RADIO TEST REPORT

No. 181101313SHA-002

Applicant	:	Ericsson AB Isafjordsgatan 10 SE-164 80 Stockholm 16480 Sweden
Manufacturer	:	Ericsson AB Isafjordsgatan 10 SE-164 80 Stockholm 16480 Sweden
Product Name	:	Radio 2205 B46
Product Number	:	KRC 161 609/2
TEST RESULT	:	**PASS**

SUMMARY

The equipment complies with the requirements according to the following standard(s) or specification:

47CFR Part 15 (2017): Radio Frequency Devices (Subpart E)

ANSI C63.10 (2013): American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

RSS-247 Issue 2 (February 2017): Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

RSS-Gen Issue 5 (April 2018): General Requirements for Compliance of Radio Apparatus

Date of issue: November 22, 2018

Prepared by:

Nemo Li (Project engineer)

Reviewed by:

Daniel Zhao (Reviewer)

Contents

Revision History

Issue No.	Version	Description	Date Issued
181101313SHA-002	Rev. 01	Initial issue of report	November 22, 2018

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

EUT	:	Remote Radio Unit
Product name	:	Radio 2205 B46
Product number	:	KRC 161 609/2
Serial Number(s)	:	D827375618
Hardware Version	:	R1D
Software Version	:	CXP9034873%2_R1L01
Description of EUT	:	The equipment is the Remote Radio Part designed for use in LTE cellular telephone system and for LAA to extend benefits of LTE on unlicensed spectrum. This is a Class II Permissive Change report, EUT adds one antenna for FCC, the antenna gain is 12dBi. EUT adds one antenna for IC, the antenna gain is 11dBi. After technical evaluation, only the items of Maximum Output Power and EIRP, Maximum Power Spectral Density and Undesirable Emission at Band Edge were chosen to perform the test, other test items please refer to the original report 171100617SHA-001 for reference.
Rating	:	36V DC
Sample received date	:	October 17, 2018
Date of test	:	October 17, 2018 ~ November 2, 2018

1.2 RF Technical Information

Operating Frequency Range	:	5160 - 5250MHz 5735 - 5850MHz
Type of Modulation	:	LTE: QPSK, 16QAM, 64QAM, 256QAM
ITU Designation of Emission		LTE: 20M0F9W
Number of Channels	:	5160 - 5250MHz Band: 4 channels 5735 - 5850MHz Band: 5 channels
Frequency of Channels	:	5160 - 5250MHz Band: 5180MHz, 5200MHz, 5220MHz, 5240MHz 5735 - 5850MHz Band: 5745MHz, 5765MHz, 5785MHz, 5805MHz, 5825MHz
Number of Carriers	:	Maximum 3 carriers

Channel Bandwidth	:	20MHz
Output Power (RMS)	:	Maximum 18dBm for ports be equipped with directional 12dBi antenna gain for FCC at band 5160 - 5250MHz. Maximum 19dBm for ports be equipped with directional 12dBi antenna gain for FCC at band 5735 - 5850MHz. Maximum 6dBm for ports be equipped with directional 11dBi antenna gain for IC at band 5160 - 5250MHz. Maximum 19dBm for ports be equipped with directional 11dBi antenna gain for IC at band 5735 - 5850MHz.
Instantaneous Bandwidth	:	60MHz
Number of Antenna Ports	:	2 TX ports
FCC ID	:	TA8AKRC161609-2
IC	:	287AB-AS1616092

1.3 Description of Test Facility

Name	:	Intertek Testing Service Limited Shanghai
Address	:	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone	:	86 21 61278200
Telefax	:	86 21 54262353

The test facility is recognized, certified, or accredited by these organizations	:	CNAS Accreditation Lab Registration No. CNAS L0139 A2LA Accreditation Lab Certificate Number: 3309.02 FCC Accredited Lab Designation Number: CN1175 IC Registration Lab Registration code No.: 2042B-1 VCCI Registration Lab Registration No.: G-10845, R-14243, C-14723, T-12252

2 TEST SPECIFICATIONS

2.1 Related documents

47CFR Part 2 (2017)
47CFR Part 15 (2017)
ANSI C63.10 (2013)
RSS-247 Issue 2 (February 2017)
RSS-Gen Issue 5 (April 2018)
KDB 789033 D02 v01r04
KDB 662911 D01 v02r01

2.2 Product Information

The Equipment Under Test (EUT) is shown in the photograph below. The Radio 2205 B46 KRC 161 609/2 operates from a 36V DC with PSU AC 10 or PSU 48 05. A full technical description can be found in the Manufacturer's documentation.

2.3 Configuration Description

Configuration A
Configuration A1 – Maximum 18 dBm for ports equipped with directional 12dBi antenna at Band 5160 - 5250MHz for FCC.
Configuration A2 – Maximum 19 dBm for ports equipped with directional 12dBi antenna at Band 5735 - 5850MHz for FCC.

Configuration B
Configuration B1 – Maximum 6 dBm for ports equipped with directional 11dBi antenna at Band 5160 - 5250MHz for IC.
Configuration B2 – Maximum 19 dBm for ports equipped with directional 11dBi antenna at Band 5735 - 5850MHz for IC.

Configuration Code	Carrier(s)	Configuration Description
L-MIMO-SC	1C	LTE MIMO, Single Carrier
L-MIMO-MC 1	2C	LTE MIMO, Multi Carrier x2
L-MIMO-MC 2	3C	LTE MIMO, Multi Carrier x3

The settings below were deemed representative for all traffic scenarios when settings with different modulations, channel bandwidths, number for carriers and RF configurations have been tested to find the worst case setting. The settings below were used for all measurements unless otherwise noted:

LTE:
MIMO mode single carrier: E-TM1.1
MIMO mode multi carrier (x2): E-TM1.1
MIMO mode multi carrier (x3): E-TM1.1

MIMO mode single carrier: E-TM3.2
MIMO mode multi carrier (x2): E-TM3.2
MIMO mode multi carrier (x3): E-TM3.2

MIMO mode single carrier: E-TM3.1
MIMO mode multi carrier (x2): E-TM3.1
MIMO mode multi carrier (x3): E-TM3.1

MIMO mode single carrier: E-TM3.1a
MIMO mode multi carrier (x2): E-TM3.1a
MIMO mode multi carrier (x3): E-TM3.1a

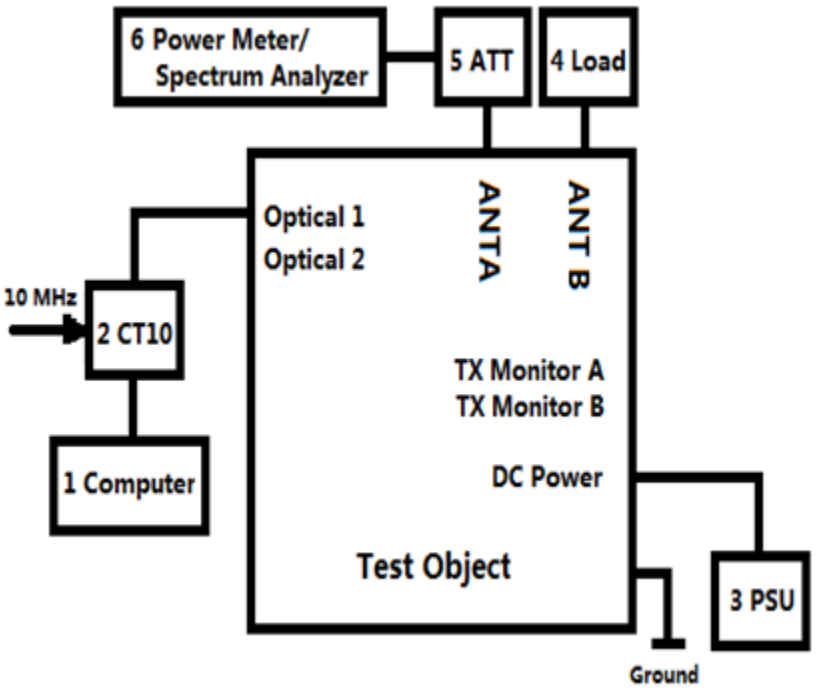
The EUT includes two TX ports and it can be configured to transmit in MIMO mode for LTE carriers, MIMO mode for LTE was used for measurements as the worst configuration.

The complete testing was performed with the EUT transmitting at maximum RF power unless otherwise stated.

For LAA (Radio Access Technology) MIMO mode, all the Maximum Output Power and Maximum Power Spectral Density was tested on all TX output connector RF A and B. All the other TX measurements of LAA MIMO mode, were performed on the combined TX output connector RF A of the EUT as the representative port.

2.4 Test Setup

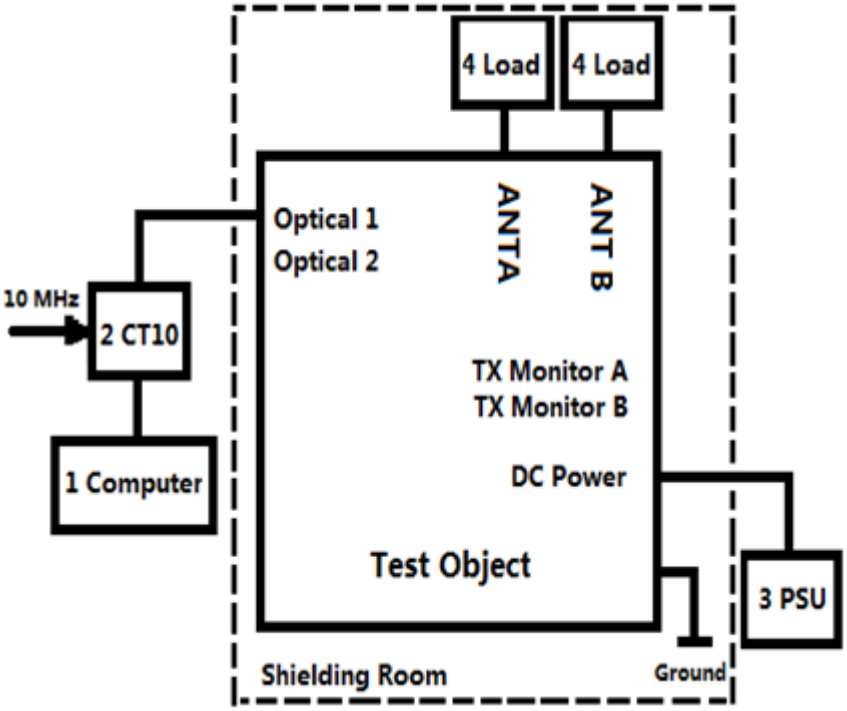
Test Setup, Conducted Measurement:



Product Name	Product Number	Version	Serial Number
Radio 2205 B46	KRC 161 609/2	R1D	D827375618

No.	Auxiliary Equipment	Product Number / Model Type	Version	Serial Number
1	Computer	HP ProBook 430 G3	--	5CD7099QN1
2	CT10	LPC 102 487/1	R1C	T01F437145
3	PSU AC 10	BML 901 350/1	R3B	CD3Q440769
	PSU 48 05	BMR 910 434/1	R3B	CD3P924655
4	Load	53K17R-005	--	--
5	20dB Attenuator	53AS102-K20	--	--

Test Setup, Radiated Measurement:



Product Name	Product Number	Version	Serial Number
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No.	Auxiliary Equipment	Product Number / Model Type	Version	Serial Number
1	Computer	HP ProBook 430 G3	--	5CD7099QN1
2	CT10	LPC 102 487/1	R1C	T01F437145
3	PSU	PSU AC 08	R1B	BR83767592
4	PSU AC 10	BML 901 350/1	R3B	CD3Q440769
	PSU 48 05	BMR 910 434/1	R3B	CD3P924655
5	Load	53K17R-005	--	--
6	20dB Attenuator	53AS102-K20	--	--

2.5 Test condition:

For all tests, the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure, test laboratories or a chamber as appropriate.

All test cases were tested with the EUT supplied with 36V DC via PSU AC 10 or PSU 48 05.

2.6 Test environment condition:

Temperature:	18-24°C
Humidity:	48-58% RH
Atmospheric Pressure:	100-101kPa

2.7 Duty cycle factor:

Modulation	Duty cycle (%)	Duty cycle factor (dB)
QPSK	67.86	1.68
16QAM	67.86	1.68
64QAM	67.86	1.68
256QAM	67.86	1.68

2.8 Test software list:

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

2.9 Instrument list

Conducted Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Test Receiver	R&S	ESCS 30	EC 2107	2019-07-15
☒	A.M.N.	R&S	ESH2-Z5	EC 3119	2018-12-07
☒	A.M.N.	R&S	ENV 216	EC 3393	2019-07-04
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Test Receiver	R&S	ESIB 26	EC 3045	2019-09-12
☒	Bilog Antenna	TESEQ	CBL 6112D	EC 4206	2019-06-10
☒	Horn antenna	R&S	HF 906	EC 3049	2019-09-23
☒	Horn antenna	TOYO	HAP18-26W	EC 4792-3	2020-07-09
☒	Pre-amplifier	R&S	Pre-amp 18	EC 5881	2019-06-19
☒	Horn antenna	ETS-Lindgren	3116C 3116C-PA	-	2018-12-29
☒	Active loop antenna	Schwarzbeck	FMZB1519	EC 5345	2019-03-07
RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2019-03-05
☒	Test Receiver	R&S	ESCI 7	EC 4501	2019-09-12
☒	Power sensor/ Power meter	Agilent	N1911A/ N1921A	EC 4318	2019-04-19
Frequency Stability					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Signal Analyzer	Anritsu	MS2691A	ETC/L743	2018-12-17
☒	Climate Test Chamber	GWS	MT3065	EC 6021	2019-07-03
Tet Site					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Shielded room	Zhongyu	-	EC 2838	2019-01-07
☒	Semi-anechoic chamber	Albatross project	-	EC 3048	2019-07-31

2.10 Measurement Uncertainty

Test Items	Expanded Uncertainty (k=2) (±)
Conducted maximum output power	0.74dB
RF conducted emission	2.89dB
Radiated Emissions in restricted frequency bands below 1GHz	4.90dB
Radiated Emissions in restricted frequency bands above 1GHz	5.02dB
Power line conducted emission	3.19dB
Frequency stability	0.84×10^{-7}

2.11 Test Summary

This report applies to tested sample only. The test results have been compared directly with the limits, and the measurement uncertainty is recorded. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai.

SECTION	TEST ITEM	FCC REFERANCE	IC REFERANCE	RESULT
3	Maximum Output Power and Equivalent Isotropically Radiated Power (EIRP)	15.407 (a)	RSS-247 Issue 2 Clause 6	Pass
4	Maximum Power Spectral Density	15.407 (a)	RSS-247 Issue 2 Clause 6	Pass
5	26 dB Bandwidth and 99% Occupied Bandwidth	15.407 (a)	RSS-247 Issue 2 Clause 6	NP
6	Undesirable Emission – Conducted	15.407 (b) 15.209	RSS-247 Issue 2 Clause 6 RSS-Gen Issue 5 Clause 8	NP
7	Undesirable Emission at Band Edge	15.407 (b) 15.209 15.205	RSS-247 Issue 2 Clause 6 RSS-Gen Issue 5 Clause 8	Pass
8	Undesirable Emission – Radiated	15.407 (b) 15.209 15.205	RSS-247 Issue 2 Clause 6 RSS-Gen Issue 5 Clause 8	NP
9	Conducted Emission	15.407 (b) 15.207	RSS-Gen Issue 5 Clause 8	NP
10	Frequency Stability	15.407 (g)	RSS-Gen Issue 5 Clause 6	NP

Notes: 1: NA =Not Applicable

2: NP =Not Performed after technical evaluation, the data please refer to the original report 171100617SHA-001.

3: Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

4: Additions, Deviations and Exclusions from Standards: None.

5: This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by use of this report. Only the Client is authorized

3 Maximum Output Power and Equivalent Isotropically Radiated Power (EIRP)

Test result: Pass

3.1 Limit

☒ For an outdoor access point operating in the band 5.15 - 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.
The maximum e.i.r.p. at any elevation angle above 30 degrees from the horizon must not exceed 125 mW (21 dBm).

☒ For an indoor access point operating in the band 5.15 - 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

☐ For fixed point-to-point access points operating in the band 5.15 - 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

☐ For mobile and portable client devices in the 5.15 - 5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

☒ For Frequency Band 5.15 - 5.25 GHz, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. (IC)

☒ For the band 5.725 - 5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

3.2 Test Method

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15, Clause 15.407(a) and RSS-247 Clause 6.

Using a power meter, spectrum analyzer and attenuator(s), the output power of the EUT was measured at the antenna terminal in accordance with FCC KDB 789033 D02. The path loss between the EUT and the power sensor was measured and recorded for the test band. The path loss and duty cycle factor was entered as an offset into the power meter and spectrum analyzer.

The EUT was configured to transmit on maximum power on the configurations defined in the tables below. In case of the EUT was configured to MIMO mode, since the EUT transmits on two antennas simultaneously in the same frequency range for MIMO devices, i.e., TX MIMO mode, using the Measure-and-Sum approach, the output power at both antennas were tested, and the total output power were then summed mathematically in linear power units according to FCC KDB 662911 D01.

Outdoor Maximum EIRP was calculated in accordance with FCC CFR 47 Part 15, Clause 15.407 (a).

The RMS power was measured and Maximum EIRP calculated and recorded with the results being compared with the limits.

3.3 Test Results

Configuration A1:

L-MIMO-SC

Maximum Output Power 18dBm per port:

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	QPSK / 20.0 MHz	18.15	18.14	18.14
B		18.12	18.00	18.09
Total		21.15	21.08	21.13

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	16QAM / 20.0 MHz	18.17	18.13	18.13
B		18.12	17.98	18.09
Total		21.16	21.07	21.12

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	64QAM / 20.0 MHz	18.15	18.12	18.13
B		18.10	18.07	18.06
Total		21.14	21.11	21.11

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	256QAM / 20.0 MHz	18.15	18.12	18.14
B		18.09	18.08	18.07
Total		21.13	21.11	21.12

L-MIMO-MC 1 (2C)

Maximum Output Power 18dBm per port:

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5240MHz
A	QPSK / 20.0 MHz	18.03	-	18.03
B		18.03	-	17.94
Total		21.04	-	21.00

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5240MHz
A	16QAM / 20.0 MHz	18.06	-	18.04
B		18.05	-	17.96
Total		21.07	-	21.01

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5240MHz
A	64QAM / 20.0 MHz	18.03	-	18.01
B		18.00	-	17.94
Total		21.03	-	20.99

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5240MHz
A	256QAM / 20.0 MHz	18.06	-	18.00
B		18.02	-	17.92
Total		21.05	-	20.97

L-MIMO-MC 2 (3C)

Maximum Output Power 18dBm per port:

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5200MHz+ 5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5220MHz+ 5240MHz
A	QPSK / 20.0 MHz	18.11	-	18.12
B		18.06	-	18.10
Total		21.10	-	21.12

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5200MHz+ 5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5220MHz+ 5240MHz
A	16QAM / 20.0 MHz	18.14	-	18.10
B		18.07	-	18.11
Total		21.12	-	21.12

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5200MHz+ 5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5220MHz+ 5240MHz
A	64QAM / 20.0 MHz	18.10	-	18.09
B		18.06	-	18.09
Total		21.09	-	21.10

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5200MHz+ 5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5220MHz+ 5240MHz
A	256QAM / 20.0 MHz	18.10	-	18.07
B		18.06	-	18.07
Total		21.09	-	21.08

Configuration A2 and B2

L-MIMO-SC

Maximum Output Power 19dBm per port:

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5745MHz	Channel Position M 5785MHz	Channel Position T 5825MHz
A	QPSK / 20.0 MHz	18.85	18.86	18.82
B		18.87	18.95	18.87
Total		21.87	21.92	21.86

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5745MHz	Channel Position M 5785MHz	Channel Position T 5825MHz
A	16QAM / 20.0 MHz	18.85	18.96	18.81
B		18.87	18.93	18.87
Total		21.87	21.96	21.85

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5745MHz	Channel Position M 5785MHz	Channel Position T 5825MHz
A	64QAM / 20.0 MHz	18.84	18.94	18.80
B		18.85	18.92	18.83
Total		21.86	21.94	21.83

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5745MHz	Channel Position M 5785MHz	Channel Position T 5825MHz
A	256QAM / 20.0 MHz	18.85	18.96	18.79
B		18.97	18.94	18.87
Total		21.92	21.96	21.84

L-MIMO-MC 1 (2C)

Maximum Output Power 19dBm per port:

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5745MHz+5785MHz	Channel Position M_{RFBW} 5765MHz+5805MHz	Channel Position T_{RFBW} 5785MHz+5825MHz
A	QPSK / 20.0 MHz	18.80	18.82	18.79
B		18.95	18.86	18.87
Total		21.89	21.85	21.84

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5745MHz+5785MHz	Channel Position M_{RFBW} 5765MHz+5805MHz	Channel Position T_{RFBW} 5785MHz+5825MHz
A	16QAM / 20.0 MHz	18.81	18.82	18.78
B		18.81	18.86	18.86
Total		21.82	21.85	21.83

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5745MHz+5785MHz	Channel Position M_{RFBW} 5765MHz+5805MHz	Channel Position T_{RFBW} 5785MHz+5825MHz
A	64QAM / 20.0 MHz	18.78	18.81	18.77
B		18.79	18.84	18.85
Total		21.80	21.84	21.82

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5745MHz+5785MHz	Channel Position M_{RFBW} 5765MHz+5805MHz	Channel Position T_{RFBW} 5785MHz+5825MHz
A	256QAM / 20.0 MHz	18.78	18.78	18.78
B		18.87	18.86	18.81
Total		21.84	21.83	21.81

L-MIMO-MC 2 (3C)

Maximum Output Power 20.5dBm per port:

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5745MHz+5765MHz+ 5785MHz	Channel Position M_{RFBW} 5765MHz+5785MHz+ 5805MHz	Channel Position T_{RFBW} 5785MHz+5805MHz+ 5825MHz
A	QPSK / 20.0 MHz	18.85	18.90	18.83
B		18.95	18.94	18.87
Total		21.91	21.93	21.86

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5745MHz+5765MHz+ 5785MHz	Channel Position M_{RFBW} 5765MHz+5785MHz+ 5805MHz	Channel Position T_{RFBW} 5785MHz+5805MHz+ 5825MHz
A	16QAM / 20.0 MHz	18.85	18.89	18.84
B		18.96	18.96	18.88
Total		21.92	21.94	21.87

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5745MHz+5765MHz+ 5785MHz	Channel Position M_{RFBW} 5765MHz+5785MHz+ 5805MHz	Channel Position T_{RFBW} 5785MHz+5805MHz+ 5825MHz
A	64QAM / 20.0 MHz	18.86	18.90	18.84
B		18.86	18.92	18.86
Total		21.87	21.92	21.86

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5745MHz+5765MHz+ 5785MHz	Channel Position M_{RFBW} 5765MHz+5785MHz+ 5805MHz	Channel Position T_{RFBW} 5785MHz+5805MHz+ 5825MHz
A	256QAM / 20.0 MHz	18.85	18.89	18.81
B		18.92	18.92	18.84
Total		21.90	21.92	21.84

Configuration B1:

L-MIMO-SC

Maximum Output Power 6dBm per port:

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	QPSK / 20.0 MHz	5.99	5.88	5.90
B		5.92	5.82	5.92
Total		8.97	8.86	8.92

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	16QAM / 20.0 MHz	5.99	5.87	5.85
B		5.92	5.81	5.91
Total		8.97	8.85	8.89

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	64QAM / 20.0 MHz	5.98	5.86	5.85
B		5.87	5.80	5.88
Total		8.94	8.84	8.88

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	256QAM / 20.0 MHz	6.00	5.85	5.86
B		5.89	5.78	5.89
Total		8.96	8.83	8.89

L-MIMO-MC 1 (2C)

Maximum Output Power 6dBm per port:

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5240MHz
A	QPSK / 20.0 MHz	5.91	-	5.86
B		5.83	-	5.88
Total		8.88	-	8.88

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5240MHz
A	16QAM / 20.0 MHz	5.91	-	5.86
B		5.80	-	5.87
Total		8.87	-	8.88

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5240MHz
A	64QAM / 20.0 MHz	5.90	-	5.85
B		5.80	-	5.83
Total		8.86	-	8.85

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5240MHz
A	256QAM / 20.0 MHz	5.88	-	5.84
B		5.80	-	5.85
Total		8.85	-	8.86

L-MIMO-MC 2 (3C)

Maximum Output Power 6dBm per port:

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5200MHz+ 5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5220MHz+ 5240MHz
A	QPSK / 20.0 MHz	5.92	-	5.88
B		5.82	-	5.93
Total		8.88	-	8.92

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5200MHz+ 5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5220MHz+ 5240MHz
A	16QAM / 20.0 MHz	5.91	-	5.91
B		5.82	-	5.92
Total		8.88	-	8.93

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5200MHz+ 5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5220MHz+ 5240MHz
A	64QAM / 20.0 MHz	5.89	-	5.88
B		5.93	-	5.91
Total		8.92	-	8.91

Antenna	Modulation / Carrier bandwidth (MHz)	Conducted Output Power (dBm)		
		Channel Position B_{RFBW} 5180MHz+5200MHz+ 5220MHz	Channel Position M_{RFBW}	Channel Position T_{RFBW} 5200MHz+5220MHz+ 5240MHz
A	256QAM / 20.0 MHz	5.88	-	5.86
B		5.92	-	5.92
Total		8.91	-	8.90

Maximum Output Power and Maximum E.I.R.P.

	Configuration A1	Configuration A2	Configuration B1	Configuration B2
Maximum Total Output Power (dBm)	21.16	21.96	8.97	21.96
Maximum E.I.R.P. (dBm)	-	-	19.97	-
Outdoor Maximum E.I.R.P *	≤ 18.16	-	-	-

"*" The Maximum Gain at elevation angle above 30 degrees was less than -3dBi for Configuration A.

Configuration B1 E.I.R.P. limit calculation:

Frequency range (MHz)	Modulation	Min 99% emission Bandwidth (MHz)	10+10log B (dBm)	Chosen Limit (dBm)
5150 - 5250	QPSK	17.896	22.53	22.53
	16QAM	17.856	22.52	22.52
	64QAM	17.870	22.52	22.52
	256QAM	17.888	22.53	22.53
Note: Chosen limit is 23dBm or 10dBm + 10logB(99% OBW), which is lesser				

4 Power Spectrum Density

Test result: **Pass**

4.1 Limit

☒ For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.

☒ For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.

☐ For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

☒ For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band.

☒For the 5.15-5.25 GHz, the e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band. (IC)

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beam forming type, the limit should be the less of original and original + (6 - antenna gain - beamforming gain).

4.2 Test method

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15, Clause 15.407(a) and RSS-247 Clause 6.

Using a Spectrum Analyzer and attenuator(s), the Power Spectral Density (PSD) of the EUT was measured at the antenna terminal. The path loss between the EUT and the Spectrum Analyzer was measured and recorded for the test band. The path loss and duty cycle factor were entered as an offset into Spectrum Analyzer.

The EUT was configured to transmit on maximum power on the configurations defined in the tables below. Since the EUT transmits on two antennas simultaneously in the same frequency range for MIMO devices, i.e., TX MIMO mode, using the Measure-and-Sum approach, the PSD at both antennas were tested, and the total PSD were then summed mathematically in linear power units according to FCC KDB 662911 D01.

The PSD was measured and recorded with the results being compared with the limits.

4.3 Test Results

Configuration A1:

L-MIMO-SC

Maximum Output Power 18dBm per port:

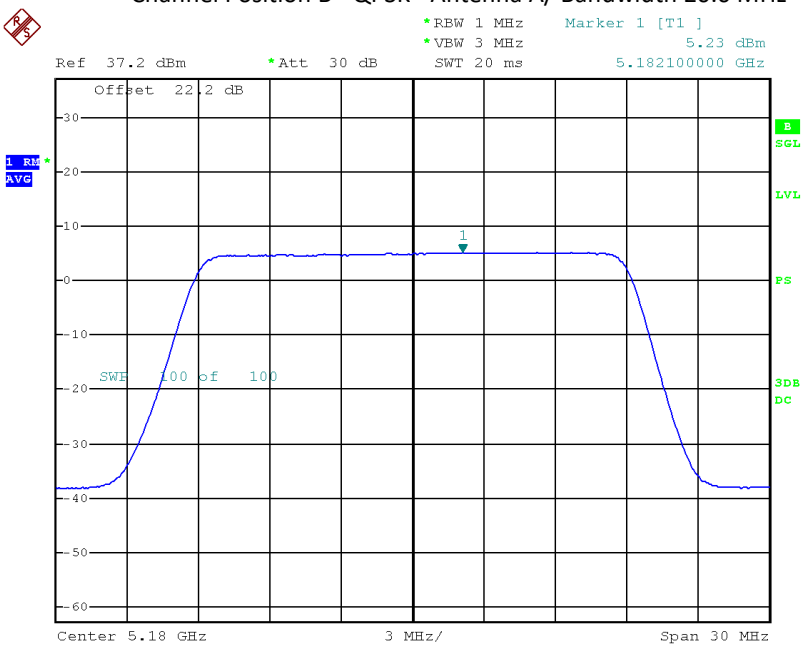
Antenna	Modulation / Carrier bandwidth (MHz)	Power Spectrum Density (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	QPSK / 20.0 MHz	6.91	6.96	6.79
B		6.85	6.84	7.08
Total		9.89	9.91	9.95

Antenna	Modulation / Carrier bandwidth (MHz)	Power Spectrum Density (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	16QAM / 20.0 MHz	7.64	7.62	7.28
B		7.60	7.48	7.16
Total		10.63	10.56	10.23

Antenna	Modulation / Carrier bandwidth (MHz)	Power Spectrum Density (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	64QAM / 20.0 MHz	6.92	6.90	7.18
B		6.83	6.87	7.21
Total		9.89	9.90	10.21

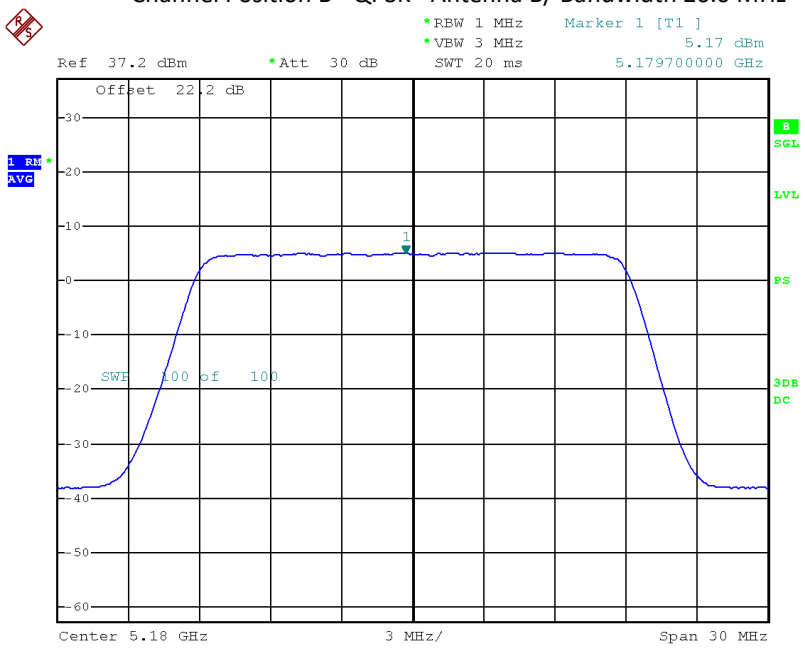
Antenna	Modulation / Carrier bandwidth (MHz)	Power Spectrum Density (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	256QAM / 20.0 MHz	6.96	7.16	7.02
B		6.72	7.06	7.47
Total		9.86	10.12	10.26

Channel Position B - QPSK - Antenna A/ Bandwidth 20.0 MHz



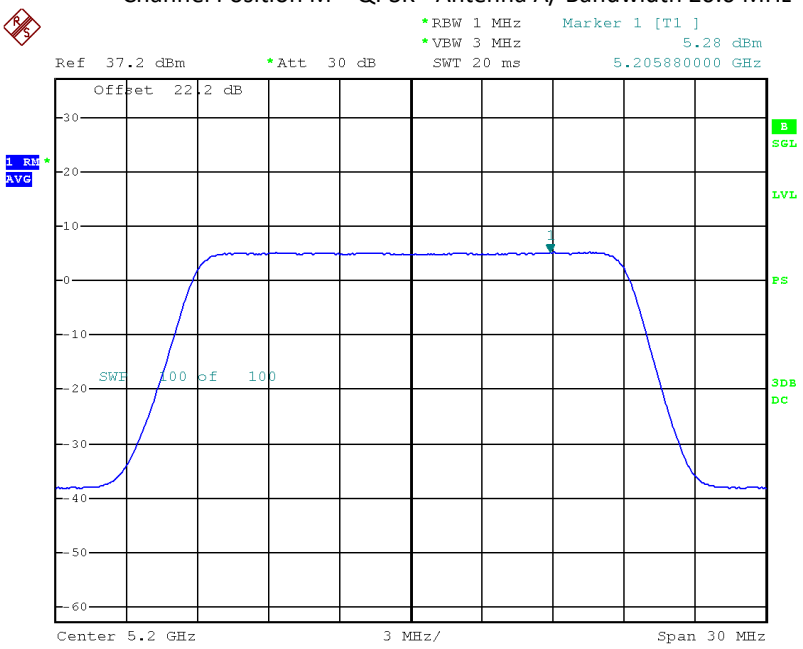
Date: 30.OCT.2018 06:17:06

Channel Position B - QPSK - Antenna B/ Bandwidth 20.0 MHz



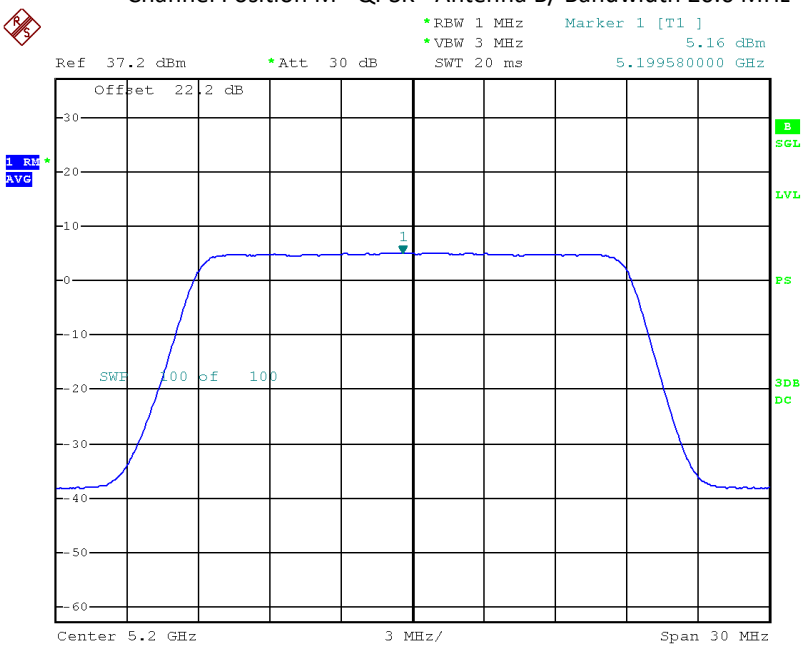
Date: 30.OCT.2018 11:14:41

Channel Position M – QPSK - Antenna A/ Bandwidth 20.0 MHz



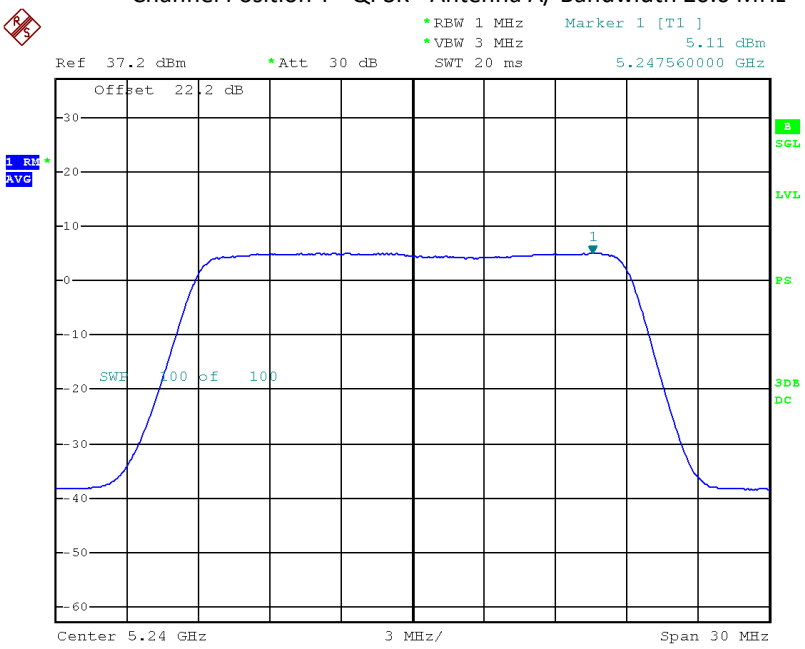
Date: 30.OCT.2018 06:31:57

Channel Position M - QPSK - Antenna B/ Bandwidth 20.0 MHz



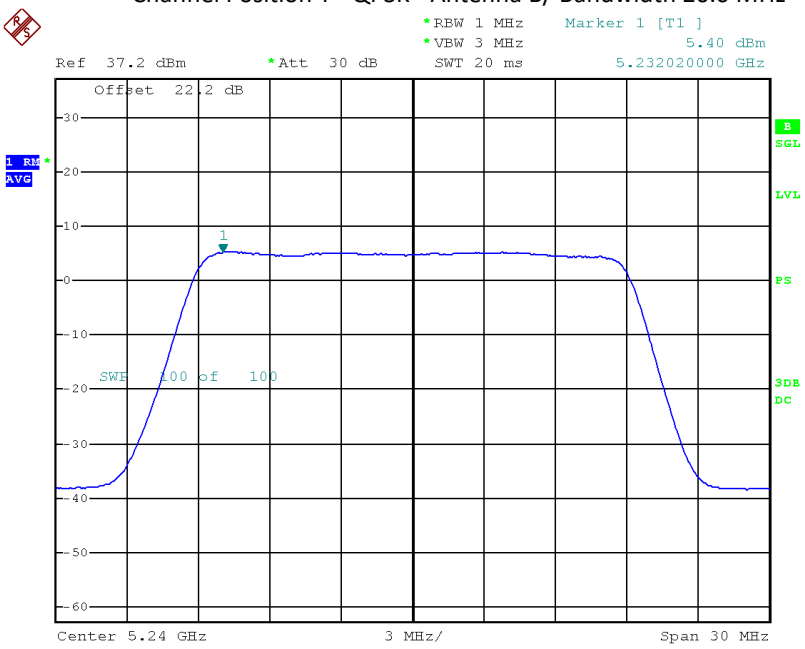
Date: 30.OCT.2018 11:18:03

Channel Position T - QPSK - Antenna A/ Bandwidth 20.0 MHz



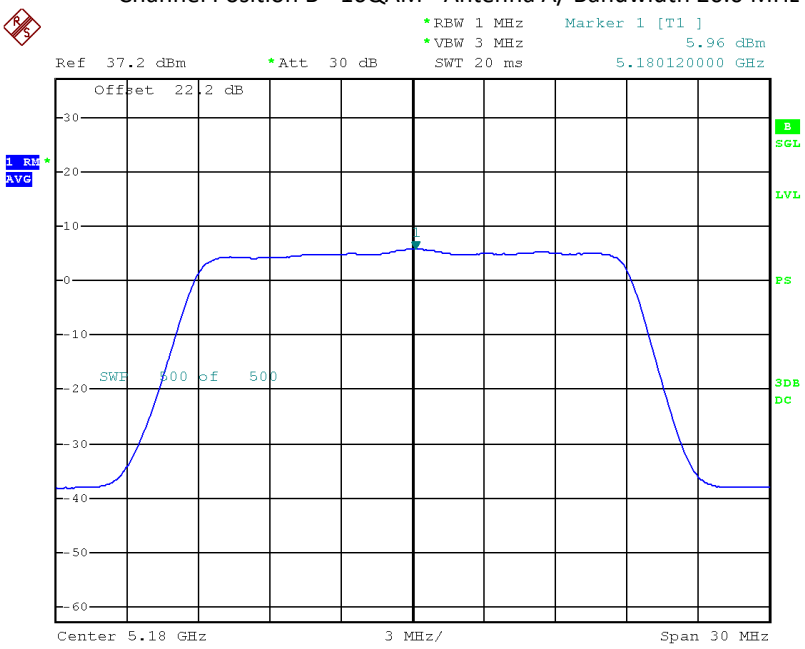
Date: 30.OCT.2018 08:28:56

Channel Position T - QPSK - Antenna B/ Bandwidth 20.0 MHz



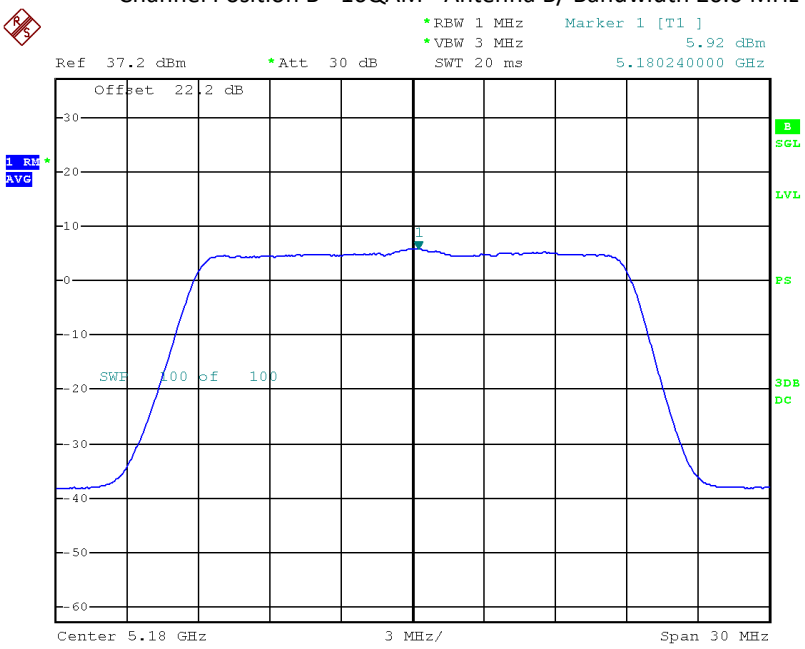
Date: 30.OCT.2018 11:21:55

Channel Position B - 16QAM - Antenna A/ Bandwidth 20.0 MHz



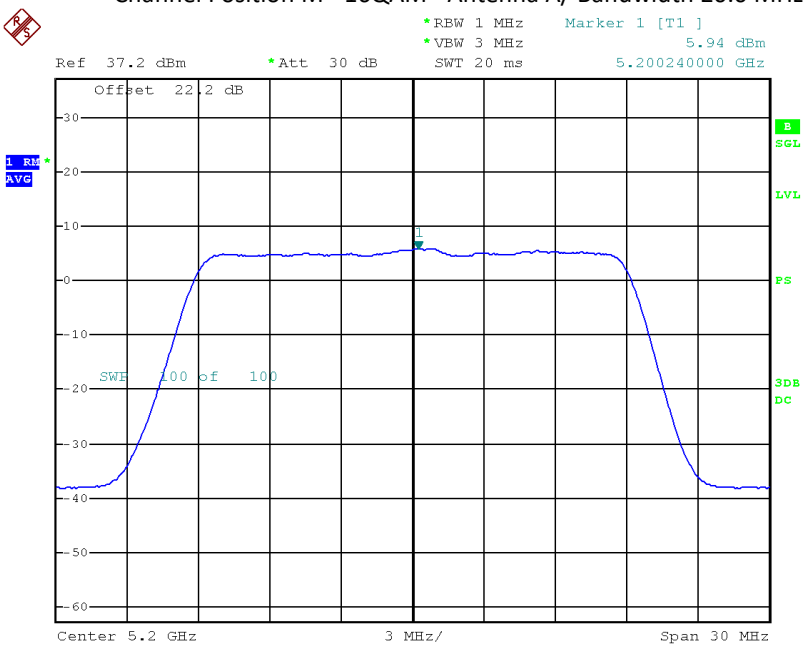
Date: 30.OCT.2018 06:23:49

Channel Position B - 16QAM - Antenna B/ Bandwidth 20.0 MHz



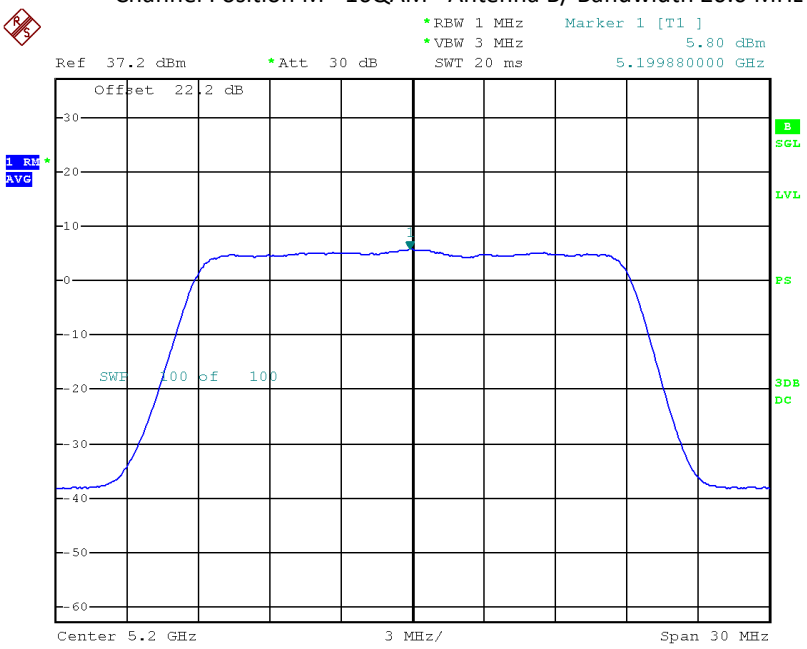
Date: 30.OCT.2018 11:15:18

Channel Position M - 16QAM - Antenna A/ Bandwidth 20.0 MHz



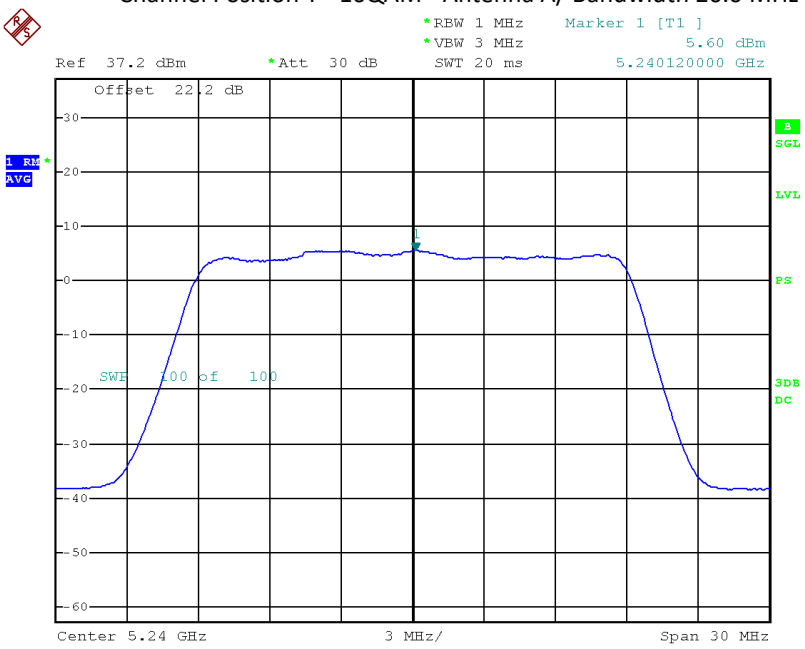
Date: 30.OCT.2018 06:33:52

Channel Position M - 16QAM - Antenna B/ Bandwidth 20.0 MHz



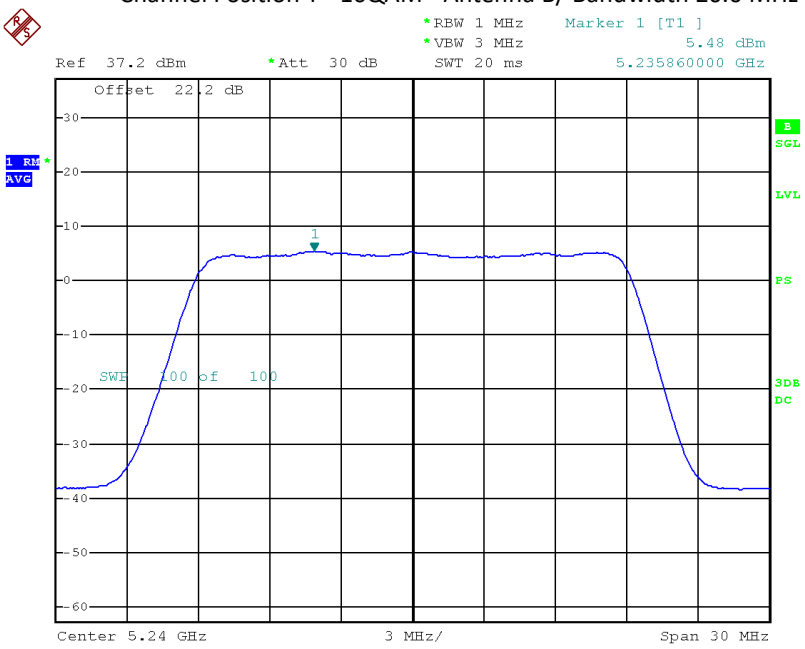
Date: 30.OCT.2018 11:19:09

Channel Position T - 16QAM - Antenna A/ Bandwidth 20.0 MHz



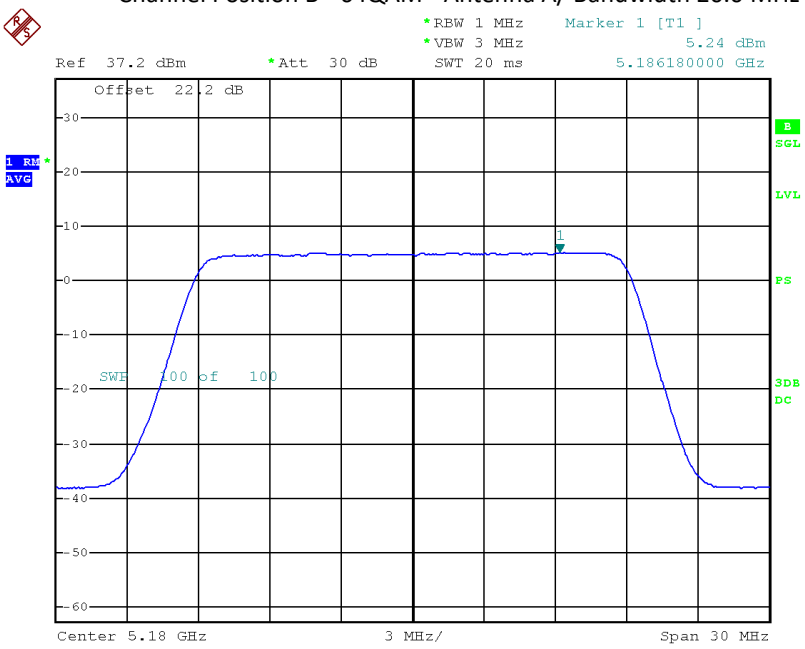
Date: 30.OCT.2018 08:30:47

Channel Position T - 16QAM - Antenna B/ Bandwidth 20.0 MHz



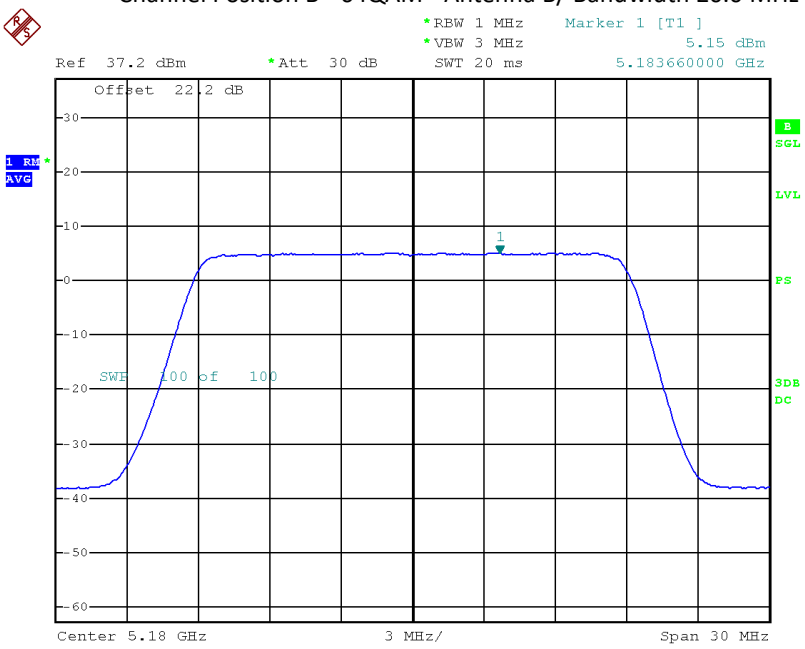
Date: 30.OCT.2018 11:24:05

Channel Position B - 64QAM - Antenna A/ Bandwidth 20.0 MHz



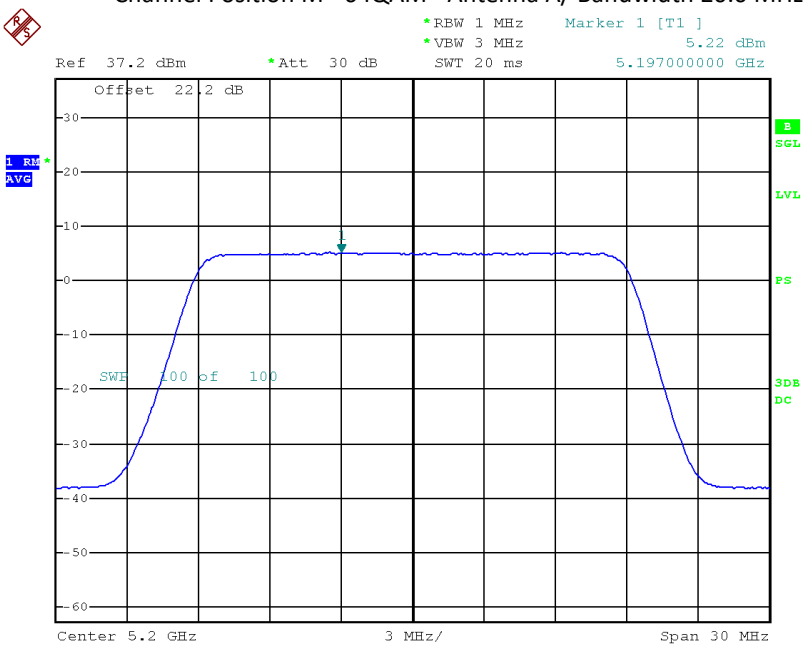
Date: 30.OCT.2018 06:24:37

Channel Position B - 64QAM - Antenna B/ Bandwidth 20.0 MHz



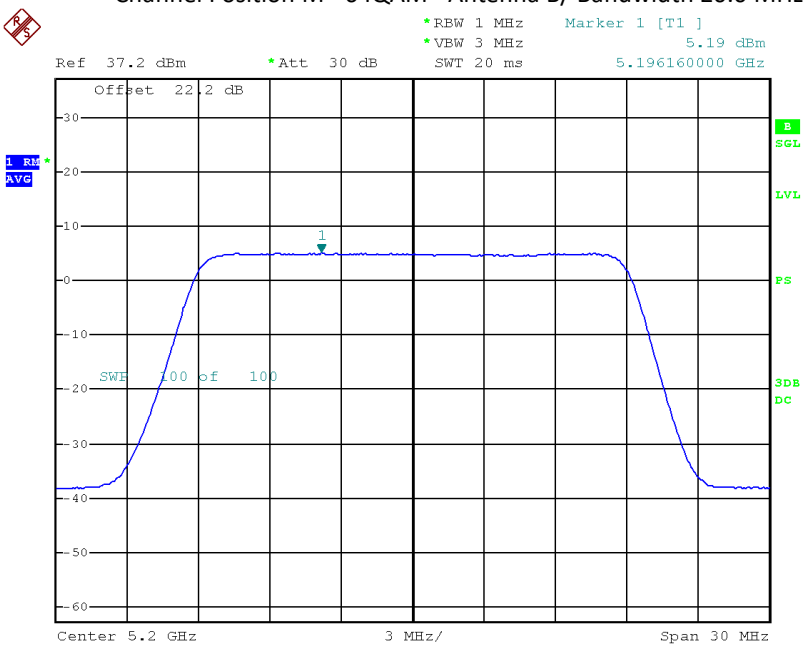
Date: 30.OCT.2018 11:15:49

Channel Position M - 64QAM - Antenna A/ Bandwidth 20.0 MHz



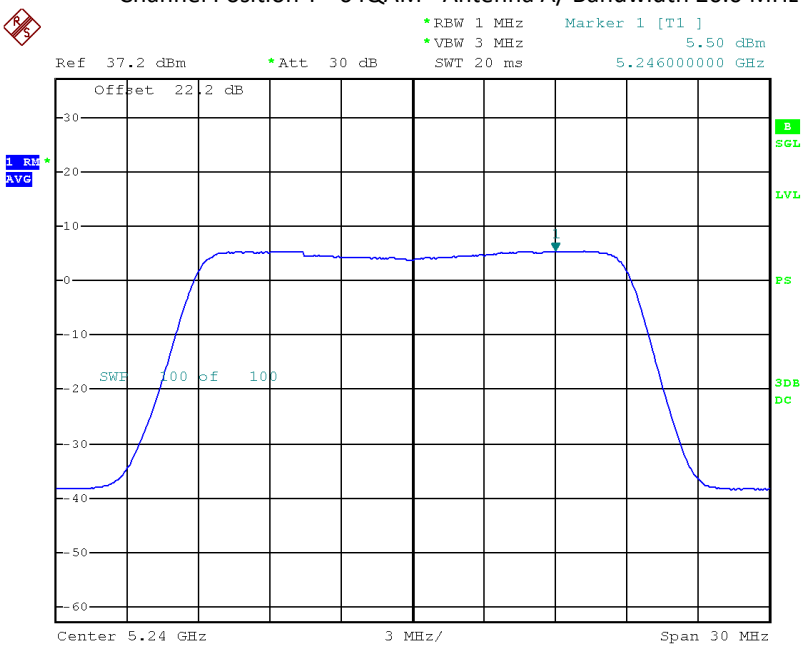
Date: 30.OCT.2018 06:34:18

Channel Position M - 64QAM - Antenna B/ Bandwidth 20.0 MHz



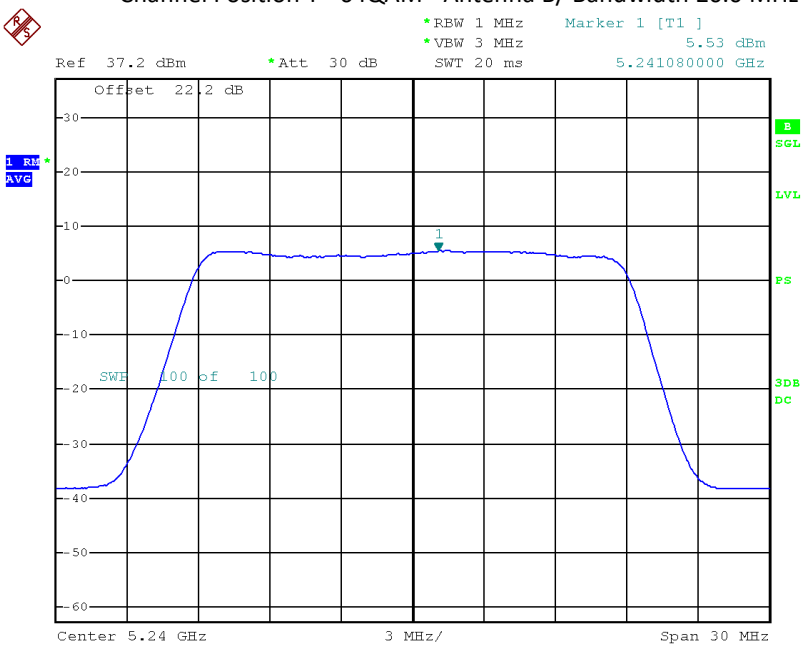
Date: 30.OCT.2018 11:20:01

Channel Position T - 64QAM - Antenna A/ Bandwidth 20.0 MHz



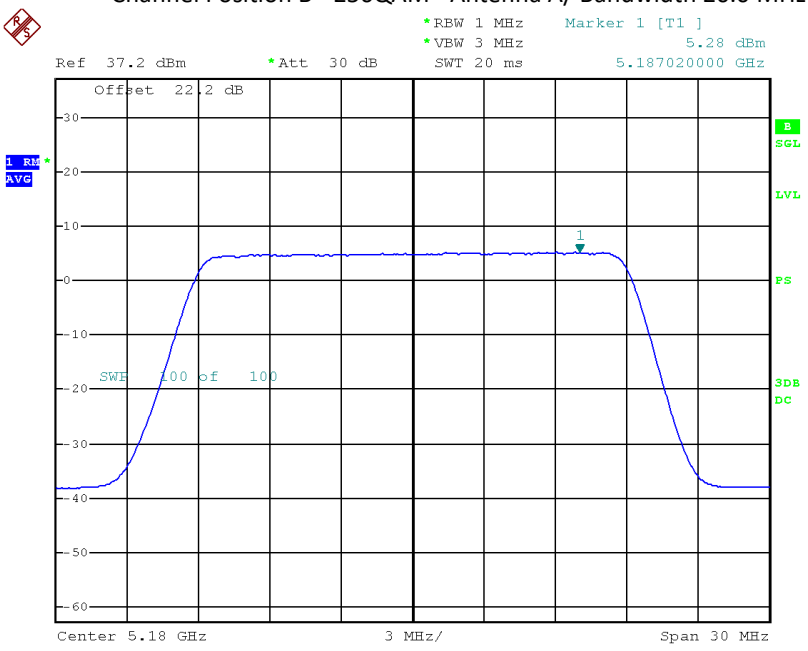
Date: 30.OCT.2018 08:31:54

Channel Position T - 64QAM - Antenna B/ Bandwidth 20.0 MHz



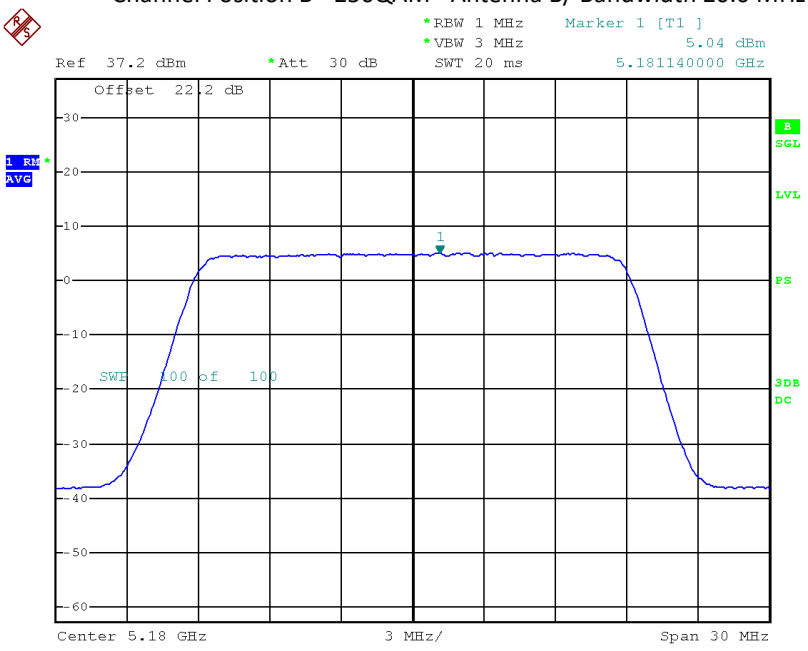
Date: 30.OCT.2018 11:24:39

Channel Position B - 256QAM - Antenna A/ Bandwidth 20.0 MHz



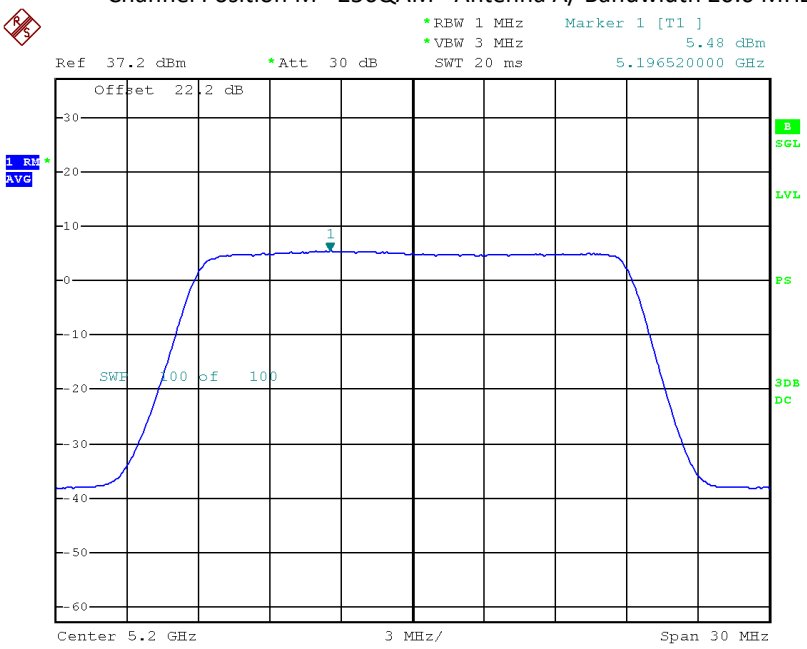
Date: 30.OCT.2018 06:25:49

Channel Position B - 256QAM - Antenna B/ Bandwidth 20.0 MHz



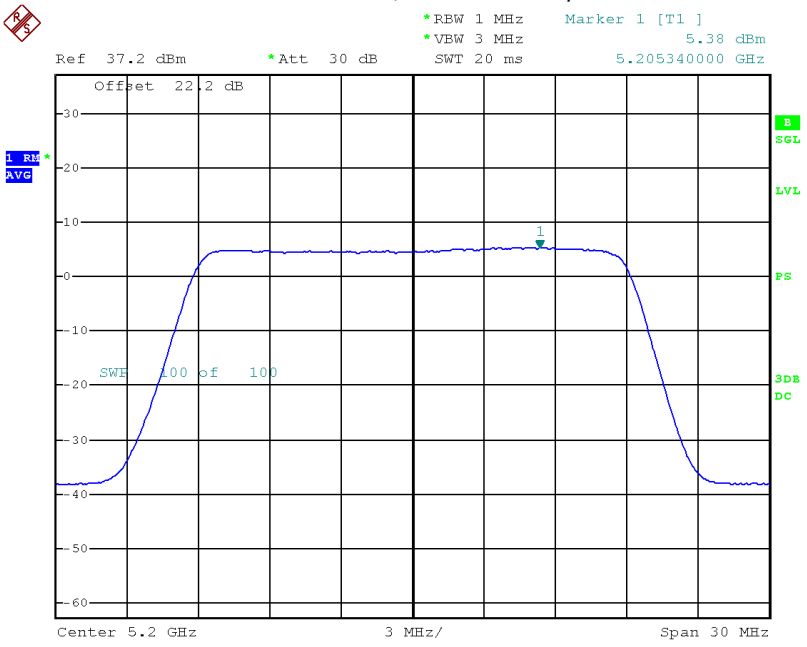
Date: 30.OCT.2018 11:13:26

Channel Position M - 256QAM - Antenna A/ Bandwidth 20.0 MHz



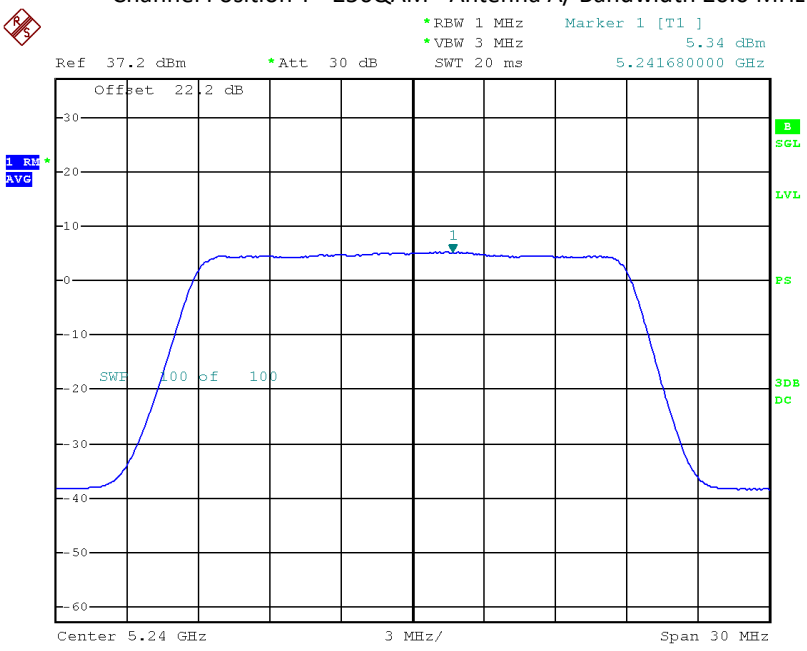
Date: 30.OCT.2018 06:34:45

Channel Position M - 256QAM - Antenna B/ Bandwidth 20.0 MHz



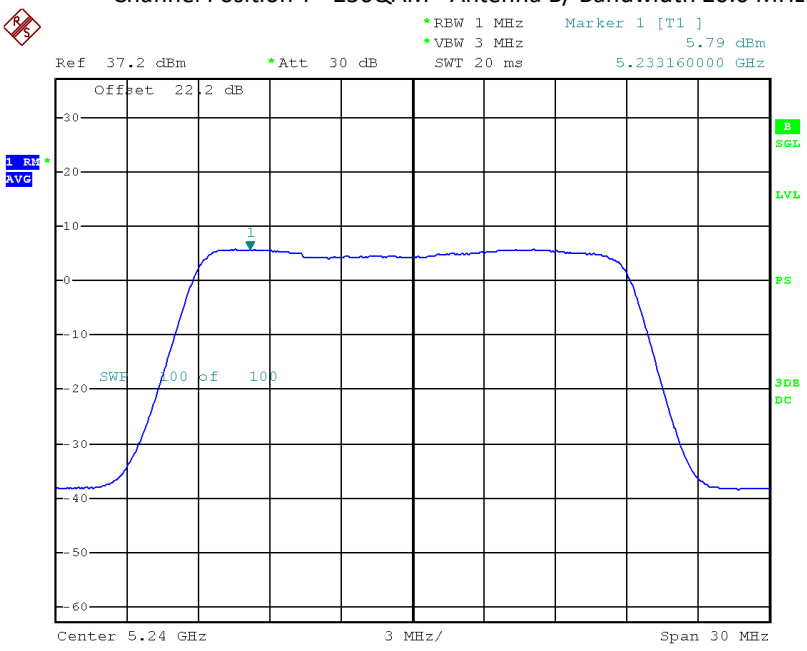
Date: 30.OCT.2018 11:21:12

Channel Position T - 256QAM - Antenna A/ Bandwidth 20.0 MHz



Date: 30.OCT.2018 08:33:48

Channel Position T - 256QAM - Antenna B/ Bandwidth 20.0 MHz



Date: 30.OCT.2018 11:25:35

Configuration A2 and B2:

L-MIMO-SC

Maximum Output Power 19dBm per port:

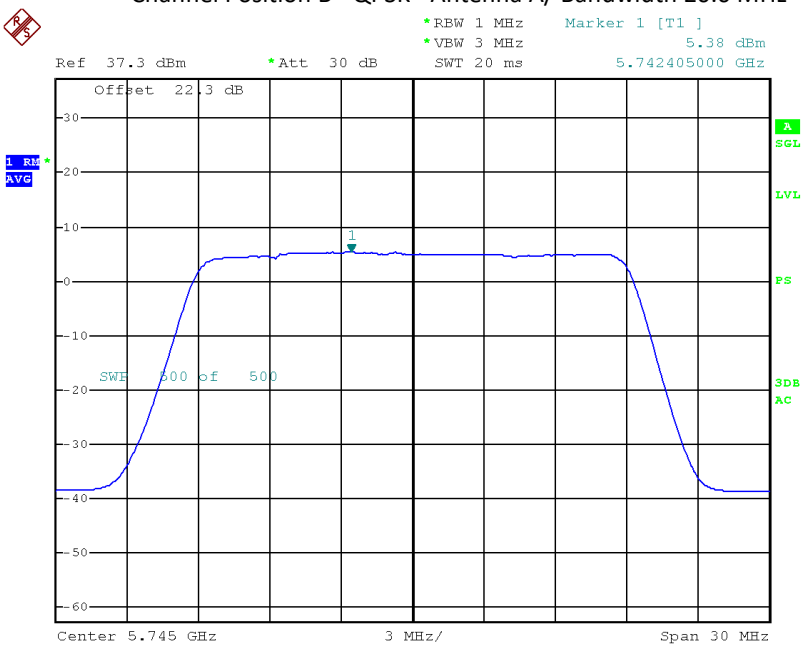
Antenna	Modulation / Carrier bandwidth (MHz)	Power Spectrum Density (dBm)		
		Channel Position B 5745MHz	Channel Position M 5785MHz	Channel Position T 5825MHz
A	QPSK / 20.0 MHz	7.06	7.35	7.52
B		7.15	7.52	7.33
Total		10.12	10.45	10.44

Antenna	Modulation / Carrier bandwidth (MHz)	Power Spectrum Density (dBm)		
		Channel Position B 5745MHz	Channel Position M 5785MHz	Channel Position T 5825MHz
A	16QAM / 20.0 MHz	7.78	8.20	8.33
B		7.78	8.23	8.07
Total		10.79	11.23	11.22

Antenna	Modulation / Carrier bandwidth (MHz)	Power Spectrum Density (dBm)		
		Channel Position B 5745MHz	Channel Position M 5785MHz	Channel Position T 5825MHz
A	64QAM / 20.0 MHz	7.01	7.34	7.67
B		7.07	7.31	7.33
Total		10.05	10.34	10.52

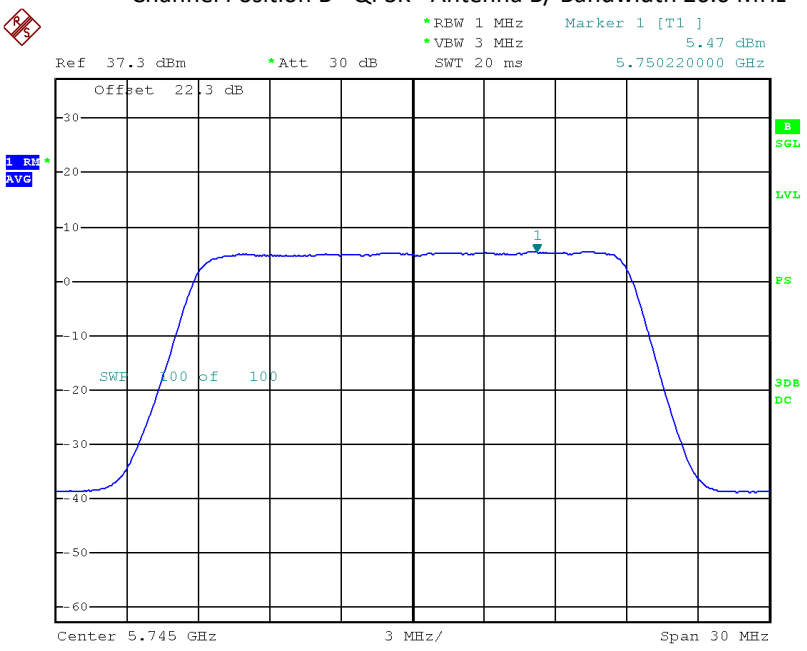
Antenna	Modulation / Carrier bandwidth (MHz)	Power Spectrum Density (dBm)		
		Channel Position B 5745MHz	Channel Position M 5785MHz	Channel Position T 5825MHz
A	256QAM / 20.0 MHz	7.06	7.34	7.49
B		7.06	7.24	7.30
Total		10.07	10.30	10.41

Channel Position B - QPSK - Antenna A/ Bandwidth 20.0 MHz



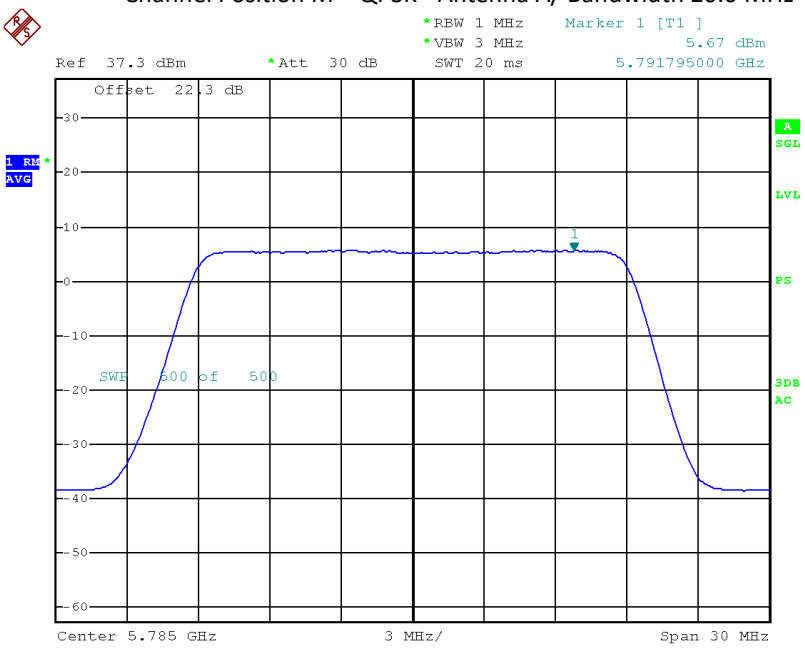
Date: 31.OCT.2018 11:53:14

Channel Position B - QPSK - Antenna B/ Bandwidth 20.0 MHz



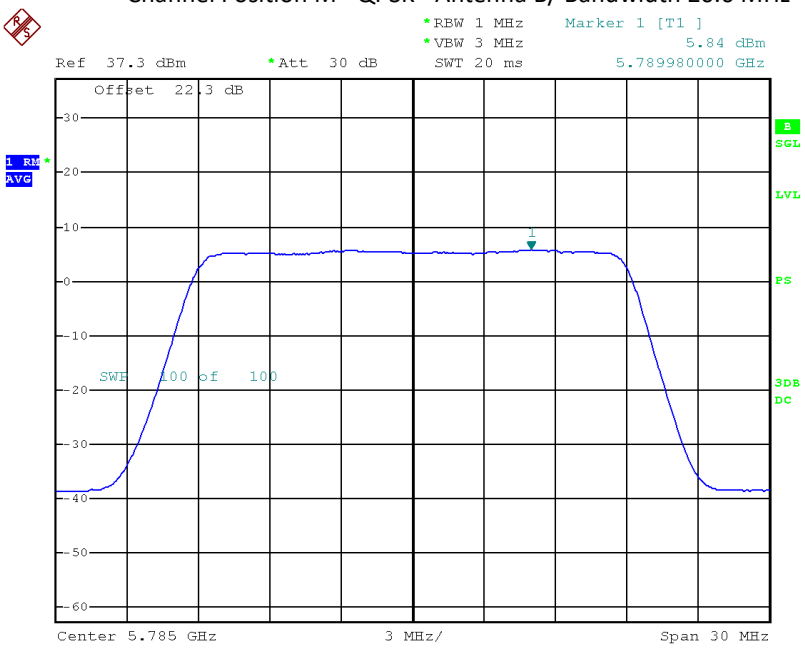
Date: 30.OCT.2018 12:06:19

Channel Position M – QPSK - Antenna A/ Bandwidth 20.0 MHz



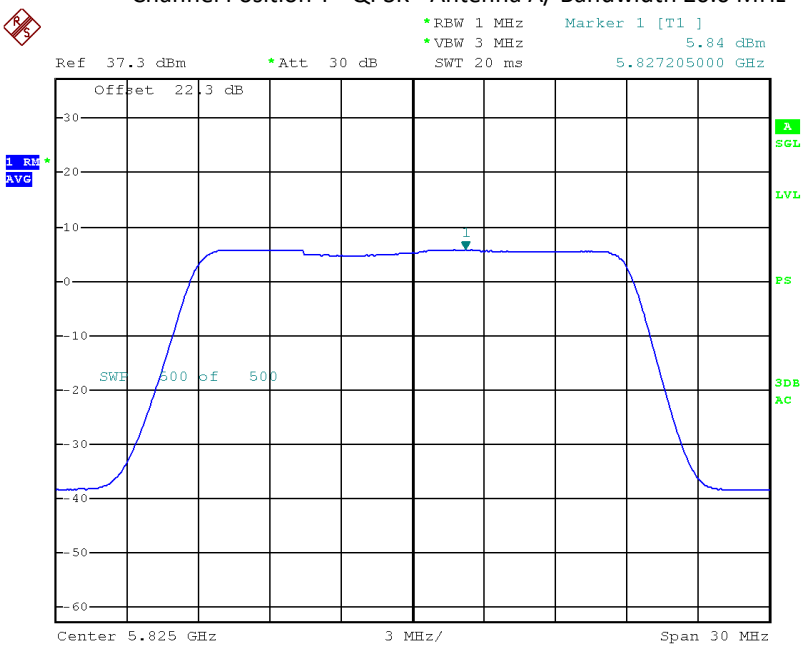
Date: 31.OCT.2018 11:59:52

Channel Position M - QPSK - Antenna B/ Bandwidth 20.0 MHz



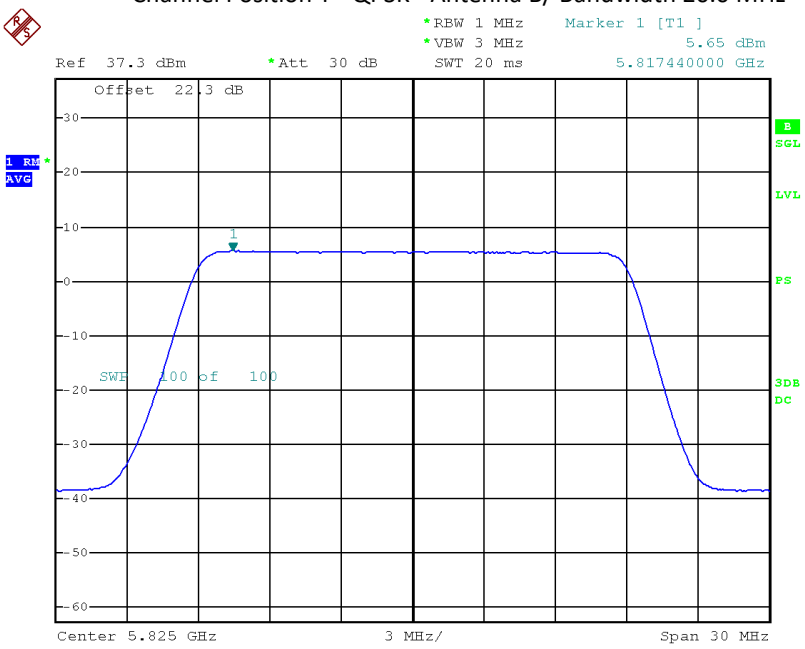
Date: 30.OCT.2018 12:08:54

Channel Position T - QPSK - Antenna A/ Bandwidth 20.0 MHz



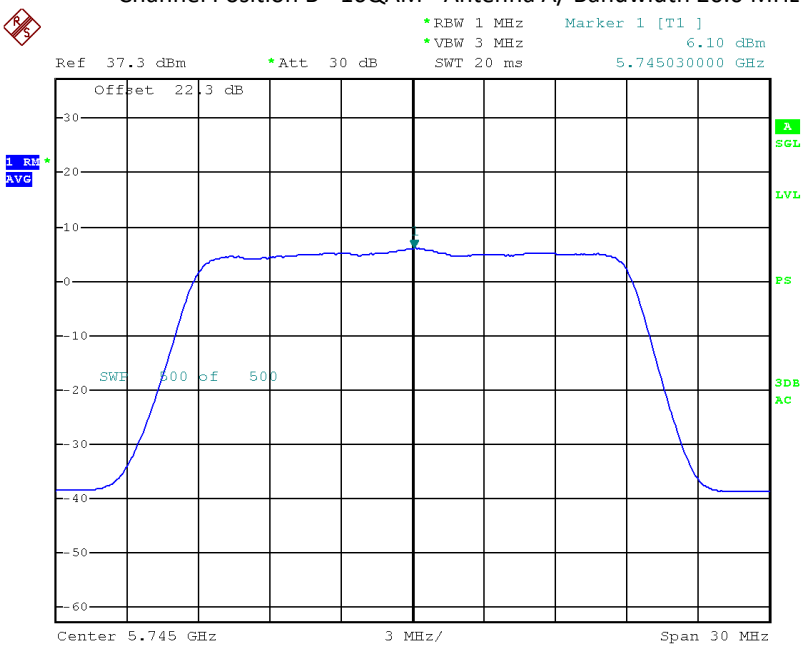
Date: 31.OCT.2018 12:07:55

Channel Position T - QPSK - Antenna B/ Bandwidth 20.0 MHz



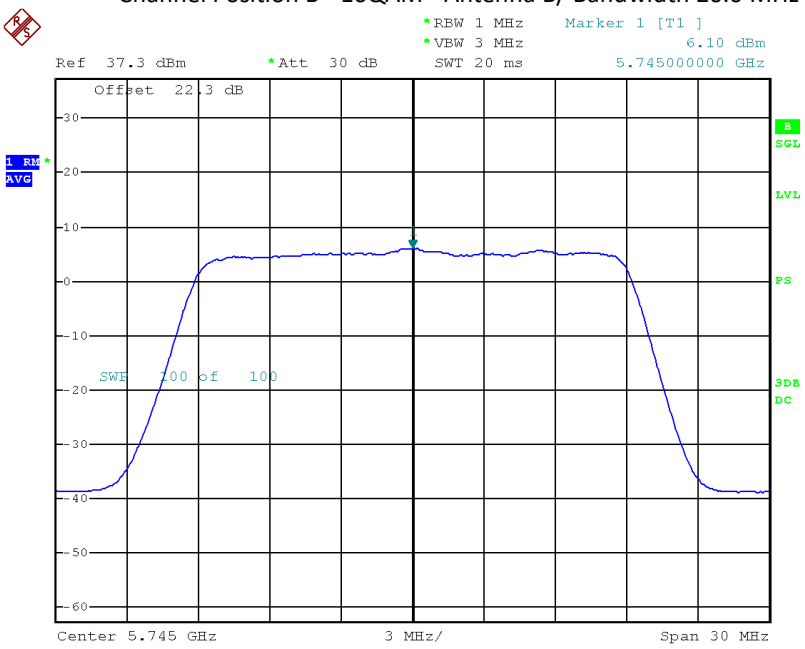
Date: 30.OCT.2018 12:12:52

Channel Position B - 16QAM - Antenna A/ Bandwidth 20.0 MHz



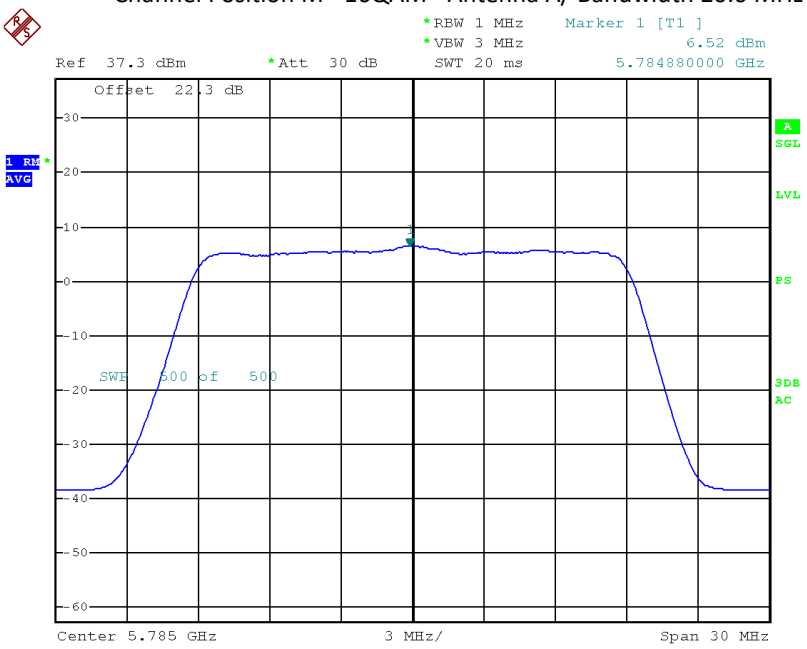
Date: 31.OCT.2018 11:54:36

Channel Position B - 16QAM - Antenna B/ Bandwidth 20.0 MHz



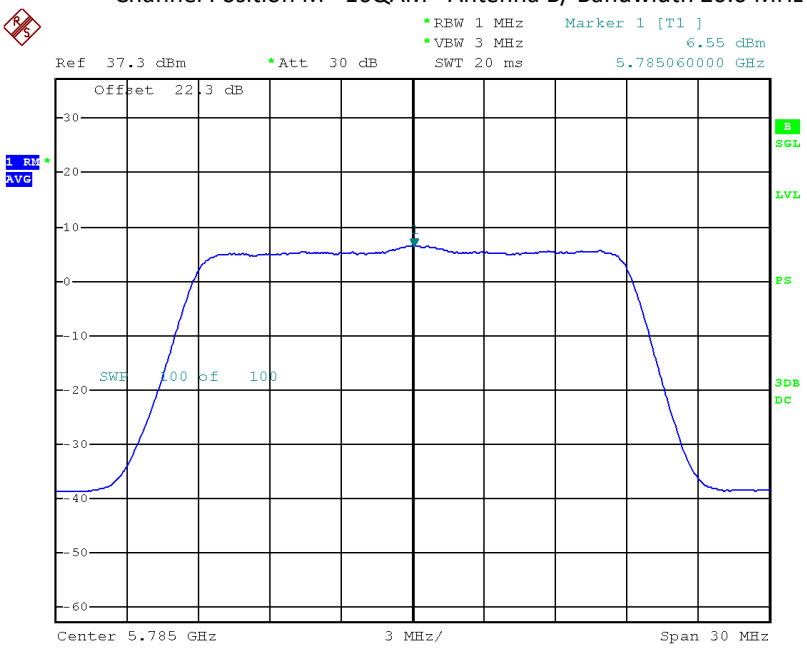
Date: 30.OCT.2018 12:06:44

Channel Position M - 16QAM - Antenna A/ Bandwidth 20.0 MHz



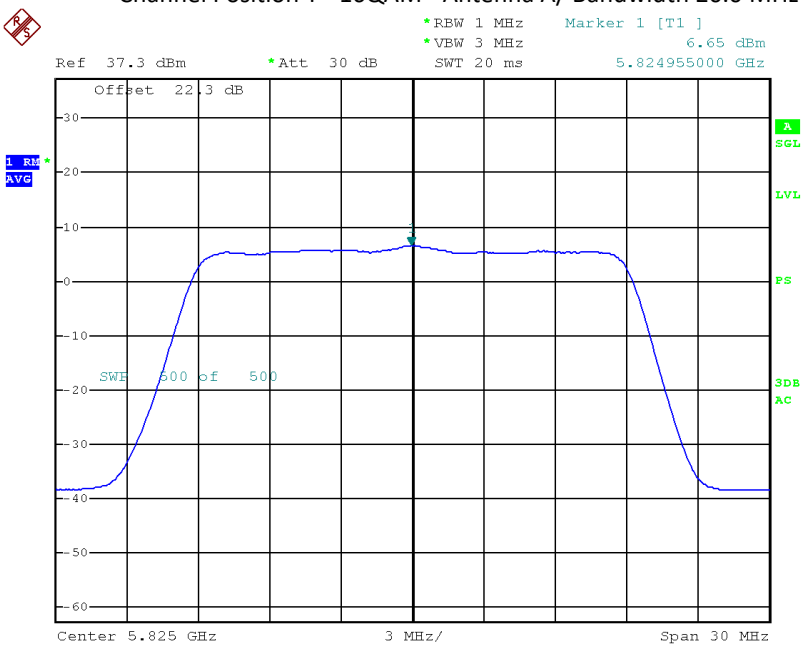
Date: 31.OCT.2018 12:01:45

Channel Position M - 16QAM - Antenna B/ Bandwidth 20.0 MHz



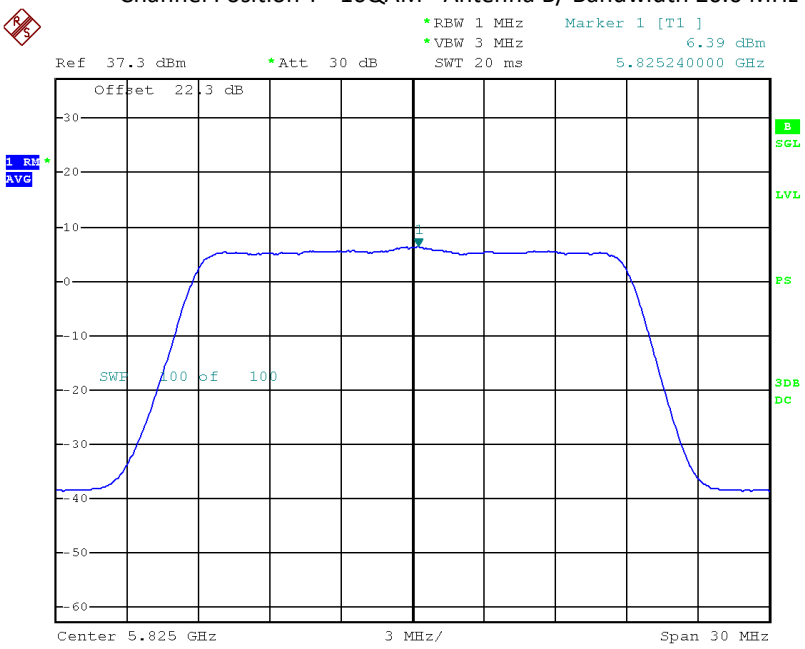
Date: 30.OCT.2018 12:09:36

Channel Position T - 16QAM - Antenna A/ Bandwidth 20.0 MHz



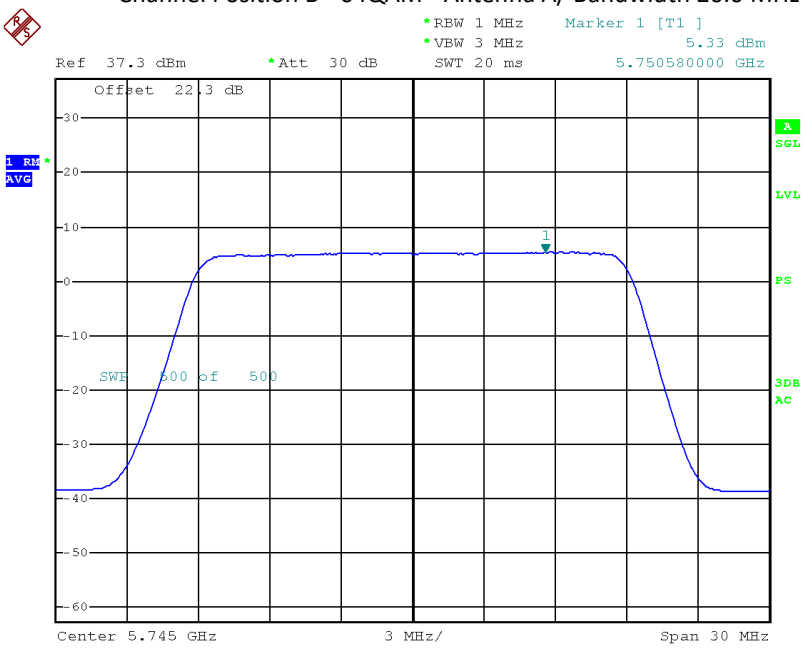
Date: 31.OCT.2018 12:09:17

Channel Position T - 16QAM - Antenna B/ Bandwidth 20.0 MHz



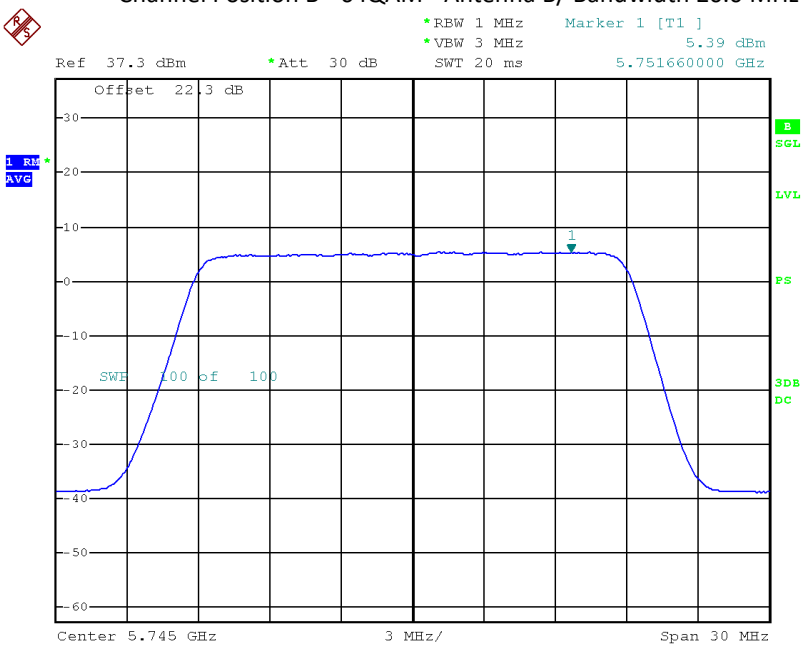
Date: 30.OCT.2018 12:15:52

Channel Position B - 64QAM - Antenna A/ Bandwidth 20.0 MHz



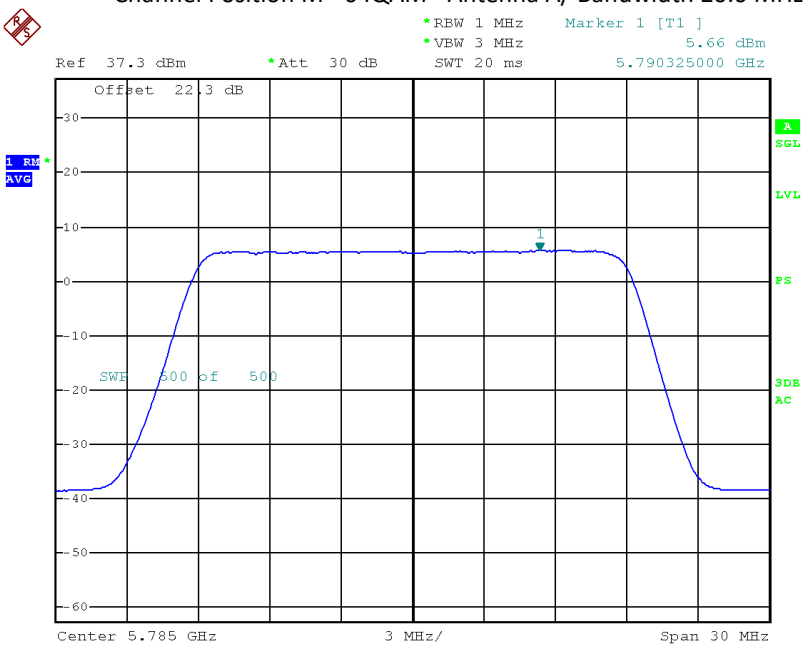
Date: 31.OCT.2018 11:55:53

Channel Position B - 64QAM - Antenna B/ Bandwidth 20.0 MHz



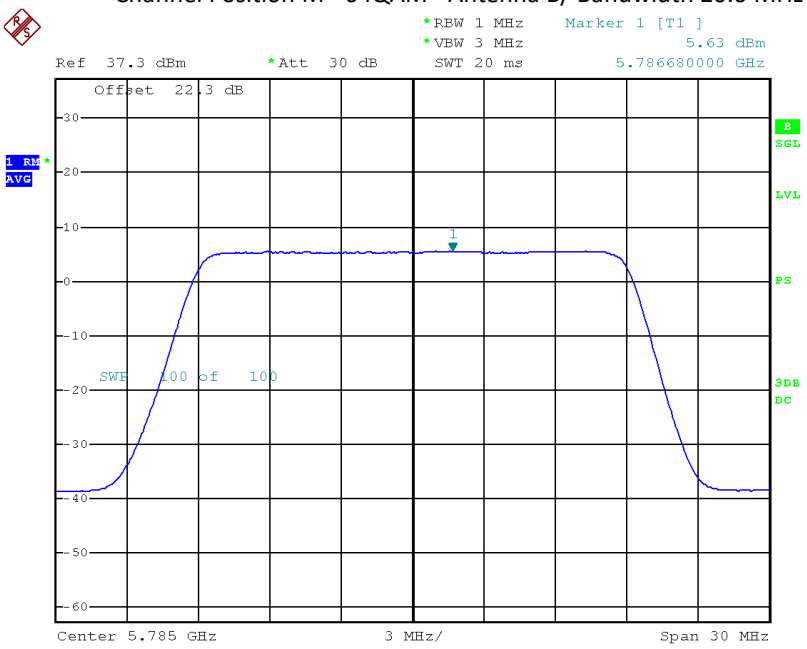
Date: 30.OCT.2018 12:07:20

Channel Position M - 64QAM - Antenna A/ Bandwidth 20.0 MHz



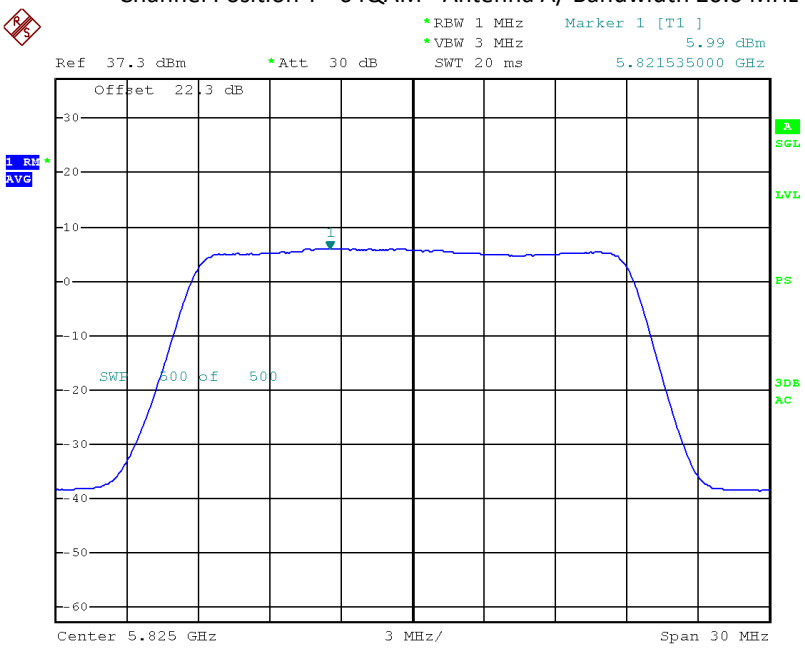
Date: 31.OCT.2018 12:03:44

Channel Position M - 64QAM - Antenna B/ Bandwidth 20.0 MHz



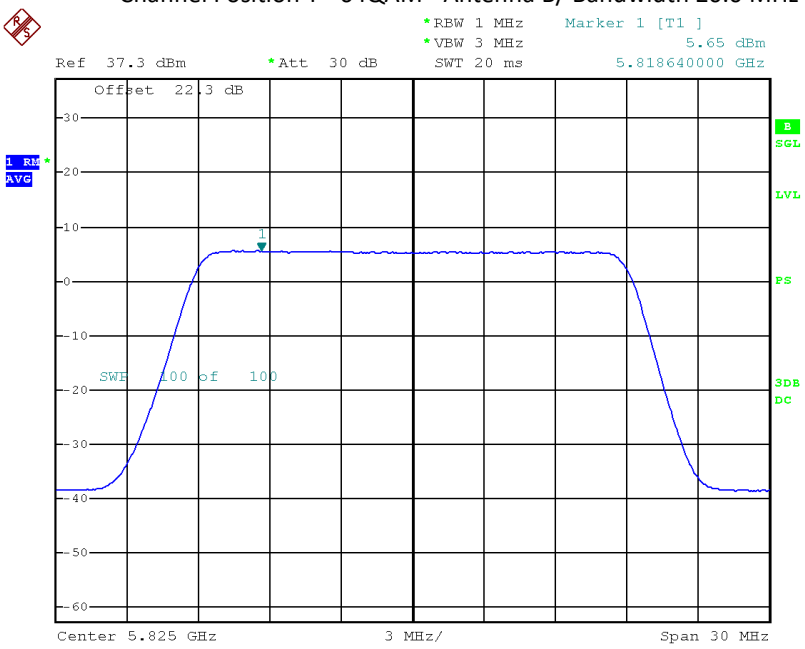
Date: 30.OCT.2018 12:10:27

Channel Position T - 64QAM - Antenna A/ Bandwidth 20.0 MHz



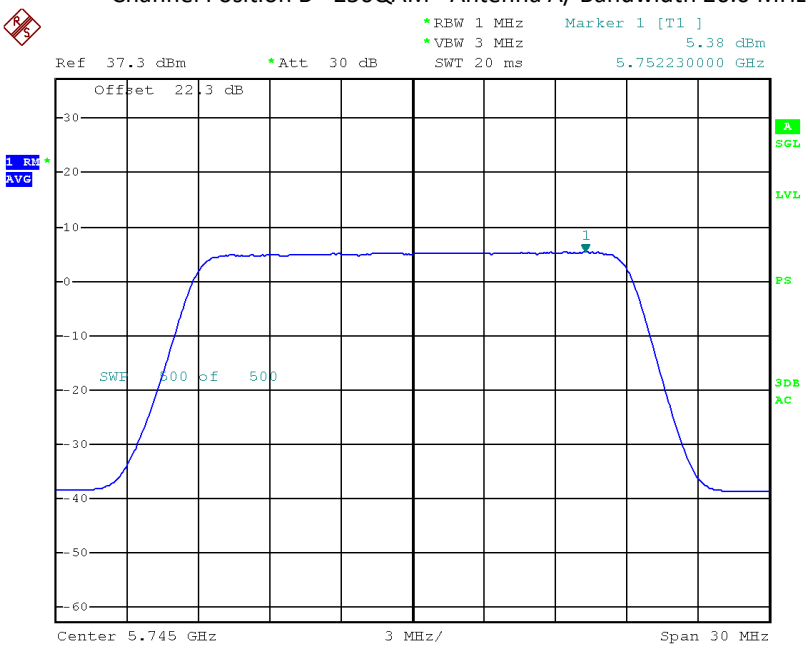
Date: 31.OCT.2018 12:10:27

Channel Position T - 64QAM - Antenna B/ Bandwidth 20.0 MHz



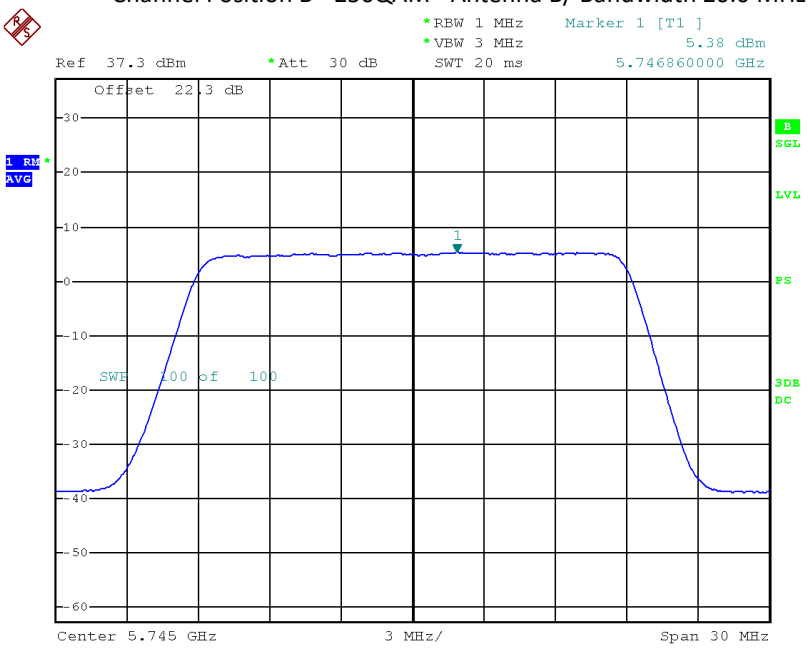
Date: 30.OCT.2018 12:13:55

Channel Position B - 256QAM - Antenna A/ Bandwidth 20.0 MHz



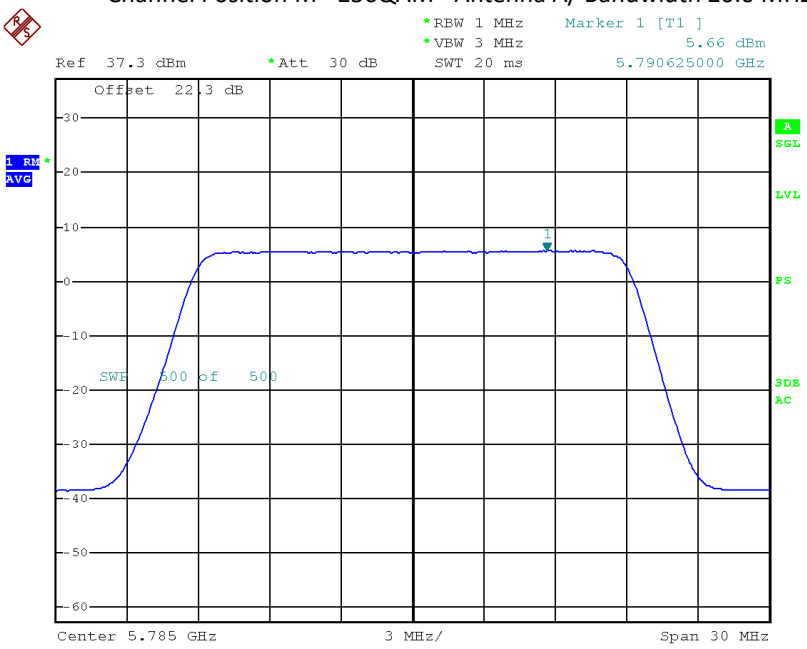
Date: 31.OCT.2018 11:56:53

Channel Position B - 256QAM - Antenna B/ Bandwidth 20.0 MHz



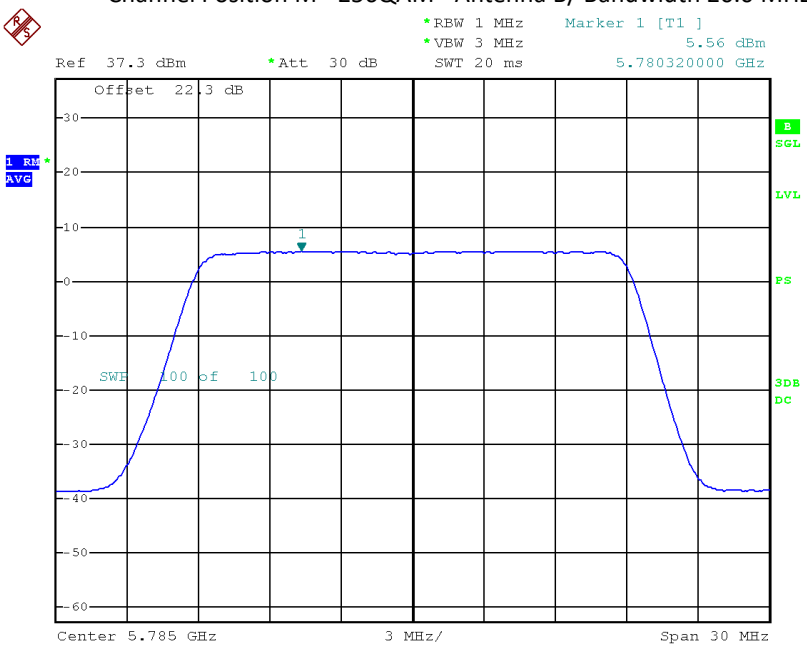
Date: 30.OCT.2018 12:07:49

Channel Position M - 256QAM - Antenna A/ Bandwidth 20.0 MHz



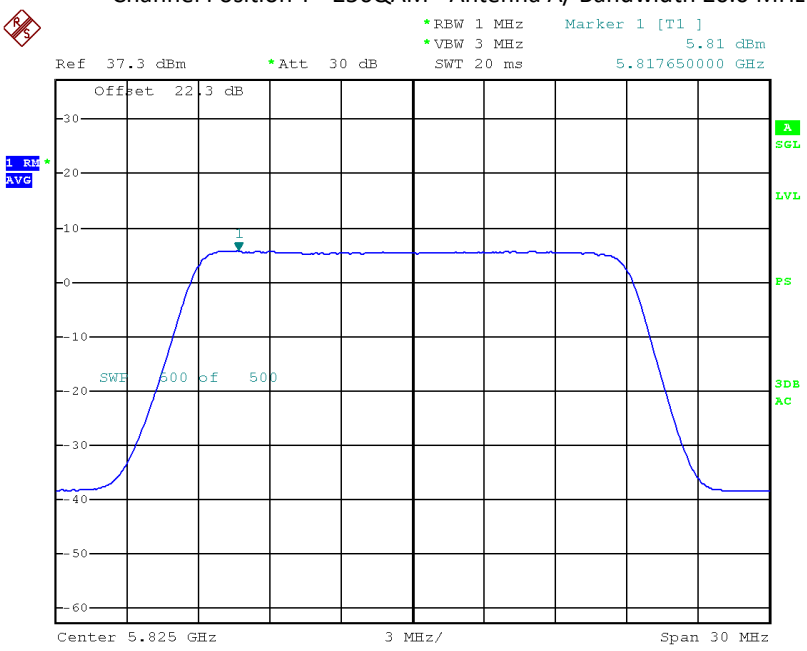
Date: 31.OCT.2018 12:05:19

Channel Position M - 256QAM - Antenna B/ Bandwidth 20.0 MHz



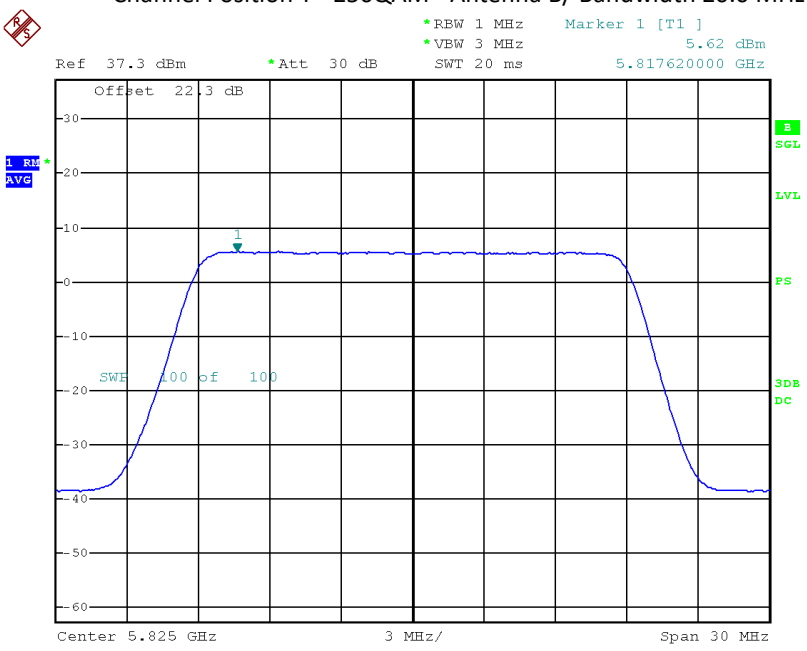
Date: 30.OCT.2018 12:11:38

Channel Position T - 256QAM - Antenna A/ Bandwidth 20.0 MHz



Date: 31.OCT.2018 12:11:47

Channel Position T - 256QAM - Antenna B/ Bandwidth 20.0 MHz



Date: 30.OCT.2018 12:14:31

Configuration B1:

L-MIMO-SC

Maximum Output Power 6dBm per port:

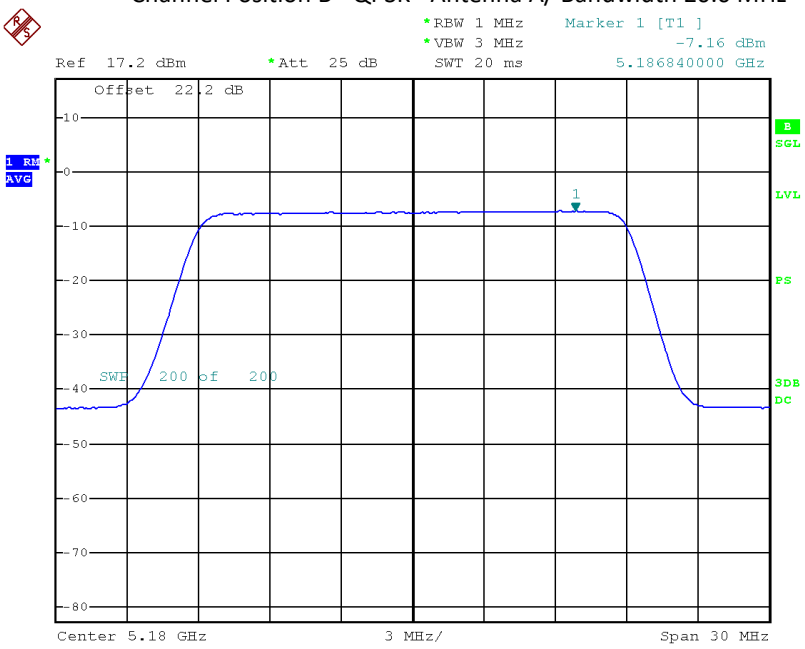
Antenna	Modulation / Carrier bandwidth (MHz)	Power Spectrum Density (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	QPSK / 20.0 MHz	-5.48	-5.50	-5.36
B		-5.54	-5.47	-5.21
Total EIRP PSD		8.50	8.53	8.73

Antenna	Modulation / Carrier bandwidth (MHz)	Power Spectrum Density (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	16QAM / 20.0 MHz	-4.54	-4.99	-4.87
B		-4.67	-4.53	-4.65
Total EIRP PSD		9.41	9.26	9.25

Antenna	Modulation / Carrier bandwidth (MHz)	Power Spectrum Density (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	64QAM / 20.0 MHz	-5.38	-5.32	-5.35
B		-5.59	-5.50	-4.98
Total EIRP PSD		8.53	8.60	8.85

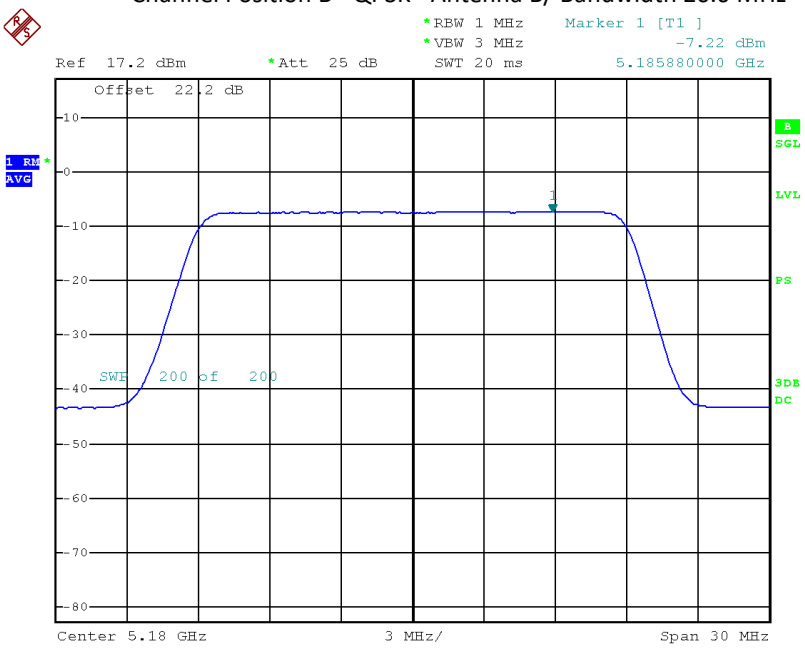
Antenna	Modulation / Carrier bandwidth (MHz)	Power Spectrum Density (dBm)		
		Channel Position B 5180MHz	Channel Position M 5220MHz	Channel Position T 5240MHz
A	256QAM / 20.0 MHz	-5.36	-5.41	-5.26
B		-5.55	-5.41	-5.33
Total EIRP PSD		8.56	8.60	8.72

Channel Position B - QPSK - Antenna A/ Bandwidth 20.0 MHz



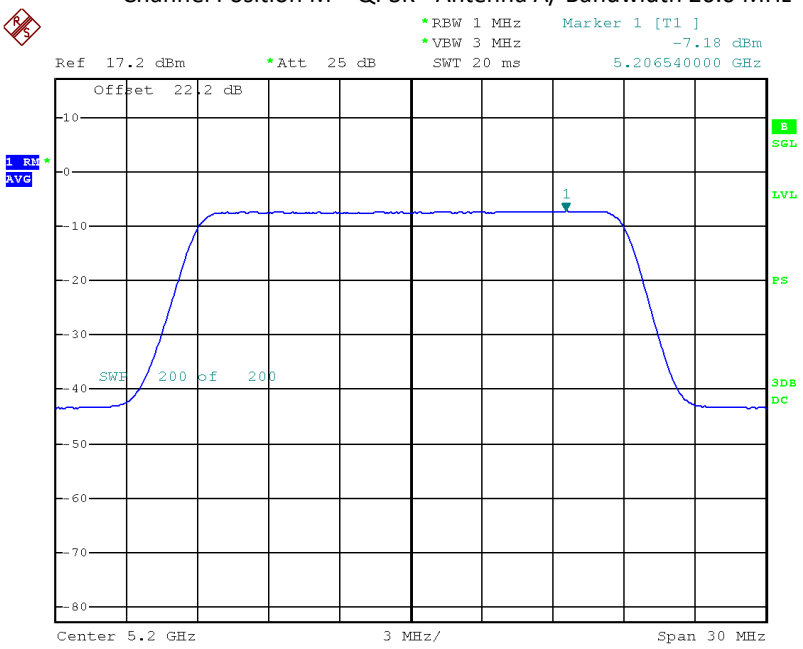
Date: 30.OCT.2018 10:45:08

Channel Position B - QPSK - Antenna B/ Bandwidth 20.0 MHz



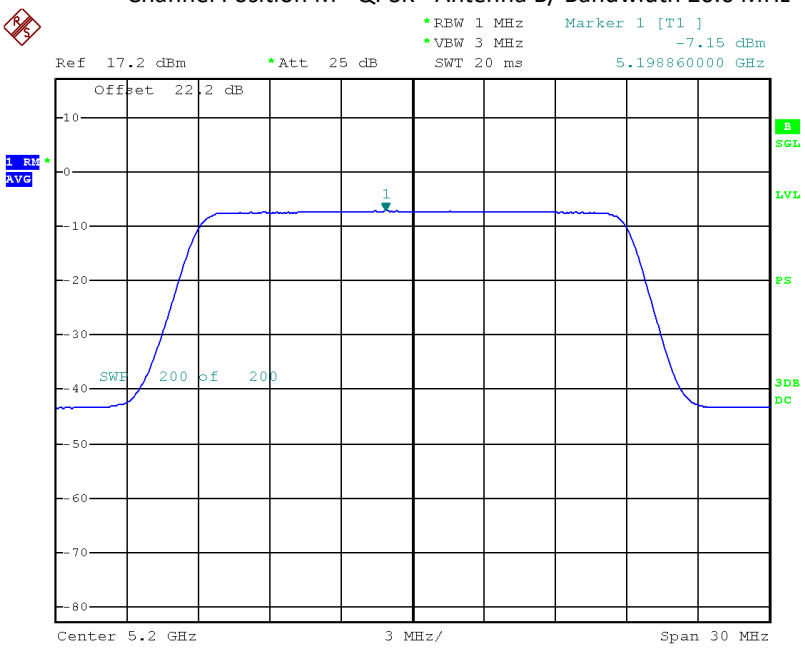
Date: 30.OCT.2018 11:50:35

Channel Position M – QPSK - Antenna A/ Bandwidth 20.0 MHz



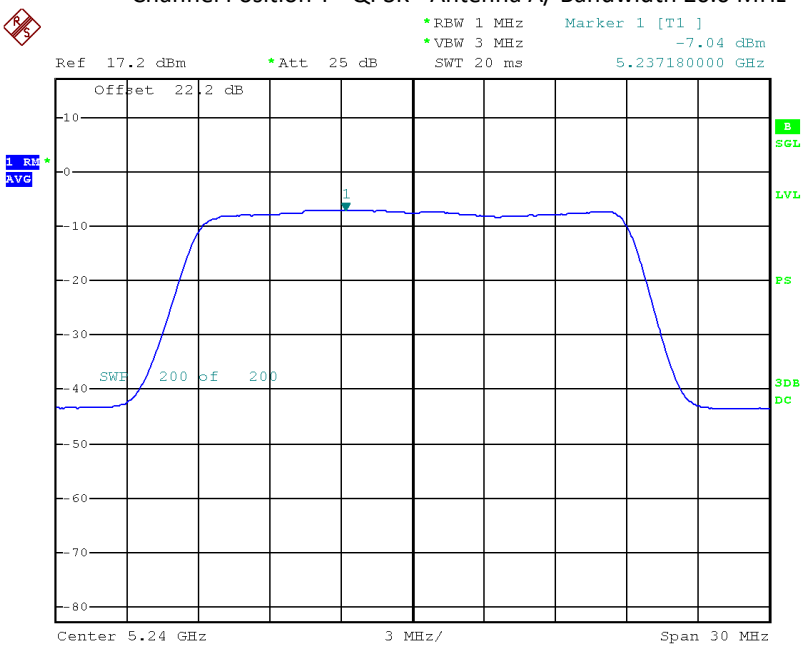
Date: 30.OCT.2018 10:52:59

Channel Position M - QPSK - Antenna B/ Bandwidth 20.0 MHz



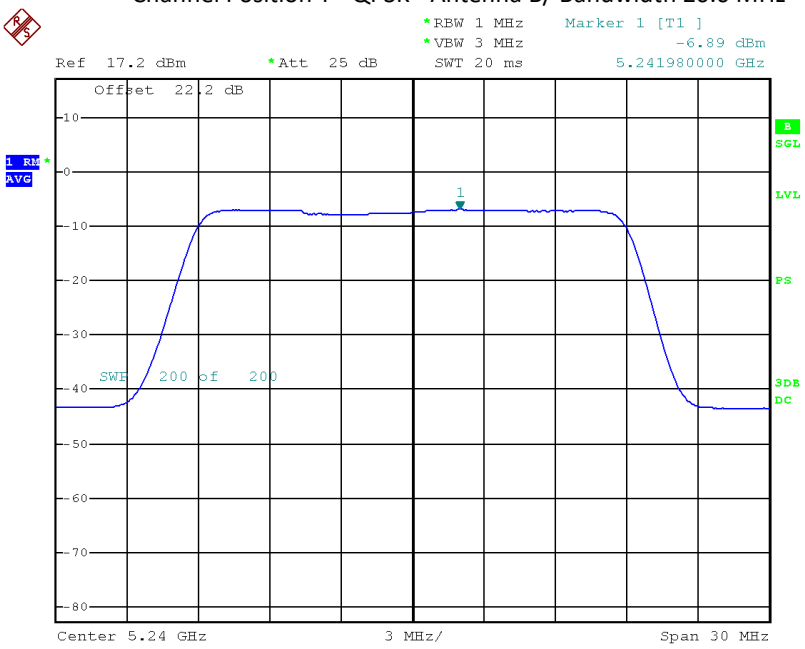
Date: 30.OCT.2018 11:54:25

Channel Position T - QPSK - Antenna A/ Bandwidth 20.0 MHz



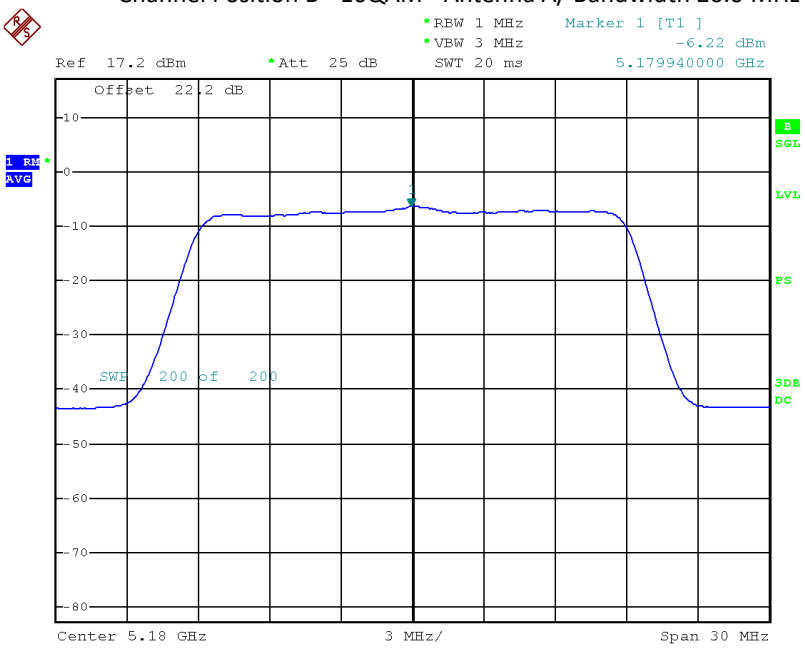
Date: 30.OCT.2018 10:59:24

Channel Position T - QPSK - Antenna B/ Bandwidth 20.0 MHz



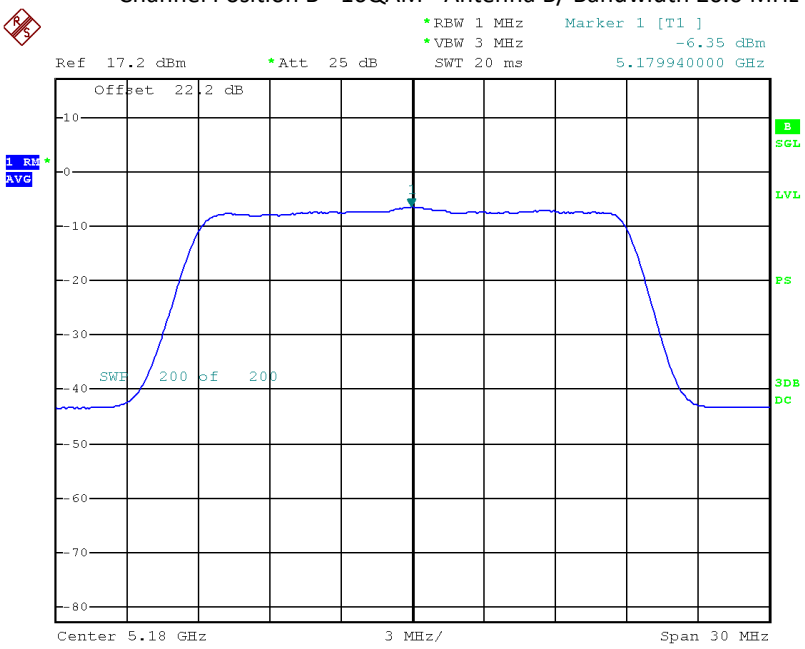
Date: 30.OCT.2018 11:58:09

Channel Position B - 16QAM - Antenna A/ Bandwidth 20.0 MHz



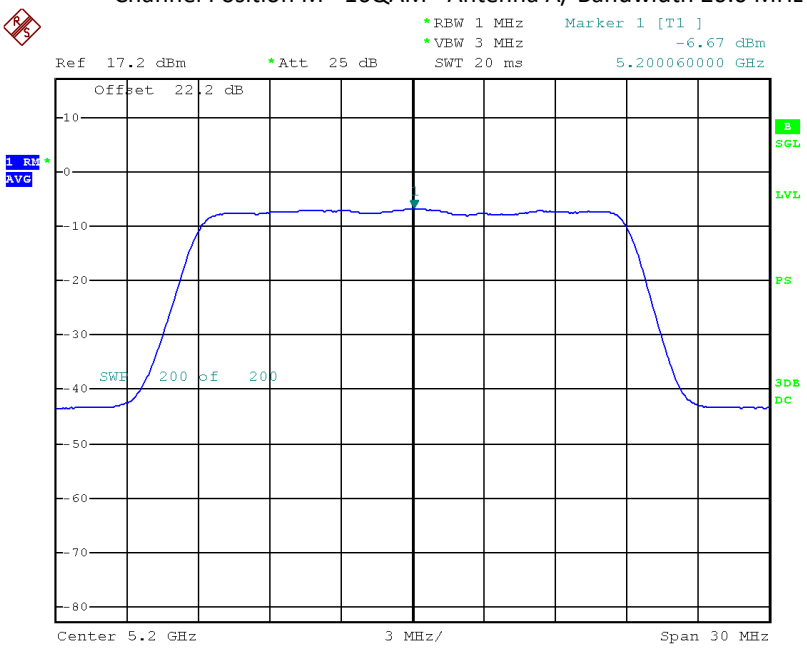
Date: 30.OCT.2018 10:50:16

Channel Position B - 16QAM - Antenna B/ Bandwidth 20.0 MHz



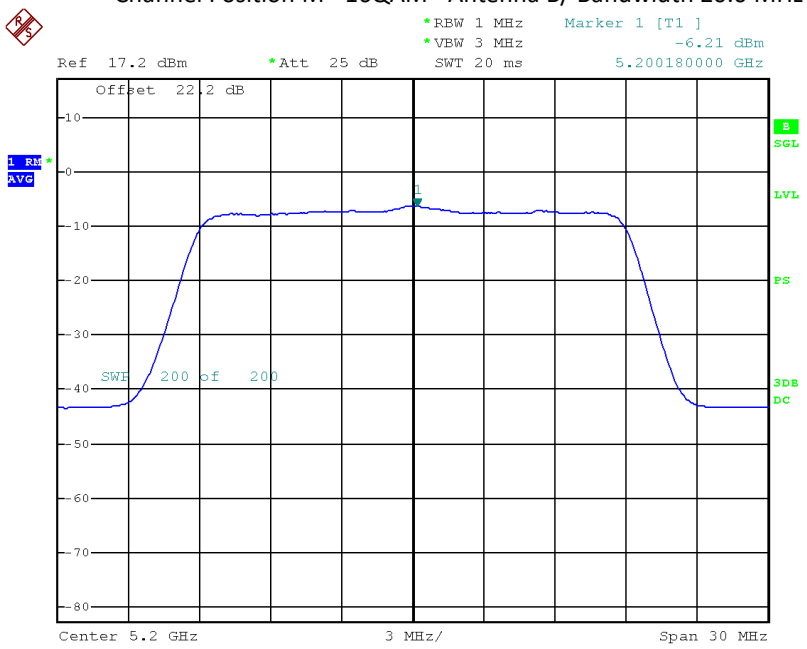
Date: 30.OCT.2018 11:49:58

Channel Position M - 16QAM - Antenna A/ Bandwidth 20.0 MHz



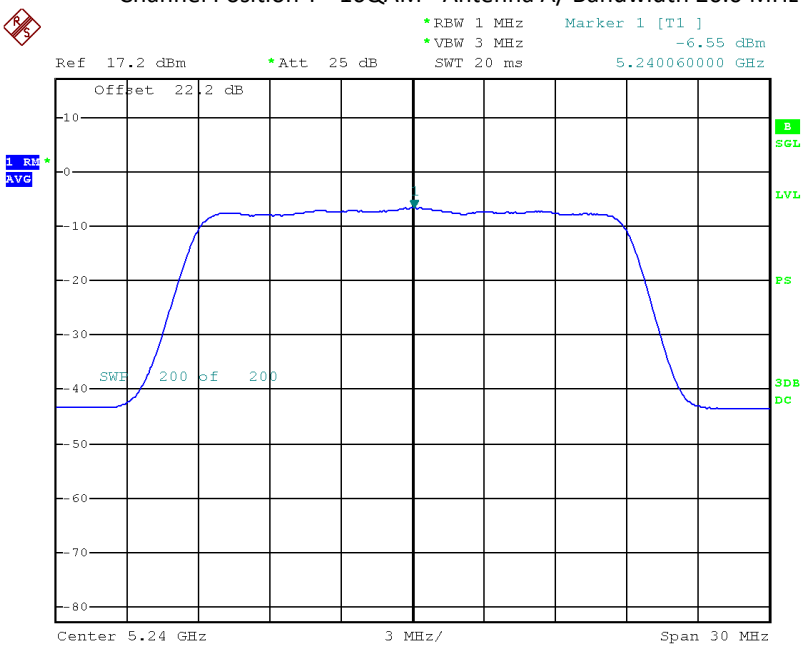
Date: 30.OCT.2018 10:53:43

Channel Position M - 16QAM - Antenna B/ Bandwidth 20.0 MHz



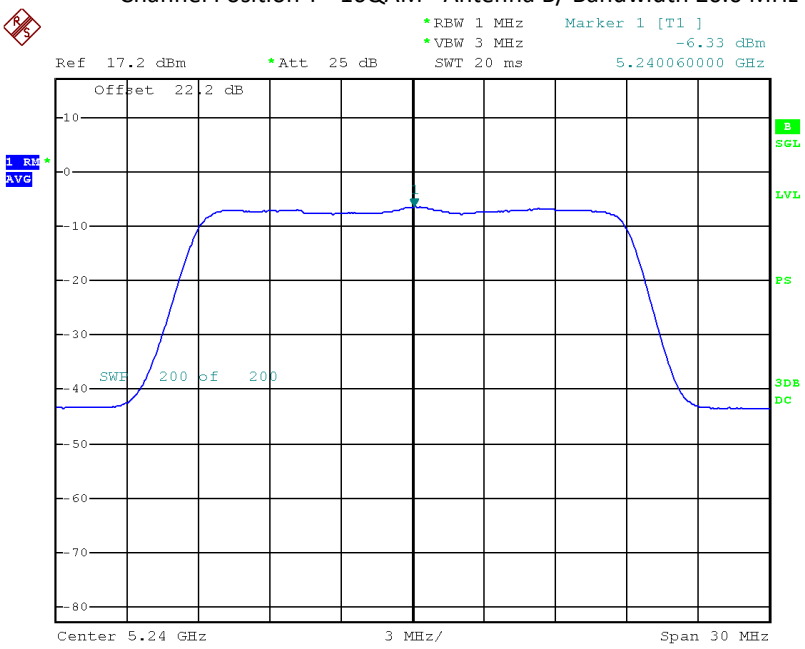
Date: 30.OCT.2018 11:54:58

Channel Position T - 16QAM - Antenna A/ Bandwidth 20.0 MHz



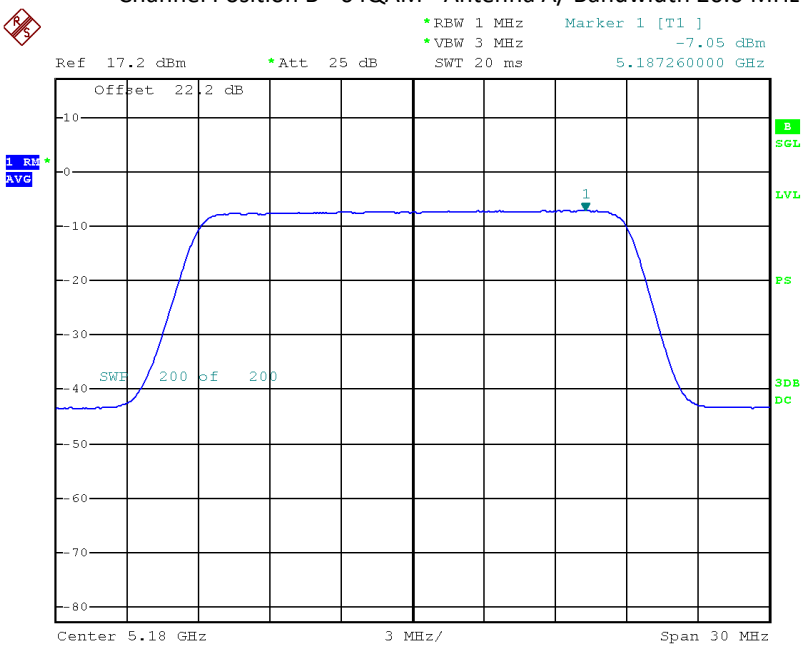
Date: 30.OCT.2018 11:00:18

Channel Position T - 16QAM - Antenna B/ Bandwidth 20.0 MHz



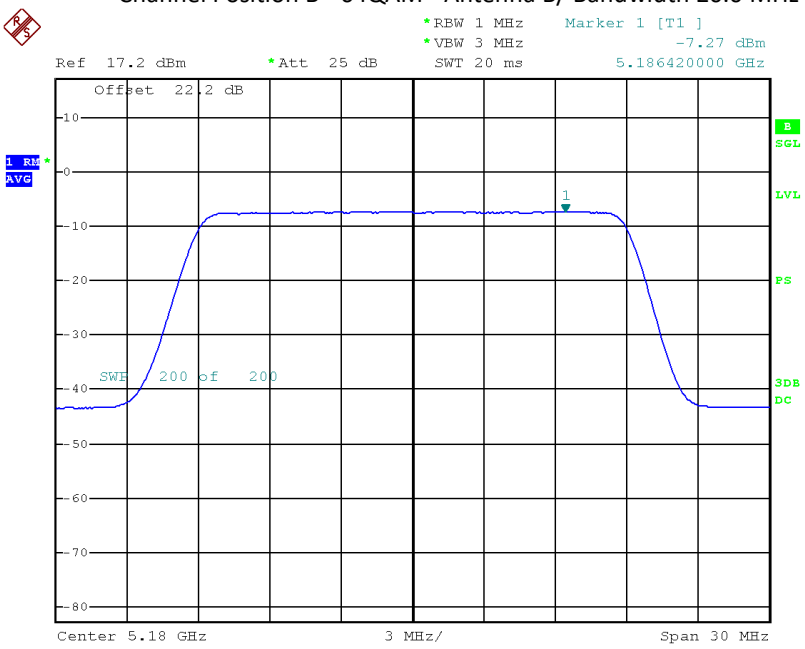
Date: 30.OCT.2018 11:59:04

Channel Position B - 64QAM - Antenna A/ Bandwidth 20.0 MHz



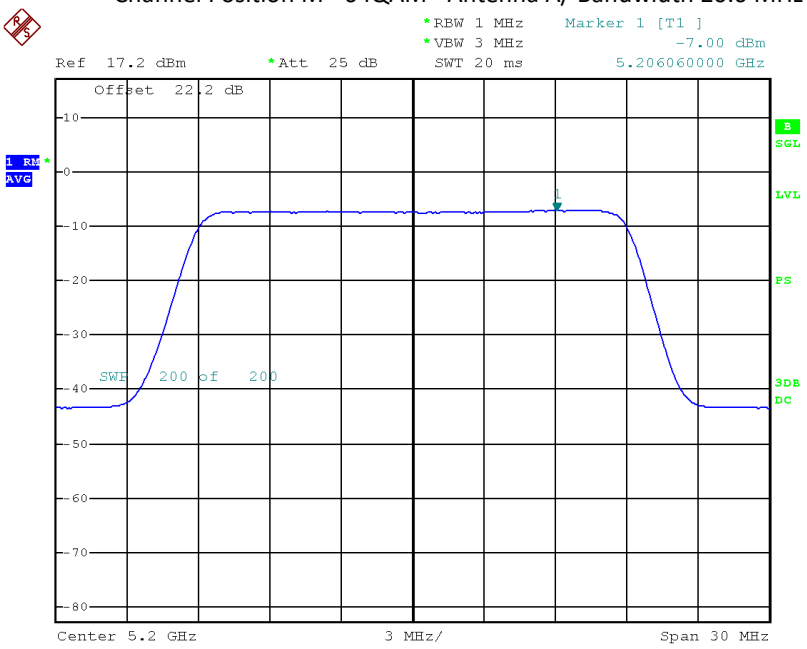
Date: 30.OCT.2018 10:48:43

Channel Position B - 64QAM - Antenna B/ Bandwidth 20.0 MHz



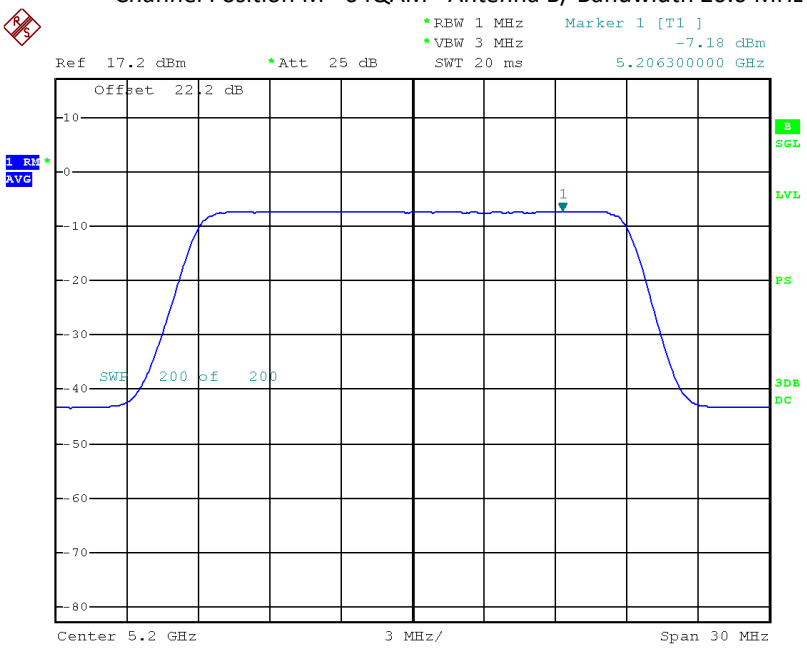
Date: 30.OCT.2018 11:51:40

Channel Position M - 64QAM - Antenna A/ Bandwidth 20.0 MHz



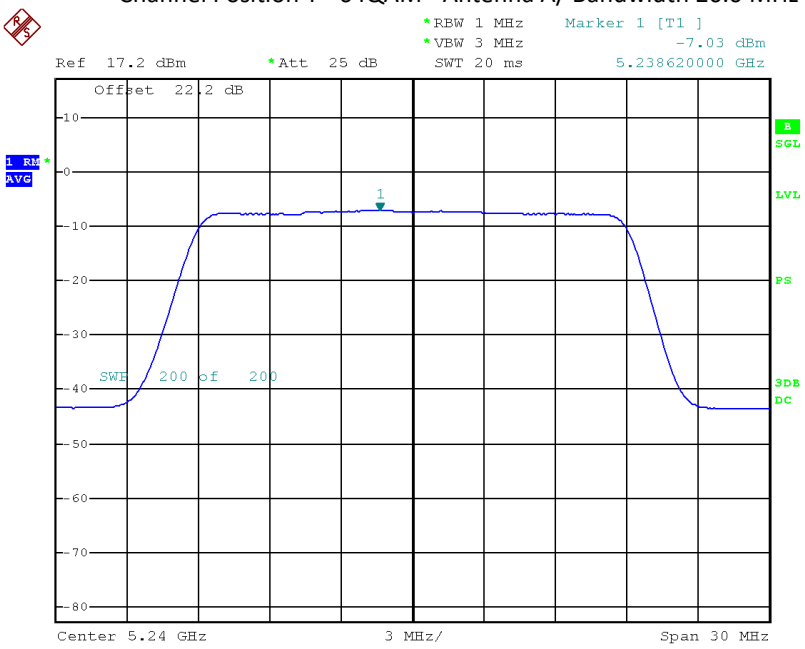
Date: 30.OCT.2018 10:55:27

Channel Position M - 64QAM - Antenna B/ Bandwidth 20.0 MHz



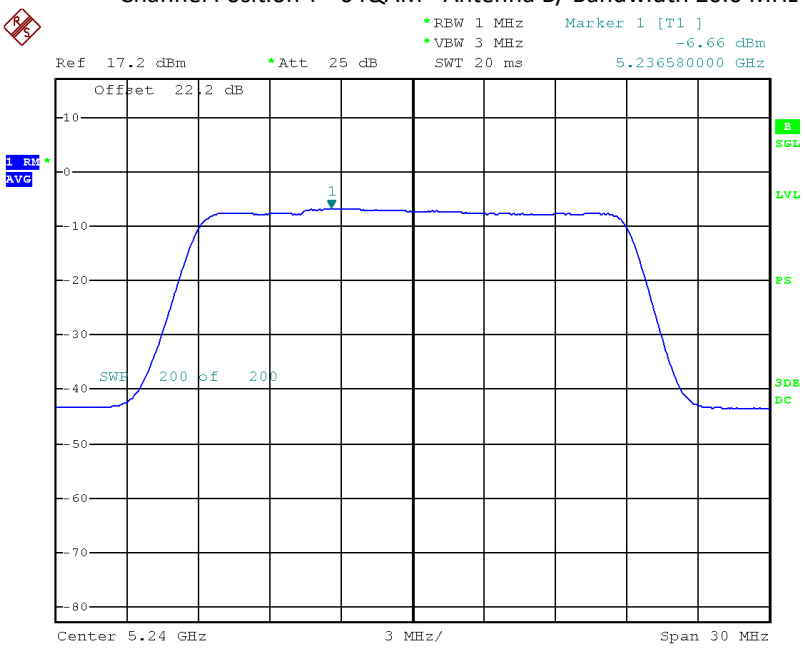
Date: 30.OCT.2018 11:55:28

Channel Position T - 64QAM - Antenna A/ Bandwidth 20.0 MHz



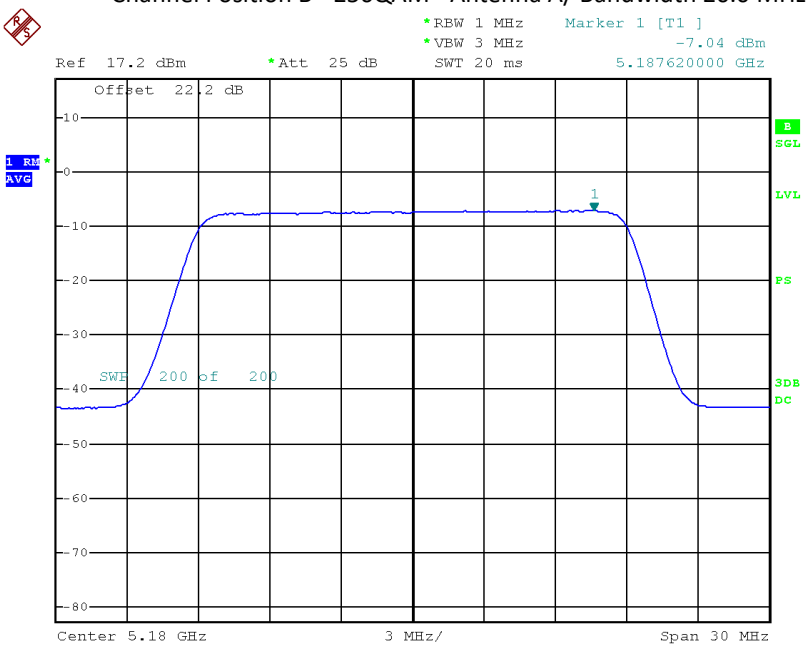
Date: 30.OCT.2018 11:01:45

Channel Position T - 64QAM - Antenna B/ Bandwidth 20.0 MHz



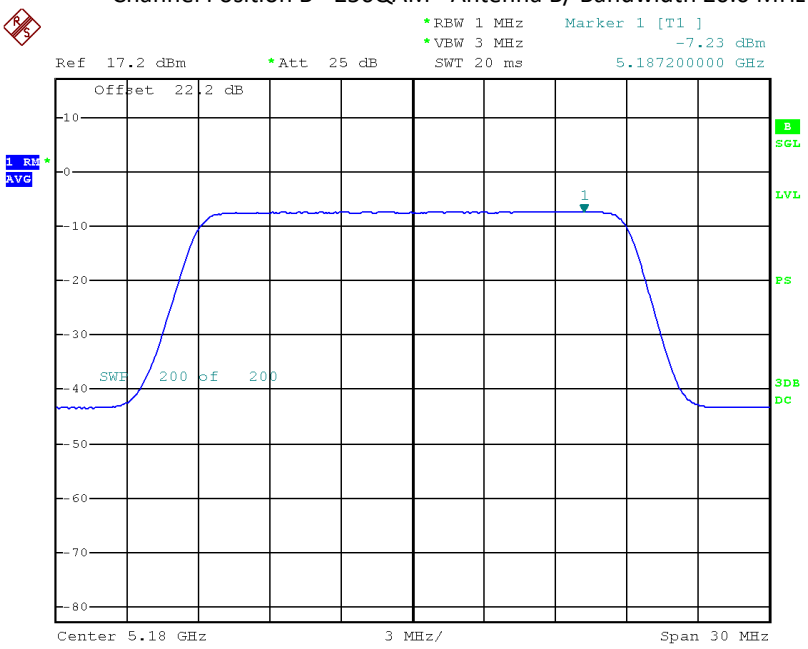
Date: 30.OCT.2018 12:00:04

Channel Position B - 256QAM - Antenna A/ Bandwidth 20.0 MHz



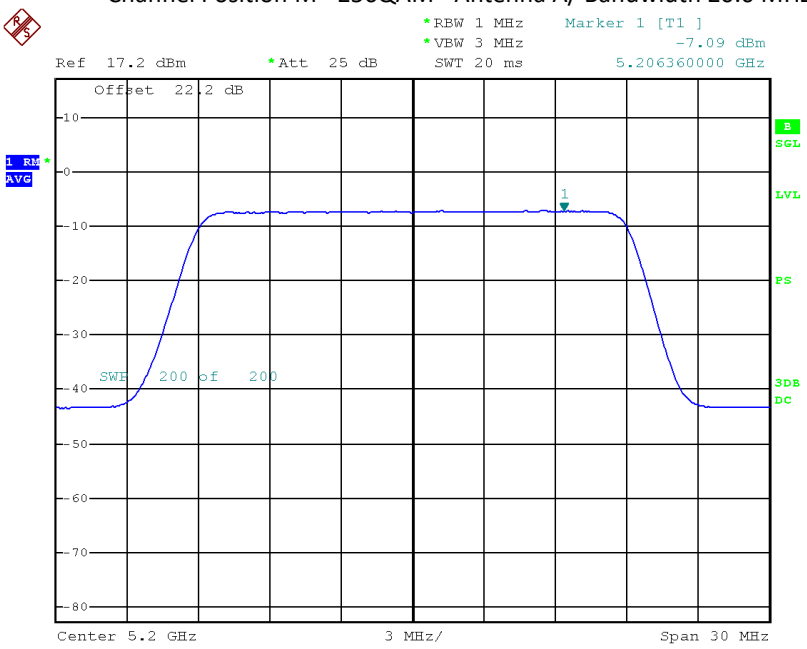
Date: 30.OCT.2018 10:51:38

Channel Position B - 256QAM - Antenna B/ Bandwidth 20.0 MHz



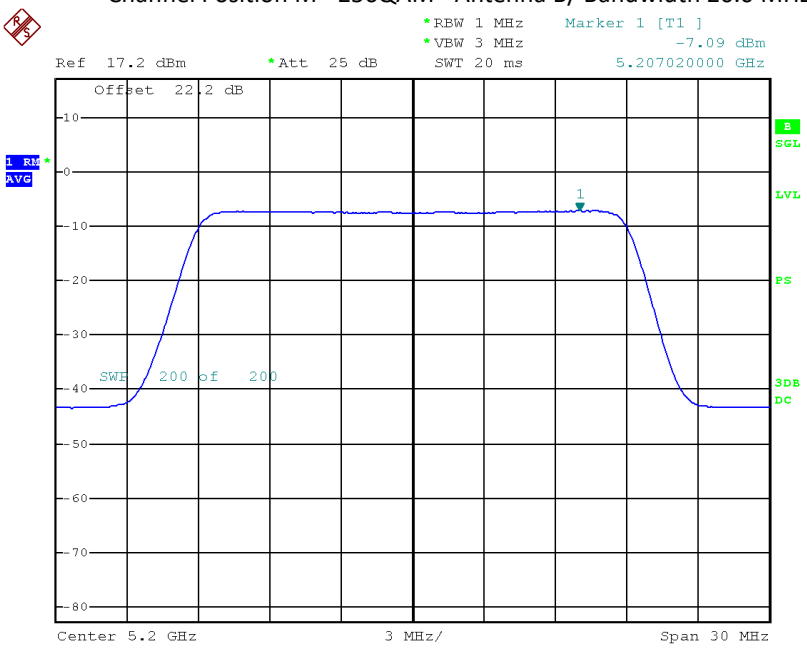
Date: 30.OCT.2018 11:52:22

Channel Position M - 256QAM - Antenna A/ Bandwidth 20.0 MHz



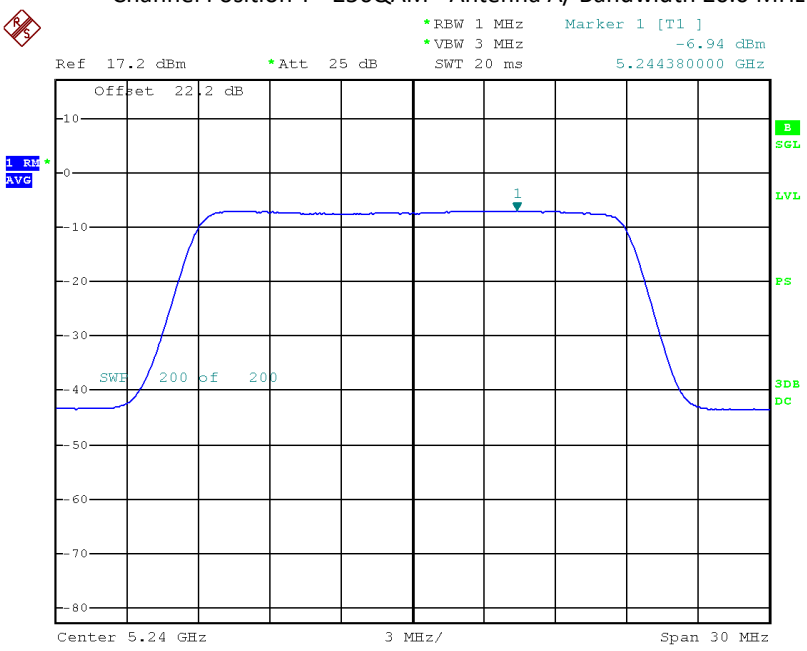
Date: 30.OCT.2018 10:57:54

Channel Position M - 256QAM - Antenna B/ Bandwidth 20.0 MHz



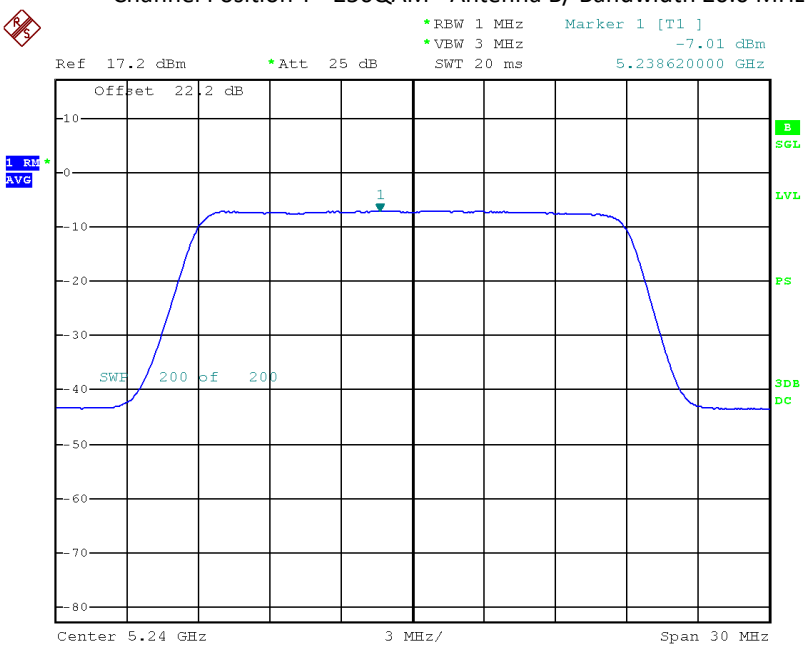
Date: 30.OCT.2018 11:55:56

Channel Position T - 256QAM - Antenna A/ Bandwidth 20.0 MHz



Date: 30.OCT.2018 11:02:44

Channel Position T - 256QAM - Antenna B/ Bandwidth 20.0 MHz



Date: 30.OCT.2018 12:00:46

5 Undesirable Emission at Band Edge

Test result: **Pass**

5.1 Limit

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 e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.725 - 5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

5.2 Test Method

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15, Clause 15.407(b) and Clause 15.209, and RSS-247 Clause 6.

In accordance with FCC CFR 47 Part 15, Clause 15.407 (b), and RSS-247 Clause 6, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(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 e.i.r.p. of -27 dBm/MHz.

(2) For transmitters operating in the 5.725 - 5.85 GHz band:
All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(3) The provisions of § 15.205 apply to intentional radiators operating under this section.

(4) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

For 5150 MHz in the restricted band, use the following formula as per Section G (1) of 789033 D02 General UNII Test Procedures v01r04:

E (dBµV/m) = E.I.R.P. (dBm) + 95.2, and the results should comply with peak limit 74 dBµV/m and average limit 54 dBµV/m at 3 meters in accordance with FCC CFR 47 Part 15, Clause 15.209.

For MIMO mode configurations, the limit was adjusted with a correction of -3.01dB [10Log2] by using the Measure and Add 10Log(N) dB technique according to FCC KDB 662911 D01 Multiple Transmitter Output v02r01 accounting for simultaneous transmission from antenna ports RF A and RF B.

The measurements were performed on the output connector RF A. Limited complementary measurement were done at output connector RF B to verify identical performance for both transmitter chains in MIMO mode.

The maximum path loss across the measurement band was used as the reference level offset to ensure worst case.

The worst results are shown in the plots below.

The maximum path loss and duty cycle factor were entered as a reference level offset. The EUT was set to transmit at its maximum rated output power in the configurations described in the tables below. The measurements were made at the bottom and top of the band with all channel bandwidth.

5.3 Test Results

Configuration A1:

L-MIMO-SC

Maximum Output Power 18dBm per port:

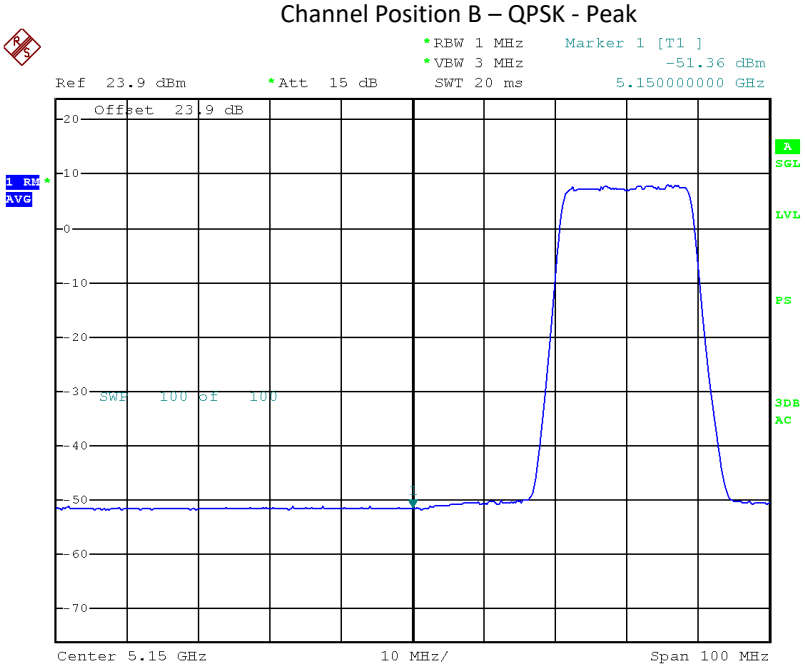
Channel Position	Bandwidth (MHz)	Channel Frequency	RBW (MHz)	EIRP Limit (dBm/MHz)
B	20.0 MHz	5180MHz	1	-30.01
T	20.0 MHz	5240MHz	1	-30.01

Note 1: The channels shown in the table above are the minimum and maximum channels that can be used in the authorized frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be available to the end user.

Note 2: 5150 MHz in the restricted band, use the following formula as per Section G (1) of 789033 D02 General UNII Test Procedures v01r04:
E (dBµV/m) = EIRP (dBm) + 95.2 = (measured level dBm + 12 dBi antenna gain) + 95.2 for FCC.
E (dBµV/m) = EIRP (dBm) + 95.2 = (measured level dBm + 11 dBi antenna gain) + 95.2 for IC.

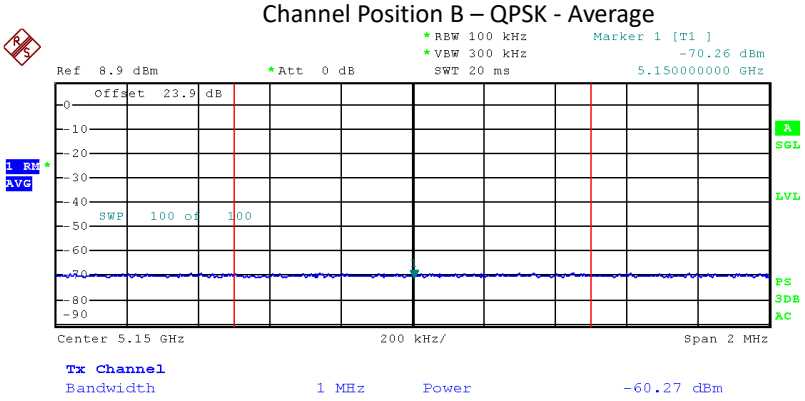
Note 3: For MIMO mode configurations, the limit was adjusted with a correction of -3.01dB [10Log(2)] to limits -27 dBm/MHz (Clause 15.407), and peak limits 74 dBµV/m and average limit 54 dBµV/m (Clause 15.209).

Channel Position B – QPSK - Peak



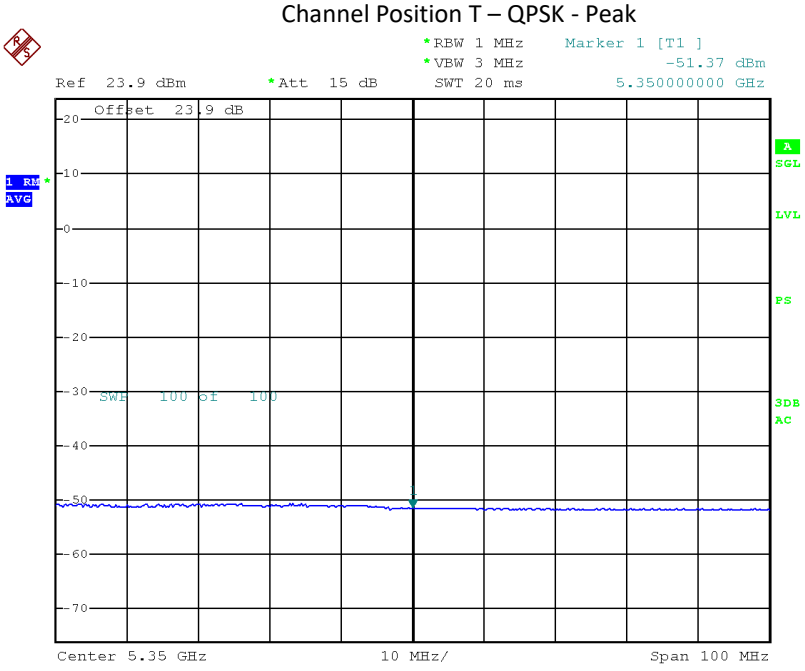
Date: 31.OCT.2018 09:00:10

Channel Position B – QPSK - Average



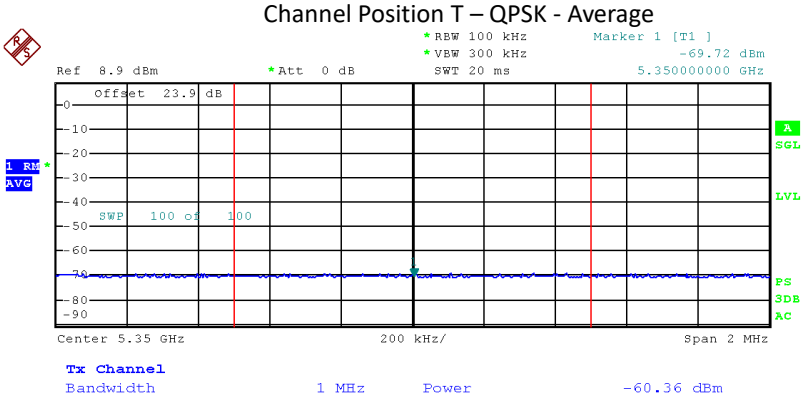
Date: 31.OCT.2018 09:01:32

Channel Position T – QPSK - Peak



Date: 31.OCT.2018 09:26:16

Channel Position T – QPSK - Average



Date: 31.OCT.2018 09:27:32

L-MIMO-MC 1 (2C)

Maximum Output Power 18dBm per port:

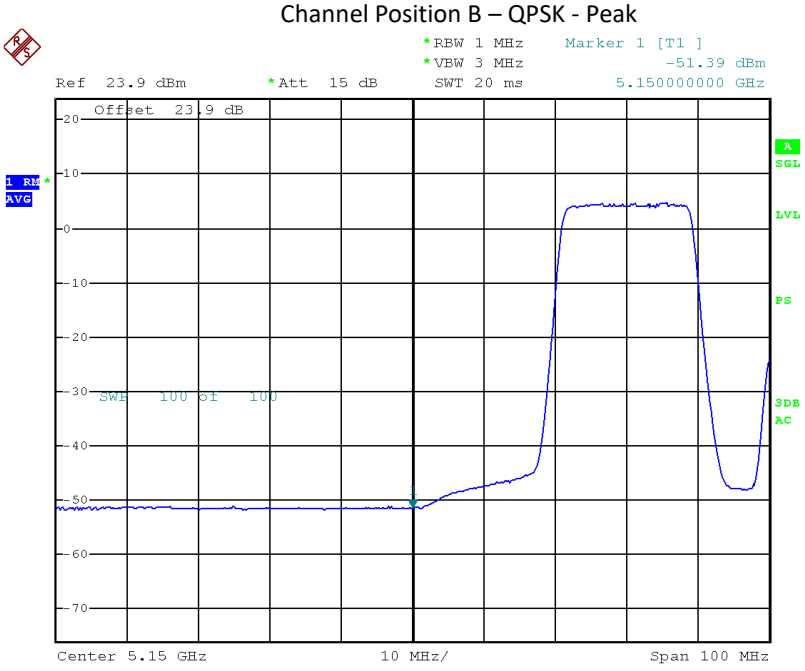
Channel Position	Bandwidth (MHz)	Channel Frequency	RBW (MHz)	EIRP Limit (dBm/MHz)
B	20.0 MHz	5180MHz + 5220MHz	1	-30.01
T	20.0 MHz	5200MHz + 5240MHz	1	-30.01

Note 1: The channels shown in the table above are the minimum and maximum channels that can be used in the authorised frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be available to the end user.

Note 2: 5150 MHz in the restricted band, use the following formula as per Section G (1) of 789033 D02 General UNII Test Procedures v01r04:
E (dBµV/m) = EIRP (dBm) + 95.2 = (measured level dBm + 12 dBi antenna gain) + 95.2 for FCC.
E (dBµV/m) = EIRP (dBm) + 95.2 = (measured level dBm + 11 dBi antenna gain) + 95.2 for IC.

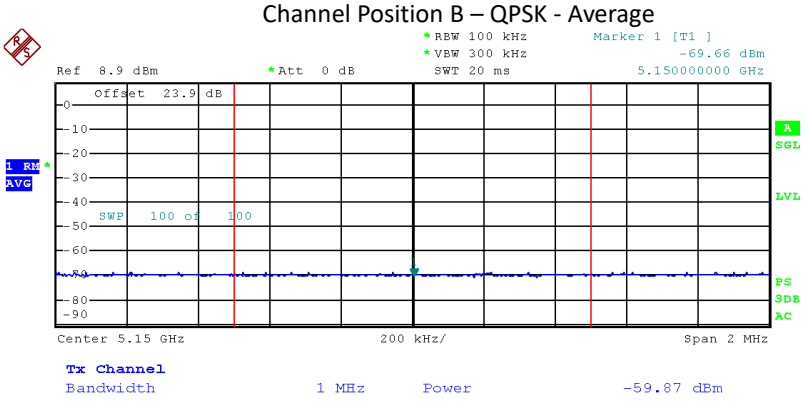
Note 3: For MIMO mode configurations, the limit was adjusted with a correction of -3.01dB [10Log(2)] to limits -27 dBm/MHz (Clause 15.407), and peak limits 74 dBµV/m and average limit 54 dBµV/m (Clause 15.209).

Channel Position B – QPSK - Peak



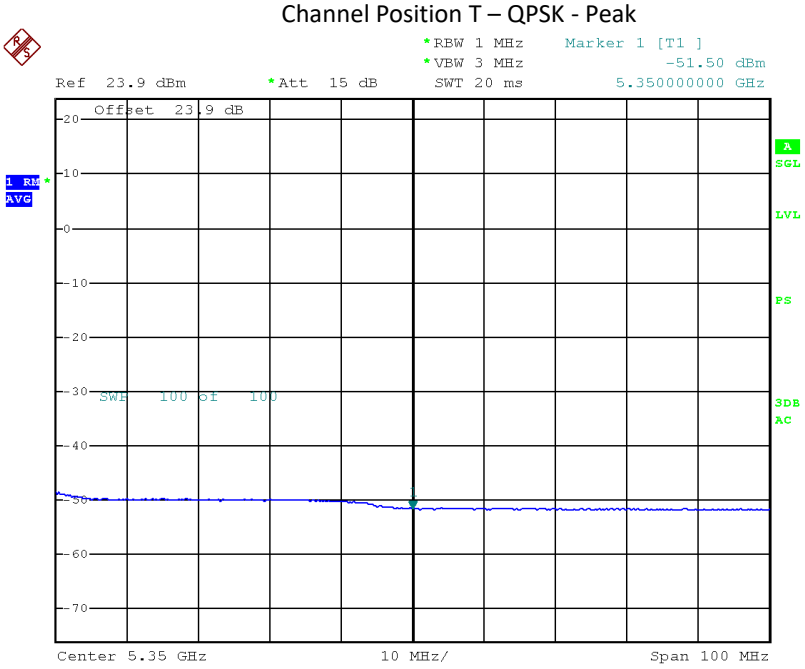
Date: 31.OCT.2018 09:06:53

Channel Position B – QPSK - Average



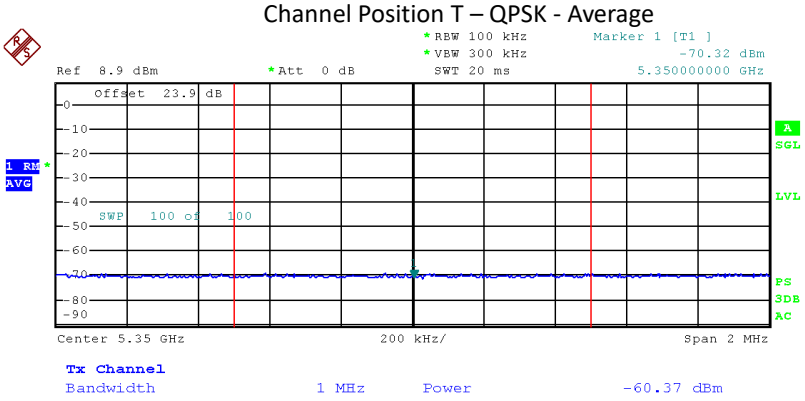
Date: 31.OCT.2018 09:07:46

Channel Position T – QPSK - Peak



Date: 31.OCT.2018 09:33:30

Channel Position T – QPSK - Average



Date: 31.OCT.2018 09:34:12

L-MIMO-MC 2 (3C)

Maximum Output Power 18dBm per port:

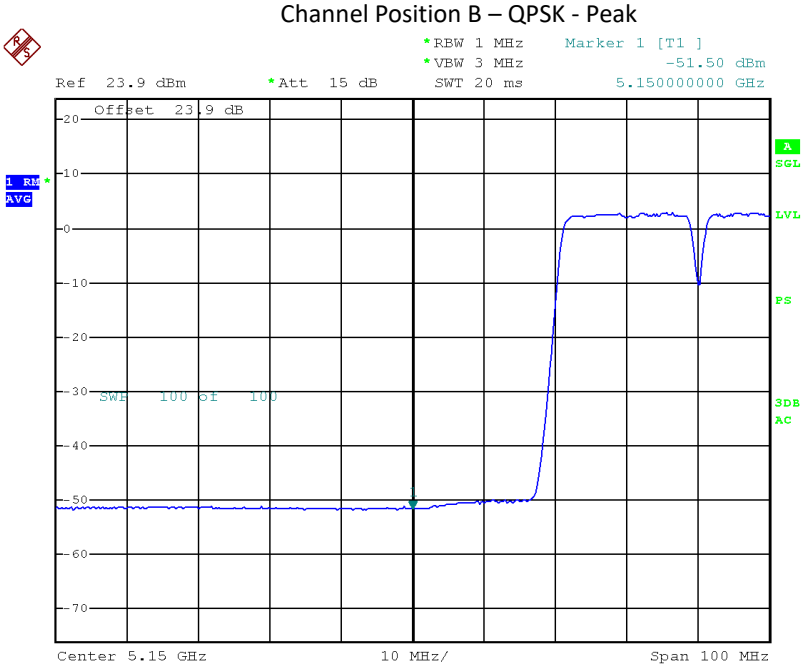
Channel Position	Bandwidth (MHz)	Channel Frequency	RBW (MHz)	EIRP Limit (dBm/MHz)
B	20.0 MHz	5180MHz + 5200MHz + 5220MHz	1	-30.01
T	20.0 MHz	5200MHz + 5220MHz + 5240MHz	1	-30.01

Note 1: The channels shown in the table above are the minimum and maximum channels that can be used in the authorized frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be available to the end user.

Note 2: 5150 MHz in the restricted band, use the following formula as per Section G (1) of 789033 D02 General UNII Test Procedures v01r04:
E (dBµV/m) = EIRP (dBm) + 95.2 = (measured level dBm + 12 dBi antenna gain) + 95.2 for FCC.
E (dBµV/m) = EIRP (dBm) + 95.2 = (measured level dBm + 11 dBi antenna gain) + 95.2 for IC.

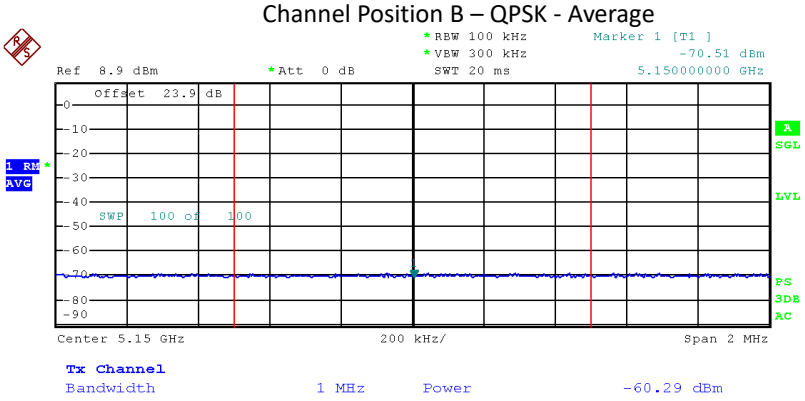
Note 3: For MIMO mode configurations, the limit was adjusted with a correction of -3.01dB [10Log(2)] to limits -27 dBm/MHz (Clause 15.407), and peak limits 74 dBµV/m and average limit 54 dBµV/m (Clause 15.209).

Channel Position B – QPSK - Peak



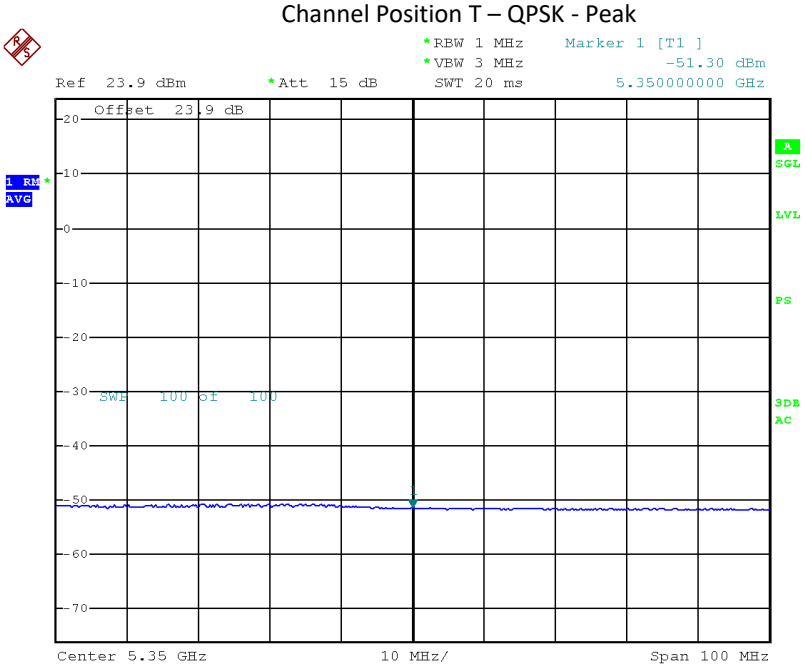
Date: 31.OCT.2018 09:16:33

Channel Position B – QPSK - Average



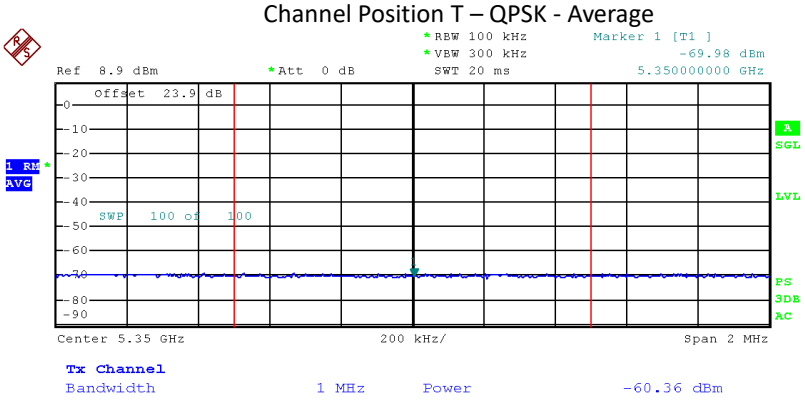
Date: 31.OCT.2018 09:17:00

Channel Position T – QPSK - Peak



Date: 31.OCT.2018 09:38:11

Channel Position T – QPSK - Average



Date: 31.OCT.2018 09:38:58

Configuration A2 and B2:

L-MIMO-SC

Maximum Output Power 19dBm per port:

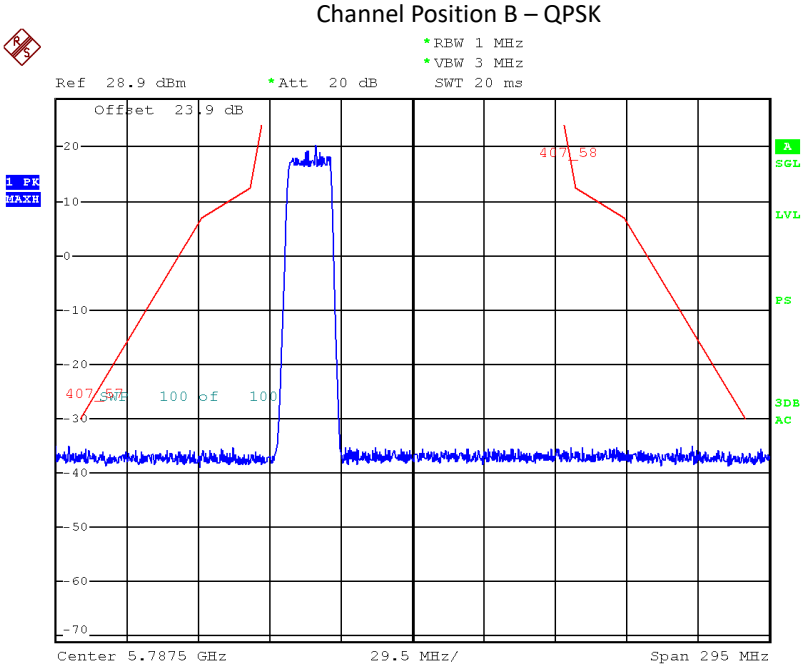
Channel Position	Bandwidth (MHz)	Channel Frequency	RBW (MHz)	EIRP Limit (dBm/MHz)
B	20.0 MHz	5745MHz	1	-30.01
T	20.0 MHz	5825MHz	1	-30.01

Note 1: The channels shown in the table above are the minimum and maximum channels that can be used in the authorized frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be available to the end user.

Note 2: For MIMO mode configurations, the limit was adjusted with a correction of -3.01dB [10Log(2)] to the following limit:

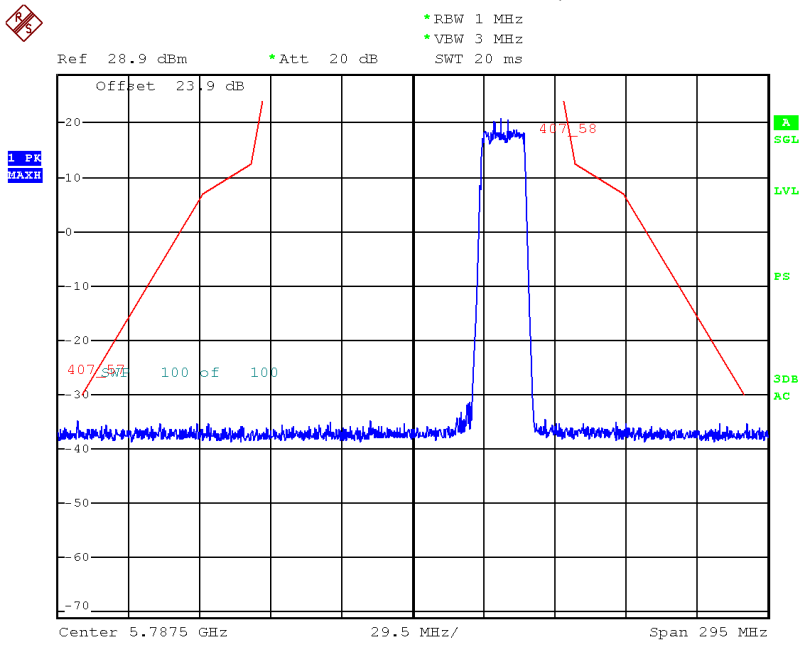
All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Channel Position B – QPSK



Date: 31.OCT.2018 10:32:33

Channel Position T – QPSK



Date: 31.OCT.2018 10:34:51

L-MIMO-MC 1 (2C)

Maximum Output Power 19dBm per port:

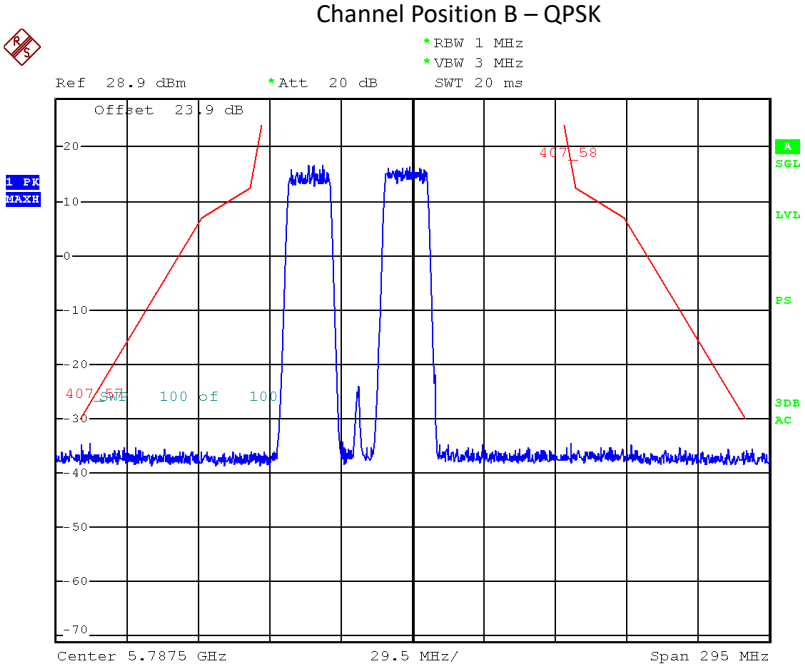
Channel Position	Bandwidth (MHz)	Channel Frequency	RBW (MHz)	EIRP Limit (dBm/MHz)
B	20.0 MHz	5785MHz + 5825MHz	1	-30.01
T	20.0 MHz	5785MHz + 5825MHz	1	-30.01

Note 1: The channels shown in the table above are the minimum and maximum channels that can be used in the authorized frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be available to the end user.

Note 2: For MIMO mode configurations, the limit was adjusted with a correction of -3.01dB [10Log(2)] to the following limit:

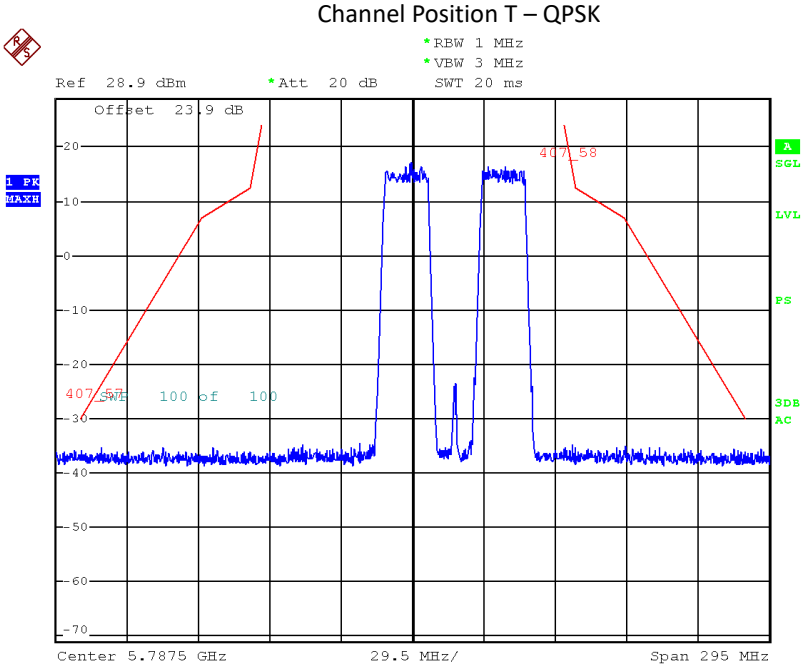
All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Channel Position B – QPSK



Date: 31.OCT.2018 10:39:20

Channel Position T – QPSK



Date: 31.OCT.2018 10:37:38

L-MIMO-MC 2 (3C)

Maximum Output Power 19dBm per port:

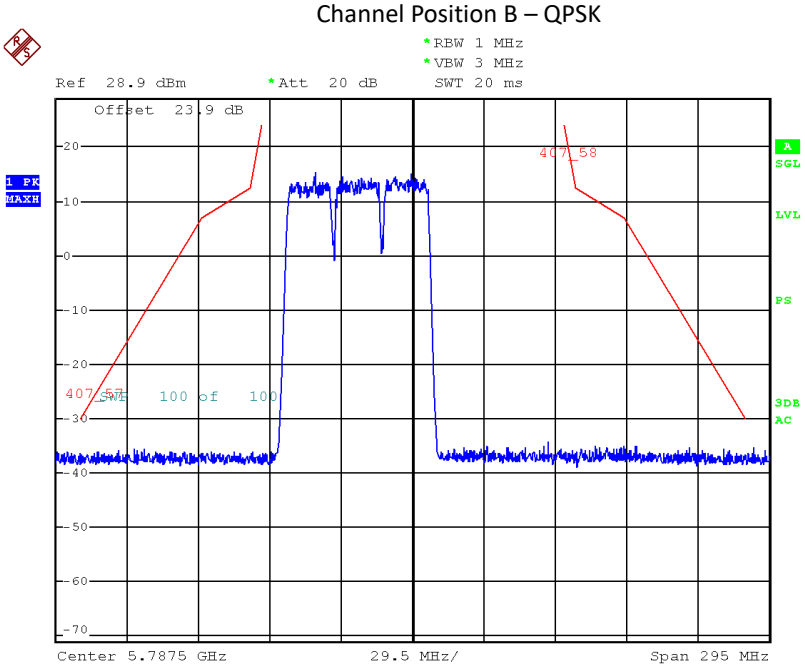
Channel Position	Bandwidth (MHz)	Channel Frequency	RBW (MHz)	EIRP Limit (dBm/MHz)
B	20.0 MHz	5745MHz + 5765MHz + 57850MHz	1	-30.01
T	20.0 MHz	5785MHz + 5805MHz + 5825MHz	1	-30.01

Note 1: The channels shown in the table above are the minimum and maximum channels that can be used in the authorized frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be available to the end user.

Note 2: For MIMO mode configurations, the limit was adjusted with a correction of -3.01dB [10Log(2)] to the following limit:

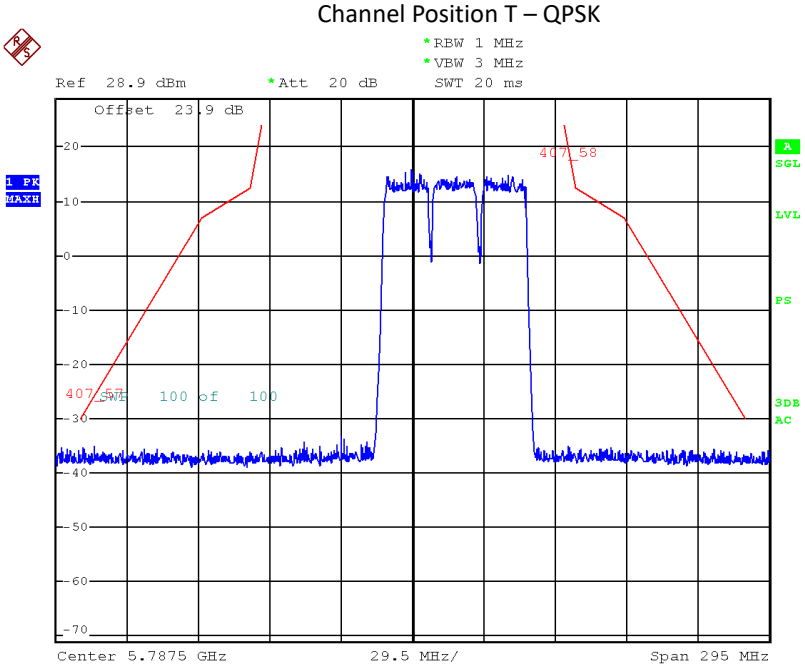
All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Channel Position B – QPSK



Date: 31.OCT.2018 10:41:41

Channel Position T – QPSK



Date: 31.OCT.2018 10:43:27

Configuration B1:

L-MIMO-SC

Maximum Output Power 6dBm per port:

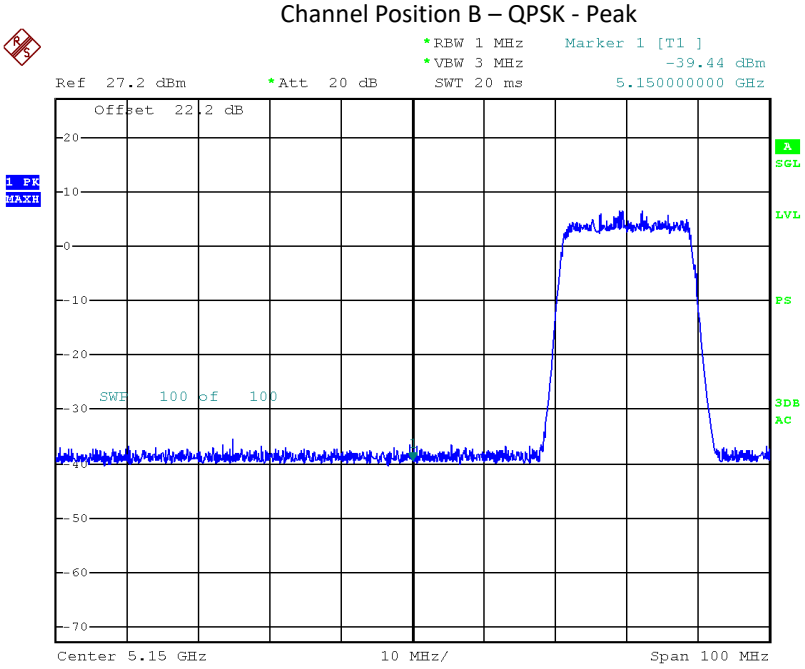
Channel Position	Bandwidth (MHz)	Channel Frequency	RBW (MHz)	EIRP Limit (dBm/MHz)
B	20.0 MHz	5180MHz	1	-30.01
T	20.0 MHz	5240MHz	1	-30.01

Note 1: The channels shown in the table above are the minimum and maximum channels that can be used in the authorized frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be available to the end user.

Note 2: 5150 MHz in the restricted band, use the following formula as per Section G (1) of 789033 D02 General UNII Test Procedures v01r04:
E (dBµV/m) = EIRP (dBm) + 95.2 = (measured level dBm + 11 dBi antenna gain) + 95.2

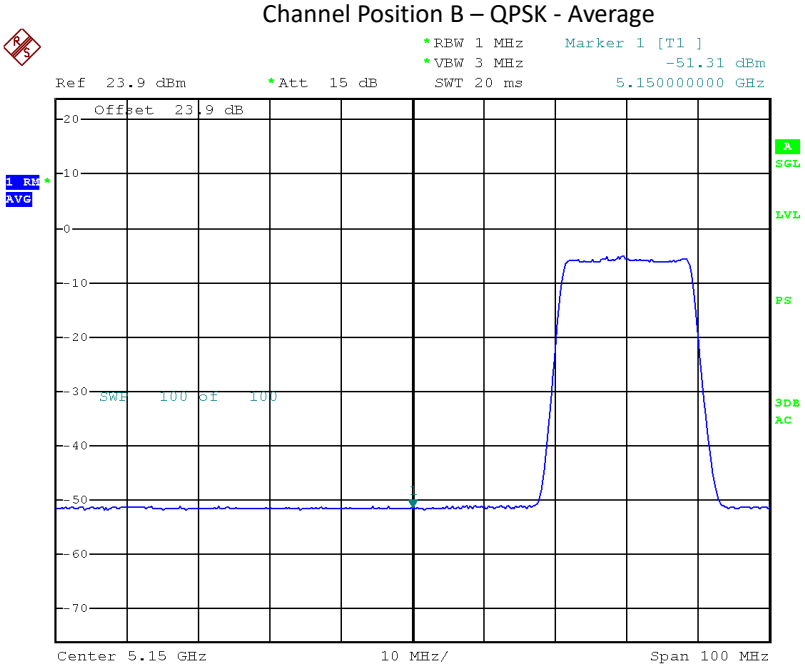
Note 3: For MIMO mode configurations, the limit was adjusted with a correction of -3.01dB [10Log(2)] to limits -27 dBm/MHz (Clause 15.407), and peak limits 74 dBµV/m and average limit 54 dBµV/m (Clause 15.209).

Channel Position B – QPSK - Peak



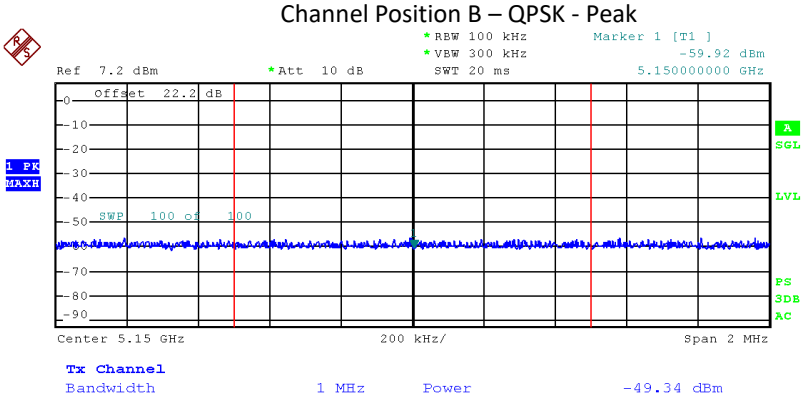
Date: 31.OCT.2018 10:45:45

Channel Position B – QPSK - Average



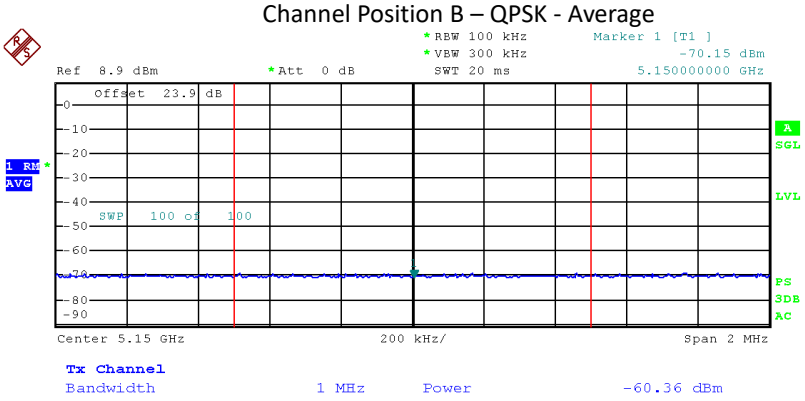
Date: 31.OCT.2018 10:48:35

Channel Position B – QPSK - Peak



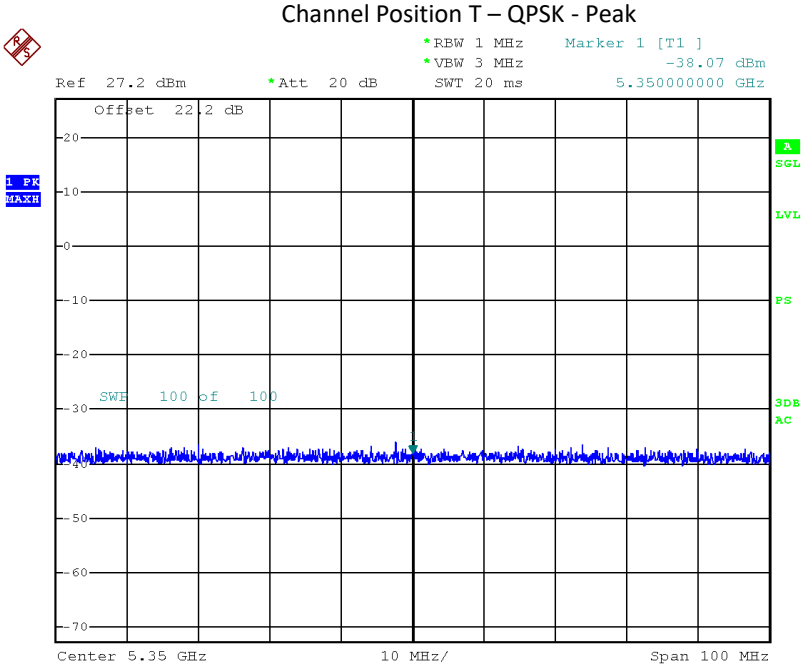
Date: 31.OCT.2018 10:48:05

Channel Position B – QPSK - Average



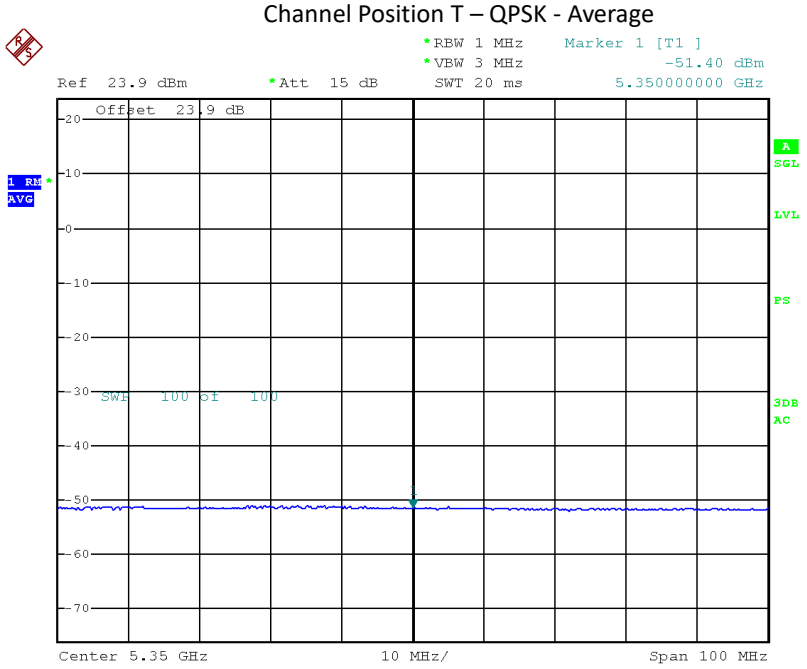
Date: 31.OCT.2018 10:49:16

Channel Position T – QPSK - Peak



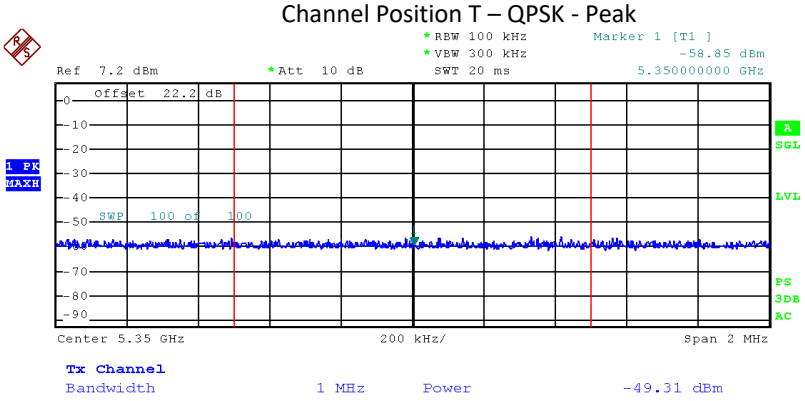
Date: 31.OCT.2018 10:50:28

Channel Position T – QPSK - Average



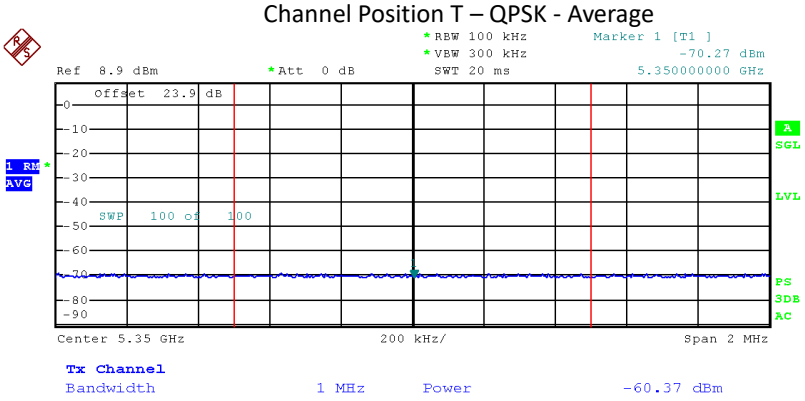
Date: 31.OCT.2018 10:52:03

Channel Position T – QPSK - Peak



Date: 31.OCT.2018 10:51:12

Channel Position T – QPSK - Average



Date: 31.OCT.2018 10:52:47

L-MIMO-MC 1 (2C)

Maximum Output Power 6dBm per port:

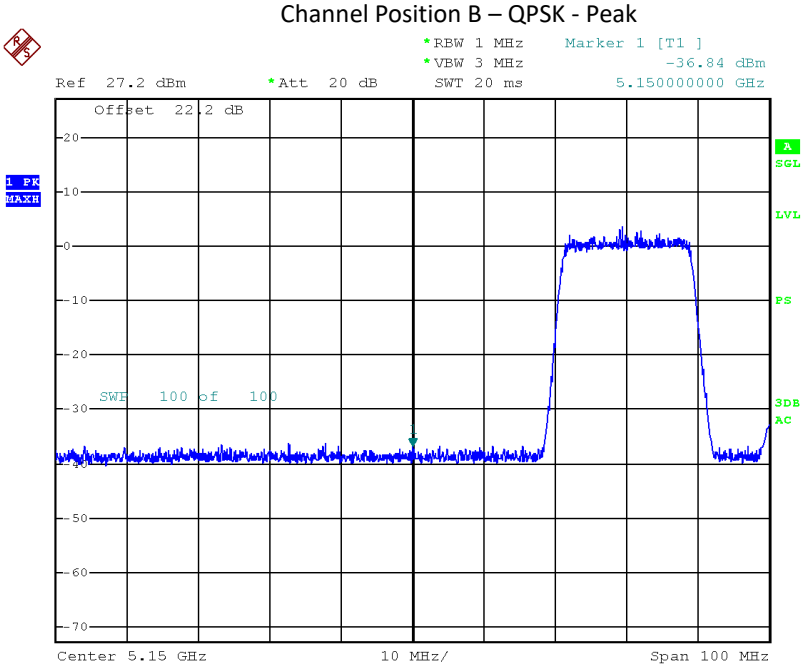
Channel Position	Bandwidth (MHz)	Channel Frequency	RBW (MHz)	EIRP Limit (dBm/MHz)
B	20.0 MHz	5180MHz + 5220MHz	1	-30.01
T	20.0 MHz	5200MHz + 5240MHz	1	-30.01

Note 1: The channels shown in the table above are the minimum and maximum channels that can be used in the authorized frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be available to the end user.

Note 2: 5150 MHz in the restricted band, use the following formula as per Section G (1) of 789033 D02 General UNII Test Procedures v01r04:
E (dBµV/m) = EIRP (dBm) + 95.2 = (measured level dBm + 11 dBi antenna gain) + 95.2

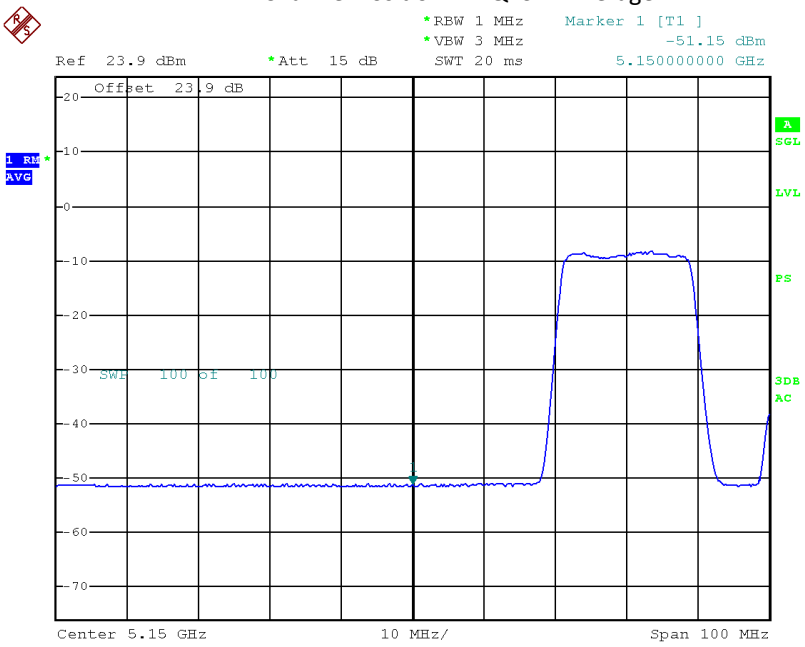
Note 3: For MIMO mode configurations, the limit was adjusted with a correction of -3.01dB [10Log(2)] to limits -27 dBm/MHz (Clause 15.407), and peak limits 74 dBµV/m and average limit 54 dBµV/m (Clause 15.209).

Channel Position B – QPSK - Peak



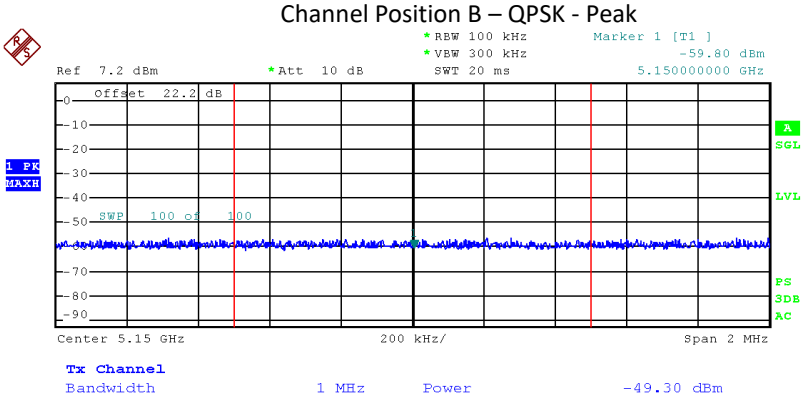
Date: 31.OCT.2018 11:18:22

Channel Position B – QPSK - Average



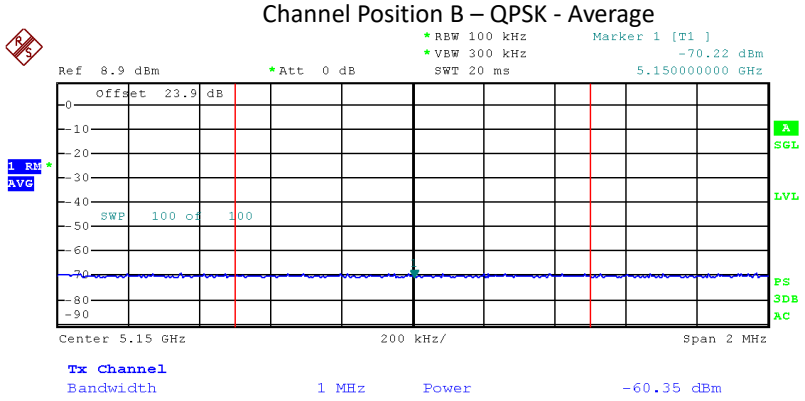
Date: 31.OCT.2018 11:20:36

Channel Position B – QPSK - Peak



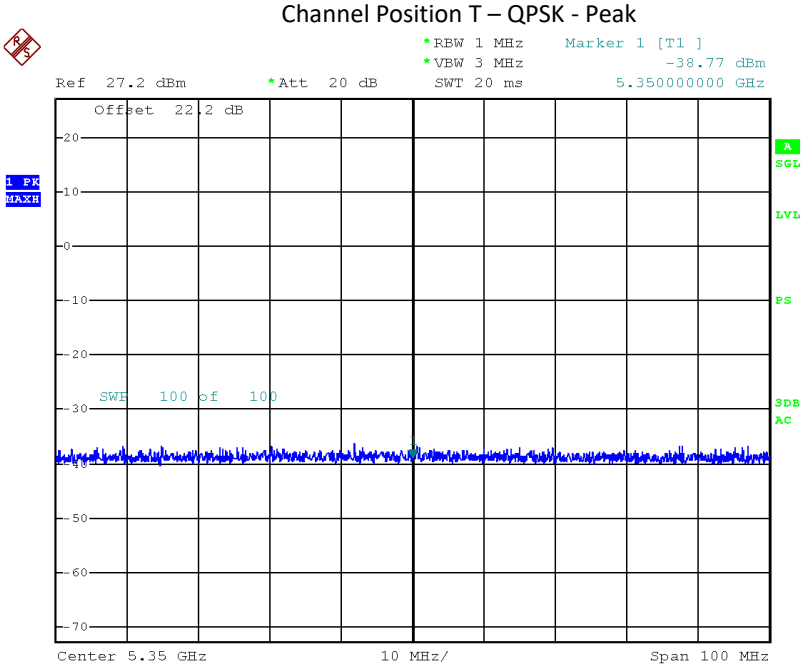
Date: 31.OCT.2018 11:19:07

Channel Position B – QPSK - Average



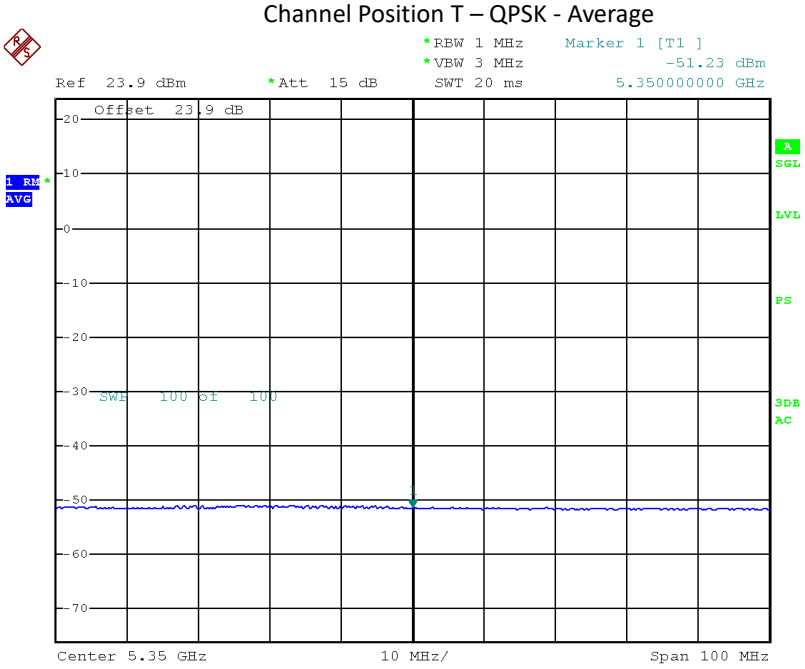
Date: 31.OCT.2018 11:21:32

Channel Position T – QPSK - Peak



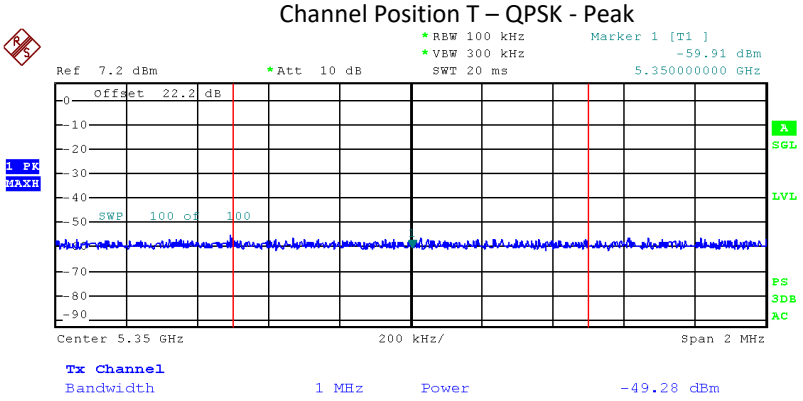
Date: 31.OCT.2018 11:23:25

Channel Position T – QPSK - Average



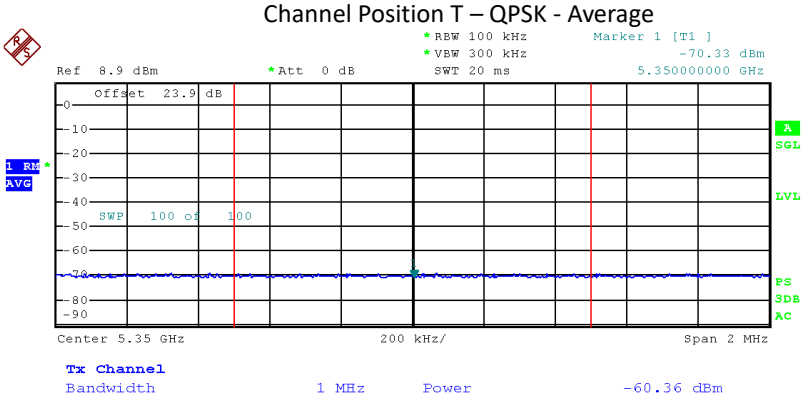
Date: 31.OCT.2018 11:24:54

Channel Position T – QPSK - Peak



Date: 31.OCT.2018 11:23:56

Channel Position T – QPSK - Average



Date: 31.OCT.2018 11:25:32

L-MIMO-MC 2 (3C)

Maximum Output Power 6dBm per port:

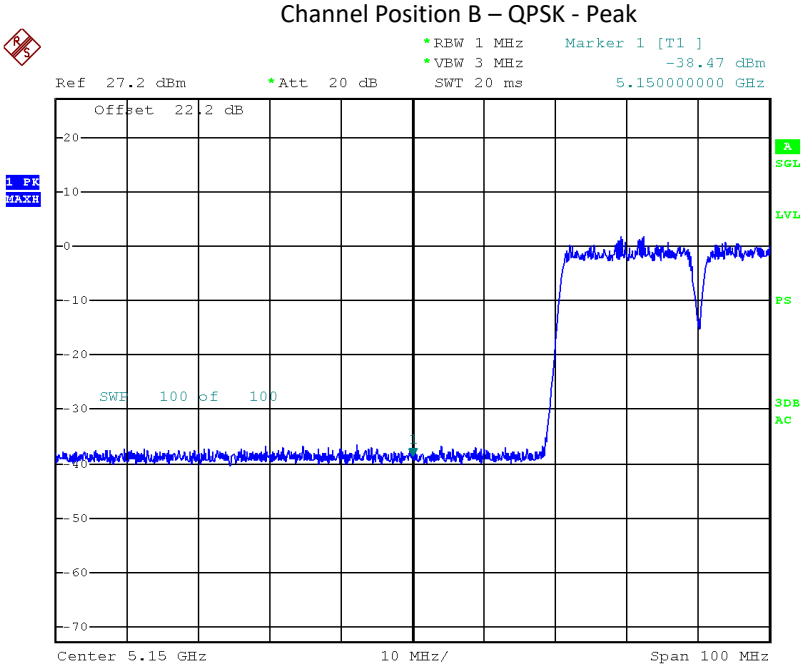
Channel Position	Bandwidth (MHz)	Channel Frequency	RBW (MHz)	EIRP Limit (dBm/MHz)
B	20.0 MHz	5180MHz + 5200MHz + 5220MHz	1	-30.01
T	20.0 MHz	5200MHz + 5220MHz + 5240MHz	1	-30.01

Note 1: The channels shown in the table above are the minimum and maximum channels that can be used in the authorized frequency ranges to maintain compliance. Channels outside of the ranges shown in the above tables shall not be available to the end user.

Note 2: 5150 MHz in the restricted band, use the following formula as per Section G (1) of 789033 D02 General UNII Test Procedures v01r04:
E (dBµV/m) = EIRP (dBm) + 95.2 = (measured level dBm + 11 dBi antenna gain) + 95.2

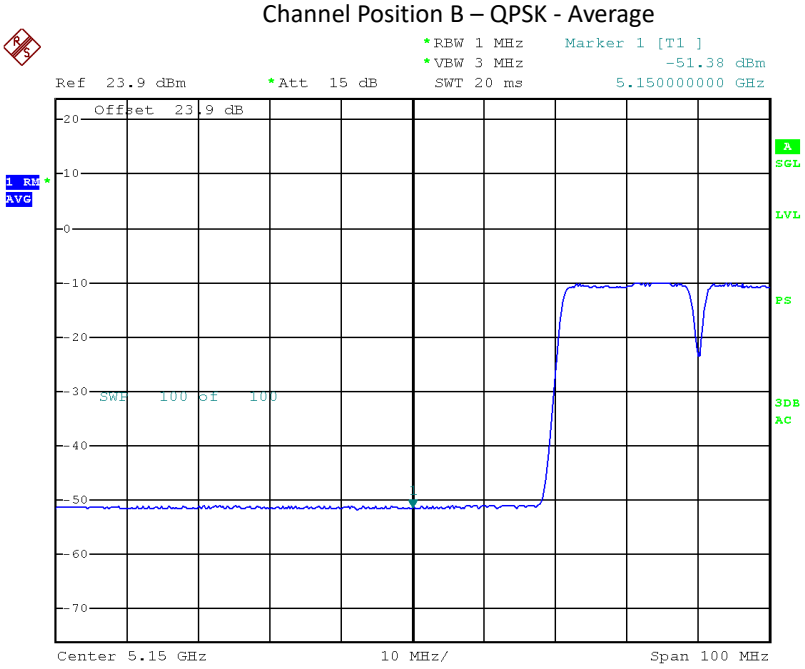
Note 3: For MIMO mode configurations, the limit was adjusted with a correction of -3.01dB [10Log(2)] to limits -27 dBm/MHz (Clause 15.407), and peak limits 74 dBµV/m and average limit 54 dBµV/m (Clause 15.209).

Channel Position B – QPSK - Peak



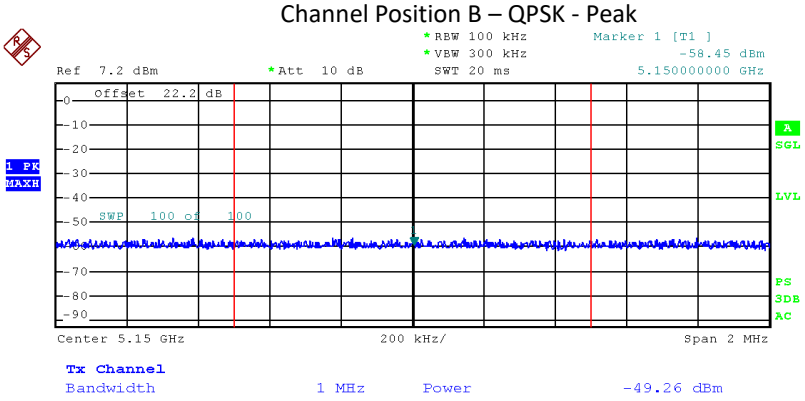
Date: 31.OCT.2018 11:27:41

Channel Position B – QPSK - Average



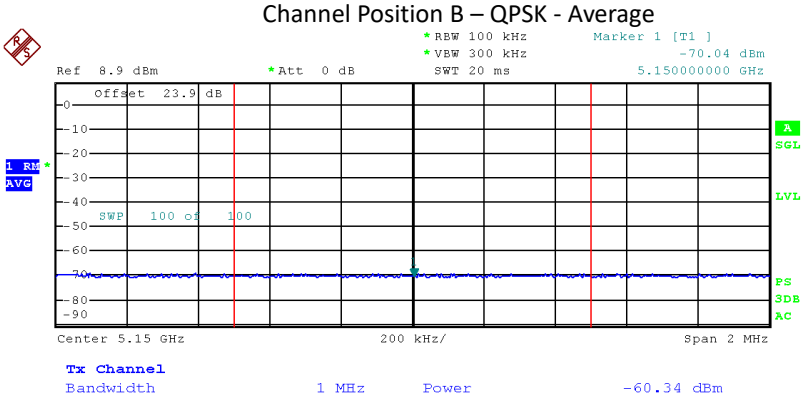
Date: 31.OCT.2018 11:28:51

Channel Position B – QPSK - Peak



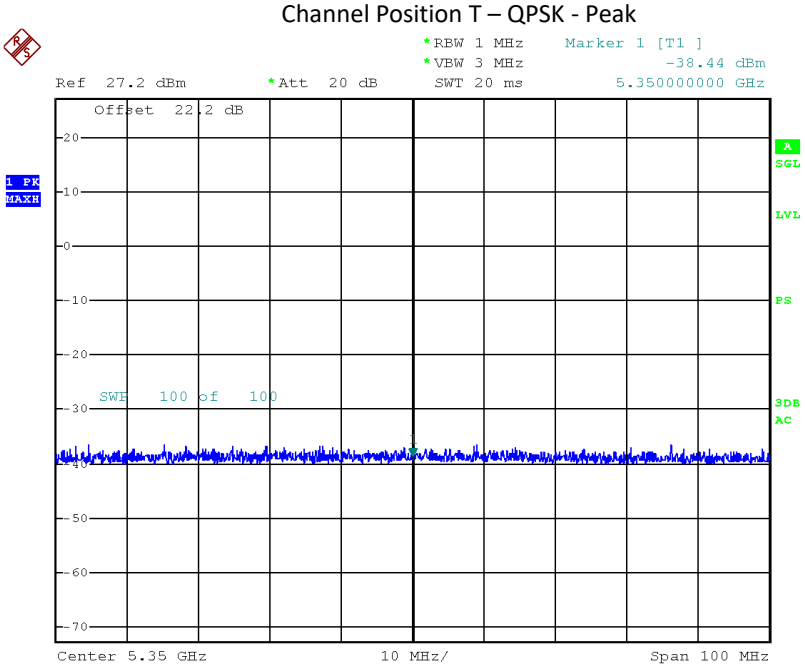
Date: 31.OCT.2018 11:28:18

Channel Position B – QPSK - Average



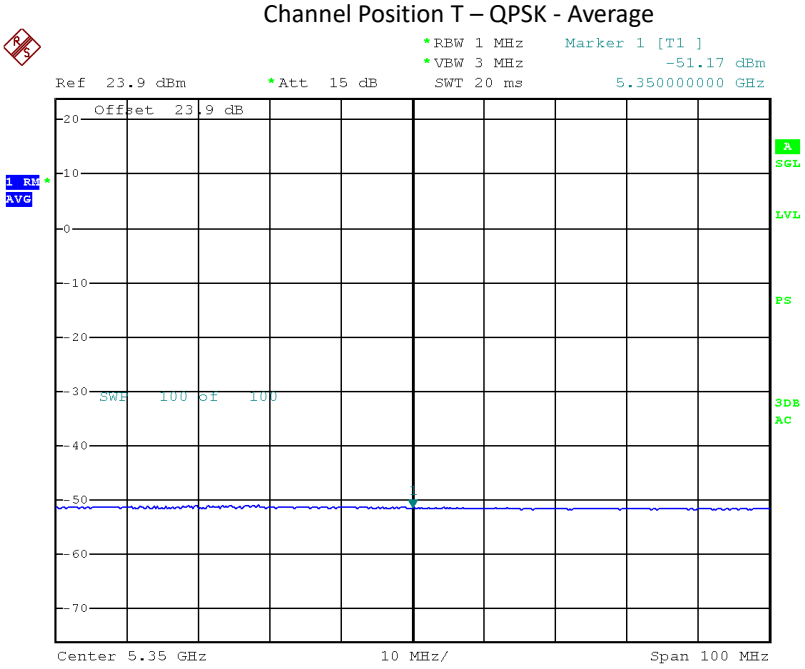
Date: 31.OCT.2018 11:29:37

Channel Position T – QPSK - Peak



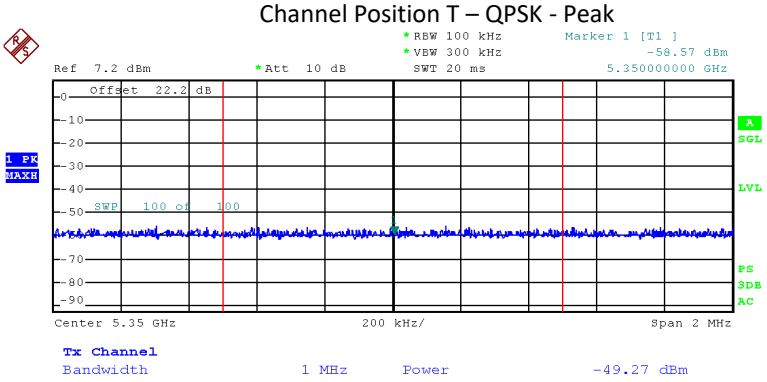
Date: 31.OCT.2018 11:31:26

Channel Position T – QPSK - Average



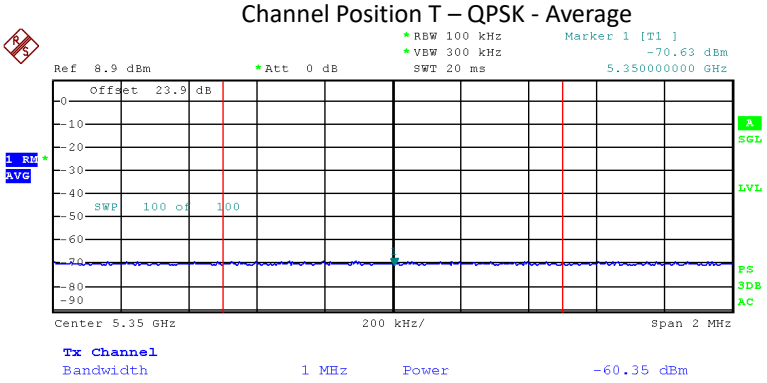
Date: 31.OCT.2018 11:32:58

Channel Position T – QPSK - Peak



Date: 31.OCT.2018 11:32:22

Channel Position T – QPSK - Average



Date: 31.OCT.2018 11:33:24

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