

# **TEST REPORT**

**APPLICANT**: Anker Innovations Limited

**PRODUCT NAME**: eufyCam S330

MODEL NAME : T8160C

**BRAND NAME**: eufy

**FCC ID** : 2AOKB-T8160C

STANDARD(S) : 47 CFR Part 15 Subpart C

**RECEIPT DATE** : 2024-05-31

**TEST DATE** : 2024-06-13 to 2024-07-15

**ISSUE DATE** : 2024-07-24

Certification

Road Servett

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Change History				
Version Date Reason for change				
1.0 2024-07-24		First edition		



# 1. Summary of Test Result

No.	Section	Description	Test Date	Test Engineer	Result	Method Determination /Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	No deviation
2	N/A	Duty Cycle of Test Signal	Jun. 14, 2024	Lin Haoyang	PASS	No deviation
3	15.247(b)	Maximum Peak Conducted Output Power	Jun. 14, 2024	Lin Haoyang	PASS	No deviation
4	15.247(b)	Maximum Average Conducted Output Power	Jun. 14, 2024	Lin Haoyang	PASS	No deviation
5	15.247(a)	Bandwidth	Jun. 14, 2024	Lin Haoyang	PASS	No deviation
6	15.247(d)	Conducted Spurious Emission and Band Edge	Jun. 14, 2024	Lin Haoyang	PASS	No deviation
7	15.247(e)	Power Spectral Density	Jun. 14, 2024	Lin Haoyang	PASS	No deviation
8	15.207	Conducted Emission	Jun. 11, 2024 to Jul. 15, 2024	Wang Deyong Wen Zhe	PASS	No deviation
9	15.247(d)	Restricted Frequency Bands	Jul. 10, 2024	Li Hanbin	PASS	No deviation
10	15.209, 15.247(d)	Radiated Emission	Jun. 20, 2024 to Jul. 10, 2024	Li Hanbin	PASS	No deviation

**Note 1:** The tests were performed according to the method of measurements prescribed in ANSI C63.10-2013 and KDB 558074 D01 v05r02.

**Note 2:** Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 3: When the test result is a critical value, we will use the measurement uncertainty give the





judgment result based on the 95% confidence intervals.

## 1.1. Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

• 47 CFR Part 15 Subpart C Radio Frequency Devices





## 1.2. Test Equipment List

#### 1.2.1 Conducted Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
EXA Signal	MY53470836	N9010A	Agilopt	2024.02.19	2025.02.18
Analyzer	WH 5547 0650	N90TUA	Agilent	2024.02.19	2023.02.10
Power Sensor	MY54180008	U2021XA	Agilent	2023.10.17	2024.10.16
Attenuator	MTJ6004-20	VAT-10+	MTJ Cooperation	N/A	N/A
RF Cable	CD04	DE04	Maylah	NI/A	NI/A
(30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial Cable	CB02	RF02	Morlab	N/A	N/A
ONA O	CNIO4	DEO2	HUBER-		21/0
SMA Connector	CN01	RF03	SUHNER	N/A	N/A

#### 1.2.2 Conducted Emission Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY56400093	N9038A	KEYSIGHT	2024.01.25	2025.01.24
LISN	8127449	NSLK 8127	Schwarzbeck	2024.02.02	2025.02.01
Pulse Limiter	VTSD 9561 F-	VTSD	Schwarzbeck	2024.05.30	2025.05.29
(10dB)	B #206	9561-F	Scriwarzbeck	2024.03.30	2023.03.29
RF Coaxial Cable (DC-100MHz)	BNC	MRE04	Qualwave	N/A	N/A

#### 1.2.3 List of Software Used

Name	Manufacturer	Software Version
MTS 8310	MaiWei	2.0.0.0
Morlab EMCR	Morlab	V1.2
TS+ -[JS32-CE]	Tonscend	V2.5.0.0

Tel: 86-755-36698555

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### 1.2.4 Radiated Test Equipment

Equipment	Serial No.	Туре	Manufacturer	Cal. Date	Due Date
Receiver	MY54130016	N9038A	Agilent	2024.05.30	2025.05.29
Test Antenna - Bi-	0400 540	\/\!\\D\0460		2023.07.01	2024.06.30
Log	9163-519	VULB 9163	Schwarzbeck	2024.06.22	2025.06.21
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2024.06.03	2025.06.02
Test Antenna –				2023.07.01	2024.06.30
Horn	01774	BBHA 9120D	Schwarzbeck	2024.06.22	2025.06.21
Test Antenna –	BBHA9170	DD1140470		2023.07.01	2024.06.30
Horn	#773	BBHA9170	Schwarzbeck	2024.06.22	2025.06.21
Preamplifier (10MHz-6GHz)	46732	S10M100L38 02	LUCIX CORP.	2024.05.30	2025.05.29
Preamplifier (2GHz-18GHz)	61171/61172	S020180L32 03	LUCIX CORP.	2024.05.30	2025.05.29
Preamplifier (18GHz-40GHz)	DS77209	DCLNA0118- 40C-S	Decentest	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE001	PE330	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE002	CLU18	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE003	CLU18	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-40GHz)	22290045	QA360-40- KK-0.5	Qualwave	N/A	N/A
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40- KKF-2	Qualwave	N/A	N/A
RF Coaxial Cable (DC-18GHz)	22120181	QA500-18- NN-5	Qualwave	N/A	N/A
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.05.10	2025.05.09



## 1.3. Measurement Uncertainty

Test Items	Uncertainty	Remark
Peak Output Power	±2.22dB	Confidence levels of 95%
Power Spectral Density	±2.22dB	Confidence levels of 95%
Bandwidth	±5%	Confidence levels of 95%
Conducted Spurious Emission	±2.77dB	Confidence levels of 95%
Restricted Frequency Bands	±5%	Confidence levels of 95%
Radiated Emission	±2.95dB	Confidence levels of 95%
Conducted Emission	±2.44dB	Confidence levels of 95%

## 1.4. Testing Laboratory

Laboratory Name	Shenzhen Morlab Communications Technology Co., Ltd.		
	FL.3, Building A, FeiYang Science Park, No.8 LongChang		
Laboratory Address	Road, Block 67, BaoAn District, ShenZhen, GuangDong		
	Province, P. R. China		
Telephone	+86 755 36698555		
Facsimile	+86 755 36698525		
FCC Designation Number	CN1192		
FCC Test Firm	226174		
Registration Number	220174		



# 2. General Description

## 2.1. Information of Applicant and Manufacturer

Applicant	Anker Innovations Limited		
Applicant Address	Unit 56, 8th Floor, Tower 2, Admiralty Centre, 18 Harcourt Road,		
Applicant Address	Hong Kong		
Manufacturer	Anker Innovations Limited		
Manufacturer Address	Unit 56, 8th Floor, Tower 2, Admiralty Centre, 18 Harcourt Road,		
Manufacturer Address	Hong Kong		

### 2.2. Information of EUT

Product Name:	eufyCam S330		
Sample No.:	1#		
Hardware Version:	V03		
Software Version:	V3.0.0.0		
Modulation Technology:	DSSS, OFDM		
Modulation Type:	Refer to section 1	1.3	
Operating Frequency Range:	802.11b/g/n (HT2	20): 2412MHz–2462MHz	
Antenna Type:	FPC Antenna		
Antenna Gain:	2.62dBi		
	Battery		
	Brand Name:	N/A	
	Model No.:	C0914G3	
Accessory Information:	Serial No.:	N/A	
Accessory information.	Capacity:	12300mAh	
	Rated Voltage:	3.6V	
	Charge Limit:	4.2V	
	Manufacturer:	Guangdong Pow-Tech New Power Co.,Ltd.	

**Note 1:** We use the dedicated software to control the EUT continuous transmission.

**Note 2:** For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.





## 2.3. Channel List of EUT

Nominal Channel Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
	1	2412	8	2447
	2	2417	9	2452
	3	2422	10	2457
20MHz	4	2427	11	2462
	5	2432		
	6	2437		
	7	2442		

Note 1: The black bold channels were selected for test.



## 2.4. Test Configuration of EUT

#### 2.4.1.Modulation Type and Data Rate of EUT

Modulation technology	Modulation Type	Data Rate (Mbps) Note1
	DBPSK	1
DSSS (802.11b)	DQPSK	2
	CCK	5.5/ 11
	BPSK	<b>6</b> / 9
OFDM (902.44a)	QPSK	12 / 18
OFDM (802.11g)	16QAM	24 / 36
	64QAM	48 / 54
	BPSK	6.5
OFDM	QPSK	13/19.5
(802.11n (HT20))	16QAM	26/39
	64QAM	52/58.5/65

**Note1:** The worst-case mode (bold face) in all data rates has been determined during the pre-scan, only the test data of the worst-case were recorded in this report.

**Note2:** The RF signal transmission of EUT is controlled by the build-in engineering mode which is provided by the manufacturer. The recorded power setting value is the maximum that the engineering mode has configuration during testing.

### 2.5. Test Conditions

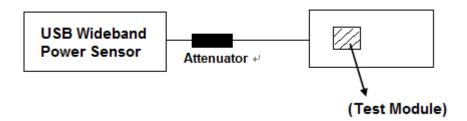
Temperature (°C)	15-35
Relative Humidity (%)	30-60
Atmospheric Pressure (kPa)	86-106



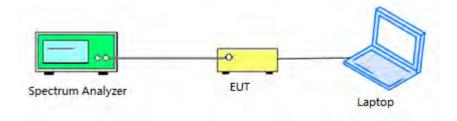
## 2.6. Test Setup Layout Diagram

#### 2.6.1.Conducted Measurement

Power item

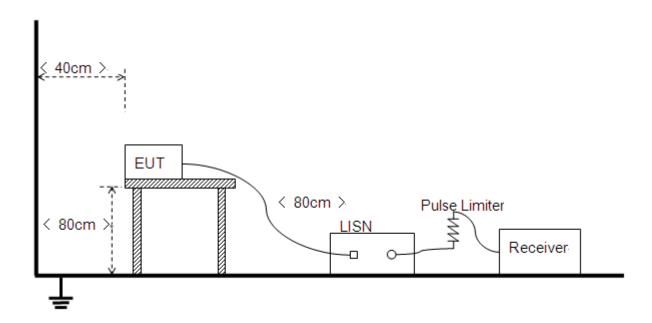


#### Other items



#### 2.6.2.Conducted Emission Measurement

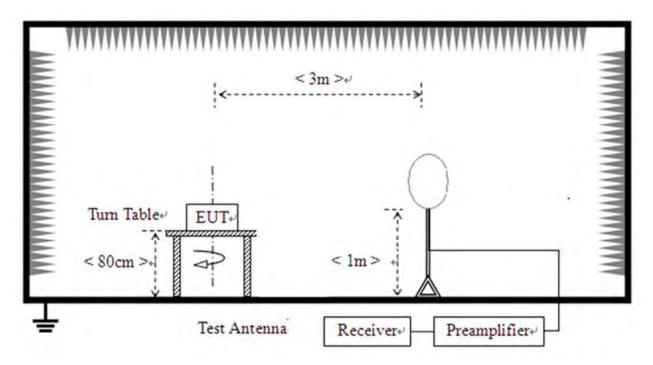
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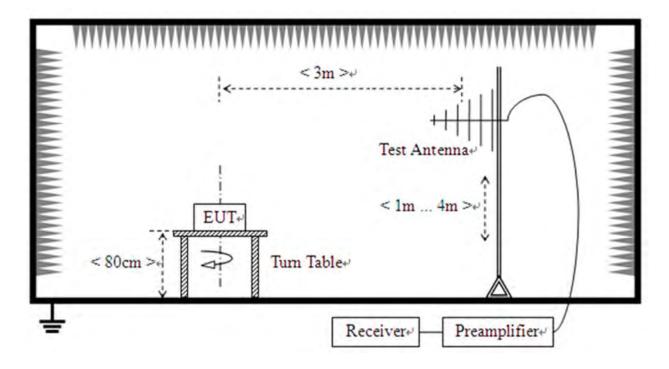


#### 2.6.3. Radiation Measurement

1) For radiated emissions from 9kHz to 30MHz



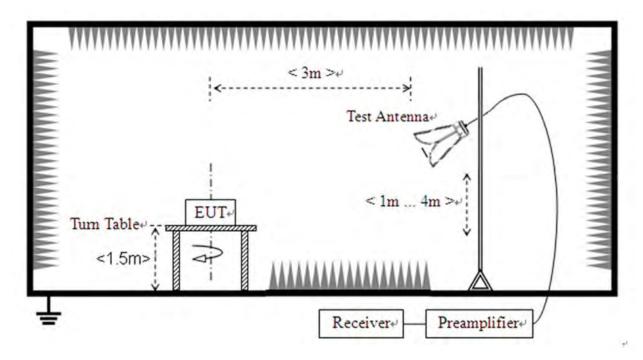
2) For radiated emissions from 30MHz to 1GHz







#### 3) For radiated emissions above 1GHz







3. Test Results

## 3.1. Antenna Requirement

#### 3.1.1.Requirement

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

#### 3.1.2.Test Result

Antenna location	Antenna Type	Coupling Method		
⊠Internal	⊠FPC Antenna	□I-PEX Connector		
□External	□Spring Antenna	☐SMA Connector		
	□Ceramic Antenna	□RP-SMA Connector		
	□Integrated Antenna	⊠Metal Shrapnel		
	□Dipole Antenna			
	□PCB Antenna			
	□PIFA Antenna			





### 3.2. Duty Cycle of Test Signal

#### 3.2.1.Requirement

Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%). When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be used to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration(T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data are being acquired (i.e.,no transmitter OFF-time is to be considered).

When continuous transmission cannot be achieved and sweep triggering/signal gating cannot be implemented, alternative procedures are provided that can be used to measure the average power; however, they will require an additional measurement of the transmitter duty cycle (D). Within this sub clause, the duty cycle refers to the fraction of time over which the transmitter is ON and is transmitting at its maximum power control level. The duty cycle is considered to be constant if variations are less than ±2%; otherwise, the duty cycle is considered to be non constant.

#### 3.2.2.Test Result

Refer to Annex A.1 in this report.



### 3.3. Maximum Peak and Average Conducted Output Power

#### 3.3.1.Requirement

According to FCC section 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: The maximum conducted output power of the intentional radiator shall not exceed 1 Watt.

#### 3.3.2.Test Procedures

The EUT (Equipment under the test) which is coupled to the USB Wideband Power Sensor; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading.

#### 3.3.3.Test Setup Layout

Refer to chapter 2.6.1 in this report.

#### 3.3.4.Test Result

Refer to Annex A.2 and A.3 in this report.



### 3.4.6 dB Bandwidth

#### 3.4.1.Requirement

According to FCC section 15.247(a) (2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

#### 3.4.1.Test Procedures

KDB 558074 Section 8.2 was used in order to prove compliance.

#### 3.4.2.Test Setup Layout

Refer to chapter 2.6.1 in this report.

#### 3.4.3.Test Result

Refer to Annex A.4 in this report.



### 3.5. Conducted Spurious Emissions and Band Edge

#### 3.5.1.Requirement

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

#### 3.5.2.Test Procedures

KDB 558074 Section 8.5 and 8.7 was used in order to prove compliance.

#### 3.5.3.Test Setup Layout

Refer to chapter 2.6.1 in this report.

#### 3.5.4.Test Result

Refer to Annex A.5 and A.6 in this report.



### 3.6. Power Spectral Density

#### 3.6.1.Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

#### 3.6.2.Test Procedures

The measured power spectral density was calculated by the reading of the spectrum analyzer and calibration. Following is the test procedure for PSD test:

- a) Set analyzer center frequency to channel center frequency
- b) Set span to 1.5 times DTS
- c) Set RBW to 30kHz
- d) Set VBW to 100kHz
- e) Detector = peak
- f) Sweep time = auto couple
- g) Trace mode = max hold
- h) Allow trace to fully stabilize
- i) Use the peak marker function to determine the maximum amplitude level and recorded as PD
- j) Use below formula to calculate the Conducted PSD value that at specified RBW: Conducted PSD=PD-10lg(30k/3k)

#### 3.6.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

#### 3.6.4.Test Result

Refer to Annex A.7 in this report.





### 3.7. Conducted Emission

#### 3.7.1.Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a  $50\mu$ H/ $50\Omega$  line impedance stabilization network (LISN).

		•	,
Fro	Fraguanay Panga (MUz)	Conducted	Limit (dBµV)
	Frequency Range (MHz)	Quai-peak	Average
0.15 - 0.50		66 to 56	56 to 46
	0.50 - 5	56	46
	5 - 30	60	50

#### Note:

- (a) The lower limit shall apply at the band edges.
- (b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 0.50MHz.

#### 3.7.2.Test Procedures

The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10: 2013.

#### 3.7.3.Test Setup Layout

Refer to chapter 2.6.2 in this report.

#### 3.7.4.Test Result

Refer to Annex A.8 in this report.

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## 3.8. Restricted Frequency Bands

#### 3.8.1.Requirement

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

#### 3.8.2.Test Procedures

The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

For the Test Antenna:

Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for f ≥ 1GHz, 100 kHz for f < 1GHz

VBW = 3 MHz

Sweep = auto

Detector function = peak/average

Trace = max hold

Allow the trace to stabilize

#### 3.8.3.Test Setup Layout

Refer to chapter 2.6.3 in this report.

#### 3.8.4.Test Result

Refer to Annex A.9 in this report.





### 3.9. Radiated Emission

#### 3.9.1.Requirement

According to FCC section 15.247(d), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

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

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

**Note1:** For above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit. **Note2:**For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table).





#### 3.9.2.Test Procedures

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 30MHz, the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9kHz-90 kHz, 110kHz-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

For measurements below 1GHz the resolution bandwidth is set to 100kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements and as applicable for average measurements.

The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions. For measurements above 1 GHz, keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

#### 3.9.3.Test Setup Layout

Refer to chapter 2.6.3 in this report.

#### 3.9.4.Test Result

Refer to Annex A.10 in this report.

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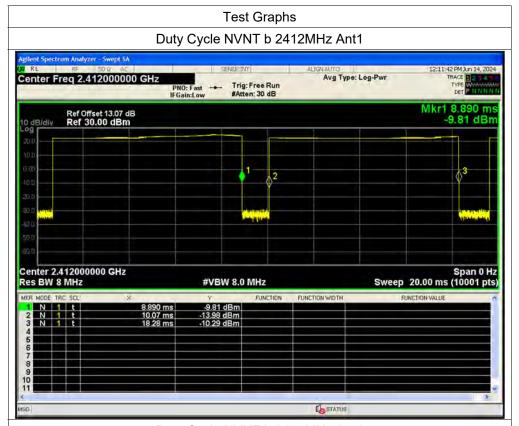


### **Annex A Test Data and Result**

### A.1. Duty Cycle of Test Signal

Condition	Mode	Frequency	Antenna	<b>Duty Cycle</b>	Correction Factor	1/T
		(MHz)		(%)	(dB)	(kHz)
NVNT	b	2412	Ant1	87.44	0.58	0.12
NVNT	b	2437	Ant1	87.48	0.58	0.12
NVNT	b	2462	Ant1	87.49	0.58	0.12
NVNT	g	2412	Ant1	99.93	0	0.08
NVNT	g	2437	Ant1	99.93	0	0.08
NVNT	g	2462	Ant1	99.97	0	0
NVNT	n20	2412	Ant1	99.93	0	0.09
NVNT	n20	2437	Ant1	99.93	0	0.09
NVNT	n20	2462	Ant1	99.93	0	0.09



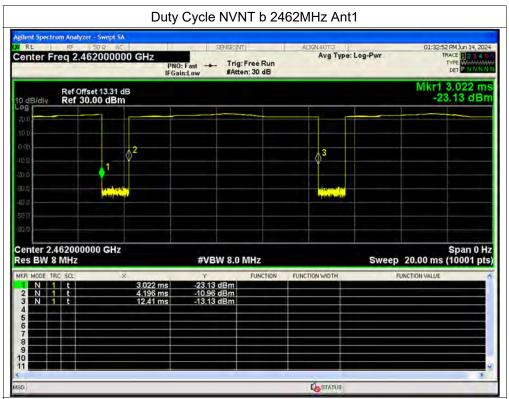


Duty Cycle NVNT b 2437MHz Ant1

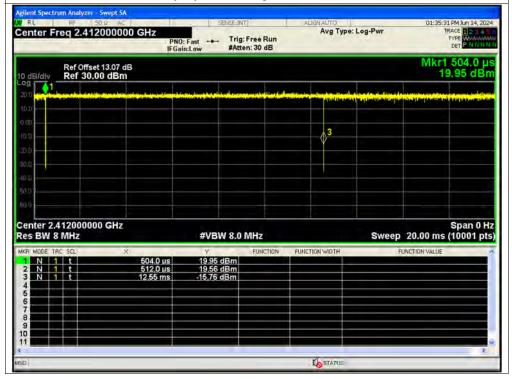






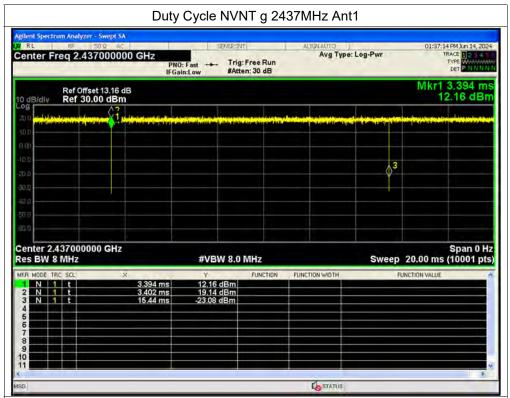




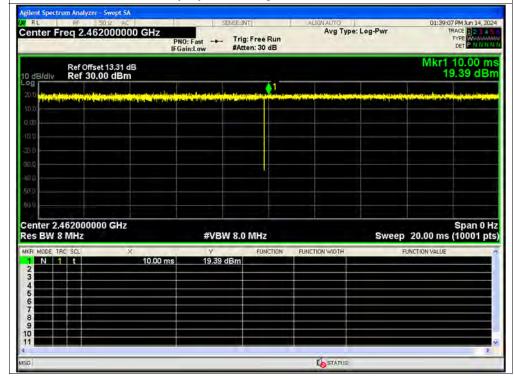






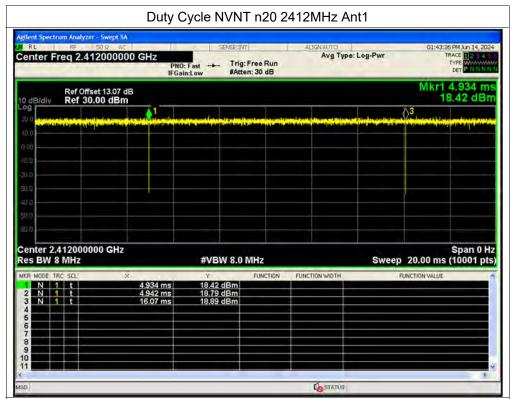


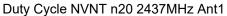


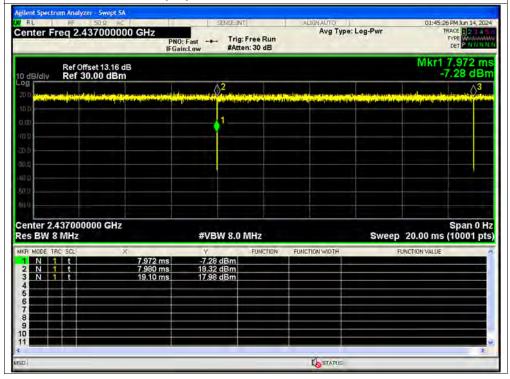






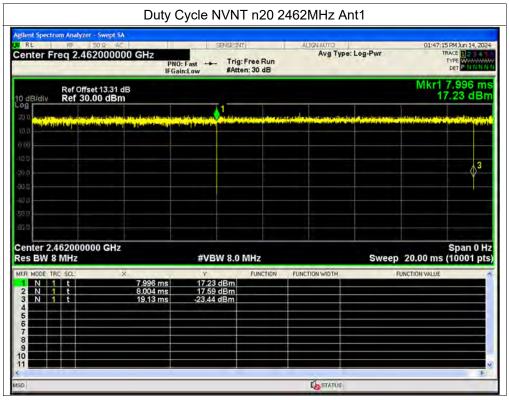














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### A.2. Maximum Peak Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Conducted Power (dBm)	Total Conducted Power (W)	Limit Conducted (dBm)	Verdict
NVNT	b	2412	Ant1	17.97	0	17.97	0.0627	30	Pass
NVNT	b	2437	Ant1	17.91	0	17.91	0.0618	30	Pass
NVNT	b	2462	Ant1	17.7	0	17.7	0.0589	30	Pass
NVNT	g	2412	Ant1	22.18	0	22.18	0.1652	30	Pass
NVNT	g	2437	Ant1	21.38	0	21.38	0.1374	30	Pass
NVNT	g	2462	Ant1	21.43	0	21.43	0.1390	30	Pass
NVNT	n20	2412	Ant1	20.97	0	20.97	0.1250	30	Pass
NVNT	n20	2437	Ant1	20.78	0	20.78	0.1197	30	Pass
NVNT	n20	2462	Ant1	20.38	0	20.38	0.1091	30	Pass



### A.3. Maximum Average Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Conducted Power (dBm)	Total Conducted Power (W)	Limit Conducted (dBm)	Verdict
NVNT	b	2412	Ant1	15.22	0.58	15.8	0.0380	30	Pass
NVNT	b	2437	Ant1	14.6	0.58	15.18	0.0330	30	Pass
NVNT	b	2462	Ant1	14.59	0.58	15.17	0.0329	30	Pass
NVNT	g	2412	Ant1	15.12	0	15.12	0.0325	30	Pass
NVNT	g	2437	Ant1	14.82	0	14.82	0.0303	30	Pass
NVNT	g	2462	Ant1	14.39	0	14.39	0.0275	30	Pass
NVNT	n20	2412	Ant1	14.2	0	14.2	0.0263	30	Pass
NVNT	n20	2437	Ant1	13.91	0	13.91	0.0246	30	Pass
NVNT	n20	2462	Ant1	13.43	0	13.43	0.0220	30	Pass



#### A.4. 6 dB Bandwidth

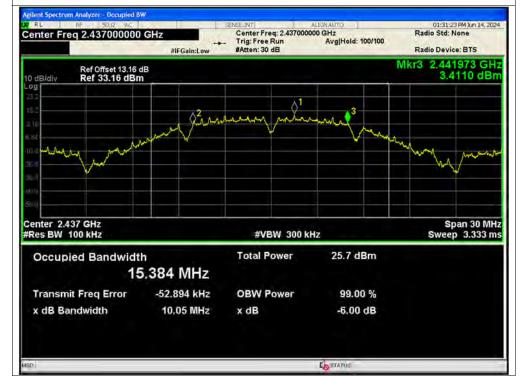
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	b	2412	Ant1	10.013	0.5	Pass
NVNT	b	2437	Ant1	10.052	0.5	Pass
NVNT	b	2462	Ant1	9.582	0.5	Pass
NVNT	g	2412	Ant1	15.895	0.5	Pass
NVNT	g	2437	Ant1	12.571	0.5	Pass
NVNT	g	2462	Ant1	16.252	0.5	Pass
NVNT	n20	2412	Ant1	14.317	0.5	Pass
NVNT	n20	2437	Ant1	15.036	0.5	Pass
NVNT	n20	2462	Ant1	16.277	0.5	Pass













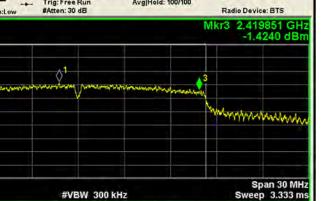


01:35:48 PM Jun 14, 2024 Radio Std: None









Occupied Bandwidth
16.746 MHz

Ref Offset 13.07 dB Ref 33.07 dBm

almost appropriately pro-

Center 2.412 GHz #Res BW 100 kHz

Transmit Freq Error

-96.393 kHz OBW Power

**Total Power** 

99.00 %

22.3 dBm

x dB Bandwidth 15,89 MHz

x dB

-6.00 dB

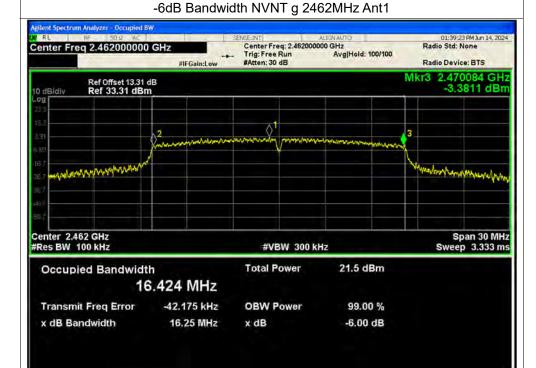
**STATUS** 

**MORLAB** 



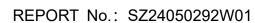








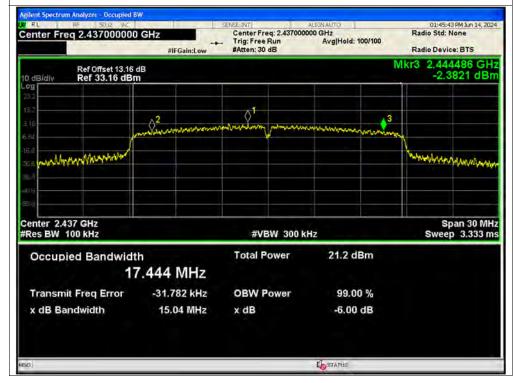
TATUS .













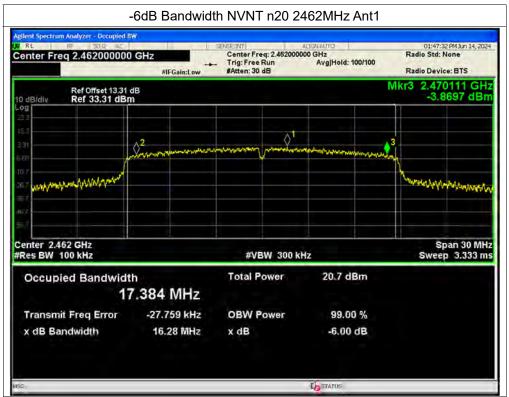
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# A.5. Conducted Spurious Emissions

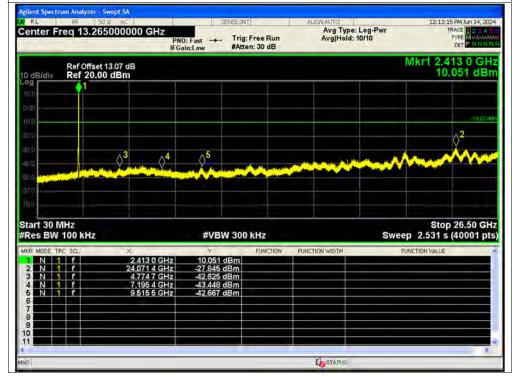
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-37.82	-20	Pass
NVNT	b	2437	Ant1	-37.96	-20	Pass
NVNT	b	2462	Ant1	-38.57	-20	Pass
NVNT	g	2412	Ant1	-33.17	-20	Pass
NVNT	g	2437	Ant1	-32.69	-20	Pass
NVNT	g	2462	Ant1	-31.14	-20	Pass
NVNT	n20	2412	Ant1	-33.77	-20	Pass
NVNT	n20	2437	Ant1	-30.85	-20	Pass
NVNT	n20	2462	Ant1	-33.38	-20	Pass





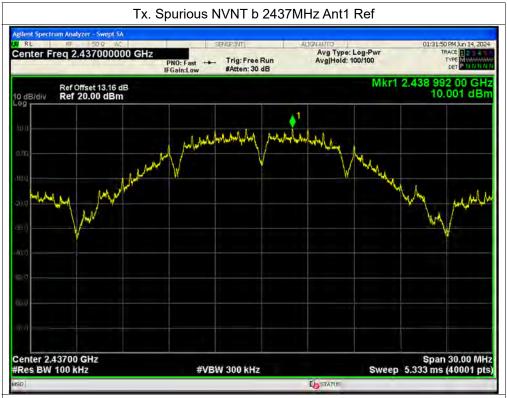


Tx. Spurious NVNT b 2412MHz Ant1 Emission

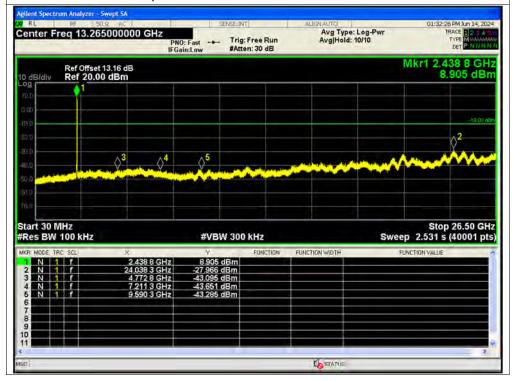






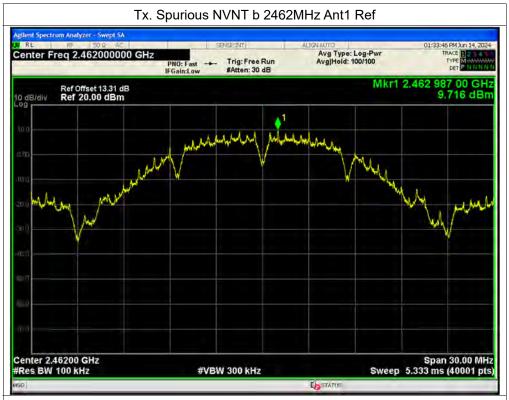




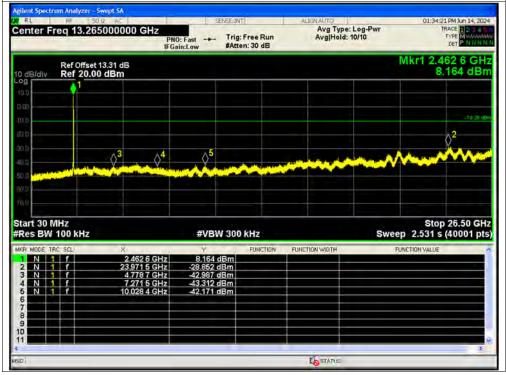






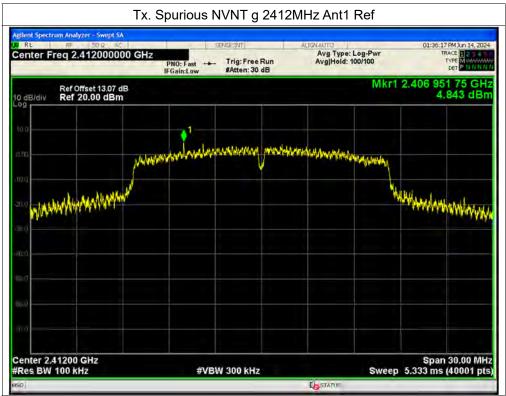




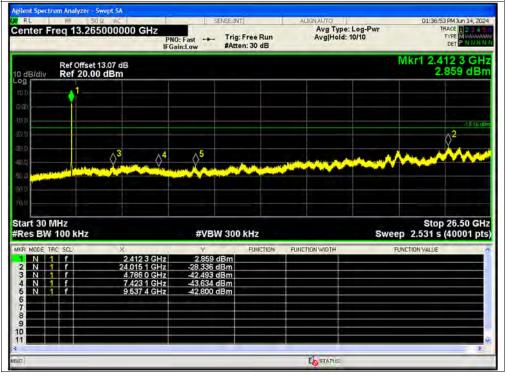






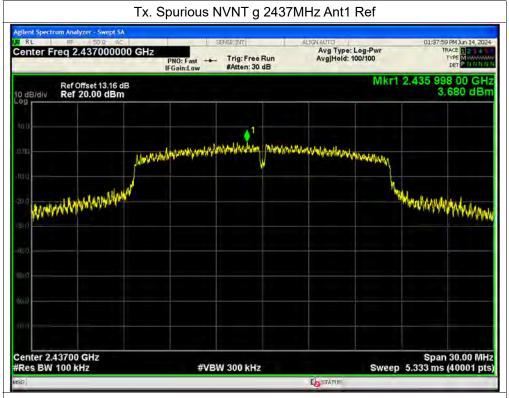


Tx. Spurious NVNT g 2412MHz Ant1 Emission

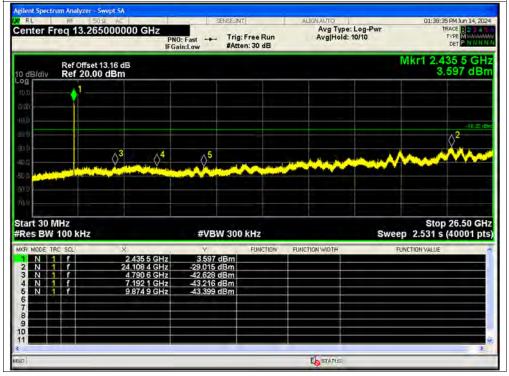






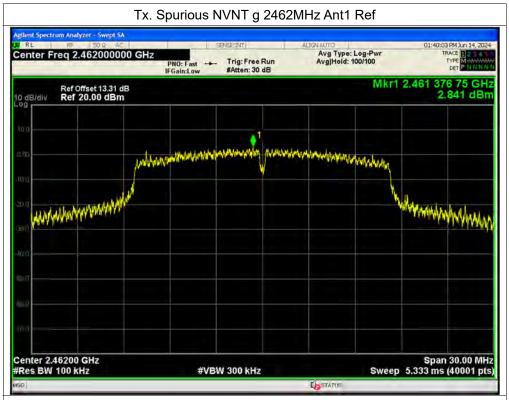




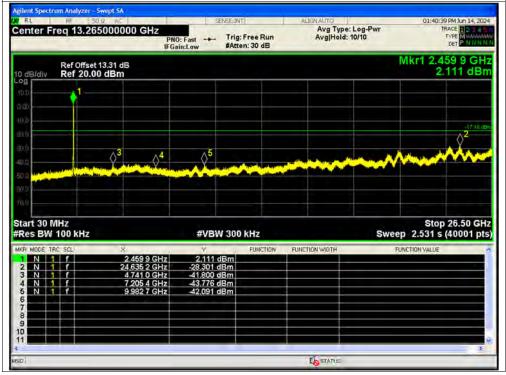






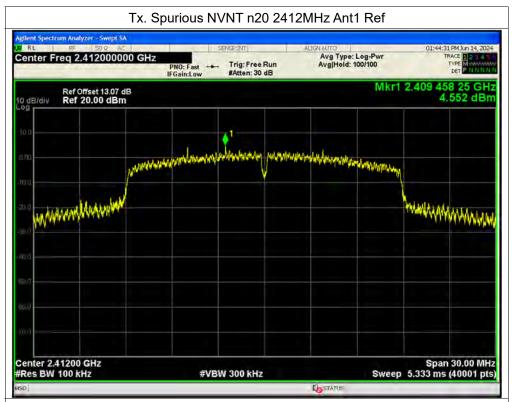




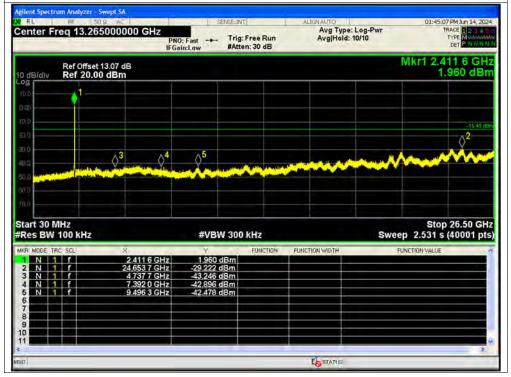






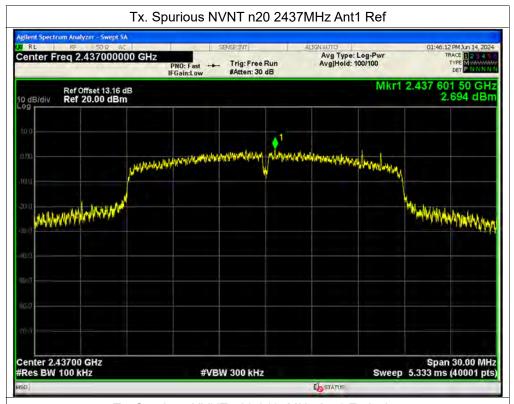


Tx. Spurious NVNT n20 2412MHz Ant1 Emission

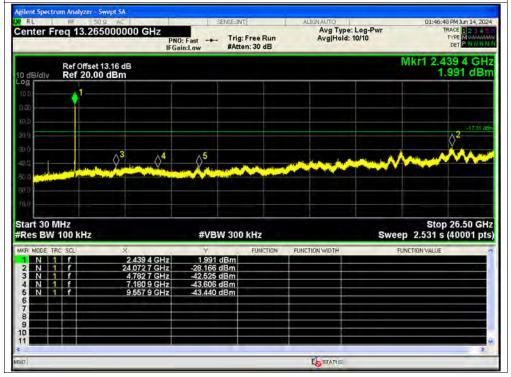






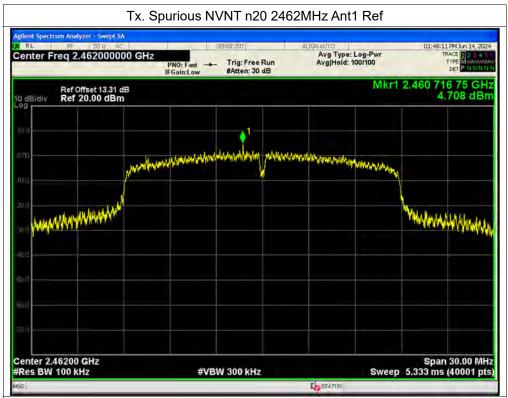


Tx. Spurious NVNT n20 2437MHz Ant1 Emission

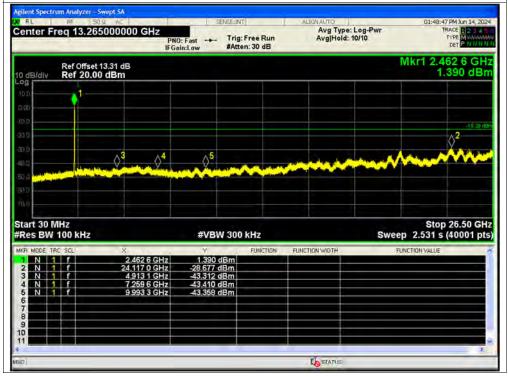








Tx. Spurious NVNT n20 2462MHz Ant1 Emission



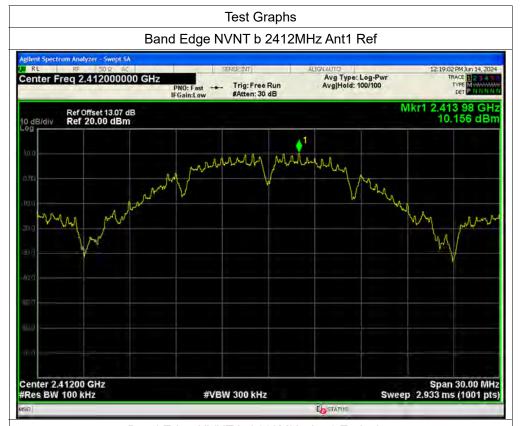


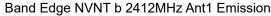


# A.6. Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-23.08	-20	Pass
NVNT	b	2462	Ant1	-48.07	-20	Pass
NVNT	g	2412	Ant1	-22.06	-20	Pass
NVNT	g	2462	Ant1	-44.81	-20	Pass
NVNT	/NT n20 2412		Ant1	-24.57	-20	Pass
NVNT	n20	2462	Ant1	-42.56	-20	Pass



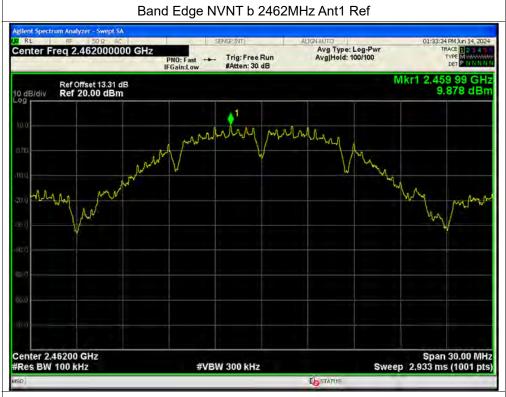










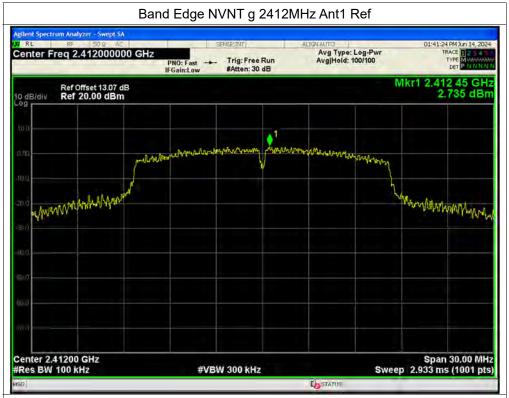












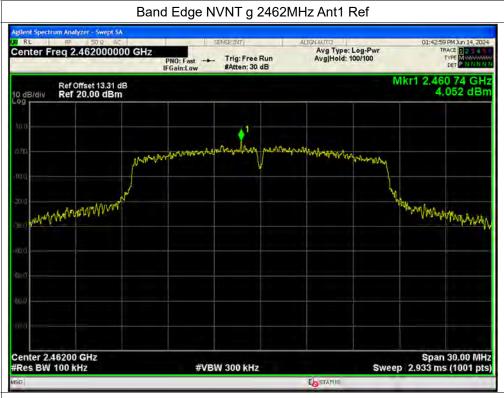


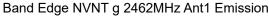




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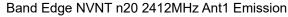










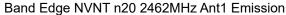














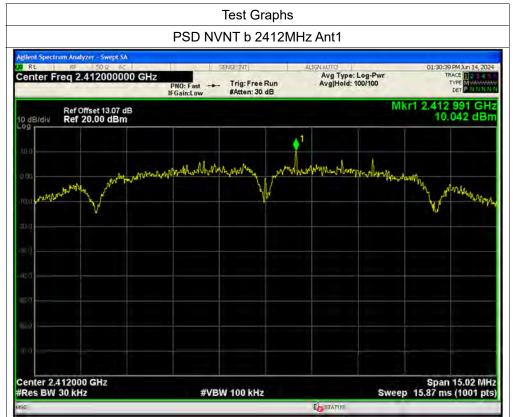


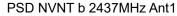


# A.7. Power Spectral Density

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Duty Factor (dB)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	b	2412	Ant1	0.04	0	0.04	8	Pass
NVNT	b	2437	Ant1	-0.12	0	-0.12	8	Pass
NVNT	b	2462	Ant1	-0.30	0	-0.30	8	Pass
NVNT	g	2412	Ant1	-8.98	0	-8.98	8	Pass
NVNT	g	2437	Ant1	-8.63	0	-8.63	8	Pass
NVNT	g	2462	Ant1	-8.89	0	-8.89	8	Pass
NVNT	n20	2412	Ant1	-8.54	0	-8.54	8	Pass
NVNT	n20	2437	Ant1	-9.81	0	-9.81	8	Pass
NVNT	n20	2462	Ant1	-9.84	0	-9.84	8	Pass



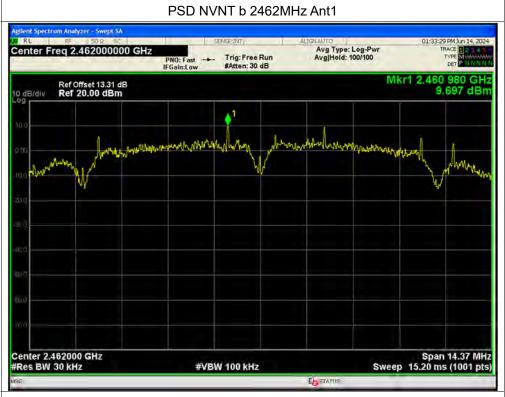


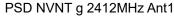








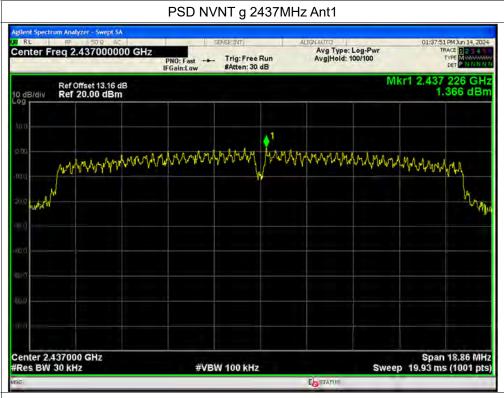


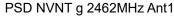


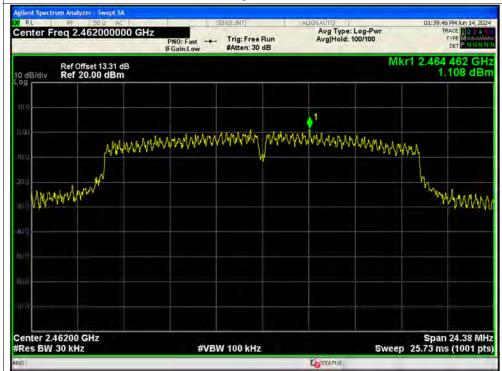
















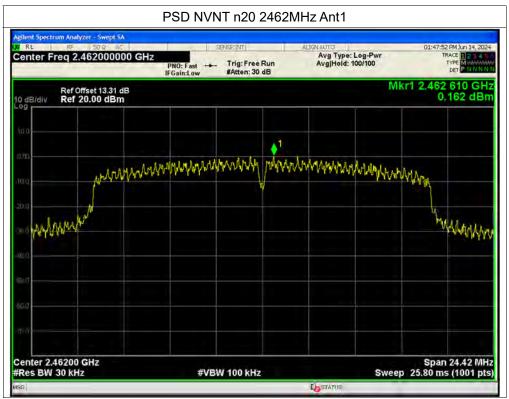


#### PSD NVNT n20 2437MHz Ant1













### A.8. Conducted Emission

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be remeasured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Set RBW=9kHz, VBW=30kHz. Refer to recorded points and plots below.

**Note:** Both of the test voltage AC 120V/60Hz and AC 230V/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

### A. Test Setup:

Test Mode: <u>EUT+ Adapter + USB cable + WIFI TX</u>

Test voltage: AC 120V/60Hz

The measurement results are obtained as below:

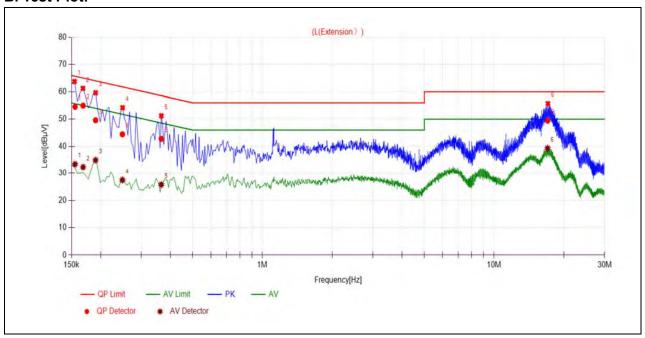
 $E [dB\mu V] = U_R + L_{Cable loss} [dB] + A_{Factor}$ 

U<sub>R</sub>: Receiver Reading

A<sub>Factor</sub>: Voltage division factor of LISN



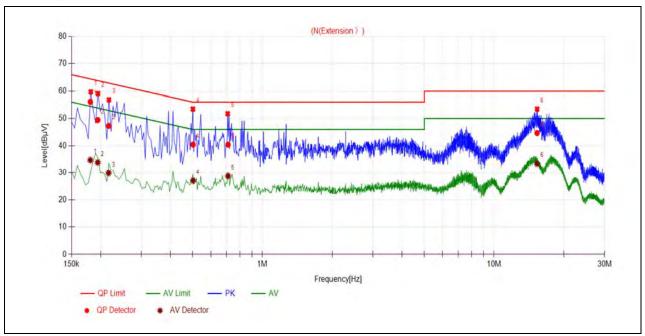
## **B. Test Plot:**



(L Phase)

No.	Fre.	Emission Level (dBµV)		Limit (	dΒμV)	Power-line	Verdict
	(MHz)	Quai-peak	Average	Quai-peak	Average		00.0.00
1	0.1552	54.58	33.42	65.72	55.72		PASS
2	0.1682	55.01	32.34	65.05	55.05		PASS
3	0.1904	49.63	34.93	64.02	54.02	Line	PASS
4	0.2486	44.44	27.47	61.80	51.80	Lille	PASS
5	0.3659	42.80	25.75	58.59	48.59		PASS
6	17.0202	49.49	39.28	60.00	50.00		PASS





(N Phase)

No.	Fre.	Emission Level (dBµV)		Limit (	dBμV)	Power-line	Verdict
	(MHz)	Quai-peak	Average	Quai-peak	Average		
1	0.1808	56.12	34.76	64.45	54.45		PASS
2	0.1945	49.45	33.91	63.84	53.84		PASS
3	0.2168	47.31	29.87	62.94	52.94	Nautral	PASS
4	0.5017	40.45	27.06	56.00	46.00	Neutral	PASS
5	0.7104	40.44	28.73	56.00	46.00		PASS
6	15.3308	44.70	33.42	60.00	50.00		PASS



### A.9. Restricted Frequency Bands

The lowest and highest channels are tested to verify the Restricted Frequency Bands.

The measurement results are obtained as below:

 $E [dB\mu V/m] = U_R + A_T + A_{Factor} [dB]; A_T = L_{Cable loss} [dB] - G_{preamp} [dB]$ 

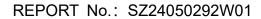
A<sub>T</sub>: Total correction Factor except Antenna

U<sub>R</sub>: Receiver Reading G<sub>preamp</sub>: Preamplifier Gain A<sub>Factor</sub>: Antenna Factor at 3m

Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

### 802.11b Mode

Channel	Frequency	Detector	Receiver Reading	A <sub>T</sub>	A <sub>Factor</sub>	Max. Emission	Limit	Verdict
Onamici	(MHz)	PK/ AV	U <sub>R</sub> (dBµV)	(dB)	(dB@3m)	E (dBµV/m)	(dBµV/m)	Verdict
1	2387.47	PK	27.84	6.74	27.20	61.78	74	PASS
1	2387.25	AV	19.74	6.74	27.20	53.68	54	PASS
11	2486.40	PK	26.37	6.74	27.20	60.31	74	PASS
11	2484.61	AV	17.89	6.74	27.20	51.83	54	PASS







(PEAK, Channel 1, 802.11b)



(AVERAGE, Channel 1, 802.11b)



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(PEAK, Channel 11, 802.11b)



(AVERAGE, Channel 11, 802.11b)



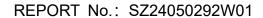


## 802.11g Mode

Channel	Frequency	Detector	Receiver Reading	A <sub>T</sub>	A <sub>Factor</sub>	Max. Emission	Limit	Verdict
Grianner	(MHz)	PK/ AV	$U_R$ (dB $\mu$ V)	(dB)	(dB@3m)	E (dBµV/m)	(dBµV/m)	verdict
1	2389.49	PK	35.45	6.74	27.20	69.39	74	PASS
1	2390.00	AV	19.18	6.74	27.20	53.12	54	PASS
11	2483.50	PK	36.44	6.74	27.20	70.38	74	PASS
11	2483.50	AV	18.85	6.74	27.20	52.79	54	PASS



(PEAK, Channel 1, 802.11g)







(AVERAGE, Channel 1, 802.11g)



(PEAK, Channel 11, 802.11g)



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(AVERAGE, Channel 11, 802.11g)



## 802.11n (HT20) Mode

Channel	Frequency	Detector	Receiver Reading	A <sub>T</sub>	A <sub>Factor</sub>	Max. Emission	Limit	Verdict
	(MHz)	PK/ AV	U <sub>R</sub> (dBµV)	(dB)	(dB@3m)	E (dBµV/m)	(dBµV/m)	
1	2389.94	PK	37.12	6.74	27.20	71.06	74	PASS
1	2390.00	AV	18.44	6.74	27.20	52.38	54	PASS
11	2483.50	PK	36.22	6.74	27.20	70.16	74	PASS
11	2483.50	AV	17.68	6.74	27.20	51.62	54	PASS



(PEAK, Channel 1, 802.11n (HT20))

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(AVERAGE, Channel 1, 802.11n (HT20))



(PEAK, Channel 11, 802.11n (HT20))



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(AVERAGE, Channel 11, 802.11n (HT20))



#### A.10. Radiated Emission

According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak (or average) limit, it is unnecessary to perform an quasi-peak measurement (or average).

The measurement results are obtained as below:

 $E [dB\mu V/m] = U_R + A_T + A_{Factor} [dB]; A_T = L_{Cable loss} [dB] - G_{preamp} [dB]$ 

A<sub>T</sub>: Total correction Factor except Antenna

U<sub>R</sub>: Receiver Reading G<sub>preamp</sub>: Preamplifier Gain

A<sub>Factor</sub>: Antenna Factor at 3m

During the test, the total correction Factor  $A_T$  and  $A_{Factor}$  were built in test software.

**Note1:** All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

**Note2:** For the frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

**Note3:** For the frequency, which started from 18GHz to 10th harmonic of the highest frequency, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

#### Field strength of fundamental:

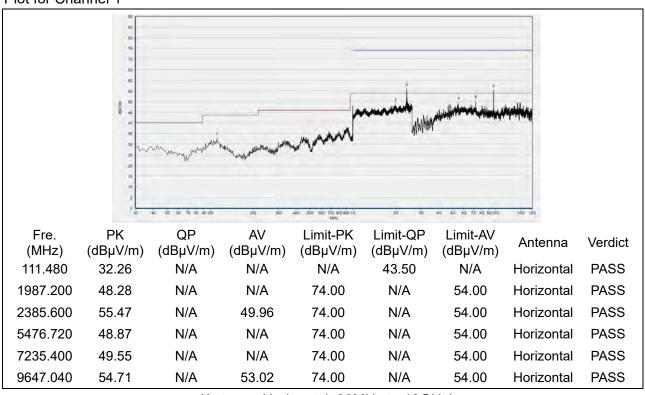
Frequency		Reading_Peak	Antenna	Path Loss	Final_Peak	Antenna
	(MHz)	(dBµV/m)	Factor (dB)	(dB)	(dBµV/m)	Polarity
	2414.65	74.07	27.20	6.74	108.01	Horizontal
	2414.65	74.87	27.20	6.74	108.81	Vertical

The field strength (the lowest) of fundamenta is more than 20dB higher than the unwanted emissions, in accordance with FCC part 15.215(b).

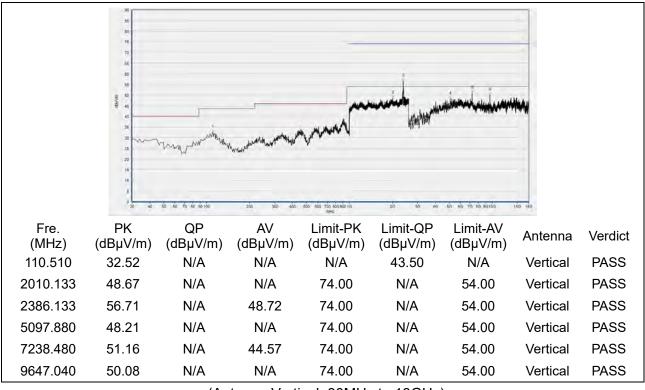


802.11b Mode

#### Plot for Channel 1



(Antenna Horizontal, 30MHz to 18GHz)

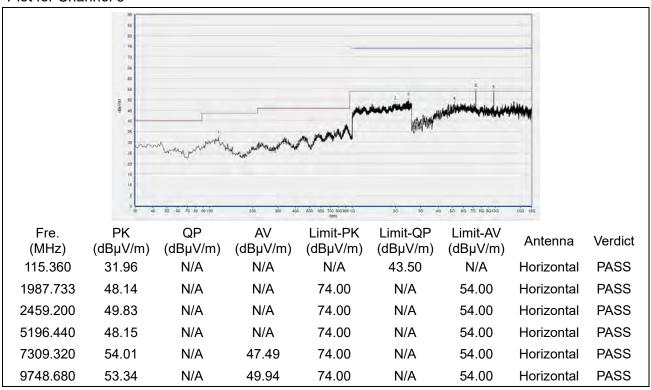




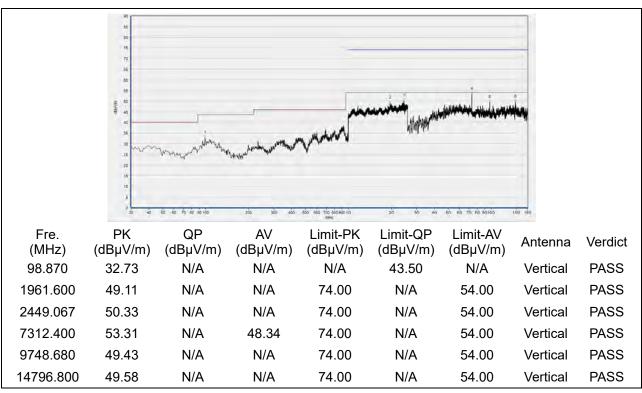




### Plot for Channel 6



(Antenna Horizontal, 30MHz to 18GHz)

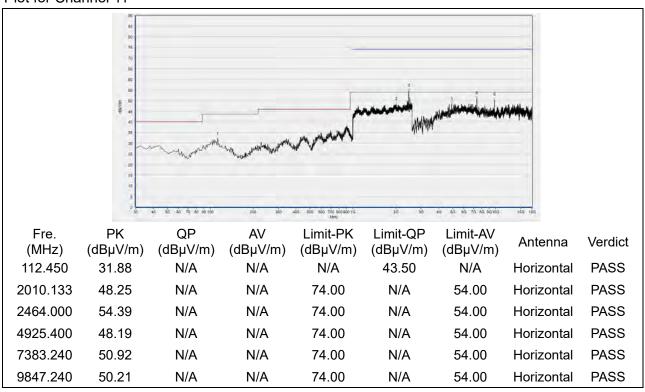




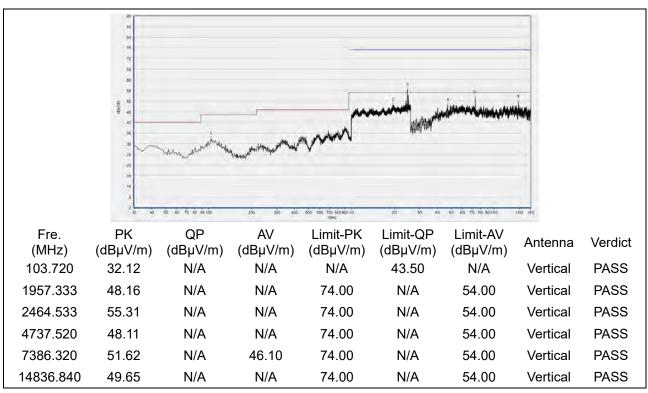




### Plot for Channel 11



(Antenna Horizontal, 30MHz to 18GHz)

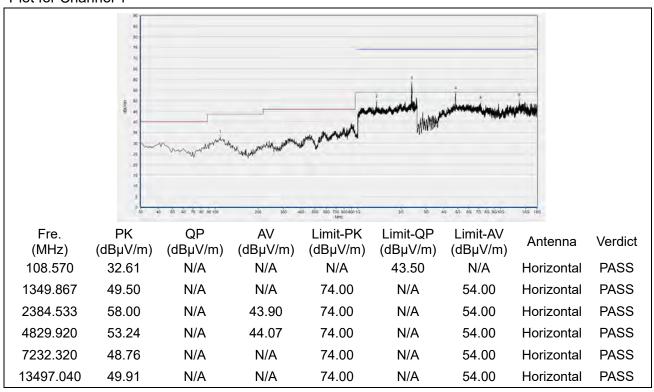




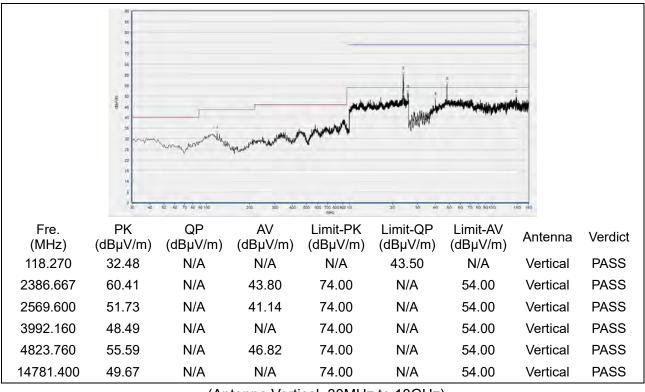


802.11g Mode

### Plot for Channel 1



(Antenna Horizontal, 30MHz to 18GHz)

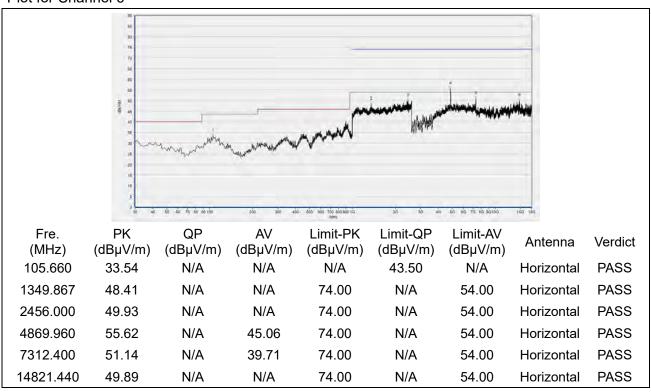




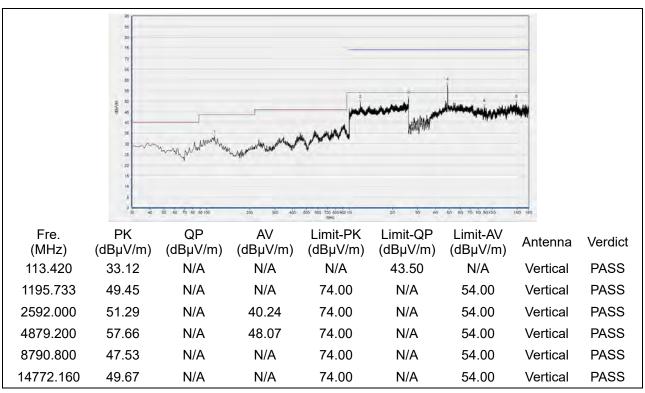




### Plot for Channel 6



(Antenna Horizontal, 30MHz to 18GHz)



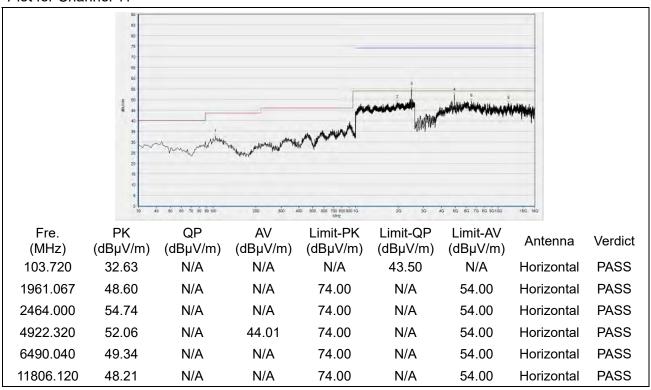
(Antenna Vertical, 30MHz to 18GHz)



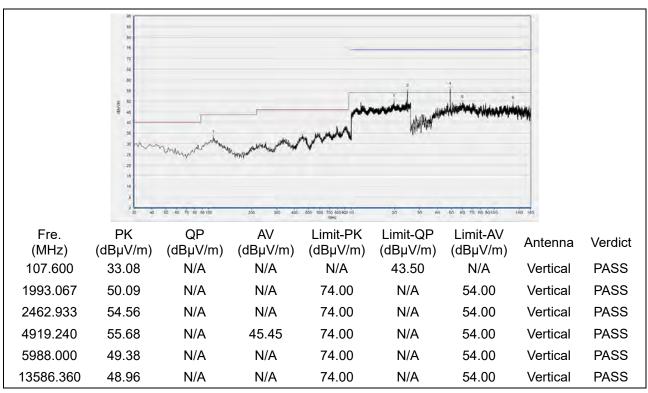




### Plot for Channel 11



(Antenna Horizontal, 30MHz to 18GHz)

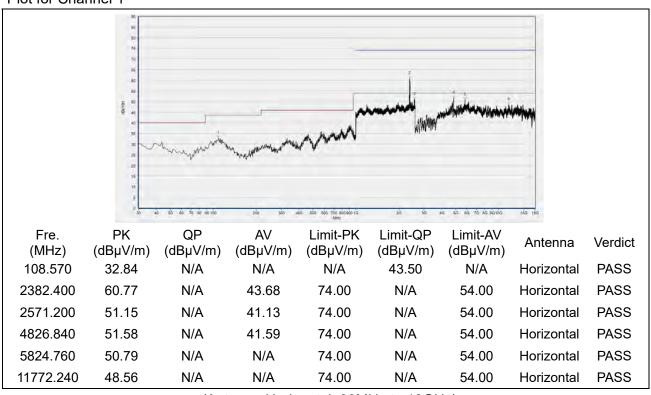




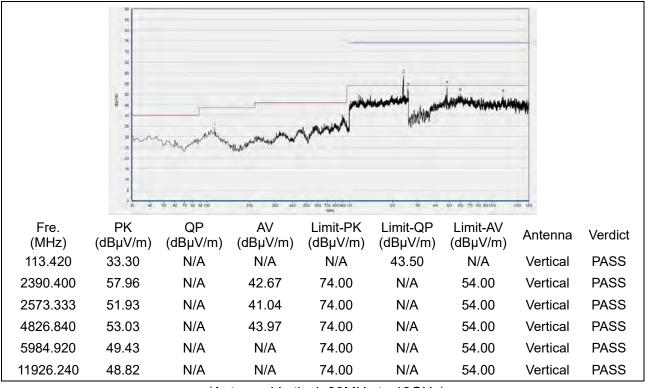


### 802.11n (HT20) Mode

#### Plot for Channel 1



(Antenna Horizontal, 30MHz to 18GHz)

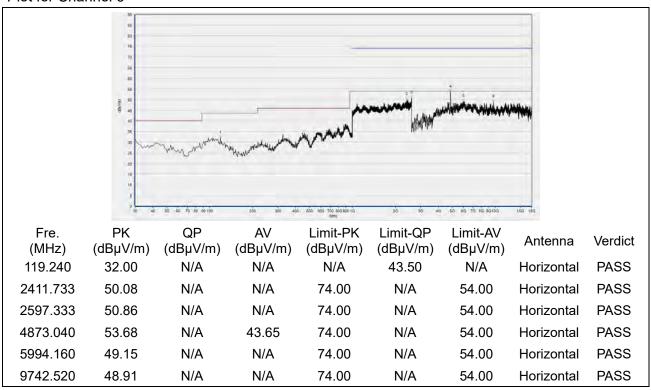




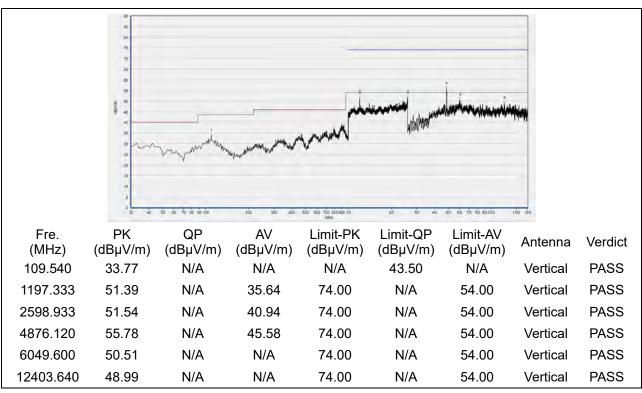




### Plot for Channel 6



(Antenna Horizontal, 30MHz to 18GHz)



(Antenna Vertical, 30MHz to 18GHz)



a

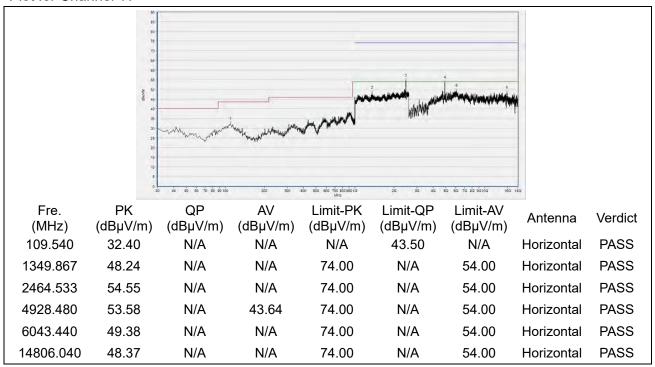
Tel: 86-755-36698555

Http://www.morlab.cn

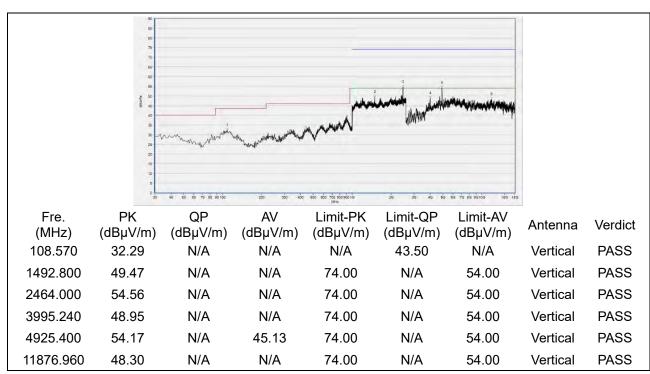
Fax: 86-755-36698525
E-mail: service@morlab.cn



### Plot for Channel 11



(Antenna Horizontal, 30MHz to 18GHz)



(Antenna Vertical, 30MHz to 18GHz)

——— END OF REPORT ———



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