TEST REPORT

Report No:	TW2206192-02E
File reference No:	2022-07-04
Applicant:	SHENZHEN TQSKY TECHNOLOGY CO.,LTD
Product:	TQSky Tbox
Model No:	TBOX
Trademark:	TQSKY
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:

Terry Tang

Manager

Dated: July 04, 2022

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 17025:2017 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

Test Report Conclusion

Content

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 TQSKY TECHNOLOGY CO.,LTD

Address: No.2306 Haowei Building Yuehai Street, Nanshan, Shenzhen, China.

Telephone: 18923731089

Fax: --

1.3 Description of EUT

Product:	TQSky Tbox
Manufacturer:	SHENZHEN TQSKY TECHNOLOGY CO.,LTD
Address:	No.2306 Haowei Building Yuehai Street, Nanshan, Shenzhen, China.
Trademark:	TQSKY
Additional Trademark:	N/A
Model Number:	TBOX
Additional Model Number: N/A	
Hardware Version:	BJ203-V1
Software Version:	20220708.V1.4.2
Serial No.:	2AA227C0001
Rating:	Input: DC5V, 2A
Battery:	DC3.85V, 5000mAh Li-ion battery
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; Band 4: 5745MHz-5805MHz
Air Data Rate	IEEE 802.11a: 54, 48,36, 24, 18, 12, 9, 6 Mbps IEEE 802.11n/HT20: mcs0-mcs15 IEEE 802.11n/HT40: mcs0-mcs15 IEEE 802.11ac: NSS1 mcs0-mcs9

Antenna: FPC Antenna. The gain of the antennas is 0.8dBi (Declared by 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; NSS1 mcs0 air data rate was the worst case for 802.11ac mode;

Frequency Selection By software

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				
Band 4					
802.11a / 11n HT20 / 802.11ac VHT20		802.11n HT40 / 802.11acVHT40		802.11ac VHT80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745 MHz	151	5755 MHz	155	5775 MHz
153	5765 MHz	159	5795 MHz		
157	5785 MHz				
161	5805 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				

Band 4					
802.11a / 11n HT20		802.11n HT40		802.11ac VHT80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745 MHz	151	5755 MHz	155	5775 MHz
153	5765 MHz	159	5795 MHz		
161	5805 MHz				

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

1.4 Submitted Sample: 1 Samples

1.5 Test Duration

2022-06-17 to 2022-07-04

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

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

The sample tested by _____

Print Name: Andy Xing

2.0 Test Equipment					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	R&S	ESPI 3	100379	2022-06-17	2023-06-16
LISN	R&S	EZH3-Z5	100294	2022-06-17	2023-06-16
LISN	R&S	EZH3-Z5	100253	2022-06-17	2023-06-16
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2022-06-17	2023-06-16
Loop Antenna	EMCO	6507	00078608	2022-06-17	2023-06-16
Spectrum	R&S	FSIQ26	100292	2022-06-17	2023-06-16
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2022-06-17	2023-06-16
Horn Antenna	R&S	BBHA 9120D	9120D-631	2021-07-02	2024-07-01
Power meter	Anritsu	ML2487A	6K00003613	2022-06-17	2023-06-16
Power sensor	Anritsu	MA2491A	32263	2022-06-17	2023-06-16
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2021-07-02	2024-07-01
9*6*6 Anechoic	--	--	N/A	2022-06-17	2023-06-16
EMI Test Receiver	RS	ESVB	826156/011	2022-06-17	2023-06-16
EMI Test Receiver	RS	ESH3	860904/006	2022-06-17	2023-06-16
Spectrum	HP/Agilent	ESA-L1500A	US37451154	2022-06-17	2023-06-16
Spectrum	HP/Agilent	E4407B	MY50441392	2022-06-17	2023-06-16
Spectrum	RS	FSP	1164.4391.38	2022-01-14	2023-01-13
RF Cable	Zhengdi	ZT26-NJ-NJ-8 M/FA	--	2022-06-17	2023-06-16
RF Cable	Zhengdi	7m	--	2022-06-17	2023-06-16
RF Switch	EM	EMSW18	060391	2022-06-17	2023-06-16
Pre-Amplifier	Schwarebeck	BBV9743	#218	2022-06-17	2023-06-16
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2022-06-17	2023-06-16
LISN	SCHAFFNER	NNB42	00012	2022-01-05	2023-01-04

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

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 15.407	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 (a/1/2/3)	Peak Power Spectral Density	Pass	Complies
FCC Part 15, Paragraph 15.407(g)	Frequency Stability	Pass	Complies

3.2 Test Standards

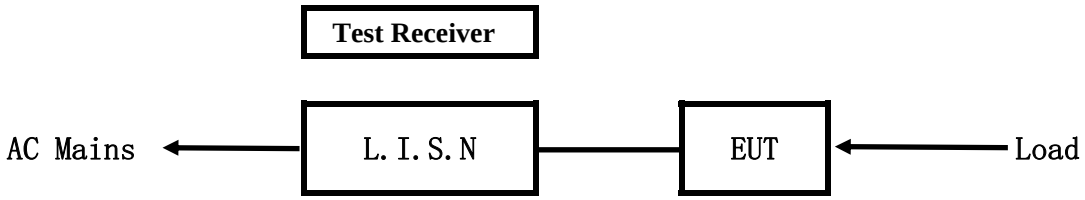
FCC Part 15 Subpart & Subpart C, Paragraph 15.247, ANSI C63.10 :2013 and ANSI C63.4 :2014
789033 D02 General UNII Test Procedures New Rules v01r04

4.0 EUT Modification

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES.

5. Power Line Conducted Emission Test

5.1 Schematics of the test



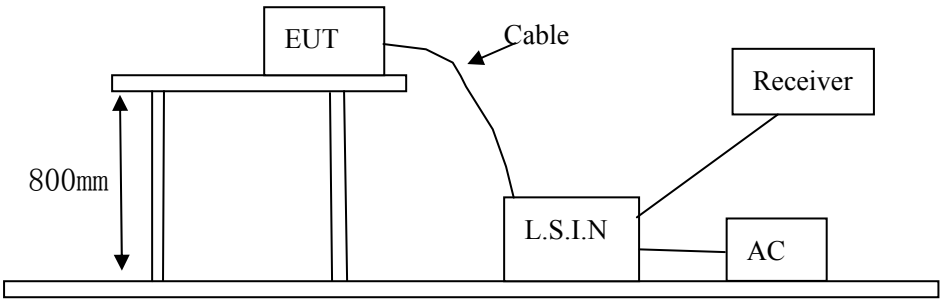
EUT: Equipment Under Test

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
TQSky Tbox	SHENZHEN TQSKY TECHNOLOGY CO.,LTD	TBOX	2A7Q4-TBOX

B. Internal Device

Device	Manufacturer	Model	Rating

C. Peripherals

Device	Manufacturer	Model	Rating
Power Supply	KEYU	KA23-0502000DEU	Input: 100-240V~, 50/60Hz, 0.35A; Output: DC5V, 2A

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 μ 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.

Note: Only the worst case was recorded in the test report.

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

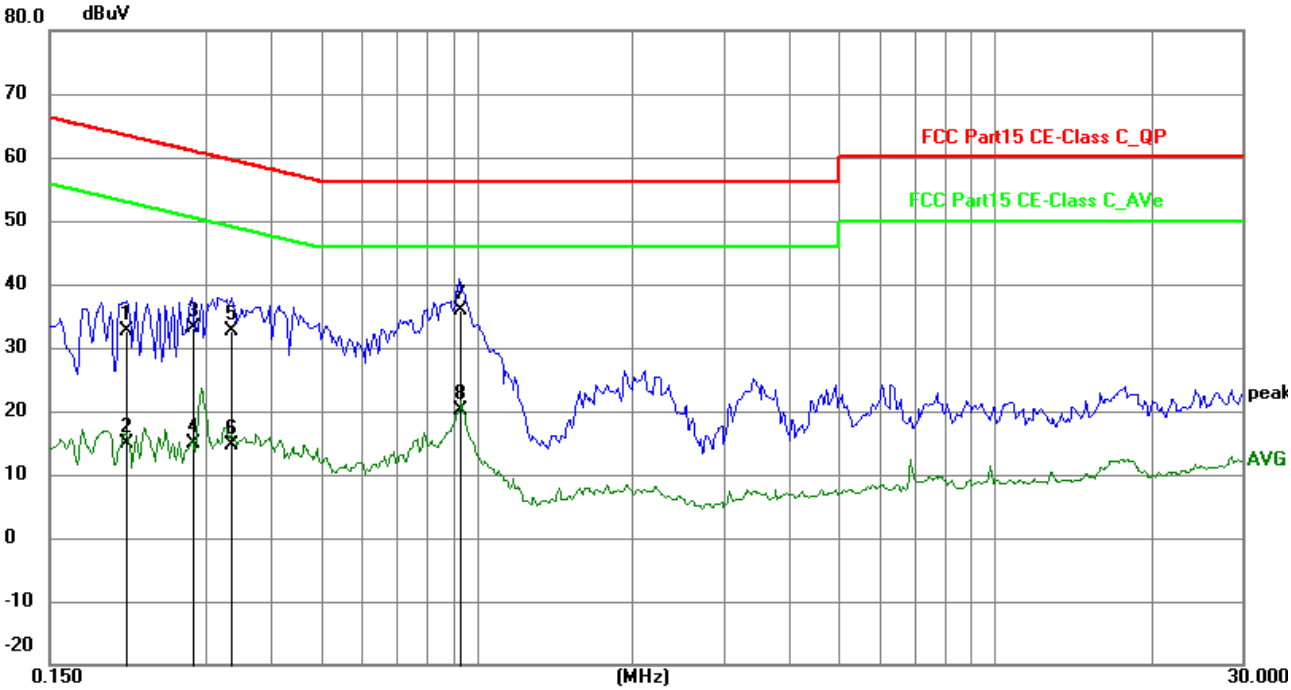
EUT Operating Environment

Temperature: 26℃ Humidity: 65%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Keeping WIFI Transmitting

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	0.2106	22.78	9.75	32.53	63.18	-30.65	QP	P
2	0.2106	5.02	9.75	14.77	53.18	-38.41	AVG	P
3	0.2826	23.40	9.76	33.16	60.74	-27.58	QP	P
4	0.2826	5.22	9.76	14.98	50.74	-35.76	AVG	P
5	0.3372	22.83	9.76	32.59	59.27	-26.68	QP	P
6	0.3372	4.91	9.76	14.67	49.27	-34.60	AVG	P
7	0.9261	26.12	9.79	35.91	56.00	-20.09	QP	P
8	0.9261	10.33	9.79	20.12	46.00	-25.88	AVG	P

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

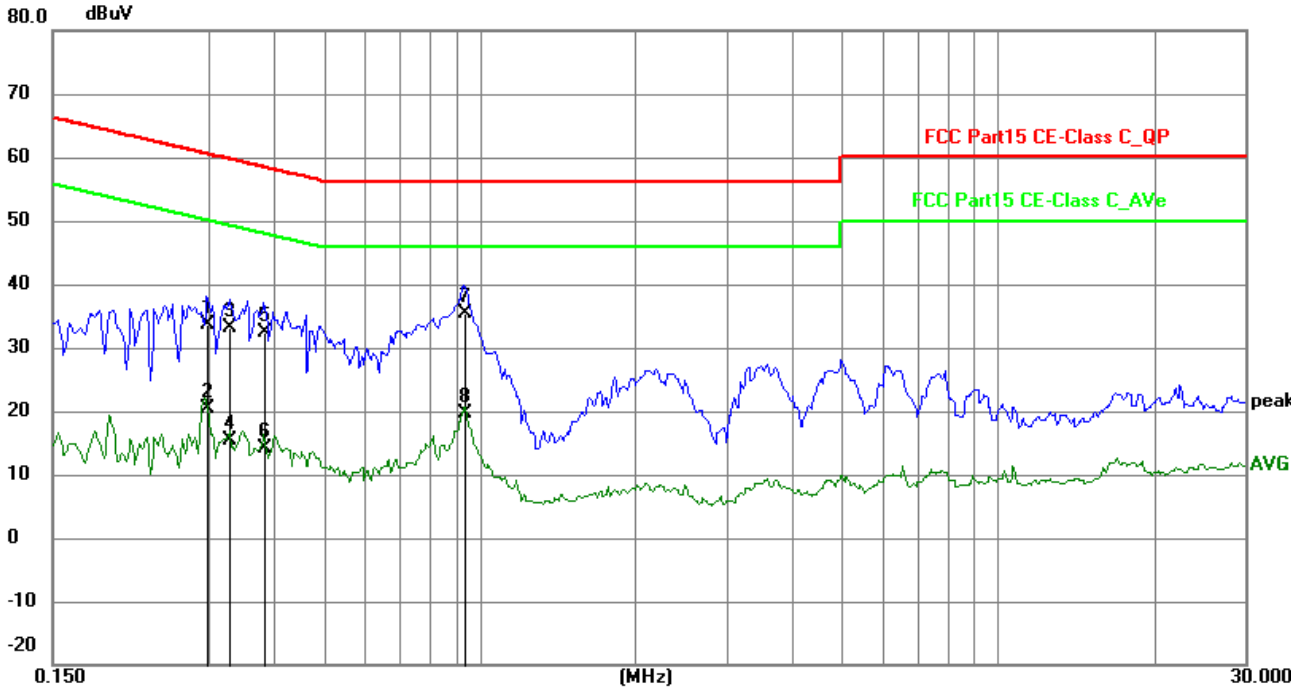
EUT Operating Environment

Temperature: 26℃ Humidity: 65%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Keeping WIFI Transmitting

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	0.2982	23.77	9.76	33.53	60.29	-26.76	QP	P
2	0.2982	10.50	9.76	20.26	50.29	-30.03	AVG	P
3	0.3294	23.40	9.76	33.16	59.47	-26.31	QP	P
4	0.3294	5.68	9.76	15.44	49.47	-34.03	AVG	P
5	0.3840	22.54	9.76	32.30	58.19	-25.89	QP	P
6	0.3840	4.41	9.76	14.17	48.19	-34.02	AVG	P
7	0.9378	25.54	9.79	35.33	56.00	-20.67	QP	P
8	0.9378	9.96	9.79	19.75	46.00	-26.25	AVG	P

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.

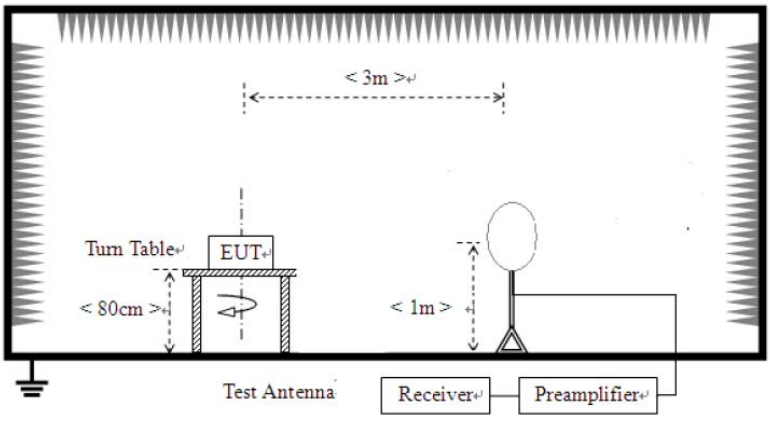
(4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.

(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.

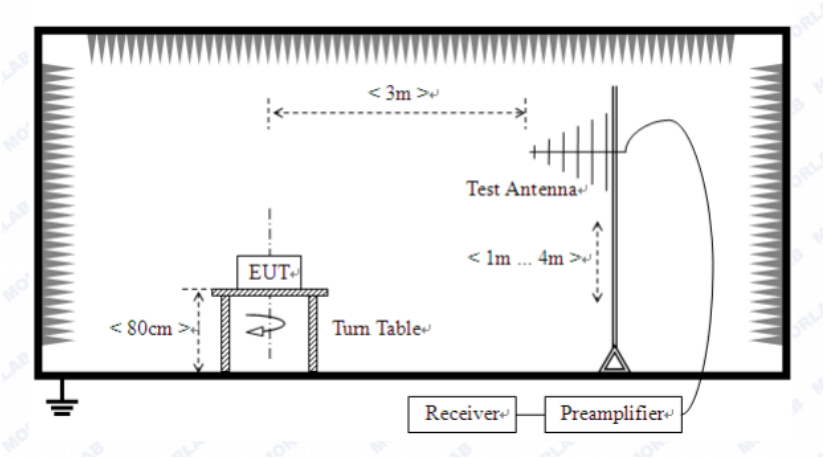
(6) The antenna polarization: Vertical polarization and Horizontal polarization.

Block diagram of Test setup

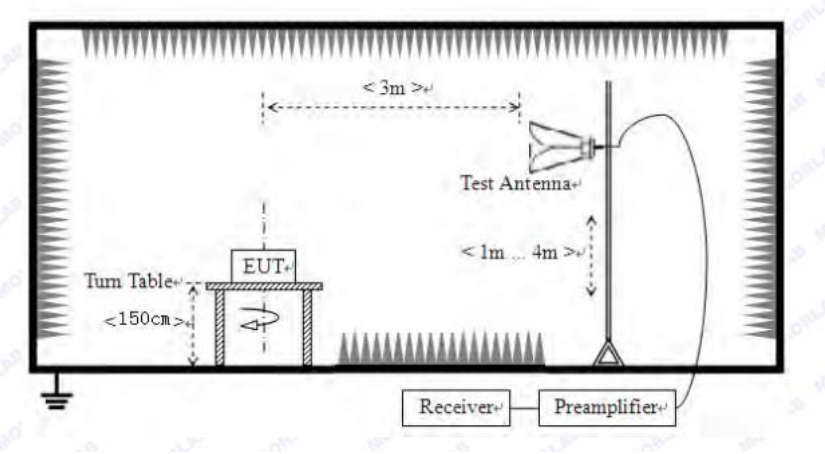
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to1GHz



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:

Frequencies in restricted band are complied to limit on Paragraph 15.209

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

(1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27dBm/MHz

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

Note: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the higher limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

4. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

Note: Only the worst case was recorded in the test report. and 802.11a is the worst case.

Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

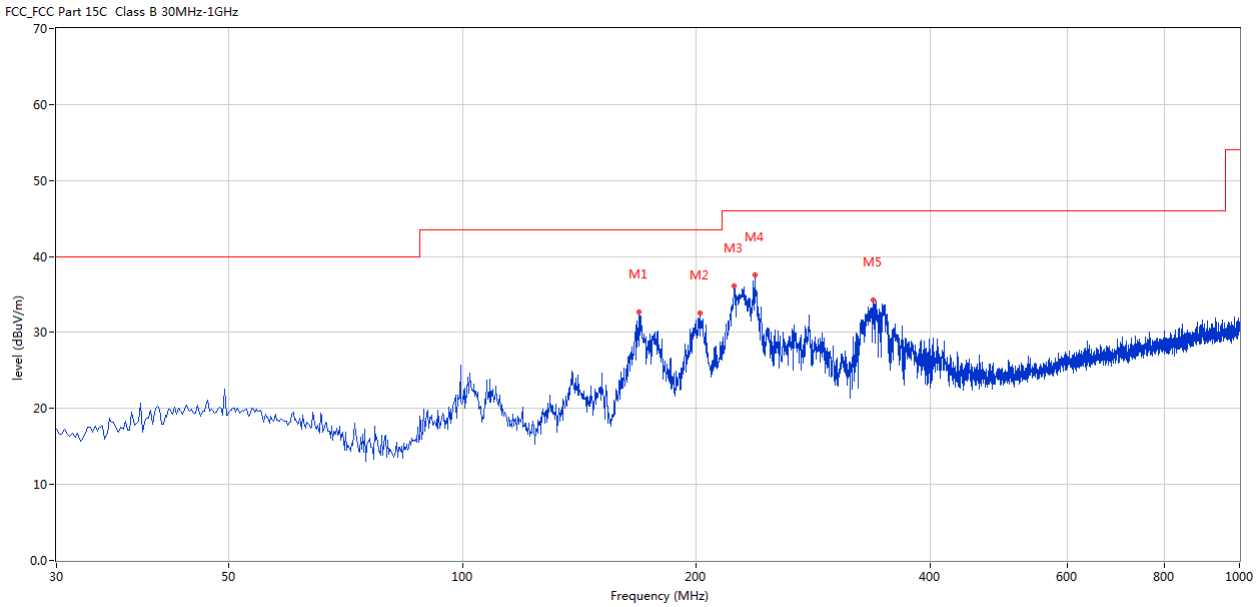
Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: **Keeping WIFI Transmitting**

Results: **Pass**

Test Figure:

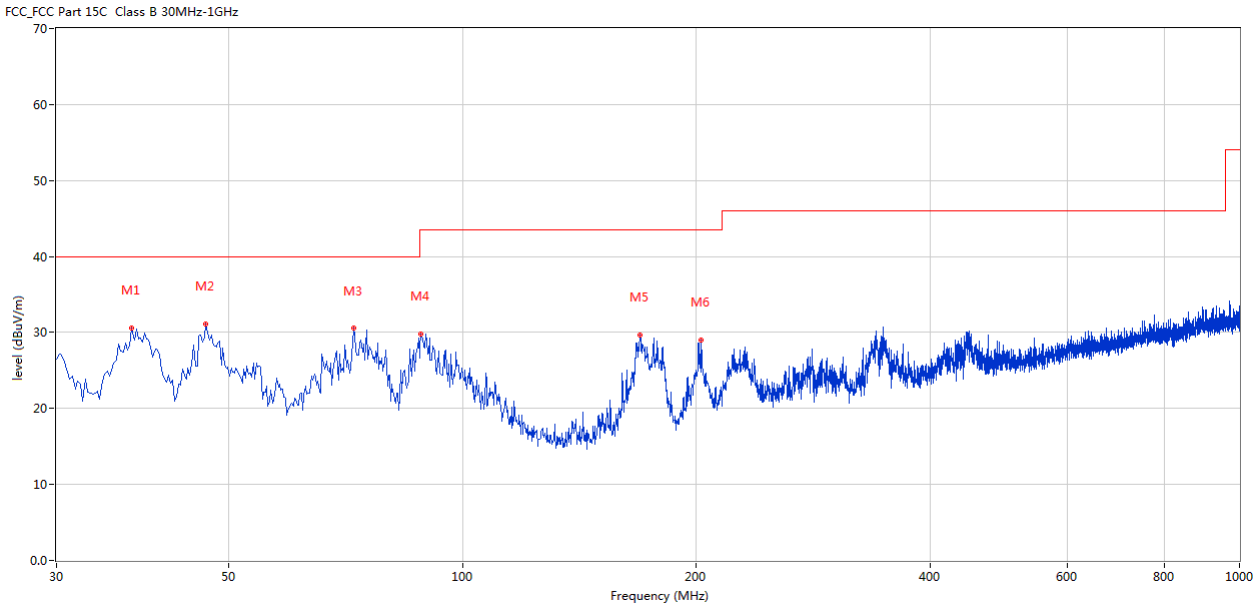
H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	168.675	32.67	-16.12	43.5	-10.83	Peak	127.00	200	Horizontal	Pass
2	202.374	32.51	-13.39	43.5	-10.99	Peak	245.00	100	Horizontal	Pass
3	223.224	36.08	-13.17	46.0	-9.92	Peak	93.00	100	Horizontal	Pass
4	237.771	37.53	-12.44	46.0	-8.47	Peak	252.00	100	Horizontal	Pass
5	337.898	34.33	-9.79	46.0	-11.67	Peak	67.00	100	Horizontal	Pass

Test Figure:

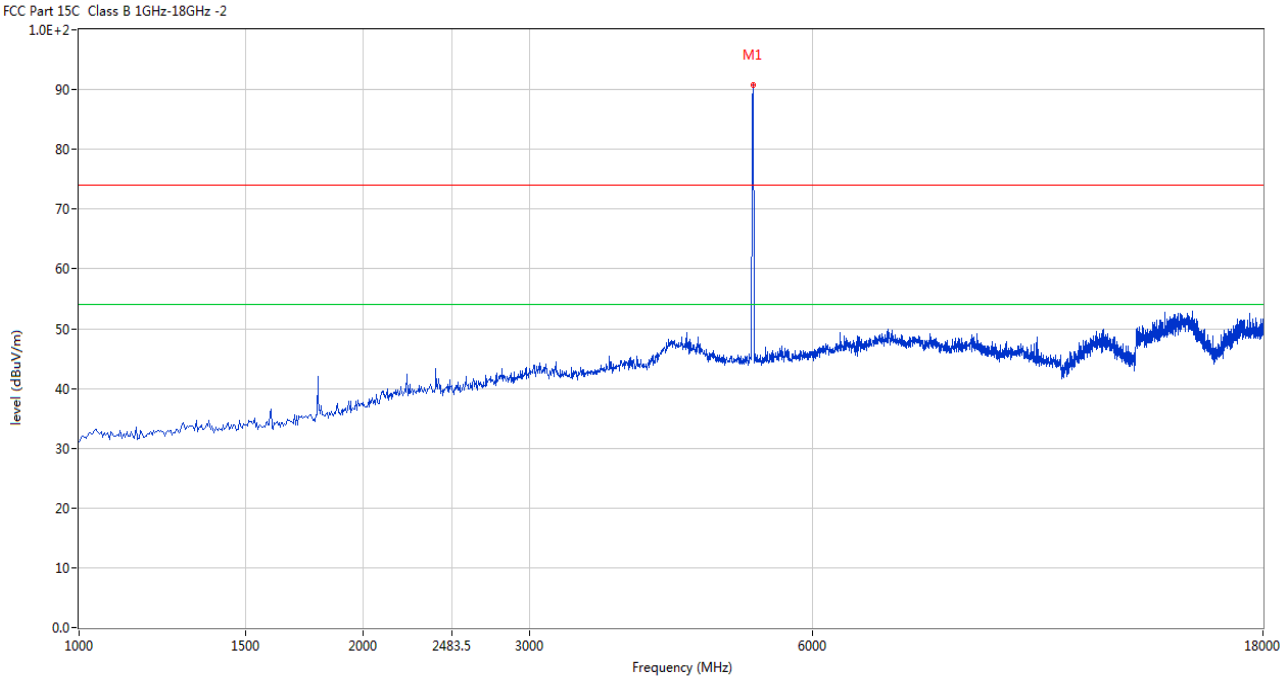
V



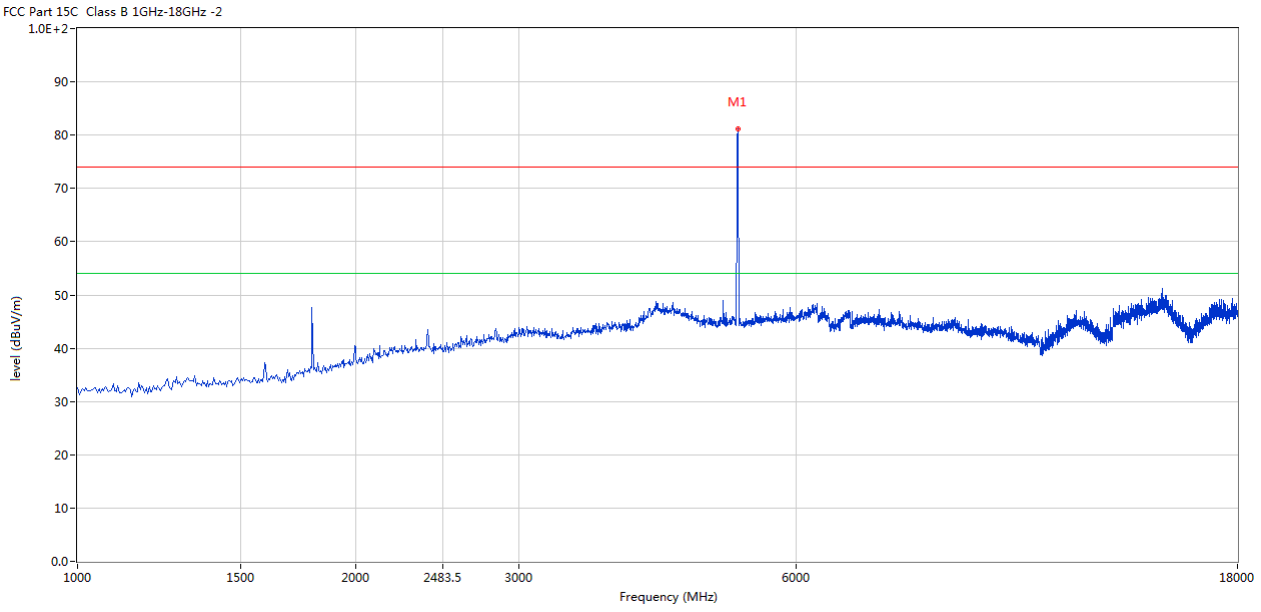
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	37.516	30.53	-12.95	40.0	-9.47	Peak	129.00	100	Vertical	Pass
2	46.728	31.08	-11.44	40.0	-8.92	Peak	269.00	100	Vertical	Pass
3	72.427	30.52	-16.69	40.0	-9.48	Peak	0.00	100	Vertical	Pass
4	88.428	29.82	-15.55	43.5	-13.68	Peak	203.00	100	Vertical	Pass
5	169.160	29.71	-16.10	43.5	-13.79	Peak	0.00	100	Vertical	Pass
6	202.859	29.00	-13.42	43.5	-14.50	Peak	166.00	100	Vertical	Pass

Please refer to the following test plots for details:

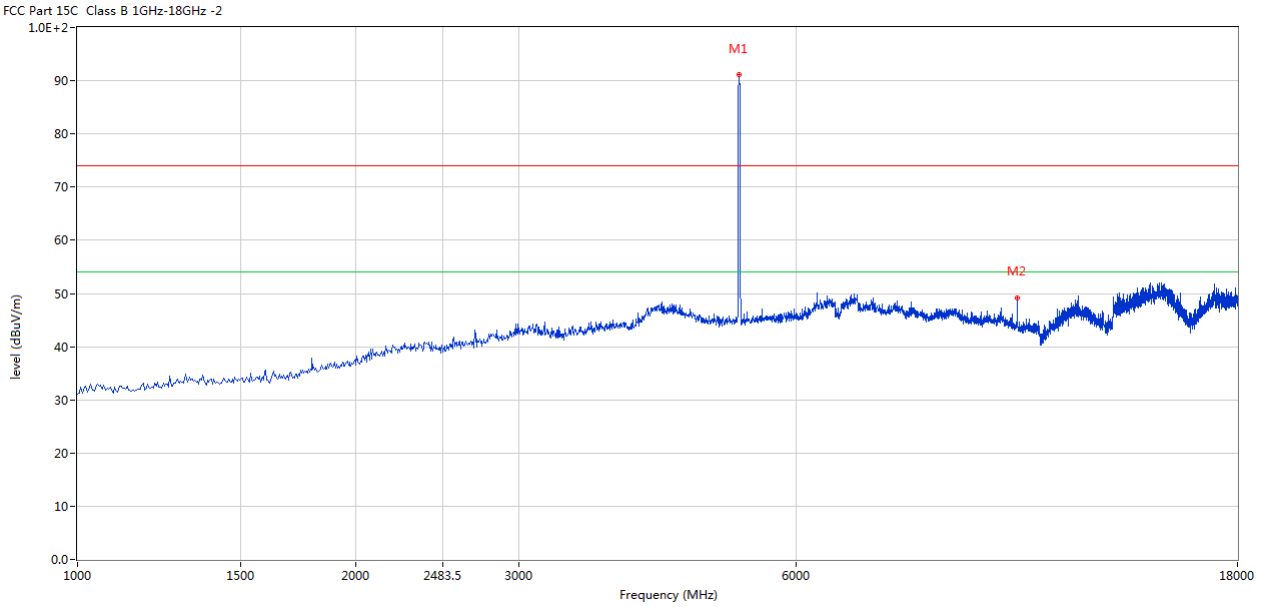
CH36 for 11a at 6Mbps: Horizontal



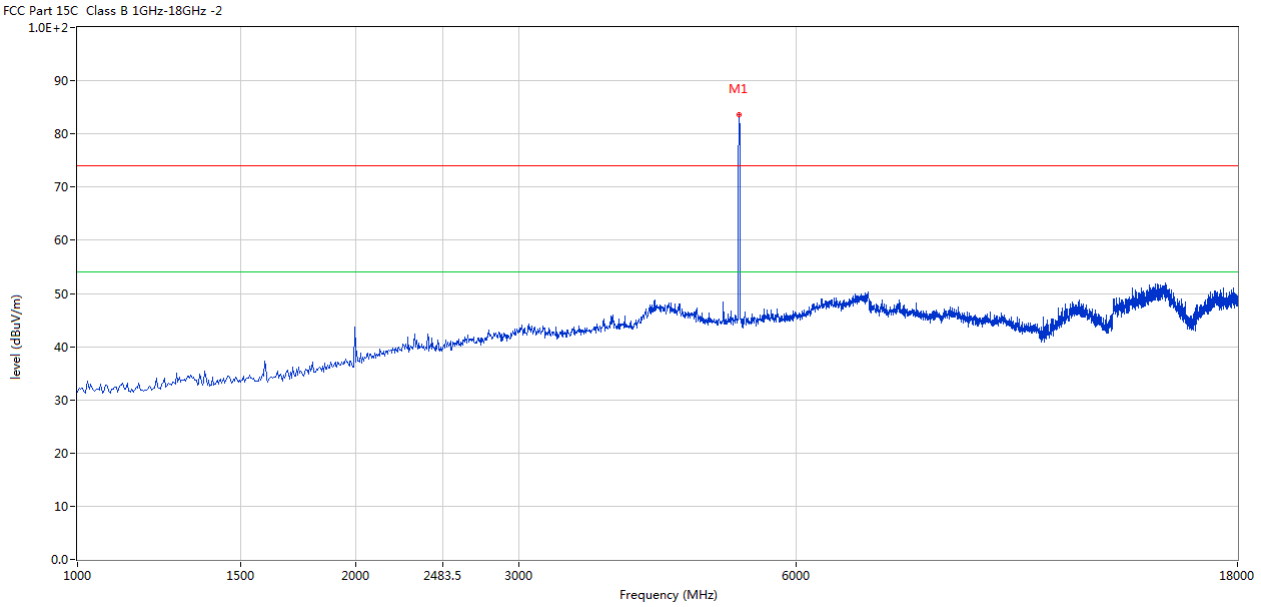
CH36 for 11a at 6Mbps: Vertical



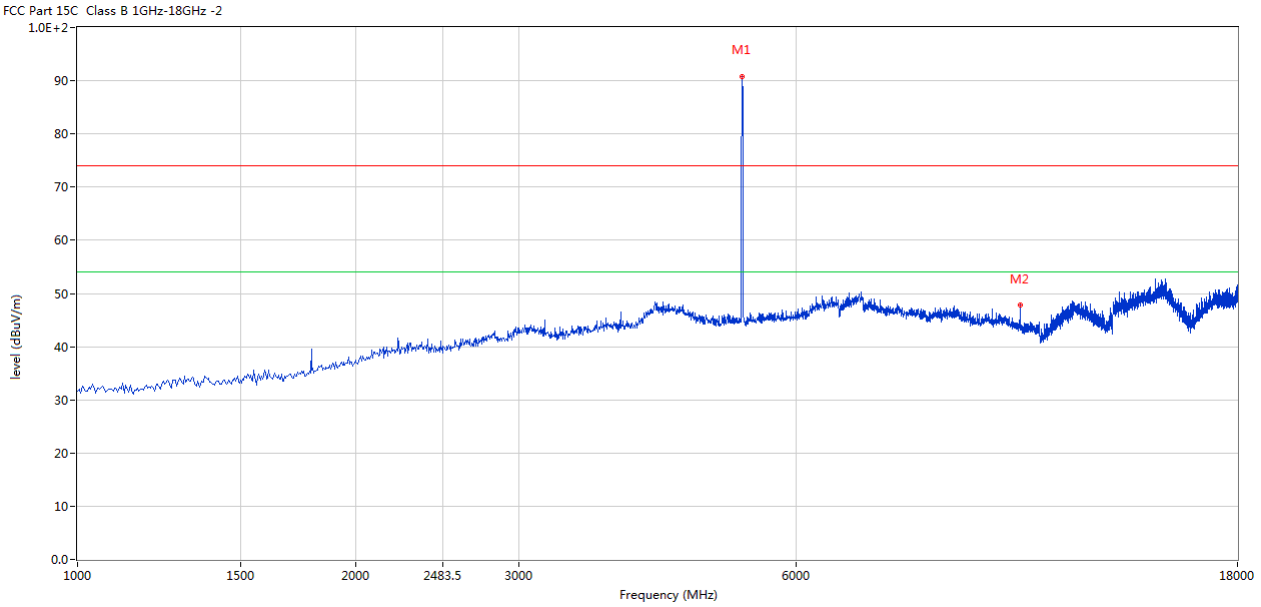
CH40 for 11a at 6Mbps: Horizontal



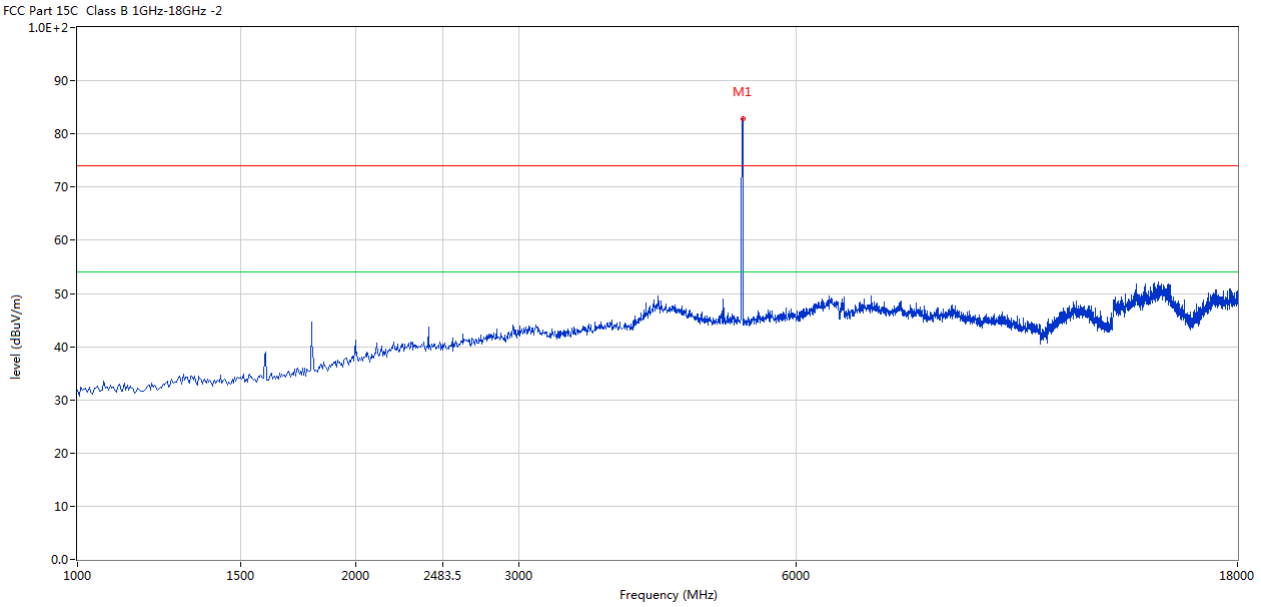
CH40 for 11a at 6Mbps: Vertical



CH48 for 11a at 6Mbps: Horizontal



CH48 for 11g at 6Mbps: Vertical



Note: 1. For radiated Emissions from 18-40GHz and below 30MHz, it is only the floor noise and less than the limit for more than 20dB. No necessary to take down.

2. 802.11a is the worst case.

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 36 (5180MHz)-11a
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	45.1 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-50.1		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 45.1 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=45.1-95.2=-50.1dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 36 (5180MHz)-11a
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	42.6 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-52.6		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 42.6 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=42.6-95.2=-52.6dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 48 (5240MHz)-11a
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	49.3 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-45.9		
Polarity	Horizontal			

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:
EIRP[dBm] = E[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 49.3dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=49.3-95.2=-45.9dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 48 (5240MHz)-11a
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	46.9 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-48.3		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 46.9dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=46.9-95.2=-48.3dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 149 (5745MHz)-11a
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5725	PK (dBμV/m)	53.6 (PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-41.6		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 53.6 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=53.6-95.2=-41.6dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 149 (5745MHz)-11a
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5725	PK (dBμV/m)	47.8(PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-47.4		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 47.8 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=47.8-95.2=-47.4dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 161 (5805MHz)-11a
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5850	PK (dBμV/m)	55.1 (PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-40.1		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 55.1 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=55.1-95.2= -40.1dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 161 (5805MHz)-11a
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5850	PK (dBμV/m)	50.3 (PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-44.9		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]=50.3 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=50.3-95.2=-44.9dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 36 (5180MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	46.5(PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-48.7		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 46.5 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=46.5-95.2=-48.7dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 36 (5180MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	43.0 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-52.2		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 43.0dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=43.0-95.2= -52.2dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 48 (5240MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	47.9(PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-47.3		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 47.9 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=47.9-95.2=-47.3dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 48 (5240MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	44.7(PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-50.5		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 44.7dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=44.7-95.2=-50.5dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 149 (5745MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5725	PK (dBμV/m)	50.4 (PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-44.8		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 50.4dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=50.4-95.2=-44.8dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 149 (5745MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5725	PK (dBμV/m)	46.6 (PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-48.6		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 46.6dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=46.6-95.2= -48.6 dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 161 (5805MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5850	PK (dBμV/m)	50.3 (PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-44.9		
Polarity	Horizontal		--	--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:
EIRP[dBm] = E[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 50.3dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=50.3-95.2= -44.9dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 161 (5805MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5850	PK (dBμV/m)	46.4 (PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-48.8		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 46.4dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=46.4-95.2=-48.8dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 38 (5190MHz)-11n/HT40
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	44.9 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-50.3		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 44.9 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=44.9-95.2=-50.3dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 38 (5190MHz)-11n/HT40
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	42.6 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-52.6		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 42.6dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=42.6-95.2= -52.6dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 46 (5230MHz)-11n/HT40
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	48.3(PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-46.9		
Polarity	Horizontal			

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:
EIRP[dBm] = E[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 48.3dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=48.3-95.2=-46.9 dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 46 (5230MHz)-11n/HT40
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	45.8(PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-49.4		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 45.8dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=45.8-95.2= -49.4dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 151 (5755MHz)-11n/HT40
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5725	PK (dBμV/m)	51.2(PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-44.0		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 51.2 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=51.2 -95.2= -44.0dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 151 (5755MHz)-11n/HT40
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5725	PK (dBμV/m)	46.7(PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-48.5		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 46.7dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=46.7-95.2=-48.5dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 159 (5795MHz)-11n/HT40
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5850	PK (dBμV/m)	53.9 (PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-41.3		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 53.9 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=53.9-95.2=-41.3dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 159 (5795MHz)-11n/HT40
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5850	PK (dBμV/m)	47.1(PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-48.1		
Polarity	Vertical		--	--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:
EIRP[dBm] = E[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 47.1 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=47.1-95.2=-48.1 dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 42 (5210MHz)-11ac/VHT80
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	47.7 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-47.5		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 47.7 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=47.7-95.2=-47.5dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 42 (5210MHz)-11ac/VHT80
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	45.3 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-49.9		
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[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 45.3dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=45.3-95.2= -49.9dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 155 (5775MHz)-11ac/VHT80
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5850	PK (dBμV/m)	52.5 (PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-42.7		
Polarity	Horizontal		--	--

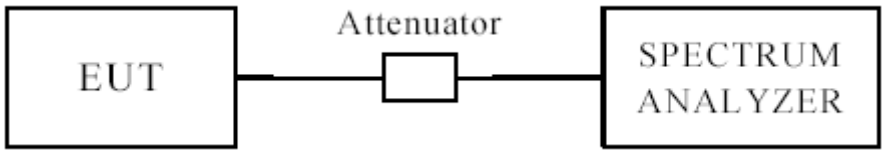
Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:
EIRP[dBm] = E[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 52.5 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=52.5-95.2= -42.7 dBm
2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	TQSky Tbox		Test Mode:	Channel 157 (5775MHz)-11ac/VHT80
Mode	Keeping Transmitting		Input Voltage	DC3.85V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5850	PK (dBμV/m)	47.1(PK)	Limit	-17dBm/MHz
	EIRP (dBm)	-48.1		
Polarity	Vertical		--	--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:
EIRP[dBm] = E[dBμV/m] - 95.2
For Example, if E[dBμV/m]= 47.1dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=47.1-95.2=-48.1dBm
2. RBW=1MHz, VBW=3MHz

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≥ 3 × 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≥ 3 × 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

7.6 Test Result

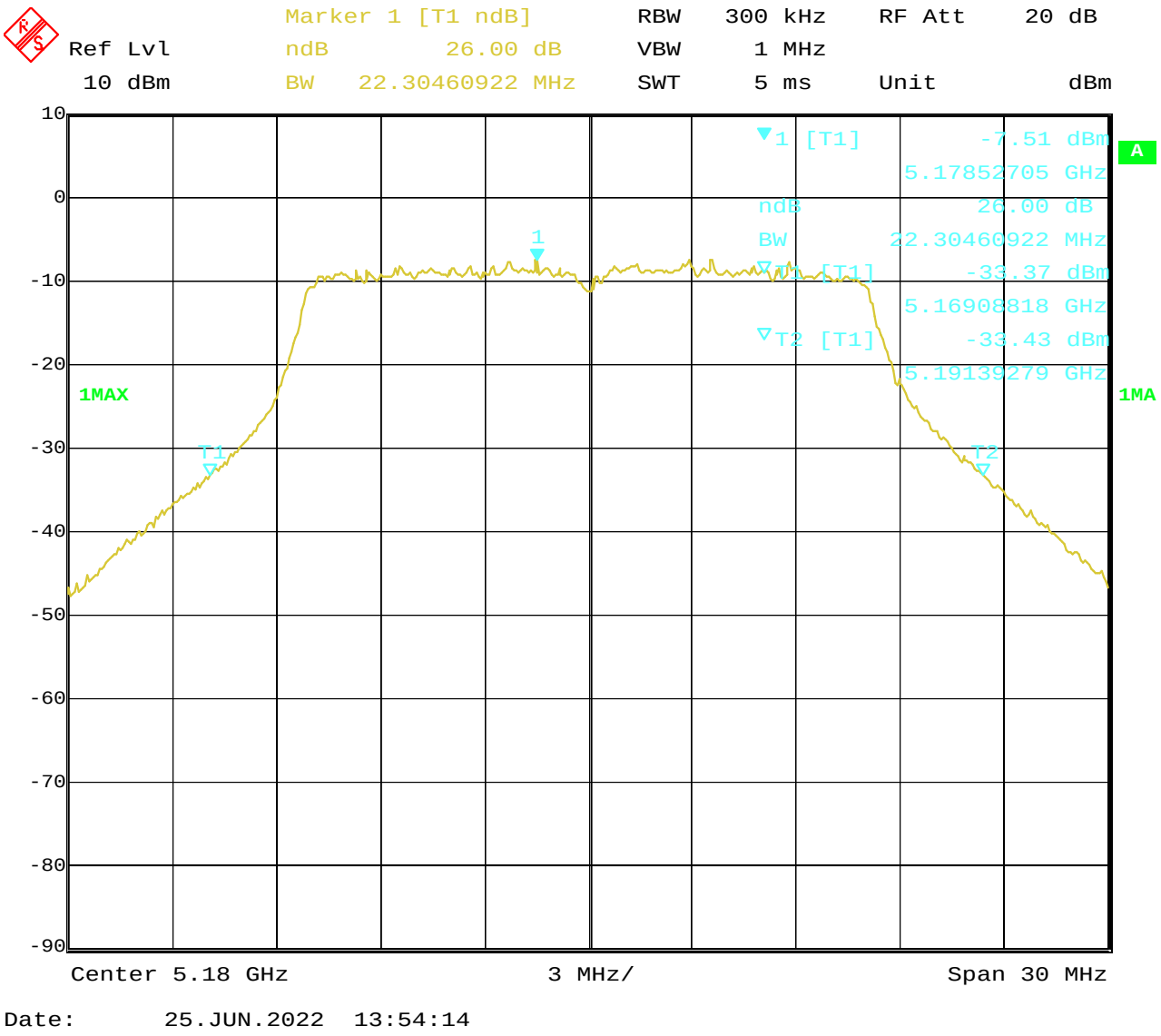
EUT	TQSky Tbox	Model	TBOX
Mode	802.11a	Input Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
36	5180	6	22.30	--	Pass
40	5200	6	22.48	--	Pass
48	5240	6	22.48	--	Pass
99% Bandwidth					
36	5180	6	16.89	--	Pass
40	5200	6	16.89	--	Pass
48	5240	6	16.89	--	Pass

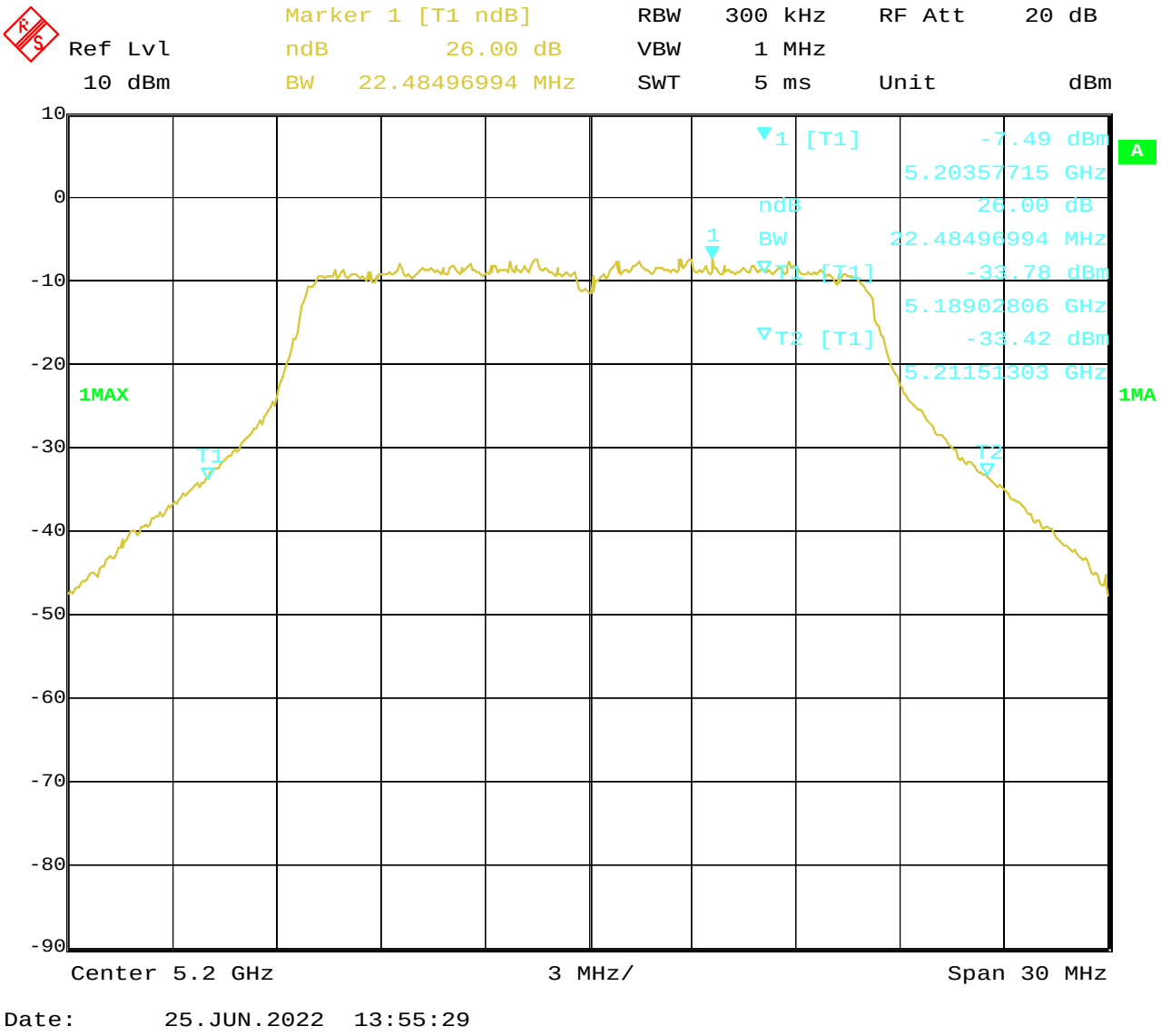
Test Figure:

26dB Bandwidth

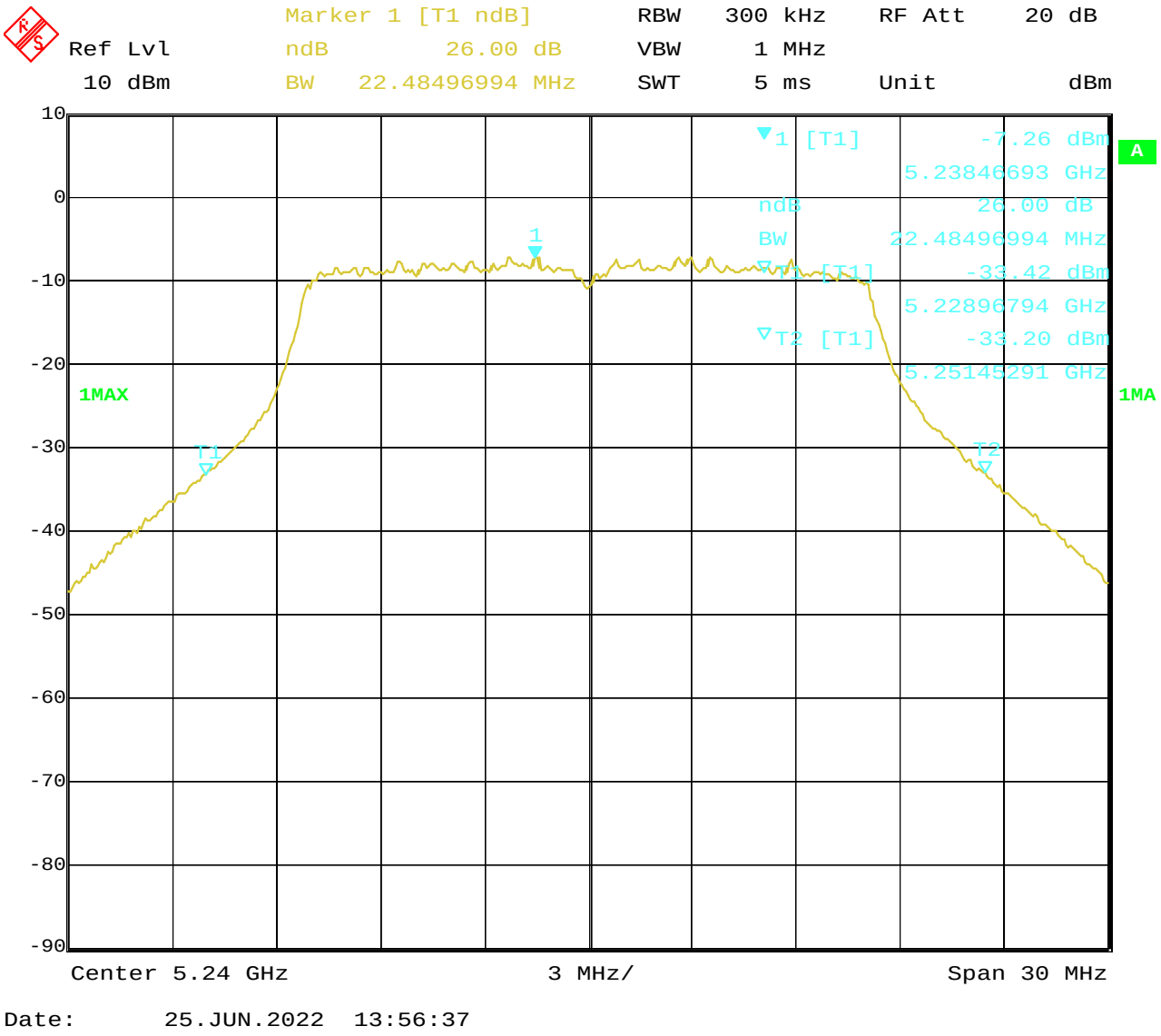
Channel 36



Channel 40



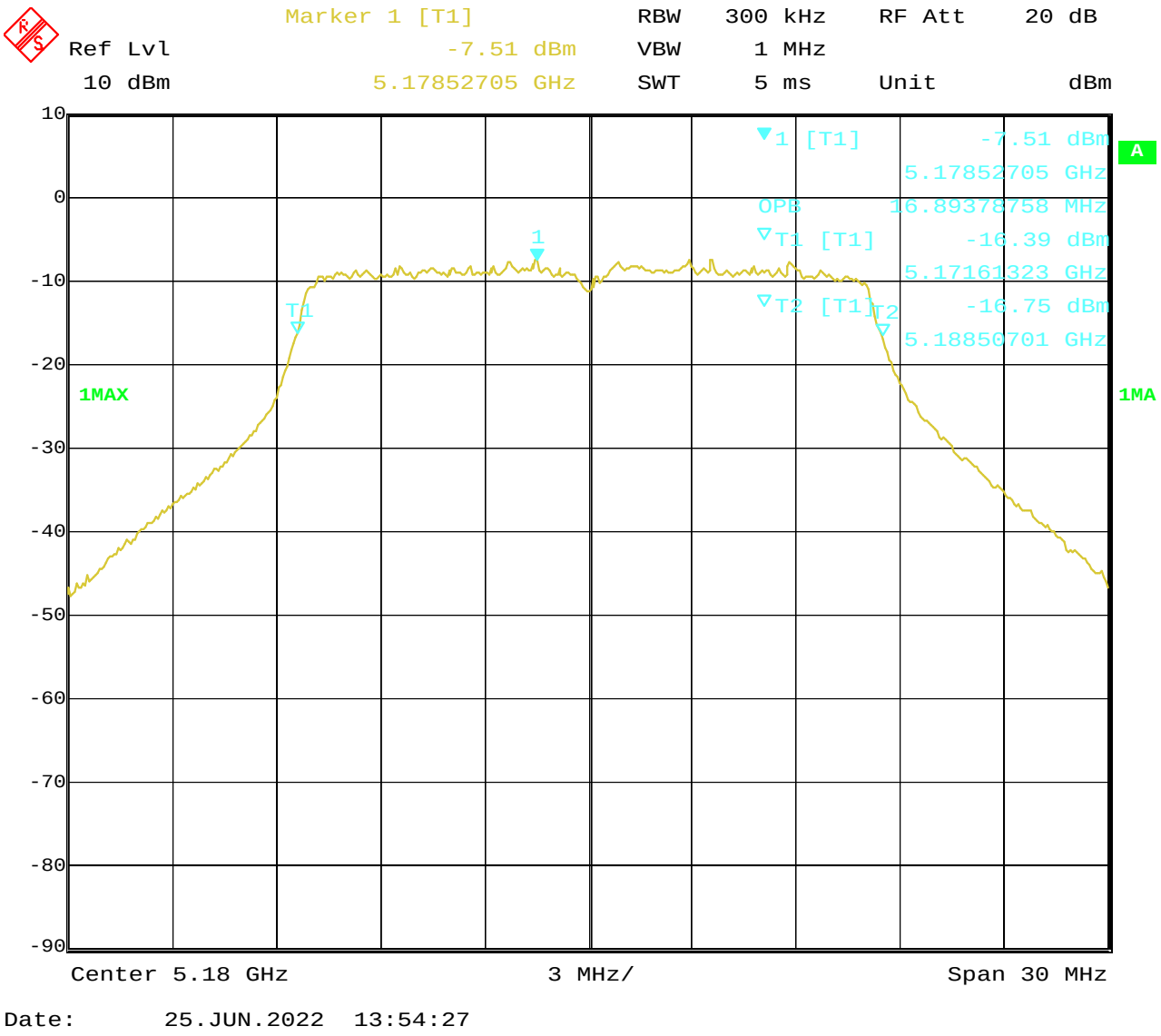
Channel 48



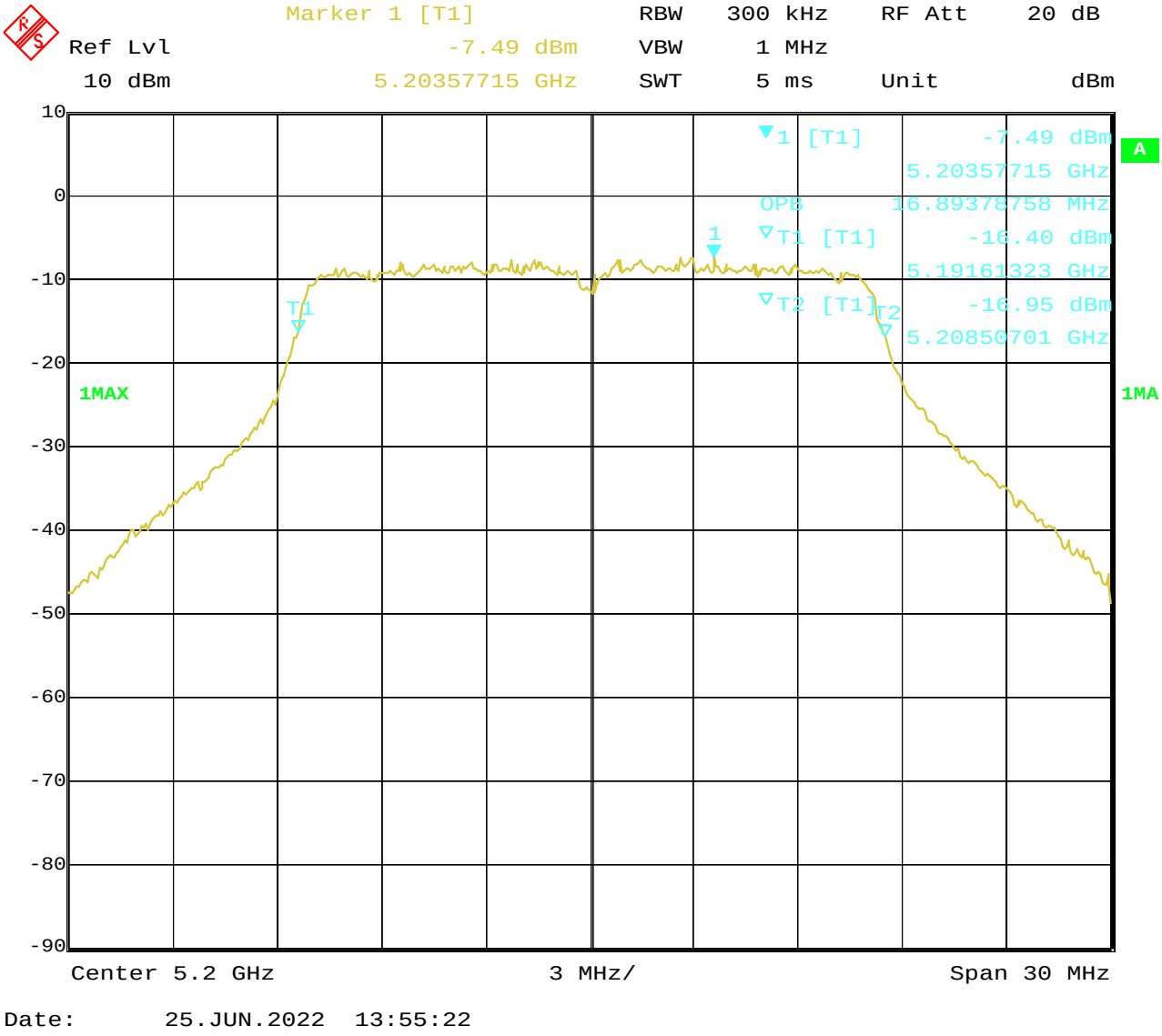
Test Figure:

99% Bandwidth

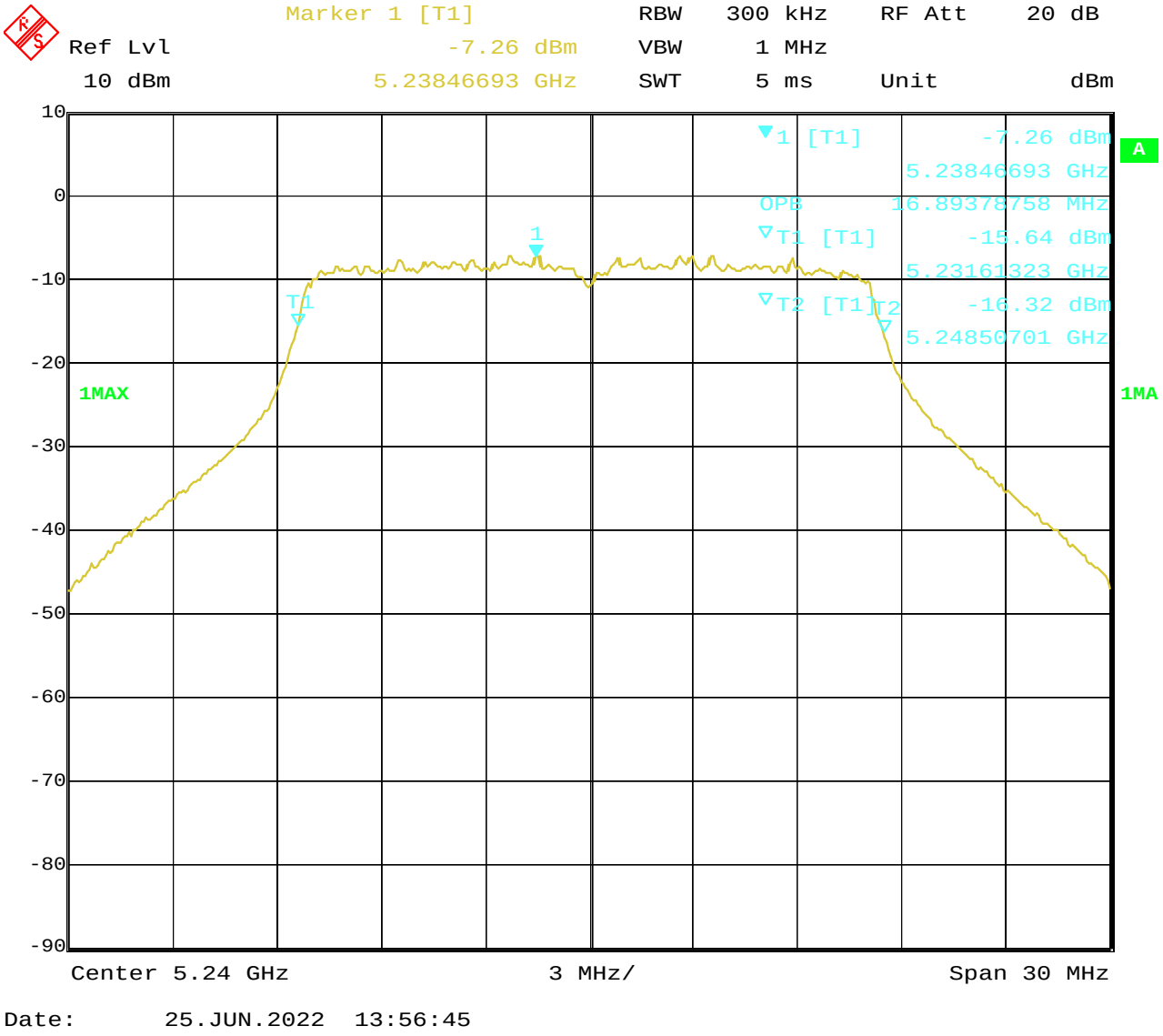
Channel 36



Channel 40



Channel 48



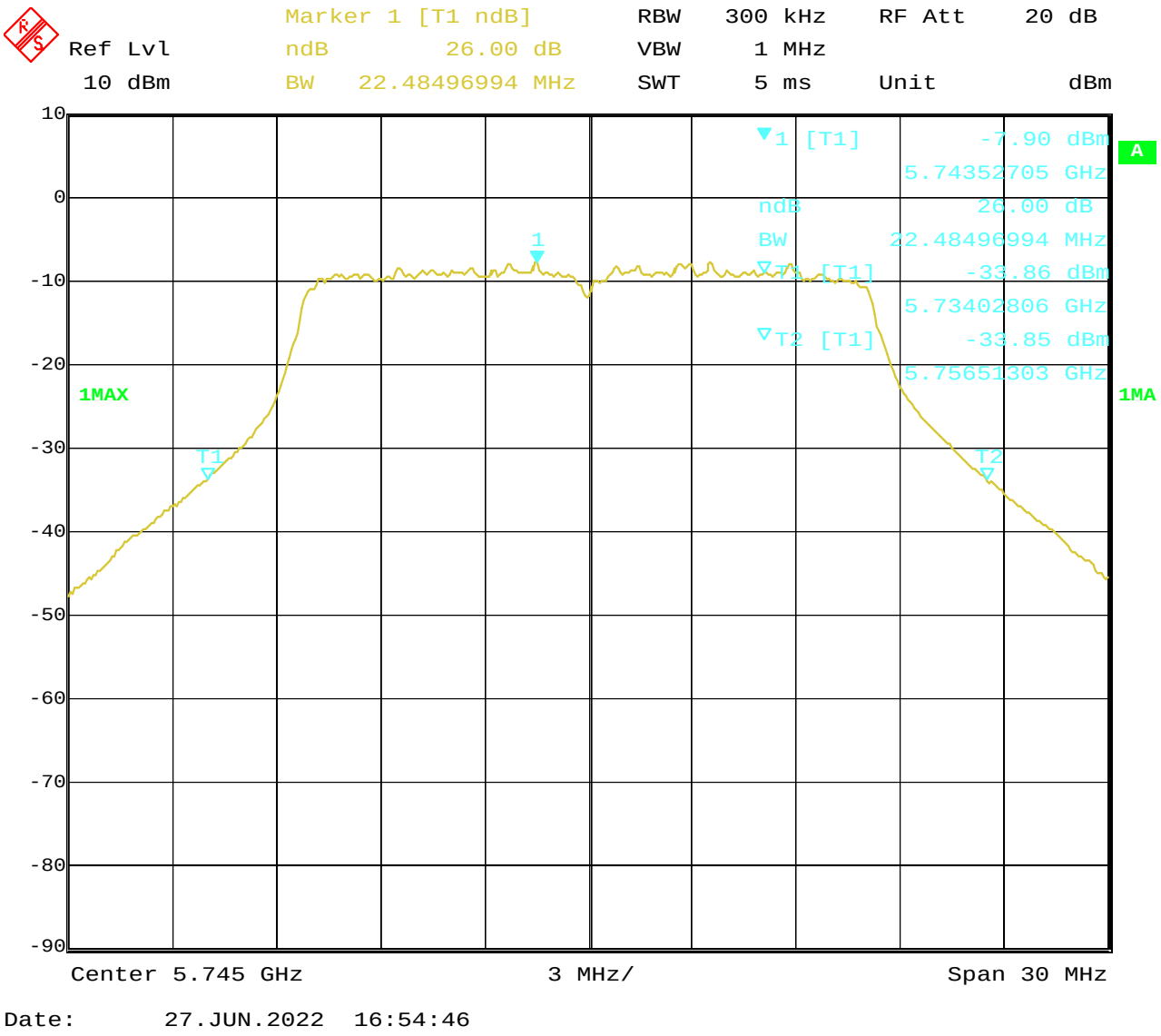
EUT	TQSky Tbox	Model	TBOX
Mode	802.11a	Input Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
149	5745	6	22.48	--	Pass
153	5765	6	22.30	--	Pass
161	5805	6	22.55	--	Pass
6dB Bandwidth					
149	5745	6	16.38	0.5	Pass
153	5765	6	16.37	0.5	Pass
161	5805	6	16.35	0.5	Pass
99% Bandwidth					
149	5745	6	16.89	--	Pass
153	5765	6	16.89	--	Pass
161	5805	6	16.89	--	Pass

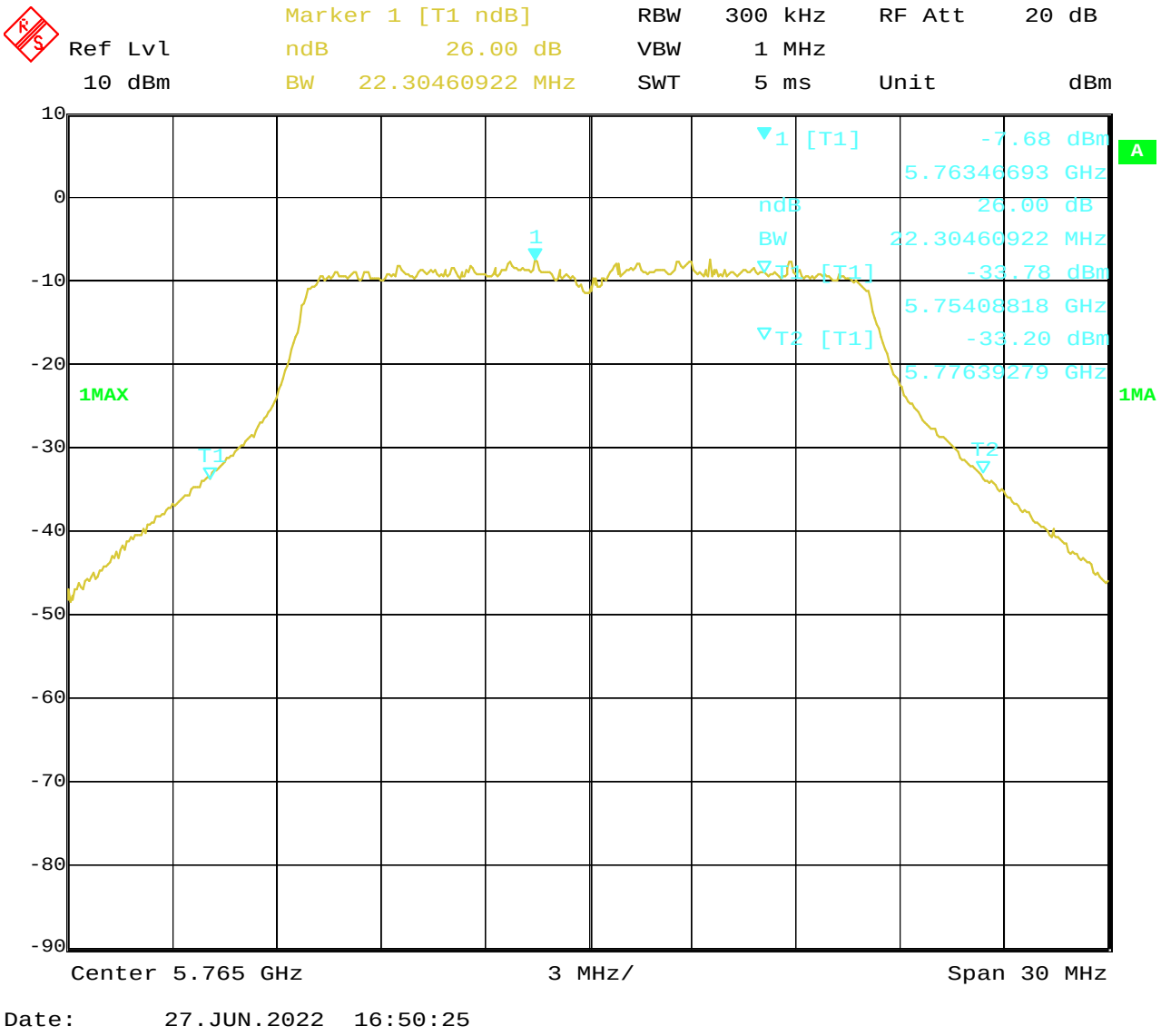
Test Figure:

26dB Bandwidth

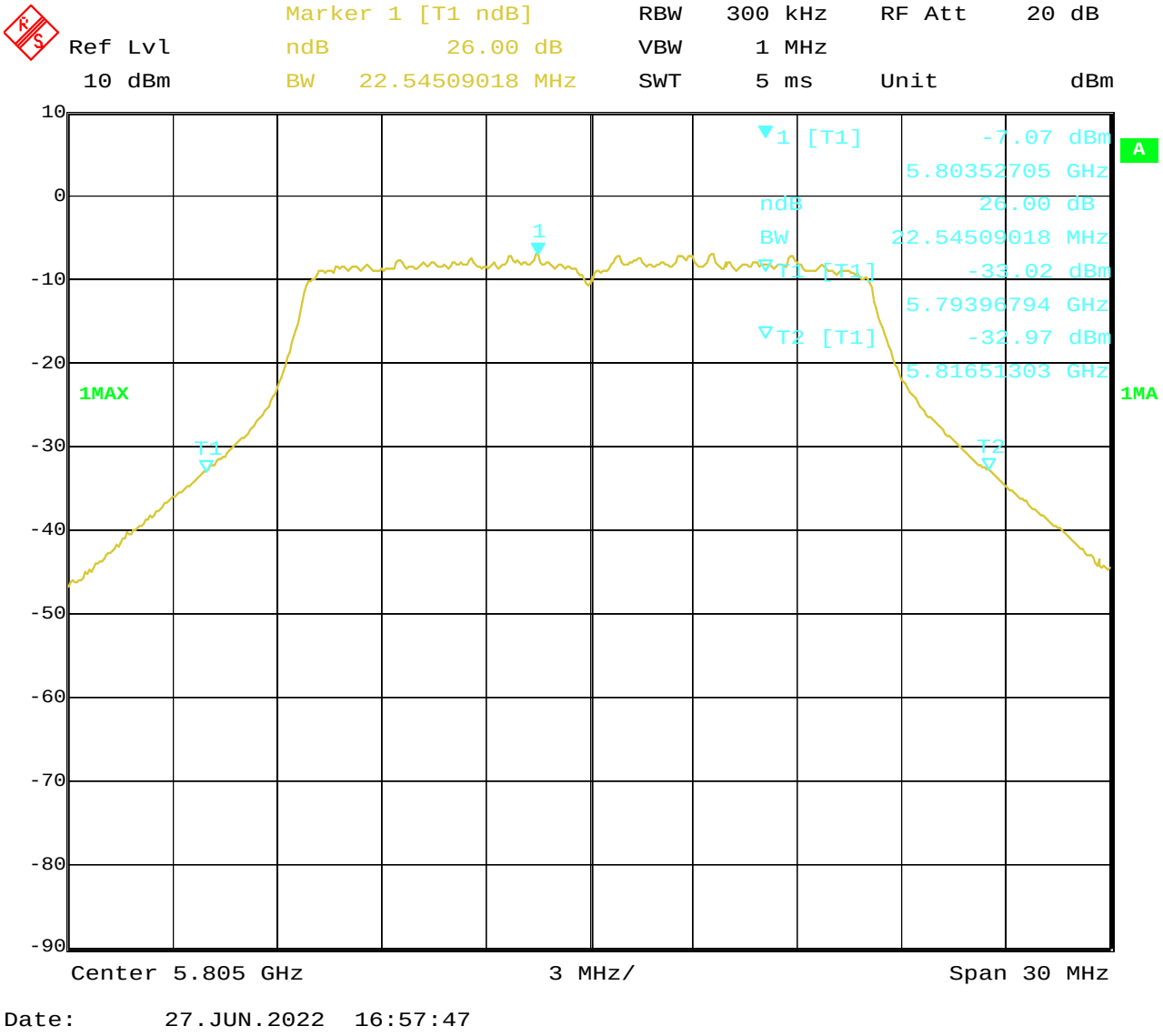
Channel 149



Channel 153



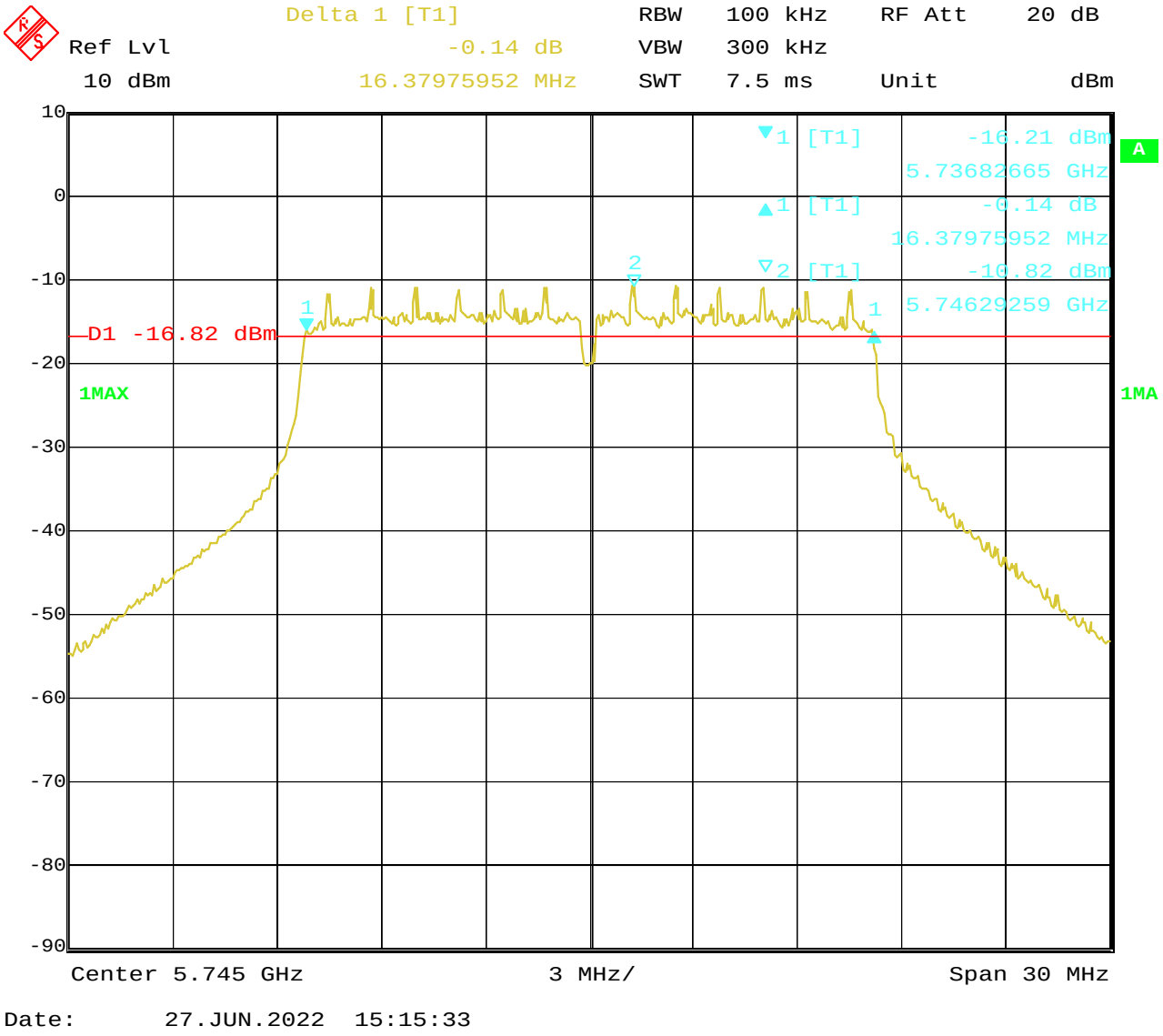
Channel 161



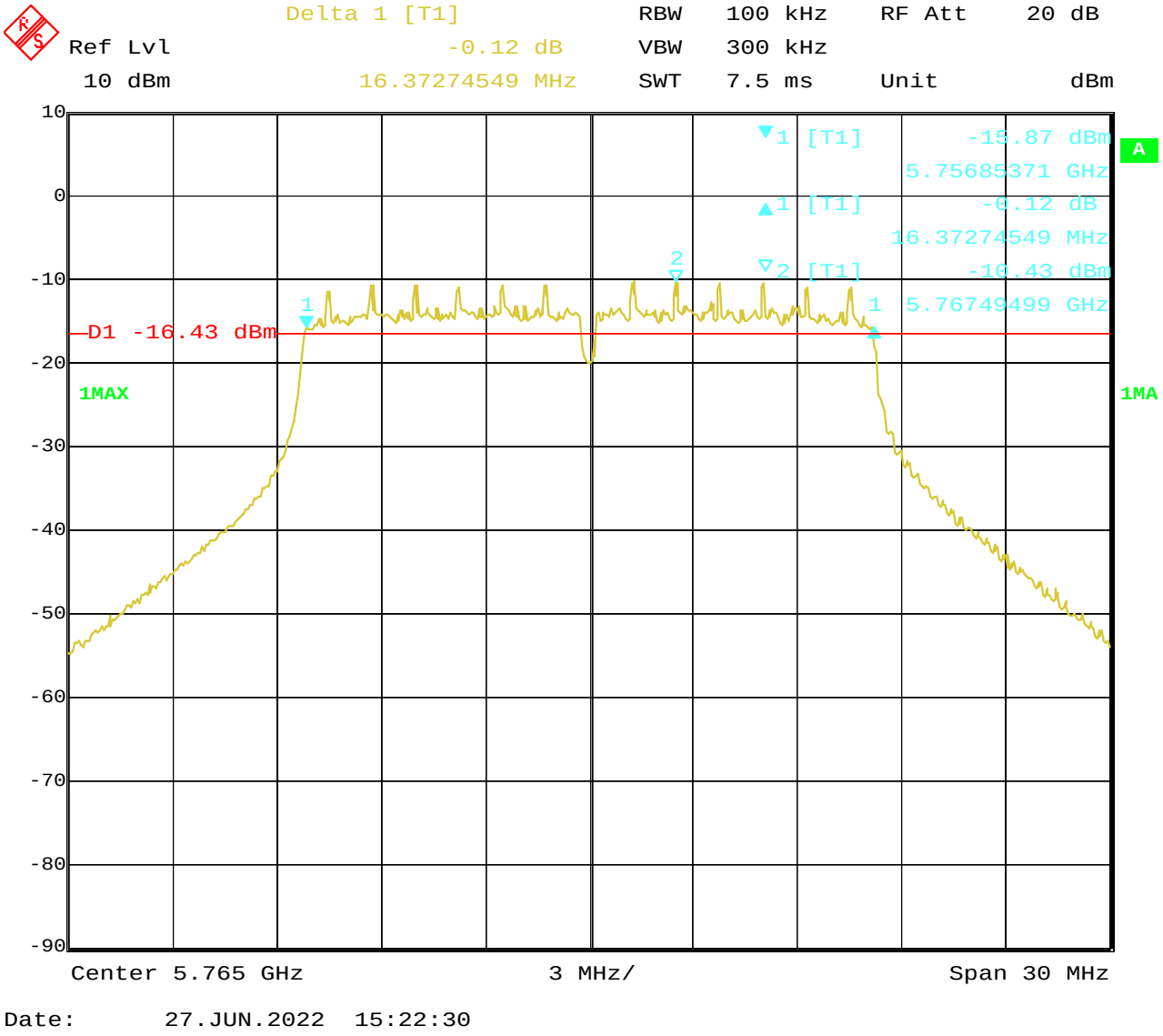
Test Figure:

6dB Bandwidth

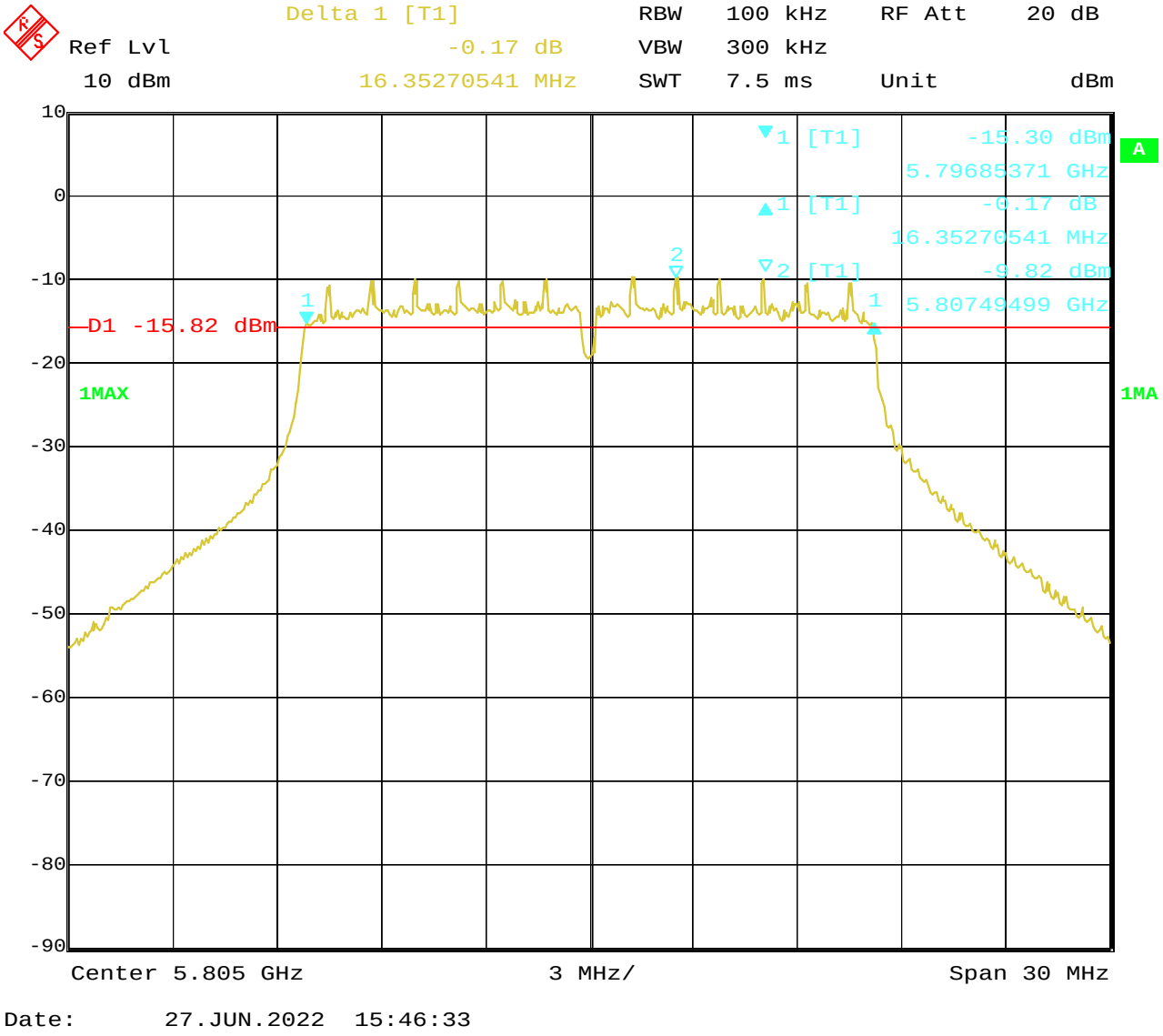
Channel 149



Channel 153



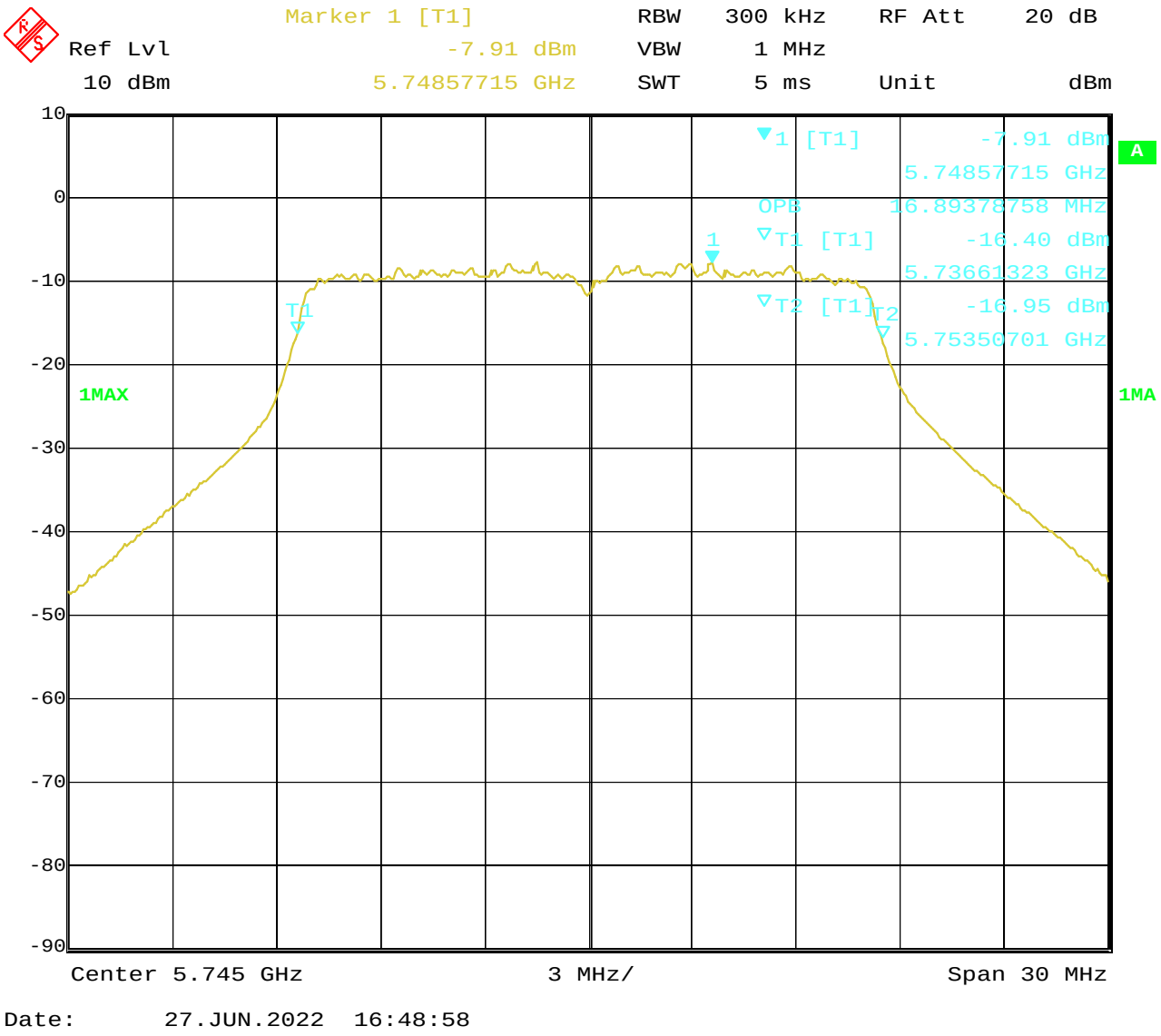
Channel 161



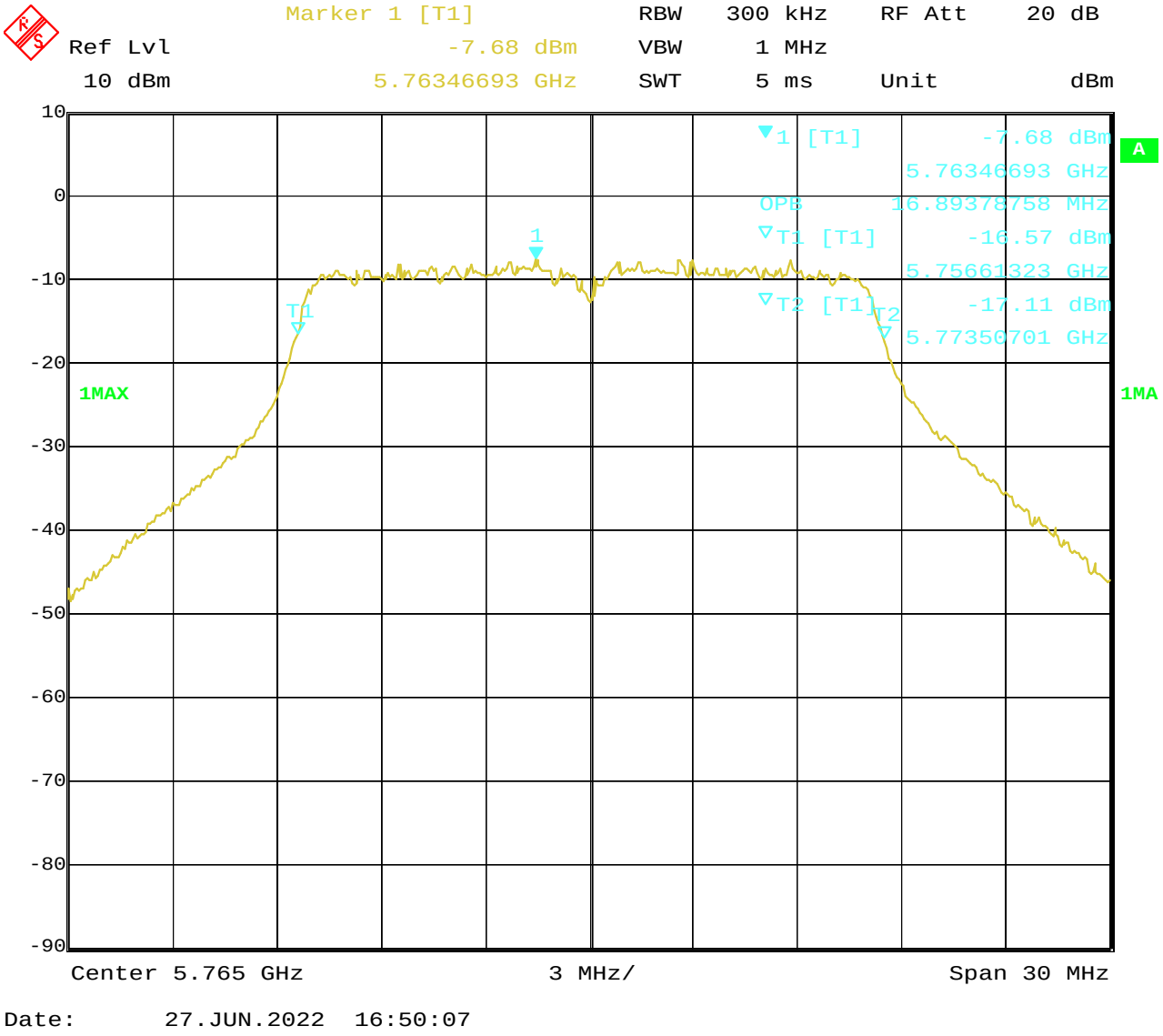
Test Figure:

99% Bandwidth

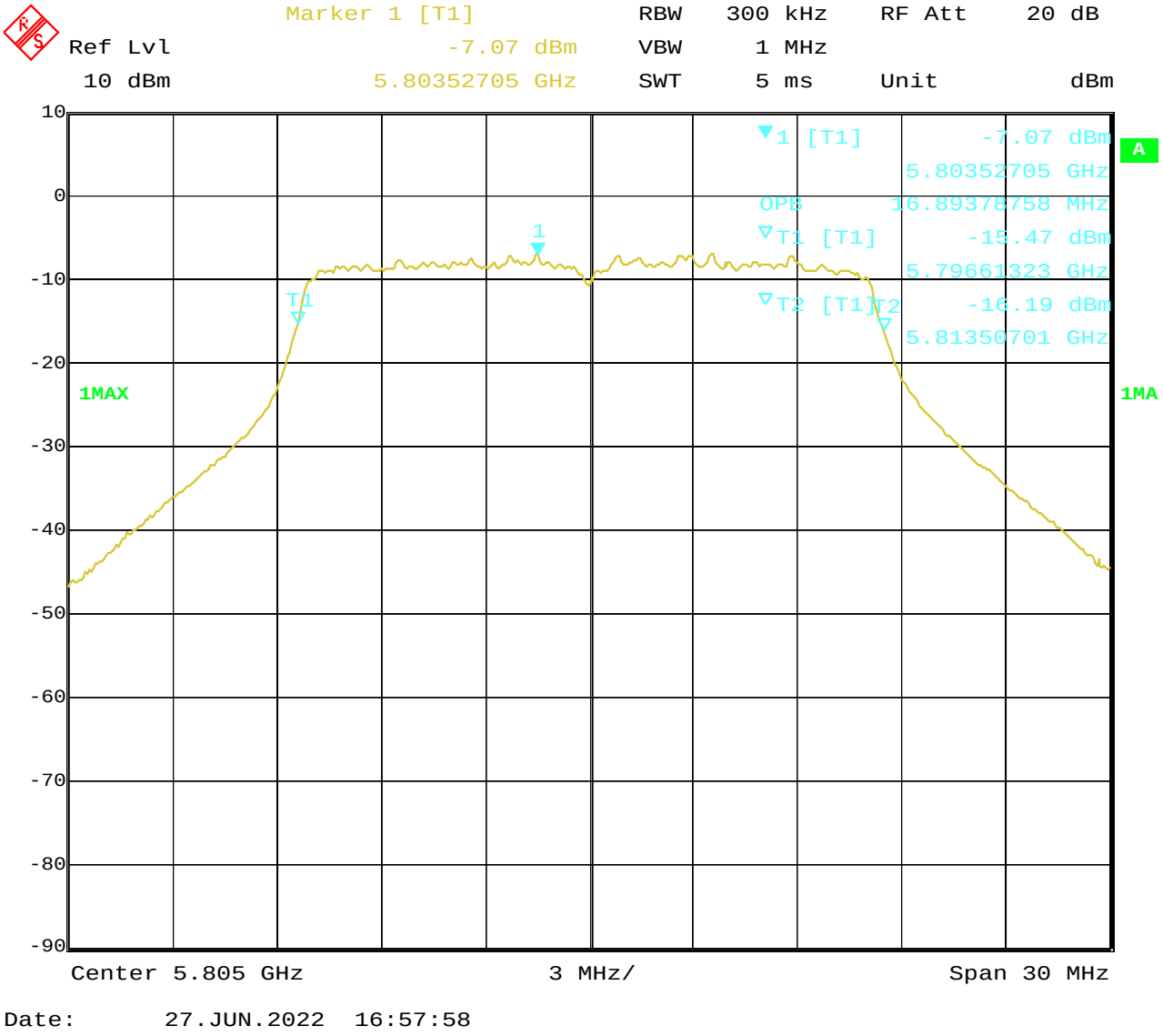
Channel 149



Channel 153



Channel 161



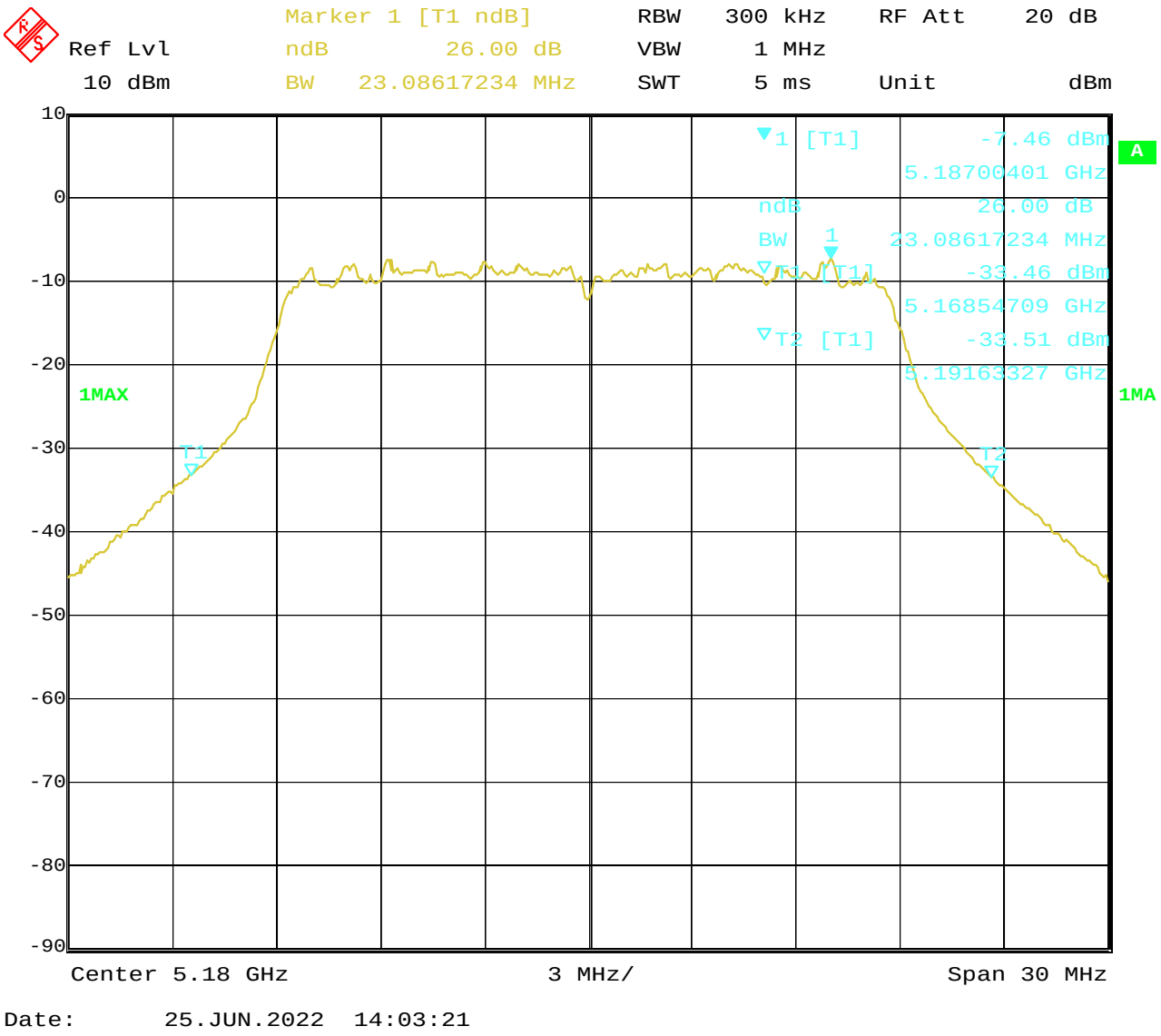
EUT	TQSky Tbox	Model	TBOX
Mode	802.11n HT20	Input Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
36	5180	mcs0	23.09	--	Pass
40	5200	mcs0	23.21	--	Pass
48	5240	mcs0	23.09	--	Pass
99% Bandwidth					
36	5180	mcs0	18.04	--	Pass
40	5200	mcs0	18.04	--	Pass
48	5240	mcs0	18.04	--	Pass

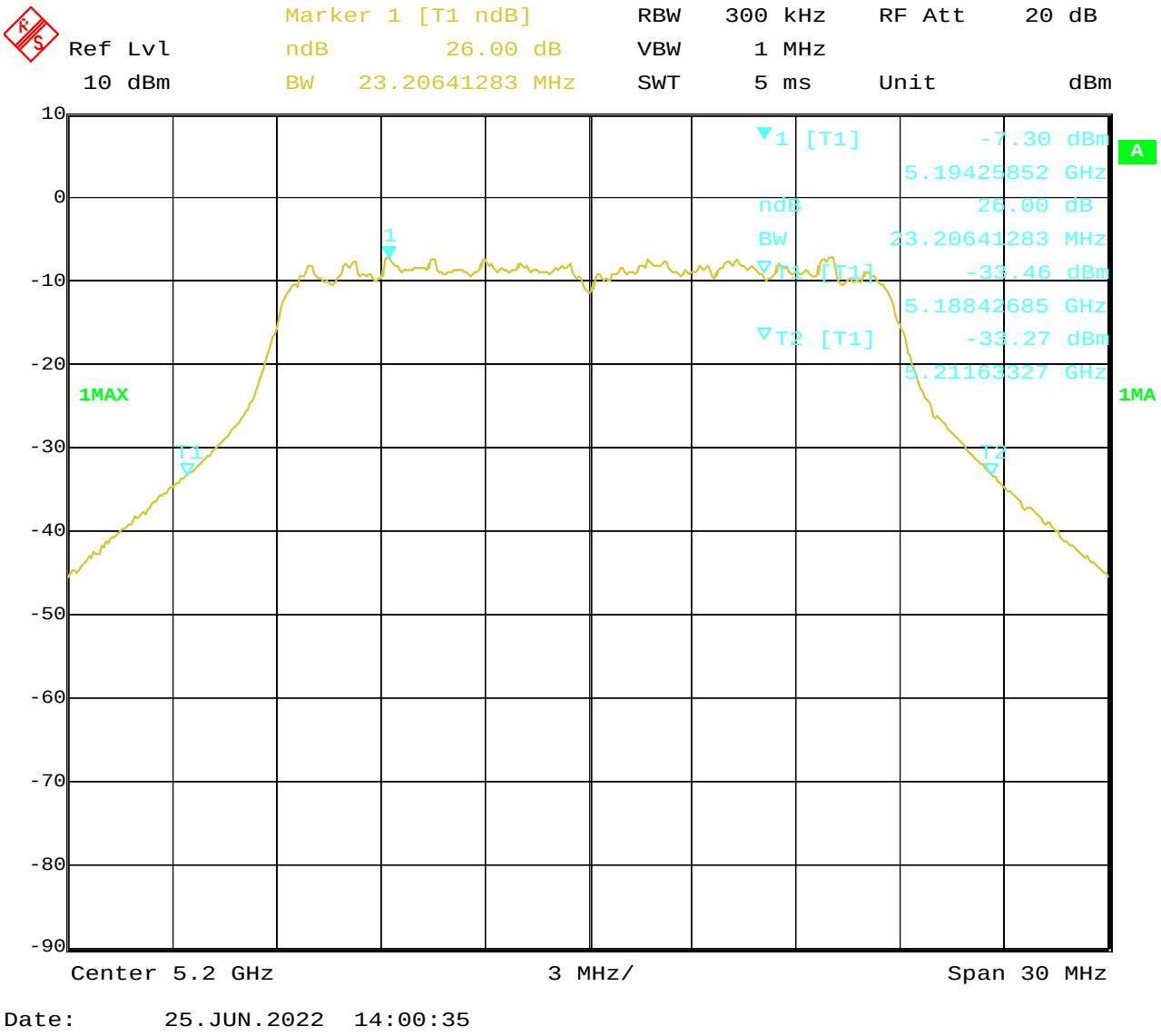
Test Configure

26dB Bandwidth

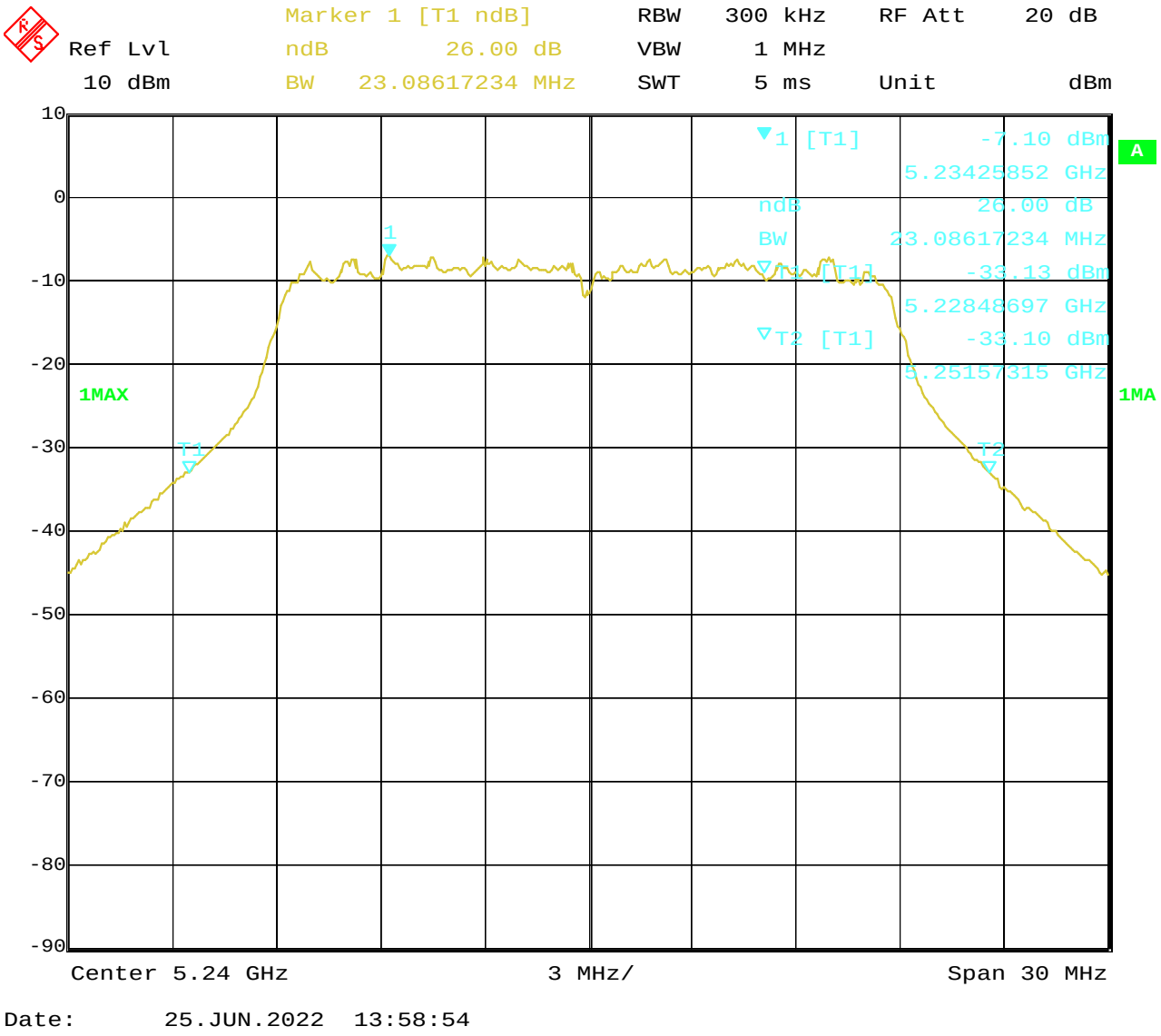
Channel 36



Channel 40



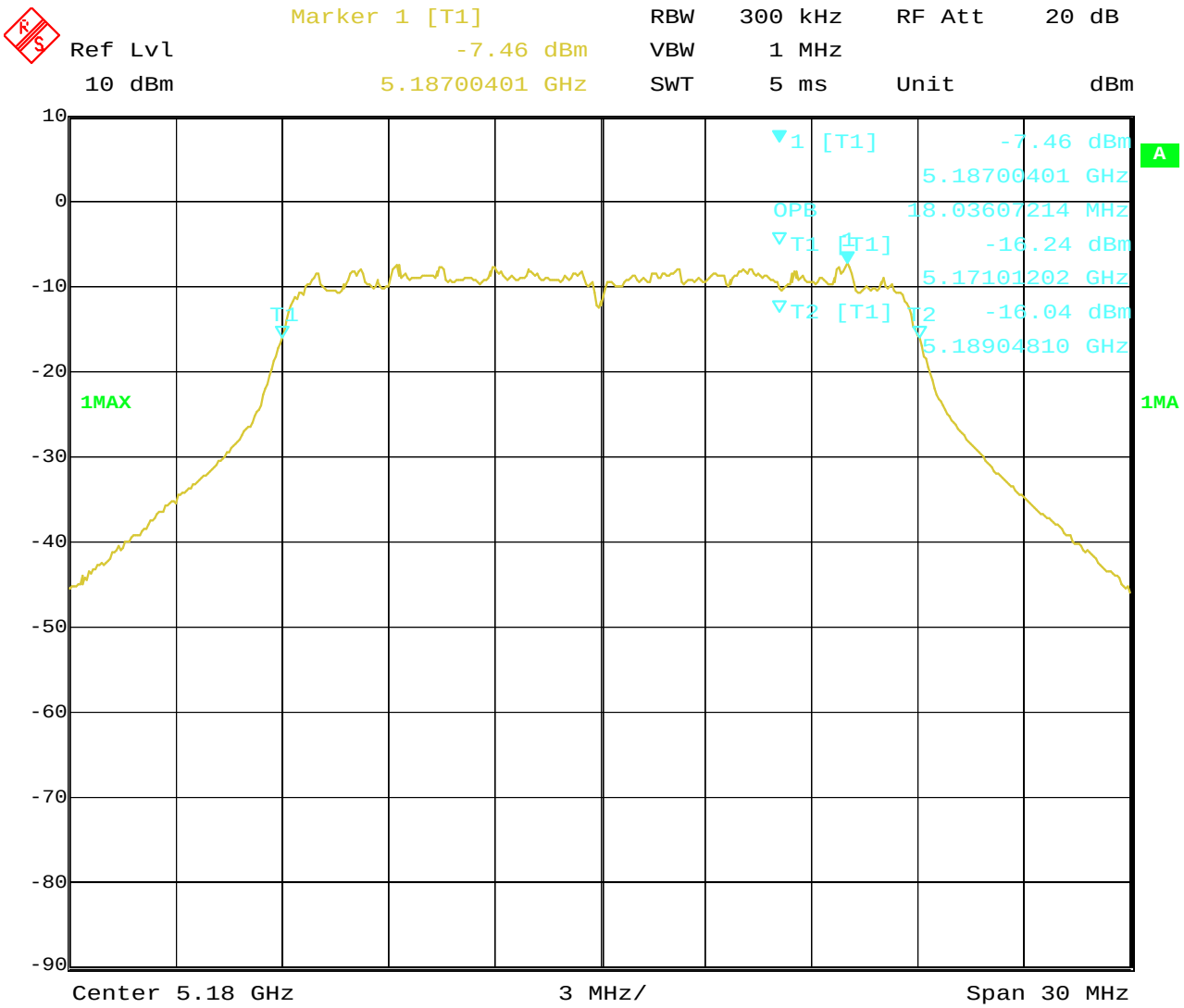
Channel 48



Test Configure

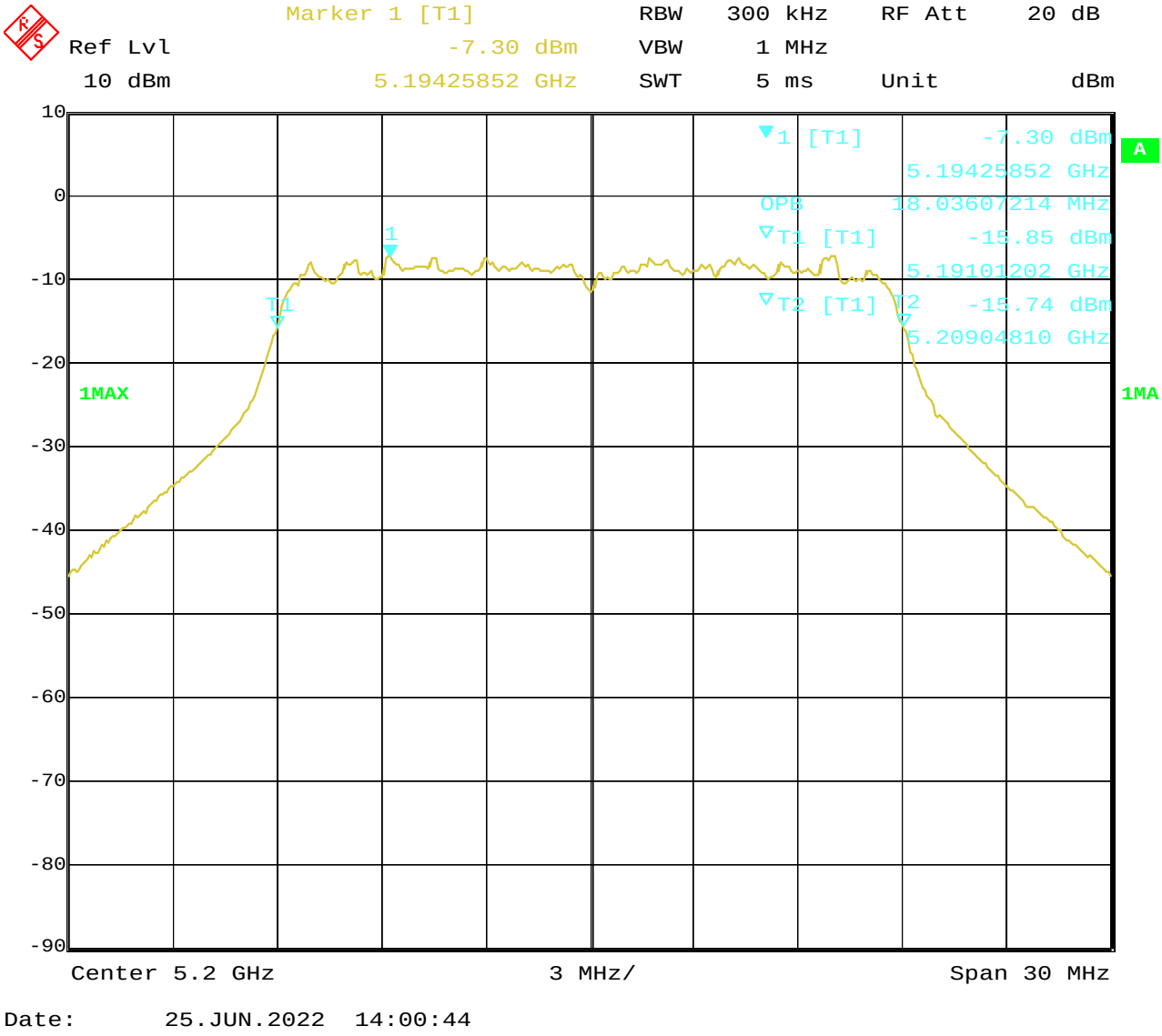
99% Bandwidth

Channel 36

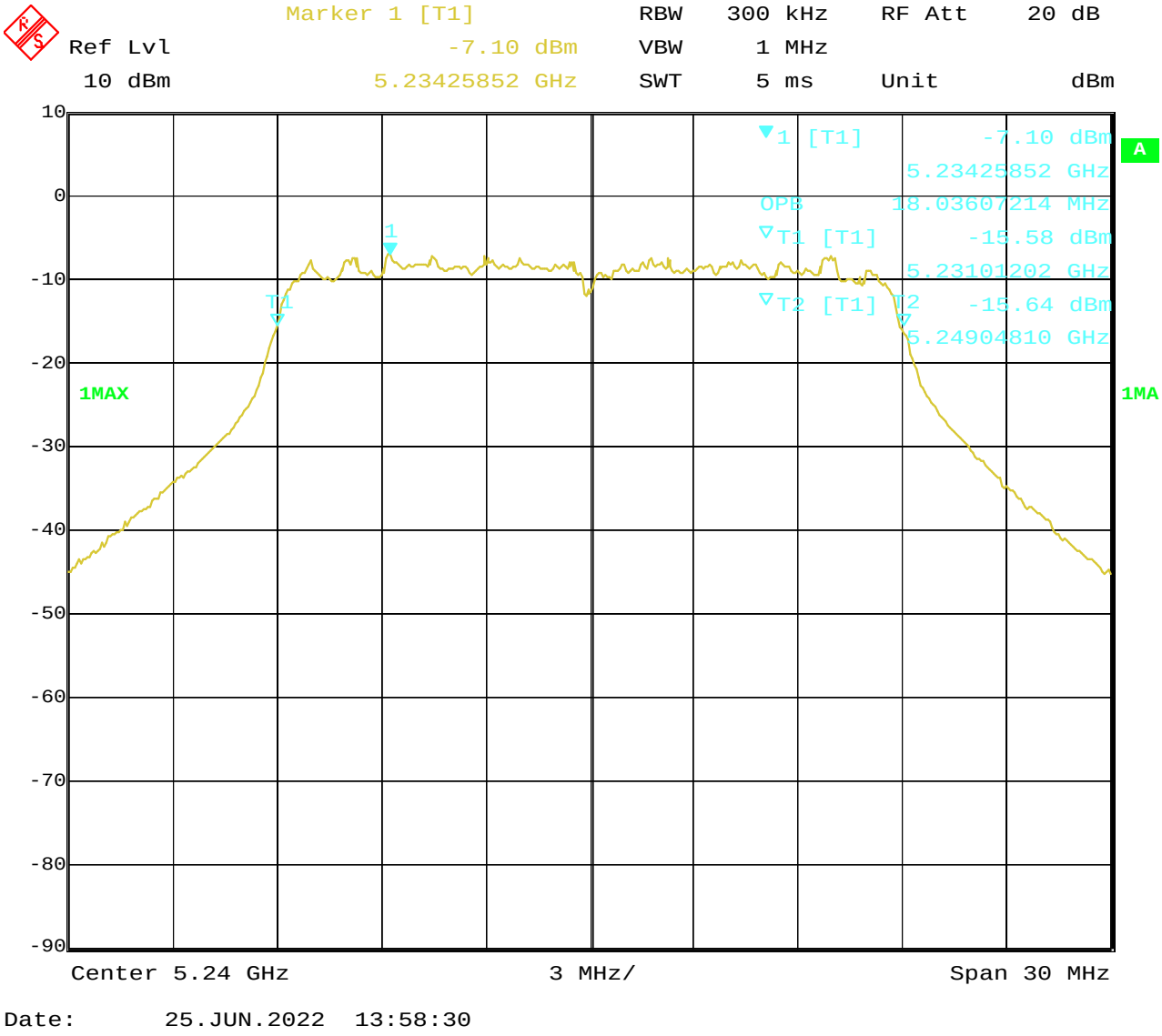


Date: 25.JUN.2022 14:03:11

Channel 40



Channel 48



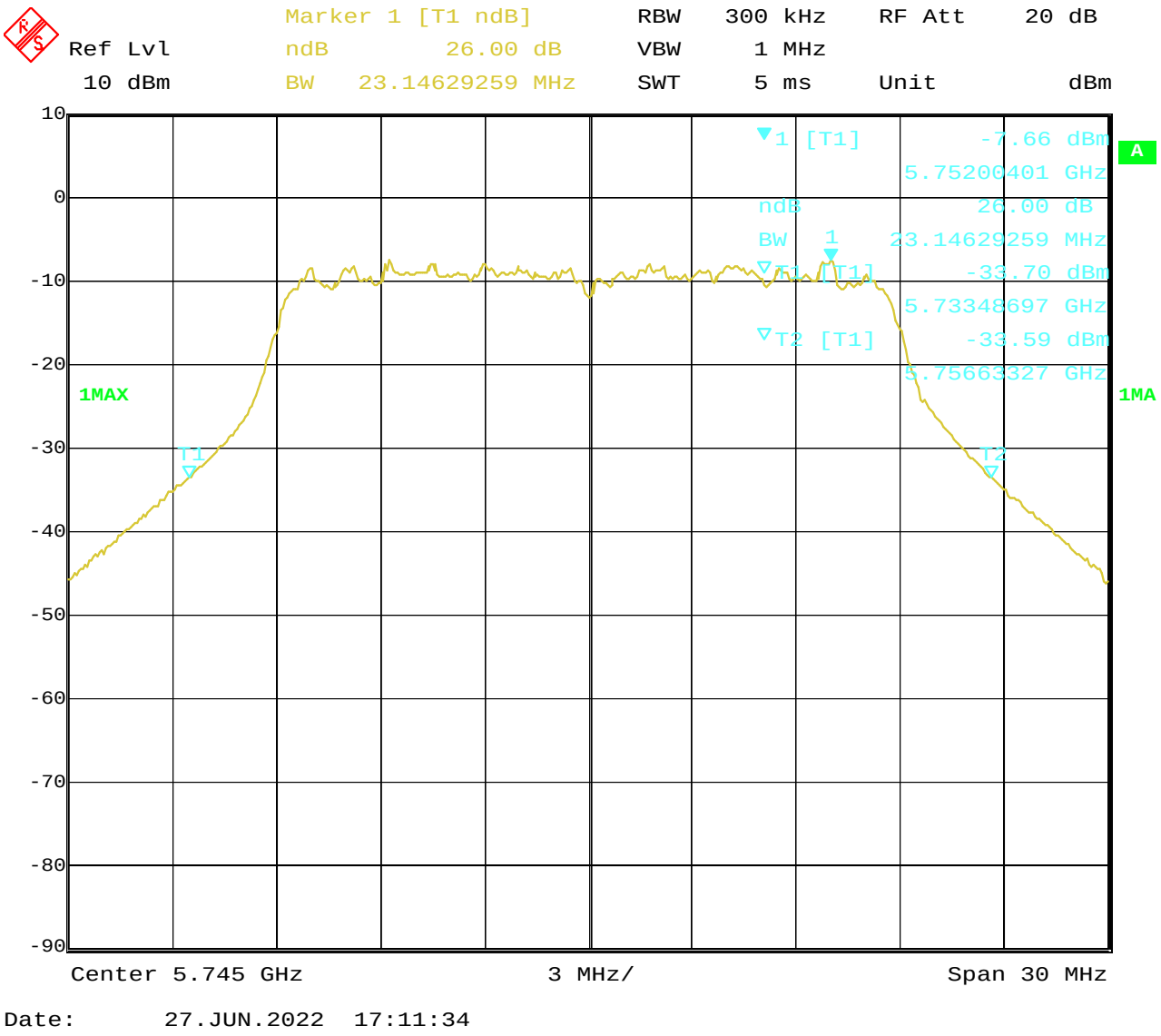
EUT	TQSky Tbox	Model	TBOX
Mode	802.11n HT20	Input Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
149	5745	6	23.15	--	Pass
153	5765	6	23.15	--	Pass
161	5805	6	23.27	--	Pass
6dB Bandwidth					
149	5745	6	17.64	0.5	Pass
153	5765	6	17.56	0.5	Pass
161	5805	6	17.62	0.5	Pass
99% Bandwidth					
149	5745	6	18.04	--	Pass
153	5765	6	18.04	--	Pass
161	5805	6	18.04	--	Pass

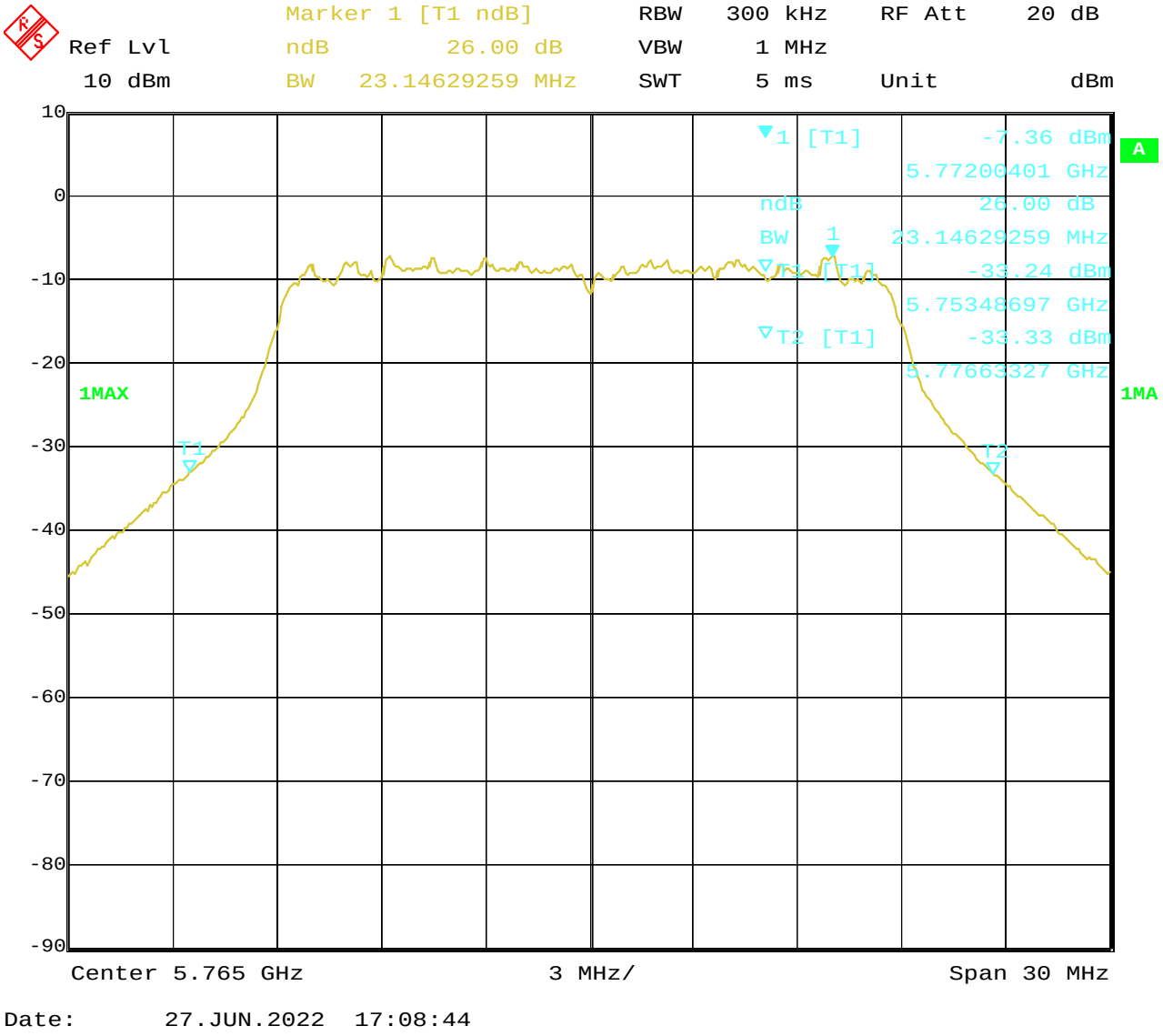
Test Configure

26dB Bandwidth

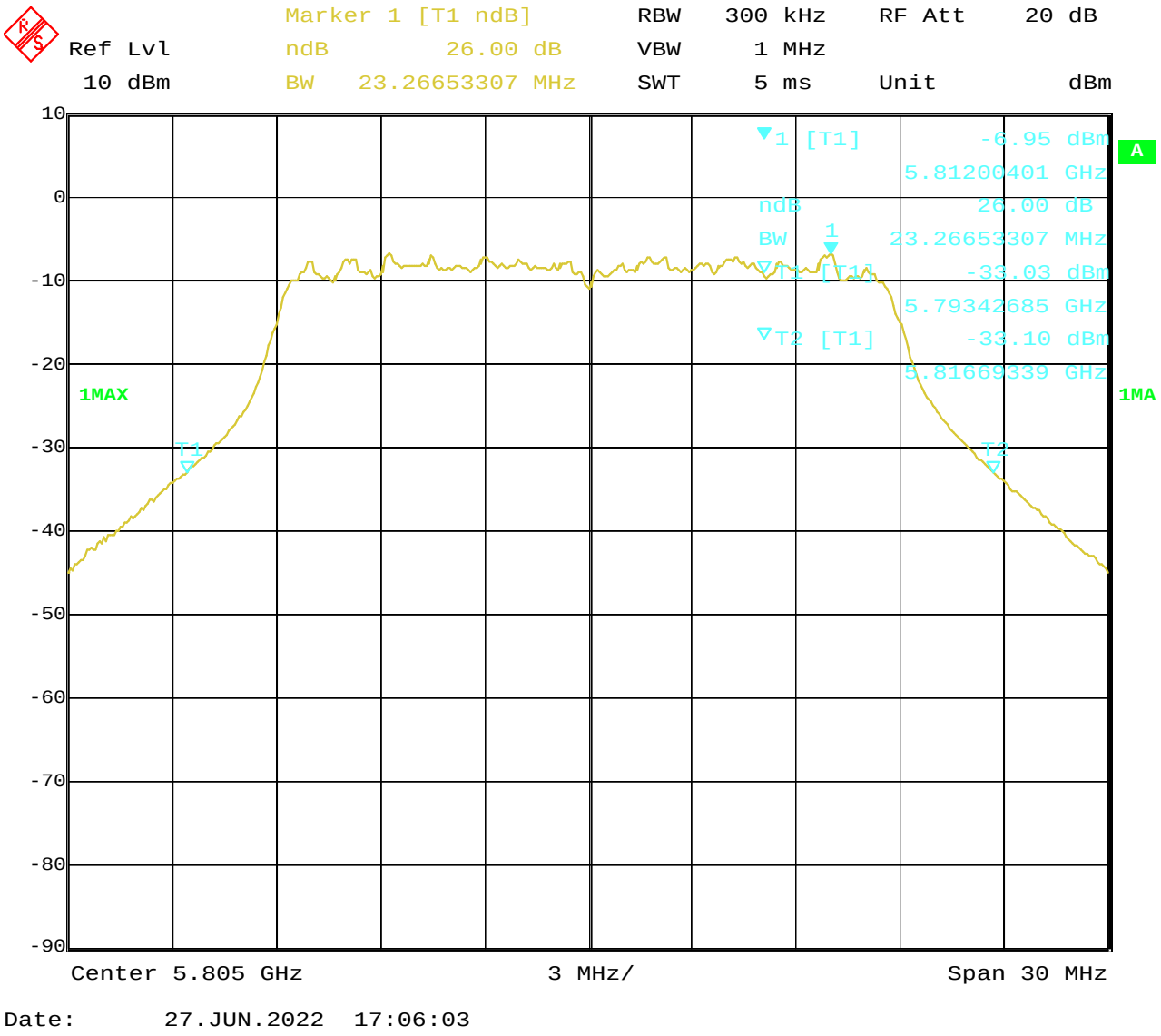
Channel 149



Channel 153



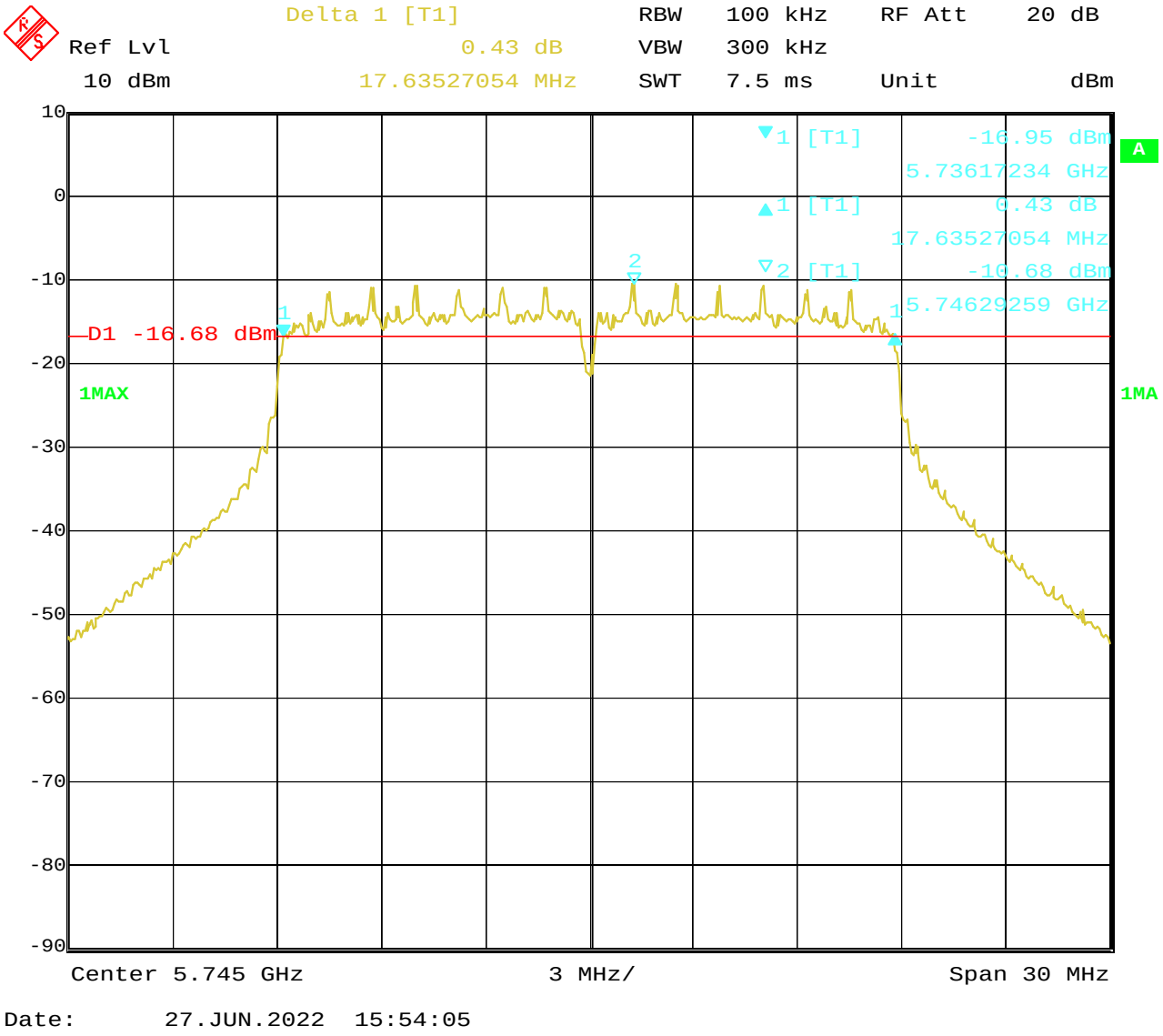
Channel 161



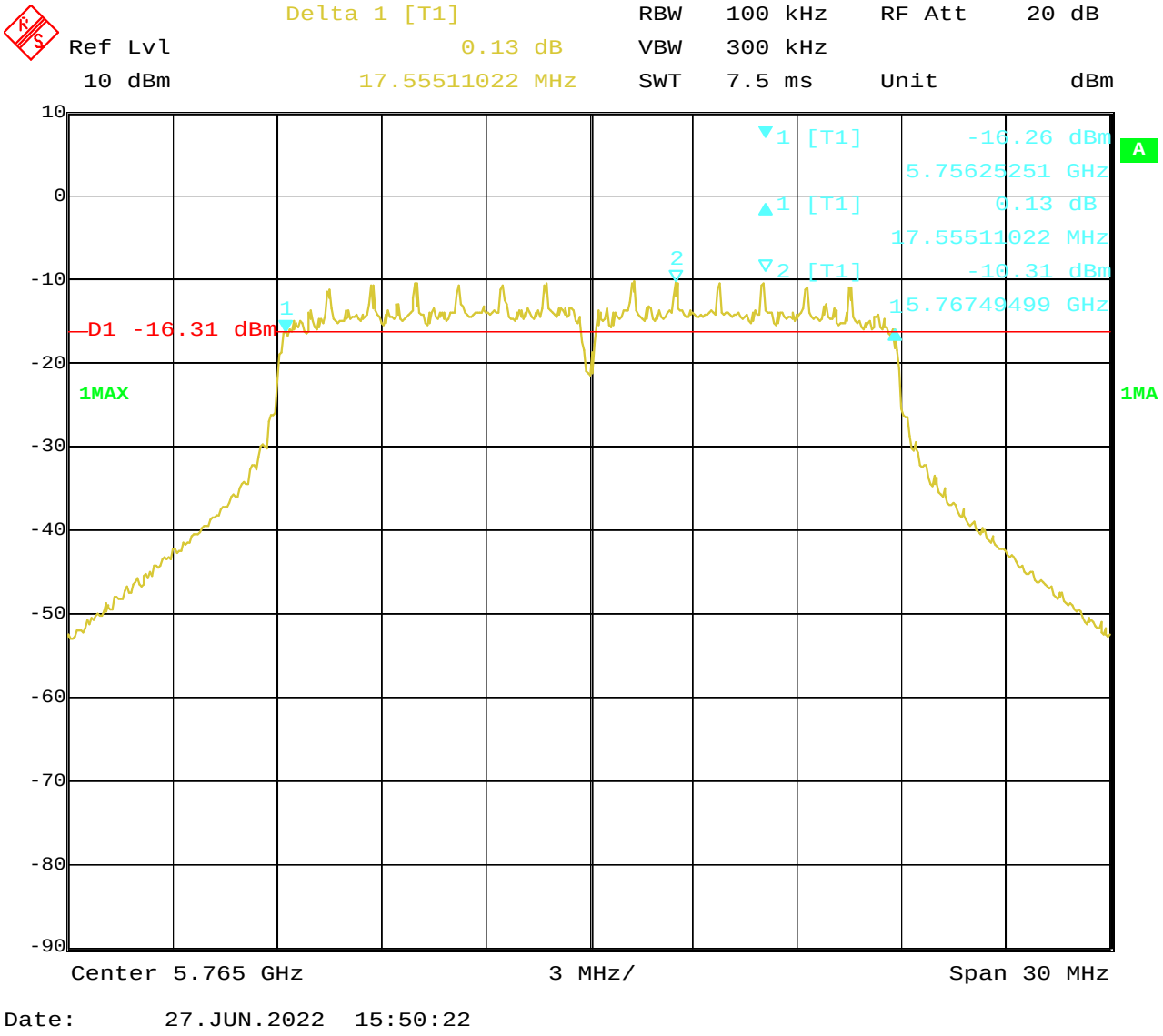
Test Configure

6dB Bandwidth

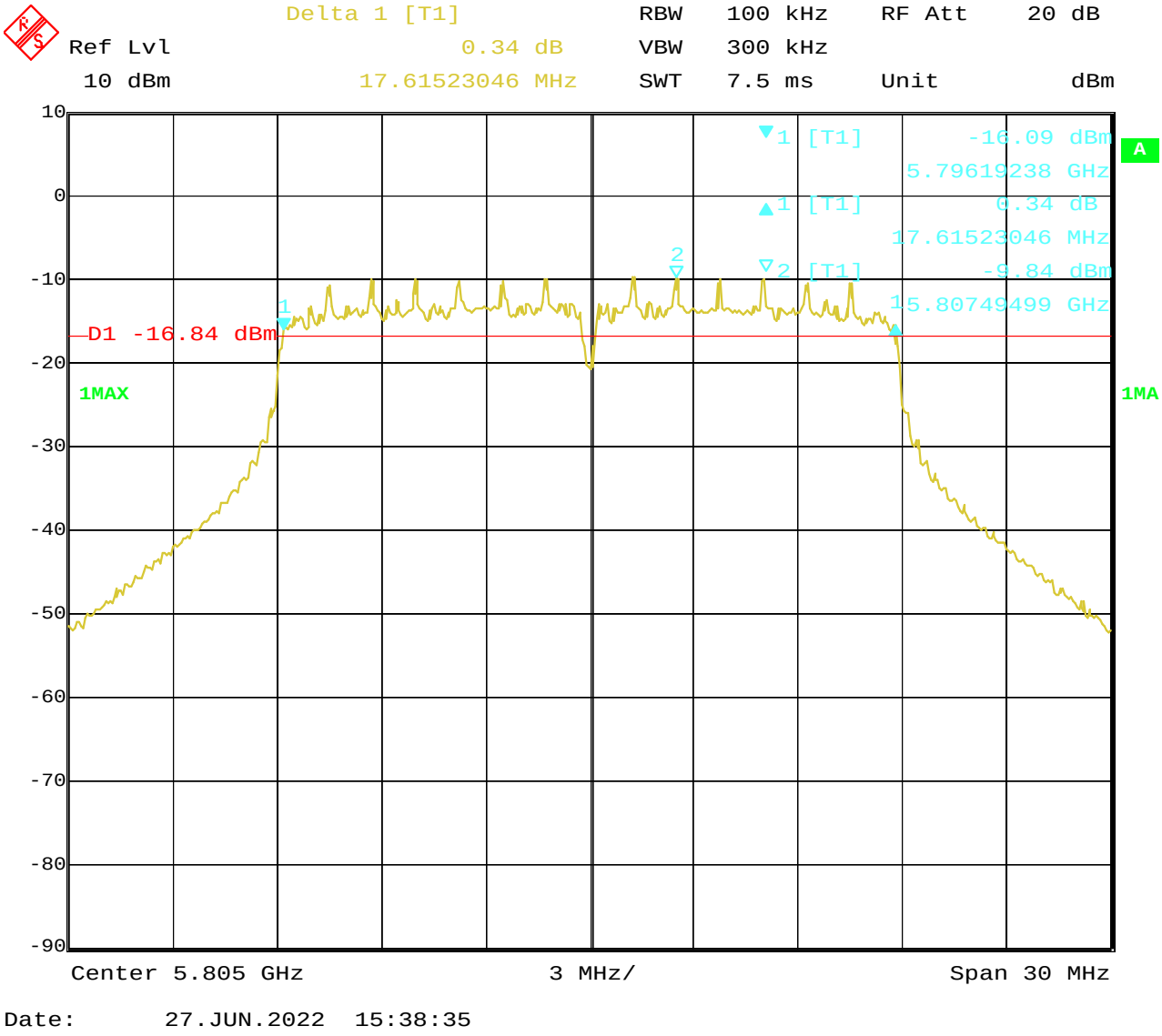
Channel 149



Channel 153



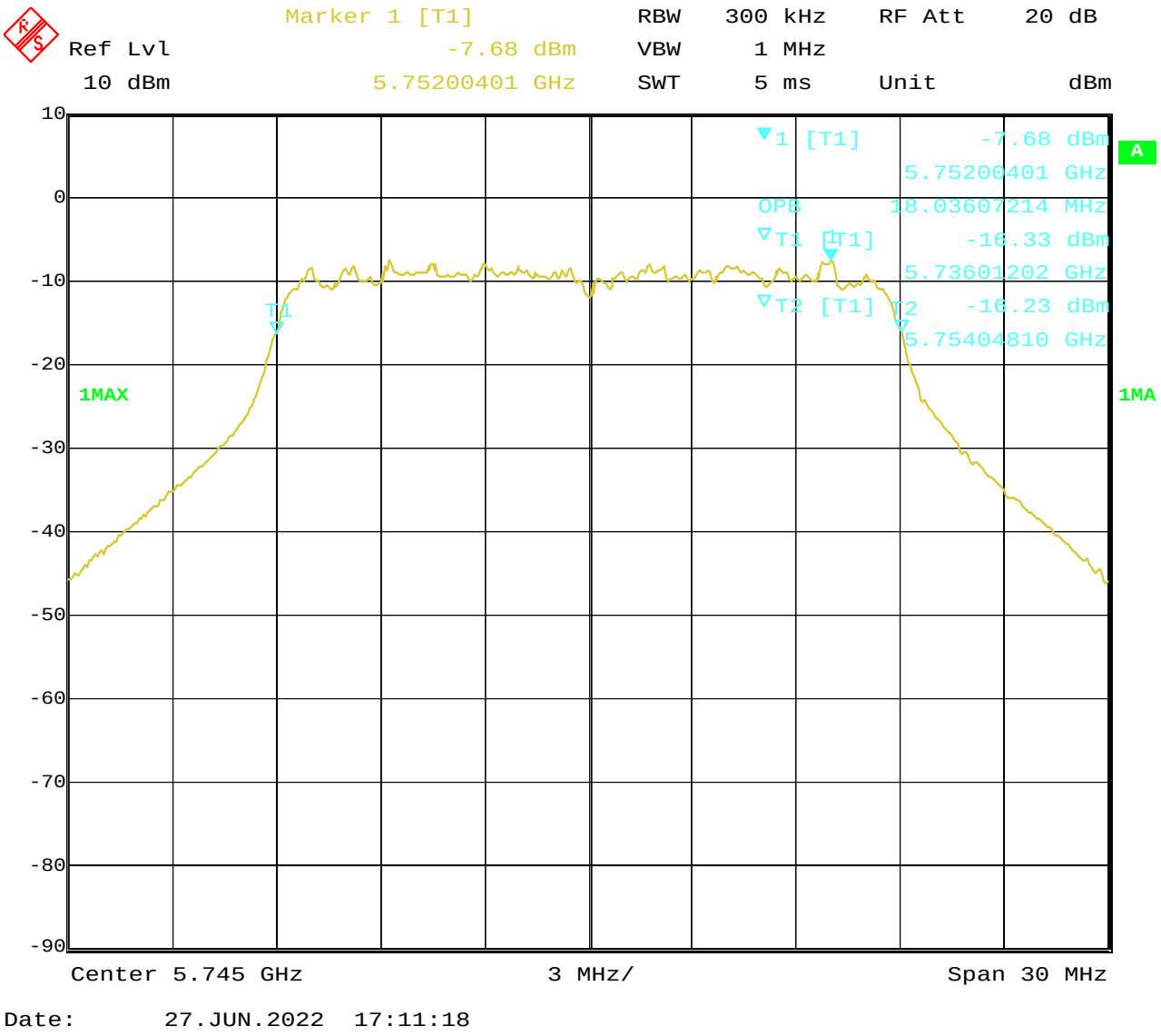
Channel 161



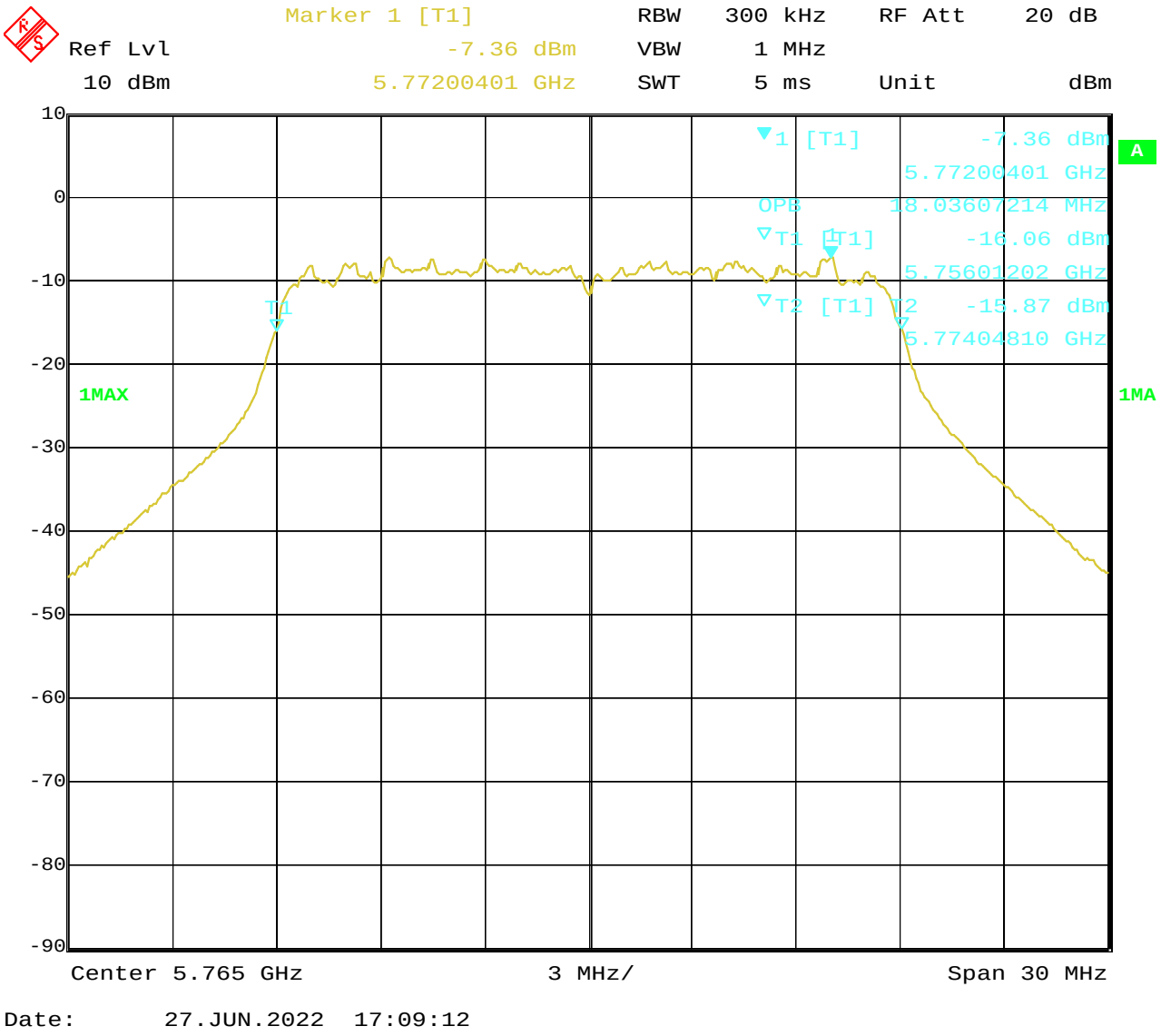
Test Configure

99% Bandwidth

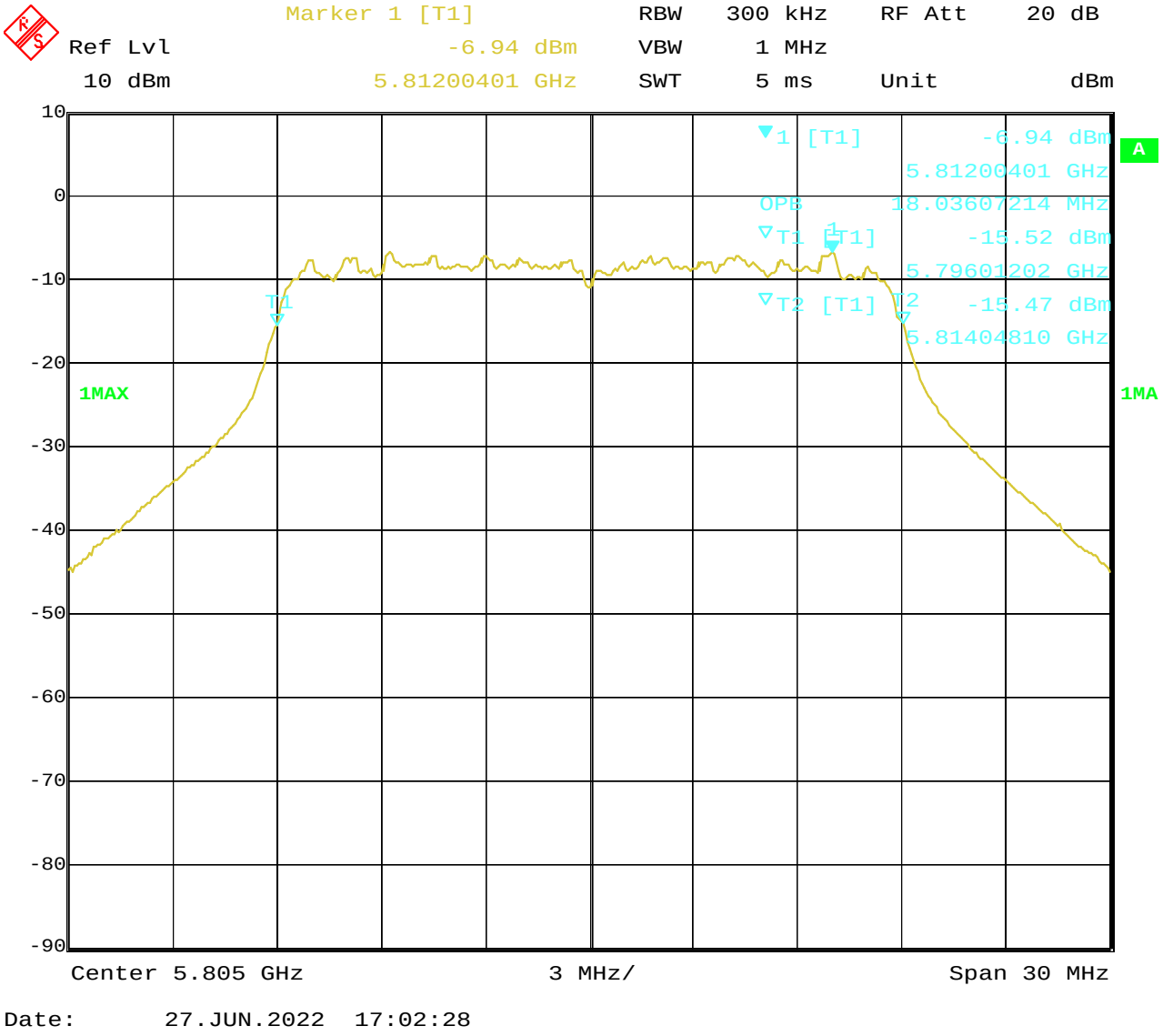
Channel 149



Channel 153



Channel 161



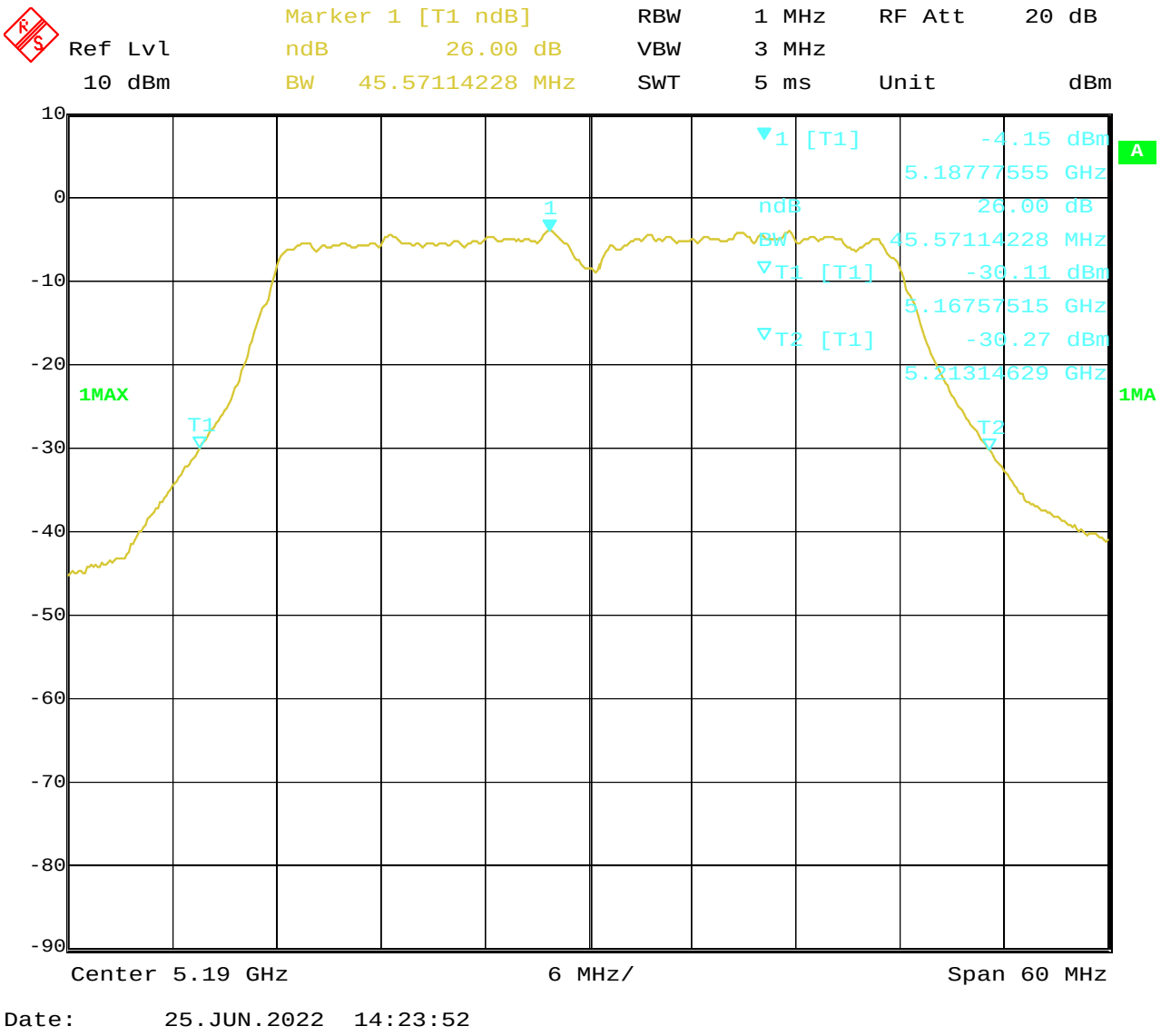
EUT	TQSky Tbox	Model	TBOX
Mode	802.11n HT40	Input Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
38	5190	mcs0	45.57	--	Pass
46	5230	mcs0	45.57	--	Pass
99% Bandwidth					
38	5190	mcs0	37.15	--	Pass
46	5230	mcs0	37.27	--	Pass

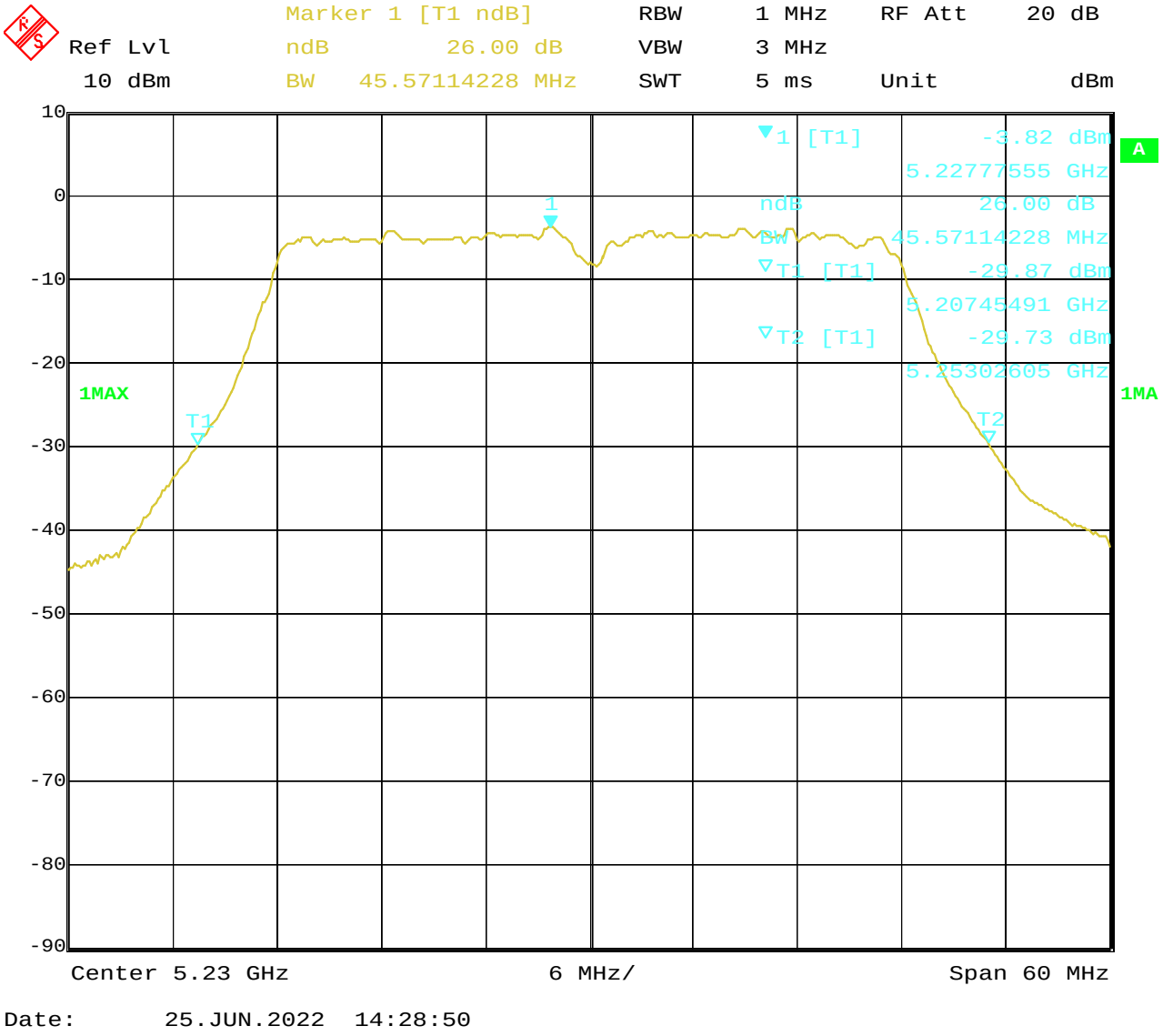
Test Configure

26dB Bandwidth

Channel 38



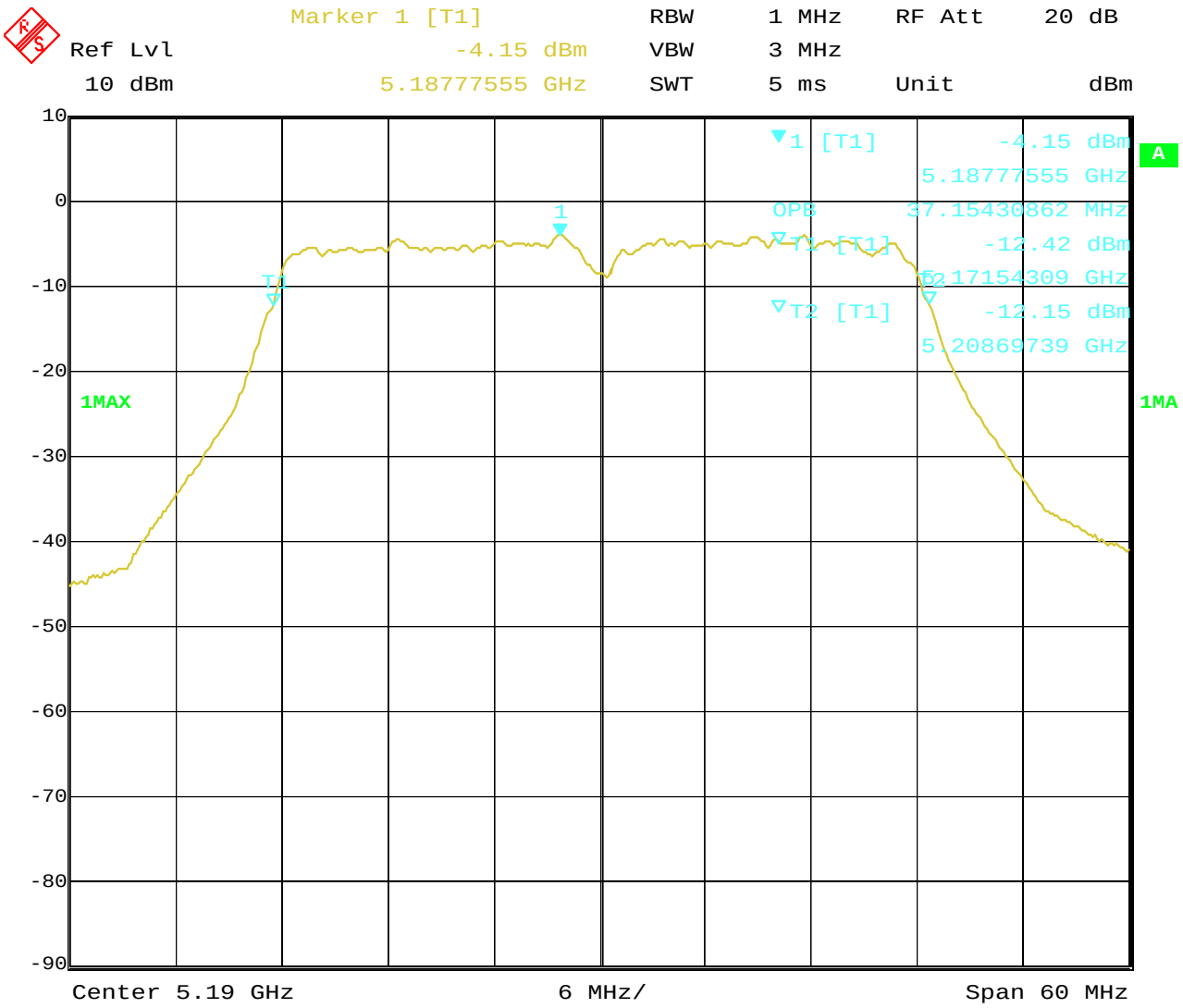
Channel 46



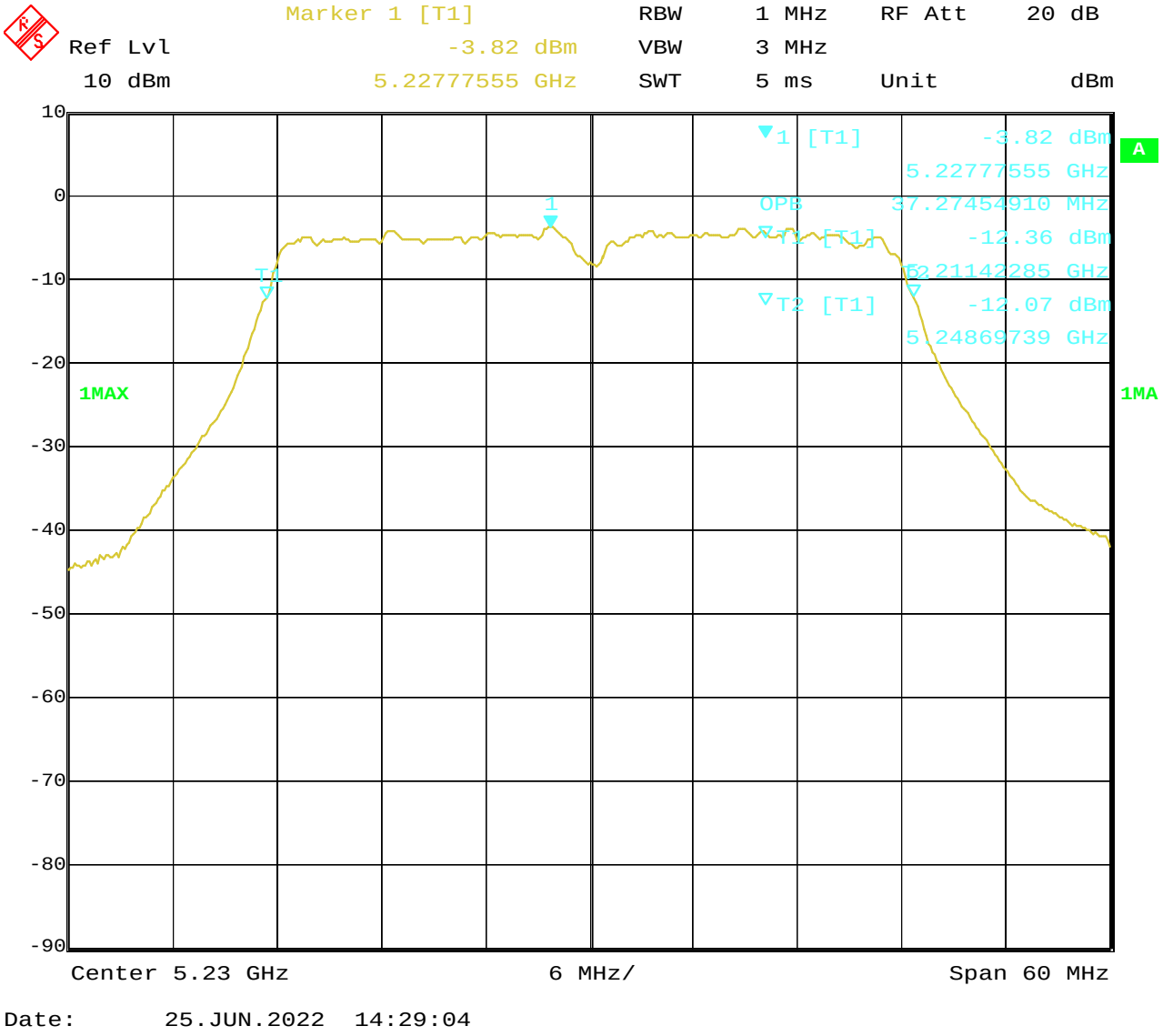
Test Configure

99% Bandwidth

Channel 38



Channel 46



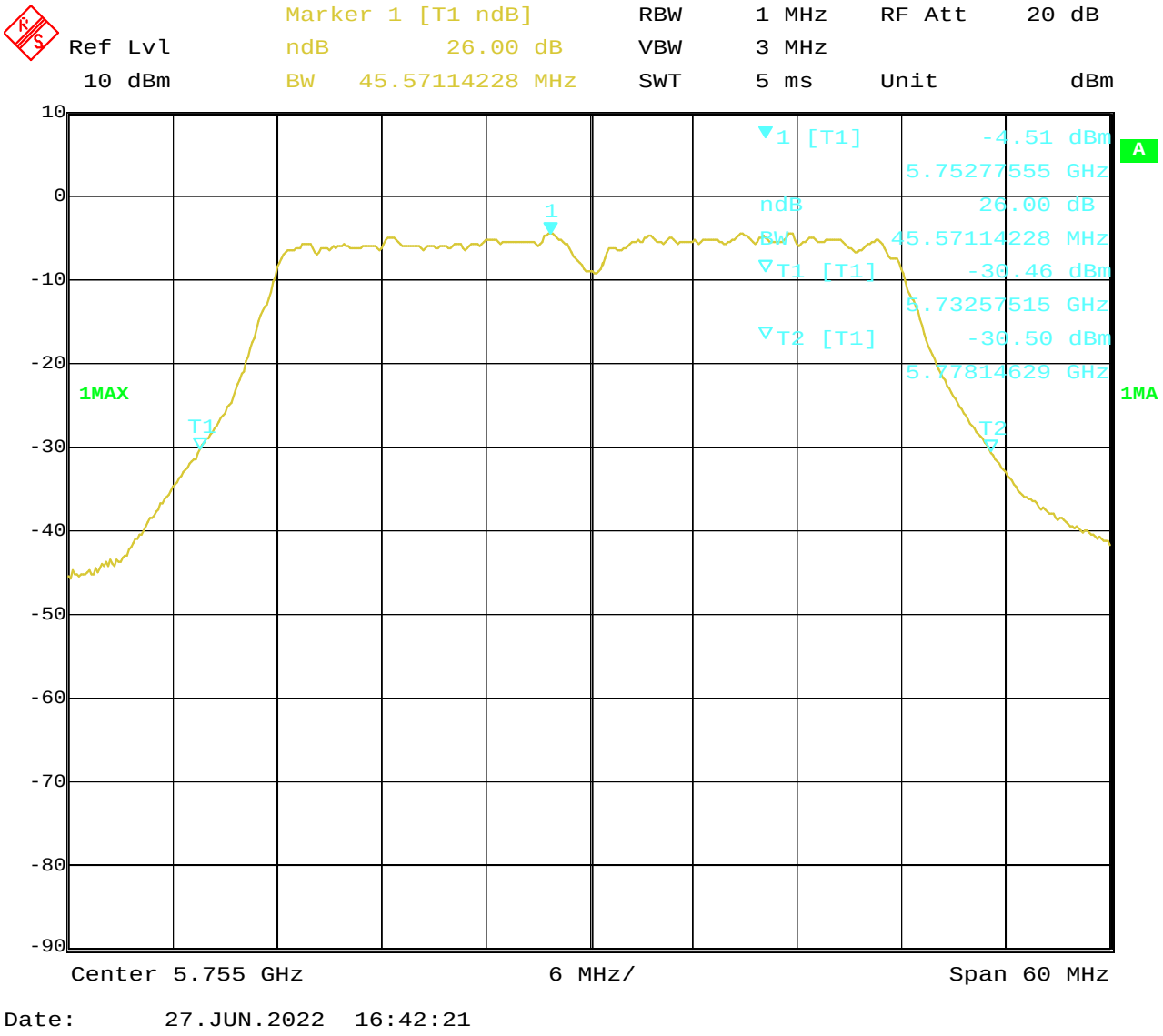
EUT	TQSky Tbox	Model	TBOX
Mode	802.11n HT40	Input Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
151	5755	mcs0	45.57	--	Pass
159	5795	mcs0	45.45	--	Pass
6dB Bandwidth					
151	5755	mcs0	36.31	0.5	Pass
159	5795	mcs0	36.26	0.5	Pass
99% Bandwidth					
151	5755	mcs0	37.15	--	Pass
159	5795	mcs0	37.15	--	Pass

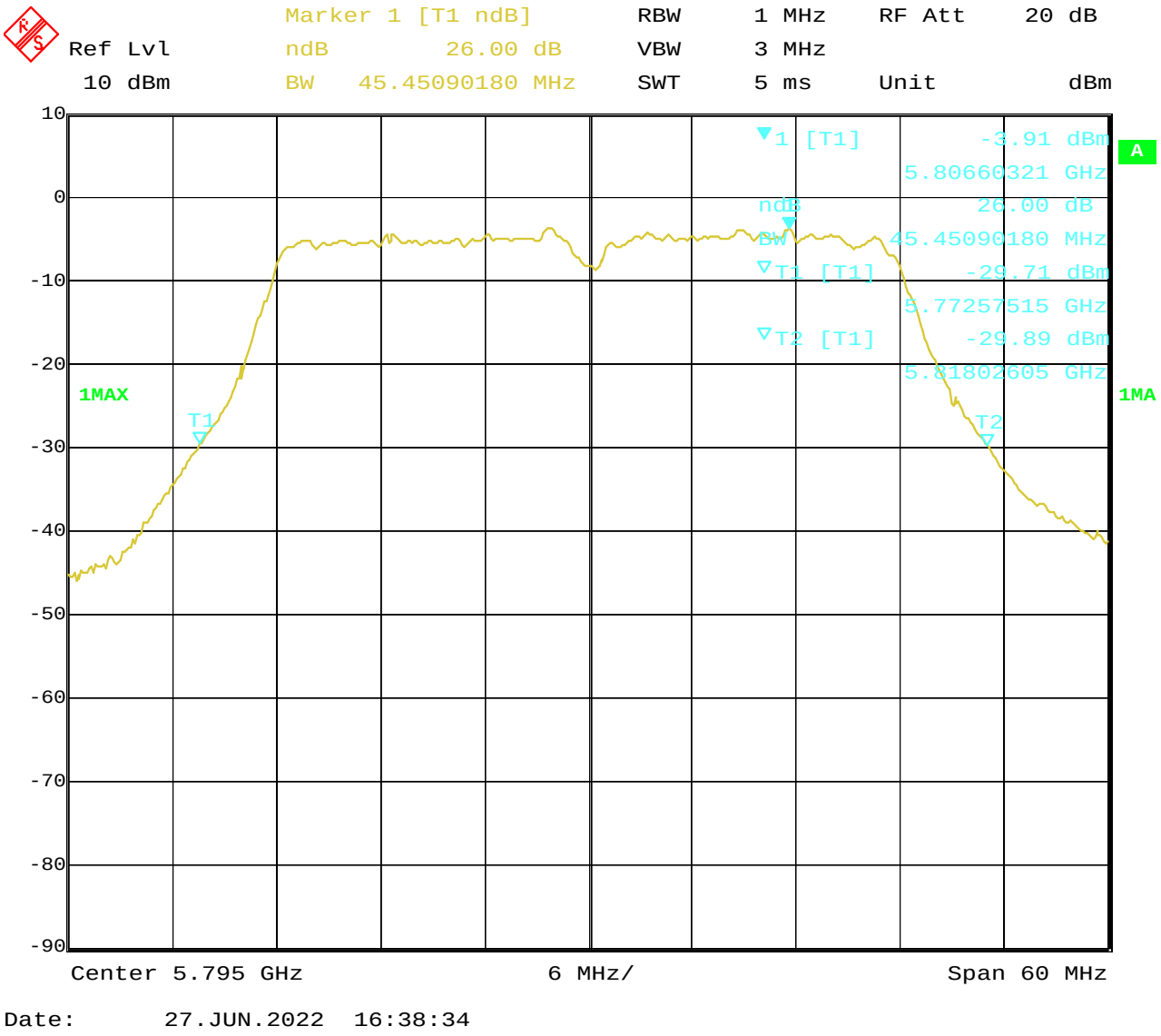
Test Configure

26dB Bandwidth

Channel 151



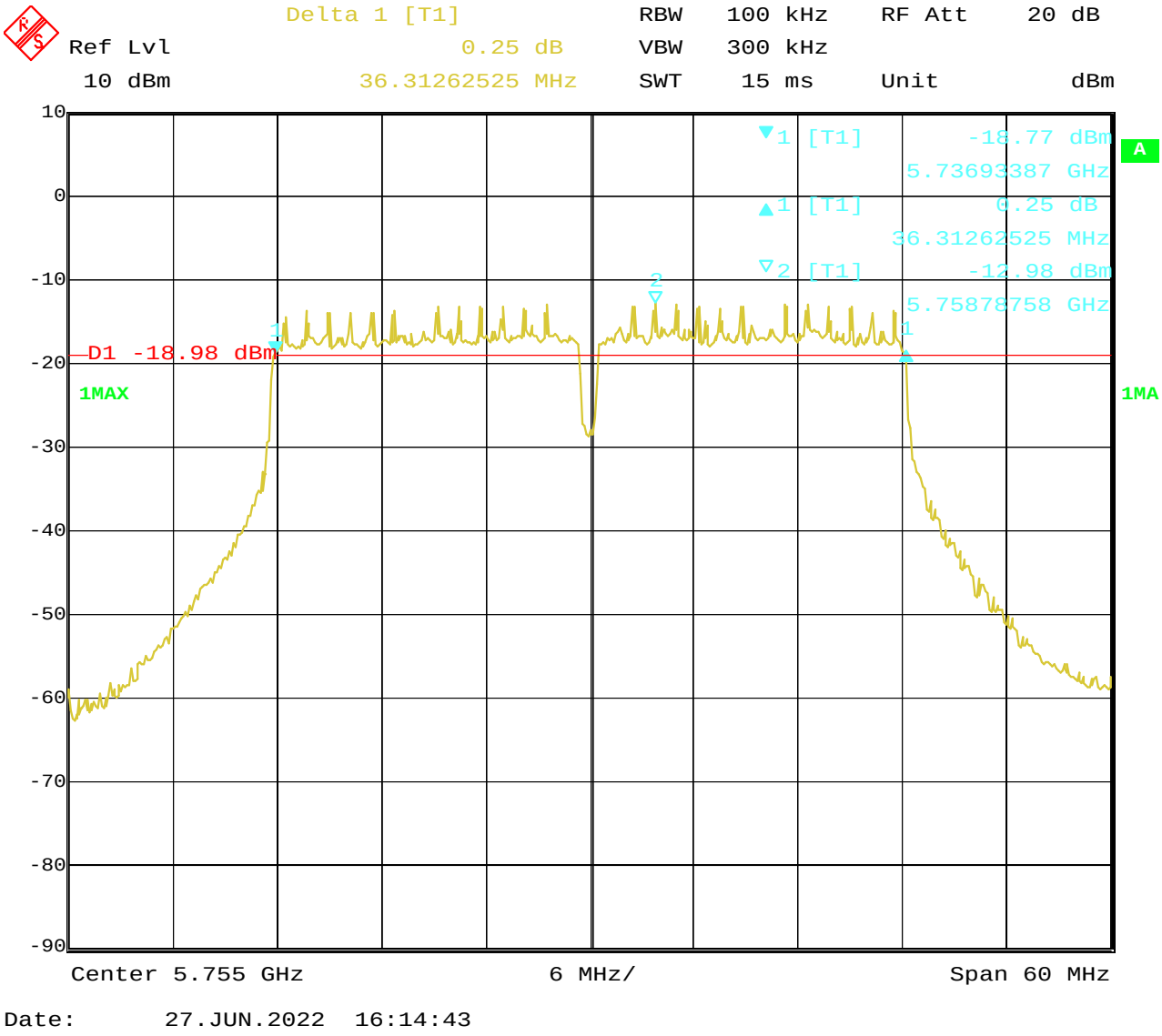
Channel 159



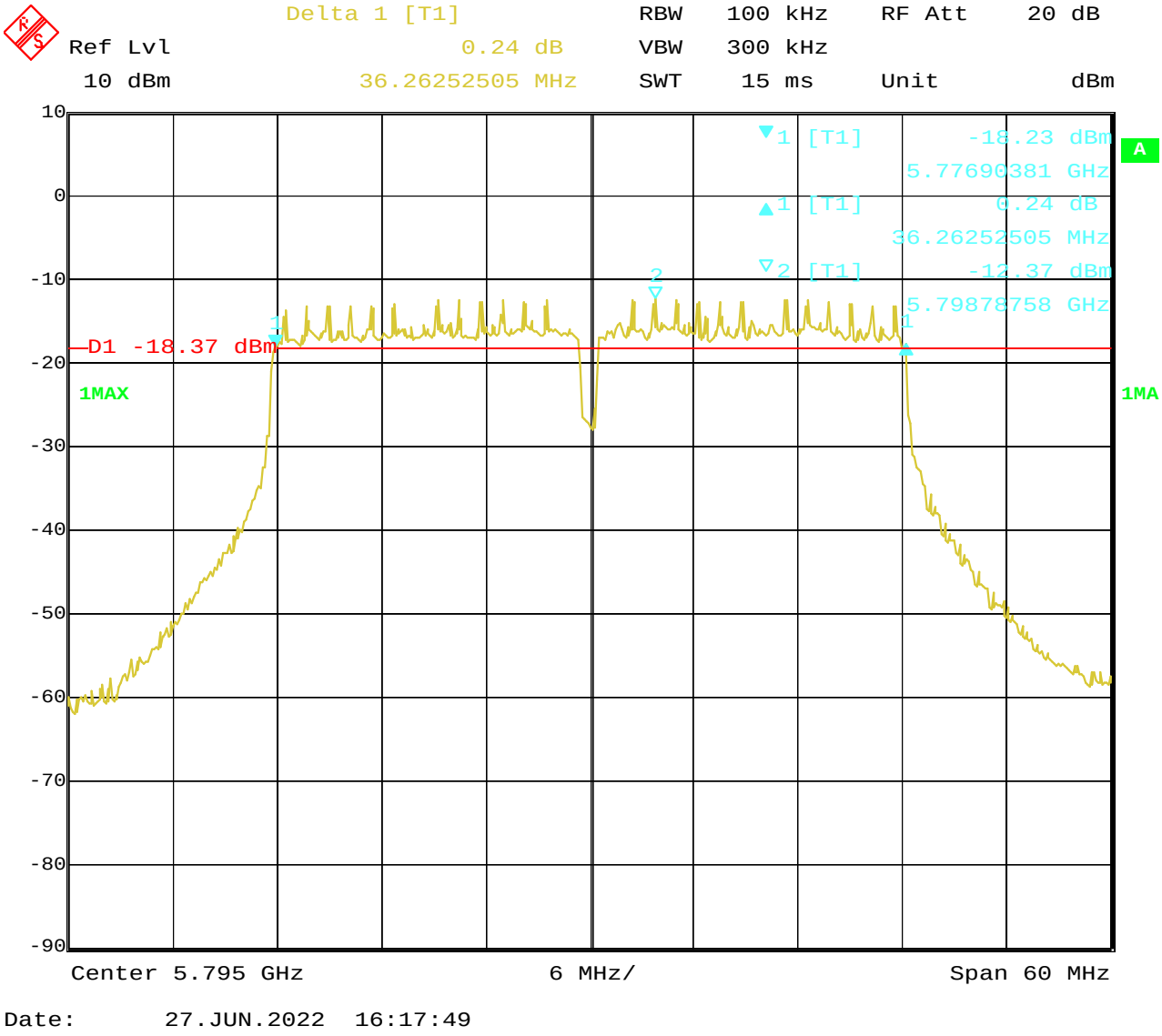
Test Configure

6dB Bandwidth

Channel 151



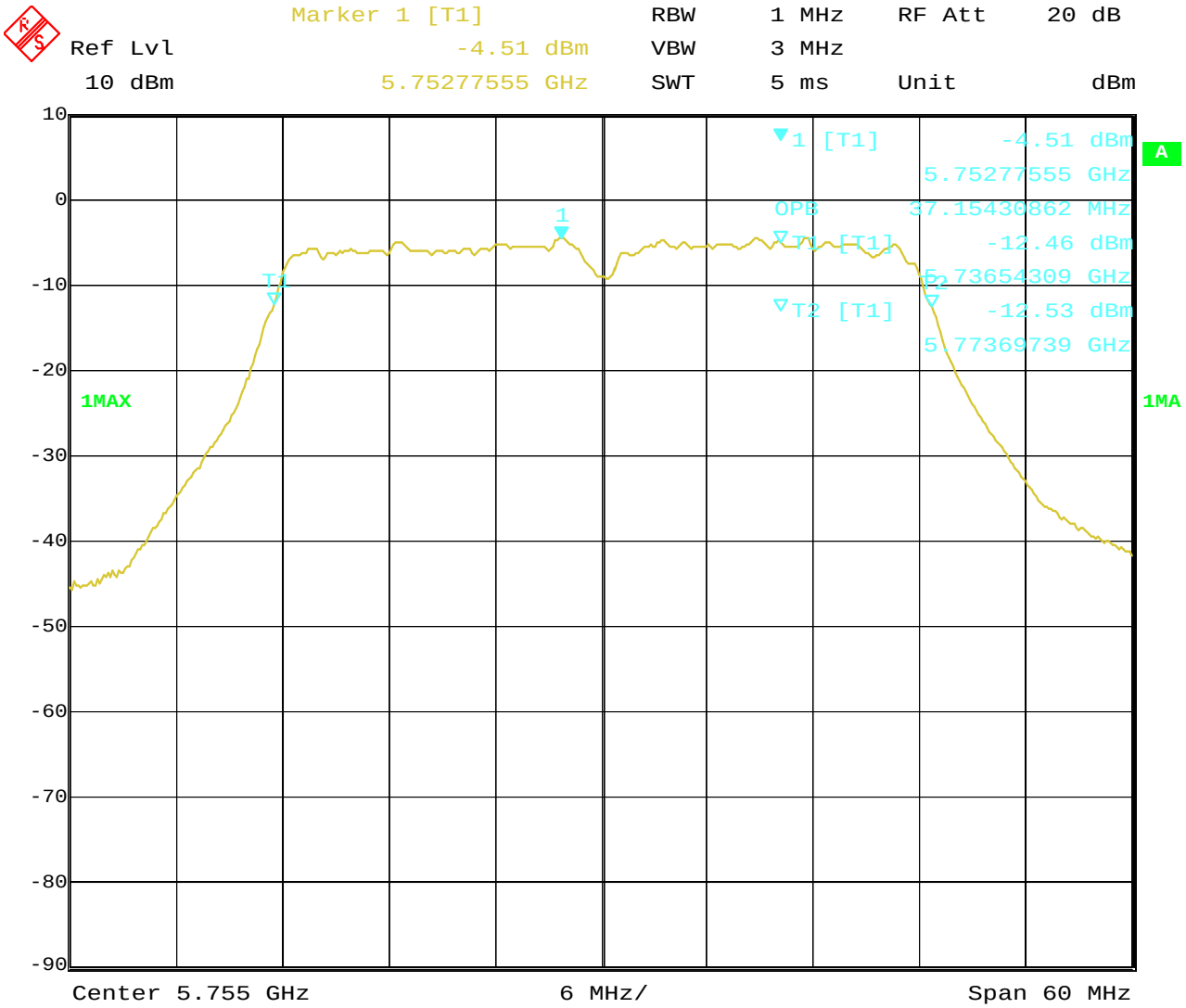
Channel 159



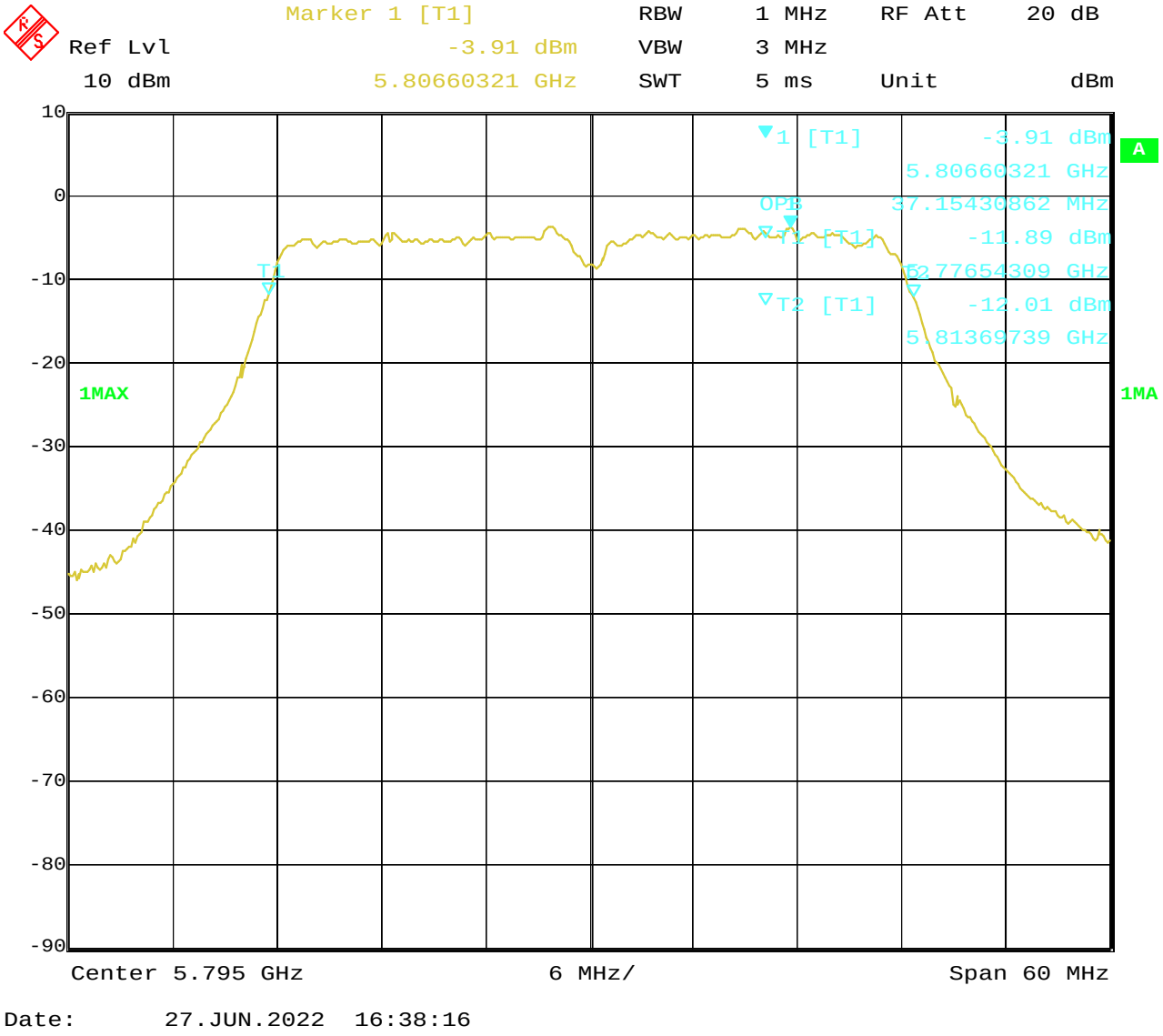
Test Configure

99% Bandwidth

Channel 151



Channel 159



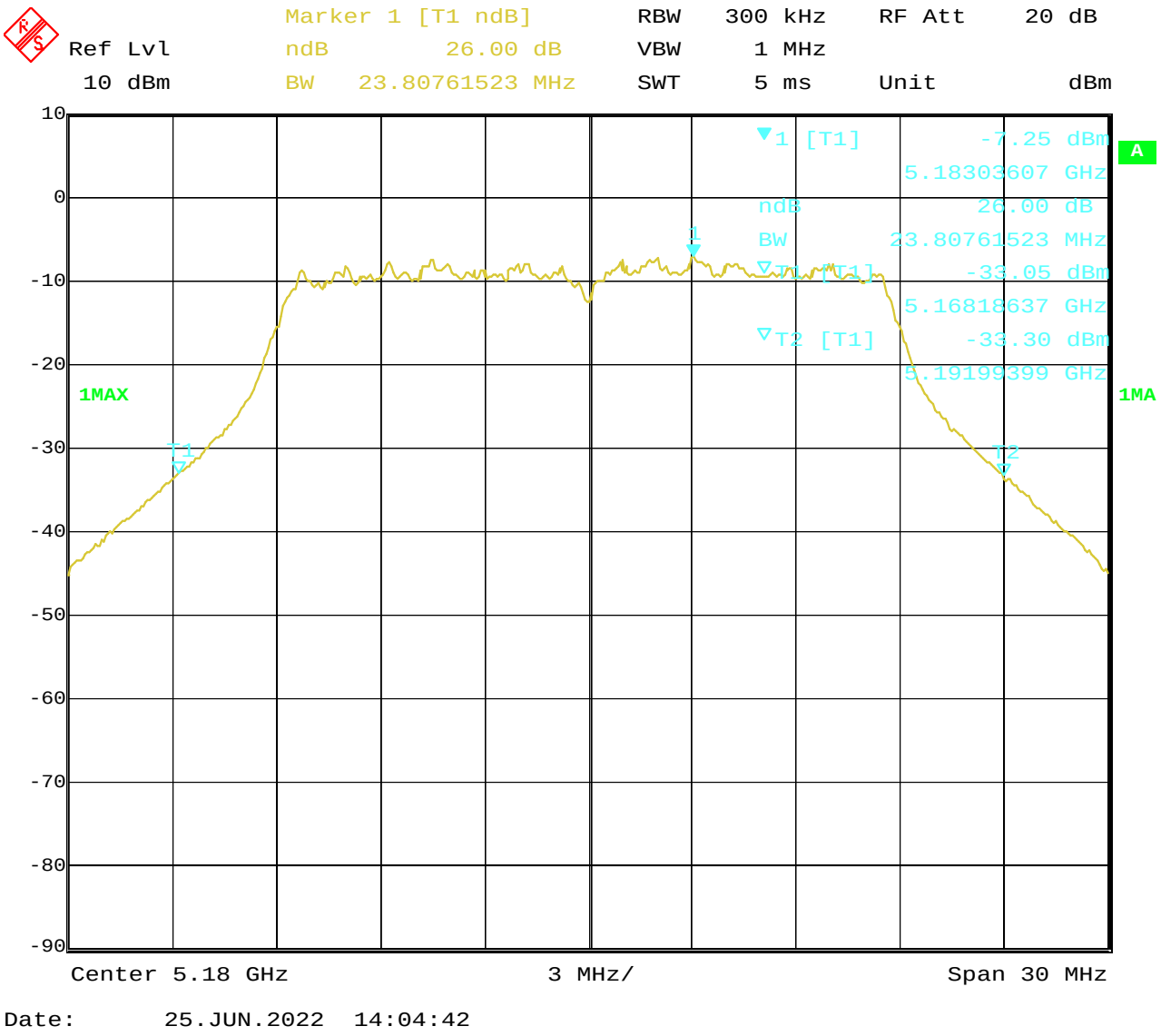
EUT	TQSky Tbox	Model	TBOX
Mode	802.11ac VHT20	Input Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
36	5180	mcs0	23.81	--	Pass
40	5200	mcs0	23.87	--	Pass
48	5240	mcs0	23.81	--	Pass
99% Bandwidth					
36	5180	mcs0	18.16	--	Pass
40	5200	mcs0	18.22	--	Pass
48	5240	mcs0	18.22	--	Pass

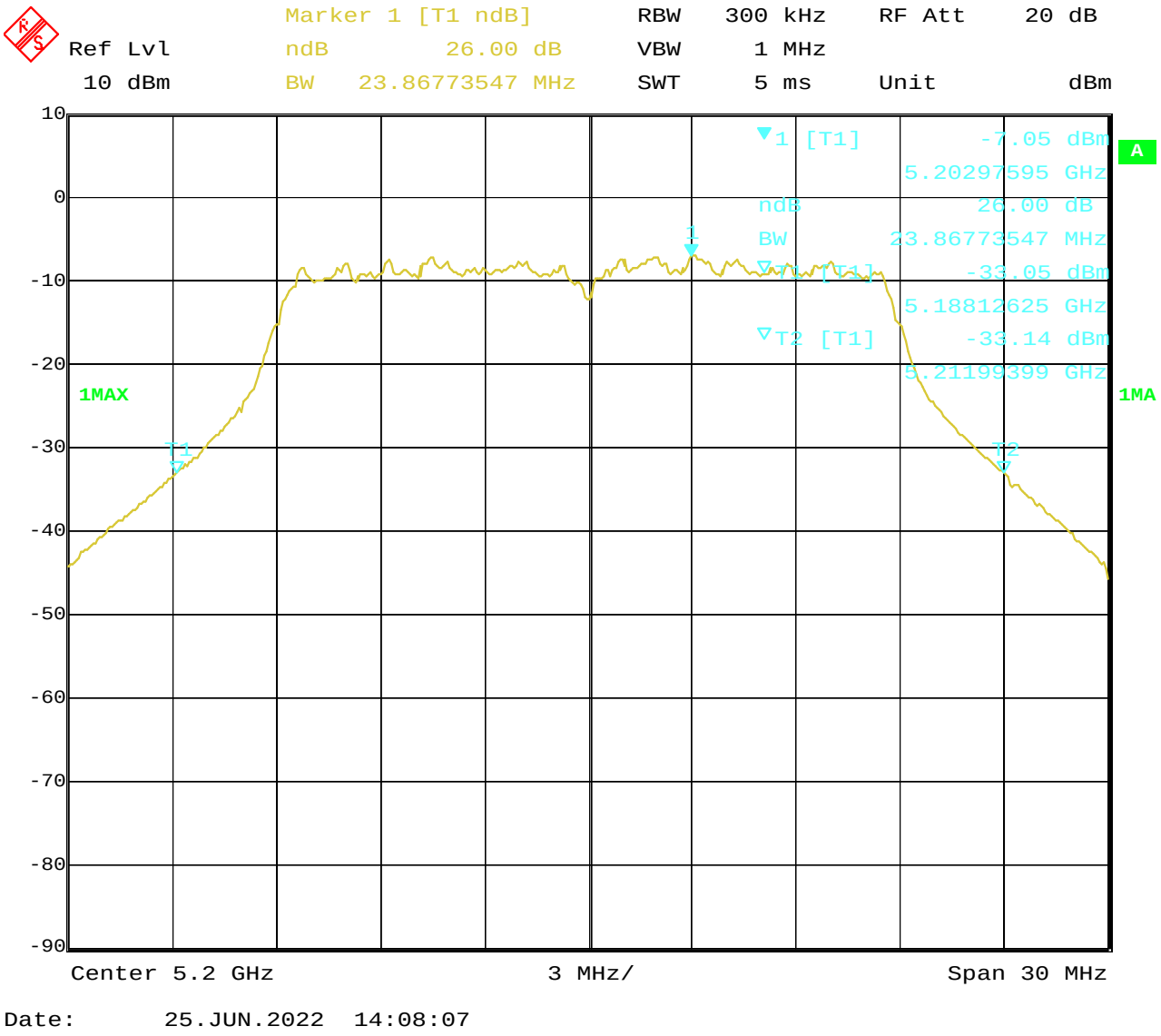
Test Configure

26dB Bandwidth

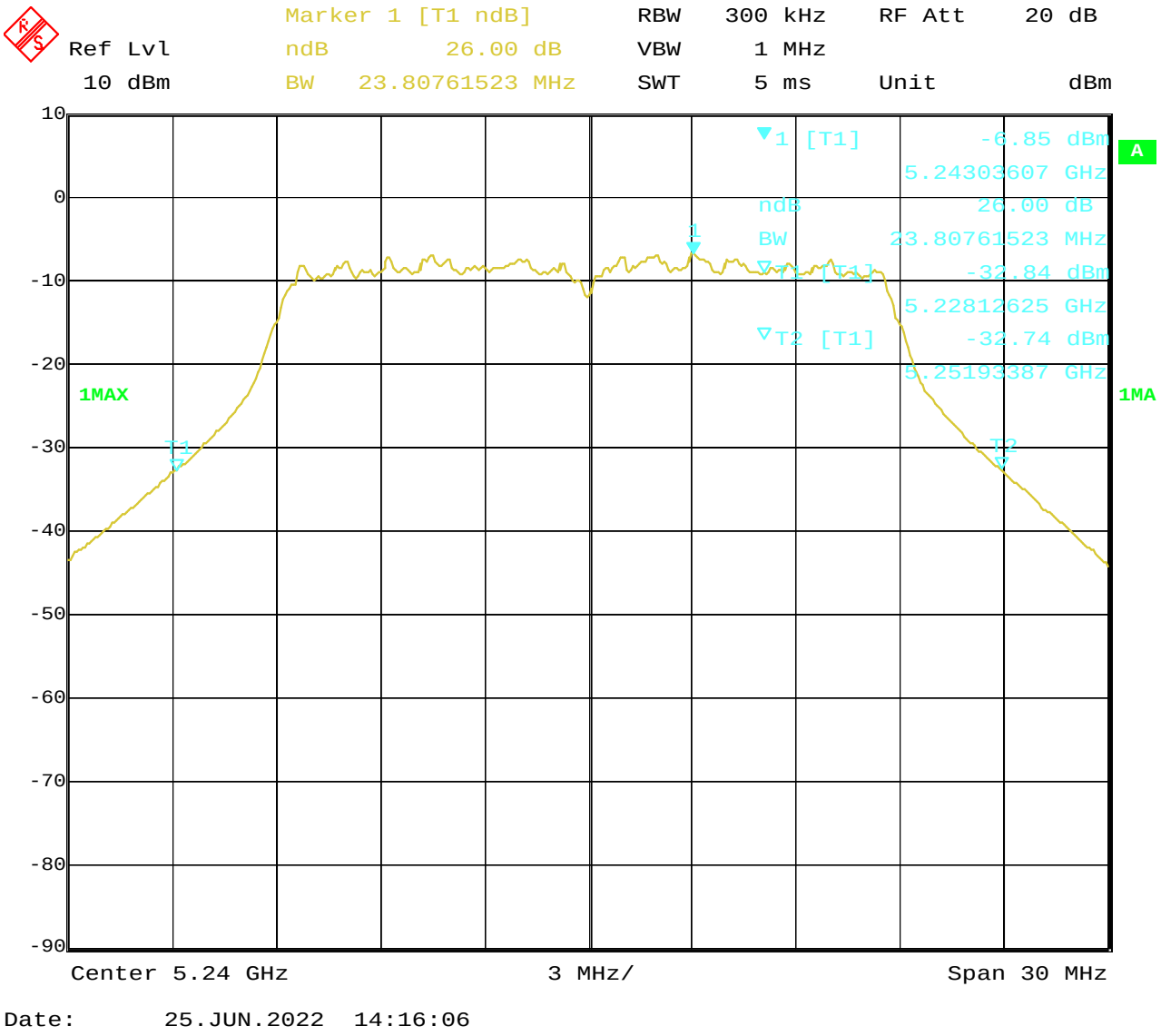
Channel 36



Channel 40



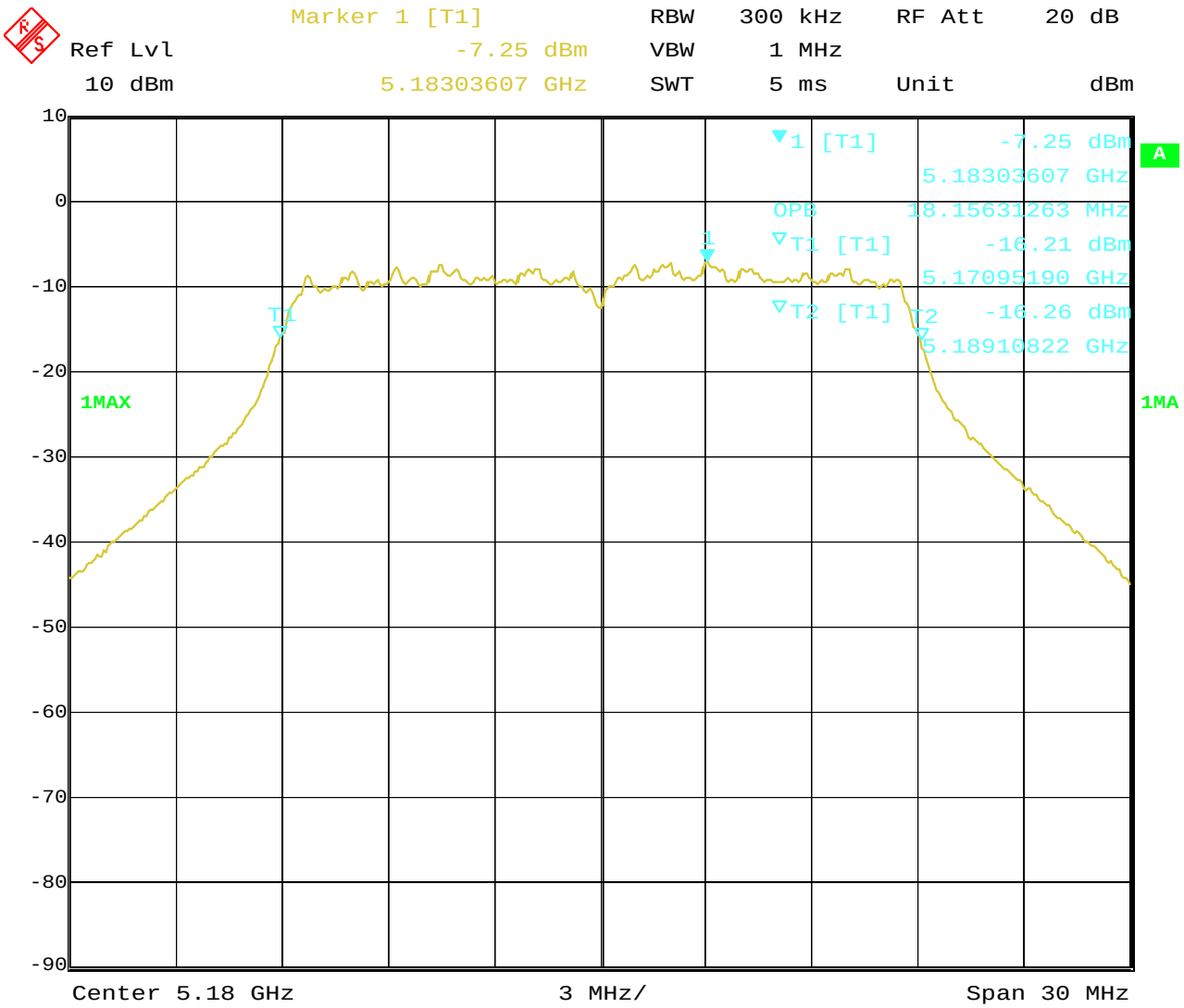
Channel 48



Test Configure

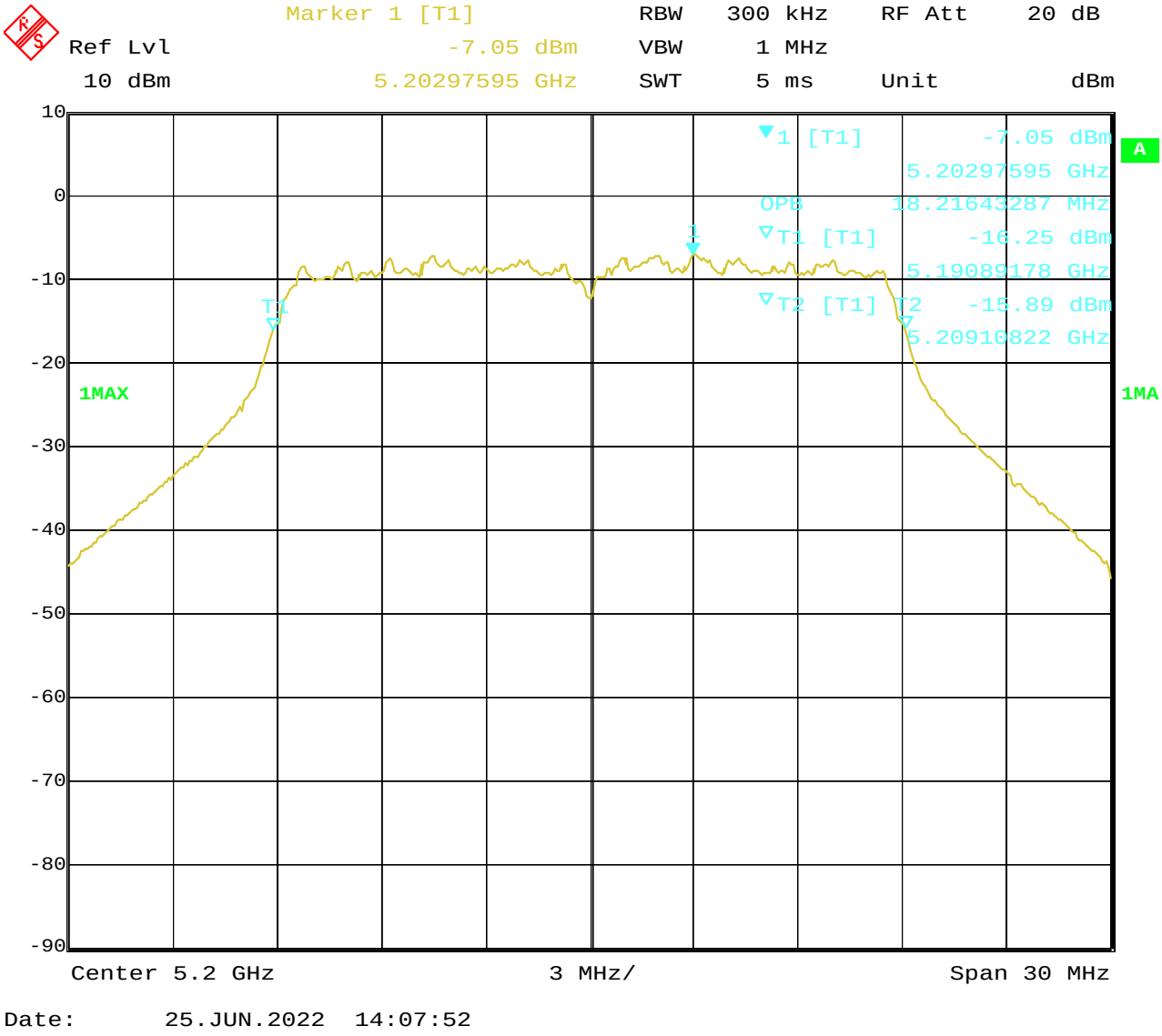
99% Bandwidth

Channel 36

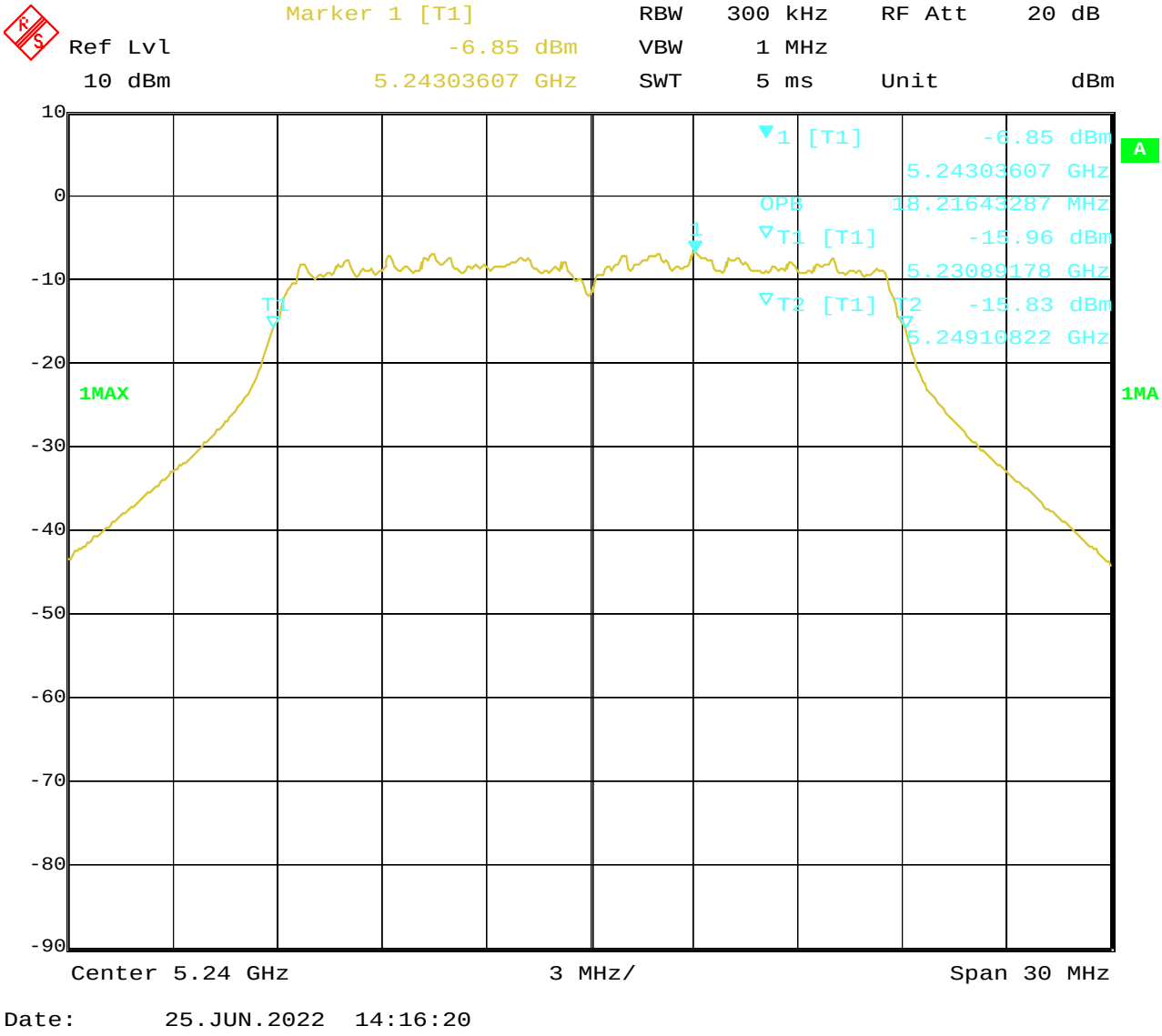


Date: 25.JUN.2022 14:04:56

Channel 40



Channel 48



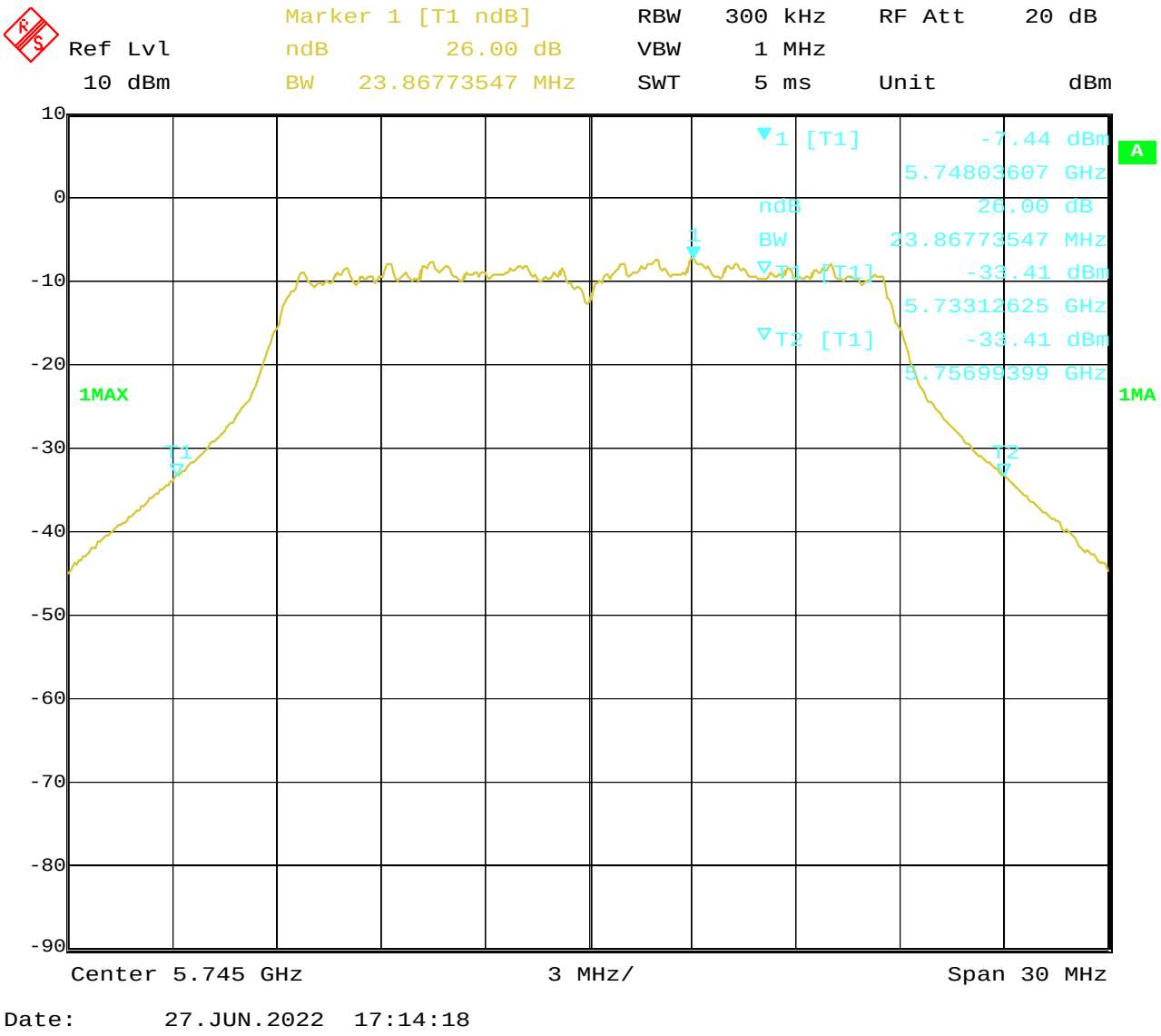
EUT	TQSky Tbox	Model	TBOX
Mode	802.11ac VHT20	Input Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
149	5745	6	23.87	--	Pass
153	5765	6	23.81	--	Pass
161	5805	6	23.81	--	Pass
6dB Bandwidth					
149	5745	6	17.64	0.5	Pass
153	5765	6	17.64	0.5	Pass
161	5805	6	17.56	0.5	Pass
99% Bandwidth					
149	5745	6	18.22	--	Pass
153	5765	6	18.16	--	Pass
161	5805	6	18.22	--	Pass

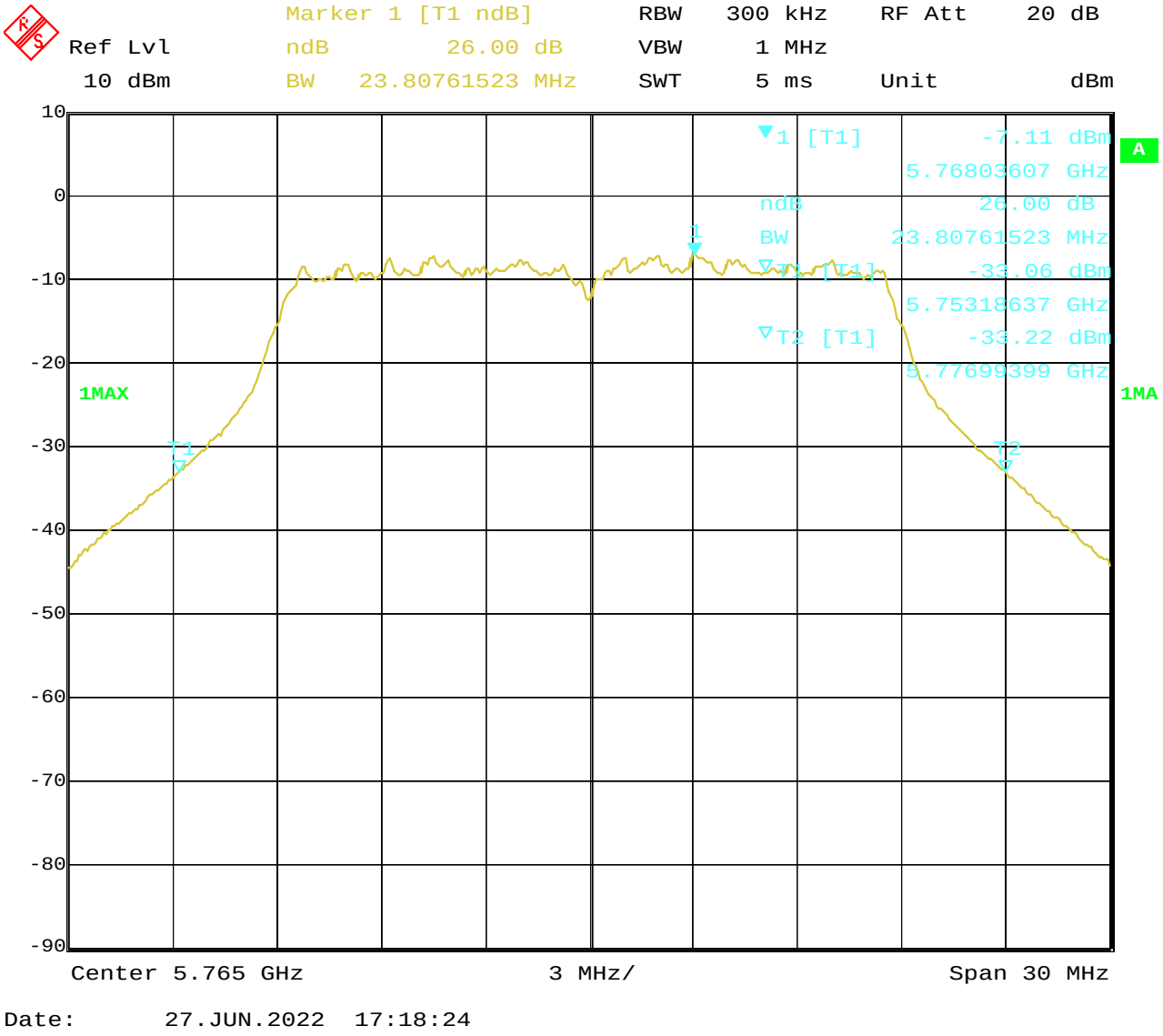
Test Configure

26dB Bandwidth

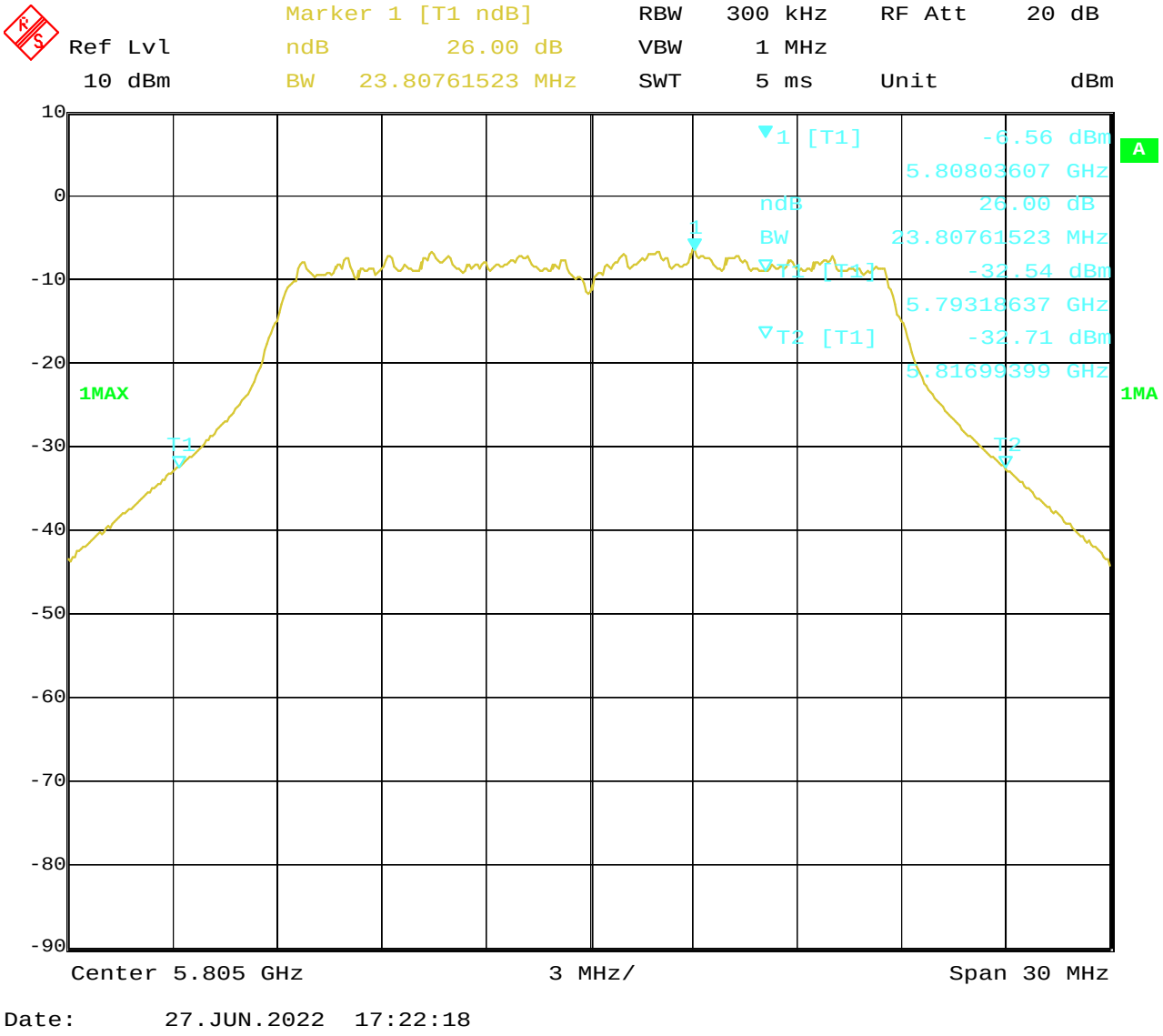
Channel 149



Channel 153



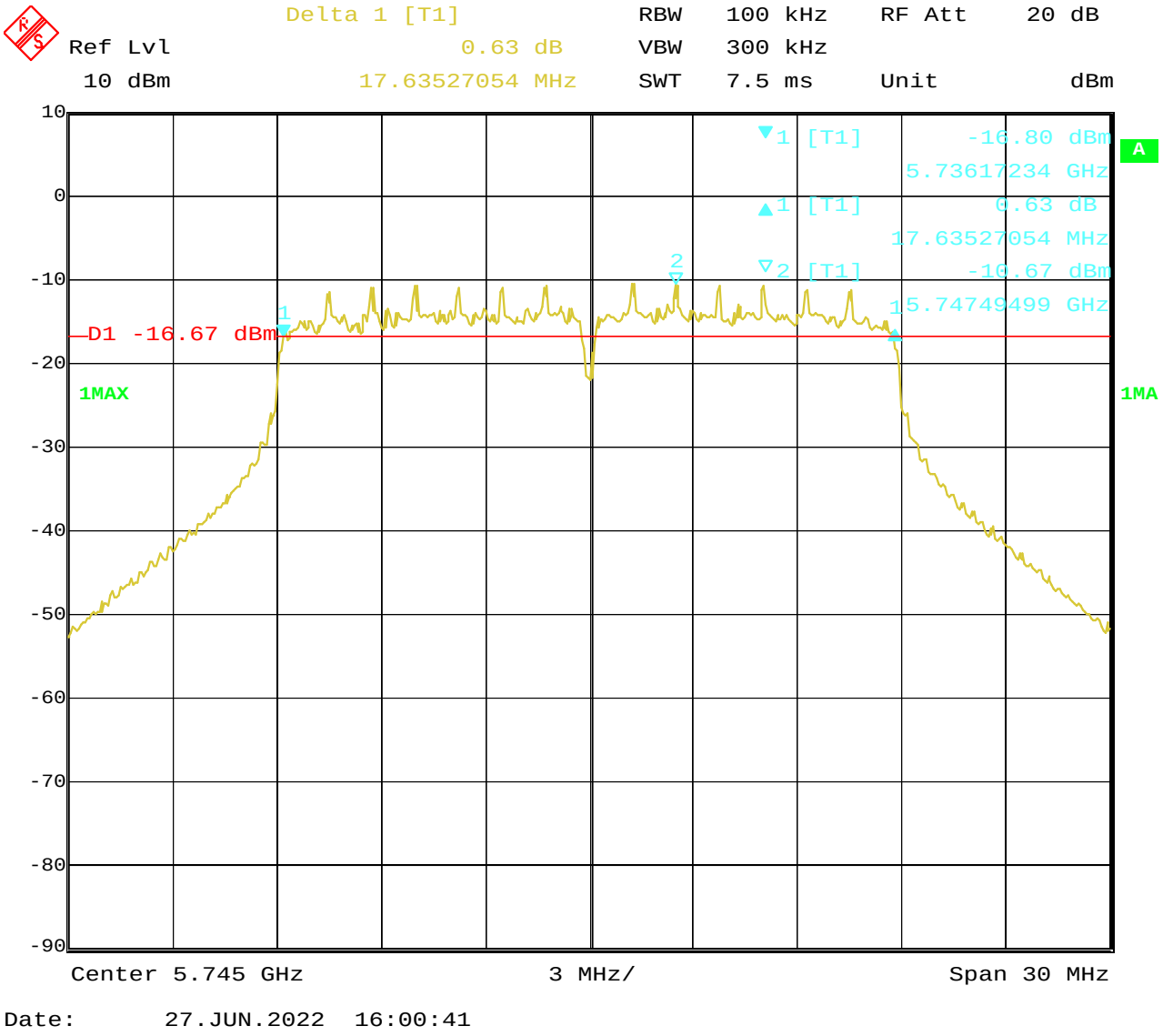
Channel 161



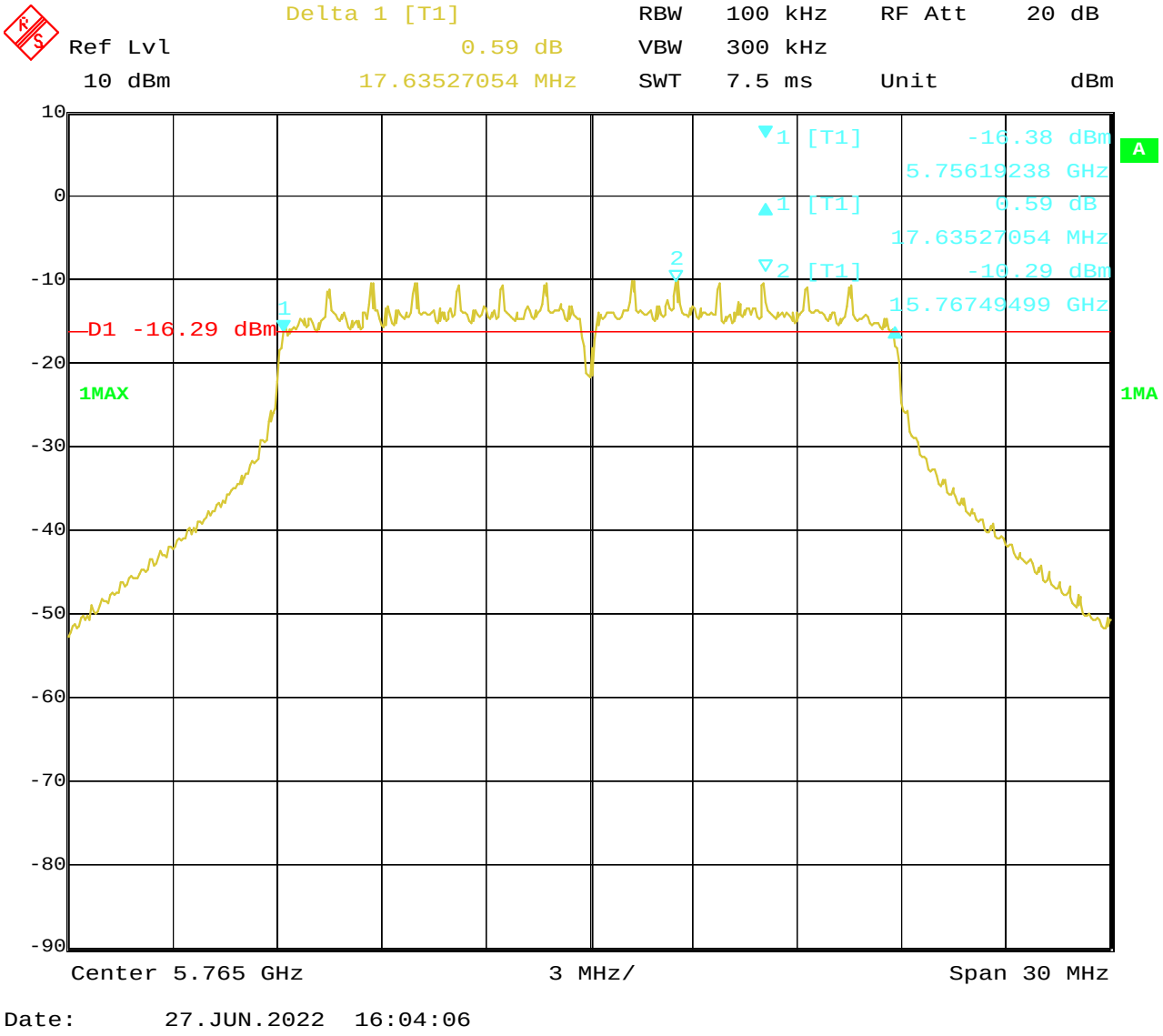
Test Configure

6dB Bandwidth

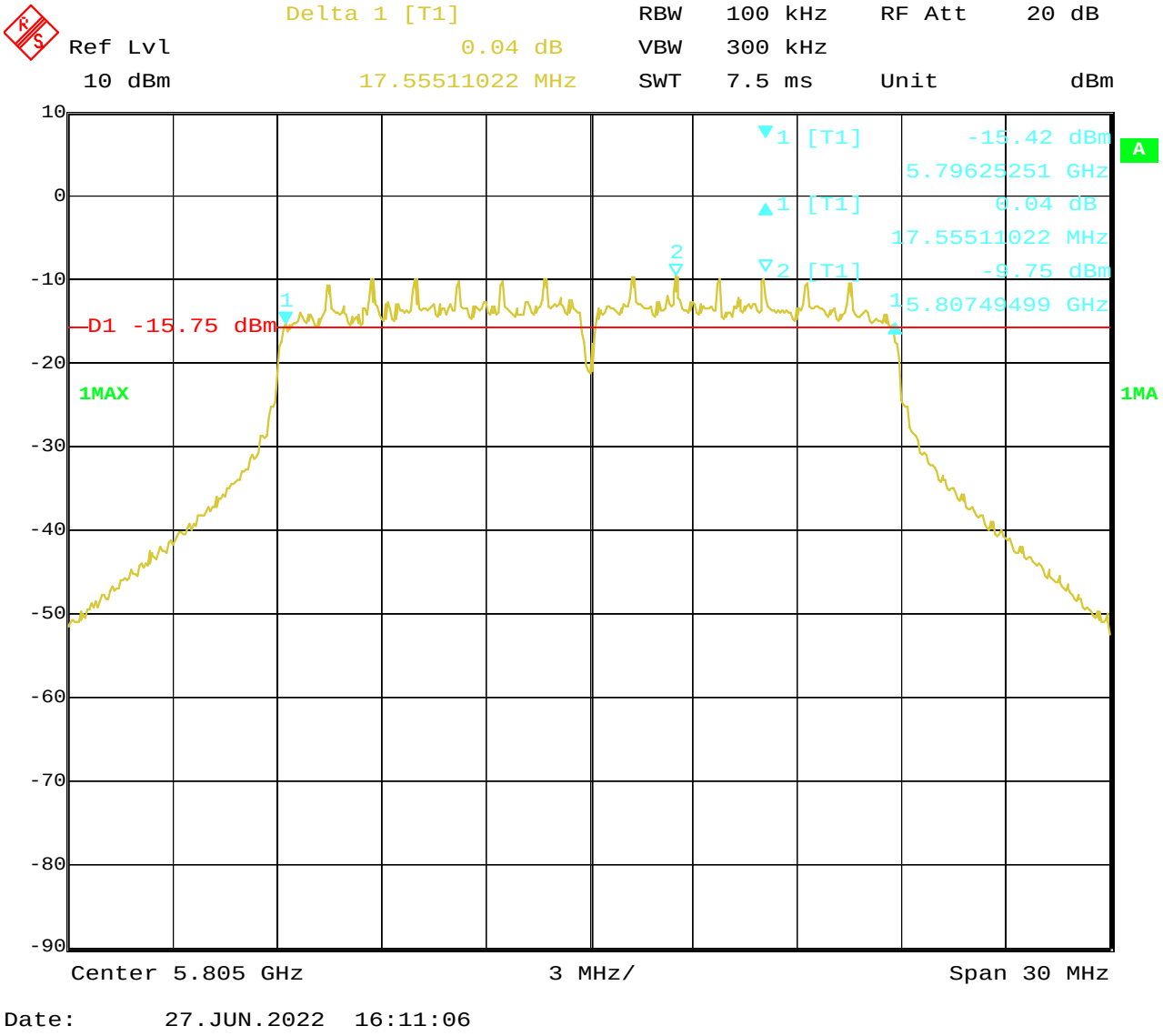
Channel 149



Channel 153



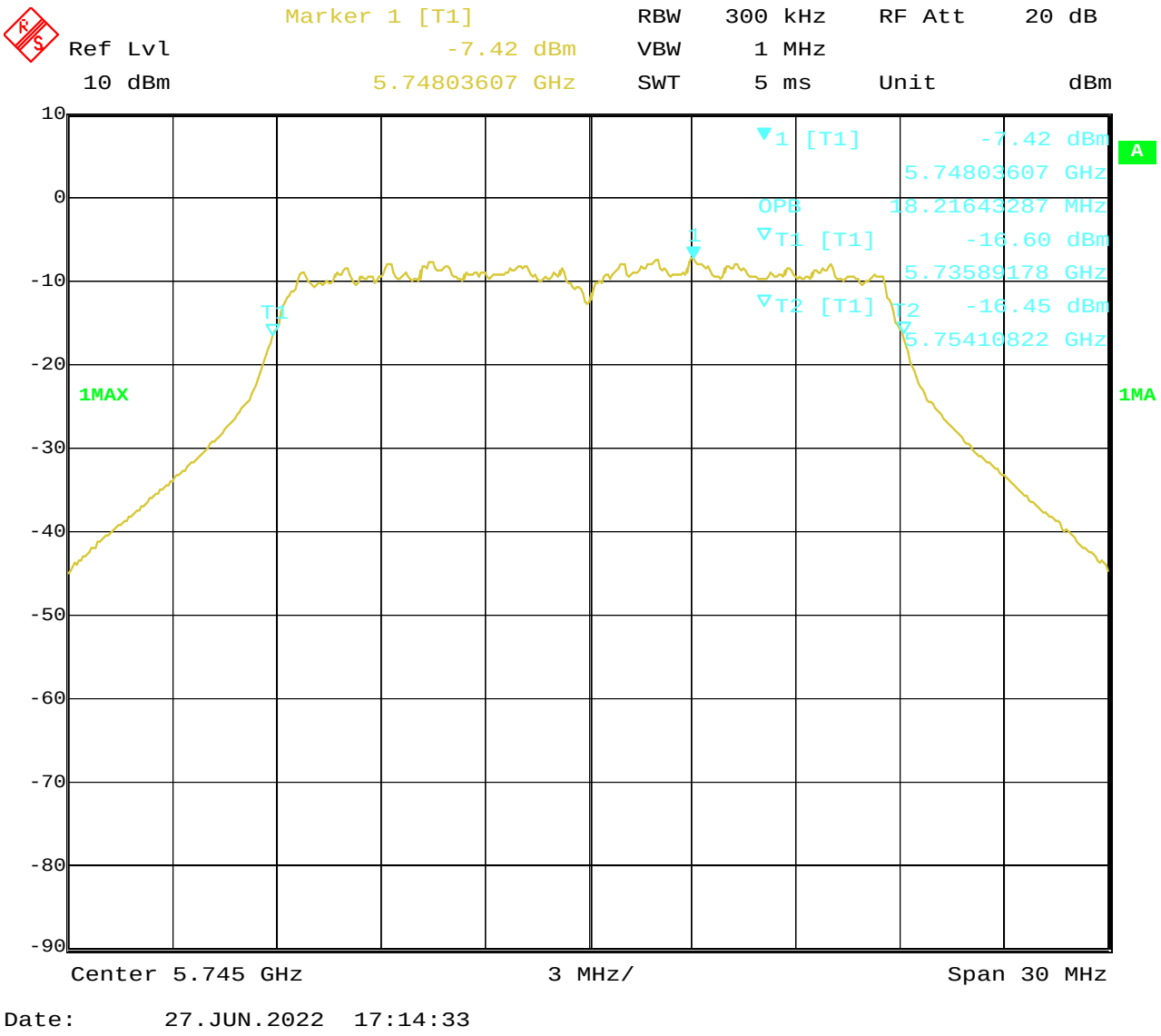
Channel 161



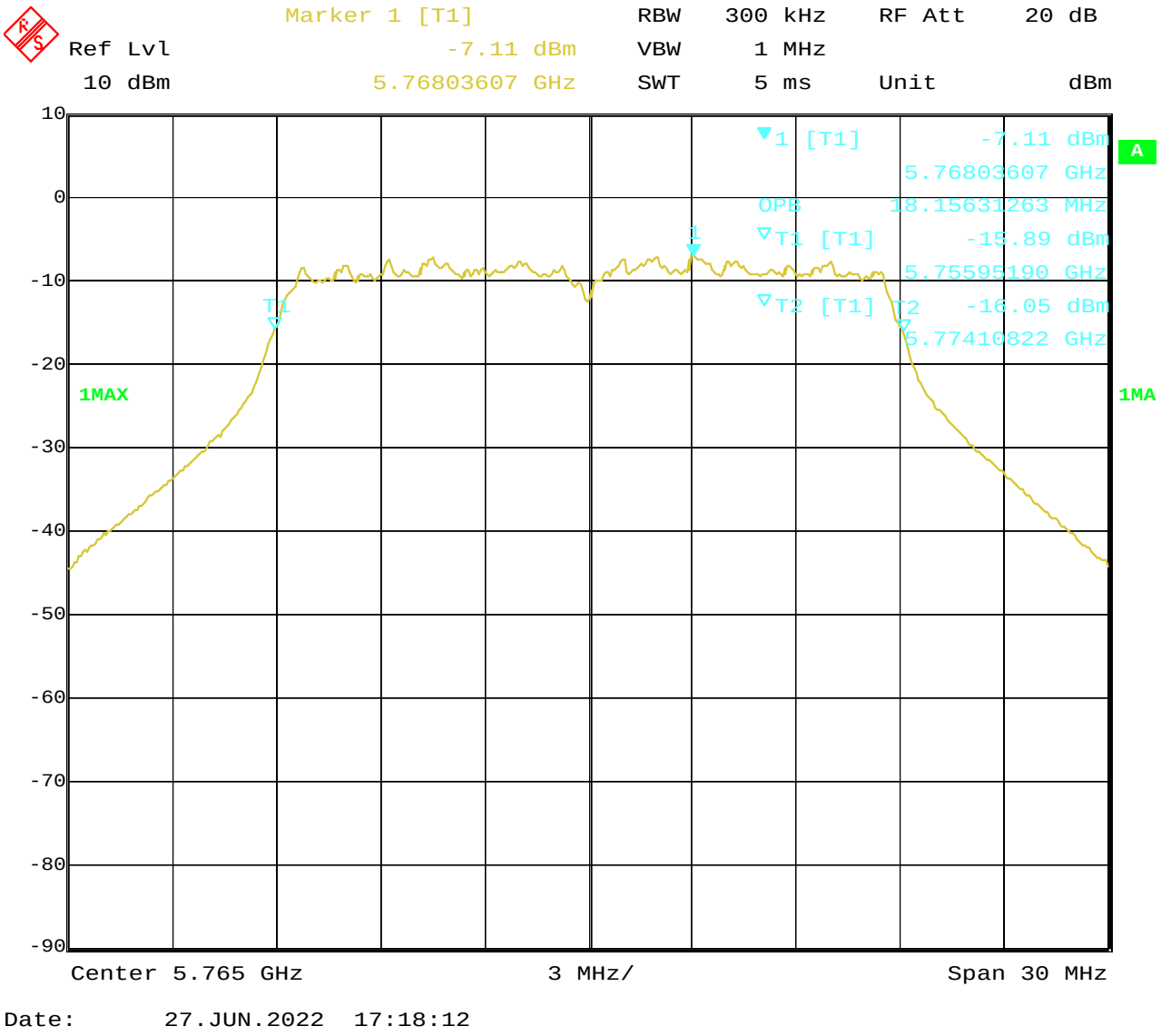
Test Configure

99% Bandwidth

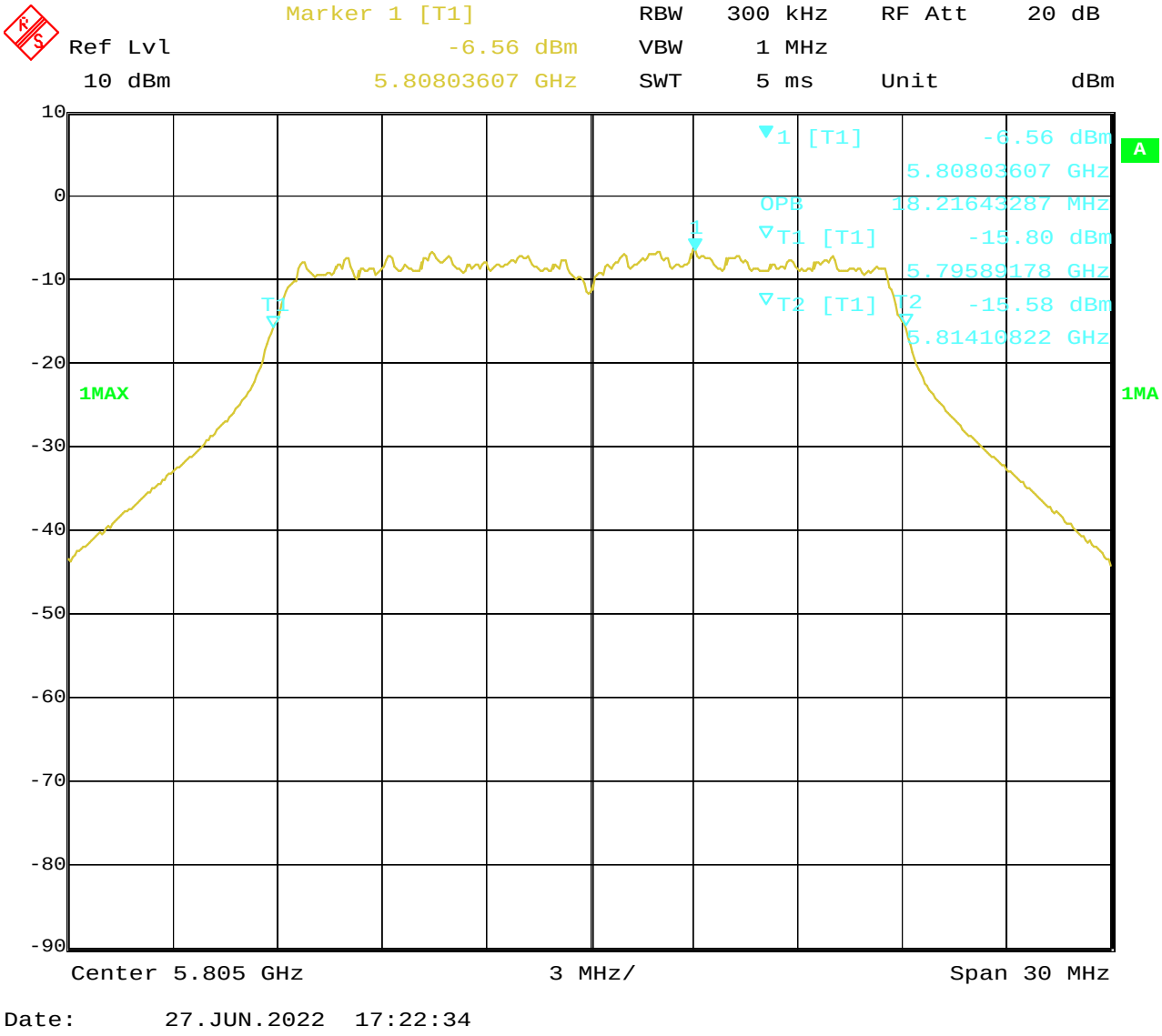
Channel 149



Channel 153



Channel 161



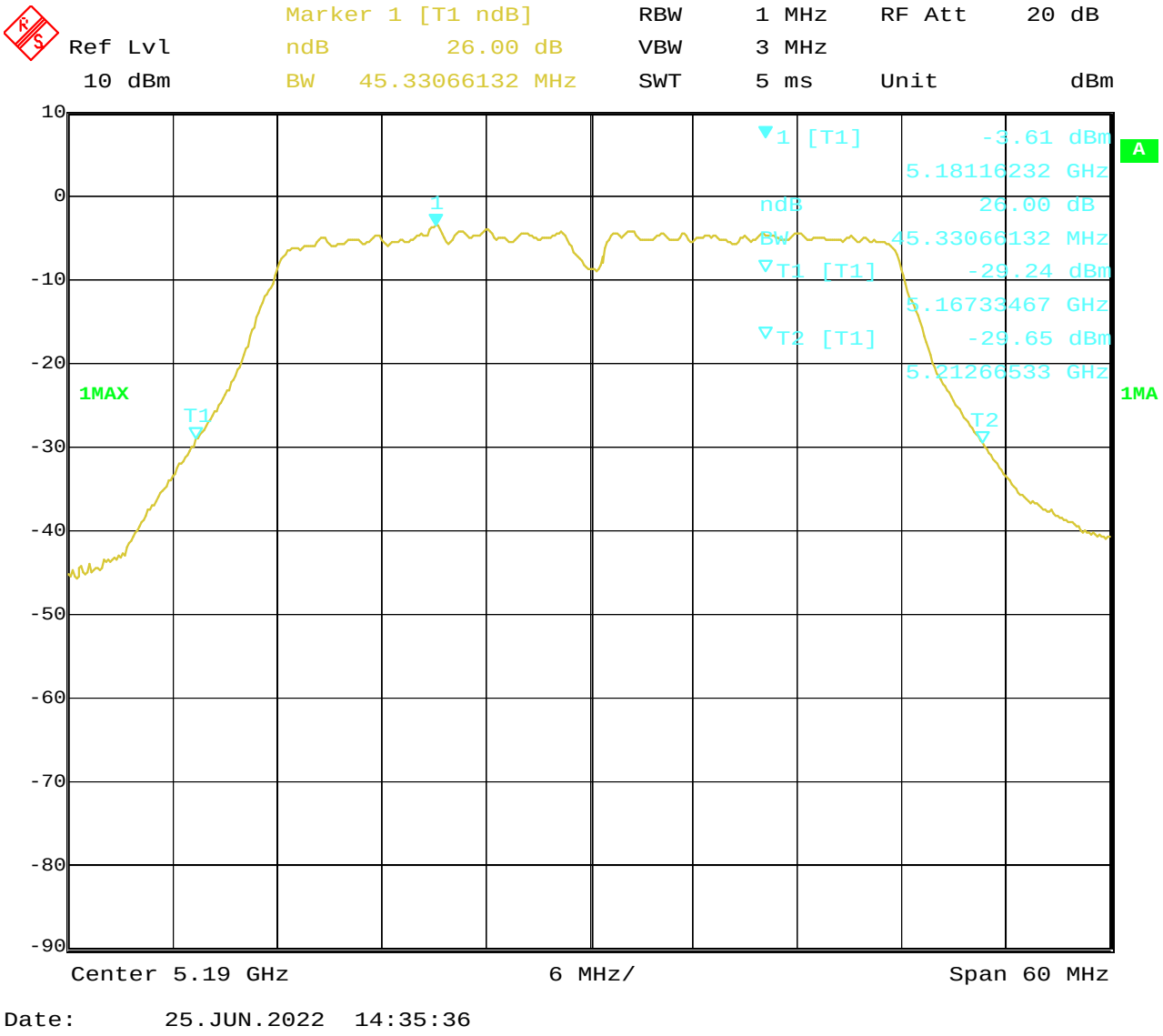
EUT	TQSky Tbox	Model	TBOX
Mode	802.11ac VHT40	Input Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
38	5190	mcs0	45.33	--	Pass
46	5230	mcs0	45.45	--	Pass
99% Bandwidth					
38	5190	mcs0	37.15	--	Pass
46	5230	mcs0	37.15	--	Pass

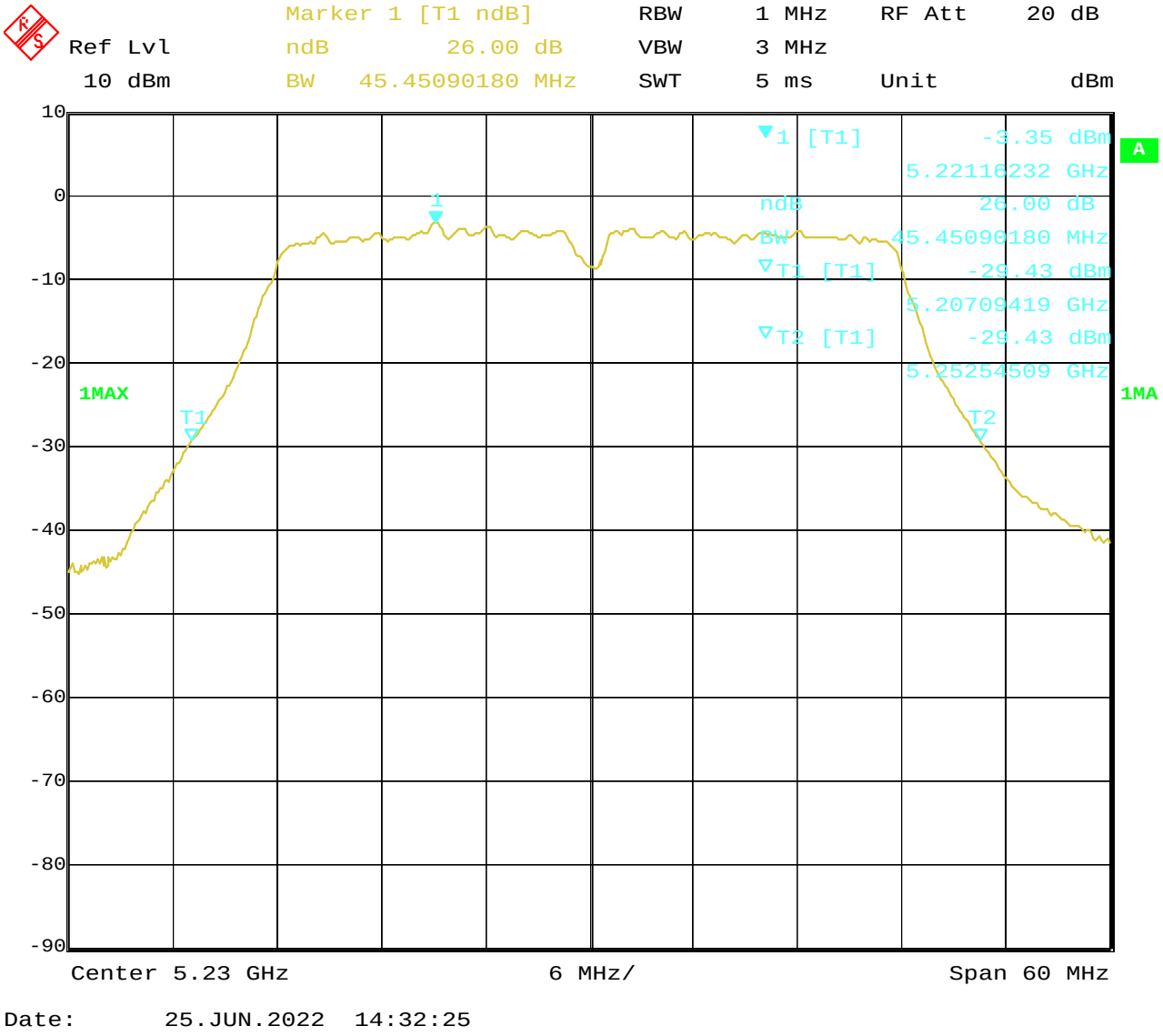
Test Configure

26dB Bandwidth

Channel 38



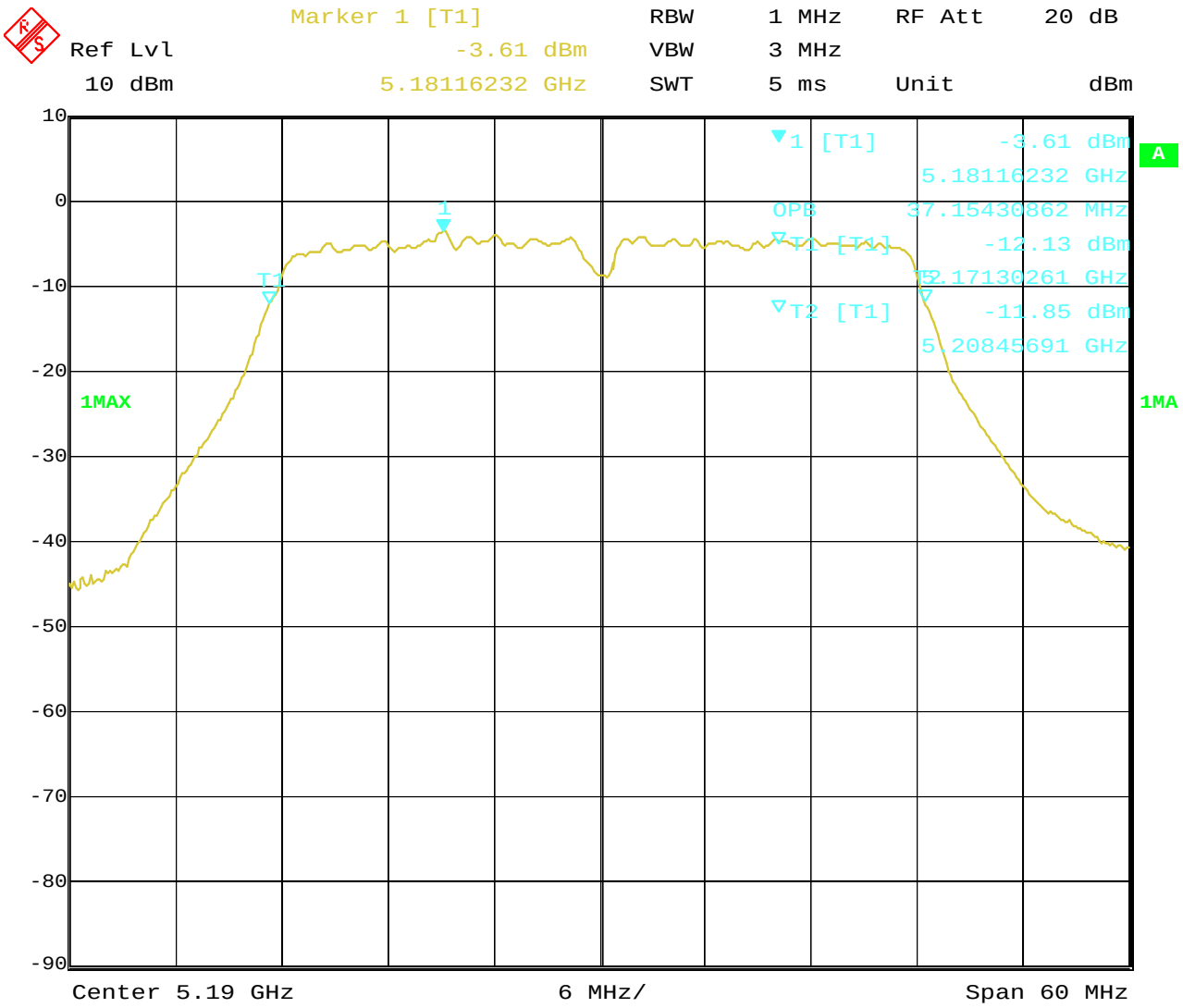
Channel 46



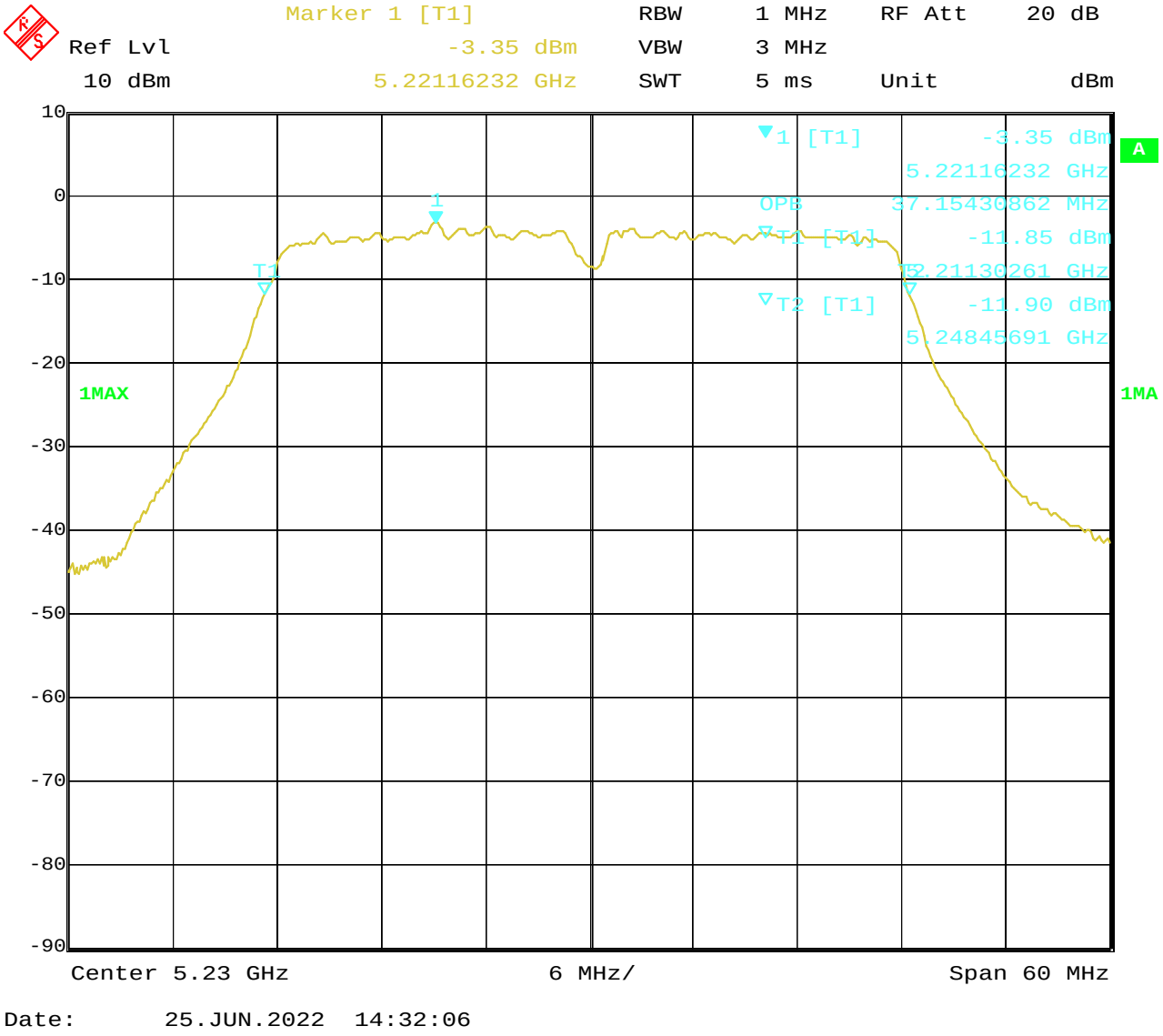
Test Configure

99% Bandwidth

Channel 38



Channel 46



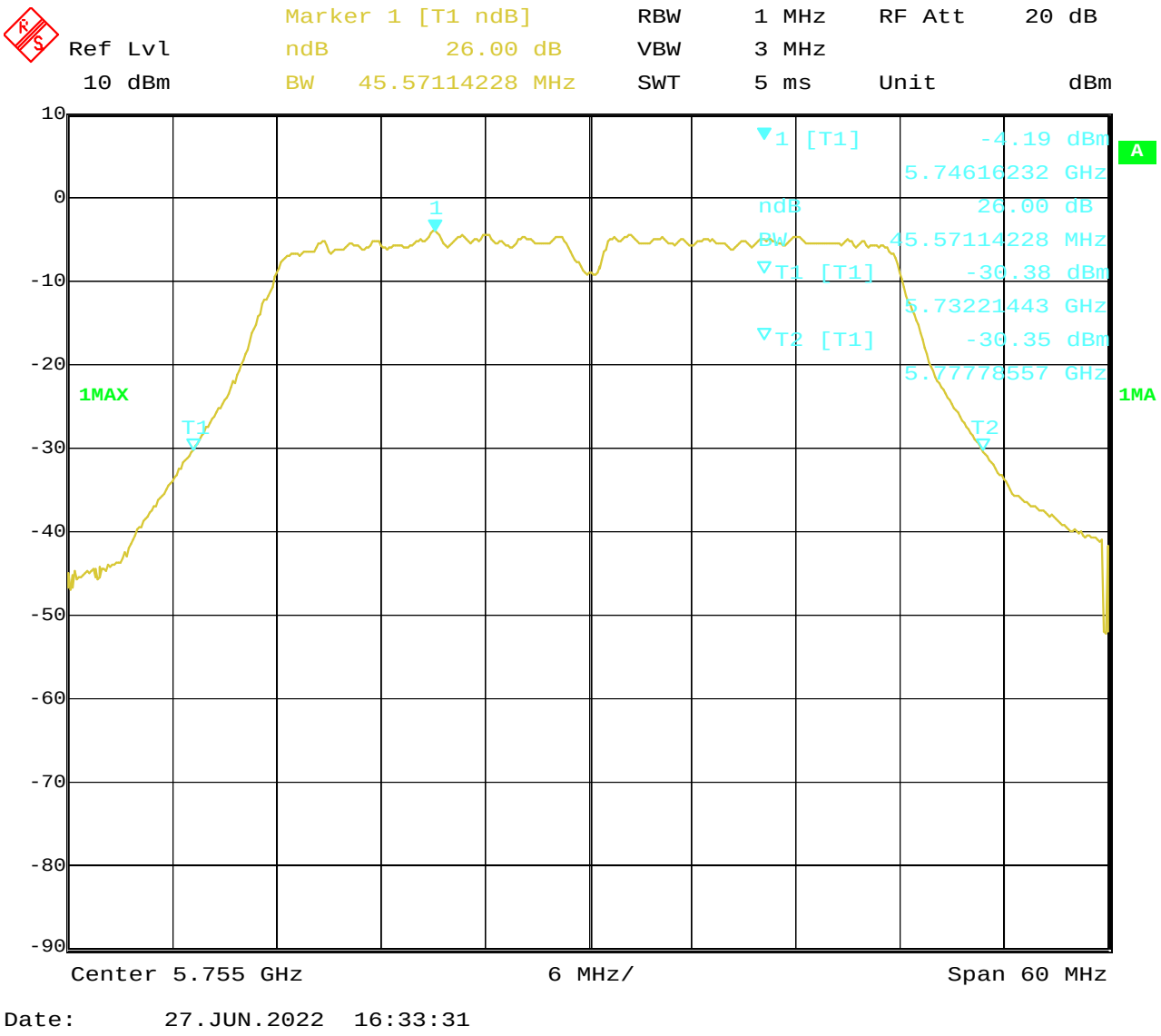
EUT	TQSky Tbox	Model	TBOX
Mode	802.11ac VHT40	Input Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
151	5755	mcs0	45.57	--	Pass
159	5795	mcs0	45.45	--	Pass
6dB Bandwidth					
151	5755	mcs0	36.23	0.5	Pass
159	5795	mcs0	36.14	0.5	Pass
99% Bandwidth					
151	5755	mcs0	37.15	--	Pass
159	5795	mcs0	37.15	--	Pass

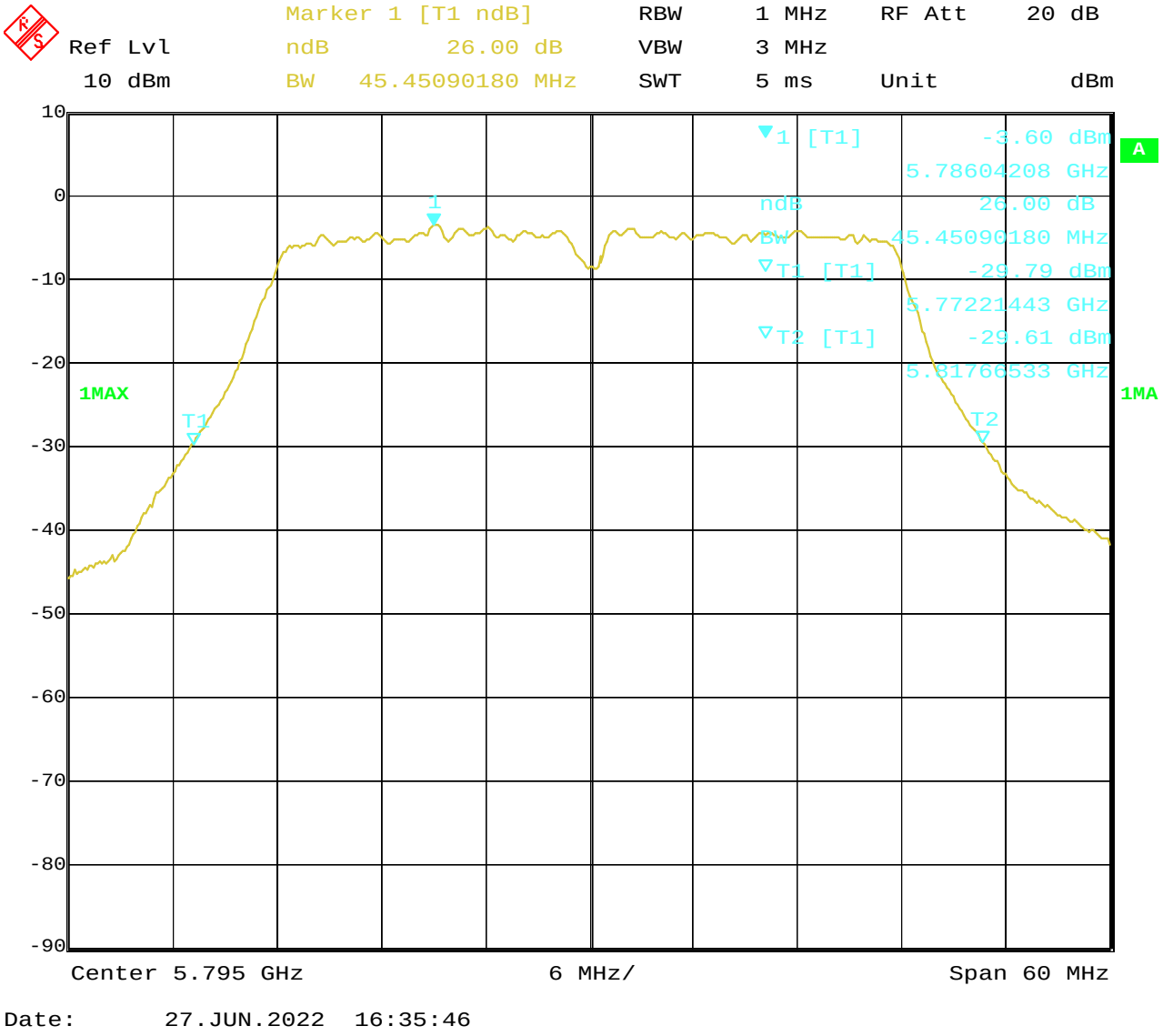
Test Configure

26dB Bandwidth

Channel 151



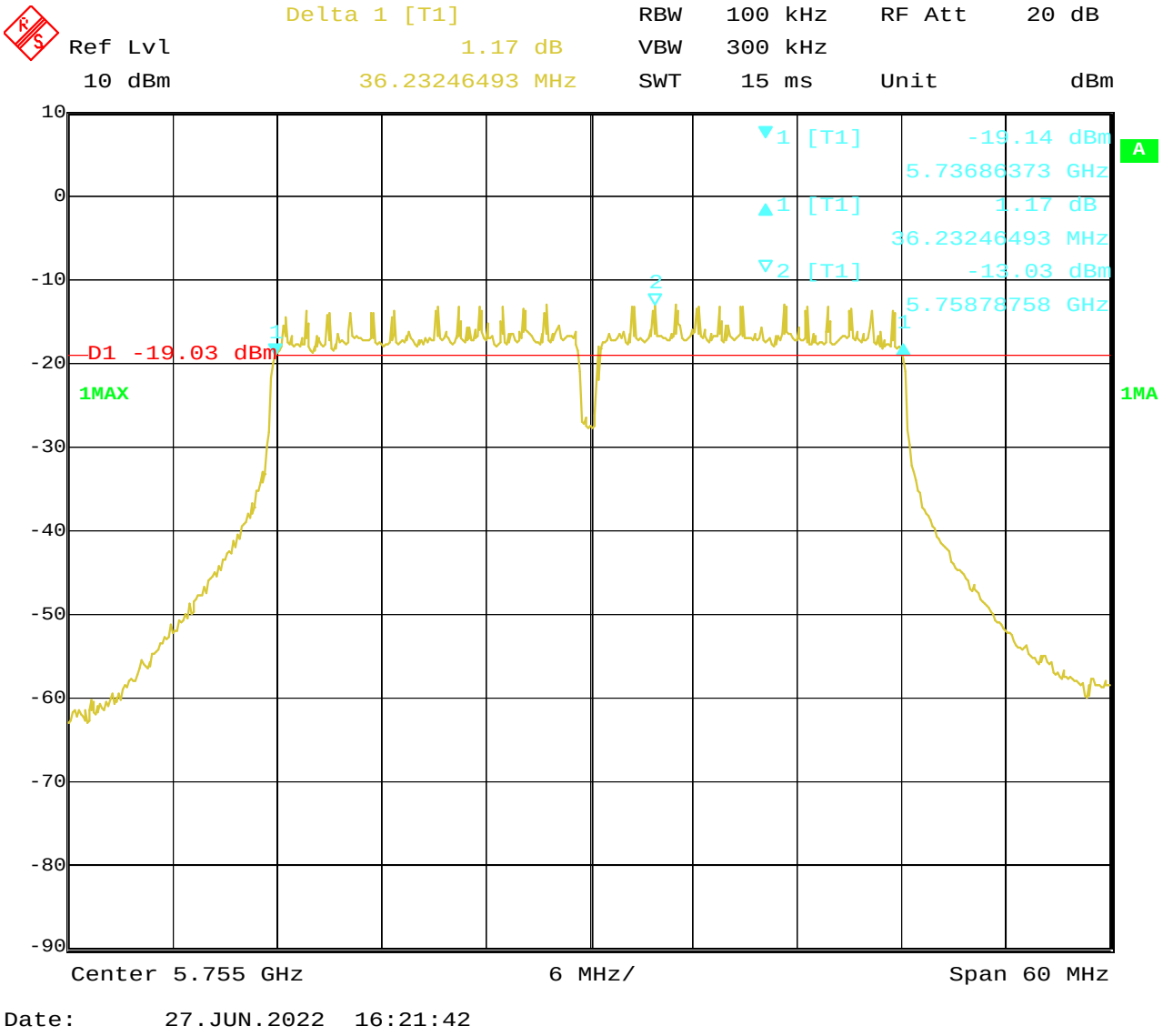
Channel 159



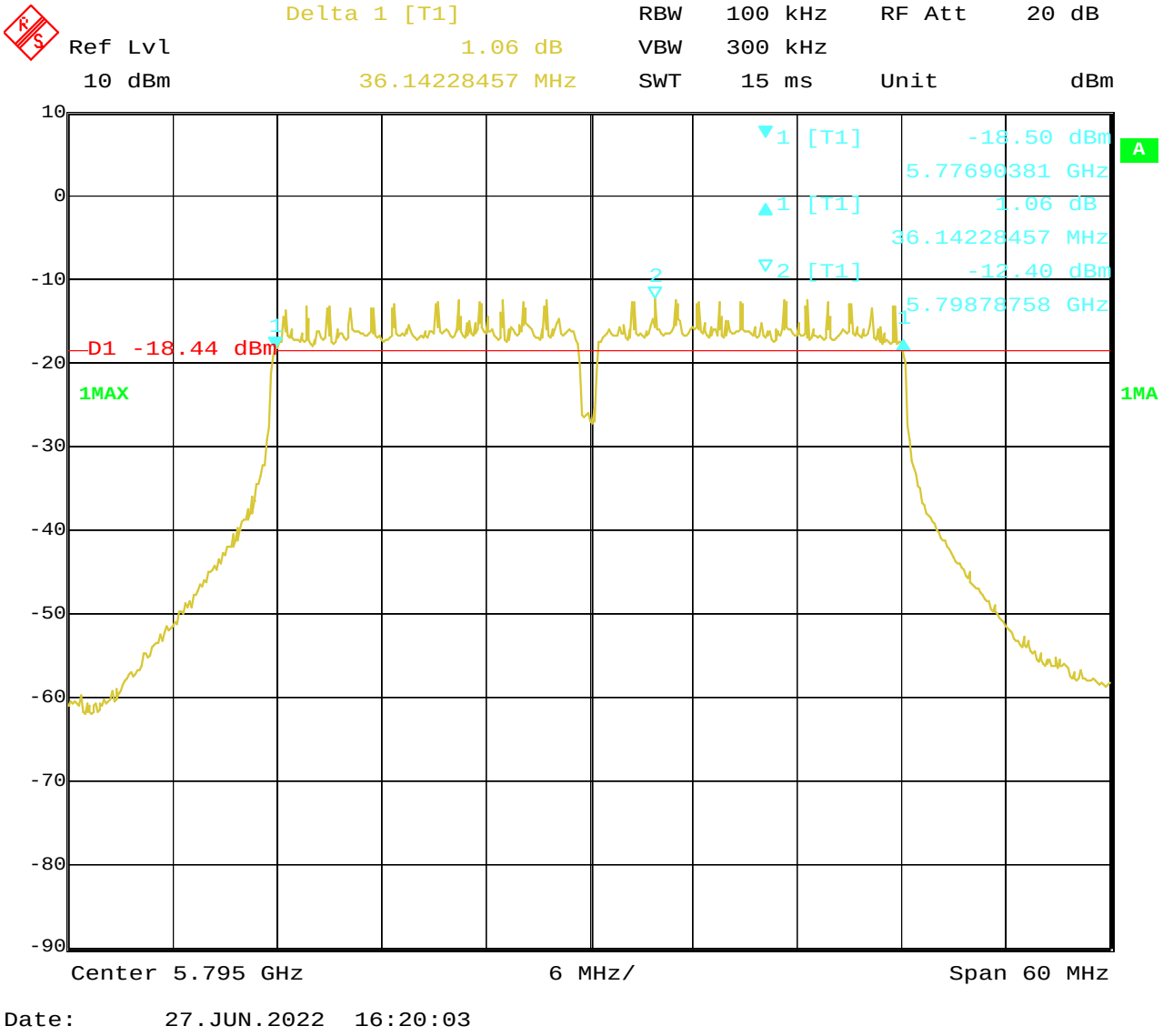
Test Configure

6dB Bandwidth

Channel 151



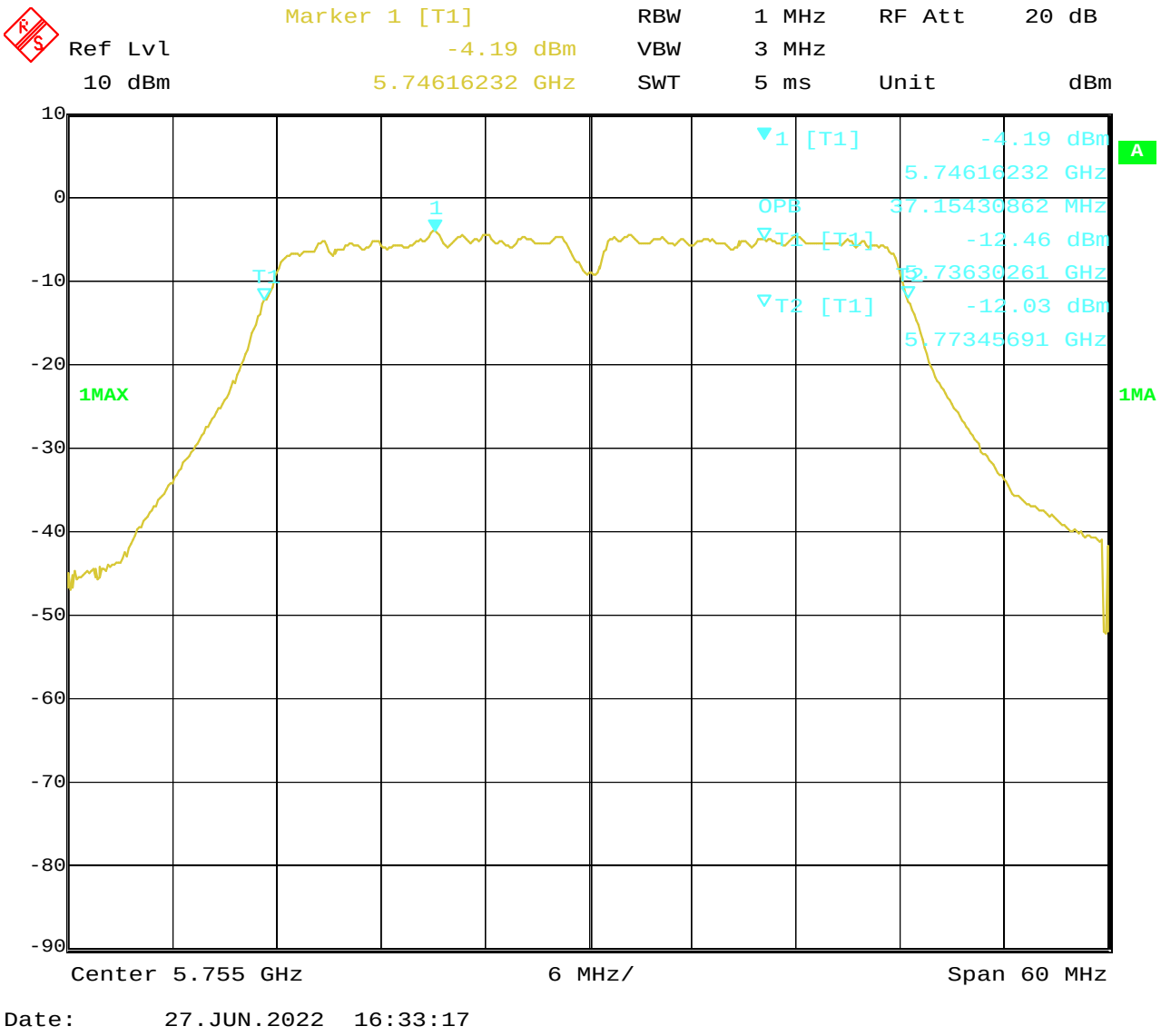
Channel 159



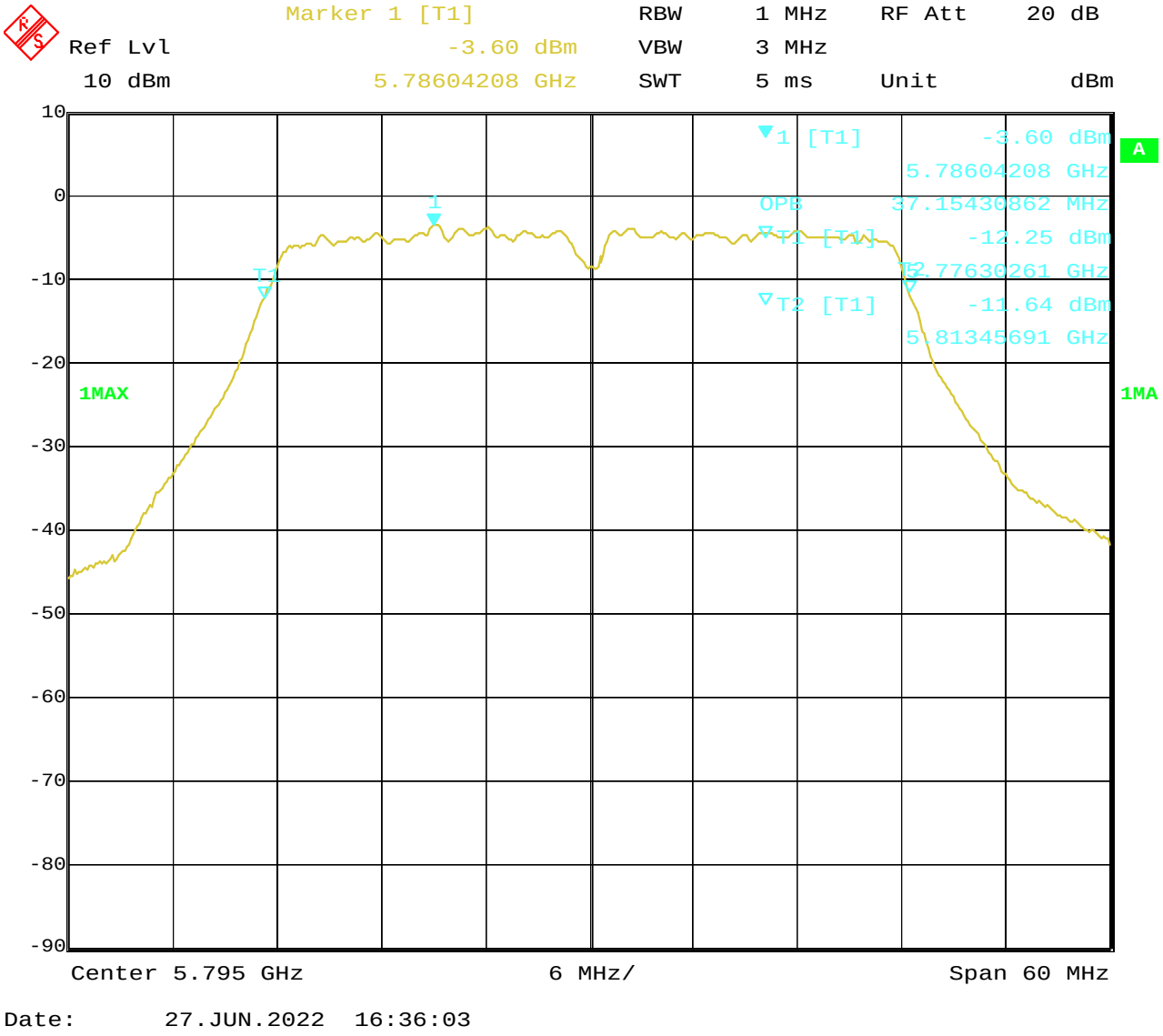
Test Configure

99% Bandwidth

Channel 151



Channel 159



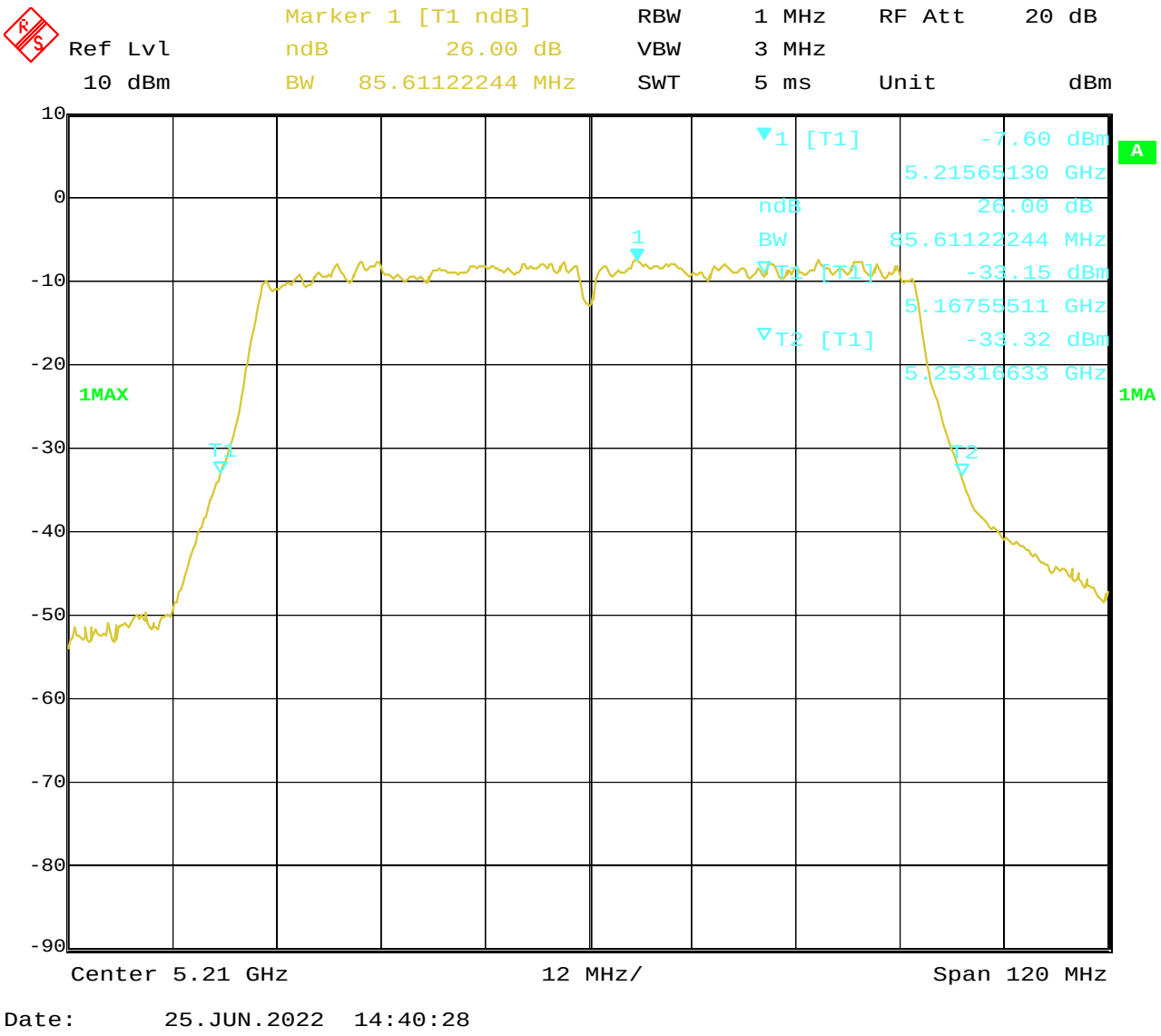
EUT	TQSky Tbox	Model	TBOX
Mode	802.11ac VHT80	Input Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
42	5210	mcs0	85.61	--	Pass
99% Bandwidth					
42	5210	mcs0	75.99	--	Pass

Test Configure

26dB Bandwidth

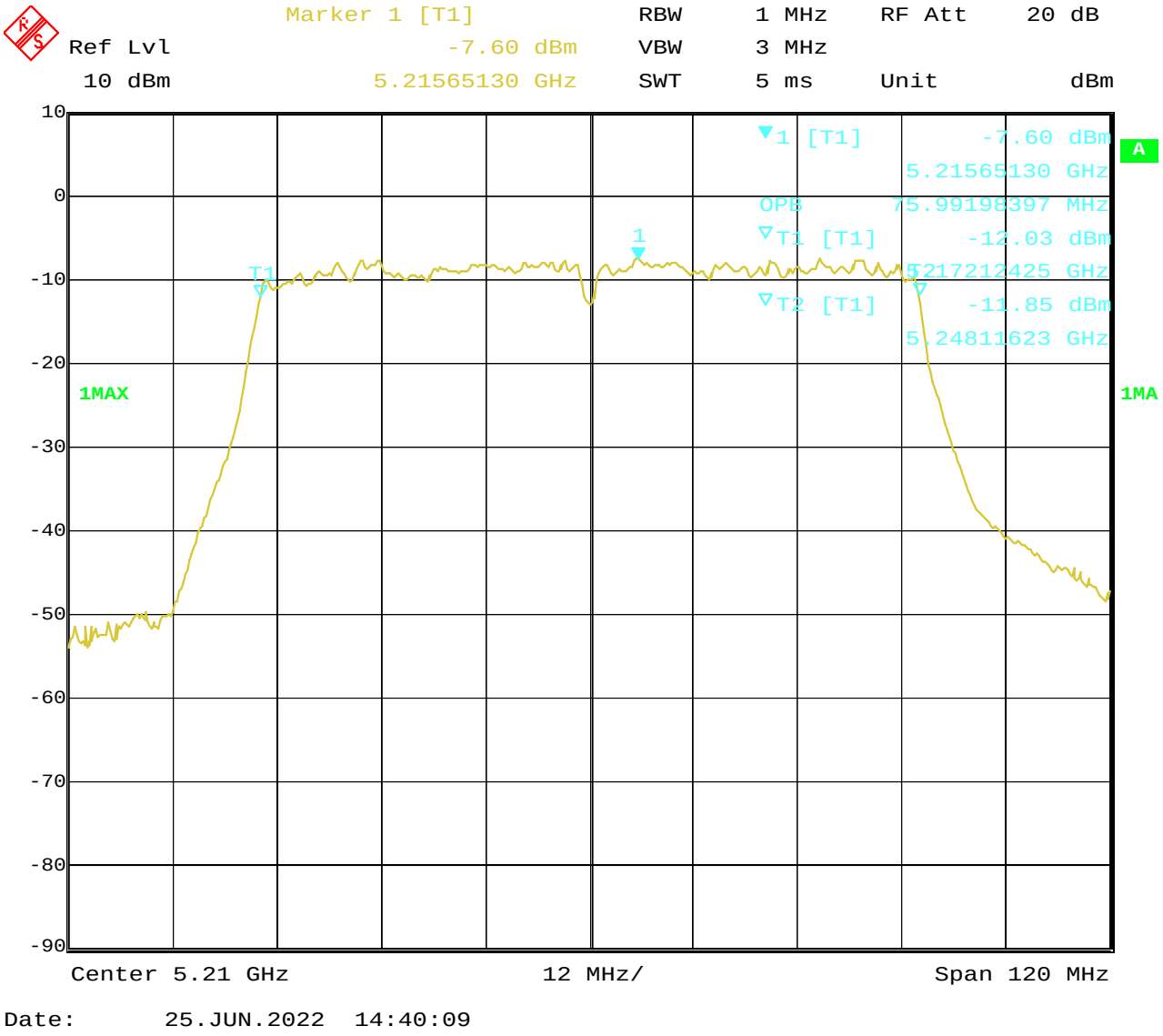
Channel 42



Test Configure

99% Bandwidth

Channel 42



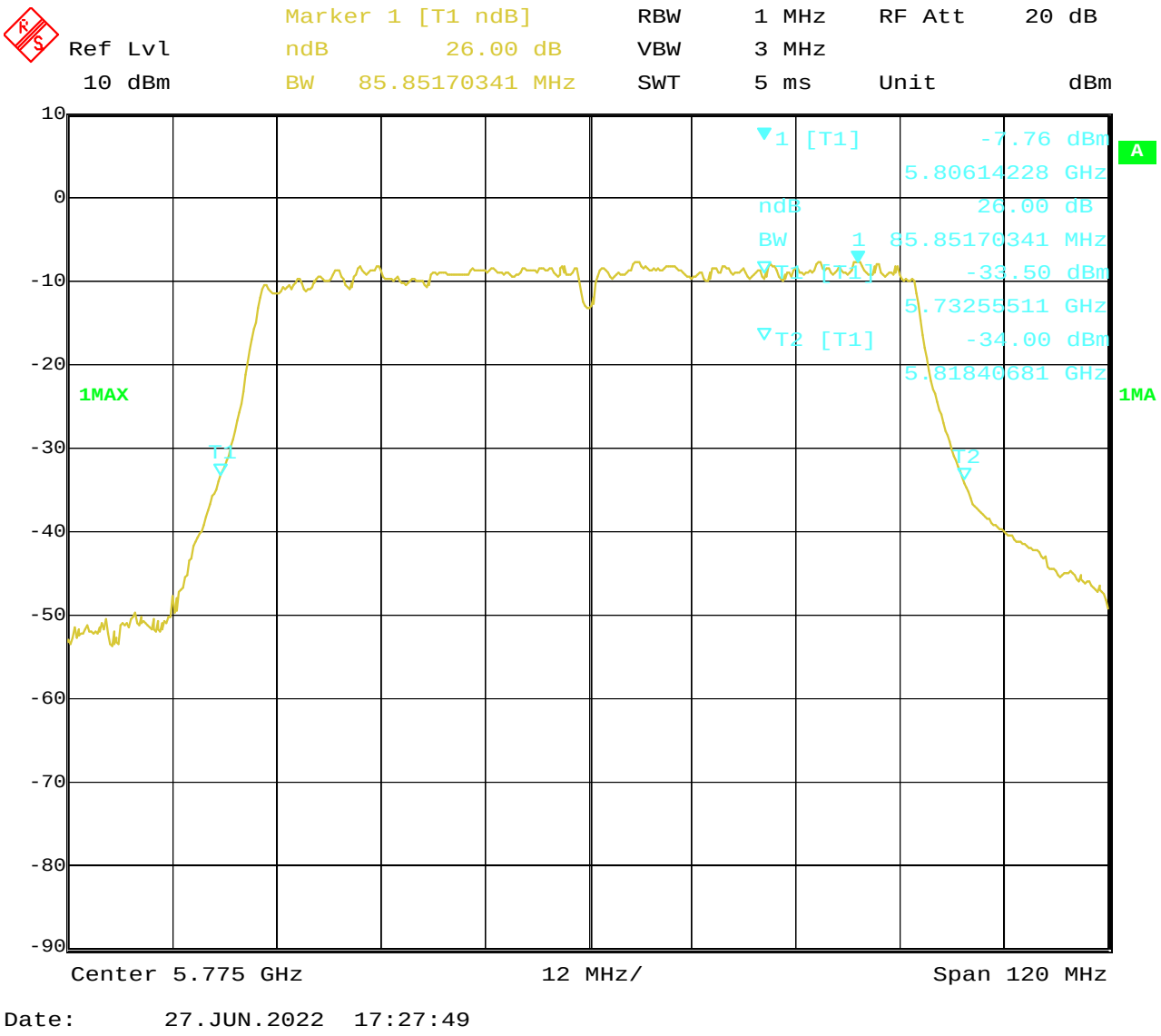
EUT	TQSky Tbox	Model	TBOX
Mode	802.11ac VHT80	Input Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
155	5775	mcs0	85.85	--	Pass
6dB Bandwidth					
155	5775	mcs0	75.75	0.5	Pass
99% Bandwidth					
155	5775	mcs0	75.99	--	Pass

Test Configure

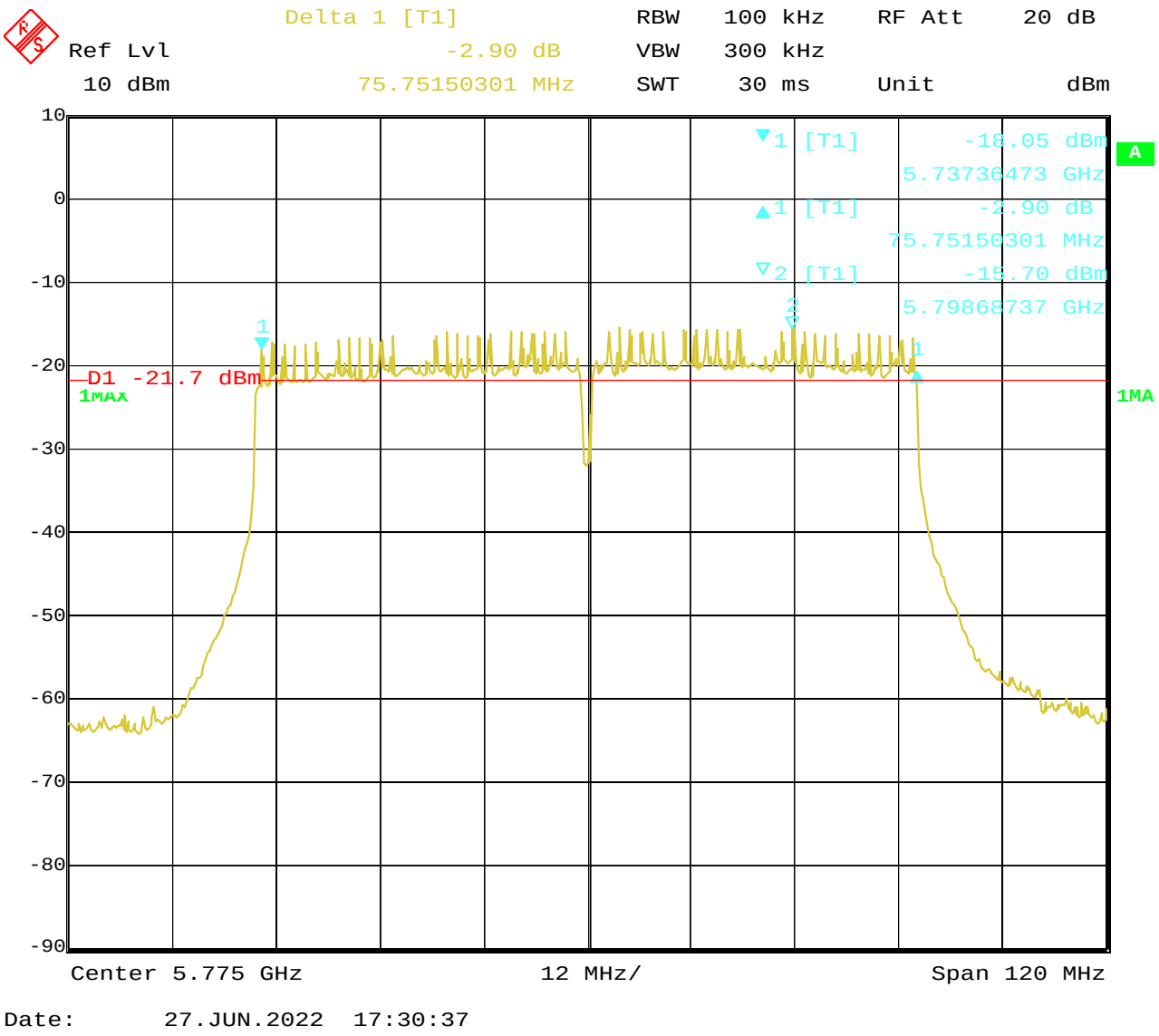
26dB Bandwidth

Channel 155



6dB Bandwidth

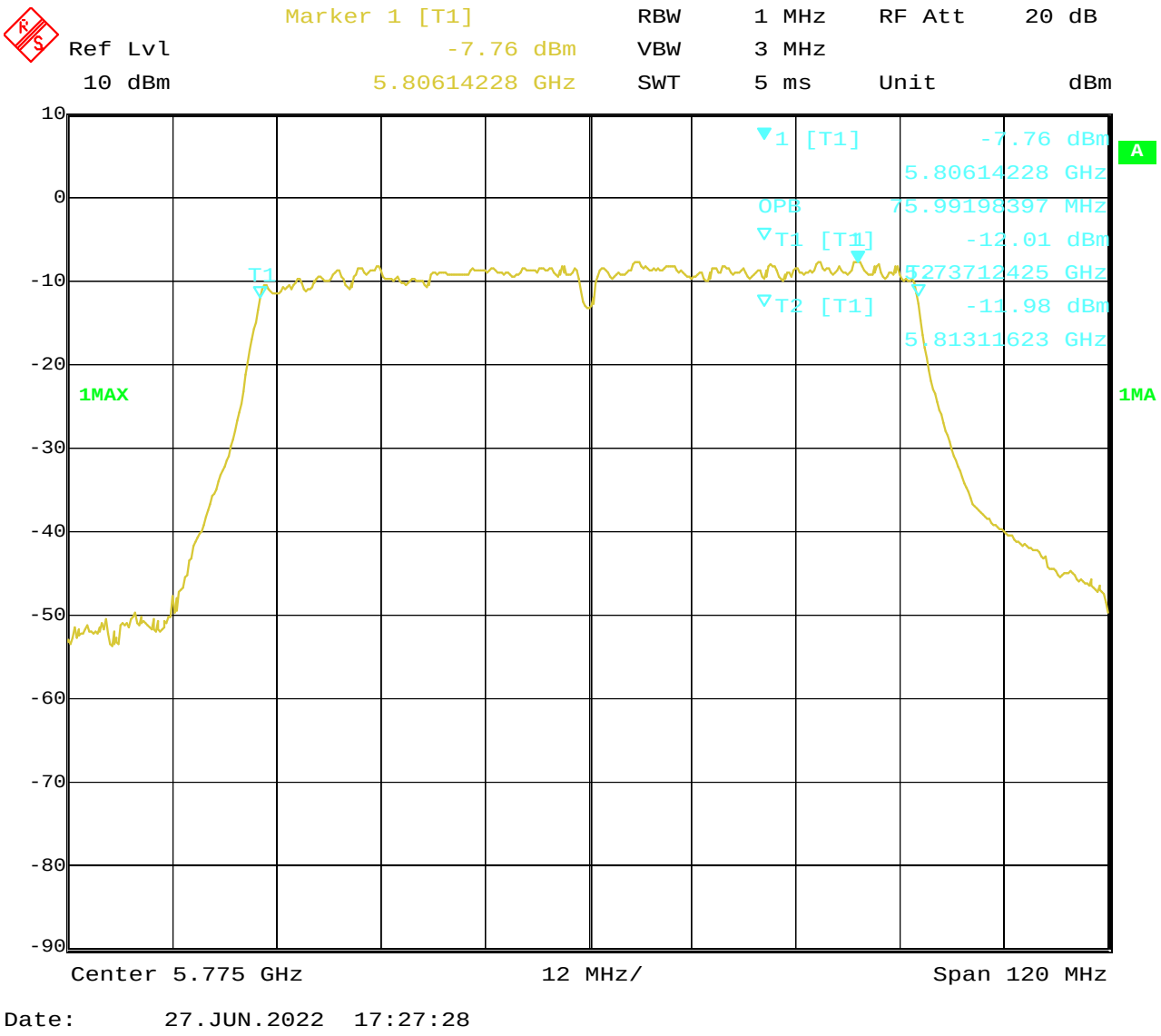
Channel 155



Test Configure

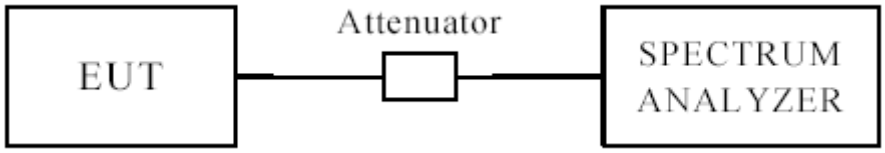
99% Bandwidth

Channel 155



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) ≦(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

8.4Test Results

EUT	TQSky Tbox	Model	TBOX
Mode	802.11a	Test Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Pass/ Fail
36	5180	-3.88	24	Pass
40	5200	-3.68	24	Pass
48	5240	-3.50	24	Pass
149	5745	-4.09	30	Pass
153	5765	-3.76	30	Pass
161	5805	-3.33	30	Pass

Note: 1. At finial 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	TQSky Tbox	Model	TBOX
Mode	802.11n HT20	Test Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Pass/ Fail
36	5180	-4.38	24	Pass
40	5200	-4.16	24	Pass
48	5240	-3.97	24	Pass
149	5745	-4.65	30	Pass
153	5765	-4.33	30	Pass
161	5805	-3.81	30	Pass

Note: 1. At finial test to get the worst-case emission at mcs0 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	TQSky Tbox	Model	TBOX
Mode	802.11n HT40	Test Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Pass/ Fail
38	5190	-6.26	24	Pass
46	5230	-5.96	24	Pass
151	5755	-6.66	30	Pass
159	5795	-6.08	30	Pass

Note: 1. At finial 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	TQSky Tbox	Model	TBOX
Mode	802.11ac VHT20	Test Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Pass/ Fail
36	5180	-4.32	24	Pass
40	5200	-4.08	24	Pass
48	5240	-3.90	24	Pass
149	5745	-4.63	30	Pass
153	5765	-4.35	30	Pass
161	5805	-3.86	30	Pass

Note: 1. At finial test to get the worst-case emission at mcs0 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	TQSky Tbox	Model	TBOX
Mode	802.11ac VHT40	Test Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Pass/ Fail
38	5190	-6.23	24	Pass
46	5230	-5.95	24	Pass
151	5755	-6.71	30	Pass
159	5795	-6.11	30	Pass

Note: 1. At finial 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

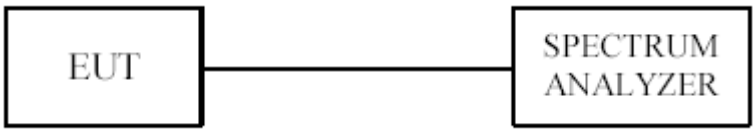
EUT	TQSky Tbox	Model	TBOX
Mode	802.11ac VHT80	Test Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Pass/ Fail
42	5210	-8.85	24	Pass
155	5775	-9.17	30	Pass

Note: 1. At finial 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

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 or 500kHz
3. Set the VBW =3MHz or 2MHz
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.

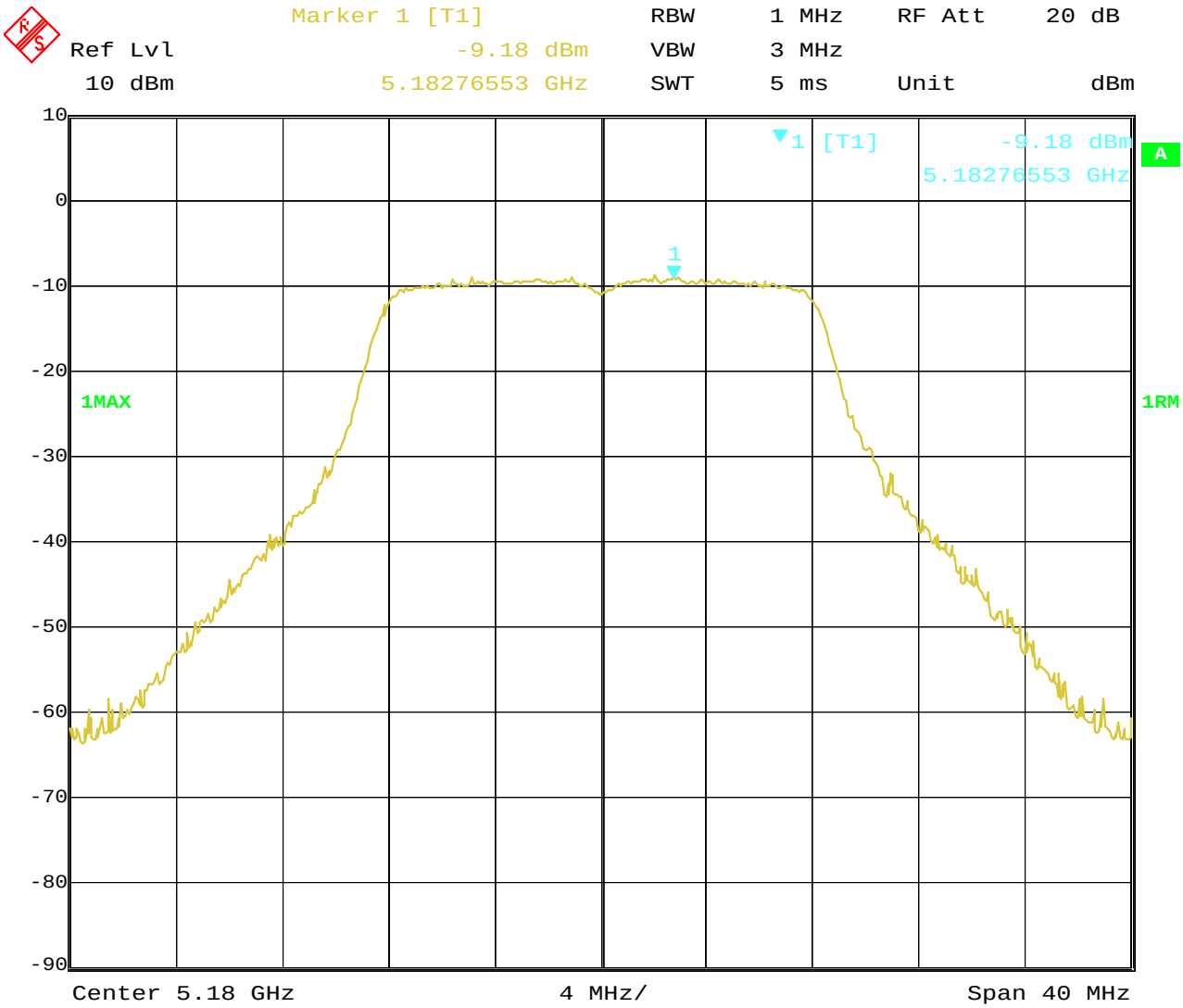
9.4Test Result

EUT	TQSky Tbox	Model	TBOX
Mode	802.11a 6Mbps	Test Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

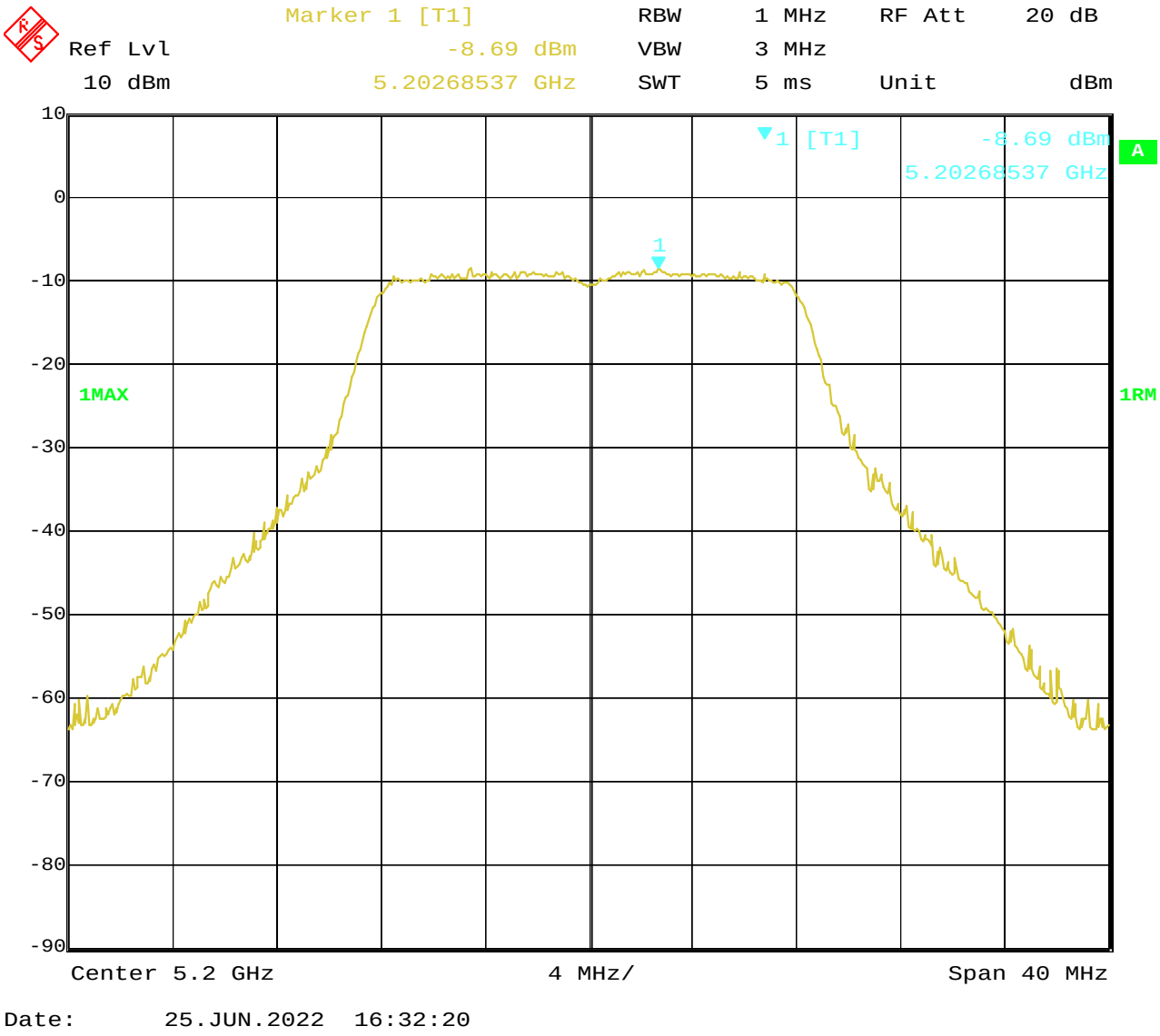
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)	Limit (dBm/MHz)	Pass/ Fail
36	5180	-9.18	11	Pass
40	5200	-8.69	11	Pass
48	5240	-8.62	11	Pass
Channel	Frequency (MHz)	Power Spectral Density(dBm/500kHz)	Limit (dBm/500kHz)	Pass/ Fail
149	5745	-9.87	30	Pass
153	5765	-9.75	30	Pass
161	5805	-9.24	30	Pass

9.5 Plots of Power Spectral Density Measurement

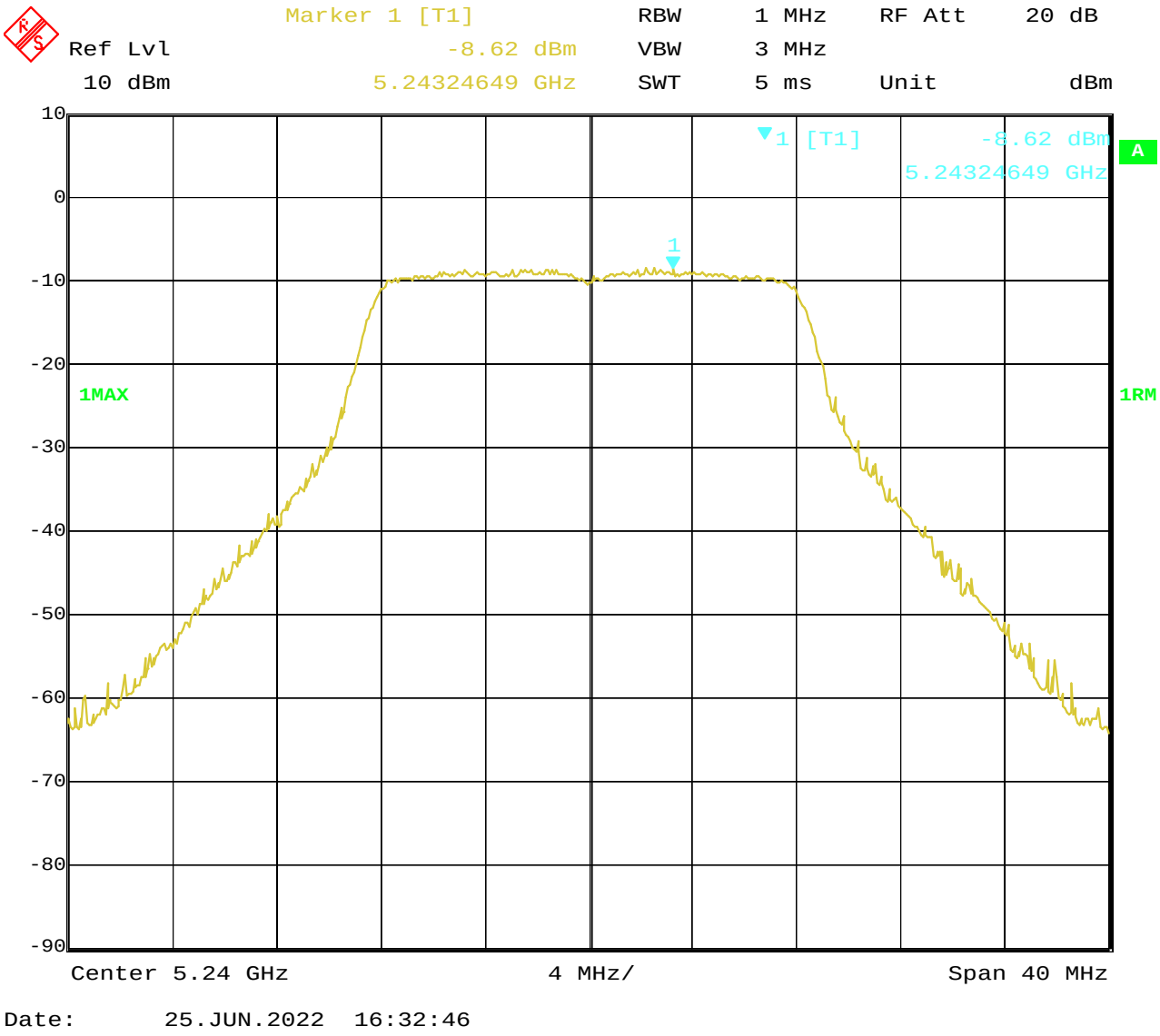
1.802.11a at 6Mbps of CH36



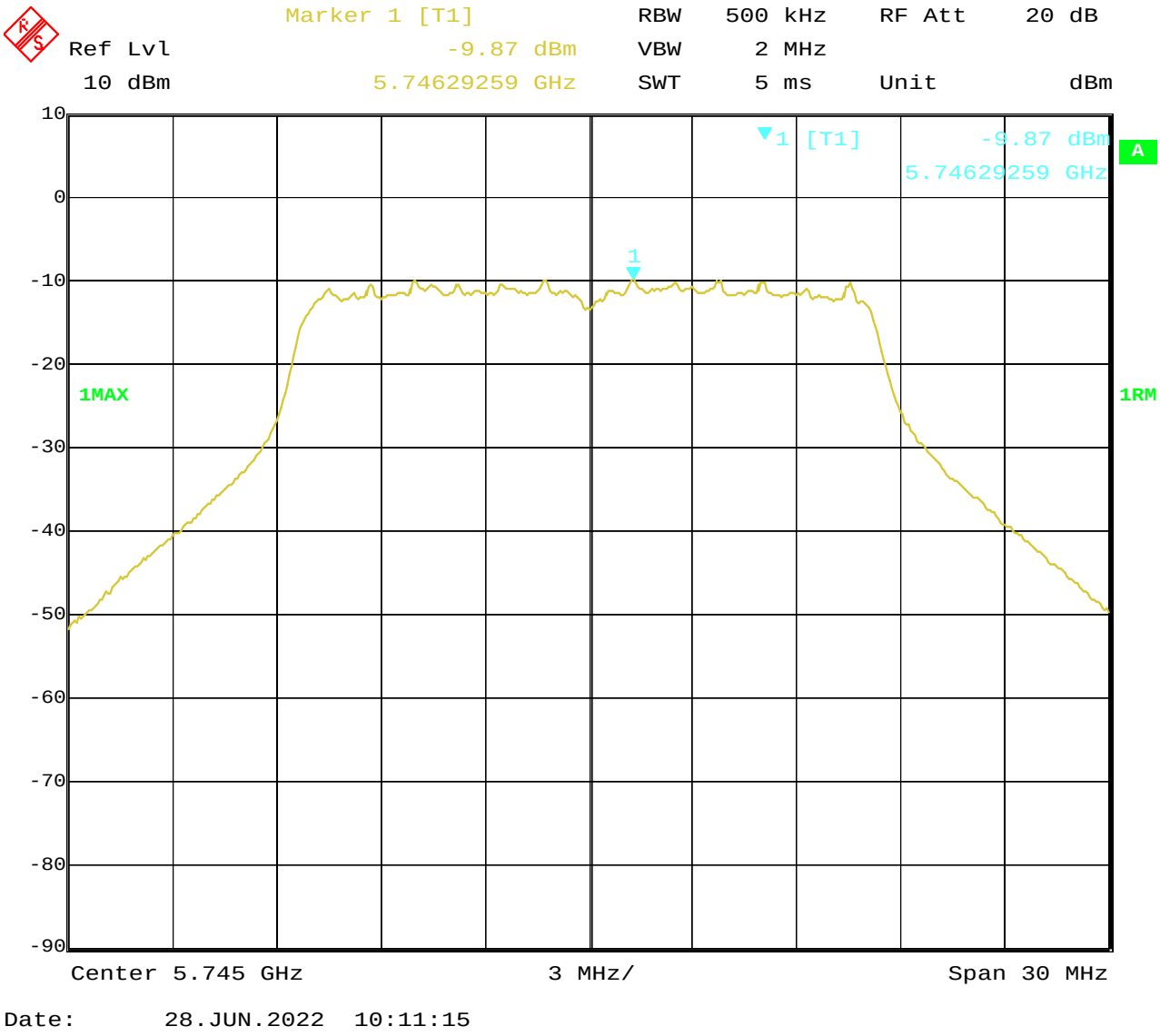
2.802.11a at 6Mbps of CH40



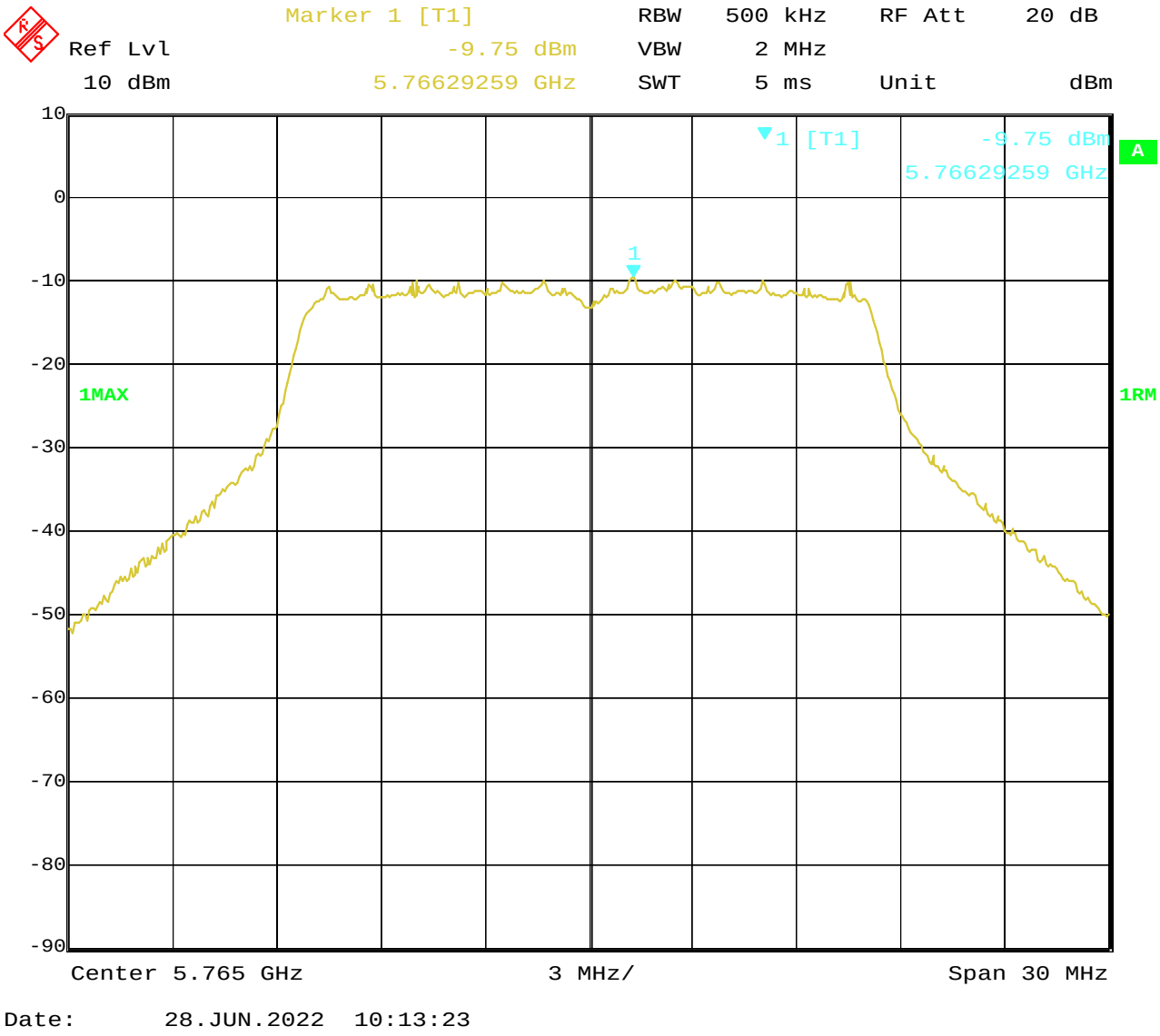
3.802.11a at 6Mbps of CH48



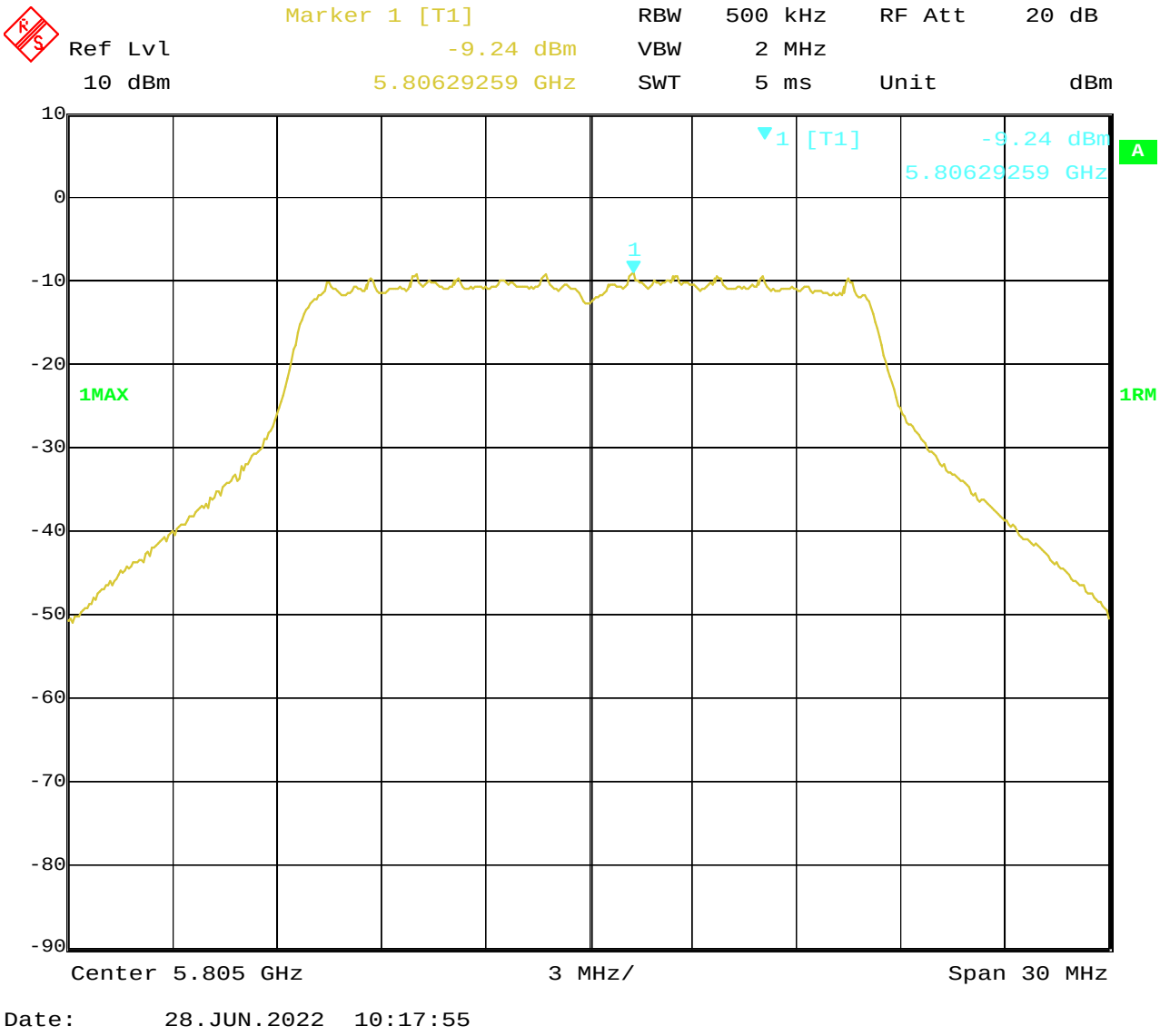
4.802.11a at 6Mbps of CH149



5.802.11a at 6Mbps of CH153



6.802.11a at 6Mbps of CH161

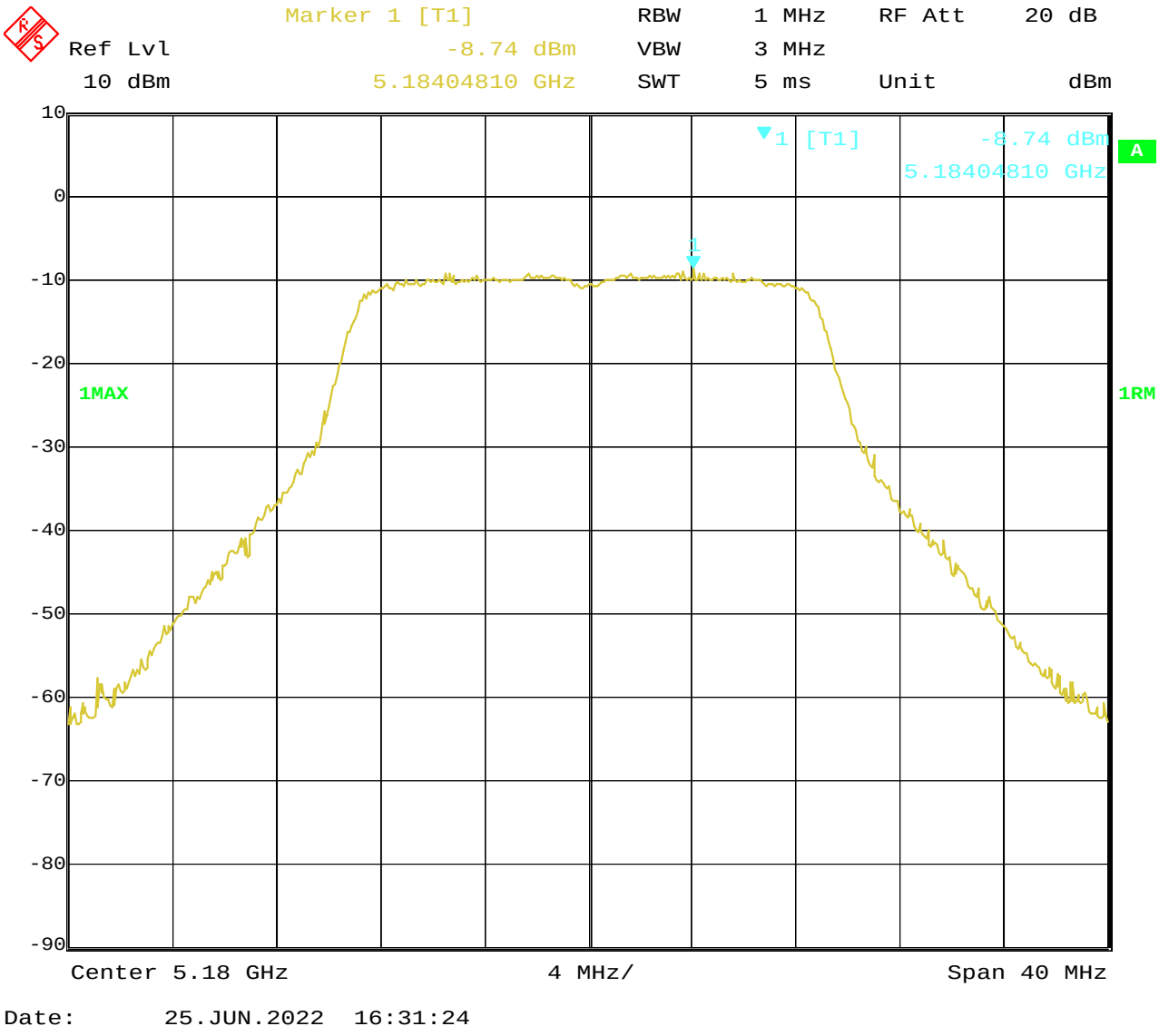


EUT	TQSky Tbox	Model	TBOX
Mode	802.11n HT20 mcs0	Test Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

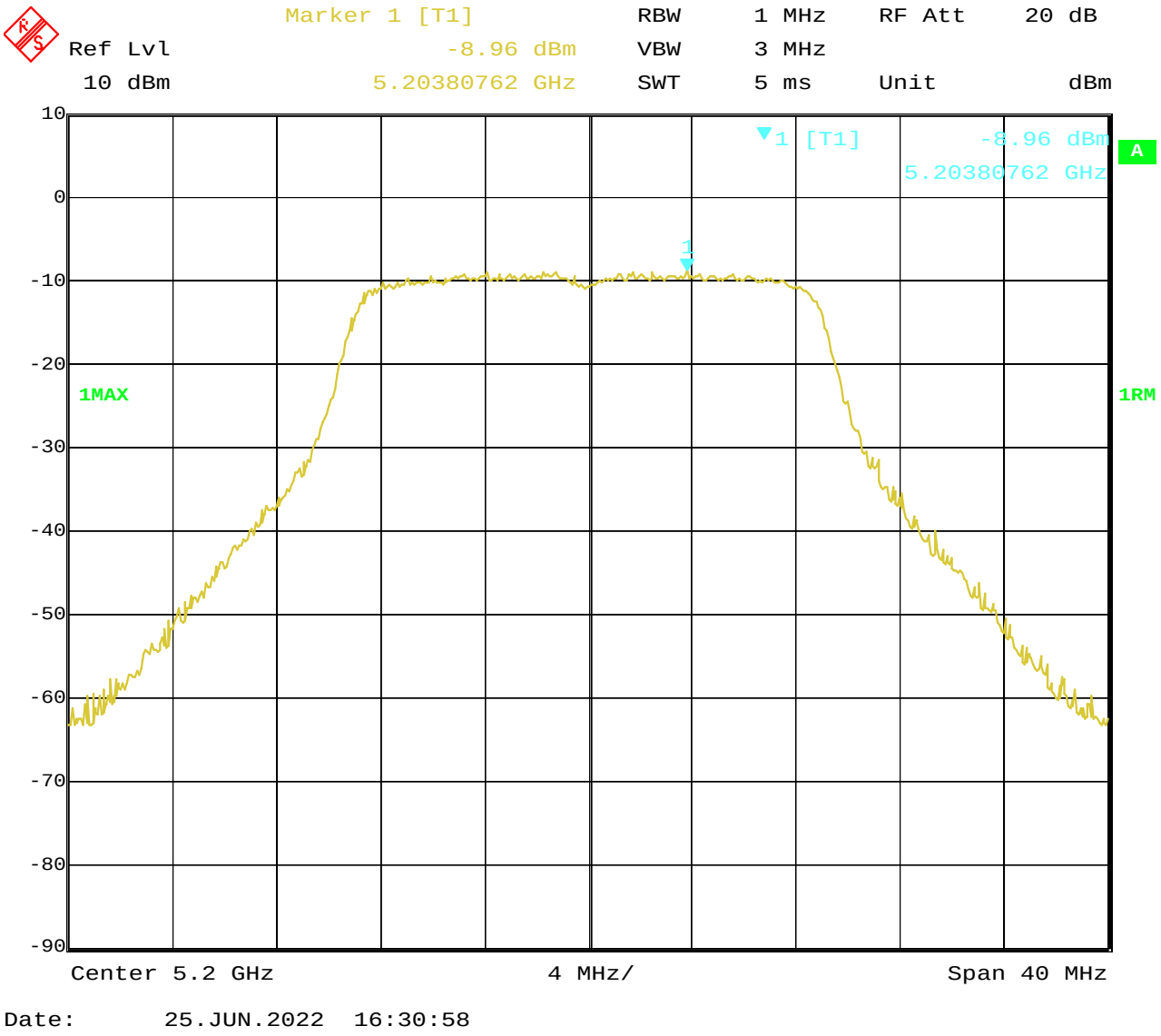
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)	Limit (dBm/MHz)	Pass/ Fail
36	5180	-8.74	11	Pass
40	5200	-8.96	11	Pass
48	5240	-8.83	11	Pass
Channel	Frequency (MHz)	Power Spectral Density(dBm/500kHz)	Limit (dBm/500kHz)	Pass/ Fail
149	5745	-10.37	30	Pass
153	5765	-10.01	30	Pass
161	5805	-9.19	30	Pass

Test Plots

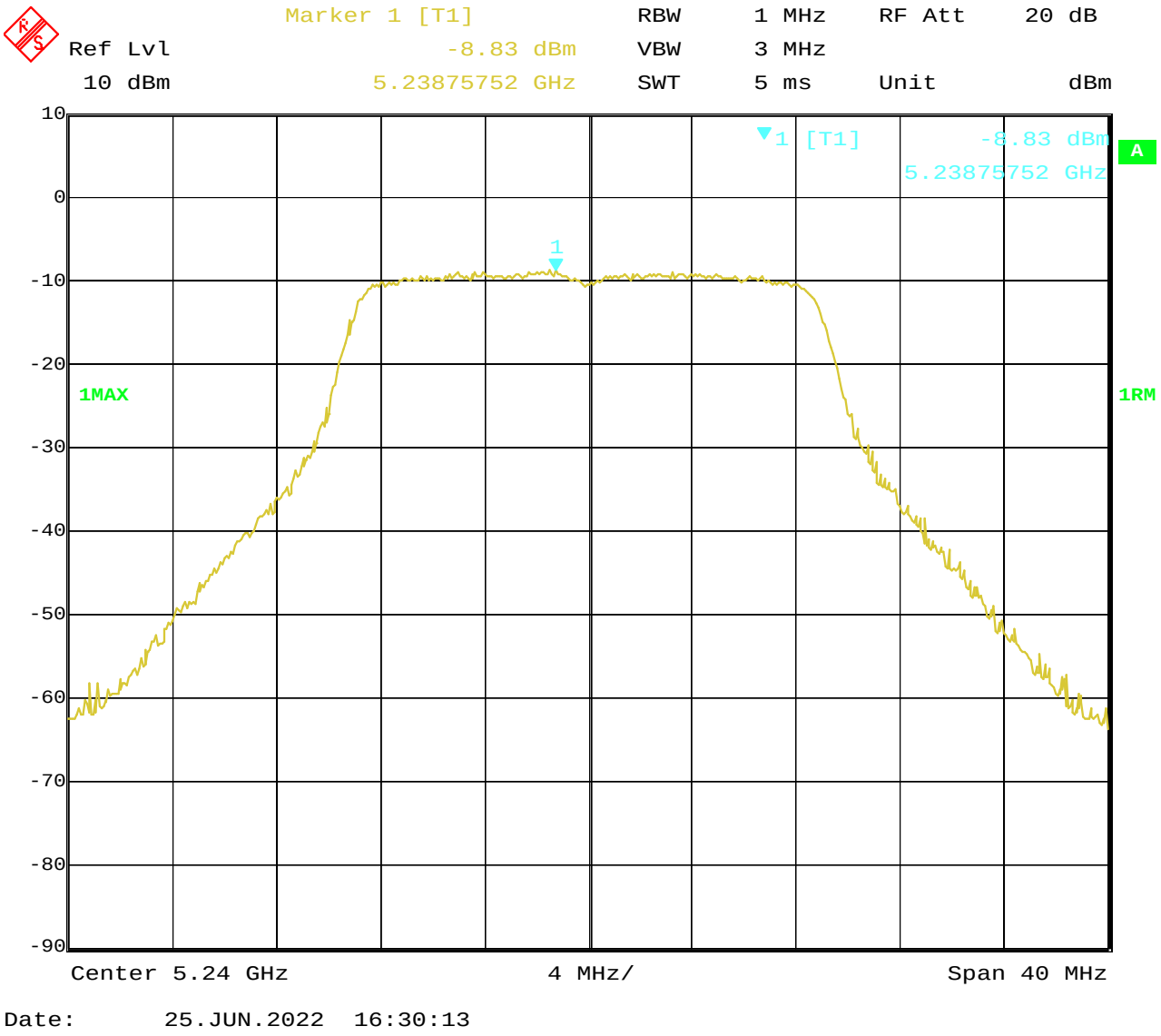
1.802.11n at mcs0 of CH36



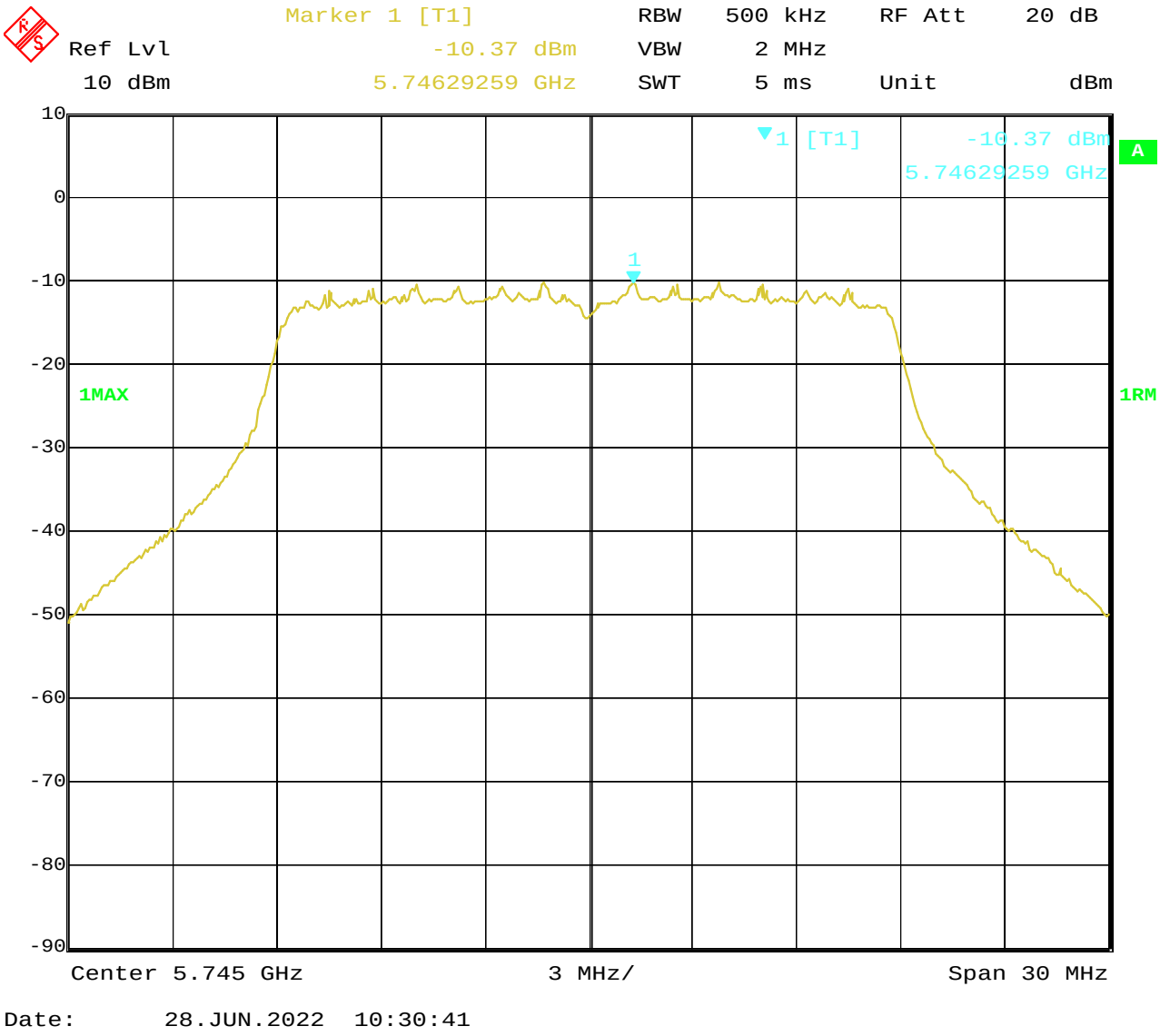
2.802.11n at mcs0 of CH40



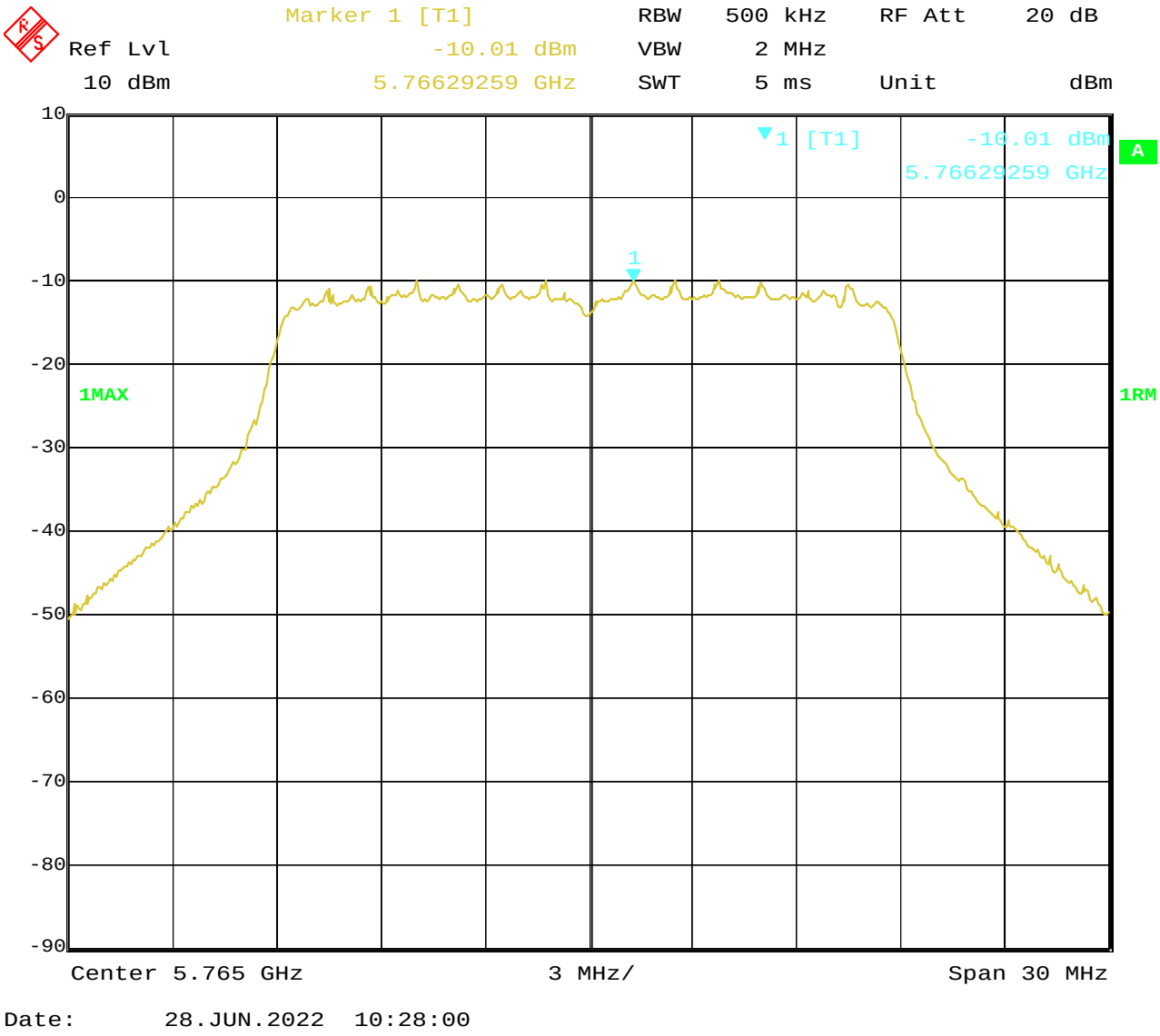
3.802.11n at mcs0 of CH48



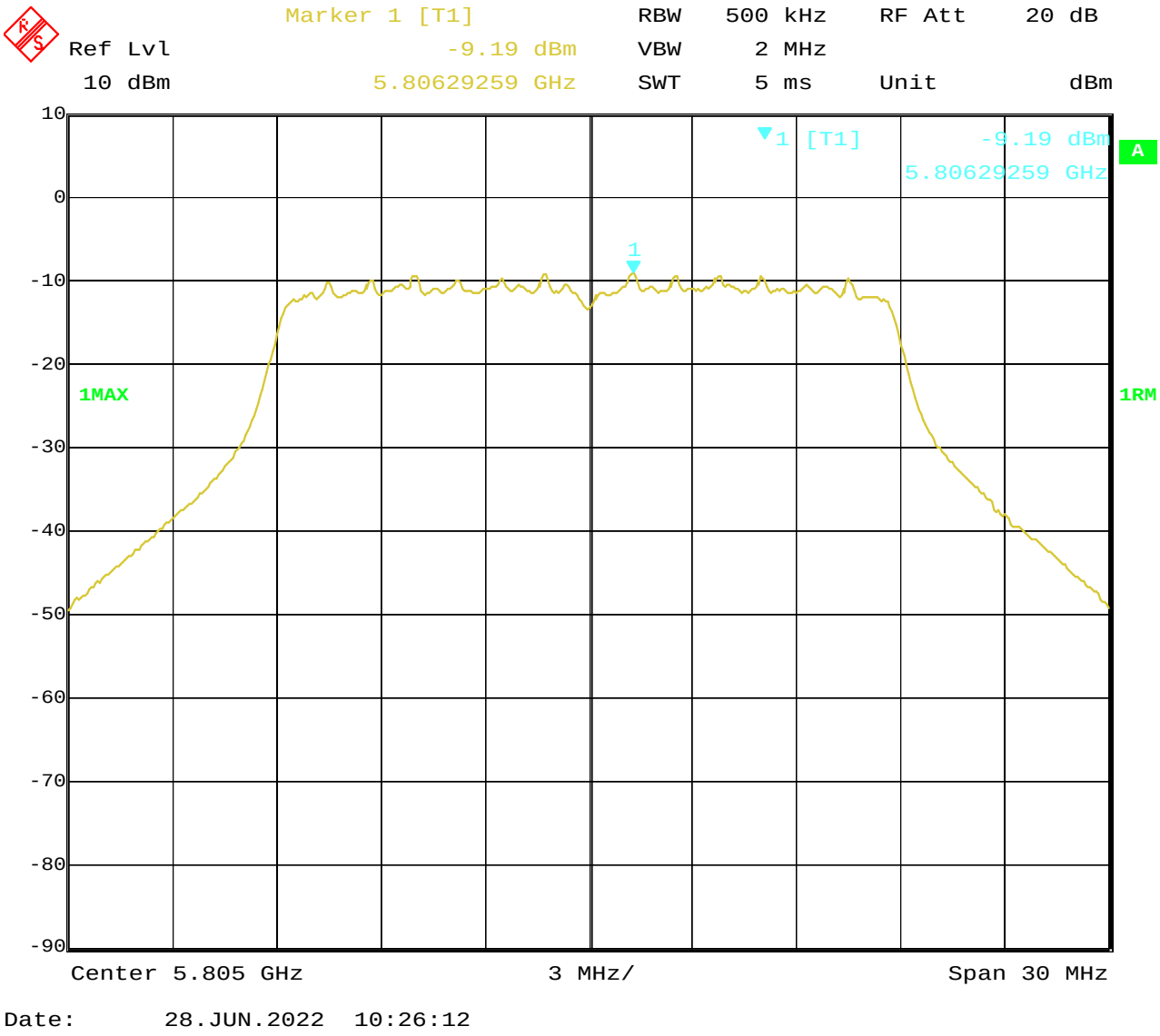
4.802.11n at mcs0 of CH149



5.802.11n at mcs0 of CH153



6.802.11n at mcs0 of CH161

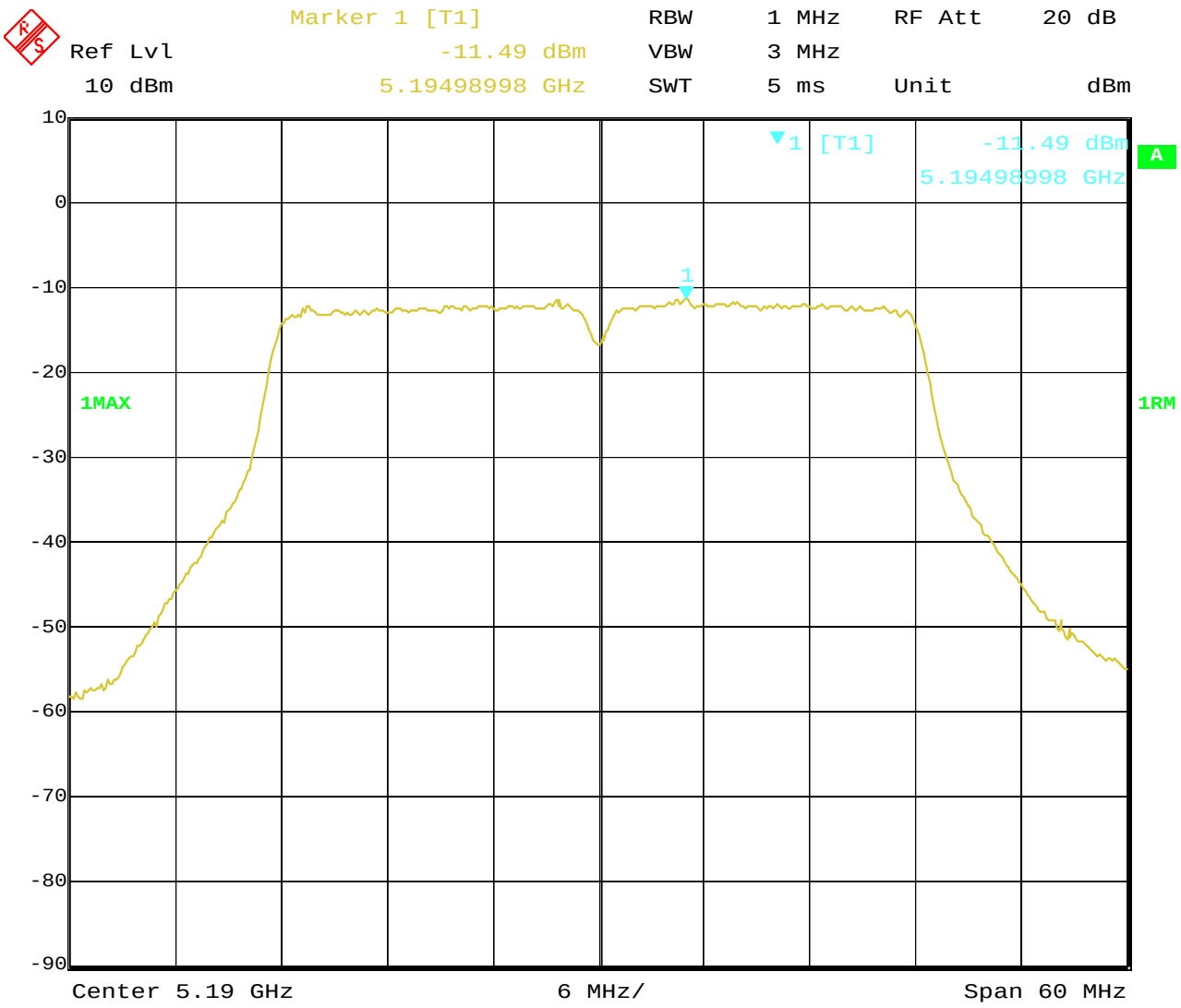


EUT	TQSky Tbox	Model	TBOX
Mode	802.11n HT40 mcs0	Test Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

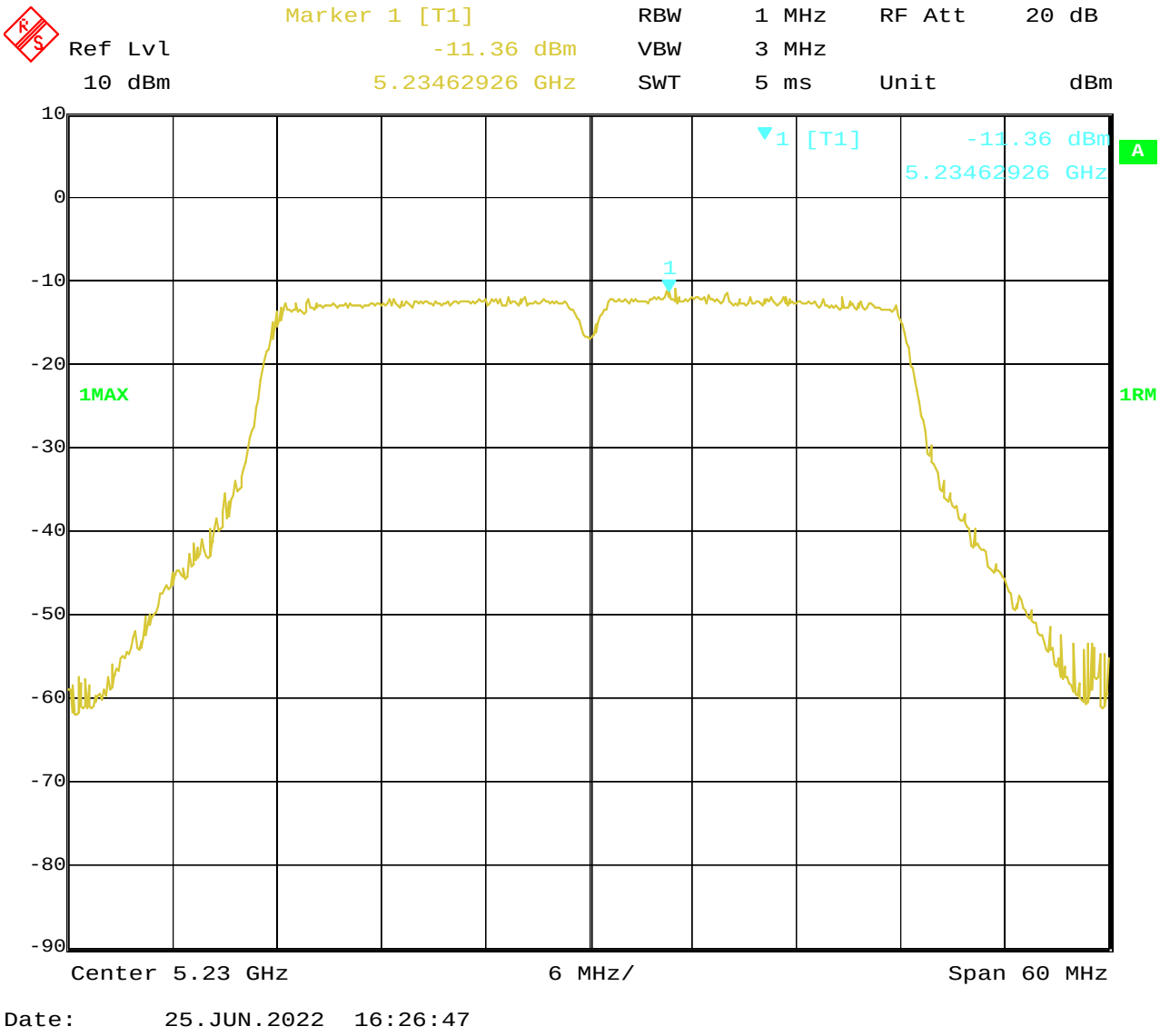
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)	Limit (dBm/MHz)	Pass/ Fail
38	5190	-11.49	11	Pass
46	5230	-11.36	11	Pass
Channel	Frequency (MHz)	Power Spectral Density(dBm/500kHz)	Limit (dBm/500kHz)	Pass/ Fail
151	5755	-13.13	30	Pass
159	5795	-12.68	30	Pass

Test Plots

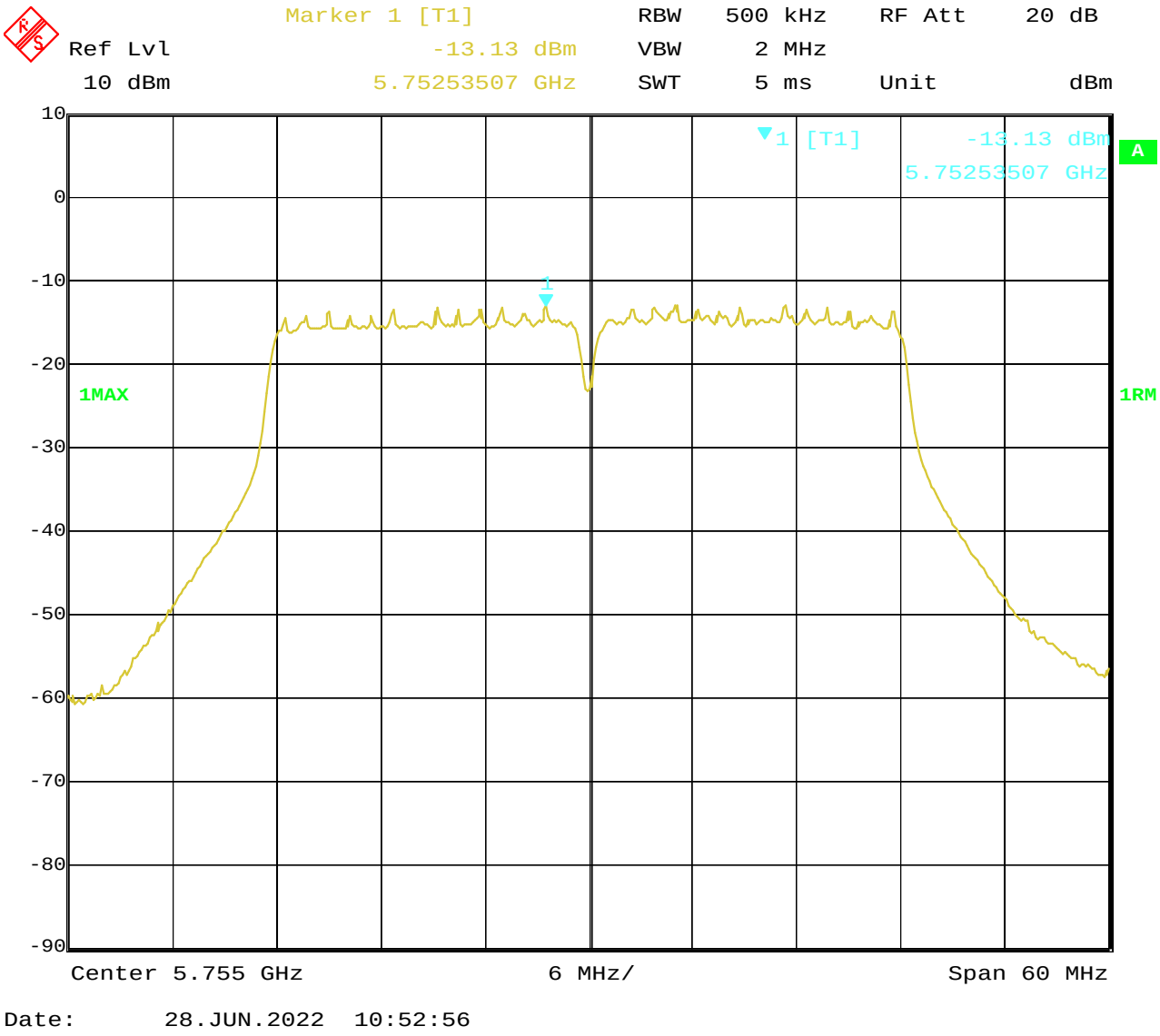
1.802.11n HT40 at mcs0 of CH38



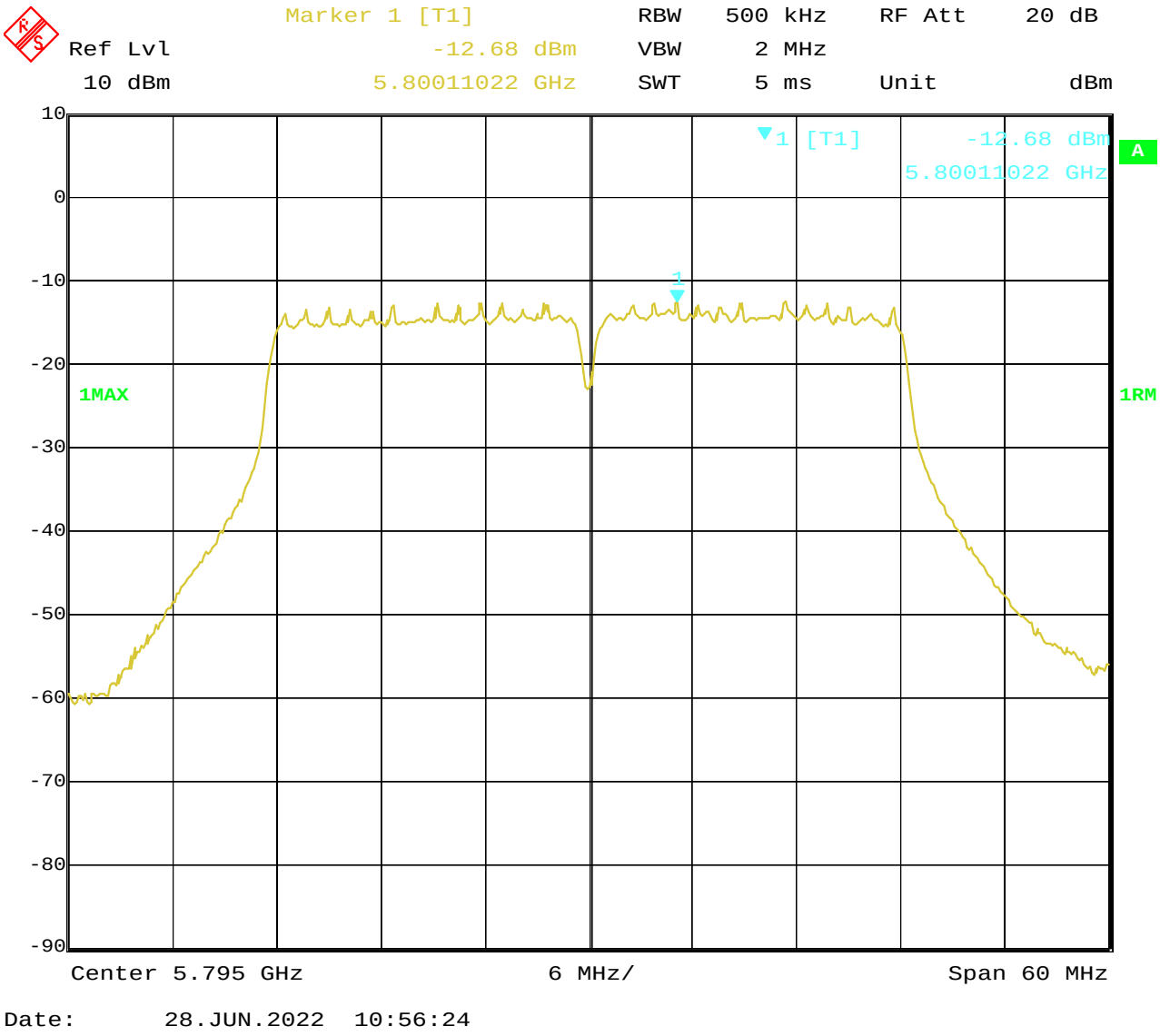
2.802.11n HT40 at mcs0 of CH46



3.802.11n HT40 at mcs0 of CH151



4.802.11n HT40 at mcs0 of CH159

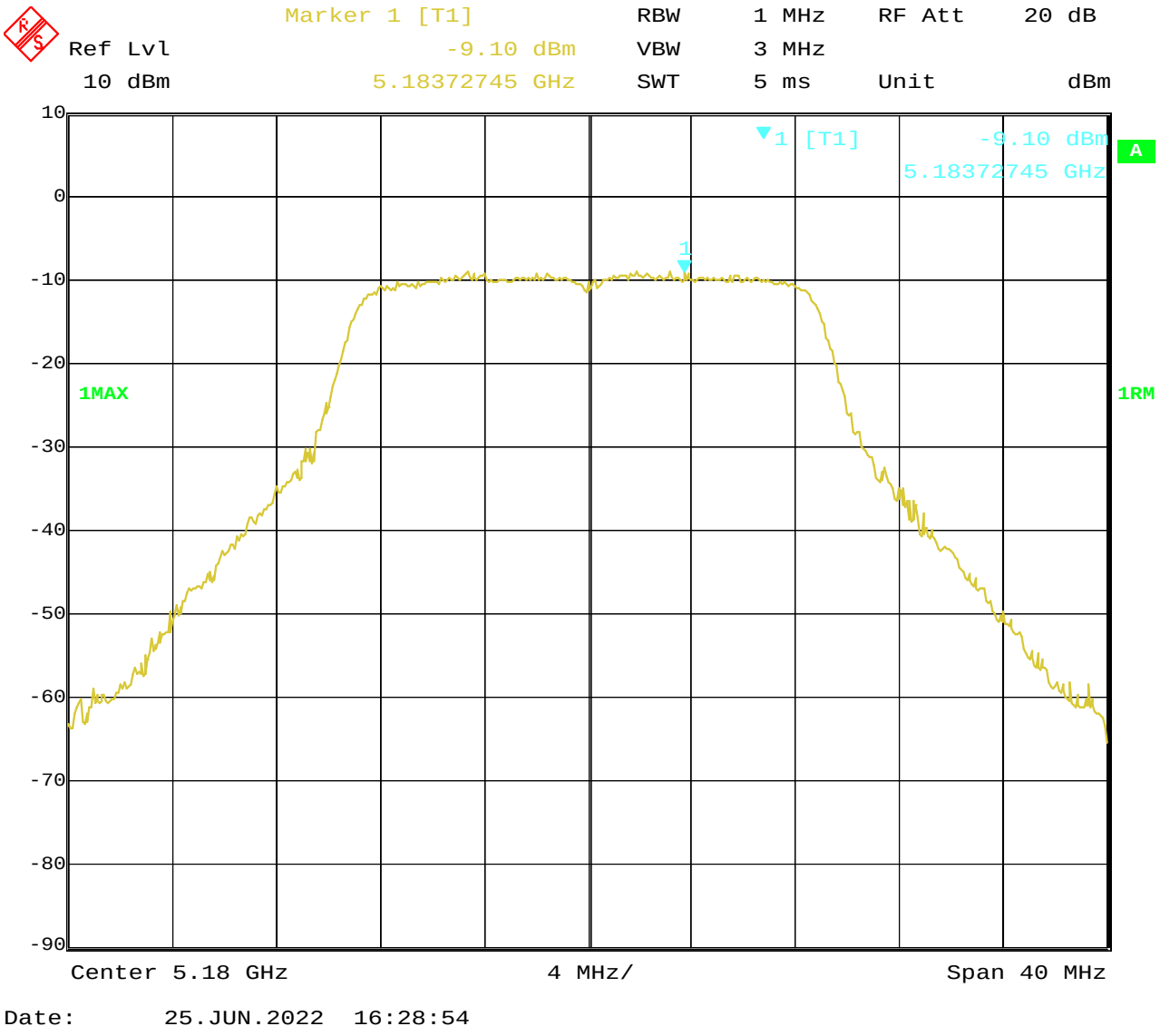


EUT	TQSky Tbox	Model	TBOX
Mode	802.11ac VHT20	Test Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

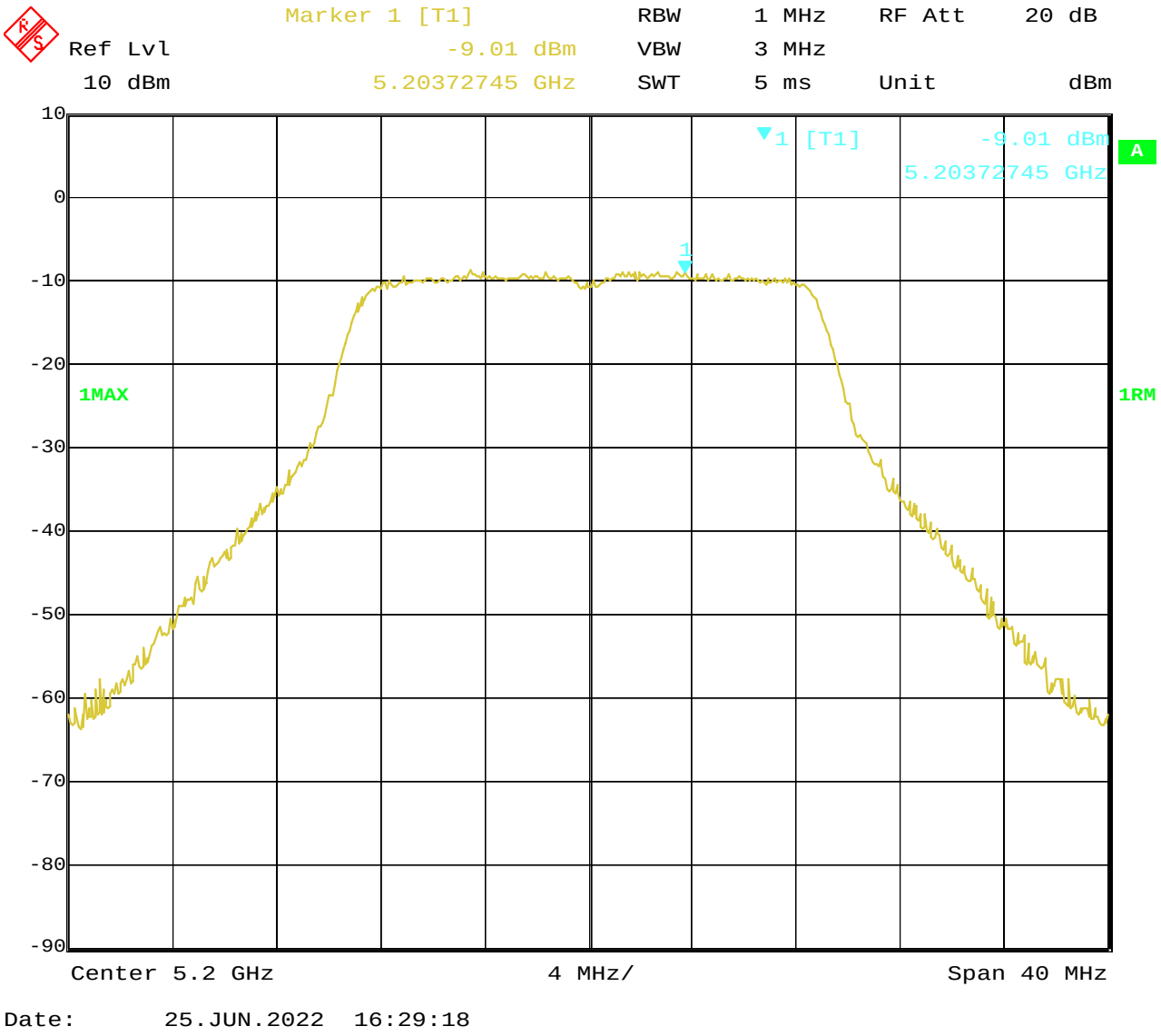
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)	Limit (dBm/MHz)	Pass/ Fail
36	5180	-9.10	11	Pass
40	5200	-9.01	11	Pass
48	5240	-8.39	11	Pass
Channel	Frequency (MHz)	Power Spectral Density(dBm/500kHz)	Limit (dBm/500kHz)	Pass/ Fail
149	5745	-10.28	30	Pass
153	5765	-10.17	30	Pass
161	5805	-9.34	30	Pass

Test Plots

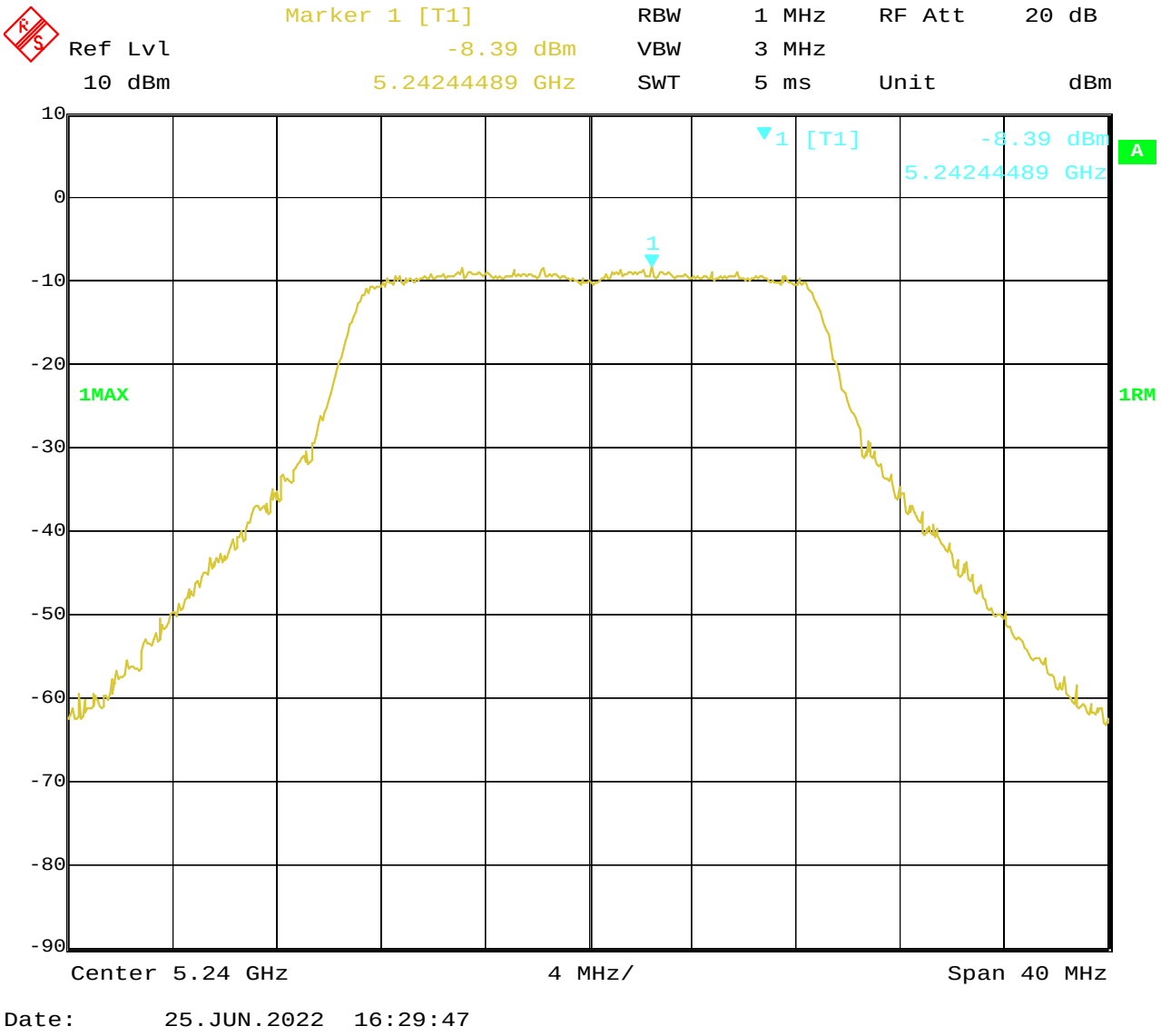
1.802.11ac at mcs0 of CH36



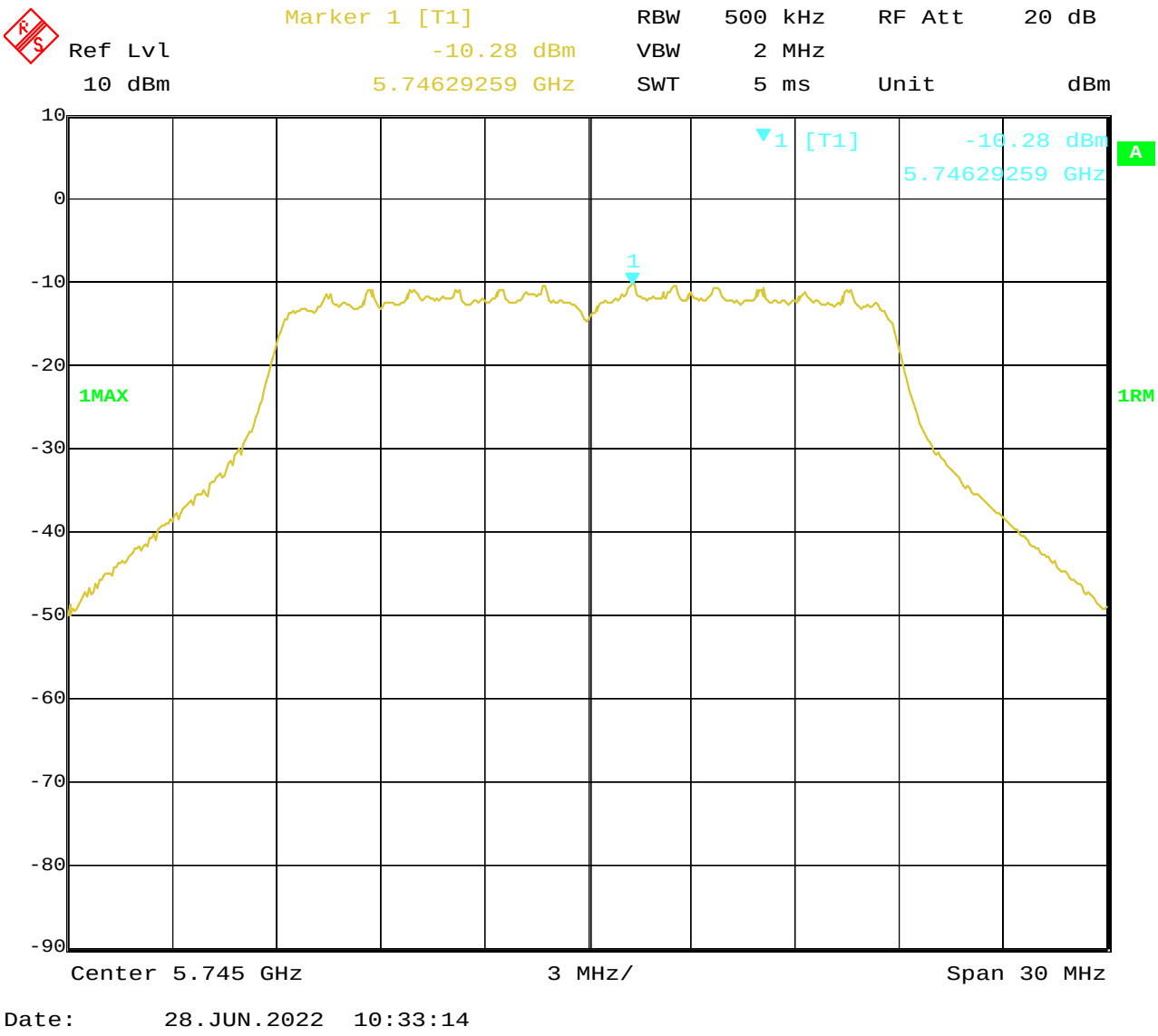
2.802.11ac at mcs0 of CH40



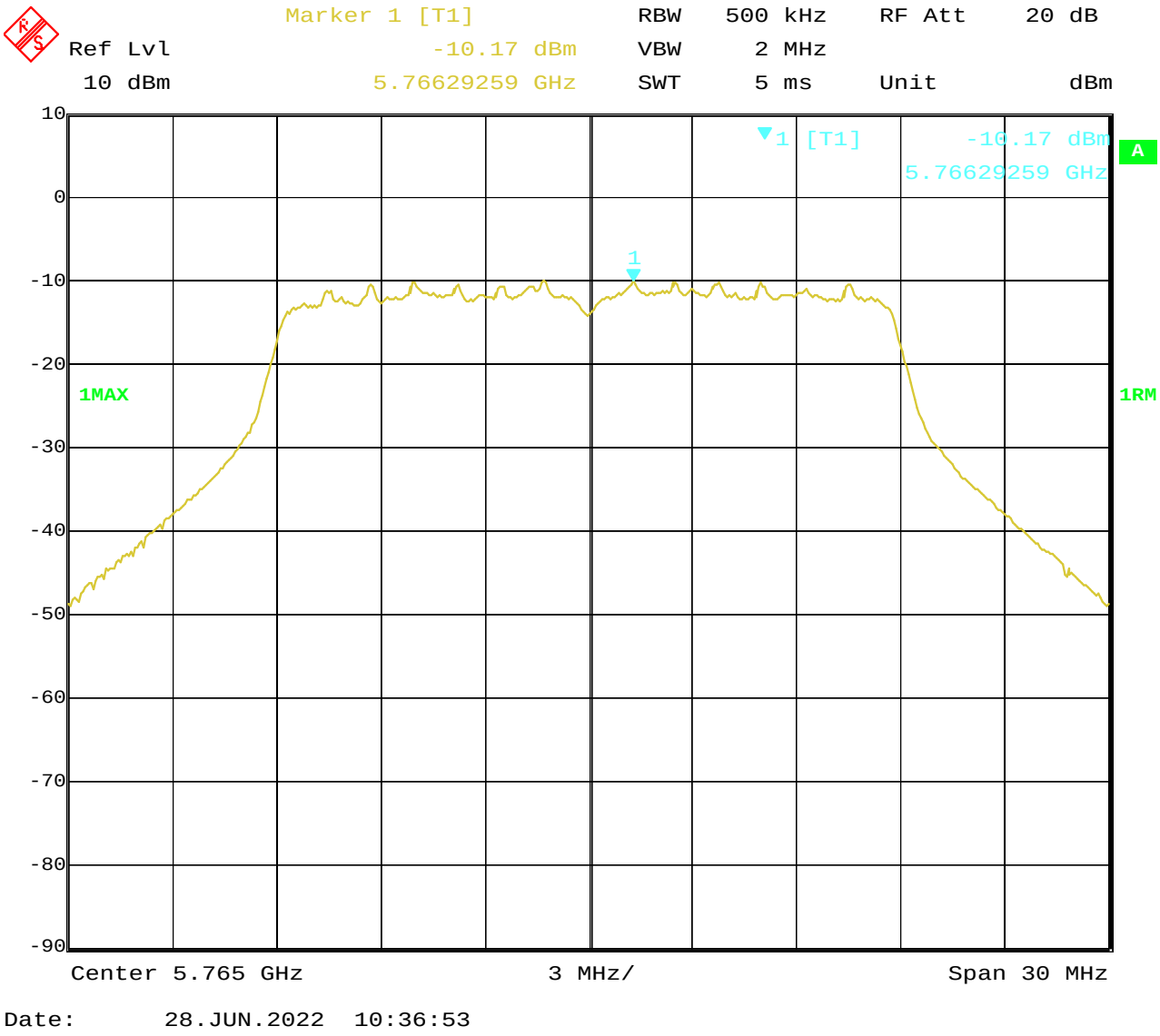
3.802.11ac at mcs0 of CH48



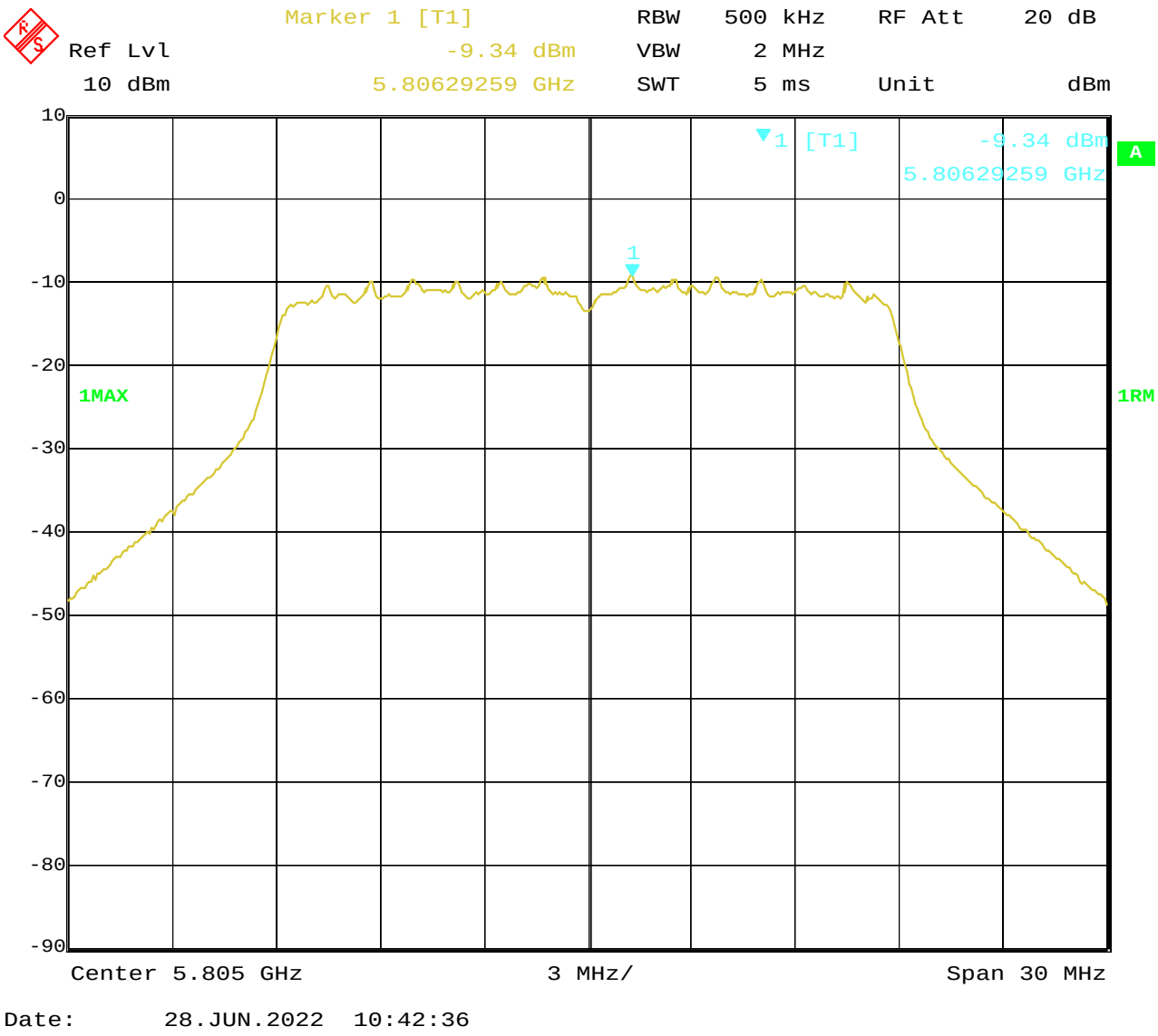
4.802.11ac at mcs0 of CH149



5.802.11ac at mcs0 of CH153



6.802.11ac at mcs0 of CH161

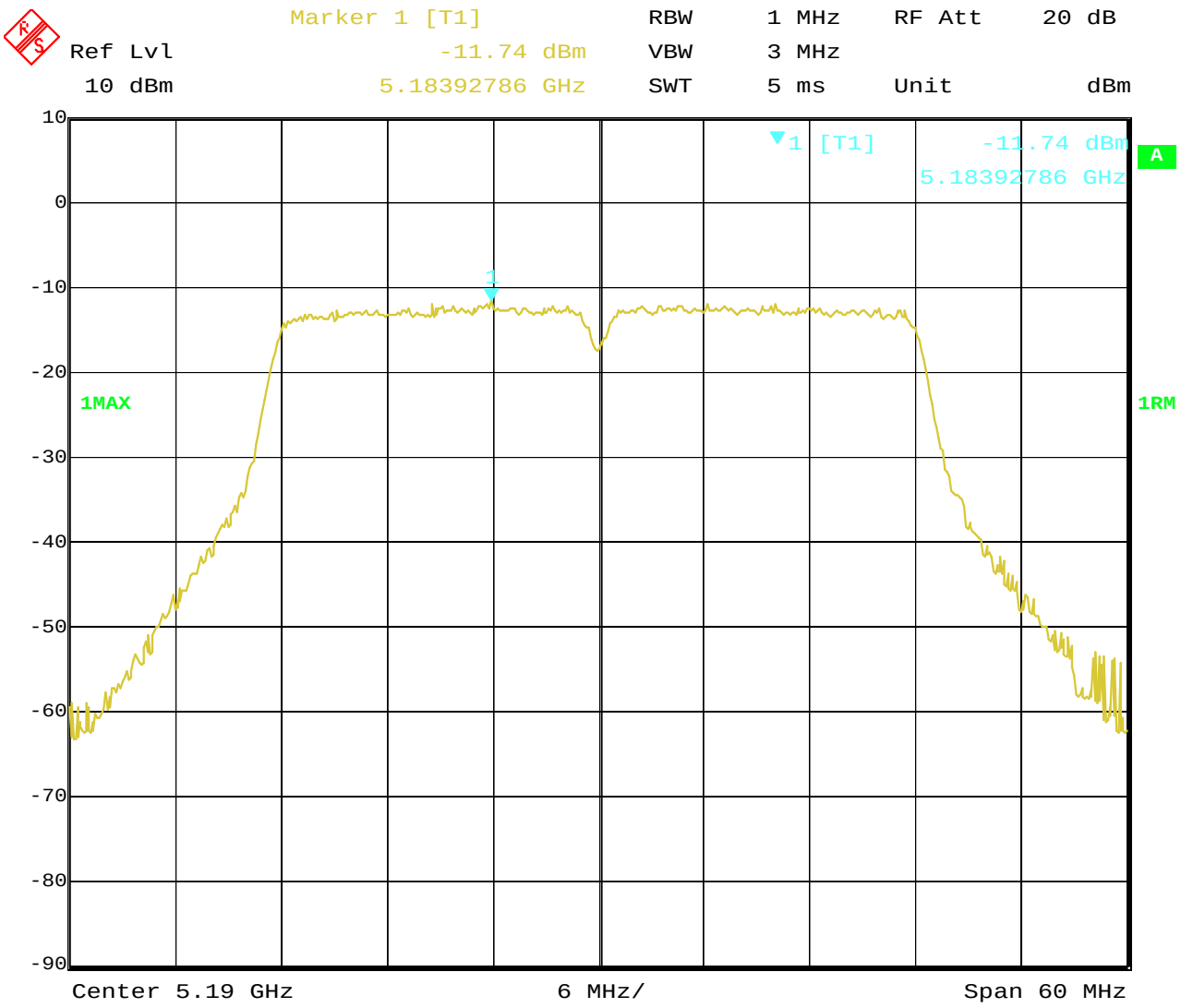


EUT	TQSky Tbox	Model	TBOX
Mode	802.11ac VHT40	Test Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

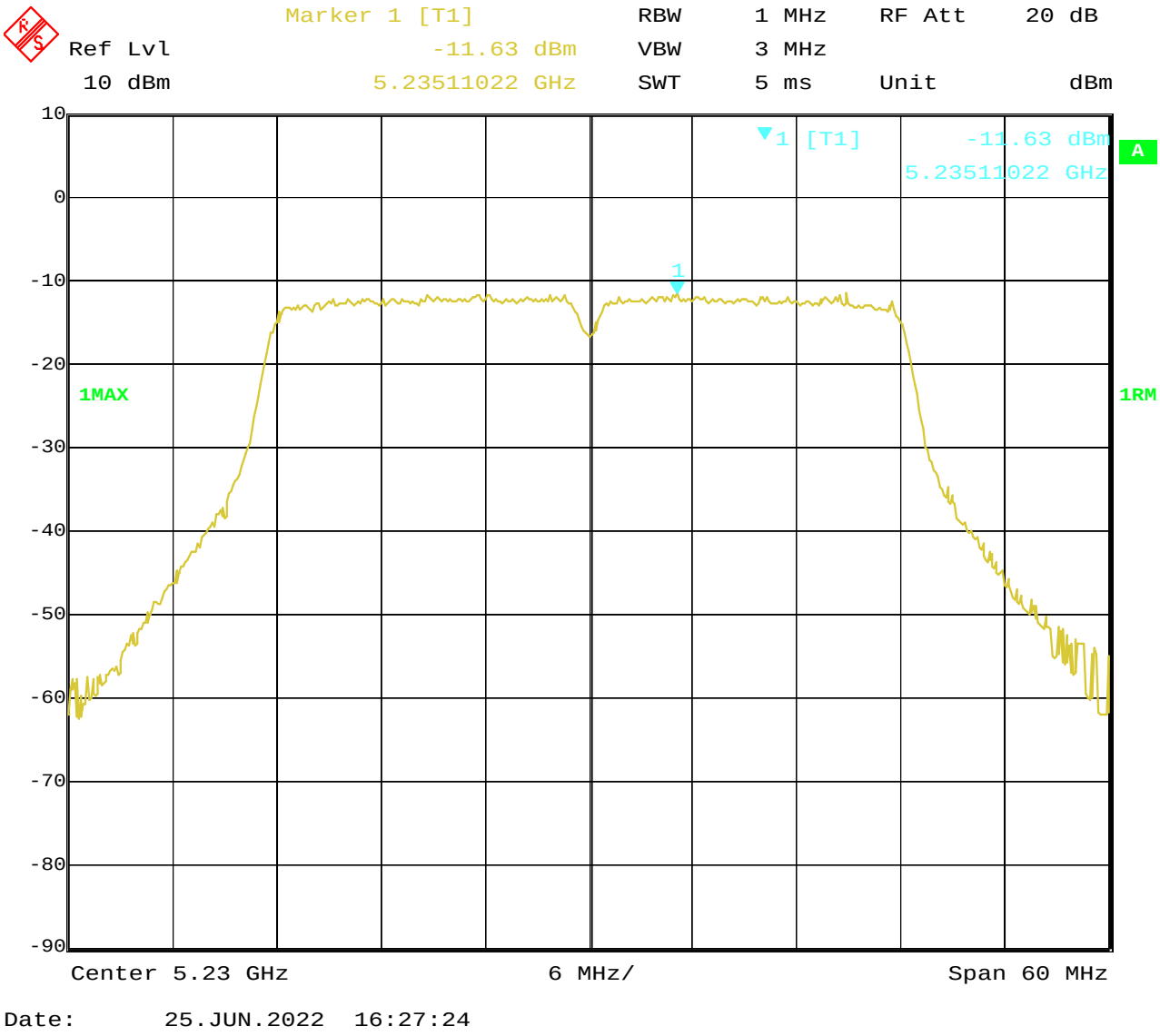
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)	Limit (dBm/MHz)	Pass/ Fail
38	5190	-11.74	11	Pass
46	5230	-11.63	11	Pass
Channel	Frequency (MHz)	Power Spectral Density(dBm/500kHz)	Limit (dBm/500kHz)	Pass/ Fail
151	5755	-13.21	30	Pass
159	5795	-12.54	30	Pass

Test Plots

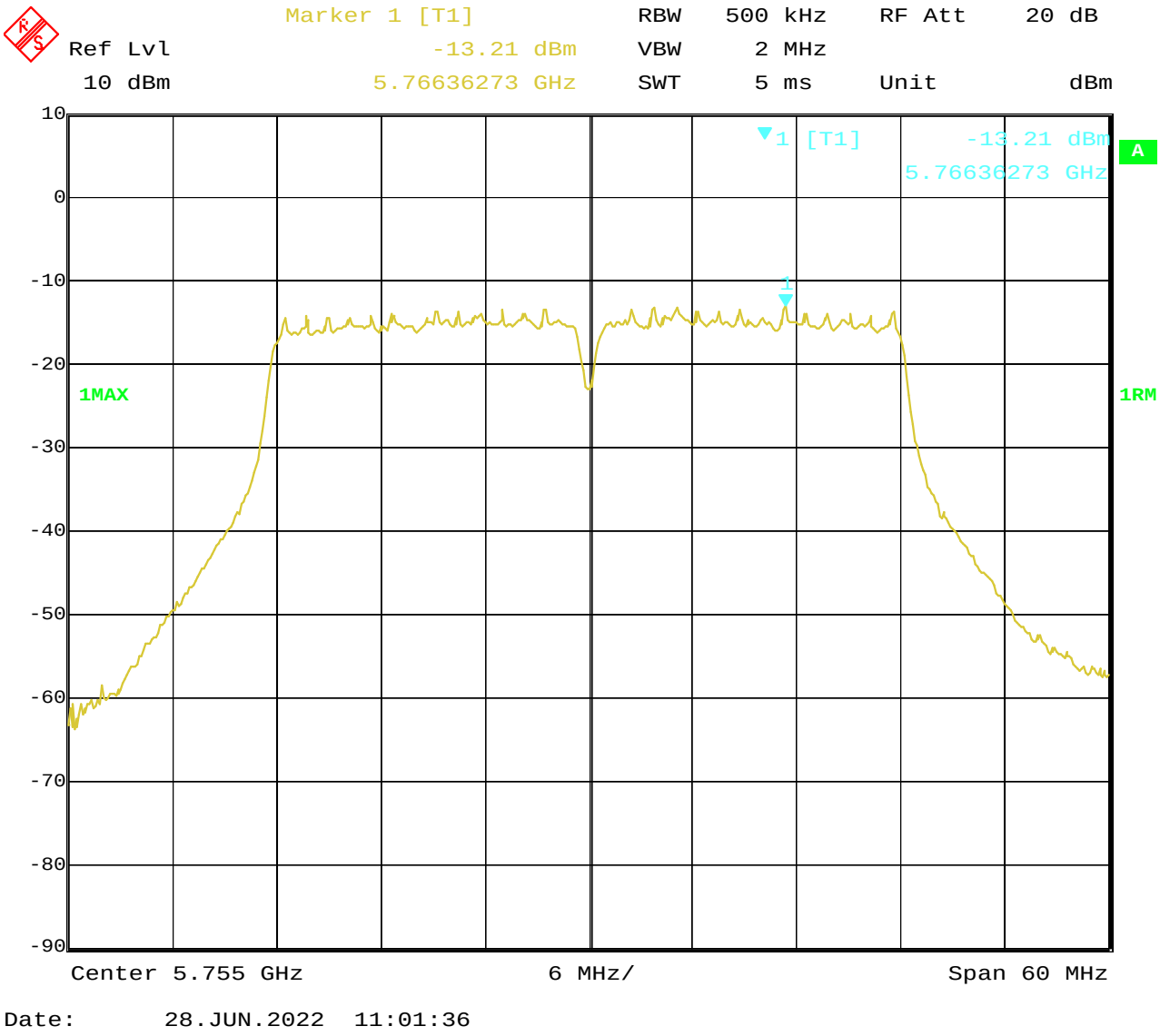
1.802.11ac at mcs0 of CH38



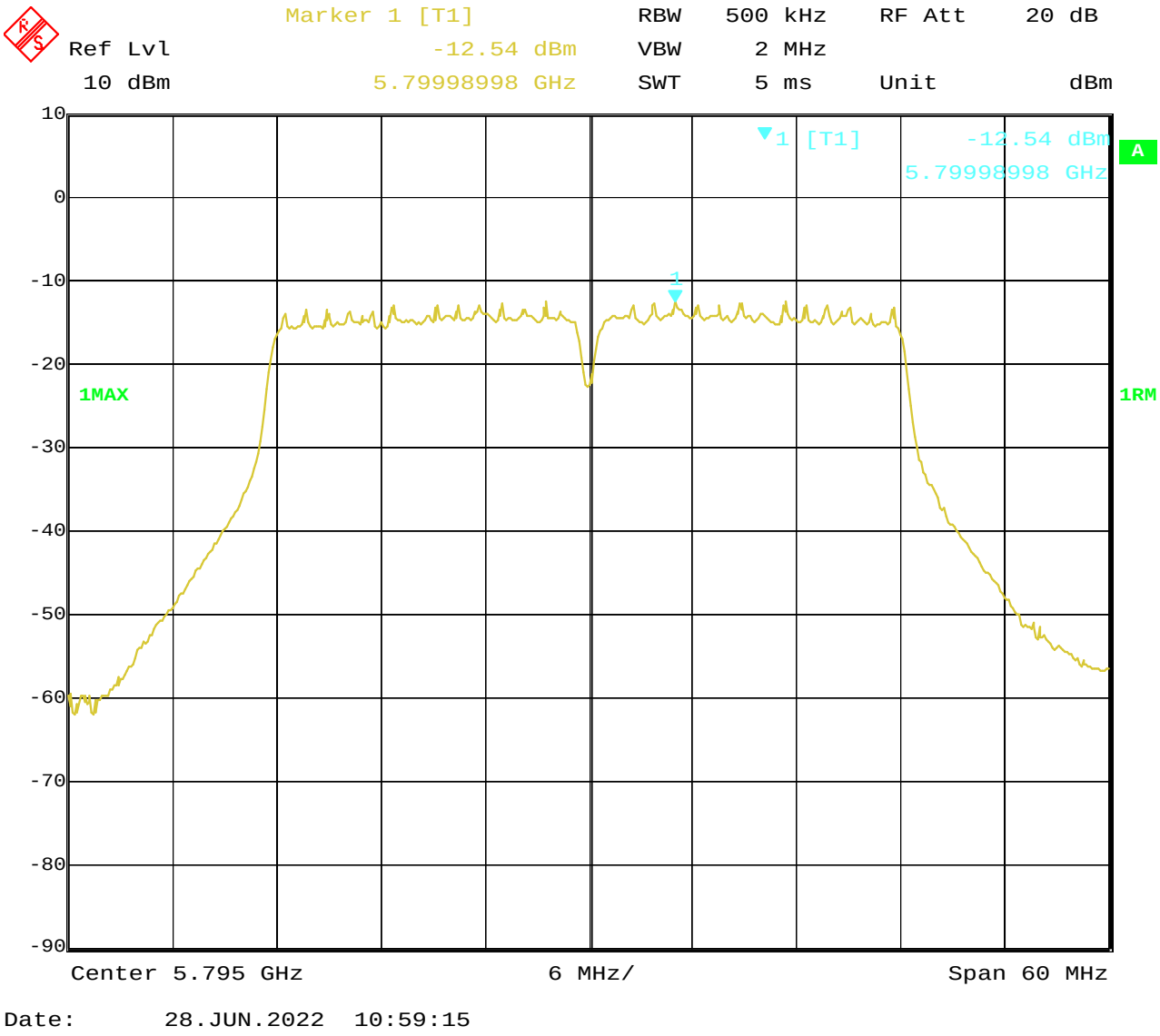
2.802.11ac at mcs0 of CH46



3.802.11ac at mcs0 of CH151



4.802.11ac at mcs0 of CH159

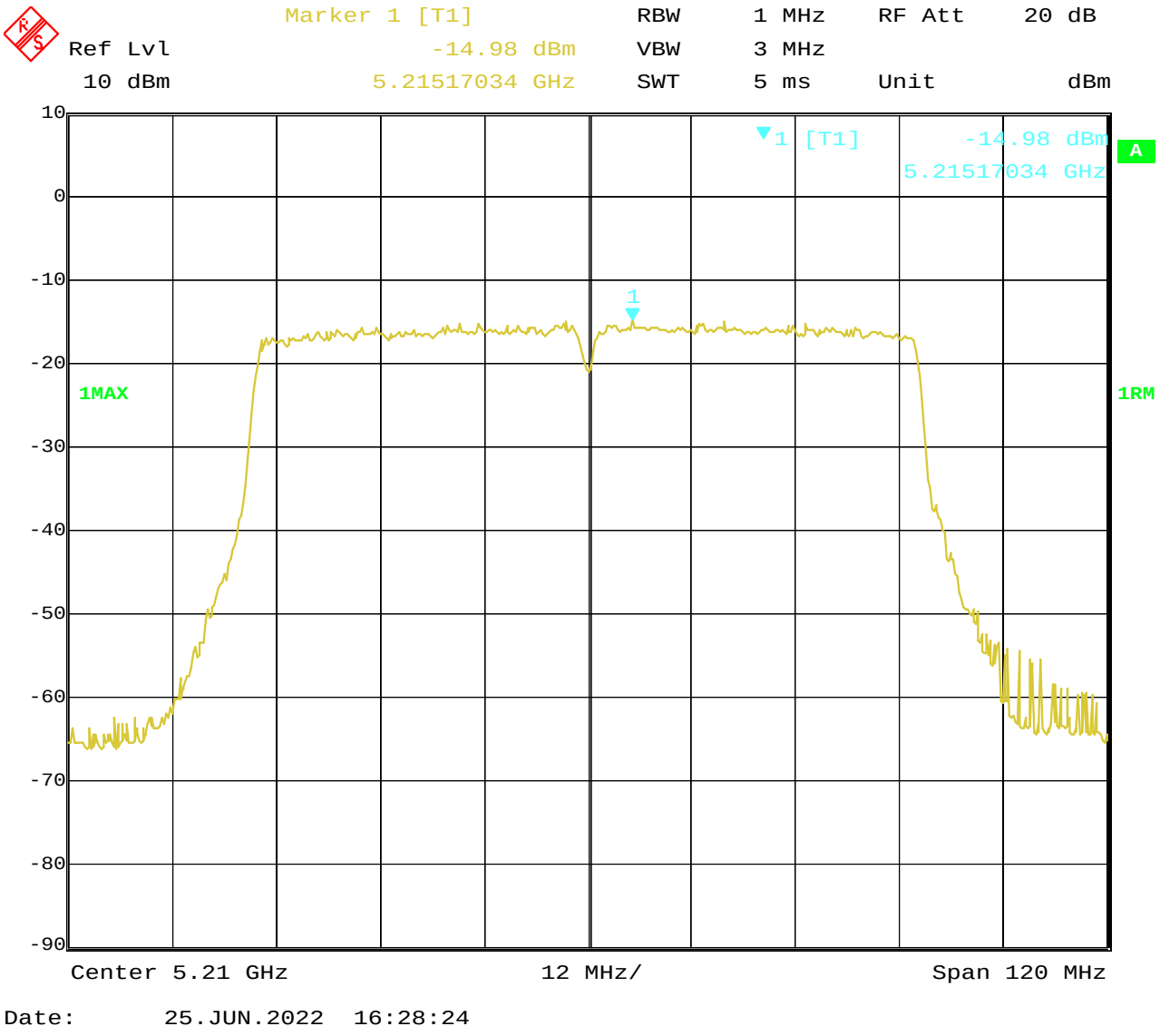


EUT	TQSky Tbox	Model	TBOX
Mode	802.11ac VHT80	Test Voltage	DC3.85V
Temperature	24 deg. C,	Humidity	56% RH

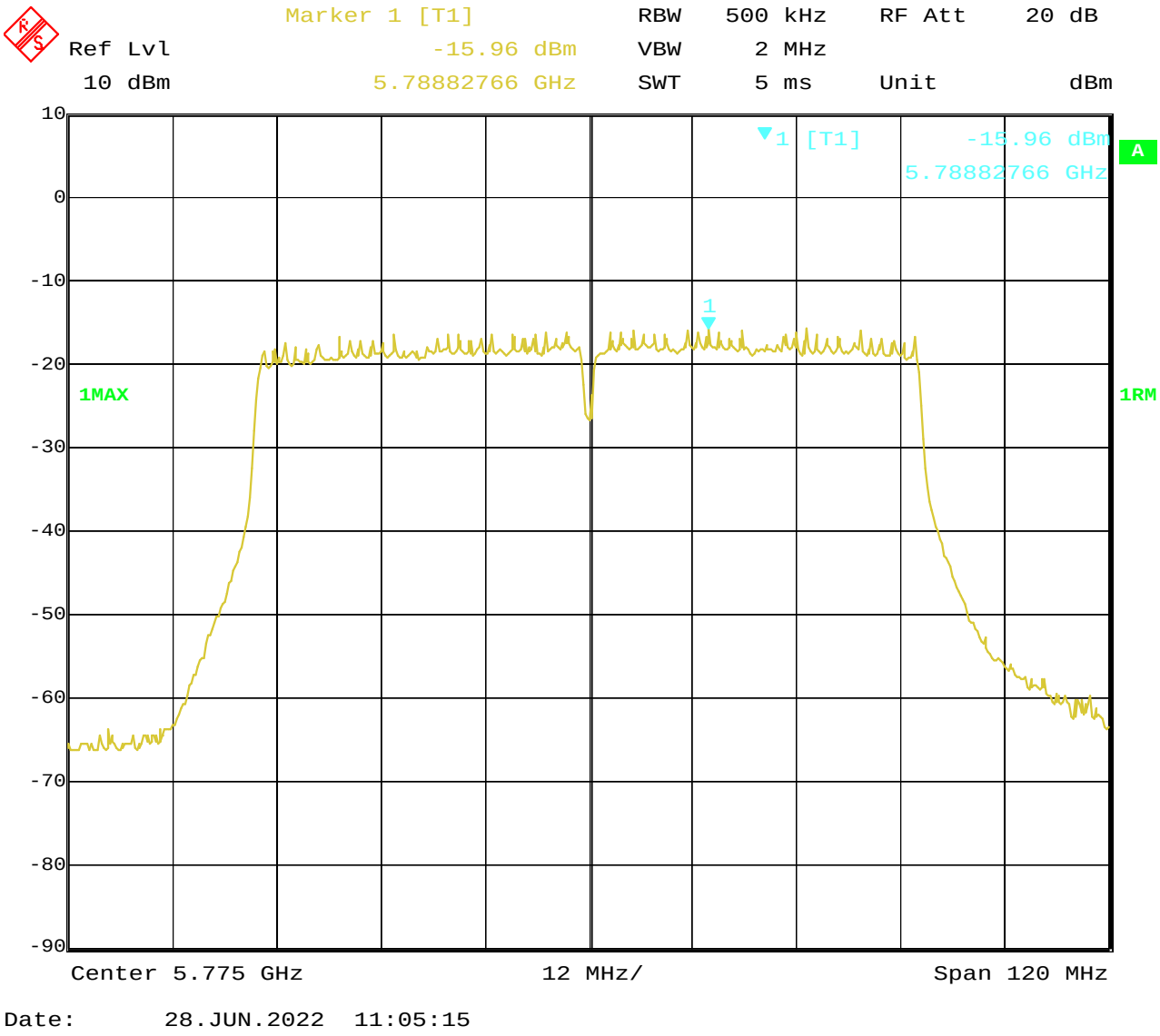
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)	Limit (dBm/MHz)	Pass/ Fail
42	5210	-14.98	11	Pass
Channel	Frequency (MHz)	Power Spectral Density(dBm/500kHz)	Limit (dBm/500kHz)	Pass/ Fail
155	5775	-15.96	30	Pass

Test Plots

1.802.11ac at mcs0Mbps of CH42



2.802.11ac at mcs0Mbps of CH155



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.

10.3 Test Result

Channel 36 (5180MHz)

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
3.85V	5180.0319
3.3V	5180.0323
4.2V	5180.0337
Max. Deviation (MHz)	0.0337
Max. Deviation (ppm)	6.51

Rated working voltage: DC3.85V

Temperature vs. Frequency Stability

Temperature（℃）	Measurement Frequency (MHz)
-30	5180.0327
-20	5180.0340
-10	5180.0331
0	5180.0338
10	5180.0326
20	5180.0335
30	5180.0318
40	5180.0325
50	5180.0330
Max. Deviation (MHz)	0.0340
Max. Deviation (ppm)	6.56

Channel 149 (5745MHz)

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
3.85V	5745.0523
3.3V	5745.0535
4.2V	5745.0518
Max. Deviation (MHz)	0.0535
Max. Deviation (ppm)	9.31

Rated working voltage: DC3.85V

Temperature vs. Frequency Stability

Temperature（℃）	Measurement Frequency (MHz)
-30	5745.0522
-20	5745.0513
-10	5745.0528
0	5745.0508
10	5745.0511
20	5745.0527
30	5745.0533
40	5745.0520
50	5745.0533
Max. Deviation (MHz)	0.0533
Max. Deviation (ppm)	9.28

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 mount in dB that the directional gain of the antenna exceeds 6 dBi.

11.2 Antenna Connected construction

FPC antennas used. The gain of the antennas is 0.8dBi maximum. (Declared by the applicant)

12.0 FCC ID Label

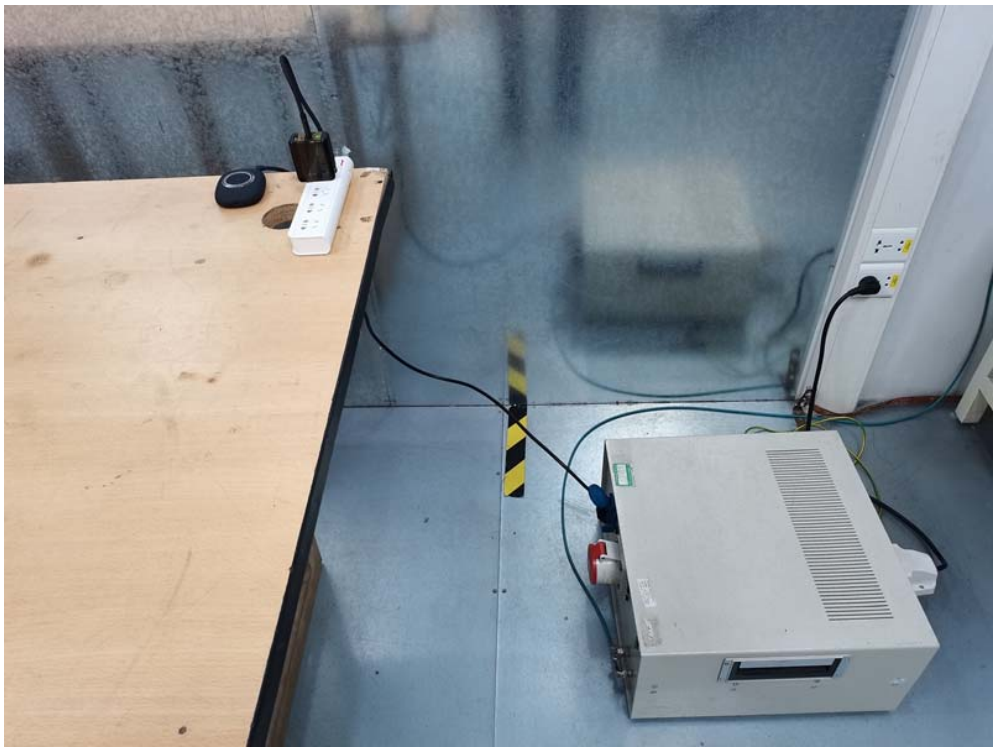
FCC ID: 2A7Q4-TBOX

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.

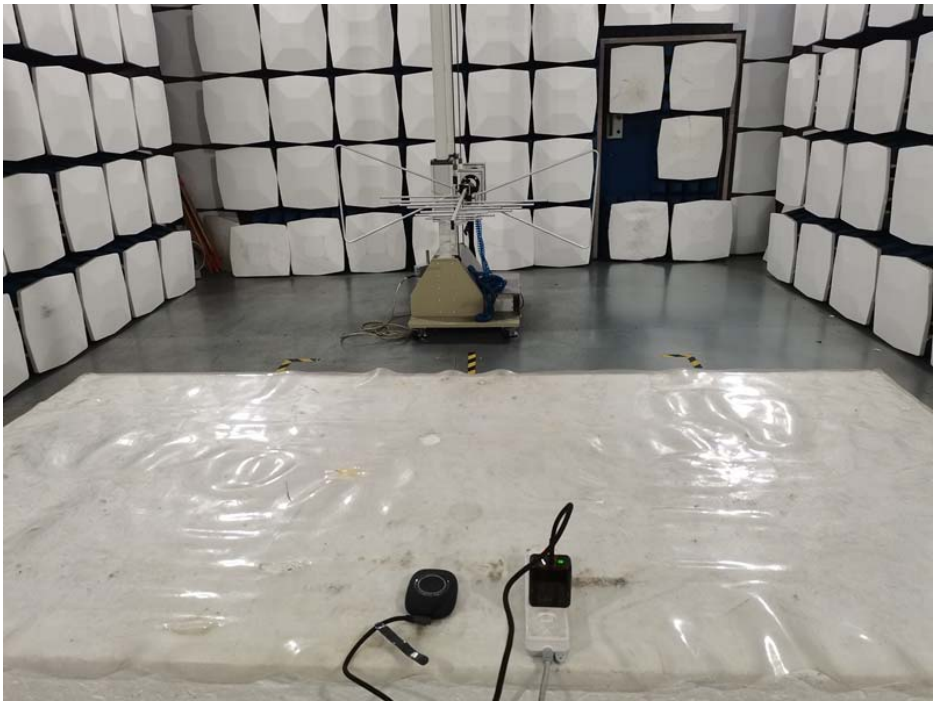
Mark Location:

13.0 Photo of testing

Conducted Emission Test Setup:



Radiated Emission Test Setup



Photos of EUT

Please see test report TW2206192-01E

--End of the report--