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

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

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TEST REPORT

Application No.:	SZEM1707007365CR (GZEM1707004198CR)
Applicant:	Harman International Industries, Inc.
Address of Applicant:	8500 Balboa Boulevard, Northridge, California, 91329, United States
Manufacturer:	Harman International Industries, Inc.
Address of Manufacturer:	8500 Balboa Boulevard, Northridge, California, 91329, United States
Factory:	Guoguang Electric Co., Ltd.
Address of Factory:	No.8 Jinghu Road, Xinya Street, Huadu Reg, Guangzhou, China
Equipment Under Test (EUT):	
EUT Name:	JBL Wireless Speaker-Secondary
Model No.:	CONTROL XSTREAM Secondary
Trade mark:	JBL
FCC ID:	APICNTRLXSTRMS
Standard(s) :	47 CFR Part 15, Subpart E 15.407
Date of Receipt:	2017-07-13
Date of Test:	2017-07-28 to 2017-08-11
Date of Issue:	2017-09-14
Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards specified above.

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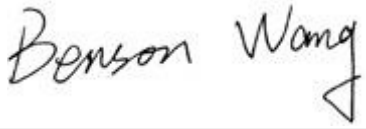
Jack Zhang
EMC Laboratory Manager

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.

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2017-09-14		Original

Authorized for issue by:				
				
		Benson Wang /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

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 & 15.407 b(6)	Pass
99% Bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 II D	N/A	Pass
26dB Emission bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II C 1	47 CFR Part 15, Subpart C 15.407 (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 C 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 C 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 C 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
Duty Cycle	47 CFR Part 15, Subpart E 15.407	KDB 789033 II B 1	KDB 789033 D02 II B 1	Pass
Frequency Stability	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 6.8	47 CFR Part 15, Subpart C 15.407 (g)	Pass

N/A: Not applicable

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply:	AC 100-240V 50/60Hz
Cable:	AC cable: 153cm unshielded
For 5.2G property:	
Operation Frequency:	5180MHz~5240MHz
Modulation Type:	QPSK
Sample Type:	Fixed production
Antenna Type:	Integral
Antenna Gain:	Antenna A: 3.0dBi
	Antenna B: 3.0dBi
	The two antennas and match circuit are the identical and only one antenna is selected for use at any one time, through the on-board Transmit-receive/Diversity RF switch.
For 5.8G property:	
Operation Frequency:	5736MHz~5814MHz
Modulation Type:	QPSK
Sample Type:	Fixed production
Antenna Type:	Integral
Antenna Gain:	Antenna A: 3.2dBi
	Antenna B: 3.2dBi
	The two antennas and match circuit are the identical and only one antenna is selected for use at any one time, through the on-board Transmit-receive/Diversity RF switch.

For 5.2G property:

Channel List:

0	5180MHz
1	5210MHz
2	5240MHz

Using test software was control EUT work in continuous transmitter and receiver mode. And select test channel as below:

Channel	Frequency
The lowest channel	5180MHz
The middle channel	5210MHz
The highest channel	5240MHz

For 5.8G property:

Channel List:

0	5736MHz
1	5762MHz
2	5814MHz

Using test software was control EUT work in continuous transmitter and receiver mode. And select test channel as below:

Channel	Frequency
The lowest channel	5736MHz
The middle channel	5762MHz
The highest channel	5814MHz

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	7.25×10^{-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℃
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 –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• 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

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2017-05-10	2018-05-10
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
LISN	Rohde & Schwarz	ENV216	SEM007-01	2016-10-09	2017-10-09
LISN	ETS-LINDGREN	3816/2	SEM007-02	2017-04-14	2018-04-13
8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	EMC0120	2016-09-28	2017-09-28
4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	EMC0121	2016-09-28	2017-09-28
2 Line ISN	Fischer Custom	FCC-TLISN-T2-02	EMC0122	2016-09-28	2017-09-28
Cable	SGS	CE	--	2017-10-09	2018-10-09

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
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2017-04-14	2018-04-13
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09
Coaxial Cable	SGS	N/A	SEM031-01	2017-07-13	2018-07-12
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A

RE in Chamber					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2017-05-02	2020-05-01
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2017-04-14	2018-04-13
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2017-03-05	2020-03-05
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-14	2017-06-16	2020-06-15
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2016-10-09	2017-10-09
Low Noise Amplifier (100MHz-18GHz)	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2016-10-09	2017-10-09
Pre-amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-10	2016-10-17	2017-10-17
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2017-04-14	2018-04-13
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21
Band filter	N/A	N/A	SEM023-01	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2017-07-13	2018-07-12
Cable	SGS	RE	--	2017-10-09	2018-10-09

RE in Chamber					
Test Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date (yyyy-mm-dd)**	**Cal. Due date (yyyy-mm-dd)**
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04
MXE EMI Receiver (20Hz-8.4GHz)	Agilent Technologies	N9038A	SEM004-05	2016-10-09	2017-10-09
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-02	2017-03-05	2020-03-05
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2017-04-14	2018-04-13
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Cable	SGS	RE 1#	--	2017-10-09	2018-10-09

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 A and B are 3.0dBi of the 5.2G property, The best case gain of the antenna A and B are 3.2dBi of the 5.8G property. The two antennas and match circuit are the identical and only one antenna is selected for use at any one time, through the on-board Transmit-receive/Diversity RF switch.

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 & 15.407 b(6)
Test Method: ANSI C63.10 (2013) Section 6.2
Limit:

Frequency of emission(MHz)	Conducted limit(dBμV)	
	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

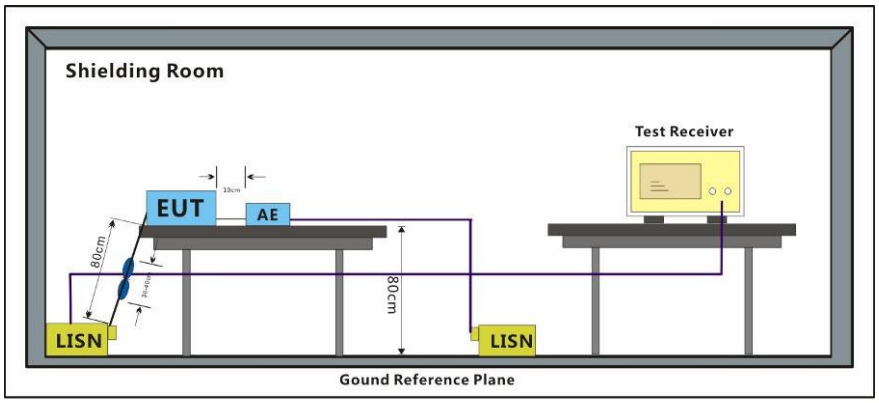
Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1005 mbar

Pretest these mode to find the worst case: a:TX mode (5.2G)_Keep the EUT in continuously transmitting mode.
b:TX mode (5.8G)_Keep the EUT in continuously transmitting mode.

The worst case for final test: a:TX mode (5.2G)_Keep the EUT in continuously transmitting mode.

7.1.2 Test Setup Diagram



7.1.3 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.

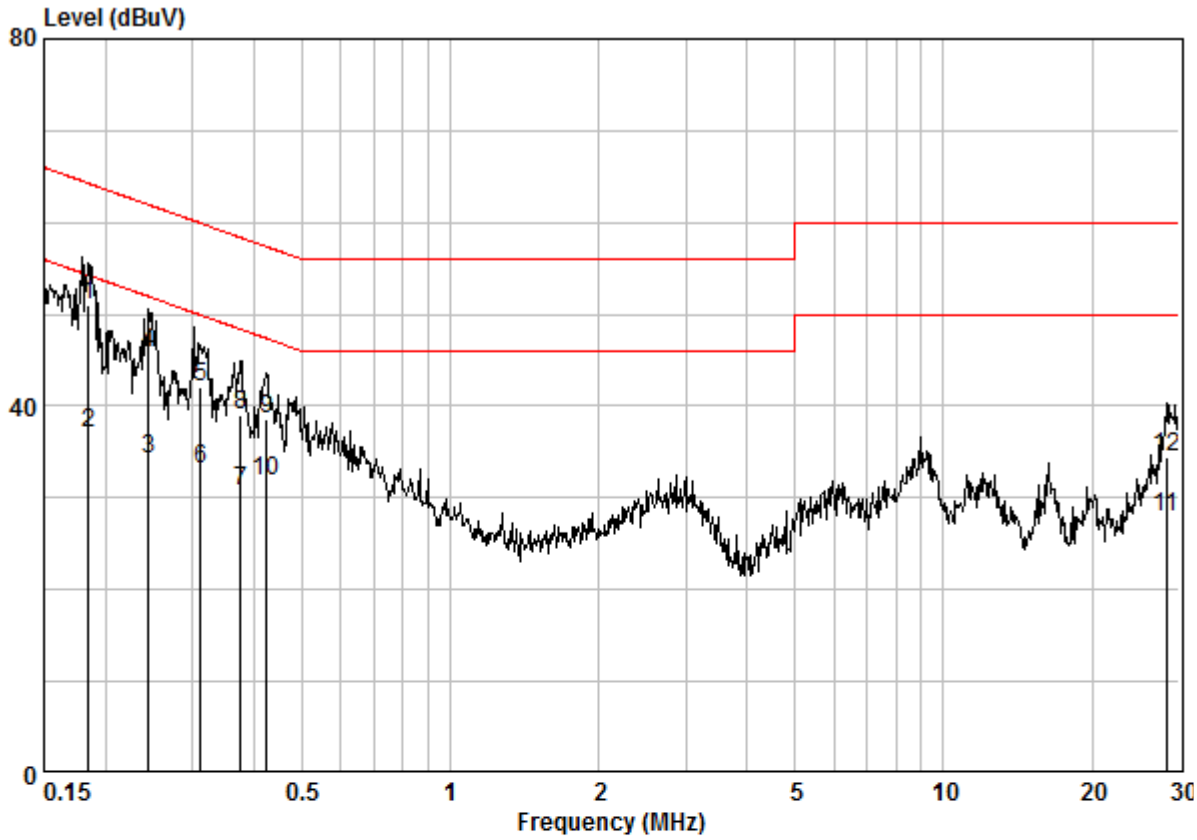
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,

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.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor

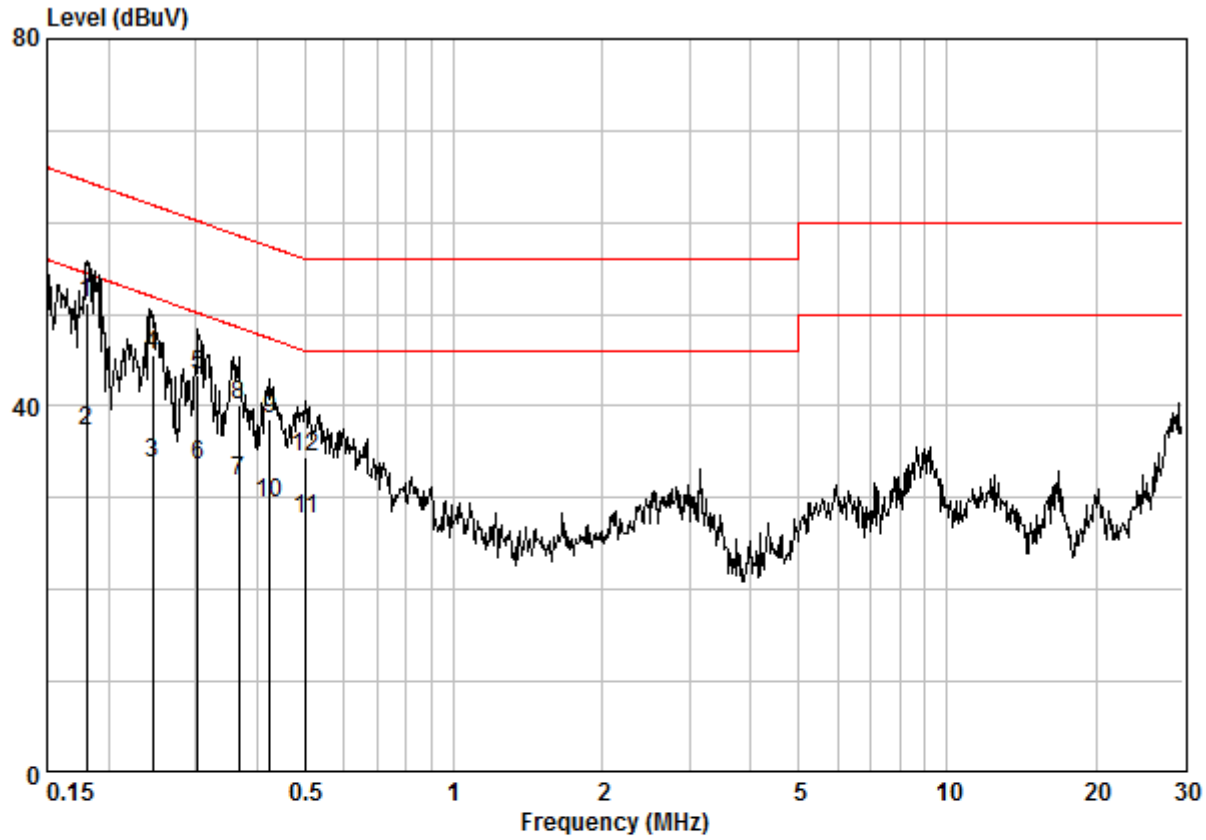
Mode:a; Line:Live Line



Site : Shielding Room
Condition : CE LINE
Job No. : 07365CR
Test Mode : a

		Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
		MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	@	0.18443	0.02	9.64	41.42	51.08	64.28	-13.21	QP
2		0.18443	0.02	9.64	27.44	37.10	54.28	-17.18	AVERAGE
3		0.24422	0.02	9.64	24.56	34.22	51.95	-17.73	AVERAGE
4		0.24422	0.02	9.64	36.08	45.74	61.95	-16.21	QP
5		0.31163	0.02	9.64	32.41	42.07	59.93	-17.85	QP
6		0.31163	0.02	9.64	23.47	33.13	49.93	-16.79	AVERAGE
7		0.37512	0.02	9.64	20.98	30.64	48.39	-17.75	AVERAGE
8		0.37512	0.02	9.64	29.37	39.03	58.39	-19.36	QP
9		0.42373	0.02	9.64	28.86	38.52	57.37	-18.85	QP
10		0.42373	0.02	9.64	22.23	31.89	47.37	-15.48	AVERAGE
11		28.302	0.15	10.43	17.36	27.94	50.00	-22.06	AVERAGE
12		28.302	0.15	10.43	23.84	34.42	60.00	-25.58	QP

Mode:a; Line:Neutral Line



Site : Shielding Room
Condition : CE NEUTRAL
Job No. : 07365CR
Test Mode : a

		Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
		MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	@	0.18056	0.02	9.63	41.62	51.27	64.46	-13.19	QP
2		0.18056	0.02	9.63	27.61	37.26	54.46	-17.20	AVERAGE
3		0.24552	0.02	9.63	24.09	33.74	51.91	-18.17	AVERAGE
4		0.24552	0.02	9.63	35.91	45.56	61.91	-16.35	QP
5		0.30348	0.02	9.63	33.73	43.38	60.15	-16.77	QP
6		0.30348	0.02	9.63	23.84	33.49	50.15	-16.65	AVERAGE
7		0.36725	0.02	9.63	22.14	31.79	48.56	-16.77	AVERAGE
8		0.36725	0.02	9.63	30.44	40.09	58.56	-18.47	QP
9		0.42373	0.02	9.63	28.92	38.57	57.37	-18.80	QP
10		0.42373	0.02	9.63	19.68	29.33	47.37	-18.04	AVERAGE
11		0.50203	0.02	9.63	18.09	27.74	46.00	-18.26	AVERAGE
12		0.50203	0.02	9.63	24.75	34.40	56.00	-21.60	QP

7.2 99% Bandwidth

Test Requirement N/A

Test Method: KDB 789033 II D

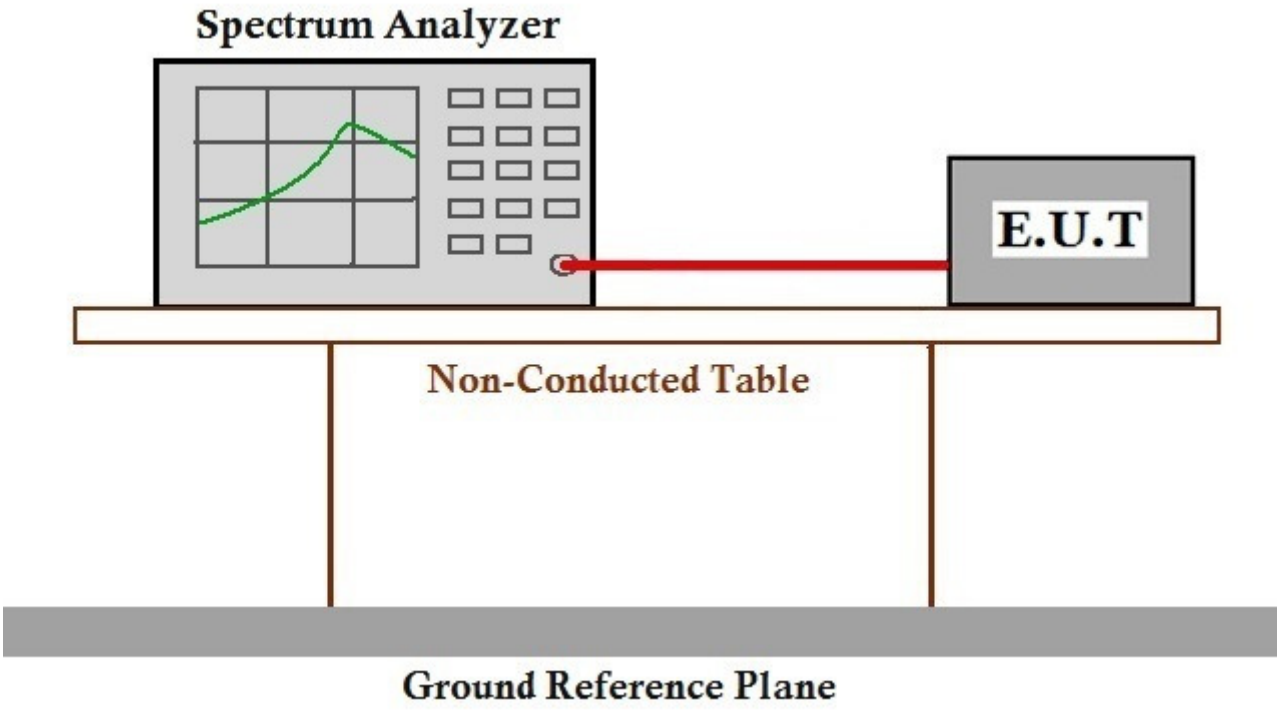
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1000 mbar

Pretest these mode to find the worst case: a:TX mode (5.2G)_Keep the EUT in continuously transmitting mode.
b:TX mode (5.8G)_Keep the EUT in continuously transmitting mode.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

7.3 26dB Emission bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.407 (a)

Test Method: KDB 789033 D02 II C 1

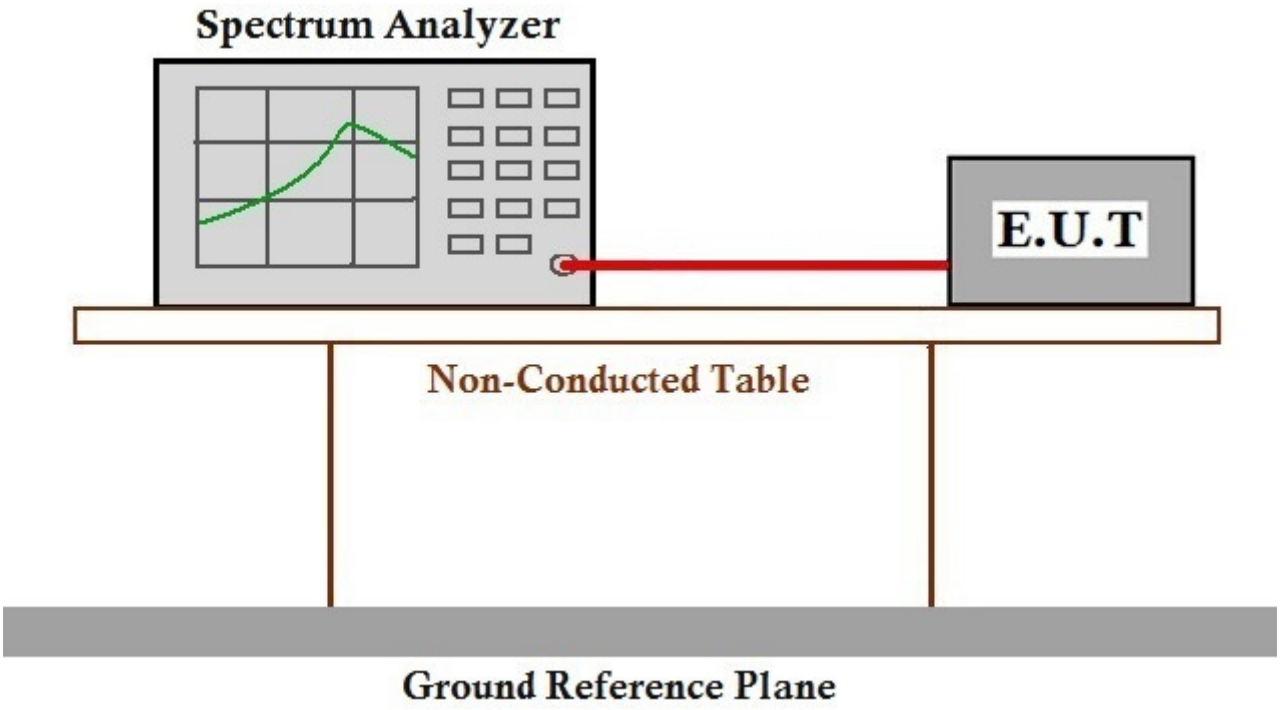
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1000 mbar

Pretest these mode to find the worst case: a:TX mode (5.2G)_Keep the EUT in continuously transmitting mode.
b:TX mode (5.8G)_Keep the EUT in continuously transmitting mode.

7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

7.4 Minimum 6 dB bandwidth (5.725-5.85 GHz band)

Test Requirement 47 CFR Part 15, Subpart C 15.407 (e)

Test Method: KDB 789033 D02 II C 2

Limit: ⩾500 kHz

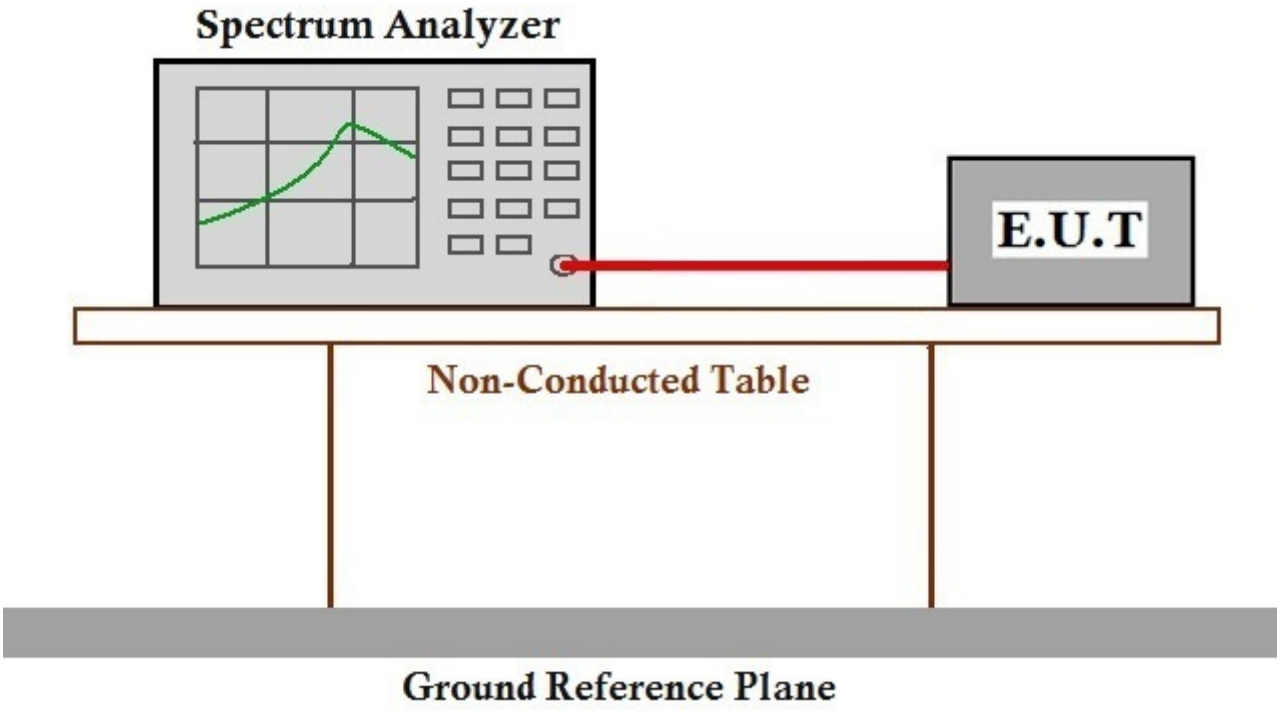
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1000 mbar

Pretest these mode to find the worst case: b:TX mode (5.8G)_Keep the EUT in continuously transmitting mode.

7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

7.5 Maximum Conducted output power

Test Requirement 47 CFR Part 15, Subpart C 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.	

7.5.1 E.U.T. Operation

Operating Environment:

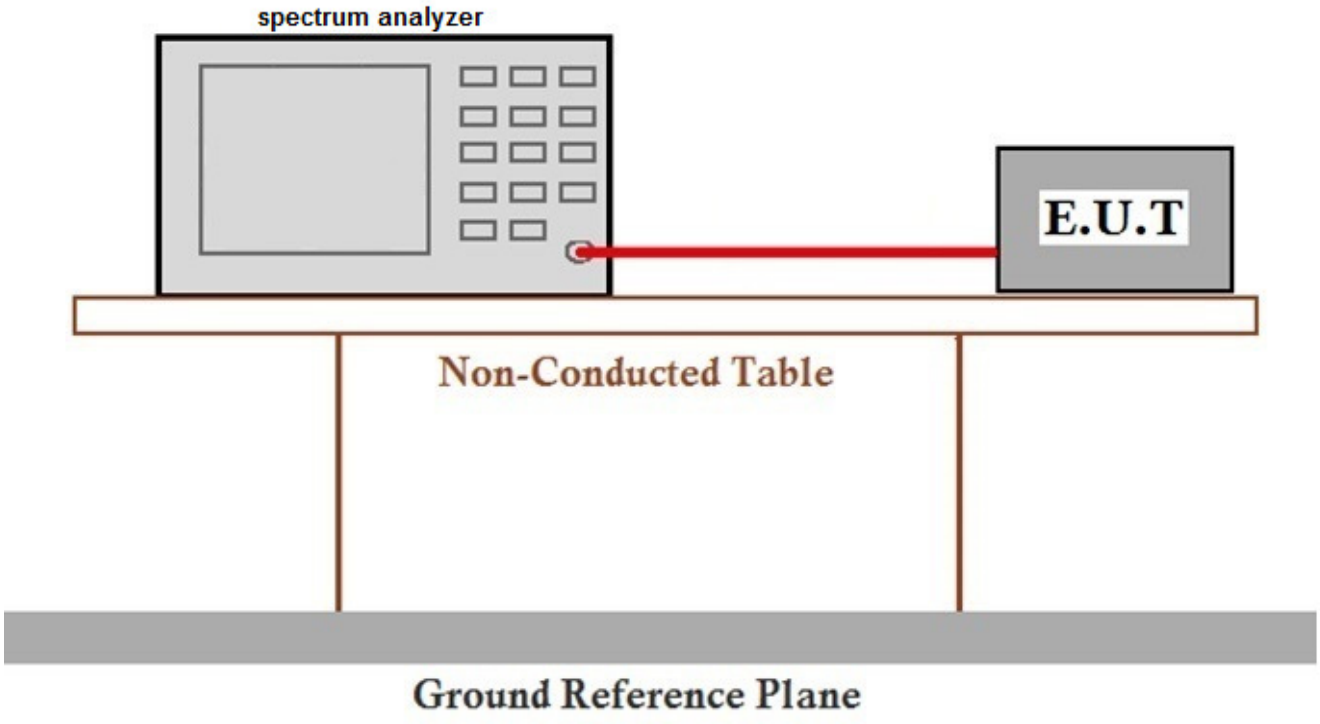
Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1000 mbar

Pretest these mode to find the worst case:

a:TX mode (5.2G)_Keep the EUT in continuously transmitting mode.

b:TX mode (5.8G)_Keep the EUT in continuously transmitting mode.

7.5.2 Test Setup Diagram



7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

7.6 Peak Power spectrum density

Test Requirement 47 CFR Part 15, Subpart C 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.	

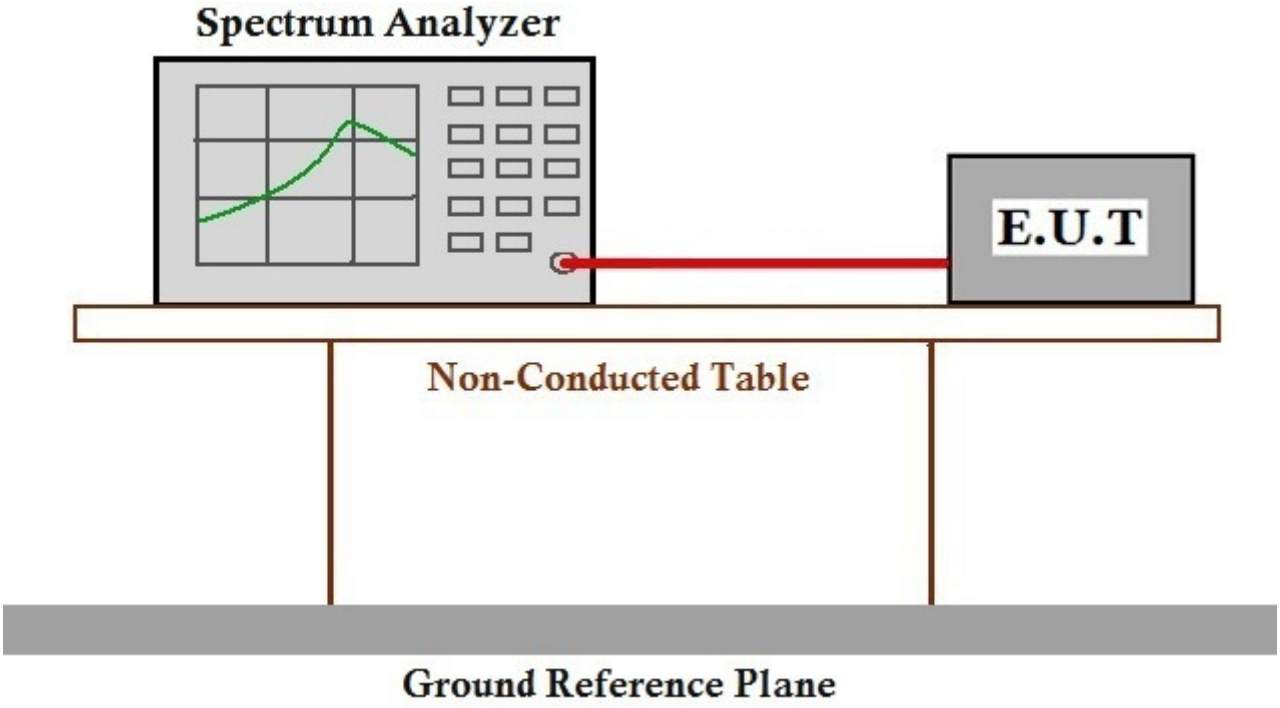
7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1000 mbar

Pretest these mode to find the worst case:
a:TX mode (5.2G)_Keep the EUT in continuously transmitting mode.
b:TX mode (5.8G)_Keep the EUT in continuously transmitting mode.

7.6.2 Test Setup Diagram



7.6.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

7.7 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

7.7.1 E.U.T. Operation

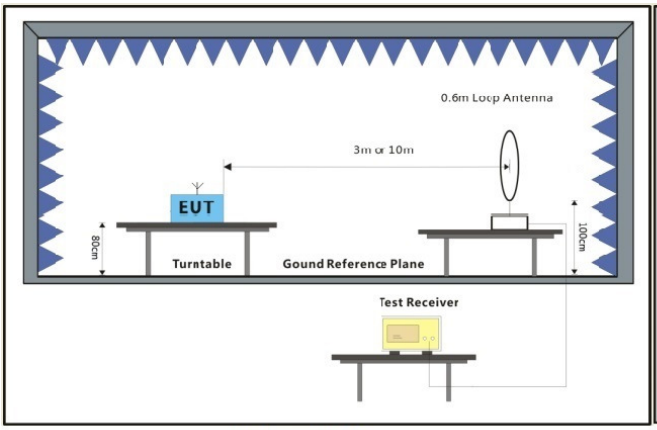
Operating Environment:

Temperature: 24 °C Humidity: 54 % RH Atmospheric Pressure: 1005 mbar

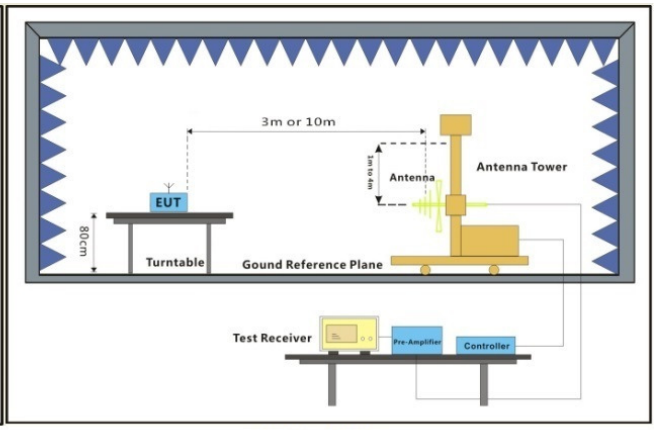
Pretest these mode to find the worst case: a:TX mode (5.2G)_Keep the EUT in continuously transmitting mode.
b:TX mode (5.8G)_Keep the EUT in continuously transmitting mode.

The worst case for final test: a:TX mode (5.2G)_Keep the EUT in continuously transmitting mode.
b:TX mode (5.8G)_Keep the EUT in continuously transmitting mode.

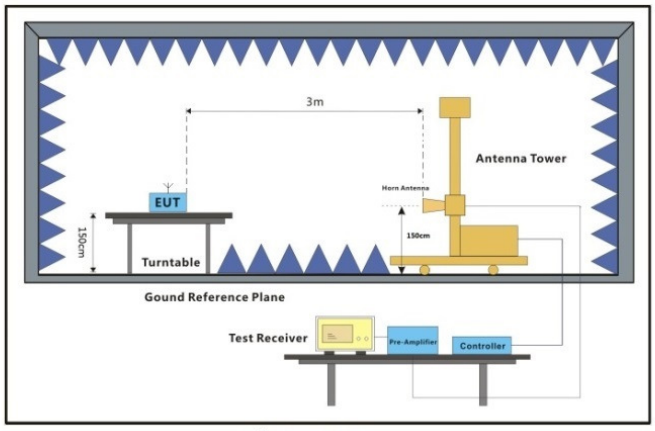
7.7.2 Test Setup Diagram



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.

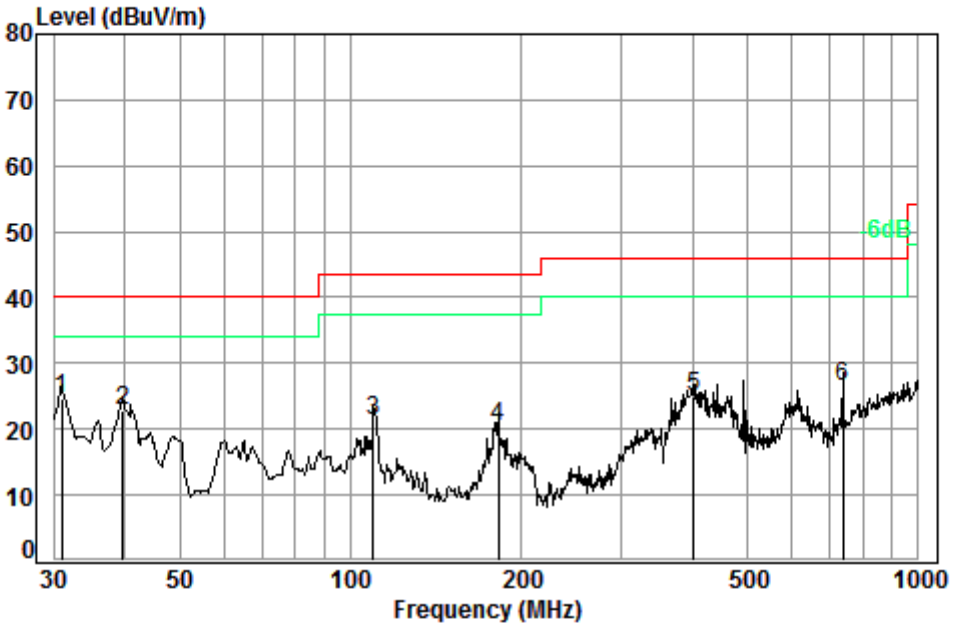
Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Below 1G:

Detector: QP

Mode: a; Polarization: Horizontal

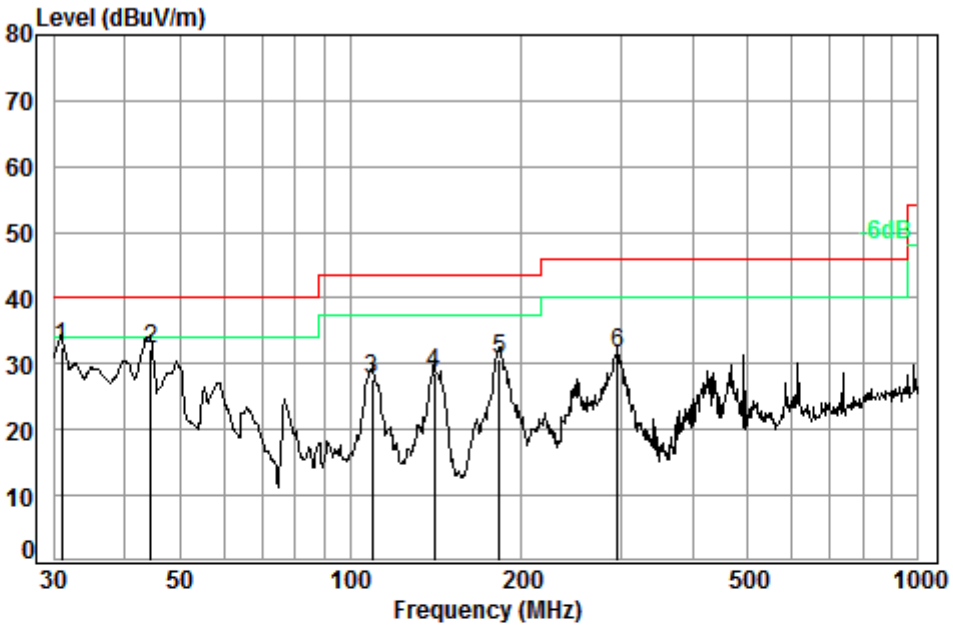
Pre-test the EUT at antenna 1 and antenna 2 of the 5.2G and 5.8G property: and found the antenna 1 of the 5.2G property which is worst case, So, Only the antenna 1 of the 5.2G property is recorded in the report.



Condition: 3m HORIZONTAL
Job No. : 07365CR
Test mode: a

	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 pp	30.96	0.60	18.16	27.35	33.36	24.77	40.00	-15.23
2	39.71	0.60	13.26	27.32	36.13	22.67	40.00	-17.33
3	109.80	1.23	8.61	27.13	38.60	21.31	43.50	-22.19
4	182.56	1.37	9.95	26.77	35.84	20.39	43.50	-23.11
5	401.84	2.21	16.31	27.15	33.48	24.85	46.00	-21.15
6	737.07	3.02	21.65	27.37	29.20	26.50	46.00	-19.50

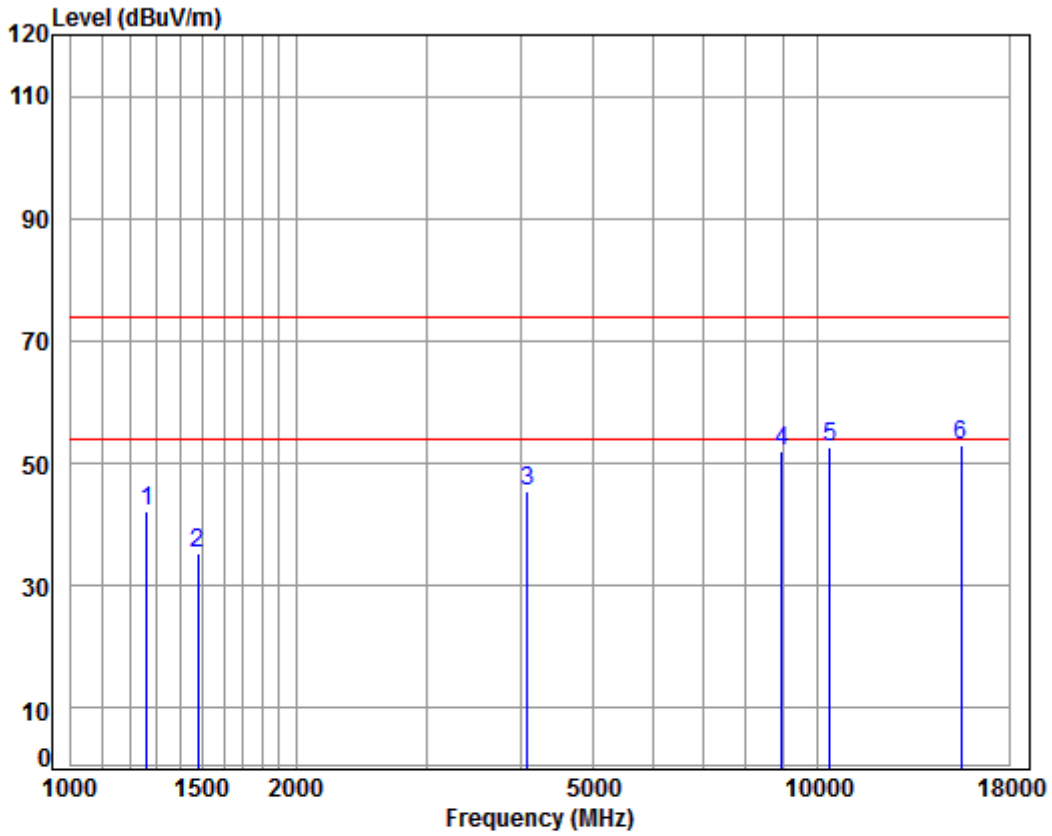
Mode:a; Polarization:Vertical



Condition: 3m VERTICAL
Job No. : 07365CR
Test mode: a

	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 pp	30.96	0.60	18.16	27.35	41.21	32.62	40.00	-7.38
2	44.59	0.70	11.08	27.31	47.90	32.37	40.00	-7.63
3	109.41	1.23	8.63	27.14	44.97	27.69	43.50	-15.81
4	140.34	1.30	8.13	26.95	46.26	28.74	43.50	-14.76
5	183.20	1.37	9.96	26.76	46.06	30.63	43.50	-12.87
6	295.15	1.88	13.69	26.42	42.34	31.49	46.00	-14.51

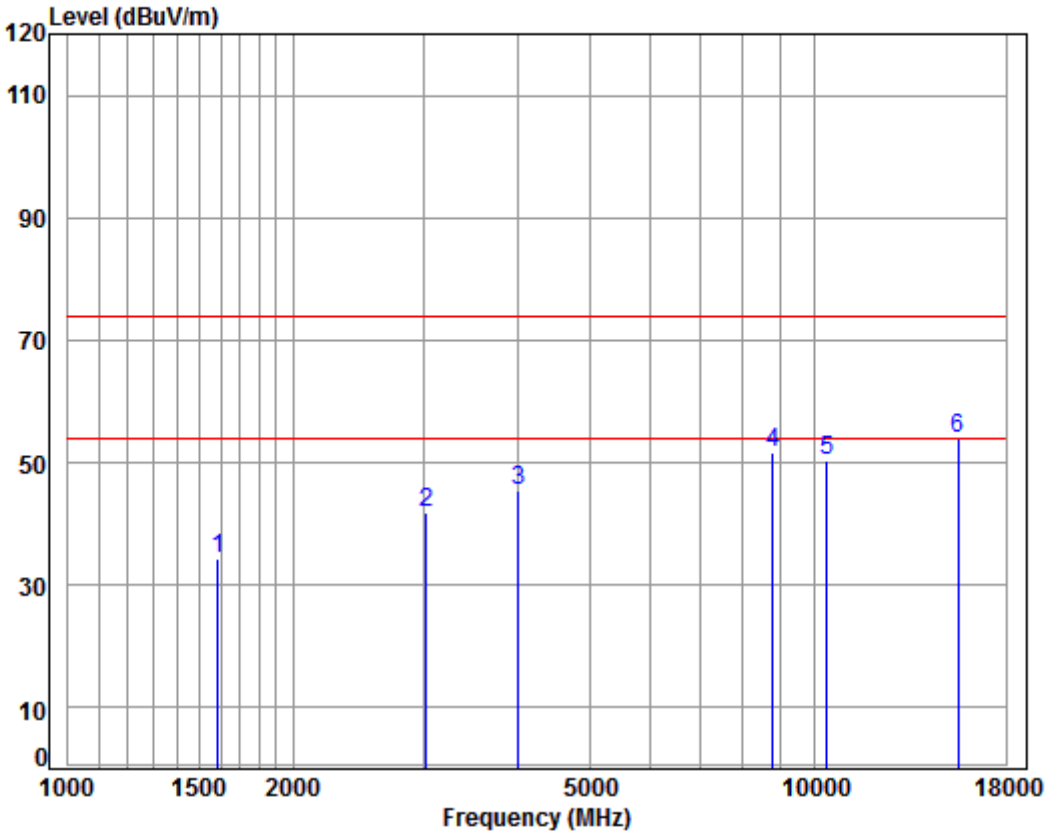
Above 1G :5.2g property
Mode:a; Polarization:Horizontal; Channel:Low



Condition: 3m HORIZONTAL
Job No : 07362CR/07363CR
Mode : 5180 TX SE
Note : 5.2G

	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	1263.796	4.66	24.79	38.07	50.72	42.10	74.00	-31.90	peak
2	1477.276	5.41	25.71	38.04	42.23	35.31	74.00	-38.69	peak
3	4086.182	7.08	33.60	38.05	42.74	45.37	74.00	-28.63	peak
4	8943.274	10.39	36.53	35.45	40.65	52.12	74.00	-21.88	peak
5	10360.000	11.19	37.24	35.09	39.31	52.65	74.00	-21.35	peak
6	pp15540.000	14.30	41.38	38.30	35.70	53.08	74.00	-20.92	peak

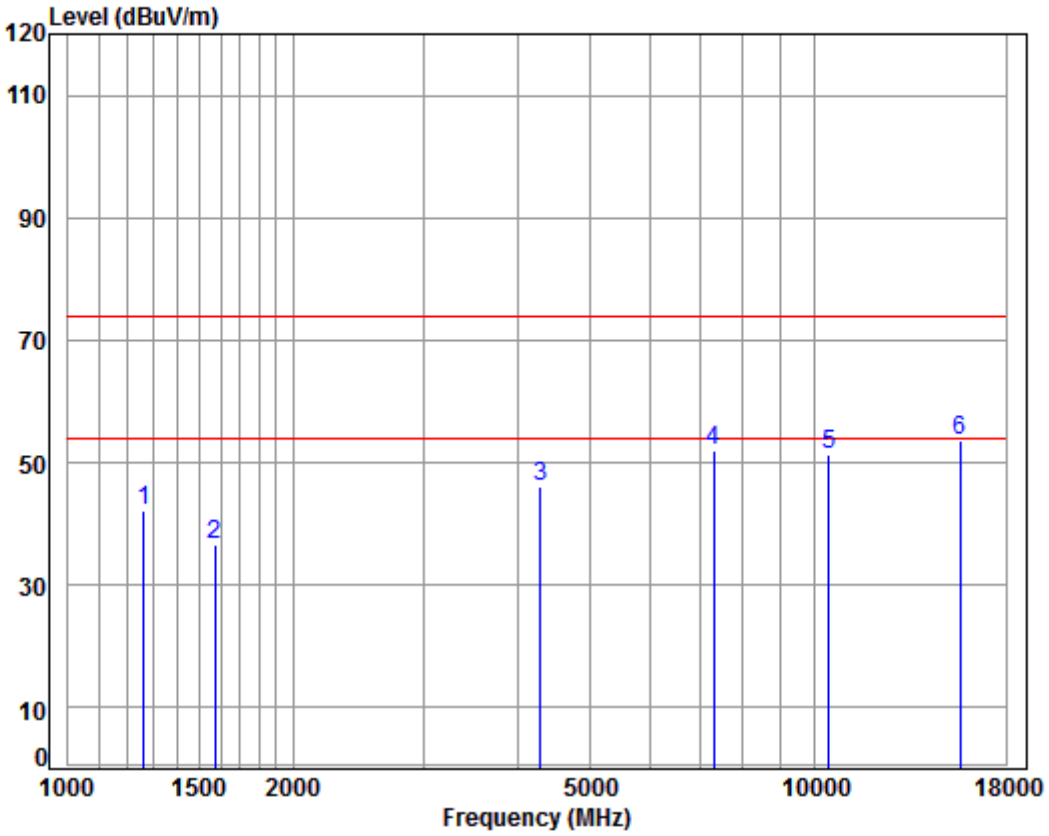
Mode:a; Polarization:Vertical; Channel:Low



Condition: 3m VERTICAL
Job No : 07362CR/07363CR
Mode : 5180 TX SE
Note : 5.2G

	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	1587.975	5.37	26.20	38.03	40.88	34.42	74.00	-39.58	Peak
2	3016.575	6.00	31.33	37.90	42.40	41.83	74.00	-32.17	Peak
3	4004.339	6.99	33.60	38.00	42.80	45.39	74.00	-28.61	peak
4	8764.146	10.34	36.32	35.63	40.72	51.75	74.00	-22.25	peak
5	10360.000	11.19	37.24	35.09	36.91	50.25	74.00	-23.75	peak
6	pp15540.000	14.30	41.38	38.30	36.46	53.84	74.00	-20.16	peak

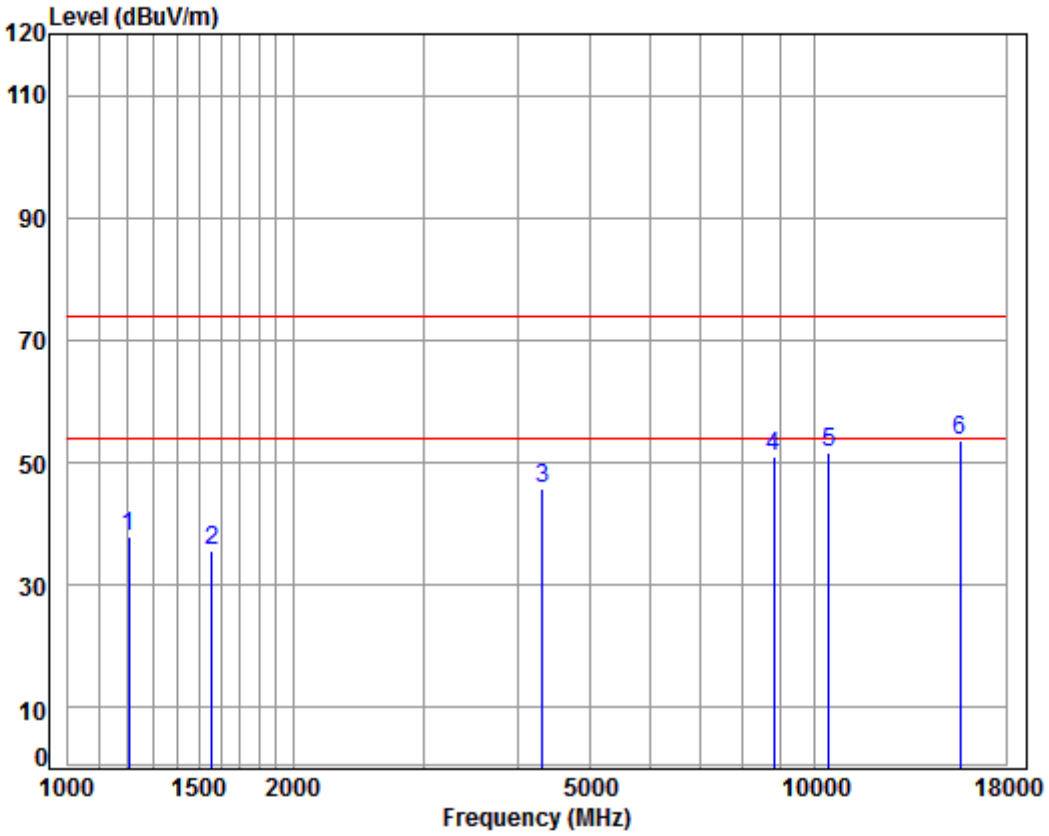
Mode:a; Polarization:Horizontal; Channel:middle



Condition: 3m HORIZONTAL
Job No : 07362CR/07363CR
Mode : 5210 TX SE
Note : 5.2G

	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	1263.796	4.66	24.79	38.07	50.72	42.10	74.00	-31.90	peak
2	1574.265	5.38	26.14	38.03	43.00	36.49	74.00	-37.51	peak
3	4291.977	7.33	33.60	38.16	43.38	46.15	74.00	-27.85	peak
4	7305.122	10.05	36.38	37.01	42.72	52.14	74.00	-21.86	peak
5	10420.000	11.24	37.18	35.12	38.12	51.42	74.00	-22.58	peak
6	pp15630.000	14.44	41.35	38.20	35.97	53.56	74.00	-20.44	peak

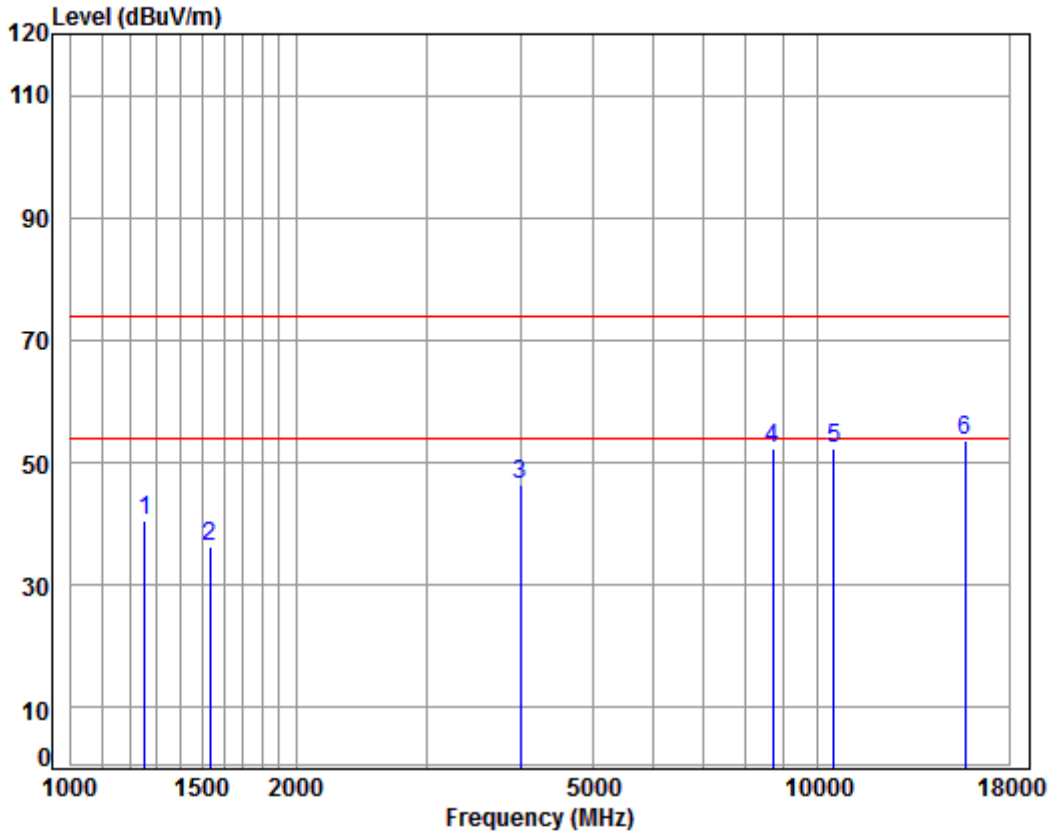
Mode:a; Polarization:Vertical; Channel:middle



Condition: 3m VERTICAL
Job No : 07362CR/07363CR
Mode : 5210 TX SE
Note : 5.2G

	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	1206.682	4.44	24.51	38.07	47.03	37.91	74.00	-36.09	peak
2	1560.673	5.40	26.08	38.04	42.09	35.53	74.00	-38.47	peak
3	4316.859	7.36	33.60	38.17	43.03	45.82	74.00	-28.18	peak
4	8814.957	10.35	36.38	35.58	40.01	51.16	74.00	-22.84	peak
5	10420.000	11.24	37.18	35.12	38.50	51.80	74.00	-22.20	peak
6	pp15630.000	14.44	41.35	38.20	35.96	53.55	74.00	-20.45	peak

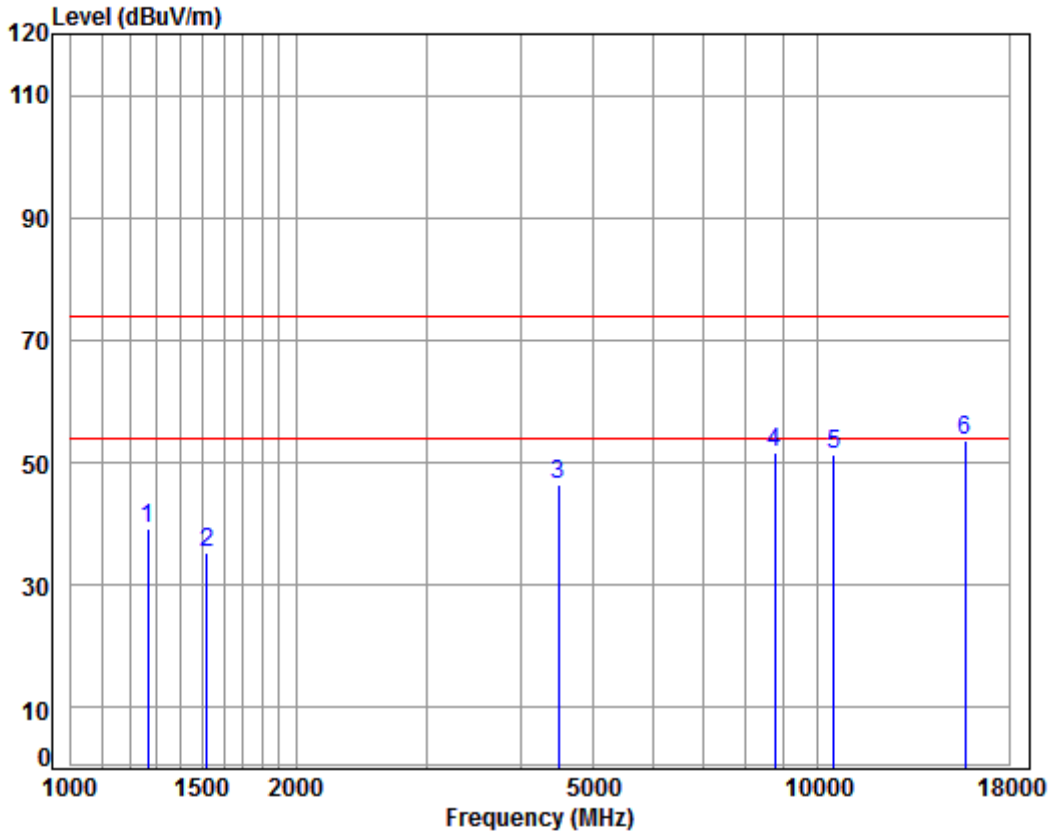
Mode:a; Polarization:Horizontal; Channel:High



Condition: 3m HORIZONTAL
Job No : 07362CR/07363CR
Mode : 5240 TX SE
Note : 5.2G

	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	1256.512	4.64	24.75	38.07	49.25	40.57	74.00	-33.43	peak
2	1533.841	5.44	25.96	38.04	42.90	36.26	74.00	-37.74	peak
3	3992.781	6.97	33.58	38.00	43.75	46.30	74.00	-27.70	peak
4	8688.480	10.32	36.23	35.70	41.38	52.23	74.00	-21.77	peak
5	10480.000	11.28	37.12	35.15	39.15	52.40	74.00	-21.60	peak
6	pp15720.000	14.57	41.31	38.10	35.69	53.47	74.00	-20.53	peak

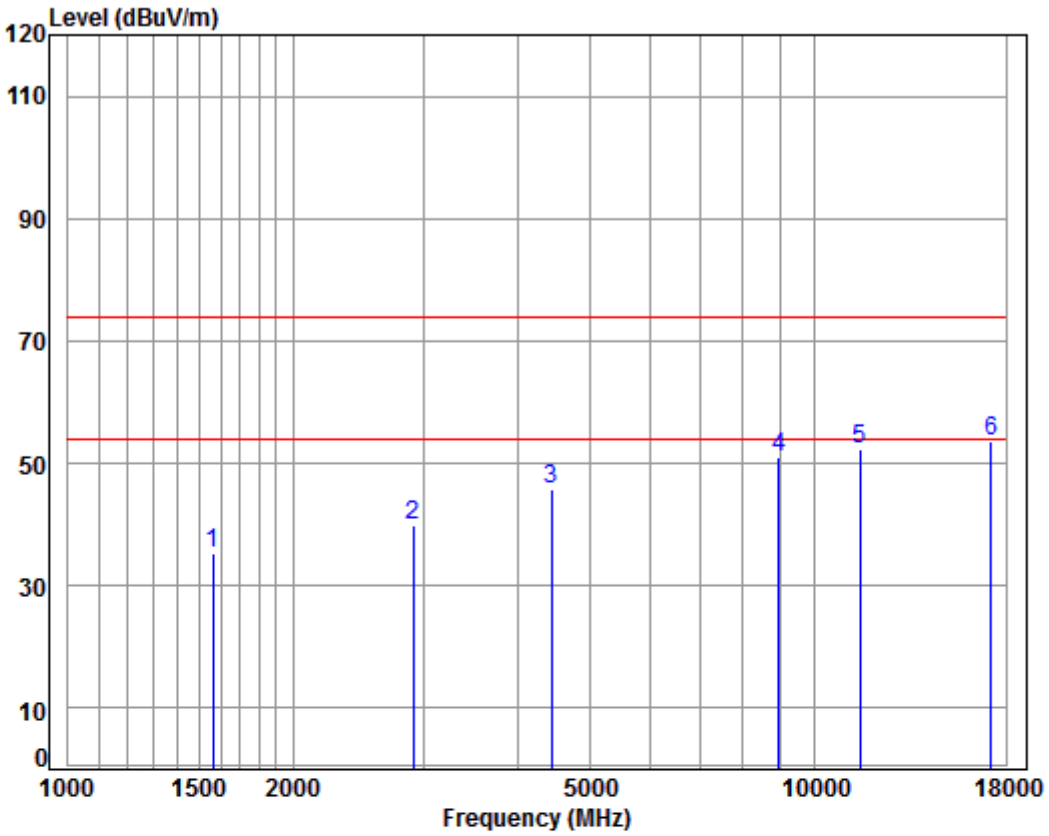
Mode:a; Polarization:Vertical; Channel:High



Condition: 3m VERTICAL
Job No : 07362CR/07363CR
Mode : 5240 TX SE
Note : 5.2G

	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	4.68	24.80	38.07	47.68	39.09	74.00	-34.91	peak
2	1520.598	5.45	25.89	38.04	42.08	35.38	74.00	-38.62	peak
3	4495.125	7.55	33.60	38.26	43.40	46.29	74.00	-27.71	peak
4	8738.852	10.33	36.29	35.65	40.67	51.64	74.00	-22.36	peak
5	10480.000	11.28	37.12	35.15	38.19	51.44	74.00	-22.56	peak
6	pp15720.000	14.57	41.31	38.10	35.97	53.75	74.00	-20.25	peak

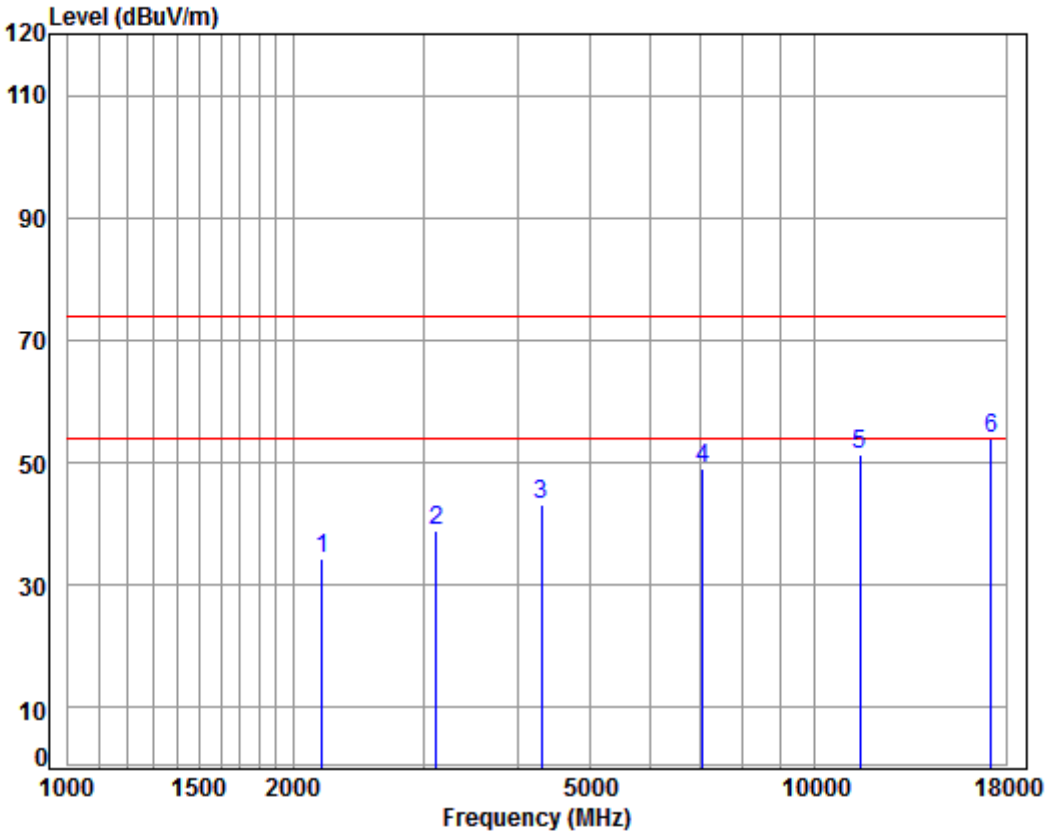
5.8g property:
Mode:b; Polarization:Horizontal; Channel:Low



Condition: 3m HORIZONTAL
Job No : 07362CR/07363CR
Mode : 5736 TX SE
Note : 5.8G

	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	1565.191	5.39	26.10	38.04	41.72	35.17	74.00	-38.83	Peak
2	2896.945	5.91	30.94	37.91	41.04	39.98	74.00	-34.02	Peak
3	4443.453	7.50	33.60	38.24	43.06	45.92	74.00	-28.08	Peak
4	8943.274	10.39	36.53	35.45	39.41	50.88	74.00	-23.12	Peak
5	11472.000	12.11	38.07	35.97	38.10	52.31	74.00	-21.69	Peak
6	pp17208.000	16.29	43.03	36.20	30.48	53.60	74.00	-20.40	Peak

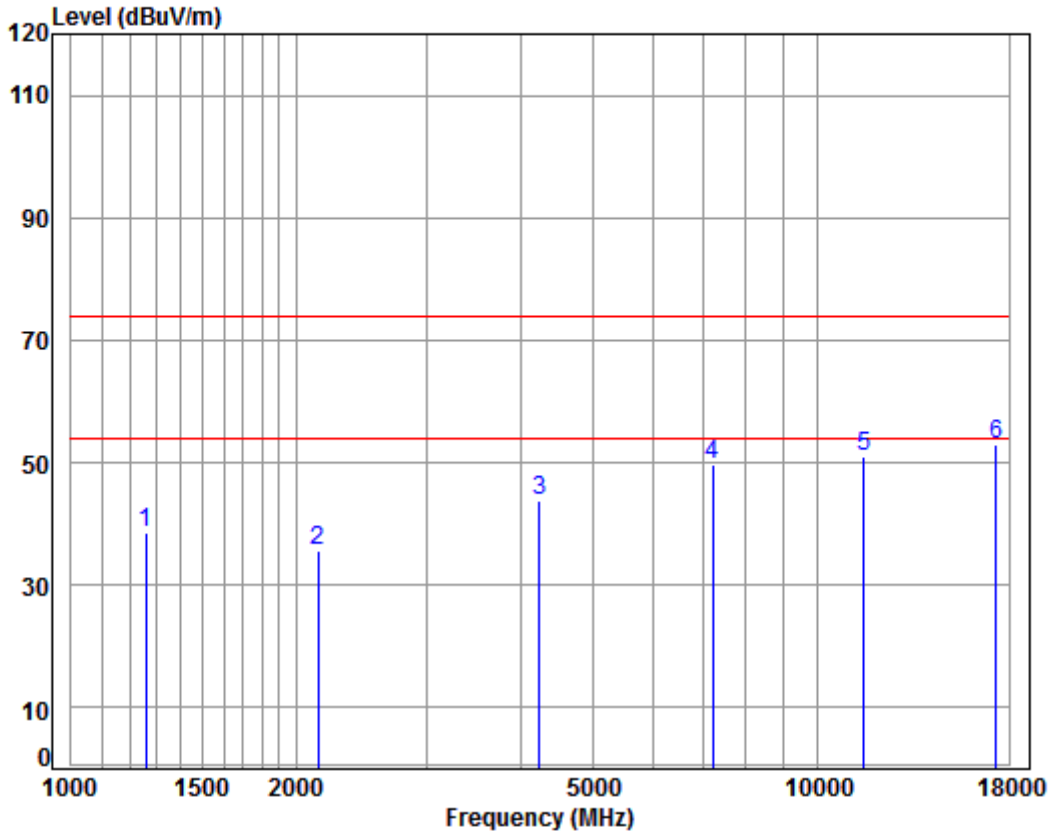
Mode:b; Polarization:Vertical; Channel:Low



Condition: 3m VERTICAL
Job No : 07362CR/07363CR
Mode : 5736 TX SE
Note : 5.8G

	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	2188.663	5.19	28.45	37.98	38.60	34.26	74.00	-39.74	Peak
2	3114.025	6.10	31.52	37.91	39.09	38.80	74.00	-35.20	Peak
3	4304.400	7.34	33.60	38.16	40.22	43.00	74.00	-31.00	Peak
4	7076.516	10.11	36.47	37.23	39.82	49.17	74.00	-24.83	Peak
5	11472.000	12.11	38.07	35.97	37.01	51.22	74.00	-22.78	Peak
6	pp17208.000	16.29	43.03	36.20	30.74	53.86	74.00	-20.14	Peak

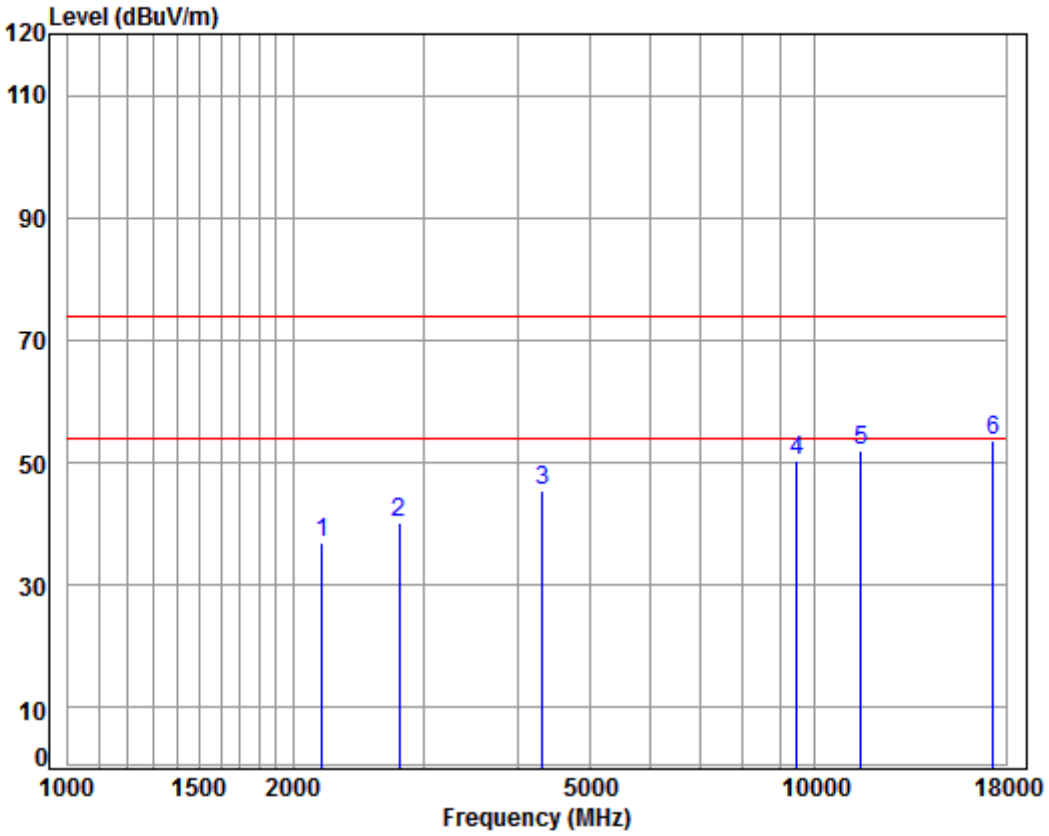
Mode:b; Polarization:Horizontal; Channel:middle



Condition: 3m HORIZONTAL
Job No : 07362CR/07363CR
Mode : 5762 TX SE
Note : 5.8G

	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	1260.149	4.65	24.77	38.07	47.15	38.50	74.00	-35.50	Peak
2	2138.635	5.12	28.28	37.98	40.20	35.62	74.00	-38.38	Peak
3	4230.396	7.26	33.60	38.13	41.16	43.89	74.00	-30.11	Peak
4	7221.150	10.07	36.41	37.09	40.16	49.55	74.00	-24.45	Peak
5	11524.000	12.15	38.13	36.05	36.79	51.02	74.00	-22.98	Peak
6	pp17286.000	16.07	43.15	36.15	30.04	53.11	74.00	-20.89	Peak

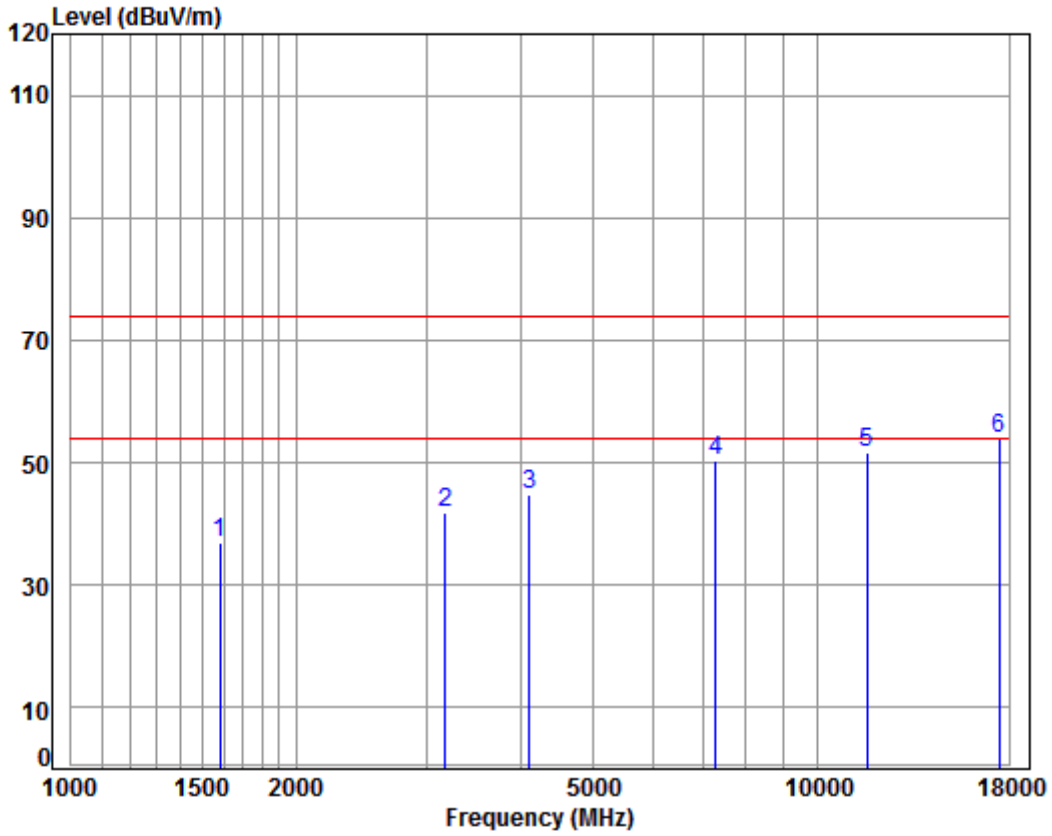
Mode:b; Polarization:Vertical; Channel:middle



Condition: 3m VERTICAL
Job No : 07362CR/07363CR
Mode : 5762 TX SE
Note : 5.8G

	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	2188.663	5.19	28.45	37.98	41.23	36.89	74.00	-37.11	Peak
2	2774.030	5.83	30.48	37.92	41.68	40.07	74.00	-33.93	Peak
3	4316.859	7.36	33.60	38.17	42.59	45.38	74.00	-28.62	Peak
4	9448.149	10.66	37.41	35.17	37.30	50.20	74.00	-23.80	Peak
5	11524.000	12.15	38.13	36.05	37.72	51.95	74.00	-22.05	Peak
6	pp17286.000	16.07	43.15	36.15	30.62	53.69	74.00	-20.31	Peak

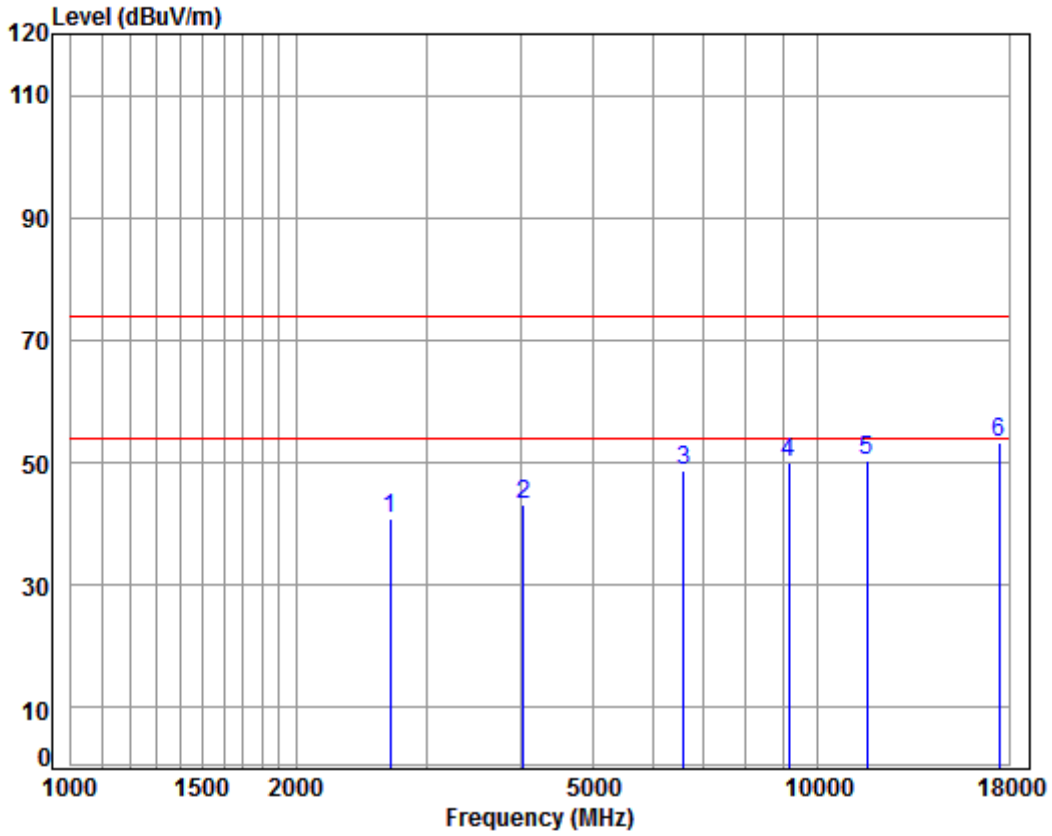
Mode:b; Polarization:Horizontal; Channel:High



Condition: 3m HORIZONTAL
Job No : 07362CR/07363CR
Mode : 5814 TX SE
Note : 5.8G

	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	1583.392	5.37	26.18	38.03	43.43	36.95	74.00	-37.05	Peak
2	3168.500	6.15	31.62	37.92	41.84	41.69	74.00	-32.31	Peak
3	4109.872	7.11	33.60	38.06	42.30	44.95	74.00	-29.05	Peak
4	7284.038	10.06	36.38	37.03	41.10	50.51	74.00	-23.49	Peak
5	11628.000	12.19	38.24	36.17	37.30	51.56	74.00	-22.44	Peak
6	pp17442.000	15.74	43.33	36.08	30.99	53.98	74.00	-20.02	Peak

Mode:b; Polarization:Vertical; Channel:High



Condition: 3m VERTICAL
Job No : 07362CR/07363CR
Mode : 5814 TX SE
Note : 5.8G

	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	2671.730	5.75	30.09	37.93	42.97	40.88	74.00	-33.12	Peak
2	4027.554	7.01	33.60	38.02	40.56	43.15	74.00	-30.85	Peak
3	6602.265	11.24	35.39	37.68	39.78	48.73	74.00	-25.27	Peak
4	9126.063	10.47	36.83	35.33	37.94	49.91	74.00	-24.09	Peak
5	11628.000	12.19	38.24	36.17	36.02	50.28	74.00	-23.72	Peak
6	pp17442.000	15.74	43.33	36.08	30.44	53.43	74.00	-20.57	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 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics 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. So, only the peak measurement data were shown in the report.

7.8 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.		

7.8.1 E.U.T. Operation

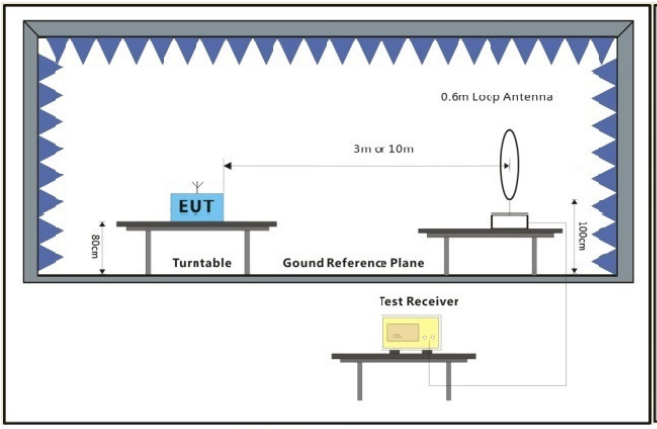
Operating Environment:

Temperature: 24 °C Humidity: 52 % RH Atmospheric Pressure: 1005 mbar

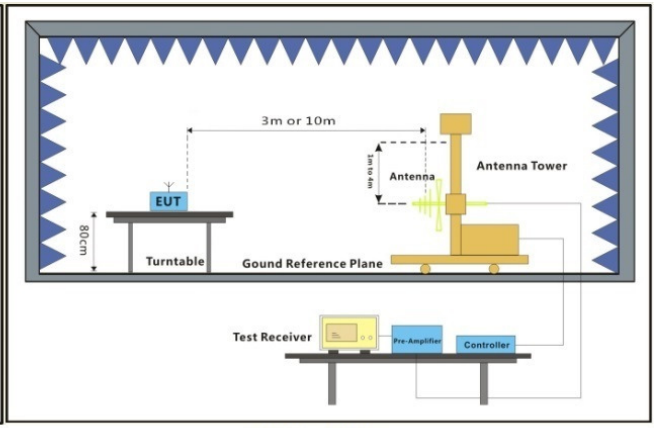
Pretest these mode to find the worst case: a:TX mode (5.2G)_Keep the EUT in continuously transmitting mode.
b:TX mode (5.8G)_Keep the EUT in continuously transmitting mode.

The worst case for final test: a:TX mode (5.2G)_Keep the EUT in continuously transmitting mode.
b:TX mode (5.8G)_Keep the EUT in continuously transmitting mode.

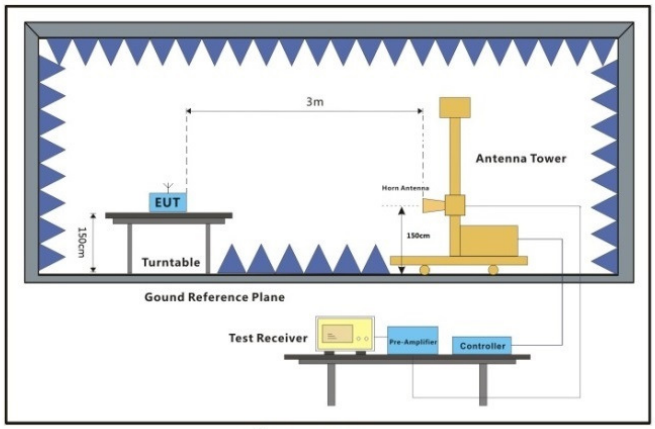
7.8.2 Test Setup Diagram



Below 30MHz



30MHz-1GHz



Above 1GHz

7.8.3 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.

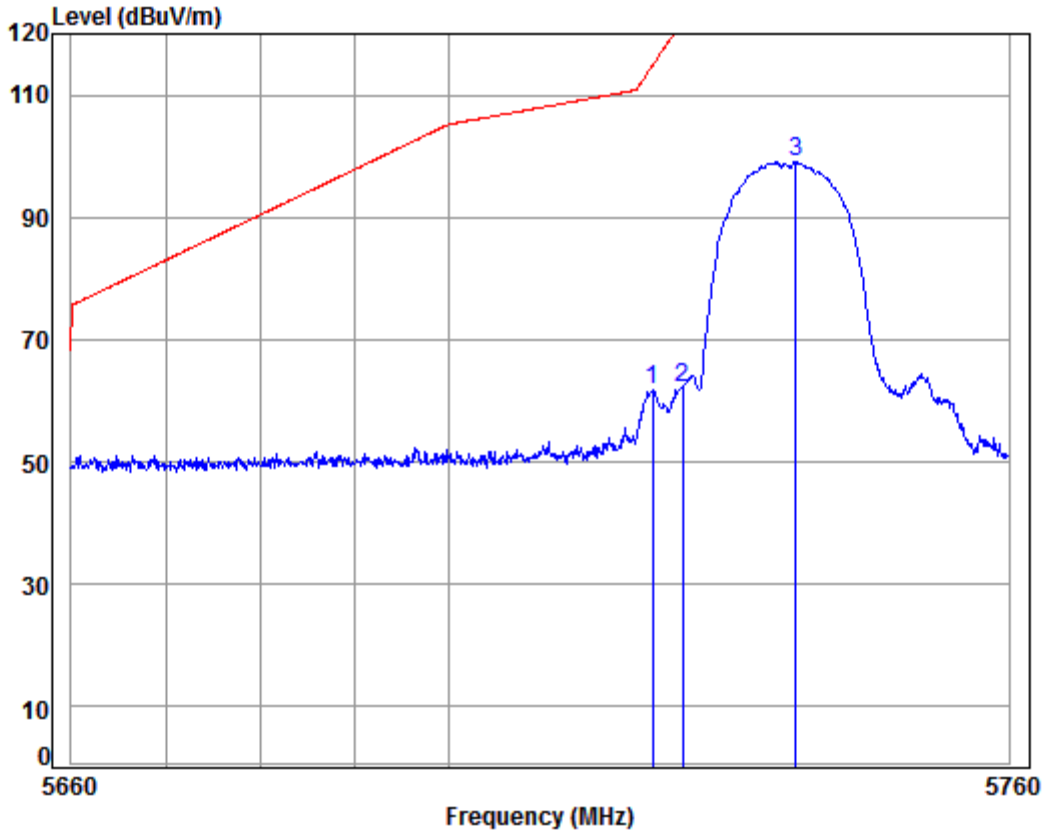
j. Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Pre-test the EUT at antenna 1 and antenna 2 of the 5.2G and 5.8G property: and found the antenna 1 which is worst case, So, Only the antenna 1 is recorded in the report.

5.8g Bandedge

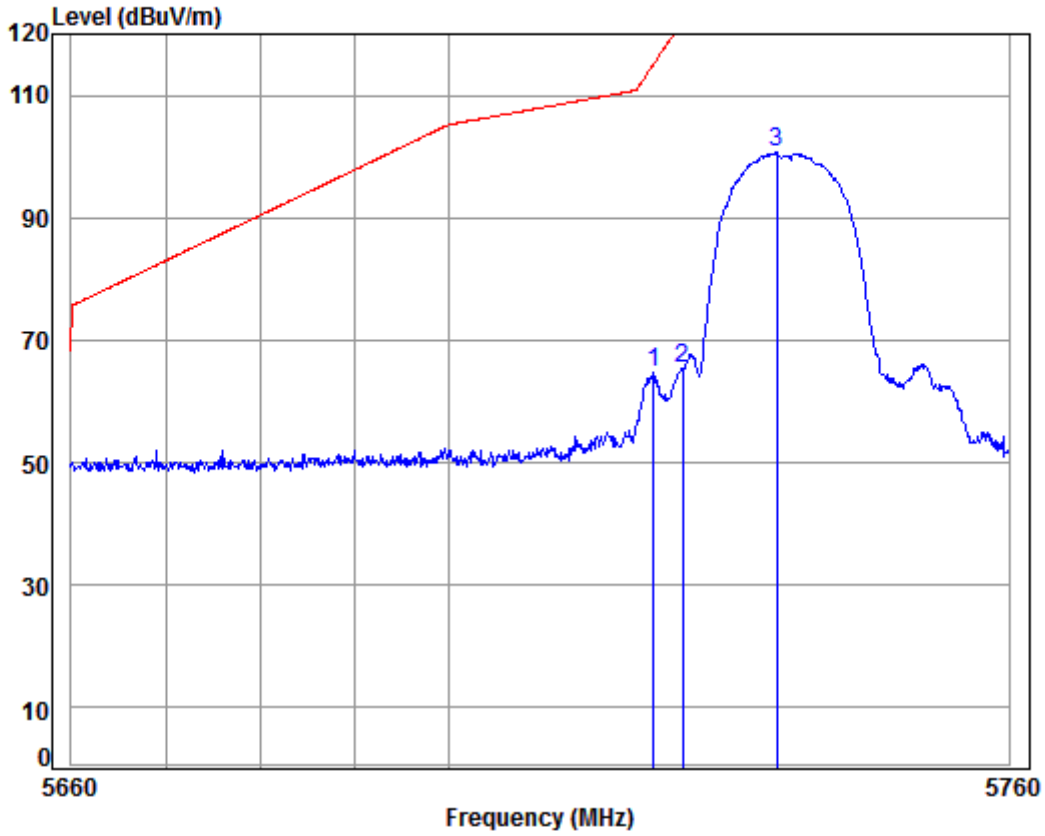
Mode:k; Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 07362CR/07363CR
Mode : 5736 Band edge
Note : 5.8G

	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	5721.793	9.63	34.54	38.35	55.82	61.64	114.89	-53.25	Peak
2	5725.000	9.64	34.54	38.35	56.14	61.97	125.20	-63.23	Peak
3 pp	5737.146	9.68	34.55	38.35	93.27	99.15	125.20	-26.05	Peak

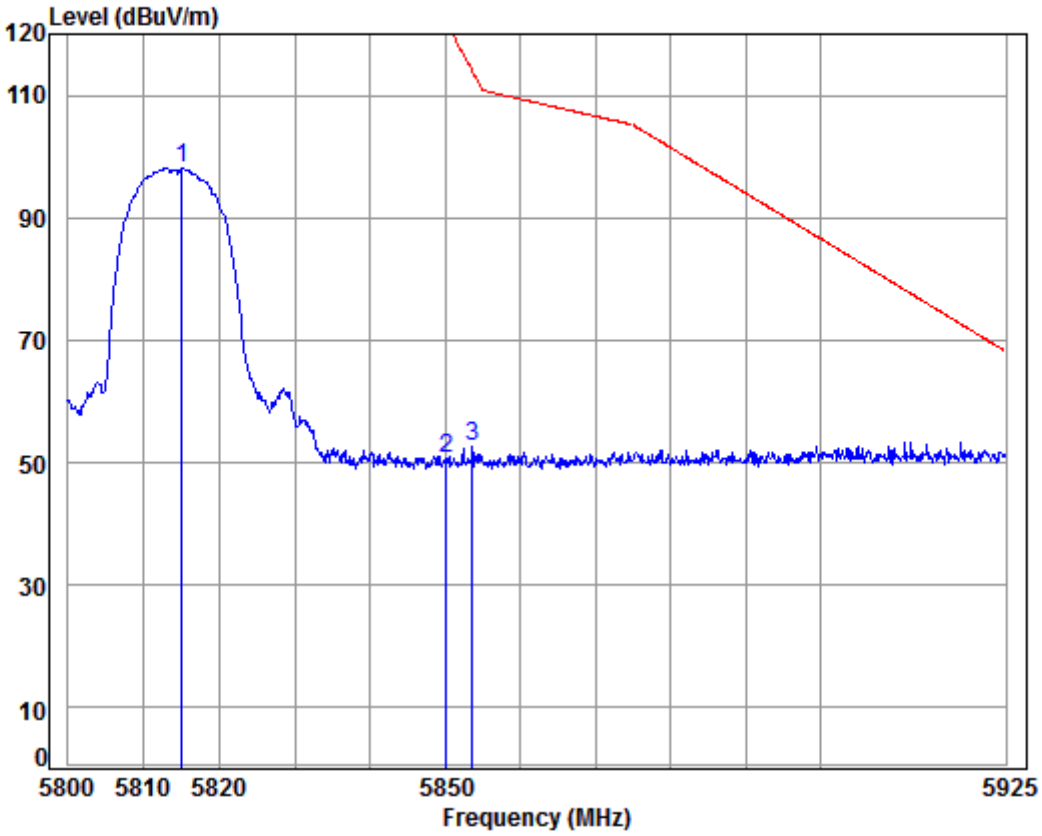
Mode:k; Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 07362CR/07363CR
Mode : 5736 Band edge
Note : 5.8G

	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	5721.894	9.63	34.54	38.35	58.77	64.59	115.12	-50.53	Peak
2	5725.000	9.64	34.54	38.35	59.54	65.37	125.20	-59.83	Peak
3 pp	5735.037	9.68	34.54	38.35	94.72	100.59	125.20	-24.61	Peak

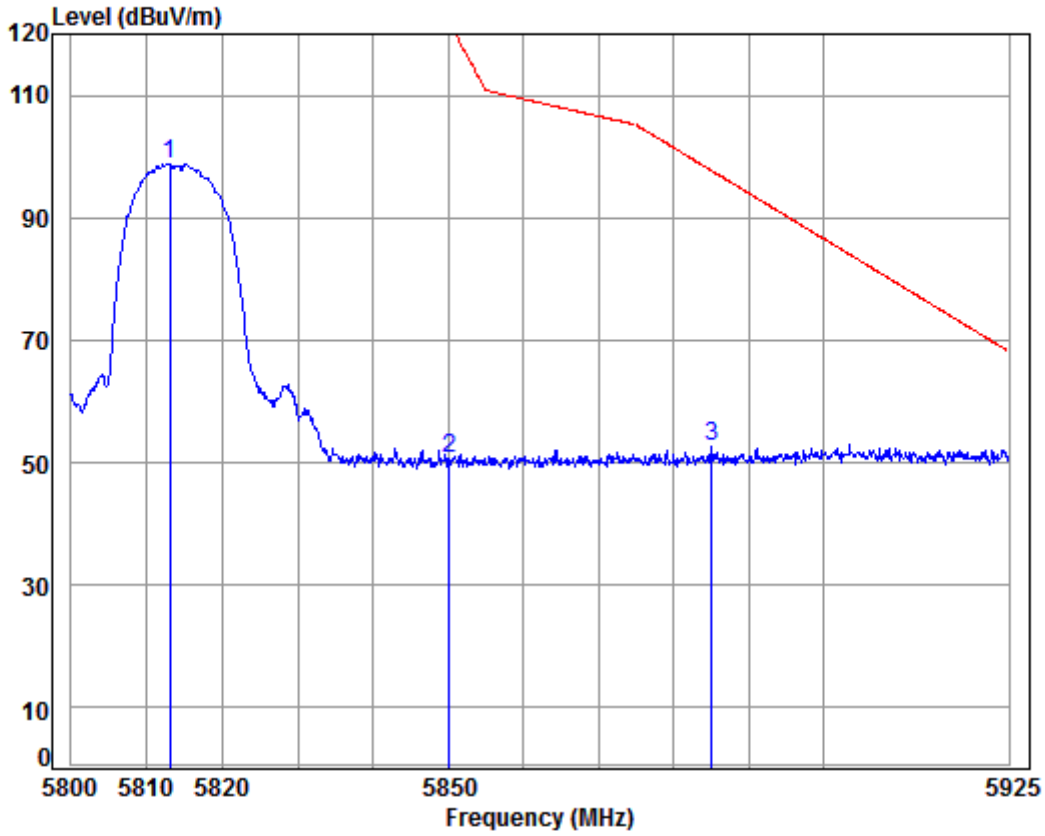
Mode:k; Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 07362CR/07363CR
Mode : 5814 Band edge
Note : 5.8G

	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 pp	5814.983	9.95	34.59	38.33	91.99	98.20	125.20	-27.00	Peak
2	5850.055	10.07	34.61	38.33	44.45	50.80	122.08	-71.28	Peak
3	5853.548	10.08	34.61	38.33	46.13	52.49	114.11	-61.62	Peak

Mode:k; Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:High

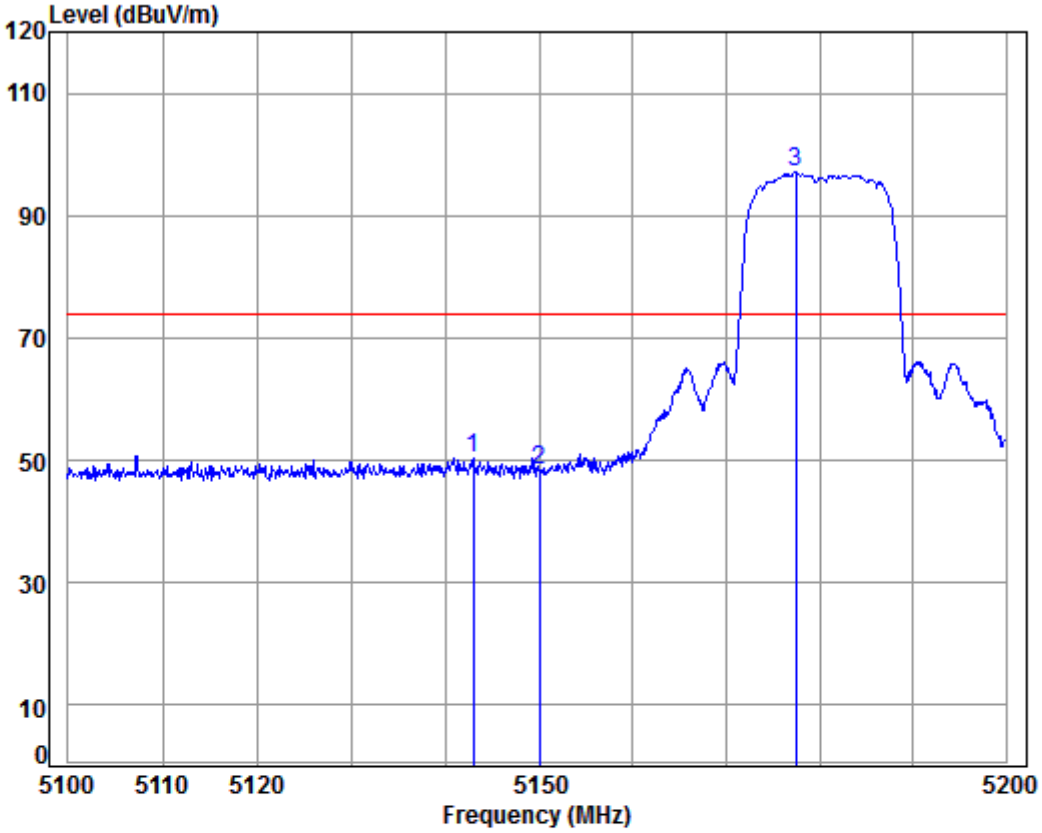


Condition: 3m VERTICAL
Job No : 07362CR/07363CR
Mode : 5814 Band edge
Note : 5.8G

	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 pp	5813.000	9.94	34.59	38.33	92.71	98.91	125.20	-26.29	Peak
2	5850.055	10.07	34.61	38.33	44.40	50.75	122.08	-71.33	Peak
3	5885.086	10.19	34.63	38.32	46.29	52.79	97.74	-44.95	Peak

5.2g Bandedge

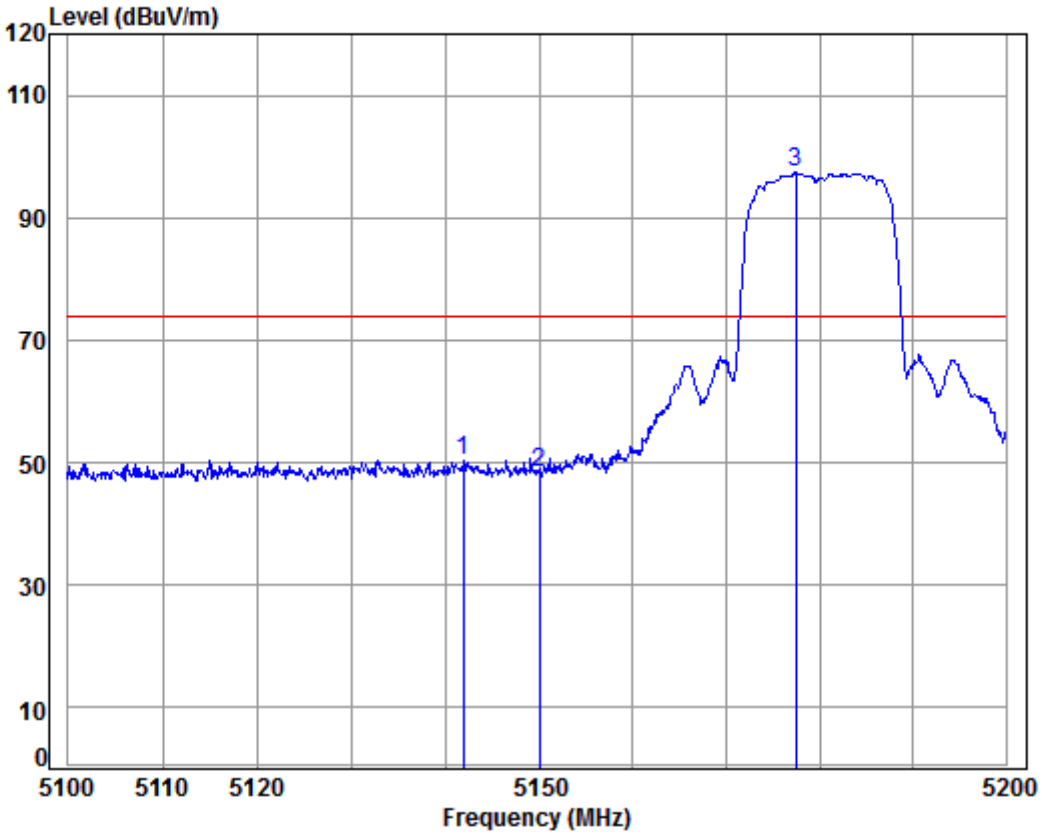
Mode:a; Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 07362CR/07363CR
Mode : 5180 Band edge
Note : 5.2G

	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	5142.962	8.31	34.47	38.47	46.13	50.44	74.00	-23.56	Peak
2	5150.000	8.33	34.47	38.47	44.12	48.45	74.00	-25.55	Peak
3 pp	5177.431	8.37	34.46	38.46	92.69	97.06	74.00	23.06	Peak

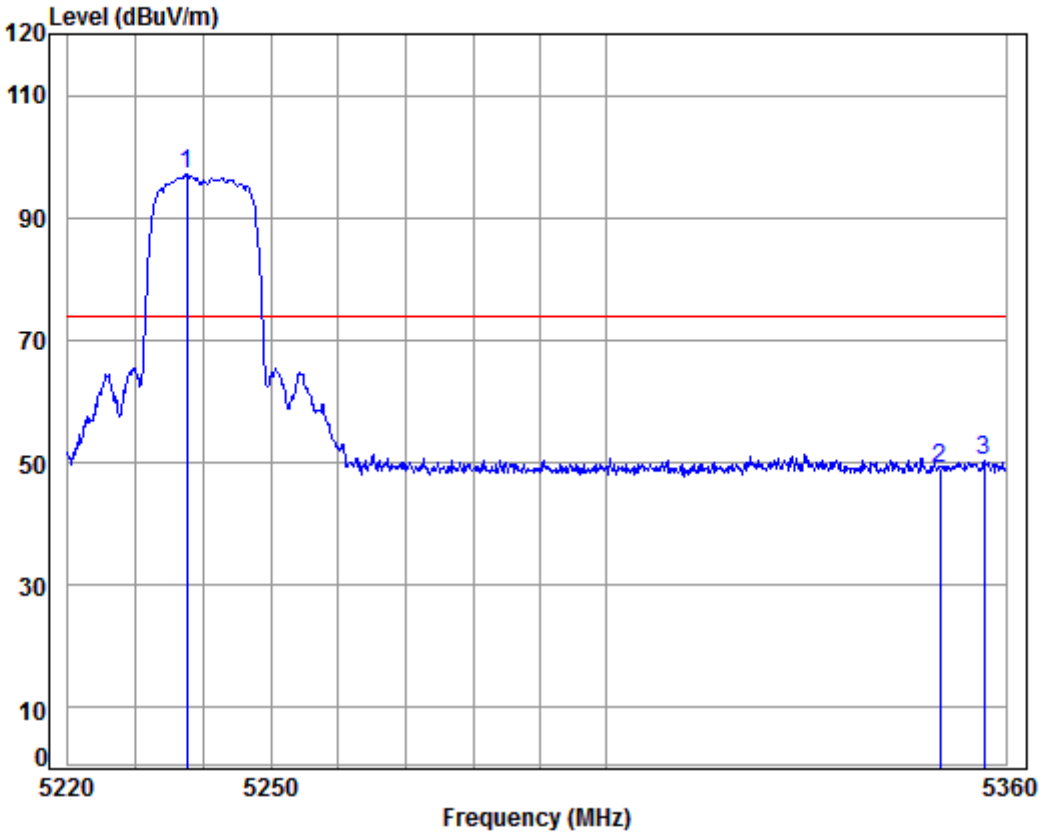
Mode:a; Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 07362CR/07363CR
Mode : 5180 Band edge
Note : 5.2G

	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	5141.963	8.31	34.47	38.47	46.20	50.51	74.00	-23.49	Peak
2	5150.000	8.33	34.47	38.47	43.91	48.24	74.00	-25.76	Peak
3 pp	5177.431	8.37	34.46	38.46	93.06	97.43	74.00	23.43	Peak

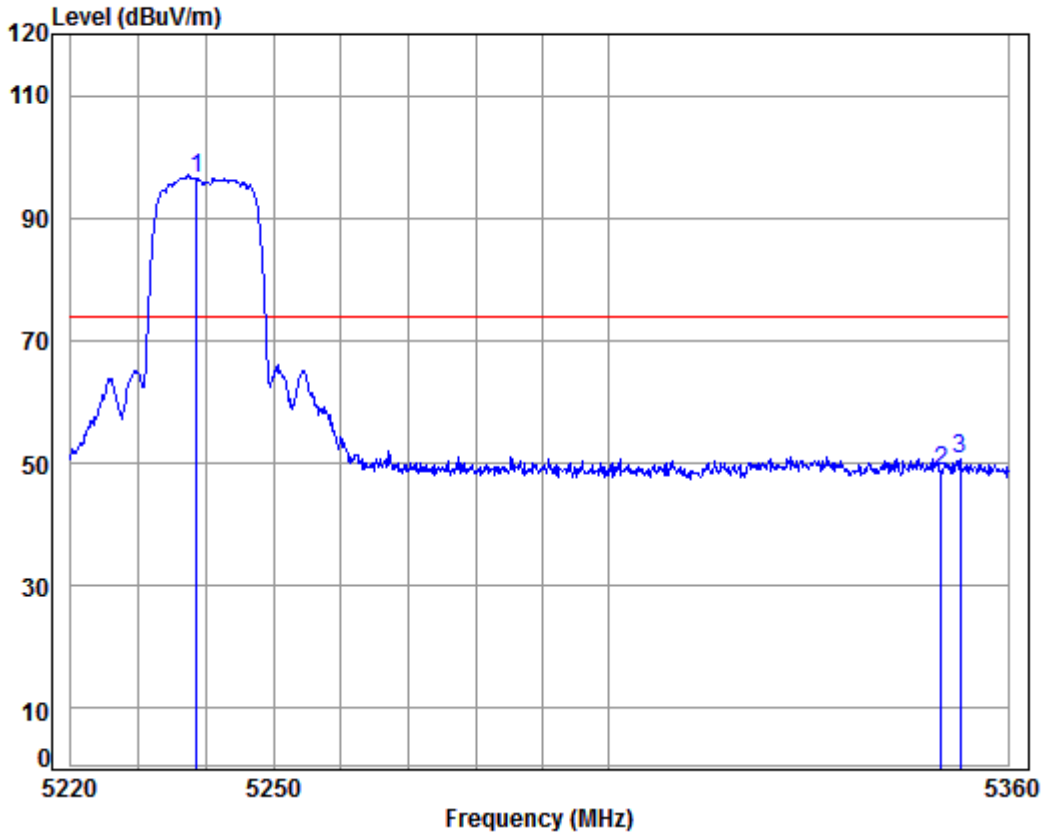
Mode:a; Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 07362CR/07363CR
Mode : 5240 Band edge
Note : 5.2G

	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 pp	5237.575	8.46	34.45	38.45	92.58	97.04	74.00	23.04	Peak
2	5350.000	8.63	34.43	38.43	44.36	48.99	74.00	-25.01	Peak
3	5356.738	8.64	34.43	38.42	45.70	50.35	74.00	-23.65	Peak

Mode:a; Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL
Job No : 07362CR/07363CR
Mode : 5240 Band edge
Note : 5.2G

	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 pp	5238.546	8.46	34.45	38.45	91.97	96.43	74.00	22.43	Peak
2	5349.938	8.63	34.43	38.43	44.19	48.82	74.00	-25.18	Peak
3	5352.770	8.63	34.43	38.43	46.00	50.63	74.00	-23.37	Peak

Remark:

As shown in this section, 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. So, only the peak measurements were shown in the report .

7.9 Frequency Stability

Test Requirement	47 CFR Part 15, Subpart C 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.

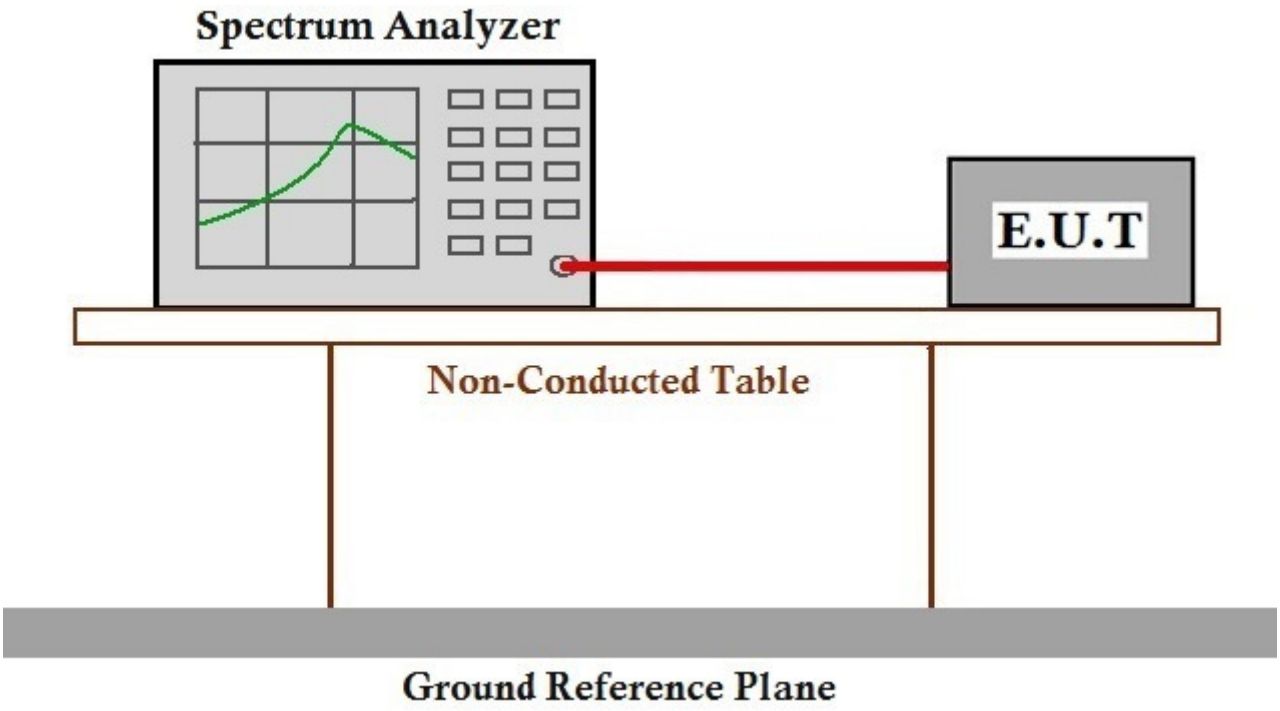
7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1000 mbar

Pretest these mode to find the worst case:
a:TX mode (5.2G)_Keep the EUT in continuously transmitting mode.
b:TX mode (5.8G)_Keep the EUT in continuously transmitting mode.

7.9.2 Test Setup Diagram



7.9.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

7.1 Duty Cycle

Test Requirement KDB 789033 D02 II B 1

Test Method: KDB 789033 II B 1

7.1.1 E.U.T. Operation

Operating Environment:

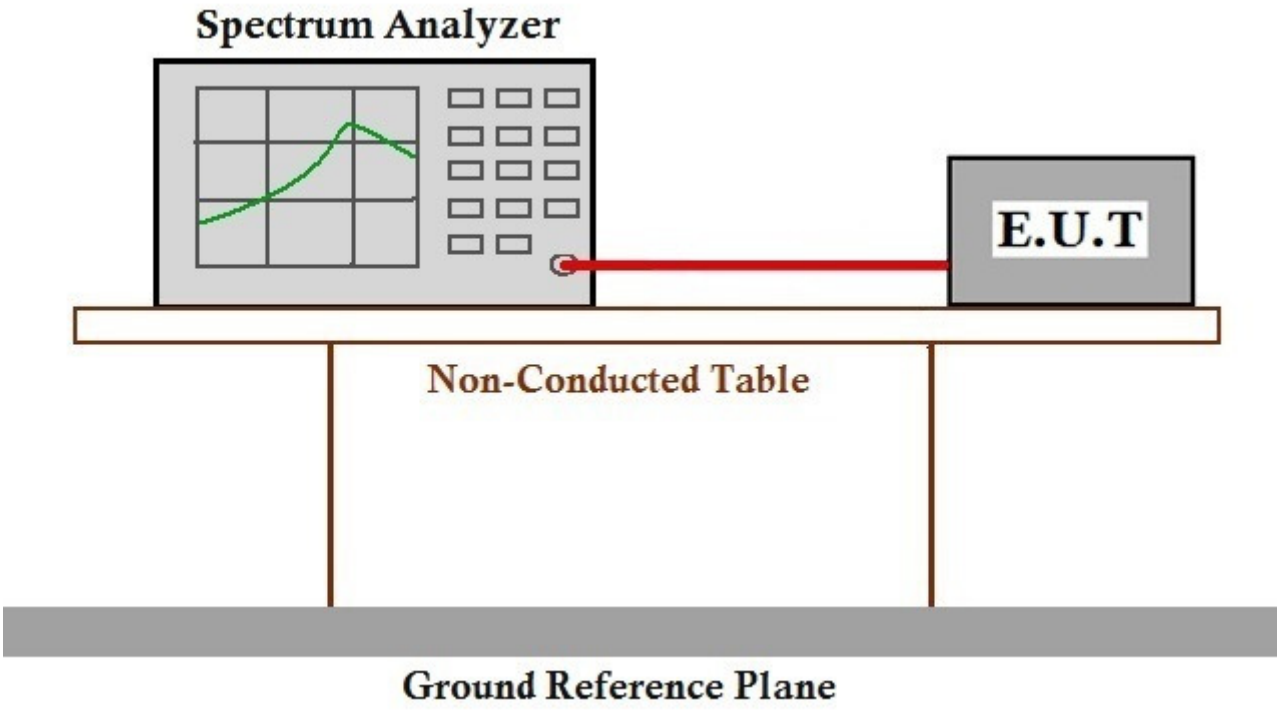
Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1005 mbar

Pretest these mode to find the worst case:

a:TX mode (5.2G)_Keep the EUT in continuously transmitting mode.

b:TX mode (5.8G)_Keep the EUT in continuously transmitting mode.

7.1.2 Test Setup Diagram



7.1.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

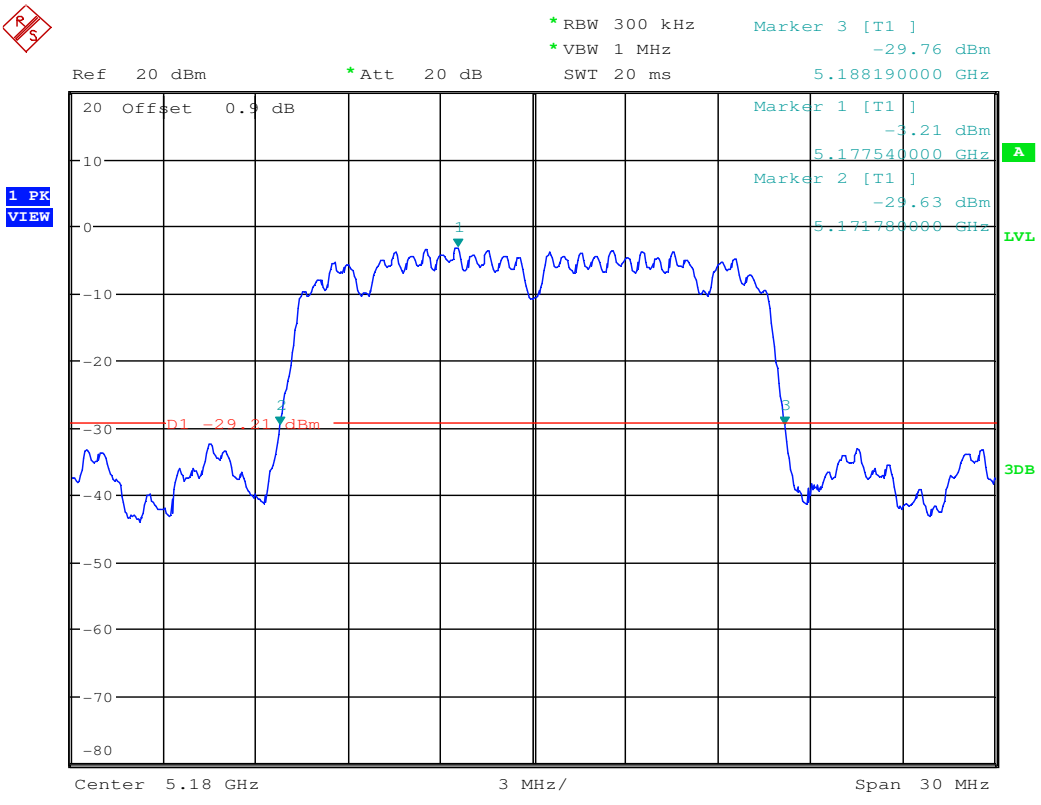
8 Appendix

8.1 Appendix 15.407

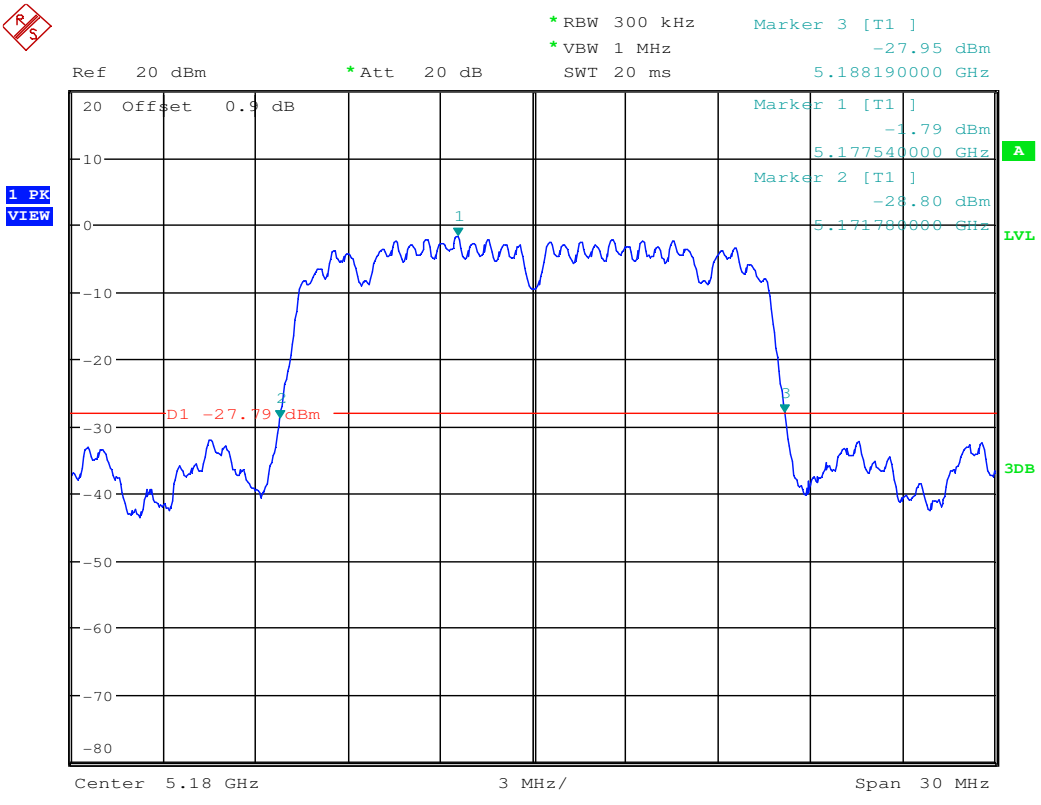
1.Emission Bandwidth Measurement

Test Mode	Test Channel	Ant	EBW[MHz]	Limit[MHz]	Verdict
11A	5180	Ant1	16.410	---	PASS
11A	5180	Ant2	16.410	---	PASS
11A	5210	Ant1	16.410	---	PASS
11A	5210	Ant2	16.410	---	PASS
11A	5240	Ant1	16.380	---	PASS
11A	5240	Ant2	16.410	---	PASS
11A	5736	Ant1	9.900	>=0.5	PASS
11A	5736	Ant2	9.870	>=0.5	PASS
11A	5762	Ant1	9.900	>=0.5	PASS
11A	5762	Ant2	9.870	>=0.5	PASS
11A	5814	Ant1	9.870	>=0.5	PASS
11A	5814	Ant2	9.870	>=0.5	PASS

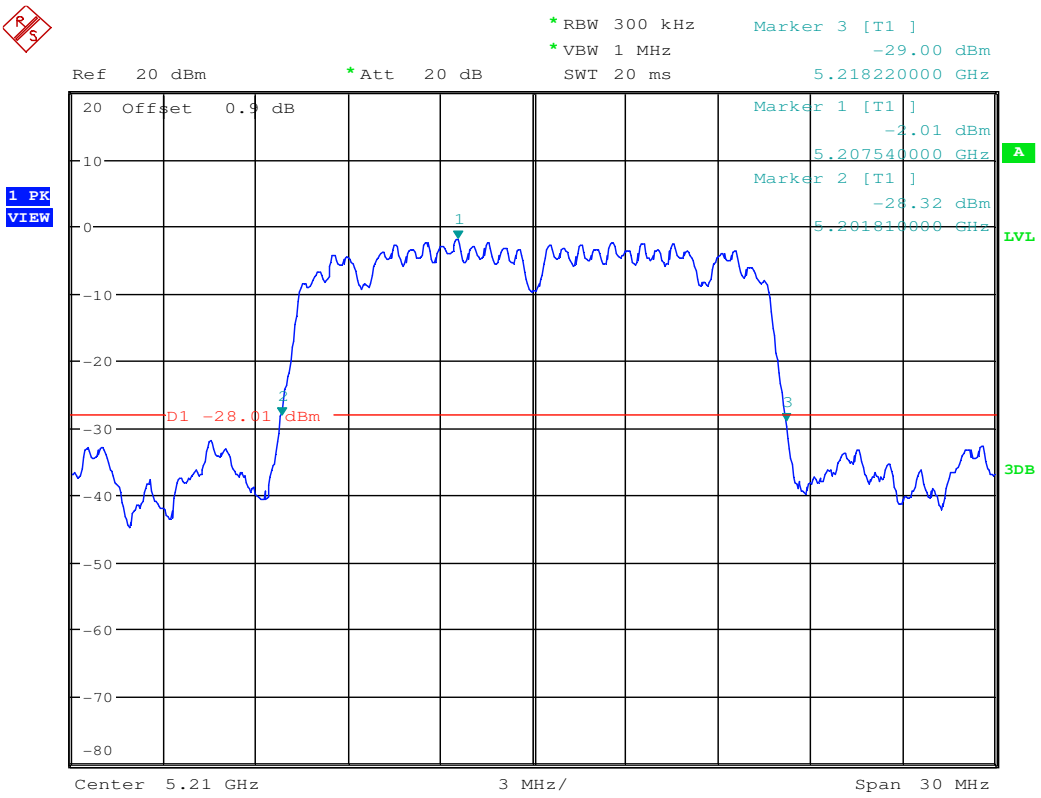
Emission Bandwidth Measurement_11A_5180_Ant1



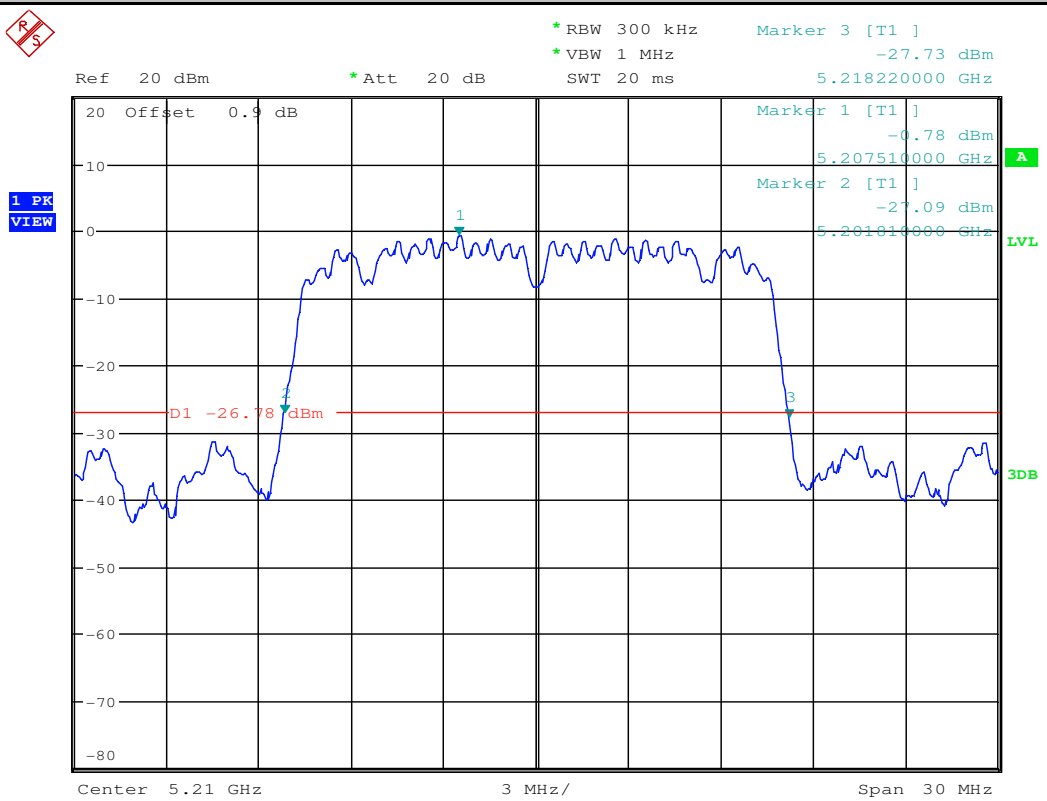
Emission Bandwidth Measurement_11A_5180_Ant2



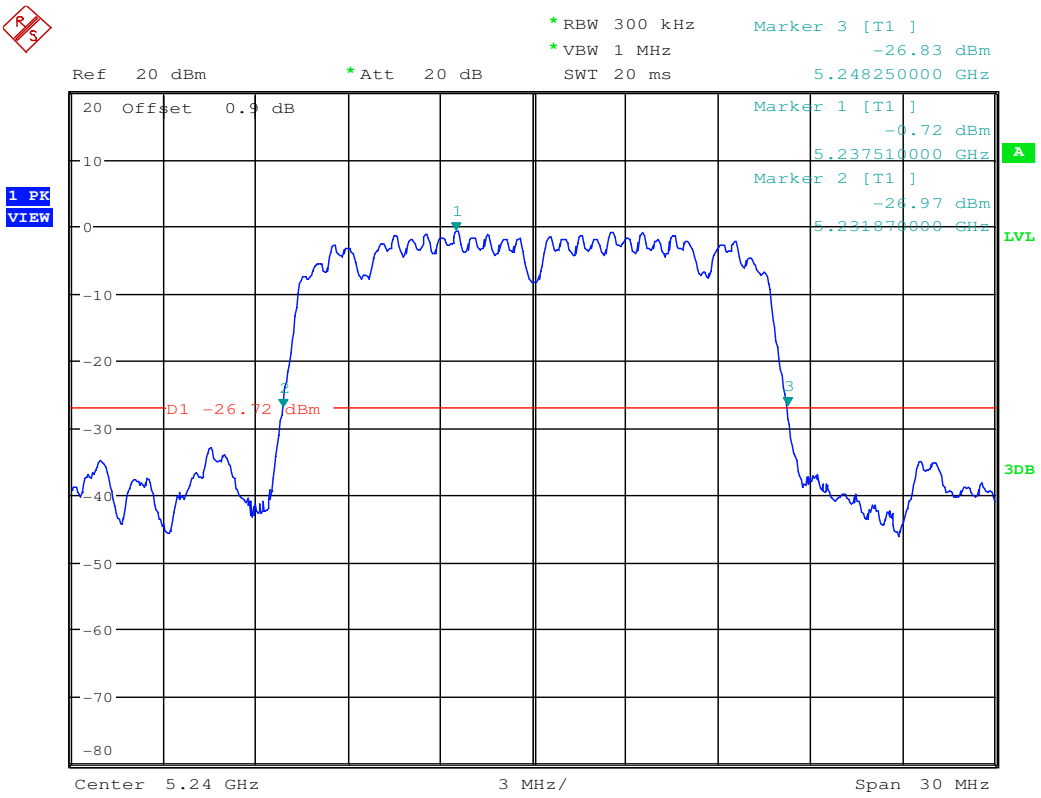
Emission Bandwidth Measurement_11A_5210_Ant1



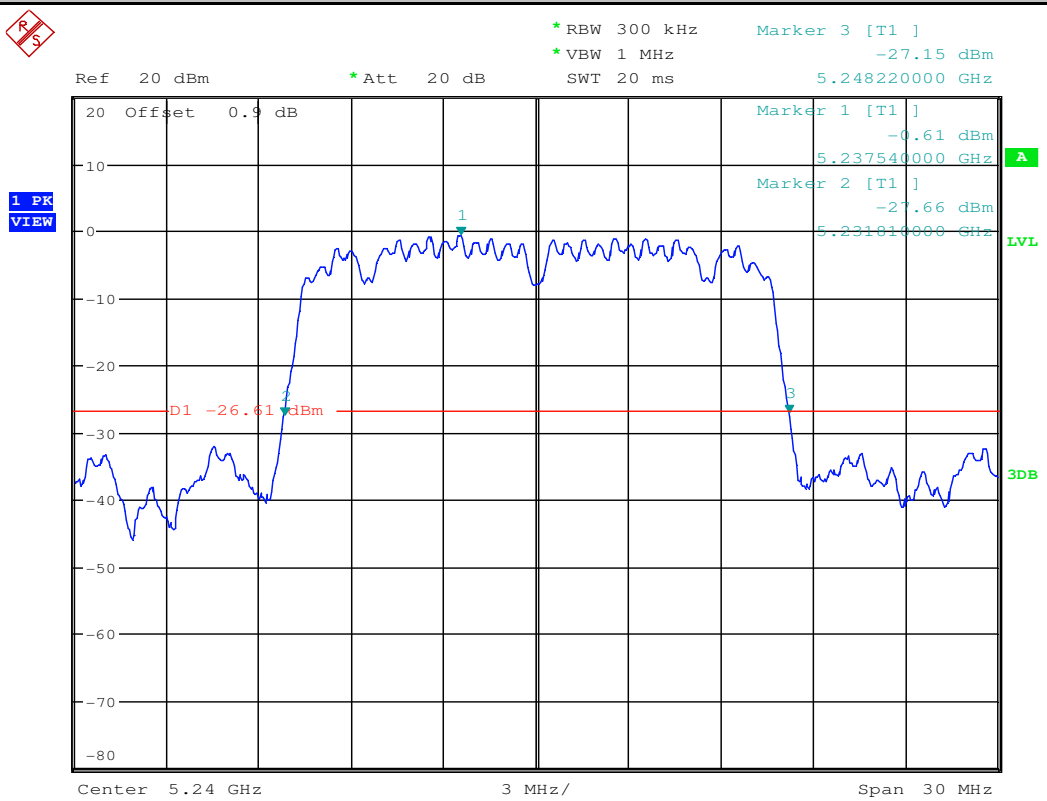
Emission Bandwidth Measurement_11A_5210_Ant2



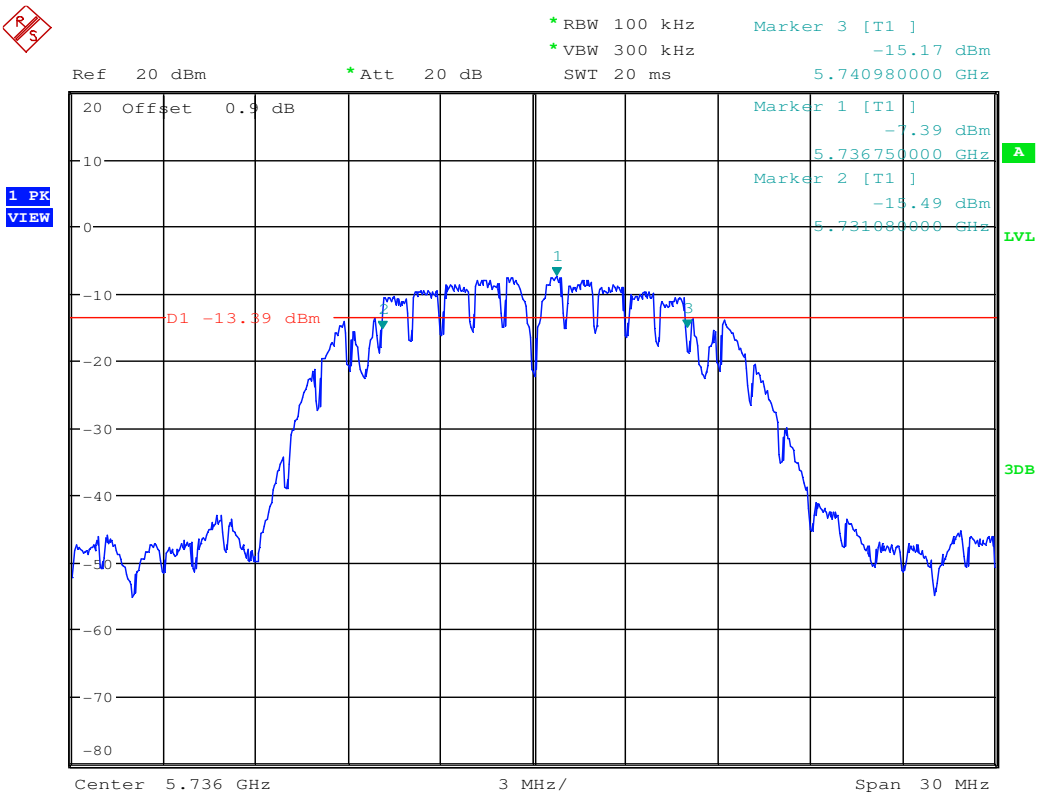
Emission Bandwidth Measurement_11A_5240_Ant1



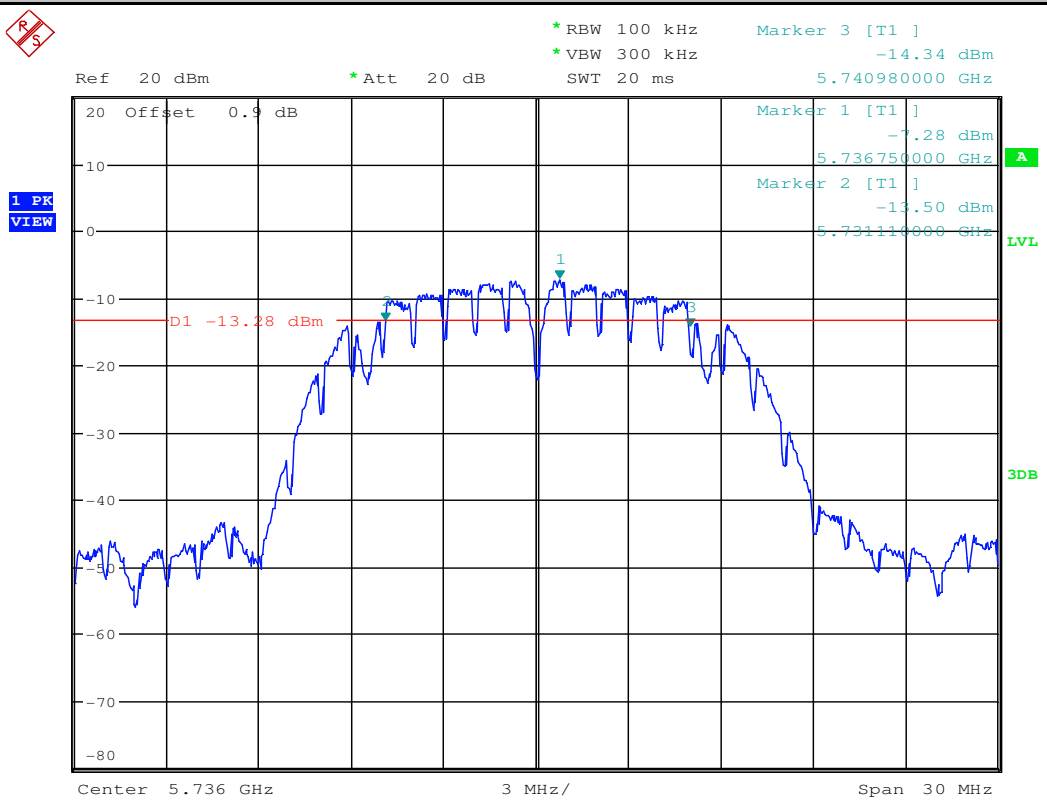
Emission Bandwidth Measurement_11A_5240_Ant2



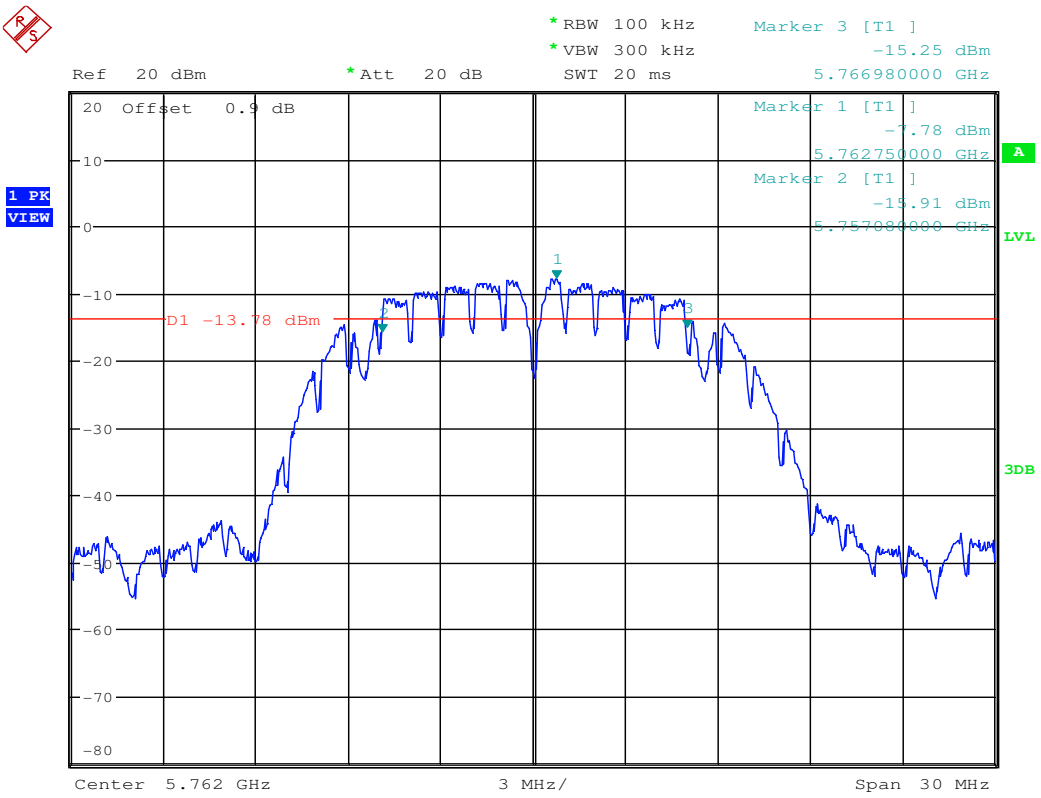
Emission Bandwidth Measurement_11A_5736_Ant1



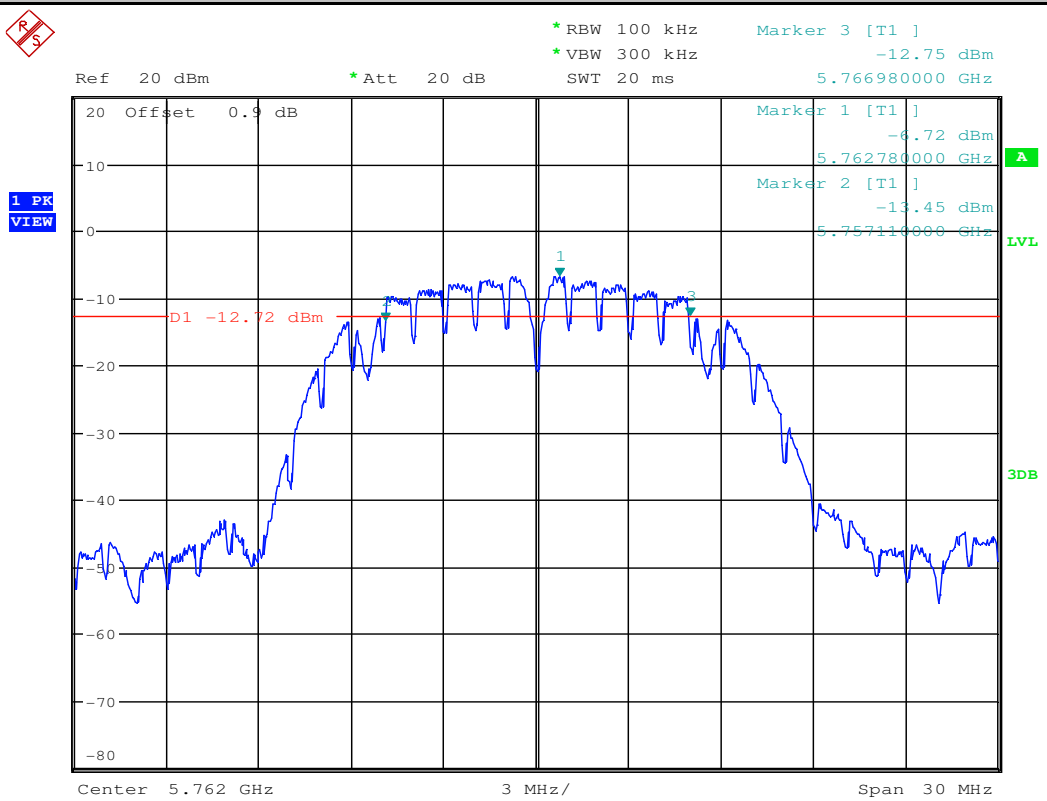
Emission Bandwidth Measurement_11A_5736_Ant2



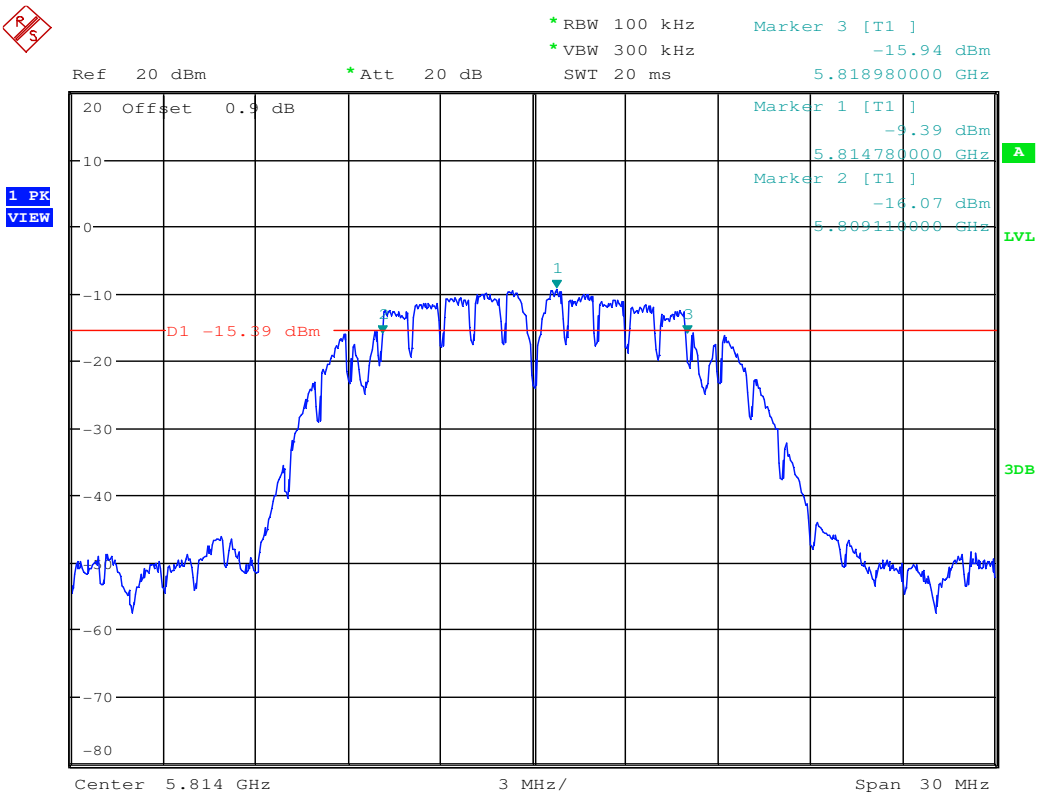
Emission Bandwidth Measurement_11A_5762_Ant1



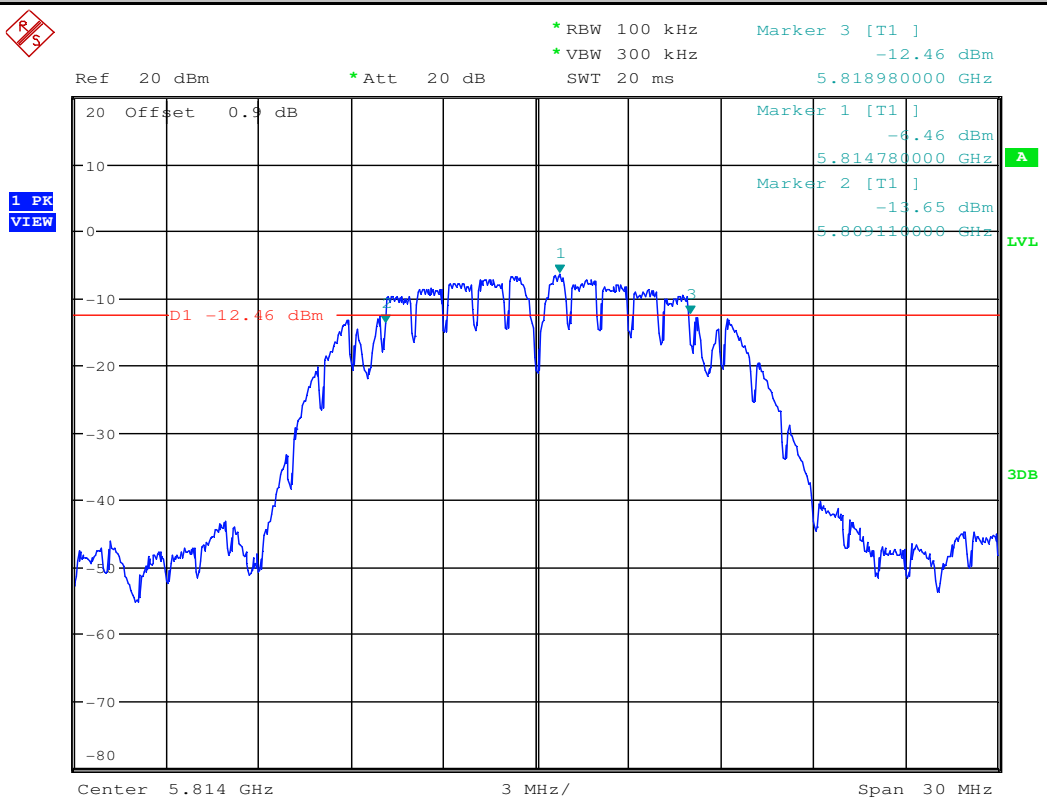
Emission Bandwidth Measurement_11A_5762_Ant2



Emission Bandwidth Measurement_11A_5814_Ant1



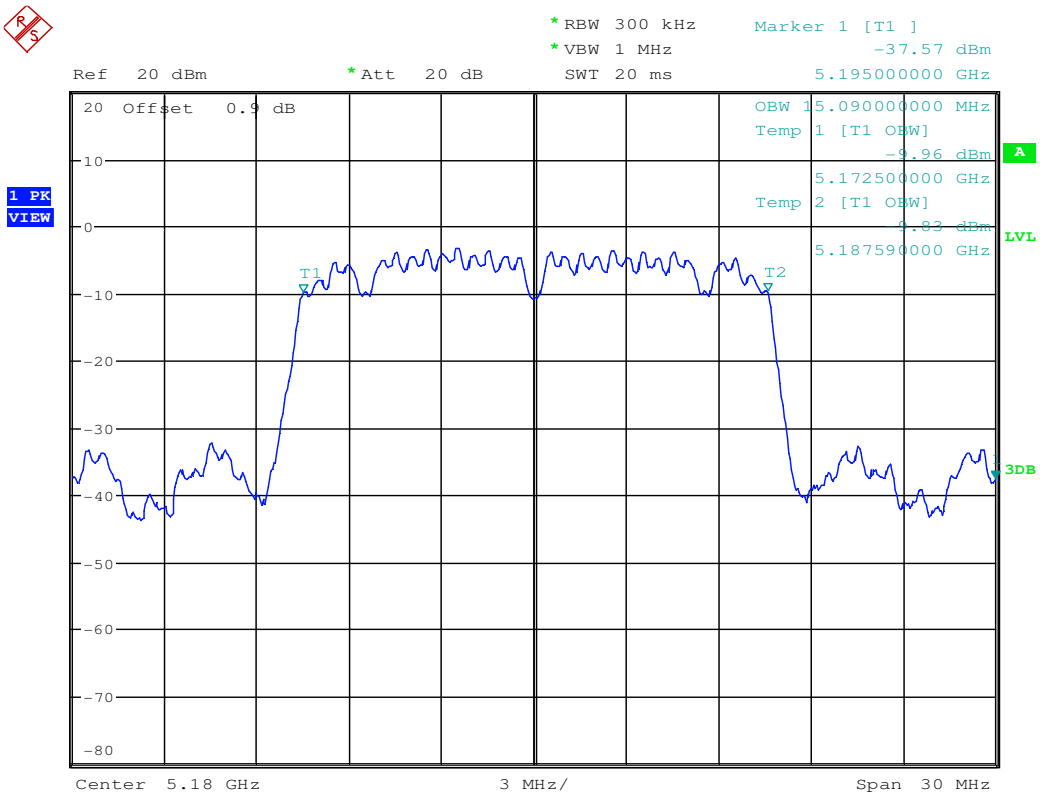
Emission Bandwidth Measurement_11A_5814_Ant2



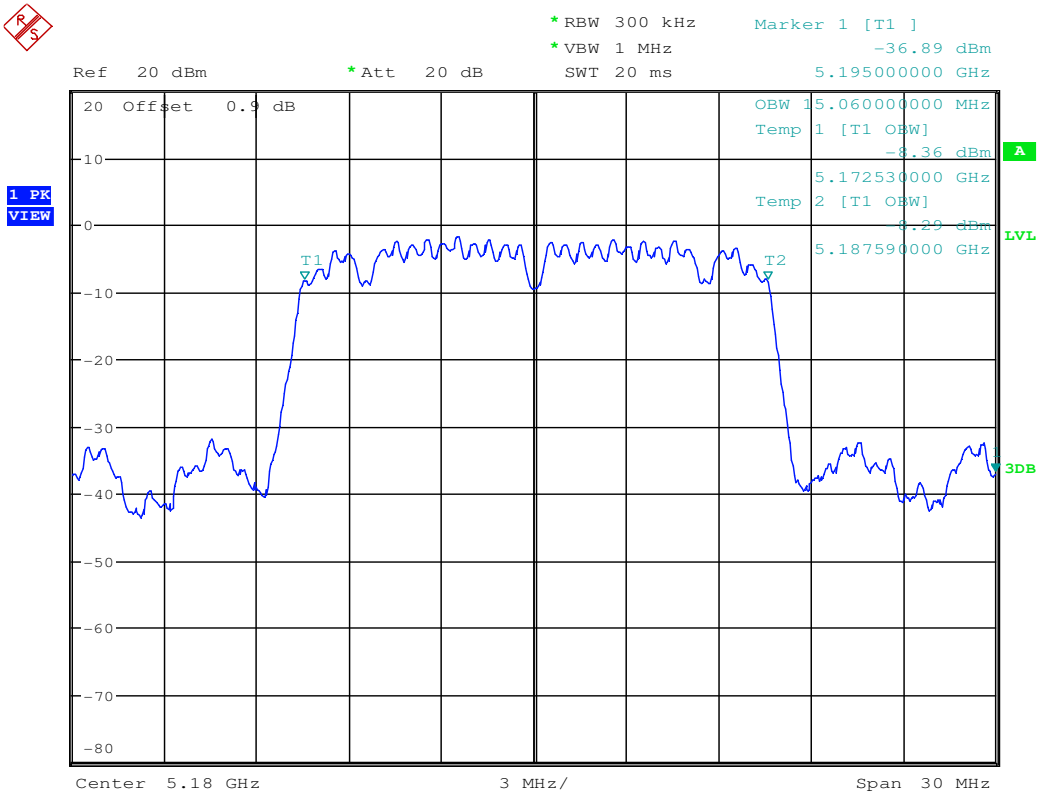
2.Occupied Bandwidth Measurement

Test Mode	Test Channel	Ant	OBW[MHz]	Limit[MHz]	Verdict
11A	5180	Ant1	15.090	---	PASS
11A	5180	Ant2	15.060	---	PASS
11A	5210	Ant1	15.060	---	PASS
11A	5210	Ant2	15.090	---	PASS
11A	5240	Ant1	15.060	---	PASS
11A	5240	Ant2	15.060	---	PASS
11A	5736	Ant1	13.740	---	PASS
11A	5736	Ant2	13.770	---	PASS
11A	5762	Ant1	13.770	---	PASS
11A	5762	Ant2	13.770	---	PASS
11A	5814	Ant1	13.770	---	PASS
11A	5814	Ant2	13.740	---	PASS

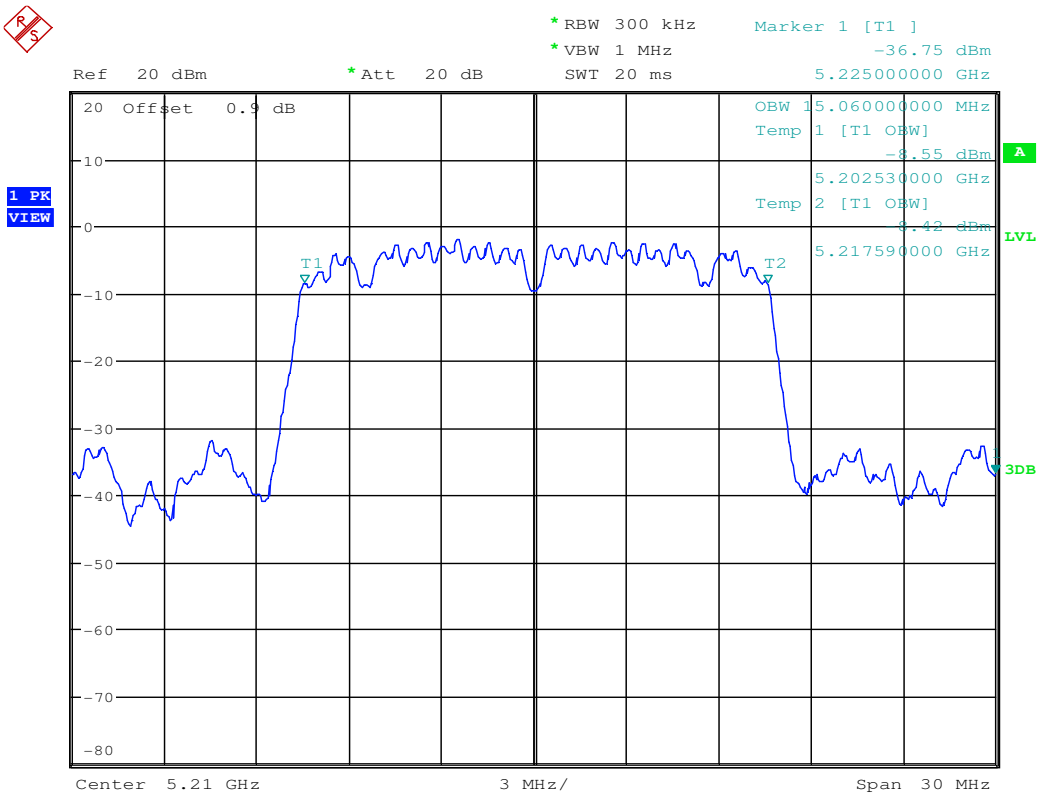
Occupied Bandwidth Measurement_11A_5180_Ant1



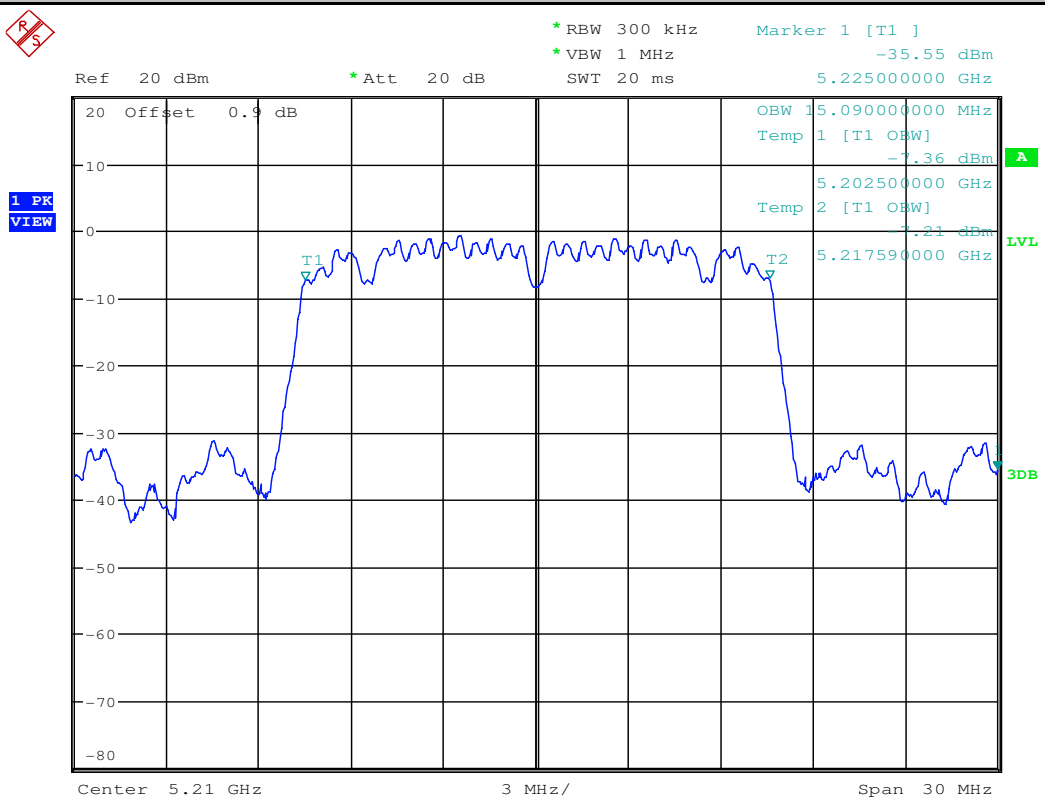
Occupied Bandwidth Measurement_11A_5180_Ant2



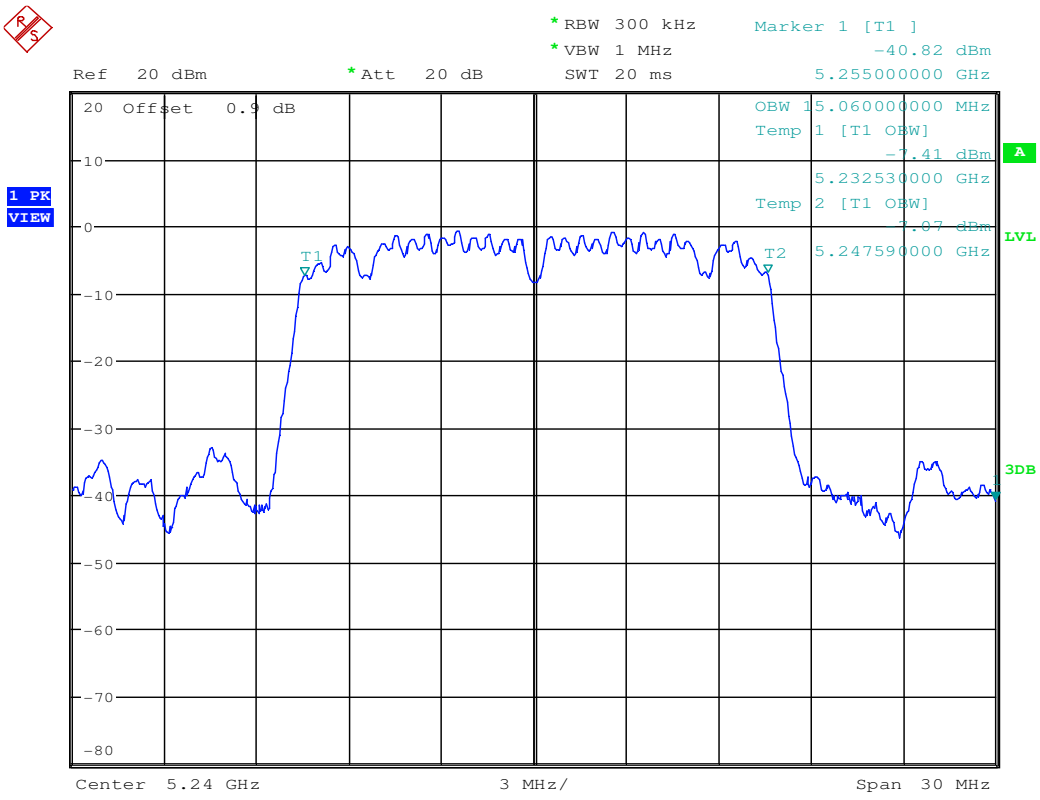
Occupied Bandwidth Measurement_11A_5210_Ant1



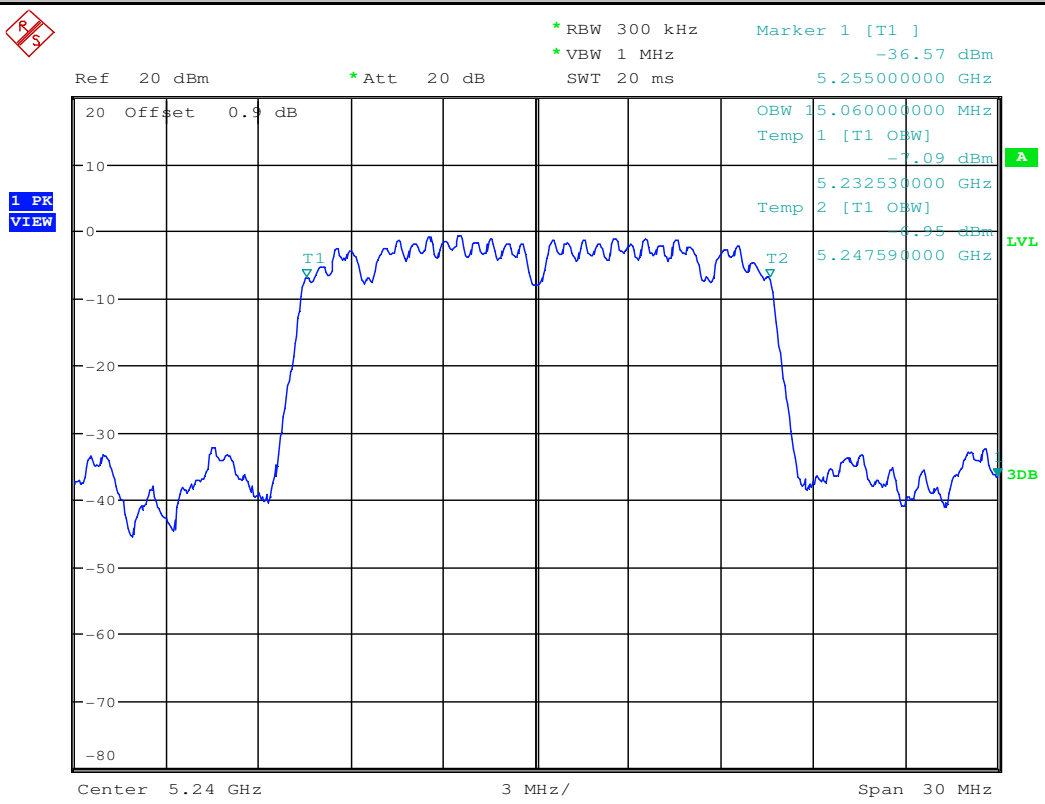
Occupied Bandwidth Measurement_11A_5210_Ant2



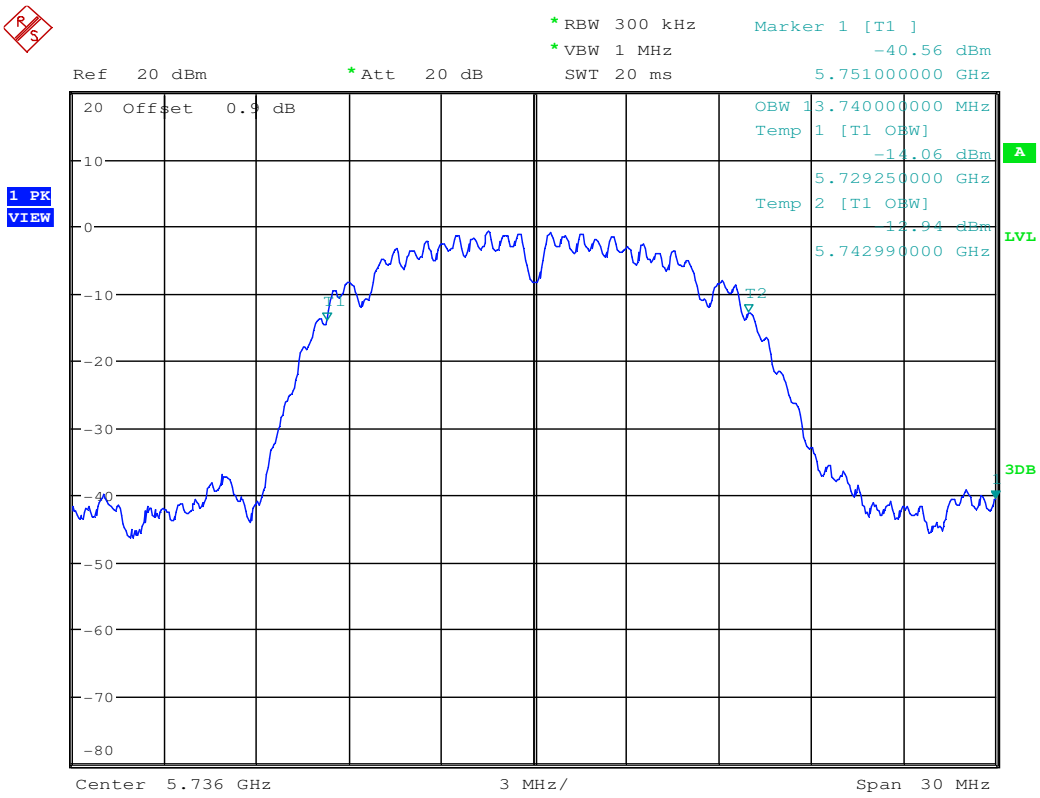
Occupied Bandwidth Measurement_11A_5240_Ant1



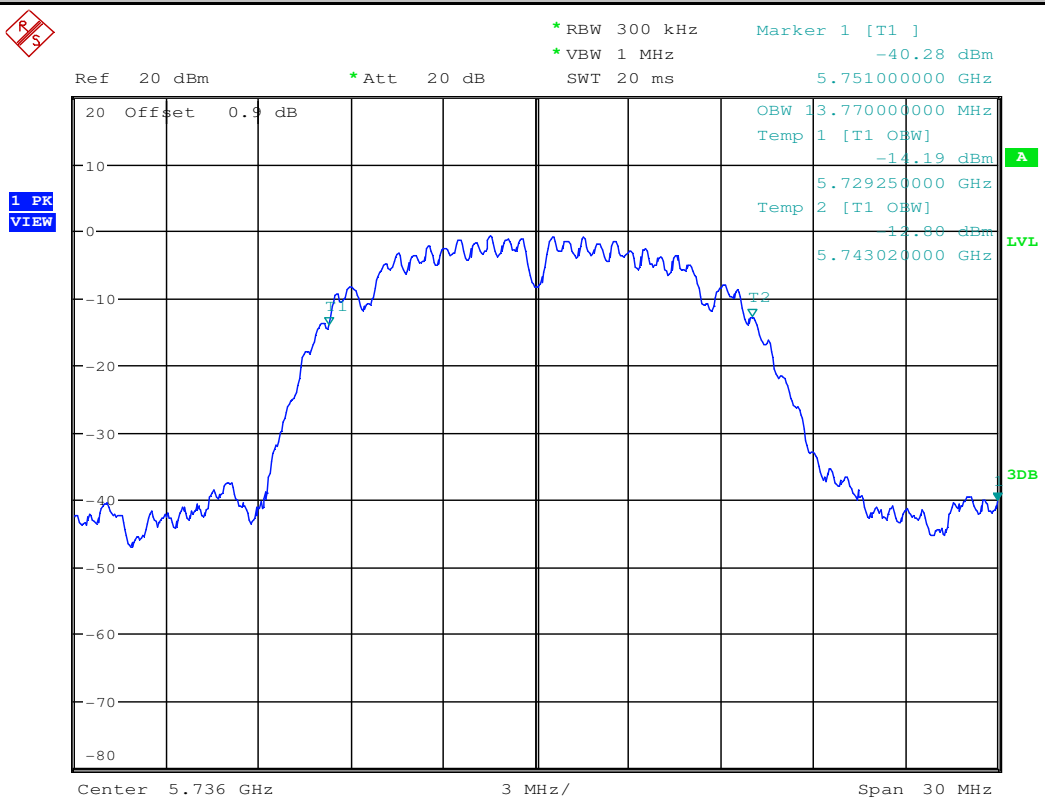
Occupied Bandwidth Measurement_11A_5240_Ant2



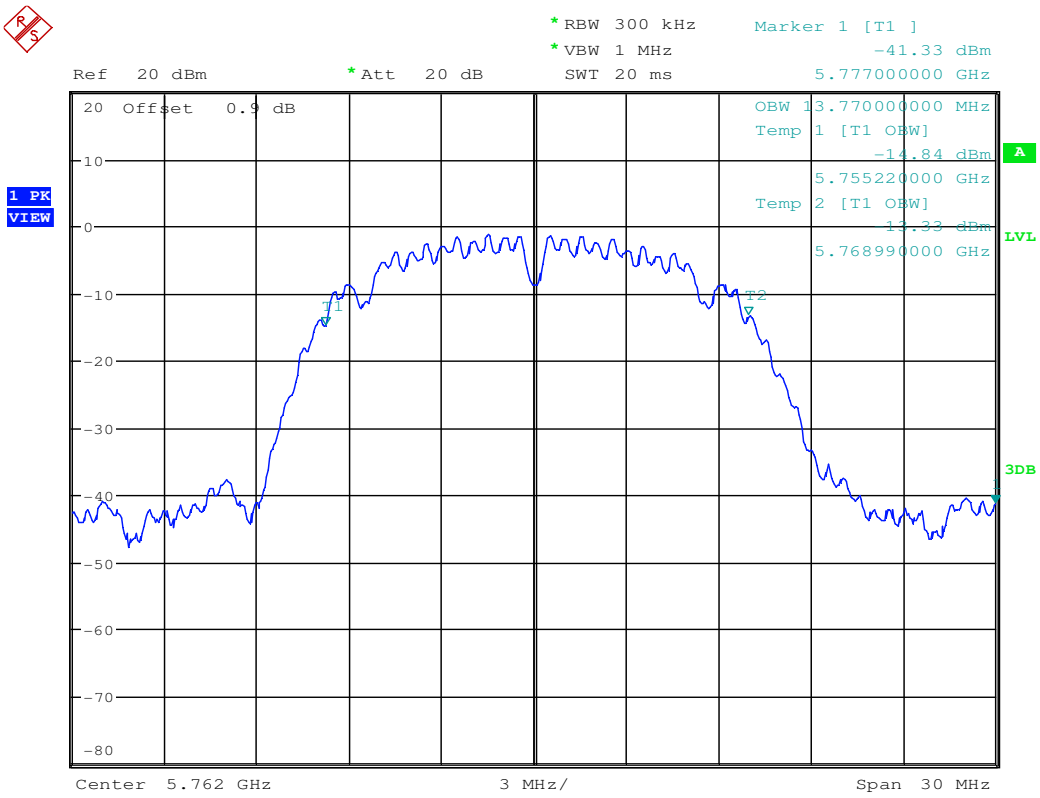
Occupied Bandwidth Measurement_11A_5736_Ant1



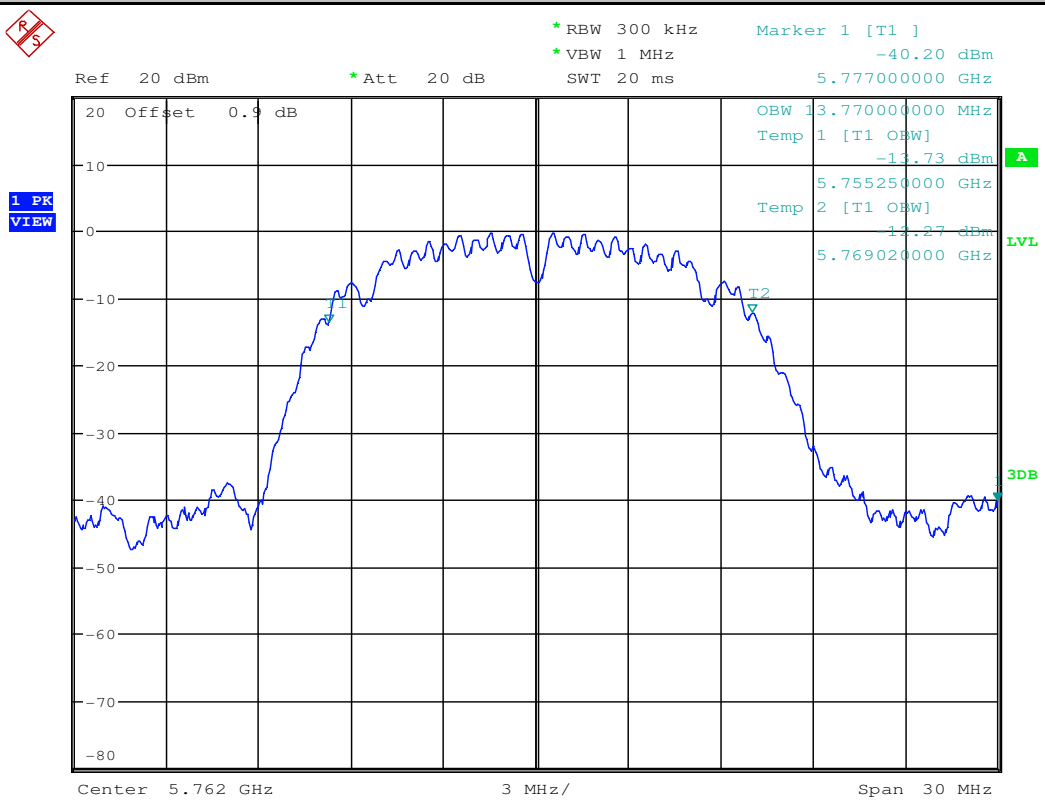
Occupied Bandwidth Measurement_11A_5736_Ant2



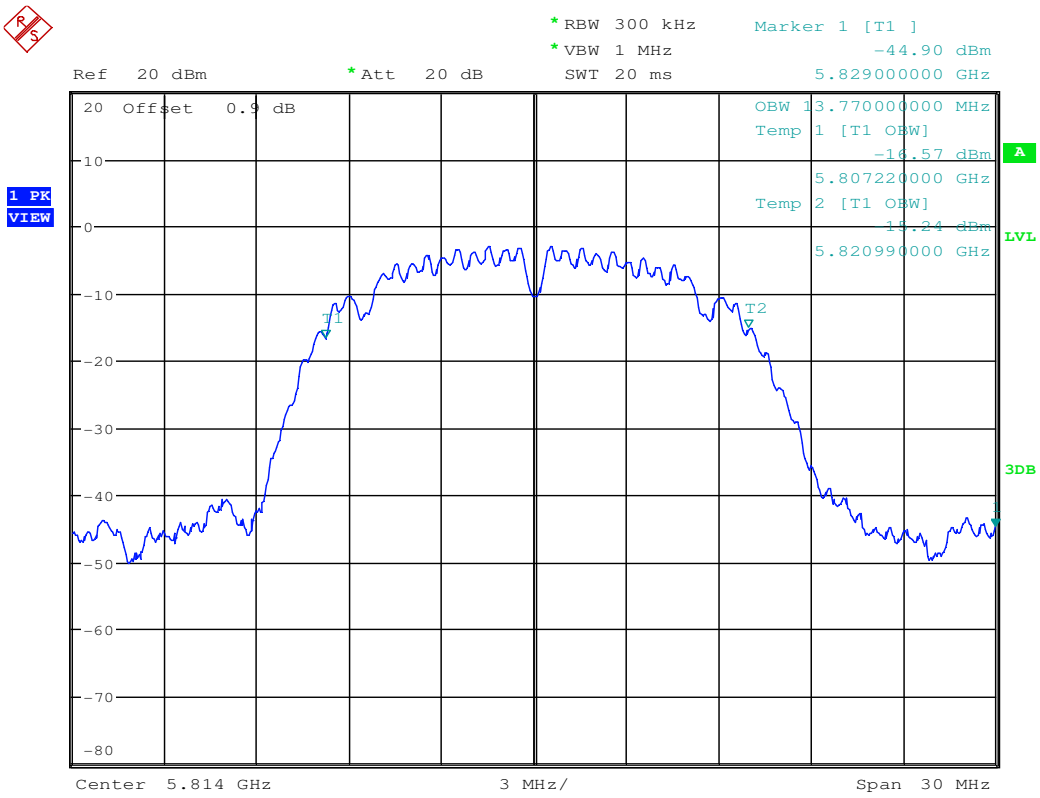
Occupied Bandwidth Measurement_11A_5762_Ant1



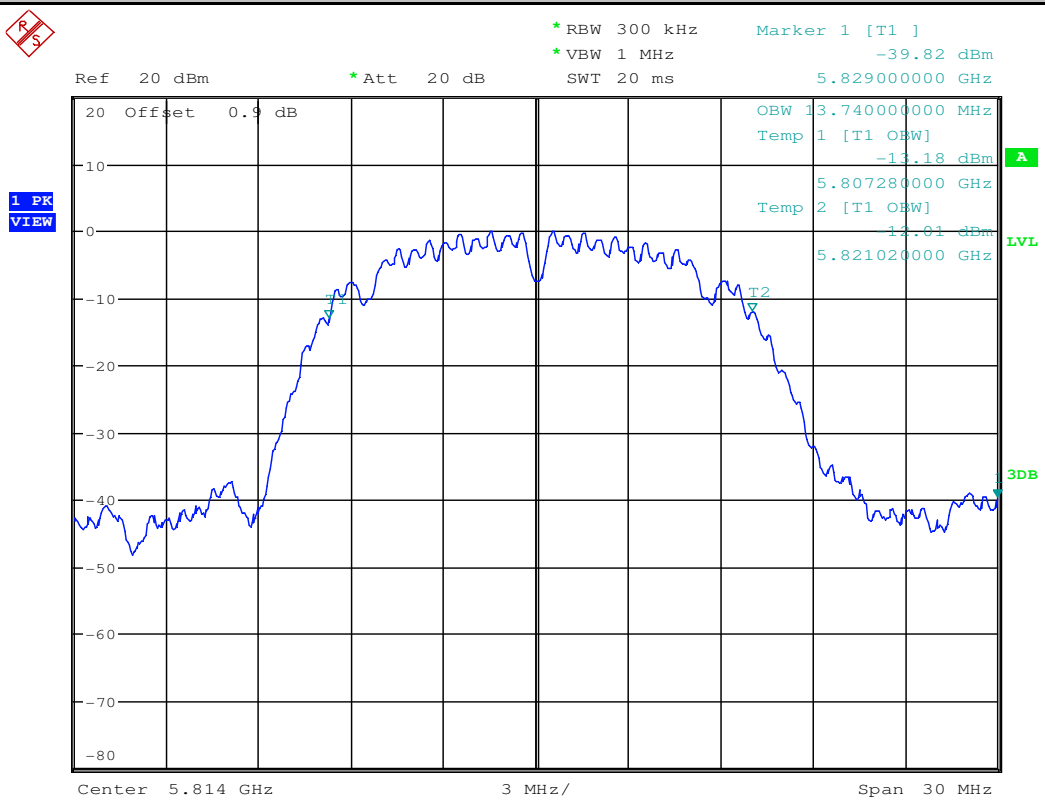
Occupied Bandwidth Measurement_11A_5762_Ant2



Occupied Bandwidth Measurement_11A_5814_Ant1



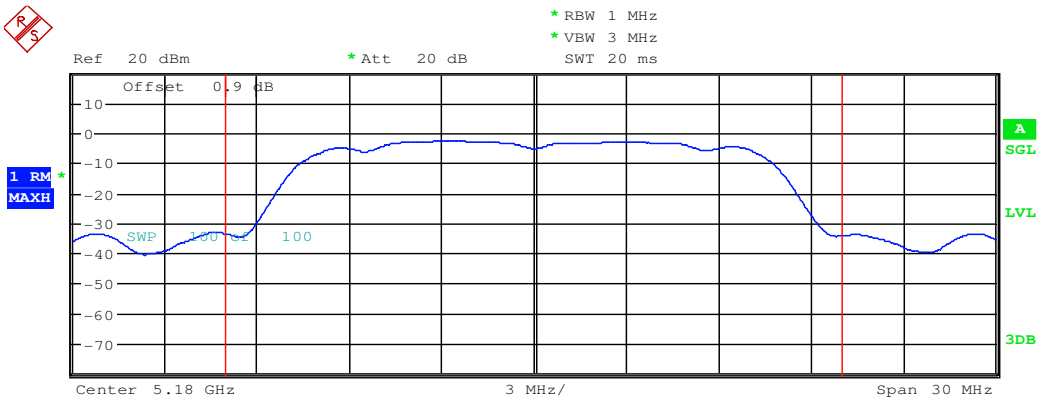
Occupied Bandwidth Measurement_11A_5814_Ant2



3.Maximum Conduct Output Power

Test Mode	Test Channel	Ant	Level [dBm]	10log(1/x) Factor [dB]	Power [dBm]	Limit [dBm]	Verdict
11A	5180	Ant1	7.05	0	7.05	<23.98	PASS
11A	5180	Ant2	8.51	0	8.51	<23.98	PASS
11A	5210	Ant1	8.28	0	8.28	<23.98	PASS
11A	5210	Ant2	9.49	0	9.49	<23.98	PASS
11A	5240	Ant1	9.71	0	9.71	<23.98	PASS
11A	5240	Ant2	10.3	0	10.30	<23.98	PASS
11A	5736	Ant1	8.02	0	8.02	<30.00	PASS
11A	5736	Ant2	8.87	0	8.87	<30.00	PASS
11A	5762	Ant1	7.71	0	7.71	<30.00	PASS
11A	5762	Ant2	8.91	0	8.91	<30.00	PASS
11A	5814	Ant1	6.16	0	6.16	<30.00	PASS
11A	5814	Ant2	9.08	0	9.08	<30.00	PASS

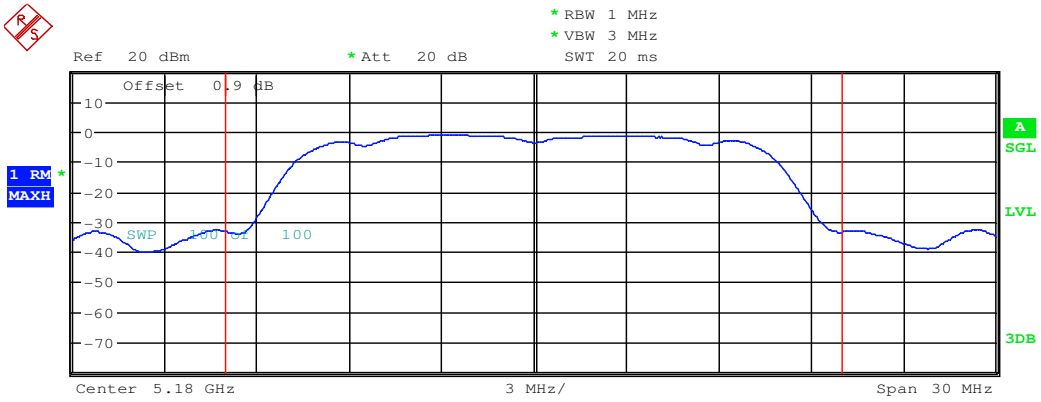
Maximum Conduct Output Power_11A_5180_Ant1



Tx Channel

Bandwidth	20 MHz	Power	7.05 dBm

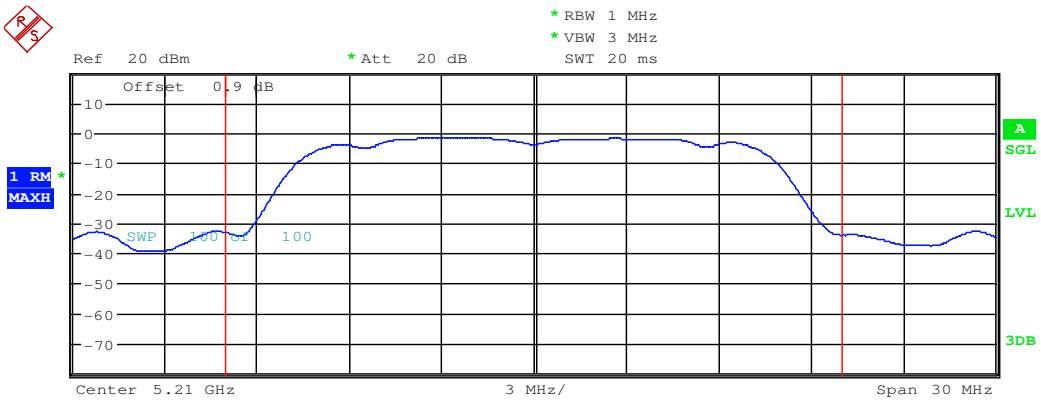
Maximum Conduct Output Power_11A_5180_Ant2



Tx Channel

Bandwidth	20 MHz	Power	8.51 dBm

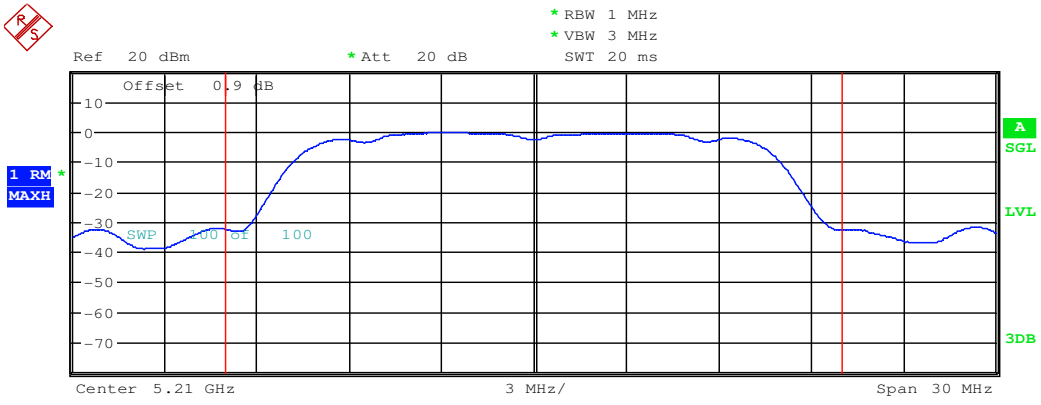
Maximum Conduct Output Power_11A_5210_Ant1



Tx Channel

Bandwidth	20 MHz	Power	8.28 dBm

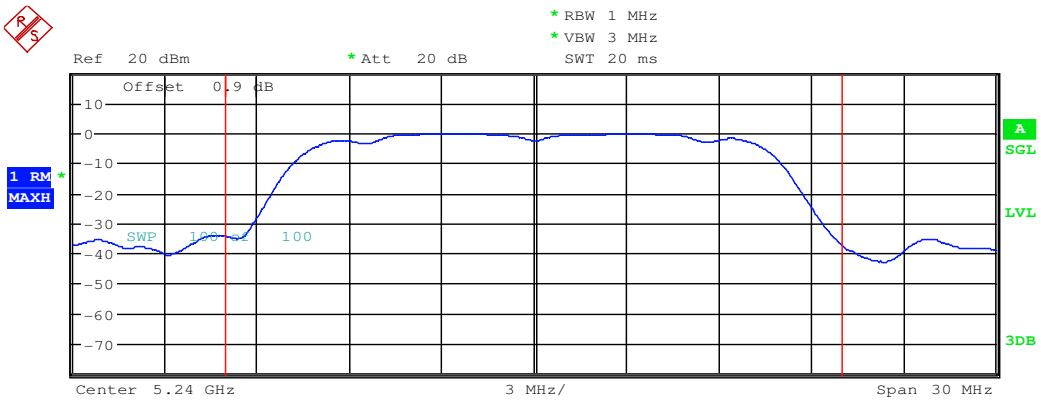
Maximum Conduct Output Power_11A_5210_Ant2



Tx Channel

Bandwidth	20 MHz	Power	9.49 dBm

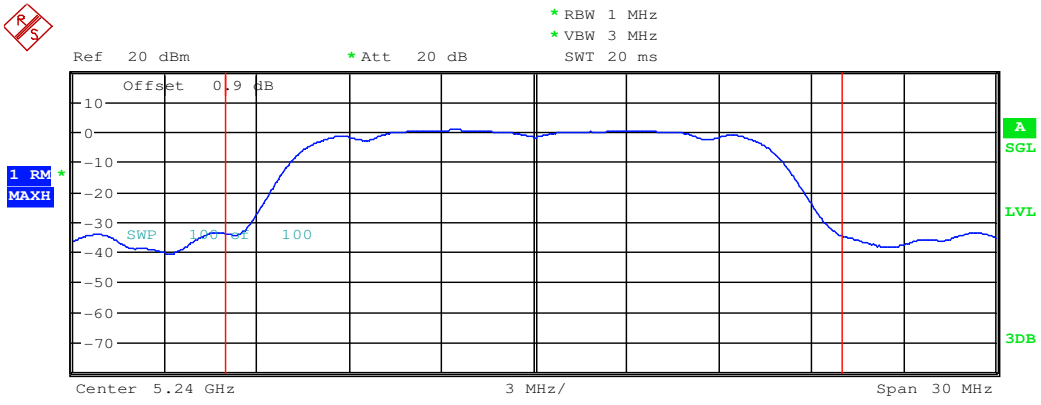
Maximum Conduct Output Power_11A_5240_Ant1



Tx Channel

Bandwidth 20 MHz Power 9.71 dBm

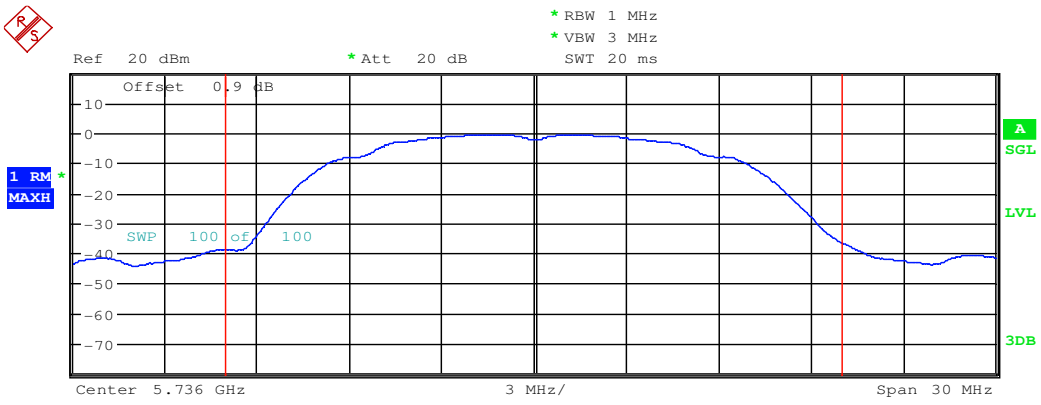
Maximum Conduct Output Power_11A_5240_Ant2



Tx Channel

Bandwidth 20 MHz Power 10.30 dBm

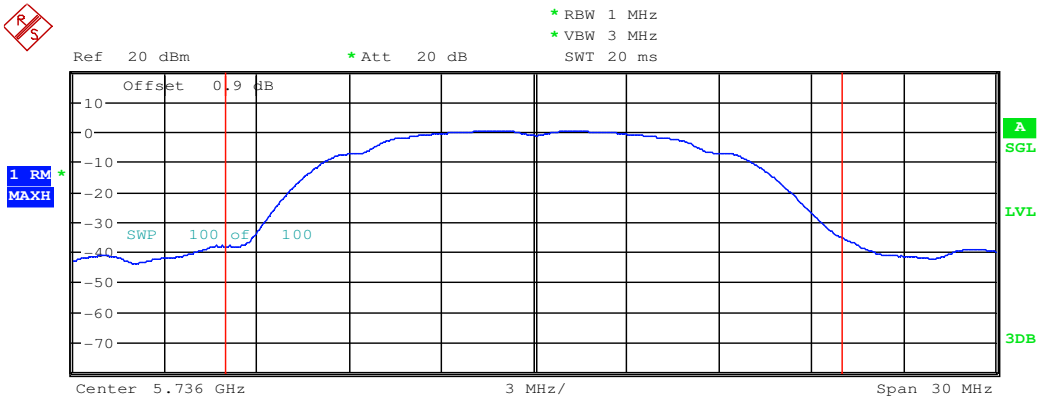
Maximum Conduct Output Power_11A_5736_Ant1



Tx Channel

Bandwidth	20 MHz	Power	8.02 dBm

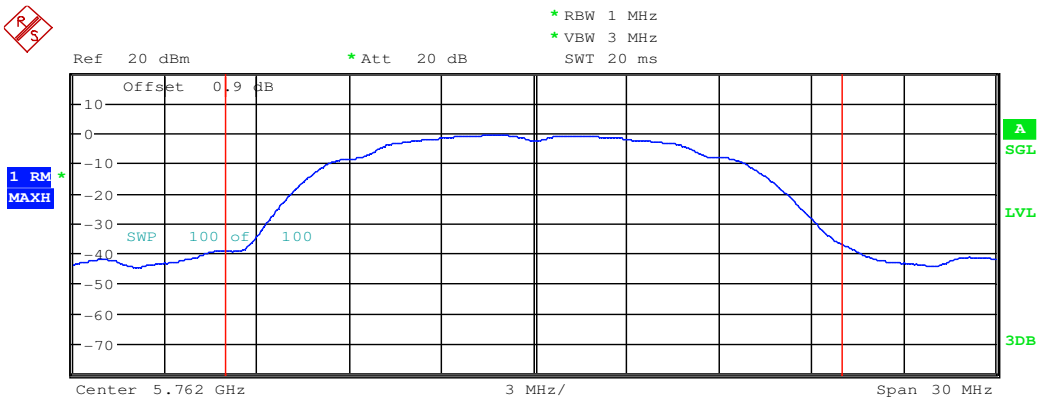
Maximum Conduct Output Power_11A_5736_Ant2



Tx Channel

Bandwidth	20 MHz	Power	8.87 dBm

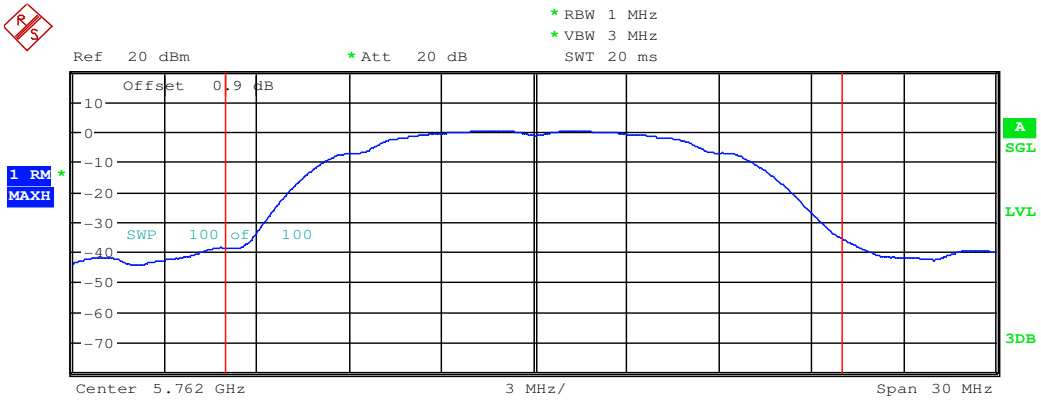
Maximum Conduct Output Power_11A_5762_Ant1



Tx Channel

Bandwidth 20 MHz Power 7.71 dBm

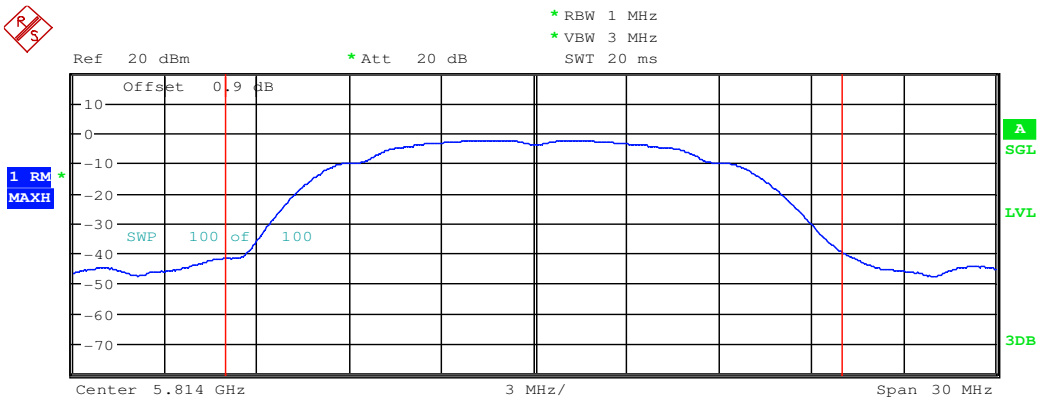
Maximum Conduct Output Power_11A_5762_Ant2



Tx Channel

Bandwidth 20 MHz Power 8.91 dBm

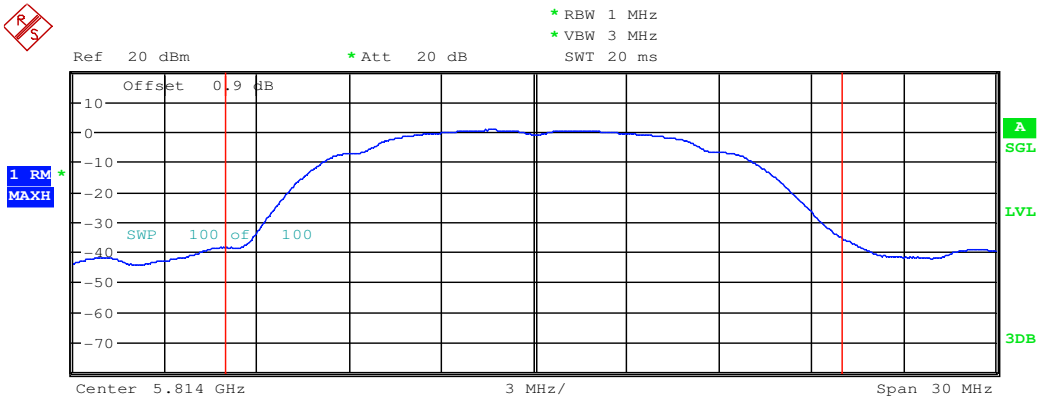
Maximum Conduct Output Power_11A_5814_Ant1



Tx Channel

Bandwidth	20 MHz	Power	6.16 dBm

Maximum Conduct Output Power_11A_5814_Ant2



Tx Channel

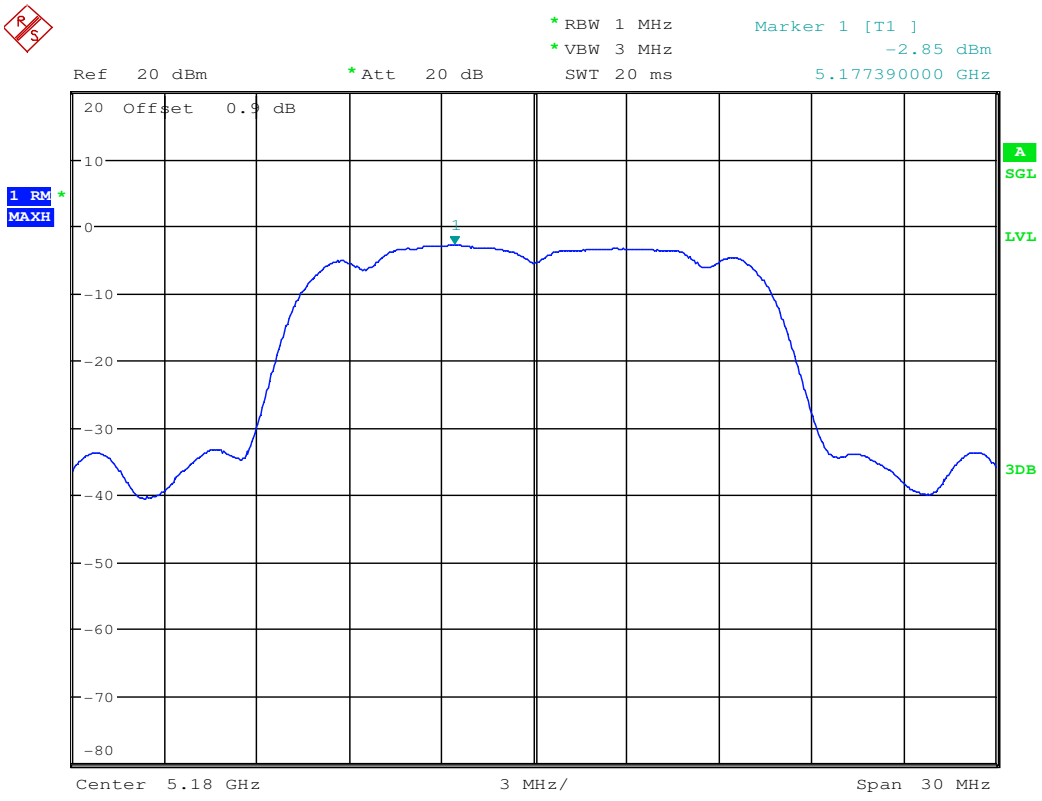
Bandwidth	20 MHz	Power	9.08 dBm

4.Maximum Power Spectral Density

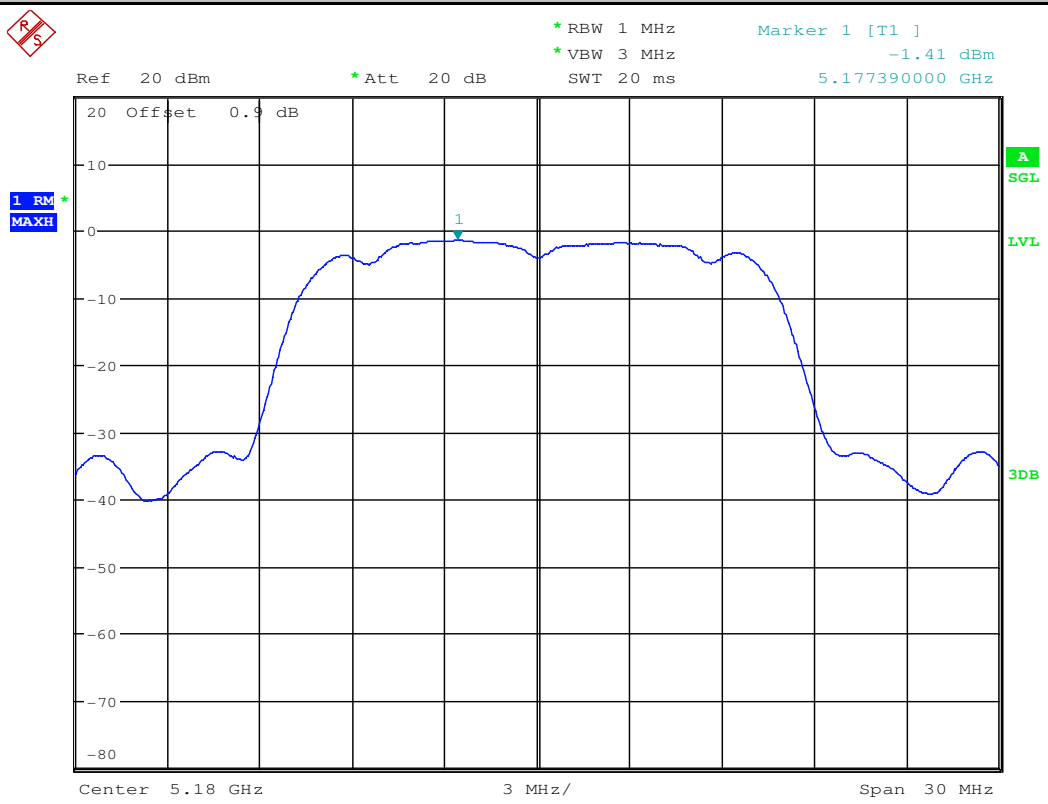
Test Mode	Test Channel	Ant	Level [dBm/MHz]	10log(1/x) Factor [dB]	PSD [dBm/MHz]	Limit [dBm/MHz]	Verdict
11A	5180	Ant1	-2.85	0	-2.85	<11.00	PASS
11A	5180	Ant2	-1.41	0	-1.41	<11.00	PASS
11A	5210	Ant1	-1.65	0	-1.65	<11.00	PASS
11A	5210	Ant2	-0.45	0	-0.45	<11.00	PASS
11A	5240	Ant1	-0.29	0	-0.29	<11.00	PASS
11A	5240	Ant2	0.35	0	0.35	<11.00	PASS

Test Mode	Test Channel	Ant	Level [dBm/500kHz]	10log(1/x) Factor[dB]	10log(500kHz/RBW) Factor [dB]	PSD [dBm/500kHz]	Limit [dBm/500kHz]	Verdict
11A	5736	Ant1	-3.14	0	0	-3.14	<17.00	PASS
11A	5736	Ant2	-2.35	0	0	-2.35	<17.00	PASS
11A	5762	Ant1	-3.48	0	0	-3.48	<17.00	PASS
11A	5762	Ant2	-2.22	0	0	-2.22	<17.00	PASS
11A	5814	Ant1	-5.02	0	0	-5.02	<17.00	PASS
11A	5814	Ant2	-2.12	0	0	-2.12	<17.00	PASS

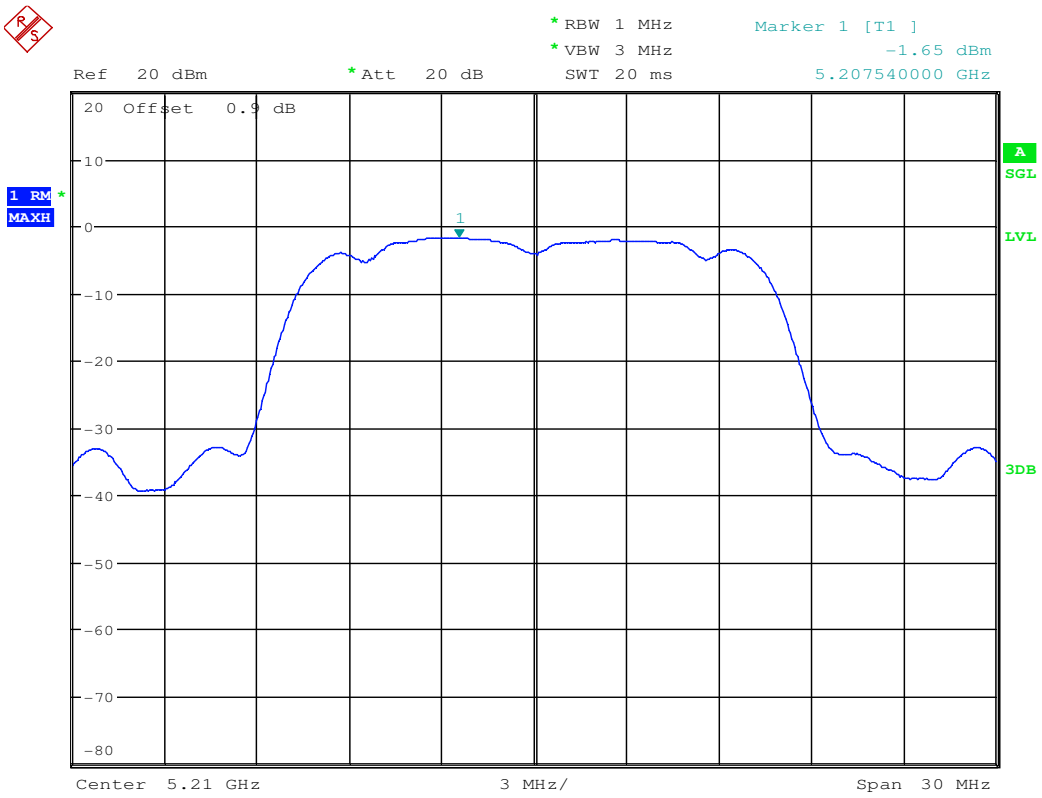
Maximum Power Spectral Density_TNVN_11A_5180_Ant1



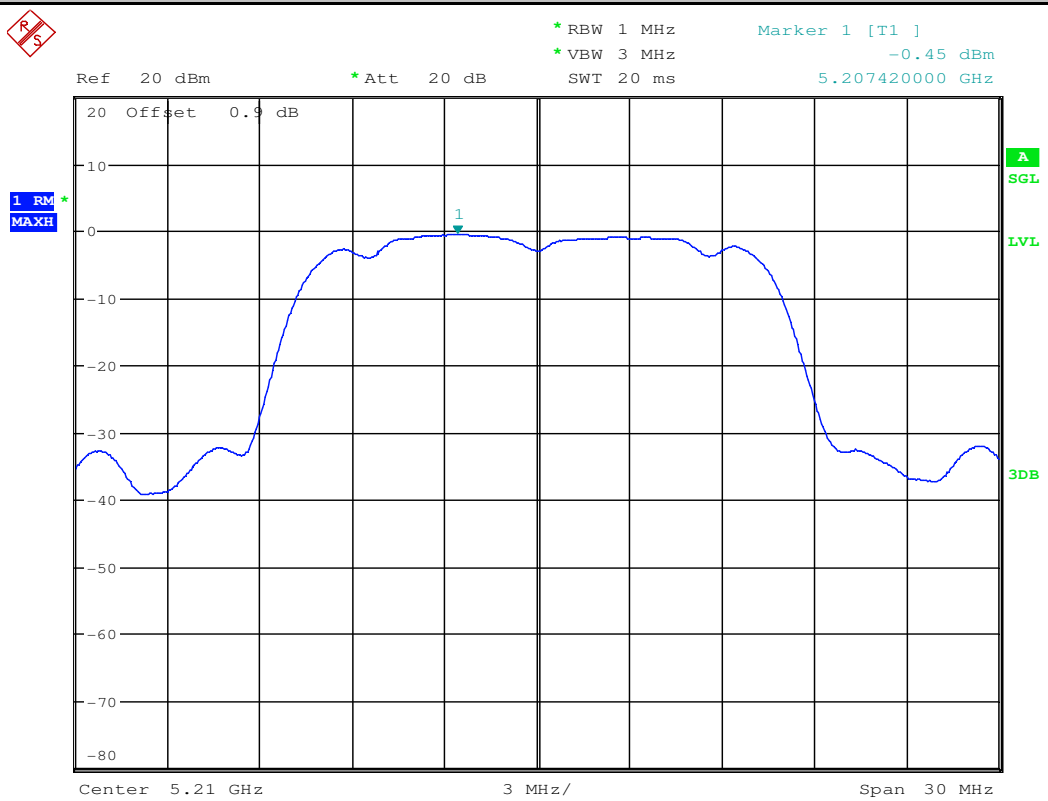
Maximum Power Spectral Density_TNVN_11A_5180_Ant2



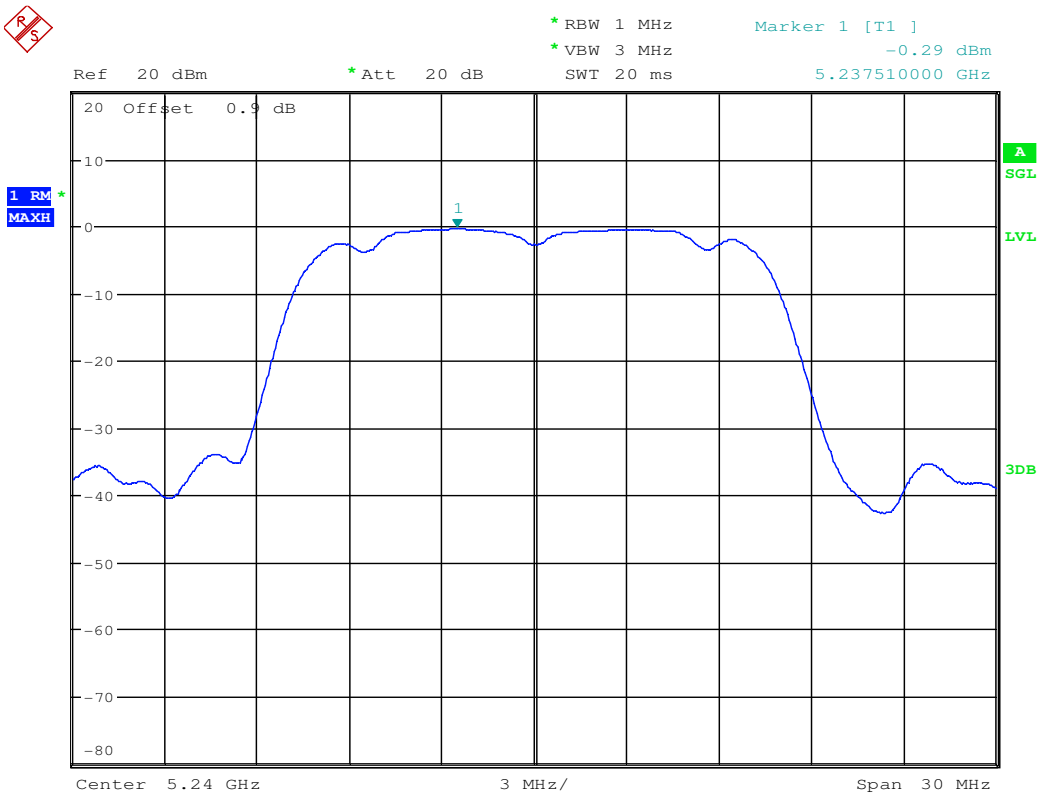
Maximum Power Spectral Density_TNVN_11A_5210_Ant1



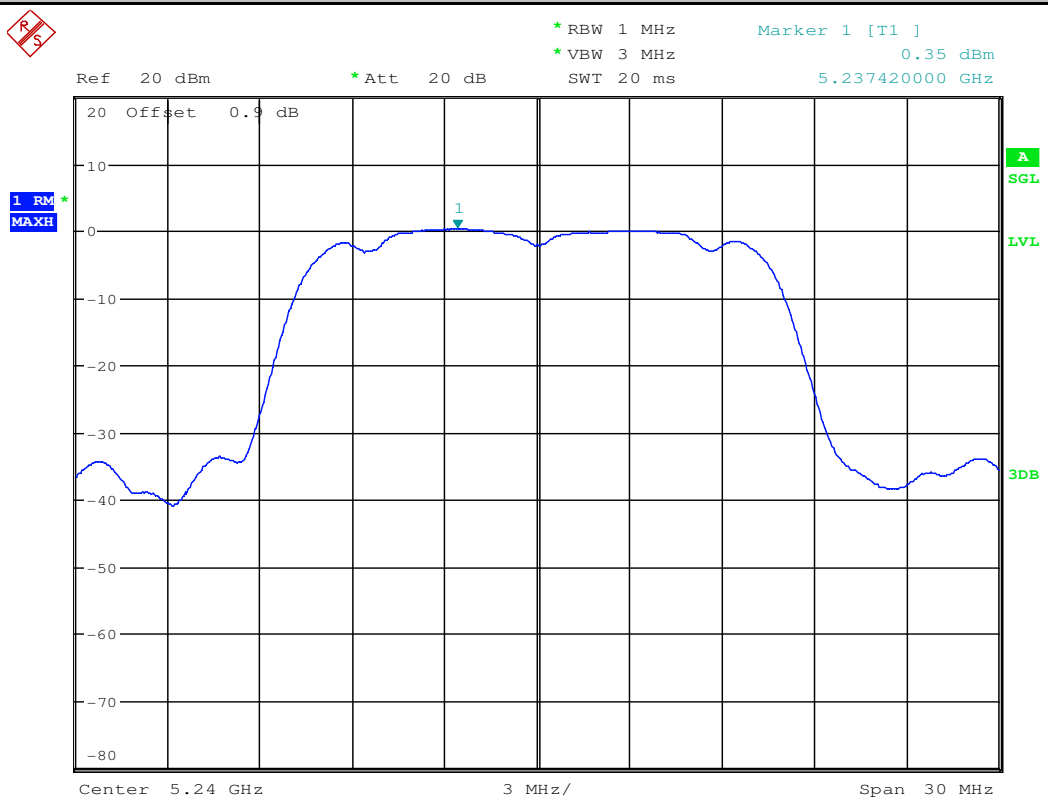
Maximum Power Spectral Density_TNVN_11A_5210_Ant2



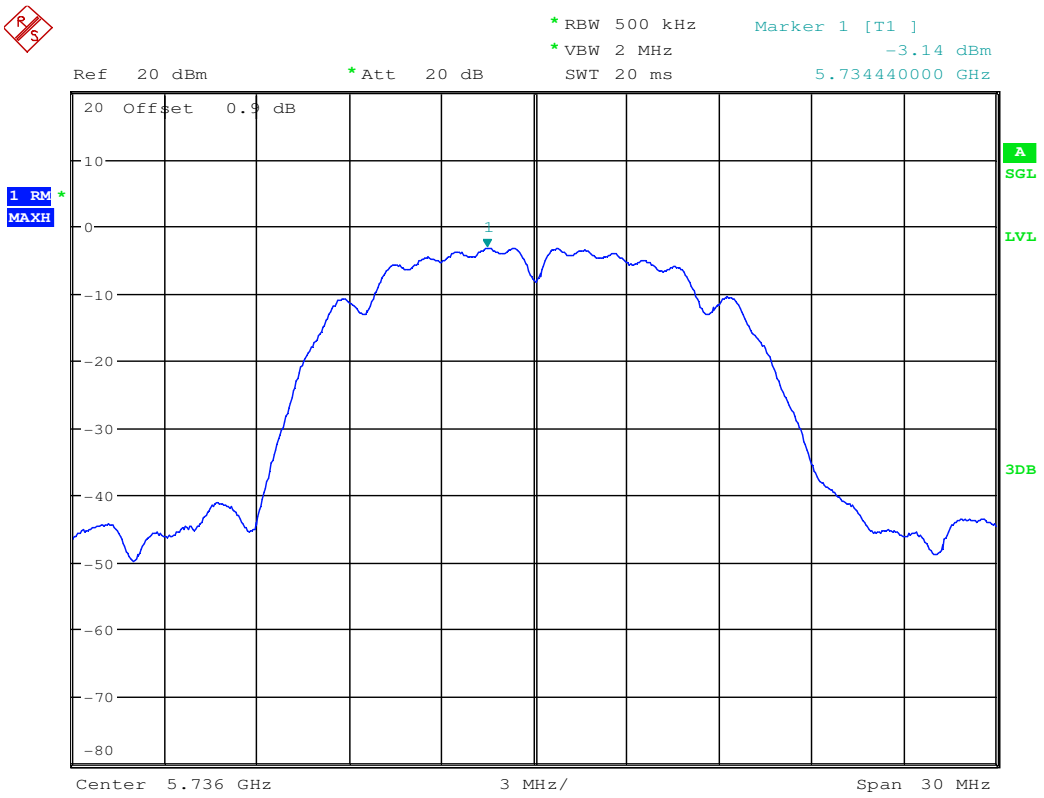
Maximum Power Spectral Density_TNVN_11A_5240_Ant1



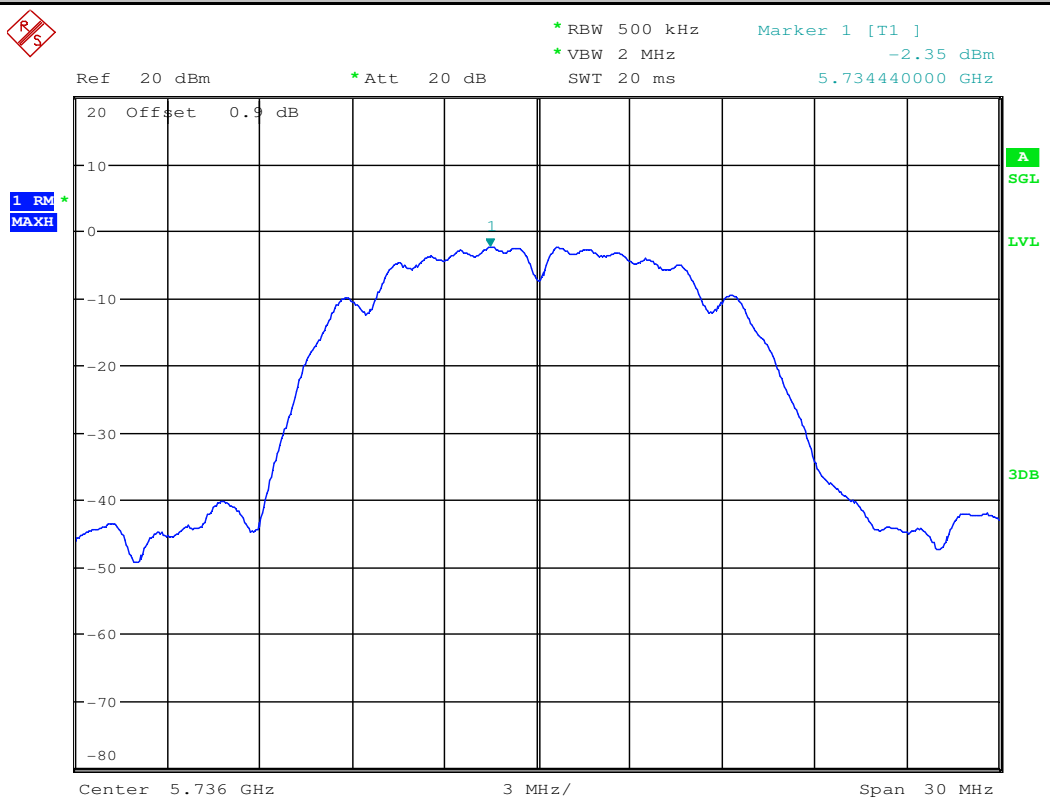
Maximum Power Spectral Density_TNVN_11A_5240_Ant2



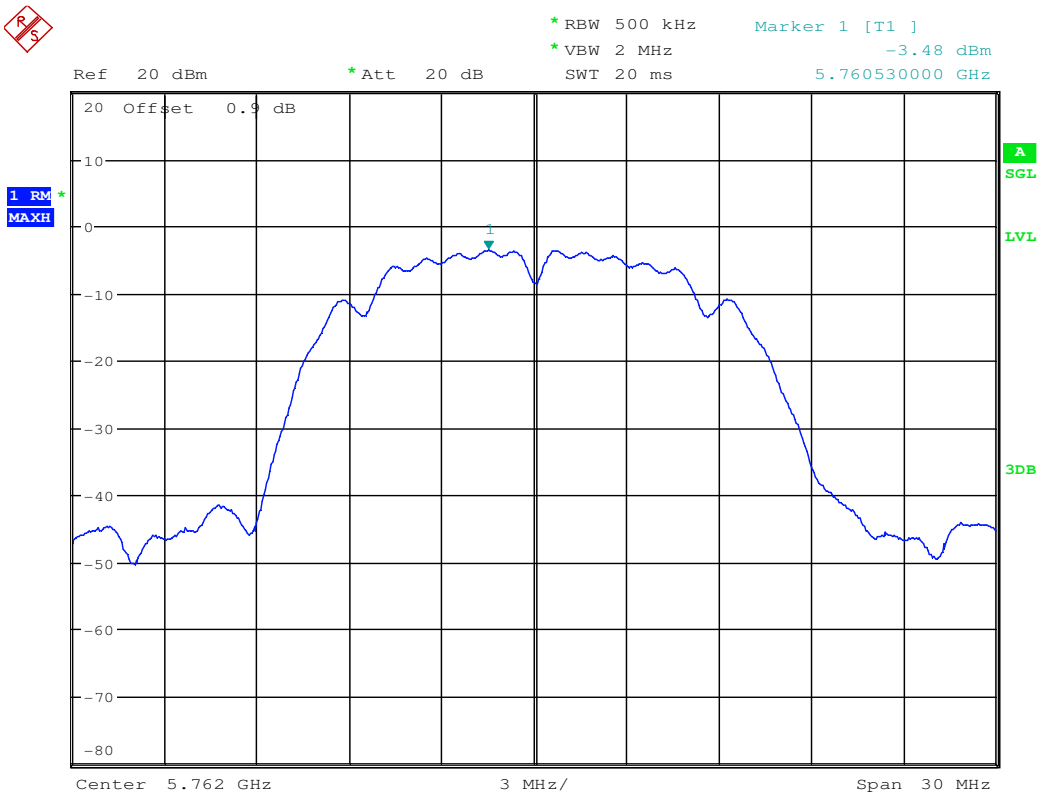
Maximum Power Spectral Density_TNVN_11A_5736_Ant1



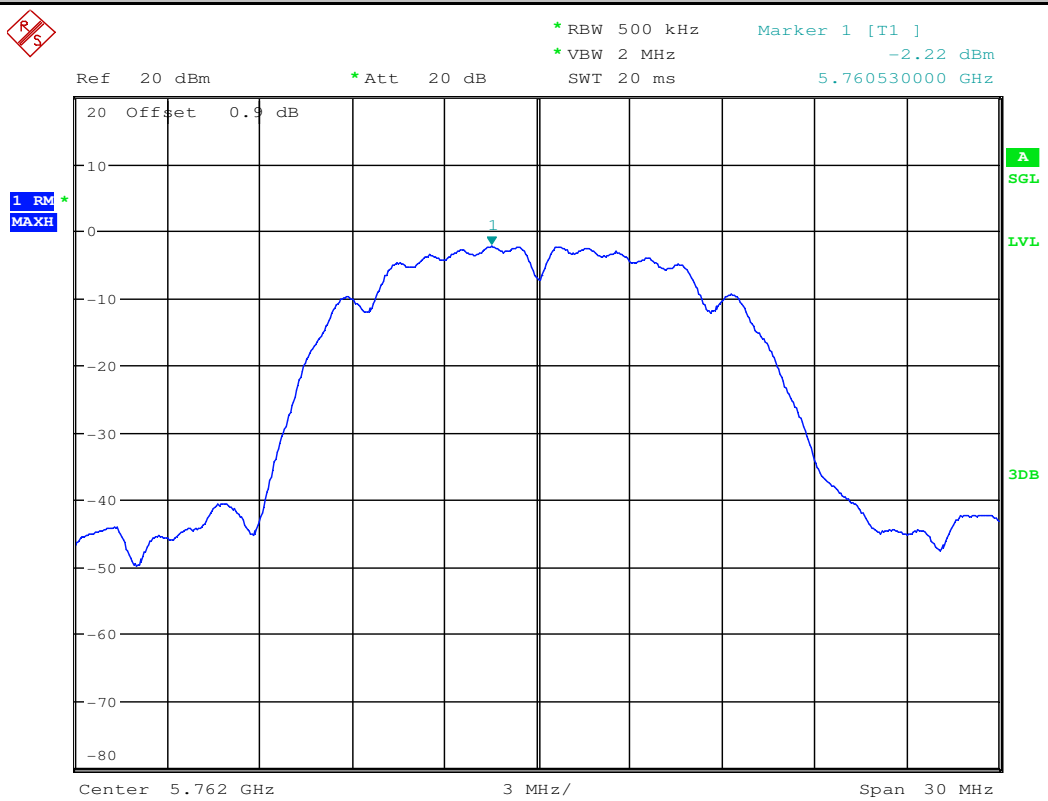
Maximum Power Spectral Density_TNVN_11A_5736_Ant2



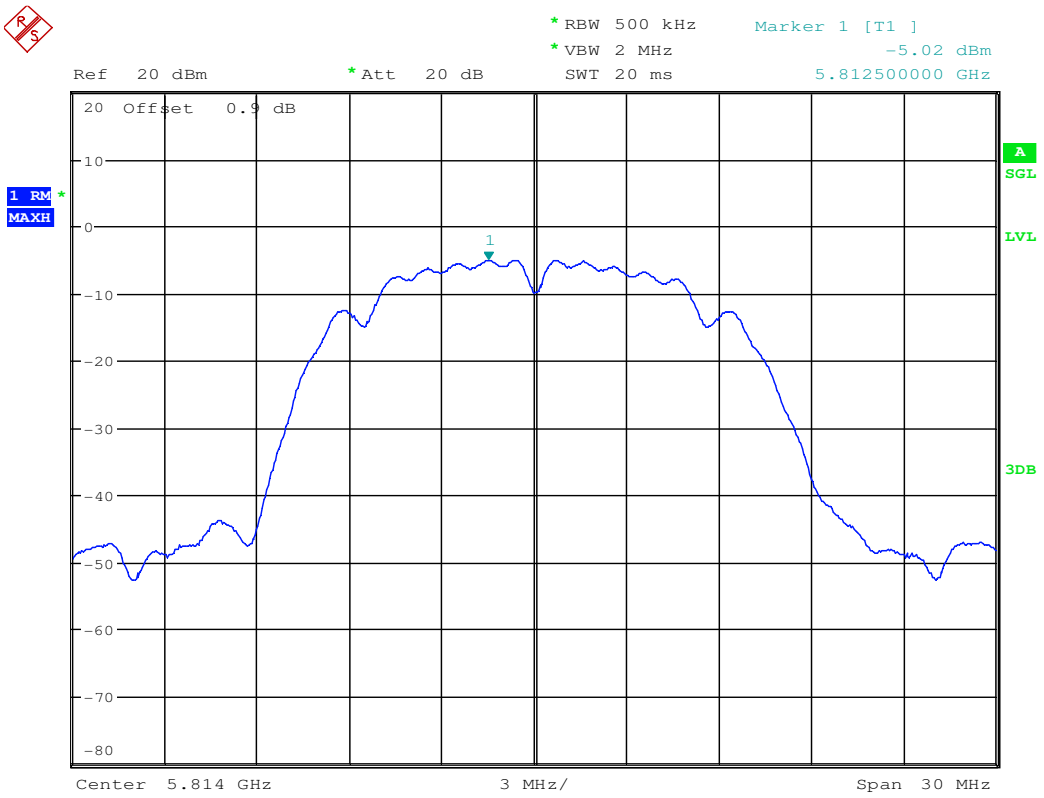
Maximum Power Spectral Density_TNVN_11A_5762_Ant1



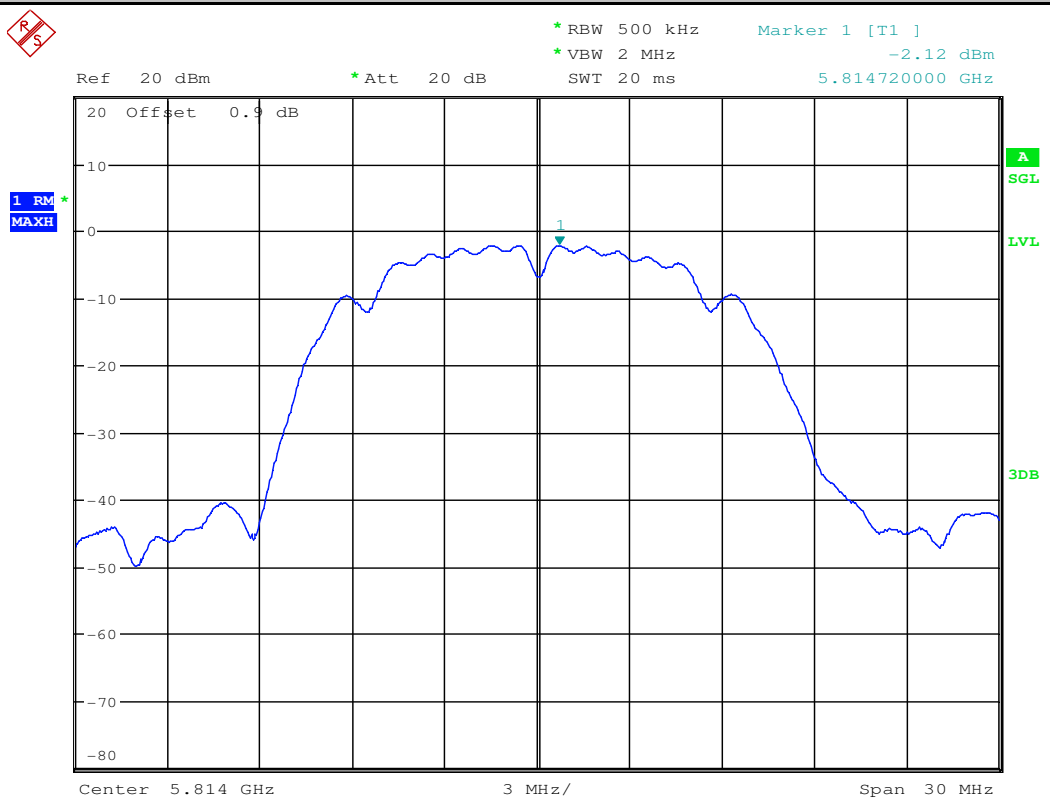
Maximum Power Spectral Density_TNVN_11A_5762_Ant2



Maximum Power Spectral Density_TNVN_11A_5814_Ant1



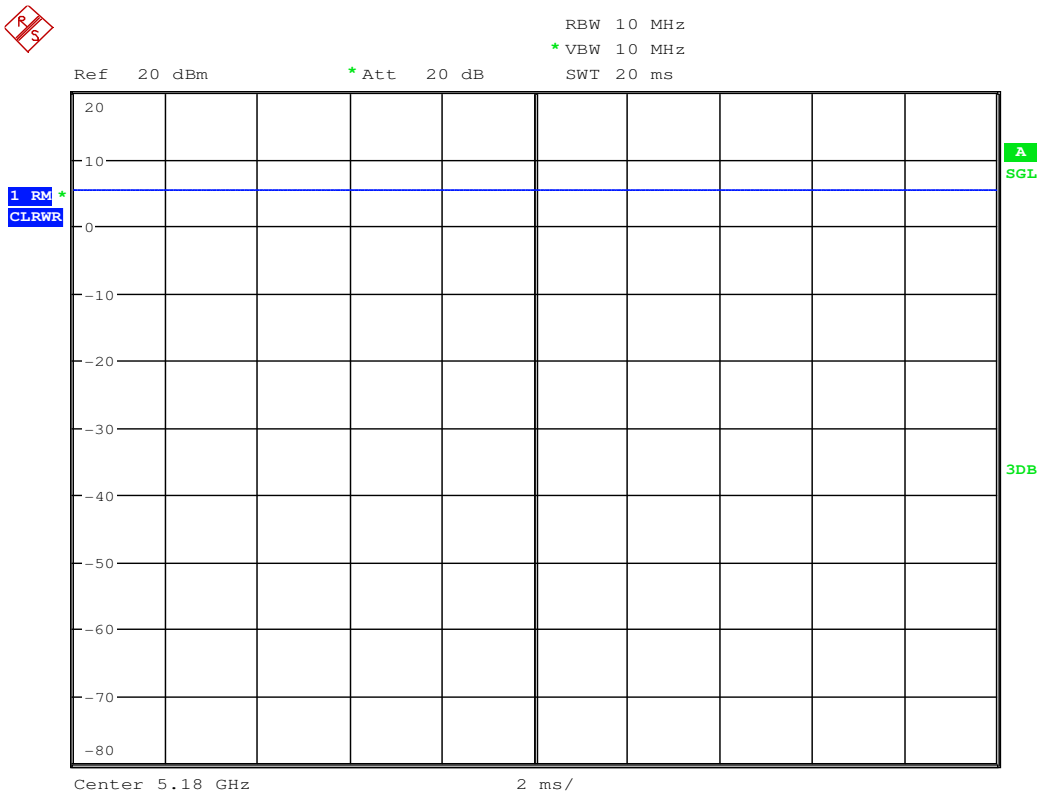
Maximum Power Spectral Density_TNVN_11A_5814_Ant2



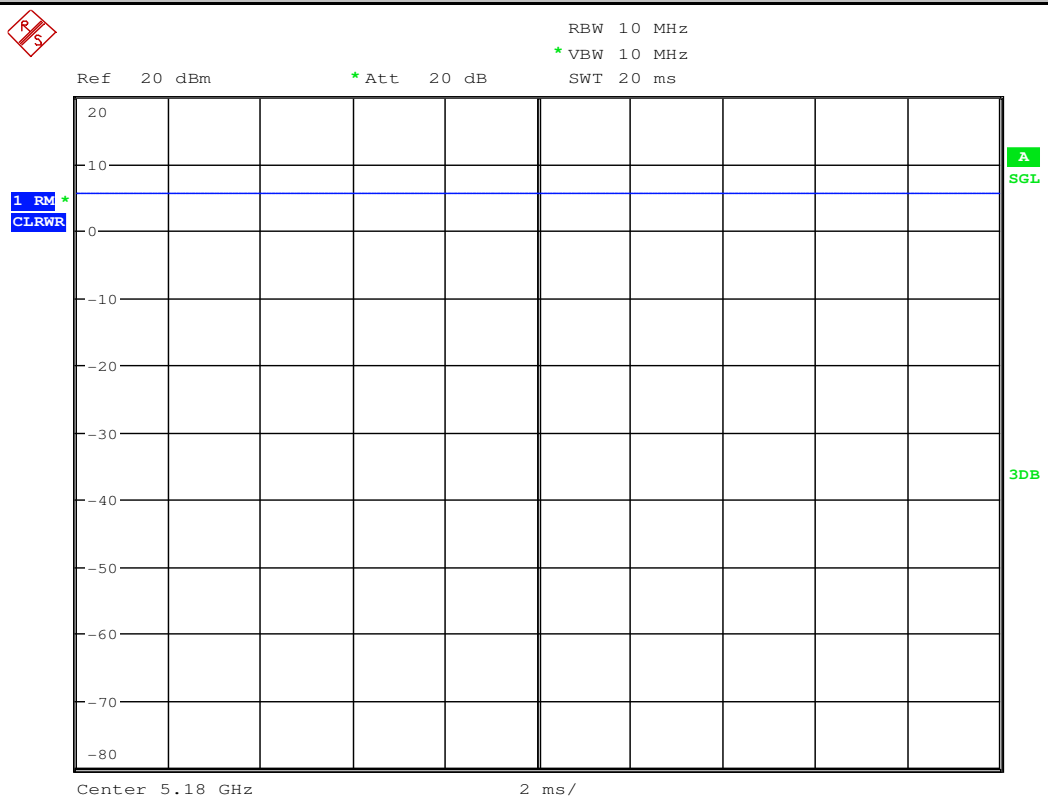
5.Duty Cycle (x)

Test Mode	Test Channel	Ant	Duty Cycle[%]	10log(1/x) Factor[dB]
11A	5180	Ant1	100	0
11A	5180	Ant2	100	0
11A	5210	Ant1	100	0
11A	5210	Ant2	100	0
11A	5240	Ant1	100	0
11A	5240	Ant2	100	0
11A	5736	Ant1	100	0
11A	5736	Ant2	100	0
11A	5762	Ant1	100	0
11A	5762	Ant2	100	0
11A	5814	Ant1	100	0
11A	5814	Ant2	100	0

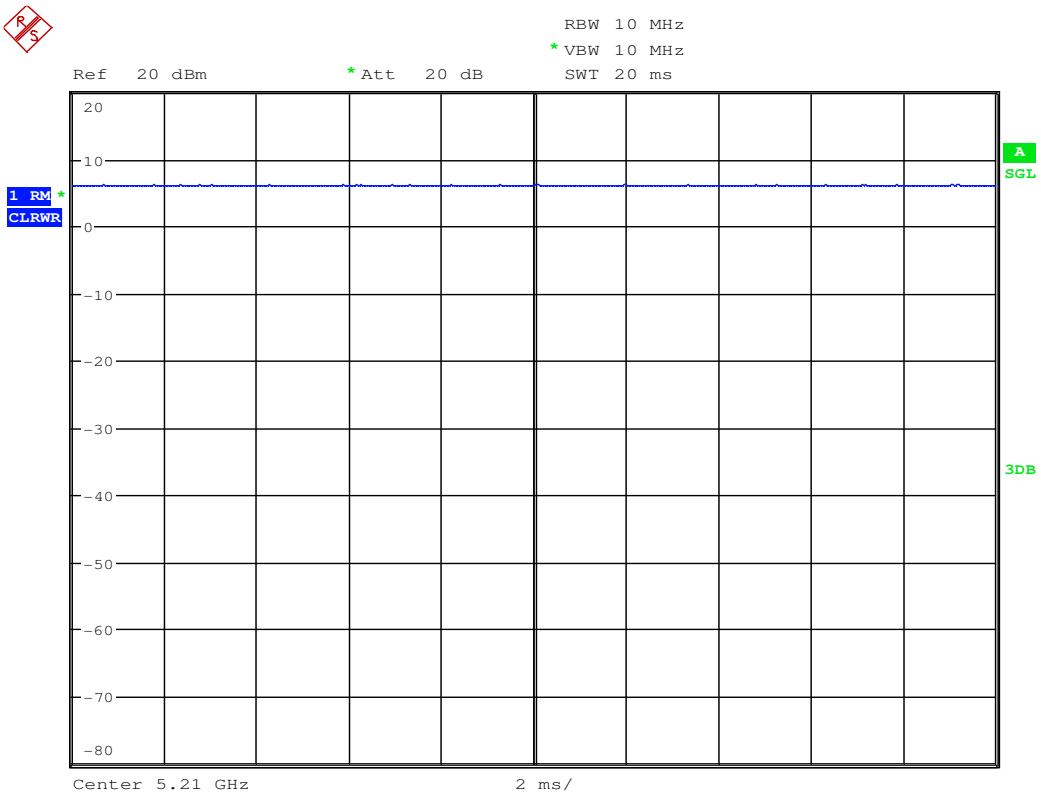
Duty Cycle_11A_5180_Ant1



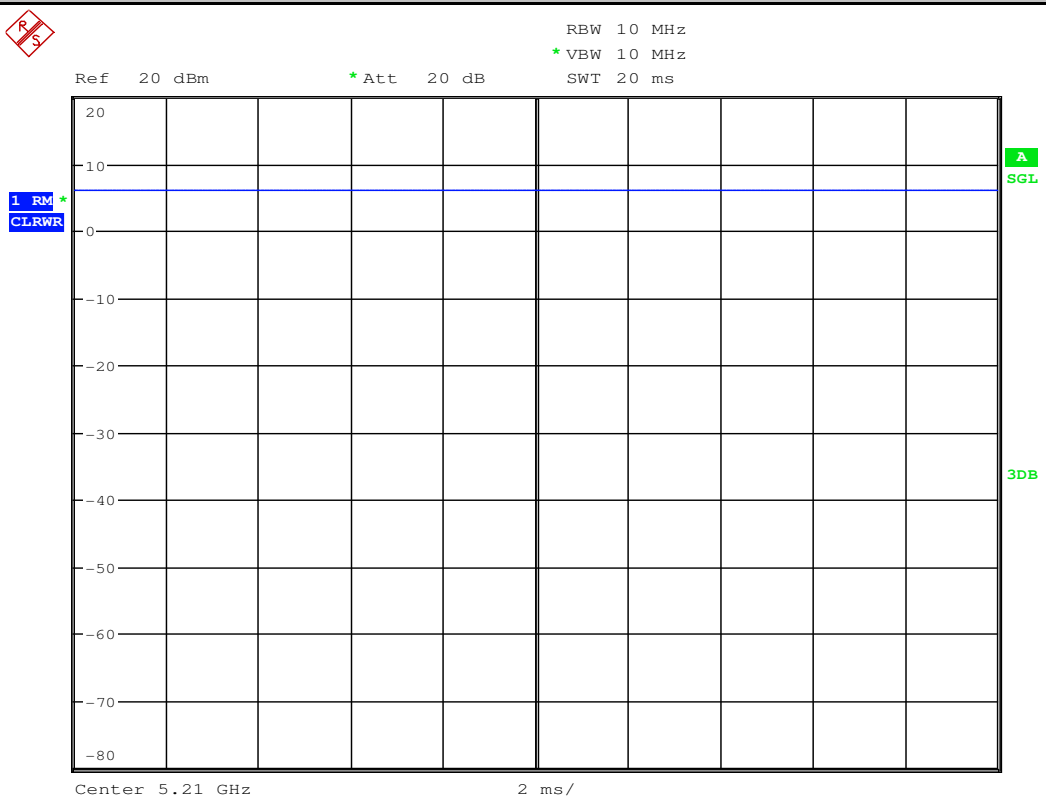
Duty Cycle_11A_5180_Ant2



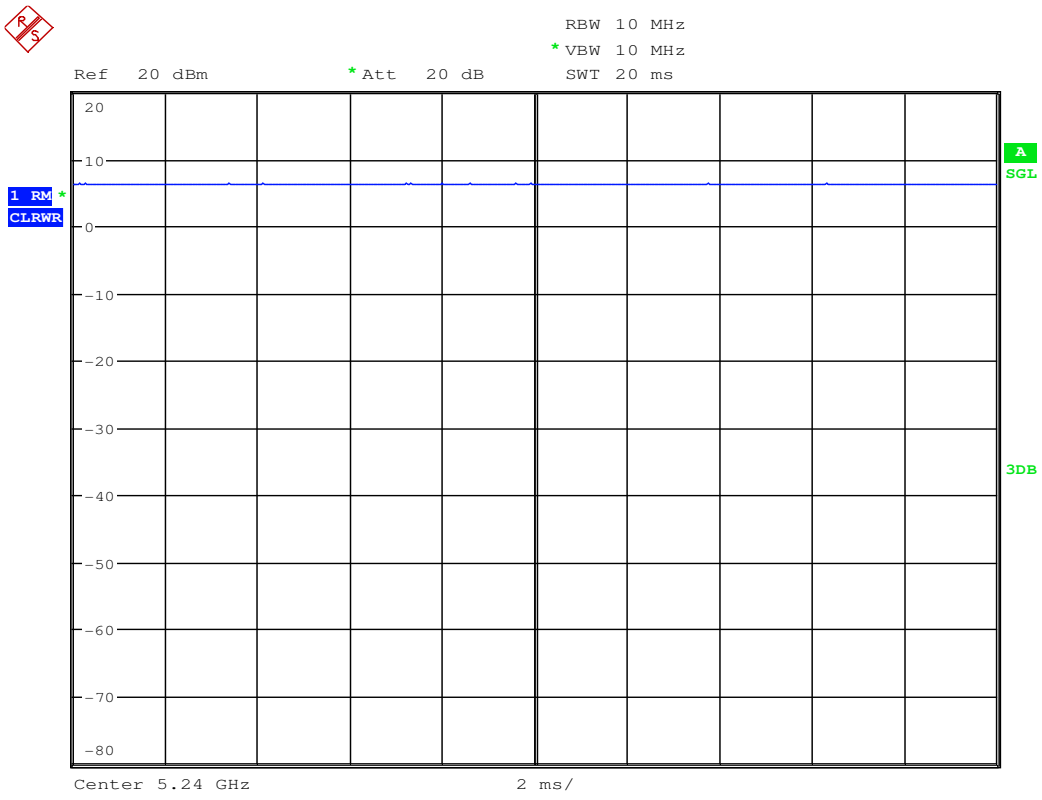
Duty Cycle_11A_5210_Ant1



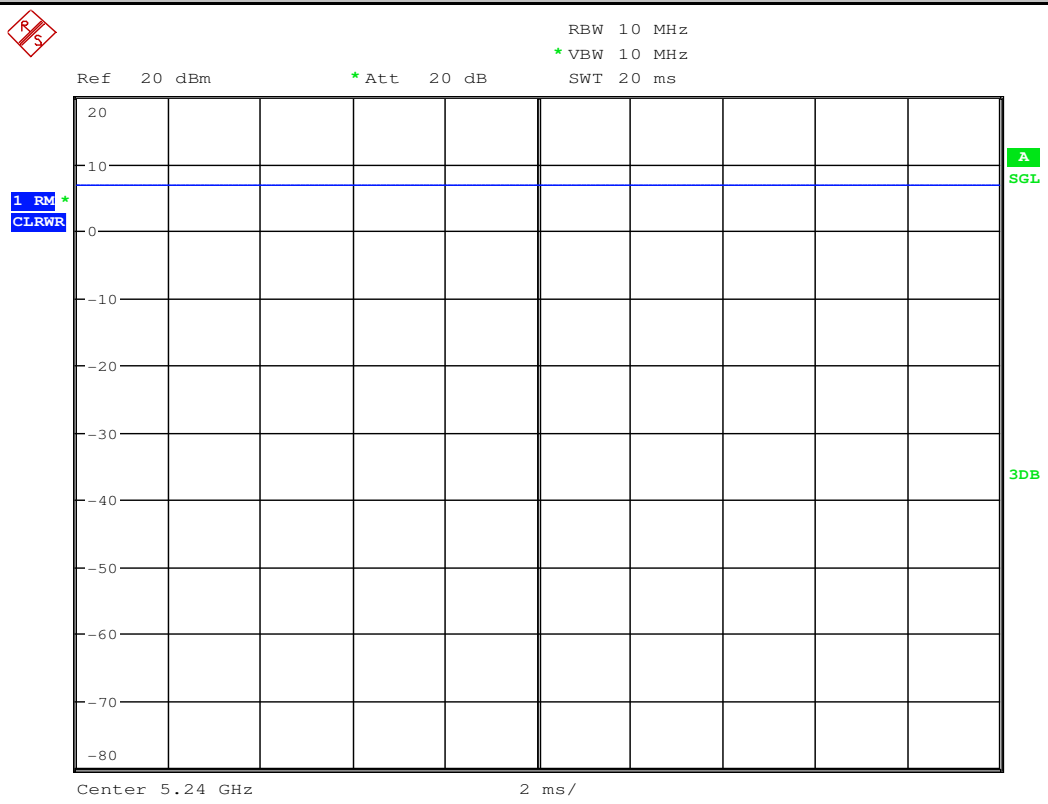
Duty Cycle_11A_5210_Ant2



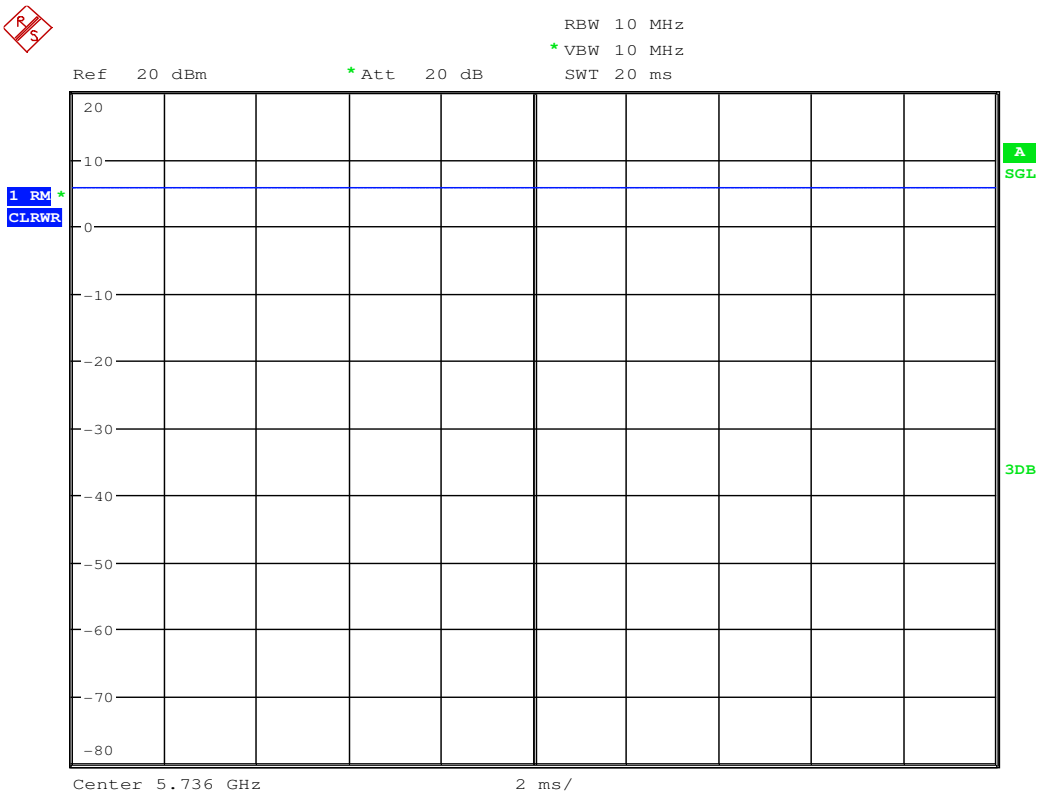
Duty Cycle_11A_5240_Ant1



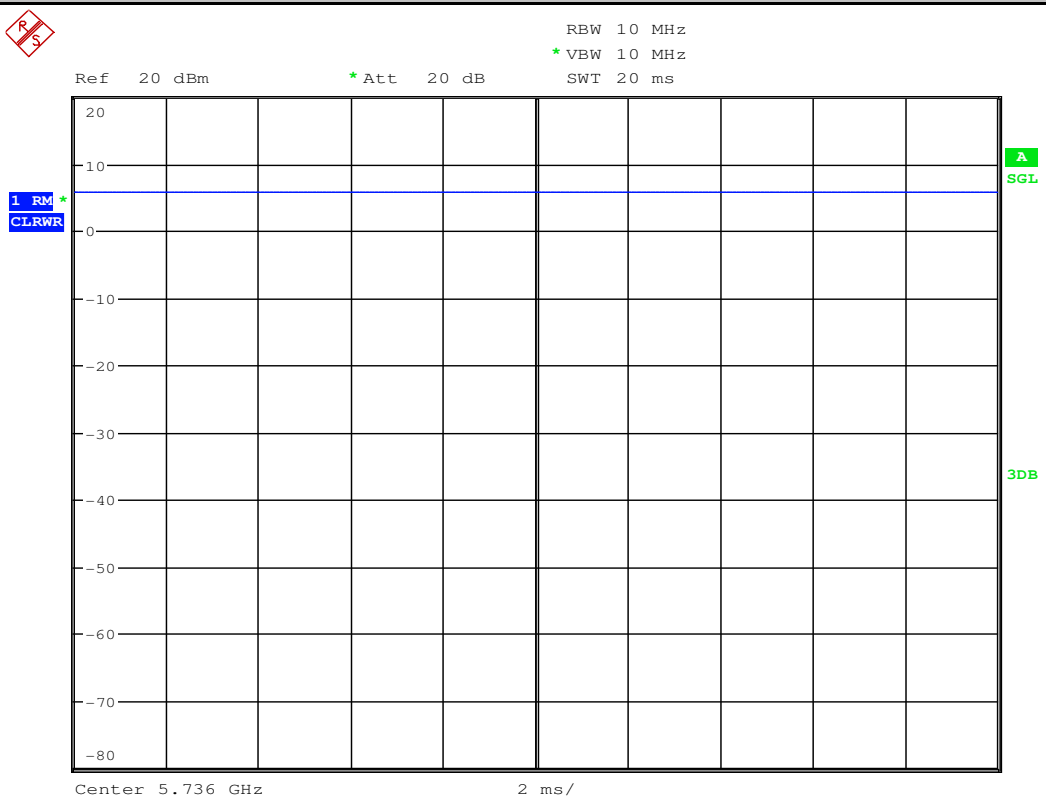
Duty Cycle_11A_5240_Ant2



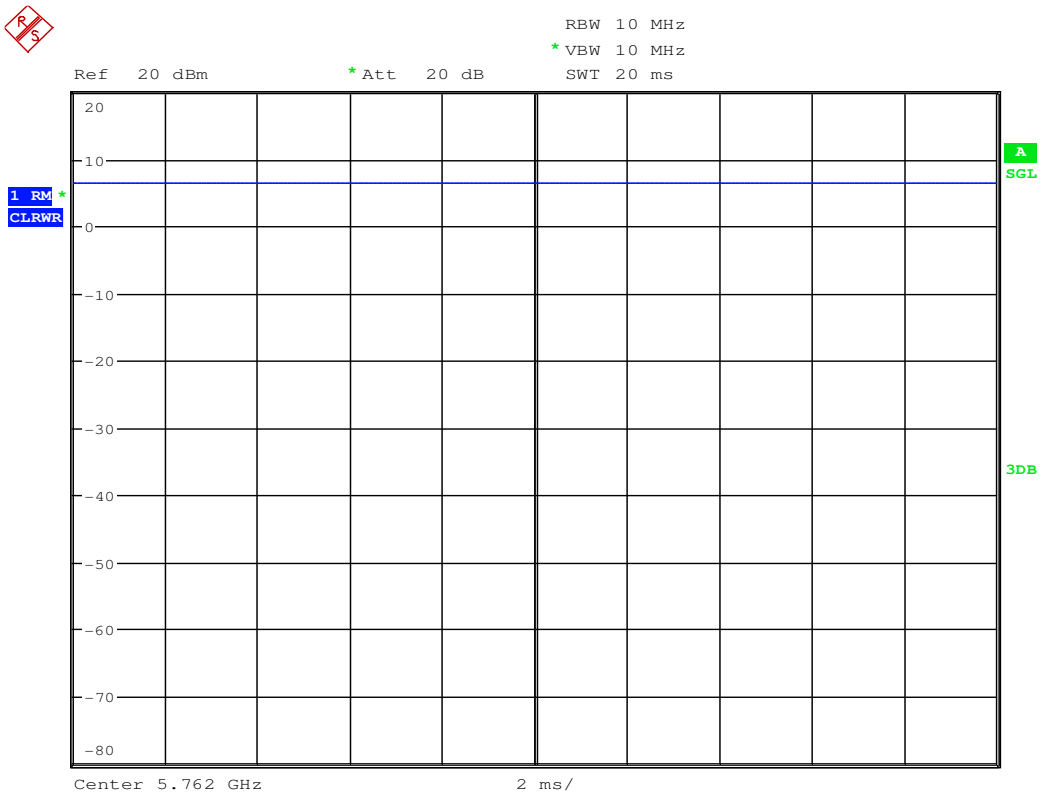
Duty Cycle_11A_5736_Ant1



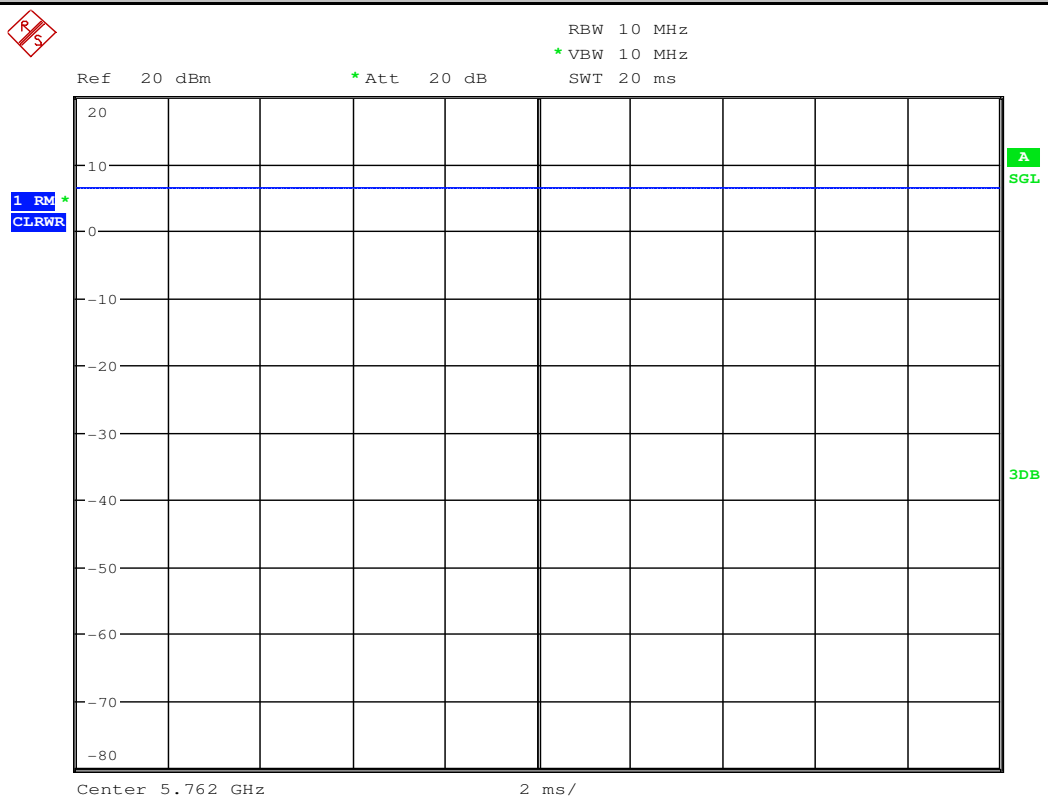
Duty Cycle_11A_5736_Ant2



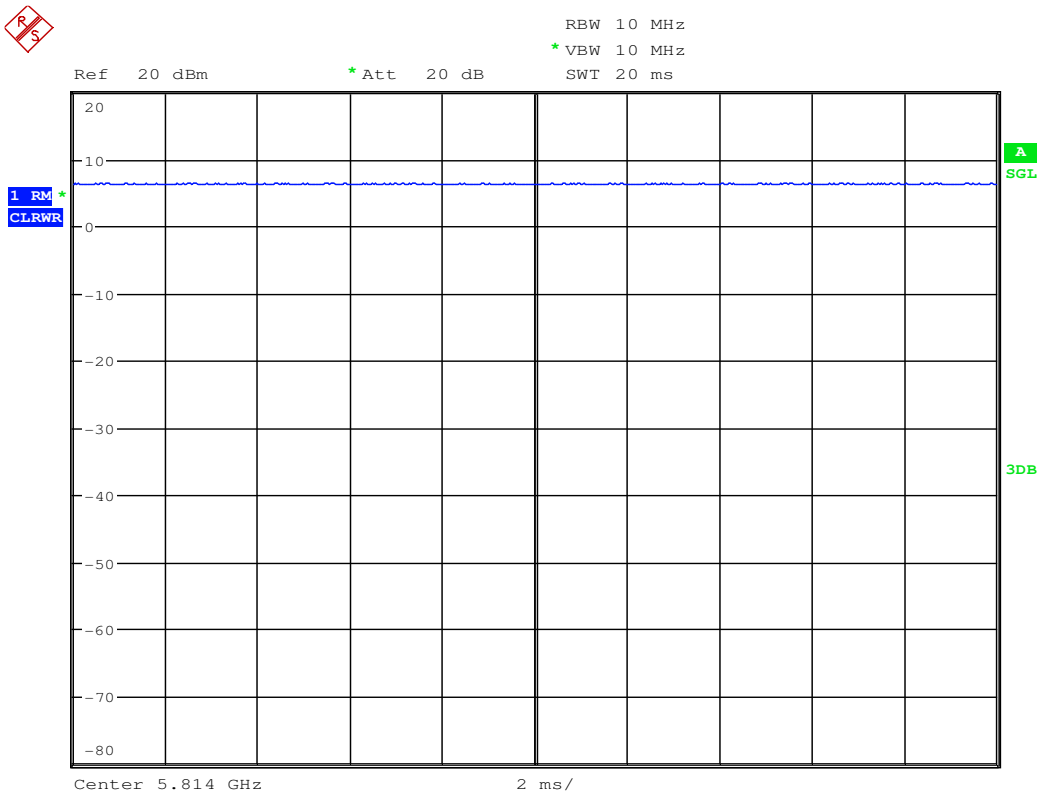
Duty Cycle_11A_5762_Ant1



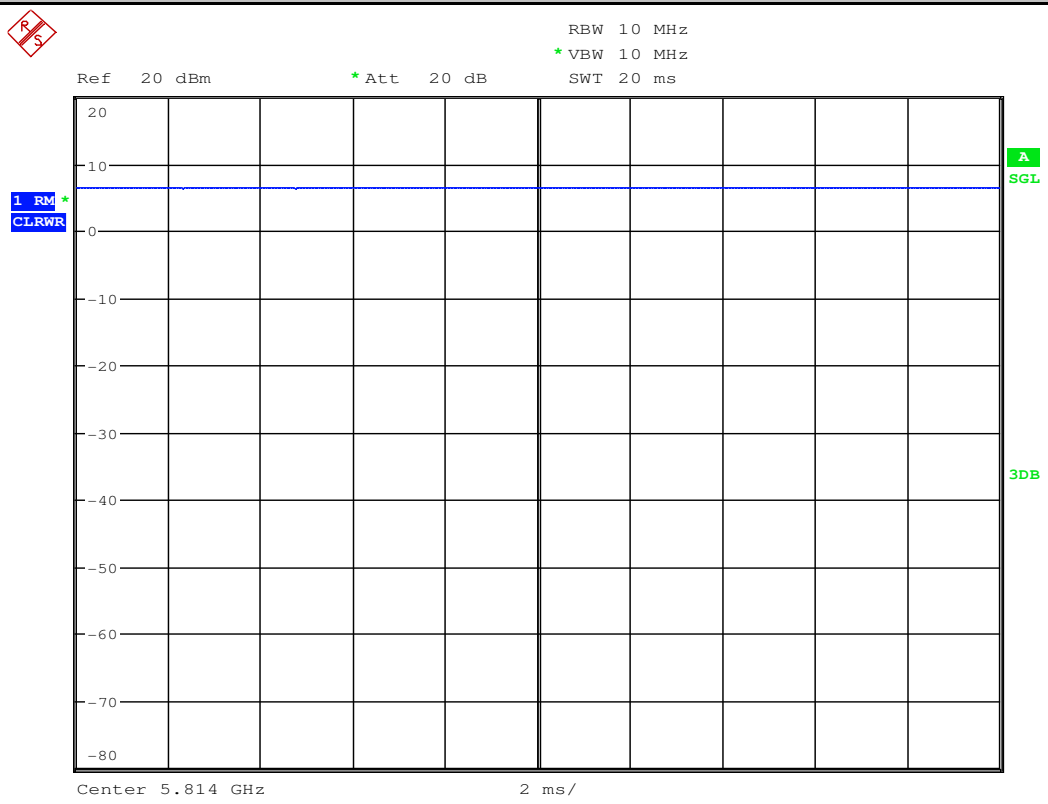
Duty Cycle_11A_5762_Ant2



Duty Cycle_11A_5814_Ant1



Duty Cycle_11A_5814_Ant2



6. Frequency Stability

Remark: Only the data of Ant.2 is recorded.

Test mode:	5.2g	Frequency(MHz):	5180

Temperature (℃)	Voltage(VAC)	Measurement Frequency(MHz)	Result
40	120	5178.4131	Pass
30		5178.4139	Pass
20		5178.4143	Pass
10		5178.4136	Pass
0		5178.4135	Pass
25	138	5178.4139	Pass
	120	5178.4141	Pass
	102	5178.4131	Pass

Test mode:	5.2g	Frequency(MHz):	5210

Temperature (℃)	Voltage(VAC)	Measurement Frequency(MHz)	Result
40	120	5211.2286	Pass
30		5211.2295	Pass
20		5211.2299	Pass
10		5211.2293	Pass
0		5211.2287	Pass
25	138	5211.2295	Pass
	120	5211.2304	Pass
	102	5211.2286	Pass

Test mode:	5.2g	Frequency(MHz):	5240

Temperature (℃)	Voltage(VAC)	Measurement Frequency(MHz)	Result
40	120	5240.8440	Pass
30		5240.8443	Pass
20		5240.8451	Pass
10		5240.8445	Pass
0		5240.8443	Pass
25	138	5240.8443	Pass
	120	5240.8444	Pass
	102	5240.8440	Pass

Test mode:	5.8g	Frequency(MHz):	5736

Temperature (℃)	Voltage(VAC)	Measurement Frequency(MHz)	Result
40	120	5736.3583	Pass
30		5736.3586	Pass
20		5736.3595	Pass
10		5736.3593	Pass
0		5736.3590	Pass
25	138	5736.3584	Pass
	120	5736.3586	Pass
	102	5736.3593	Pass

Test mode:	5.8g	Frequency(MHz):	5762

Temperature (℃)	Voltage(VAC)	Measurement Frequency(MHz)	Result
40	120	5762.5344	Pass
30		5762.5348	Pass
20		5762.5354	Pass
10		5762.5344	Pass
0		5762.5336	Pass
25	138	5762.5345	Pass
	120	5762.5348	Pass
	102	5762.5351	Pass

Test mode:	5.8g	Frequency(MHz):	5814

Temperature (℃)	Voltage(VAC)	Measurement Frequency(MHz)	Result
40	120	5814.7908	Pass
30		5814.7910	Pass
20		5814.7919	Pass
10		5814.7915	Pass
0		5814.7911	Pass
25	138	5814.7908	Pass
	120	5814.7910	Pass
	102	5814.7918	Pass