



TEST REPORT

Applicant: Intrepid Control Systems, Inc.
Address: 1850 Research Dr., Troy Michigan 48083 USA
Equipment Type: neoVI-Connect
Model Name: 110-0071-02
Brand Name: Intrepid
FCC ID: 2A923241206ROEM1
ISED Number: 29961-241206ROEM1
Test Standard: 47 CFR Part 15 Subpart E
RSS-247 Issue 3
(refer to section 3.1)
Sample Arrival Date: Feb. 17, 2025
Test Date: Mar. 24, 2025 - Mar. 25, 2025
Date of Issue: Apr. 14, 2025

ISSUED BY:

Shanghai Tejet Communications Technology Co., Ltd. Testing Center

Tested by: Hai Su

Checked by: Zhang Yanqing

Approved by: Chen Zidong
(Technical Director)

Hai Su

Zhang Yanqing

Chen Zidong

Revision History

Version	Issue Date	Revisions
<u>Rev. 01</u>	<u>Apr. 08, 2025</u>	<u>Initial Issue</u>
<u>Rev. 02</u>	<u>Apr. 14, 2025</u>	<u>Modify the Antenna Gain in Section 2.4.</u>
		<u>The original report is invalid.</u>

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shanghai Tejet Communications Technology Co., Ltd. Testing Center
Address	1st to 2nd floors, Building 1, No. 222 Xuanlan Road, Xuanqiao Town, Pudong New District, Shanghai

1.2 Test Location

Name	Shanghai Tejet Communications Technology Co., Ltd. Testing Center
Location	1st to 2nd floors, Building 1, No. 222 Xuanlan Road, Xuanqiao Town, Pudong New District, Shanghai
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1352. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 29671.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Intrepid Control Systems, Inc.
Address	1850 Research Dr., Troy Michigan 48083 USA

2.2 Manufacturer Information

Manufacturer	Intrepid Control Systems, Inc.
Address	1850 Research Dr., Troy Michigan 48083 USA

2.3 General Description for Equipment under Test (EUT)

EUT Name	neoVI-Connect
Model Name Under Test	110-0071-02
Series Model Name	N/A
Description of Model name differentiation	N/A
Sample Number	SC-SH2510055-S02(conducted) SC-SH2510055-S05(radiated)
Hardware Version	110-0071
Software Version	R2C1224
Dimensions (Approx.)	L:155.0mm* W:209.7mm* H:43.75mm*
Weight (Approx.)	N/A

2.4 Technical Information

Network and Wireless connectivity	2G Network GSM 850/1900 MHz 3G Network WCDM Band 2/4/5 4G Network LTE FDD Band 2/4/5/7/12/13/25/26/66 TDD Band 38/41 2.4G WIFI 802.11b, 802.11g, 802.11n(HT20/40) 5G WIFI 802.11a, 802.11n(HT20/40), 802.11ac(VHT20/40/80)
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The requirement for the following technical information of the EUT was tested in this report:

Frequency Range		5250 MHz to 5350 MHz, 5470 MHz to 5725 MHz
Maximum Output Power		5250 MHz to 5350 MHz: 14.02 dBm 5470 MHz to 5725 MHz: 13.99 dBm
Antenna Type	Main Antenna	Rod Antenna
	Aux. Antenna	
Antenna Gain	Main Antenna	5250 MHz to 5350 MHz: 4.90 dBi 5470 MHz to 5725 MHz: 4.90 dBi
	Aux. Antenna	5250 MHz to 5350 MHz: 4.90 dBi 5470 MHz to 5725 MHz: 4.90 dBi
Note: This device (Client) is without radar detection, then the manufacturer statement confirming that information regarding the parameters of the detected Radar Waveforms is not available to the end user. And the device doesn't have Ad Hoc mode on DFS frequency band.		

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No	Identity	Document Title
1	47 CFR Part 15 Subpart E	Unlicensed National Information Infrastructure Devices
2	RSS-247 Issue 3	Digital Transmission Systems (DTSS), Frequency Hopping Systems(FHSs) and Licence-Exemp Local Area Network (LE-LAN) Devices
3	KDB Publication 905462 D02v02	UNII DFS Compliance Procedures New Rules
4	KDB Publication 905462 D03v01r02	UNII Clients Without Radar Detection New Rules
5	KDB Publication 789033 D02v02r01	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E

3.2 Test Verdict

No.	Description	FCC Part No.	RSS Part No.	Verdict	Remark
1	Channel Move Time	15.407	RSS-247, 6.3	Pass	Applicable
2	Channel Closing Transmission Time	15.407	RSS-247, 6.3	Pass	Applicable
3	Non- Occupancy Period	15.407	RSS-247, 6.3	Pass	Applicable
Note : The RF module installed in the EUT is electronically and mechanically identical to the original certified module in the test report, No. ER/2022/20059 (FCC ID: XMR202201AF51Y), (ISED Number: 10224A-202201AF51Y) which issued by SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd on Apr. 01, 2022. Test projects refer to the original report, No. ER/2022/20059 (FCC ID: XMR202201AF51Y) which issued by SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd on Apr. 01, 2022.					

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

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

Relative Humidity	N/A	
Atmospheric Pressure	N/A	
Temperature	NT (Normal Temperature)	N/A
Working Voltage of the EUT	NV (Normal Voltage)	12 V

4.2 Test Equipment List

Note: The Test Equipment List, please refer to the Report No. ER/2022/20059 which issued by SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd on Apr. 01, 2022. Chapters 5.1.

Note: The Master information, please refer to the Report No. ER/2022/20059 which issued by SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd on Apr. 01, 2022. Chapters 1.2.

4.3 Test Software List

Note: Not applicable.

4.4 Decision Rule

- ☐ No Need
- ☒ Use General conformity decision rule (Consider uncertainty or not ☒No ☐Yes)
- ☐ Use Special Conformity Decision Rule (Consider uncertainty or not ☐No ☐Yes)

4.5 Measurement Uncertainty

Note: The Measurement Uncertainty, please refer to the Report No. ER/2022/20059 which issued by SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd on Apr. 01, 2022. Chapters 3.

4.6 Description of Test Setup

Note: The Description of Test Setup, please refer to the Report No. ER/2022/20059 which issued by SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd on Apr. 01, 2022. Chapters 5.

5 TEST ITEMS

5.1 DFS

5.1.1 U-NII DFS Rule Requirements

5.1.1.1 Working Mode and Required Test Items

The manufacturer shall state whether the UUT is capable of operating as a Master and/or a Client. If the UUT is capable of operating in more than one operating mode then each operating mode shall be tested separately. See tables 1 and 2 for the applicability of DFS requirements for each of the operational modes.

APPLICABILITY OF DFS REQUIREMENTS PRIOR TO USE A CHANNEL

Requirement	Operational Mode		
	Master	Client without radar detection	Client with radar detection
Non-Occupancy Period	✓	✓	✓
DFS Detection Threshold	✓	Not required	✓
Channel Availability Check Time	✓	Not required	Not required
Uniform Spreading	✓	Not required	Not required
U-NII Detection Bandwidth	✓	Not required	✓

APPLICABILITY OF DFS REQUIREMENTS DURING NORMAL OPERATION

Requirement	Operational Mode		
	Master	Client without radar detection	Client with radar detection
DFS Detection Threshold	✓	Not required	✓
Channel Closing Transmission Time	✓	✓	✓
Channel Move Time	✓	✓	✓
U-NII Detection Bandwidth	✓	Not required	✓

5.1.2 Test Limits and Radar Signal Parameters

Detection Threshold Values

DFS DETECTION THRESHOLDS FOR MASTER DEVICES AND CLIENT DEVICES WITH RADAR DETECTION

Maximum Transmit Power	Value (See Note ^{1 & 2})
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 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.

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 Note ^{1&2} .
U-NII Detection Bandwidth	100% of the UNII transmission power bandwidth. See Note ³ .

Note ¹: The instant that the Channel Move Time and the Channel Closing Transmission Time begins is as follows:

- For the Short Pulse Radar Test Signals this instant is the end of the Burst.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar Burst generated.
- For the Long Pulse Radar Test Signal this instant is the end of the 12 second period defining the Radar Waveform.

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 1 is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

Parameters of DFS Test Signals

Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

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	See Note
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a 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	$\text{Roundup} \left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	60%	30
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: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

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

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

5.1.2.1 Test Setup

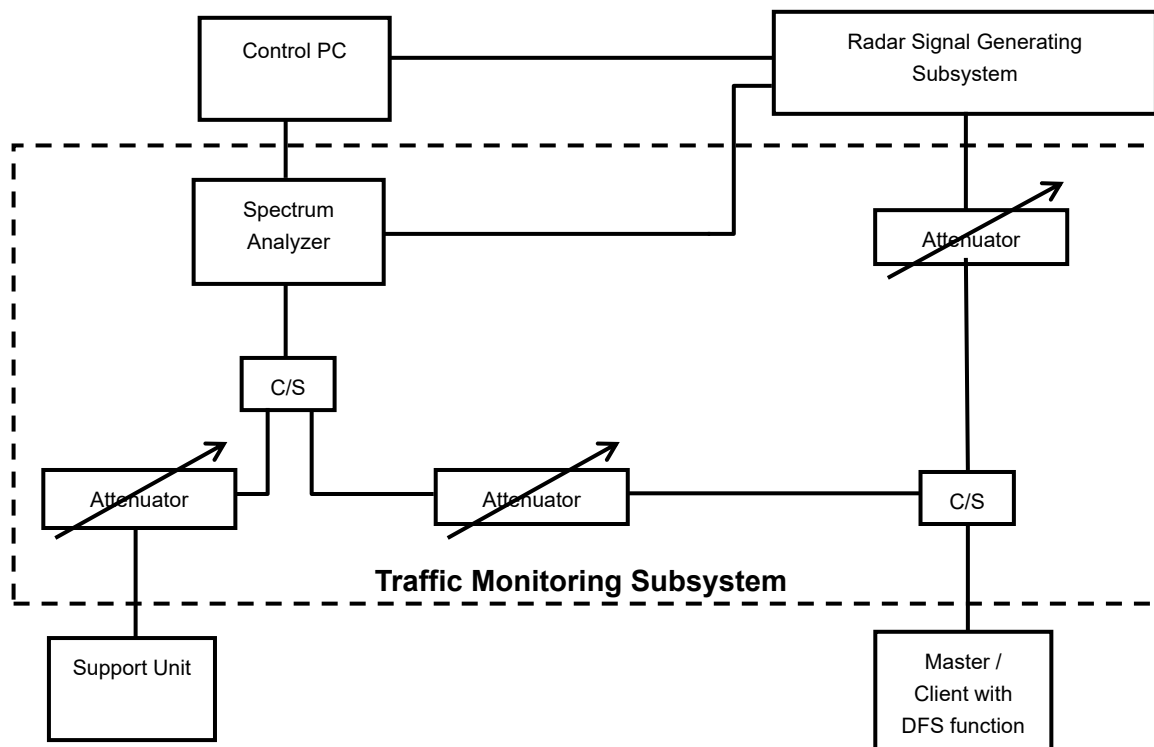
See 4.6 for test setup description for the radiated test. The photo of test setup please refer to ANNEX B.

5.1.2.2 Test Procedure

DFS MEASUREMENT SYSTEM:

A complete DFS Measurement System consists of two subsystems: (1) the Radar Signal Generating Subsystem and (2) the Traffic Monitoring Subsystem. The control PC is necessary for generating the Radar waveforms in Table 6, 7 and 8. The traffic monitoring subsystem is specified to the type of unit under test (UUT).

Conducted setup configuration of ADT DFS Measurement System

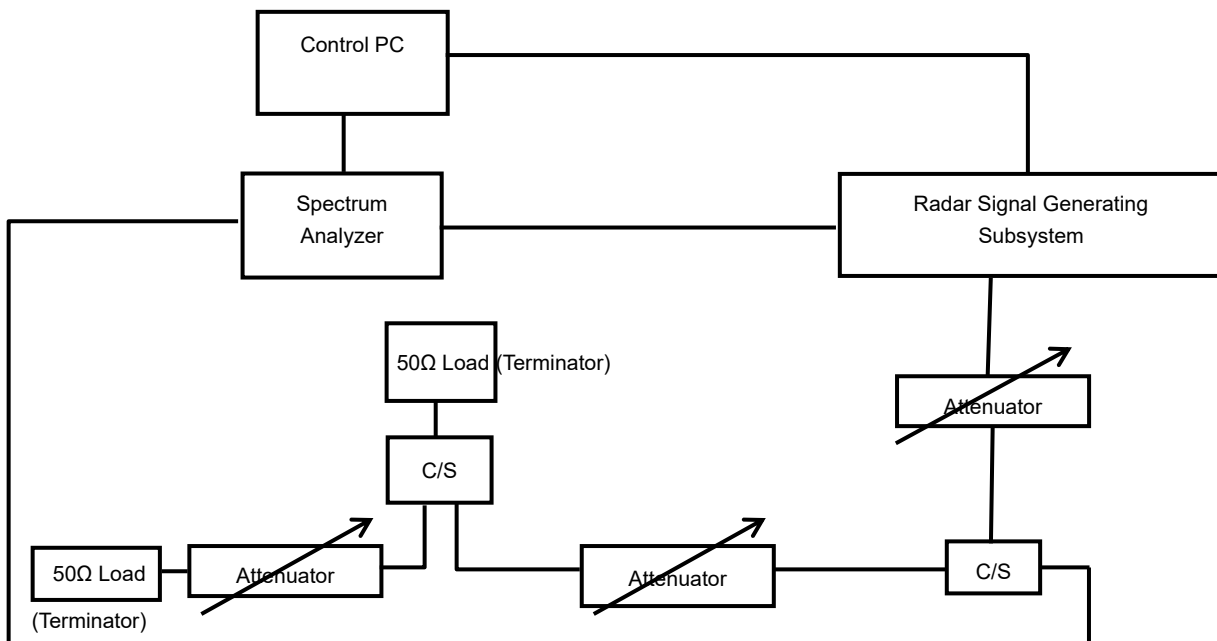


The test transmission will always be from the Master Device to the Client Device. While the Client device is set up to associate with the Master device and play the MPEG file (6 $\ominus$ Magic Hours) from Master device, the designated MPEG test file and instructions are located at: <http://ntiacsd.ntia.doc.gov/dfs/>.

CALIBRATION OF DFS DETECTION THRESHOLD LEVEL:

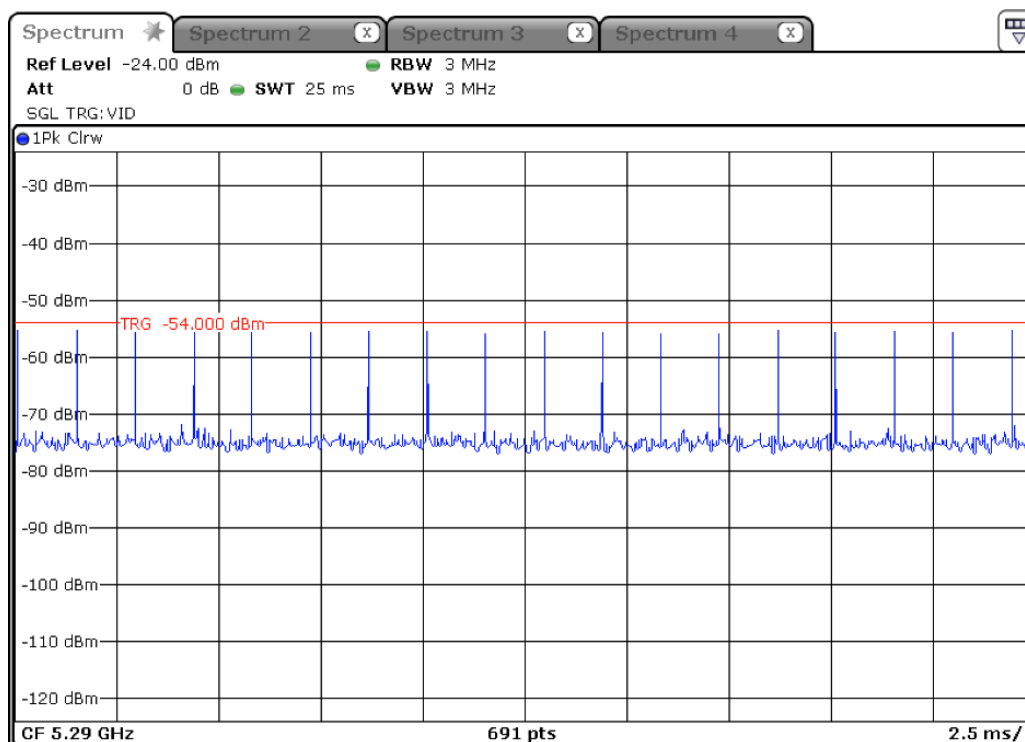
The measured channel is 5500 MHz in 20MHz Bandwidth and 5530MHz in 80MHz Bandwidth. The radar signal was the same as transmitted channels, and injected into the antenna port of AP (master) or Client Device with Radar Detection, measured the channel closing transmission time and channel move time. The Master antenna gain is 6.57dBi and required detection threshold is -54.43dBm ($= -62 + 1 + 6.57$)dBm. The calibrated conducted detection threshold level is set to -54.43 dBm.

Conducted setup configuration of Calibration of DFS Detection Threshold Level

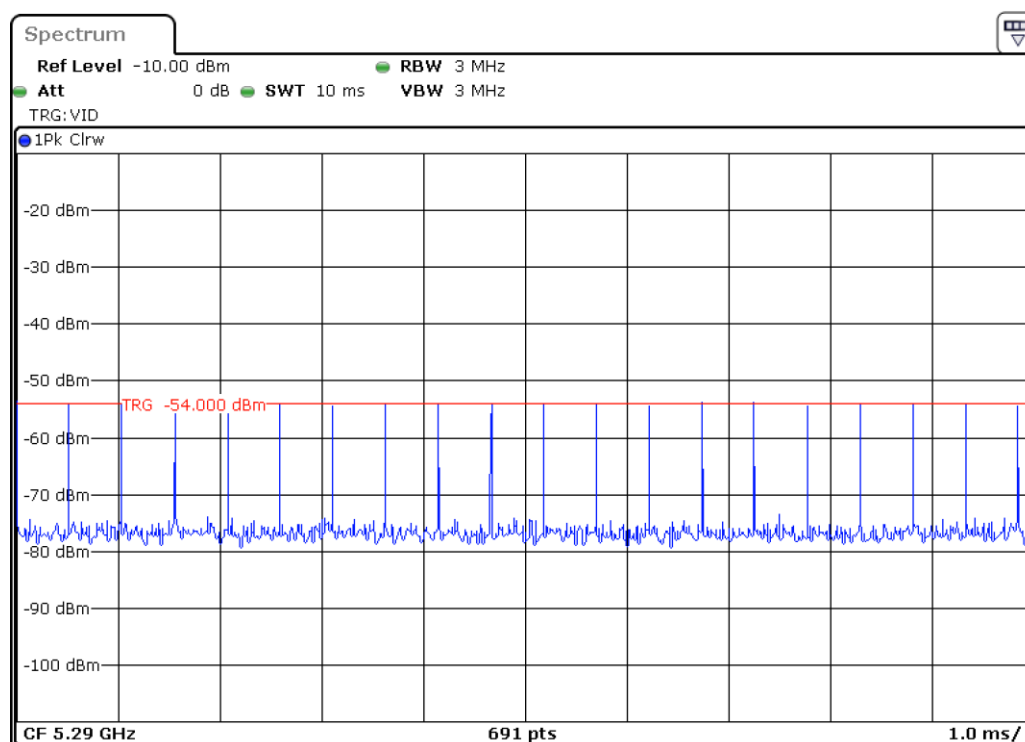


Radar Waveform Calibration Result

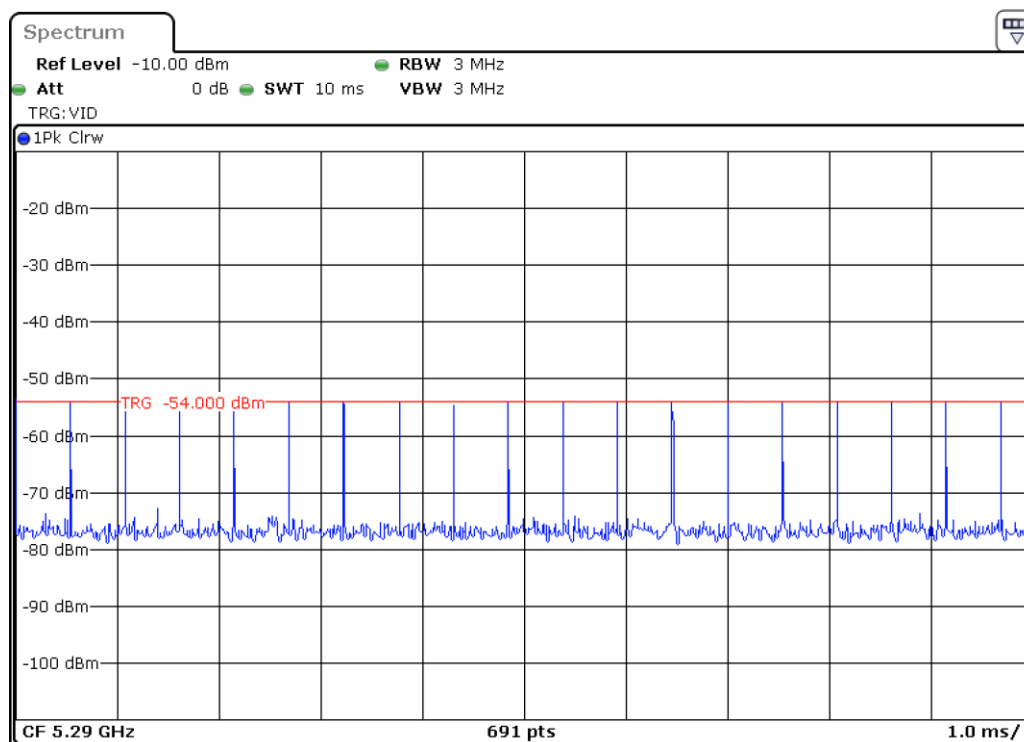
Radar Type 0 Calibration Plot (5290MHz)



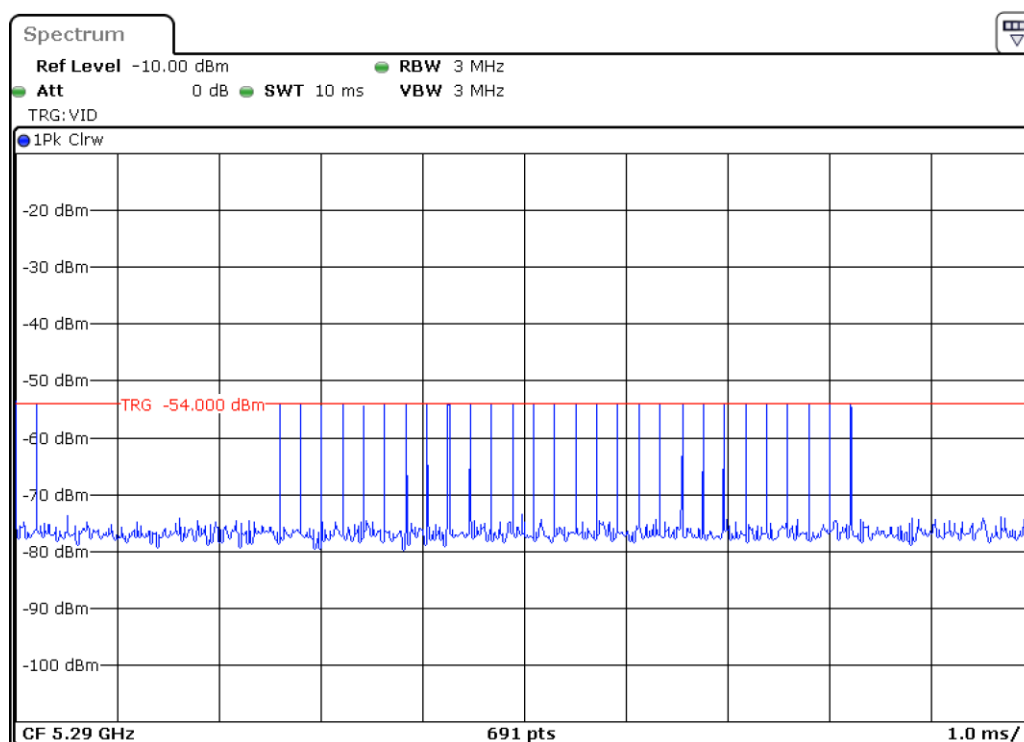
Radar Type 1 test A Calibration Plot (5290MHz)



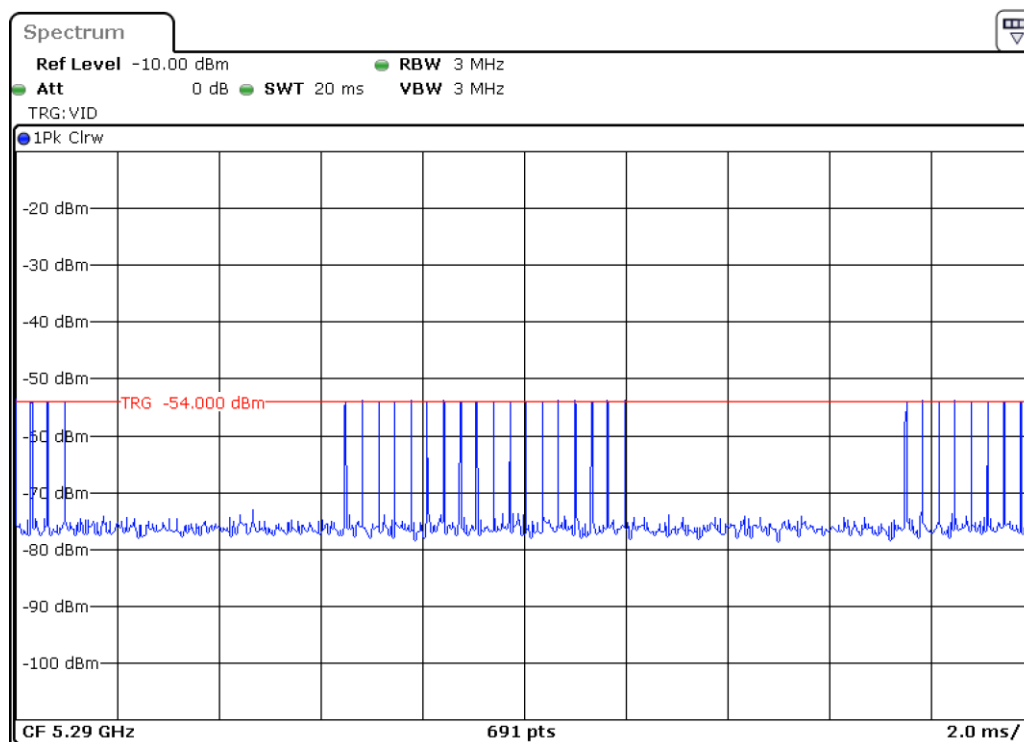
Radar Type 1 test B Calibration Plot (5290MHz)



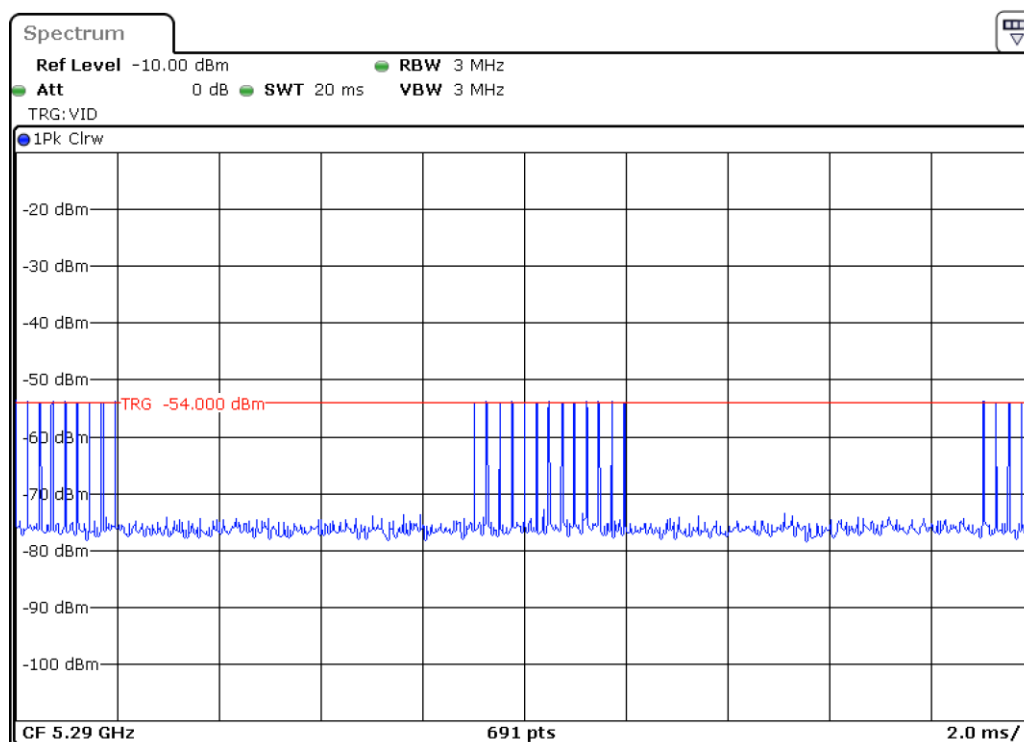
Radar Type 2 Calibration Plot (5290MHz)



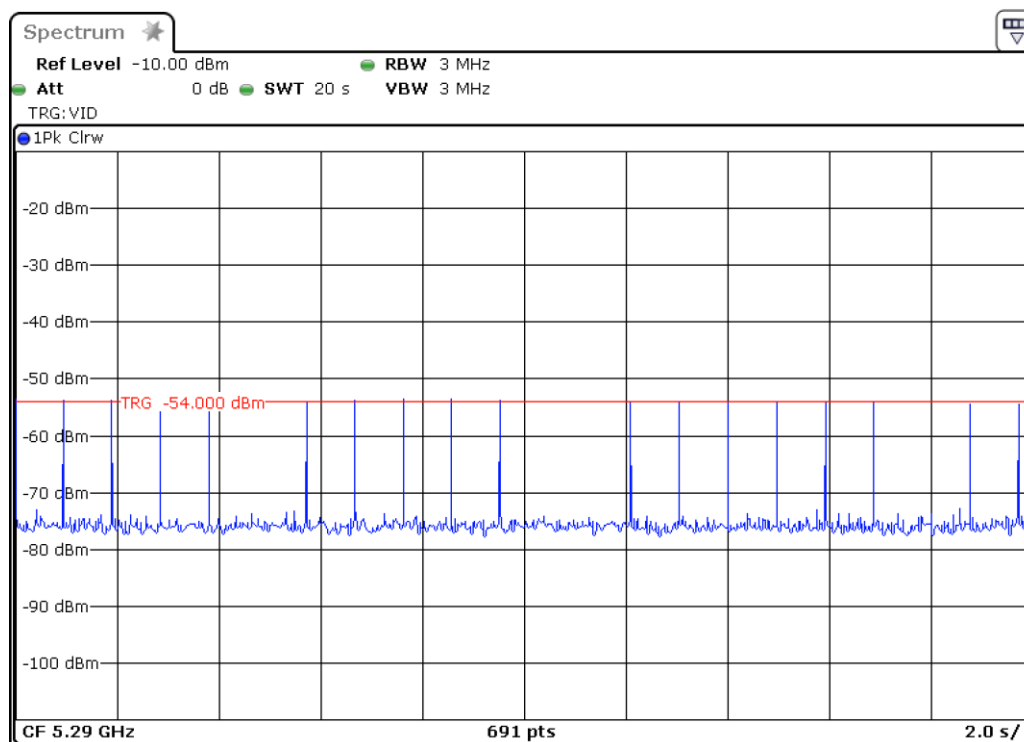
Radar Type 3 Calibration Plot (5290MHz)



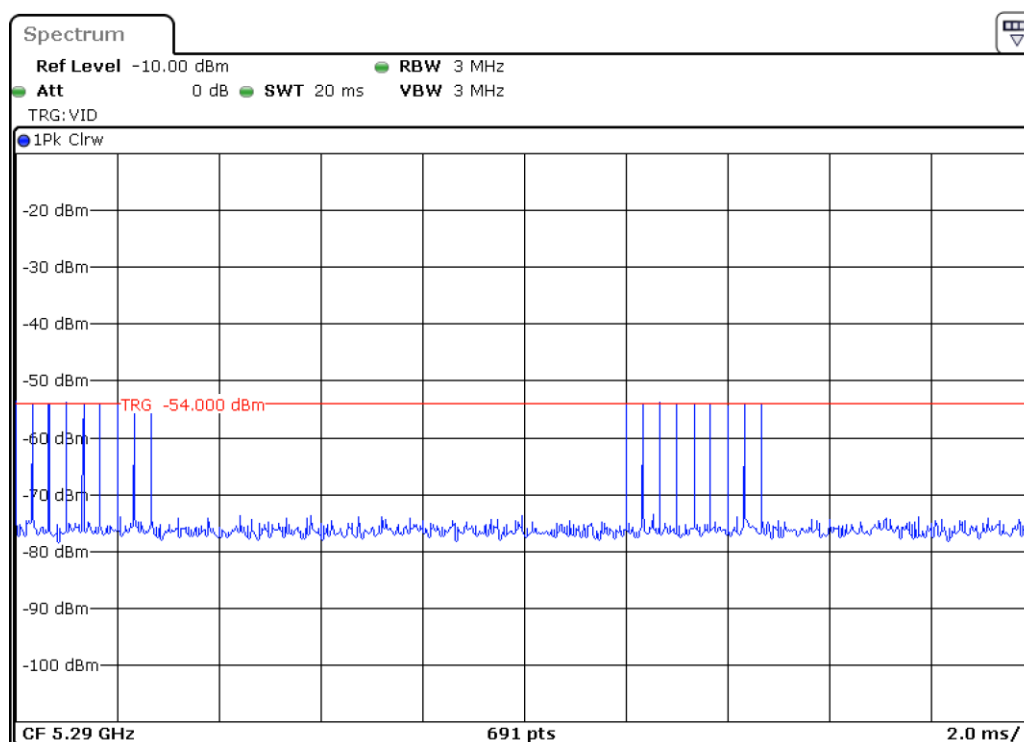
Radar Type 4 Calibration Plot (5290MHz)



Radar Type 5 Calibration Plot (5290MHz)



Radar Type 6 Calibration Plot (5290MHz)



5.1.2.3 Test Result

Please refer to ANNEX A.

ANNEX A TEST RESULT

A.1 CHANNEL CLOSING TRANSMISSION AND CHANNEL MOVE TIME

Note: The CHANNEL CLOSING TRANSMISSION AND CHANNEL MOVE TIME, please refer to the Report No. ER/2022/20059 which issued by SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd on Apr. 01, 2022. Chapters 5.3.3.

A.2 NON-OCCUPANCY PERIOD

Note: The NON-OCCUPANCY PERIOD, please refer to the Report No. ER/2022/20059 which issued by SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd on Apr. 01, 2022. Chapters 5.3.3.

ANNEX B TEST SETUP PHOTOS

Note: The TEST SETUP PHOTOS, please refer to the Report No. ER/2022/20059 which issued by SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd on Feb. 17, 2022. Chapters 6.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document "BL-SH2510057-AW.PDF".

ANNEX D EUT INTERNAL PHOTOS

Please refer the document "BL-SH2510057-AI.PDF".

Statement

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--END OF REPORT--