Product Service

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Report On

FCC Testing of the
Ericsson KRD 901 060/83 (RBS 6402)
LAA (Band 46A and 46D) Base Station In accordance with
FCC CFR 47 Part 15E

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8AKRD90106083

PREPARED BY	APPROVED BY	DATED
Nic Forsyth Senior Engineer	Simon Bennett Authorised Signatory	30 September 2016

Document 75934780 Report 03 Issue 5 **September 2016**

CONTENTS

SECTION 1

REPORT INFORMATION

1.1 REPORT DETAILS

Manufacturer	Ericsson
Address	Elektroniikkatie 10 Oulu 90590 Finland
Product Name	RBS 6402
Product Number	KRD 901 060/83
Serial Number(s)	C82A516905
Software Version	RASW_20160516_LBT_DFE_4_5_UPDATE
Hardware Version	R1C
Test Specification/Issue/Date	FCC CFR 47 Part 15E (2015)
Start of Test	08 August 2016
Finish of Test	10 August 2016
Name of Engineer(s)	N Forsyth
Related Document(s)	789033 D02 General U-NII Test Procedures New Rules v01r02 662911 D01 Multiple Transmitter Output v02r01

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 15E. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

_____

Nic Forsyth

This report has been up-issued to Issue 5 and should be read in place of Issue 4. This report has been up-issued to correct the FCC ID.

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15E is shown below.

Section	Specification Clause		Test Description	Result
	FCC CFR 47 Part 2	FCC CFR 47 Part 15E		
2.1	-	15.407 (a)	26 dB Bandwidth	Pass
2.2	-	15.407 (a)(1)(2)(3)	Conducted Output Power	Pass
2.3	-	15.407 (a)(5)	Power Spectral Density	Pass
2.4	2.1055	15.407 (g)	Frequency Stability	Pass

1.3 CONFIGURATION DESCRIPTION

The RBS 6402 supports up to two different types of RF module.

The first type of RF module supports LAA single carrier and is capable of 2 port, single carrier MIMO operation.

The second type of RF module supports LTE single and dual carrier and is capable of 4 port, single carrier and 2 port, dual carrier MIMO operation.

The EUT also supports Test Models E-TM1.1, E-TM3.2 and E-TM3.1 as defined in 3GPP TS 36.141. Test Model E-TM1.1 was used to represent QPSK modulation only, Test Model E-TM3.2 was used to represent 16QAM modulation, and Test Model E-TM3.1 was used to represent 64QAM modulation.

The EUT was configured with both types of RF module in position 0 and 1. RF module 0 was an LTE module, transmitting in 3GPP band 7 on ports A and B. RF module 1 was an LAA module, transmitting on ports C and D.

All LAA RF ports were tested for conducted output power and results recorded using the Measure and Sum approach to account for MIMO operation. All testing was performed with the EUT transmitting at maximum RF power unless otherwise stated.

1.4 DECLARATION OF BUILD STATUS

Manufacturer	Ericsson AB		
Model number(s)	RBS 6402		
Identification/Type(s)	KRD 901 060/83		
Cabinet type(s)	Indoor		
Cabinet identification(s)	N/A		
Number of sectors	1		
Number of carriers	1		
Base station class	Local Area		
Maximum rated output power(s)			
FCC	5150-5170MHz 2 x 100mW, 5170MHz-5250MHz: 2 x 125mW, 5735MHz-5845MHz: 2 x 125mW		
IC	5150MHz-5250MHz: 2 x 25mW, 5735MHz-5835MHz: 2 x 125mW		
Duplex Mode	FDD		
Frequency Band	5150 – 5250 MHz		
	5725 – 5875 MHz		
Modulation type(s)	QPSK		
	16 QAM		
	64 QAM		
Channel Bandwidth(s)			
	LTE: 20MHz		
Transmit diversity	Yes [1]		
Receive diversity	Yes[2]		
MIMO	2 x 1		
ITU designation or class of emission			
	LTE: 17M9G7D, 17M9W7D		
Environment temperature range(s)	Minimum	Maximum	
	0 C	+50 C (+40 C without fan)	
AC Power source	Yes		
	Voltage Range(s)		
	Minimum VAC	Nominal VAC	Maximum VAC
	100	230	240
DC Power source	Yes (PoE)		
	Voltage Range(s)		
	Minimum VDC	Nominal VDC	Maximum VDC
	37	48	58
Options	Type	Model	

[1] Each transmitter path is declared to be equivalent.

[2] Each receiver path is declared to be equivalent.

I hereby declare that I am entitled to sign on behalf of the manufacturer and that the information supplied is correct and complete.

Signature:

Name : Mika Savilakso
Position held : Senior Developer, Regulatory Approvals
Date :19.08.2016

1.5 PRODUCT INFORMATION

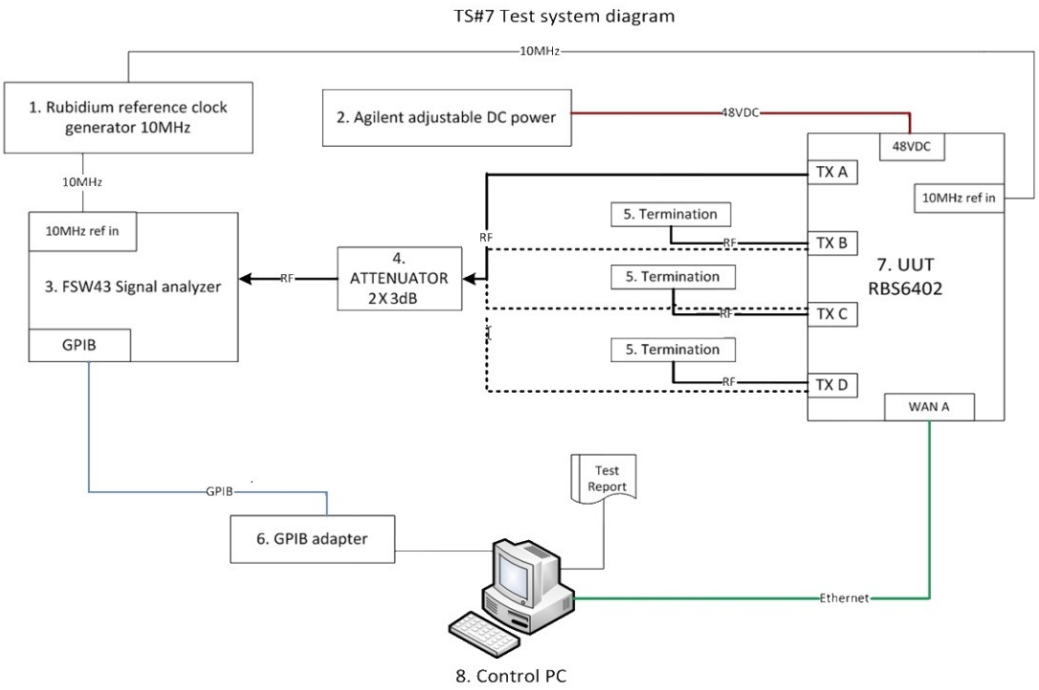
1.5.1 Technical Description

The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturer's documentation.

Equipment Under Test

1.6 TEST SETUP

Test Setup, Conducted Measurement:



See Section 3 for a list of the test equipment used in the test.

1.7 TEST CONDITIONS

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.

The EUT was powered from a +48V DC supply.

1.8 DEVIATION FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.9 MODIFICATION RECORD

No modifications were made to the EUT during testing.

1.10 ALTERNATIVE TEST SITE

Under our group UKAS Accreditation, TÜV SÜD Product Service conducted the tests at Ericsson in Oulu, Finland.

SECTION 2

TEST DETAILS

2.1 26 DB BANDWIDTH

2.1.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (a)

2.1.2 Date of Test and Modification State

08 August 2016 - Modification State 0

2.1.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.4 Environmental Conditions

Ambient Temperature	23.4°C
Relative Humidity	53.2%

2.1.5 Test Method

All measurements were made in accordance with FCC KDB 789033 D02 sections II.C.1, II.C.2 and II.D.

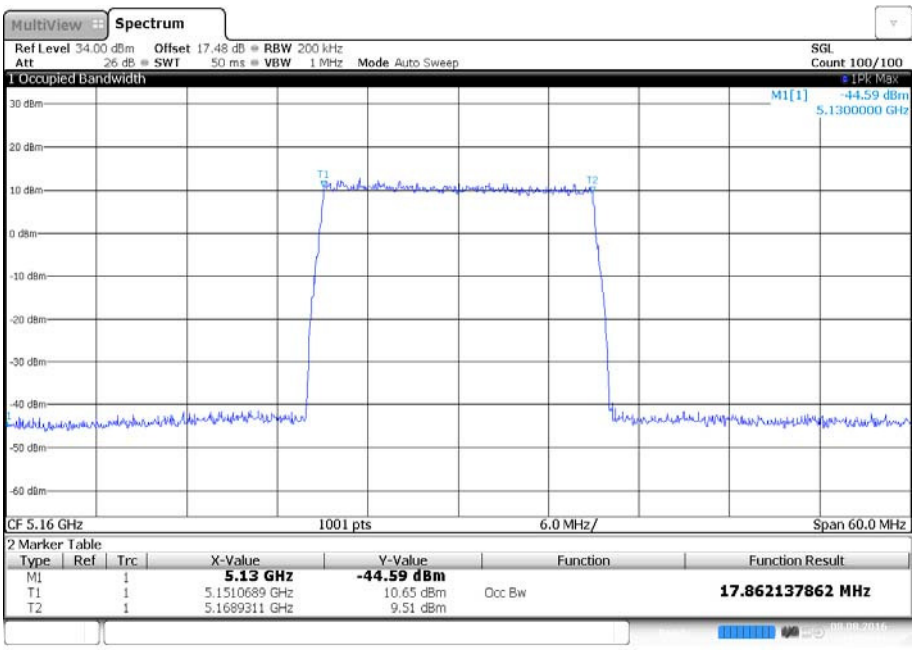
2.1.6 Test Results

Configuration A

Maximum Output Power Per Carrier 21 dBm

Modulation	Carrier Bandwidth	Result (MHz)					
		5160 MHz		5200 MHz		5240 MHz	
		99% Bandwidth	-26 dB Bandwidth	99% Bandwidth	-26 dB Bandwidth	99% Bandwidth	-26 dB Bandwidth
QPSK	20.0 MHz	17.86	19.24	17.86	19.30	17.86	19.24
16QAM	20.0 MHz	17.92	19.18	17.86	19.24	17.92	19.24
64QAM	20.0 MHz	17.92	19.24	17.92	19.18	17.86	19.24

Antenna C - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5160 MHz - Measurement 99 % BW



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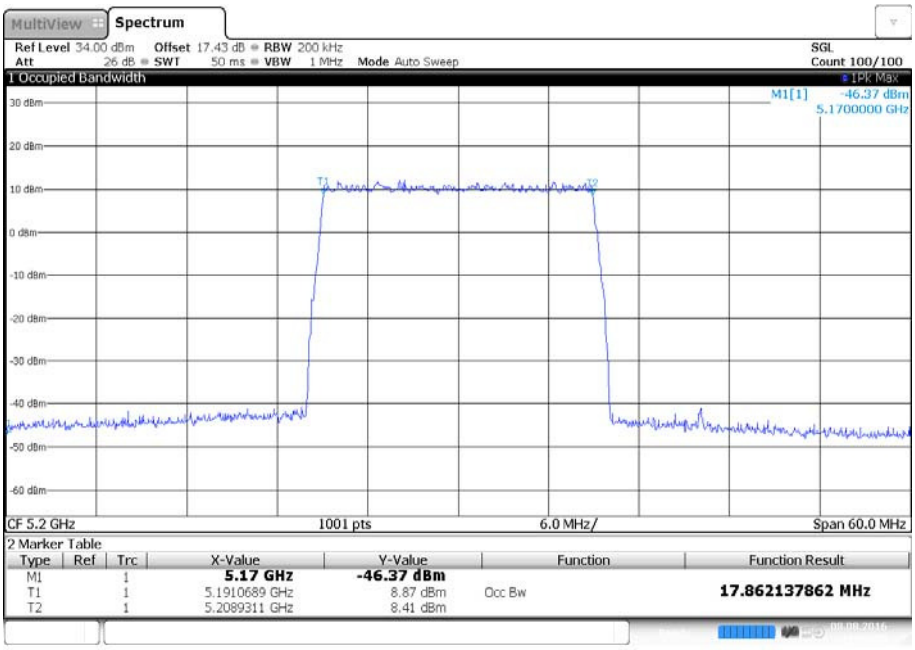
Antenna C - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5200 MHz - Measurement 99 % BW



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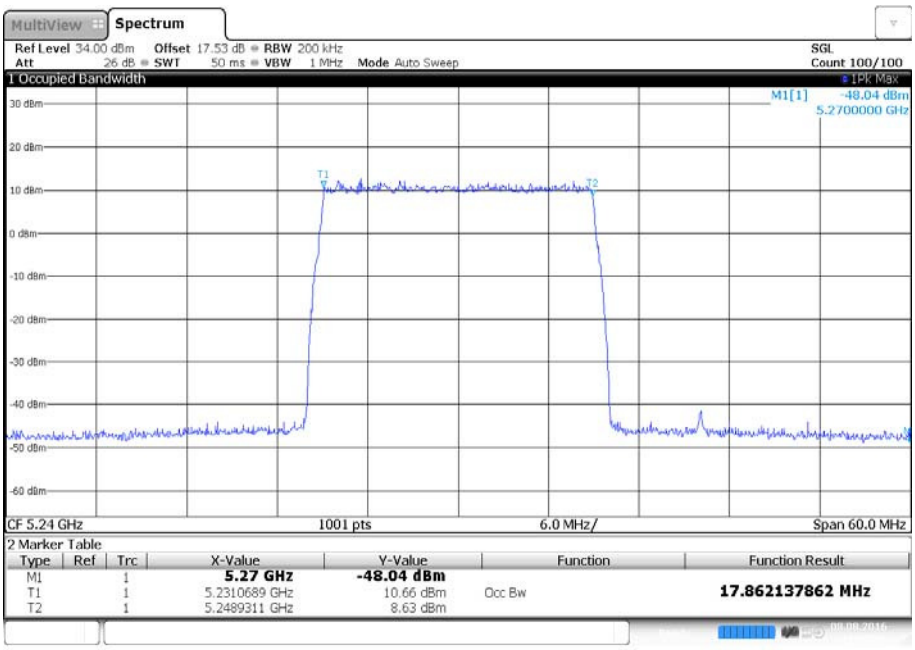
Antenna C - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5240 MHz - Measurement 99 % BW



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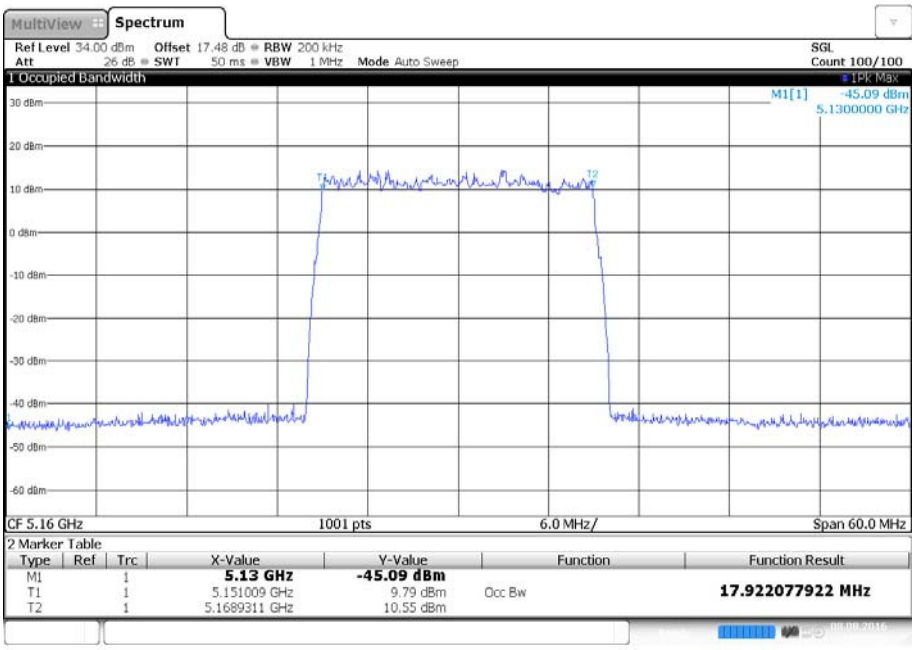
Antenna C - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5160 MHz - Measurement 99 % BW



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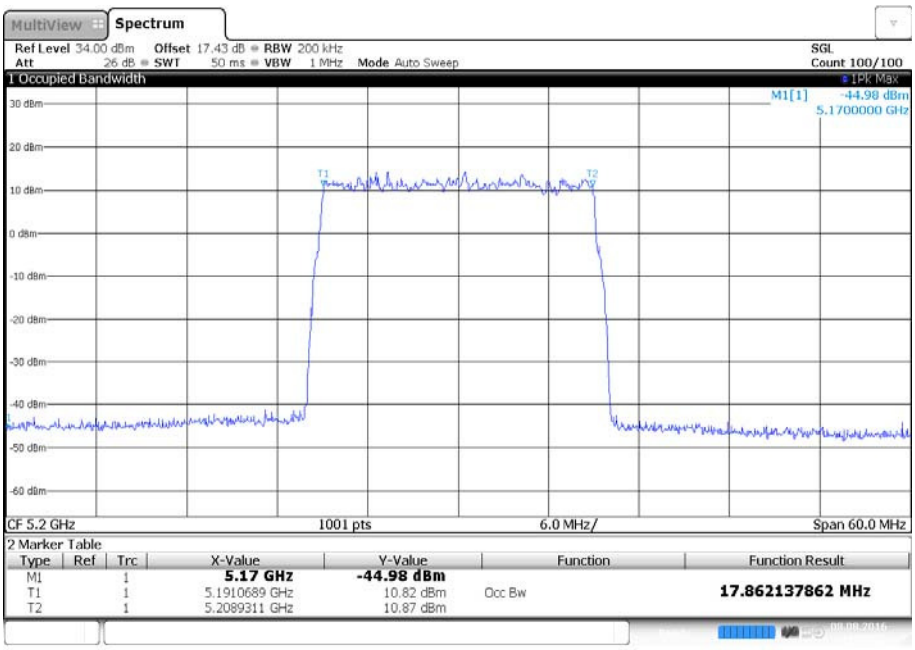
Antenna C - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5200 MHz - Measurement 99 % BW



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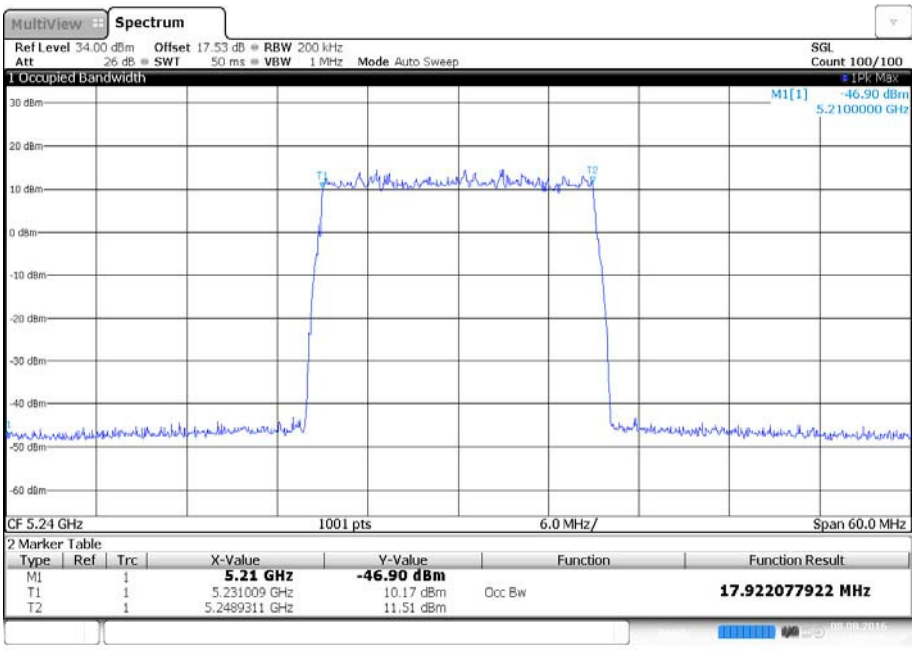
Antenna C - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5240 MHz - Measurement 99 % BW



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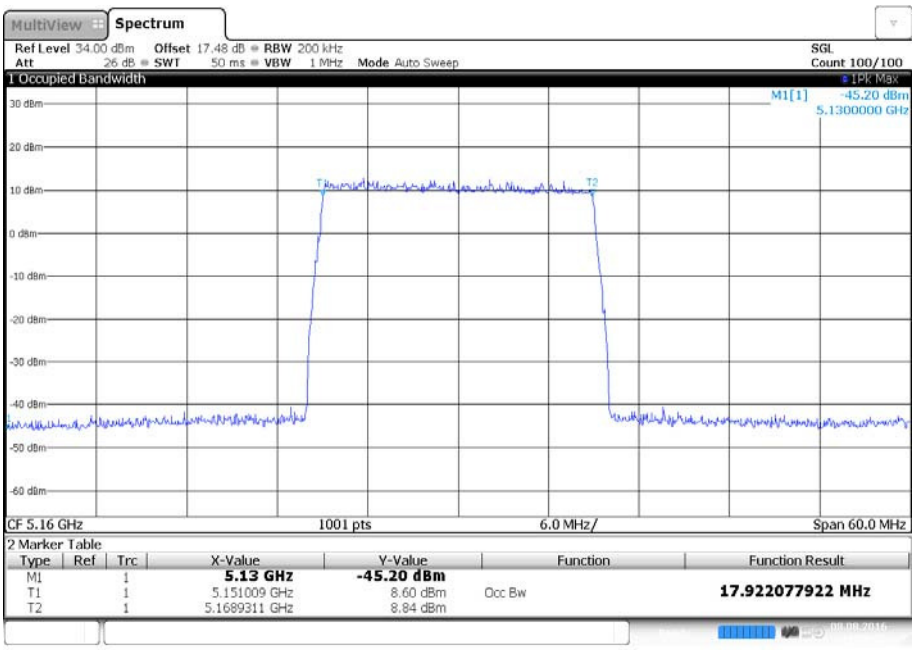
Antenna C - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5160 MHz - Measurement 99 % BW



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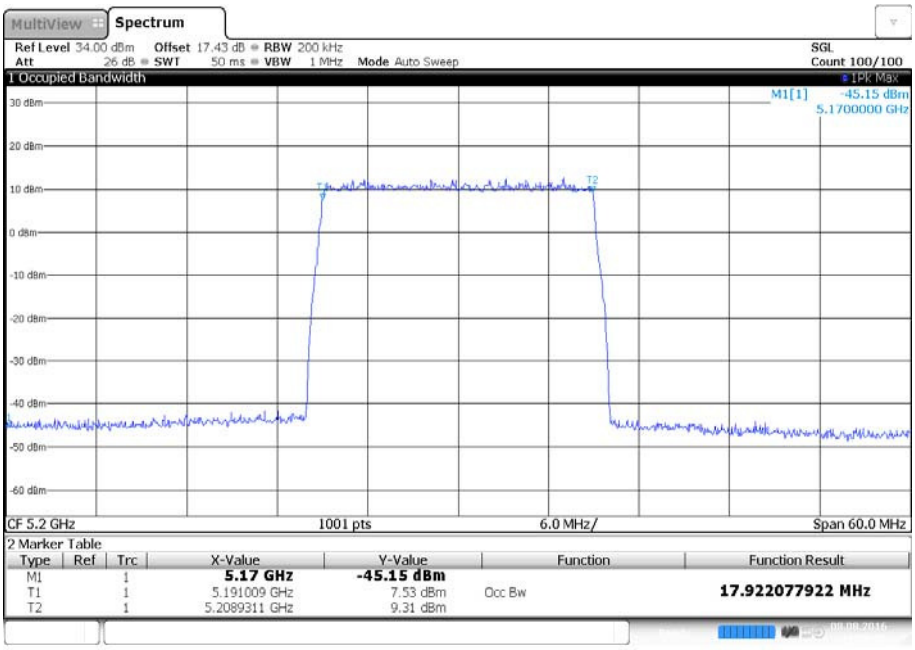

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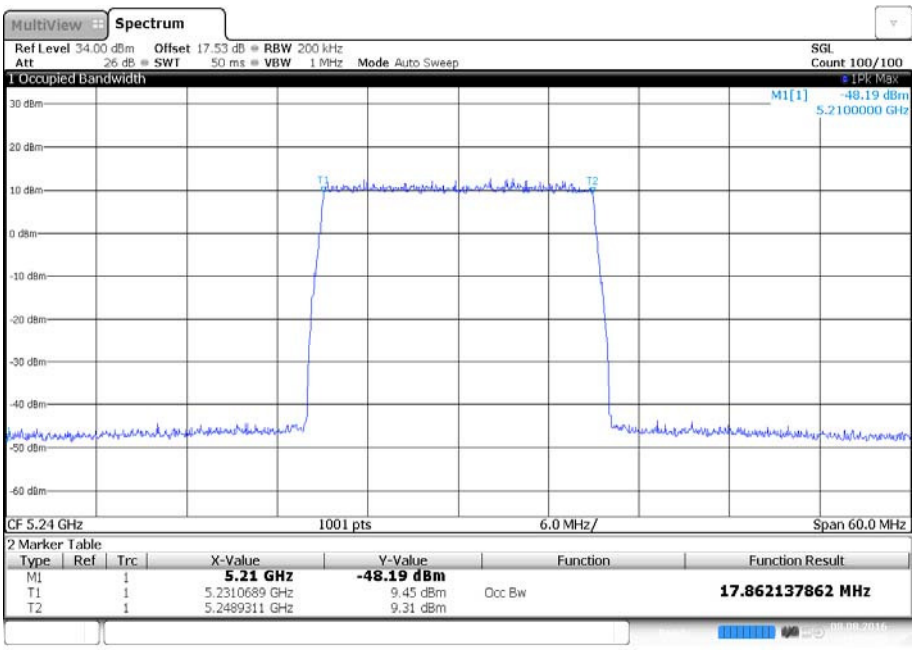
Antenna C - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5240 MHz - Measurement 99 % BW



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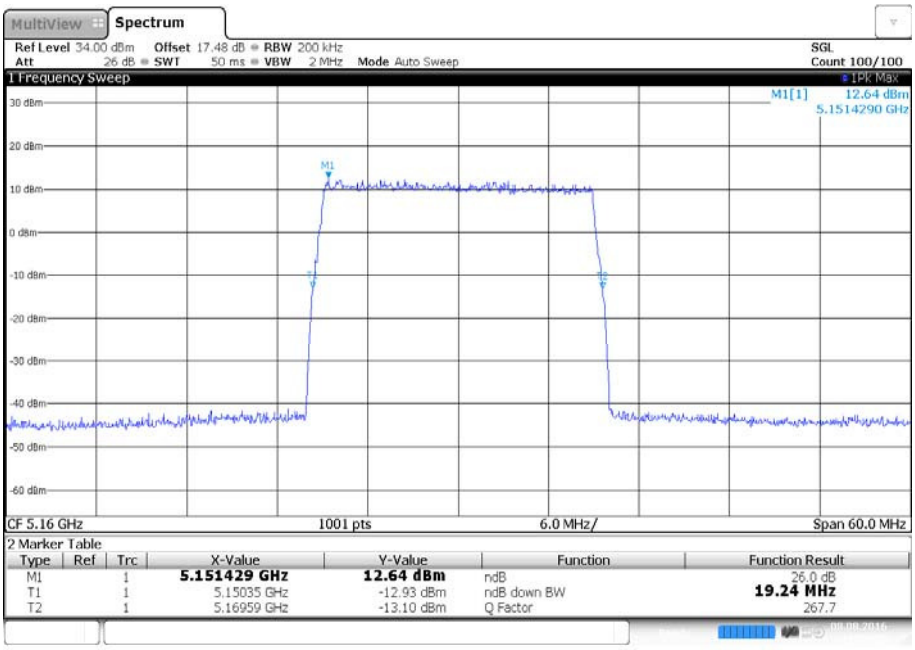
Antenna C - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5160 MHz - Measurement -26 dB BW



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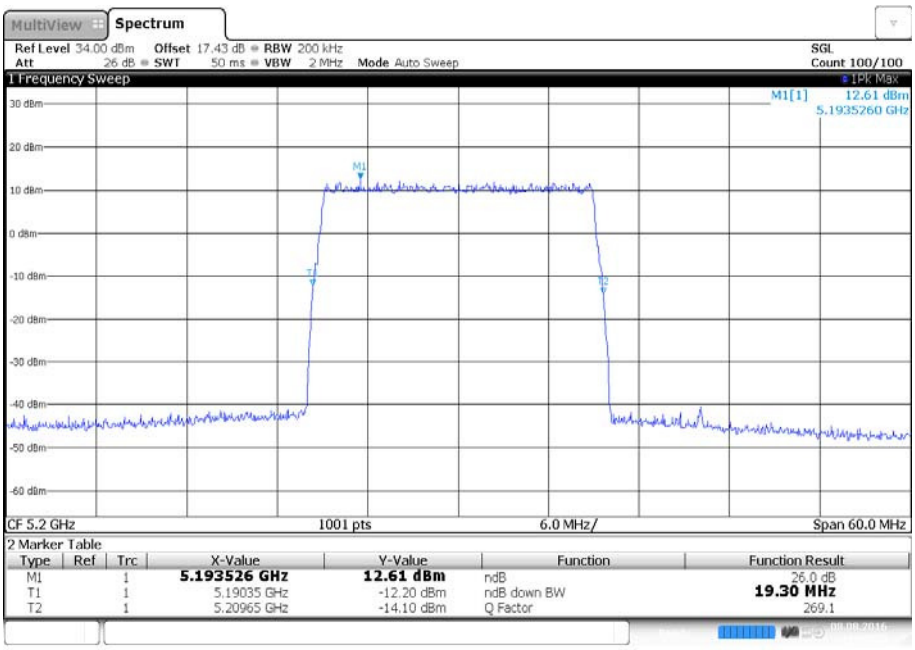
Antenna C - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5200 MHz - Measurement -26 dB BW



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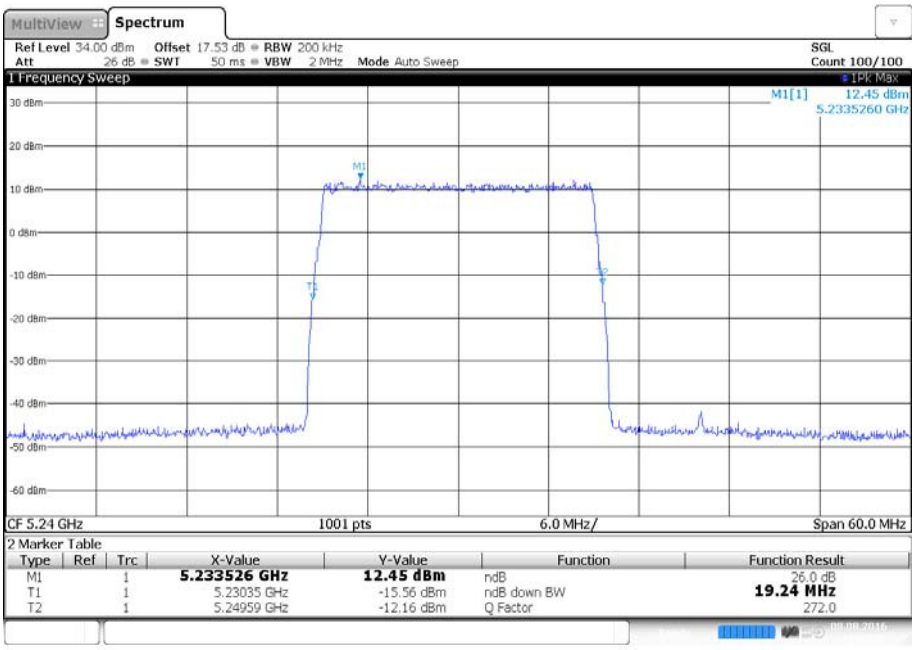
Antenna C - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5240 MHz - Measurement -26 dB BW



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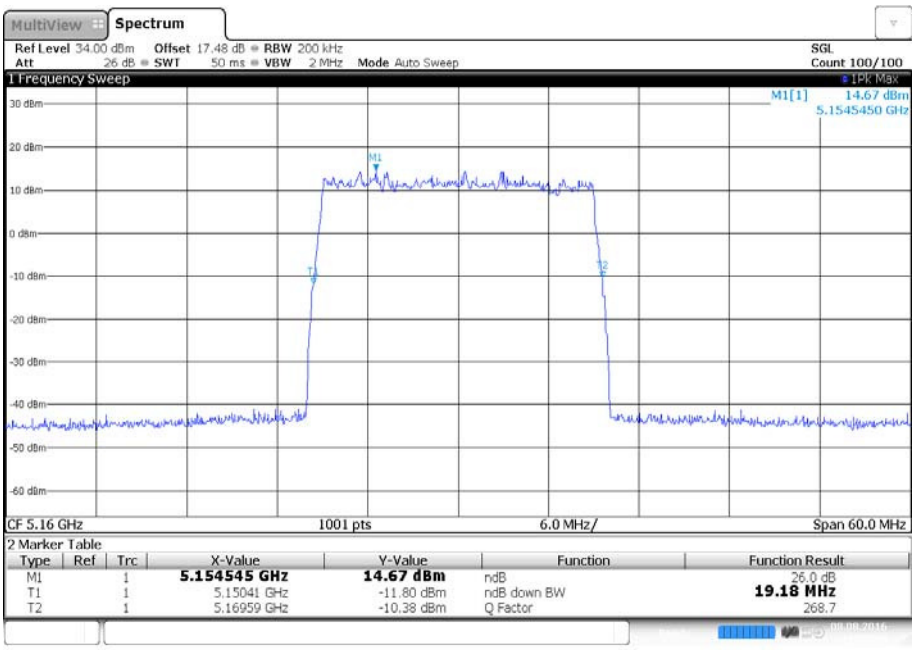
Antenna C - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5160 MHz - Measurement -26 dB BW



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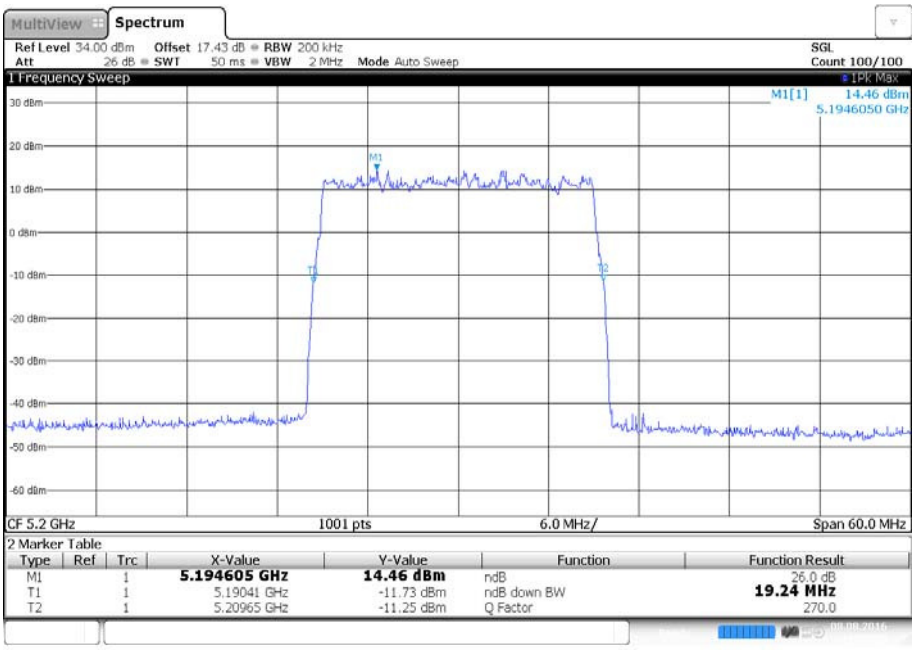
Antenna C - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5200 MHz - Measurement -26 dB BW



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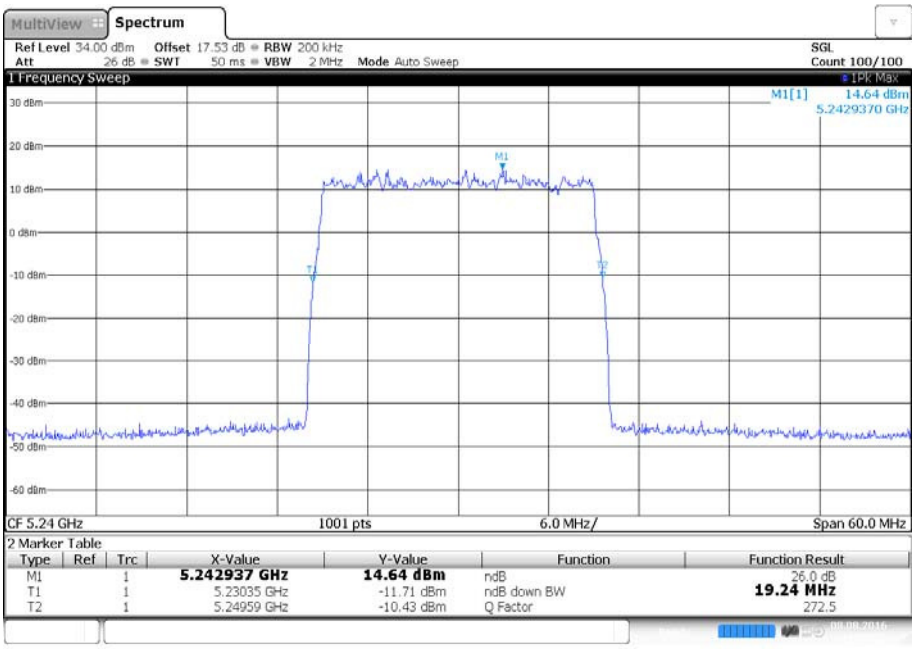
Antenna C - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5240 MHz - Measurement -26 dB BW



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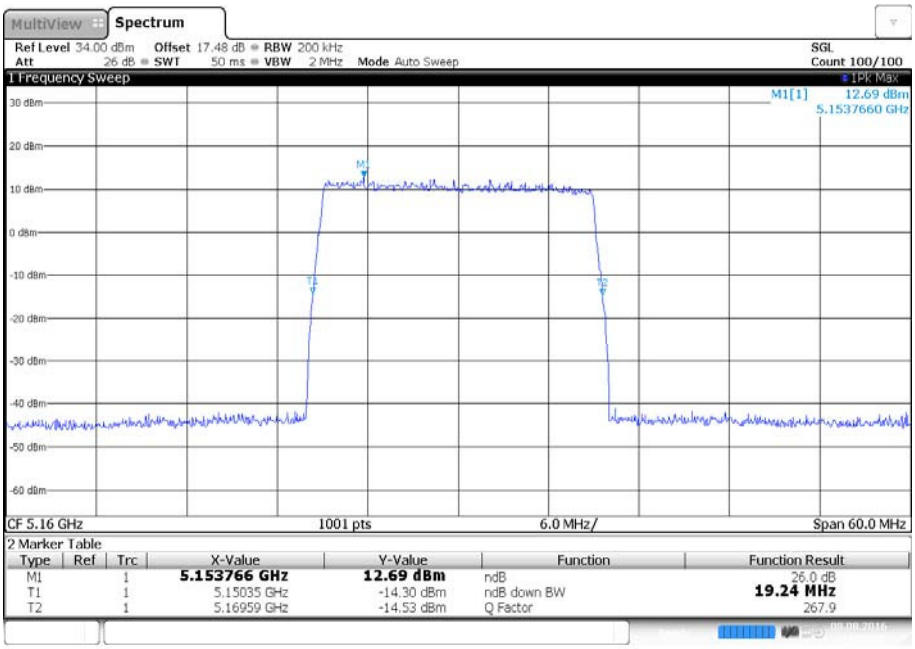

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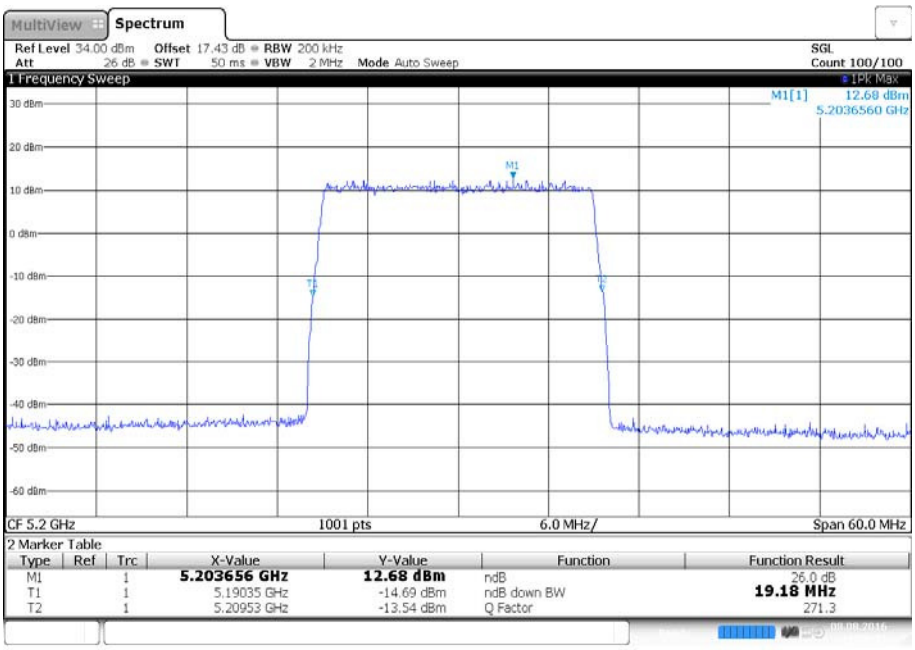
Antenna C - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5200 MHz - Measurement -26 dB BW



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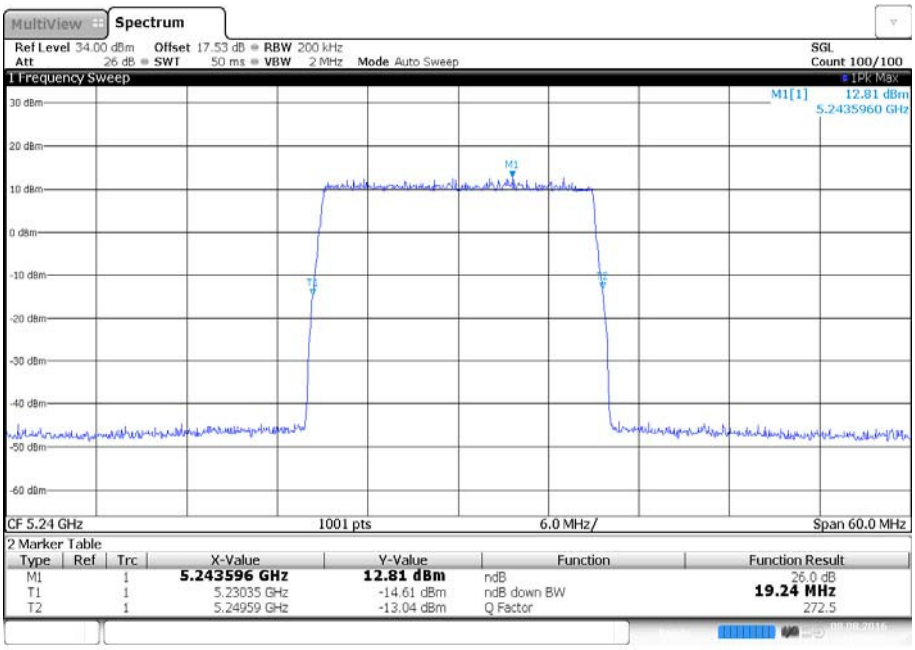
Antenna C - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5240 MHz - Measurement -26 dB BW



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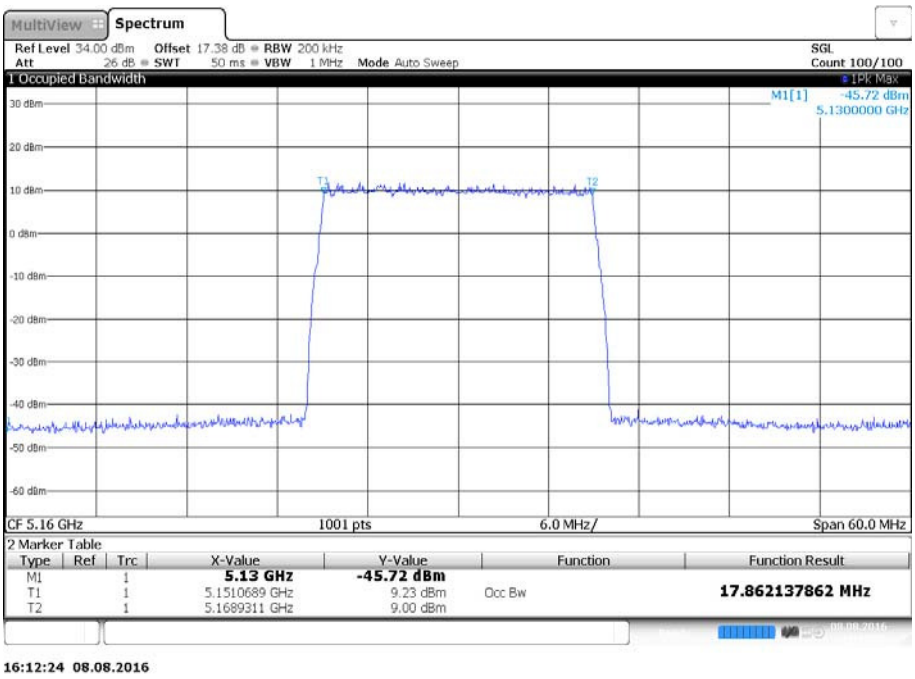
Configuration A

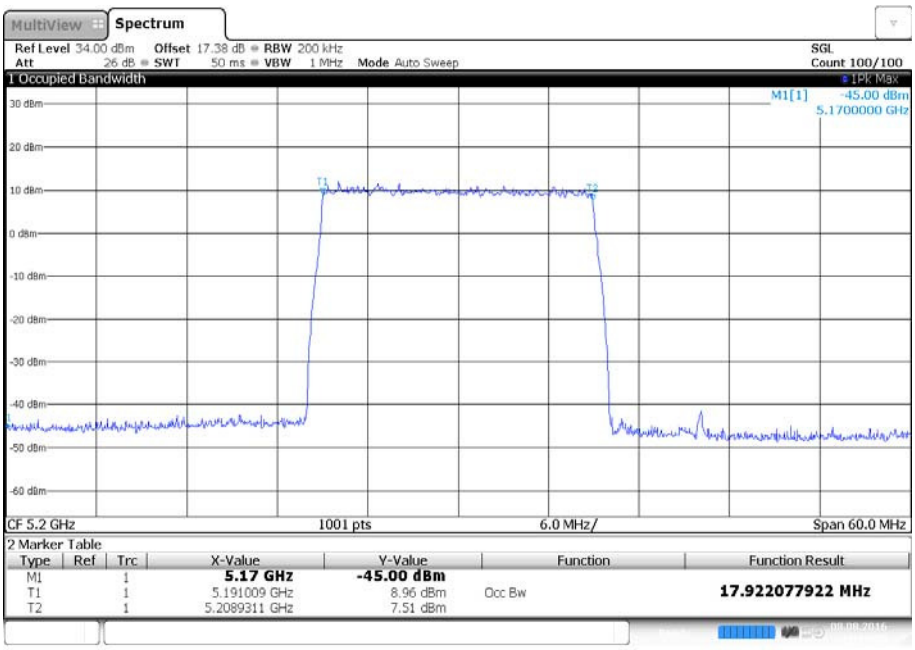
Maximum Output Power Per Carrier 21 dBm

Modulation	Carrier Bandwidth	Result (MHz)					
		5160 MHz		5200 MHz		5240 MHz	
		99% Bandwidth	-26 dB Bandwidth	99% Bandwidth	-26 dB Bandwidth	99% Bandwidth	-26 dB Bandwidth
QPSK	20.0 MHz	17.86	19.24	17.92	19.30	17.86	19.30
16QAM	20.0 MHz	17.92	19.18	17.98	19.18	17.92	19.18
64QAM	20.0 MHz	17.92	19.24	17.92	19.24	17.92	19.24

Antenna D - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5160 MHz - Measurement 99 % BW



Antenna D - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5200 MHz - Measurement 99 % BW



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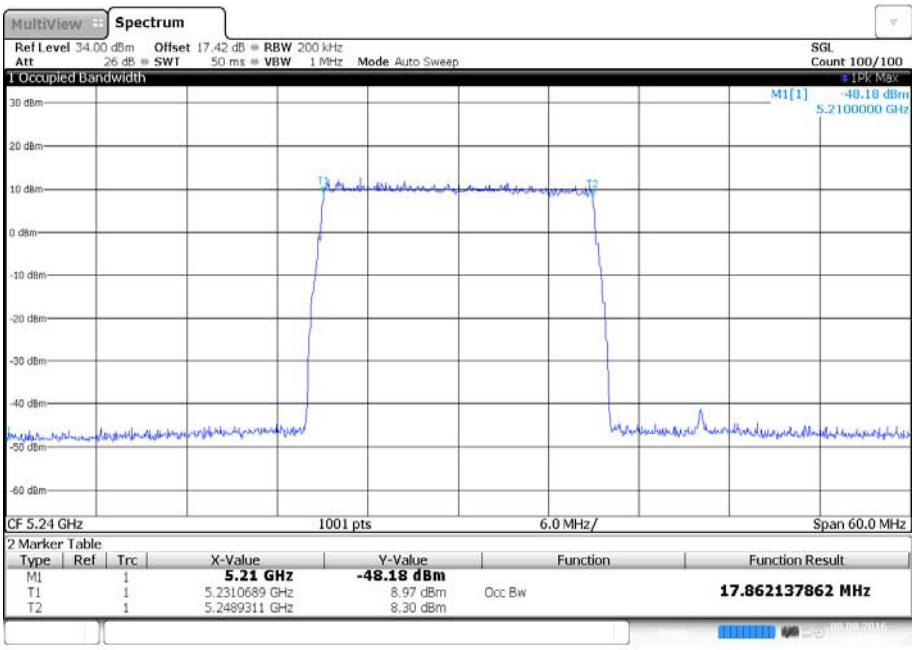
Antenna D - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5240 MHz - Measurement 99 % BW



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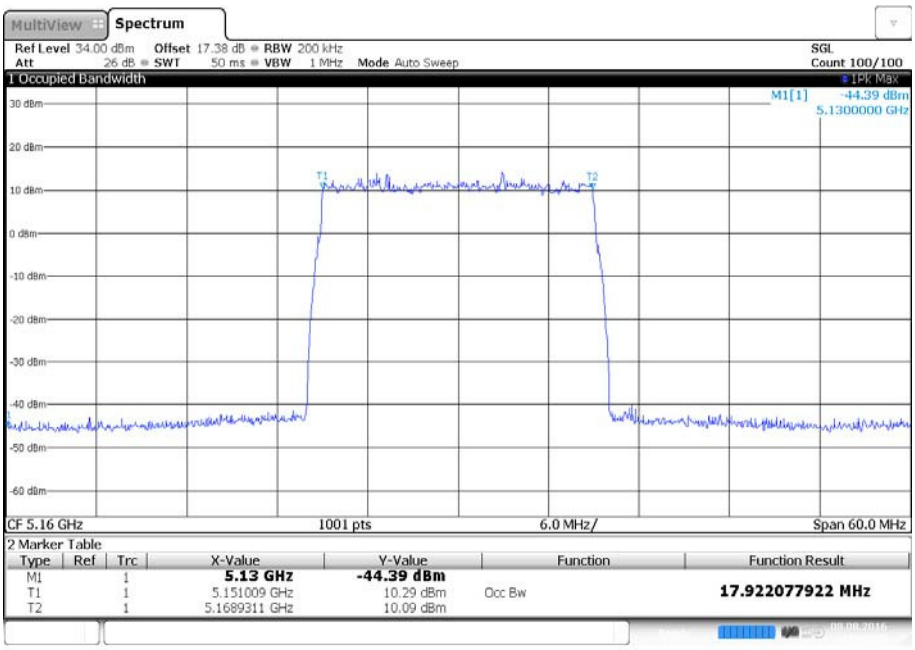
Antenna D - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5160 MHz - Measurement 99 % BW



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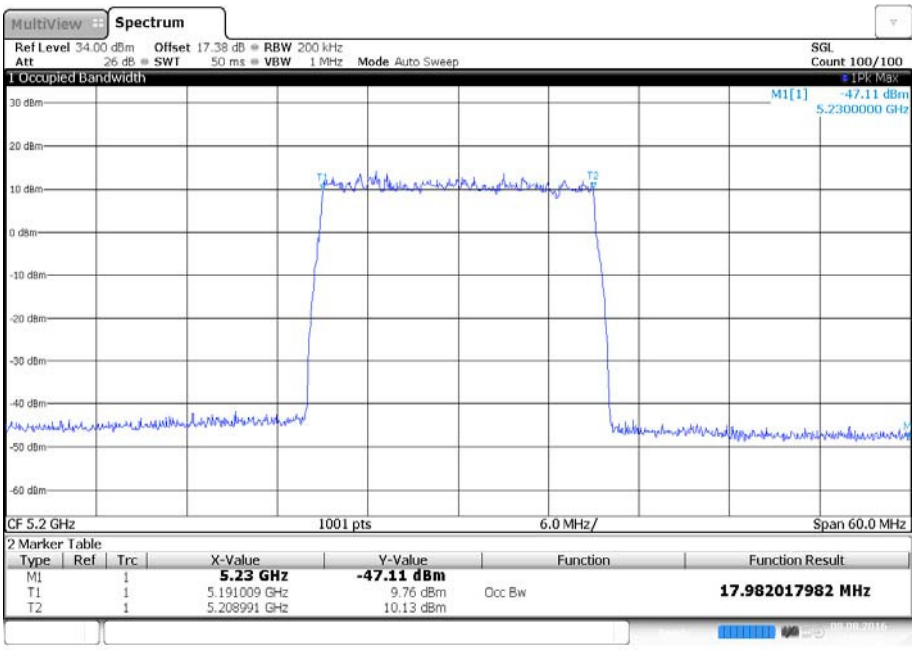
Antenna D - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5200 MHz - Measurement 99 % BW



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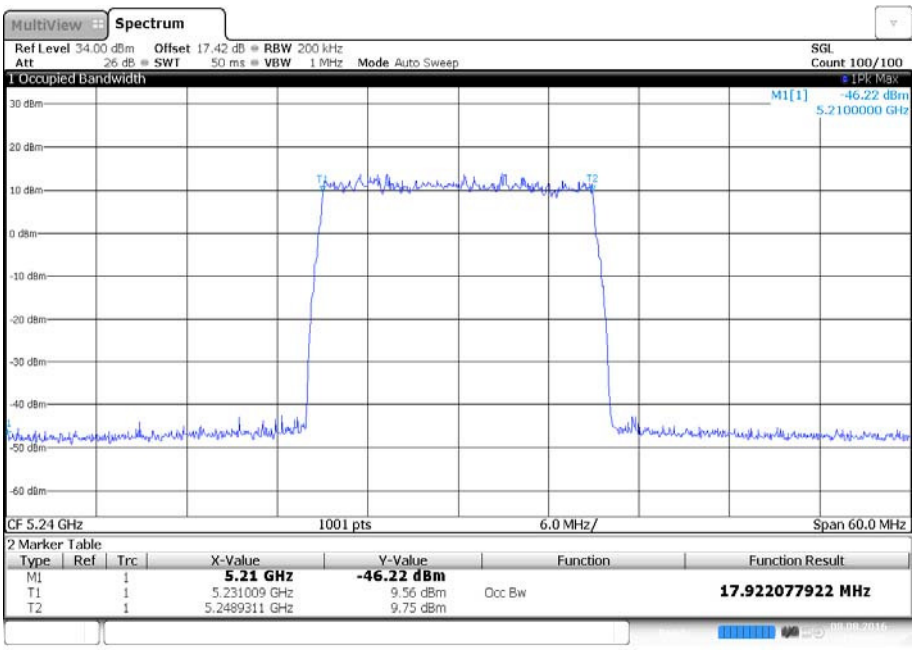
Antenna D - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5240 MHz - Measurement 99 % BW



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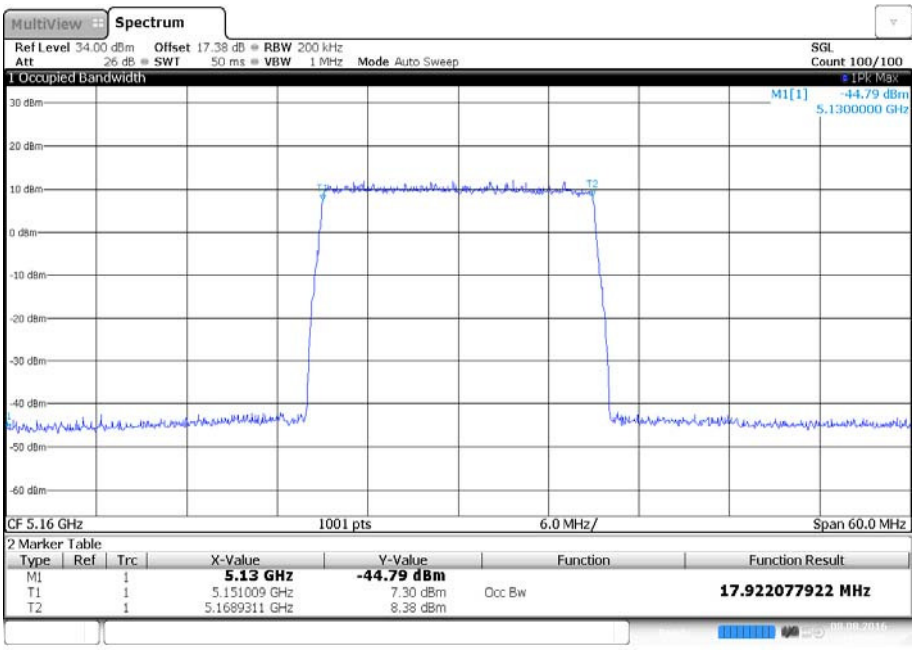
Antenna D - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5160 MHz - Measurement 99 % BW



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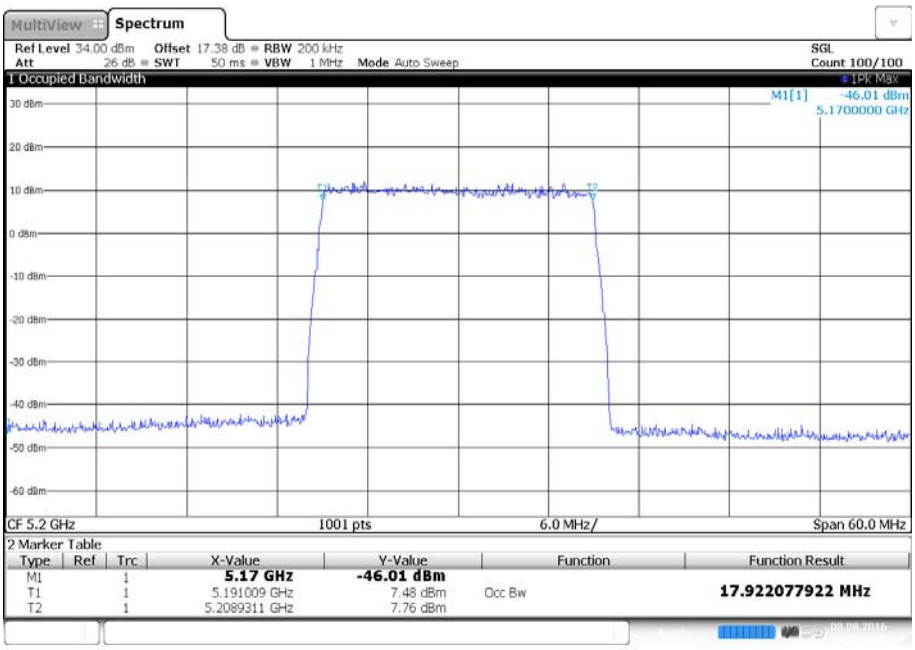
Antenna D - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5200 MHz - Measurement 99 % BW



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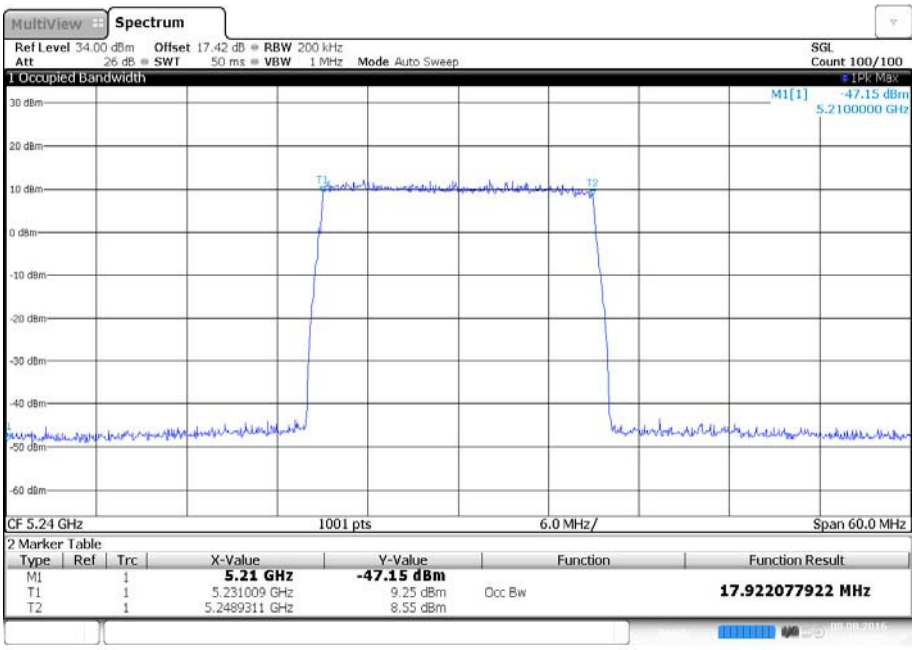
Antenna D - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5240 MHz - Measurement 99 % BW



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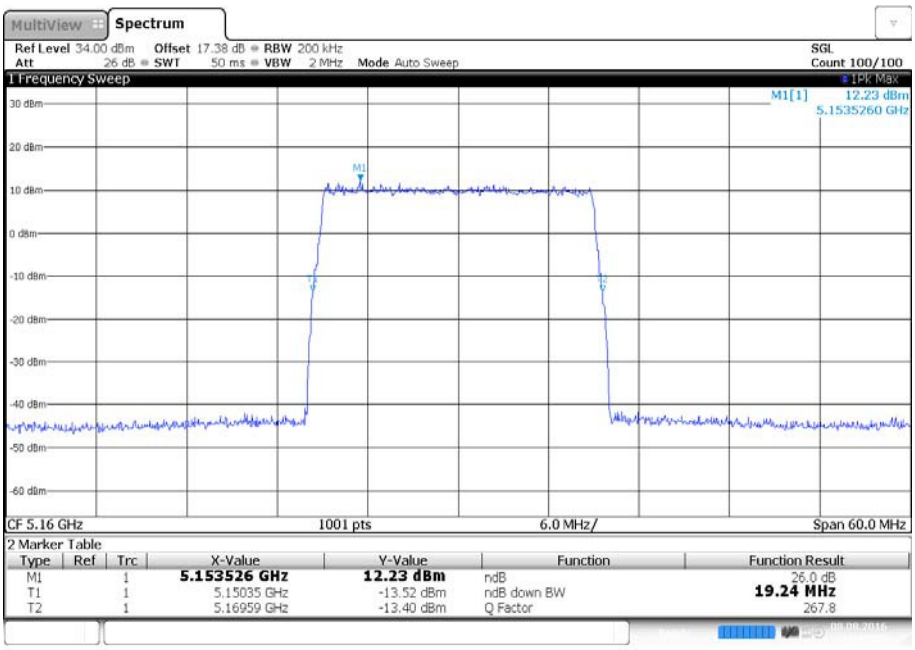
Antenna D - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5160 MHz - Measurement -26 dB BW



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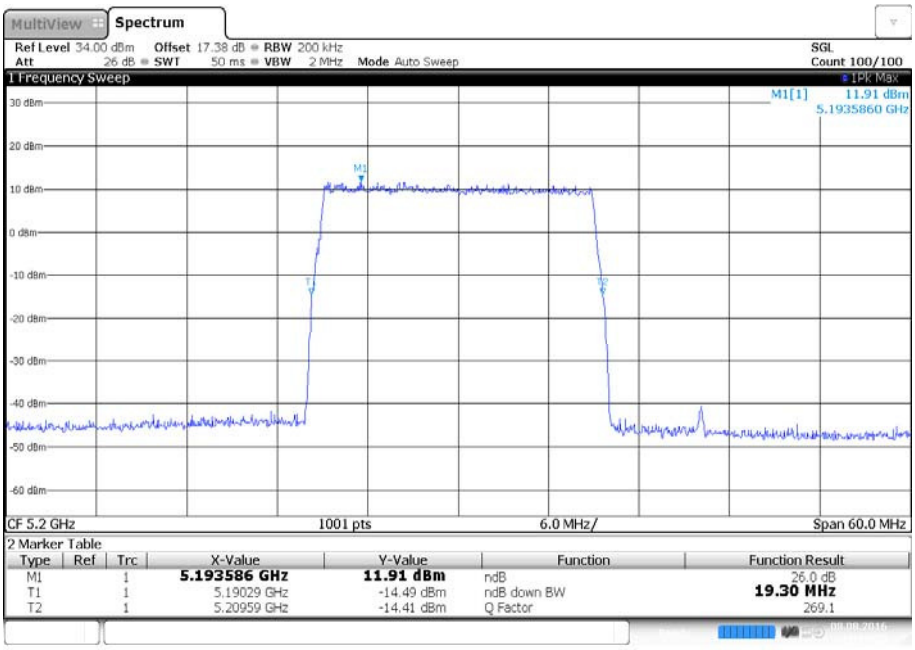

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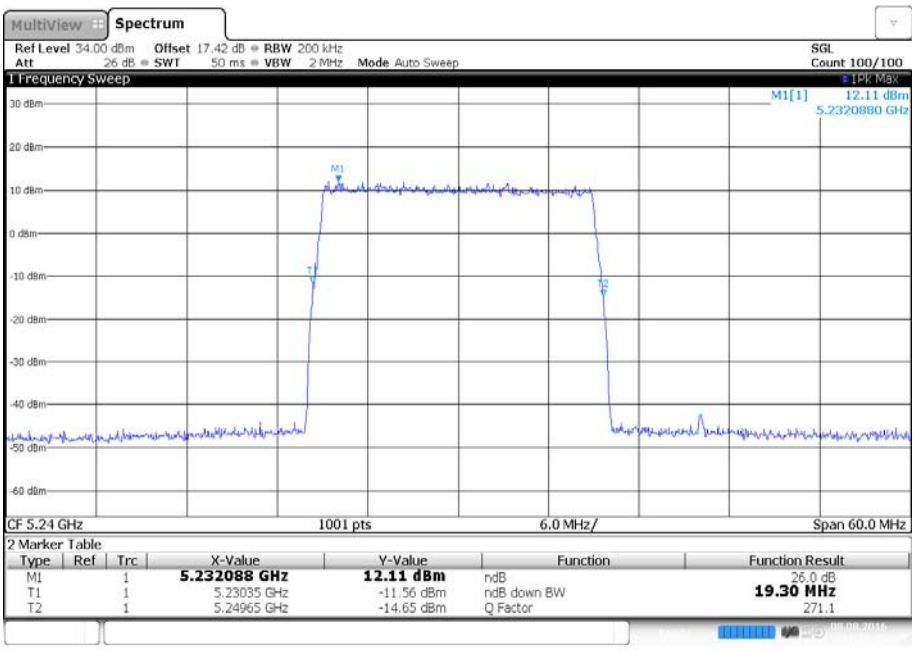
Antenna D - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5240 MHz - Measurement -26 dB BW



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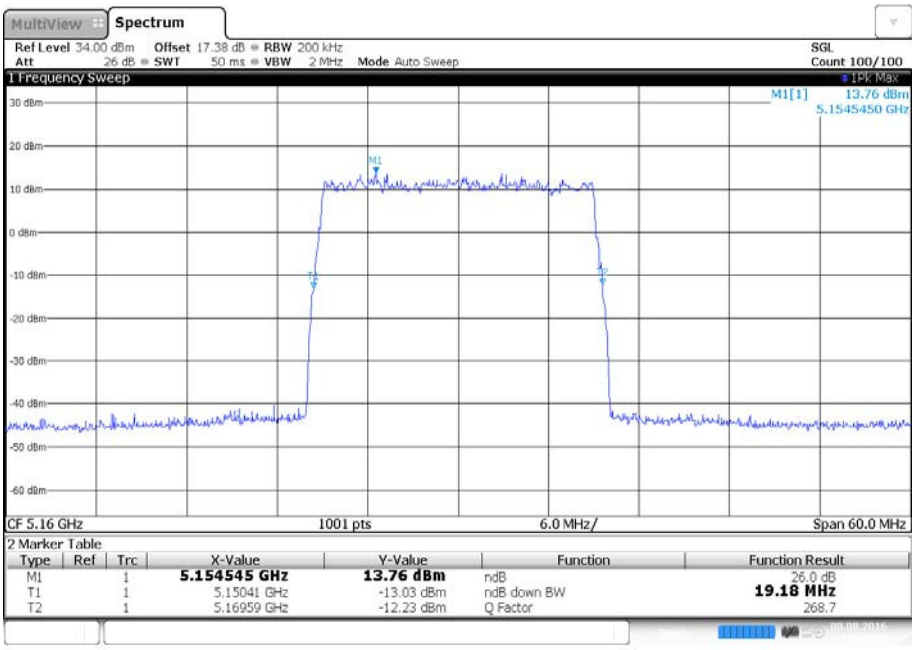

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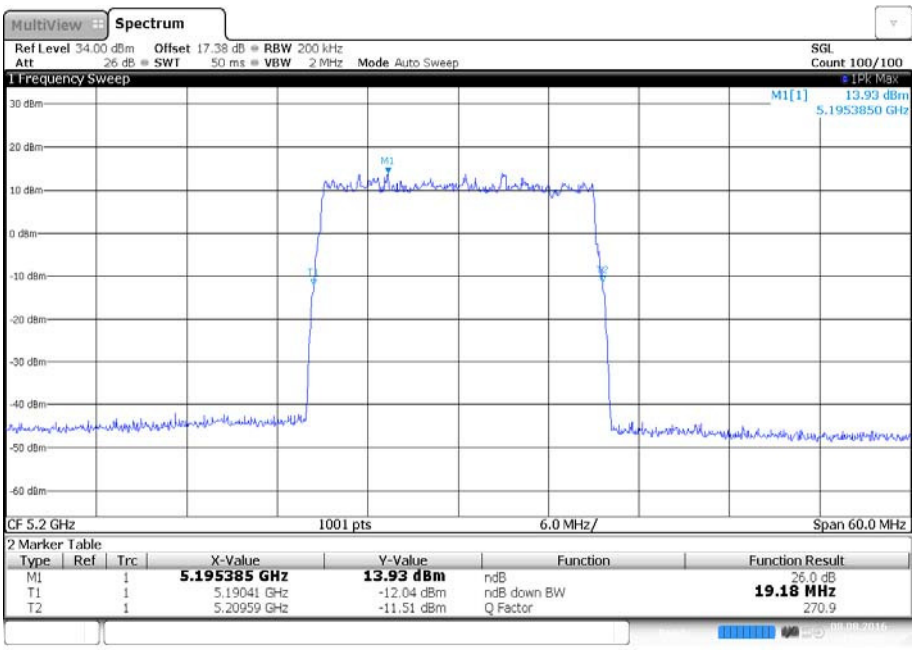
Antenna D - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5200 MHz - Measurement -26 dB BW



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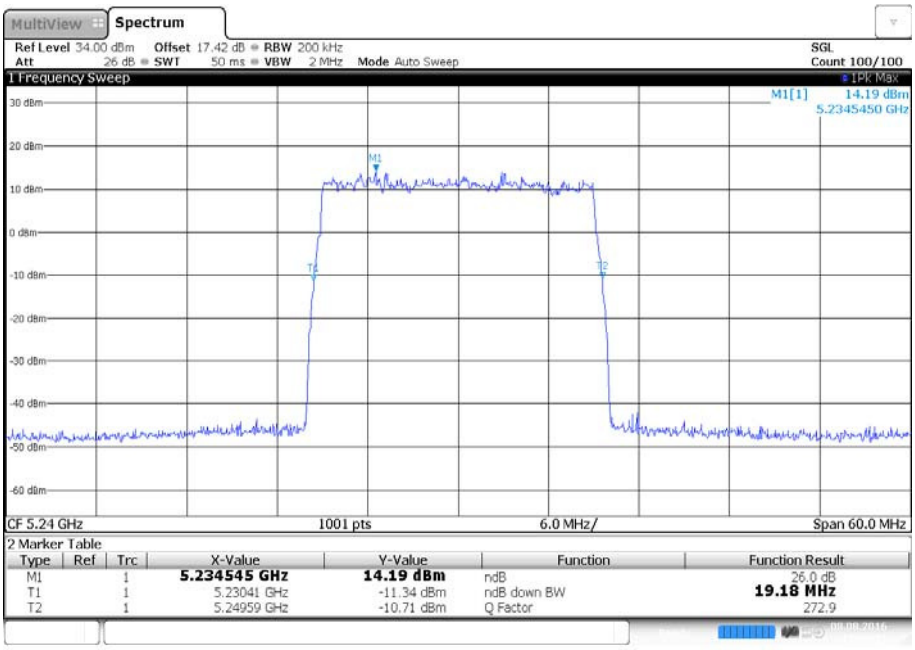
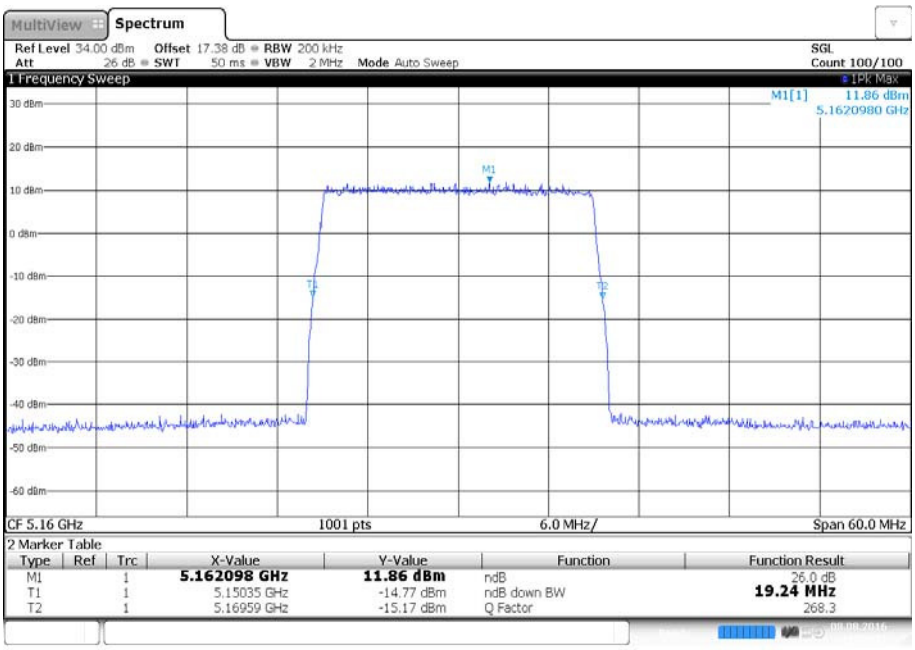
Antenna D - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5240 MHz - Measurement -26 dB BW



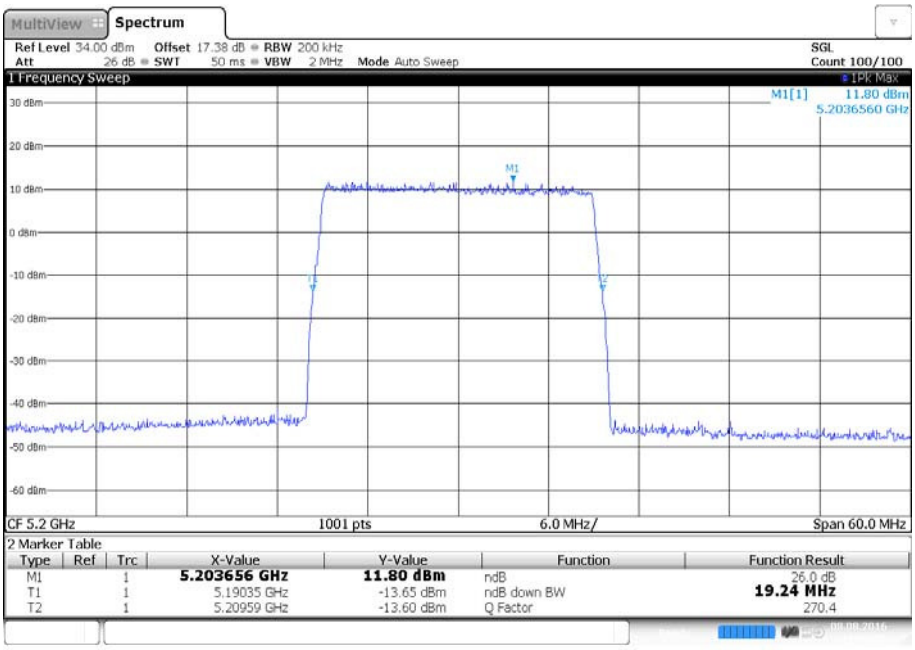
17:09:21 08.08.2016

Antenna D - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5160 MHz - Measurement -26 dB BW



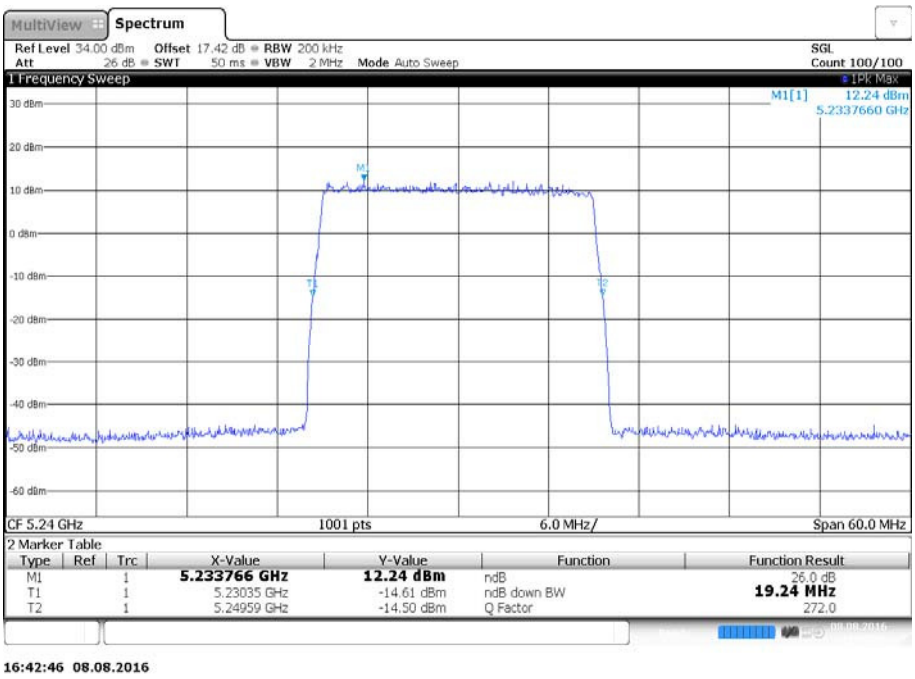
16:39:18 08.08.2016

Antenna D - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5200 MHz - Measurement -26 dB BW



16:41:02 08.08.2016

Antenna D - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5240 MHz - Measurement -26 dB BW



Configuration B

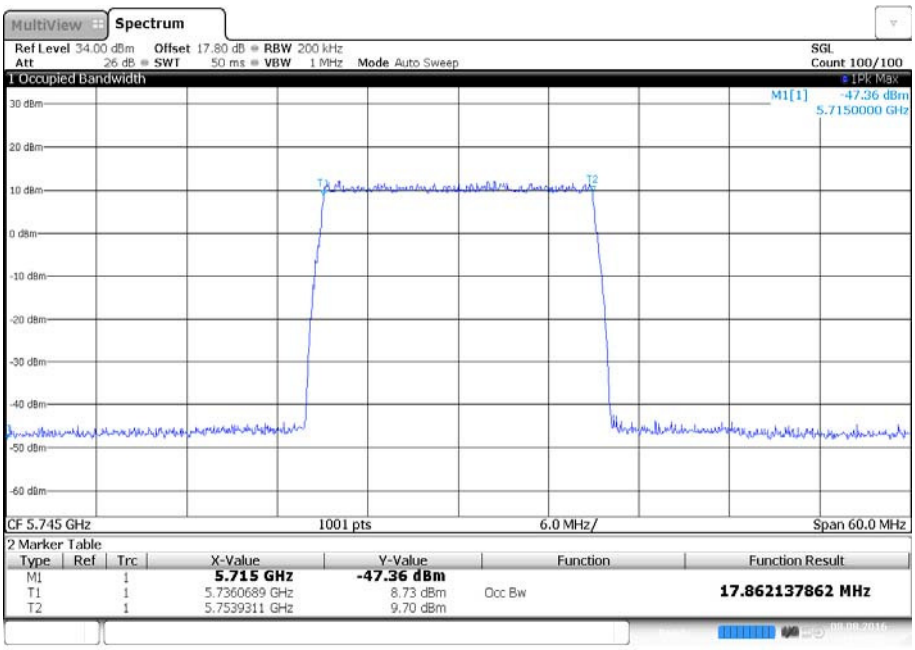
Maximum Output Power Per Carrier 21 dBm

Modulation	Carrier Bandwidth	Result (MHz)					
		5745 MHz		5785 MHz		5825 MHz	
		99% Bandwidth	-26 dB Bandwidth	99% Bandwidth	-26 dB Bandwidth	99% Bandwidth	-26 dB Bandwidth
QPSK	20.0 MHz	17.86	19.24	17.86	19.24	17.86	19.30
16QAM	20.0 MHz	17.92	19.18	17.92	19.24	17.86	19.18
64QAM	20.0 MHz	17.86	19.24	17.86	19.18	17.86	19.24

Remarks

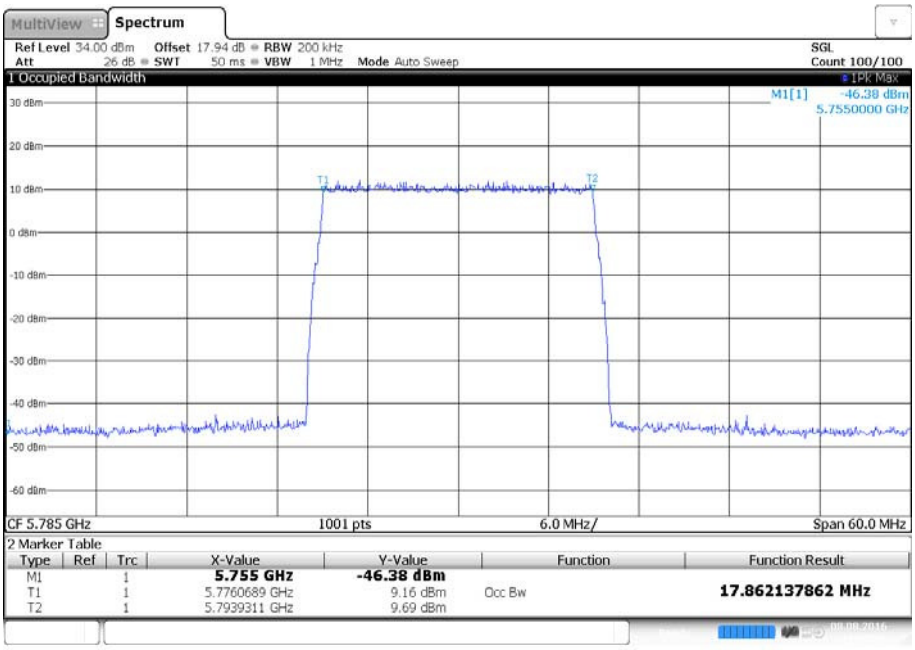
The minimum 6 dB bandwidth was greater than 500 kHz.

Antenna C - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5745 MHz - Measurement 99 % BW



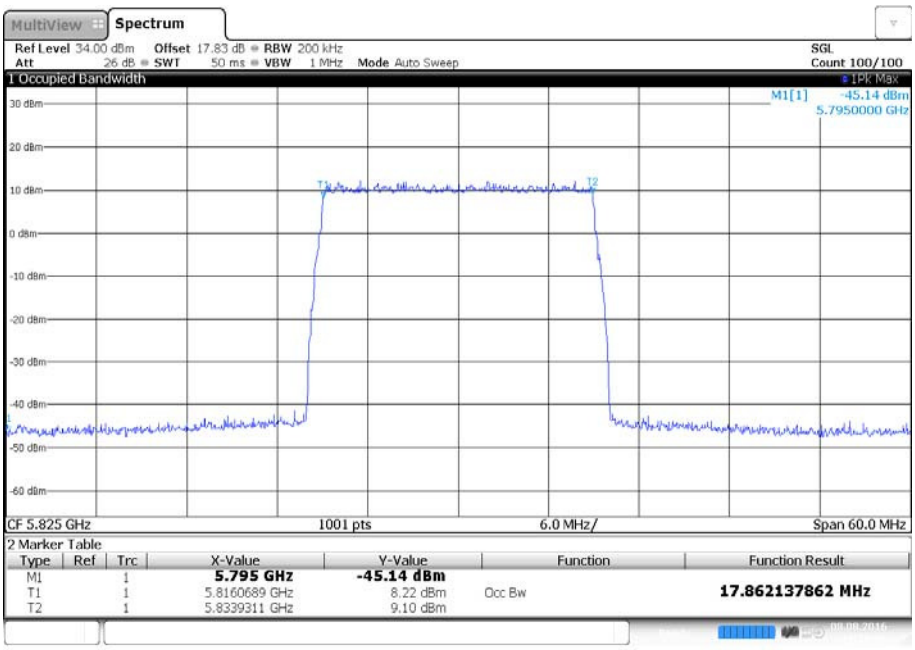
16:05:27 08.08.2016

Antenna C - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5785 MHz - Measurement 99 % BW



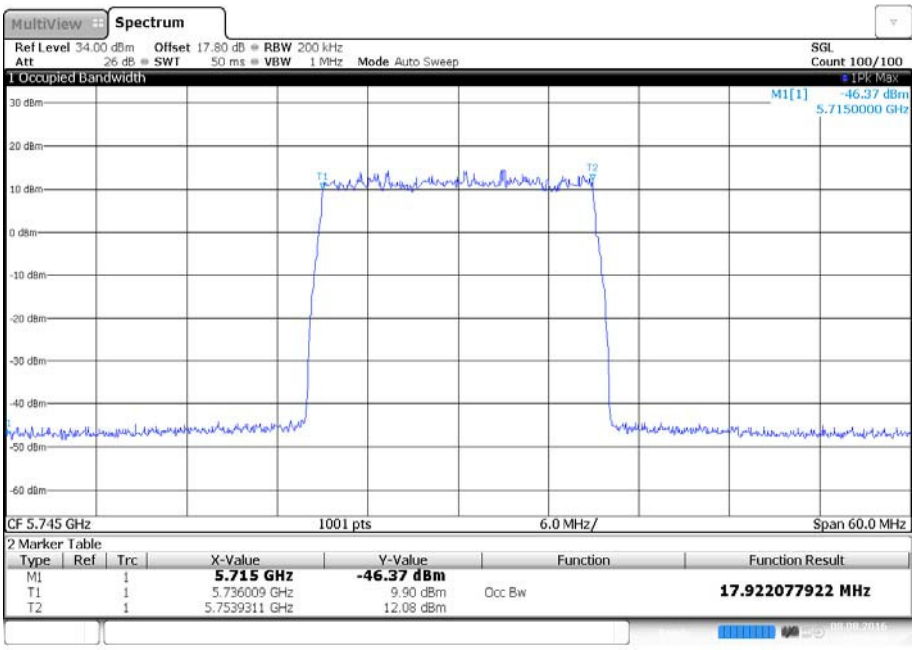
16:07:46 08.08.2016

Antenna C - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5825 MHz - Measurement 99 % BW



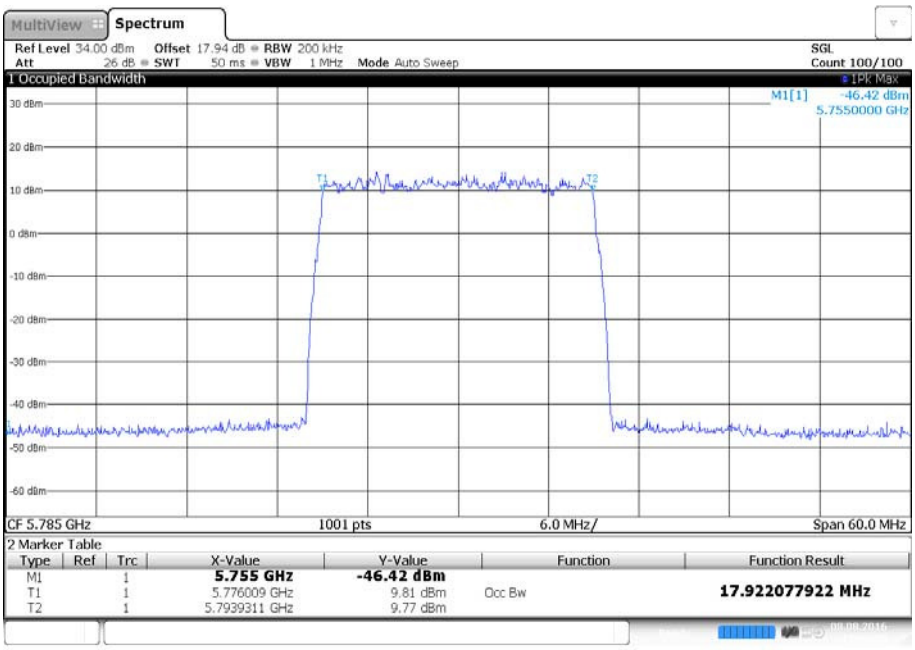
16:10:05 08.08.2016

Antenna C - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5745 MHz - Measurement 99 % BW



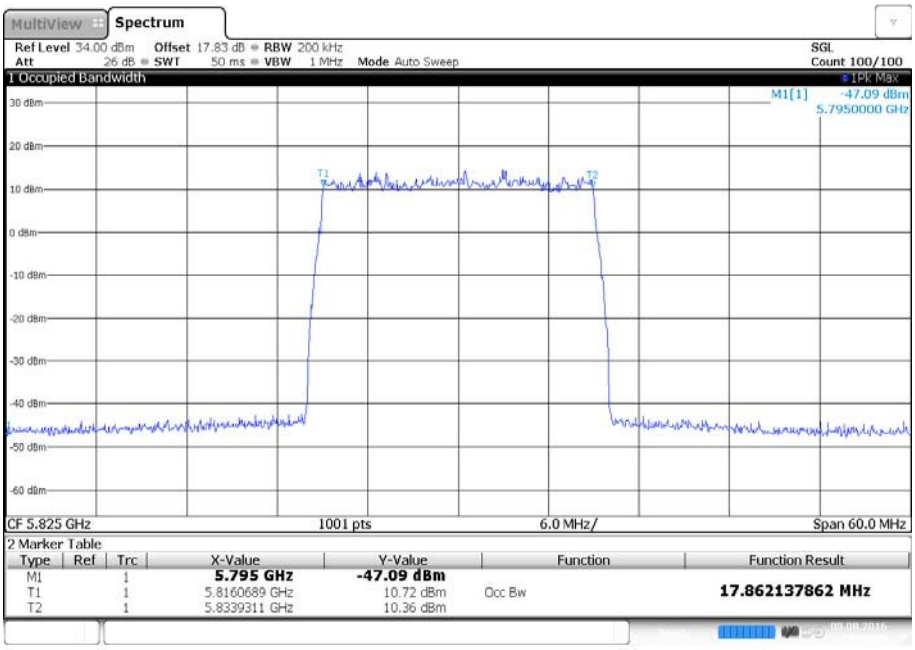
16:58:41 08.08.2016

Antenna C - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5785 MHz - Measurement 99 % BW



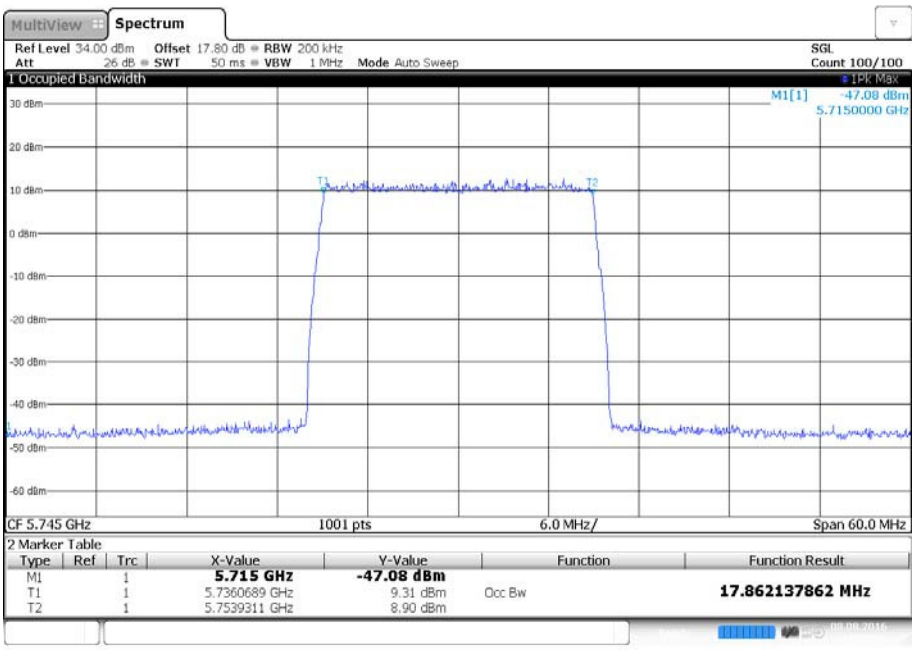
17:01:00 08.08.2016

Antenna C - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5825 MHz - Measurement 99 % BW



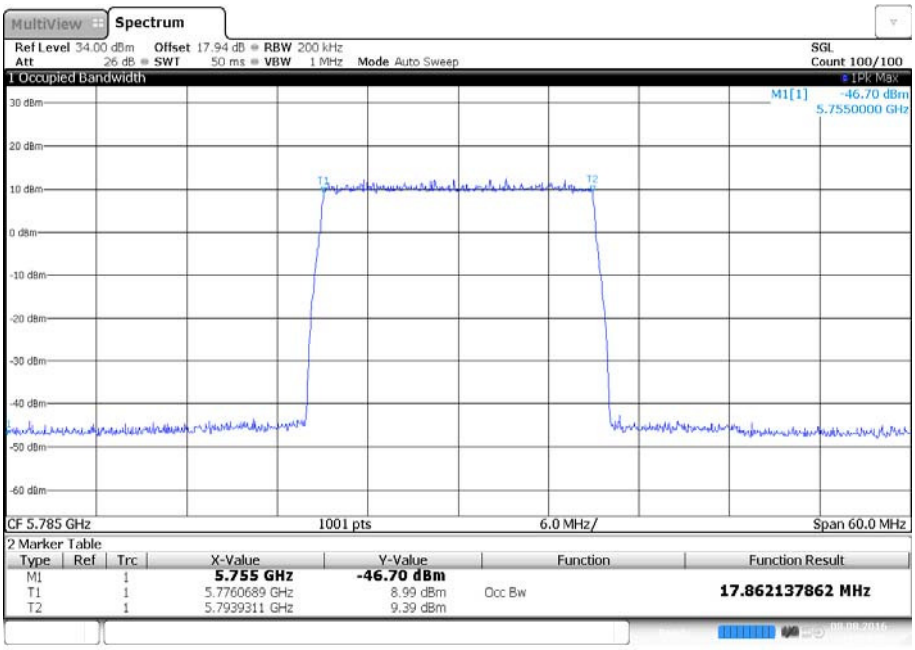
17:03:19 08.08.2016

Antenna C - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5745 MHz - Measurement 99 % BW



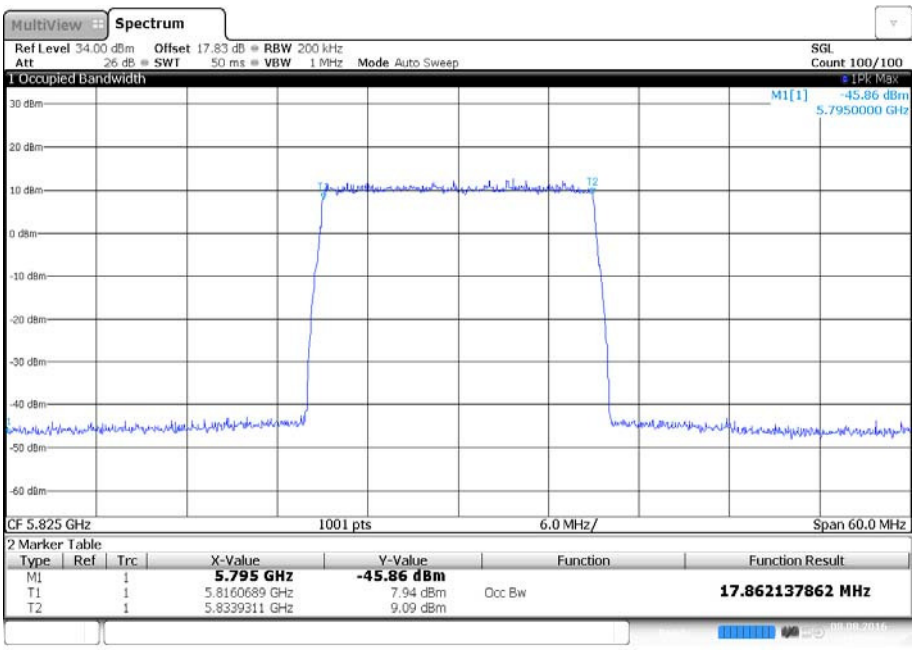
16:32:05 08.08.2016

Antenna C - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5785 MHz - Measurement 99 % BW



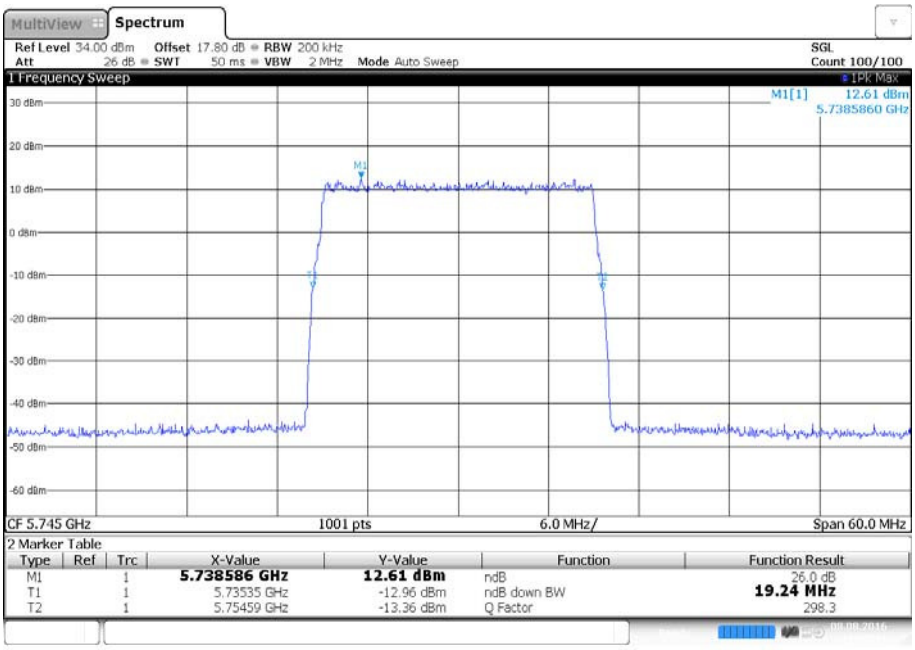
16:34:24 08.08.2016

Antenna C - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5825 MHz - Measurement 99 % BW



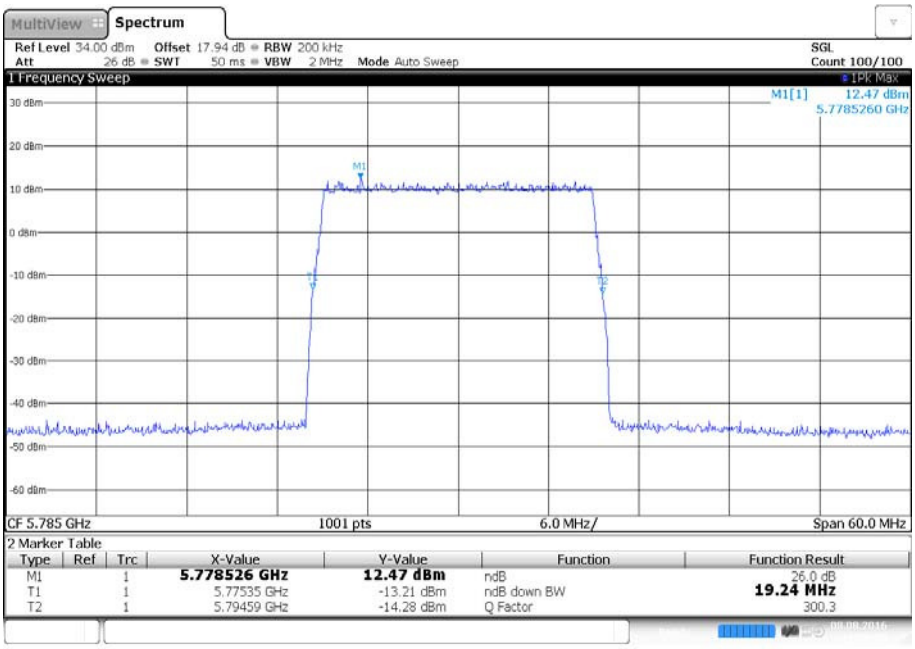
16:36:43 08.08.2016

Antenna C - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5745 MHz - Measurement -26 dB BW



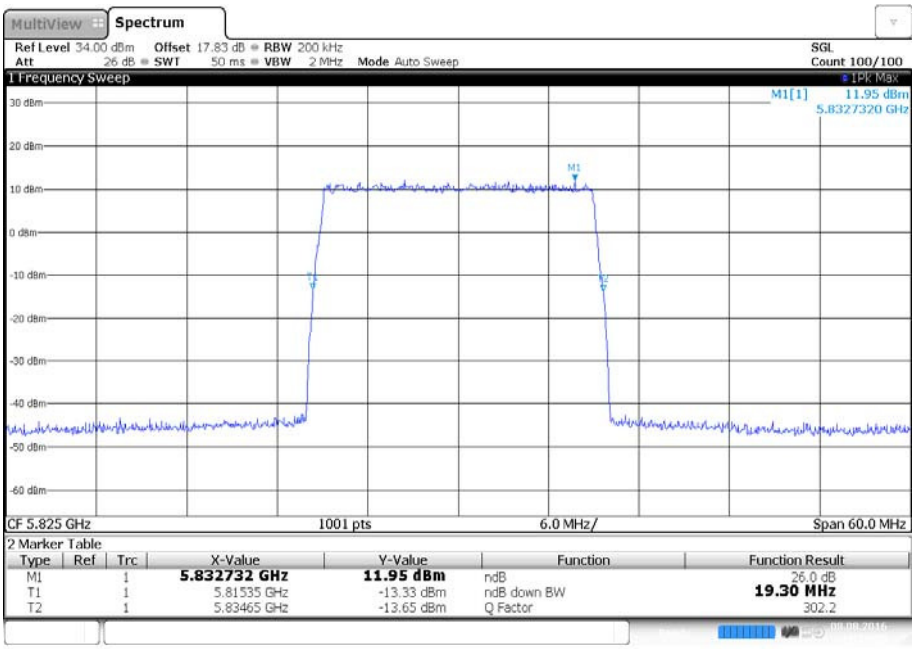
16:05:42 08.08.2016

Antenna C - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5785 MHz - Measurement -26 dB BW



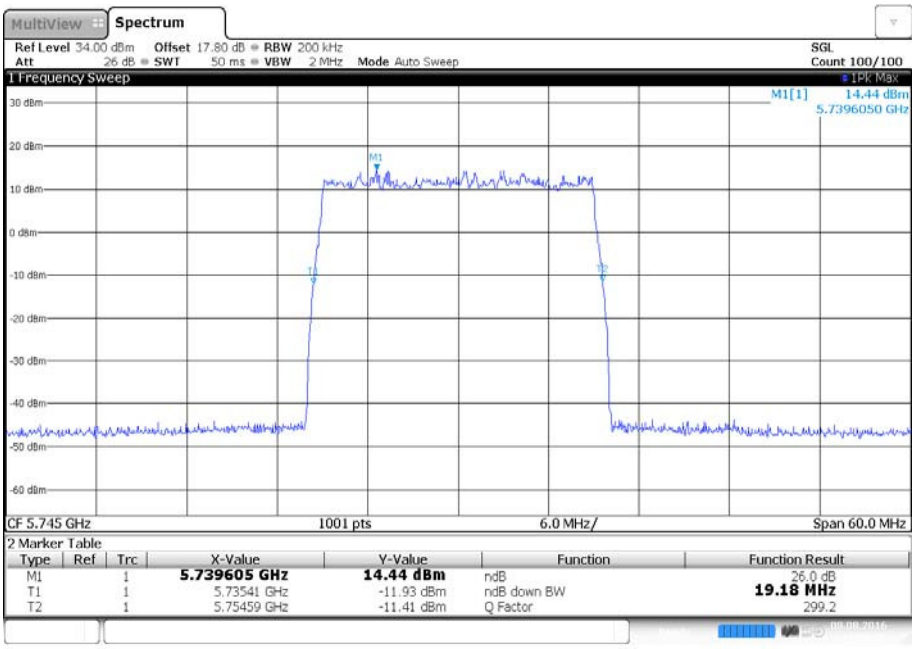
16:08:01 08.08.2016

Antenna C - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5825 MHz - Measurement -26 dB BW



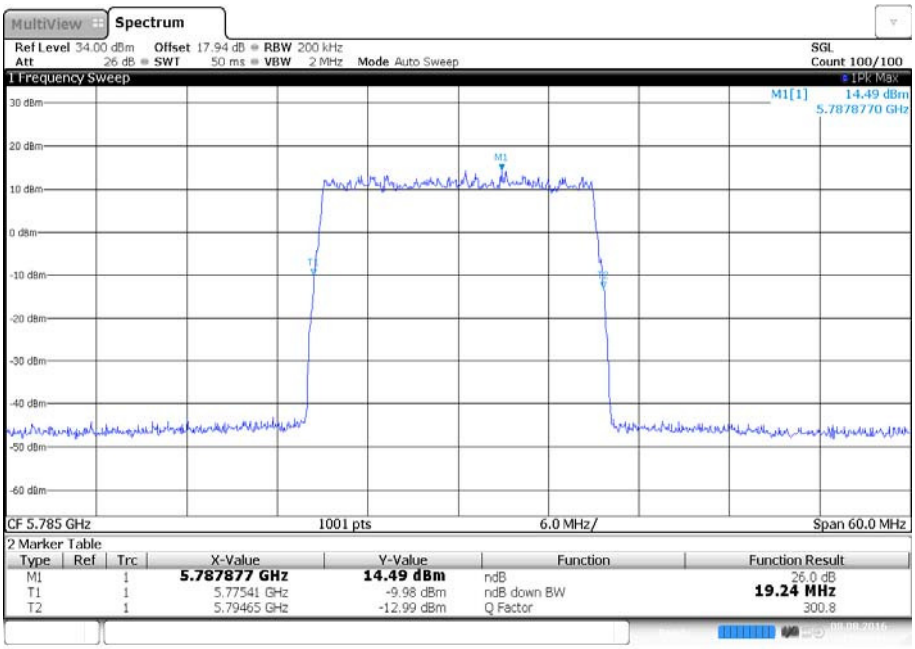
16:10:20 08.08.2016

Antenna C - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5745 MHz - Measurement -26 dB BW



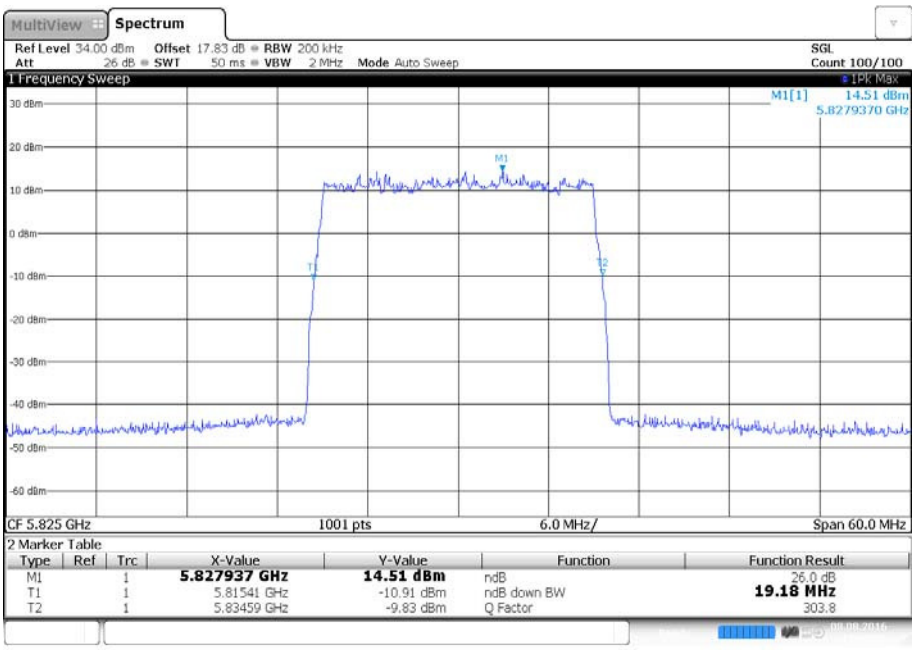
16:58:57 08.08.2016

Antenna C - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5785 MHz - Measurement -26 dB BW



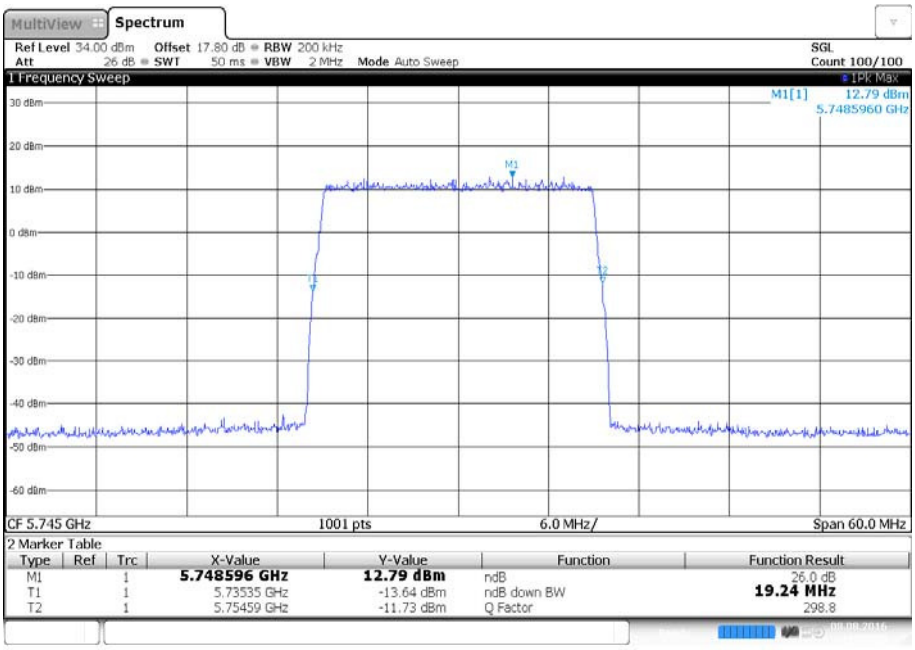
17:01:15 08.08.2016

Antenna C - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5825 MHz - Measurement -26 dB BW



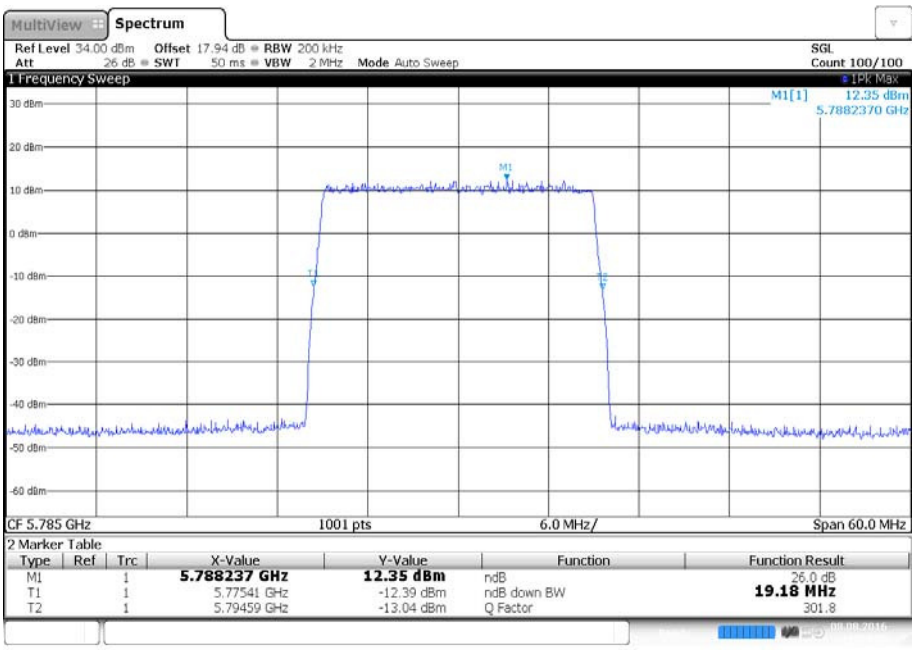
17:03:35 08.08.2016

Antenna C - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5745 MHz - Measurement -26 dB BW



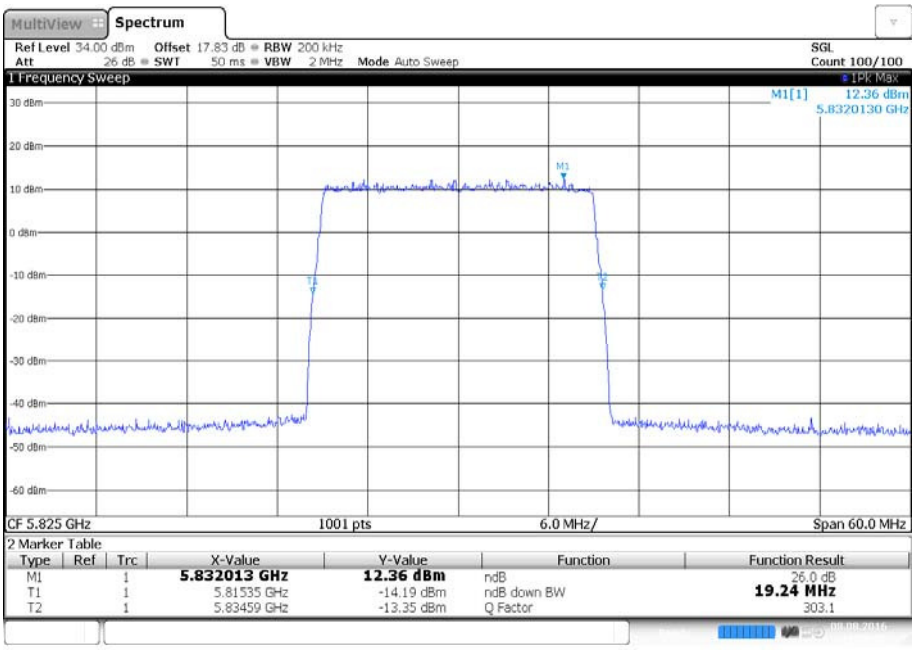
16:32:21 08.08.2016

Antenna C - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5785 MHz - Measurement -26 dB BW



16:34:40 08.08.2016

Antenna C - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5825 MHz - Measurement -26 dB BW



16:36:58 08.08.2016

Configuration B

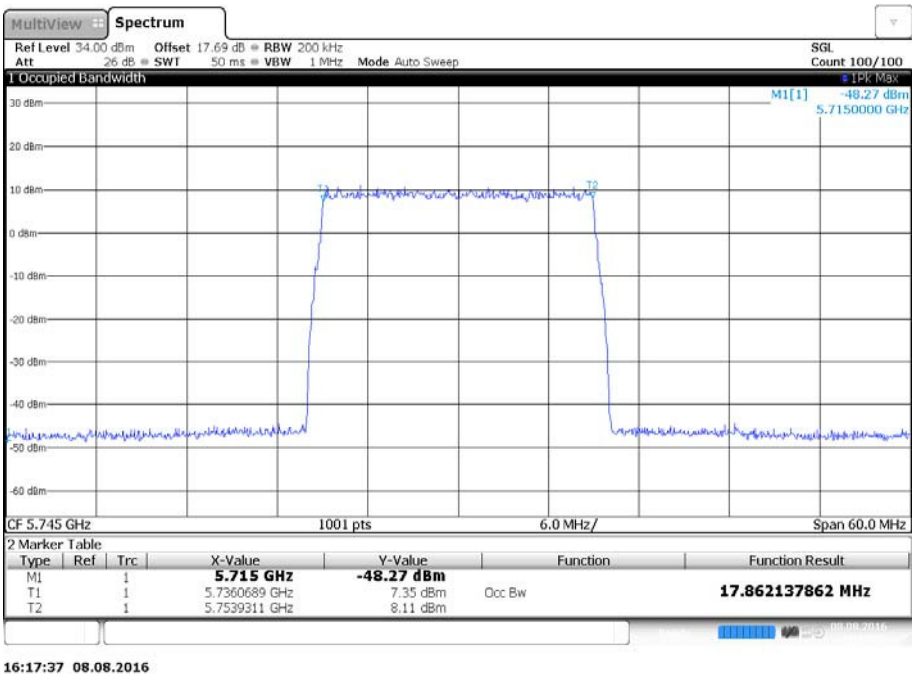
Maximum Output Power Per Carrier 21 dBm

Modulation	Carrier Bandwidth	Result (MHz)					
		5745 MHz		5785 MHz		5825 MHz	
		99% Bandwidth	-26 dB Bandwidth	99% Bandwidth	-26 dB Bandwidth	99% Bandwidth	-26 dB Bandwidth
QPSK	20.0 MHz	17.86	19.30	17.86	19.30	17.86	19.30
16QAM	20.0 MHz	17.98	19.24	17.92	19.18	17.92	19.24
64QAM	20.0 MHz	17.92	19.30	17.86	19.12	17.86	19.24

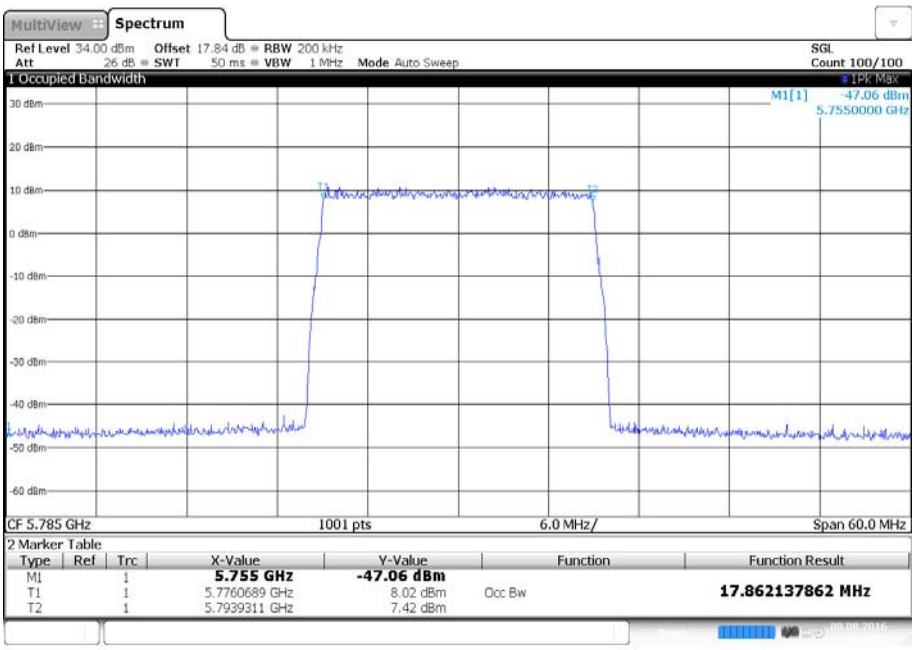
Remarks

The minimum 6 dB bandwidth was greater than 500 kHz.

Antenna D - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5745 MHz - Measurement 99 % BW

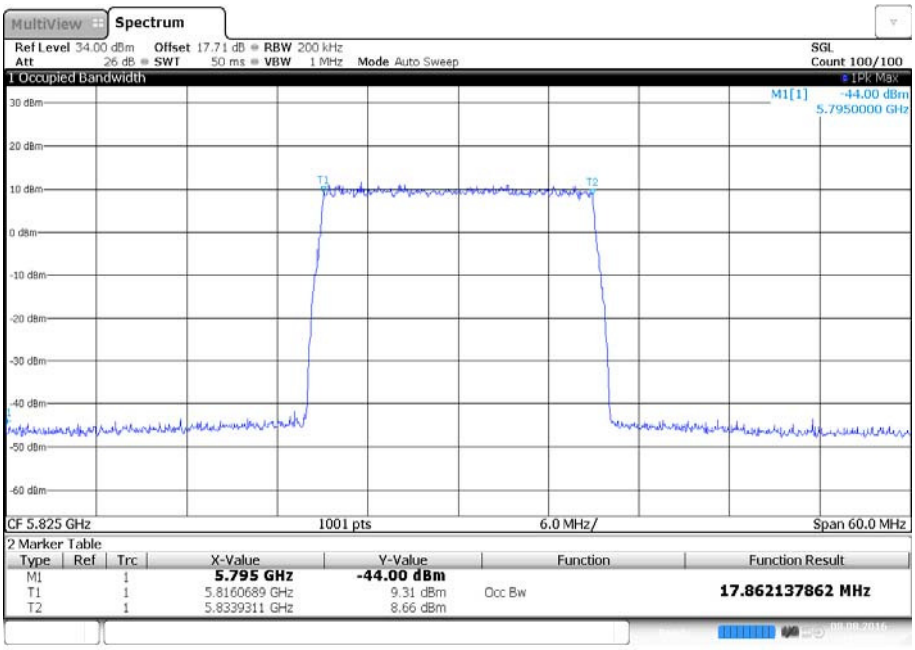


Antenna D - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5785 MHz - Measurement 99 % BW



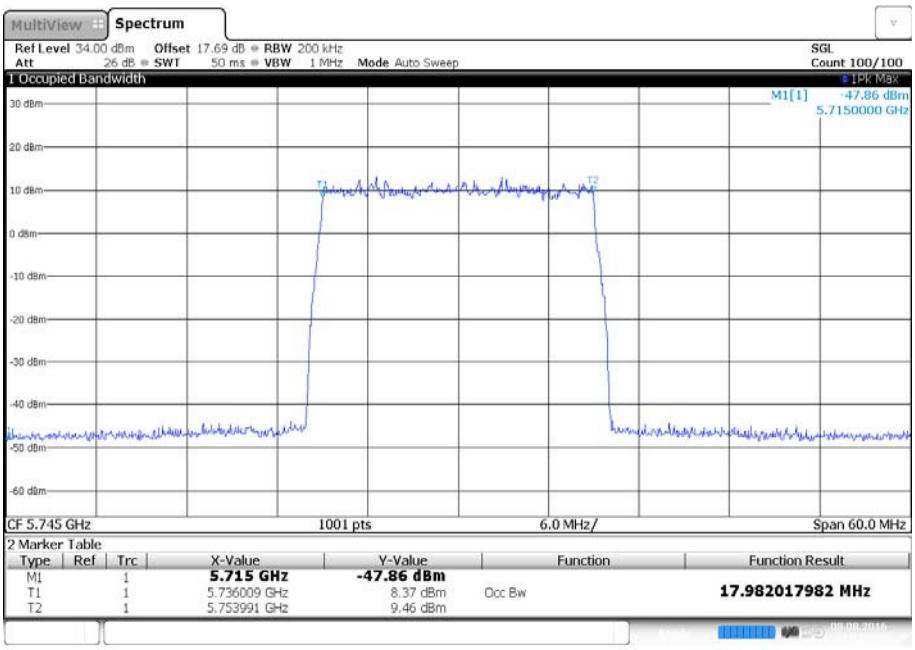
16:19:56 08.08.2016

Antenna D - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5825 MHz - Measurement 99 % BW



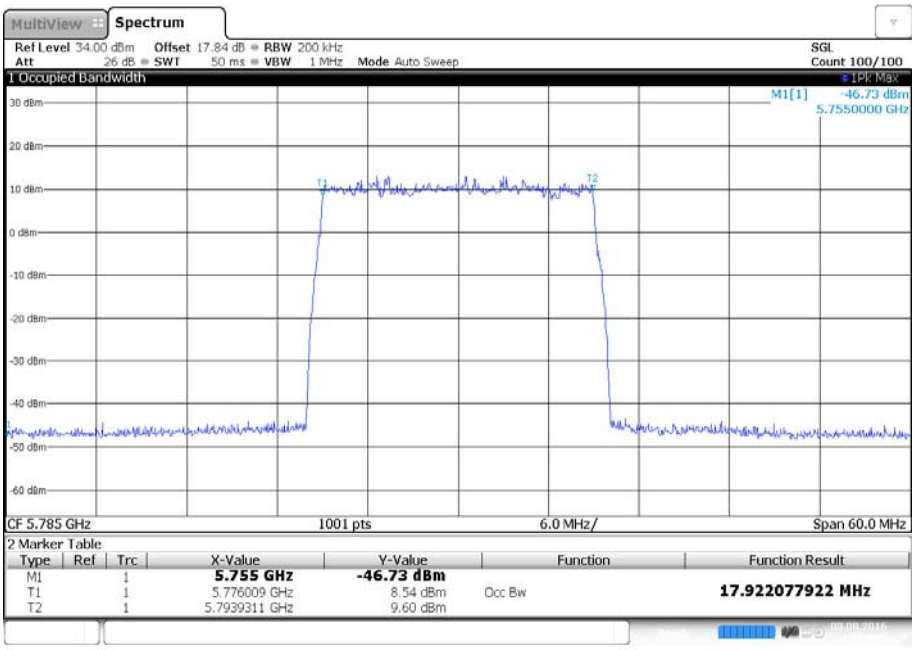
16:22:15 08.08.2016

Antenna D - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5745 MHz - Measurement 99 % BW



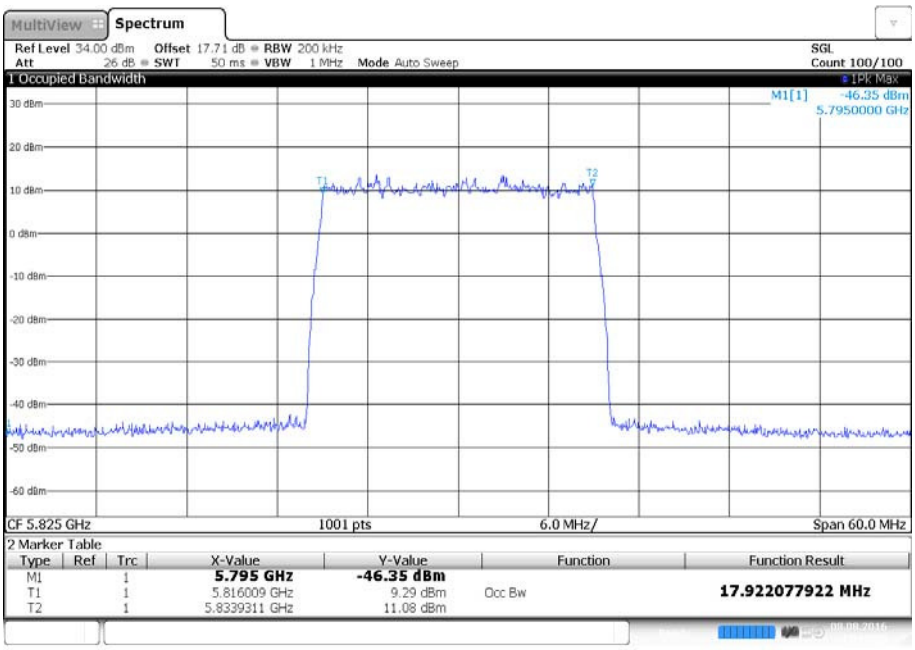
17:10:50 08.08.2016

Antenna D - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5785 MHz - Measurement 99 % BW



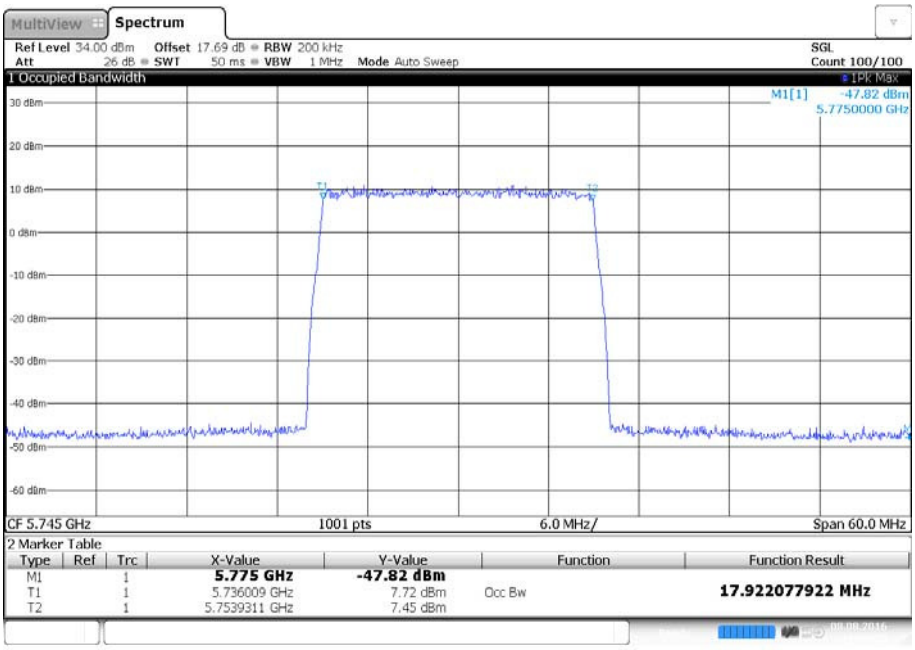
17:13:10 08.08.2016

Antenna D - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5825 MHz - Measurement 99 % BW



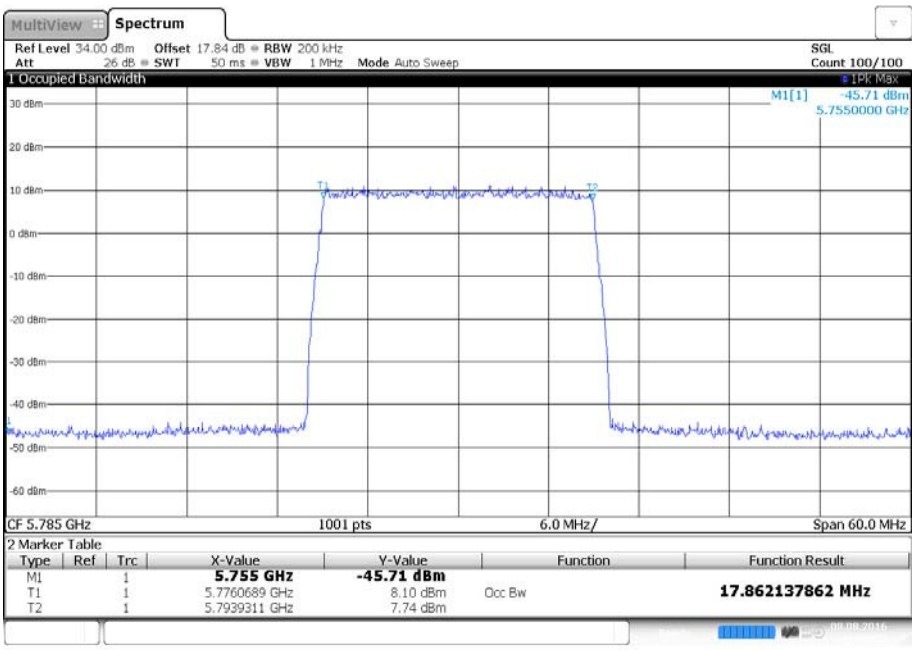
17:15:29 08.08.2016

Antenna D - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5745 MHz - Measurement 99 % BW



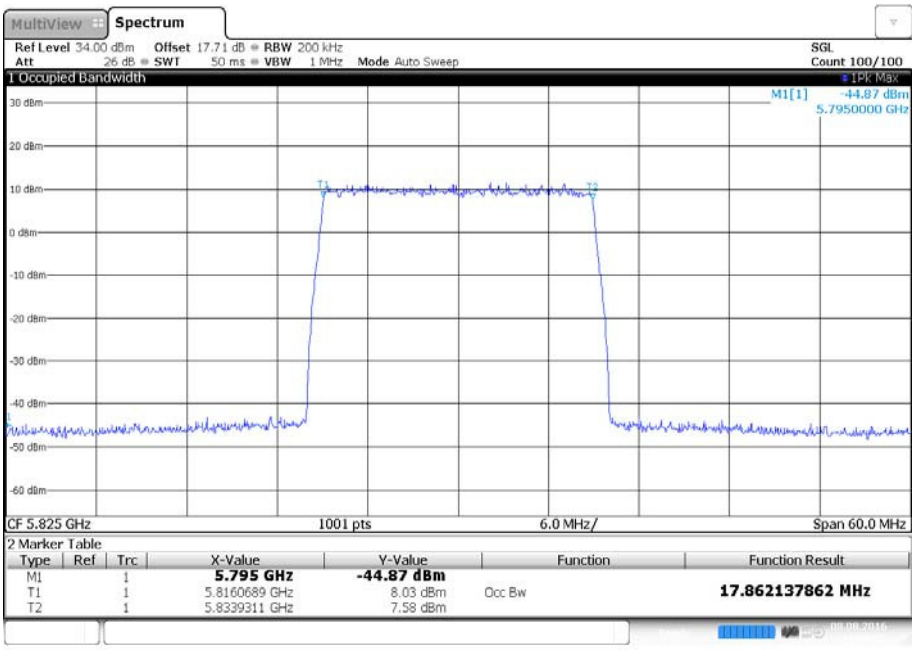
16:44:14 08.08.2016

Antenna D - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5785 MHz - Measurement 99 % BW



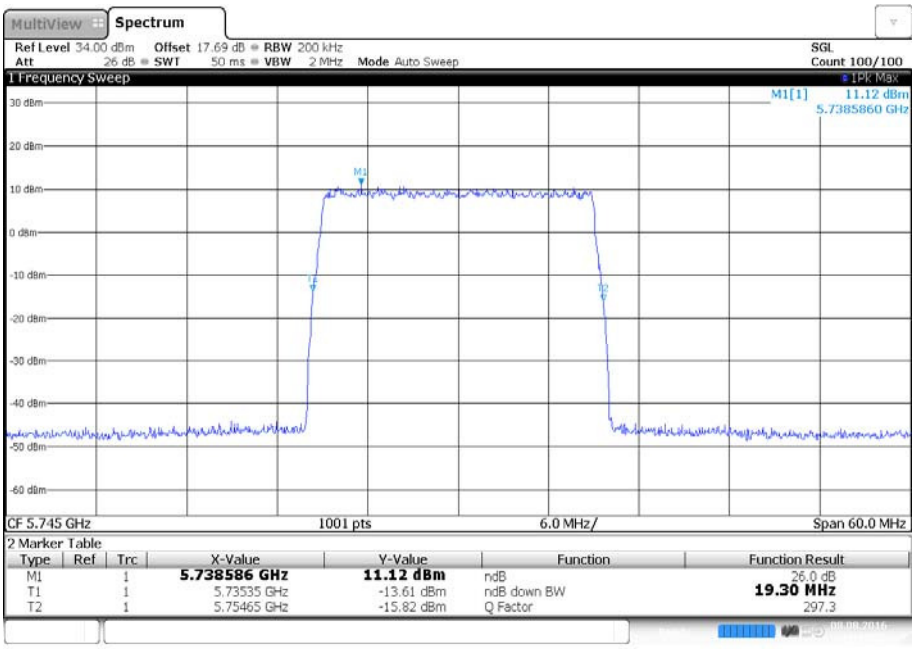
16:46:33 08.08.2016

Antenna D - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5825 MHz - Measurement 99 % BW



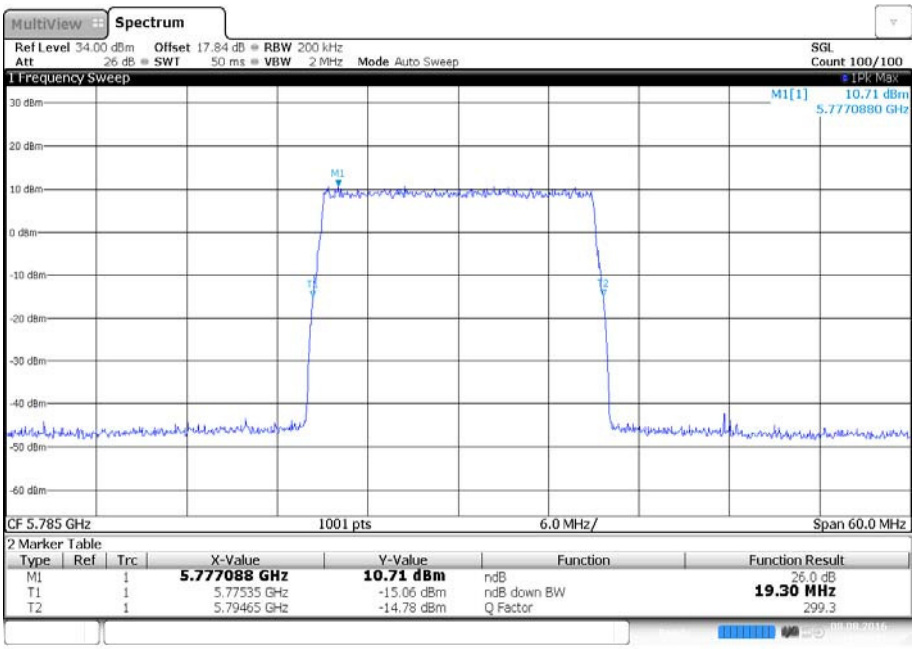
16:48:52 08.08.2016

Antenna D - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5745 MHz - Measurement -26 dB BW



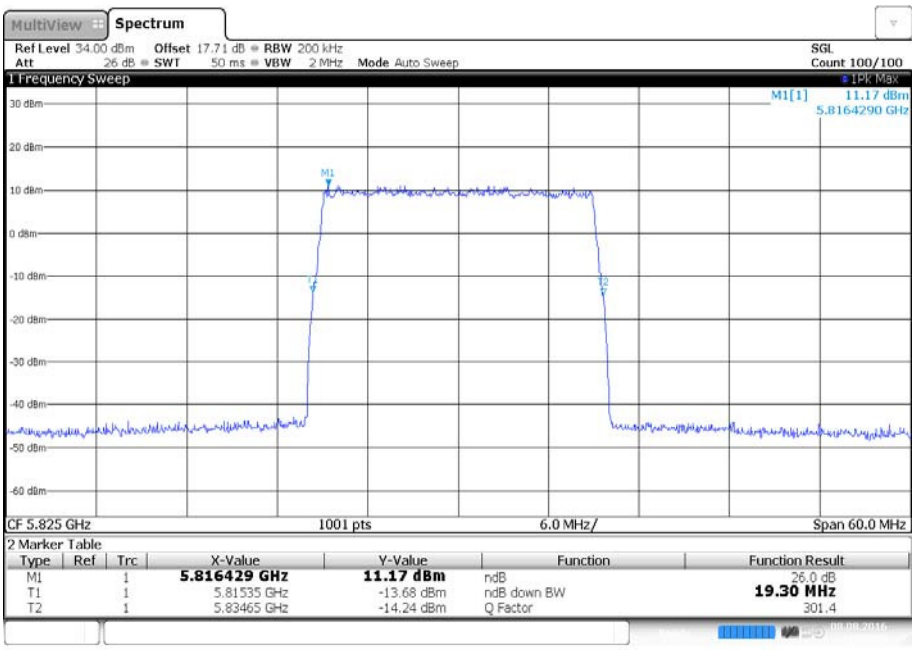
16:17:53 08.08.2016

Antenna D - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5785 MHz - Measurement -26 dB BW



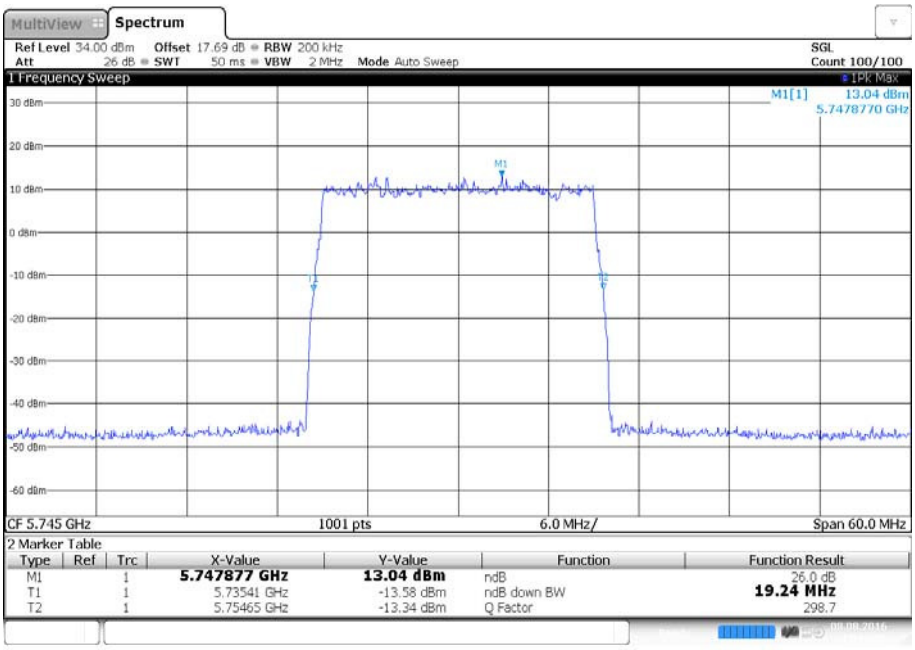
16:20:11 08.08.2016

Antenna D - Modulation QPSK - Carrier Bandwidth 20.0 MHz - Frequency 5825 MHz - Measurement -26 dB BW



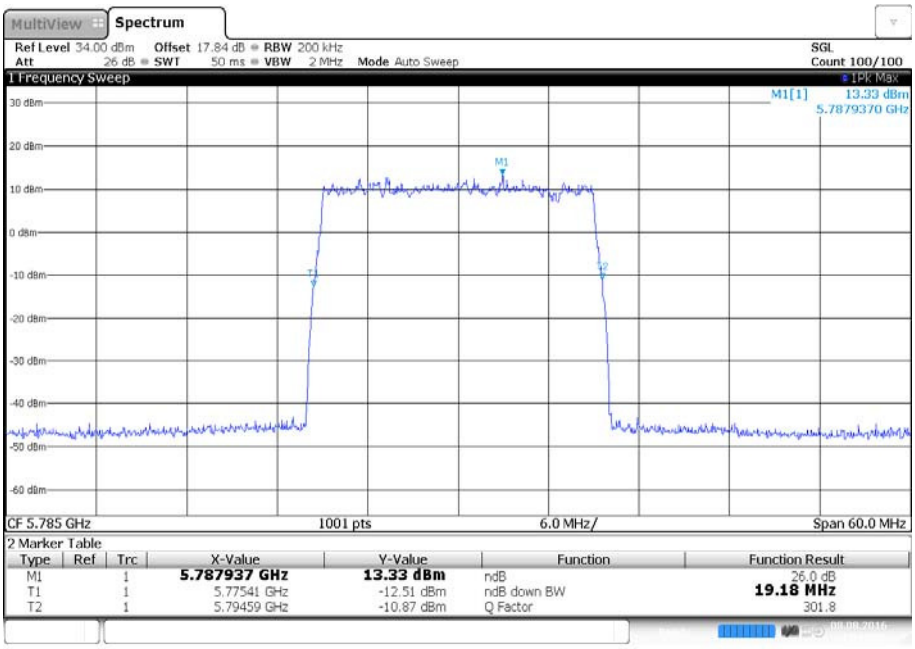
16:22:31 08.08.2016

Antenna D - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5745 MHz - Measurement -26 dB BW



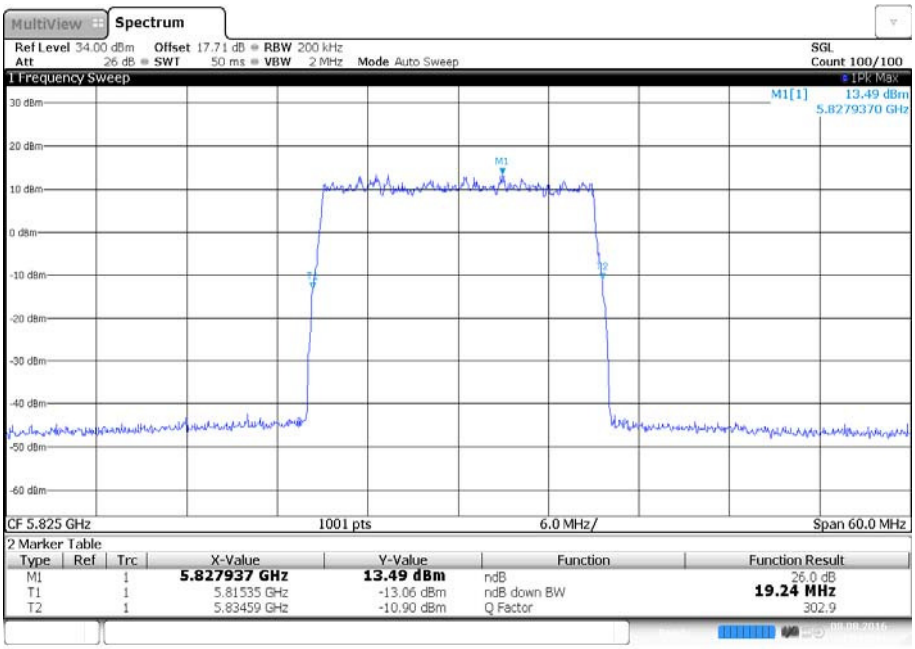
17:11:06 08.08.2016

Antenna D - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5785 MHz - Measurement -26 dB BW



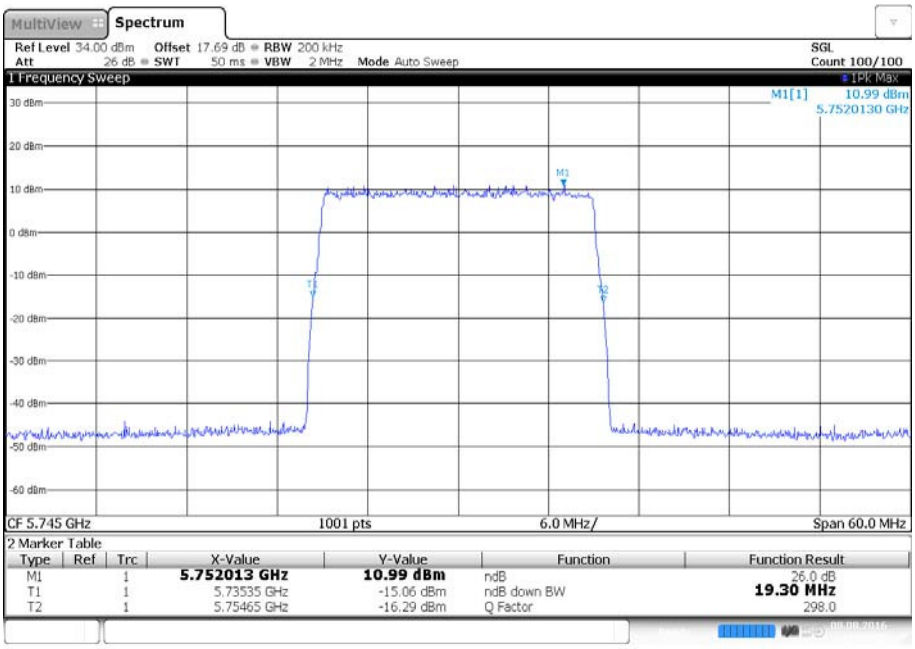
17:13:25 08.08.2016

Antenna D - Modulation 16QAM - Carrier Bandwidth 20.0 MHz - Frequency 5825 MHz - Measurement -26 dB BW



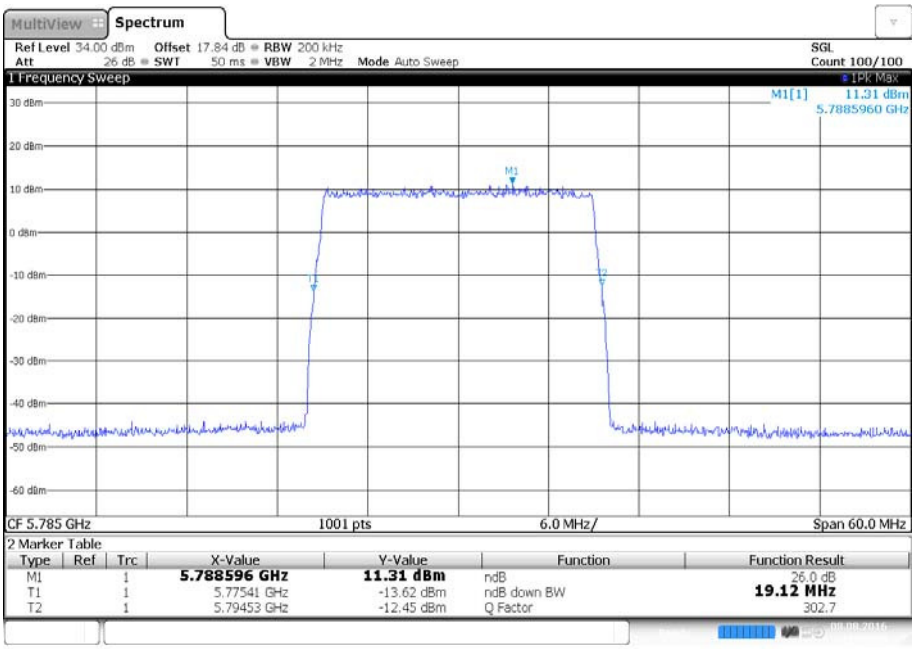
17:15:45 08.08.2016

Antenna D - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5745 MHz - Measurement -26 dB BW



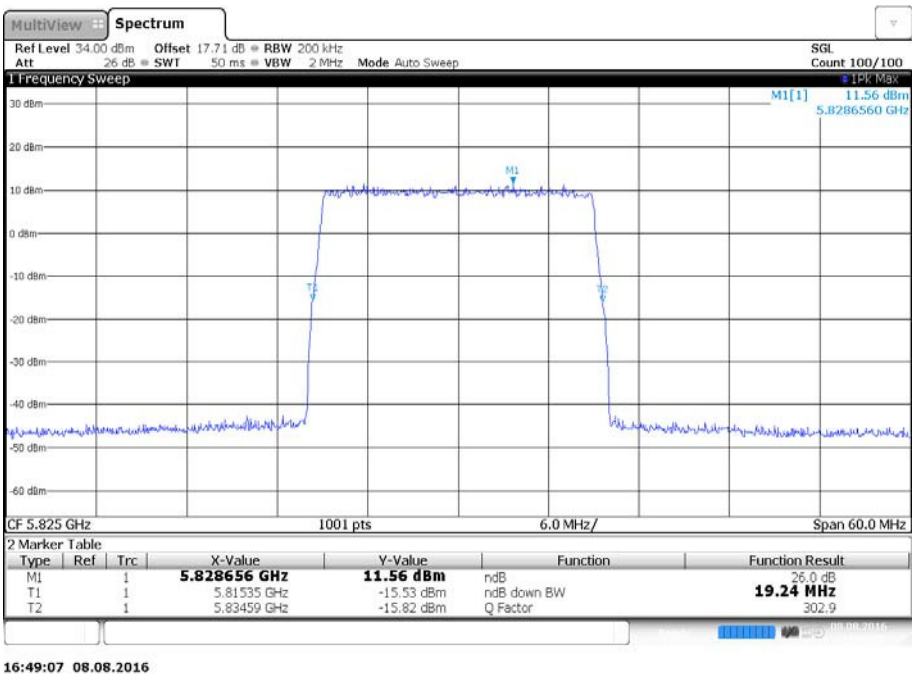
16:44:30 08.08.2016

Antenna D - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5785 MHz - Measurement -26 dB BW



16:46:49 08.08.2016

Antenna D - Modulation 64QAM - Carrier Bandwidth 20.0 MHz - Frequency 5825 MHz - Measurement -26 dB BW



2.2 CONDUCTED OUTPUT POWER

2.2.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (a)(1)(2)(3)

2.2.2 Date of Test and Modification State

08 August 2016 - Modification State 0

2.2.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.4 Environmental Conditions

Ambient Temperature 23.2°C
Relative Humidity 51.2%

2.2.5 Test Method

All measurements were made in accordance with FCC KDB 789033 D02 section II.E.3.a) and summed in accordance with FCC KDB 662911 D01.

2.2.6 Test Results

Configuration A

Maximum Output Power Per Carrier 21 dBm

Modulation	Carrier Bandwidth (MHz)	Antenna	Conducted Output Power (dBm)		
			5160 MHz	5200 MHz	5240 MHz
QPSK	20.0 MHz	C	19.40	20.66	20.77
		D	18.84	20.12	20.26
Total			22.14	23.41	23.53
16QAM	20.0 MHz	C	19.42	20.65	20.74
		D	18.82	20.07	20.27
Total			22.14	23.38	23.52
64QAM	20.0 MHz	C	19.39	20.64	20.74
		D	18.85	20.08	20.28
Total			22.14	23.38	23.53

Remarks

The radiation pattern is different for both antennas. The gain of one antenna is higher in one direction than the other resulting in an overall maximum gain of 5 dBi.

Configuration B

Maximum Output Power Per Carrier 21 dBm

Modulation	Carrier Bandwidth (MHz)	Antenna	Conducted Output Power (dBm)		
			5745 MHz	5785 MHz	5825 MHz
QPSK	20.0 MHz	C	20.48	20.37	20.38
		D	18.89	19.16	19.55
Total			22.77	22.82	23.00
16QAM	20.0 MHz	C	20.49	20.36	20.41
		D	18.90	19.13	19.54
Total			22.78	22.80	23.01
64QAM	20.0 MHz	C	20.48	20.34	20.38
		D	18.90	19.12	19.53
Total			22.77	22.78	22.99

Remarks

The radiation pattern is different for both antennas. The gain of one antenna is higher in one direction than the other resulting in an overall maximum gain of 5 dBi.

2.3 POWER SPECTRAL DENSITY

2.3.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (a)(5)

2.3.2 Date of Test and Modification State

08 August 2016 - Modification State 0

2.3.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.4 Environmental Conditions

Ambient Temperature 23.1°C
Relative Humidity 54.7%

2.3.5 Test Method

All measurements were made in accordance with FCC KDB 789033 D02 section II.F.

2.3.6 Test Results

Configuration A

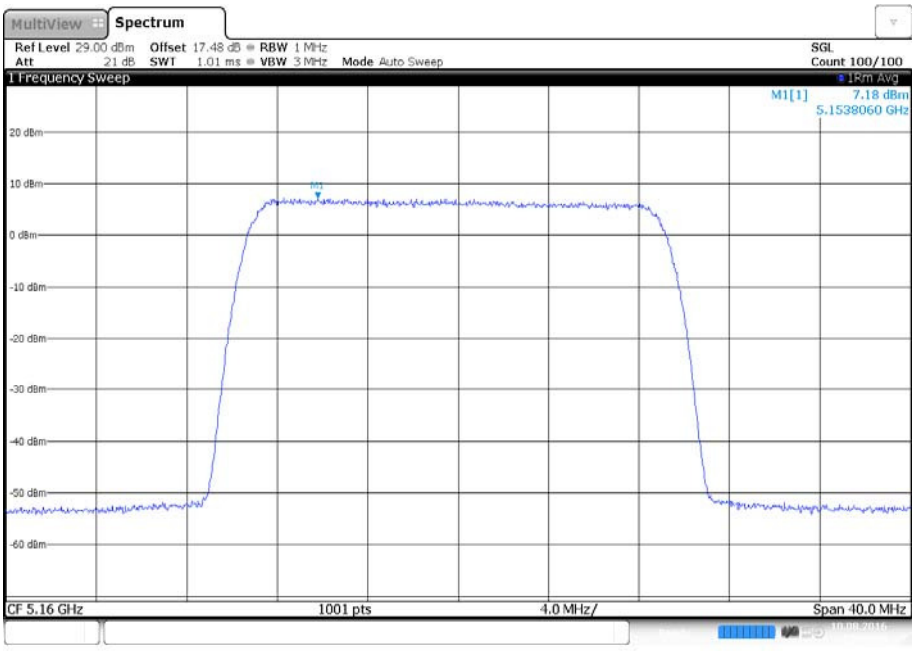
Maximum Output Power Per Carrier 21 dBm

Modulation	Carrier Bandwidth (MHz)	Antenna	Power Spectral Density (dBm)		
			5160 MHz	5200 MHz	5240 MHz
QPSK	20.0 MHz	C	7.18	7.95	7.98
		D	6.48	7.58	7.76
Total			9.85	10.78	10.88
16QAM	20.0 MHz	C	7.39	8.43	8.19
		D	6.55	7.97	8.39
Total			10.00	11.22	11.30
64QAM	20.0 MHz	C	7.25	8.17	8.03
		D	6.80	7.80	8.26
Total			10.04	11.00	11.16

Remarks

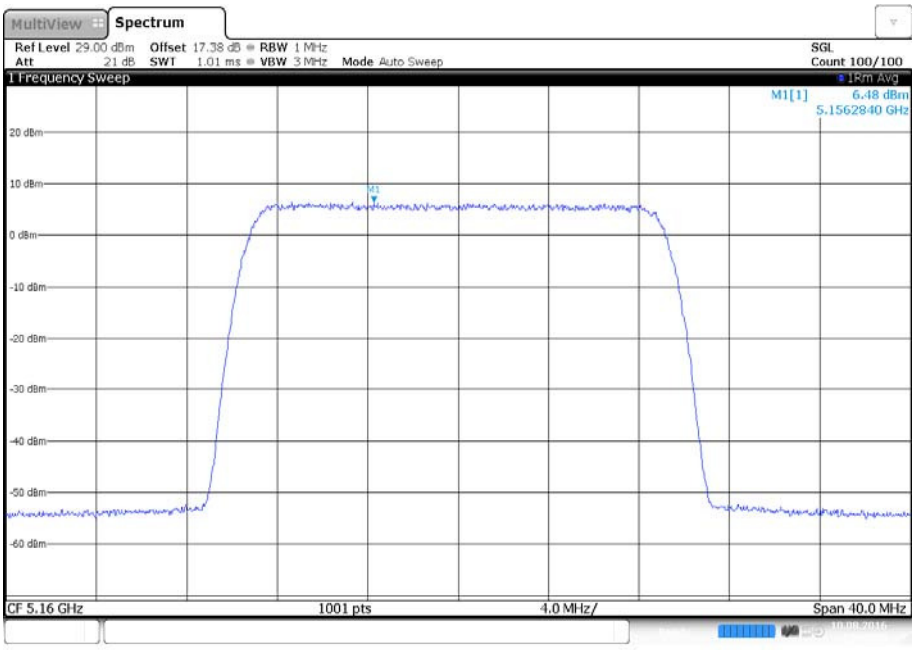
The radiation pattern is different for both antennas. The gain of one antenna is higher in one direction than the other resulting in an overall maximum gain of 5 dBi.

Modulation QPSK - Bandwidth 20.0 MHz - Antenna C - Frequency 5160 MHz



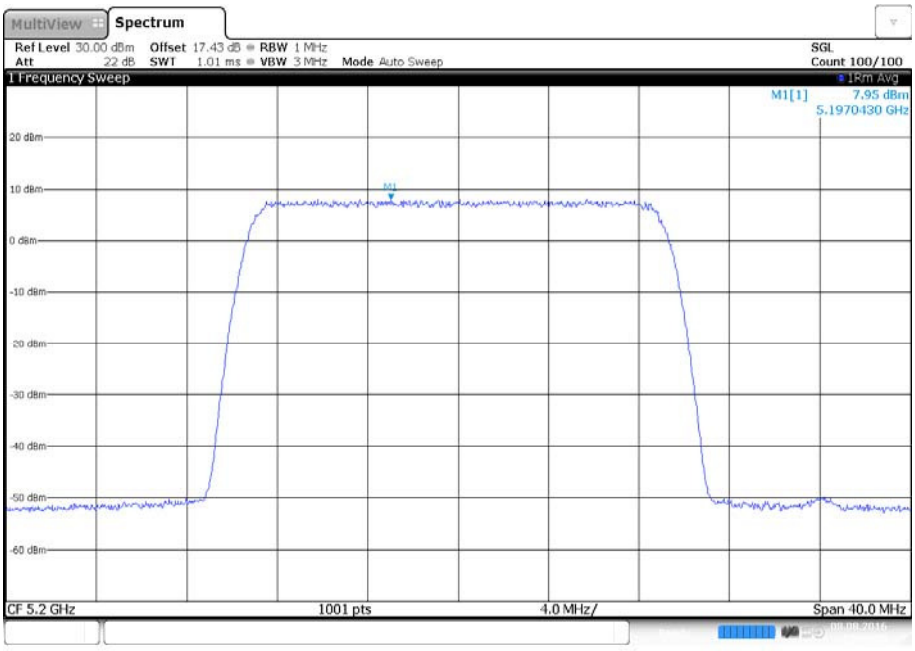
13:41:43 10.08.2016

Modulation QPSK - Bandwidth 20.0 MHz - Antenna D - Frequency 5160 MHz



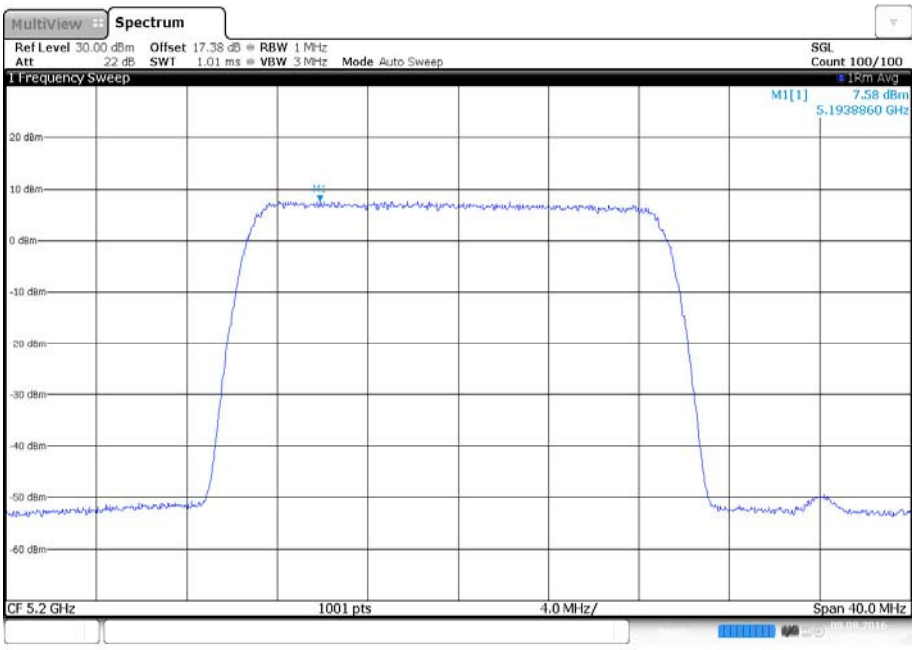
13:43:11 10.08.2016

Modulation QPSK - Bandwidth 20.0 MHz - Antenna C - Frequency 5200 MHz



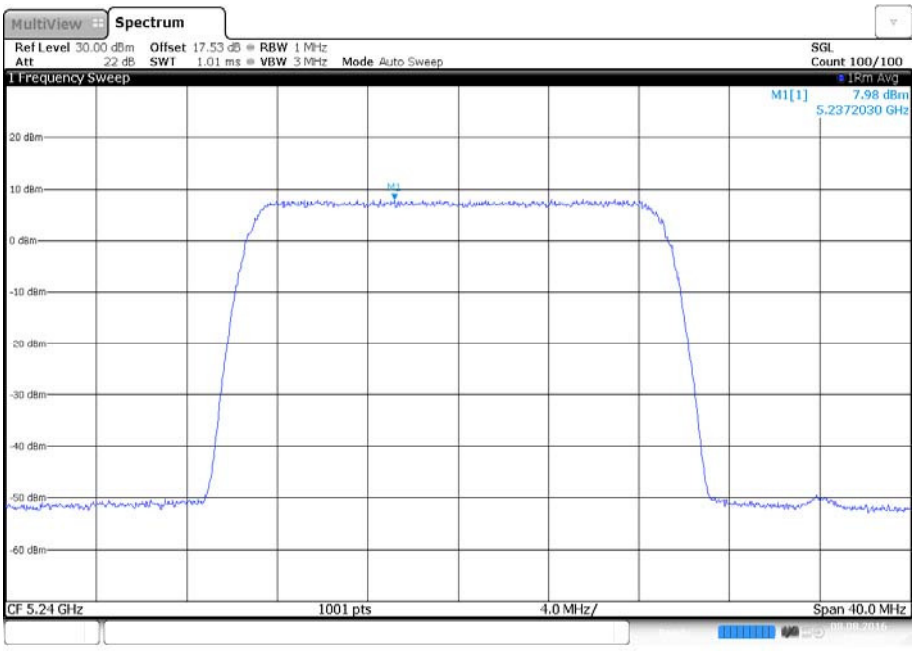
13:49:01 08.08.2016

Modulation QPSK - Bandwidth 20.0 MHz - Antenna D - Frequency 5200 MHz



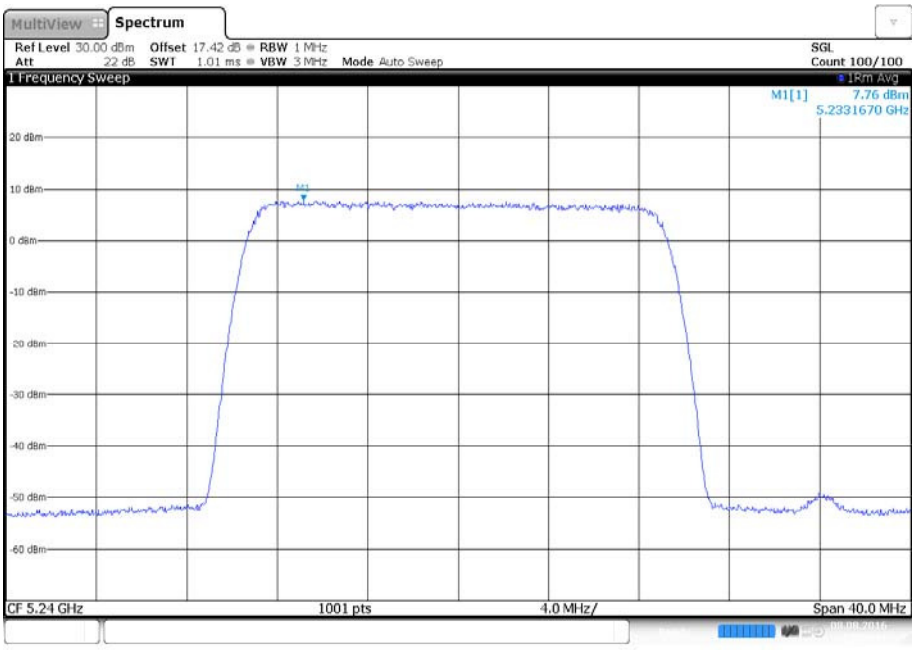
13:53:21 08.08.2016

Modulation QPSK - Bandwidth 20.0 MHz - Antenna C - Frequency 5240 MHz



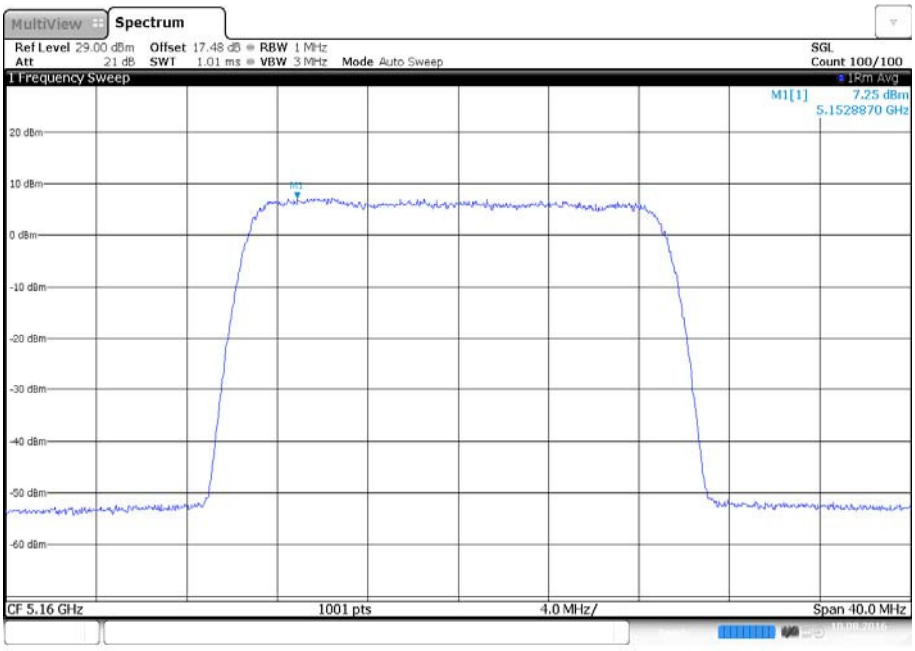
13:50:27 08.08.2016

Modulation QPSK - Bandwidth 20.0 MHz - Antenna D - Frequency 5240 MHz



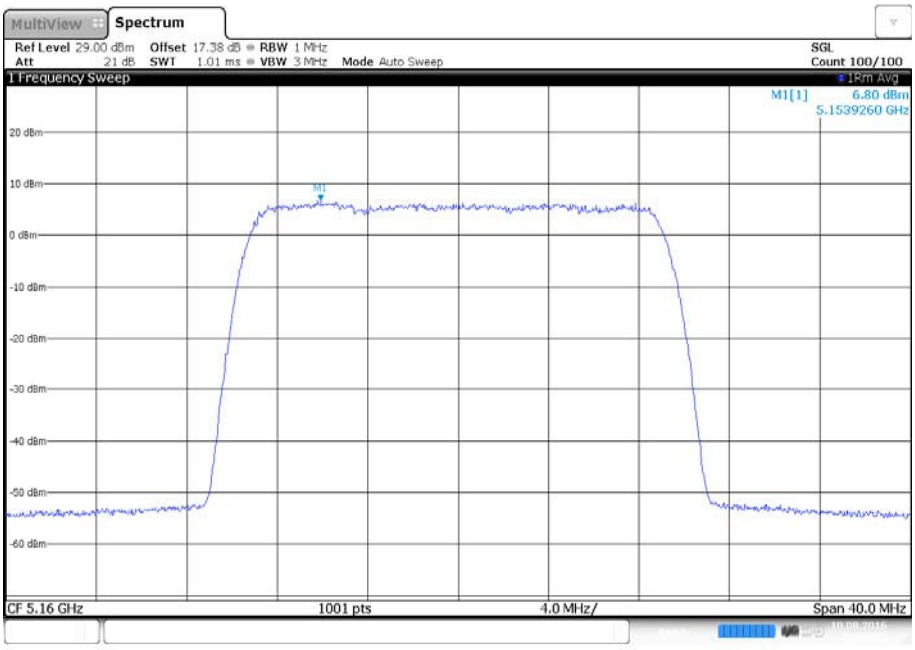
13:54:47 08.08.2016

Modulation 16QAM - Bandwidth 20.0 MHz - Antenna C - Frequency 5160 MHz



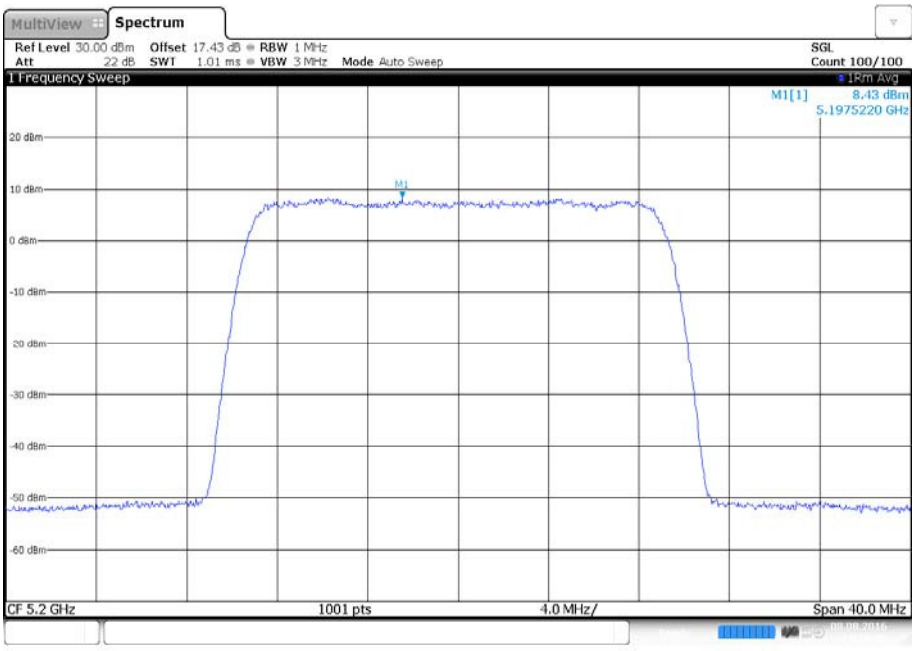
13:52:07 10.08.2016

Modulation 16QAM - Bandwidth 20.0 MHz - Antenna D - Frequency 5160 MHz



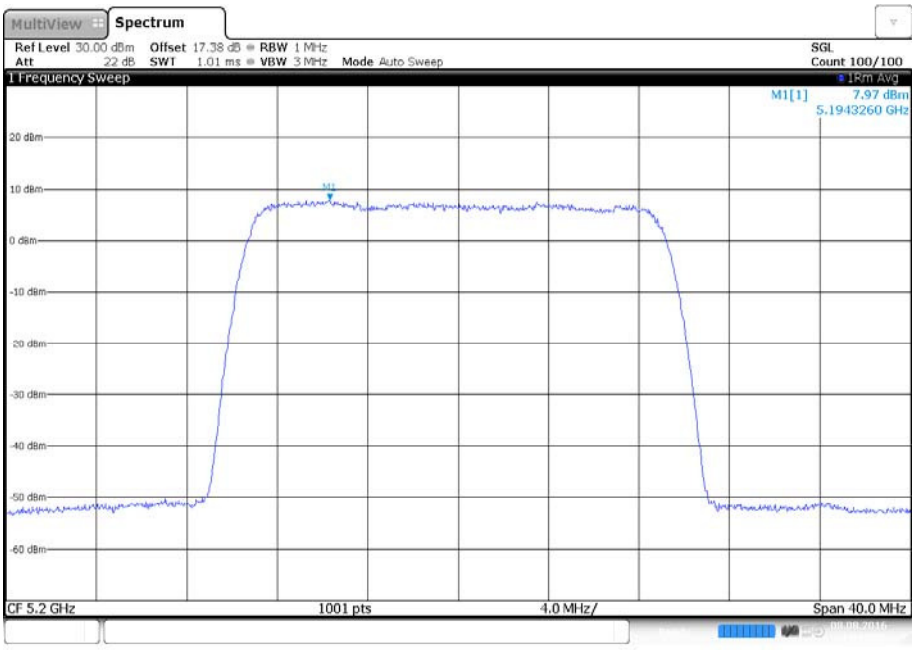
13:53:34 10.08.2016

Modulation 16QAM - Bandwidth 20.0 MHz - Antenna C - Frequency 5200 MHz



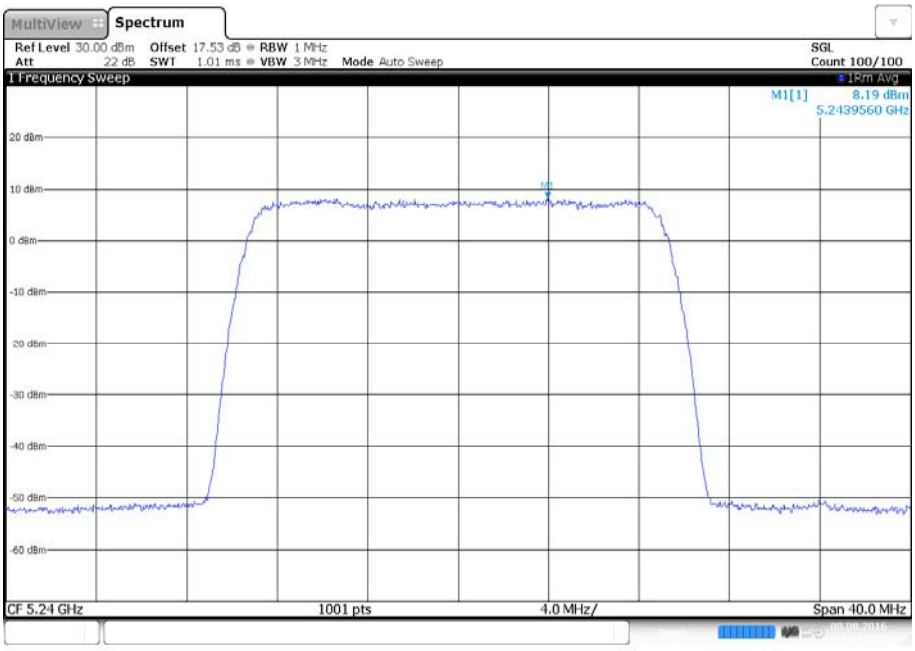
14:10:56 08.08.2016

Modulation 16QAM - Bandwidth 20.0 MHz - Antenna D - Frequency 5200 MHz



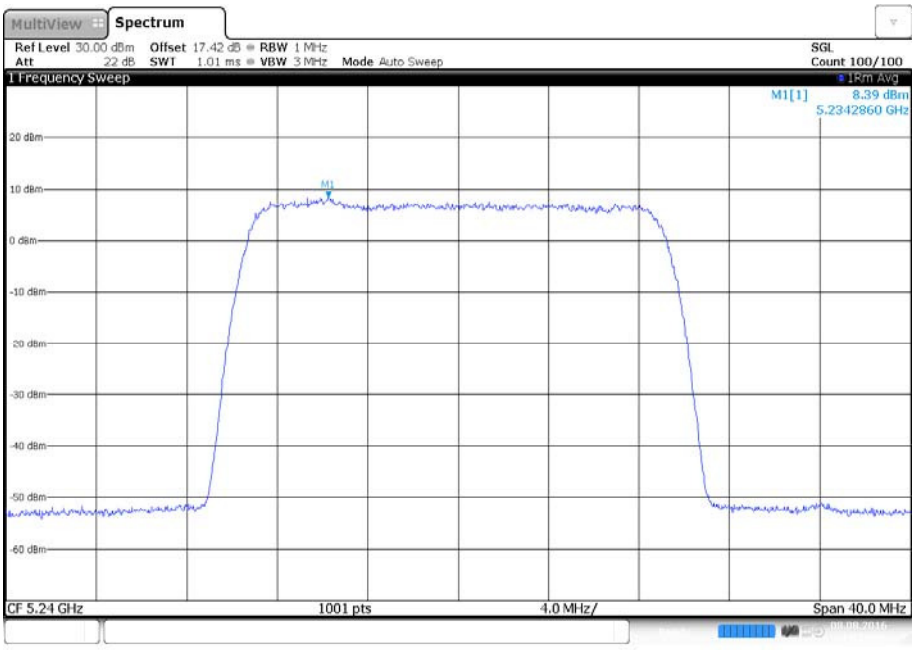
14:15:16 08.08.2016

Modulation 16QAM - Bandwidth 20.0 MHz - Antenna C - Frequency 5240 MHz



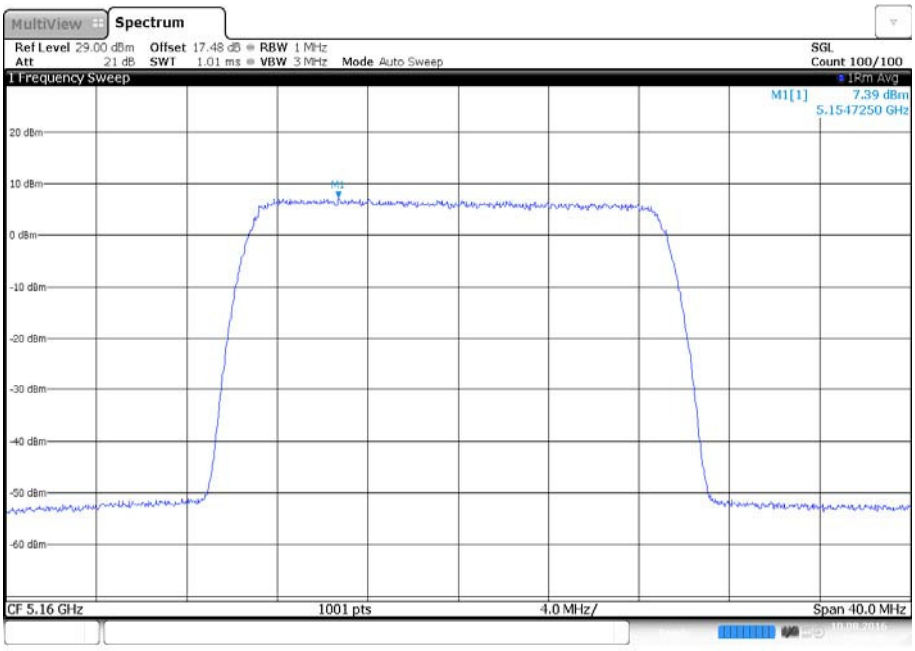
14:12:22 08.08.2016

Modulation 16QAM - Bandwidth 20.0 MHz - Antenna D - Frequency 5240 MHz



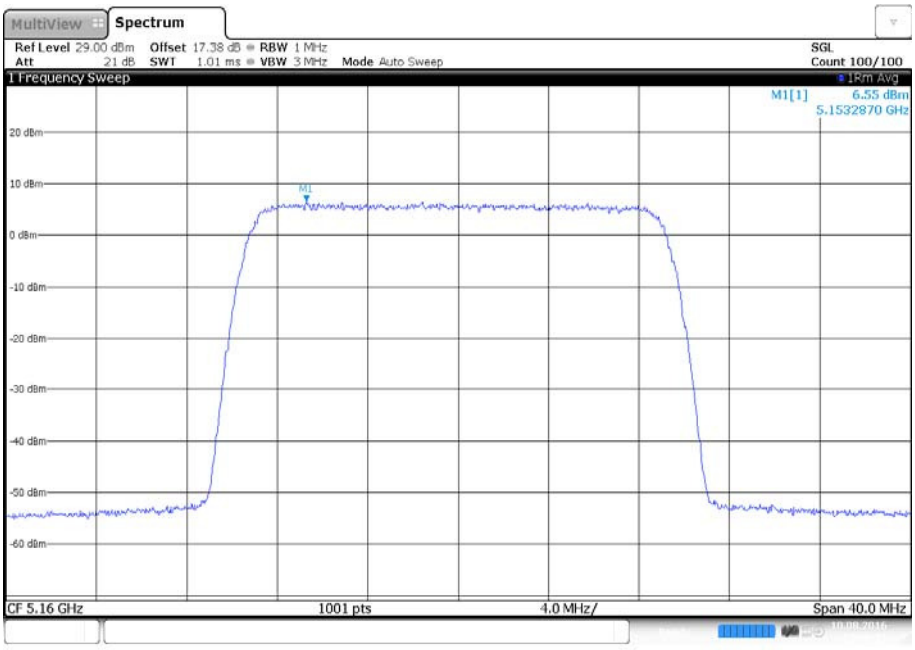
14:16:43 08.08.2016

Modulation 64QAM - Bandwidth 20.0 MHz - Antenna C - Frequency 5160 MHz



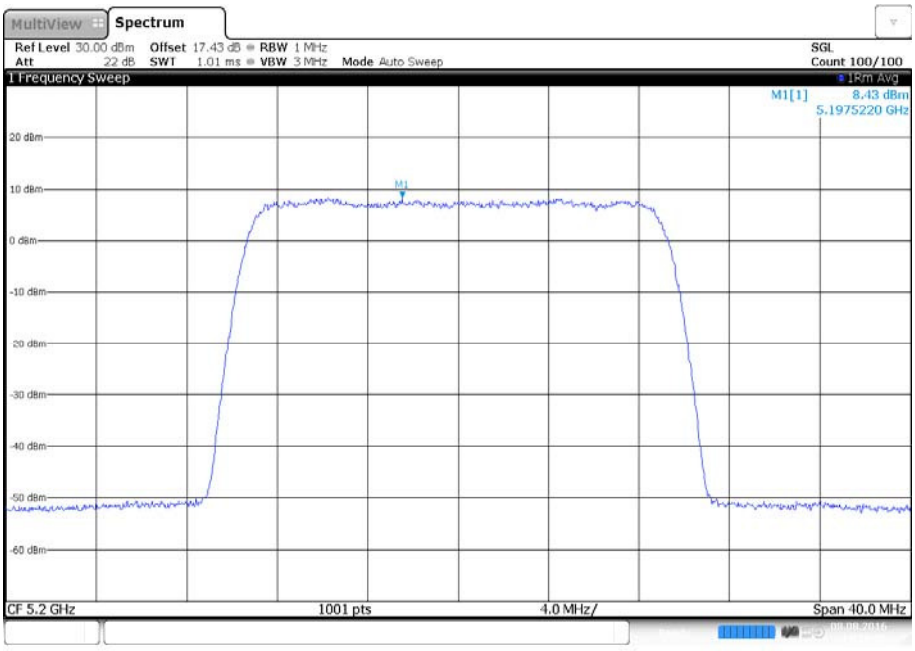
13:46:55 10.08.2016

Modulation 64QAM - Bandwidth 20.0 MHz - Antenna D - Frequency 5160 MHz



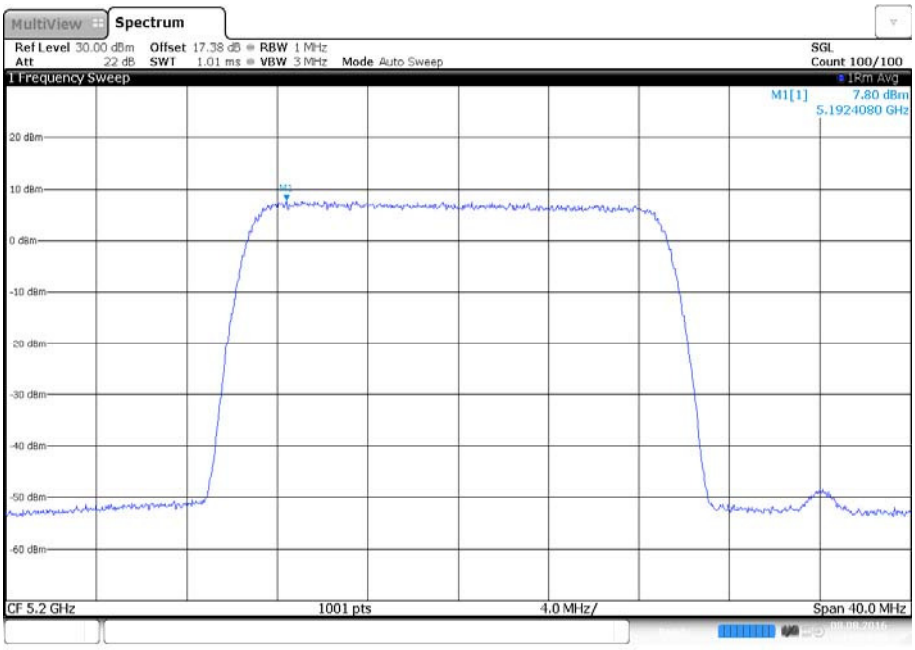
13:48:22 10.08.2016

Modulation 64QAM - Bandwidth 20.0 MHz - Antenna C - Frequency 5200 MHz



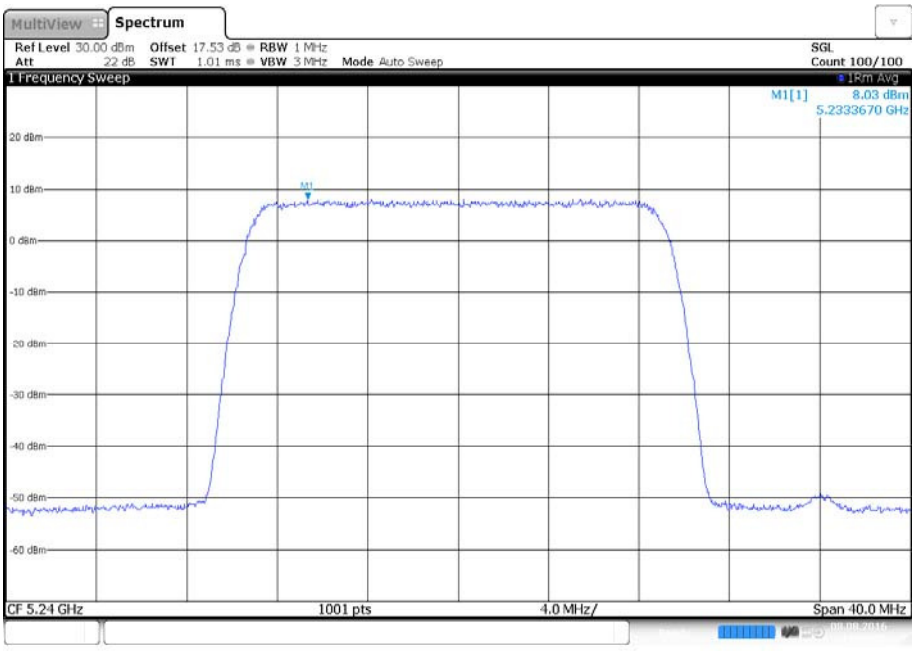
14:10:56 08.08.2016

Modulation 64QAM - Bandwidth 20.0 MHz - Antenna D - Frequency 5200 MHz



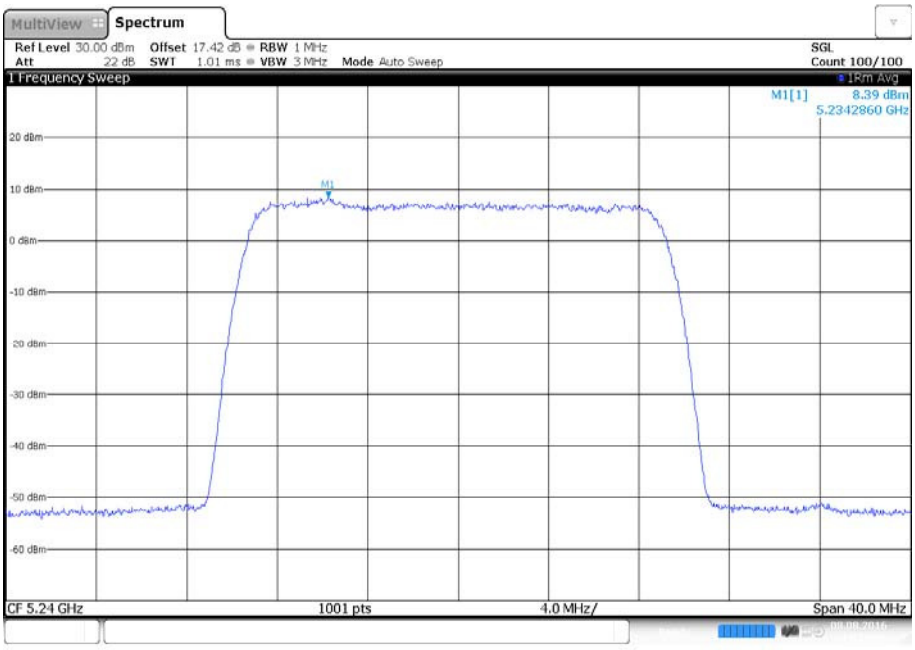
14:04:19 08.08.2016

Modulation 64QAM - Bandwidth 20.0 MHz - Antenna C - Frequency 5240 MHz



14:01:25 08.08.2016

Modulation 64QAM - Bandwidth 20.0 MHz - Antenna D - Frequency 5240 MHz



14:16:43 08.08.2016

Configuration B

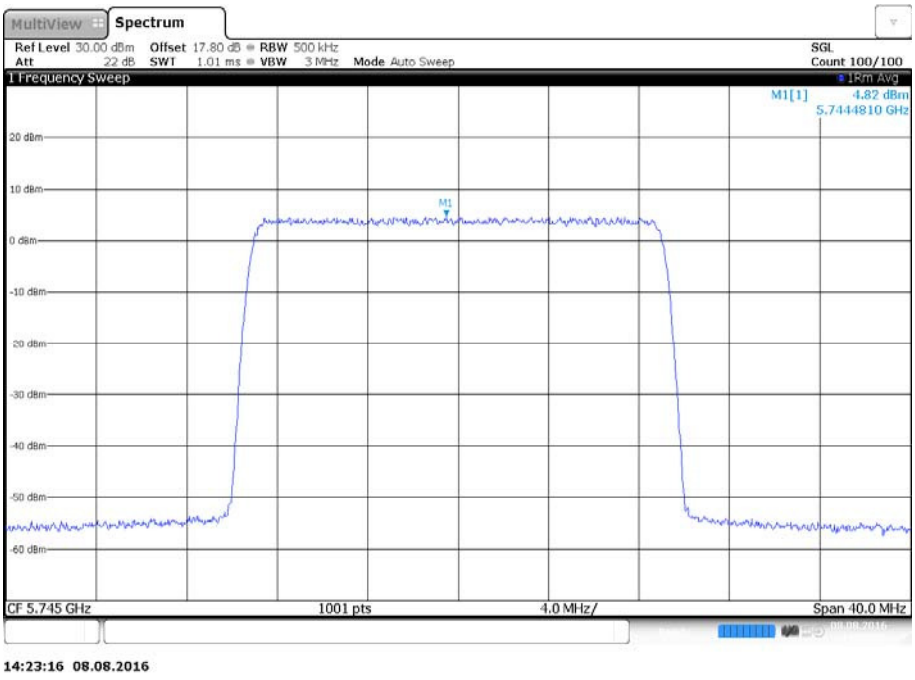
Maximum Output Power Per Carrier 21 dBm

Modulation	Carrier Bandwidth (MHz)	Antenna	Power Spectral Density (dBm)		
			5745 MHz	5785 MHz	5825 MHz
QPSK	20.0 MHz	C	4.82	4.49	4.61
		D	3.28	3.15	3.66
Total			7.13	6.88	7.17
16QAM	20.0 MHz	C	4.96	5.18	4.93
		D	3.65	3.56	4.30
Total			7.36	7.46	7.64
64QAM	20.0 MHz	C	4.88	4.76	4.56
		D	3.32	3.38	3.66
Total			7.18	7.13	7.14

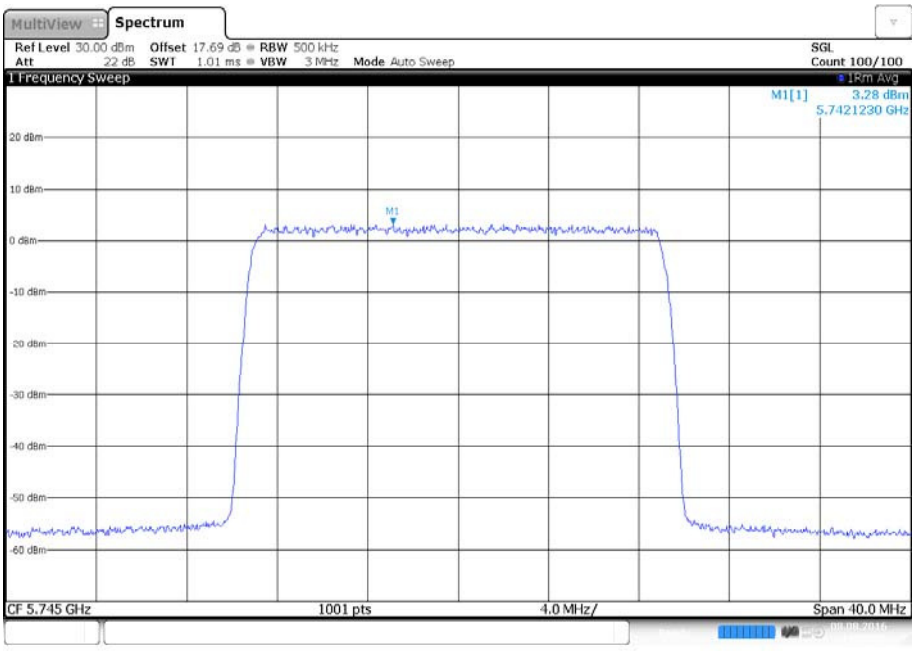
Remarks

The radiation pattern is different for both antennas. The gain of one antenna is higher in one direction than the other resulting in an overall maximum gain of 5 dBi.

Modulation QPSK - Bandwidth 20.0 MHz - Antenna C - Frequency 5745 MHz

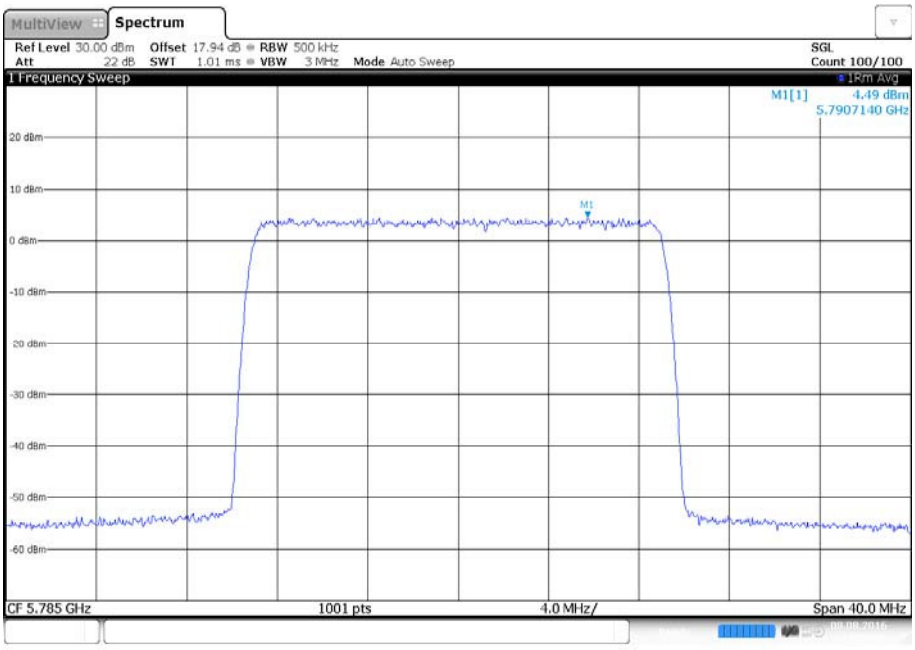


Modulation QPSK - Bandwidth 20.0 MHz - Antenna D - Frequency 5745 MHz



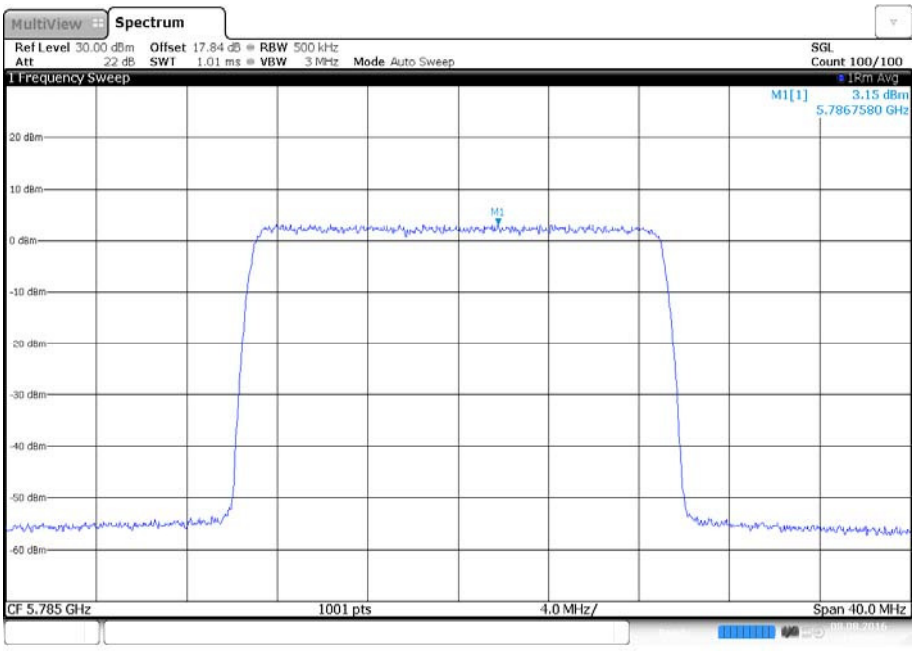
14:27:36 08.08.2016

Modulation QPSK - Bandwidth 20.0 MHz - Antenna C - Frequency 5785 MHz



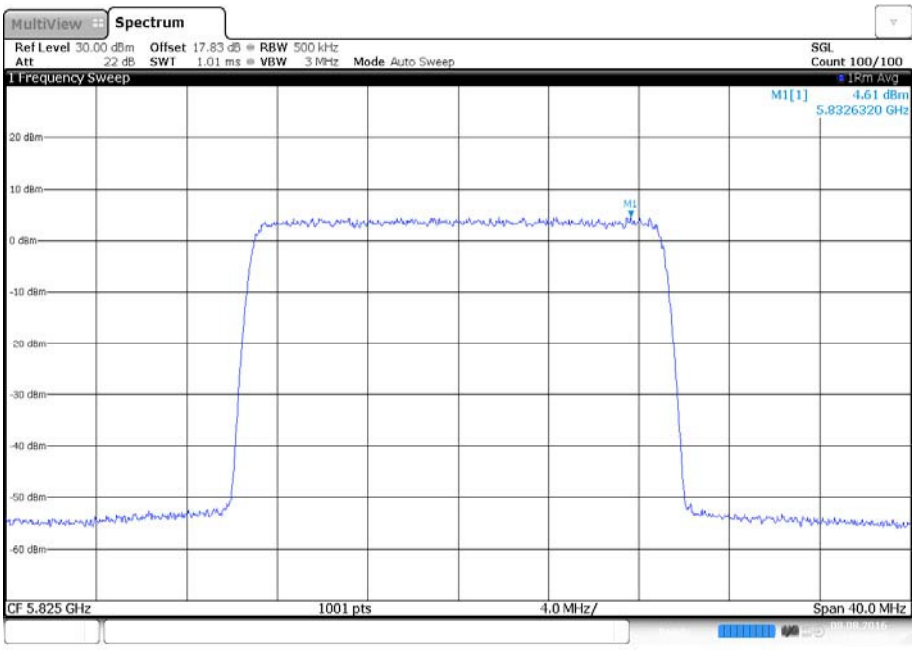
14:24:42 08.08.2016

Modulation QPSK - Bandwidth 20.0 MHz - Antenna D - Frequency 5785 MHz



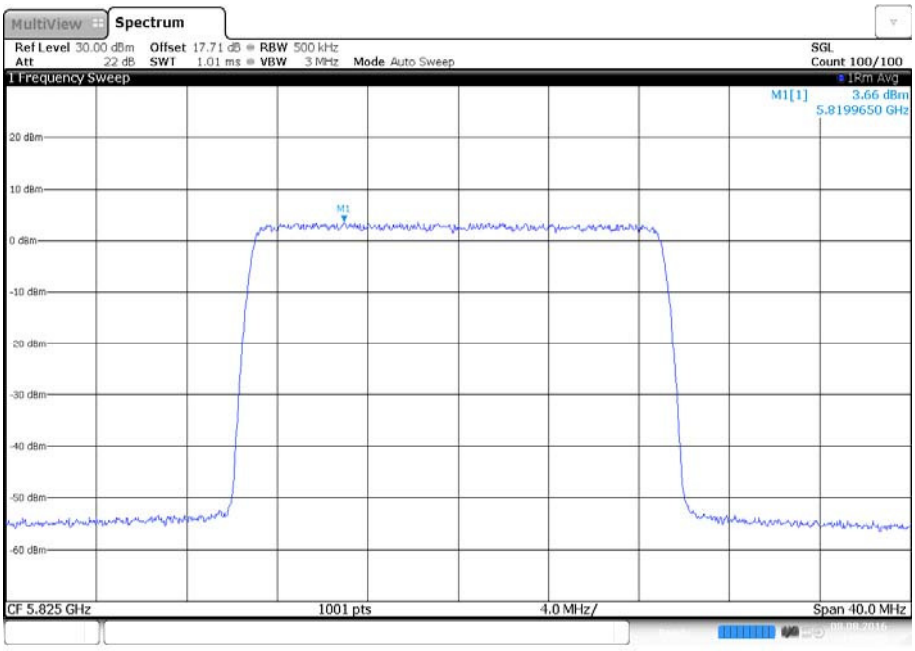
14:29:02 08.08.2016

Modulation QPSK - Bandwidth 20.0 MHz - Antenna C - Frequency 5825 MHz



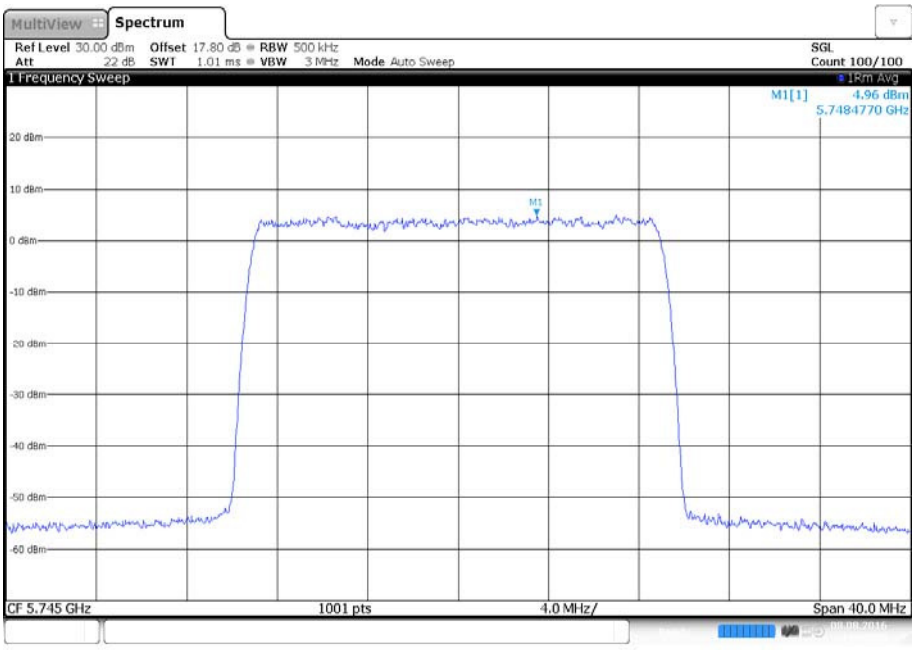
14:26:09 08.08.2016

Modulation QPSK - Bandwidth 20.0 MHz - Antenna D - Frequency 5825 MHz



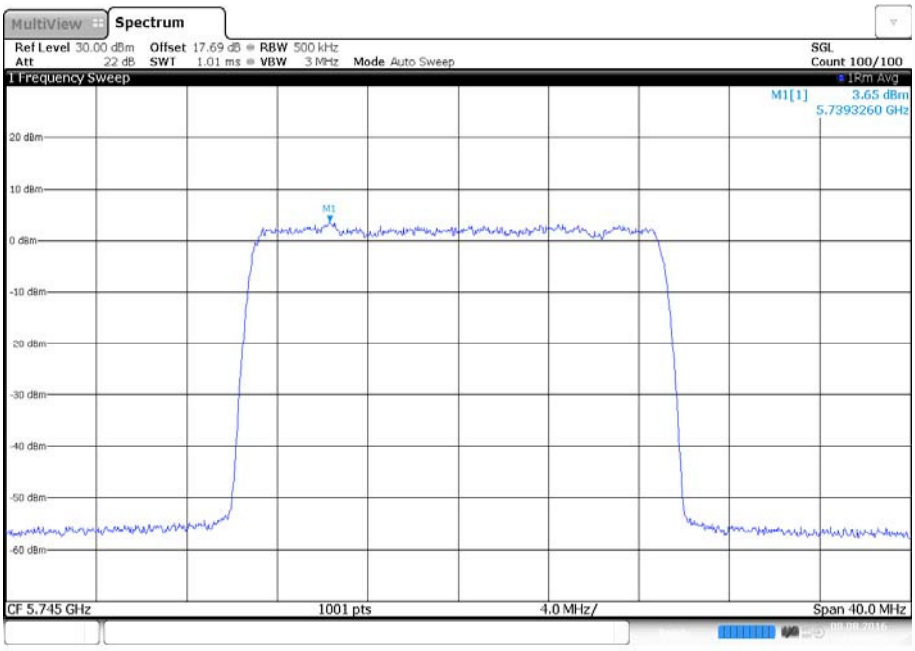
14:30:29 08.08.2016

Modulation 16QAM - Bandwidth 20.0 MHz - Antenna C - Frequency 5745 MHz

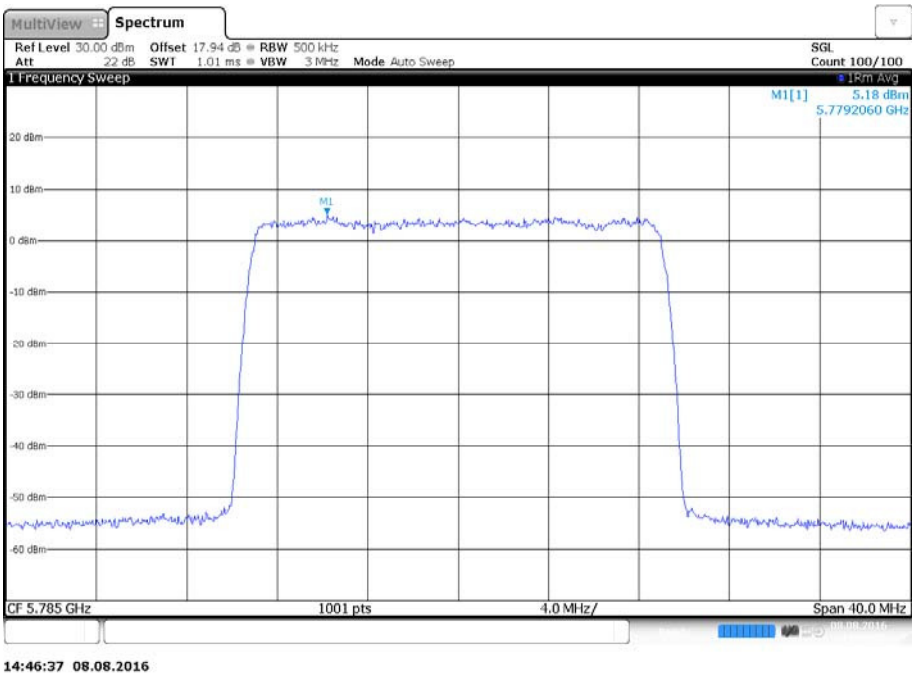


14:45:10 08.08.2016

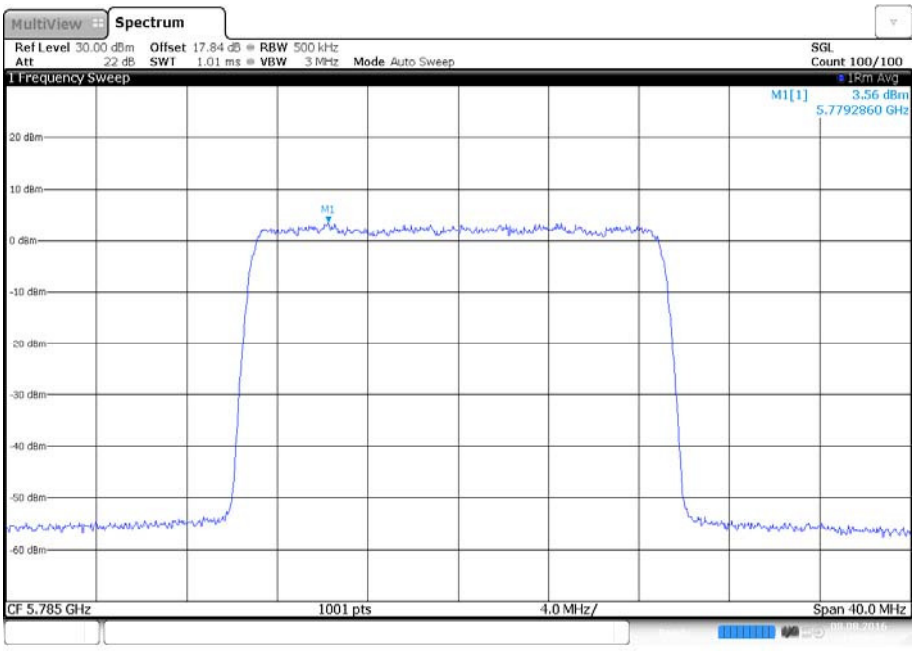
Modulation 16QAM - Bandwidth 20.0 MHz - Antenna D - Frequency 5745 MHz



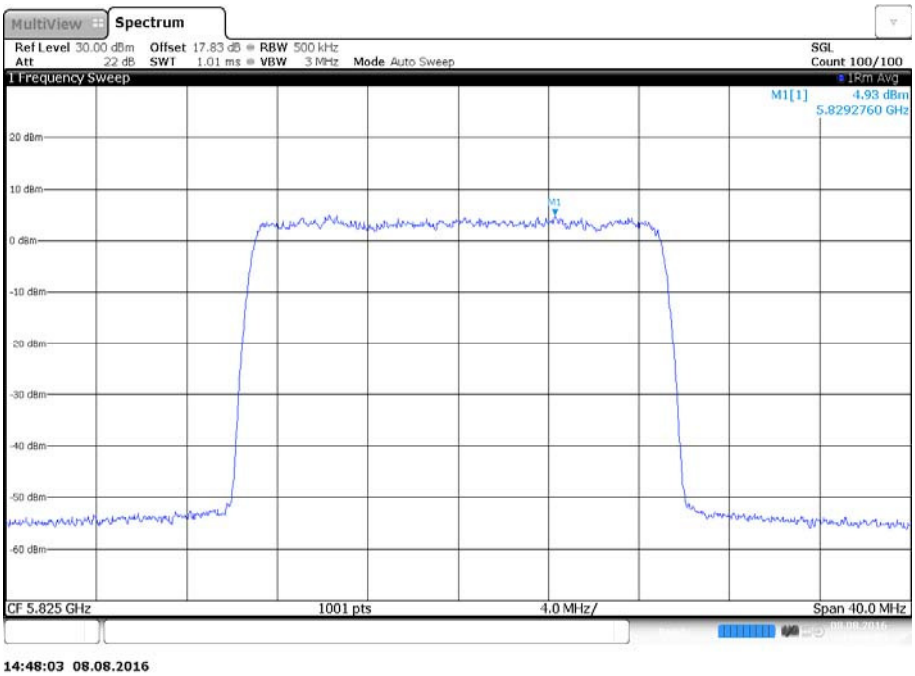
Modulation 16QAM - Bandwidth 20.0 MHz - Antenna C - Frequency 5785 MHz



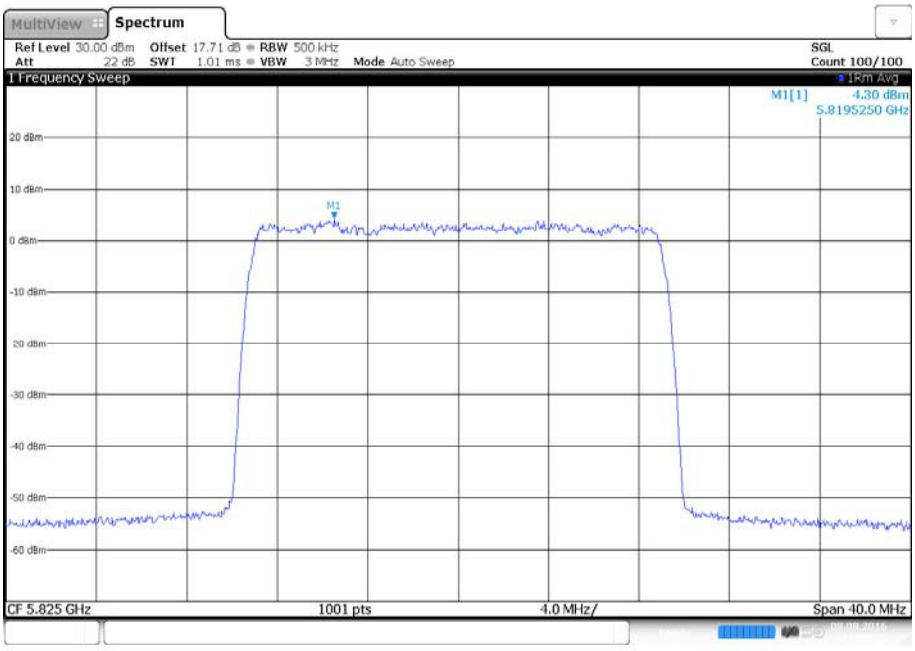
Modulation 16QAM - Bandwidth 20.0 MHz - Antenna D - Frequency 5785 MHz



Modulation 16QAM - Bandwidth 20.0 MHz - Antenna C - Frequency 5825 MHz

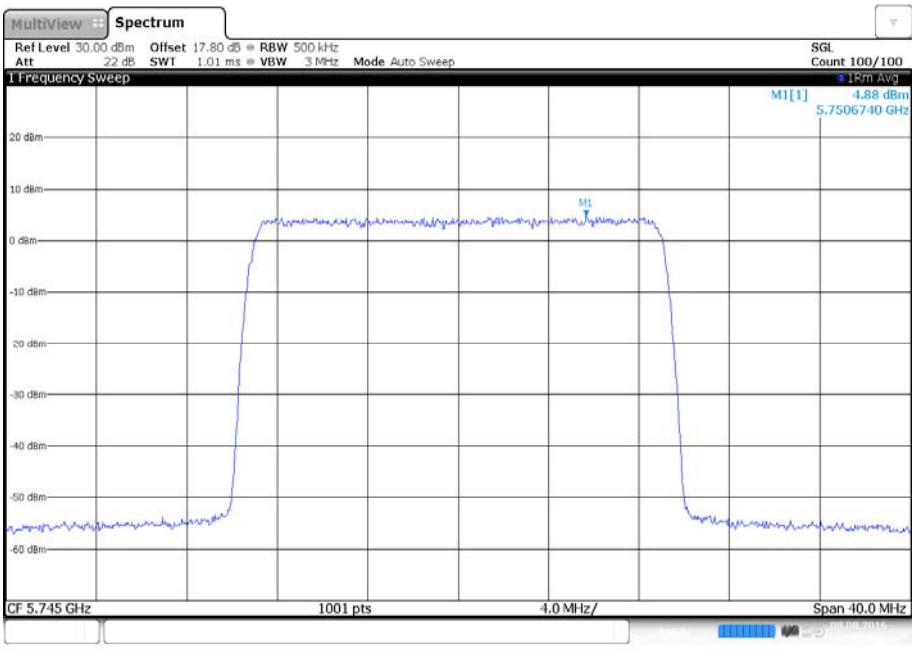


Modulation 16QAM - Bandwidth 20.0 MHz - Antenna D - Frequency 5825 MHz



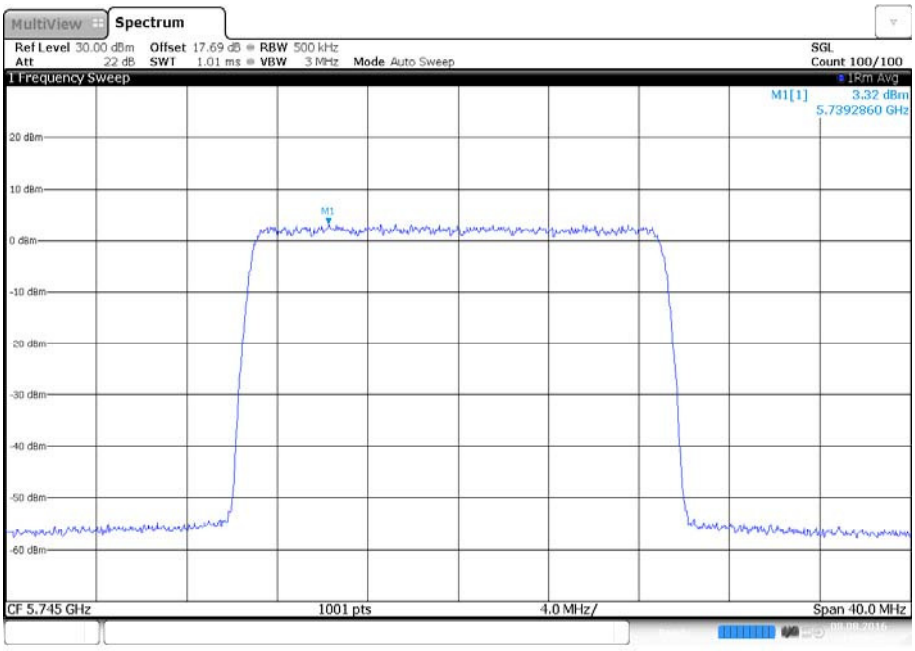
14:52:23 08.08.2016

Modulation 64QAM - Bandwidth 20.0 MHz - Antenna C - Frequency 5745 MHz



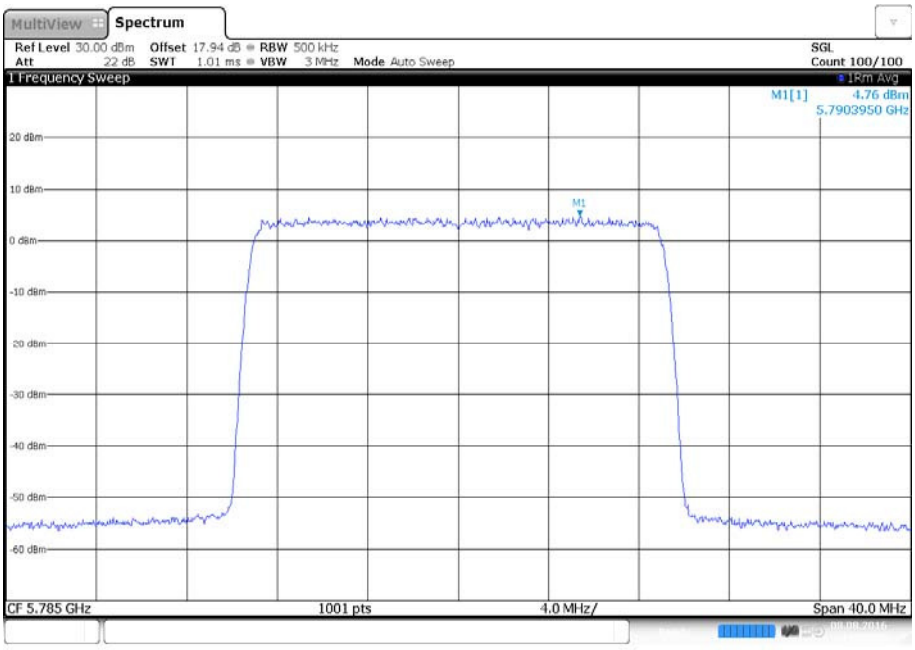
14:34:13 08.08.2016

Modulation 64QAM - Bandwidth 20.0 MHz - Antenna D - Frequency 5745 MHz



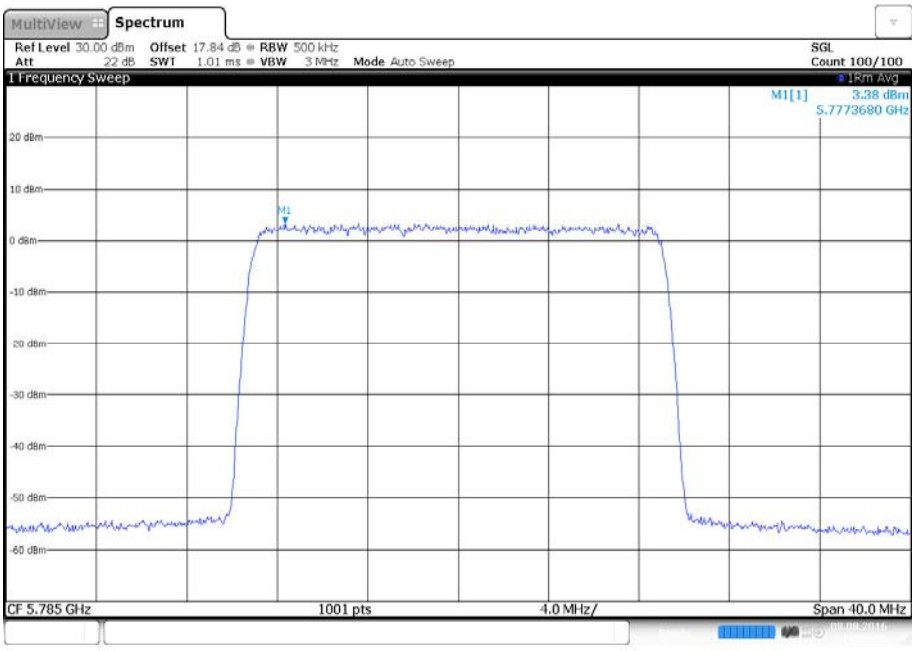
14:38:33 08.08.2016

Modulation 64QAM - Bandwidth 20.0 MHz - Antenna C - Frequency 5785 MHz

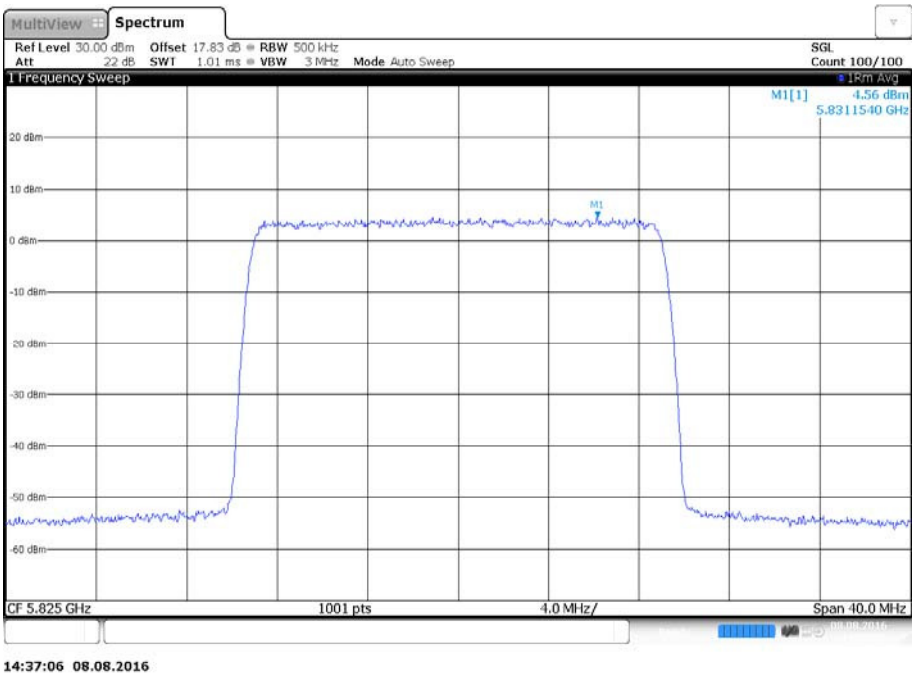


14:35:39 08.08.2016

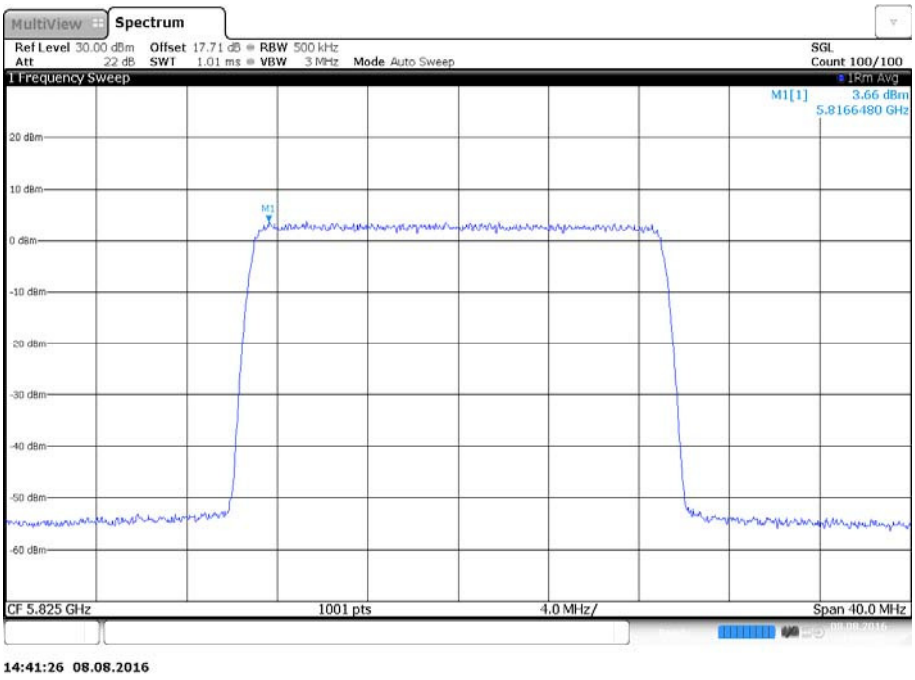
Modulation 64QAM - Bandwidth 20.0 MHz - Antenna D - Frequency 5785 MHz



Modulation 64QAM - Bandwidth 20.0 MHz - Antenna C - Frequency 5825 MHz



Modulation 64QAM - Bandwidth 20.0 MHz - Antenna D - Frequency 5825 MHz



2.4 FREQUENCY STABILITY

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1055
FCC CFR 47 Part 15E, Clause 15.407 (g)

2.4.2 Date of Test and Modification State

10 August 2016 - Modification State 0

2.4.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.4 Environmental Conditions

Ambient Temperature	22.5 - 22.6°C
Relative Humidity	53.2 - 54.2%

2.4.5 Test Method

All measurements were made in accordance with FCC KDB 789033 D02. The EUT was set to transmit at maximum power on bottom and top channels in each band of operation using the antenna that gave the highest level of conducted output power. The EUT was connected to a spectrum analyser via a cable and attenuator and the resultant trace was displayed on screen with the operating band edges shown using an emission limit of -27dBm/MHz to ensure the emission is maintained with the band of operation.

2.4.6 Test Results

Configuration A

Maximum Output Power Per Carrier 21 dBm

Temperature	Voltage	Frequency Stability					
		5160 MHz			5240 MHz		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
0°C	37.0 V DC	Pass	Pass	Pass	Pass	Pass	Pass
	58.0 V DC	Pass	Pass	Pass	Pass	Pass	Pass
+40°C	37.0 V DC	Pass	Pass	Pass	Pass	Pass	Pass
	58.0 V DC	Pass	Pass	Pass	Pass	Pass	Pass

Remarks

The emission was maintained within the band of operation at all temperature and voltage conditions. Measurements were performed on Antenna C as this antenna has the highest measured conducted output power.

Configuration B

Maximum Output Power Per Carrier 21 dBm

Temperature	Voltage	Frequency Stability					
		5745 MHz			5825 MHz		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
0°C	37.0 V DC	Pass	Pass	Pass	Pass	Pass	Pass
	58.0 V DC	Pass	Pass	Pass	Pass	Pass	Pass
+40°C	37.0 V DC	Pass	Pass	Pass	Pass	Pass	Pass
	58.0 V DC	Pass	Pass	Pass	Pass	Pass	Pass

Remarks

The emission was maintained within the band of operation at all temperature and voltage conditions. Measurements were performed on Antenna C as this antenna has the highest measured conducted output power.

SECTION 3

TEST EQUIPMENT USED

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Conducted Output Power					
Hygromer	Rotronic	A1	2138	12	09-Dec-2016
Digital Multimeter	Fluke	79 Series II	611	12	02-Sep-2016
Signal Analyzer	R&S	FSW	103947	12	01-Feb-2017
Signal Switch Unit	Orbis	TX SSU	EB ID 2571	-	TU
DC power supply	HP	6032A	US38321561	-	OP MON
Power sensor	R&S	NRP-Z21	101290	12	01-Oct-2016
Power Spectral Density					
Hygromer	Rotronic	A1	2138	12	09-Dec-2016
Digital Multimeter	Fluke	79 Series II	611	12	02-Sep-2016
Signal Analyzer	R&S	FSW	103799	12	01-Feb-2017
Signal Switch Unit	Orbis	TX SSU	EB ID 2571	-	TU
DC power supply	HP	6032A	US38321561	-	OP MON
Occupied Bandwidth					
Hygromer	Rotronic	A1	2138	12	09-Dec-2016
Digital Multimeter	Fluke	79 Series II	611	12	02-Sep-2016
Signal Analyzer	R&S	FSW	103799	12	01-Feb-2017
Signal Switch Unit	Orbis	TX SSU	EB ID 2571	-	TU
DC power supply	HP	6032A	US38321561	-	OP MON
Frequency Stability					
Hygromer	Rotronic	A1	2138	12	09-Dec-2016
Digital Multimeter	Fluke	79 Series II	611	12	02-Sep-2016
Signal Analyzer	R&S	FSW	103799	12	01-Feb-2017
Signal Switch Unit	Orbis	TX SSU	EB ID 2571	-	TU
DC power supply	HP	6032A	US38321561	-	OP MON
Climatic Chamber	Votsch	VT 4018	58566065410010	-	OP MON
Digital Thermometer	Fluke	51	2267	12	09-Dec-2016

N/A – Not Applicable
OP MON – Output Monitored with Calibrated Equipment

3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Conducted Output Power	30 MHz to 20 GHz Amplitude	± 0.1 dB
Occupied Bandwidth	Up to 20 MHz Bandwidth	± 606 kHz
Band Edge	30 MHz to 20 GHz Amplitude	± 2.3 dB

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

ANNEX A

MODULE LIST

Configuration A			
Product	Product No	R-State	Serial No
RBS 6402	KRD 901 060/83	R1C	C82A516905
Software Version :	RASW_20160516_LBT_DFE_4_5_UPDATE		