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Shenzhen Branch**

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Report No.: SZEM170500530703
Page: 1 of 52

TEST REPORT

Application No.: SZEM1705005307CR
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: Phantom 3 SE
Model No.: W328
Trade mark: DJI
FCC ID: SS3-W3281705
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

Test Result :	Pass*
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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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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2017-06-23		Original

Authorized for issue by:				
				
		Hank Yan /Project Engineer		
				
		Eric Fu /Reviewer		



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
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 15.2V Li-ion Battery
Operation Frequency:	5745MHz to 5825MHz
Modulation Type:	OFDM
Channel Numbers:	17
Antenna Type:	PCB Antenna
Antenna Gain:	3.09dBi (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 ⁻⁸
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 a 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 3.09dBi.

The Direction Gain = 3.09dBi + 10 x log(2) = 6.09dBi

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 99% Bandwidth

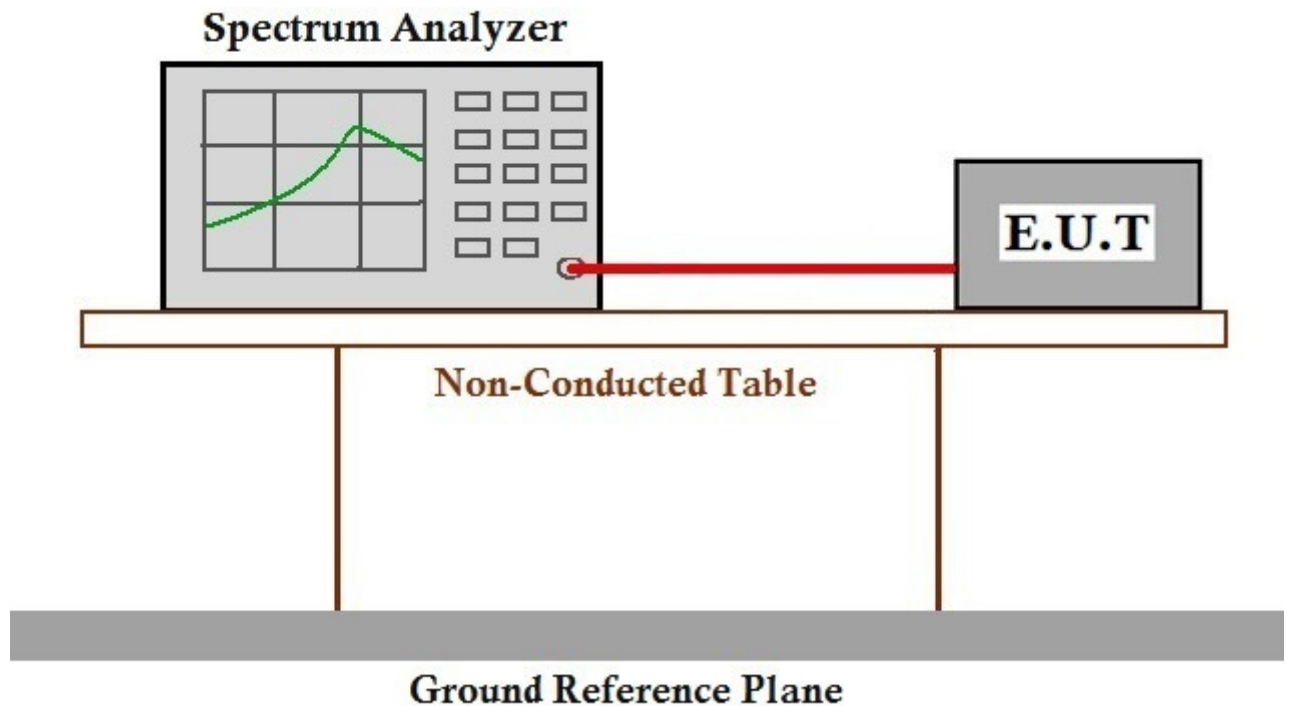
Test Requirement KDB 789033 II D
Test Method: KDB 789033 II D

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 mbar
Test mode b:TX mode_Keep the EUT in continuously transmitting with modulation mode.

7.1.2 Test Setup Diagram



7.1.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

7.2 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: ≥ 500 kHz

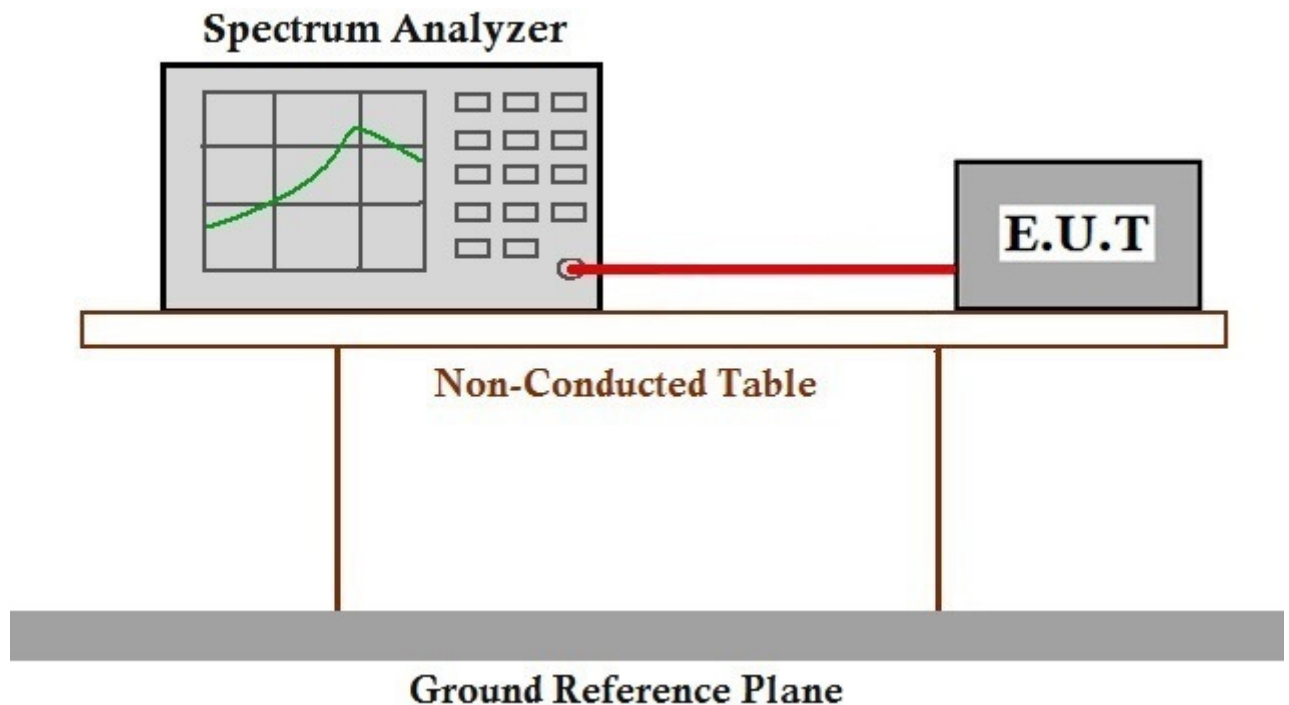
7.2.1 E.U.T. Operation

Operating Environment:

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

Test mode b: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 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	$\leq 1W(30dBm)$ for master device
	$\leq 250mW(24dBm)$ for client device
5250-5350	$\leq 250mW(24dBm)$ for client device or $11dBm+10\log B^*$
5470-5725	$\leq 250mW(24dBm)$ for client device or $11dBm+10\log B^*$
5725-5850	$\leq 1W(30dBm)$

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.

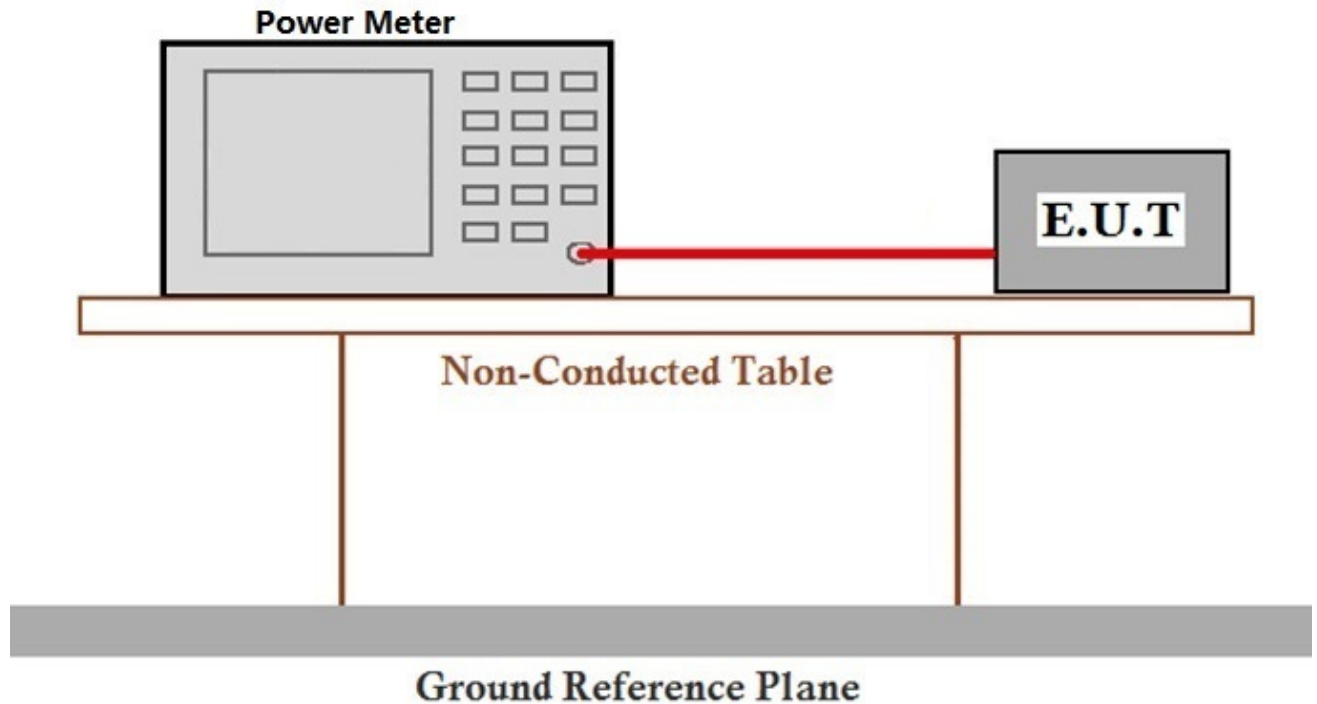
7.3.1 E.U.T. Operation

Operating Environment:

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

Test mode b: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 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.

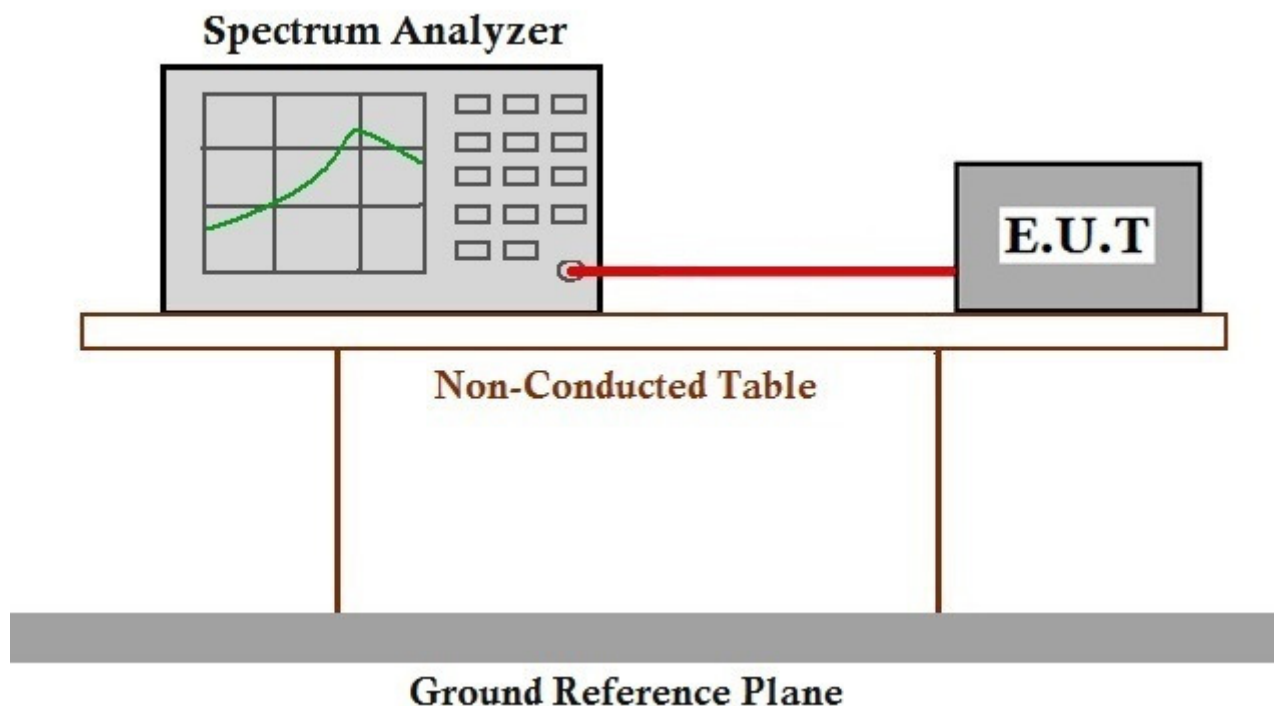
7.4.1 E.U.T. Operation

Operating Environment:

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

Test mode b: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 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

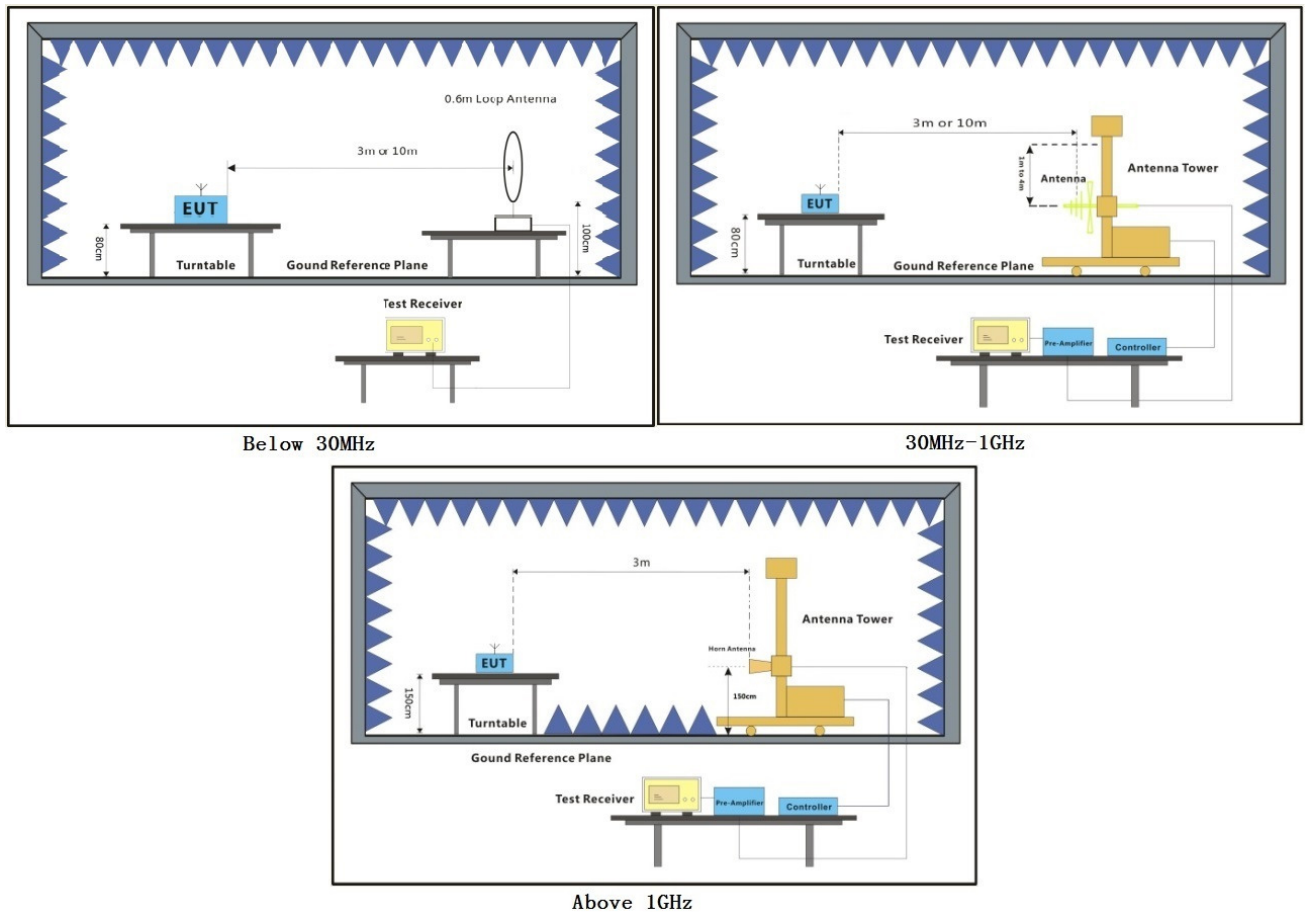
7.5.1 E.U.T. Operation

Operating Environment:

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

Test mode b:TX mode_Keep the EUT in continuously transmitting with modulation mode.

7.5.2 Test Setup Diagram





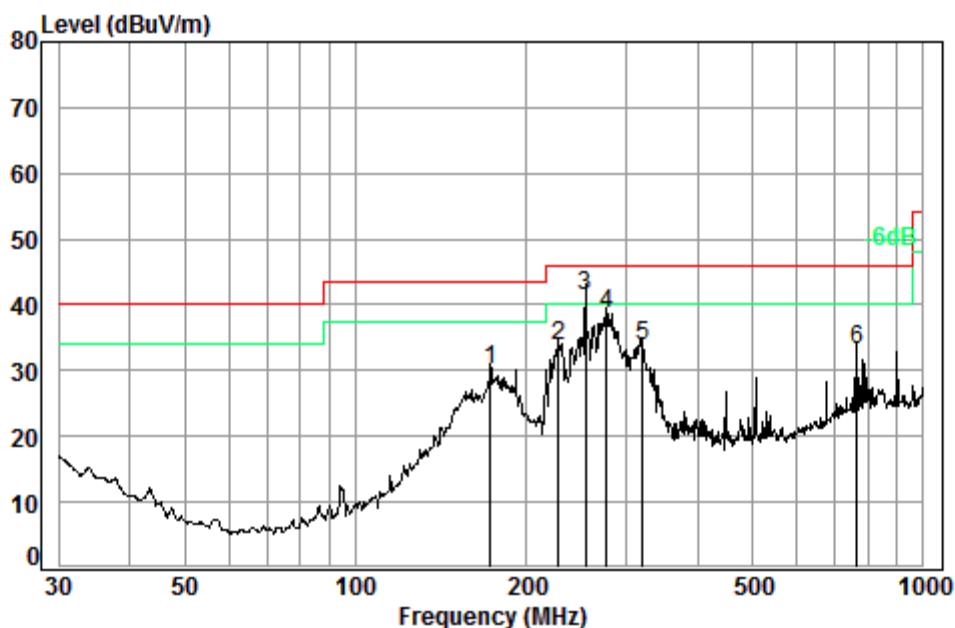
7.5.3 Measurement Procedure and Data

- 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:b; Polarization:Horizontal; Modulation Type:OFDM; bandwidth:5MHz; Channel:Low



Condition: 3m HORIZONTAL

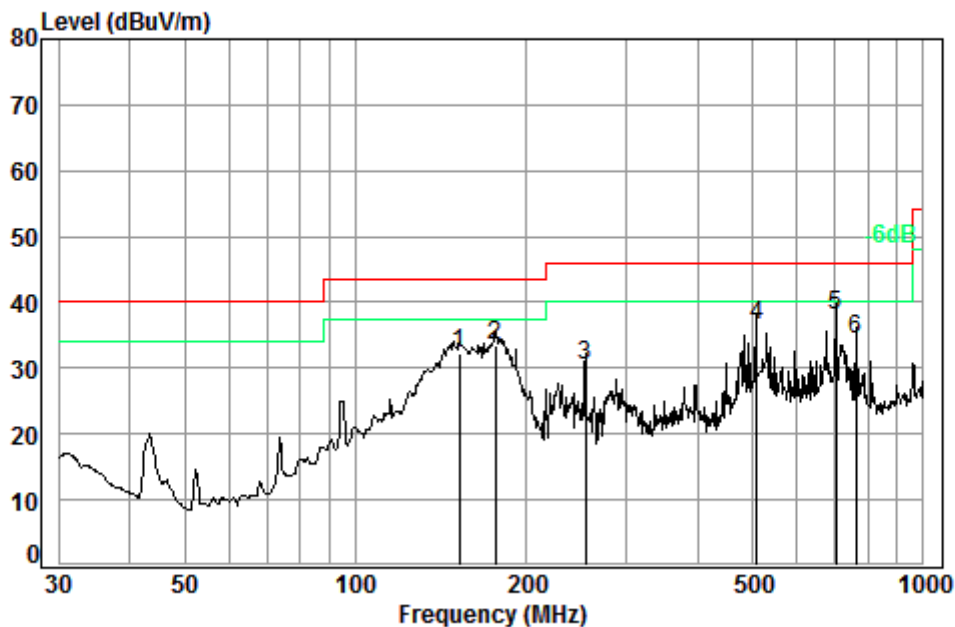
Job No. : 05305CR/5307CR

Test mode: b

	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	172.60	1.36	9.60	26.81	45.82	29.97	43.50	-13.53
2	227.69	1.56	11.59	26.61	47.17	33.71	46.00	-12.29
3 pp	253.84	1.69	12.38	26.53	53.73	41.27	46.00	-4.73
4	277.09	1.80	12.89	26.46	50.39	38.62	46.00	-7.38
5	321.06	1.97	14.66	26.56	43.72	33.79	46.00	-12.21
6	763.38	3.10	21.86	27.34	35.66	33.28	46.00	-12.72



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



Condition: 3m VERTICAL

Job No. : 05305CR/5307CR

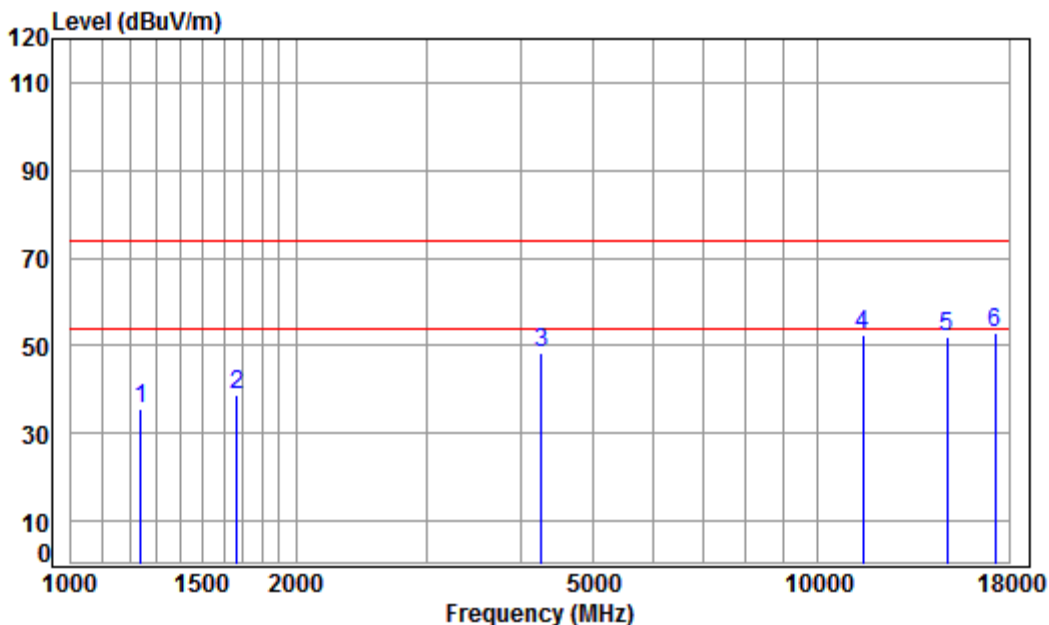
Test mode: b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	152.13	1.32	9.13	26.90	48.67	32.22	43.50	-11.28
2	176.27	1.36	9.75	26.79	49.13	33.45	43.50	-10.05
3	253.84	1.69	12.38	26.53	42.78	30.32	46.00	-15.68
4	508.26	2.61	18.03	27.68	43.44	36.40	46.00	-9.60
5 pp	701.76	2.91	21.60	27.41	40.81	37.91	46.00	-8.09
6	760.70	3.09	21.83	27.34	36.69	34.27	46.00	-11.73



Above 1GHz:

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



Condition: 3m HORIZONTAL

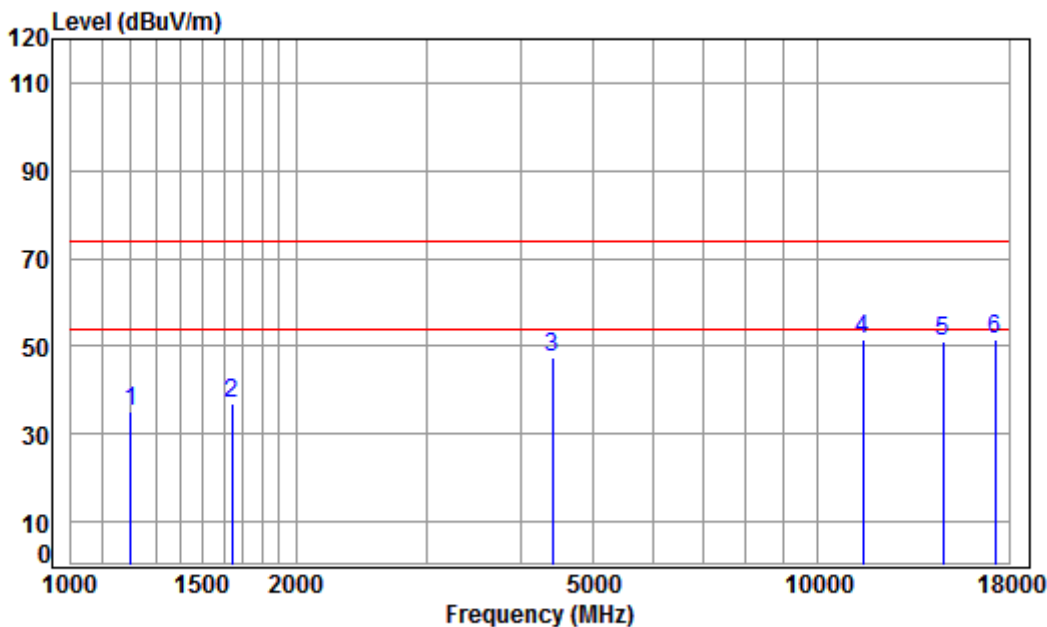
Job No: : 05307CR

Mode: : 5745 TX RSE

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1238.483	4.13	24.67	38.08	45.03	35.75	74.00	-38.25	peak
2	1667.951	4.67	26.54	38.03	45.38	38.56	74.00	-35.44	peak
3	4267.237	7.02	33.60	38.13	45.79	48.28	74.00	-25.72	peak
4	11490.000	12.33	38.09	35.50	37.62	52.54	74.00	-21.46	peak
5	14873.890	14.82	41.08	38.91	35.17	52.16	74.00	-21.84	peak
6	17235.000	17.60	43.08	36.18	28.42	52.92	74.00	-21.08	peak



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



Condition: 3m VERTICAL

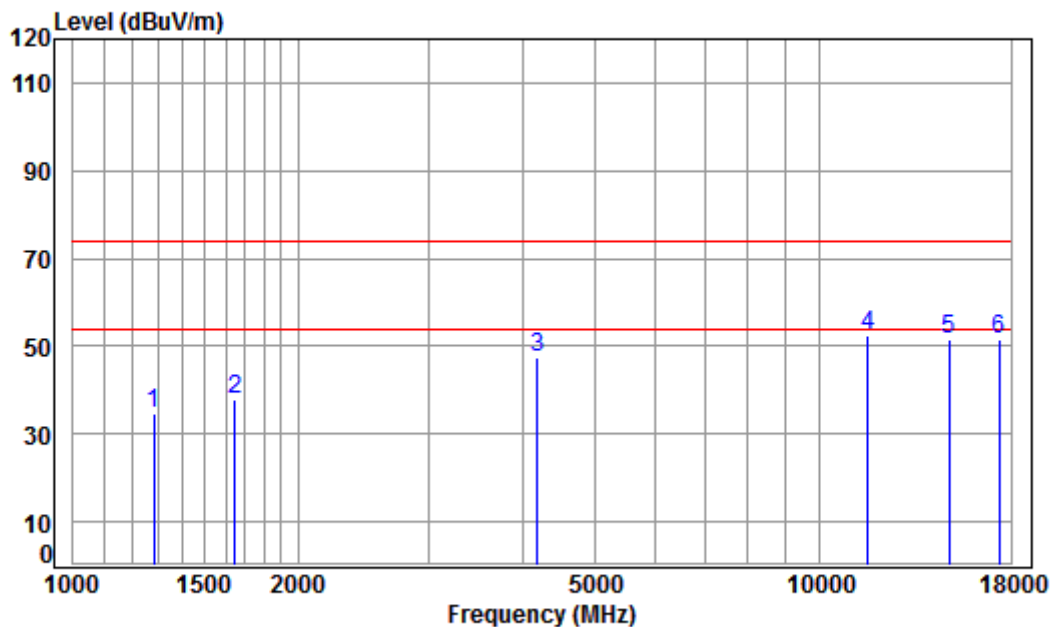
Job No: : 05307CR

Mode: : 5745 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	1203.199	4.08	24.49	38.08	44.51	35.00	74.00	-39.00	peak
2	1644.019	4.64	26.44	38.04	44.08	37.12	74.00	-36.88	peak
3	4405.090	7.18	33.60	38.20	45.07	47.65	74.00	-26.35	peak
4	pp11490.000	12.33	38.09	35.50	36.75	51.67	74.00	-22.33	peak
5	14702.910	14.77	40.77	38.93	34.46	51.07	74.00	-22.93	peak
6	17235.000	17.60	43.08	36.18	27.08	51.58	74.00	-22.42	peak



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



Condition: 3m HORIZONTAL

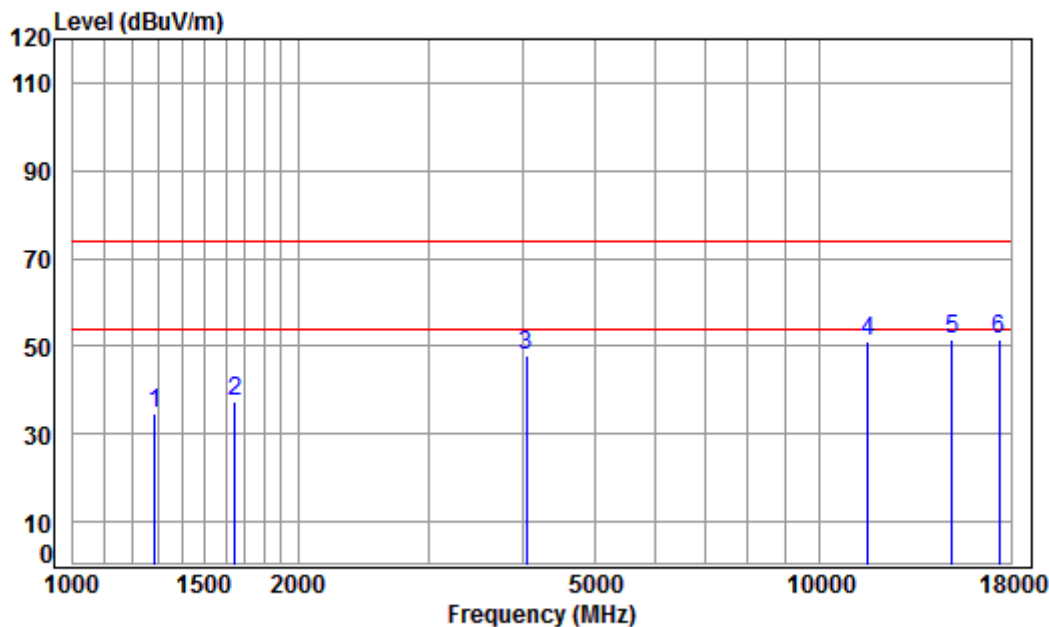
Job No: : 05307CR

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	43.58	34.58	74.00	-39.42	peak
2	1648.778	4.65	26.46	38.04	44.97	38.04	74.00	-35.96	peak
3	4181.768	6.92	33.60	38.09	45.22	47.65	74.00	-26.35	peak
4	pp11570.000	12.34	38.17	35.51	37.26	52.26	74.00	-21.74	peak
5	14873.890	14.82	41.08	38.91	34.34	51.33	74.00	-22.67	peak
6	17355.000	17.93	43.23	36.12	26.59	51.63	74.00	-22.37	peak



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



Condition: 3m VERTICAL

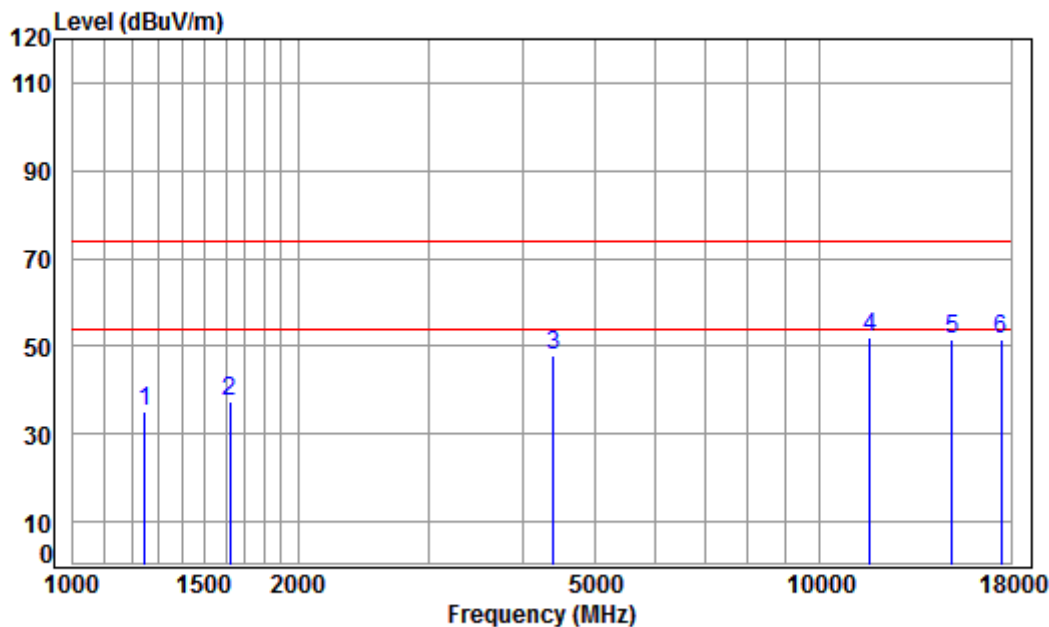
Job No: : 05307CR

Mode: : 5785 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1285.904	4.20	24.89	38.07	43.73	34.75	74.00	-39.25	peak
2	1648.778	4.65	26.46	38.04	44.34	37.41	74.00	-36.59	peak
3	4039.212	6.75	33.60	38.02	45.51	47.84	74.00	-26.16	peak
4	11570.000	12.34	38.17	35.51	36.04	51.04	74.00	-22.96	peak
5	15003.420	14.85	41.30	38.90	34.25	51.50	74.00	-22.50	peak
6	pp17355.000	17.93	43.23	36.12	26.73	51.77	74.00	-22.23	peak



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



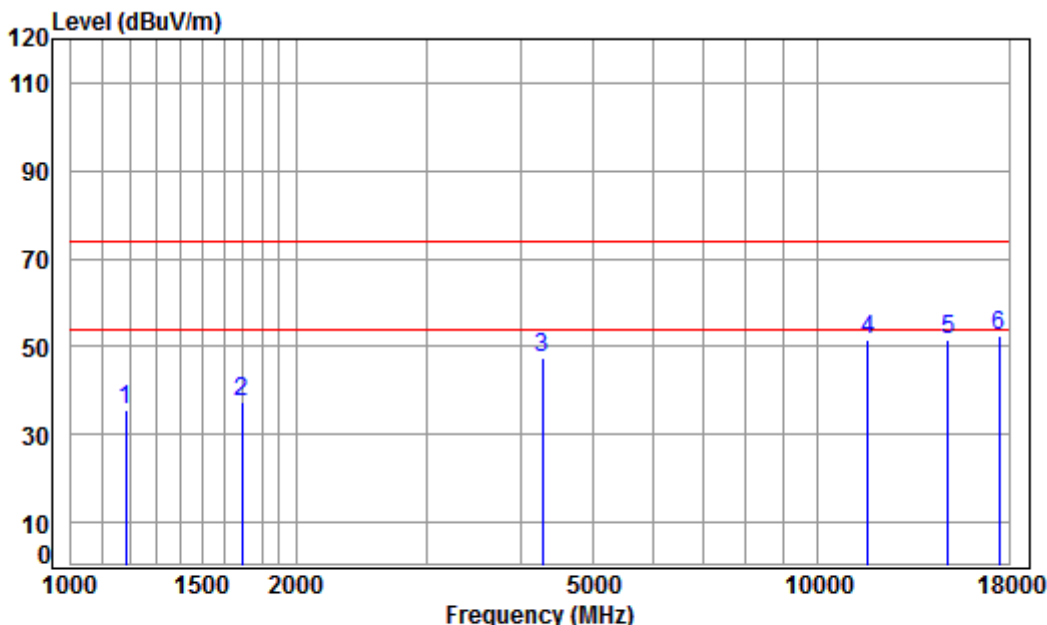
Condition: 3m HORIZONTAL

Job No: : 05307CR

Mode: : 5825 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1249.269	4.15	24.72	38.08	44.44	35.23	74.00	-38.77	peak
2	1620.431	4.61	26.34	38.04	44.31	37.22	74.00	-36.78	peak
3	4392.376	7.16	33.60	38.20	45.17	47.73	74.00	-26.27	peak
4	pp11650.000	12.35	38.25	35.53	36.98	52.05	74.00	-21.95	peak
5	15003.420	14.85	41.30	38.90	34.52	51.77	74.00	-22.23	peak
6	17475.000	18.25	43.37	36.06	25.82	51.38	74.00	-22.62	peak

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



Condition: 3m VERTICAL

Job No: : 05307CR

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	1185.936	4.06	24.41	38.08	45.28	35.67	74.00	-38.33	peak
2	1692.231	4.70	26.64	38.03	43.94	37.25	74.00	-36.75	peak
3	4279.589	7.03	33.60	38.14	45.07	47.56	74.00	-26.44	peak
4	11650.000	12.35	38.25	35.53	36.62	51.69	74.00	-22.31	peak
5	14916.940	14.83	41.15	38.91	34.60	51.67	74.00	-22.33	peak
6	pp17475.000	18.25	43.37	36.06	26.77	52.33	74.00	-21.67	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:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – 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.



7.6 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.

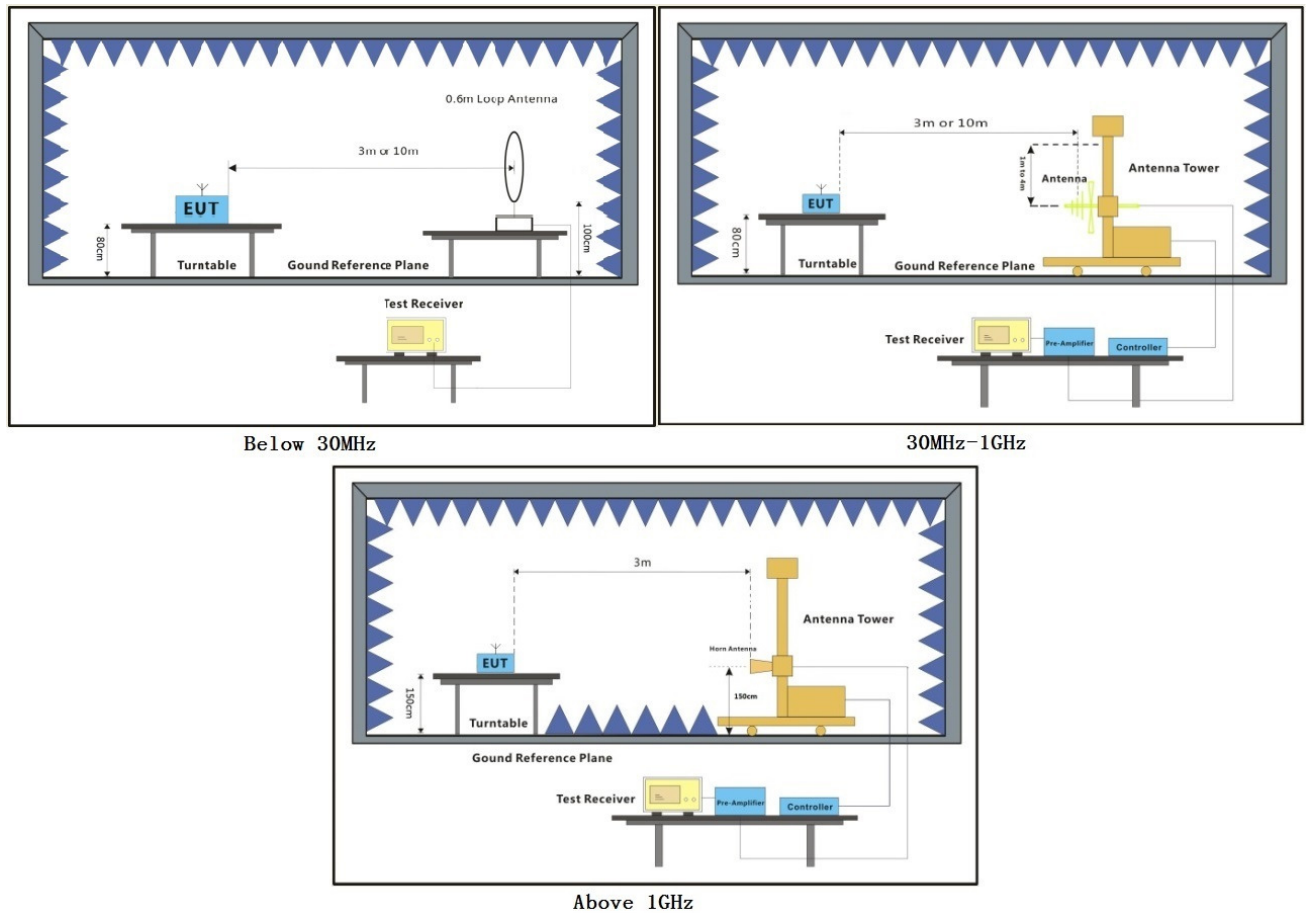
7.6.1 E.U.T. Operation

Operating Environment:

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

Test mode b:TX mode_Keep the EUT in continuously transmitting with modulation mode.

7.6.2 Test Setup Diagram

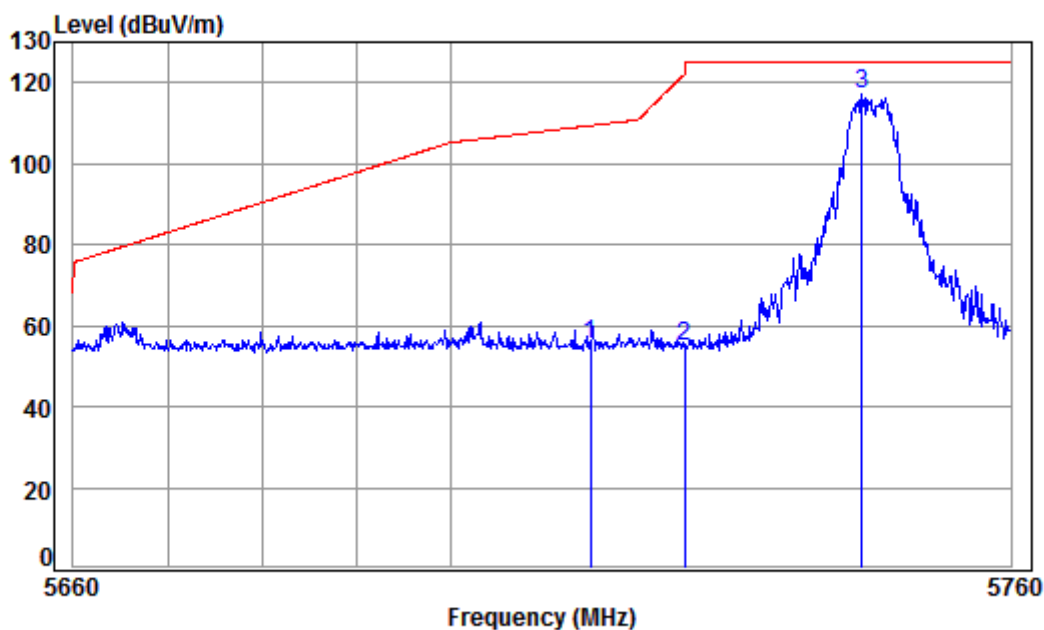




7.6.3 Measurement Procedure and Data

- 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.

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



Condition: 3m HORIZONTAL

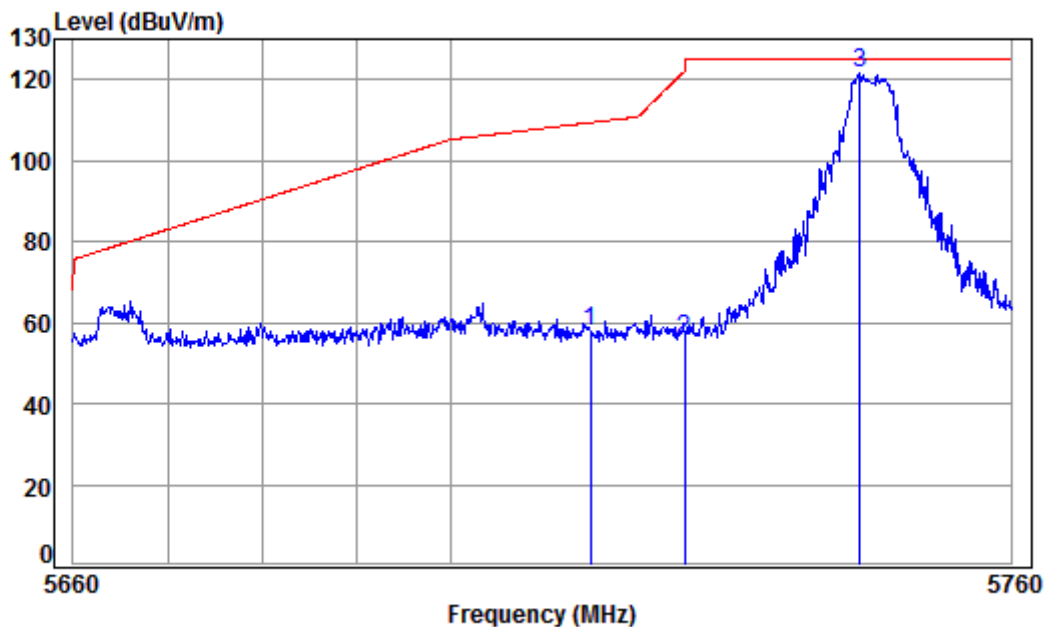
Job No: : 05307CR

Mode: : 5745 Band edge

		Cable	Ant	Preamp	Read		Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5715.000	8.47	34.53	38.36	50.79	55.43	109.40	-53.97	peak
2	5725.000	8.48	34.54	38.35	50.40	55.07	122.20	-67.13	peak
3 pp	5743.983	8.50	34.55	38.35	112.34	117.04	125.20	-8.16	peak



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



Condition: 3m VERTICAL

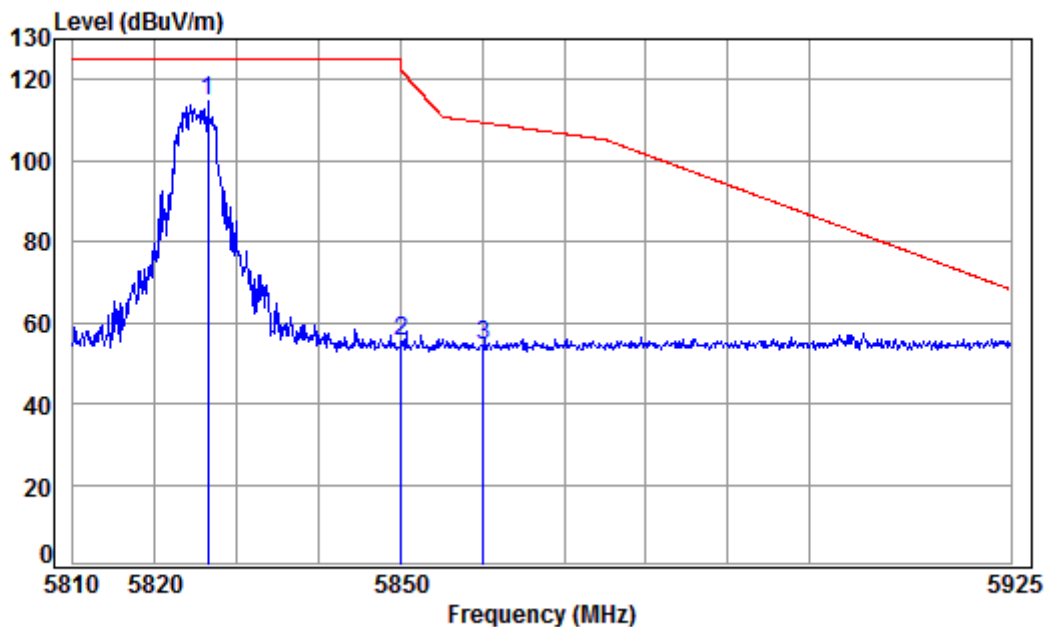
Job No: : 05307CR

Mode: : 5745 Band edge

	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	5715.000	8.47	34.53	38.36	53.26	57.90	109.40	-51.50	peak
2	5725.000	8.48	34.54	38.35	51.27	55.94	122.20	-66.26	peak
3 pp	5743.781	8.50	34.55	38.35	117.02	121.72	125.20	-3.48	peak



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



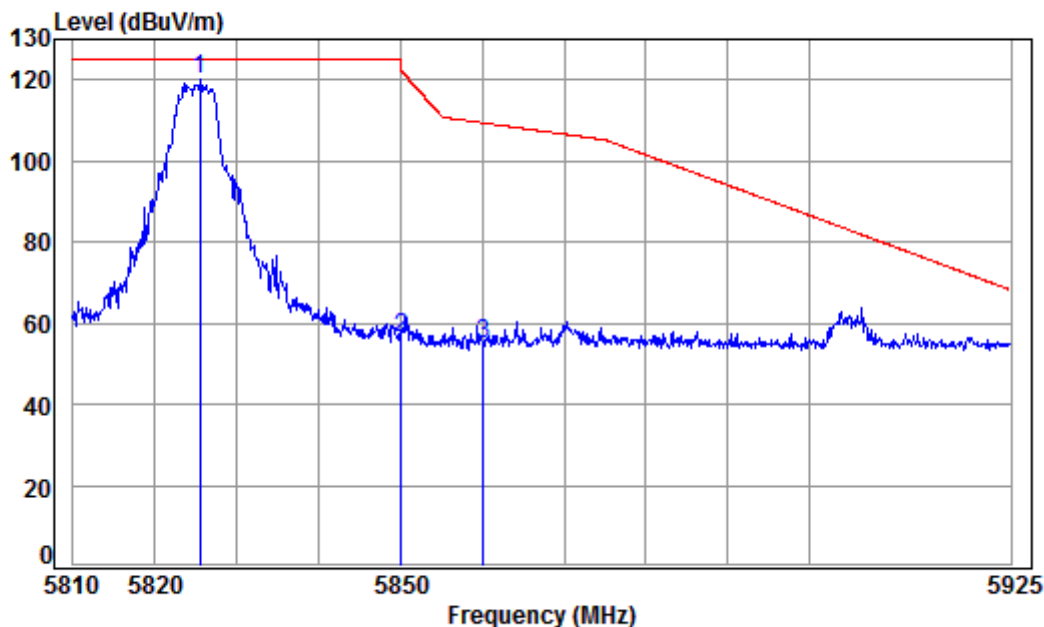
Condition: 3m HORIZONTAL

Job No: : 05307CR

Mode: : 5825 Band edge

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp 5826.421	8.58	34.60	38.33	109.60	114.45	125.20	-10.75 peak
2	5850.000	8.60	34.61	38.33	50.30	55.18	122.20	-67.02 peak
3	5860.000	8.61	34.62	38.33	49.69	54.59	109.40	-54.81 peak

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



Condition: 3m VERTICAL

Job No: : 05307CR

Mode: : 5825 Band edge

		Cable	Ant	Preamp	Read		Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 5825.394	8.58	34.60	38.33	115.38	120.23	125.20	-4.97	peak
2	5850.000	8.60	34.61	38.33	51.63	56.51	122.20	-65.69	peak
3	5860.000	8.61	34.62	38.33	49.86	54.76	109.40	-54.64	peak

7.7 Frequency Stability

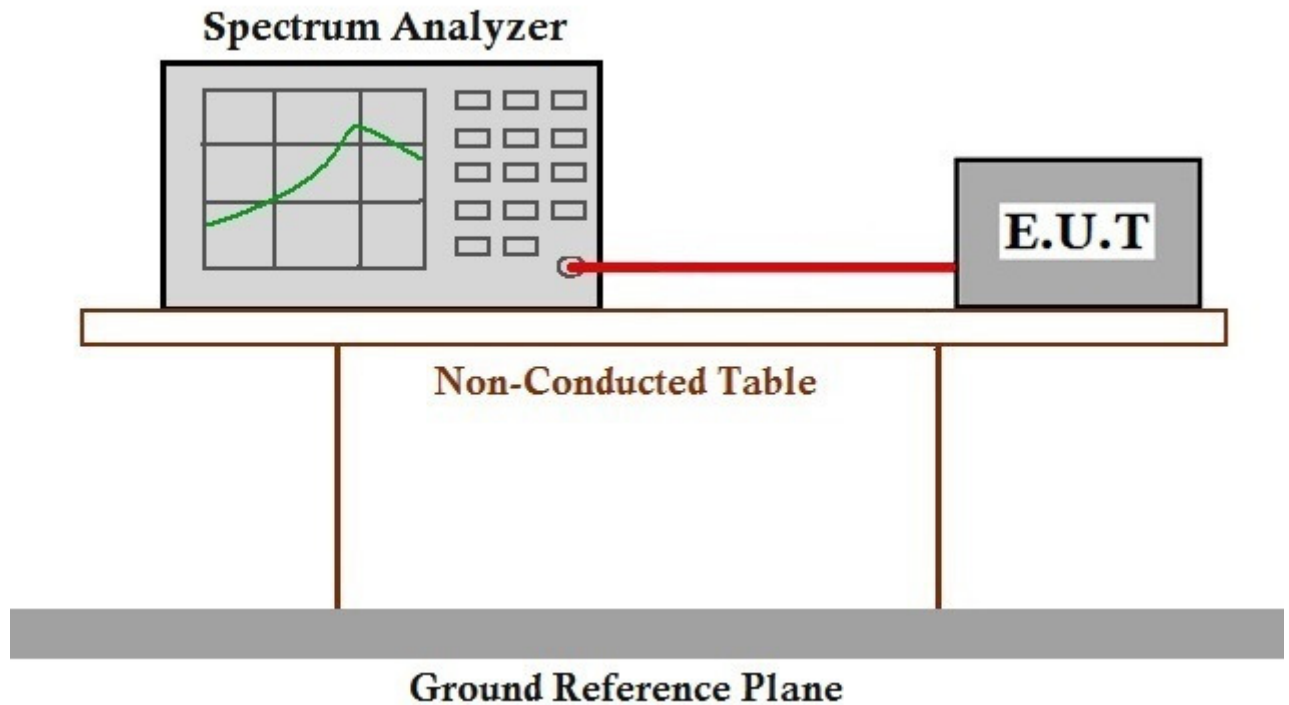
Test Requirement	47 CFR Part 15, Subpart E 15.407 (g)
Test Method:	ANSI C63.10 (2013) Section 6.8
Limit:	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary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

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 mbar
 Test mode b:TX mode_Keep the EUT in continuously transmitting with modulation mode.

7.7.2 Test Setup Diagram



7.7.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407



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

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Test mode:	OFDM	Frequency(MHz):	5745
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Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Result
40	15.2	5745.6222	Pass
30		5745.6230	Pass
20		5745.6238	Pass
10		5745.6234	Pass
0		5745.6231	Pass
25	17.4	5745.6228	Pass
	15.2	5745.6230	Pass
	14.4	5745.6234	Pass

Test mode:	OFDM	Frequency(MHz):	5785
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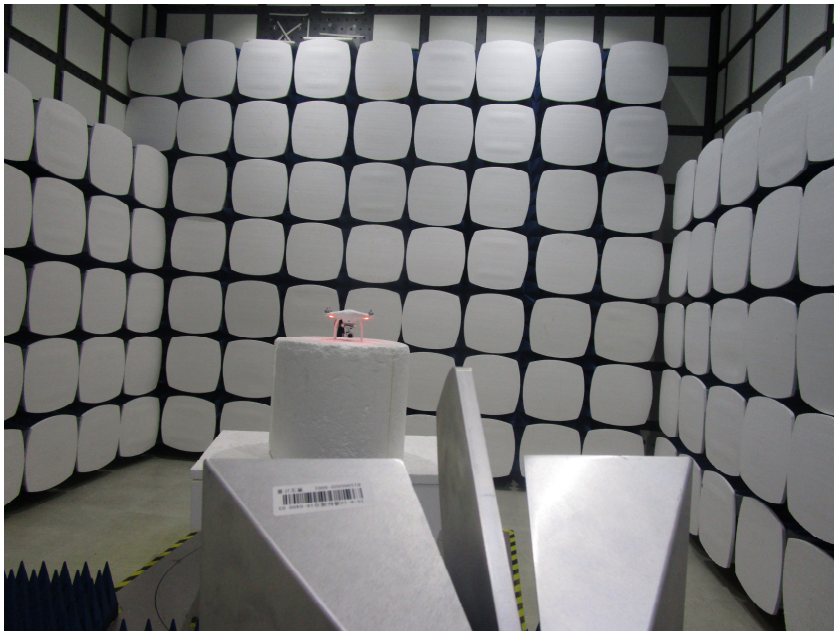
Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Result
40	15.2	5785.6937	Pass
30		5785.6947	Pass
20		5785.6949	Pass
10		5785.6944	Pass
0		5785.6937	Pass
25	17.4	5785.6946	Pass
	15.2	5785.6947	Pass
	14.4	5785.6956	Pass

Test mode:	OFDM	Frequency(MHz):	5825
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Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Result
40	15.2	5825.6799	Pass
30		5825.6803	Pass
20		5825.6806	Pass
10		5825.6799	Pass
0		5825.6798	Pass
25	17.4	5825.6797	Pass
	15.2	5825.6803	Pass
	14.4	5825.6807	Pass

8 Photographs

8.1 Radiated Emissions Test Setup





8.2 EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1705005307CR.

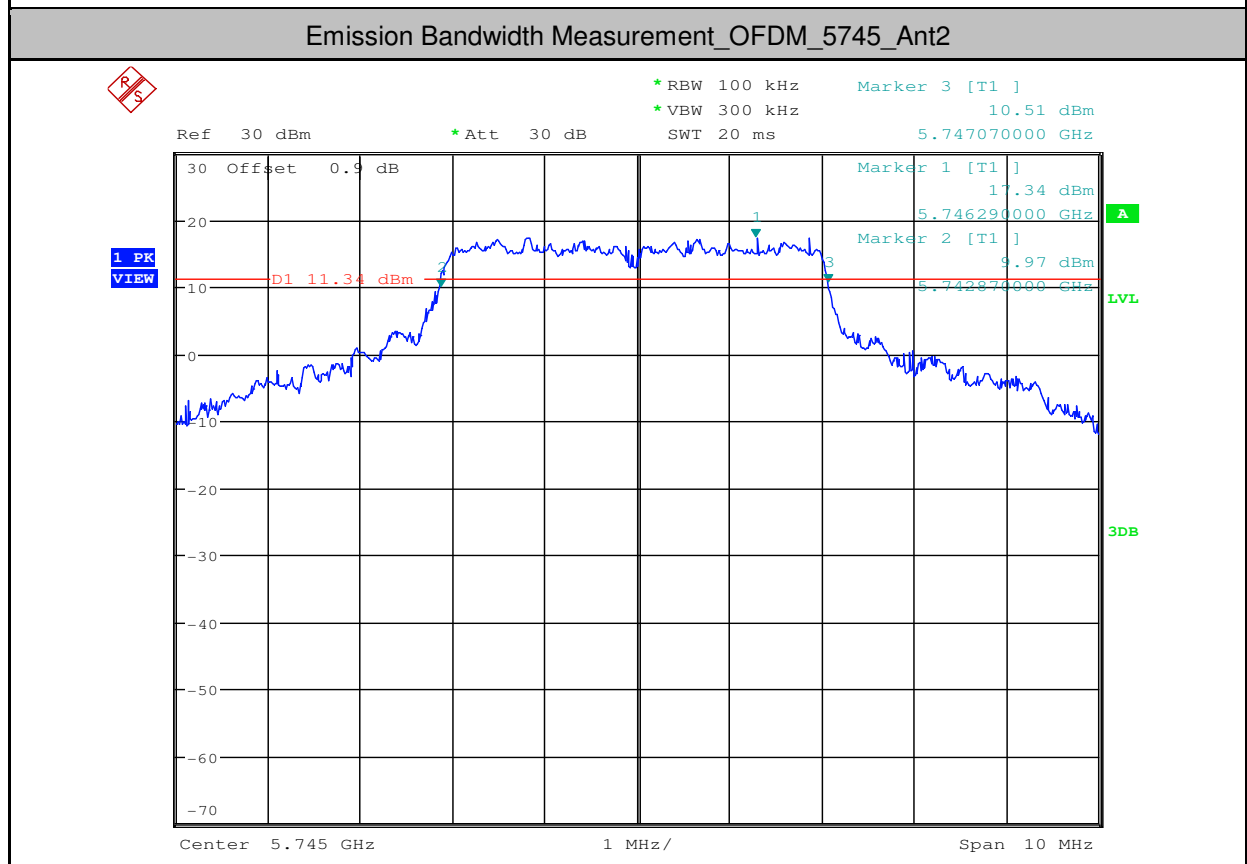
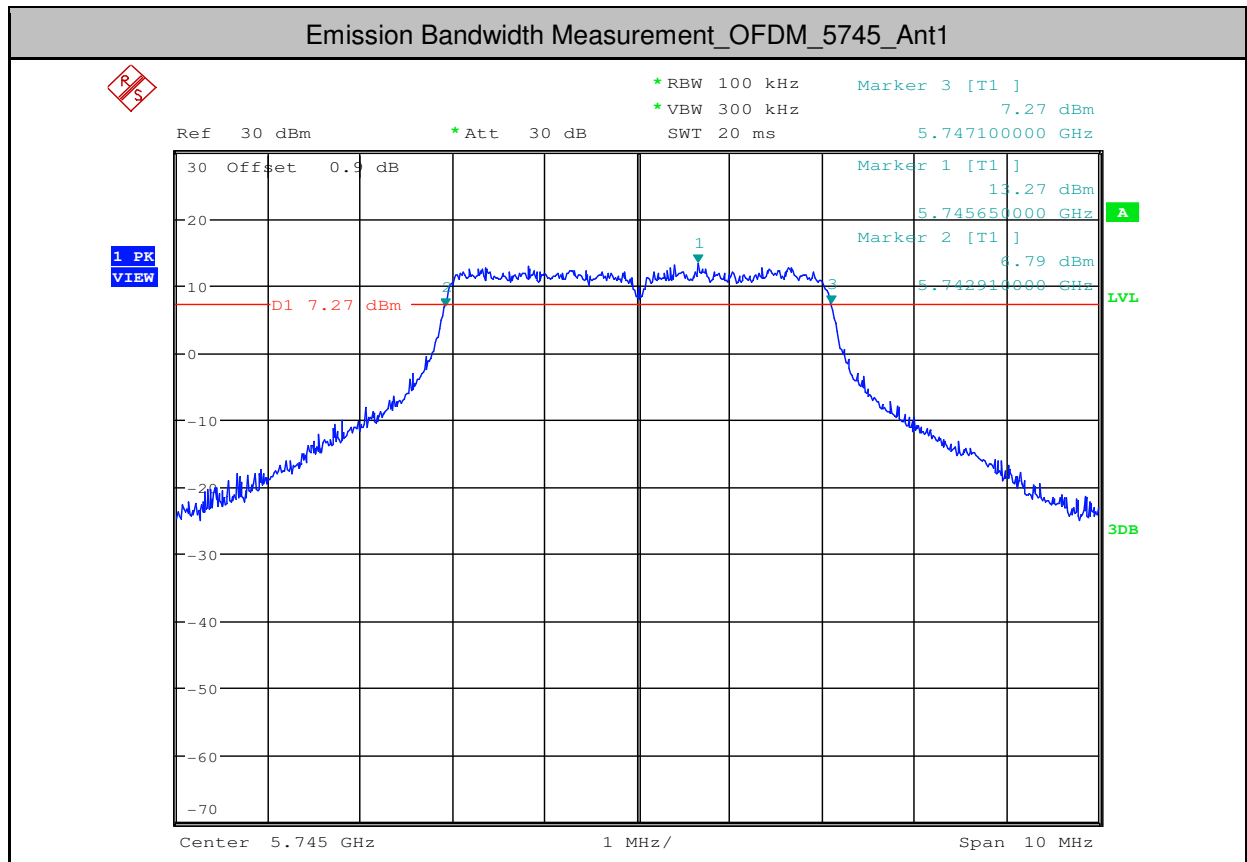


9 Appendix

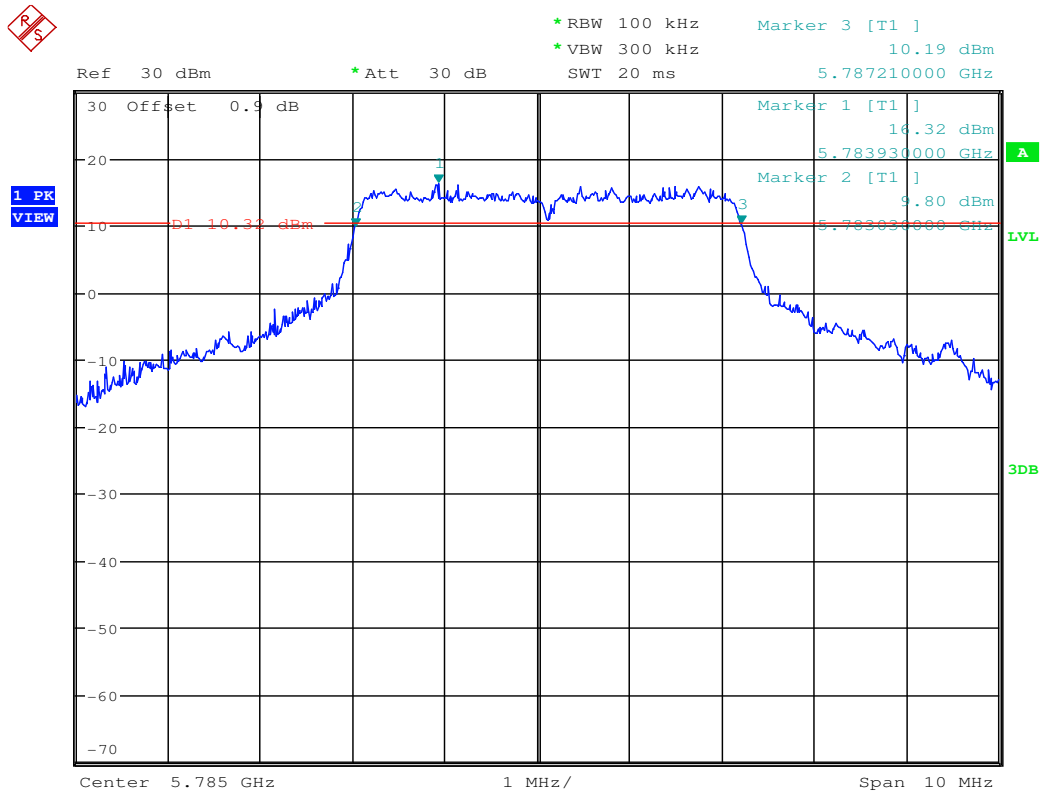
9.1 Appendix 15.407

1.Emission Bandwidth Measurement

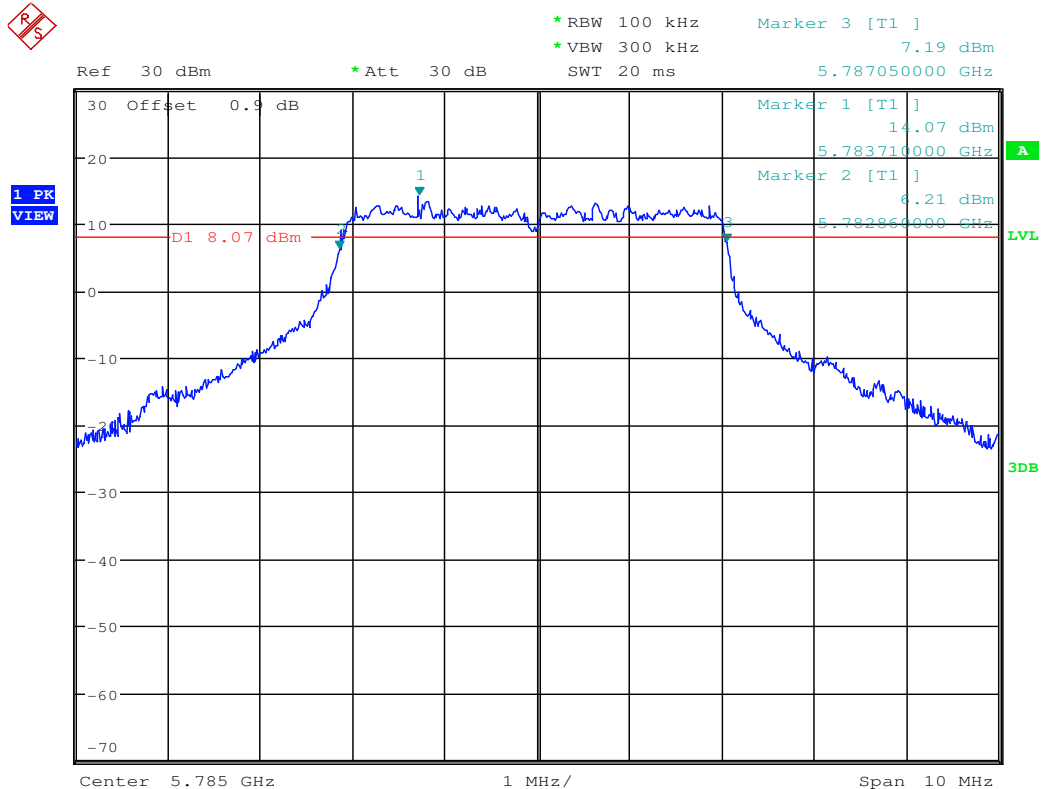
Test Mode	Test Channel	Ant	EBW[MHz]	Limit[MHz]	Verdict
OFDM	5745	Ant1	4.190	≥ 0.5	PASS
OFDM	5745	Ant2	4.200	≥ 0.5	PASS
OFDM	5785	Ant1	4.180	≥ 0.5	PASS
OFDM	5785	Ant2	4.190	≥ 0.5	PASS
OFDM	5825	Ant1	4.220	≥ 0.5	PASS
OFDM	5825	Ant2	4.220	≥ 0.5	PASS

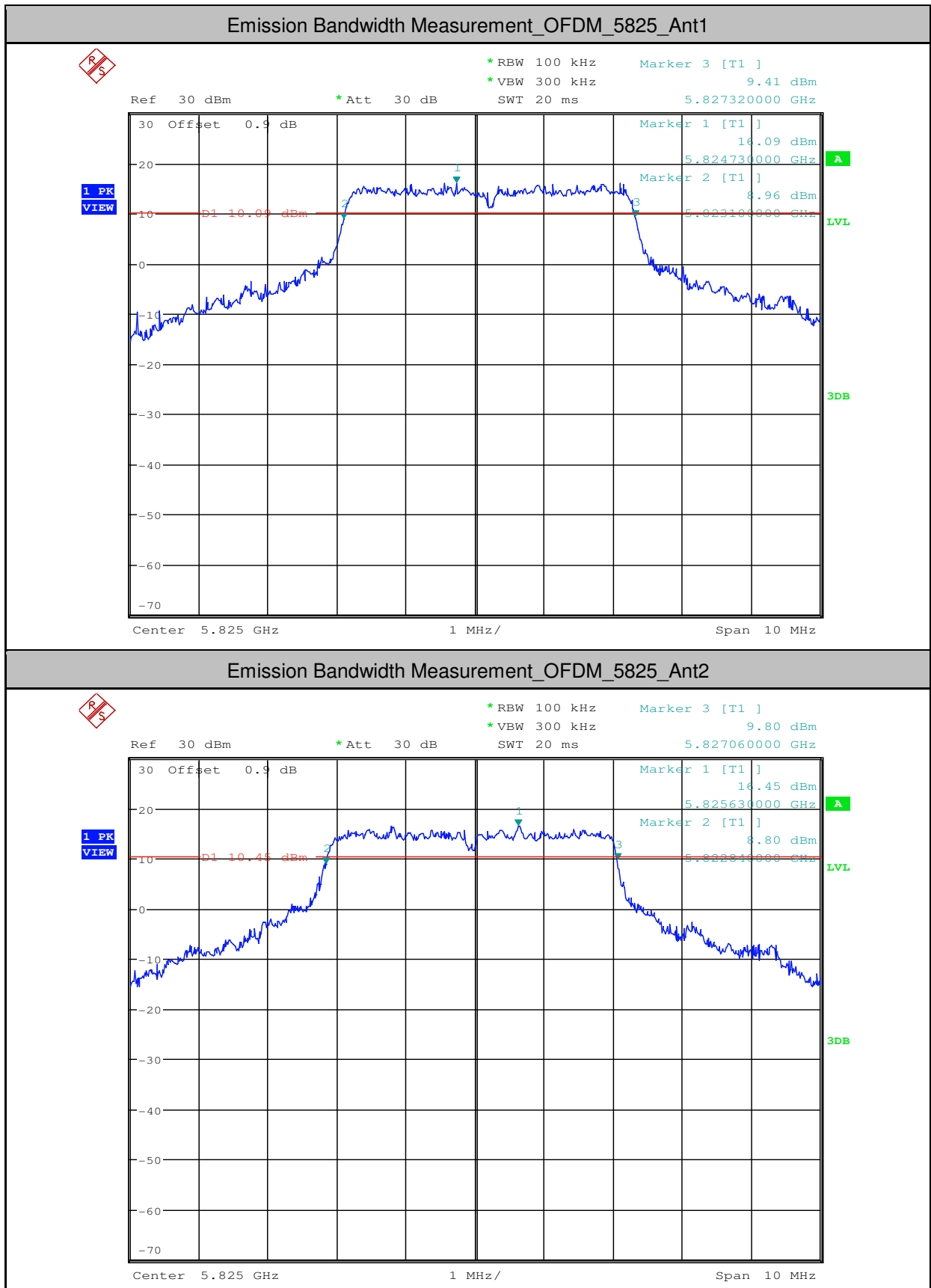


Emission Bandwidth Measurement_OFDM_5785_Ant1



Emission Bandwidth Measurement_OFDM_5785_Ant2



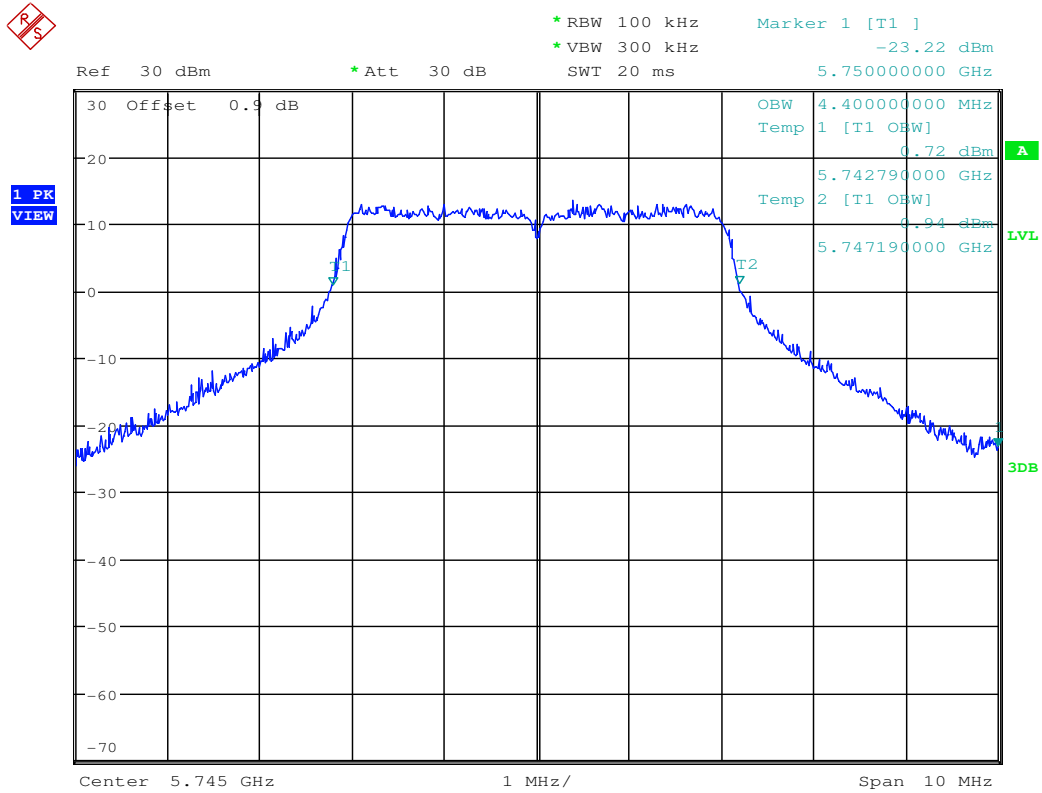




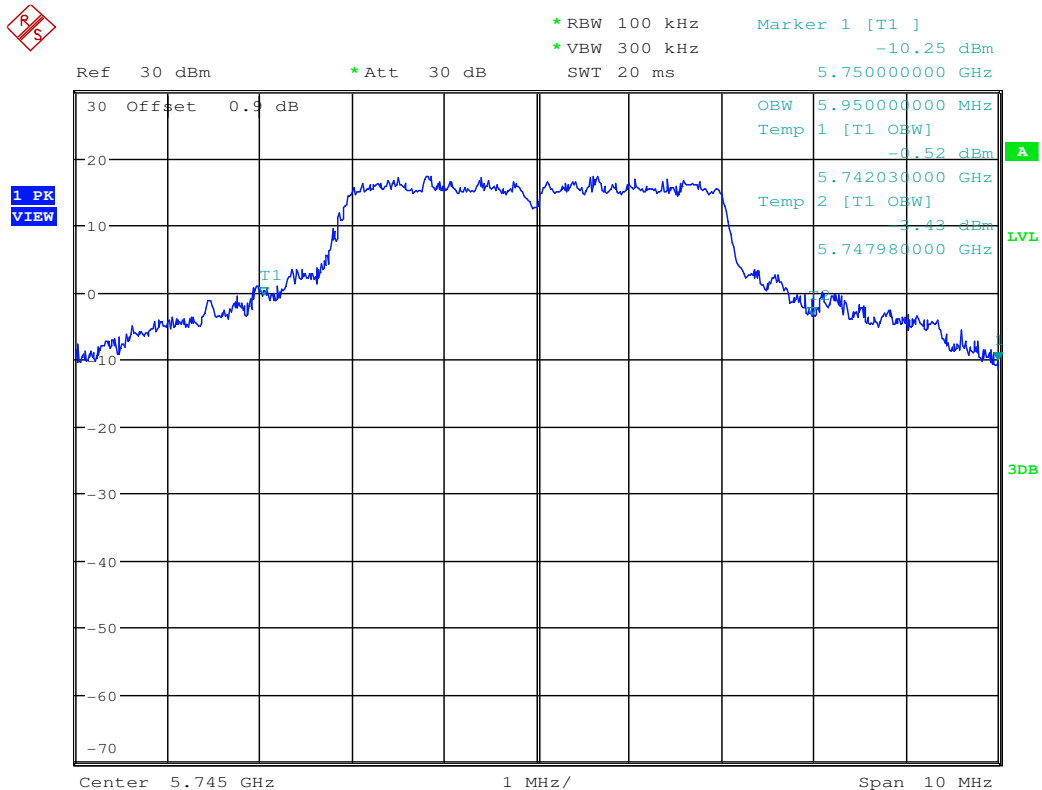
2.Occupied Bandwidth Measurement

Test Mode	Test Channel	Ant	OBW[MHz]	Limit[MHz]	Verdict
OFDM	5745	Ant1	4.400	---	PASS
OFDM	5745	Ant2	5.950	---	PASS
OFDM	5785	Ant1	4.780	---	PASS
OFDM	5785	Ant2	4.430	---	PASS
OFDM	5825	Ant1	5.160	---	PASS
OFDM	5825	Ant2	4.930	---	PASS

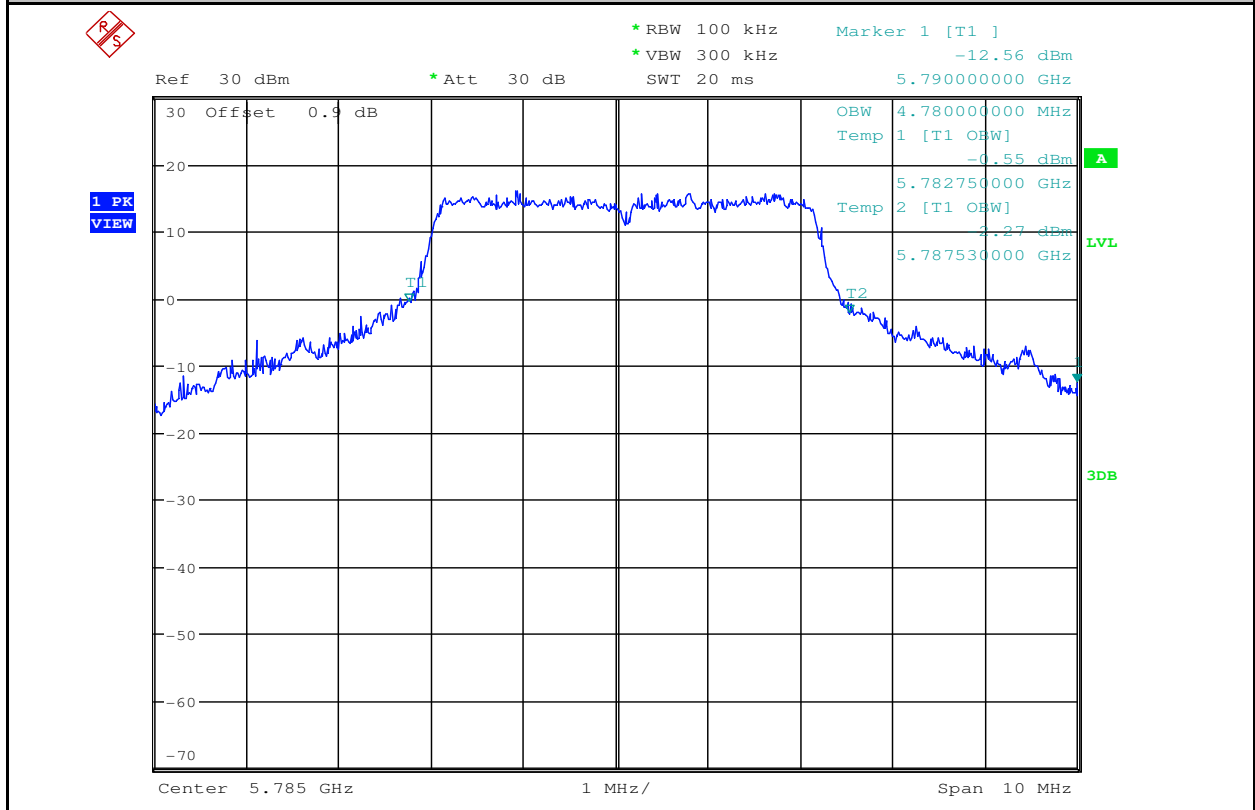
Occupied Bandwidth Measurement_OFDM_5745_Ant1



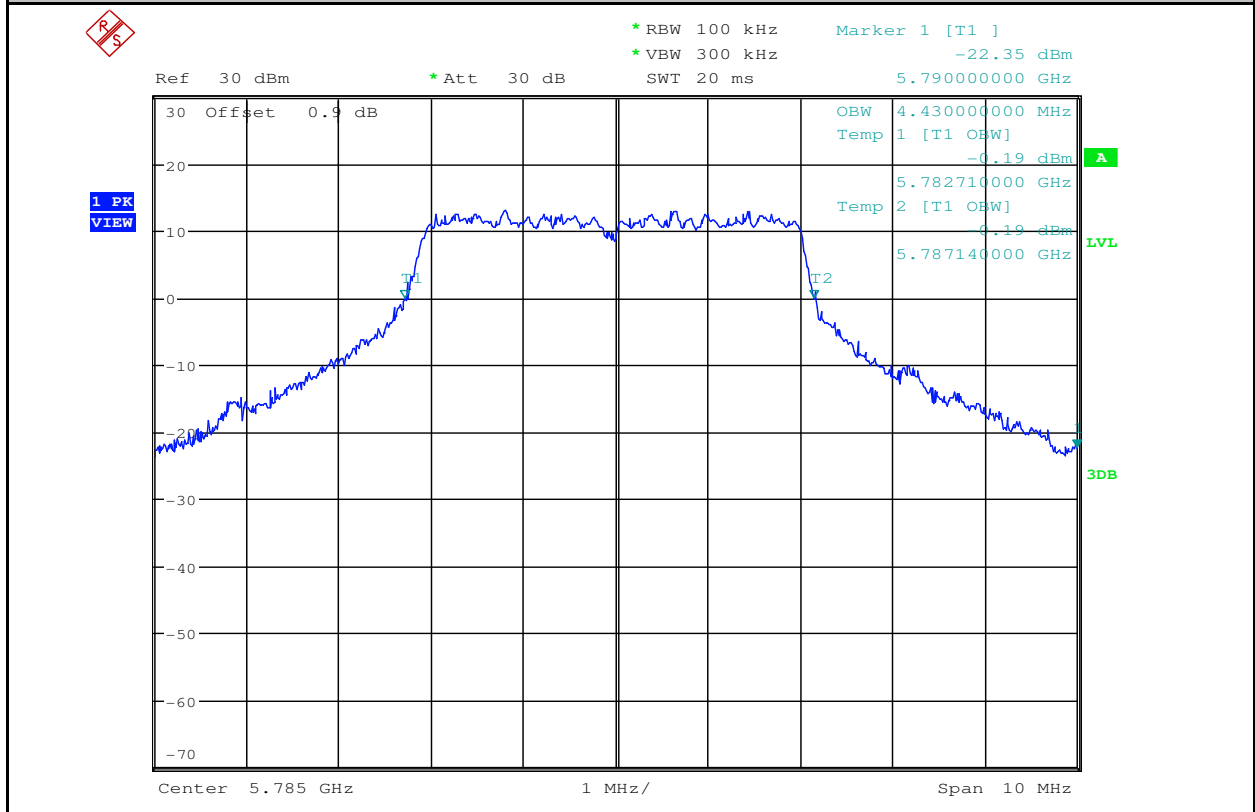
Occupied Bandwidth Measurement_OFDM_5745_Ant2

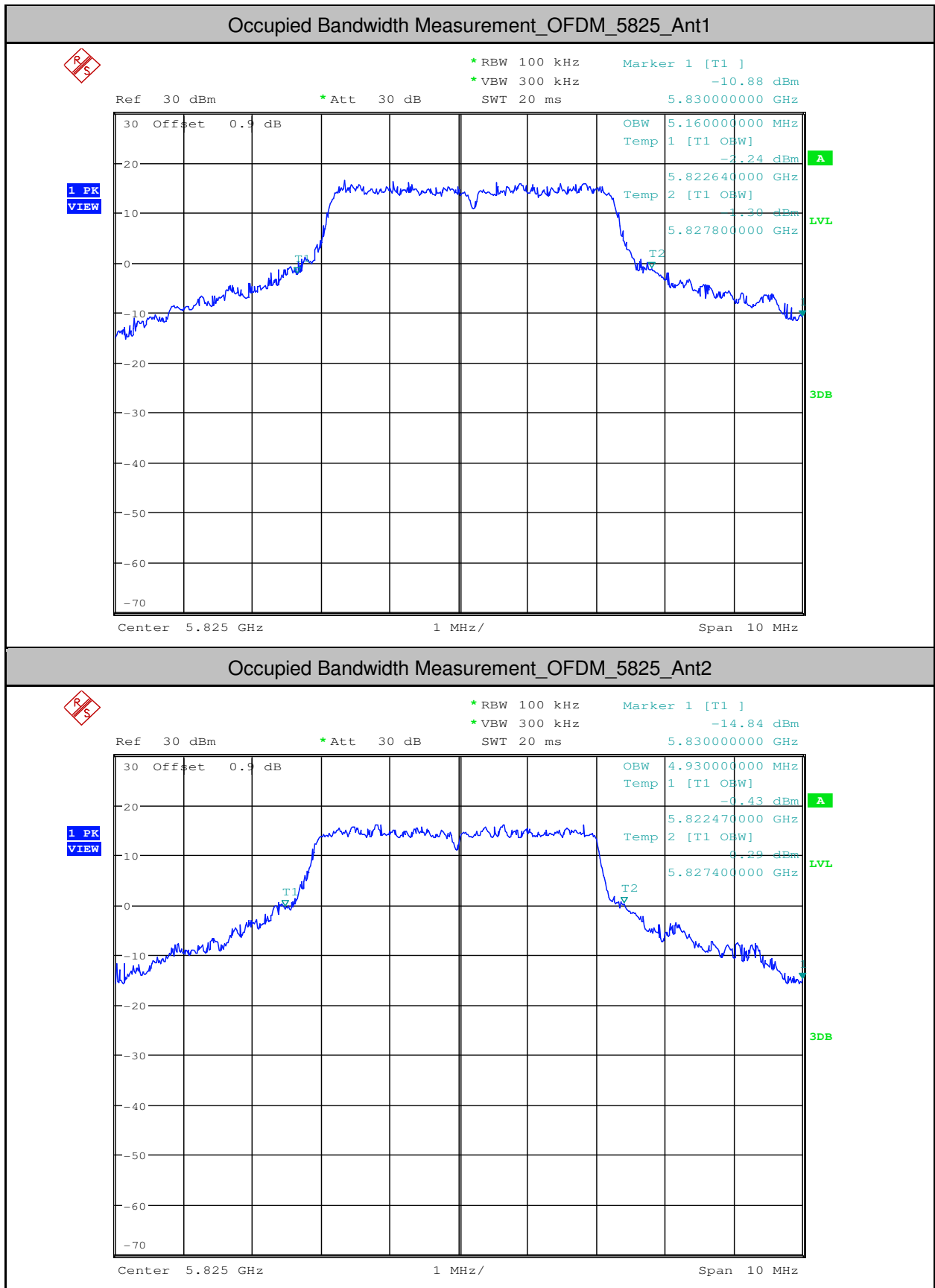


Occupied Bandwidth Measurement_OFDM_5785_Ant1



Occupied Bandwidth Measurement_OFDM_5785_Ant2







3.Maximum Conduct Output Power

Frequency (MHz)	Conducted Output Power (dBm)			Limit (dBm)	Result
	Ant1	Ant2	Total		
5745.00	25.93	26.58	29.28	29.91	Pass
5785.00	24.57	26.60	28.71	29.91	Pass
5825.00	24.20	25.86	28.12	29.91	Pass

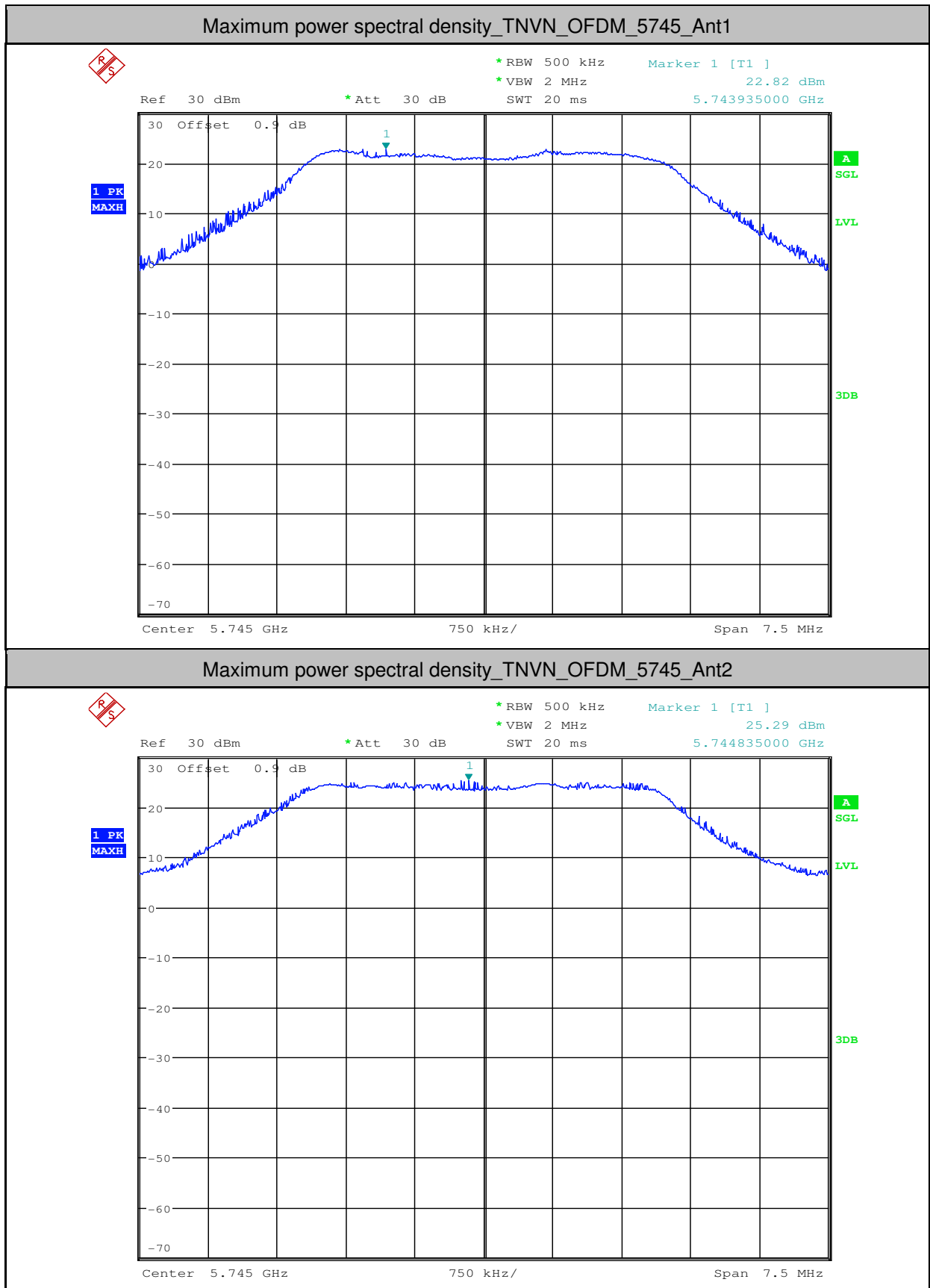
4.Maximum Power Spectral Density

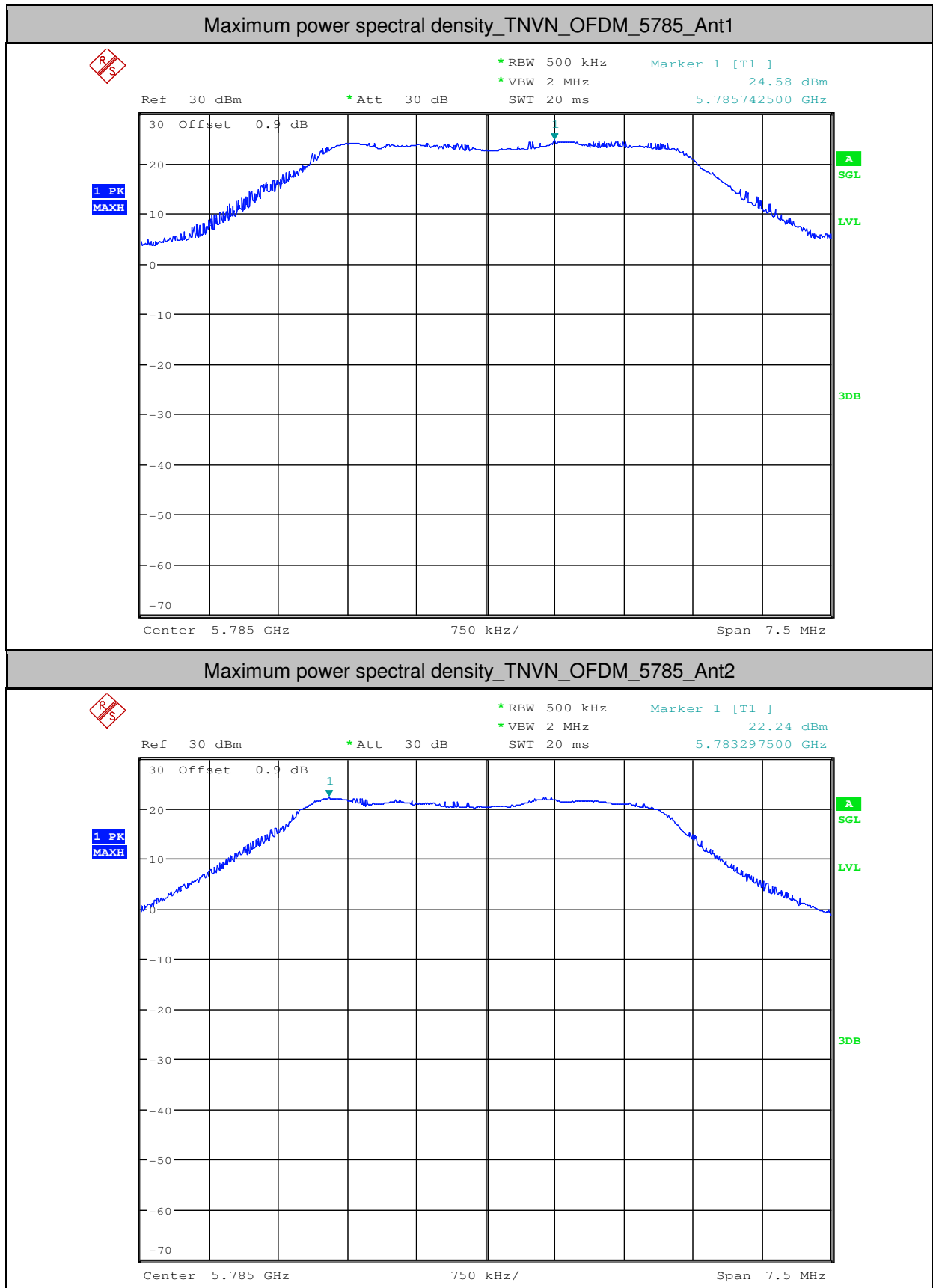
Frequency (MHz)	Maximum power spectral density (dBm/500kHz)			Limit (dBm/500kHz)	Result
	Ant1	Ant2	Total		
5745.00	22.90	25.37	27.32	29.91	Pass
5785.00	24.66	22.32	26.66	29.91	Pass
5825.00	24.97	25.15	28.07	29.91	Pass

Remark:

PSD = Measured PSD + Duty factor

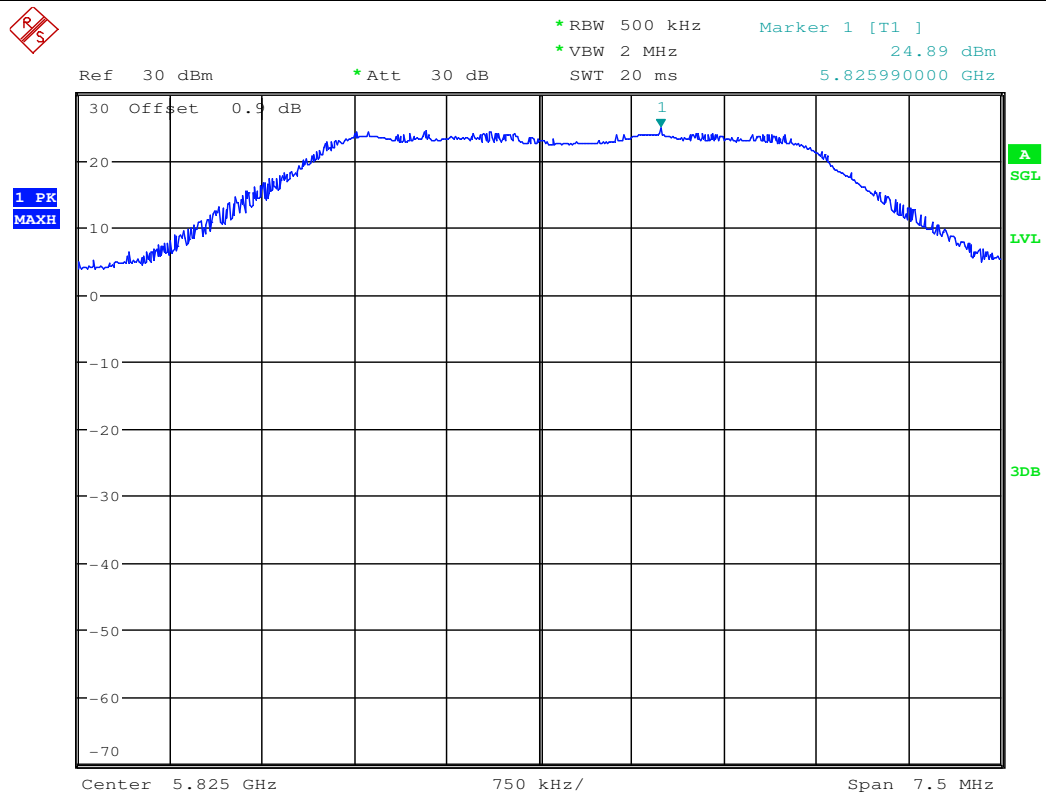
PSD: Maximum Power Spectral Density



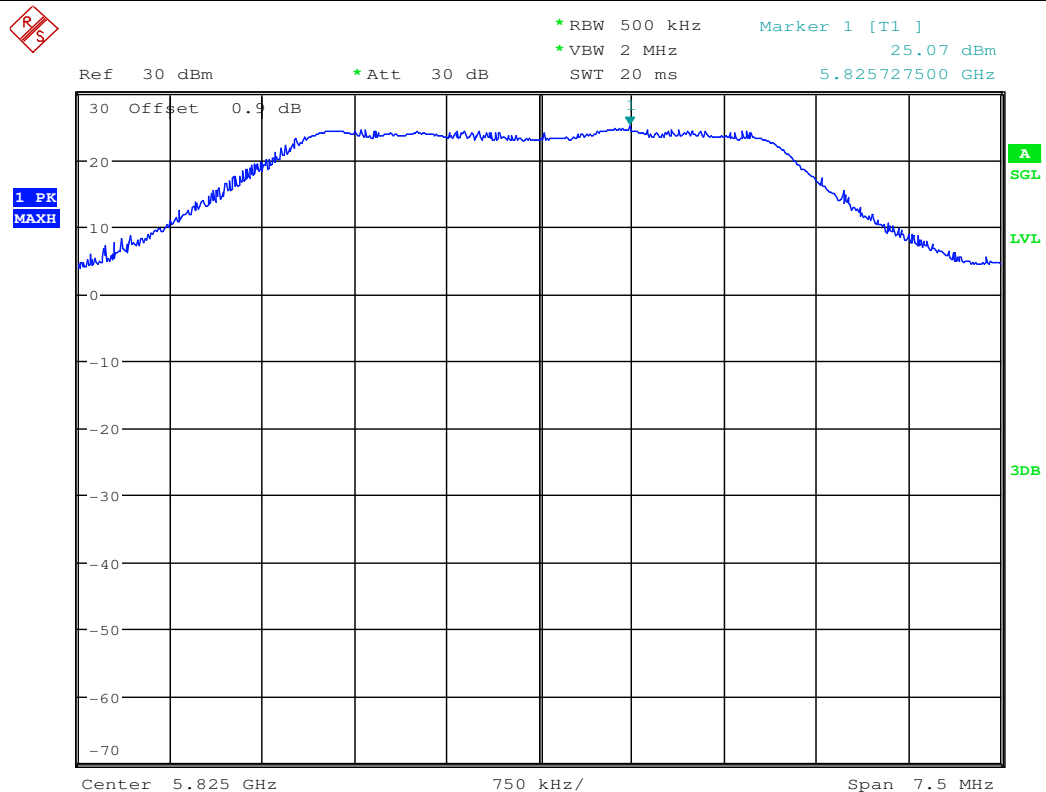




Maximum power spectral density_TNVN_OFDM_5825_Ant1



Maximum power spectral density_TNVN_OFDM_5825_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

