



ISO/IEC17025 Accredited Lab.

Report No:

FCC 1505170-02

File reference No:

2015-06-30

Applicant:

ShenZhen Netxeon Technology Co.,Ltd

Product:

TV BOX

Model No:

i826, i818, i828

Trademark:

N/A

Test Standards:

FCC Part 15 Subpart E, Paragraph 15.407

Test result:

It is herewith confirmed and found to comply with the requirements set up by ANSI C63.10, FCC Part 15 Subpart C, Paragraph 15.247 regulations for the evaluation of electromagnetic compatibility

Approved By

Jack Chung

Jack Chung

Manager

Dated:

June 30, 2015

Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TESTING LABORATORIES

Room 512-519, 5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen, Guangdong, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail: info@timewaytech.com



Special Statement:

The testing quality ability of our laboratory meet with “Quality Law of People’s Republic of China” Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAL. This approval result is accepted by MRA of APLAC.

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

CNAL-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 899988.

IC- Registration No.: IC5205A-02

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-02.

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Test Report Conclusion

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1.0 General Details

1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TESTING LABORATORIES.
Address: Room 512-519,5/F., East Tower,Building 4, Anhua Industrial Zone, Futian District,Shenzhen, Guangdong China
Telephone: (755) 83448688
Fax: (755) 83442996
Site on File with the Federal Communications Commission – United States
Registration Number: 899988
For 3m & 10 m OATS
Site Listed with Industry Canada of Ottawa, Canada
Registration Number: IC: 5205A-02
For 3m & 10 m OATS

1.2 Applicant Details

Applicant: ShenZhen Netxeon Technology Co.,Ltd
Address: Unit 708,7/F West,Building 202 Tai Ran Industrial Park,Chegongmiao,Shenzhen,China
Telephone: --
Fax: --

1.3 Description of EUT

Product: TV BOX
Manufacturer: ShenZhen Netxeon Technology Co.,Ltd
Address: Unit 708,7/F West,Building 202 Tai Ran Industrial Park,Chegongmiao,Shenzhen,China
Brand Name: N/A
Additional Brand Name: N/A
Model Number: i826
Additional Model Number: i818, i828
Type of Modulation IEEE 802.11a : OFDM(64QAM, 16QAM, QPSK, BPSK)
Frequency 5180MHz, 5200MHz, 5220MHz, 5240MHz;
5745MHz, 5765MHz, 5785MHz, 5805MHz
Air Data Rate IEEE 802.11a : 54, 48,36, 24, 18, 12, 9, 6 Mbps
Antenna: Two Integral antennas used. MIMO Technology use for all frequency bands.
Antenna Gain: Maximum 1.2dBi for 5G band for each antenna.
Test Mode: 5180MHz, 5200MHz, 5240MHz, 5745MHz, 5765MHz, 5805MHz, was tested. And 6Mbps air data rate was the worse case. During testing, EUT was set to 100% duty cycle.
Frequency Selection By software
Input Voltage: DC5V

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1.4 Submitted Sample: 2 Samples

1.5 Test Duration
2015-05-26 to 2015-06-30

1.6 Test Uncertainty
Conducted Emissions Uncertainty =3.6dB
Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer *Terry Tang*
The sample tested by _____

Print Name: Terry Tang

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2.0 Test Equipments					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	R&S	ESPI 3	100379	2014-08-21	2015-08-20
TWO Line-V-NETW	R&S	EZH3-Z5	100294	2014-08-22	2015-08-21
TWO Line-V-NETW	R&S	EZH3-Z5	100253	2014-08-22	2015-08-21
Ultra Broadband ANT	R&S	HL562	100157	2014-08-23	2015-08-22
ESDV Test Receiver	R&S	ESDV	100008	2014-08-22	2015-08-21
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2014-08-21	2015-08-20
System Controller	CT	SC100	-	--	--
Printer	EPSON	PHOTO EX3	CFNH234850	--	--
Computer	IBM	8434	1S8434KCE99BLXLO*	-	-
Loop Antenna	EMCO	6502	00042960	2014-08-22	2015-08-21
ESPI Test Receiver	R&S	ESI26	838786/013	2014-08-22	2015-08-21
3m OATS	--	--	N/A	2014-08-21	2015-08-20
Horn Antenna	R&S	BBHA 9170	BBHA9170265	2014-08-23	2015-08-22
Horn Antenna	R&S	BBHA 9120D	9120D-631	2014-08-23	2015-08-22
Power meter	Anritsu	ML2487A	6K00003613	2014-08-22	2015-08-21
Power sensor	Anritsu	MA2491A	32263	2014-08-22	2015-08-21
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2014-08-23	2015-08-22
LISN	AFJ	LS16C	10010947251	2014-08-21	2015-08-20
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2014-08-22	2015-08-21
9*6*6 Anechoic	--	--	N/A	2014-08-21	2015-08-20
EMI Test Receiver	RS	ESCS30	100139	2014-08-22	2015-08-21

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2.1 Auxiliary Equipment

Name	Model No.	Serial No.	Manufacturer	Cable	FCC ID/DOC
TF Card	--	--	Kingston	--	--
Mouse	--		--	--	--
U-Disk	--	--	--	--	--
LCD Monitor	PH2450	--	SAMSUNG	--	DOC
Power Supply	JHD-AP012U-050200AB	--	JHD	--	VOC

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3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:			
Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107 & 15.407	Conducted Emission Test	PASS	Complies
FCC Part 15 Subpart E Paragraph 15.407 (b1/4/5/6/7), Part 15.205 and Part 15.209	Undesirable Emission and Restrict band	PASS	Complies
FCC Part 15, Paragraph 15.407 (a1/2/3)	Peak Transmit Power	PASS	Complies
FCC Part 15, Paragraph 15.407 (a)(6)	Peak Power Excursion	PASS	Complies
FCC Part 15, Paragraph 15.407 (a1/2/3)	Peak Power Spectral Density	PASS	Complies
FCC Part 15, Paragraph 15.407(g)	Frequency Stability	PASS	Complies

3.2 Test Standards

FCC Part 15 Subpart & Subpart C, Paragraph 15.247, ANSI C63.10 :2009 and ANSI C63.4 :2009
789033 D02 General UNII Test Procedures New Rules v01
662911 D01 Multiple Transmitter Output v02r01

4.0 EUT Modification

No modification by Shenzhen Timeway Technology Consulting Co., Ltd

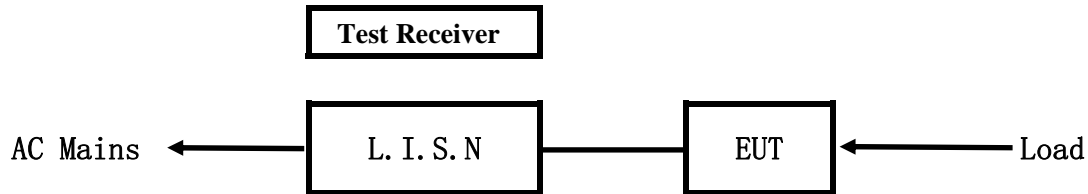
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5. Power Line Conducted Emission Test

5.1 Schematics of the test



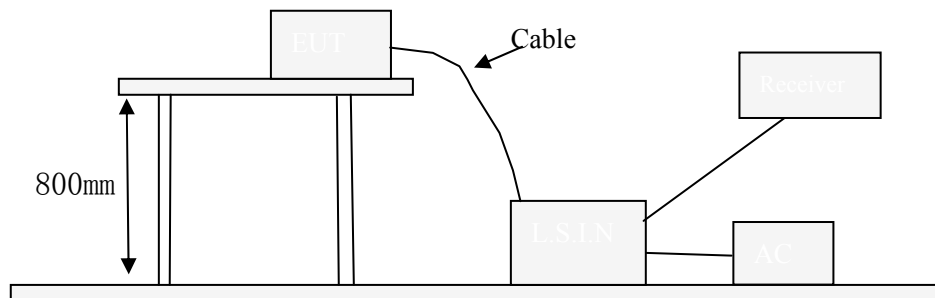
EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2009. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.10-2009.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.10-2009. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

Device	Manufacturer	Model	FCC
TV BOX	ShenZhen Netxeon Technology Co.,Ltd	i826, i818, i828	2AE6JI826

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B. Internal Device

Device	Manufacturer	Model	Rating

C. Peripherals

Device	Manufacturer	Model	Rating
Power Supply	JHD	JHD-AP012U-050200AB	Input: 100-240V~, 50/60Hz, 0.35A; Output: DC5V, 2A

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10 -2009.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207 and 15.107

Frequency (MHz)	Class A Limits (dB μ V)		Class B Limits (dB μ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.0	66.0	66.0~56.0*	56.0~46.0*
0.50 ~ 5.00	73.0	60.0	56.0	46.0
5.00 ~ 30.00	73.0	60.0	60.0	50.0

- Notes:
1. *Decreasing linearly with logarithm of frequency.
 2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

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A: Conducted Emission on Live Terminal (150kHz to 30MHz)

EUT Operating Environment

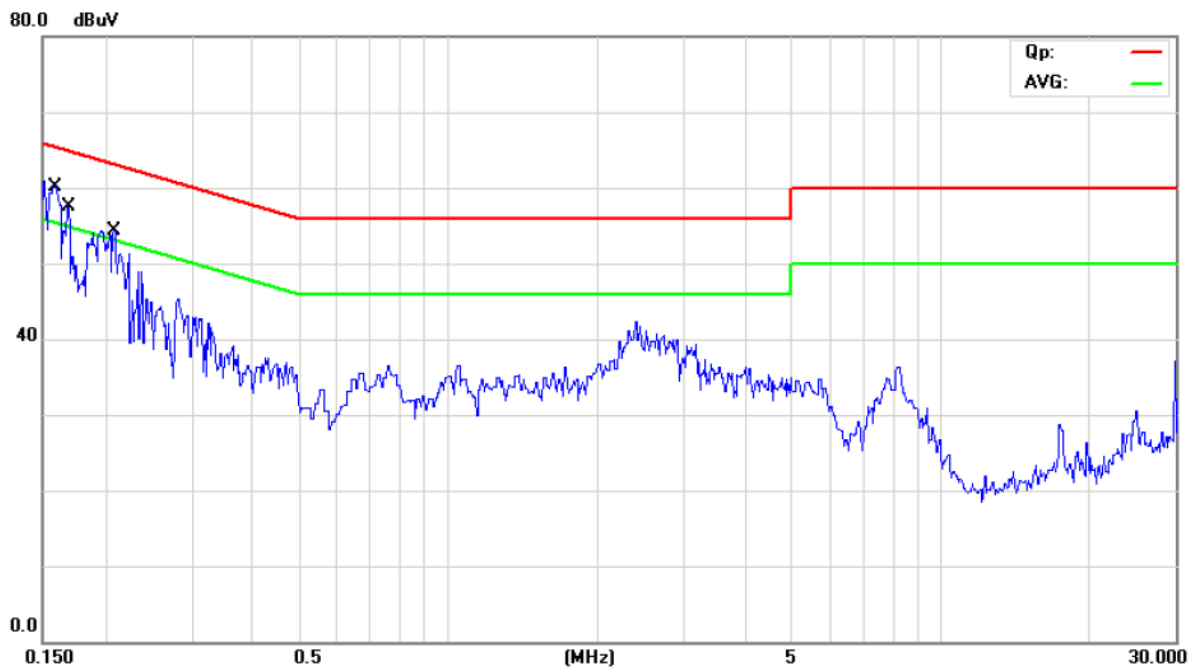
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: WIFI MIMO Keeping TX mode

Equipment Level: Class B

Results: PASS

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1578	47.10	11.01	58.11	65.58	-7.47	QP	
2		0.1578	33.10	11.01	44.11	55.58	-11.47	AVG	
3		0.1692	44.54	11.02	55.56	65.00	-9.44	QP	
4		0.1692	31.56	11.02	42.58	55.00	-12.42	AVG	
5		0.2086	41.03	11.06	52.09	63.26	-11.17	QP	
6		0.2086	28.18	11.06	39.24	53.26	-14.02	AVG	

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B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

EUT Operating Environment

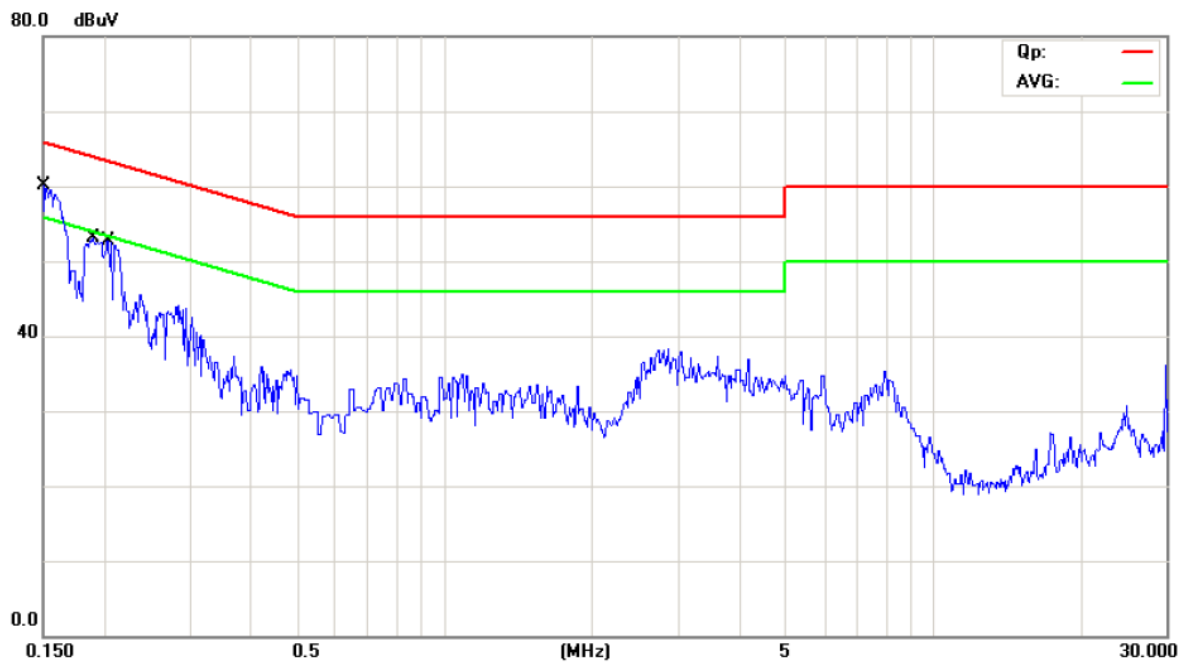
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: WIFI MIMO Keeping TX mode

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1517	46.79	11.00	57.79	65.91	-8.12	QP	
2		0.1517	34.27	11.00	45.27	55.91	-10.64	AVG	
3		0.1911	39.29	11.04	50.33	63.99	-13.66	QP	
4		0.1911	25.69	11.04	36.73	53.99	-17.26	AVG	
5		0.2068	39.35	11.06	50.41	63.33	-12.92	QP	
6		0.2068	25.76	11.06	36.82	53.33	-16.51	AVG	

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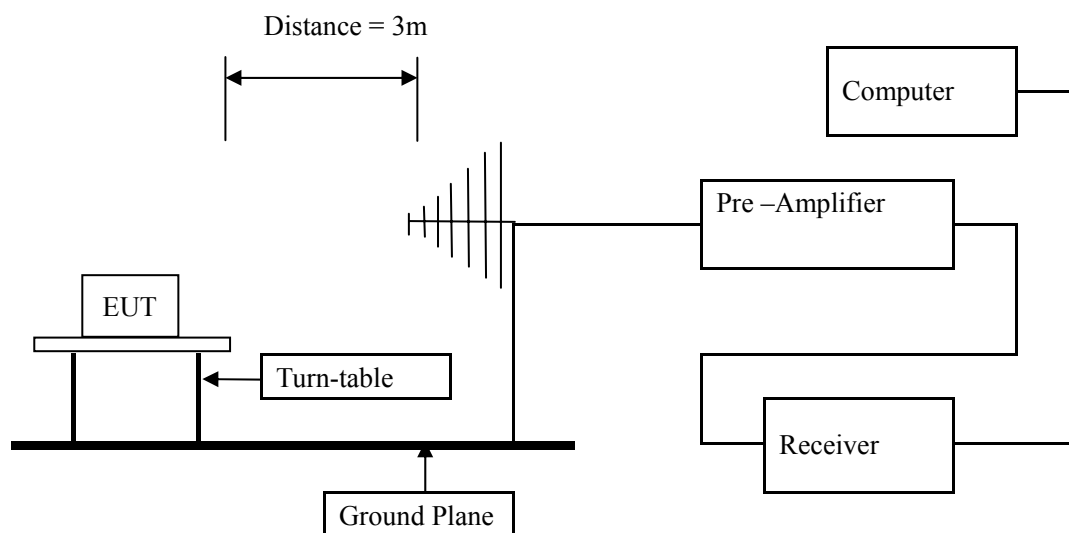
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6 Undesirable Emission and Restrict band

6.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.10-2009. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2009.
- (3) The frequency spectrum from 30 MHz to 40 GHz was investigated. All readings from 30 MHz to 1 GHz are Quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=1MHz, VBW=3MHz and PK detector.
Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a “QP” in the data table.
- (6) The antenna polarization : Vertical polarization and Horizontal polarization.

Block diagram of Test setup



6.2 Configuration of The EUT

Same as section 5.3 of this report

6.3 EUT Operating Condition

Same as section 5.4 of this report.

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6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequencies in restricted band are complied to limit on Paragraph 15.209 and 15.109

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

- (1) 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 EIRP of -27dBm/MHz
- (2) For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27dBm/MHz.

- Note:
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the higher limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

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Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

Radiated Emission In Horizontal (30MHz---1000MHz)

EUT set Condition: WIFI MIMO Keeping TX mode

Results: Pass

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
141.680	27.20	H	43.50
148.480	32.75	H	43.50
925.280	43.39	V	46.00
205.120	30.43	V	43.50
118.720	30.86	V	43.50

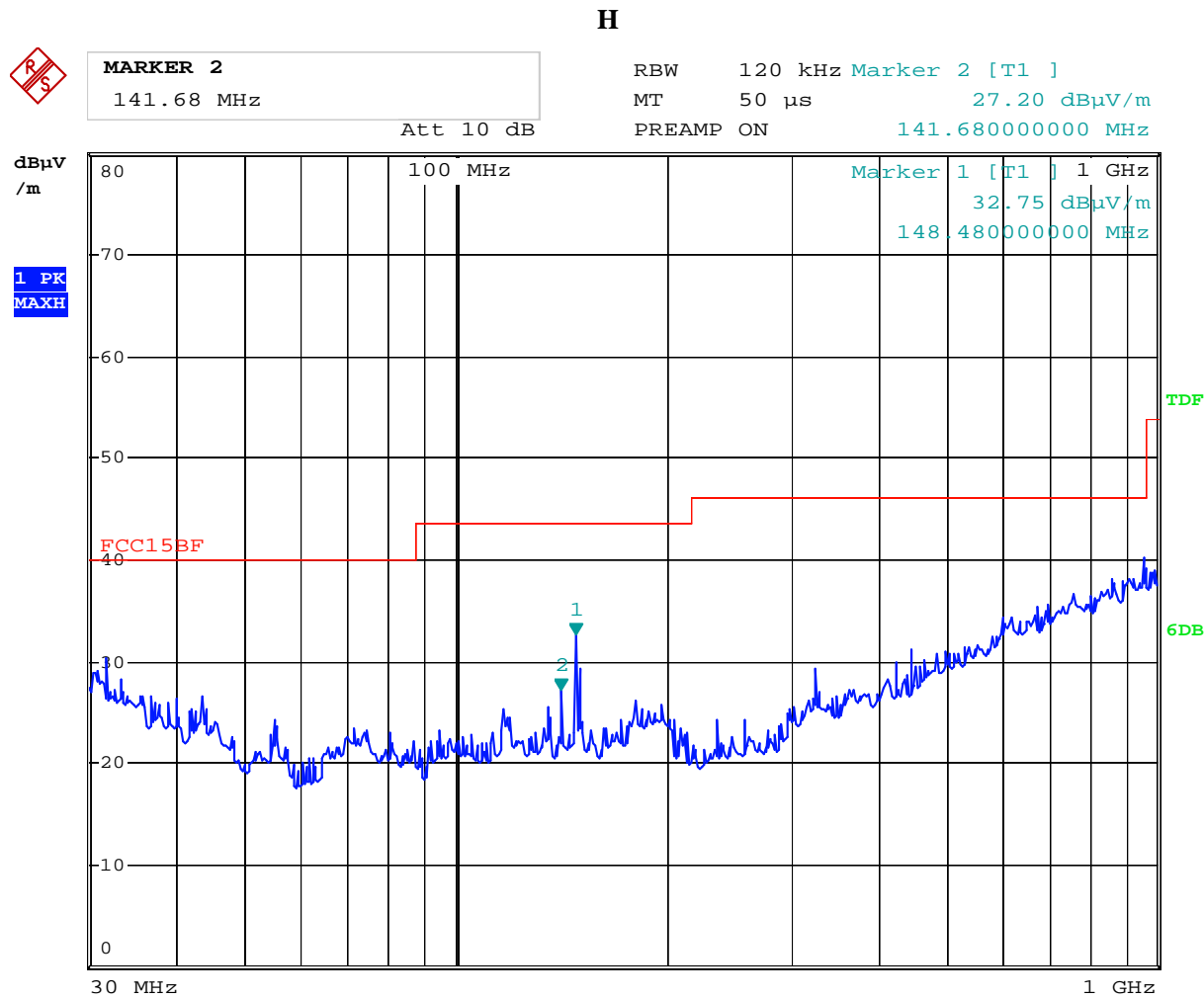
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Test Figure:

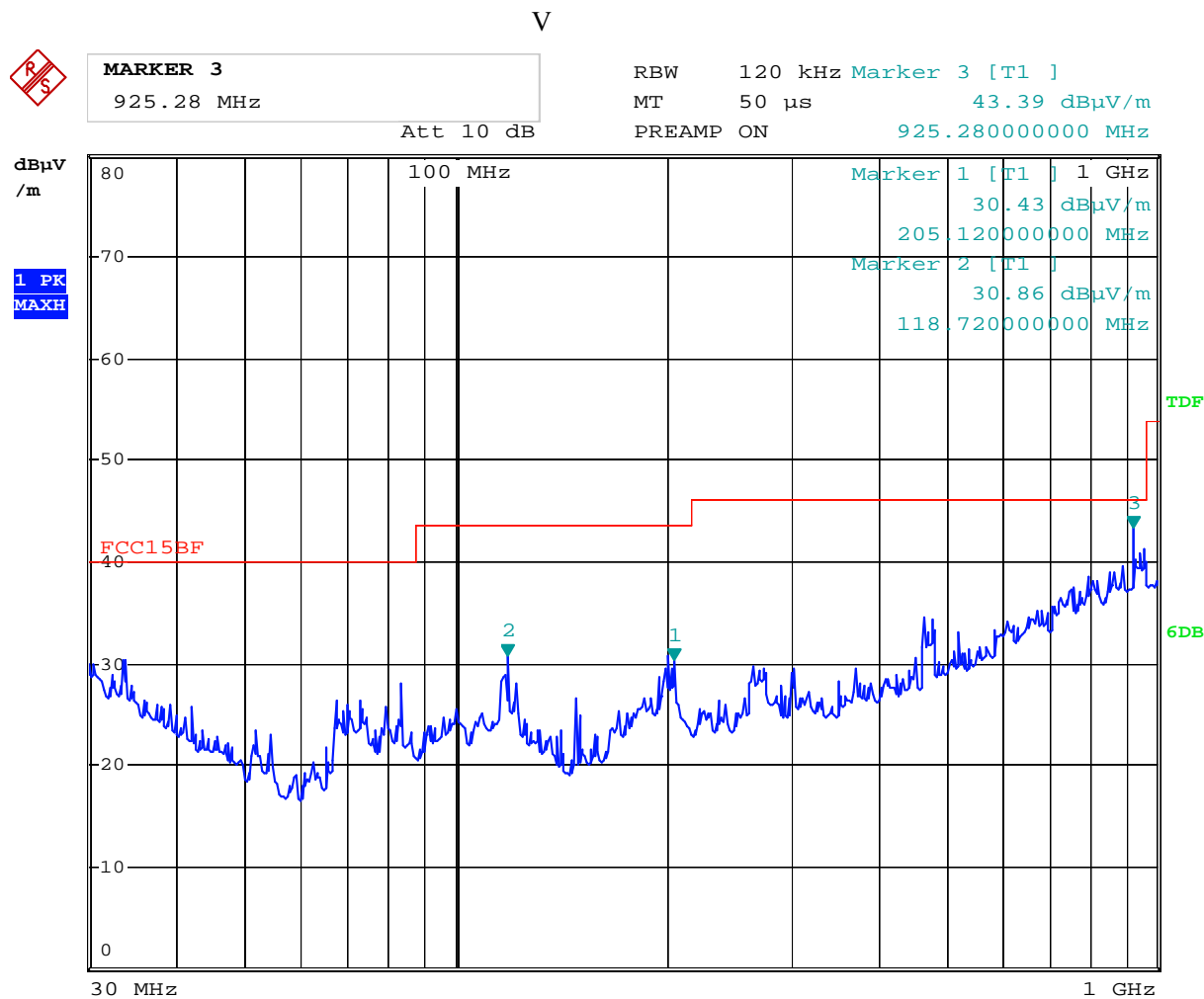


Date: 26.JUN.2015 16:11:27

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Test Figure:



Date: 26.JUN.2015 16:13:15

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Operation Mode: WIFI MIMO Keeping TX mode under CH36 for 11g at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
5180.00	100.21 (PK)	H	Fundamental Frequency
5180.00	97.12 (PK)	V	
10360	--	H	74(Peak)/ 54(AV)
15540	--	V	74(Peak)/ 54(AV)
20720	--	H/V	74(Peak)/ 54(AV)
25900	--	H/V	74(Peak)/ 54(AV)
31080	--	H/V	74(Peak)/ 54(AV)
36260	--	H/V	74(Peak)/ 54(AV)

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
2. Remark "---" means that the emissions level is too low to be measured
3. For 802.11a mode 6Mbps

Operation Mode: WIFI MIMO Keeping TX mode under CH40 for 11g at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
5200.00	98.47 (PK)	H	Fundamental Frequency
5200.00	95.97 (PK)	V	
10400	--	H	74(Peak)/ 54(AV)
15600	--	V	74(Peak)/ 54(AV)
20800	--	H/V	74(Peak)/ 54(AV)
26000	--	H/V	74(Peak)/ 54(AV)
31200	--	H/V	74(Peak)/ 54(AV)
36400	--	H/V	74(Peak)/ 54(AV)

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
2. Remark "---" means that the emissions level is too low to be measured
3. For 802.11a mode 6Mbps

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Operation Mode: WIFI MIMO Keeping TX mode under CH48 for 11g at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
5240.00	99.47 (PK)	H	Fundamental Frequency
5240.00	95.41 (PK)	V	
10480	--	H	74(Peak)/ 54(AV)
15720	--	V	74(Peak)/ 54(AV)
20960	--	H/V	74(Peak)/ 54(AV)
26200	--	H/V	74(Peak)/ 54(AV)
31440	--	H/V	74(Peak)/ 54(AV)
36680	--	H/V	74(Peak)/ 54(AV)

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
2. Remark "---" means that the emissions level is too low to be measured
3. For 802.11a mode 6Mbps

Operation Mode: WIFI MIMO Keeping TX mode under CH149 for 11g at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
5745.00	99.43 (PK)	H	Fundamental Frequency
5745.00	95.46 (PK)	V	
11490	--	H	74(Peak)/ 54(AV)
17235	--	V	74(Peak)/ 54(AV)
22980	--	H/V	74(Peak)/ 54(AV)
28725	--	H/V	74(Peak)/ 54(AV)
34470	--	H/V	74(Peak)/ 54(AV)

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
2. Remark "---" means that the emissions level is too low to be measured
3. For 802.11a mode 6Mbps

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Operation Mode: WIFI MIMO Keeping TX mode under CH153 for 11g at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
5765.00	99.93 (PK)	H	Fundamental Frequency
5765.00	96.86 (PK)	V	
11530	--	H	74(Peak)/ 54(AV)
17295	--	V	74(Peak)/ 54(AV)
23060	--	H/V	74(Peak)/ 54(AV)
28825	--	H/V	74(Peak)/ 54(AV)
34590	--	H/V	74(Peak)/ 54(AV)

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
2. Remark "---" means that the emissions level is too low to be measured
3. For 802.11a mode 6Mbps

Operation Mode: WIFI MIMO Keeping TX mode under CH161 for 11g at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
5805.00	98.60 (PK)	H	Fundamental Frequency
5805.00	95.51 (PK)	V	
11610	--	H	74(Peak)/ 54(AV)
17415	--	V	74(Peak)/ 54(AV)
23220	--	H/V	74(Peak)/ 54(AV)
29025	--	H/V	74(Peak)/ 54(AV)
34830	--	H/V	74(Peak)/ 54(AV)

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
2. Remark "---" means that the emissions level is too low to be measured
3. For 802.11a mode 6Mbps

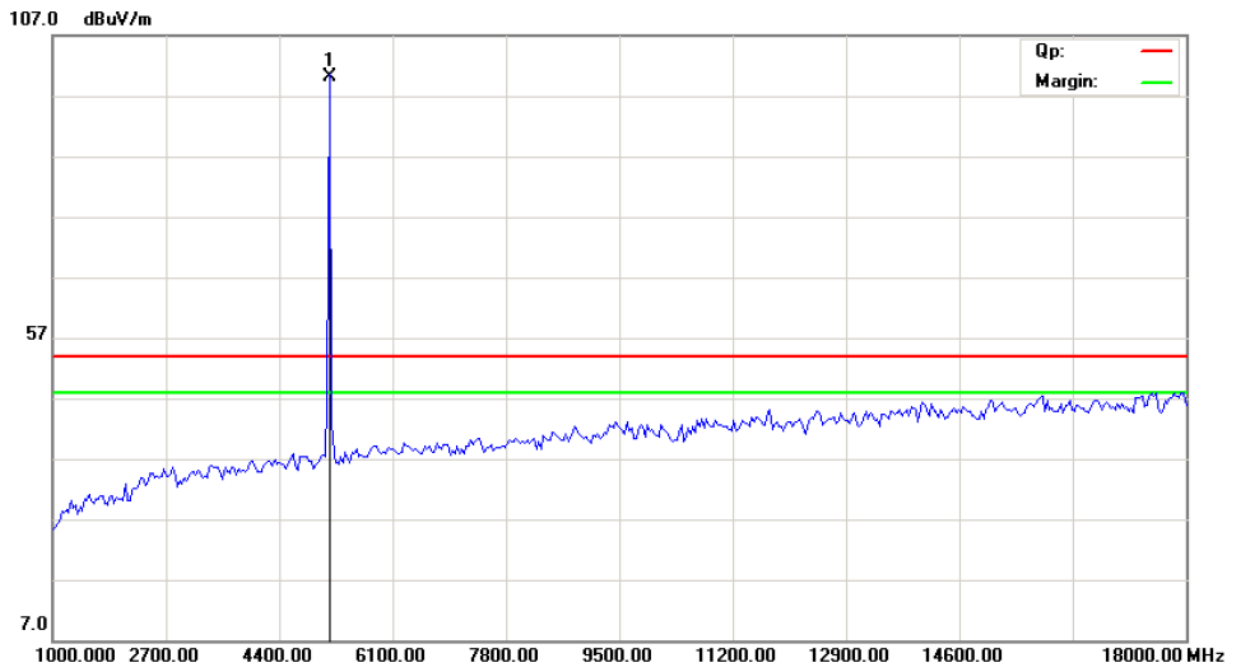
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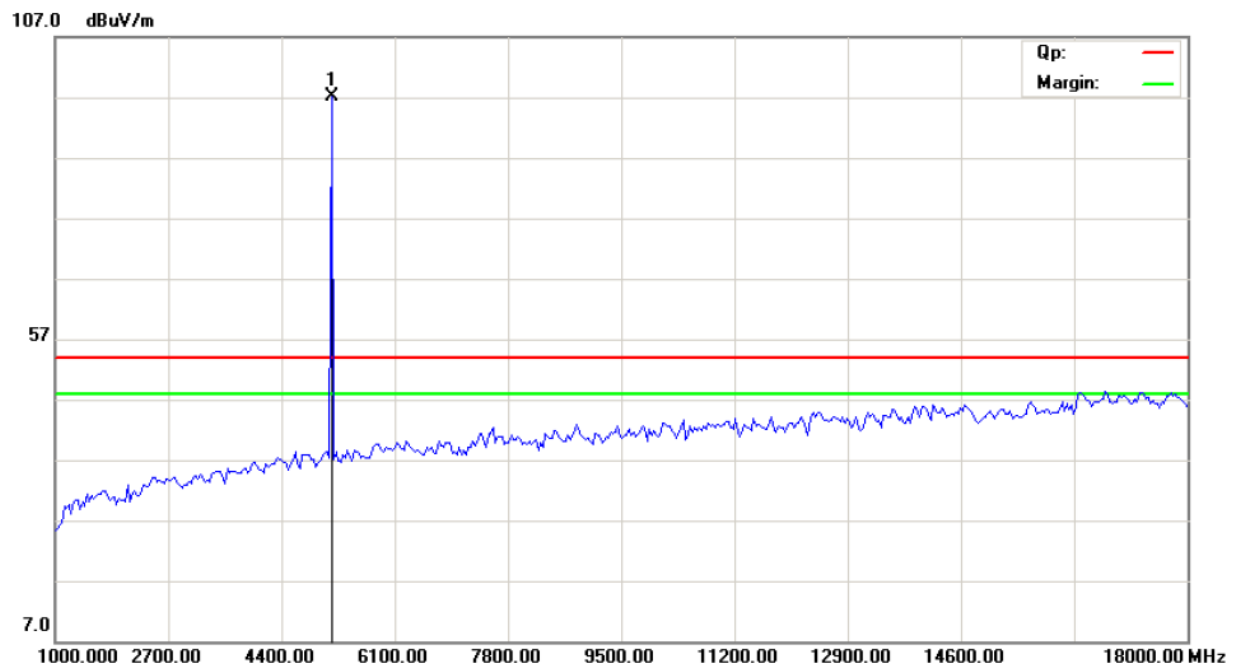
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Please refer to the following test plots for details:

CH36 for 11g at 6Mbps: Horizontal



CH36 for 11g at 6Mbps: Vertical



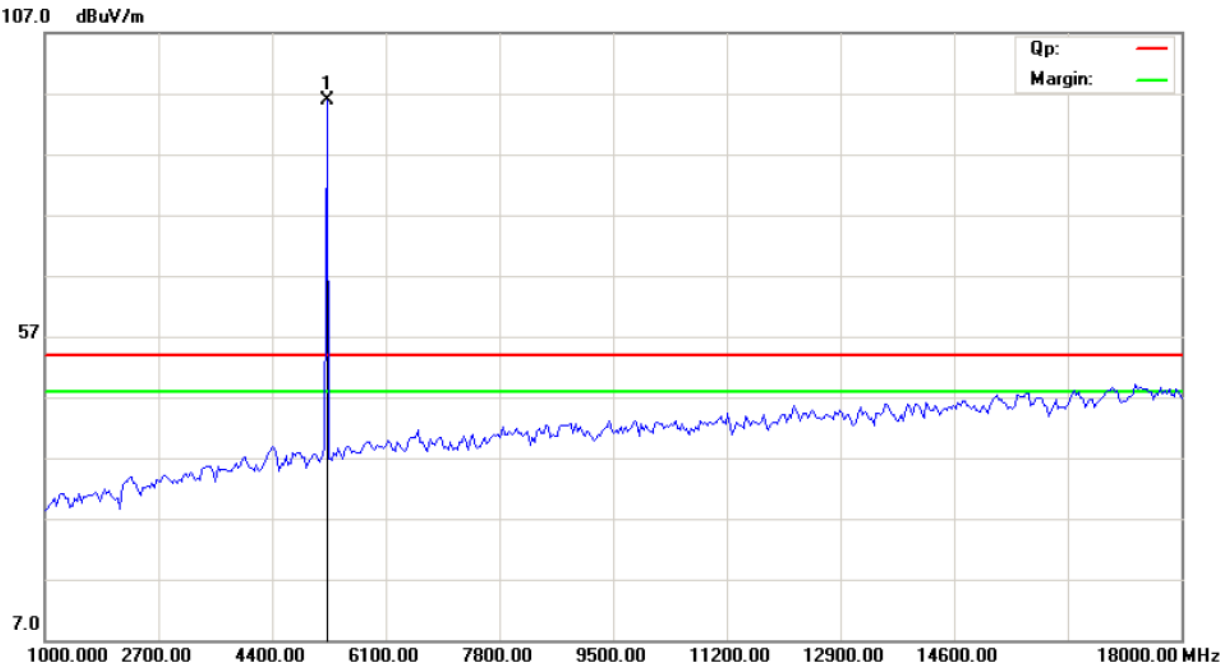
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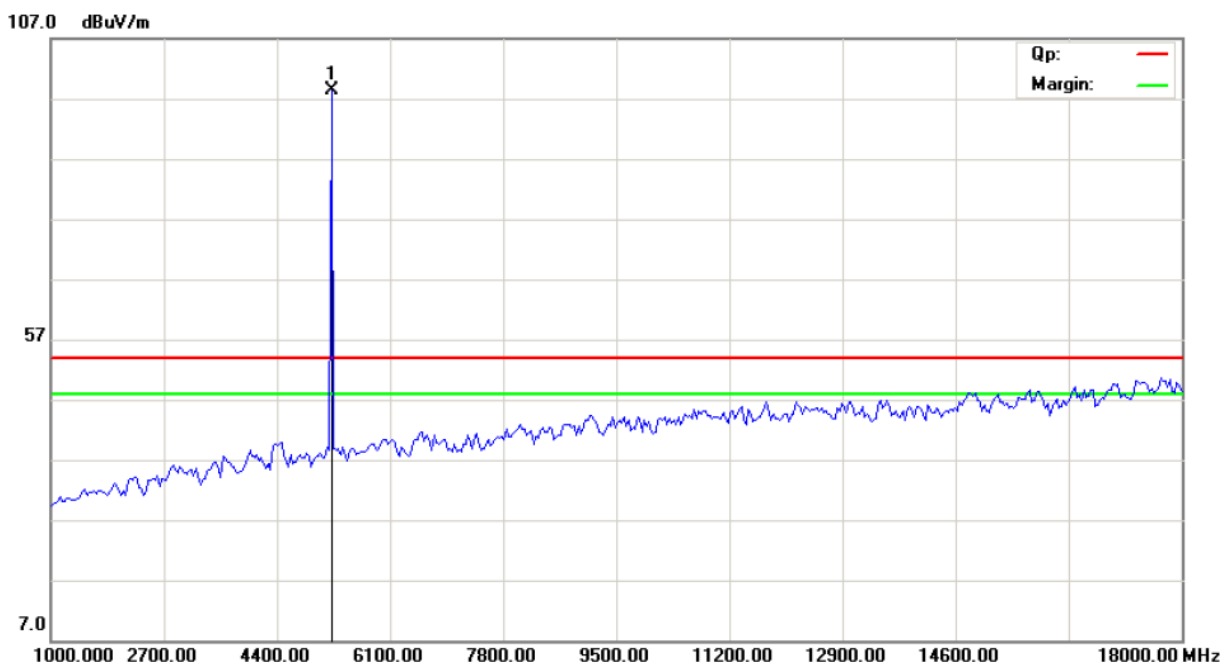
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CH40 for 11g at 6Mbps: Vertical



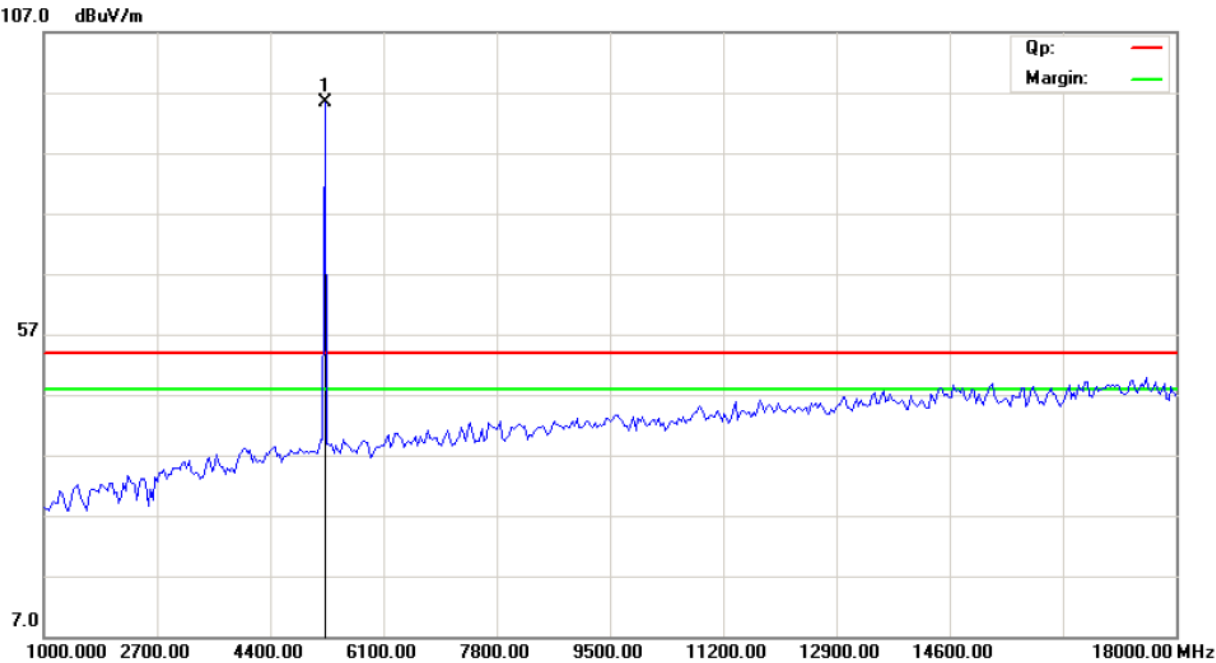
CH40 for 11g at 6Mbps: Horizontal



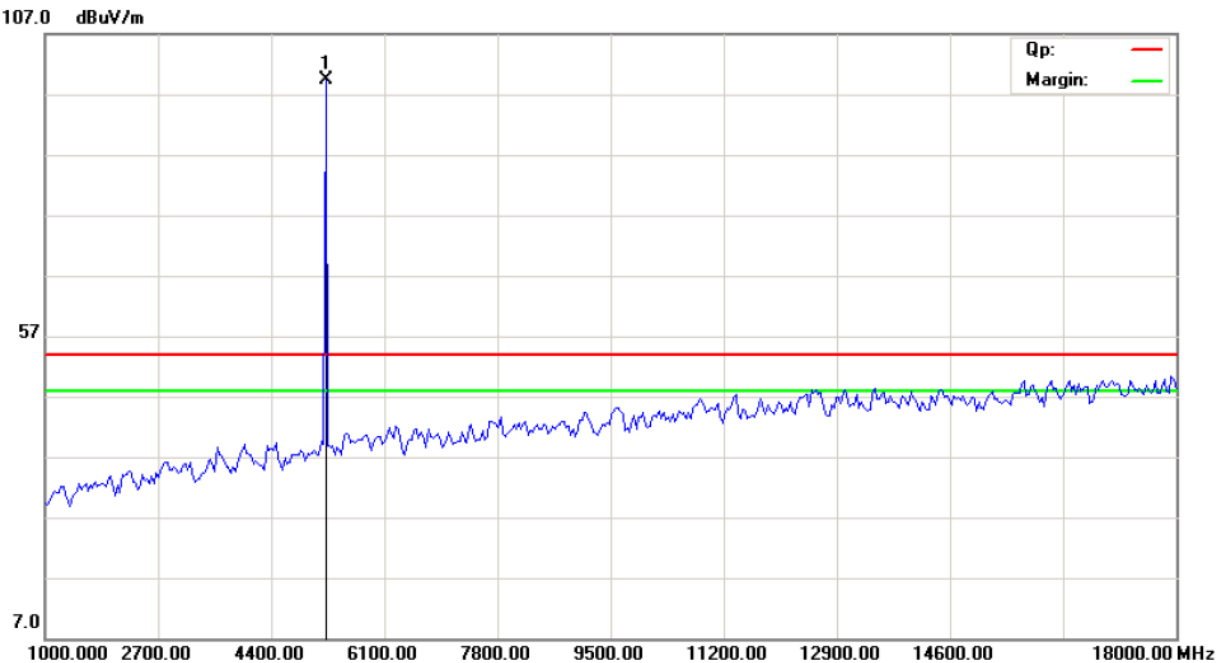
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CH48 for 11g at 6Mbps: Vertical



CH48 for 11g at 6Mbps: Horizontal

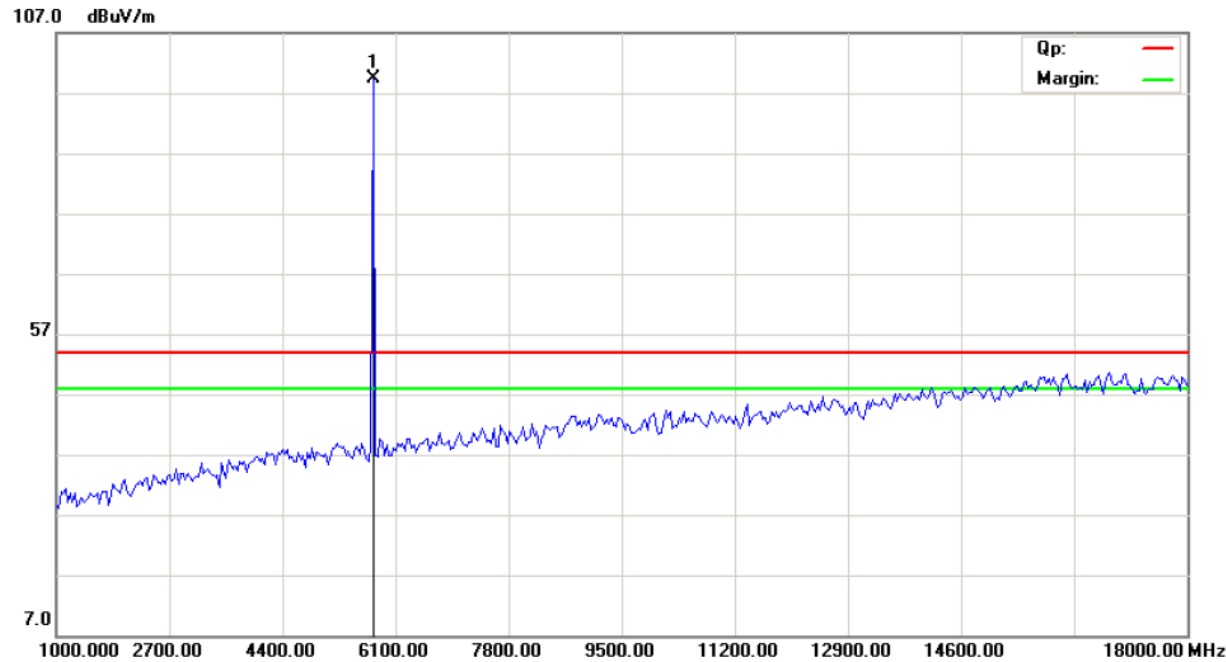


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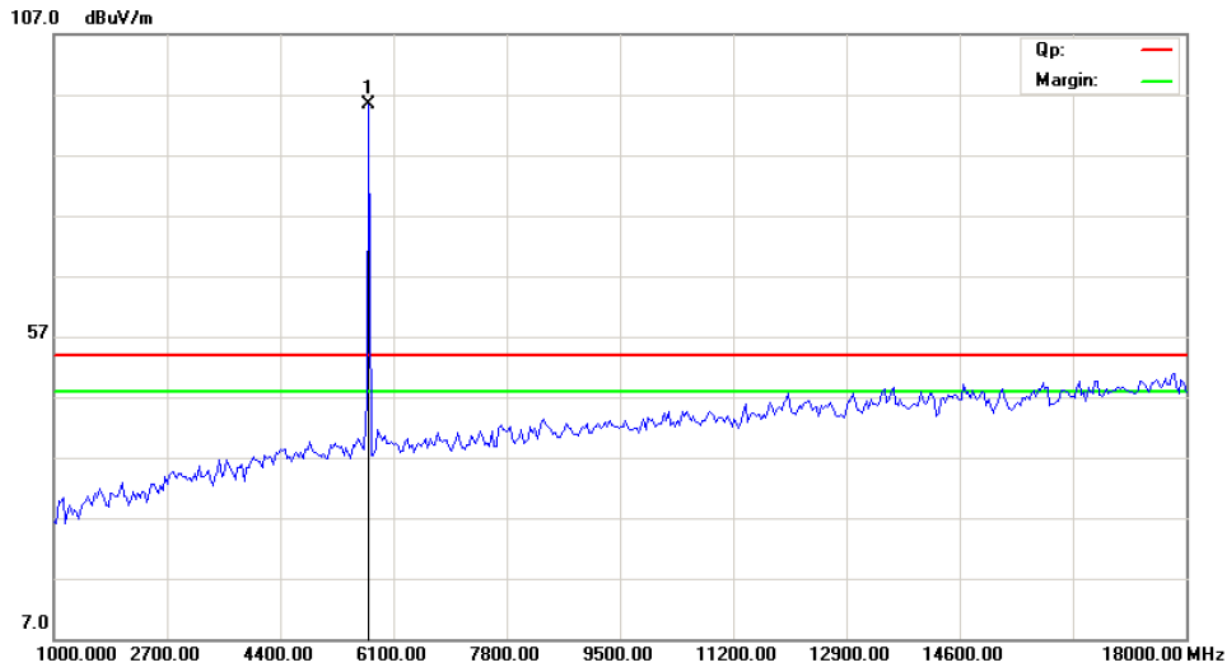


Please refer to the following test plots for details:

CH149 for 11g at 6Mbps: Horizontal



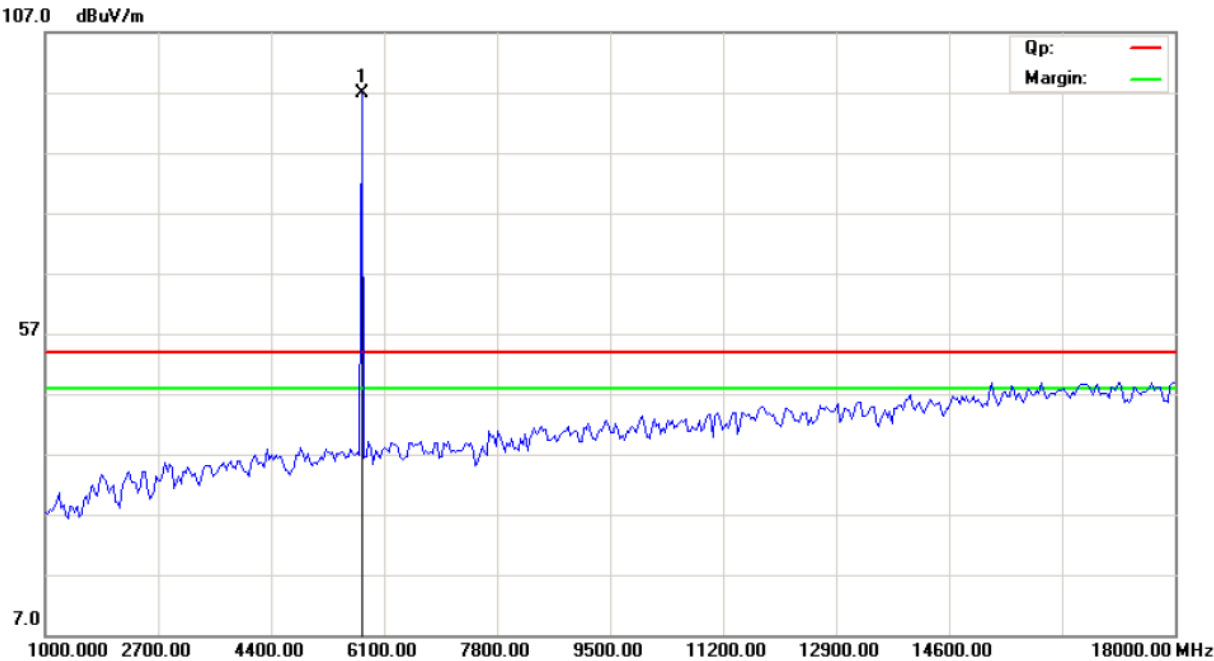
CH149 for 11g at 6Mbps: Vertical



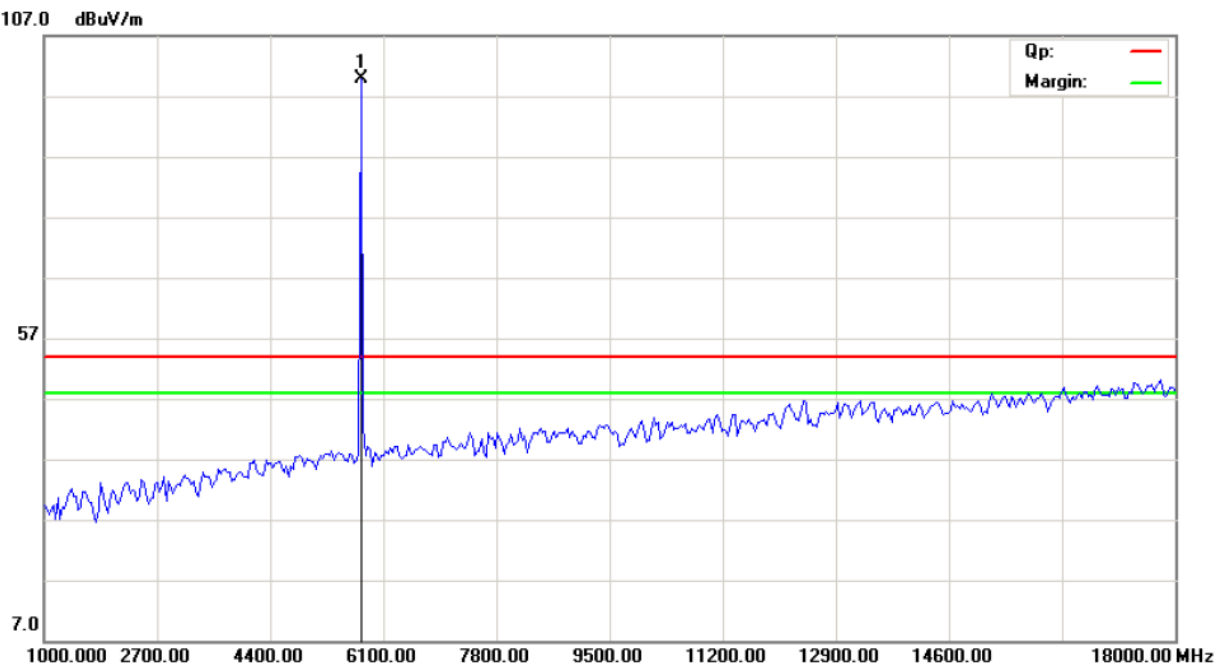
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CH153 for 11g at 6Mbps: Vertical

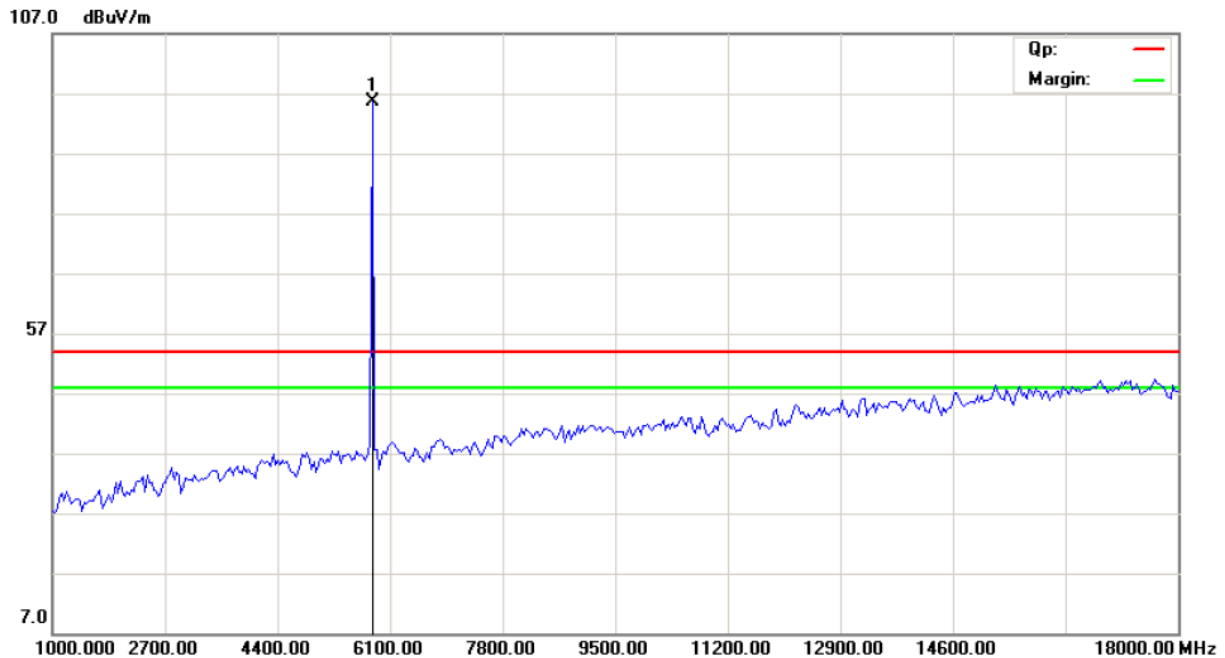


CH153 for 11g at 6Mbps: Horizontal

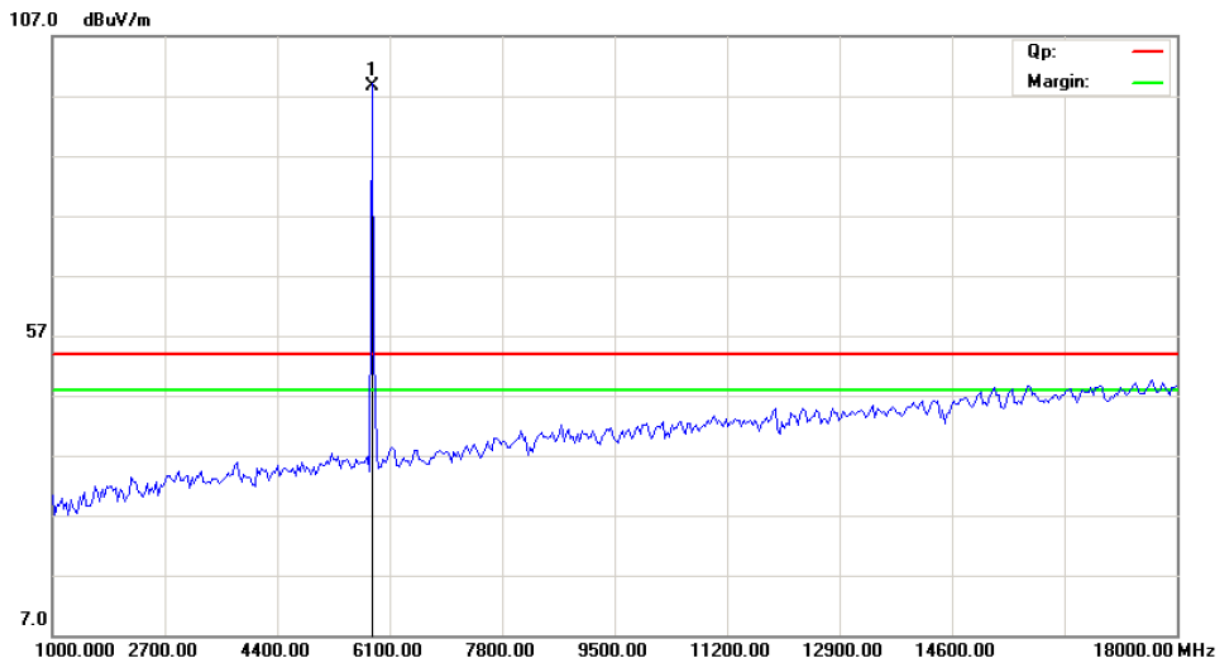


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CH161 for 11g at 6Mbps: Vertical



CH161 for 11g at 6Mbps: Horizontal



Note: For radiated Emissions from 18-40GHz, it is only the floor noise.

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Restricted band Measurement			
EUT	TV BOX		Test Mode:
Mode	WIFI MIMO Keeping TX mode		Channel 36 (5180MHz)
Temperature	24 deg. C,		Input Voltage
Test Result:	Pass		Humidity
5150	PK (dBμV/m)	53.6 (PK)	56% RH
	EIRP (dBm)	-41.6	Detector
Polarity	Horizontal		PK
			Limit
			-27dBm/MHz
			--
			--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2$$

For Example, if $\text{E[dB}\mu\text{V/m]} = 53.6 \text{ dB}\mu\text{V/m}$,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 53.6 - 95.2 = -41.6 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	TV BOX		Test Mode:
Mode	WIFI MIMO Keeping TX mode		Channel 36 (5180MHz)
Temperature	24 deg. C,		Input Voltage
Test Result:	Pass		Humidity
5150	PK (dBμV/m)	51.6 (PK)	56% RH
	EIRP (dBm)	-43.6	Detector
Polarity	Vertical		PK
			Limit
			-27dBm/MHz
			--
			--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2$$

For Example, if $\text{E[dB}\mu\text{V/m]} = 51.6 \text{ dB}\mu\text{V/m}$,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 51.6 - 95.2 = -43.6 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	TV BOX		Test Mode:
Mode	WIFI MIMO Keeping TX mode		Channel 48 (5240MHz)
Temperature	24 deg. C,		Input Voltage
Test Result:	Pass		Humidity
5250	PK (dBμV/m)	55.2 (PK)	56% RH
	EIRP (dBm)	-40.0	Detector
Polarity	Horizontal		PK
		Limit	-27dBm/MHz

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2$$

For Example, if $\text{E[dB}\mu\text{V/m]}=55.2 \text{ dB}\mu\text{V/m}$,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 55.2 - 95.2 = -40.0 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	TV BOX		Test Mode:
Mode	WIFI MIMO Keeping TX mode		Channel 48 (5240MHz)
Temperature	24 deg. C,		Input Voltage
Test Result:	Pass		Humidity
5250	PK (dBμV/m)	50.9 (PK)	56% RH
	EIRP (dBm)	-44.3	Detector
Polarity	Vertical		PK
		Limit	-27dBm/MHz
		--	--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2$$

For Example, if $\text{E[dB}\mu\text{V/m]}=50.9 \text{ dB}\mu\text{V/m}$,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 50.9 - 95.2 = -44.3 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	TV BOX		Test Mode:
Mode	WIFI MIMO Keeping TX mode		Channel 149 (5745MHz)
Temperature	24 deg. C,		Input Voltage
Test Result:	Pass		Humidity
			56% RH
			Detector
			PK
5725	PK (dBμV/m)	62.8 (PK)	Limit
	EIRP (dBm)	-32.4	
5715	PK (dBμV/m)	59.3 (PK)	Limit
	EIRP (dBm)	-35.9	
Polarity	Horizontal		--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$EIRP[dBm] = E[dB\mu V/m] - 95.2$$

For Example, if $E[dB\mu V/m]=62.8 \text{ dB}\mu V/m$,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 62.8 - 95.2 = -32.4 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	TV BOX		Test Mode:
Mode	WIFI MIMO Keeping TX mode		Channel 149 (5745MHz)
Temperature	24 deg. C,		Input Voltage
Test Result:	Pass		Humidity
			56% RH
			Detector
			PK
5725	PK (dBμV/m)	60.6 (PK)	Limit
	EIRP (dBm)	-34.6	
5715	PK (dBμV/m)	57.1 (PK)	Limit
	EIRP (dBm)	-38.1	
Polarity	Vertical		--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$EIRP[dBm] = E[dB\mu V/m] - 95.2$$

For Example, if $E[dB\mu V/m]=60.6 \text{ dB}\mu V/m$,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 60.6 - 95.2 = -34.6 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	TV BOX		Test Mode:
Mode	WIFI MIMO Keeping TX mode		Channel 161 (5805MHz)
Temperature	24 deg. C,		Input Voltage
Test Result:	Pass		Humidity
			56% RH
			Detector
			PK
5850	PK (dBμV/m)	56.2 (PK)	Limit
	EIRP (dBm)	-39.0	
5860	PK (dBμV/m)	54.1 (PK)	Limit
	EIRP (dBm)	-41.1	
Polarity	Horizontal		--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$EIRP[dBm] = E[dB\mu V/m] - 95.2$$

For Example, if $E[dB\mu V/m]=63.3 \text{ dB}\mu V/m$,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 63.3 - 95.2 = -31.9 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	TV BOX		Test Mode:
Mode	WIFI MIMO Keeping TX mode		Channel 161 (5805MHz)
Temperature	24 deg. C,		Input Voltage
Test Result:	Pass		Humidity
			56% RH
			Detector
			PK
5850	PK (dBμV/m)	55.6 (PK)	Limit
	EIRP (dBm)	-39.6	
5860	PK (dBμV/m)	53.3 (PK)	Limit
	EIRP (dBm)	-41.9	
Polarity	Vertical		--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$EIRP[dBm] = E[dB\mu V/m] - 95.2$$

For Example, if $E[dB\mu V/m]=61.1 \text{ dB}\mu V/m$,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 61.1 - 95.2 = -34.1 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

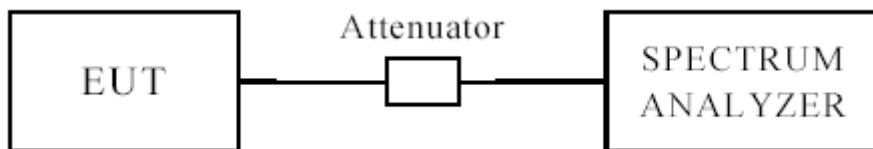
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7.0 Emission Bandwidth

7.1 Test Setup



7.3 Test Procedure for Band 5150-5250MHz

1. Set RBW = approximately 1% of the emission bandwidth.
 2. Set VBW > RBW
 3. Detector = Peak.
 4. Trace mode = max hold.
 5. Sweep = auto couple.
 6. Allow the trace to stabilize.
 7. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission.
- Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

7.4 Test Procedure for Band 5725-5850MHz

1. Set RBW = 100 kHz.
2. Set $VBW \geq 3 \times RBW$.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.5 Test Result

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Antenna A

EUT	TV BOX		Model	i826, i818, i828	
Mode	802.11a		Input Voltage	DC5.0V	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
36	5180	6	44.39	--	Pass
40	5200	6	38.88	--	Pass
48	5240	6	27.96	--	Pass
6dB Bandwidth					
149	5745	6	16.05	--	Pass
153	5765	6	16.31	--	Pass
161	5805	6	16.17	--	Pass

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Antenna B

EUT	TV BOX		Model	i826, i818, i828	
Mode	802.11a		Input Voltage	DC5.0V	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
36	5180	6	60.12	--	Pass
40	5200	6	37.35	--	Pass
48	5240	6	33.51	--	Pass
6dB Bandwidth					
149	5745	6	16.29	--	Pass
153	5765	6	15.83	--	Pass
161	5805	6	16.29	--	Pass

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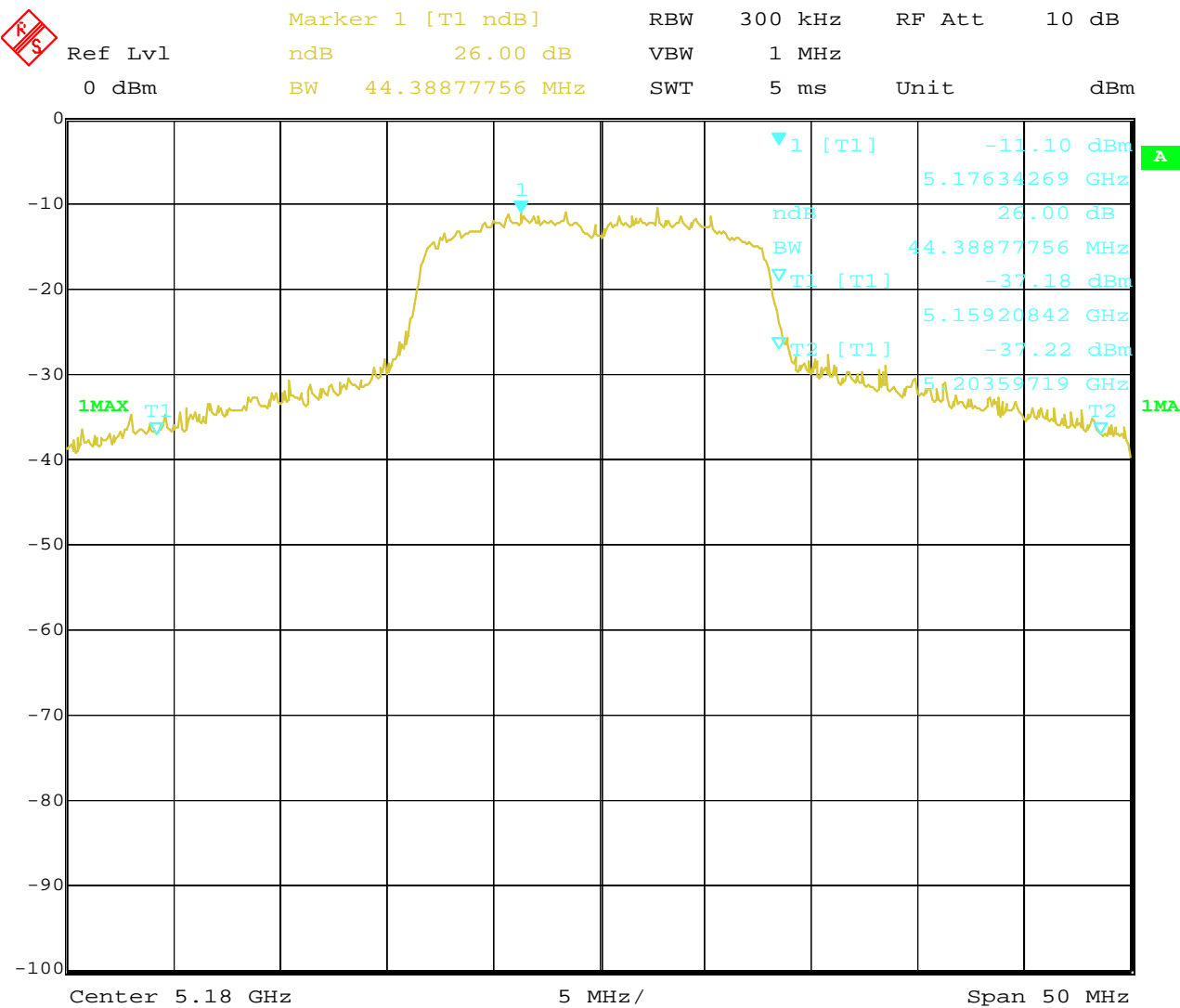
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Test Figure:

Antenna A

Channel 36

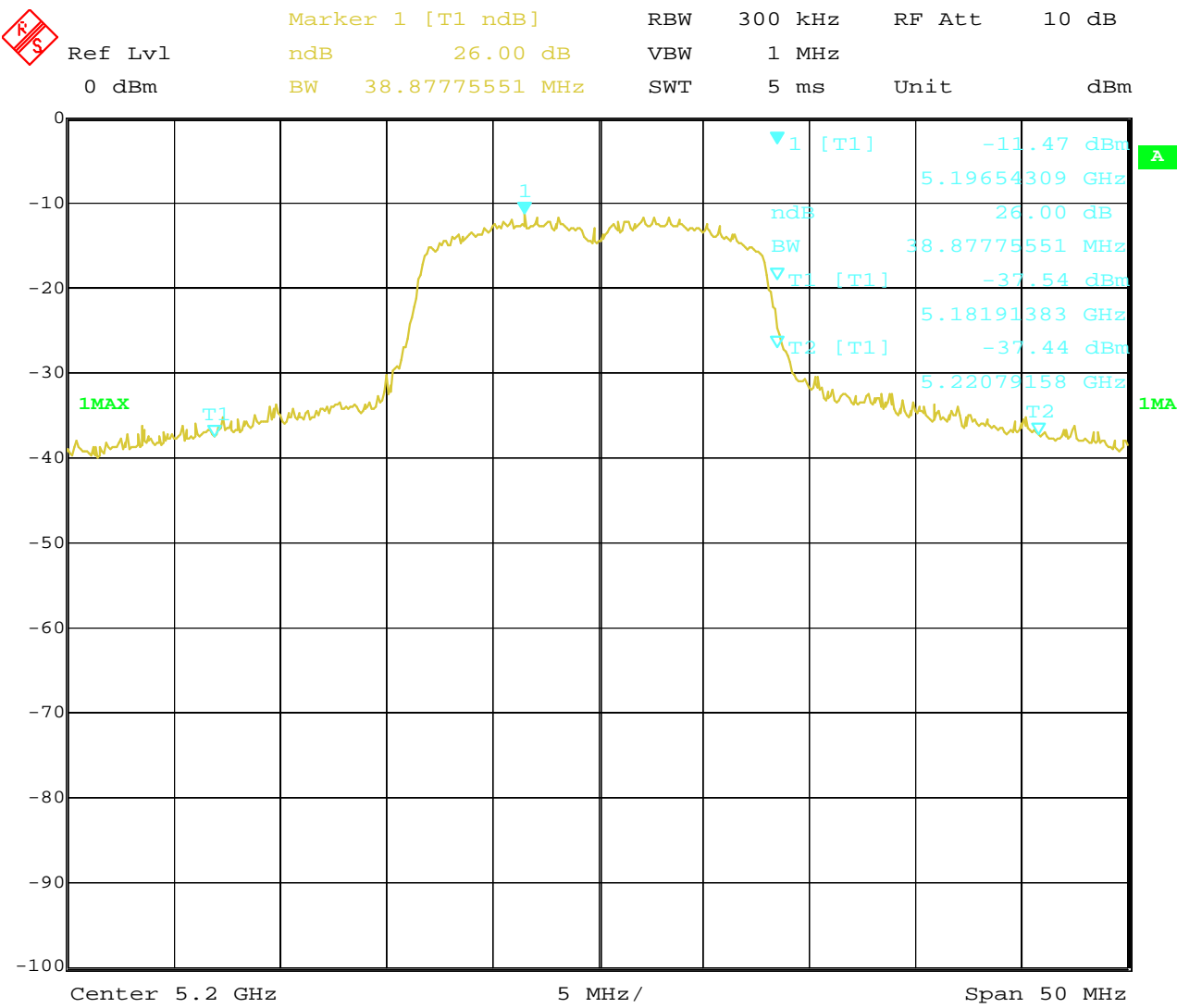


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Channel 40

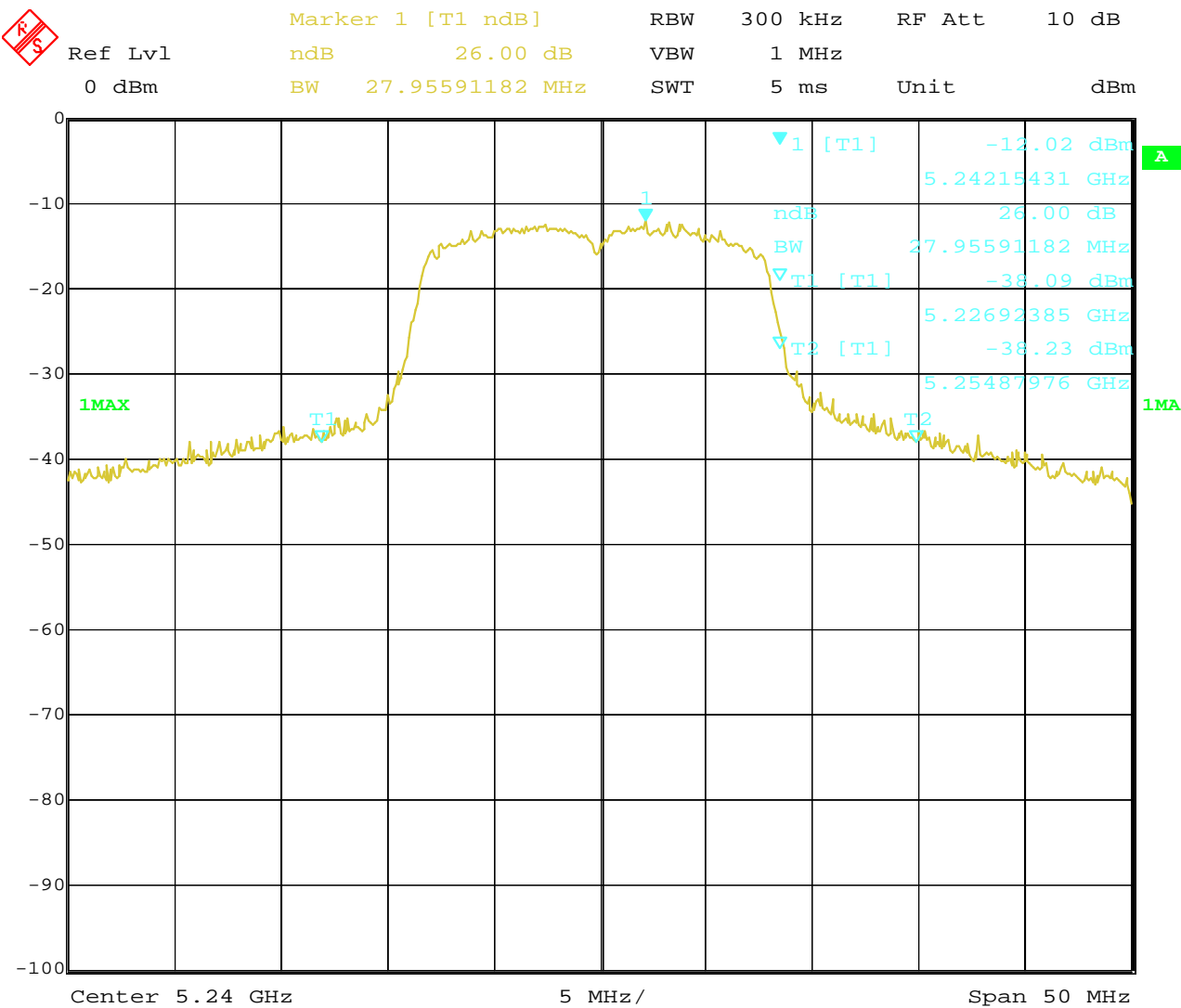


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Channel 48



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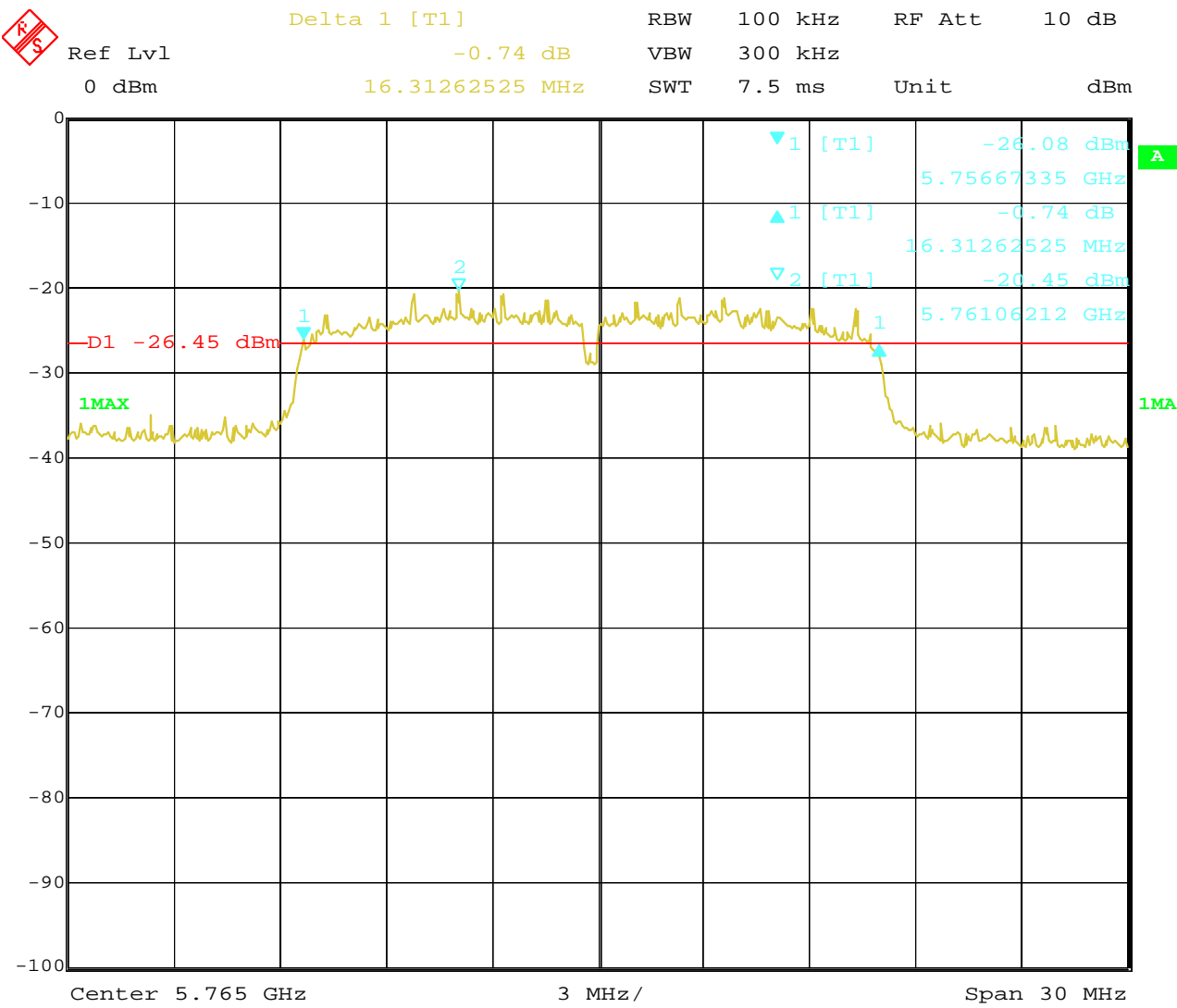
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Channel 153

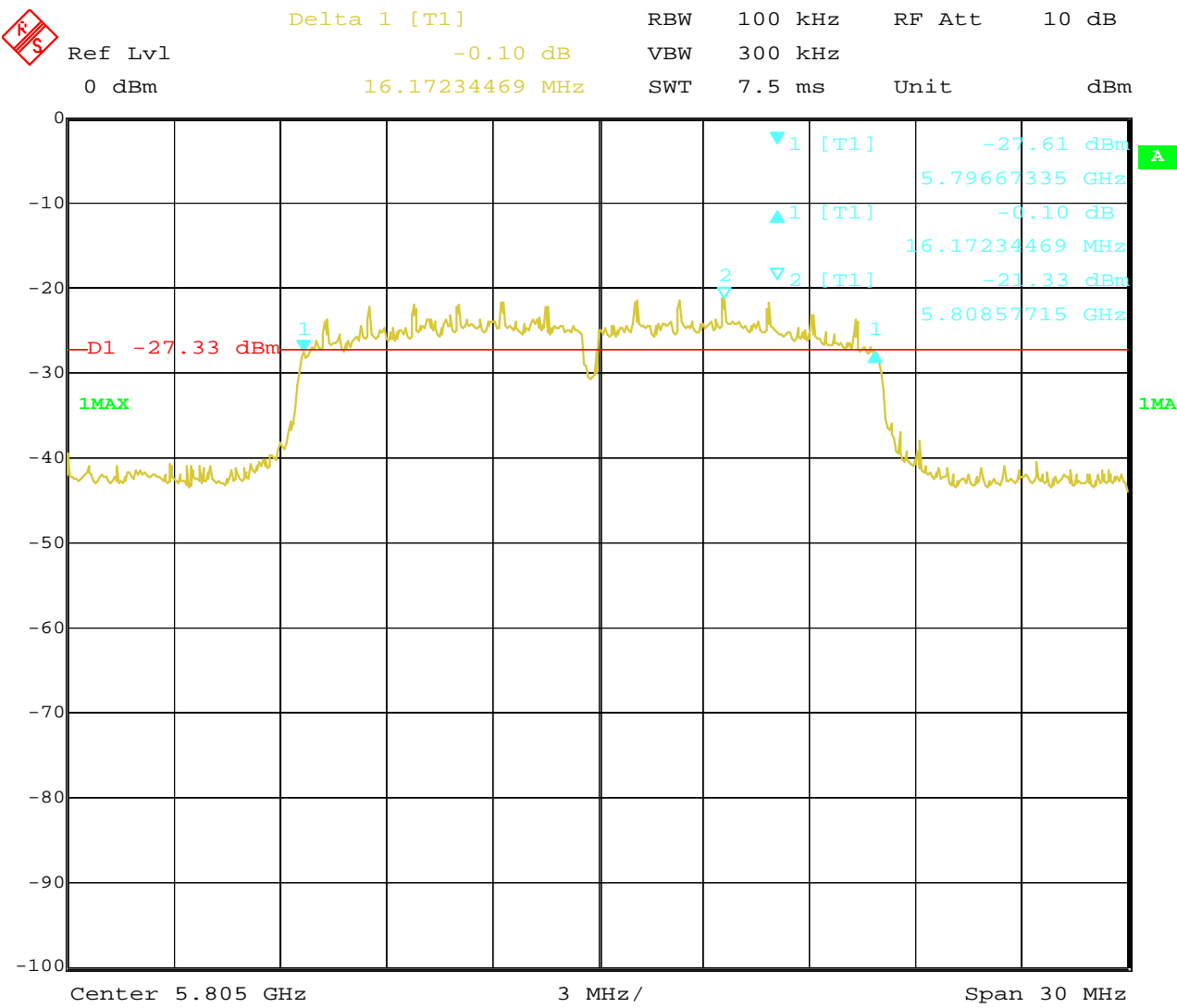


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Channel 161



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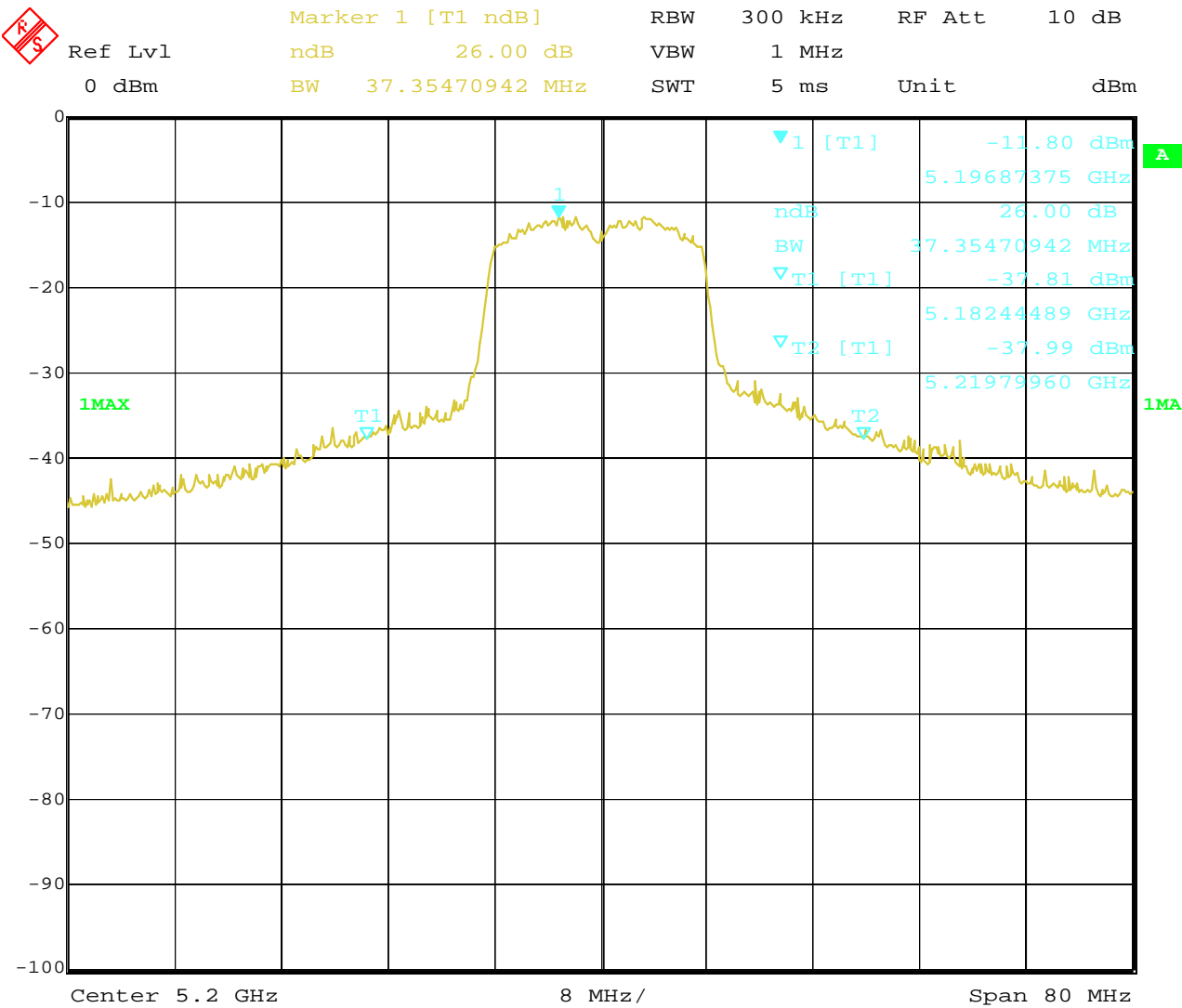


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Channel 40

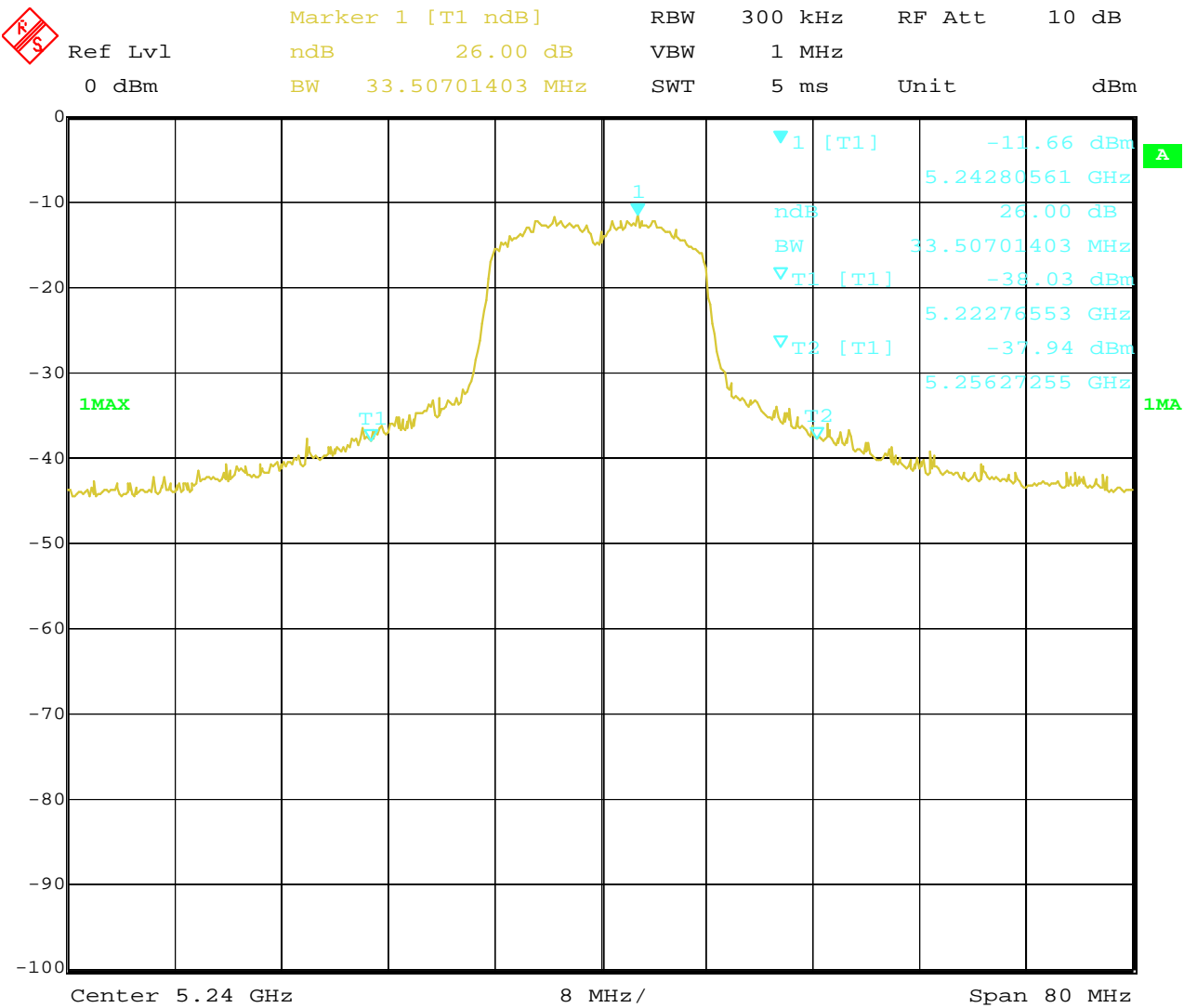


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Channel 48

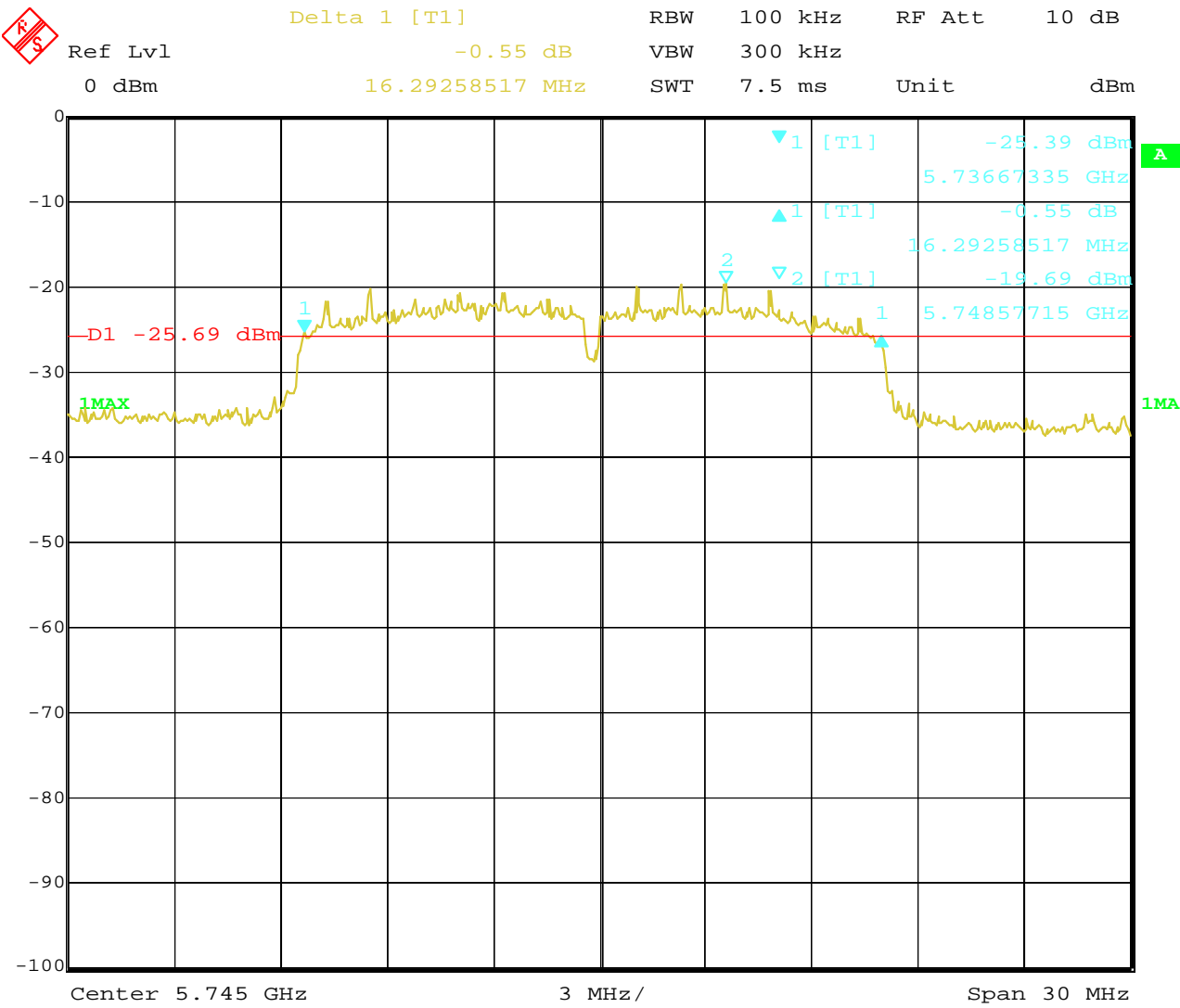


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Channel 149

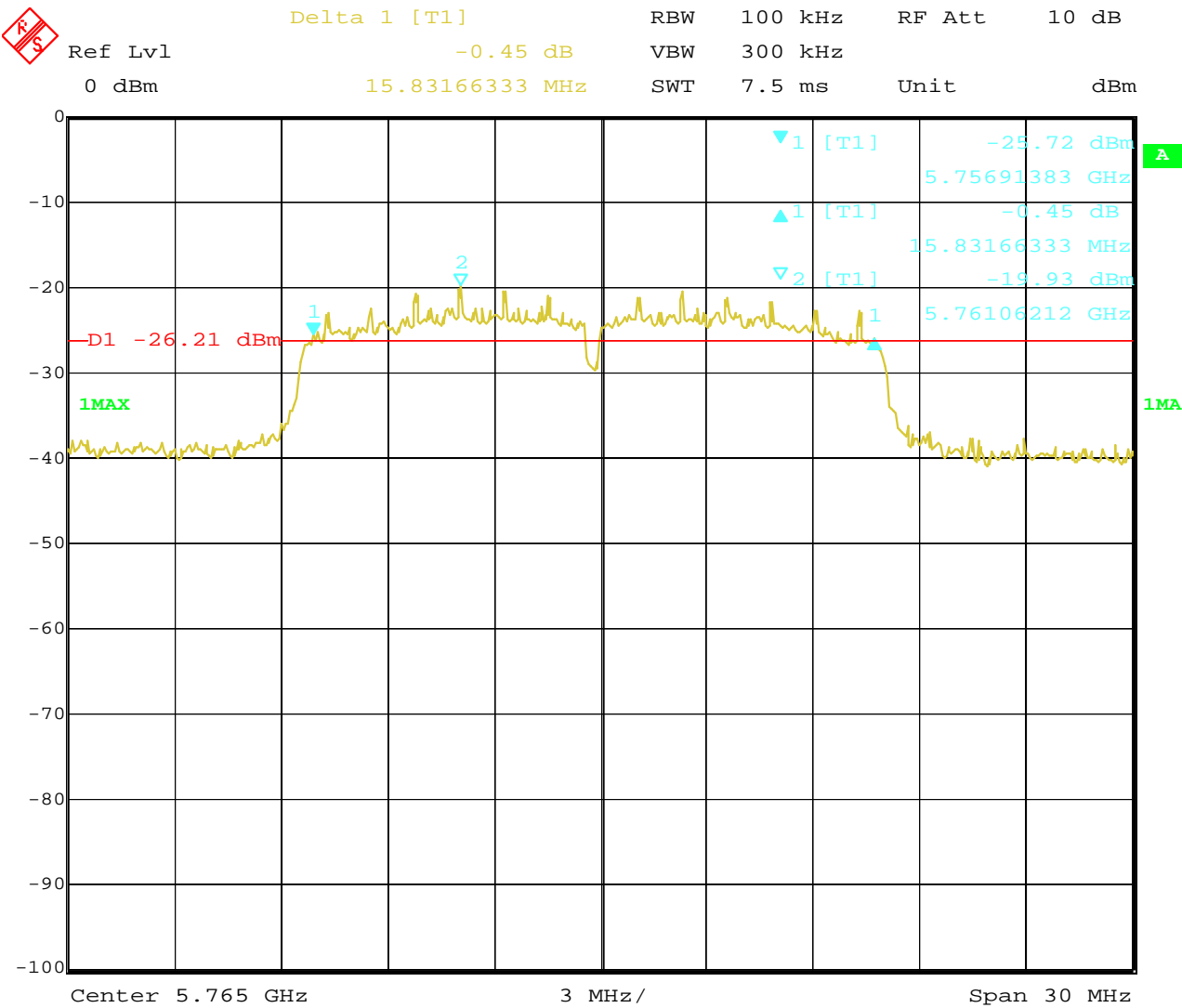


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Channel 153

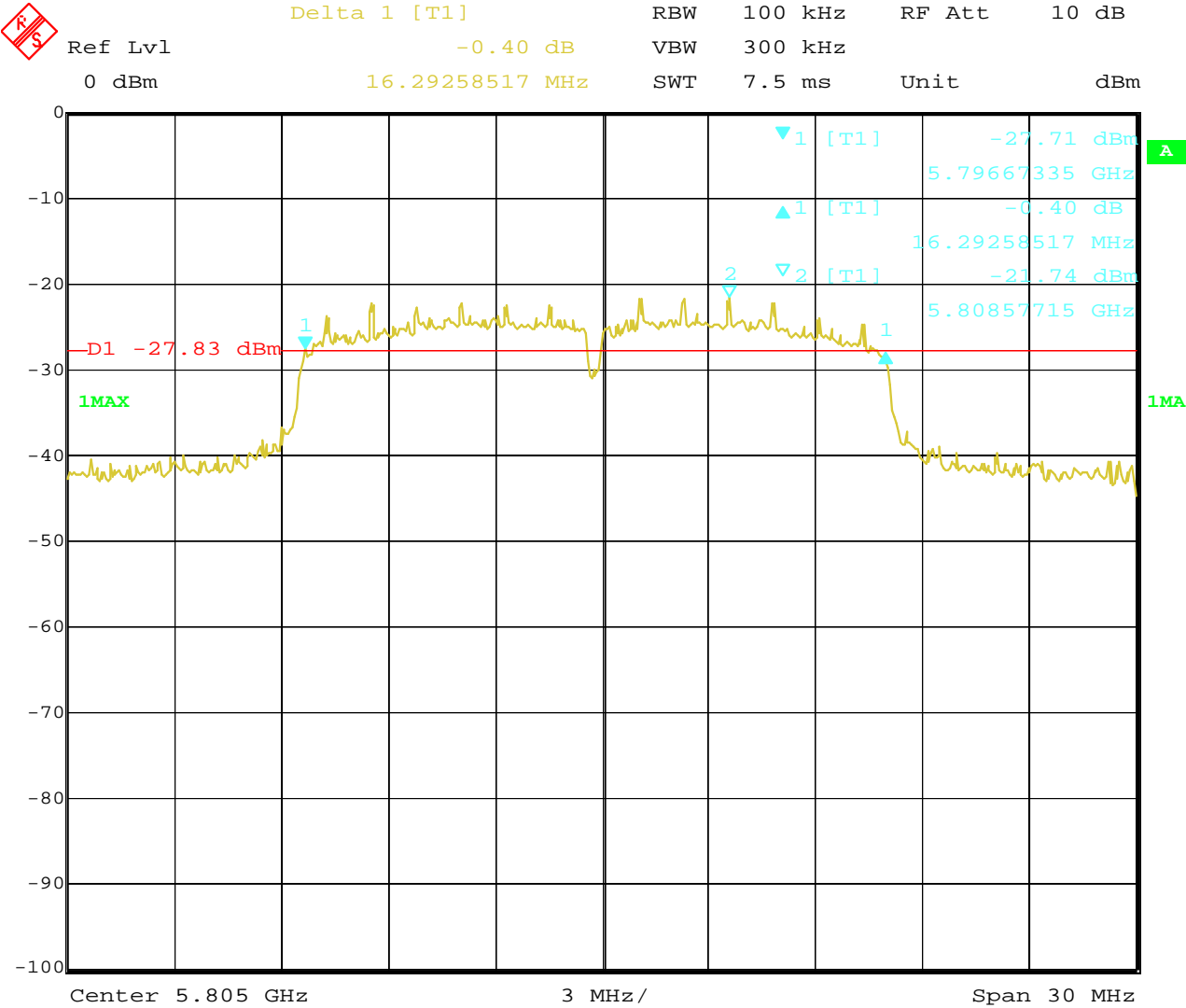


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Channel 161

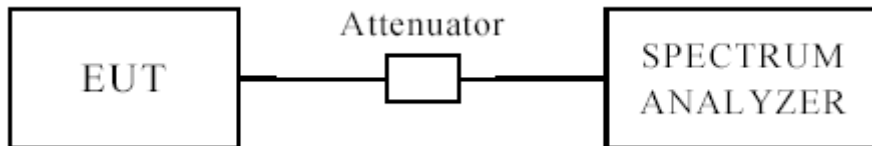


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8.0 Peak Transmit Power Measurement

8.1 Test Setup



8.2 Limits of Peak Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) \leq (Max. e.i.r.p 125mW (21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
	√	Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	--		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	--		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	--		1 Watt (30 dBm)

Note: Where B is the 26dB emission bandwidth in MHz.

8.3 Test Procedure

The RF power output was measured with a Spectrum analyzer connected to the RF Antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate centre frequency.

Note: the average power was measured

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8.4 Test Results

EUT		TV BOX		Model	i826, i818, i828	
Mode		802.11a		Input Voltage	DC5.0V	
Temperature		24 deg. C,		Humidity	56% RH	
Channel	Frequency (MHz)	Antenna Port	Average Power Output (dBm)	Total Power (dBm)	Limit (dBm)	Pass/ Fail
36	5180	A	4.37	7.69	24	Pass
		B	4.97			
40	5200	A	4.56	7.54	24	Pass
		B	4.49			
48	5240	A	3.98	7.00	24	Pass
		B	4.01			
149	5745	A	-0.96	2.28	30	Pass
		B	-0.50			
153	5765	A	-1.82	1.40	30	Pass
		B	-1.40			
161	5805	A	-2.65	0.49	30	Pass
		B	-2.37			

Note: 1. At final test to get the worst-case emission at 6Mbps for CH36, CH40, CH48, CH149, CH153 and CH161

2. The result basic equation calculation as follow:

$$\text{Average Power Output} = \text{Peak Power Reading} + \text{Cable loss} + \text{Attenuator}$$

3. The worse case was recorded

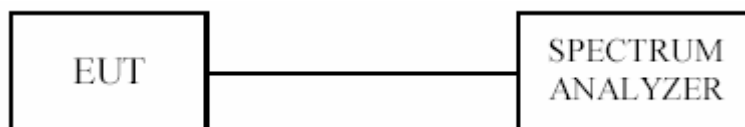
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9. Power Power Spectral Density Measurement

9.1 Test Setup



9.2 Limits of Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17dBm/MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
	√	Mobile and Portable client device	11dBm/MHz
U-NII-2A	--		11dBm/MHz
U-NII-2C	--		11dBm/MHz
U-NII-3	--		30dBm/500kHz

9.3 Test Procedure

1. The EUT was directly connected to the spectrum analyzer
2. Set the RBW = 1MHz.
3. Set the VBW = 3MHz.
4. Set the span to encompass the entire emissions bandwidth (EBW) of the signal
5. Detector = RMS
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.

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9.4 Test Result

EUT		TV BOX		Model		i826, i818, i828
Mode		802.11a 6Mbps		Input Voltage		DC5.0V
Temperature		24 deg. C,		Humidity		56% RH
Channel	Frequency (MHz)	Power Spectral Density (dBm)	$10 \log(N_{ANT})$ dB	Final Power Spectral Density (dBm)	Limit (dBm)	Pass/ Fail
36	5180	-12.74	3.01	-9.73	11	Pass
40	5200	-13.33	3.01	-10.32	11	Pass
48	5240	-13.60	3.01	-10.59	11	Pass
149	5745	-22.39	3.01	-19.38	30	Pass
153	5765	-22.31	3.01	-19.30	30	Pass
161	5805	-21.60	3.01	-18.59	30	Pass

Note: 1. Test method According to KDB669211 E) 2) c)

2. Antenna A AND B were tested only the worse case was recorded.

The report refers only to the sample tested and does not apply to the bulk.

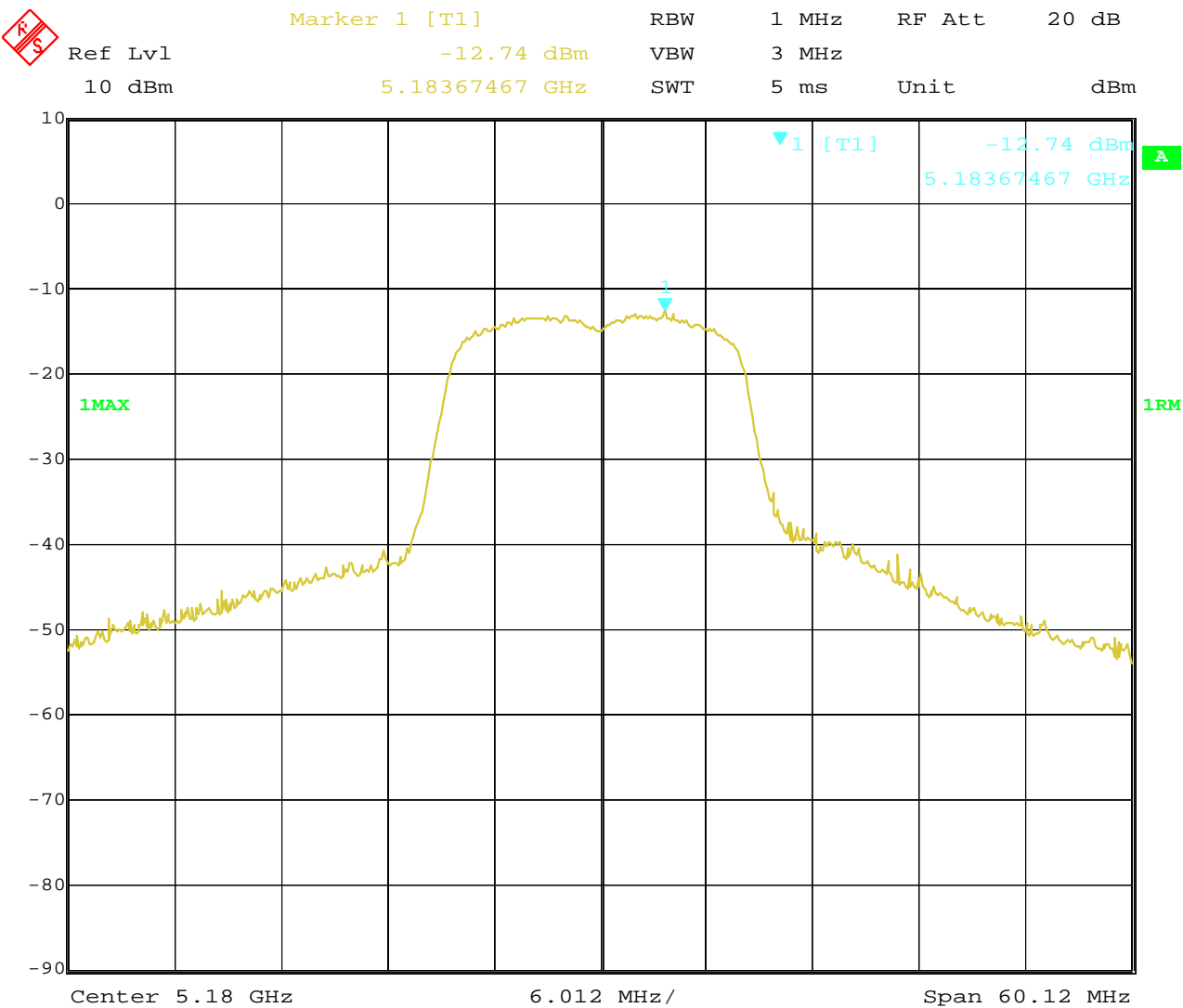
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9.5 Photo of Power Spectral Density Measurement

1.802.11a at 6Mbps of CH36

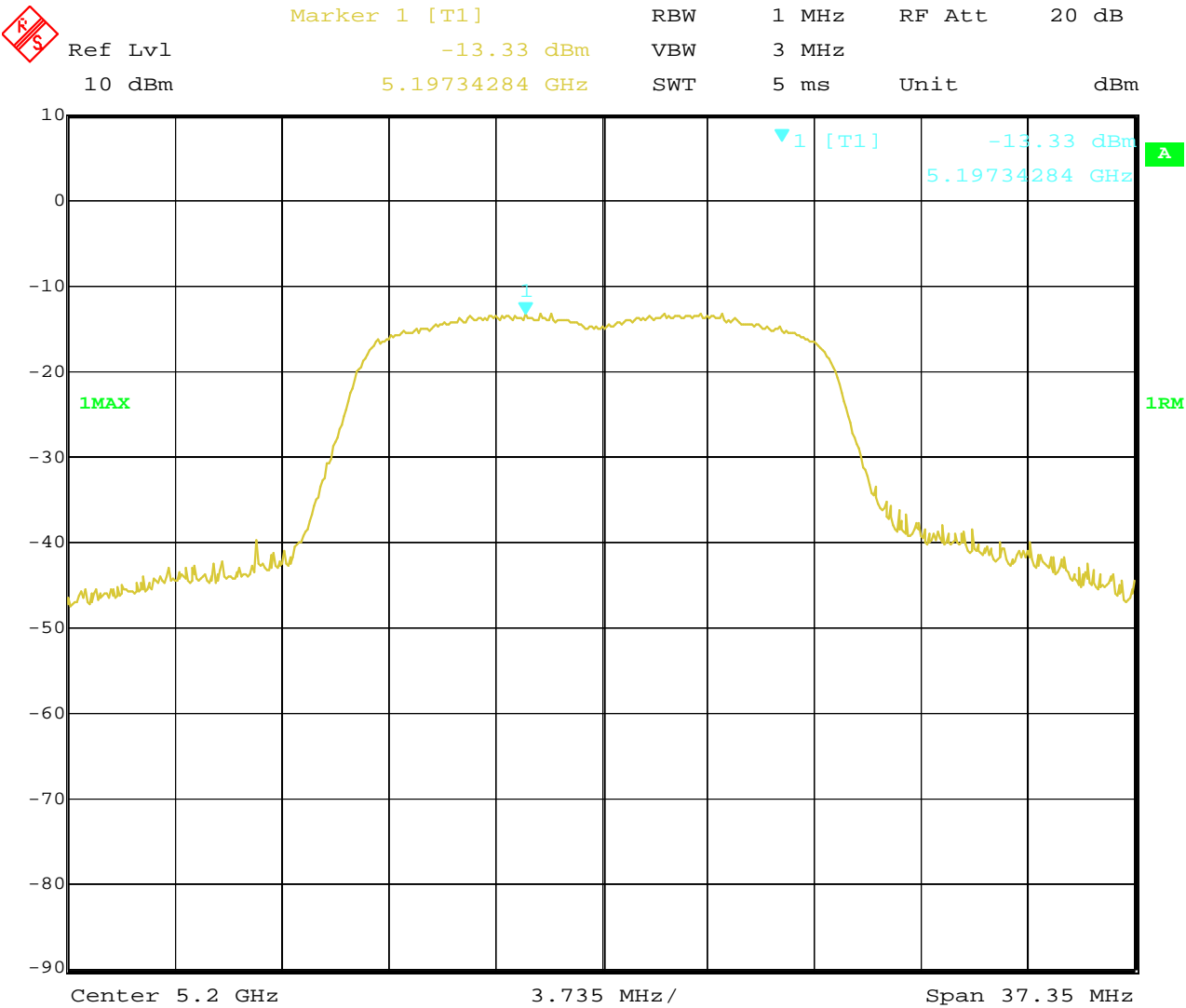


Date: 10.JUN.2015 10:27:43

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2.802.11a at 6Mbps of CH40



Center 5.2 GHz

3.735 MHz/

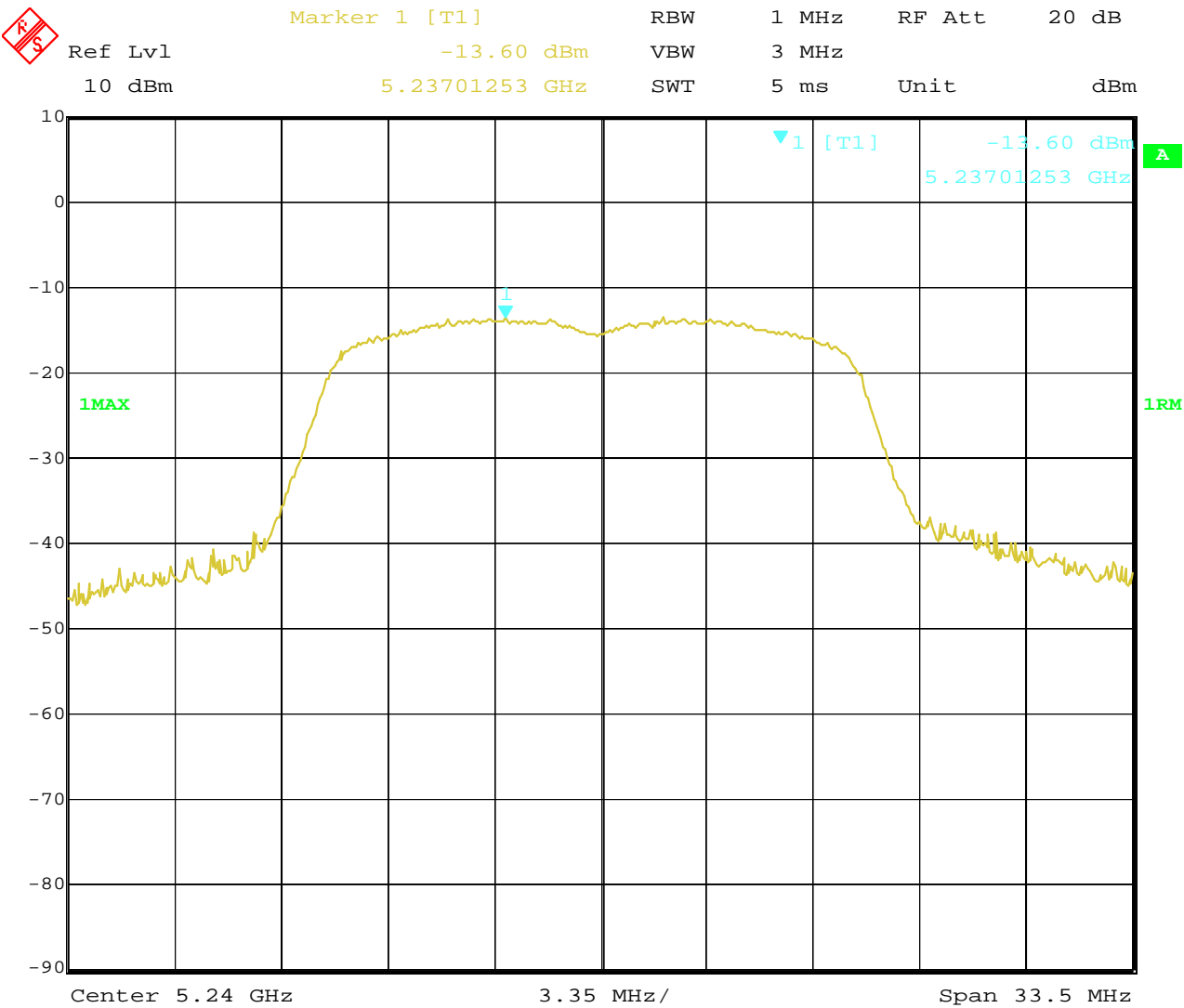
Span 37.35 MHz

Date: 10.JUN.2015 10:29:14

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3.802.11a at 6Mbps of CH48

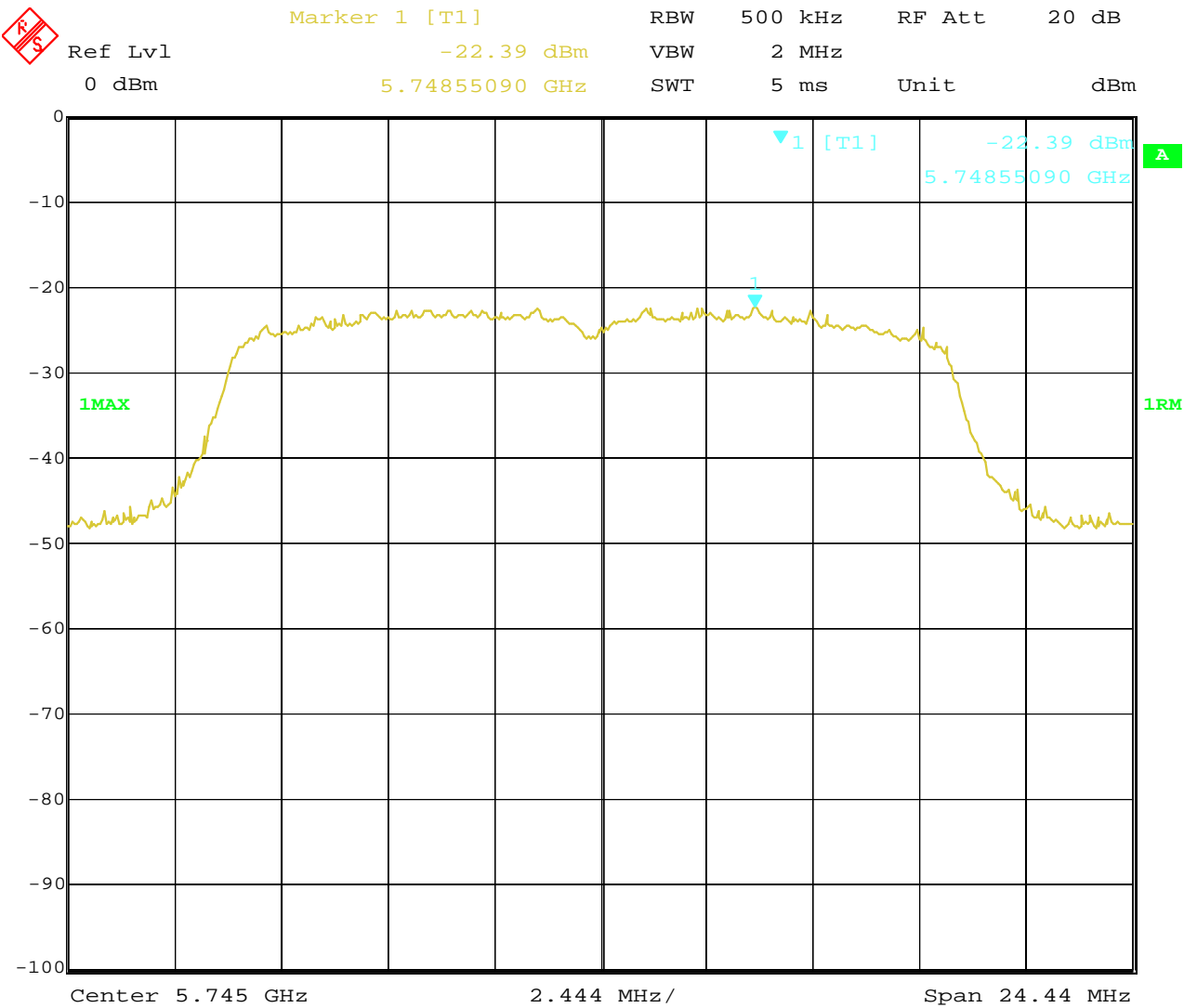


Date: 10.JUN.2015 10:33:59

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4.802.11a at 6Mbps of CH149

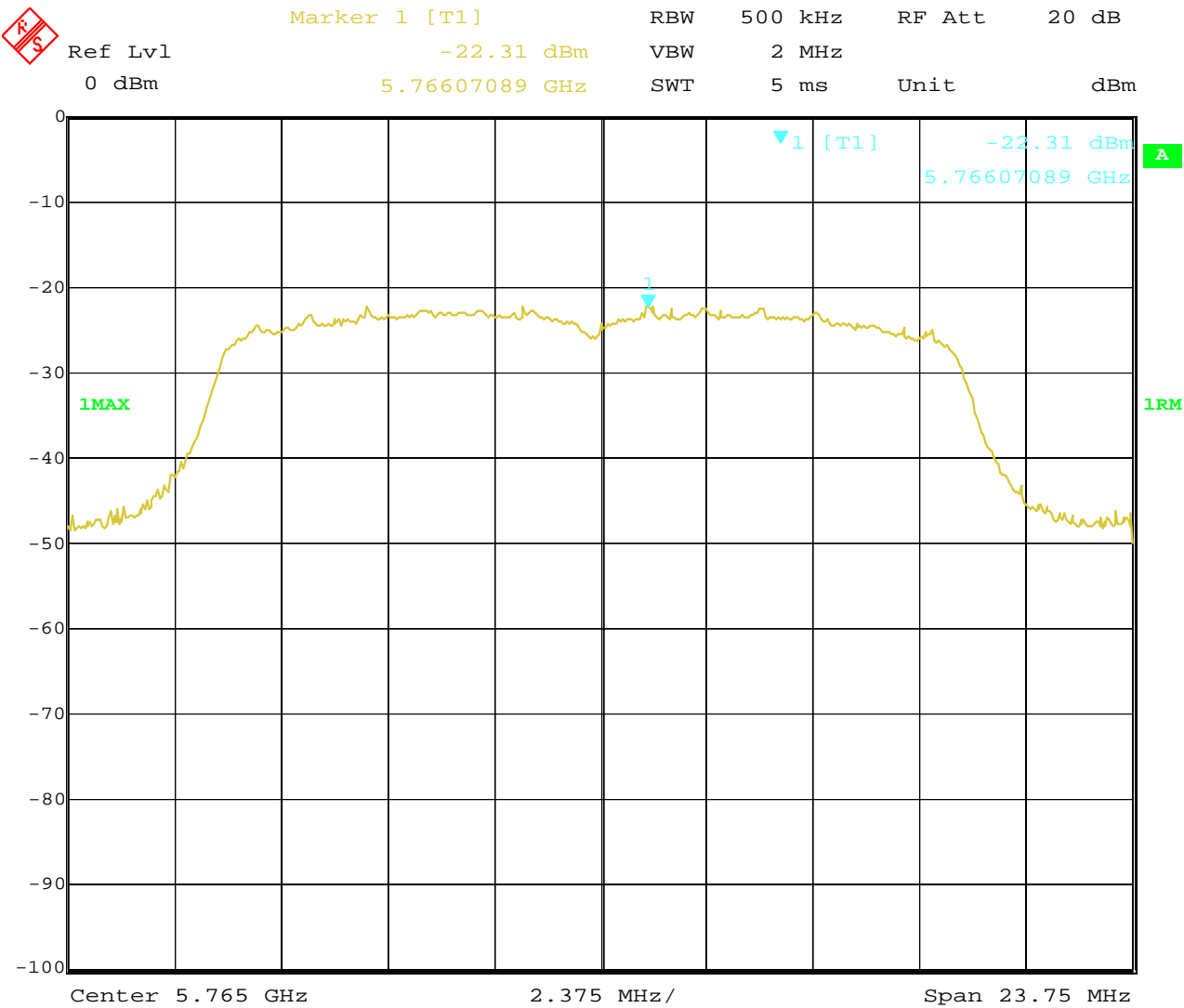


Date: 11.JUN.2015 09:12:26

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5.802.11a at 6Mbps of CH153

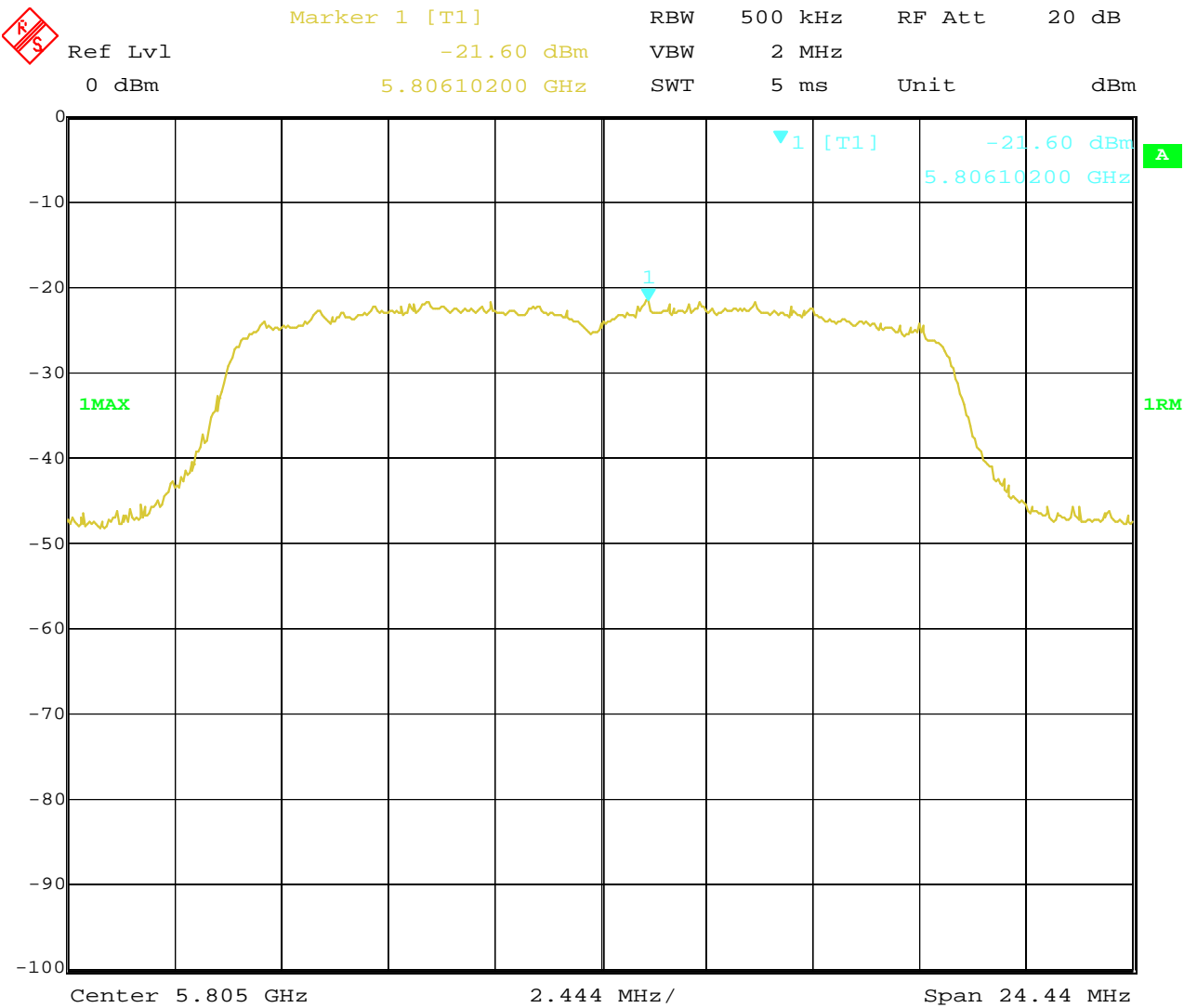


Date: 11.JUN.2015 09:18:37

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6.802.11a at 6Mbps of CH0161



Date: 11.JUN.2015 09:26:12

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10.0 Frequency Stability

10.1 Limits of Frequency Stability Measurement

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.02\%$ of the operating frequency over a temperature variation of -30 degrees to 50 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

10.2 Test Procedure

1. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at $+20$ degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

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11.3 Test Result

Channel 36 (5180MHz)

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
4.3V	5179.9834
3.7V	5179.9857
3.2V	5179.9841
Max. Deviation (MHz)	0.0166
Max. Deviation (ppm)	3.2

Rated working voltage: DC5.0V

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-30	5179.9832
-20	5179.9818
-10	5179.9857
0	5179.9868
10	5179.9824
20	5179.9839
30	5179.9827
40	5179.9860
50	5179.9845
Max. Deviation (MHz)	0.0182
Max. Deviation (ppm)	3.5

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Channel 40 (5200MHz)

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
4.3V	5199.9870
3.7V	5199.9841
3.2V	5199.9866
Max. Deviation (MHz)	0.0159
Max. Deviation (ppm)	3.1

Rated working voltage: DC5.0V

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-30	5199.9826
-20	5199.9861
-10	5199.9840
0	5199.9853
10	5199.9818
20	5199.9854
30	5199.9837
40	5199.9822
50	5199.9845
Max. Deviation (MHz)	0.0182
Max. Deviation (ppm)	3.5

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Channel 48 (5240MHz)

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
4.3V	5239.9864
3.7V	5239.9883
3.2V	5239.9849
Max. Deviation (MHz)	0.0151
Max. Deviation (ppm)	2.9

Rated working voltage: DC5.0V

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-30	5239.9847
-20	5239.9832
-10	5329.9867
0	5239.9828
10	5239.9851
20	5239.9856
30	5239.9813
40	5239.9844
50	5239.9836
Max. Deviation (MHz)	0.0187
Max. Deviation (ppm)	3.6

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Channel 149 (5745MHz)

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
4.3V	5744.9831
3.7V	5744.9815
3.2V	5744.9846
Max. Deviation (MHz)	0.0185
Max. Deviation (ppm)	3.2

Rated working voltage: DC5.0V

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-30	5744.9764
-20	5744.9777
-10	5744.9823
0	5744.9786
10	5744.9812
20	5744.9792
30	5744.9775
40	5744.9803
50	5744.9758
Max. Deviation (MHz)	0.0242
Max. Deviation (ppm)	4.2

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Channel 153 (5765MHz)

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
4.3V	5764.9836
3.7V	5764.9812
3.2V	5764.9793
Max. Deviation (MHz)	0.0207
Max. Deviation (ppm)	3.6

Rated working voltage: DC5.0V

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-30	5764.9773
-20	5764.9742
-10	5764.9801
0	5764.9745
10	5764.9827
20	5764.9733
30	5764.9806
40	5764.9758
50	5764.9799
Max. Deviation (MHz)	0.0268
Max. Deviation (ppm)	4.6

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Channel 161 (5805MHz)

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
4.3V	5804.9738
3.7V	5804.9717
3.2V	5804.9759
Max. Deviation (MHz)	0.0283
Max. Deviation (ppm)	4.9

Rated working voltage: DC5.0V

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-30	5804.9784
-20	5804.9742
-10	5804.9767
0	5804.9788
10	5804.9824
20	5804.9750
30	5804.9816
40	5804.9749
50	5804.9763
Max. Deviation (MHz)	0.0258
Max. Deviation (ppm)	4.4

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11.0 Antenna Requirement

11.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, 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.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

11.2 Antenna Connected construction

Two Integral antennas used. The maximum Gain of each antenna is 1.2 dBi for 5G band.

Directional gain = $1.2\text{dBi} + 10\log(2) = 4.21\text{dBi} < 6\text{dBi}$

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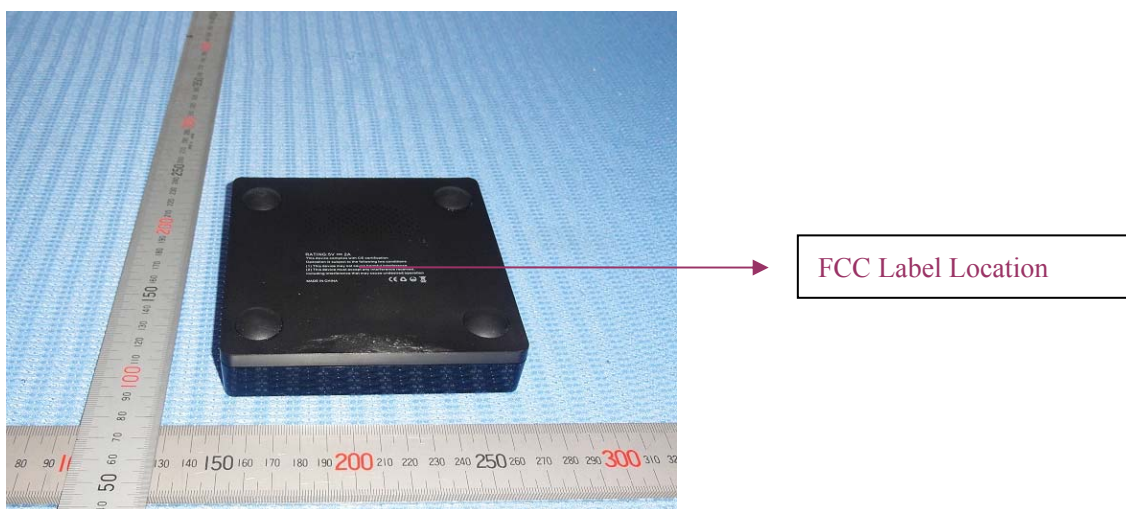
12.0 FCC Label

FCC ID: 2AE6JI826

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



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13.0 Photo of testing

Conducted Emission Test Setup:

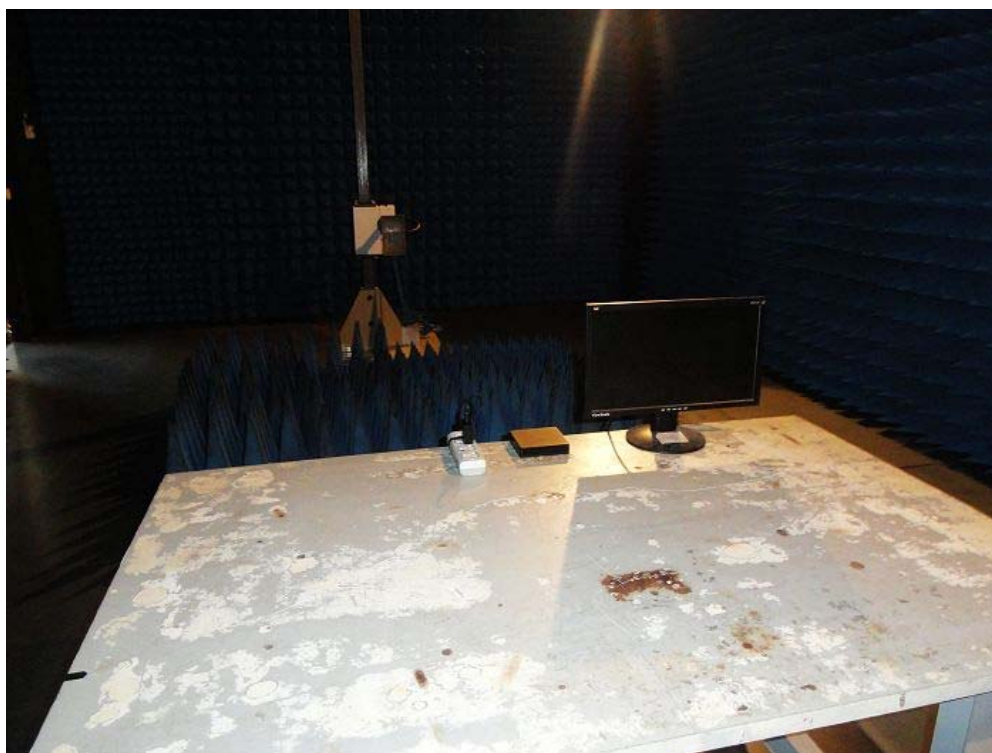


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Radiated Emission Test Setup:



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Photos of EUT

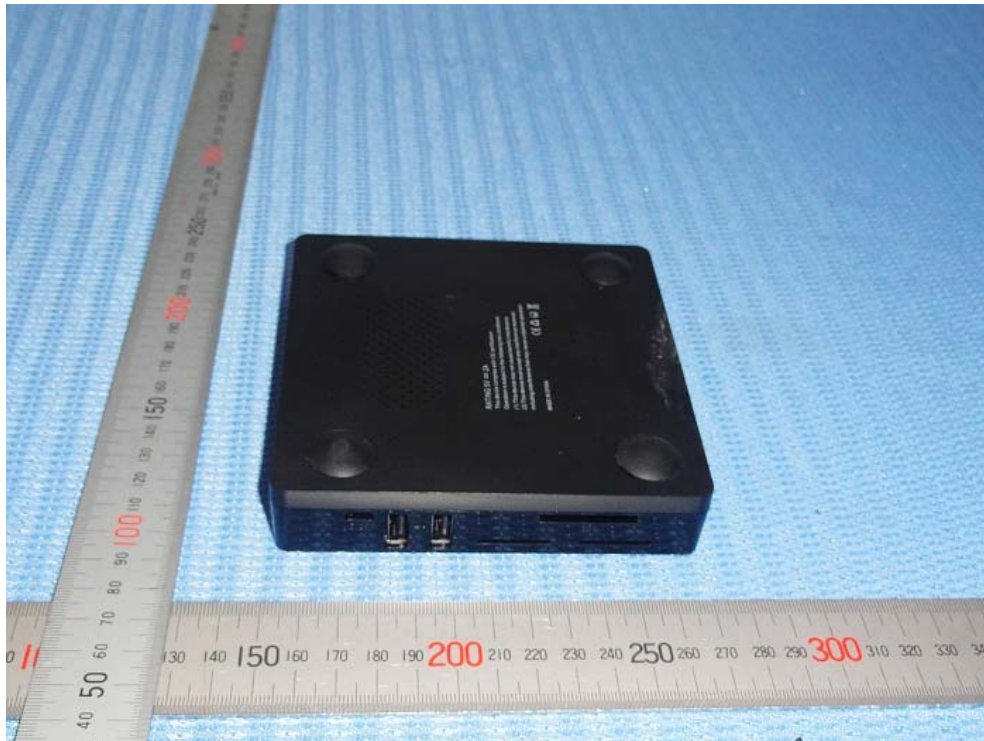


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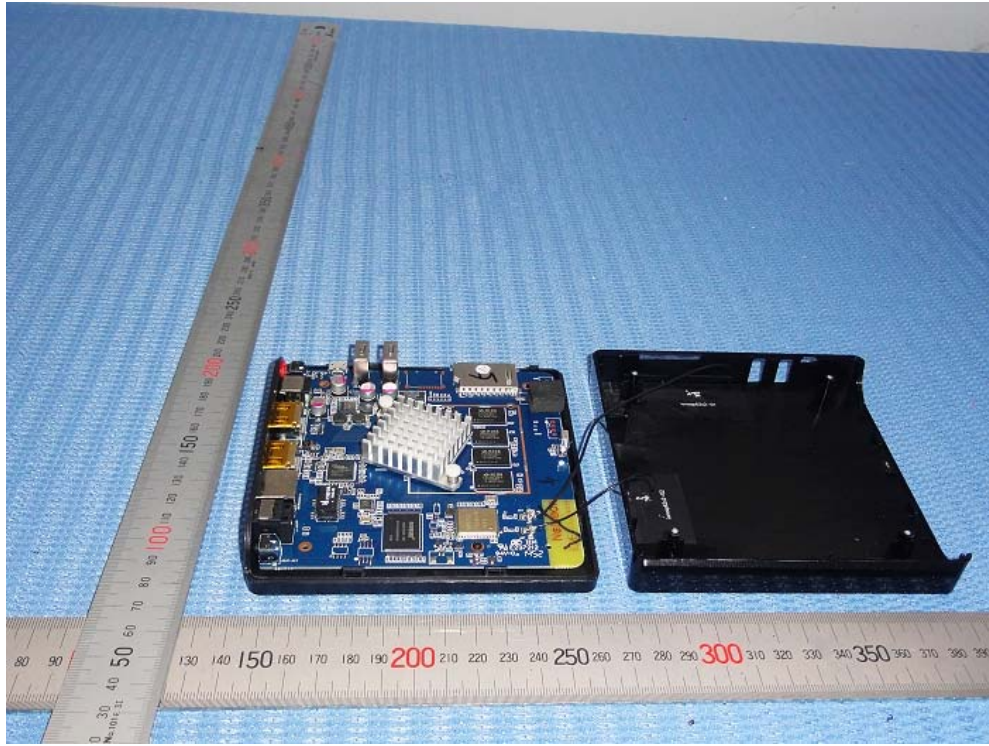


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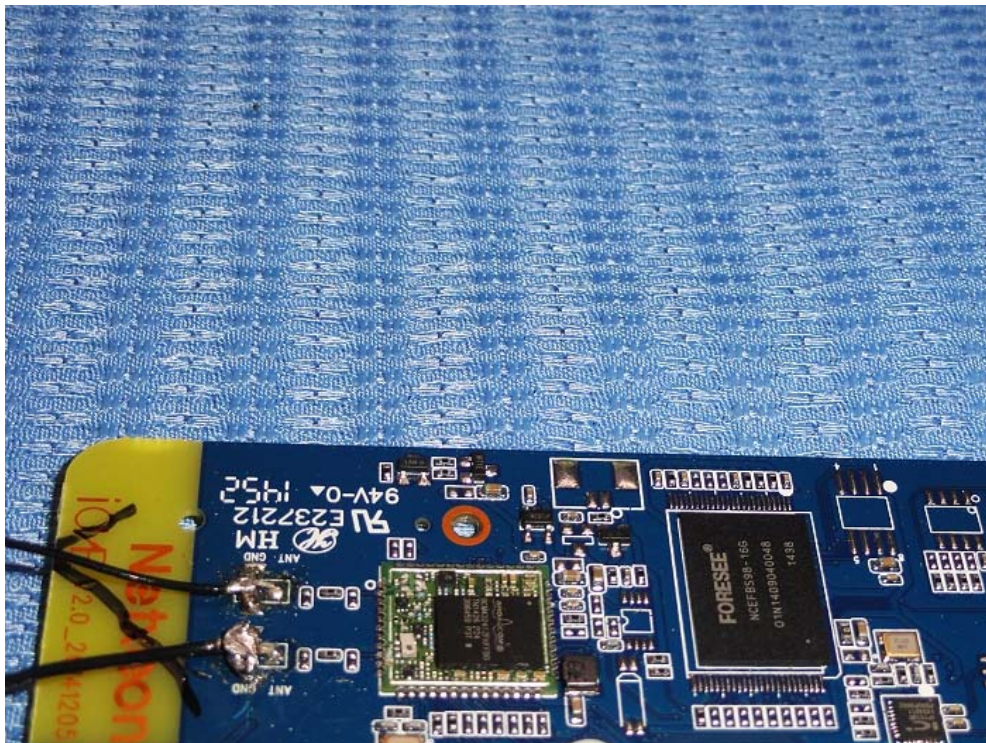
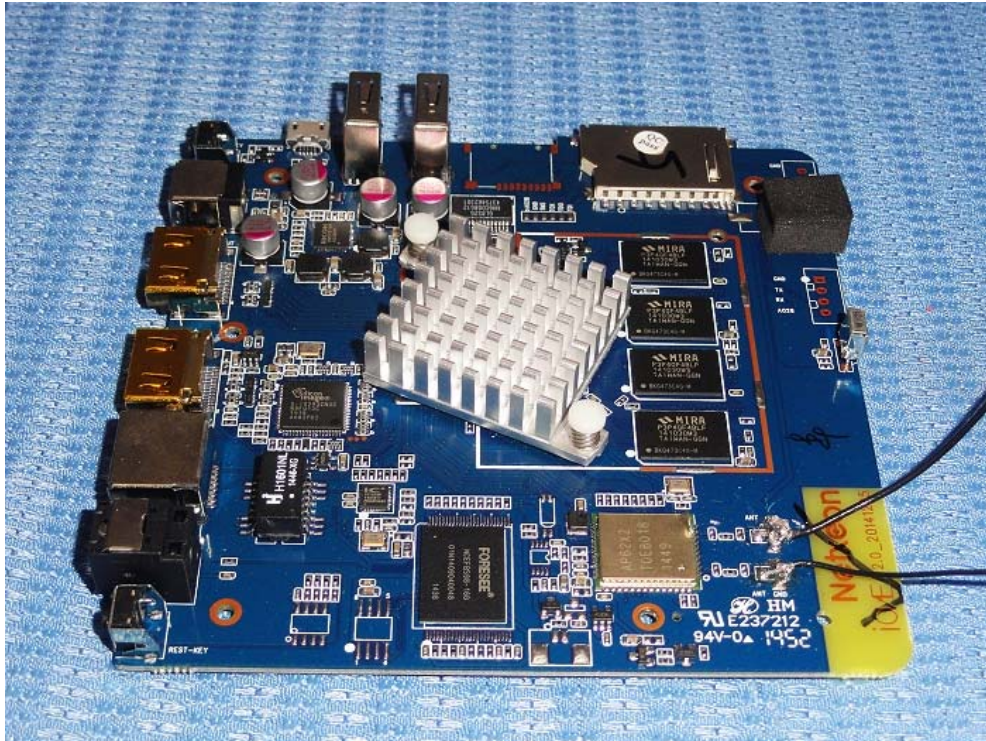


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Photos of EUT

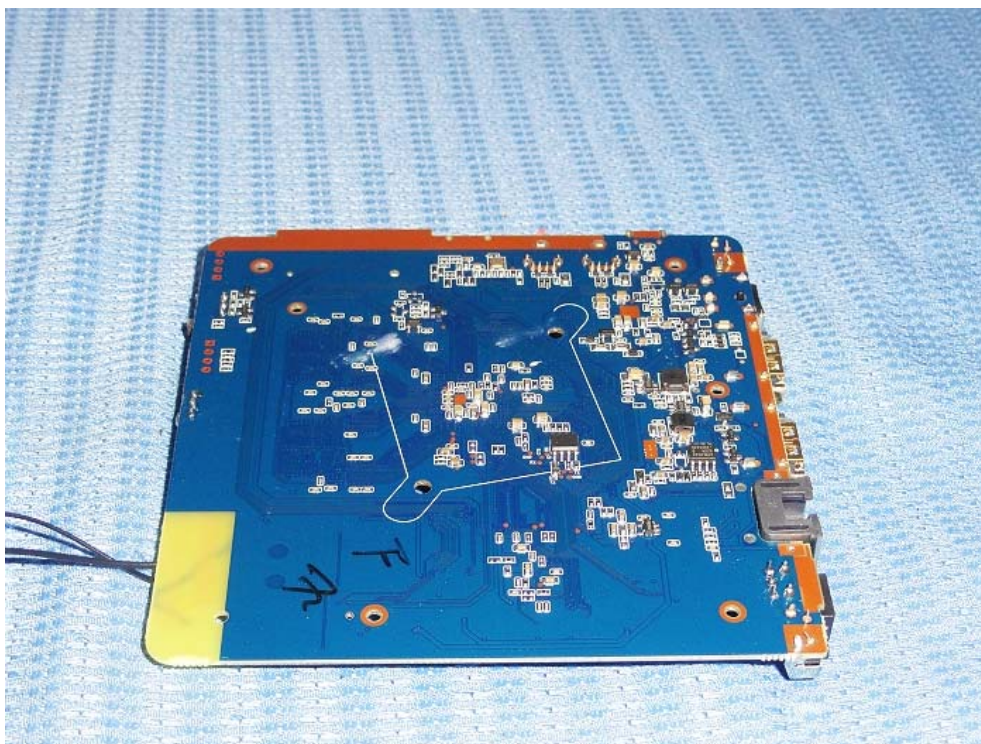
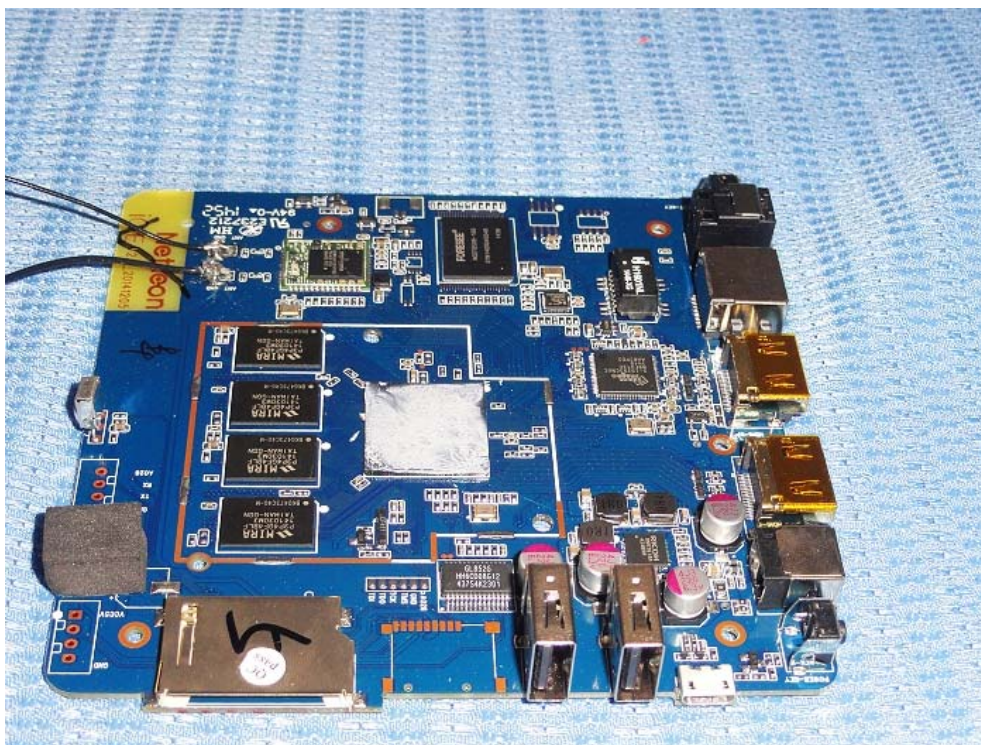


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Photos of EUT



End of the report

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