

FCC DFS TEST REPORT

FCC ID: 2BAWSRDL-NA

Sample : Dride4K

Trade Name : N/A

Main Model : DR4K1-RDL-NA

Additional Model : N/A

Report No. : 23032013ER-68

Prepared for

Dride Technology LTD

Eliyahu Eitan 1, Rishon Letzion, Israel

Prepared by

Global United Technology Services Co. Ltd.

No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

TEST RESULT CERTIFICATION

Applicant.....: Dride Technology LTD

Address: Eliyahu Eitan 1, Rishon Letzion, Israel

Manufacturer.....: Dride Technology LTD

Address: Eliyahu Eitan 1, Rishon Letzion, Israel

Product description

Product.....: Dride4K

Trade Name: N/A

Model Name.....: DR4K1-RDL-NA

Test Methods.....: FCC Rules and Regulations Part 15 Subpart C Section 15.407
ANSI C63.10: 2013

This device described above has been tested by Global United Technology Services Co. Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test

Date (s) of performance of tests: Mar. 20, 2023 ~ May 31, 2023

Date of Issue.....: Jul. 13, 2023

Test Result: Pass

Prepared By:



Date:

2023-7-13

Project Engineer

Check By:



Date:

2023-7-13

Reviewer

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1 TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

1.1.1 Item	FCC Rules	Description Of Test	Result
1	FCC Part 15.407	DFS Detection Threshold	N/A
2	FCC Part 15.407	Channel Availability Check Time	N/A
3	FCC Part 15.407	Channel Move Time	Pass
4	FCC Part 15.407	Channel Closing Transmission Time	Pass
5	FCC Part 15.407	Non- Occupancy Period	N/A
6	FCC Part 15.407	Uniform Spreading	N/A
7	FCC Part 15.407	U-NII Detection Bandwidth	N/A

Note:

“N/A” denotes test is not applicable in this Test Report.

1.2 TEST FACILITY

Test Firm : Global United Technology Services Co. Ltd.
Address : No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC—Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co. Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

- **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co. Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

- **NVLAP (LAB CODE: 600179-0)**

Global United Technology Services Co. Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

1.3 MEASUREMENT UNCERTAINTY

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

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U , (dB)
UNI	ANSI	9kHz ~ 150kHz	2.96
		150kHz ~ 30MHz	2.44

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	U , (dB)
UNI	ANSI	9kHz ~ 30MHz	2.50
		30MHz ~ 1000MHz	4.80
		1000MHz ~ 18000MHz	4.13

C. RF Conducted Method:

Item	Measurement Uncertainty
Uncertainty of total RF power, conducted	$U_c = \pm 0.8$ dB
Uncertainty of RF power density, conducted	$U_c = \pm 2.6$ dB
Uncertainty of spurious emissions, conducted	$U_c = \pm 2$ %
Uncertainty of Occupied Channel Bandwidth	$U_c = \pm 2$ %

1.4 ENVIRONMENTAL CONDITIONS

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35 °C
Relative Humidity:	30~60 %
Air Pressure:	950~1050 hPa

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product:	Dride4K
Trade Name:	N/A
Main Model:	DR4K1-RDL-NA
Additional Model:	N/A
Model Difference:	N/A
Operation Frequency:	Band 1: 5150 MHz ~ 5250MHz; Band 2: 5250 MHz ~ 5350MHz; Band 3: 5470 MHz ~ 5725MHz; Band 4: 5725 MHz ~ 5850MHz
Modulation Type:	BPSK, QPSK, 16QAM, 64QAM, 128QAM, 256QAM, OFDM
Antenna Type:	PCB Antenna
Antenna Gain:	Band 1: -10.49dBi; Band 2: -11.51dBi; Band 3: -4.35dBi; Band 4: -1.01dBi
Battery:	N/A
Adapter:	N/A
Power Source:	DC 12-24V from car charger

Note:

1. The EUT is designed as client devices without radar detection.
2. The device do not support TPC.

2.2 CARRIER FREQUENCY OF CHANNELS

Frequency Band	Channel Number	Frequency	Frequency Band	Channel Number	Frequency
5150 MHz ~ 5250MHz	36	5180 MHz	5470 MHz ~ 5725MHz	112	5560 MHz
	38	5190 MHz		116	5580 MHz
	40	5200 MHz		118	5590 MHz
	42	5210 MHz		120	5600 MHz
	44	5220 MHz		122	5610 MHz
	46	5230 MHz		124	5620 MHz
	48	5240 MHz		126	5630 MHz
5250 MHz ~ 5350MHz	52	5260 MHz	5725 MHz ~ 5850MHz	128	5640 MHz
	54	5270 MHz		132	5660 MHz
	56	5280 MHz		134	5670 MHz
	58	5290 MHz		136	5680 MHz
	60	5300 MHz		140	5700 MHz
	62	5310 MHz		149	5745 MHz
	64	5320 MHz		151	5755 MHz
5470 MHz ~ 5725MHz	100	5500 MHz	5725 MHz ~ 5850MHz	153	5765 MHz
	102	5510 MHz		155	5775 MHz
	104	5520 MHz		157	5785 MHz
	106	5530 MHz		159	5795 MHz
	108	5540 MHz		165	5825MHz
	110	5550 MHz			

Note: For 20MHz bandwidth system use Channel 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 149, 153, 157, 161, 165; For 40MHz bandwidth system use Channel 38, 46, 54, 62, 102, 110, 118, 126, 134, 151, 159; For 80MHz bandwidth system use Channel 42, 58, 106, 122, 155

2.3 TEST MODE

Mode	Available channel	Tested channel	Modulation	Date rate(Mbps)
802.11a/n20/ac20	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 149, 153, 157, 161, 165	36, 40, 48, 52, 60, 64, 100, 120, 140, 149, 157, 165	OFDM	6Mbps/MCS0
802.11n40/ac40	38, 46, 54, 62, 102, 110, 118, 126, 134, 151, 159;	38, 46, 54, 62, 102, 118, 134, 151, 159	OFDM	MCS0
802.11ac80	42, 58, 106, 122, 155	42, 58, 106, 122, 155	OFDM	MCS0

Note:

1. The EUT has been set to operate continuously on tested channel individually, and the EUT is operating at its maximum duty cycle>or equal 98%.
2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.
3. Restart time of the router and EUT network: 90s; Router FCC ID: Q78-ZXHNF670E.

2.4 DESCRIPTION OF THE TEST MODES

During the measurement the environmental conditions were within the listed ranges:

Voltage	Normal Voltage	DC 24V
	High Voltage	DC 26.4V
	Low Voltage	DC 21.6V
Other	Normal Temperature	24°C
	Relative Humidity	55 %
	Air Pressure	989 hPa

Note: All modes were test at Normal Voltage, High Voltage, and Low Voltage, only the worst results of Normal Voltage was reported in the test report.

2.5 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

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	Model No.	Cable Length(cm)	Remark
1	Dride4K	DR4K1-RDL-NA	3m	EUT
2	DC power supply	--	--	AE
3	AP(Master)	ZXHN F670	--	AE
4	PC	Lenovo	--	AE

Note:

1. The support equipment was authorized by Declaration of Confirmation.
2. All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

2.6 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
Radiated Emissions Measurement					
1	Radiated Emission Test Software	EZ-EMC	Ver.CCS-03A1	N/A	N/A
2	Horn Antenna	Sunol	DRH-118	A101415	2023.09.27
3	Broadband Hybrid Antenna	Sunol	JB1	A090215	2024.02.26
4	PREAMP	HP	8449B	3008A00160	2023.09.22
5	PREAMP	HP	8447D	2944A07999	2023.05.17
6	EMI TEST RECEIVER	Rohde&Schwarz	ESR3	101891	2023.09.22
7	VECTOR Signal Generator	Rohde&Schwarz	SMU200A	101521	2023.09.22
8	Signal Generator	Agilent	E4421B	MY4335105	2023.09.22
9	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2023.09.22
10	MXA Signal Analyzer	Keysight	N9020A	MY51110104	2023.09.22
11	RF Power sensor	DARE	RPR3006W	15I00041SNO88	2023.05.17
12	RF Power sensor	DARE	RPR3006W	15I00041SNO89	2023.05.17
13	RF power divider	Anritsu	K241B	992289	2023.09.22
14	Wideband radio communication tester	Rohde&Schwarz	CMM500	154987	2023.09.22
15	Active Loop Antenna	Com-Power	AL-130R	10160009	2023.07.25
16	Broadband Hybrid Antennas	Schwarzbeck	VULB9163	VULB9163#958	2023.09.22
17	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2023.05.23
18	Horn Antenna	A-INFOMW	LB-180400-KF	J211060660	2023.09.27
19	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2023.09.22
20	Signal Generator	Agilent	N5183A	MY47420153	2023.09.22
21	Spectrum Analyzer	Rohde&Schwarz	FSP 40	100501	2023.09.22
22	Power Meter	KEYSIGHT	N1911A	MY50520168	2023.09.22
23	Frequency Meter	VICTOR	VC2000	997406086	2023.09.22
24	DC Power Source	HYELEC	HY5020E	055161818	2023.09.22

3 DFS TEST INFORMATION

3.1 DFS TEST REQUIREMENT

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	<input type="checkbox"/> Master	<input checked="" type="checkbox"/> Client Without Radar Detection	<input type="checkbox"/> Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

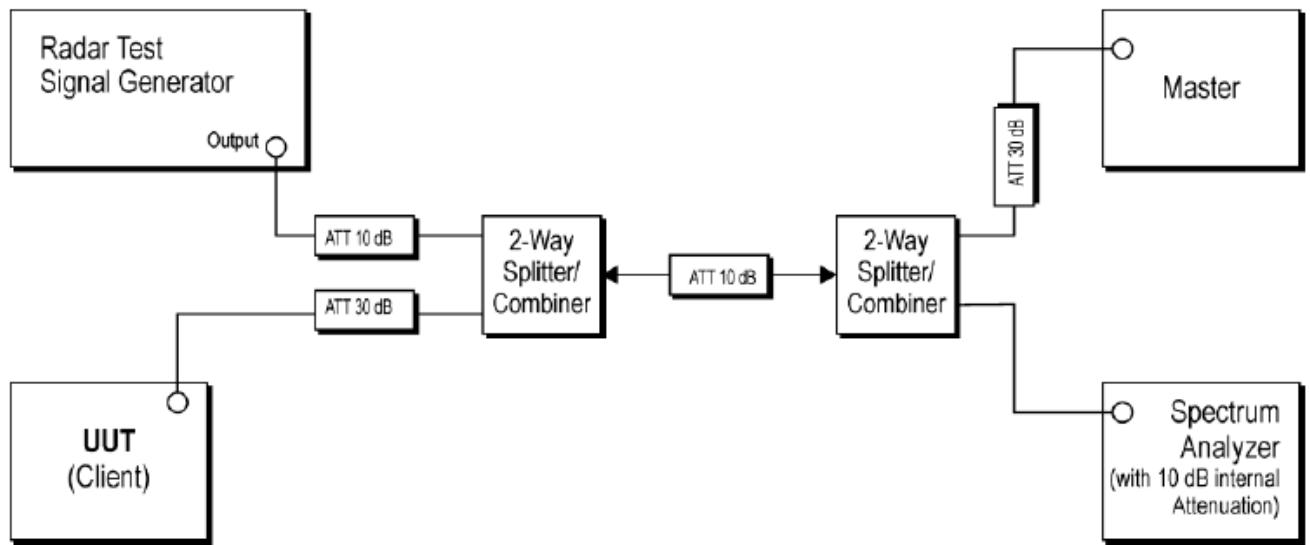
Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	<input type="checkbox"/> Master Device or Client with Radar Detection	<input checked="" type="checkbox"/> Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	<input type="checkbox"/> Master Device or Client with Radar Detection	<input checked="" type="checkbox"/> Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required

Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.

3.2 TEST SETUP



3.3 LIMITS

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
$\text{EIRP} \geq 200 \text{ milliwatt}$	-64 dBm
$\text{EIRP} < 200 \text{ milliwatt}$ and power spectral density $< 10 \text{ dBm/MHz}$	-62 dBm
$\text{EIRP} < 200 \text{ milliwatt}$ that do not meet the power spectral density requirement	-64 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.

Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Note 3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

3.4 RADAR TEST WAVEFORMS

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	Roundup $\left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

Table 6 – Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 7 – Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

3.5 TEST PROCEDURE

1. When a Client Device without Radar Detection is the UUT, the Master Device is the Radar Detection Device.
2. A spectrum analyzer is used to establish the test signal level for each radar type.
3. During this process, there are no transmissions by either the Master Device or Client Device.
4. The spectrum analyzer is switched to the zero span (time domain) mode at the frequency of the Radar Waveform generator. The peak detector function of the spectrum analyzer is utilized. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) are set to at least 3 MHz.
5. The measured channels are 5530MHz in 80MHz Bandwidth and 5290MHz in 80MHz Bandwidth. The Radar signal was the same as transmitted channels, and injected into the antenna port of AP(master) ,measured the DFS parameters. The master transmitted the test data to client, the transmitted duty cycle is 30.8%.

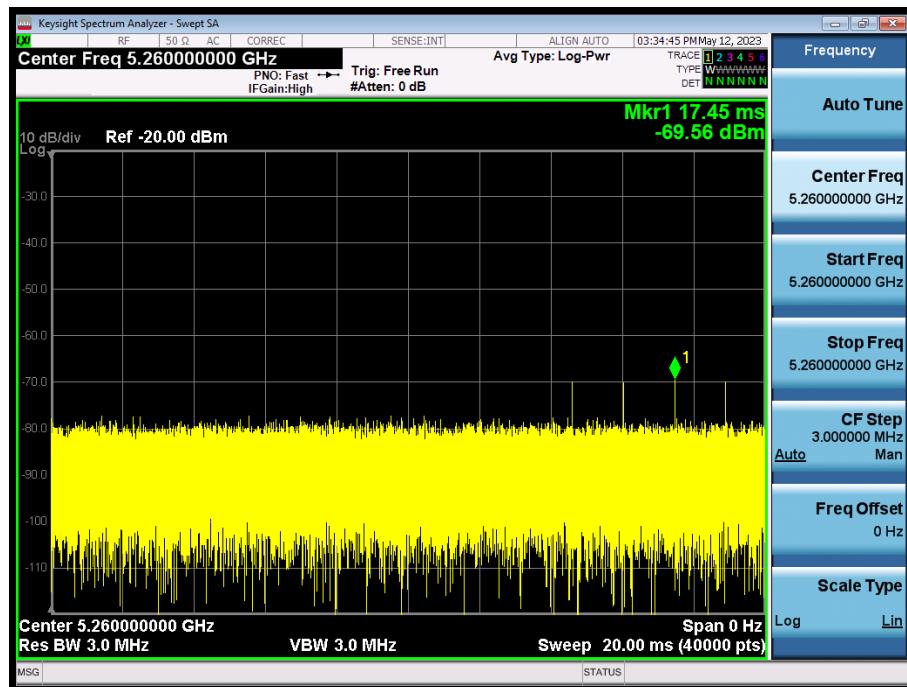
3.5 TEST RESULT

3.5.1 Calibration of Radar Waveform

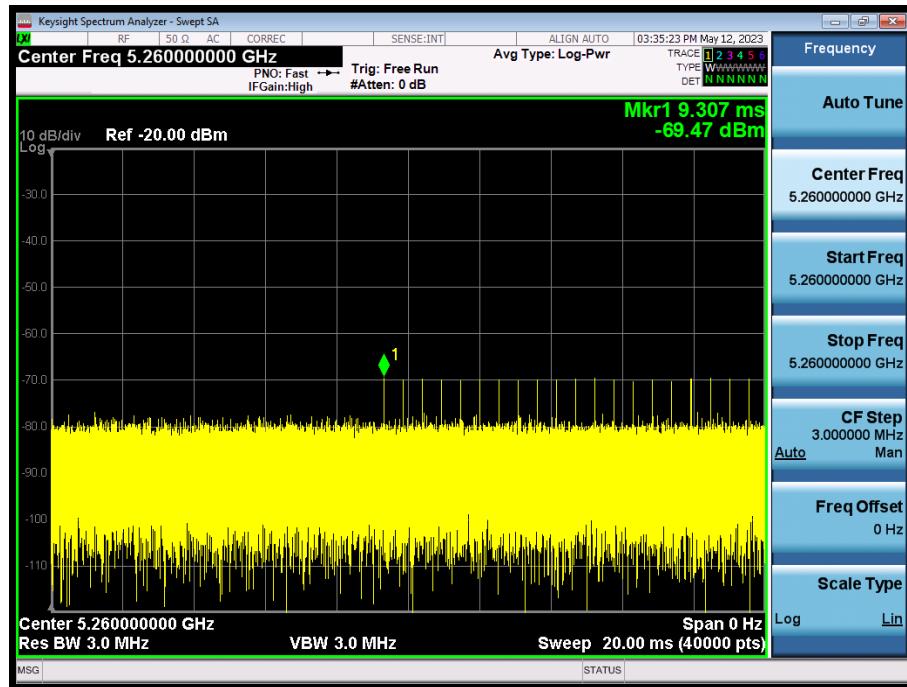
For a detection threshold level of -64dBm and the Client antenna gain is -4.35dBi, required detection threshold is -68.35dBm ($= -64 + (-4.35)$).

Note: Maximum Transmit Power is greater than 200 milliwatt in this report, so detection threshold level is -64dBm.

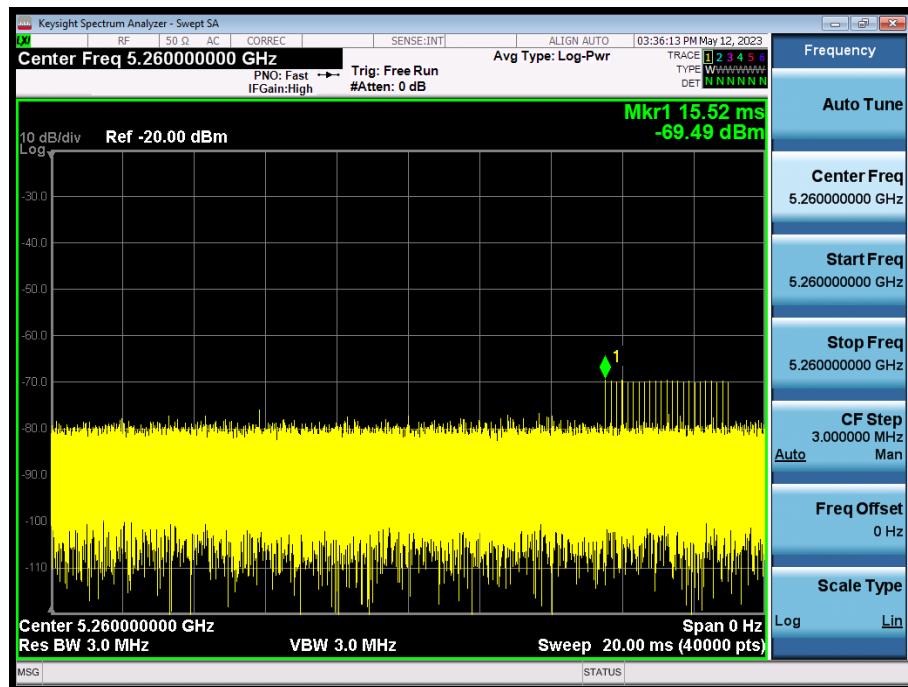
Radar Type 0



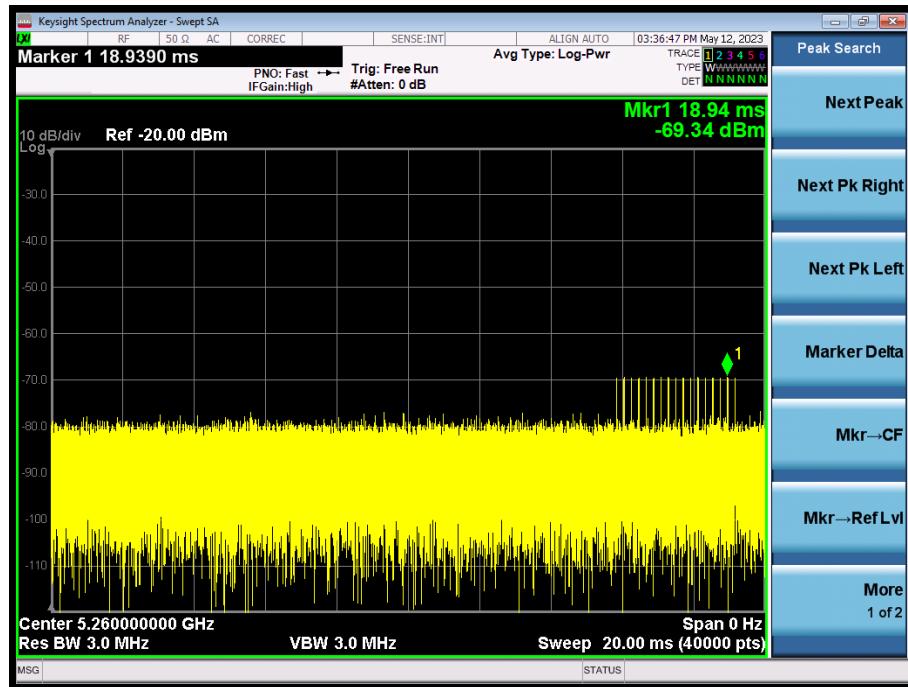
Radar Type 1



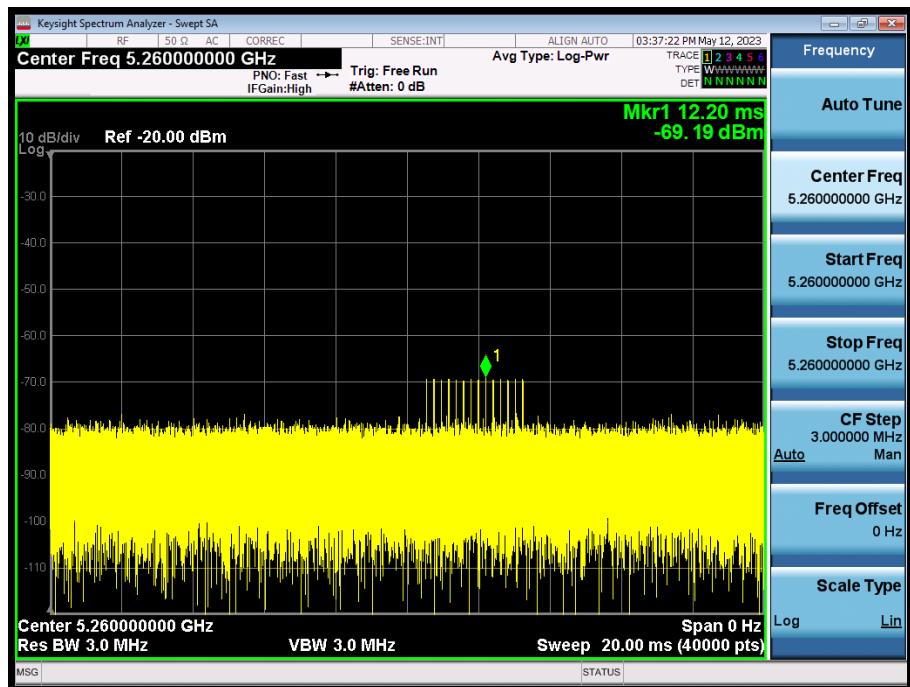
Radar Type 2



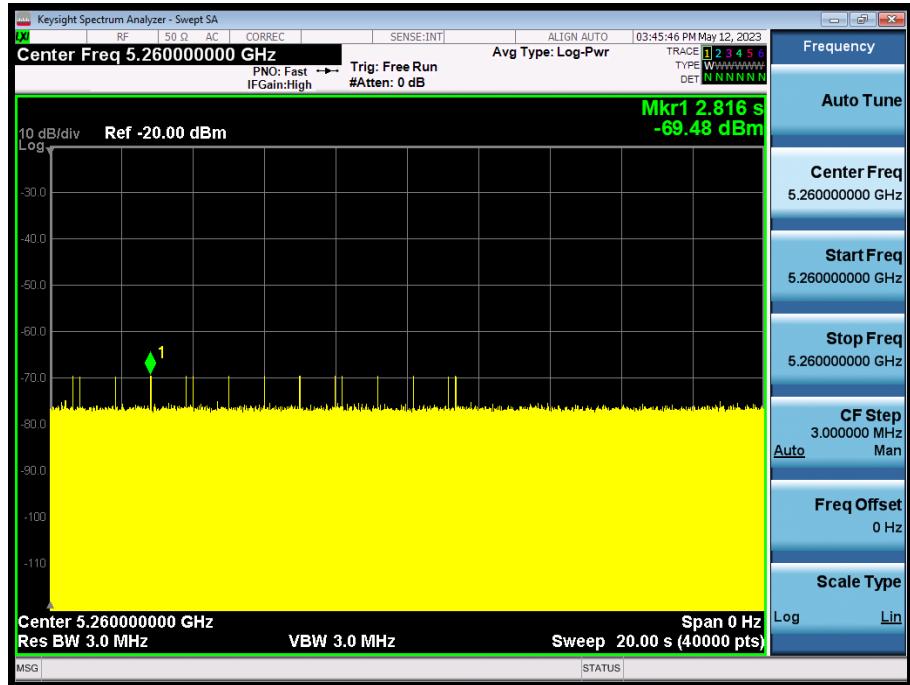
Radar Type 3



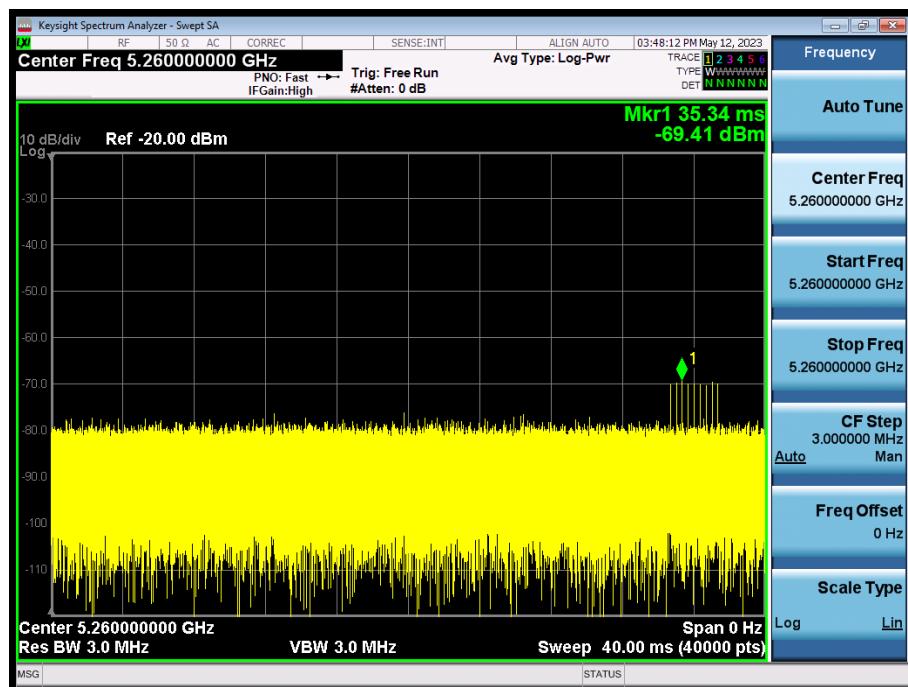
Radar Type 4



Radar Type 5



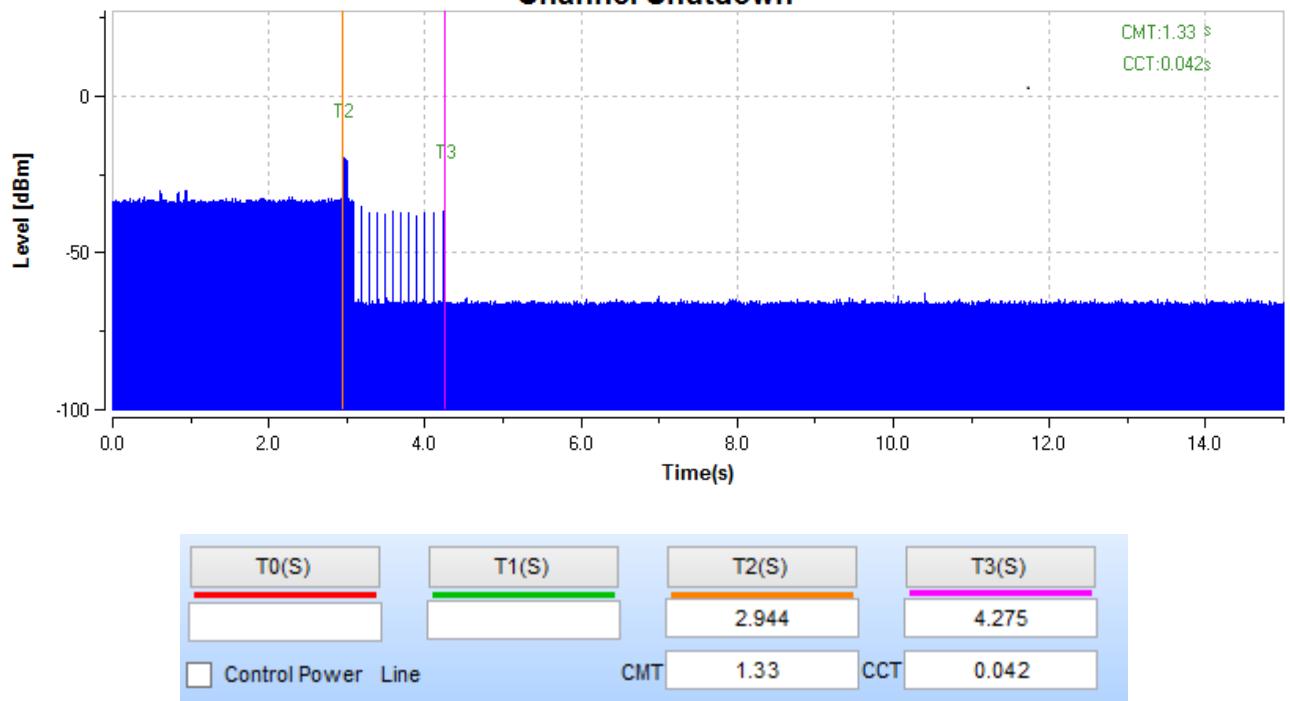
Radar Type 6



3.5.2 CHANNEL CLOSING TRANSMISSION AND CHANNEL MOVE TIME WLAN TRAFFIC

Channel Move Time and Channel Closing Transmission Time

Test Frequency	Requirement	Measurement Level	Limit
5260MHz	Channel Closing Transmission Time	0.042	≤0.26s
	Channel Move Time	1.33	≤10s
5500MHz	Channel Closing Transmission Time	0.008	≤0.26s
	Channel Move Time	1.068	≤10s
5290MHz	Channel Closing Transmission Time	0.009	≤0.26s
	Channel Move Time	1.026	≤10s
5530MHz	Channel Closing Transmission Time	0.01	≤0.26s
	Channel Move Time	1.18	≤10s

A20-5260MHz(Radar Type 0)**Channel Shutdown**

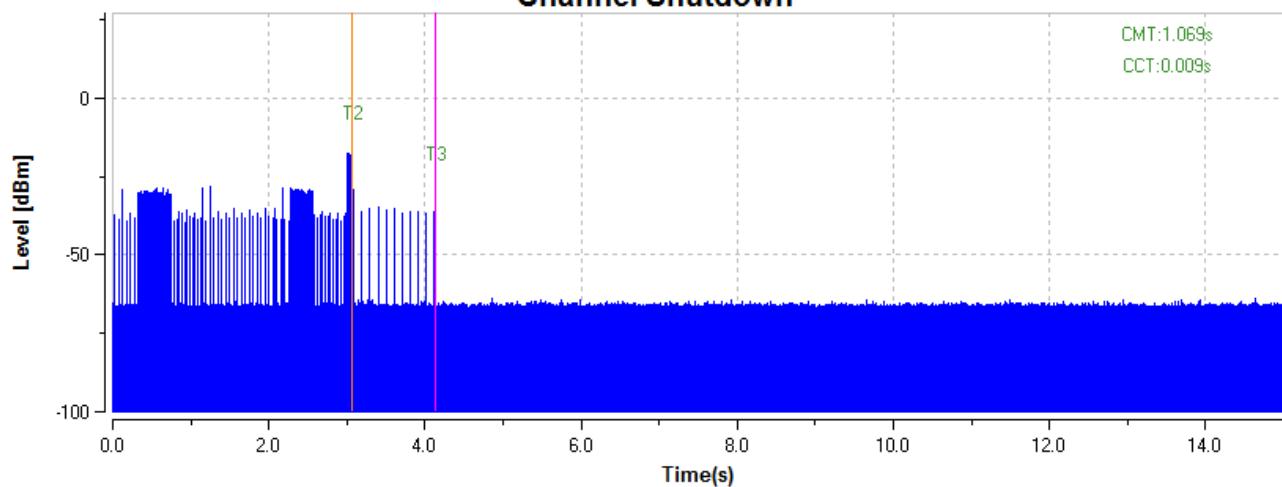
Note :

CMT: Channel Move Time

CCT: Channel Closing Transmission Time

T2 denote injected radar burst.

T3 denote Channel Move Time

A20-5500MHz (Radar Type 0)**Channel Shutdown**

T0(S)	T1(S)	T2(S)	T3(S)
Control Power Line		3.065	4.174

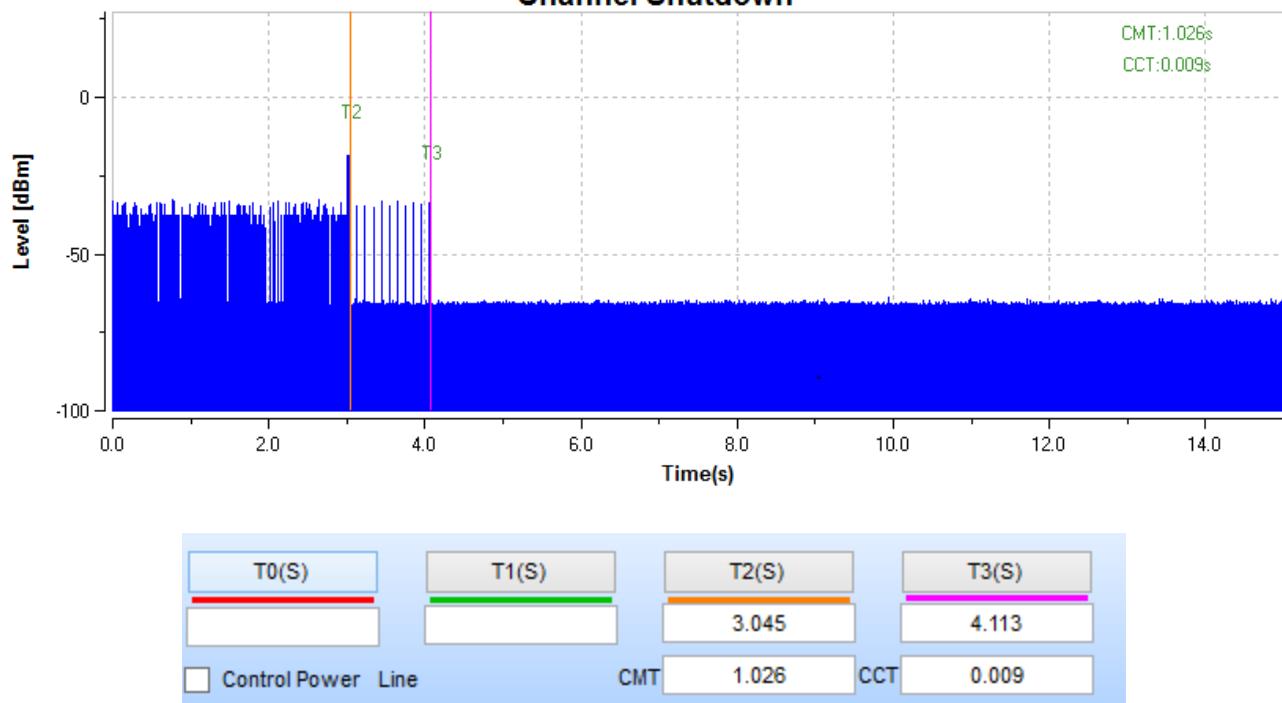
CMT 1.068 CCT 0.008

CMT: Channel Move Time

CCT: Channel Closing Transmission Time

T2 denote injected radar burst.

T3 denote Channel Move Time

AC80-5290MHz (Radar Type 0)**Channel Shutdown**

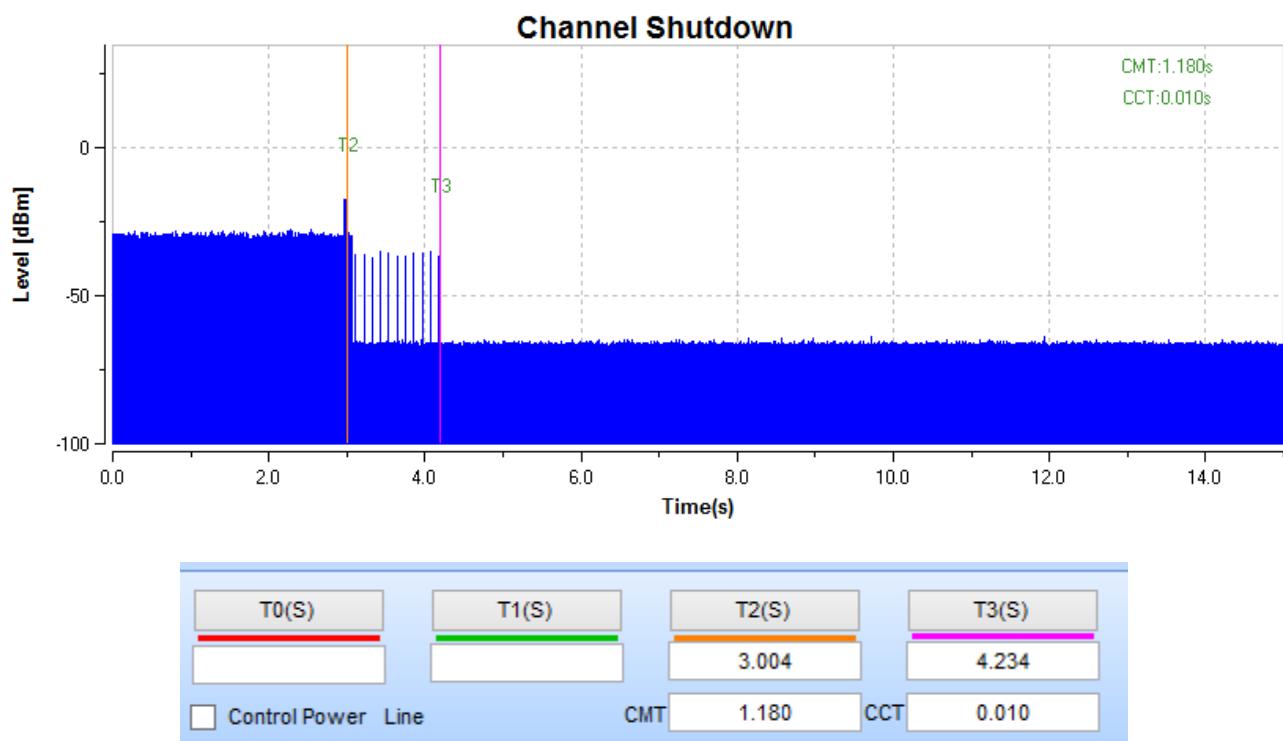
CMT: Channel Move Time

CCT: Channel Closing Transmission Time

T2 denote injected radar burst.

T3 denote Channel Move Time

AC80-5530MHz (Radar Type 0)



CMT: Channel Move Time

CCT: Channel Closing Transmission Time

T2 denote injected radar burst.

T3 denote Channel Move Time

4 ANTENNA REQUIREMENT

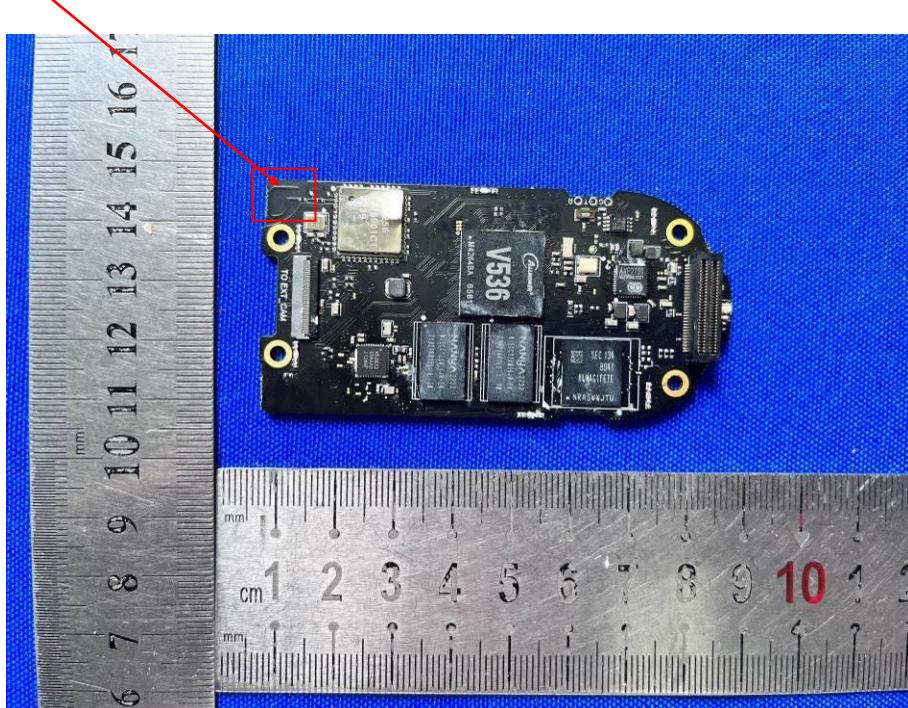
Standard Applicable:

For intentional device, according to FCC 47 CFR Section 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.

Antenna Connected Construction

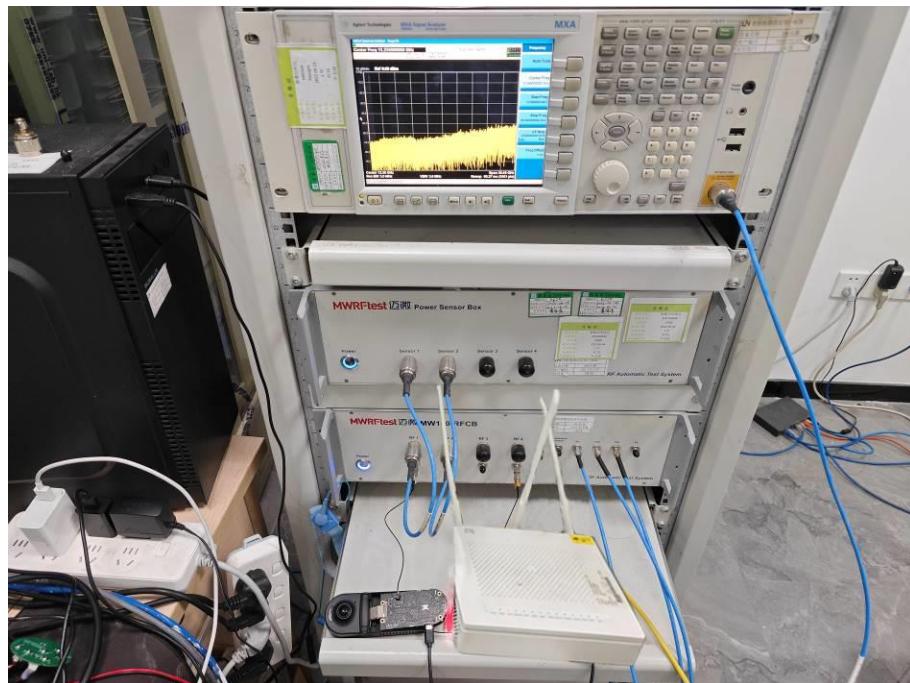
The antenna used in this product is a PCB Antenna.

ANTENNA:



5 PHOTO OF TEST

RF Conducted



End of Report