



Report No.:

TW2009393-04E

File Reference No.:

2020-10-27

Applicant:

Shenzhen Jingwah Information Technology Co., Ltd.

Product:

Laptop

Model No.:

NP141AQ-T, N14550

Trademark:

PACKARD BELL

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 for the evaluation of electromagnetic compatibility

Approved By

Jack Chung

Manager

Dated:

October 27, 2020

**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**

Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timeway-lab.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:

#### **CNAS-LAB Code: L2292**

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

#### **FCC-Registration No.: 744189**

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.: 744189.

#### **Industry Canada (IC) —Registration No.:5205A**

The EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5205A.

#### **A2LA (Certification Number:5013.01)**

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA). Certification Number:5013.01

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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: Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China  
Telephone: (755) 83448688  
Fax: (755) 83442996  
Site Listed with Federal Communications commission (FCC)  
Registration Number: 744189  
For 3m Anechoic Chamber  
Site Listed with Industry Canada of Ottawa, Canada  
Registration Number: IC: 5205A  
For 3m Anechoic Chamber

### 1.2 Applicant Details

Applicant: Shenzhen Jingwah Information Technology Co., Ltd.  
Address: 6F, Bldg.4, Jinghua Square, No. 168, Zhenzhong Rd., Fuqiang Community, Huaqiangbei, Futian District, Shenzhen  
Telephone: 0755-84688843  
Fax: --

### 1.3 Description of EUT

Product: Laptop  
Manufacturer: Shenzhen Jingwah Information Technology Co., Ltd.  
Address: 6F, Bldg.4, Jinghua Square, No. 168, Zhenzhong Rd., Fuqiang Community, Huaqiangbei, Futian District, Shenzhen  
Brand Name: PACKARD BELL  
Additional Brand Name: N/A  
Model Number: NP141AQ-T  
Additional Model Number: N14550  
Type of Modulation IEEE 802.11a/n (HT20/HT40) : OFDM(64QAM, 16QAM, QPSK, BPSK);  
IEEE 802.11ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM  
Frequency Band 1: 5180MHz-5240MHz  
Channel Separation 802.11a/802.11n20:20MHz, 802.11n40:40MHz, 802.11ac : 80MHz  
Air Data Rate IEEE 802.11a : 54, 48, 36, 24, 18, 12, 9, 6 Mbps  
IEEE 802.11n/HT20: mcs0: 6.5Mbps, mcs1: 13Mbps, mcs2: 19.5Mbps, mcs3: 26Mbps, mcs4: 39Mbps, mcs5: 52Mbps, mcs6: 58.5Mbps, mcs7: 65Mbps  
IEEE 802.11n/HT40: mcs0: 15Mbps, mcs1: 30Mbps, mcs2: 45Mbps, mcs3: 60Mbps, mcs4: 90Mbps, mcs5: 120Mbps, mcs6: 135Mbps, mcs7: 150Mbps  
IEEE 802.11ac: Up to 433.3Mbps  
Antenna: Two FPC antennas used.

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Antenna Gain: Maximum 1.71dBi for each one. (get from the antenna specification provided the applicant)

Test Mode: During testing, EUT was set to 100% duty cycle. 6Mbps air data rate was the worst case for 802.11a mode; mcs0 air data rate was the worst case for 802.11n mode; 23.9Mbps air data rate was the worst case for 802.11ac mode.

Frequency Selection By software

Test Voltage: DC12V, 2A

Power Adapter Model: FJ-SW1202000U;  
Input: 100-240V~50/60Hz 0.6A Max; Output: DC12V, 2000mA

#### Each Channel Operation Frequency

Band 1					
802.11a / 11n HT20 / 802.11ac VHT20		802.11n HT40 / 802.11acVHT40		802.11ac VHT80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	38	5190 MHz	42	5210 MHz
40	5200 MHz	46	5230 MHz		
44	5220 MHz				
48	5240 MHz				

The selected test channels as follows:

Band 1					
802.11a / 11n HT20		802.11n HT40		802.11ac VHT80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	38	5190 MHz	42	5210 MHz
40	5200 MHz	46	5230 MHz		
48	5240 MHz				

Note: 802.11ac VHT20/VHT40 is similar with 802.11n HT20/HT40.

1.4 Submitted Sample: 2 Samples

1.5 Test Duration  
2020-09-29 to 2020-10-27

1.6 Test Uncertainty  
Conducted Emissions Uncertainty =3.6dB  
Radiated Emissions below 1GHz Uncertainty =4.7dB  
Radiated Emissions above 1GHz Uncertainty =6.0dB  
Conducted Power Uncertainty =6.0dB

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Occupied Channel Bandwidth Uncertainty =5%

Note: The measurement uncertainty is for coverage factor of  $k=2$  and a level of confidence of 95%.

1.7

Test Engineer

*Terry Tang*

The sample tested by \_\_\_\_\_

Print Name: Terry Tang

Remark:

RF Test Software Name: DRTU.Ink

Power Setting Level: 0

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2.0 Test Equipment					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	R&S	ESPI 3	100379	2020-06-23	2021-06-22
TWO Line-V-NETW	R&S	EZH3-Z5	100294	2020-06-23	2021-06-22
TWO Line-V-NETW	R&S	EZH3-Z5	100253	2020-06-23	2021-06-22
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2020-06-23	2021-06-22
Loop Antenna	EMCO	6507	00078608	2020-06-23	2021-06-22
Spectrum	R&S	FSIQ26	100292	2020-06-23	2021-06-22
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2020-06-23	2021-06-22
Horn Antenna	R&S	BBHA 9120D	9120D-631	2018-07-09	2021-07-08
Power meter	Anritsu	ML2487A	6K00003613	2020-06-23	2021-06-22
Power sensor	Anritsu	MA2491A	32263	2020-06-23	2021-06-22
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2018-07-04	2021-07-03
9*6*6 Anechoic	--	--	N/A	2018-02-07	2021-02-06
EMI Test Receiver	RS	ESVB	826156/011	2020-06-23	2021-06-22
EMI Test Receiver	RS	ESH3	860904/006	2020-06-23	2021-06-22
Spectrum	HP/Agilent	ESA-L1500A	US37451154	2020-06-23	2021-06-22
Spectrum	HP/Agilent	E4407B	MY50441392	2020-06-23	2021-06-22
Spectrum	RS	FSP	1164.4391.38	2020-01-18	2021-01-17
RF Cable	Zhengdi	ZT26-NJ-NJ-8M/FA	--	2020-06-23	2021-06-22
RF Cable	Zhengdi	7m	--	2020-06-23	2021-06-22
RF Switch	EM	EMSW18	060391	2020-06-23	2021-06-22
Pre-Amplifier	Schwarebeck	BBV9743	#218	2020-06-23	2021-06-22
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2020-06-23	2021-06-22
LISN	SCHAFFNER	NNB42	00012	2020-01-07	2021-01-06

## 2.2 Automation Test Software

### For Conducted Emission Test

Name	Version
EZ-EMC	Ver.EMC-CON 3A1.1

### For Radiated Emissions

Name	Version
EMI Test Software BL410-EV18.91	V18.905
EMI Test Software BL410-EV18.806 High Frequency	V18.06

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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 :2013, ANSI C63.4 :2014  
789033 D02 General UNII Test Procedures New Rules v01r04

#### 4.0 EUT Modification

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES.

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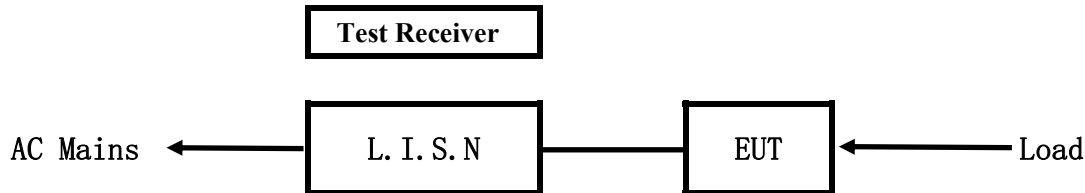
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## 5. Power Line Conducted Emission Test

### 5.1 Schematics of the test



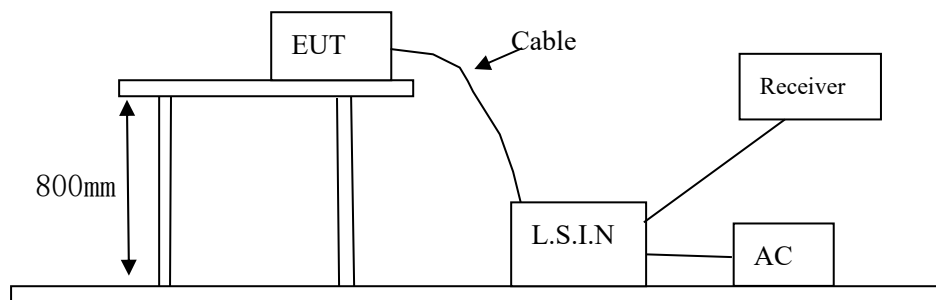
EUT: Equipment Under Test

### 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 C63.10-2013.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



### 5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.10-2013. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT			
Device	Manufacturer	Model	FCC ID
Laptop	Shenzhen Jingwah Information Technology Co., Ltd.	NP141AQ-T, N14550	RBD-NP141AT

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B. Internal Device

Device	Manufacturer	Model	Rating

C. Peripherals

Device	Manufacturer	Model	Rating

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10 -2013.

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

Frequency (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0~56.0*	56.0~46.0*
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	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**

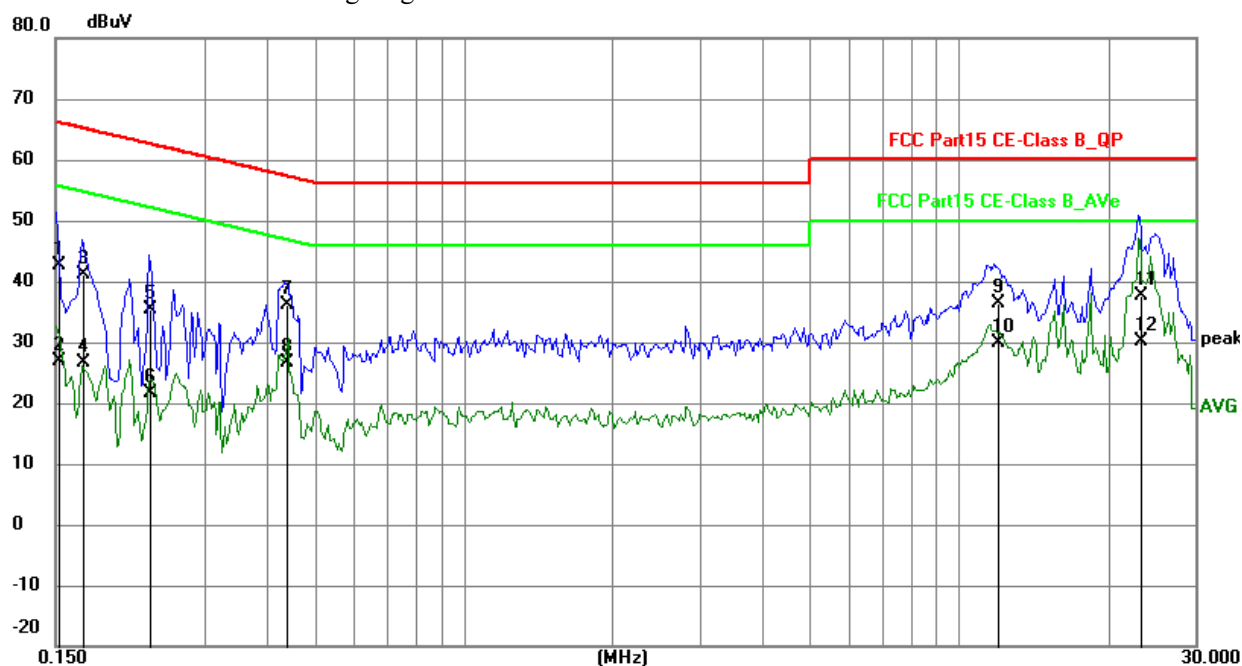
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Keeping WIFI Transmitting**

**Equipment Level: Class B**

**Results: PASS**

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1516	32.77	9.78	42.55	65.91	-23.36	QP	P
2	0.1516	17.14	9.78	26.92	55.91	-28.99	AVG	P
3	0.1695	31.43	9.77	41.20	64.98	-23.78	QP	P
4	0.1695	16.77	9.77	26.54	54.98	-28.44	AVG	P
5	0.2319	25.57	9.75	35.32	62.38	-27.06	QP	P
6	0.2319	12.00	9.75	21.75	52.38	-30.63	AVG	P
7	0.4397	26.26	9.77	36.03	57.07	-21.04	QP	P
8	0.4397	16.98	9.77	26.75	47.07	-20.32	AVG	P
9	11.9328	26.20	10.25	36.45	60.00	-23.55	QP	P
10	11.9328	19.65	10.25	29.90	50.00	-20.10	AVG	P
11	23.1404	26.78	10.87	37.65	60.00	-22.35	QP	P
12	23.1404	19.26	10.87	30.13	50.00	-19.87	AVG	P

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

**EUT Operating Environment**

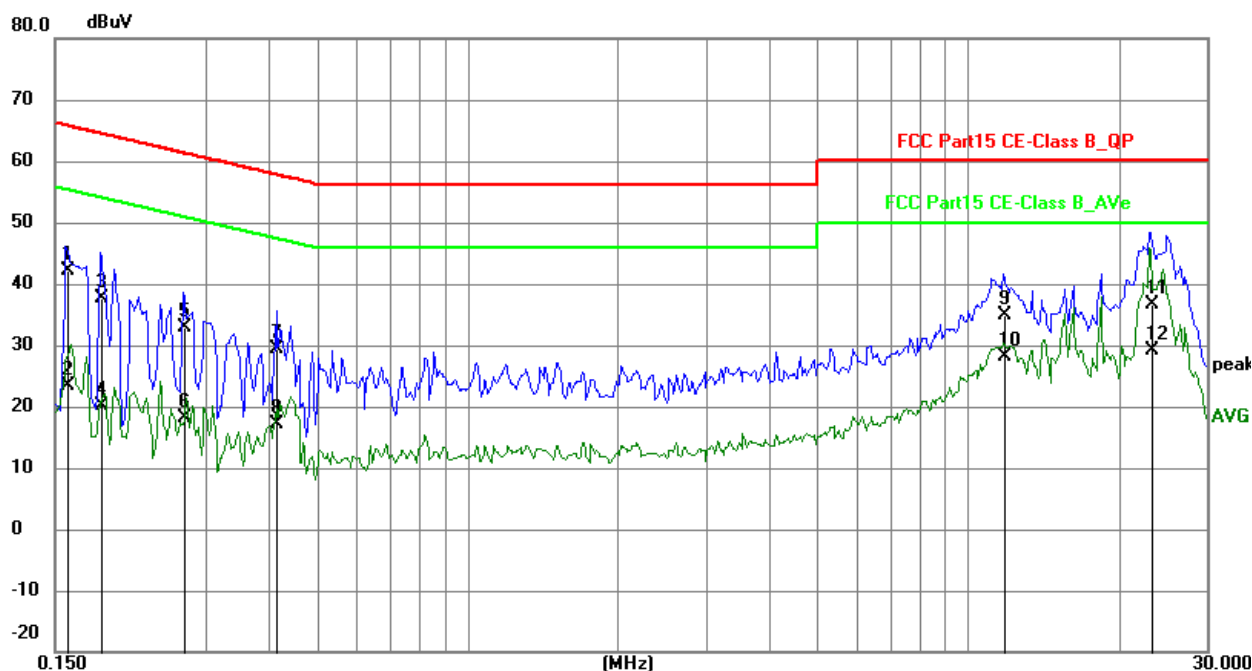
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Keeping WIFI Transmitting**

**Equipment Level: Class B**

**Results: Pass**

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1582	32.34	9.78	42.12	65.56	-23.44	QP	P
2	0.1582	13.54	9.78	23.32	55.56	-32.24	AVG	P
3	0.1853	27.97	9.76	37.73	64.24	-26.51	QP	P
4	0.1853	10.35	9.76	20.11	54.24	-34.13	AVG	P
5	0.2709	23.04	9.75	32.79	61.09	-28.30	QP	P
6	0.2709	8.48	9.75	18.23	51.09	-32.86	AVG	P
7	0.4152	19.59	9.76	29.35	57.54	-28.19	QP	P
8	0.4152	7.40	9.76	17.16	47.54	-30.38	AVG	P
9	11.8070	24.69	10.24	34.93	60.00	-25.07	QP	P
10	11.8070	17.91	10.24	28.15	50.00	-21.85	AVG	P
11	23.1404	25.69	10.87	36.56	60.00	-23.44	QP	P
12	23.1404	18.31	10.87	29.18	50.00	-20.82	AVG	P

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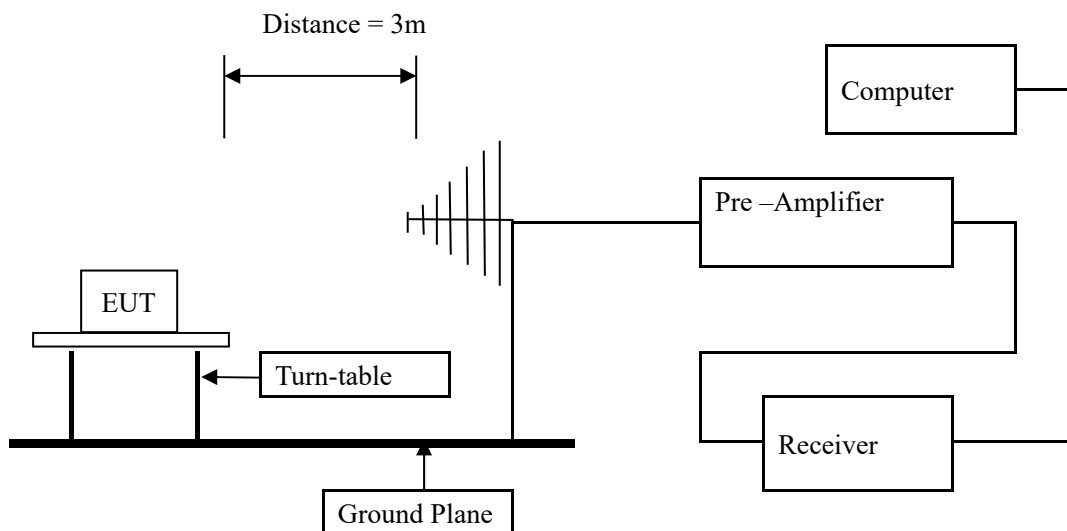


## 6 Undesirable Emission and Restrict band

### 6.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.10-2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with Federal Communications commission, Registration No.744189
- (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 C63.10-2013.
- (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 $\mu$ 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:      Keeping WIFI Transmitting**

**Results:                      Pass**

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

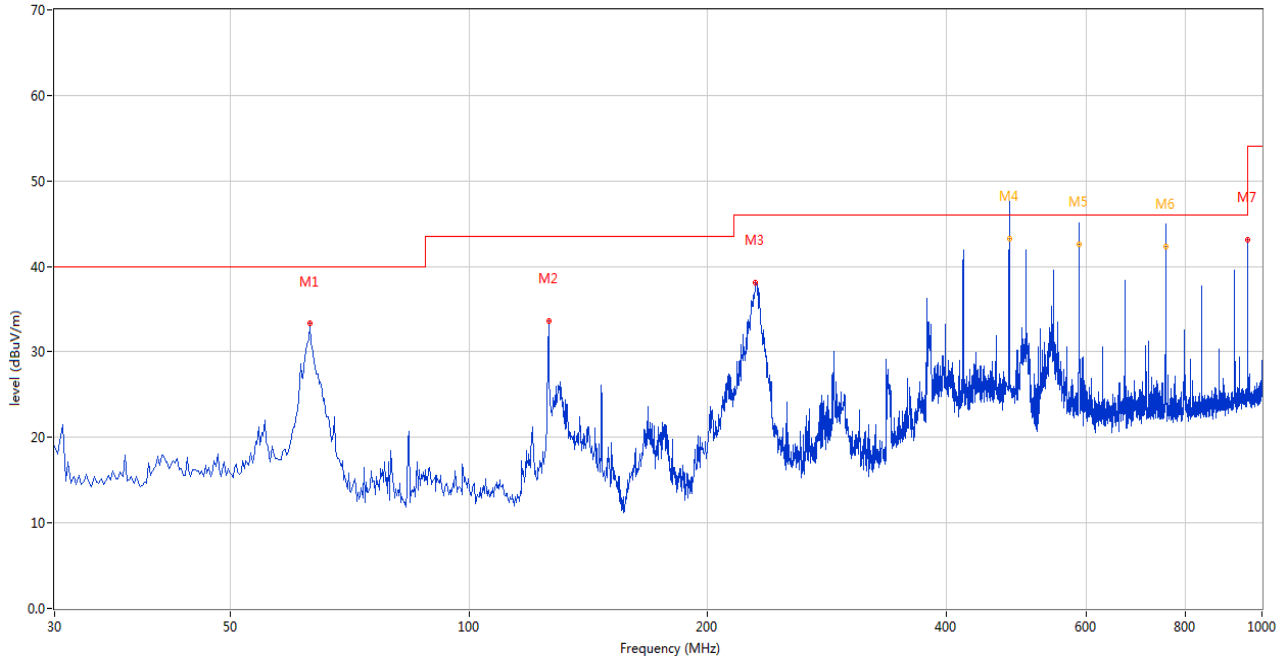
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Test Figure:

FCC\_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	62.972	33.29	-13.31	40.0	-6.71	Peak	360.00	200	Horizontal	Pass
2	126.006	33.60	-16.48	43.5	-9.90	Peak	293.00	200	Horizontal	Pass
3	229.770	38.13	-12.68	46.0	-7.87	Peak	30.00	100	Horizontal	Pass
4	479.989	55.56	-7.40	46.0	9.56	Peak	39.00	167	Horizontal	N/A
4*	479.989	43.28	-7.40	46.0	-2.72	QP	39.00	167	Horizontal	Pass
5	587.956	47.04	-5.49	46.0	1.04	Peak	185.00	124	Horizontal	N/A
5*	587.956	42.58	-5.49	46.0	-3.42	QP	185.00	124	Horizontal	Pass
6	756.064	46.98	-3.25	46.0	0.98	Peak	172.00	100	Horizontal	N/A
6*	756.064	42.33	-3.25	46.0	-3.67	QP	172.00	100	Horizontal	Pass
7	959.998	43.09	-1.63	46.0	-2.91	Peak	360.00	200	Horizontal	Pass

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

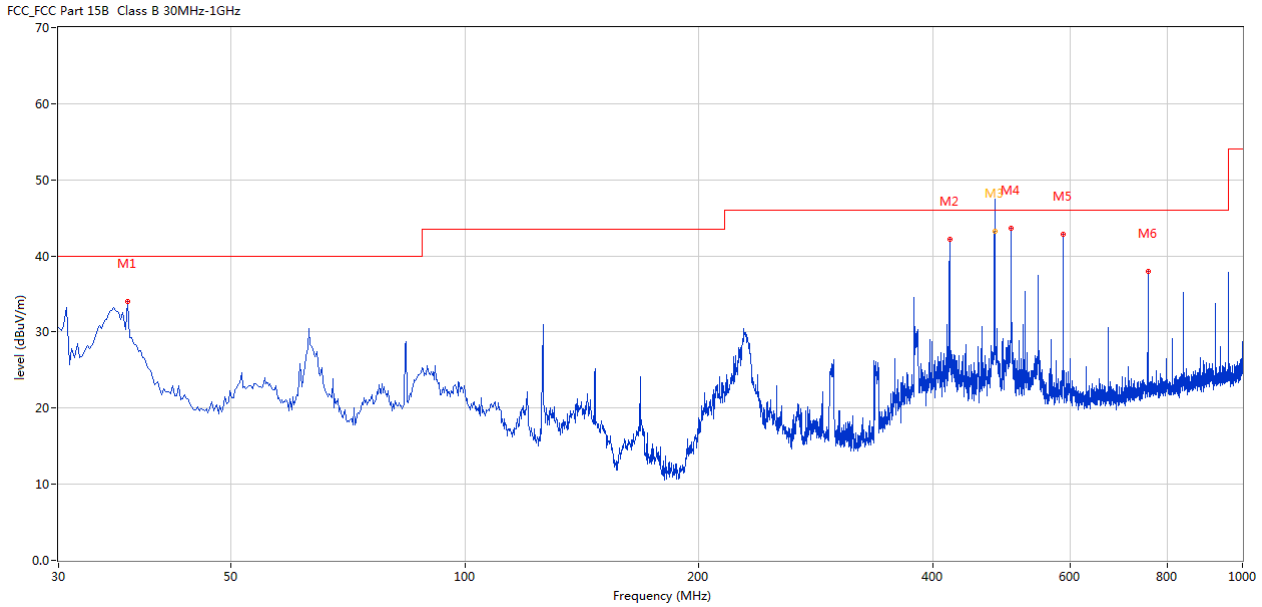
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Test Figure:



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	36.788	34.07	-13.31	40.0	-5.93	Peak	360.00	200	Vertical	Pass
2	420.085	42.15	-8.21	46.0	-3.85	Peak	360.00	200	Vertical	Pass
3	480.210	49.48	-7.38	46.0	3.48	Peak	304.00	100	Vertical	N/A
3*	480.210	43.25	-7.38	46.0	-2.75	QP	304.00	100	Vertical	Pass
4	503.969	43.66	-7.05	46.0	-2.34	Peak	272.00	200	Vertical	Pass
5	587.853	42.89	-5.49	46.0	-3.11	Peak	38.00	100	Vertical	Pass
6	756.106	38.03	-3.25	46.0	-7.97	Peak	258.00	200	Vertical	Pass

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**Operation Mode: Keeping Transmitting under CH36 for 11g at 6Mbps**

Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB $\mu$ V/m)
5180.00	99.93 (PK)	H	Fundamental Frequency
5180.00	85.58 (PK)	V	
10360	50.94 (PK)	H	74(Peak)/ 54(AV)
10360	51.16 (PK)	V	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: Keeping Transmitting under CH40 for 11g at 6Mbps**

Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB $\mu$ V/m)
5200.00	98.54 (PK)	H	Fundamental Frequency
5200.00	85.49 (PK)	V	
10400	50.30 (PK)	H	74(Peak)/ 54(AV)
10400	51.68 (PK)	V	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: Keeping Transmitting under CH48 for 11g at 6Mbps**

Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB $\mu$ V/m)
5240.00	98.39 (PK)	H	Fundamental Frequency
5240.00	84.95 (PK)	V	
10480	50.31 (PK)	H	74(Peak)/ 54(AV)
15720	51.18 (PK)	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

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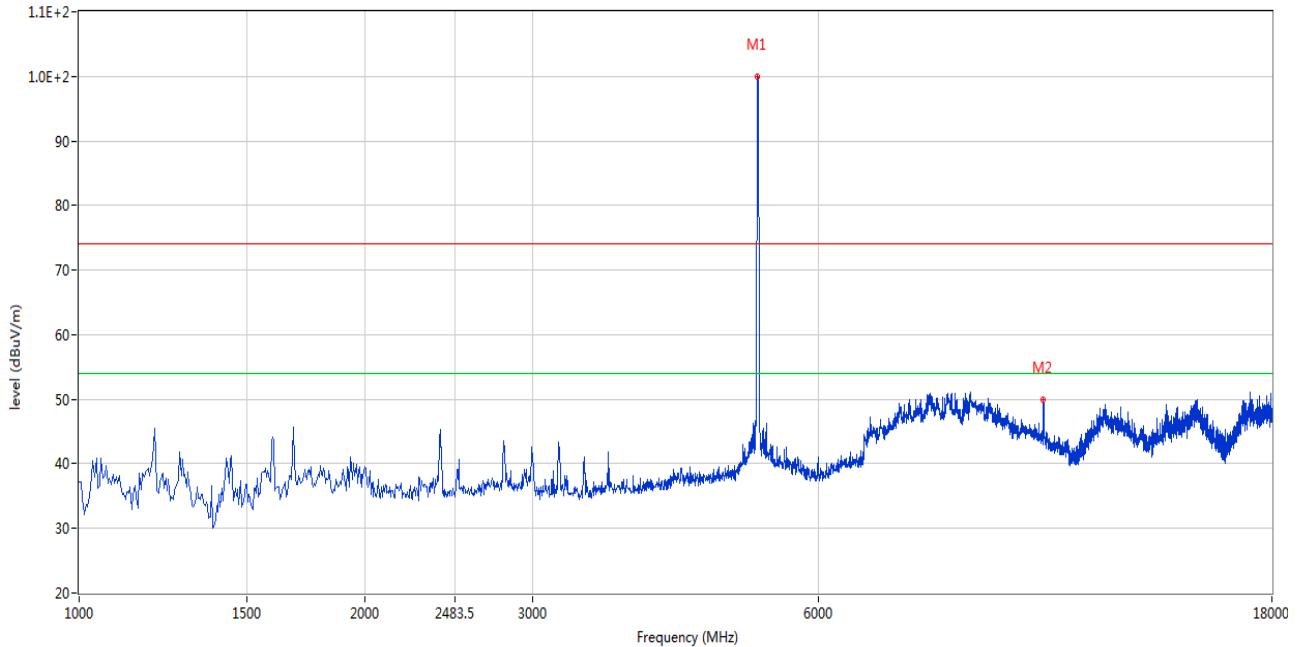
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Please refer to the following test plots for details:

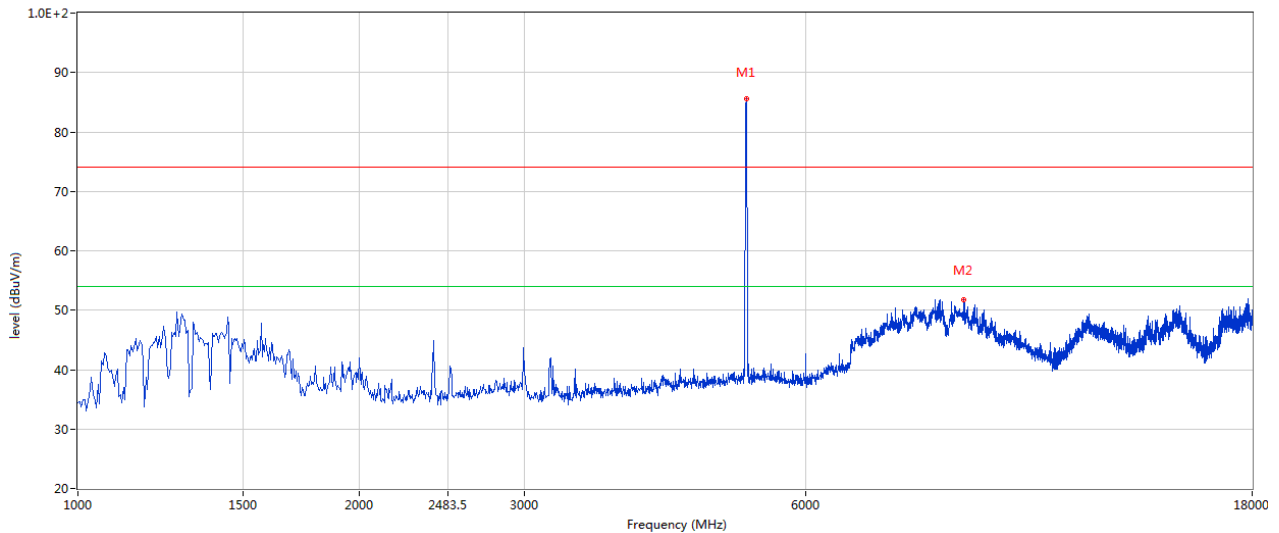
### CH36 for 11a at 6Mbps: Horizontal

FCC\_FCC Part 15B Class B 1GHz-18GHz - 2



### CH36 for 11a at 6Mbps: Vertical

FCC\_FCC Part 15B Class B 1GHz-18GHz - 2



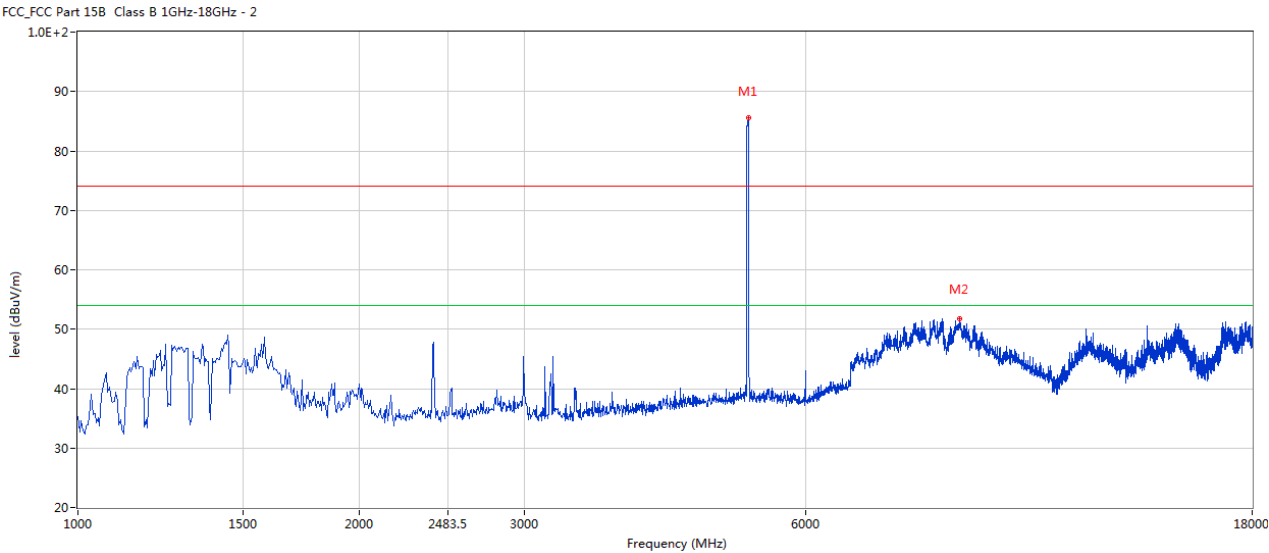
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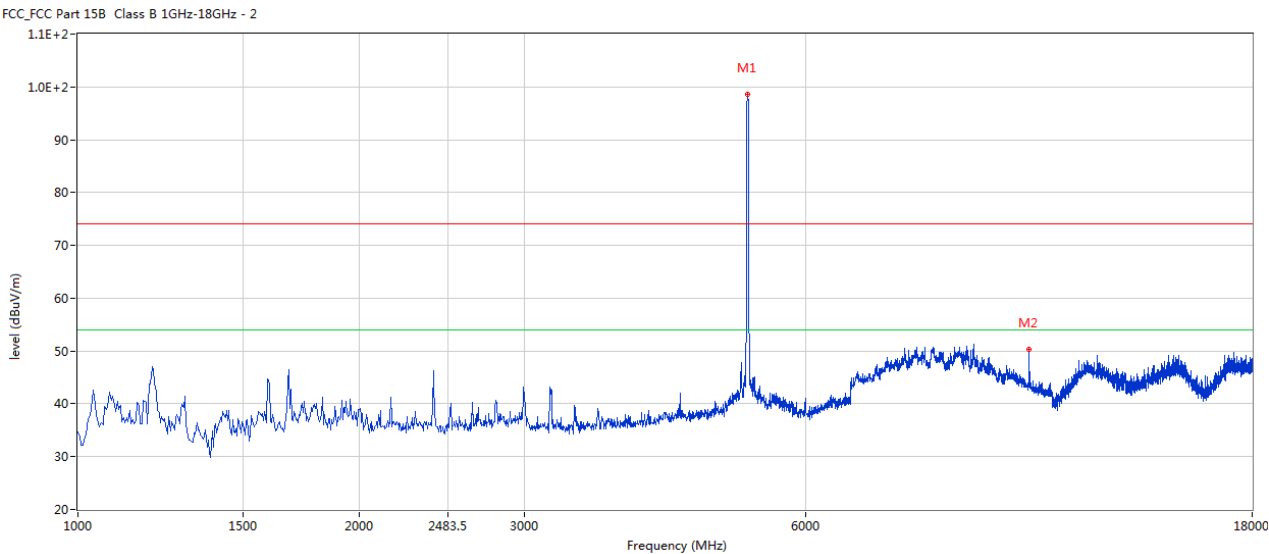
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CH40 for 11a at 6Mbps: Vertical



CH40 for 11a at 6Mbps: Horizontal

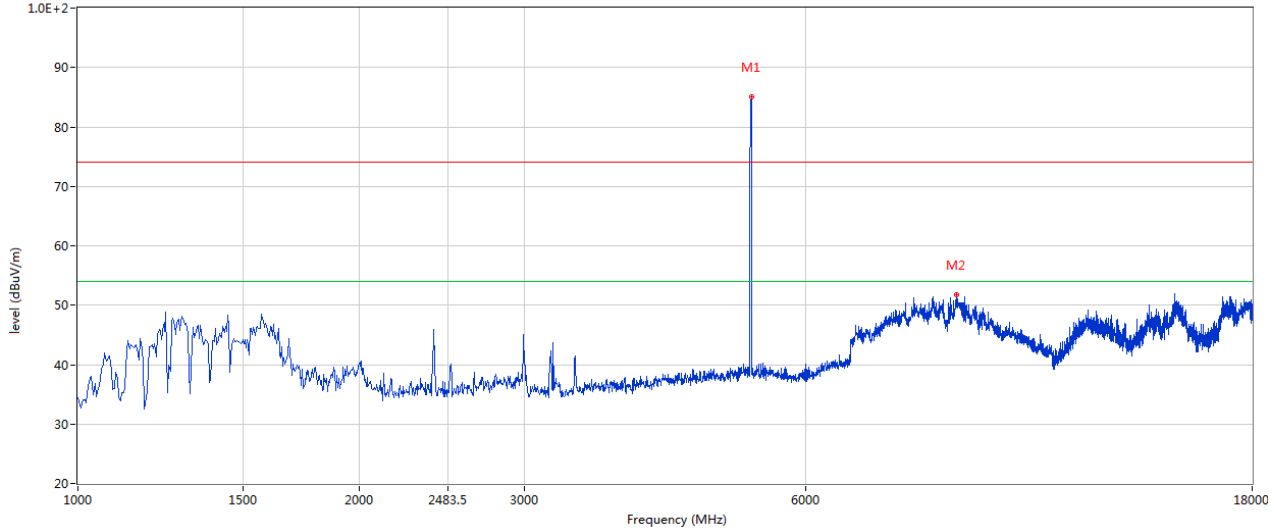


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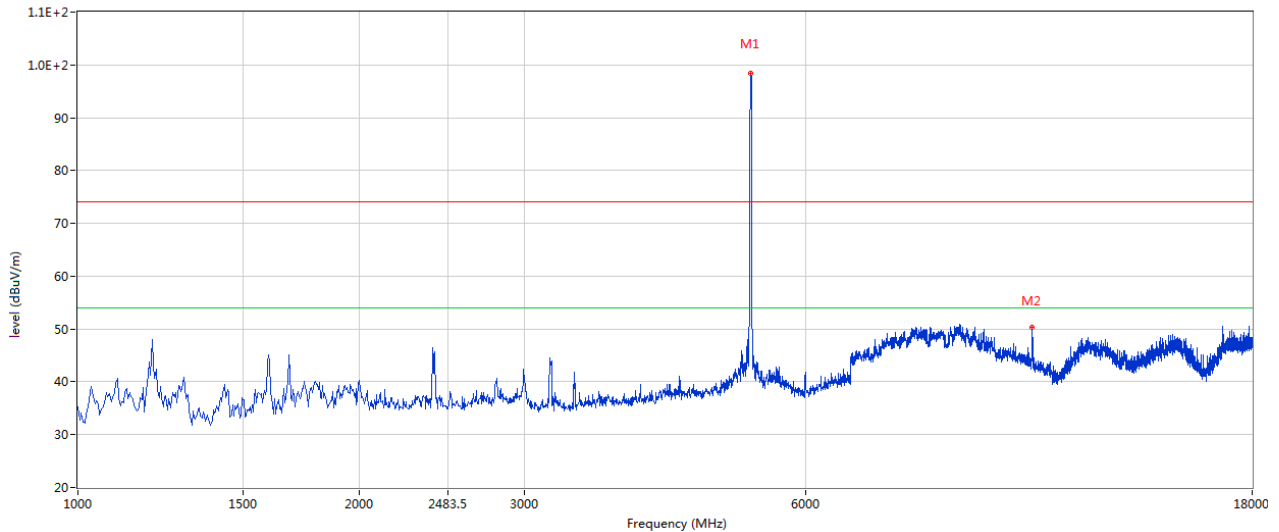
### CH48 for 11a at 6Mbps: Vertical

FCC\_FCC Part 15B Class B 1GHz-18GHz - 2



### CH48 for 11g at 6Mbps: Horizontal

FCC\_FCC Part 15B Class B 1GHz-18GHz - 2

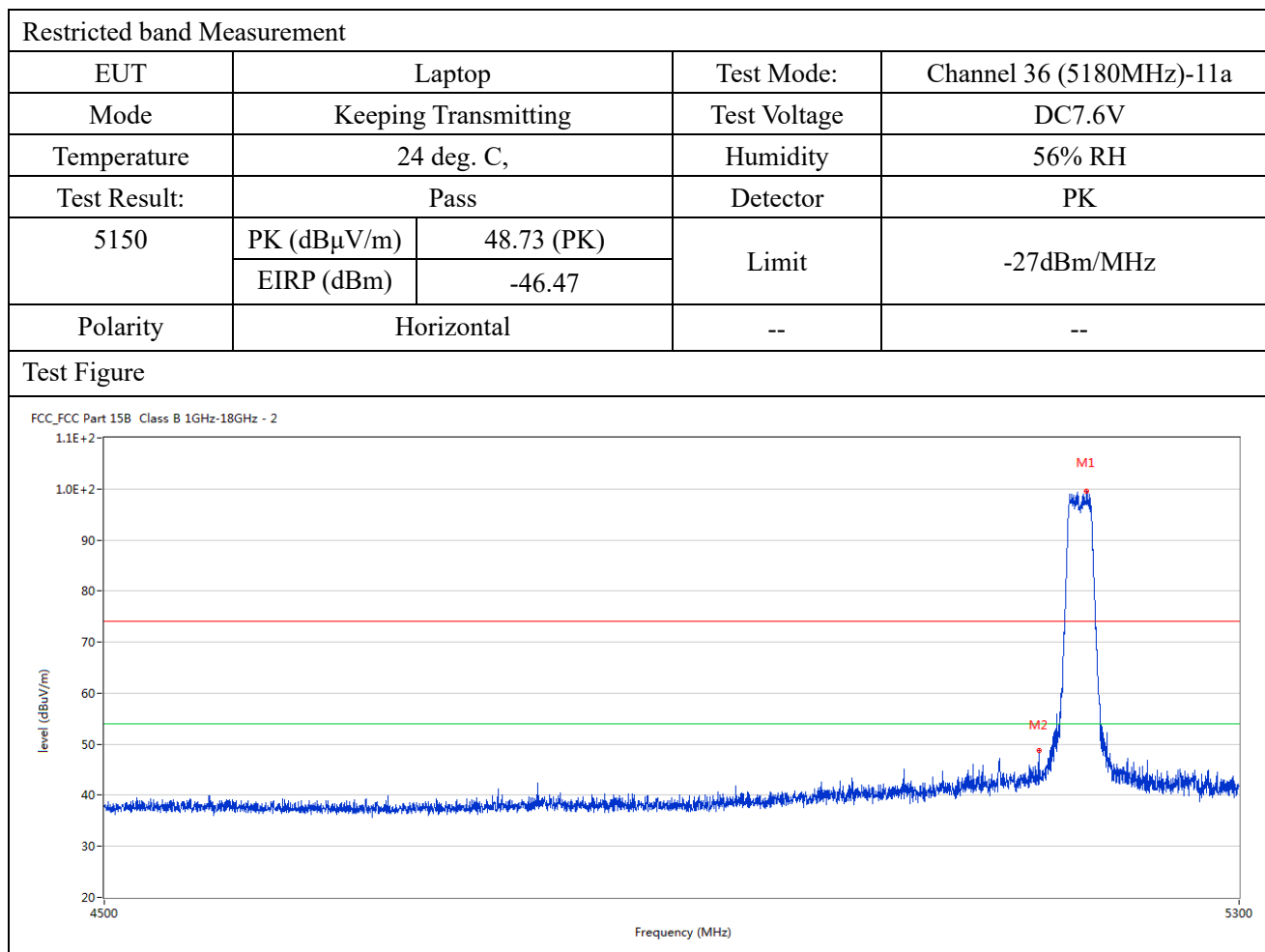


- Note: 1. For radiated Emissions from 18-40GHz, it is only the floor noise.  
2. 802.11a is the worst case.

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Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), 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  $\text{E[dB}\mu\text{V/m]} = 48.73 \text{ dB}\mu\text{V/m}$ ,

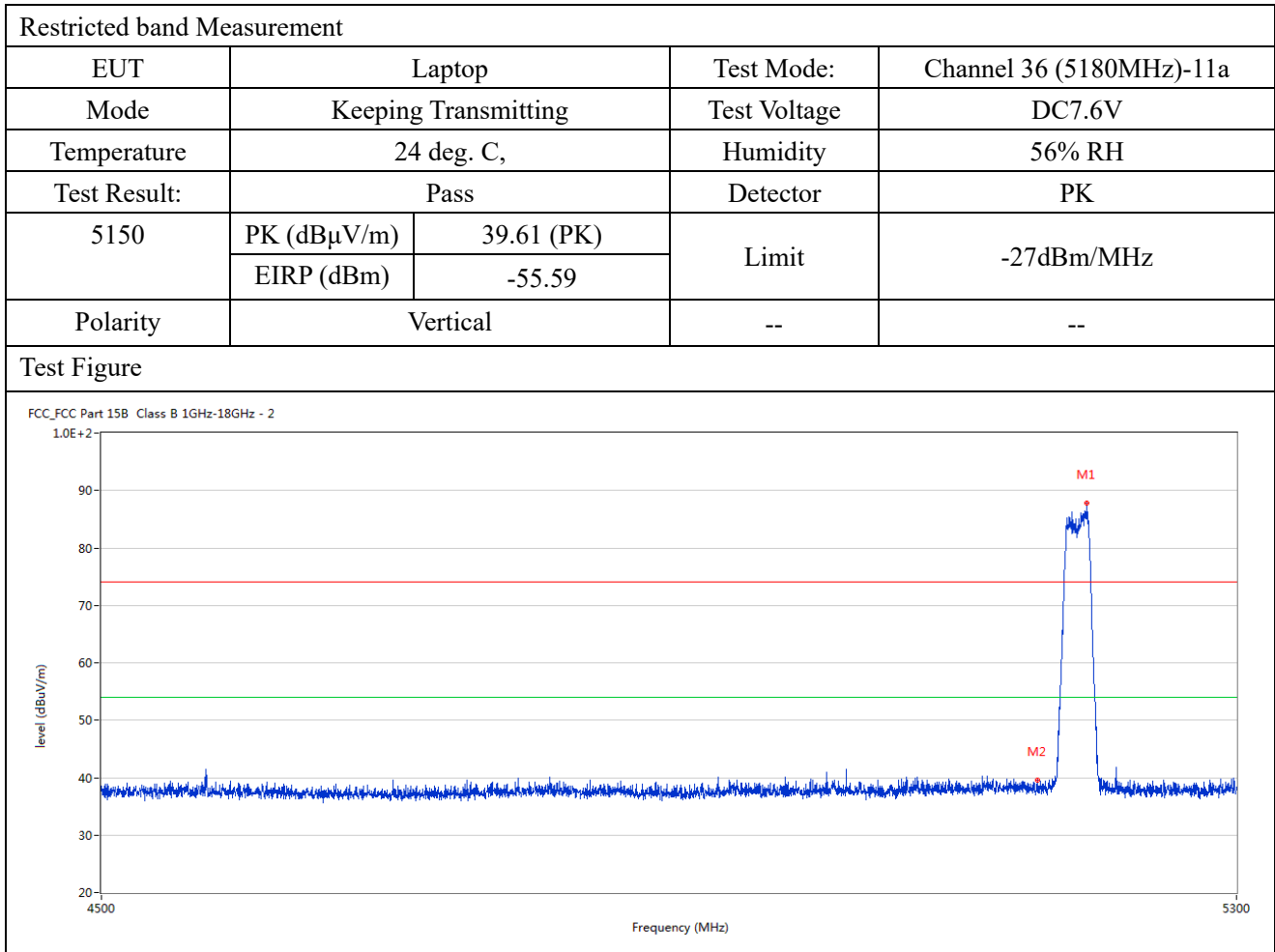
$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 48.73 - 95.2 = -46.47 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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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  $\text{E[dB}\mu\text{V/m]} = 39.61 \text{ dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 39.61 - 95.2 = -55.59 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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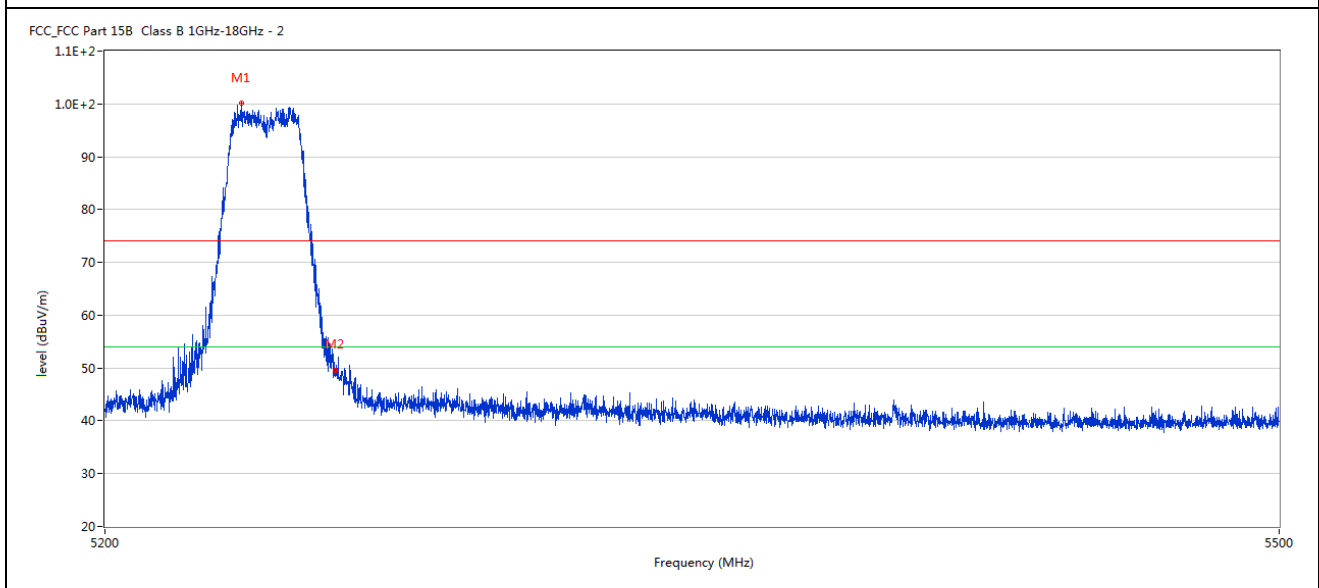
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Restricted band Measurement				
EUT	Laptop		Test Mode:	Channel 48 (5240MHz)-11a
Mode	Keeping Transmitting		Test Voltage	DC7.6V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	50.29 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-44.91		
Polarity	Horizontal			

#### Test Figure



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  $\text{E[dB}\mu\text{V/m]} = 50.29 \text{ dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 50.29 - 95.2 = -44.91 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

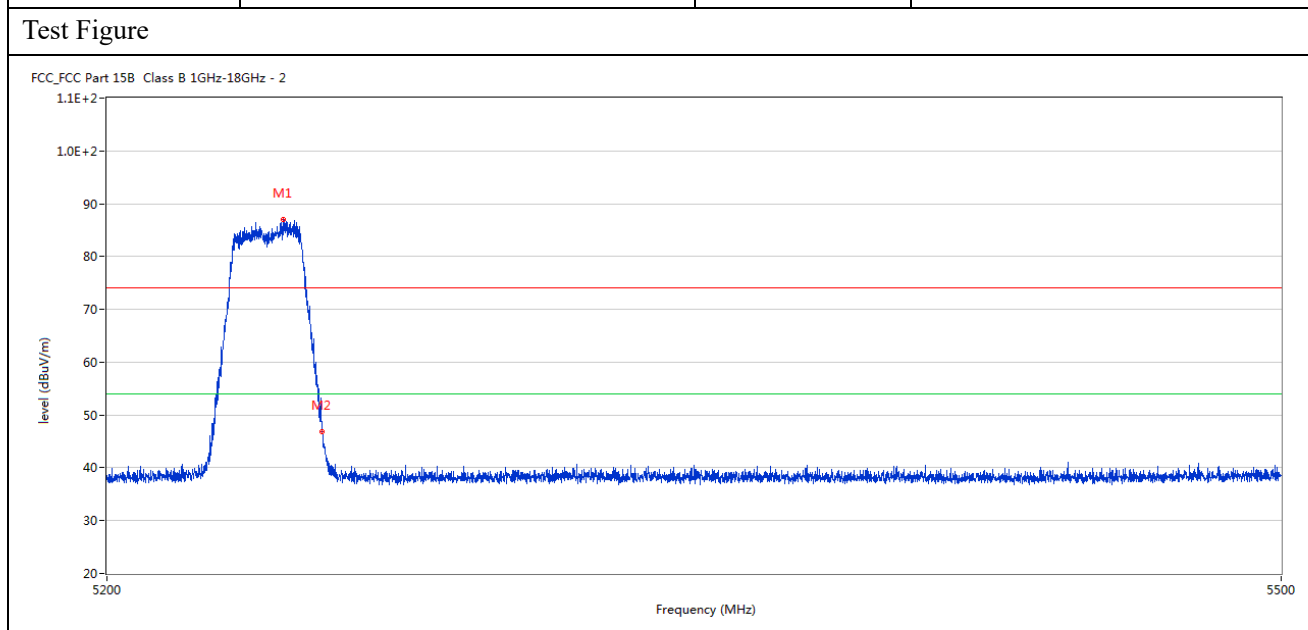
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Restricted band Measurement			
EUT	Laptop		Test Mode:
Mode	Keeping Transmitting		Channel 48 (5240MHz)-11a
Temperature	24 deg. C,		Test Voltage
Test Result:	Pass		Humidity
5250	PK (dBμV/m)	46.90 (PK)	56% RH
	EIRP (dBm)	-48.30	Detector
Polarity	Vertical		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  $\text{E[dB}\mu\text{V/m]} = 46.90 \text{ dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 46.90 - 95.2 = -48.30 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement				
EUT	Laptop		Test Mode:	Channel 36 (5180MHz)-11n/HT20
Mode	Keeping Transmitting		Test Voltage	DC7.6V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	47.26 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-47.94		
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:

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

For Example, if  $\text{E[dB}\mu\text{V/m]} = 47.26\text{dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 47.26 - 95.2 = -47.94\text{dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	Laptop		Test Mode:	Channel 36 (5180MHz)-11n/HT20
Mode	Keeping Transmitting		Test Voltage	DC7.6V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	40.15 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-55.05		
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:

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

For Example, if  $\text{E[dB}\mu\text{V/m]} = 40.15\text{dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 40.15 - 95.2 = -55.05\text{dBm}$$

2. RBW=1MHz, VBW=3MHz

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

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Restricted band Measurement				
EUT	Laptop		Test Mode:	Channel 48 (5240MHz)-11n/HT20
Mode	Keeping Transmitting		Test Voltage	DC7.6V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	49.86(PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-45.34		
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:

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

For Example, if  $\text{E[dB}\mu\text{V/m]} = 49.86 \text{ dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 49.86 - 95.2 = -45.34 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	Laptop		Test Mode:	Channel 48 (5240MHz)-11n/HT20
Mode	Keeping Transmitting		Test Voltage	DC7.6V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	46.52(PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-48.68		
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:

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

For Example, if  $\text{E[dB}\mu\text{V/m]} = 46.52 \text{ dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 46.52 - 95.2 = -48.68 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement				
EUT	Laptop		Test Mode:	Channel 38 (5190MHz)-11n/HT40
Mode	Keeping Transmitting		Test Voltage	DC7.6V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	47.66 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-47.54		
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:

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

For Example, if  $\text{E[dB}\mu\text{V/m]} = 47.66 \text{ dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 47.66 - 95.2 = -47.54 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	Laptop		Test Mode:	Channel 38 (5190MHz)-11n/HT40
Mode	Keeping Transmitting		Test Voltage	DC7.6V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	38.23 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-56.97		
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:

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

For Example, if  $\text{E[dB}\mu\text{V/m]} = 38.23 \text{ dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 38.23 - 95.2 = -56.97 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement				
EUT	Laptop		Test Mode:	Channel 46 (5230MHz)-11n/HT40
Mode	Keeping Transmitting		Test Voltage	DC7.6V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	48.51(PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-46.69		
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:

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

For Example, if  $\text{E[dB}\mu\text{V/m]} = 48.51 \text{ dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 48.51 - 95.2 = -46.69 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	Laptop		Test Mode:	Channel 46 (5230MHz)-11n/HT40
Mode	Keeping Transmitting		Test Voltage	DC7.6V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	49.74(PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-45.46		
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:

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

For Example, if  $\text{E[dB}\mu\text{V/m]} = 49.74 \text{ dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 49.74 - 95.2 = -45.46 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement				
EUT	Laptop		Test Mode:	Channel 42 (5210MHz)-11ac/VHT80
Mode	Keeping Transmitting		Test Voltage	DC7.6V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	46.37 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-48.83		
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:

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

For Example, if  $\text{E[dB}\mu\text{V/m]} = 46.37 \text{ dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 46.37 - 95.2 = -48.83 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	Laptop		Test Mode:	Channel 42 (5210MHz)- 11ac/VHT80
Mode	Keeping Transmitting		Test Voltage	DC7.6V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	39.02 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-56.18		
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:

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

For Example, if  $\text{E[dB}\mu\text{V/m]} = 39.02 \text{ dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 39.02 - 95.2 = -56.18 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement				
EUT	Laptop		Test Mode:	Channel 42 (5210MHz)-11ac/VHT80
Mode	Keeping Transmitting		Test Voltage	DC7.6V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	48.56 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-46.64		
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:

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

For Example, if  $\text{E[dB}\mu\text{V/m]} = 48.56 \text{ dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 48.56 - 95.2 = -46.64 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	Laptop		Test Mode:	Channel 42 (5210MHz)- 11ac/VHT80
Mode	Keeping Transmitting		Test Voltage	DC7.6V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	44.35 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-50.85		
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:

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

For Example, if  $\text{E[dB}\mu\text{V/m]} = 44.35 \text{ dB}\mu\text{V/m}$ ,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 44.35 - 95.2 = -50.85 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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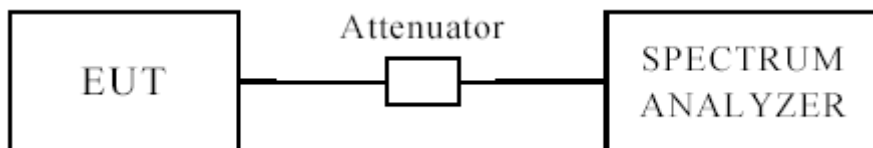
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## 7.0 Emission Bandwidth

### 7.1 Test Setup



### 7.3 Test Procedure for Emission Bandwidth

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 Minimum Bandwidth for the 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 Procedure for 99% Bandwidth

1. Set center frequency to the nominal EUT channel center frequency
2. Set span = 1.5 times to 5.0 times OBW
3. Set RBW = 1% TO 5% of the OBW
4. Set  $VBW \geq 3 \times RBW$
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Other, peak detection and max mode (until trace stabilizes) shall be used.
6. Use the 99% power bandwidth function of the instrument

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## 7.6 Test Result

EUT	Laptop		Model	NP141AQ-T	
Mode	802.11a		Test Voltage	DC7.6V	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
<b>26dB Bandwidth</b>					
36	5180	6	24.21	--	Pass
40	5200	6	22.61	--	Pass
48	5240	6	23.25	--	Pass
<b>99% Bandwidth</b>					
36	5180	6	16.83	--	Pass
40	5200	6	16.67	--	Pass
48	5240	6	16.75	--	Pass

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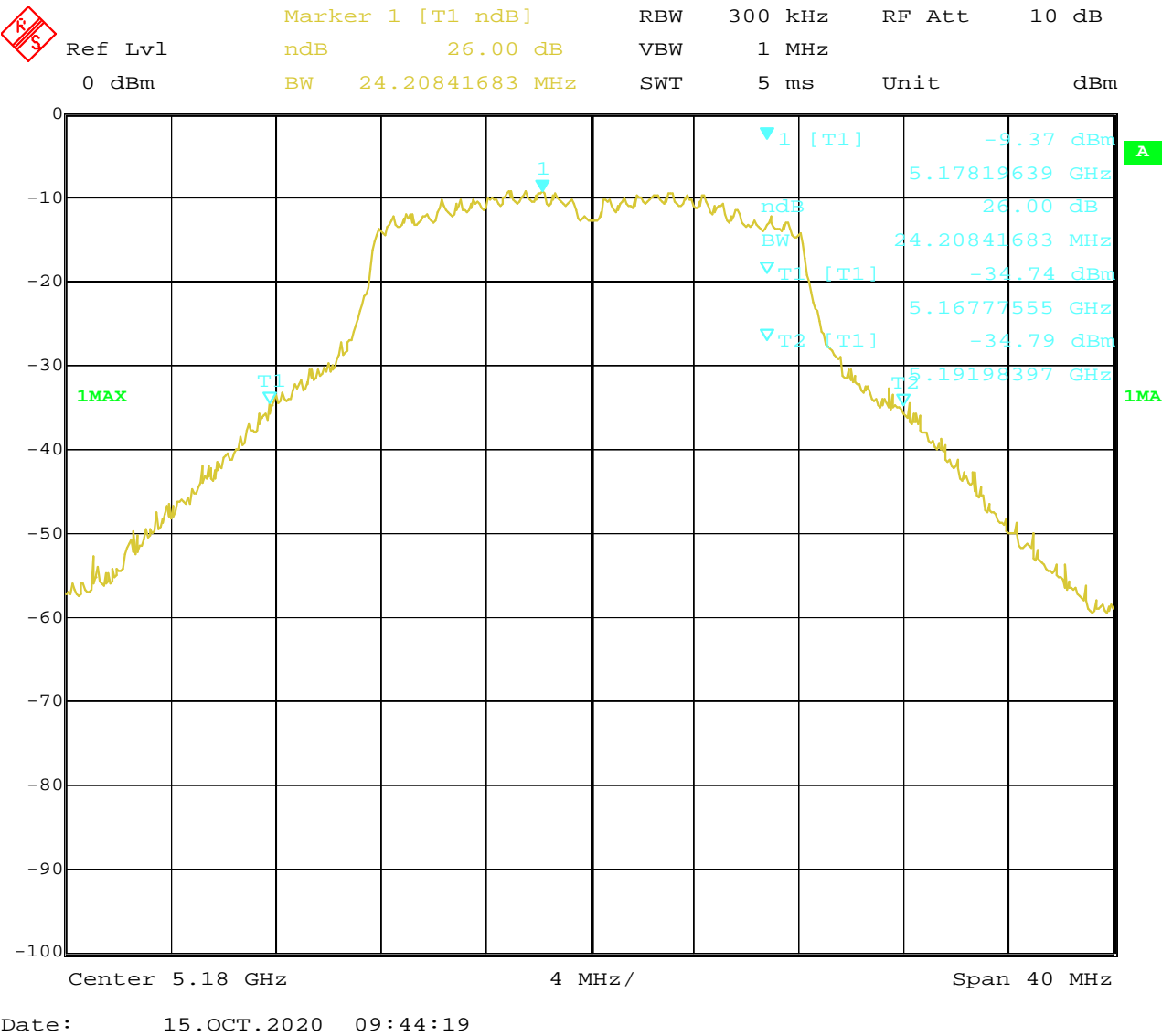
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Test Figure:

26dB Bandwidth

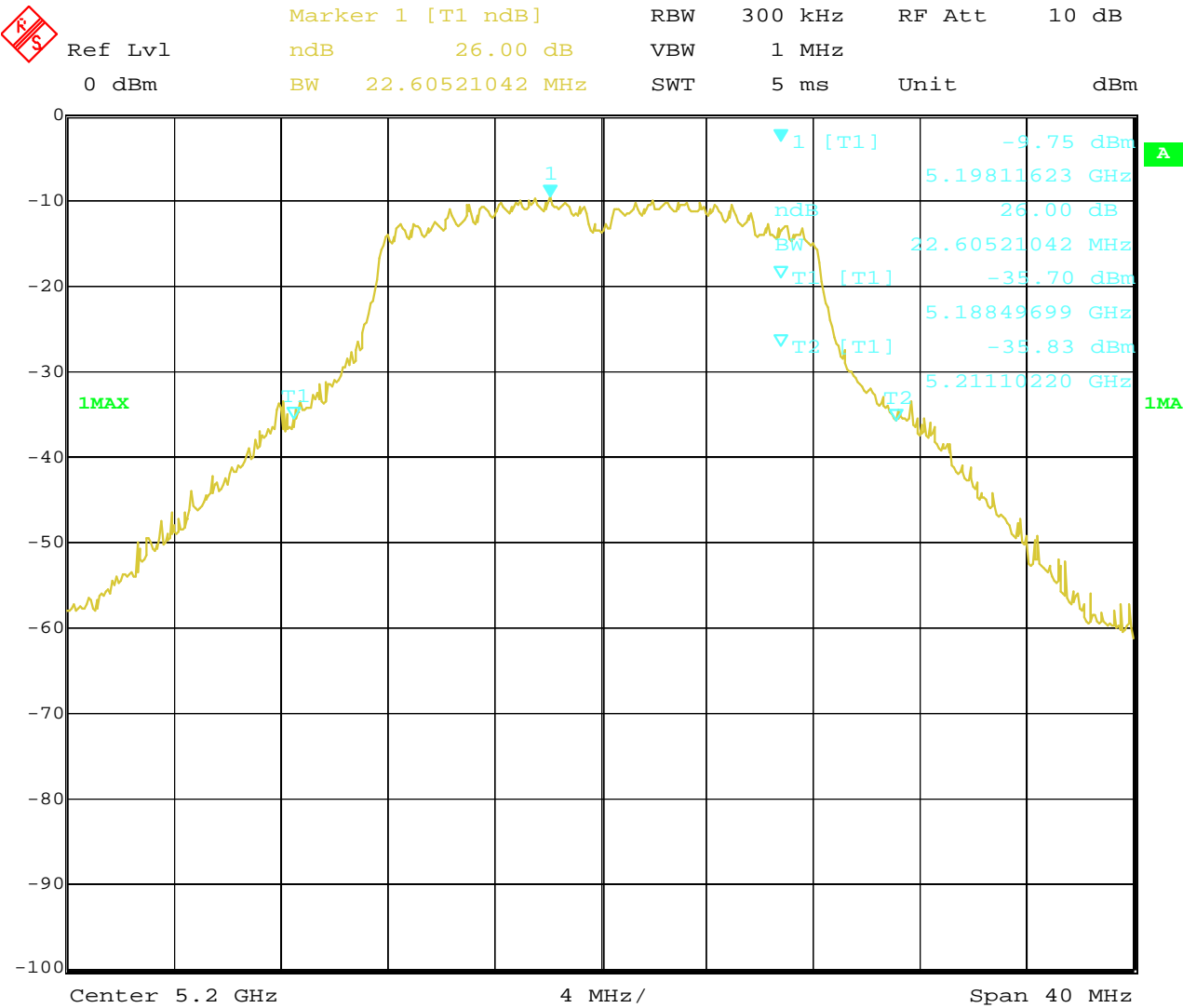
Channel 36



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Channel 40

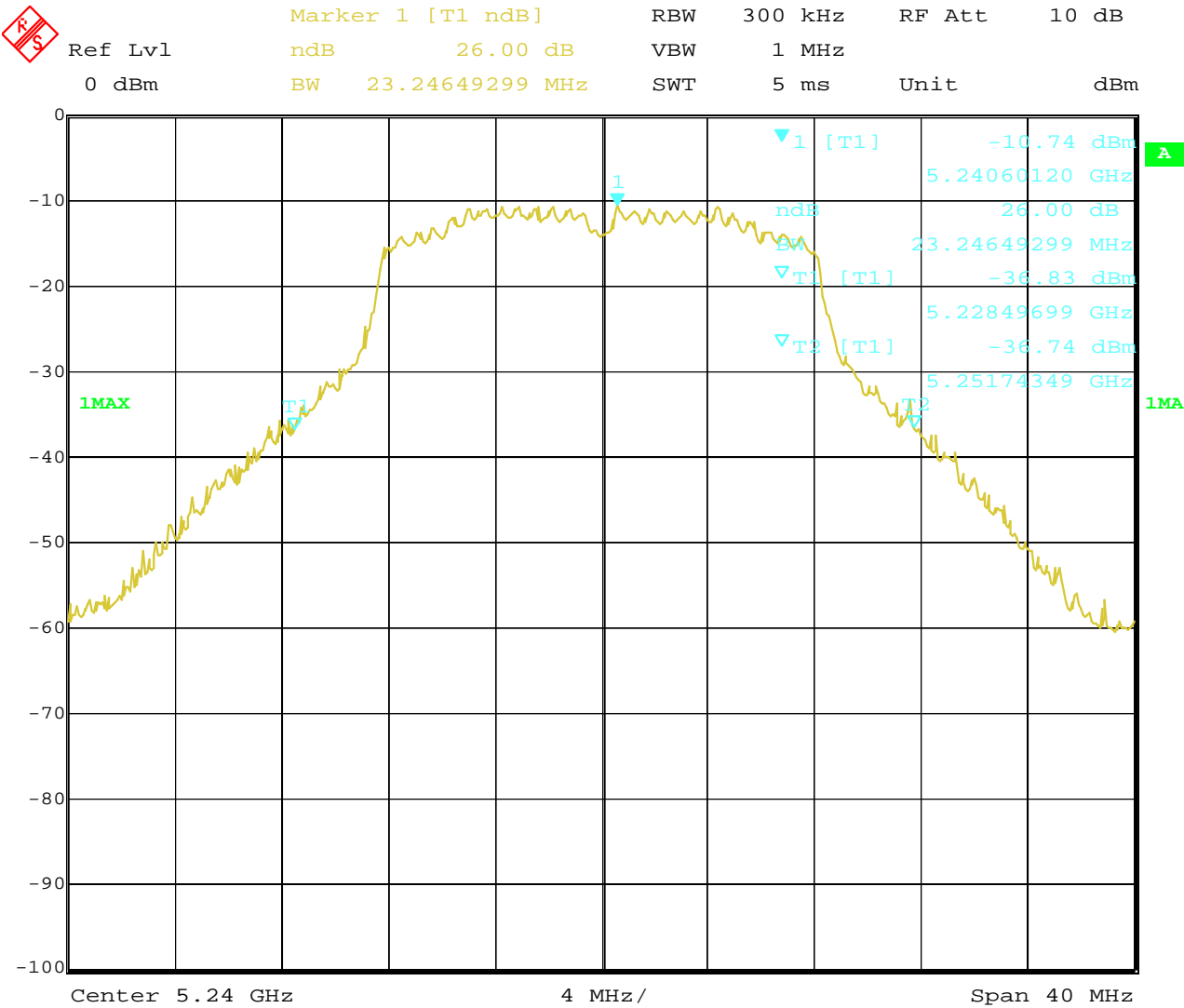


Date: 15.OCT.2020 09:50:36

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Channel 48



Date: 15.OCT.2020 09:54:51

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## 99% Bandwidth

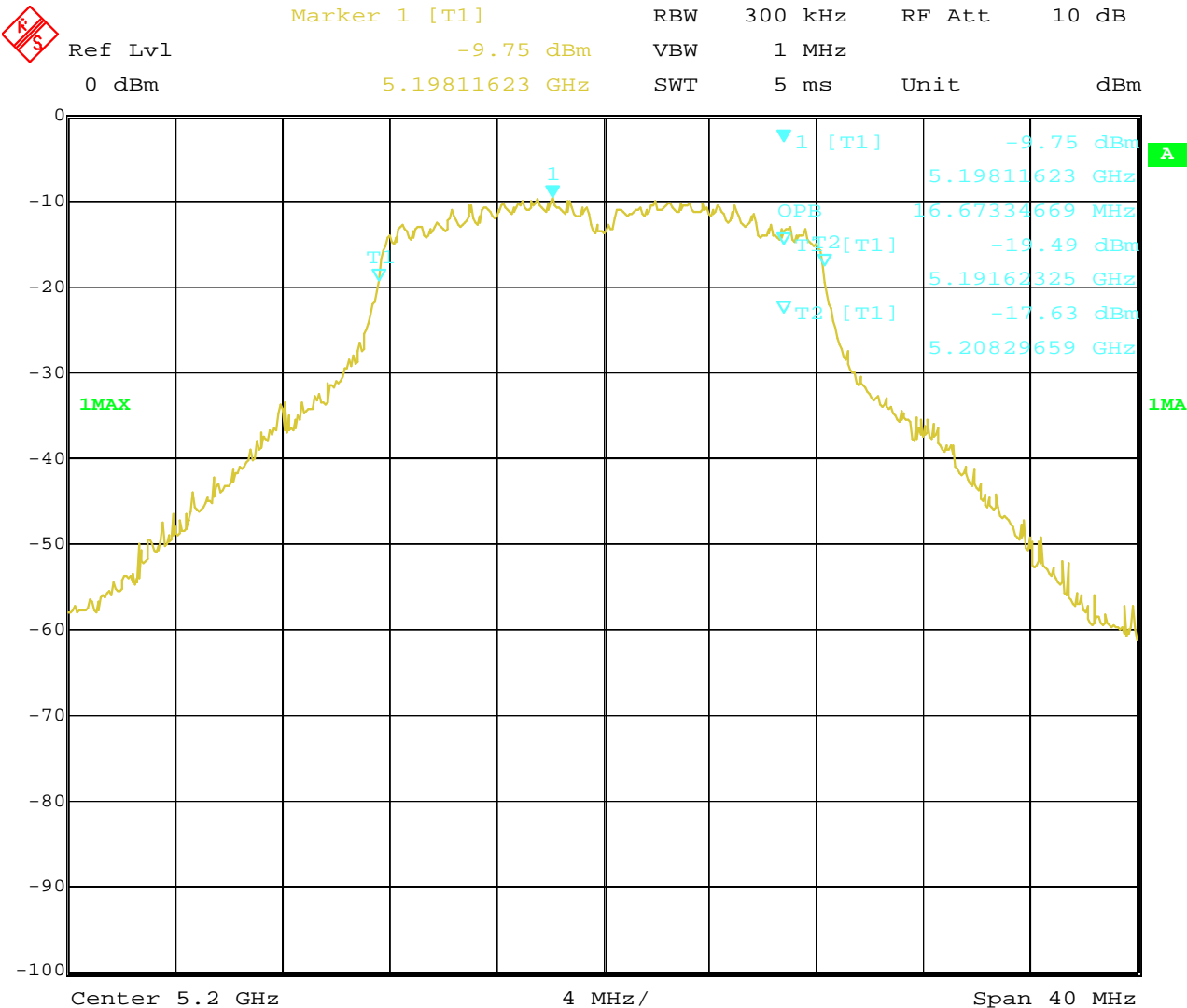
Channel 36



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Channel 40

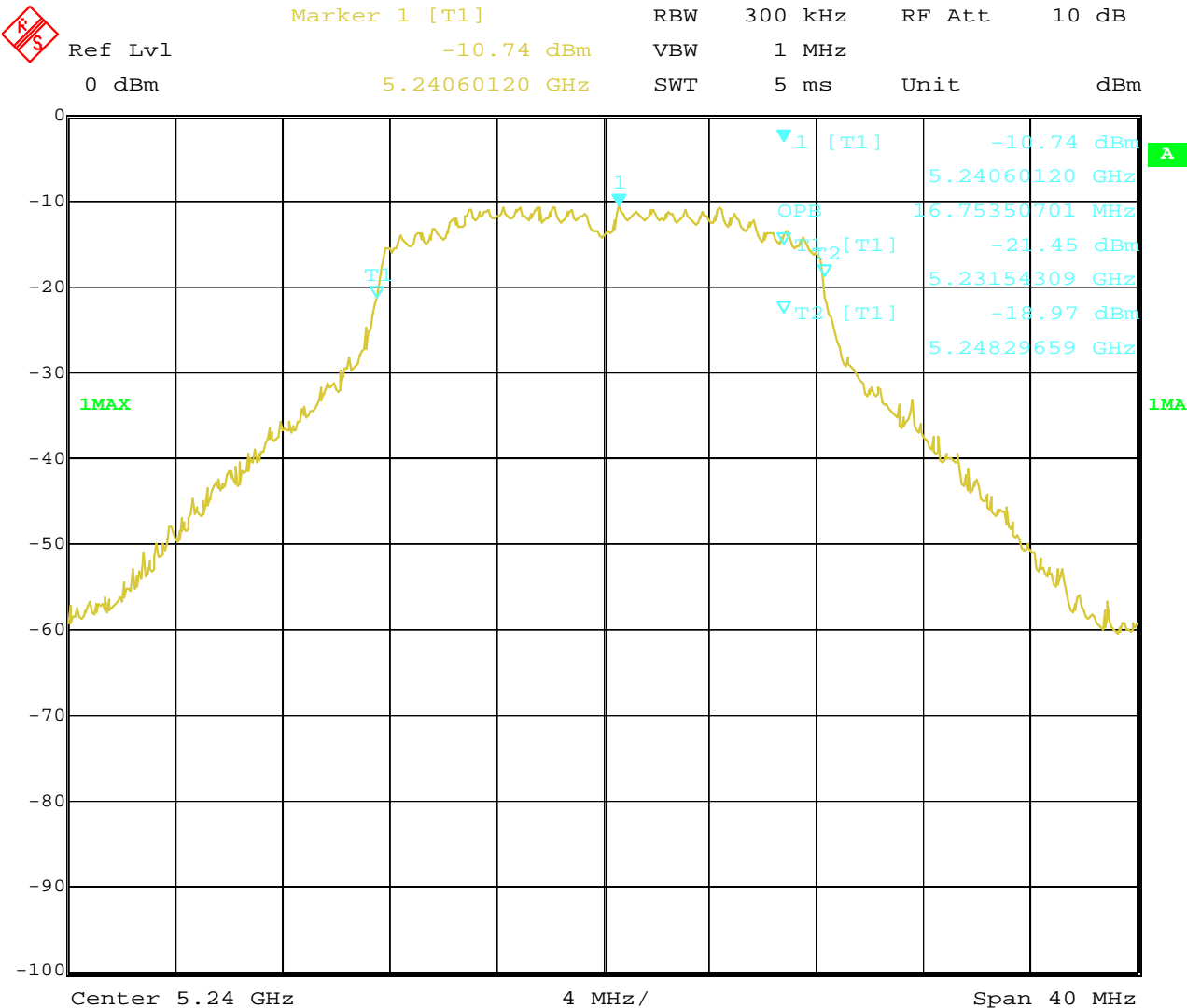


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Channel 48



Date: 15.OCT.2020 09:55:12

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EUT		Laptop		Model	NP141AQ-T
Mode		802.11n HT20		Test Voltage	DC7.6V
Temperature		24 deg. C,		Humidity	56% RH
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
<b>26dB Bandwidth</b>					
36	5180	mcs0	23.73	--	Pass
40	5200	mcs0	24.13	--	Pass
48	5240	mcs0	23.49	--	Pass
<b>99% Bandwidth</b>					
36	5180	mcs0	17.96	--	Pass
40	5200	mcs0	17.96	--	Pass
48	5240	mcs0	17.96	--	Pass

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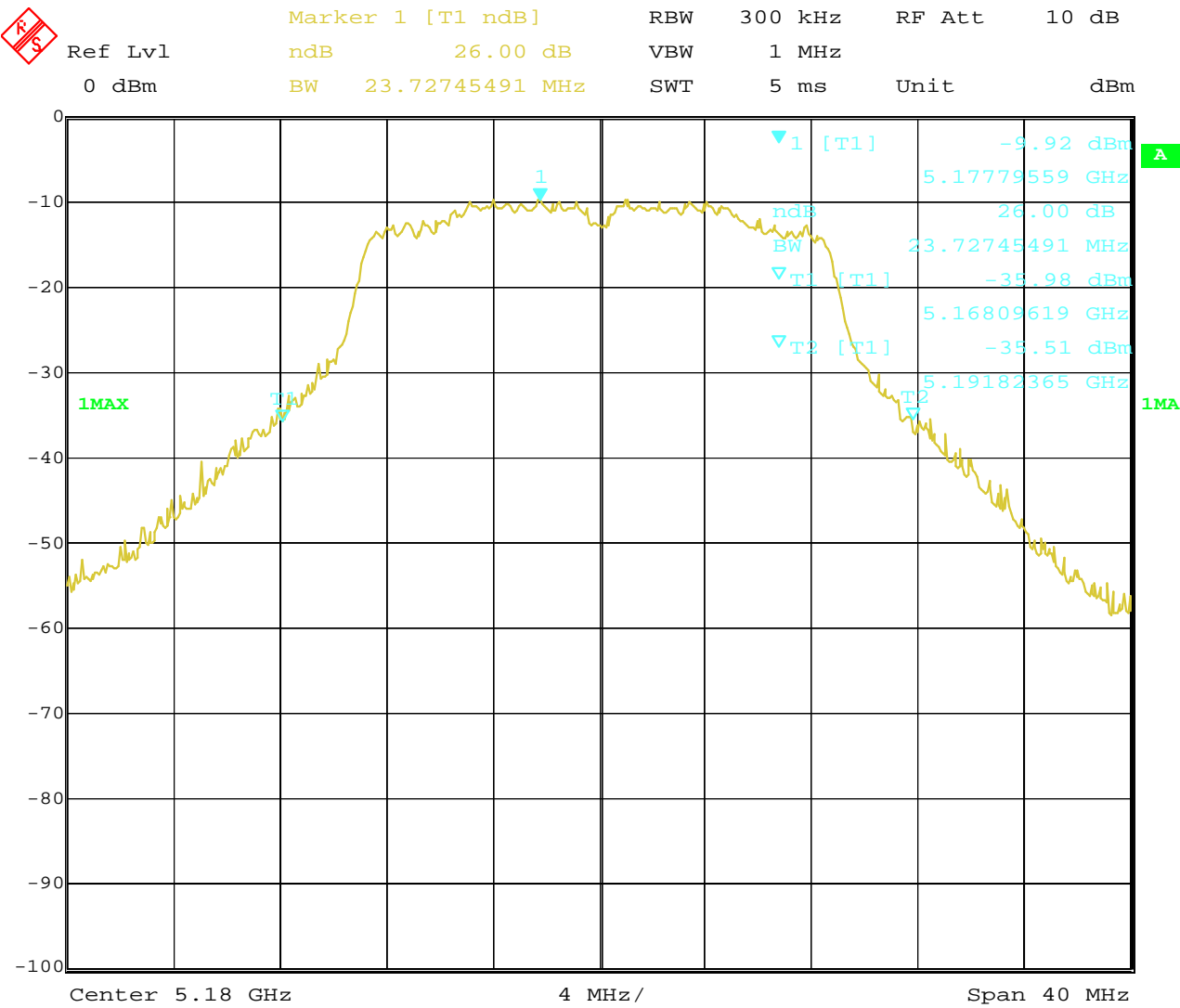
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Test Configure

26dB Bandwidth

Channel 36

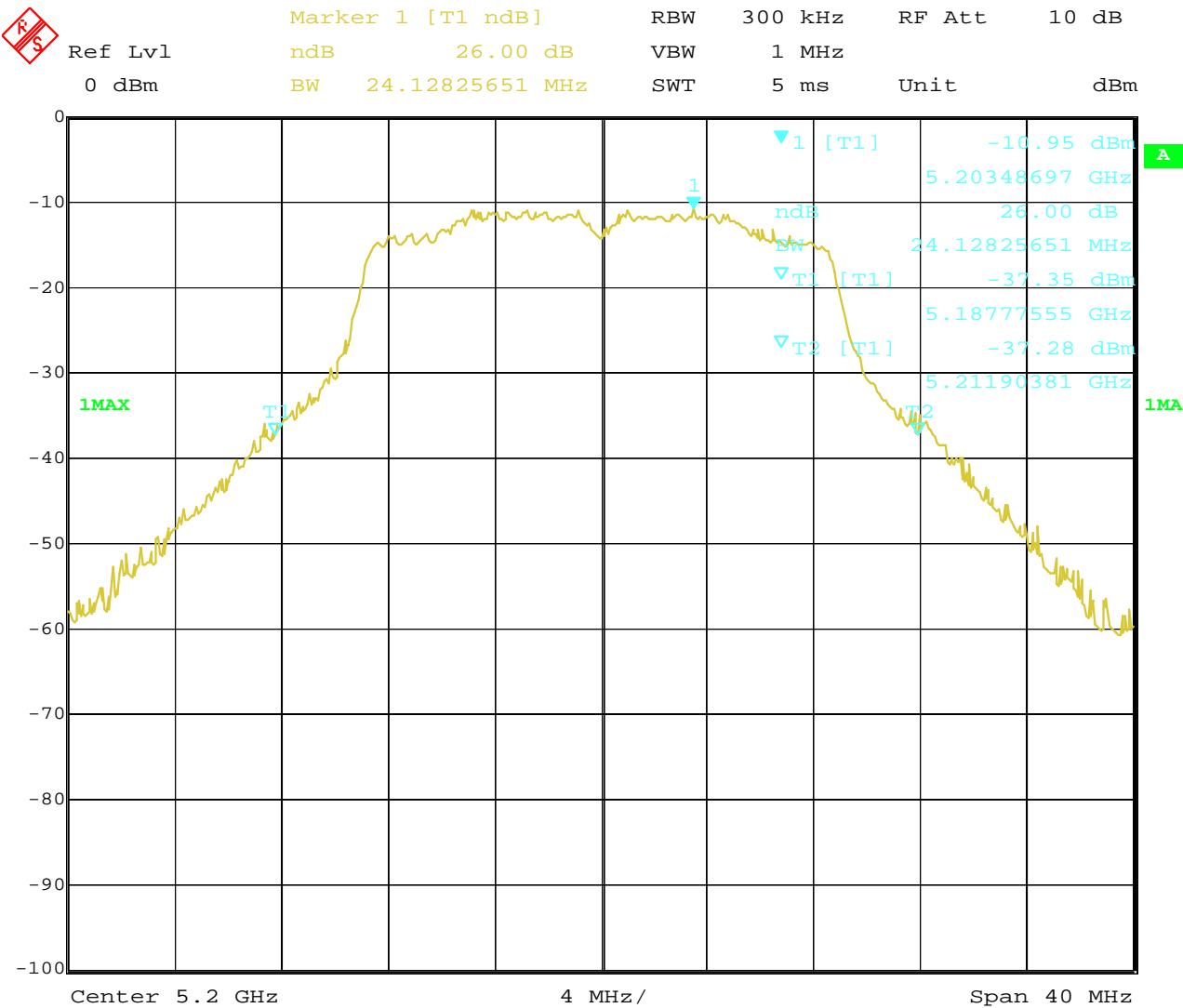


Date: 15.OCT.2020 09:57:59

The report refers only to the sample tested and does not apply to the bulk.  
This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for advertizing. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.  
In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.



Channel 40

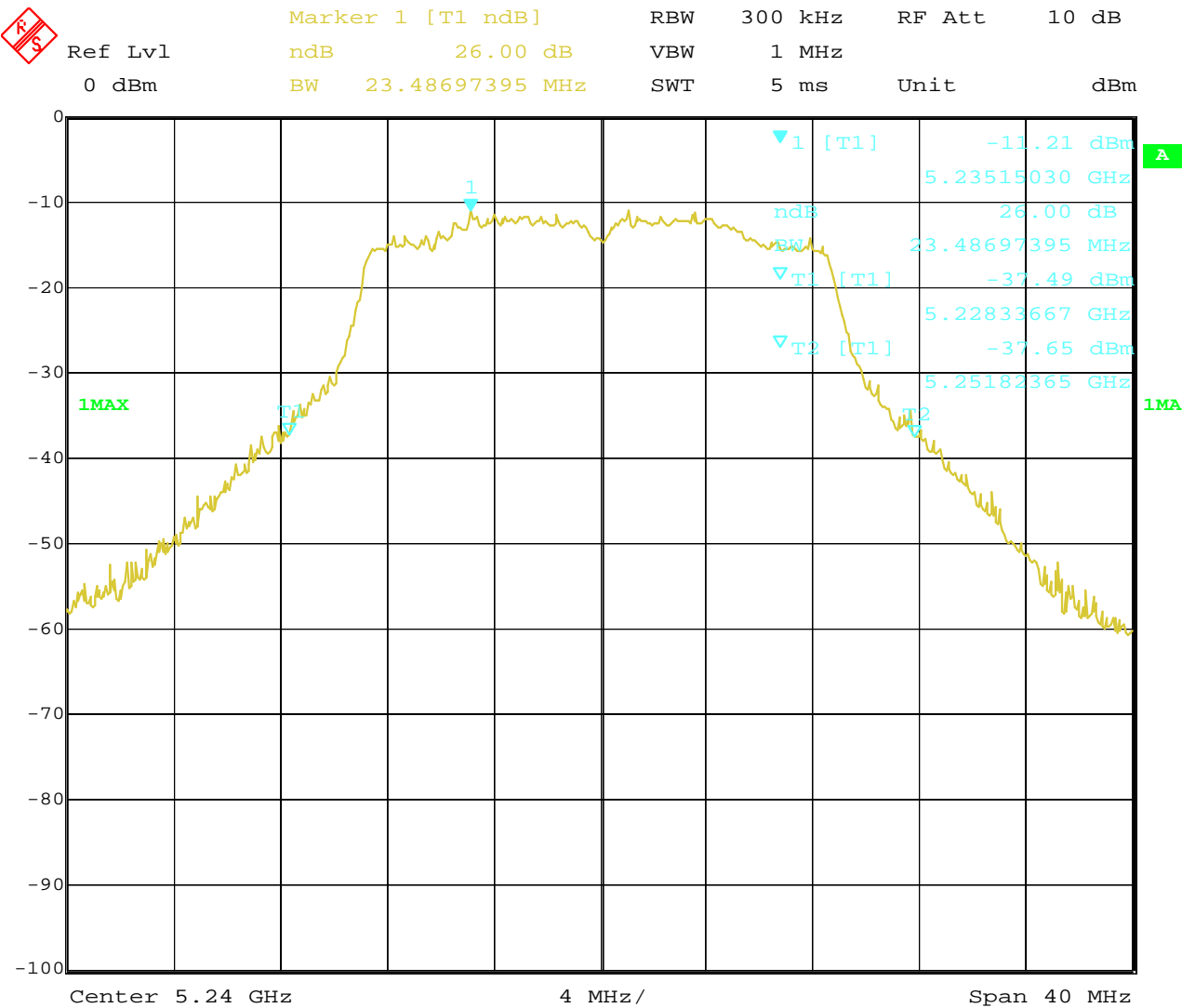


Date: 15.OCT.2020 10:00:34

The report refers only to the sample tested and does not apply to the bulk.  
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Channel 48



Date: 15.OCT.2020 10:03:18

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

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## Channel 36

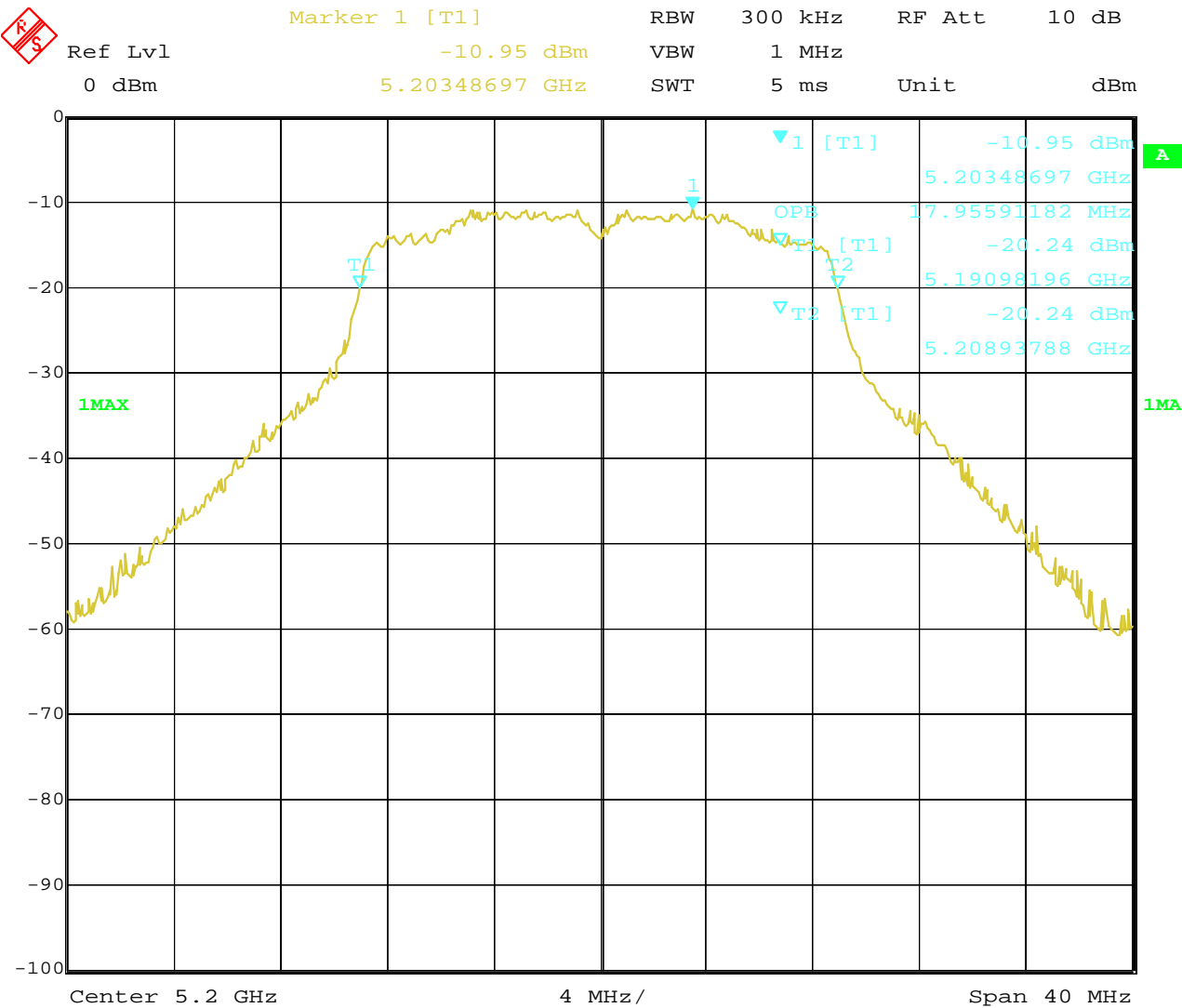


discussion or correspondence with any third party concerning the contents of the report.

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Channel 40

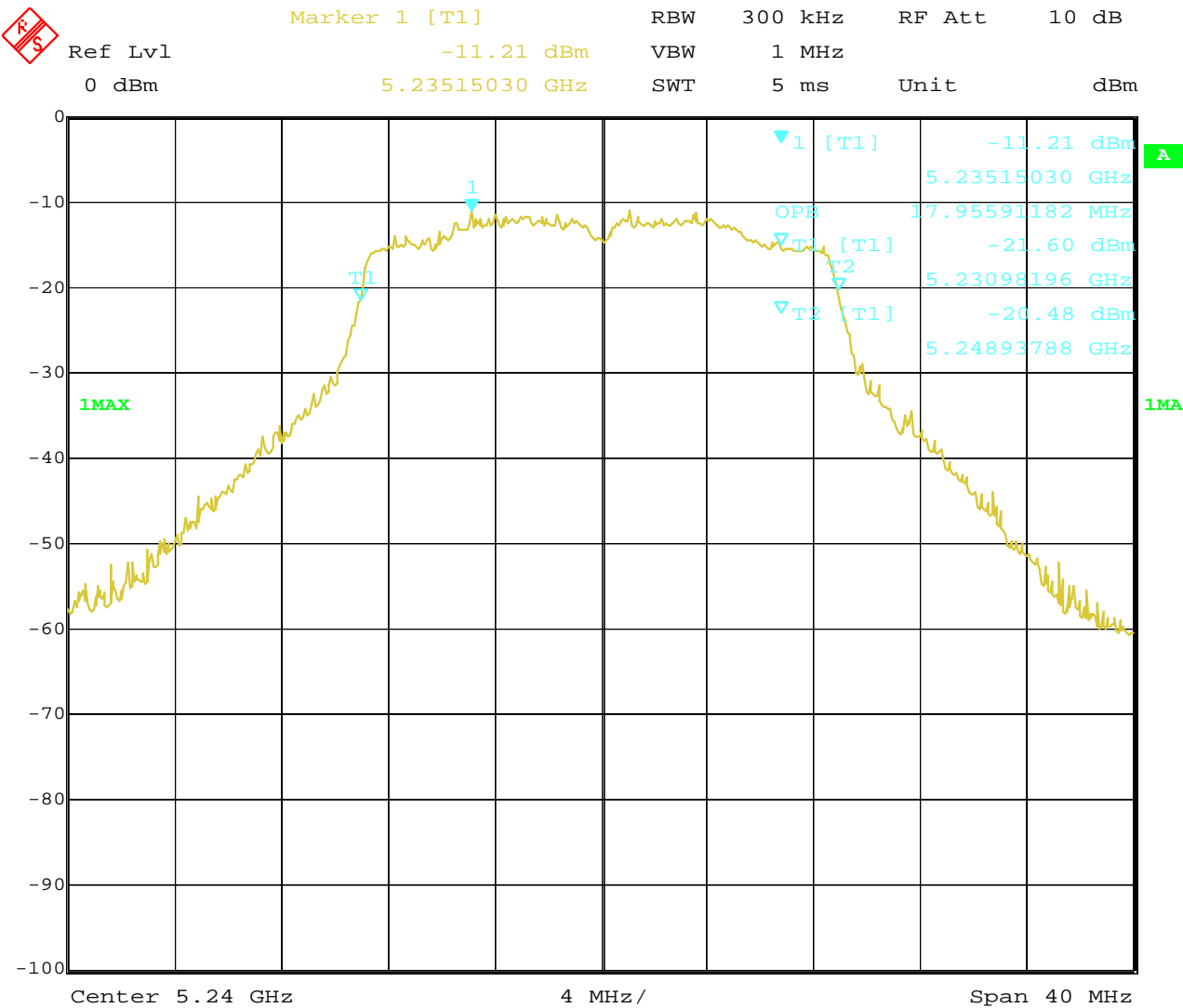


Date: 15.OCT.2020 10:00:52

The report refers only to the sample tested and does not apply to the bulk.  
This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for advertizing. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.  
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Channel 48



Date: 15.OCT.2020 10:03:04

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EUT	Laptop		Model	NP141AQ-T	
Mode	802.11n HT40		Test Voltage	DC7.6V	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
<b>26dB Bandwidth</b>					
38	5190	mcs0	44.25	--	Pass
46	5230	mcs0	44.01	--	Pass
<b>99% Bandwidth</b>					
38	5190	mcs0	36.43	--	Pass
46	5230	mcs0	36.43	--	Pass

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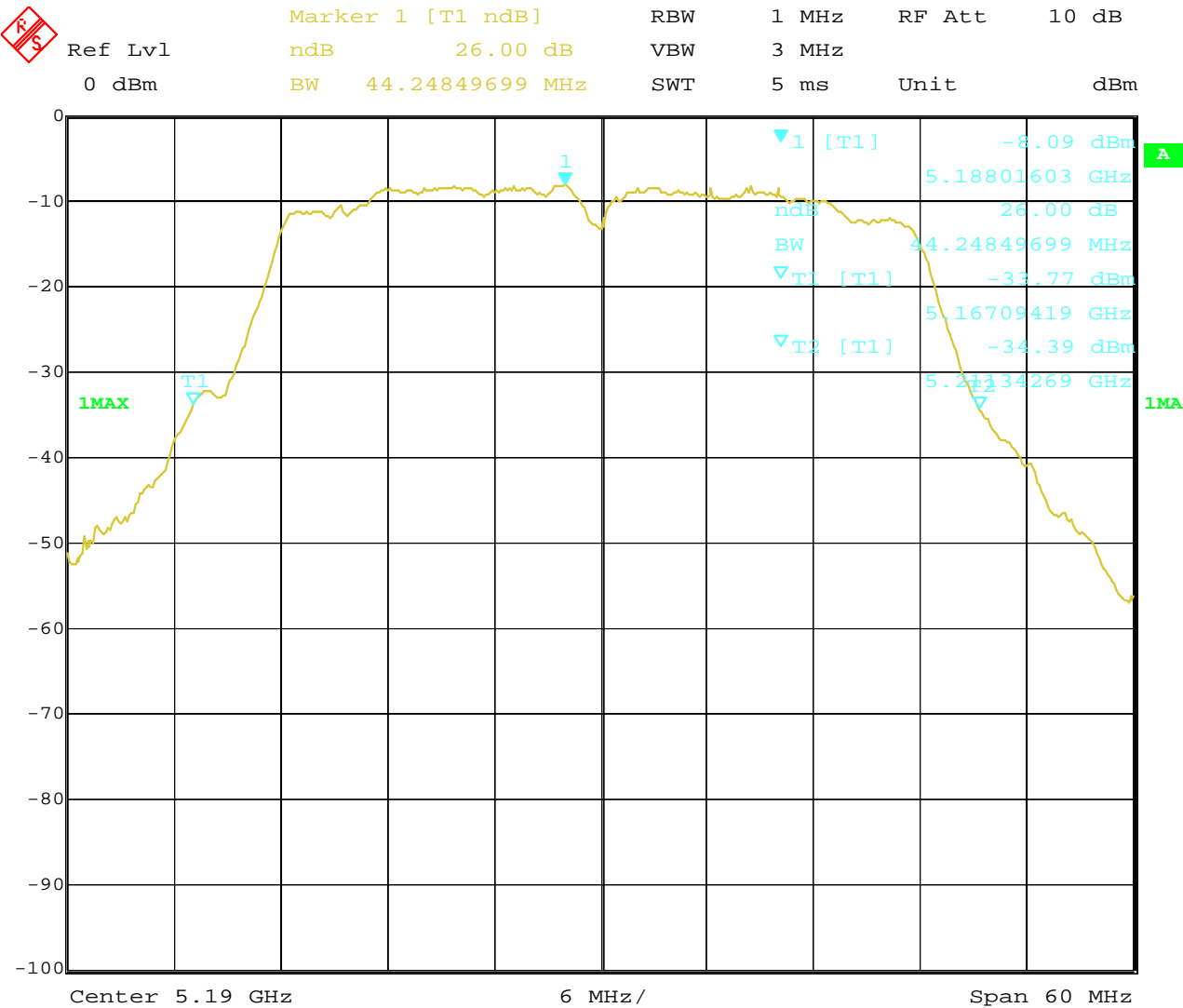




Test Configure

26dB Bandwidth

Channel 38

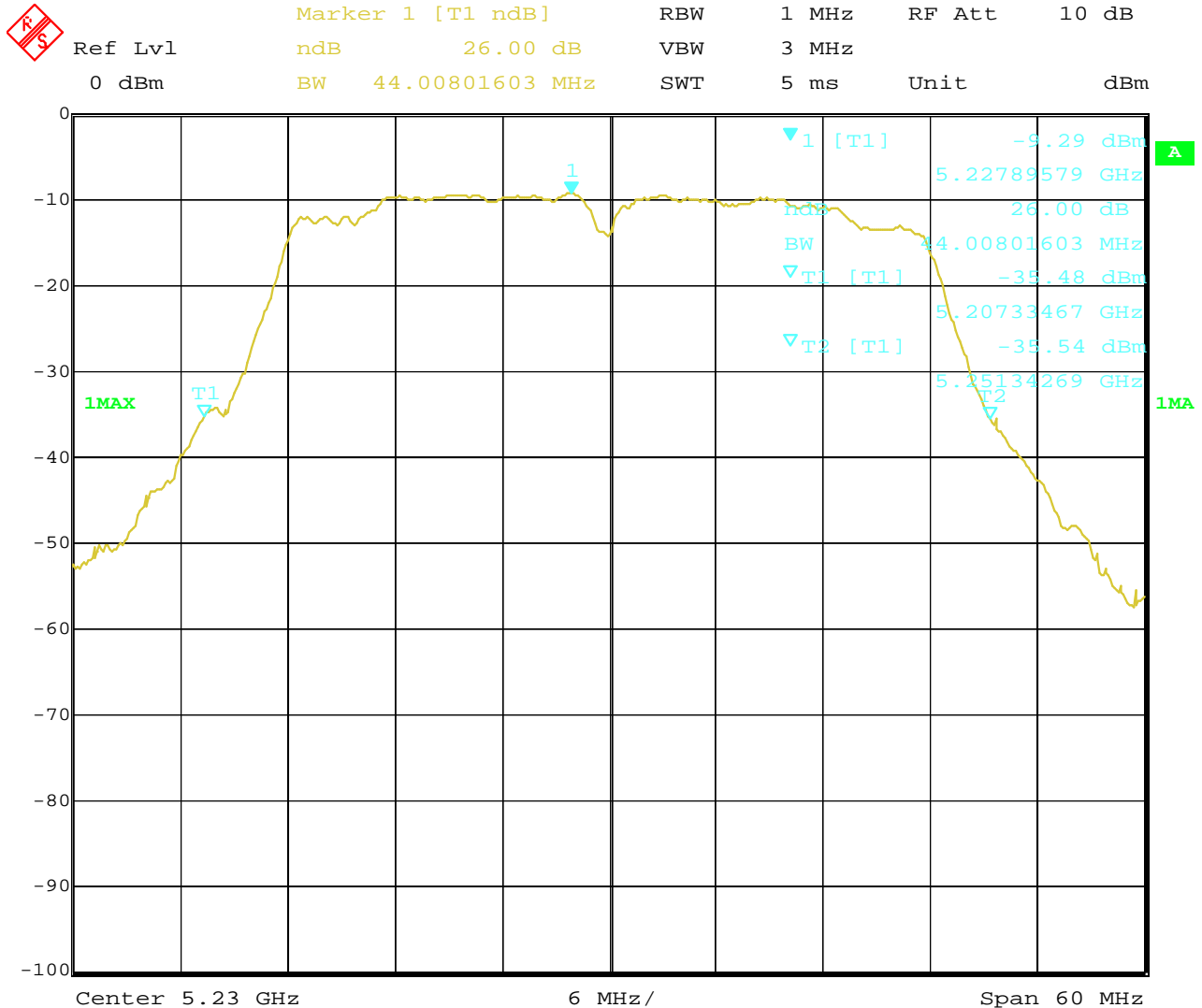


Date: 15.OCT.2020 10:12:40

The report refers only to the sample tested and does not apply to the bulk.  
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Channel 46



Date: 15.OCT.2020 10:10:44

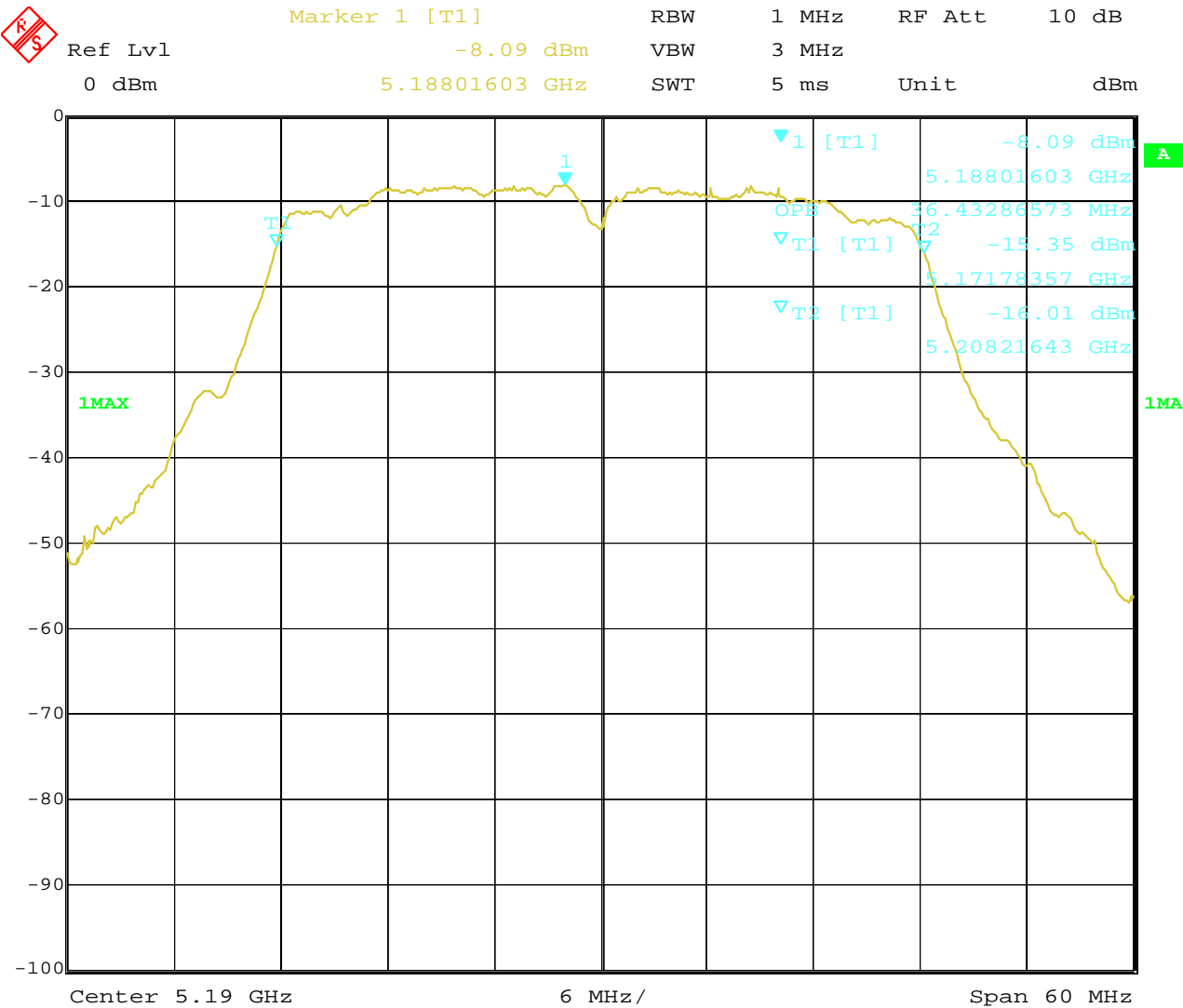
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Test Configure

99% Bandwidth

Channel 38

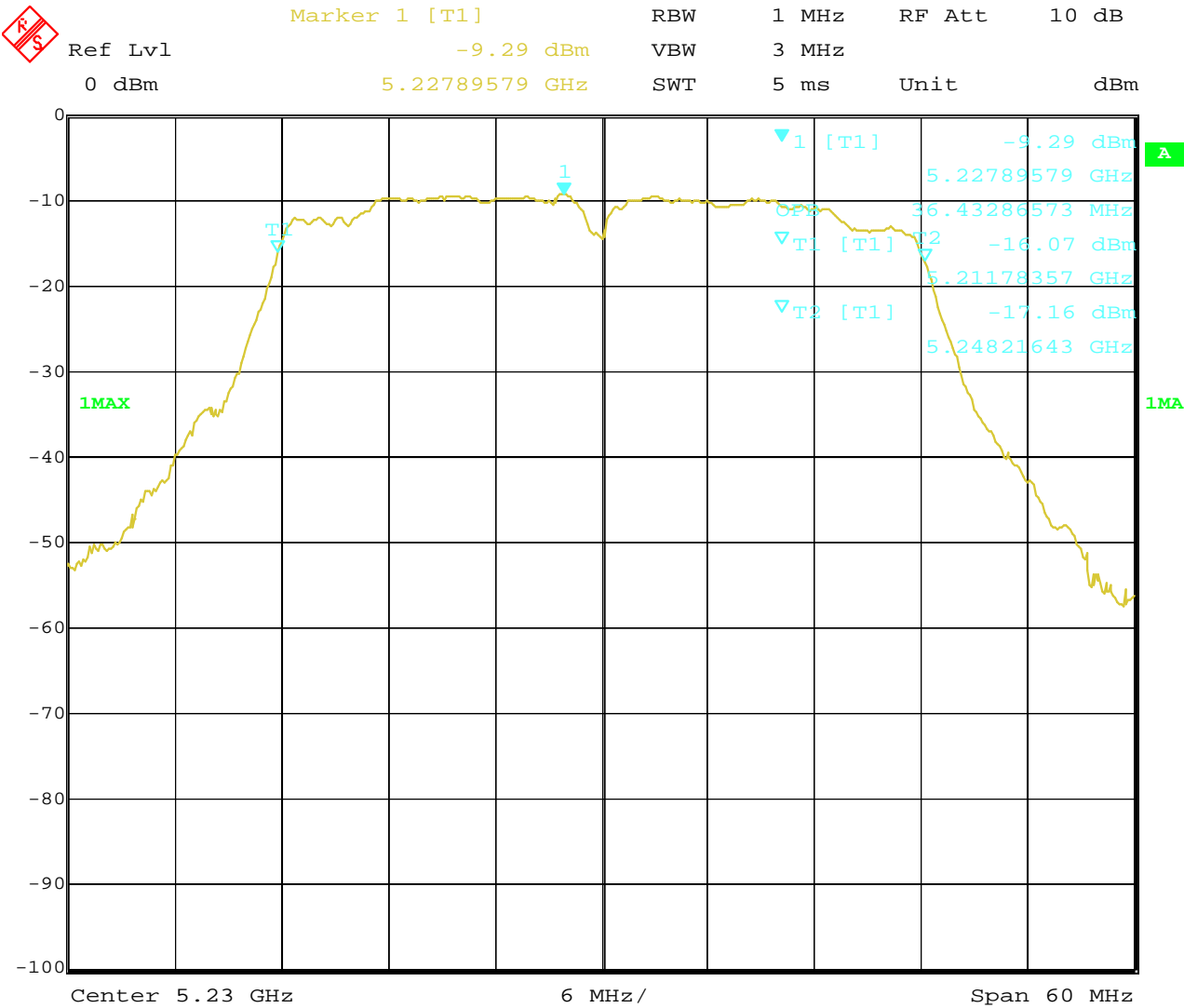


Date: 15.OCT.2020 10:12:52

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Channel 46



Date: 15.OCT.2020 10:10:20

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EUT	Laptop		Model	NP141AQ-T	
Mode	802.11ac VHT20		Test Voltage	DC7.6V	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
<b>26dB Bandwidth</b>					
36	5180	mcs0	23.65	--	Pass
40	5200	mcs0	23.65	--	Pass
48	5240	mcs0	23.97	--	Pass
<b>99% Bandwidth</b>					
36	5180	mcs0	17.80	--	Pass
40	5200	mcs0	17.80	--	Pass
48	5240	mcs0	17.80	--	Pass

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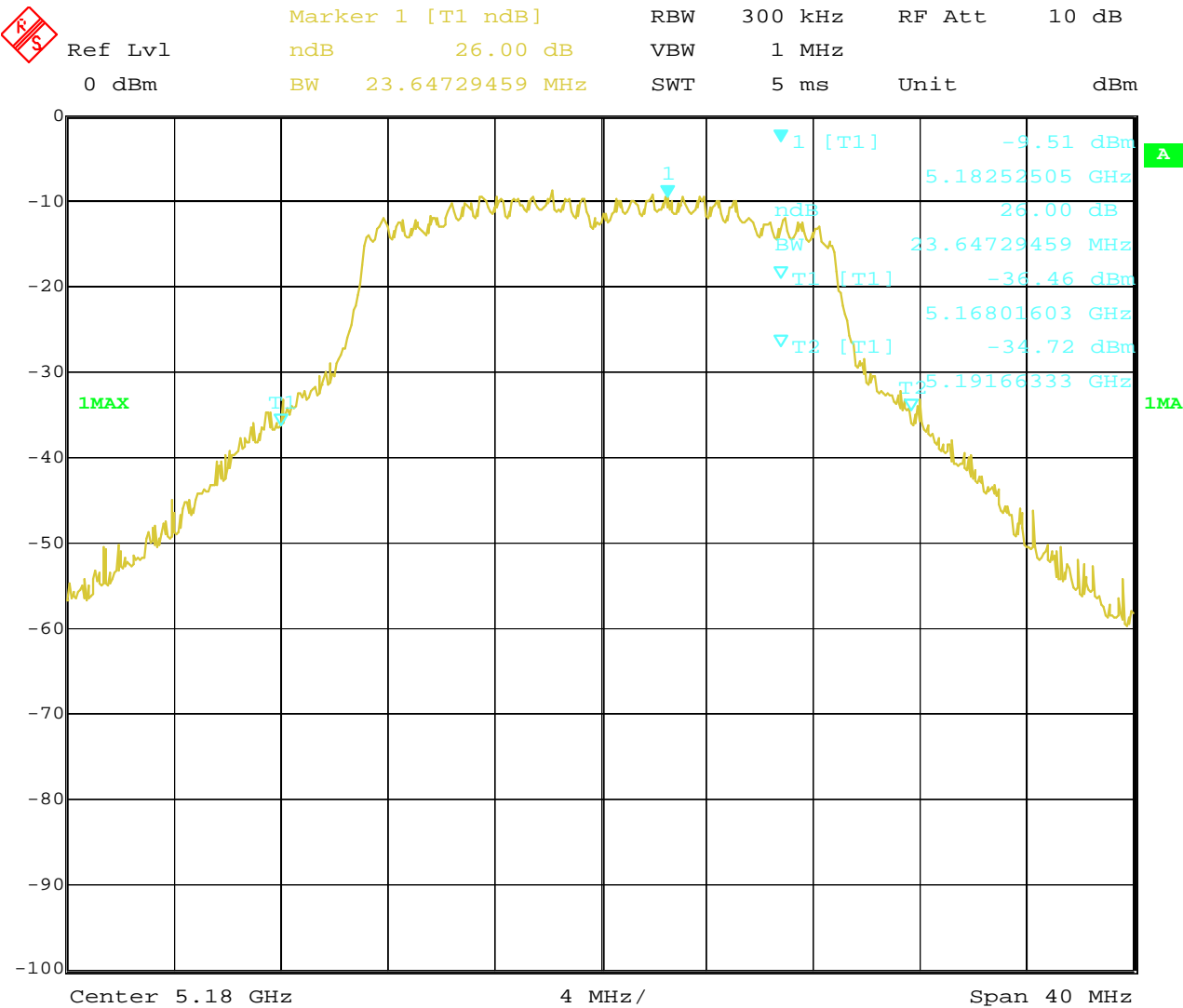
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Test Configure

26dB Bandwidth

Channel 36

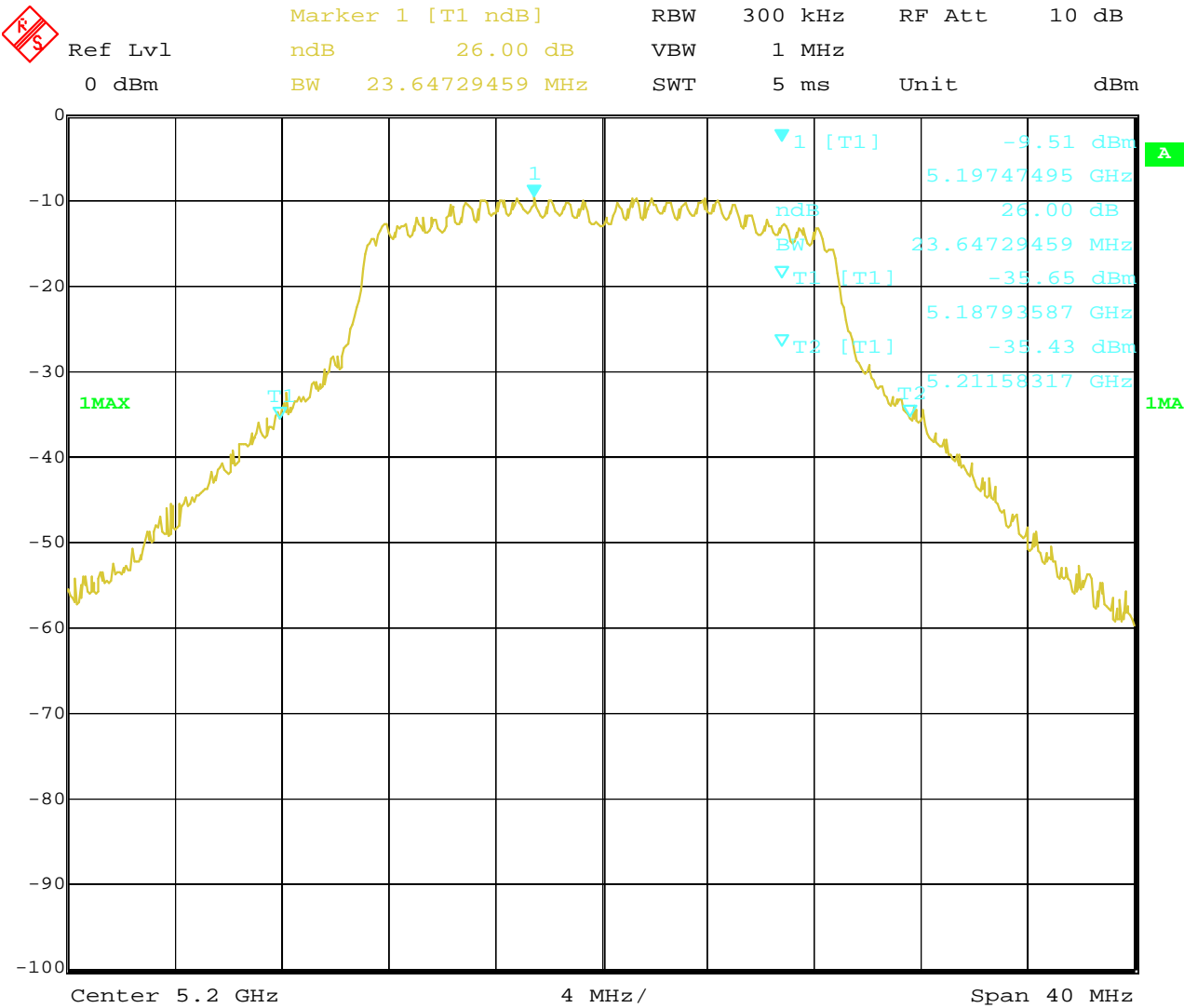


Date: 15.OCT.2020 10:15:48

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Channel 40

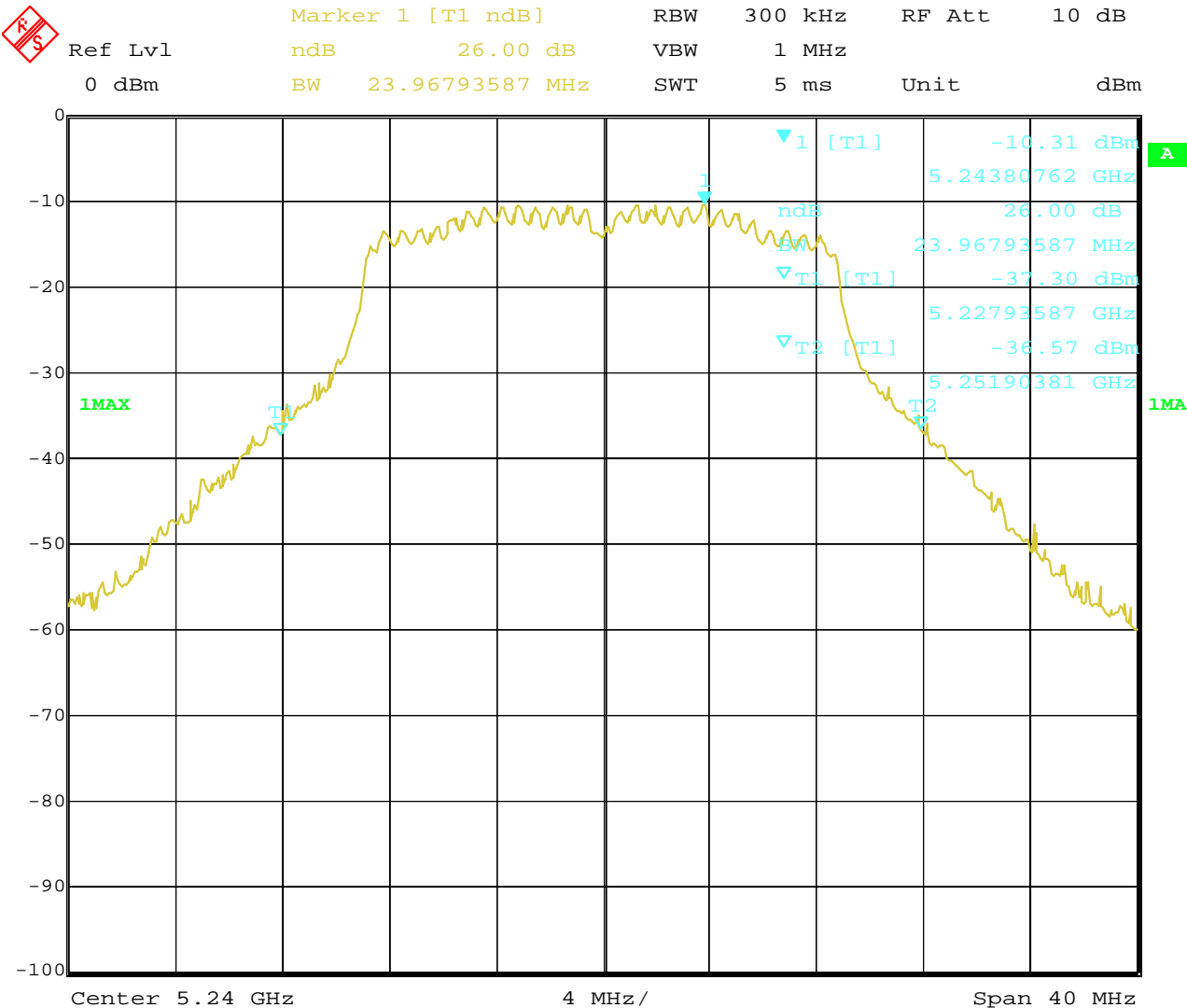


Date: 15.OCT.2020 10:18:39

The report refers only to the sample tested and does not apply to the bulk.  
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Channel 48



Date: 15.OCT.2020 10:28:08

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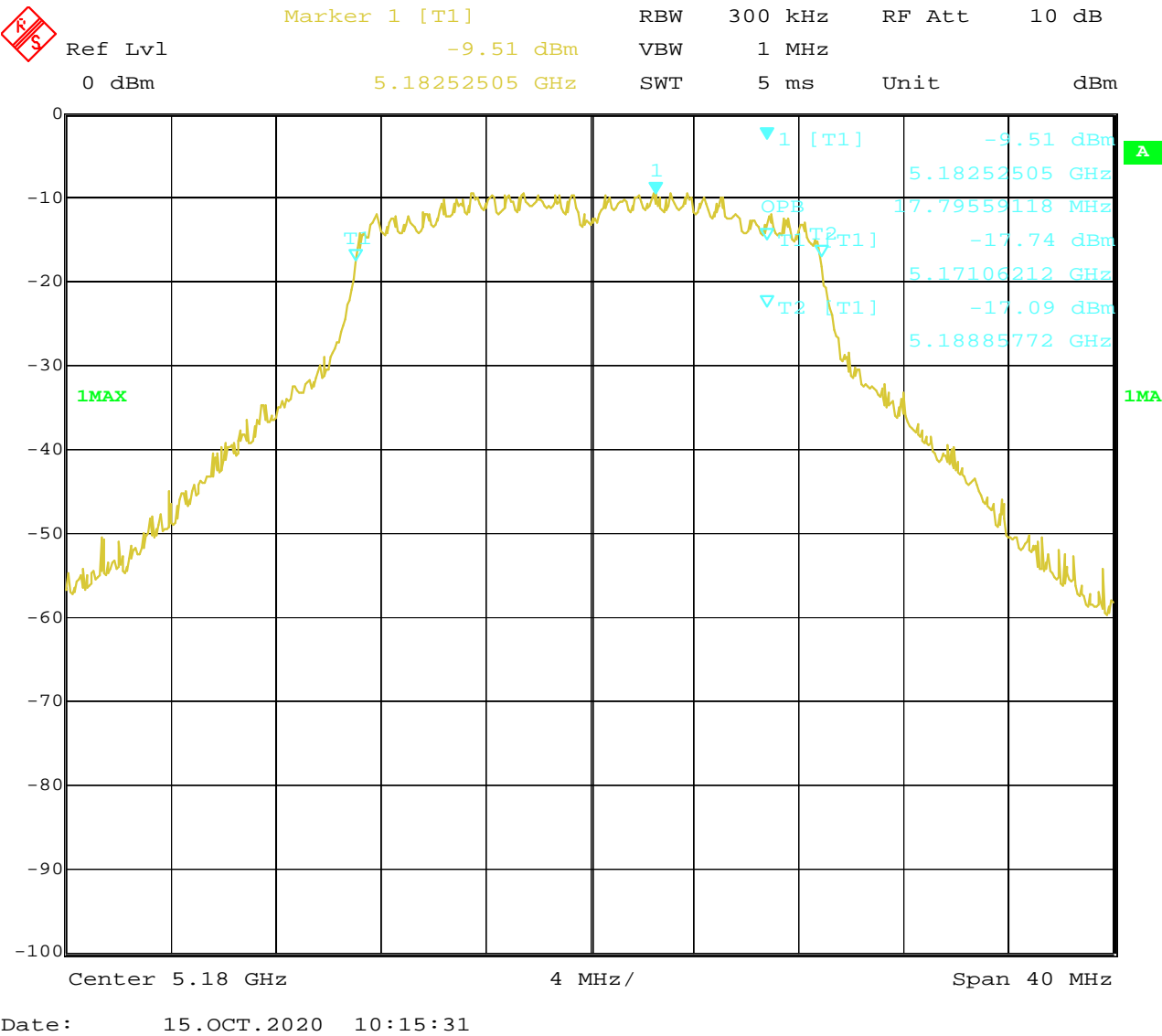




Test Configure

99% Bandwidth

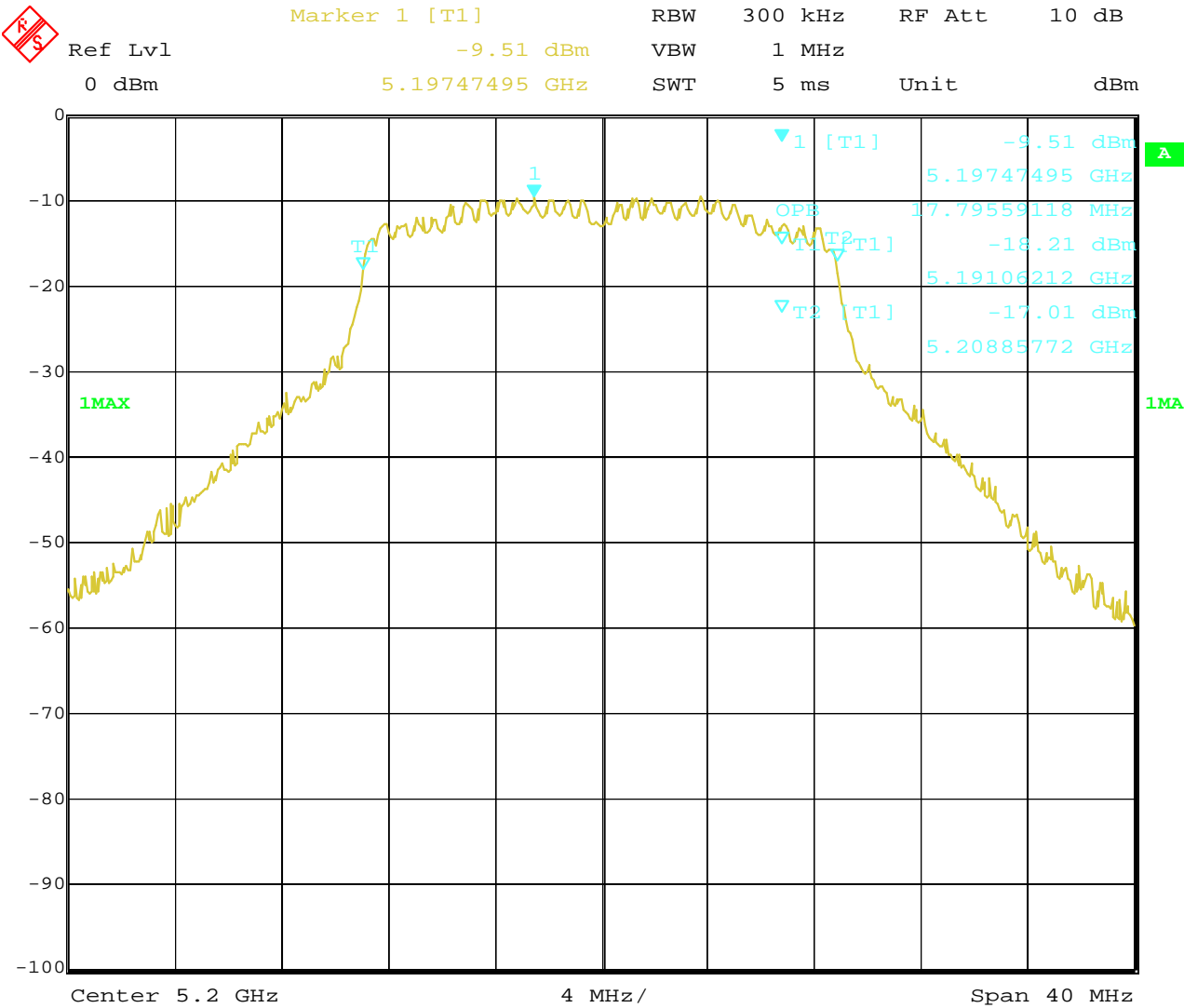
Channel 36



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Channel 40

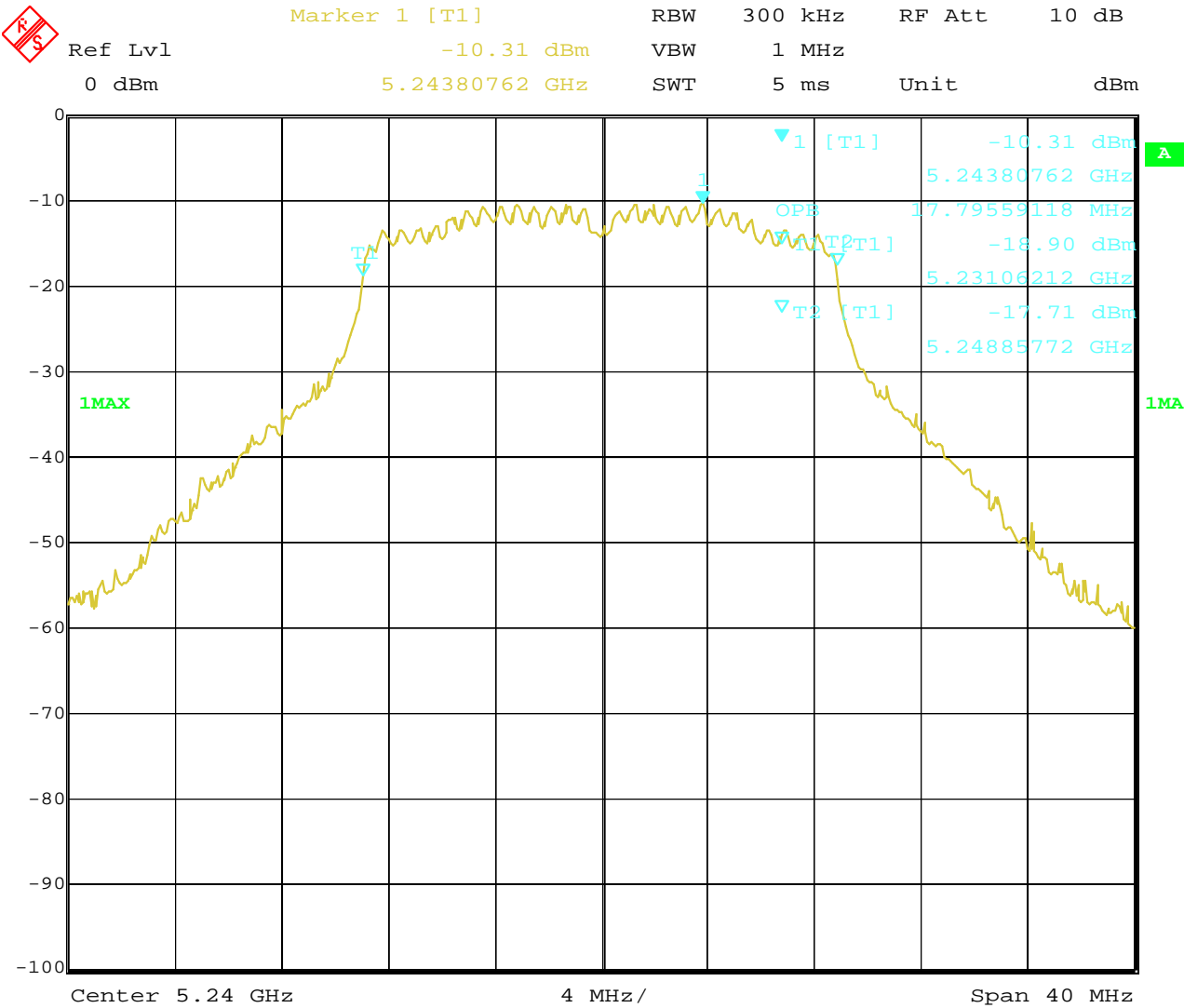


Date: 15.OCT.2020 10:18:52

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Channel 48



Date: 15.OCT.2020 10:27:51

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EUT	Laptop		Model	NP141AQ-T	
Mode	802.11ac VHT40		Test Voltage	DC7.6V	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
<b>26dB Bandwidth</b>					
38	5190	mcs0	42.93	--	Pass
46	5230	mcs0	43.41	--	Pass
<b>99% Bandwidth</b>					
38	5190	mcs0	36.43	--	Pass
46	5230	mcs0	36.43	--	Pass

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

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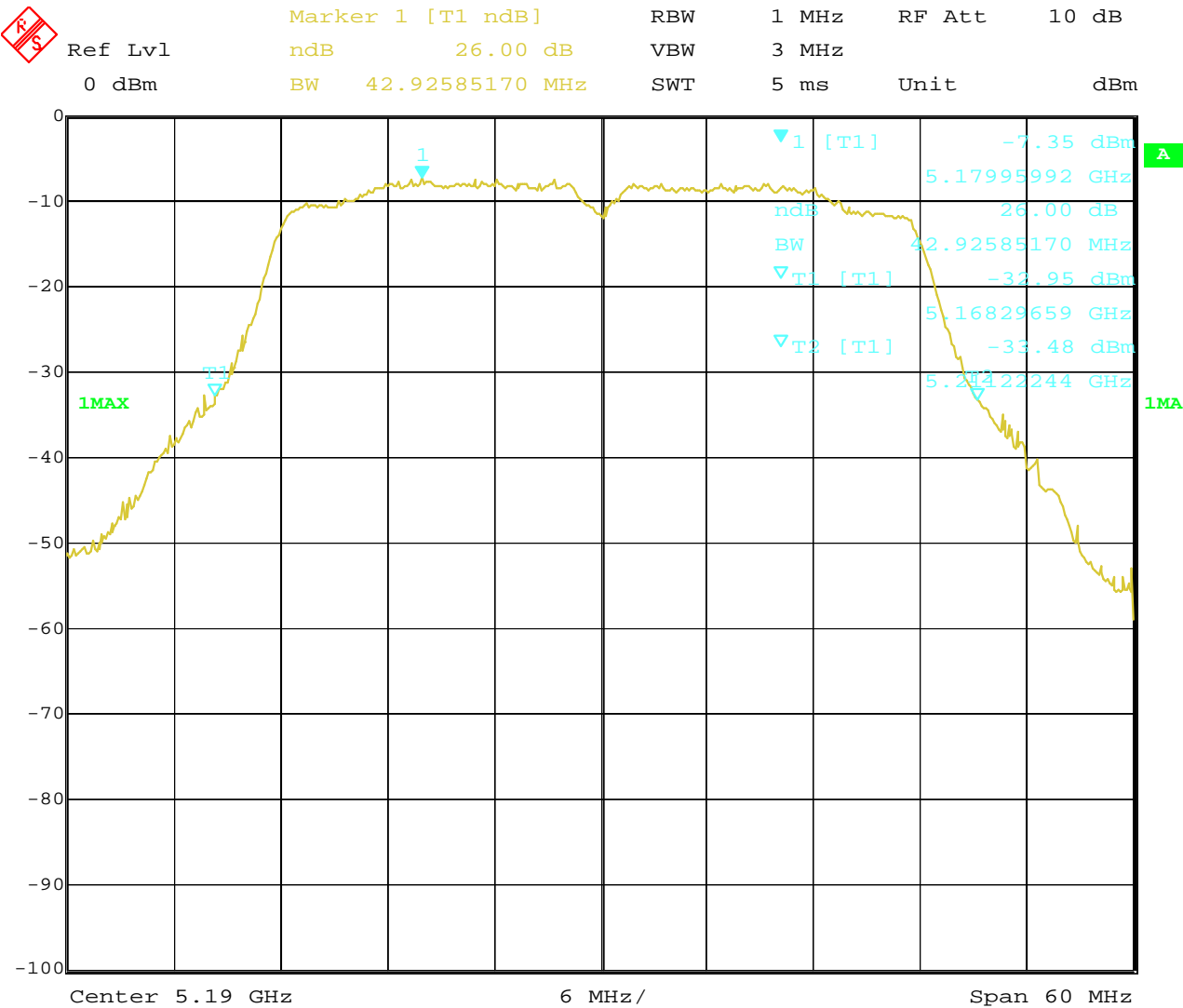
In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES, reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.



Test Configure

26dB Bandwidth

Channel 38

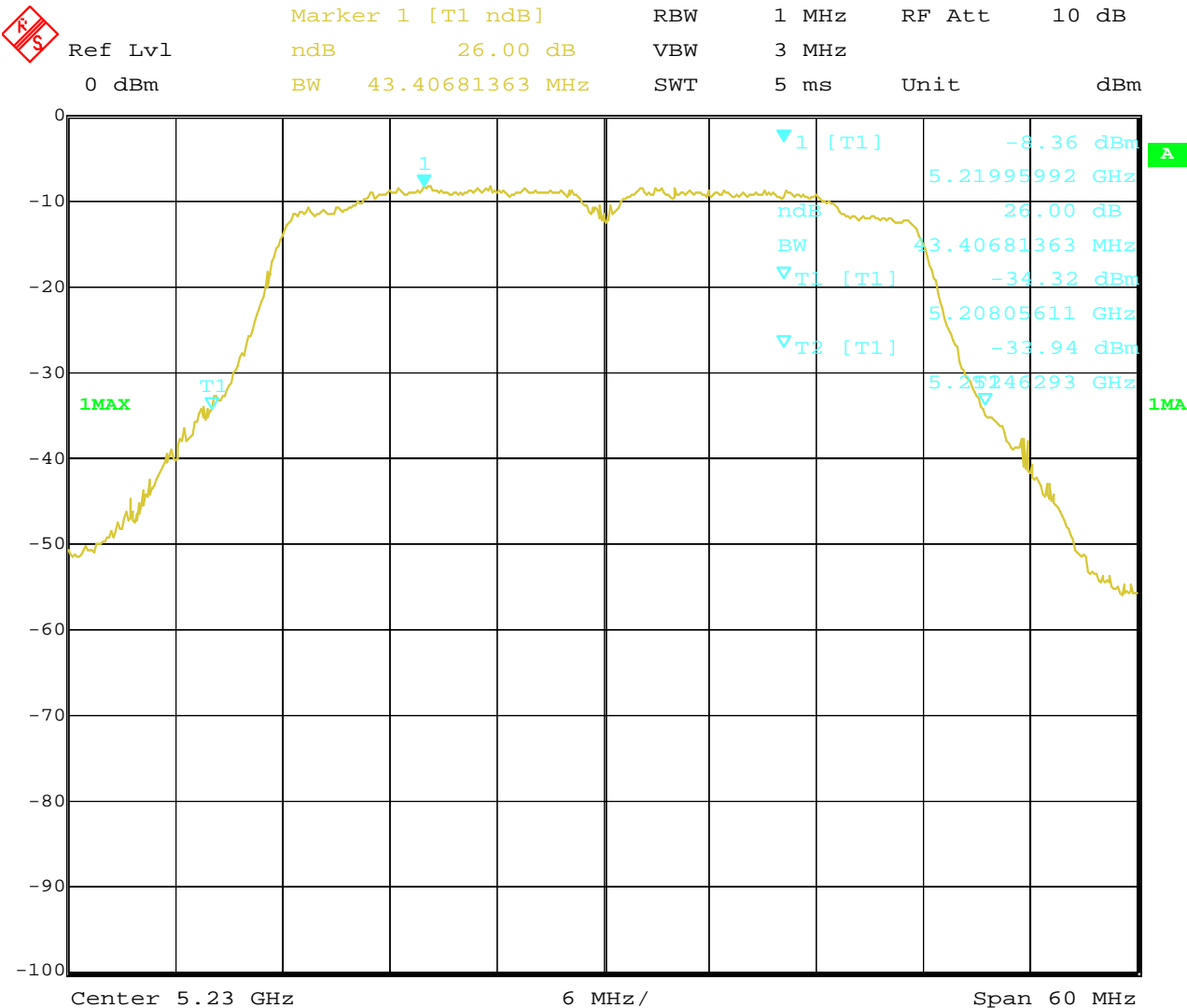


Date: 15.OCT.2020 10:31:05

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Channel 46



Date: 15.OCT.2020 10:34:53

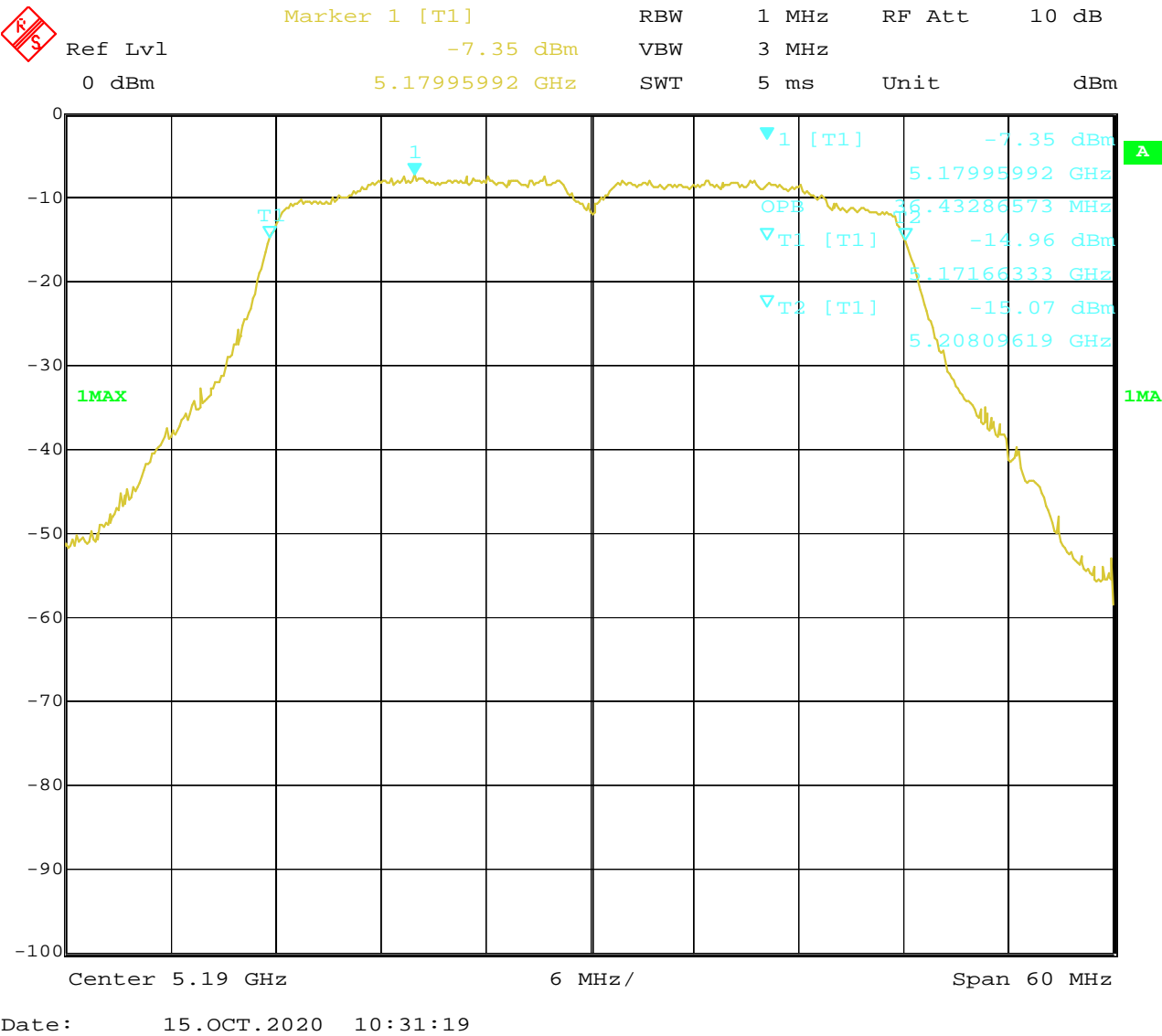
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Test Configure

99% Bandwidth

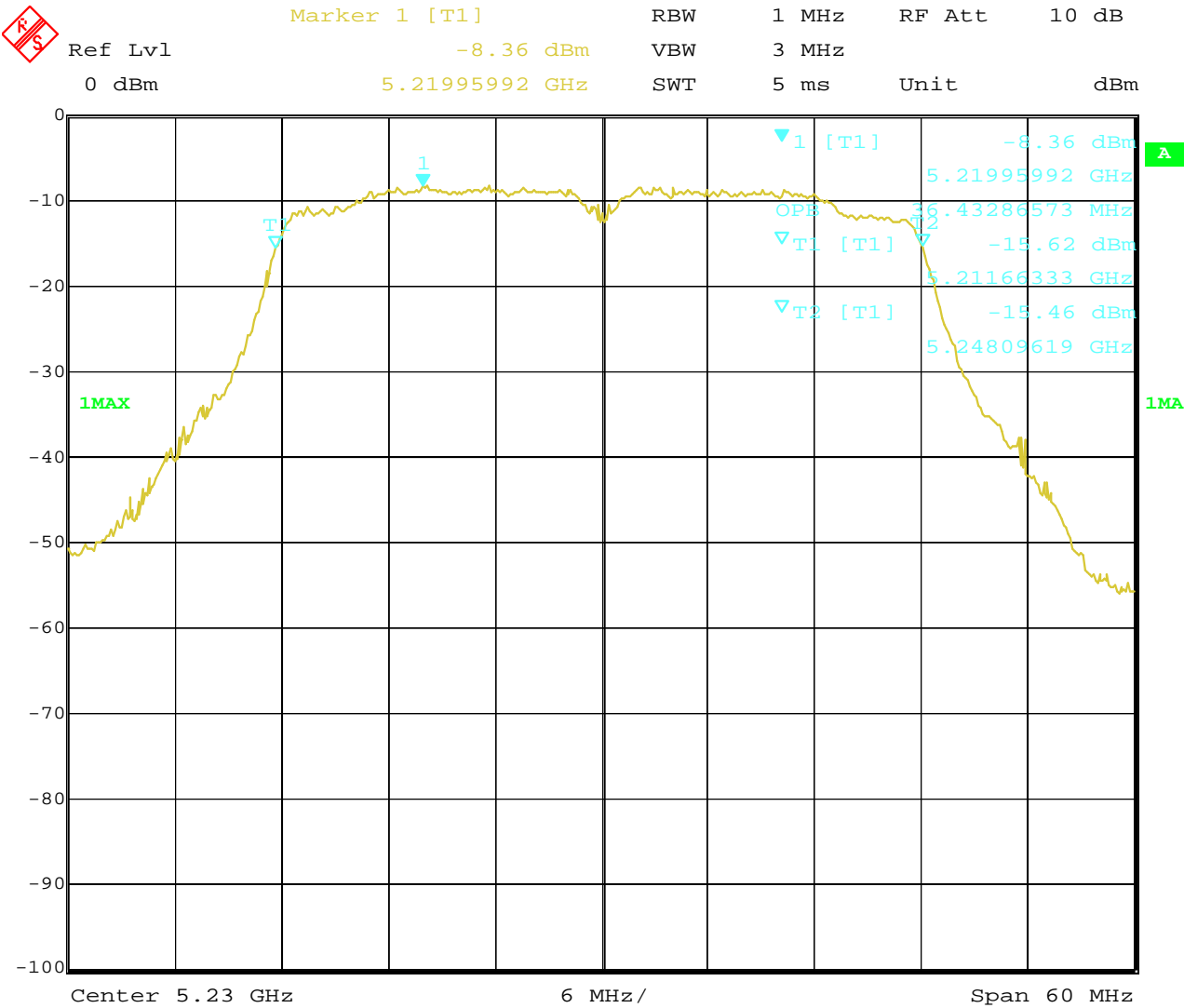
Channel 38



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Channel 46



Date: 15.OCT.2020 10:34:35

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EUT	Laptop		Model	NP141AQ-T	
Mode	802.11ac VHT80		Test Voltage	DC7.6V	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
<b>26dB Bandwidth</b>					
42	5210	23.9	82.24	--	Pass
<b>99% Bandwidth</b>					
42	5210	23.9	75.27	--	Pass

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

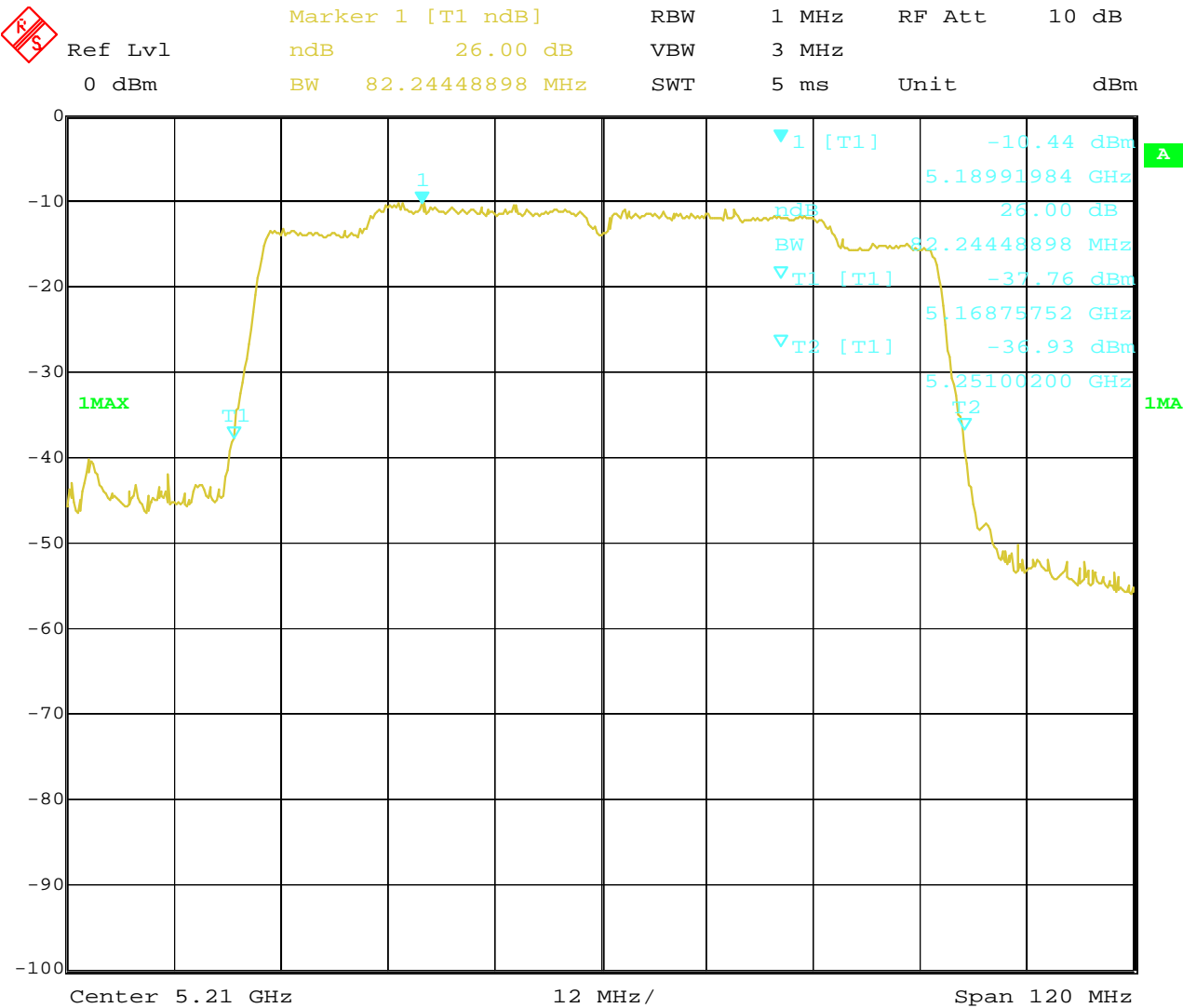
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Test Configure

26dB Bandwidth

Channel 42



Date: 15.OCT.2020 13:10:05

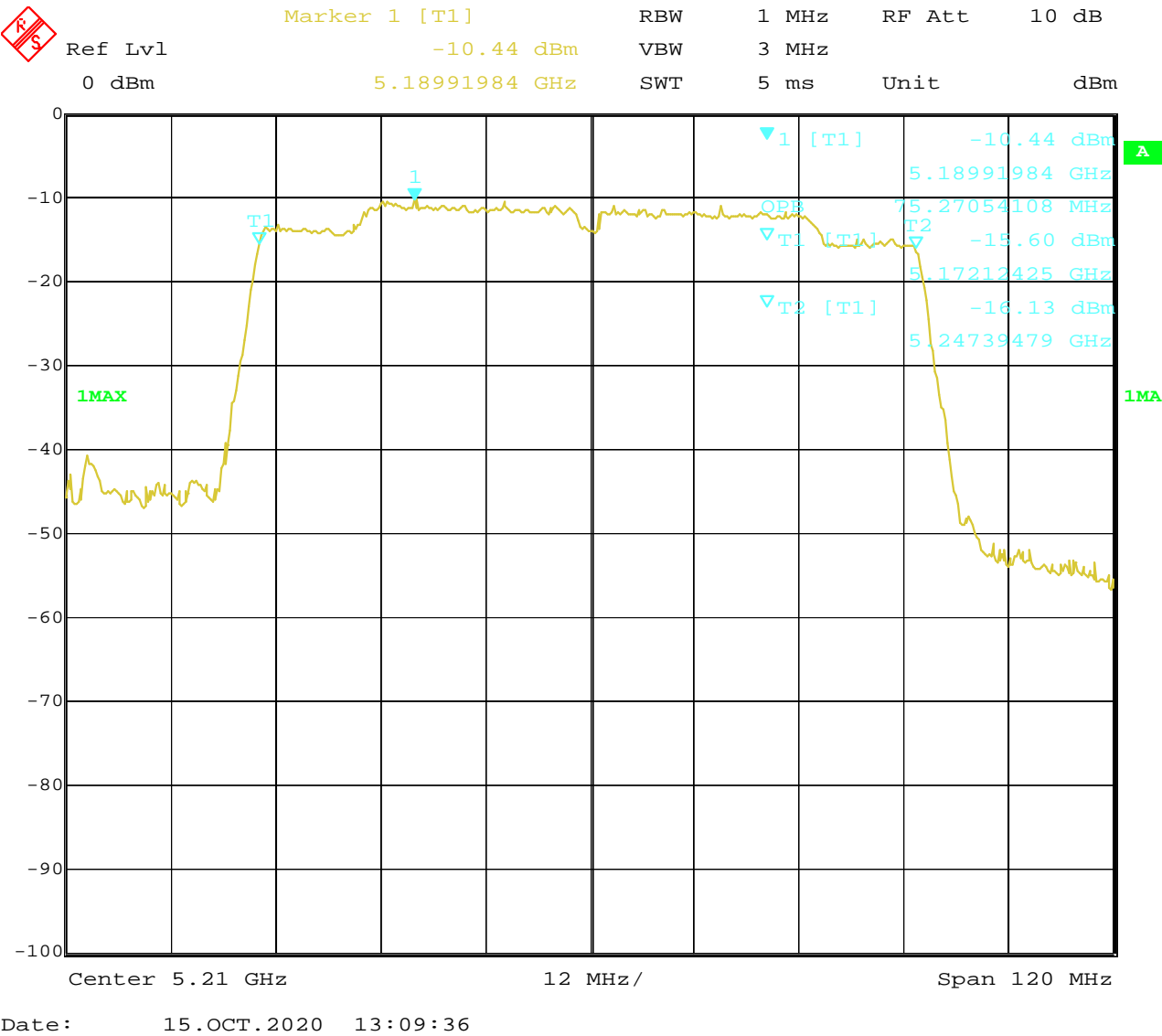
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Test Configure

99% Bandwidth

Channel 42

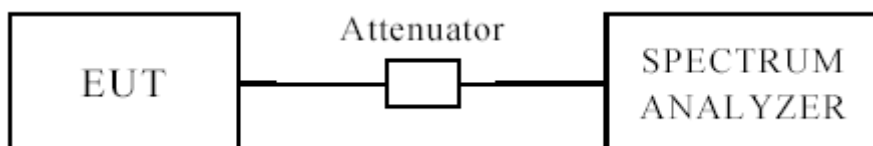


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## 8.0 Peak Transmit Power Measurement

### 8.1 Test Setup



### 8.2 Limits of Peak Transmit Power Measurement

Operation Band	EUT Category	Limit
U-NII-2A		For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10} B^*$ , dBm, whichever is less
	√	For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B^*$ , dBm, whichever power is less

Note: 1. Where B is the 99% emission bandwidth in MHz.

2. EIRP was measured,  $EIRP = AV \text{ Power} + \text{Antenna Gain}$

U-NII-2A	--	250mW (24 dBm) or $11 \text{ dBm} + 10 \log B^*$
U-NII-2C	--	250mW (24 dBm) or $11 \text{ dBm} + 10 \log B^*$
U-NII-3	--	1 Watt (30 dBm)

Note: 1. Where B is the 26dB emission bandwidth in MHz.

2. The average power was measured

### 8.3 Test Procedure

The average 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		Laptop		Model		NP141AQ-T		
Mode		802.11a		Test Voltage		DC7.6V		
Temperature		24 deg. C,		Humidity		56% RH		
Channel	Frequency (MHz)	Ant 1 Power		Ant 2 Power		Total Power (dBm)	Limit (dBm)	Pass/ Fail
		dBm	mW	dBm	mW			
36	5180	-8.61	0.14	-8.69	0.14	-5.64	22.38	Pass
40	5200	-9.18	0.12	-9.23	0.12	-6.19	22.38	Pass
48	5240	-9.92	0.10	-9.97	0.10	-6.93	22.38	Pass

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:

Average Power Output = AV Power Reading + Cable loss + Attenuator

3. The worse case was recorded

EUT		Laptop		Model		NP141AQ-T		
Mode		802.11n HT20		Test Voltage		DC7.6V		
Temperature		24 deg. C,		Humidity		56% RH		
Channel	Frequency (MHz)	Ant 1 Power		Ant 2 Power		Total Power (dBm)	Limit (dBm)	Pass/ Fail
		dBm	mW	dBm	mW			
36	5180	-8.58	0.14	-8.64	0.14	-5.60	22.38	Pass
40	5200	-9.18	0.12	-9.27	0.12	-6.21	22.38	Pass
48	5240	-10.00	0.10	-10.13	0.10	-7.05	22.38	Pass

Note: 1. At final test to get the worst-case emission at mcs0 (6.5Mbps) for CH36, CH40, CH48, CH149, CH153 and CH161

2. The result basic equation calculation as follow:

Average Power Output = AV Power Reading + Cable loss + Attenuator

3. The worse case was recorded

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EUT		Laptop		Model		NP141AQ-T		
Mode		802.11n HT40		Test Voltage		DC7.6V		
Temperature		24 deg. C,		Humidity		56% RH		
Channel	Frequency (MHz)	Ant 1 Power		Ant 2 Power		Total Power (dBm)	Limit (dBm)	Pass/ Fail
		dBm	mW	dBm	mW			
38	5190	-9.56	0.11	-9.64	0.11	-6.59	23.01	Pass
46	5230	-10.97	0.08	-10.06	0.10	-7.48	23.01	Pass

- Note: 1. At final test to get the worst-case emission at mcs0 (13.5Mbps) for CH38, CH46, CH151 and CH159  
2. The result basic equation calculation as follow:  
Average Power Output = AV Power Reading + Cable loss + Attenuator  
3. The worse case was recorded

EUT		Laptop		Model		NP141AQ-T		
Mode		802.11ac VHT20		Test Voltage		DC7.6V		
Temperature		24 deg. C,		Humidity		56% RH		
Channel	Frequency (MHz)	Ant 1 Power		Ant 2 Power		Total Power (dBm)	Limit (dBm)	Pass/ Fail
		dBm	mW	dBm	mW			
36	5180	-8.92	0.13	-8.98	0.13	-5.94	22.58	Pass
40	5200	-9.51	0.11	-9.56	0.11	-6.52	22.58	Pass
48	5240	-10.08	0.10	-10.17	0.10	-7.11	22.58	Pass

- Note: 1. At final test to get the worst-case emission at mcs0 (6.5Mbps) for CH36, CH40, CH48, CH149, CH153 and CH161  
2. The result basic equation calculation as follow:  
Average Power Output = AV Power Reading + Cable loss + Attenuator  
3. The worse case was recorded

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EUT		Laptop		Model		NP141AQ-T		
Mode		802.11ac VHT40		Test Voltage		DC7.6V		
Temperature		24 deg. C,		Humidity		56% RH		
Channel	Frequency (MHz)	Ant 1 Power		Ant 2 Power		Total Power (dBm)	Limit (dBm)	Pass/ Fail
		dBm	mW	dBm	mW			
38	5190	-9.23	0.12	-9.30	0.12	-6.25	23.01	Pass
46	5230	-10.23	0.09	-10.34	0.09	-7.27	23.01	Pass

- Note: 1. At final test to get the worst-case emission at mcs0 (13.5Mbps) for CH38, CH46, CH151, and CH159  
2. The result basic equation calculation as follow:  
Average Power Output = AV Power Reading + Cable loss + Attenuator  
3. The worse case was recorded

EUT		Laptop		Model		NP141AQ-T		
Mode		802.11ac VHT80		Test Voltage		DC7.6V		
Temperature		24 deg. C,		Humidity		56% RH		
Channel	Frequency (MHz)	Ant 1 Power		Ant 2 Power		Total Power (dBm)	Limit (dBm)	Pass/ Fail
		dBm	mW	dBm	mW			
42	5210	-9.99	0.10	-10.10	0.10	-7.03	23.01	Pass

- Note: 1. At final test to get the worst-case emission at 23.9Mbps for CH42 and CH155  
2. The result basic equation calculation as follow:  
Average Power Output = AV Power Reading + Cable loss + Attenuator  
3. The worse case was recorded

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

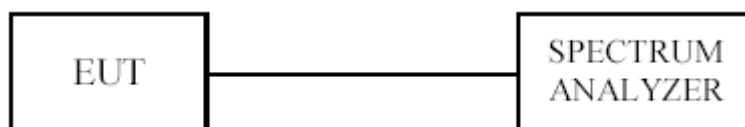
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## 9. Power Spectral Density Measurement

### 9.1 Test Setup



### 9.2 Limits of Power Spectral Density Measurement

Operation Band	Limit
U-NII-1	10dBm/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	Laptop		Model	NP141AQ-T		
Mode	802.11a 6Mbps		Test Voltage	DC7.6V		
Temperature	24 deg. C,		Humidity	56% RH		
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)	Factor	Total Spectral Density (dBm/MHz)	Limit (dBm)	Pass/ Fail
36	5180	-17.55	3.01	-14.54	10	Pass
40	5200	-18.43	3.01	-15.42	10	Pass
48	5240	-18.83	3.01	-15.82	10	Pass

Note: 1. Total Power Spectral Density = Ant1 Power Spectral Density + Factor

2. Factor=10log2=3.01

3. Ant1 and Ant 2 were tested and Ant 1 was the worst case

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

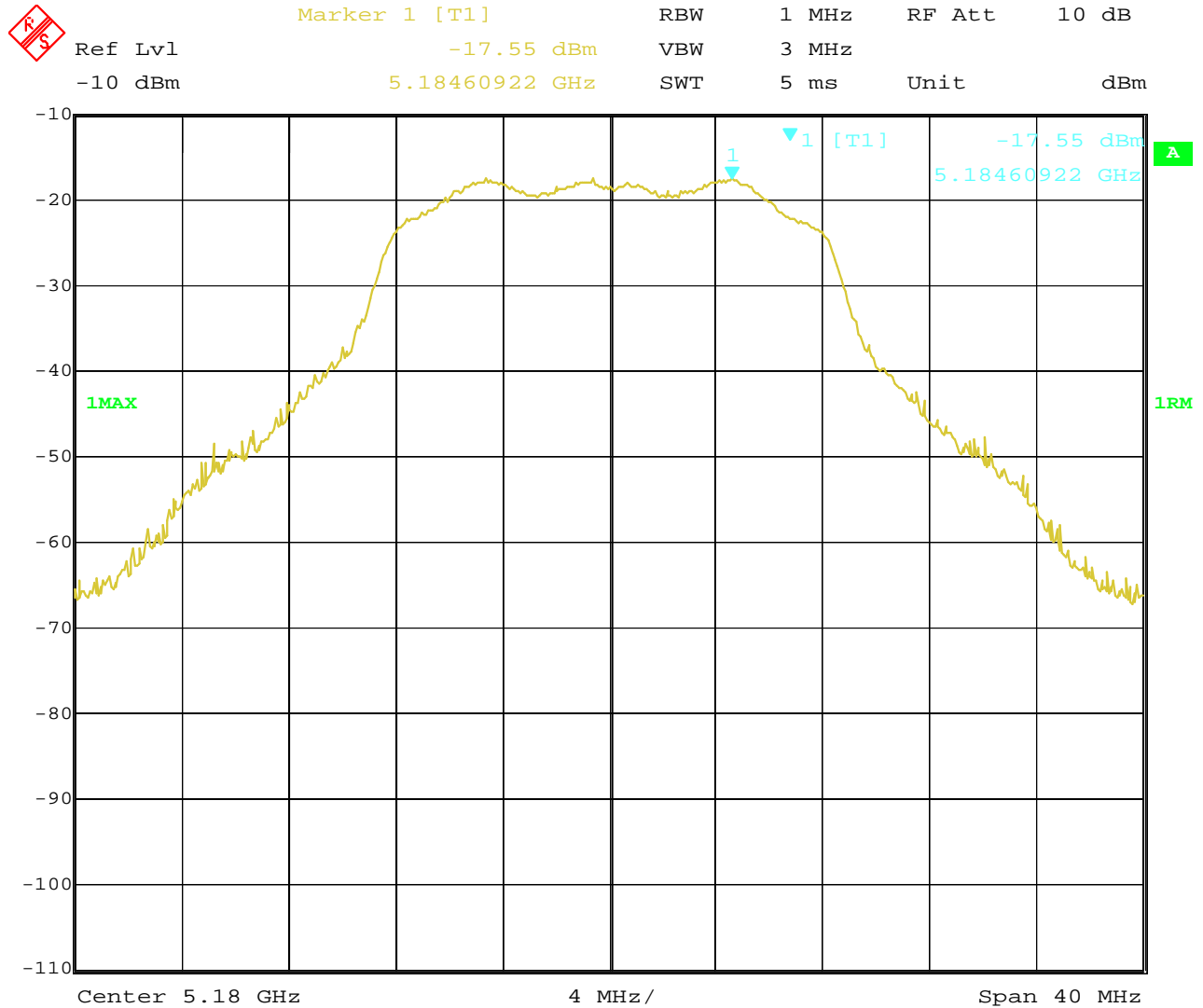
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### 9.5 Plots of Power Spectral Density Measurement

1.802.11a at 6Mbps of CH36



Date: 16.OCT.2020 10:57:03

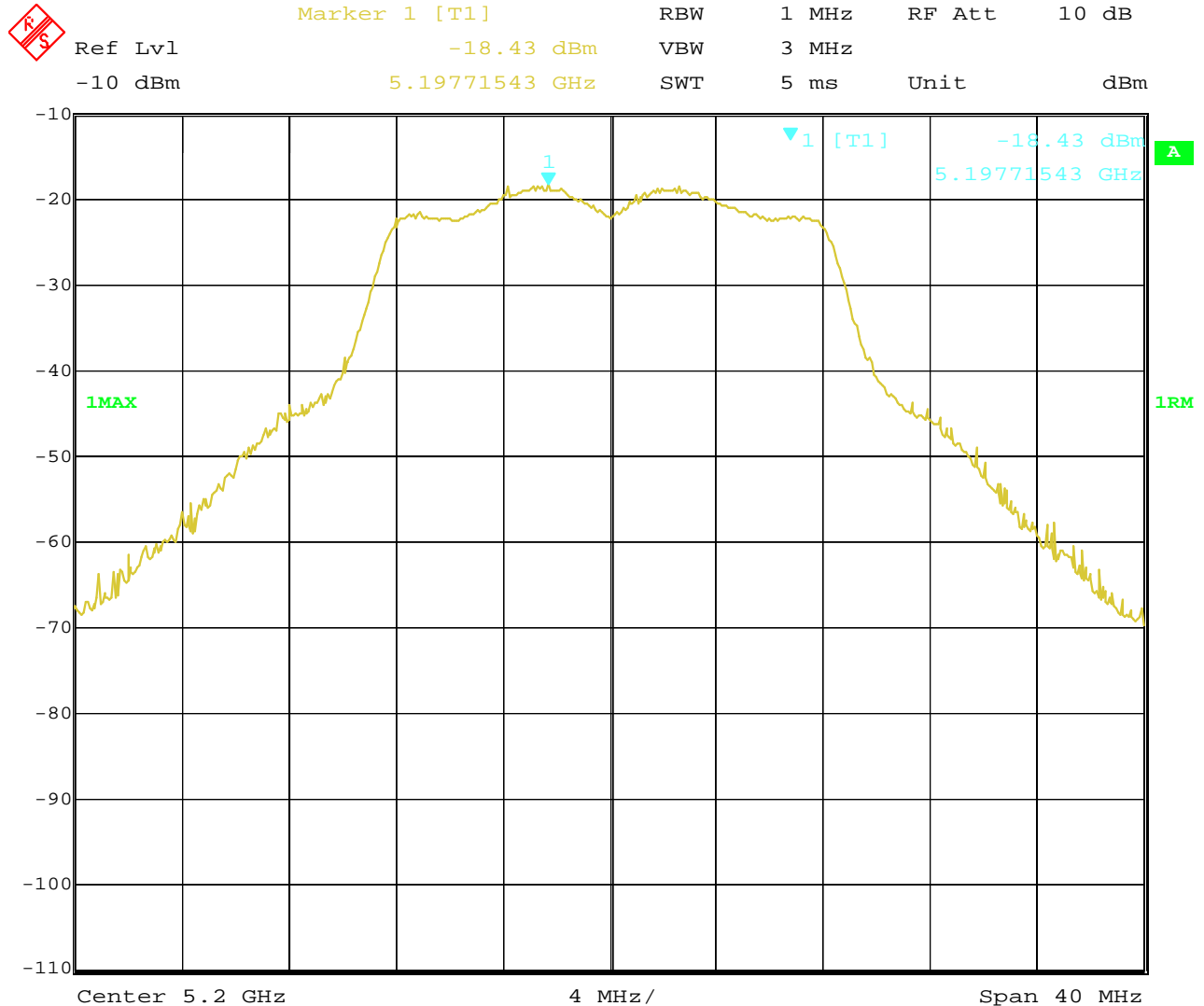
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2.802.11a at 6Mbps of CH40



Date: 16.OCT.2020 10:58:21

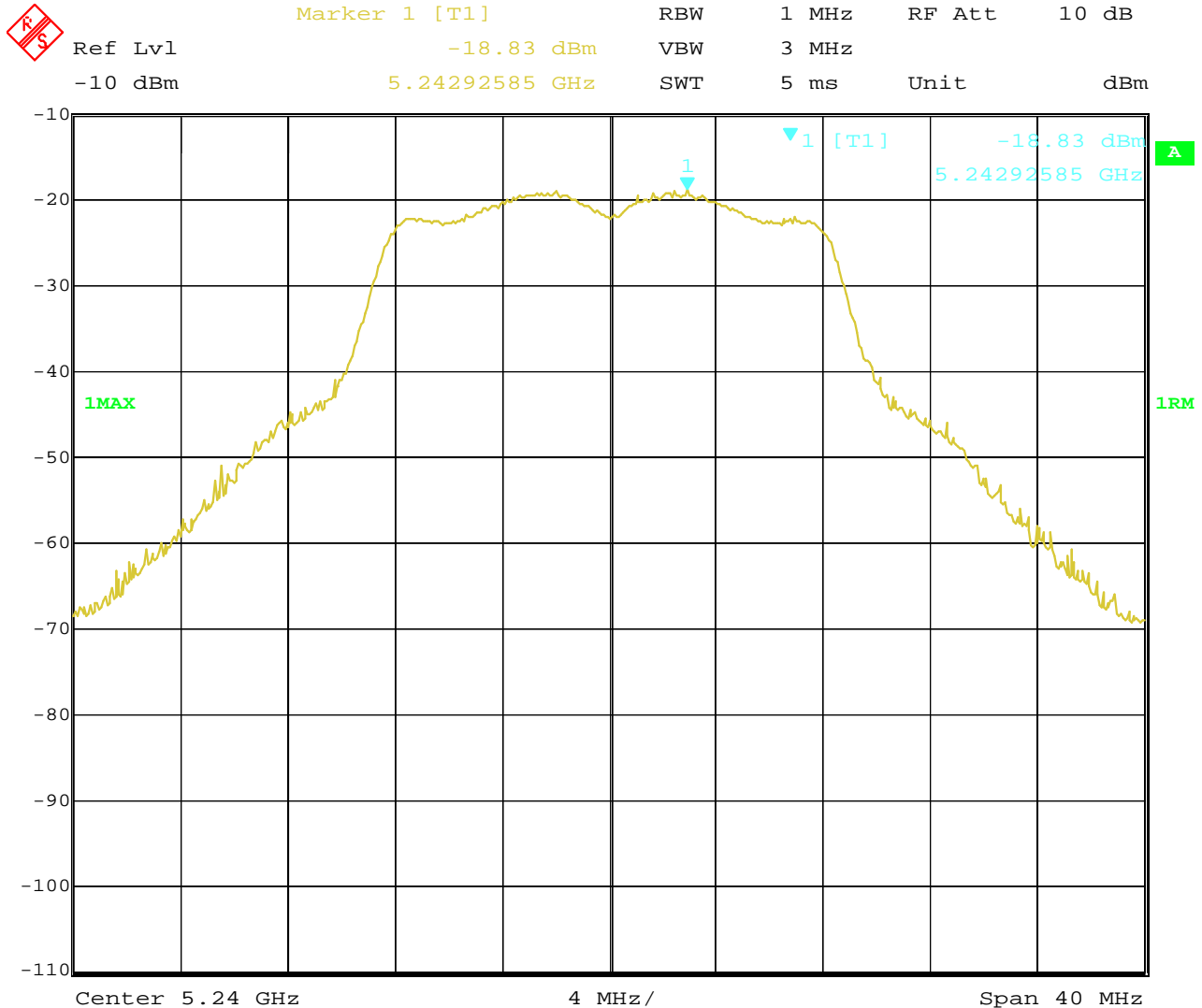
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3.802.11a at 6Mbps of CH48



Date: 16.OCT.2020 10:59:10

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EUT		Laptop		Model		NP141AQ-T	
Mode		802.11n HT20 mcs0		Test Voltage		DC7.6V	
Temperature		24 deg. C,		Humidity		56% RH	
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)	Factor	Total Spectral Density (dBm/MHz)	Limit (dBm)	Pass/ Fail	
36	5180	-18.08	3.01	-15.07	10	Pass	
40	5200	-18.15	3.01	-15.14	10	Pass	
48	5240	-18.50	3.01	-15.49	10	Pass	

Note: 1. Total Power Spectral Density = Ant1 Power Spectral Density + Factor

2. Factor= $10\log 2=3.01$

3. Ant1 and Ant 2 were tested and Ant 1 was the worst case

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

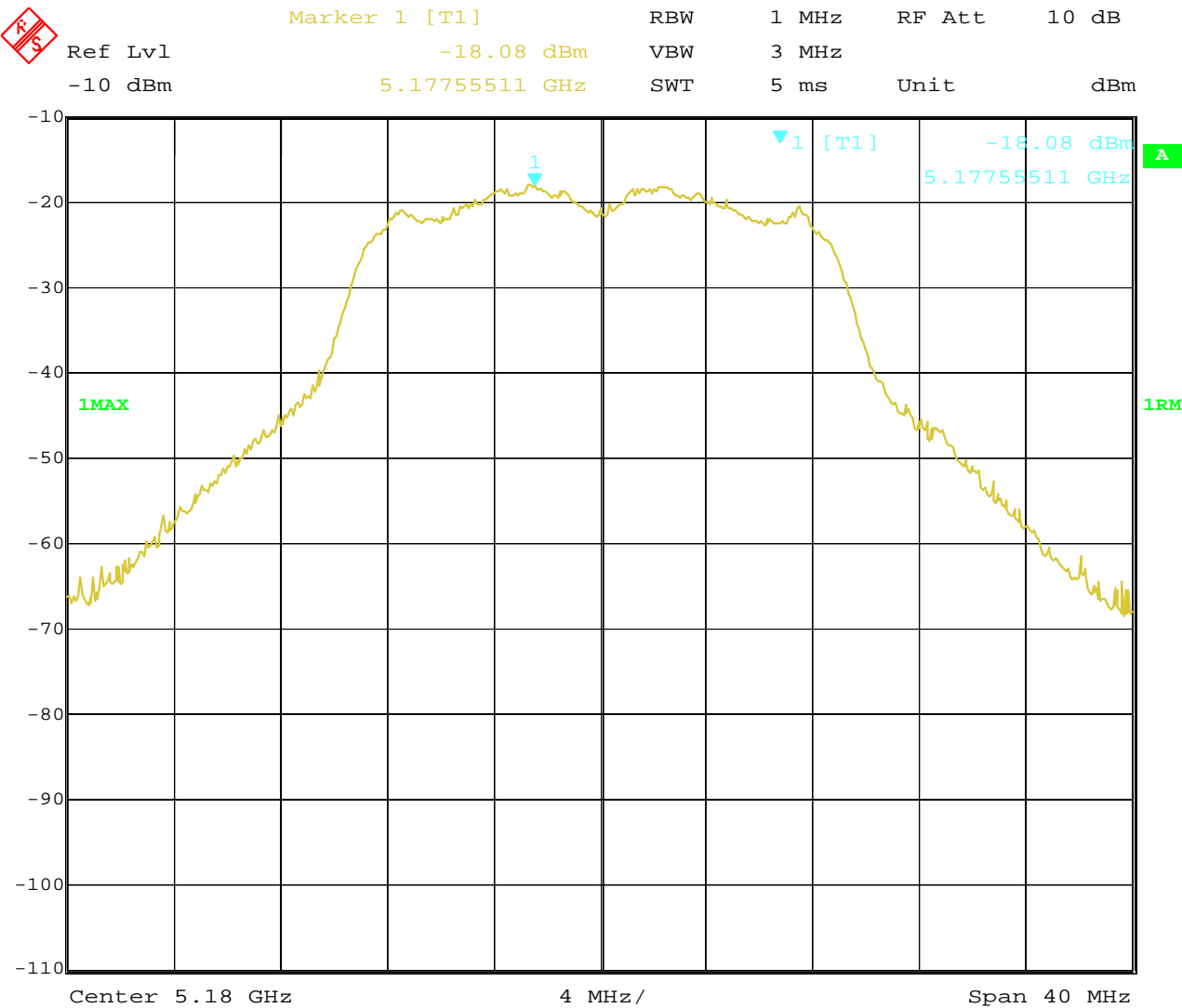
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Test Plots

1.802.11n at mcs0 of CH36

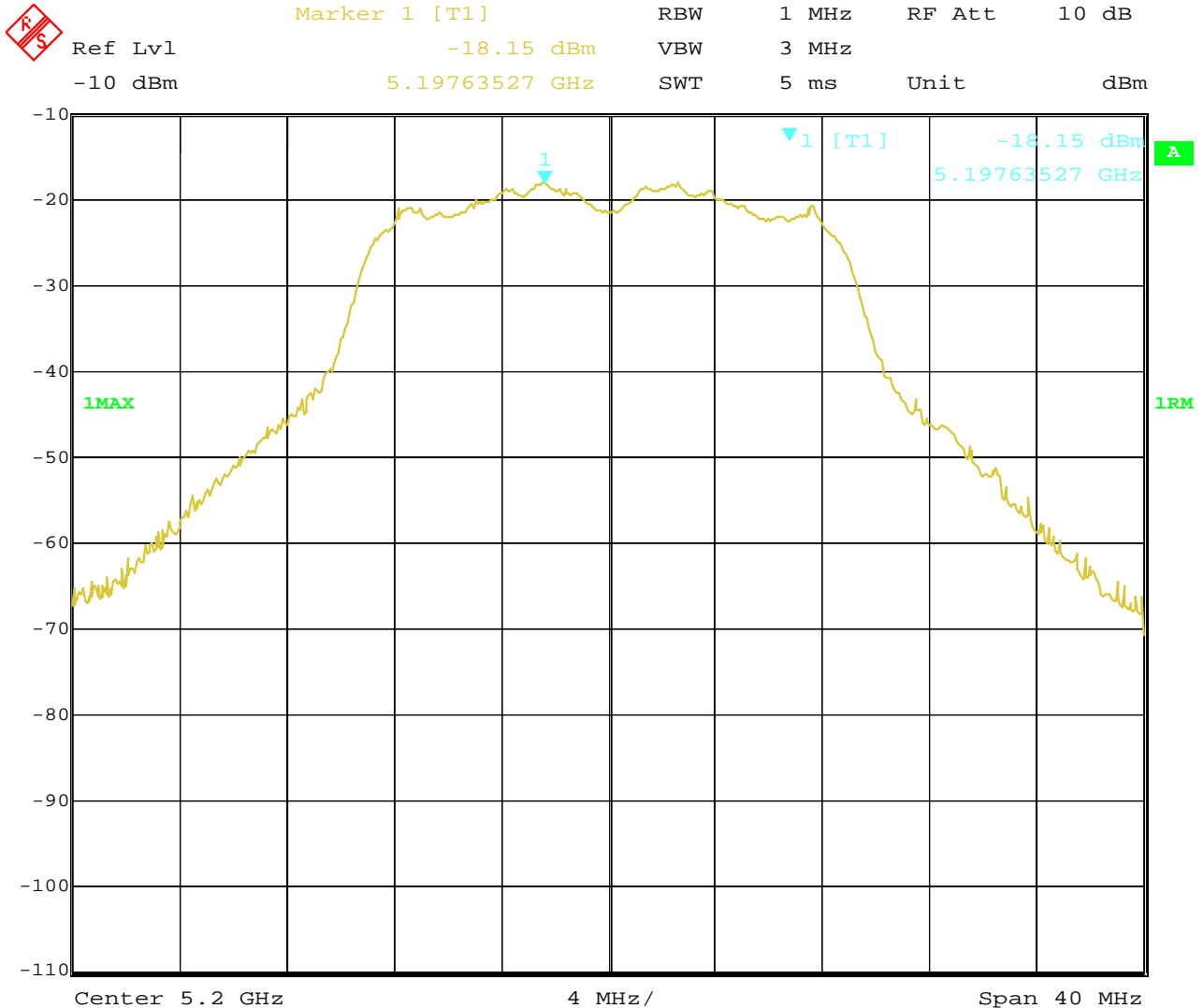


Date: 16.OCT.2020 11:06:57

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2.802.11n at mcs0 of CH40



Date: 16.OCT.2020 11:04:51

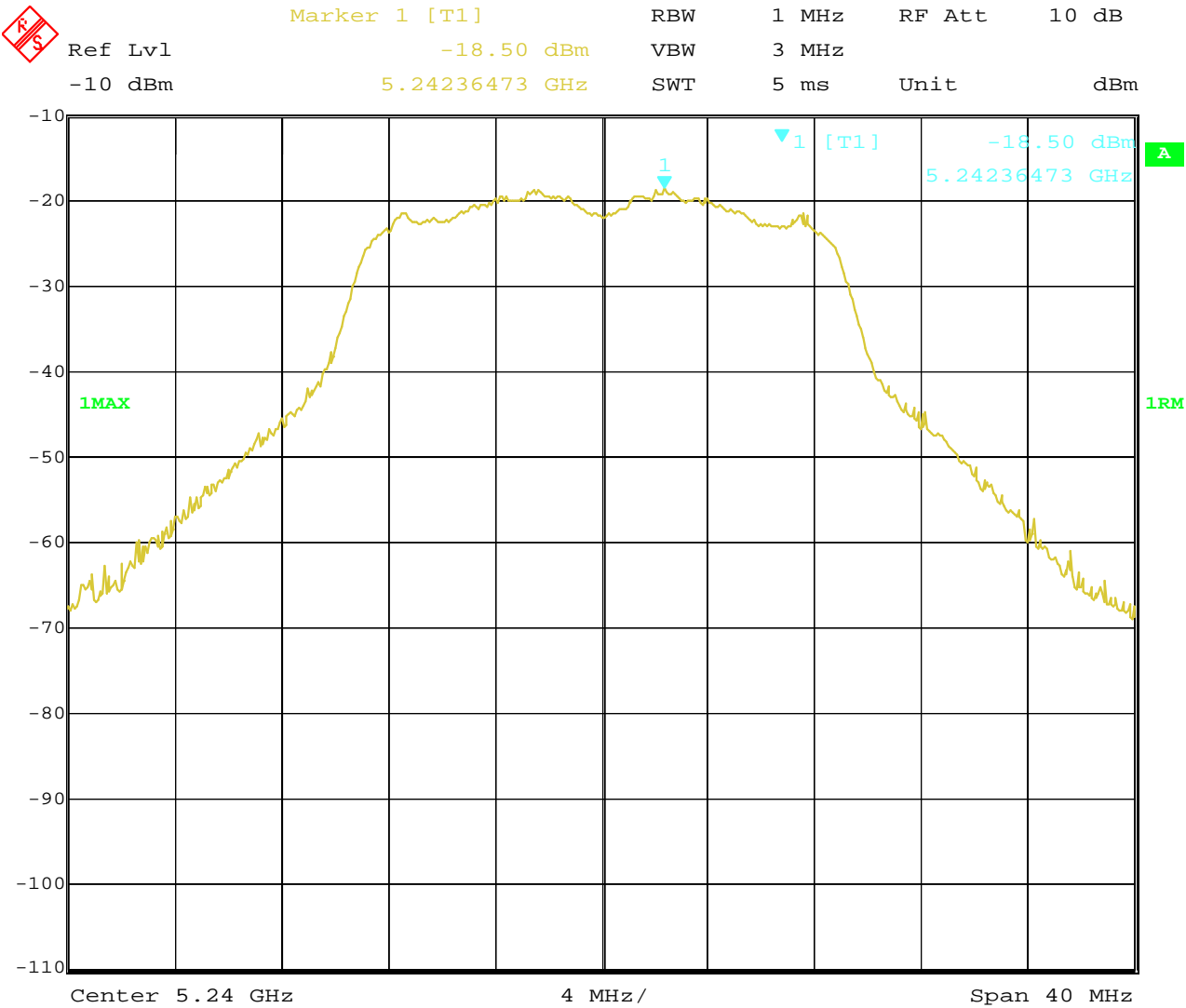
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3.802.11n at mcs0 of CH48



Date: 16.OCT.2020 11:02:21

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EUT		Laptop		Model		NP141AQ-T	
Mode		802.11n HT40 mcs0		Test Voltage		DC7.6V	
Temperature		24 deg. C,		Humidity		56% RH	
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)	Factor	Total Spectral Density (dBm/MHz)	Limit (dBm)	Pass/ Fail	
38	5190	-21.68	3.01	-18.67	10	Pass	
46	5230	-21.06	3.01	-18.05	10	Pass	

- Note: 1. Total Power Spectral Density = Ant1 Power Spectral Density + Factor  
2. Factor= $10\log 2=3.01$   
3. Ant1 and Ant 2 were tested and Ant 1 was the worst case

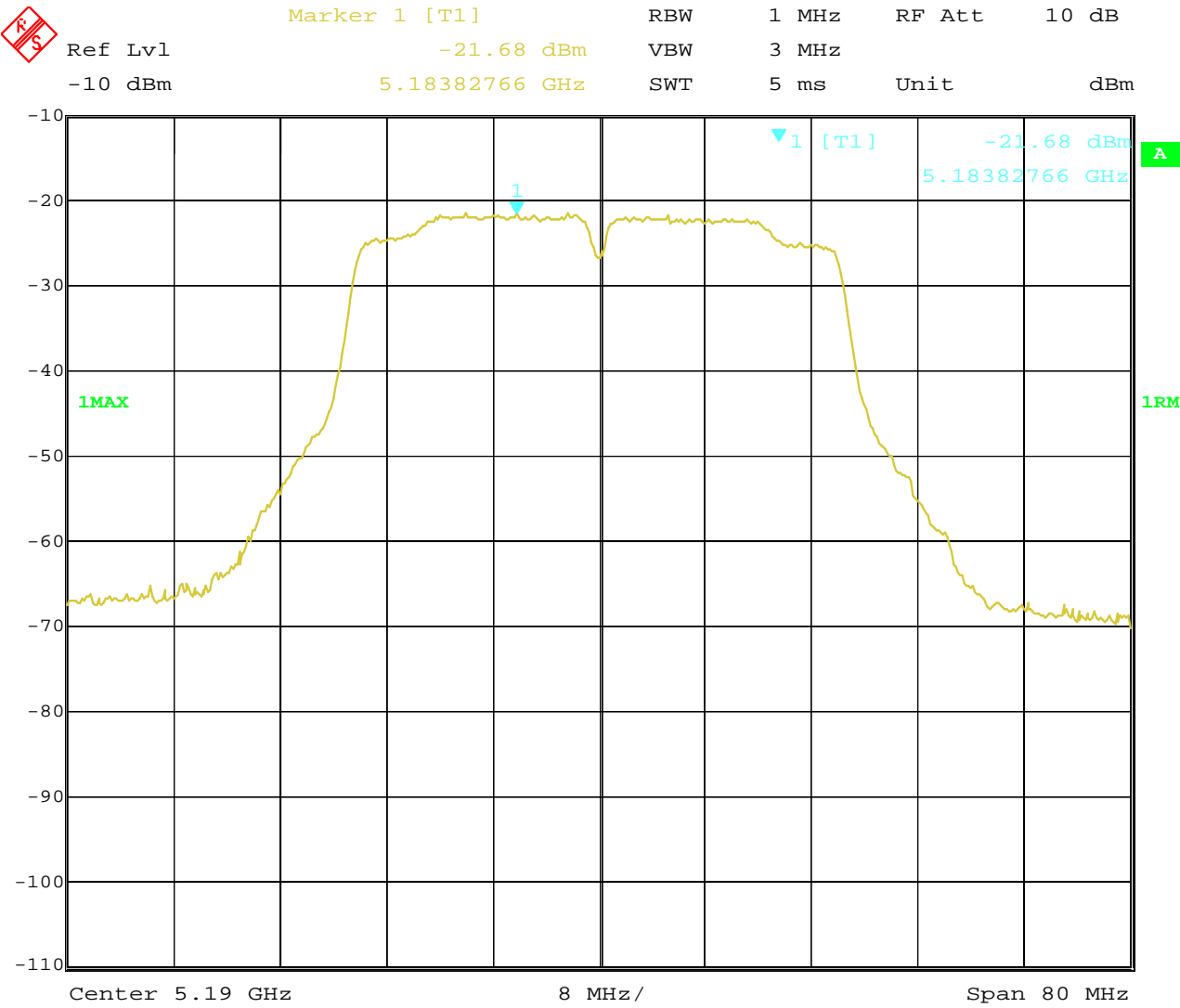
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Test Plots

1.802.11n HT40 at mcs0 of CH38

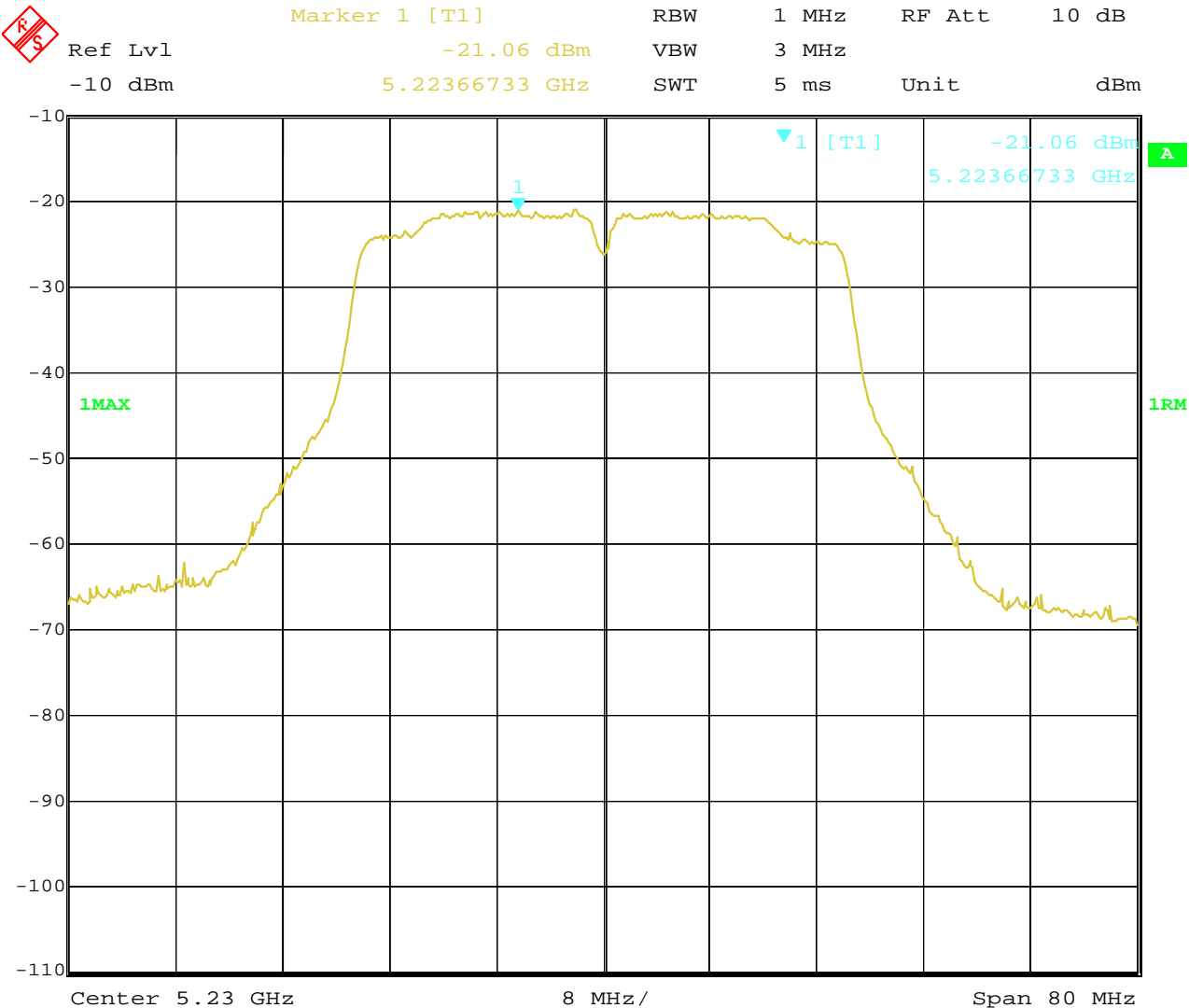


Date: 16.OCT.2020 11:11:18

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2.802.11n HT40 at mcs0 of CH46



Date: 16.OCT.2020 11:10:35

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EUT		Laptop		Model		NP141AQ-T	
Mode		802.11ac VHT20		Test Voltage		DC7.6V	
Temperature		24 deg. C,		Humidity		56% RH	
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)	Factor	Total Spectral Density (dBm/MHz)	Limit (dBm)	Pass/ Fail	
36	5180	-18.14	3.01	-15.13	10	Pass	
40	5200	-19.74	3.01	-16.73	10	Pass	
48	5240	-19.47	3.01	-16.46	10	Pass	

Note: 1. Total Power Spectral Density = Ant1 Power Spectral Density + Factor

2. Factor= $10\log 2=3.01$

3. Ant1 and Ant 2 were tested and Ant 1 was the worst case

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

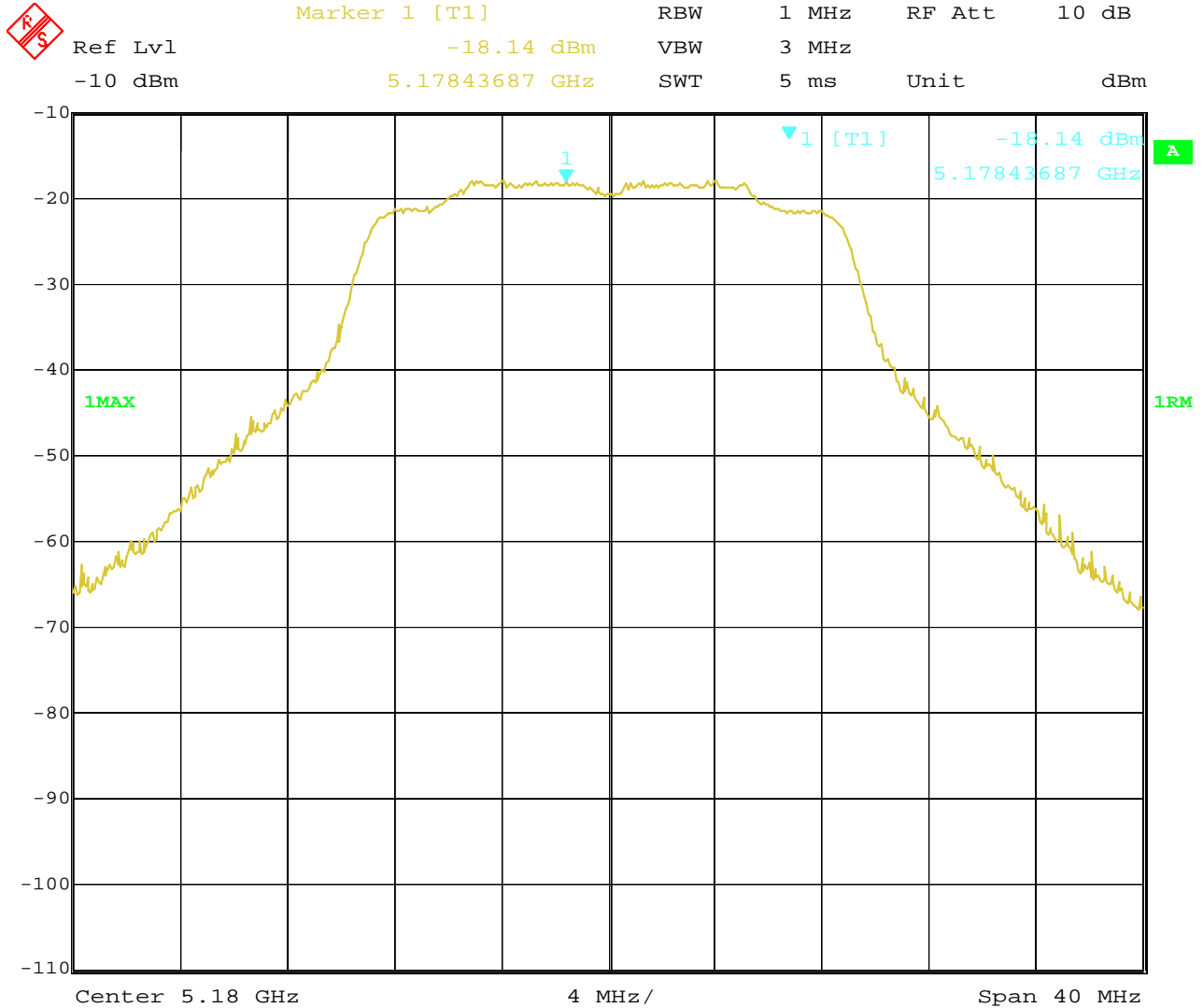
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### Test Plots

1.802.11ac at mcs0 of CH36



Date: 16.OCT.2020 11:13:02

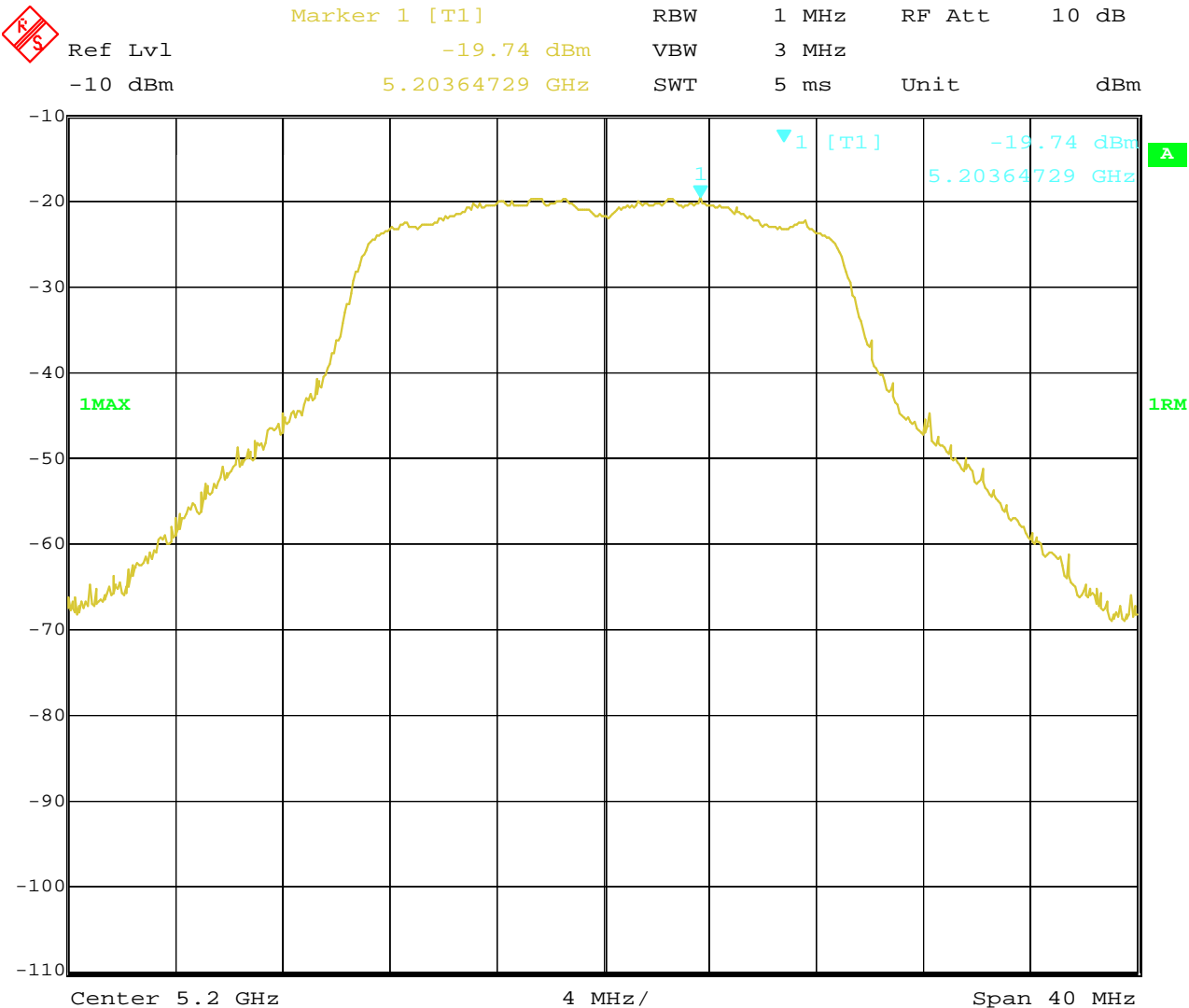
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2.802.11ac at mcs0 of CH40

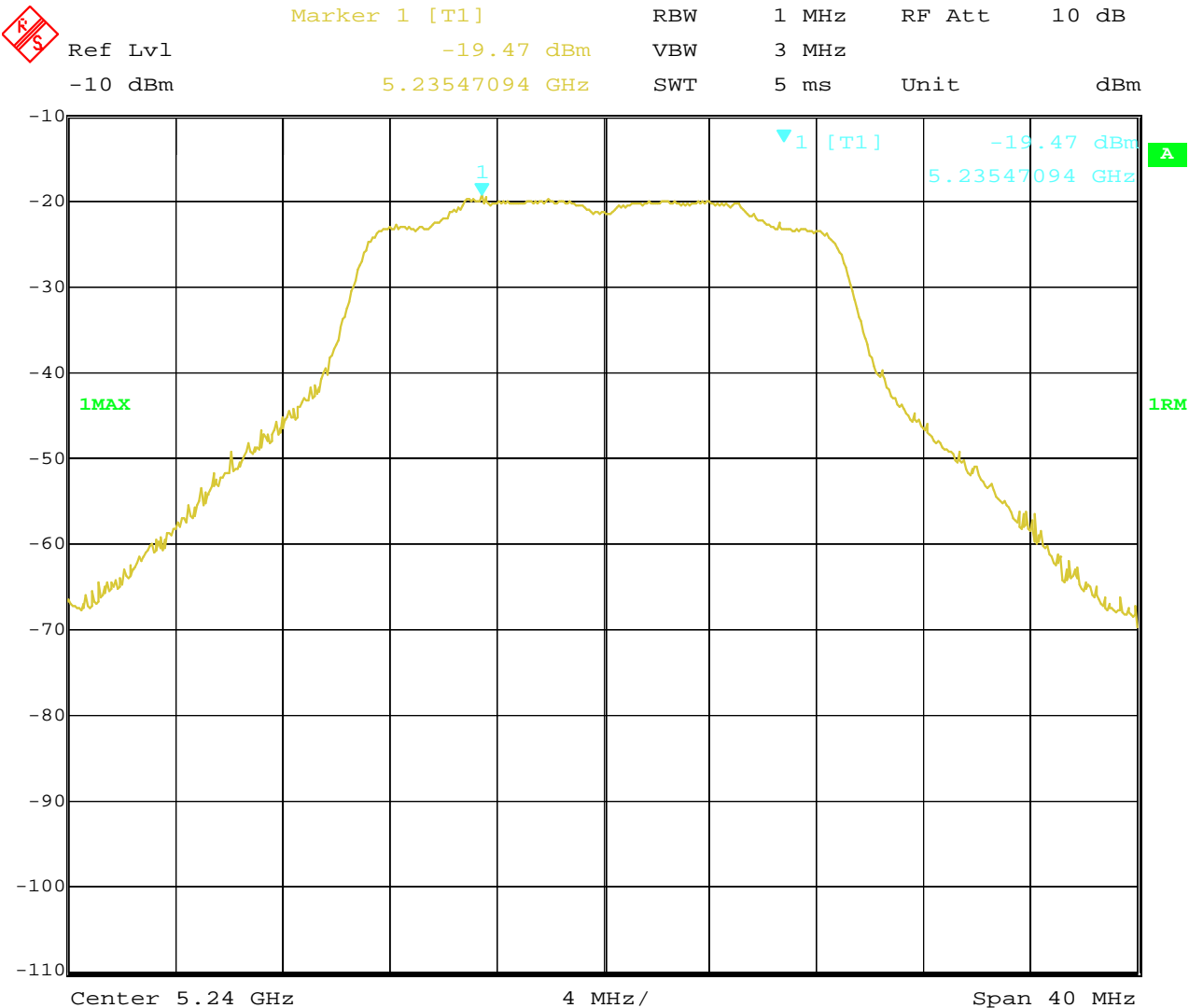


Date: 16.OCT.2020 11:13:54

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3.802.11ac at mcs0 of CH48



Date: 16.OCT.2020 11:14:45

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EUT		Laptop		Model		NP141AQ-T	
Mode		802.11ac VHT40		Test Voltage		DC7.6V	
Temperature		24 deg. C,		Humidity		56% RH	
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)	Factor	Total Spectral Density (dBm/MHz)	Limit (dBm)	Pass/ Fail	
38	5190	-21.64	3.01	-18.63	10	Pass	
46	5230	-21.94	3.01	-18.93	10	Pass	

- Note: 1. Total Power Spectral Density = Ant1 Power Spectral Density + Factor  
2. Factor= $10\log 2=3.01$   
3. Ant1 and Ant 2 were tested and Ant 1 was the worst case

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

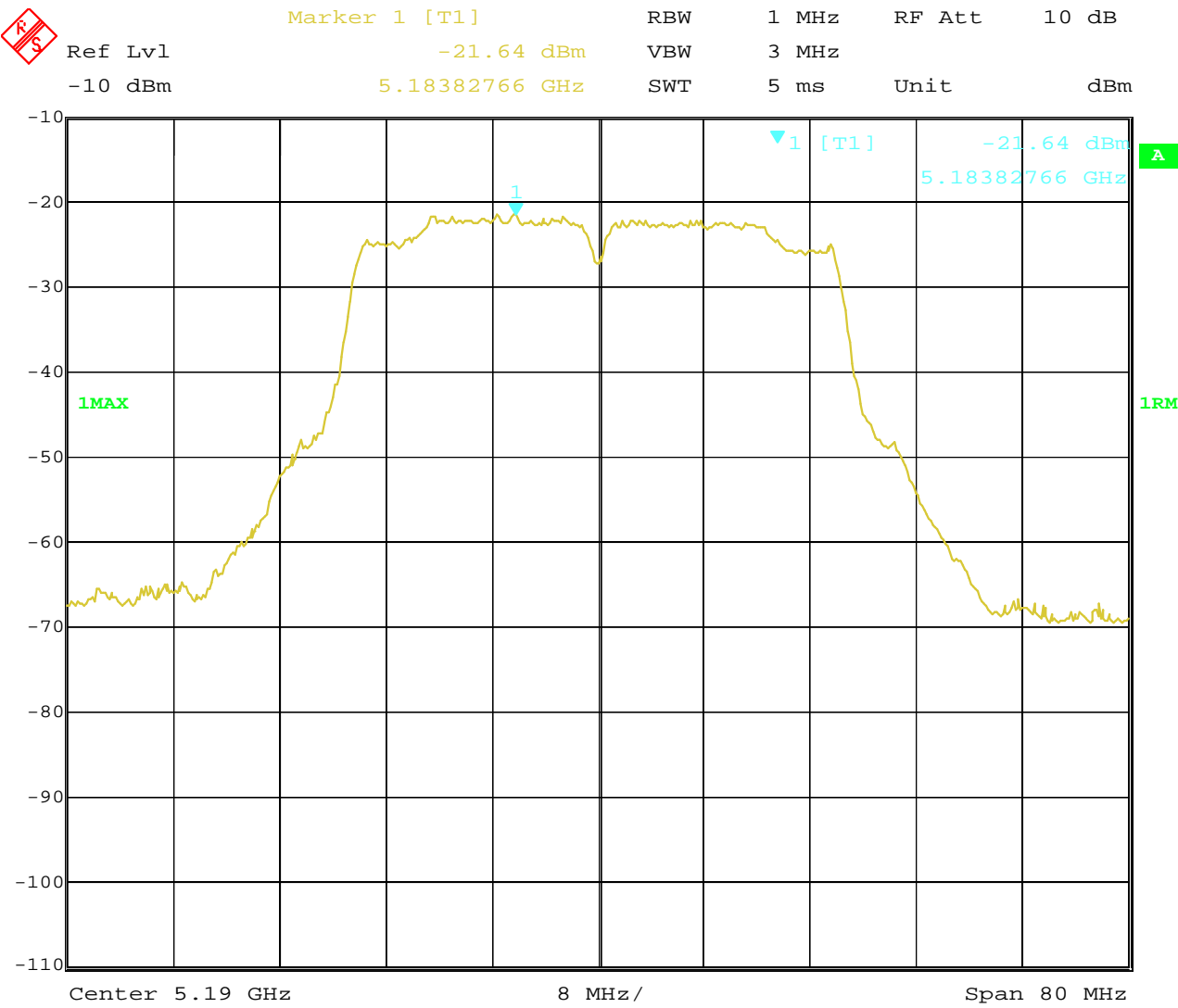
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Test Plots

1.802.11ac at mcs0 of CH38

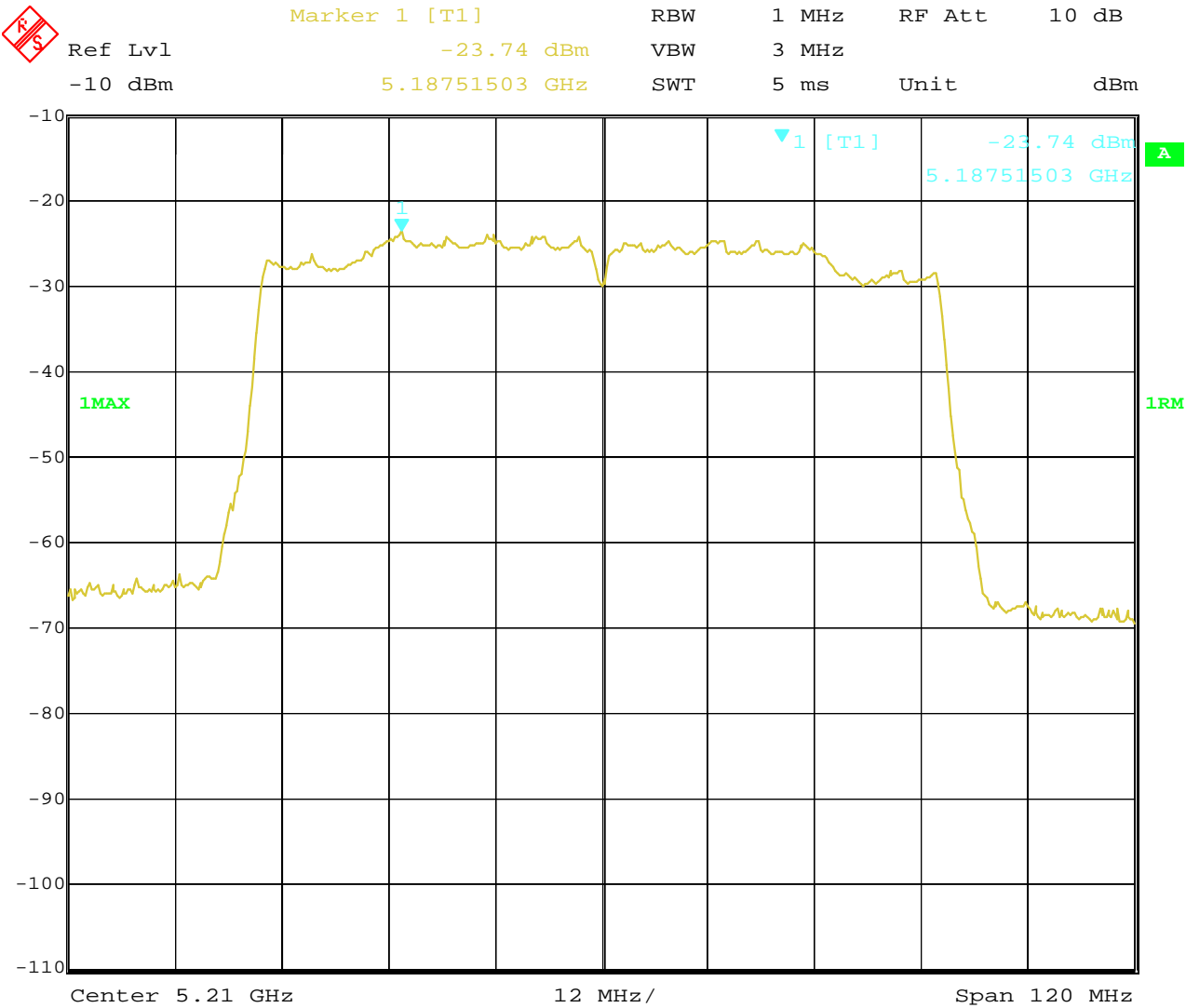


Date: 16.OCT.2020 11:16:00

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2.802.11ac at mcs0 of CH46



Date: 16.OCT.2020 11:19:17

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EUT	Laptop		Model		NP141AQ-T	
Mode	802.11ac VHT80 23.9Mbps		Test Voltage		DC7.6V	
Temperature	24 deg. C,		Humidity		56% RH	
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)	Factor	Total Spectral Density (dBm/MHz)	Limit (dBm)	Pass/ Fail
42	5210	-23.74	3.01	-20.73	10	Pass

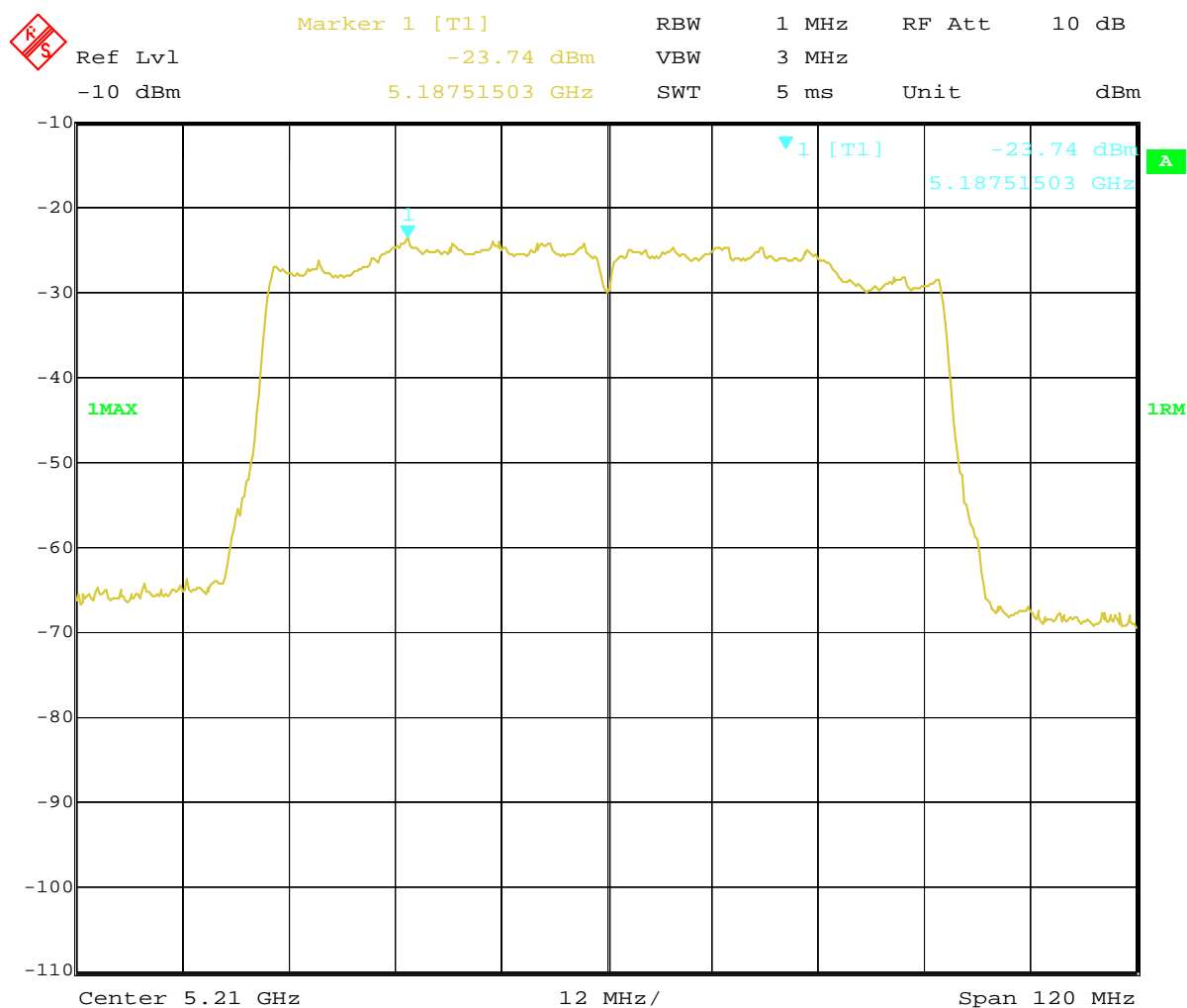
Note: 1. Total Power Spectral Density = Ant1 Power Spectral Density + Factor

2. Factor=10log2=3.01

3. Ant1 and Ant 2 were tested and Ant 1 was the worst case

### Test Plots

1.802.11ac at 23.9Mbps of CH42



Date: 16.OCT.2020 11:19:17

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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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### 10.3 Test Result

#### Channel 36 (5180MHz)

##### Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
8.7V	5179.9822
7.6V	5179.9836
6.6V	5179.9819
Max. Deviation (MHz)	0.0181
Max. Deviation (ppm)	3.5

Rated working voltage: DC7.6V

##### Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-30	5179.9796
-20	5179.9802
-10	5179.9831
0	5179.9822
10	5179.9833
20	5179.9812
30	5179.9835
40	5179.9789
50	5179.9808
Max. Deviation (MHz)	0.0211
Max. Deviation (ppm)	4.1

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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 FPC antennas used. The maximum Gain is 1.79dBi for each one.

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## 12.0 FCC Label

### FCC ID: RBD-NP141AT

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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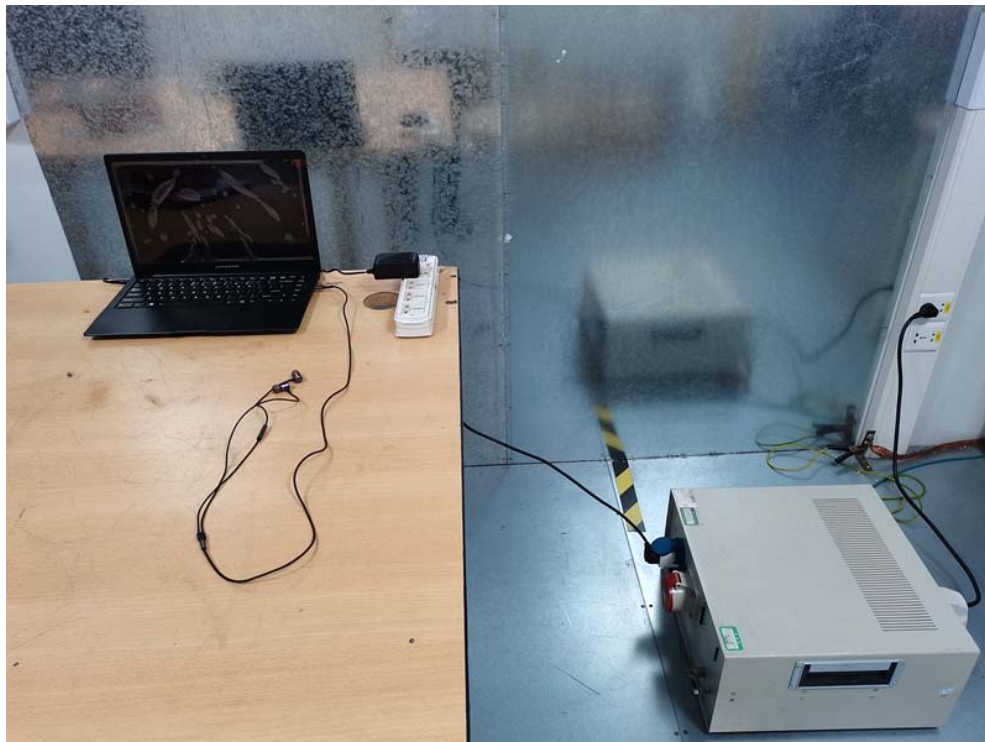
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### 13.0 Photo of testing

Conducted Emission Test Setup:



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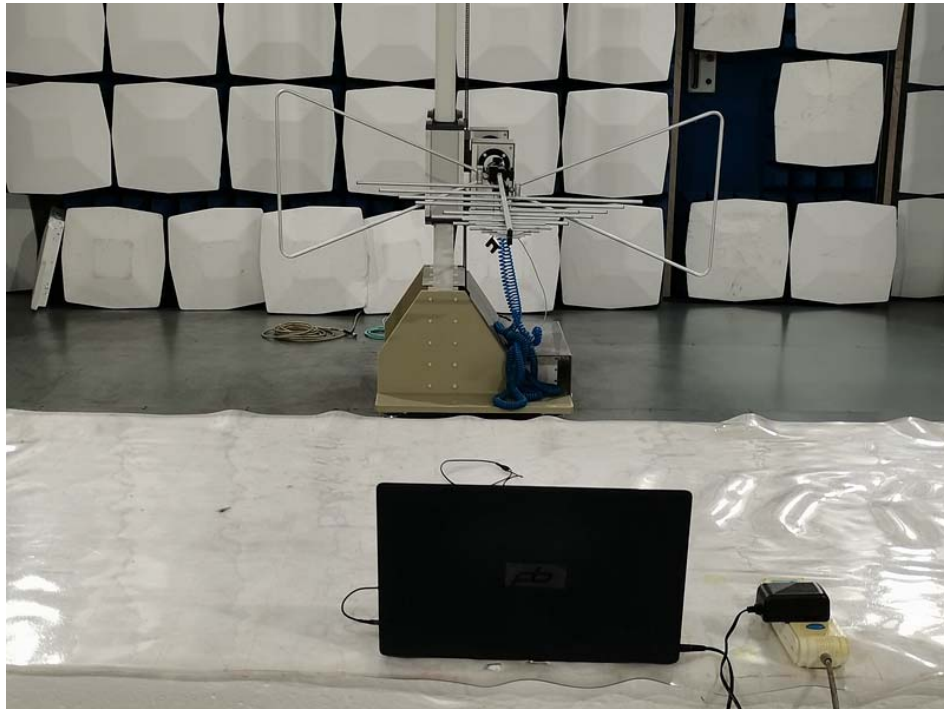
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**Radiated Emission Test Setup:**



**Photos of EUT**

Please see test report TW2009393-01E

**End of the report**

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