minimum VBW (kHz)
11B	100	100	1	100	0	0.01
11G	100	100	1	100	0	0.01
11N HT20	100	100	1	100	0	0.01
11N HT40	100	100	1	100	0	0.01

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

- 2) Where: x is Duty Cycle (Linear)
- 3) Where: T is On Time (transmit duration)
- 4) Pre-testing Antenna 1 and Antenna 2, and pre-testing SISO and MIMO modes, only the data of worse case is shown in this test repot.



### **TEST GRAPHS**







11N HT20 ON T	IME AND DUTY C	YCLE MID CH	(WORSE CASE)
	+	#Avg Type: Power (RMS 1 2 3 4 5 6	
KEYSIGHT Input RF RL →→ Coupling DC Align: Auto	Corrections: Off Preamp: Off Gate: Off Freq Ref. Int (S) IF Gain: Low Sig Track: Off	Trig Delay: 200.0 µs	ter Frequency 37000000 GHz Settings
1 Spectrum v Scale/Div 10 dB	Ref LvI Offset 8.73 dB Ref Level 28.73 dBm		n 00000000 Hz Swept Span
Log 18.7 8.73			Zero Span Full Span
-1.27 -11.3 -21.3			t Freq 3700000 GHz
31.3 41.3 51.3			p Freq 37000000 GHz
-61.3 Center 2.437000000 GHz Res BW 3 MHz	#Video BW 8.0 MHz*	Span 0 Hz Sweep 100.0 ms (1001 pts) CF S	AUTO TUNE Siso
5 Marker Table • Mode Trace Scale	X Y Function		00000 MHz Auto Man
			q Offset
4 5 6			xis Scale Log Lin
<b>↓</b> して	P Apr 15, 2022 11:47:13 AM		nal Track an Zoom)

11N HT40 ON TIME AND DUTY CYCLE MID C	CH (WORSE CASE)
Spectrum Analyzer 1 Swept SA     +       KEYSIGHT input RF RL     Input Z 50 Ω Align Auto     #Atten: 30 dB Correctors: Off Preag Ref Int (S)     PNO: Fast Gate: Off Freag Ref Int (S)     #Atten: 30 dB Gate: Off So Tack Coff     PNO: Fast Tag: Video	2.43700000 GHz
Evaluation     Y     Ref Lvi Offset 8.73 dB       Scale/Div 10 dB     Ref Level 28.73 dBm       Log     18.7	Span 0.00000000 Hz Swept Span Zero Span
873	Full Span Start Freq 2.43700000 GHz Stop Freq
4.13 5.13 6.13 Center 2.437000000 GHz #Video BW 8.0 MHz* Span 0 H Res BW 8 MHz Sweep 100.0 ms 1001 pt	2.437000000 GHz AUTO TUNE
5 Marker Table  Mode Trace Scale X Y Function Violath Function Value	8 000000 MHz Auto Man Freq Offset
2 3 4 5 6	VAvis Scale
📲 🦳 🍽 💽 Apr 15,2022	Singal Track



## 7.2. 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

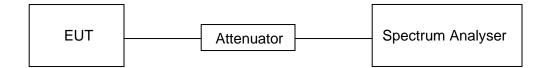
#### TEST PROCEDURE

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

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	100 kHz
VBW	≥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





### TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

#### **RESULTS**

Test Mode	Test Antenna	Test Channel	6dB bandwidth (MHz)	Result
		LCH	10.08	Pass
11B	Antenna 1	MCH	9.60	Pass
		HCH	10.04	Pass
		LCH	16.52	Pass
11G	Antenna 1	MCH	16.52	Pass
		HCH	16.52	Pass
		LCH	17.76	Pass
	Antenna 1	MCH	17.72	Pass
11N20 MIMO		HCH	17.72	Pass
		LCH	17.72	Pass
	Antenna 2	MCH	17.68	Pass
		HCH	17.76	Pass
		LCH	36.40	Pass
	Antenna 1	MCH	36.40	Pass
11N40 MIMO		HCH	36.40	Pass
		LCH	36.40	Pass
	Antenna 2	MCH	36.32	Pass
		HCH	36.40	Pass

Remark:

1) For this product, it has two antennas, antenna 1 and antenna 2, but only the 802.11N HT20 and 802.11N HT40 modes can support both the SISO and MIMO technical. But for the modes of 11B &11G, only the antenna 1 is working.

2) Through pre-testing all the test modes of 11N 20 and 11N40, including SISO and MIMO, but only the data if worse case is included in this test report.



### TEST GRAPHS

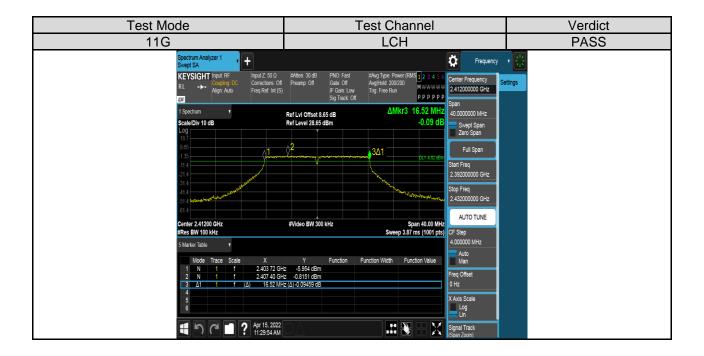
#### Antenna 1:







Test Mode		Т	est Chanr	nel	Verdict
11B			HCH		PASS
Spectrum Analyze Swept SA KEYSIGHT int RL →→ All			Trig: Free Run	2 3 4 5 6 WWWWW 2.45200000 GHz 9 P P P P Span	n 🐹
1 Spectrum Scale/Div 10 dB Log	•	Ref LvI Offset 8.73 dB Ref Level 28.73 dBm	ΔMkr3 10.	0.4 MHz 40.0000000 MHz 0.46 dB Swept Span Zero Span	
6 73 1 27 1 13 		2 Annon Annon Annon Anno Anno Anno Anno A		Full Span Start Freq 2.442000000 GHz	
313 413 413 453				Stop Freq 2.48200000 GHz	
Center 2.46200 #Res BW 100 kHz 5 Marker Table	,	#Video BW 300 kHz	Sweep 3.87 ms	40.00 MHz (1001 pts) CF Step 4.000000 MHz Auto	
1 N 1 2 N 1 3 <u>4</u>			Function Width Function	Freq Offset 0 Hz	
: • • • •	Apr 15, 2022 11:26:28 AM		.: N	X Axis Scale Log Lin Signal Track (Span Zoom)	



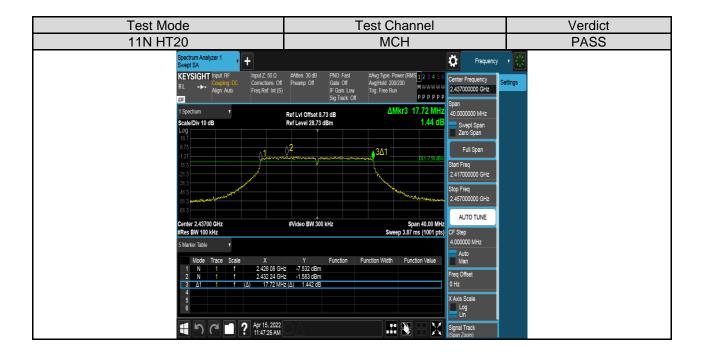


Test Mode	Test Channel	Verdict
11G	MCH	PASS
Spectrum Analyzer 1 ↓ + Swept SA KEYSIGHT Induit IP RL →→ Align Auto Competing DC Align Auto	) IF Gain: Low Trig: Free Run P P P P P P Sig Track: Off Span	۱ 🔀
1 Spectrum v Scale Div 10 dB Log	Ref Lvi Offset 8,73 dB         ΔMkr3         16.52 MHz         40.000000 MHz           Ref Level 28.73 dBm         -0.45 dB         Swept Span         Zero Span	
873 - 127 - 13	<u>2</u> Start Free Start Free	
213 313 413	2.41700000 GHz Stop Freq 2.45700000 GHz	
-513 -513 Center 2.43700 GHz #Res BW 100 KHz	#Video BW 300 kHz Span 40.00 MHz AUTO TUNE Sweep 3.87 ms (1001 pts) [CF Step	
s Marker Table • Marker Table •	Y Function Function Width Function Value Man	
2 N 1 f 2.434 48 G	iz _ 5.881 dBm •z0.8006 dBm •z _ Δ) =0.474 dB 0 Hz	
5	X Axis Scale Log Lin	
4 5 C <b>1</b> ? Apr 15, 2022	Signal Track (Span Zoom)	





Test Mode	Test Channel	Verdict
11N HT20	LCH	PASS
Spectrum Analyzer 1 ↓ + Swept SA KEYSIGHT Input RF RL →→ Align Auto Corrections Off Freq Ref Int (S)	IF Gain: Low Trig: Free Run 2.412000000 GHz Sig Track: Off PPPPP	tings
1 Spectrum v Scale/Div 10 dB	Ref Lvi Offset 8.65 dB         ΔMkr3         17.76         MHz 40.0000000 MHz         Span           Ref Level 28.65 dBm         0.08         dB         Swept Span         Zero Span	
865 -1.35 -1.14 -1.14	3Δ1 Full Span Start Freq 2.232000000 GHz	
314 414 514 	Stop Freq 2.43200000 GHz	
Center 2.41200 GHz #Res BW 100 KHz 5 Marker Table v Mode Trace Scale X	#Video BW 300 kHz Span 40.00 HHz Sweep 3.87 ms (1001 pts) CF Step 4 0000000 MHz Auto	
1 N 1 f 2.403 12 GH 2 N 1 f 2.409 08 GH 3 Δ1 f (Δ) 17.76 MH 4	iz -7.083 dBm iz -1.320 dBm Freq Offset iz (Δ) 0.07657 dB 0 Hz	
5 6 日 つ ご ? Apr 15, 2022 1140/35 AM	X Avis Scale La La La Signal Track Signal Track	





Test Mode	Test Channel	Verdict
11N HT20	НСН	PASS
Spectrum Analyzer 1     +       Swept SA     +       KEYSIGHT Input RF RL     +       Align Audo     Freq Ref Int (s)	#Atten: 30 dB         PNO: Fast.         #Avg Type Power (RMS 1 2 3 4 5 6 Avg/Hold 200200 IF Gant.Low         Center Frequency Avg/Hold 200200 IT free Run         MWWWWW P P P P P P         Scan           Sig Track: Off         Scan         Scan         Scan         Scan         Scan	• 🔀
1 Specifium   Scale/Div 10 dB Log 187	Ref Lvl Offset 8.73 dB         ΔMkr3 17.72 MHz         40.000000 MHz           Ref Level 28.73 dBm         0.85 dB         Swept Span           Zero Span         Zero Span	
	2 3Δ1 Full Span 1.1 4.55 den Staft Freq 2.44200000 GHz	
313 413 513	Stop Freq 2 43200000 GHz AUTO TUNE	
Center 2.45200 GHz #Res BW 100 kHz 5 Marker Table •	#Video BW 300 kHz Span 40.00 WHz Sweep 3.87 ms (1001 pts) CF Step 4 000000 MHz Auto	
2 N 1 f 2.456 60 GH	Y Function Function Width Function Value     Man     Z8.460 dBm     Z2.549 dBm     Z -2.549 dBm     O 18451 dB     O 142	
5	X Avis Scale	
4 5 C 1 ? Apr 15, 2022 11:54:06 AM	Signal Track (Span Zoom)	





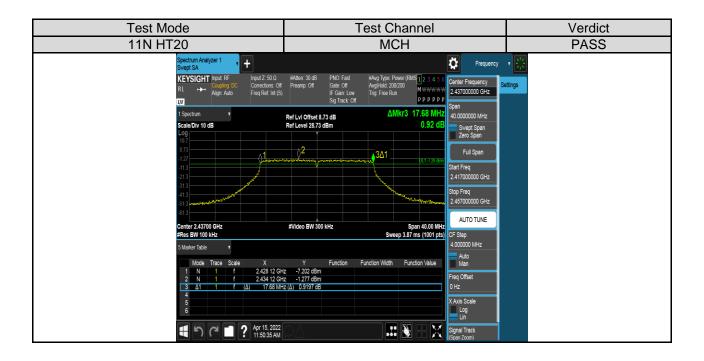
Test Mode	Test Channel	Verdict
11N HT40	MCH	PASS
Spectrum Analyzer 1  Swept SA KEYSIGHT Input RF RL →→ Align: Auto EX	IF Gain Low Trig: Free Run P P P P P P Soan Soan Soan	• 😿
1 Spectrum V Scale/Div 10 dB Log	Ref Lvl Offset 8.73 dB         ΔMkr3 36.40 MHz         60.000000 MHz           Ref Level 28.73 dBm         1.30 dB         Swept Span           Zero Span         Zero Span         Zero Span	
873 -127 -113	2 Full Span Start Freq	
213 313 413 513	2.33700000 GHz Stop Freq 2.47700000 GHz	
-61.3 Center 2.43700 GHz #Res BW 100 KHz	#Video BW 300 kHz Span 80.00 MHz Sweep 7.67 ms (1001 pts) [CF Step	
5 Marker Table v Mode Trace Scale X	Y Function Function Width Function Value 8.000000 MHz 4.00 Man 210.01 dBm	
2 N 1 f 2.429.24 G 3 Δ1 f (Δ) 36.40 M 4	z - 4.146 dBm Freq Offset z (Δ) - 1.297 dB 0 Hz	
	X Avis Scale Log Lin	
4 5 C 1 ? Apr 15, 2022 12:08:21 PM	Signal Track (Span Zoom)	





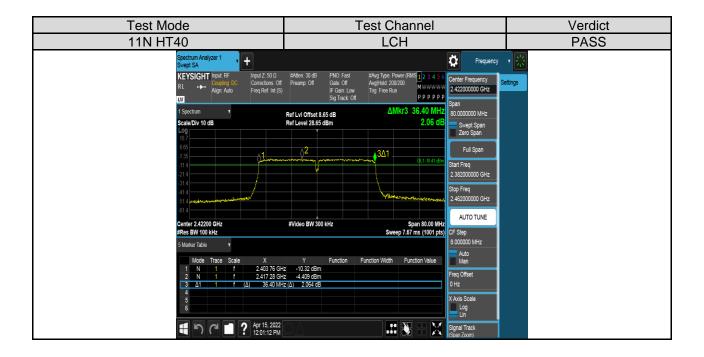
## Antenna 2:

Test Mode	Test Channel	Verdict
11N HT20	LCH	PASS
Spectrum Analyzer 1 ↓ + Swept SA KEYSIGHT Input RF RL →→ Align Auto RU	#Atten 30 dB PNO Fast #Avg Type: Power (RMS 1 2 3 4 5 6 Pleamp Of Gate Off AvgHold 200200 IF Gain Low Trg: Free Run P P P P P P 2	ttings
1 Spectrum   Scale/Div 10 dB Log 10	Ref Lvi Offset 8.65 dB         ΔMkr3         17.72 MHz         Span           Ref Level 28.65 dBm         -0.28 dB         Swept Span         Seen Span	
865 -135 -114 -214 -314	3Δ1     1.1 /21	
41.4 51.4 сонущение сонимали сонима 81.4 Center 2.41200 GHz #Res BW 100 kHz	#Video BW 300 kHz Span 40.00 MHz Sweep 3.87 ms (1001 pts) CF Step	
<u>3 Δ1 1 f (Δ) 17.72 Μ</u> 4	iz 1.228 dBm Freq Offset [z (Δ) -0.2796 dB 0 Hz	
5 6 <b>1 1 2</b> Apr 15, 2022 11:43:54 AM	X Avis Scale Lig Lin Lin Signal Track Rean Zoom)	



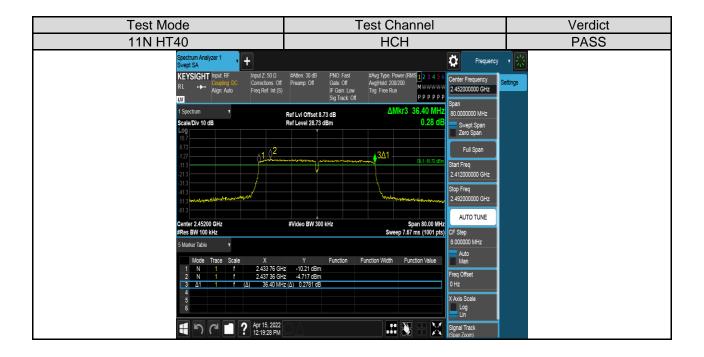


Test Mode	Test Channel	Verdict
11N HT20	НСН	PASS
Spectrum Analyzer 1     ▼       Snept SA     ▼       KEVSIGHT     Input RF       Connections Off     RL       Align Audo     Fineq Ref. Int (S)	#Atten: 30 dB         PNO Fast         #Avg Type Power (RMS 1 2 3 4 5 6 Preamp Off         Center Frequency         Sector         Sector <th< td=""><td>• Ettings</td></th<>	• Ettings
1 Spectrum   Scale Div 10 dB Log 18	Ref Lvl Offset 8.73 dB         ΔMkr3         17.76 MHz         40.0000000 MHz           Ref Level 28.73 dBm         -0.32 dB         Swept Span         Zero Span	
873 127 113 -213	2 Full Span Start Freq 2.442000000 GHz	
313 413 513 <del>1400 </del>	Stop Freq 2.48200000 GHz AUTO TUNE	
Center 2.46200 GHz #Res BW 100 kHz	#Video BW 300 KHz Span 40.00 MHz Span 40.00 MHz Sweep 3.87 ms (1001 pts) CF Step 4.000000 MHz	
5 Marker Table v Mode Trace Scale X 1 N 1 f 2 453 DR CH	Y Function Function Width Function Value Man	
2 Ν 1 f 2.457 28 G+ 3 Δ1 f (Δ) 17.76 M+ 4	z: (Δ) -0.3183 dB 0 Hz	
5	X Avis Scale Log Lin	
4 5 C 12 ? Apr 15, 2022	Signal Track (Span Zoom)	





Test Mode	Test Channel	Verdict
11N HT40	MCH	PASS
Spectrum Analyzer 1 Swept SA KEYSIGHT Input RF RL → Align Auto Contentions Off Freq Ref Int (S)	#Atten: 30 dB PNO Fast #Avg Type Power (RMS) 12 3 4 5 6 Preamp: 0f Gate 0ff AvgHold 200200 IF Gain Low Trig Free Run P P P P P P So Track. 0ff P	tings
	Amily Constraints         ΔMikr3         36.32         Mirs         Span         Span	
873 4.27 	2 βΔ1 (L1-12.27 dBn Start Freq 2.39700000 GHz	
41.3 51.3 61.3 Conter 2.45700 GHz	#Video BW 300 HHz         Stop Freq         2.477000000 GHz           #Video BW 300 HHz         Span 80.00 MHz         AUTO TUNE	
#Res BW 100 kHz 5 Marker Table • Mode Trace Scale X 1 N 1 f 2.418 84 GH 2 N 1 f 2.432 84 GH	Sweep 7.87 ms (1001 pt)         CF Step           Y         Function         B           2         -0.256 dBm         Audo           -         -4.272 dBm         Man           2(A)         -0.4811 dB         0 Hz           X         Audo         Kassistic	
4 つ つ 目 ? Apr 15, 2022 12:11:38 PM	Lin Lin Signal Track (Sear Zoom)	





## 7.3. CONDUCTED POWER

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

FCC Part15 (15.247) Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	
FCC 15.247(b)(3)	Output Power	1 watt or 30dBm	2400-2483.5	
1)If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.				

TEST PROCEDURE

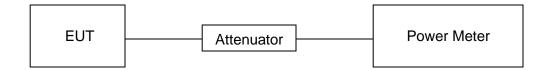
Place the EUT on the table and set it in the transmitting mode.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.

Measure the power of each channel.  $\Delta V = 0$ 

AVG Detector use for AVG result.

#### TEST SETUP



#### TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V



#### **RESULTS**

Test Mode	Test Antenna	Test Channel	Measurement Output Power (AV)	10log(1/x) Factor	Maximum Conducted Output Power (AV)	Verdict
			dBm	dBm	dBm	
		LCH	12.98	0	12.98	Pass
11B	Antenna 1	MCH	13.09	0	13.09	Pass
		HCH	12.76	0	12.76	Pass
		LCH	13.43	0	13.43	Pass
11G	Antenna 1	MCH	13.29	0	13.29	Pass
		HCH	12.19	0	12.19	Pass
		LCH	12.68	0	12.68	Pass
	Antenna 1	MCH	12.39	0	12.39	Pass
		HCH	11.28	0	11.28	Pass
		LCH	12.57	0	12.57	Pass
11N20 MIMO	Antenna 2	MCH	12.36	0	12.36	Pass
		HCH	11.30	0	11.30	Pass
	_	LCH	15.64	0	15.64	Pass
	Antenna 1+2	MCH	15.39	0	15.39	Pass
	112	HCH	14.30	0	14.30	Pass
		LCH	12.94	0	12.94	Pass
	Antenna 1	MCH	12.73	0	12.73	Pass
		HCH	12.20	0	12.20	Pass
		LCH	12.93	0	12.93	Pass
11N40 MIMO	Antenna 2	MCH	12.74	0	12.74	Pass
		HCH	12.21	0	12.21	Pass
	_	LCH	15.95	0	15.95	Pass
	Antenna 1+2	MCH	15.75	0	15.75	Pass
	1 52	HCH	15.22	0	15.22	Pass

Remark:

1) For all the test results has been adjusted the duty cycle factor.

2) For Correction Factor is refer to the result in section 7.1

3) For this product, it has two antennas, antenna1 and antenna2, but only the 802.11N HT20 and 802.11N HT40 modes can support both the SISO and MIMO technical. But for the modes of 11B &11G, only the antenna 1 is working.

4) Through pre-testing all the test modes of 11N 20 and 11N40, including SISO and MIMO, but only the data if worse case is included in this test report.



## 7.4. 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	
1)If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.				

#### TEST PROCEDURE

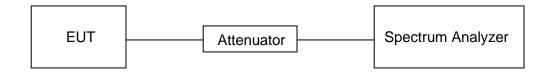
Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following settings:

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



### TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

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## **RESULTS**

Test Mode	Test Antenna	Test Channel	Maximum Peak power spectral density(dBm/30kHz)	Verdict
		LCH	-2.00	Pass
11B	Antenna 1	MCH	-1.93	Pass
		HCH	-2.21	Pass
		LCH	-3.71	Pass
11G	Antenna 1	MCH	-3.94	Pass
		HCH	-4.99	Pass
		LCH	-4.21	Pass
	Antenna 1	MCH	-4.52	Pass
		HCH	-5.60	Pass
		LCH	-4.30	Pass
11N20 MIMO	Antenna 2	MCH	-4.59	Pass
		HCH	-5.64	Pass
		LCH	-1.24	Pass
	Antenna 1+2	MCH	-1.54	Pass
		HCH	-2.61	Pass
		LCH	-7.08	Pass
	Antenna 1	MCH	-7.22	Pass
		HCH	-7.76	Pass
		LCH	-7.05	Pass
11N40 MIMO	Antenna 2	MCH	-7.30	Pass
		HCH	-7.76	Pass
		LCH	-4.05	Pass
	Antenna 1+2	MCH	-4.25	Pass
		HCH	-4.75	Pass

Remark:

1) For this product, it has two antennas, antenna1 and antenna2, but only the 802.11N HT20 and 802.11N HT40 modes can support both the SISO and MIMO technical. But for the modes of 11B &11G, only the antenna 1 is working.

2) Through pre-testing all the test modes of 11N 20 and 11N40, including SISO and MIMO, but only the data if worse case is included in this test report.



### **TEST GRAPHS**

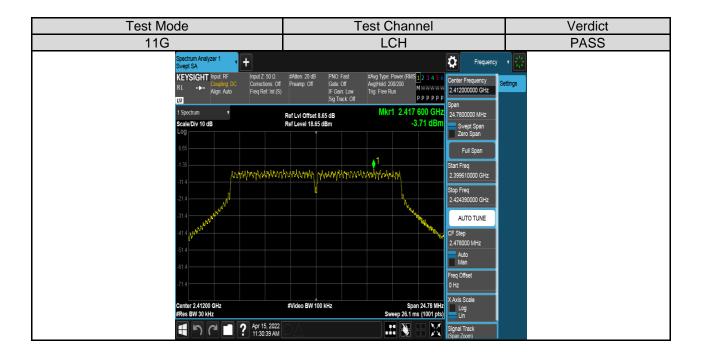
#### Antenna 1:





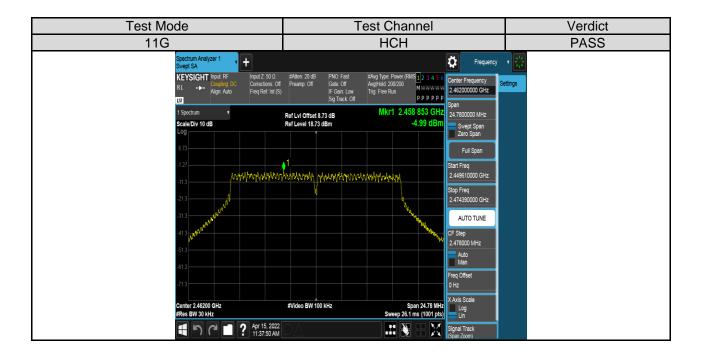


Test Mode	Test Channel	Verdict
11B	НСН	PASS
Spectrum Analyzer 1 Swept SA KEYSIGHT Input: RF RL RL 1 Solctum 1 Solctum	) IF Gain Low Trig Free Run P P P P P P P Sig Track Off P P Run Span Span Span	1 🔀
Scale/Div 10 dB	Ref Lvi Offset 8.73 dB         WK1 2.492 070 CH2         15.0500000 MHz           Ref Level 18.73 dBm         -2.21 dBm         Swept Span           Zero Span         Zero Span	
673 .127	Full Span	
-1.22 -113 -129	γ <sup>γ</sup> <sup>1</sup> <sup>γ</sup> Υγγγ <sub>γ</sub> Stop Freq	
313	N/ 2.469530000 GHz	
-113	CF Step 1.506000 MHz	
-61.3	Auto Man Freq Offset	
-713	0 Hz X Axis Scale	
Center 2.462000 GHz #Res BW 30 kHz	#Video BW 100 kHz Span 15.06 MHz Log Sweep 15.9 ms (1001 pts) Lin	
「う (* 」? 4pr 15.2022     1127:10 AW	Signal Track (Scen Zoom)	



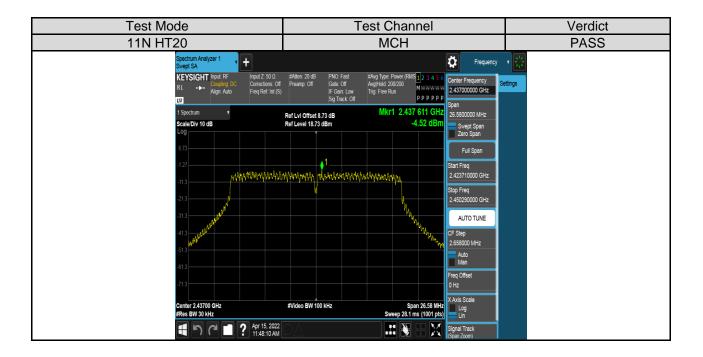


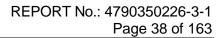
Test Mode	Test Channel	Verdict
11G	MCH	PASS
Spectrum Analyzer 1 Swept SA KEYSIGHT Input RF RL →→ Align Auto KU	CONT Preamp: Off Gate: Off AvgiHold 200200 HE CONT Center Frequency It(S) IF Gain: Low Trig: Free Run P P P P P P P P P P P P P P P P P P P	cy • 🔀
1 Spectrum Scale/Div 10 dB	Ref Lvi Offset 8.73 dB Mkr1 2.433 853 GHz 24.7800000 MHz	
	Ker Level 18.73 dam -3.54 dBill Swept Span Zero Span	
8.73	Full Span	
-1.27	1 Start Freq 2.424610000 GHz 2.424610000 GHz	
-11.3	Stop Freq 2.449390000 GHz	
313 413 www.	AUTO TUNE OF Step	
-51.3	2.478000 MHz	
-61.3	Auto	
-71.3	Freq Offset 0 Hz	
Center 2.43700 GHz #Res BW 30 kHz	#Video BW 100 kHz Span 24.76 MHz Log Sweep 26.1 ms (1001 pts)	
4 5 C 1 ? Apr 15, 11:343	AM	





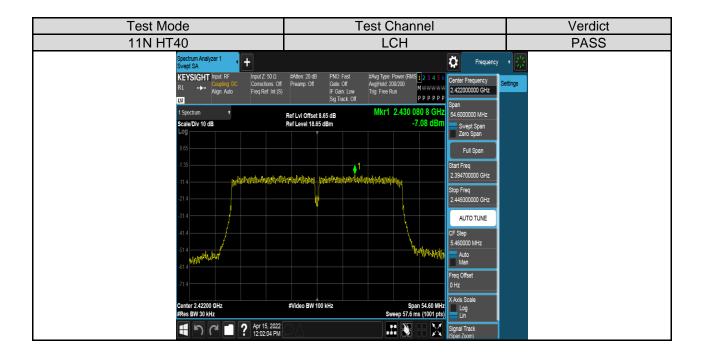
Test Mode	Test Channel	Verdict
11N HT20	LCH	PASS
Spectrum Analyzer 1 ↓ + Swept SA KEYSIGHT Input RF RL →→ Coopting DC Align Auto	IF Gain: Low Trig: Free Run P P P P P P Soan Soan Soan	۱ 🔀
1 Spectrum v Scale/Div 10 dB	Ref Level 18.65 dB Mkr1 2.412 613 GHz 26.6400000 MHz Ref Level 18.65 dBm -4.21 dBm Swept Span Zero Span	
8.65 -1.35 -11.4	Full Span	
-21.4	Stop Freq 2.425320000 GHz	
41.4 51.4	AUTO TUNE CF Step 2.664000 MHz Auto	
-51.4 -71.4	Man Freq Offset 0 Hz	
Center 2.41200 GHz #Res BW 30 kHz	≢Video BW 100 kHz Span 26.64 MHz Sweep 28.1 ms (1001 pts)	
E 7 C 222 11:4120 AM	Signal Track Signal Track (Span Zoom)	

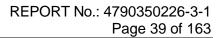






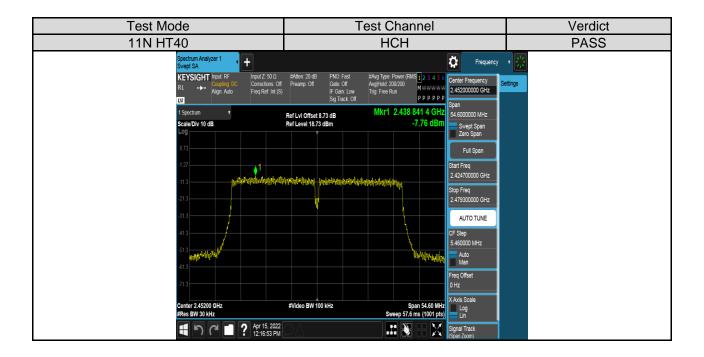
Test Mode	Test Channel	Verdict
11N HT20	НСН	PASS
Spectrum Analyzer 1 Swept SA KEYSIGHT Input RF RL →→ Align: Auto Freq Ret: Int (S)	Frequency #Atten 20 dB PNO Fast #Avg Type Power (RMS 1 2 3 4 5 6 Preamp Off Gale Off AvgHold 200200 IF Gan Low Ing Free Run P P P P P P Sog Track Off Sog P P P P P Sog P	e 🔀
1 Spectrum v Scale/Div 10 dB Log	Ref Lvi Offset 8.73 dB         Mkr1 2.462 611 GHz         26.580000 MHz           Ref Level 18.73 dBm         -5.60 dBm         Swept Span	
873 -1.27 	Full Span 1 1/1/4/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1	
-113 -213 -313	Stop Freq 2.475290000 GHz AUTO TUNE	
413 513	CF Step 2 658000 MHz Auto	
-813 -713	Man Freq Offset 0 Hz	
Center 2.46200 GHz #Res BW 30 kHz	#Video BW 100 kHz Span 26.58 MHz Log Sweep 28.1 ms (1001 pts)	
4 5 C <b>国</b> ? Apr 15, 2022 11:54:51 AM	Signal Track (Span Zoom)	







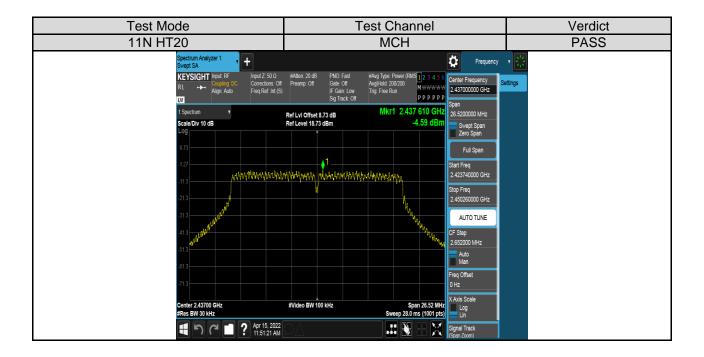
Test Mode	Test Channel	Verdict
11N HT40	MCH	PASS
Spectrum Analyzer 1 Swept SA KEYSIGHT Input RF RL →→ Align Auto L2	IF Gain: Low Trig: Free Run MWWWWW 2.437000000 GHz Sig Track: Off P P P P P P Span	tings
1 Spectrum • Scale/Div 10 dB	Ref Lvl Offset 8.73 dB         Mkr1 2.429 246 8 GHz         54,600000 MHz           Ref Level 18.73 dBm         -7.22 dBm         Swept Span	
873 -127 	Full Span T Start Freq 2409700000 GHz	
-113	Stop Freq 2.464300000 GHz	
413	CF Step 5.450000 MHz	
613 613 713	Mp Null*entite         Man           Freq Offset         Freq Offset	
Center 2.43700 GHz #Res BW 30 kHz	#Video BW 100 kHz Span 54.60 MHz Log Sweep 57.6 ms (1001 pts)	
E 🖸 C I ? Apr 15, 2022 12:09:12 PM	Signal Track Span Zoom)	

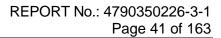




## Antenna 2:

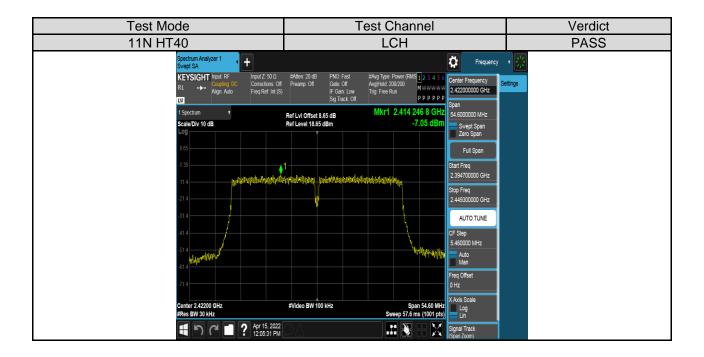
Test Mode	Test Channel	Verdict
11N HT20	LCH	PASS
Spectrum Analyzer 1 Swept SA KEYSIGHT Input RF RL → Augn Auto L L L L L L L L L L L L L	#Atten: 20 dB PNO Fast #Ang Type: Power (RMS 1 2 3 4 5 6 Pleamp: Off Gate: Off AngHold 2002/20 IF Gant. Low Ting: Free Run P P P P P P	• 🔀
1 Spectrum v Scale/Div 10 dB Log	Ref Lvi Offset 8.65 dB         Mkr1         2.412         611         GHz         25.6500000 MHz           Ref Level 18.65 dBm         -4.30 dBm         Swept Span         Swept Span         Zero Span	
865 -1.35 	Full Span Start Freq 2.398710000 GHz	
-11.4 -21.4 -31.4	Stop Freq 2.425290000 GHz	
-41.4	CF Step 2.26500 MHz Auto	
-61.4	Man Freq Offset 0 Hz	
Center 2.41200 GHz #Res BW 30 kHz	≢Video BW 100 kHz Span 26.58 MHz Log Sweep 28.1 ms (1001 pts) Lin	
📲 🄊 (?) 🖬 ? Apr 15, 2022 11:44:41 AM	Signal Track Star Zoom)	

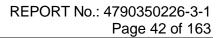






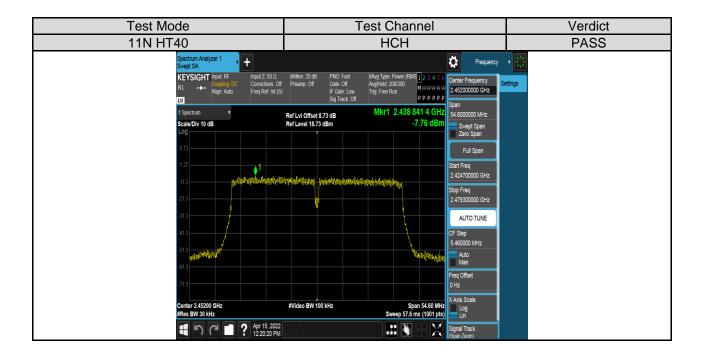
Test Mode	Test Channel	Verdict
11N HT20	НСН	PASS
Spectrum Analyzer 1 Swept SA KEYSIGHT Input RF RL →→ Coupling DC LU	IF Gain: Low Trig: Free Run P P P P P P Sig Track: Off Soan	• 🔀
1 Spectrum v Scale/Div 10 dB	Ref Level 18.73 dB MKr1 2.462 613 GHz 26 5400000 MHz Ref Level 18.73 dBm -5.64 dBm 26 5400000 MHz Swept Span 2ero Span	
873 1.27 .113 <u>Kirvivivivivivivi</u>	Full Span	
-213 -313	Stop Freq 2.475320000 GHz AUTO TUNE	
413 -513	CF Step 2.664000 MHz 4.440	
-613 -713	Freq Offset 0 Hz	
Center 2.46200 GHz #Res BW 30 kHz	#Video BW 100 kHz Span 26.64 MHz Log Sweep 28.1 ms (1001 pts)	
4 5 C <b>国</b> ? Apr 15, 2022 11:58-11 AM	Signal Track (Span Zoom)	







Test Mode	Test Channel	Verdict
11N HT40	MCH	PASS
11N HT40         Spectrum Analyzer 1         Spectrum Analyzer 1         Seet SA         KEYSIGHT Input RF         RL → Cale Div To dB         Scale Div 10 dB         Log         1 Spectrum         Scale Div 10 dB         Log         1 T         T	Frequency #Atten: 20 dB PNO Fast #Avg Type Power (RMS 2 3 4 5 6 Construct Functioners)	PASS Intros
-213 -313 -413 -413 -413 -413 -413 -413 -4	2.464240000 GHz         2.464240000 GHz         AUTO TUNE         GF Step         5.44000 MHz         Auto         Man         Freq Offset         Hz         Sweep 57.5 ms (1001 pts)         Log         Lin         Signal Track         Signal Track	





## 7.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

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

FCC Part15 (15.247) Subpart C		
Section	Test Item	Limit
FCC §15.247 (d)	Conducted Bandedge and Spurious Emissions	At least 30 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 settings:

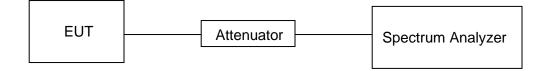
Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	100 kHz
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

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	100 kHz
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



#### **TEST ENVIRONMENT**

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

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### PART 1: REFERENCE LEVEL MEASUREMENT

### TEST RESULTS TABLE

Test Mode	Test Antenna	Test Channel	Result[dBm]
		LCH	3.16
11B	Antenna 1	MCH	3.21
		HCH	2.94
		LCH	-0.90
11G	Antenna 1	MCH	-1.04
		HCH	-2.03
		LCH	-1.28
	Antenna 1	MCH	-1.34
11N20 MIMO		HCH	-2.59
		LCH	-1.50
	Antenna 2	MCH	-1.44
		HCH	-2.44
		LCH	-4.17
	Antenna 1	MCH	-4.27
		HCH	-4.65
11N40 MIMO		LCH	-4.48
	Antenna 2	MCH	-4.15
			-4.63



### **TEST GRAPHS**

### Antenna 1:







HCH         Spectrum Analyzer 1 Swept SA       HCH         Spectrum Analyzer 1 Swept SA       Frequency       Spectrum Analyzer 1 Swept SA         Impair 250.01       #ND Bet Wole Concitions Off Freq Ref. trs(5)       PND Bet Wole Sag Tata.com       Analy Sag Sag Tata.com       Settings         Spectrum 1       Ref Lvi Offset 8.73 dB       Mkr1 2.461 473 GHz Sag Tata.com       Spectrum 2.873 dB       Mkr1 2.461 473 GHz Sag Tata.com       Spectrum 2.873 dB       Spectrum 2.874 dB       Spectrum 2.874 dB       Spectrum 2.874 dB <th< th=""><th>Test Mode</th><th>Channel</th></th<>	Test Mode	Channel
Swept SA       Inspect S0 (Comparison of the second of the	11B	НСН
Spectrum       Ref Lvi Offset 8.73 dB       Mkr1 2.461 473 GHz       Span         Scale/Div 10 dB       Ref Lvel 28.73 dBm       2.94 dBm       15 060000 MHz         187       Image: Span       Zero Span       Image: Span         187       Image: Span       Zero Span       Image: Span         187       Image: Span       Zero Span       Image: Span         187       Image: Span       Image: Span       Image: Span         197       Image: Span       Image: Span       Image: Span         197       Image: Span       Image: Span       Image: Span         197       Image: Span       Image: Span       Image: Span       Image: Span         197       Image: Span       Image: Span       Image: Span       Image: Span         197       Image: Span       Image: Span       Image: Span       Image: Span         213       Image: Span       Image: Span       Image: Span       Image: Span	Swept SA KEYSIGHT Input Z: 50 Ω Counting FC RL ↔ Align Auto Freq Ref. Int (S) Freq Ref. Int (S)	de #Avg Type: Power (RMS) 1 2 3 4 5 6 Avg/Hold 2002000 Ting: Fice Run P p P p P p P P 2 462000000 GHz
873 127 113 213 31.3 413 873 127 137 137 137 137 137 137 137 13	1 Spectrum Y Ref Lvi Offset 8.73 dB Scale/Div 10 dB Ref Level 28.73 dBm	Mkr1 2.461 473 GHz 2.94 dBm Svept Span
31.3 CF Step 41.3 CF Step 41.3 CF Step 1.506000 MHz Auto	.113	Start Freq 2.454470000 GHz Stop Freq
513 MBh	-213 -313 -413 -513	CF Step 1.506000 MHz
Center 2.462000 GHz     #Video BW 300 kHz     Span 15.06 IMF       #Res BW 100 kHz     #Video BW 300 kHz     Sweep 1.47 ms (1001 pts)       Image: Center 2.452000 GHz     Apr 15.2022     Image: Center 2.45200 GHz	#Res BW 100 kHz	Span 15.06 MHz Sweep 1.47 ms (1007 pts)





Test Mode			Channel
11G			MCH
Spectrum Analyzer 1 v +		Frequ	ency •
DI Coupling: DC Corre	Z 50 Ω #Atten: 30 dB PNO: Fast ctions: Off Preamp: Off Gate: Off Ref: Int (S) IF Gain: Low Sig Track: Off	#Avg Type: Power (RMS 1 2 3 4 5 6 Avg]Hold 200/200 Trig: Free Run P P P P P P	
1 Spectrum v Scale/Div 10 dB L0g	Ref LvI Offset 8.73 dB Ref Level 28.73 dBm	Mkr1 2.431 524 GHz -1.04 dBm 24.7800000 MHz Swept Span Zero Span	
18.7		Full Span	
8.73	1	Start Freq 2.424610000 GH	2
-113	and the second	Stop Freq 2.449390000 GH	2
-21.3		AUTO TUNE CF Step	
-413 60 - 2013		2.478000 MHz	
-51.3		Man Freq Offset	
-61.3		0 Hz X Axis Scale	
Center 2.43700 GHz #Res BW 100 kHz	#Video BW 300 kHz	Span 24.78 MHz Sweep 2.40 ms (1001 pts)	
	15, 2022 34:39 AM	Signal Track (Span Zoom)	

