



**SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch**

No. 1 Workshop, M-10, Middle section, Science & Technology Park,  
Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053  
Fax: +86 (0) 755 2671 0594  
Email: ee.shenzhen@sgs.com

Report No.: SZEM170500530604  
Page: 1 of 56

# TEST REPORT

**Application No.:** SZEM1705005306CR  
**Applicant:** SZ DJI TECHNOLOGY CO., LTD  
**Address of Applicant:** 14th floor, West Wing, Skyworth Semiconductor Design Building NO. 18 Gaoxin South 4th Ave, Nanshan District, Shenzhen, China  
**Manufacturer:** SZ DJI TECHNOLOGY CO., LTD  
**Address of Manufacturer:** 14th floor, West Wing, Skyworth Semiconductor Design Building NO. 18 Gaoxin South 4th Ave, Nanshan District, Shenzhen, China  
**Factory:** SZ DJI TECHNOLOGY CO., LTD  
**Address of Factory:** 14th floor, West Wing, Skyworth Semiconductor Design Building NO. 18 Gaoxin South 4th Ave, Nanshan District, Shenzhen, China  
**Equipment Under Test (EUT):**  
**EUT Name:** C1  
**Model No.:** GL358wD  
**Trade mark:** DJI  
**FCC ID:** SS3-GL358WD1705  
**Standards:** 47 CFR Part 15, Subpart E 15.407  
**Date of Receipt:** 2017-05-31  
**Date of Test:** 2017-06-02 to 2017-06-19  
**Date of Issue:** 2017-06-23

<b>Test Result :</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.



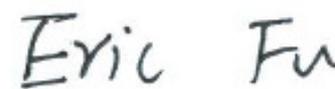
Jack Zhang  
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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<i>Revision Record</i>				
<i>Version</i>	<i>Chapter</i>	<i>Date</i>	<i>Modifier</i>	<i>Remark</i>
01		2017-06-23		Original

Authorized for issue by:				
				
		<hr/> <b>Hank Yan /Project Engineer</b>		
				
		<hr/> <b>Eric Fu /Reviewer</b>		



## 2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart E 15.407	N/A	47 CFR Part 15, Subpart C 15.203	Pass
Transmission in the Absence of Data	47 CFR Part 15, Subpart E 15.407	N/A	47 CFR Part 15, Subpart E 15.407 (c)	Pass

N/A: Not applicable

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
99% Bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 II D	N/A	Pass
Minimum 6 dB bandwidth (5.725-5.85 GHz band )	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II C 2	47 CFR Part 15, Subpart E 15.407 (e)	Pass
Maximum Conducted output power	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II E	47 CFR Part 15, Subpart E 15.407 (a)	Pass
Peak Power spectrum density	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II F	47 CFR Part 15, Subpart E 15.407 (a)	Pass
Radiated Emissions	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Pass
Frequency Stability	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 6.8	47 CFR Part 15, Subpart E 15.407 (g)	Pass

N/A: Not applicable



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## 4 General Information

### 4.1 Details of E.U.T.

Power supply: DC 3.7V Li-ion Battery  
Charged by DC 5V via USB port

Operation Frequency: 5745MHz to 5825MHz

Modulation Type: OFDM

Channel Numbers: 17

Antenna Type: PCB Antenna

Antenna Gain: 3.1dBi (2x2 MIMO)

Channel list							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	5745.00	6	5770.00	11	5795.00	16	5820.00
2	5750.00	7	5775.00	12	5800.00	17	5825.00
3	5755.00	8	5780.00	13	5805.00		
4	5760.00	9	5785.00	14	5810.00		
5	5765.00	10	5790.00	15	5815.00		

Selected Test Channel	
Channel	Frequency
The lowest channel (CH1)	5745MHz
The middle channel (CH9)	5785MHz
The highest channel (CH17)	5825MHz

### 4.2 Description of Support Units

The EUT has been tested as an independent unit.

### 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10 <sup>-8</sup>
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	RF Radiated power	4.5dB (below 1GHz)
		4.8dB (above 1GHz)
8	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-18GHz)
9	Temperature test	1 °C
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%



#### **4.4 Test Location**

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.  
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

#### **4.5 Test Facility**

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

#### **4.6 Deviation from Standards**

None

#### **4.7 Abnormalities from Standard Conditions**

None

## 5 Equipment List

RF Conducted Test					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

Radiated Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2017-05-10	2018-05-10
EXA Spectrum Analyzer	Agilent Technologies Inc	N9010A	SEM004-09	2016-07-19	2017-07-19
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2014-11-15	2017-11-15
Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2016-10-09	2017-10-09
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
Horn Antenna (18-26GHz)	ETS-Lindgren	3160	SEM003-12	2014-11-24	2017-11-24
Horn Antenna(26GHz-40GHz)	A.H.Systems, inc.	SAS-573	SEM003-13	2015-02-12	2018-02-12
Low Noise Amplifier	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2016-10-09	2017-10-09
Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2016-10-12	2017-10-12
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2017-04-18	2018-04-18

## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

#### 6.1.2 Conclusion

Standard Requirement:

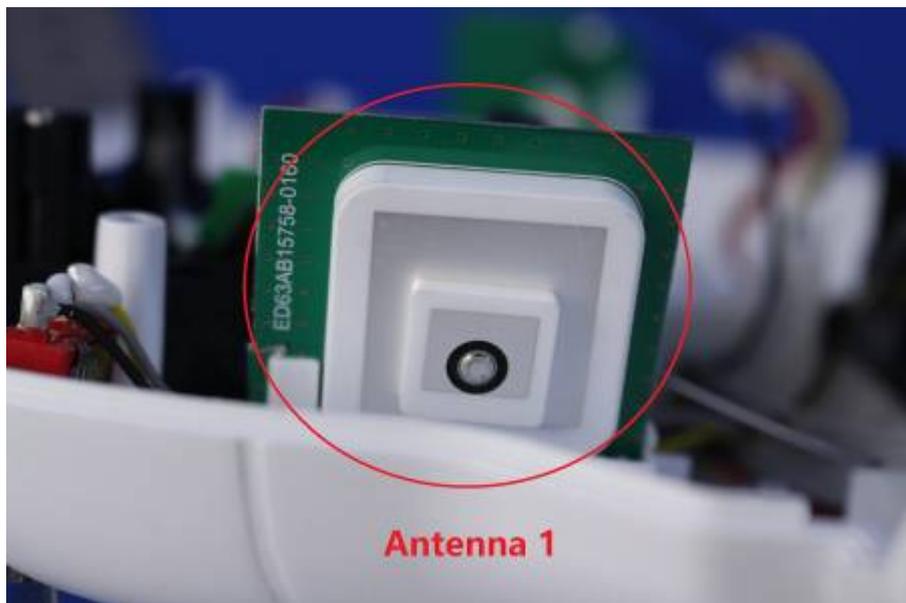
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

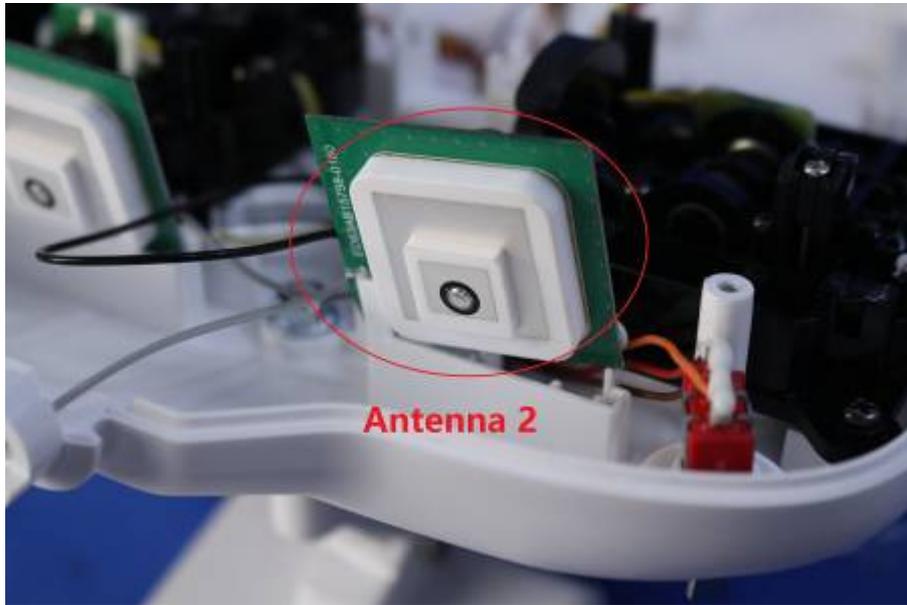
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 3.1dBi.

Direction Gain = 3.1dBi + 10 x log(2) = 6.1dBi

Ant1



Ant2





## **6.2 Transmission in the Absence of Data**

### **6.2.1 Test Requirement:**

47 CFR Part 15, Subpart E 15.407 (c)

### **6.2.2 Conclusion**

Standard Requirement:

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

Applicants shall include in their application for equipment authorization a description of how this requirement is met.

EUT Details:

RF chip (AR9342) support automatically discontinue transmission in case of either absence of information to transmit or operational failure, if the chip detect absence of information to transmit or operational failure, it will be automatically shut off.

## 7 Radio Spectrum Matter Test Results

### 7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

#### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 mbar

Pretest these f:TX mode\_Keep the EUT in continuously transmitting with modulation mode.

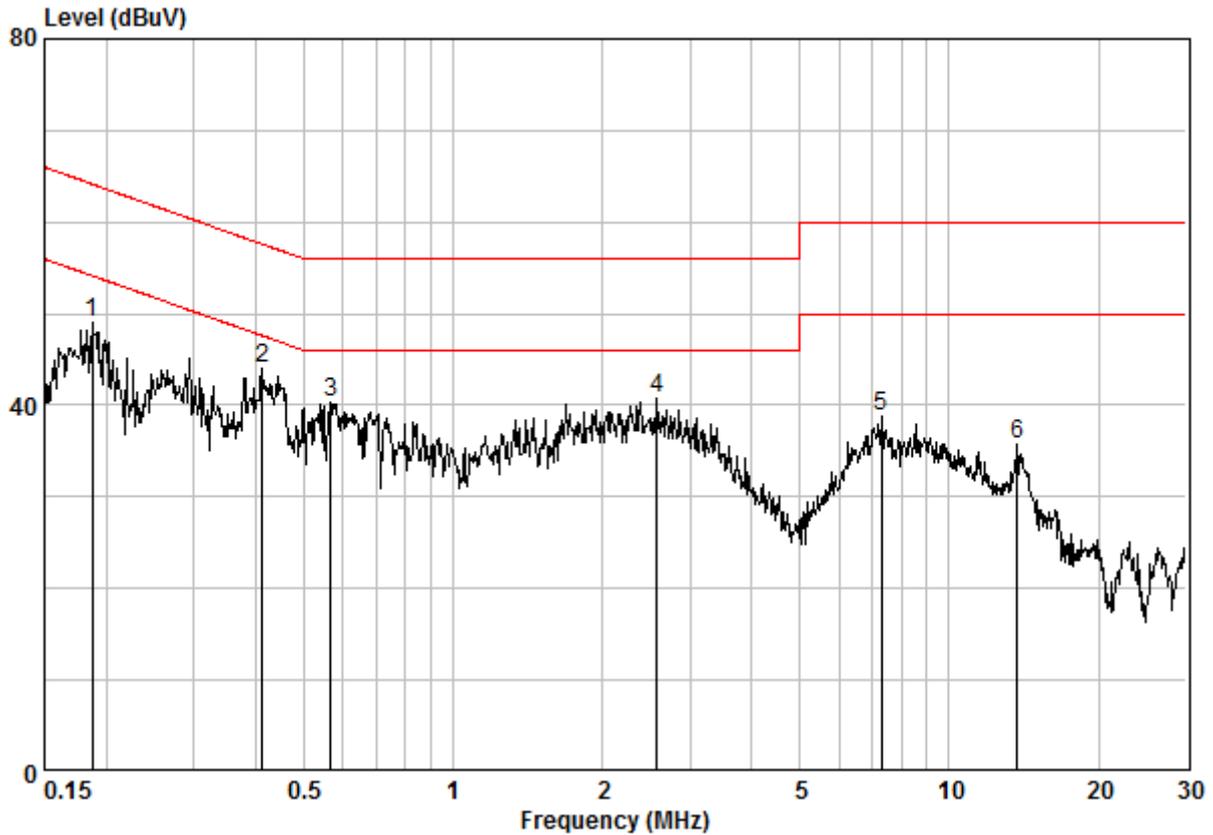
mode to find the g:Charge + TX mode\_Keep the EUT in charging and continuously transmitting with modulation mode.

worst case:  
The worst case g:Charge + TX mode\_Keep the EUT in charging and continuously transmitting with modulation mode.  
for final test:

#### 7.1.2 Measurement Procedure and Data

- 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 50ohm/50μH + 5ohm 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.

Mode:g; Line:Live Line

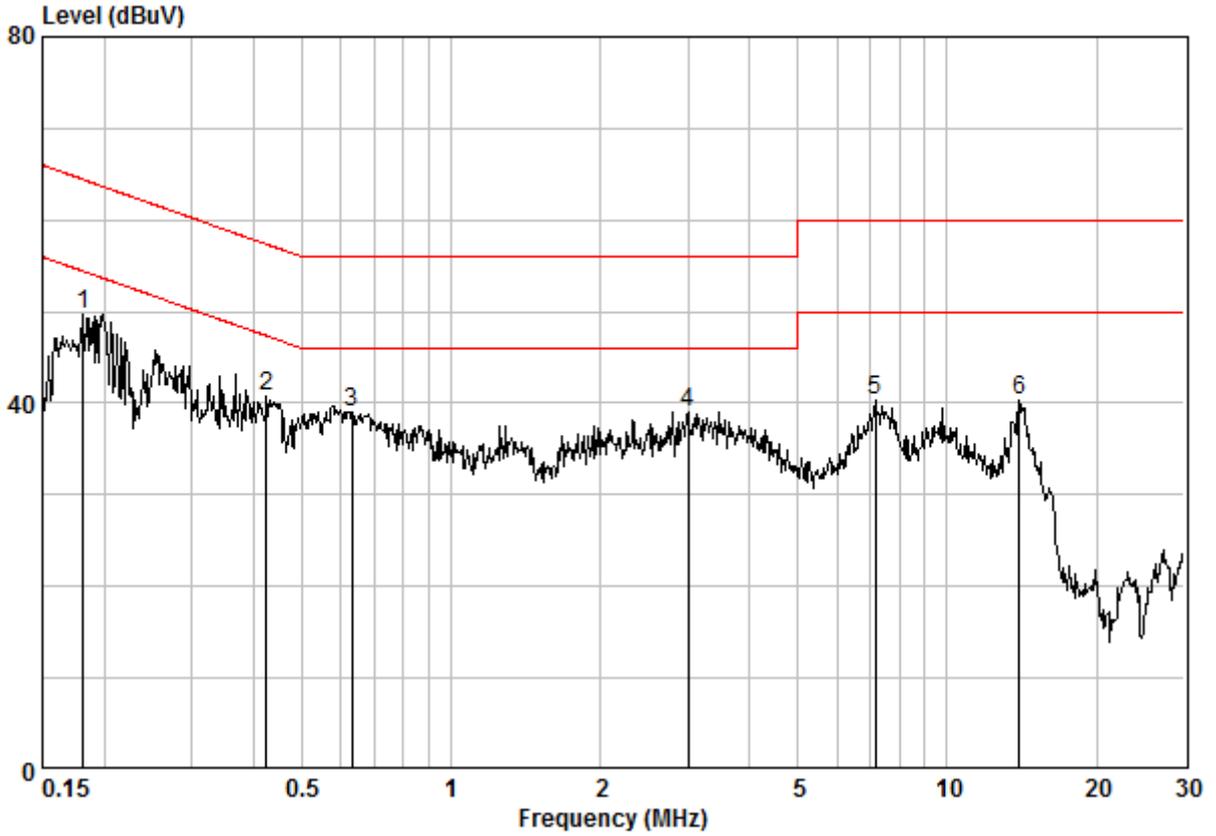


Site : Shielding Room  
 Condition : CE LINE  
 Job No. : 05306CR  
 Test Mode : g

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.18738	0.02	9.64	39.39	49.05	54.15	-5.10	Peak
2 @	0.41266	0.02	9.64	34.42	44.08	47.59	-3.51	Peak
3	0.56709	0.02	9.65	30.59	40.26	46.00	-5.74	Peak
4	2.581	0.03	9.68	30.97	40.68	46.00	-5.32	Peak
5	7.290	0.09	9.80	28.90	38.79	50.00	-11.21	Peak
6	13.695	0.15	9.93	25.72	35.80	50.00	-14.20	Peak



Mode:g; Line:Neutral Line



Site : Shielding Room  
Condition : CE NEUTRAL  
Job No. : 05306CR  
Test Mode : g

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.18152	0.02	9.63	40.13	49.78	54.42	-4.64	Peak
2	0.42373	0.02	9.63	31.06	40.71	47.37	-6.66	Peak
3	0.63048	0.02	9.63	29.35	39.00	46.00	-7.00	Peak
4	3.009	0.03	9.67	29.33	39.03	46.00	-6.97	Peak
5	7.175	0.08	9.77	30.56	40.42	50.00	-9.59	Peak
6	13.989	0.15	9.95	30.30	40.40	50.00	-9.60	Peak

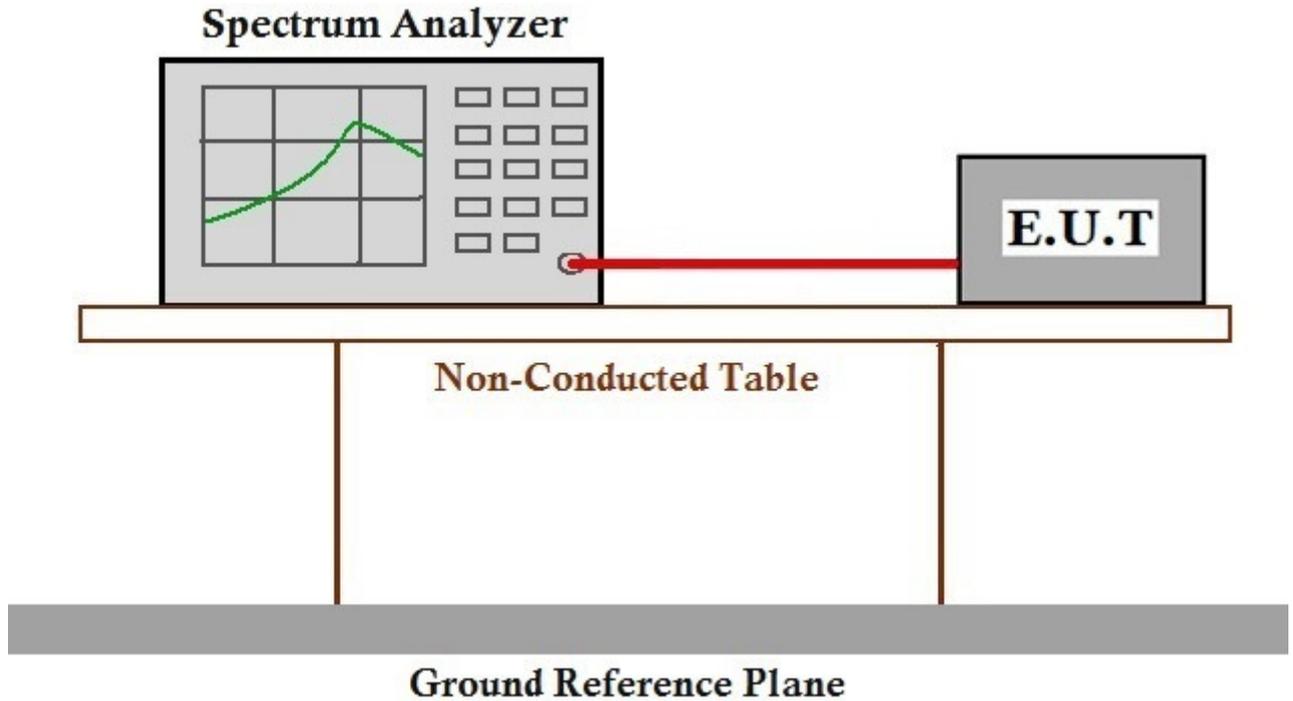
**7.2 99% Bandwidth**

Test Requirement N/A  
 Test Method: KDB 789033 II D

**7.2.1 E.U.T. Operation**

Operating Environment:  
 Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 mbar  
 Test mode f:TX mode\_Keep the EUT in continuously transmitting with modulation mode.

**7.2.2 Test Setup Diagram**



**7.2.3 Measurement Procedure and Data**

The detailed test data see: Appendix 15.407

**7.3 Minimum 6 dB bandwidth (5.725-5.85 GHz band )**

Test Requirement 47 CFR Part 15, Subpart E 15.407 (e)  
 Test Method: KDB 789033 D02 II C 2  
 Limit:  $\geq 500$  kHz

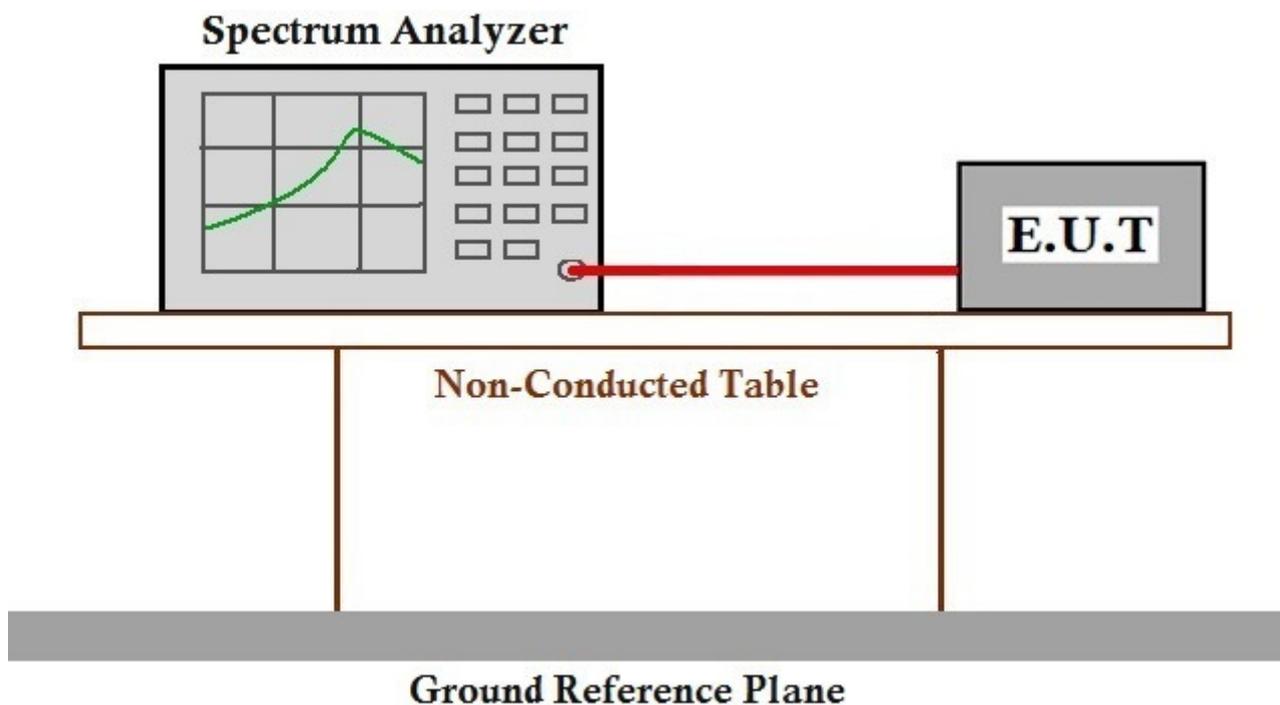
**7.3.1 E.U.T. Operation**

Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 mbar

Test mode f:TX mode\_Keep the EUT in continuously transmitting with modulation mode.

**7.3.2 Test Setup Diagram**



**7.3.3 Measurement Procedure and Data**

The detailed test data see: Appendix 15.407



#### 7.4 Maximum Conducted output power

Test Requirement 47 CFR Part 15, Subpart E 15.407 (a)  
Test Method: KDB 789033 D02 II E  
Limit:

Frequency band(MHz)	Limit
5150-5250	≤1W(30dBm) for master device
	≤250mW(24dBm) for client device
5250-5350	≤250mW(24dBm) for client device or 11dBm+10logB*
5470-5725	≤250mW(24dBm) for client device or 11dBm+10logB*
5725-5850	≤1W(30dBm)

Remark: \*Where B is the 26dB emission bandwidth in MHz.  
The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

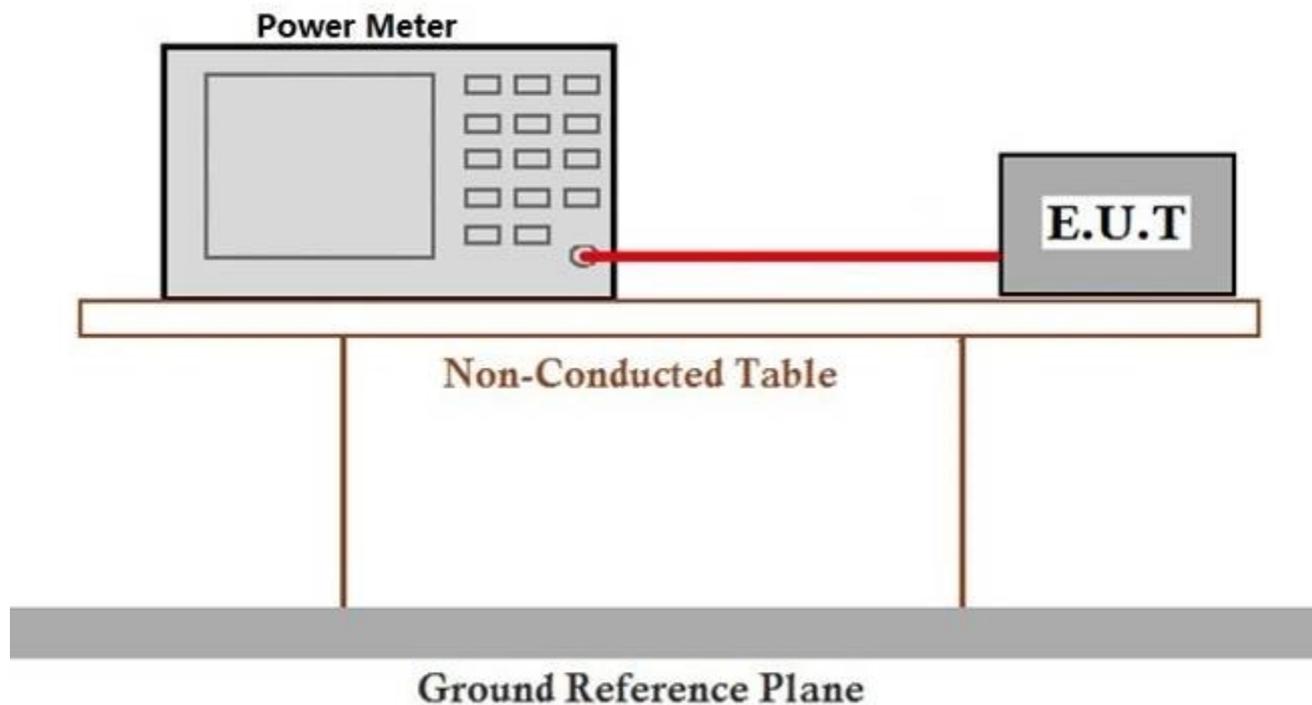
**7.4.1 E.U.T. Operation**

Operating Environment:

Temperature: 22 °C      Humidity: 52 % RH      Atmospheric Pressure: 1005 mbar

Test mode      f:TX mode\_Keep the EUT in continuously transmitting with modulation mode.

**7.4.2 Test Setup Diagram**



**7.4.3 Measurement Procedure and Data**

The detailed test data see: Appendix 15.407

### 7.5 Peak Power spectrum density

Test Requirement 47 CFR Part 15, Subpart E 15.407 (a)  
 Test Method: KDB 789033 D02 II F  
 Limit:

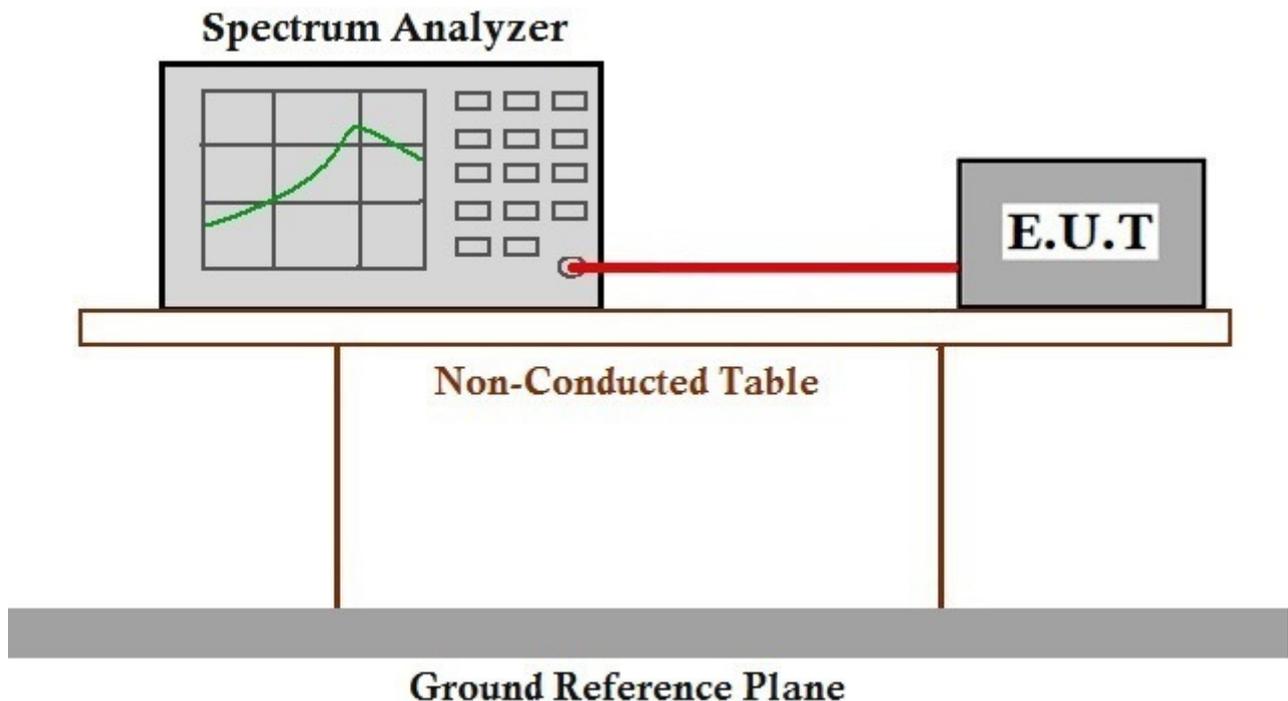
Frequency band(MHz)	Limit
5150-5250	≤17dBm in 1MHz for master device
	≤11dBm in 1MHz for client device
5250-5350	≤11dBm in 1MHz for client device
5470-5725	≤11dBm in 1MHz for client device
5725-5850	≤30dBm in 500 kHz

Remark: The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.

#### 7.5.1 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 mbar  
 Test mode f:TX mode\_Keep the EUT in continuously transmitting with modulation mode.

#### 7.5.2 Test Setup Diagram



#### 7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

## 7.6 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.407(b)  
 Test Method: KDB 789033 D02 II G  
 Measurement Distance: 3m

### 7.6.1 E.U.T. Operation

Operating Environment:

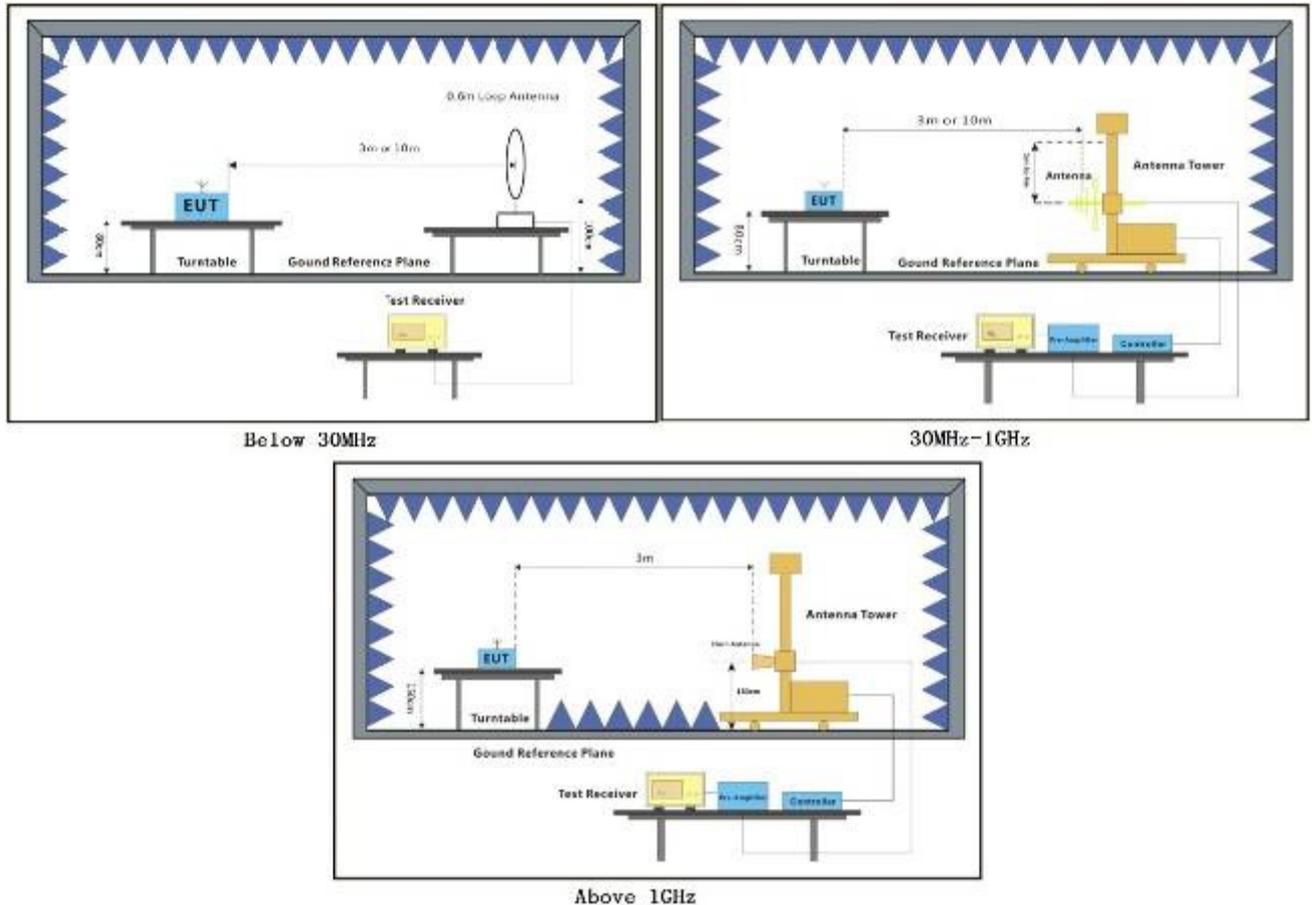
Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 mbar

Pretest these mode to find the worst case: f:TX mode\_Keep the EUT in continuously transmitting with modulation mode.

g:Charge + TX mode\_Keep the EUT in charging and continuously transmitting with modulation mode.

The worst case for final test: g:Charge + TX mode\_Keep the EUT in charging and continuously transmitting with modulation mode.

### 7.6.2 Test Setup Diagram





### **7.6.3 Measurement Procedure and Data**

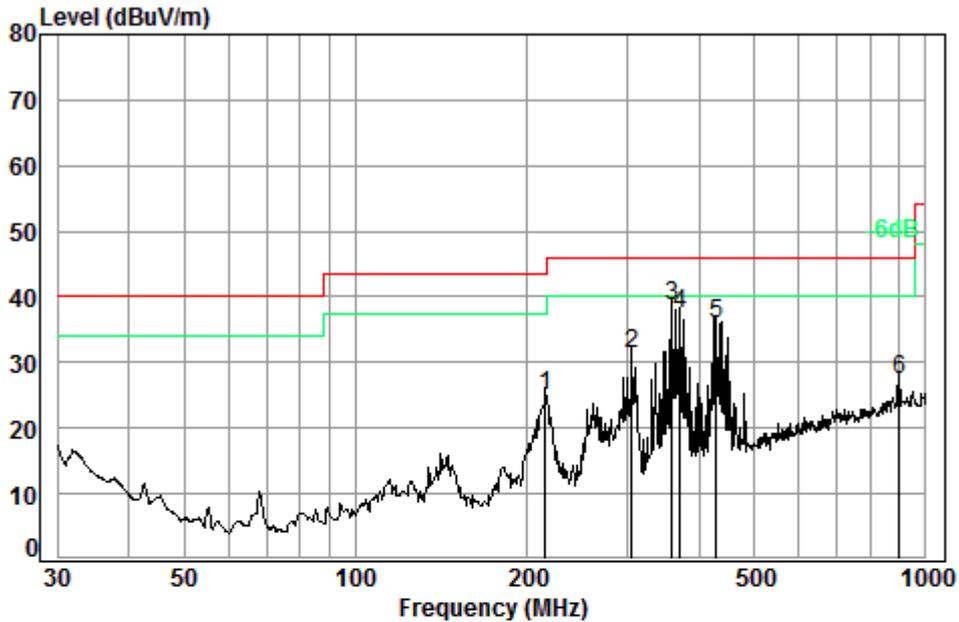
- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. 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.
- e. 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. 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.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.



**Below 1GHz:**

For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

Mode:g; Polarization:Horizontal; Modulation Type:OFDM; bandwidth:5MHz; Channel:Low

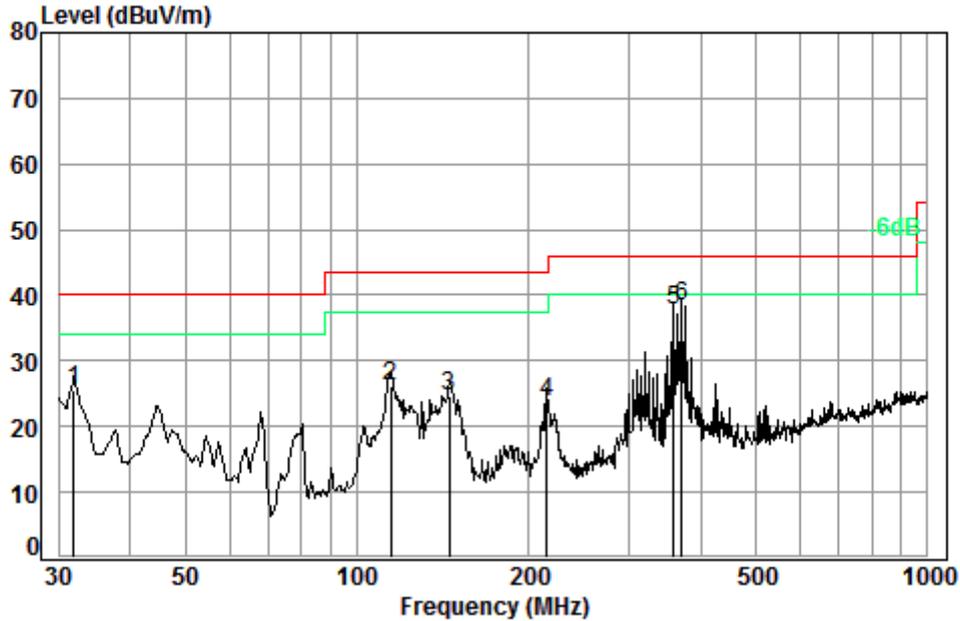


Condition: 3m HORIZONTAL  
Job No. : 05304CR/5306CR  
Test mode: g

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	215.27	1.49	10.99	26.65	39.24	25.07	43.50	-18.43
2	305.68	1.92	14.10	26.44	41.73	31.31	46.00	-14.69
3 pp	359.19	2.09	14.67	26.85	48.81	38.72	46.00	-7.28
4	370.70	2.12	15.64	26.93	46.45	37.28	46.00	-8.72
5	429.52	2.33	16.49	27.31	44.52	36.03	46.00	-9.97
6	900.15	3.60	23.20	26.78	27.48	27.50	46.00	-18.50



Mode:g; Polarization:Vertical; Modulation Type:OFDM; bandwidth:5MHz; Channel:Low



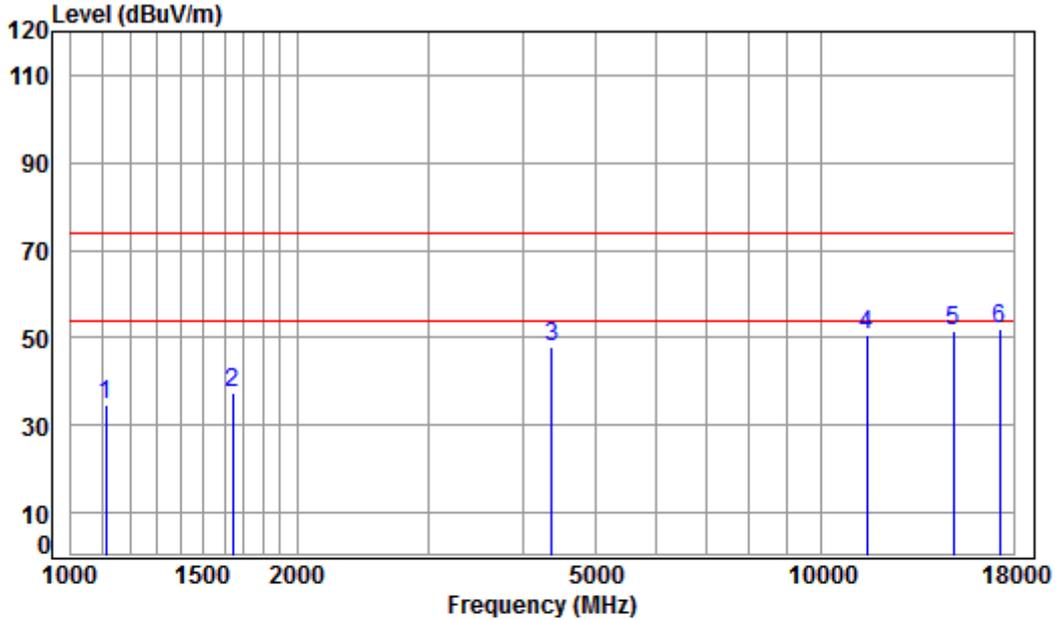
Condition: 3m VERTICAL  
Job No. : 05304CR/5306CR  
Test mode: g

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	31.95	0.60	17.61	27.35	34.71	25.57	40.00	-14.43
2	114.51	1.24	8.28	27.10	43.85	26.27	43.50	-17.23
3	145.35	1.31	8.58	26.93	41.72	24.68	43.50	-18.82
4	215.27	1.49	10.99	26.65	37.96	23.79	43.50	-19.71
5	359.19	2.09	14.67	26.85	47.89	37.80	46.00	-8.20
6 pp	370.70	2.12	15.64	26.93	47.49	38.32	46.00	-7.68



**Above 1GHz:**

Mode:g; Polarization:Horizontal; Modulation Type:OFDM; bandwidth:5MHz; Channel:Low

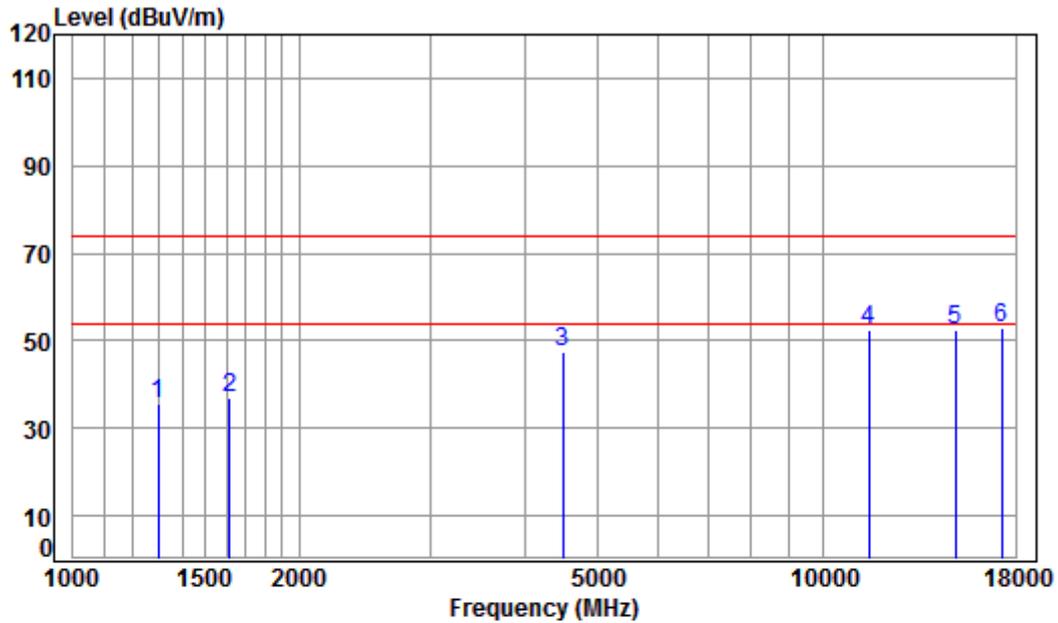


Condition: 3m HORIZONTAL  
Job No: : 05304CR\05306CR  
Mode: : 5745 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1112.872	3.95	24.03	38.09	44.56	34.45	74.00	-39.55	peak
2	1644.019	4.64	26.44	38.04	44.35	37.39	74.00	-36.61	peak
3	4367.058	7.13	33.60	38.18	45.15	47.70	74.00	-26.30	peak
4	11490.000	12.33	38.09	35.50	35.64	50.56	74.00	-23.44	peak
5	14960.120	14.84	41.23	38.90	34.49	51.66	74.00	-22.34	peak
6	pp17235.000	17.60	43.08	36.18	27.29	51.79	74.00	-22.21	peak



Mode:g; Polarization:Vertical; Modulation Type:OFDM; bandwidth:5MHz; Channel:Low

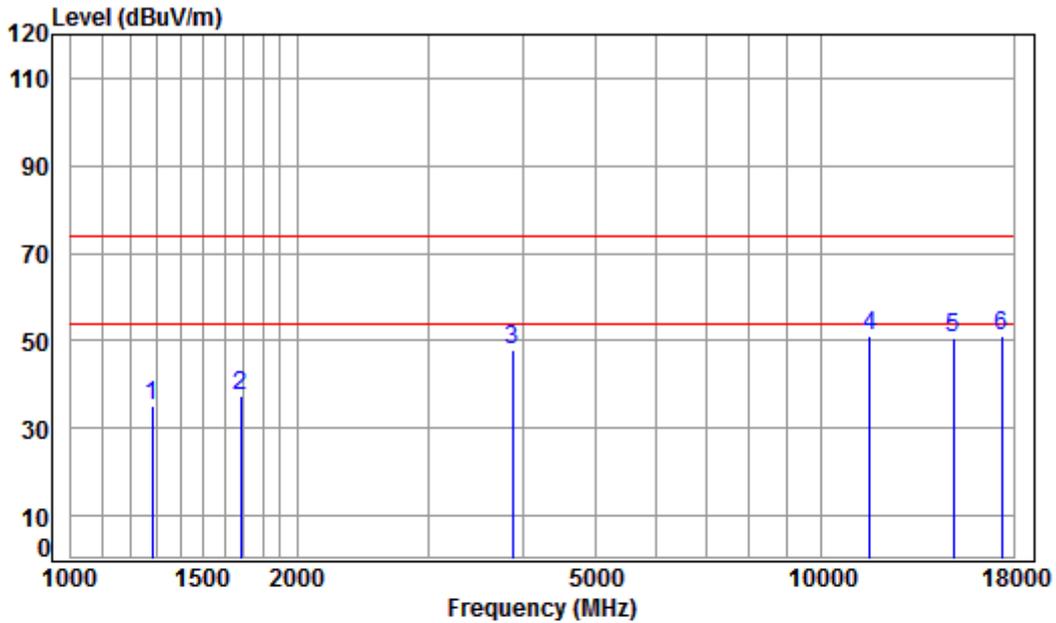


Condition: 3m VERTICAL  
Job No: : 05304CR\05306CR  
Mode: : 5745 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1300.858	4.22	24.96	38.07	44.40	35.51	74.00	-38.49	peak
2	1615.754	4.61	26.32	38.04	44.16	37.05	74.00	-36.95	peak
3	4495.125	7.27	33.60	38.25	44.97	47.59	74.00	-26.41	peak
4	11490.000	12.33	38.09	35.50	37.72	52.64	74.00	-21.36	peak
5	14960.120	14.84	41.23	38.90	35.44	52.61	74.00	-21.39	peak
6	pp17235.000	17.60	43.08	36.18	28.35	52.85	74.00	-21.15	peak



Mode:g; Polarization:Horizontal; Modulation Type:OFDM; bandwidth:5MHz; Channel:middle

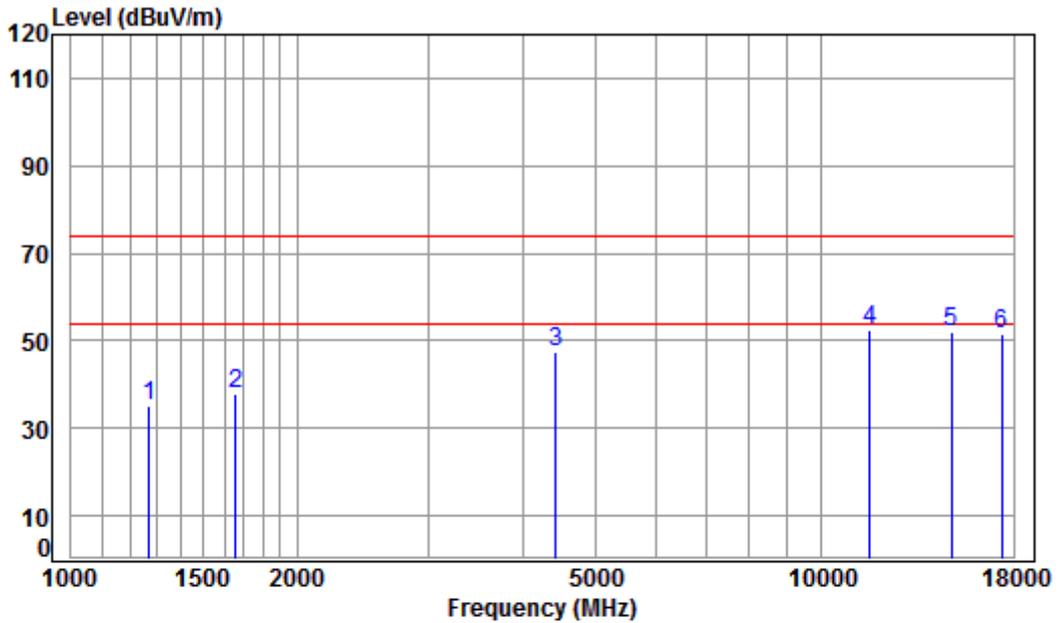


Condition: 3m HORIZONTAL  
Job No: : 05304CR\05306CR  
Mode: : 5785 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1282.193	4.20	24.87	38.07	44.17	35.17	74.00	-38.83	peak
2	1682.477	4.69	26.60	38.03	44.10	37.36	74.00	-36.64	peak
3	3867.831	6.60	33.25	37.99	45.97	47.83	74.00	-26.17	peak
4	11570.000	12.34	38.17	35.51	35.94	50.94	74.00	-23.06	peak
5	14960.120	14.84	41.23	38.90	33.31	50.48	74.00	-23.52	peak
6	pp17355.000	17.93	43.23	36.12	26.24	51.28	74.00	-22.72	peak



Mode:g; Polarization:Vertical; Modulation Type:OFDM; bandwidth:5MHz; Channel:middle

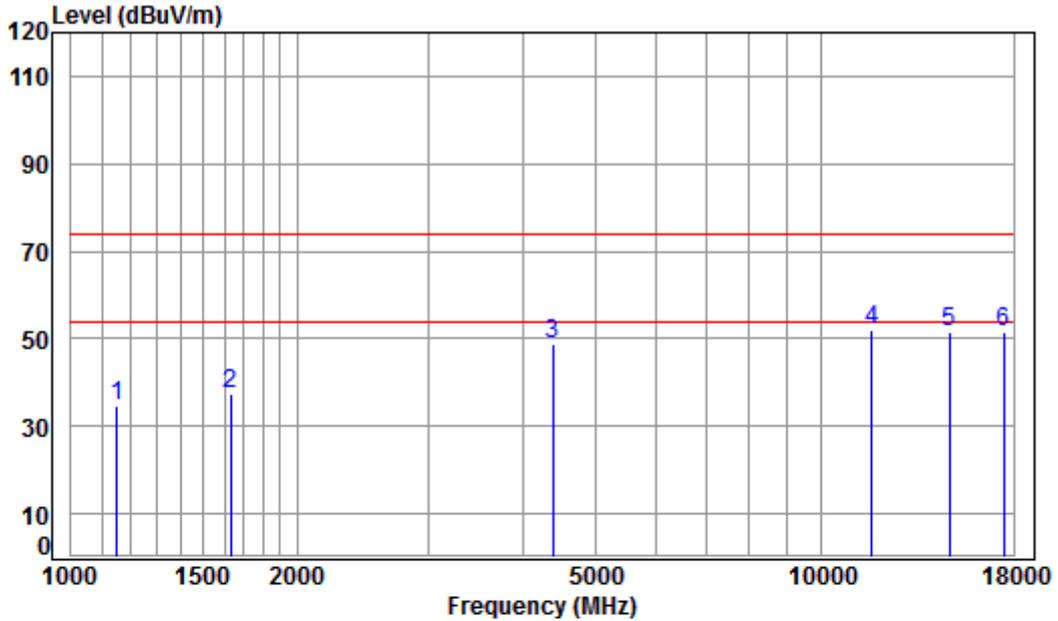


Condition: 3m VERTICAL  
Job No: : 05304CR\05306CR  
Mode: : 5785 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1271.123	4.18	24.82	38.07	44.06	34.99	74.00	-39.01	peak
2	1658.337	4.66	26.50	38.03	44.51	37.64	74.00	-36.36	peak
3	4417.841	7.19	33.60	38.21	44.81	47.39	74.00	-26.61	peak
4	pp11570.000	12.34	38.17	35.51	37.41	52.41	74.00	-21.59	peak
5	14873.890	14.82	41.08	38.91	34.97	51.96	74.00	-22.04	peak
6	17355.000	17.93	43.23	36.12	26.70	51.74	74.00	-22.26	peak



Mode:g; Polarization:Horizontal; Modulation Type:OFDM; bandwidth:5MHz; Channel:High

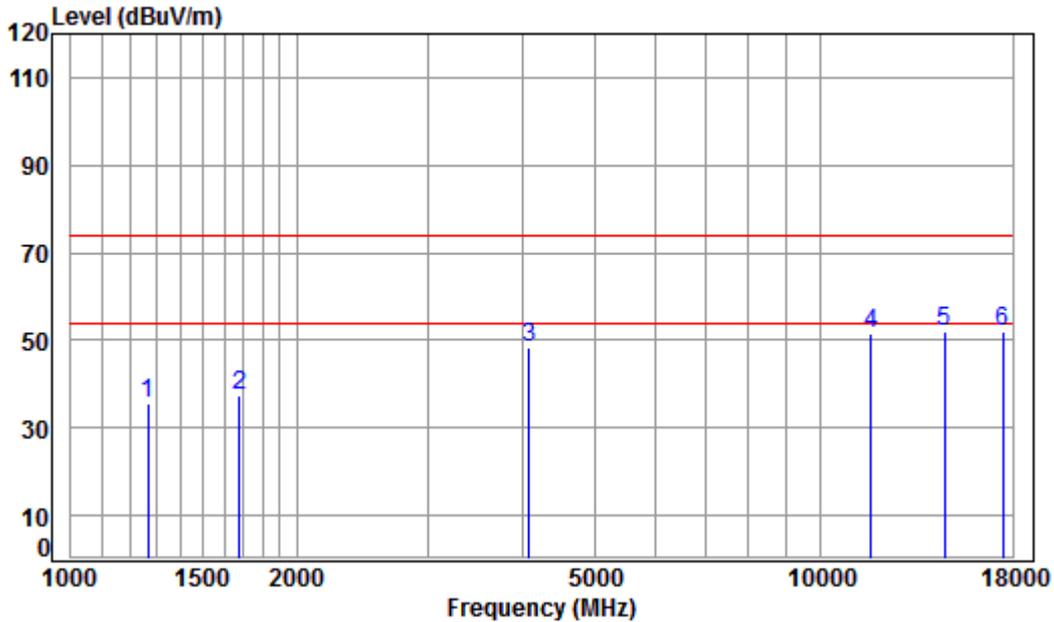


Condition: 3m HORIZONTAL  
Job No: : 05304CR\05306CR  
Mode: : 5825 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1152.148	4.01	24.24	38.08	44.65	34.82	74.00	-39.18	peak
2	1634.543	4.63	26.40	38.04	44.27	37.26	74.00	-36.74	peak
3	4379.699	7.15	33.60	38.19	46.25	48.81	74.00	-25.19	peak
4	pp11650.000	12.35	38.25	35.53	36.78	51.85	74.00	-22.15	peak
5	14788.150	14.80	40.92	38.92	34.71	51.51	74.00	-22.49	peak
6	17475.000	18.25	43.37	36.06	25.98	51.54	74.00	-22.46	peak



Mode:g; Polarization:Vertical; Modulation Type:OFDM; bandwidth:5MHz; Channel:High



Condition: 3m VERTICAL  
Job No: : 05304CR\05306CR  
Mode: : 5825 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1267.454	4.18	24.80	38.07	44.51	35.42	74.00	-38.58	peak
2	1677.621	4.68	26.58	38.03	44.06	37.29	74.00	-36.71	peak
3	4086.182	6.80	33.60	38.04	45.82	48.18	74.00	-25.82	peak
4	11650.000	12.35	38.25	35.53	36.70	51.77	74.00	-22.23	peak
5	pp14618.170	14.75	40.62	38.94	35.80	52.23	74.00	-21.77	peak
6	17475.000	18.25	43.37	36.06	26.33	51.89	74.00	-22.11	peak

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$

2) Scan from 9kHz to 40GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



### 7.7 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.407(b)  
Test Method: KDB 789033 D02 II G  
Measurement Distance: 3m  
Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

**7.7.1 E.U.T. Operation**

Operating Environment:

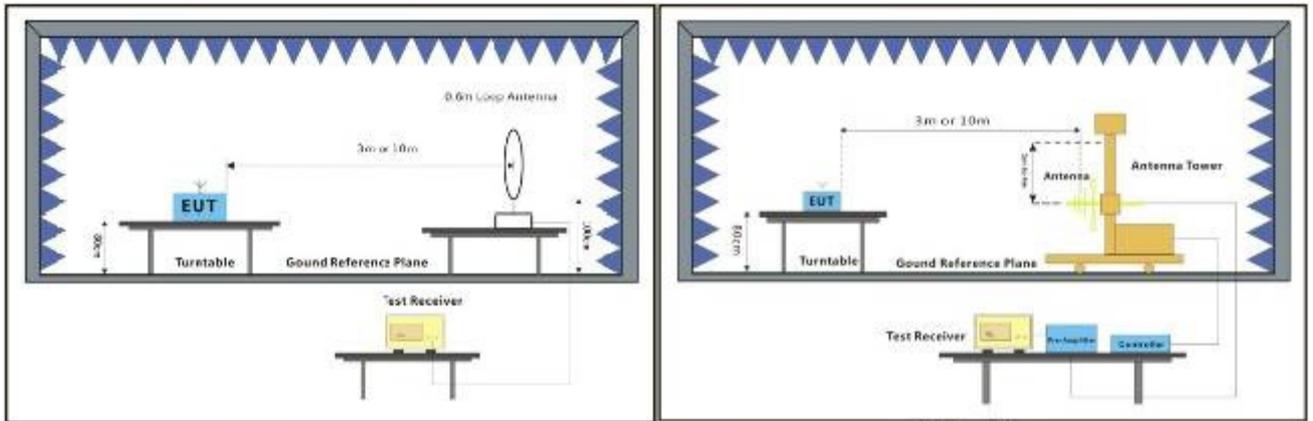
Temperature: 22 °C      Humidity: 52 % RH      Atmospheric Pressure: 1005 mbar

Pretest these mode to find the worst case: f:TX mode\_Keep the EUT in continuously transmitting with modulation mode.

g:Charge + TX mode\_Keep the EUT in charging and continuously transmitting with modulation mode.

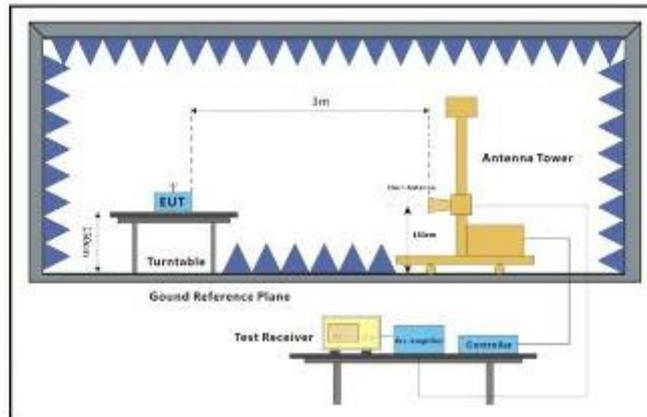
The worst case for final test: g:Charge + TX mode\_Keep the EUT in charging and continuously transmitting with modulation mode.

**7.7.2 Test Setup Diagram**



Below 30MHz

30MHz-1GHz



Above 1GHz

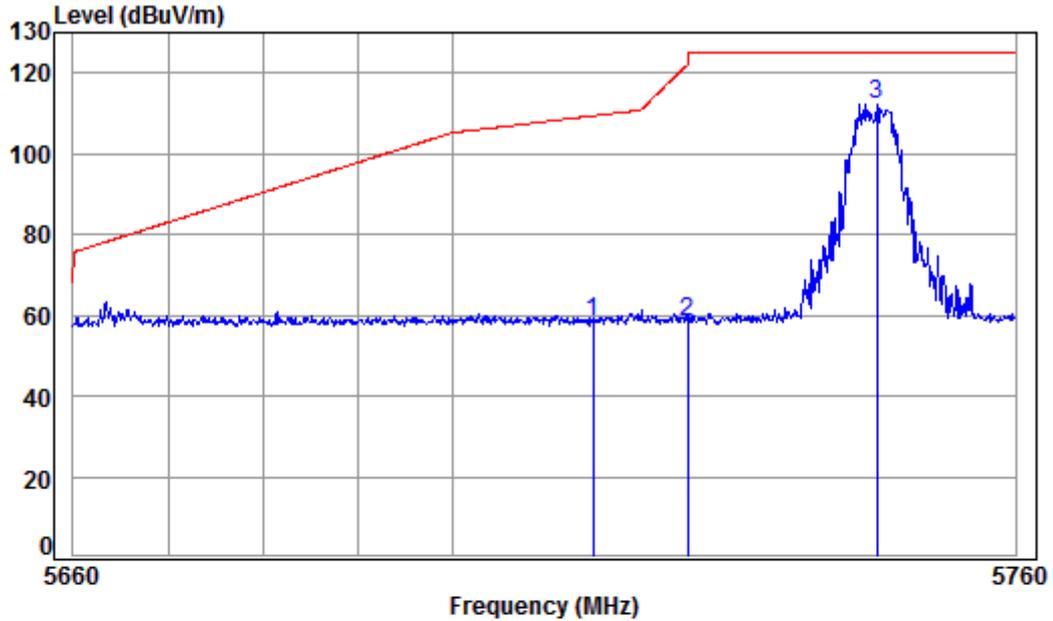


### **7.7.3 Measurement Procedure and Data**

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. 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.
- e. 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. 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.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.



Mode:g; Polarization:Horizontal; Modulation Type:OFDM; bandwidth:5MHz; Channel:Low

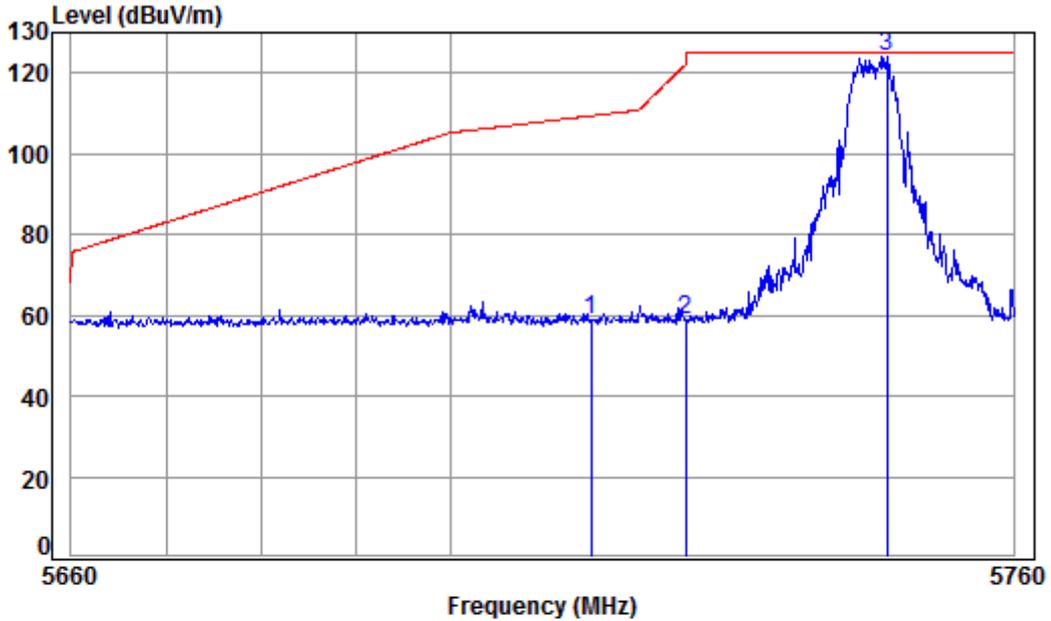


Condition: 3m HORIZONTAL  
Job No: : 05304CR\05306CR  
Mode: : 5745 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5715.000	8.47	34.53	38.36	53.57	58.21	109.40	-51.19	peak
2	5725.000	8.48	34.54	38.35	53.66	58.33	122.20	-63.87	peak
3 pp	5745.190	8.50	34.55	38.35	107.66	112.36	125.20	-12.84	peak



Mode:g; Polarization:Vertical; Modulation Type:OFDM; bandwidth:5MHz; Channel:Low



Condition: 3m VERTICAL

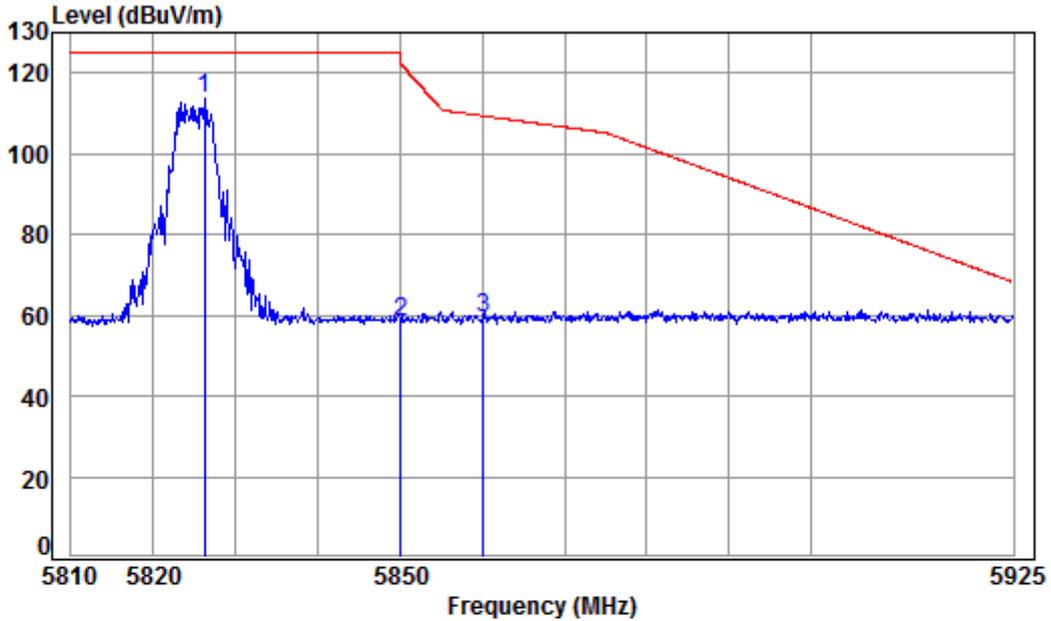
Job No: : 05304CR\05306CR

Mode: : 5745 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5715.000	8.47	34.53	38.36	54.18	58.82	109.40	-50.58	peak
2	5725.000	8.48	34.54	38.35	53.96	58.63	122.20	-63.57	peak
3 pp	5746.498	8.50	34.55	38.35	119.30	124.00	125.20	-1.20	peak



Mode:g; Polarization:Horizontal; Modulation Type:OFDM; bandwidth:5MHz; Channel:High



Condition: 3m HORIZONTAL

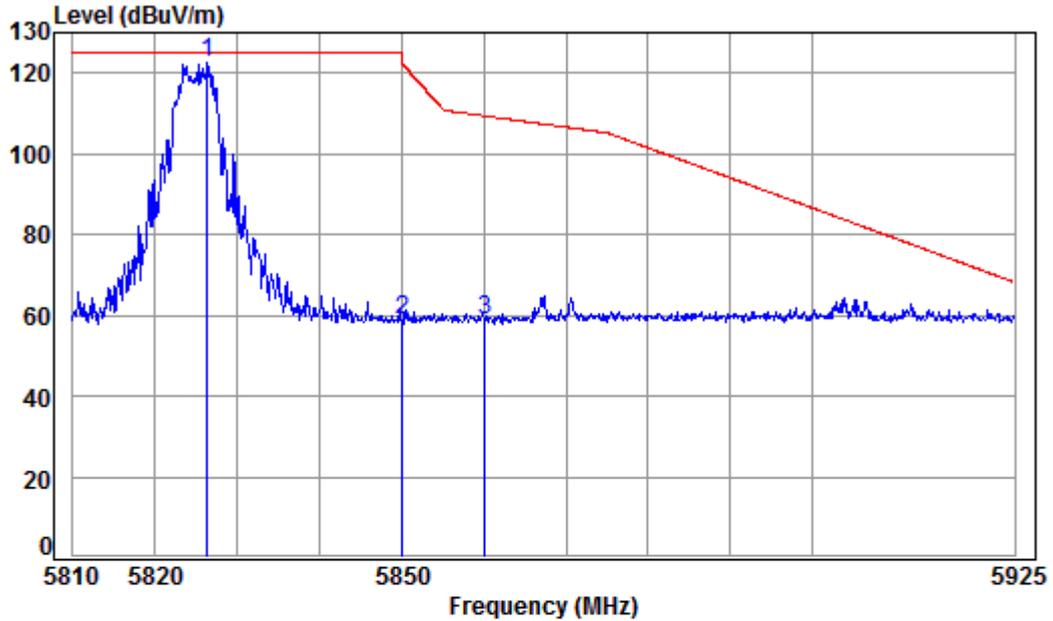
Job No: : 05304CR\05306CR

Mode: : 5825 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	5826.193	8.58	34.60	38.33	108.90	113.75	125.20	-11.45	peak
2	5850.000	8.60	34.61	38.33	53.43	58.31	122.20	-63.89	peak
3	5860.000	8.61	34.62	38.33	54.64	59.54	109.40	-49.86	peak



Mode:g; Polarization:Vertical; Modulation Type:OFDM; bandwidth:5MHz; Channel:High



Condition: 3m VERTICAL

Job No: : 05304CR\05306CR

Mode: : 5825 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	5826.307	8.58	34.60	38.33	117.54	122.39	125.20	-2.81	peak
2	5850.000	8.60	34.61	38.33	53.95	58.83	122.20	-63.37	peak
3	5860.000	8.61	34.62	38.33	54.01	58.91	109.40	-50.49	peak

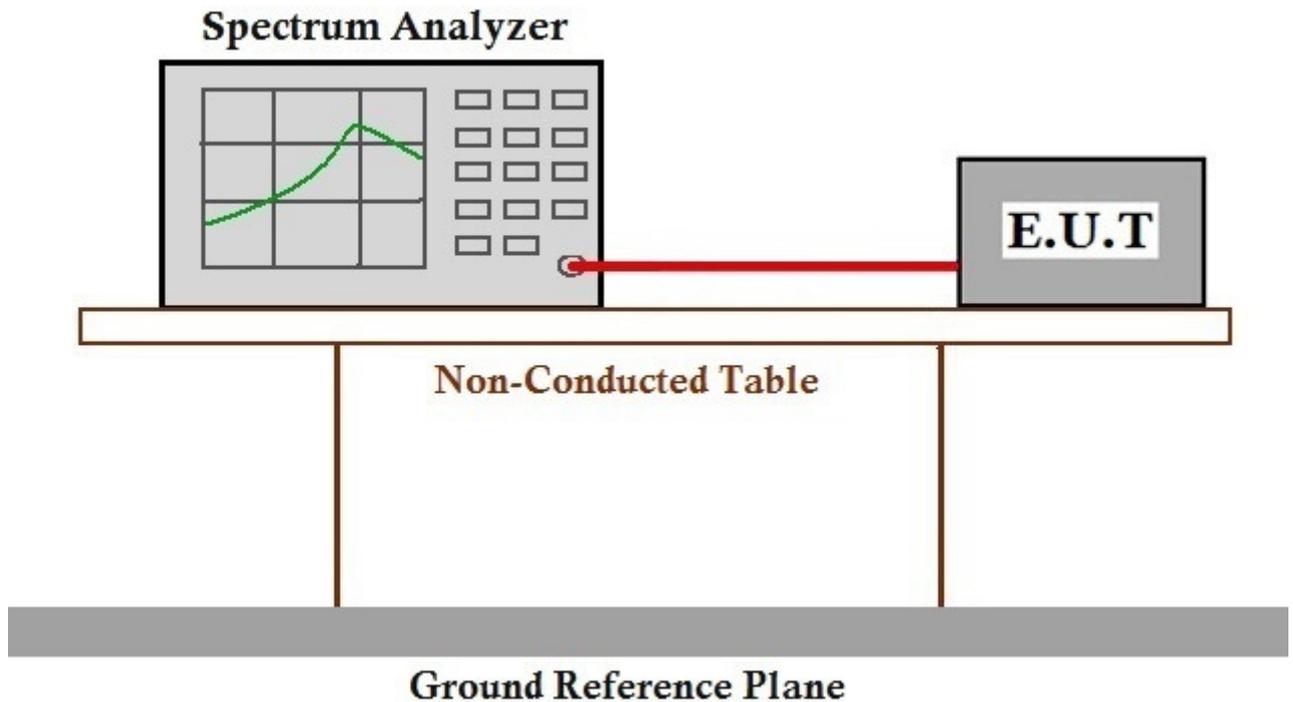
**7.8 Frequency Stability**

Test Requirement 47 CFR Part 15, Subpart E 15.407 (g)  
 Test Method: ANSI C63.10 (2013) Section 6.8  
 Limit: The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

**7.8.1 E.U.T. Operation**

Operating Environment:  
 Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 mbar  
 Test mode f:TX mode\_Keep the EUT in continuously transmitting with modulation mode.

**7.8.2 Test Setup Diagram**



**7.8.3 Measurement Procedure and Data**

The detailed test data see: Appendix 15.407



Test mode:	OFDM	Frequency(MHz):	5745
------------	------	-----------------	------

Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Result
40	3.7	5744.4709	Pass
30		5744.4713	Pass
20		5744.4722	Pass
10		5744.4716	Pass
0		5744.4711	Pass
25	4.2	5744.4710	Pass
	3.7	5744.4713	Pass
	3.6	5744.4723	Pass

Test mode:	OFDM	Frequency(MHz):	5785
------------	------	-----------------	------

Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Result
40	3.7	5784.5893	Pass
30		5784.5902	Pass
20		5784.5911	Pass
10		5784.5908	Pass
0		5784.5903	Pass
25	4.2	5784.5897	Pass
	3.7	5784.5902	Pass
	3.6	5784.5911	Pass

Test mode:	OFDM	Frequency(MHz):	5825
------------	------	-----------------	------

Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Result
40	3.7	5824.6184	Pass
30		5824.6189	Pass
20		5824.6198	Pass
10		5824.6191	Pass
0		5824.6187	Pass
25	4.2	5824.6179	Pass
	3.7	5824.6189	Pass
	3.6	5824.6197	Pass

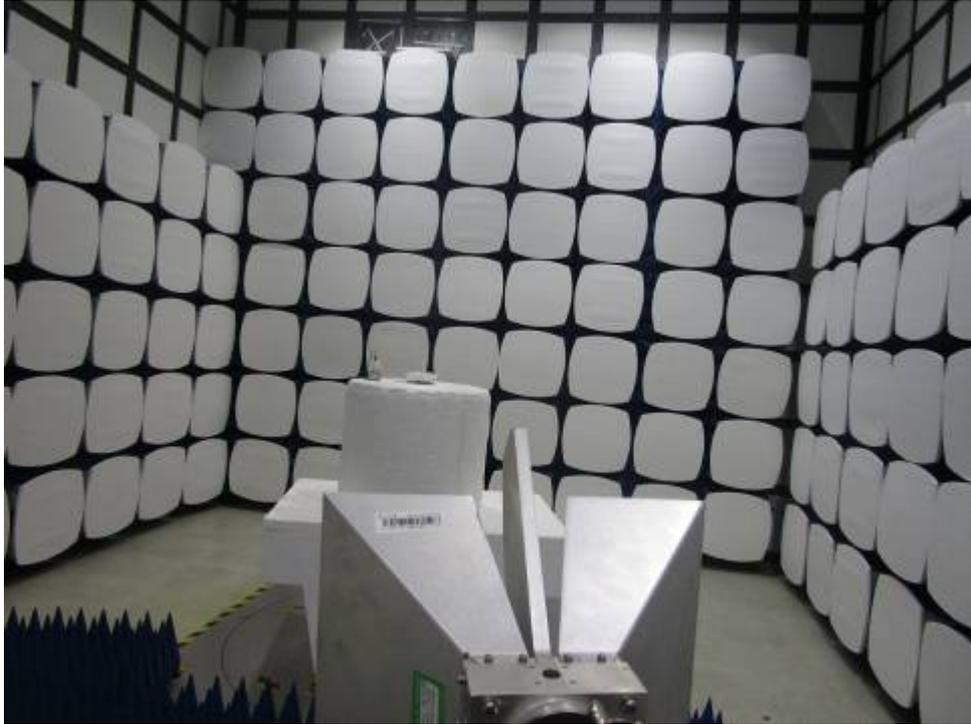
## 8 Photographs

### 8.1 Conducted Emissions at AC Power Line (150kHz-30MHz) Test Setup



### 8.2 Radiated Spurious Emissions Test Setup







### **8.3 EUT Constructional Details**

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1705005306CR.

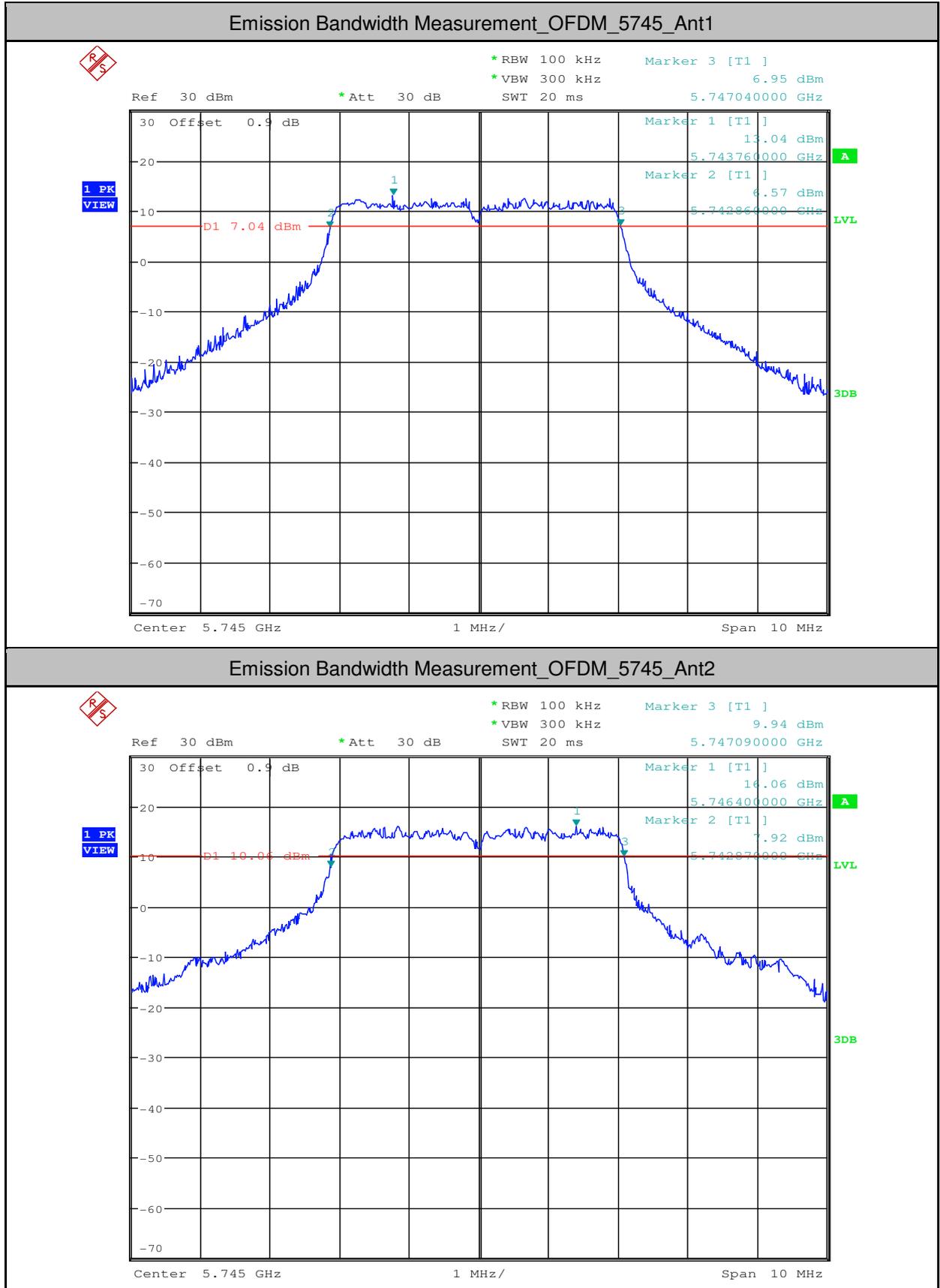


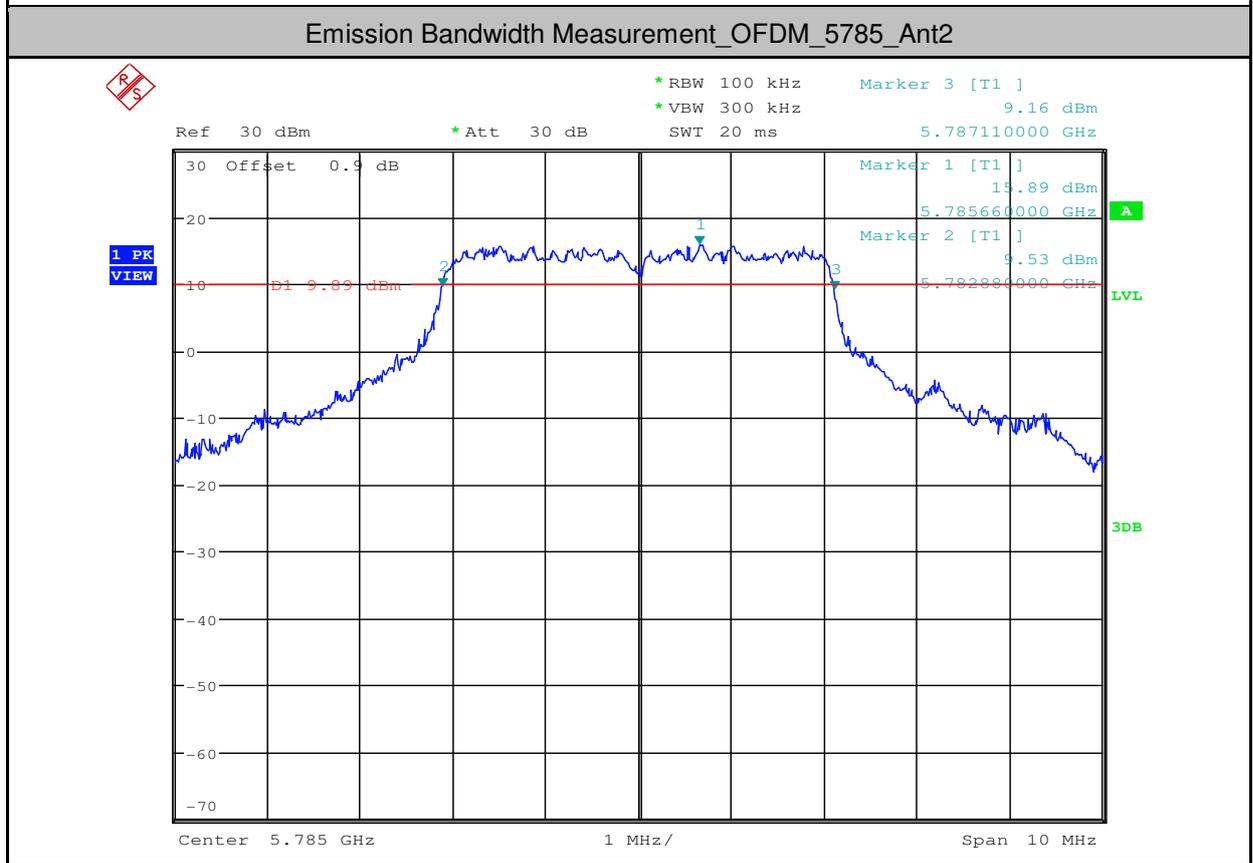
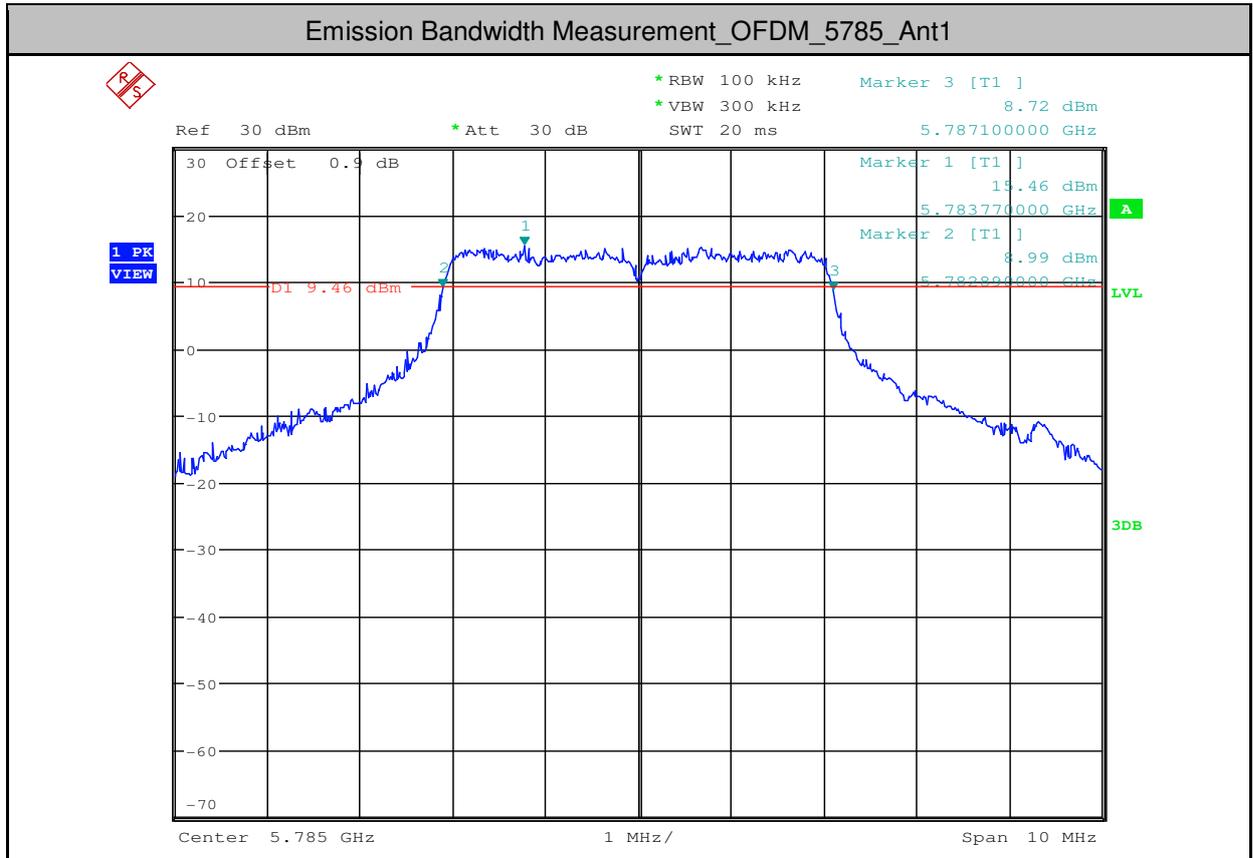
## 9 Appendix

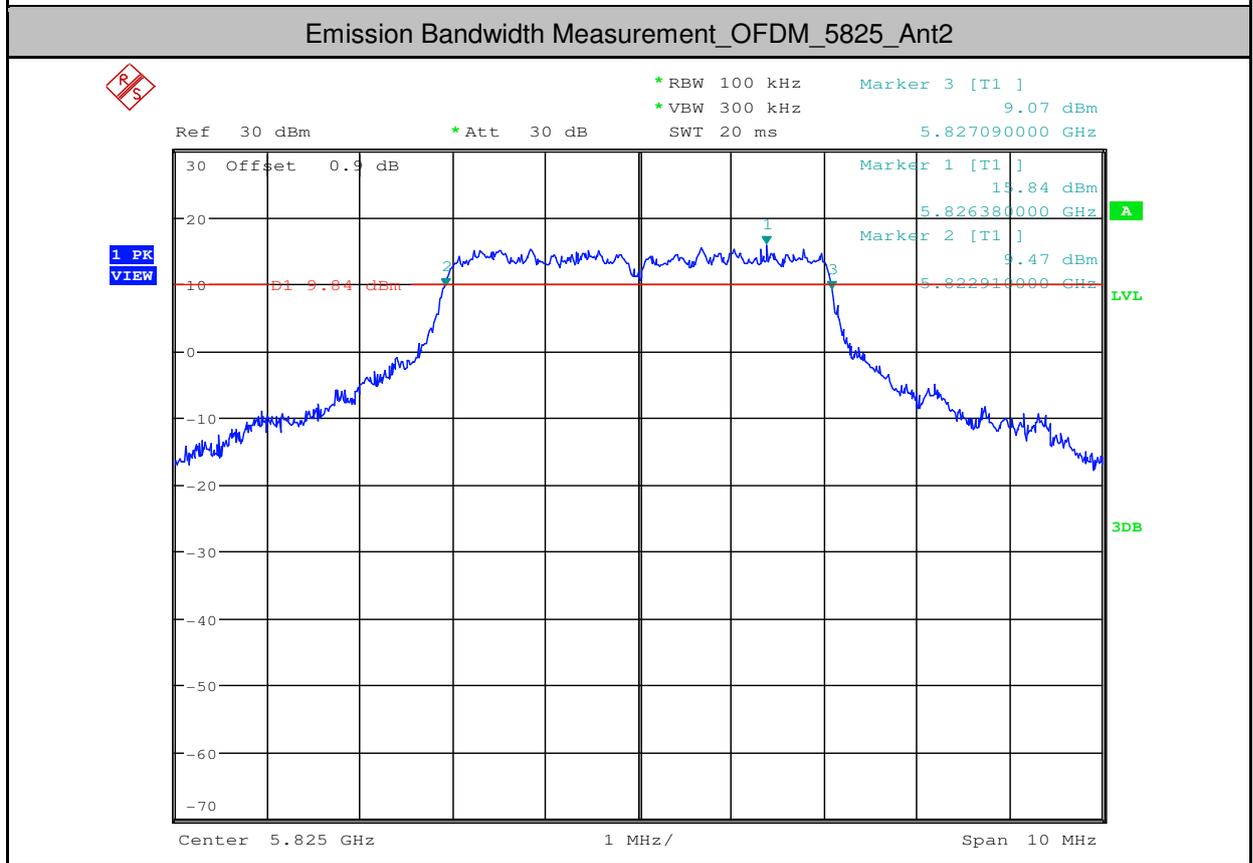
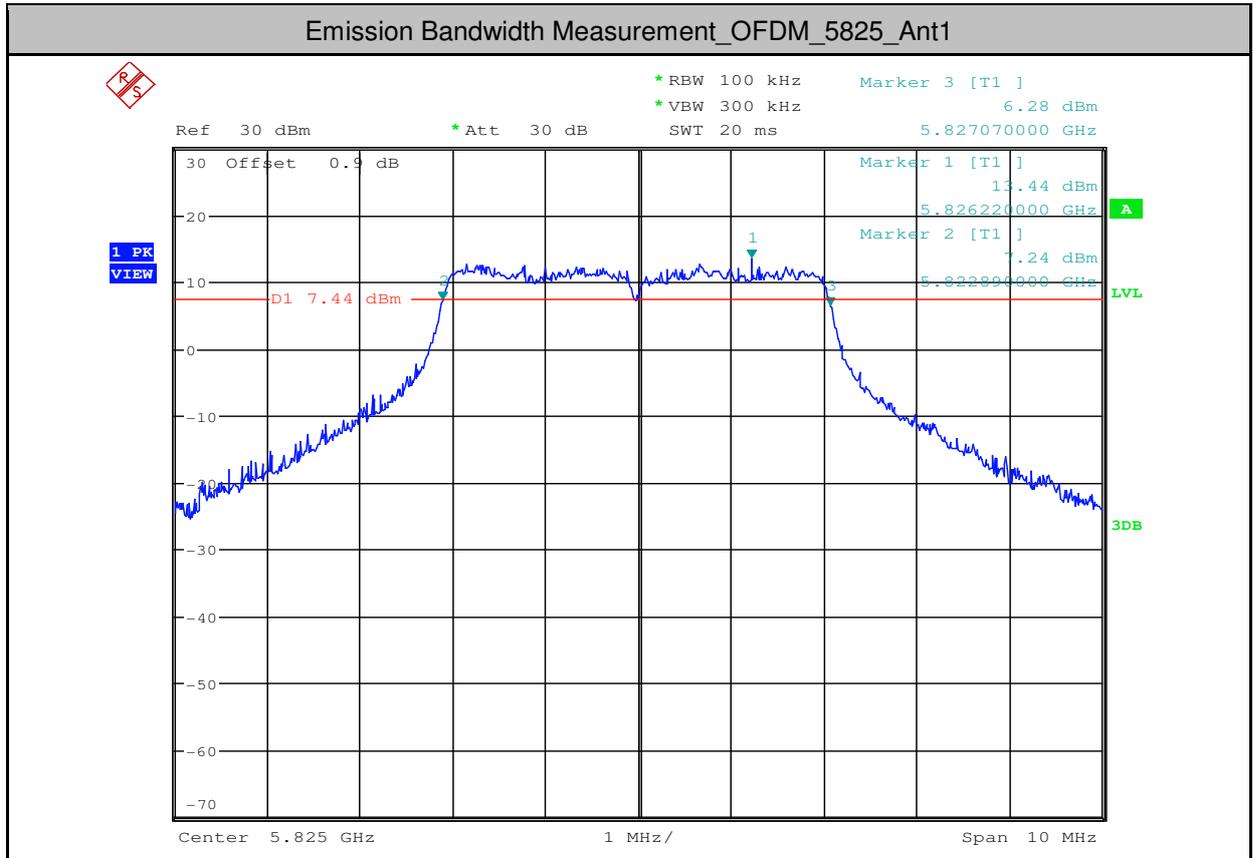
### 9.1 Appendix 15.407

#### 1.Emission Bandwidth Measurement

Test Mode	Test Channel	Ant	EBW[MHz]	Limit[MHz]	Verdict
OFDM	5745	Ant1	4.180	$\geq 0.5$	PASS
OFDM	5745	Ant2	4.220	$\geq 0.5$	PASS
OFDM	5785	Ant1	4.210	$\geq 0.5$	PASS
OFDM	5785	Ant2	4.230	$\geq 0.5$	PASS
OFDM	5825	Ant1	4.180	$\geq 0.5$	PASS
OFDM	5825	Ant2	4.180	$\geq 0.5$	PASS







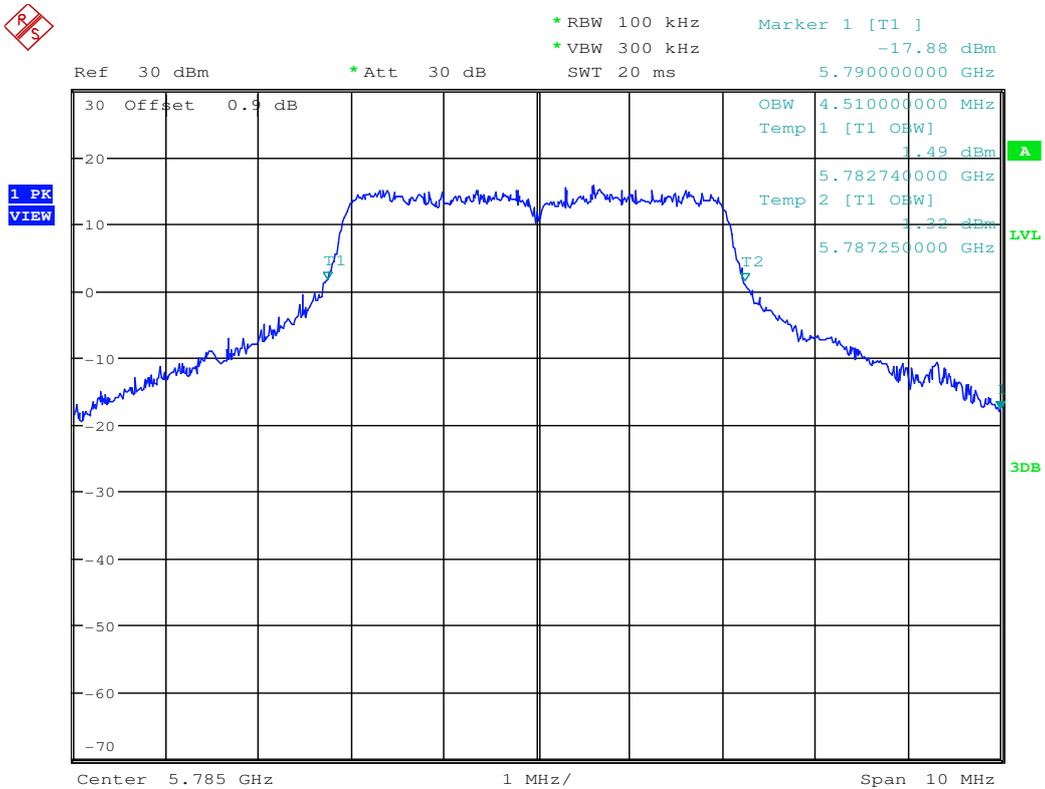


## 2.Occupied Bandwidth Measurement

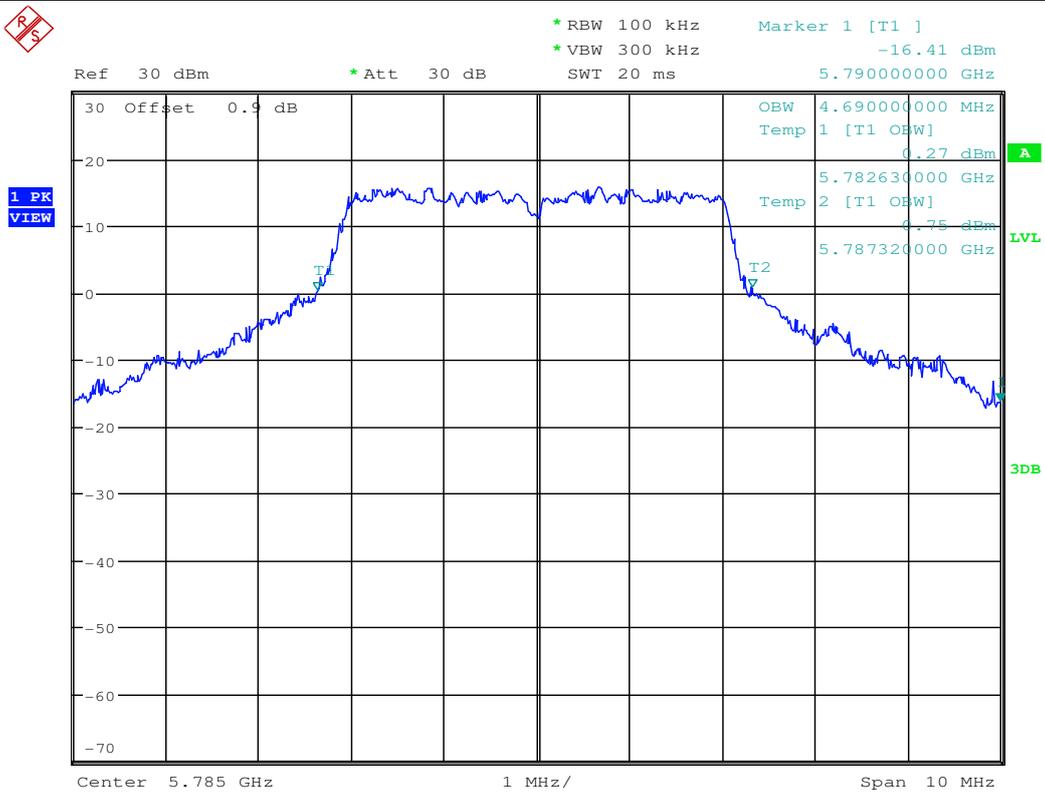
Test Mode	Test Channel	Ant	OBW[MHz]	Limit[MHz]	Verdict
OFDM	5745	Ant1	4.400	---	PASS
OFDM	5745	Ant2	4.610	---	PASS
OFDM	5785	Ant1	4.510	---	PASS
OFDM	5785	Ant2	4.690	---	PASS
OFDM	5825	Ant1	4.400	---	PASS
OFDM	5825	Ant2	4.680	---	PASS



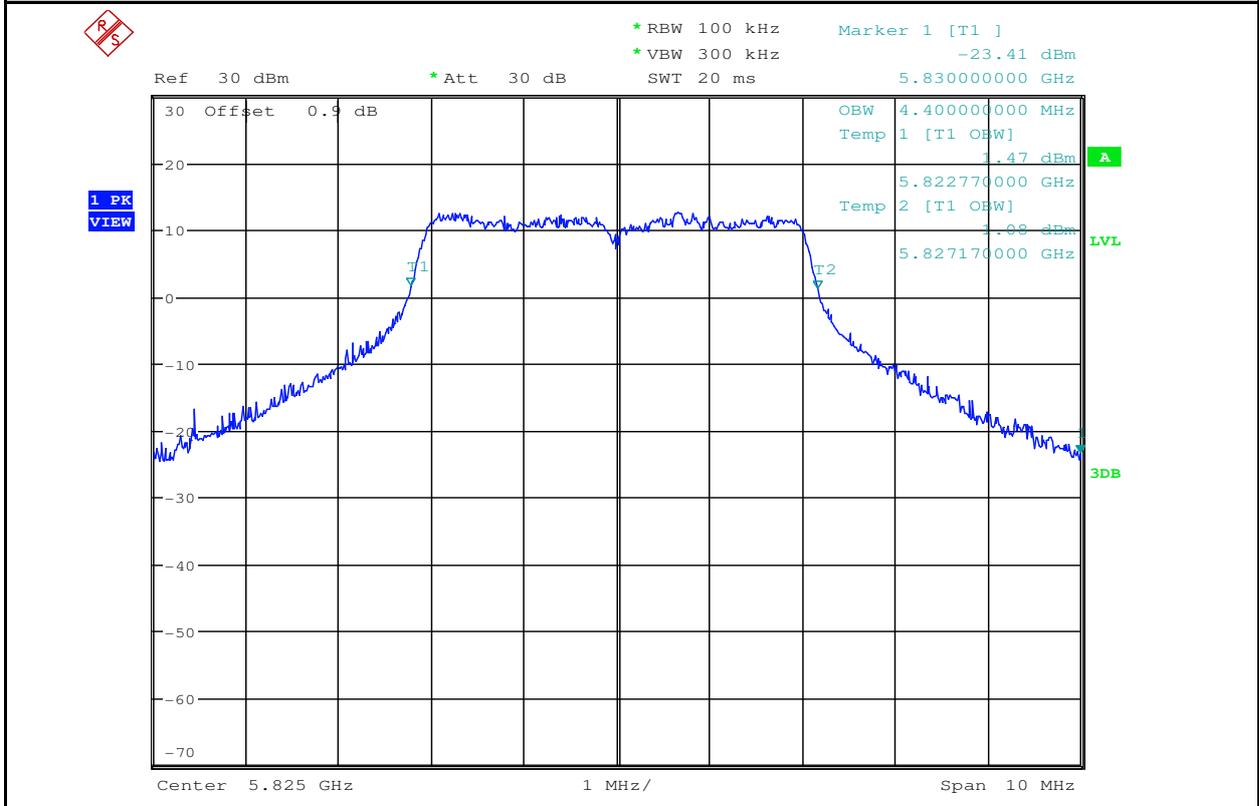
Occupied Bandwidth Measurement\_OFDM\_5785\_Ant1



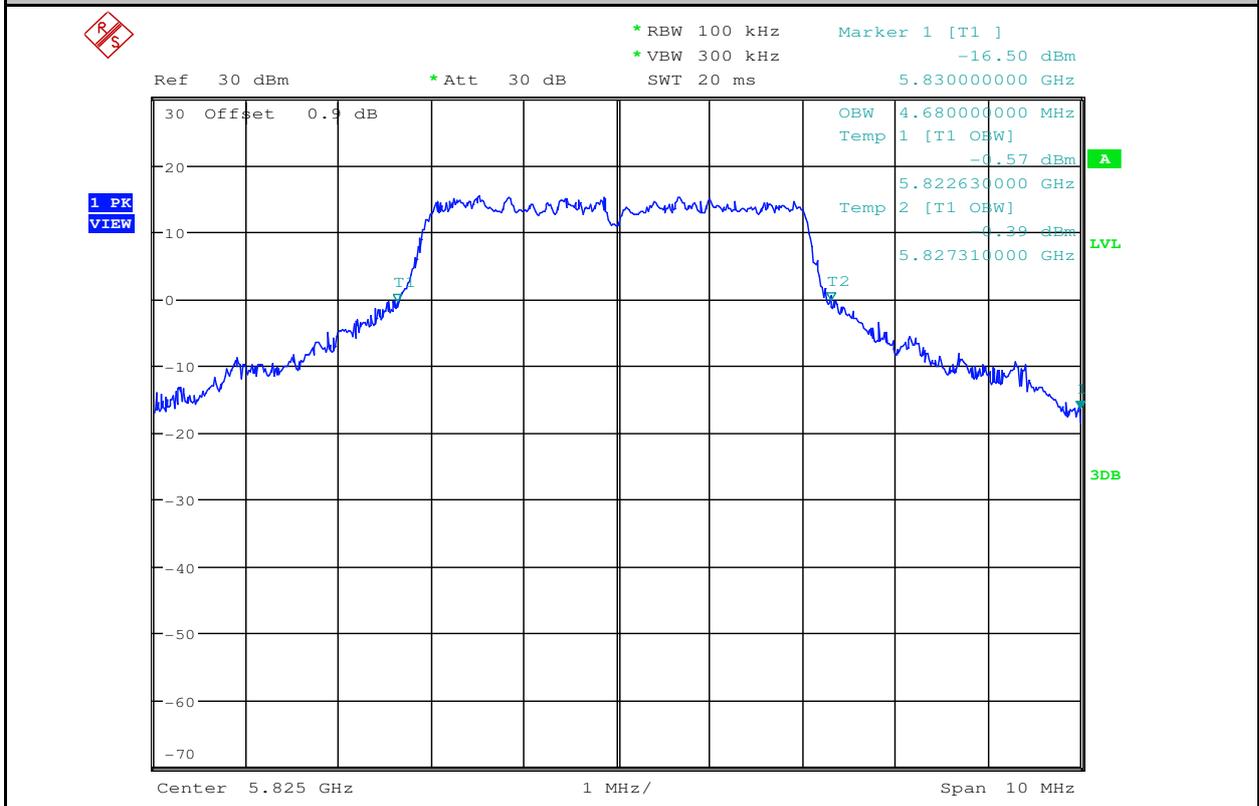
Occupied Bandwidth Measurement\_OFDM\_5785\_Ant2



Occupied Bandwidth Measurement\_OFDM\_5825\_Ant1



Occupied Bandwidth Measurement\_OFDM\_5825\_Ant2





### 3. Maximum Conduct Output Power

Frequency (MHz)	Conducted Output Power (dBm)			Limit (dBm)	Result
	Ant1	Ant2	Total		
5745.00	22.64	21.58	25.15	29.90	Pass
5785.00	22.91	21.32	25.20	29.90	Pass
5825.00	22.21	21.67	24.96	29.90	Pass

### 4. Maximum Power Spectral Density

Frequency (MHz)	Maximum power spectral density (dBm/500kHz)			Limit (dBm/500kHz)	Result
	Ant1	Ant2	Total		
5745.00	22.38	24.96	26.87	29.90	Pass
5785.00	24.44	24.70	27.58	29.90	Pass
5825.00	21.94	24.25	26.26	29.90	Pass

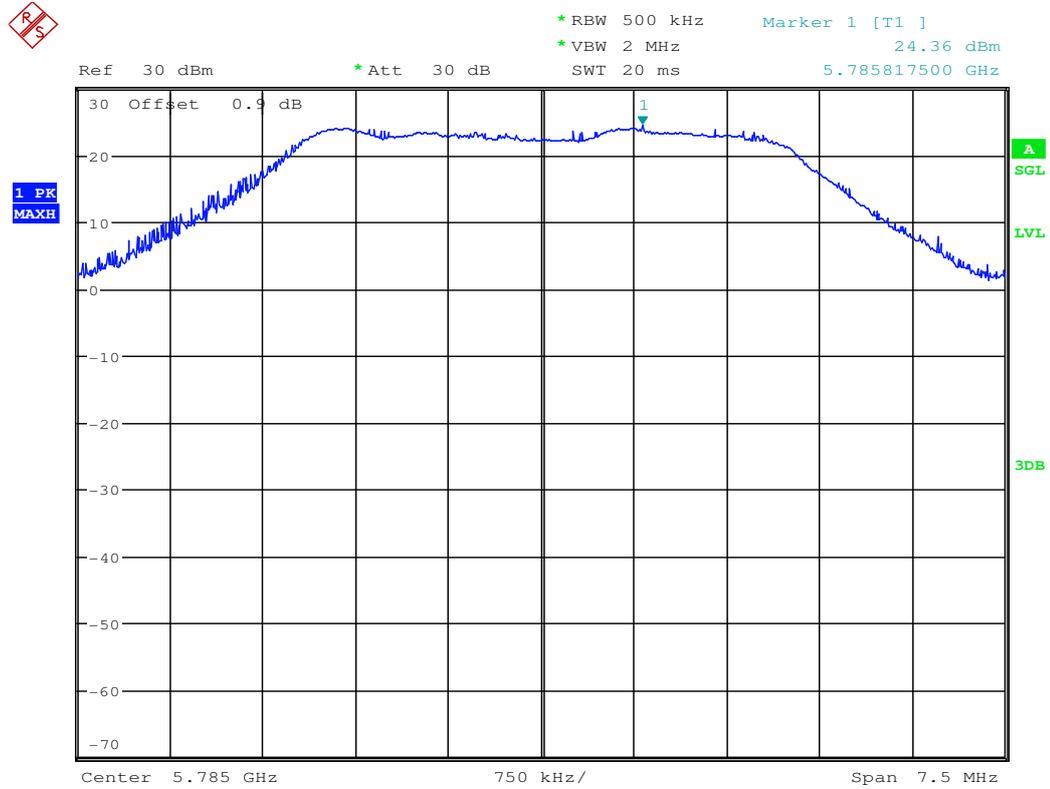
**Remark:**

PSD = Measured PSD + Duty factor

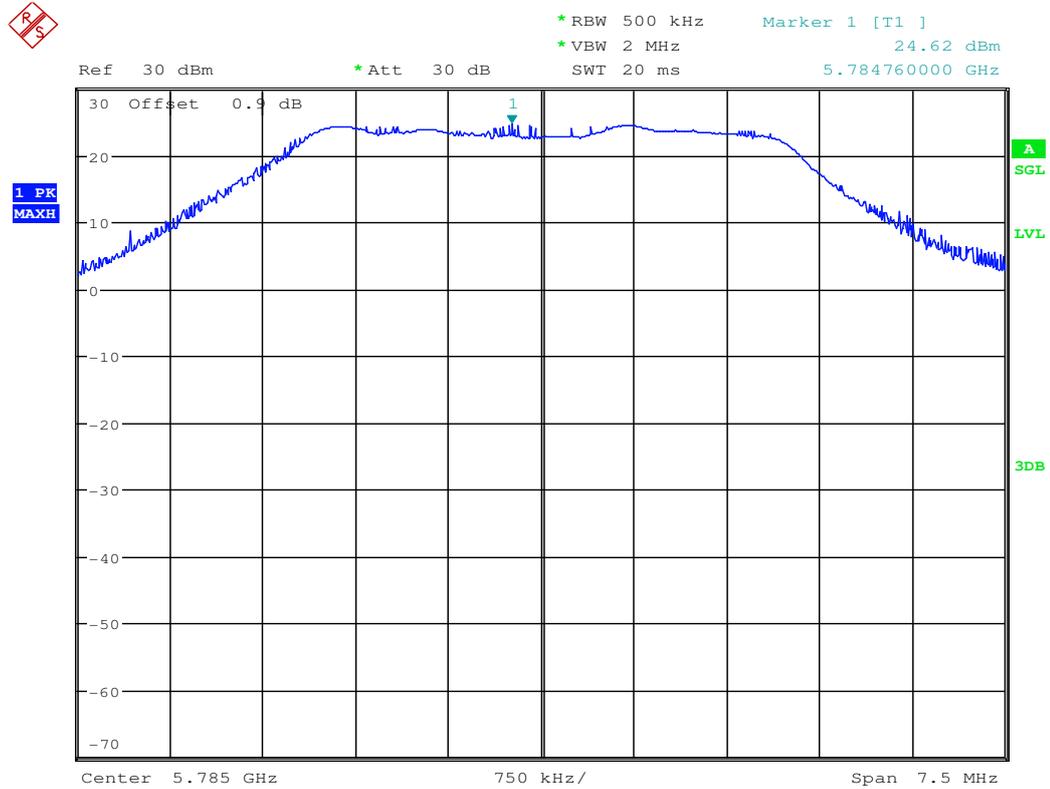
PSD: Maximum Power Spectral Density



Maximum Power Spectral Density\_TNVN\_OFDM\_5785\_Ant1



Maximum Power Spectral Density\_TNVN\_OFDM\_5785\_Ant2







5.Duty Cycle (x)

Test Mode	Ant	Duty Cycle[%]	10log(1/x) Factor[dB]
OFDM	Ant1	98.15	0.08
OFDM	Ant2	98.15	0.08

