

# TEST REPORT

**Application No.:** KSCR2110000161AT  
**FCC ID:** 2ADTD-AEC8PRO  
**Applicant:** Hangzhou Hikvision Digital Technology Co.,Ltd.  
**Address of Applicant:** No. 555, Qianmo Road, Binjiang District, Hangzhou  
**Manufacturer:** Hangzhou Hikvision Digital Technology Co.,Ltd.  
**Address of Manufacturer:** No. 555, Qianmo Road, Binjiang District, Hangzhou  
**Factory:** Hangzhou Ymir Enterprise.,Ltd.  
**Address of Factory:** No.356, Hongda Rd, Xiaoshan District, Hangzhou City  
**Equipment Under Test (EUT):**  
**EUT Name:** DashCam  
**Model No.:** AE-DC8012-C8,AE-DC8012-C8+,AE-DC8012-C8P,AE-DC8212-C8PRO,AE-DC8212-C8PRO+,AE-DC8222-C8PRO,AE-DC8222-C8PRO+,AE-DC8232-C8S,AE-DCXXX2-CXX ( "X" =0-9, A-Z, a-z, -, + or space)²  
 ² Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.  
**Trade mark:** HIKVISION  
**Standard(s) :** 47 CFR Part 15, Subpart E 15.407  
**Date of Receipt:** 2021-10-14  
**Date of Test:** 2021-10-19 to 2021-11-08  
**Date of Issue:** 2021-11-08

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

parlan zhan

Eric Lin  
Laboratory Manager

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



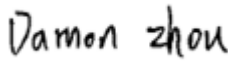
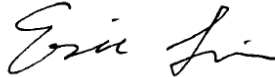
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Revision Record			
Version	Description	Date	Remark
00	Original	2021-11-08	/

Authorized for issue by:			
			
		Damon Zhou / Project Engineer	
			
		Eric Lin / Reviewer	



## 2 Test Summary

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

N/A: Not applicable

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
99% Bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 II D	N/A	Pass
26dB Emission bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II C 1	47 CFR Part 15, Subpart E 15.407 (a)	Pass
Minimum 6 dB bandwidth (5.725-5.85 GHz band)	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II C 2	47 CFR Part 15, Subpart E 15.407 (e)	Pass
Maximum Conducted output power	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II E	47 CFR Part 15, Subpart E 15.407 (a)	Pass
Peak Power spectrum density	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II F	47 CFR Part 15, Subpart E 15.407 (a)	Pass
Radiated Emissions	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & Subpart E 15.407(b)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & Subpart E 15.407(b)	Pass
Frequency Stability	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 6.8	47 CFR Part 15, Subpart E 15.407 (g)	Pass

N/A: Not applicable

### Declaration of EUT Family Grouping:

Note: There are series models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model AE-DC8012-C8 was tested since their differences were the model number and appearance.



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## 4 General Information

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

Power supply: DC 5V by Car cigarette lighter transverter  
 Car cigarette lighter transverter 1# information:  
 Model: PYS-CAC20002-01  
 Input: DC 12V-24V 2.5A  
 USB1 Output: 5V,2.1A  
 USB2 Output: 5V,1.0A  
 Car cigarette lighter transverter 2# information:  
 Model: TC16A-0503100D  
 Input: DC 12V-24V  
 Output: 5V,3.1A

Cable: DC/DC charger cable (Unshielded, 392cm)

Test voltage: DC 12V

Operation Frequency:	Band	Mode	Frequency Range (MHz)	Number of channels
	UNII Band I	802.11a/n(HT20)	5180-5240	4
		802.11n(HT40)	5190-5230	2
	UNII Band III	802.11a/n(HT20)	5745-5825	5
		802.11n(HT40)	5755-5795	2
Modulation Type:	802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)			
Date Rate:	802.11a:6/9/12/18/24/36/48/54Mbps 802.11n: MCS0-MCS7			
Channel Spacing:	802.11a/n(HT20): 20MHz 802.11n(HT40): 40MHz			
Antenna Gain:	2.50dBi (Provided by manufacturer)			
Antenna Type:	Chip Antenna			



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**4.2 Power level setting using in test:**

Channel	802.11a	802.11n(HT20)
	Ant 1	Ant 1
36	Default	Default
40	Default	Default
48	Default	Default
149	Default	Default
157	Default	Default
165	Default	Default
Channel	802.11n(HT40)	
	Ant 1	
38	Default	
46	Default	
151	Default	
159	Default	

**4.3 Description of Support Units**

Description	Manufacturer	Model No.	Serial No.
Note Book	Acer	ZQT	NXM0QCN01031403EE876



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EMC Laboratory

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#### 4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$8.4 \times 10^{-8}$
2	Timeout	2s
3	Duty Cycle	0.37%
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	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
9	Radiated Spurious Emission Test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-18GHz)
		5.4dB (Above 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.



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#### 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.

Company Number: 2324E

- **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-20134, R-11600, C-11707, T-11499, G-10216 respectively.

#### 4.7 Deviation from Standards

None

#### 4.8 Abnormalities from Standard Conditions

None



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## 5 Equipment List

Item	Equipment	Manufacturer	Model	Serial Number	Cal Date	Cal. Due Date
<b>Conducted Emission at Mains Terminals (150kHz-30MHz)</b>						
1	EMI Test Receive	R&S	ESCI	100781	02/01/2021	01/31/2022
2	LISN	R&S	ENV216	101604	10/12/2021	10/11/2022
3	LISN	Schwarzbeck	NNLK 8129	8129-143	10/12/2021	10/11/2022
4	Pulse Limiter	R&S	ESH3-Z2	100609	02/01/2021	01/31/2022
5	CE test Cable	Thermax	/	14	10/16/2021	10/15/2022
6	Test Software	Farad	EZ-EMC	CCS-03A1	N.C.R	N.C.R
<b>RF Conducted Test</b>						
1	Spectrum Analyzer	Agilent	E4446A	MY44020154	04/16/2021	04/15/2022
2	Spectrum Analyzer	Keysight	N9020A	MY55370209	10/11/2021	10/10/2022
3	Spectrum Analyzer	Keysight	N9010A	MY56480443	02/01/2021	01/31/2022
4	Signal Generator	Agilent	N5182A	MY50142015	08/27/2021	08/26/2022
5	Radio Communication Test Station	Anritsu	MT8000A	6262012849	N/A	N/A
6	Radio Communication Analyzer	Anritsu	MT8821C	6201692222	N/A	N/A
7	Universal Radio Communication Tester	R&S	CMW500	159275	10/12/2021	10/11/2022
8	Universal Radio Communication Tester	R&S	CMW500	167239	04/16/2021	04/15/2022
9	Power Meter	Anritsu	ML2495A	1445010	04/15/2021	04/14/2022
10	Switcher	CCSRF	FY562	KUS2001M001-3	10/12/2021	10/11/2022
11	AC Power Source	EXTECH	6605	1570106	N.C.R	N.C.R
12	DC Power Supply	Aglient	E3632A	MY50340053	N.C.R	N.C.R
13	6dB Attenuator	Mini-Circuits	NAT-6-2W	15542-1	N.C.R	N.C.R
14	Power Divider	AISI	IOWOPE2068	PE2068	N.C.R	N.C.R
15	Filter	MICRO-TRONICS	BRM50701	5	N.C.R	N.C.R
16	Conducted test cable	/	RF01-RF04	/	04/15/2021	04/14/2022
17	Software	BST	TST-PASS	N/A	N/A	N/A
18	Temp. / Humidity Chamber	TERCHY	MHK-120AK	X30109	04/15/2021	04/14/2022
19	Thermometer	Anymetre	TH603	CCS007	10/14/2021	10/13/2022
<b>RF Radiated Test</b>						
1	Spectrum Analyzer	R&S	FSV40	101493	10/11/2021	10/10/2022
2	Signal Generator	Agilent	E8257C	MY43321570	10/18/2021	10/17/2022
3	Loop Antenna	Schwarzbeck	HXYZ9170	9170-108	02/22/2021	02/21/2022
4	Bilog Antenna	TESEQ	CBL 6112D	35403	06/21/2021	06/20/2023
5	Bilog Antenna	SCHWARZBECK	VULB9160	9160-3342	04/13/2021	04/12/2023
6	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	267	10/26/2020	10/25/2022
7	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	00143290	02/22/2021	02/21/2023
8	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	BBHA9170171	02/22/2021	02/21/2022
9	Pre-Amplifier(30MHz~18GHz)	LNA	/	/	04/15/2021	04/14/2022
10	Amplifier(18~40GHz)	COM-POWER	PAM-840A	461332	10/18/2021	10/17/2022
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



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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	/	04/15/2021	04/14/2022
24	Software	Faratronic	EZ_EM-C-v 3A1	N/A	N/A	N/A



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## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

#### 6.1.2 Conclusion

Standard Requirement:

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

EUT Antenna:

The antenna is Chip Antenna integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2.50dBi.

Antenna location: Refer to Appendix (Internal Photos).



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## 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 (SV6256P) 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.



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## 7 Radio Spectrum Matter Test Results

### 7.1 99% Bandwidth

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

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

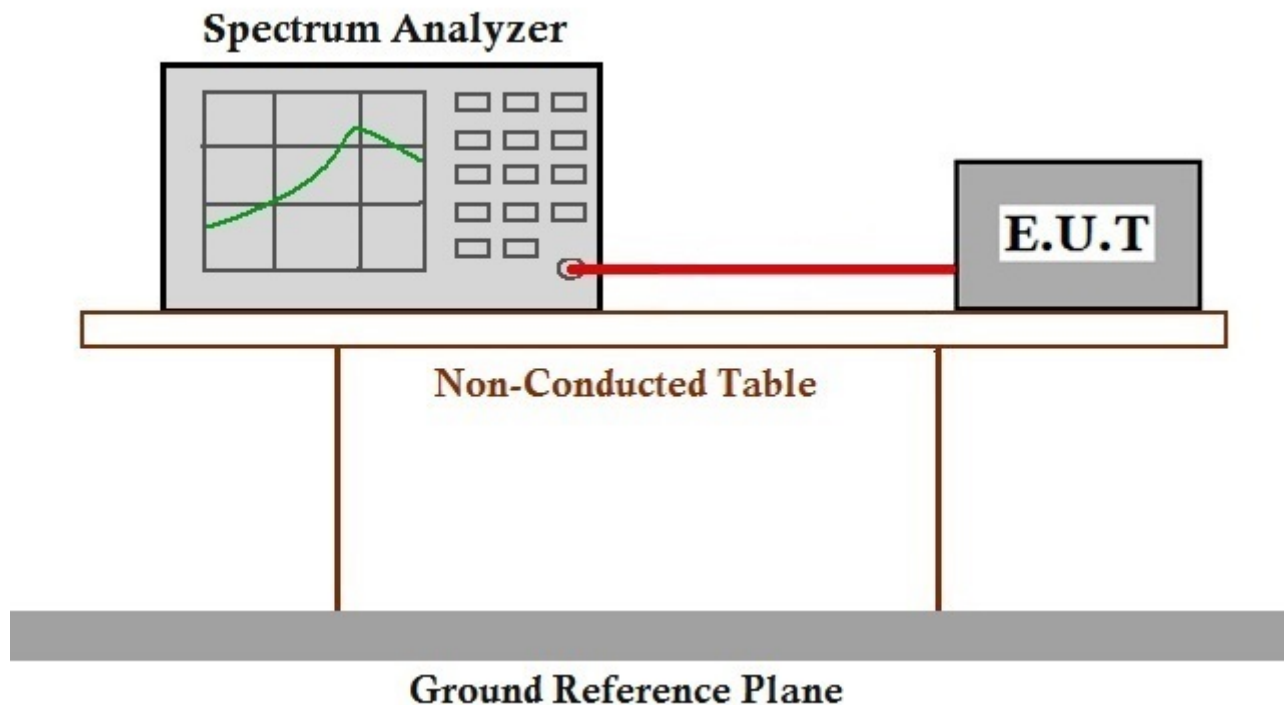
Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar  
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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

d: TX mode (Band 3)\_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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

#### 7.1.2 Test Setup Diagram



#### 7.1.3 Measurement Procedure and Data

The detailed test data see: Appendix B for KSCR210900016102



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## 7.2 26dB Emission bandwidth

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

Test Method: KDB 789033 D02 II C 1

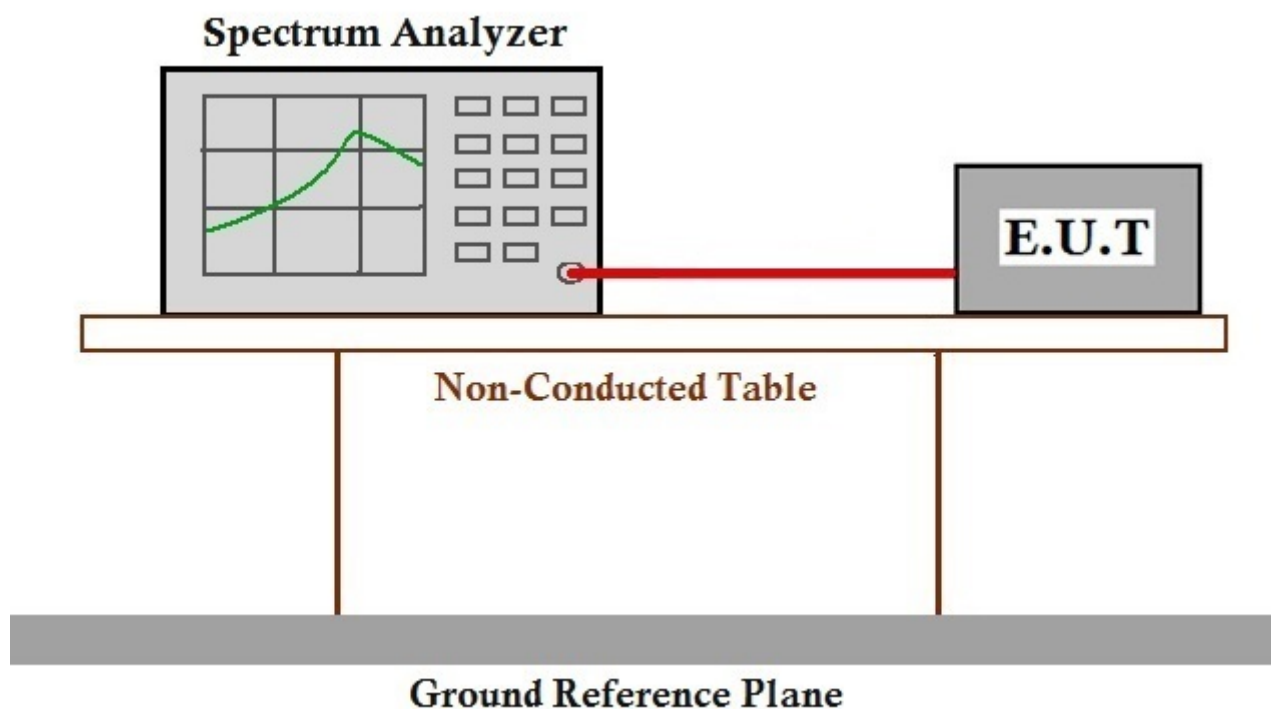
### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

### 7.2.2 Test Setup Diagram



### 7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix B for KSCR210900016102



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### 7.3 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:  $\geq 500$  kHz

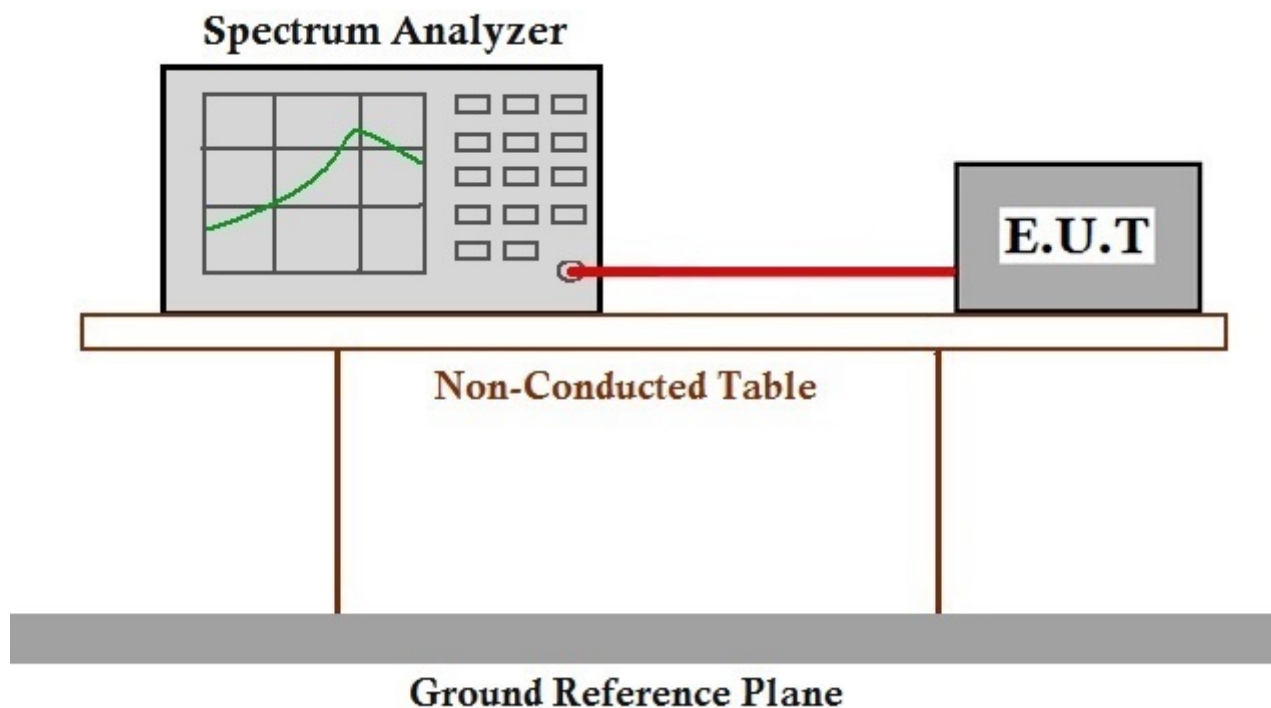
#### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test Mode d: TX mode (Band 3)\_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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

#### 7.3.2 Test Setup Diagram



#### 7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix B for KSCR210900016102



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**7.4 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	$\leq 1\text{W}(30\text{dBm})$ for master device
	$\leq 250\text{mW}(24\text{dBm})$ for client device
5250-5350	$\leq 250\text{mW}(24\text{dBm})$ for client device or $11\text{dBm}+10\log B^*$
5470-5725	$\leq 250\text{mW}(24\text{dBm})$ for client device or $11\text{dBm}+10\log B^*$
5725-5850	$\leq 1\text{W}(30\text{dBm})$
Remark:	<p>* Where B is the 26dB emission bandwidth in MHz.</p> <p>The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.</p>

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

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

d: TX mode (Band 3)\_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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).



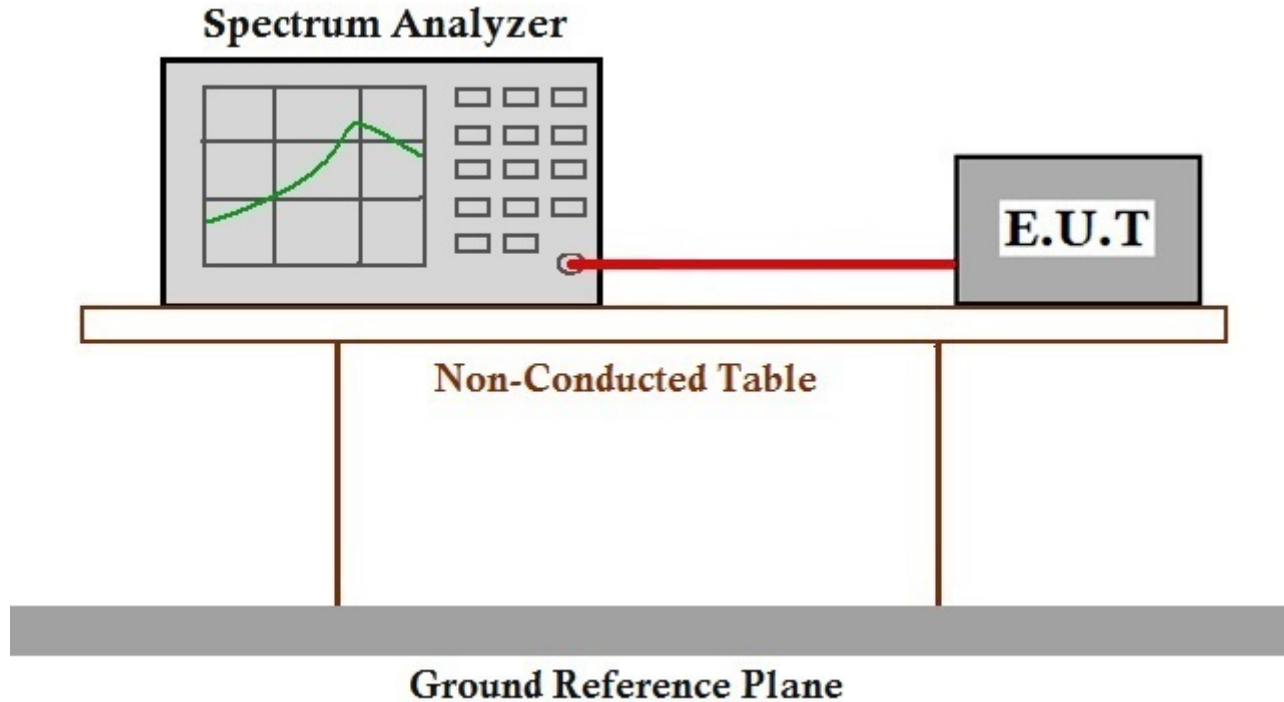
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#### 7.4.2 Test Setup Diagram



#### 7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix B for KSCR210900016102



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## 7.5 Peak Power spectrum density

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

Test Method: KDB 789033 D02 II F

Limit:

Frequency band (MHz)	Limit
5150-5250	≤17dBm in 1MHz for master device
	≤11dBm in 1MHz for client device
5250-5350	≤11dBm in 1MHz for client device
5470-5725	≤11dBm in 1MHz for client device
5725-5850	≤30dBm in 500 kHz
Remark:	The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.

### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

d: TX mode (Band 3) 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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).



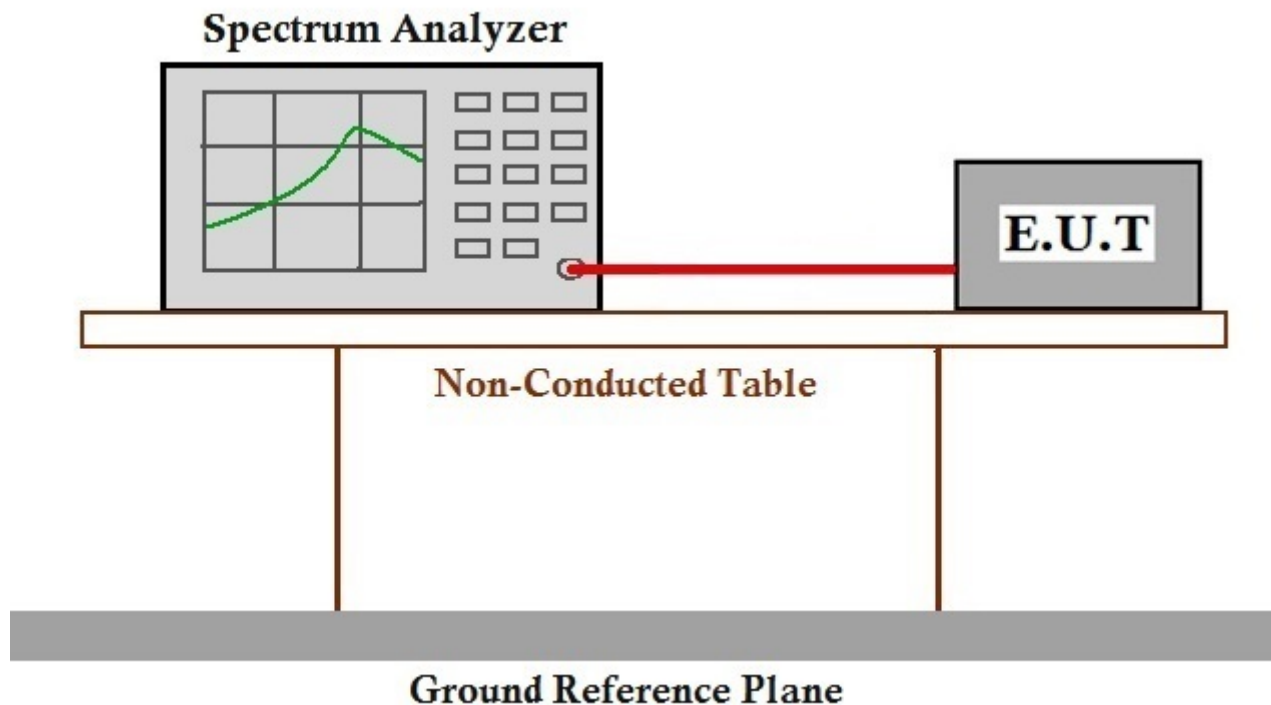
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### 7.5.2 Test Setup Diagram



### 7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix B for KSCR210900016102



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## 7.6 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.



### 7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Pretest these  
modes to find  
the worst case:

a: 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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 1#).

b: TX mode (Band 3)\_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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 1#).

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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

d: TX mode (Band 3)\_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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

The worst case  
for final test:

d: TX mode (Band 3)\_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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

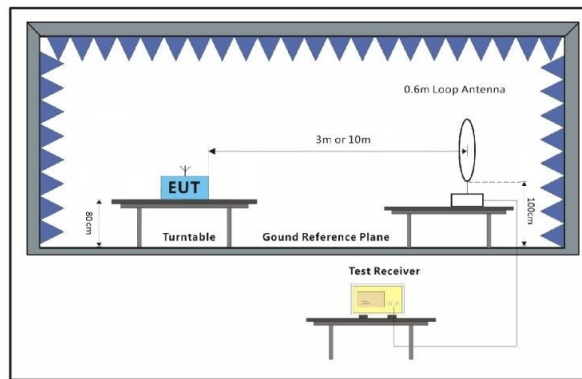
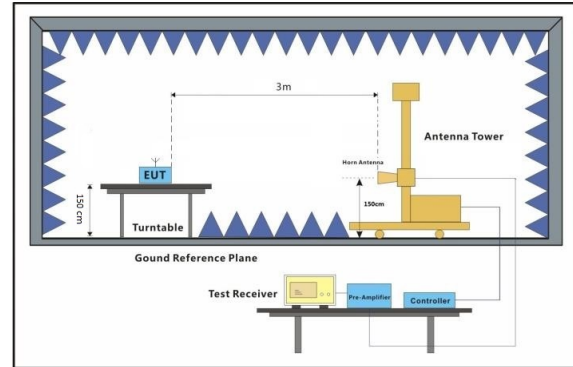
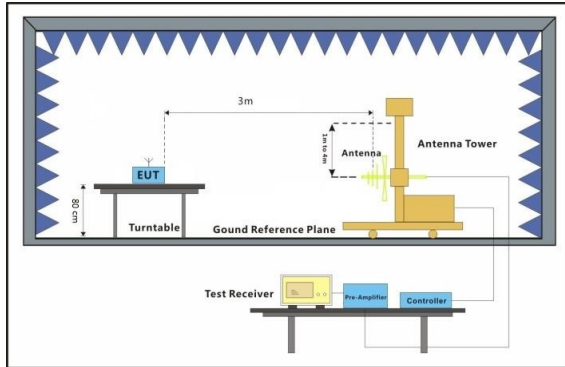


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## 7.6.2 Test Setup Diagram



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### 7.6.3 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

#### 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.



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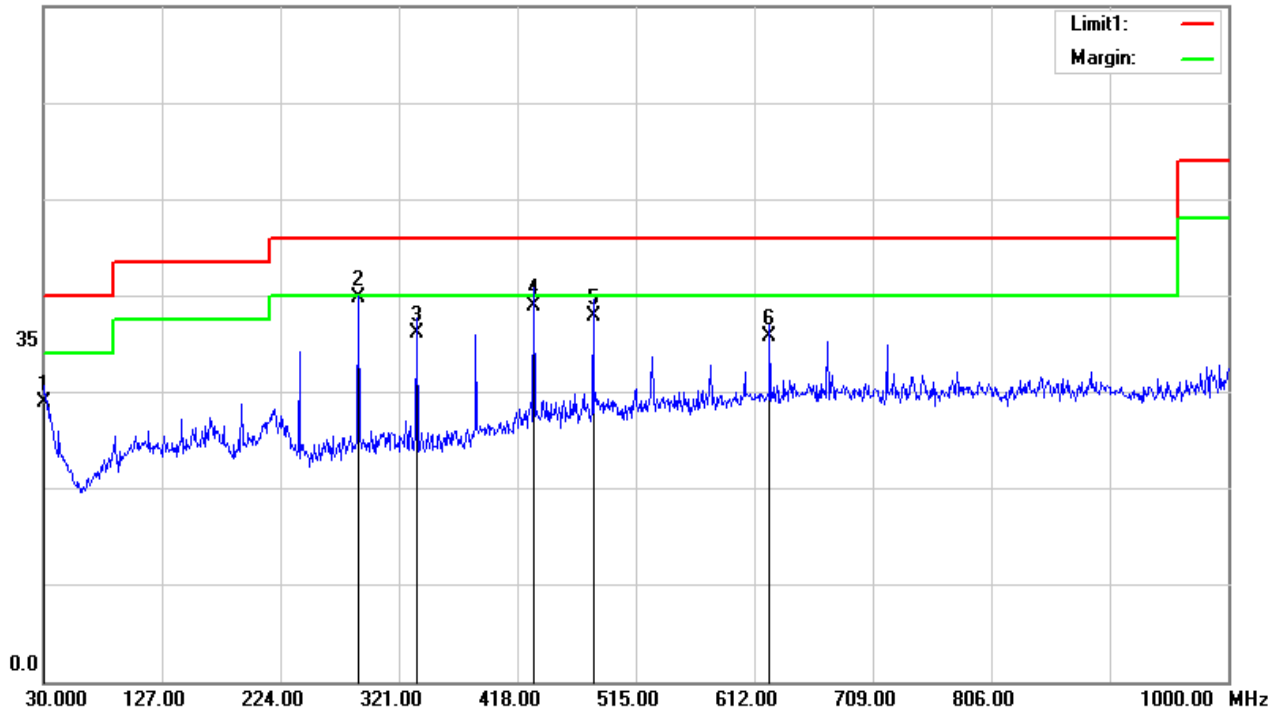
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30MHz-1GHz

Horizontal

70.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	30.9700	3.58	25.38	28.96	40.00	-11.04	100	214	QP
2	288.0200	19.43	20.31	39.74	46.00	-6.26	100	17	QP
3	335.5500	14.25	21.87	36.12	46.00	-9.88	100	25	QP
4	431.5800	14.92	24.04	38.96	46.00	-7.04	100	124	QP
5	480.0800	12.98	24.87	37.85	46.00	-8.15	100	111	QP
6	624.6100	9.02	26.81	35.83	46.00	-10.17	100	147	QP



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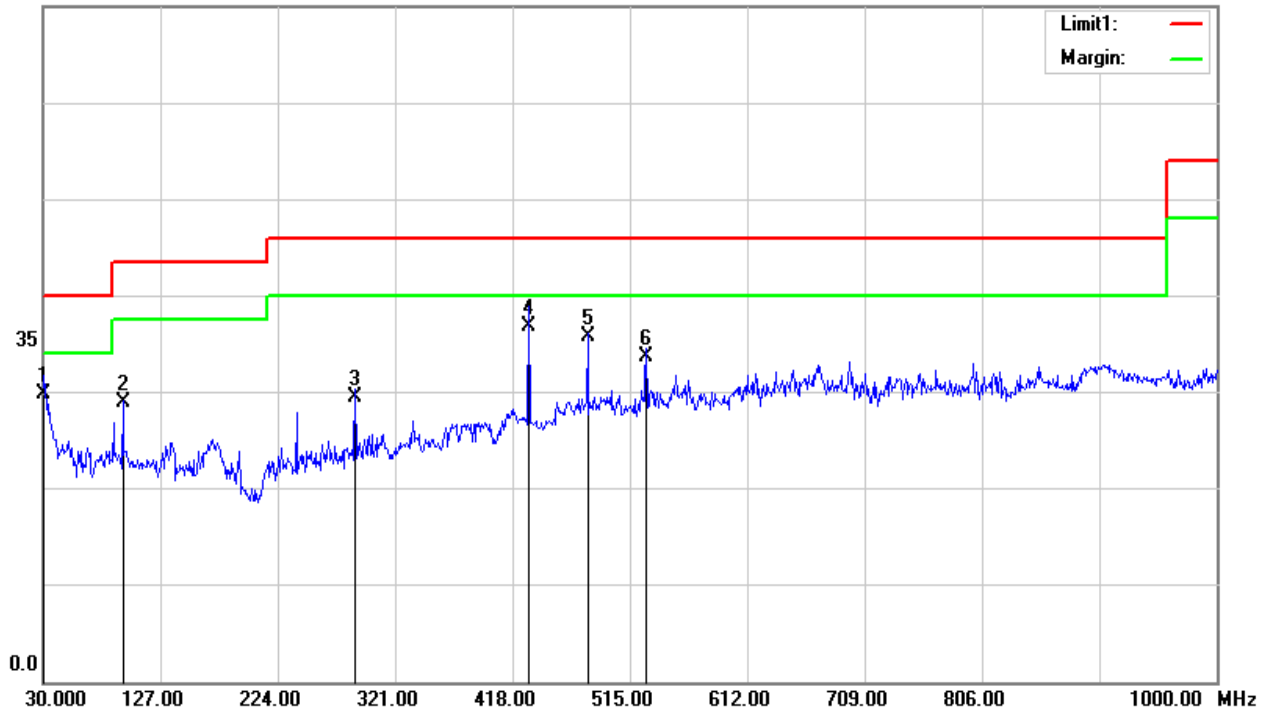
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Vertical

70.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	30.9700	4.46	25.38	29.84	40.00	-10.16	100	19	QP
2	95.9600	11.16	17.74	28.90	43.50	-14.60	100	152	QP
3	288.0200	9.10	20.31	29.41	46.00	-16.59	100	197	QP
4	431.5800	12.88	24.04	36.92	46.00	-9.08	100	254	QP
5	480.0800	10.88	24.87	35.75	46.00	-10.25	100	0	QP
6	528.5800	8.11	25.58	33.69	46.00	-12.31	100	16	QP

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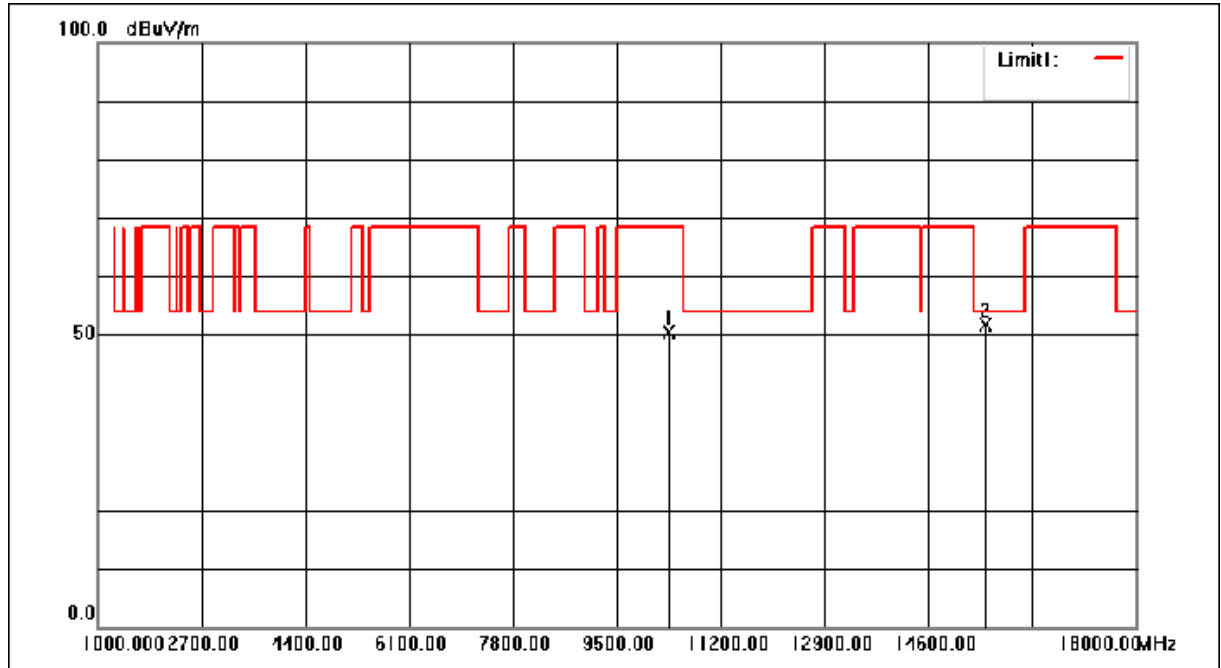
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Above 1GHz

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



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10360.000	50.25	0.16	50.41	68.30	-17.89	peak
2	15540.000	45.89	5.73	51.62	54.00	-2.38	peak

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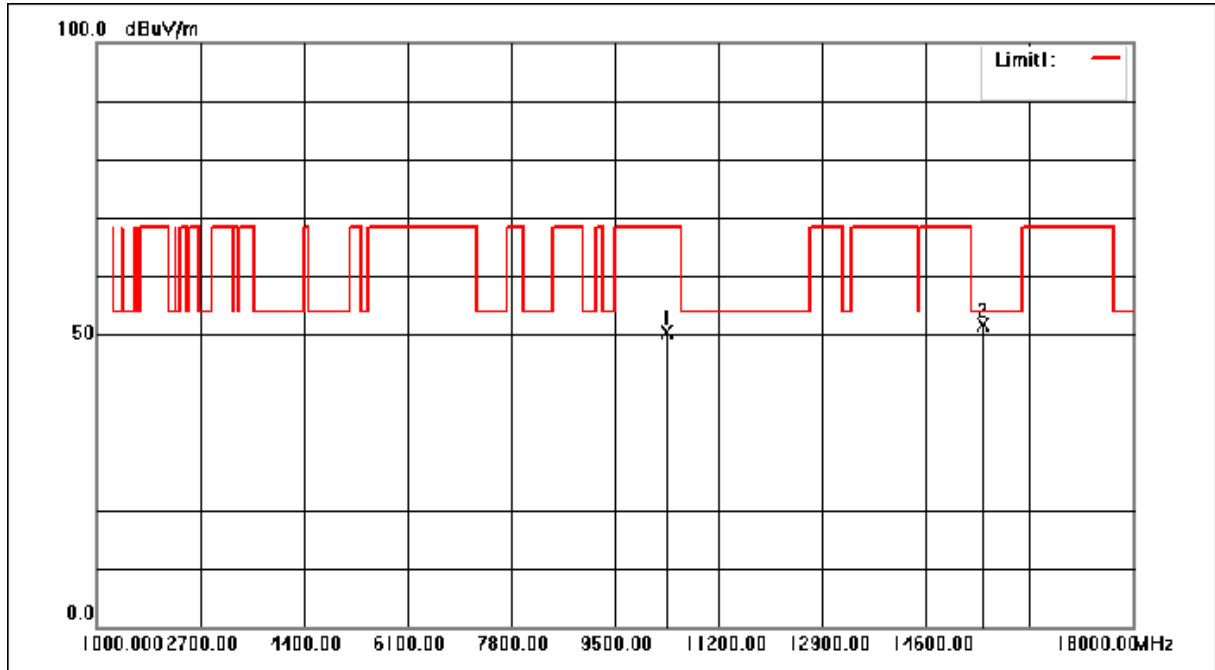
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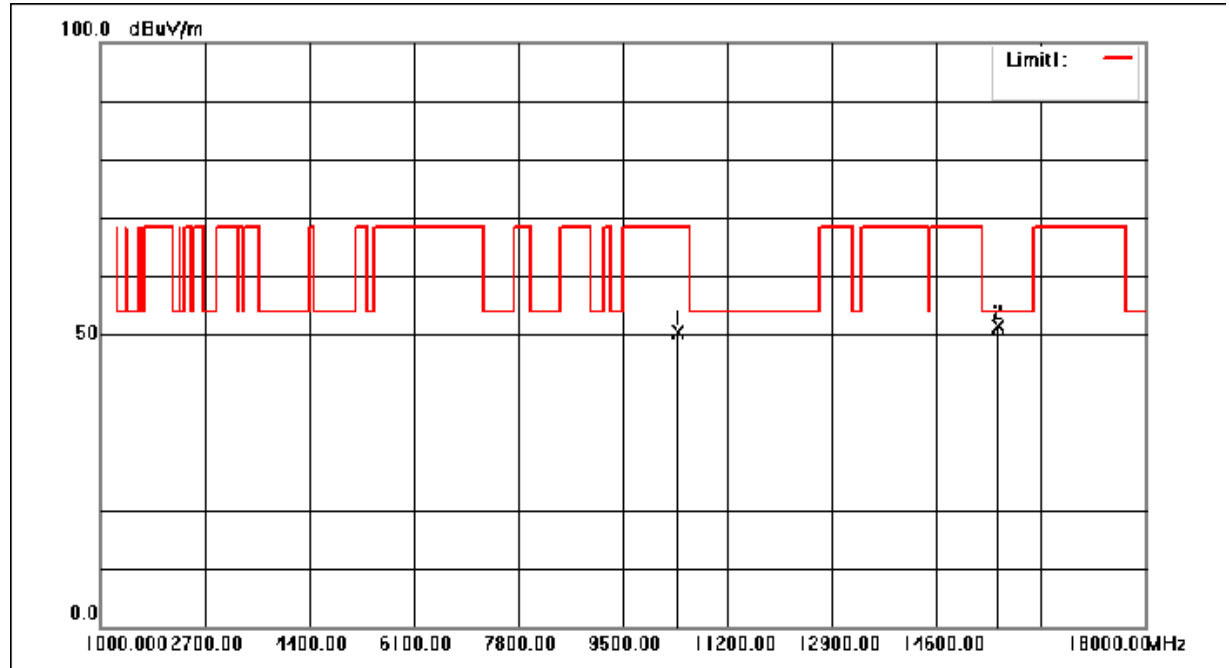
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10360.000	50.16	0.16	50.32	68.30	-17.98	peak
2	15540.000	45.86	5.73	51.59	54.00	-2.41	peak



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

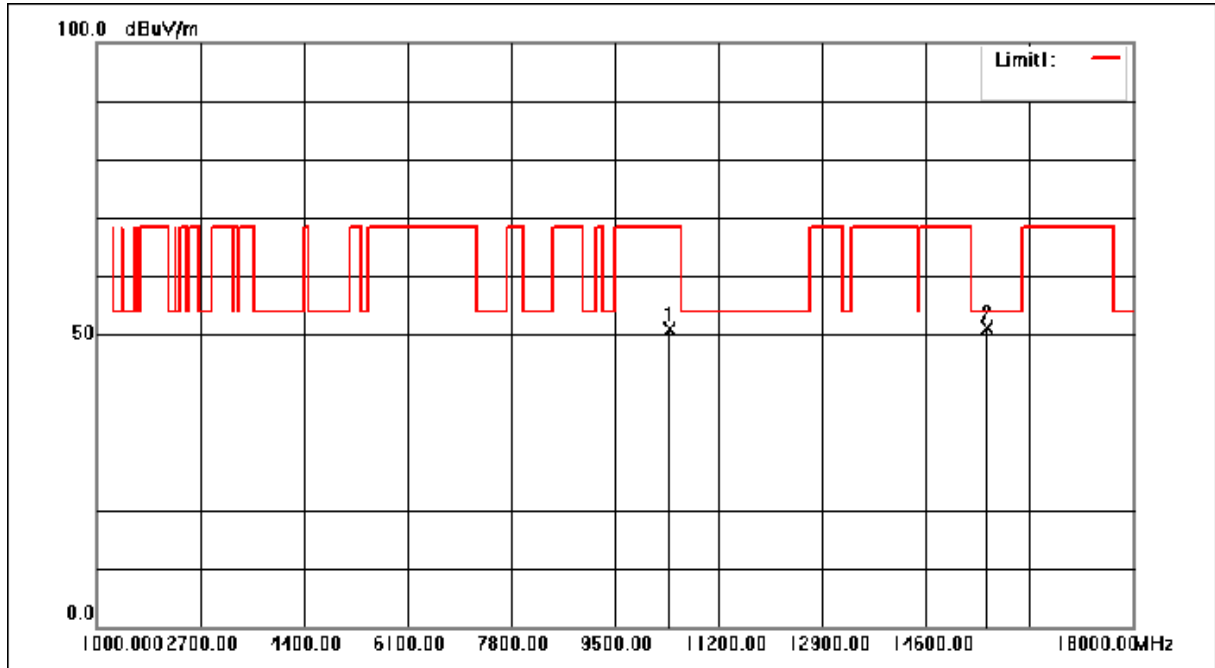


No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10400.000	50.20	0.24	50.44	68.30	-17.86	peak
2	15600.000	45.51	5.85	51.36	54.00	-2.64	peak





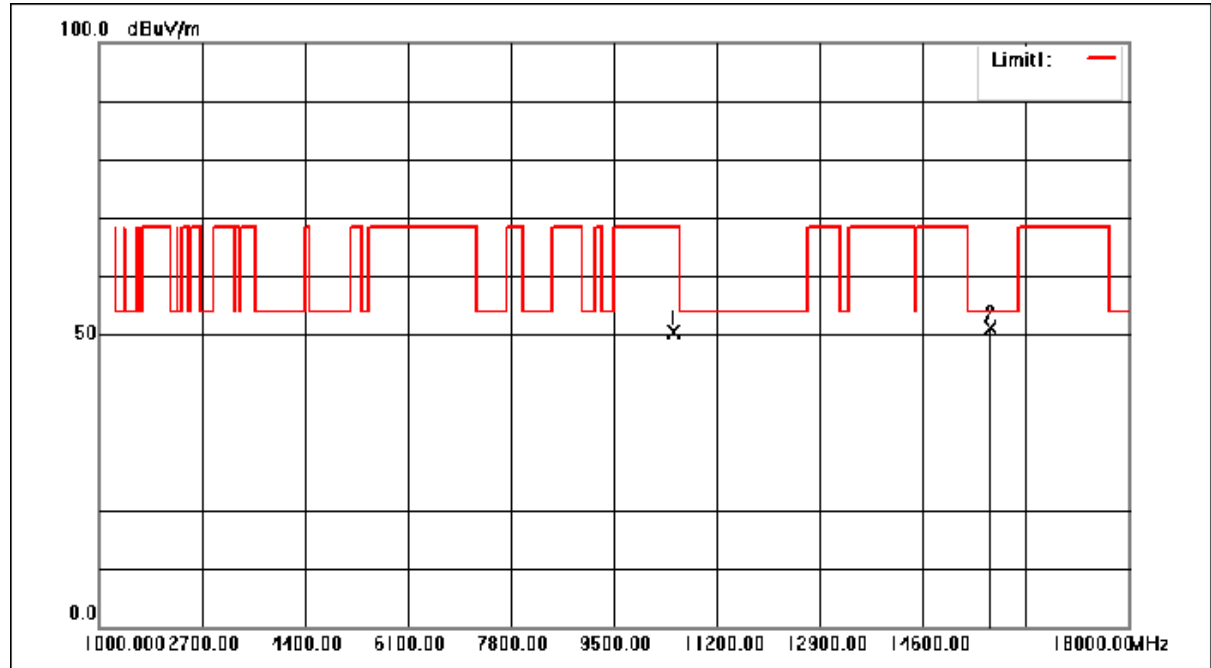
Mode: c; Polarization: Vertical; Modulation: a; bandwidth: 20MHz; Channel: middle



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10400.000	50.63	0.24	50.87	68.30	-17.43	peak
2	15600.000	45.24	5.85	51.09	54.00	-2.91	peak



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



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10480.000	49.99	0.40	50.39	68.30	-17.91	peak
2	15720.000	45.03	6.10	51.13	54.00	-2.87	peak



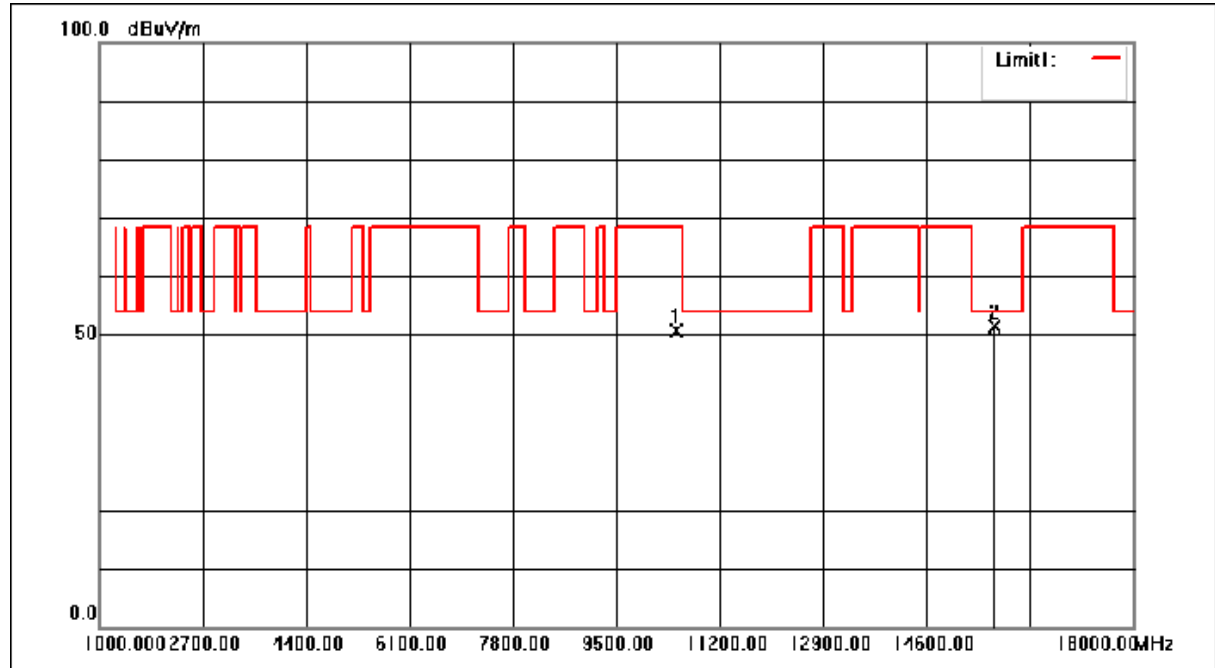
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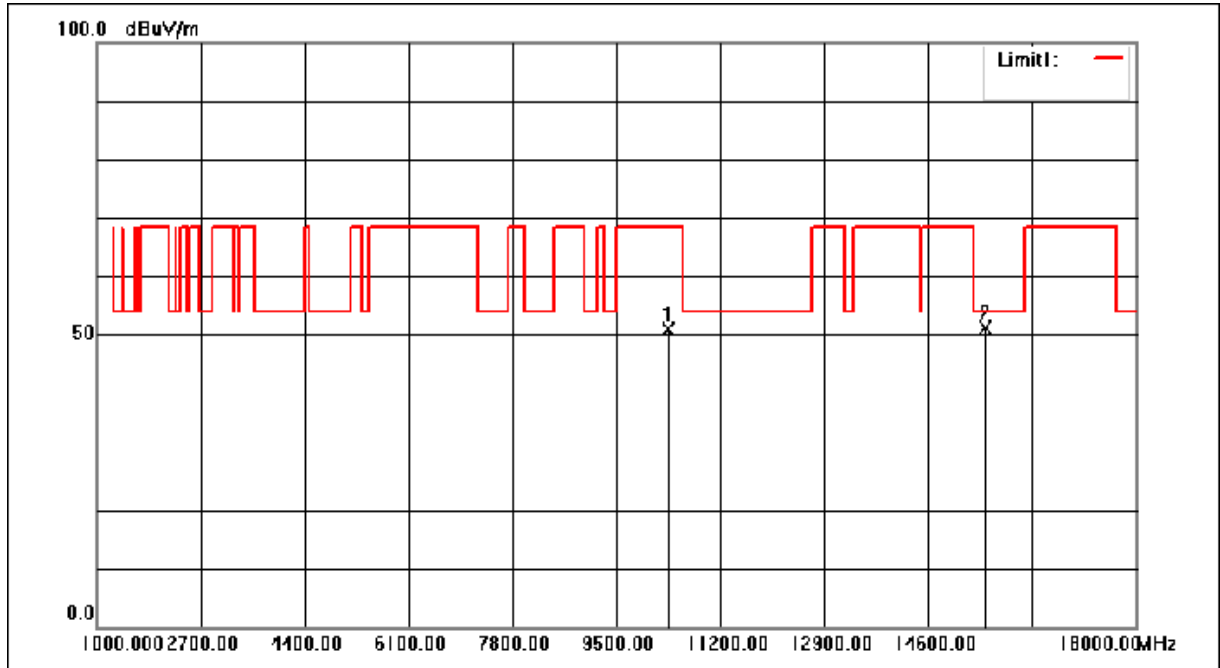
Mode: c; Polarization: Vertical; Modulation: a; bandwidth: 20MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10480.000	50.27	0.40	50.67	68.30	-17.63	peak
2	15720.000	45.18	6.10	51.28	54.00	-2.72	peak



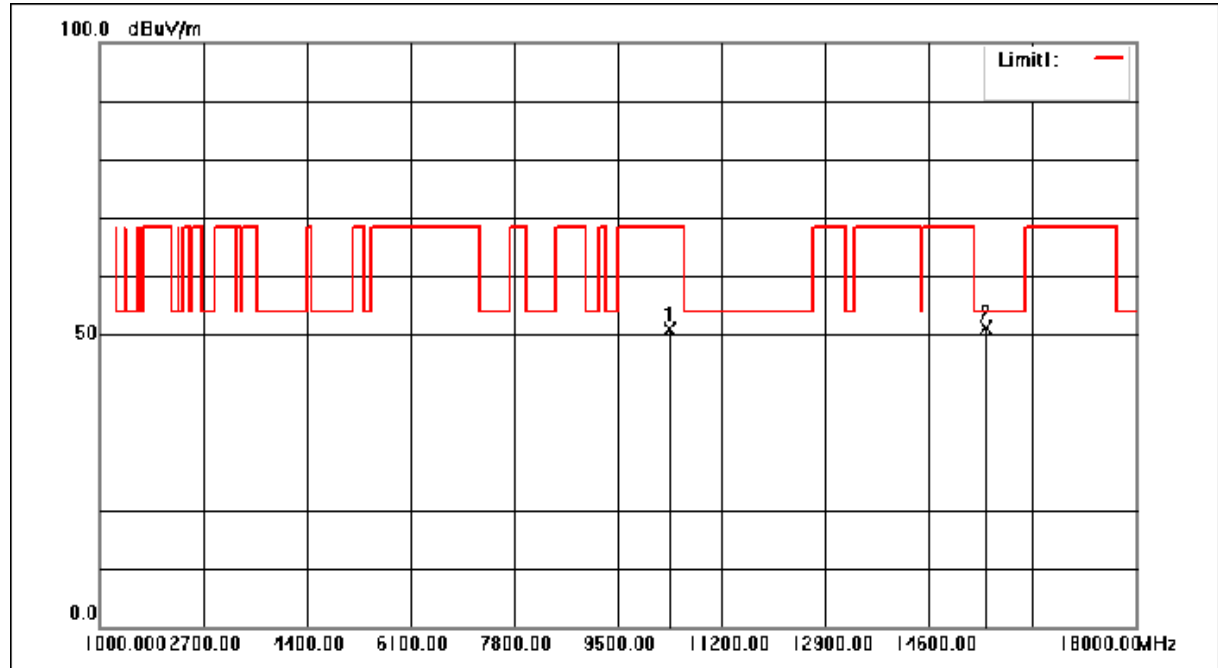
Mode: c; Polarization: Horizontal; Modulation: n; bandwidth: 20MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10360.000	50.69	0.16	50.85	68.30	-17.45	peak
2	15540.000	45.29	5.73	51.02	54.00	-2.98	peak



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

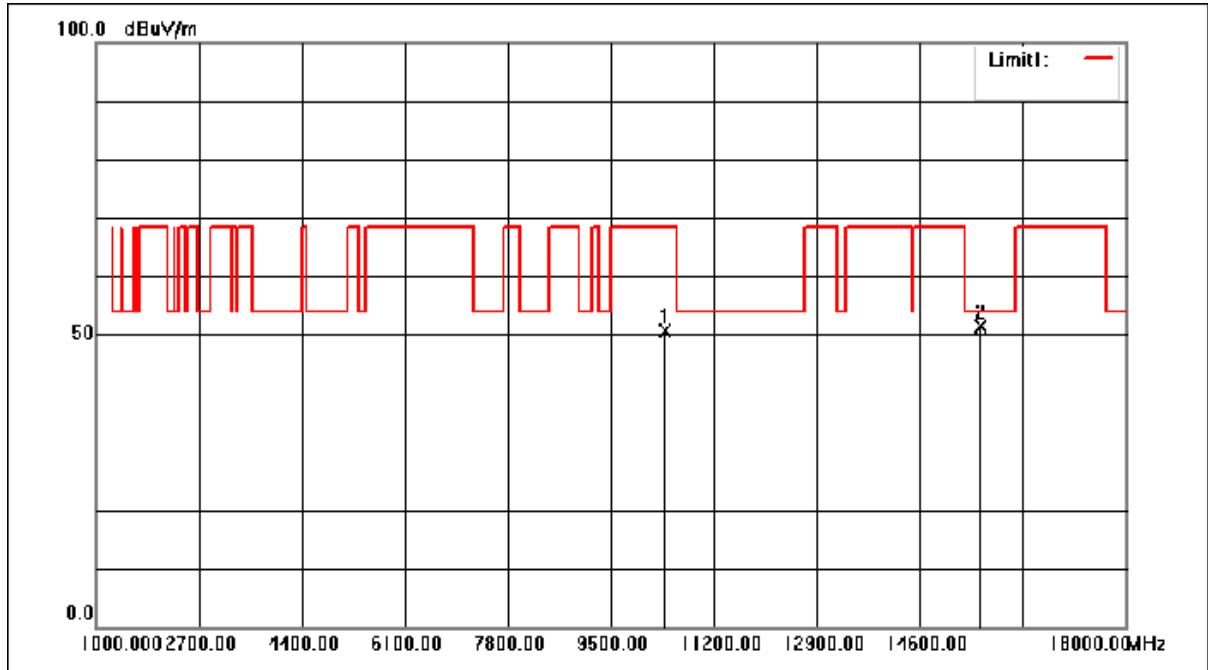


No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10360.000	50.75	0.16	50.91	68.30	-17.39	peak
2	15540.000	45.52	5.73	51.25	54.00	-2.75	peak





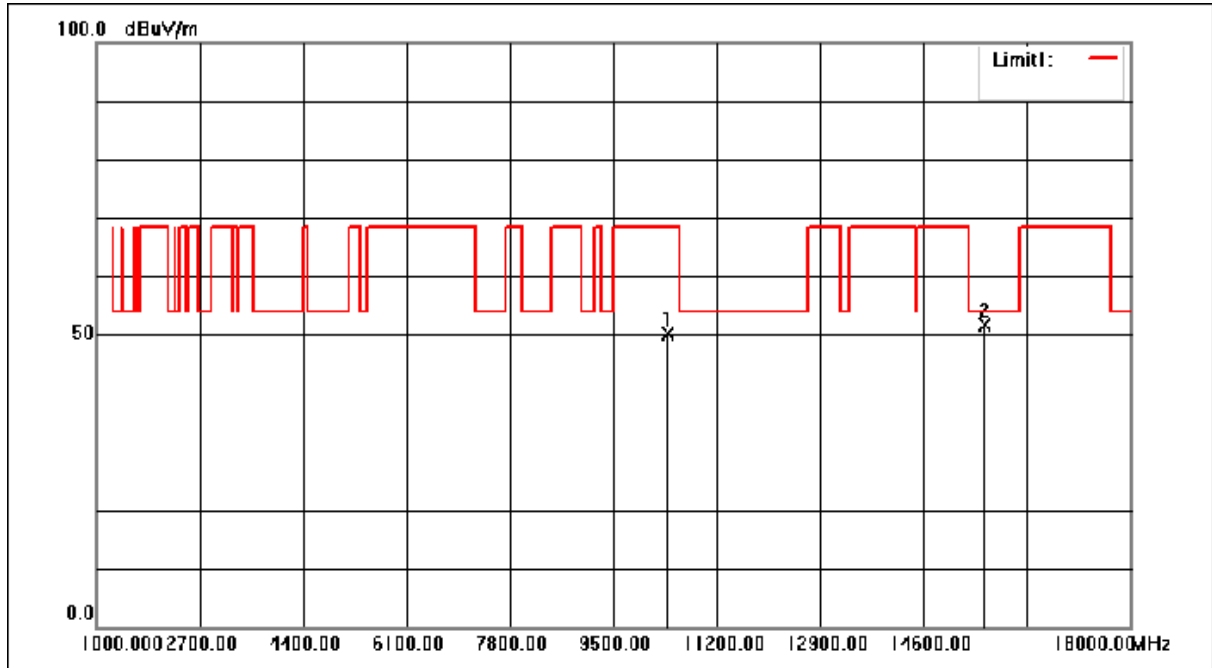
Mode: c; Polarization: Horizontal; Modulation: n; bandwidth: 20MHz; Channel: middle



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10400.000	50.27	0.24	50.51	68.30	-17.79	peak
2	15600.000	45.52	5.85	51.37	54.00	-2.63	peak



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



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10400.000	49.81	0.24	50.05	68.30	-18.25	peak
2	15600.000	45.83	5.85	51.68	54.00	-2.32	peak



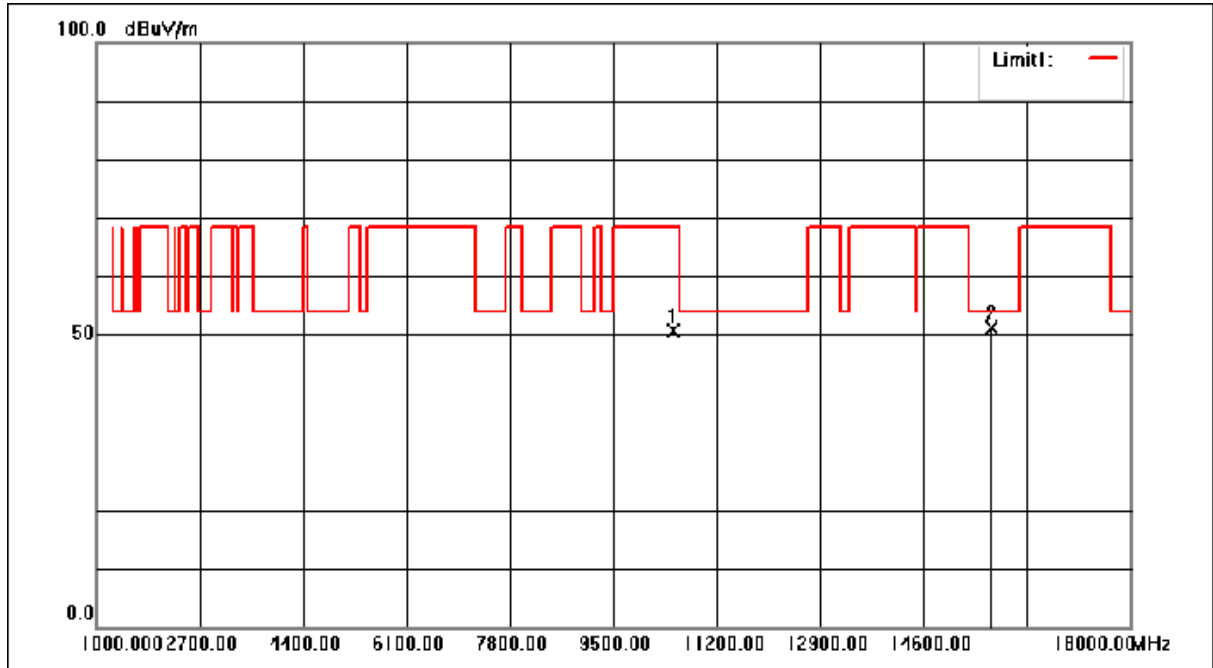
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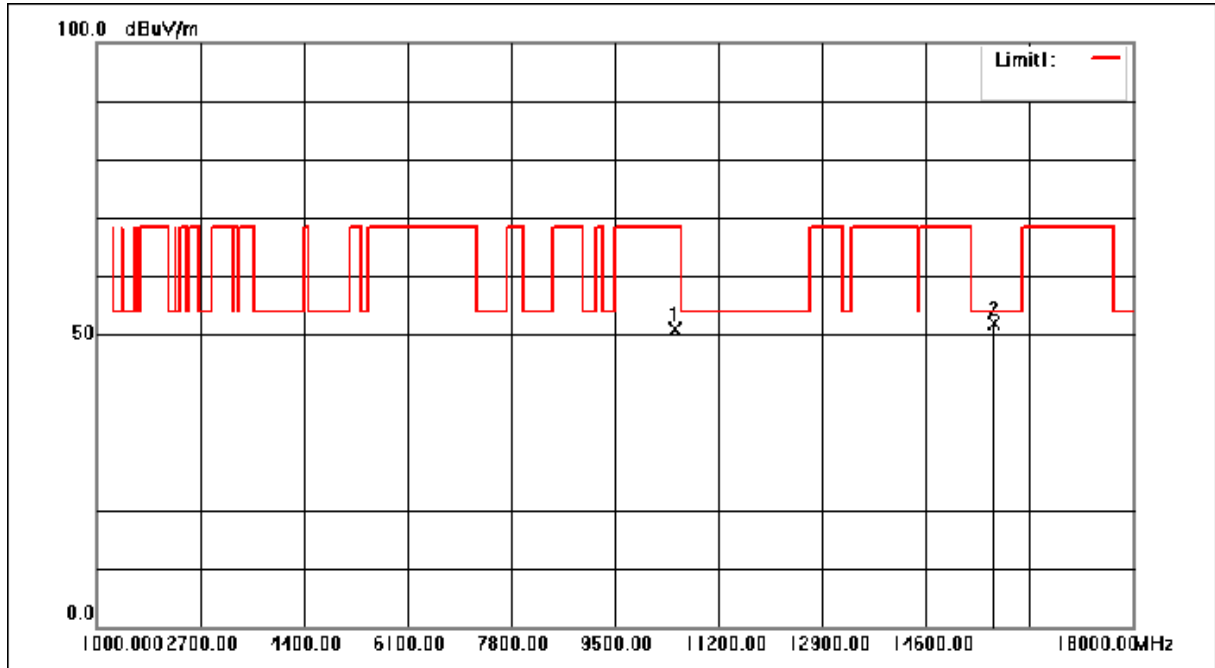
Mode: c; Polarization: Horizontal; Modulation: n; bandwidth: 20MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10480.000	50.21	0.40	50.61	68.30	-17.69	peak
2	15720.000	45.02	6.10	51.12	54.00	-2.88	peak



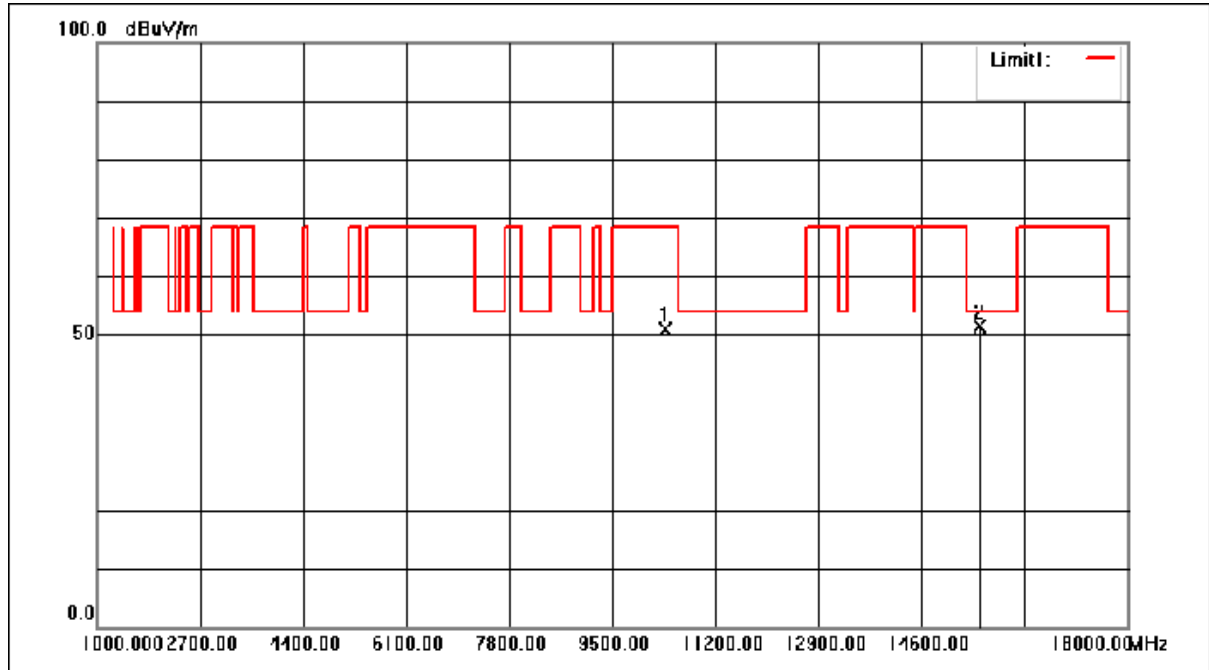
Mode: c; Polarization: Vertical; Modulation: n; bandwidth: 20MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10480.000	50.44	0.40	50.84	68.30	-17.46	peak
2	15720.000	45.88	6.10	51.98	54.00	-2.02	peak



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



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10380.000	50.58	0.20	50.78	68.30	-17.52	peak
2	15570.000	45.56	5.79	51.35	54.00	-2.65	peak



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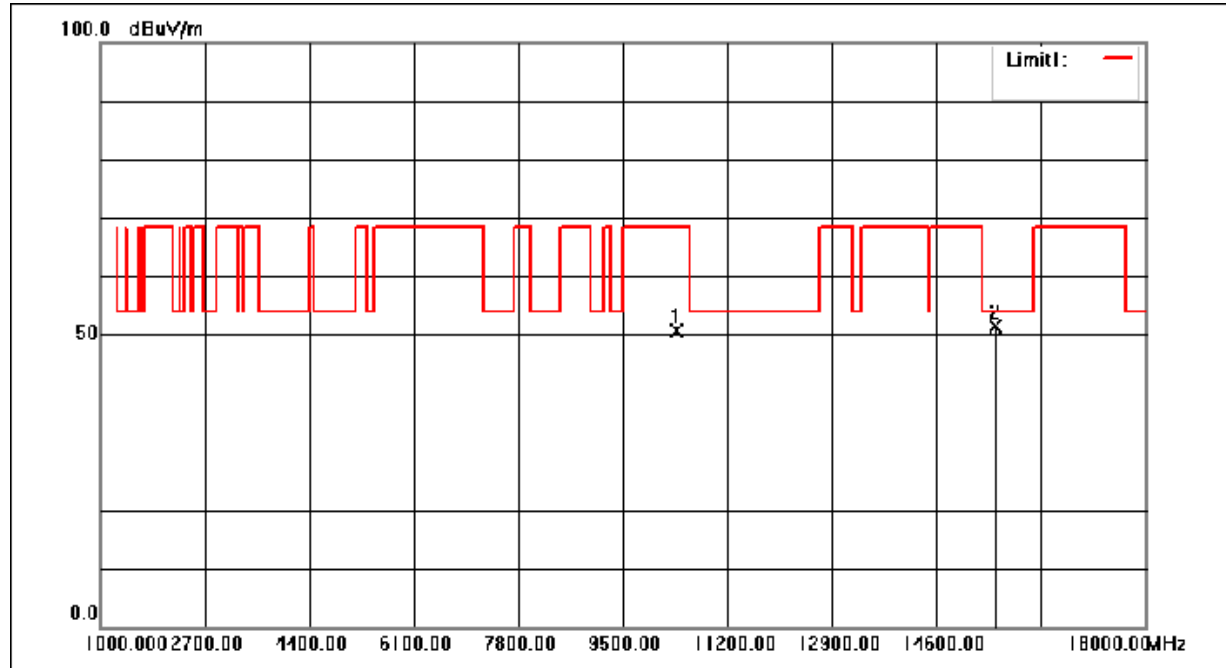
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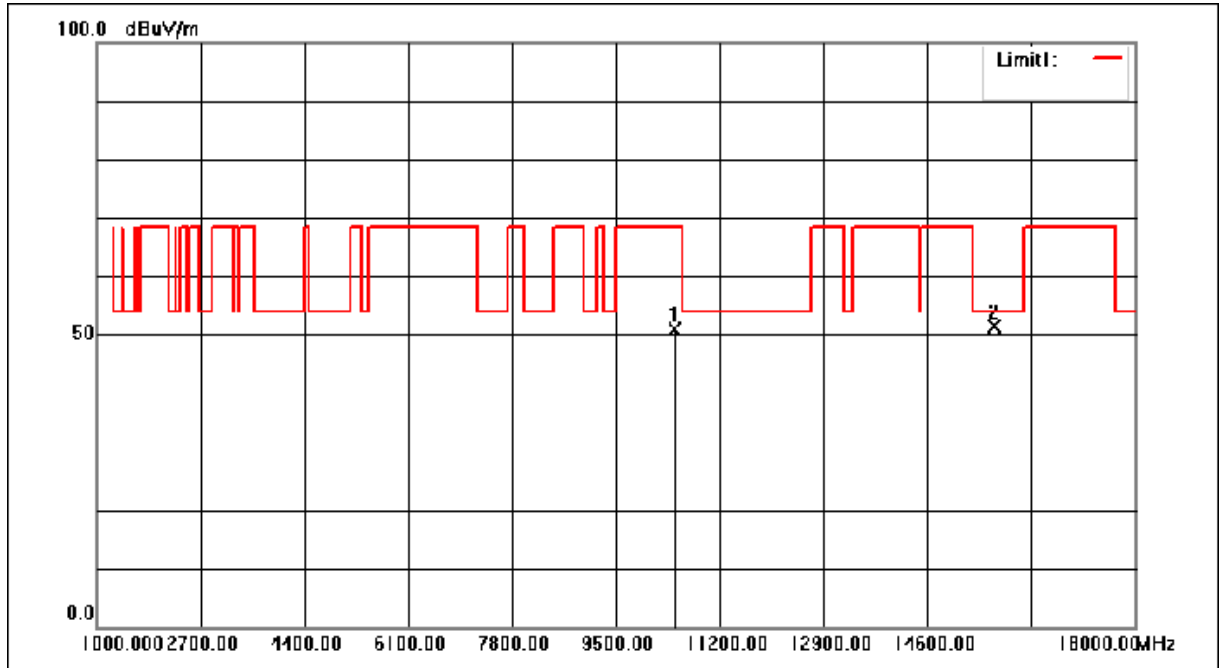
Mode: c; Polarization: Vertical; Modulation: n; bandwidth: 40MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10380.000	50.39	0.20	50.59	68.30	-17.71	peak
2	15570.000	45.59	5.79	51.38	54.00	-2.62	peak



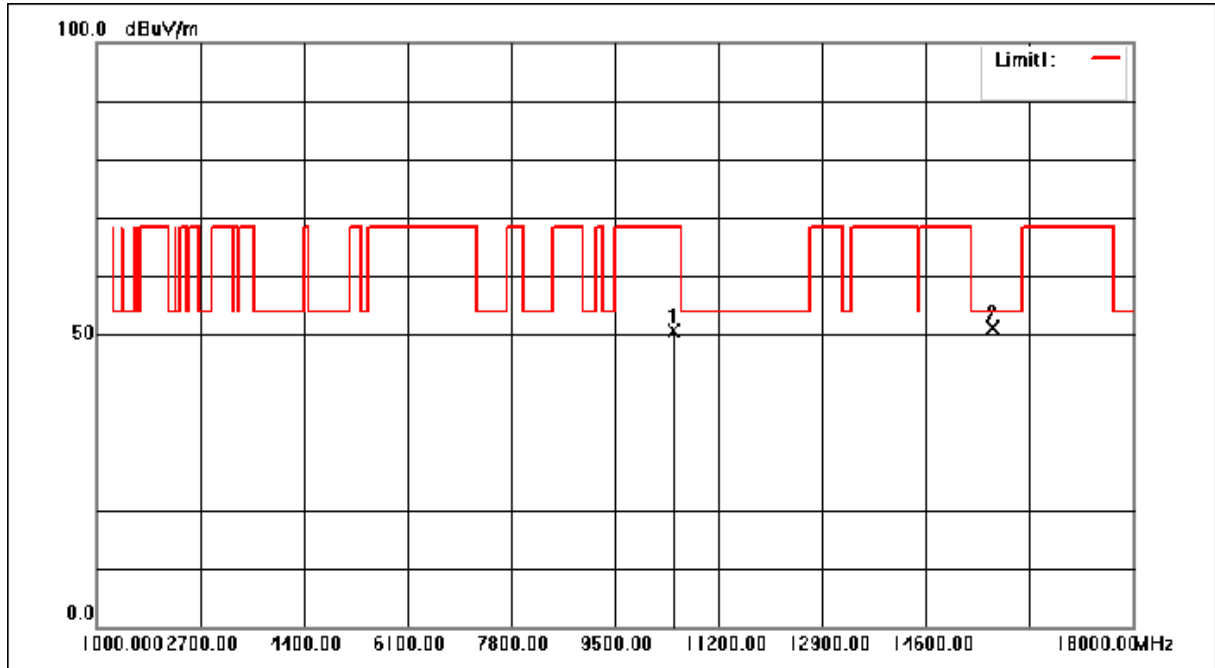
Mode: c; Polarization: Horizontal; Modulation: n; bandwidth: 40MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10460.000	50.47	0.36	50.83	68.30	-17.47	peak
2	15690.000	45.31	6.04	51.35	54.00	-2.65	peak



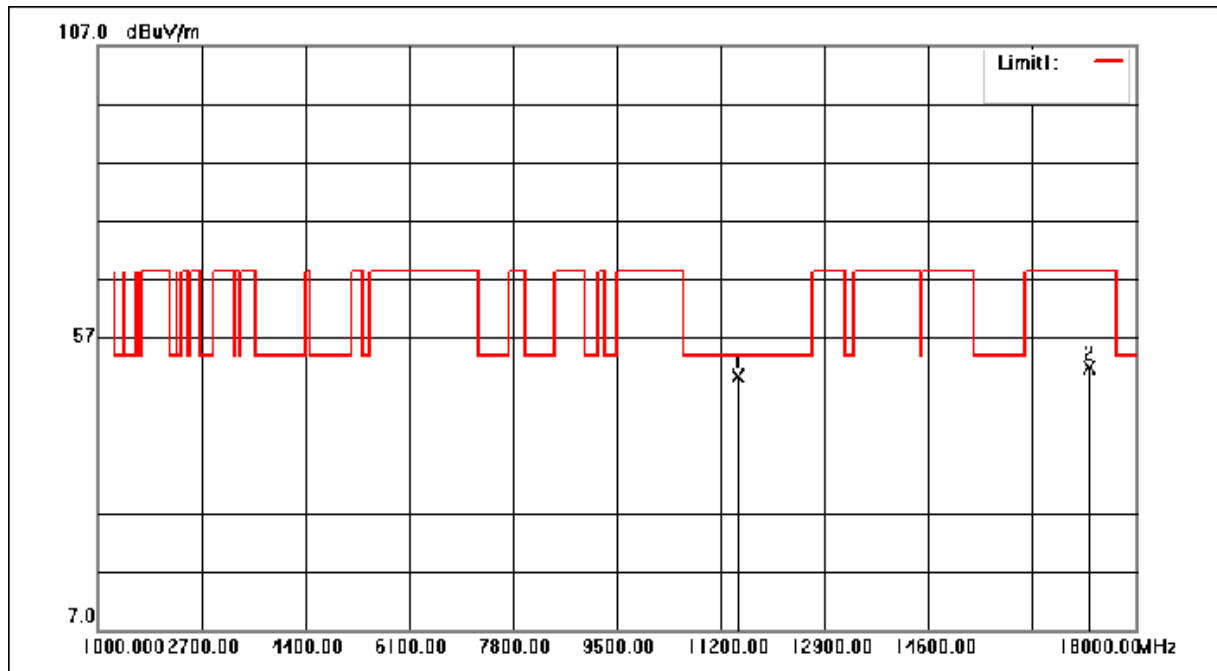
Mode: c; Polarization: Vertical; Modulation: n; bandwidth: 40MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10460.000	50.35	0.36	50.71	68.30	-17.59	peak
2	15690.000	45.15	6.04	51.19	54.00	-2.81	peak



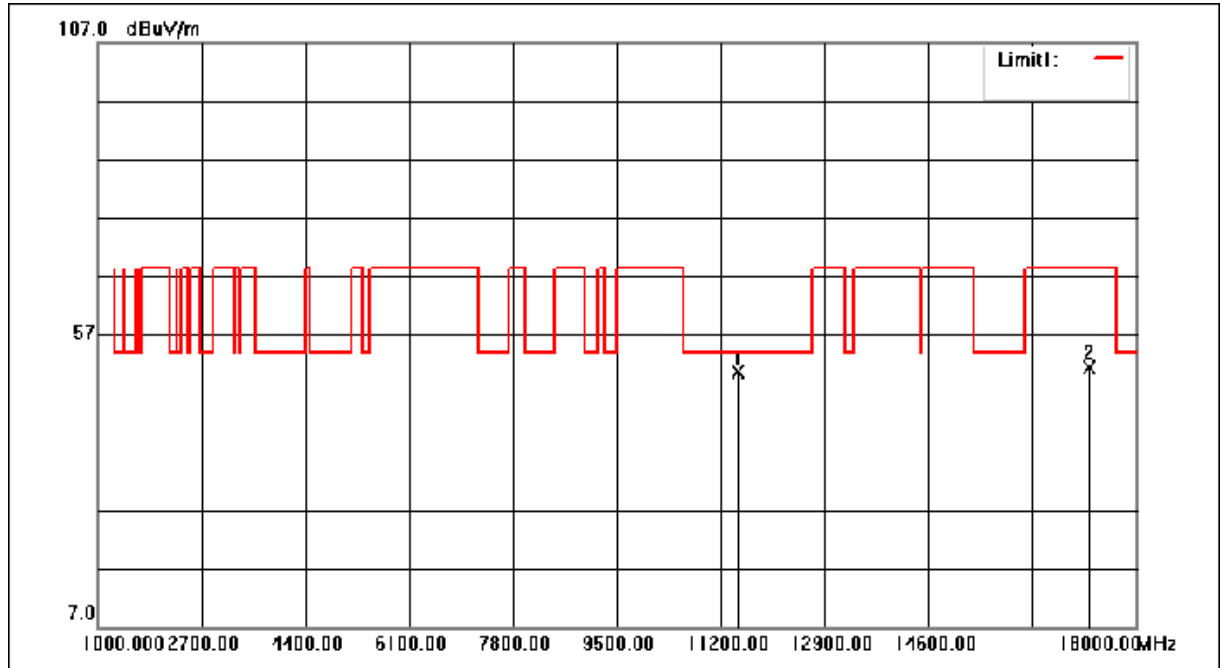
Mode: d; Polarization: Horizontal; Modulation: a; bandwidth: 20MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11490.000	49.39	0.94	50.33	54.00	-3.67	peak
2	17235.000	42.90	9.05	51.95	68.30	-16.35	peak



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

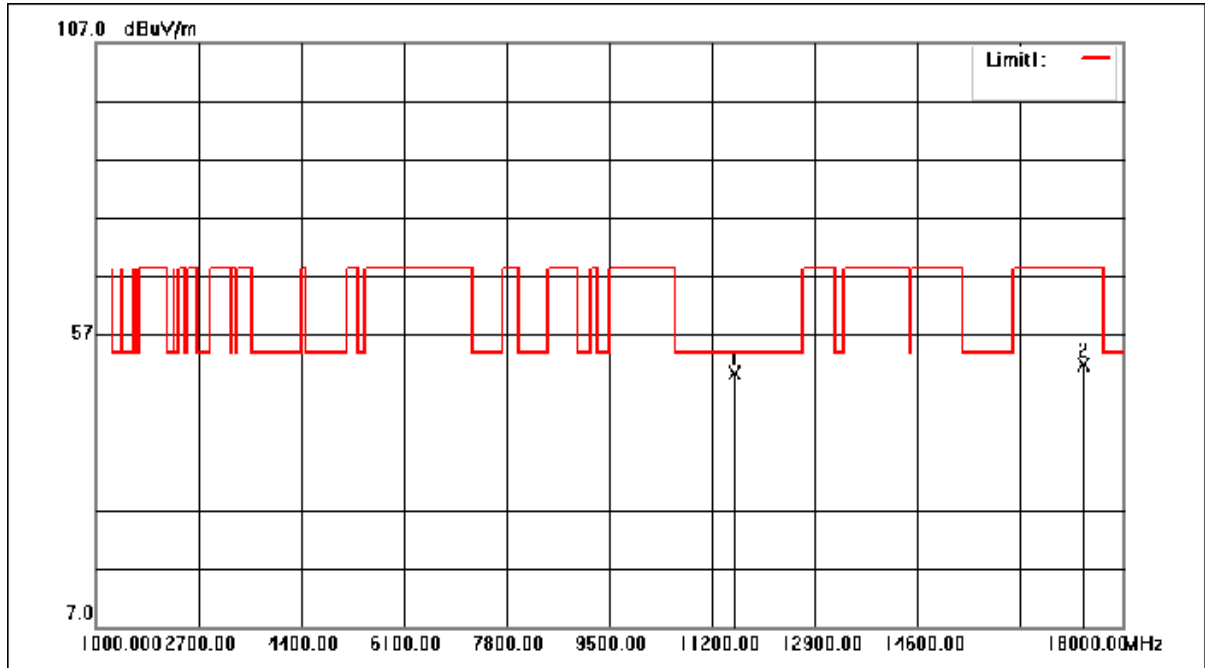


No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11490.000	49.69	0.94	50.63	54.00	-3.37	peak
2	17235.000	42.37	9.05	51.42	68.30	-16.88	peak





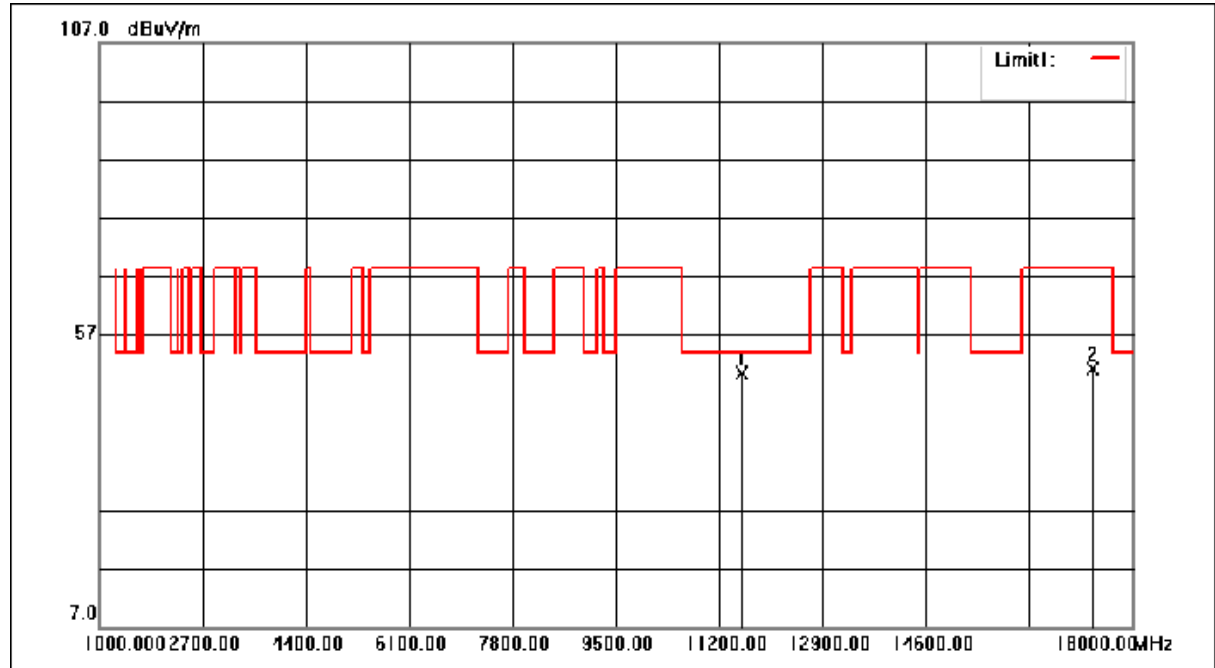
Mode: d; Polarization: Horizontal; Modulation: a; bandwidth: 20MHz; Channel: middle



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11570.000	49.25	1.18	50.43	54.00	-3.57	peak
2	17355.000	42.80	8.98	51.78	68.30	-16.52	peak



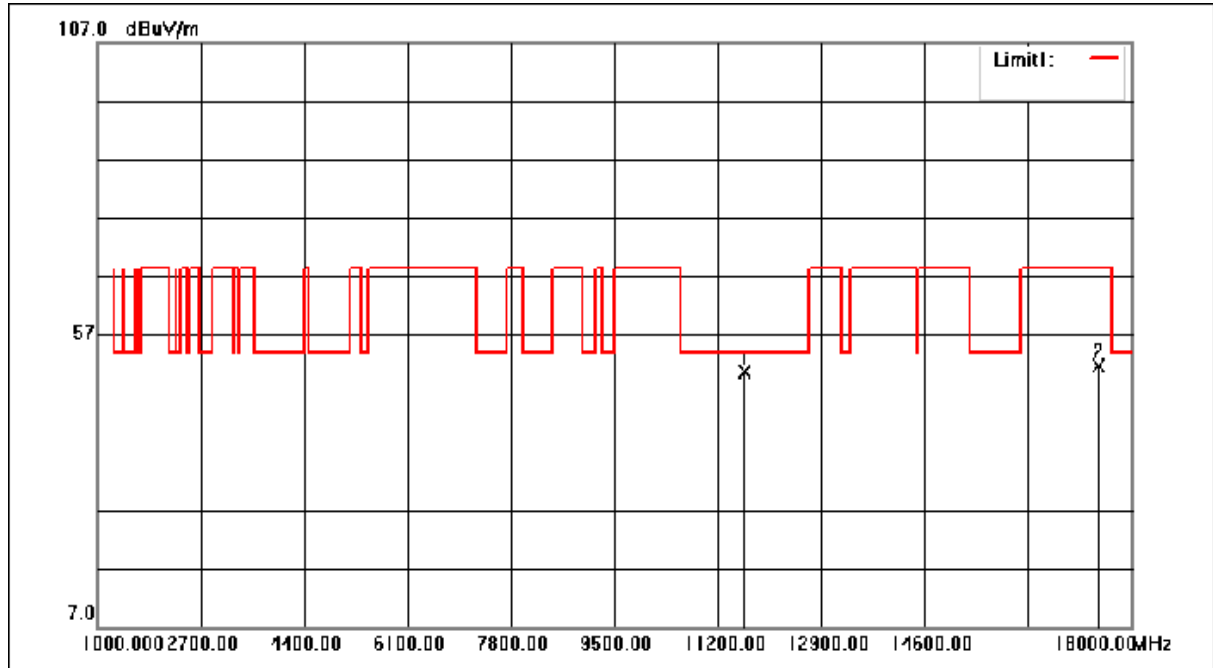
Mode: d; Polarization: Vertical; Modulation: a; bandwidth: 20MHz; Channel: middle



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11570.000	49.16	1.18	50.34	54.00	-3.66	peak
2	17355.000	42.10	8.98	51.08	68.30	-17.22	peak



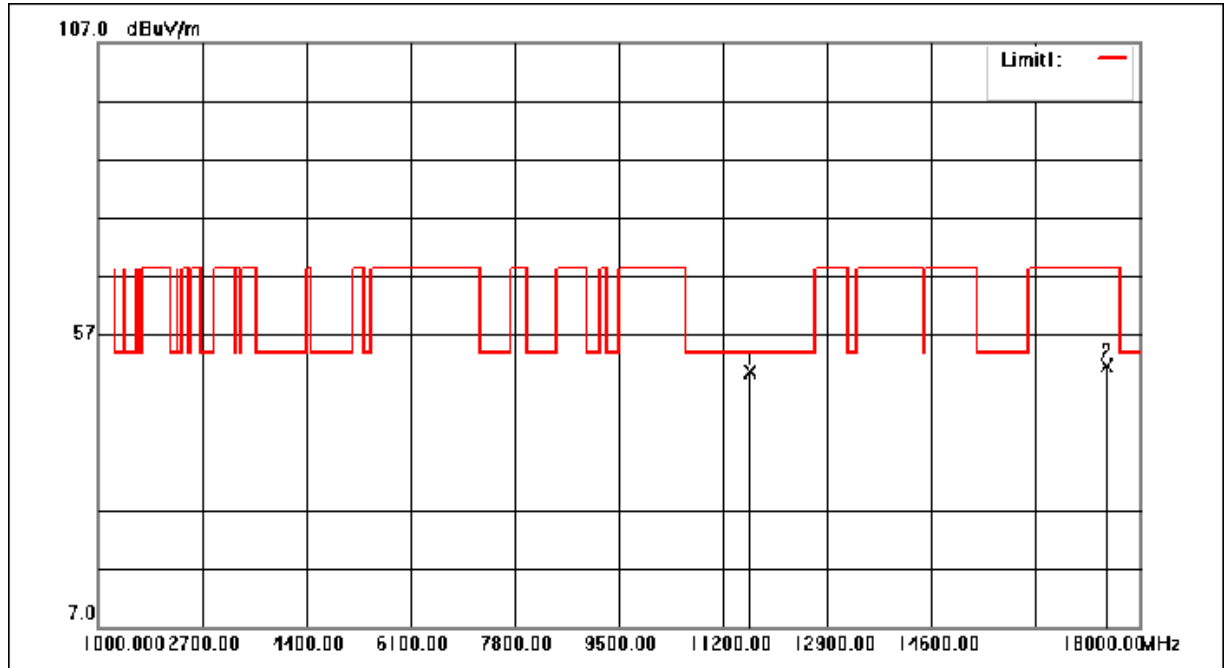
Mode: d; Polarization: Horizontal; Modulation: a; bandwidth: 20MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11650.000	49.09	1.45	50.54	54.00	-3.46	peak
2	17475.000	42.77	8.90	51.67	68.30	-16.63	peak



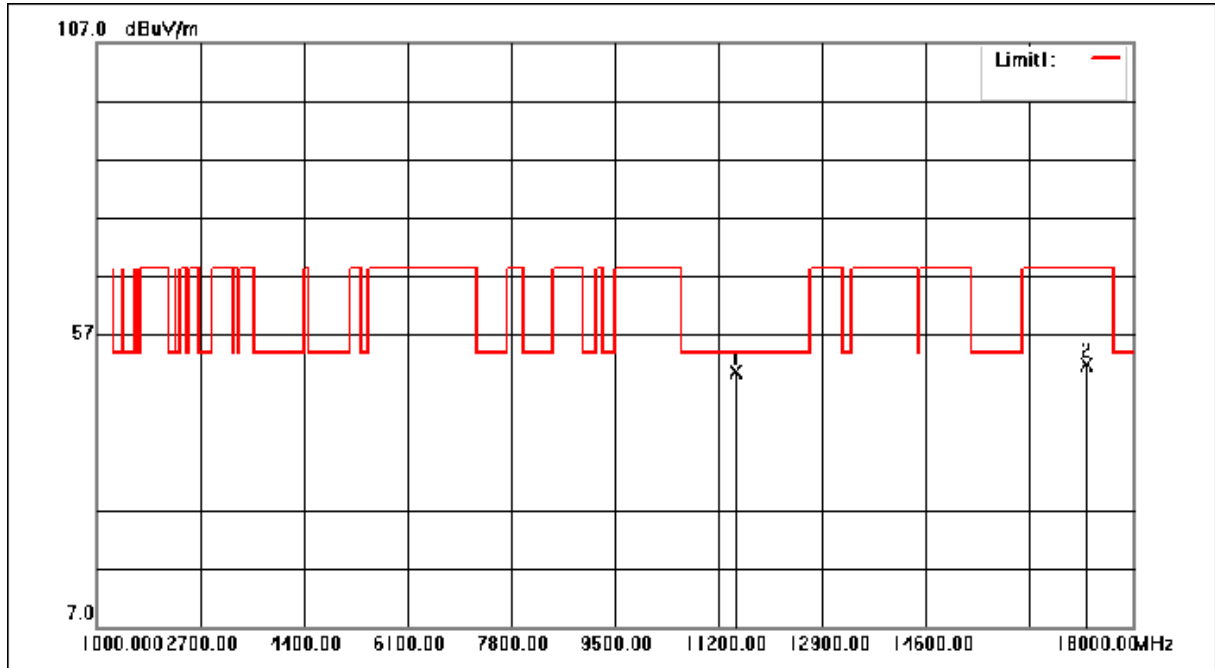
Mode: d; Polarization: Vertical; Modulation: a; bandwidth: 20MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11650.000	49.15	1.45	50.60	54.00	-3.40	peak
2	17475.000	42.83	8.90	51.73	68.30	-16.57	peak



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

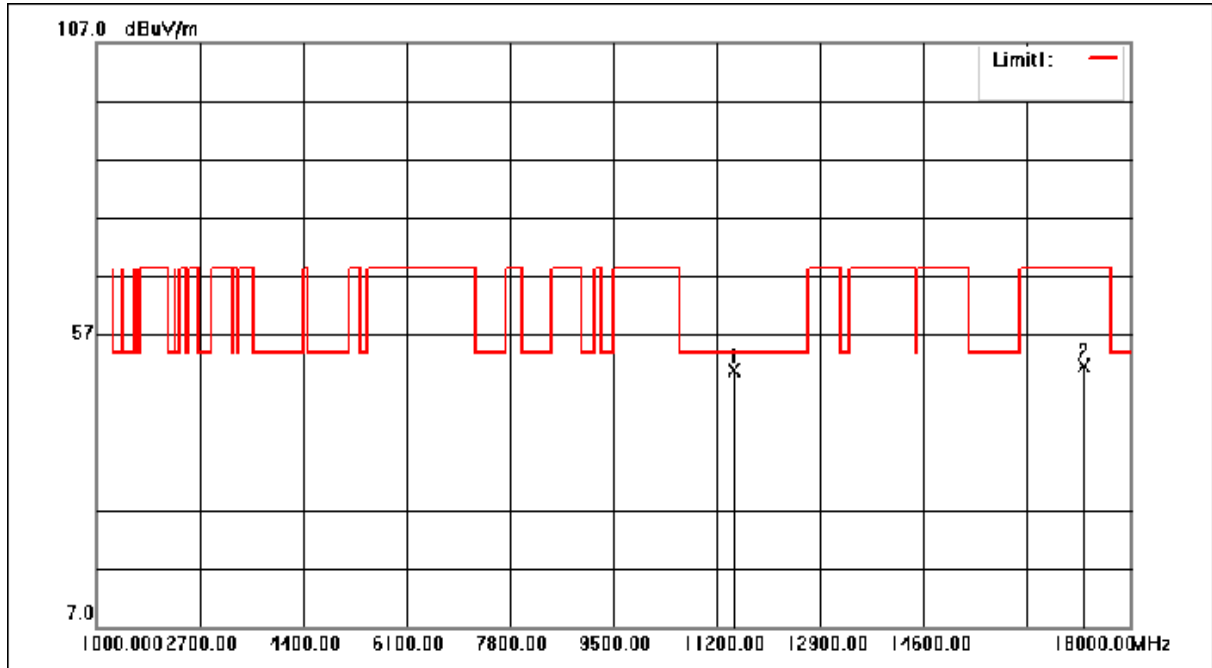


No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11490.000	49.81	0.94	50.75	54.00	-3.25	peak
2	17235.000	42.79	9.05	51.84	68.30	-16.46	peak





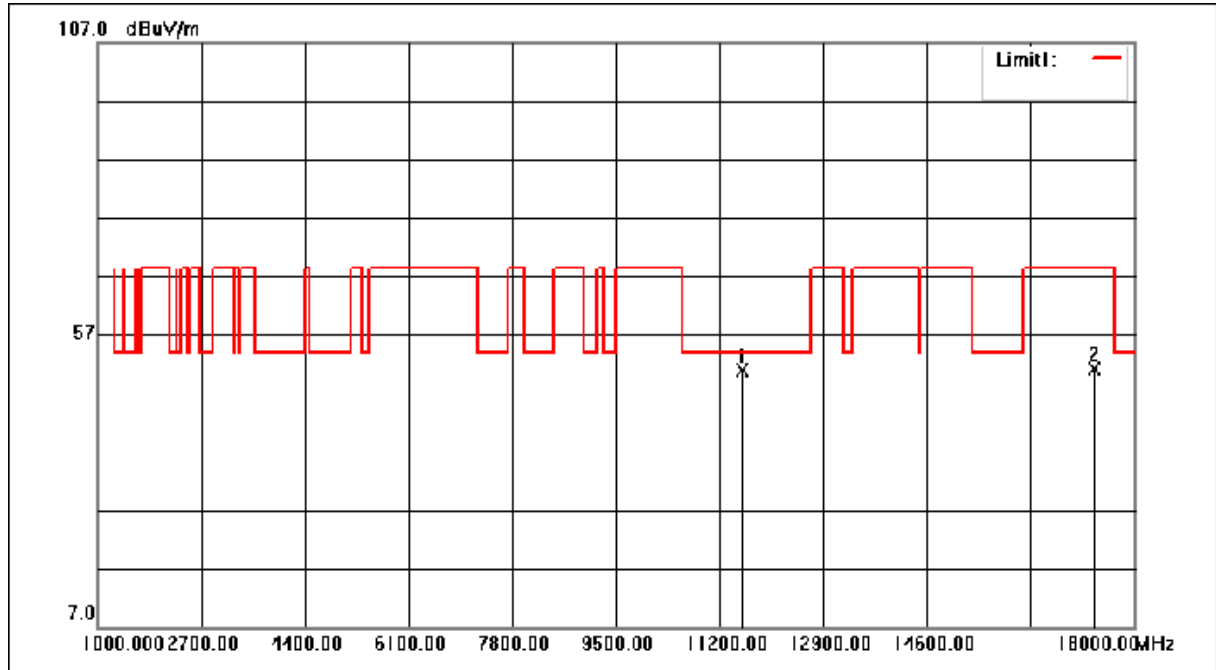
Mode: d; Polarization: Vertical; Modulation: n; bandwidth: 20MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11490.000	49.95	0.94	50.89	54.00	-3.11	peak
2	17235.000	42.51	9.05	51.56	68.30	-16.74	peak



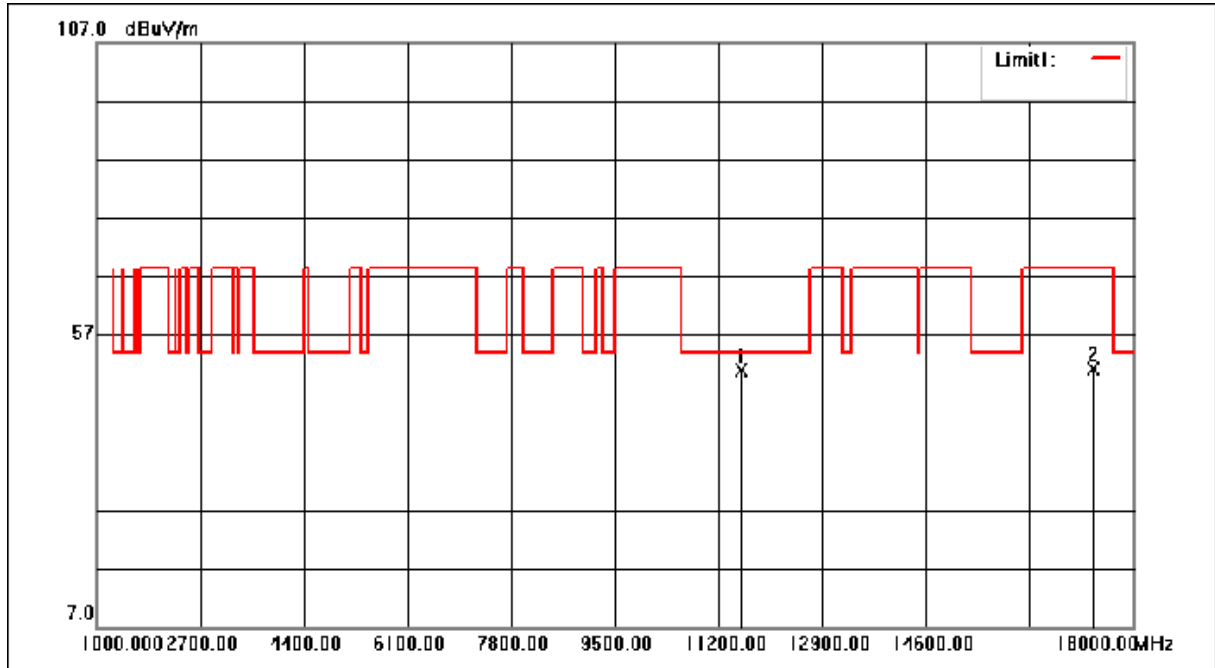
Mode: d; Polarization: Horizontal; Modulation: n; bandwidth: 20MHz; Channel: middle



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11570.000	49.61	1.18	50.79	54.00	-3.21	peak
2	17355.000	42.23	8.98	51.21	68.30	-17.09	peak



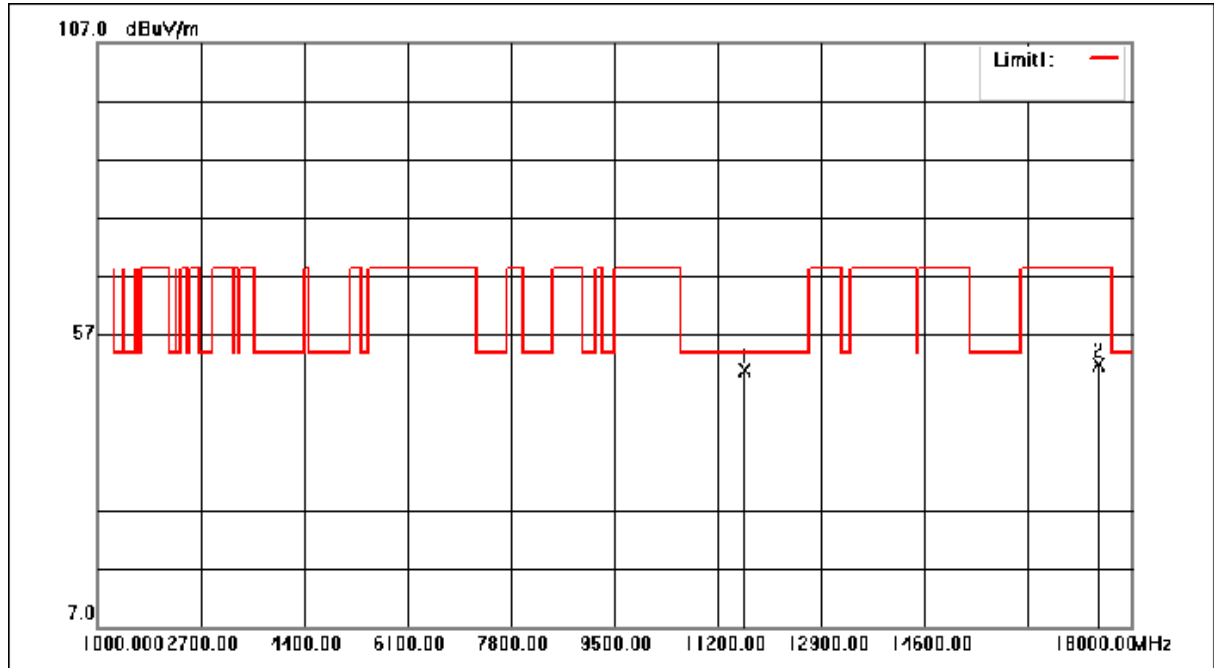
Mode: d; Polarization: Vertical; Modulation: n; bandwidth: 20MHz; Channel: middle



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11570.000	49.78	1.18	50.96	54.00	-3.04	peak
2	17355.000	42.24	8.98	51.22	68.30	-17.08	peak



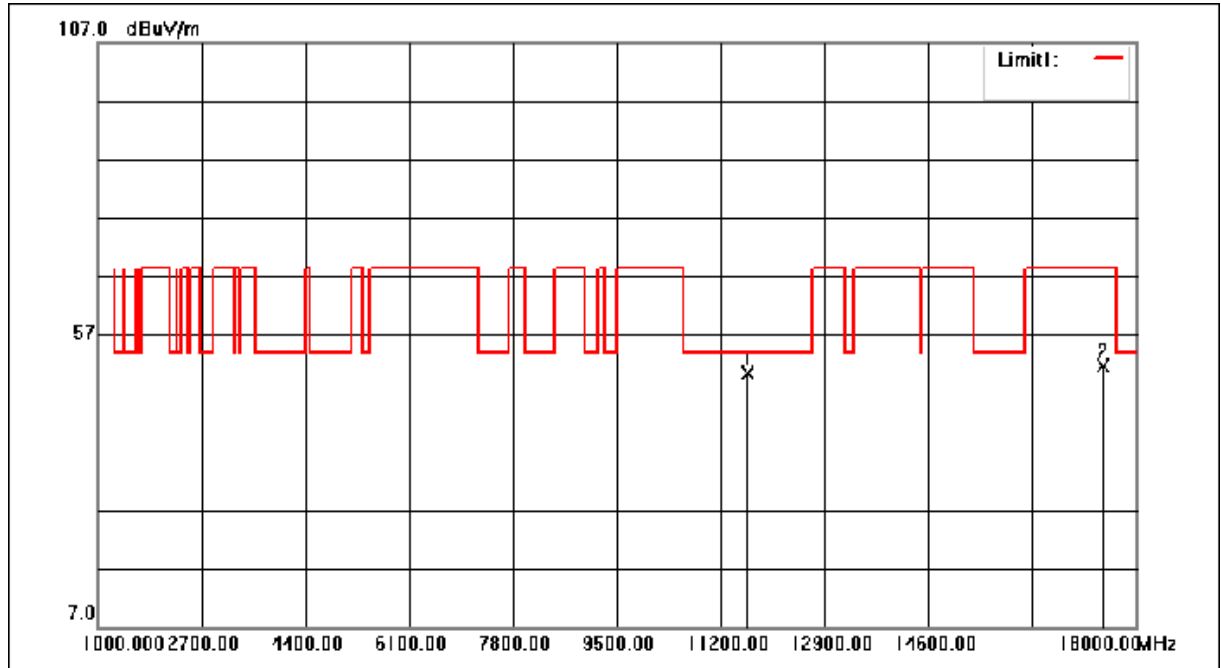
Mode: d; Polarization: Horizontal; Modulation: n; bandwidth: 20MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11650.000	49.41	1.45	50.86	54.00	-3.14	peak
2	17475.000	42.87	8.90	51.77	68.30	-16.53	peak



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

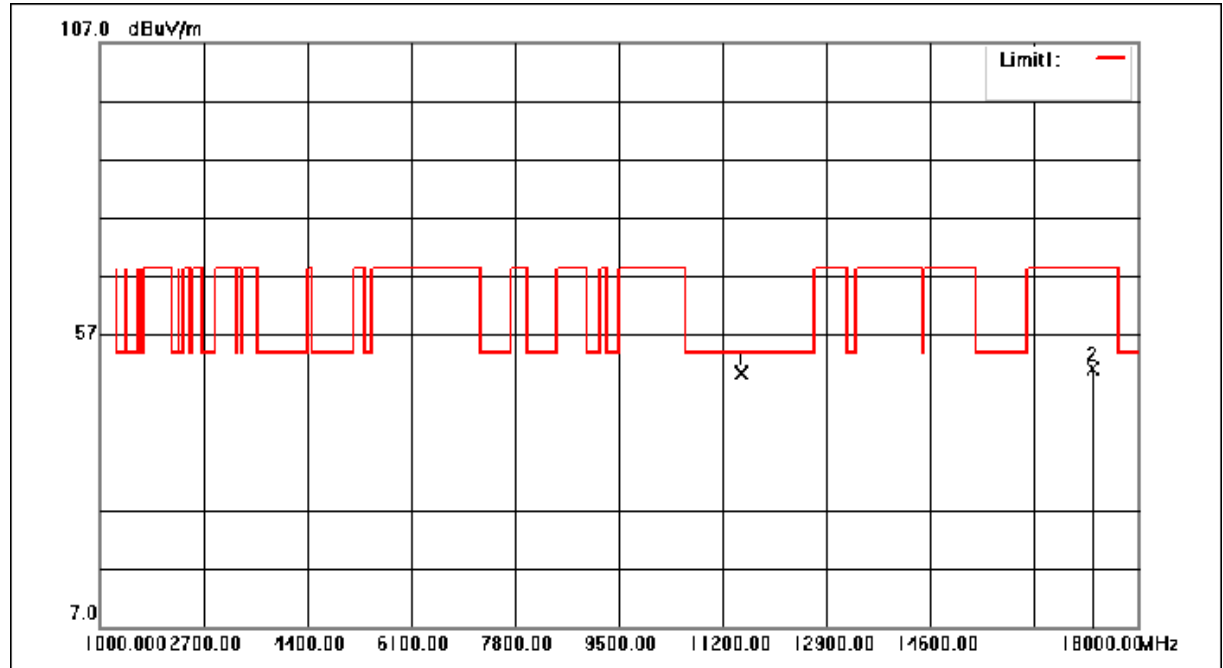


No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11650.000	48.86	1.45	50.31	54.00	-3.69	peak
2	17475.000	42.62	8.90	51.52	68.30	-16.78	peak





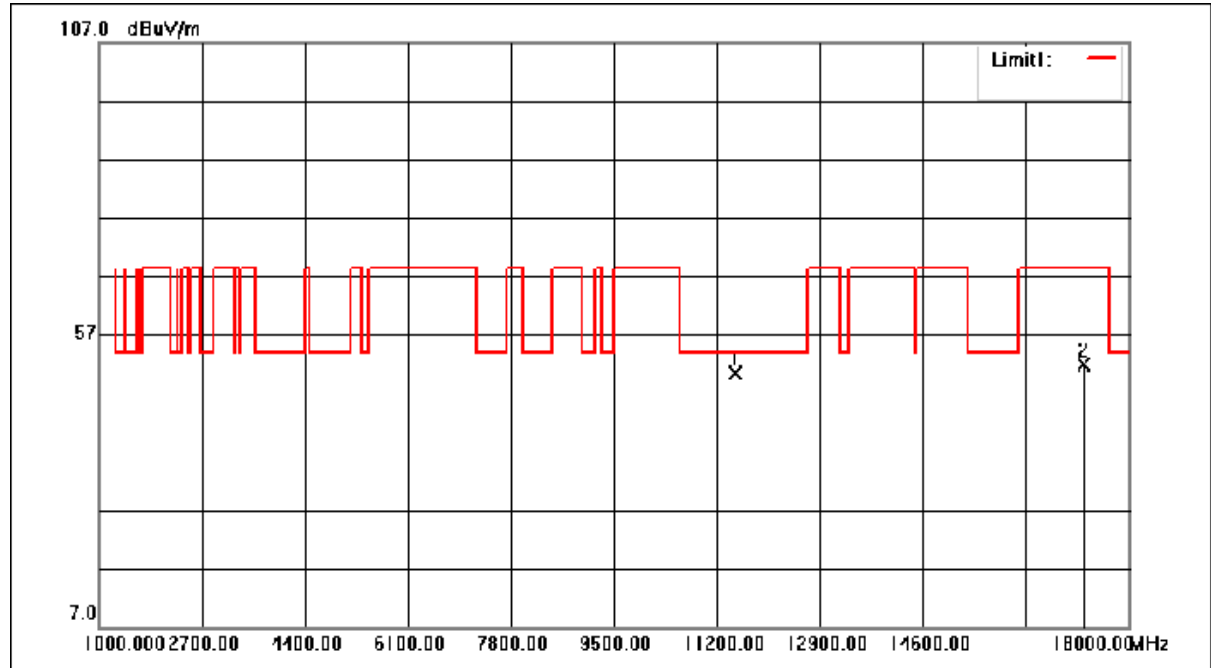
Mode: d; Polarization: Horizontal; Modulation: n; bandwidth: 40MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11510.000	49.49	0.99	50.48	54.00	-3.52	peak
2	17265.000	42.08	9.03	51.11	68.30	-17.19	peak



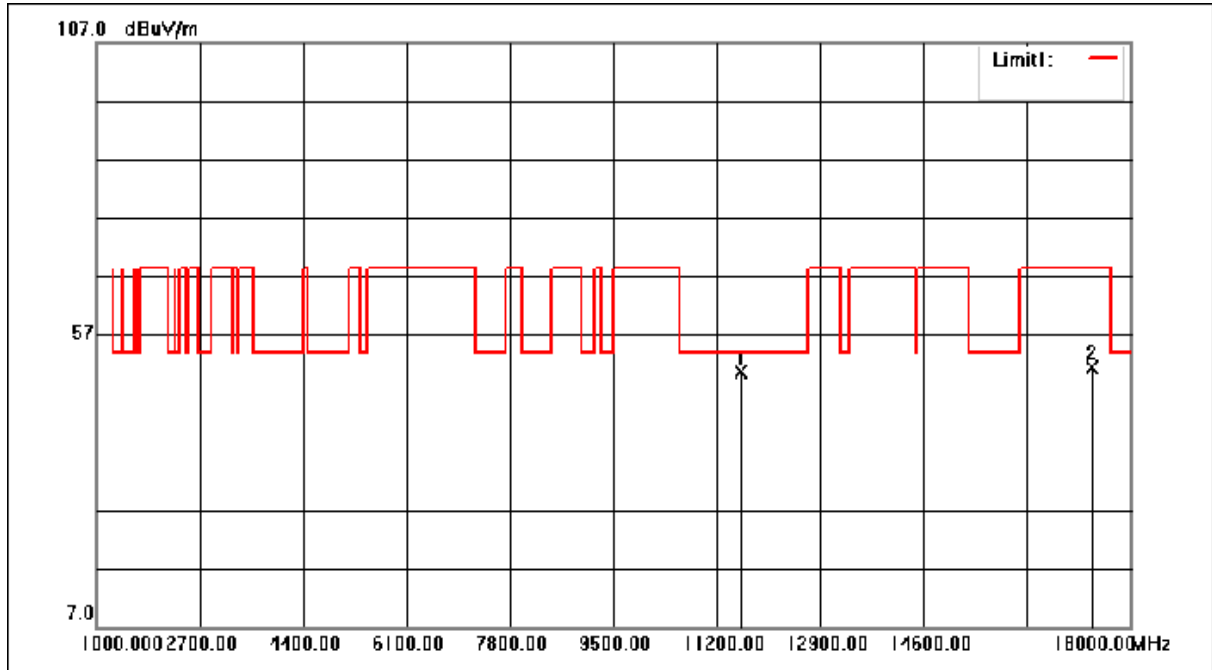
Mode: d; Polarization: Vertical; Modulation: n; bandwidth: 40MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11510.000	49.30	0.99	50.29	54.00	-3.71	peak
2	17265.000	42.90	9.03	51.93	68.30	-16.37	peak



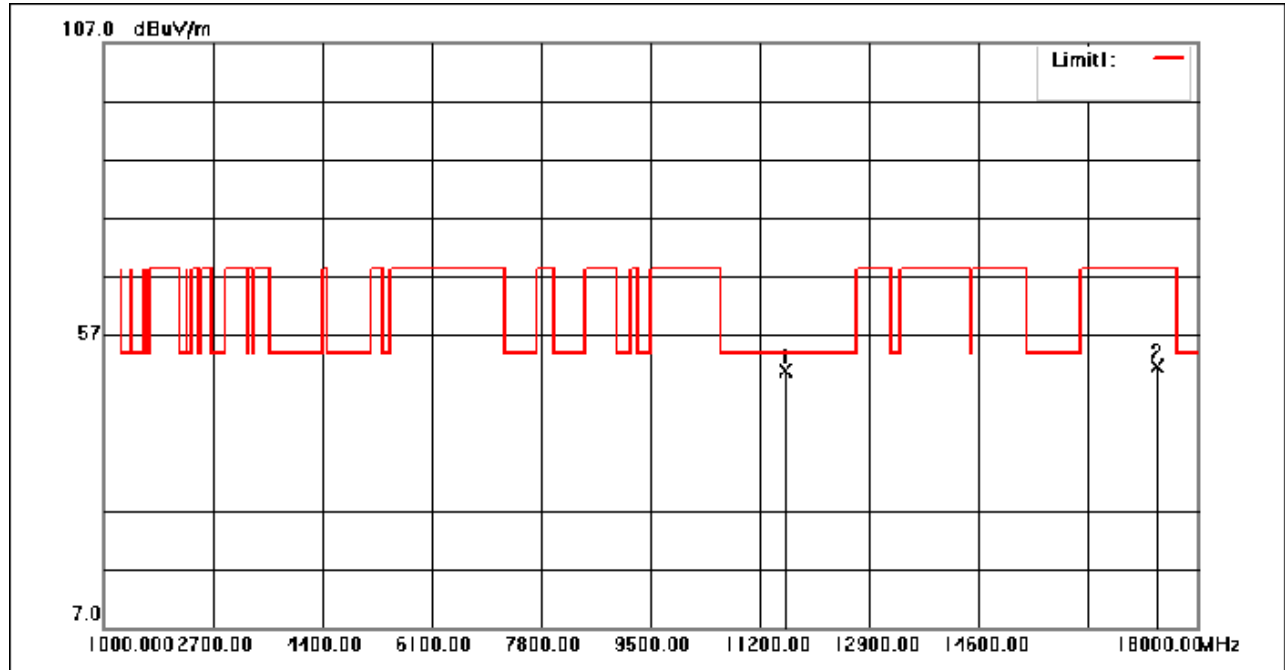
Mode: d; Polarization: Horizontal; Modulation: n; bandwidth: 40MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11590.000	49.32	1.25	50.57	54.00	-3.43	peak
2	17385.000	42.43	8.96	51.39	68.30	-16.91	peak



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



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11590.000	49.51	1.25	50.76	54.00	-3.24	peak
2	17385.000	42.56	8.96	51.52	68.30	-16.78	peak

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

Test Requirement 47 CFR Part 15, Subpart C 15.209 &amp; 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.



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t(86-512)57355888 f(86-512)57370818 [sgs.china@sgs.com](mailto:sgs.china@sgs.com)



### 7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Pretest these  
modes to find  
the worst case:

a: 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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 1#).

b: TX mode (Band 3)\_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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 1#).

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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

d: TX mode (Band 3)\_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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

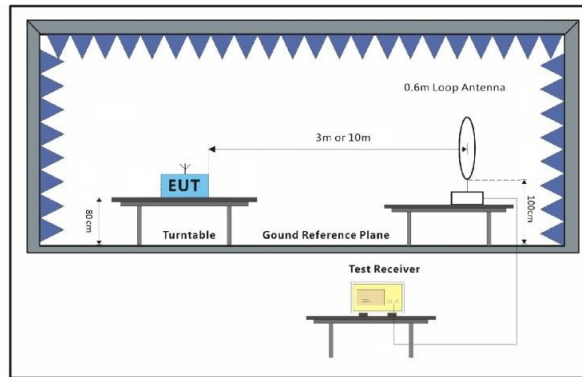
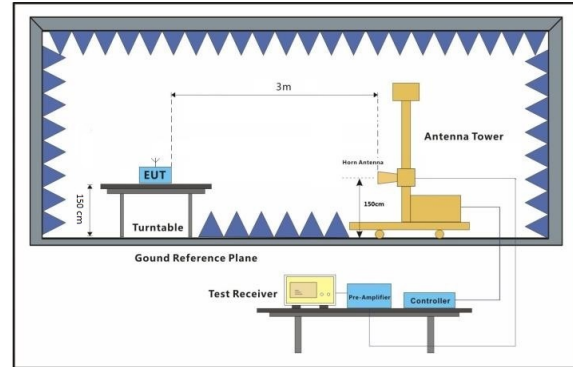
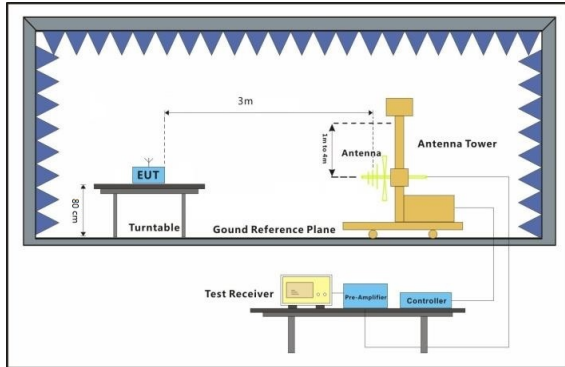
c: TX mode (Band 1)\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

The worst case  
for final test:

d: TX mode (Band 3)\_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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).



## 7.7.2 Test Setup Diagram



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### 7.7.3 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

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

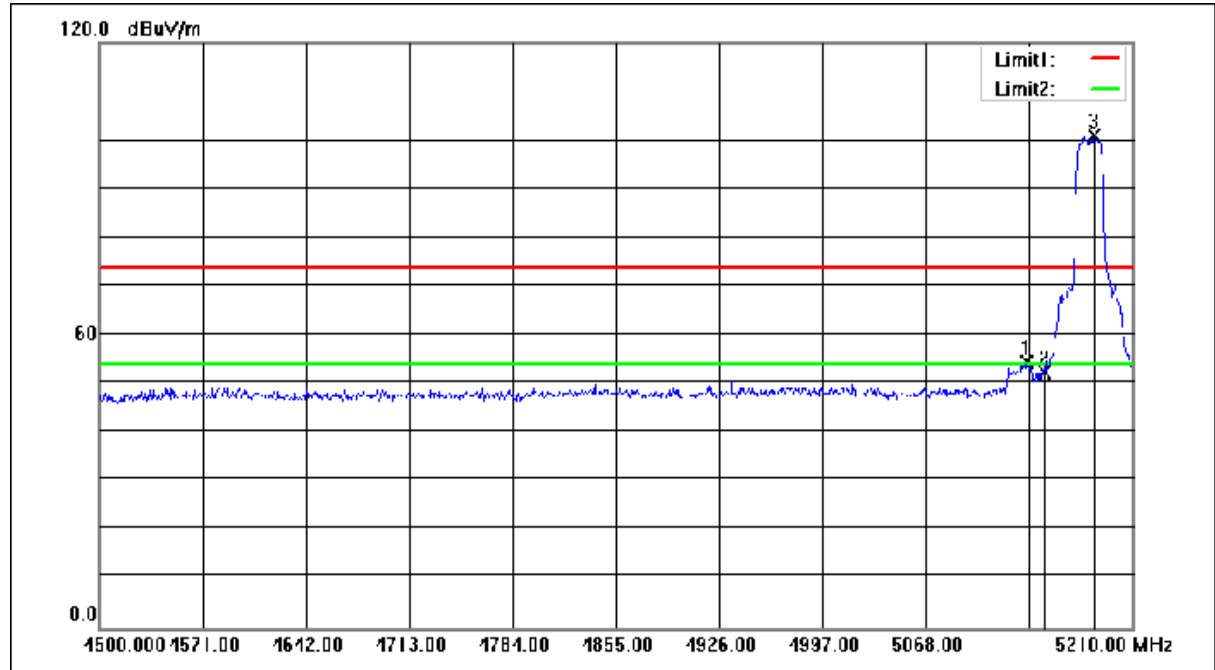


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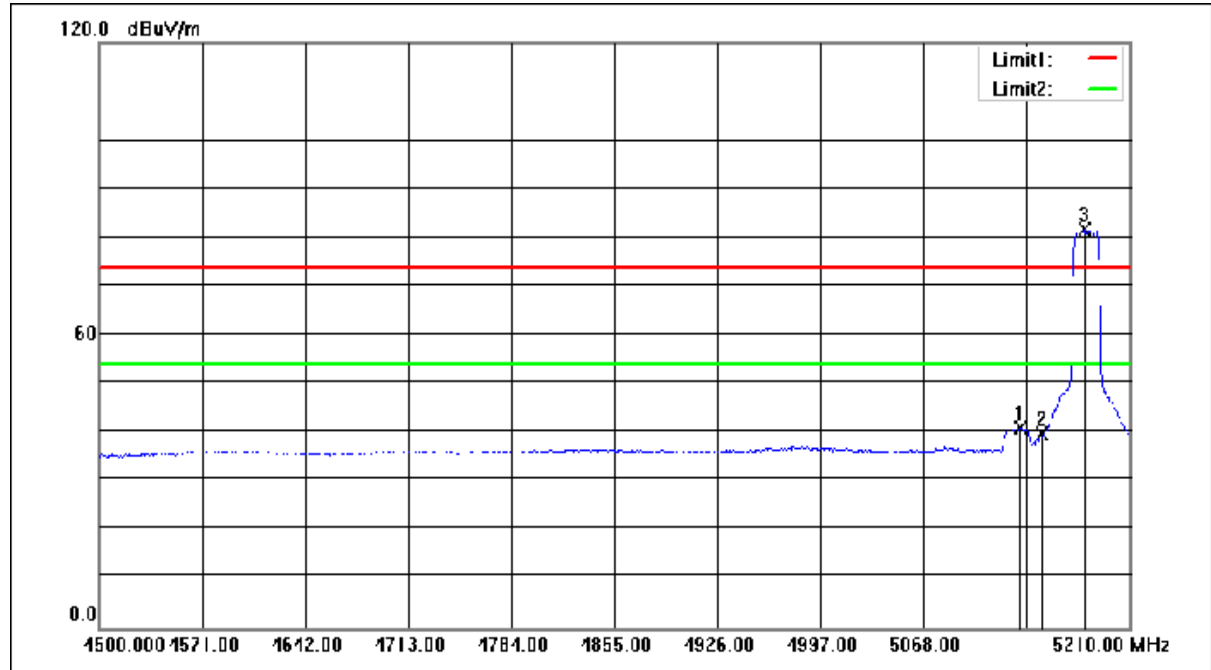
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5137.580	62.18	-7.87	54.31	74.00	-19.69	peak
2	5150.000	60.17	-7.84	52.33	74.00	-21.67	peak
3	5183.730	108.86	-7.76	101.10	74.00	27.10	peak



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

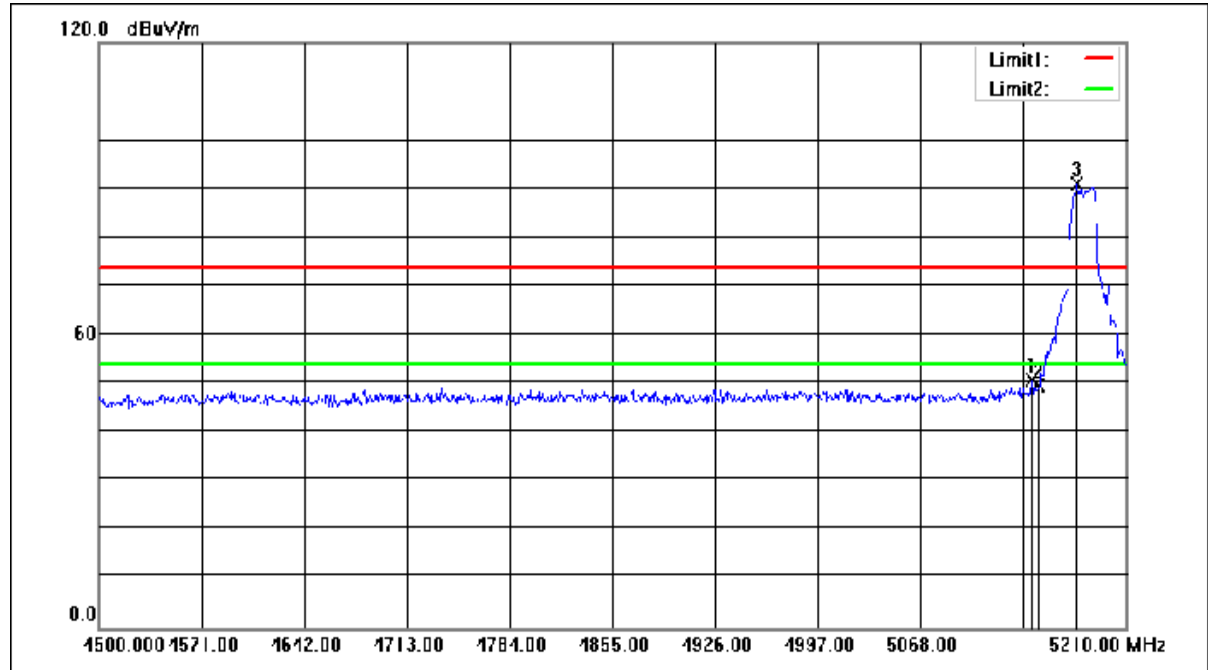


No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5134.740	48.78	-7.88	40.90	54.00	-13.10	AVG
2	5150.000	47.56	-7.84	39.72	54.00	-14.28	AVG
3	5178.760	89.51	-7.78	81.73	54.00	27.73	AVG





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



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5144.680	58.73	-7.85	50.88	74.00	-23.12	peak
2	5150.000	57.46	-7.84	49.62	74.00	-24.38	peak
3	5175.920	98.88	-7.78	91.10	74.00	17.10	peak



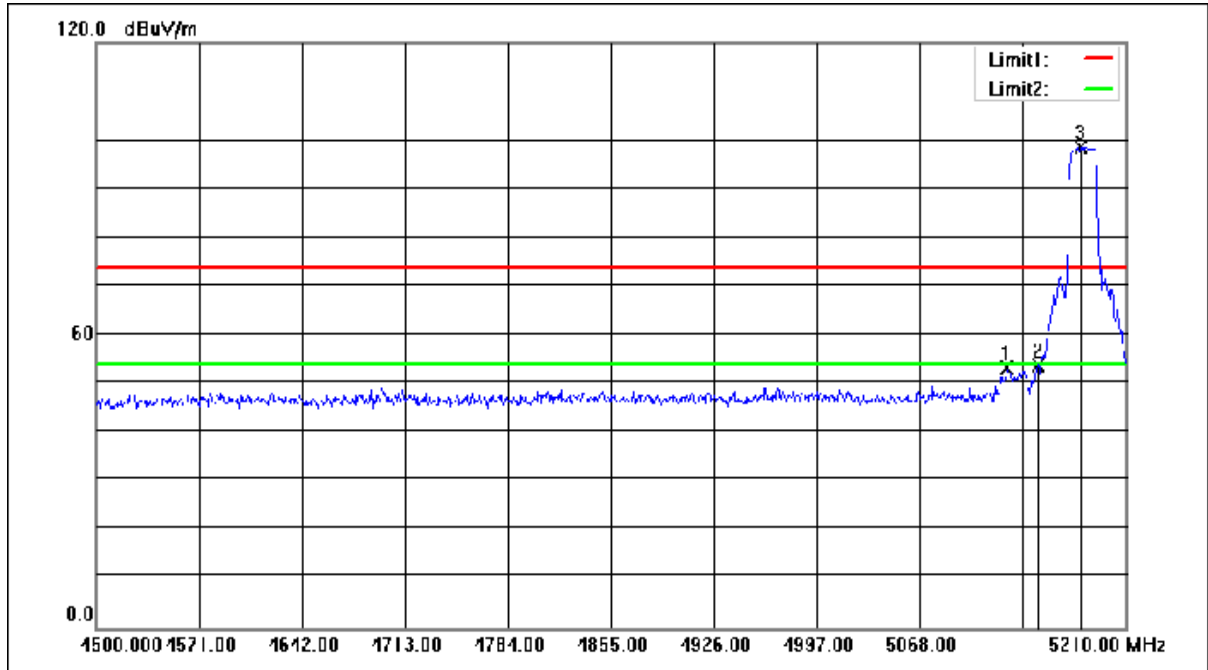
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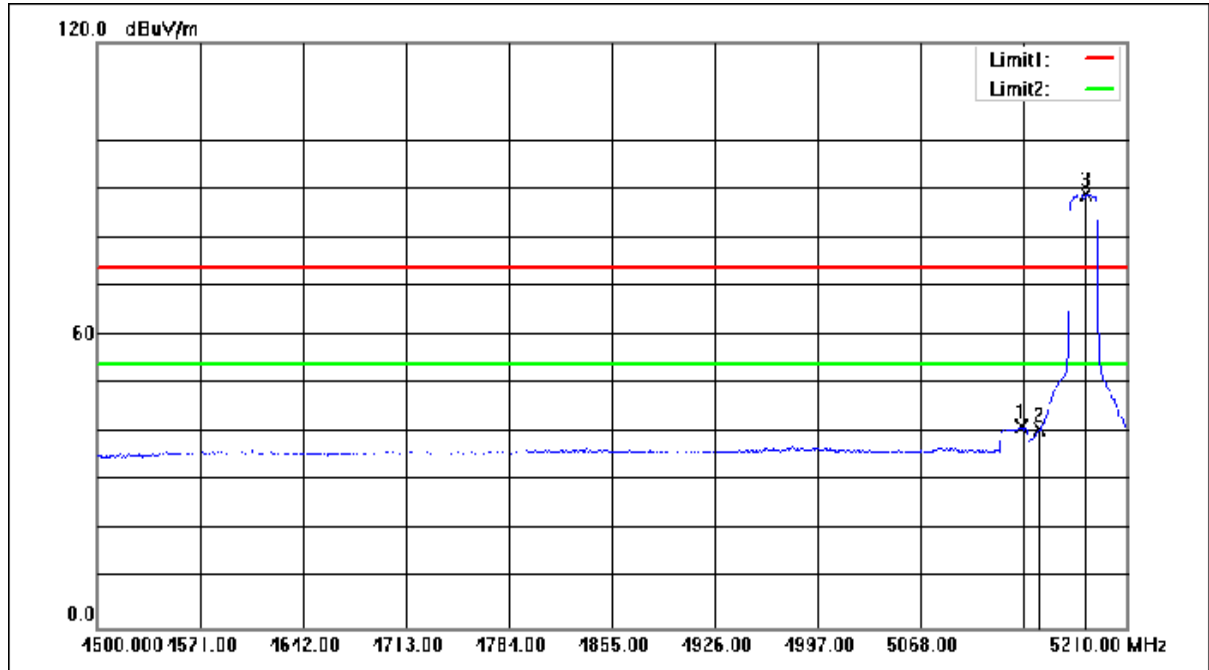
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5128.350	61.17	-7.89	53.28	74.00	-20.72	peak
2	5150.000	61.60	-7.84	53.76	74.00	-20.24	peak
3	5179.470	106.40	-7.77	98.63	74.00	24.63	peak



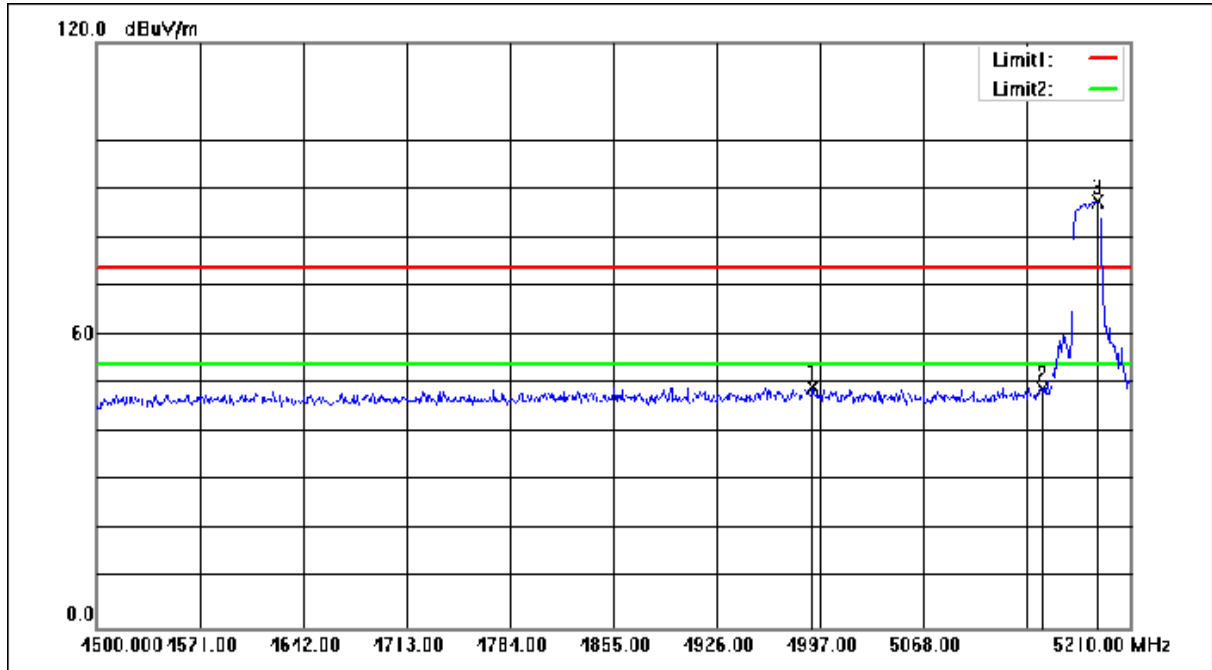
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5137.580	49.11	-7.87	41.24	54.00	-12.76	AVG
2	5150.000	48.64	-7.84	40.80	54.00	-13.20	AVG
3	5182.310	96.72	-7.77	88.95	54.00	34.95	AVG



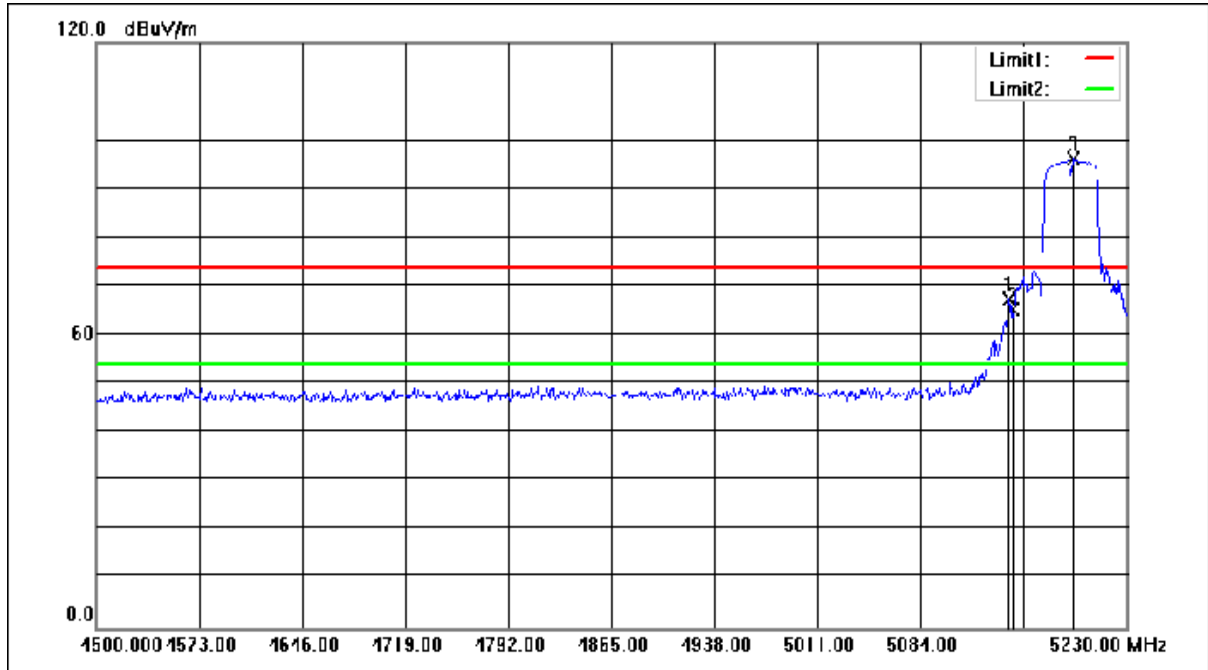
Mode: c; Polarization: Vertical; Modulation: n; bandwidth: 20MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4992.030	57.44	-8.21	49.23	74.00	-24.77	peak
2	5150.000	56.89	-7.84	49.05	74.00	-24.95	peak
3	5187.990	95.21	-7.76	87.45	74.00	13.45	peak



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

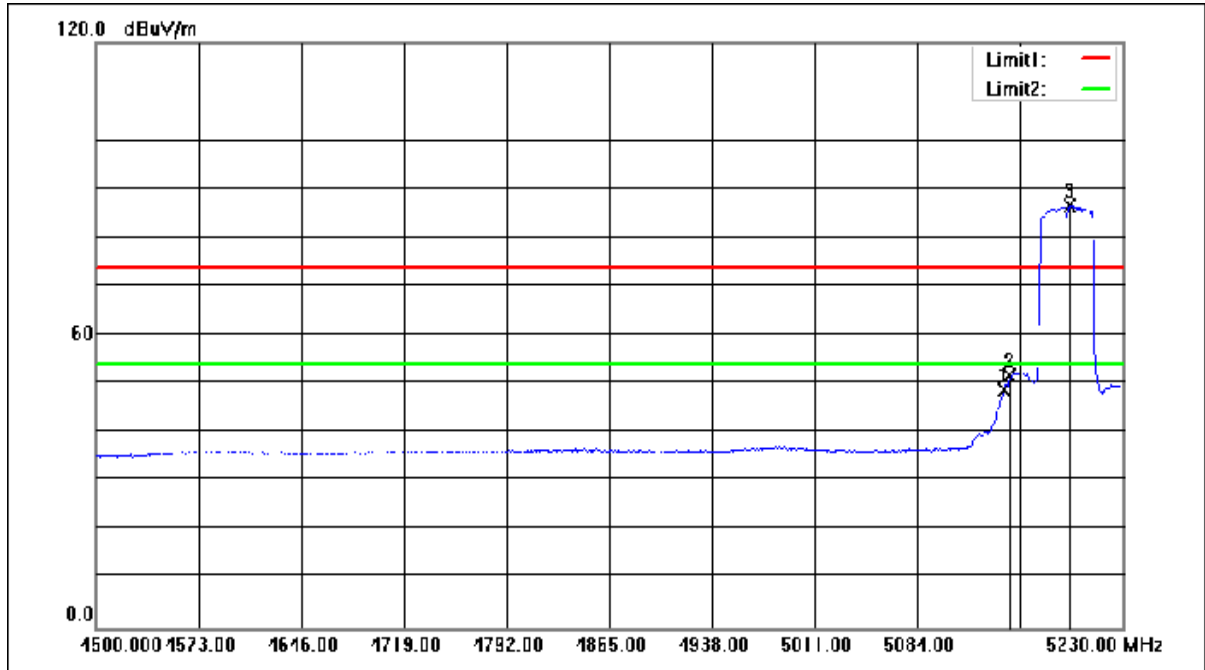


No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5146.780	75.10	-7.85	67.25	74.00	-6.75	peak
2	5150.000	73.20	-7.84	65.36	74.00	-8.64	peak
3	5192.770	103.78	-7.75	96.03	74.00	22.03	peak





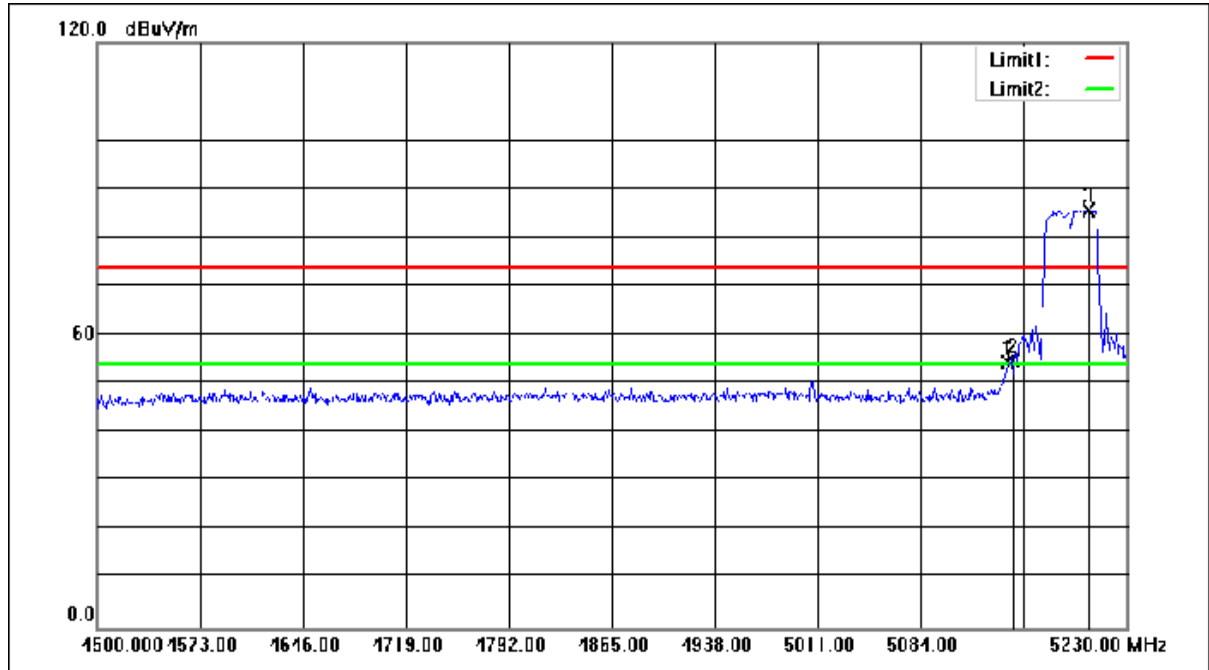
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5146.050	56.71	-7.85	48.86	54.00	-5.14	AVG
2	5150.000	59.60	-7.84	51.76	54.00	-2.24	AVG
3	5192.770	94.19	-7.75	86.44	54.00	32.44	AVG



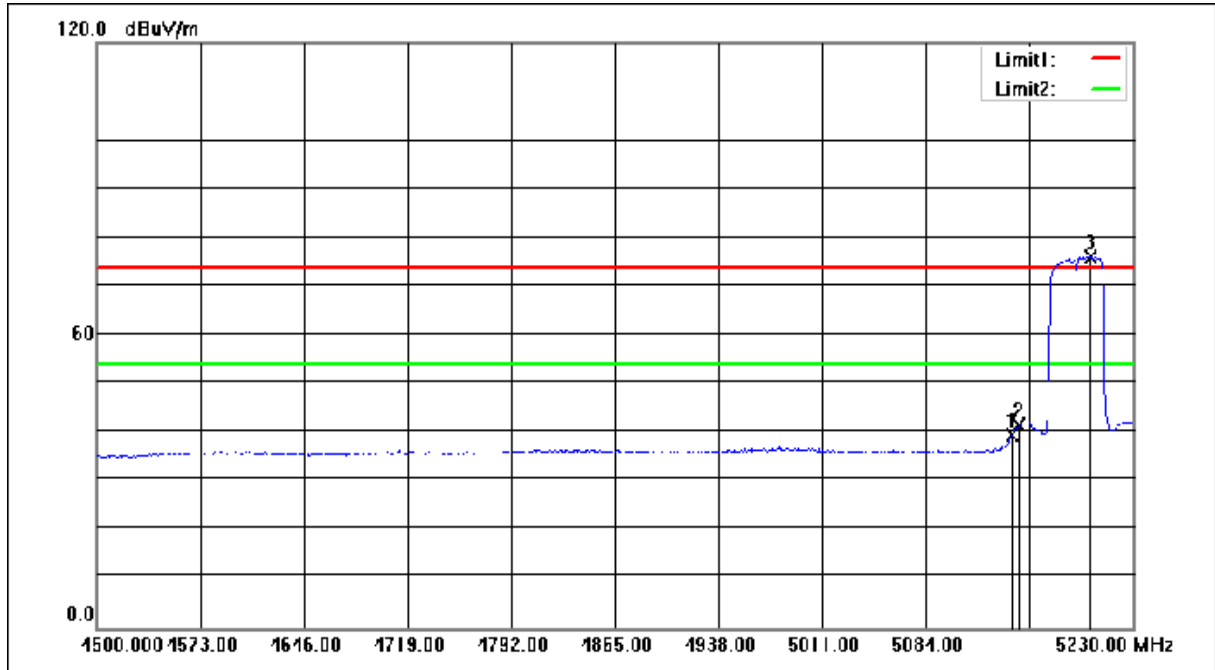
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5145.320	62.23	-7.85	54.38	74.00	-19.62	peak
2	5150.000	62.62	-7.84	54.78	74.00	-19.22	peak
3	5202.990	93.46	-7.72	85.74	74.00	11.74	peak



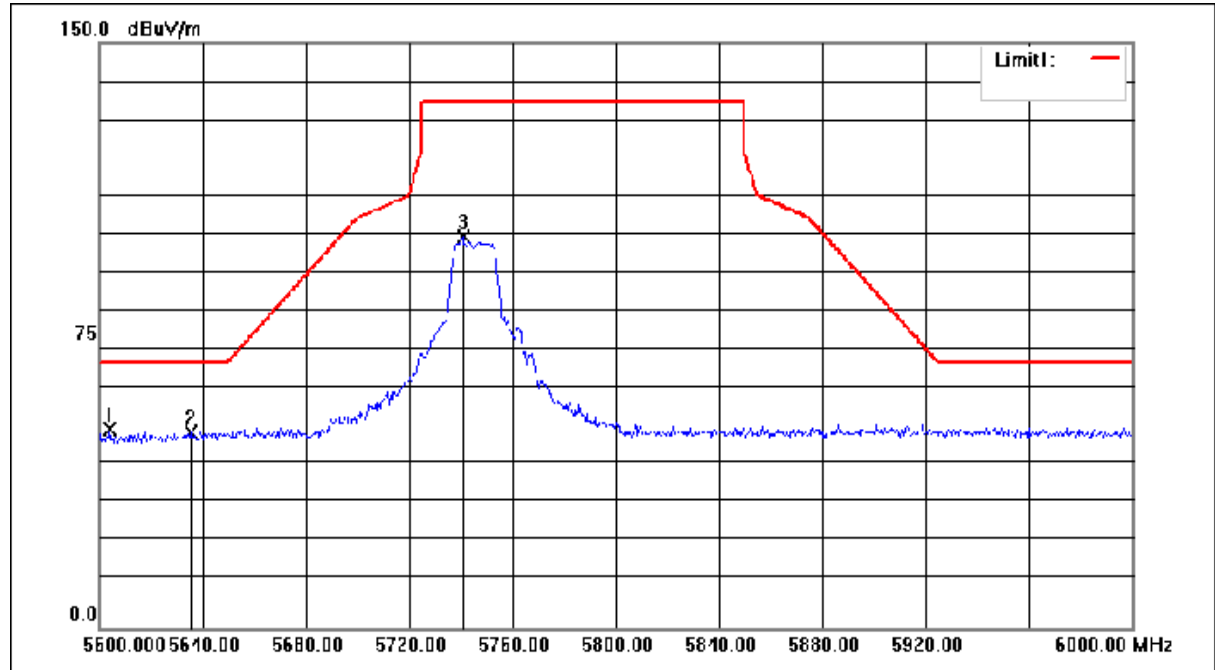
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5144.590	47.39	-7.85	39.54	54.00	-14.46	AVG
2	5150.000	49.31	-7.84	41.47	54.00	-12.53	AVG
3	5200.070	83.89	-7.73	76.16	54.00	22.16	AVG



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



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5604.000	57.64	-6.96	50.68	68.20	-17.52	peak
2	5635.200	57.11	-6.88	50.23	68.20	-17.97	peak
3	5740.800	106.77	-6.61	100.16	135.00	-34.84	peak



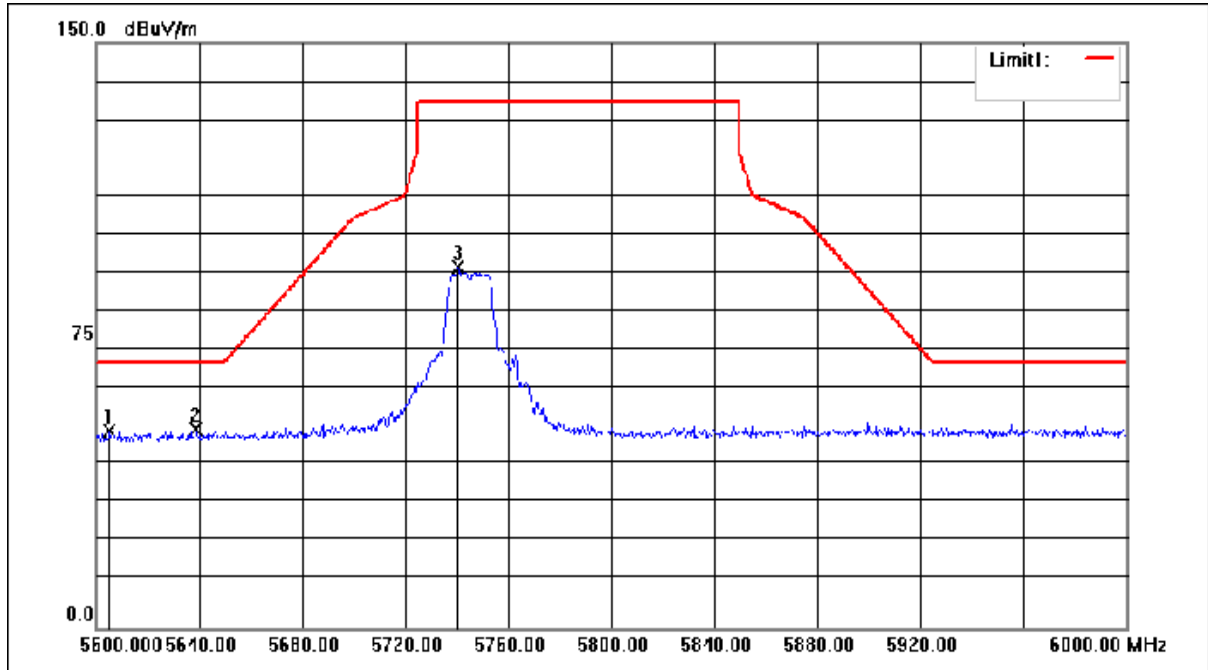
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5605.200	57.34	-6.95	50.39	68.20	-17.81	peak
2	5638.800	57.58	-6.87	50.71	68.20	-17.49	peak
3	5740.400	99.07	-6.61	92.46	135.00	-42.54	peak



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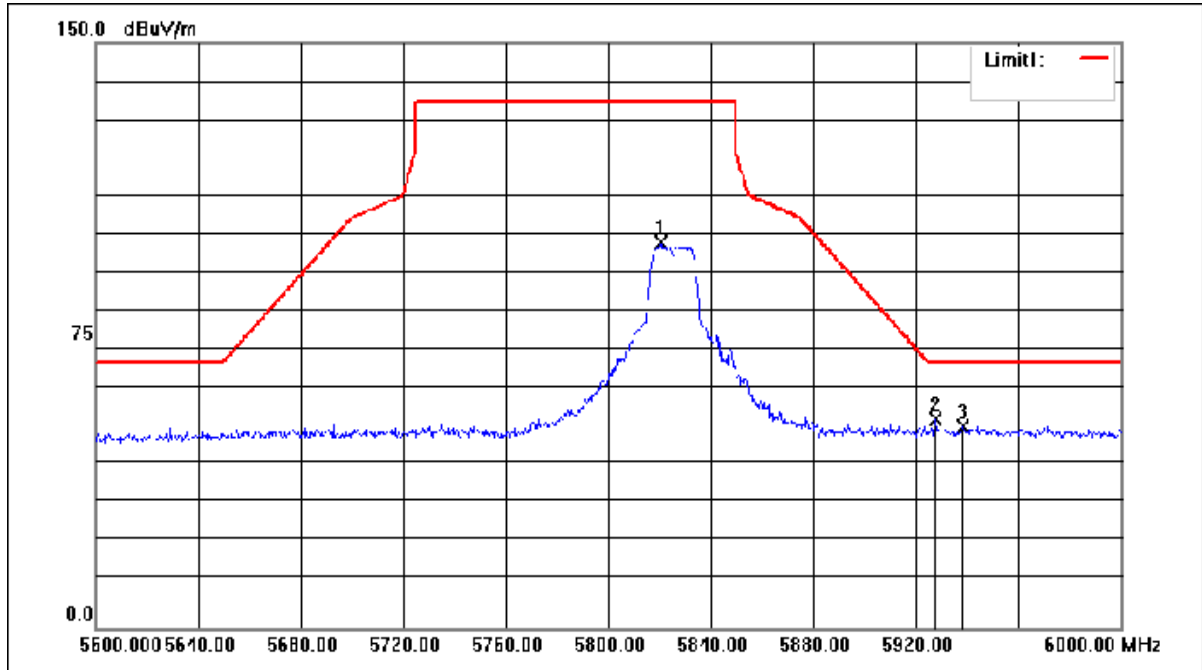
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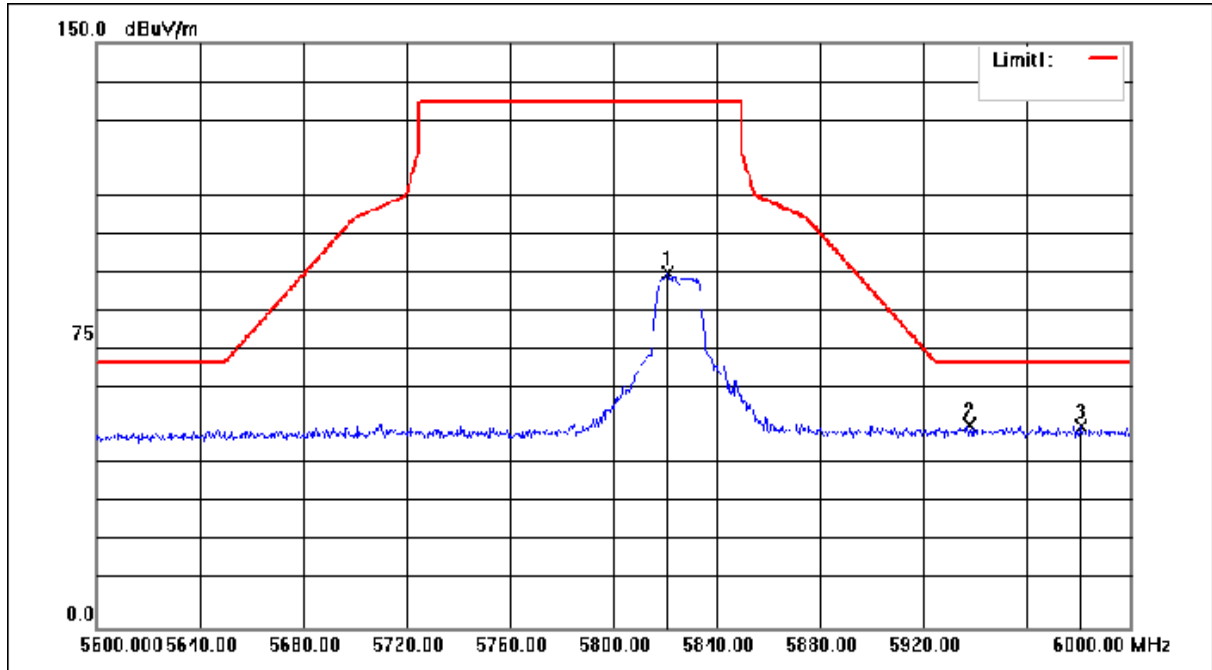
Mode: d; Polarization: Horizontal; Modulation: a; bandwidth: 20MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5820.400	105.29	-6.35	98.94	135.00	-36.06	peak
2	5927.600	59.34	-5.76	53.58	68.20	-14.62	peak
3	5938.400	57.44	-5.70	51.74	68.20	-16.46	peak



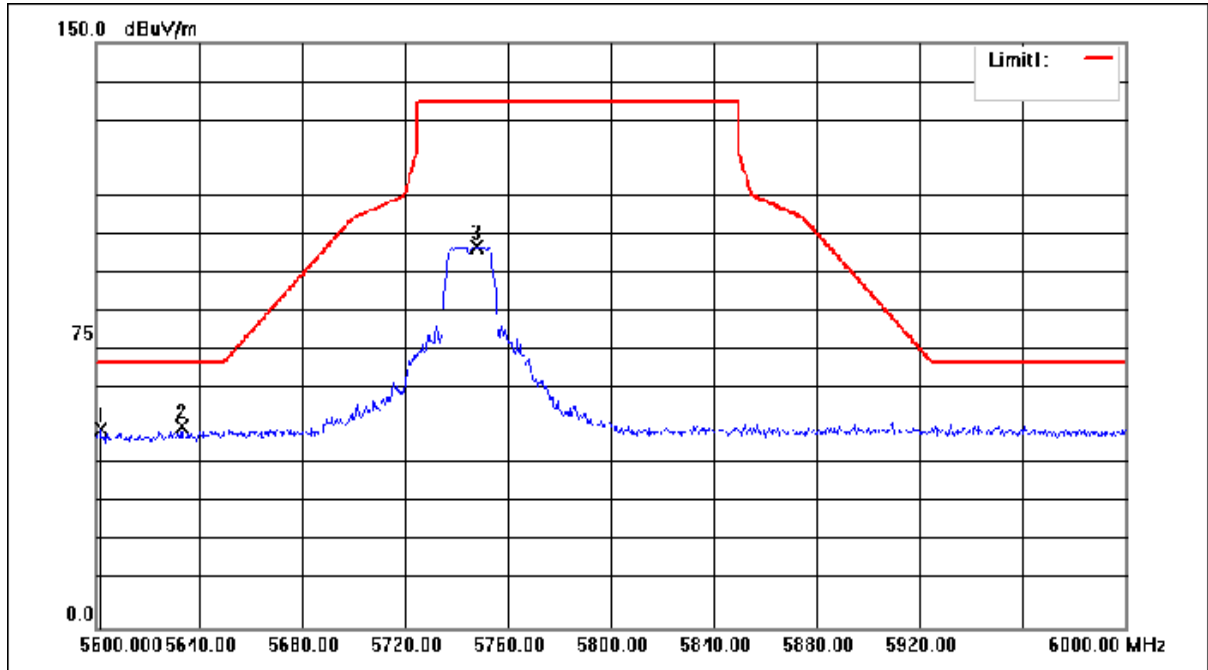
Mode: d; Polarization: Vertical; Modulation: a; bandwidth: 20MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5820.800	97.24	-6.35	90.89	135.00	-44.11	peak
2	5938.000	57.70	-5.71	51.99	68.20	-16.21	peak
3	5981.200	57.09	-5.47	51.62	68.20	-16.58	peak



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



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5601.600	57.76	-6.97	50.79	68.20	-17.41	peak
2	5633.200	58.33	-6.89	51.44	68.20	-16.76	peak
3	5748.000	104.13	-6.59	97.54	135.00	-37.46	peak

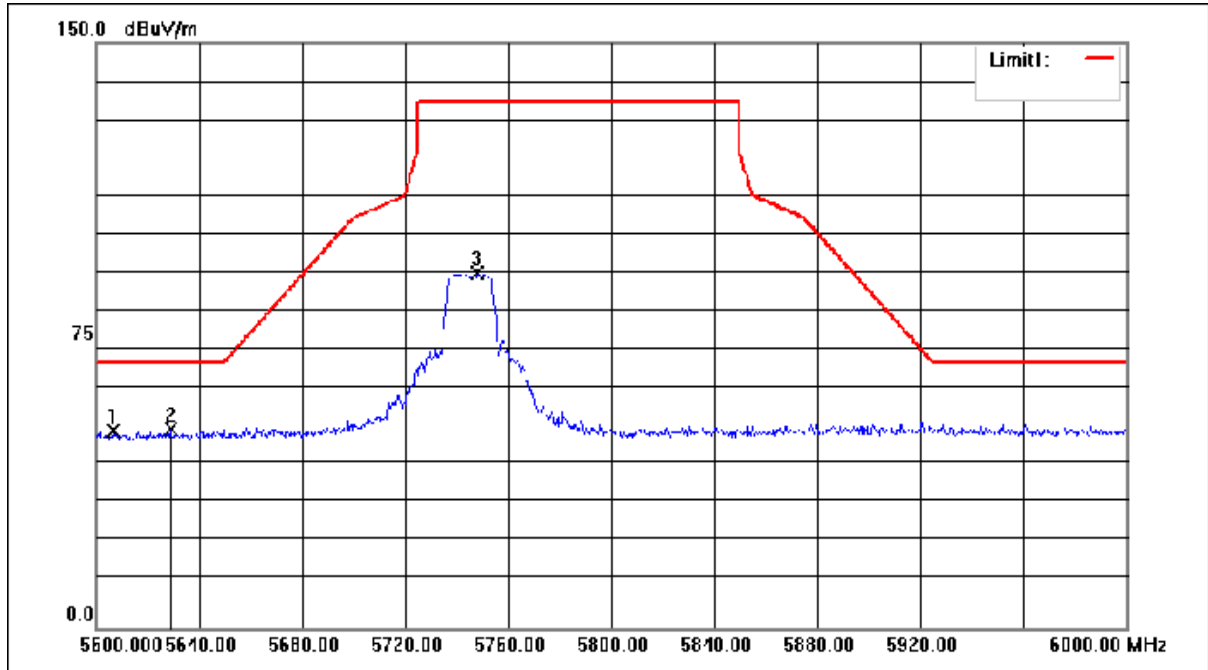


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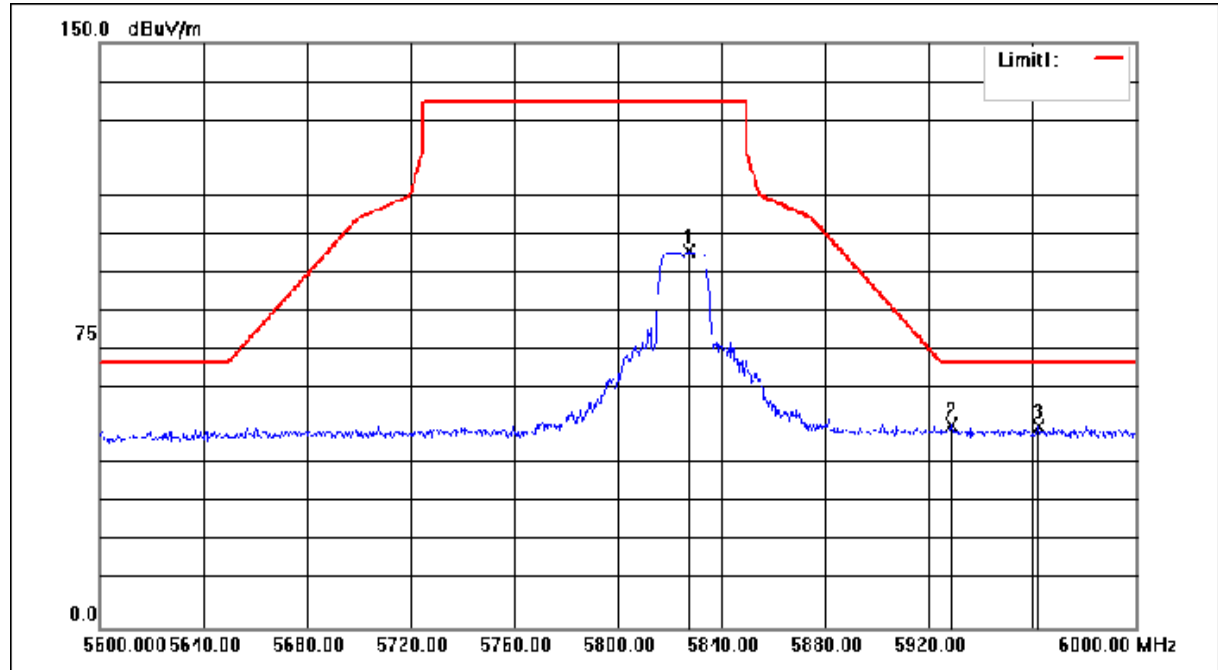
Mode: d; Polarization: Vertical; Modulation: n; bandwidth: 20MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5606.800	57.35	-6.95	50.40	68.20	-17.80	peak
2	5628.800	57.72	-6.90	50.82	68.20	-17.38	peak
3	5748.000	97.43	-6.59	90.84	135.00	-44.16	peak



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



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5827.600	102.76	-6.31	96.45	135.00	-38.55	peak
2	5928.800	57.54	-5.75	51.79	68.20	-16.41	peak
3	5962.400	57.20	-5.57	51.63	68.20	-16.57	peak



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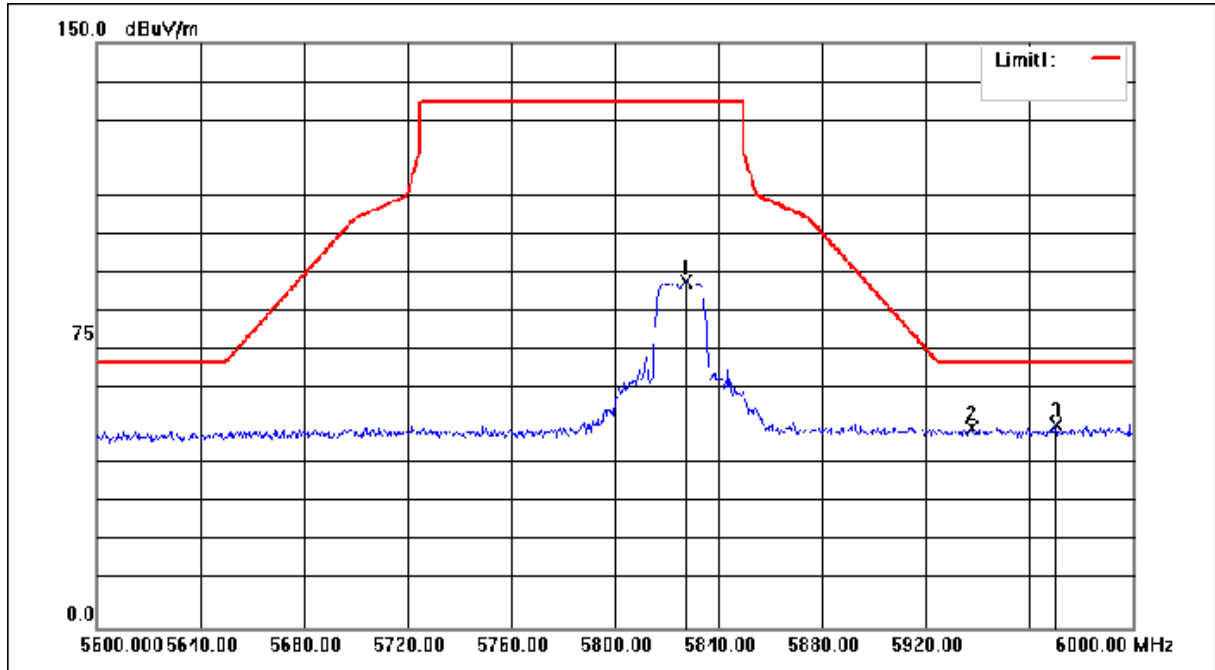
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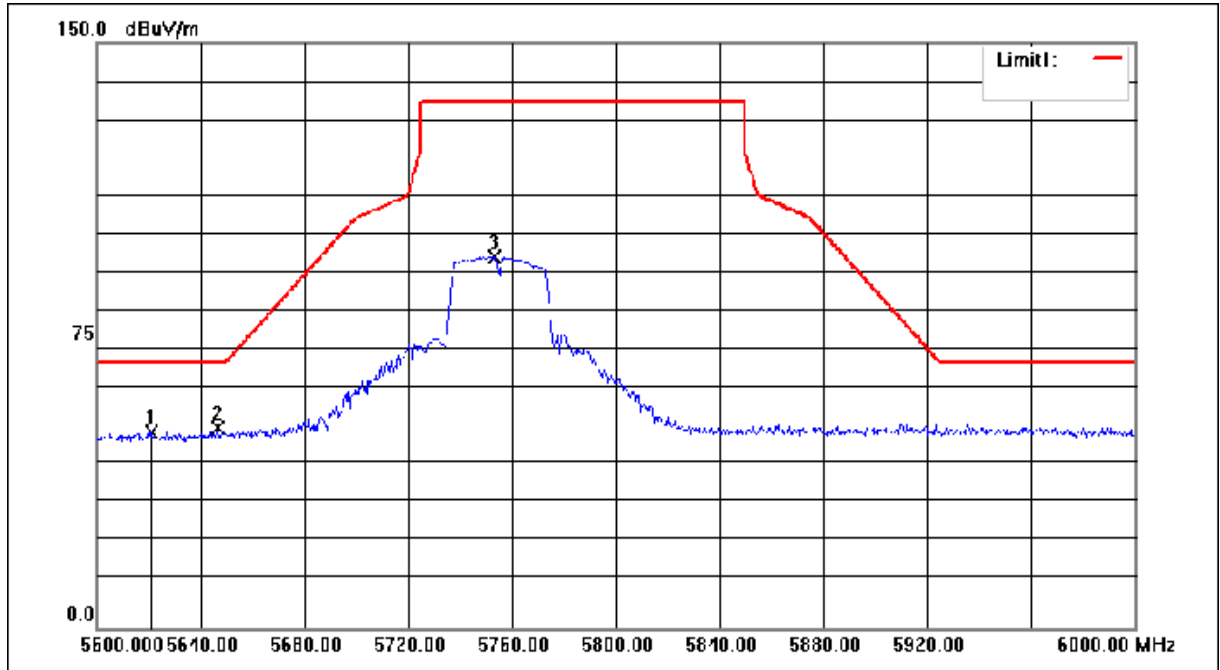
Mode: d; Polarization: Vertical; Modulation: n; bandwidth: 20MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5827.200	95.00	-6.31	88.69	135.00	-46.31	peak
2	5937.600	56.88	-5.70	51.18	68.20	-17.02	peak
3	5970.400	57.43	-5.53	51.90	68.20	-16.30	peak



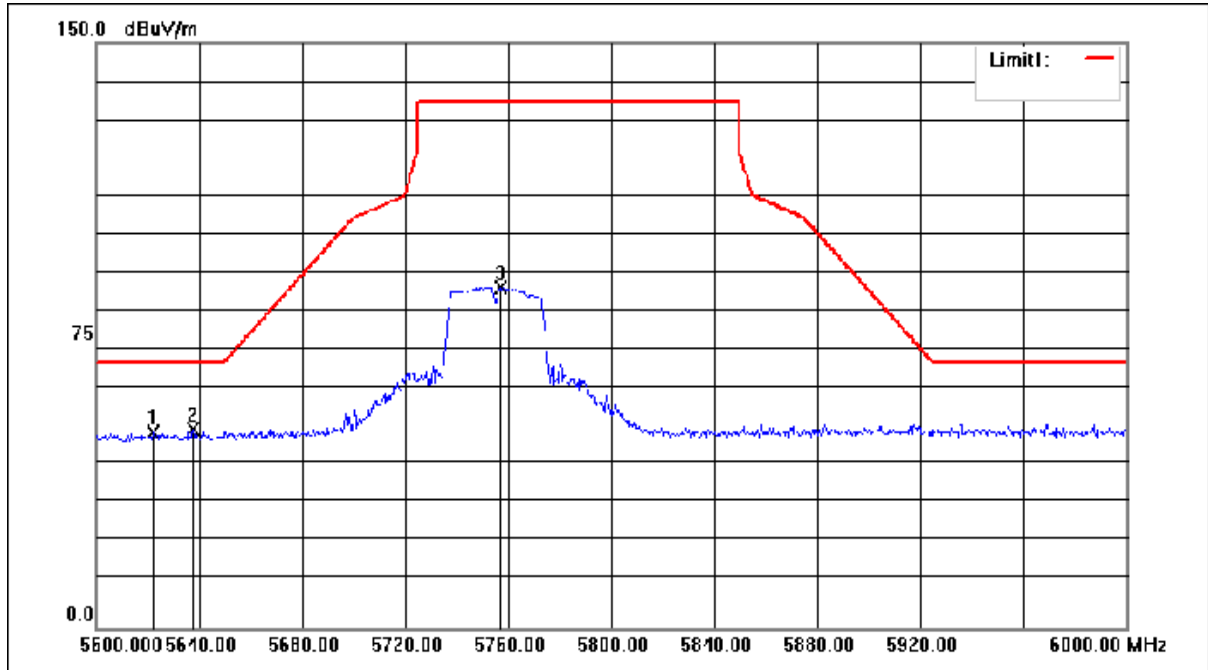
Mode: d; Polarization: Horizontal; Modulation: n; bandwidth: 40MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5620.800	57.07	-6.92	50.15	68.20	-18.05	peak
2	5646.400	57.93	-6.85	51.08	68.20	-17.12	peak
3	5753.200	101.62	-6.58	95.04	135.00	-39.96	peak



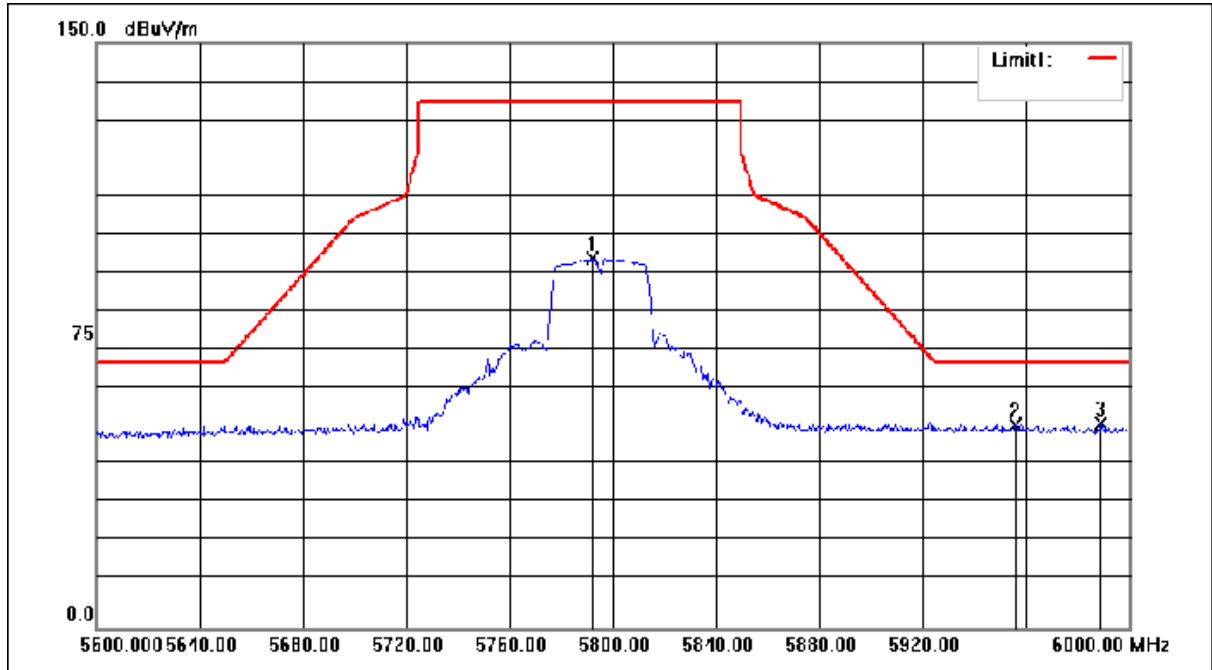
Mode: d; Polarization: Vertical; Modulation: n; bandwidth: 40MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5622.000	57.04	-6.92	50.12	68.20	-18.08	peak
2	5637.600	57.68	-6.87	50.81	68.20	-17.39	peak
3	5757.200	93.81	-6.56	87.25	135.00	-47.75	peak



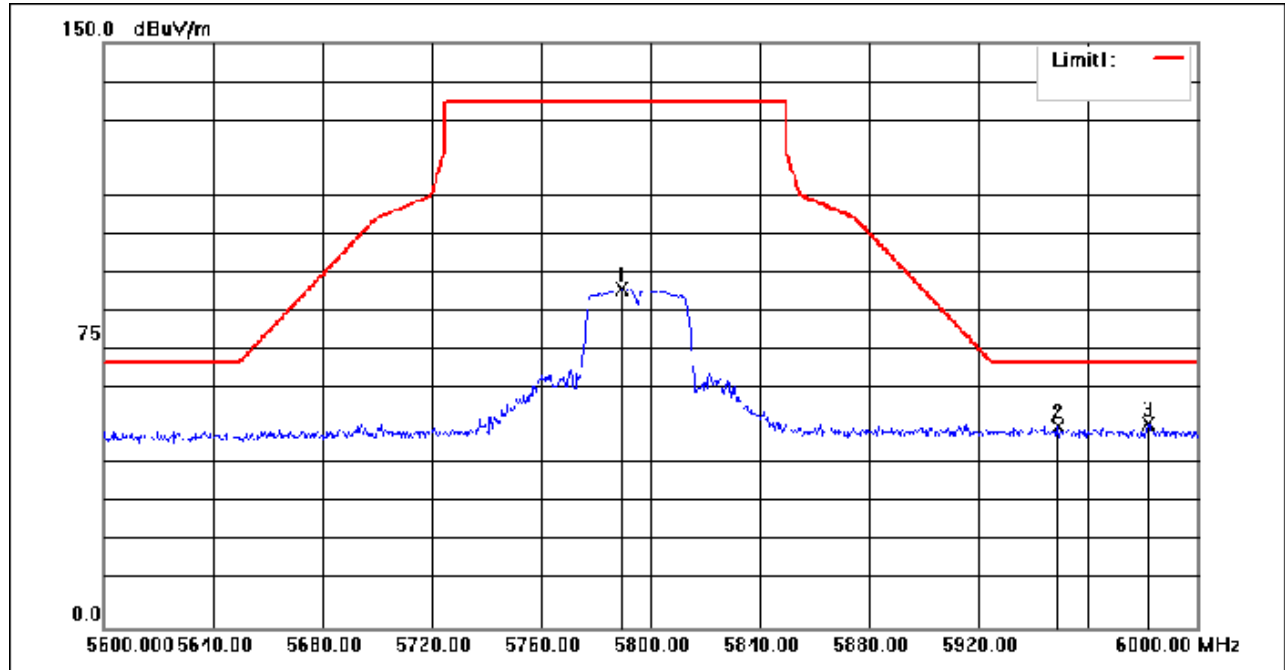
Mode: d; Polarization: Horizontal; Modulation: n; bandwidth: 40MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5792.000	101.06	-6.48	94.58	135.00	-40.42	peak
2	5956.000	57.65	-5.60	52.05	68.20	-16.15	peak
3	5989.200	57.68	-5.42	52.26	68.20	-15.94	peak



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



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5789.600	93.37	-6.49	86.88	135.00	-48.12	peak
2	5948.800	57.27	-5.65	51.62	68.20	-16.58	peak
3	5982.000	57.65	-5.46	52.19	68.20	-16.01	peak

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## 7.8 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.

### 7.8.1 E.U.T. Operation

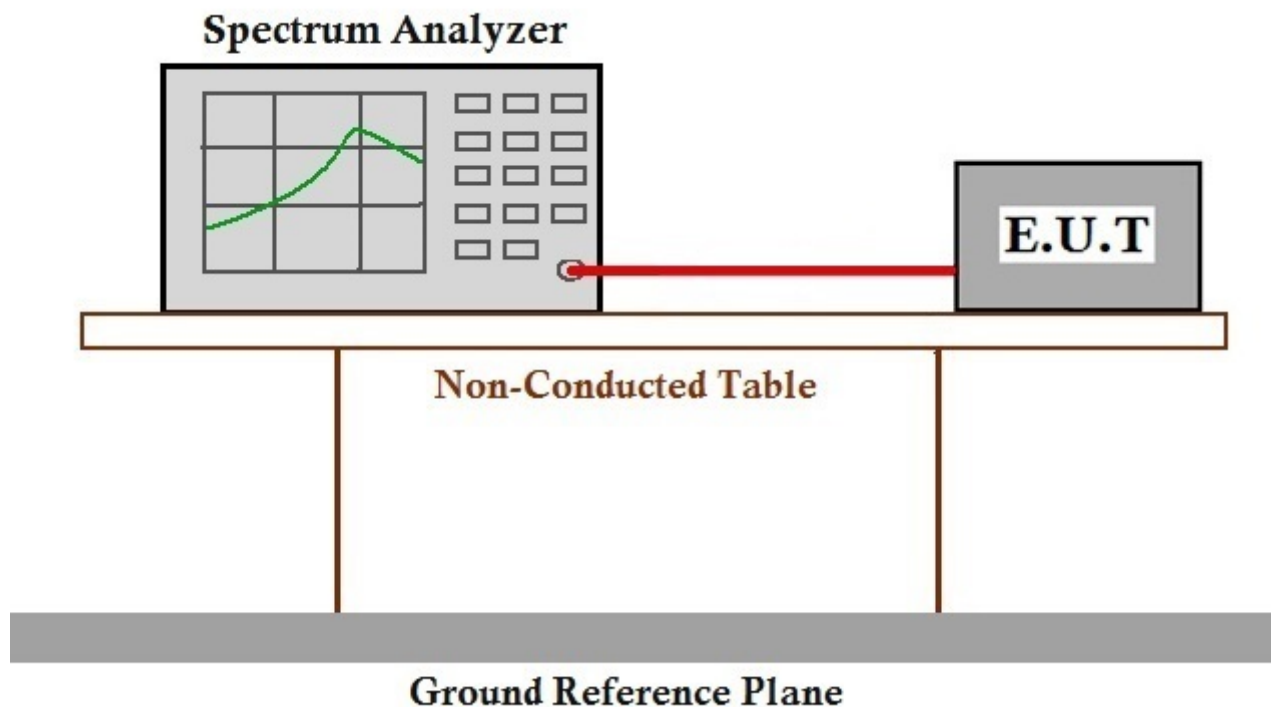
Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

d: TX mode (Band 3)\_ 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). Only the data of worst case is recorded in the report (With Car cigarette lighter transverter 2#).

### 7.8.2 Test Setup Diagram



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### 7.8.3 Measurement Procedure and Data

The detailed test data see: Appendix B for KSCR210900016102



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## 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 -



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