

TECHNICAL REPORT



Report No: TW2102107-04E  
File reference No: 2021-04-06

Applicant: Qingdao Hisense Intelligent Commercial System Co., Ltd.

Product: POS COMPUTER

Model No: HK316V

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: April 06, 2021

**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: Qingdao Hisense Intelligent Commercial System Co., Ltd.  
Address: 399 Songling Road, Laoshan, Qingdao, Shandong  
Telephone: --  
Fax: --

### 1.3 Description of EUT

Product: POS COMPUTER  
Manufacturer: Qingdao Hisense Intelligent Commercial System Co., Ltd.  
Address: 399 Songling Road, Laoshan, Qingdao, Shandong  
Brand Name: N/A  
Additional Brand Name: N/A  
Model Number: HK316V  
Hardware Version: HZS7.820  
Software Version: HK316V  
Additional Model Number: N/A  
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-mcs7  
IEEE 802.11n/HT40: mcs0-mcs7  
IEEE 802.11ac: NSSI mcs0-mcs9  
Antenna: Two Integral Antennas used.  
Antenna Gain: Maximum 5.0dBi for each one  
Test Mode: During testing, EUT was set to 100% duty cycle. 6Mbps air data rate was the worst case

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for 802.11a mode; mcs0 air data rate was the worst case for 802.11n mode; NSSI mcs0 air data rate was the worst case for 802.11ac mode.

- Frequency Selection By software
- Input Voltage: DC24V
- Power Supply: Model: FSP120-AAAN3; Input: 100-240V~, 50/60Hz, 1.8A;  
Output: 24V 5A,120W
- Alternative Power Model: FSP090-AAAN3; Input: 100-240V~, 50-60Hz, 1.2A;  
Supply: Output: DC24.0V, 3.75A,90W
- Remark: Two power supplies were tested and only the worst case was recorded in the test report.

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: 1 Samples

1.5 Test Duration

2021-02-25 to 2021-04-06

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

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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
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	2020-07-06	2021-07-05
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	2021-01-06	2022-01-05

## 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**

<b>The EUT has been tested according to the following specifications:</b>			
<b>Standard</b>	<b>Test Type</b>	<b>Result</b>	<b>Notes</b>
<b>FCC Part 15, Paragraph 15.107 &amp; 15.407</b>	<b>Conducted Emission Test</b>	<b>PASS</b>	<b>Complies</b>
<b>FCC Part 15 Subpart E Paragraph 15.407 (b1/4/5/6/7), Part 15.205 and Part 15.209</b>	<b>Undesirable Emission and Restrict band</b>	<b>PASS</b>	<b>Complies</b>
<b>FCC Part 15, Paragraph 15.407 (a1/2/3)</b>	<b>Peak Transmit Power</b>	<b>PASS</b>	<b>Complies</b>
<b>FCC Part 15, Paragraph 15.407 (a)(6)</b>	<b>Peak Power Excursion</b>	<b>PASS</b>	<b>Complies</b>
<b>FCC Part 15, Paragraph 15.407 (a/1/2/3)</b>	<b>Peak Power Spectral Density</b>	<b>PASS</b>	<b>Complies</b>
<b>FCC Part 15, Paragraph 15.407(g)</b>	<b>Frequency Stability</b>	<b>PASS</b>	<b>Complies</b>

**3.2 Test Standards**

**FCC Part 15 Subpart & Subpart C, Paragraph 15.247, ANSI C63.10 :2013 and ANSI C63.4 :2014 789033 D02 General UNII Test Procedures New Rules v01r04**

**4.0 EUT Modification**

**No modification by SHENZHEN TIMEWAY TESTING LABORATORIES.**

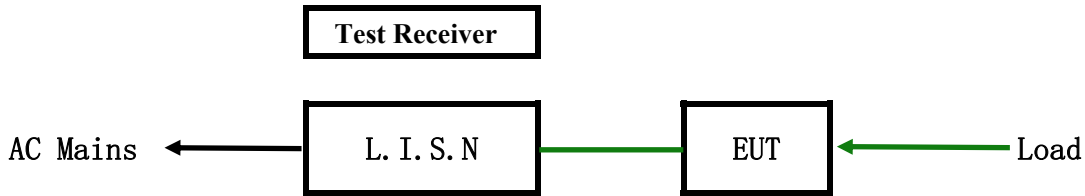
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**5. Power Line Conducted Emission Test**

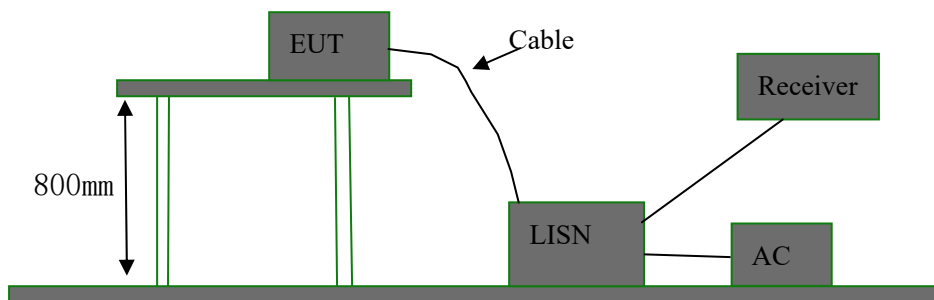
5.1 Schematics of the test



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: DC24V, 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
POS COMPUTER	Qingdao Hisense Intelligent Commercial System Co., Ltd.	HK316V	GQK-HK316V

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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**

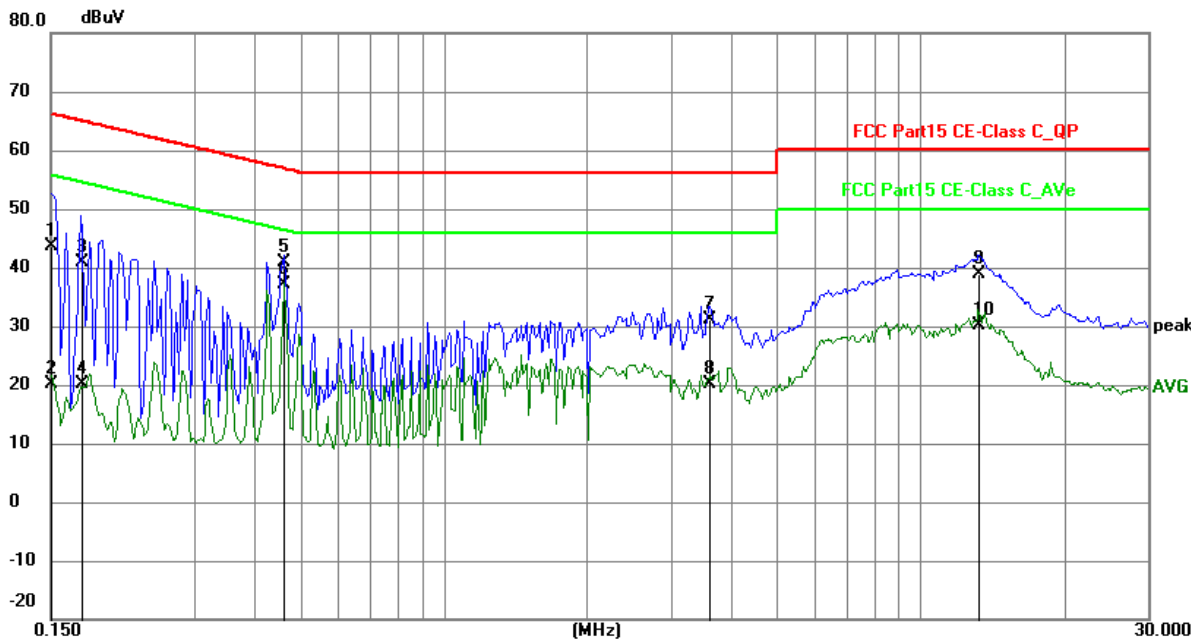
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**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	0.1500	33.92	9.79	43.71	66.00	-22.29	QP	P
2	0.1500	10.42	9.79	20.21	56.00	-35.79	AVG	P
3	0.1734	31.13	9.77	40.90	64.80	-23.90	QP	P
4	0.1734	10.41	9.77	20.18	54.80	-34.62	AVG	P
5	0.4620	31.13	9.77	40.90	56.66	-15.76	QP	P
6	0.4620	27.40	9.77	37.17	46.66	-9.49	AVG	P
7	3.6006	21.19	9.87	31.06	56.00	-24.94	QP	P
8	3.6006	10.17	9.87	20.04	46.00	-25.96	AVG	P
9	13.2258	28.59	10.30	38.89	60.00	-21.11	QP	P
10	13.2258	19.95	10.30	30.25	50.00	-19.75	AVG	P

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

**EUT Operating Environment**

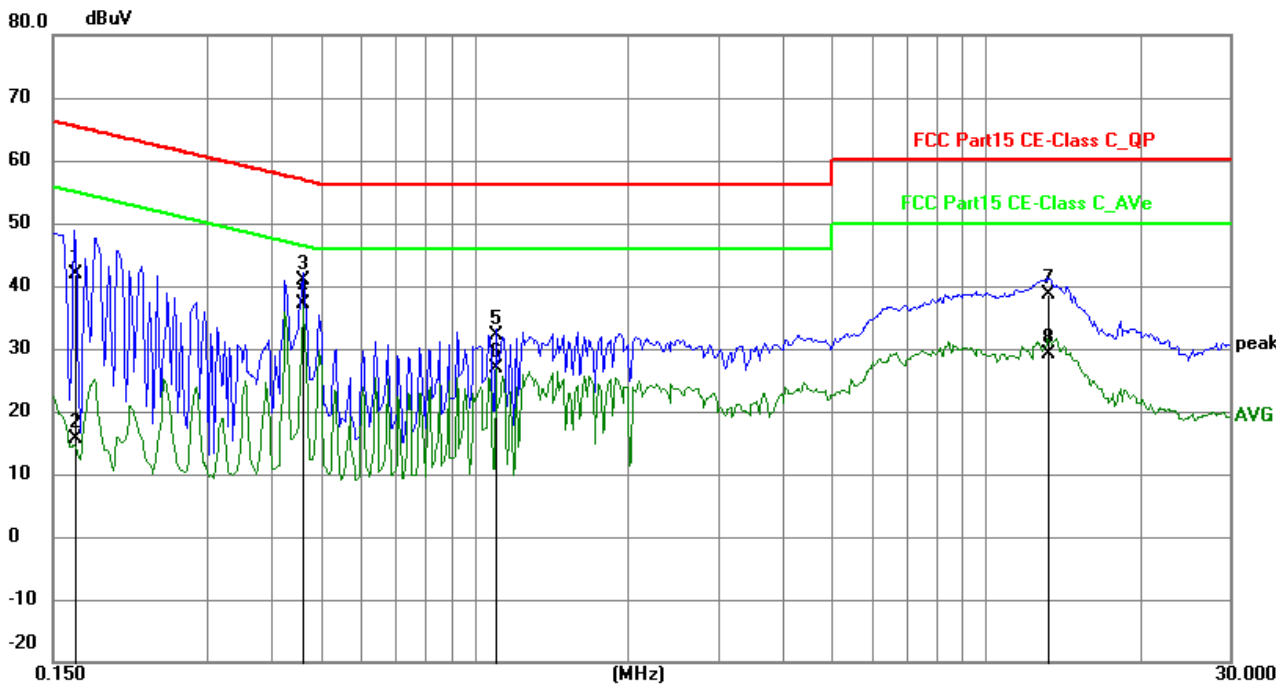
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**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	0.1655	32.10	9.77	41.87	65.18	-23.31	QP	P
2	0.1655	5.80	9.77	15.57	55.18	-39.61	AVG	P
3	0.4620	31.07	9.77	40.84	56.66	-15.82	QP	P
4	0.4620	27.32	9.77	37.09	46.66	-9.57	AVG	P
5	1.1055	22.22	9.79	32.01	56.00	-23.99	QP	P
6	1.1055	17.07	9.79	26.86	46.00	-19.14	AVG	P
7	13.2219	28.37	10.30	38.67	60.00	-21.33	QP	P
8	13.2219	18.75	10.30	29.05	50.00	-20.95	AVG	P

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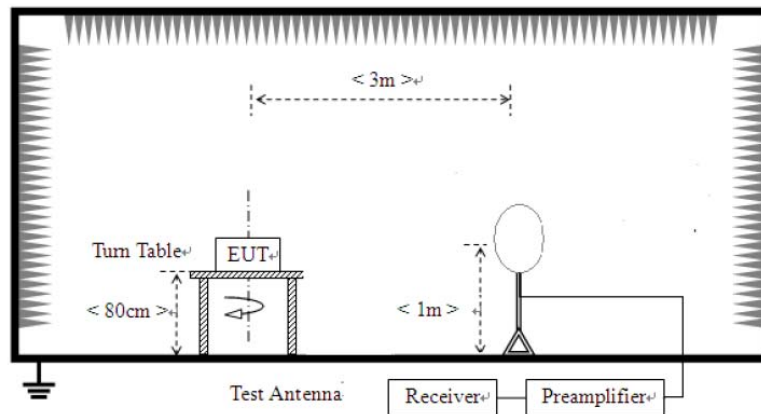
## 6 Undesirable Emission and Restrict band

### 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 Laboratory. This site is on file with the FCC laboratory division, 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

For radiated emissions from 9kHz to 30MHz



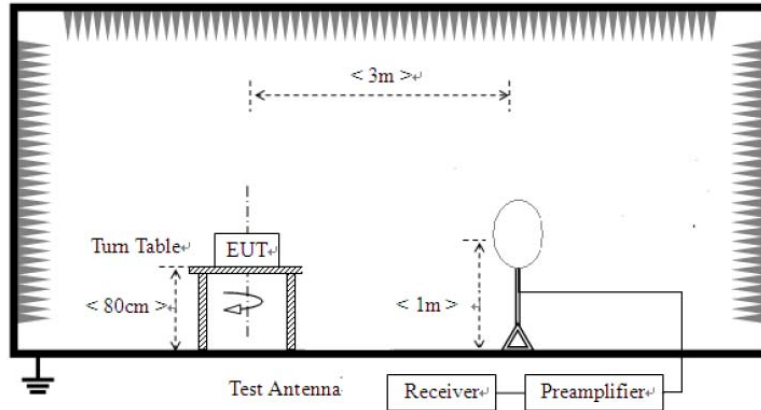
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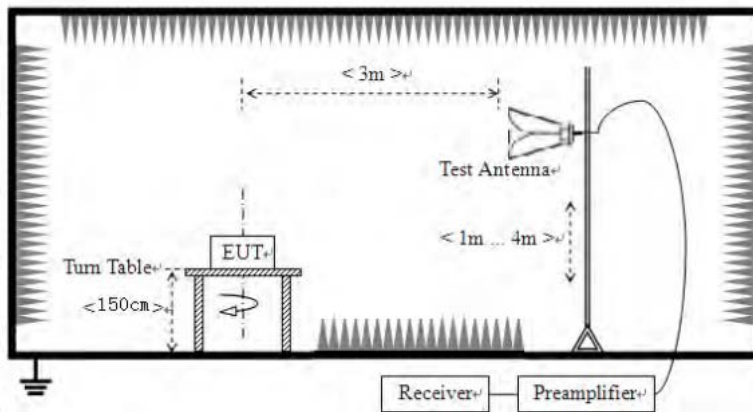
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For radiated emissions from 9kHz to 30MHz



For radiated emissions above 1GHz



## 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.

## 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:

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**Frequencies in restricted band are complied to limit on Paragraph 15.209**

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.

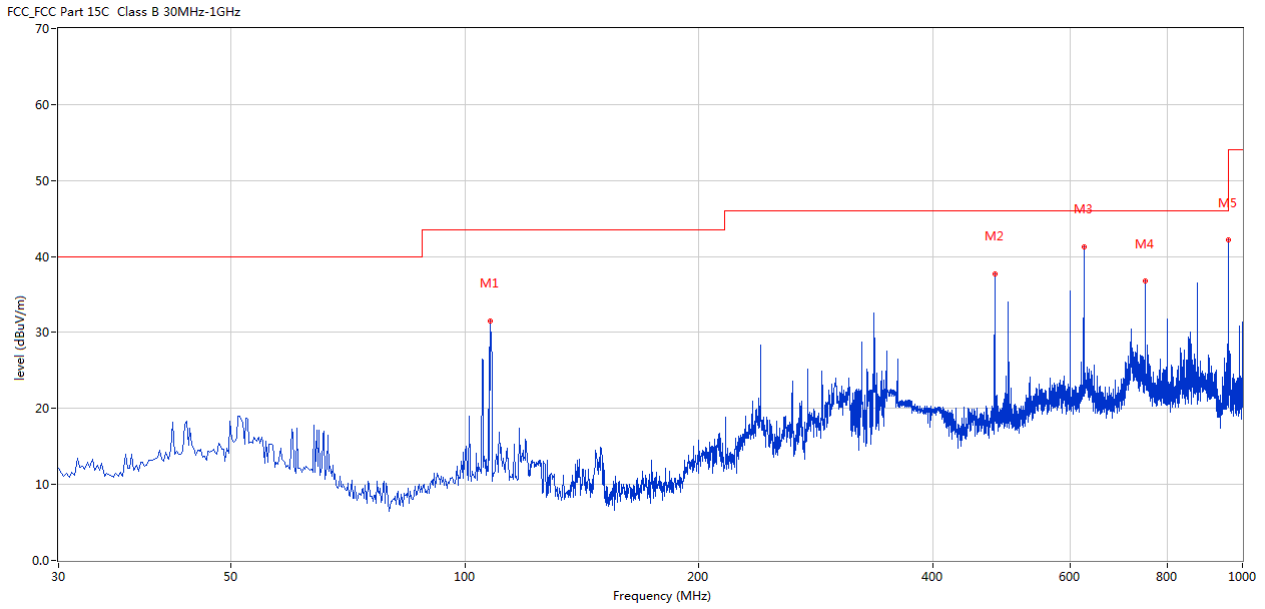
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Test Figure:

H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	107.823	33.50	-13.41	43.5	-10.00	Peak	313.00	100	Horizontal	Pass
2	479.968	37.73	-7.40	46.0	-8.27	Peak	298.00	100	Horizontal	Pass
3	624.946	39.72	-4.85	46.0	-6.28	Peak	280.00	100	Horizontal	Pass
4	750.045	36.71	-3.43	46.0	-9.29	Peak	323.00	100	Horizontal	Pass
5	959.998	40.87	-1.63	46.0	-5.13	Peak	285.00	100	Horizontal	Pass

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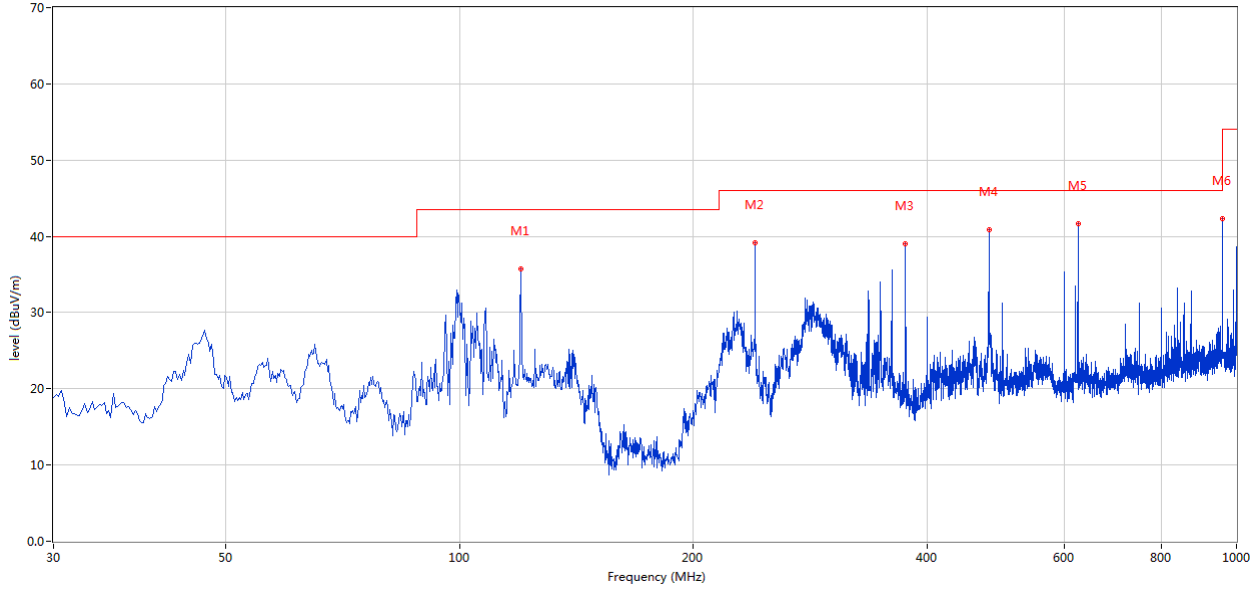
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Test Figure:

V

FCC\_FCC Part 15C 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	119.945	35.79	-15.32	43.5	-7.71	Peak	122.00	100	Vertical	Pass
2	239.953	39.19	-12.33	46.0	-6.81	Peak	30.00	100	Vertical	Pass
3	374.991	39.02	-9.44	46.0	-6.98	Peak	0.00	100	Vertical	Pass
4	479.968	40.85	-7.40	46.0	-5.15	Peak	15.00	100	Vertical	Pass
5	624.946	41.28	-4.85	46.0	-4.72	Peak	0.00	100	Vertical	Pass
6	960.240	50.30	-1.63	54.0	-3.70	Peak	110.00	100	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	94.27 (PK)	H	Fundamental Frequency
5180.00	99.43 (PK)	V	
10360	47.76 (PK)	H	74(Peak)/ 54(AV)
10360	49.96 (PK)	V	74(Peak)/ 54(AV)
15540		H/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	96.52 (PK)	H	Fundamental Frequency
5200.00	99.37 (PK)	V	
10400	49.75 (PK)	H	74(Peak)/ 54(AV)
10400	49.25 (PK)	V	74(Peak)/ 54(AV)
15600	--	H/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	96.29 (PK)	H	Fundamental Frequency
5240.00	100.02 (PK)	V	
10480	46.84 (PK)	H	74(Peak)/ 54(AV)
10480	49.42 (PK)	V	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)

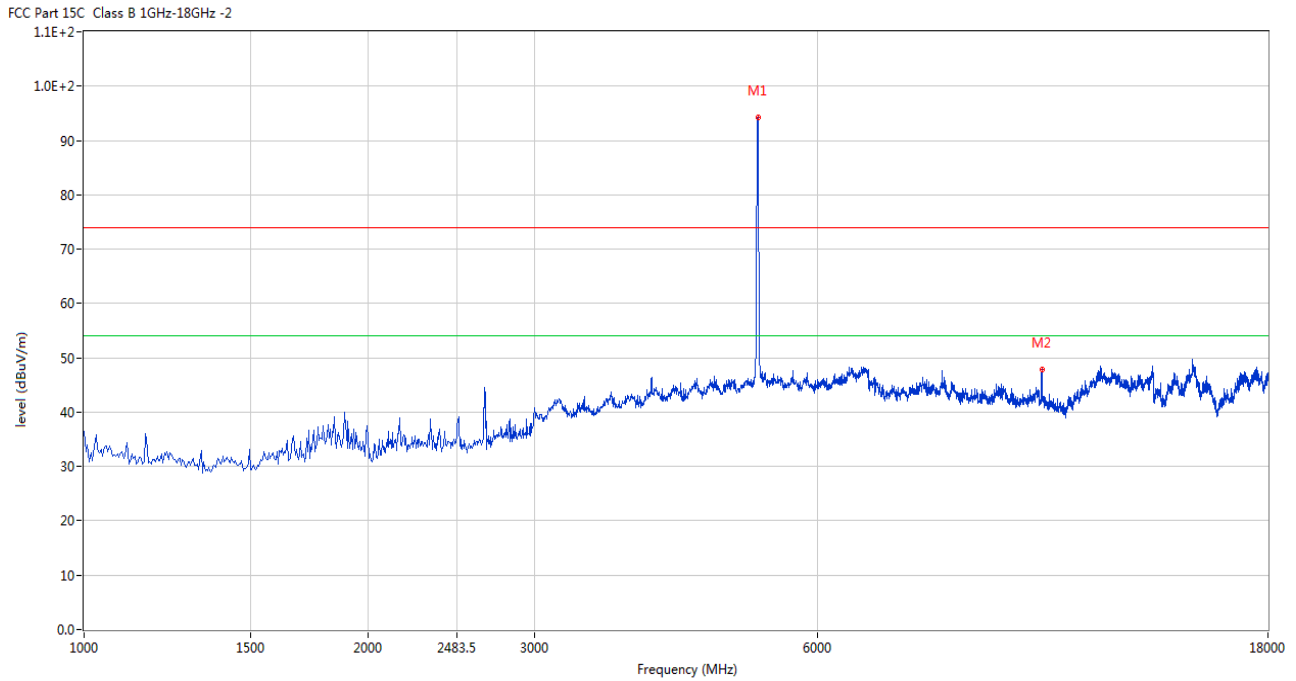
- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit  
 2. Remark “---” means that the emissions level is too low to be measured  
 3. For 802.11a mode 6Mbps

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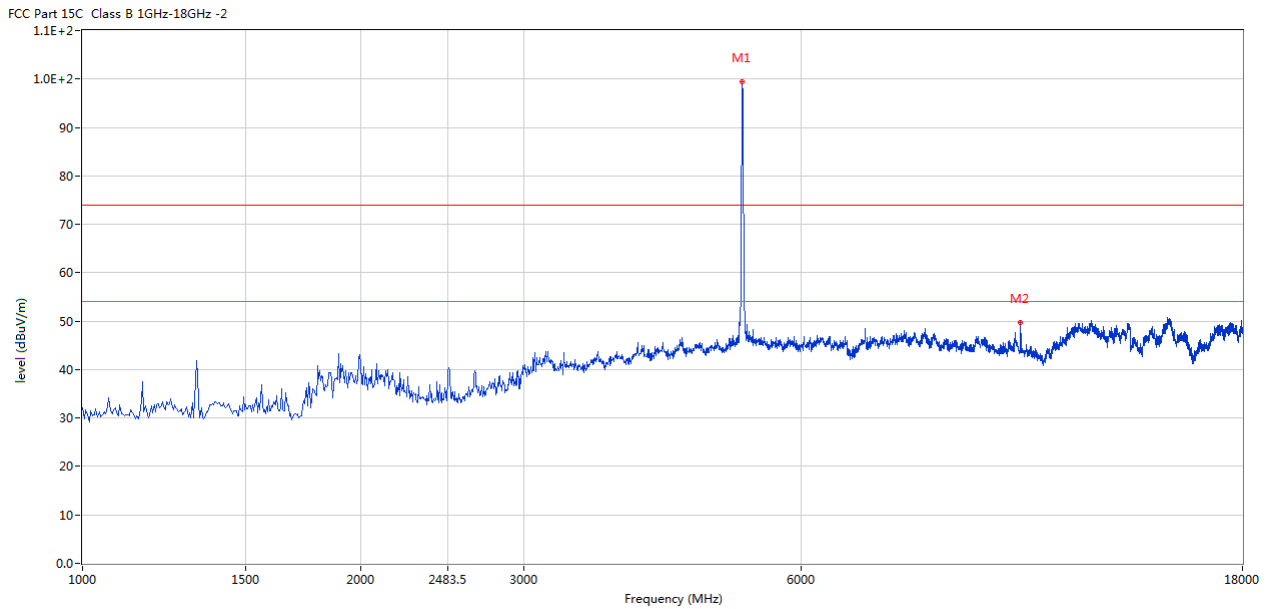


Please refer to the following test plots for details:

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



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



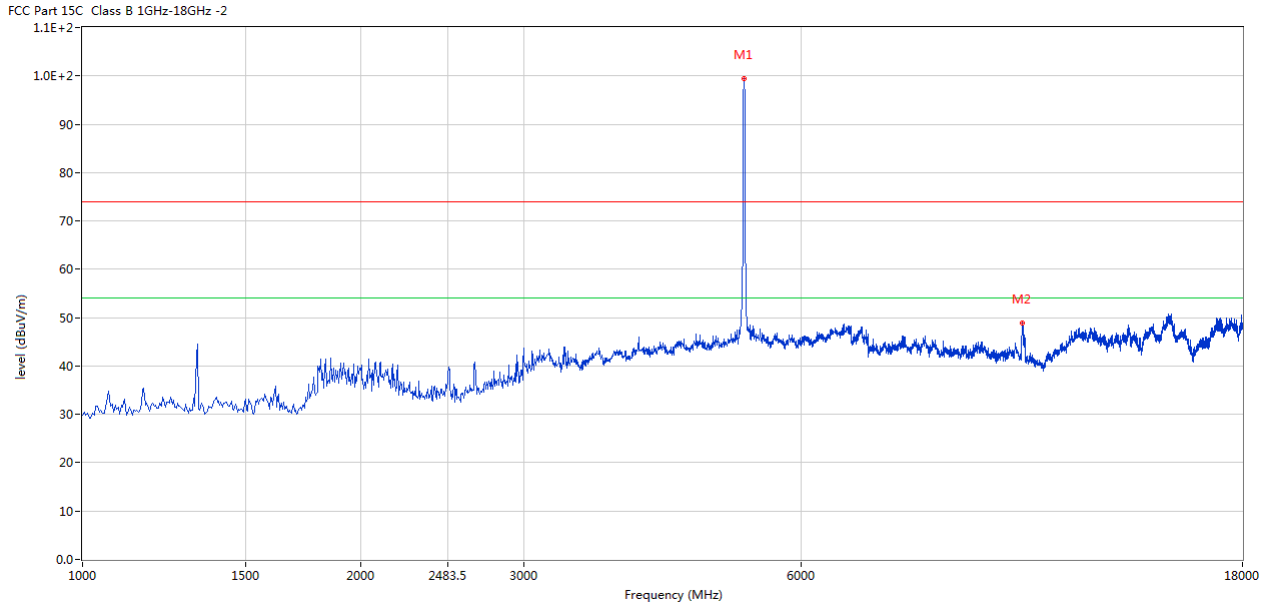
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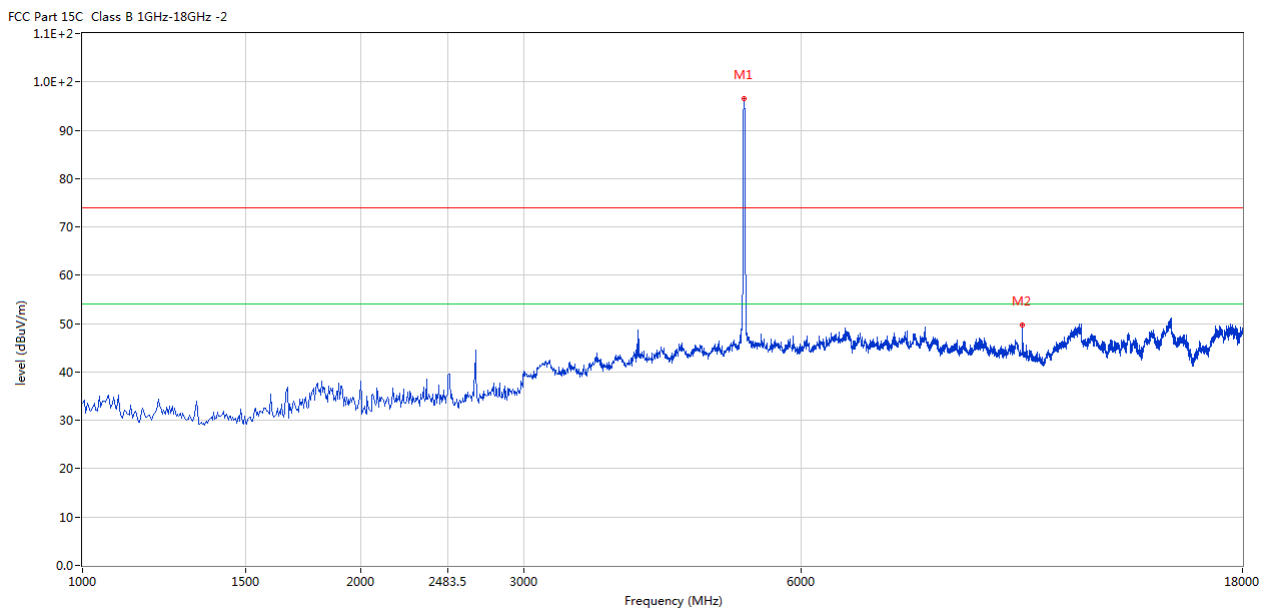
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### CH40 for 11a at 6Mbps: Vertical



### CH40 for 11a at 6Mbps: Horizontal



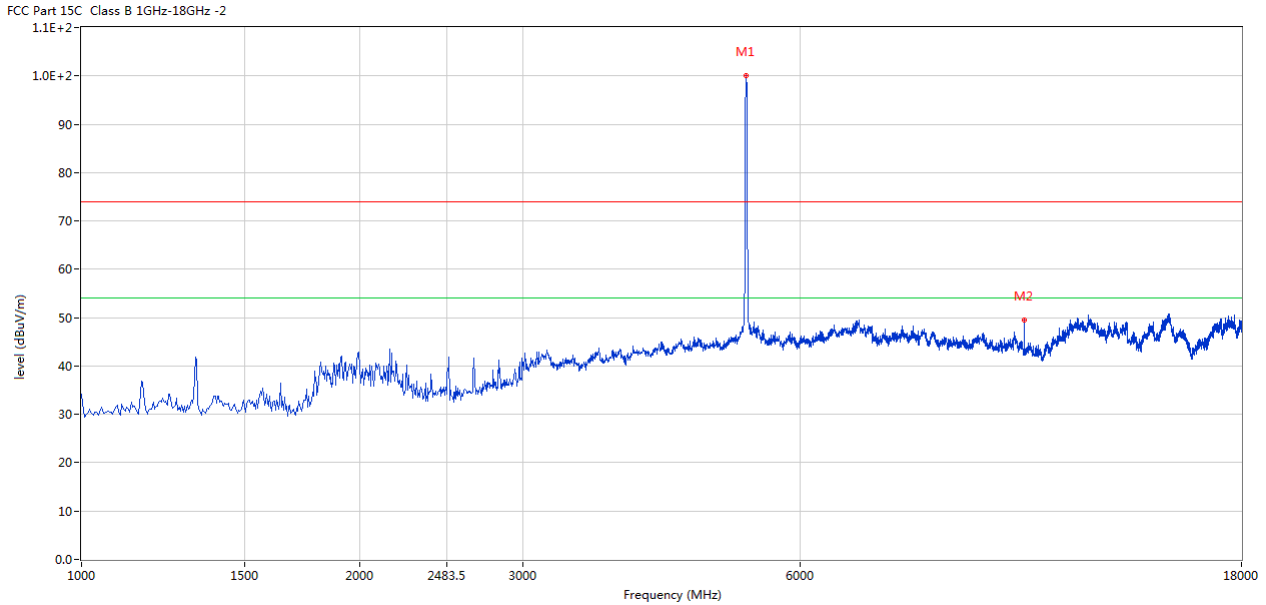
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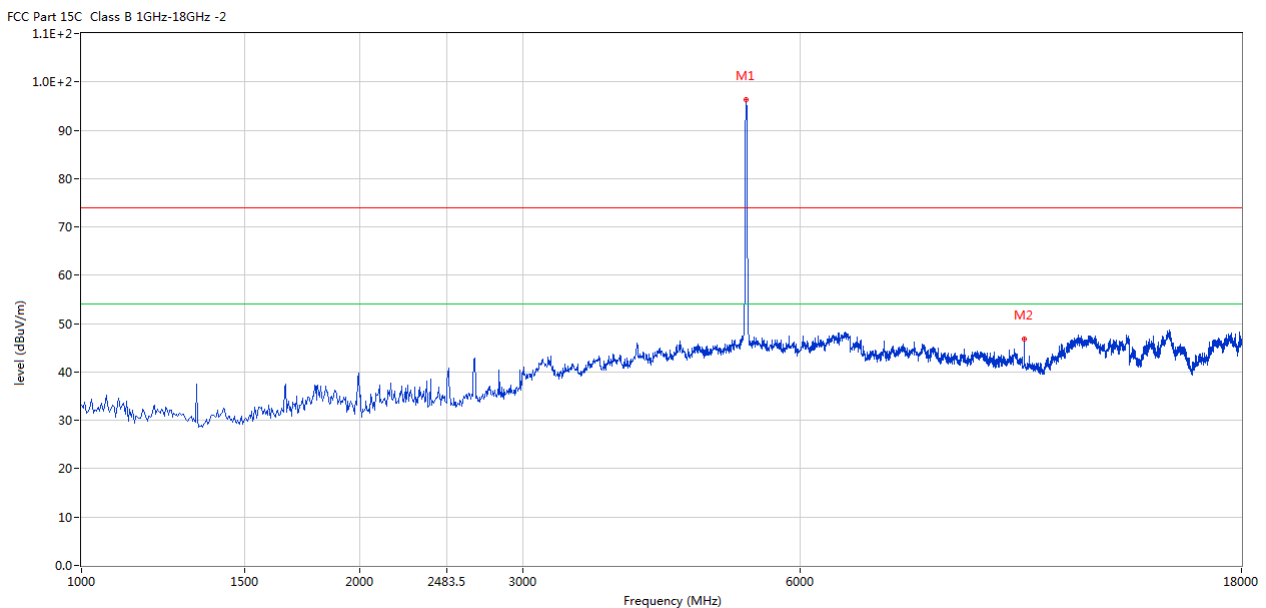
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### CH48 for 11a at 6Mbps: Vertical



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



- 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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Restricted band Measurement			
EUT	POS COMPUTER		Test Mode: Channel 36 (5180MHz)-11a
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5150	PK (dB $\mu$ V/m)	48.72 (PK)	Limit -27dBm/MHz
	EIRP (dBm)	-46.48	
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 E[dB $\mu$ V/m]=48.72 dB $\mu$ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 48.72 - 95.2 = -46.48\text{dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	POS COMPUTER		Test Mode: Channel 36 (5180MHz)-11a
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5150	PK (dB $\mu$ V/m)	50.00 (PK)	Limit -27dBm/MHz
	EIRP (dBm)	-45.20	
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 E[dB $\mu$ V/m]=50.00 dB $\mu$ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 50.00 - 95.2 = -45.20\text{dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	POS COMPUTER		Test Mode: Channel 48 (5240MHz)-11a
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5250	PK (dBμV/m)	60.32 (PK)	Limit -27dBm/MHz
	EIRP (dBm)	-34.88	
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  $E[dB\mu V/m]=60.32 \text{ dB}\mu V/m$ ,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 60.32 - 95.2 = -34.88 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	POS COMPUTER		Test Mode: Channel 48 (5240MHz)-11a
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5250	PK (dBμV/m)	58.23 (PK)	Limit -27dBm/MHz
	EIRP (dBm)	-36.97	
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:

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

For Example, if  $E[dB\mu V/m]=58.23 \text{ dB}\mu V/m$ ,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 58.23 - 95.2 = -36.97 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	POS COMPUTER		Test Mode: Channel 36 (5180MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5150	PK (dBμV/m)	48.34 (PK)	Limit -27dBm/MHz
	EIRP (dBm)	-46.86	
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  $E[dB\mu V/m] = 48.34 dB\mu V/m$ ,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 48.34 - 95.2 = -46.86 dBm$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	POS COMPUTER		Test Mode: Channel 36 (5180MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5150	PK (dBμV/m)	56.74 (PK)	Limit -27dBm/MHz
	EIRP (dBm)	-38.46	
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:

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

For Example, if  $E[dB\mu V/m] = 56.74 dB\mu V/m$ ,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 56.74 - 95.2 = -38.46 dBm$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	POS COMPUTER		Test Mode: Channel 48 (5240MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5250	PK (dBμV/m)	60.16(PK)	Limit -27dBm/MHz
	EIRP (dBm)	-35.04	
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  $E[dB\mu V/m]=60.16dB\mu V/m$ ,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2=60.16-95.2= -35.04dBm$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	POS COMPUTER		Test Mode: Channel 48 (5240MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5250	PK (dBμV/m)	60.40(PK)	Limit -27dBm/MHz
	EIRP (dBm)	-34.80	
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  $E[dB\mu V/m]= 60.40 dB\mu V/m$ ,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2=60.40-95.2= -34.80dBm$$

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	POS COMPUTER		Test Mode: Channel 38 (5190MHz)-11n/HT40
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5150	PK (dBμV/m)	49.6 (PK)	Limit -27dBm/MHz
	EIRP (dBm)	-45.6	
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  $E[dB\mu V/m] = 49.6 dB\mu V/m$ ,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 49.6 - 95.2 = -45.6 dBm$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	POS COMPUTER		Test Mode: Channel 38 (5190MHz)-11n/HT40
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5150	PK (dBμV/m)	51.3 (PK)	Limit -27dBm/MHz
	EIRP (dBm)	-43.9	
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  $E[dB\mu V/m] = 41.3 dB\mu V/m$ ,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 41.3 - 95.2 = -43.9dBm$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	POS COMPUTER		Test Mode: Channel 46 (5230MHz)-11n/HT40
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5250	PK (dBμV/m)	52.1PK)	Limit -27dBm/MHz
	EIRP (dBm)	-43.1	
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  $E[dB\mu V/m] = 52.1 dB\mu V/m$ ,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 52.1 - 95.2 = -43.1 dBm$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	POS COMPUTER		Test Mode: Channel 46 (5230MHz)-11n/HT40
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5250	PK (dBμV/m)	59.8(PK)	Limit -27dBm/MHz
	EIRP (dBm)	-35.4	
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  $E[dB\mu V/m] = 59.8 dB\mu V/m$ ,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 59.8 - 95.2 = -35.4dBm$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	POS COMPUTER		Test Mode: Channel 42 (5210MHz)-11ac/VHT80
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5150	PK (dBμV/m)	46.8 (PK)	Limit -27dBm/MHz
	EIRP (dBm)	-48.4	
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  $E[dB\mu V/m] = 46.8 dB\mu V/m$ ,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 46.8 - 95.2 = -48.4 dBm$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	POS COMPUTER		Test Mode: Channel 42 (5210MHz)- 11ac/VHT80
Mode	Keeping Transmitting		Input Voltage DC24V
Temperature	24 deg. C,		Humidity 56% RH
Test Result:	Pass		Detector PK
5150	PK (dBμV/m)	49.7 (PK)	Limit -27dBm/MHz
	EIRP (dBm)	-45.5	
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  $E[dB\mu V/m] = 49.7 dB\mu V/m$ ,

$$EIRP[dBm] = E[dB\mu V/m] - 95.2 = 49.7 - 95.2 = -45.5 dBm$$

2. RBW=1MHz, VBW=3MHz

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

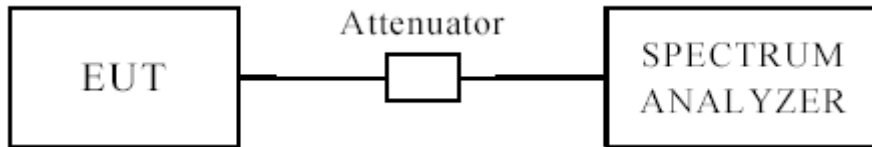
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## 7.0 Emission Bandwidth

### 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		POS COMPUTER		Model	HK316V
Mode		802.11a		Input Voltage	DC24V
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	22.61	--	Pass
40	5200	6	22.36	--	Pass
48	5240	6	22.36	--	Pass
<b>99% Bandwidth</b>					
36	5180	6	16.83	--	Pass
40	5200	6	16.71	--	Pass
48	5240	6	16.83	--	Pass

Note: Ant 0 and Ant 1 were tested and Ant 0 was the worst case. Ant 0 was the worst case.

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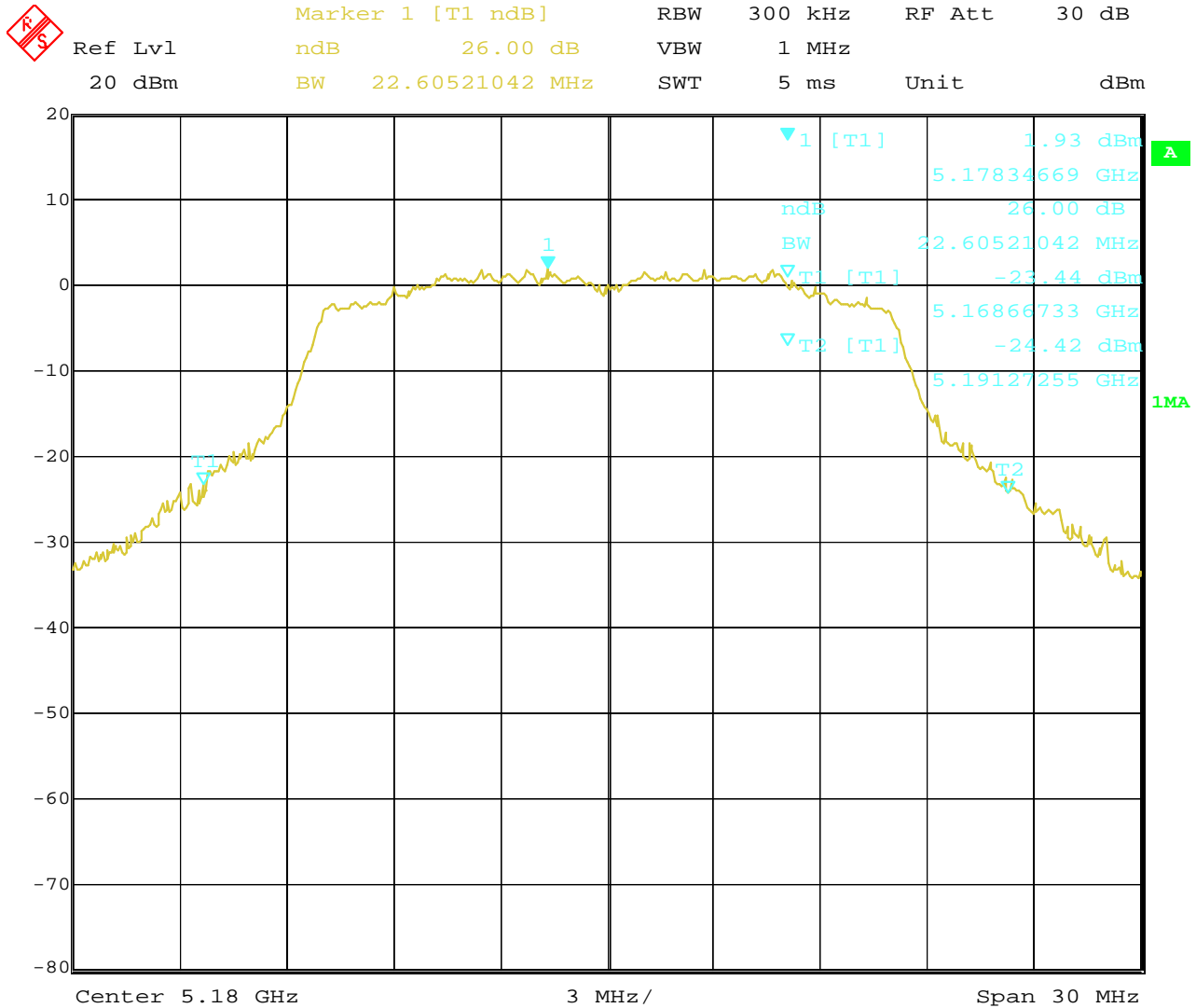




Test Figure:

**26dB Bandwidth**

Channel 36



Date: 26.MAR.2021 09:11:16

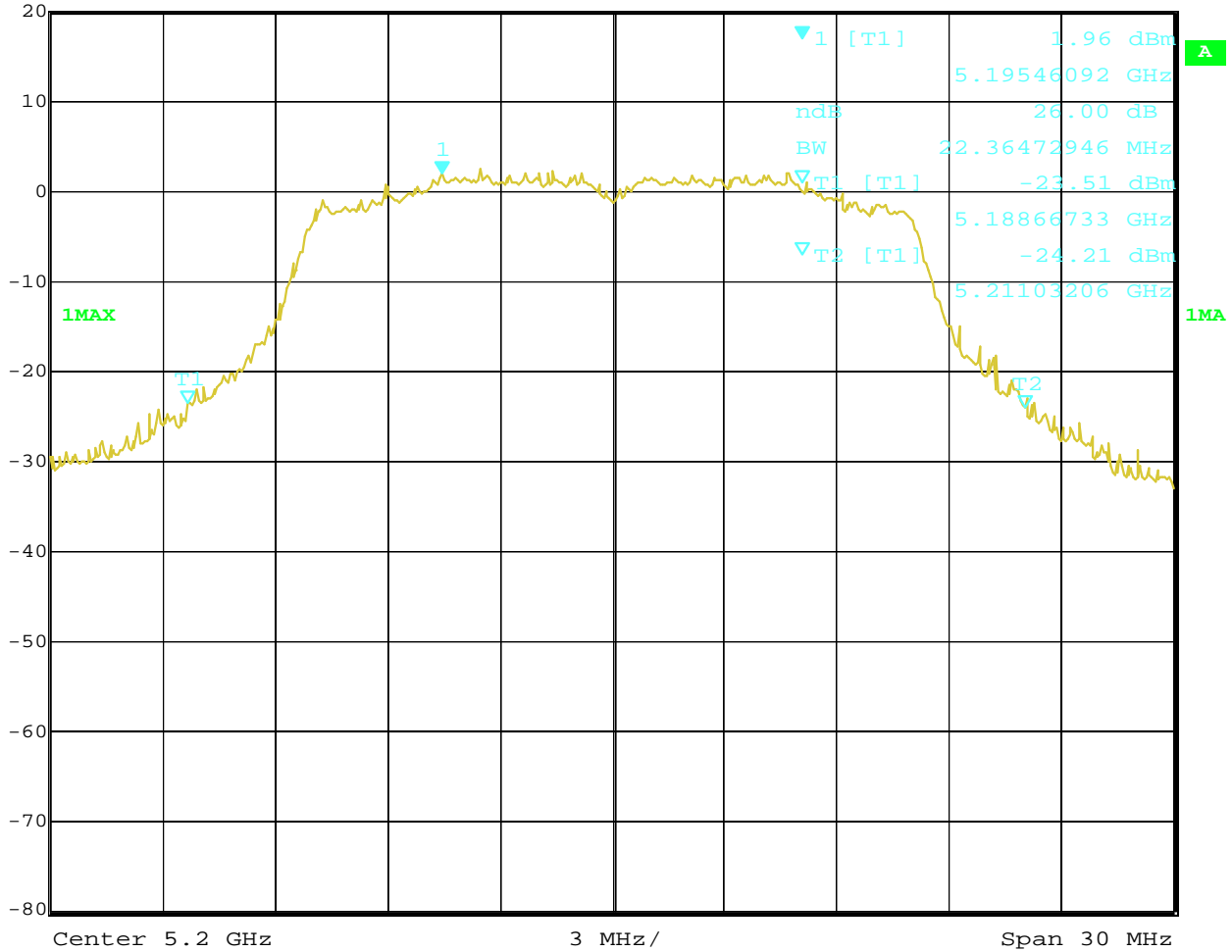
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Channel 40



Ref Lvl	Marker 1 [T1 ndB]	RBW	300 kHz	RF Att	30 dB
20 dBm	ndB 26.00 dB	VBW	1 MHz		
	BW 22.36472946 MHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 09:13:35

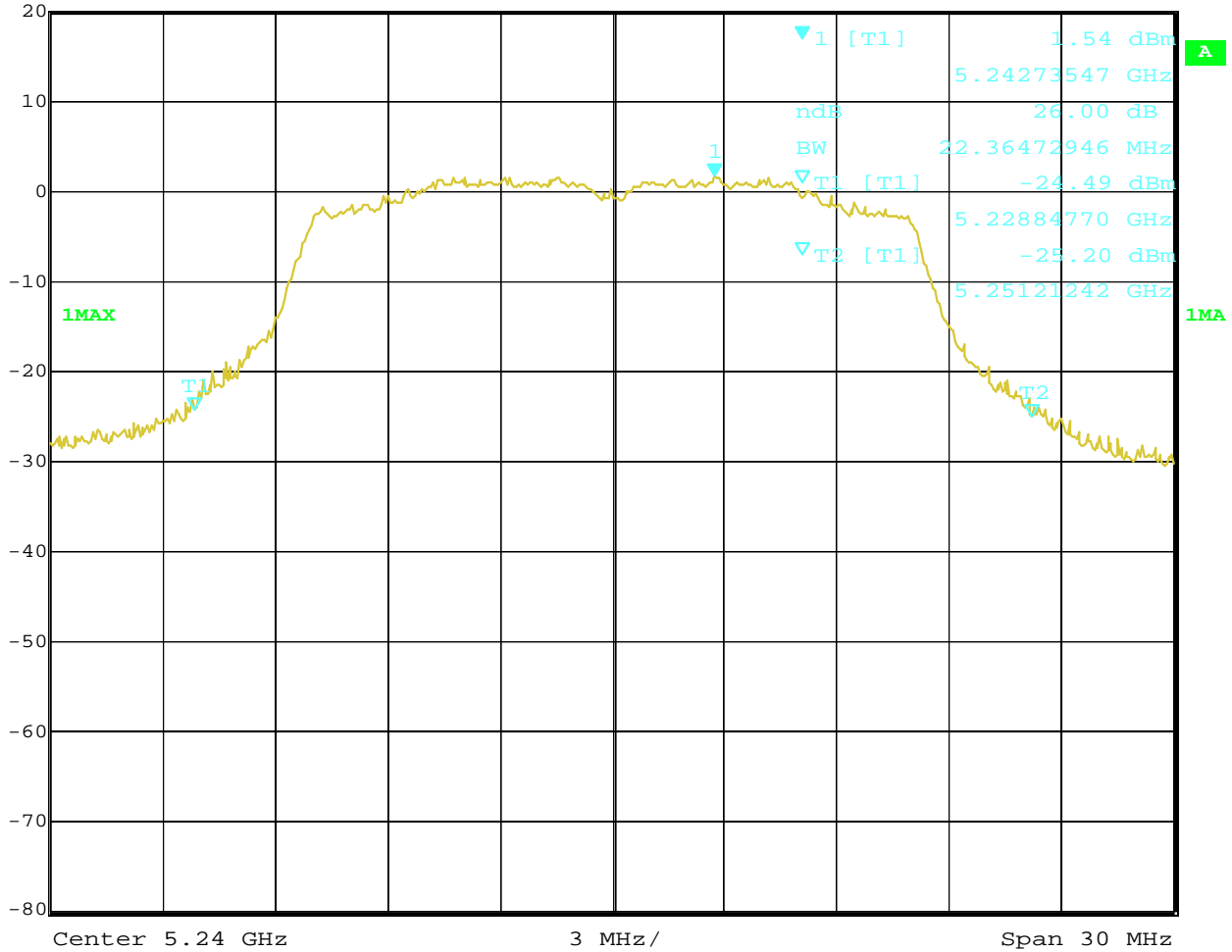
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Channel 48



Ref Lvl	Marker 1 [T1 ndB]	RBW	300 kHz	RF Att	30 dB
20 dBm	ndB 26.00 dB	VBW	1 MHz		
	BW 22.36472946 MHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 09:14:52

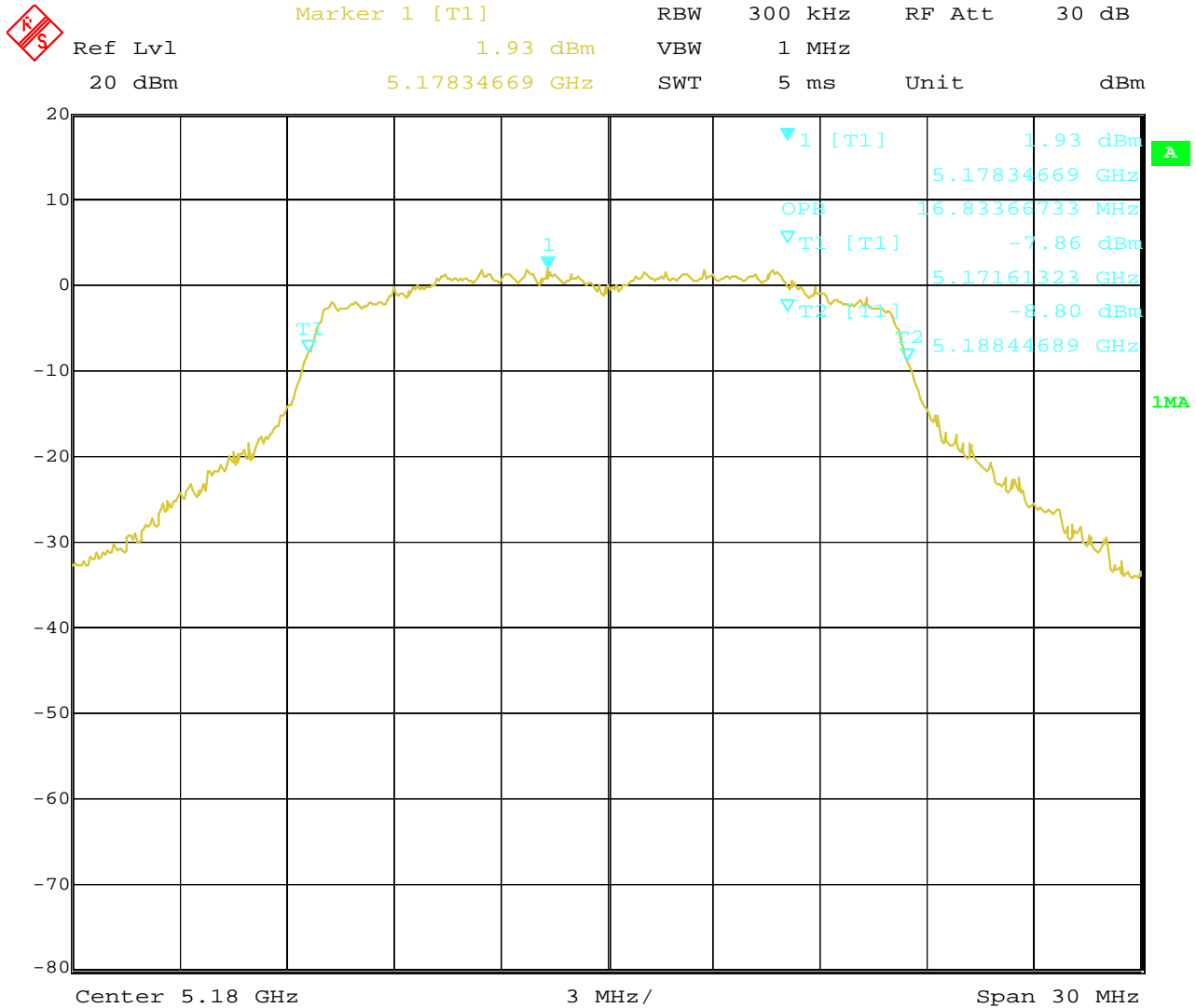
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Test Figure:

**99% Bandwidth**

Channel 36



Date: 26.MAR.2021 09:12:13

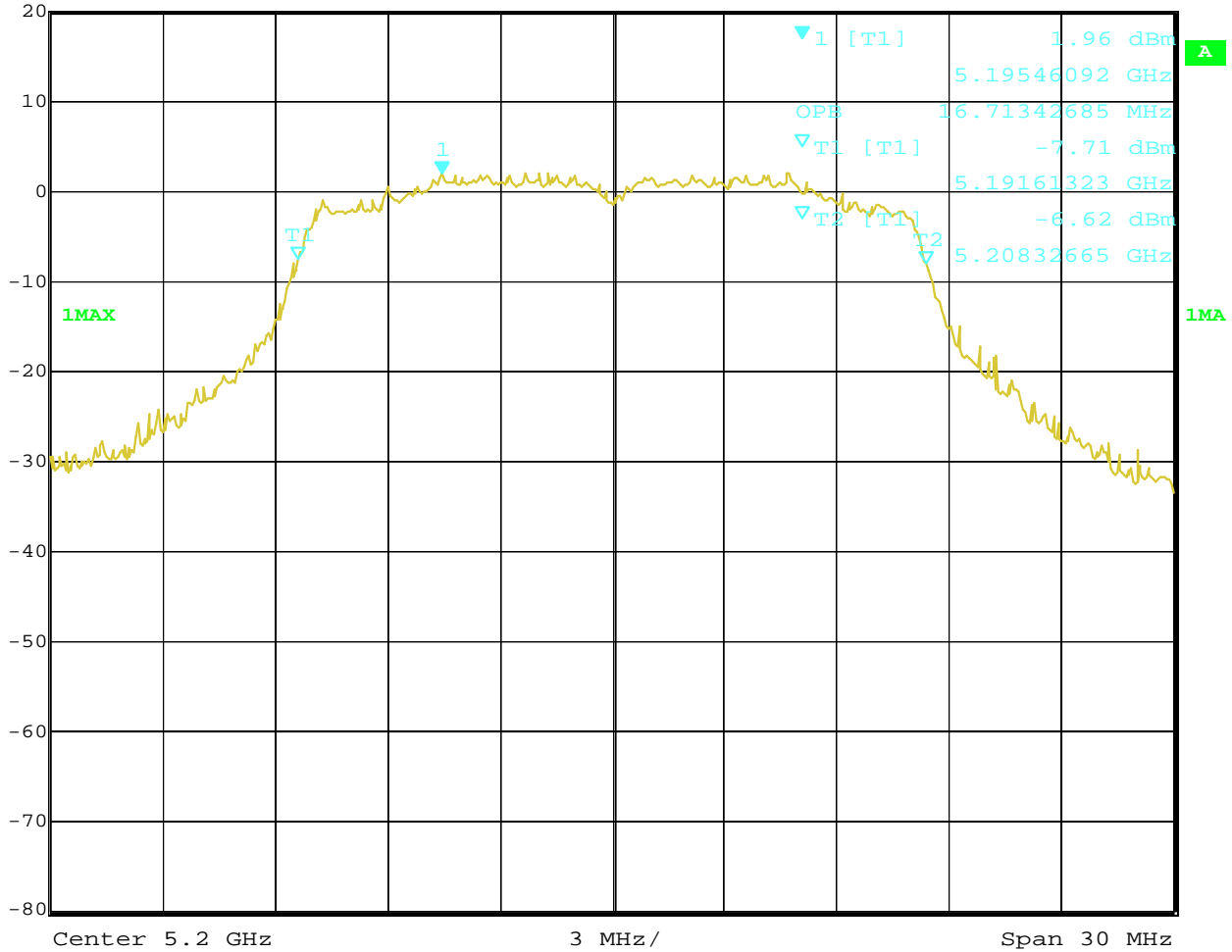
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Channel 40



Ref Lvl	Marker 1 [T1]	RBW	300 kHz	RF Att	30 dB
20 dBm	1.96 dBm	VBW	1 MHz		
	5.19546092 GHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 09:13:21

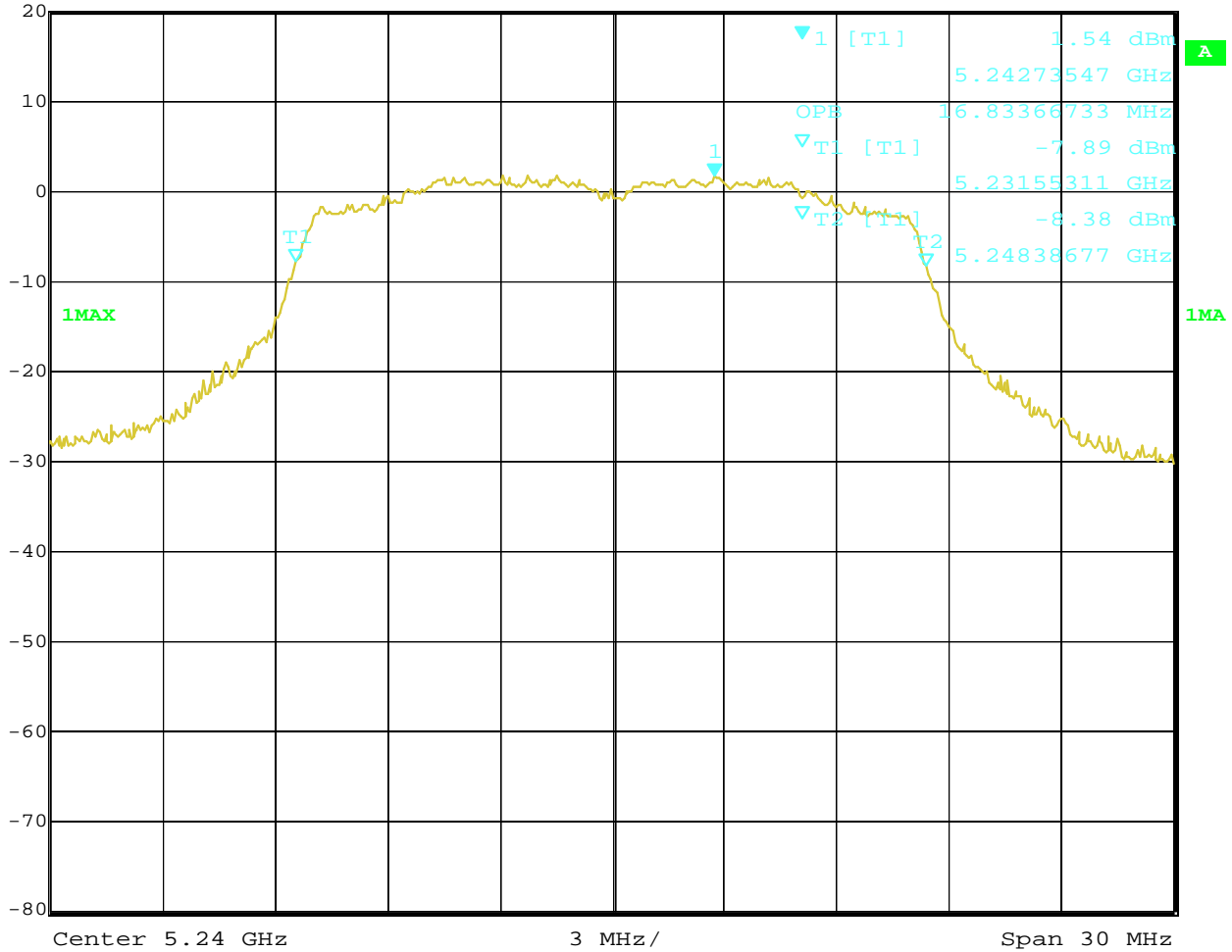
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Channel 48



Ref Lvl	Marker 1 [T1]	RBW	300 kHz	RF Att	30 dB
20 dBm	1.54 dBm	VBW	1 MHz		
	5.24273547 GHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 09:15:07

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EUT		POS COMPUTER		Model	HK316V
Mode		802.11n HT20		Input Voltage	DC24V
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	22.91	--	Pass
40	5200	mcs0	23.21	--	Pass
48	5240	mcs0	23.09	--	Pass
<b>99% Bandwidth</b>					
36	5180	mcs0	17.86	--	Pass
40	5200	mcs0	17.92	--	Pass
48	5240	mcs0	17.92	--	Pass

Note: Ant 0 and Ant 1 were tested and Ant 0 was the worst case. Ant 0 was the worst case.

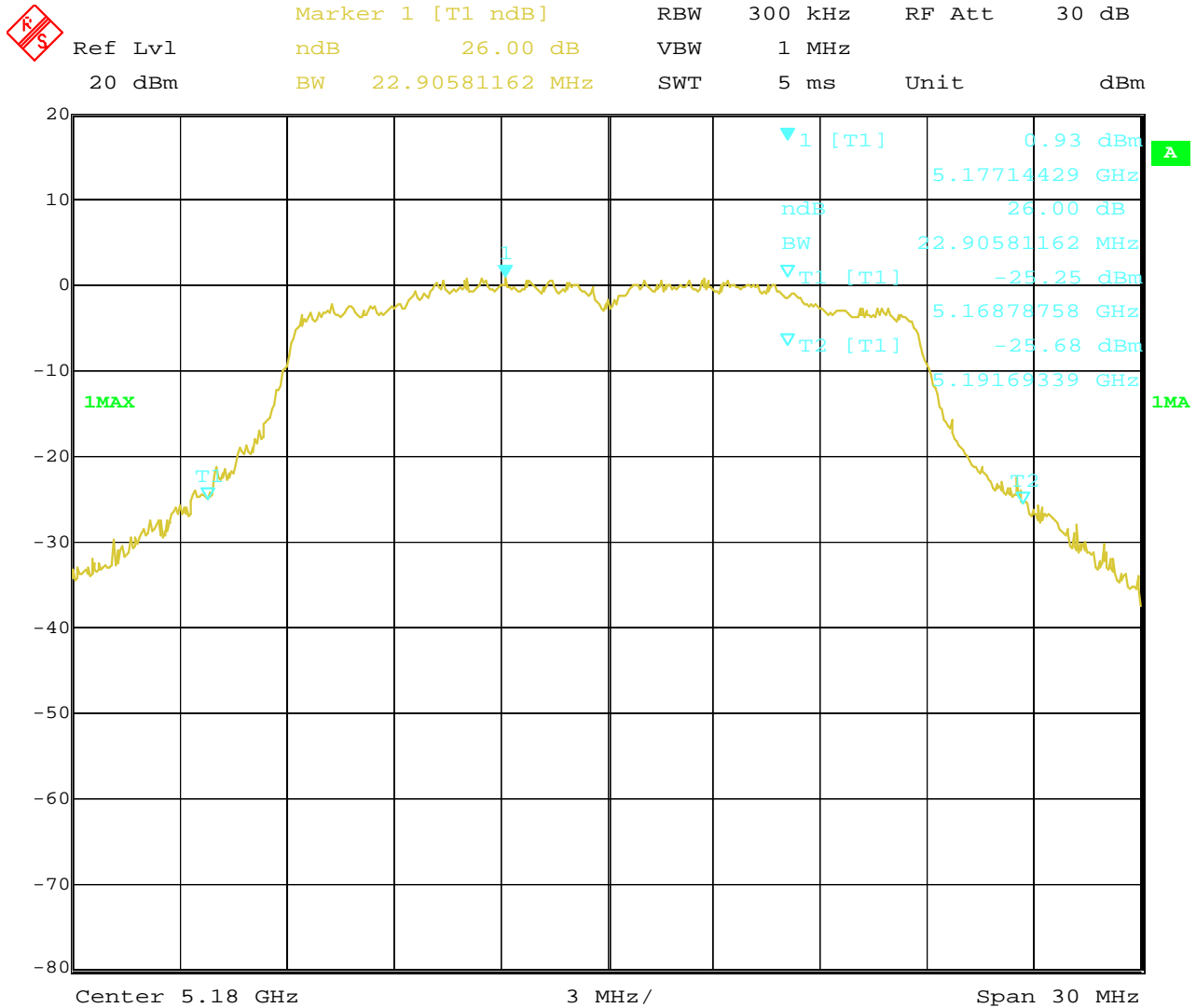
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Test Figure

26dB Bandwidth

Channel 36



Date: 26.MAR.2021 09:39:15

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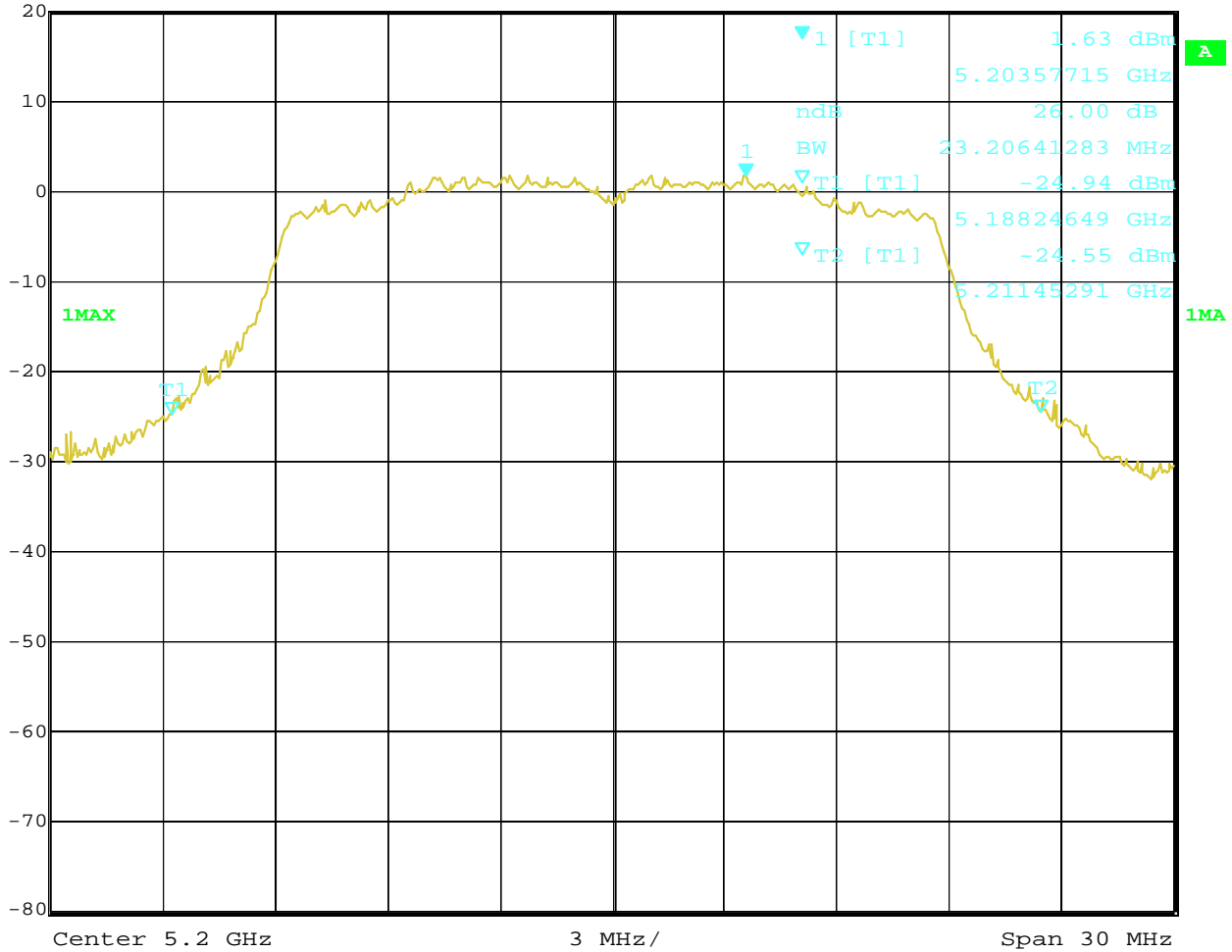




Channel 40



Ref Lvl	20 dBm	Marker 1 [T1 ndB]	ndB	26.00 dB	RBW	300 kHz	RF Att	30 dB
		BW	23.20641283 MHz		VBW	1 MHz	Unit	dBm
					SWT	5 ms		



Date: 26.MAR.2021 09:36:57

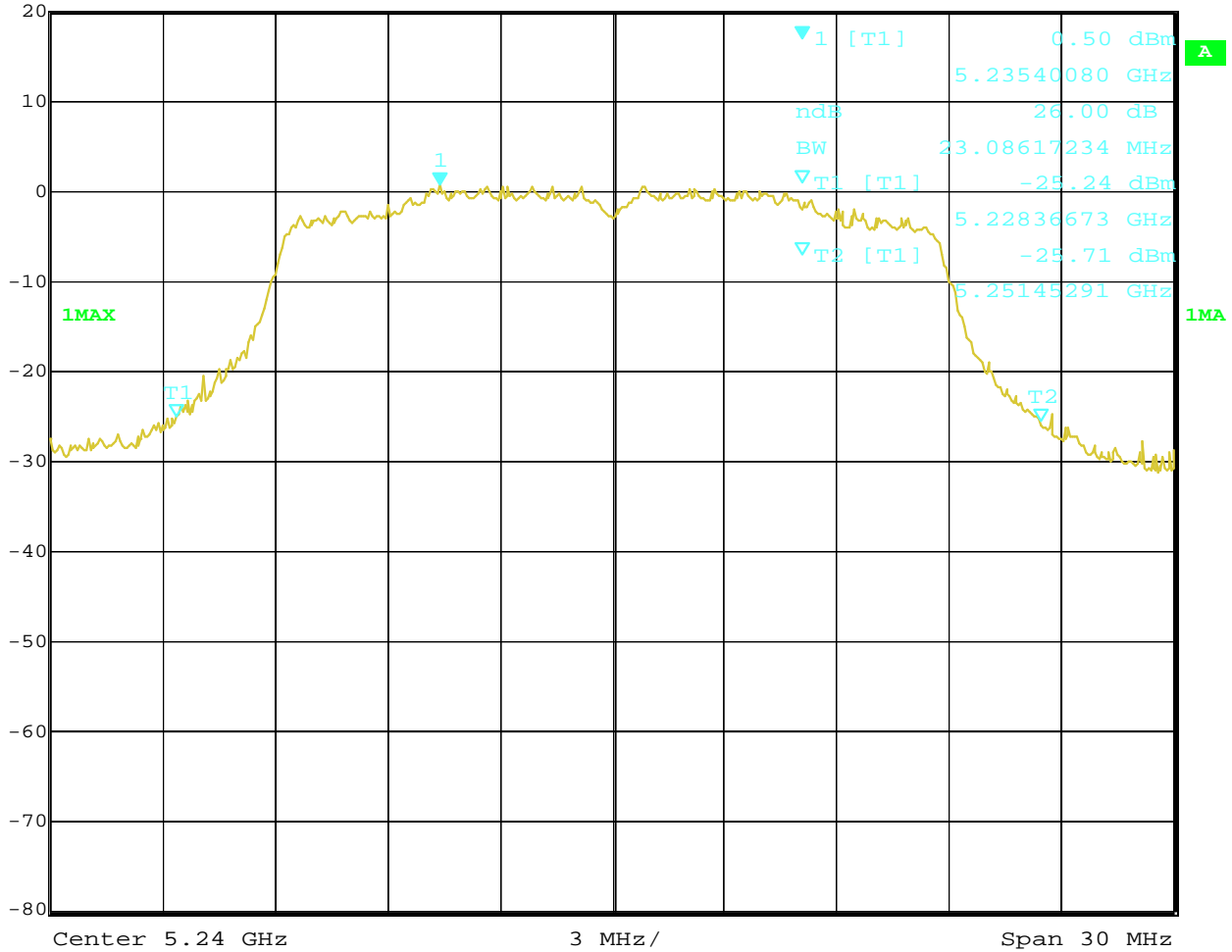
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Channel 48



Ref Lvl	20 dBm	Marker 1 [T1 ndB]	ndB	26.00 dB	RBW	300 kHz	RF Att	30 dB
		BW	23.08617234 MHz		VBW	1 MHz	Unit	dBm
					SWT	5 ms		



Date: 26.MAR.2021 09:33:59

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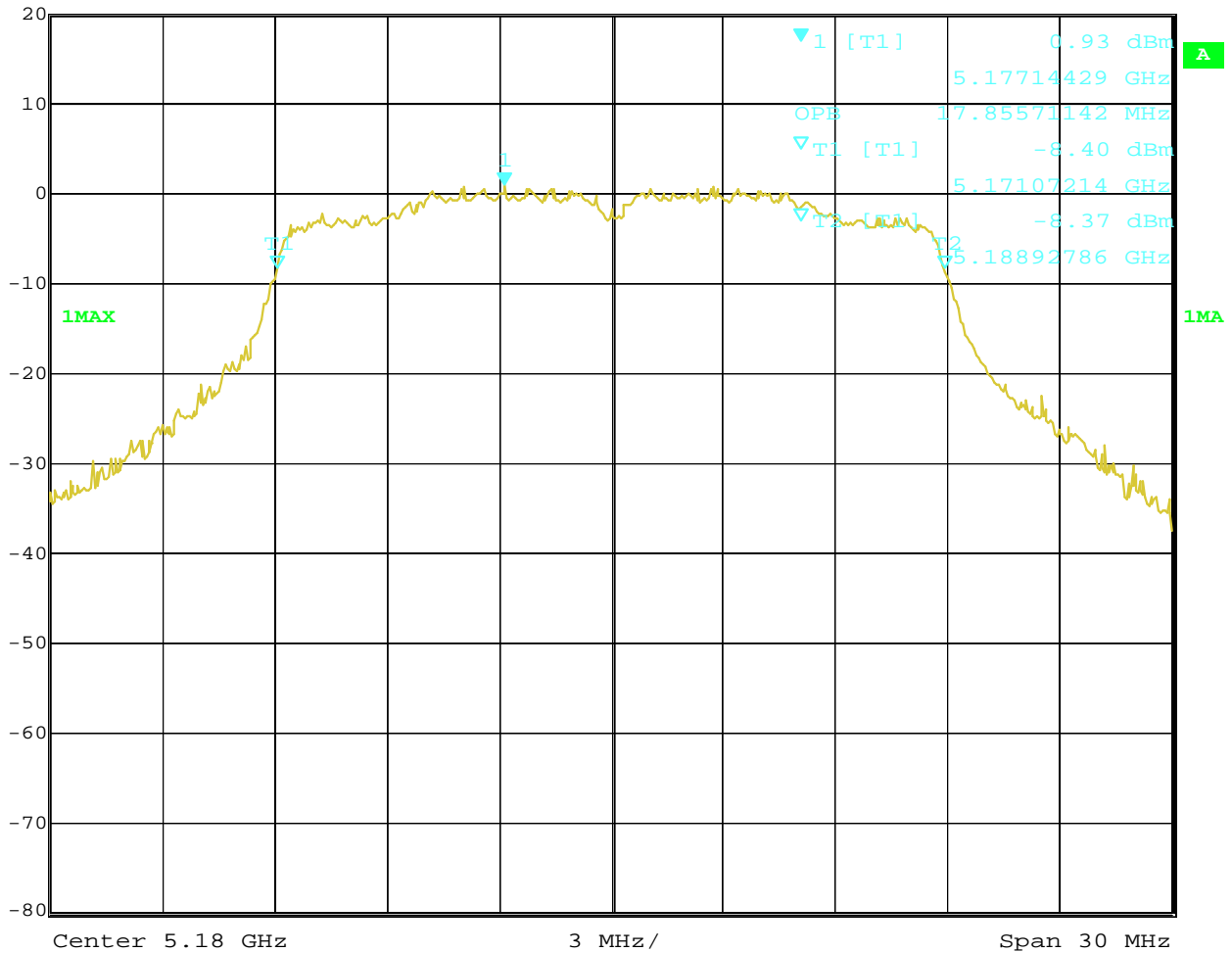


Test Configure

99% Bandwidth

Channel 36

	Ref Lvl	Marker 1 [T1]	RBW	300 kHz	RF Att	30 dB
	20 dBm	0.93 dBm	VBW	1 MHz		
		5.17714429 GHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 09:39:02

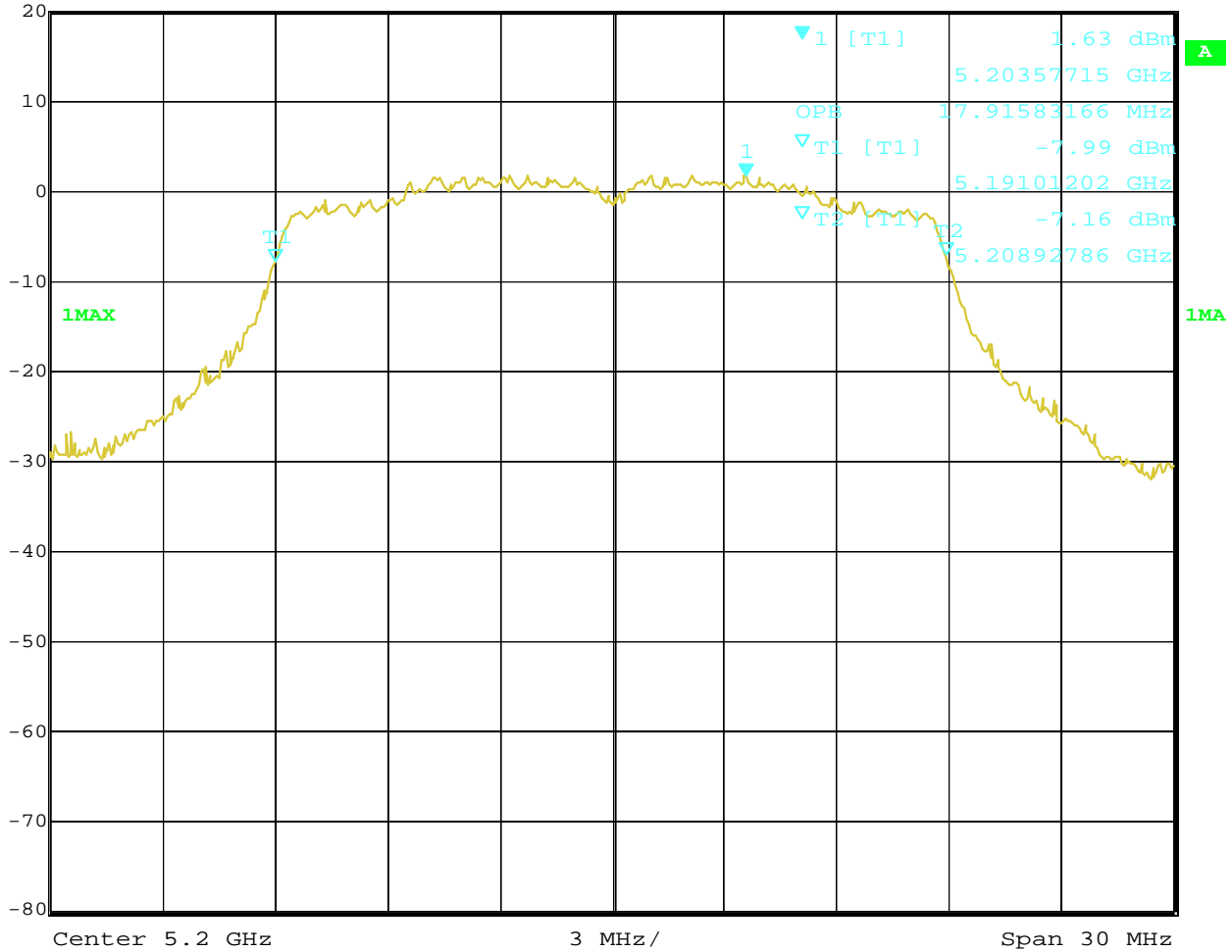
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Channel 40



	Marker 1 [T1]	RBW	300 kHz	RF Att	30 dB
Ref Lvl	1.63 dBm	VBW	1 MHz		
20 dBm	5.20357715 GHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 09:37:13

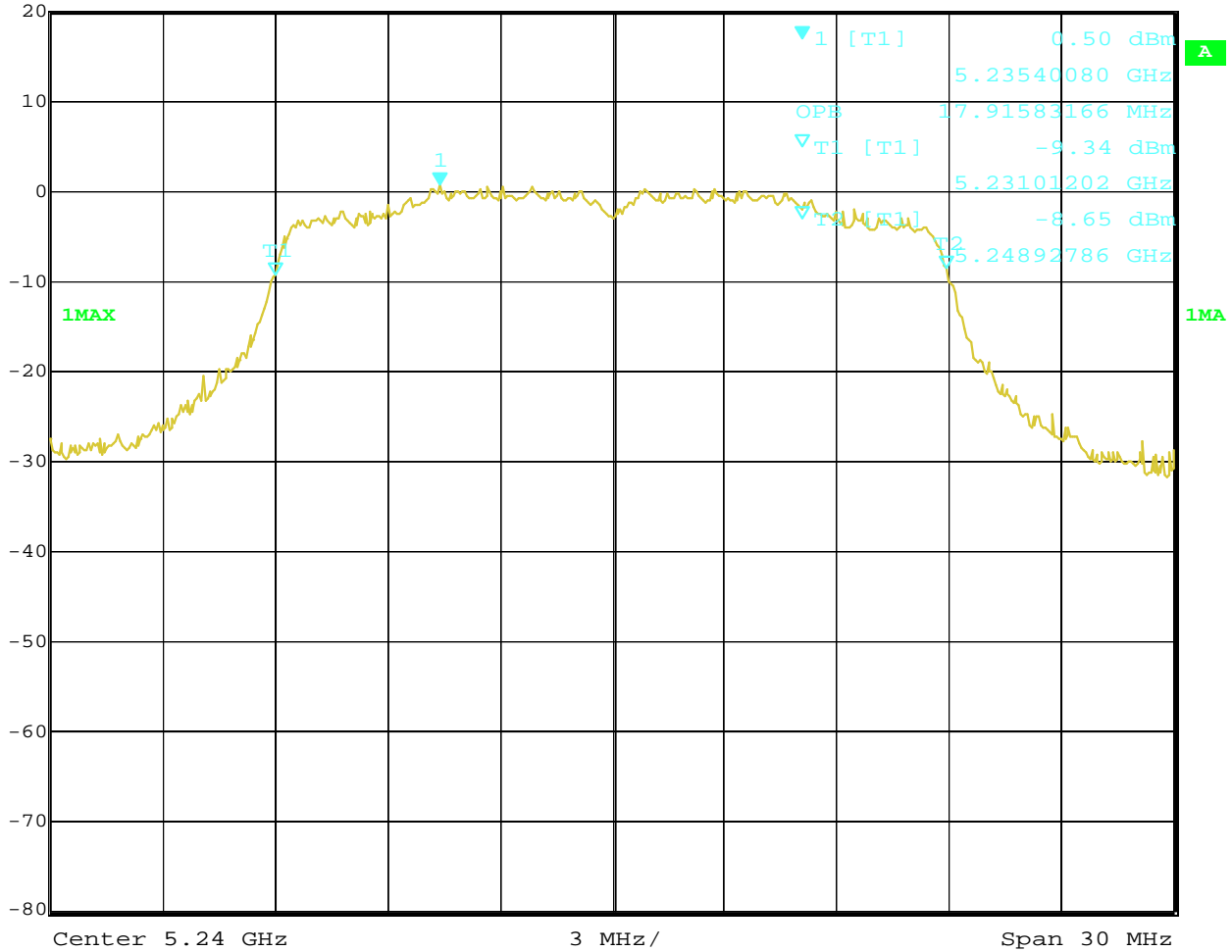
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Channel 48



Ref Lvl	Marker 1 [T1]	RBW	300 kHz	RF Att	30 dB
20 dBm	0.50 dBm	VBW	1 MHz		
	5.23540080 GHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 09:33:40

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EUT		POS COMPUTER		Model	HK316V
Mode		802.11n HT40		Input Voltage	DC24V
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	42.65	--	Pass
46	5230	mcs0	42.97	--	Pass
<b>99% Bandwidth</b>					
38	5190	mcs0	36.39	--	Pass
46	5230	mcs0	36.71	--	Pass

Note: Ant 0 and Ant 1 were tested and Ant 0 was the worst case. Ant 0 was the worst case.

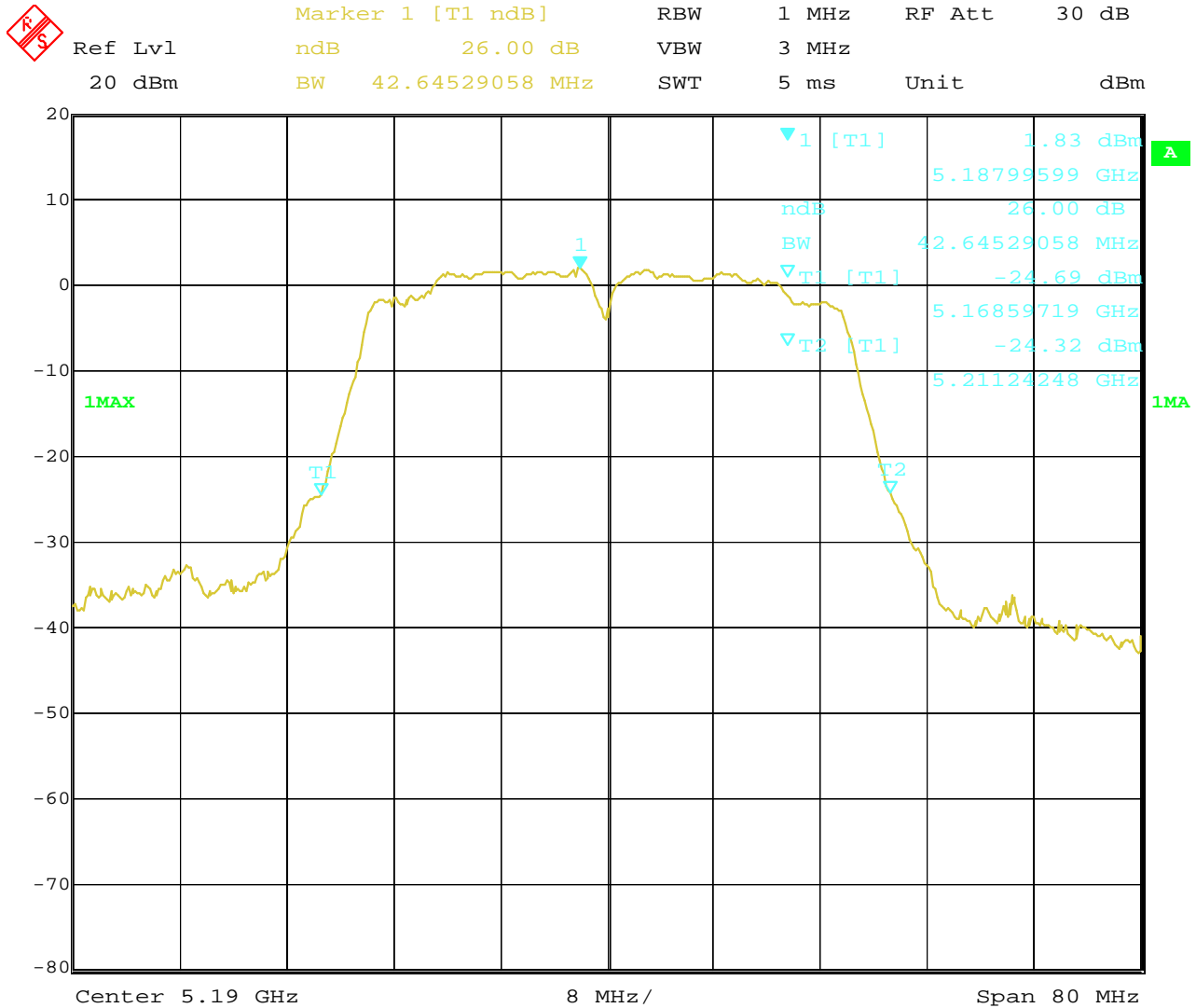
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Test Figure

26dB Bandwidth

Channel 38



Date: 26.MAR.2021 10:05:06

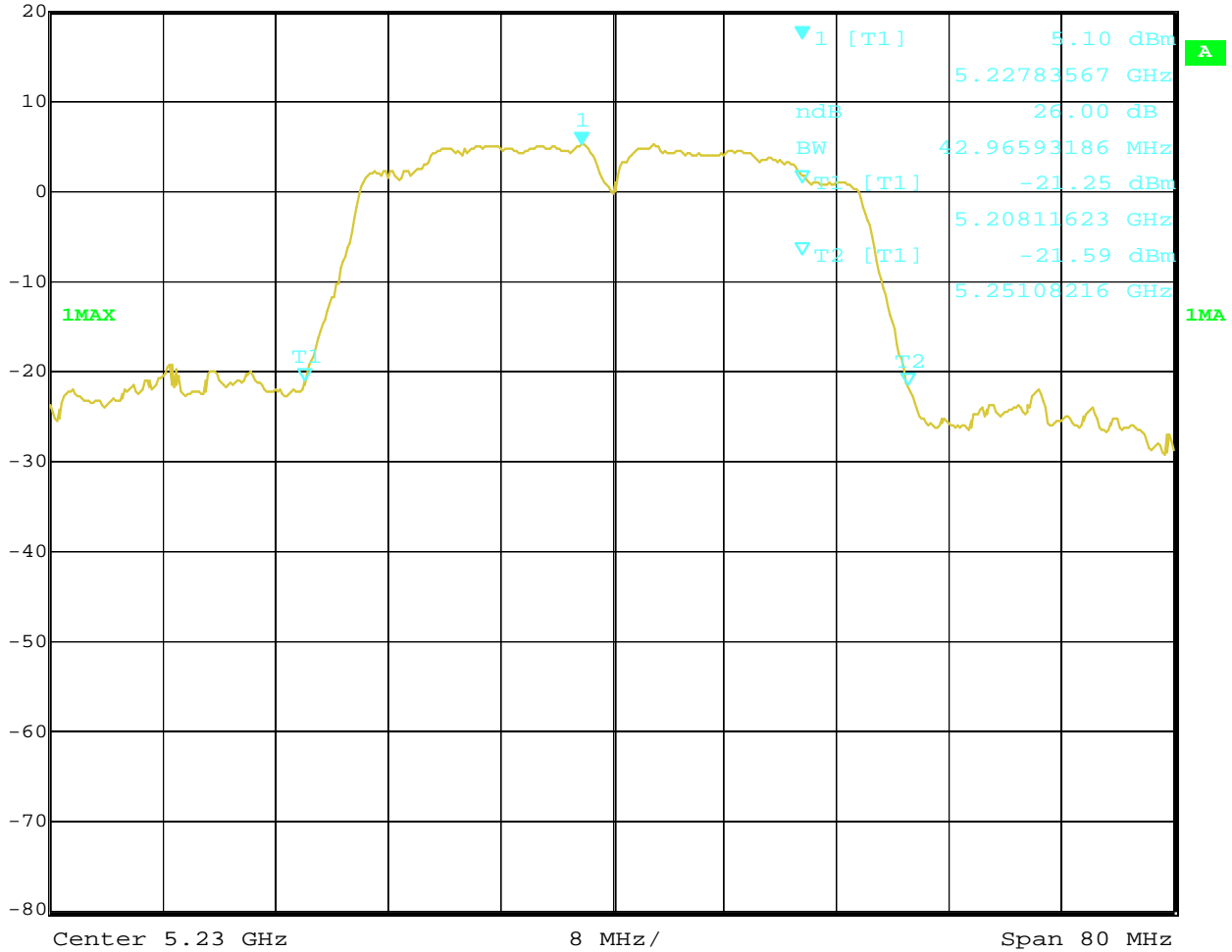
The report refers only to the sample tested and does not apply to the bulk.  
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Channel 46



Ref Lvl	20 dBm	Marker 1 [T1 ndB]	26.00 dB	RBW	1 MHz	RF Att	30 dB
		BW	42.96593186 MHz	VBW	3 MHz	Unit	dBm
		SWT			5 ms		



Date: 26.MAR.2021 10:06:53

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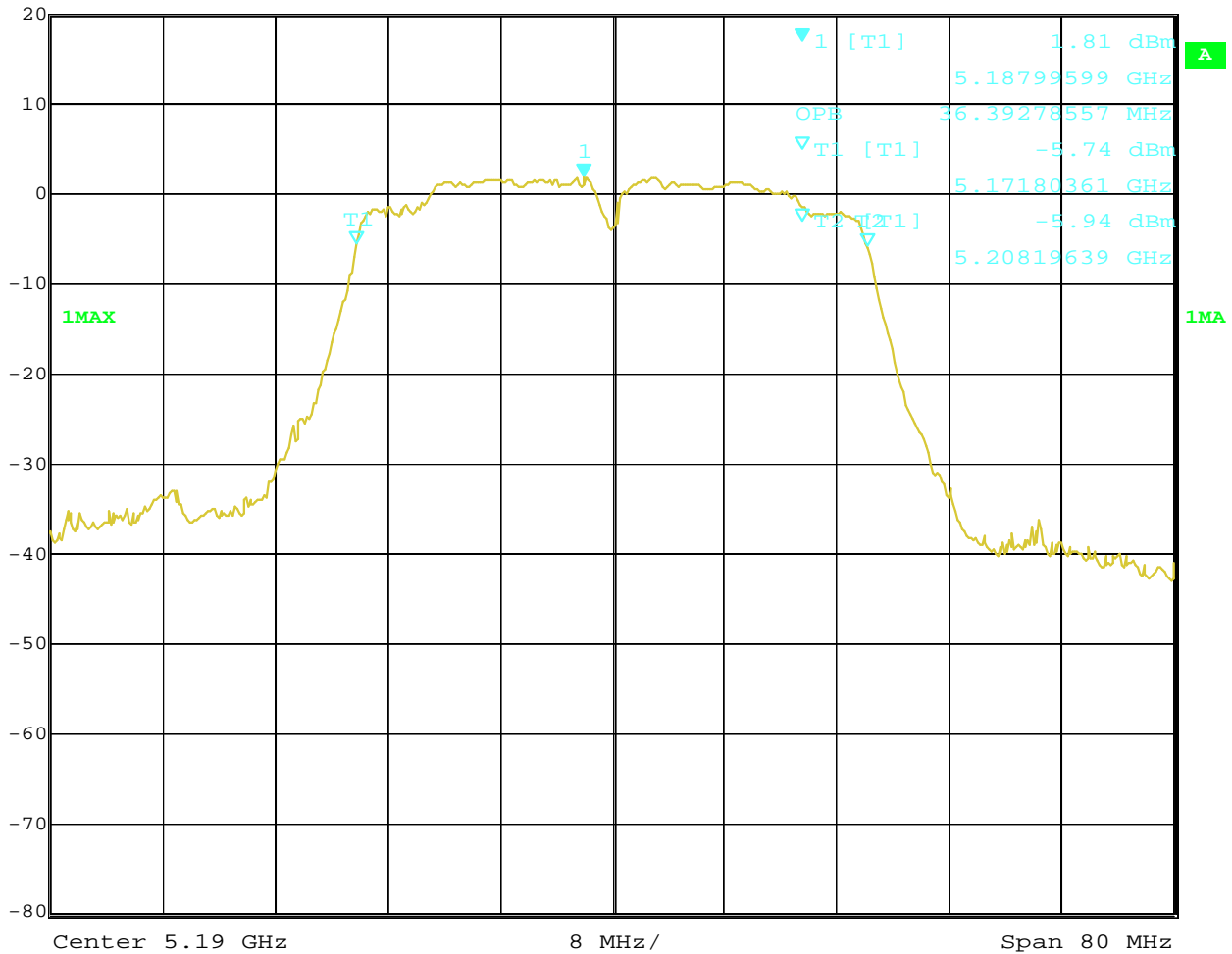


Test Configure

99% Bandwidth

Channel 38

	Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	30 dB
	20 dBm	1.81 dBm	VBW	3 MHz		
		5.18799599 GHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 10:04:51

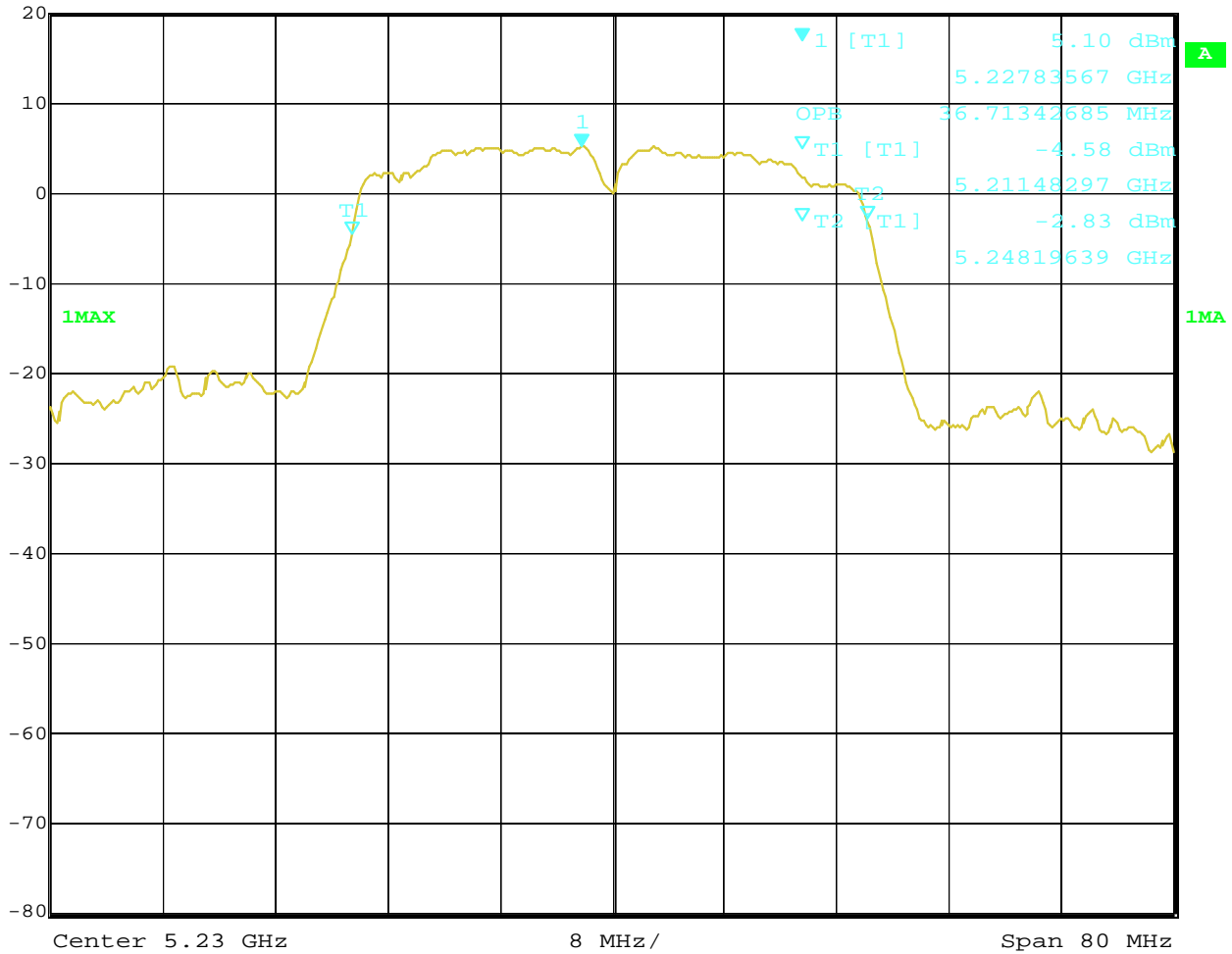
The report refers only to the sample tested and does not apply to the bulk.  
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Channel 46



Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	30 dB
20 dBm	5.10 dBm	VBW	3 MHz		
	5.22783567 GHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 10:07:10

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EUT		POS COMPUTER		Model	HK316V
Mode		802.11ac VHT20		Input Voltage	DC24V
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	22.79	--	Pass
40	5200	mcs0	22.85	--	Pass
48	5240	mcs0	22.73	--	Pass
<b>99% Bandwidth</b>					
36	5180	mcs0	17.86	--	Pass
40	5200	mcs0	17.92	--	Pass
48	5240	mcs0	17.92	--	Pass

Note: Ant 0 and Ant 1 were tested and Ant 0 was the worst case. Ant 0 was the worst case.

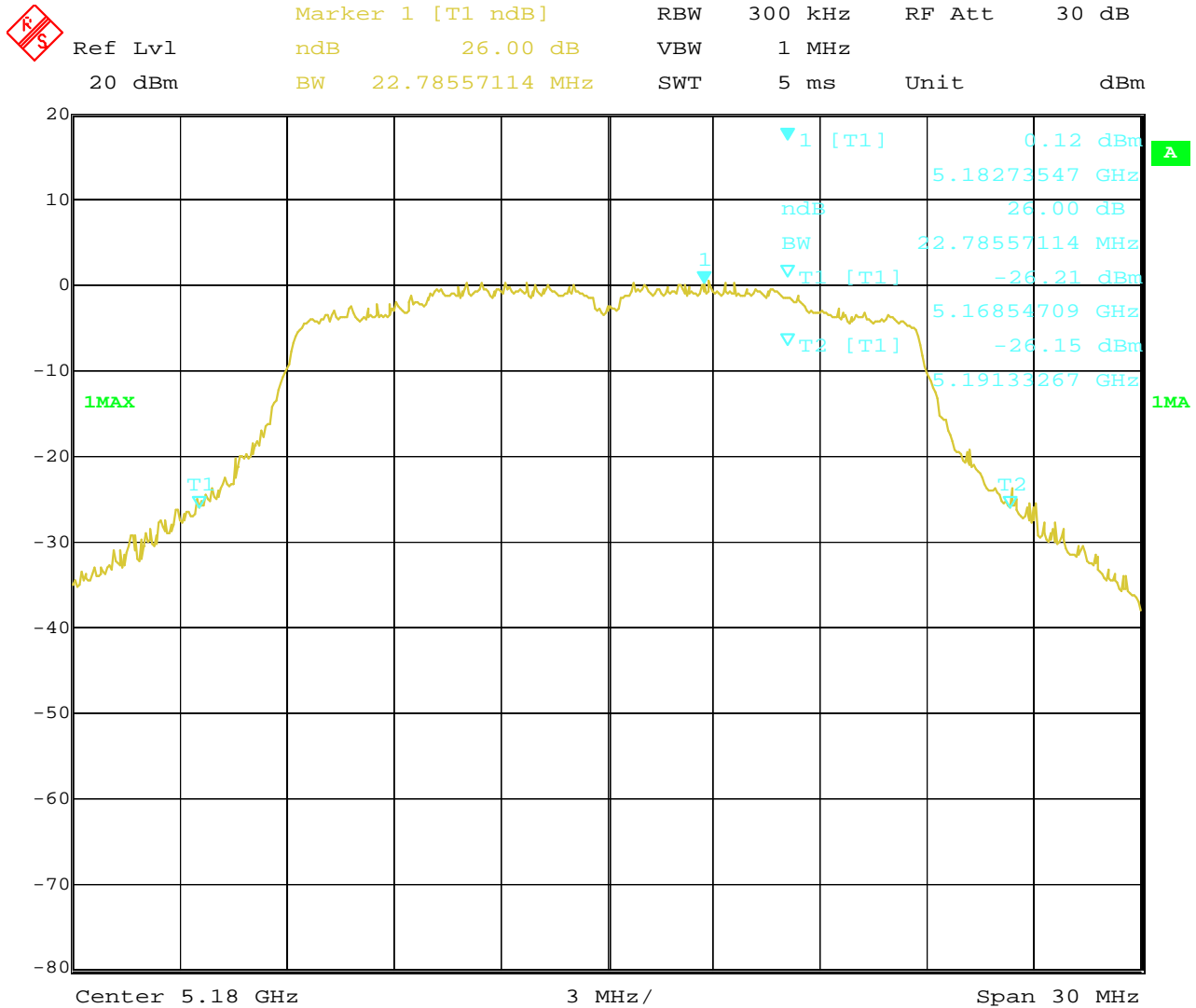
The report refers only to the sample tested and does not apply to the bulk.  
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Test Figure

26dB Bandwidth

Channel 36



Date: 26.MAR.2021 09:39:57

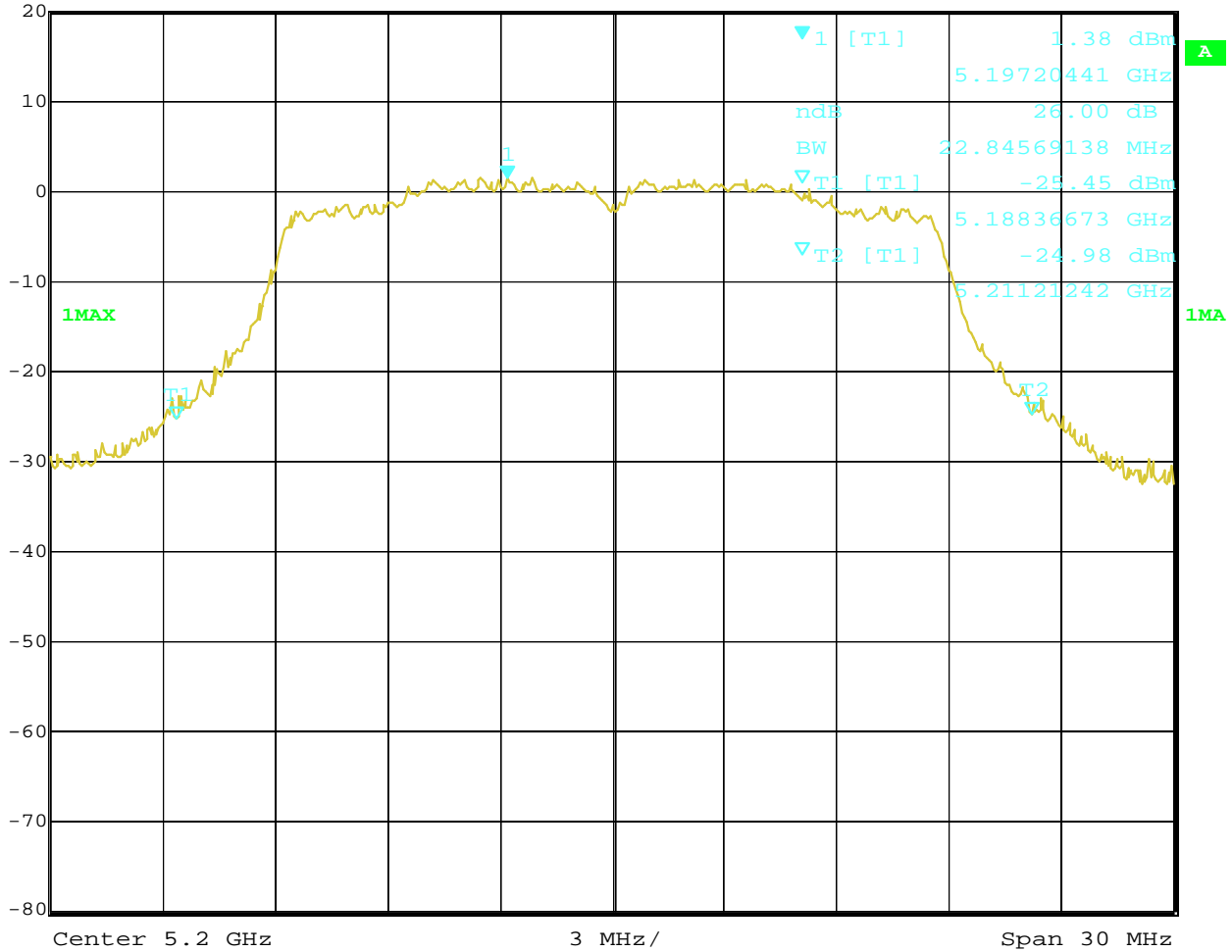
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Channel 40



Ref Lvl	Marker 1 [T1 ndB]	RBW	300 kHz	RF Att	30 dB
20 dBm	ndB 26.00 dB	VBW	1 MHz		
	BW 22.84569138 MHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 09:42:30

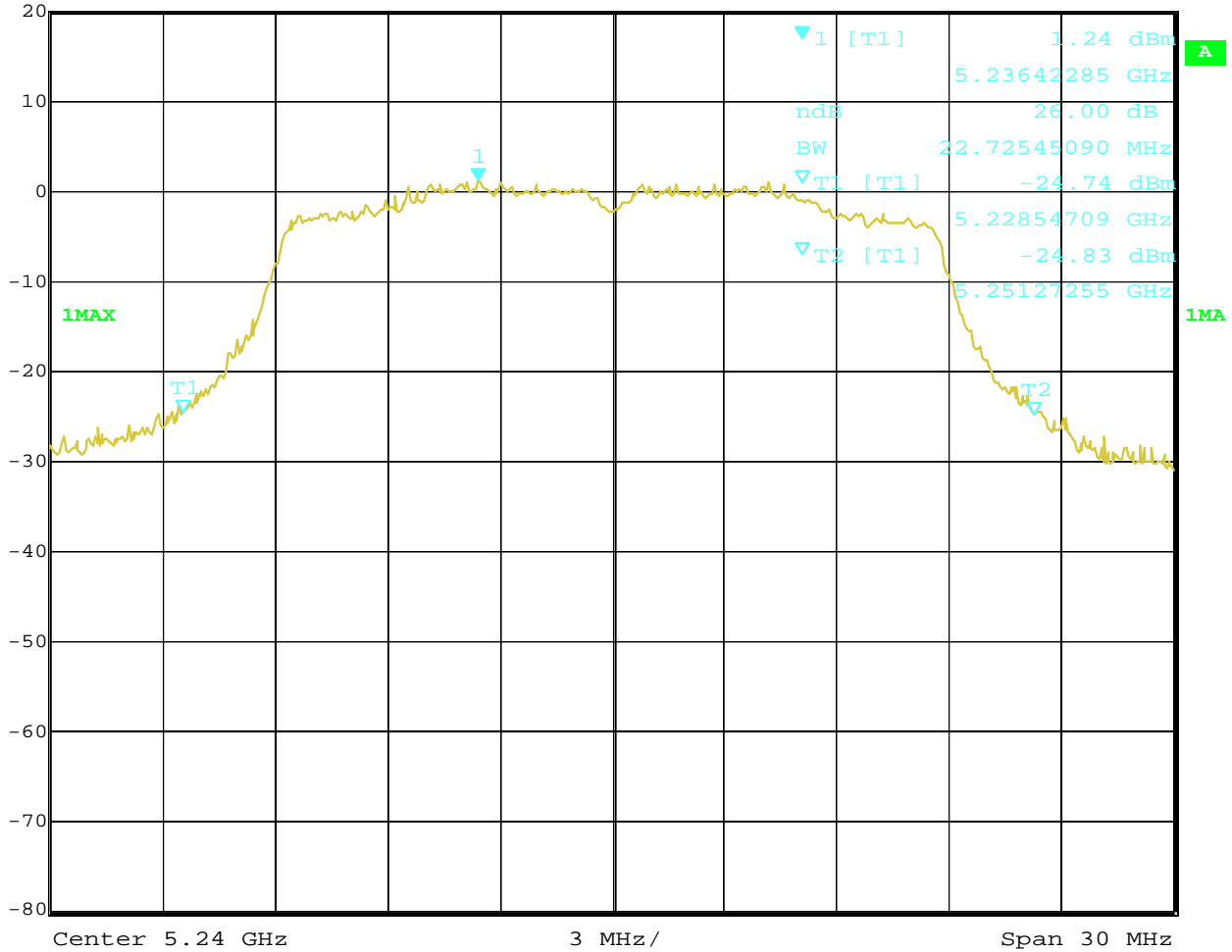
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Channel 48



Ref Lvl	Marker 1 [T1 ndB]	RBW	300 kHz	RF Att	30 dB
20 dBm	ndB 26.00 dB	VBW	1 MHz		
	BW 22.72545090 MHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 09:43:45

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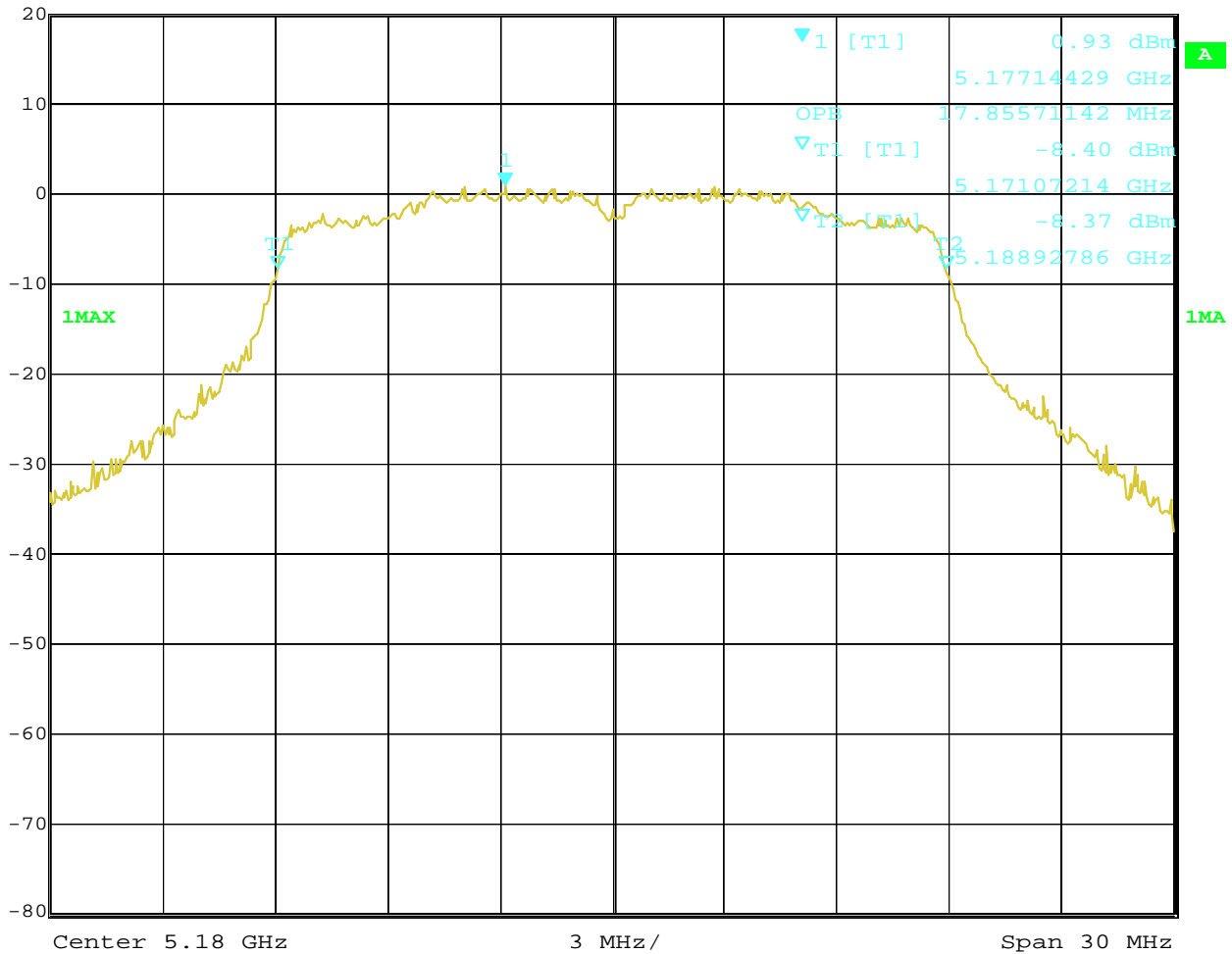


Test Configure

99% Bandwidth

Channel 36

	Ref Lvl	Marker 1 [T1]	RBW	300 kHz	RF Att	30 dB
	20 dBm	0.93 dBm	VBW	1 MHz		
		5.17714429 GHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 09:39:02

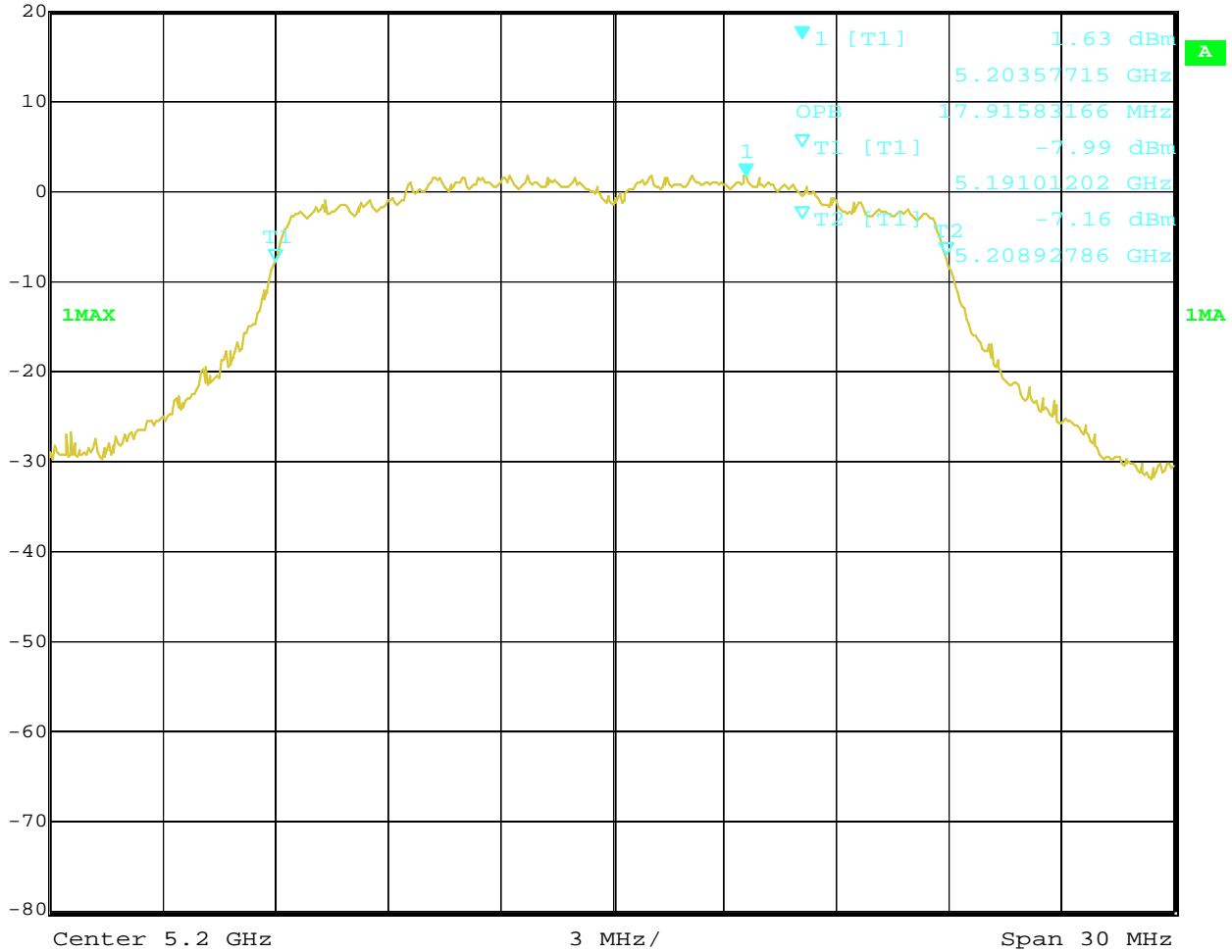
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Channel 40



Ref Lvl	Marker 1 [T1]	RBW	300 kHz	RF Att	30 dB
20 dBm	1.63 dBm	VBW	1 MHz		
	5.20357715 GHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 09:37:13

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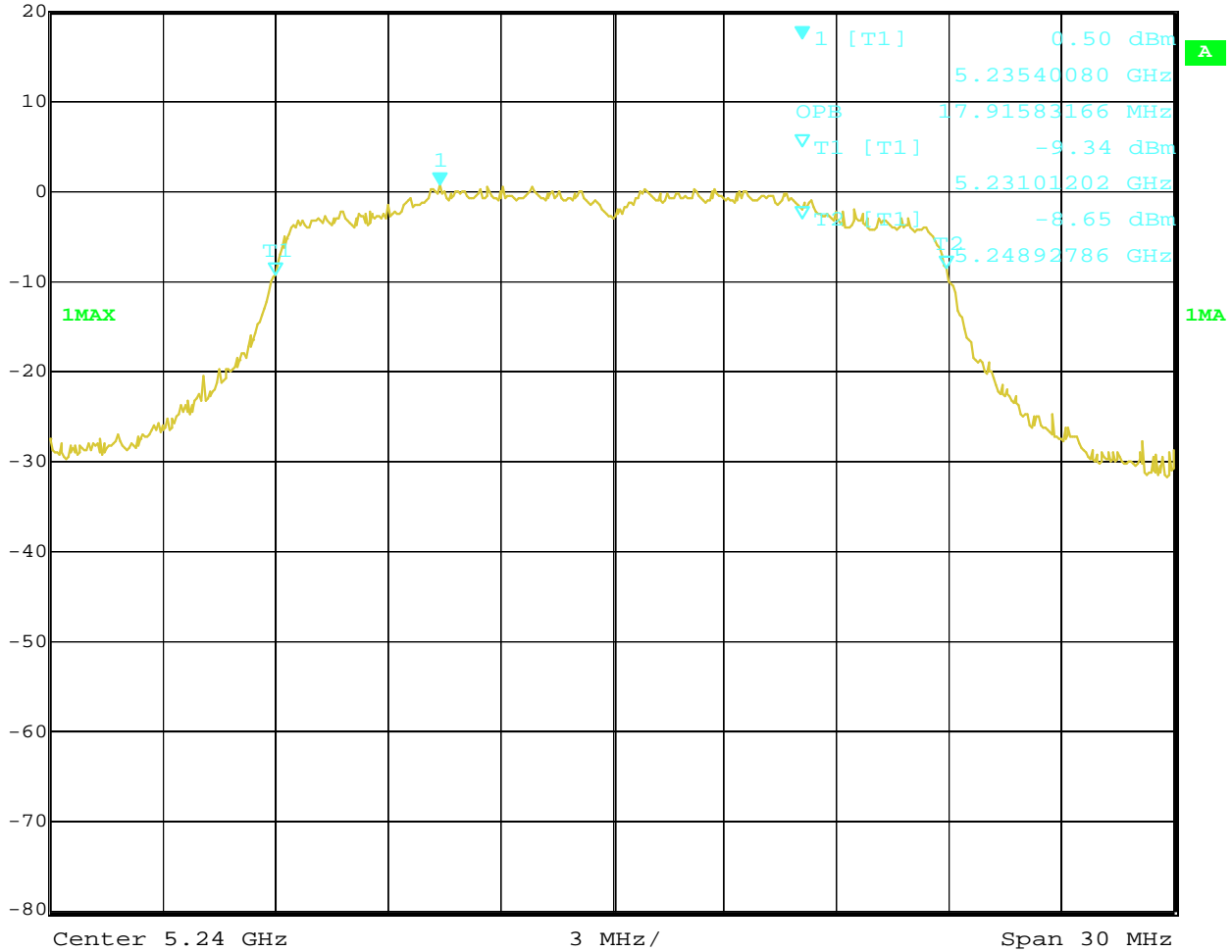




Channel 48



Ref Lvl	Marker 1 [T1]	RBW	300 kHz	RF Att	30 dB
20 dBm	0.50 dBm	VBW	1 MHz		
	5.23540080 GHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 09:33:40

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EUT		POS COMPUTER		Model	HK316V
Mode		802.11ac VHT40		Input Voltage	DC24V
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	42.13	--	Pass
46	5230	mcs0	43.29	--	Pass
<b>99% Bandwidth</b>					
38	5190	mcs0	36.39	--	Pass
46	5230	mcs0	36.71	--	Pass

Note: Ant 0 and Ant 1 were tested and Ant 0 was the worst case. Ant 0 was the worst case.

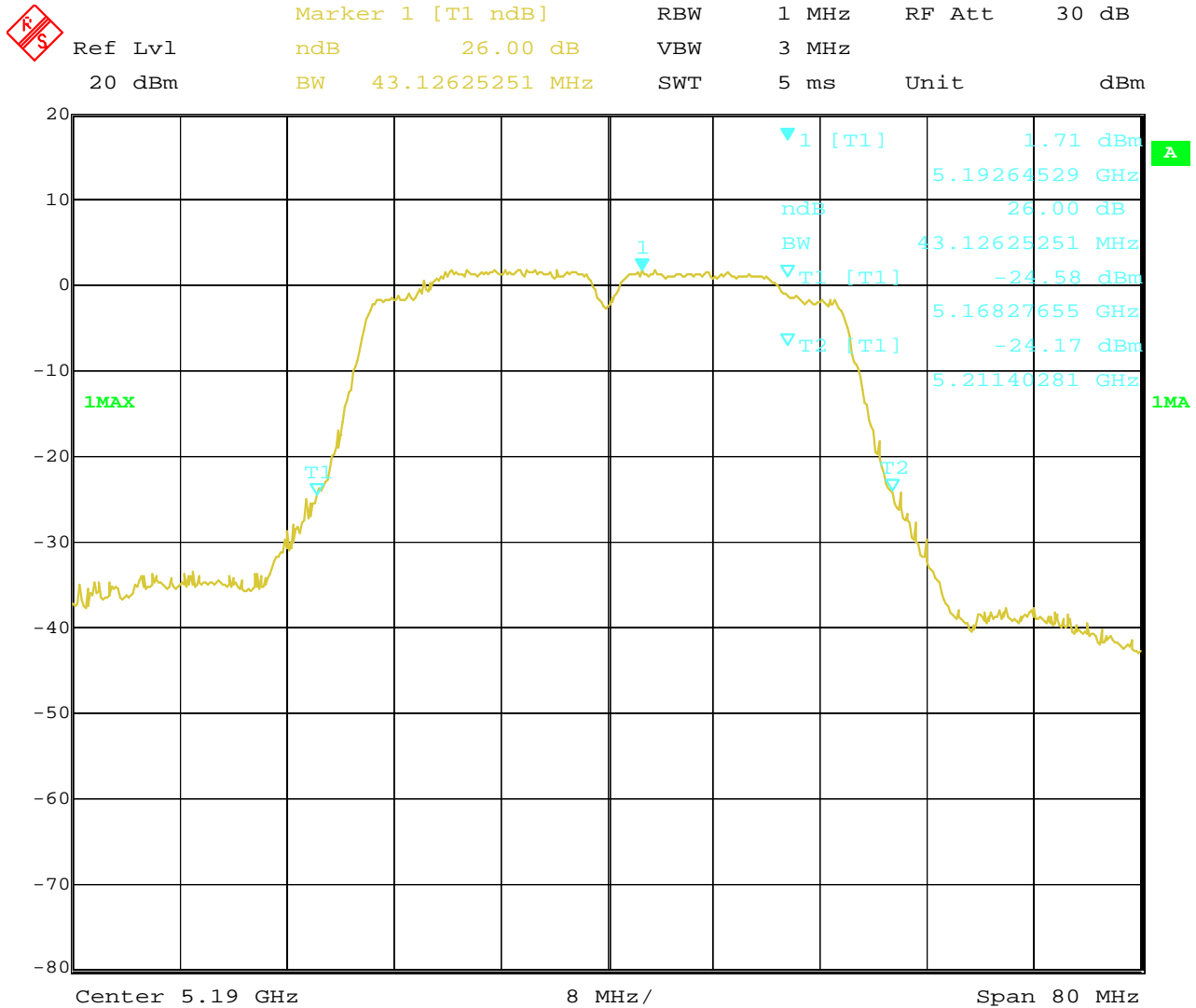
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Test Figure

26dB Bandwidth

Channel 38



Date: 26.MAR.2021 10:03:56

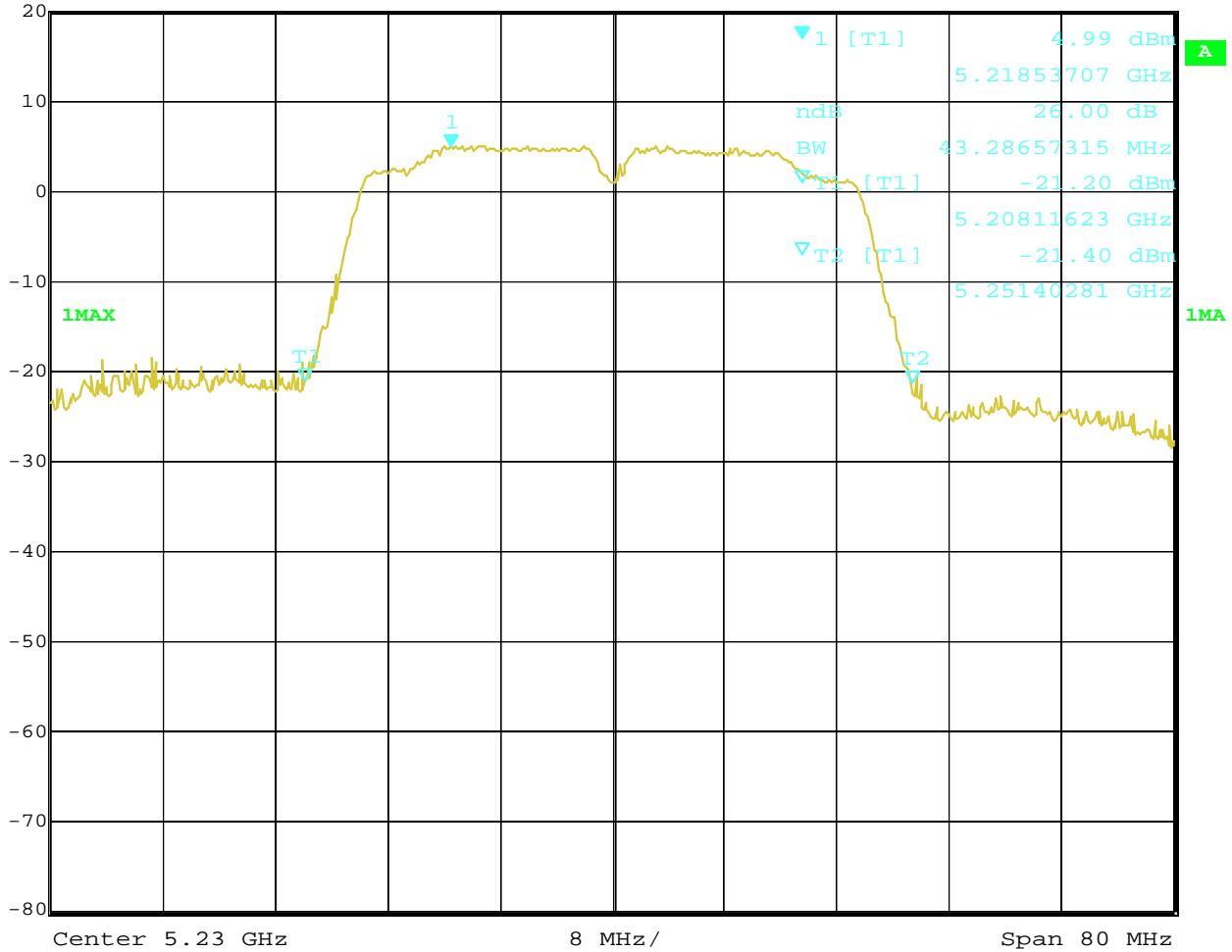
The report refers only to the sample tested and does not apply to the bulk.  
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Channel 46



Ref Lvl	20 dBm	Marker 1 [T1 ndB]	ndB	26.00 dB	RBW	1 MHz	RF Att	30 dB
		BW	43.28657315 MHz		VBW	3 MHz	Unit	dBm
					SWT	5 ms		



Date: 26.MAR.2021 10:08:33

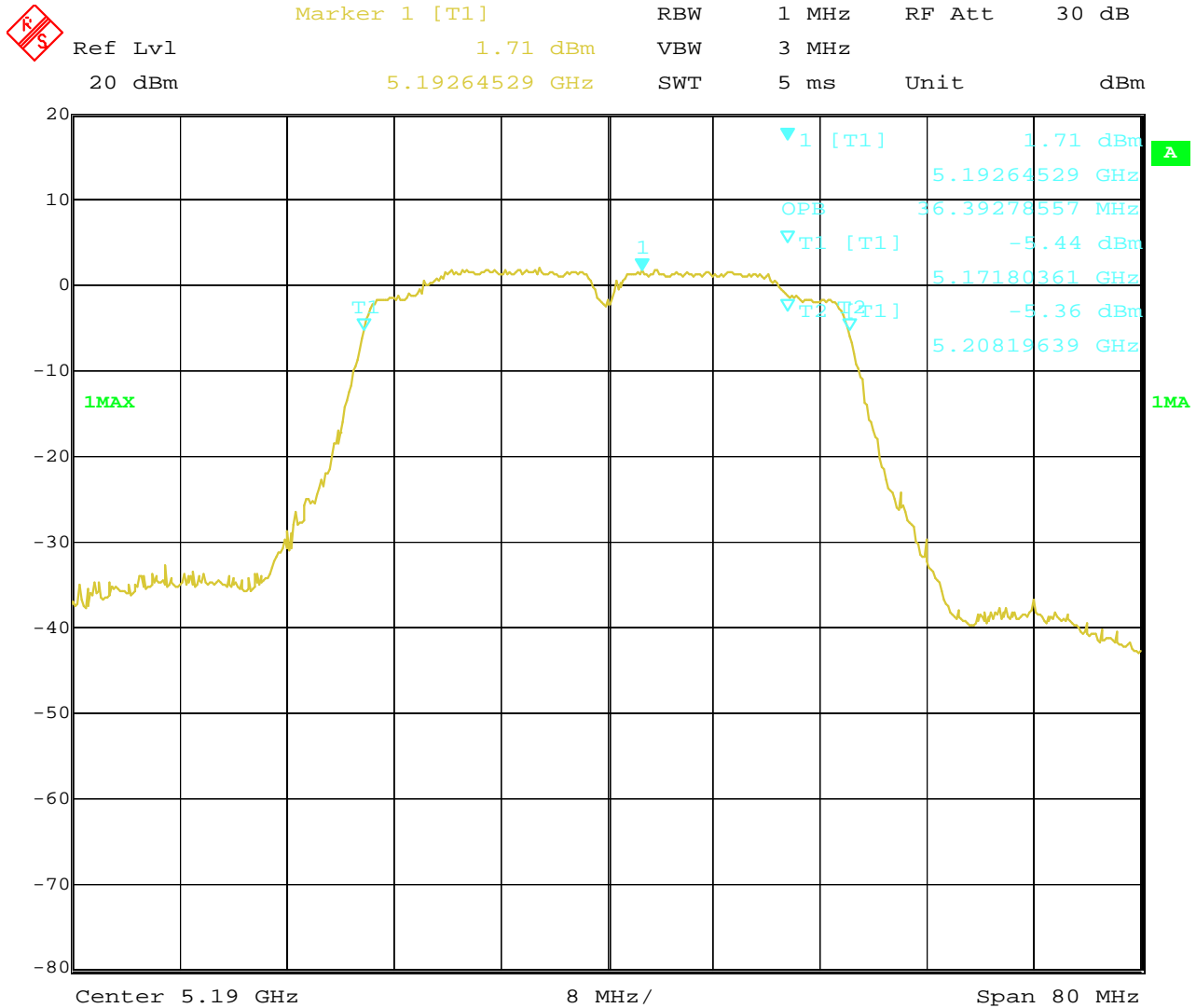
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Test Figure

99% Bandwidth

Channel 38



Date: 26.MAR.2021 10:04:08

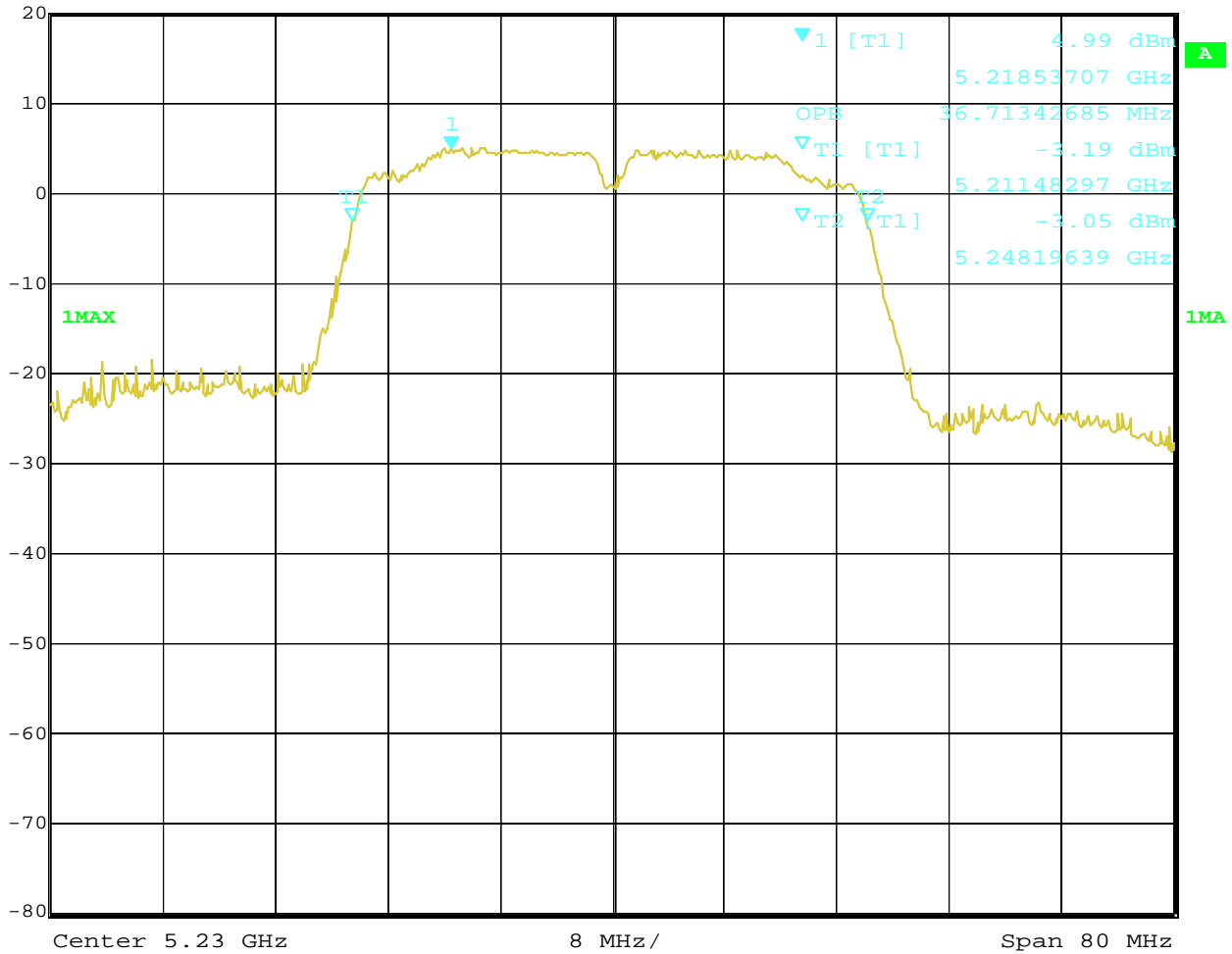
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Channel 46



Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	30 dB
20 dBm	4.99 dBm	VBW	3 MHz		
	5.21853707 GHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 10:08:15

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EUT		POS COMPUTER		Model	HK316V
Mode		802.11ac VHT80		Input Voltage	DC24V
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	mcs0	94.99	--	Pass
<b>99% Bandwidth</b>					
42	5210	mcs0	75.75	--	Pass

Note: Ant 0 and Ant 1 were tested and Ant 0 was the worst case. Ant 0 was the worst case.

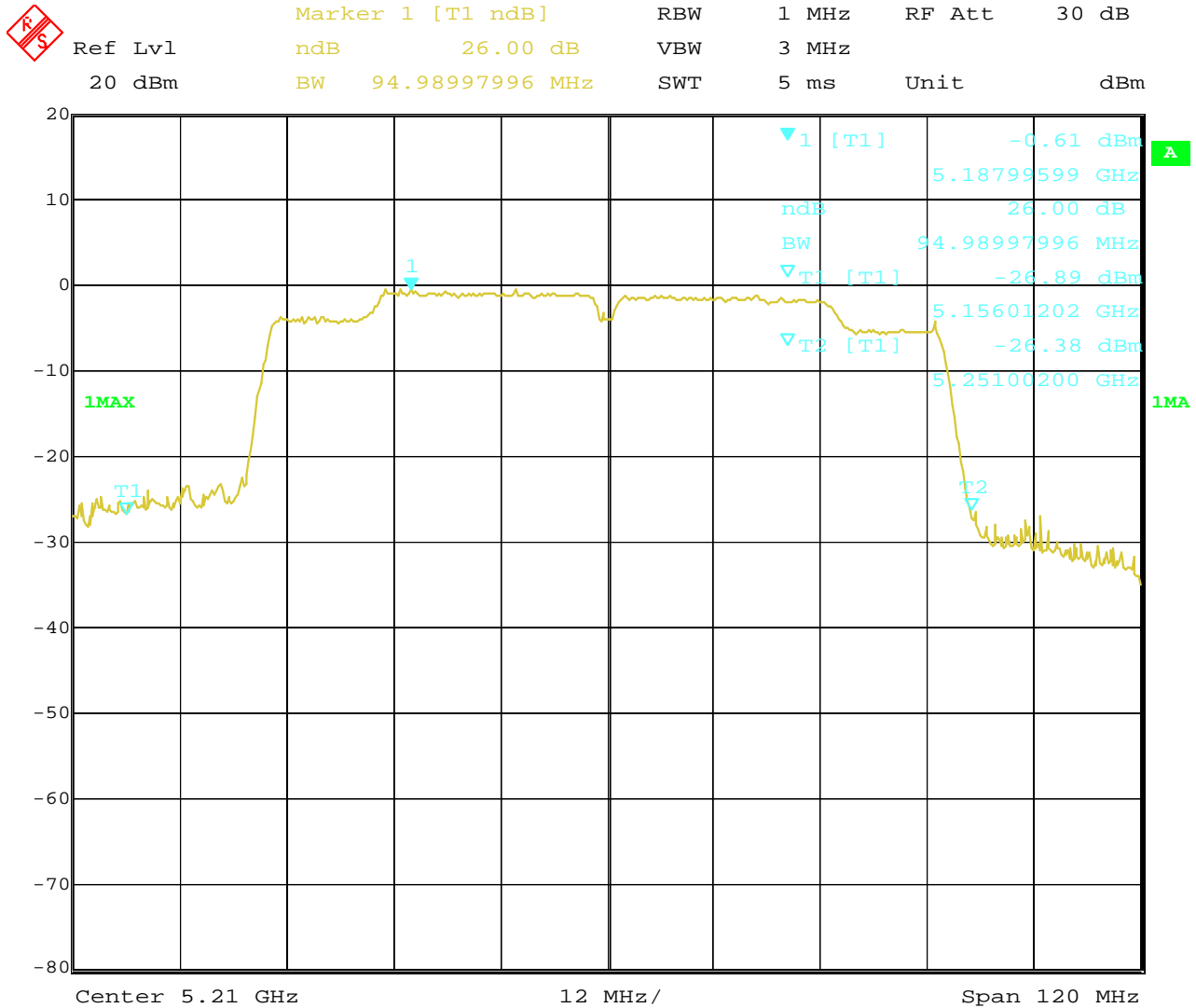
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Test Figure

26dB Bandwidth

Channel 42



Date: 26.MAR.2021 10:01:28

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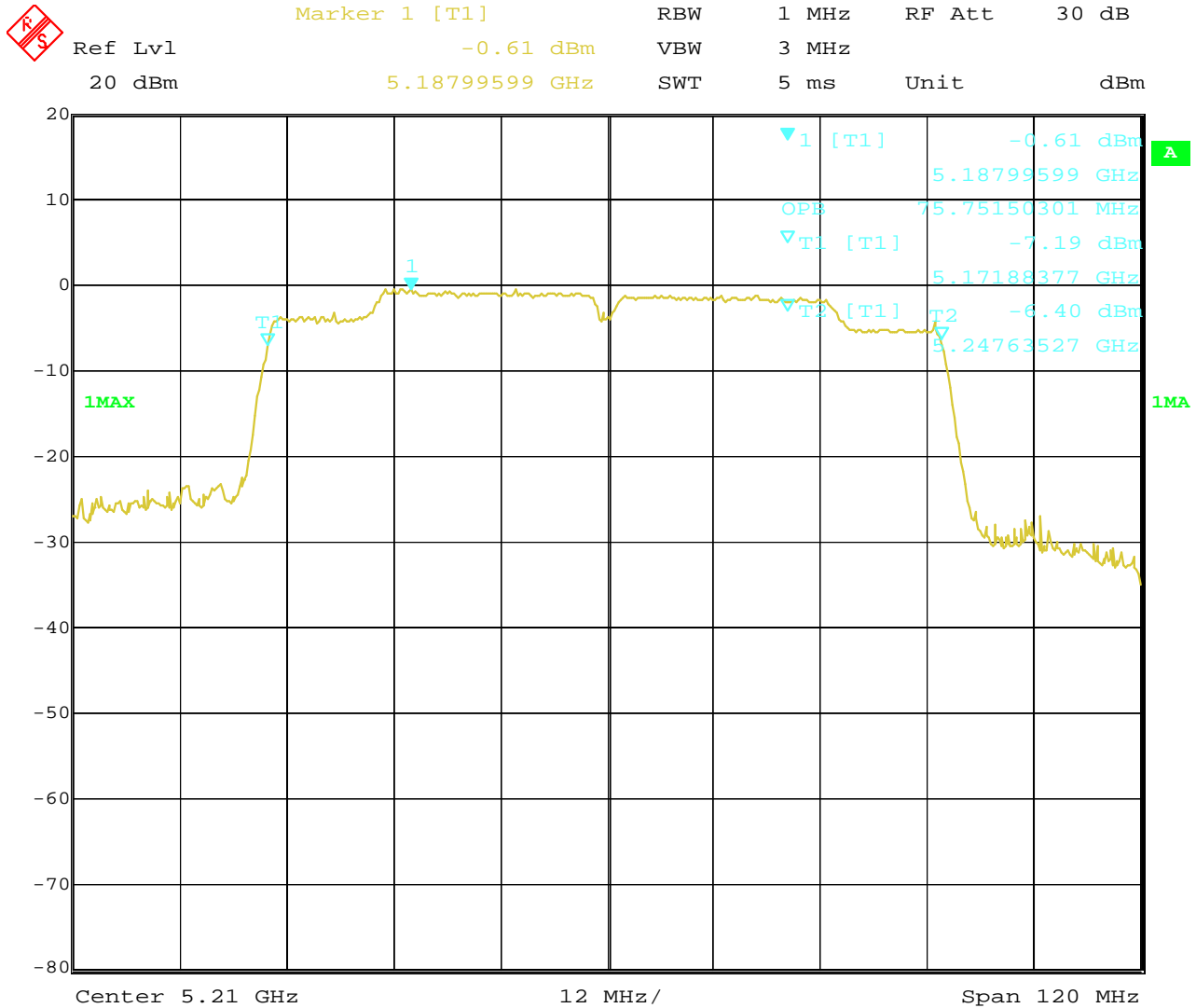




Test Figure

99% Bandwidth

Channel 42



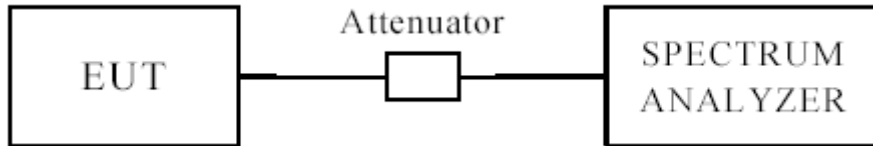
Date: 26.MAR.2021 10:01:49

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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) $\cong$ (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		POS COMPUTER		Model		HK316V		
Mode		802.11a		Test Voltage		DC24V		
Temperature		24 deg. C,		Humidity		56% RH		
Channel	Frequency (MHz)	Ant 0 Power		Ant 1 Power		Total Power (dBm)	Limit (dBm)	Pass/ Fail
		dBm	mW	dBm	mW			
36	5180	8.41	6.93	8.25	6.68	11.34	24	Pass
40	5200	8.76	7.52	8.59	7.23	11.69	24	Pass
48	5240	8.29	6.75	8.11	6.47	11.21	24	Pass

Note: 1. At final test to get the worst-case emission at 6Mbps for CH36, CH40, CH48, CH149, CH157 and CH165

2. The result basic equation calculation as follow:

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

3. The worse case was recorded

EUT		POS COMPUTER		Model		HK316V		
Mode		802.11n HT20		Test Voltage		DC24V		
Temperature		24 deg. C,		Humidity		56% RH		
Channel	Frequency (MHz)	Ant 0 Power		Ant 1 Power		Total Power (dBm)	Limit (dBm)	Pass/ Fail
		dBm	mW	dBm	mW			
36	5180	7.74	5.94	7.61	5.77	10.69	24	Pass
40	5200	9.09	8.11	8.84	7.66	11.98	24	Pass
48	5240	8.11	6.47	7.92	6.19	11.03	24	Pass

Note: 1. At final test to get the worst-case emission at mcs0 for CH36, CH40, CH48, CH149, CH157 and CH165

2. The result basic equation calculation as follow:

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

3. The worse case was recorded

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EUT		POS COMPUTER		Model		HK316V		
Mode		802.11n HT40		Test Voltage		DC24V		
Temperature		24 deg. C,		Humidity		56% RH		
Channel	Frequency (MHz)	Ant 0 Power		Ant 1 Power		Total Power (dBm)	Limit (dBm)	Pass/ Fail
		dBm	mW	dBm	mW			
38	5190	7.28	5.35	6.92	4.92	10.11	24	Pass
46	5230	10.21	10.50	10.05	10.12	13.14	24	Pass

- Note: 1. At final test to get the worst-case emission at mcs0 for CH38, CH46, CH151, CH159 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		POS COMPUTER		Model		HK316V		
Mode		802.11ac VHT20		Test Voltage		DC24V		
Temperature		24 deg. C,		Humidity		56% RH		
Channel	Frequency (MHz)	Ant 0 Power		Ant 1 Power		Total Power (dBm)	Limit (dBm)	Pass/ Fail
		dBm	mW	dBm	mW			
36	5180	7.93	6.21	7.79	6.01	10.87	24	Pass
40	5200	8.95	7.85	8.70	7.41	11.84	24	Pass
48	5240	8.14	6.52	7.81	6.04	10.99	24	Pass

- Note: 1. At final test to get the worst-case emission at mcs0 for CH36, CH40, CH48, CH149, CH157 and CH165  
 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		POS COMPUTER		Model		HK316V		
Mode		802.11ac VHT40		Test Voltage		DC24V		
Temperature		24 deg. C,		Humidity		56% RH		
Channel	Frequency (MHz)	Ant 0 Power		Ant 1 Power		Total Power (dBm)	Limit (dBm)	Pass/ Fail
		dBm	mW	dBm	mW			
38	5190	6.82	4.81	6.67	4.65	9.76	24	Pass
46	5230	10.30	10.72	10.09	12.30	13.62	24	Pass

- Note: 1. At final test to get the worst-case emission at mcs0 for CH38, CH46, CH151, CH159 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		POS COMPUTER		Model		HK316V		
Mode		802.11ac VHT80		Test Voltage		DC24V		
Temperature		24 deg. C,		Humidity		56% RH		
Channel	Frequency (MHz)	Ant 0 Power		Ant 1 Power		Total Power (dBm)	Limit (dBm)	Pass/ Fail
		dBm	mW	dBm	mW			
42	5210	7.80	6.03	7.63	5.79	10.73	24	Pass

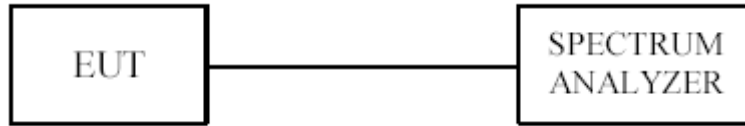
- Note: 1. At final test to get the worst-case emission at mcs0 s for CH42 and CH155  
 2. The result basic equation calculation as follow:  
 Average Power Output = AV Power Reading + Cable loss + Attenuator  
 3. The worse case was recorded

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## 9. 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		POS COMPUTER		Model		HK316V	
Mode		802.11a 6Mbps		Test Voltage		DC24V	
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	-0.59	3.01	2.42	11	Pass	
40	5200	0.34	3.01	3.35	11	Pass	
48	5240	-0.04	3.01	2.97	11	Pass	

Note: Ant 0 and Ant 1 were tested and Ant 0 was the worst case. Ant 0 was the worst case.

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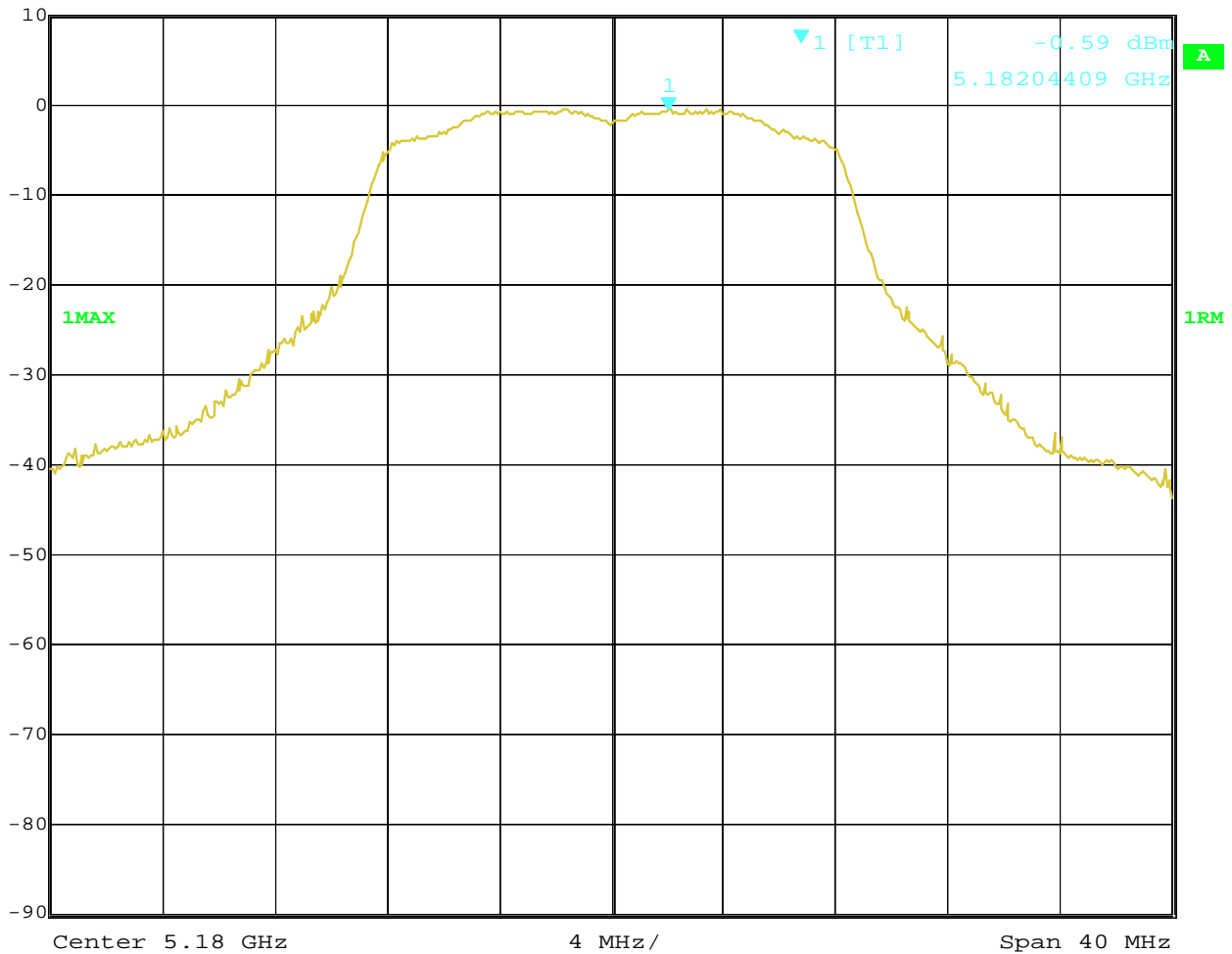


**9.5 Plots of Power Spectral Density Measurement**

1.802.11a at 6Mbps of CH36



Ref Lvl	10 dBm	Marker 1 [T1]	5.18204409 GHz	RBW	1 MHz	RF Att	20 dB
			-0.59 dBm	VBW	3 MHz		
				SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 15:37:28

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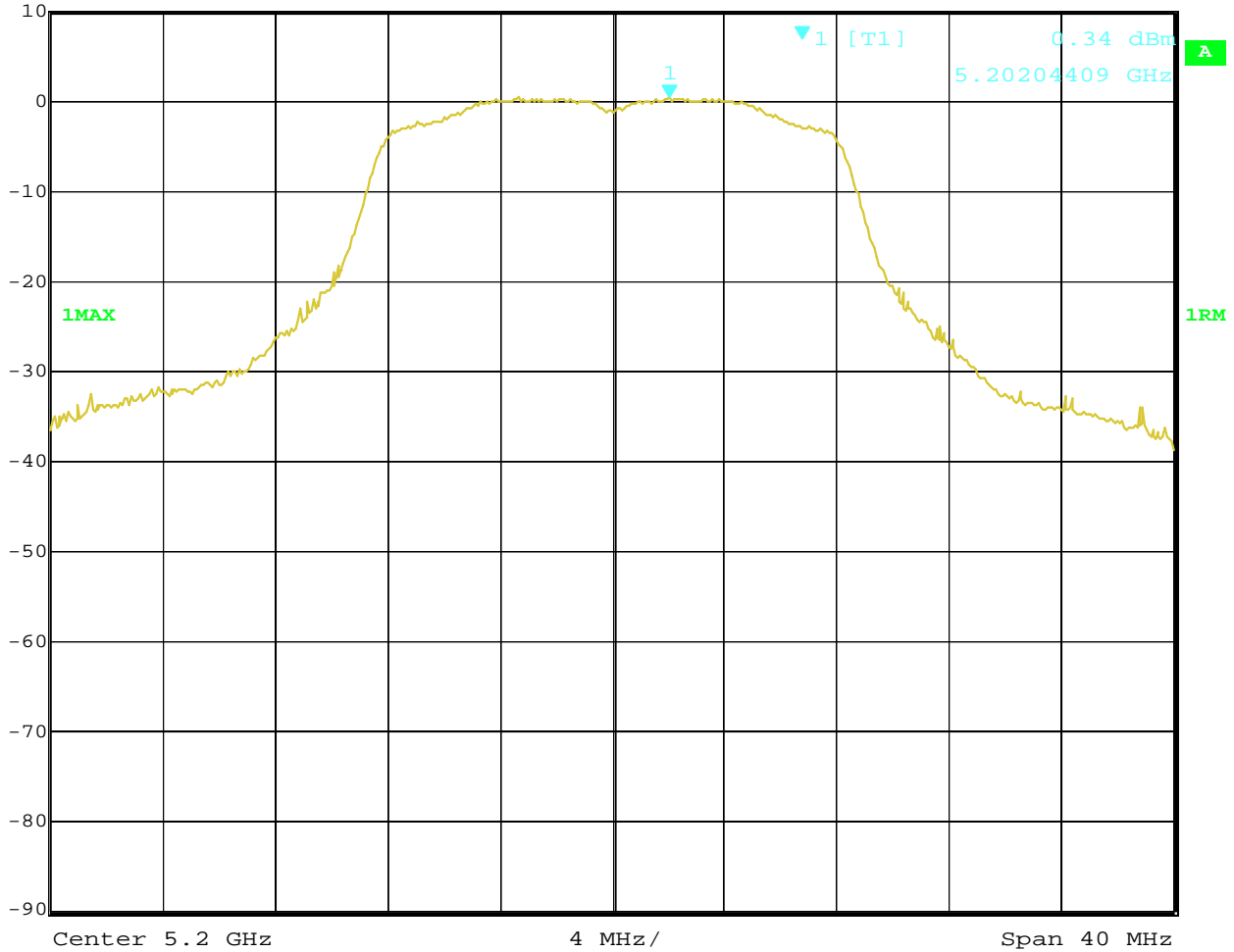




2.802.11a at 6Mbps of CH40



Ref Lvl	0.34 dBm	RBW	1 MHz	RF Att	20 dB
10 dBm	5.20204409 GHz	VBW	3 MHz	Unit	dBm
		SWT	5 ms		



Date: 26.MAR.2021 15:45:34

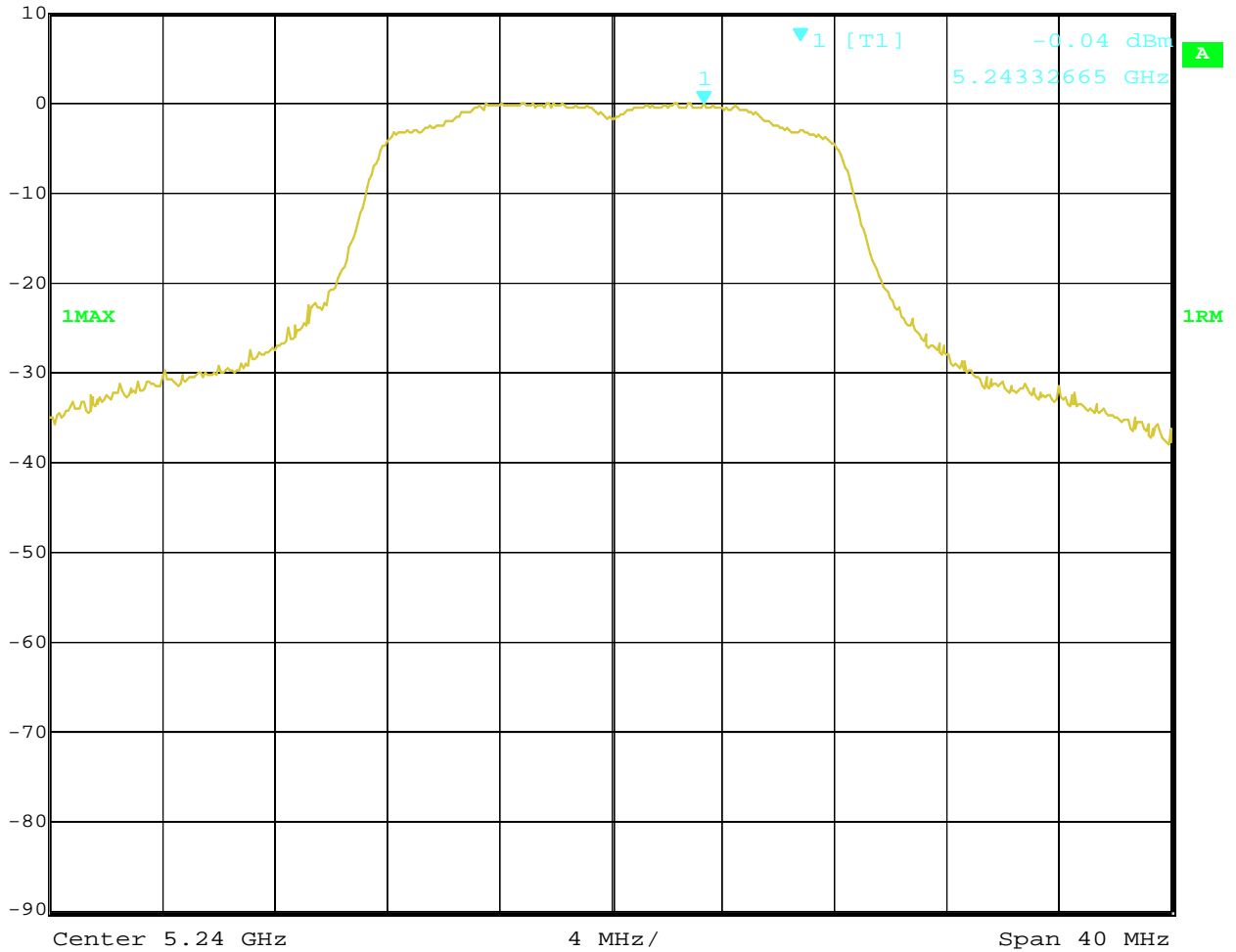
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3.802.11a at 6Mbps of CH48



Ref Lvl	10 dBm	Marker 1 [T1]	-0.04 dBm	RBW	1 MHz	RF Att	20 dB
			5.24332665 GHz	VBW	3 MHz	Unit	dBm
				SWT	5 ms		



Date: 26.MAR.2021 15:47:18

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EUT		POS COMPUTER		Model		HK316V	
Mode		802.11n HT20 mcs0		Test Voltage		DC24V	
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	-1.19	3.01	1.82	11	Pass	
40	5200	0.02	3.01	3.03	11	Pass	
48	5240	-0.70	3.01	2.31	11	Pass	

Note: Ant 0 and Ant 1 were tested and Ant 0 was the worst case. Ant 0 was the worst case.

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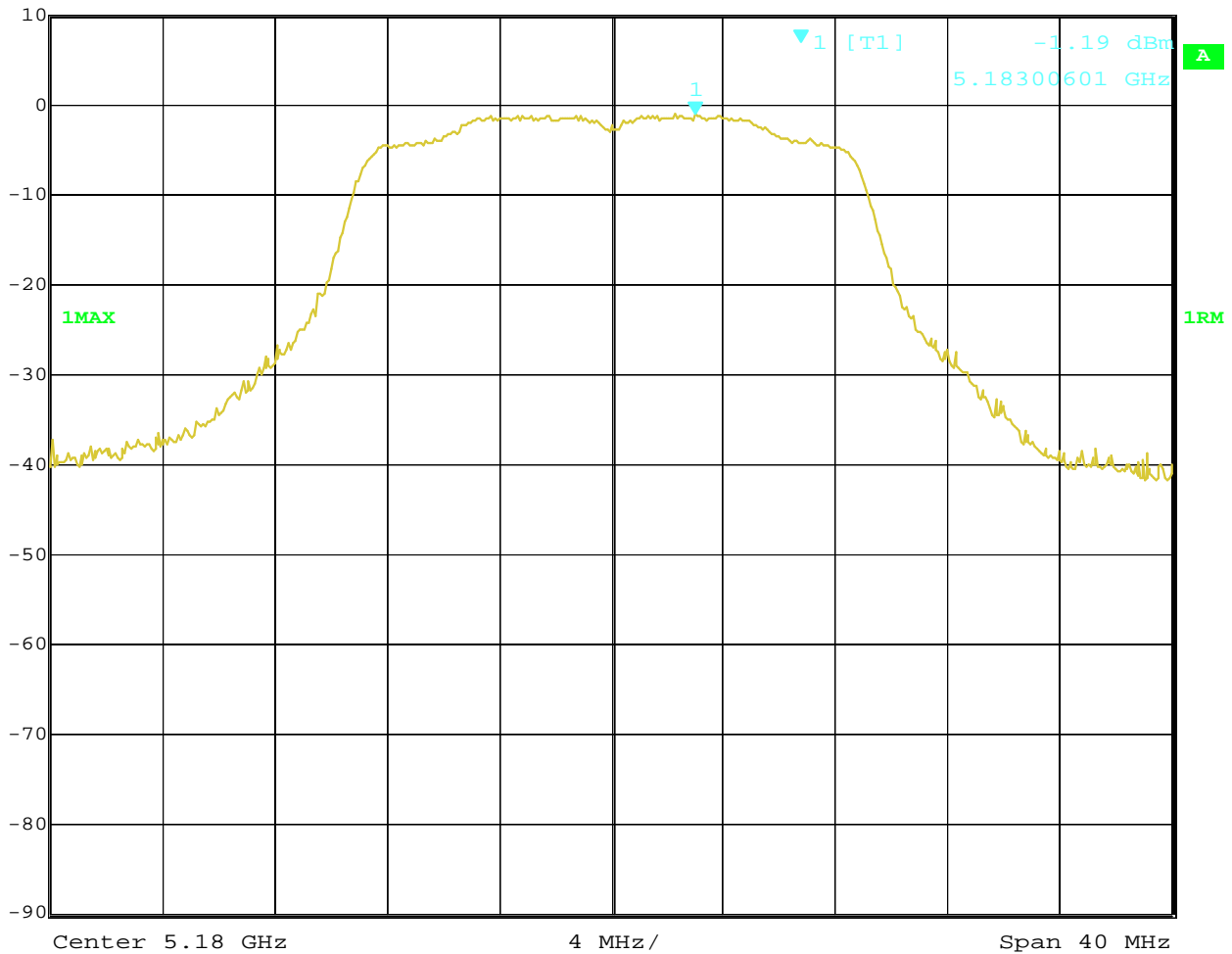


**Test Plots**

1.802.11n at mcs0 of CH36



Ref Lvl	10 dBm	Marker 1 [T1]	5.18300601 GHz	RBW	1 MHz	RF Att	20 dB
			-1.19 dBm	VBW	3 MHz		
				SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 15:09:37

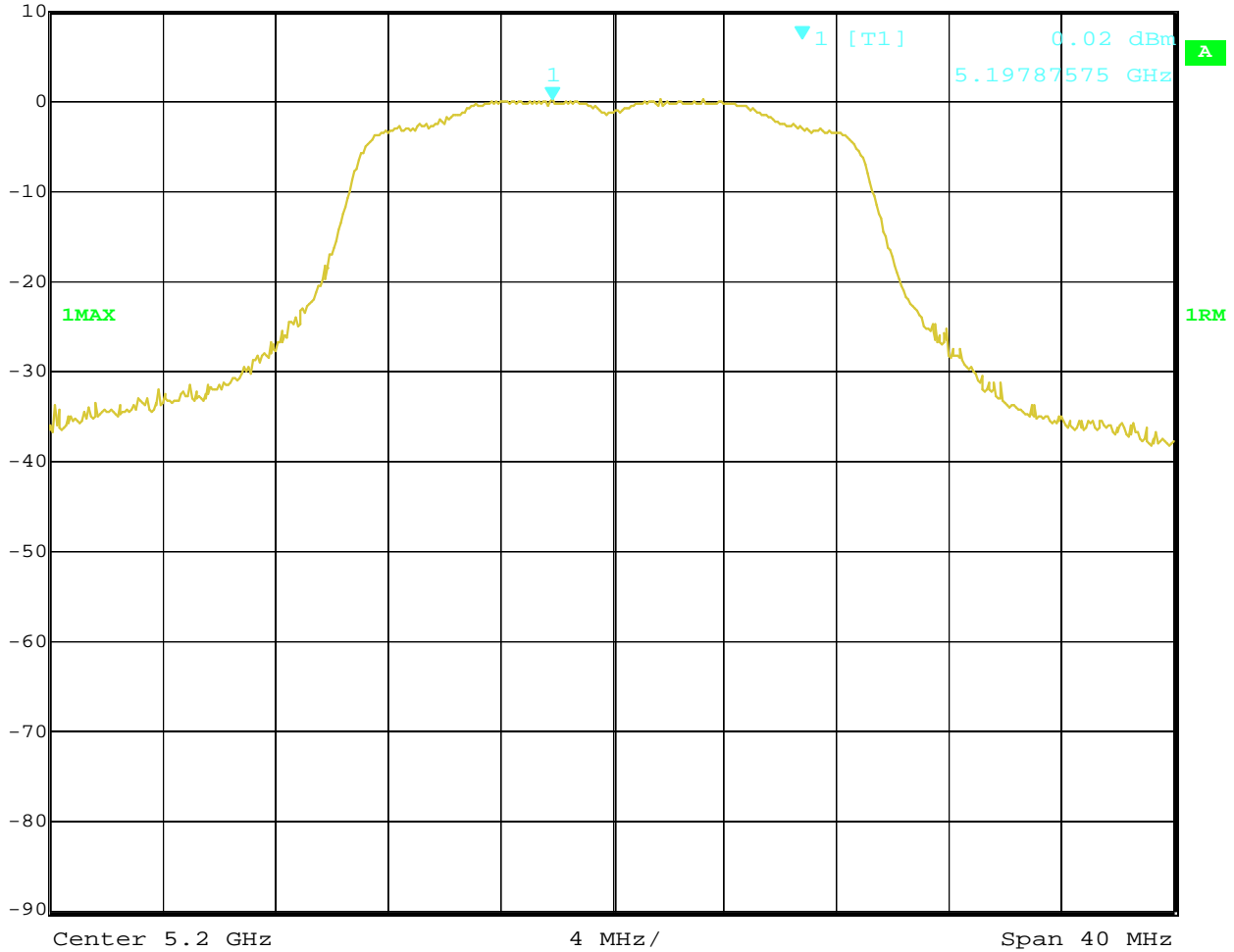
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2.802.11n at mcs0 of CH40



Ref Lvl	0.02 dBm	RBW	1 MHz	RF Att	20 dB
10 dBm	5.19787575 GHz	VBW	3 MHz	Unit	dBm
		SWT	5 ms		



Date: 26.MAR.2021 15:10:57

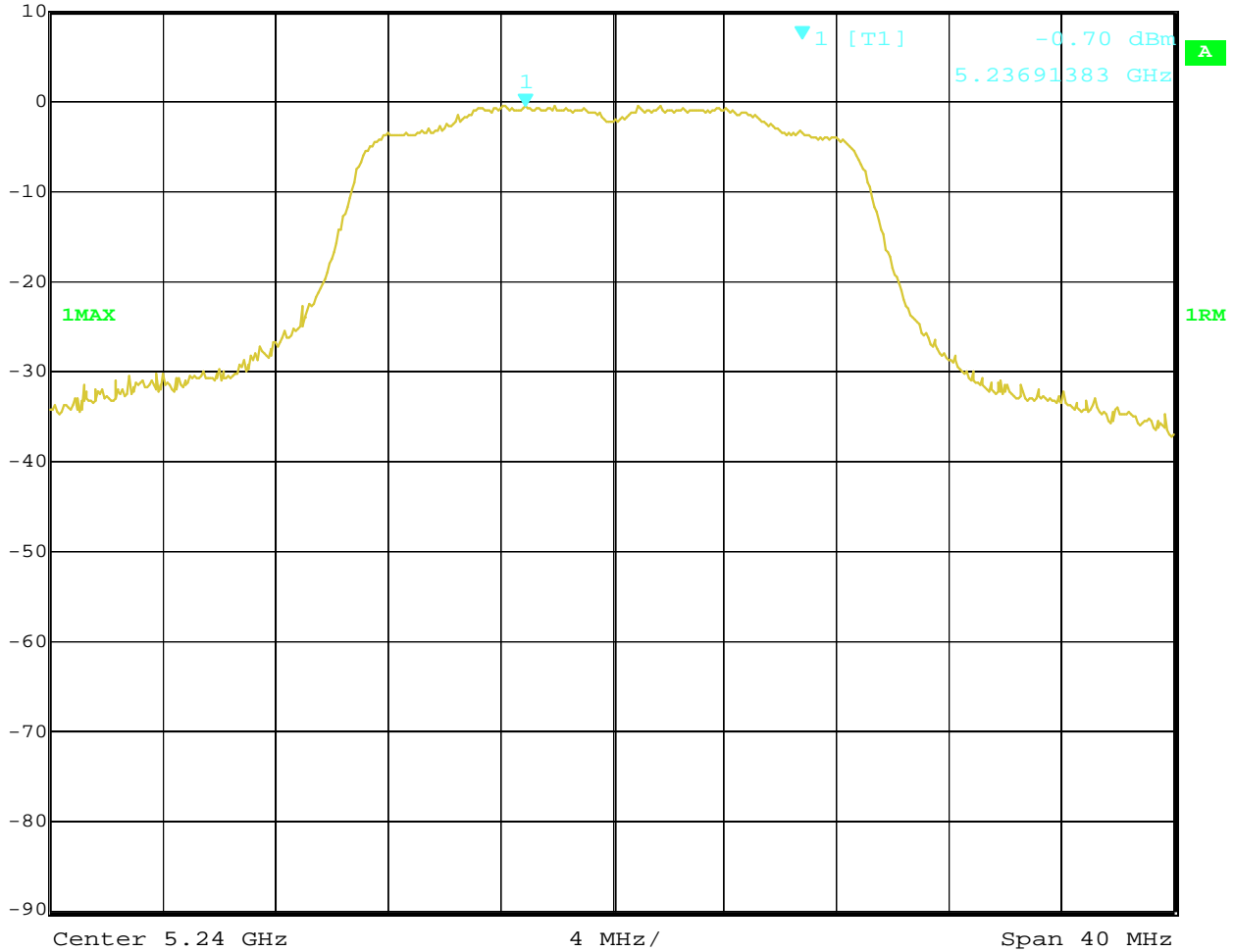
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3.802.11n at mcs0 of CH48



Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	20 dB
10 dBm	-0.70 dBm	VBW	3 MHz		
	5.23691383 GHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 15:11:40

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EUT		POS COMPUTER		Model		HK316V	
Mode		802.11n HT40 mcs0		Test Voltage		DC24V	
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	-6.95	3.01	-3.94	11	Pass	
46	5230	-1.85	3.01	1.16	11	Pass	

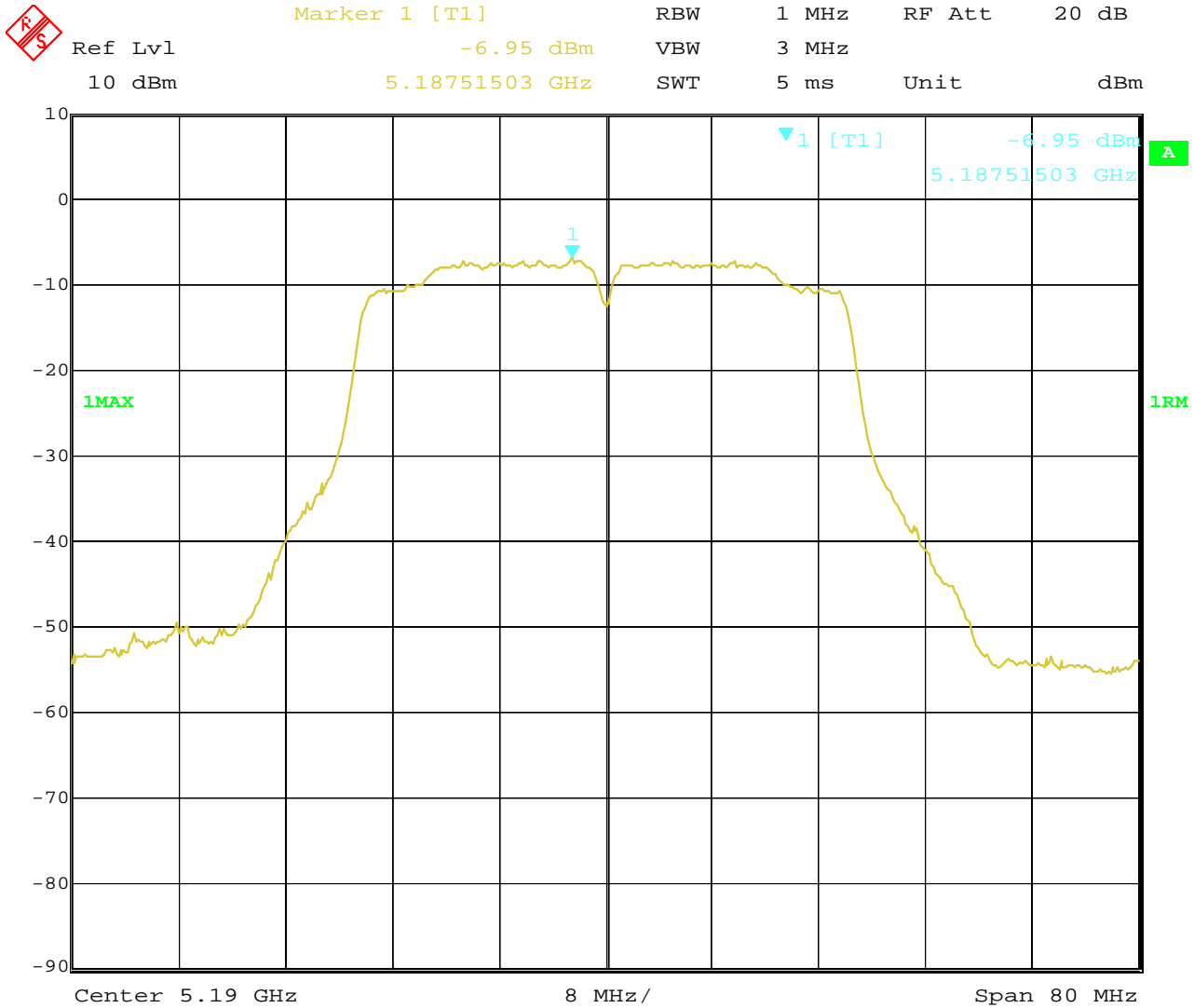
Note: Ant 0 and Ant 1 were tested and Ant 0 was the worst case. Ant 0 was the worst case.

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**Test Plots**

1.802.11n HT40 at mcs0 of CH38



Date: 6.APR.2021 10:04:31

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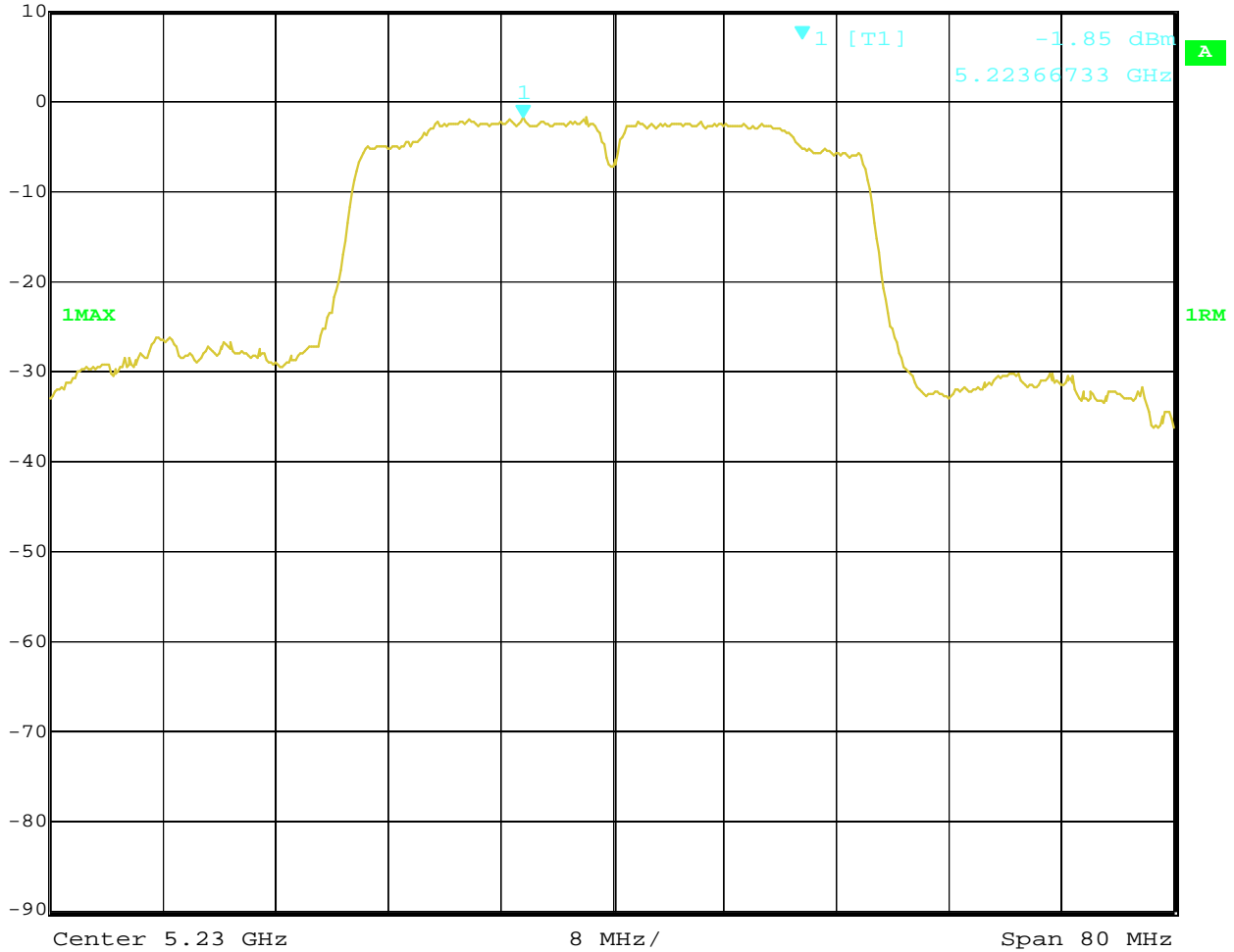




2.802.11n HT40 at mcs0 of CH46



Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	20 dB
10 dBm	-1.85 dBm	VBW	3 MHz		
	5.22366733 GHz	SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 15:07:58

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EUT		POS COMPUTER		Model		HK316V	
Mode		802.11ac VHT20		Test Voltage		DC24V	
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	-1.01	3.01	2.00	11	Pass	
40	5200	0.51	3.01	3.52	11	Pass	
48	5240	-0.45	3.01	2.56	11	Pass	

Note: Ant 0 and Ant 1 were tested and Ant 0 was the worst case. Ant 0 was the worst case.

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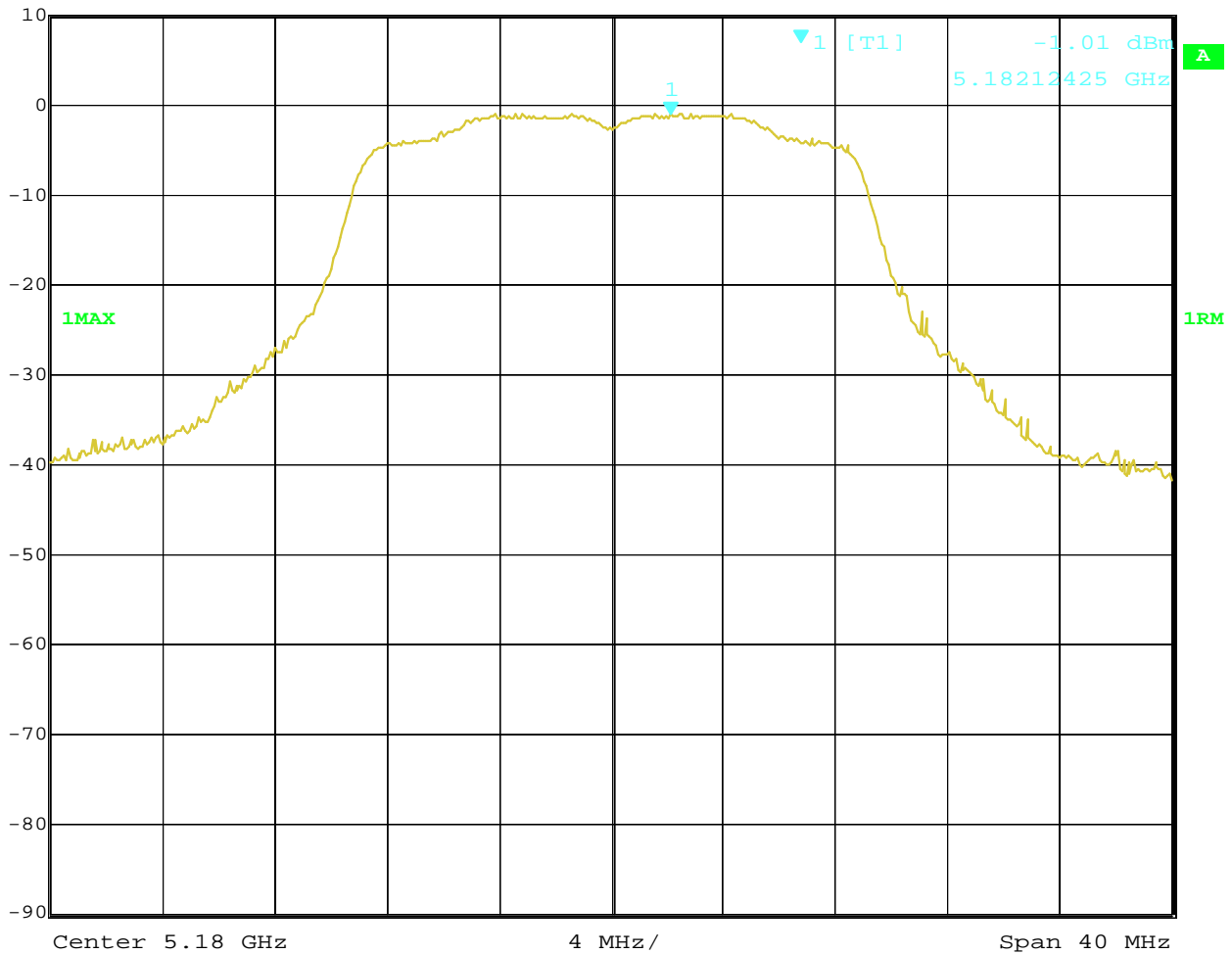


**Test Plots**

1.802.11ac at mcs0 of CH36



Ref Lvl	10 dBm	Marker 1 [T1]	5.18212425 GHz	RBW	1 MHz	RF Att	20 dB
			-1.01 dBm	VBW	3 MHz		
				SWT	5 ms	Unit	dBm

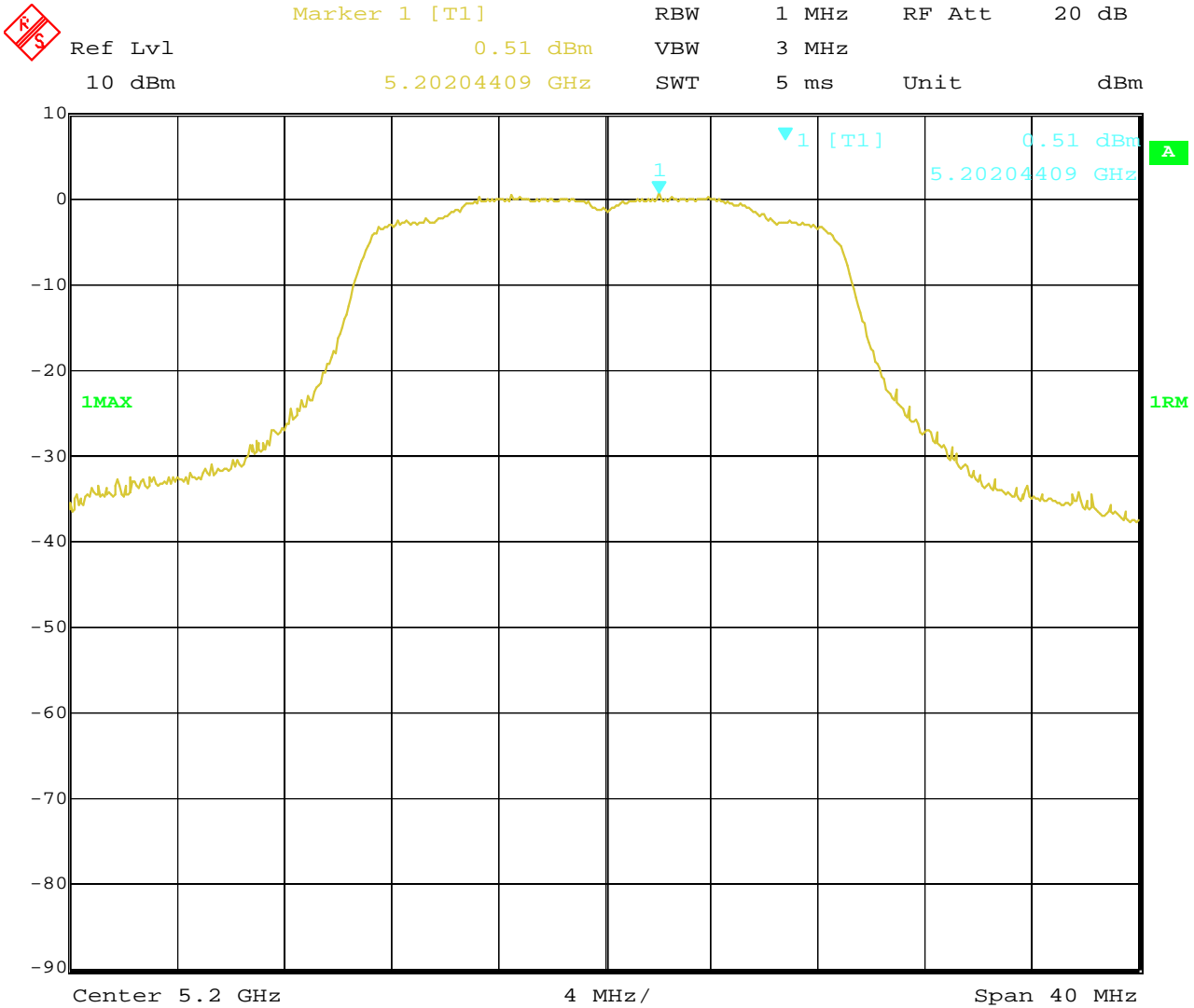


Date: 26.MAR.2021 15:32:36

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2.802.11ac at mcs0 of CH40



Date: 26.MAR.2021 15:28:53

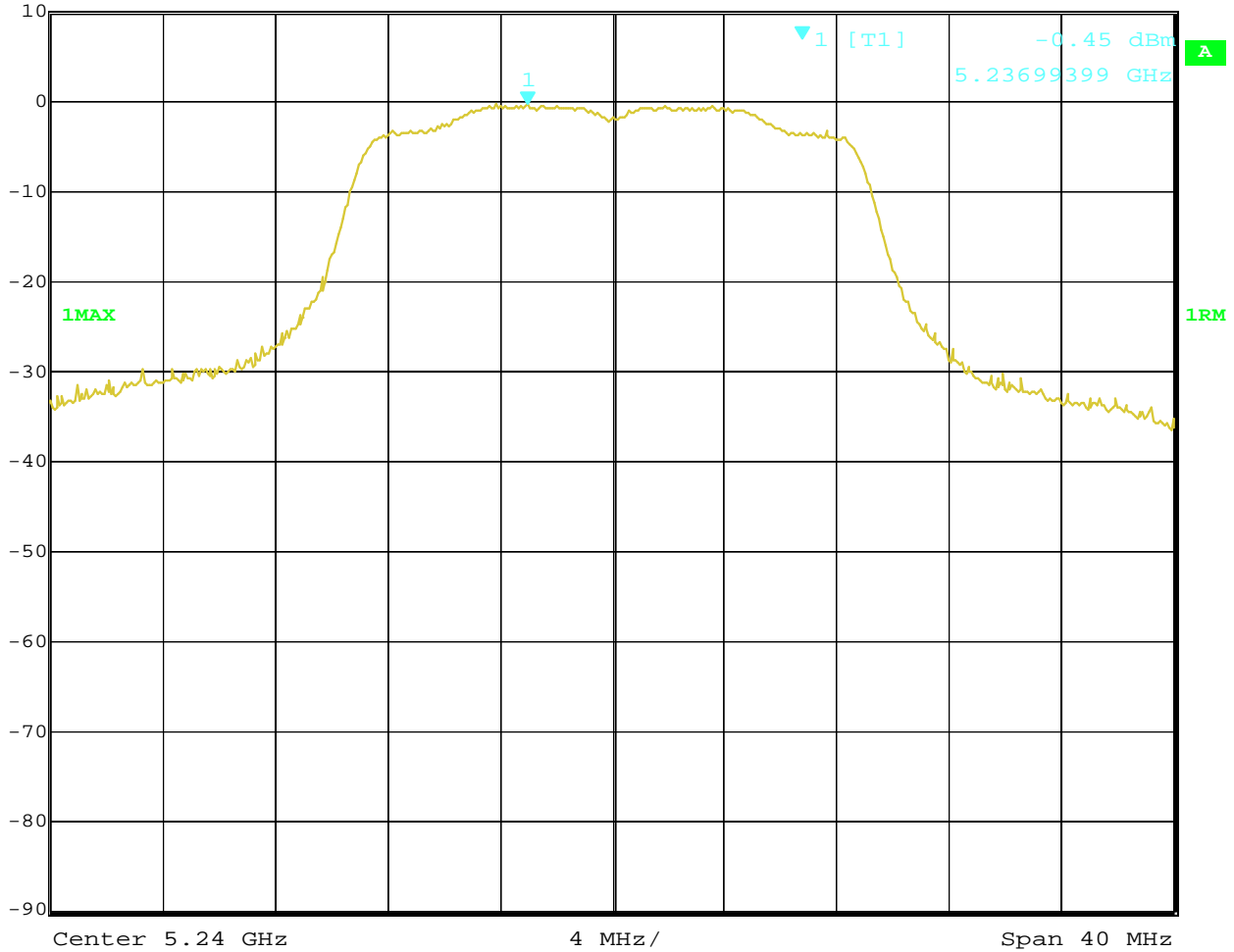
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3.802.11ac at mcs0 of CH48



Ref Lvl	10 dBm	Marker 1 [T1]	-0.45 dBm	RBW	1 MHz	RF Att	20 dB
			5.23699399 GHz	VBW	3 MHz	Unit	dBm
				SWT	5 ms		



Date: 26.MAR.2021 15:26:46

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EUT		POS COMPUTER		Model		HK316V	
Mode		802.11ac VHT40		Test Voltage		DC24V	
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	-5.32	3.01	-2.31	11	Pass	
46	5230	-1.79	3.01	1.22	11	Pass	

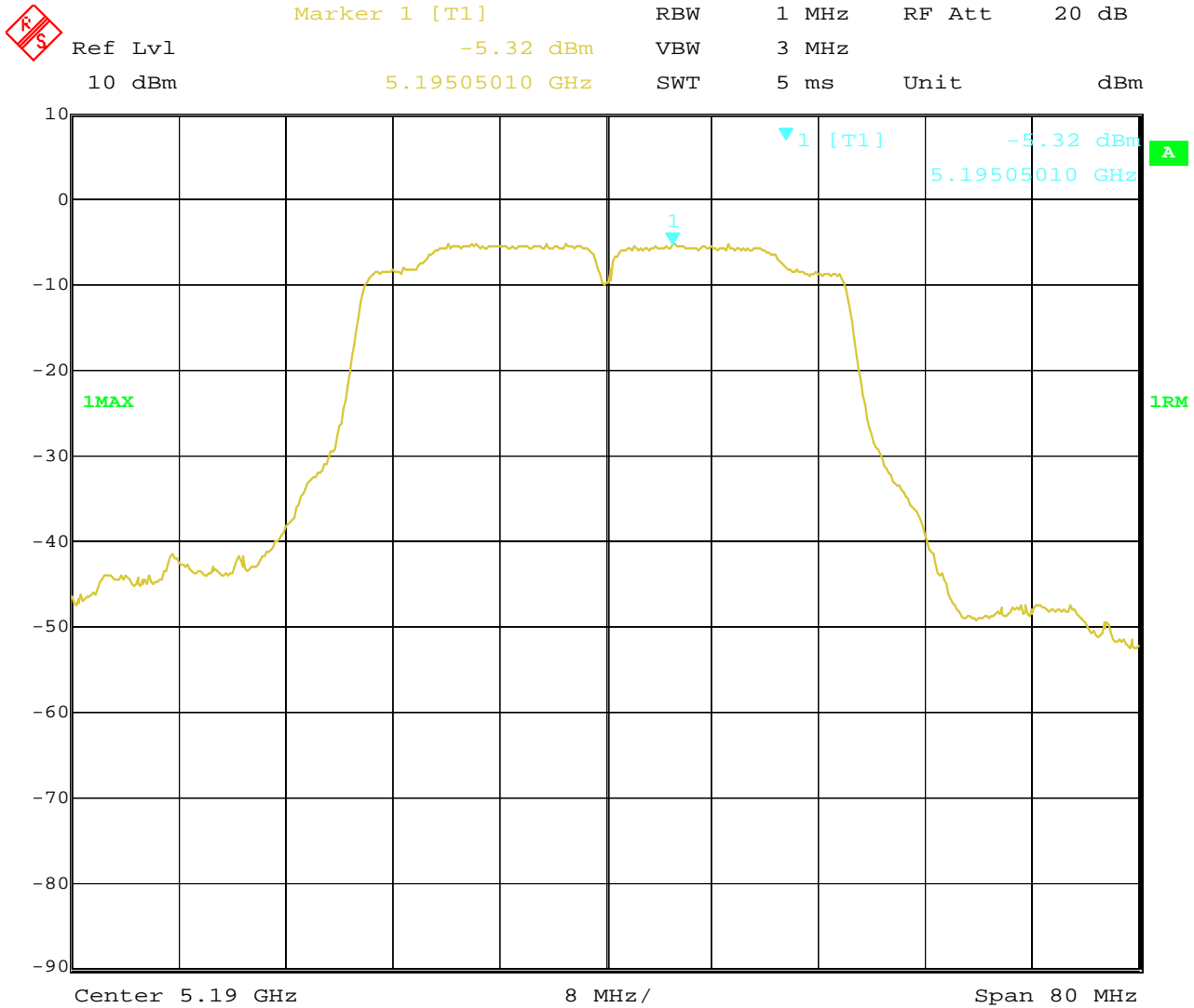
Note: Ant 0 and Ant 1 were tested and Ant 0 was the worst case. Ant 0 was the worst case.

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**Test Plots**

1.802.11ac at mcs0 of CH38



Date: 26.MAR.2021 15:01:13

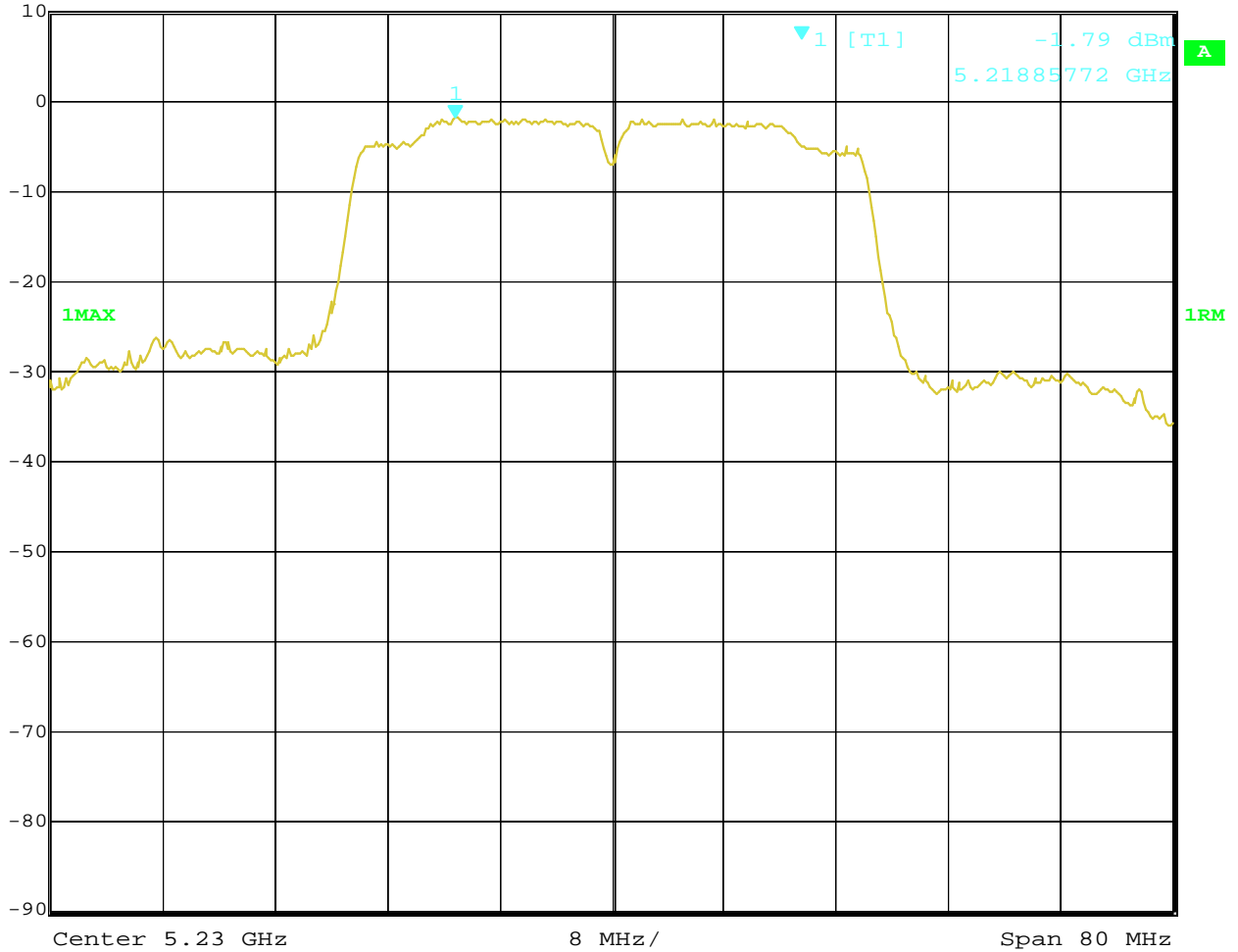
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2.802.11ac at mcs0 of CH46



Ref Lvl	10 dBm	Marker 1 [T1]	-1.79 dBm	RBW	1 MHz	RF Att	20 dB
			5.21885772 GHz	VBW	3 MHz	Unit	dBm
				SWT	5 ms		



Date: 26.MAR.2021 15:02:42

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EUT		POS COMPUTER		Model		HK316V	
Mode		802.11ac VHT80 mcs0Mbps		Test Voltage		DC24V	
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	-7.30	3.01	-4.29	11	Pass	

Note: Ant 0 and Ant 1 were tested and Ant 0 was the worst case. Ant 0 was the worst case.

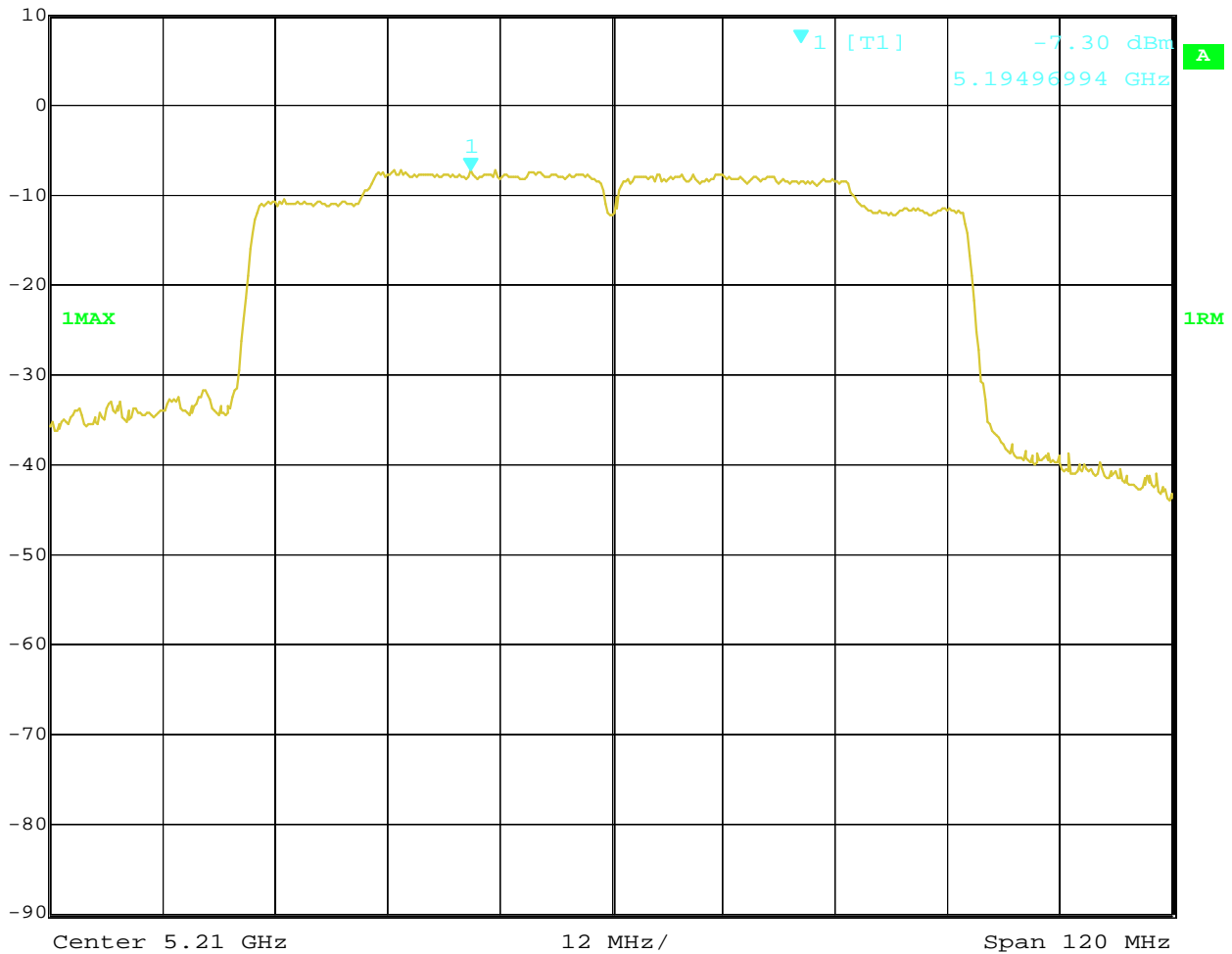
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**Test Plots**

1.802.11ac at mcs0Mbps of CH42

	Ref Lvl	10 dBm	Marker 1 [T1]	-7.30 dBm	RBW	1 MHz	RF Att	20 dB
			5.19496994 GHz		VBW	3 MHz		
					SWT	5 ms	Unit	dBm



Date: 26.MAR.2021 14:57:32

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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 +/- 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)
138V	5179.9868
120V	5179.9853
102V	5179.9839
Max. Deviation (MHz)	0.0161
Max. Deviation (ppm)	3.1

Rated working voltage: DC24V

##### Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-30	5179.9811
-20	5179.9843
-10	5179.9821
0	5179.9863
10	5179.9840
20	5179.9828
30	5179.9833
40	5179.9817
50	5179.9825
Max. Deviation (MHz)	0.0189
Max. Deviation (ppm)	3.6

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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 5.0 dBi for each one.

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## 12.0 FCC ID Label

### FCC ID: GQK-HK316V

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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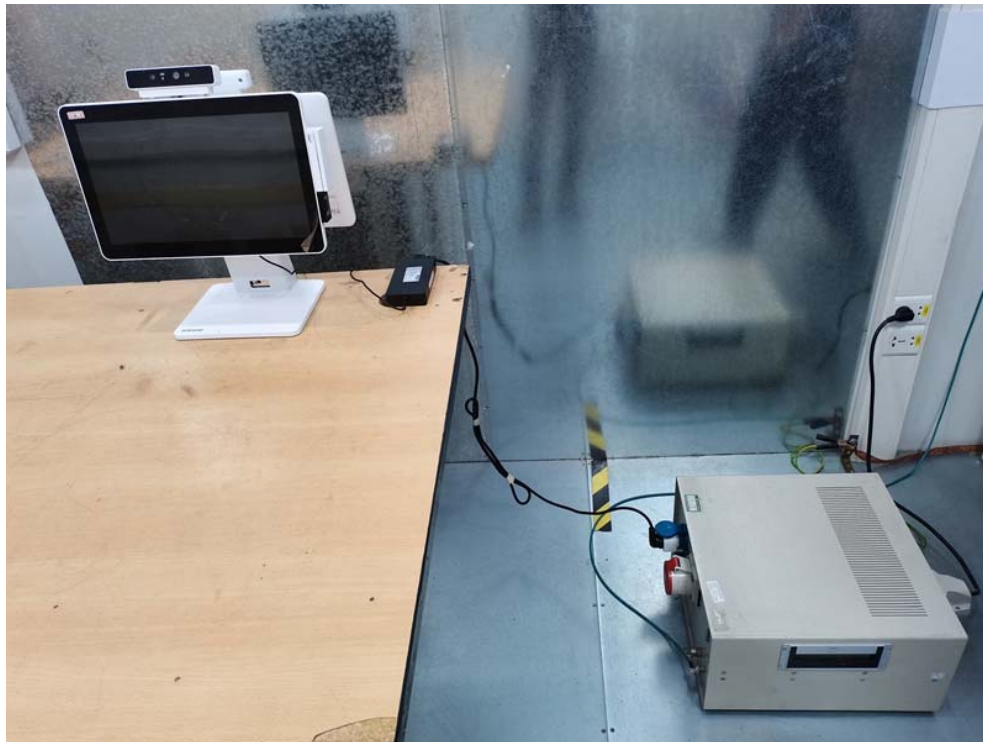
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### 13.0 Photo of testing

Conducted Emission Test Setup:



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Radiated Emission Test Setup:



**Photos of EUT**

Please see test report TW2102107-01E

**End of the report**

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