

TECHNICAL REPORT



Report No.:

TW2011121-04E

File Reference No.:

2020-12-15

Applicant: GLORY STAR TECHNICS (SHENZHEN) CO., LTD.

Product: Commercial Kiosk Tablet

Model No.: NEB215, NEB156

Trademark: GloryStar

Test Standards: FCC Part 15 Subpart E, Paragraph 15.407

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

Approved By

A handwritten signature in black ink, appearing to read "Jack Chung".

Jack Chung

Manager

Dated: December 15, 2020

Results appearing herein relate only to the sample tested

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

SHENZHEN TIMEWAY TESTING LABORATORIES

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

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



Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

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

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

CNAS-LAB Code: L2292

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

FCC-Registration No.: 744189

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 744189.

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

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

A2LA (Certification Number:5013.01)

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



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-02

For 3m Anechoic Chamber

1.2 Applicant Details

Applicant: GLORY STAR TECHNICS (SHENZHEN) CO., LTD.

Address: Bldg 9, 4/F ZhongYunTai Technology Industrial Park, Tangtou No.1 Road,Shiyan Street, Baoan, Shenzhen, China

Telephone: (0755)-26001808-305

Fax: (0755)-26002933

1.3 Description of EUT

Product: Commercial Kiosk Tablet

Manufacturer: GLORY STAR TECHNICS (SHENZHEN) CO., LTD.

Address: Bldg 9, 4/F ZhongYunTai Technology Industrial Park, Tangtou No.1 Road,Shiyan Street, Baoan, Shenzhen, China

Brand Name: N/A

Additional Brand Name: N/A

Model Number: NEB215, NEB156

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: 6.5Mbps, mcs1: 13Mbps, mcs2: 19.5Mbps, mcs3: 26Mbps, mcs4: 39Mbps, mcs5: 52Mbps, mcs6: 58.5Mbps, mcs7: 65Mbps

IEEE 802.11n/HT40: mcs0: 15Mbps, mcs1: 30Mbps, mcs2: 45Mbps, mcs3: 60Mbps, mcs4: 90Mbps, mcs5: 120Mbps, mcs6: 135Mbps, mcs7: 150Mbps

IEEE 802.11ac: Up to 433.3Mbps

Antenna: Two FPC antennas used.

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Antenna Gain: 2.0dBi for each one. (get from the antenna specification provided the applicant)
Test Mode: During testing, EUT was set to 100% duty cycle. 6Mbps air data rate was the worst case for 802.11a mode; mcs0 air data rate was the worst case for 802.11n mode; 23.9Mbps air data rate was the worst case for 802.11ac mode.
Frequency Selection By software
Input Voltage: NEB156: DC12V, 5A,15W (MAX); NEB215: DC12V, 5A,32W (MAX)
Power Supply: Model: SOY-1200500-327; Input: 100-240V~50/60Hz,1.7A Max;
Output: 12.0V—5.0A,60.0W

Each Channel Operation Frequency

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

The selected test channels as follows:

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

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

1.4 Submitted Sample: 2 Samples

1.5 Test Duration

2020-11-10 to 2020-12-15

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB

Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer

A handwritten signature in black ink that reads "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
LISN	R&S	EZH3-Z5	100294	2020-06-23	2021-06-22
LISN	R&S	EZH3-Z5	100253	2020-06-23	2021-06-22
Ultra Broadband ANT	R&S	HL562	100157	2020-06-23	2021-06-22
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2020-06-23	2021-06-22
Loop Antenna	EMCO	6507	00078608	2018-06-25	2021-06-24
Spectrum	R&S	FSIQ26	100292	2020-06-23	2021-06-22
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2019-06-21	2021-06-20
Horn Antenna	R&S	BBHA 9120D	9120D-631	2018-07-09	2021-07-08
Power meter	Anritsu	ML2487A	6K00003613	2019-08-22	2020-08-21
Power sensor	Anritsu	MA2491A	32263	2019-08-22	2020-08-21
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2018-07-04	2021-07-03
9*6*6 Anechoic	--	--	N/A	2018-02-07	2021-02-06
EMI Test Receiver	RS	ESVB	826156/011	2020-06-23	2021-06-22
EMI Test Receiver	RS	ESH3	860904/006	2020-06-23	2021-06-22
Spectrum	HP/Agilent	E4407B	MY50441392	2020-06-23	2021-06-22
Spectrum	RS	FSP	1164.4391.38	2020-01-16	2020-01-15
RF Cable	Zhengdi	ZT26-NJ-NJ-8 M/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	2021-01-07	2020-01-06

2.2 Automation Test Software

For Conducted Emission Test

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

For Radiated Emissions

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

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3.0 Technical Details

3.1 Summary of test results

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

3.2 Test Standards

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

4.0 EUT Modification

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES.

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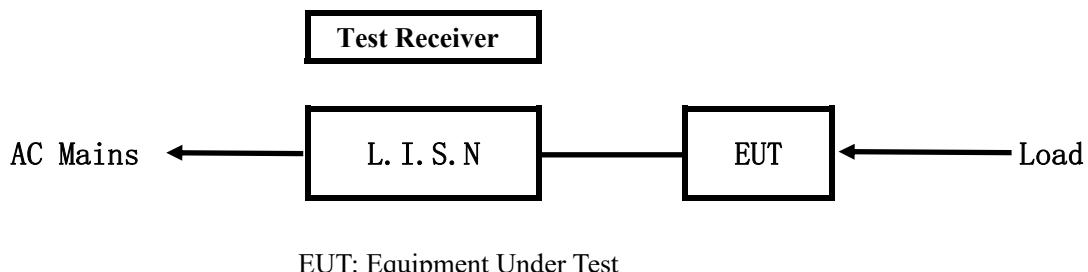
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5. Power Line Conducted Emission Test

5.1 Schematics of the test

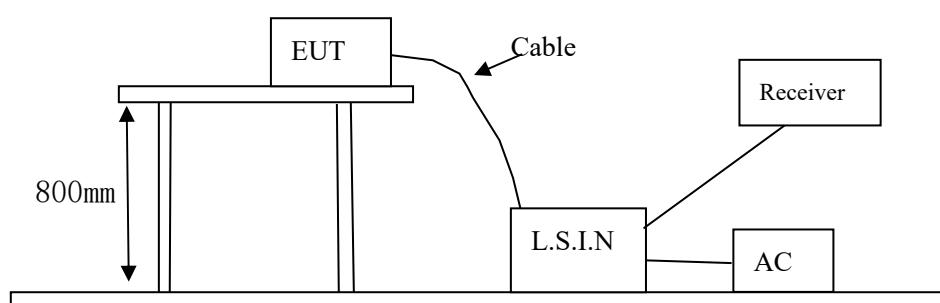


5.2 Test Method and test Procedure

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
Commercial Kiosk Tablet	GLORY STAR TECHNICS (SHENZHEN) CO., LTD.	NEB215, NEB156	2AACS-NEB15-21FOR99

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B. Internal Device

Device	Manufacturer	Model	Rating

C. Peripherals

Device	Manufacturer	Model	Rating
Power Supply	SOY	SOY-1200500-327	Input: 100-240V~50/60Hz,1.7A Max; Output: 12.0V 5.0A,60.0W

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)	Class B 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.

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

EUT Operating Environment

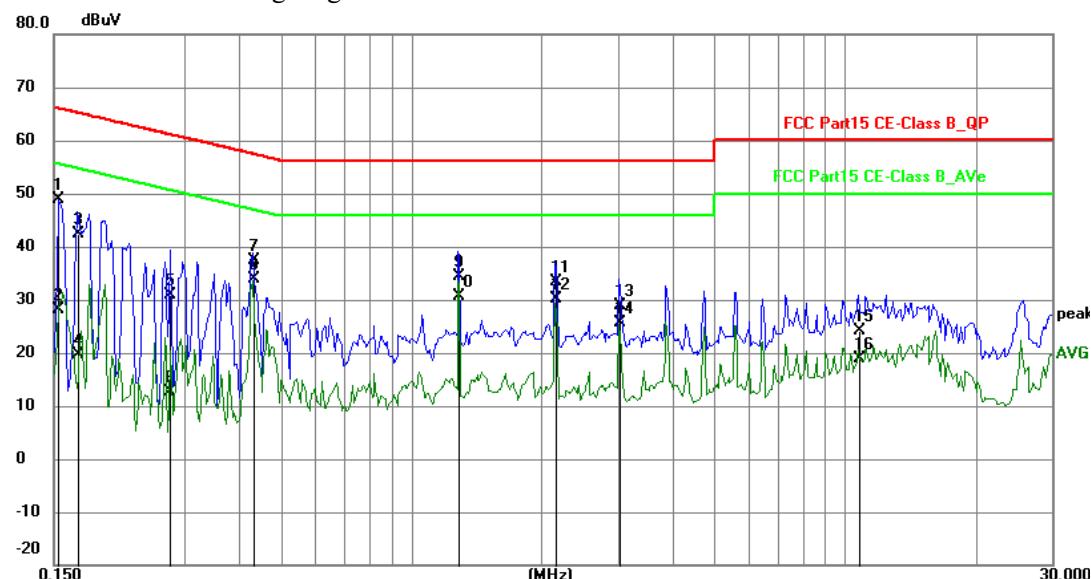
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keeping WIFI Transmitting (NEB156)

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	0.1539	39.04	9.78	48.82	65.79	-16.97	QP	P
2	0.1539	18.28	9.78	28.06	55.79	-27.73	AVG	P
3	0.1695	32.71	9.77	42.48	64.98	-22.50	QP	P
4	0.1695	9.79	9.77	19.56	54.98	-35.42	AVG	P
5	0.2787	21.09	9.76	30.85	60.85	-30.00	QP	P
6	0.2787	2.94	9.76	12.70	50.85	-38.15	AVG	P
7	0.4308	27.70	9.77	37.47	57.24	-19.77	QP	P
8	0.4308	24.11	9.77	33.88	47.24	-13.36	AVG	P
9	1.2888	24.53	9.79	34.32	56.00	-21.68	QP	P
10	1.2888	20.83	9.79	30.62	46.00	-15.38	AVG	P
11	2.1507	23.57	9.81	33.38	56.00	-22.62	QP	P
12	2.1507	20.28	9.81	30.09	46.00	-15.91	AVG	P
13	3.0116	19.10	9.84	28.94	56.00	-27.06	QP	P
14	3.0116	15.89	9.84	25.73	46.00	-20.27	AVG	P
15	10.7649	14.05	10.19	24.24	60.00	-35.76	QP	P
16	10.7649	8.75	10.19	18.94	50.00	-31.06	AVG	P

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

EUT Operating Environment

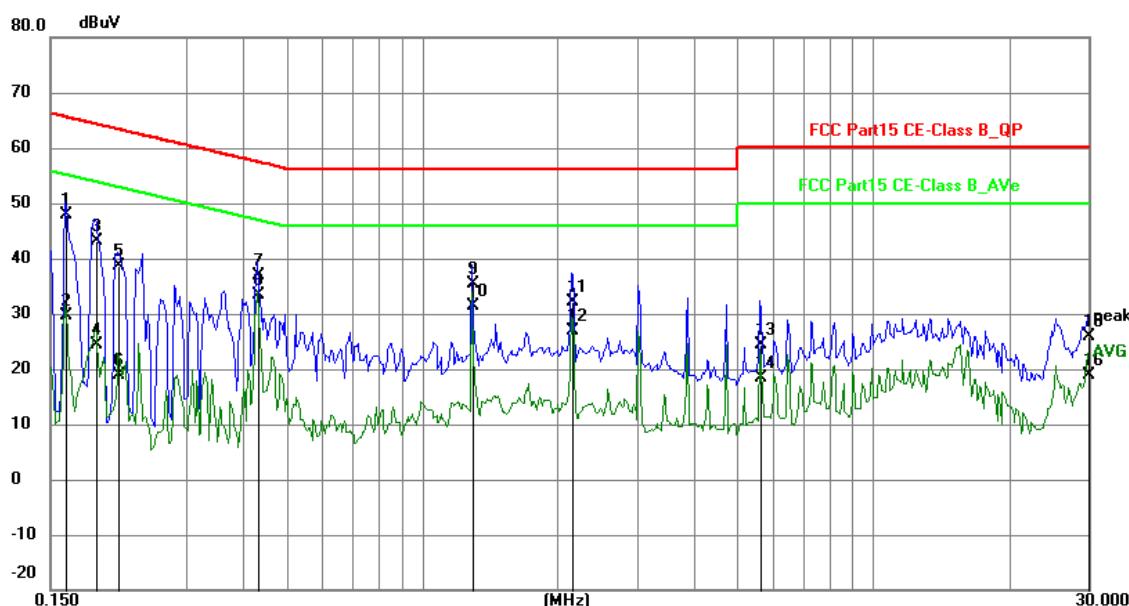
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keeping WIFI Transmitting (NEB156)

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	0.1617	38.11	9.78	47.89	65.38	-17.49	QP	P
2	0.1617	19.75	9.78	29.53	55.38	-25.85	AVG	P
3	0.1890	33.39	9.76	43.15	64.08	-20.93	QP	P
4	0.1890	14.53	9.76	24.29	54.08	-29.79	AVG	P
5	0.2124	28.92	9.75	38.67	63.11	-24.44	QP	P
6	0.2124	9.06	9.75	18.81	53.11	-34.30	AVG	P
7	0.4308	27.23	9.77	37.00	57.24	-20.24	QP	P
8	0.4308	23.72	9.77	33.49	47.24	-13.75	AVG	P
9	1.2927	25.61	9.79	35.40	56.00	-20.60	QP	P
10	1.2927	21.67	9.79	31.46	46.00	-14.54	AVG	P
11	2.1546	22.20	9.81	32.01	56.00	-23.99	QP	P
12	2.1546	17.09	9.81	26.90	46.00	-19.10	AVG	P
13	5.6052	14.31	9.95	24.26	60.00	-35.74	QP	P
14	5.6052	8.41	9.95	18.36	50.00	-31.64	AVG	P
15	30.0000	14.46	11.30	25.76	60.00	-34.24	QP	P
16	30.0000	7.48	11.30	18.78	50.00	-31.22	AVG	P

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

EUT Operating Environment

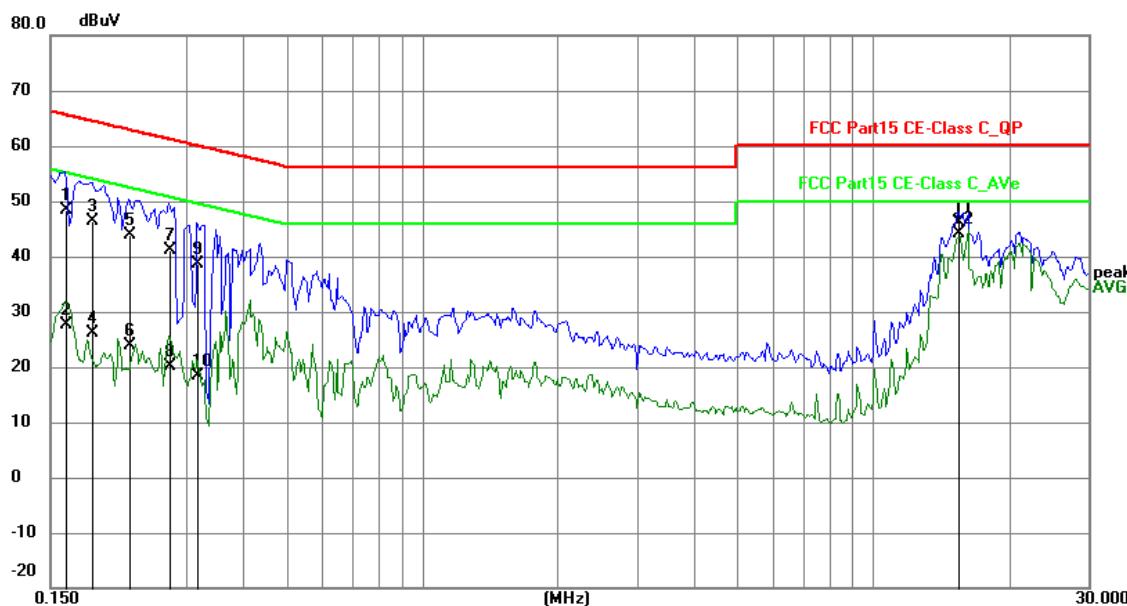
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep Bluetooth Transmitting (NEB215)

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	0.1617	38.49	9.78	48.27	65.38	-17.11	QP	P
2	0.1617	17.88	9.78	27.66	55.38	-27.72	AVG	P
3	0.1850	36.61	9.76	46.37	64.26	-17.89	QP	P
4	0.1850	16.36	9.76	26.12	54.26	-28.14	AVG	P
5	0.2241	34.03	9.75	43.78	62.67	-18.89	QP	P
6	0.2241	14.11	9.75	23.86	52.67	-28.81	AVG	P
7	0.2748	31.33	9.75	41.08	60.97	-19.89	QP	P
8	0.2748	10.44	9.75	20.19	50.97	-30.78	AVG	P
9	0.3177	28.89	9.76	38.65	59.77	-21.12	QP	P
10	0.3177	8.70	9.76	18.46	49.77	-31.31	AVG	P
11	15.4332	35.66	10.41	46.07	60.00	-13.93	QP	P
12	15.4332	33.65	10.41	44.06	50.00	-5.94	AVG	P

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

EUT Operating Environment

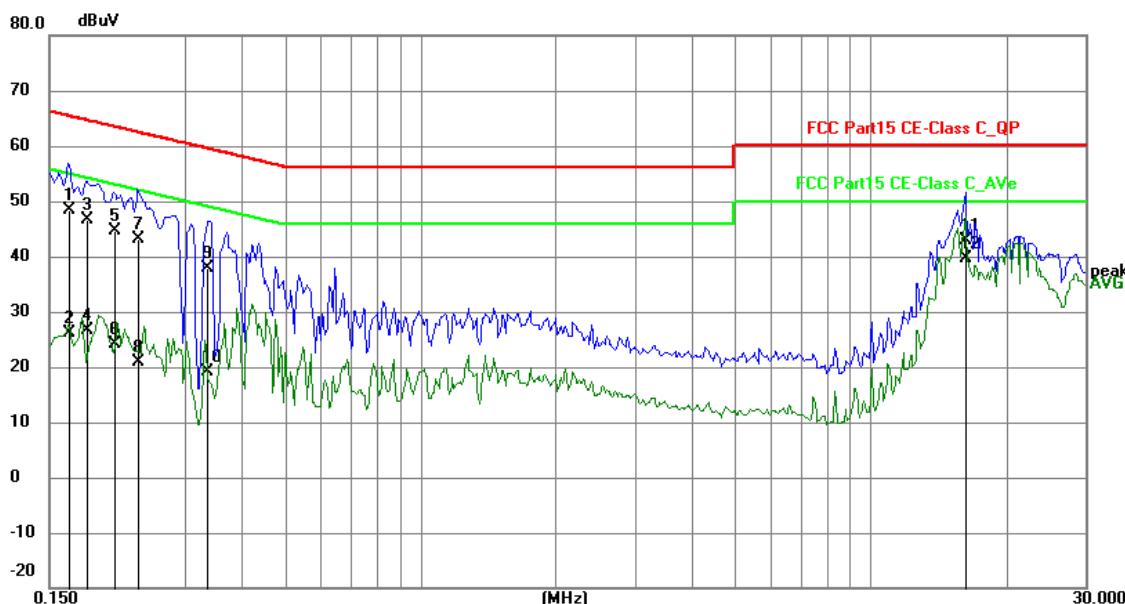
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep Bluetooth Transmitting (NEB215)

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	38.51	9.77	48.28	65.18	-16.90	QP	P
2	0.1655	16.32	9.77	26.09	55.18	-29.09	AVG	P
3	0.1812	36.97	9.76	46.73	64.43	-17.70	QP	P
4	0.1812	16.82	9.76	26.58	54.43	-27.85	AVG	P
5	0.2085	35.00	9.75	44.75	63.26	-18.51	QP	P
6	0.2085	14.39	9.75	24.14	53.26	-29.12	AVG	P
7	0.2358	33.27	9.75	43.02	62.24	-19.22	QP	P
8	0.2358	11.10	9.75	20.85	52.24	-31.39	AVG	P
9	0.3372	28.08	9.76	37.84	59.27	-21.43	QP	P
10	0.3372	9.49	9.76	19.25	49.27	-30.02	AVG	P
11	16.2288	32.32	10.45	42.77	60.00	-17.23	QP	P
12	16.2288	29.11	10.45	39.56	50.00	-10.44	AVG	P

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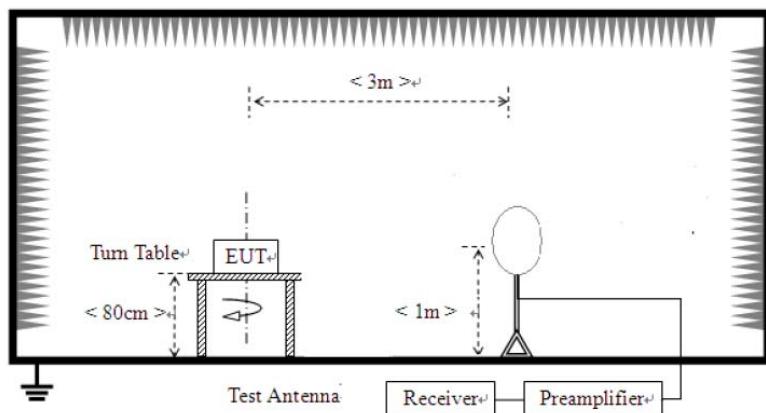
6 Undesirable Emission and Restrict band

6.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.10-2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with 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



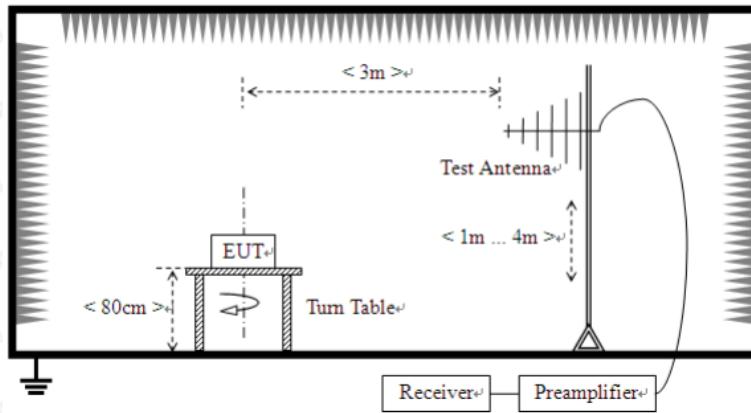
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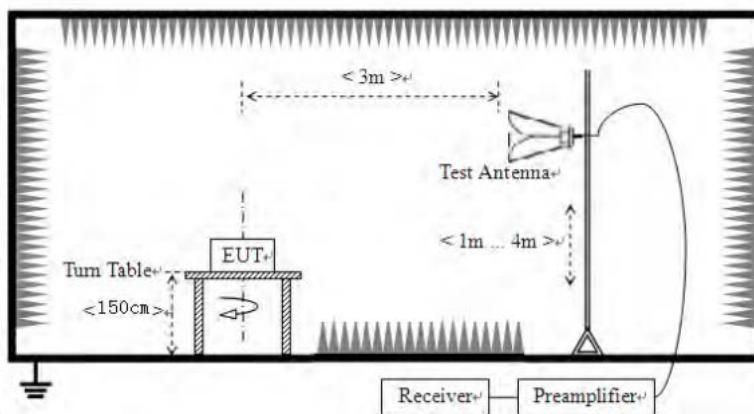
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For radiated emissions from 30MHz to 1GHz



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 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) = $20 \log \text{RF Voltage (uV)}$
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**

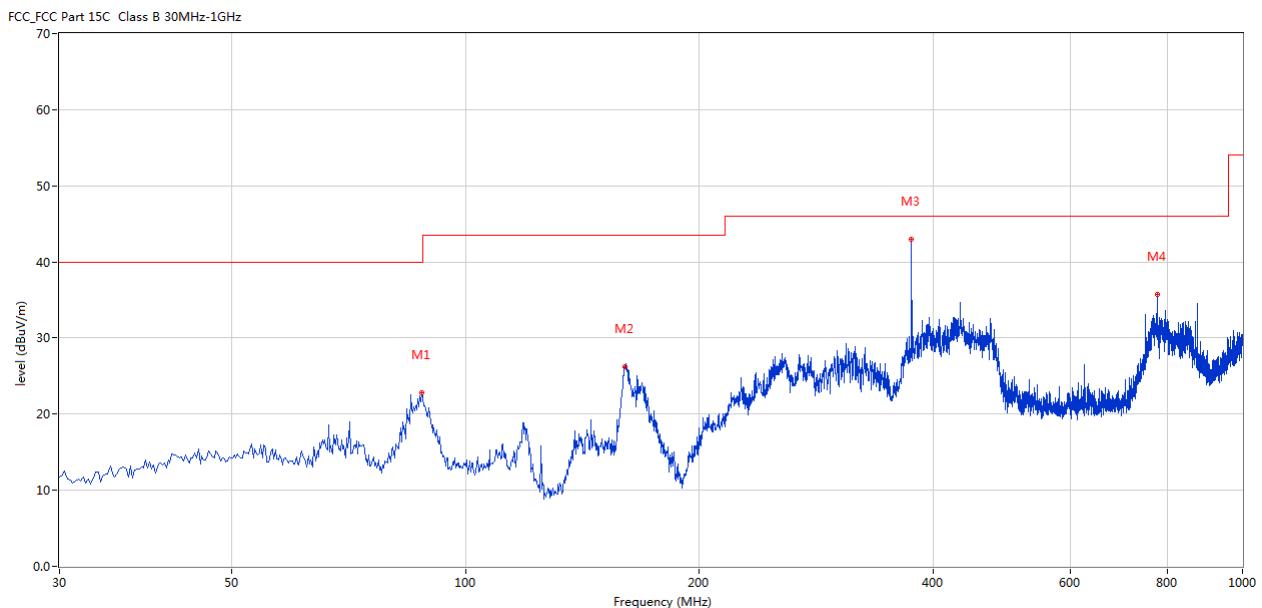
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Test Figure: for NEB156



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	87.701	22.76	-15.67	40.0	-17.24	Peak	123.00	100	Horizontal	Pass
2	160.190	26.28	-16.34	43.5	-17.22	Peak	257.00	100	Horizontal	Pass
3	374.991	42.99	-9.44	46.0	-3.01	Peak	0.00	100	Horizontal	Pass
4	776.713	35.68	-3.13	46.0	-10.32	Peak	188.00	100	Horizontal	Pass

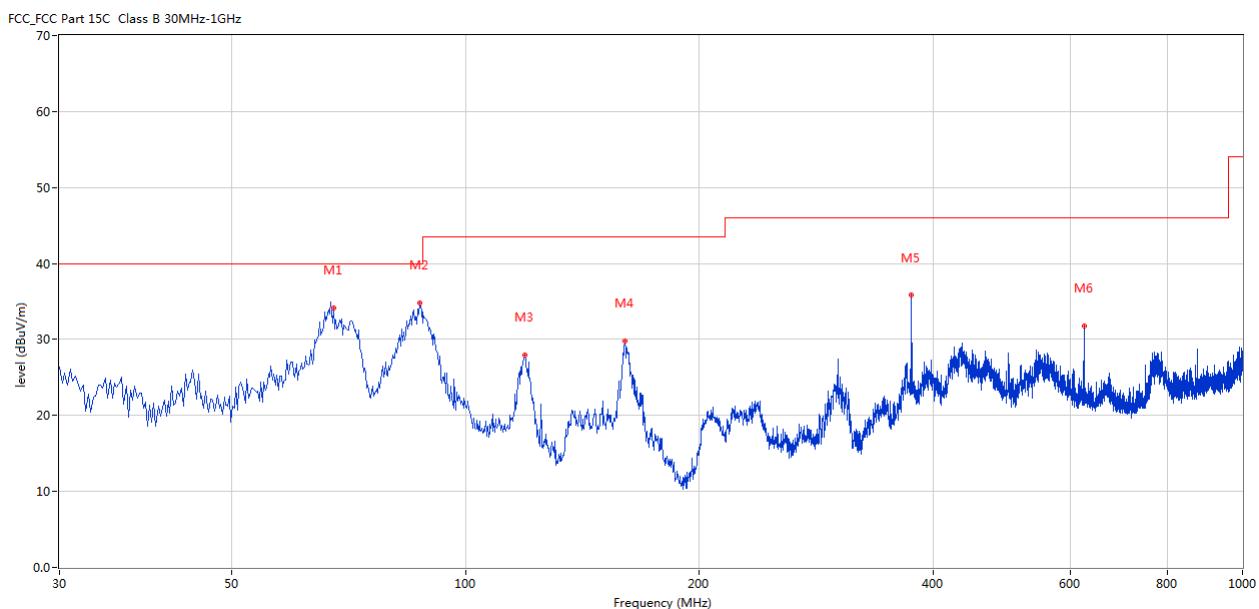
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Test Figure: for NEB156



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	67.578	34.21	-14.47	40.0	-5.79	Peak	147.00	100	Vertical	Pass
2	87.216	34.84	-15.78	40.0	-5.16	Peak	184.00	100	Vertical	Pass
3	119.218	27.92	-15.13	43.5	-15.58	Peak	28.00	100	Vertical	Pass
4	160.432	29.79	-16.32	43.5	-13.71	Peak	28.00	100	Vertical	Pass
5	374.991	35.79	-9.44	46.0	-10.21	Peak	86.00	100	Vertical	Pass
6	625.189	30.95	-4.84	46.0	-15.05	Peak	4.00	100	Vertical	Pass

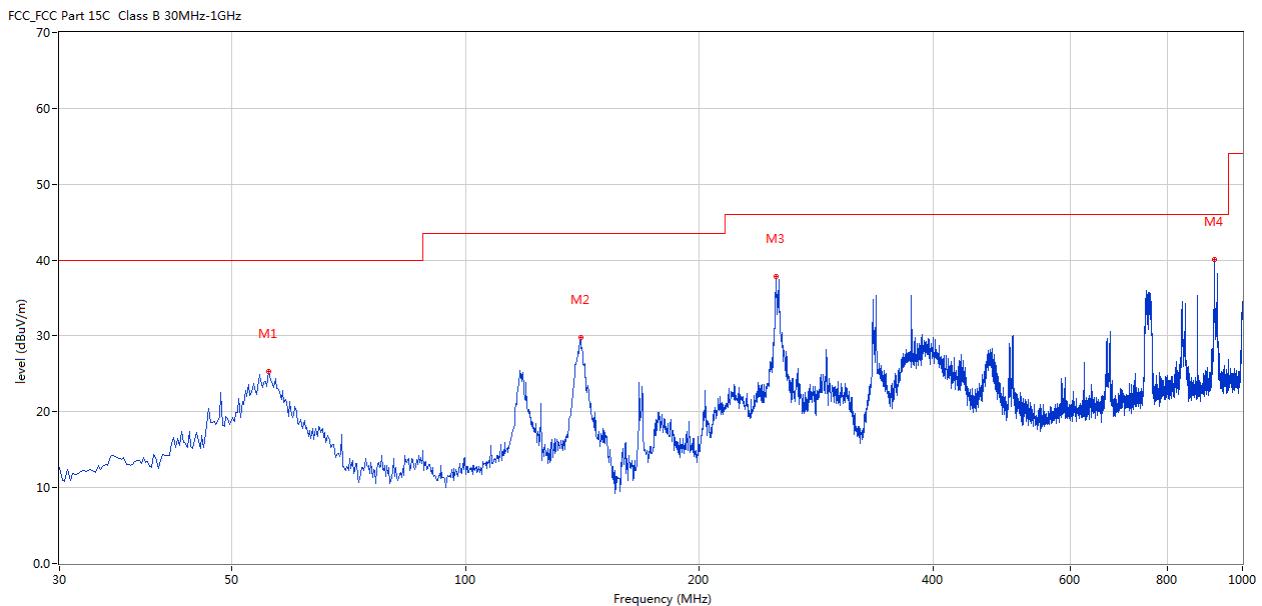
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Test Figure: for NEB215



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	55.699	25.26	-11.94	40.0	-14.74	Peak	360.00	100	Horizontal	Pass
2	140.552	29.75	-17.24	43.5	-13.75	Peak	63.00	100	Horizontal	Pass
3	250.620	37.85	-12.04	46.0	-8.15	Peak	316.00	100	Horizontal	Pass
4	919.510	40.05	-1.84	46.0	-5.95	Peak	282.00	100	Horizontal	Pass

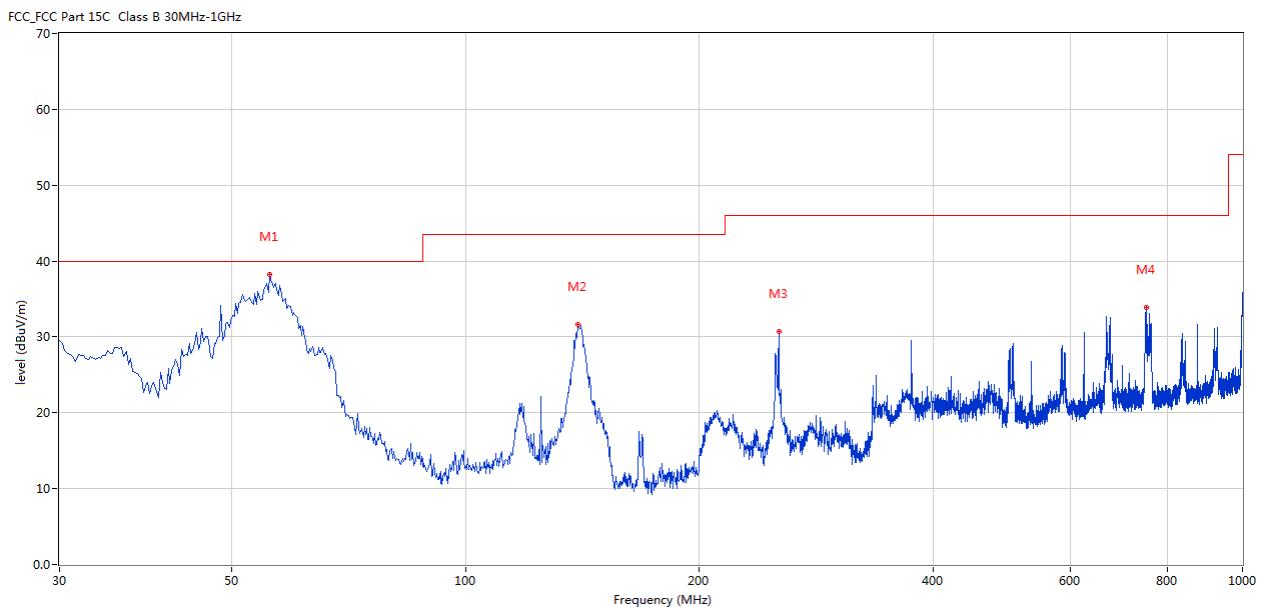
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Test Figure: for NEB215



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	55.941	38.18	-12.00	40.0	-1.82	Peak	244.00	100	Vertical	Pass
2	139.340	31.59	-17.19	43.5	-11.91	Peak	280.00	100	Vertical	Pass
3	253.044	30.71	-12.15	46.0	-15.29	Peak	127.00	100	Vertical	Pass
4	752.469	33.92	-3.38	46.0	-12.08	Peak	196.00	100	Vertical	Pass

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

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
5180.00	90.88 (PK)	H	Fundamental Frequency
5180.00	96.84 (PK)	V	
10360	49.58 (PK)	H	74(Peak)/ 54(AV)
10360	49.34 (PK)	V	74(Peak)/ 54(AV)
15540	--	V	74(Peak)/ 54(AV)
20720	--	H/V	74(Peak)/ 54(AV)
25900	--	H/V	74(Peak)/ 54(AV)
31080	--	H/V	74(Peak)/ 54(AV)
36260	--	H/V	74(Peak)/ 54(AV)

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

Operation Mode: Keeping Transmitting under CH40 for 11g at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
5200.00	93.86 (PK)	H	Fundamental Frequency
5200.00	100.14 (PK)	V	
10400	49.51 (PK)	H	74(Peak)/ 54(AV)
10400	50.86 (PK)	V	74(Peak)/ 54(AV)
15600	--	V	74(Peak)/ 54(AV)
20800	--	H/V	74(Peak)/ 54(AV)
26000	--	H/V	74(Peak)/ 54(AV)
31200	--	H/V	74(Peak)/ 54(AV)
36400	--	H/V	74(Peak)/ 54(AV)

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

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Operation Mode: Keeping Transmitting under CH48 for 11g at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
5240.00	93.56 (PK)	H	Fundamental Frequency
5240.00	97.69 (PK)	V	
10480	49.95 (PK)	H	74(Peak)/ 54(AV)
15720	49.52 (PK)	V	74(Peak)/ 54(AV)
20960	--	H/V	74(Peak)/ 54(AV)
26200	--	H/V	74(Peak)/ 54(AV)
31440	--	H/V	74(Peak)/ 54(AV)
36680	--	H/V	74(Peak)/ 54(AV)

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

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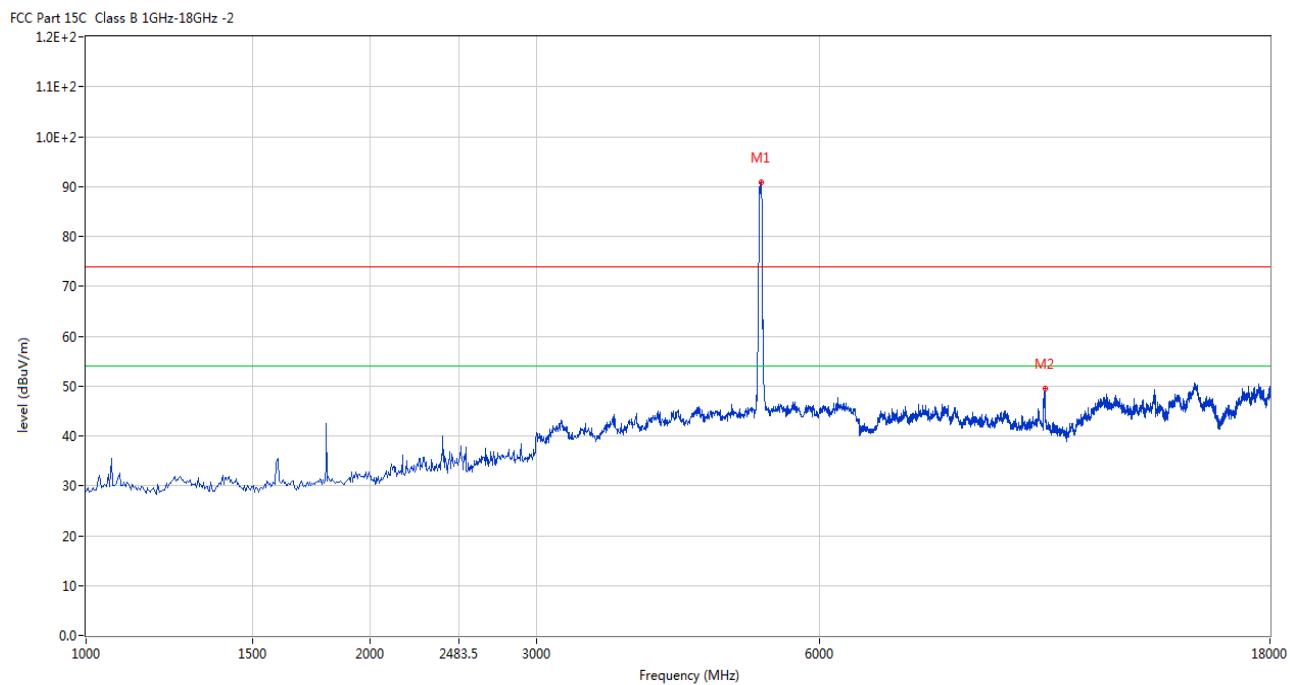
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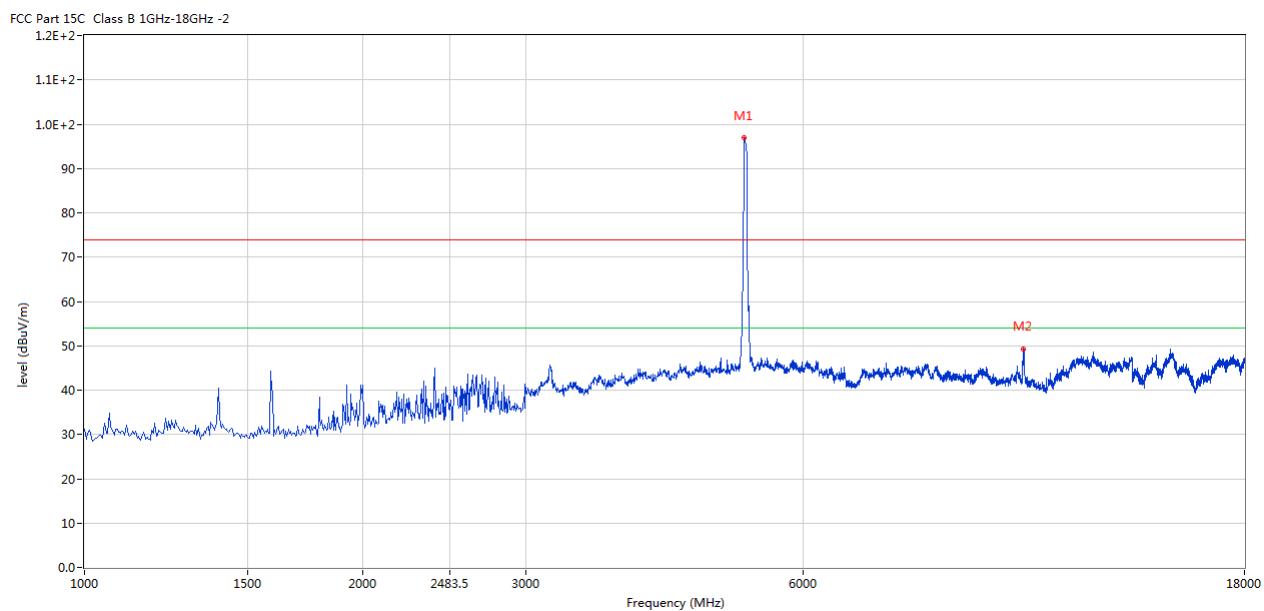


Please refer to the following test plots for details:

CH36 for 11a at 6Mbps: Horizontal



CH36 for 11a at 6Mbps: Vertical



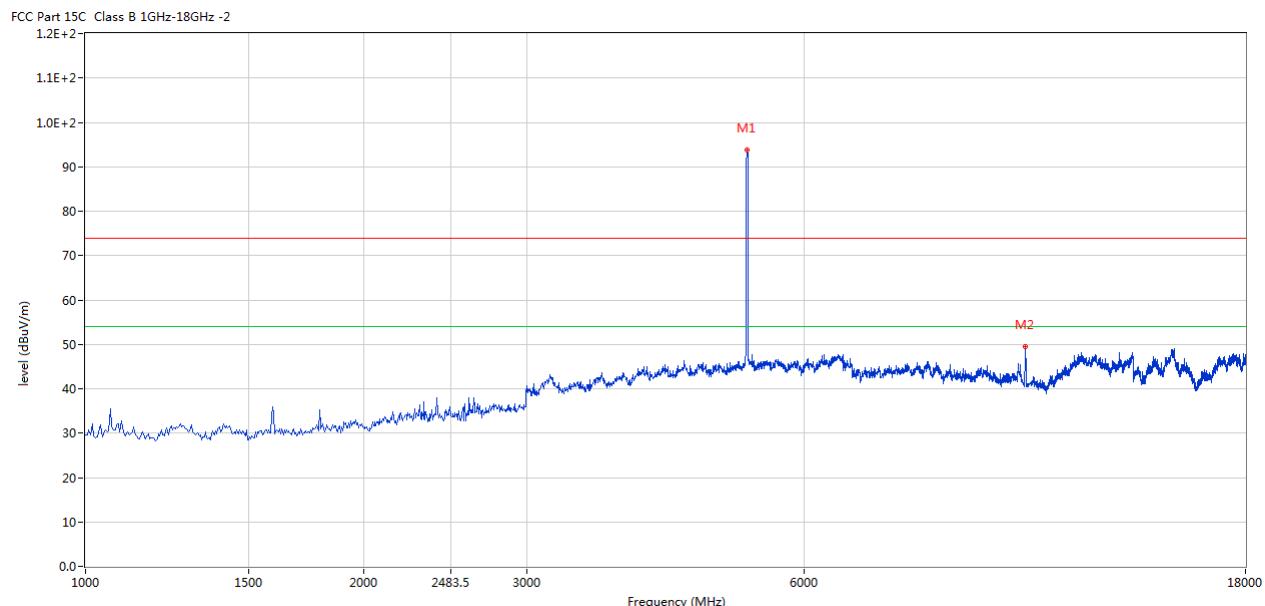
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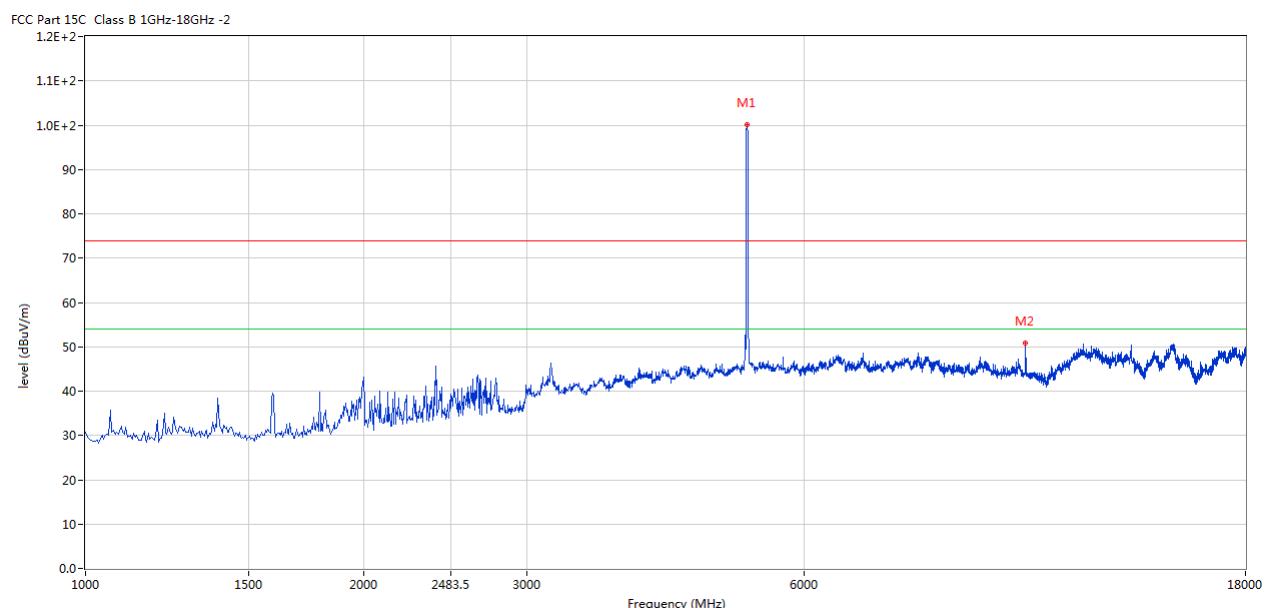
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CH40 for 11a at 6Mbps: Vertical



CH40 for 11a at 6Mbps: Horizontal



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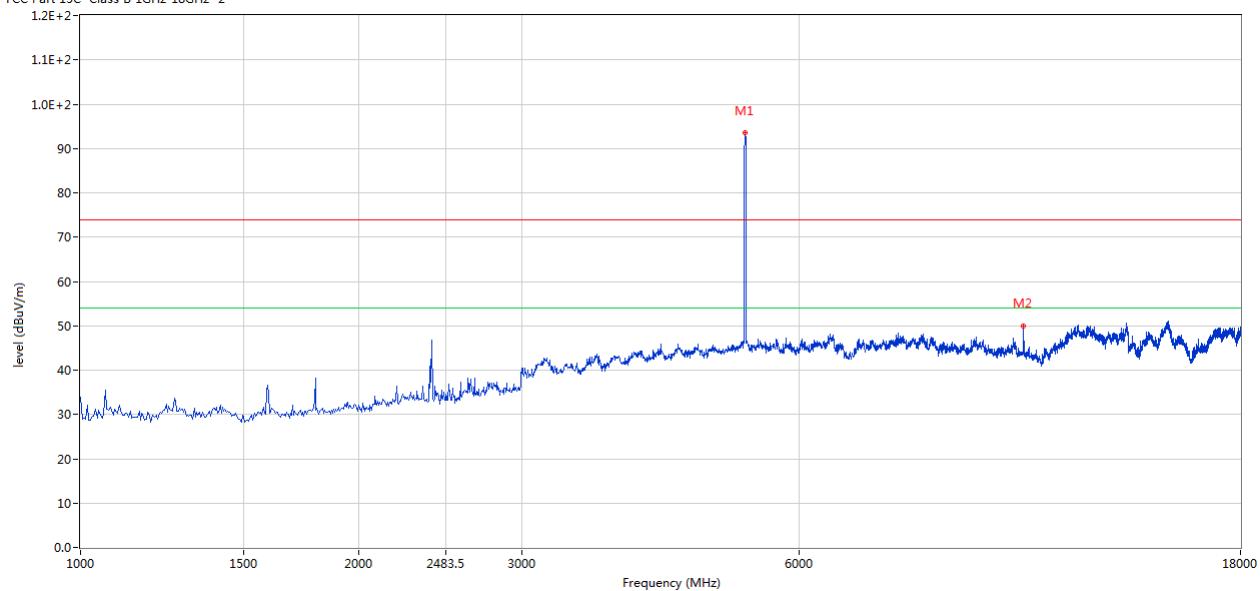
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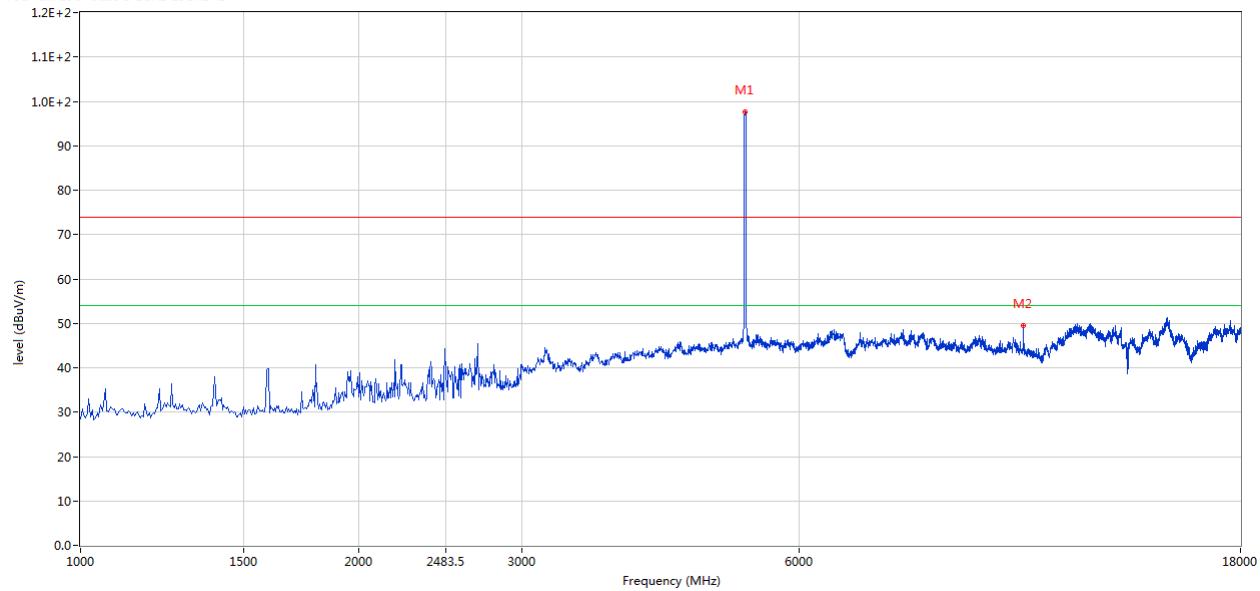
CH48 for 11a at 6Mbps: Vertical

FCC Part 15C Class B 1GHz-18GHz -2



CH48 for 11g at 6Mbps: Horizontal

FCC Part 15C Class B 1GHz-18GHz -2



Note: 1. For radiated Emissions from 18-40GHz and below 30MHz, it is only the floor noise.
2. 802.11a is the worst case.

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Restricted band Measurement				
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 36 (5180MHz)-11a	
Mode	Keeping Transmitting	Input Voltage	120V~	
Temperature	24 deg. C,	Humidity	56% RH	
Test Result:	Pass	Detector	PK	
5150	PK (dB μ V/m)	48.57 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-46.63		
Polarity	Horizontal	--	--	
Test Figure				

Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

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

For Example, if E[dB μ V/m]=48.57 dB μ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 48.57 - 95.2 = -46.63 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 36 (5180MHz)-11a
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
5150	PK (dB μ V/m)	57.85 (PK)	Limit
	EIRP (dBm)	-37.35	
Polarity	Vertical	--	--
Test Figure			

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

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

For Example, if E[dB μ V/m]=57.85 dB μ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 57.85 - 95.2 = -37.35 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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

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Restricted band Measurement			
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 48 (5240MHz)-11a
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
5250	PK (dB μ V/m)	50.59 (PK)	Limit
	EIRP (dBm)	-44.61	
Polarity	Horizontal		
Test Figure			

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

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

For Example, if $\text{E[dB}\mu\text{V/m]} = 50.59 \text{ dB}\mu\text{V/m}$,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 50.59 - 95.2 = -44.61 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 48 (5240MHz)-11a
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
5250	PK (dB μ V/m)	50.90 (PK)	Limit
	EIRP (dBm)	-44.30	
Polarity	Vertical	--	--
Test Figure			

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

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

For Example, if E[dB μ V/m]=50.90 dB μ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 50.90 - 95.2 = -44.30 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 36 (5180MHz)-11n/HT20
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
5150	PK (dB μ V/m)	47.92 (PK)	Limit
	EIRP (dBm)	-47.28	
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 μ V/m]= 47.92dB μ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 47.92 - 95.2 = -47.28 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 36 (5180MHz)-11n/HT20
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
5150	PK (dB μ V/m)	56.33 (PK)	Limit
	EIRP (dBm)	-38.87	
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 μ V/m]= 56.33 dB μ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 56.33 - 95.2 = -38.87 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 48 (5240MHz)-11n/HT20
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
5250	PK (dB μ V/m)	49.61(PK)	Limit
	EIRP (dBm)	-45.59	
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 μ V/m]= 49.6 dB μ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 49.61 - 95.2 = -45.59 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 48 (5240MHz)-11n/HT20
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
5250	PK (dB μ V/m)	50.12(PK)	Limit
	EIRP (dBm)	-45.08	
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 μ V/m]= 50.12dB μ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 50.12 - 95.2 = -45.08 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 38 (5190MHz)-11n/HT40
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
5150	PK (dB μ V/m)	48.23 (PK)	Limit
	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:

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

For Example, if E[dB μ V/m]= 48.23 dB μ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 48.23 - 95.2 = -46.97 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 38 (5190MHz)-11n/HT40
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
5150	PK (dB μ V/m)	56.70 (PK)	Limit
	EIRP (dBm)	-38.50	
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 μ V/m]= 56.70 dB μ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 56.70 - 95.2 = -38.50 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 46 (5230MHz)-11n/HT40
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
5250	PK (dB μ V/m)	50.11(PK)	Limit
	EIRP (dBm)	-45.09	
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 μ V/m]=50.11dB μ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 50.11 - 95.2 = -45.09 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 46 (5230MHz)-11n/HT40
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
5250	PK (dB μ V/m)	50.36(PK)	Limit
	EIRP (dBm)	-44.84	
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 μ V/m]= 50.66 dB μ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 50.36 - 95.2 = -44.84 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement			
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 42 (5210MHz)-11ac/VHT80
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
5150	PK (dB μ V/m)	46.75 (PK)	Limit
	EIRP (dBm)	-48.45	
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 μ V/m]= 46.75 dB μ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 46.75 - 95.2 = -48.45 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement			
EUT	Commercial Kiosk Tablet	Test Mode:	Channel 42 (5210MHz)- 11ac/VHT80
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
5150	PK (dB μ V/m)	55.18 (PK)	Limit
	EIRP (dBm)	-40.02	
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 μ V/m]=55.18 dB μ V/m,

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2 = 55.18 - 95.2 = -40.02 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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

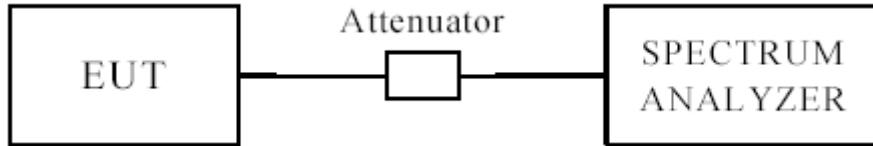
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7.0 Emission Bandwidth

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		Commercial Kiosk Tablet		Model	NEB215
Mode		802.11a		Input Voltage	120V~
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	18.82	--	Pass
40	5200	6	18.88	--	Pass
48	5240	6	18.82	--	Pass
99% Bandwidth					
36	5180	6	16.53	--	Pass
40	5200	6	16.53	--	Pass
48	5240	6	16.47	--	Pass

Note: Two antennas were tested and only the worst cased was recorded in the test report. Ant 0 was the worst case.

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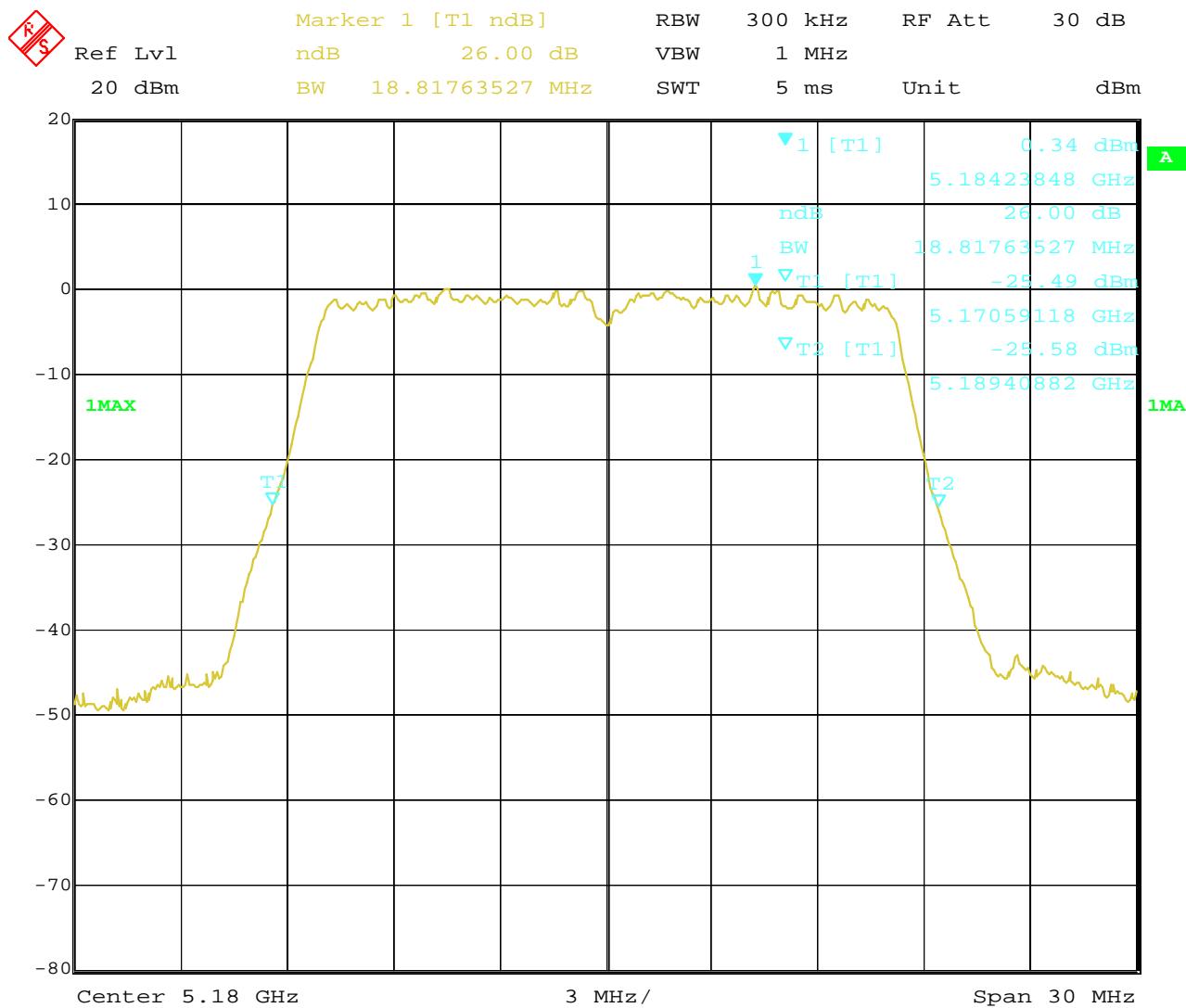
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Test Figure:

26dB Bandwidth

Channel 36



Date: 1.DEC.2020 15:46:30

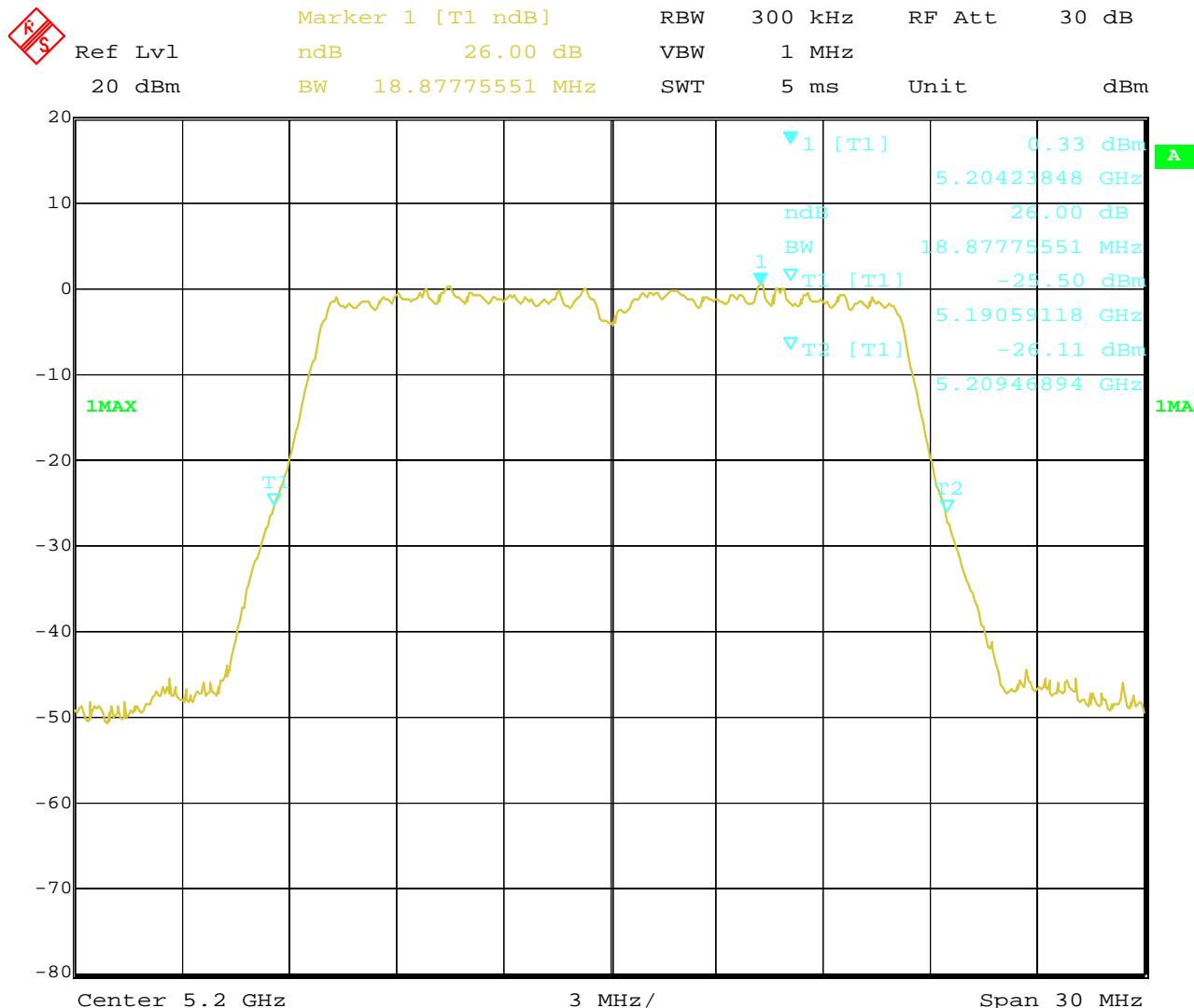
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Channel 40



Date: 1.DEC.2020 15:48:24

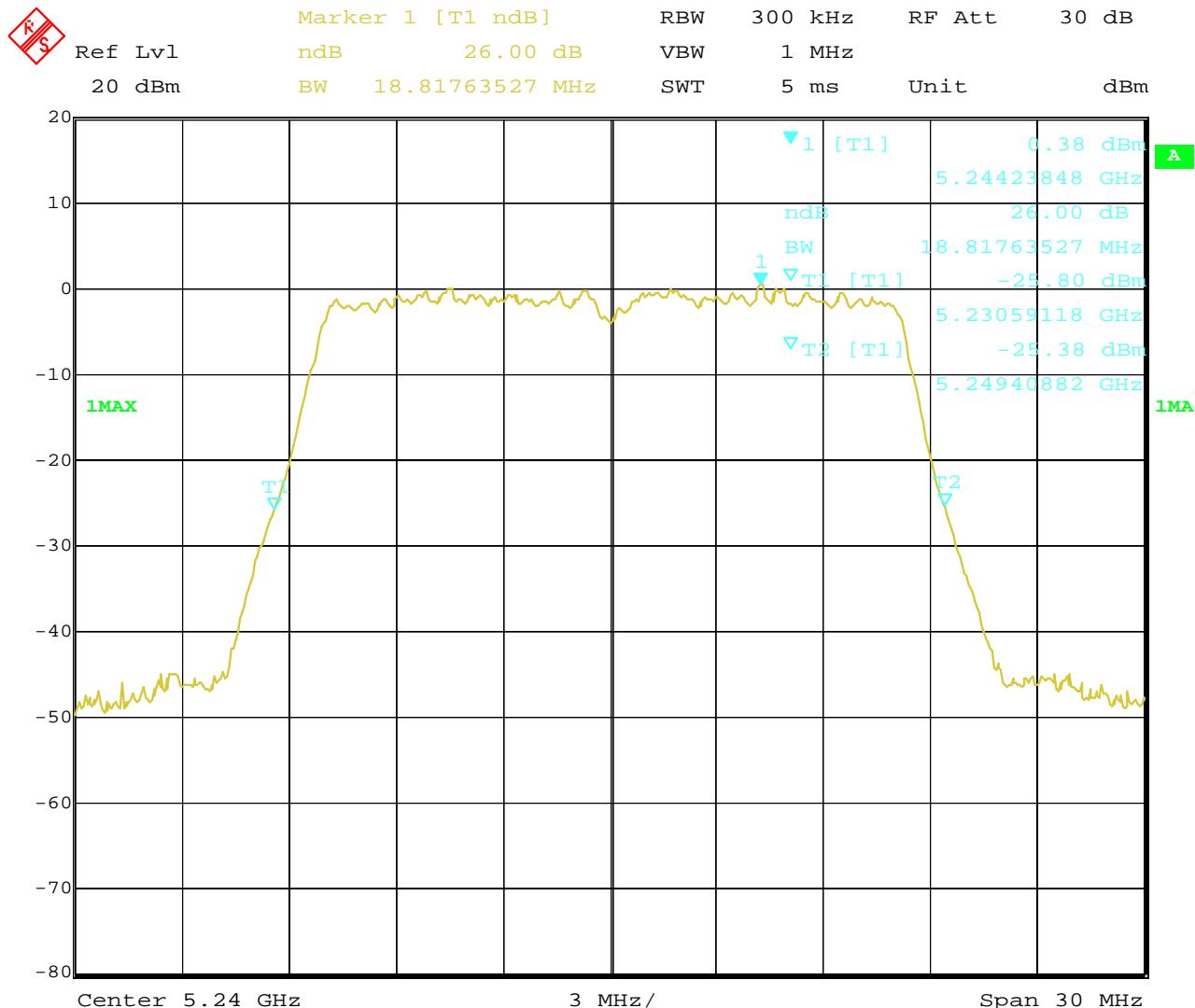
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Channel 48



Date: 1.DEC.2020 15:52:10

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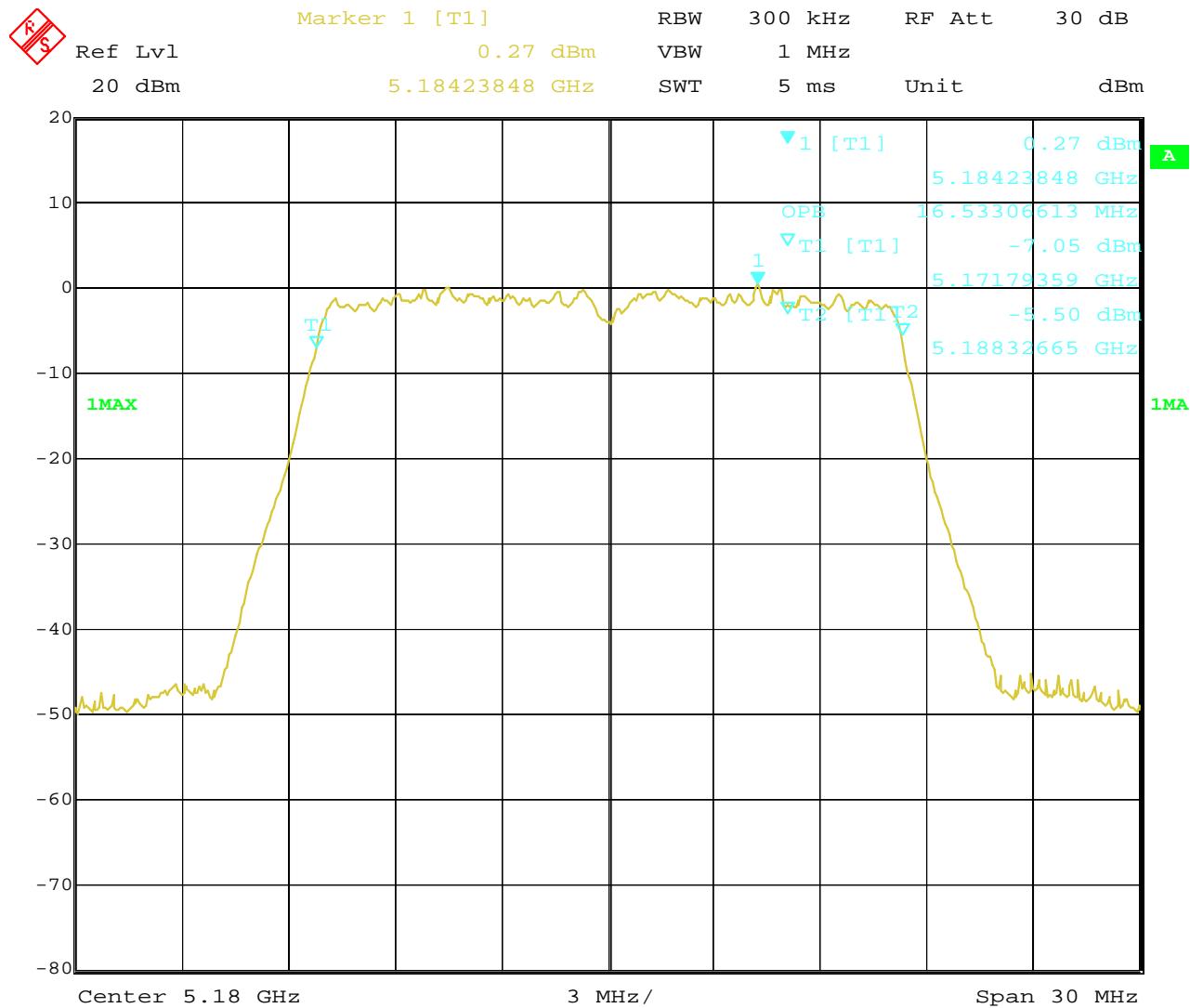
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Test Figure:

99% Bandwidth

Channel 36



Date: 1.DEC.2020 15:50:53

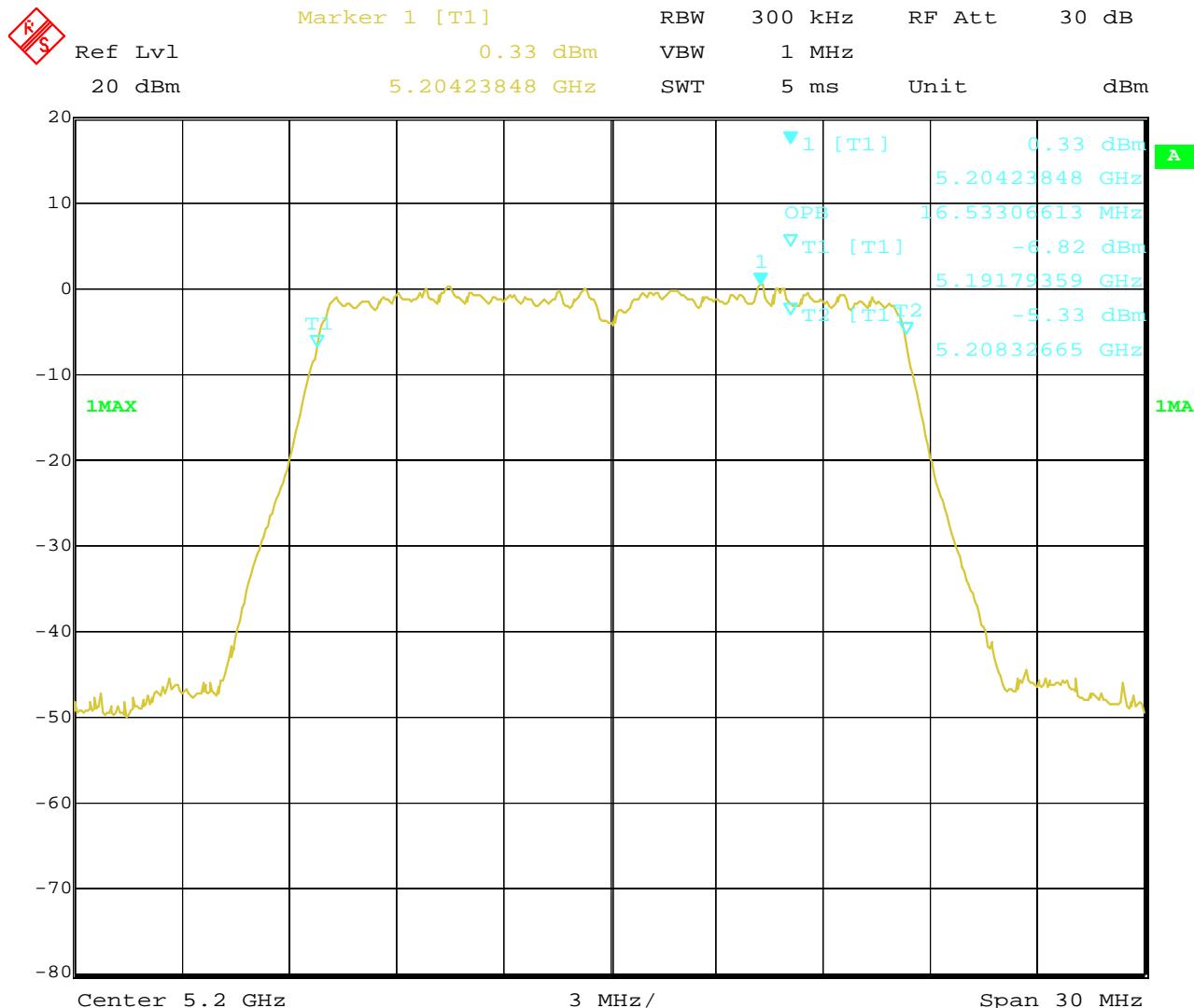
The report refers only to the sample tested and does not apply to the bulk

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Channel 40



Date: 1.DEC.2020 15:48:48

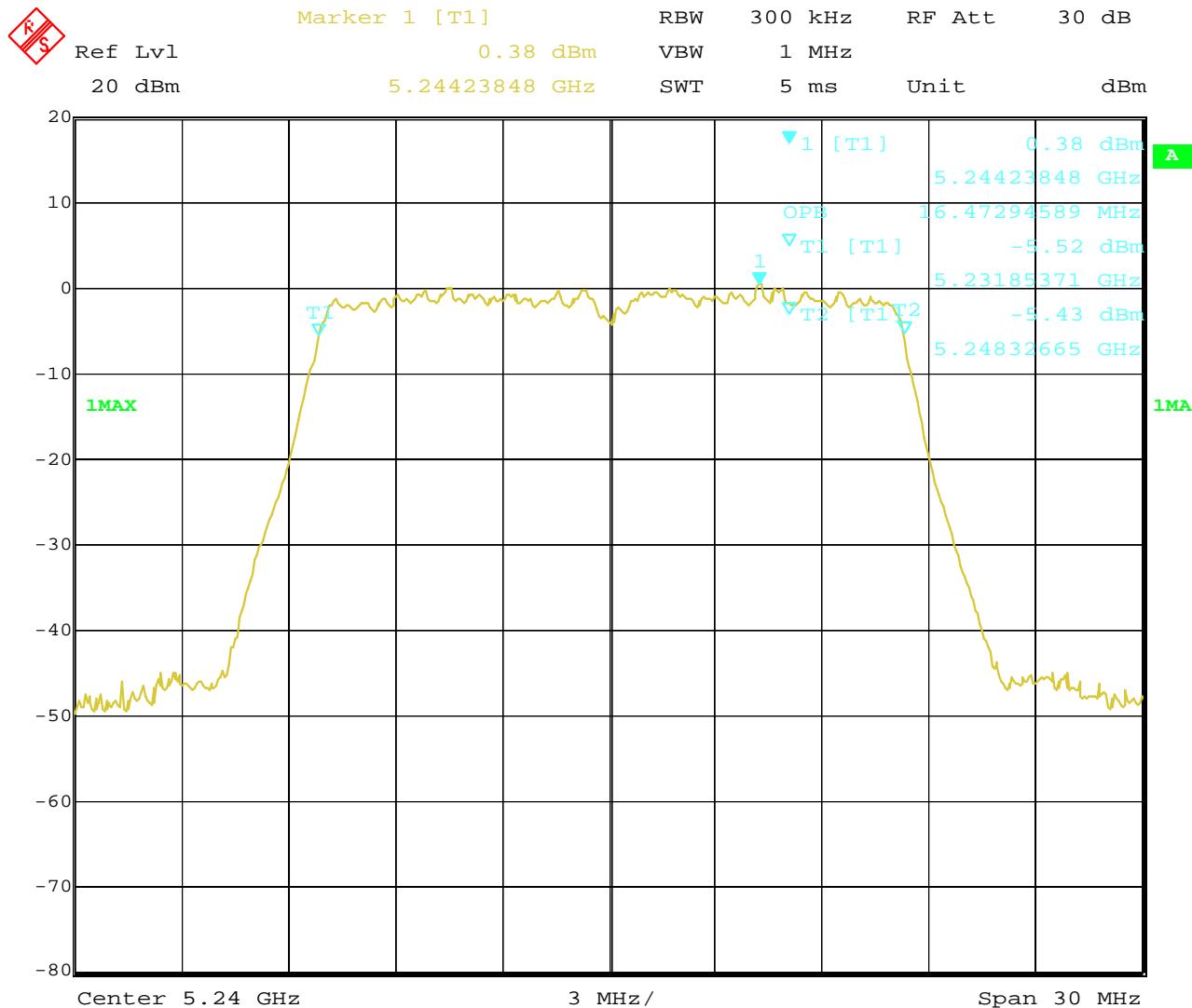
The report refers only to the sample tested and does not apply to the bulk.

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Channel 48



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EUT		Commercial Kiosk Tablet		Model		NEB215
Mode		802.11n HT20		Input Voltage		120V~
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	19.78	--	Pass	
40	5200	mcs0	19.72	--	Pass	
48	5240	mcs0	19.78	--	Pass	
99% Bandwidth						
36	5180	mcs0	17.68	--	Pass	
40	5200	mcs0	17.68	--	Pass	
48	5240	mcs0	17.68	--	Pass	

Note: Two antennas were tested and only the worst cased was recorded in the test report. 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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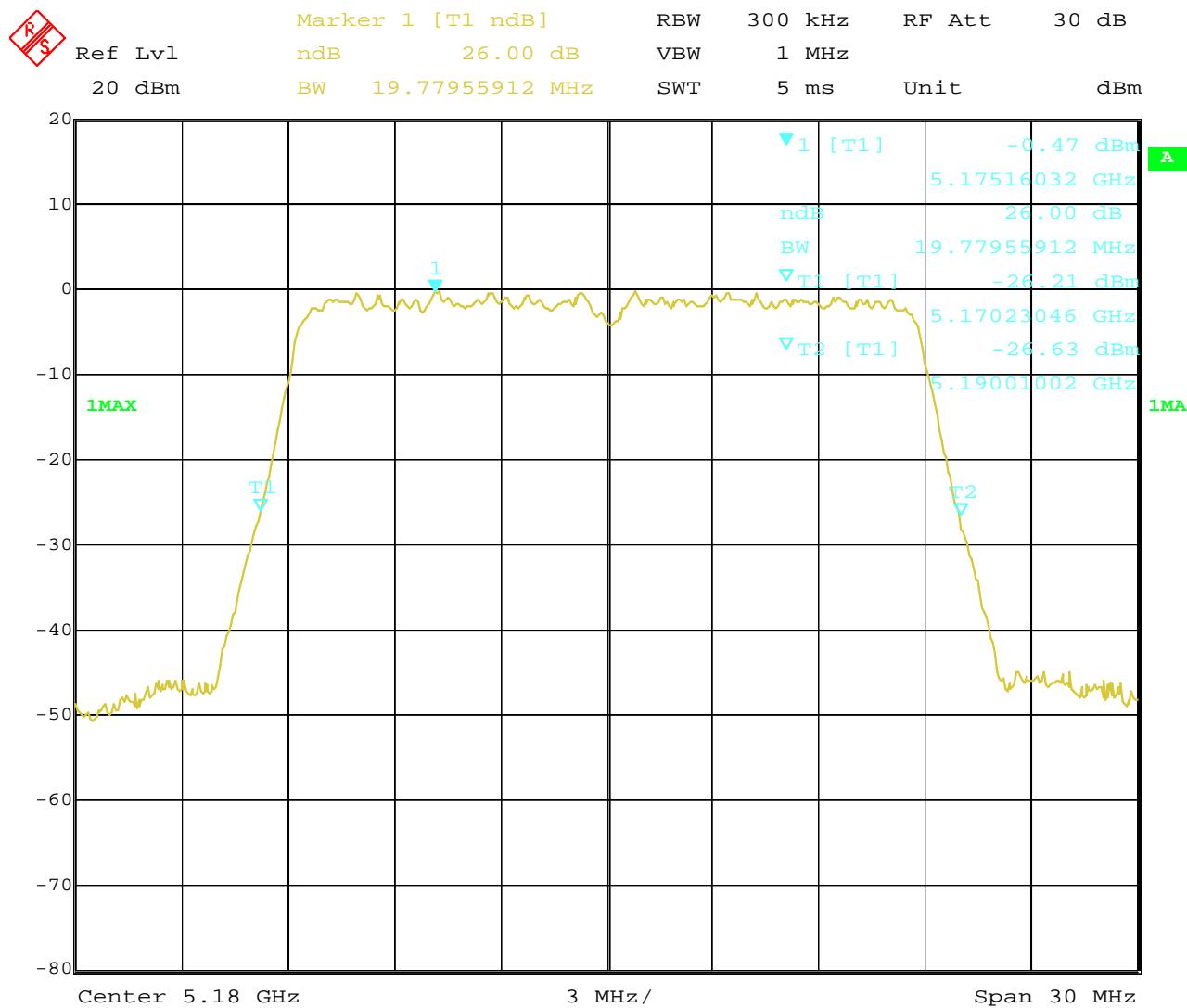
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Test Configure

26dB Bandwidth

Channel 36



Date: 1.DEC.2020 15:56:00

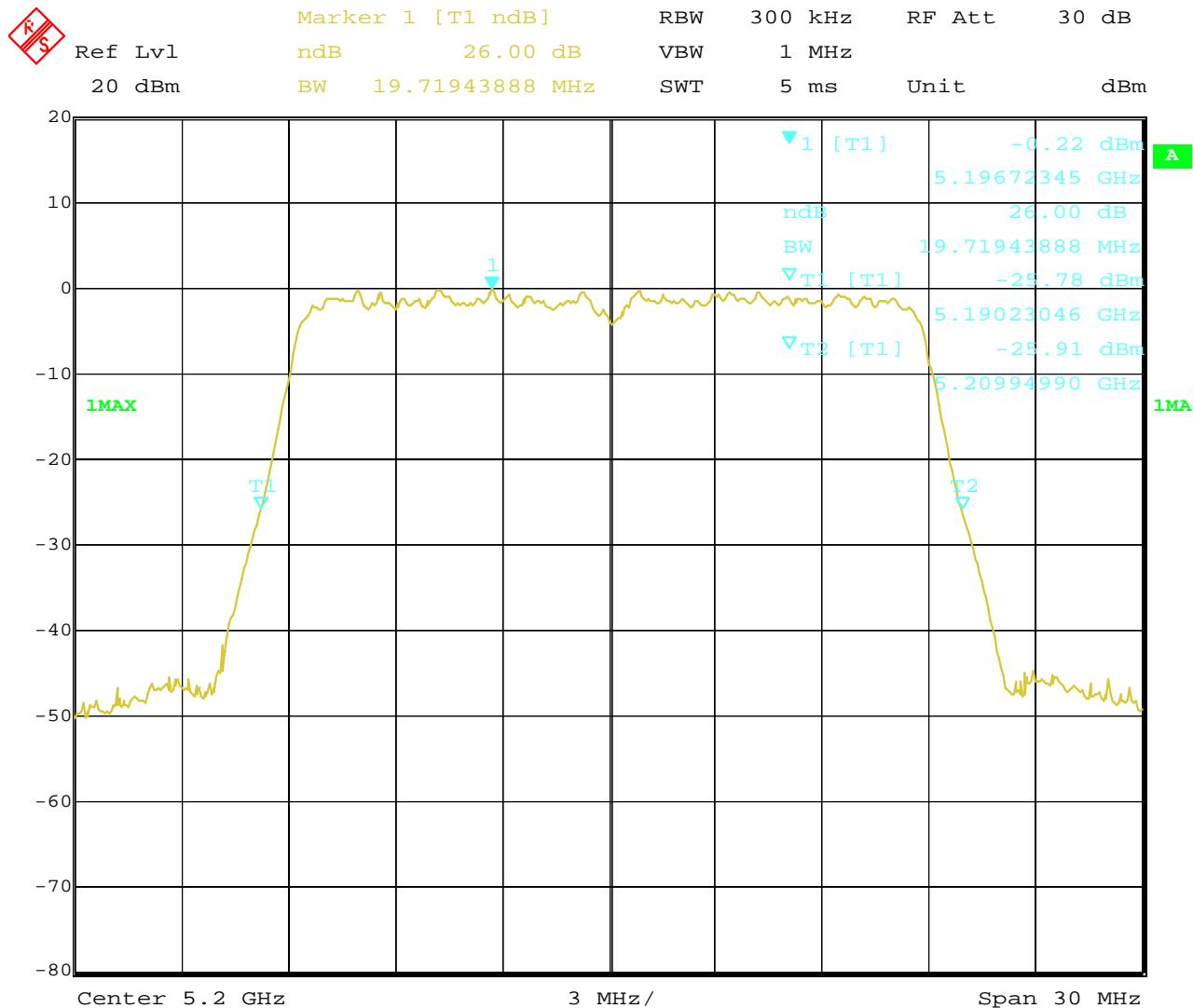
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Channel 40



Date: 1.DEC.2020 15:55:08

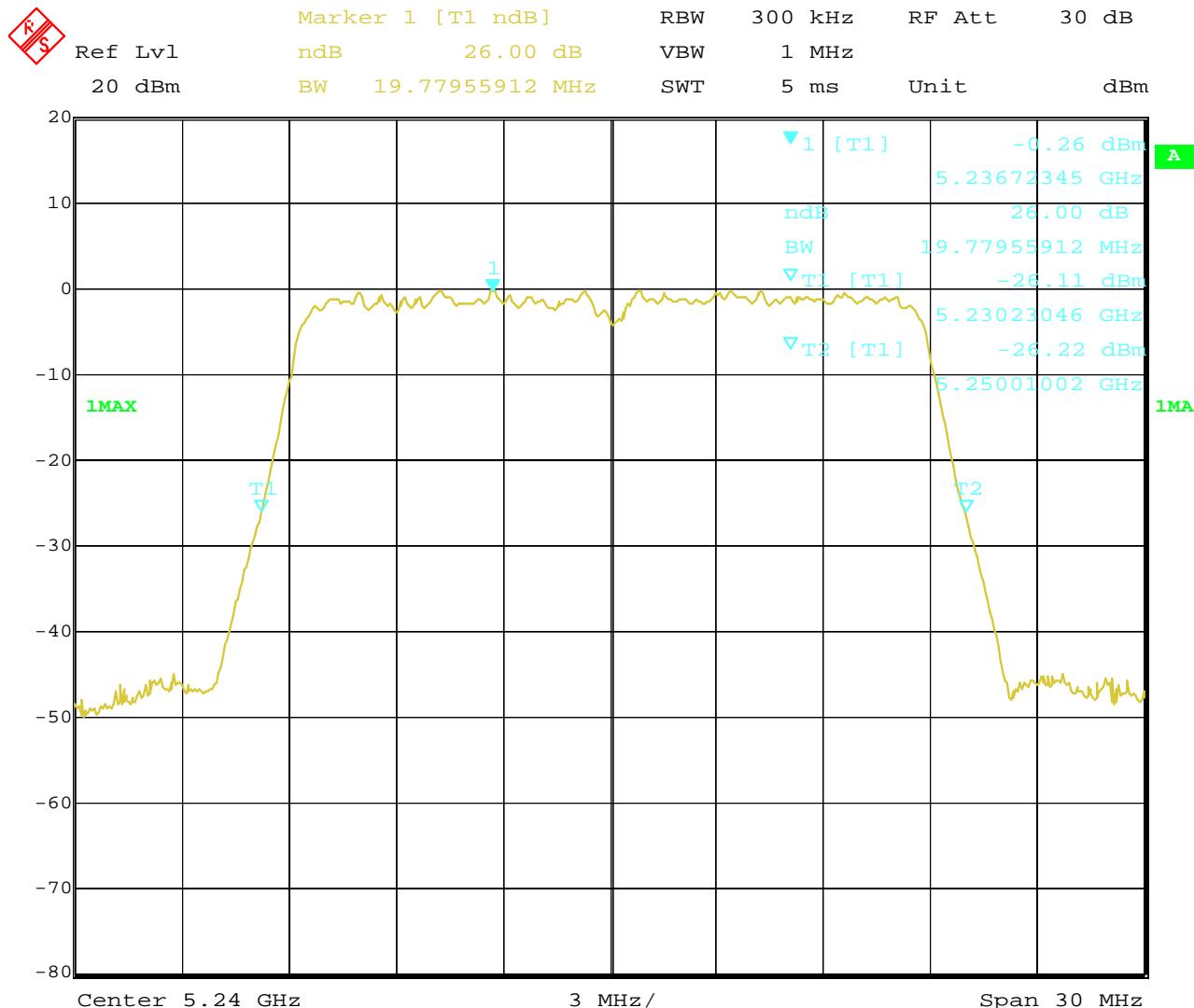
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Channel 48



Date: 1.DEC.2020 15:53:22

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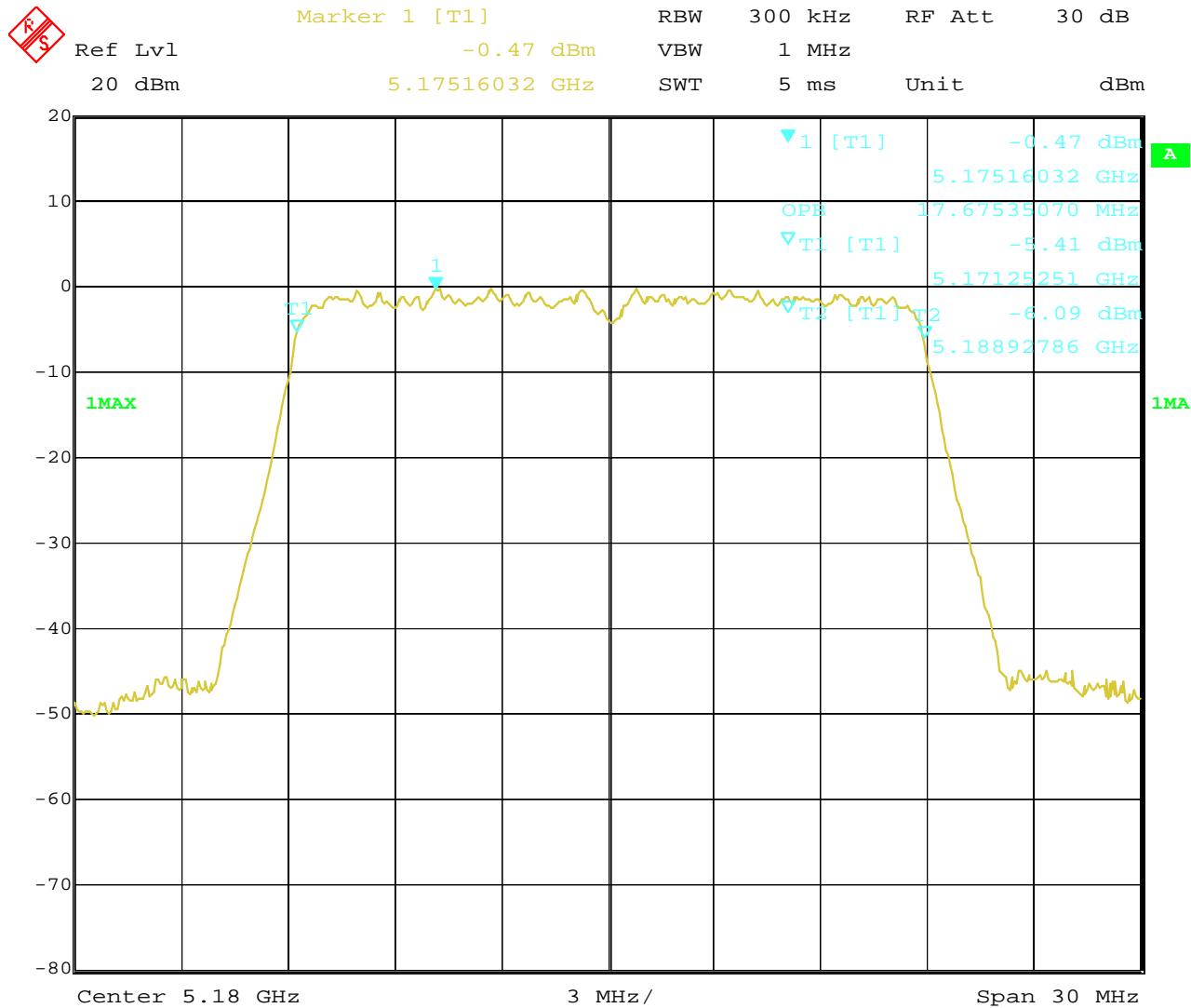
In the event of the improper use of the report, The SHENZHEN TIMEWAY TESTING LABORATORIES, reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.



Test Configure

99% Bandwidth

Channel 36



Date: 1.DEC.2020 15:56:09

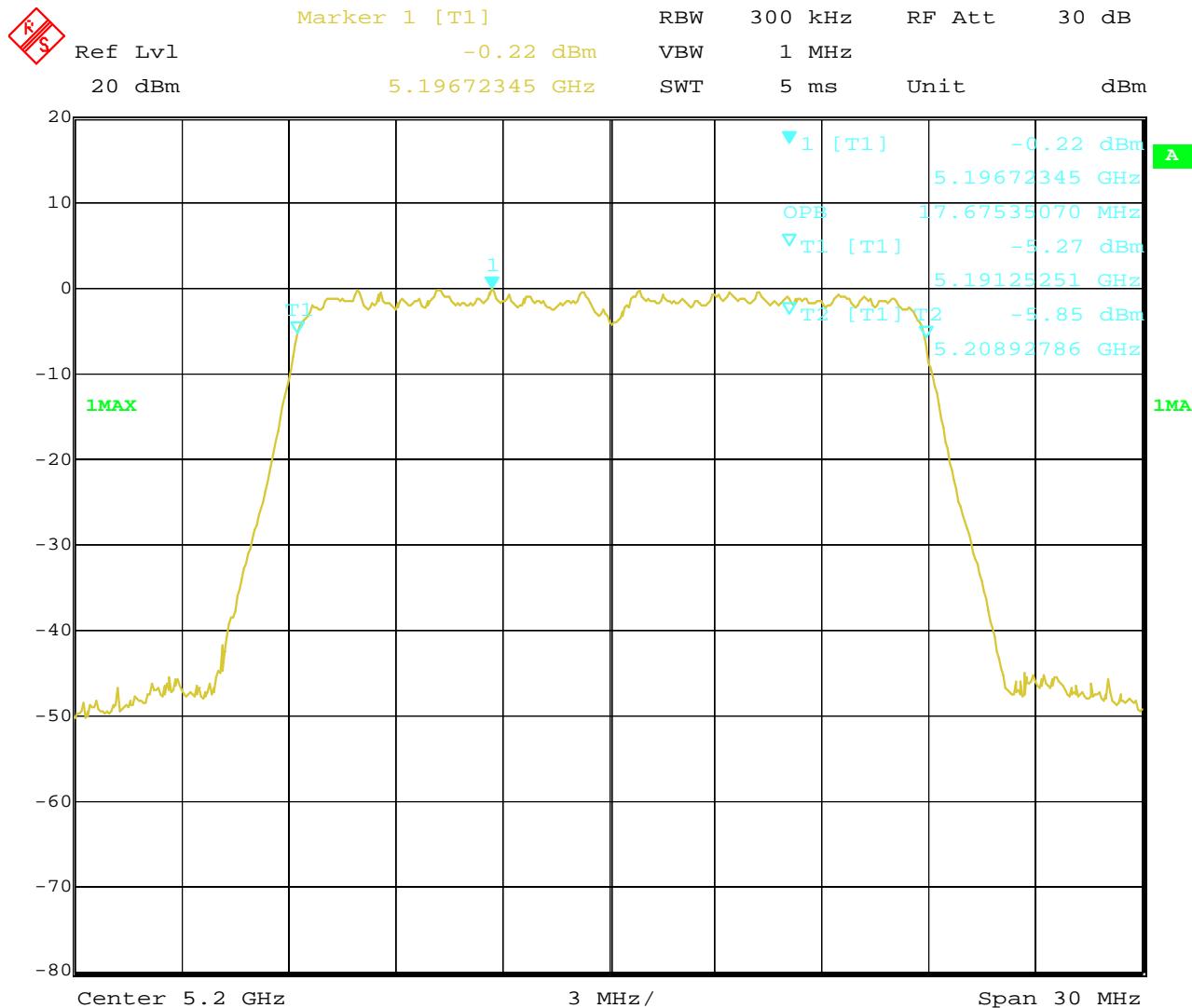
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Channel 40



Date: 1. DEC. 2020 15:54:54

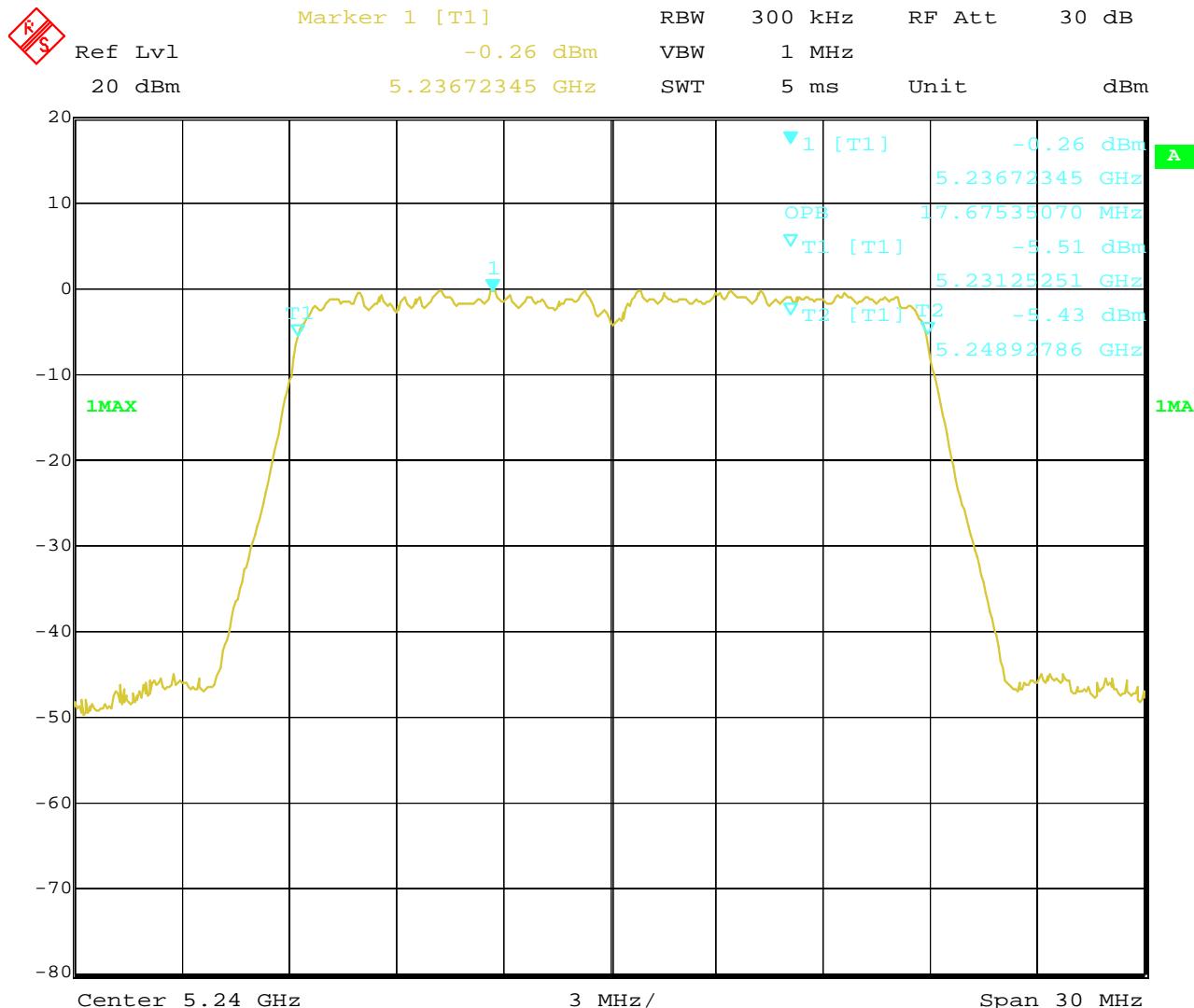
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Channel 48



Date: 1.DEC.2020 15:53:48

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EUT		Commercial Kiosk Tablet		Model		NEB215
Mode		802.11n HT40		Input Voltage		120V~
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	42.93	--	Pass	
46	5230	mcs0	43.05	--	Pass	
99% Bandwidth						
38	5190	mcs0	36.67	--	Pass	
46	5230	mcs0	36.55	--	Pass	

Note: Two antennas were tested and only the worst cased was recorded in the test report. 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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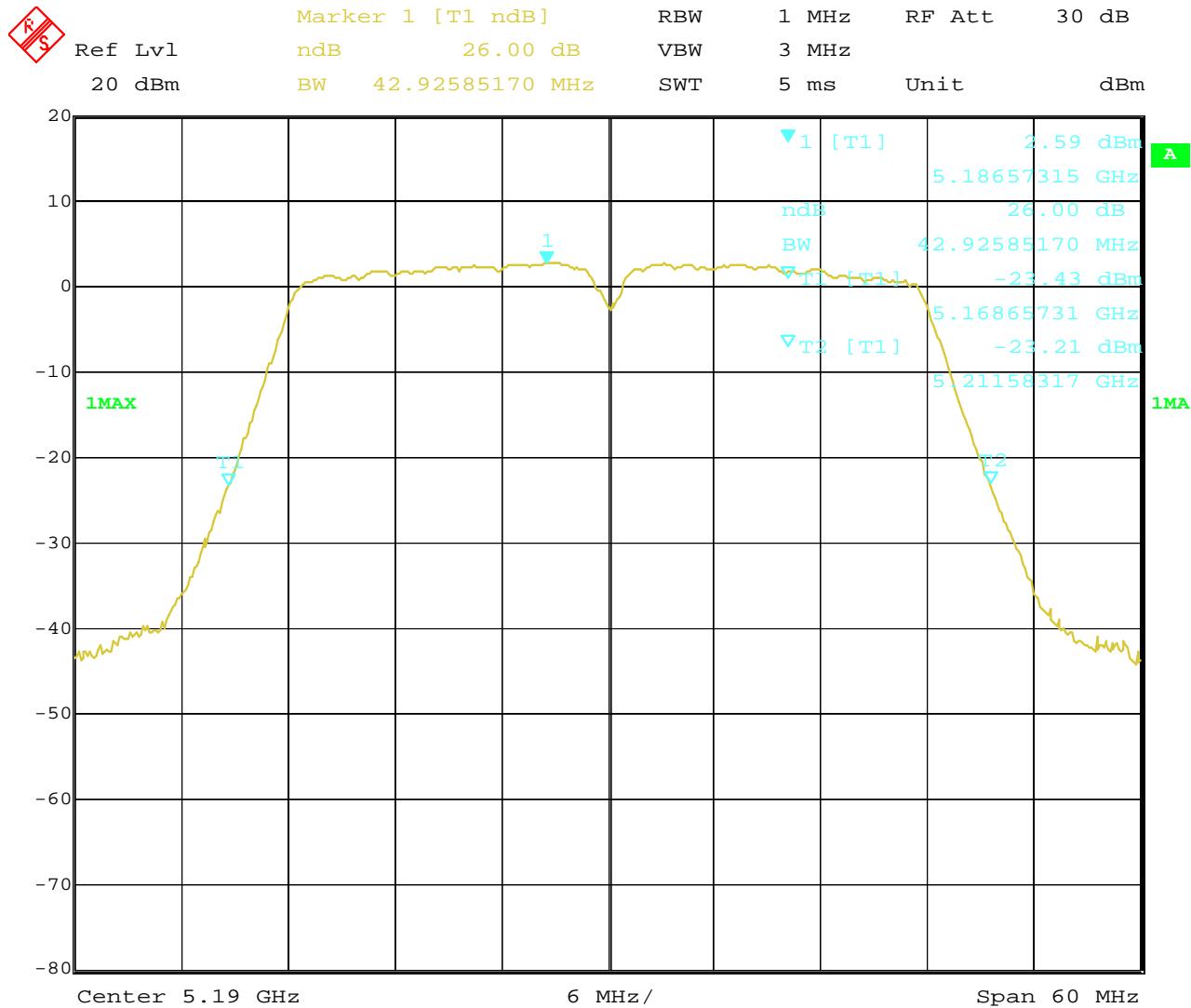
In the event of the improper use of the report, The SHENZHEN TIMEWAY TESTING LABORATORIES, reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.



Test Configure

26dB Bandwidth

Channel 38



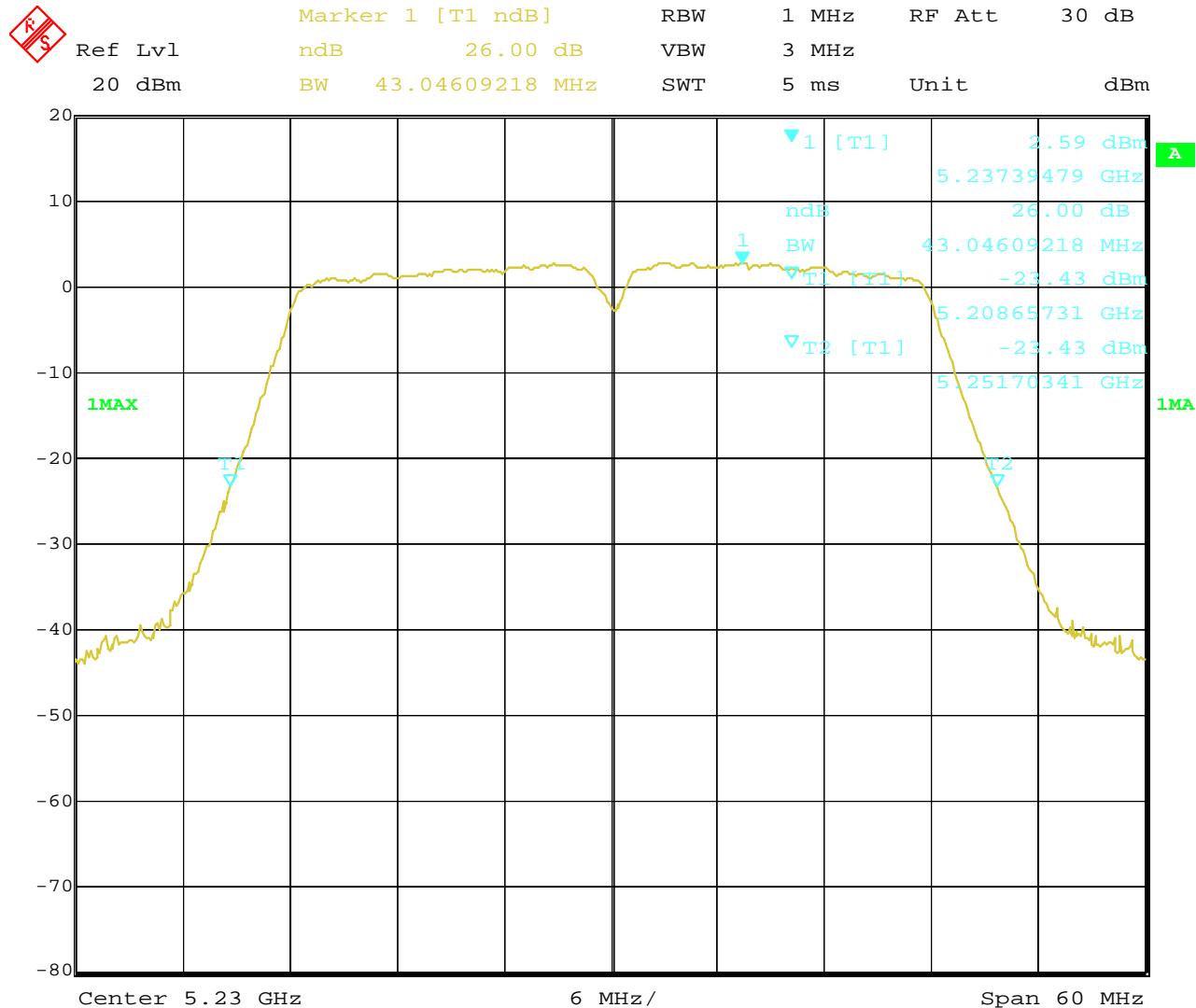
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Channel 46



Date: 1.DEC.2020 16:08:58

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

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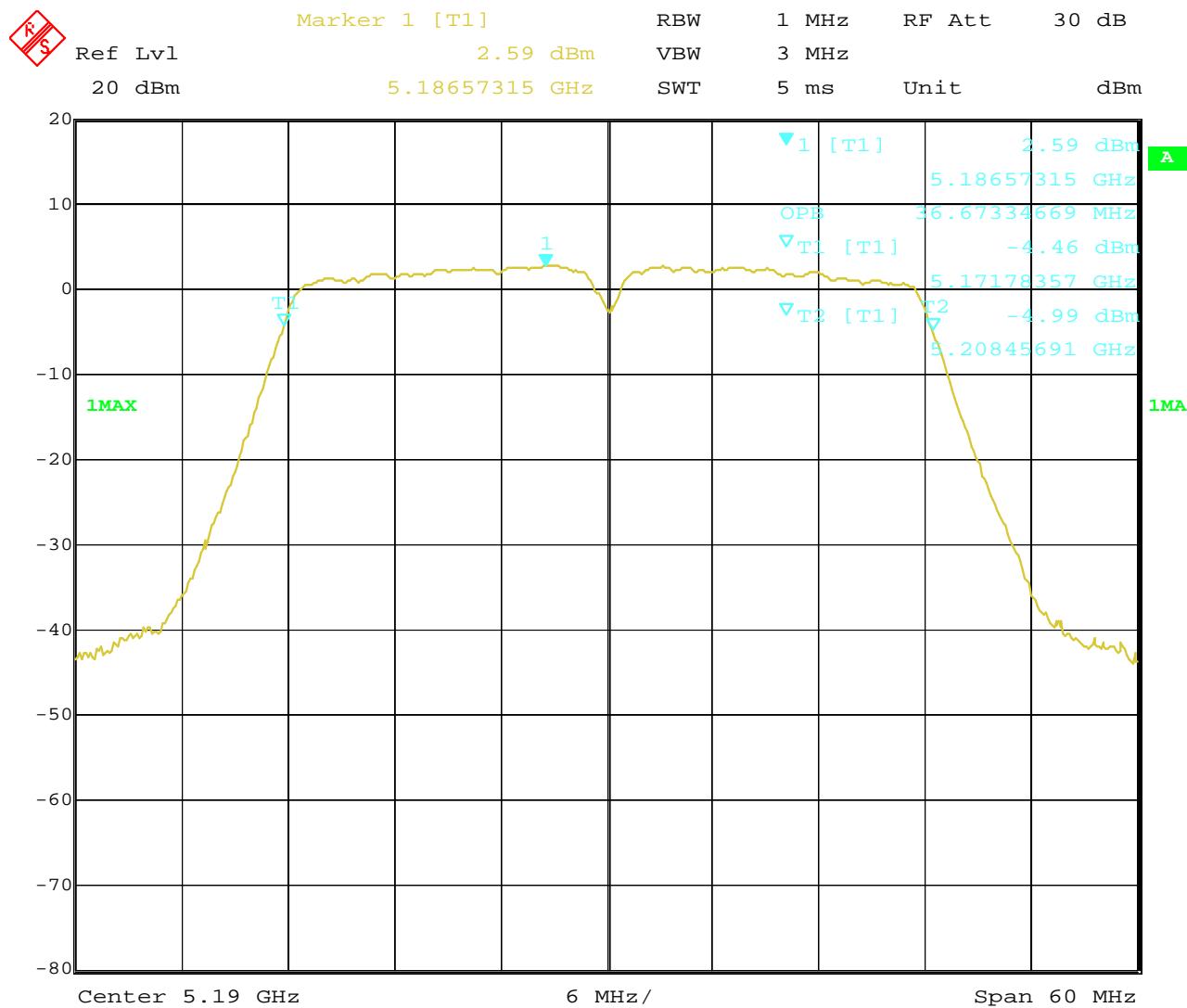
In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.



Test Configure

99% Bandwidth

Channel 38



Date: 1.DEC.2020 16:02:45

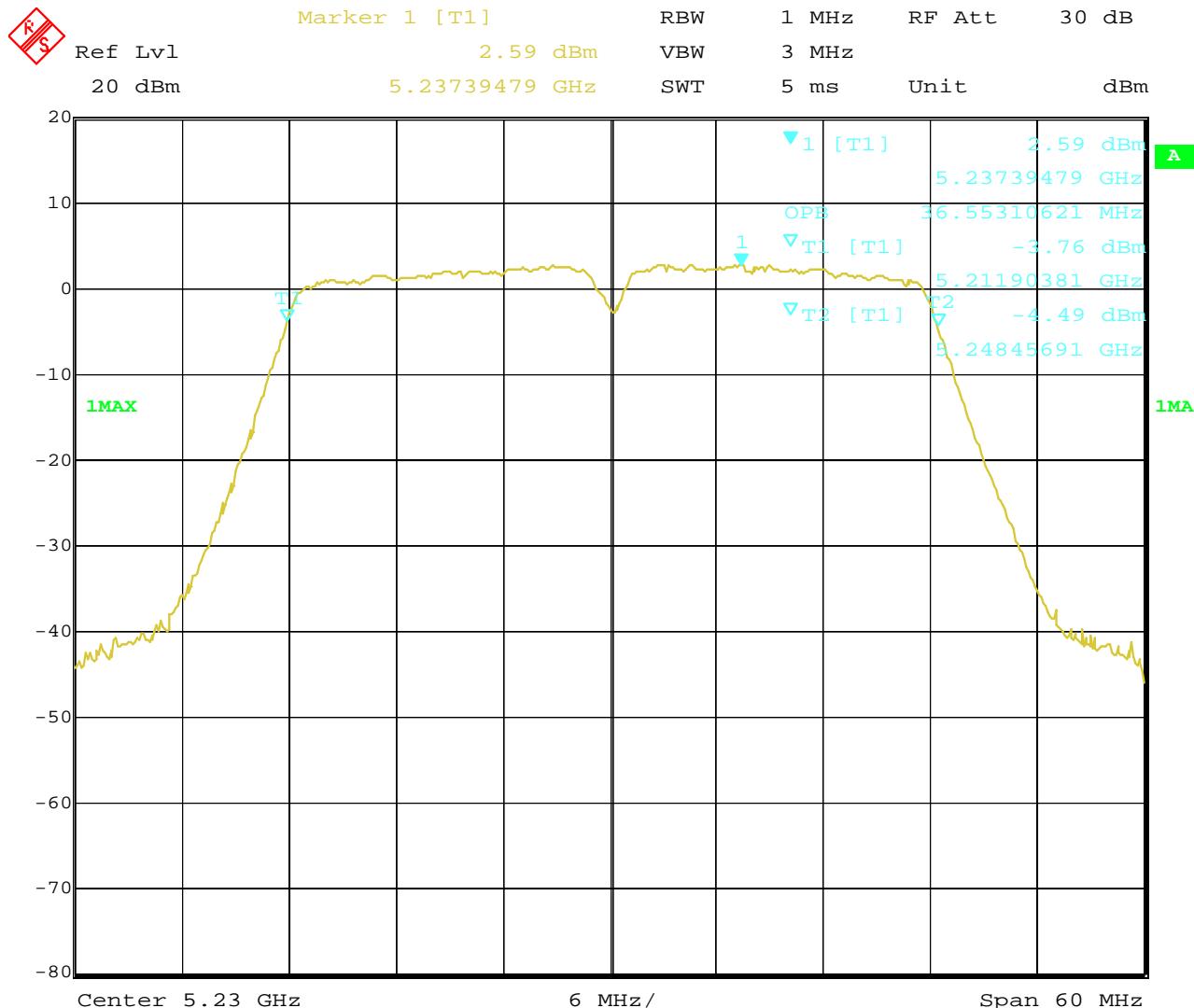
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Channel 46



Date: 1.DEC.2020 16:08:46

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EUT		Commercial Kiosk Tablet		Model		NEB215
Mode		802.11ac VHT20		Input Voltage		120V~
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	19.84	--	Pass	
40	5200	mcs0	19.84	--	Pass	
48	5240	mcs0	19.84	--	Pass	
99% Bandwidth						
36	5180	mcs0	17.68	--	Pass	
40	5200	mcs0	17.68	--	Pass	
48	5240	mcs0	17.68	--	Pass	

Note: Two antennas were tested and only the worst cased was recorded in the test report. 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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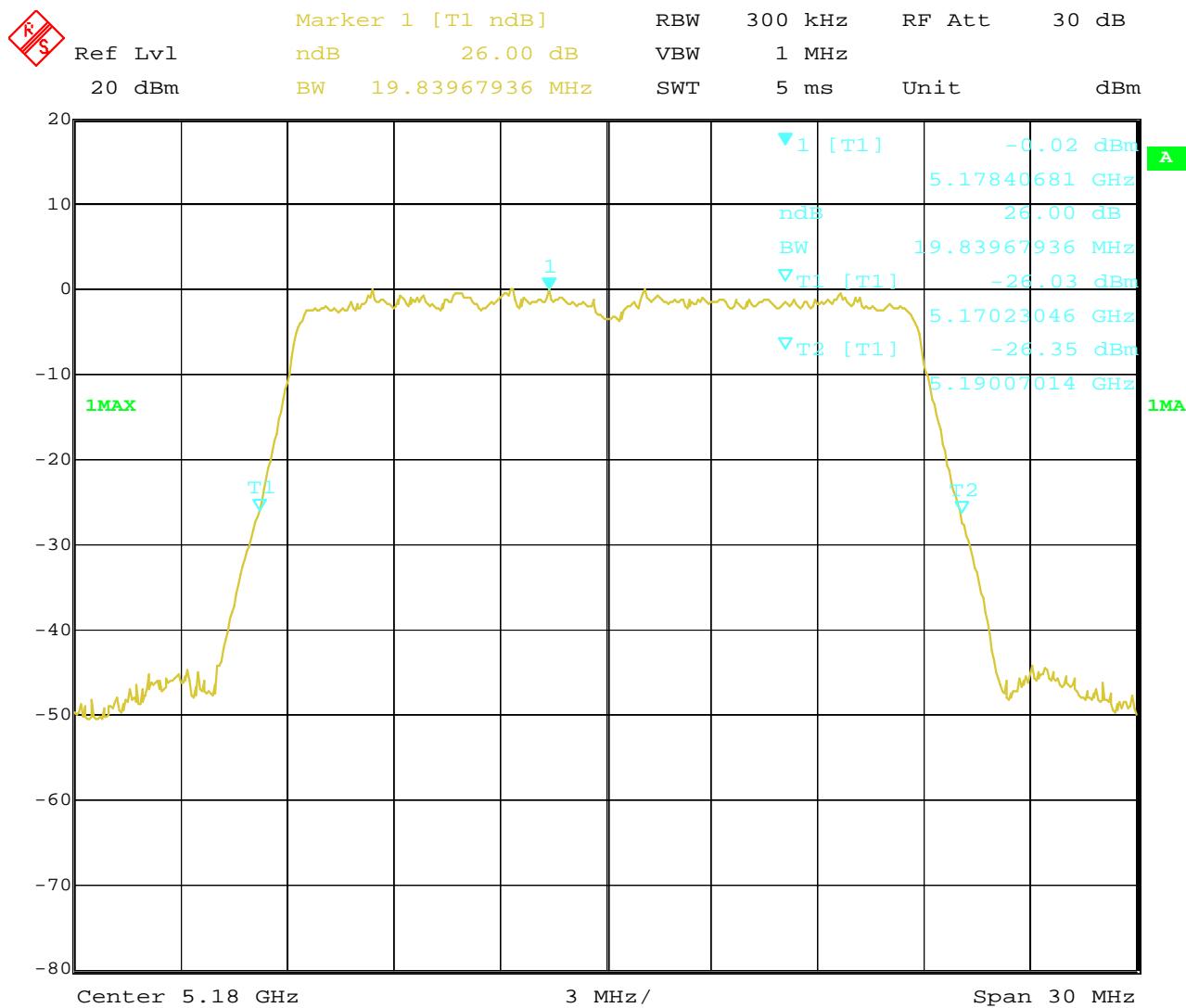
In the event of the improper use of the report, the SHENZHEN TIMEWAY TESTING LABORATORIES reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.



Test Configure

26dB Bandwidth

Channel 36



Date: 1.DEC.2020 15:57:56

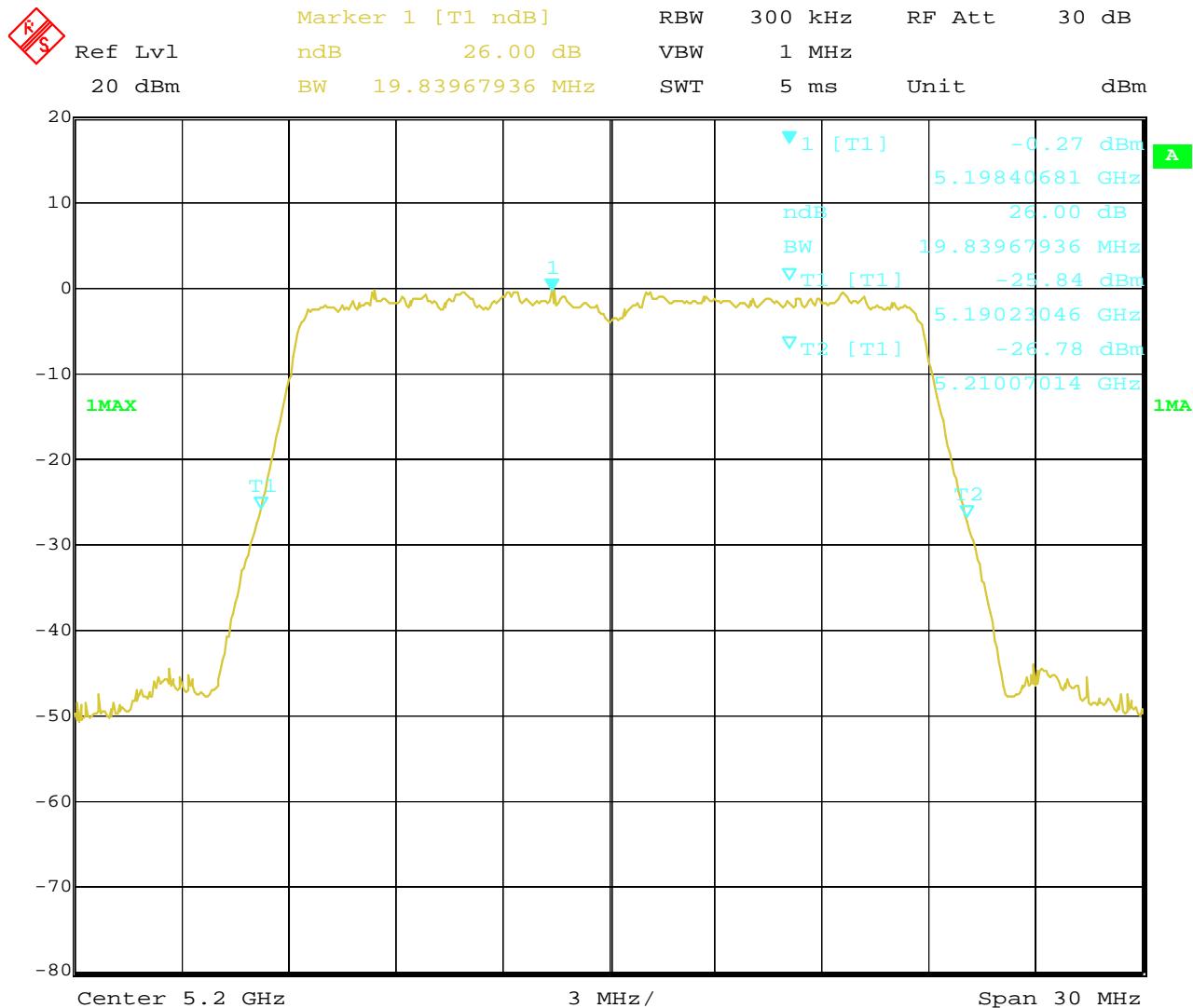
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Channel 40



Date: 1.DEC.2020 15:58:34

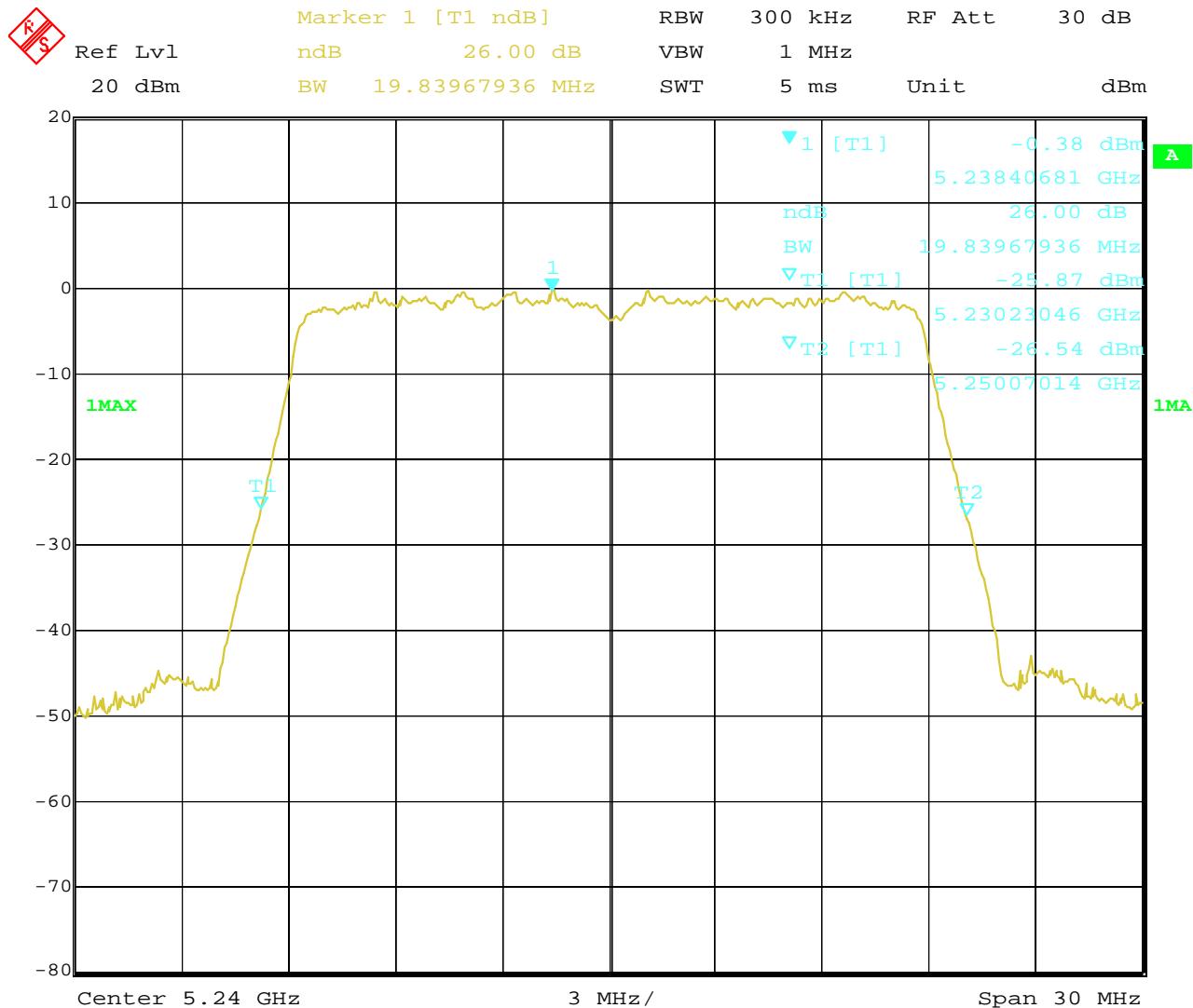
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Channel 48



Date: 1.DEC.2020 16:00:28

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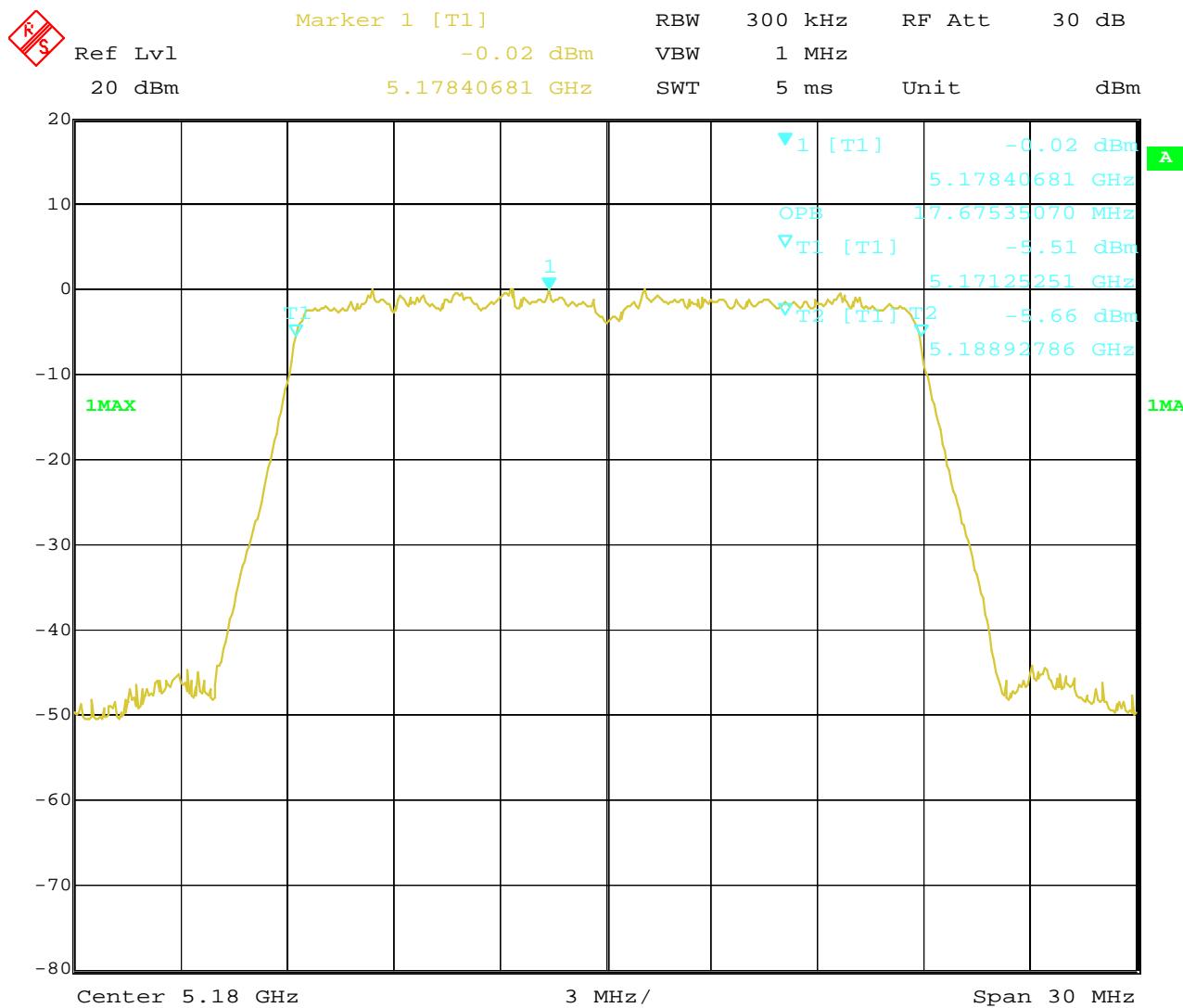
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Test Configure

99% Bandwidth

Channel 36



Date: 1.DEC.2020 15:57:43

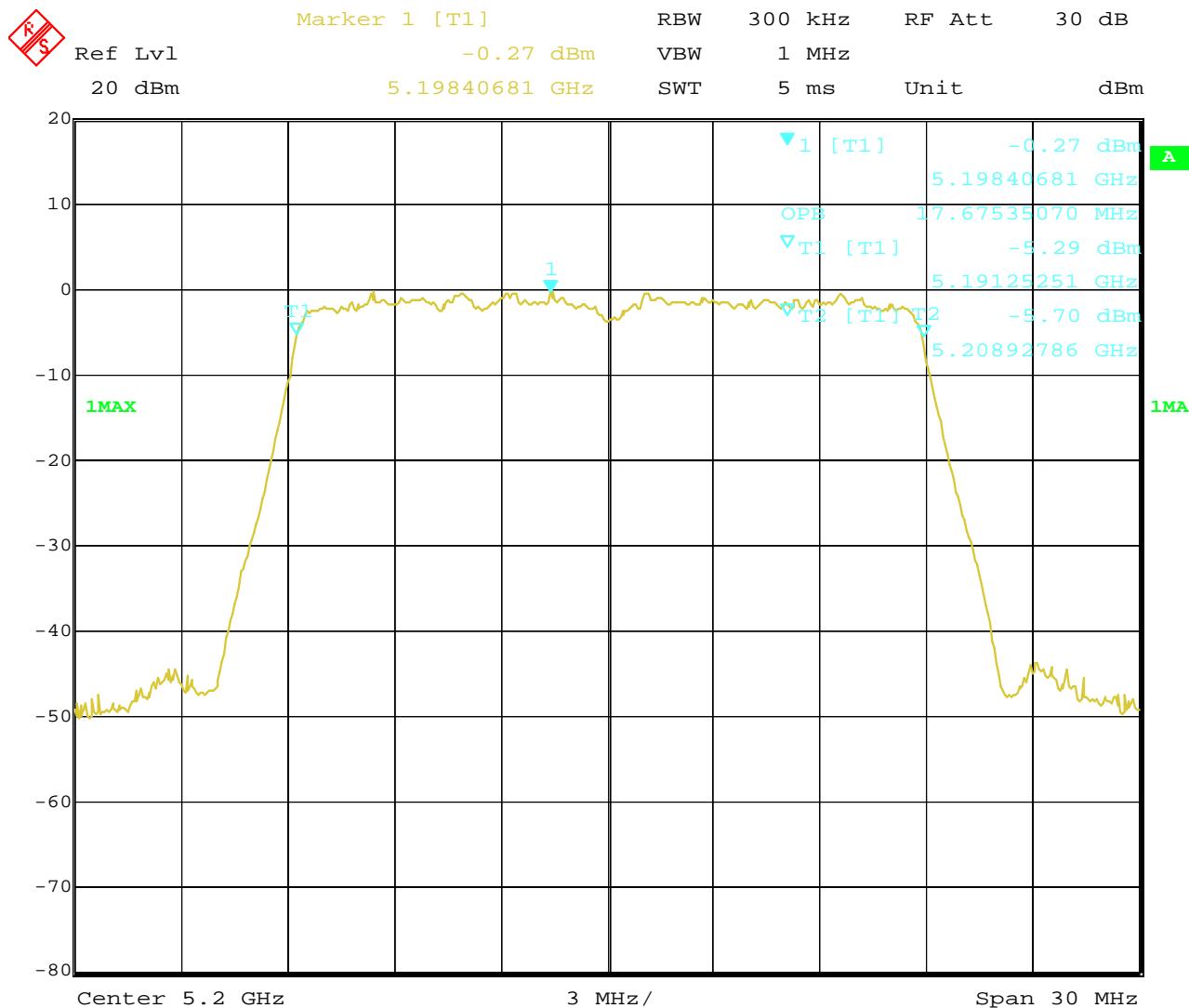
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Channel 40



Date: 1.DEC.2020 15:58:47

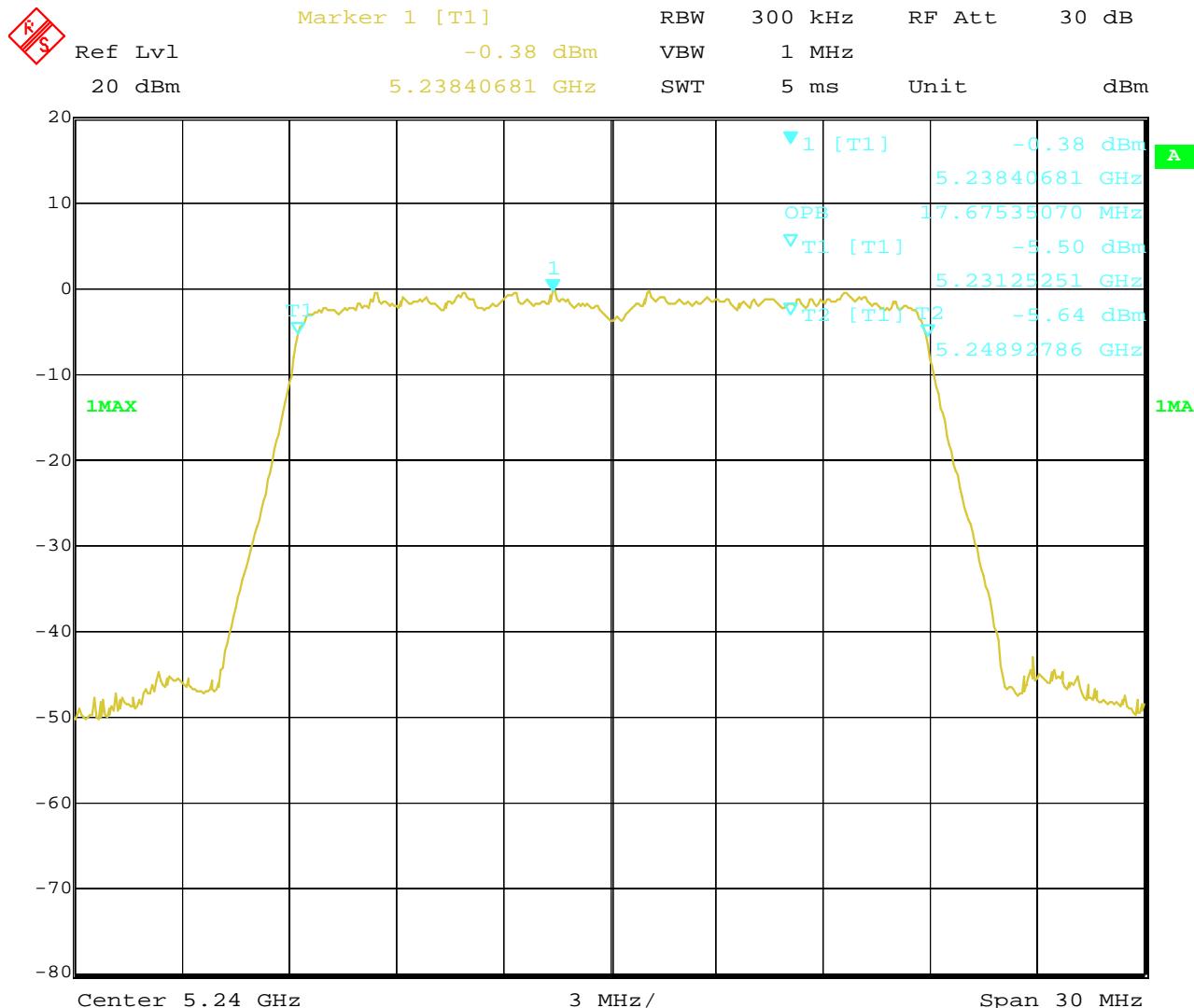
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Channel 48



Date: 1.DEC.2020 16:00:11

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EUT		Commercial Kiosk Tablet		Model		NEB215		
Mode		802.11ac VHT40		Input Voltage		120V~		
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	42.93	--	Pass			
46	5230	mcs0	43.05	--	Pass			
99% Bandwidth								
38	5190	mcs0	36.67	--	Pass			
46	5230	mcs0	36.67	--	Pass			

Note: Two antennas were tested and only the worst cased was recorded in the test report. Ant 0 was the worst case.

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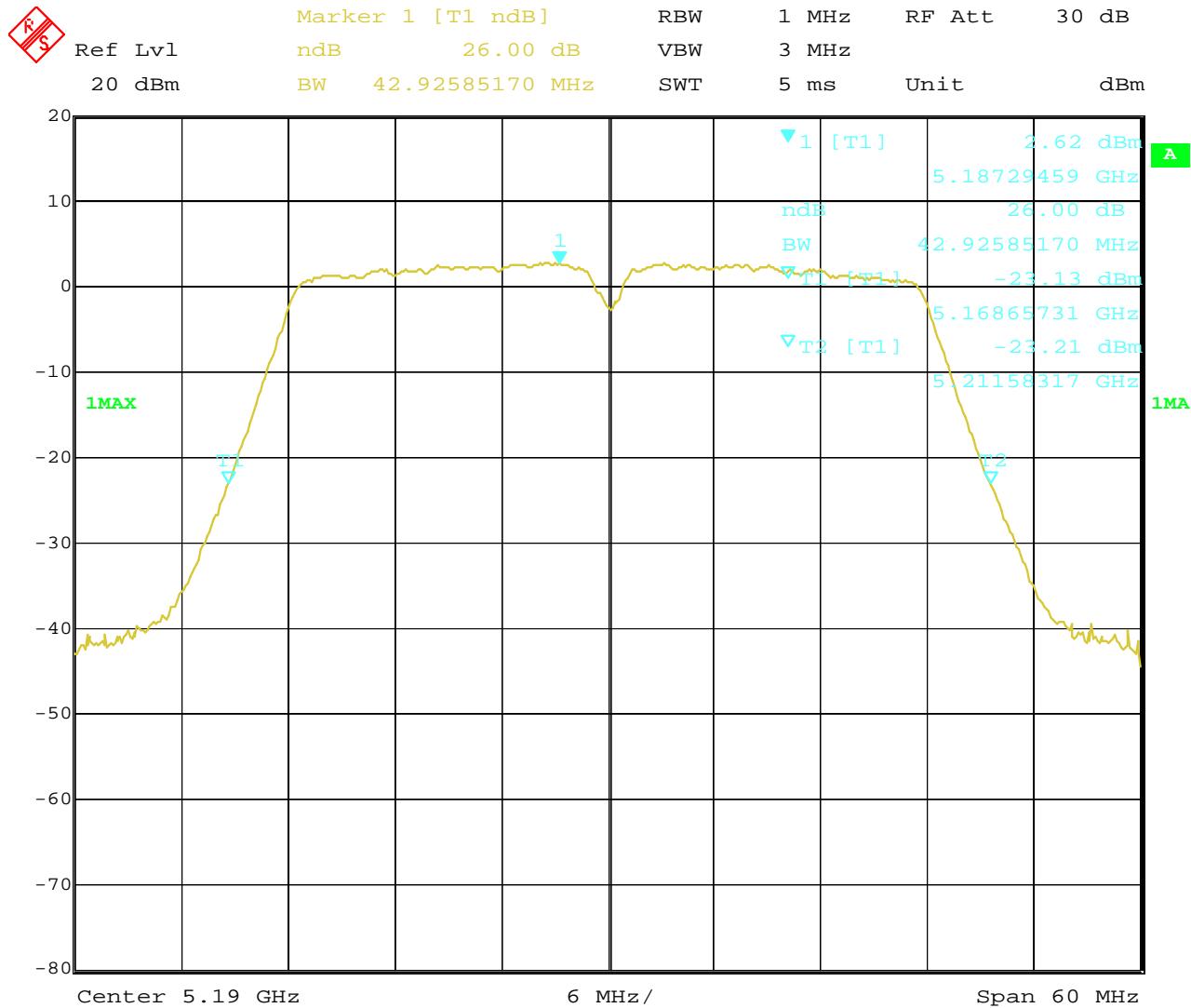
In the event of the improper use of the report, The SHENZHEN TIMEWAY TESTING LABORATORIES, reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.



Test Configure

26dB Bandwidth

Channel 38



Date: 1.DEC.2020 16:12:17

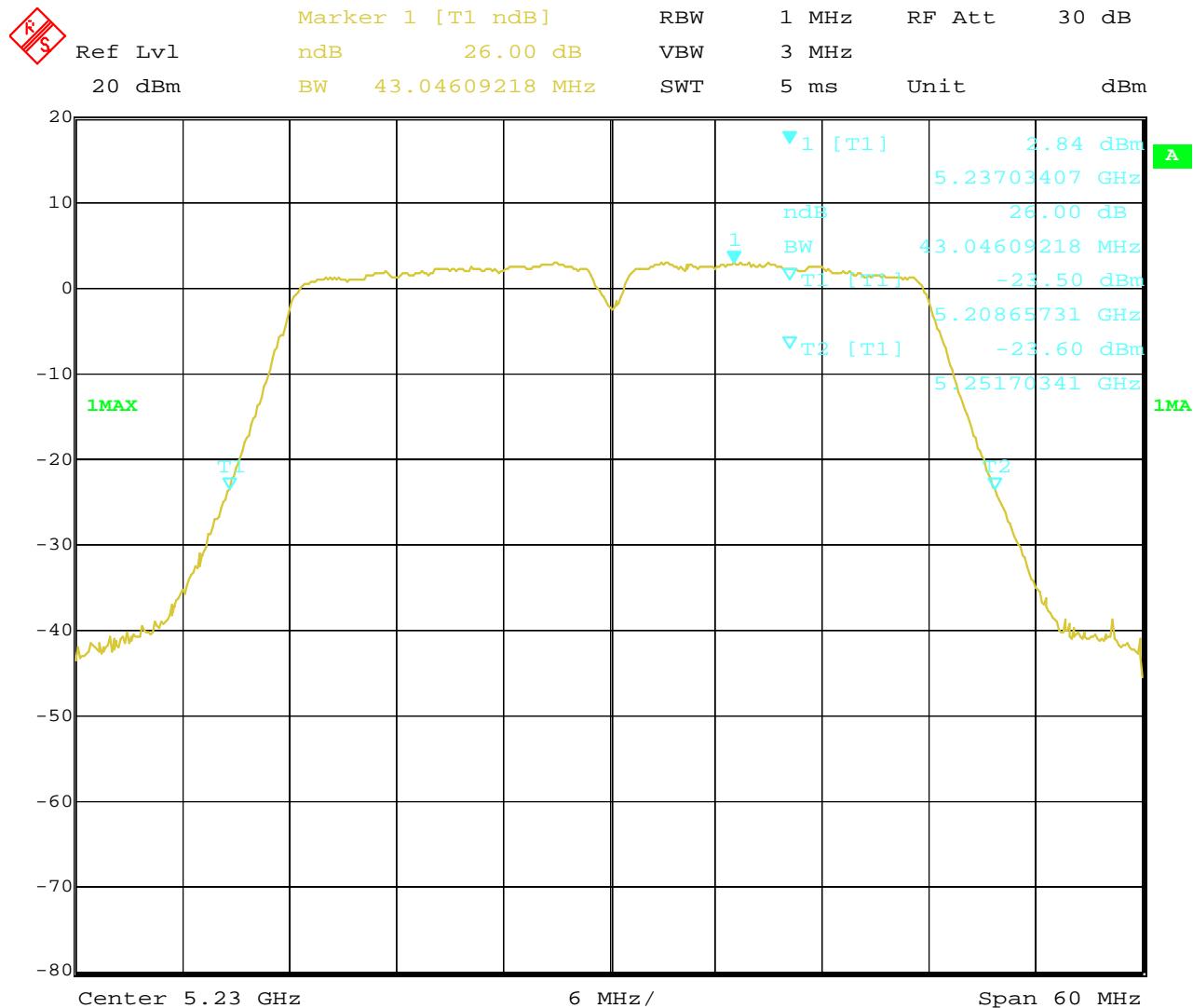
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Channel 46



Date: 1.DEC.2020 16:10:00

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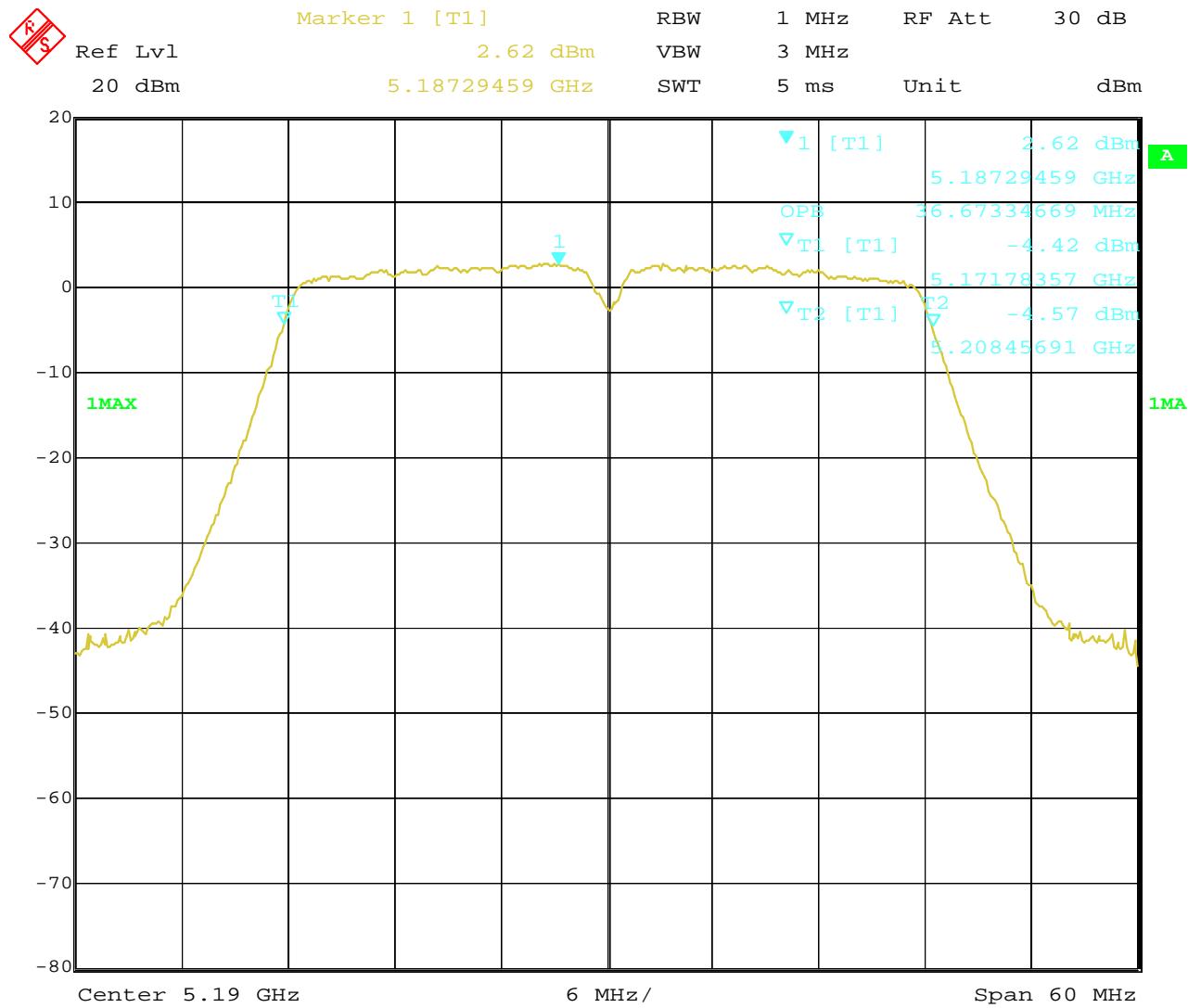
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Test Configure

99% Bandwidth

Channel 38



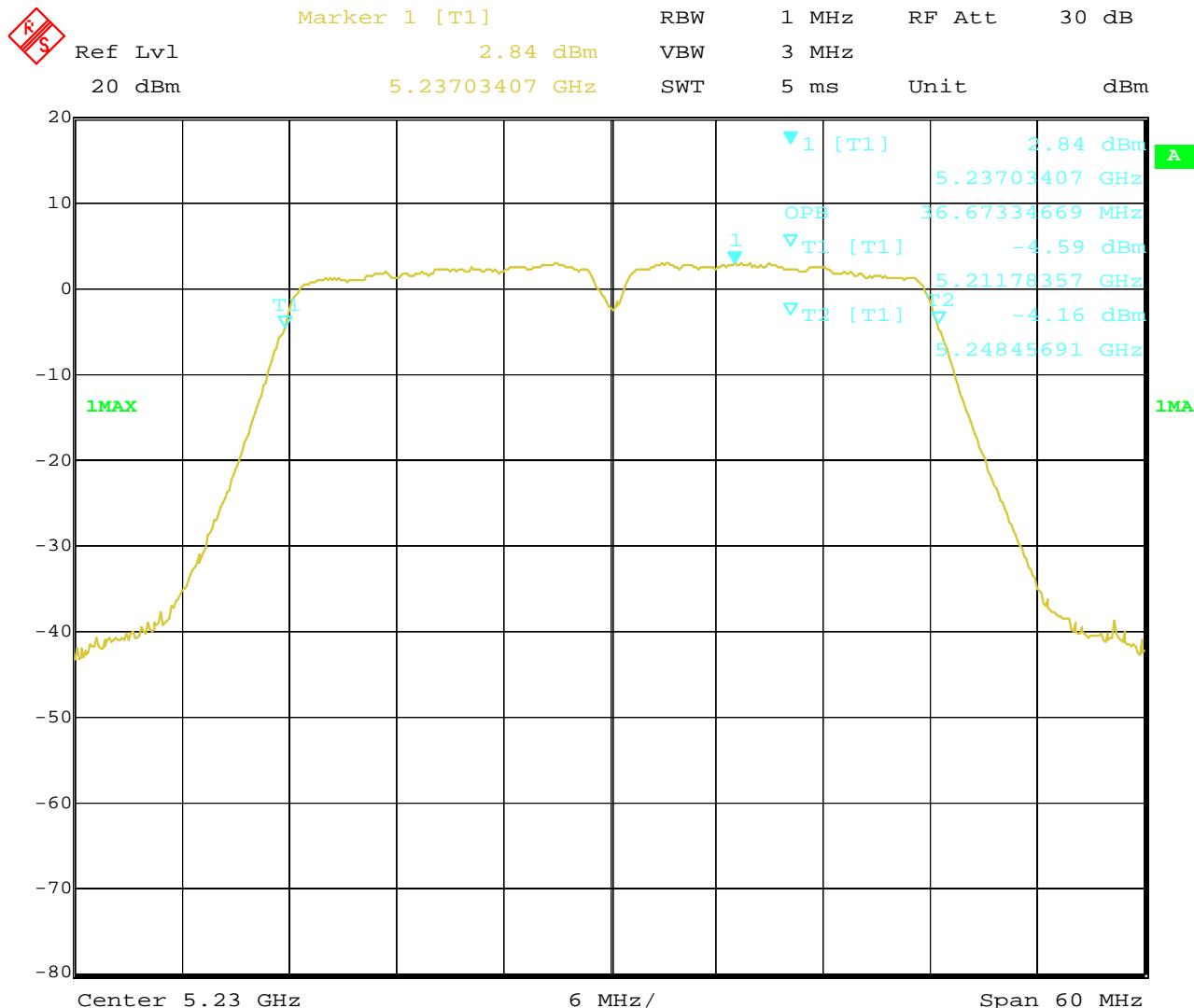
The report refers only to the sample tested and does not apply to the bulk

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Channel 46



Date: 1.DEC.2020 16:10:41

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EUT		Commercial Kiosk Tablet		Model		NEB215		
Mode		802.11ac VHT80		Input Voltage		120V~		
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	23.9	82.24	--	Pass			
99% Bandwidth								
42	5210	23.9	75.51	--	Pass			

Note: Two antennas were tested and only the worst cased was recorded in the test report. Ant 0 was the worst case.

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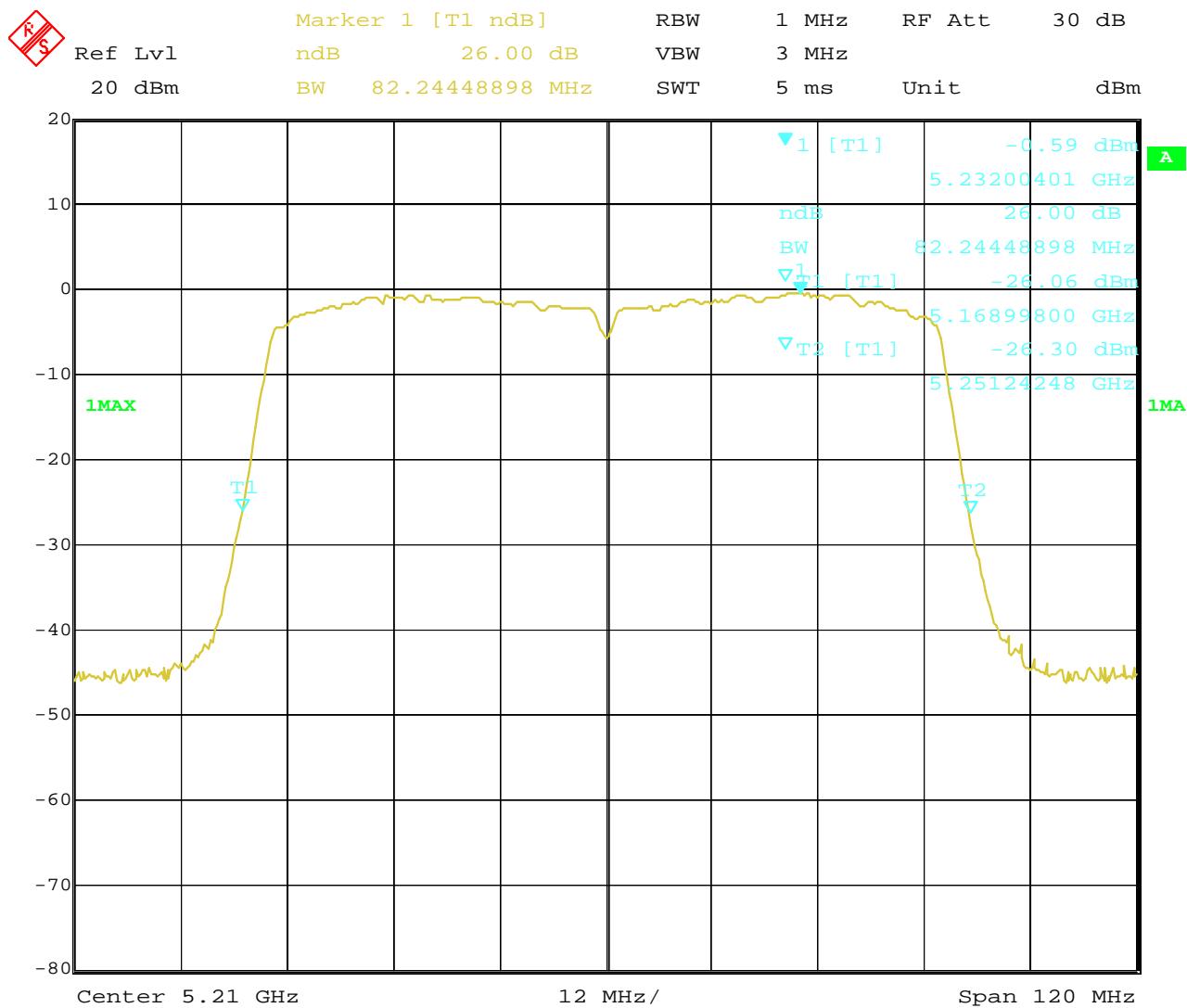
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Test Configure

26dB Bandwidth

Channel 42



Date: 1.DEC.2020 16:14:53

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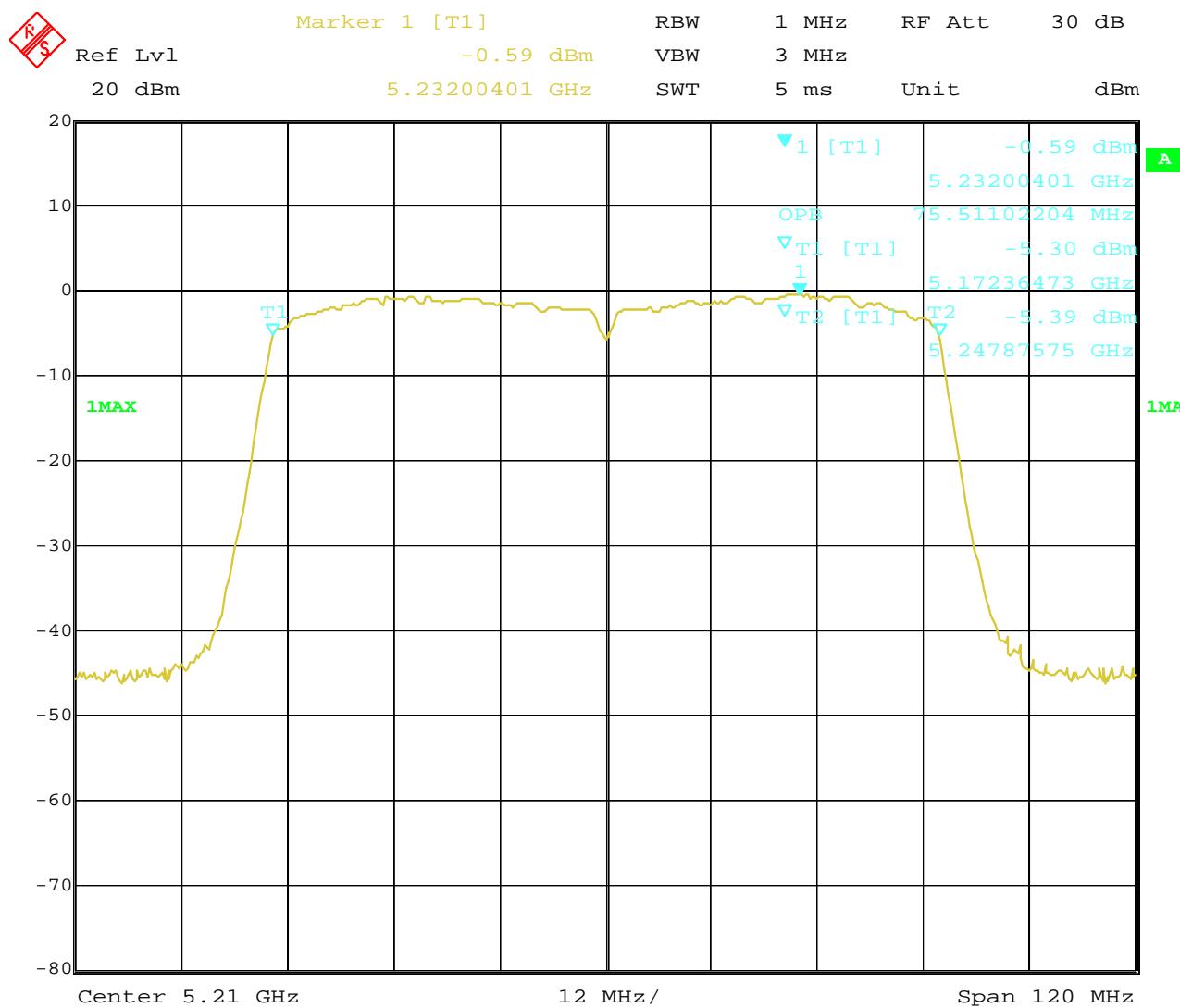
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Test Configure

99% Bandwidth

Channel 42



Date: 1.DEC.2020 16:15:02

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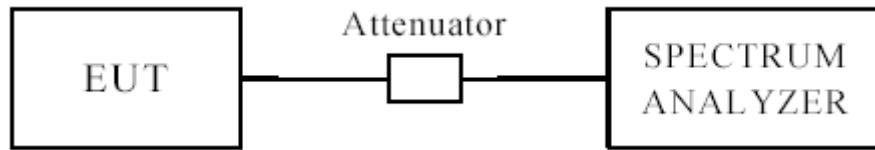
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8.0 Peak Transmit Power Measurement

8.1 Test Setup



8.2 Limits of Peak Transmit Power Measurement

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

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

2. EIRP was measured, EIRP=AV Power +Antenna Gain

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

2. The average power was measured

8.3 Test Procedure

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

Note: the average power was measured

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8.4 Test Results

EUT		Commercial Kiosk Tablet		Model		NEB215		
Mode		802.11a		Test Voltage		120V~		
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	8.30	6.76	8.25	6.68	11.29	22.38	Pass
40	5200	8.45	7.00	8.36	6.85	11.42	22.38	Pass
48	5240	8.51	7.10	8.43	6.97	11.48	22.38	Pass

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

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		Commercial Kiosk Tablet		Model		NEB215		
Mode		802.11n HT20		Test Voltage		120V~		
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	8.09	6.44	8.02	6.34	11.07	22.38	Pass
40	5200	8.24	6.67	8.15	6.53	11.21	22.38	Pass
48	5240	8.32	6.79	8.21	6.62	11.28	22.38	Pass

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

2. The result basic equation calculation as follow:

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

3. The worse case was recorded

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EUT		Commercial Kiosk Tablet		Model		NEB215		
Mode		802.11n HT40		Test Voltage		120V~		
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	8.01	6.32	7.95	6.24	10.99	23.01	Pass
46	5230	8.05	6.38	7.96	6.25	11.02	23.01	Pass

Note: 1. At final test to get the worst-case emission at mcs0 (13.5Mbps) for CH38 and CH46

2. The result basic equation calculation as follow:

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

3. The worse case was recorded

EUT		Commercial Kiosk Tablet		Model		NEB215		
Mode		802.11ac VHT20		Test Voltage		120V~		
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	8.16	6.55	8.09	6.44	11.14	22.58	Pass
40	5200	8.22	6.64	8.12	6.49	11.18	22.58	Pass
48	5240	8.22	6.64	8.15	6.53	11.20	22.58	Pass

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

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		Commercial Kiosk Tablet		Model		NEB215		
Mode		802.11ac VHT40		Test Voltage		120V~		
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	8.02	6.34	7.96	6.25	11.00	23.01	Pass
46	5230	8.16	6.55	8.10	6.46	11.14	23.01	Pass

Note: 1. At final test to get the worst-case emission at mcs0 (13.5Mbps) for CH38 and CH46

2. The result basic equation calculation as follow:

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

3. The worse case was recorded

EUT		Commercial Kiosk Tablet		Model		NEB215		
Mode		802.11ac VHT80		Test Voltage		120V~		
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	7.99	6.30	7.89	6.15	10.95	23.01	Pass

Note: 1. At final test to get the worst-case emission at 23.9Mbps for CH42

2. The result basic equation calculation as follow:

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

3. The worse case was recorded

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

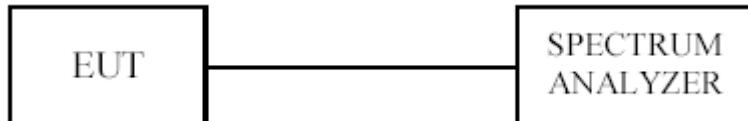
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9. Power Spectral Density Measurement

9.1 Test Setup



9.2 Limits of Power Spectral Density Measurement

Operation Band	Limit
U-NII-1	10dBm/MHz
U-NII-2A	11dBm/MHz
U-NII-2C	11dBm/MHz
U-NII-3	30dBm/500kHz

9.3 Test Procedure

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

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9.4 Test Result

EUT		Commercial Kiosk Tablet		Model		NEB215	
Mode		802.11a 6Mbps		Test Voltage		120V~	
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	-1.54	3.01	1.47		10	Pass
40	5200	-1.56	3.01	1.45		10	Pass
48	5240	-1.36	3.01	1.65		10	Pass

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

2. Factor=10log2=3.01

3. Ant 0 and Ant 1 were tested and Ant 0 was the worst case

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

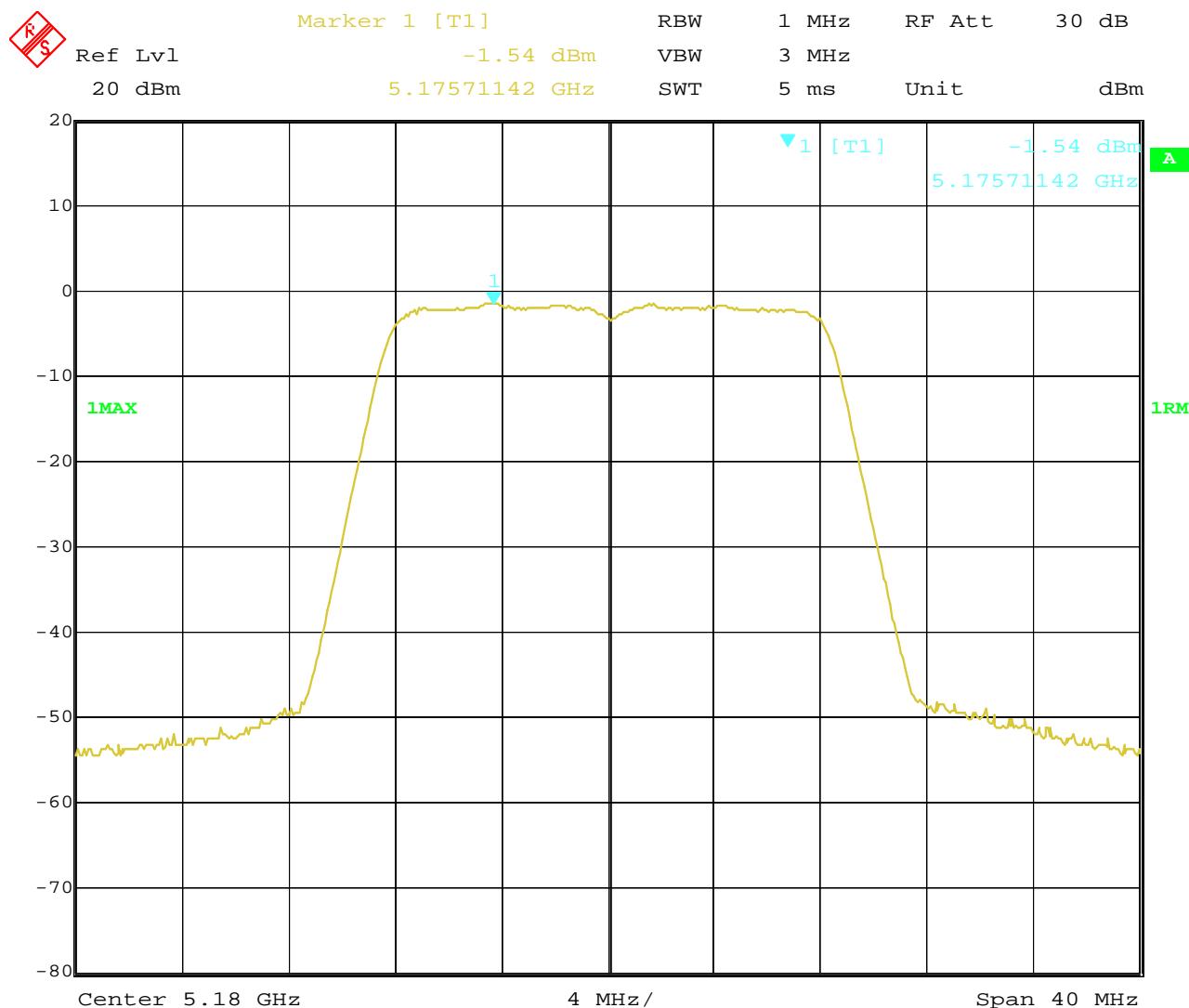
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9.5 Plots of Power Spectral Density Measurement

1.802.11a at 6Mbps of CH36



Date: 1.DEC.2020 16:54:53

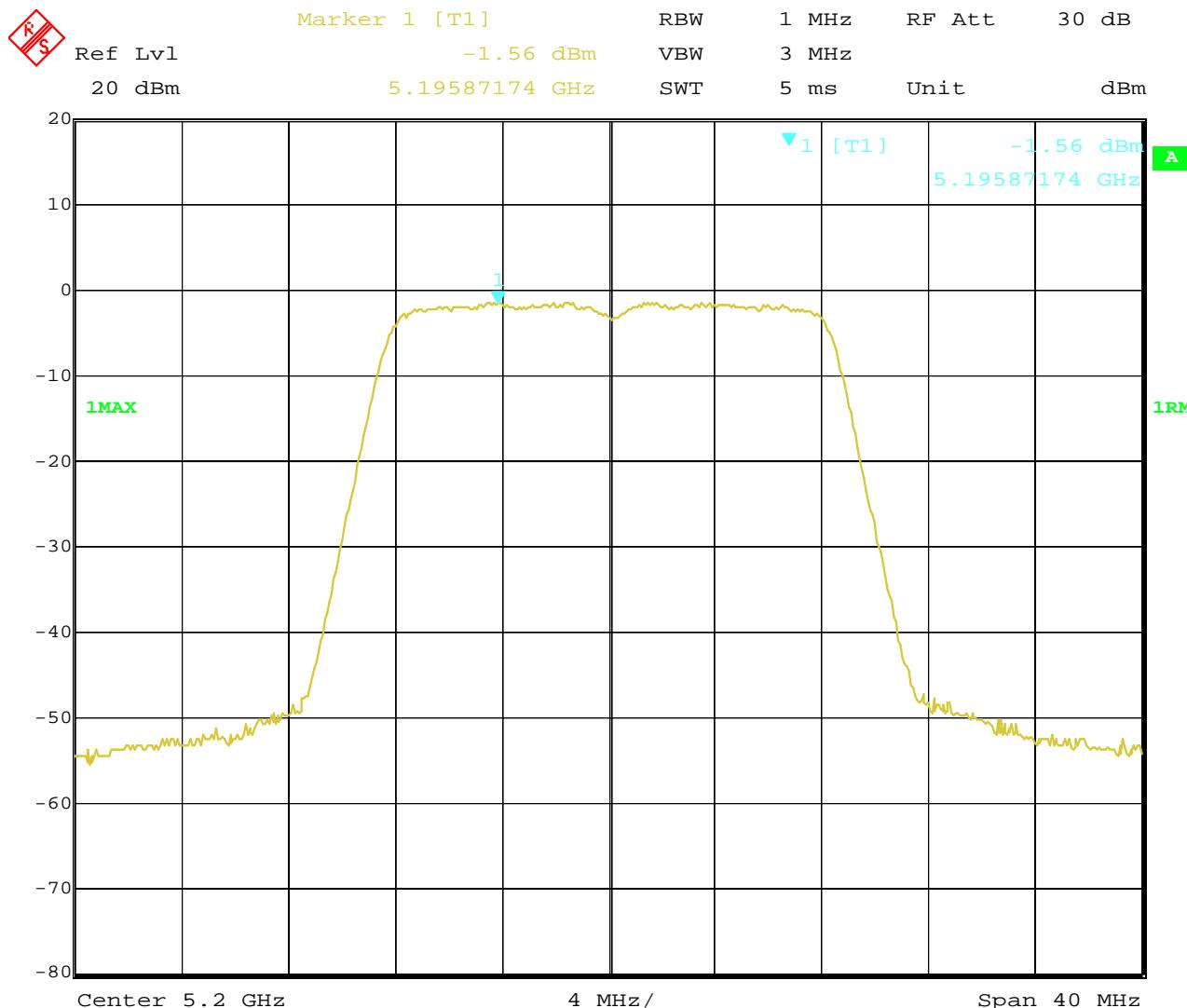
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2.802.11a at 6Mbps of CH40



Date: 1. DEC. 2020 16:55:20

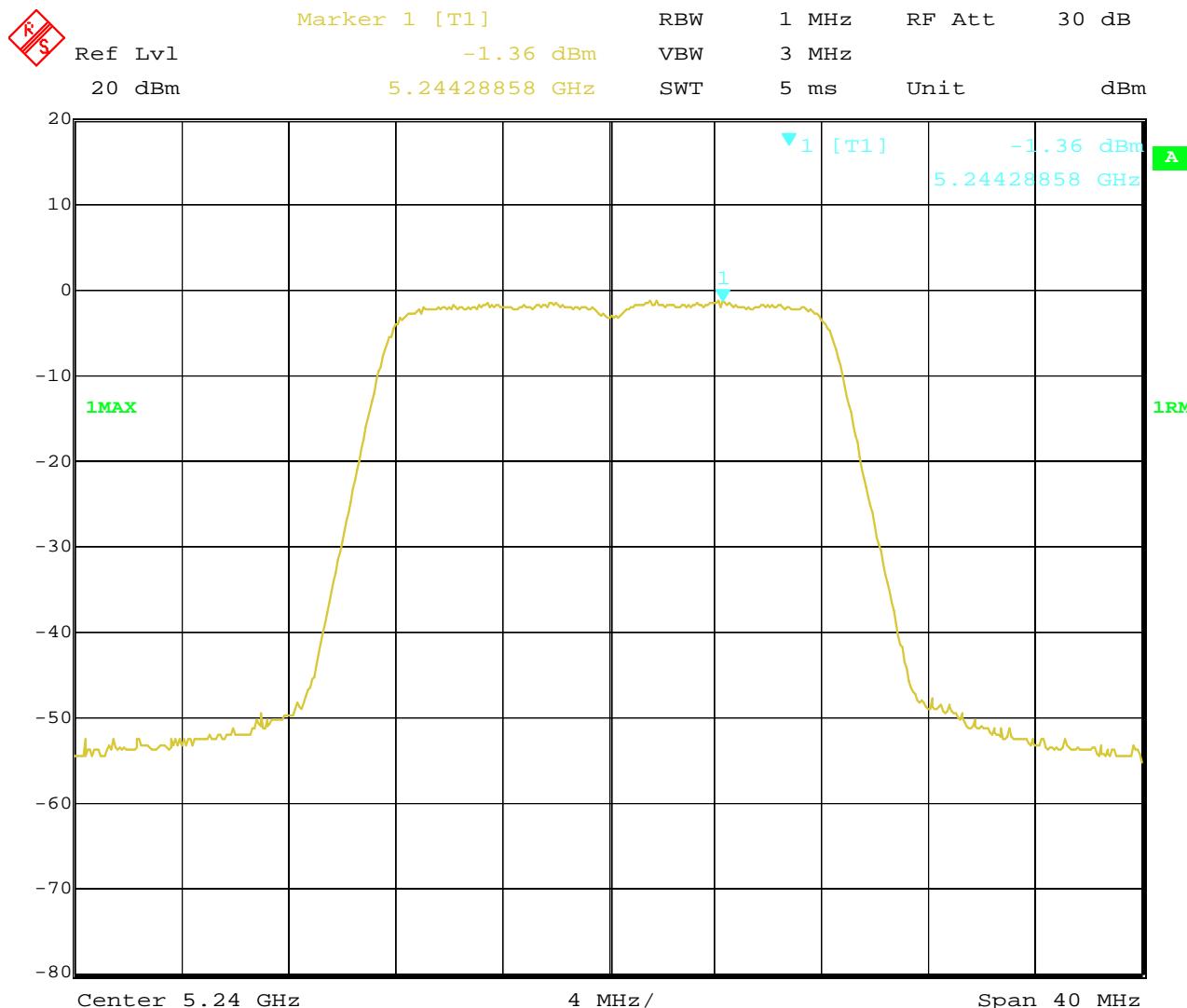
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3.802.11a at 6Mbps of CH48



Date: 1.DEC.2020 16:55:41

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EUT		Commercial Kiosk Tablet		Model		NEB215	
Mode		802.11n HT20 mcs0		Test Voltage		120V~	
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	-1.65	3.01	1.36		10	Pass
40	5200	-1.59	3.01	1.42		10	Pass
48	5240	-1.24	3.01	1.77		10	Pass

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

2. Factor=10log2=3.01

3. Ant 0 and Ant 1 were tested and Ant 0 was the worst case

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

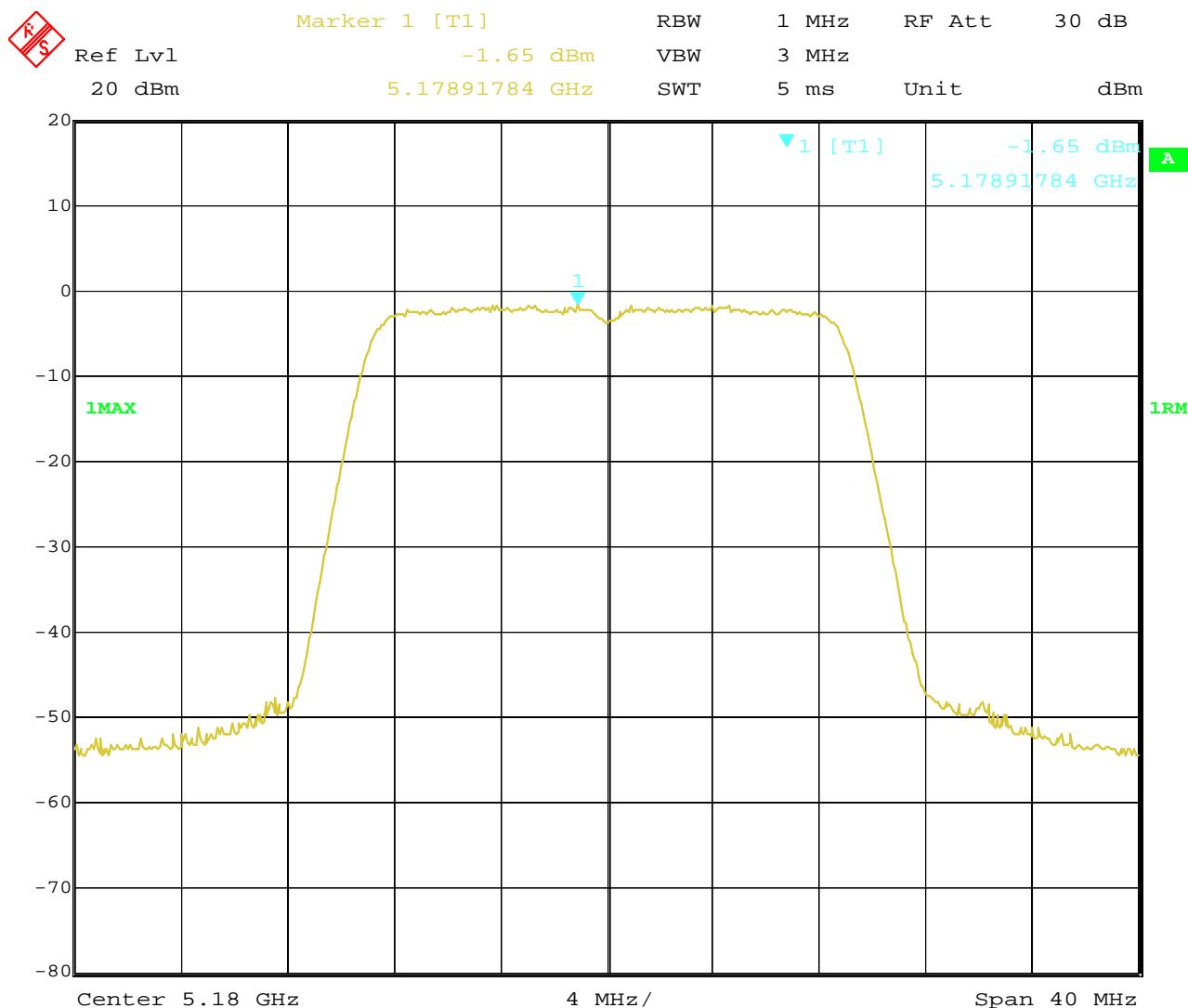
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Test Plots

1.802.11n at mcs0 of CH36



Date: 1.DEC.2020 16:57:14

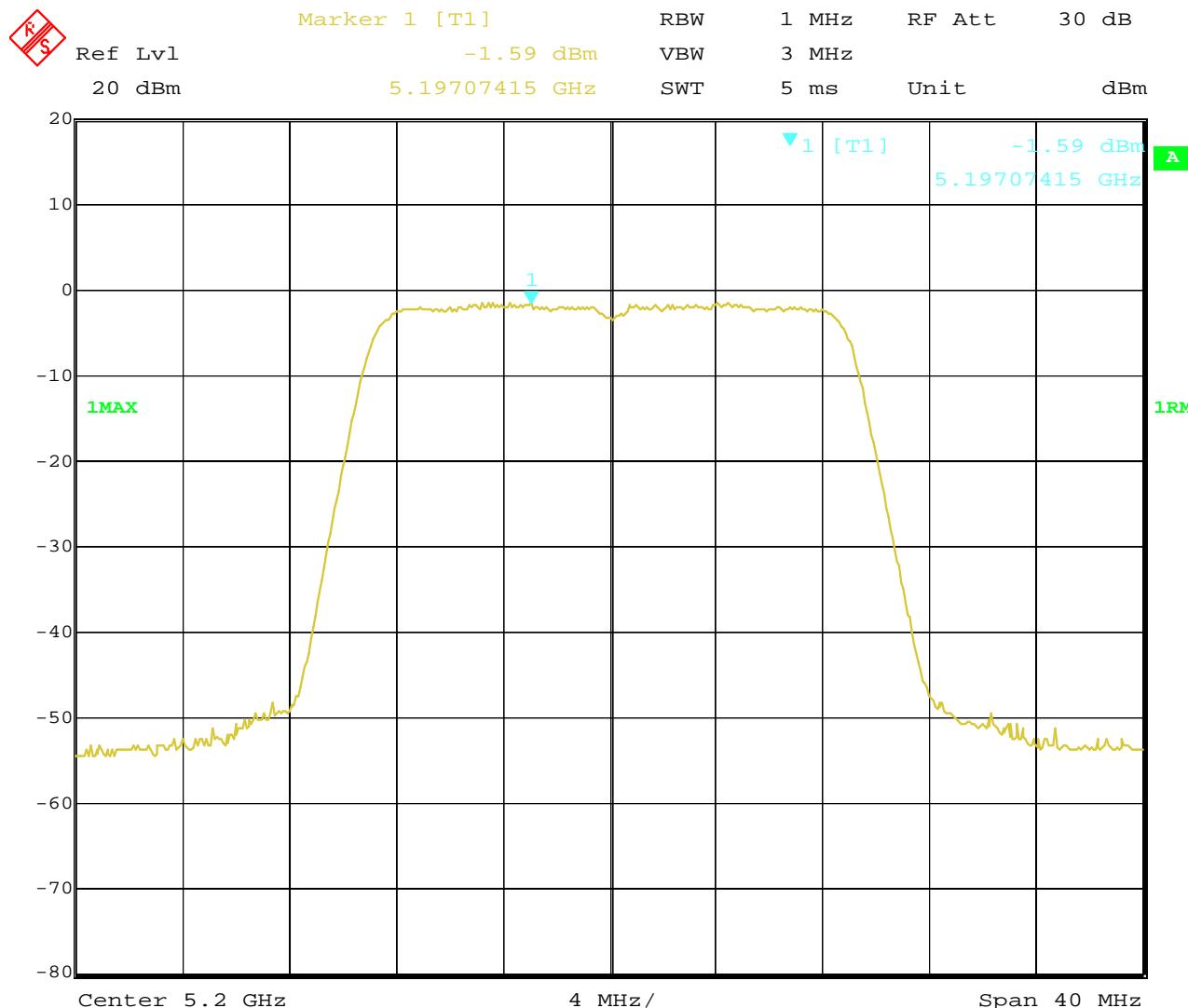
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2.802.11n at mcs0 of CH40



Date: 1. DEC. 2020 16:56:45

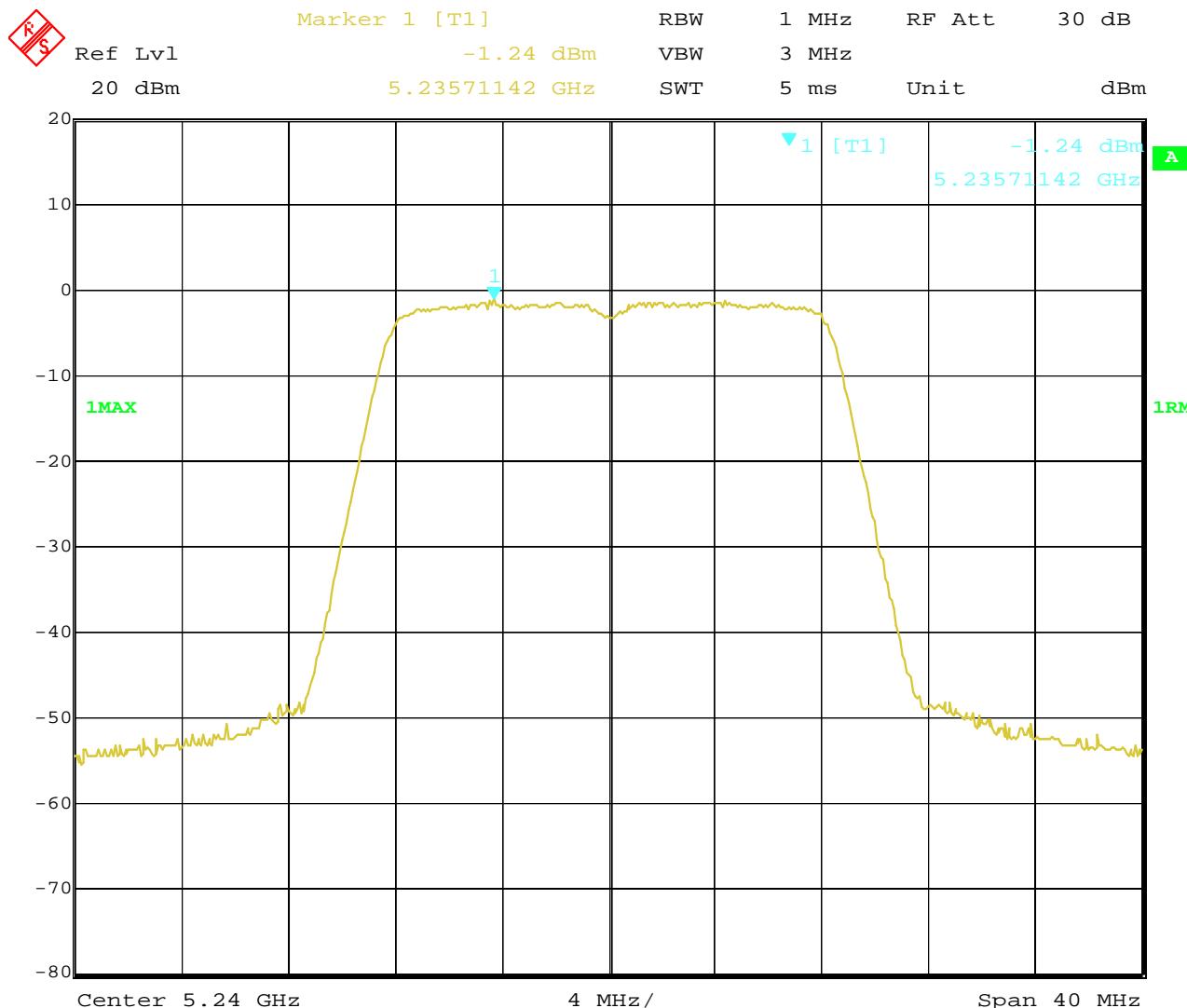
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3.802.11n at mcs0 of CH48



Date: 1. DEC. 2020 16:59:23

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EUT		Commercial Kiosk Tablet		Model		NEB215	
Mode		802.11n HT40 mcs0		Test Voltage		120V~	
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	-4.83	3.01	-1.82		10	Pass
46	5230	-4.68	3.01	-1.67		10	Pass

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

2. Factor=10log2=3.01

3. Ant 0 and Ant 1 were tested and Ant 0 was the worst case

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

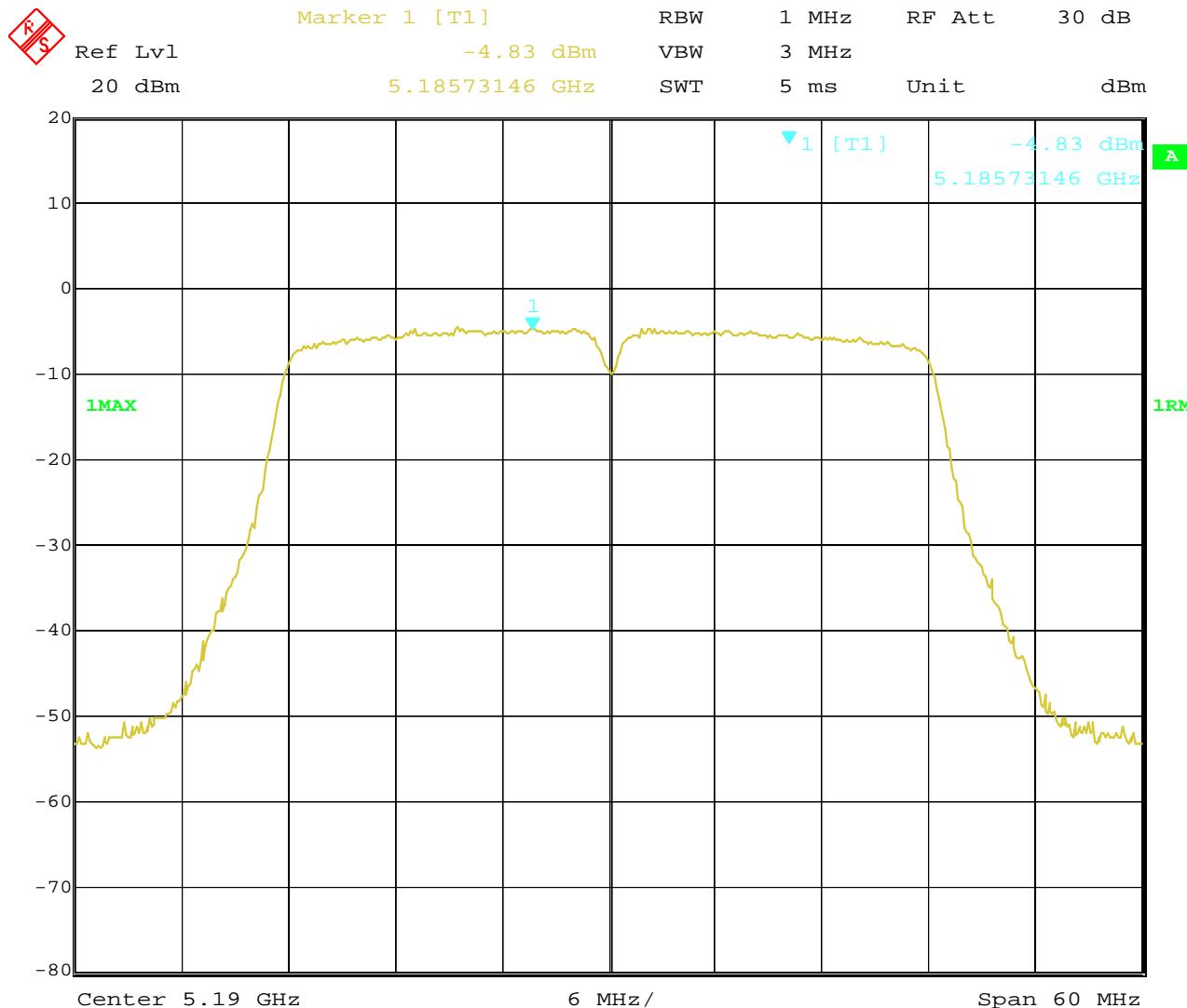
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Test Plots

1.802.11n HT40 at mcs0 of CH38



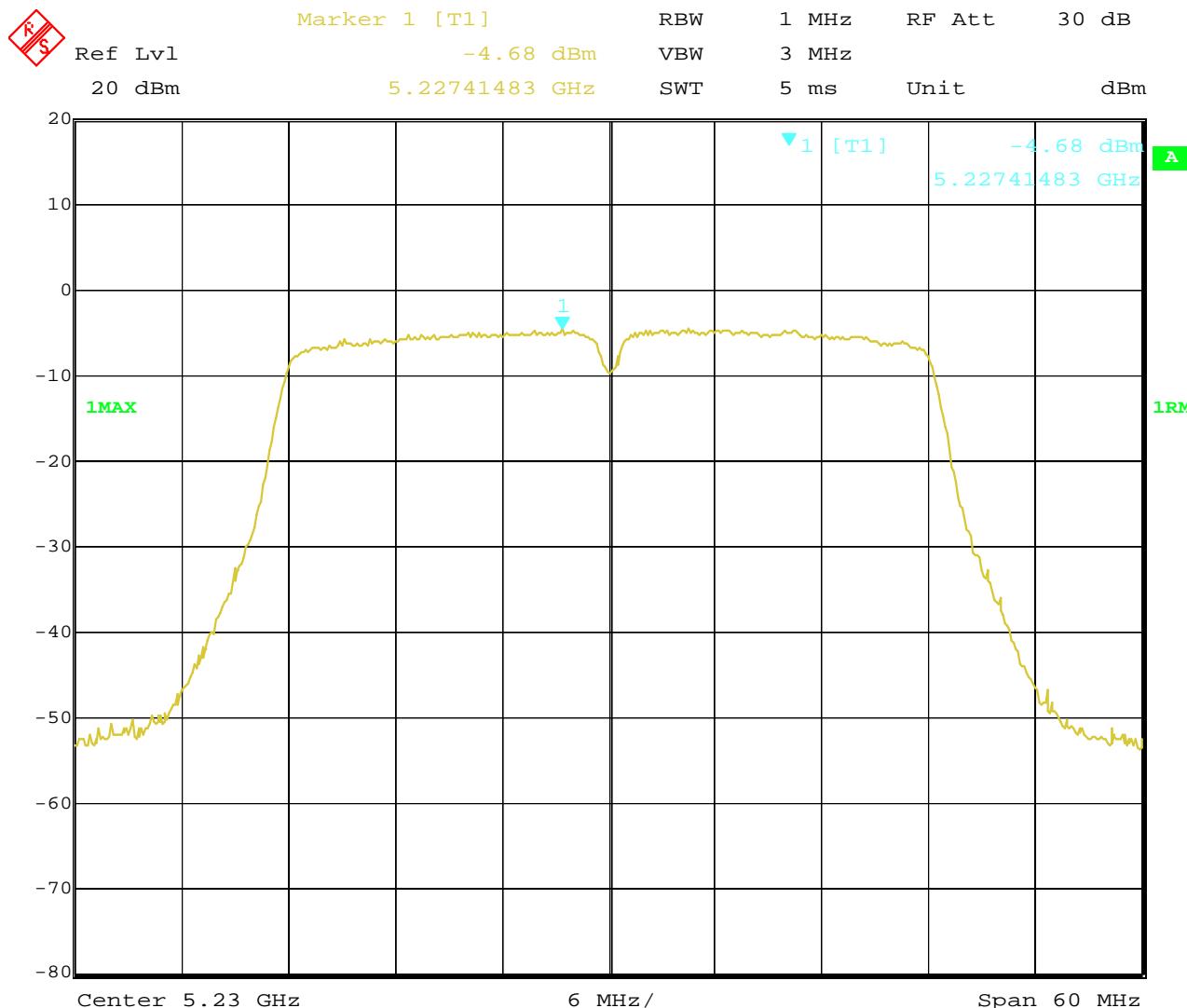
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2.802.11n HT40 at mcs0 of CH46



Date: 1. DEC. 2020 16:58:32

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EUT		Commercial Kiosk Tablet		Model		NEB215	
Mode		802.11ac VHT20		Test Voltage		120V~	
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	-1.77	3.01	1.24		10	Pass
40	5200	-1.65	3.01	1.36		10	Pass
48	5240	-1.53	3.01	1.48		10	Pass

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

2. Factor=10log2=3.01

3. Ant 0 and Ant 1 were tested and Ant 0 was the worst case

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

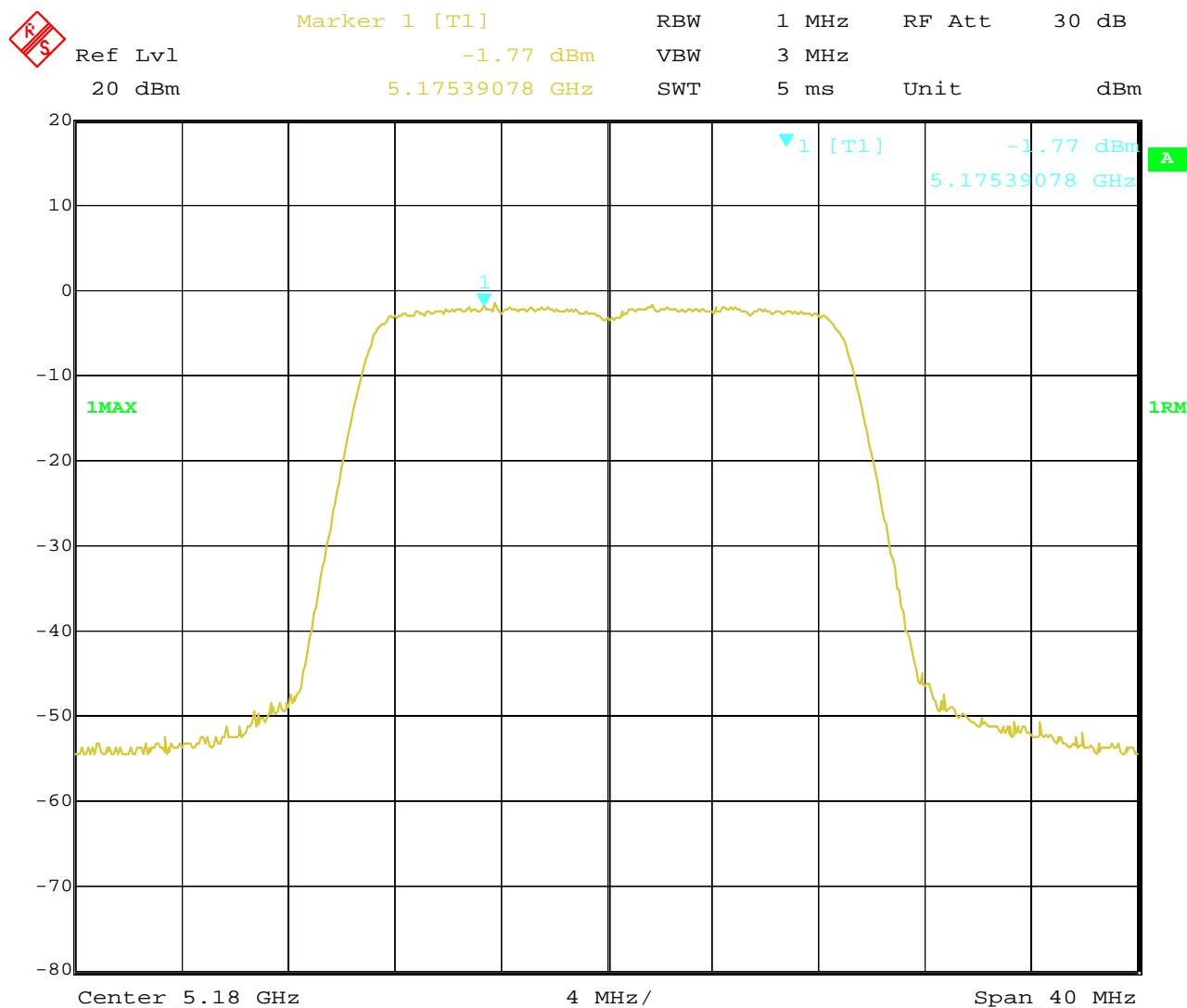
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Test Plots

1.802.11ac at mcs0 of CH36



Date: 1.DEC.2020 17:02:53

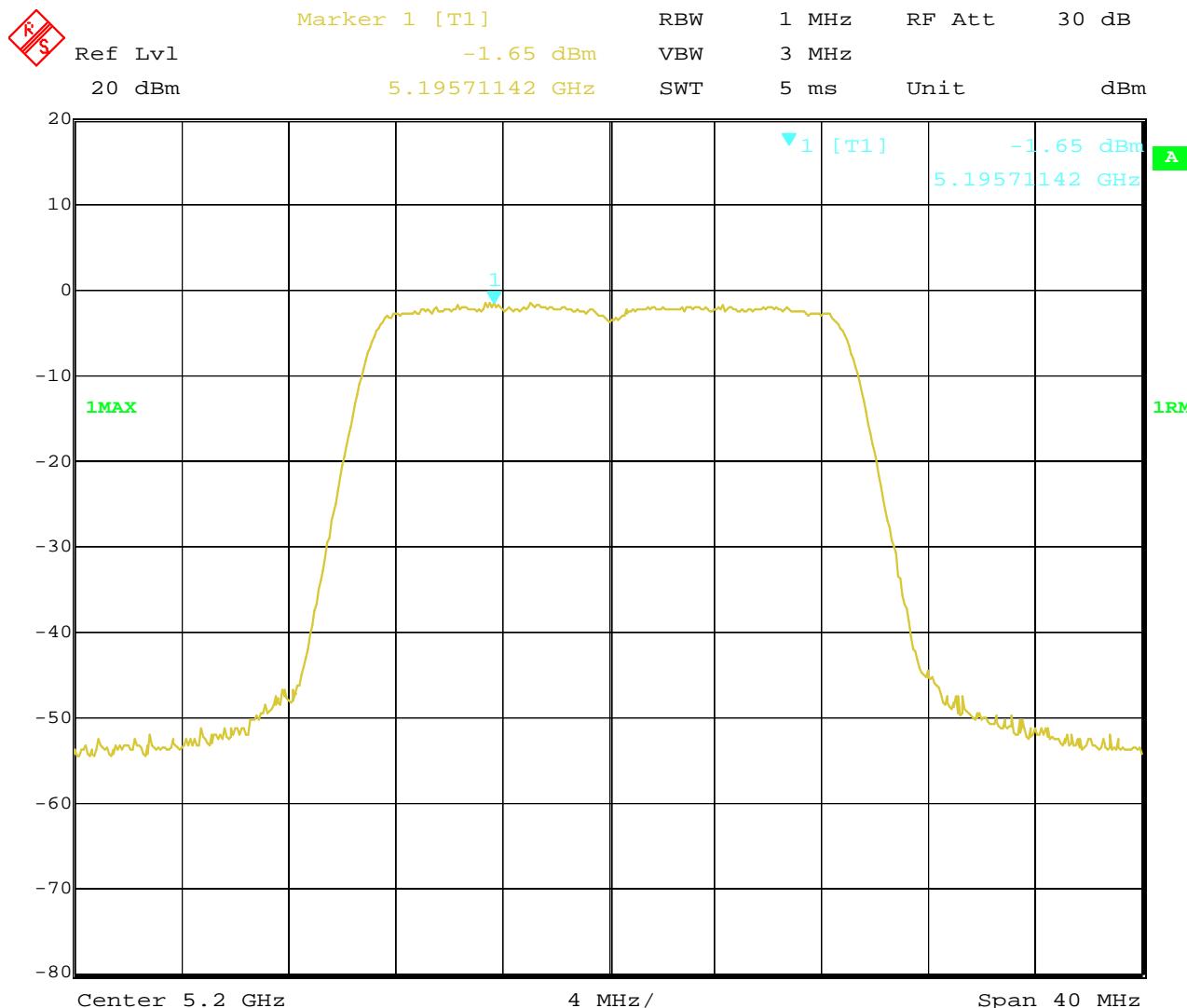
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2.802.11ac at mcs0 of CH40



Date: 1.DEC.2020 17:03:19

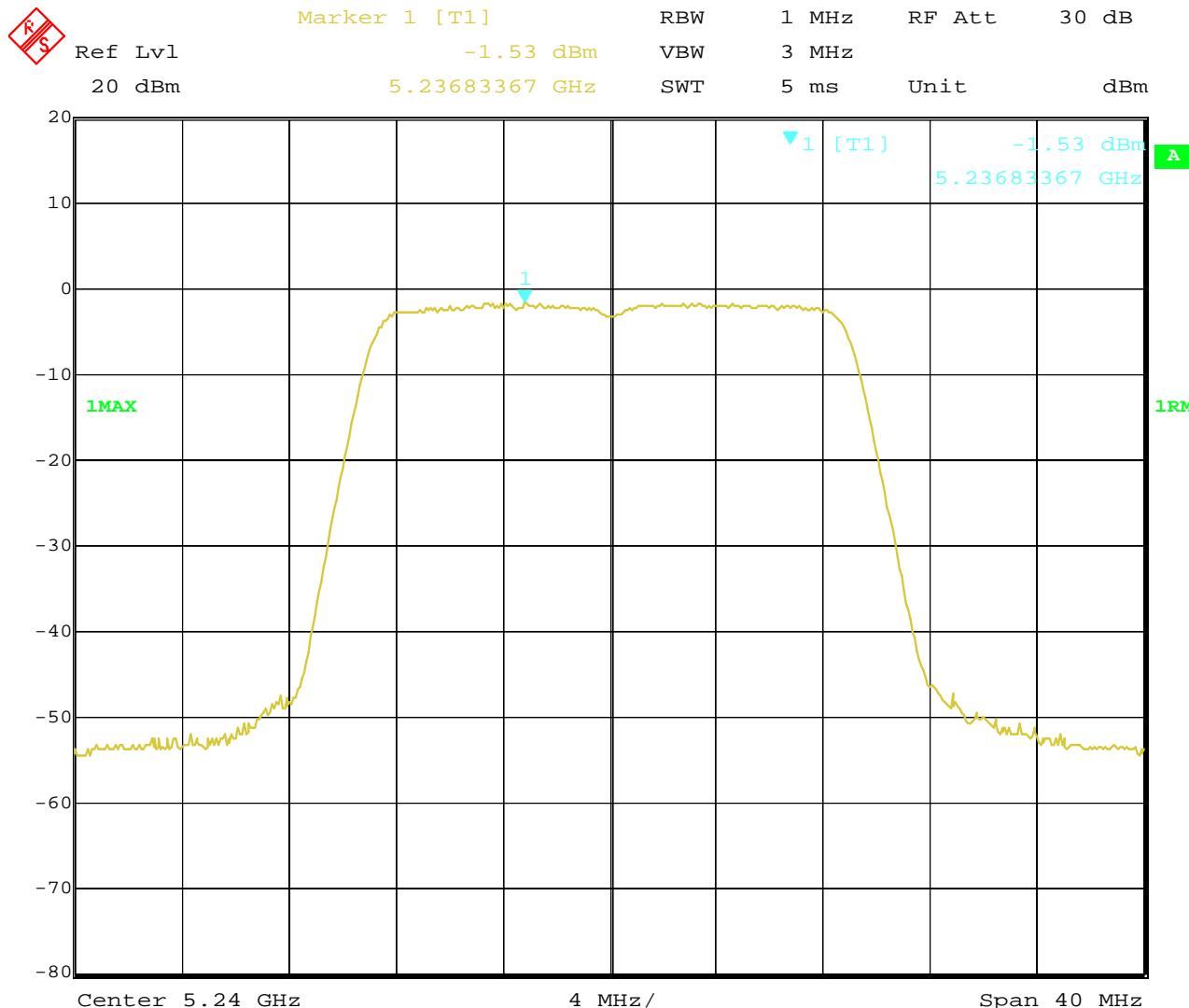
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3.802.11ac at mcs0 of CH48



Date: 1.DEC.2020 17:03:47

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EUT		Commercial Kiosk Tablet		Model		NEB215	
Mode		802.11ac VHT40		Test Voltage		120V~	
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	-4.70	3.01	-1.69		10	Pass
46	5230	-4.68	3.01	-1.67		10	Pass

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

2. Factor=10log2=3.01

3. Ant 0 and Ant 1 were tested and Ant 0 was the worst case

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

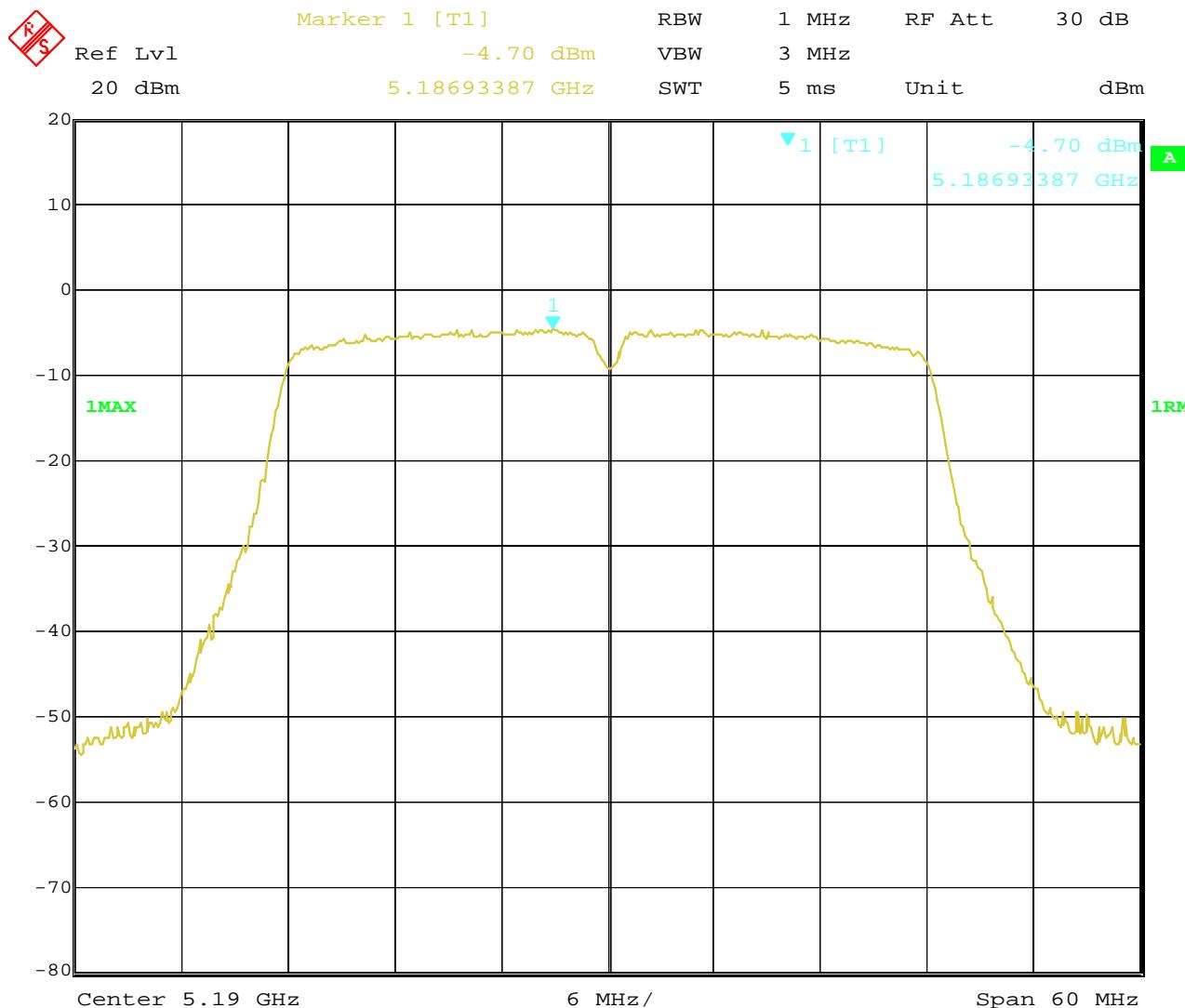
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Test Plots

1.802.11ac at mcs0 of CH38



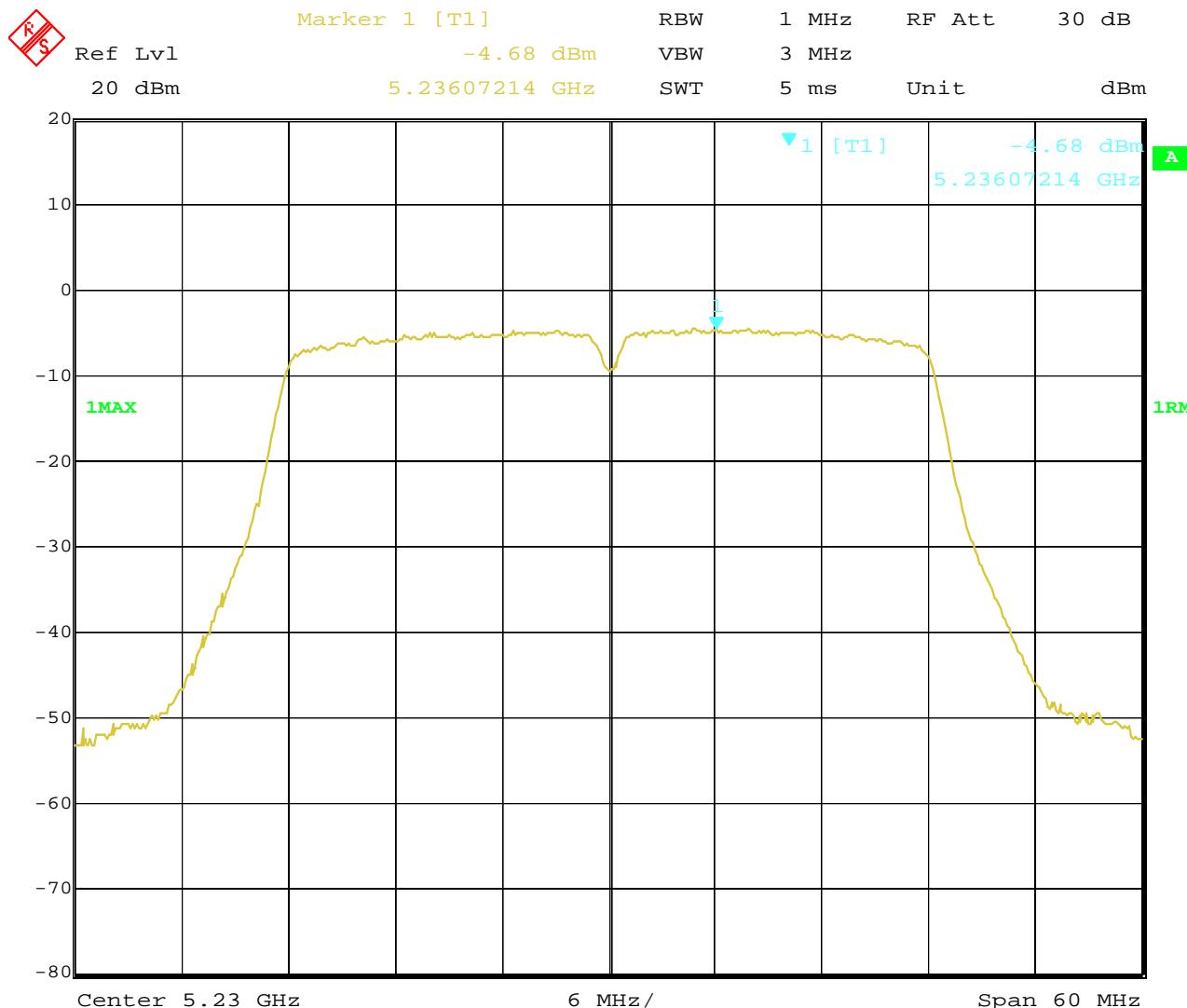
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2.802.11ac at mcs0 of CH46



Date: 1.DEC.2020 17:01:24

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EUT		Commercial Kiosk Tablet		Model		NEB215	
Mode		802.11ac VHT80 23.9Mbps		Test Voltage		120V~	
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	-7.80	3.01	-4.79		10	Pass

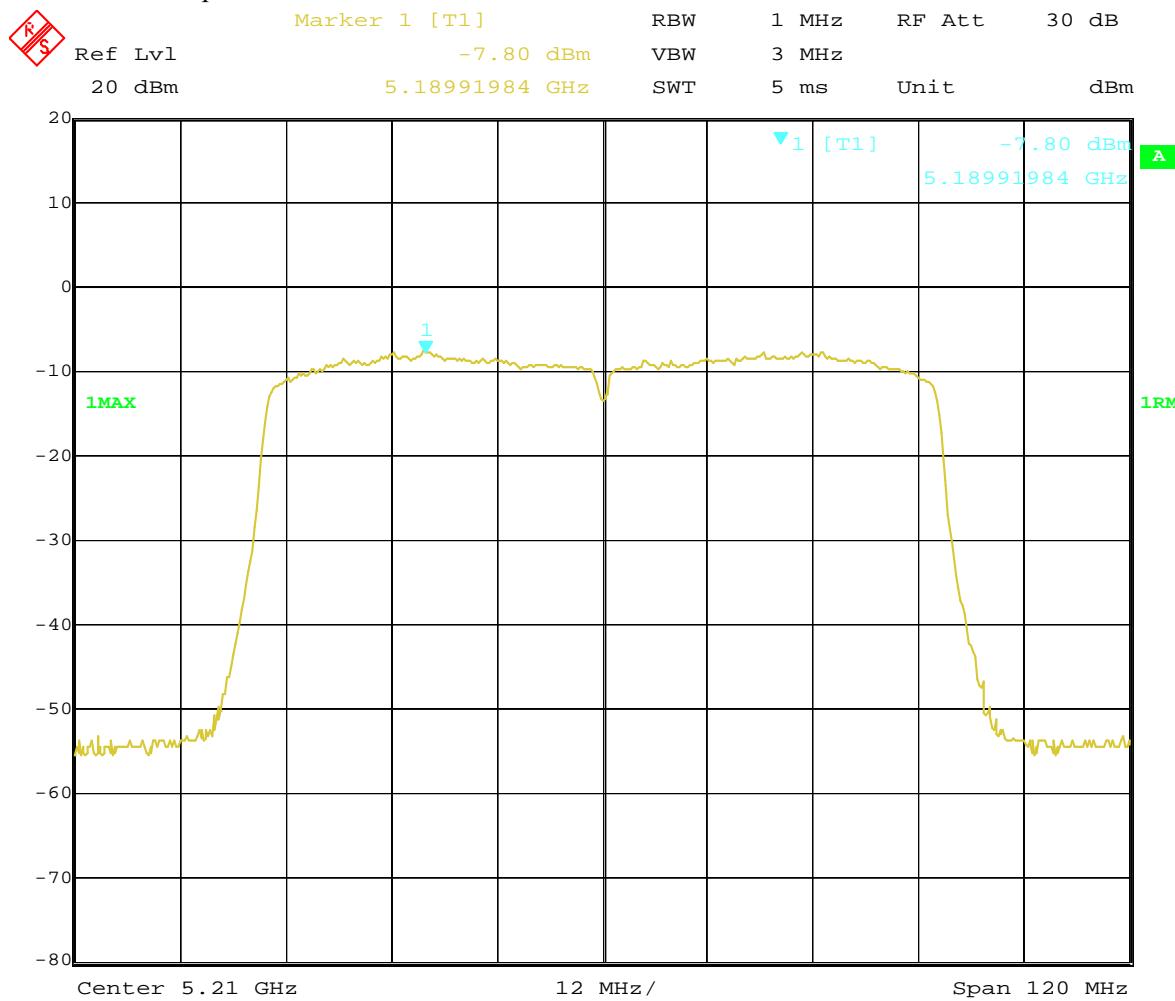
Note: 1. Total Power Spectral Density = Ant1 Power Spectral Density + Factor

2. Factor=10log2=3.01

3. Ant 0 and Ant 1 were tested and Ant 0 was the worst case

Test Plots

1.802.11ac at 23.9Mbps of CH42



Date: 1.DEC.2020 17:02:15

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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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10.3 Test Result

Channel 36 (5180MHz)

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
138V	5179.9816
120V	5179.9826
102V	5179.9837
Max. Deviation (MHz)	0.0184
Max. Deviation (ppm)	3.55

Rated working voltage: 120V~

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-30	5179.9812
-20	5179.9830
-10	5179.9827
0	5179.9803
10	5179.9841
20	5179.9825
30	5179.9838
40	5179.9809
50	5179.9805
Max. Deviation (MHz)	0.0195
Max. Deviation (ppm)	3.76

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

11.2 Antenna Connected construction

Two FPC antenna used. The maximum Gain is 2.0dBi for each one.

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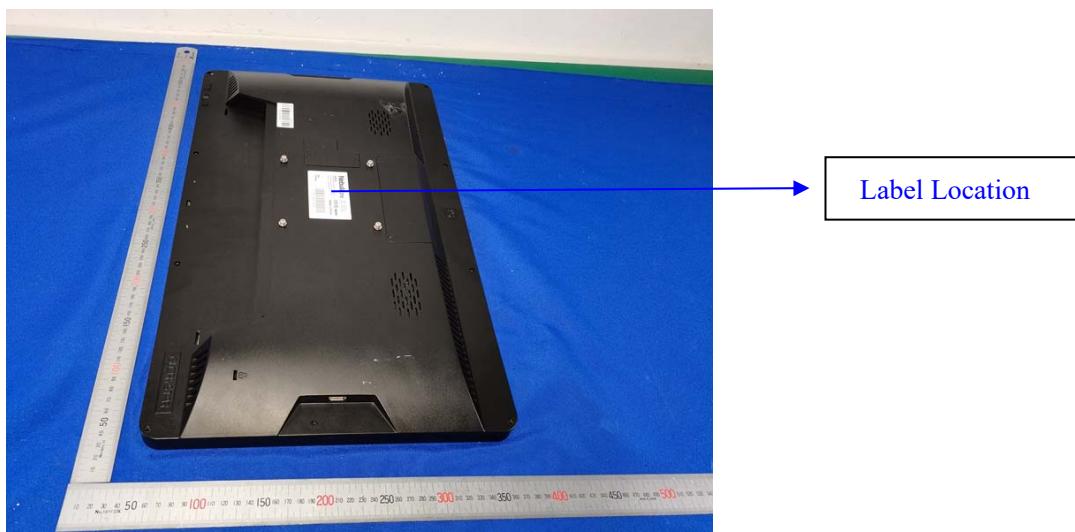
12.0 FCC Label

FCC ID: 2AACs-NEB15-21FOR99

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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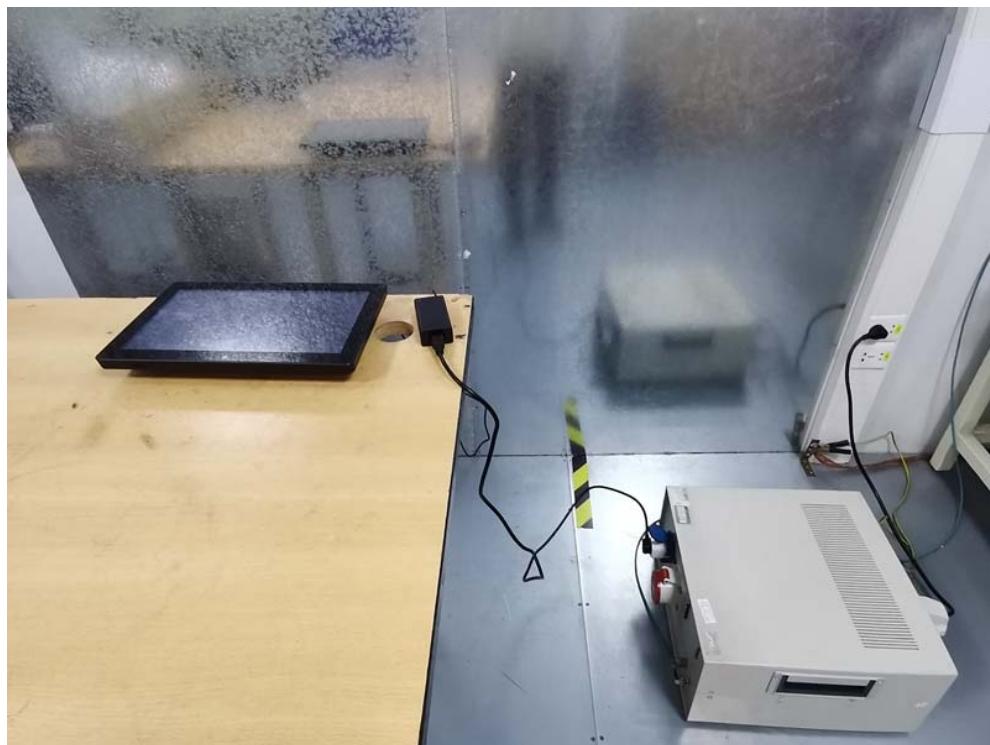
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13.0 Photo of testing

Conducted Emission Test Setup:



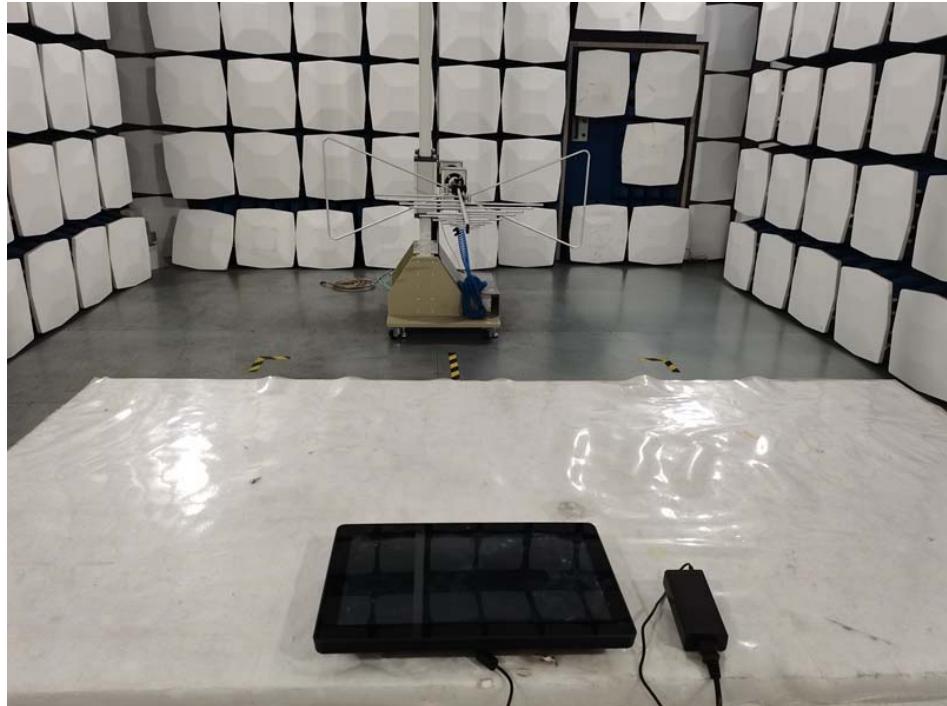
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Radiated Emission Test Setup:



Photos of EUT

Please refer test report TW2011121-01E

End of the report

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