



FCC TEST REPORT

Application No: HR/2019/40008
Applicant: Huawei Technologies Co., Ltd.
Address of Applicant: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
Manufacturer: Huawei Technologies Co., Ltd.
Address of Manufacturer: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
EUT Description: Mobile Phone
Model No.: YAL-L21
Trade Mark: Honor
FCC ID: QISYAL-L21
Standards: 47 CFR FCC Part 2, Subpart J
 47 CFR FCC Part 15, Subpart C
 47 CFR FCC Part 15, Subpart E
 KDB 789033 D02 General UNII Test Procedures New Rules v02
 FCC KDB 558074 D01 DTS Meas Guidance v05
Test Method: KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02
 KDB 905462 D03 Client Without DFS New Rules v01r02
 ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices
Date of Receipt: 2019/4/10
Date of Test: 2019/4/10 to 2019/4/24
Date of Issue: 2019/4/25

Test Result:	PASS *
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. * In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Derek Yang
Wireless Laboratory Manager



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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2019/4/25		Original

Authorized for issue by:			
Tested By	 (Mike Hu) /Project Engineer	2019/4/25	Date
Checked By	 (David Chen) /Reviewer	2019/4/25	Date



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2 Test Summary

Test Item	Band	FCC Rule	Requirements	Test Result	Verdict
Emission Bandwidth	5150-5250	15.403(i) 15.407(a)(1)	No limit.	Clause 4.4 Clause 4.5	Pass
	5250-5350	15.403(i) 15.407(a)(2)			
	5470-5725	15.403(i) 15.407(a)(2)			
	5725-5850	15.403(i) 15.407(e)	≥ 500 kHz.		
Occupied Bandwidth	5150-5250	KDB 789033 D02§ D	No limit.		Pass
	5250-5350				
	5470-5725				
	5725-5850				
Duty Cycle	5150-5850	--	No limit.		
Maximum Conducted Output Power	5150-5250	15.407(a)(1) 15.407(a)(4)	FCC < 250mW (avg during transmission)	Clause 4.3	Pass
	5250-5350	15.407(a)(2) 15.407(a)(4)	<MIN{250mW,11dBm+10*Ig(EBW)} (avg during transmission)		
	5470-5725	15.407(a)(2) 15.407(a)(4)	<MIN{250mW,11dBm+10*Ig(EBW)} (avg during transmission)		
	5725-5850	15.407(a)(3)	< 1W (avg during transmission)		
maximum Power Spectral Density	5150-5250	15.407(a)(1) 15.407(a)(4)	<11dBm/MHz (avg during transmission)	Clause 4.6	
	5250-5350	15.407(a)(2) 15.407(a)(4)	<11dBm/MHz (avg during transmission)		
	5470-5725	15.407(a)(2) 15.407(a)(4)	<11dBm/MHz (avg during transmission)		
	5725-5850	15.407(a)(3) 15.407(a)(4)	<30dBm/500KHz (avg during transmission)		
Unwanted Emissions that fall Outside of the Restricted Bands(Radiated)	5150-5250	15.407(b)(1) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: §15.209/§7.2.5 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.15-5.35 GHz). F≥1GHz & in-restricted: §15.209/§7.2.5 limit (AV&PK).	Clause 4.7	Pass
	5250-5350	15.407(b)(2) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: §15.209/§7.2.5 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.25-5.35 GHz). F≥1GHz & in-restricted: §15.209/§7.2.5 limit (AV&PK).		



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Test Item	Band	FCC Rule	Requirements	Test Result	Verdict
	5470-5750	15.407(b)(3) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: §15.209/§7.2.5 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.47-5.725 GHz). F≥1GHz & in-restricted: §15.209/§7.2.5 limit (AV&PK).		
	5725-5850	15.407(b)(4) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: §15.209/§7.2.5 limit (QP) F≥1GHz & out-restricted:(QP) a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges; b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges; c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges. F≥1GHz & in-restricted: §15.209/§7.2.5 limit (AV&PK).		
Unwanted Emissions in the Restricted Bands (Radiated)	5150-5250 5250-5350 5470-5725 5725-5850	15.209		Clause 4.8	Pass
AC Power Line Conducted Emissions	5150-5250 5250-5350 5470-5725 5725-5850	15.207		Clause 4.2	Pass
Frequency Stability	5150-5250 5250-5350 5470-5600 5650-5725 5725-5850	15.209	IC RSS-Gen, 6.11	Clause 4.9	Pass



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Test Item	Band	FCC Rule	Requirements	Test Result	Verdict
Dynamic Frequency Selection	5250-5350 5470-5725	47 CFR Part 15, Subpart E 15.407	Channel Move Time:10 Seconds	Clause 4.10	Pass
			Transmission Time: milliseconds + an aggregate of 60 milliseconds over remaining 10 second period.		
			Non-occupancy period: Minimum 30 minutes		



3 General Information

3.1 Client Information

Applicant:	Huawei Technologies Co., Ltd.
Address of Applicant:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
Manufacturer:	Huawei Technologies Co., Ltd.
Address of Manufacturer:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

3.2 Test Location

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address:	No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
Post code:	518057
Telephone:	+86 (0) 755 2601 2053
Fax:	+86 (0) 755 2671 0594
E-mail:	ee.shenzhen@sgs.com

3.3 Test Facility

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

• **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.



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3.4 General Description of EUT

EUT Description::	Mobile Phone	
Model No.:	YAL-L21	
Trade Mark:	Honor	
Hardware Version:	HL2YALEM01	
Software Version:	9.1.0.101 (SP1C900E101R1P2)	
IEEE 802.11 WLAN Mode Supported	☒ 802.11a (20 MHz channel bandwidth) ; ☒ 802.11n (20 MHz channel bandwidth); ☒ 802.11n (40 MHz channel bandwidth); ☒ 802.11ac (20 MHz channel bandwidth); ☒ 802.11ac (40 MHz channel bandwidth); ☒ 802.11ac (80 MHz channel bandwidth), ☒ 802.11ac (160 MHz channel bandwidth),	
Operation Frequency:	All	$f_c = 5000 \text{ MHz} + N * 5 \text{ MHz}$, where: - f_c = "Operating Frequency" in MHz, - N = "Channel Number".
	5150-5250 MHz (U-NII)	$N = 36$ to 48 with step of 4 for the 20 MHz channel bandwidth. $N = 38$ to 46 with step of 8 for the 40 MHz channel bandwidth. $N = 42$ for the 80 MHz channel bandwidth.
	5250-5350 MHz (U-NII)	$N = 52$ to 64 with step of 4 for the 20 MHz channel bandwidth. $N = 54$ to 62 with step of 8 for the 40 MHz channel bandwidth. $N = 58$ for the 80 MHz channel bandwidth. $N = 50$ for the 160 MHz channel bandwidth.
	5470-5650 MHz (U-NII) (for FCC)	$N = 100$ to 128 with step of 4 for the 20 MHz channel bandwidth. $N = 102$ to 126 with step of 8 for the 40 MHz channel bandwidth. $N = 106$ to 122 with step of 16 for the 80 MHz channel bandwidth. $N = 114$ for the 160 MHz channel bandwidth.
	5650-5725 MHz (U-NII)	$N = 132$ to 144 with step of 4 for the 20 MHz channel bandwidth. $N = 134$ to 142 with step of 8 for the 40 MHz channel bandwidth. $N = 138$ for the 80 MHz channel bandwidth.
	5725-5850MHz(U-NII)	$N = 149$ to 165 with step of 4 for the 20 MHz channel bandwidth. $N = 151$ to 159 with step of 8 for the 40 MHz channel bandwidth. $N = 155$ for the 80 MHz channel bandwidth.
	* The 5580-5650MHz can not be used.	



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Type of Modulation:	OFDM
DFS mode:	☐ Master ☐ Slave with radar detection ☒ Slave without radar detection
Sample Type:	☒ Portable Device, ☐ Module
Antenna Type:	☐ External, ☒ Integrated
Antenna Ports	☒ Ant 1, ☐ Ant 2, ☐ Ant 3
Smart System	☒ SISO (for 802.11a/n/ac), ☐ MIMO (for 802.11n/ac), ☐ Diversity (for 802.11a) : Tx & Rx
Antenna Gain:	1.0dBi,
Power Supply	☒ AC/DC Adapter; ☐ PoE; ☐ Other:
Accessories	Model: HW-050450E01 Manufacturer: Huawei Technologies Co.,Ltd. Input Voltage: 100-240V ~50/60Hz 0.75A Output Voltage: 5V ☒ 2A OR 4.5V ☒ 5A OR 5V ☒ 4.5A Model: HW-050450A01 Manufacturer: Huawei Technologies Co.,Ltd. Input Voltage: 100-240V ~50/60Hz 0.75A Output Voltage: 5V ☒ 2A OR 4.5V ☒ 5A OR 5V ☒ 4.5A Model: HW-050450E00 Manufacturer: Huawei Technologies Co.,Ltd. Input Voltage: 100-240V ~50/60Hz 0.75A Output Voltage: 5V ☒ 2A OR 4.5V ☒ 5A OR 5V ☒ 4.5A Model: HW-050450A00 Manufacturer: Huawei Technologies Co.,Ltd. Input Voltage: 100-240V ~50/60Hz 0.75A Output Voltage: 5V ☒ 2A OR 4.5V ☒ 5A OR 5V ☒ 4.5A Model: HW-050450B00 Manufacturer: Huawei Technologies Co.,Ltd. Input Voltage: 100-240V ~50/60Hz 0.75A Output Voltage: 5V ☒ 2A OR 4.5V ☒ 5A OR 5V ☒ 4.5A Model: HW-050450U00 Manufacturer: Huawei Technologies Co.,Ltd. Input Voltage: 100-240V ~50/60Hz 0.75A Output Voltage: 5V ☒ 2A OR 4.5V ☒ 5A OR 5V ☒ 4.5A

Remark:

In FCC 15.31, for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table, and the selected channel to perform the test as below:



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Frequency Range of Operation Operating Frequency Range (in each Band)	Number of Measurement Frequencies Required	Location of Measurement Frequency in Band of Operation
1 MHz or less	1	centre
1 MHz to 10 MHz	2	1 near high end, 1 near low end
Greater than 10 MHz	3	1 near high end, 1 near centre

For UNII Band I:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5180
	The Middle channel	5220
	The Highest channel	5240
IEEE 802.11n/ac 40MHz	The Lowest channel	5190
	The Highest channel	5230
IEEE 802.11ac 80MHz	The Middle channel	5210

For UNII Band II-A:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5260
	The Middle channel	5300
	The Highest channel	5320
IEEE 802.11n/ac 40MHz	The Lowest channel	5270
	The Highest channel	5310
IEEE 802.11ac 80MHz	The Middle channel	5290
IEEE 802.11ac 160MHz	The Middle channel	5250

For UNII Band II-C:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5500
	The Middle channel	5580
	The Highest channel	5700
IEEE 802.11n/ac 40MHz	The Lowest channel	5510
	The Middle channel	5500
	The Highest channel	5670
IEEE 802.11ac 80MHz	The Lowest channel	5500
	The Highest channel	5580



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Shenzhen Branch Testing Center (CCC Laboratory)

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IEEE 802.11ac 160MHz	The Middle channel	5570
----------------------	--------------------	------

For UNII Band III:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5745
	The Middle channel	5785
	The Highest channel	5825
IEEE 802.11n/ac 40MHz	The Lowest channel	5755
	The Highest channel	5795
IEEE 802.11ac 80MHz	The Middle channel	5775

3.5 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	55 % RH
Atmospheric Pressure:	101.32 KPa
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.



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4 Test results and Measurement Data

4.1 Antenna Requirement

Test Requirement:	47 CFR Part 15 Section 15.203
The antenna is integrated antenna and no consideration of replacement. The best case gain of the antenna is 1.0dBi.	

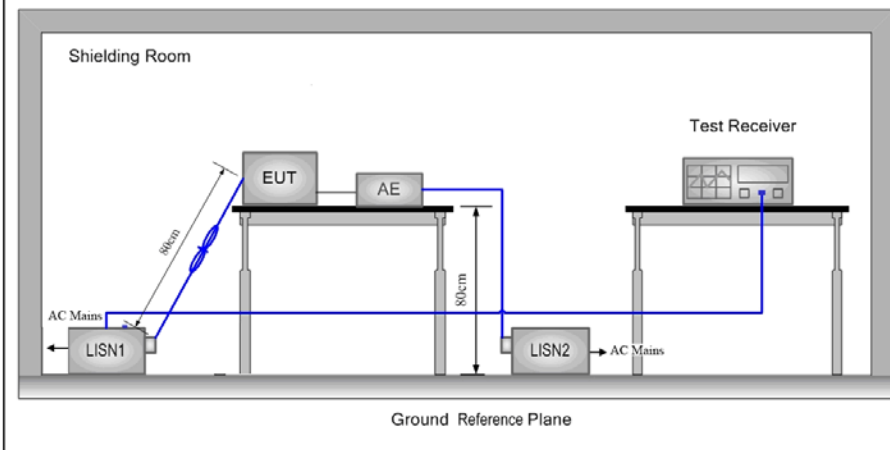
4.2 Conducted Emissions

Test Requirement:	47 CFR Part 15 Section 15.407(b)		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.		



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Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.
Final Test Mode:	Through Pre-scan, find the 6Mbps of rate of 802.11a at lowest channel is the worst case. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass

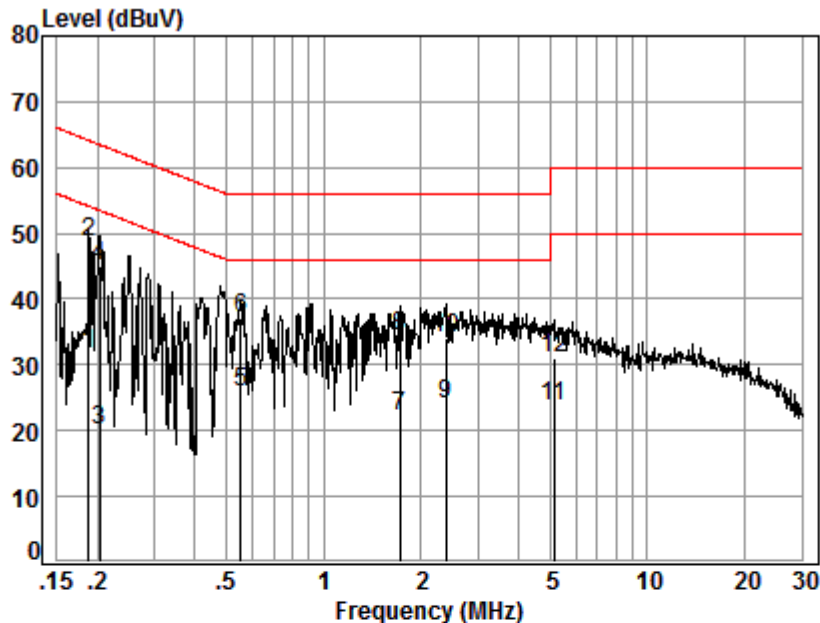
Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.



Live Line:



Site : Shielding Room

Condition: Line

Job No. : 12626CR

Test mode: f

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.19	0.02	9.66	22.09	31.77	54.11	-22.34	Average
2	0.19	0.02	9.66	38.96	48.64	64.11	-15.47	QP
3	0.20	0.02	9.66	10.30	19.98	53.49	-33.51	Average
4	0.20	0.02	9.66	35.34	45.02	63.49	-18.47	QP
5	0.56	0.06	9.67	16.06	25.79	46.00	-20.21	Average
6	0.56	0.06	9.67	27.32	37.05	56.00	-18.95	QP
7	1.72	0.14	9.73	12.20	22.07	46.00	-23.93	Average
8	1.72	0.14	9.73	24.57	34.44	56.00	-21.56	QP
9	2.38	0.16	9.71	14.03	23.90	46.00	-22.10	Average
10	2.38	0.16	9.71	24.07	33.94	56.00	-22.06	QP
11	5.14	0.17	9.74	13.72	23.63	50.00	-26.37	Average
12	5.14	0.17	9.74	21.13	31.04	60.00	-28.96	QP



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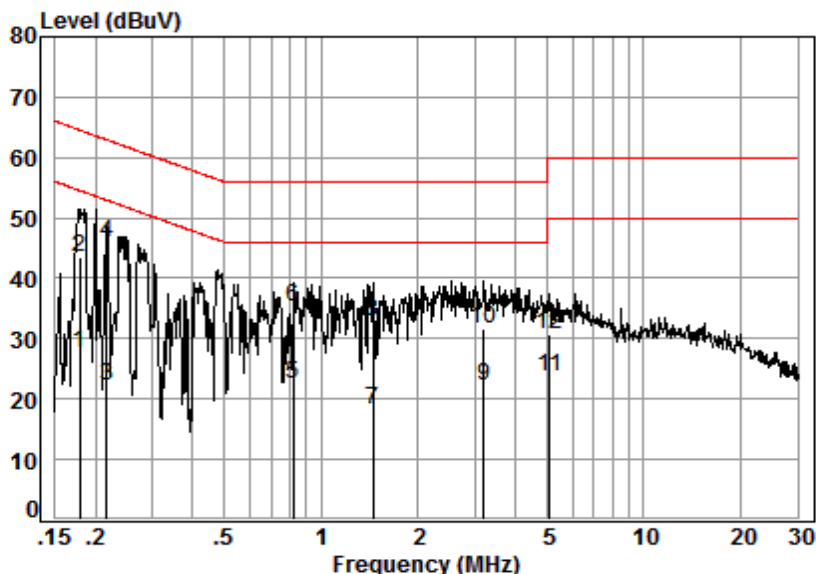
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Neutral Line:



Site : Shielding Room

Condition: Neutral

Job No. : 12626CR

Test mode: f

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.18	0.02	9.64	17.93	27.59	54.55	-26.96	Average
2	0.18	0.02	9.64	33.99	43.65	64.55	-20.90	QP
3	0.22	0.03	9.64	12.43	22.10	52.92	-30.82	Average
4	0.22	0.03	9.64	36.15	45.82	62.92	-17.10	QP
5	0.82	0.08	9.71	12.59	22.38	46.00	-23.62	Average
6	0.82	0.08	9.71	25.39	35.18	56.00	-20.82	QP
7	1.45	0.13	9.70	8.37	18.20	46.00	-27.80	Average
8	1.45	0.13	9.70	23.11	32.94	56.00	-23.06	QP
9	3.19	0.16	9.68	12.49	22.33	46.00	-23.67	Average
10	3.19	0.16	9.68	21.75	31.59	56.00	-24.41	QP
11	5.11	0.17	9.71	13.78	23.66	50.00	-26.34	Average
12	5.11	0.17	9.71	20.99	30.87	60.00	-29.13	QP

Remarks:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.



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4.3 Duty Cycle

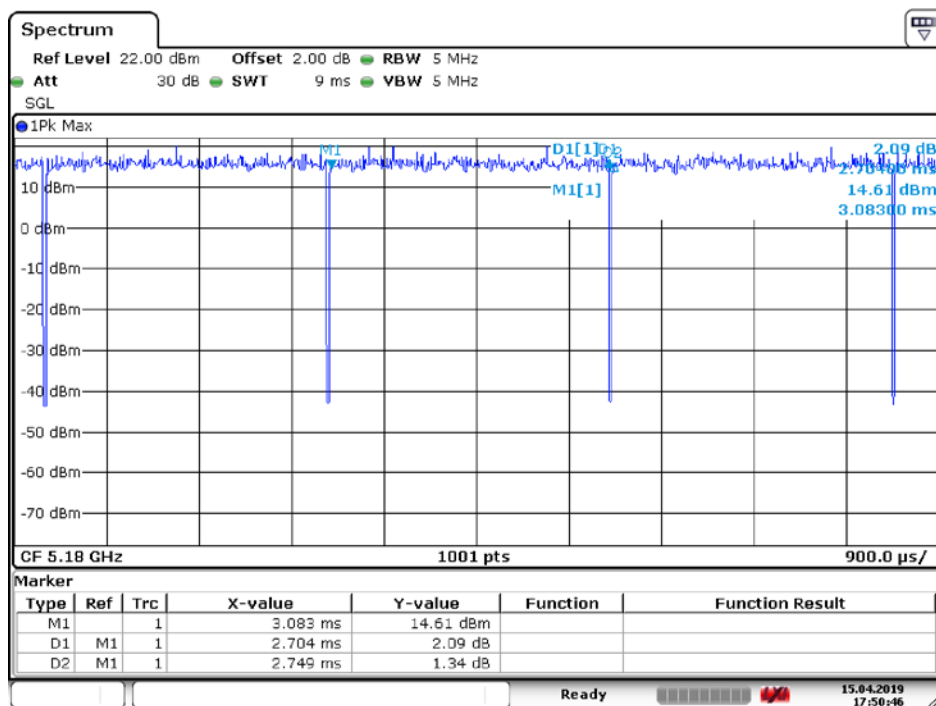
4.3.1 Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]
11A	Ant 1: CH36	98.36
11N20	Ant 1: CH36	98.95
11N40	Ant 1: CH38	97.18
11AC20	Ant 1: CH36	98.95
11AC40	Ant 1: CH38	94.91
11AC80	Ant 1: CH42	92.38
11AC160	Ant 1: CH50	94.66

4.3.1 Test Plots

4.3.1.1 ANT1

4.3.1.1.1 11A



Date: 15.APR.2019 17:50:47



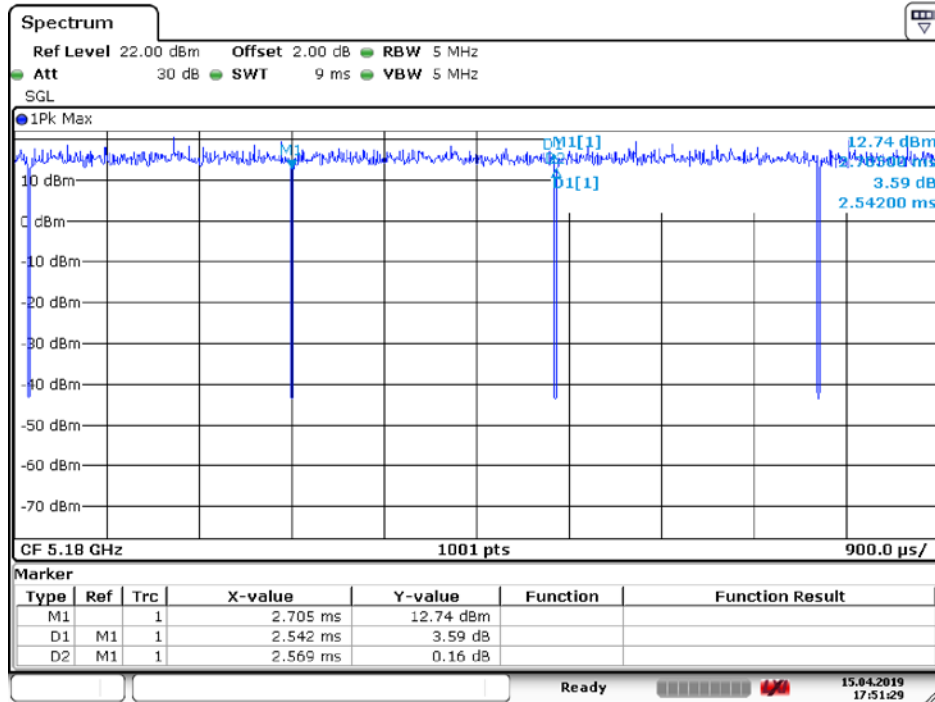
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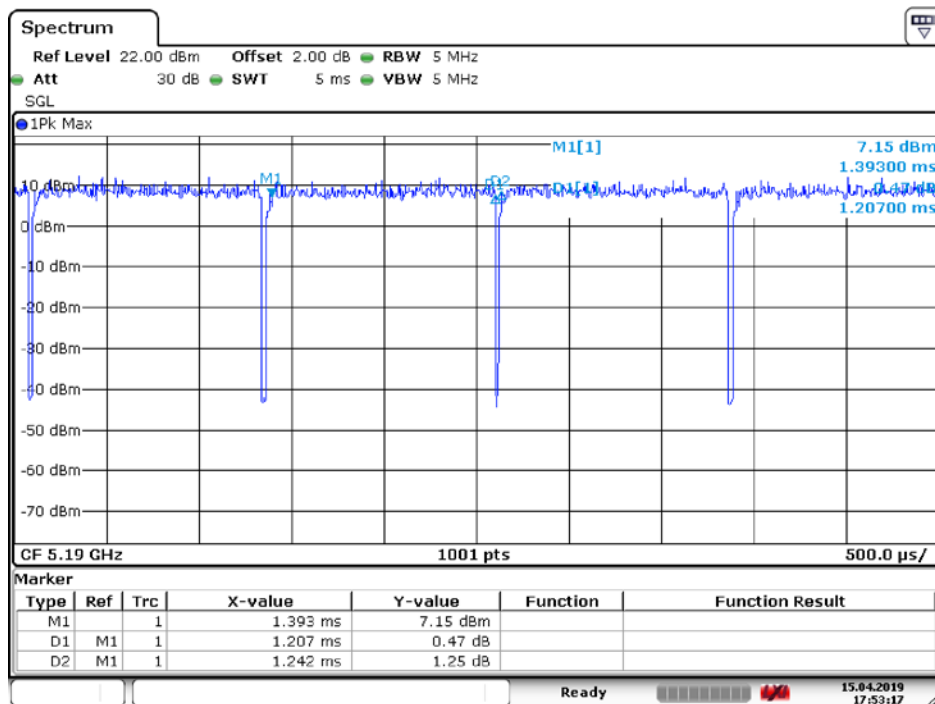
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4.3.1.1.2 11N20



Date: 15.APR 2019 17:51:29

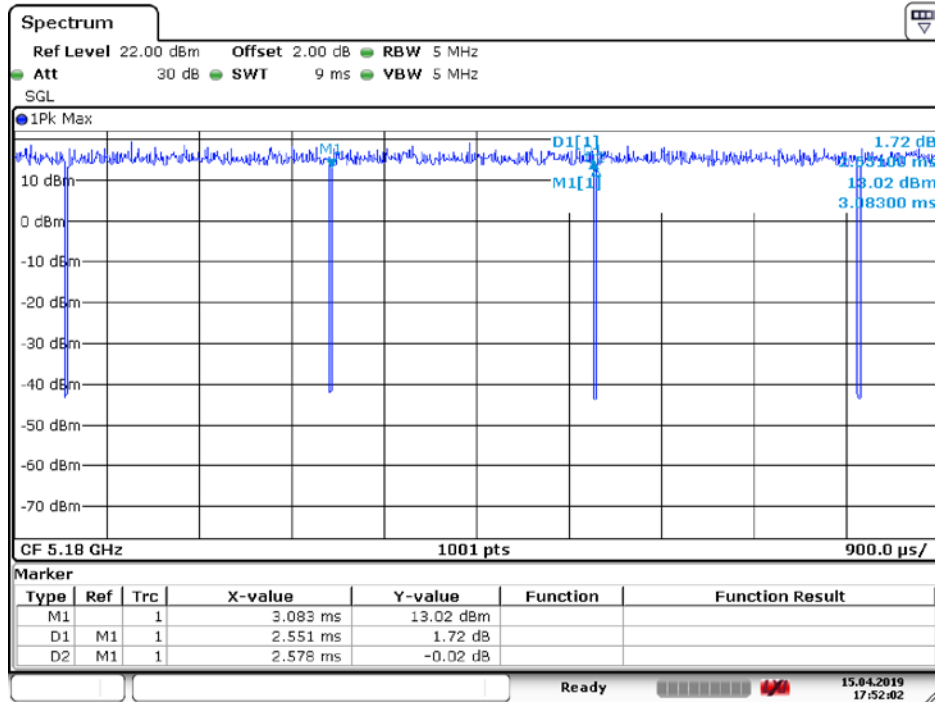
4.3.1.1.3 11N40



Date: 15.APR 2019 17:53:18

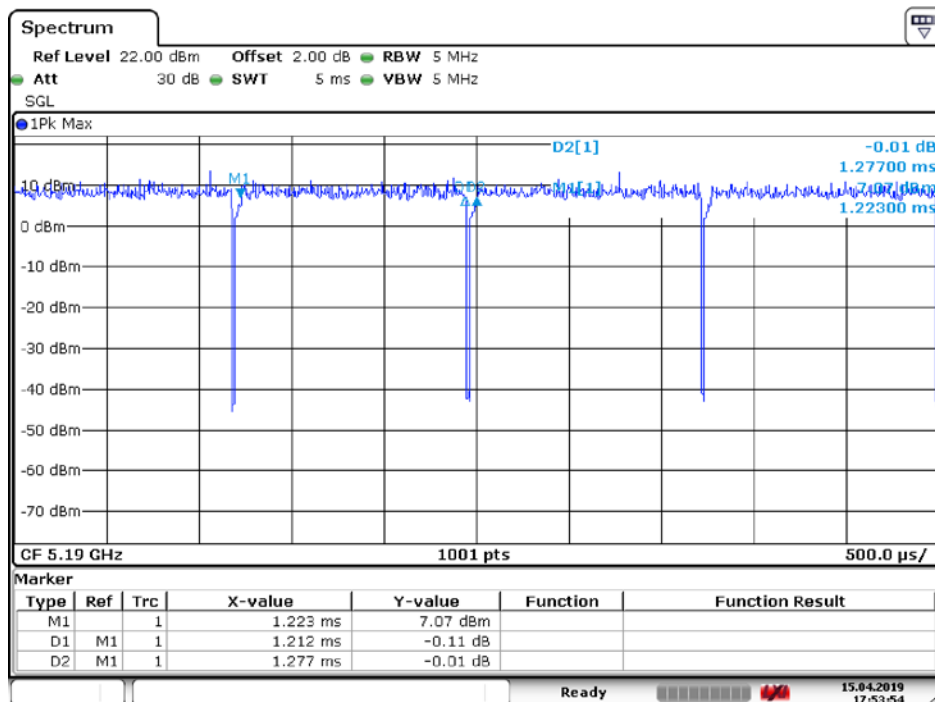


4.3.1.1.4 11AC20



Date: 15.APR 2019 17:52:02

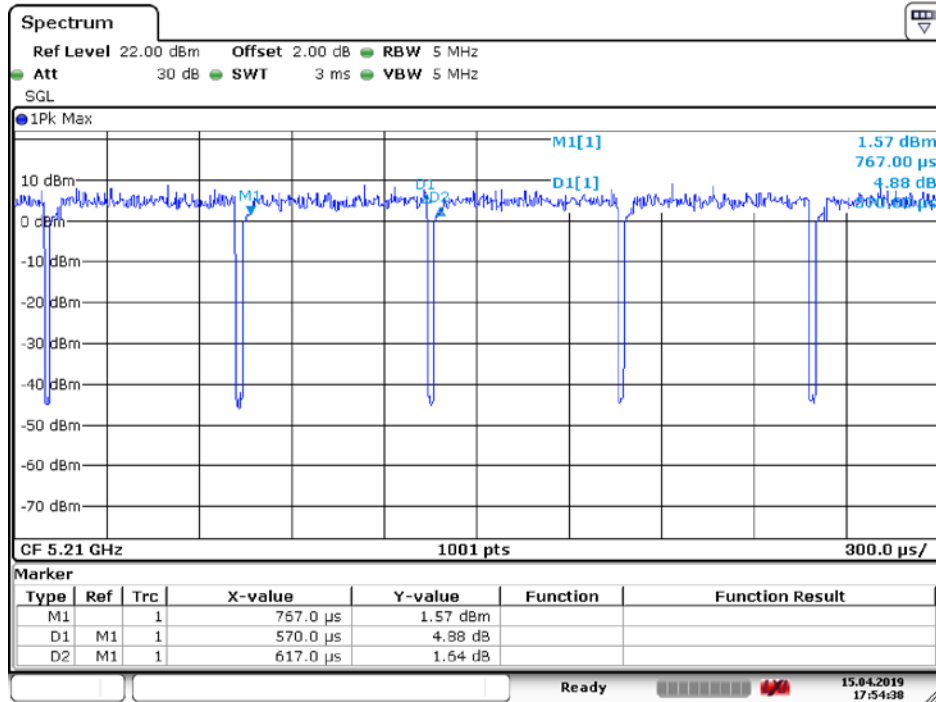
4.3.1.1.5 11AC40



Date: 15.APR 2019 17:53:54

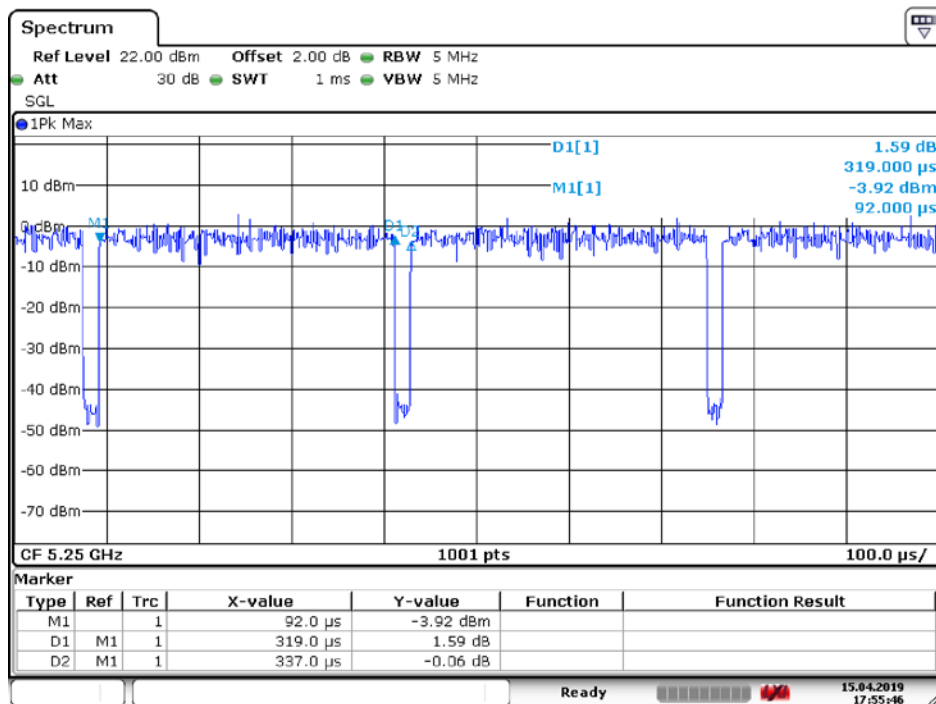


4.3.1.1.6 11AC80



Date: 15.APR 2019 17:54:38

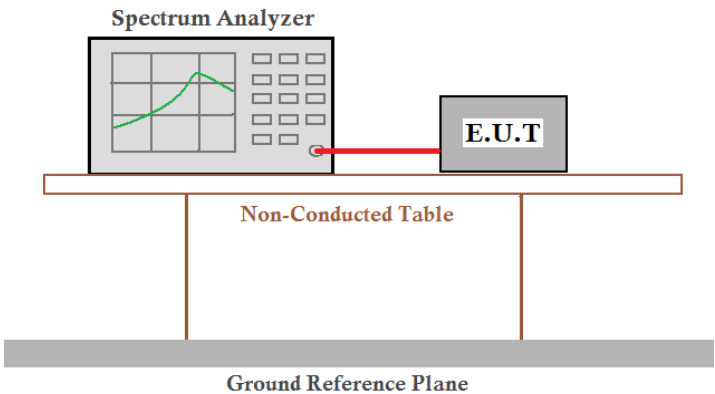
4.3.1.1.7 11AC160



Date: 15.APR 2019 17:55:47



4.4 Conducted Output Power

Test Requirement:	47 CFR Part 15 Section 15.407(a)	
Test Method:	ANSI C63.10: 2013	
Test Setup:		
Test Instruments:	Refer to section 5.10 for details	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates	
Final Test Mode:	Through Pre-scan, find that 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40); MCSAC0 of rate is the worst case of 802.11ac(HT20); MCSAC0 of rate is the worst case of 802.11ac(HT40); MCSAC0 of rate is the worst case of 802.11ac(HT80); MCSAC0 of rate is the worst case of 802.11ac(HT160); Only the worst case is recorded in the report.	
Limit:	Frequency Band	Limit
	5150-5250MHz	Not exceed 250mW(24dBm)
	5250-5350MHz	The lesser of 250mW(24dBm) or 11+ 10logB
	5470-5725MHz	The lesser of 250mW(24dBm) or 11+ 10logB
	5725-5850MHz	Not exceed 1W(30dBm)
	*Where B is the 26dB emission bandwidth in MHz	
Test Results:	Pass	



Measurement Data:

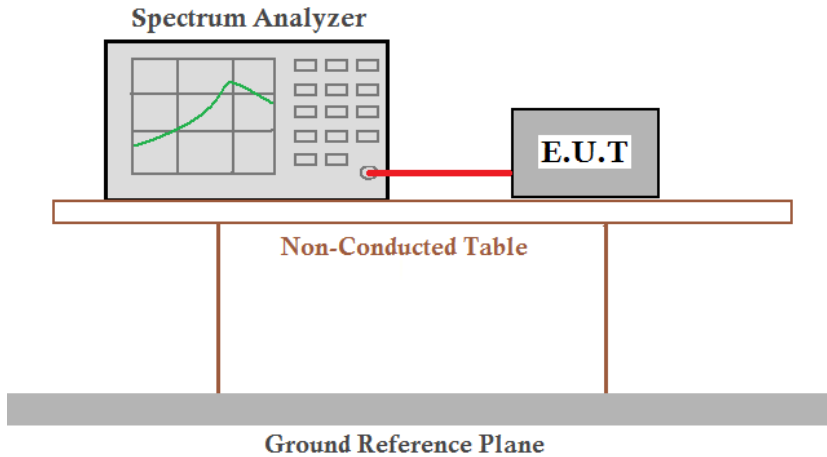
Test Mode	Test Channel	Frequency [MHz]	Antenna Port	Meas. Level (Cond.) [dBm]	Meas. Level (EIRP) [dBm]	Verdict
11A20	36	5180	ANT 1	10.83	11.83	PASS
	44	5220	ANT 1	16.48	17.48	PASS
	48	5240	ANT 1	16.59	17.59	PASS
	52	5260	ANT 1	16.64	17.64	PASS
	60	5300	ANT 1	16.67	17.67	PASS
	64	5320	ANT 1	11.76	12.76	PASS
	100	5500	ANT 1	11.62	12.62	PASS
	116	5580	ANT 1	16.33	17.33	PASS
	140	5700	ANT 1	11.08	12.08	PASS
	149	5745	ANT 1	11.25	12.25	PASS
	157	5785	ANT 1	16.02	17.02	PASS
	165	5825	ANT 1	11.08	12.08	PASS
11N20	36	5180	ANT 1	10.73	11.73	PASS
	44	5220	ANT 1	15.58	16.58	PASS
	48	5240	ANT 1	15.65	16.65	PASS
	52	5260	ANT 1	11.53	12.53	PASS
	60	5300	ANT 1	15.74	16.74	PASS
	64	5320	ANT 1	11.67	12.67	PASS
	100	5500	ANT 1	11.53	12.53	PASS
	116	5580	ANT 1	15.41	16.41	PASS
	140	5700	ANT 1	10.93	11.93	PASS
	149	5745	ANT 1	11.43	12.43	PASS
	157	5785	ANT 1	15.08	16.08	PASS
	165	5825	ANT 1	10.97	11.97	PASS
11N40	38	5190	ANT 1	11.11	12.11	PASS
	46	5230	ANT 1	15.44	16.44	PASS
	54	5270	ANT 1	15.52	16.52	PASS
	62	5310	ANT 1	11.43	12.43	PASS
	102	5510	ANT 1	11.69	12.69	PASS
	110	5550	ANT 1	15.53	16.53	PASS
	134	5670	ANT 1	10.64	11.64	PASS
	151	5755	ANT 1	11.03	12.03	PASS
	159	5795	ANT 1	11.12	12.12	PASS



11AC20	36	5180	ANT 1	10.57	11.57	PASS
	44	5220	ANT 1	15.58	16.58	PASS
	48	5240	ANT 1	15.65	16.65	PASS
	52	5260	ANT 1	15.70	16.7	PASS
	60	5300	ANT 1	15.74	16.74	PASS
	64	5320	ANT 1	11.15	12.15	PASS
	100	5500	ANT 1	11.42	12.42	PASS
	116	5580	ANT 1	15.41	16.41	PASS
	140	5700	ANT 1	10.83	11.83	PASS
	149	5745	ANT 1	11.03	12.03	PASS
	157	5785	ANT 1	15.08	16.08	PASS
	165	5825	ANT 1	10.74	11.74	PASS
11AC40	38	5190	ANT 1	11.09	12.09	PASS
	46	5230	ANT 1	15.43	16.43	PASS
	54	5270	ANT 1	15.51	16.51	PASS
	62	5310	ANT 1	11.42	12.42	PASS
	102	5510	ANT 1	11.76	12.76	PASS
	110	5550	ANT 1	15.64	16.64	PASS
	134	5670	ANT 1	10.62	11.62	PASS
	151	5755	ANT 1	11.02	12.02	PASS
	159	5795	ANT 1	11.13	12.13	PASS
11AC80	42	5210	ANT 1	11.15	12.15	PASS
	58	5290	ANT 1	11.43	12.43	PASS
	106	5530	ANT 1	11.56	12.56	PASS
	122	5610	ANT 1	10.71	11.71	PASS
	155	5775	ANT 1	11.02	12.02	PASS
11AC160	50	5250	ANT 1	10.33	11.33	PASS
	114	5570	ANT 1	10.21	11.21	PASS



4.5 Emission Bandwidth and 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15 Section 15.407(a)
Test Method:	ANSI C63.10: 2013
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40); MCSAC0 of rate is the worst case of 802.11ac(HT20); MCSAC0 of rate is the worst case of 802.11ac(HT40); MCSAC0 of rate is the worst case of 802.11ac(HT80); MCSAC0 of rate is the worst case of 802.11ac(HT160). Only the worst case is recorded in the report.
Limit:	No restriction limits
Test Results:	Pass



4.5.1 Measurement Data:

Test Mode	Test Channel	Frequency [MHz]	Antenna Port	26dB Emission Bandwidth [MHz]	Occupied Bandwidth [MHz]	Verdict
11A20	36	5180	ANT 1	20.98	16.82	PASS
	44	5220	ANT 1	20.70	16.86	PASS
	48	5240	ANT 1	20.98	16.86	PASS
	52	5260	ANT 1	20.74	16.86	PASS
	60	5300	ANT 1	20.98	16.86	PASS
	64	5320	ANT 1	20.70	16.82	PASS
	100	5500	ANT 1	20.70	16.90	PASS
	116	5580	ANT 1	20.94	16.94	PASS
	140	5700	ANT 1	20.58	16.82	PASS
11N20	36	5180	ANT 1	21.14	17.78	PASS
	44	5220	ANT 1	21.22	17.74	PASS
	48	5240	ANT 1	21.22	17.78	PASS
	52	5260	ANT 1	21.14	17.78	PASS
	60	5300	ANT 1	21.22	17.78	PASS
	64	5320	ANT 1	21.02	17.74	PASS
	100	5500	ANT 1	21.26	17.74	PASS
	116	5580	ANT 1	21.10	17.74	PASS
	140	5700	ANT 1	21.10	17.74	PASS
11N40	38	5190	ANT 1	42.36	36.20	PASS
	46	5230	ANT 1	41.80	36.36	PASS
	54	5270	ANT 1	42.04	36.44	PASS
	62	5310	ANT 1	42.28	36.28	PASS
	102	5510	ANT 1	42.20	36.28	PASS
	110	5550	ANT 1	41.88	36.36	PASS
	134	5670	ANT 1	42.04	36.28	PASS
11AC20	36	5180	ANT 1	21.18	17.74	PASS
	44	5220	ANT 1	21.06	17.78	PASS
	48	5240	ANT 1	21.26	17.78	PASS
	52	5260	ANT 1	21.22	17.86	PASS
	60	5300	ANT 1	21.18	17.86	PASS
	64	5320	ANT 1	21.26	17.74	PASS
	100	5500	ANT 1	21.14	17.78	PASS
	116	5580	ANT 1	21.02	17.78	PASS
	140	5700	ANT 1	21.18	17.74	PASS
11AC40	38	5190	ANT 1	41.96	36.20	PASS



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	46	5230	ANT 1	42.12	36.44	PASS
	54	5270	ANT 1	41.88	36.44	PASS
	62	5310	ANT 1	42.20	36.36	PASS
	102	5510	ANT 1	41.88	36.28	PASS
	110	5550	ANT 1	42.36	36.44	PASS
	134	5670	ANT 1	42.04	36.36	PASS
11AC80	42	5210	ANT 1	84.88	75.28	PASS
	58	5290	ANT 1	84.72	75.44	PASS
	106	5530	ANT 1	84.88	75.28	PASS
	122	5610	ANT 1	84.72	75.44	PASS
11AC160	50	5250	ANT 1	173.27	154.40	PASS
	114	5570	ANT 1	173.91	154.72	PASS

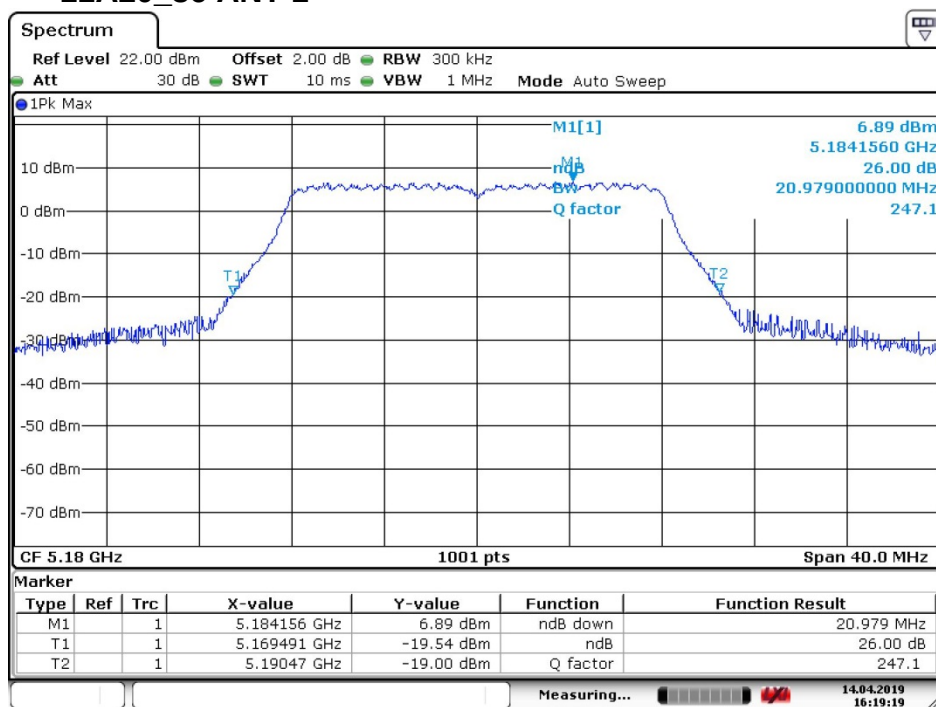


4.5.2

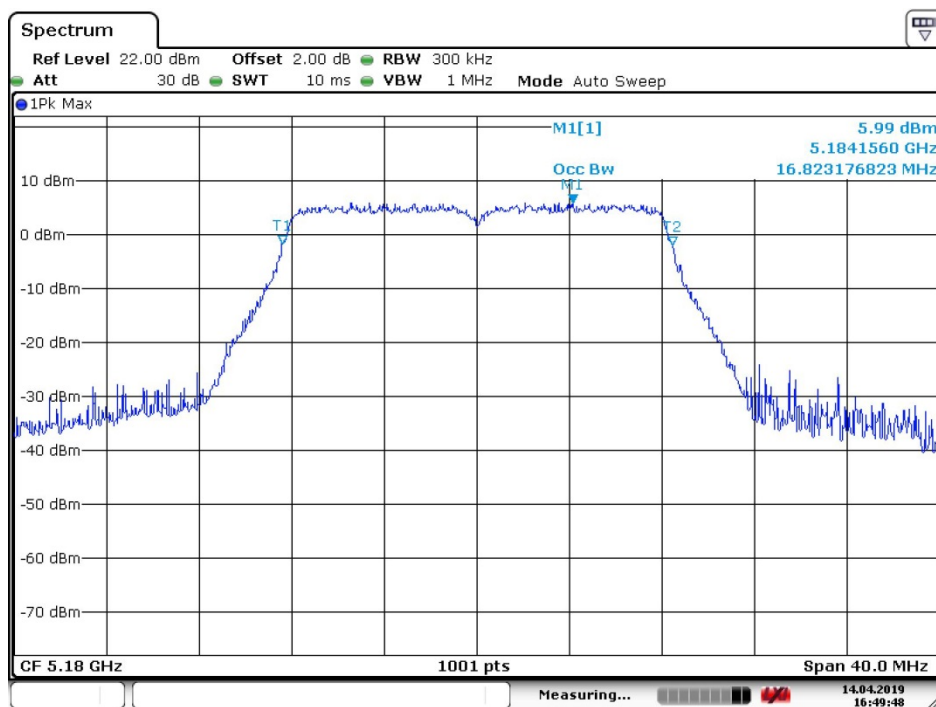
Plots for 26dB Emission Bandwidth & 99% Occupied Bandwidth

4.5.2.1

11A20_36 ANT 1



Date: 14.APR.2019 16:19:19



Date: 14.APR.2019 16:49:48

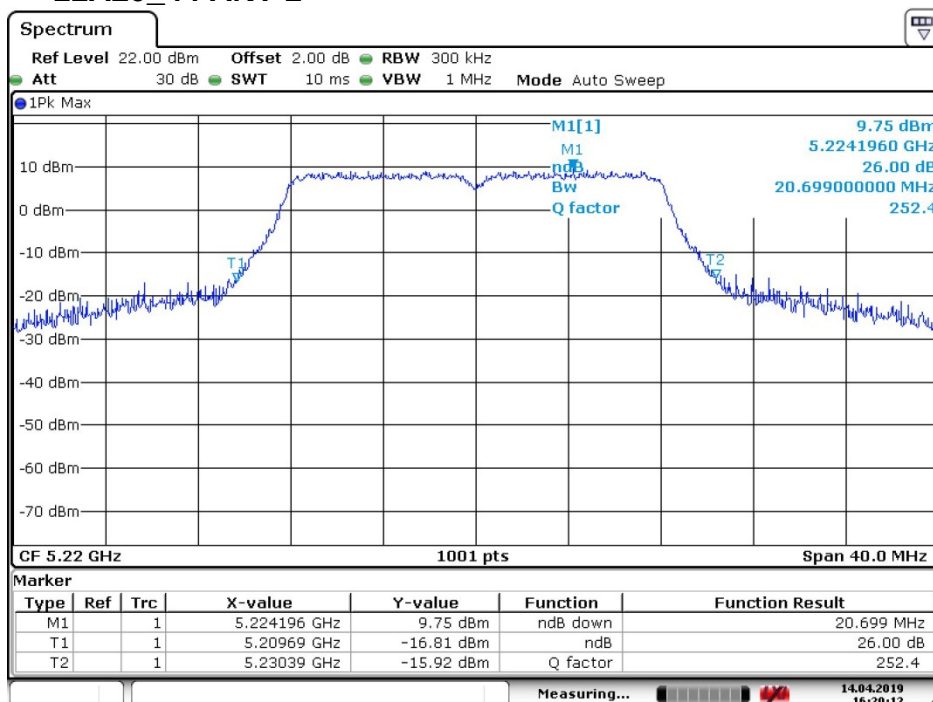


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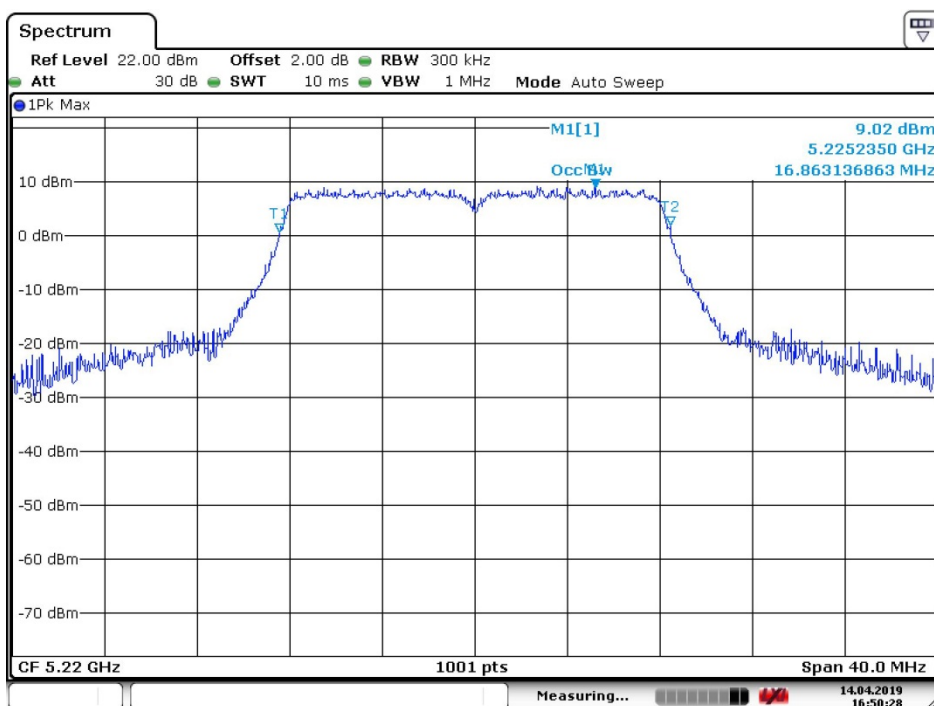
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4.5.2.2

11A20_44 ANT 1



Date: 14.APR.2019 16:20:12

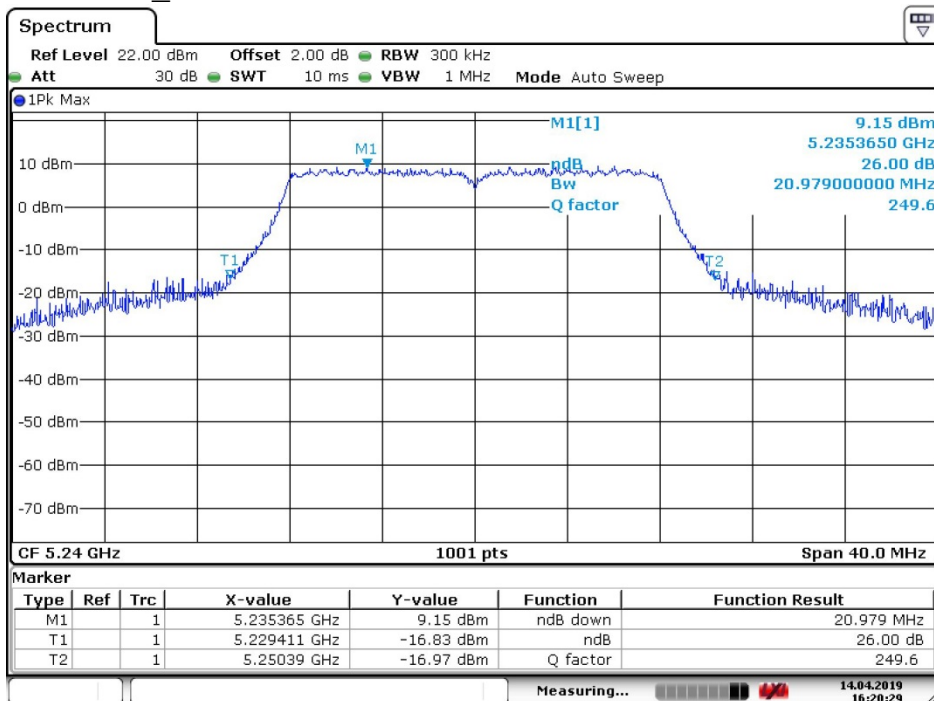


Date: 14.APR.2019 16:50:28

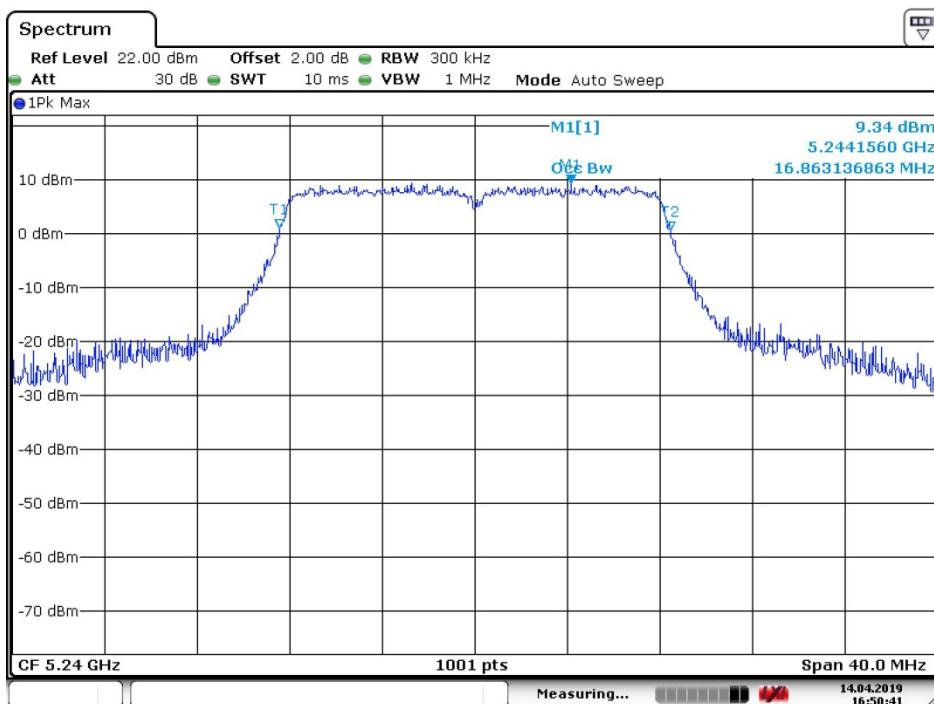


4.5.2.3

11A20_48 ANT 1



Date: 14.APR.2019 16:20:30



Date: 14.APR.2019 16:50:42

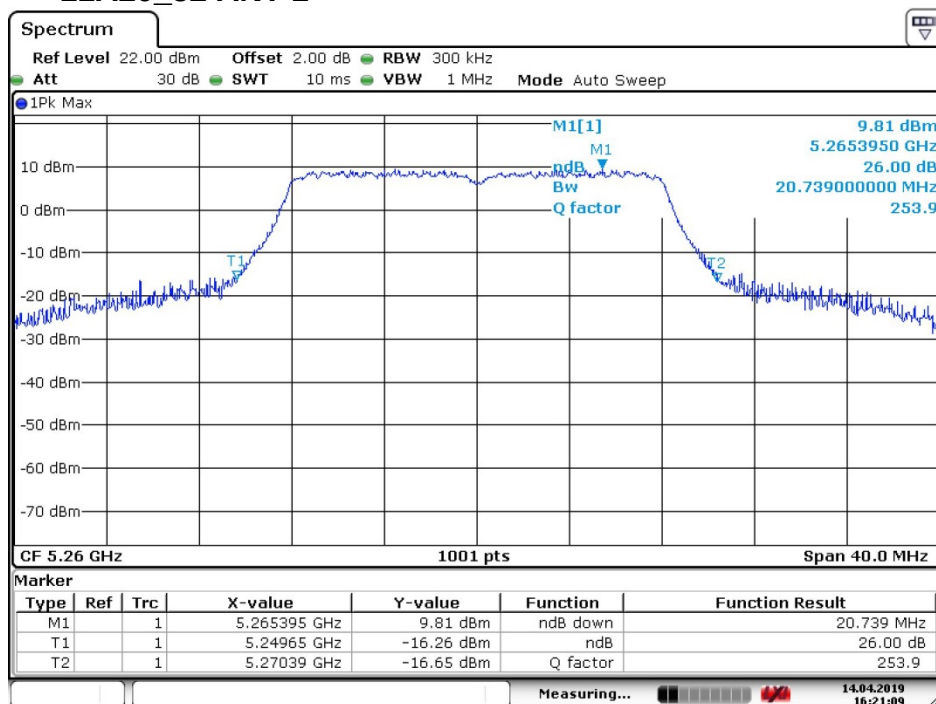


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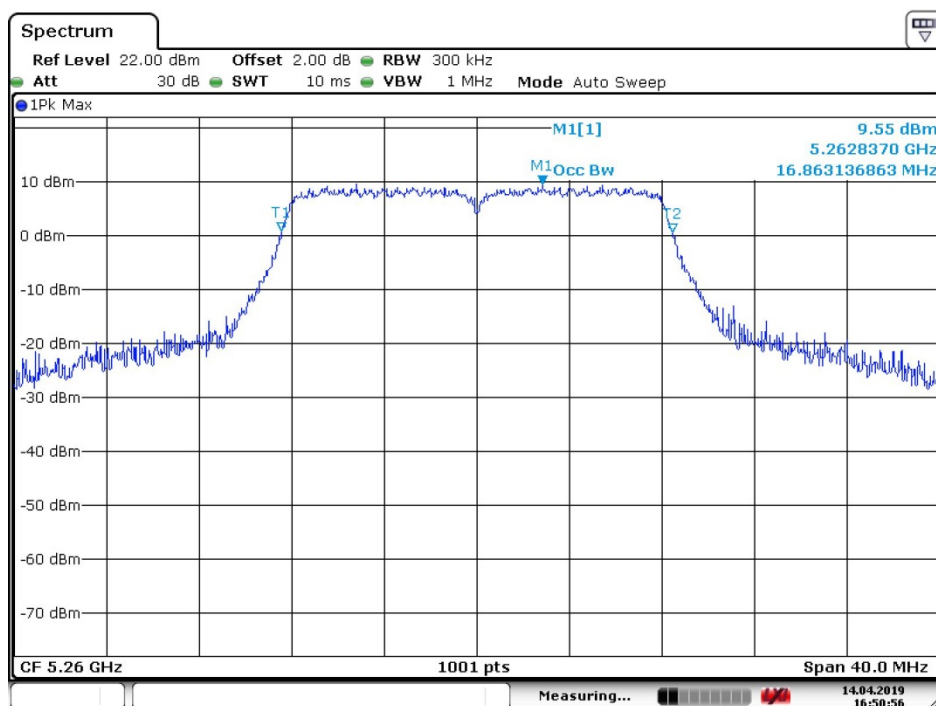
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4.5.2.4

11A20_52 ANT 1



Date: 14.APR.2019 16:21:09

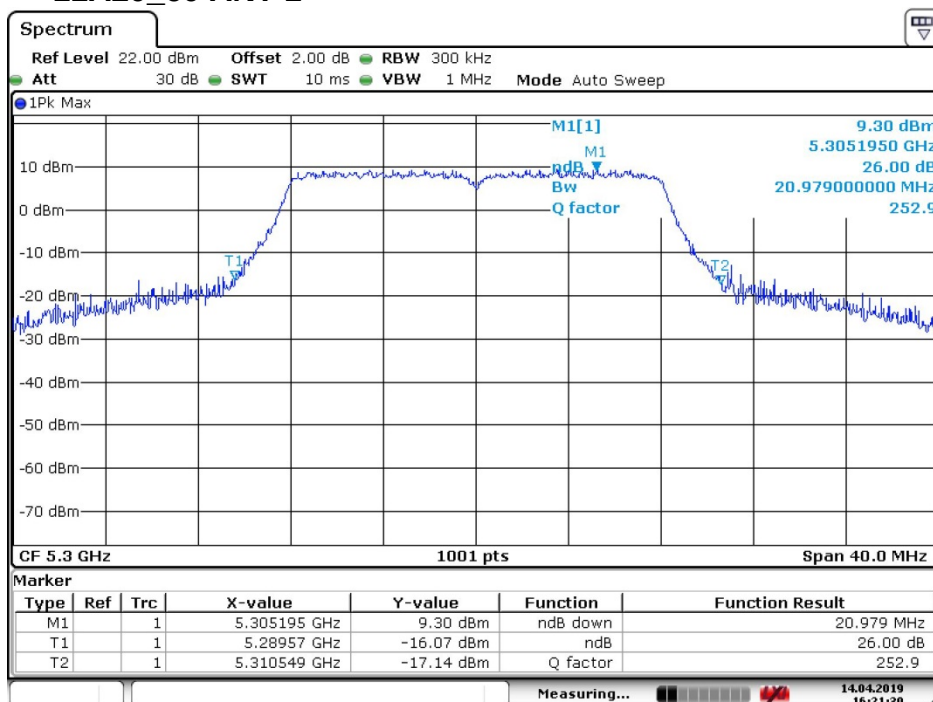


Date: 14.APR.2019 16:50:57

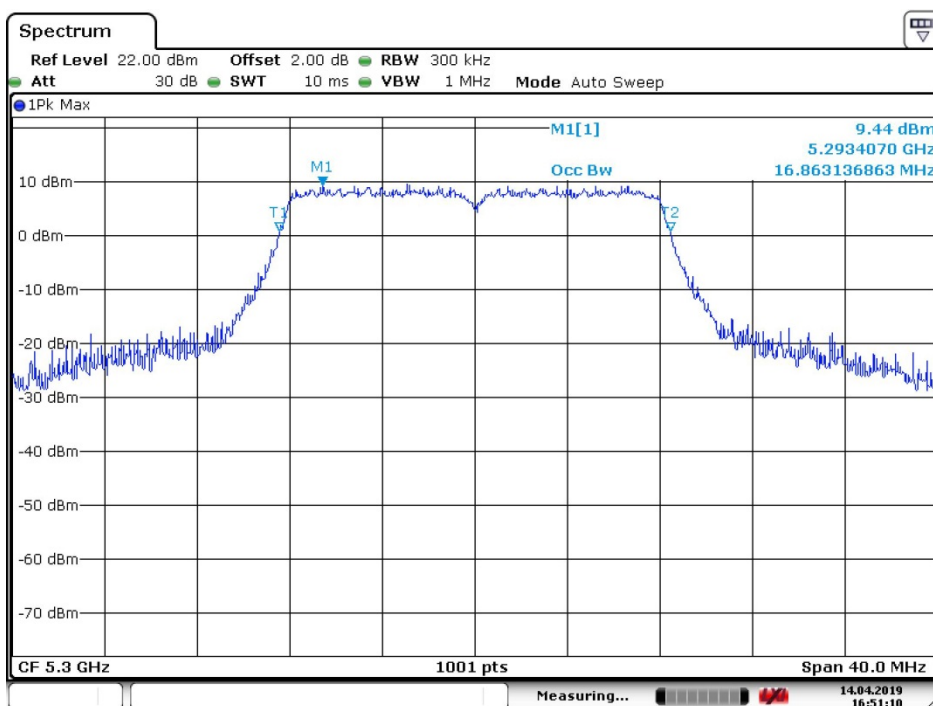


4.5.2.5

11A20_60 ANT 1



Date: 14.APR.2019 16:21:30

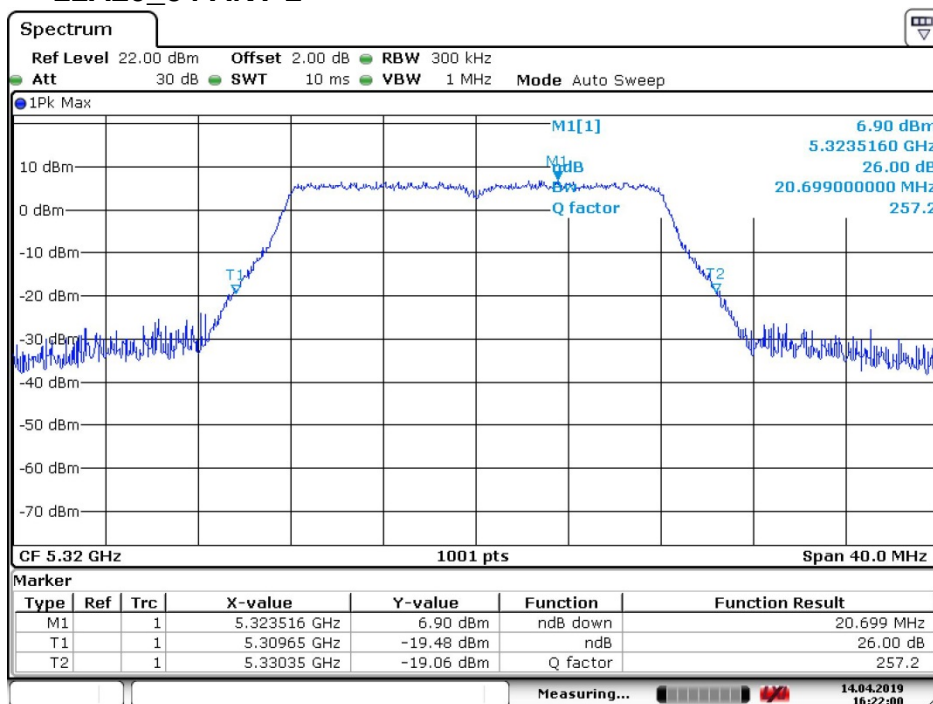


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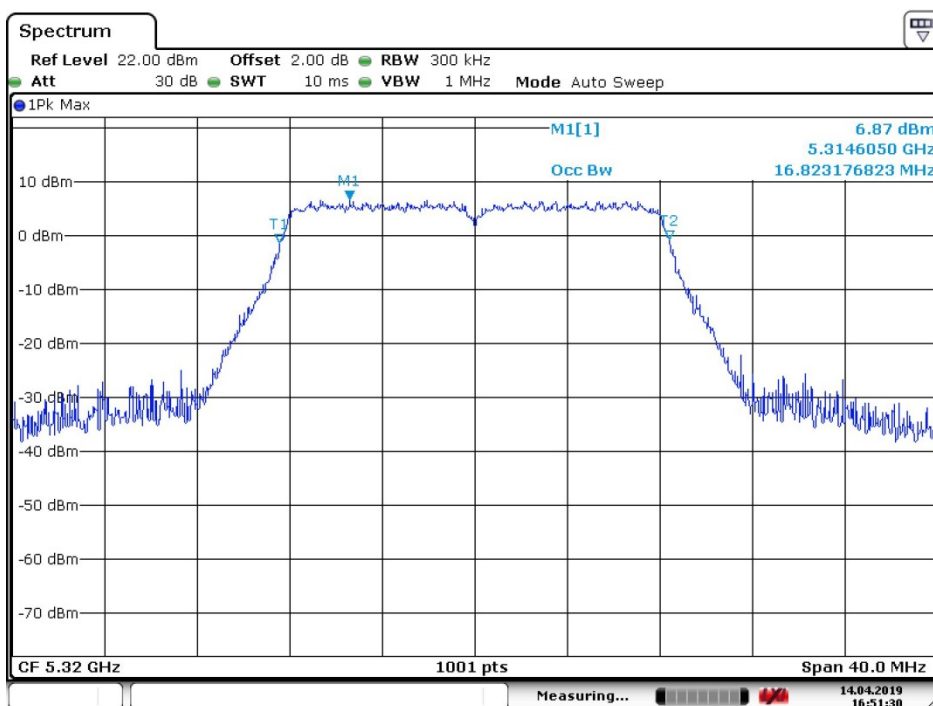


4.5.2.6

11A20_64 ANT 1



Date: 14.APR.2019 16:22:00



Date: 14.APR.2019 16:51:30

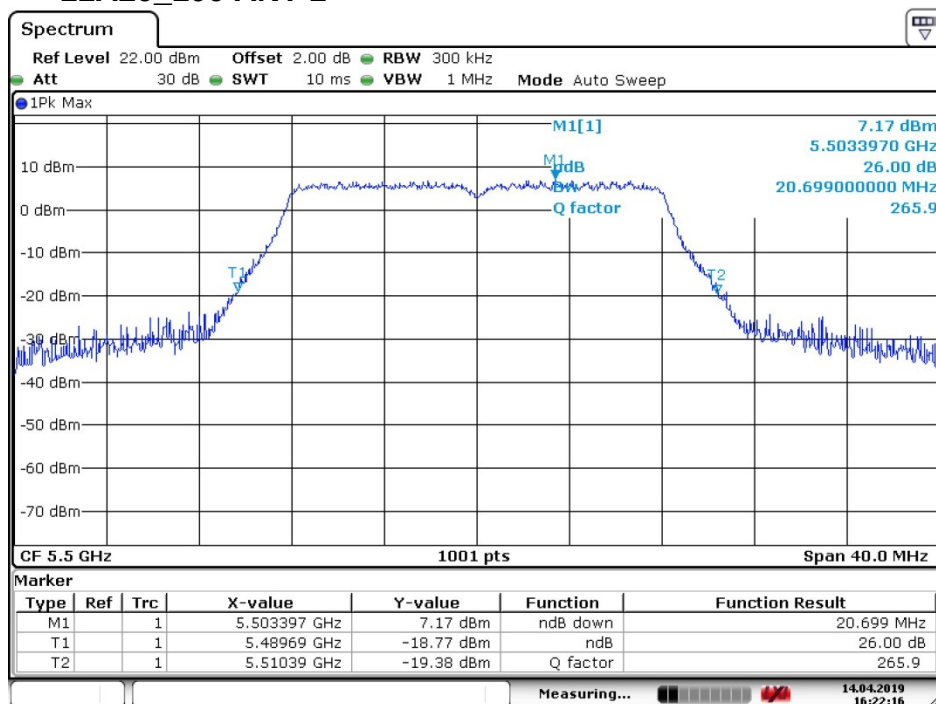


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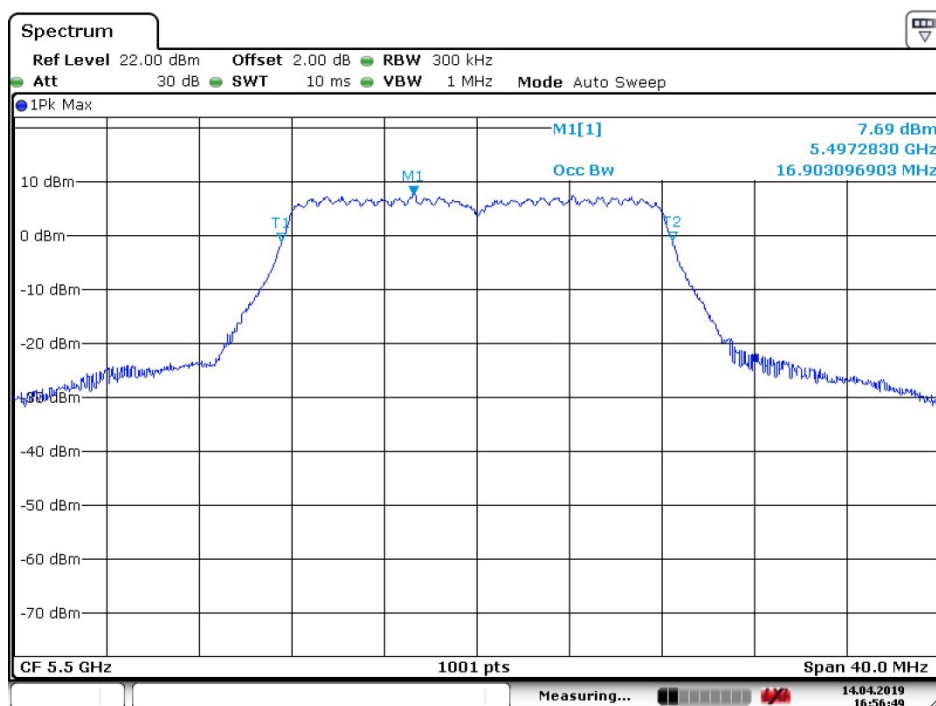
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4.5.2.7

11A20_100 ANT 1



Date: 14.APR.2019 16:22:17



Date: 14.APR.2019 16:56:50

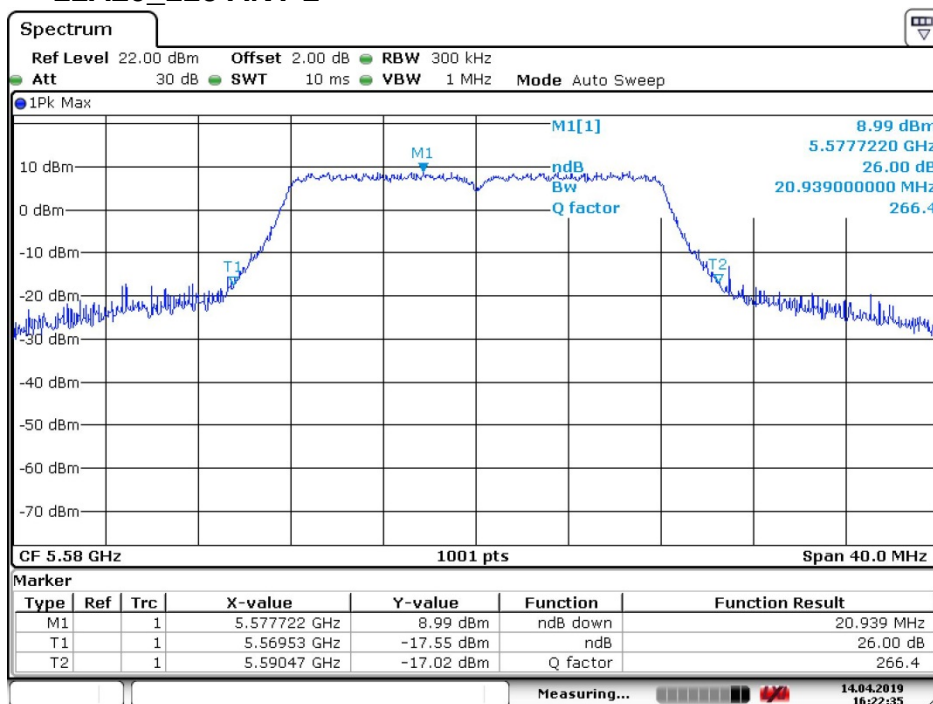


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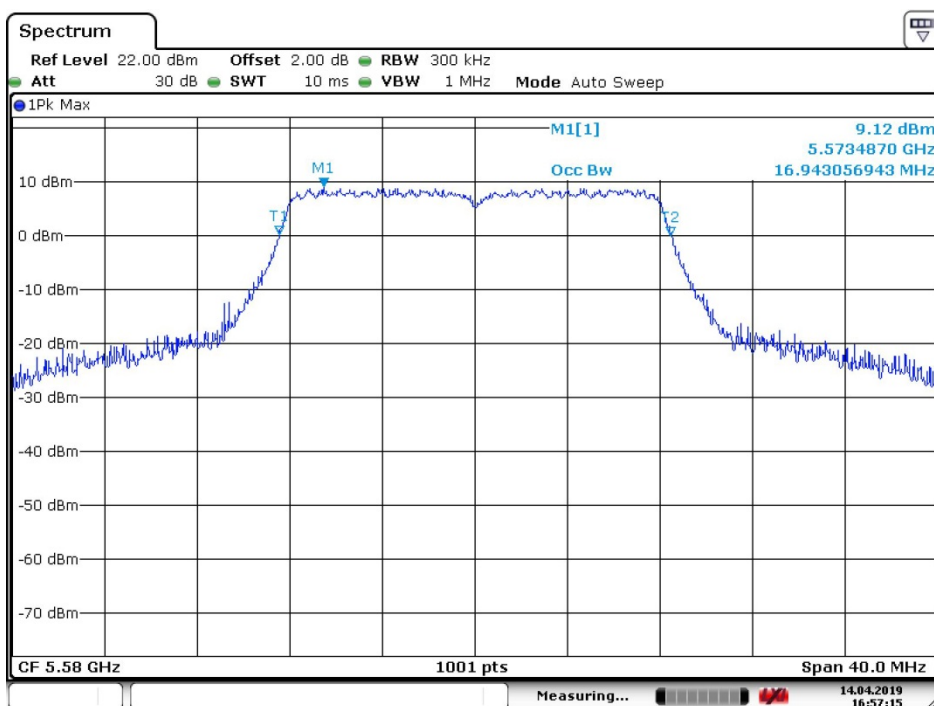
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4.5.2.8

11A20_116 ANT 1



Date: 14.APR.2019 16:22:35

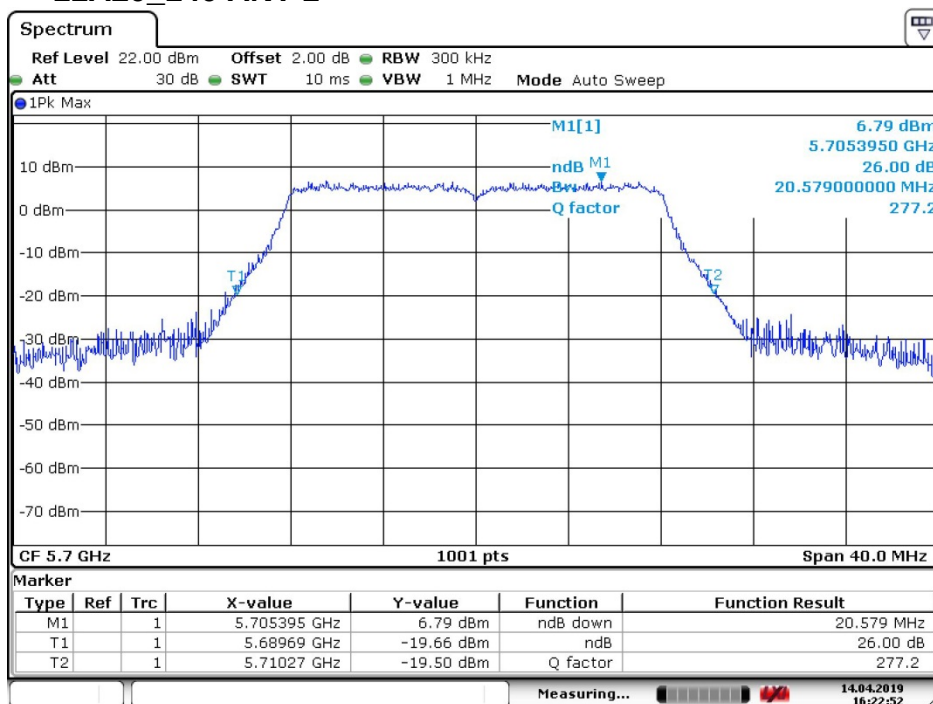


Date: 14.APR.2019 16:37:15

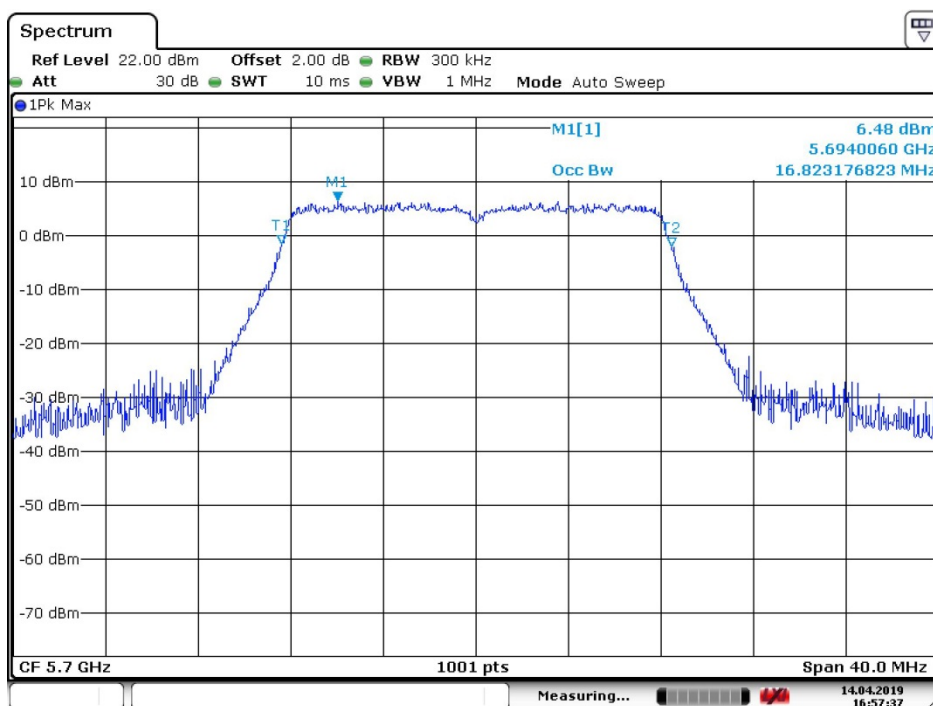


4.5.2.9

11A20_140 ANT 1



Date: 14.APR.2019 16:22:53



Date: 14.APR.2019 16:57:37

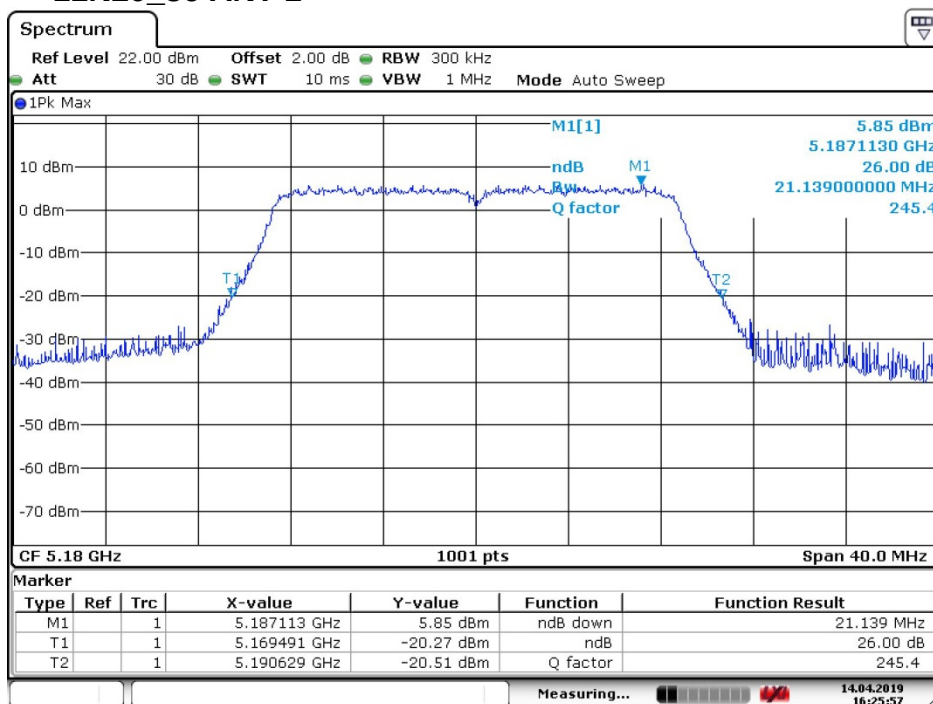


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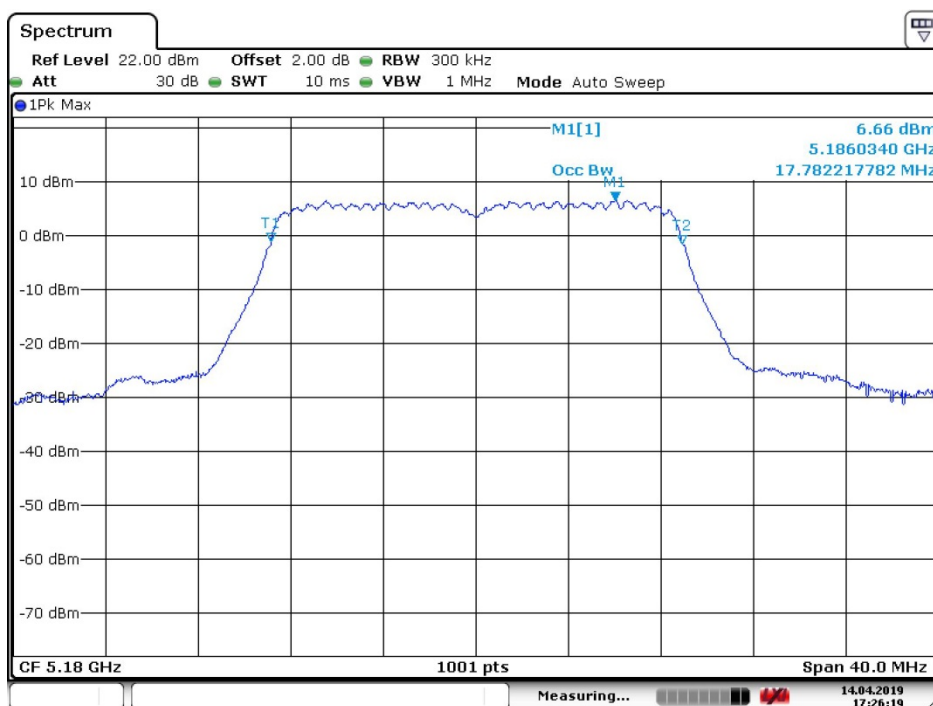
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4.5.2.10

11N20_36 ANT 1



Date: 14.APR.2019 16:25:57



Date: 14.APR.2019 17:26:19



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