

FCC RF Test Report

(FHSS)

Report No.: JYTSZ-R12-2401308

Applicant: Voxx Electronics Corporation

Address of Applicant: 2365 Pontiac Road, Auburn Hills, Michigan 48326 - USA

Equipment Under Test (EUT)

Product Name: 7858V

Model No.: 7858V

Trade Mark: N/A

FCC ID: EZS7858V

Applicable Standards: FCC CFR Title 47 Part 15C (§15.247)

Date of Sample Receipt: 30 Oct., 2024

Date of Test: 31 Oct., to 04 Dec., 2024

Date of Report Issued: 05 Dec., 2024

Test Result: PASS

Tested by:

Alan Chen
Project Engineer

Date:

05 Dec., 2024

Reviewed by:

W. Ding
Senior Engineer

Date:

05 Dec., 2024

Approved by:

James Wei
Manager

Date:

05 Dec., 2024

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in above the application standard version. Test results reported herein relate only to the item(s) tested.

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1 Version

Version No.	Date	Description
00	05 Dec., 2024	Original

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3 General Information

3.1 Client Information

Applicant:	Voxx Electronics Corporation
Address:	2365 Pontiac Road, Auburn Hills, Michigan 48326 - USA
Manufacturer:	Nutek Coropration
Address:	no. 167, Lane 235, Bauchiau Rd, Xindian District, New Taeipi City 23145, Taiwan
Factory:	Voxx Automotive Corporation
Address:	2351 J. Lawson Blvd, Orlando, FL 32824 - USA

3.2 General Description of E.U.T.

Product Name:	7858V
Model No.:	7858V
Operation Frequency:	902 MHz - 928 MHz
Number of Channel:	25
Modulation Technology:	FSK
Antenna Type:	Internal Ceramic Antenna
Antenna Gain:	2.06dBi (declare by applicant)
Power Supply:	Rechargeable Li-ion Battery DC3.7V, 100mAh
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

3.3 Test Mode and Test Environment

Test Modes:	
Non-hopping mode:	Keep the EUT in continuous transmitting mode.
Hopping mode:	Keep the EUT in hopping mode.
Remark: For spurious emission of below 1GHz, pre-scan lowest, middle and highest channel, found lowest channel was worse case mode. The report only reflects the test data of worst mode.	
Operating Environment:	
Temperature:	15°C ~ 35°C
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1008 mbar
Voltage:	Nominal: 3.70 Vdc, Extreme: Low 3.50 Vdc, High 4.20 Vdc
Test Engineer:	Logan Li(Conducted measurement) Real Chen(Radiated measurement)

3.4 Description of Test Auxiliary Equipment

The EUT has been tested as an independent unit.

3.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%(U = 2Uc(y)))
Conducted Emission for LISN (9kHz ~ 150kHz)	3.57 dB
Conducted Emission for LISN (150kHz ~ 30MHz)	3.14 dB
Radiated Emission (30MHz ~ 200MHz) (3m SAC)	4.6 dB
Radiated Emission (200MHz ~ 1000MHz) (3m SAC)	5.8 dB
Radiated Emission (1GHz ~ 6GHz) (3m FAR)	4.95 dB
Radiated Emission (6GHz ~ 18GHz) (3m FAR)	5.23 dB
Radiated Emission (18GHz ~ 40GHz) (3m FAR)	5.32 dB

Note: All the measurement uncertainty value were shown with a coverage k=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

3.6 Additions to, Deviations, or Exclusions From the Method

No

3.7 Laboratory Facility

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

● **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

● **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber and 10m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **CNAS - Registration No.: CNAS L15527**

JianYan Testing Group Shenzhen Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L15527.

● **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

3.8 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.

Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info-JYTee@lets.com, Website: <http://jyt.lets.com>

3.9 Test Instruments List

Radiated Emission(3m SAC):					
Test Equipment	Manufacturer	Model No.	Manage No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	ETS	9m*6m*6m	WXJ001-1	04-14-2021	04-13-2026
Loop Antenna	Schwarzbeck	FMZB 1519 B	WXJ002-4	01-05-2024	01-04-2025
BiConiLog Antenna	Schwarzbeck	VULB9163	WXJ002	01-09-2024	01-08-2025
Horn Antenna	Schwarzbeck	BBHA9120D	WXJ002-2	01-05-2024	01-04-2025
Horn Antenna	Schwarzbeck	BBHA9170	WXJ002-5	12-28-2023	12-27-2024
Pre-amplifier (30MHz ~ 1GHz)	Schwarzbeck	BBV9743B	WXJ001-2	12-27-2023	12-26-2024
Pre-amplifier (1GHz ~ 18GHz)	SKET	LNPA_0118G-50	WXJ001-3	12-27-2023	12-26-2024
Pre-amplifier (18GHz ~ 40GHz)	RF System	TRLA-180400G45B	WXJ002-7	12-28-2023	12-27-2024
EMI Test Receiver	Rohde & Schwarz	ESRP7	WXJ003-1	12-27-2023	12-26-2024
Spectrum Analyzer	Rohde & Schwarz	FSP 30	WXJ004	12-27-2023	12-26-2024
Spectrum Analyzer	KEYSIGHT	N9010B	WXJ004-2	09-09-2024	09-08-2025
Coaxial Cable (30MHz ~ 1GHz)	JYTSZ	JYT3M-1G-NN-8M	WXG001-4	01-17-2024	01-16-2025
Coaxial Cable (1GHz ~ 18GHz)	JYTSZ	JYT3M-18G-NN-8M	WXG001-5	01-17-2024	01-16-2025
Coaxial Cable (18GHz ~ 40GHz)	JYTSZ	JYT3M-40G-SS-8M	WXG001-7	01-17-2024	01-16-2025
Band Reject Filter Group	Tonscend	JS0806-F	WXJ089	N/A	
Test Software	Tonscend	TS+	Version: 3.0.0.1		
EMI Test Software	AUDIX	E3	Version: 6.110919b		

Radiated Emission(3m FAR):					
Test Equipment	Manufacturer	Model No.	Manage No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m FAR	YUNYI	9m*6m*6m	WXJ097	06-15-2023	06-14-2028
BiConiLog Antenna	Schwarzbeck	VULB9163	WXJ097-2	07-01-2024	06-30-2025
Biconical Antenna	Schwarzbeck	VUBA9117	WXJ002-1	07-01-2024	06-30-2027
Horn Antenna	Schwarzbeck	BBHA9120D	WXJ097-3	06-16-2024	06-15-2025
Horn Antenna	Schwarzbeck	BBHA9120D	WXJ002-3	12-28-2023	12-27-2024
Horn Antenna	Schwarzbeck	BBHA9170	WXJ002-5	12-28-2023	12-27-2024
Horn Antenna	Schwarzbeck	BBHA9170	WXJ002-6	12-28-2023	12-27-2024
Pre-amplifier (30MHz ~ 1GHz)	YUNYI	PAM-310N	WXJ097-5	04-24-2024	04-23-2025
Pre-amplifier (1GHz ~ 18GHz)	YUNYI	PAM-118N	WXJ097-6	04-24-2024	04-23-2025
Pre-amplifier (18GHz ~ 40GHz)	RF System	TRLA-180400G45B	WXJ002-7	12-28-2023	12-27-2024
EMI Test Receiver	Rohde & Schwarz	ESCI3	WXJ003	12-27-2023	12-26-2024
Spectrum Analyzer	Rohde & Schwarz	FSP 30	WXJ004	12-27-2023	12-26-2024
Spectrum Analyzer	KEYSIGHT	N9020B	WXJ081-1	06-11-2024	06-10-2025
Coaxial Cable (30MHz ~ 1GHz)	JYTSZ	JYT3M-1G-NN-13M	WXG097-1	07-30-2024	07-29-2025
Coaxial Cable (1GHz ~ 18GHz)	JYTSZ	JYT3M-18G-NN-8M	WXG097-2	07-30-2024	07-29-2025
Coaxial Cable (18GHz ~ 40GHz)	JYTSZ	JYT3M-40G-SS-8M	WXG097-3	07-30-2024	07-29-2025
High Band Reject Filter Group	Tonscend	JS0806-F	WXJ089	N/A	
Low Band Reject Filter Group	Tonscend	JS0806-F	WXJ097-4	N/A	
Test Software	Tonscend	TS+	Version: 5.0.0		

Conducted Emission:					
Test Equipment	Manufacturer	Model No.	Manage No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESR3	WXJ003-2	06-11-2024	06-10-2025
LISN	Schwarzbeck	NSLK 8127	QCJ001-13	12-27-2023	12-26-2024
LISN	Rohde & Schwarz	ESH3-Z5	WXJ005-1	12-27-2023	12-26-2024
LISN Coaxial Cable (9kHz ~ 30MHz)	JYTSZ	JYTCE-1G-NN-2M	WXG003-1	01-17-2024	01-16-2025
RF Switch	TOP PRECISION	RSU0301	WXG003	N/A	
Test Software	AUDIX	E3	Version: 6.110919b		

Conducted Method:					
Test Equipment	Manufacturer	Model No.	Manage No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
Spectrum Analyzer	Rohde & Schwarz	FSP 30	WXJ004	09-10-2024	09-09-2025
DC Power Supply	Keysight	E3642A	WXJ025-2	N/A	

4 Measurement Setup and Procedure

4.1 Test Channel

According to ANSI C63.10-2013 chapter 5.6.1 Table 4 requirement, select lowest channel, middle channel, and highest channel in the frequency range in which device operates for testing. The detailed frequency points are as follows:

Lowest channel		Middle channel		Middle channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	907.095	12	916.395	24	923.835

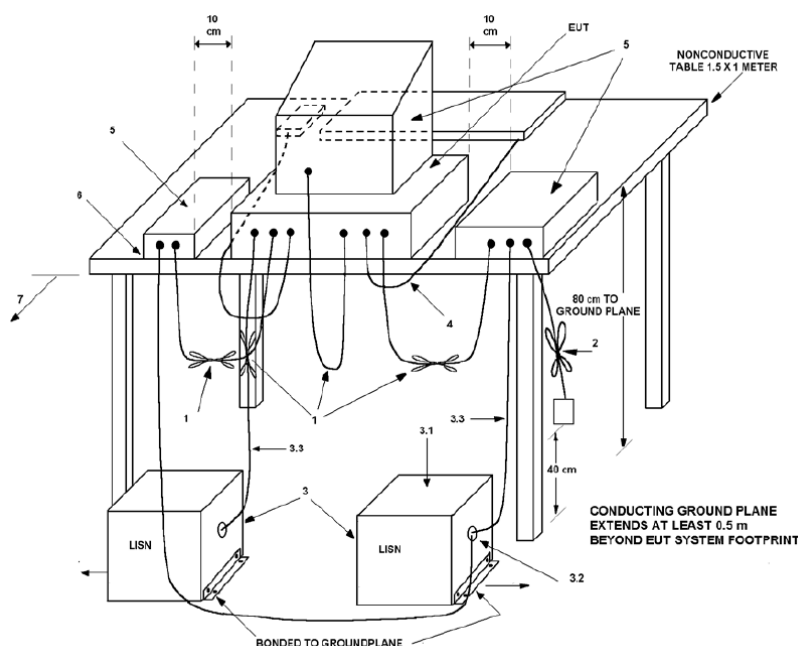
According to ANSI C63.10-2013 chapter 5.6.1 Table 4 requirement, select lowest channel, middle channel, and highest channel in the frequency range in which device operates for testing. The detailed frequency points are as follows:

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	907.095	13	917.015
1	907.715	14	917.635
2	908.335	15	918.255
3	908.955	16	918.875
4	909.575	17	919.495
5	910.195	18	920.115
6	910.815	19	920.735
7	911.435	20	921.355
8	912.055	21	921.975
9	912.675	22	922.595
10	913.295	23	923.215
11	913.915	24	923.835
12	916.395		

Remark: Channel 0,12& 24 selected for tested.

4.2 Test Setup

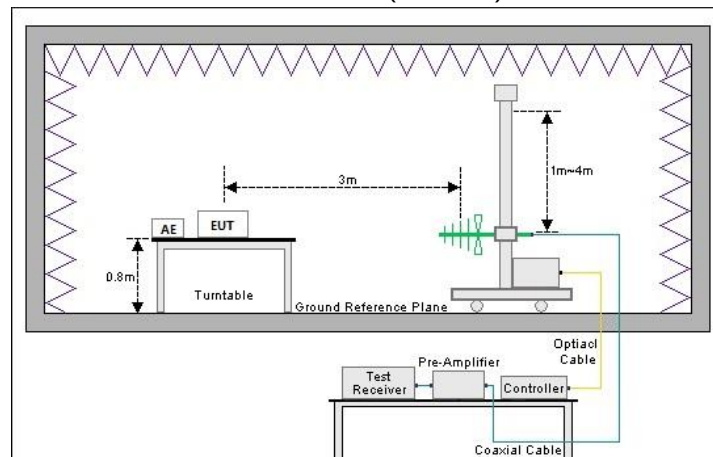
1) Conducted emission measurement:



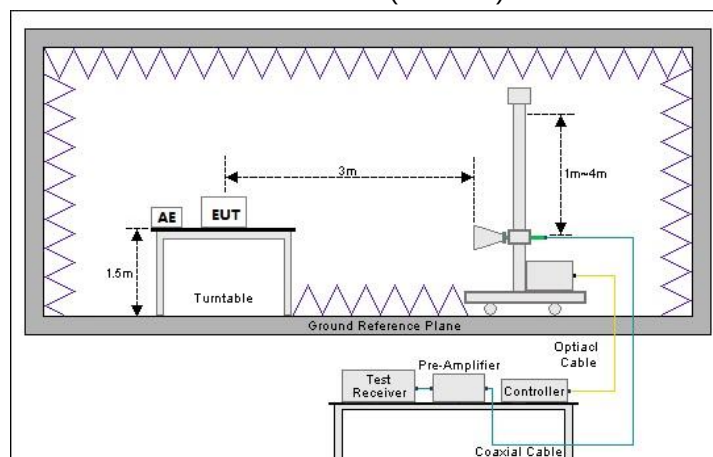
Note: The detailed descriptions please refer to Figure 8 of ANSI C63.4:2014.

2) Radiated emission measurement:

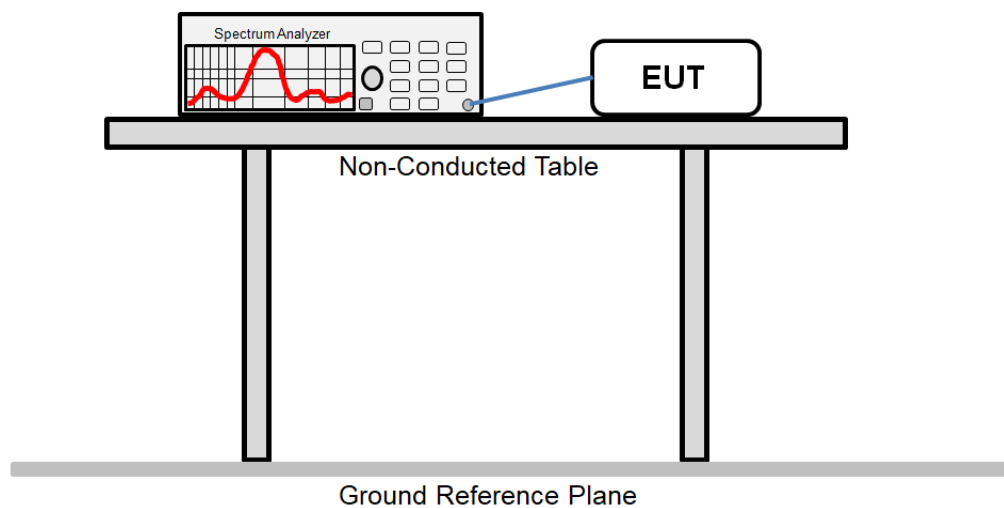
Below 1GHz (3m SAC)



Above 1GHz (3m FAR)



3) Conducted test method



4.3 Test Procedure

Test method	Test step
Conducted emission	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. 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.
Radiated emission	For below 1GHz: 1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m. 2. EUT works in each mode of operation that needs to be tested, and having the EUT continuously working, respectively on 3 axis (X, Y & Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations. 3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data. For above 1GHz: 1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m. 2. EUT works in each mode of operation that needs to be tested, and having the EUT continuously working, respectively on 3 axis (X, Y & Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations. 3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
Conducted test method	1. The antenna port of EUT was connected to the test port of the test system through an RF cable. 2. The EUT is keeping in continuous transmission mode and tested in all modulation modes. 3. Open the test software, prepare a test plan, and control the system through the software. After the test is completed, the test report is exported through the test software.

5 Test Results

5.1 Summary

5.1.1 Clause and data summary

Test items	Standard clause	Test data	Result
Antenna Requirement	15.203 15.247 (b)(4)	See Section 5.2	Pass
AC Power Line Conducted Emission	15.207	See Section 5.3	Pass
Conducted Output Power	15.247 (b)(2)	See Section 5.4	Pass
20dB Occupied Bandwidth	15.247 (a)(1)(i)	See Section 5.5	Pass
Carrier Frequencies Separation	15.247 (a)(1)	See Section 5.6	Pass
Hopping Channel Number	15.247 (a)(1)(i)	See Section 5.7	Pass
Dwell Time	15.247 (a)(1)(i)	See Section 5.8	Pass
Spurious Emission	15.205 15.209 15.247 (d)	See Section 5.9	Pass
Remark: 1. Pass: The EUT complies with the essential requirements in the standard. 2. N/A: Not Applicable. 3. The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB (provided by the customer).			
Test Method:	ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02		

5.1.2 Test Limit

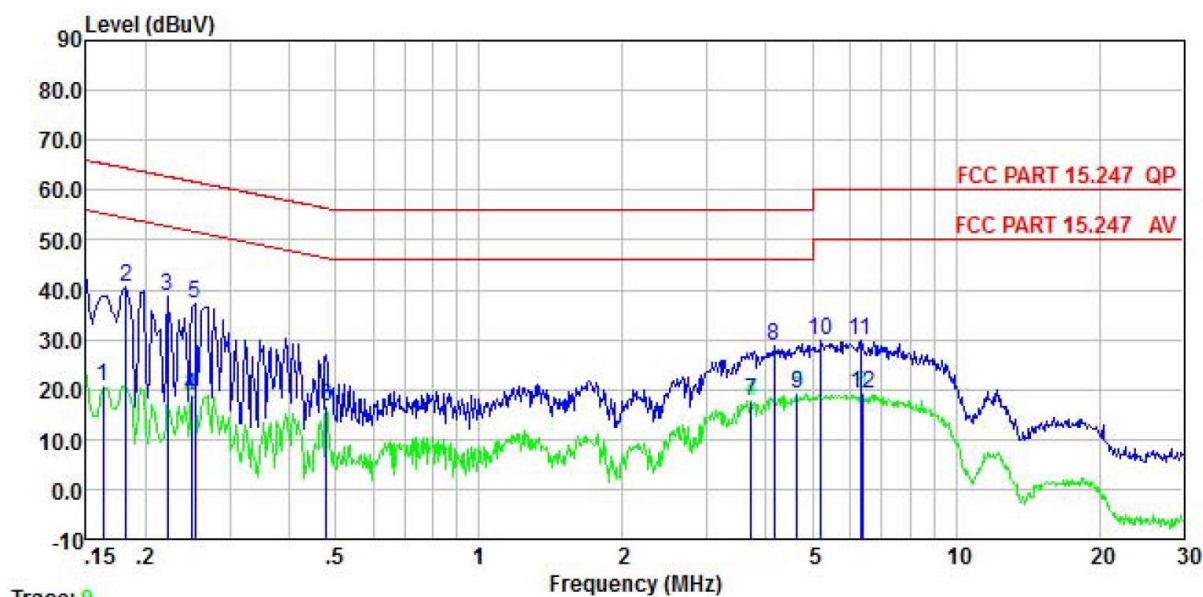
Test items	Limit																														
AC Power Line Conducted Emission	<table><tr><th rowspan="2">Frequency (MHz)</th><th colspan="2">Limit (dBμV)</th></tr><tr><th>Quasi-Peak</th><th>Average</th></tr><tr><td>0.15 – 0.5</td><td>66 to 56 Note 1</td><td>56 to 46 Note 1</td></tr><tr><td>0.5 – 5</td><td>56</td><td>46</td></tr><tr><td>5 – 30</td><td>60</td><td>50</td></tr></table> Note 1: The limit level in dBμV decreases linearly with the logarithm of frequency. Note 2: The more stringent limit applies at transition frequencies.	Frequency (MHz)	Limit (dBμV)		Quasi-Peak	Average	0.15 – 0.5	66 to 56 Note 1	56 to 46 Note 1	0.5 – 5	56	46	5 – 30	60	50																
Frequency (MHz)	Limit (dBμV)																														
	Quasi-Peak	Average																													
0.15 – 0.5	66 to 56 Note 1	56 to 46 Note 1																													
0.5 – 5	56	46																													
5 – 30	60	50																													
Conducted Output Power	For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.																														
20dB Occupied Bandwidth Hopping Channel Number Dwell Time	For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.																														
Carrier Frequencies Separation	Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater																														
Spurious Emission	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)): <table><tr><th rowspan="2">Frequency (MHz)</th><th colspan="2">Limit (dBμV/m)</th><th rowspan="2">Detector</th></tr><tr><th>@ 3m</th><th>@ 10m</th></tr><tr><td>30 – 88</td><td>40.0</td><td>30.0</td><td>Quasi-peak</td></tr><tr><td>88 – 216</td><td>43.5</td><td>33.5</td><td>Quasi-peak</td></tr><tr><td>216 – 960</td><td>46.0</td><td>36.0</td><td>Quasi-peak</td></tr><tr><td>960 – 1000</td><td>54.0</td><td>44.0</td><td>Quasi-peak</td></tr></table> Note: The more stringent limit applies at transition frequencies. <table><tr><th rowspan="2">Frequency</th><th colspan="2">Limit (dBμV/m) @ 3m</th></tr><tr><th>Average</th><th>Peake</th></tr><tr><td>Above 1 GHz</td><td>54.0</td><td>74.0</td></tr></table> Note: The measurement bandwidth shall be 1 MHz or greater.	Frequency (MHz)	Limit (dBμV/m)		Detector	@ 3m	@ 10m	30 – 88	40.0	30.0	Quasi-peak	88 – 216	43.5	33.5	Quasi-peak	216 – 960	46.0	36.0	Quasi-peak	960 – 1000	54.0	44.0	Quasi-peak	Frequency	Limit (dBμV/m) @ 3m		Average	Peake	Above 1 GHz	54.0	74.0
Frequency (MHz)	Limit (dBμV/m)		Detector																												
	@ 3m	@ 10m																													
30 – 88	40.0	30.0	Quasi-peak																												
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Frequency	Limit (dBμV/m) @ 3m																														
	Average	Peake																													
Above 1 GHz	54.0	74.0																													

5.2 Antenna Requirement

Standard requirement:	FCC Part 15 C Section 15.203 & 247(b)
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. 15.247(b) (4) requirement: (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	
E.U.T Antenna:	
The EUT antenna is an Internal Ceramic Antenna which cannot replace by end-user, the best case gain of the antenna is 2.06 dBi. See product internal photos for details.	

5.3 AC Power Line Conducted Emission

Product name:	7858V	Product model:	7858V
Test by:	Kiran Zeng	Test mode:	Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz		

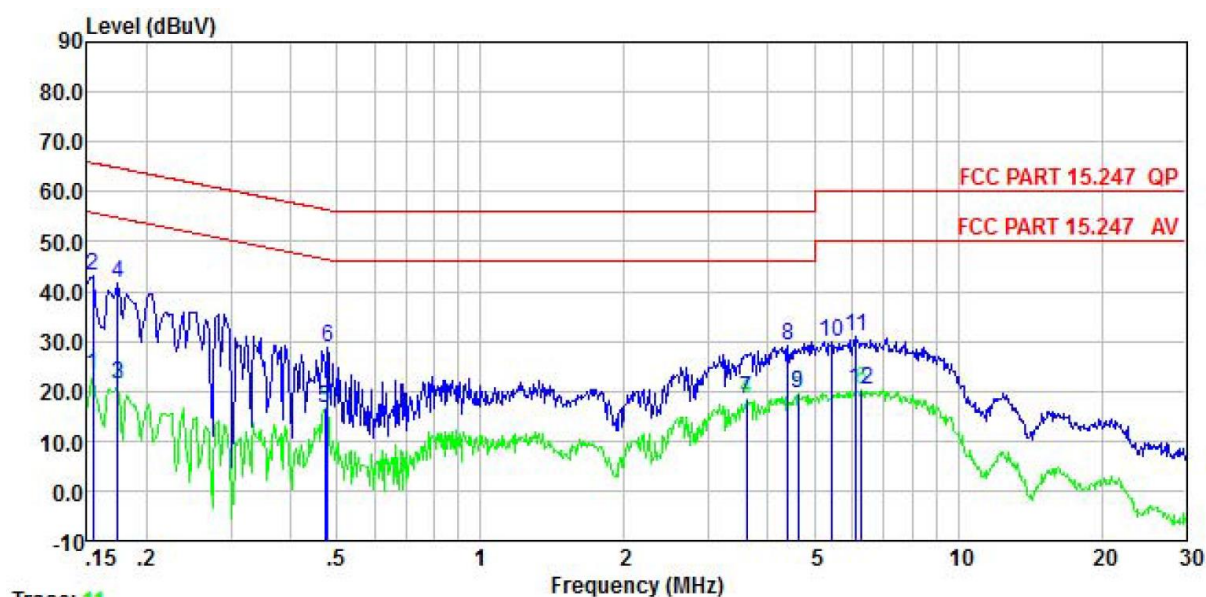


	Read Freq	Read Level	LISN Factor	Aux Factor	Aux2 Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dB	dBuV	dBuV	dB	
1	0.162	10.58	0.20	0.00	9.88	0.01	20.67	55.34	-34.67	Average
2	0.182	30.51	0.20	0.00	9.88	0.01	40.60	64.42	-23.82	QP
3	0.222	28.56	0.20	0.00	9.88	0.03	38.67	62.74	-24.07	QP
4	0.249	8.71	0.20	0.00	9.88	0.01	18.80	51.78	-32.98	Average
5	0.253	27.14	0.20	0.00	9.88	0.01	37.23	61.64	-24.41	QP
6	0.479	6.53	0.20	0.00	9.88	0.03	16.64	46.36	-29.72	Average
7	3.720	7.62	0.20	0.00	9.89	0.08	17.79	46.00	-28.21	Average
8	4.158	18.47	0.20	0.00	9.89	0.08	28.64	56.00	-27.36	QP
9	4.647	8.95	0.20	0.00	9.89	0.09	19.13	46.00	-26.87	Average
10	5.221	19.50	0.20	0.00	9.89	0.09	29.68	60.00	-30.32	QP
11	6.319	19.52	0.20	0.00	9.90	0.09	29.71	60.00	-30.29	QP
12	6.352	8.85	0.20	0.00	9.90	0.09	19.04	50.00	-30.96	Average

Remark:

1. Level = Read level + LISN Factor + Cable Loss.

Product name:	7858V	Product model:	7858V
Test by:	Kiran Zeng	Test mode:	Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz		



	Freq	Read Level	LISN Factor	Aux Factor	Aux2 Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dB	dBuV	dBuV	dB	
1	0.154	13.09	0.20	0.00	9.88	0.01	23.18	55.78	-32.60	Average
2	0.154	33.08	0.20	0.00	9.88	0.01	43.17	65.78	-22.61	QP
3	0.174	11.26	0.20	0.00	9.88	0.01	21.35	54.77	-33.42	Average
4	0.174	31.59	0.20	0.00	9.88	0.01	41.68	64.77	-23.09	QP
5	0.471	6.36	0.20	0.00	9.88	0.03	16.47	46.49	-30.02	Average
6	0.479	18.76	0.20	0.00	9.88	0.03	28.87	56.36	-27.49	QP
7	3.603	8.00	0.30	0.00	9.89	0.08	18.27	46.00	-27.73	Average
8	4.407	18.90	0.30	0.00	9.89	0.08	29.17	56.00	-26.83	QP
9	4.622	9.11	0.30	0.00	9.89	0.09	19.39	46.00	-26.61	Average
10	5.447	19.70	0.30	0.00	9.90	0.09	29.99	60.00	-30.01	QP
11	6.121	20.81	0.30	0.00	9.90	0.09	31.10	60.00	-28.90	QP
12	6.285	10.06	0.30	0.00	9.90	0.09	20.35	50.00	-29.65	Average

Remark:

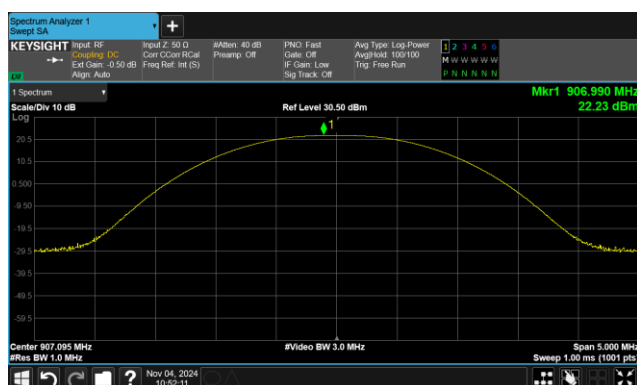
1. Level = Read level + LISN Factor + Cable Loss.

5.4 Conducted Output Power

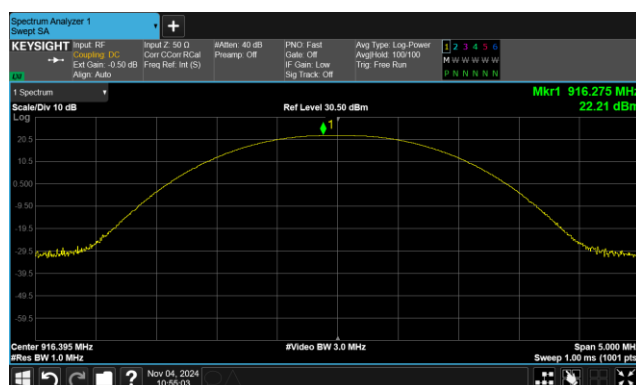
Test channel	Maximum Output Power (dBm)	Limit (dBm)	Result
Lowest channel	22.23	24.00	Pass
Middle channel	22.21	24.00	Pass
Highest channel	22.10	24.00	Pass

Test plot as follows:

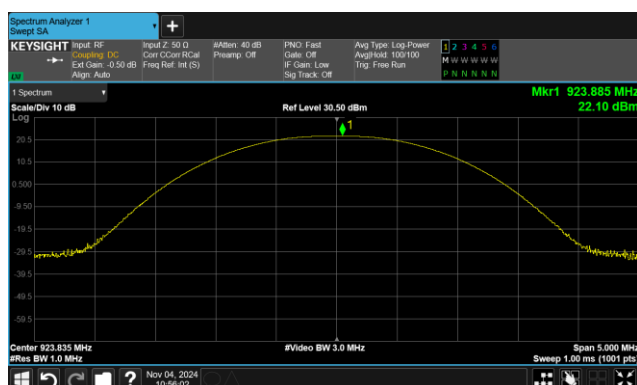
Lowest channel



Middle channel



Highest channel

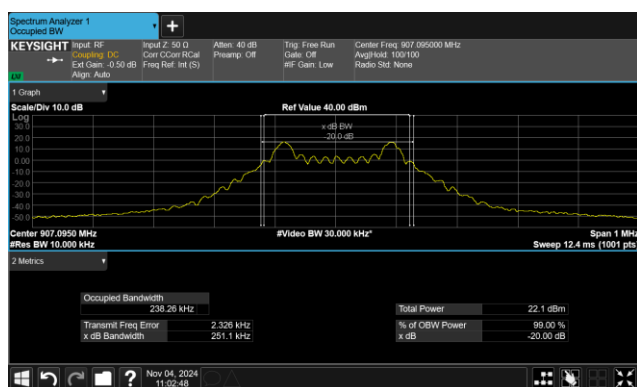


5.5 20dB Occupied Bandwidth

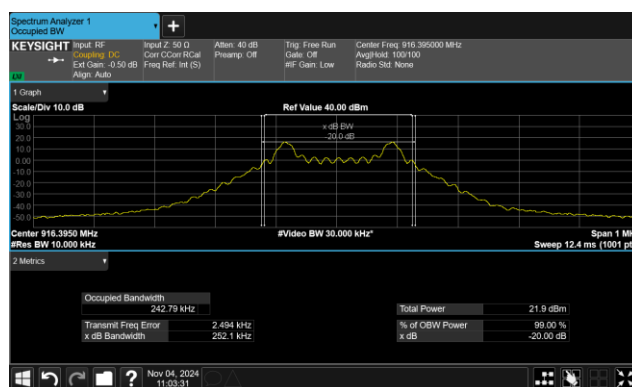
Test channel	20dB Occupy Bandwidth (kHz)	Limit (kHz)	Result
Lowest channel	251.1	$250 < BW_{20dB} \leq 500$	Pass
Middle channel	252.1	$250 < BW_{20dB} \leq 500$	Pass
Highest channel	252.2	$250 < BW_{20dB} \leq 500$	Pass

Test plot as follows:

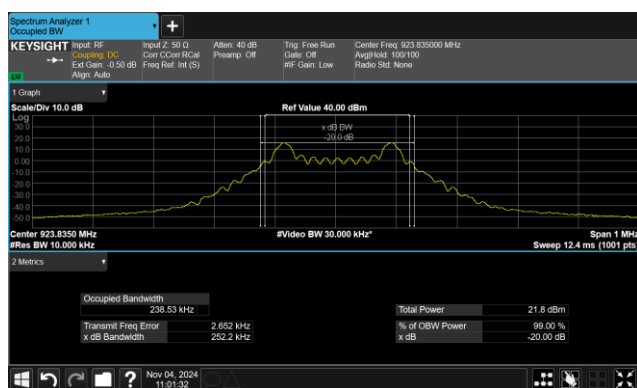
Lowest channel



Middle channel



Highest channel

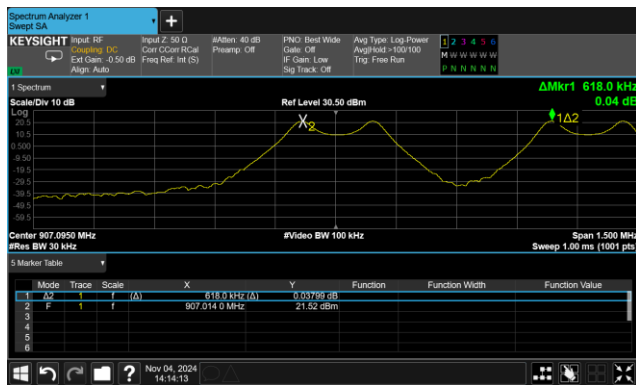


5.6 Carrier Frequencies Separation

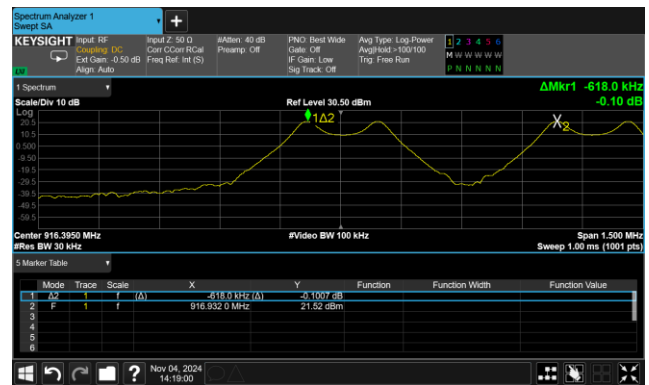
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest channel	618.0	252.2	Pass
Middle channel	618.0	252.2	Pass
Highest channel	622.5	252.2	Pass

Test plot as follows:

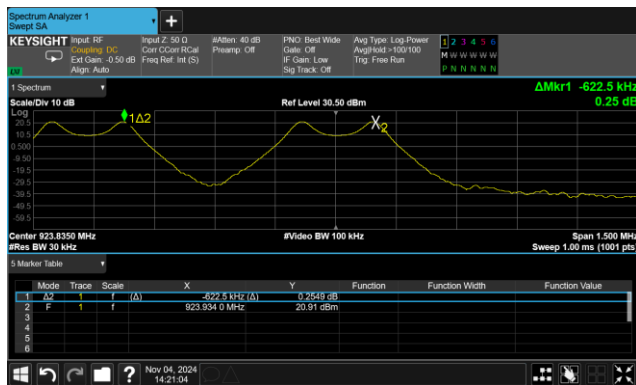
Lowest channel



Middle channel



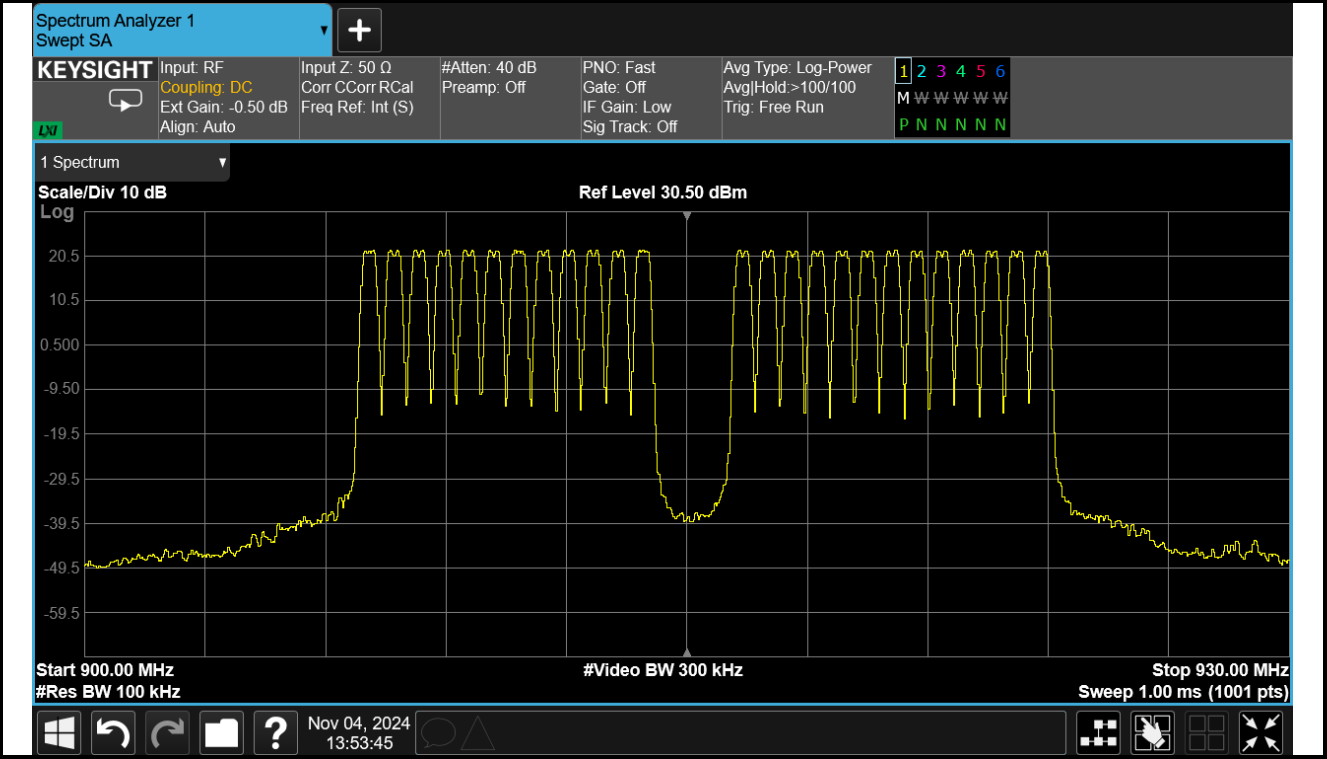
Highest channel



5.7 Hopping Channel Number

Hopping channel numbers	Limit	Result
25	$25 \leq N_{ch} < 50$	Pass

Test plot as follows:



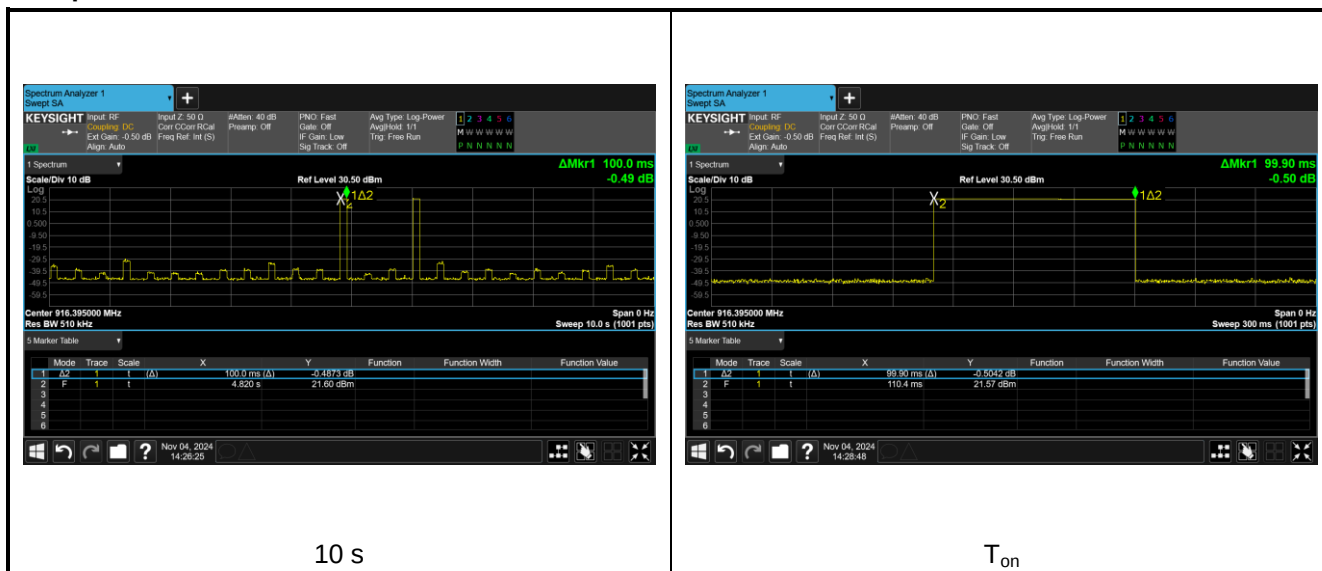
5.8 Dwell Time

T_{on} (s)	Hopping numbers (10 s)	Dwell time (s)	Limit (s)	Result
99.90	2	199.8	0.4	Pass

Note:

- T_{on} is time per hop.
- Dwell time = $T_{on} * \text{Hopping numbers}$.

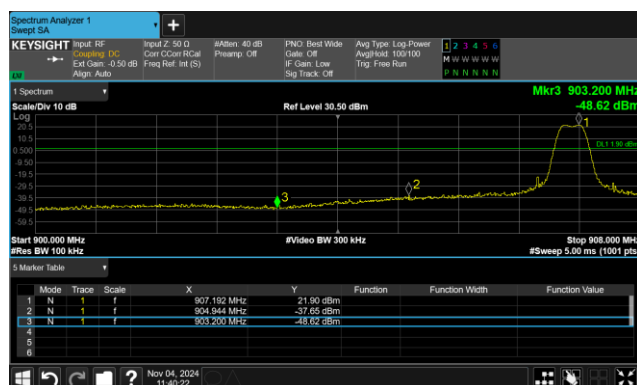
Test plot as follows:



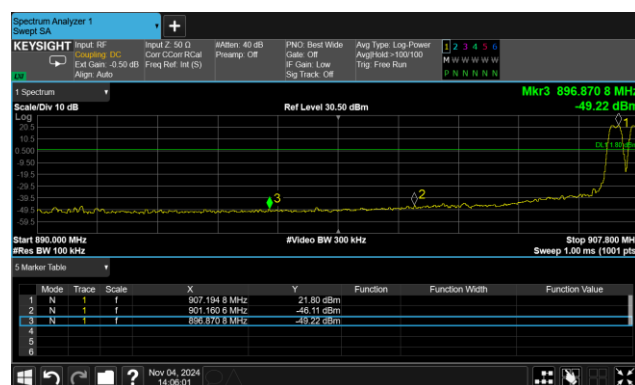
5.9 Spurious Emission

5.9.1 Band-edge Emission

Lowest Channel

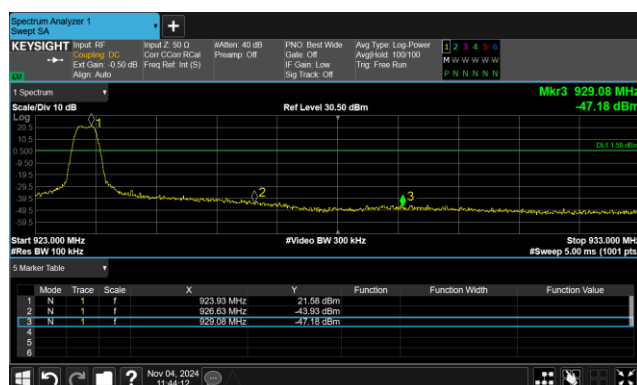


No-hopping mode

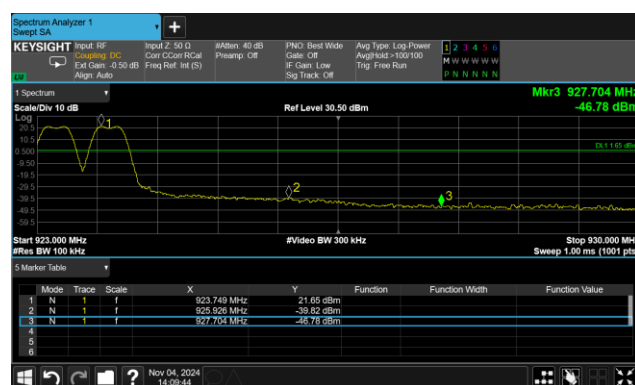


Hopping mode

Highest Channel



No-hopping mode



Hopping mode

5.9.2 Conducted Spurious Emission

Lowest channel



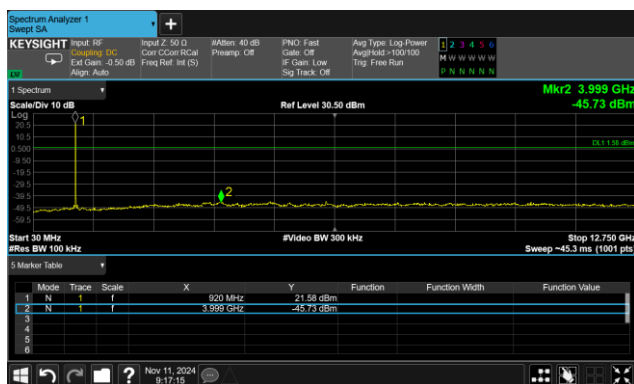
30MHz~10GHz

Middle channel



30MHz~10GHz

Highest channel

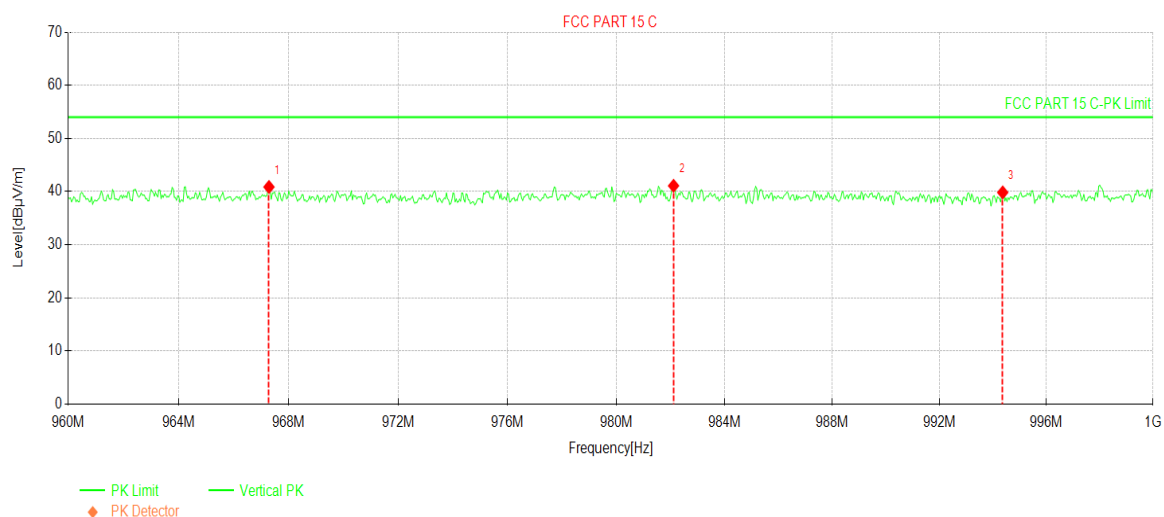


30MHz~10GHz

5.9.3 Emissions in Restricted Frequency Bands

906.095 MHz:

Product Name:	7858V	Product Model:	7858V
Test By:	Kiran Zeng	Test mode:	Lowest channel Tx mode
Test Frequency:	960 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		



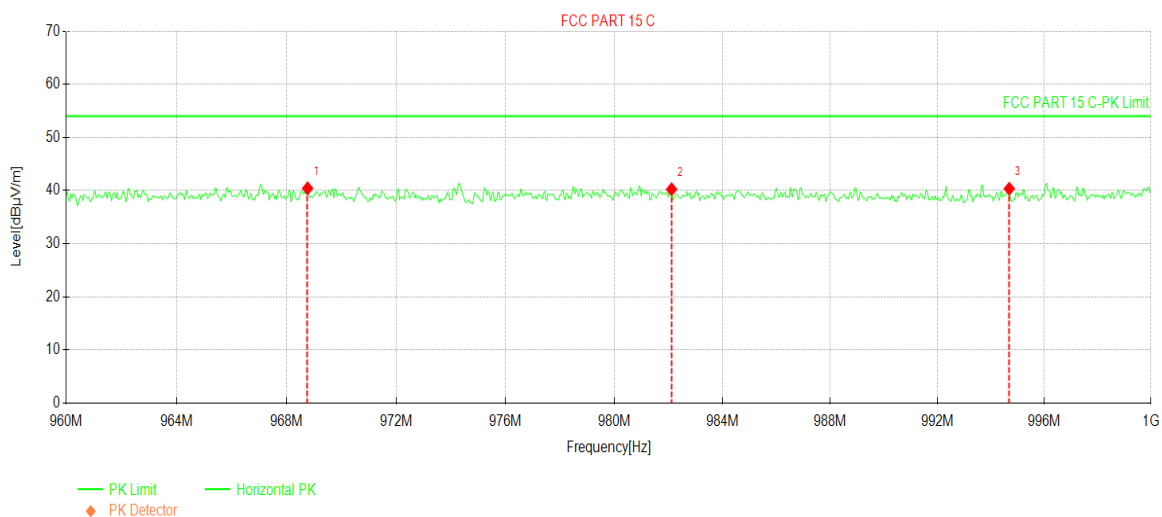
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	967.2800	14.22	40.87	26.65	54.00	13.13	PK	Vertical
2	982.1200	14.28	41.09	26.81	54.00	12.91	PK	Vertical
3	994.3600	13.05	39.84	26.79	54.00	14.16	PK	Vertical

Remark:

1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

Product Name:	7858V	Product Model:	7858V
Test By:	Kiran Zeng	Test mode:	Lowest channel Tx mode
Test Frequency:	960 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		



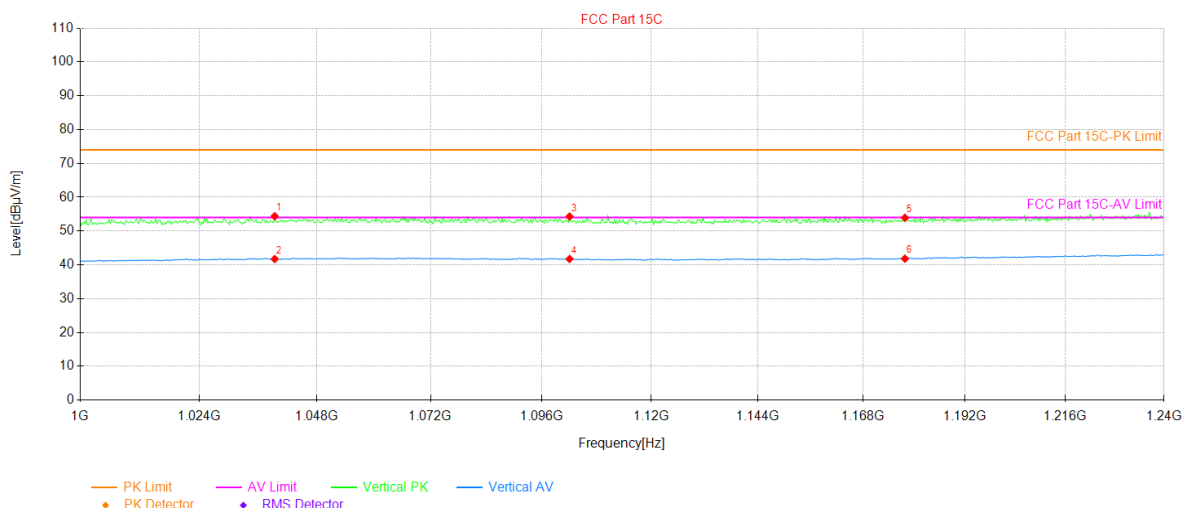
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	968.7600	13.73	40.42	26.69	54.00	13.58	PK	Horizontal
2	982.1200	13.43	40.24	26.81	54.00	13.76	PK	Horizontal
3	994.6800	13.57	40.35	26.78	54.00	13.65	PK	Horizontal

Remark:

1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

Product Name:	7858V	Product Model:	7858V
Test By:	Real Chen	Test mode:	Lowest channel Tx mode
Test Frequency:	1 GHz ~ 1.24 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		



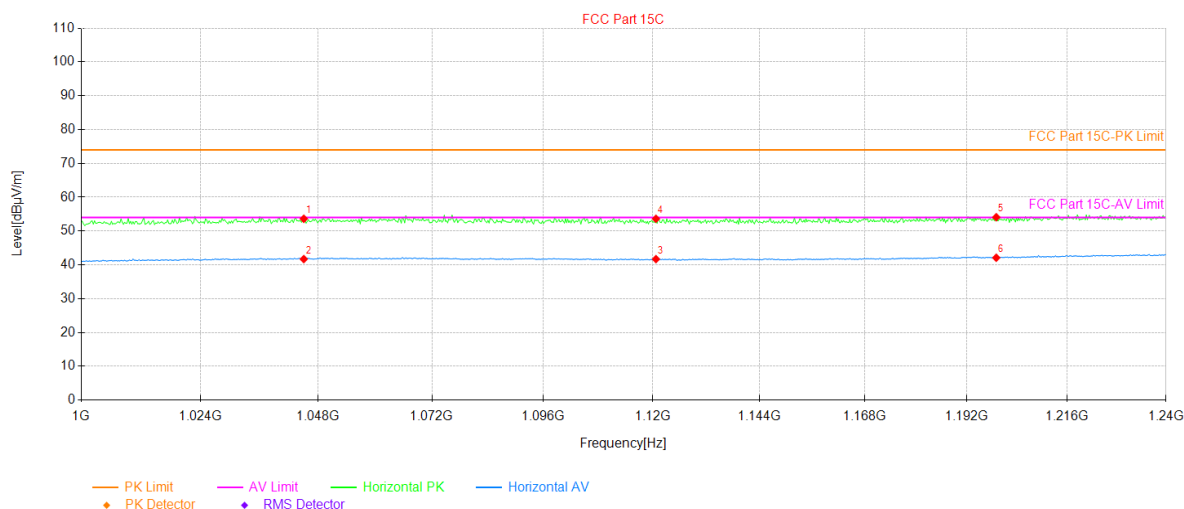
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Verdict	Polarity
1	1039.36	23.71	30.68	54.39	74.00	19.61	195	PK	PASS	Vertical
2	1039.36	11.05	30.68	41.73	54.00	12.27	270	AV	PASS	Vertical
3	1102.00	23.57	30.71	54.28	74.00	19.72	142	PK	PASS	Vertical
4	1102.00	11.03	30.71	41.74	54.00	12.26	182	AV	PASS	Vertical
5	1177.84	22.81	31.09	53.90	74.00	20.10	44	PK	PASS	Vertical
6	1177.84	10.74	31.09	41.83	54.00	12.17	293	AV	PASS	Vertical

Remark:

1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

Product Name:	7858V	Product Model:	7858V
Test By:	Real Chen	Test mode:	Lowest channel Tx mode
Test Frequency:	1 GHz ~ 1.24 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		



Suspected Data List

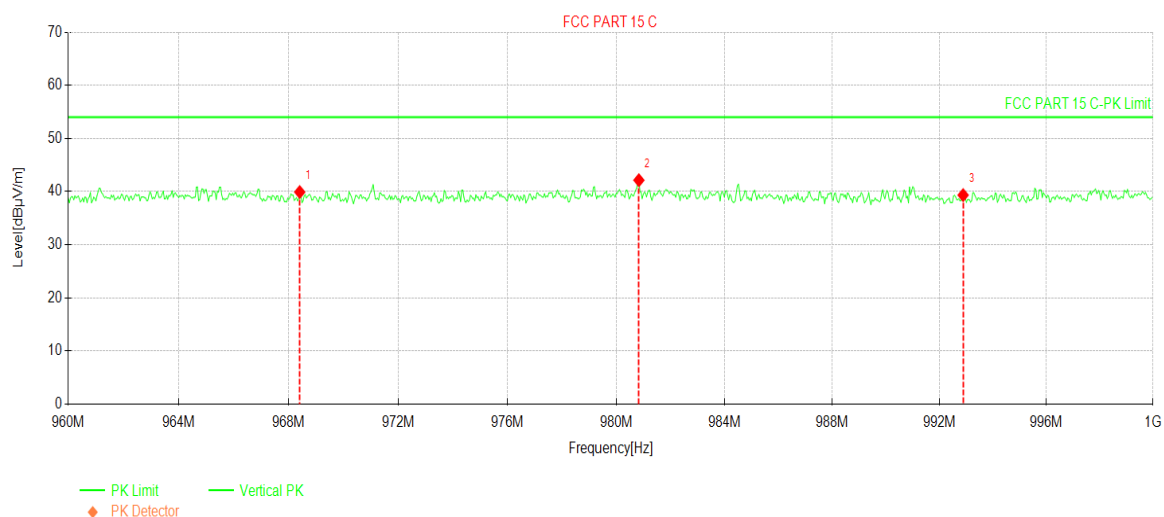
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Verdict	Polarity
1	1045.12	22.91	30.71	53.62	74.00	20.38	178	PK	PASS	Horizontal
2	1045.12	11.00	30.71	41.71	54.00	12.29	46	AV	PASS	Horizontal
3	1120.72	10.90	30.80	41.70	54.00	12.30	218	AV	PASS	Horizontal
4	1120.72	22.82	30.80	53.62	74.00	20.38	352	PK	PASS	Horizontal
5	1198.96	22.88	31.21	54.09	74.00	19.91	205	PK	PASS	Horizontal
6	1198.96	10.90	31.21	42.11	54.00	11.89	289	AV	PASS	Horizontal

Remark:

1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

923.835 MHz:

Product Name:	7858V	Product Model:	7858V
Test By:	Kiran Zeng	Test mode:	Highest channel Tx mode
Test Frequency:	960 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		



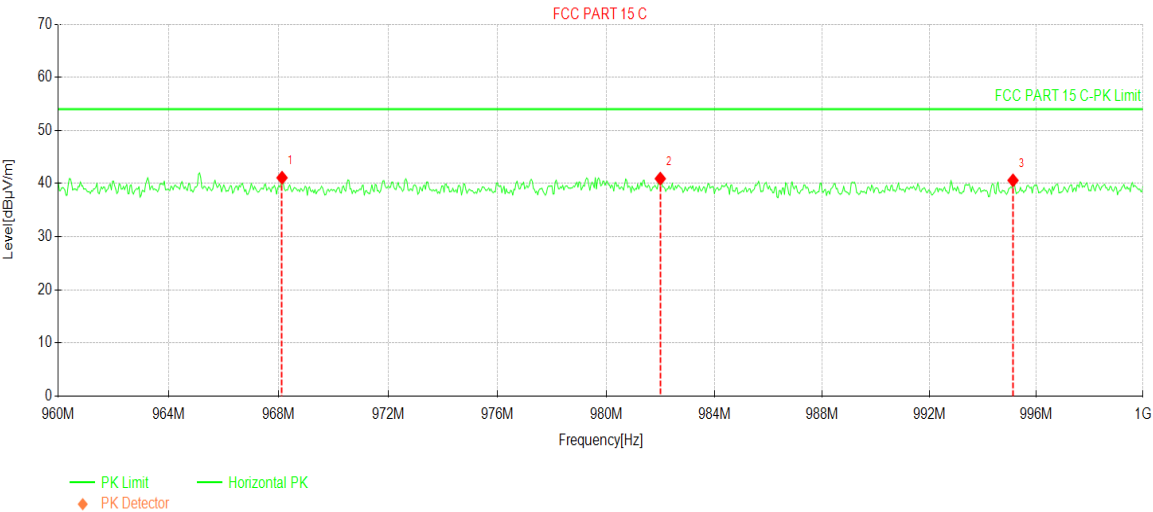
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	968.4000	13.23	39.91	26.68	54.00	14.09	PK	Vertical
2	980.8400	15.33	42.14	26.81	54.00	11.86	PK	Vertical
3	992.8800	12.51	39.34	26.83	54.00	14.66	PK	Vertical

Remark:

1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

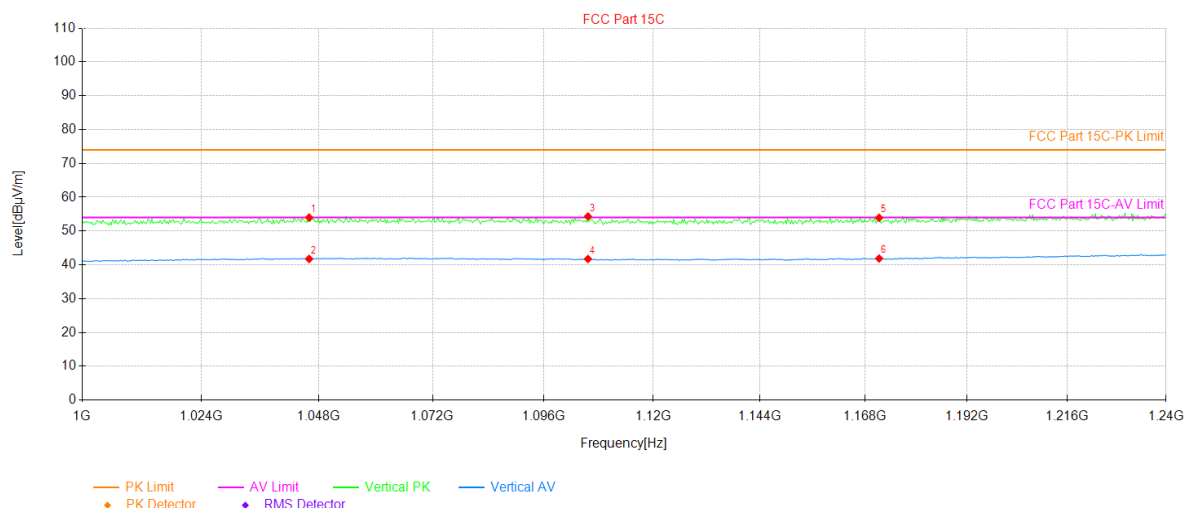
Product Name:	7858V	Product Model:	7858V
Test By:	Kiran Zeng	Test mode:	Highest channel Tx mode
Test Frequency:	960 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	968.1200	14.43	41.10	26.67	54.00	12.90	PK	Horizontal
2	982.0000	14.11	40.92	26.81	54.00	13.08	PK	Horizontal
3	995.1200	13.84	40.61	26.77	54.00	13.39	PK	Horizontal

Remark:
1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

Product Name:	7858V	Product Model:	7858V
Test By:	Real Chen	Test mode:	Highest channel Tx mode
Test Frequency:	1 GHz ~ 1.24 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		



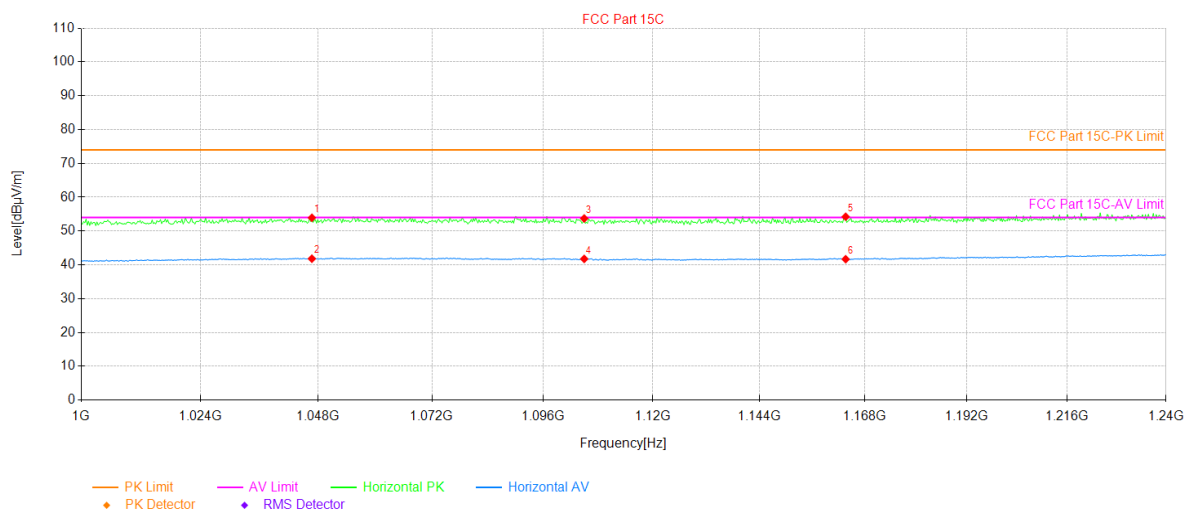
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Verdict	Polarity
1	1046.08	23.28	30.72	54.00	74.00	20.00	119	PK	PASS	Vertical
2	1046.08	11.04	30.72	41.76	54.00	12.24	174	AV	PASS	Vertical
3	1105.60	23.58	30.73	54.31	74.00	19.69	66	PK	PASS	Vertical
4	1105.60	11.01	30.73	41.74	54.00	12.26	299	AV	PASS	Vertical
5	1171.36	22.86	31.05	53.91	74.00	20.09	335	PK	PASS	Vertical
6	1171.36	10.84	31.05	41.89	54.00	12.11	57	AV	PASS	Vertical

Remark:

1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

Product Name:	7858V	Product Model:	7858V
Test By:	Real Chen	Test mode:	Highest channel Tx mode
Test Frequency:	1 GHz ~ 1.24 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Verdict	Polarity
1	1046.80	23.20	30.72	53.92	74.00	20.08	298	PK	PASS	Horizontal
2	1046.80	11.10	30.72	41.82	54.00	12.18	258	AV	PASS	Horizontal
3	1104.88	22.99	30.73	53.72	74.00	20.28	82	PK	PASS	Horizontal
4	1104.88	11.03	30.73	41.76	54.00	12.24	78	AV	PASS	Horizontal
5	1163.68	23.23	31.00	54.23	74.00	19.77	100	PK	PASS	Horizontal
6	1163.68	10.68	31.00	41.68	54.00	12.32	163	AV	PASS	Horizontal

Remark:

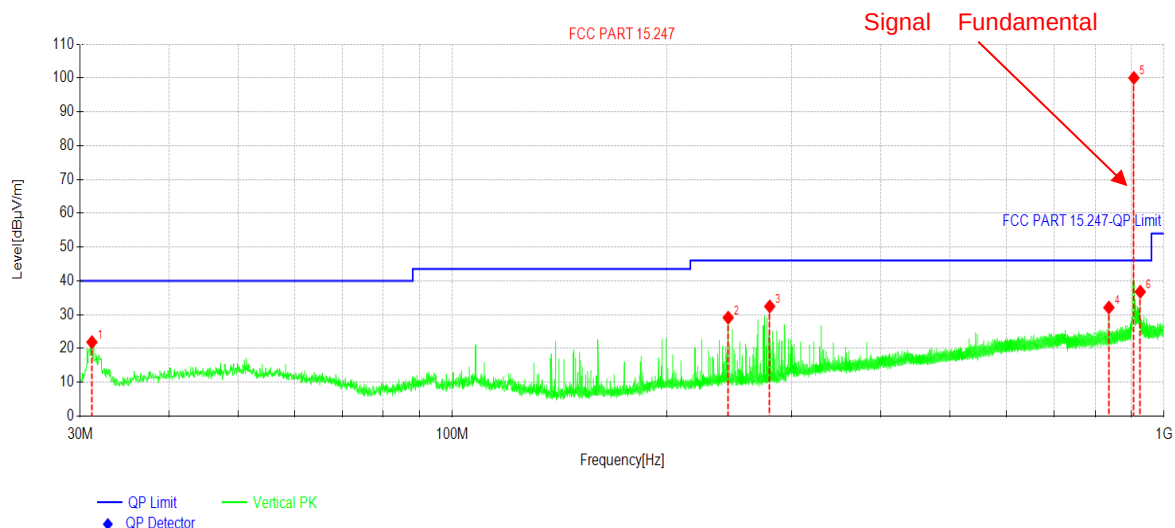
1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

5.9.4 Emissions in Non-restricted Frequency Bands

Below 1GHz:

906.095MHz

Product Name:	7858V	Product Model:	7858V
Test By:	Alan Chen	Test mode:	Lowest channel Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		



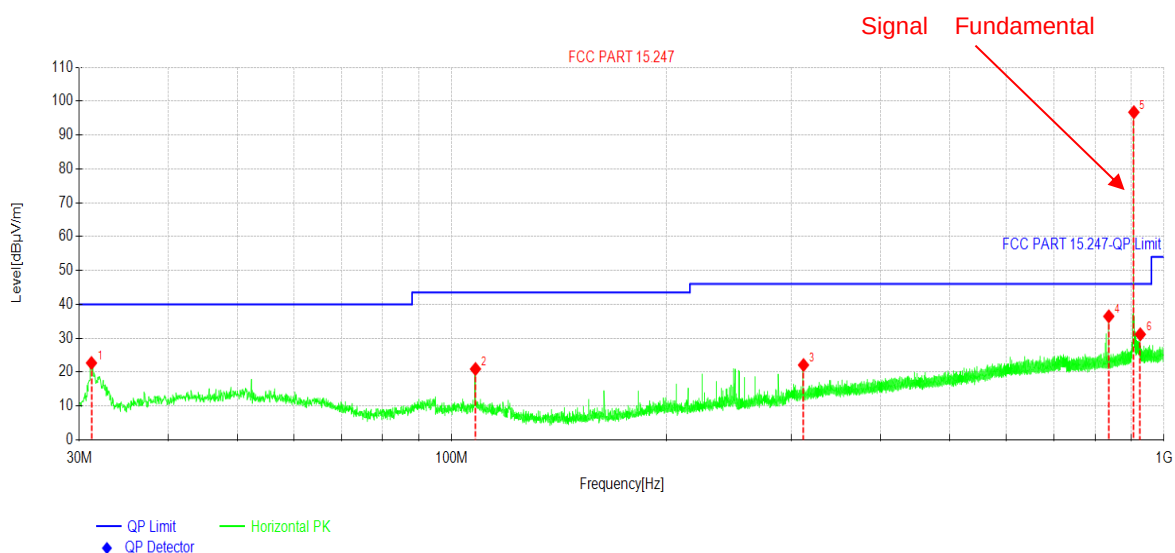
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	31.1641	37.74	-15.86	21.88	40.00	18.12	PK	Vertical
2	244.1382	43.17	-14.04	29.13	46.00	16.87	PK	Vertical
3	279.2540	45.96	-13.52	32.44	46.00	13.56	PK	Vertical
4	836.5953	35.89	-3.78	32.11	46.00	13.89	PK	Vertical
5	907.0209	102.73	-2.70	100.03	46.00	-54.03	PK	Vertical
6	926.0823	39.20	-2.43	36.77	46.00	9.23	PK	Vertical

Remark:

1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

Product Name:	7858V	Product Model:	7858V
Test By:	Alan Chen	Test mode:	Lowest channel Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		



Suspected Data List

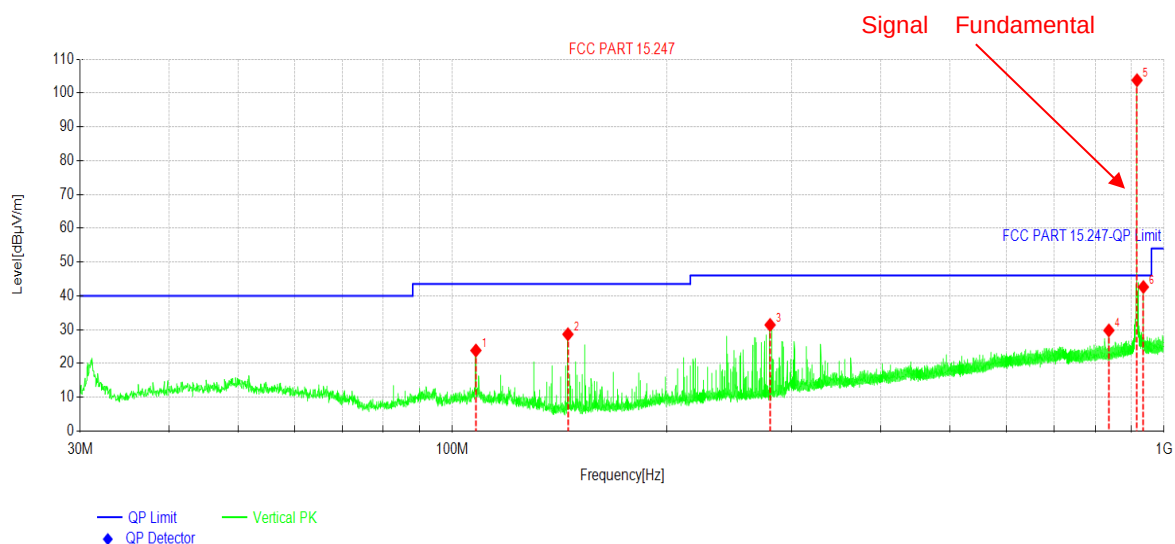
NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	31.2126	38.57	-15.87	22.70	40.00	17.30	PK	Horizontal
2	107.9919	35.54	-14.62	20.92	43.50	22.58	PK	Horizontal
3	311.8476	34.94	-12.85	22.09	46.00	23.91	PK	Horizontal
4	836.5468	40.25	-3.78	36.47	46.00	9.53	PK	Horizontal
5	907.2149	99.43	-2.70	96.73	46.00	-50.73	PK	Horizontal
6	926.2763	33.59	-2.43	31.16	46.00	14.84	PK	Horizontal

Remark:

1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

916MHz

Product Name:	7858V	Product Model:	7858V
Test By:	Alan Chen	Test mode:	Middle channel Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		



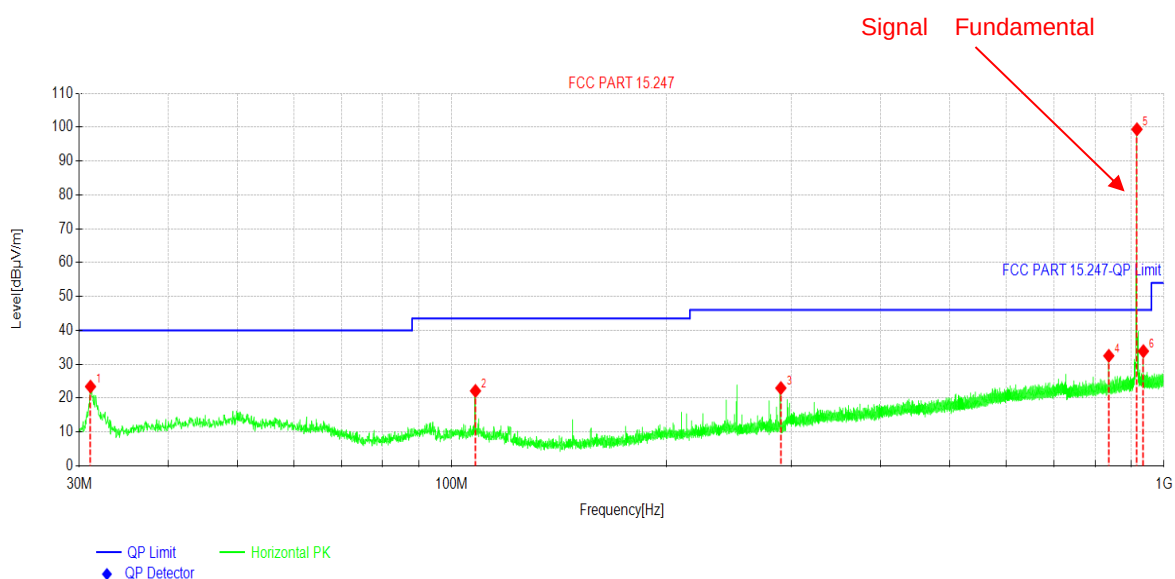
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	107.9434	38.47	-14.62	23.85	43.50	19.65	PK	Vertical
2	145.3873	47.00	-18.36	28.64	43.50	14.86	PK	Vertical
3	279.5935	44.92	-13.51	31.41	46.00	14.59	PK	Vertical
4	836.5468	33.56	-3.78	29.78	46.00	16.22	PK	Vertical
5	916.3333	106.23	-2.46	103.77	46.00	-57.77	PK	Vertical
6	935.3948	45.05	-2.43	42.62	46.00	3.38	PK	Vertical

Remark:

1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

Product Name:	7858V	Product Model:	7858V
Test By:	Alan Chen	Test mode:	Middle channel Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		



Suspected Data List

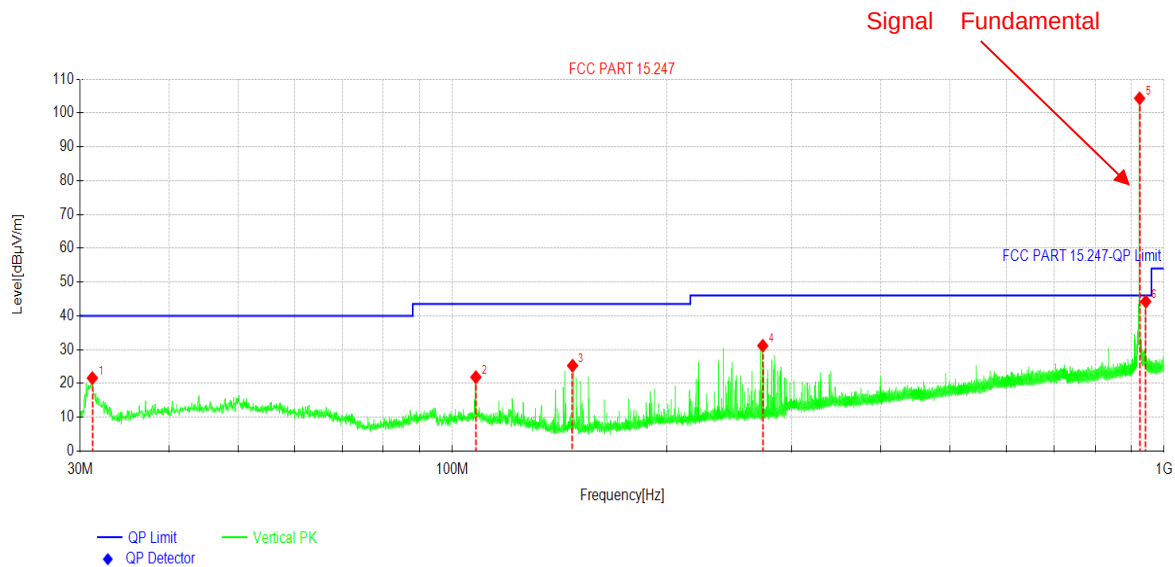
NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	31.1156	39.27	-15.86	23.41	40.00	16.59	PK	Horizontal
2	107.9919	36.74	-14.62	22.12	43.50	21.38	PK	Horizontal
3	289.8275	36.18	-13.21	22.97	46.00	23.03	PK	Horizontal
4	836.6438	36.27	-3.78	32.49	46.00	13.51	PK	Horizontal
5	916.3333	101.81	-2.46	99.35	46.00	-53.35	PK	Horizontal
6	935.5403	36.29	-2.44	33.85	46.00	12.15	PK	Horizontal

Remark:

1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

923.835MHz

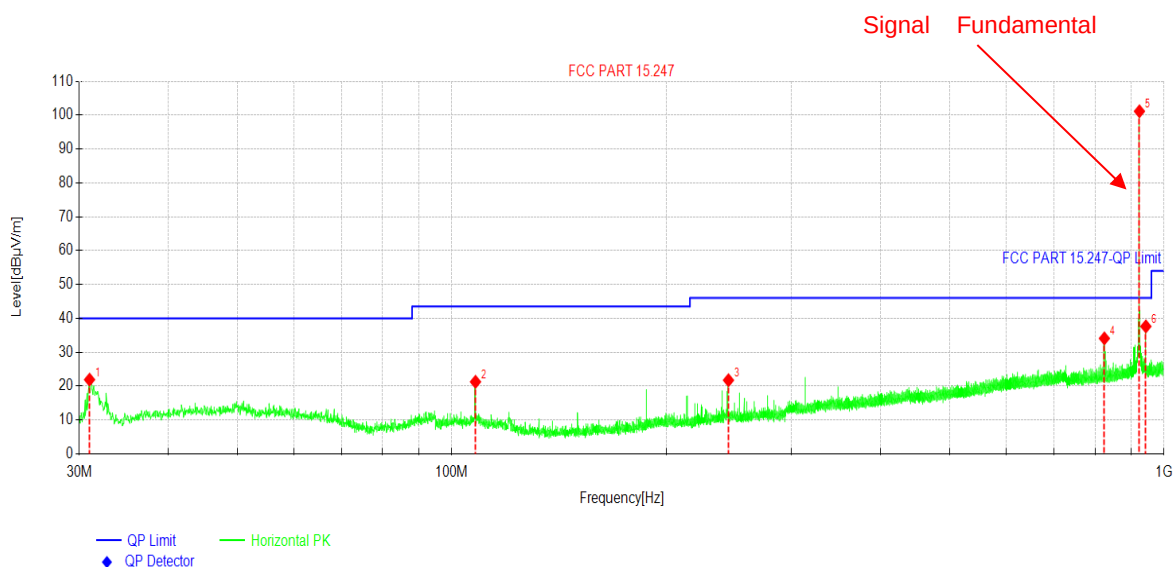
Product Name:	7858V	Product Model:	7858V
Test By:	Alan Chen	Test mode:	Highest channel Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	31.2126	37.48	-15.87	21.61	40.00	18.39	PK	Vertical
2	107.9434	36.50	-14.62	21.88	43.50	21.62	PK	Vertical
3	147.5699	43.56	-18.29	25.27	43.50	18.23	PK	Vertical
4	273.0457	44.83	-13.67	31.16	46.00	14.84	PK	Vertical
5	923.9482	106.75	-2.41	104.34	46.00	-58.34	PK	Vertical
6	942.8156	46.65	-2.43	44.22	46.00	1.78	PK	Vertical

Remark:
1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

Product Name:	7858V	Product Model:	7858V
Test By:	Alan Chen	Test mode:	Highest channel Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	31.0186	37.76	-15.85	21.91	40.00	18.09	PK	Horizontal
2	107.9919	35.89	-14.62	21.27	43.50	22.23	PK	Horizontal
3	244.6717	35.76	-14.02	21.74	46.00	24.26	PK	Horizontal
4	824.7607	37.76	-3.67	34.09	46.00	11.91	PK	Horizontal
5	923.7542	103.54	-2.41	101.13	46.00	-55.13	PK	Horizontal
6	943.0097	40.06	-2.43	37.63	46.00	8.37	PK	Horizontal

Remark:

1. Level = Reading + FactorAntenna Factor + Cable Loss – Preamplifier Factor).

Above 1GHz:

Lowest channel						
Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polarization
1814.19	61.16	-22.36	38.80	74.00	35.20	Vertical
1814.19	60.36	-22.36	38.00	74.00	36.00	Horizontal
Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polarization
1814.19	54.21	-22.36	31.85	54.00	22.15	Vertical
1814.19	54.55	-22.36	32.19	54.00	21.81	Horizontal
Middle channel						
Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polarization
1832.79	67.29	-22.24	45.05	74.00	28.95	Vertical
1832.79	66.54	-22.24	44.30	74.00	29.70	Horizontal
Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polarization
1832.79	64.56	-22.24	42.32	54.00	11.68	Vertical
1832.79	64.15	-22.24	41.91	54.00	12.09	Horizontal
Highest channel						
Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polarization
1847.67	66.54	-22.16	44.38	74.00	29.62	Vertical
1847.67	66.45	-22.16	44.29	74.00	29.71	Horizontal
Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polarization
1847.67	63.50	-22.16	41.34	54.00	12.66	Vertical
1847.67	63.00	-22.16	40.84	54.00	13.16	Horizontal
Remark:						
1. Level = Read level + Factor.						

-----End of report-----