SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

TEST REPORT

Application No.:	SHEM2007006345CR
FCC ID:	UCZ-H871T6-Z
IC:	8575A-H871T6Z
Applicant:	LOREX Technology Inc.
Address of Applicant:	250 Royal Crest Court, Markham, ON L3R 3S1 Canada
Manufacturer:	Lorex Technology Inc.
Address of Manufacturer:	250 Royal crest Court, Markham, L3R 3S1 Canada
Equipment Under Test (EUT):	
EUT Name:	HUB
Model No.:	H871T6-Z
Trade mark:	LOREX
Standard(s) :	47 CFR Part 15, Subpart E 15.407 RSS-247 Issue 2, February 2017 RSS-Gen Issue 5, March 2019 Amendment 1
Date of Receipt:	2020-07-30
Date of Test:	2020-08-13 to 2020-08-14
Date of Issue:	2020-08-15
Test Result:	

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

Parlam Zhan

Parlam Zhan
E&E Section 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	**Description**	**Date**	**Remark**
00	Original	2020-08-15	/

Authorized for issue by:				
		Micheal Niu		
		Micheal Niu / Project Engineer		
		Parlam zhan		
		Parlam Zhan / Reviewer		

2 Test Summary

Radio Spectrum Technical Requirement

Item	FCC Requirement	IC Requirement	Method	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.203	RSS-Gen Clause 6.8	N/A	Pass
Transmission in the Absence of Data	47 CFR Part 15, Subpart C 15.407 (c)	RSS-247 Section 6.4(a)	N/A	Pass

N/A: Not applicable

Radio Spectrum Matter Part

Item	FCC Requirement	IC Requirement	Method	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.207 & 15.407 b(6)	RSS-Gen Section 8.8	ANSI C63.10 (2013) Section 6.2	Pass
99% Bandwidth	N/A	RSS-Gen Section 6.7	KDB 789033 II D	Pass
26dB Emission bandwidth	47 CFR Part 15, Subpart C 15.407 (a)	RSS-247 Section 6.2.1(1)	KDB 789033 D02 II C 1	Pass
Minimum 6 dB bandwidth (5.725-5.85 GHz band)	47 CFR Part 15, Subpart C 15.407 (e)	RSS-247 Section 6.2.4	KDB 789033 D02 II C 2	Pass
Maximum Conducted output power	47 CFR Part 15, Subpart C 15.407 (a)	RSS-247 Section 6.2.1&6.2.2&6.2.3&6.2.4	KDB 789033 D02 II E	Pass
Peak Power spectrum density	47 CFR Part 15, Subpart C 15.407 (a)	RSS-247 Section 6.2.1&6.2.2&6.2.3& 6.2.4	KDB 789033 D02 II F	Pass
Radiated Emissions	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	RSS-247 Section 3.3 & RSS-Gen Section 8.9	KDB 789033 D02 II G	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	RSS-247 Section 3.3 & RSS-Gen Section 8.9	KDB 789033 D02 II G	Pass
Frequency Stability	47 CFR Part 15, Subpart C 15.407 (g)	RSS-Gen Section 8.11	ANSI C63.10 (2013) Section 6.8& RSS-Gen Section 6.11	Pass

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 5V by adapter Adapter Model:NBS10B050200VUU INPUT:100-240V,50/60Hz,0.3A OUTPUT:5V,2A
Test voltage:	AC 120V/60Hz
Serial Number:	ND012008087585
Firmware Version:	V1.000.0000002.2.R.200904
Antenna Gain:	Ant 1:3.15dBi, Ant 2:3.15dBi Directional gain: 6.16dBi
Antenna Type:	Antenna 1: PIFA Antenna Antenna 2: PIFA Antenna
DFS Function:	Slave without Radar detection
TPC Function:	Not Support

Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	Band 1	802.11a/n(HT20)/ac(VHT20)	5180-5240	4
		802.11n(HT40)/ac(VHT40)	5190-5230	2
		802.11ac(VHT80)	5210	1
	Band 4	802.11a/n(HT20)/ac(VHT20)	5745-5825	5
		802.11n(HT40)/ac(VHT40)	5755-5795	2
		802.11ac(VHT80)	5775	1
		802.11a/n(HT20)/ac(VHT20)	5180-5240	4
Modulation Type:	802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)			
Channel Spacing:	802.11a/n(HT20)/ac(VHT20): 20MHz 802.11n(HT40)/ac(VHT40): 40MHz 802.11ac(VHT80): 80MHz			
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: MCS0-7 802.11ac: MCS0-9			

4.2 Power level setting using in test:

Antenna 1：

Channel	802.11a	802.11n(HT20)	802.11ac(VHT20)
36	76	76	76
40	76	76	76
48	76	76	76
149	110	110	110
157	110	110	110
165	110	110	110
Channel	802.11n(HT40)	802.11ac(VHT40)	
38	65	65	
46	65	65	
151	110	110	
159	110	110	
Channel	802.11ac(VHT80)		
42	60		
155	110		

Antenna 2：

Channel	802.11a	802.11n(HT20)	802.11ac(VHT20)
36	76	76	76
40	76	76	76
48	76	76	76
149	110	110	110
157	110	110	110
165	110	110	110
Channel	802.11n(HT40)	802.11ac(VHT40)	
38	65	65	
46	65	65	
151	110	110	
159	110	110	
Channel	802.11ac(VHT80)		
42	60		
155	110		

4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
EMI_Tool	N/A	N/A	N/A
Laptop	Lenovo	ThinkPad X100e	/
AC adapter	MASS	NBS10B050200VUU	/

4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 10-8
2	Timeout	2s
3	Duty Cycle	0.4%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
8	RF Radiated Power	5.1dB (Below 1GHz)
		5.9dB (Above 1GHz)
9	Radiated Spurious Emission Test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-6GHz)
		5.4dB (6GHz-18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.5 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.
No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.
Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

4.6 Test Facility

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

- **CNAS (No. CNAS L4354)**

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 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. 2541.01)**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

- **FCC (Designation Number: CN1172)**

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory.

Designation Number: CN1172.

- **ISED (CAB identifier: CN0072)**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

CAB Identifier: CN0072.

- **VCCI (Member No.: 1938)**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1600, C-1707, T-1499, G-10216 respectively.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None

5 Equipment List

Item	Equipment	Manufacturer	Model	Serial Number	Cal Date	Cal. Due Date
Conducted Emission at Mains Terminals (150kHz-30MHz)						
1	EMI Test Receive	R&S	ESCI	100781	02/24/2020	02/23/2021
2	LISN	R&S	ENV216	101604	10/24/2019	10/23/2020
3	LISN	Schwarzbeck	NNLK 8129	8129-143	10/24/2019	10/23/2020
4	Pulse Limiter	R&S	ESH3-Z2	100609	02/24/2020	02/23/2021
5	CE test Cable	Thermax	/	14	02/24/2020	02/23/2021
RF Conducted Test						
1	Spectrum Analyzer	Agilent	E4446A	MY44020154	04/22/2020	04/21/2021
2	Spectrum Analyzer	Keysight	N9020A	MY55370209	12/19/2019	12/18/2020
3	Signal Generator	Agilent	E8257C	MY43321570	10/24/2019	10/23/2020
4	Vector Signal Generator	R&S	SMU 200A	102744	02/24/2020	02/23/2021
5	Universal Radio Communication Tester	R&S	CMU200	109525	12/19/2019	12/18/2020
6	Universal Radio Communication Tester	R&S	CMW500	159275	12/19/2019	12/18/2020
7	Power Meter	Anritsu	ML2495A	1445010	04/21/2020	04/20/2021
8	Switcher	CCSRF	FY562	KS301219	12/20/2019	12/19/2020
9	AC Power Source	EXTECH	6605	1570106	N.C.R	N.C.R
10	DC Power Supply	Aglient	E3632A	MY50340053	N.C.R	N.C.R
11	6dB Attenuator	Mini-Circuits	NAT-6-2W	15542-1	N.C.R	N.C.R
12	Power Divider	AISI	IOWOPE2068	PE2068	N.C.R	N.C.R
13	Filter	MICRO-TRONICS	BRM50701	5	N.C.R	N.C.R
14	Conducted test cable	/	RF01-RF04	/	04/21/2020	04/22/2021
15	Temp. / Humidity Chamber	TERCHY	MHK-120AK	X30109	04/21/2020	04/20/2021
RF Radiated Test						
1	Spectrum Analyzer	R&S	FSV40	101493	01/08/2020	01/07/2021
2	Signal Generator	Agilent	E8257C	MY43321570	10/24/2019	10/23/2020
3	Loop Antenna	Schwarzbeck	HXYZ9170	9170-108	02/24/2020	02/23/2021
4	Bilog Antenna	TESEQ	CBL 6112D	35403	06/22/2019	06/21/2021
5	Bilog Antenna	SCHWARZBECK	VULB9160	9160-3342	04/29/2019	04/28/2021
6	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	267	11/04/2018	11/03/2020
7	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	00143290	02/25/2019	02/24/2021
8	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	BBHA9170171	02/27/2018	02/26/2021
9	Pre-Amplifier(30MHz~18GHz)	CCSRF	AMP1277	1	12/19/2019	12/18/2020
10	Pre-Amplifier(0.1~26.5GHz)	EMCI	EMC012645	980060	04/21/2020	04/20/2021
11	Low Pass Filter	MICRO-TRONICS	VLFX-950	RV142900829	N.C.R	N.C.R
12	High Pass Filter	Mini-Circuits	VHF-1200	15542	N.C.R	N.C.R
13	Filter (5450MHz～5770 MHz）	MICRO-TRONICS	BRC50704-01	2	N.C.R	N.C.R
14	Filter (5690 MHz～5930 MHz）	MICRO-TRONICS	BRC50705-01	4	N.C.R	N.C.R
15	Filter (5150 MHz～5350 MHz）	MICRO-TRONICS	BRC50703-01	2	N.C.R	N.C.R
16	Filter (885 MHz～915 MHz）	MICRO-TRONICS	BRM14698	1	N.C.R	N.C.R
17	Filter (815 MHz～860 MHz）	MICRO-TRONICS	BRM14697	1	N.C.R	N.C.R
18	Filter (1745 MHz～1910 MHz)	MICRO-TRONICS	BRM14700	1	N.C.R	N.C.R
19	Filter (1922 MHz～1977 MHz)	MICRO-TRONICS	BRM50715	1	N.C.R	N.C.R
20	Filter (2550 MHz)	MICRO-TRONICS	HPM13362	5	N.C.R	N.C.R
21	Filter (1532 MHz～1845 MHz)	MICRO-TRONICS	BRM50713	1	N.C.R	N.C.R
22	Filter (2.4GHz)	MICRO-TRONICS	BRM50701	5	N.C.R	N.C.R
23	RE test cable	/	RE01-RE04	/	04/21/2020	04/22/2021

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 1 and antenna 2 is PIFA Antenna, and all on the main PCB and no consideration of replacement. The best case gain of the antenna 1 and antenna 2 is 3.15dBi.

Antenna location: Refer to Appendix (Internal Photos)

6.2 Transmission in the Absence of Data

6.2.1 Test Requirement:

47 CFR Part 15, Subpart C 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:

WIFI chip (RTL8812FR) support automatically discontinue transmission in case of either absence of information to transmit or operational failure, if the chip detect absence of information to transmit or operational failure, it will be automatically shut off.

7 Radio Spectrum Matter Test Results

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

Test Requirement	47 CFR Part 15, Subpart C 15.207 & 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.		

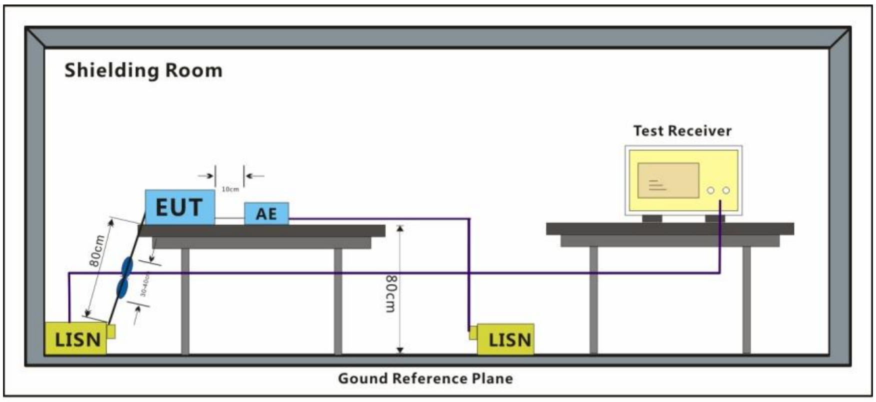
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

The final test mode:	c:TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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.

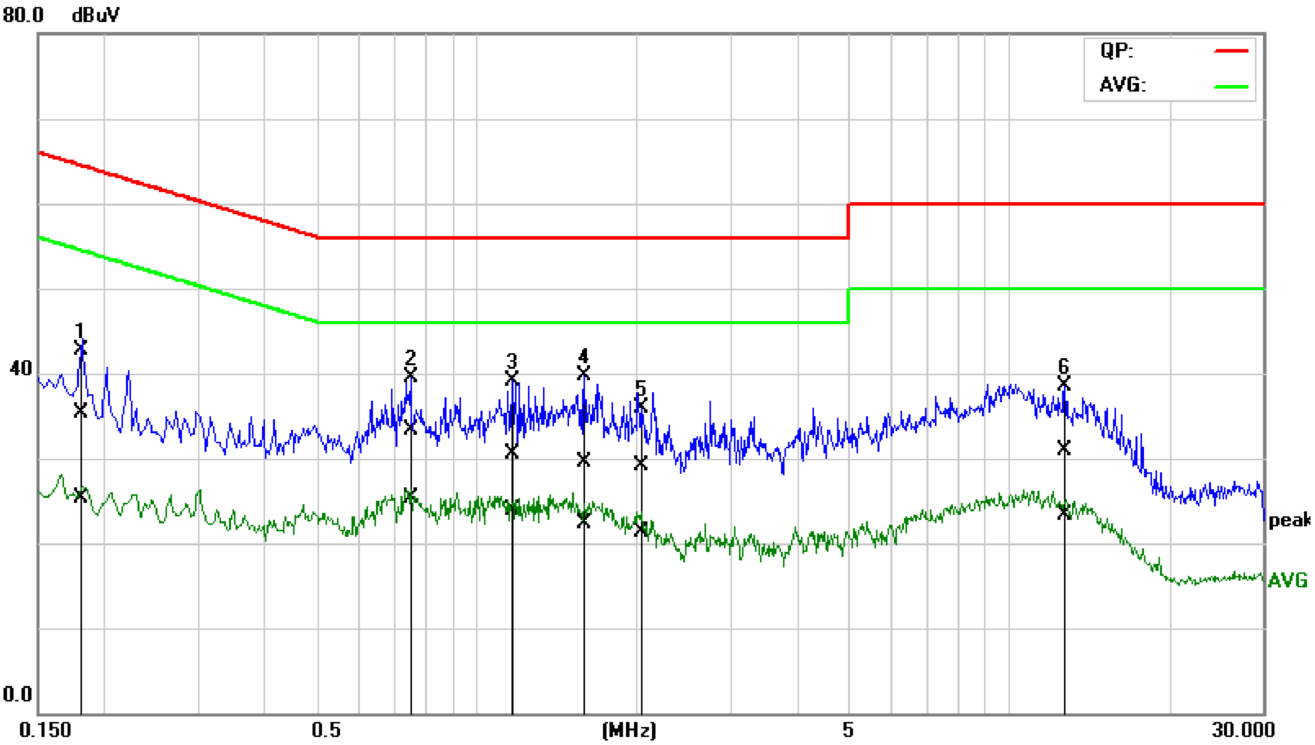
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark:

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

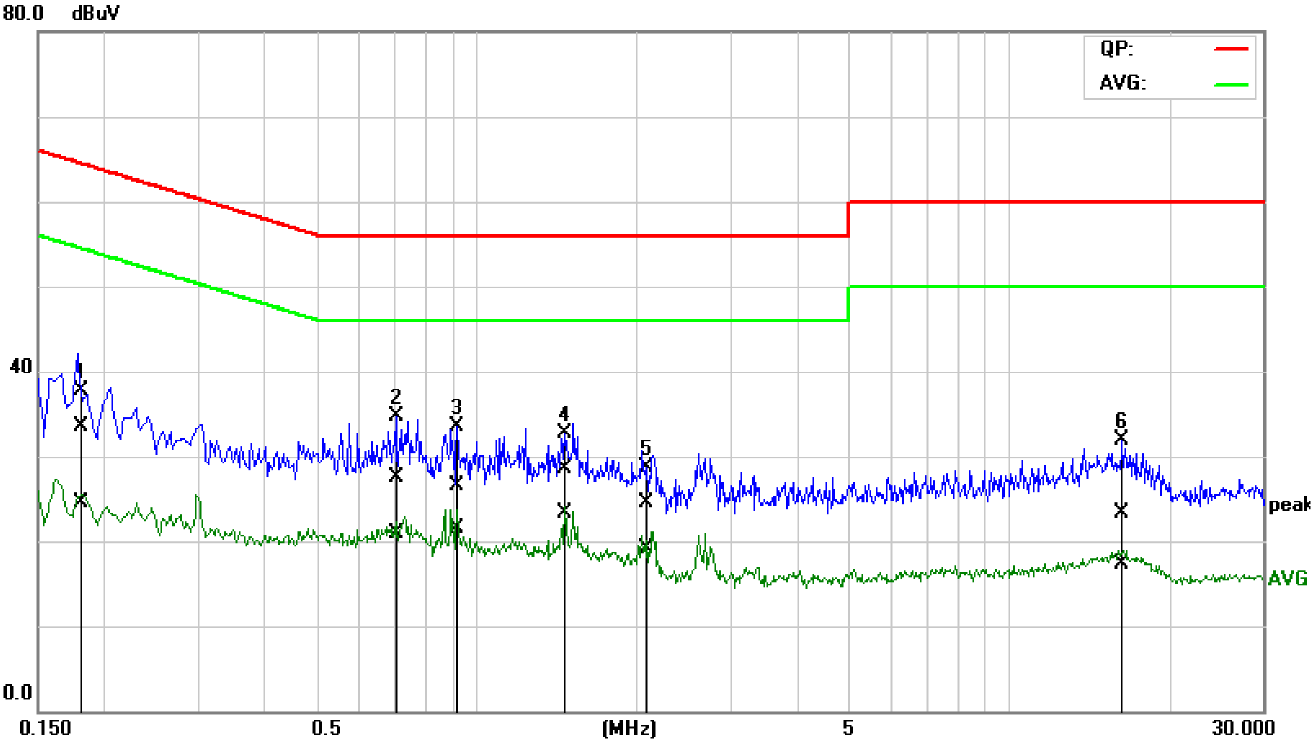
2.This test item was investigated while operating in each channel mode, however, it was determined that channel 36 operation for a modulation produced the worst conducted emissions. So the conducted emissions produced from other operation are not report.

Mode c:Line:Live Line



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1783	15.94	5.87	19.44	35.38	25.31	64.56	54.56	-29.18	-29.25	Pass
2*	0.7415	13.76	5.76	19.49	33.25	25.25	56.00	46.00	-22.75	-20.75	Pass
3	1.1594	10.84	4.34	19.59	30.43	23.93	56.00	46.00	-25.57	-22.07	Pass
4	1.6061	9.84	2.68	19.63	29.47	22.31	56.00	46.00	-26.53	-23.69	Pass
5	2.0478	9.40	1.72	19.67	29.07	21.39	56.00	46.00	-26.93	-24.61	Pass
6	12.8065	10.76	3.21	20.06	30.82	23.27	60.00	50.00	-29.18	-26.73	Pass

Mode c:Line:Neutral Line



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1815	14.20	5.01	19.40	33.60	24.41	64.42	54.42	-30.82	-30.01	Pass
2	0.6961	7.99	1.50	19.46	27.45	20.96	56.00	46.00	-28.55	-25.04	Pass
3	0.9256	6.93	2.02	19.54	26.47	21.56	56.00	46.00	-29.53	-24.44	Pass
4*	1.4700	8.85	3.67	19.60	28.45	23.27	56.00	46.00	-27.55	-22.73	Pass
5	2.0977	4.83	-0.46	19.64	24.47	19.18	56.00	46.00	-31.53	-26.82	Pass
6	16.3319	3.10	-2.84	20.15	23.25	17.31	60.00	50.00	-36.75	-32.69	Pass

7.2 99% Bandwidth

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

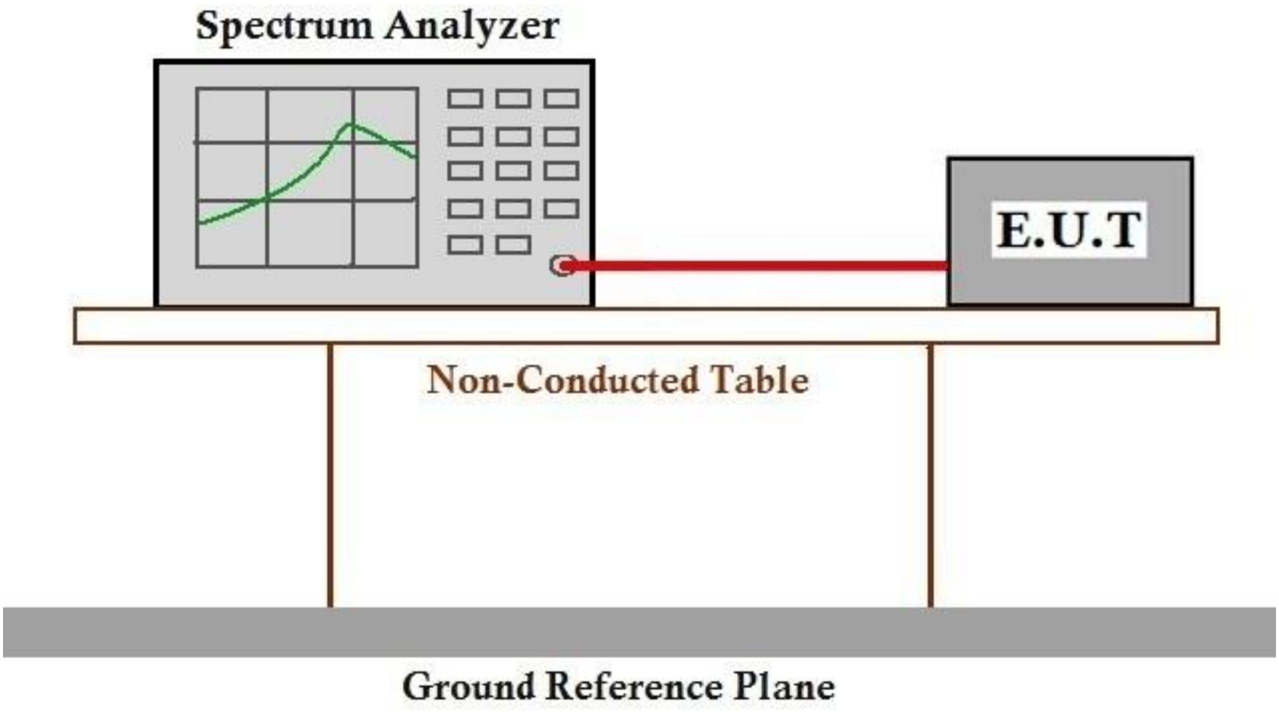
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

The final test mode:	c:TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report. d:TX mode (Band 4)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix C for SHEM200700634503

7.3 26dB Emission bandwidth

Test Requirement	47 CFR Part 15, Subpart C 15.407 (a)
Test Method:	KDB 789033 D02 II C 1

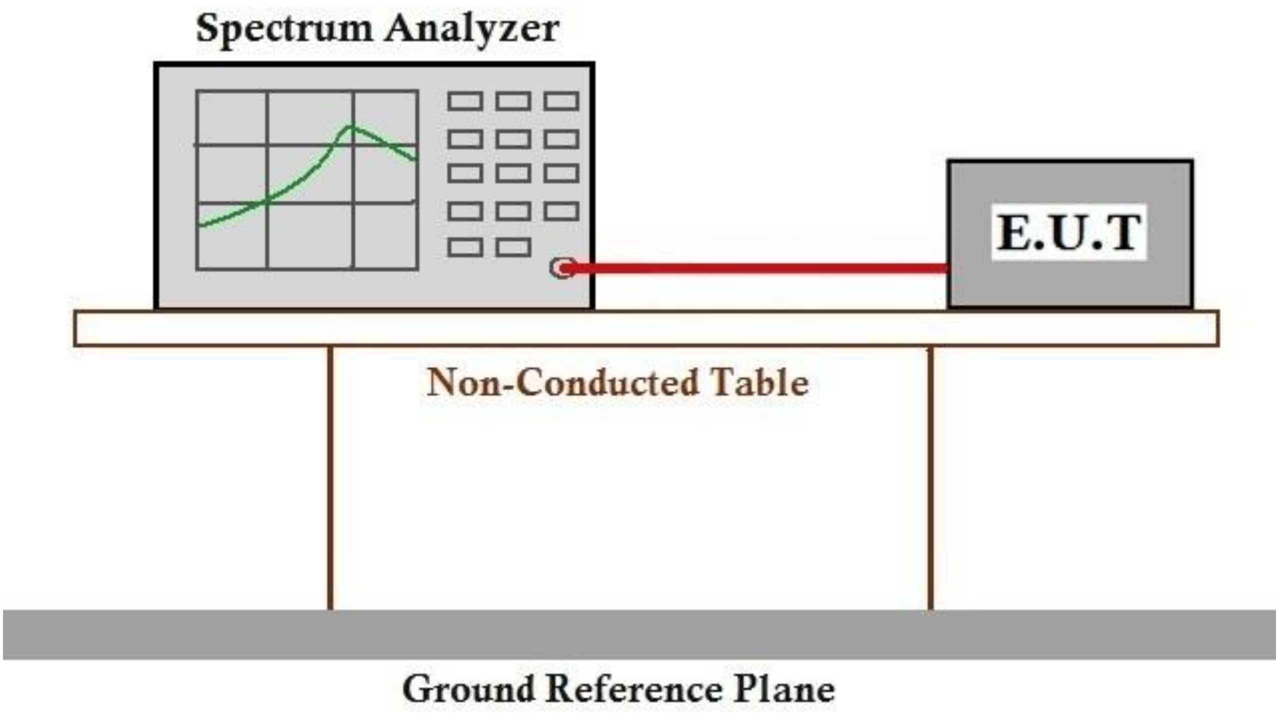
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

The final test mode: c:TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix C for SHEM200700634503

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

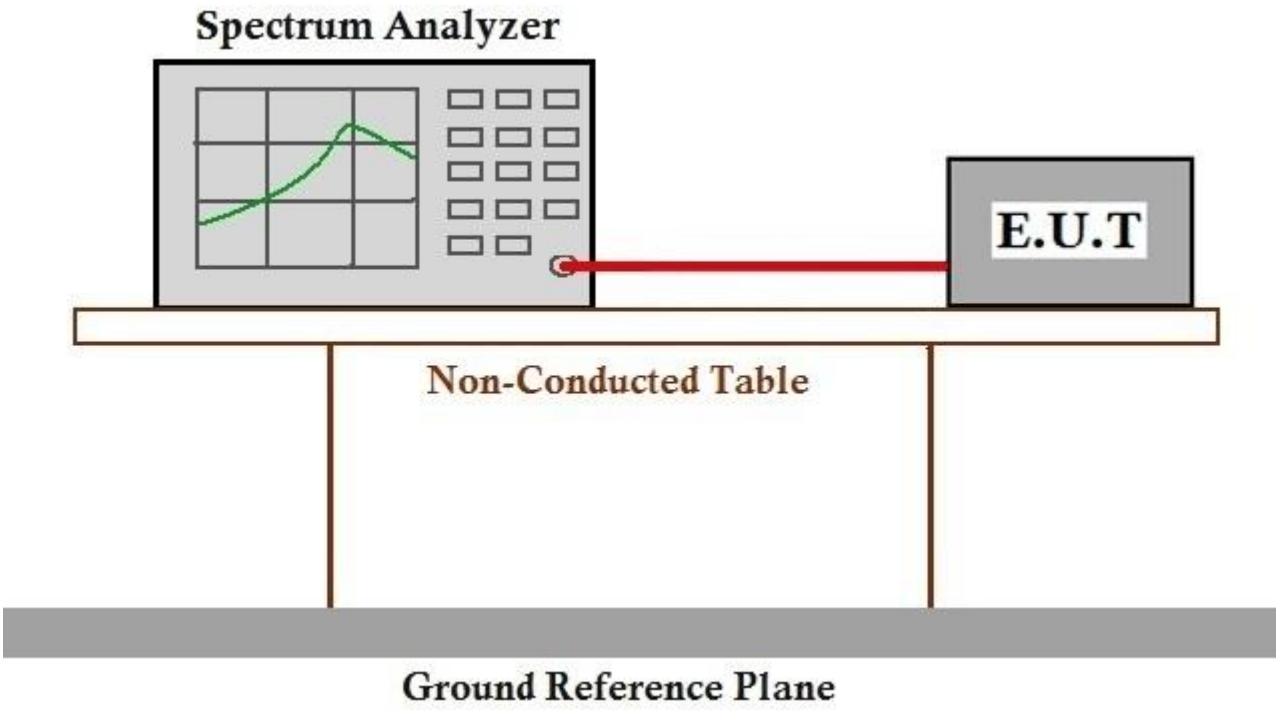
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode: d:TX mode (Band 4)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix C for SHEM200700634503

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. For IC 5150MHz to 5250MHz limit is EIRP≤200mW(23dBm) For IC 5725MHz to 5850MHz limit is POWER≤1W(30dBm) For MIMO function, two antennas are correlated, the Directional gain is 6.16dBi, the EIRP shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. So the limit is: For FCC 5150MHz to 5250MHz limit is 23.84dBm For FCC 5725MHz to 5850MHz limit is 29.84dBm For IC 5150MHz to 5250MHz limit is EIRP≤23dBm For IC 5725MHz to 5850MHz limit is POWER≤29.84dBm

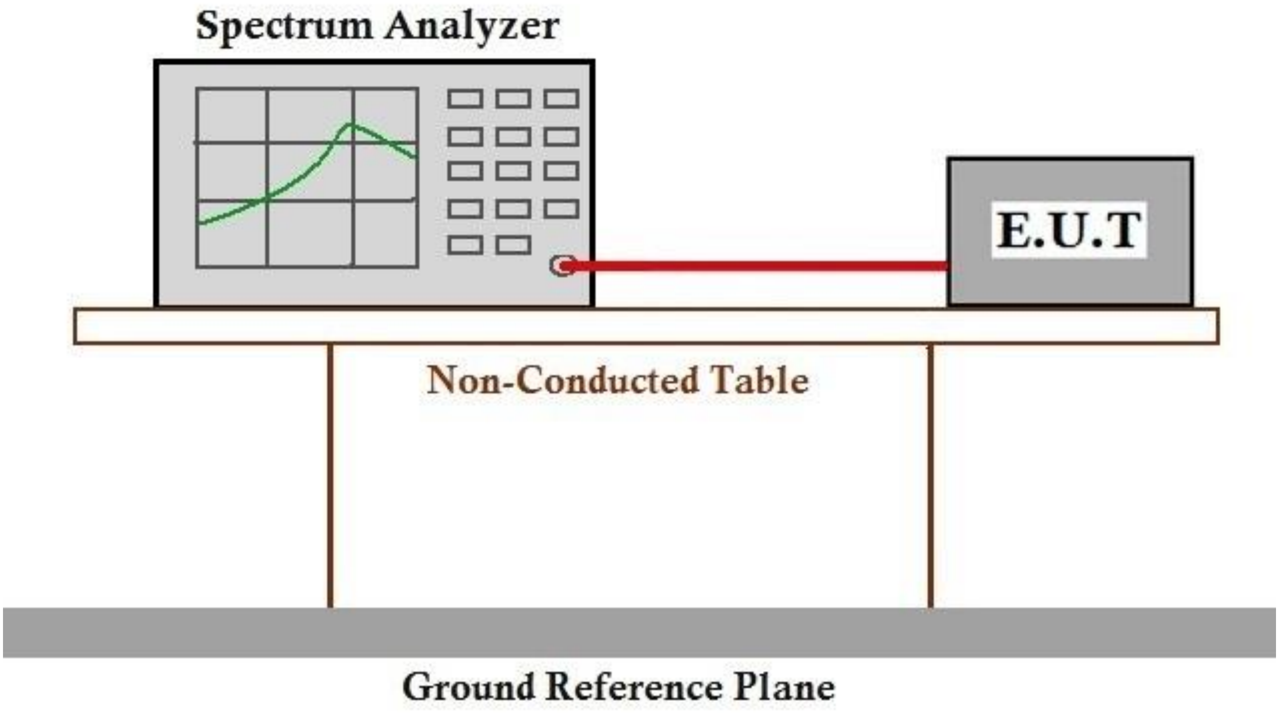
7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

The final test mode:	c:TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
	d:TX mode (Band 4)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.5.2 Test Setup Diagram



7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix C for SHEM200700634503

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. For IC 5150MHz to 5250MHz limit is EIRP PSD≤10dBm/MHz For IC 5725MHz to 5850MHz limit is PSD≤30dBm/500KHz For MIMO function, two antennas are correlated, the Directional gain is 6.16dBi, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. So the limit is: For FCC 5150MHz to 5250MHz limit is PSD≤10.84dBm/MHz For FCC 5725MHz to 5850MHz limit is PSD≤29.84dBm/500KHz For IC 5150MHz to 5250MHz limit is EIRP PSD≤10dBm/MHz For IC 5725MHz to 5850MHz limit is PSD≤29.84dBm/500KHz

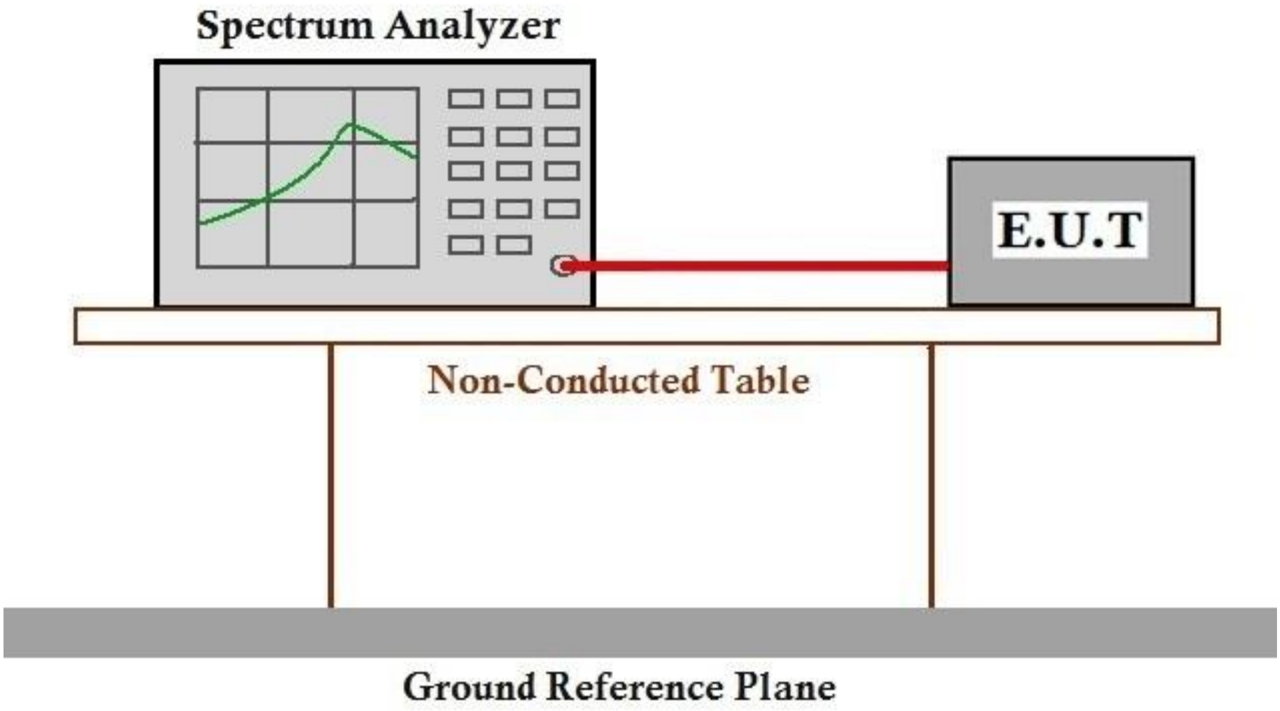
7.6.1 E.U.T. Operation

Operating Environment:

Temperature:	22 °C	Humidity:	50 % RH	Atmospheric Pressure:	1002	mbar

The final test mode:	c:TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
	d:TX mode (Band 4)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

Test Setup Diagram



7.6.2 Measurement Procedure and Data

The detailed test data see: Appendix C for SHEM200700634503

7.7 Radiated Emissions

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

Limit:

For transmitters operating in the 5.15-5.25 GHz band:	All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz (68.2dBuV/m).
For transmitters operating in the 5.25-5.35 GHz band:	All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz (68.2dBuV/m).
For transmitters operating in the 5.47-5.725 GHz band:	All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz (68.2dBuV/m).
For transmitters operating in the 5.725-5.85 GHz band:	(i) All emissions shall be limited to a level of −27 dBm/MHz (68.2dBuV/m) at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz (105.2dBuV/m) at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz (110.8dBuV/m) at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz (122.2dBuV/m) at the band edge.

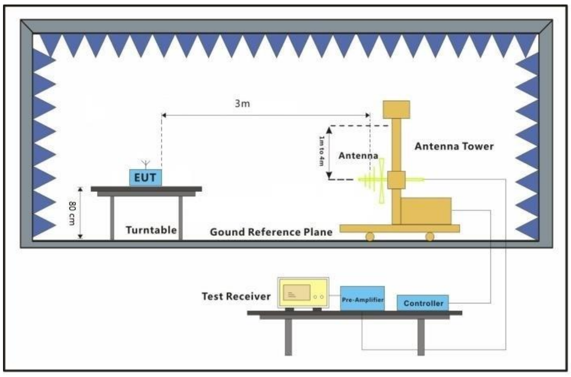
7.7.1 E.U.T. Operation

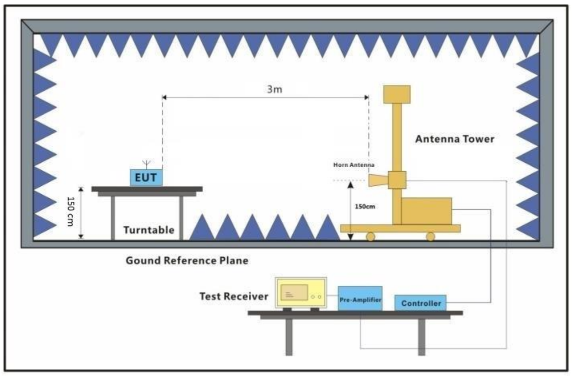
Operating Environment:

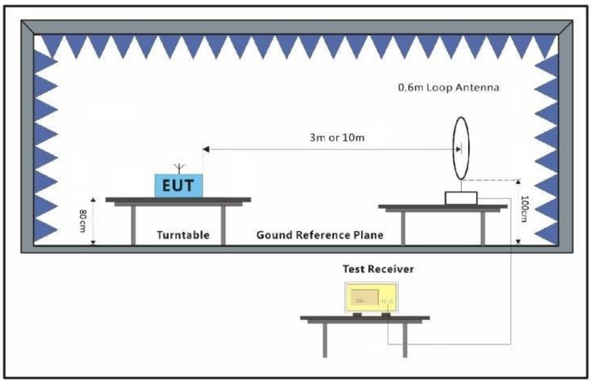
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

The final test mode:	c:TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report. d:TX mode (Band 4)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.7.2 Test Setup Diagram


3m
1m to 4m
Antenna
Antenna Tower
EUT
80 cm
Turntable
Gound Reference Plane
Test Receiver
Pre-Amplifier
Controller


3m
Antenna Tower
Horn Antenna
EUT
150 cm
150cm
Turntable
Gound Reference Plane
Test Receiver
Pre-Amplifier
Controller


0.6m Loop Antenna
3m or 10m
EUT
80 cm
100cm
Turntable
Gound Reference Plane
Test Receiver

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:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

2. For emission below 1GHz, through the pre-scan found the worst case is the lowest channel of 802.11a. Only the worst case is recorded in the report.

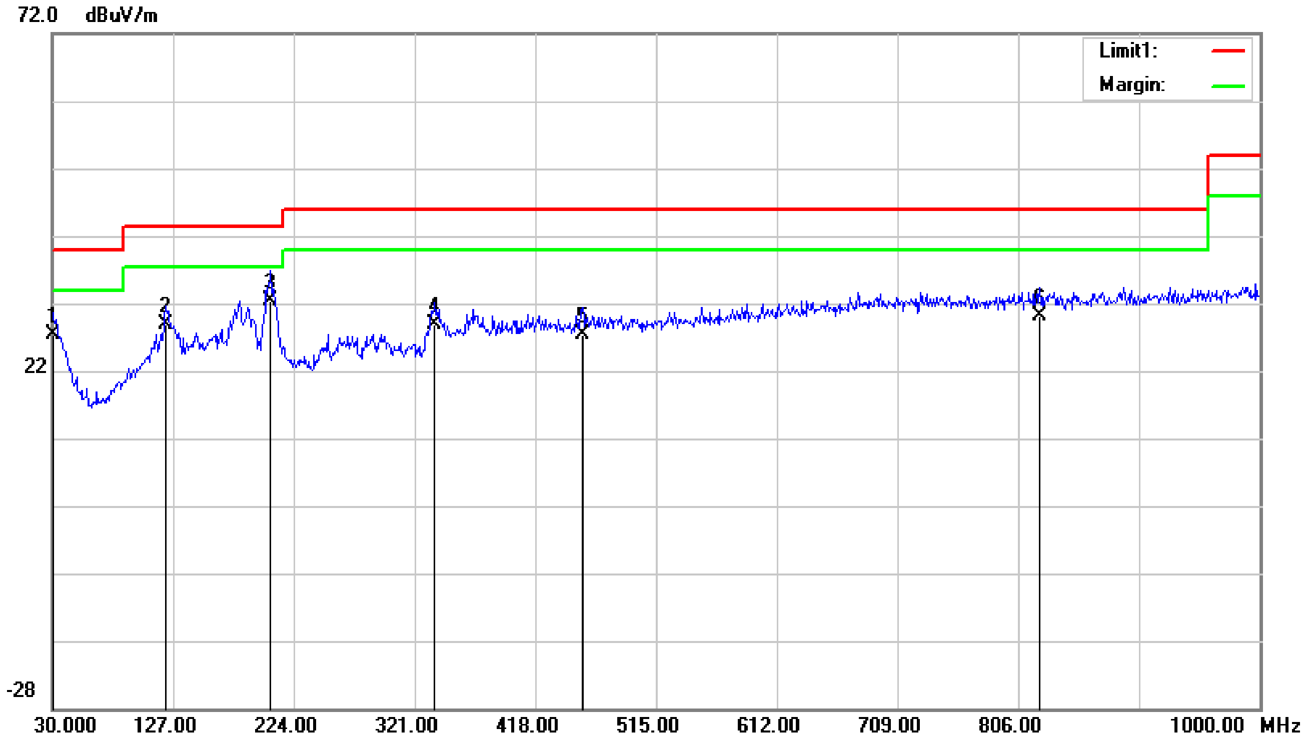
3. Scan from 9kHz to 40GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB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

4. 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.

5. This test item was investigated while operating in SISO and MIMO mode, however, it was determined that SISO antenna 1 operation for a modulation and MIMO antenna operation for n/ac modulation produced the worst emissions. So the emissions produced from other operation are not recorded in report.

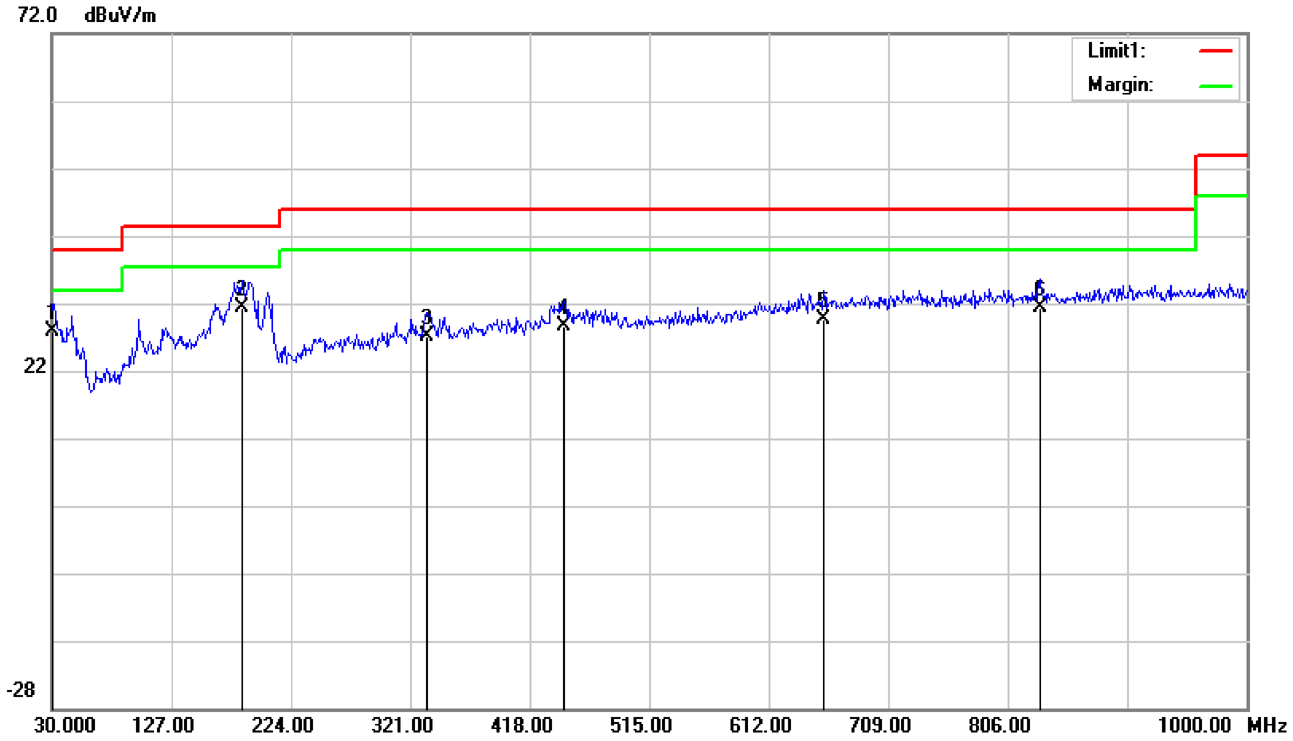
Below 1GHz:

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	30.0000	1.40	26.08	27.48	40.00	-12.52	200	360	QP
2	121.1800	9.66	19.30	28.96	43.50	-14.54	200	360	QP
3	205.5700	15.56	16.70	32.26	43.50	-11.24	300	360	QP
4	337.4900	6.63	22.25	28.88	46.00	-17.12	100	352	QP
5	455.8300	2.87	24.59	27.46	46.00	-18.54	100	93	QP
6	823.4600	1.78	28.33	30.11	46.00	-15.89	100	112	QP

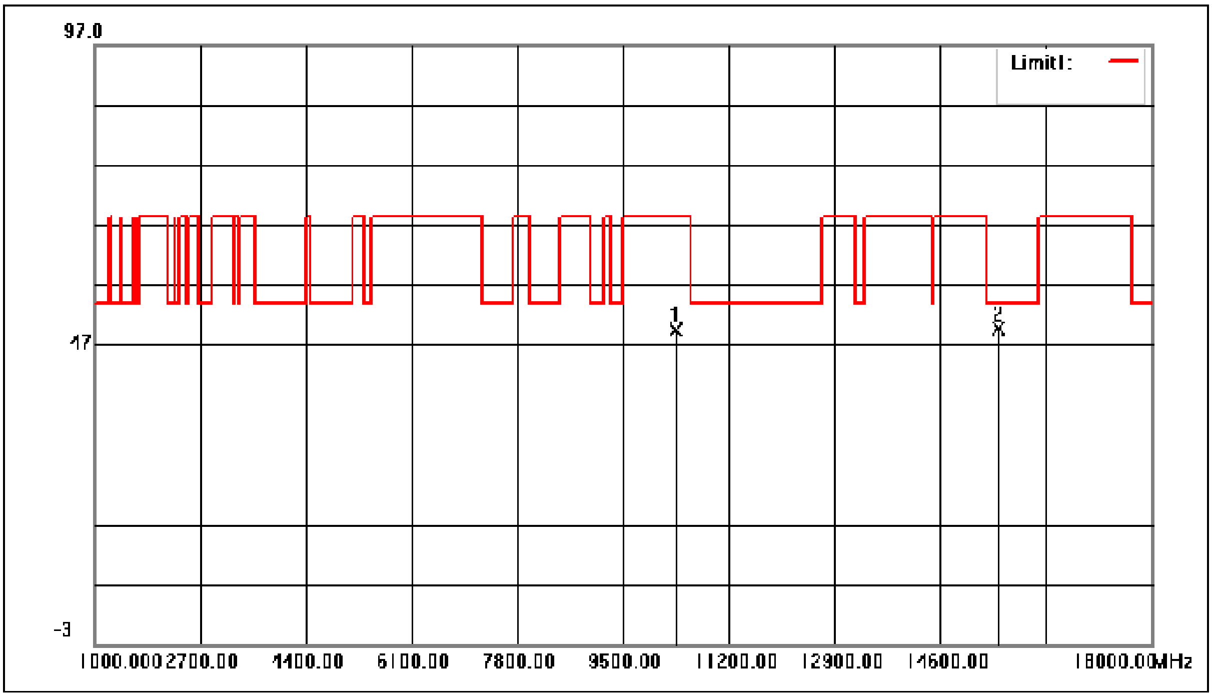
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	30.9700	2.28	25.50	27.78	40.00	-12.22	227	0	QP
2	184.2300	13.79	17.57	31.36	43.50	-12.14	100	219	QP
3	334.5800	5.02	22.13	27.15	46.00	-18.85	133	360	QP
4	446.1300	4.08	24.46	28.54	46.00	-17.46	300	360	QP
5	656.6200	2.48	27.21	29.69	46.00	-16.31	100	256	QP
6	832.1900	2.88	28.38	31.26	46.00	-14.74	100	337	QP

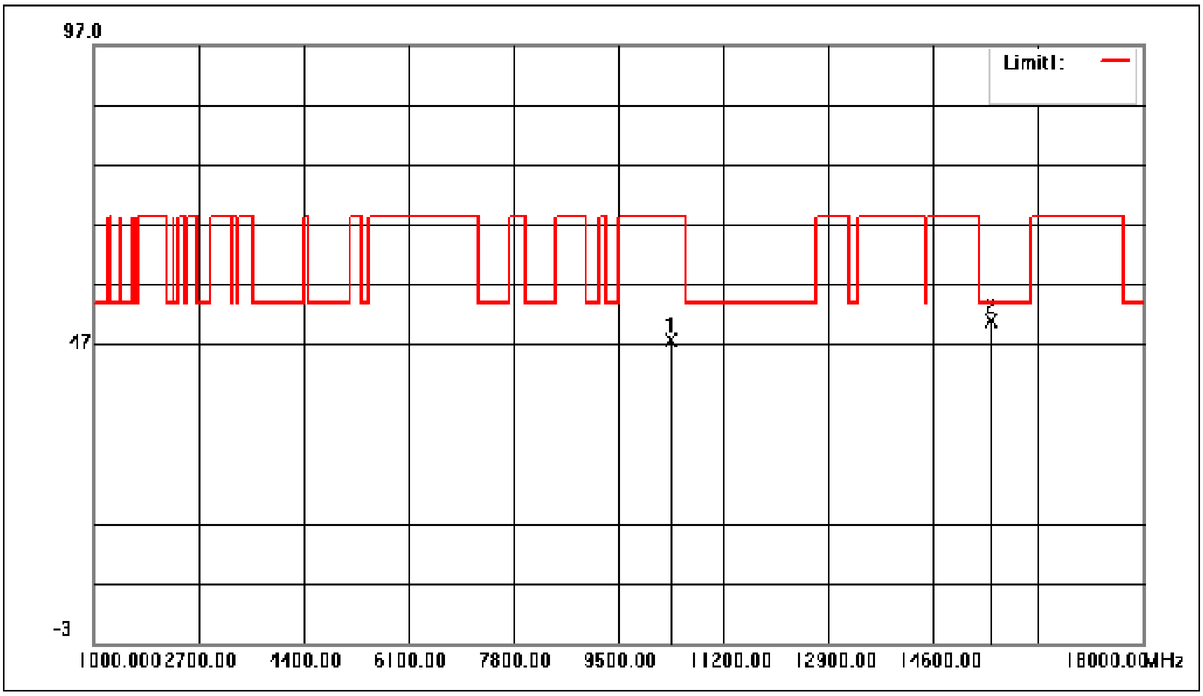
Above 1GHz:

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



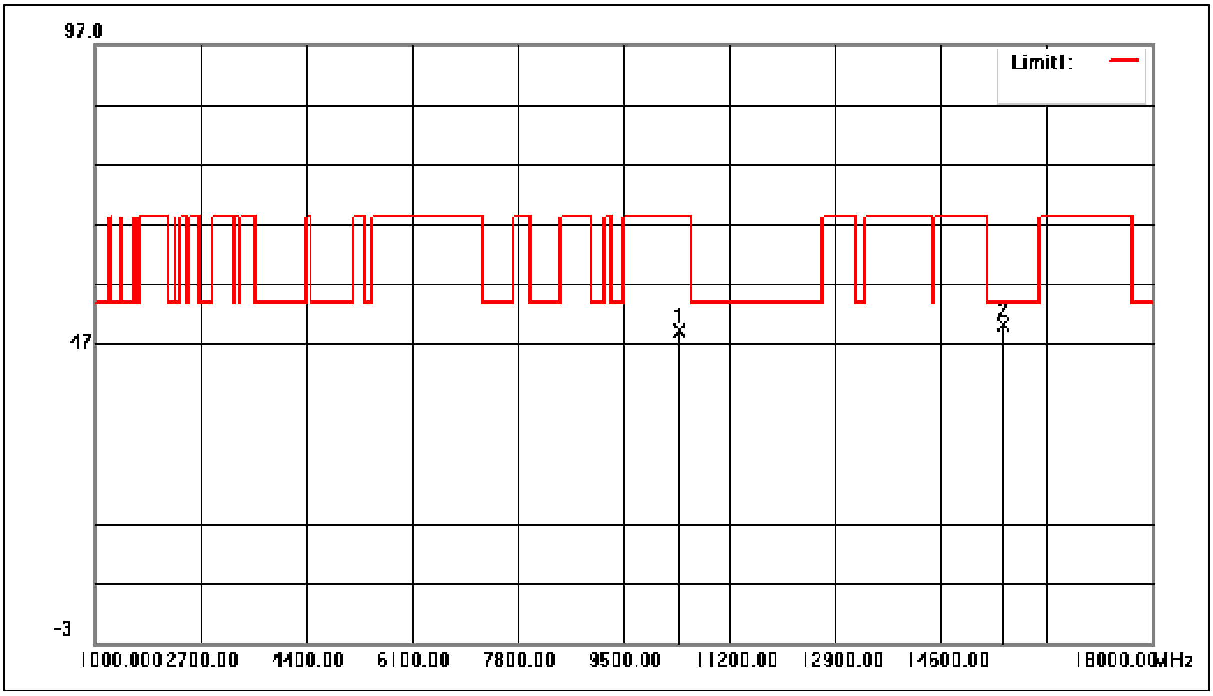
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10360.000	52.01	-2.59	49.42	68.30	-18.88	peak
2	15540.000	50.01	-0.30	49.71	54.00	-4.29	peak

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



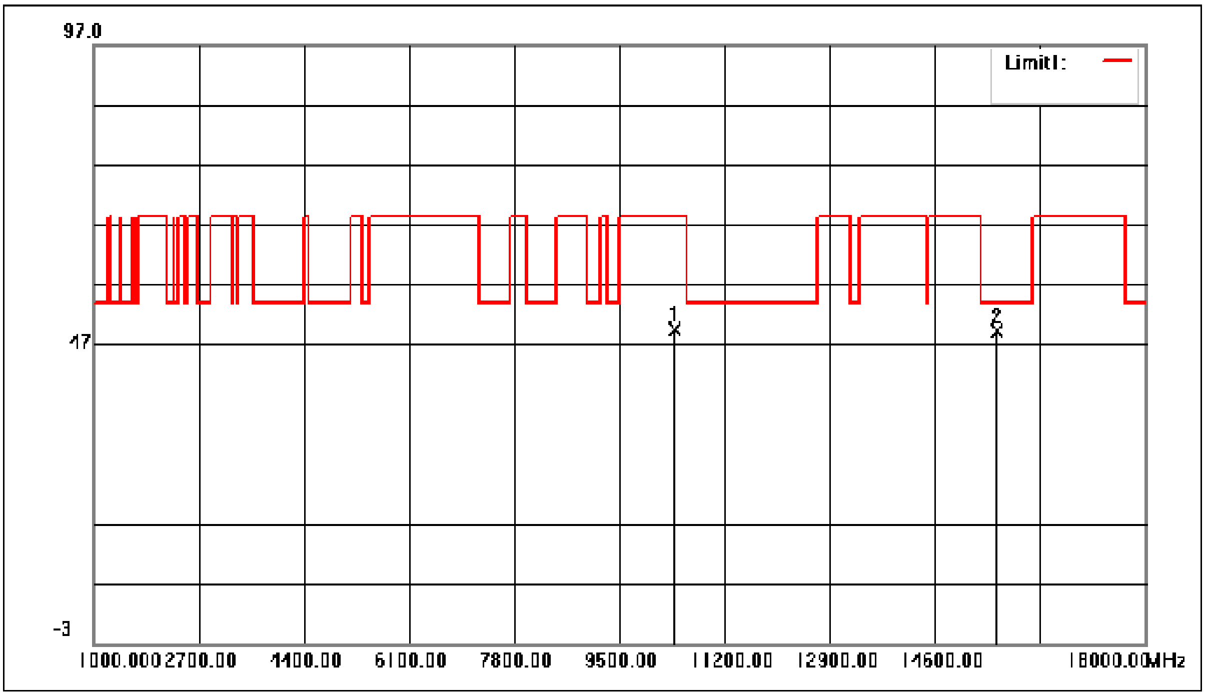
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10360.000	50.26	-2.59	47.67	68.30	-20.63	peak
2	15540.000	51.08	-0.30	50.78	54.00	-3.22	peak

Mode:c; Polarization:Horizontal; Modulation:a; bandwidth:20MHz; Channel:middle



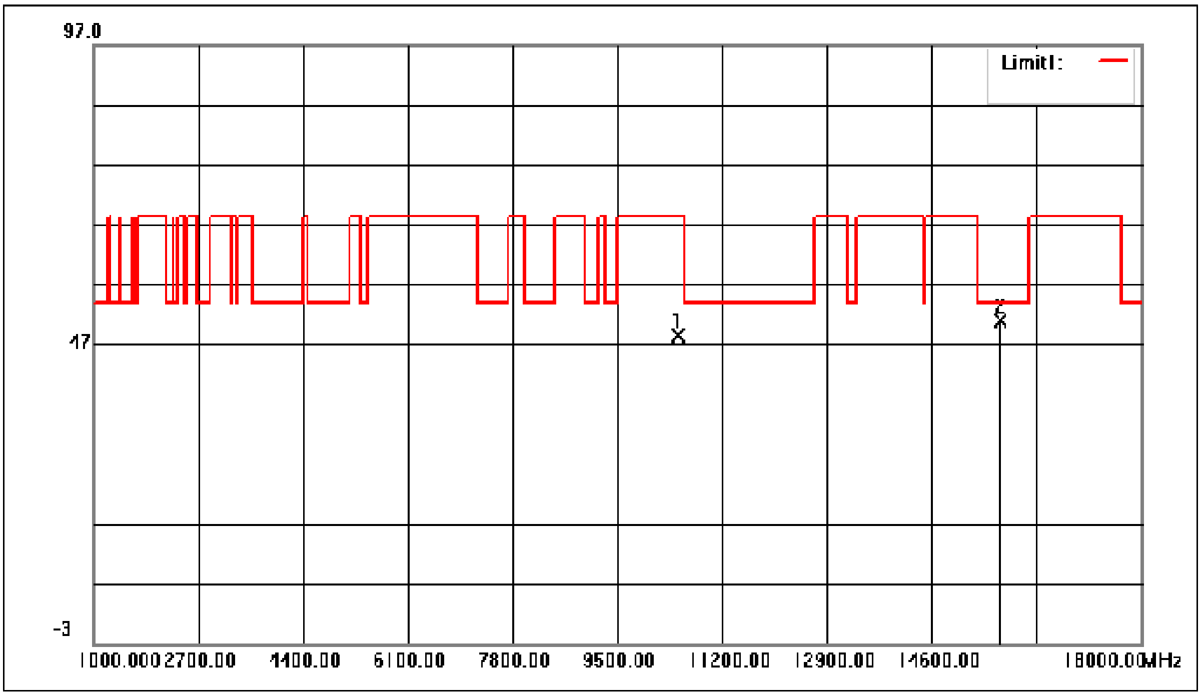
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10400.000	51.62	-2.53	49.09	68.30	-19.21	peak
2	15600.000	50.44	-0.35	50.09	54.00	-3.91	peak

Mode:c; Polarization:Vertical; Modulation:a; bandwidth:20MHz; Channel:middle



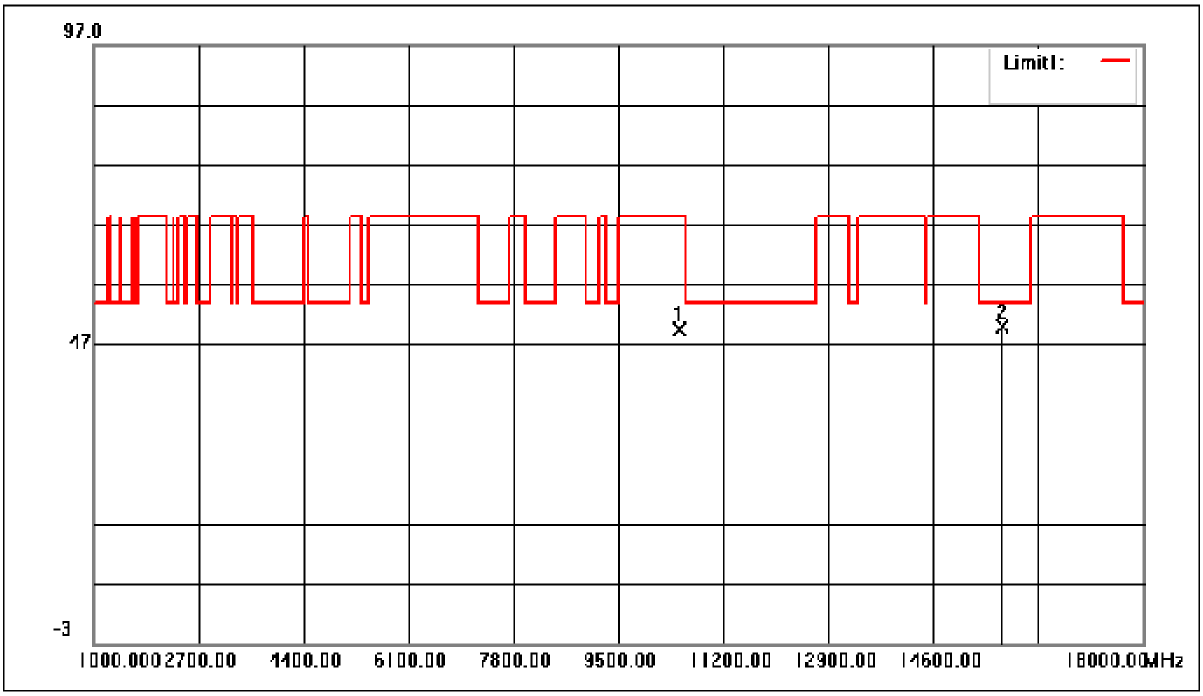
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10400.000	52.03	-2.53	49.50	68.30	-18.80	peak
2	15600.000	49.58	-0.35	49.23	54.00	-4.77	peak

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



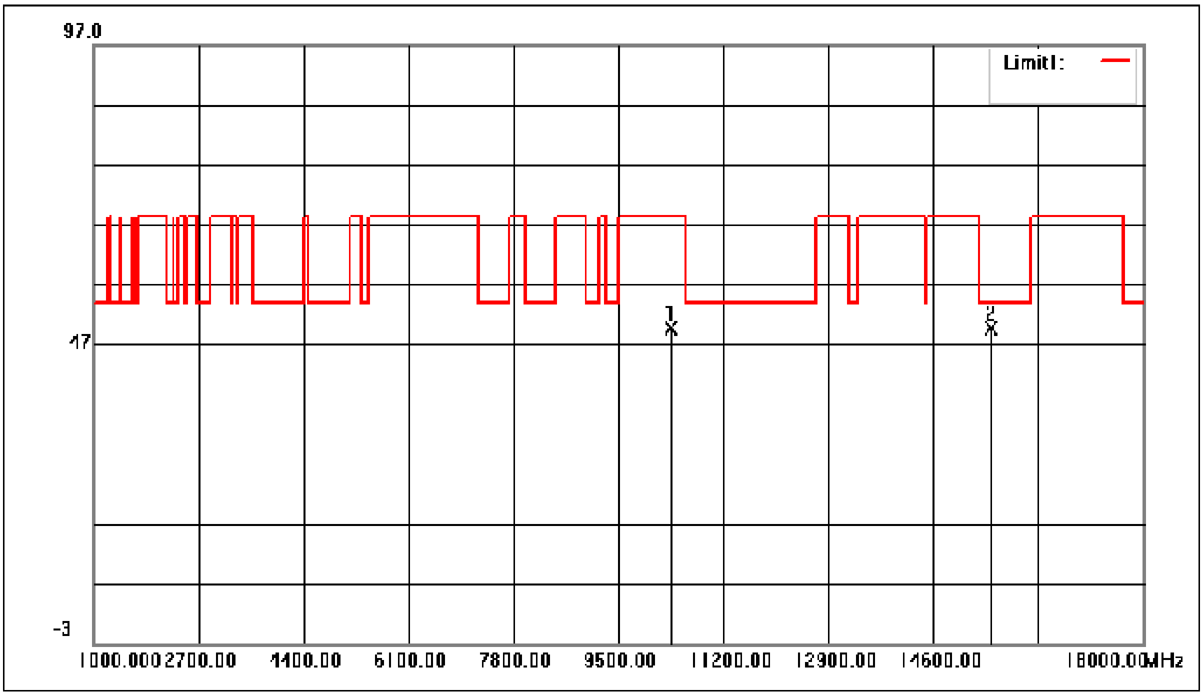
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10480.000	50.85	-2.41	48.44	68.30	-19.86	peak
2	15720.000	51.33	-0.44	50.89	54.00	-3.11	peak

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



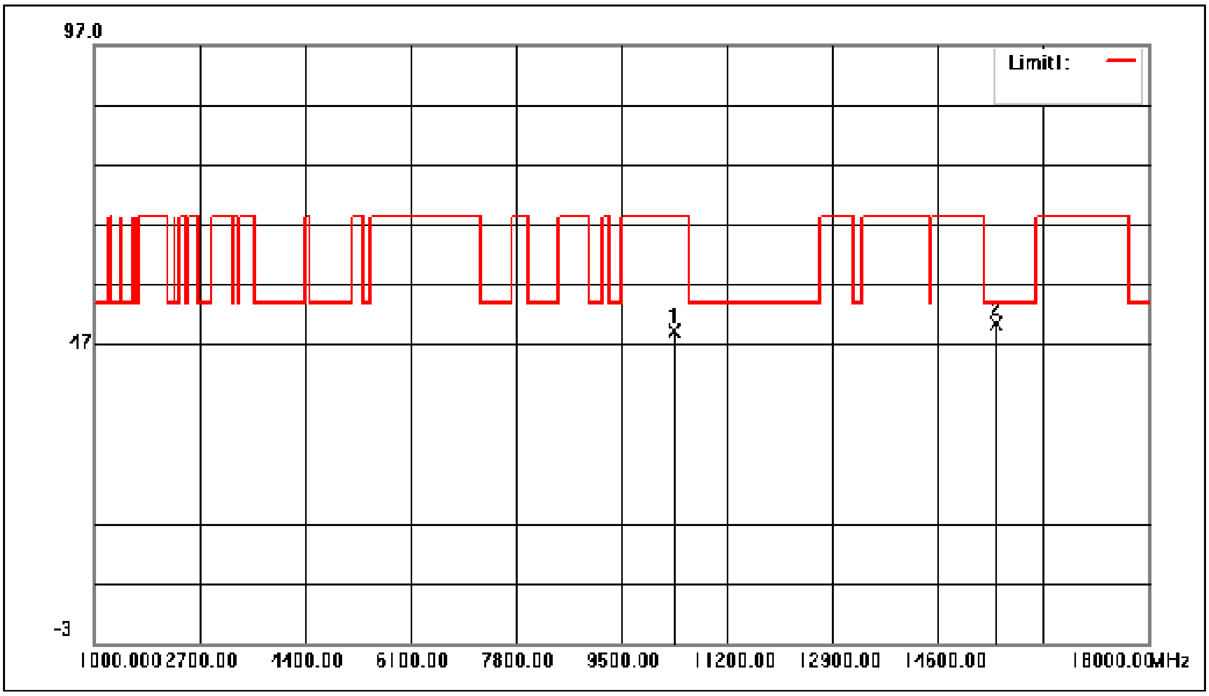
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10480.000	51.76	-2.41	49.35	68.30	-18.95	peak
2	15720.000	50.30	-0.44	49.86	54.00	-4.14	peak

Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



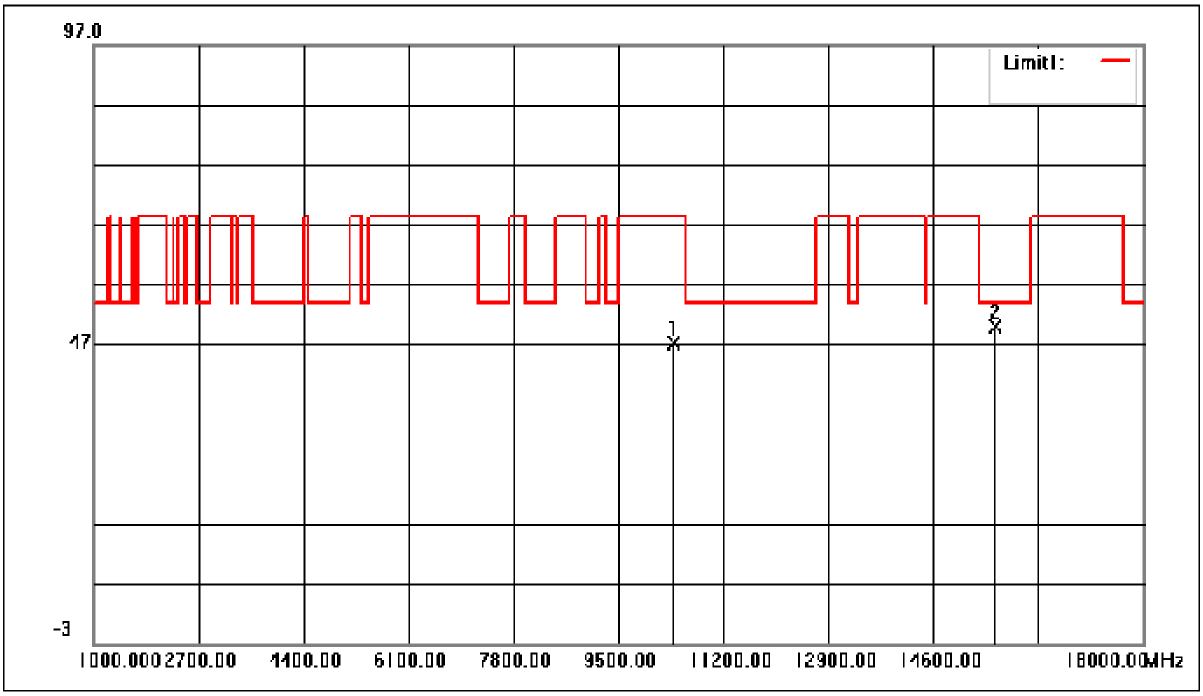
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10360.000	52.21	-2.59	49.62	68.30	-18.68	peak
2	15540.000	49.98	-0.30	49.68	54.00	-4.32	peak

Mode:c; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



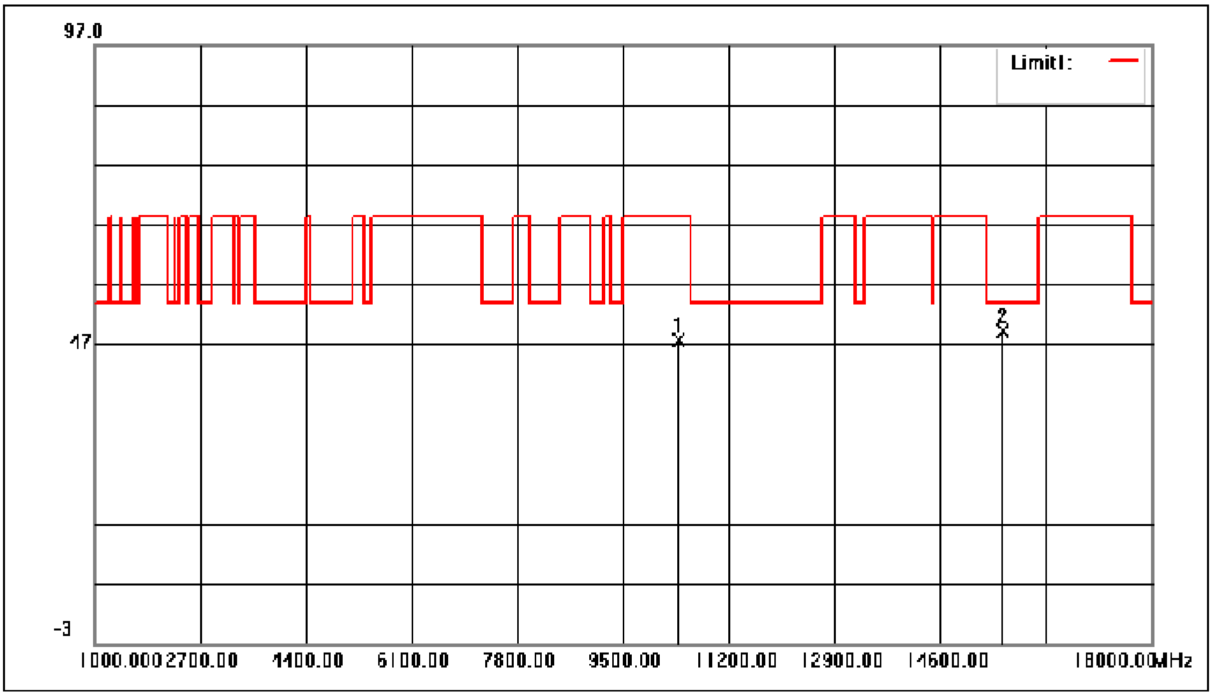
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10360.000	51.67	-2.59	49.08	68.30	-19.22	peak
2	15540.000	50.76	-0.30	50.46	54.00	-3.54	peak

Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:middle



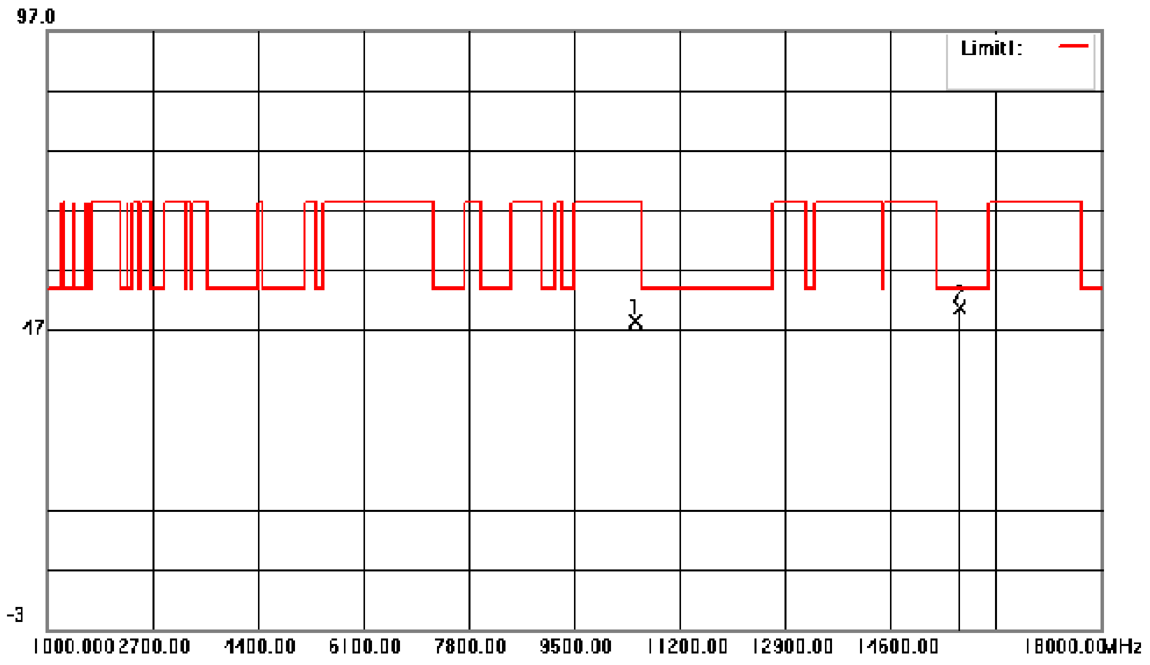
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10400.000	49.56	-2.53	47.03	68.30	-21.27	peak
2	15600.000	50.29	-0.35	49.94	54.00	-4.06	peak

Mode:c; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:middle



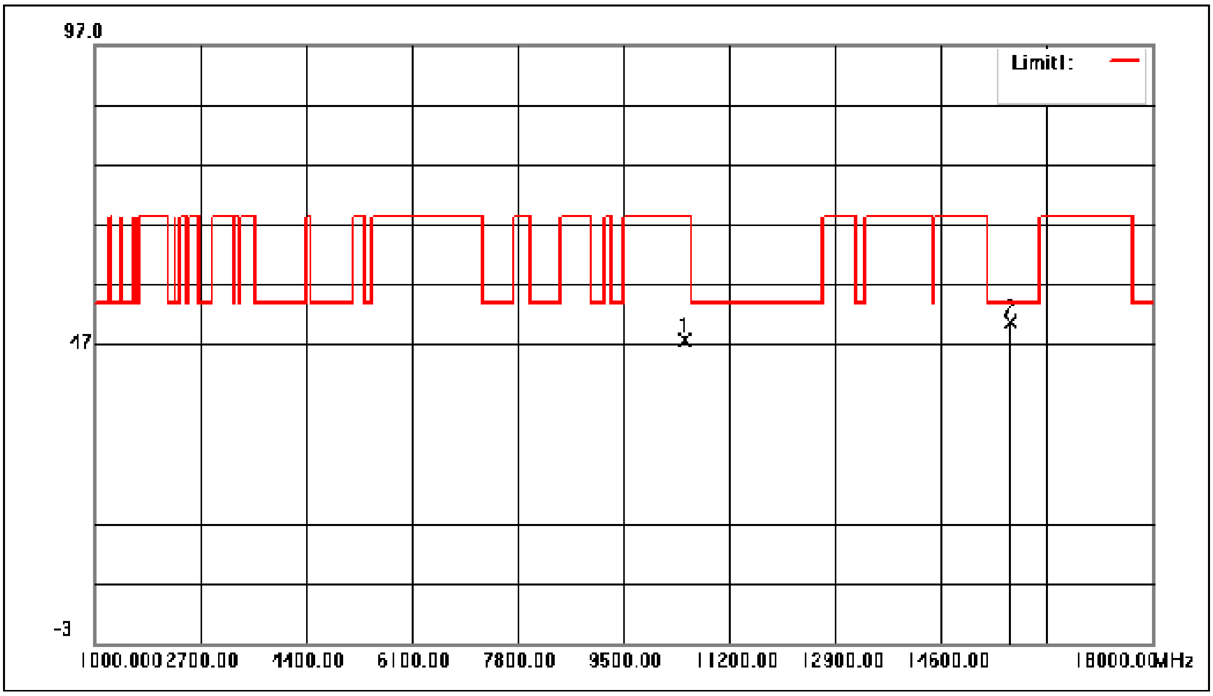
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10400.000	50.09	-2.53	47.56	68.30	-20.74	peak
2	15600.000	49.58	-0.35	49.23	54.00	-4.77	peak

Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



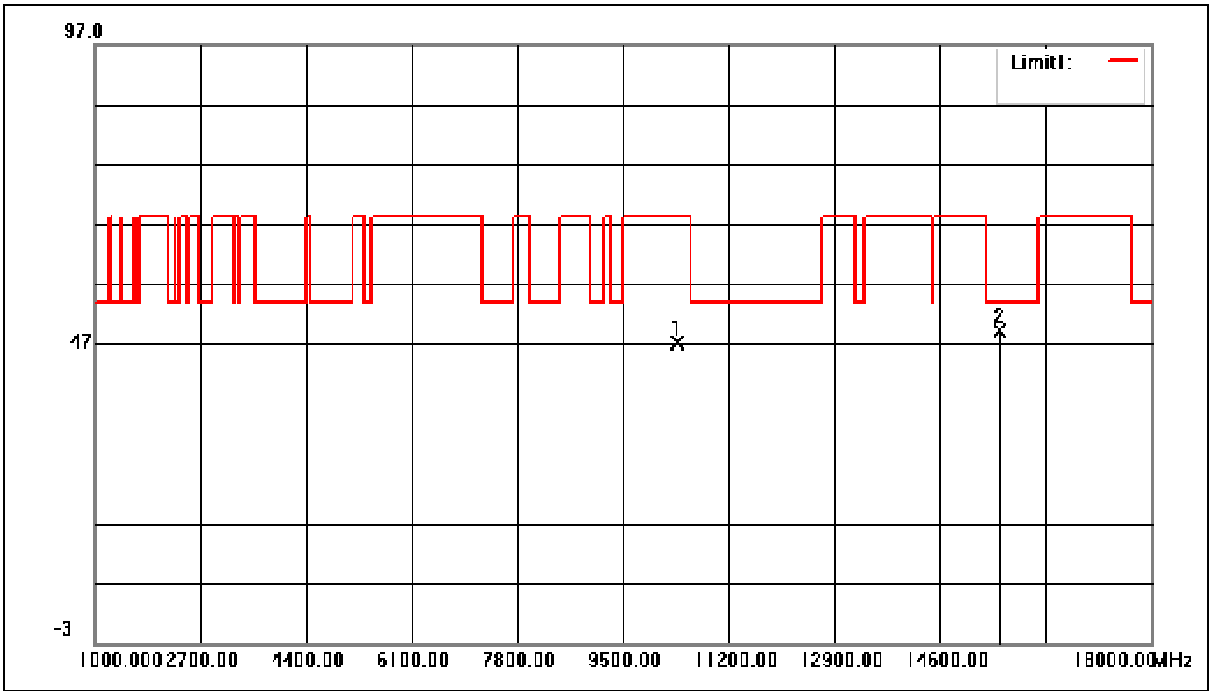
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10480.000	50.82	-2.41	48.41	68.30	-19.89	peak
2	15720.000	51.00	-0.44	50.56	54.00	-3.44	peak

Mode:c; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



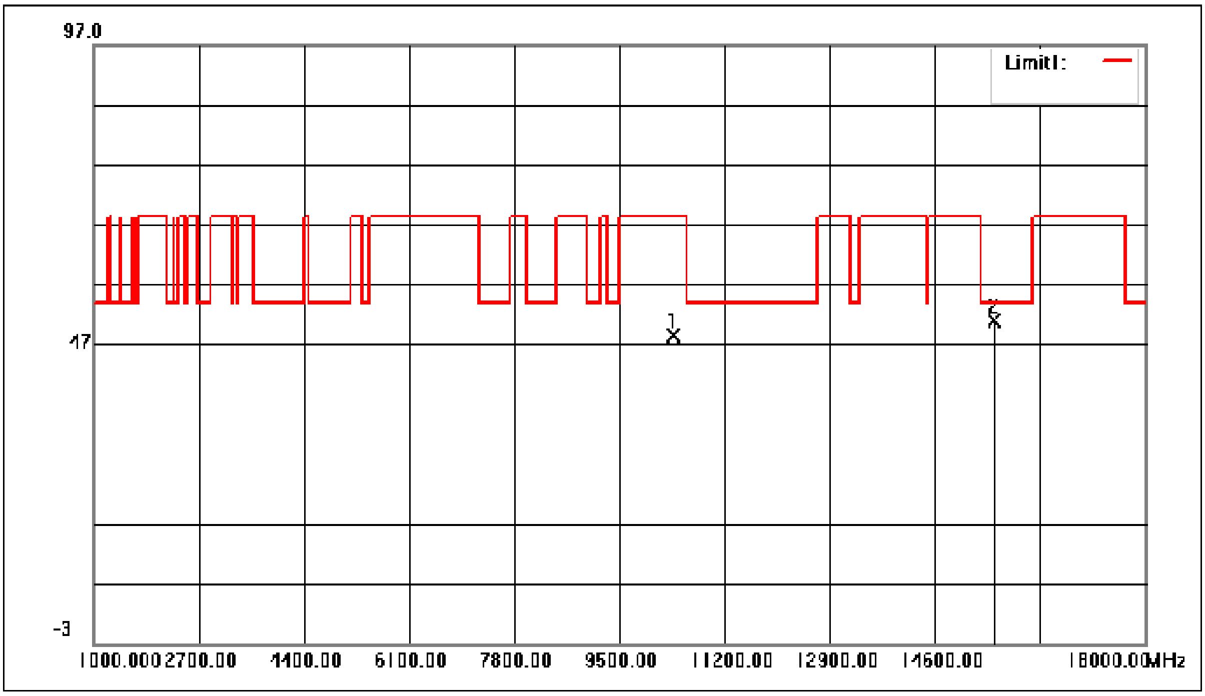
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10480.000	50.11	-2.41	47.70	68.30	-20.60	peak
2	15720.000	51.04	-0.44	50.60	54.00	-3.40	peak

Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:Low



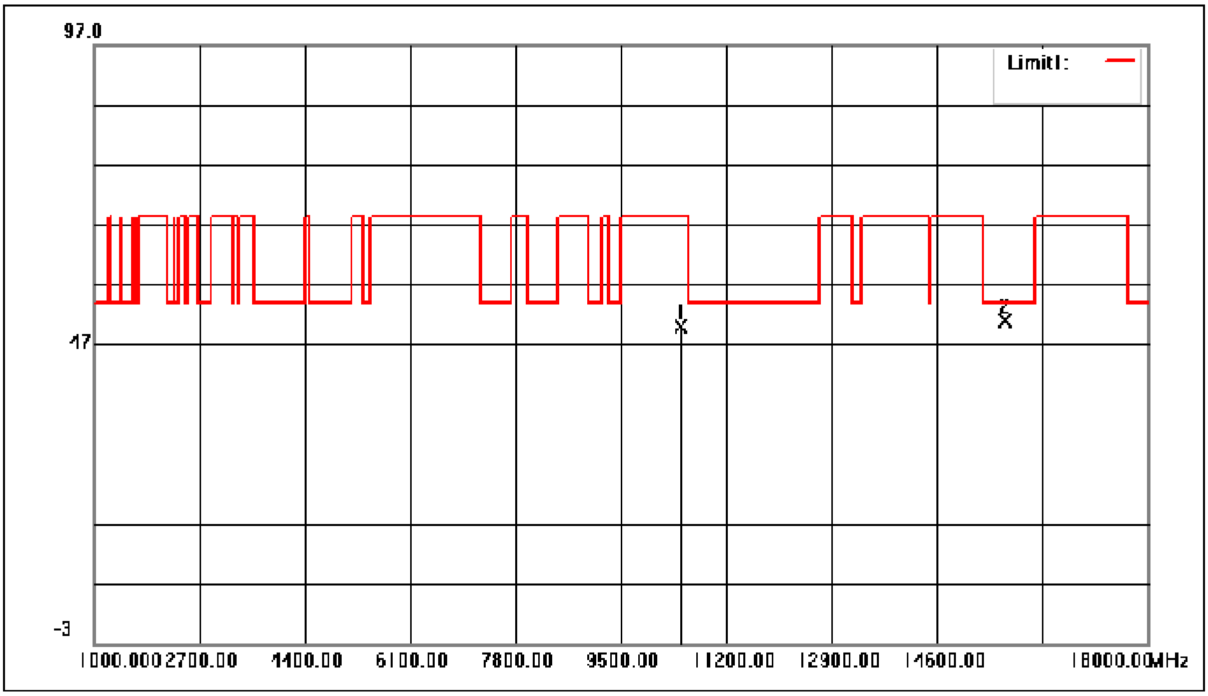
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10380.000	49.71	-2.56	47.15	68.30	-21.15	peak
2	15570.000	49.48	-0.32	49.16	54.00	-4.84	peak

Mode:c; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:Low



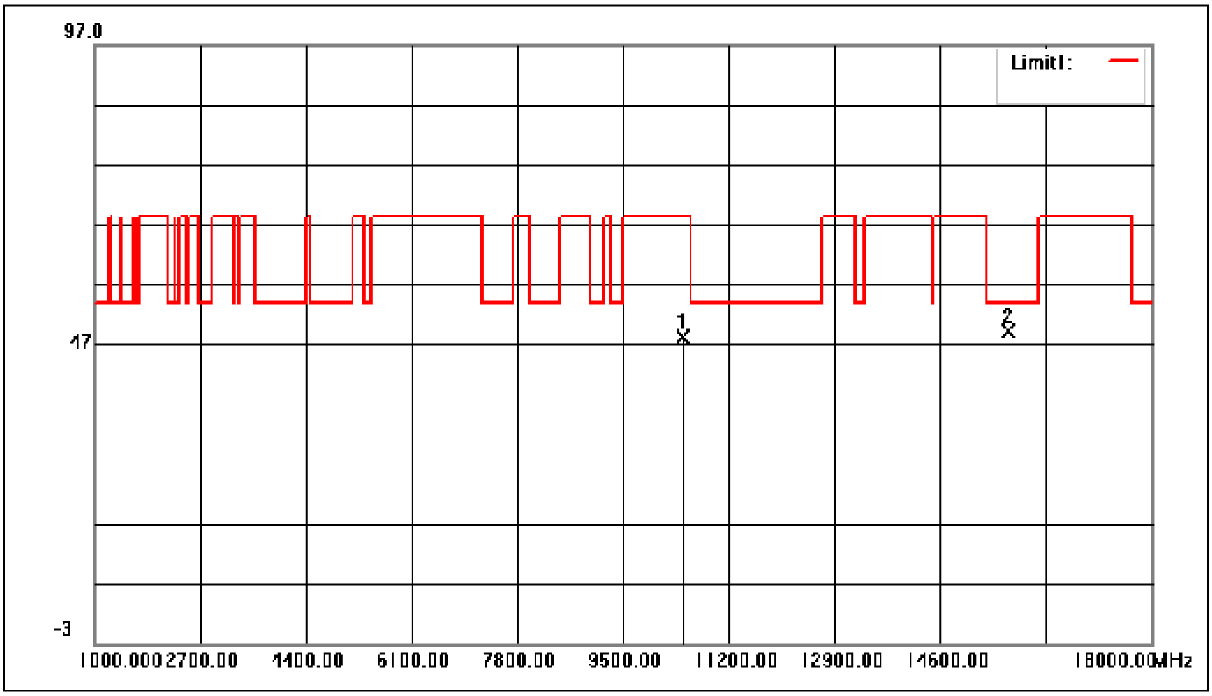
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10380.000	50.96	-2.56	48.40	68.30	-19.90	peak
2	15570.000	51.17	-0.32	50.85	54.00	-3.15	peak

Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:High



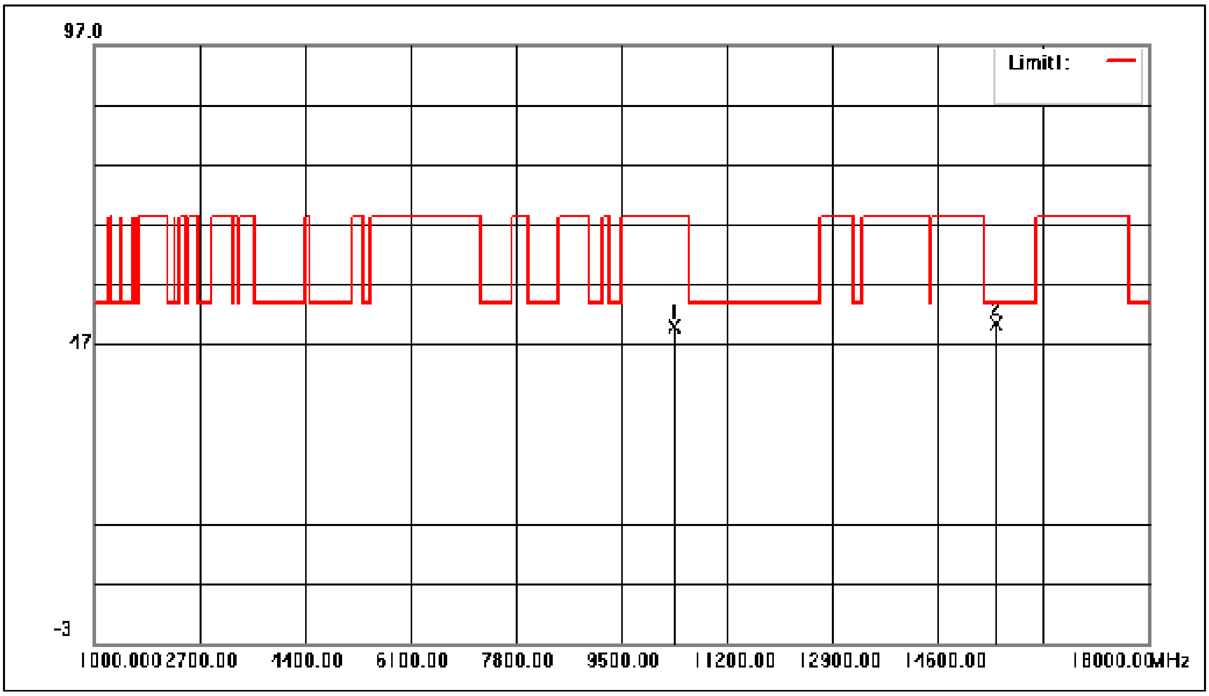
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10460.000	52.39	-2.44	49.95	68.30	-18.35	peak
2	15690.000	51.26	-0.42	50.84	54.00	-3.16	peak

Mode:c; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:High



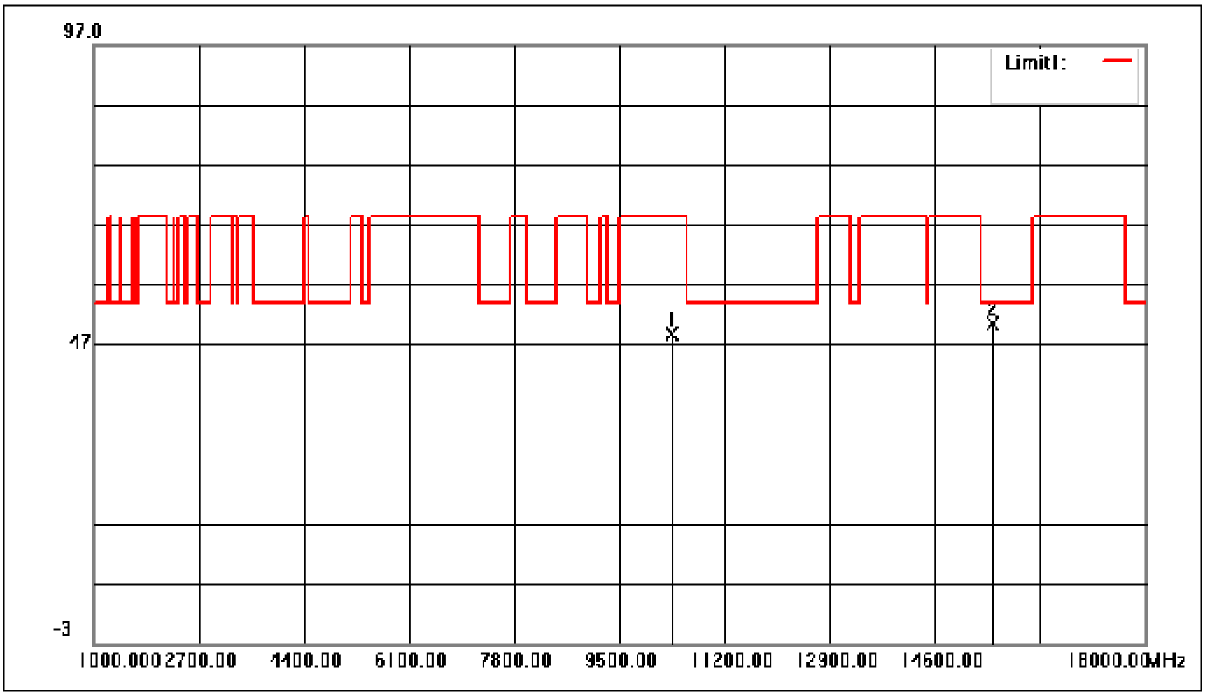
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10460.000	50.63	-2.44	48.19	68.30	-20.11	peak
2	15690.000	49.59	-0.42	49.17	54.00	-4.83	peak

Mode:c; Polarization:Horizontal; Modulation:ac; bandwidth:20MHz; Channel:Low



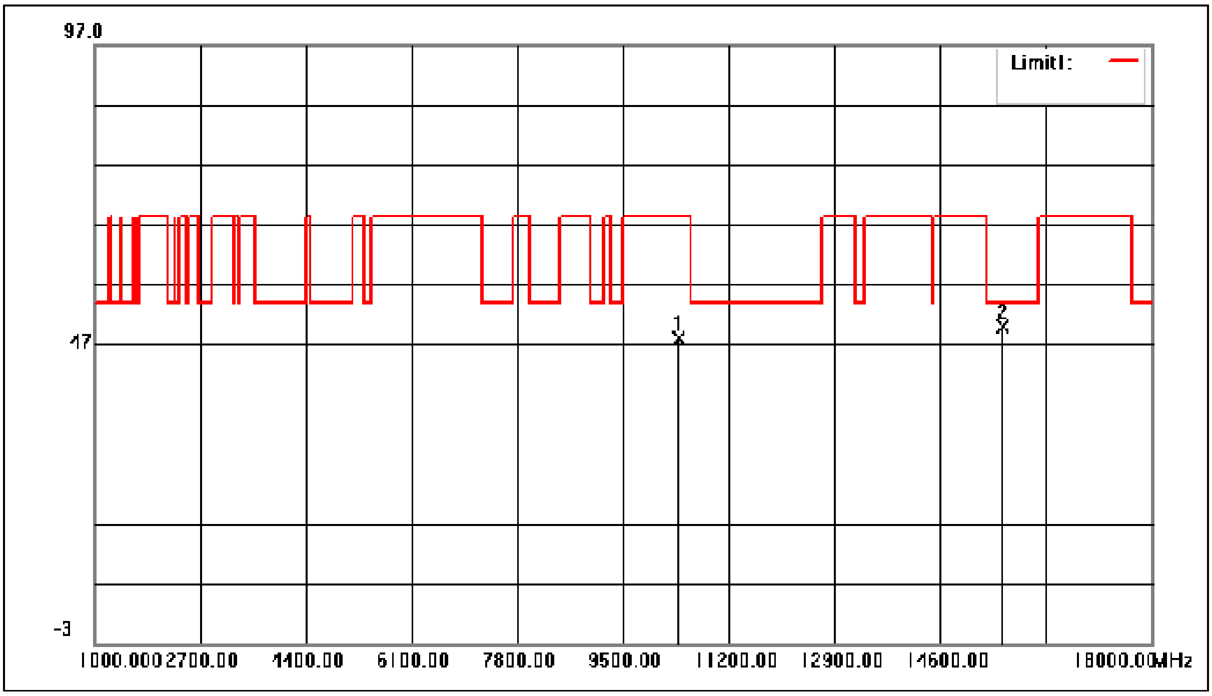
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10360.000	52.55	-2.59	49.96	68.30	-18.34	peak
2	15540.000	50.67	-0.30	50.37	54.00	-3.63	peak

Mode:c; Polarization:Vertical; Modulation:ac; bandwidth:20MHz; Channel:Low



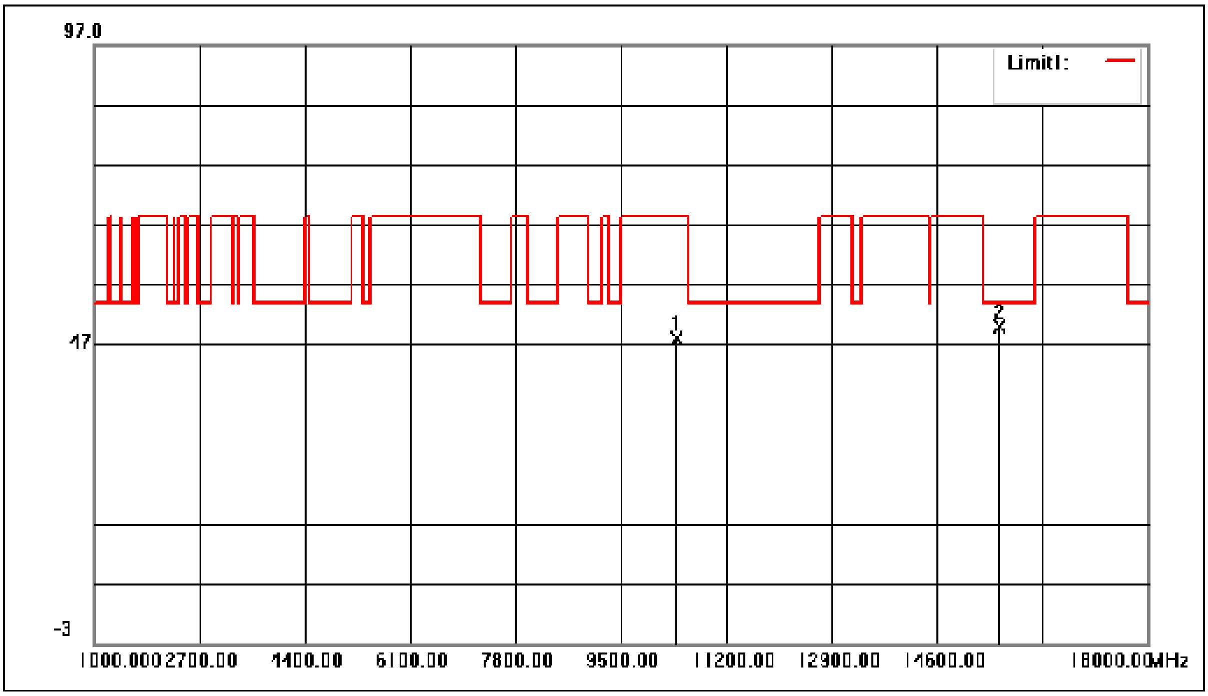
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10360.000	51.24	-2.59	48.65	68.30	-19.65	peak
2	15540.000	50.60	-0.30	50.30	54.00	-3.70	peak

Mode:c; Polarization:Horizontal; Modulation:ac; bandwidth:20MHz; Channel:middle



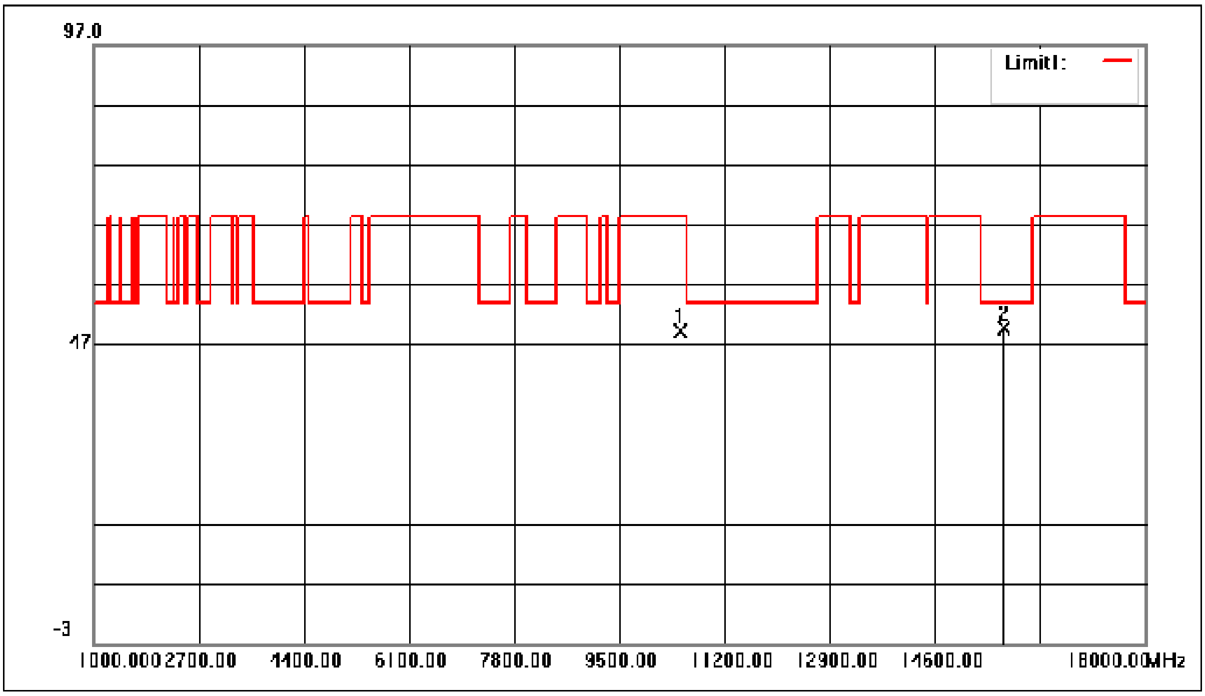
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10400.000	50.29	-2.53	47.76	68.30	-20.54	peak
2	15600.000	50.20	-0.35	49.85	54.00	-4.15	peak

Mode:c; Polarization:Vertical; Modulation:ac; bandwidth:20MHz; Channel:middle



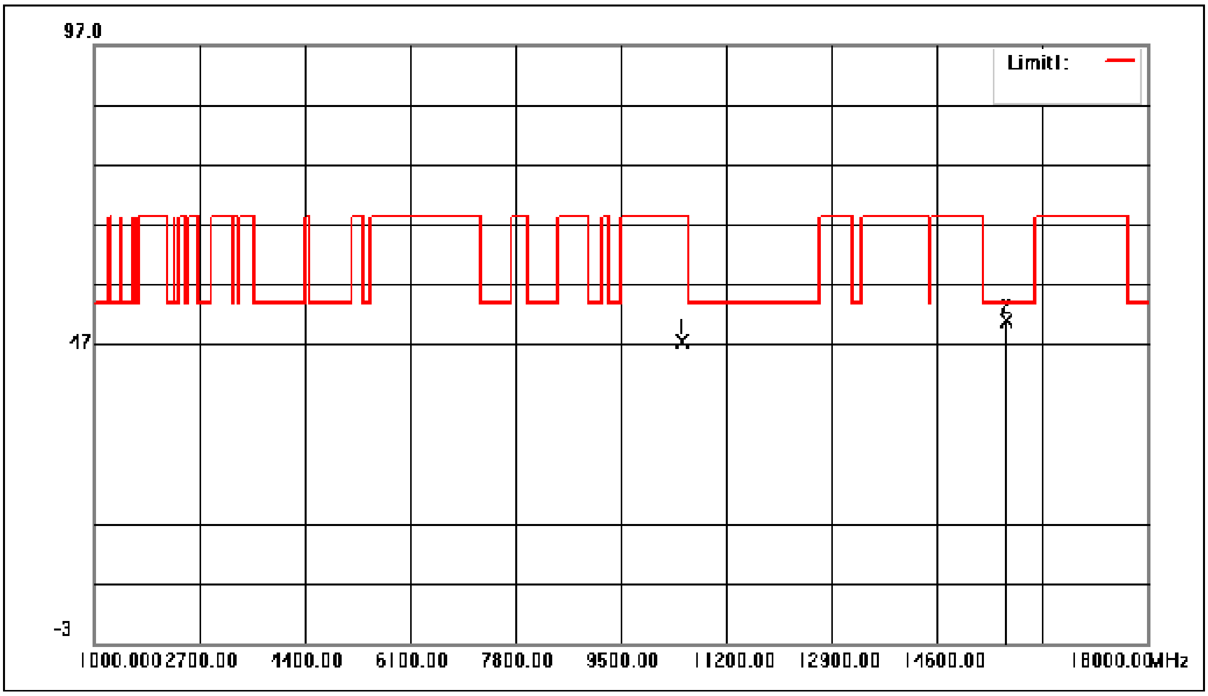
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10400.000	50.46	-2.53	47.93	68.30	-20.37	peak
2	15600.000	50.24	-0.35	49.89	54.00	-4.11	peak

Mode:c; Polarization:Horizontal; Modulation:ac; bandwidth:20MHz; Channel:High



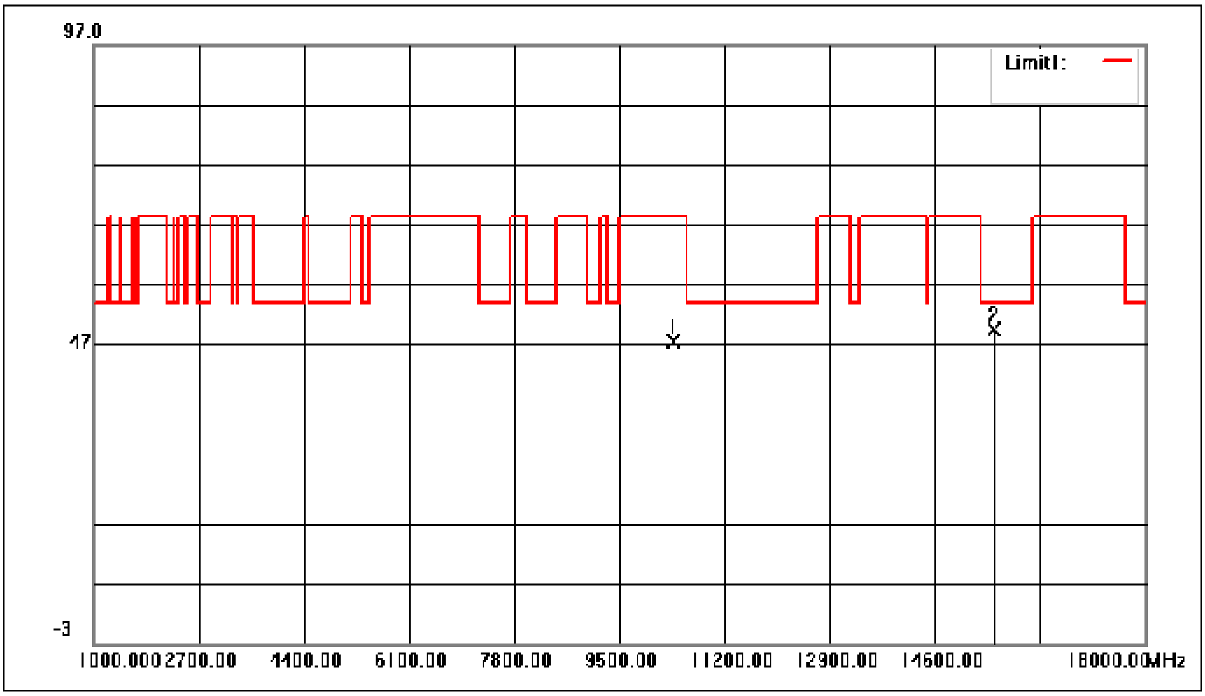
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10480.000	51.53	-2.41	49.12	68.30	-19.18	peak
2	15720.000	50.17	-0.44	49.73	54.00	-4.27	peak

Mode:c; Polarization:Vertical; Modulation:ac; bandwidth:20MHz; Channel:High



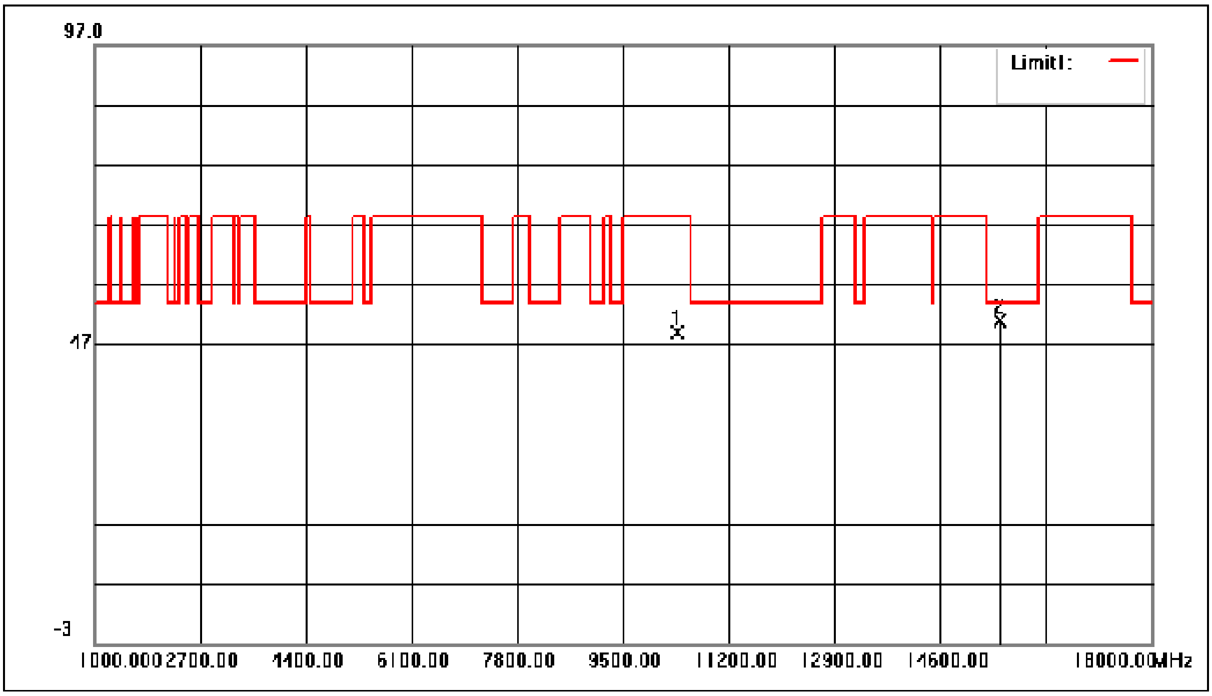
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10480.000	49.69	-2.41	47.28	68.30	-21.02	peak
2	15720.000	51.34	-0.44	50.90	54.00	-3.10	peak

Mode:c; Polarization:Horizontal; Modulation:ac; bandwidth:40MHz; Channel:Low



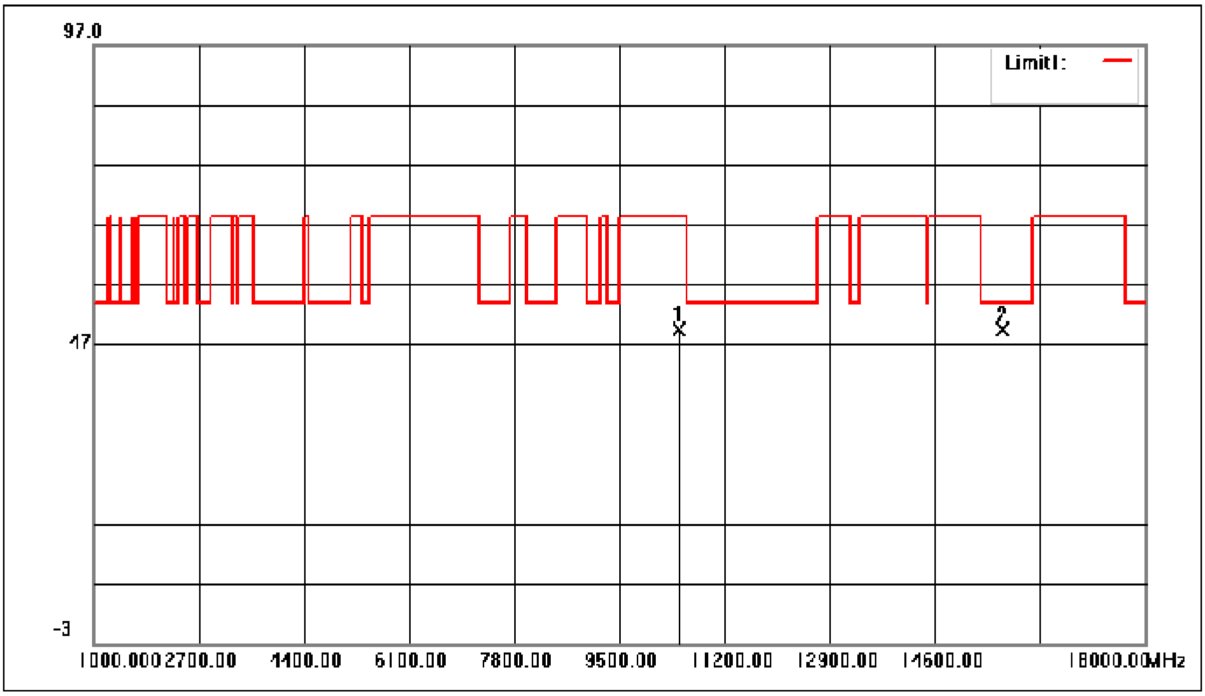
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10380.000	49.85	-2.56	47.29	68.30	-21.01	peak
2	15570.000	49.74	-0.32	49.42	54.00	-4.58	peak

Mode:c; Polarization:Vertical; Modulation:ac; bandwidth:40MHz; Channel:Low



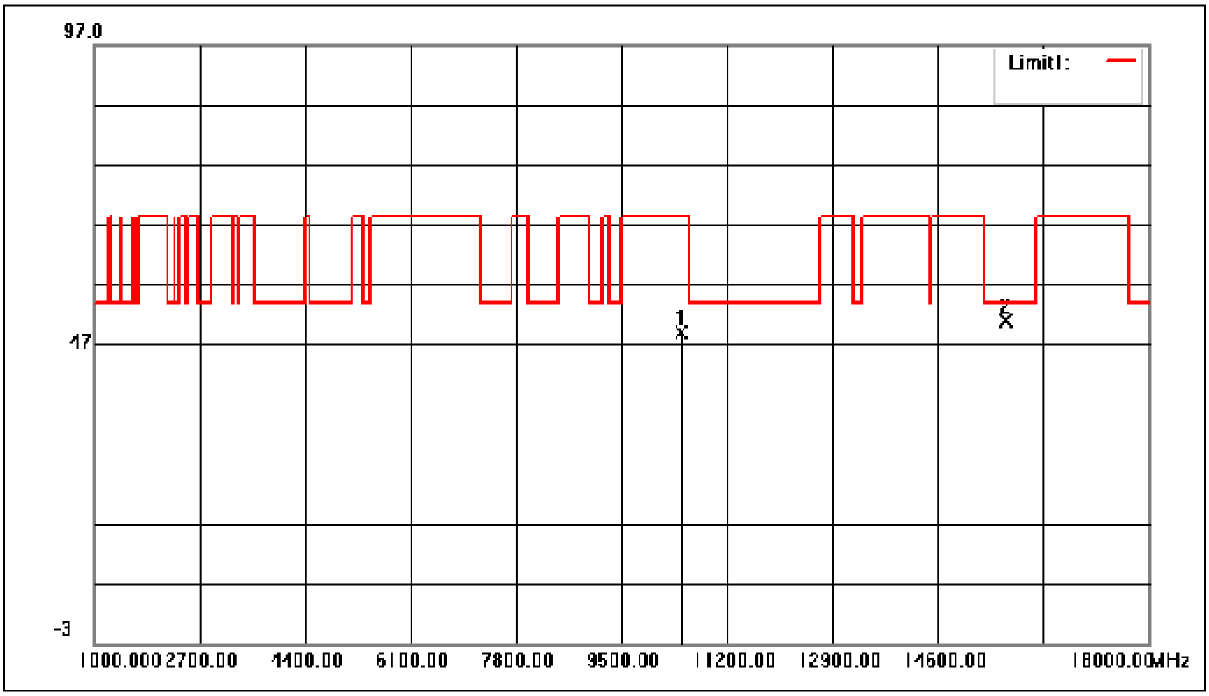
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10380.000	51.44	-2.56	48.88	68.30	-19.42	peak
2	15570.000	51.29	-0.32	50.97	54.00	-3.03	peak

Mode:c; Polarization:Horizontal; Modulation:ac; bandwidth:40MHz; Channel:High



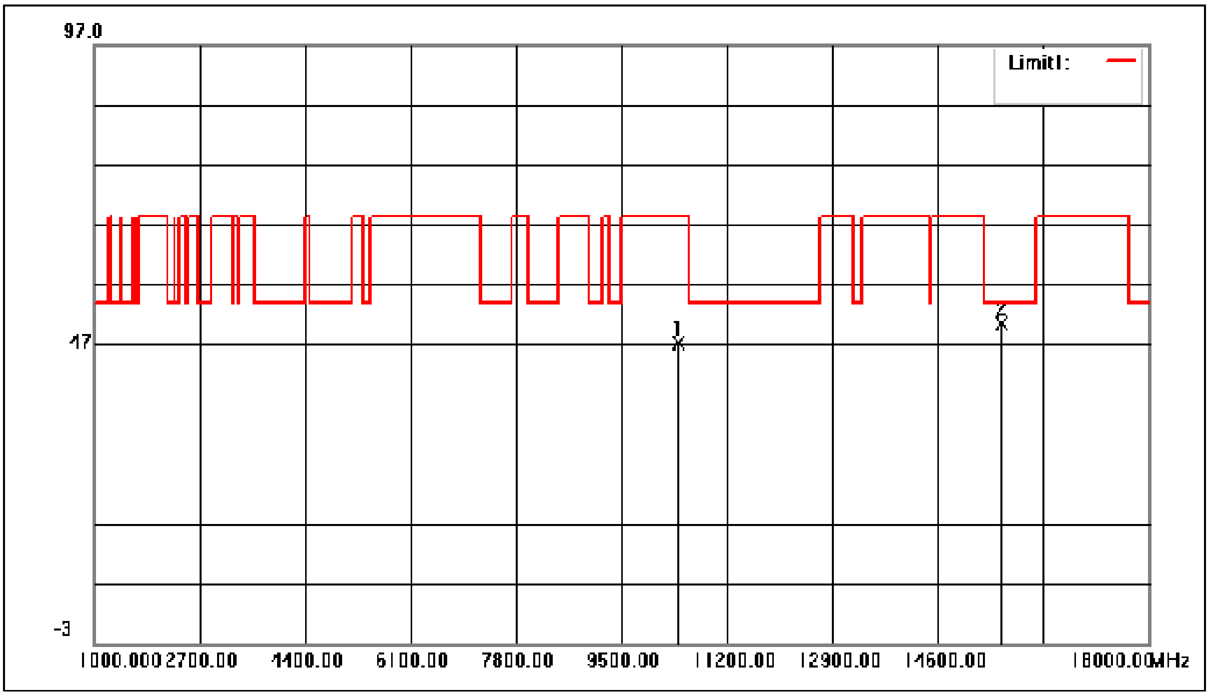
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10460.000	51.85	-2.44	49.41	68.30	-18.89	peak
2	15690.000	49.77	-0.42	49.35	54.00	-4.65	peak

Mode:c; Polarization:Vertical; Modulation:ac; bandwidth:40MHz; Channel:High



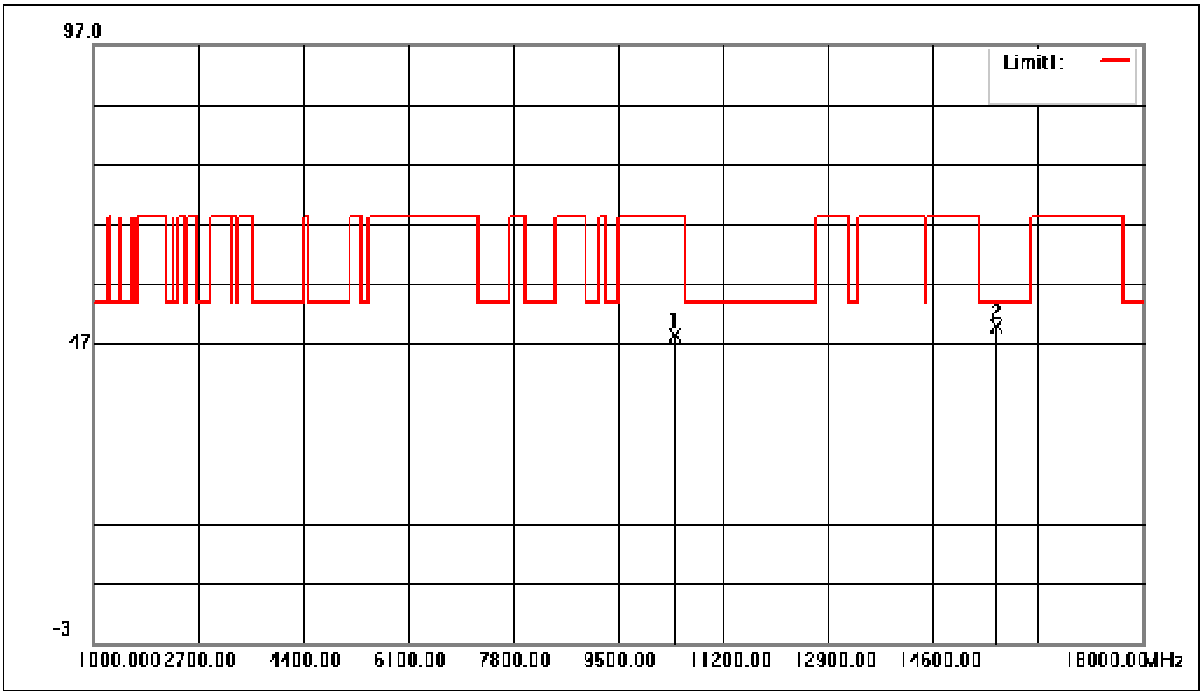
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10460.000	51.37	-2.44	48.93	68.30	-19.37	peak
2	15690.000	51.36	-0.42	50.94	54.00	-3.06	peak

Mode:c; Polarization:Horizontal; Modulation:ac; bandwidth:80MHz; Channel:Low



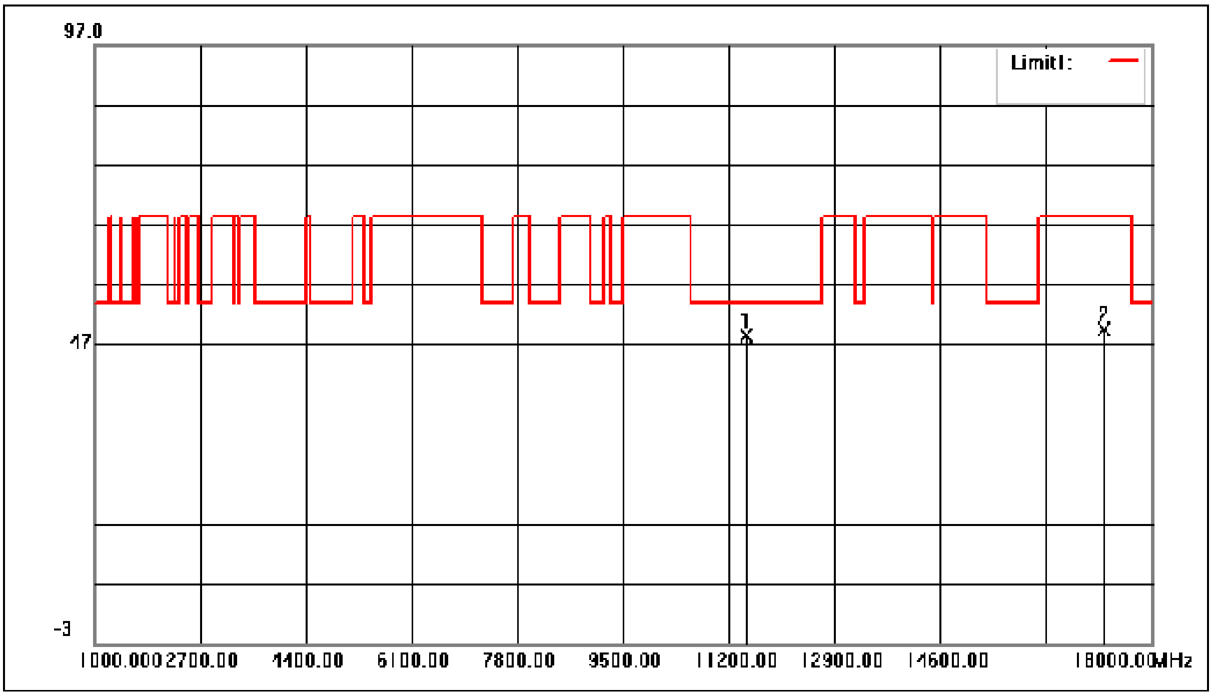
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10420.000	49.62	-2.50	47.12	68.30	-21.18	peak
2	15630.000	50.83	-0.37	50.46	54.00	-3.54	peak

Mode:c; Polarization:Vertical; Modulation:ac; bandwidth:80MHz; Channel:Low



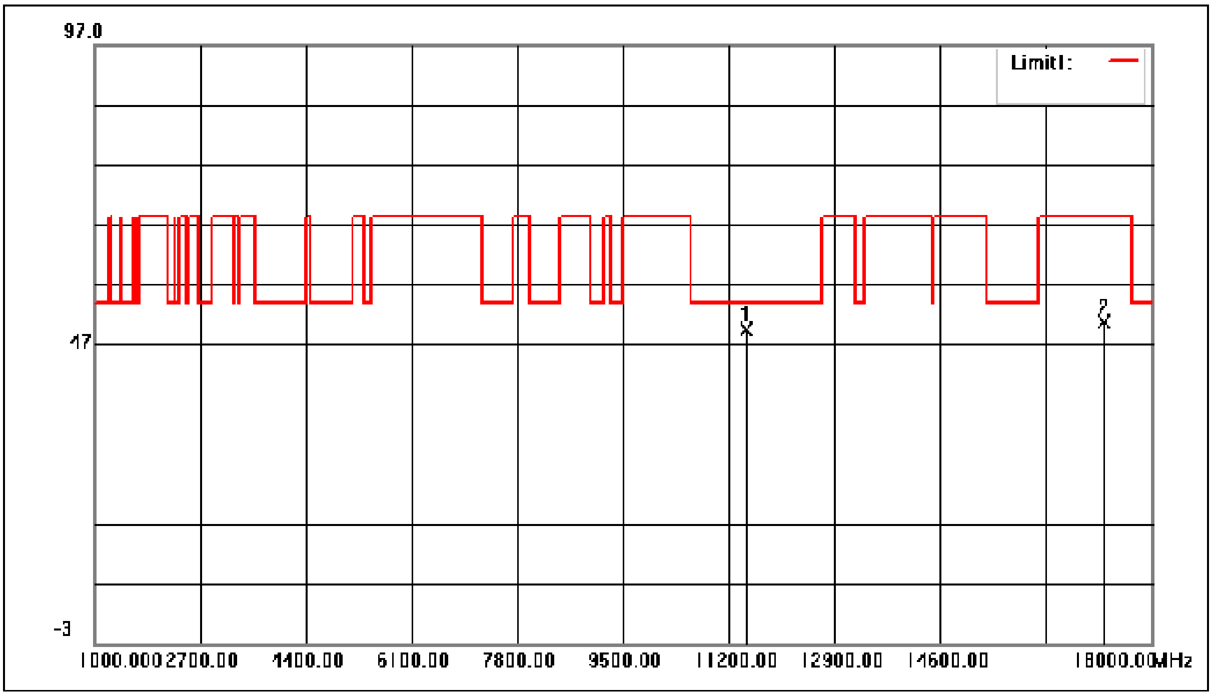
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	10420.000	50.96	-2.50	48.46	68.30	-19.84	peak
2	15630.000	50.19	-0.37	49.82	54.00	-4.18	peak

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



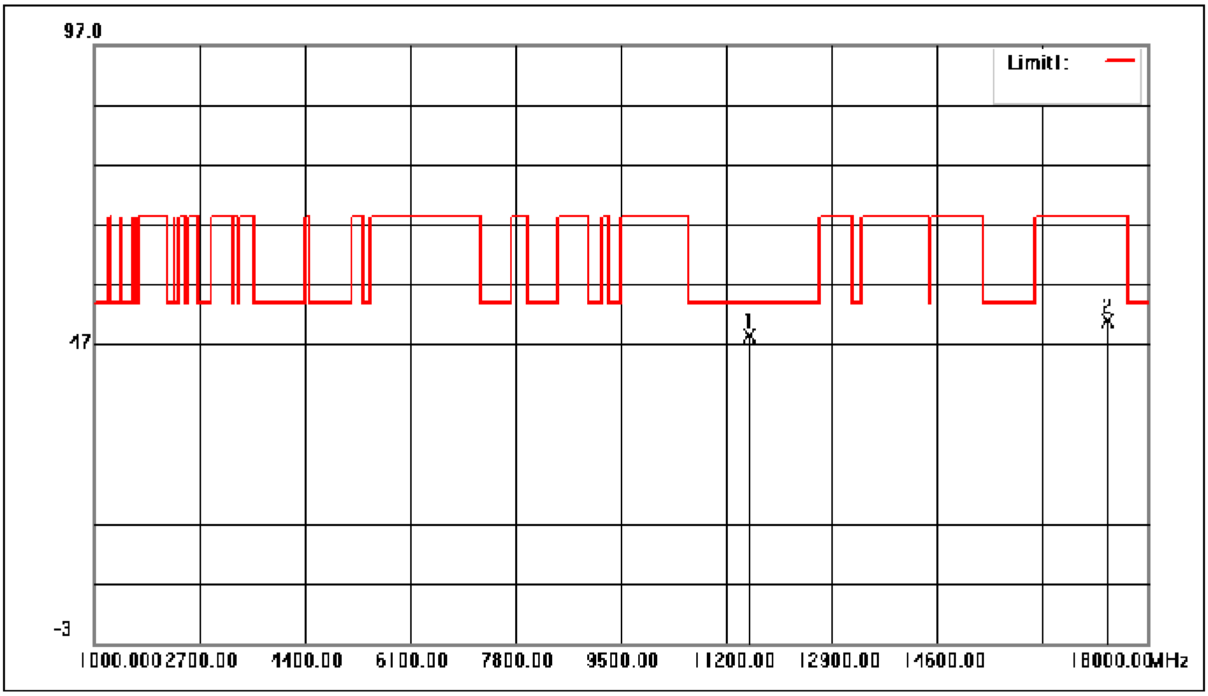
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11490.000	50.64	-2.24	48.40	54.00	-5.60	peak
2	17235.000	49.59	-0.19	49.40	68.30	-18.90	peak

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



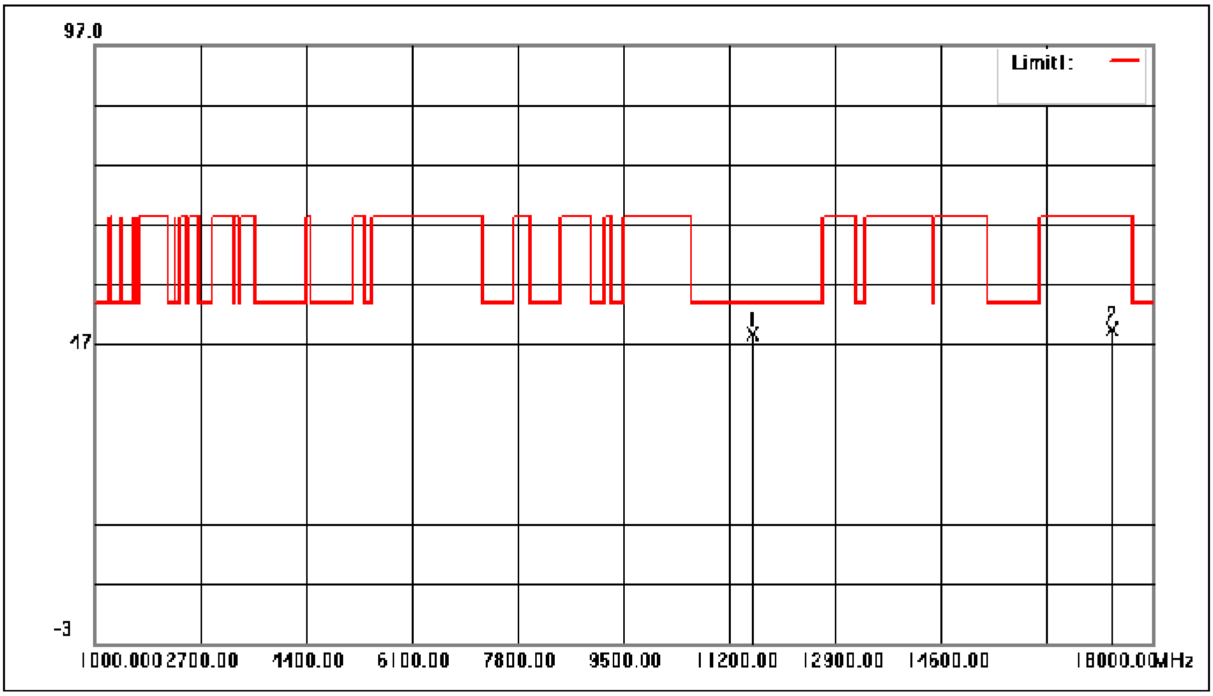
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11490.000	51.55	-2.24	49.31	54.00	-4.69	peak
2	17235.000	50.91	-0.19	50.72	68.30	-17.58	peak

Mode:d; Polarization:Horizontal; Modulation:a; bandwidth:20MHz; Channel:middle



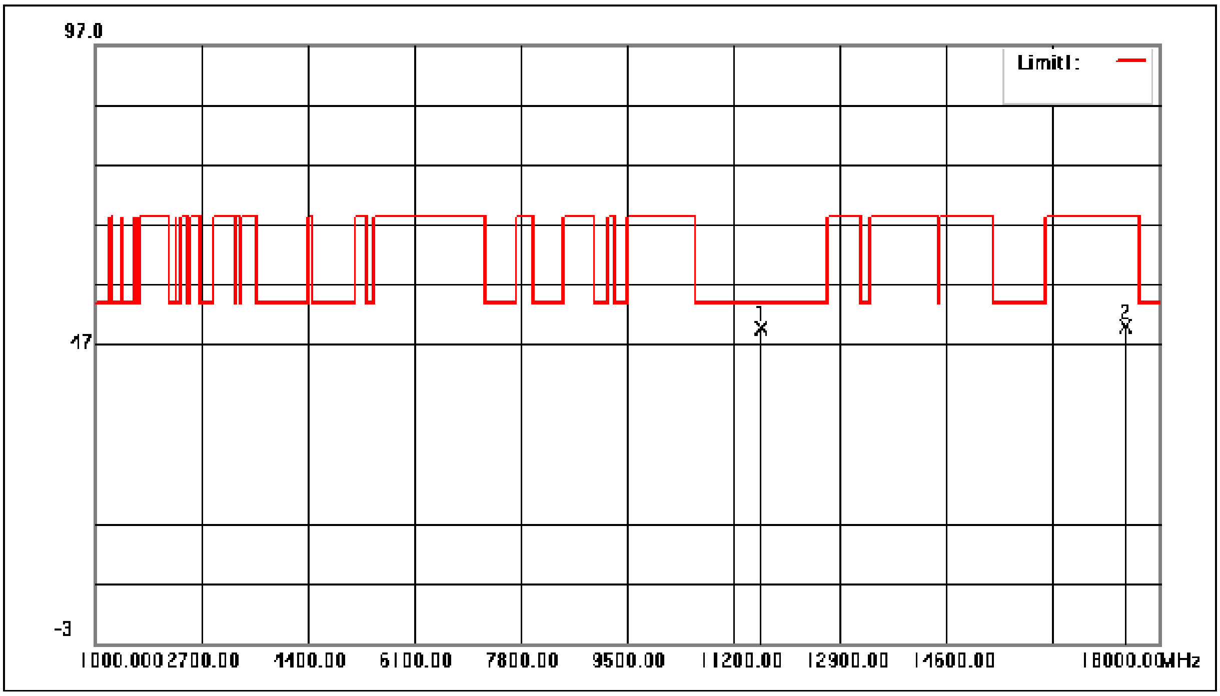
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11570.000	50.73	-2.33	48.40	54.00	-5.60	peak
2	17355.000	51.25	-0.29	50.96	68.30	-17.34	peak

Mode:d; Polarization:Vertical; Modulation:a; bandwidth:20MHz; Channel:middle



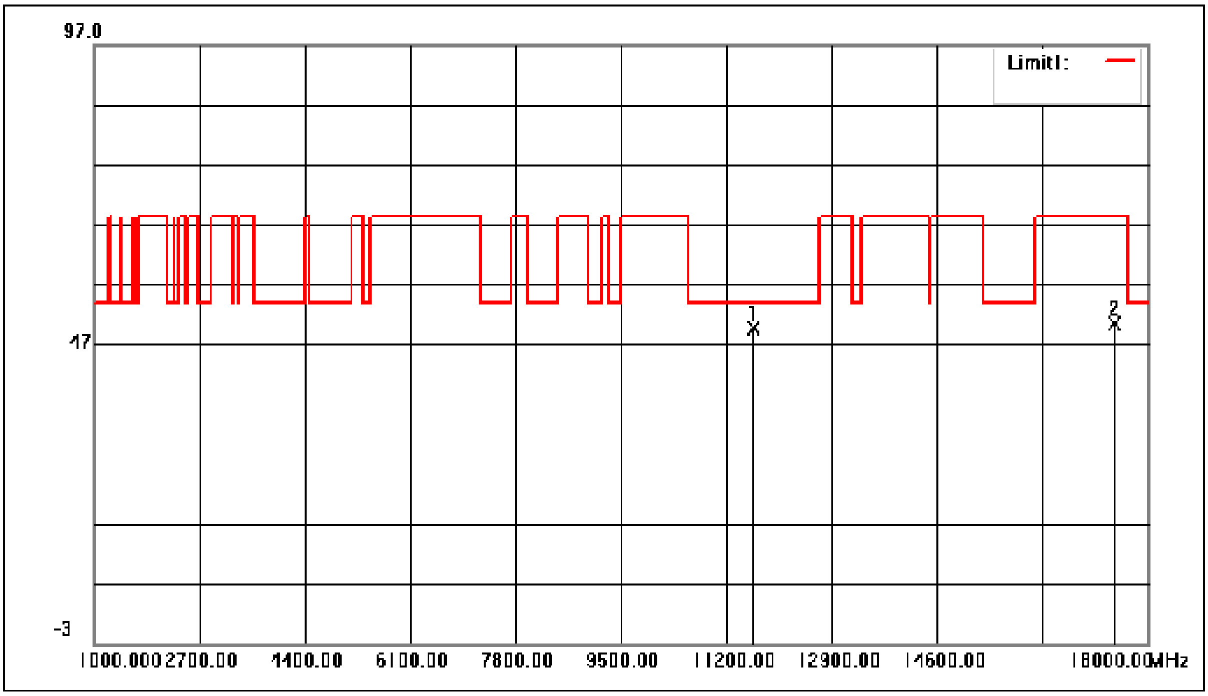
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11570.000	51.01	-2.33	48.68	54.00	-5.32	peak
2	17355.000	49.63	-0.29	49.34	68.30	-18.96	peak

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



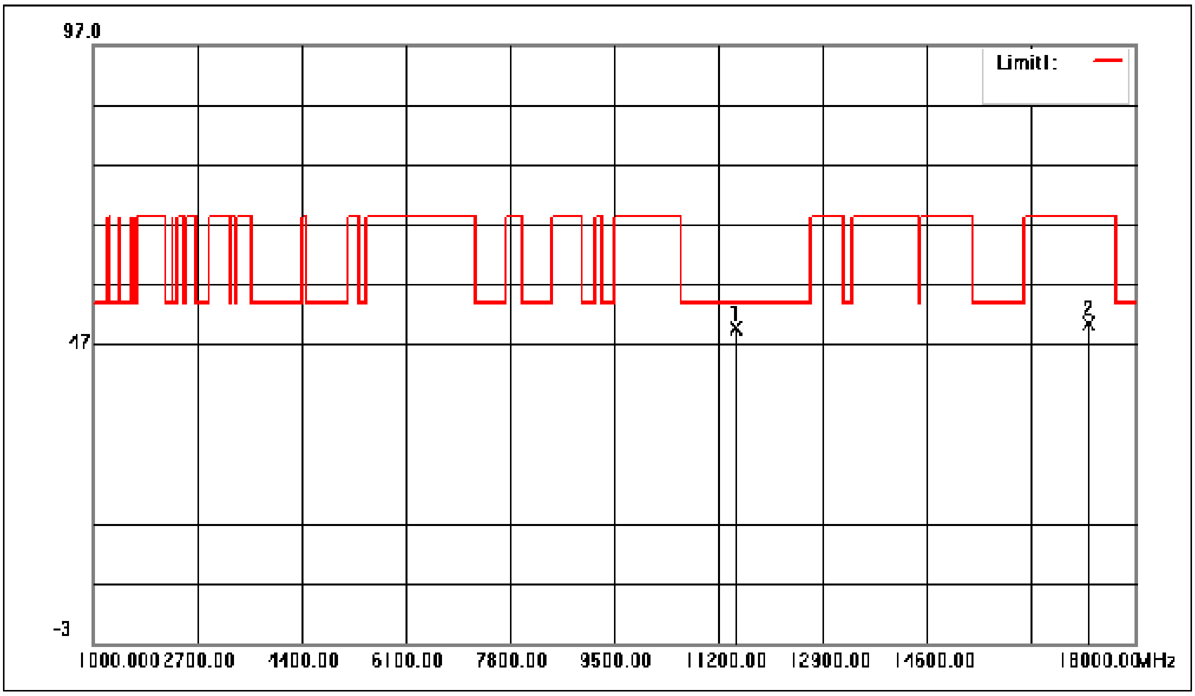
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11650.000	52.00	-2.40	49.60	54.00	-4.40	peak
2	17475.000	50.26	-0.39	49.87	68.30	-18.43	peak

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



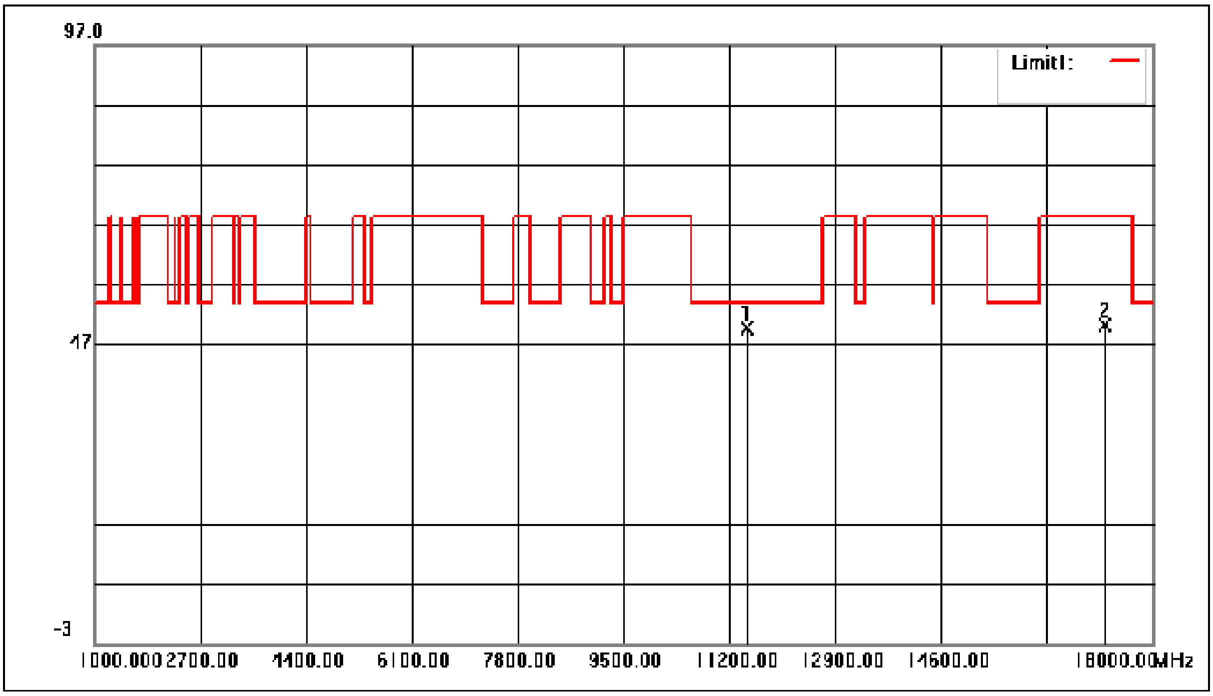
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11650.000	52.14	-2.40	49.74	54.00	-4.26	peak
2	17475.000	50.76	-0.39	50.37	68.30	-17.93	peak

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



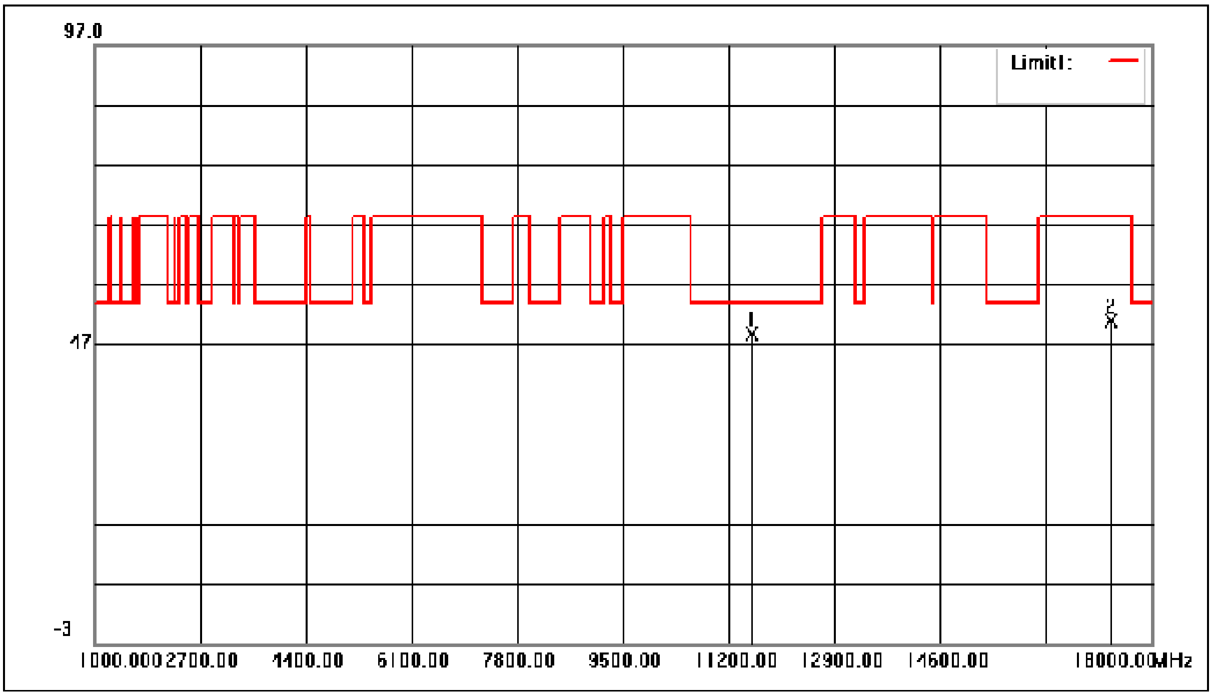
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11490.000	51.77	-2.24	49.53	54.00	-4.47	peak
2	17235.000	50.69	-0.19	50.50	68.30	-17.80	peak

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



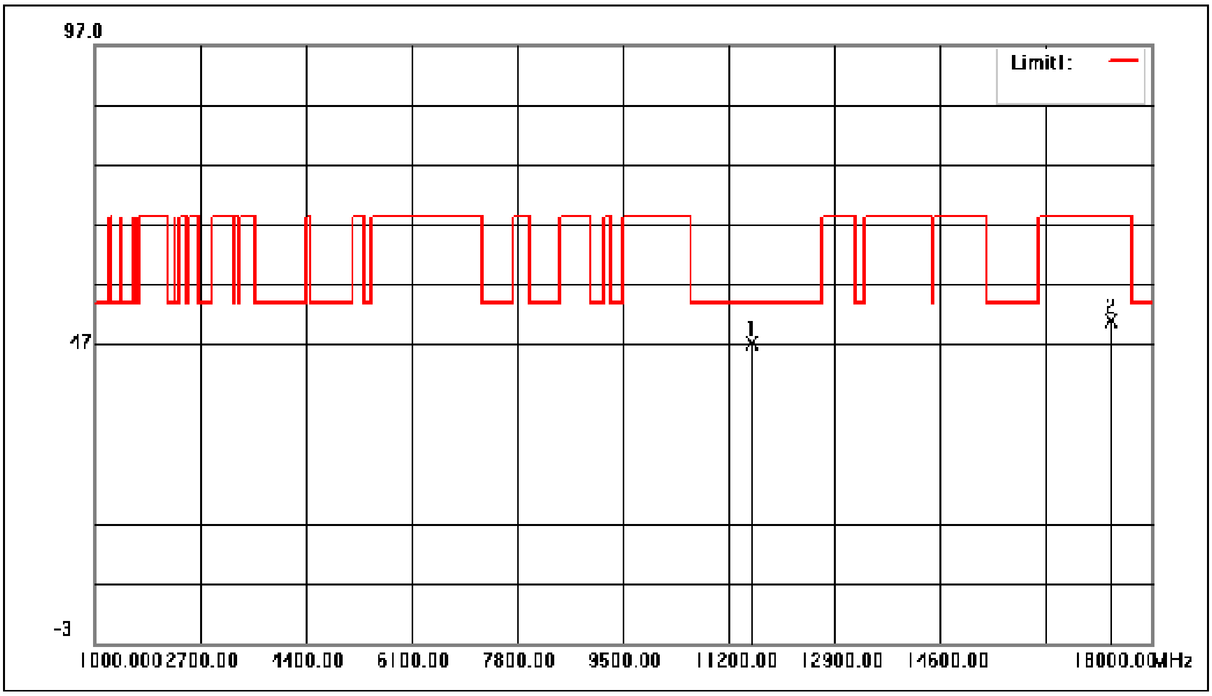
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11490.000	51.91	-2.24	49.67	54.00	-4.33	peak
2	17235.000	50.32	-0.19	50.13	68.30	-18.17	peak

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:middle



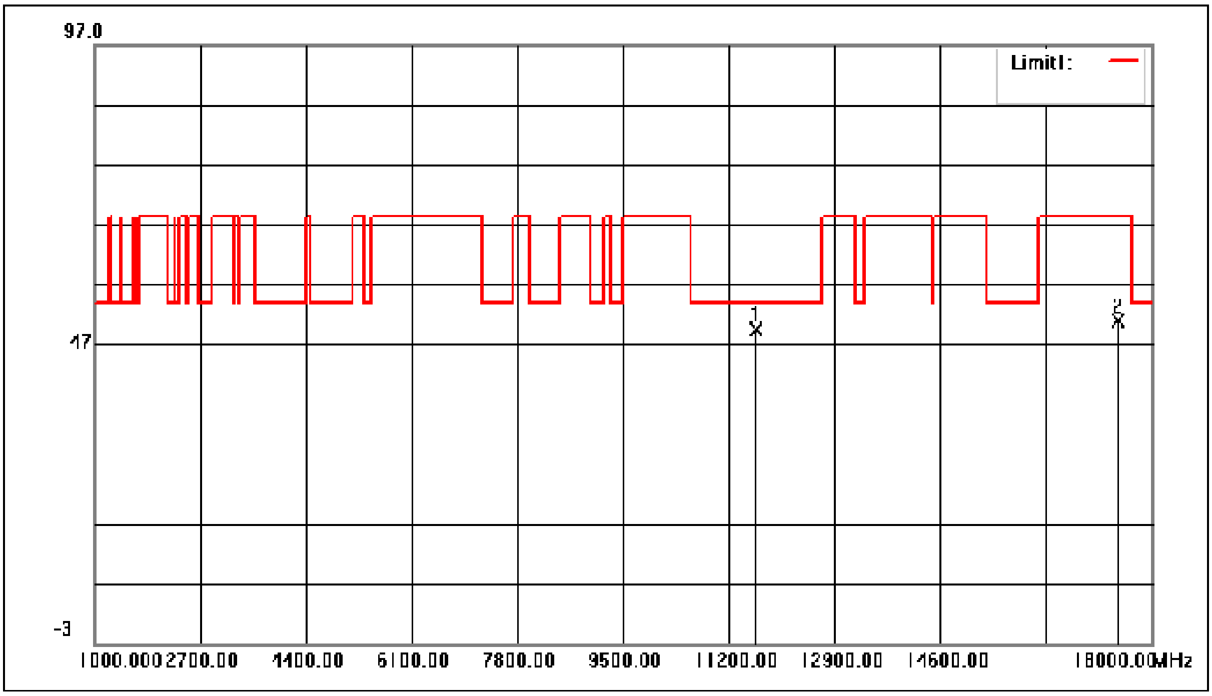
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11570.000	50.98	-2.33	48.65	54.00	-5.35	peak
2	17355.000	51.05	-0.29	50.76	68.30	-17.54	peak

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:middle



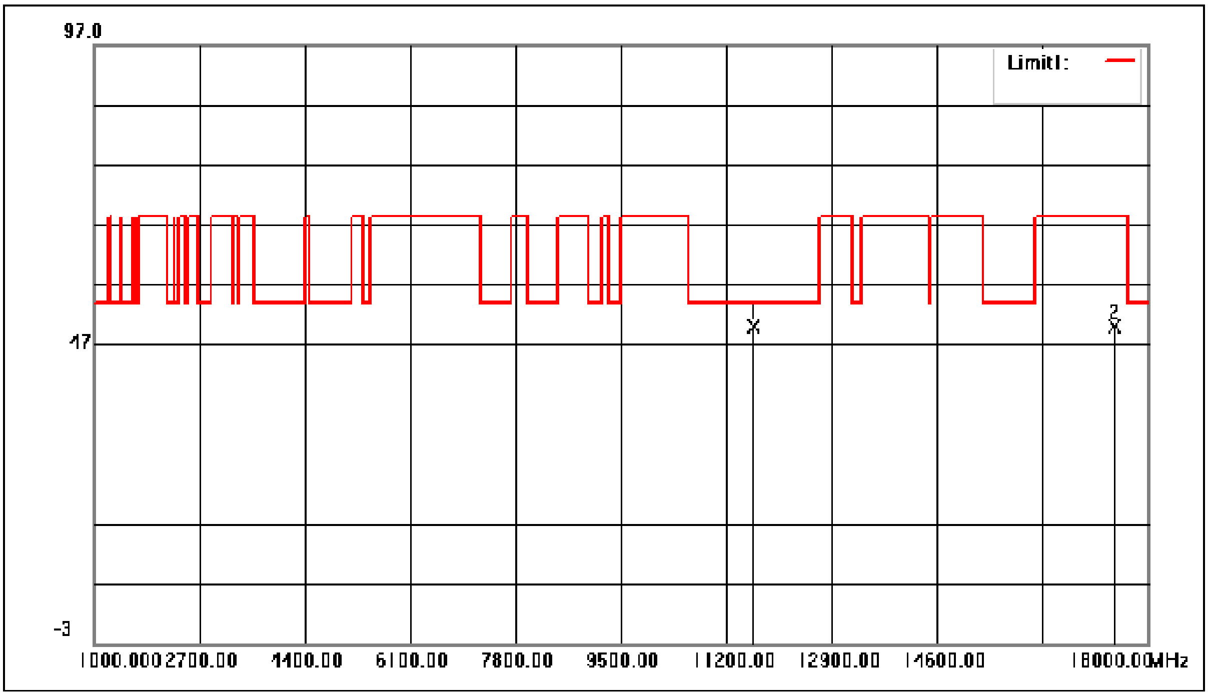
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11570.000	49.37	-2.33	47.04	54.00	-6.96	peak
2	17355.000	51.11	-0.29	50.82	68.30	-17.48	peak

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



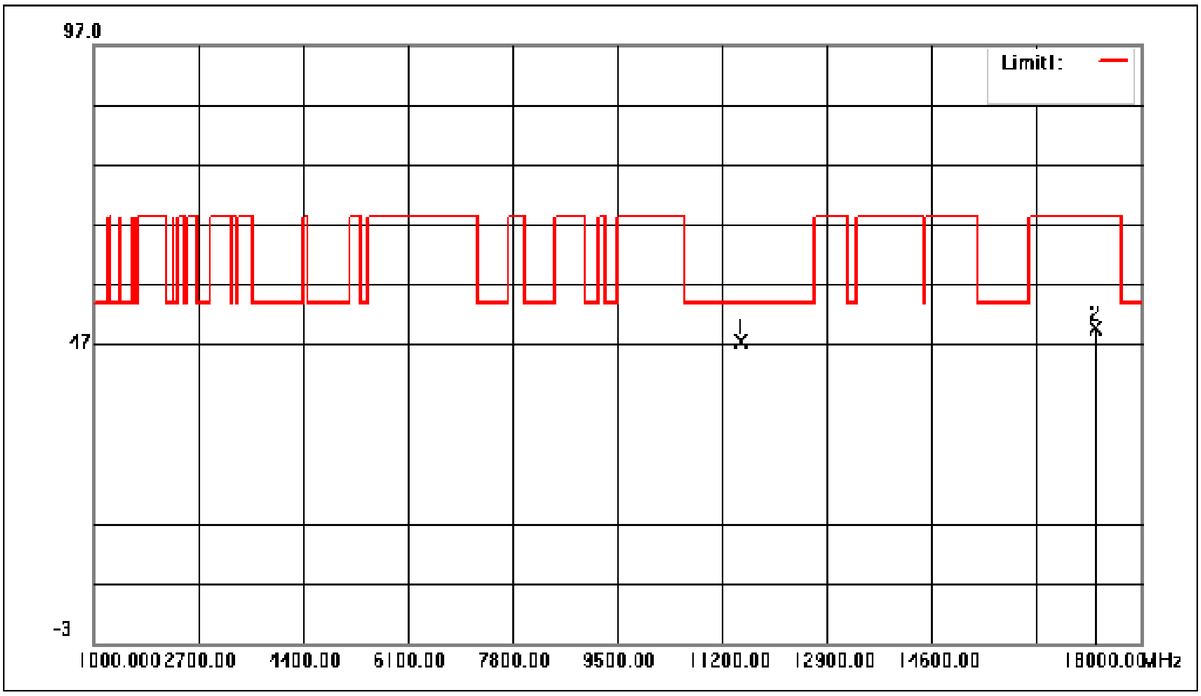
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11650.000	51.75	-2.40	49.35	54.00	-4.65	peak
2	17475.000	51.24	-0.39	50.85	68.30	-17.45	peak

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



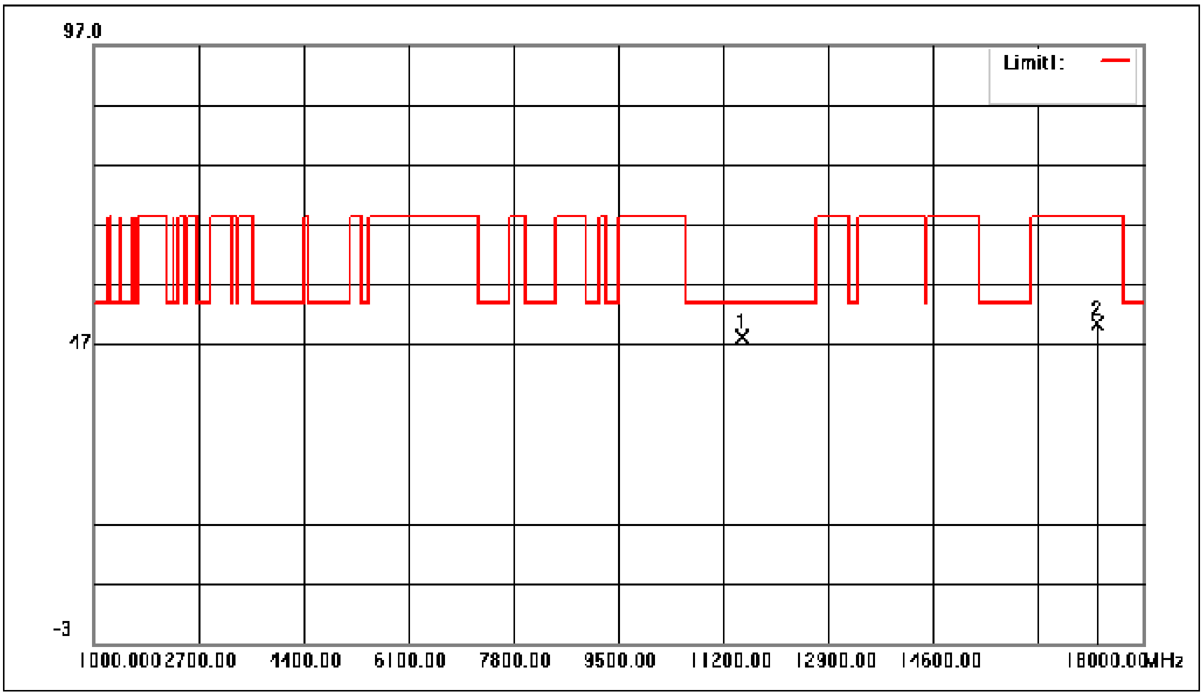
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11650.000	52.28	-2.40	49.88	54.00	-4.12	peak
2	17475.000	50.18	-0.39	49.79	68.30	-18.51	peak

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:Low



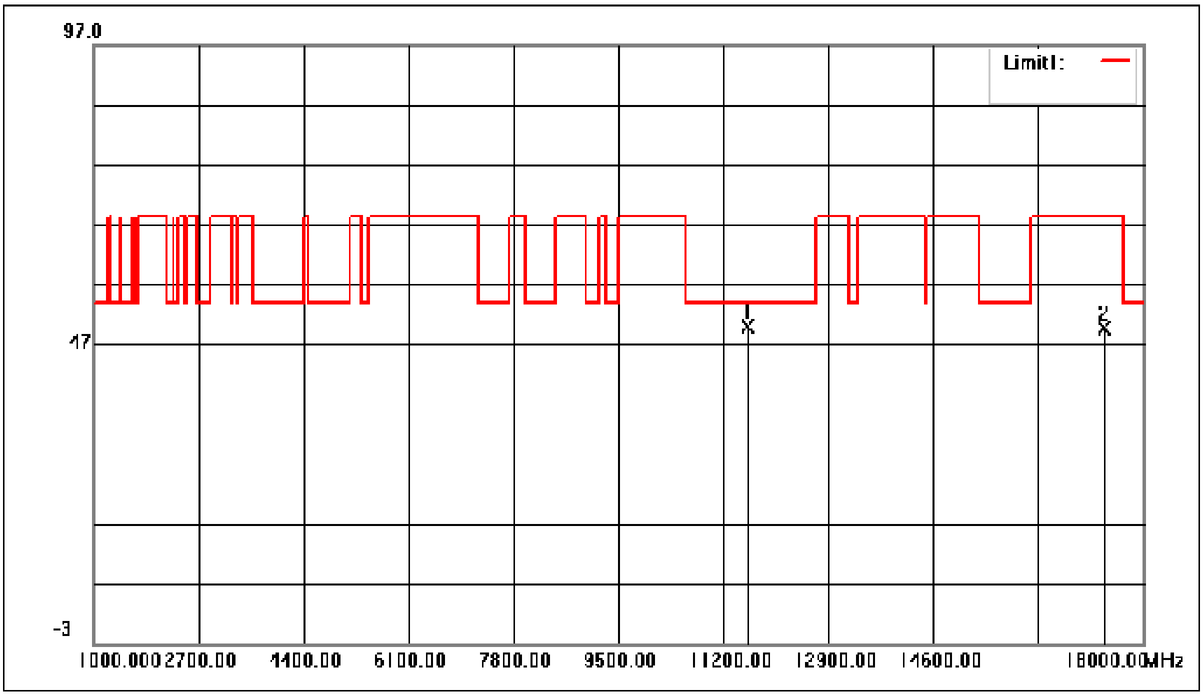
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11510.000	49.54	-2.27	47.27	54.00	-6.73	peak
2	17265.000	49.78	-0.22	49.56	68.30	-18.74	peak

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:Low



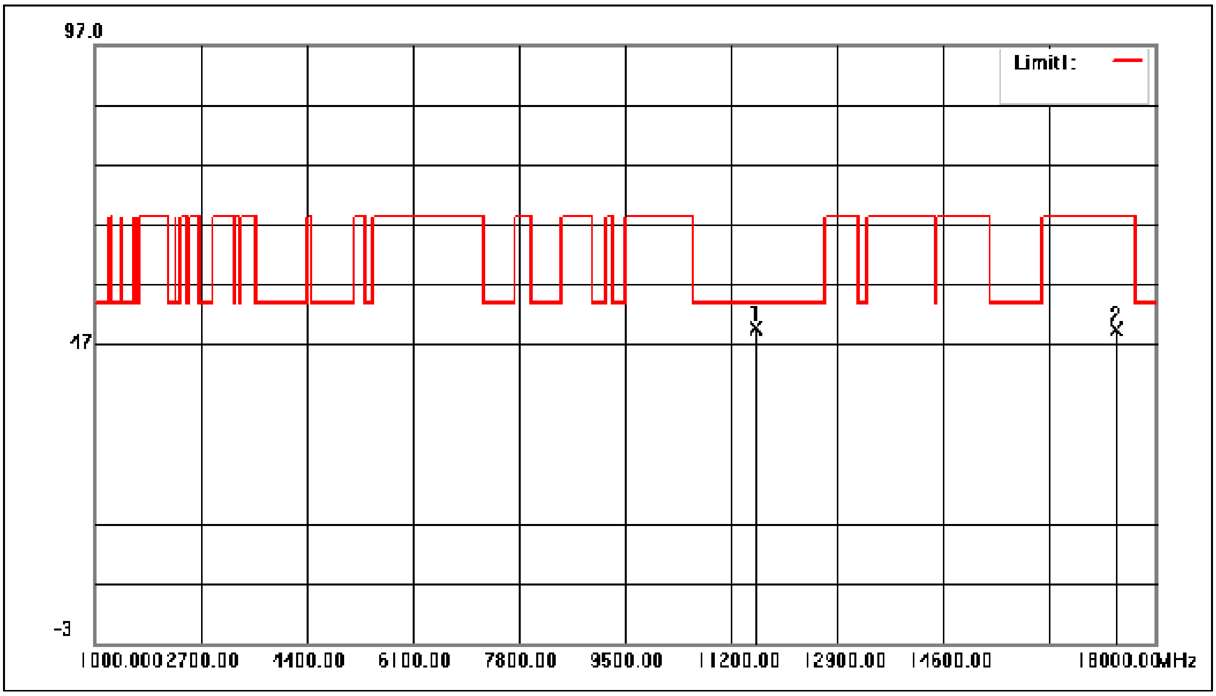
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11510.000	50.43	-2.27	48.16	54.00	-5.84	peak
2	17265.000	50.52	-0.22	50.30	68.30	-18.00	peak

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:High



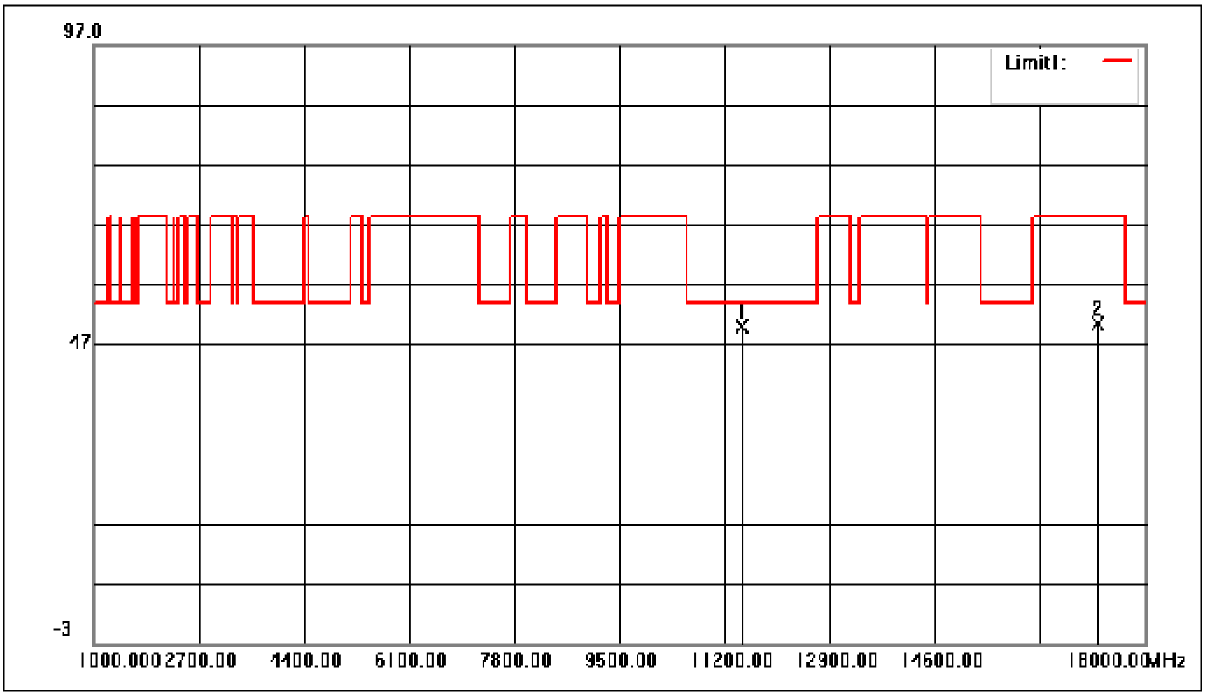
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11590.000	52.10	-2.34	49.76	54.00	-4.24	peak
2	17385.000	49.99	-0.32	49.67	68.30	-18.63	peak

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:High



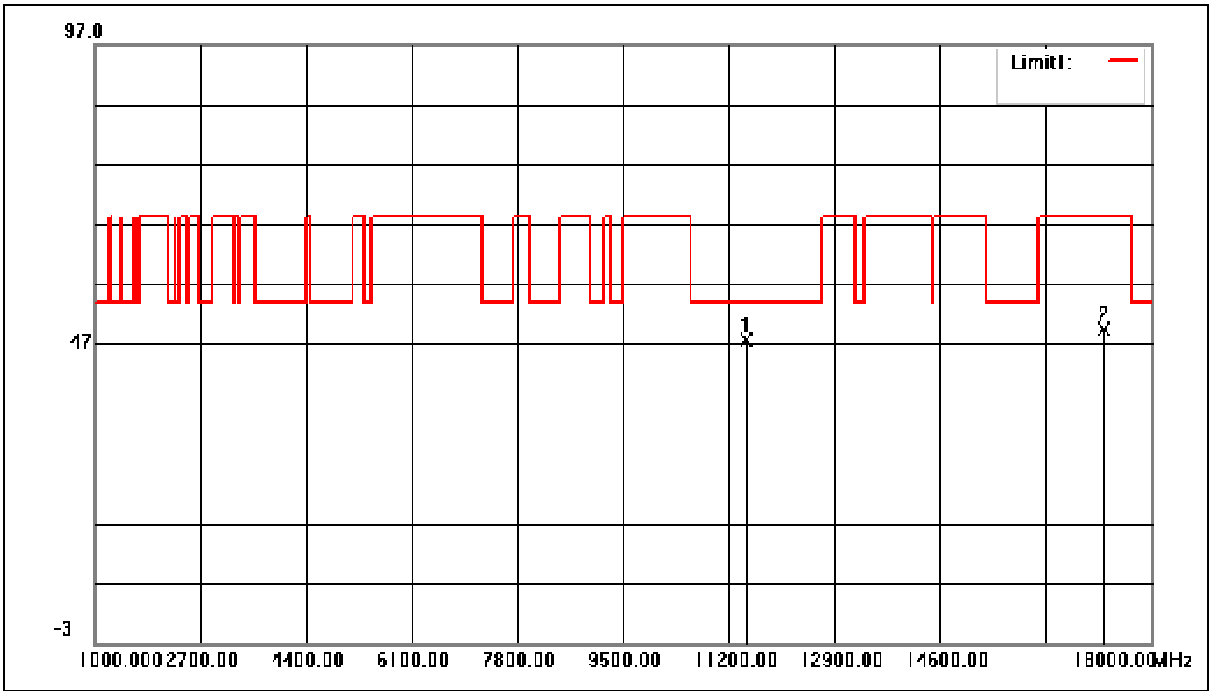
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11590.000	51.95	-2.34	49.61	54.00	-4.39	peak
2	17385.000	49.82	-0.32	49.50	68.30	-18.80	peak

Mode:d; Polarization:Horizontal; Modulation:ac; bandwidth:20MHz; Channel:Low



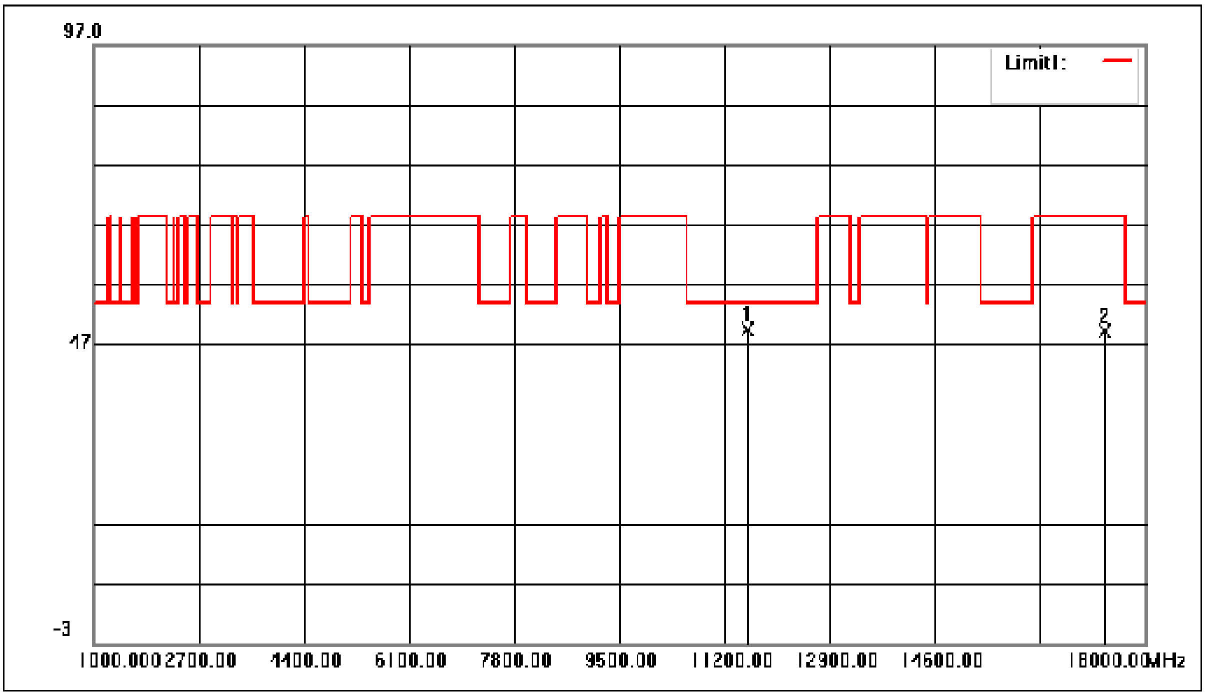
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11490.000	52.08	-2.24	49.84	54.00	-4.16	peak
2	17235.000	50.46	-0.19	50.27	68.30	-18.03	peak

Mode:d; Polarization:Vertical; Modulation:ac; bandwidth:20MHz; Channel:Low



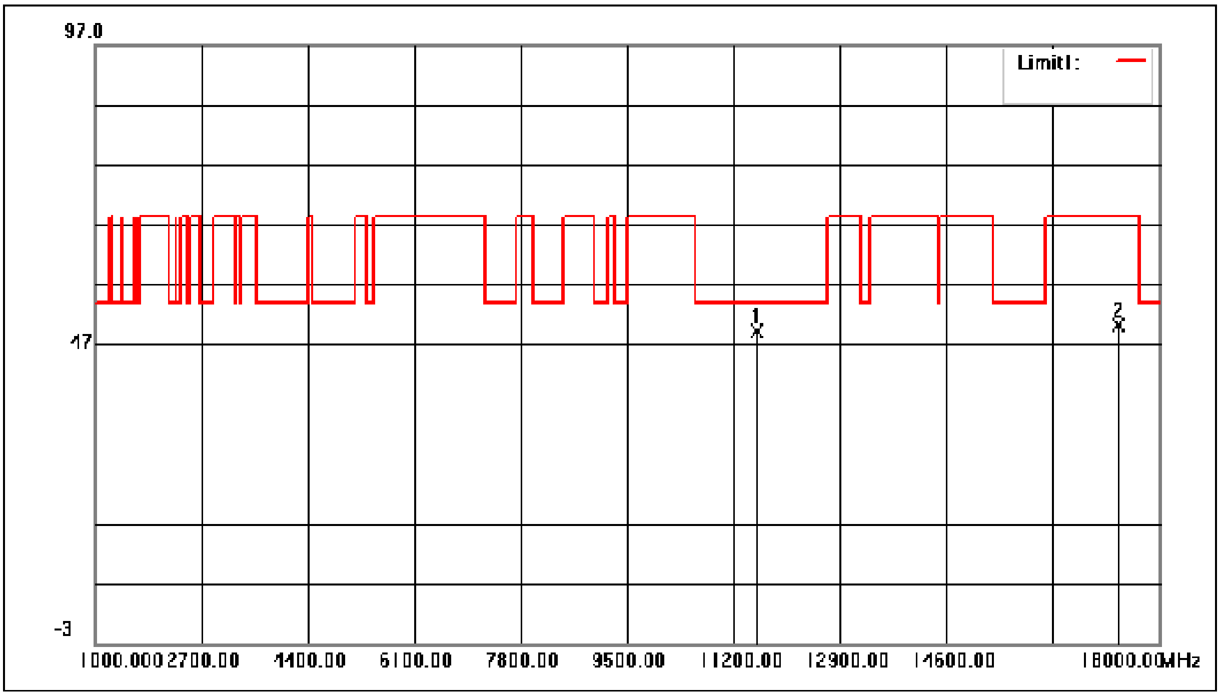
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11490.000	49.78	-2.24	47.54	54.00	-6.46	peak
2	17235.000	49.65	-0.19	49.46	68.30	-18.84	peak

Mode:d; Polarization:Horizontal; Modulation:ac; bandwidth:20MHz; Channel:middle



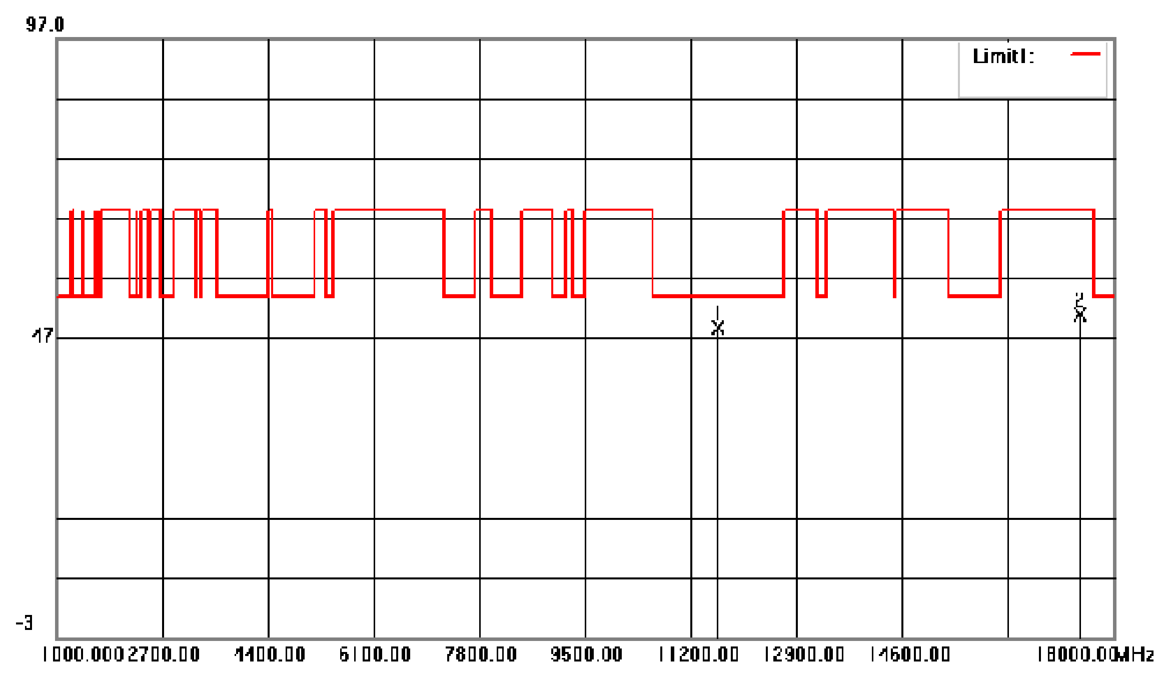
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11570.000	51.80	-2.33	49.47	54.00	-4.53	peak
2	17355.000	49.41	-0.29	49.12	68.30	-19.18	peak

Mode:d; Polarization:Vertical; Modulation:ac; bandwidth:20MHz; Channel:middle



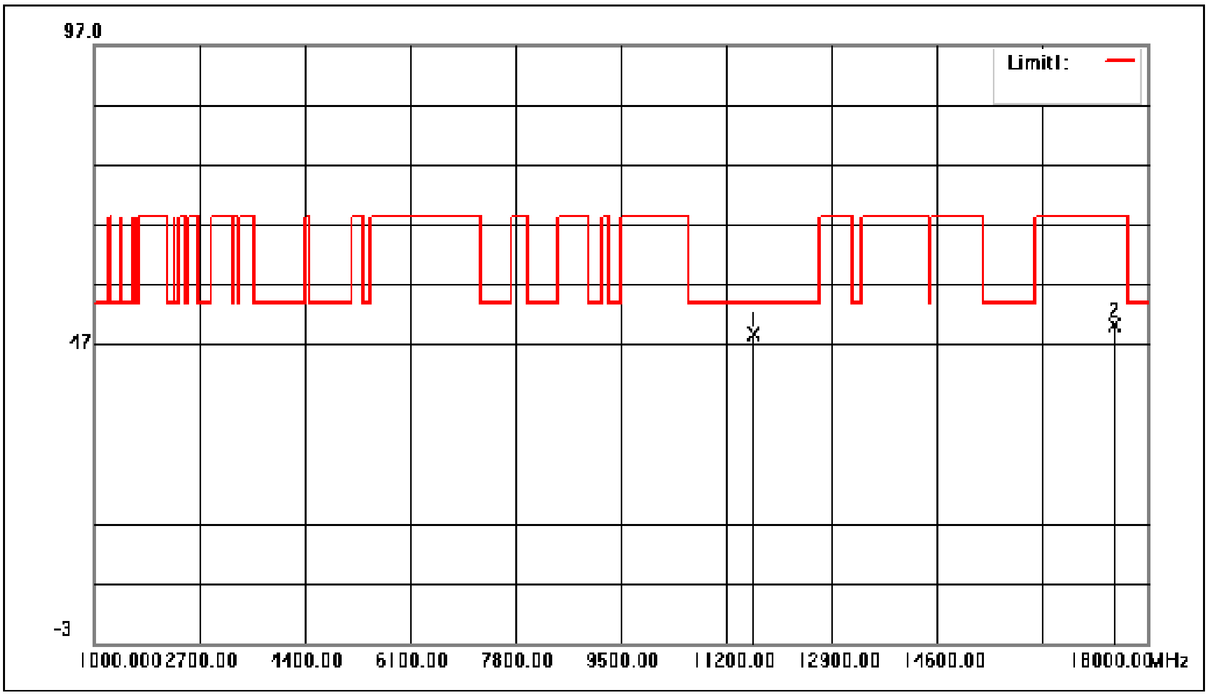
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11570.000	51.42	-2.33	49.09	54.00	-4.91	peak
2	17355.000	50.46	-0.29	50.17	68.30	-18.13	peak

Mode:d; Polarization:Horizontal; Modulation:ac; bandwidth:20MHz; Channel:High



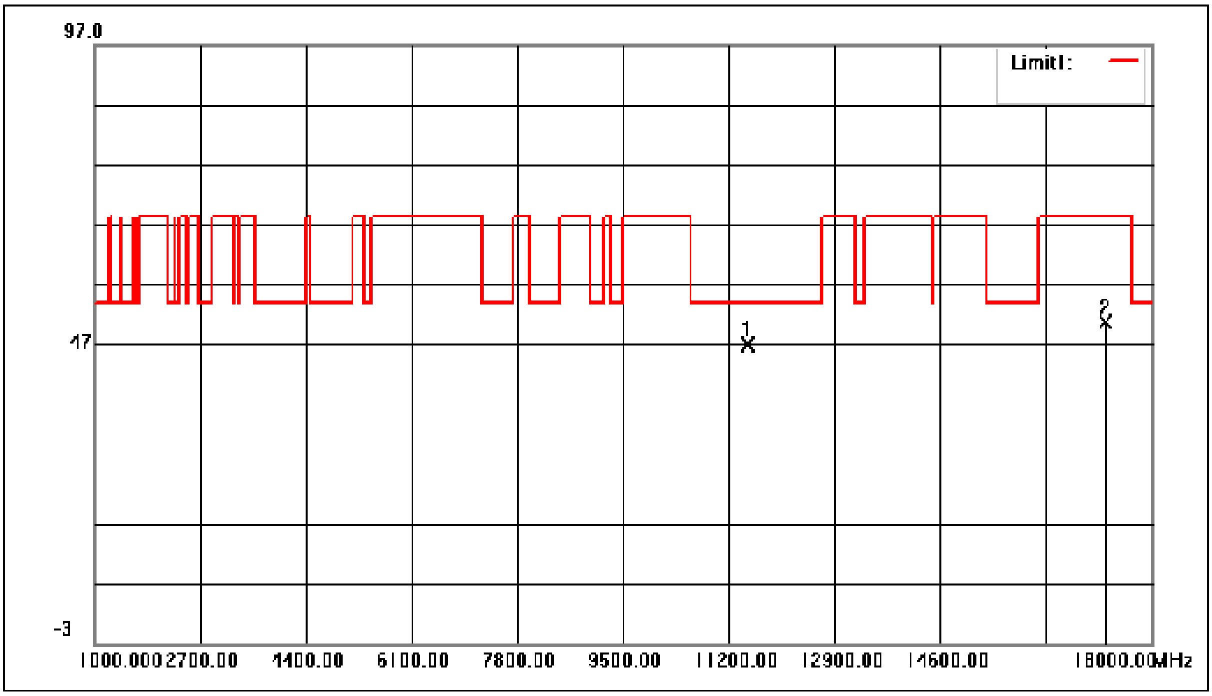
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11650.000	51.04	-2.40	48.64	54.00	-5.36	peak
2	17475.000	51.38	-0.39	50.99	68.30	-17.31	peak

Mode:d; Polarization:Vertical; Modulation:ac; bandwidth:20MHz; Channel:High



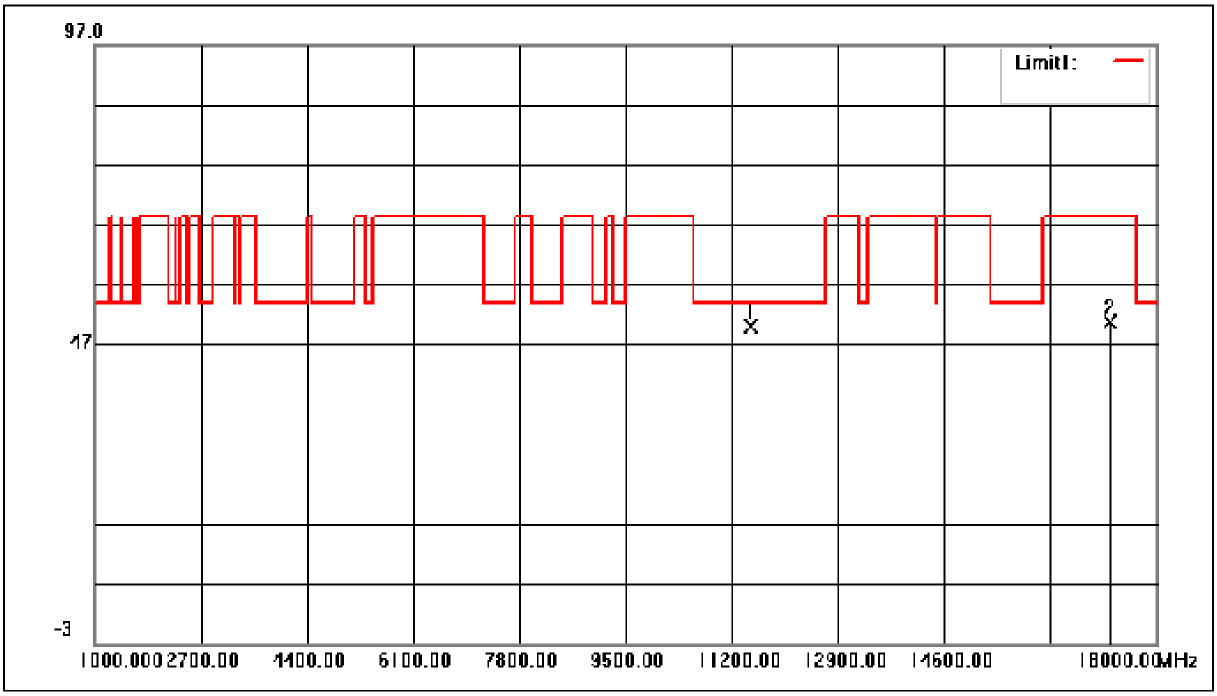
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11650.000	50.96	-2.40	48.56	54.00	-5.44	peak
2	17475.000	50.63	-0.39	50.24	68.30	-18.06	peak

Mode:d; Polarization:Horizontal; Modulation:ac; bandwidth:40MHz; Channel:Low



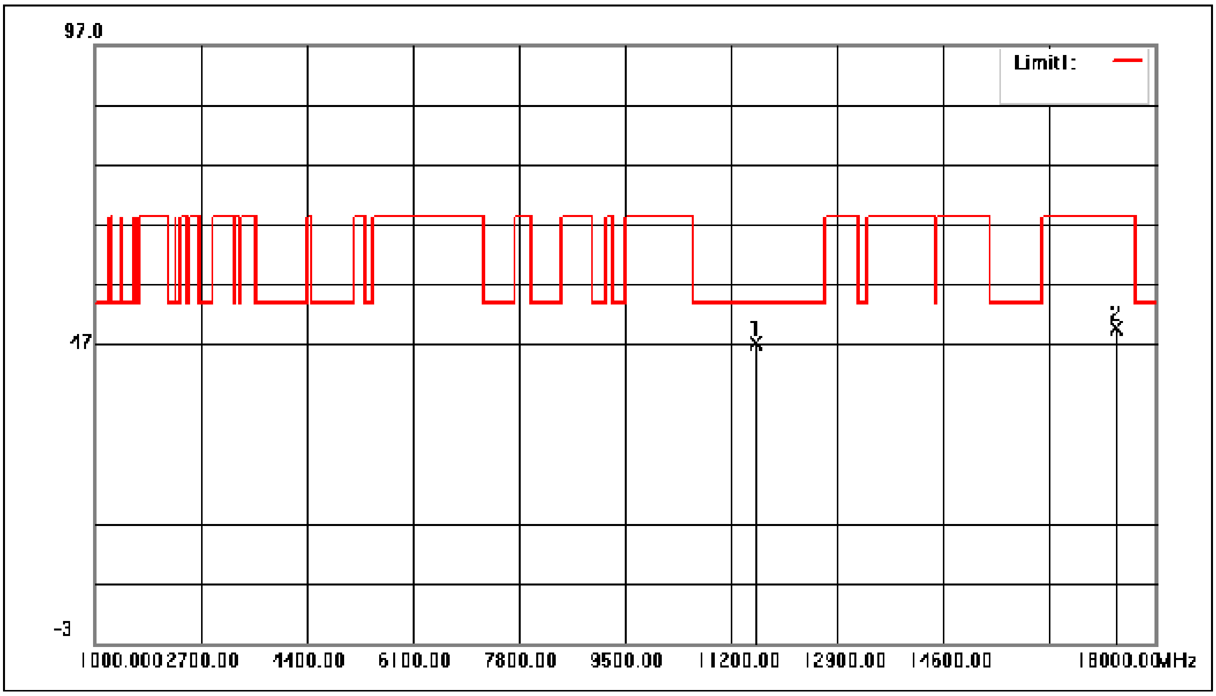
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11510.000	49.27	-2.27	47.00	54.00	-7.00	peak
2	17265.000	50.74	-0.22	50.52	68.30	-17.78	peak

Mode:d; Polarization:Vertical; Modulation:ac; bandwidth:40MHz; Channel:Low



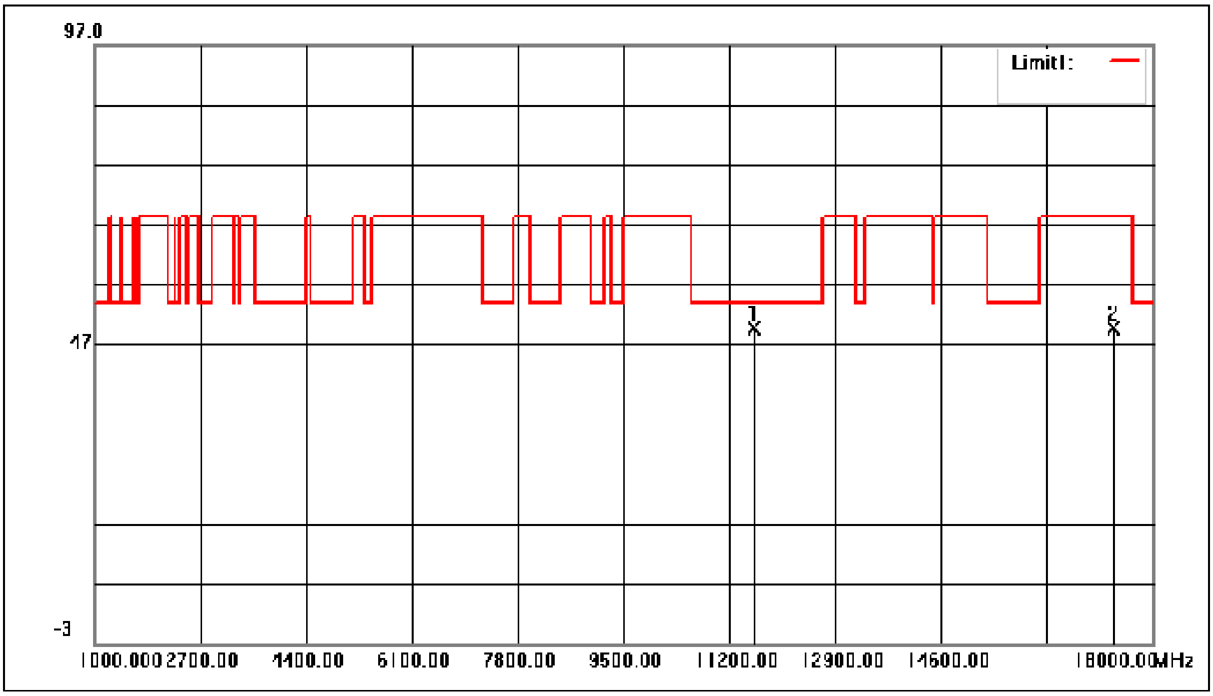
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11510.000	52.22	-2.27	49.95	54.00	-4.05	peak
2	17265.000	50.78	-0.22	50.56	68.30	-17.74	peak

Mode:d; Polarization:Horizontal; Modulation:ac; bandwidth:40MHz; Channel:High



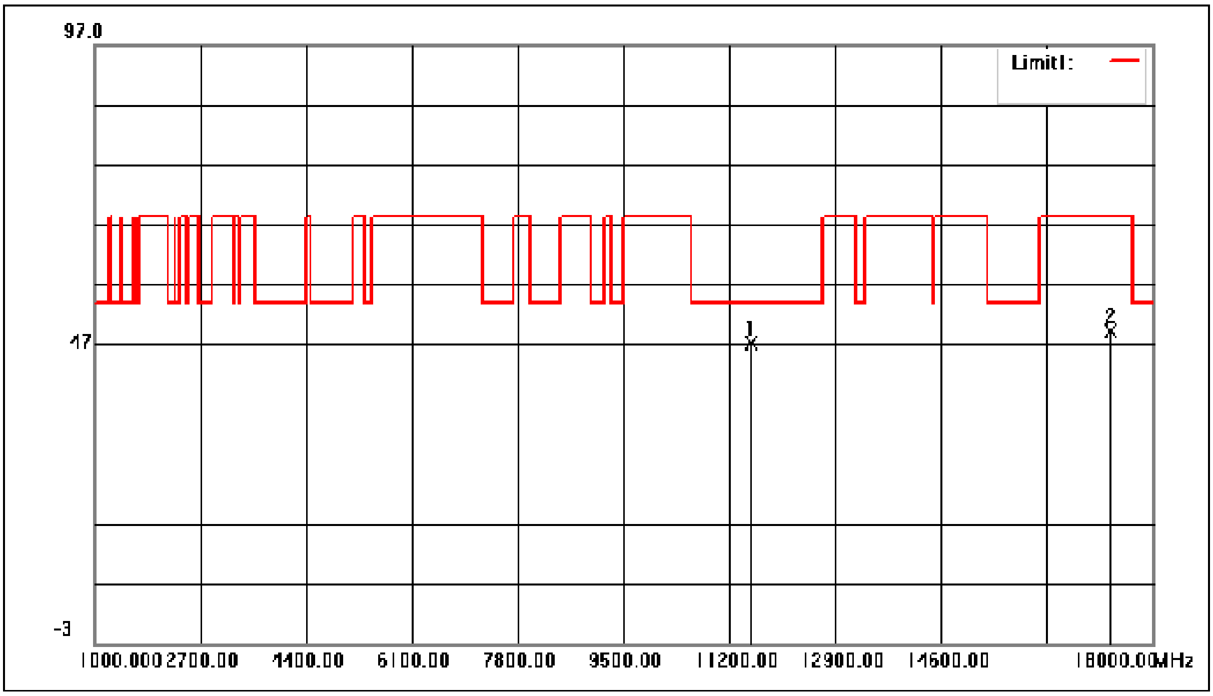
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11590.000	49.46	-2.34	47.12	54.00	-6.88	peak
2	17385.000	49.91	-0.32	49.59	68.30	-18.71	peak

Mode:d; Polarization:Vertical; Modulation:ac; bandwidth:40MHz; Channel:High



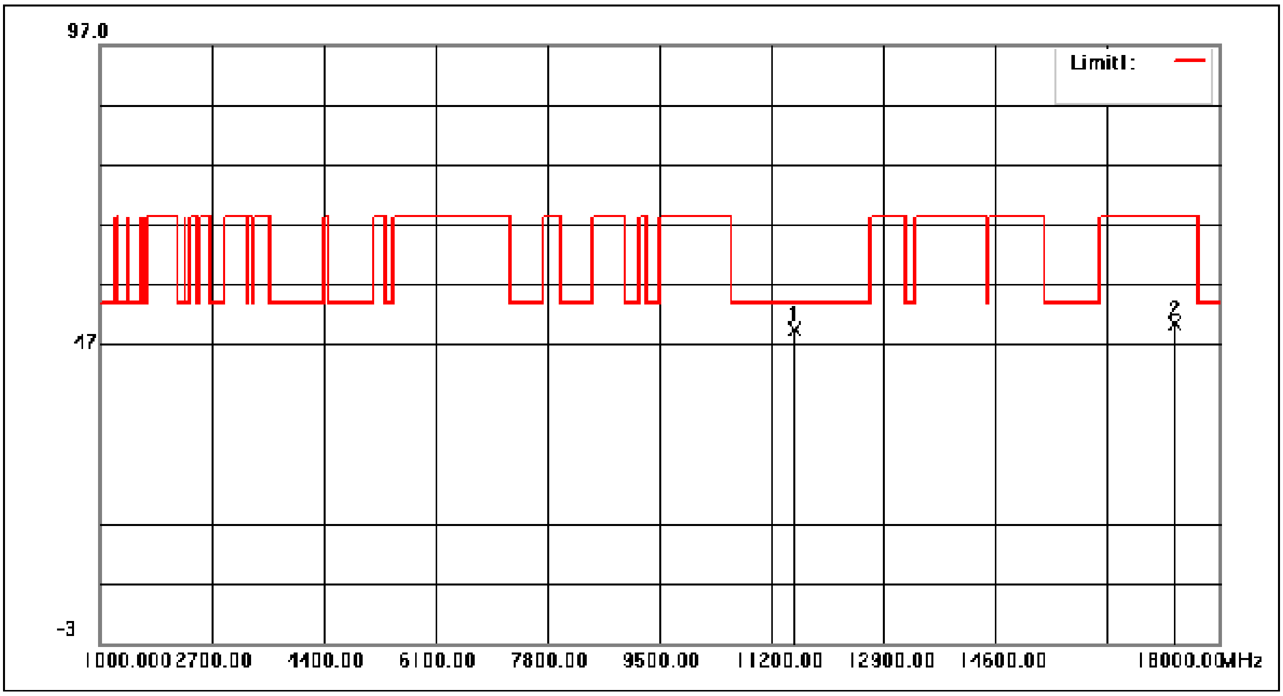
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11590.000	51.86	-2.34	49.52	54.00	-4.48	peak
2	17385.000	50.03	-0.32	49.71	68.30	-18.59	peak

Mode:d; Polarization:Horizontal; Modulation:ac; bandwidth:80MHz; Channel:Low



No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11550.000	49.49	-2.31	47.18	54.00	-6.82	peak
2	17325.000	49.47	-0.27	49.20	68.30	-19.10	peak

Mode:d; Polarization:Vertical; Modulation:ac; bandwidth:80MHz; Channel:Low



No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	11550.000	51.75	-2.31	49.44	54.00	-4.56	peak
2	17325.000	50.53	-0.27	50.26	68.30	-18.04	peak

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
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.		

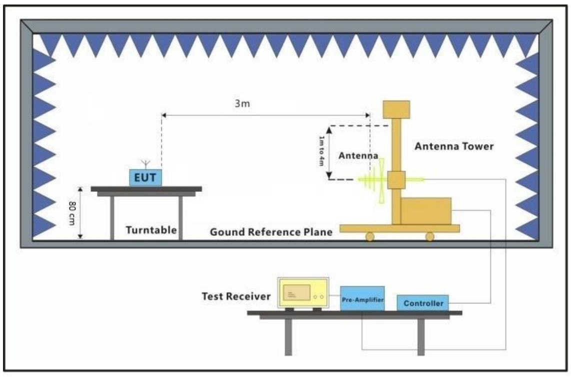
7.8.1 E.U.T. Operation

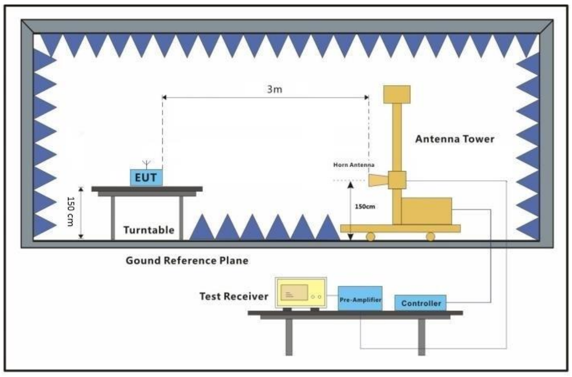
Operating Environment:

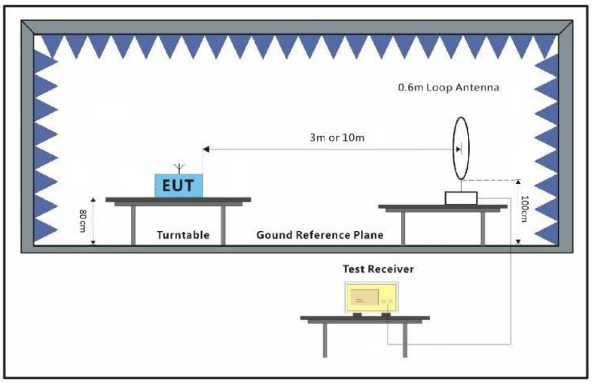
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

The final test mode:	c:TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
	d:TX mode (Band 4)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.8.2 Test Setup Diagram


3m
1m to 4m
Antenna
Antenna Tower
EUT
80 cm
Turntable
Gound Reference Plane
Test Receiver
Pre-Amplifier
Controller


3m
Antenna Tower
Horn Antenna
EUT
150 cm
150cm
Turntable
Gound Reference Plane
Test Receiver
Pre-Amplifier
Controller


0.6m Loop Antenna
3m or 10m
EUT
80 cm
100cm
Turntable
Gound Reference Plane
Test Receiver

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.

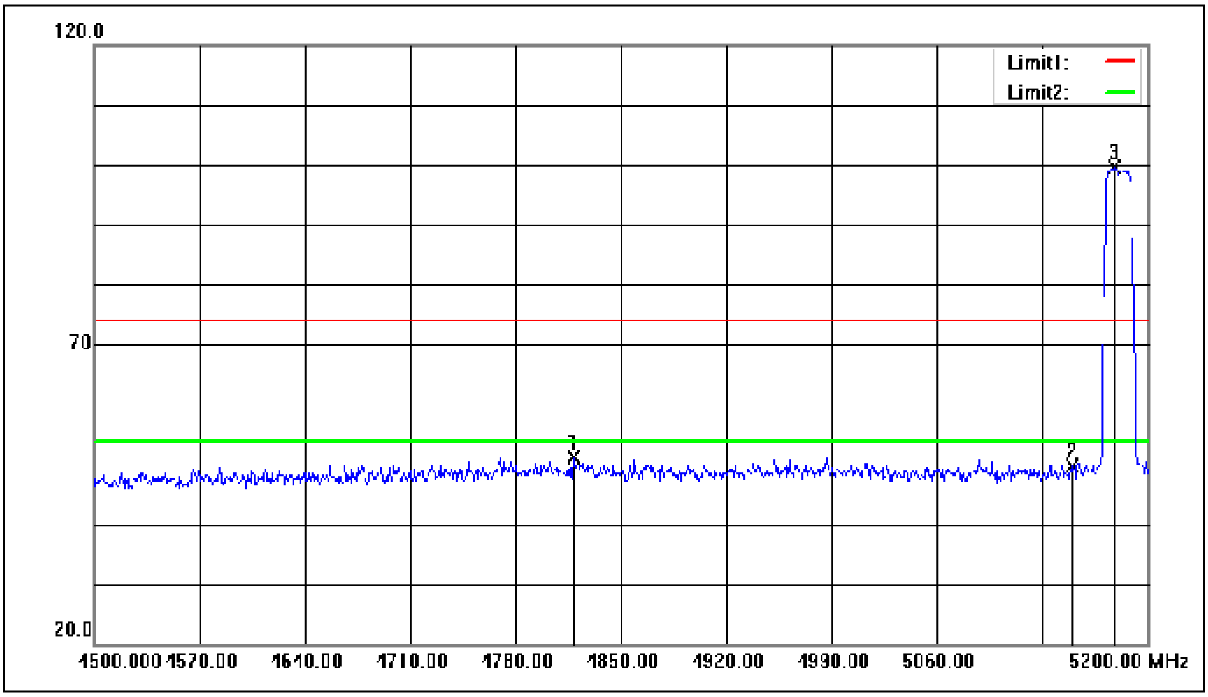
Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: 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.

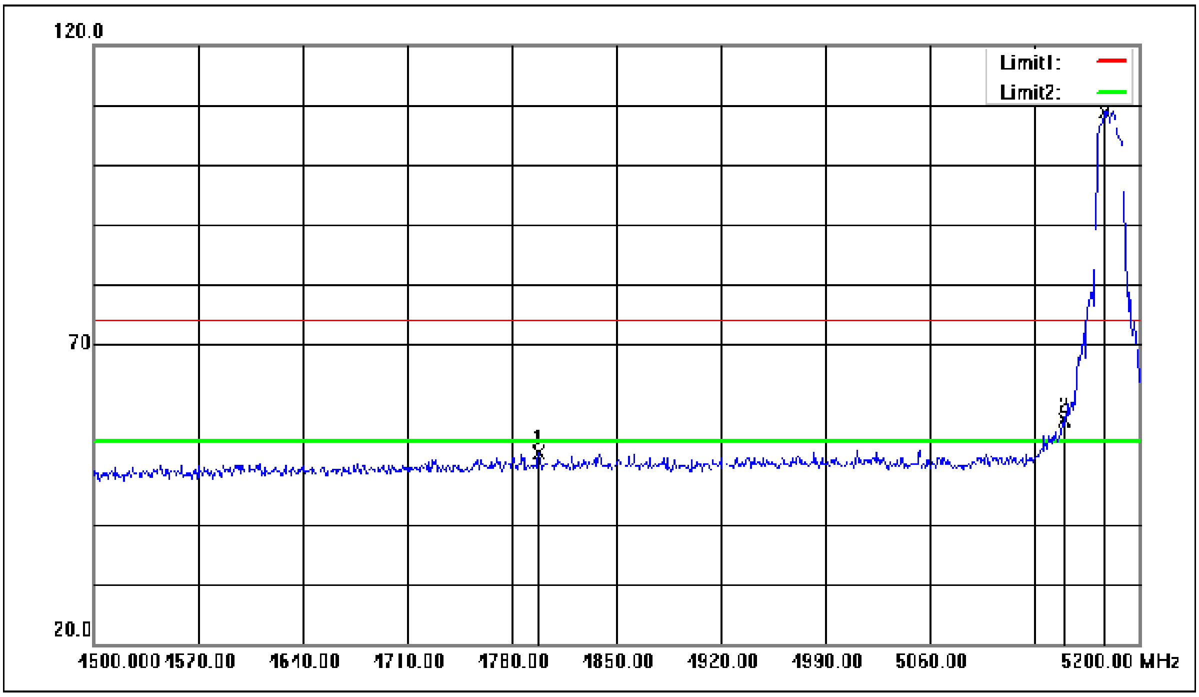
Remark 3: This test item was investigated while operating in SISO and MIMO mode, however, it was determined that SISO antenna 1 operation for a modulation and MIMO antenna operation for n/ac modulation produced the worst emissions. So the emissions produced from other operation are not recorded in report.

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



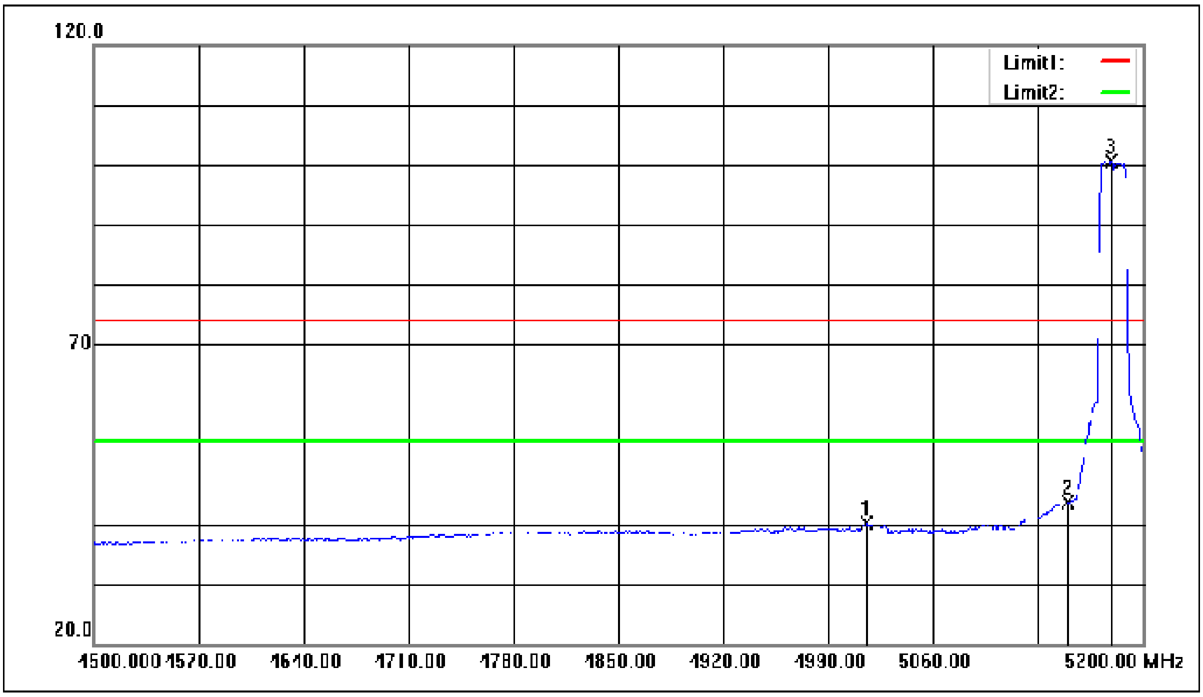
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	4818.500	50.56	0.55	51.11	74.00	-22.89	peak
2	5150.000	48.49	1.05	49.54	74.00	-24.46	peak
3	5177.600	98.44	1.07	99.51	74.00	25.51	peak

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



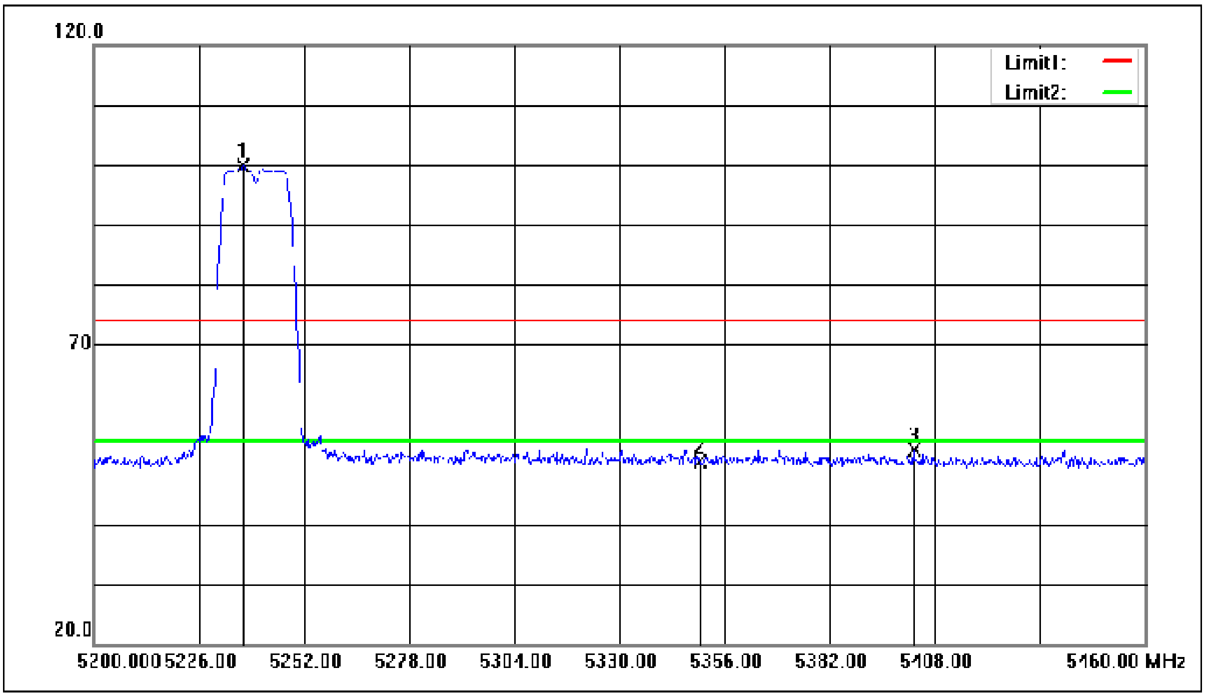
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	4798.200	51.34	0.50	51.84	74.00	-22.16	peak
2	5150.000	56.33	1.05	57.38	74.00	-16.62	peak
3	5176.900	107.90	1.07	108.97	74.00	34.97	peak

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



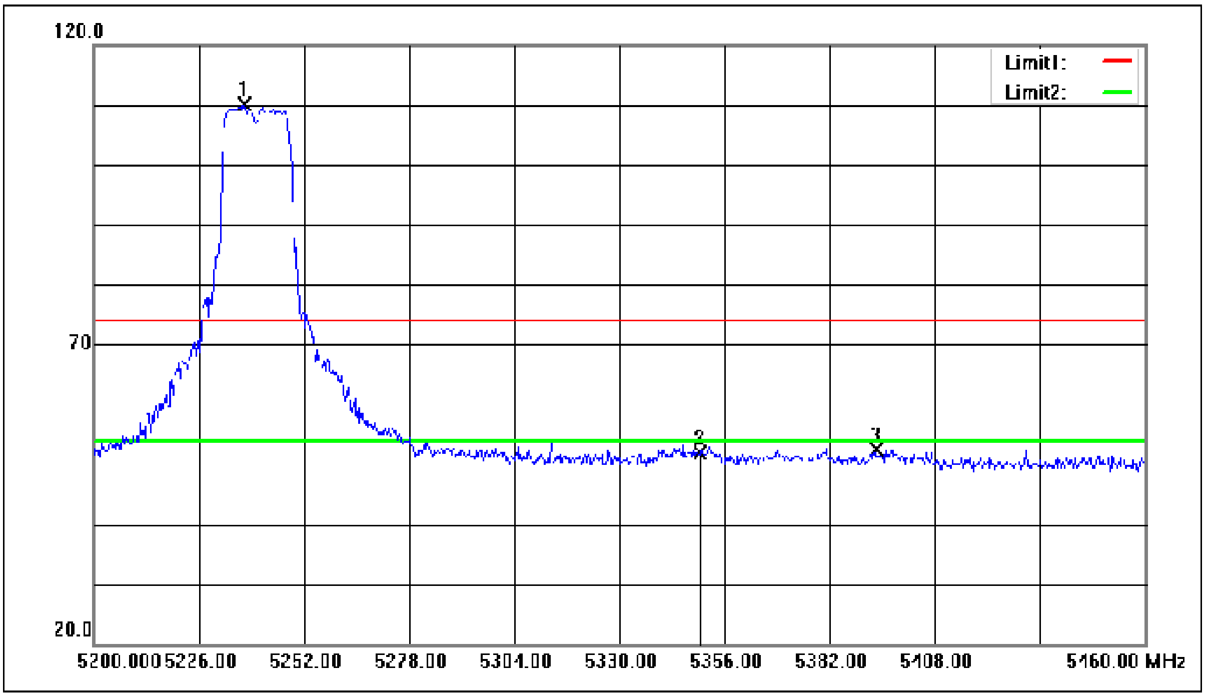
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5015.900	39.08	0.97	40.05	54.00	-13.95	AVG
2	5150.000	42.54	1.05	43.59	54.00	-10.41	AVG
3	5179.000	99.61	1.07	100.68	54.00	46.68	AVG

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



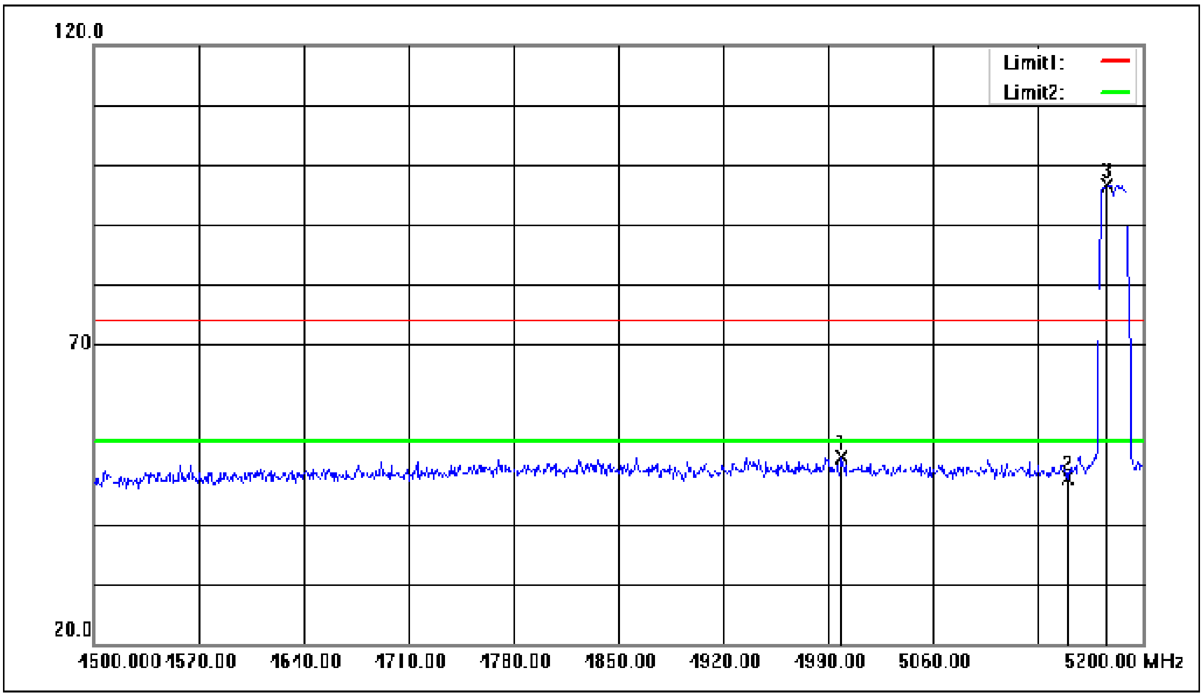
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5236.920	98.73	1.11	99.84	74.00	25.84	peak
2	5350.000	49.24	1.18	50.42	74.00	-23.58	peak
3	5402.800	51.07	1.21	52.28	74.00	-21.72	peak

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



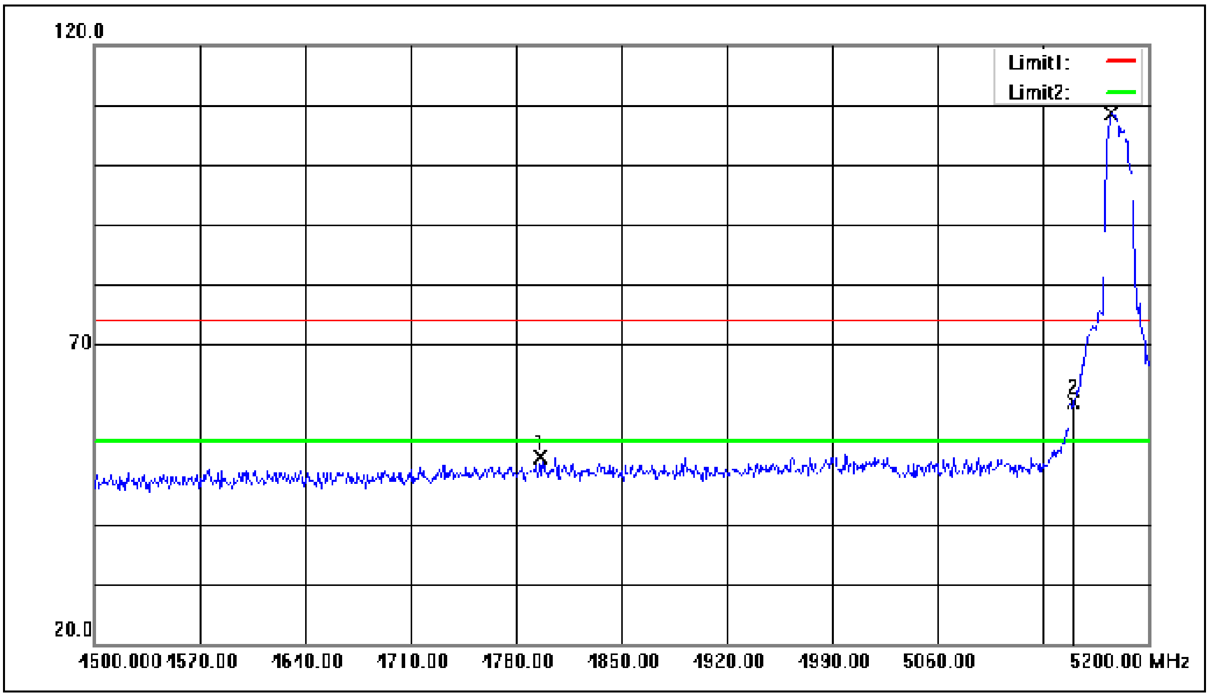
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5237.180	108.97	1.11	110.08	74.00	36.08	peak
2	5350.000	50.82	1.18	52.00	74.00	-22.00	peak
3	5393.440	51.10	1.20	52.30	74.00	-21.70	peak

Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



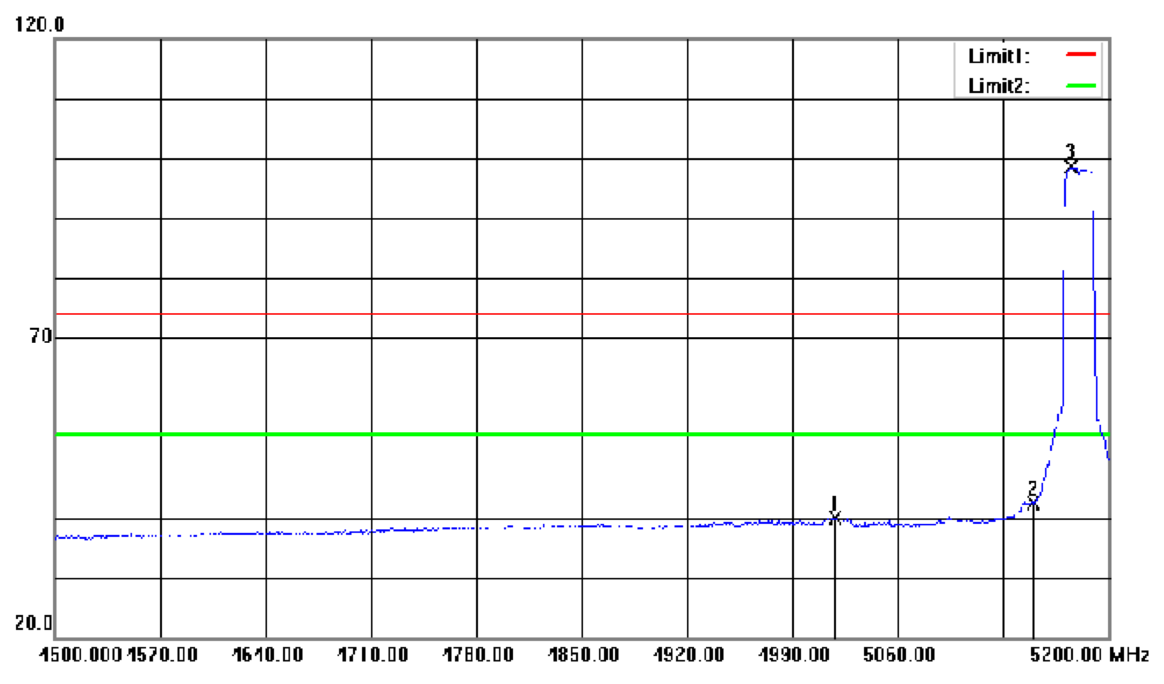
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	4999.100	50.09	0.96	51.05	74.00	-22.95	peak
2	5150.000	46.49	1.05	47.54	74.00	-26.46	peak
3	5176.200	95.48	1.07	96.55	74.00	22.55	peak

Mode:c; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



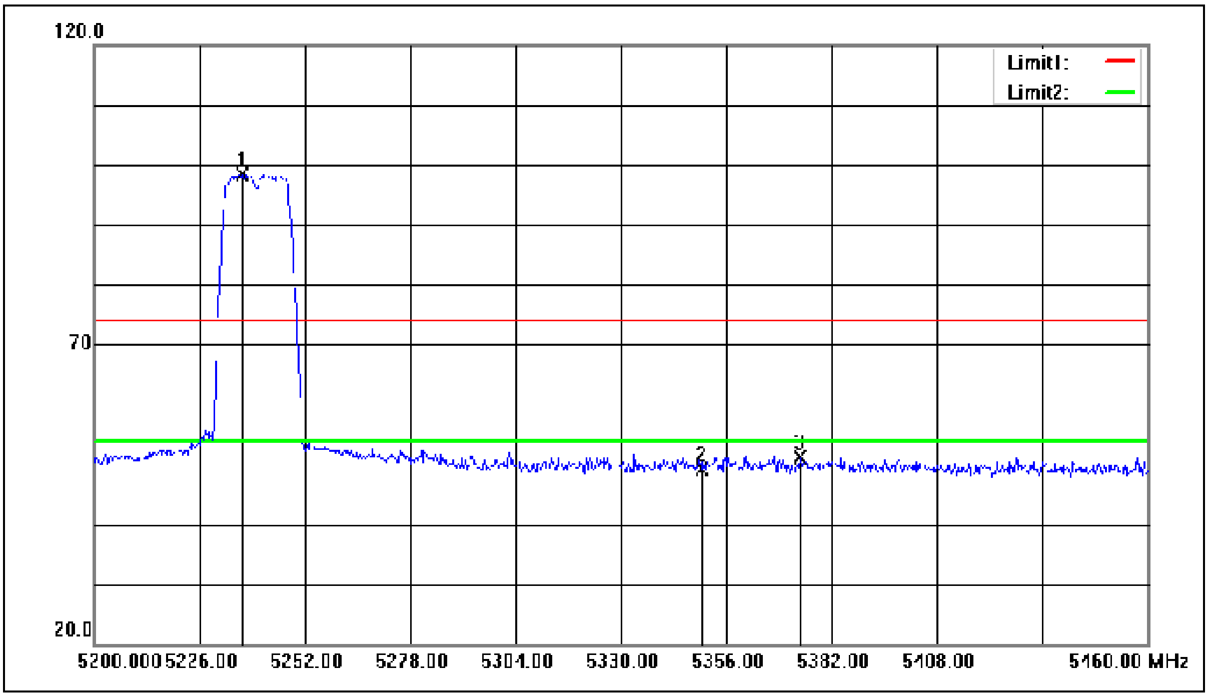
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	4796.100	50.71	0.50	51.21	74.00	-22.79	peak
2	5150.000	59.36	1.05	60.41	74.00	-13.59	peak
3	5175.500	107.57	1.07	108.64	74.00	34.64	peak

Mode:c; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



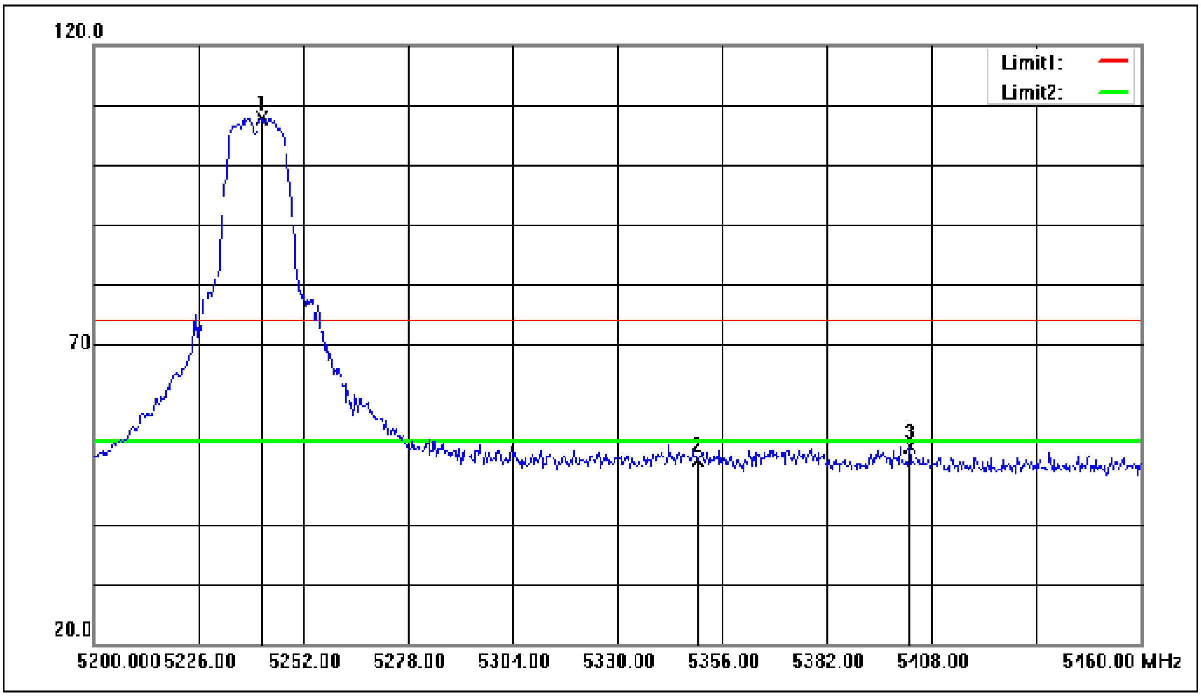
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5018.000	38.94	0.97	39.91	54.00	-14.09	AVG
2	5150.000	41.42	1.05	42.47	54.00	-11.53	AVG
3	5174.800	97.48	1.07	98.55	54.00	44.55	AVG

Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



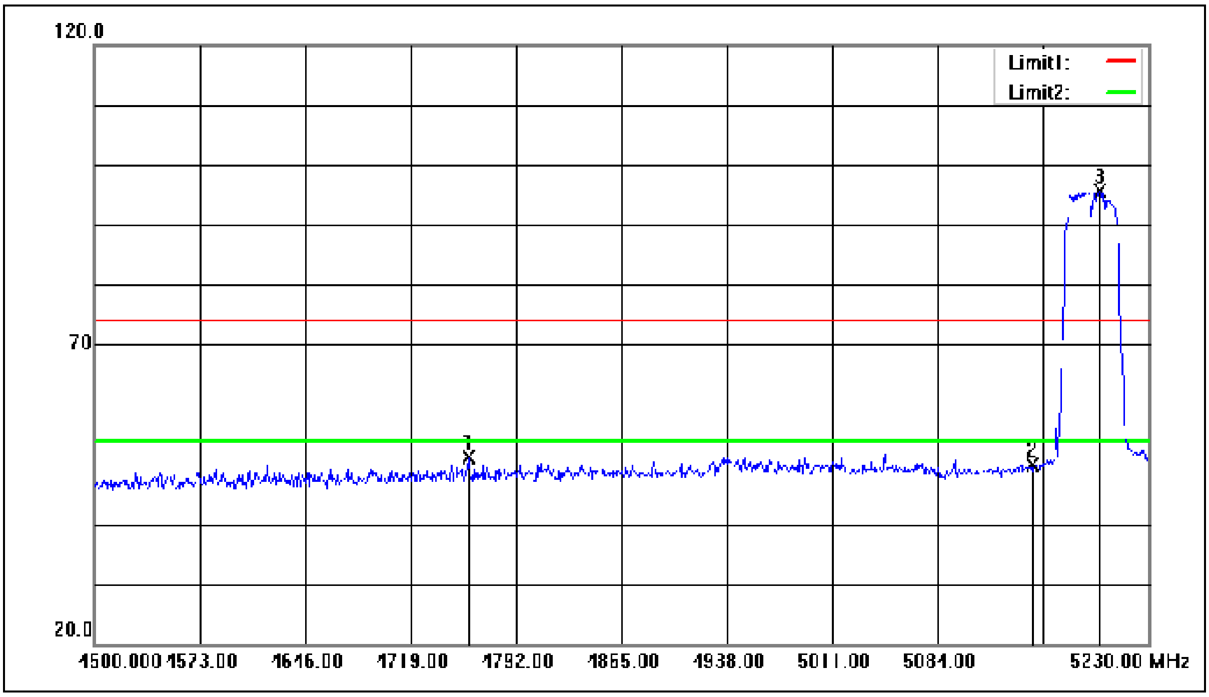
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5236.400	97.31	1.11	98.42	74.00	24.42	peak
2	5350.000	48.02	1.18	49.20	74.00	-24.80	peak
3	5374.200	50.01	1.19	51.20	74.00	-22.80	peak

Mode:c; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



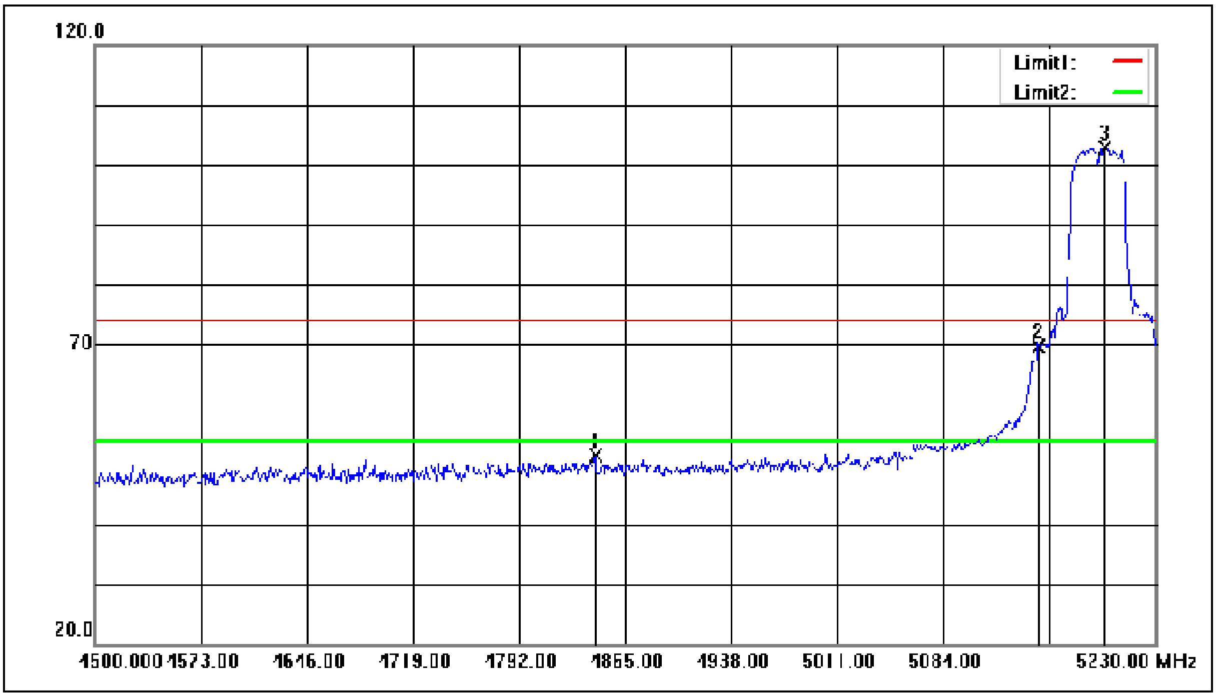
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5241.600	106.74	1.11	107.85	74.00	33.85	peak
2	5350.000	49.54	1.18	50.72	74.00	-23.28	peak
3	5402.540	51.64	1.21	52.85	74.00	-21.15	peak

Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:Low



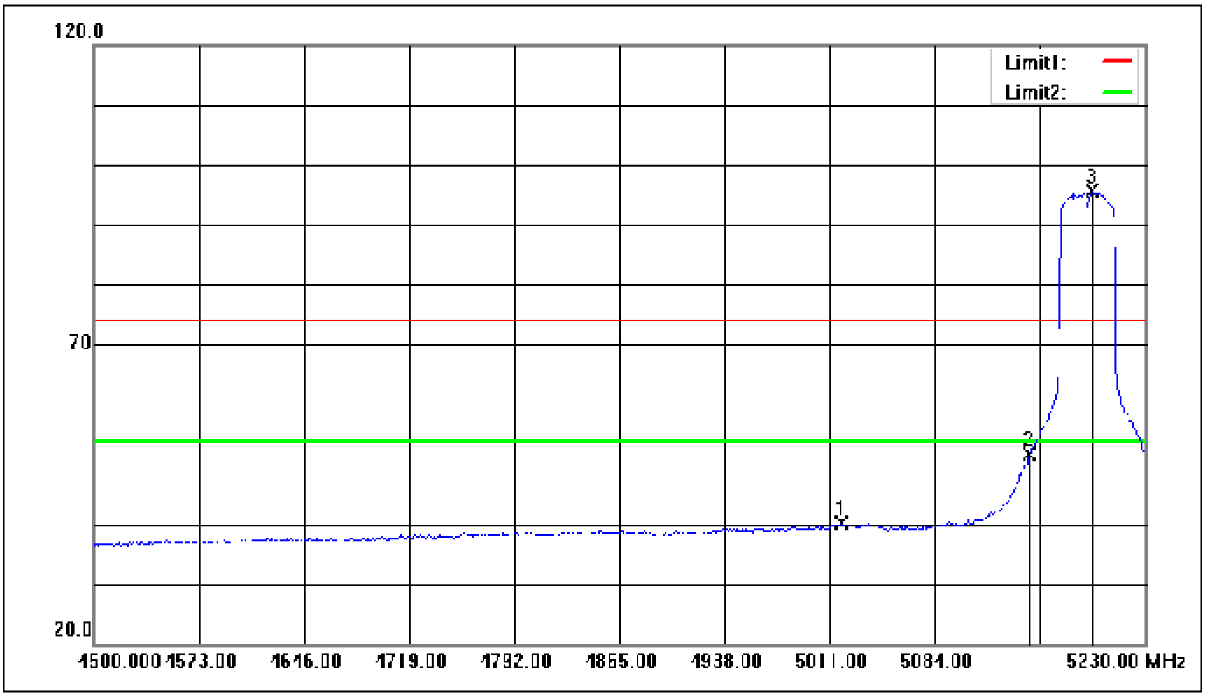
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	4759.150	50.77	0.42	51.19	74.00	-22.81	peak
2	5150.000	48.90	1.05	49.95	74.00	-24.05	peak
3	5196.420	94.47	1.08	95.55	74.00	21.55	peak

Mode:c; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:Low



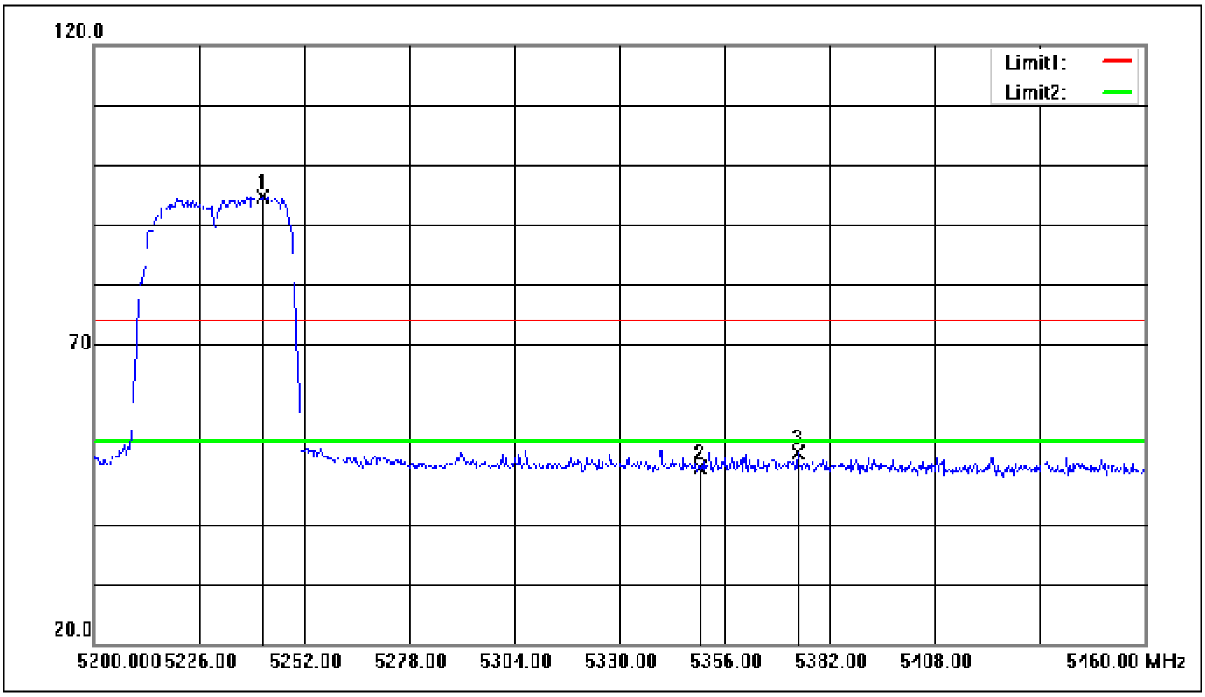
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	4844.560	50.72	0.61	51.33	74.00	-22.67	peak
2	5150.000	68.64	1.05	69.69	74.00	-4.31	peak
3	5195.690	101.89	1.08	102.97	74.00	28.97	peak

Mode:c; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:Low



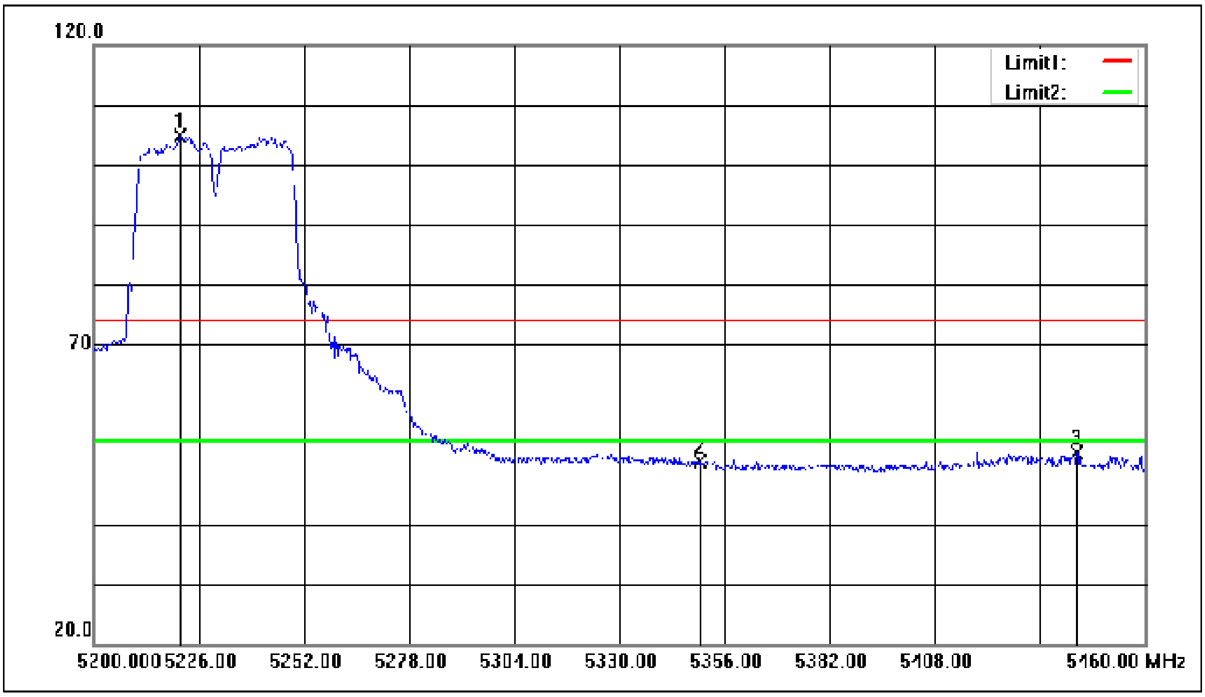
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5019.030	39.08	0.97	40.05	54.00	-13.95	AVG
2	5150.000	50.55	1.05	51.60	54.00	-2.40	AVG
3	5193.500	94.52	1.08	95.60	54.00	41.60	AVG

Mode:c; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:High



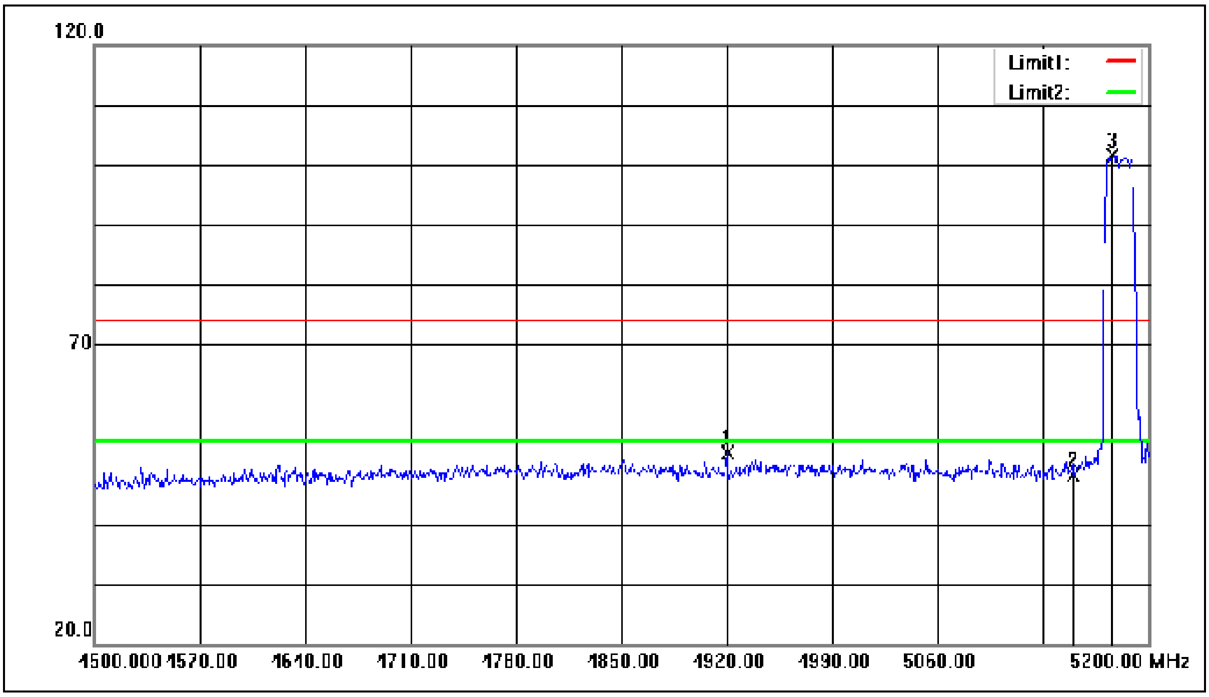
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5241.600	93.62	1.11	94.73	74.00	20.73	peak
2	5350.000	48.09	1.18	49.27	74.00	-24.73	peak
3	5374.200	50.72	1.19	51.91	74.00	-22.09	peak

Mode:c; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:High



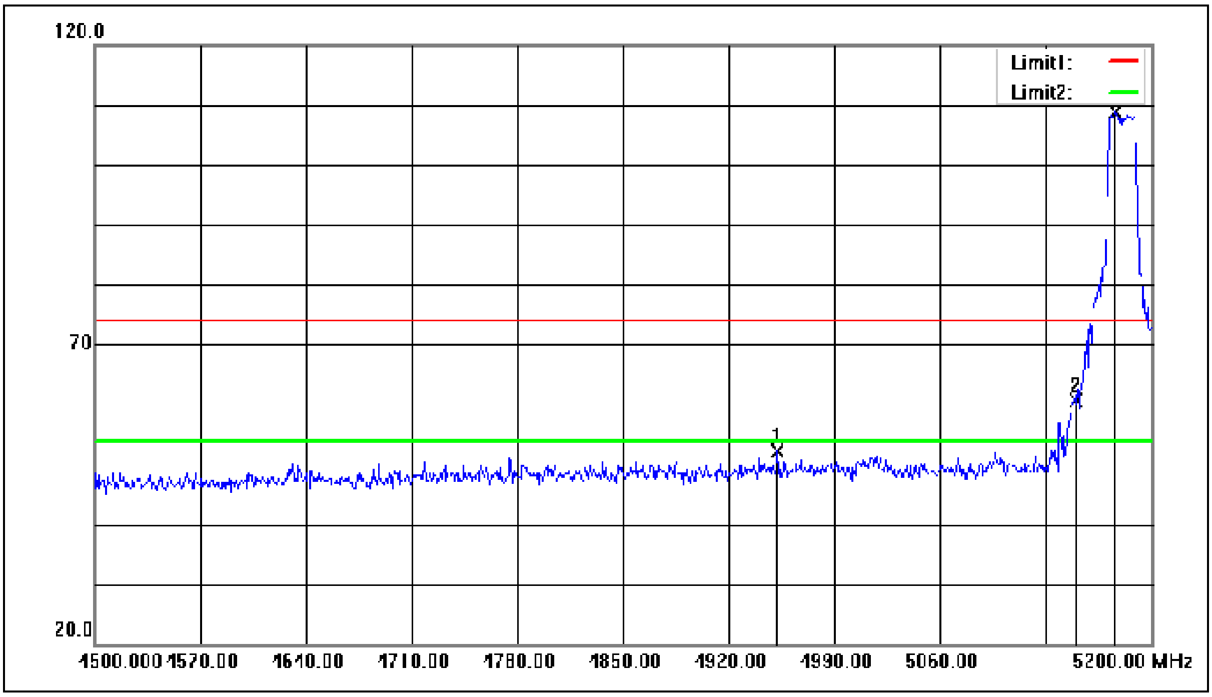
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5221.320	103.73	1.10	104.83	74.00	30.83	peak
2	5350.000	49.17	1.18	50.35	74.00	-23.65	peak
3	5443.100	50.60	1.23	51.83	74.00	-22.17	peak

Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:20MHz; Channel:Low



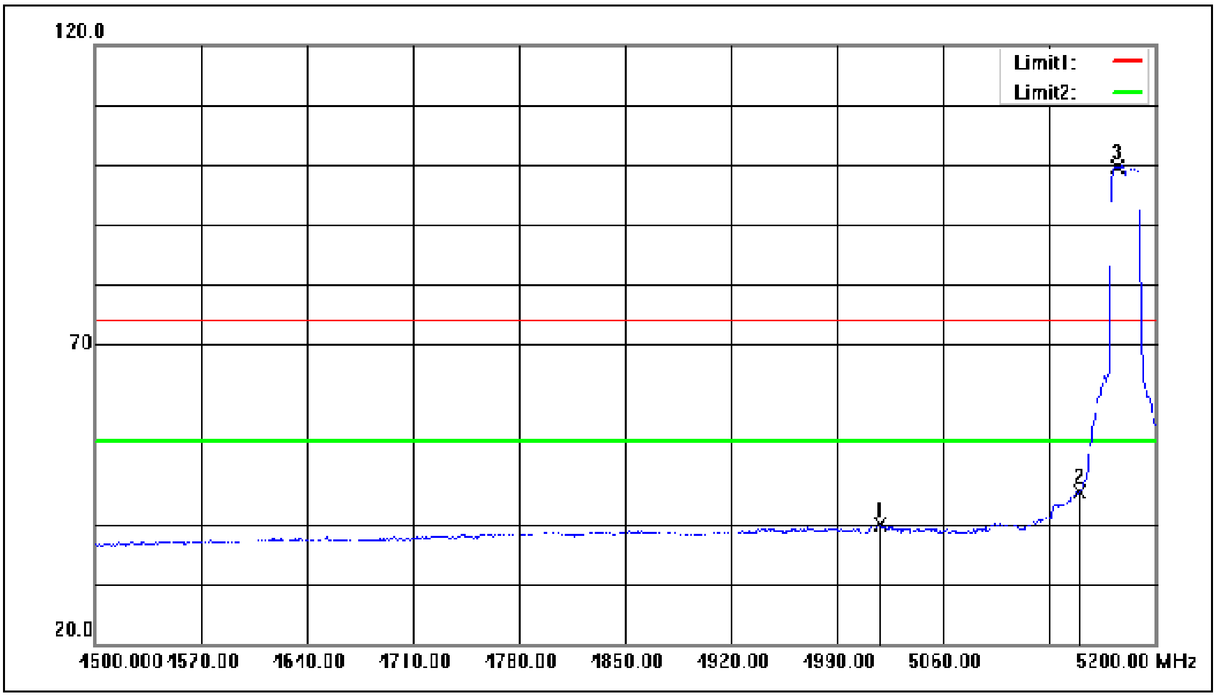
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	4920.000	51.17	0.78	51.95	74.00	-22.05	peak
2	5150.000	47.14	1.05	48.19	74.00	-25.81	peak
3	5176.200	100.64	1.07	101.71	74.00	27.71	peak

Mode:c; Polarization:Vertical; Modulation:c; bandwidth:20MHz; Channel:Low



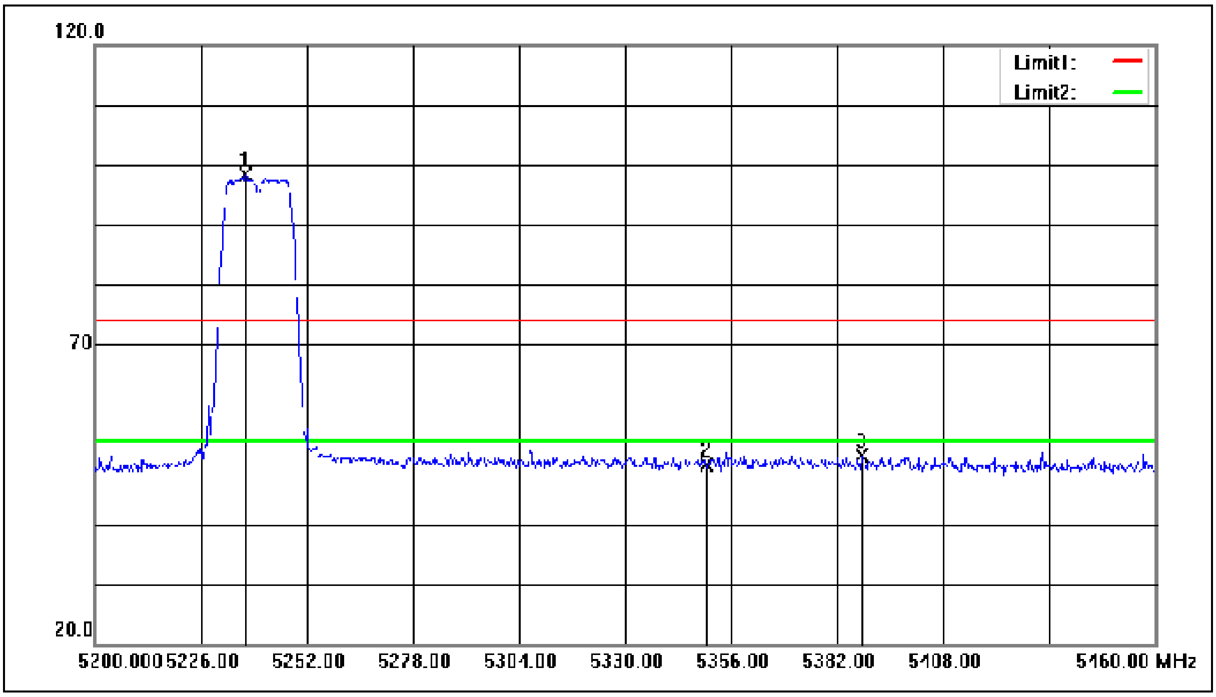
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	4952.200	51.29	0.85	52.14	74.00	-21.86	peak
2	5150.000	59.47	1.05	60.52	74.00	-13.48	peak
3	5176.200	107.78	1.07	108.85	74.00	34.85	peak

Mode:c; Polarization:Vertical; Modulation:c; bandwidth:20MHz; Channel:Low



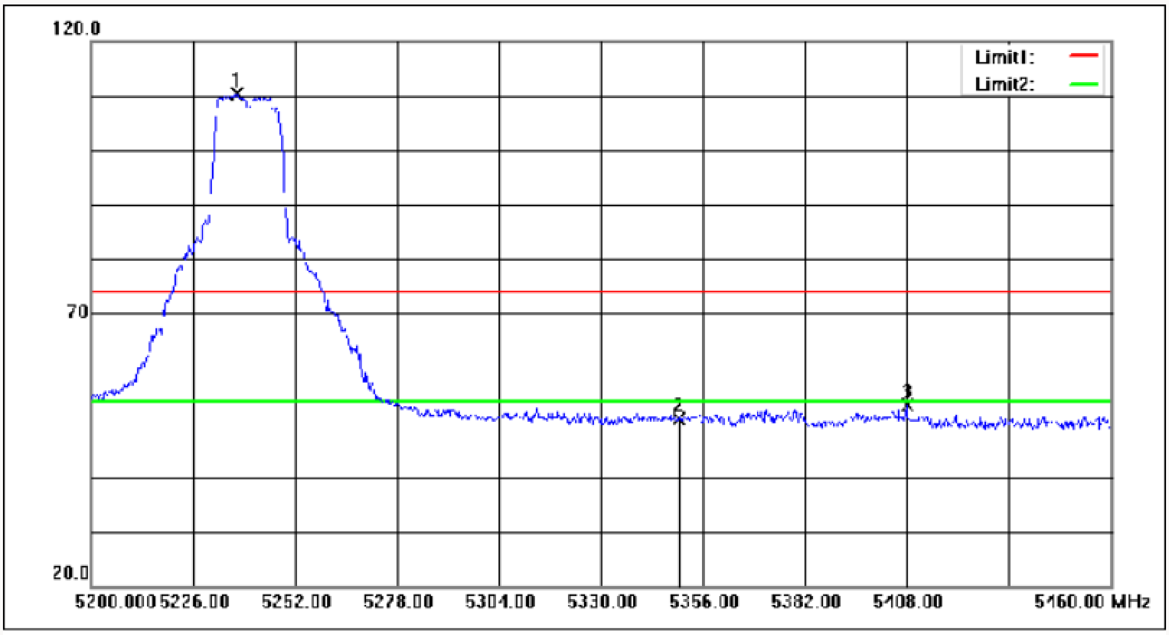
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5018.000	38.83	0.97	39.80	54.00	-14.20	AVG
2	5150.000	44.38	1.05	45.43	54.00	-8.57	AVG
3	5175.500	98.61	1.07	99.68	54.00	45.68	AVG

Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:20MHz; Channel:High



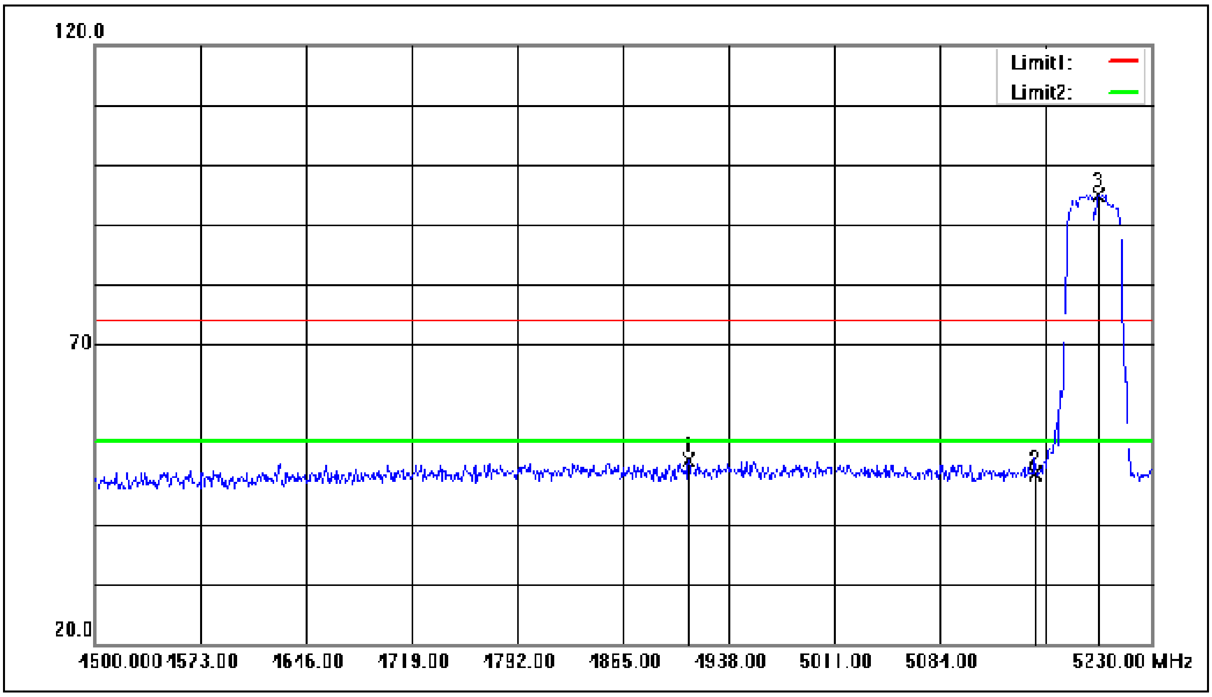
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5236.920	97.15	1.11	98.26	74.00	24.26	peak
2	5350.000	48.70	1.18	49.88	74.00	-24.12	peak
3	5387.980	50.12	1.20	51.32	74.00	-22.68	peak

Mode:c; Polarization:Vertical; Modulation:c; bandwidth:20MHz; Channel:High



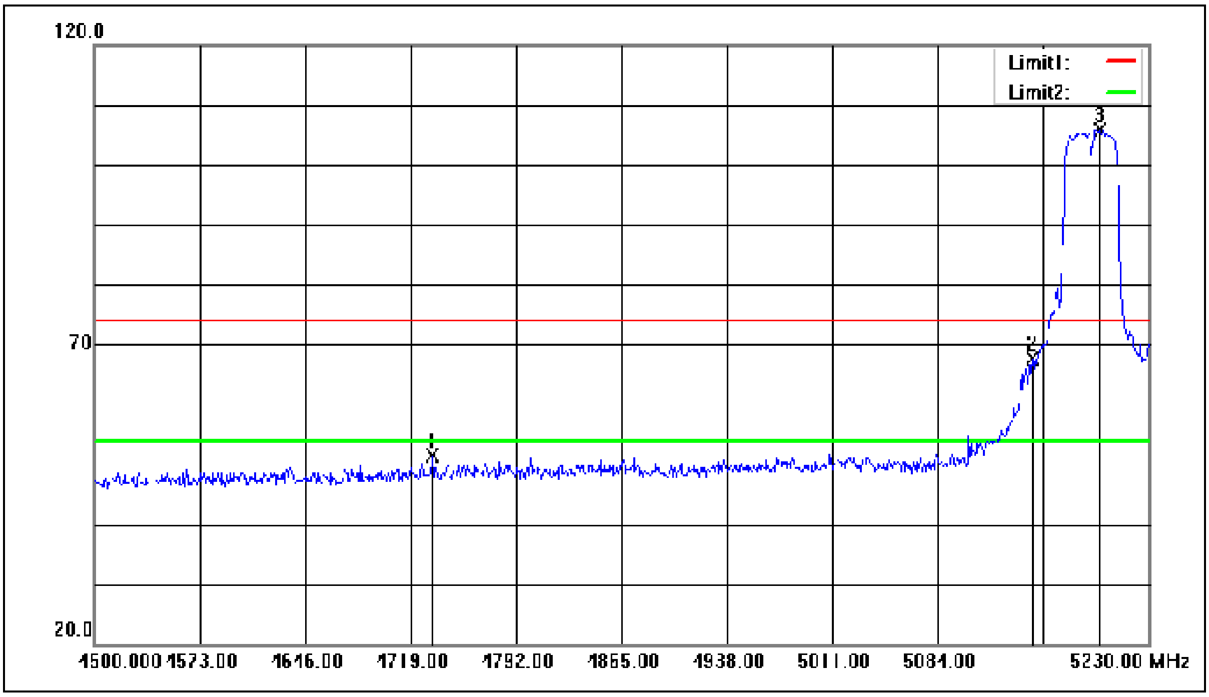
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5237.180	109.30	1.11	110.41	74.00	36.41	peak
2	5350.000	49.35	1.18	50.53	74.00	-23.47	peak
3	5408.000	51.99	1.21	53.20	74.00	-20.80	peak

Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:40MHz; Channel:Low



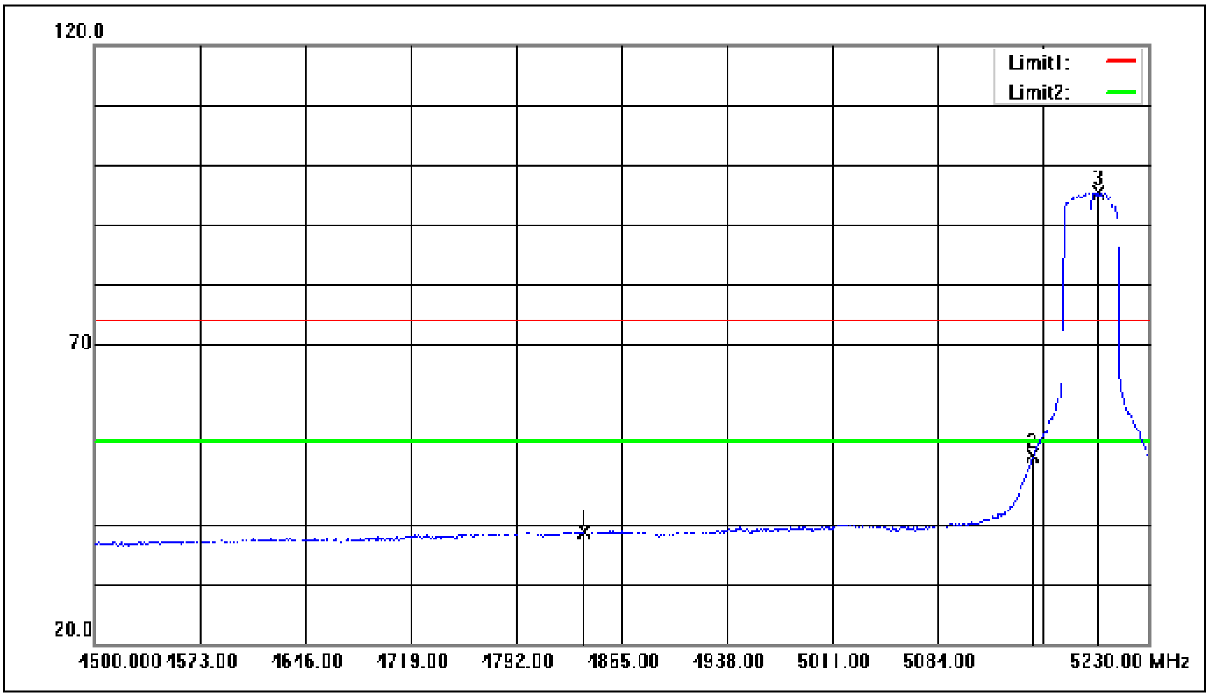
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	4910.260	49.99	0.76	50.75	74.00	-23.25	peak
2	5150.000	47.39	1.05	48.44	74.00	-25.56	peak
3	5193.500	93.79	1.08	94.87	74.00	20.87	peak

Mode:c; Polarization:Vertical; Modulation:c; bandwidth:40MHz; Channel:Low



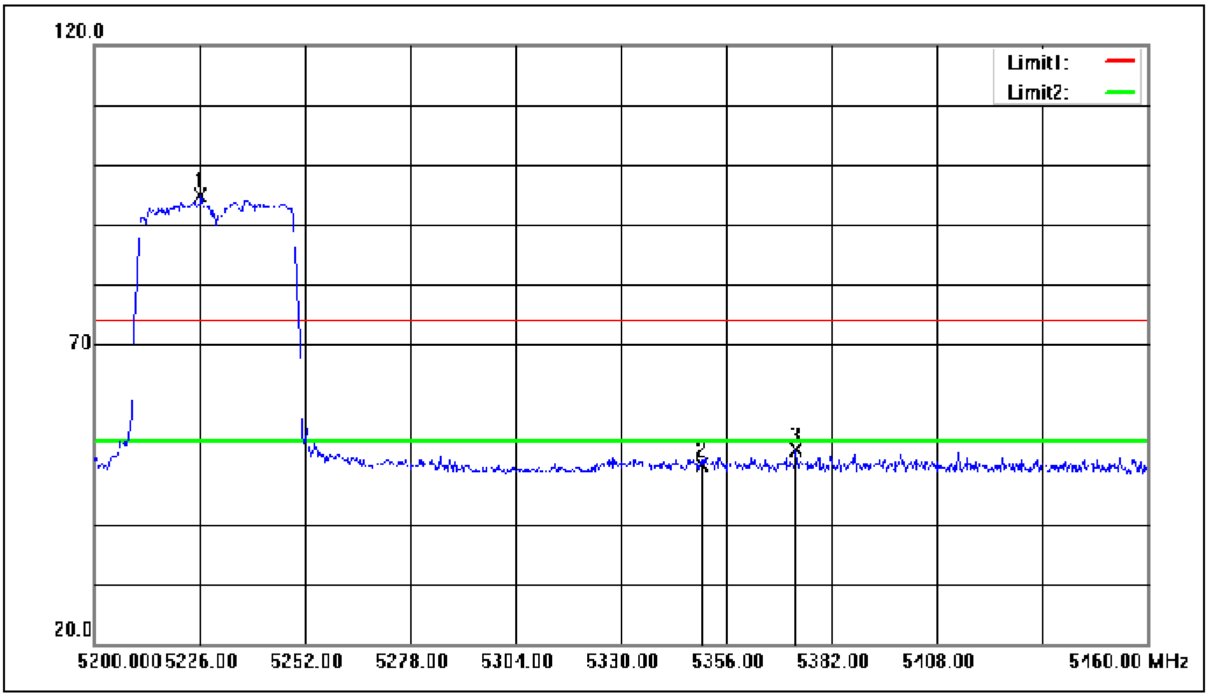
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	4734.330	51.01	0.36	51.37	74.00	-22.63	peak
2	5150.000	66.47	1.05	67.52	74.00	-6.48	peak
3	5196.420	104.86	1.08	105.94	74.00	31.94	peak

Mode:c; Polarization:Vertical; Modulation:c; bandwidth:40MHz; Channel:Low



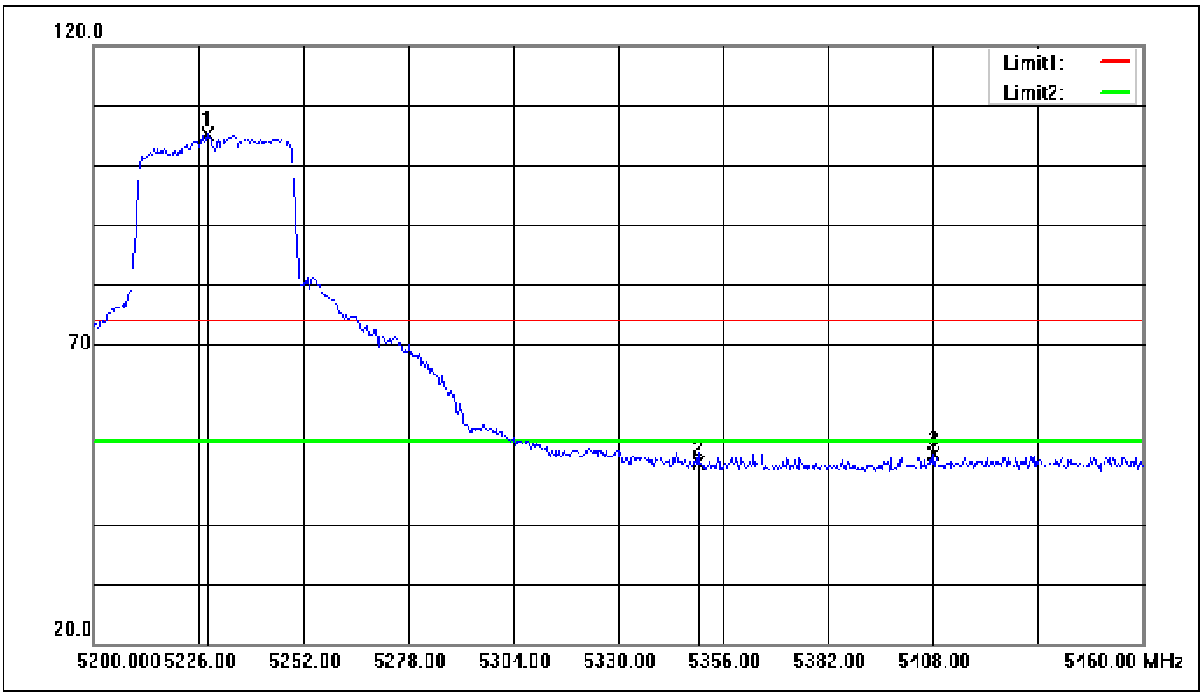
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	4838.720	38.13	0.60	38.73	54.00	-15.27	AVG
2	5150.000	50.29	1.05	51.34	54.00	-2.66	AVG
3	5194.960	94.31	1.08	95.39	54.00	41.39	AVG

Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:40MHz; Channel:High



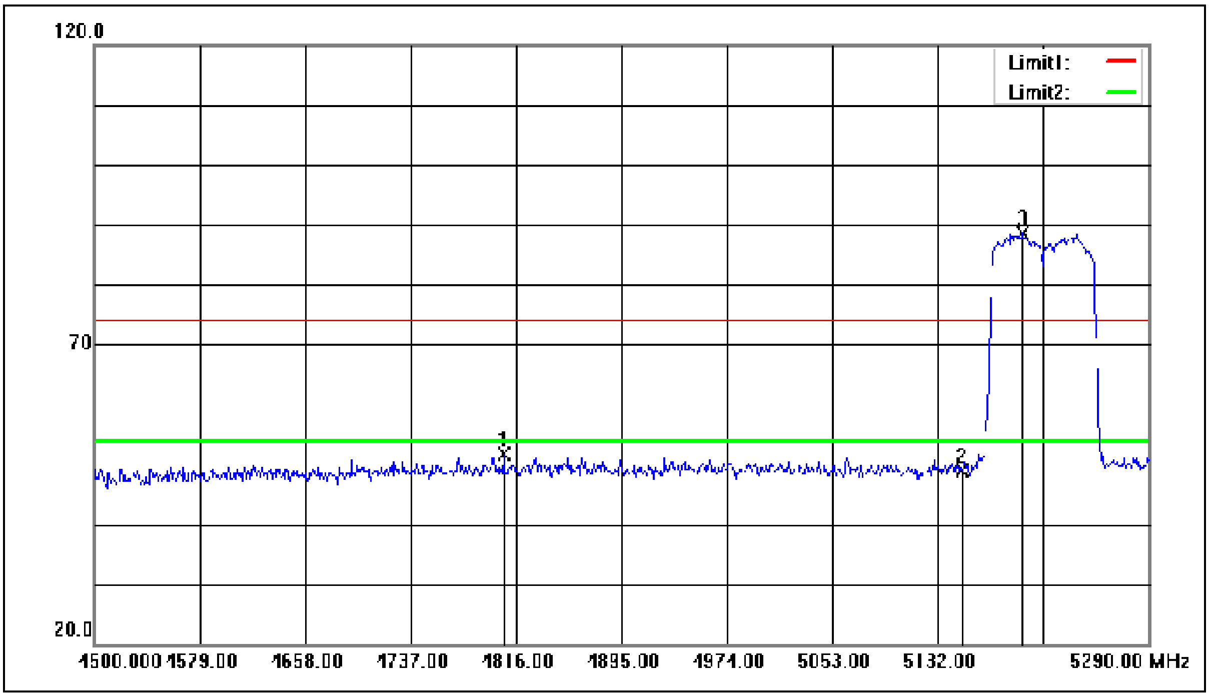
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5226.260	93.86	1.10	94.96	74.00	20.96	peak
2	5350.000	48.73	1.18	49.91	74.00	-24.09	peak
3	5373.160	51.08	1.19	52.27	74.00	-21.73	peak

Mode:c; Polarization:Vertical; Modulation:c; bandwidth:40MHz; Channel:High



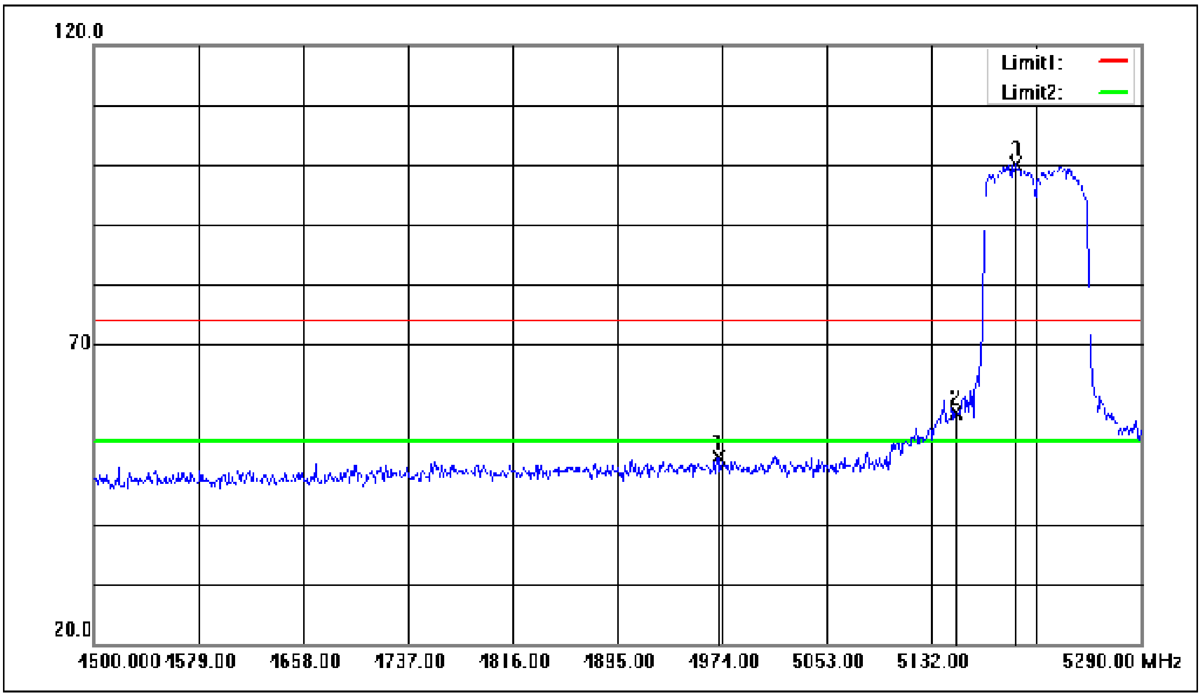
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5228.080	104.06	1.10	105.16	74.00	31.16	peak
2	5350.000	48.86	1.18	50.04	74.00	-23.96	peak
3	5408.260	50.45	1.21	51.66	74.00	-22.34	peak

Mode:c; Polarization:Horizontal; Modulation:c; bandwidth:80MHz; Channel:Low



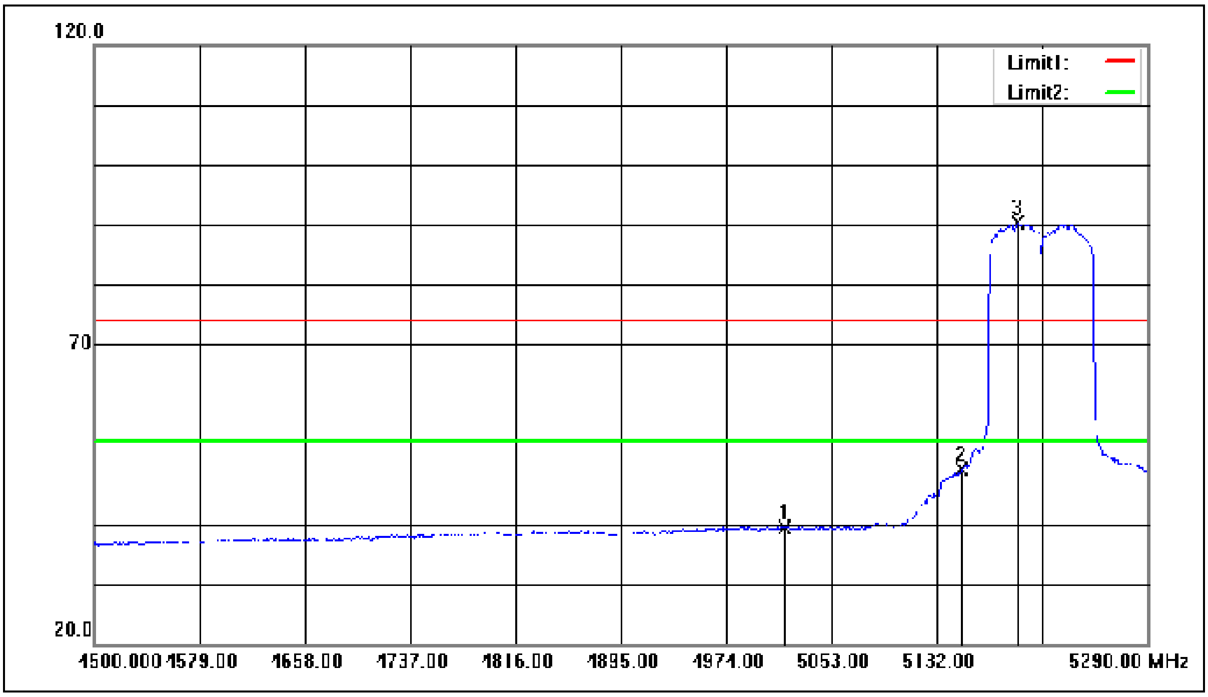
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	4806.520	51.00	0.52	51.52	74.00	-22.48	peak
2	5150.000	47.80	1.05	48.85	74.00	-25.15	peak
3	5195.990	87.62	1.08	88.70	74.00	14.70	peak

Mode:c; Polarization:Vertical; Modulation:c; bandwidth:80MHz; Channel:Low



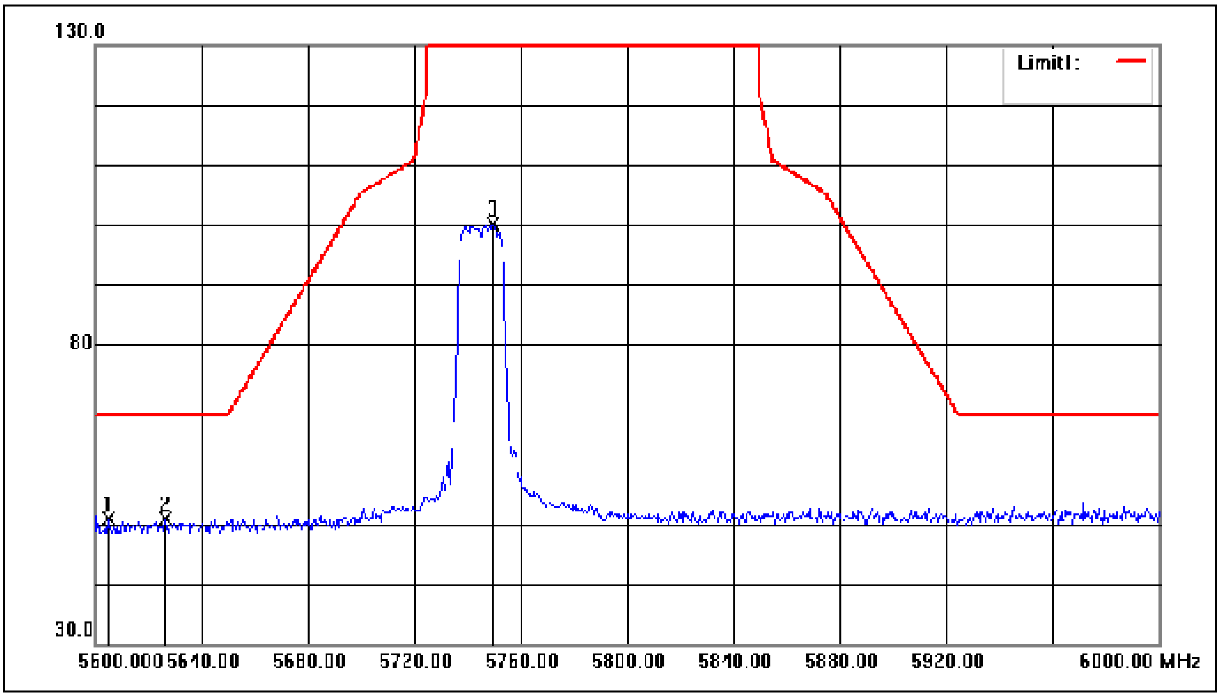
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	4970.840	50.14	0.89	51.03	74.00	-22.97	peak
2	5150.000	57.52	1.05	58.57	74.00	-15.43	peak
3	5195.200	98.94	1.08	100.02	74.00	26.02	peak

Mode:c; Polarization:Vertical; Modulation:c; bandwidth:80MHz; Channel:Low



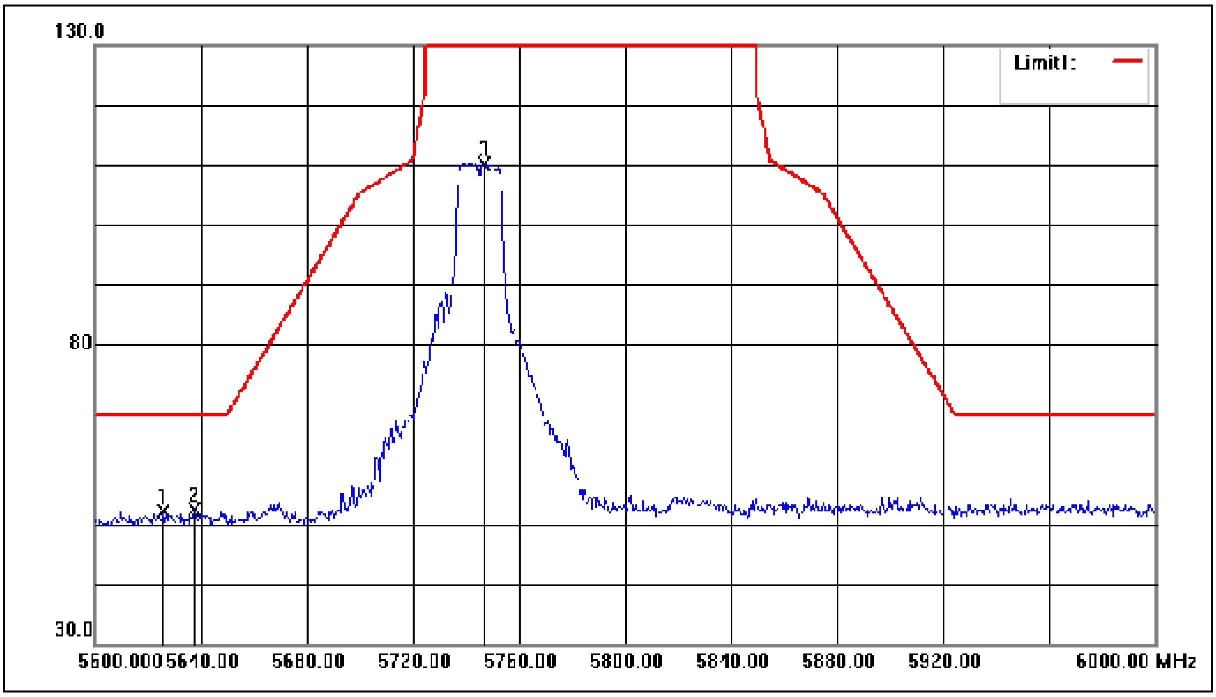
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5017.450	38.52	0.97	39.49	54.00	-14.51	AVG
2	5150.000	47.98	1.05	49.03	54.00	-4.97	AVG
3	5192.830	89.23	1.08	90.31	54.00	36.31	AVG

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



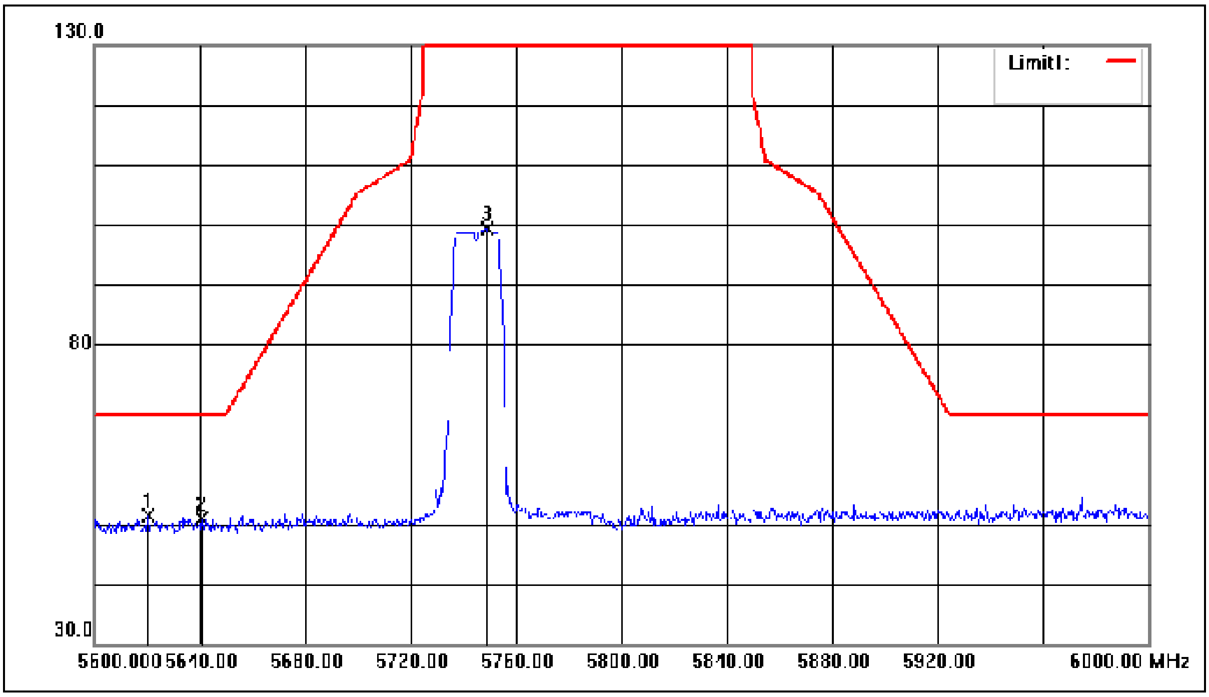
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5604.800	48.93	1.93	50.86	68.20	-17.34	peak
2	5626.400	48.93	2.07	51.00	68.20	-17.20	peak
3	5749.600	97.29	2.85	100.14	135.00	-34.86	peak

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



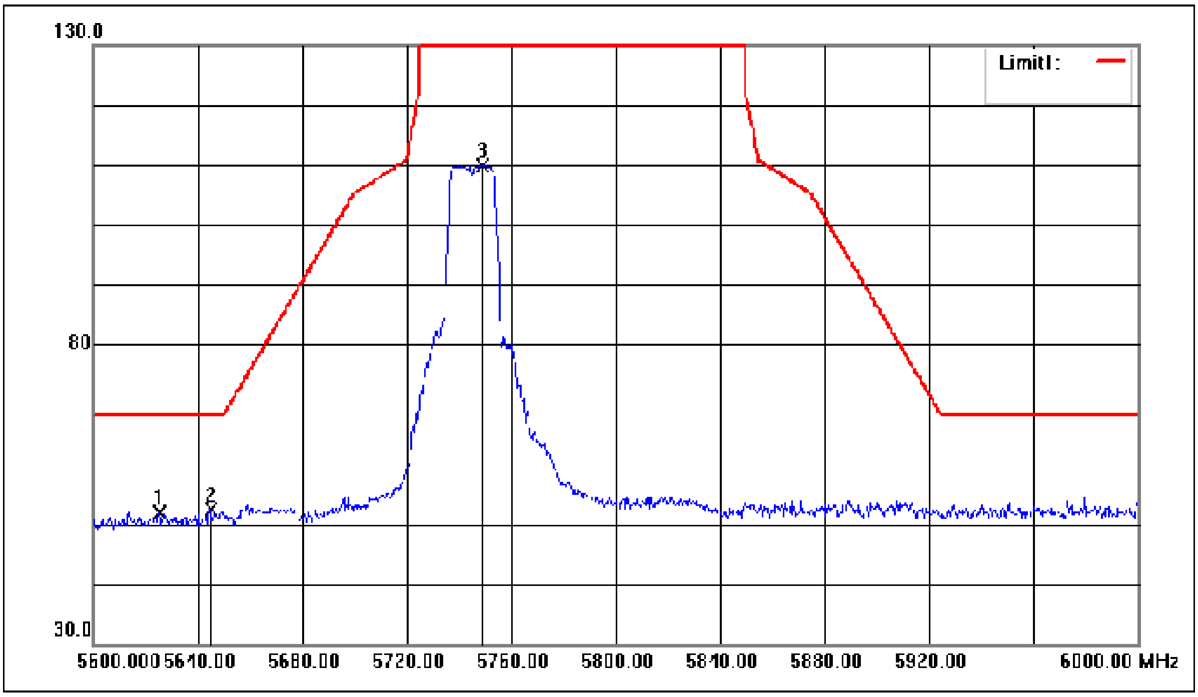
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5626.000	49.94	2.07	52.01	68.20	-16.19	peak
2	5637.600	50.14	2.14	52.28	68.20	-15.92	peak
3	5746.800	107.36	2.83	110.19	135.00	-24.81	peak

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



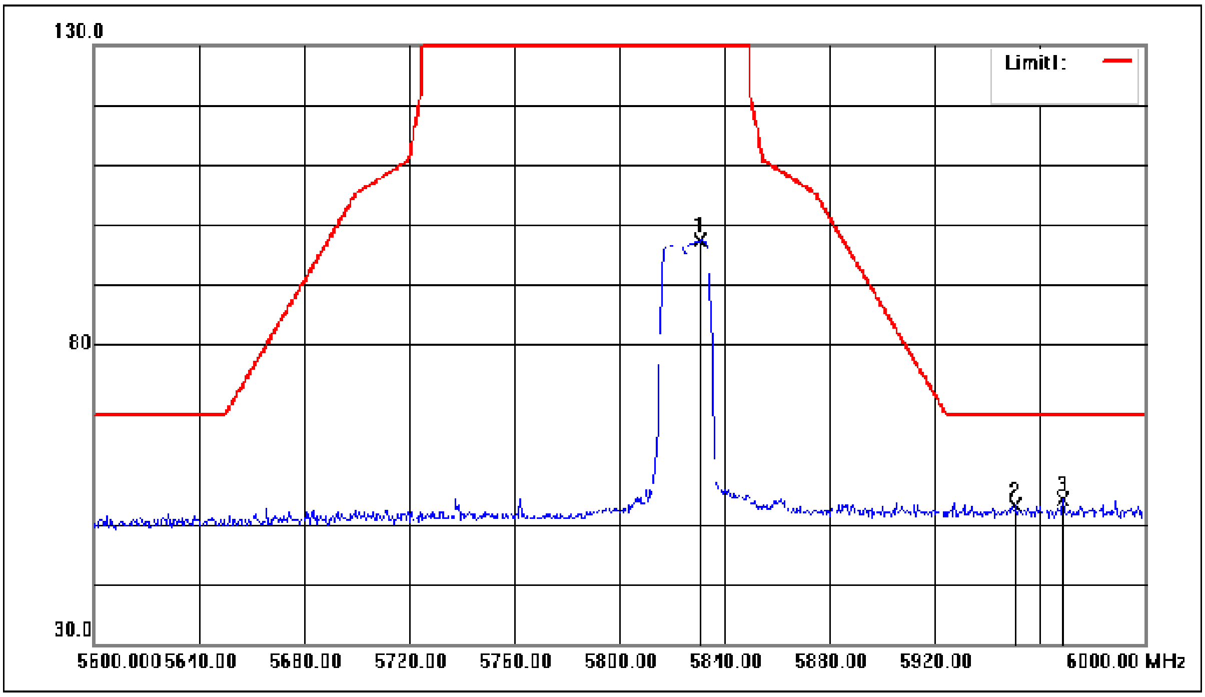
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5620.400	49.34	2.03	51.37	68.20	-16.83	peak
2	5640.800	48.76	2.16	50.92	68.20	-17.28	peak
3	5748.800	96.44	2.84	99.28	135.00	-35.72	peak

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



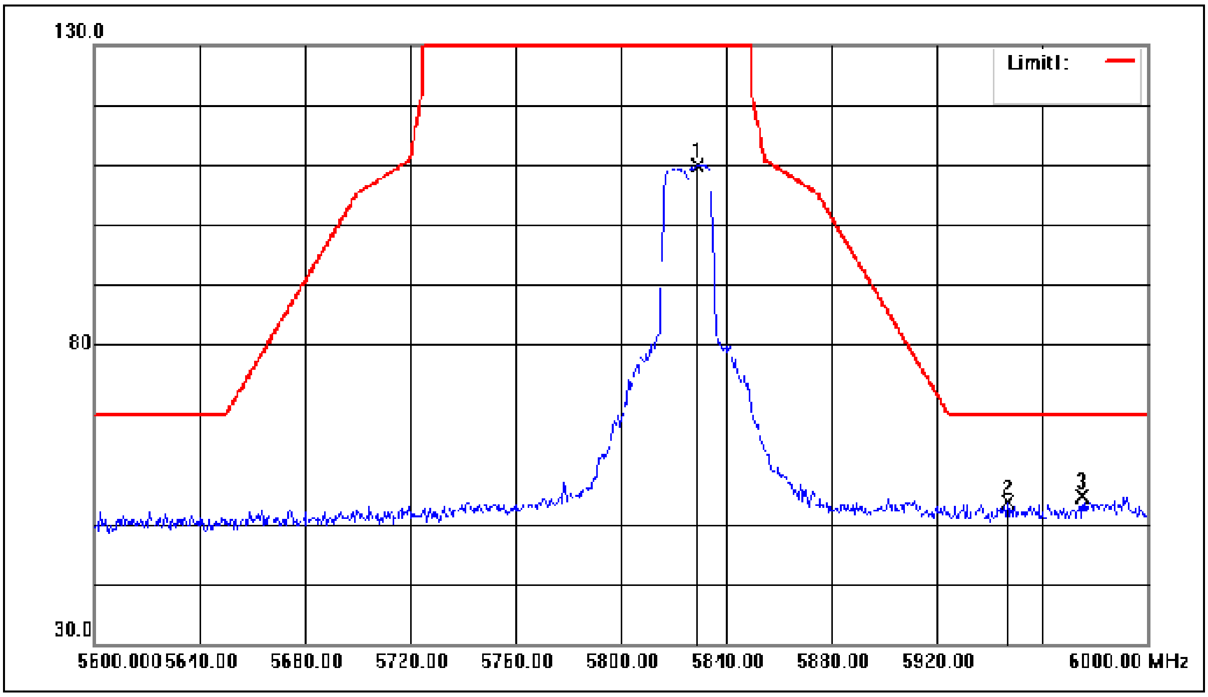
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5625.200	49.83	2.06	51.89	68.20	-16.31	peak
2	5644.800	50.26	2.19	52.45	68.20	-15.75	peak
3	5748.800	107.06	2.84	109.90	135.00	-25.10	peak

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



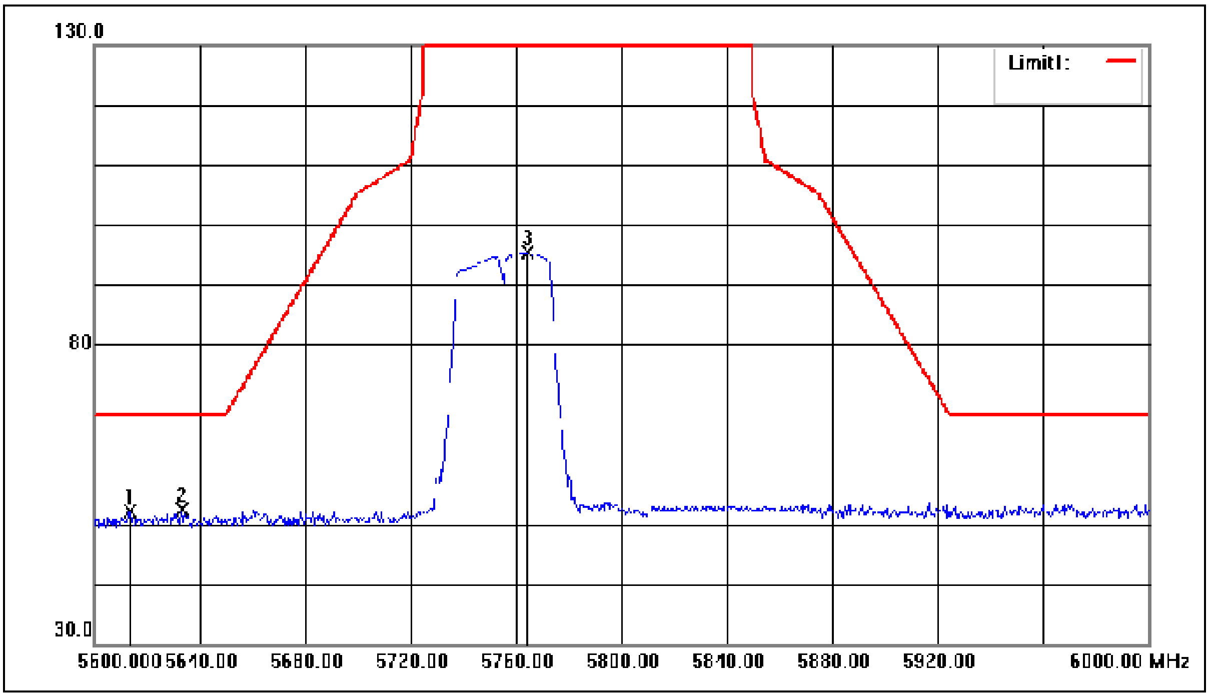
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5830.800	93.91	3.36	97.27	135.00	-37.73	peak
2	5950.800	48.89	4.12	53.01	68.20	-15.19	peak
3	5968.800	49.92	4.23	54.15	68.20	-14.05	peak

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



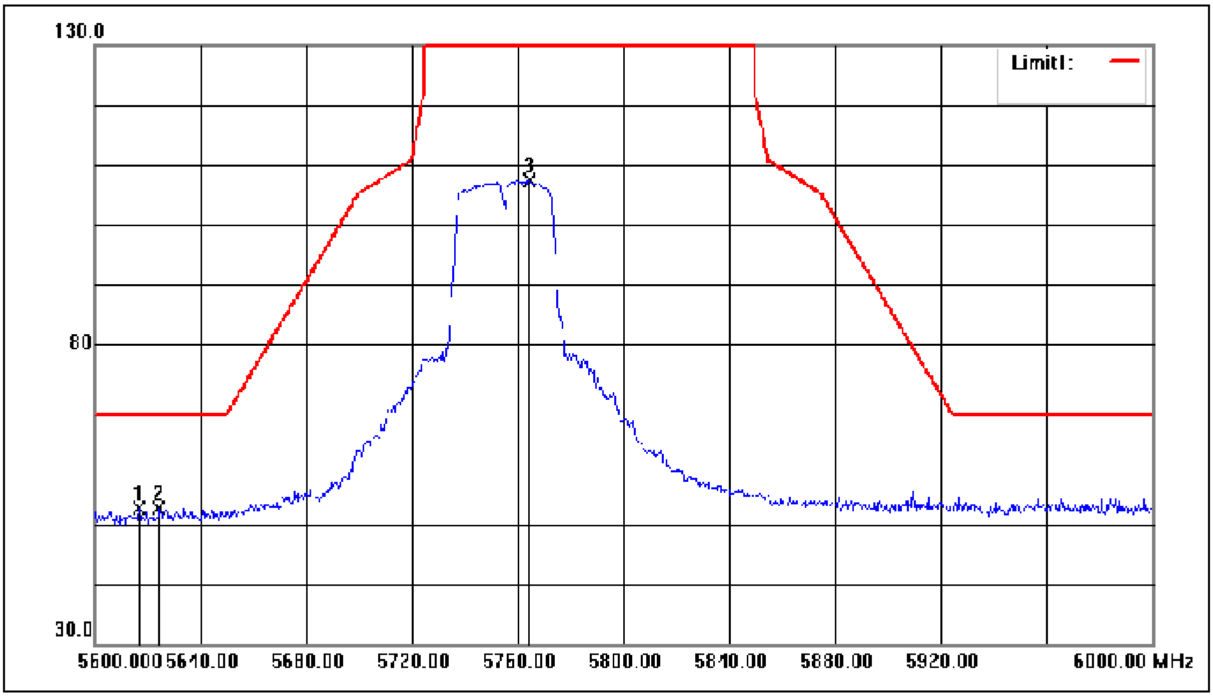
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5829.200	106.61	3.35	109.96	135.00	-25.04	peak
2	5946.800	49.64	4.09	53.73	68.20	-14.47	peak
3	5975.200	50.28	4.27	54.55	68.20	-13.65	peak

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:Low



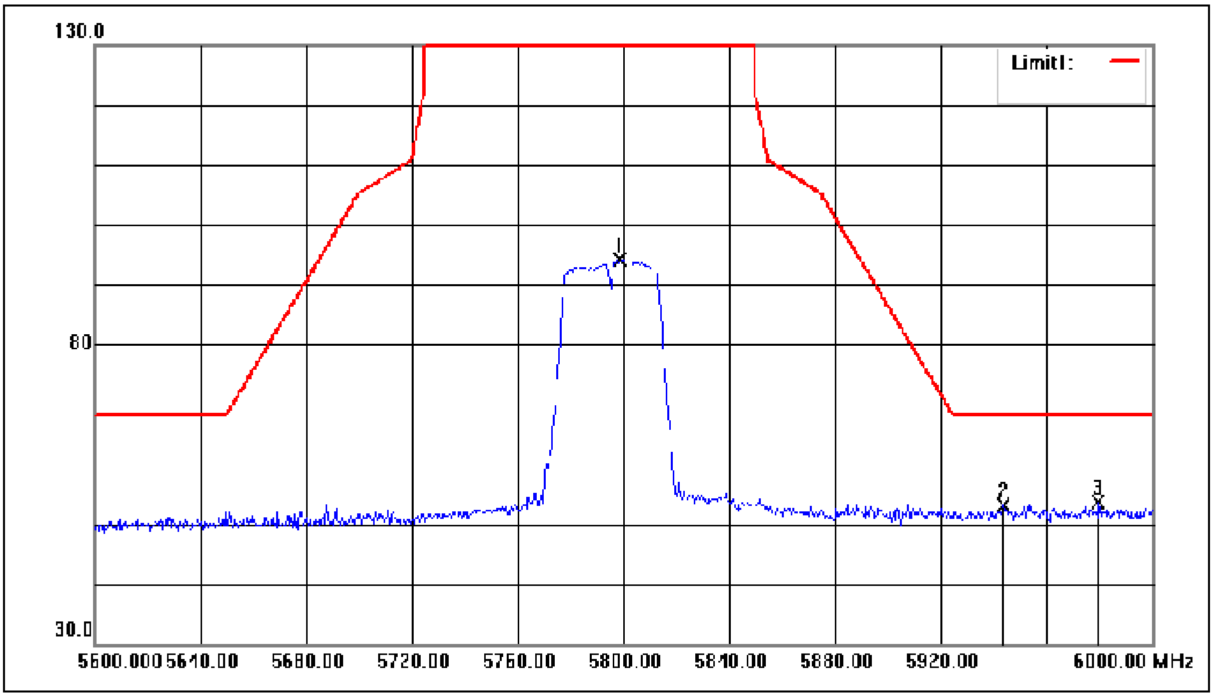
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5613.600	50.02	1.99	52.01	68.20	-16.19	peak
2	5633.200	50.32	2.11	52.43	68.20	-15.77	peak
3	5764.400	92.46	2.94	95.40	135.00	-39.60	peak

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:Low



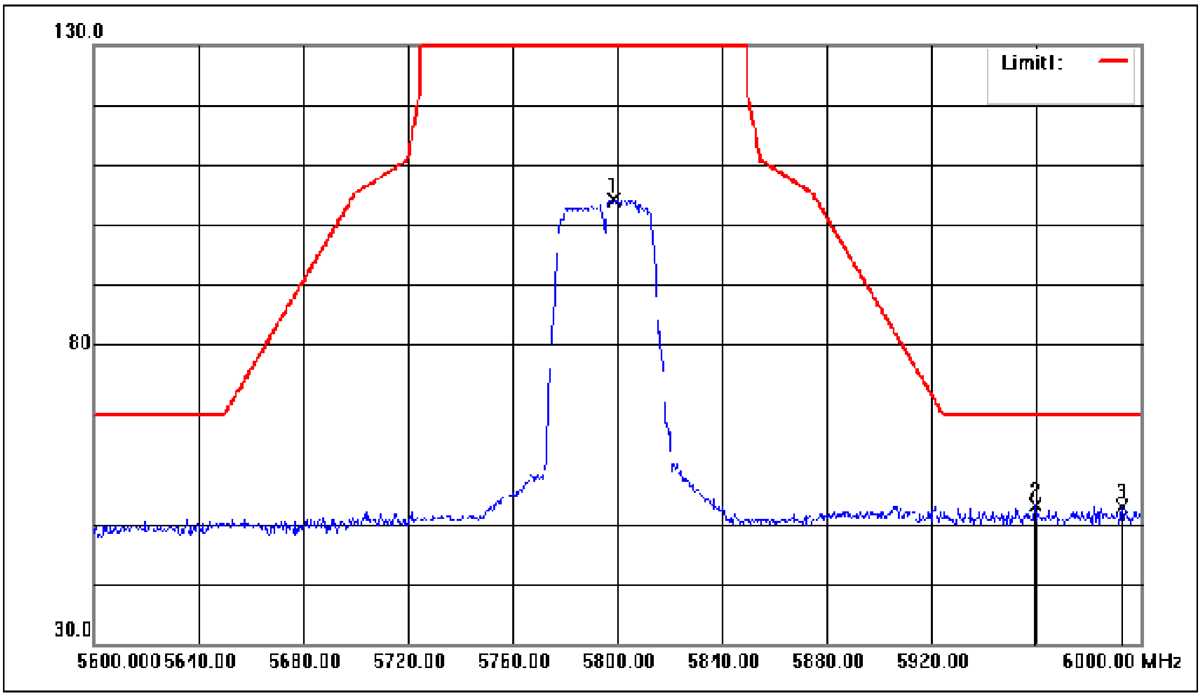
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5616.800	50.54	2.01	52.55	68.20	-15.65	peak
2	5624.400	50.64	2.06	52.70	68.20	-15.50	peak
3	5764.400	104.45	2.94	107.39	135.00	-27.61	peak

Mode:d; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:High



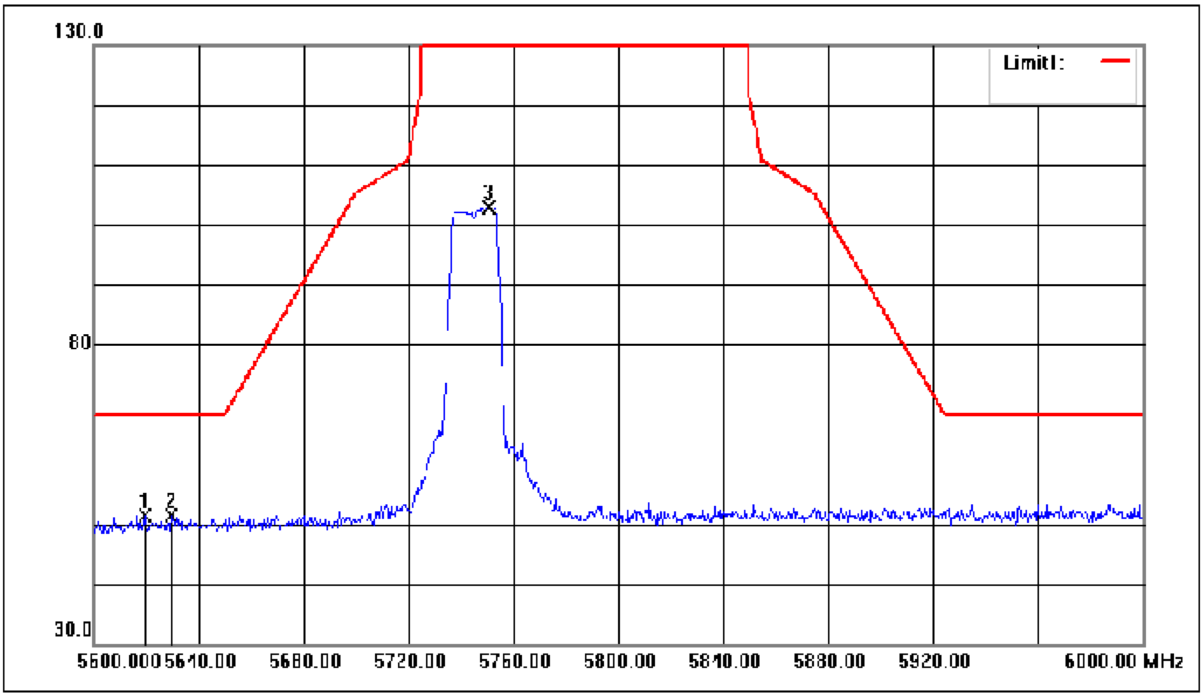
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5798.400	90.93	3.16	94.09	135.00	-40.91	peak
2	5943.600	49.02	4.07	53.09	68.20	-15.11	peak
3	5979.600	49.21	4.30	53.51	68.20	-14.69	peak

Mode:d; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:High



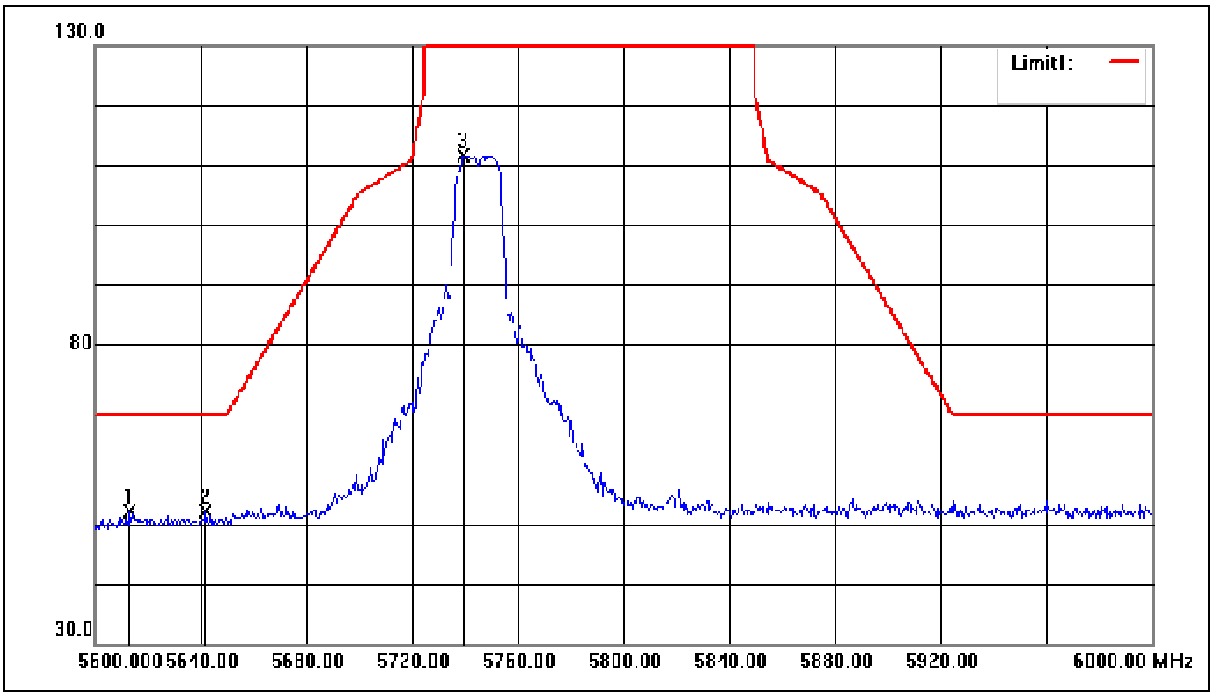
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5798.800	100.95	3.16	104.11	135.00	-30.89	peak
2	5959.600	49.03	4.17	53.20	68.20	-15.00	peak
3	5992.800	48.51	4.38	52.89	68.20	-15.31	peak

Mode:d; Polarization:Horizontal; Modulation:ac; bandwidth:20MHz; Channel:Low



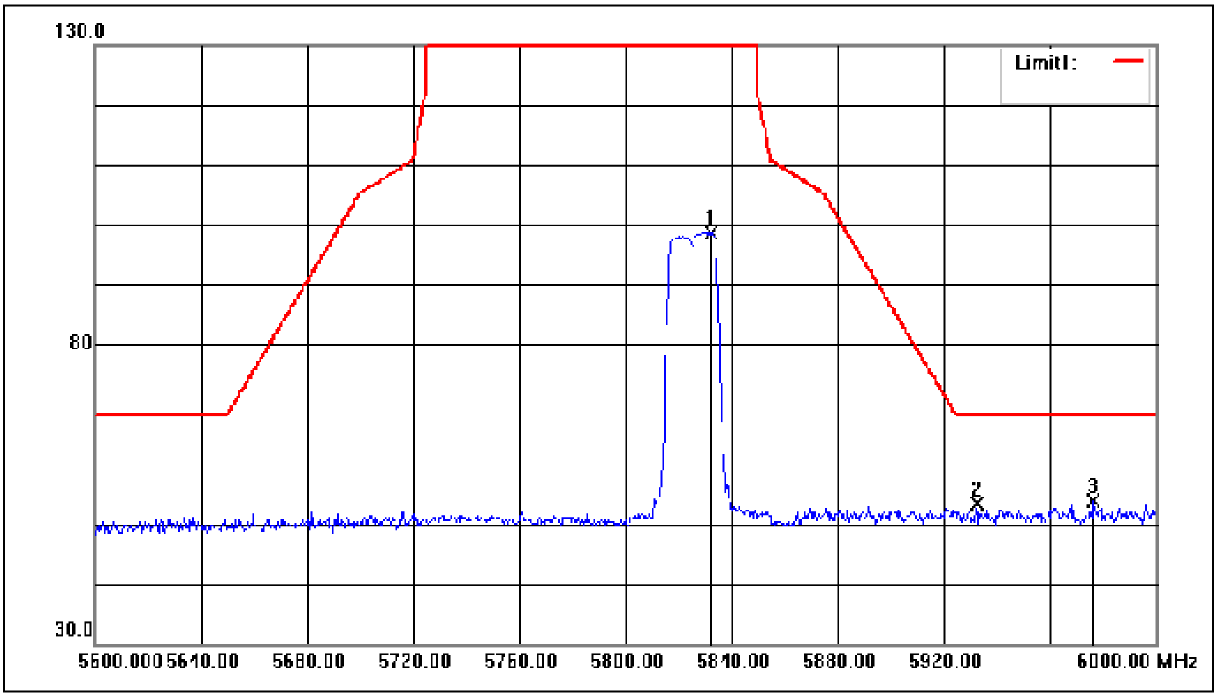
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5619.200	49.36	2.02	51.38	68.20	-16.82	peak
2	5629.600	49.20	2.09	51.29	68.20	-16.91	peak
3	5750.800	100.02	2.86	102.88	135.00	-32.12	peak

Mode:d; Polarization:Vertical; Modulation:ac; bandwidth:20MHz; Channel:Low



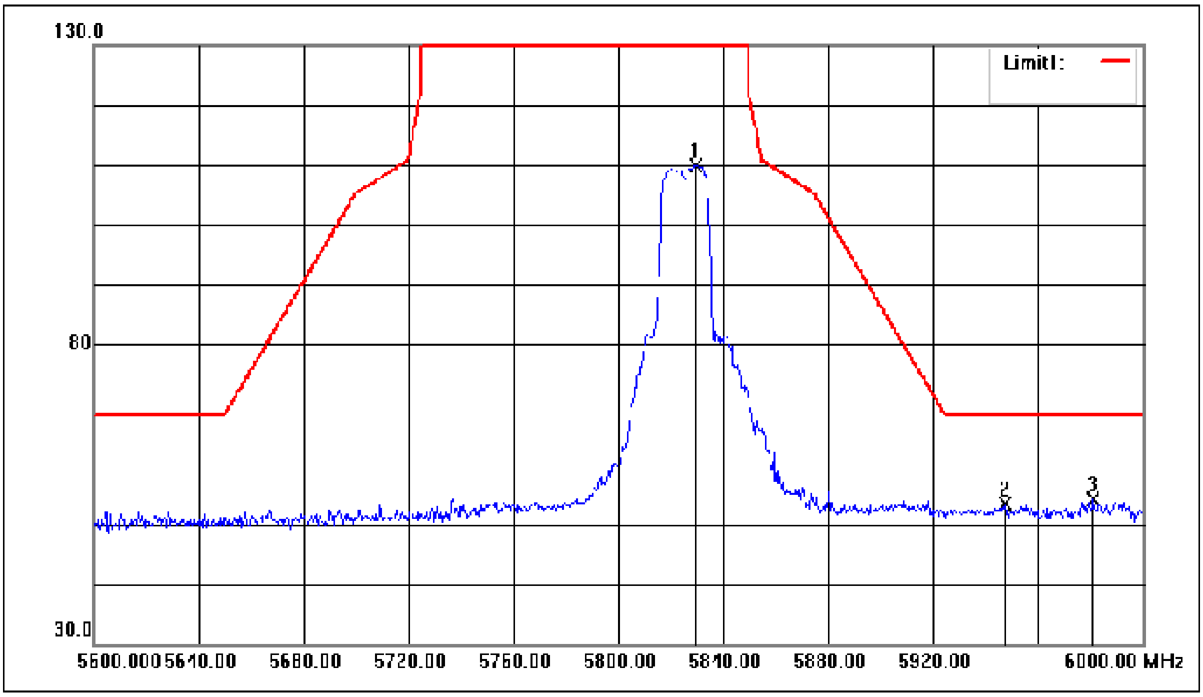
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5613.200	50.12	1.99	52.11	68.20	-16.09	peak
2	5642.000	49.90	2.17	52.07	68.20	-16.13	peak
3	5739.200	108.87	2.78	111.65	135.00	-23.35	peak

Mode:d; Polarization:Horizontal; Modulation:ac; bandwidth:20MHz; Channel:High



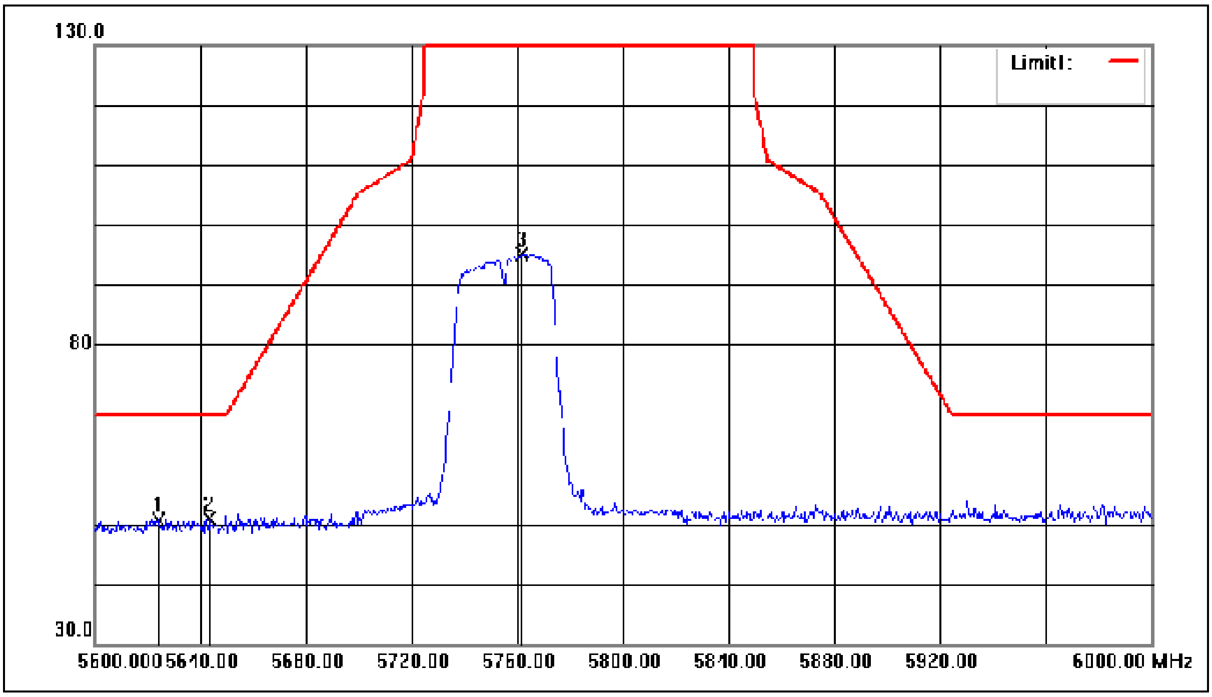
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5832.000	95.38	3.37	98.75	135.00	-36.25	peak
2	5932.400	49.42	4.00	53.42	68.20	-14.78	peak
3	5976.400	49.72	4.28	54.00	68.20	-14.20	peak

Mode:d; Polarization:Vertical; Modulation:ac; bandwidth:20MHz; Channel:High



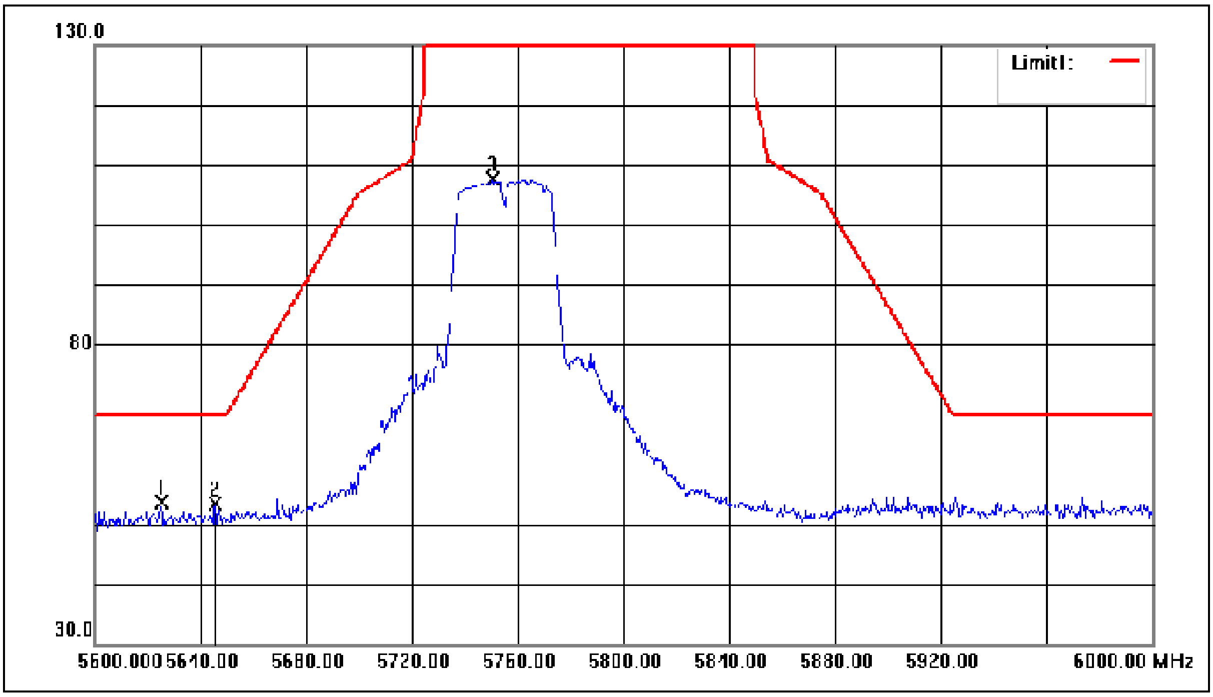
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5829.600	106.49	3.35	109.84	135.00	-25.16	peak
2	5947.200	49.24	4.10	53.34	68.20	-14.86	peak
3	5981.200	49.70	4.31	54.01	68.20	-14.19	peak

Mode:d; Polarization:Horizontal; Modulation:ac; bandwidth:40MHz; Channel:Low



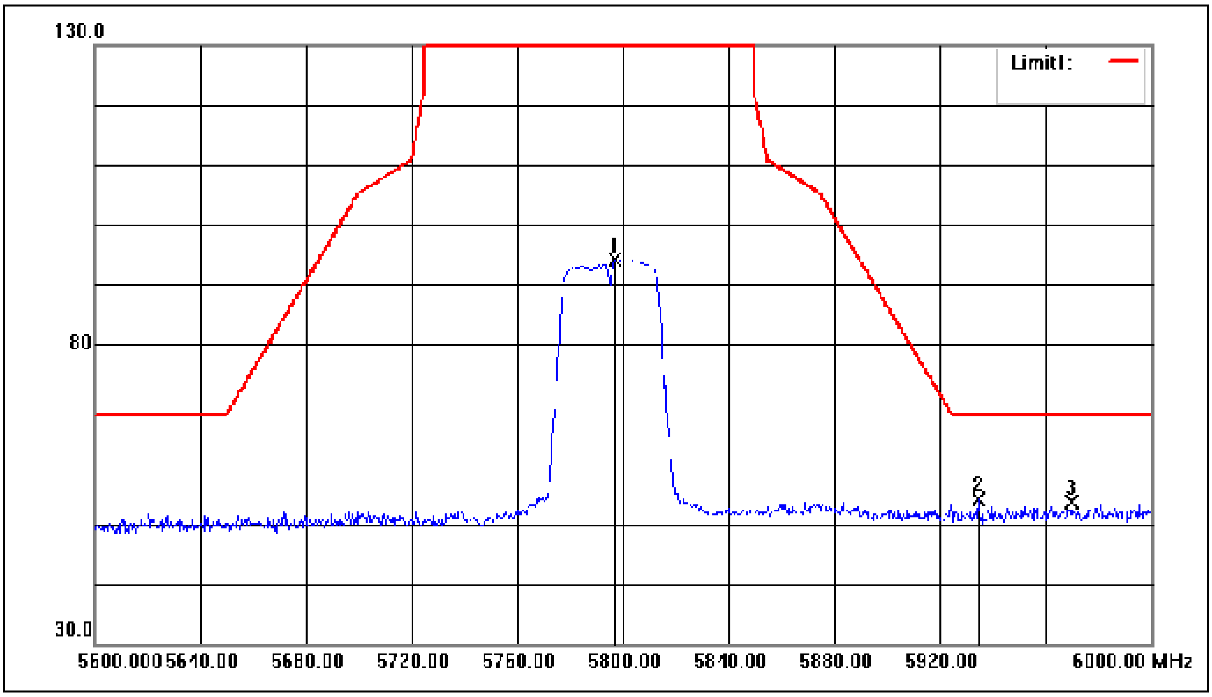
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5624.000	48.68	2.05	50.73	68.20	-17.47	peak
2	5643.600	48.76	2.18	50.94	68.20	-17.26	peak
3	5762.000	92.13	2.93	95.06	135.00	-39.94	peak

Mode:d; Polarization:Vertical; Modulation:ac; bandwidth:40MHz; Channel:Low



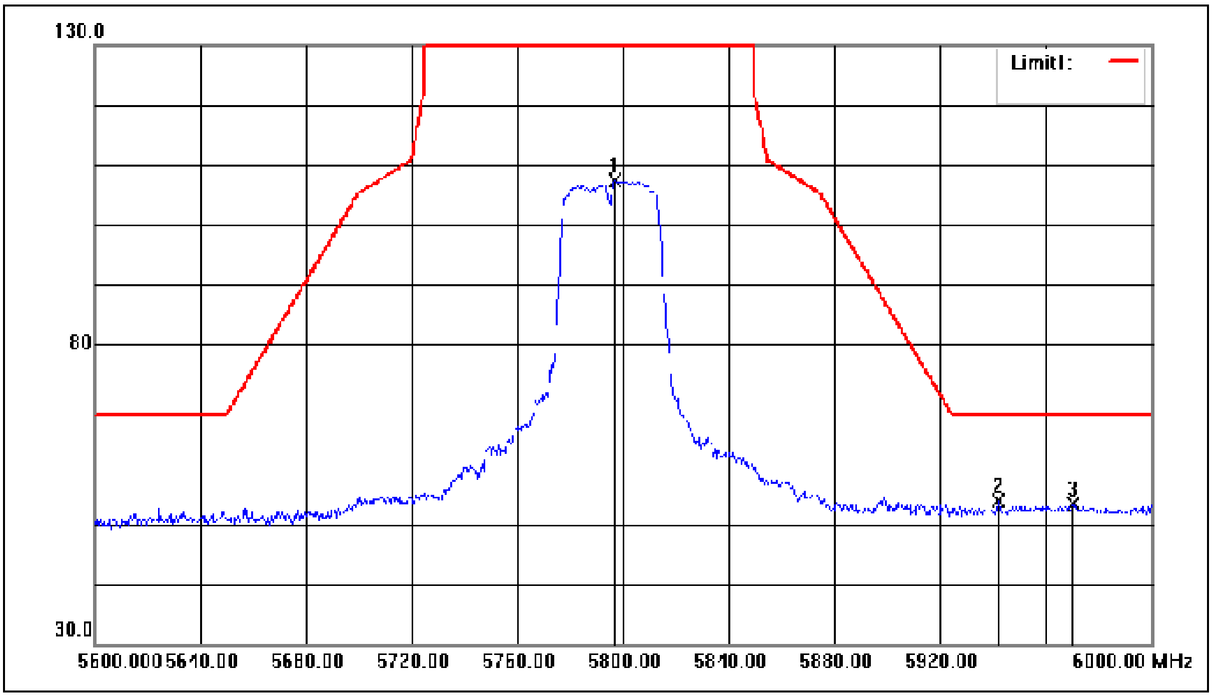
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5625.200	51.66	2.06	53.72	68.20	-14.48	peak
2	5645.600	51.10	2.19	53.29	68.20	-14.91	peak
3	5750.400	104.70	2.85	107.55	135.00	-27.45	peak

Mode:d; Polarization:Horizontal; Modulation:ac; bandwidth:40MHz; Channel:High



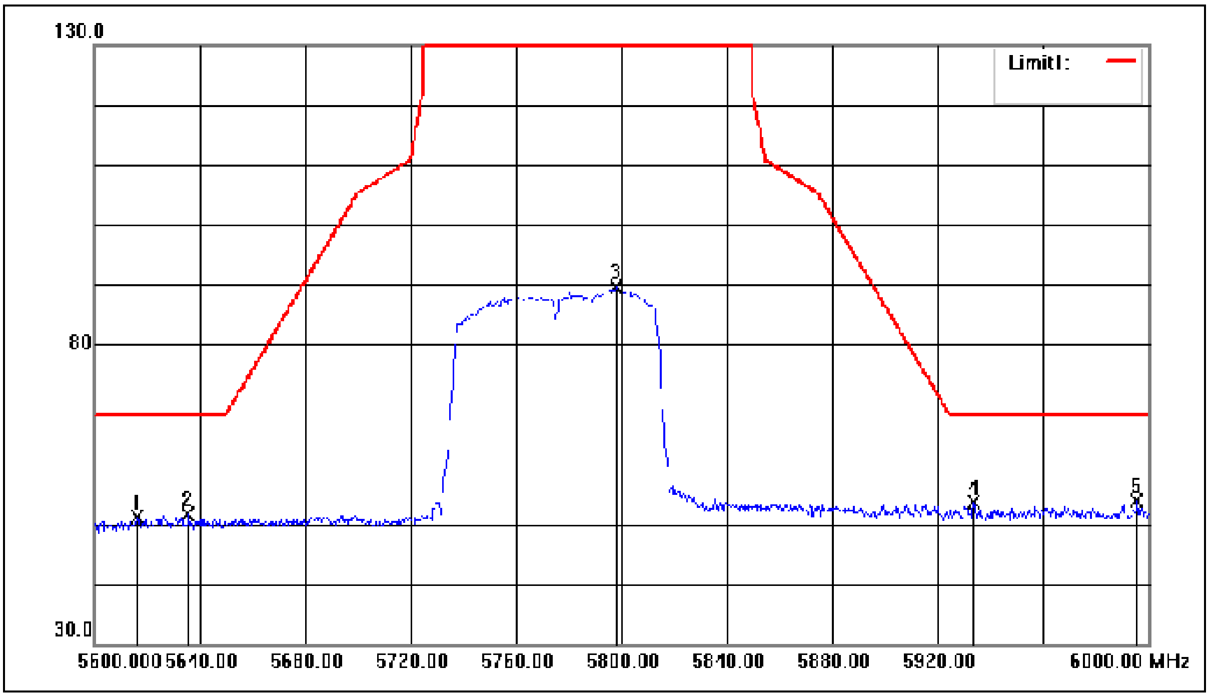
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5797.200	90.95	3.15	94.10	135.00	-40.90	peak
2	5934.400	50.07	4.02	54.09	68.20	-14.11	peak
3	5970.000	49.30	4.24	53.54	68.20	-14.66	peak

Mode:d; Polarization:Vertical; Modulation:ac; bandwidth:40MHz; Channel:High



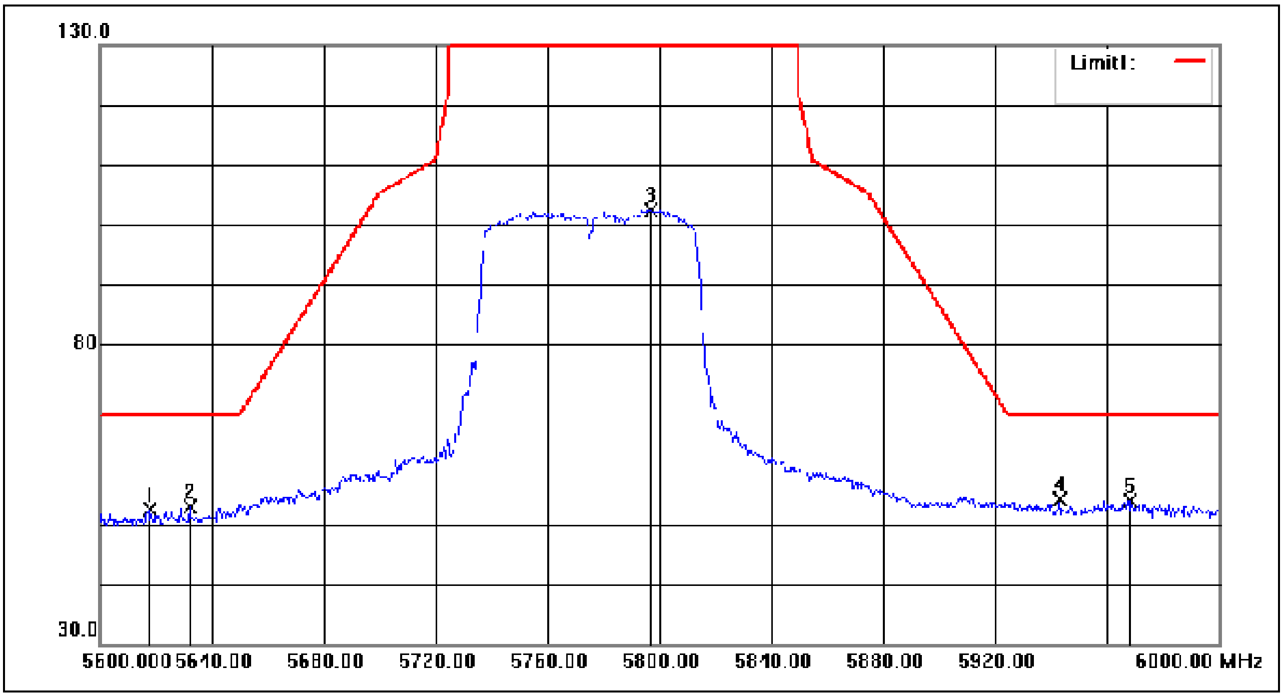
No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5797.200	104.15	3.15	107.30	135.00	-27.70	peak
2	5942.000	49.77	4.06	53.83	68.20	-14.37	peak
3	5970.400	49.05	4.24	53.29	68.20	-14.91	peak

Mode:d; Polarization:Horizontal; Modulation:ac; bandwidth:80MHz; Channel:Low



No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5616.400	49.02	2.01	51.03	68.20	-17.17	peak
2	5635.600	49.57	2.13	51.70	68.20	-16.50	peak
3	5798.000	86.41	3.15	89.56	135.00	-45.44	peak
4	5933.600	49.67	4.01	53.68	68.20	-14.52	peak
5	5995.600	49.50	4.40	53.90	68.20	-14.30	peak

Mode:d; Polarization:Vertical; Modulation:ac; bandwidth:80MHz; Channel:Low



No.	Frequency (MHz)	Reading ()	Correction factor()	Result ()	Limit ()	Margin (dB)	Remark
1	5617.600	50.25	2.01	52.26	68.20	-15.94	peak
2	5632.000	50.76	2.10	52.86	68.20	-15.34	peak
3	5797.200	99.31	3.15	102.46	135.00	-32.54	peak
4	5943.200	49.97	4.07	54.04	68.20	-14.16	peak
5	5968.400	49.56	4.23	53.79	68.20	-14.41	peak

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.

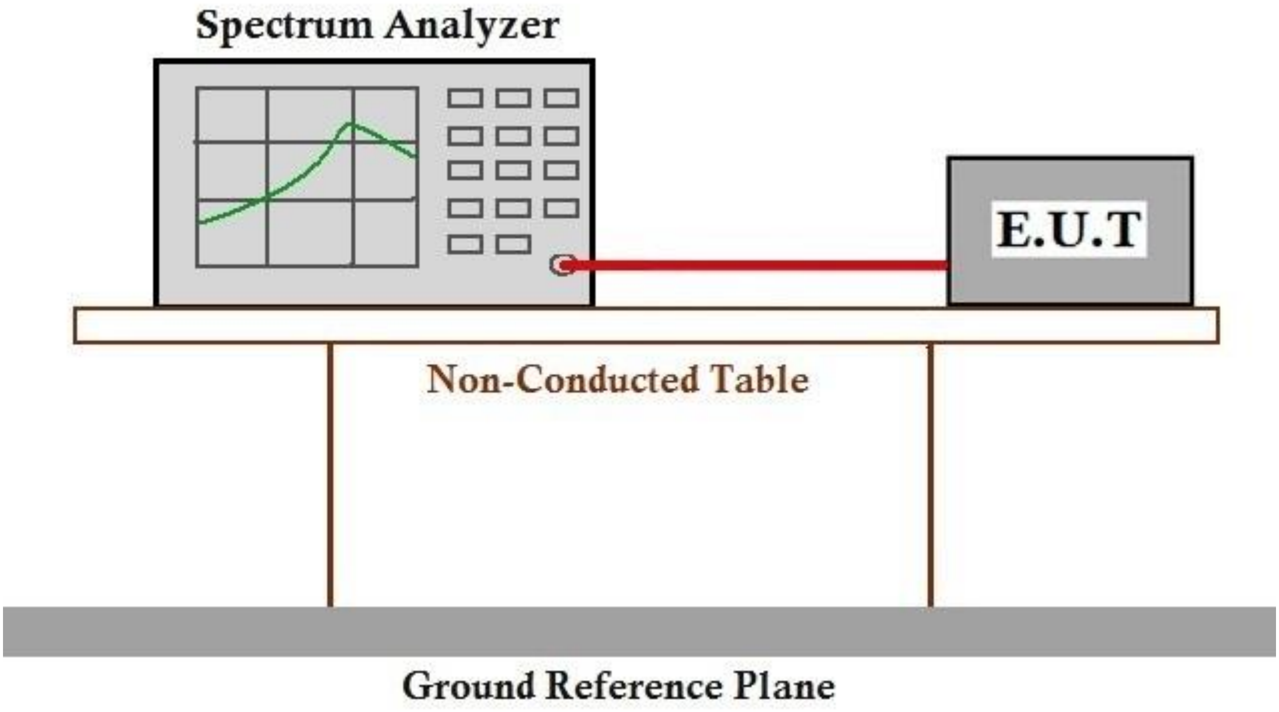
7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

The final test mode:	c:TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report. d:TX mode (Band 4)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.9.2 Test Setup Diagram



7.9.3 Measurement Procedure and Data

The detailed test data see: Appendix C for SHEM200700634503

8 Test Setup Photographs

Refer to the < Test Setup photos-FCC>.

9 EUT Constructional Details

Refer to the < External Photos > & < Internal Photos >.

- End of the Report -