

FCC TEST REPORT

Product Name: Hybrid Full-Touch Handheld computer

Trade Mark: 

Model No.: X40

Add. Model No.: N/A

Report Number: 26051324502RFC-8

Test Standards: FCC 47 CFR Part 15 Subpart F

FCC ID: VTVX40W1

Test Result: PASS

Date of Issue: October 19, 2026

Prepared for:

TSC Auto ID Technology Co., Ltd.

9F., No. 95, Minquan Rd. Xindian Dist., New Taipei City, Taiwan

Prepared by:

Shenzhen UnionTrust Quality and Technology Co., Ltd.

**16/F., Block A, Building 6, Baoneng Science and Technology Park,
Longhua Street, Longhua District, Shenzhen, Guangdong, China**

TEL: +86-755-2823 0888

FAX: +86-755-2823 0886

Prepared by:



David Chen
Senior Project Engineer

Reviewed by:



Henry Lu
Team Leader

Approved by:


Kevin Liang
Assistant Manager

Date:

October 19, 2026

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F., Block A, Building 6, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, Guangdong, China

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

<http://www.uttlab.com>

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Version

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V1.0	October 19, 2026	Original



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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	TSC Auto ID Technology Co., Ltd.
Address of Applicant:	9F., No. 95, Minquan Rd. Xindian Dist., New Taipei City, Taiwan
Manufacturer:	TSC Auto ID Technology Co., Ltd.
Address of Manufacturer:	9F., No. 95, Minquan Rd. Xindian Dist., New Taipei City, Taiwan

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	Hybrid Full-Touch Handheld computer		
Model No.:	X40		
Add. Model No.:	N/A		
Trade Mark:			
DUT Stage:	Identical Prototype		
EUT Supports Function: (Provided by the customer)	2.4 GHz ISM Band:	IEEE 802.11b/g/n/ax	
		Bluetooth V5.3	
		2 nd BLE	
	U-NII 5 GHz Bands:	5 150 - 5 250 MHz	IEEE 802.11a/n/ac/ax
		5 250 - 5 350 MHz	IEEE 802.11a/n/ac/ax
		5 470 - 5 725 MHz	IEEE 802.11a/n/ac/ax
		5 725 - 5 850 MHz	IEEE 802.11a/n/ac/ax
	U-NII 6 GHz Bands:	5 925 - 6 425 MHz	IEEE 802.11ax
		6 425 - 6 525 MHz	IEEE 802.11ax
		6 525 - 6 875 MHz	IEEE 802.11ax
		6 875 - 7 125 MHz	IEEE 802.11ax
	RFID:	902 - 928 MHz	
UWB:	6.0-8.5GHz		
NFC:	13.553 MHz to 13.567 MHz		
Software Version:	R2.00 (Provided by the customer)		
Hardware Version:	REV0.3 (Provided by the customer)		
Sample Received Date:	May 13, 2026		
Sample Tested Date:	May 25, 2026 to August 31, 2026		
Remark:	The above EUT's information was provided by customer. Please refer to the specifications or user's manual for more detailed description.		

1.2.2 Description of Accessories

Refer to Report 26051324502EMC-1 for accessories.

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Frequency Band:	6.0 GHz to 8.5 GHz
Nominal Operating Frequency:	☐ Channel 5: 6489.6 MHz ☒ Channel 9: 7987.2 MHz
Equipment type:	Hand held UWB systems.
Number of Channels:	1
Antenna Type: (Provided by the customer)	5.03 dBi
Antenna Type:	PIFA Antenna
Maximum Peak EIRP:	-3.84 dBm/50MHz
Normal Test Voltage:	3.87 Vdc and/or 120V~60Hz

1.4 OTHER INFORMATION

None

1.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	Supplied by
Notebook	DELL	Latitude 3400	16238087894	UnionTrust

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable	SMA	0.3 Meter	UnionTrust

1.6 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F., Block A, Building 6, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, Guangdong, China
Telephone: +86 (0) 755 2823 0888
Fax: +86 (0) 755 2823 0886

1.7 TEST FACILITY

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

CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

IC-Registration No.: 21600-1

The 3m Semi-anechoic chamber of Shenzhen UnionTrust Quality and Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 21600-1.

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A2LA-Lab Certificate No.: 4312.01

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC Accredited Lab.

Designation Number: CN1194

Test Firm Registration Number: 259480

1.8 DEVIATION FROM STANDARDS

None.

1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.11 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted emission 9kHz-150kHz	±3.2 dB
2	Conducted emission 150kHz-30MHz	±3.1 dB
3	Radiated emission 9kHz-30MHz	±4.7 dB
4	Radiated emission 30MHz-1GHz	±4.6 dB
5	Radiated emission 1GHz-18GHz	±4.4 dB
6	Radiated emission 18GHz-40GHz	±4.6 dB
7	Radio Frequency	±6.5x10 ⁻⁸
8	RF output power, conducted	±0.68 dB
9	Power Spectral Density, conducted	±0.6 dB
10	Conducted spurious emissions	±2.7 dB
11	Time	±0.19 %
12	Occupied Channel Bandwidth	±1.86 %

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2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart F Test Cases			
Test Item	Test Requirement	Test Method	Result
Antenna Requirement	FCC 47 CFR Part 15 Subpart C Section 15.203 FCC 47 CFR Part 15 Subpart F Section 15.519(a)(2)	N/A	PASS ^{Note 1)}
Occupied Bandwidth	N/A	ANSI C63.10-2020 Section 6.9	None; for reporting purposes only. ^{Note 1)}
EIRP	FCC 47 CFR Part 15 Subpart F Section 15.519(e)(c)	ANSI C63.10-2020 Section 10.3	PASS ^{Note 1)}
10dB Bandwidth	FCC 47 CFR Part 15 Subpart F Section 15.503(a)(b)(c)(d), 15.519(b)	ANSI C63.10-2020 Section 10.1	PASS ^{Note 1)}
Cessation time	FCC 47 CFR Part 15 Subpart F Section 15.519(a)	N/A	PASS ^{Note 1)}
Radiated Emission	FCC 47 CFR Part 15 Subpart C Section 15.209(a) FCC 47 CFR Part 15 Subpart F Section 15.519(c)	ANSI C63.10-2020 Section 10.2 and 10.3	PASS ^{Note 1)}
Radiated Emission in GPS band	FCC 47 CFR Part 15 Subpart F Section 15.519(d)	ANSI C63.10-2020 Section 10.2 and 10.3	PASS ^{Note 1)}
AC Power Line Conducted Emission	FCC 47 CFR Part 15 Subpart C Section 15.207(a)	ANSI C63.10-2020 Section 6.2	PASS ^{Note 1)}
Note: 1) This report base on the previous report 26051324500RFC-8 (FCC ID: VTVX40), remove WWAN and GNSS functions. After evaluation, all test data and photos refer to report 26051324500RFC-8 except for spot-checking Conducted Peak Output Power			

3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
☒	3M Chamber & Accessory Equipment	ETS-LINDGREN	3M	Euroshiedpn-CT001270-1317	11-Nov-2023	10-Nov-2026
☒	Loop Antenna	ETS-Lindgren	6502	00202525	26-Jan-2026	25-Jan-2027
☒	Broadband Antenna	ETS-Lindgren	3142E	00201566	26-Oct-2025	25-Oct-2026
☒	6dB Attenuator	Talent	RA6A5-N-18	18103001	26-Oct-2025	25-Oct-2026
☒	Pre-amplifier	HP	8447F	2805A02960	24-Oct-2025	23-Oct-2026
☒	Double-Ridged Waveguide Horn Antenna(Pre-amplifier)	ETS-Lindgren	3117-PA	00201541	21-Mar-2026	20-Mar-2027
☒	Pre-amplifier	ETS-Lindgren	00118385	00201874	21-Mar-2026	20-Mar-2027
☒	Double-Ridged Waveguide Horn Antenna(Pre-amplifier)	ETS-Lindgren	3116C-PA	00202652	30-Oct-2025	29-Oct-2026
☒	Pre-amplifier	ETS-Lindgren	00118384	00202652	24-Oct-2025	23-Oct-2026
☒	Receiver	ROHDE & SCHWARZ	ESIB26	100114	24-Oct-2025	23-Oct-2026
☒	Spectrum analyzer	ROHDE & SCHWARZ	FSV40-N	101653	20-Mar-2026	19-Mar-2027
☒	Highpass Filter (8000-18000MHz)	Micro-tronics	HPM50107	G083	20-Mar-2026	19-Mar-2027
☒	Multi device Controller	ETS-Lindgren	7006-001	160105.00	N/A	N/A
☒	Test Software	Audix	e3	Software Version: 9.160323		

RF Conducted Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
☒	EXA Signal Analyzer	KEYSIGHT	N9010A	MY51440197	20-Mar-2026	19-Mar-2027

Conducted Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
☒	LISN	ROHDE & SCHWARZ	ENV216	3560.6550.12	22-Jan-2026	21-Jan-2027
☐	LISN Artifical Mains Network	ETS-Lindgren	3816/2SH	00201088	22-Jan-2026	21-Jan-2027
☒	Receiver	ROHDE & SCHWARZ	ESCI 3	101192	24-Oct-2025	23-Oct-2026
☒	Shielding room	ETS-Lindgren	843	Euroshiedpn-CT001270-1246	25-Oct-2024	24-Oct-2027
☒	Test Software	EZ-EMC	EZ-CON	Software Version:EMC-CON 3A1.1		

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4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

4.1.1 Normal or Extreme Test Conditions

Environment Parameter	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage	Relative Humidity (%)
NT/NV	+15 to +35	3.85 Vdc and/or 120 Vac	20 to 75
Remark: 1) NV: Normal Voltage; NT: Normal Temperature			

4.1.2 Record of Normal Environment and Test Sample

Test Item	Temp. (°C)	Relative Humidity (%)	Pressure (kPa)	Sample No.	Tested by
EIRP	25.7	57.3	99.3	S202605148625-ZJB03/4	Leo Li
Radiated Emission					
Radiated Emission in GPS band					
10dB Bandwidth	24.3	53.7	99.6	S202605148625-ZJB01/4	Hank Wu
Cessation time					
Conducted Emission	24.8	51.5	99.9	S202605139612-ZJA03/26	Shirley Wu

Spot-check

Test Item	Temp. (°C)	Relative Humidity (%)	Pressure (kPa)	Sample No.	Tested by
EIRP	24.2	62.5	99.9	S202605138612-ZJA12/26	Linson Xie

4.2 TEST CHANNELS

Test RF Channel	
Channel 9	7987.2 MHz

4.3 EUT TEST STATUS

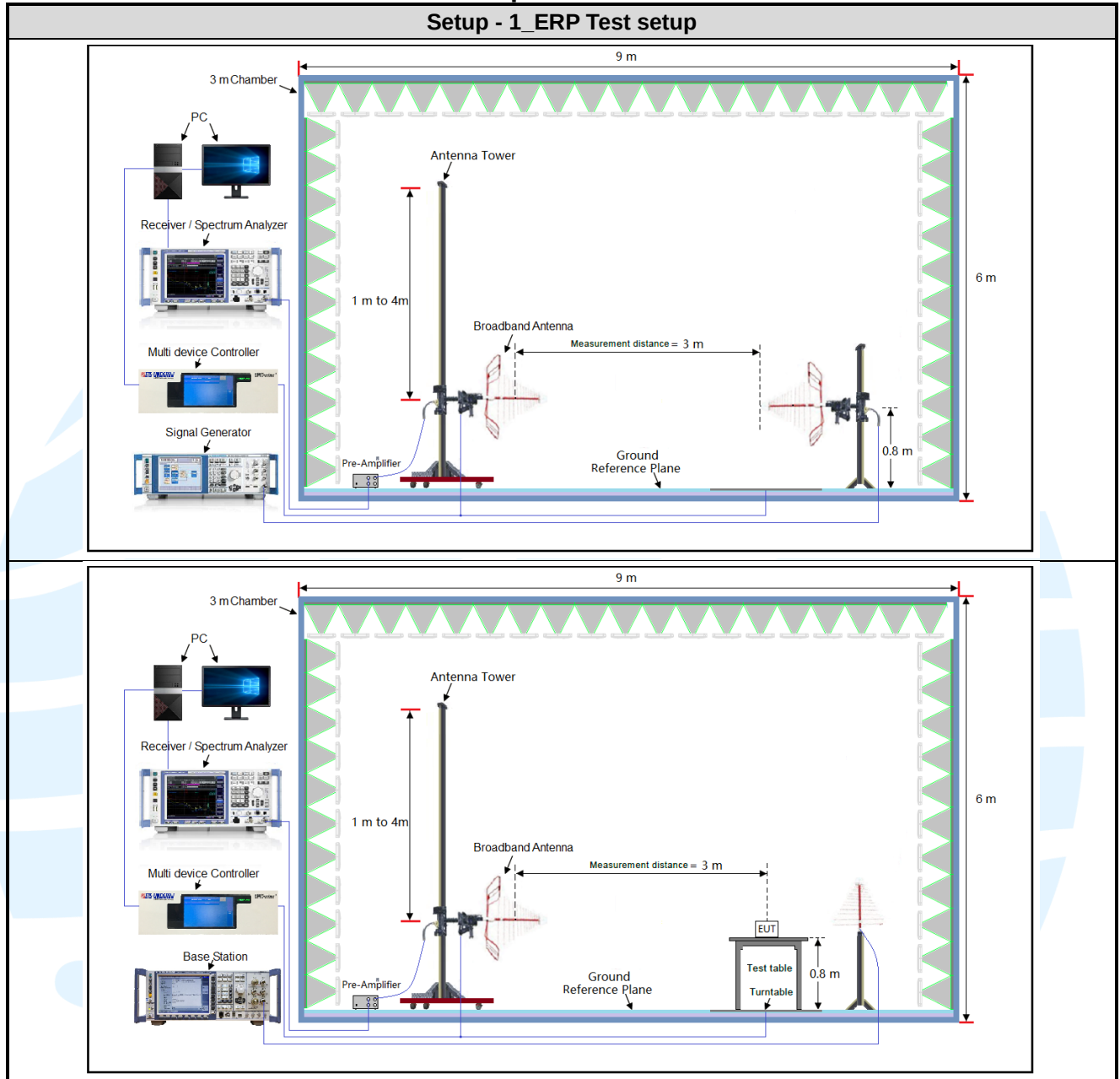
Frequency	Tx Function	Description
7987.2 MHz	1Tx	1. Keep the EUT in continuously transmitting during the test.

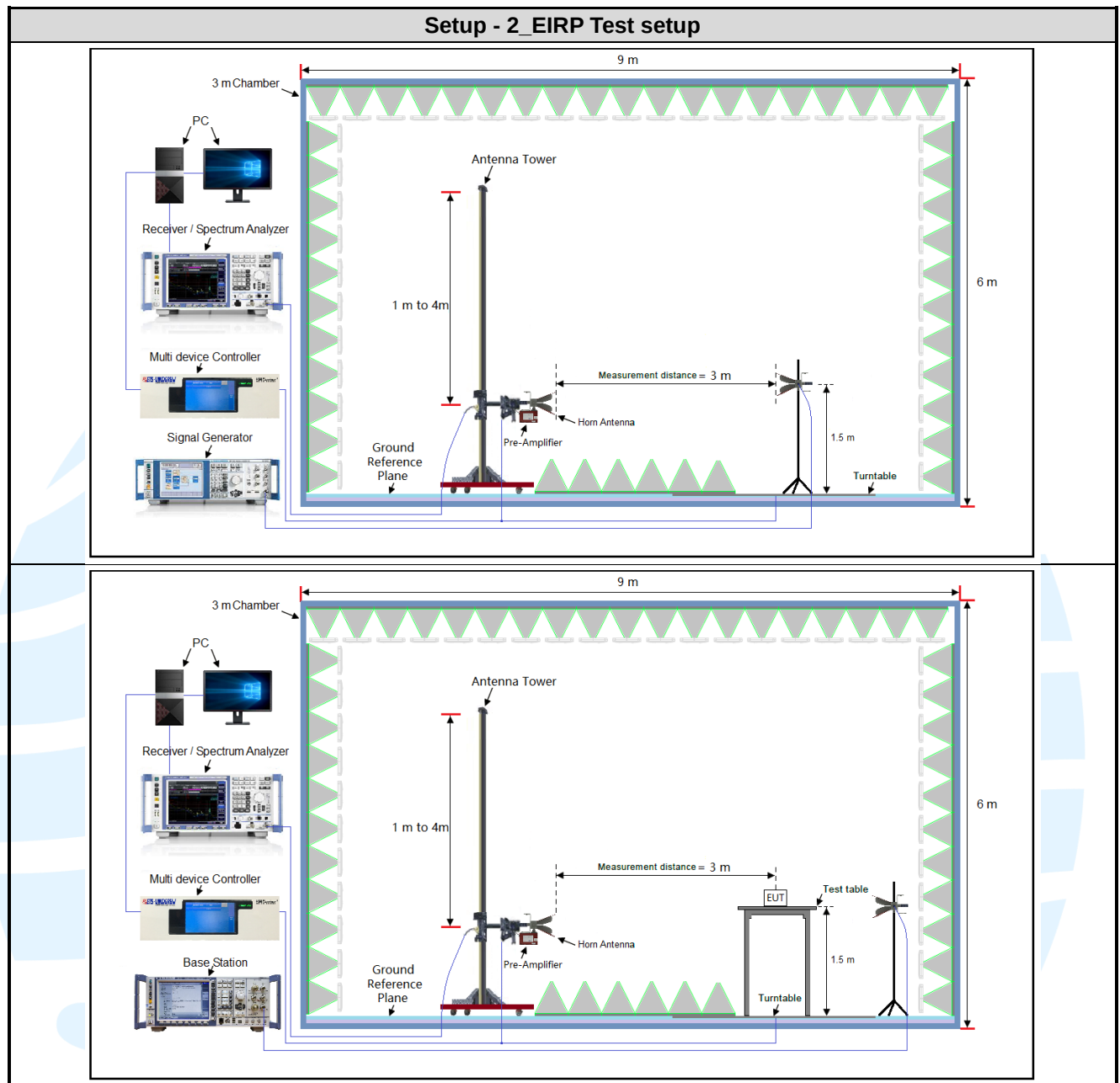
Power Setting (Provided by the customer)
Not applicable, test used software default power level.

Test Software (Provided by the customer)
N/A

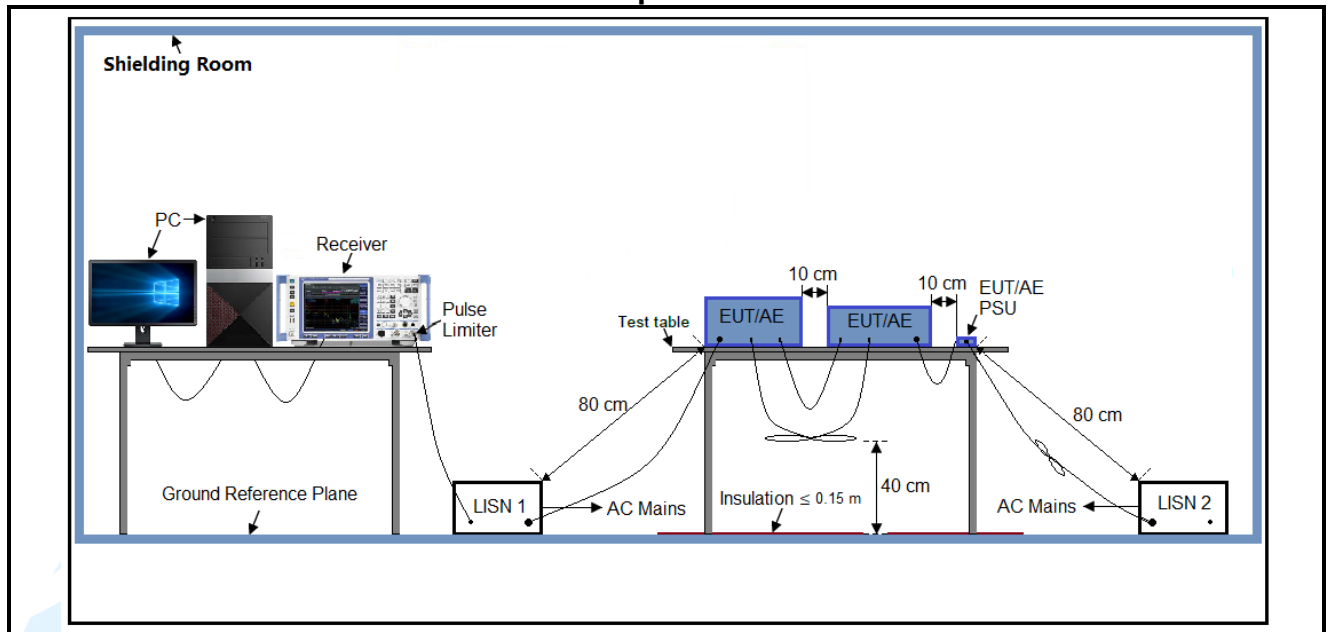
4.4 TEST SETUP

4.4.1 For Radiated Emissions test setup

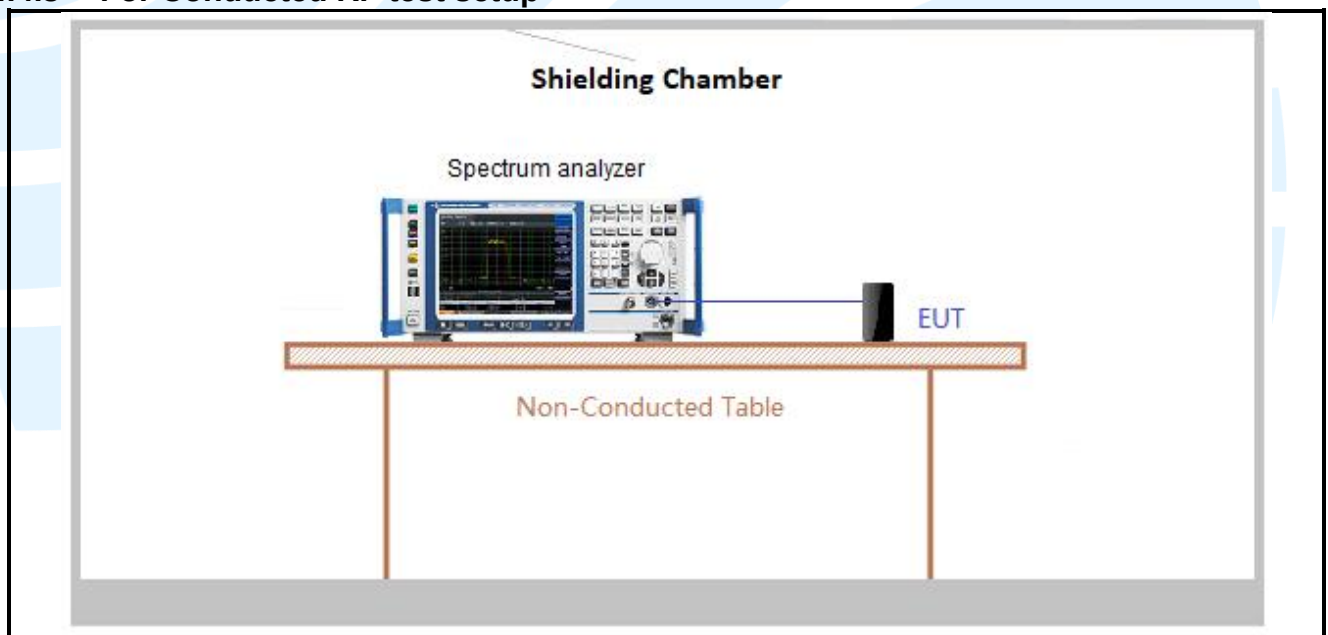




4.4.2 For Conducted Emissions test setup



4.4.3 For Conducted RF test setup



4.5 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 3.87V battery. Only the worst case data were recorded in this test report.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Therefore, all final radiated testing was performed with the EUT in orientation.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

5.1 REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part 15	Radio Frequency Devices
2	ANSI C63.10-2020	American National Standard for Testing Unlicensed Wireless Devices
3	393764 D01 UWB FAQ v02r01	ULTRA-WIDEBAND (UWB) DEVICES FREQUENTLY ASKED QUESTIONS
4	KDB 484596 Referencing Test Data v03	Test Reductions via Data Referencing

5.2 ANTENNA REQUIREMENT

Standard Requirement
15.203 requirement: 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.519(a)(2) requirement: The use of antennas mounted on outdoor structures, e.g., antennas mounted on the outside of a building or on a telephone pole, or any fixed outdoors infrastructure is prohibited. Antennas may be mounted only on the hand held UWB device. EUT Antenna: Antenna in the interior of the equipment and no consideration of replacement. The gain of the antenna is 5.03 dBi.

5.3 EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

Test Requirement: FCC 47 CFR Part 15 Subpart F Section 15.519(e)(c)

Test Method: ANSI C63.10-2020 Section 10.3

Limit:

FCC 47 CFR Part 15 Subpart F Section 15.519

(c) Click to open paragraph tools The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in § 15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

Frequency in MHz	EIRP in dBm
960-1610	-75.3
1610-1990	-63.3
1990-3100	-61.3
3100-10600	-41.3
Above 10600	-61.3

(e) There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, fM. That limit is 0 dBm EIRP. It is acceptable to employ a different resolution bandwidth, and a correspondingly different peak emission limit, following the procedures described in § 15.521.

Test Procedure:

Peak power measurement

The spectral characterization of a UWB device shall begin with a peak detected radiated measurement because the results obtained from this measurement could preclude the need for subsequent average measurements. For example, if the data collected from the peak power measurement show that the radiated emissions levels

are equal to, or less than, the applicable emissions limit, then these data are adequate to determine compliance. This is predicated on the fact that the average levels are typically less than, or equal to, the peak signal level.

The peak detector of the instrument is selected and the maximum hold feature activated. The RBW is set to 1 MHz and the VBW is set to at least 1 MHz (3 MHz is recommended).

Bandwidth conversion of peak power measurements

It is acceptable to employ an RBW of less than 50 MHz (but no less than 1 MHz) when performing the required peak power measurements. When this approach is employed, the peak emissions EIRP limit (0 dBm / 50 MHz) is converted to a limit commensurate with the RBW by employing a $[20 \log (RBW/50 \text{ MHz})]$ relationship. For example, the peak power limit could be expressed in a 1 MHz bandwidth as follows in Equation:

$$\text{EIRP}_{1 \text{ MHz}} = \text{EIRP}_{50 \text{ MHz}} + 20 \log(1 \text{ MHz} / 50 \text{ MHz}) = 0 \text{ dBm} + (-34 \text{ dB}) = -34 \text{ dBm}$$

When a resolution bandwidth of less than 50 MHz is used, this measurement shall be performed over a 50 MHz span centered on the frequency associated with the highest detected average emission level.

Evaluating rms-average power spectral density

The following procedure shall be used for evaluating rms-average power spectral density:

- Set the RBW to 1 MHz.
- Set the VBW to be at least 1 MHz (a VBW of 3 MHz is desirable).
- Set the frequency span to examine the spectrum across a convenient frequency segment (e.g., 600 MHz).
- Select the power averaging (rms) detector.
- Set the sweep time so that there is no more than a 1 ms integration period over each measurement bin.

Many older instruments use a default value of approximately 600 bins per scan. Assuming this value, a sweep time of 600 ms provides the required 1 ms integration period within each measurement bin. The number of measurement bins can be specified with many modern instruments, providing many other possible combinations of sweep time and number of measurement bins that also result in adherence to the 1 ms maximum integration time requirement. The rms-average power spectral density is the highest integrated power detected within a 1 MHz RBW over a 1 ms integration period.

Test Setup: Refer to section 4.4.1 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Test Data: See table below

Peak power (EIRP) measurements

Test Ch.	Reading (dBm/3MHz)	Corr. factor (dB)	Peak Result (dBm/3MHz)	Peak Result (dBm/50MHz)	Limit (dBm/50MHz)	Antenna Polaxis	Verdict
9	-46.25	16.03	-30.22	-5.78	0	Horizontal	PASS
	-44.31	16.03	-28.28	-3.84	0	Vertical	PASS

Note:

- $\text{EIRP}_{3 \text{ MHz}} = \text{EIRP}_{50 \text{ MHz}} + 20 \log(3 \text{ MHz} / 50 \text{ MHz}) = 0 \text{ dBm} + (-24.44 \text{ dB}) = -24.44 \text{ dBm}$

Spot-check

Test Ch.	Reading (dBm/3MHz)	Corr. factor (dB)	Peak Result (dBm/3MHz)	Peak Result (dBm/50MHz)	Limit (dBm/50MHz)	Antenna Polaxis	Verdict
9	-49.19	16.03	-33.16	-8.72	0	Horizontal	PASS
	-46.84	16.03	-30.81	-6.37	0	Vertical	PASS

RMS-Average power spectral density

Test Ch.	Reading (dBm/MHz)	Corr. factor (dB)	Avg. Result (dBm/MHz)	Limit (dBm/MHz)	Antenna Polaxis	Verdict
9	-66.69	16.03	-50.66	-41.3	Horizontal	PASS
	-64.69	16.03	-48.66	-41.3	Vertical	PASS

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5.4 CESSATION TIME

Test Requirement: FCC 47 CFR Part 15 Subpart F Section 15.519(a)

FCC 47 CFR Part 15 Subpart F Section 15.519(a)

A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

Limit:

Test Procedure:

Monitor the end time of the EUT Link.

Set RBW = 1 MHz, VBW = 3 MHz, Span = 0 Hz, remove the acknowledgement from the associated receiver to test the result.

Test Setup: Refer to section 4.4.3 for details.

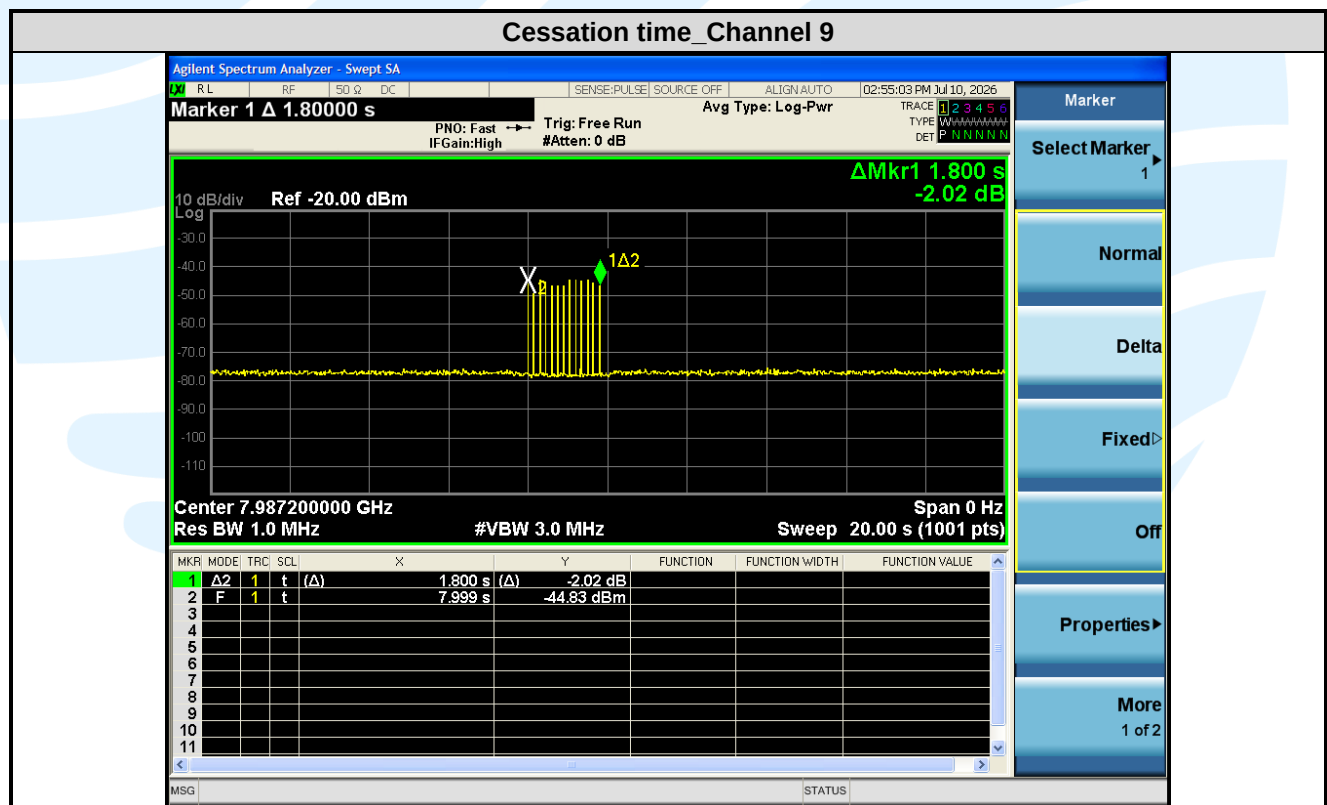
Instruments Used: Refer to section 3 for details

Test Mode: Link

Test Results: Pass

Test Data: See table below

Channel	Test Frequency (MHz)	Cessation time (s)	Limit (s)	Verdict
9	7987.2	1.8	10	PASS



Note: The device starts transmitting and it stops transmitting in 1800ms without ACK

5.5 10DB BANDWIDTH

Test Requirement: FCC 47 CFR Part 15 Subpart F Section 15.503(a)(b)(c)(d), 15.519(b)

Test Method: ANSI C63.10-2020 Section 10.1

FCC 47 CFR Part 15 Subpart F Section 15.503

(b) Center frequency. The center frequency, f_c , equals $(f_H + f_L)/2$.

(c) Fractional bandwidth. The fractional bandwidth equals $2(f_H - f_L) / (f_H + f_L)$.

(d) Ultra-wideband (UWB) transmitter. An intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

Limit:

FCC 47 CFR Part 15 Subpart F Section 15.519(b)

The UWB bandwidth of a device operating under the provisions of this section must be contained between 3100 MHz and 10 600 MHz.

Test Procedure:

The frequency at which the maximum power level is measured with the peak detector is designated f_m . The peak power measurements shall be made using a spectrum analyzer or EMI receiver with a 1 MHz resolution bandwidth and a video bandwidth of 1 MHz or greater. The instrument shall be set to peak detection using the maximum-hold trace mode. The outermost 1 MHz segments above and below f_m , where the peak power falls by 10 dB relative to the level at f_m , are designated as f_H and f_L , respectively:

a) For the lowest frequency bound f_L , the emission is searched from a frequency lower than f_m that has, by inspection, a peak power much lower than 10 dB less than the power at f_m and increased toward f_m until the peak power indicates 10 dB less than the power at f_m . The frequency of that segment is recorded.

b) This process is repeated for the highest frequency bound f_H , beginning at a frequency higher than f_m that has, by inspection, a peak power much lower than 10 dB below the power at f_m . The frequency of that segment is recorded.

c) The two recorded frequencies represent the highest f_H and lowest f_L bounds of the UWB transmission, and the -10 dB bandwidth ($B - 10$) is defined as $(f_H - f_L)$.⁸² The center frequency (f_c) is mathematically determined from $(f_H - f_L) / 2$.

d) The fractional bandwidth is defined as $2(f_H - f_L) / (f_H + f_L)$.

e) Determine whether the -10 dB bandwidth $(f_H - f_L)$ is ≥ 500 MHz, or whether the fractional bandwidth $2(f_H - f_L) / (f_H + f_L)$ is ≥ 0.2 .

Test Setup: Refer to section 4.4.3 for details.

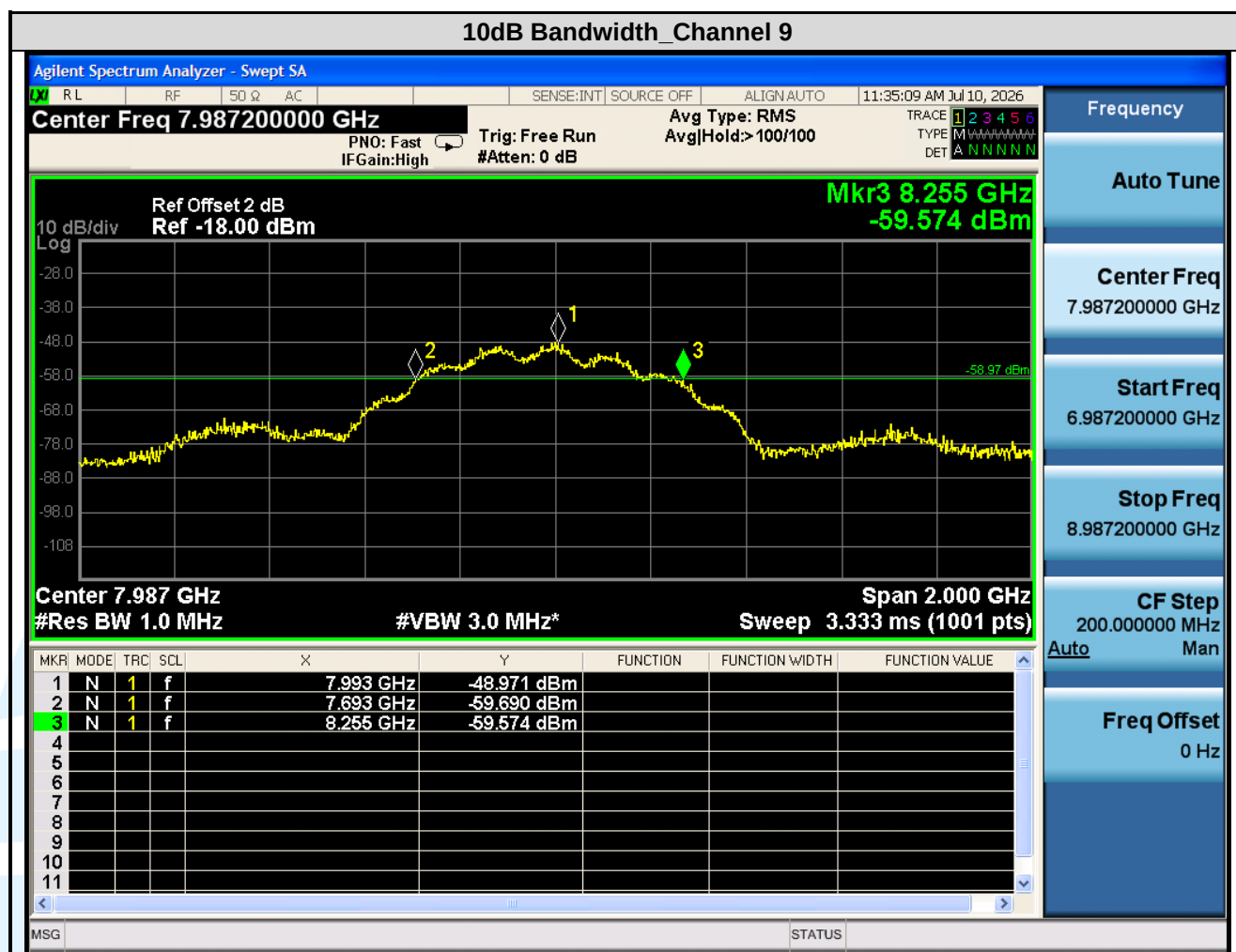
Instruments Used: Refer to section 3 for details

Test Mode: Transmit

Test Results: Pass

Test Data: See table below

Channel	Test Frequency (MHz)	10dB Bandwidth (MHz)	10dB Bandwidth Limit	F_L (MHz)	F_H (MHz)	F_c (MHz)	Frequency Band Limit	Verdict
9	7987.2	555.1	≥ 500 MHz	7693	8255	7974	3100 MHz to 10 600 MHz.	PASS



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Fax: +86-755-28230886

E-mail: info@uttlab.com

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5.6 OCCUPIED BANDWIDTH

Test Requirement: None; for reporting purposes only.

Test Method: ANSI C63.10-2020 Section 6.9

Limit: None; for reporting purposes only.

Test Procedure:

- a) Set RBW = 1% to 5% of the occupied bandwidth
- b) Set the video bandwidth (VBW) ≥ 3 x RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.4.3 for details.

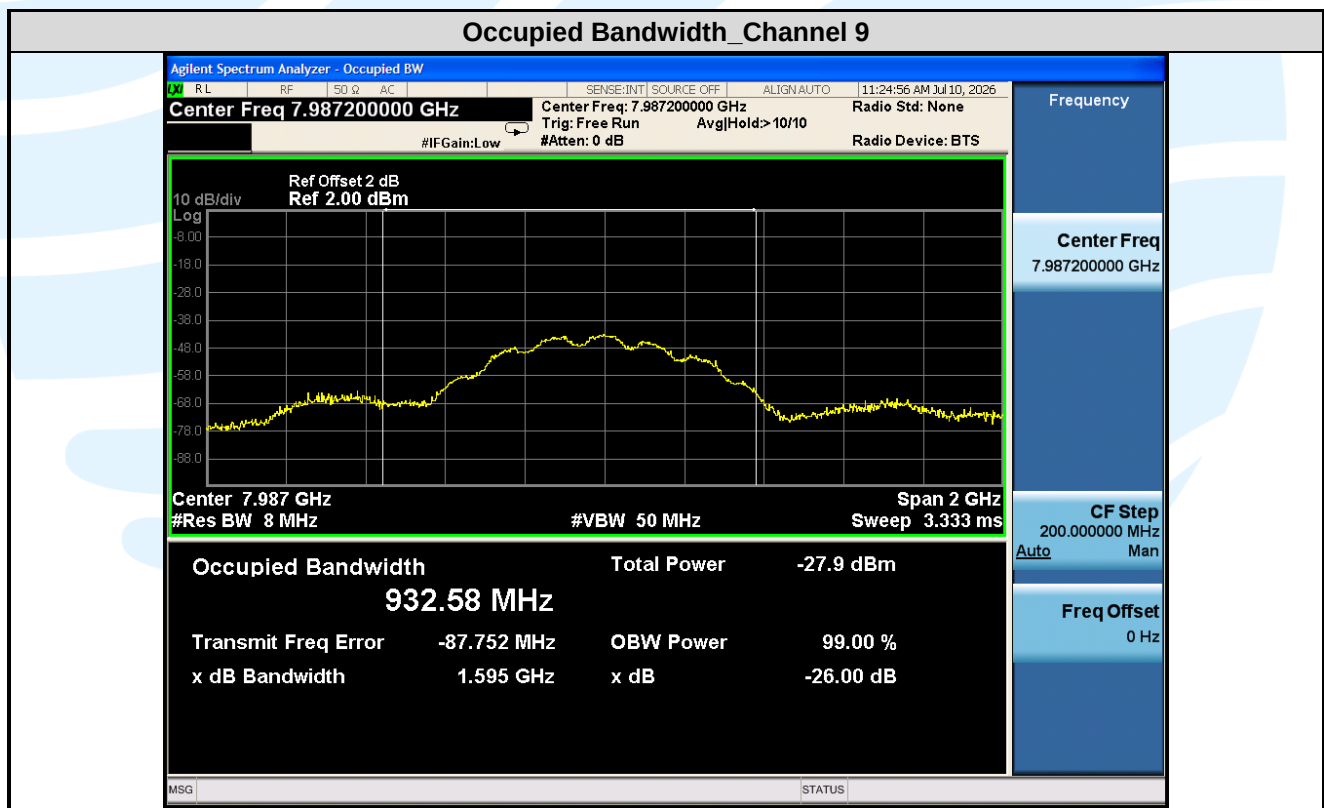
Instruments Used: Refer to section 3 for details

Test Mode: Transmit

Test Results: Pass

Test Data: See table below

Channel	Test Frequency (MHz)	Occupied Bandwidth (MHz)
9	7987.2	932.58



5.7 RADIATED EMISSION

Test Requirement: FCC 47 CFR Part 15 Subpart F Section 15.519
FCC 47 CFR Part 15 Subpart C Section 15.205/15.209

Test Method: ANSI C63.10-2020 Section 10.2 and 10.3

Receiver Setup:

Frequency	RBW
0.009 MHz-0.150 MHz	200/300 kHz
0.150 MHz -30 MHz	9/10 kHz
30 MHz-1 GHz	100/120 kHz
Above 1 GHz	1 MHz

Limits:

Below 960MHz

Frequency	Field strength (microvolt/meter)	Limit (dBμV/m)	Remark	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 MHz-88 MHz	100	40.0	Quasi-peak	3
88 MHz-216 MHz	150	43.5	Quasi-peak	3
216 MHz-960 MHz	200	46.0	Quasi-peak	3

Above 960MHz

The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in § 15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

Frequency	EIRP in dBm
960 MHz-1610 MHz	-75.3
1610 MHz-1990 MHz	-63.3
1990 MHz-3100 MHz	-61.3
3100 MHz-10600 MHz	-41.3
Above 10600 MHz	-61.3

Test Setup: Refer to section 4.4.1 for details.

Test Procedures:

1. From 30 MHz to 1GHz test procedure as below:

- 1) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 3) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 4) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 5) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 6) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

2. Above 1GHz test procedure as below:

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- 1) Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 1GHz the distance is 0.5 meter and table is 1.5 meter).
- 2) Test the EUT in the lowest channel ,middle channel, the Highest channel
- 3) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the Y positioning which it is worse case.

Repeat above procedures until all frequencies measured was complete.

Equipment Used: Refer to section 3 for details.

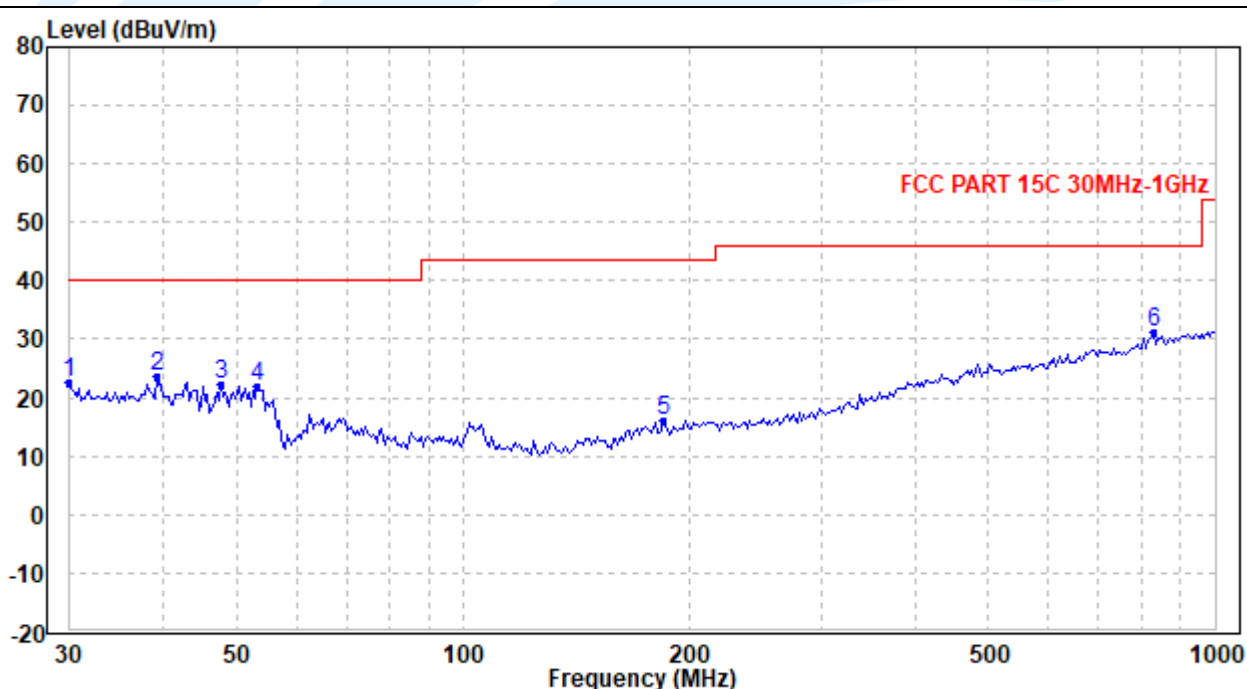
Test Result: Pass

Radiated Emission Test Data (9 kHz ~ 30 MHz):

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

Radiated Emission Test Data (30 MHz ~ 1 GHz):

Horizontal



No.	Frequency (MHz)	Reading (dBμV/m)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.000	27.22	-4.53	22.69	40.00	-17.31	Peak
2	39.182	32.28	-8.57	23.71	40.00	-16.29	Peak
3	47.703	35.85	-13.58	22.27	40.00	-17.73	Peak
4	53.379	37.49	-15.59	21.90	40.00	-18.10	Peak
5	185.163	28.39	-12.21	16.18	43.50	-27.32	Peak
6	827.179	28.21	3.10	31.31	46.00	-14.69	Peak

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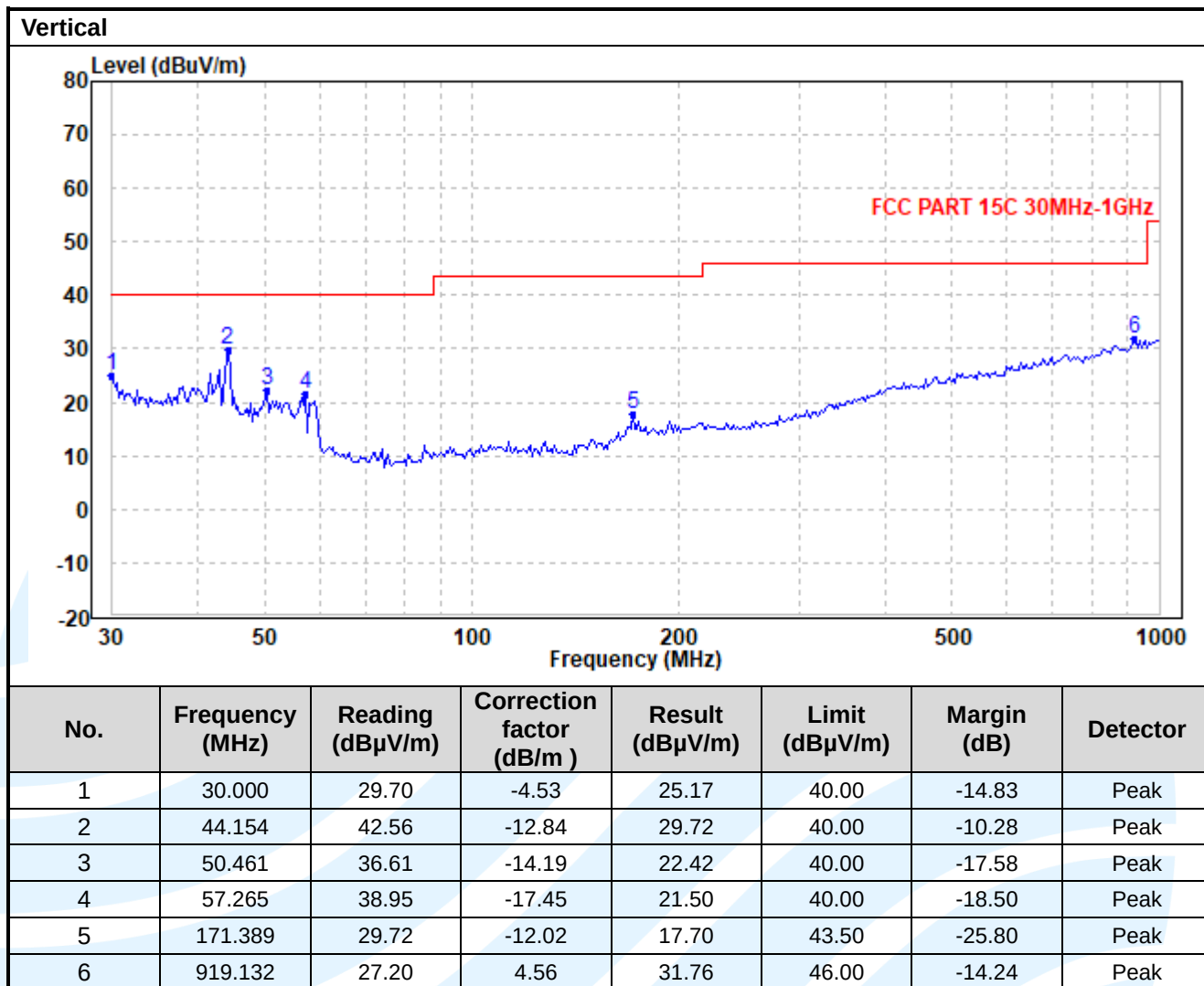
Tel: +86-755-28230888

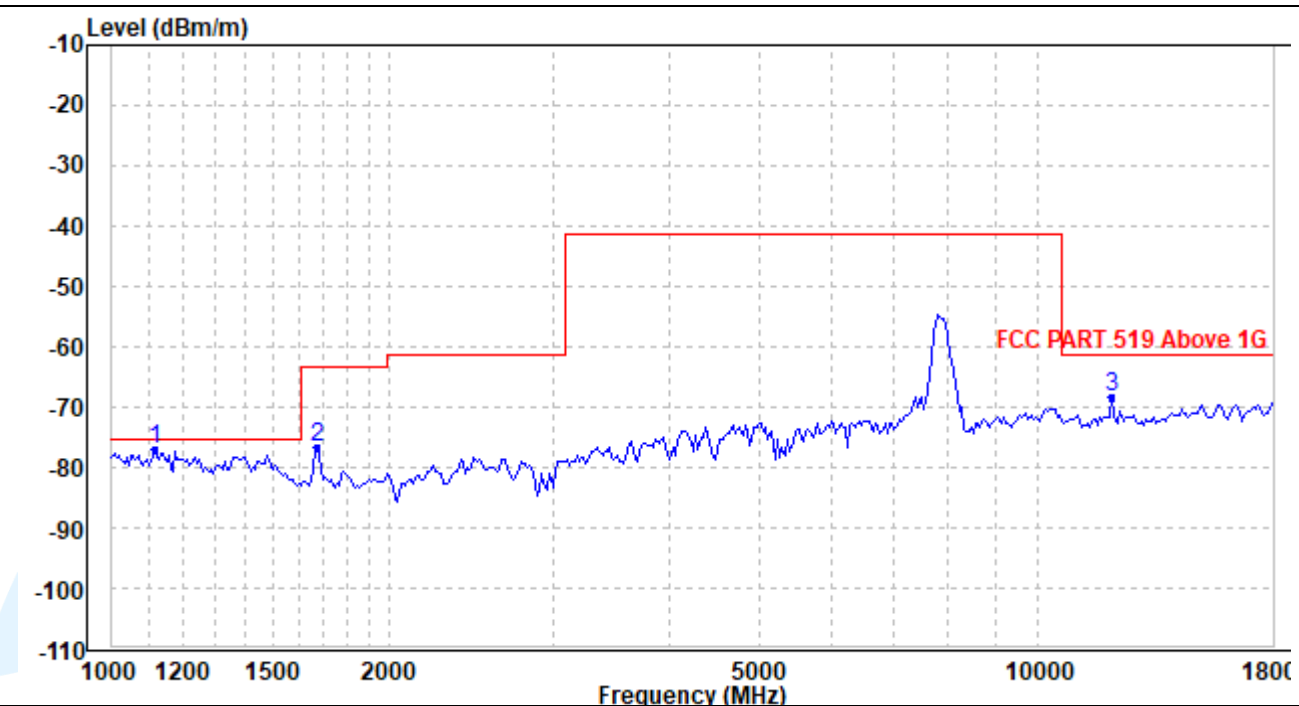
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Spurious emissions test data (1 GHz ~ 18 GHz):
Horizontal


No.	Frequency (MHz)	Reading (dBm)	Correction factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
1	1116.339	-63.50	-13.55	-77.05	-75.30	-1.75	Average
2	1674.504	-64.80	-12.01	-76.81	-63.30	-13.51	Average
3	12000.030	-71.08	2.67	-68.41	-61.30	-7.11	Average

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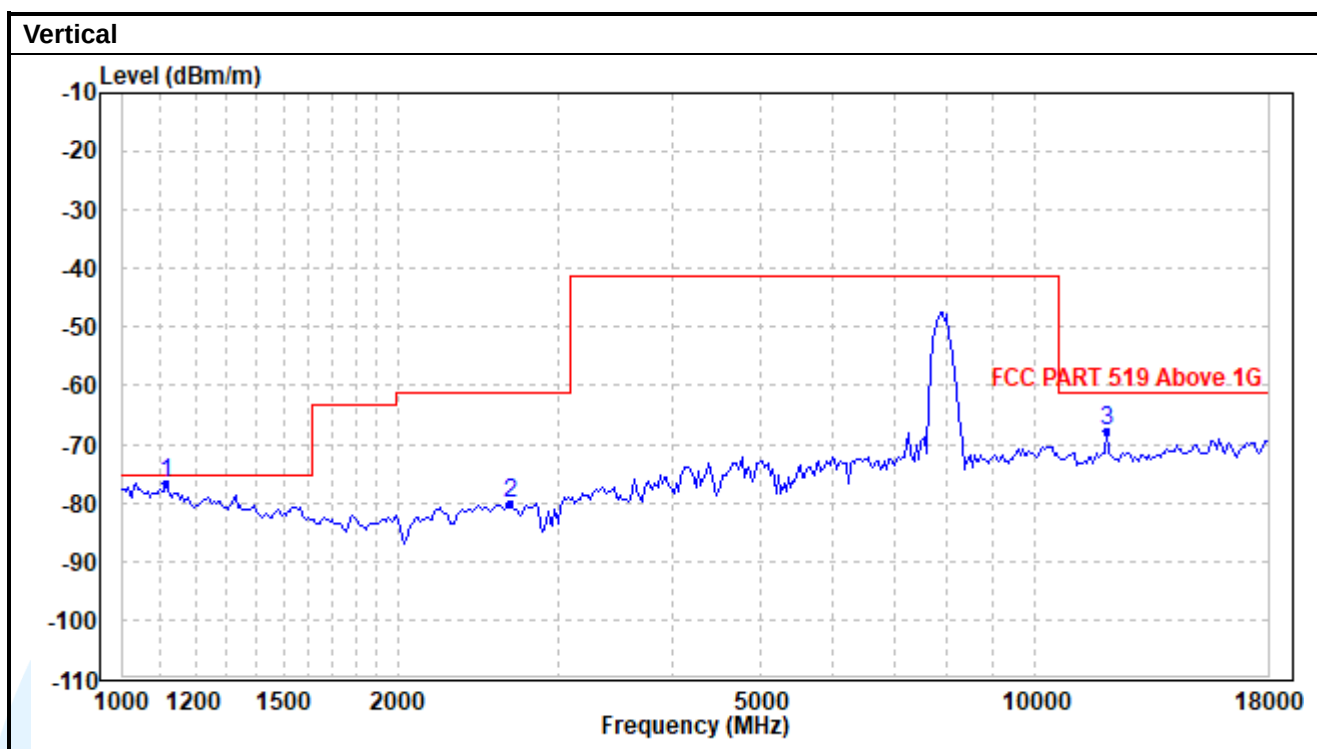
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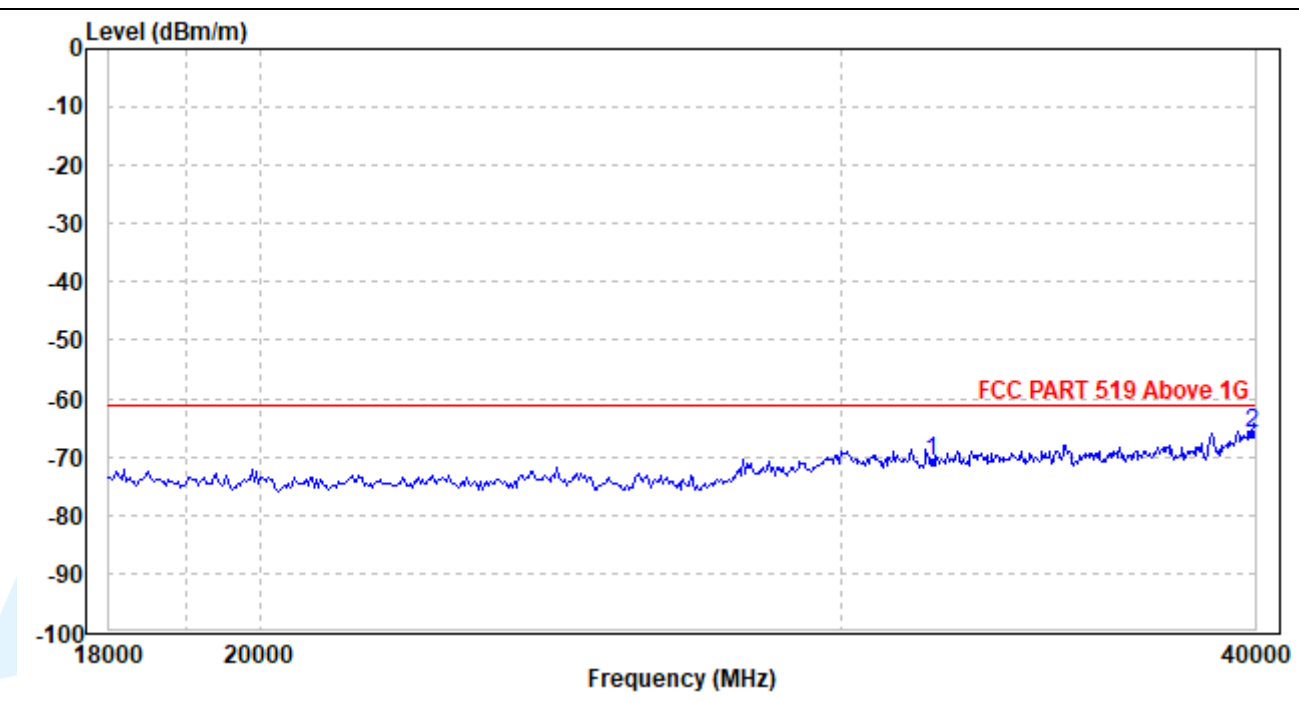
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No.	Frequency (MHz)	Reading (dBm)	Correction factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1116.339	-62.96	-13.55	-76.51	-75.30	-1.21	Average
2	2661.536	-71.24	-8.75	-79.99	-61.30	-18.69	Average
3	12000.030	-70.30	2.67	-67.63	-61.30	-6.33	Average

Spurious emissions test data (18 GHz ~ 40 GHz):
Horizontal


No.	Frequency (MHz)	Reading (dBm)	Correction factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
1	31948.800	-78.55	7.77	-70.78	-61.30	-9.48	Peak
2	39936.000	-76.26	10.40	-65.86	-61.30	-4.56	Peak

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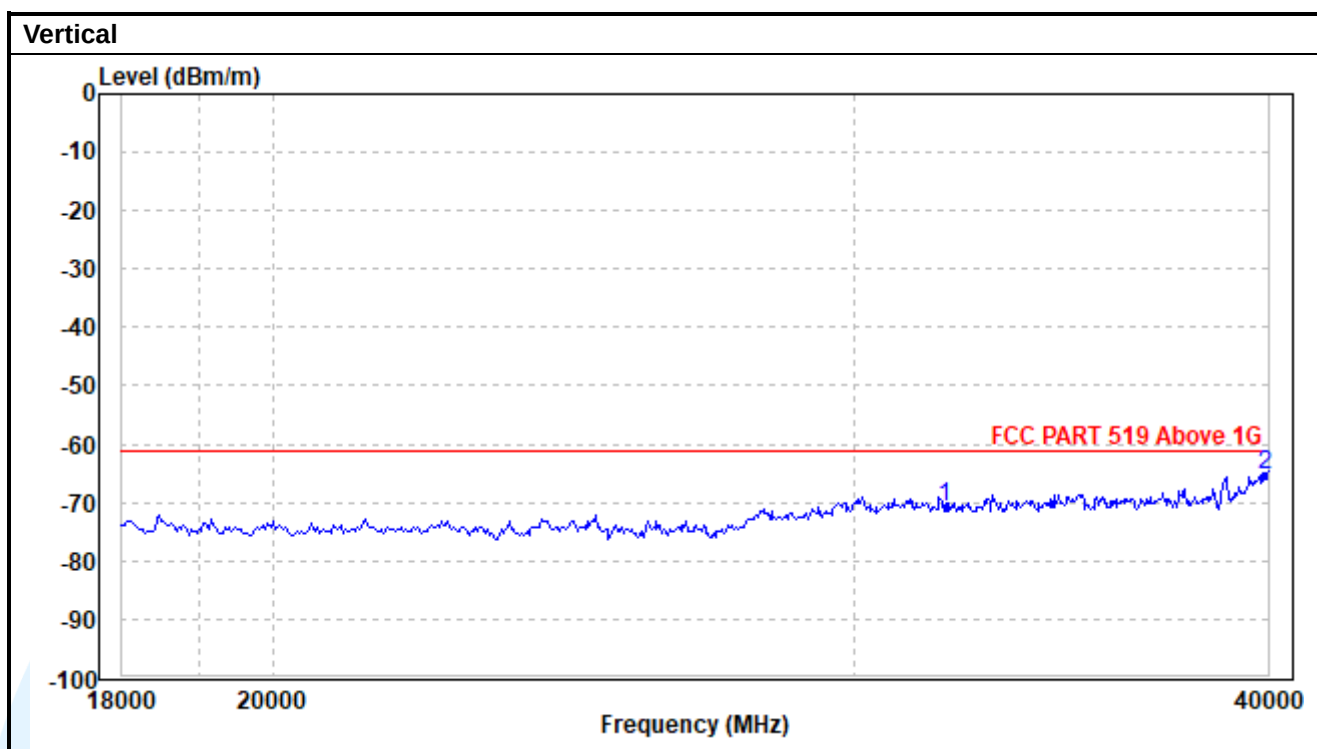
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No.	Frequency (MHz)	Reading (dBm)	Correction factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
1	31948.800	-78.56	7.83	-70.73	-61.30	-9.43	Peak
2	39936.000	-75.79	10.50	-65.29	-61.30	-3.99	Peak

5.8 RADIATED EMISSION IN GPS BAND

Test Requirement: FCC 47 CFR Part 15 Subpart F Section 15.519

Test Method: ANSI C63.10-2013 Section 6.6

Receiver Setup:

Frequency	RBW
Above 1 GHz	100/120 kHz

Limits:

FCC 47 CFR Part 15 Subpart F Section 15.519(d)

In addition to the radiated emission limits specified in the table in paragraph (c) of this section, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

Frequency	EIRP in dBm
1164 MHz-1240 MHz	-85.3
1559 MHz-1610 MHz	-85.3

Test Setup: Refer to section 4.4.1 for details.

Test Procedures:

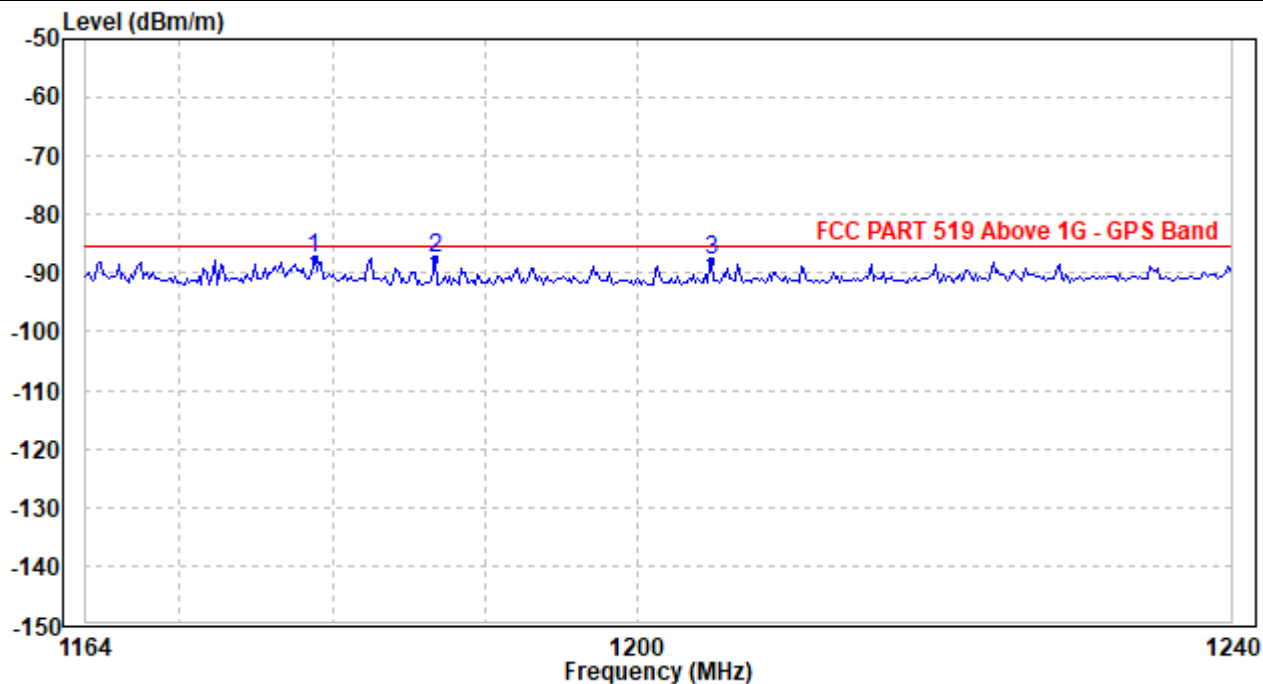
1. Above 1GHz test procedure as below:

- 1) Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 1GHz the distance is 0.5 meter and table is 1.5 meter).
- 2) Test the EUT in the lowest channel ,middle channel, the Highest channel
- 3) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the Y positioning which it is worse case.

Repeat above procedures until all frequencies measured was complete.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

Radiated Emission Test Data (1164 MHz-1240 MHz):
Horizontal


No.	Frequency (MHz)	Reading (dBm)	Correction factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
1	1178.774	-73.94	-13.40	-87.34	-85.30	-2.04	Average
2	1186.693	-74.16	-13.38	-87.54	-85.30	-2.24	Average
3	1204.970	-74.55	-13.34	-87.89	-85.30	-2.59	Average

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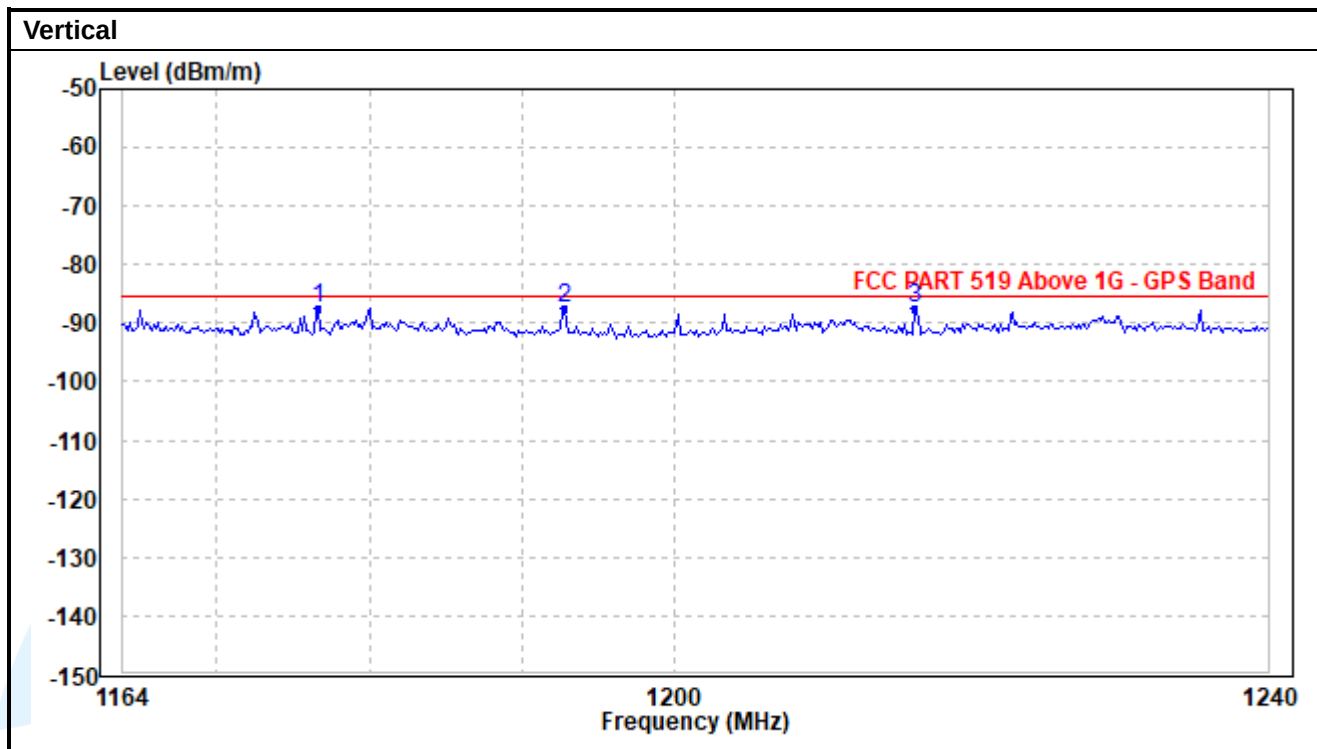
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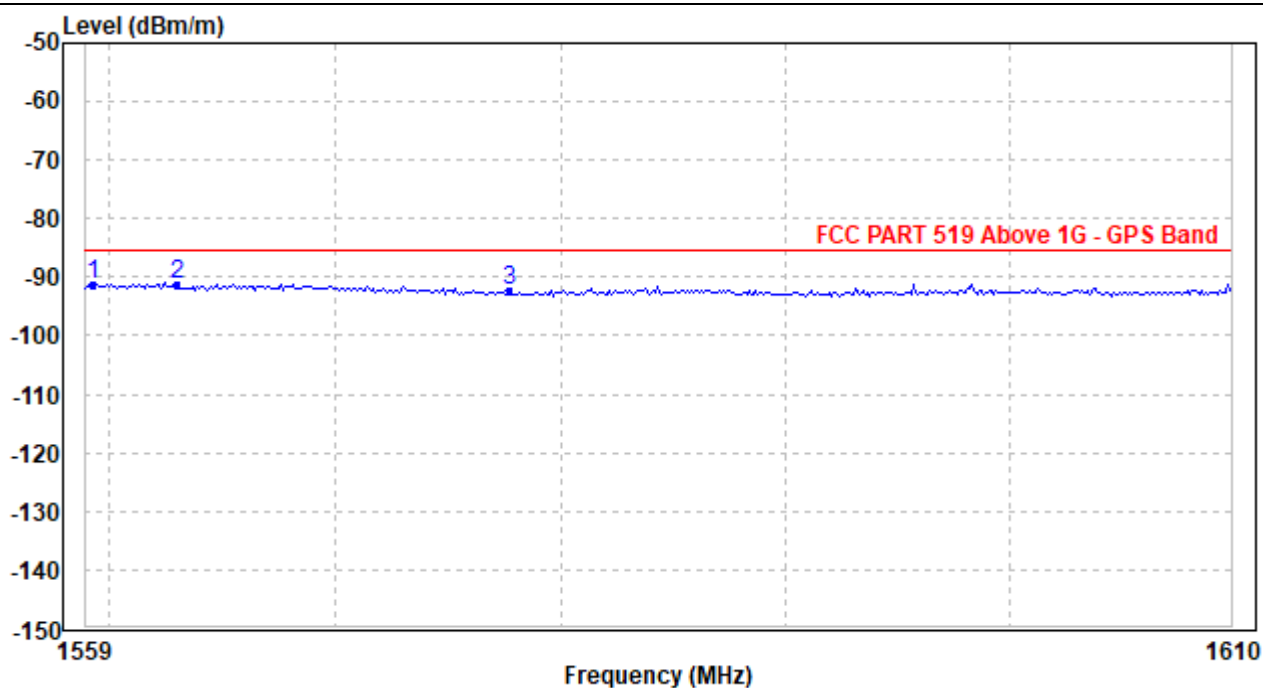
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No.	Frequency (MHz)	Reading (dBm)	Correction factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Detector
1	1176.641	-74.00	-13.41	-87.41	-85.30	-2.11	Average
2	1192.786	-74.13	-13.37	-87.50	-85.30	-2.20	Average
3	1216.088	-74.26	-13.31	-87.57	-85.30	-2.27	Average

Spurious emissions test data (1559 MHz-1610 MHz):
Horizontal


No.	Frequency (MHz)	Reading (dBm)	Correction factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1559.307	-78.67	-12.41	-91.08	-85.30	-5.78	Average
2	1562.986	-78.73	-12.40	-91.13	-85.30	-5.83	Average
3	1577.703	-79.90	-12.34	-92.24	-85.30	-6.94	Average

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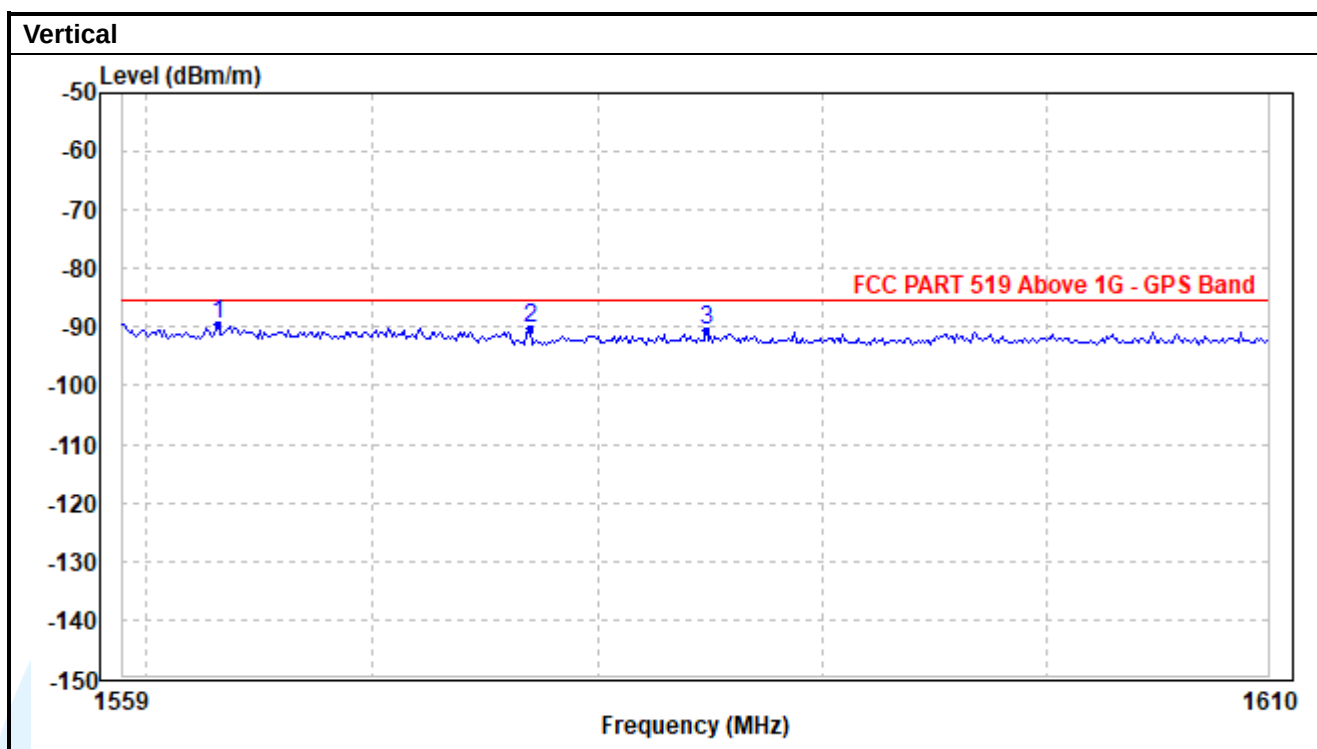
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No.	Frequency (MHz)	Reading (dBm)	Correction factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1563.190	-77.07	-12.40	-89.47	-85.30	-4.17	Average
2	1576.988	-77.96	-12.35	-90.31	-85.30	-5.01	Average
3	1584.755	-78.07	-12.32	-90.39	-85.30	-5.09	Average

5.9 CONDUCTED EMISSION

Test Requirement: 47 CFR Part 15C Section 15.207

Test Method: ANSI C63.10-2020 Section 6.2

Limits:

Frequency range (MHz)	Limits (dB(μV))	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

Remark:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

Test Setup: Refer to section 4.4.2 for details.

Test Procedures:

Test frequency range :150KHz-30MHz

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Equipment Used: Refer to section 3 for details.

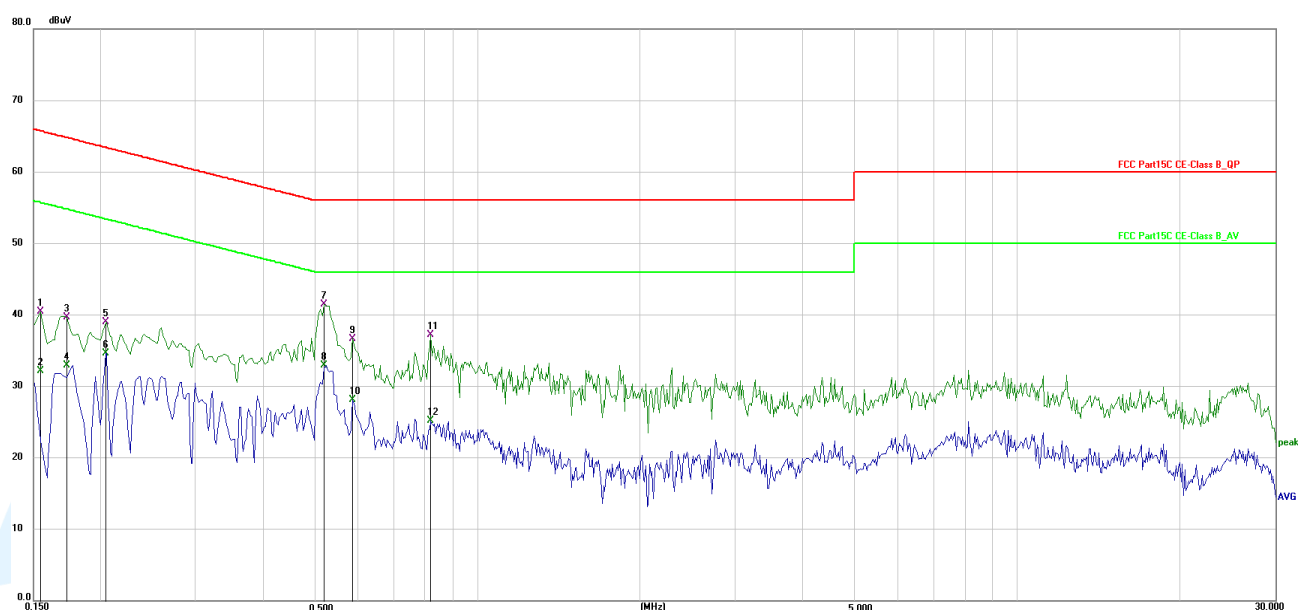
Test Result: Pass

The measurement data as follows:

Quasi Peak and Average:

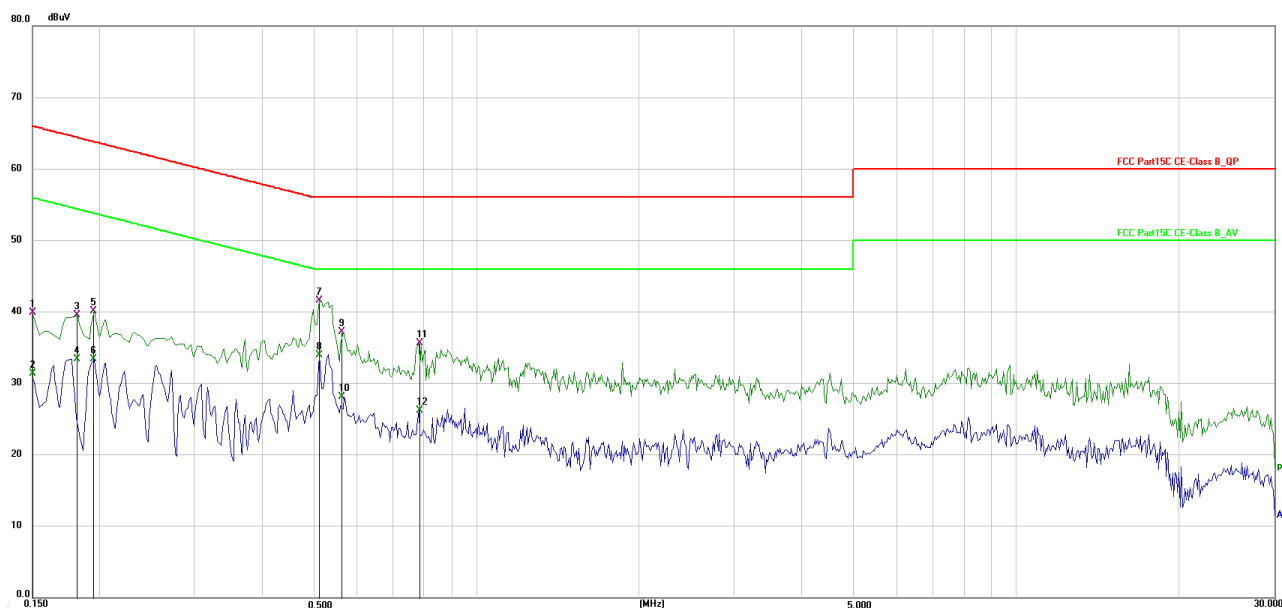
Mode: Tx

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1544	30.09	10.31	40.40	65.76	-25.36	QP
2	0.1544	21.81	10.31	32.12	55.76	-23.64	AVG
3	0.1724	29.43	10.28	39.71	64.84	-25.13	QP
4	0.1724	22.67	10.28	32.95	54.84	-21.89	AVG
5	0.2040	28.68	10.27	38.95	63.45	-24.50	QP
6	0.2040	24.37	10.27	34.64	53.45	-18.81	AVG
7	0.5190	31.30	10.20	41.50	56.00	-14.50	QP
8	0.5190	22.68	10.20	32.88	46.00	-13.12	AVG
9	0.5865	26.48	10.21	36.69	56.00	-19.31	QP
10	0.5865	17.85	10.21	28.06	46.00	-17.94	AVG
11	0.8205	27.05	10.18	37.23	56.00	-18.77	QP
12	0.8205	15.03	10.18	25.21	46.00	-20.79	AVG

Neutral Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	29.64	10.30	39.94	66.00	-26.06	QP
2	0.1500	21.03	10.30	31.33	56.00	-24.67	AVG
3	0.1814	29.25	10.28	39.53	64.42	-24.89	QP
4	0.1814	23.10	10.28	33.38	54.42	-21.04	AVG
5	0.1949	29.79	10.28	40.07	63.83	-23.76	QP
6	0.1949	23.11	10.28	33.39	53.83	-20.44	AVG
7	0.5100	31.34	10.19	41.53	56.00	-14.47	QP
8	0.5100	23.79	10.19	33.98	46.00	-12.02	AVG
9	0.5639	27.03	10.20	37.23	56.00	-18.77	QP
10	0.5639	17.93	10.20	28.13	46.00	-17.87	AVG
11	0.7799	25.40	10.20	35.60	56.00	-20.40	QP
12	0.7799	16.02	10.20	26.22	46.00	-19.78	AVG

Remark:

1. An initial pre-scan was performed on the Phase and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***

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