



Radio Test Report

Article 2 Paragraph 1 of Item 19-3

MIC notice 88 Appendix 45

Client Information:

Applicant: Shoutou CO., LTD

Applicant add.: 2333 Komatsuri Kishiwada Osaka Japan

Product Information:

Product Name: Wireless Carplay

Model No.: DA-AD

Serial Model : DA-AD01, Y1, Y2, Y3, Y4, Y6, Y7, Y8, Y9, Y10, Y11

Brand Name: N/A

Report No.: CTT2025031707R21T-03

Prepared By:

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Bao'an District, Shenzhen, Guangdong, China

Date of Receipt: Mar. 17, 2025

Date of Test: Mar. 17, 2025~ Mar. 31, 2025

Date of Issue: Mar. 31, 2025

Test Result: Pass

This device has been tested and found to comply with the stated standard(s) above, which is (are) applicable only to the tested sample identified in the report.

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Reviewed by:

Mary Ye



Approved by:

Brown Lu



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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

MIC Notice No.88 Appendix No.45	Description of Test	Result
Article 3	Frequency Tolerance	Complies
Article 4	Occupied Bandwidth	Complies
Article 5	Unwanted Emission Strength	Complies
Article 6	Antenna Power Error	Complies
Article 6	E.I.R.P	Complies
Article 7	Adjacent channel Emitted Power	Complies
Article 8	Out-Band Leakage Power	Complies
Article 9	Secondary Radiated Emission Strength	Complies
Article 10	Transmission Burst Length	Complies
Article 11	Interference Prevention Function	Complies
Article 12	Carrier Sensing Function	Complies
Article 13,14	Dynamic Frequency Selection (DFS)	Complies ⁴
Article 49.20.3	Construction Protection Confirmation	Please refer to Japan Radio Protection Declaration

Note:

1. EUT supports W53 W56 frequency band, but it is not a Master device, so it is not applicable.
2. The antenna gain has been compensated.
3. (W53) (W56): Slave Station: It has the following functions.
4. Chooses the frequency which transmits automatically by the control from a master station .
Transmission and a stop of a radio wave are performed by the control from a "master station"



1.1 TEST FACILITY

Shenzhen C-link Testing & Technology Co., Ltd.

Add. : No.709, Enhai Building, No.1 Hangkong Road, Sanwei Community, Hangcheng Street, Bao 'an District, Shenzhen, Guangdong, China

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Frequency Error / 99% & 90% Bandwidth	$\pm 0.85 \times 10^{-7}$
2	Antenna Power	± 0.70 dB
3	Spurious Emissions	± 0.80 dB
4	DC / AC Power Source	$\pm 1.4\%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Manufacturer:	shenzhen elebest technology (HK) Co., LTD	
Manufacturer Address:	6th Floor, Building 5, Guole Science and Technology Park, No. 1 Lirong Road, Dalang Street, Longhua New District, Shenzhen	
Equipment	Wireless Carplay	
Model Name	DA-AD	
Brand Name:	N/A	
Derivative model No.:	DA-AD01, Y1, Y2, Y3, Y4, Y6, Y7, Y8, Y9, Y10, Y11	
Model Difference	All the model are the same circuit and RF module, Only the model name are different.	
Product Description	The EUT is a Wireless Carplay	
	Operation Frequency:	802.11a/n: 5500.0MHz ~ 5700.0MHz
	Modulation Type:	OFDM
	Number Of Channel	Please see Note 2.
	Antenna Designation:	PCB Antenna
	Antenna Gain (dBi)	5500.0MHz ~ 5700.0MHz: 5.50dBi
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.		
Channel List	Please refer to the Note 2.	
Power Supply Range:	DC 5V	
Hard Ware Version:	C85124N_V1.1-20241218	
Soft Ware Version:	24112501.C01P	



Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

802.11a& 802.11n (20MHz):

2.

Frequency Channel (5.5-5.7GHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	104	5520	108	5540	112	5560
116	5580	120	5600	124	5620	128	5640
132	5660	136	5680	140	5700	-	-

802.11n (40MHz):

Frequency Channel (5.5-5.7GHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	110	5550	118	5590	126	5630
134	5670	-	-	-	-	-	-



2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	802.11a /n(20): CH100/ CH60/ CH 64
Mode 2	802.11n(40): CH 102/ CH 118/ CH 134

Final Test Mode	Description
Mode 1	802.11a /n(20): CH100/ CH60/ CH 64
Mode 2	802.11n(40): CH 102/ CH 118/ CH 134

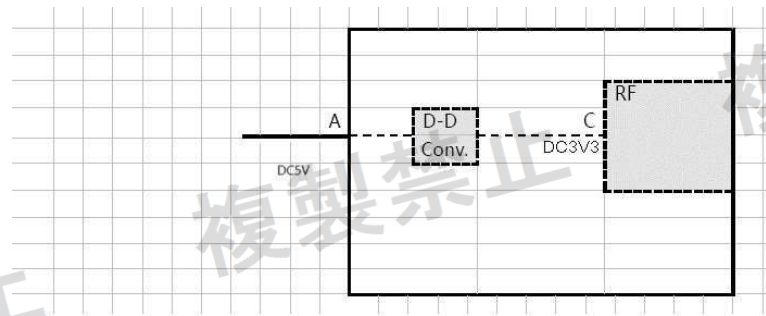
2.3 TEST CONDITIONS

The WIFI module was tested while in a continuous transmitter/receiver mode.

Power supply:

The EUT has the input voltage to the circuit of RF unit complies with output voltage limitation ($\pm 1\%$) against input voltage fluctuation ($\pm 10\%$).

So, all measurements were conducted at only rated voltage DC 5V.



Test below:

1: The fluctuation of C point is under $\pm 1\%$, when input voltage from A point to the test equipment is fluctuated by $\pm 10\%$.

The measurement result of the voltage fluctuation at RF circuit when DC 5V $\pm 10\%$

DC 5V	DC3V3
5V	3.33V
5.5V	3.33V
4.5V	3.33V

Pre-test the EUT in all voltage mode at the DC 5.5V, DC 5V and DC4.5V and conducted to determine the worst-case mode, only the worst-case results (DC 5V) are recorded in this report.

The EUT has the input voltage to the circuit of RF unit complies with output voltage limitation ($\pm 1\%$) against input voltage fluctuation ($\pm 10\%$).

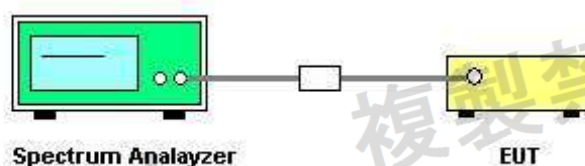
So, all measurements were conducted at only rated voltage DC 5V.

Temperature: 25.0 °C

Humidity: 75 % RH

Atmospheric Pressure: 1013 mbar

2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED





2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	Wireless Carplay	N/A	DA-AD	N/A	EUT

No.	Equipment	Manufacturer	EMC Compliance	Model No.	Serial No.	Power cord	Signal cord
1	Computer	Lenovo	N/A	TP00076A	N/A	N/A	N/A
2	USB Line	UGREEN	N/A	USB3.0	N/A	N/A	N/A

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.



2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date	Cal. Lab
1	SIGNAL Analyzer	Keysight	N9020A	MY53300466	2025.01.17	2026.01.16	Guangdong LiSai
2	RF Automatic Test System	MWRTest	MV1 00-RFCB	/	2025.01.17	2026.01.16	

Remark:

(a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1) in JRL.

(b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992) .

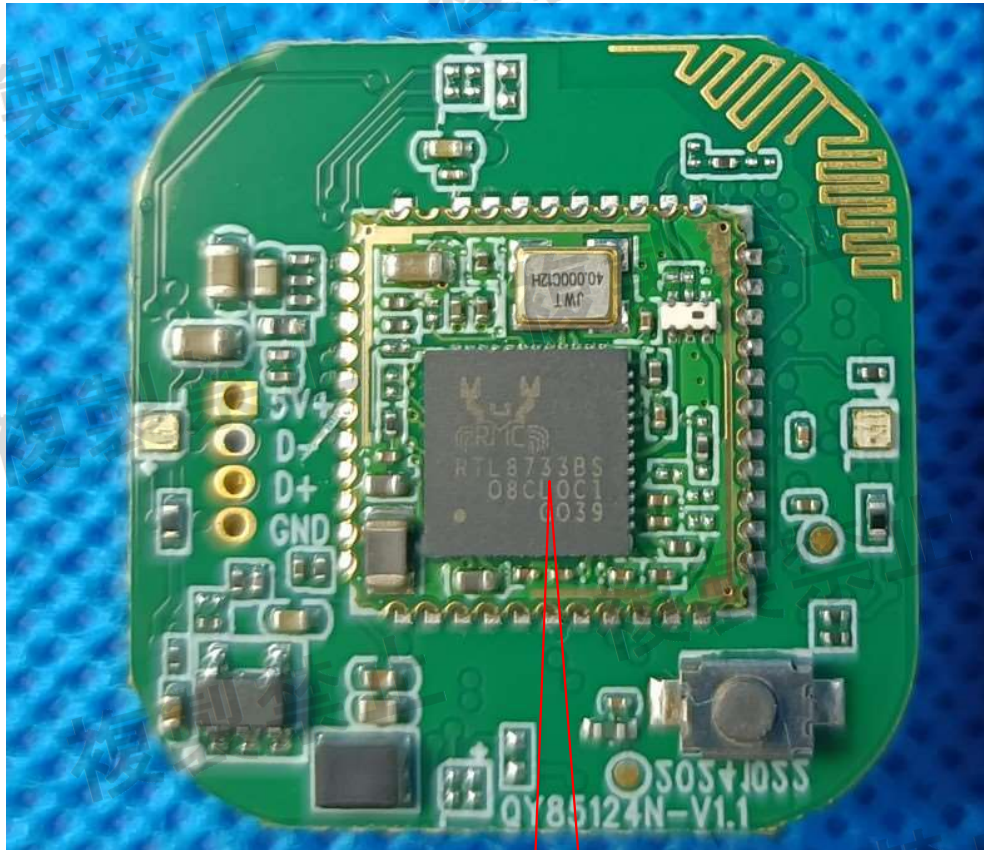
(c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).

(d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (C)

From JRL Article 24-2, paragraph 4, Item 2

3. RF SHIELDING METHOD

We apply the product for Japan RF certification. The chip's pin spacing is 0.4mm and is not easy to modify, The number of pins on the chip is 49.



Welding



4. TEST RESULT FOR WIFI

4.1 FREQUENCY ERROR

4.2 LIMIT

Item	Limits
Frequency Error	+/-20ppm

4.3 MEASURING INSTRUMENTS AND SETTING

The following table is the setting of Spectrum Analyzer.

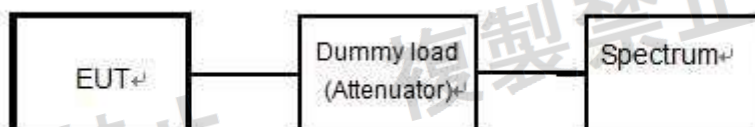
Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	10KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.4 TEST PROCEDURES

- (1) In the case of unmodulated signal (continuous or continuous burst), measure the frequency directly by a frequency meter.
- (2) In the case of burst waves, the measurement shall be done for enough time in order to obtain the enough measuring accuracy, and the average of the measured values becomes the final value.
- (3) In the case of a test mode with a specific frequency spectrum, measure the frequency of the specific spectrum by a spectrum analyzer.
- (4) In the cases above, if the frequency equivalent to the test frequency is not directly measured in principle, it shall be obtained by necessary calculation.

In the case of modulated signal, if there is no specific spectrum measurable by a spectrum analyzer but a specific dip is observed, it is allowed to measure the frequency with the signal generator (synthesized). That is, observe a signal of the signal generator concurrently (or alternately) with the tested signal using the spectrum analyzer while setting the frequency of the signal generator to the position of the dip on the screen of the spectrum analyzer, and determine the frequency of the signal generator at the time as a measured value.

4.5 TEST SETUP LAYOUT



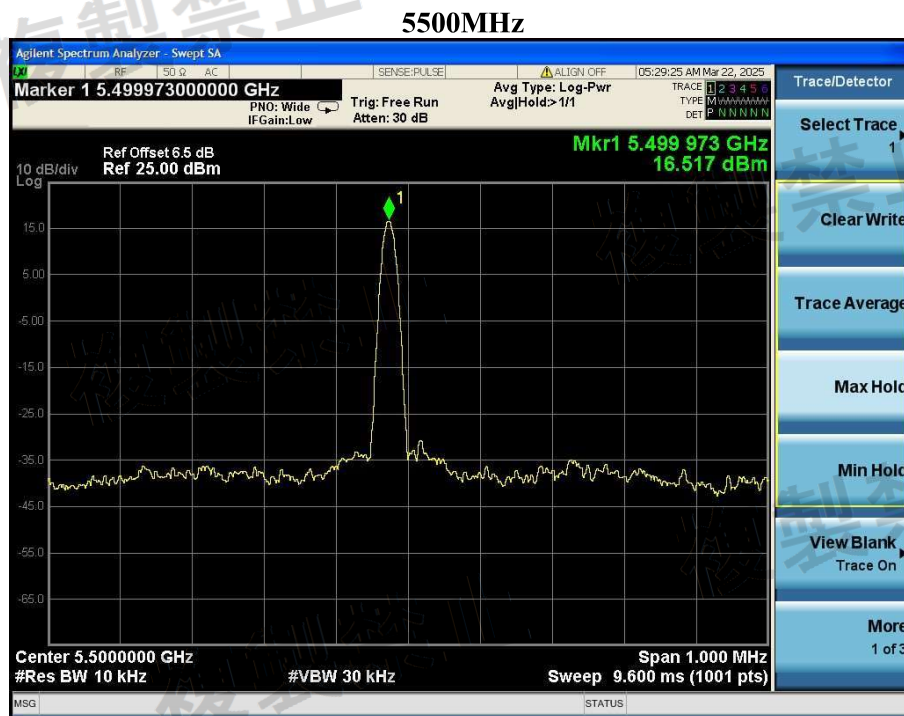
4.1.5. EUT OPERATION DURING TEST

The EUT was placed on the test table and programmed in un-modulation function.



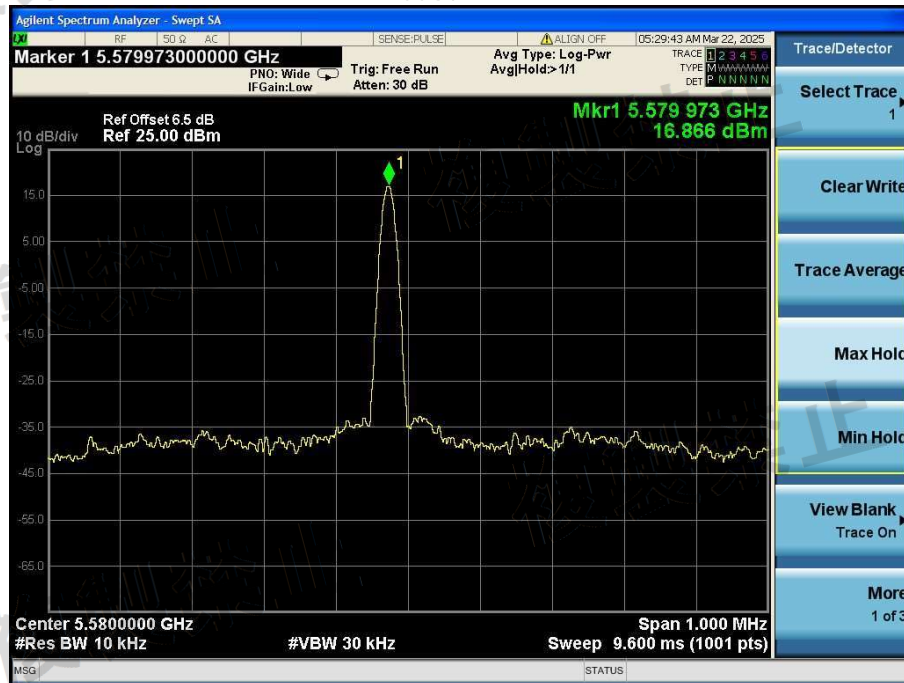
4.5.1 TEST RESULT

Test Voltage	Test Frequency (MHz)	Measured Frequency (MHz)	Frequency Error(ppm)	Limit (ppm)	P/F
Normal Voltage	5500	5499.973	-4.91	+/-20	PASS
	5580	5579.973	-4.84	+/-20	PASS
	5700	5699.972	-4.91	+/-20	PASS
	5510	5509.973	-4.90	+/-20	PASS
	5590	5589.973	-4.83	+/-20	PASS
	5670	5669.972	-4.94	+/-20	PASS

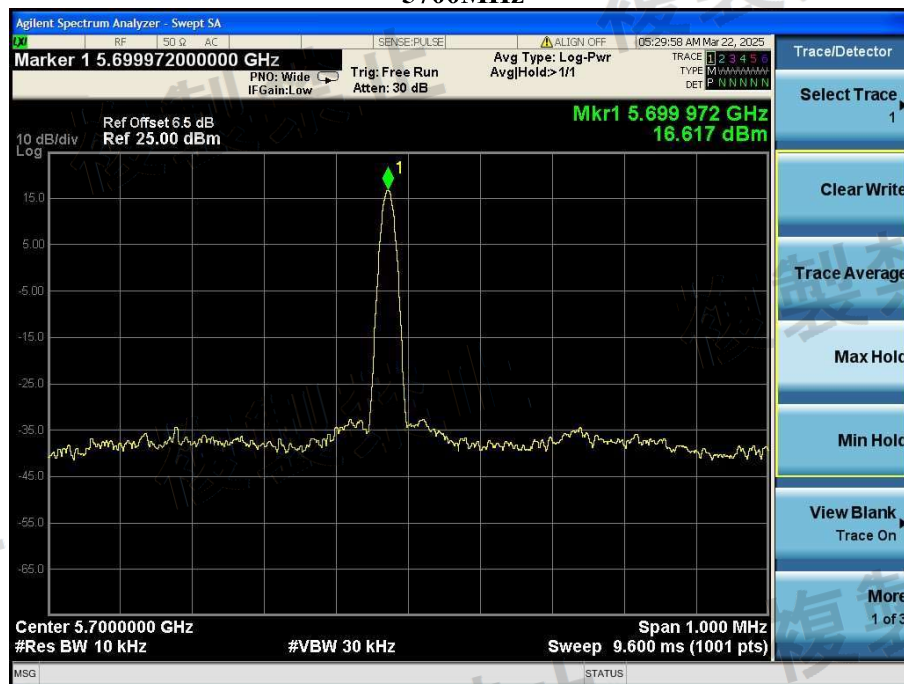




5580MHz

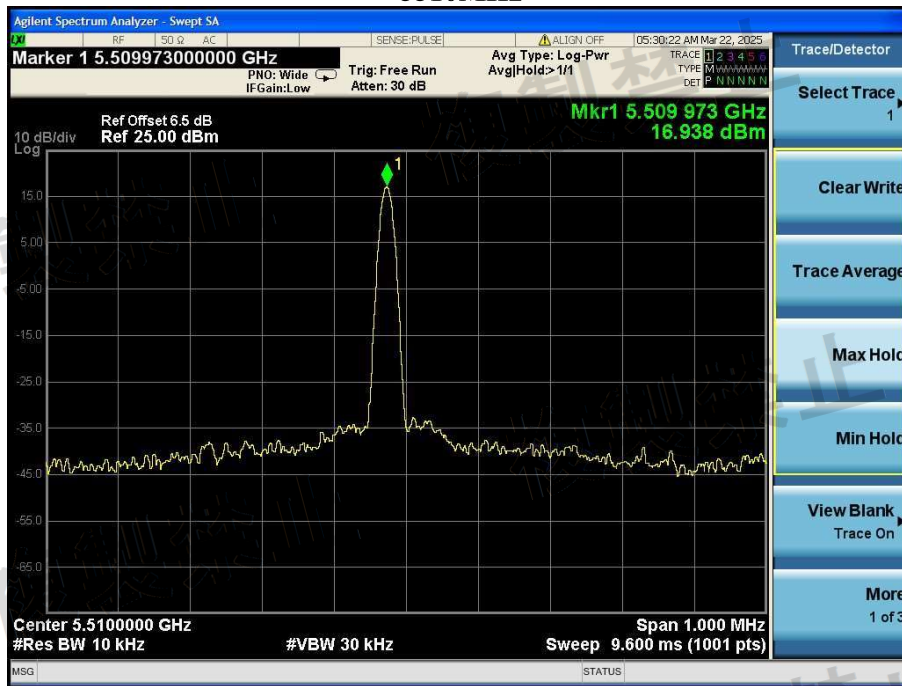


5700MHz

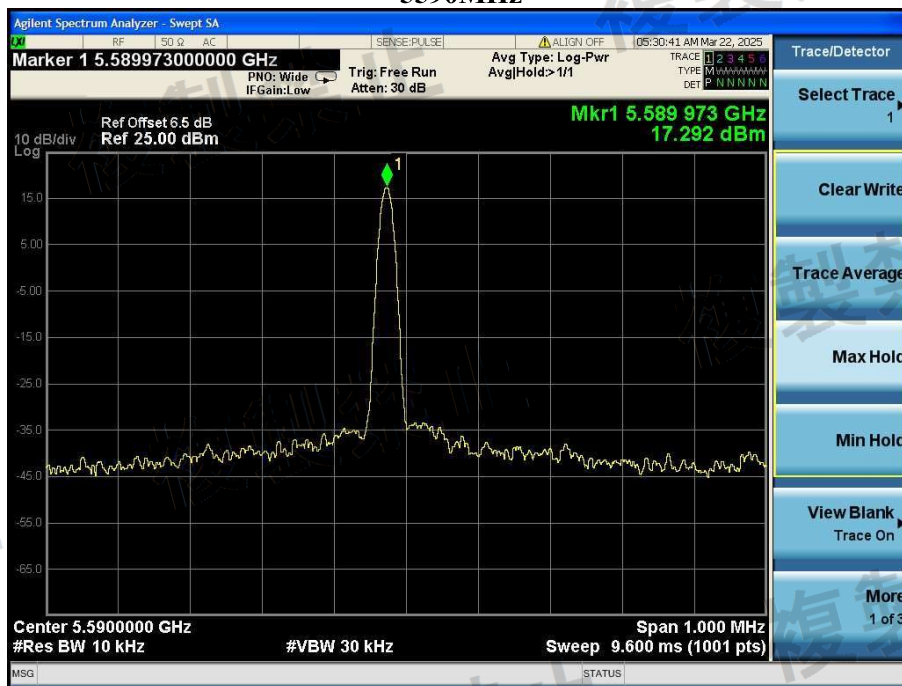




5510MHz



5590MHz





5670MHz



5. OCCUPIED BANDWIDTH MEASUREMENT (99% POWER BANDWIDTH)

5.1 LIMIT

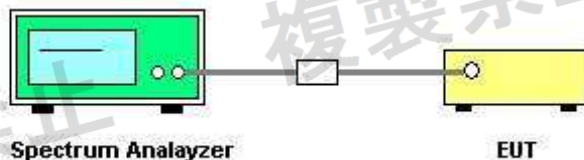
Test Item	Limits
Occupied Bandwidth	≤ 20 MHz (20MHz System for OFDM) ≤ 40 MHz (40MHz System for OFDM) ≤ 80 MHz (80MHz System for OFDM) ≤ 160 MHz (160MHz System for OFDM)

5.2 TEST PROCEDURES

The device under test is connected to the spectrum analyzer through a radio frequency cable and the settings are as follows:

1. EUT have transmitted the maximum modulation signal and fixed channelize.
2. SA set to 99% of occupied bandwidth to measure occupied bandwidth.
3. Resolution bandwidth: Limited to 3% or less of the allowable value specified in equipment regulations.
4. Video bandwidth: Comparable to the resolution bandwidth.
5. Span: Spanning from approximately twice to 3.5 times the allowable value as per equipment regulations.
6. ATT: 30dB /Ref:20dBm (actual sample power adjustment is for reference only)
7. Sweep time = The minimum duration ensuring measurement accuracy, accounting for burst wave scenarios where at least one burst occurs per sample. / Sweep Mode: Continuous sweep
8. Detect mode=Positive peak
9. Trace mode=Max hold
10. Record the result for Occupied Bandwidth Measurements in report..

5.3 TEST SETUP LAYOUT



5.4 TEST DEVIATION

There is no deviation with the original standard.

5.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.



5.6 TEST RESULT

Test Voltage	Test Frequency (MHz)	Occupied Bandwidth(MHz)
Normal Voltage	5500	16.601
	5580	16.607
	5700	16.613

CH100-Occupied Bandwidth (99%)-a Mode





CH116-Occupied Bandwidth (99%)-a Mode



CH140-Occupied Bandwidth (99%)-a Mode





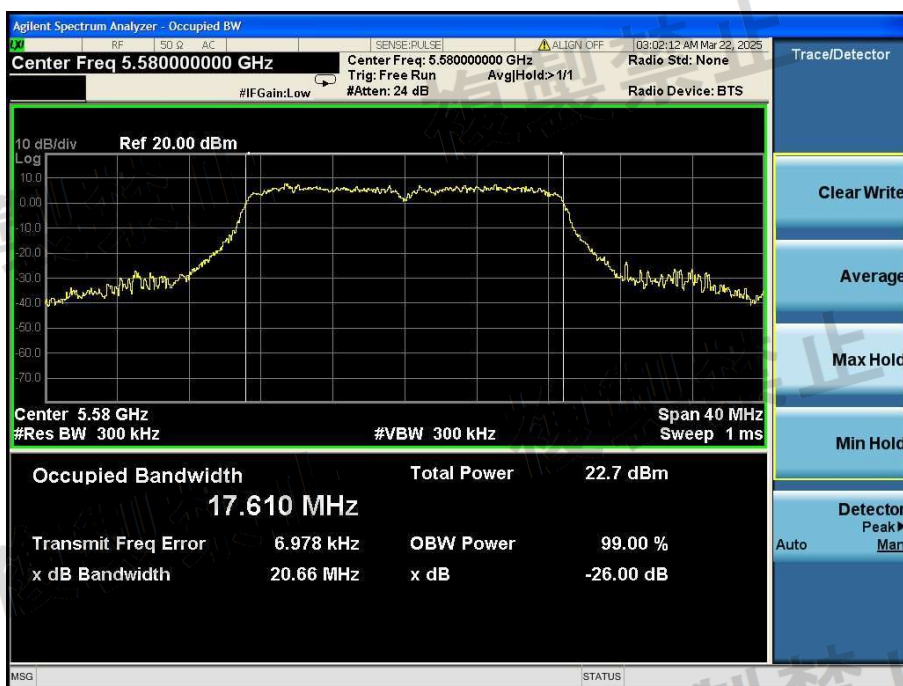
Test Voltage	Test Frequency (MHz)	Occupied Bandwidth(MHz)
Normal Voltage	5500	17.598
	5580	17.610
	5700	17.592

CH100-Occupied Bandwidth (99%)-n(20) Mode





CH116-Occupied Bandwidth (99%)-n(20) Mode

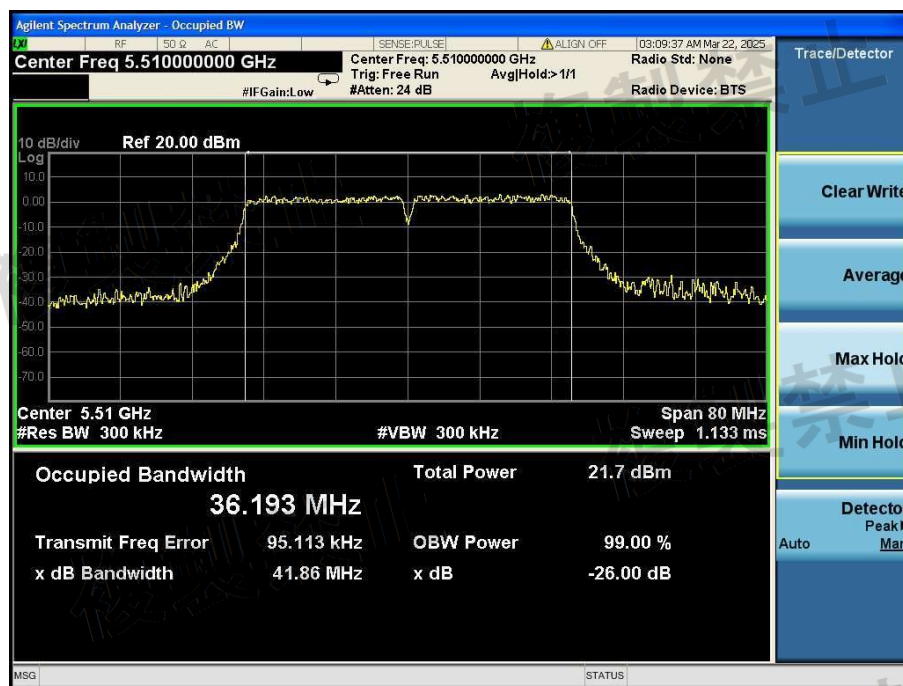


CH140-Occupied Bandwidth (99%)-n(20) Mode



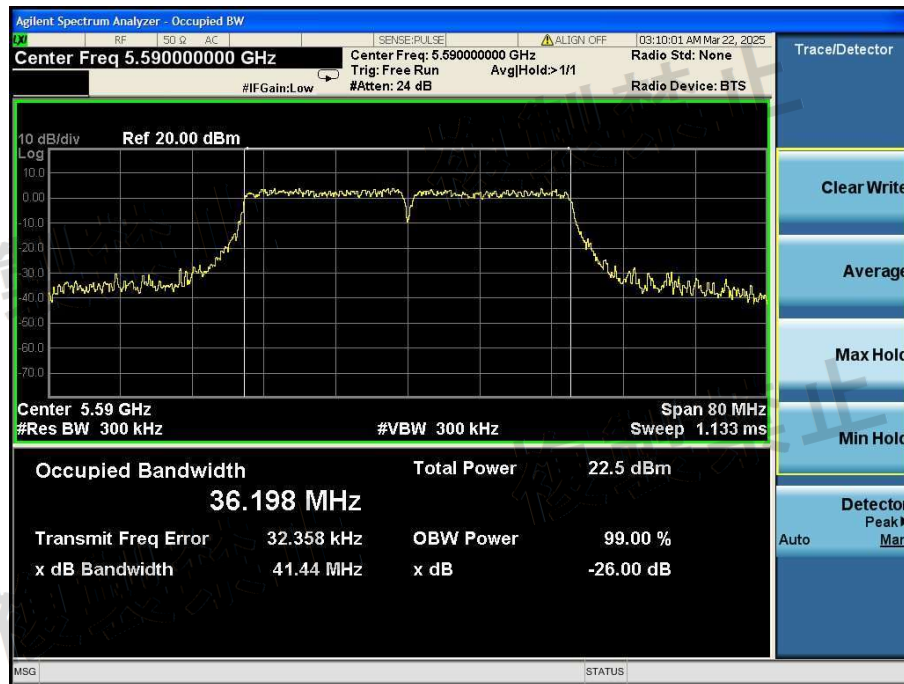


Test Voltage	Test Frequency (MHz)	Occupied Bandwidth(MHz)
Normal Voltage	5510	36.193
	5590	36.198
	5670	36.178

CH102-Occupied Bandwidth (99%)-n(40) Mode



CH118-Occupied Bandwidth (99%)-n(40) Mode



CH134-Occupied Bandwidth (99%)-n(40) Mode





6. UNWANTED EMISSION STRENGTH MEASUREMENT

6.1 LIMIT

W56 Band	
20MHz System	
DSSS, ect.	OFDM
5470 MHz or less: 12.5 μ W/MHz	5460 MHz or less: 2.5 μ W/MHz
	5460 – 5470 MHz: 12.5 μ W/MHz
5730 MHz or more: 12.5 μ W/MHz	5745 – 5765 MHz: 12.5 μ W/MHz
	Over 5765 MHz: 2.5 μ W/MHz
40MHz System	80MHz System
5460 MHz or less: 12.5 μ W/MHz	5460 MHz or less: 12.5 μ W/MHz
5460 – 5470 MHz: 50 μ W/MHz	5460 – 5469.5 MHz: 50 μ W/MHz
5770 MHz or more: 12.5 μ W/MHz	5469.5 – 5470 MHz: 51.2 μ W/MHz
	5770 MHz or more: 12.5 μ W/MHz



6.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 3.6 in this report. The following table is the setting of Spectrum Analyzer.

6.2. MEASURING INSTRUMENTS AND SETTING

Please refer to section 3.6 in this report. The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	Below 1GHz: 1MHz Above 1Ghz: 1MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto



6.3. TEST PROCEDURES

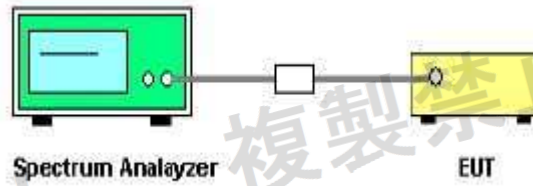
1. UT have transmitted the maximum modulation signal and fixed channelize.
2. Sweep frequency range: From 30MHz to 26GHz
 - Exclude the following frequency ranges from the sweep frequency range:
 - Occupied bandwidth $\leq 18\text{MHz}$:
 - 5.2GHz band: From 5,140MHz to 5,360MHz
 - 5.3GHz band: From 5,140MHz to 5,360MHz
 - 5.6GHz band: From 5,460MHz to 5,740MHz
 - Occupied bandwidth $> 18\text{MHz}$ and $\leq 19\text{MHz}$:
 - 5.2GHz band: From 5,135MHz to 5,365MHz
 - 5.3GHz band: From 5,135MHz to 5,365MHz
 - 5.6GHz band: From 5,455MHz to 5,745MHz
 - Occupied bandwidth $> 19\text{MHz}$ and $\leq 38\text{MHz}$:
 - 5.2GHz band: From 5,100MHz to 5,400MHz
 - 5.3GHz band: From 5,100MHz to 5,400MHz
 - 5.6GHz band: From 5,420MHz to 5,760MHz
 - Occupied bandwidth $> 38\text{MHz}$ and $\leq 78\text{MHz}$:
 - 5.2GHz band: From 5,020MHz to 5,480MHz
 - 5.3GHz band: From 5,020MHz to 5,480MHz
 - 5.6GHz band: From 5,340MHz to 5,800MHz
 - Occupied bandwidth $> 78\text{MHz}$:
 - 5.2GHz band: From 4,916MHz to 5,584MHz
 - 5.3GHz band: From 4,916MHz to 5,584MHz
 - 5.6GHz band: From 5,236MHz to 5,904MHz
3. Resolution bandwidth: 1MHz; Video bandwidth: Comparable to the resolution bandwidth
4. Y-axis scale: 10dB/Div; Input level: Set to achieve maximum dynamic range
5. Sweep time: Minimum time ensuring measurement accuracy (For burst waves, it can be determined as "(Sweep frequency range (MHz) / Resolution bandwidth (MHz)) $\times$ Burst period (s)")
6. Data points: 400 points or more; Sweep mode: Single sweep; Detection mode: Positive peak
7. The cable loss and antenna gain had been edited in the "Input Correction" of the Spectrum Analyzer. In case of MIMO mode, the $10 \times \log(N)$ also had been edited in the "Input Correction" of the Spectrum Analyzer. N is the number of transmit antenna.
8. Convert from dBm to μW : $P(\mu\text{W}) = 1000 * 10^{[P(\text{dBm})/10]}$

When configuring the spectrum analyzer for unwanted emission amplitude measurement, follow these settings:

 - a. Center frequency: Unwanted emission frequency (the frequency being investigated); Span: 0Hz
 - b. Sweep time: Minimum time ensuring measurement accuracy (For burst waves, it should be at least the duration of one burst)
 - c. Data points: 400 points or more; Sweep mode: Single sweep;



6.4. TEST SETUP LAYOUT



6.5 TEST DEVIATION

There is no deviation with the original standard.



6.5. TEST RESULT

Tx Spurious Emission

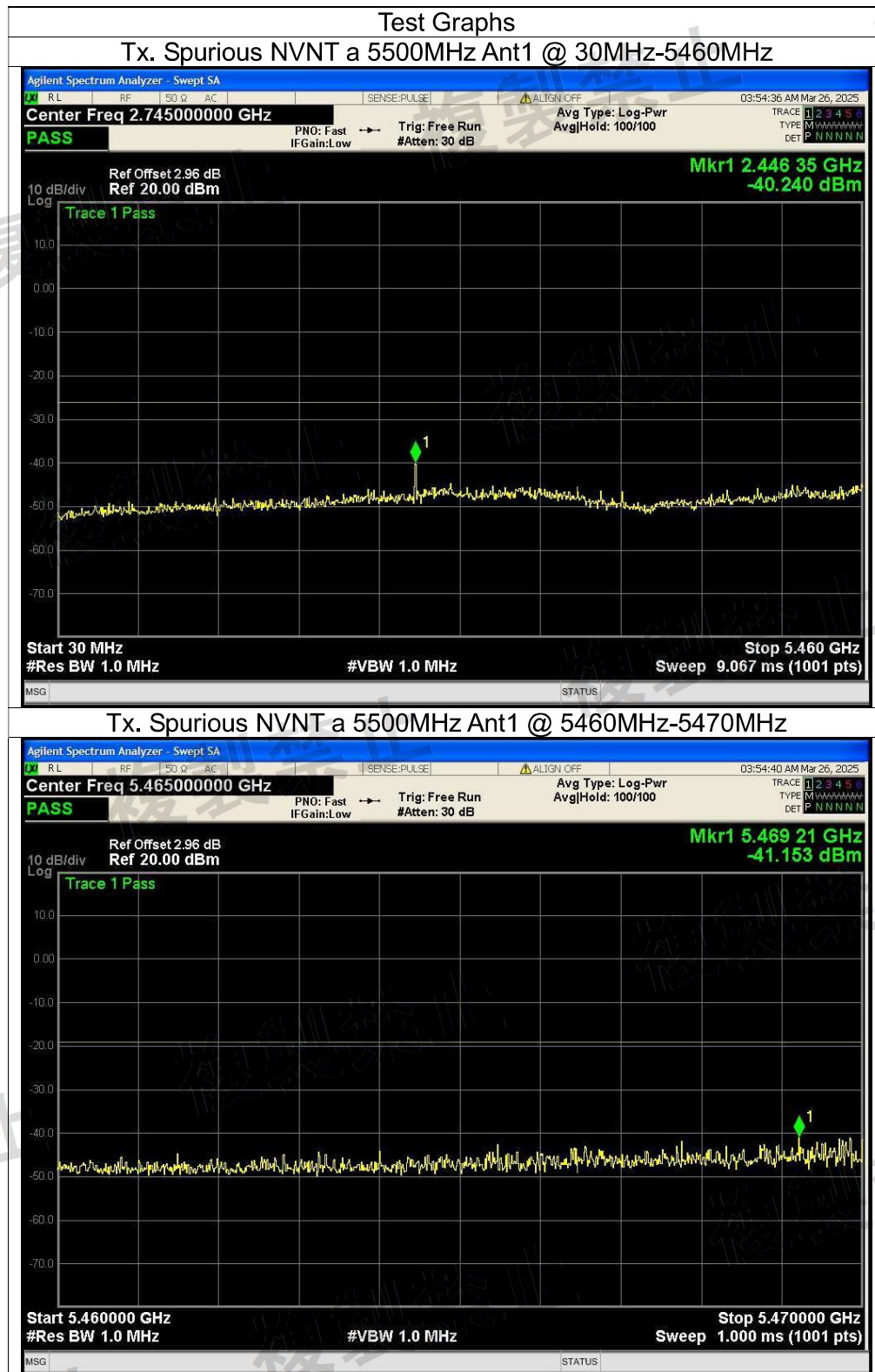
5500-5700MHz

Condition	Mode	Frequency (MHz)	Antenna	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm/MHz)	Max Value (uW/MHz)	Limit Start(uW/MHz)	Limit Stop (uW/MHz)	Verdict
NVNT	a	5500	Ant1	30-5460	2446.35	-40.24	0.0946	2.5	2.5	Pass
NVNT	a	5500	Ant1	5460-5470	5469.21	-41.15	0.0767	12.5	12.5	Pass
NVNT	a	5500	Ant1	5745-5765	5751.74	-43.16	0.0483	12.5	12.5	Pass
NVNT	a	5500	Ant1	5765-26000	25575.07	-34.55	0.3508	2.5	2.5	Pass
NVNT	a	5580	Ant1	30-5460	2446.35	-38.17	0.1524	2.5	2.5	Pass
NVNT	a	5580	Ant1	5460-5470	5464.6	-45.53	0.028	12.5	12.5	Pass
NVNT	a	5580	Ant1	5745-5765	5747.68	-43.61	0.0436	12.5	12.5	Pass
NVNT	a	5580	Ant1	5765-26000	25959.53	-33.86	0.4111	2.5	2.5	Pass
NVNT	a	5700	Ant1	30-5460	2446.35	-40.7	0.0851	2.5	2.5	Pass
NVNT	a	5700	Ant1	5460-5470	5463.19	-46.89	0.0205	12.5	12.5	Pass
NVNT	a	5700	Ant1	5745-5765	5751.08	-43.72	0.0425	12.5	12.5	Pass
NVNT	a	5700	Ant1	5765-26000	25939.3	-33.73	0.4236	2.5	2.5	Pass
NVNT	n20	5500	Ant1	30-5460	2446.35	-41.18	0.0762	2.5	2.5	Pass
NVNT	n20	5500	Ant1	5460-5470	5469.44	-42.13	0.0612	12.5	12.5	Pass
NVNT	n20	5500	Ant1	5745-5765	5750.1	-46.08	0.0247	12.5	12.5	Pass
NVNT	n20	5500	Ant1	5765-26000	25979.77	-34.49	0.3556	2.5	2.5	Pass
NVNT	n20	5580	Ant1	30-5460	2446.35	-40.52	0.0887	2.5	2.5	Pass
NVNT	n20	5580	Ant1	5460-5470	5469.37	-46.93	0.0203	12.5	12.5	Pass
NVNT	n20	5580	Ant1	5745-5765	5752.26	-44.39	0.0364	12.5	12.5	Pass
NVNT	n20	5580	Ant1	5765-26000	25939.3	-33.9	0.4074	2.5	2.5	Pass
NVNT	n20	5700	Ant1	30-5460	2446.35	-39.72	0.1067	2.5	2.5	Pass
NVNT	n20	5700	Ant1	5460-5470	5468	-46.8	0.0209	12.5	12.5	Pass
NVNT	n20	5700	Ant1	5745-5765	5752	-45.15	0.0305	12.5	12.5	Pass
NVNT	n20	5700	Ant1	5765-26000	26000	-34.52	0.3532	2.5	2.5	Pass
NVNT	n40	5510	Ant1	30-5460	2446.35	-36.95	0.2018	12.5	12.5	Pass
NVNT	n40	5510	Ant1	5460-5470	5469.97	-39.3	0.1175	50	50	Pass
NVNT	n40	5510	Ant1	5770-26000	26000	-34.35	0.3673	12.5	12.5	Pass
NVNT	n40	5590	Ant1	30-5460	2446.35	-38.77	0.1327	12.5	12.5	Pass
NVNT	n40	5590	Ant1	5460-5470	5464.08	-45.73	0.0267	50	50	Pass
NVNT	n40	5590	Ant1	5770-26000	25615.63	-35.01	0.3155	12.5	12.5	Pass
NVNT	n40	5670	Ant1	30-5460	2446.35	-39.9	0.1023	12.5	12.5	Pass
NVNT	n40	5670	Ant1	5460-5470	5465.7	-46.68	0.0215	50	50	Pass



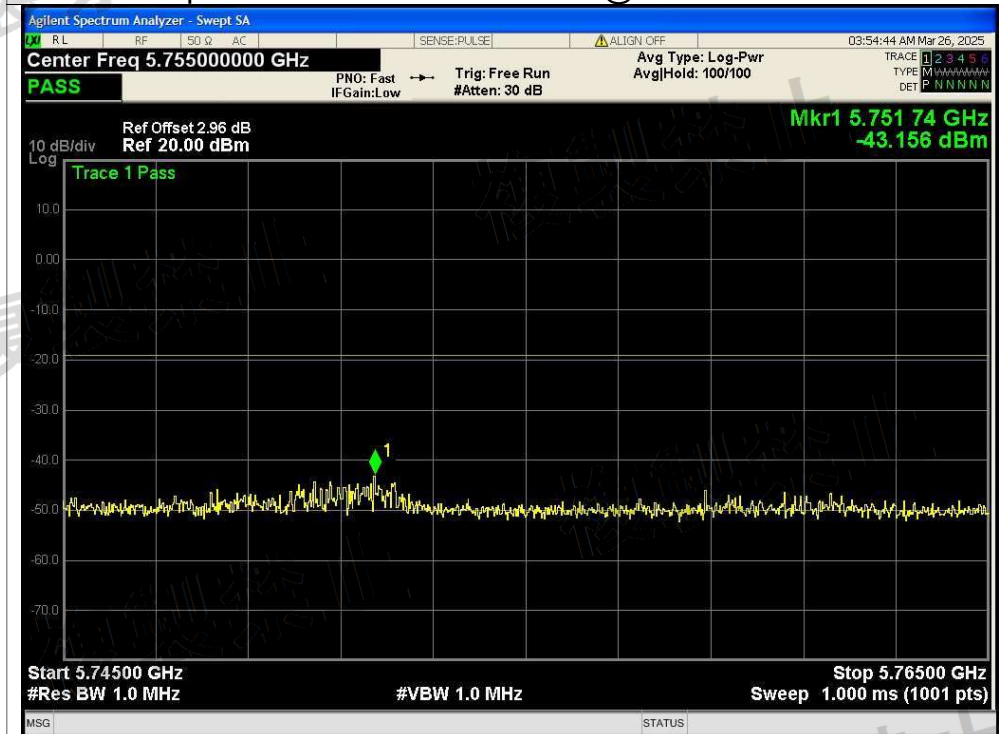
NVNT	n40	5670	Ant1	5770-26000	25979.77	-33.52	0.4446	12.5	12.5	Pass
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Note: The antenna gain has been compensated.





Tx. Spurious NVNT a 5500MHz Ant1 @ 5745MHz-5765MHz

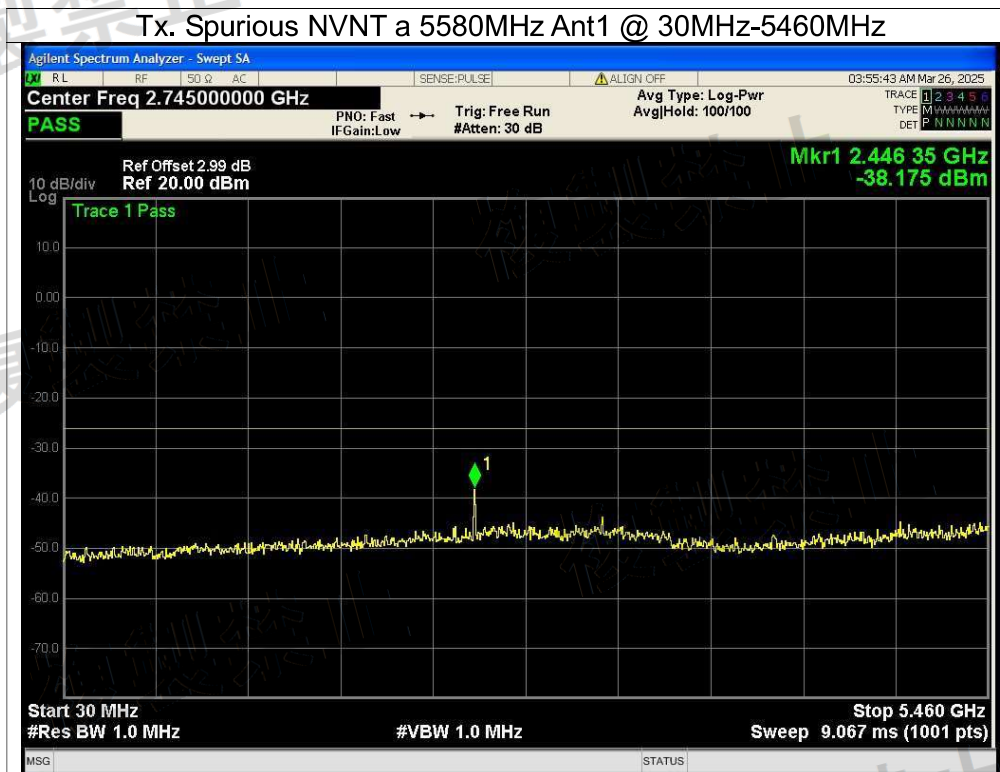


Tx. Spurious NVNT a 5500MHz Ant1 @ 5765MHz-26000MHz

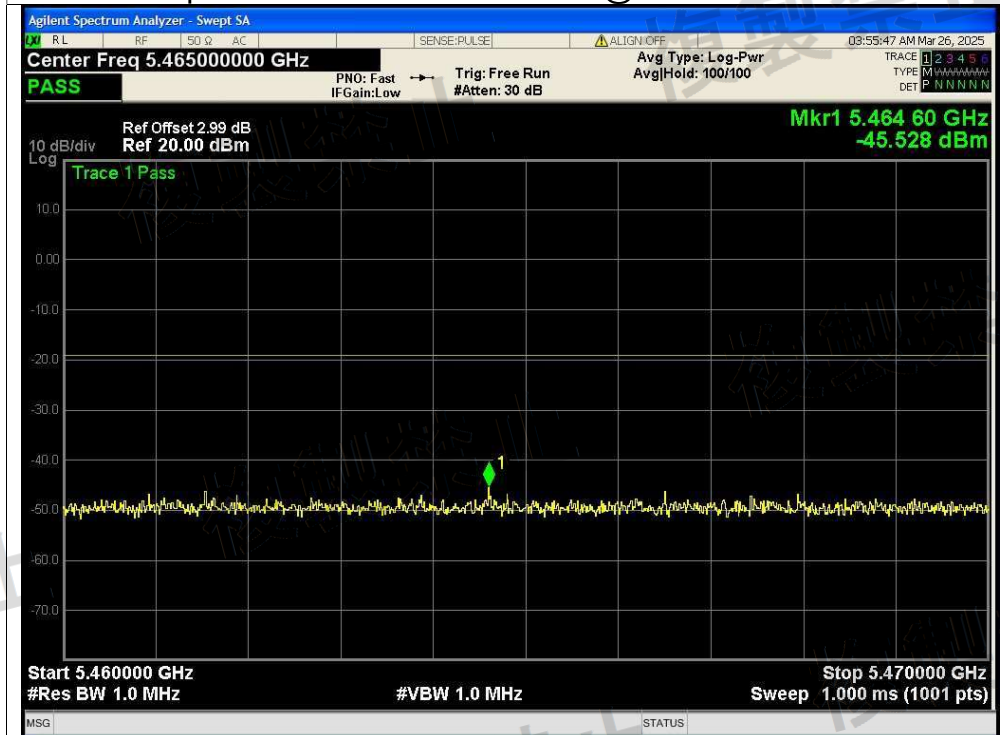




Tx. Spurious NVNT a 5580MHz Ant1 @ 30MHz-5460MHz

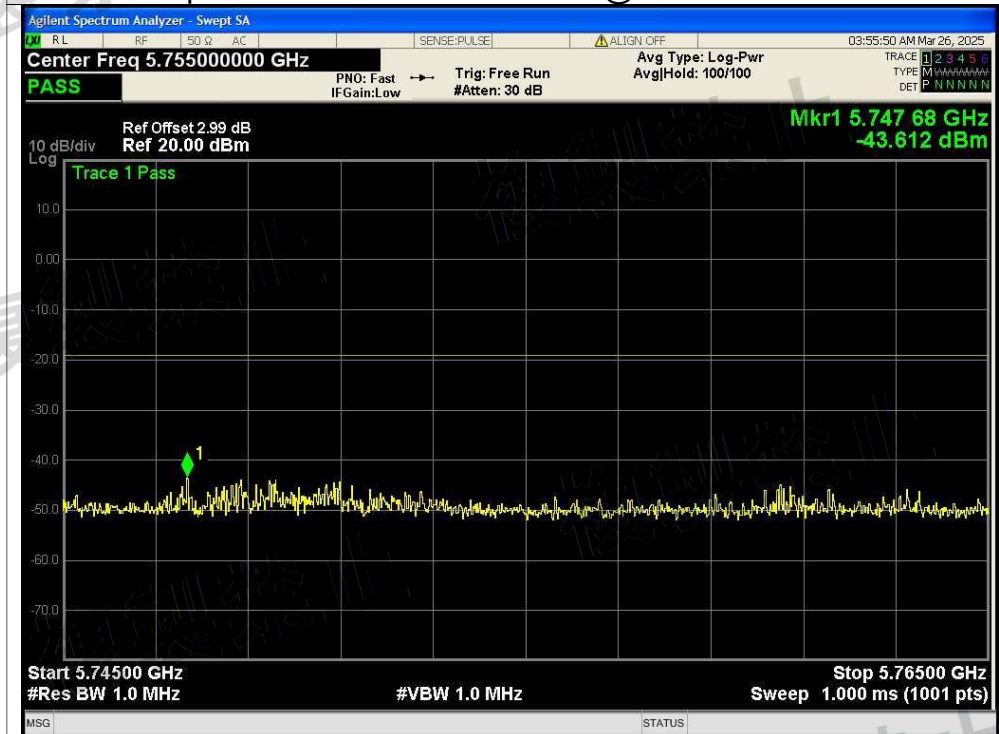


Tx. Spurious NVNT a 5580MHz Ant1 @ 5460MHz-5470MHz





Tx. Spurious NVNT a 5580MHz Ant1 @ 5745MHz-5765MHz

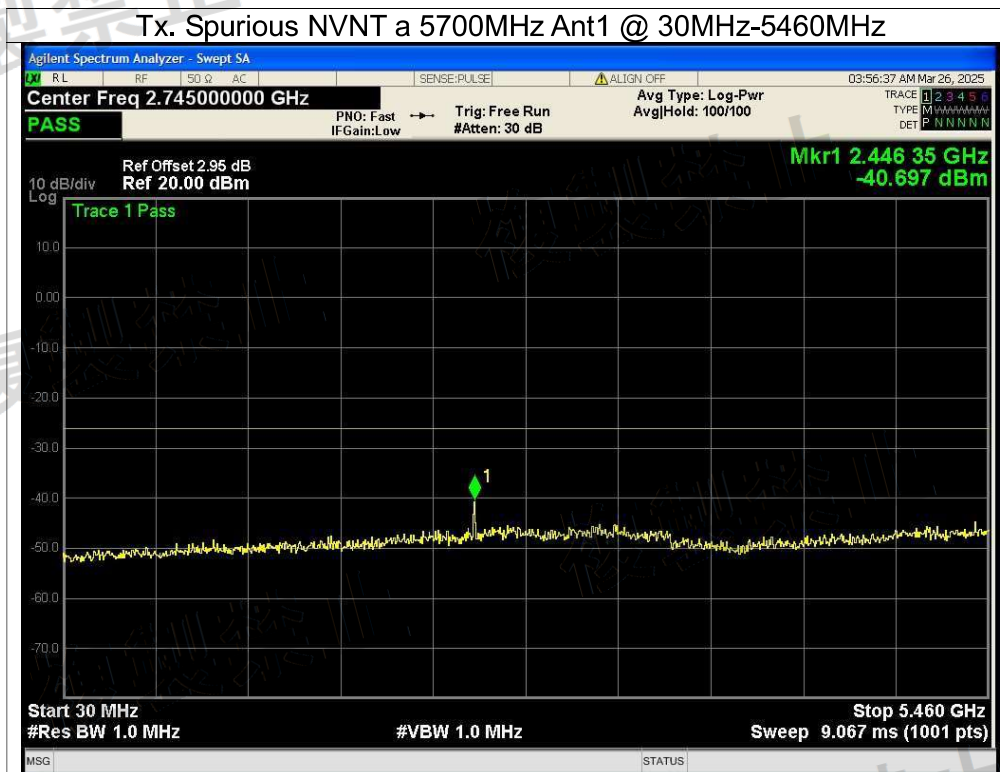


Tx. Spurious NVNT a 5580MHz Ant1 @ 5765MHz-26000MHz

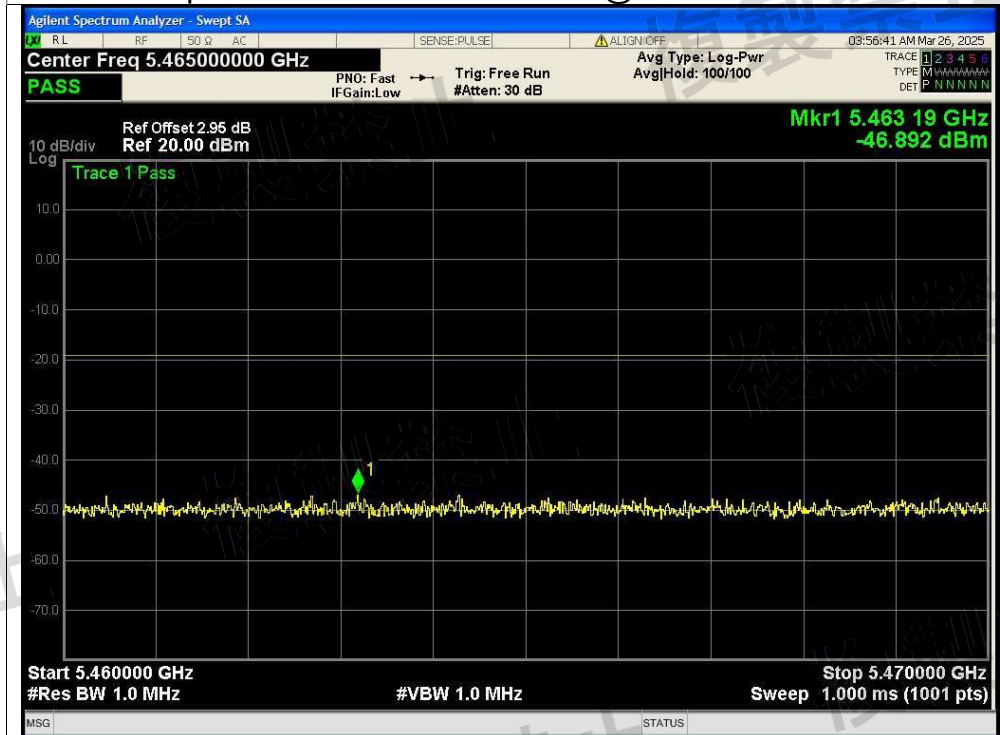




Tx. Spurious NVNT a 5700MHz Ant1 @ 30MHz-5460MHz

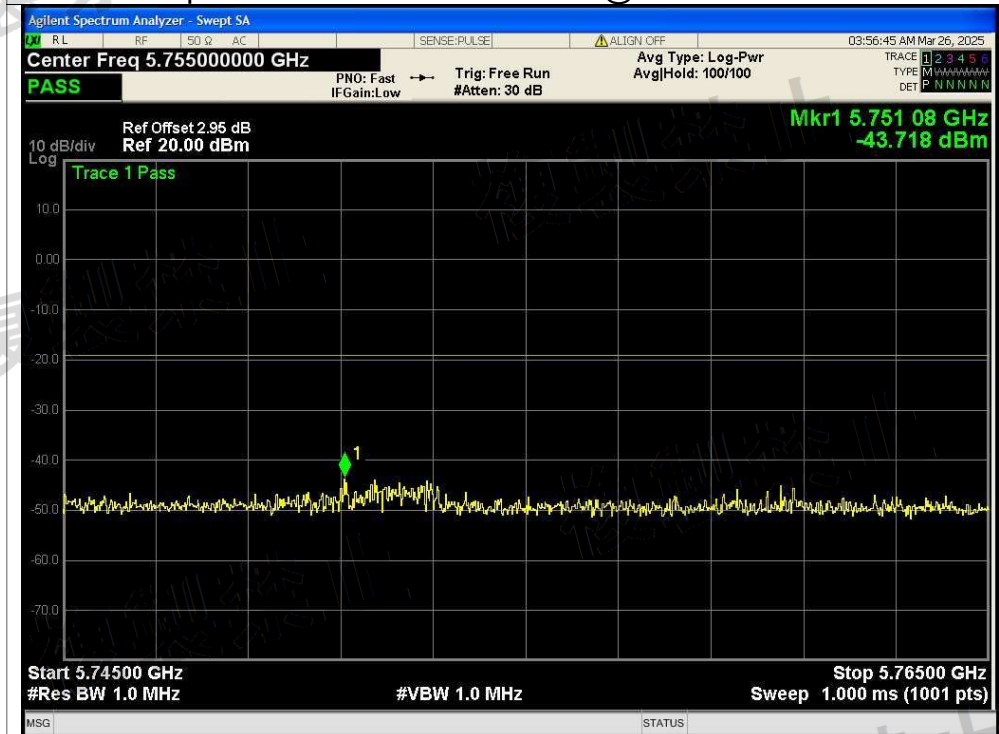


Tx. Spurious NVNT a 5700MHz Ant1 @ 5460MHz-5470MHz





Tx. Spurious NVNT a 5700MHz Ant1 @ 5745MHz-5765MHz

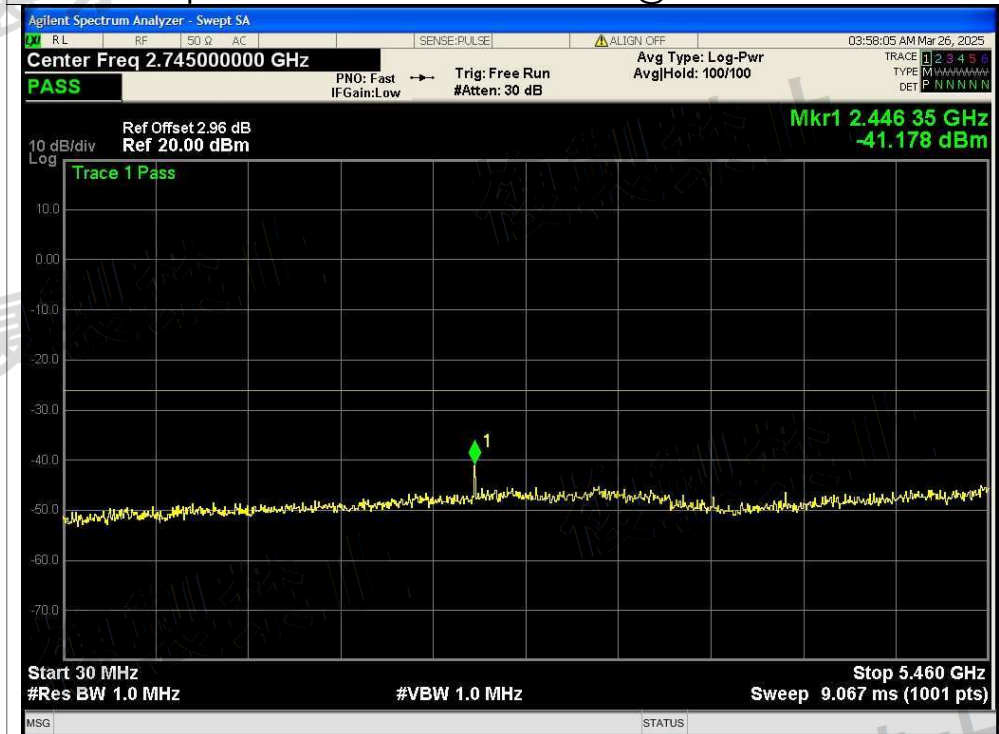


Tx. Spurious NVNT a 5700MHz Ant1 @ 5765MHz-26000MHz

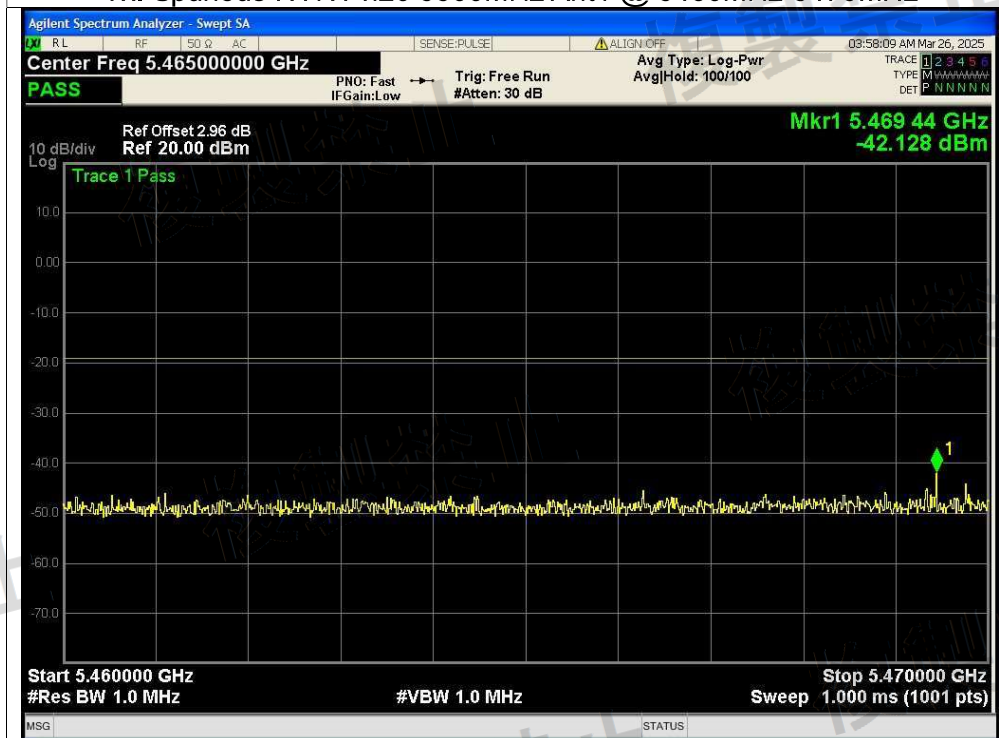




Tx. Spurious NVNT n20 5500MHz Ant1 @ 30MHz-5460MHz

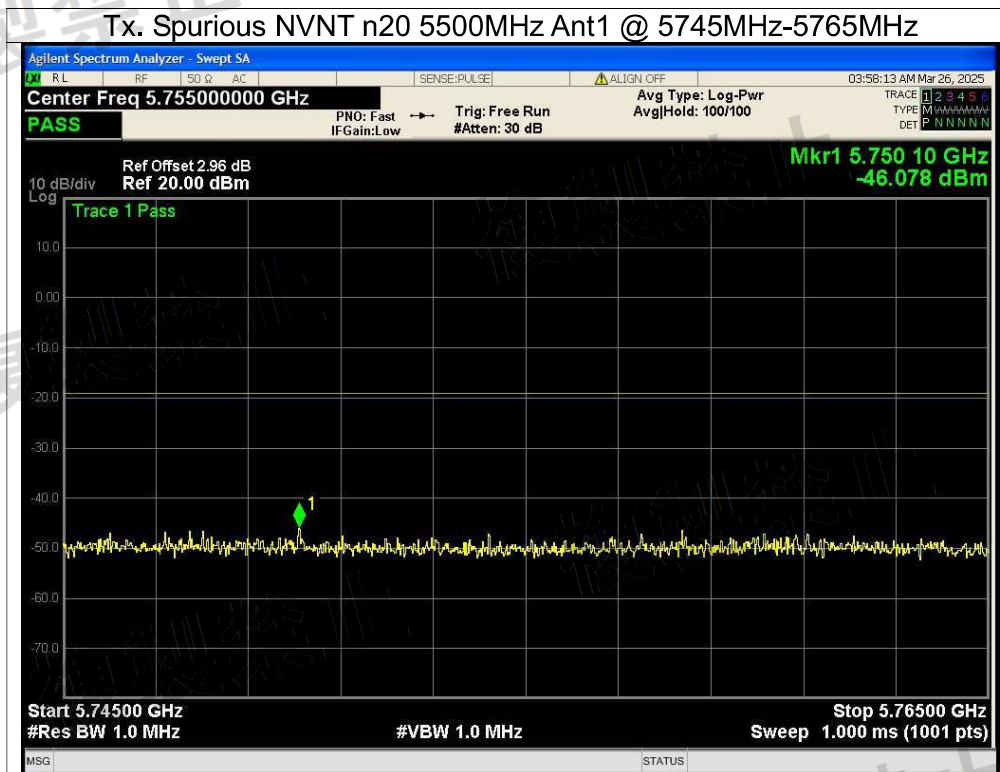


Tx. Spurious NVNT n20 5500MHz Ant1 @ 5460MHz-5470MHz





Tx. Spurious NVNT n20 5500MHz Ant1 @ 5745MHz-5765MHz

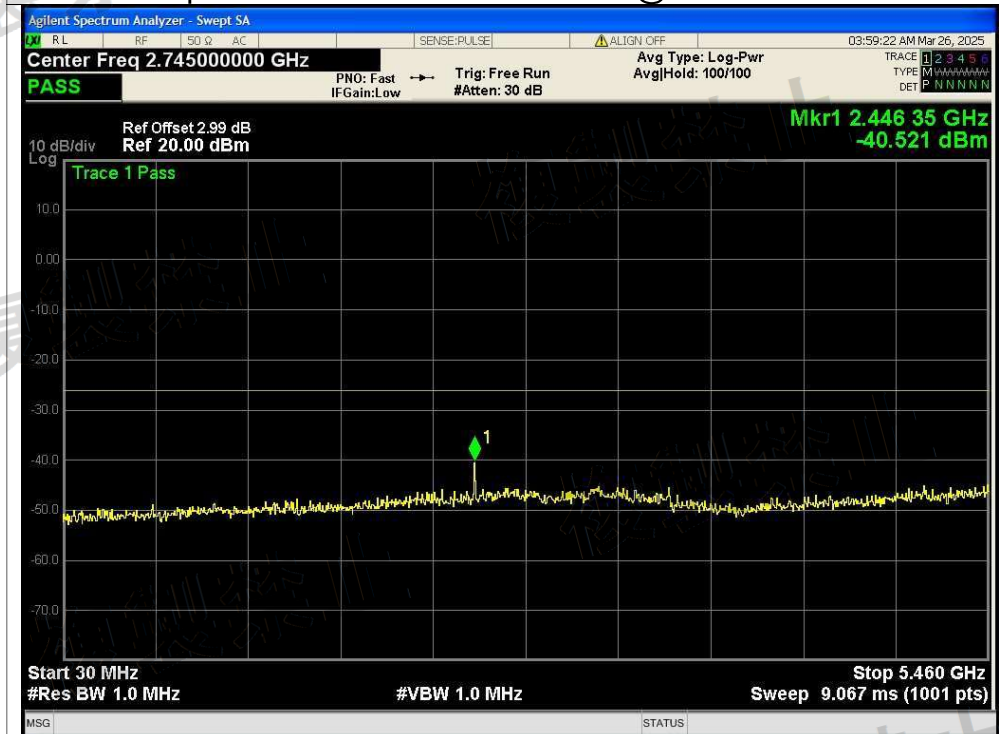


Tx. Spurious NVNT n20 5500MHz Ant1 @ 5765MHz-26000MHz

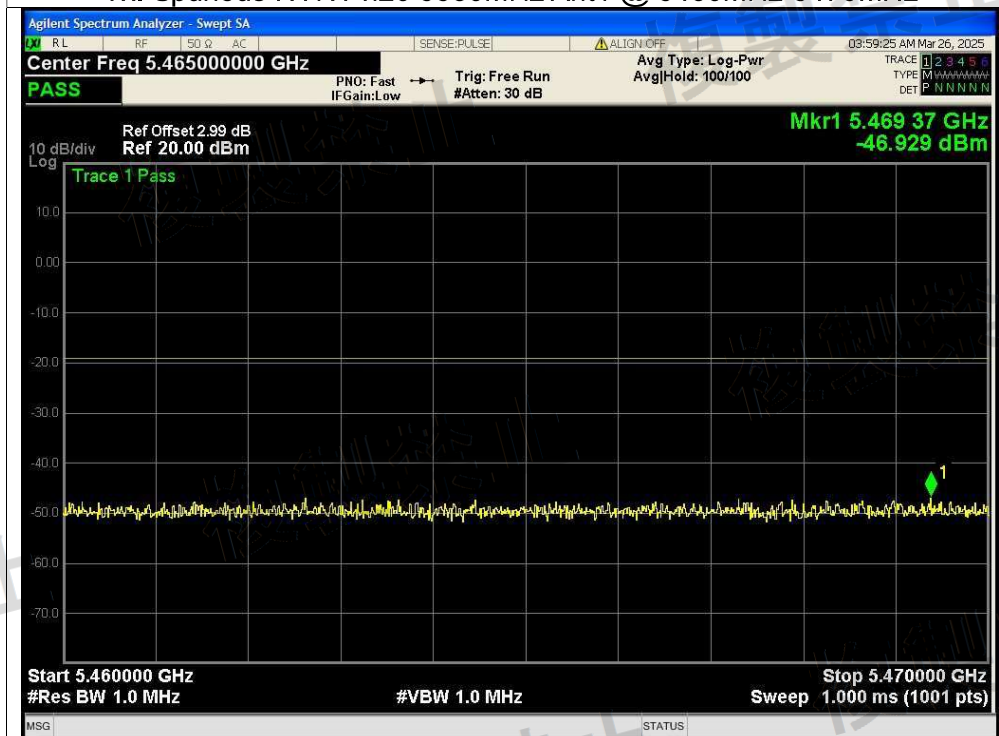




Tx. Spurious NVNT n20 5580MHz Ant1 @ 30MHz-5460MHz

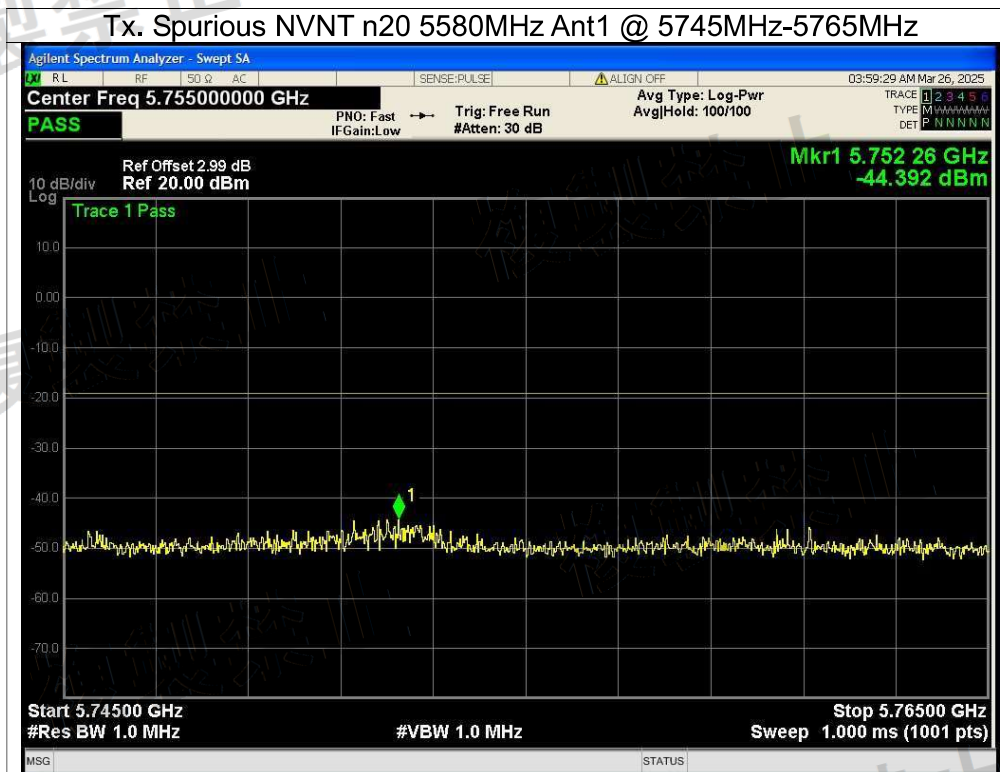


Tx. Spurious NVNT n20 5580MHz Ant1 @ 5460MHz-5470MHz





Tx. Spurious NVNT n20 5580MHz Ant1 @ 5745MHz-5765MHz

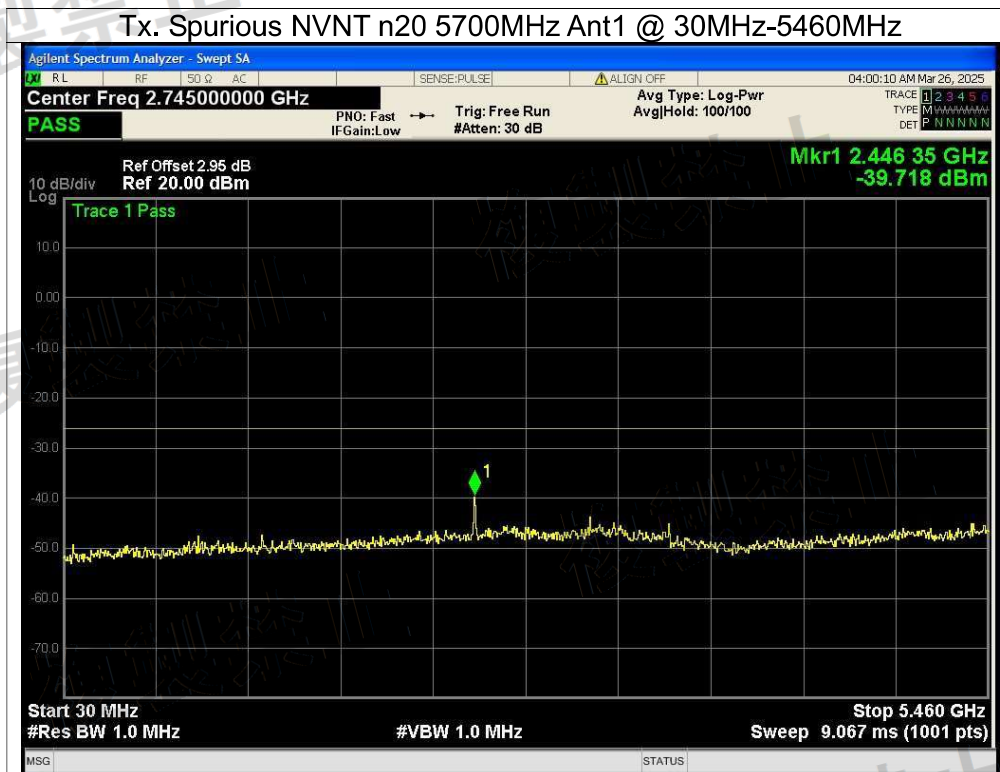


Tx. Spurious NVNT n20 5580MHz Ant1 @ 5765MHz-26000MHz

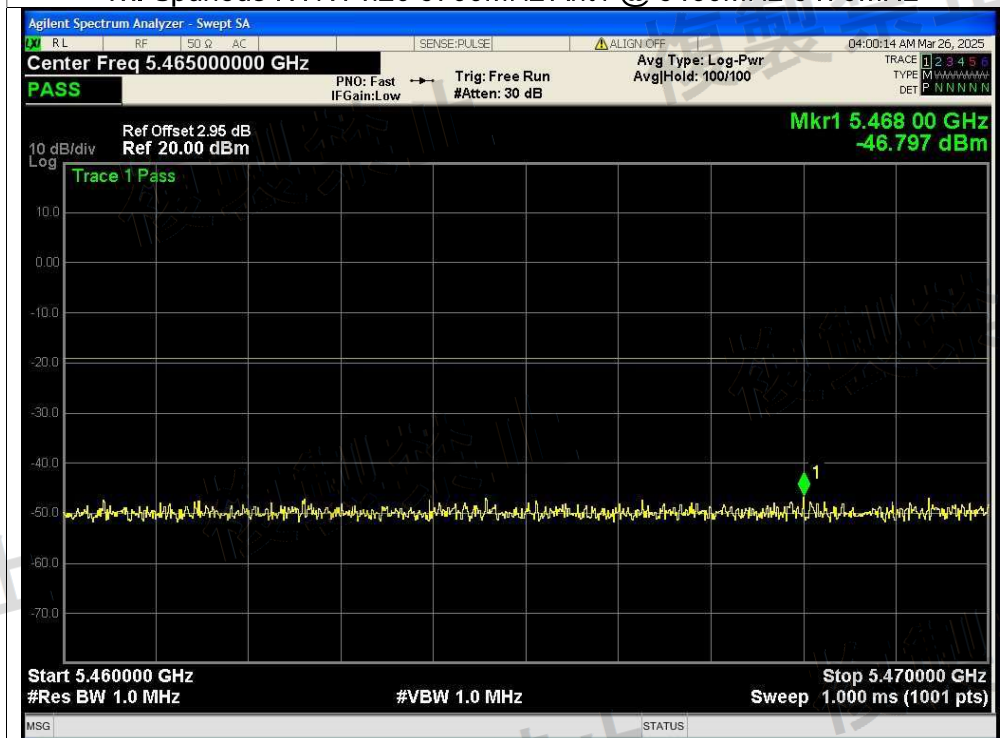




Tx. Spurious NVNT n20 5700MHz Ant1 @ 30MHz-5460MHz

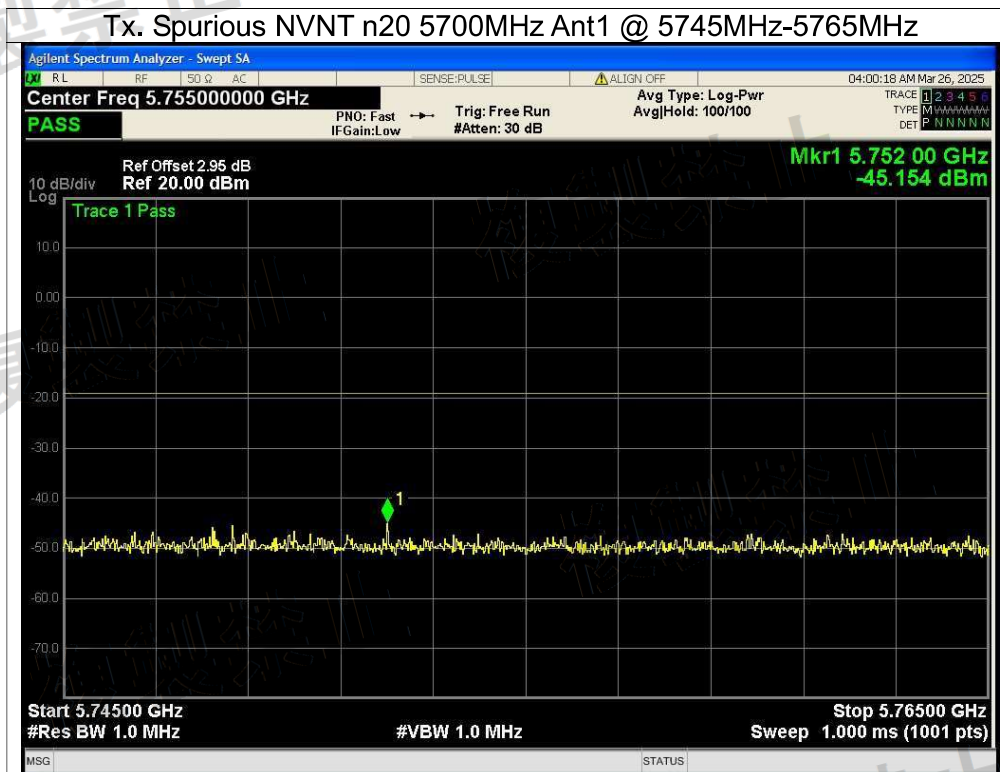


Tx. Spurious NVNT n20 5700MHz Ant1 @ 5460MHz-5470MHz





Tx. Spurious NVNT n20 5700MHz Ant1 @ 5745MHz-5765MHz

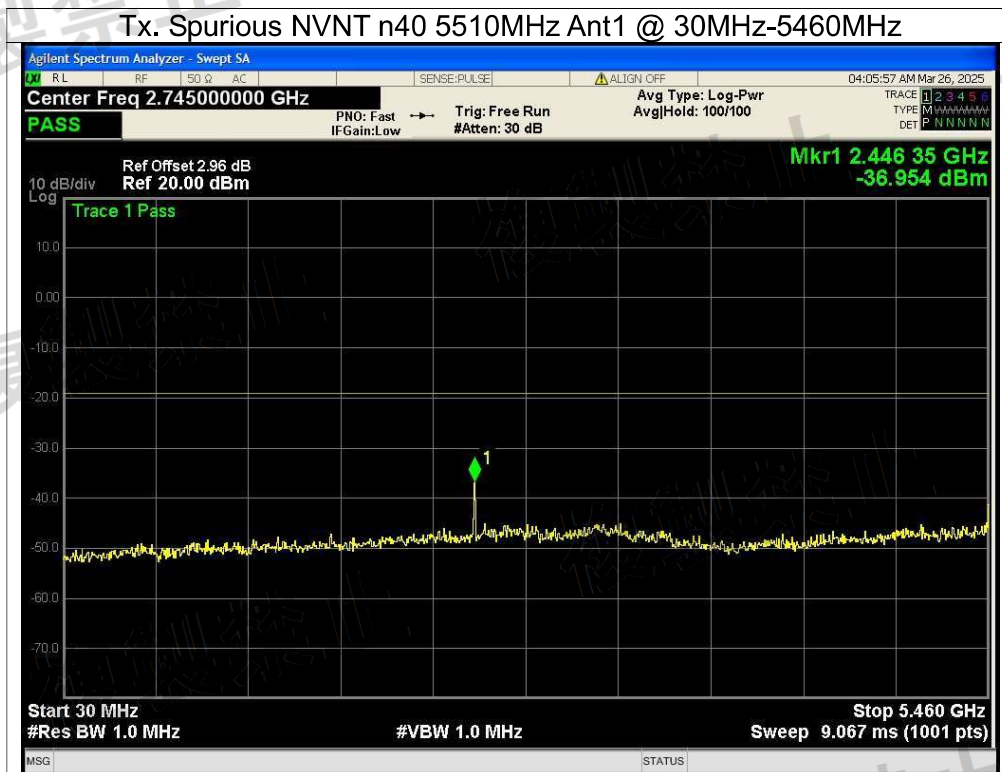


Tx. Spurious NVNT n20 5700MHz Ant1 @ 5765MHz-26000MHz

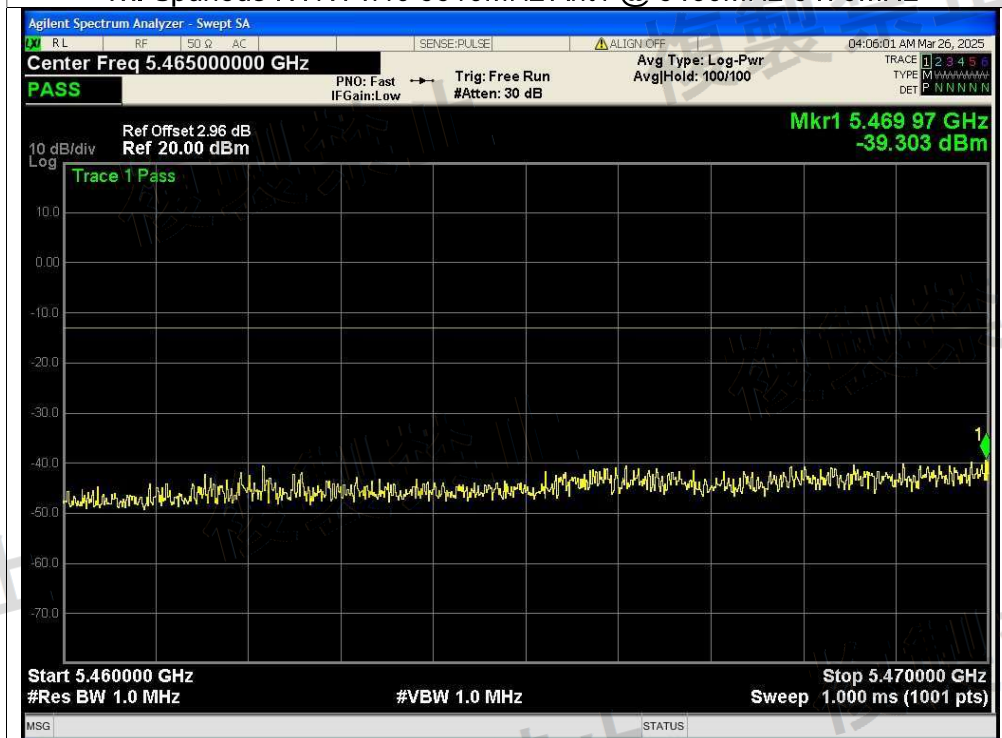




Tx. Spurious NVNT n40 5510MHz Ant1 @ 30MHz-5460MHz



Tx. Spurious NVNT n40 5510MHz Ant1 @ 5460MHz-5470MHz





Tx. Spurious NVNT n40 5510MHz Ant1 @ 5770MHz-26000MHz

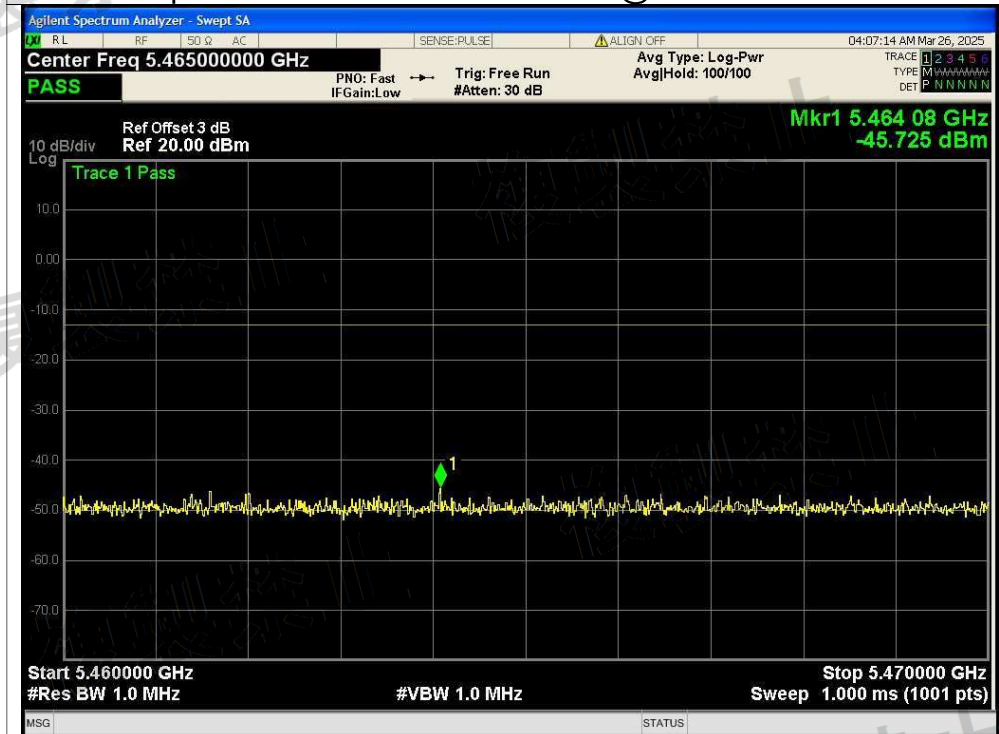


Tx. Spurious NVNT n40 5590MHz Ant1 @ 30MHz-5460MHz





Tx. Spurious NVNT n40 5590MHz Ant1 @ 5460MHz-5470MHz

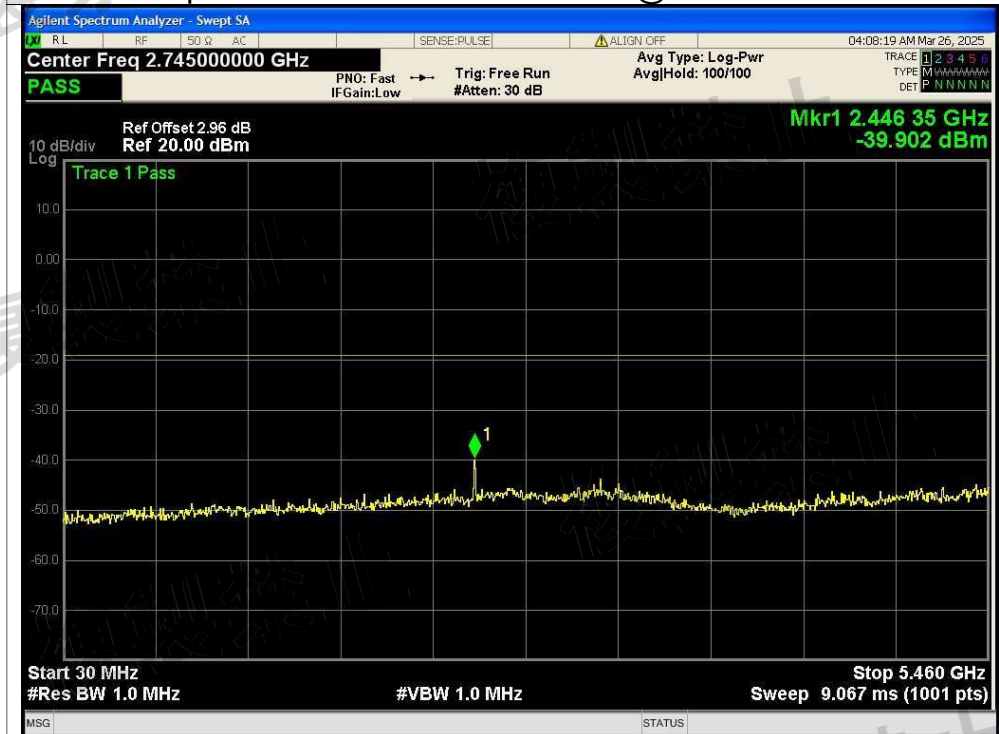


Tx. Spurious NVNT n40 5590MHz Ant1 @ 5770MHz-26000MHz

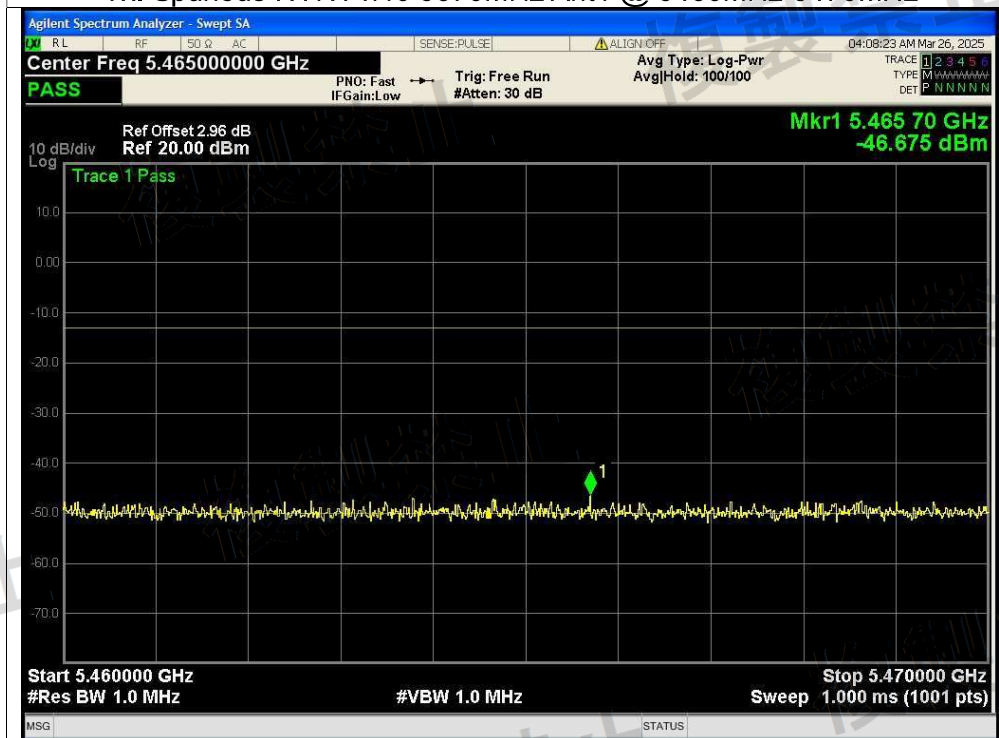




Tx. Spurious NVNT n40 5670MHz Ant1 @ 30MHz-5460MHz



Tx. Spurious NVNT n40 5670MHz Ant1 @ 5460MHz-5470MHz







7. ADJACENT CHANNEL EMITTED POWER MEASUREMENT

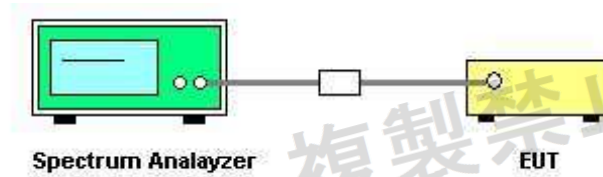
7.1 LIMIT

Item	LIMIT
Adjacent channel leakage power	$\leq -25\text{dBc}$ (within $\pm 10\text{MHz}$ band at $\pm 20\text{MHz}$ spacing) $\text{OBW} \leq 20\text{MHz}$
	$\leq -40\text{dBc}$ (within $\pm 10\text{MHz}$ band at $\pm 40\text{MHz}$ spacing) $\text{OBW} \leq 20\text{MHz}$
	$\leq -25\text{dBc}$ (within $\pm 20\text{MHz}$ band at $\pm 40\text{MHz}$ spacing) $20\text{MHz} < \text{OBW} \leq 40\text{MHz}$
	$\leq -40\text{dBc}$ (within $\pm 20\text{MHz}$ band at $\pm 80\text{MHz}$ spacing) $20\text{MHz} < \text{OBW} \leq 40\text{MHz}$
	$\leq -25\text{dBc}$ (within $\pm 40\text{MHz}$ band at $\pm 80\text{MHz}$ spacing) $40\text{MHz} < \text{OBW} \leq 80\text{MHz}$

7.2 TEST PROCEDURES

1. EUT has the continuous reception mode and fixed only one channelize.
2. SA set RBW: 300KHz and VBW: 300KHz, Span 100MHz (BW=20MHz/200MHz(BW=40MHz), RMS Detector, trace Maximum Hold and use ACLR Option.
3. Frequency spacing and measuring bandwidth be specified in section 3.6.1.
4. Reporting the worst value

7.3 TEST SETUP



7.4 TEST DEVIATION

There is no deviation with the original standard.

7.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

EUT:	Wireless Carplay	Model No.:	DA-AD
Temperature:	25°C	Test Date:	Mar. 22, 2025
Humidity:	55 % RH	Tested by:	Jack Li
Atmospheric Pressure:	1013 mbar	Test Voltage	Normal Voltage

5.500GHz-5.700GHz 802.11a

Voltage	TEST CONDITION	5500MHz	5580MHz	5700MHz	LIMIT(dBc)
Vnormal	+20MHz	-37.04	-38.39	-39.40	≤-25
	-20MHz	-38.52	-38.45	-38.35	≤-25
	+40MHz	-56.08	-57.24	-56.05	≤-40
	-40MHz	-57.30	-56.89	-57.08	≤-40

802.11n(20)

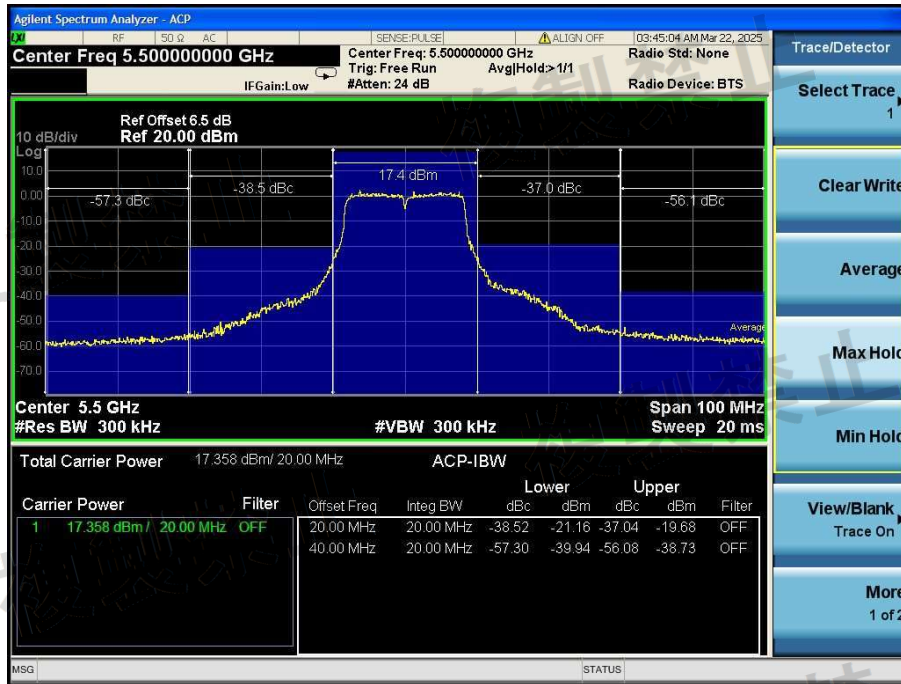
Voltage	TEST CONDITION	5500MHz	5580MHz	5700MHz	LIMIT(dBc)
Vnormal	+20MHz	-37.60	-37.98	-38.62	≤-25
	-20MHz	-37.10	-36.79	-36.72	≤-25
	+40MHz	-55.91	-57.09	-56.38	≤-40
	-40MHz	-56.96	-56.70	-56.71	≤-40

802.11n(40)

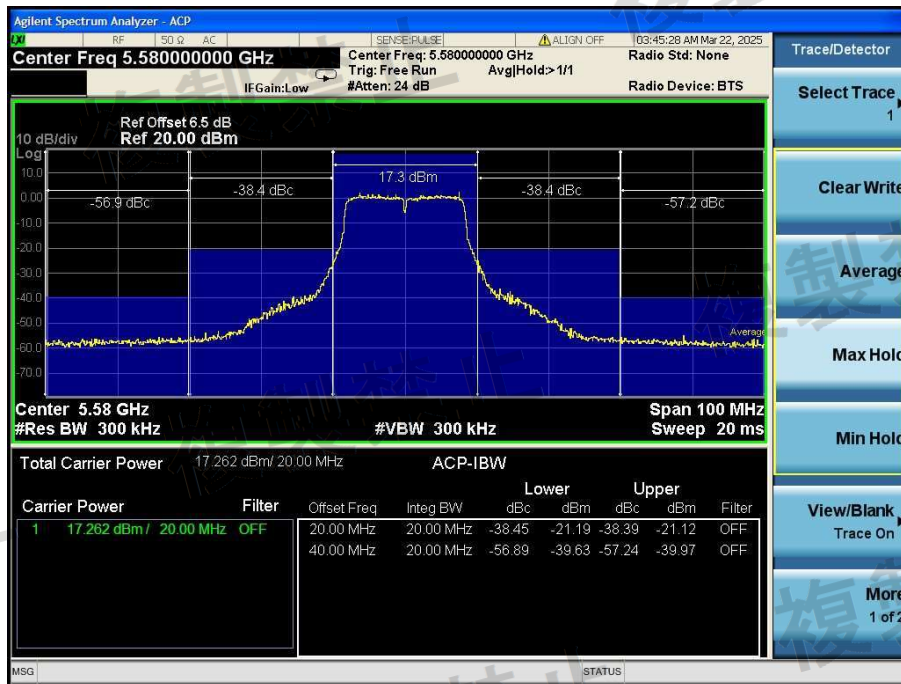
Voltage	TEST CONDITION	5510MHz	5590MHz	5670MHz	LIMIT (dBc)
Vnormal	+40MHz	-36.65	-38.52	-38.40	≤-25
	-40MHz	-37.86	-37.62	-36.61	≤-25
	+80MHz	-54.92	-55.45	-53.67	≤-40
	-80MHz	-55.93	-55.36	-54.57	≤-40



802.11a (5.5GHz-5.7GHz)
The Lowest Channel 100: 5500MHz

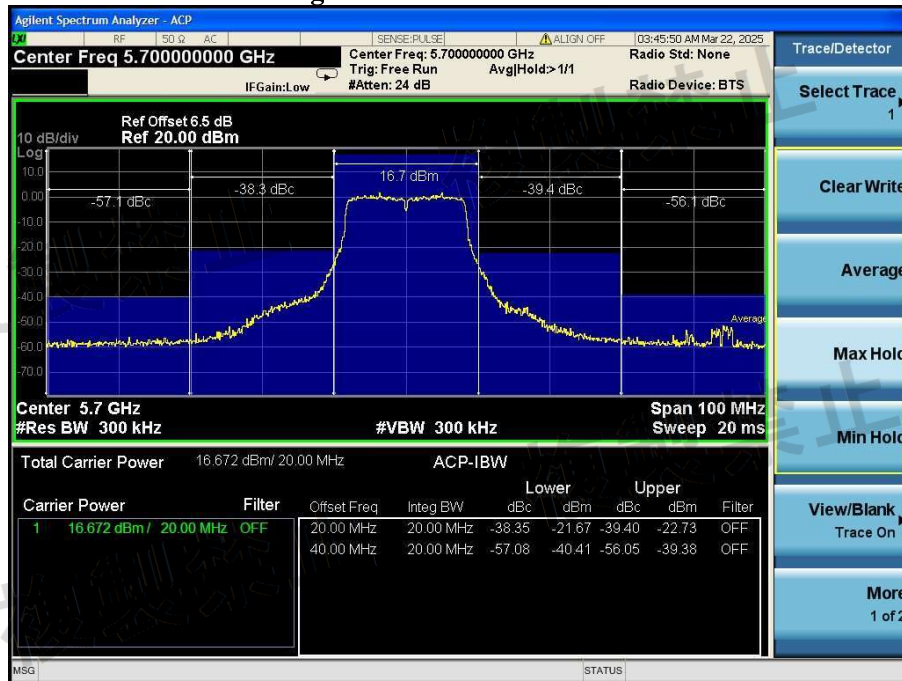


802.11a (5.5GHz-5.7GHz)
The Middle Channel 116: 5580MHz

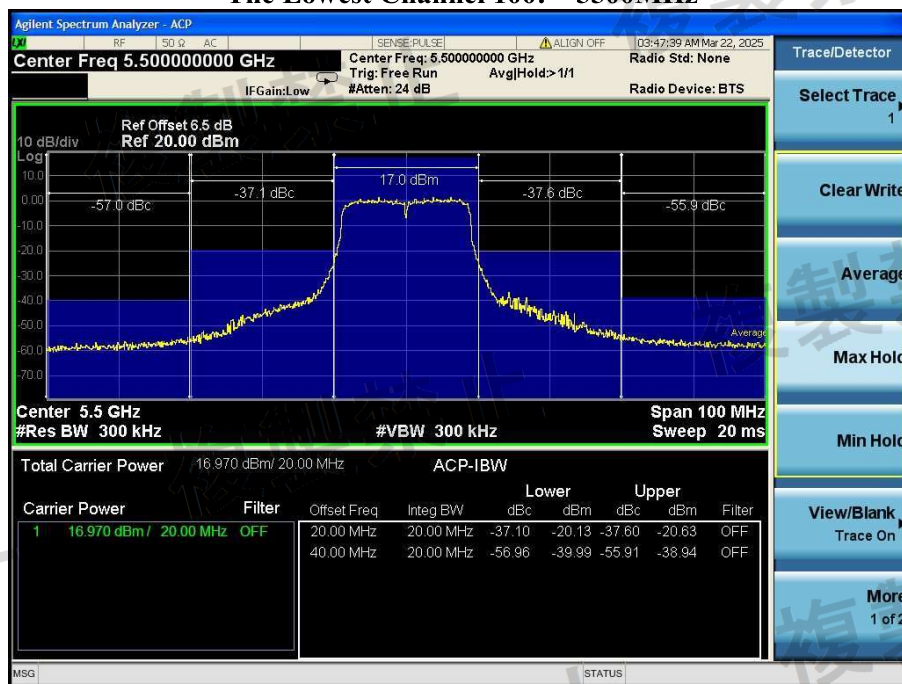




802.11a (5.5GHz-5.7GHz)
The Highest Channel 140: 5700MHz

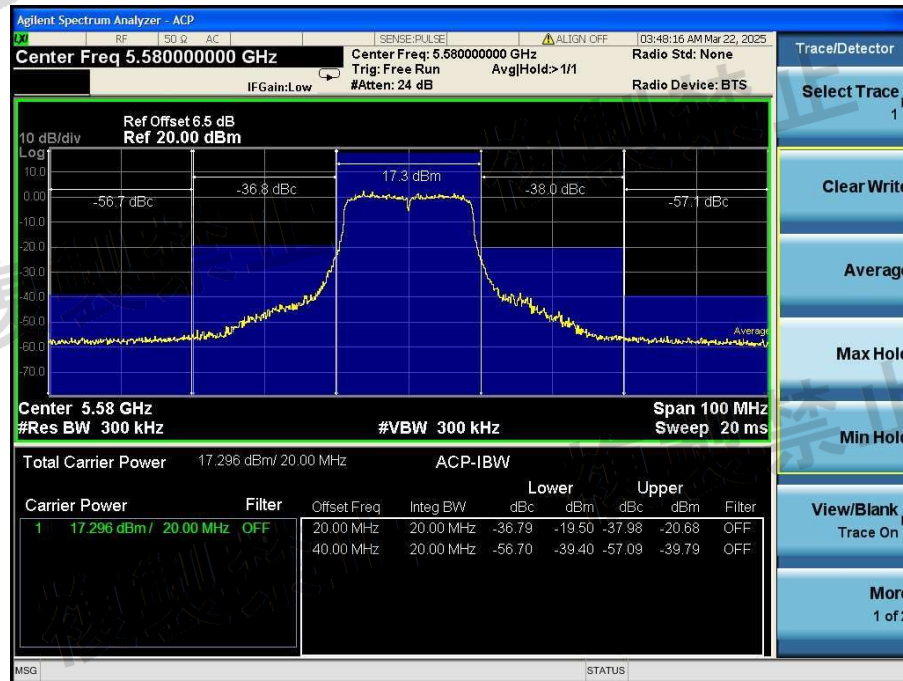


802.11n(20M) (5.5GHz-5.7GHz)
The Lowest Channel 100: 5500MHz

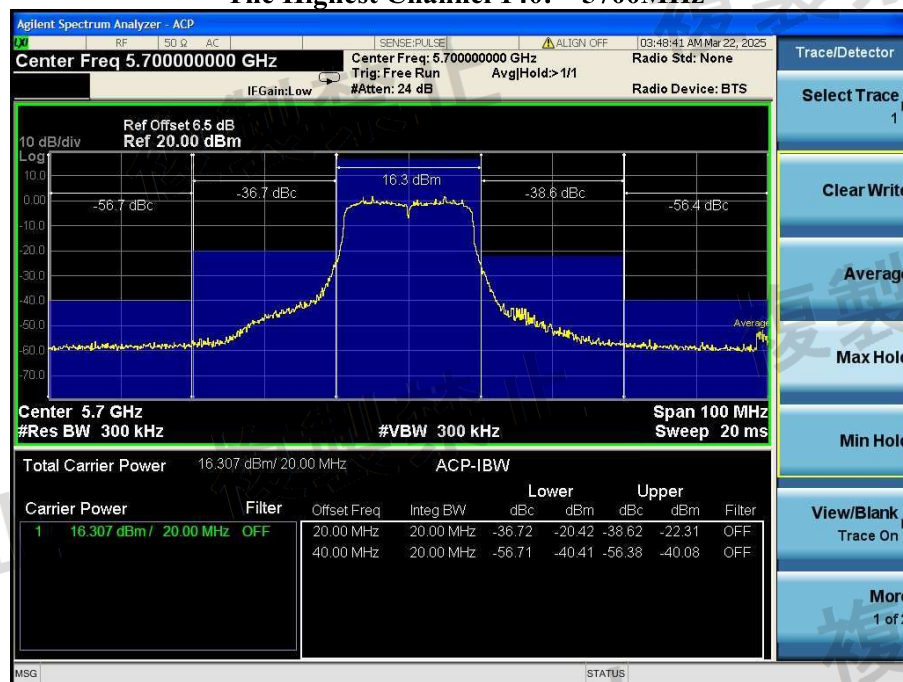




802.11n(20M) (5.5GHz-5.7GHz)
The Middle Channel 116: 5580MHz

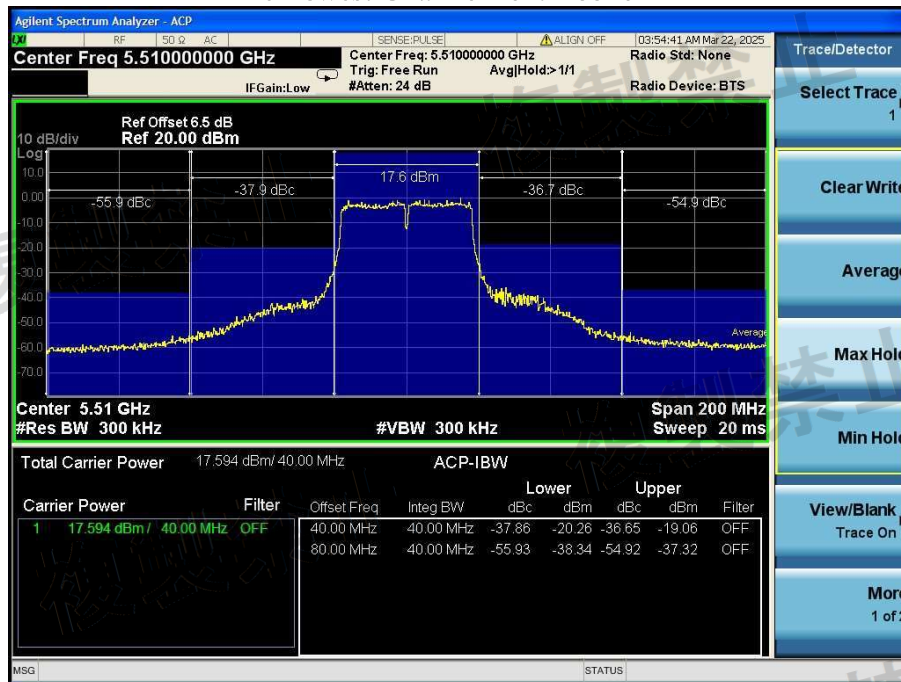


802.11n(20M) (5.5GHz-5.7GHz)
The Highest Channel 140: 5700MHz

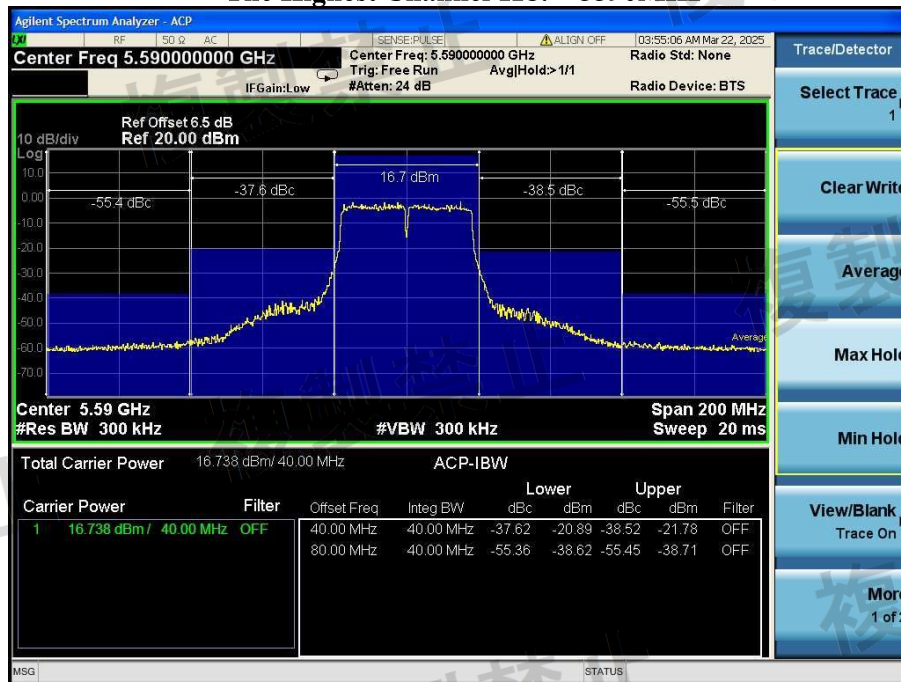




802.11n(40M) (5.5GHz-5.7GHz)
The Lowest Channel 102: 5510MHz



802.11n(40M) (5.5GHz-5.7GHz)
The Highest Channel 118: 5590MHz





802.11n(40M) (5.5GHz-5.7GHz)
The Lowest Channel 134: 5670MHz



8. RF OUTPUT POWER / TOLERANCE

Band	Item	20MHz system		40MHz system	80MHz system	160MHz system
W52&W53	Antenna Power	DSSS,etc	OFDM	OFDM		
		10mW/MHz(DSSS) 10mW(other)	10mW/MHz	5mW/MHz	2.5mW/MHz	1.25mW/MHz
	Antenna Power Error	+20%, -80% (Base on manufacturer declare antenna power density)				
	E.I.R.P.(W52)	10mW/MHz		5mW/MHz	2.5mW/MHz	1.25mW/MHz
	E.I.R.P.(W53)	10mW/MHz With TPC 5mW/MHz Without TPC		5mW/MHz With TPC 2.5mW/MHz Without TPC	2.5mW/MHz With TPC 1.25mW/MHz Without TPC	1.25mW/MHz With TPC 0.625mW/MHz Without TPC
W56	Antenna Power	10mW/MHz(DSSS) 10mW(other)	10mW/MHz	5mW/MHz	2.5mW/MHz	1.25mW/MHz
	Antenna Power Error	+50%, -50% (Base on manufacturer declare antenna power density)				
	E.I.R.P.	50mW/MHz With TPC 25mW/MHz Without TPC		25mW/MHz With TPC 12.5mW/MHz Without TPC	12.5mW/MHz With TPC 6.25mW/MHz Without TPC	6.25mW/MHz With TPC 3.125mW/MHz Without TPC

8.1 TEST DEVIATION

There is no deviation with the original standard.

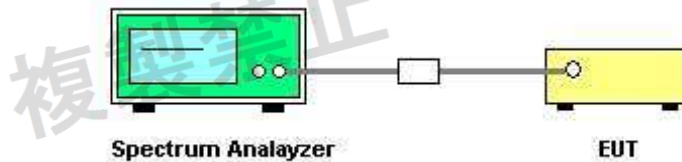
8.2 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

8.3 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

8.4 TEST SETUP



The test procedure contained in this option 1 shall be as follows:

Step 1:

Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: The centre frequency of the channel under test.
- Resolution BW: 1 MHz.
- Video BW: 3 MHz.
- Span: Wide enough to cover the complete power envelope of the signal of the UUT.
- Detector: Peak.
- Trace Mode: Max Hold.

Step 2:

When the trace is complete, find the peak value of the power envelope and record the frequency.

Step 3:

Make the following changes to the settings of the spectrum analyser:

- Centre Frequency: Equal to the frequency recorded in step 2.
- Span: 0 MHz.
- Resolution BW: 1 MHz.
- Video BW: 1 MHz.
- Sweep time: 1 minute.
- Detector: Average (see note).
- Trace Mode: Max Hold.

**8.5 TEST RESULT**

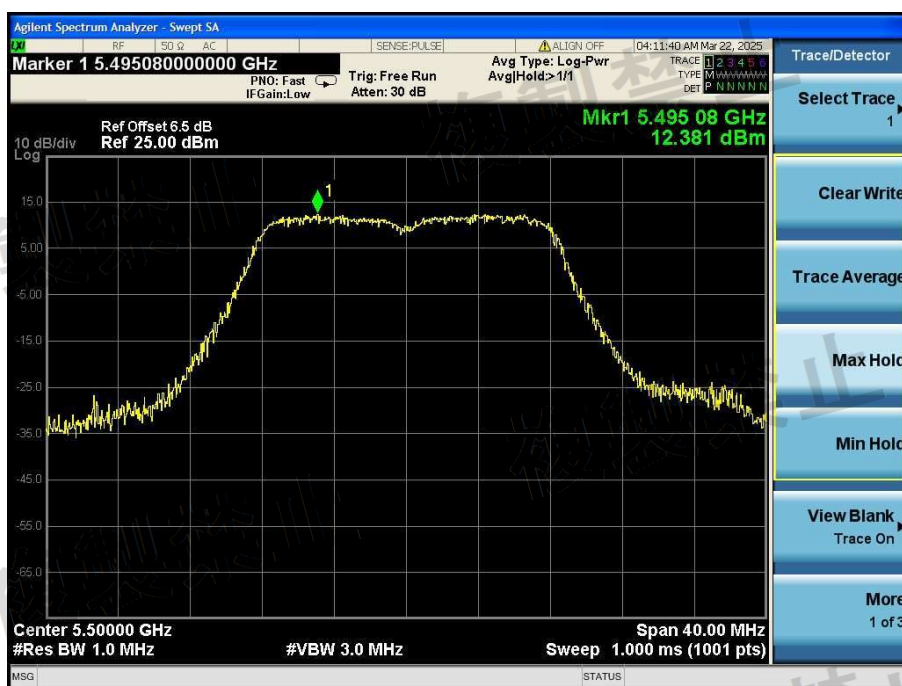
EUT:	Wireless Carplay	Model No.:	DA-AD
Temperature:	25°C	Test Date:	Mar. 22, 2025
Humidity:	55 % RH	Tested by:	Jack Li
Atmospheric Pressure:	1013 mbar	Test Voltage	Normal Voltage

5.5GHz-5.7GHz

Mode	Freq (MHz)	Antenna Power (dBm/MHz)	Antenna Power (mW/MHz)	Declared Power (mW/MHz)	Tolerance (%)	Upper Limit (%)	Lower Limit (%)	Verdict
a	5500	3.918	2.465	3.0	-17.83	50	-50	Pass
a	5580	3.573	2.277	3.0	-24.10	50	-50	Pass
a	5700	3.425	2.200	3.0	-26.67	50	-50	Pass
N20	5500	3.731	2.361	3.0	-21.30	50	-50	Pass
N20	5580	3.008	1.999	3.0	-33.37	50	-50	Pass
N20	5700	2.878	1.940	3.0	-35.33	50	-50	Pass
N40	5510	-0.472	0.897	1.0	-10.30	50	-50	Pass
N40	5590	-1.531	0.703	1.0	-29.70	50	-50	Pass
N40	5670	-1.543	0.701	1.0	-29.90	50	-50	Pass



802.11a (5.5GHz-5.7GHz)
The Lowest Channel 100: 5500MHz



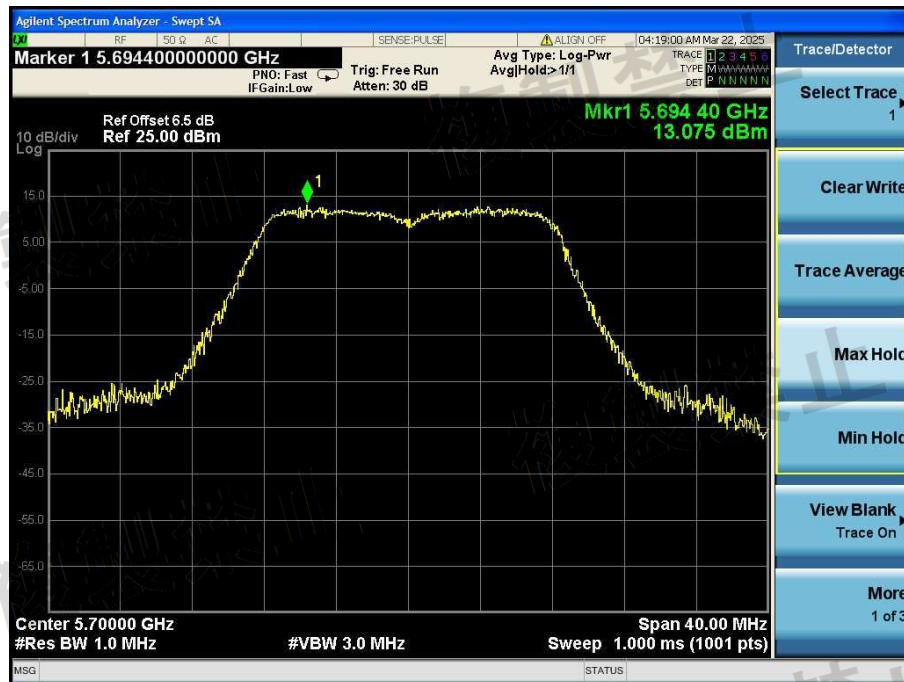


802.11a (5.5GHz-5.7GHz)
The Middle Channel 116: 5580MHz



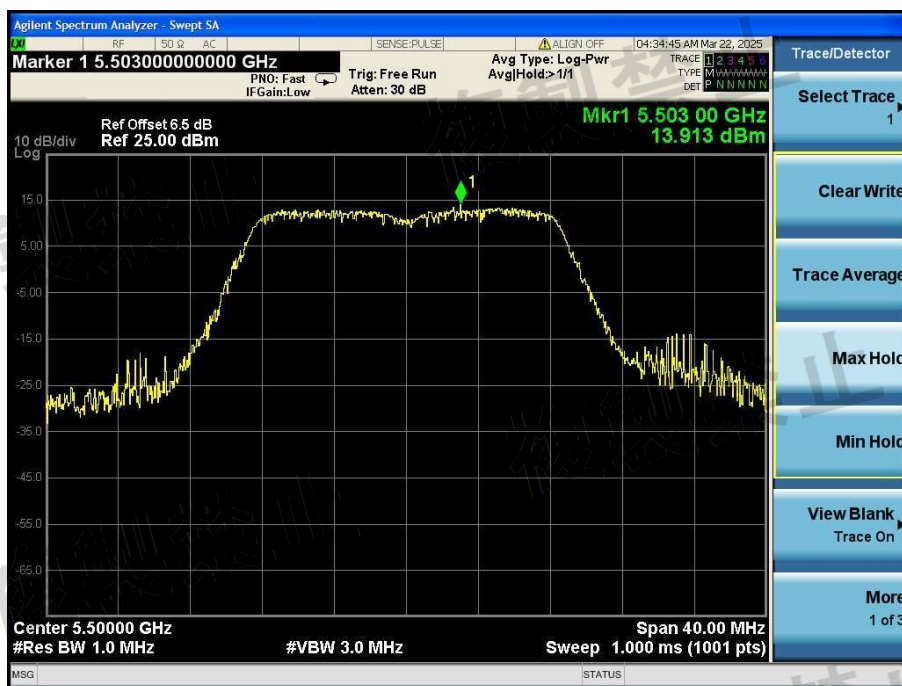


802.11a (5.5GHz-5.7GHz)
The Highest Channel 140: 5700MHz



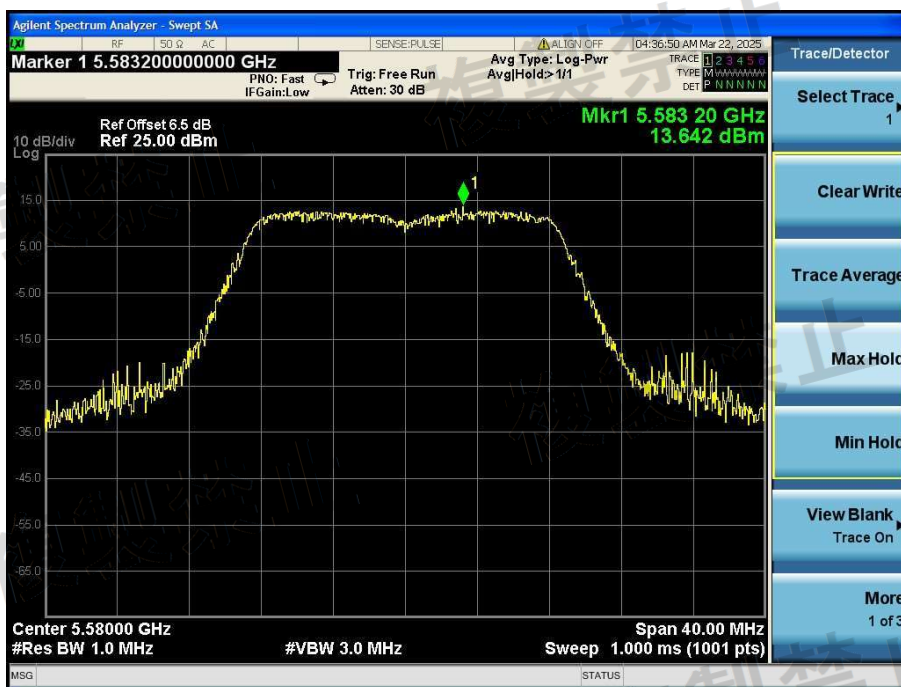


802.11n(20M) (5.5GHz-5.7GHz)
The Lowest Channel 100: 5500MHz



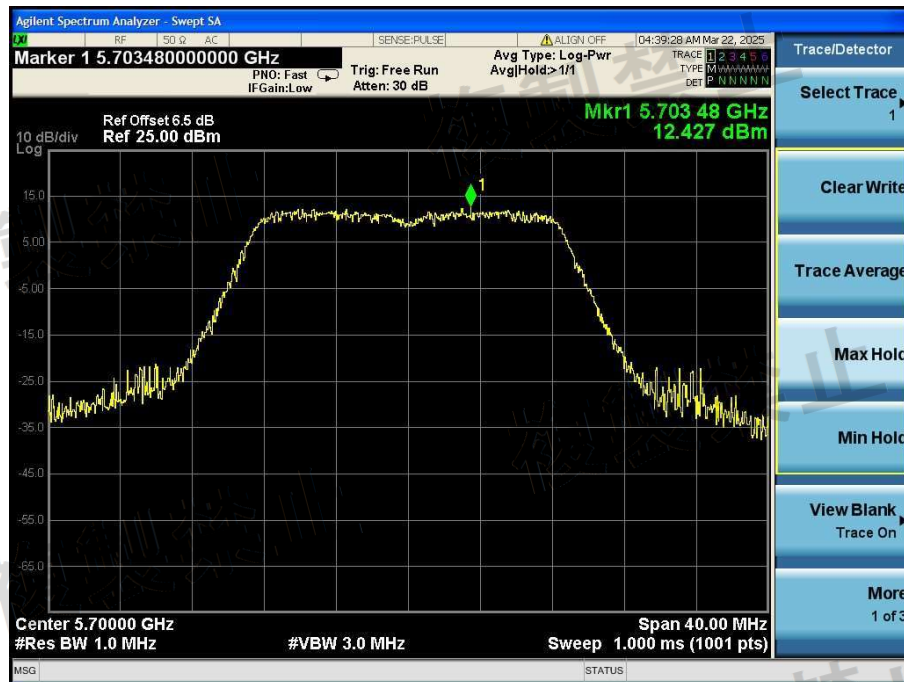


802.11n(20M) (5.5GHz-5.7GHz)
The Middle Channel 116: 5580MHz



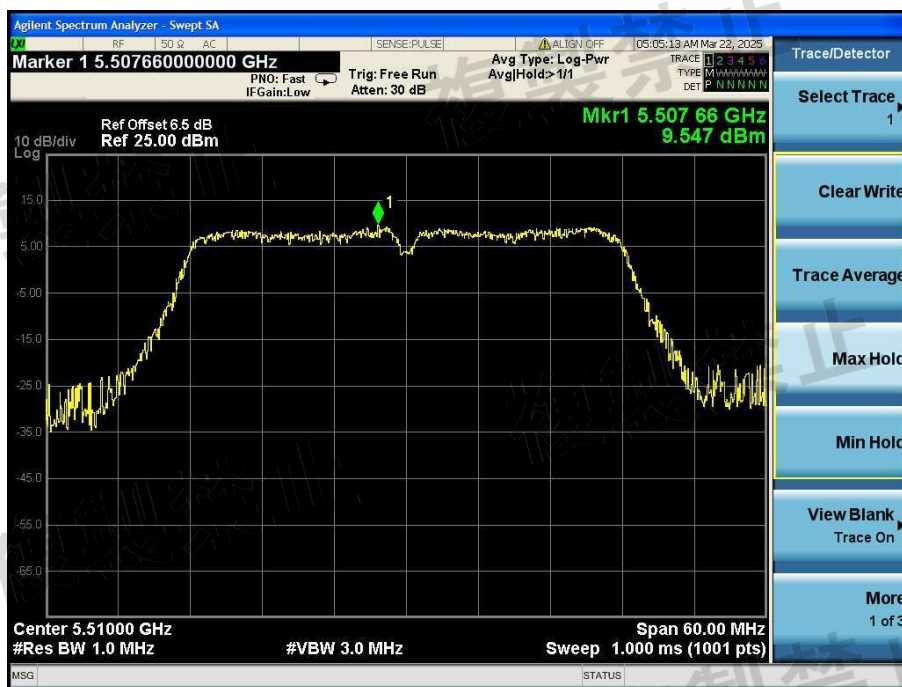


802.11n(20M) (5.5GHz-5.7GHz)
The Highest Channel 140: 5700MHz



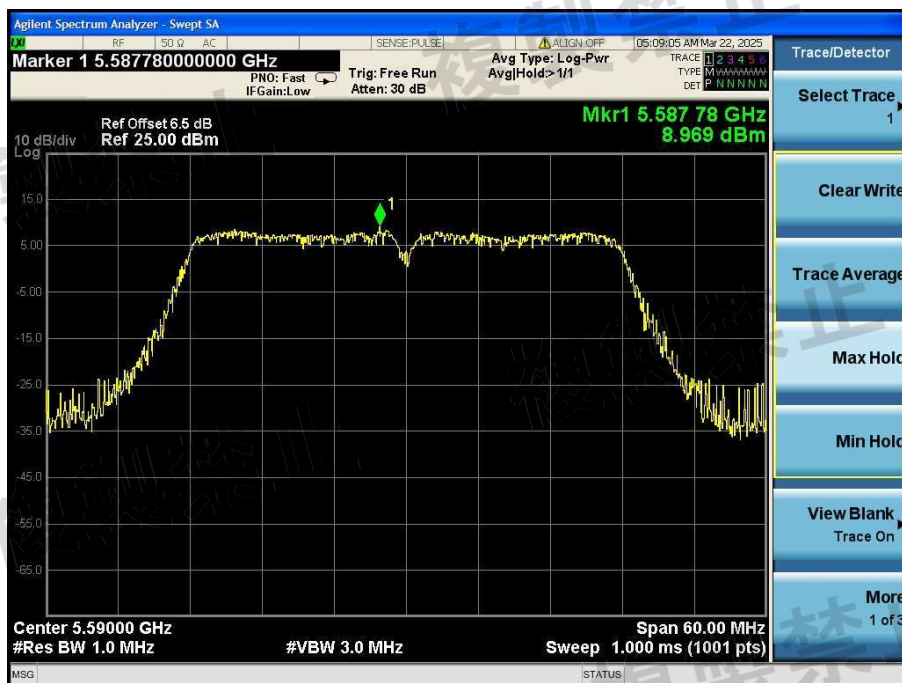


802.11n(40M) (5.5GHz-5.7GHz)
The Lowest Channel 102: 5510MHz



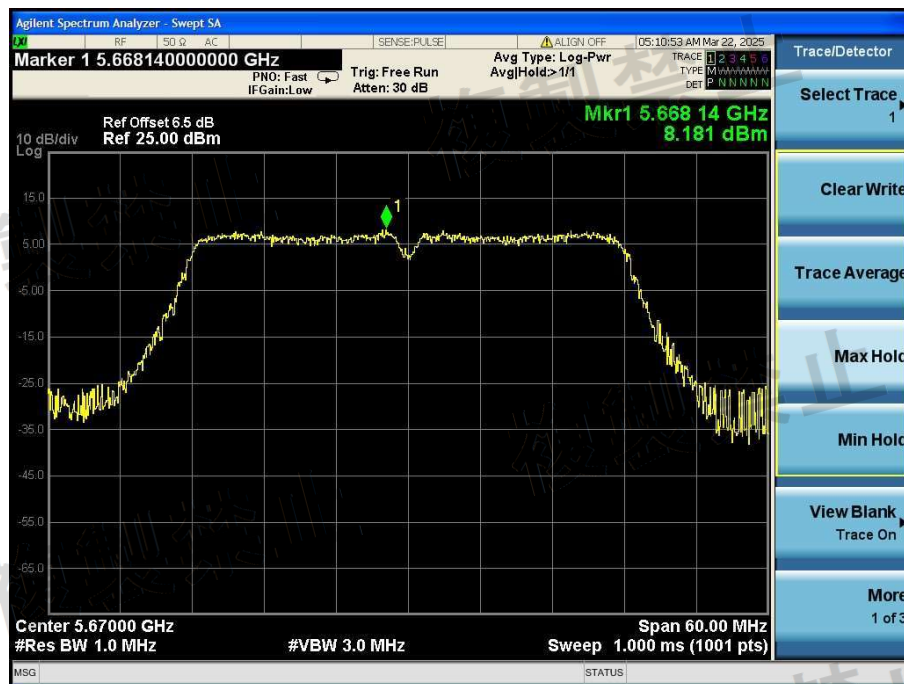


802.11n(40M) (5.5GHz-5.7GHz)
The Highest Channel 118: 5590MHz





802.11n(40M) (5.5GHz-5.7GHz)
The Highest Channel 134: 5670MHz





9. E.I.R.P MEASUREMENT

9.1 LIMIT

Band	Item	20MHz system		40MHz system	80MHz system	160MHz system
W52&W53	Antenna Power	DSSS,etc	OFDM	OFDM		
		10mW/MHz(DSSS) 10mW(other)	10mW/MHz	5mW/MHz	2.5mW/MHz	1.25mW/MHz
	Antenna Power Error	+20%, -80% (Base on manufacturer declare antenna power density)				
	E.I.R.P.(W52)	10mW/MHz		5mW/MHz	2.5mW/MHz	1.25mW/MHz
	E.I.R.P.(W53)	10mW/MHz With TPC 5mW/MHz Without TPC		5mW/MHz With TPC 2.5mW/MHz Without TPC	2.5mW/MHz With TPC 1.25mW/MHz Without TPC	1.25mW/MHz With TPC 0.625mW/MHz Without TPC
W56	Antenna Power	10mW/MHz(DSSS) 10mW(other)	10mW/MHz	5mW/MHz	2.5mW/MHz	1.25mW/MHz
	Antenna Power Error	+50%, -50% (Base on manufacturer declare antenna power density)				
	E.I.R.P.	50mW/MHz With TPC 25mW/MHz Without TPC		25mW/MHz With TPC 12.5mW/MHz Without TPC	12.5mW/MHz With TPC 6.25mW/MHz Without TPC	6.25mW/MHz With TPC 3.125mW/MHz Without TPC

9.2 TEST PROCEDURES

EIRP Power= Conducted power + antenna gain.

9.3 TEST SETUP LAYOUT

Please refer to Section 8.4 of this test report.

9.4 TEST DEVIATION

There is no deviation with the original standard.

9.5 EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmitting mode.

9.6 TEST RESULT OF TRANSMISSION ANTENNA GAIN (EIRP ANTENNA POWER)



EUT:	Wireless Carplay	Model No.:	DA-AD
Temperature:	25°C	Test Date:	Mar. 22, 2025
Humidity:	55 % RH	Tested by:	Jack Li
Atmospheric Pressure:	1013 mbar	Test Voltage	Normal Voltage

5.5GHz-5.7GHz

Normal Voltage-a mode

Frequency	power density	EIRP	EIRP	Limits
	(dBm/MHz)	(dBm/MHz)	(mW/MHz)	(mW/MHz)
5500MHz	3.918	9.418	8.746	≤25
5580MHz	3.573	9.073	8.078	≤25
5700MHz	3.425	8.925	7.807	≤25

Normal Voltage-n(20) mode

Frequency	power density	EIRP	EIRP	Limits
	(dBm/MHz)	(dBm/MHz)	(mW/MHz)	(mW/MHz)
5500MHz	3.731	9.231	8.377	≤25
5580MHz	3.008	8.508	7.093	≤25
5700MHz	2.878	8.378	6.883	≤25

Normal Voltage-n(40) mode

Frequency	power density	EIRP	EIRP	Limits
	(dBm/MHz)	(dBm/MHz)	(mW/MHz)	(mW/MHz)
5510MHz	-0.472	5.028	3.183	≤12.5
5590MHz	-1.531	3.969	2.494	≤12.5
5670MHz	-1.543	3.957	2.487	≤12.5

Note: E.I.R.P. (dBm/MHz) = Antenna Power (dBm/MHz) + Antenna Gain (dBi).

10 SPURIOUS EMISSIONS FOR RECEIVER

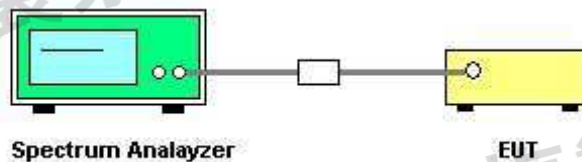
Limit

Item	Limits
Rx Spurious	$\leq 4\text{nW}$ ($f < 1\text{GHz}$)
Emission	$\leq 20\text{nW}$ ($1\text{GHz} \leq f$)

Test Procedure

1. EUT have the continuous reception mode and fixed only one channelize.
2. SA set RBW:100KHz and VBW: 100KHz. Then adjust to start frequency 30MHz and stop frequency 1000MHz. Search to mark peak reading value + cable loss shall be less than 4nW.
3. SA set RBW: 1MHz and VBW: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12500MHz. Search to mark peak reading value + cable loss shall be less than 20nW.
4. If power level of lower emissions are more than 1/10 of limit ($.0.4\text{nW}$ for $f < 1\text{GHz}$, 2nW for $f \geq 1\text{GHz}$), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.

10.1 TEST SETUP LAYOUT



10.2 TEST DEVIATION

There is no deviation with the original standard.

10.3 TEST DEVIATION

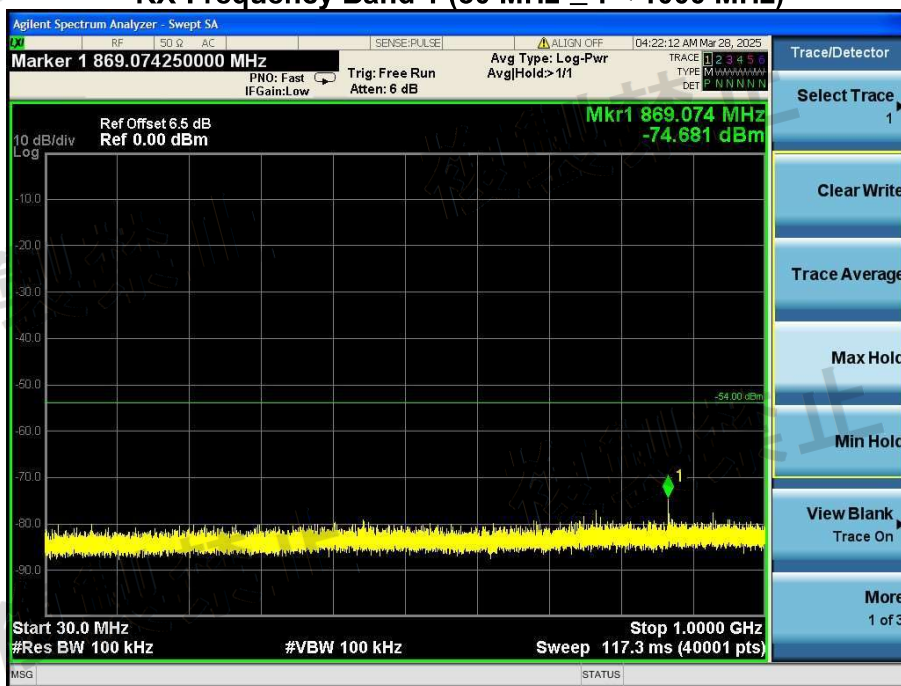
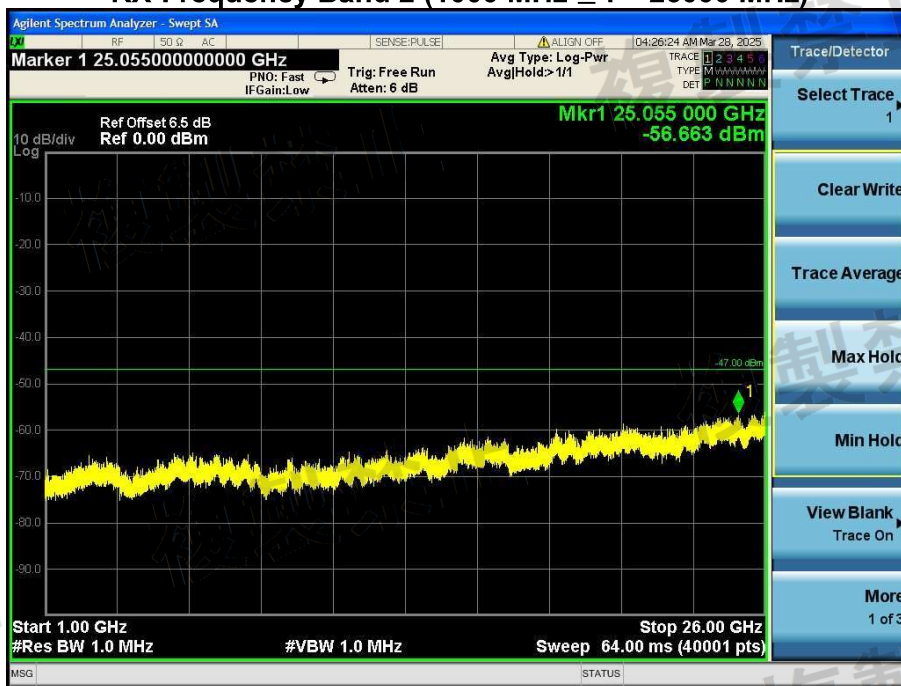
The EUT was programmed to be in continuously reception mode.

10.4 TEST RESULT OF LIMITATION OF COLLATERAL EMISSION OF RECEIVER



EUT:	Wireless Carplay	Model No.:	DA-AD
Temperature:	25°C	Test Date:	Mar. 28, 2025
Humidity:	55 % RH	Tested by:	Jack Li
Atmospheric Pressure:	1013 mbar	Test Voltage	Normal Voltage
Operation Mode:	Normal Voltage-a mode		

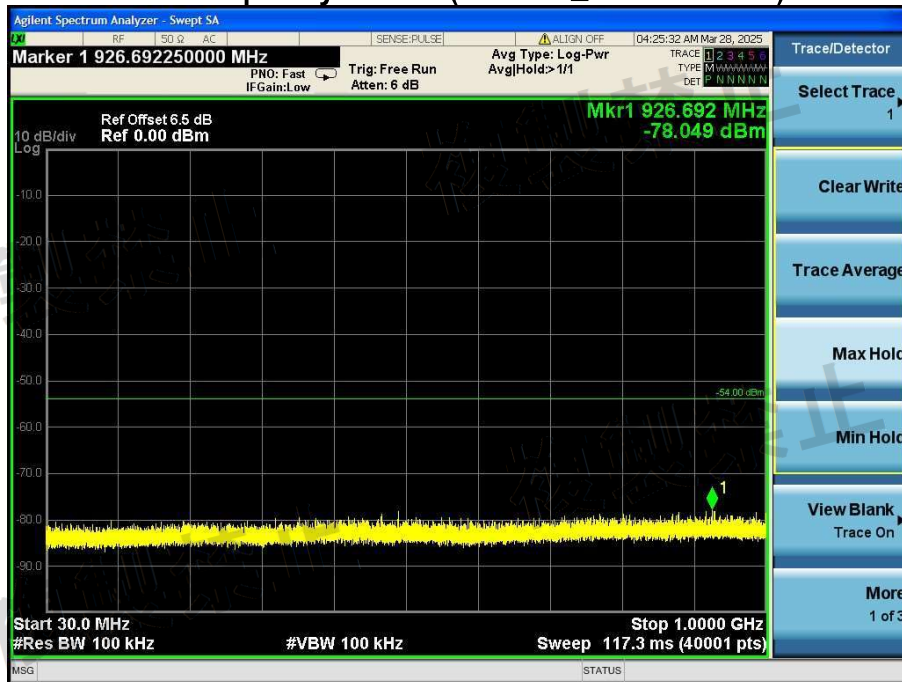
Test channel	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		5V DC	N/A	N/A		
(5500~5700 MHz)	869.074	-74.681	N/A	N/A	dBm	(1) Below 1 GHz : -54dBm
	25055.000	-56.663	N/A	N/A		(2) 1 GHz to 26GHz : -47dBm

RX-Frequency Band 1 ($30 \text{ MHz} \leq f < 1000 \text{ MHz}$)RX-Frequency Band 2 ($1000 \text{ MHz} \leq f < 26000 \text{ MHz}$)



EUT:	Wireless Carplay	Model No.:	DA-AD
Temperature:	25°C	Test Date:	Mar. 28, 2025
Humidity:	55 % RH	Tested by:	Jack Li
Atmospheric Pressure:	1013 mbar	Test Voltage	Normal Voltage
Operation Mode:	Normal Voltage-n20 mode		

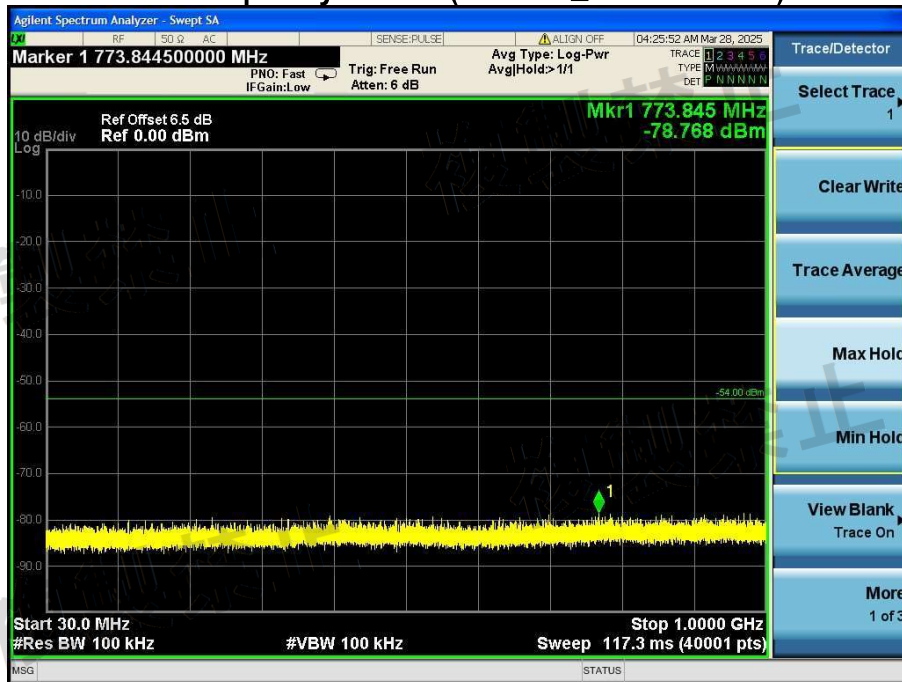
Test channel	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		5V DC	N/A	N/A		
(5500~5700 MHz)	926.692	-78.049	N/A	N/A	dBm	(1) Below 1 GHz : -54dBm
	25591.250	-56.098	N/A	N/A		(2) 1 GHz to 26GHz : -47dBm

RX-Frequency Band 1 ($30 \text{ MHz} \leq f < 1000 \text{ MHz}$)RX-Frequency Band 2 ($1000 \text{ MHz} \leq f < 26000 \text{ MHz}$)



EUT:	Wireless Carplay	Model No.:	DA-AD
Temperature:	25°C	Test Date:	Mar. 28, 2025
Humidity:	55 % RH	Tested by:	Jack Li
Atmospheric Pressure:	1013 mbar	Test Voltage	Normal Voltage
Operation Mode:	Normal Voltage-n(40) mode		

Test channel	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		5V DC	N/A	N/A		
(5500~5700 MHz)	773.845	-78.768	N/A	N/A	dBm	(1) Below 1 GHz : -54dBm
	25994.375	-55.534	N/A	N/A		(2) 1 GHz to 26GHz : -47dBm

RX-Frequency Band 1 ($30 \text{ MHz} \leq f < 1000 \text{ MHz}$)RX-Frequency Band 2 ($1000 \text{ MHz} \leq f < 26000 \text{ MHz}$)

11 TRANSMISSION BURST LENGTH MEASUREMENT

LIMITS OF BURST LENGTH

Item	Limits
Transmission Burst	≤8ms

11.1 MEASURING INSTRUMENTS

See list of measuring instruments of this test report.

11.2 TEST PROCEDURES

- Setting of SA is following as: RBW: 1MHz/VBW:1MHz /Sweep Mode:Single sweep/Detect mode: Positive peak/Zero Span I Sweet time: more than burst length.
- Measure the maximum time duration of one burst length.

11.3 TEST SETUP

Spectrum Analyzer



EUT

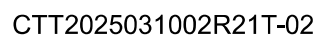
11.4 TEST DEVIATION

There is no deviation with the original standard.

11.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

11.6 TEST RESULT OF TRANSMISSION BURST LENGTH

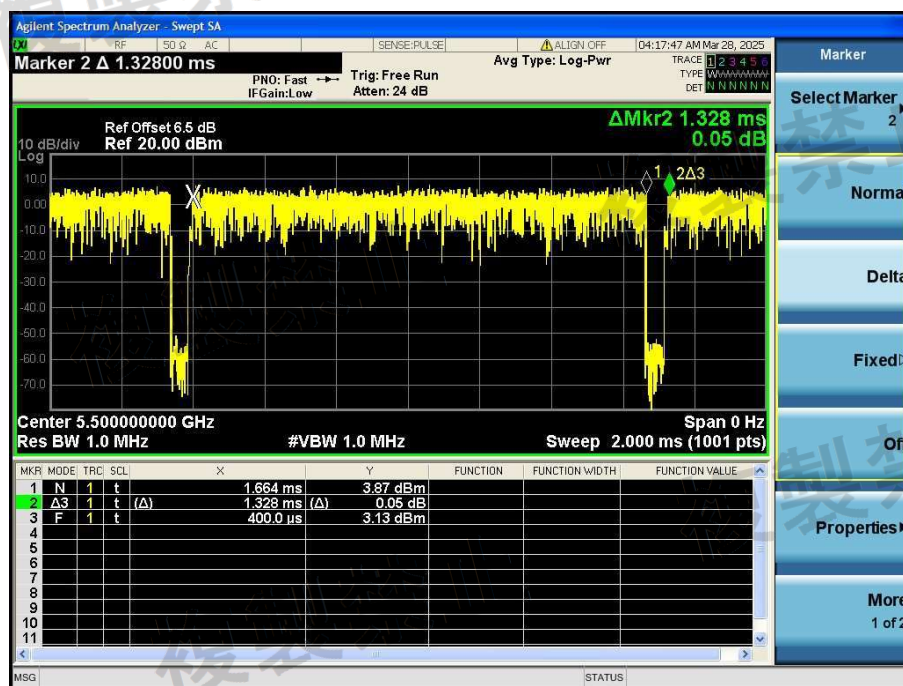
CH100[illegible]



EUT:	Wireless Carplay	Model No.:	DA-AD
Temperature:	25°C	Test Date:	Mar. 28, 2025
Humidity:	55 % RH	Tested by:	Jack Li
Atmospheric Pressure:	1013 mbar	Test Voltage	Normal Voltage
Operation Mode:	Normal Voltage-N(20) mode		

CH100

Frequency (MHz)	Burst Length (ms)	Limit (ms)	F/P
5500	1.264	8	Pass

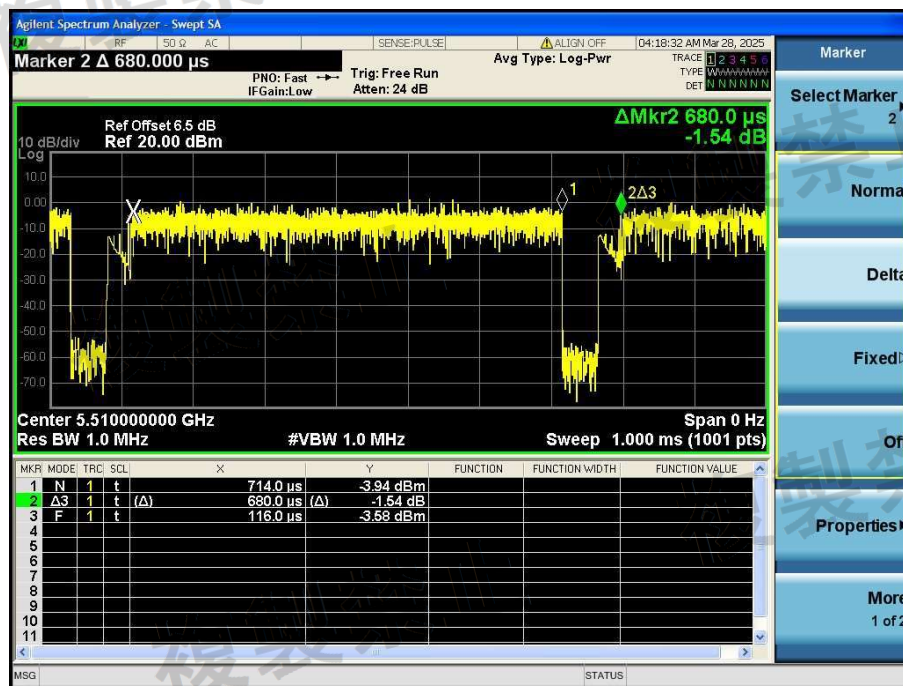




EUT:	Wireless Carplay	Model No.:	DA-AD
Temperature:	25°C	Test Date:	Mar. 28, 2025
Humidity:	55 % RH	Tested by:	Jack Li
Atmospheric Pressure:	1013 mbar	Test Voltage	Normal Voltage
Operation Mode:	Normal Voltage-n(40) mode		

CH102

Frequency (MHz)	Burst Length (ms)	Limit (ms)	F/P
5510	0.598	8	Pass



12. RADIO INTERFERENCE PREVENTION CAPABILITY MEASUREMENT

12.1 LIMIT

Item	Limits
Identification code	≥ 48 bits

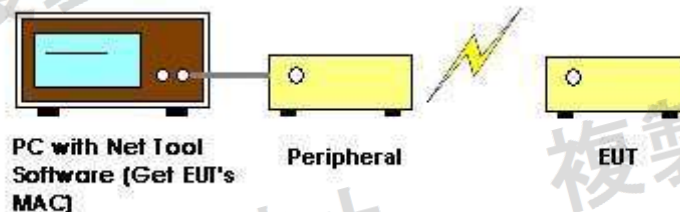
12.2 MEASURING ID CODE SOFTWARE

Item	Limits
MAC IP List	MAC Scan

12.3 TEST PROCEDURES

- In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes form EUT. b. Check the transmitted identification codes with the demodulator.
- In the case of receiving the identification ocde: a. Transmit the predetermined identification codes form the counterpart. b . Check if communication is normal. c. Transmit the signals other than predetermined ID codes form the counterpart. d. check if the EUT stops the transmission, or if it displays that idnetification codes are different from the predetermined ones.

12.4 TEST SETUP LAYOUT



12.5 TEST DEVIATION

There is no deviation with the original standard.

12.6 EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmitting mode.

12.7 TEST RESULT OF RADIO INTERFERENCE PREVENTION CAPABILIT

EUT:	Wireless Carplay	Model No.:	DA-AD
Temperature:	25 ⁰ C	Test Date:	Mar. 22, 2025
Humidity:	55 % RH	Tested by:	Jack Li
Atmospheric Pressure:	1013 mbar	Test Voltage	Normal Voltage

MAC Address: 28: D2: 43: 60: 7C: A5

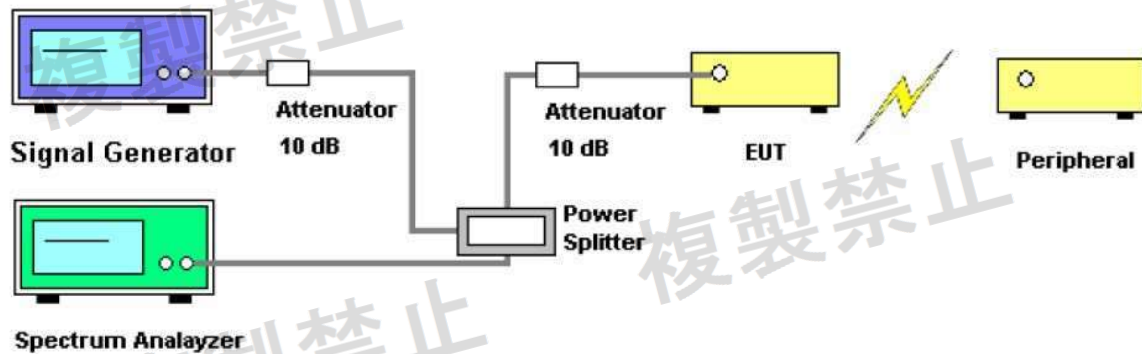
13 CARRIER SENSE CAPABILITY

Limit

EUT stop RF transmission signal after carrier inject to EUT

Test Procedure

Measurement System Diagram



1. SG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SG and power level is $(\text{on } 22.79 + G - 20 \cdot \log(f) \text{ dBm})$ (G is the antenna gain, f is the test frequency).
2. turn off the RF signal of the SG.
3. EUT have transmitted the maximum modulation signal and fixed channelize.
4. Setting of SA :RBW/VBW=1MHz/1MHz, Span=50MHz, Sweep time=auto, Sweep mode=continuous, Detect mode=positive peak
5. SG RF signal on.
6. EUT shall be stop the transmitted any signal and SG RF signal off, the EUT will be continuous transmitted signal.

Result:

Mode	Normal Voltage
802.11a	OK
802.11n20	OK
802.11 n40	OK

$\text{Pin} = 22.79 + G - 20 \cdot \log(\text{freq MHz}) [\text{dBm}]$

Limit: 100mw/m eirp

Confirmed at -50dBm

Result: OK



14. EUT TEST PHOTO

Measurement Photos

