

ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LICENSED TRANSMITTER

Test Report No. : E13OR-020

AGR No. : A139A-187

Applicant : SAMSUNG Electronics Co.,Ltd

Address : (Maetan-dong) 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do,
443-742, Republic of Korea

Manufacturer : SAMSUNG Electronics Co.,Ltd

Address : (Maetan-dong) 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do,
443-742, Republic of Korea

Type of Equipment : eSmallCell (enterprise SmallCell)

FCC ID. : A3LSLS-BU102

Model Name : SLS-BU102

Serial number : N/A

Total page of Report : 210 pages (including this page)

Date of Incoming : October 04, 2013

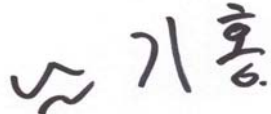
Date of issue : October 17, 2013

SUMMARY

The equipment complies with the regulation; **FCC Part 27 Subpart C.**

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

Prepared by: 
Ki-Hong, Nam / Senior Engineer
ONETECH Corp.

Approved by: 
Gea-Won, Lee / Managing Director
ONETECH Corp.

CONTENTS

	PAGE
1. VERIFICATION OF COMPLIANCE	7
2. TEST SUMMARY.....	8
2.1 TEST ITEMS AND RESULTS	8
2.2 ADDITIONS, DEVIATIONS, EXCLUSIONS FROM STANDARDS	8
2.3 RELATED SUBMITTAL(S) / GRANT(S)	8
2.4 PURPOSE OF THE TEST	8
2.5 TEST METHODOLOGY	8
2.6 TEST FACILITY	8
3. GENERAL INFORMATION.....	9
3.1 PRODUCT DESCRIPTION.....	9
3.2 ALTERNATIVE TYPE(S)/MODEL(S); ALSO COVERED BY THIS TEST REPORT.	9
3.3 PERIPHERAL EQUIPMENT.....	10
3.4 MODE OF OPERATION DURING THE TEST.....	10
4. EUT MODIFICATIONS	11
5. RF POWER OUTPUT AT ANTENNA TERMINAL	12
5.1 OPERATING ENVIRONMENT	12
5.2 TEST SET-UP	12
5.3 TEST EQUIPMENT USED	12
5.4 TEST DATA FOR OUTPUT PORT 0	13
5.4.1 Test Result for Part 27 C (AWS-1, 5 MHz).....	13
5.4.2 Test Result for Part 27 C (AWS-1, 10 MHz).....	14
5.4.3 Test Result for Part 27 C (700LTE)	15
5.5 TEST DATA FOR OUTPUT PORT 1	16
5.5.1 Test Result for Part 27 C (AWS-1, 5 MHz).....	16
5.5.2 Test Result for Part 27 C (AWS-1, 10 MHz).....	17
5.5.3 Test Result for Part 27 C (700LTE)	18
6. OCCUPIED BANDWIDTH	19
6.1 OPERATING ENVIRONMENT	19

6.2 TEST SET-UP	19
6.3 TEST EQUIPMENT USED	19
6.4 TEST DATA FOR OUTPUT PORT 0	20
6.4.1 Test Result for Part 27 C (AWS-1, 5 MHz).....	20
6.4.2 Test Result for Part 27 C (AWS-1, 10 MHz).....	33
6.4.3 Test Result for Part 27 C (700LTE)	46
6.5 TEST DATA FOR OUTPUT PORT 1	51
6.5.1 Test Result for Part 27 C (AWS-1, 5 MHz).....	51
6.5.2 Test Result for Part 27 C (AWS-1, 10 MHz).....	64
6.5.3 Test Result for Part 27 C (700LTE)	77
7. SPURIOUS EMISSION AT ANTENNA TERMINAL	82
7.1 OPERATING ENVIRONMENT	82
7.2 TEST SET-UP FOR CONDUCTED MEASUREMENT.....	82
7.3 TEST EQUIPMENT USED	82
7.4 TEST DATA FOR OUTPUT PORT 0	83
7.4.1 Test Result for Part 27 C (AWS-1, 5 MHz).....	83
7.4.2 Test Result for Part 27 C (AWS-1, 10 MHz).....	93
7.5 TEST DATA FOR OUTPUT PORT 1	113
7.5.1 Test Result for Part 27 C (AWS-1, 5 MHz).....	113
7.5.2 Test Result for Part 27 C (AWS-1, 10 MHz).....	123
8. BAND EDGE MEASUREMENT.....	143
8.1 OPERATING ENVIRONMENT	143
8.2 TEST SET-UP FOR CONDUCTED MEASUREMENT.....	143
8.3 TEST EQUIPMENT USED	143
8.4 TEST DATA FOR OUTPUT PORT 0	144
8.4.1 Test Result for Part 27 C (AWS-1, 5 MHz).....	144
8.4.2 Test Result for Part 27 C (AWS-1, 10 MHz).....	148
8.5.3 Test Result for Part 27 C (700LTE)	152
8.5 TEST DATA FOR OUTPUT PORT 1	159
8.5.1 Test Result for Part 27 C (AWS-1, 5 MHz).....	159

8.5.2 Test Result for Part 27 C (AWS-1, 10 MHz)	163
8.5.3 Test Result for Part 27 C (700LTE)	167
9. FIELD STRENGTH OF SPURIOUS RADIATION	174
9.1 OPERATING ENVIRONMENT	174
9.2 TEST SET-UP	174
9.3 TEST EQUIPMENT USED	174
9.4 TEST DATA FOR RADIATED EMISSION	175
9.4.1 Test Result for Part 27 C (AWS-1) With Adapter (SHA65S12)	175
9.4.2 Test Result for Part 27 C (AWS-1) With PoE (POE75U-1UP-S-R)	187
9.4.3 Test Result for Part 27 C (700LTE) With Adapter (SHA65S12)	199
9.4.4 Test Result for Part 27 C (700LTE) With PoE (POE75U-1UP-S-R)	201
10. FREQUENCY STABILITY WITH TEMPERATURE VARIATION	203
10.1 OPERATING ENVIRONMENT	203
10.2 TEST SET-UP	203
10.3 TEST EQUIPMENT USED	203
10.4 TEST DATA	204
10.4.1 Test Result for Part 27 C (AWS-1) With Adapter (SHA65S12)	204
10.4.2 Test Result for Part 27 C (AWS-1) With PoE (POE75U-1UP-S-R)	204
10.4.3 Test Result for Part 27 C (700LTE) With Adapter (SHA65S12)	205
10.4.4 Test Result for Part 27 C (700LTE) With PoE (POE75U-1UP-S-R)	205
11. FREQUENCY STABILITY WITH VOLTAGE VARIATION	206
11.1 OPERATING ENVIRONMENT	206
11.2 TEST SET-UP	206
11.3 TEST EQUIPMENT USED	206
11.4 TEST DATA	207
11.4.1 Test Result for 27 C (AWS-1) With Adapter (SHA65S12)	207
11.4.2 Test Result for 27 C (AWS-1) With PoE (POE75U-1UP-S-R)	207
11.4.3 Test Result for Part 27 C (700LTE) With Adapter (SHA65S12)	208
11.4.4 Test Result for Part 27 C (700LTE) With PoE (POE75U-1UP-S-R)	208
12. MAXIMUM PERMISSIBLE EXPOSURE	209

12.1 RF EXPOSURE CALCULATION	209
12.2 CALCULATED MPE SAFE DISTANCE	209
12.2.1 For Part 27 C (AWS-1, 5 MHz).....	209
12.2.2 For Part 27 C (AWS-1, 10 MHz).....	210
12.2.3 For Part 27 C (700LTE).....	210

Revision History

Issued Report No.	Issued Date	Revisions	Effect Section
E13OR-020	October 17, 2013	Initial Issue	All

1. VERIFICATION OF COMPLIANCE

APPLICANT : SAMSUNG Electronics Co.,Ltd
ADDRESS : (Maetan-dong) 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-742,
Republic of Korea
CONTACT PERSON : Hwan-Chul, Ryu / Principal Research Engineer
TELEPHONE NO : +82-31-279-1023
FCC ID : A3LSLS-BU102
MODEL NAME : SLS-BU102
SERIAL NUMBER : N/A
DATE : October 17, 2013

EQUIPMENT CLASS	TNB – Licensed Non-Broadcast Station Transmitter
EQUIPMENT DESCRIPTION	eSmallCell (enterprise SmallCell)
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2009, EIA/TIA-603-C
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC Part 27 Subpart C
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	10 m semi anechoic chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
2.1046(a), 27.50(b), 27.50(d)	RF Power Output at Antenna Terminals	Met the Limit / PASS
2.1049	Occupied Bandwidth, Bandwidth Limitation	Met the Limit / PASS
2.1049	Band Edge	Met the Limit / PASS
2.1051, 27.53(c), 27.53(h)	Spurious Emissions at Antenna Terminals	Met the Limit / PASS
2.1053, 27.53(c), 27.53(h)	Field strength of Spurious Radiation	Met the Limit / PASS
2.1055, 27.54	Frequency Stability with Temperature variation	Met the requirement / PASS
2.1055, 27.54	Frequency stability with primary voltage variation	Met the requirement / PASS
1.1307(b), 27.52	RF Safety	Met the Limit / PASS

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original Grant

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in section 2.1.

2.5 Test Methodology

Radiated testing was performed according to the procedures in ANSI C63.10: 2009 & EIA/TIA-603-C: 2004 and was performed at a distance of 10 m and 3 m from EUT to the antenna.

2.6 Test Facility

The open area test site is located at 307-51 Daessangryung-ri, Chowol-eup, Gwangju-si, Gyeonggi-do and 10 m Semi Anechoic Chamber (SAC) and conducted measurement facilities are located at 301-14, Daessangryung-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862, Korea. The Onetech Corp. has been accredited as a Conformity Assessment Body (CAB) with designation number KR0013 under APEC TEL MAR between the RRA and the FCC.

3. GENERAL INFORMATION

3.1 Product Description

The SAMSUNG Electronics Co.,Ltd, Models SLS-BU102(referred to as the EUT in this report) are eSmallCell (enterprise SmallCell). eSmallCell, an LTE eNB, is located between the UE and the EPC. It provides mobile communications services to subscribers according to the LTE air interface standard.

The eSmallCell transmits/receives radio signals to/from the UE and processes the modulation and demodulation of packet traffic signals. The eSmallCell is also responsible for packet scheduling and radio bandwidth allocation and performs handover via interface with the EPC

The eSmallCell can be installed vertically or horizontally; and it can be installed on the wall, pole or rack by using the installation brackets. The eSmallCell is an all-in-one unit. If a fault occurs, the unit must be replaced with new one.

The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE		eSmallCell (enterprise SmallCell)
LIST OF EACH OSC. or CRY. FREQ.(FREQ. >= 1 MHz)		8 MHz
EMISSION DESIGNATOR		G7D(QPSK) / D7W(16QAM,64QAM)
OPERATING FREQUENCY	700LTE	746 MHz - 756 MHz,
	AWS-1	2 110 MHz - 2 155 MHz
CHANNEL BANDWIDTH		700LTE (10 MHz) / AWS-1 (5 MHz/10 MHz)
RF OUTPUT POWER	700LTE	500 mW (250 mW * 2 Ports)
	AWS-1	500 mW (250 mW * 2 Ports)
DC VOLTAGE & CURRENT INTO FINAL AMPLIFIER	Adaptor	DC 12 V / 5.42 A
	PoE	DC 56 V / 0.6 A
ELECTRICAL RATING		AC 120 V
OPERATING TEMPERATURE		-10 °C ~ 50 °C

3.2 Alternative type(s)/model(s); also covered by this test report.

-. None

3.3 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	FCC ID	Description	Connected to
SLS-BU102	SAMSUNG Electronics Co.,Ltd	A3LSLS-BU102	eSmallCell (enterprise SmallCell) (EUT)	Notebook PC
LGR51	LG	N/A	Notebook PC	EUT
SHA65S12	SAMSUNG ELECTRONICS CO., LTD	N/A	AC/DC ADAPTER	EUT
POE75U-1UP-S-R	PHIHONG	N/A	PoE	EUT

3.4 Mode of operation during the test

The EUT was operated in a manner representative of the typical usage of the equipment. During all testing, system components were manipulated within the confines of typical usage to maximize each emission. All Modulation (QPSK, 16 QAM and 64 QAM) modes were tested.

For the above testing, following frequencies per channel were selected for each modulation.

1. Coverage band : AWS-1_5 MHz

Modulation	Channel	Frequency(MHz)	Modulation	Channel	Frequency(MHz)
16 QAM	Low	2 112.5	QPSK	Low	2 112.5
	Middle	2 132.5		Middle	2 132.5
	High	2 152.5		High	2 152.5
64 QAM	Low	2 112.5			
	Middle	2 132.5			
	High	2 152.5			

2. Coverage band: AWS-1_10 MHz

Modulation	Channel	Frequency(MHz)	Modulation	Channel	Frequency(MHz)
16 QAM	Low	2 115.0	QPSK	Low	2 115.0
	Middle	2 132.5		Middle	2 132.5
	High	2 150.0		High	2 150.0
64 QAM	Low	2 115.0			
	Middle	2 132.5			
	High	2 150.0			

It should not be reproduced except in full, without the written approval of ONETECH Corp.

EMC-003 (Rev.2)

HEAD OFFICE : 301-14 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

EMC Testing Div. : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea (TEL: 82-31-765-8289, FAX: 82-31-766-2904)

3. Coverage band: 700LTE

Modulation	Frequency(MHz)
16 QAM	751.0
64 QAM	751.0
QPSK	751.0

4. EUT MODIFICATIONS

-. None

5. RF POWER OUTPUT at ANTENNA TERMINAL

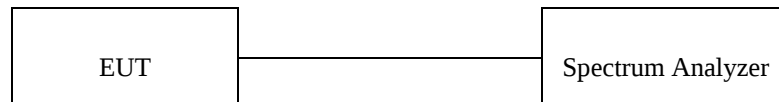
5.1 Operating environment

Temperature : 24 °C
Relative humidity : 47 % R.H.

5.2 Test set-up

The test was performed at three frequencies (low, middle, and high channels) at each band using all applicable modulation. RF output power was measured by channel power measurement function of the spectrum analyzer with RMS detector mode.

The conducted emission level is measured at each antenna port and then summed mathematically to determine the total emission level from the device. (500 mW = 250 mW * 2 Ports)



5.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	FSV30	R/S	FSV30 Signal Analyzer	101372	May 20, 2013 (1Y)
■ -	SA-26B-6	VENTRIX	6 dB Attenuator	CA5760	Dec. 06, 2012 (1Y)

All test equipment used is calibrated on a regular basis.

5.4 Test data for Output Port 0

5.4.1 Test Result for Part 27 C (AWS-1, 5 MHz)

-. Test Date : October 08, 2013
-. Measurement Function : Channel Power
-. Detector Mode : RMS detector
-. Test Result : Pass

Modulation	Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
16 QAM	Low	2 112.50	24.00	0.251 189	100.00
	Middle	2 132.50	23.83	0.241 546	
	High	2 152.50	23.89	0.244 906	
64 QAM	Low	2 112.50	24.10	0.257 040	
	Middle	2 132.50	23.96	0.248 886	
	High	2 152.50	23.79	0.239 332	
QPSK	Low	2 112.50	23.99	0.250 611	
	Middle	2 132.50	23.91	0.246 037	
	High	2 152.50	23.99	0.250 611	



Tested by: Hong-Kyu, Lee/ Engineer

5.4.2 Test Result for Part 27 C (AWS-1, 10 MHz)

-. Test Date : October 08, 2013

-. Measurement Function : Channel Power

-. Detector Mode : RMS detector

-. Test Result : Pass

Modulation	Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
16 QAM	Low	2 115.00	24.03	0.252 930	100.00
	Middle	2 132.50	23.96	0.248 886	
	High	2 150.00	23.98	0.250 035	
64 QAM	Low	2 115.00	24.12	0.258 226	
	Middle	2 132.50	23.89	0.244 906	
	High	2 150.00	23.90	0.245 471	
QPSK	Low	2 115.00	23.93	0.247 172	
	Middle	2 132.50	23.88	0.244 343	
	High	2 150.00	23.90	0.245 471	



Tested by: Hong-Kyu, Lee/ Engineer

5.4.3 Test Result for Part 27 C (700LTE)

-. Test Date : October 07, 2013
-. Measurement Function : Channel Power
-. Detector Mode : RMS detector
-. Test Result : Pass

Modulation	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
16 QAM	751.00	24.06	0.254 683	100.00
64 QAM	751.00	24.04	0.253 513	
QPSK	751.00	24.12	0.258 226	



Tested by: Hong-Kyu, Lee/ Engineer

5.5 Test data for Output Port 1

5.5.1 Test Result for Part 27 C (AWS-1, 5 MHz)

-. Test Date : October 08, 2013

-. Measurement Function : Channel Power

-. Detector Mode : RMS detector

-. Test Result : Pass

Modulation	Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
16 QAM	Low	2 112.50	23.98	0.250 035	100.00
	Middle	2 132.50	23.91	0.246 037	
	High	2 152.50	23.93	0.247 172	
64 QAM	Low	2 112.50	24.01	0.251 768	
	Middle	2 132.50	23.88	0.244 343	
	High	2 152.50	23.73	0.236 048	
QPSK	Low	2 112.50	23.92	0.246 604	
	Middle	2 132.50	23.98	0.250 035	
	High	2 152.50	24.04	0.253 513	



Tested by: Hong-Kyu, Lee/ Engineer

5.5.2 Test Result for Part 27 C (AWS-1, 10 MHz)

-. Test Date : October 08, 2013

-. Measurement Function : Channel Power

-. Detector Mode : RMS detector

-. Test Result : Pass

Modulation	Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
16 QAM	Low	2 115.00	24.01	0.251 768	100.00
	Middle	2 132.50	23.91	0.246 037	
	High	2 150.00	23.89	0.244 906	
64 QAM	Low	2 115.00	24.06	0.254 683	
	Middle	2 132.50	23.93	0.247 172	
	High	2 150.00	23.93	0.247 172	
QPSK	Low	2 115.00	23.96	0.248 886	
	Middle	2 132.50	23.91	0.246 037	
	High	2 150.00	23.89	0.244 906	



Tested by: Hong-Kyu, Lee/ Engineer

5.5.3 Test Result for Part 27 C (700LTE)

-. Test Date : October 08, 2013
-. Measurement Function : Channel Power
-. Detector Mode : RMS detector
-. Test Result : Pass

Modulation	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)
16 QAM	751.00	23.93	0.247 172	100.00
64 QAM	751.00	23.98	0.250 035	
QPSK	751.00	24.00	0.251 189	



Tested by: Hong-Kyu, Lee/ Engineer

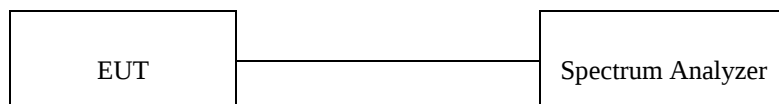
6. OCCUPIED BANDWIDTH

6.1 Operating environment

Temperature : 24 °C
Relative humidity : 47 % R.H.

6.2 Test set-up

The test was performed at three frequencies (low, middle, and high channels) at each band using all applicable modulation. For the testing, the RBW was set to 1 % to 3 % of the - 26 dB bandwidth and 99 % Occupied Bandwidth. The VBW is set to 3 times the RBW and sweep time is coupled.



6.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	FSV30	R/S	FSV30 Signal Analyzer	101372	May 20, 2013 (1Y)
■ -	SA-26B-6	VENTRIX	6 dB Attenuator	CA5760	Dec. 06, 2012 (1Y)

All test equipment used is calibrated on a regular basis.

6.4 Test data for Output Port 0

6.4.1 Test Result for Part 27 C (AWS-1, 5 MHz)

-. Test Date : October 08, 2013

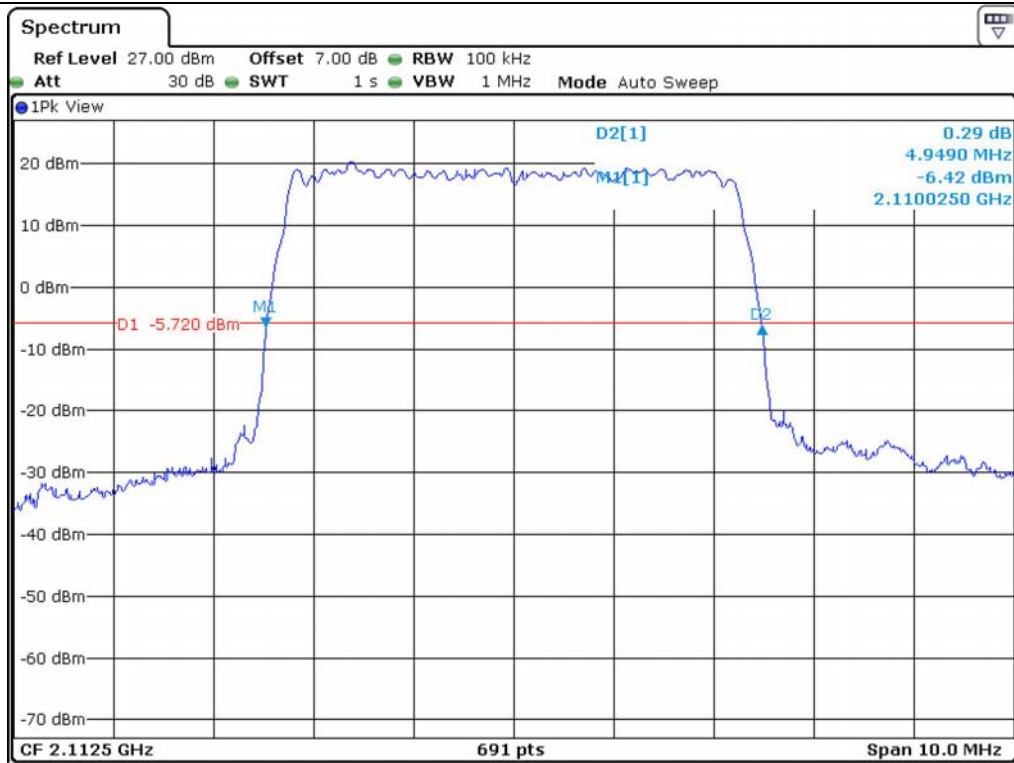
-. Test Result : Pass

Modulation	Channel	26 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)
16 QAM	Low	4.950	4.500
	Middle	4.950	4.500
	High	4.950	4.500
64 QAM	Low	4.960	4.530
	Middle	4.960	4.530
	High	4.960	4.530
QPSK	Low	4.940	4.490
	Middle	4.950	4.490
	High	4.940	4.500

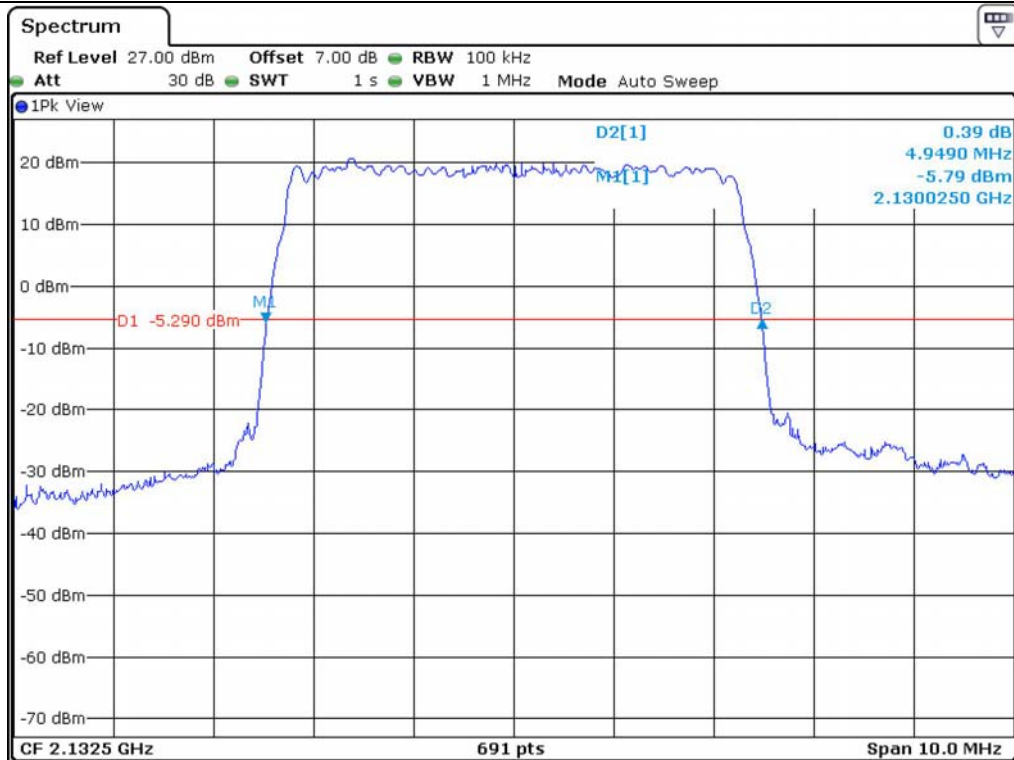
Remark: According to above result, the carrier frequency shall be within the frequency block edges.



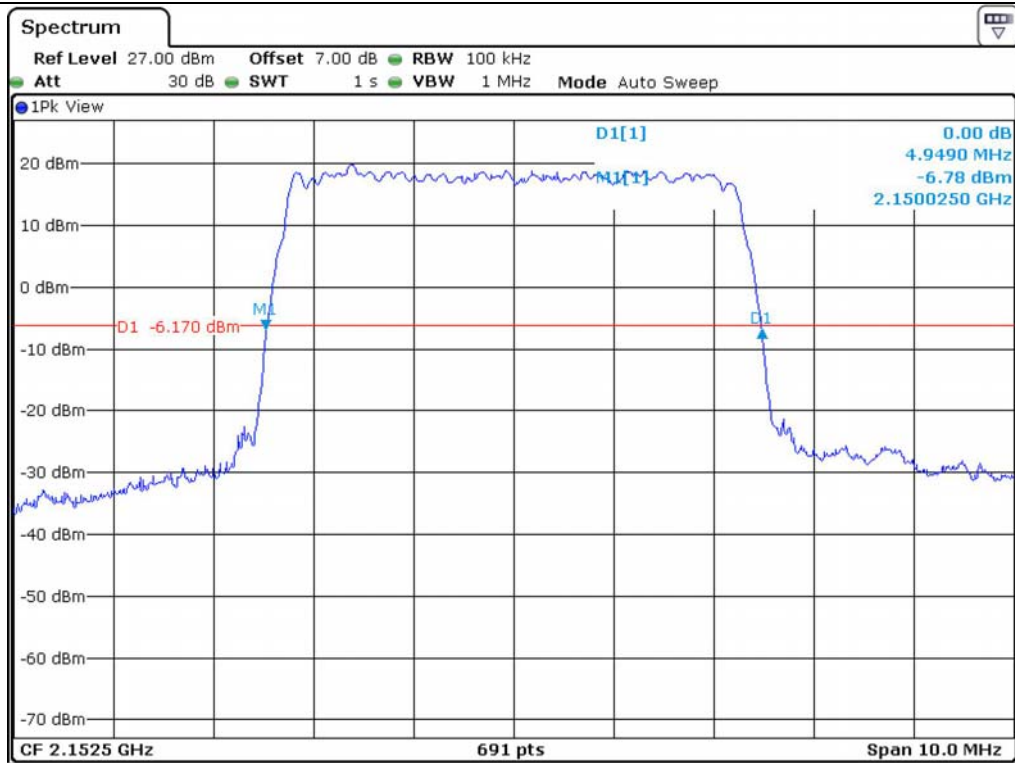
Tested by: Hong-Kyu, Lee/ Engineer



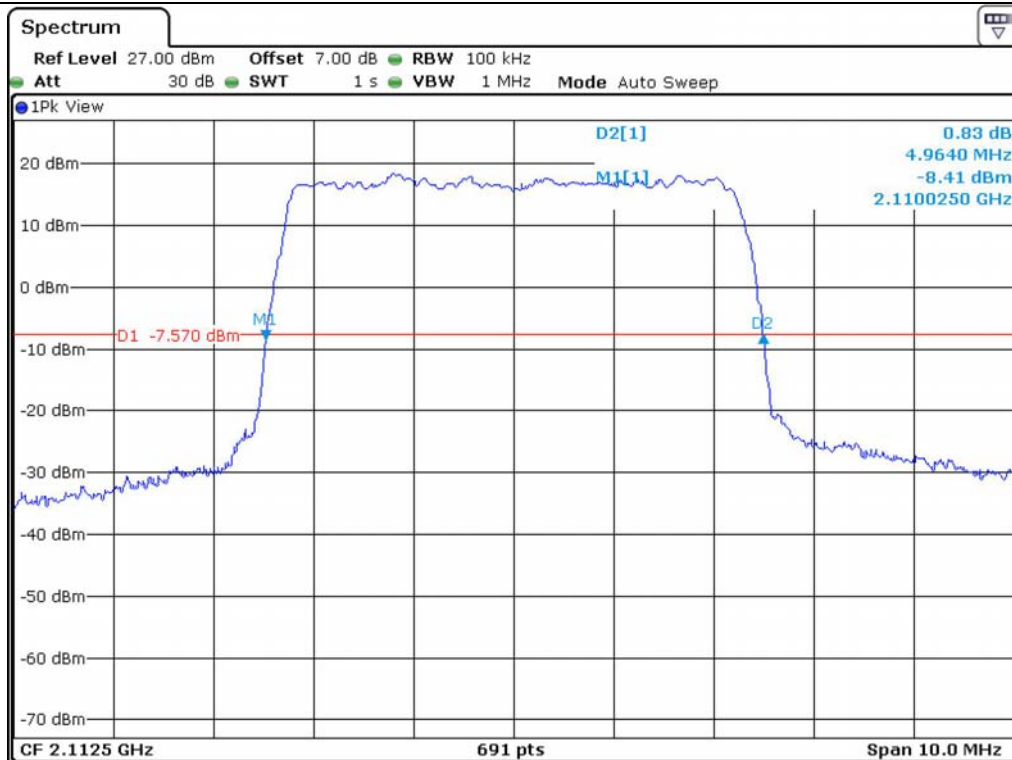
16 QAM – 26 dB Bandwidth (Low Channel)



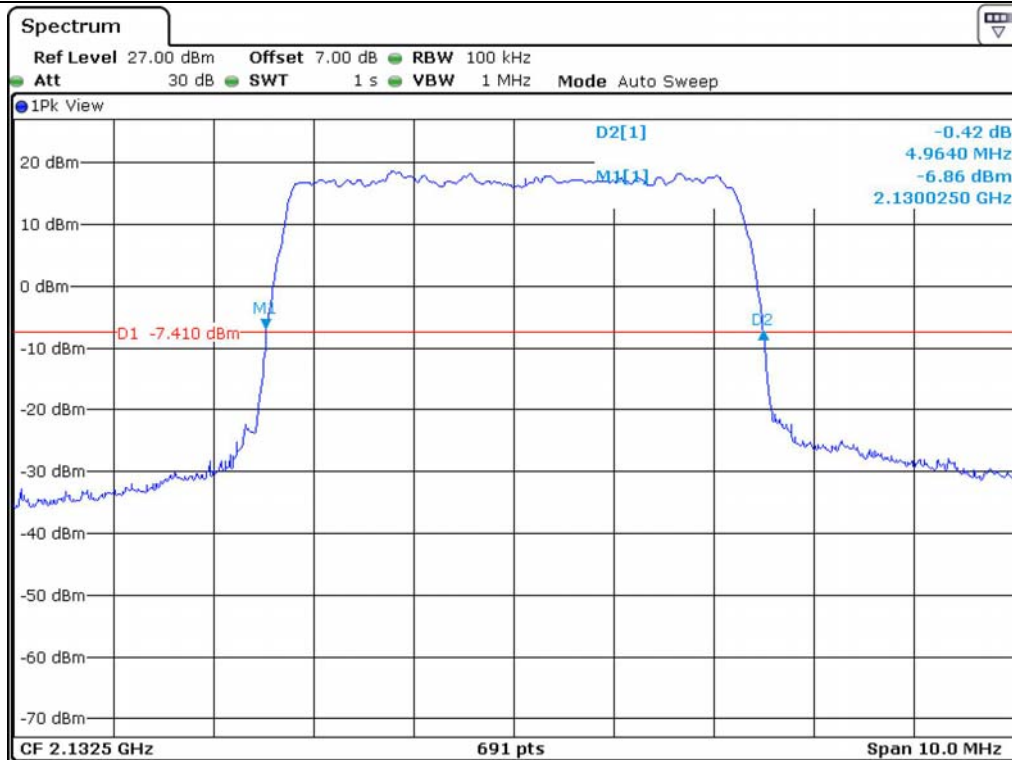
16 QAM – 26 dB Bandwidth (Middle Channel)



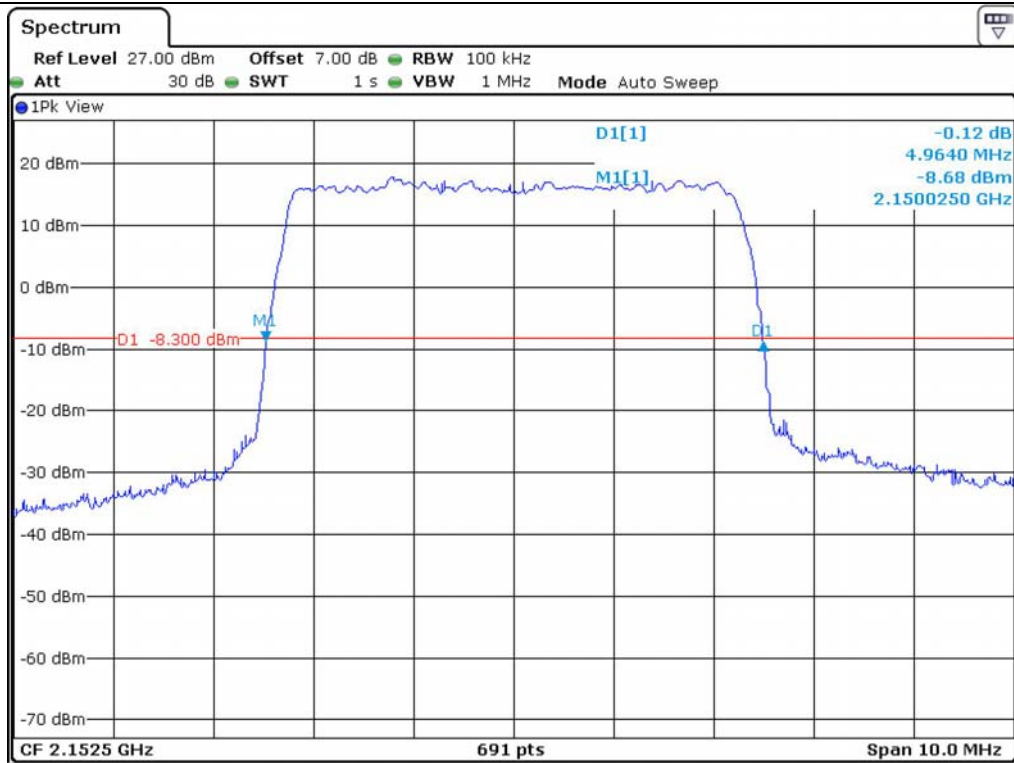
16 QAM – 26 dB Bandwidth (High Channel)



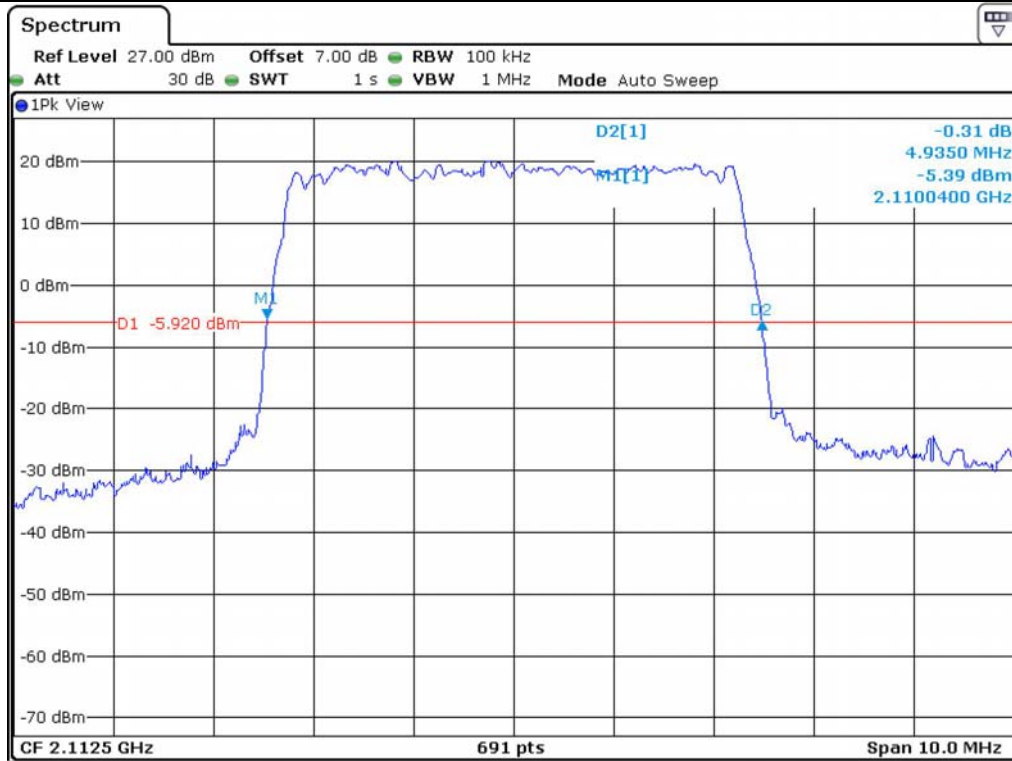
64 QAM – 26 dB Bandwidth (Low Channel)



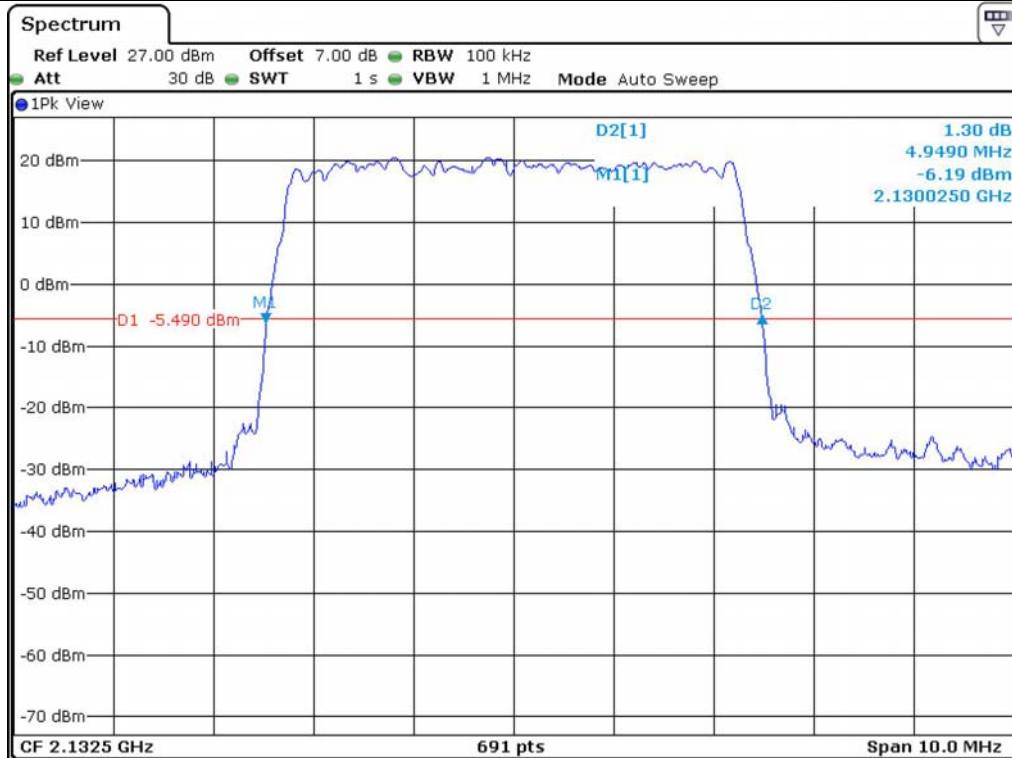
64 QAM – 26 dB Bandwidth (Middle Channel)



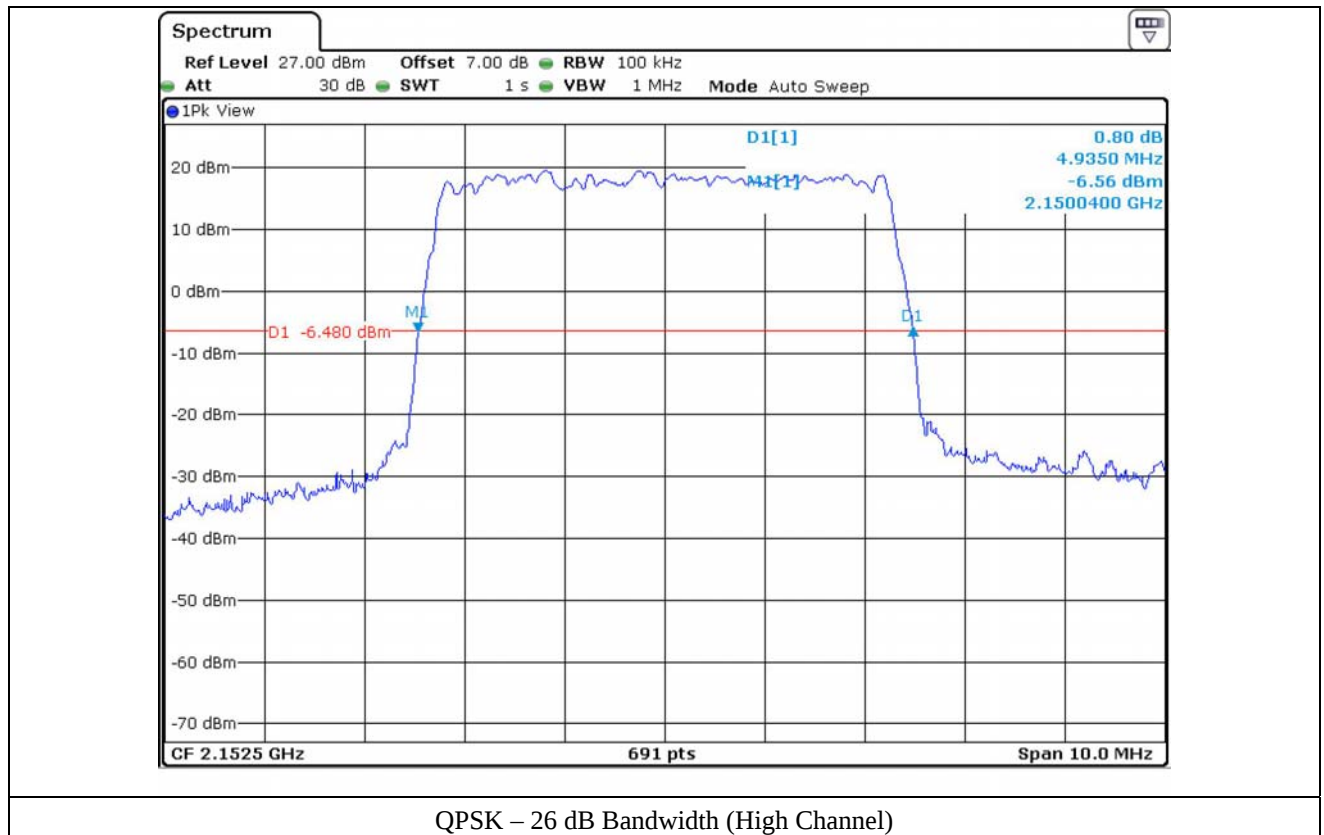
64 QAM – 26 dB Bandwidth (High Channel)

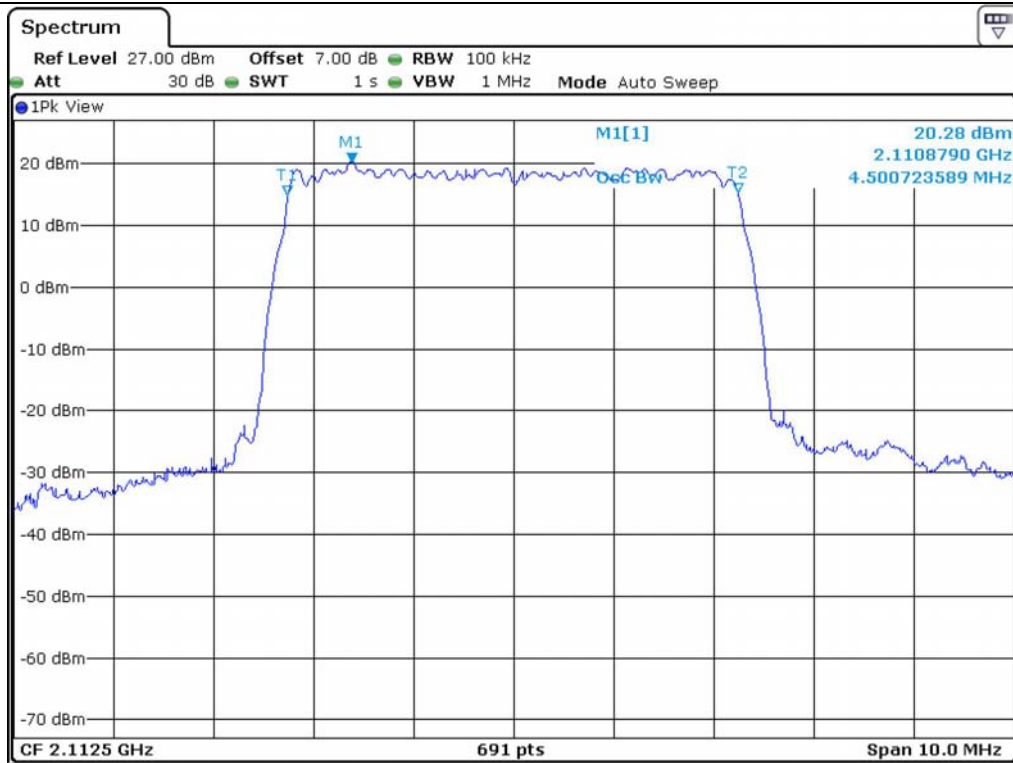


QPSK – 26 dB Bandwidth (Low Channel)

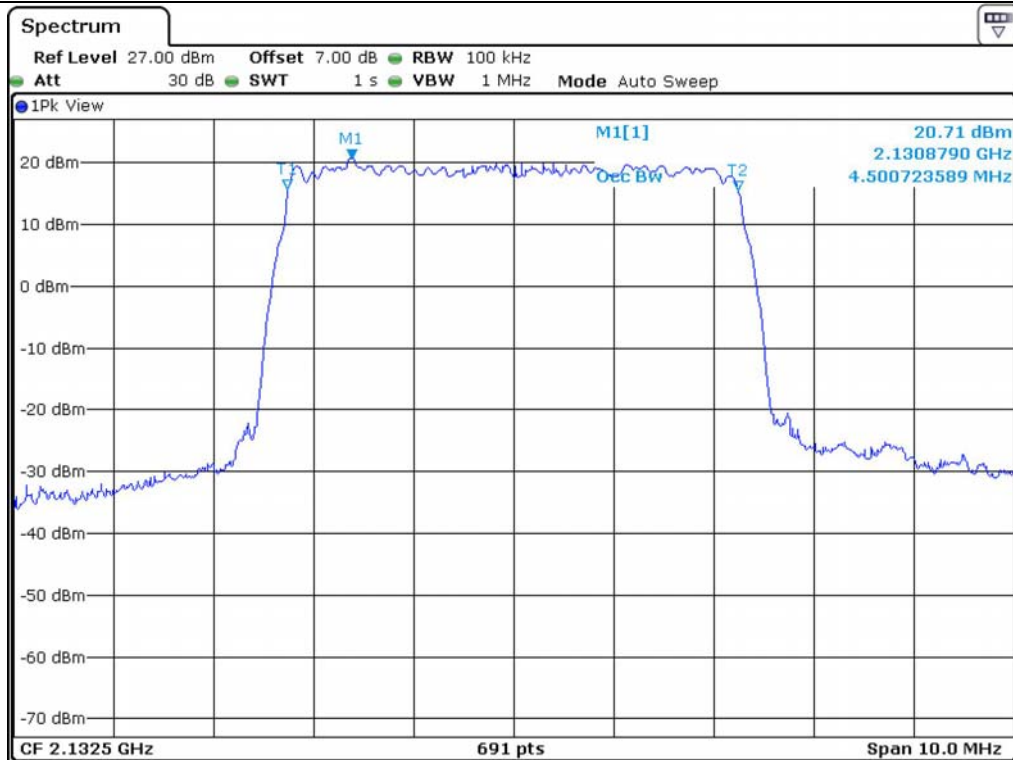


QPSK – 26 dB Bandwidth (Middle Channel)

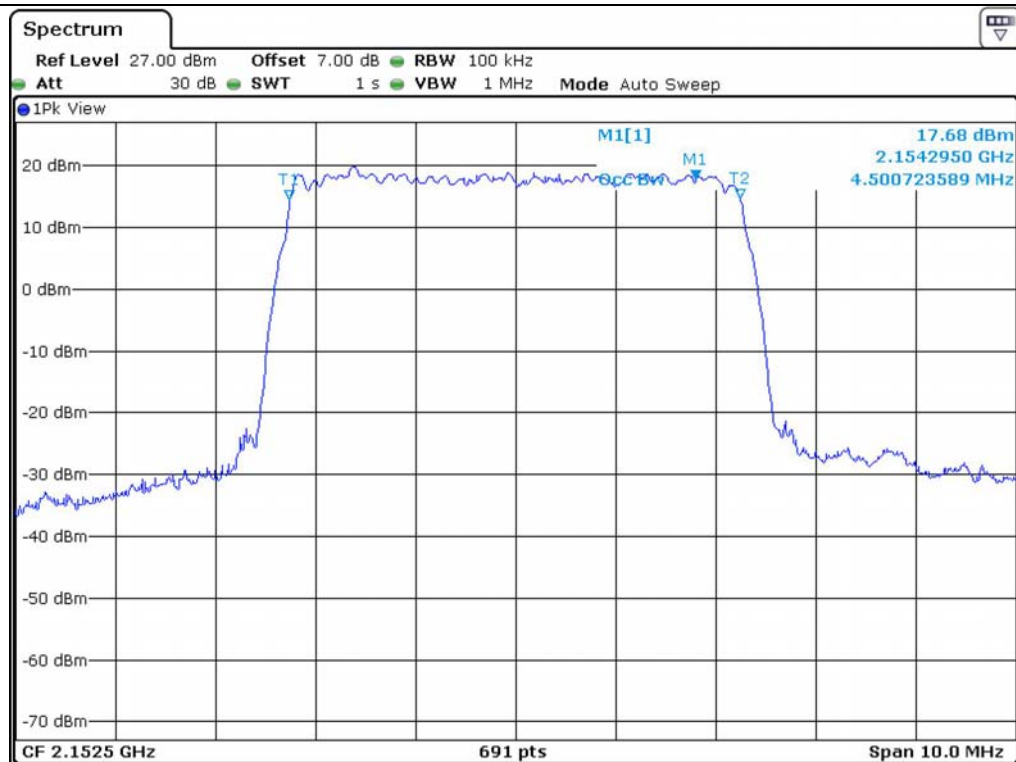




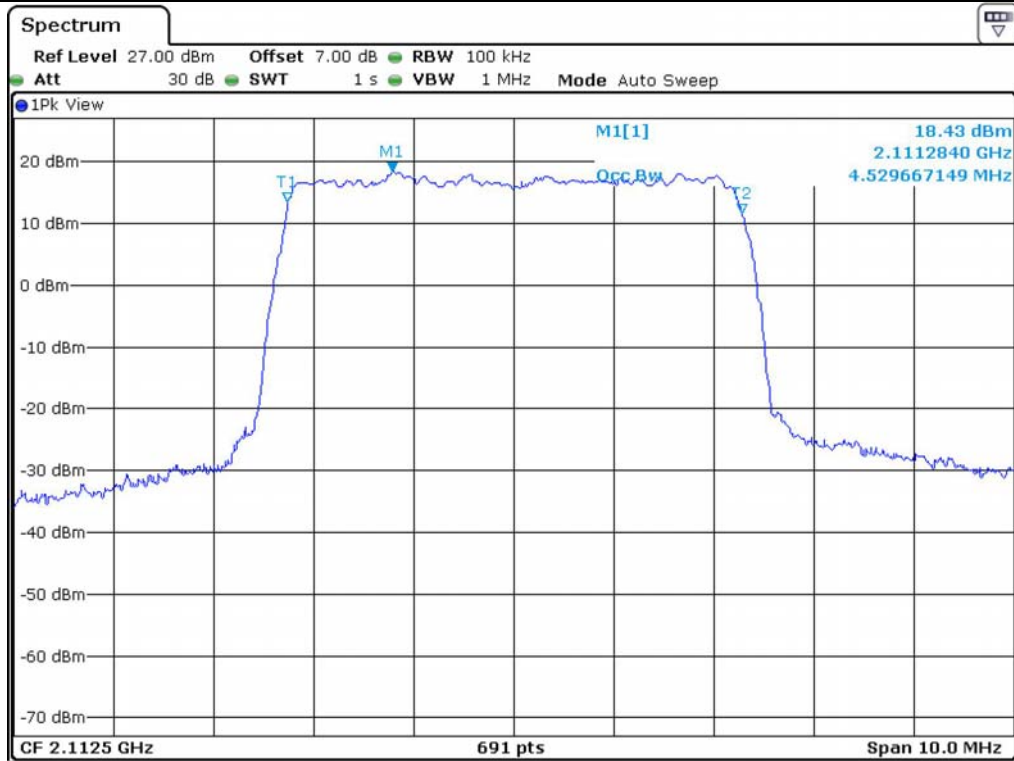
16 QAM – 99 % Occupied Bandwidth (Low Channel)



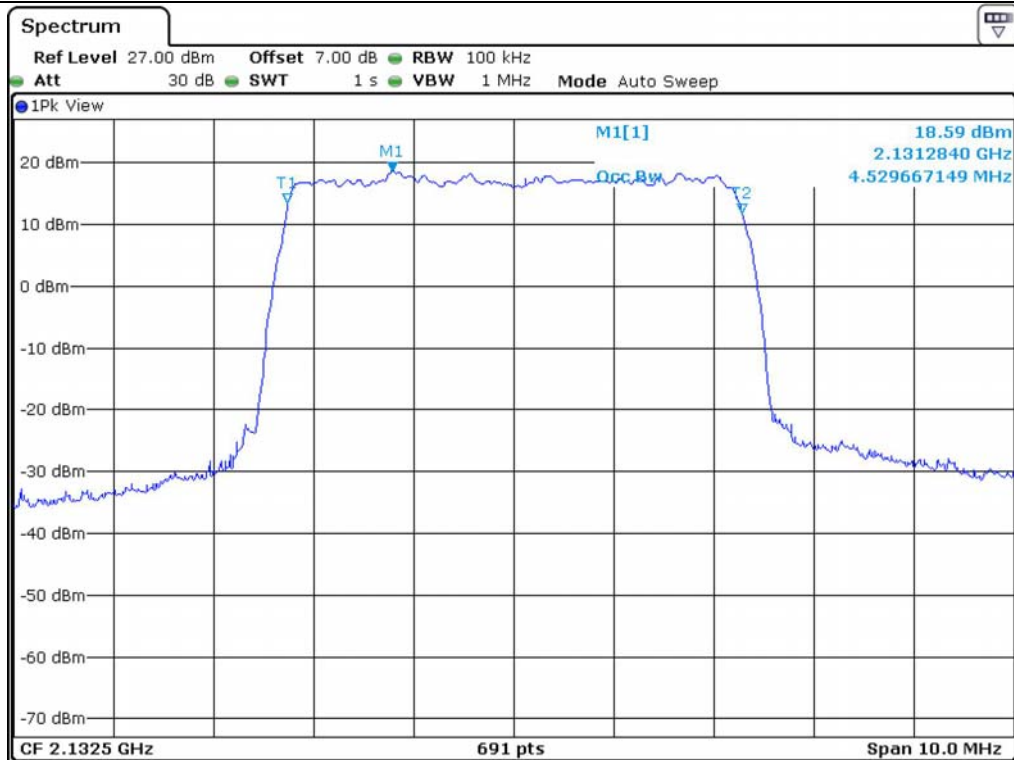
16 QAM – 99 % Occupied Bandwidth (Middle Channel)



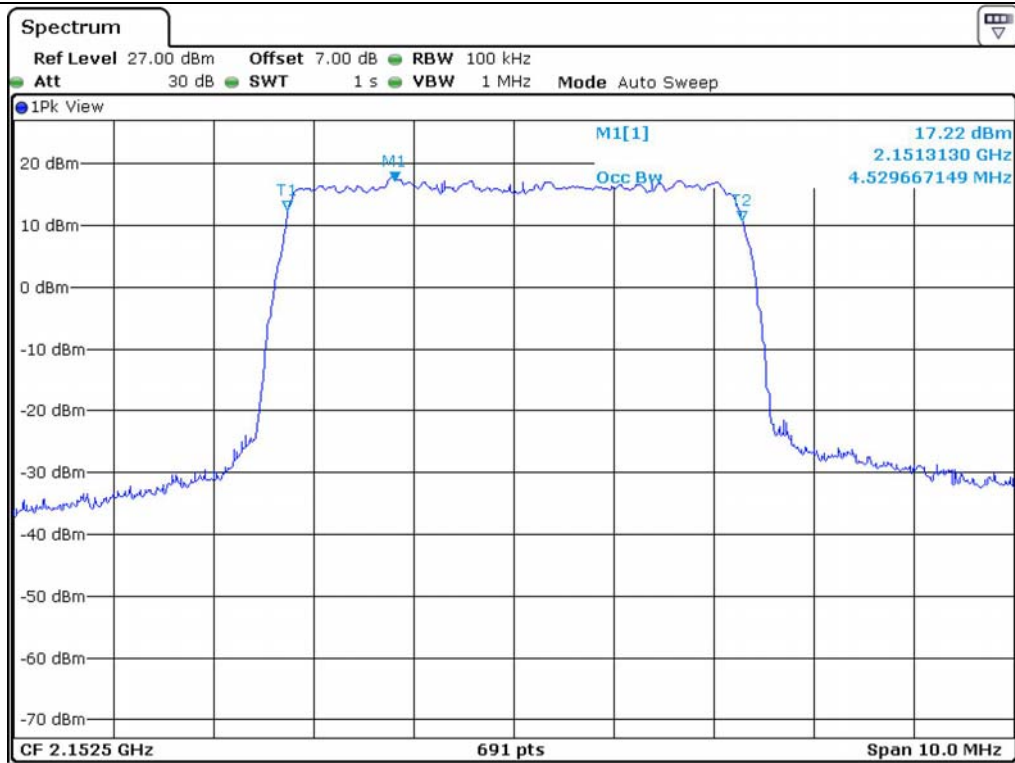
16 QAM – 99 % Occupied Bandwidth (High Channel)



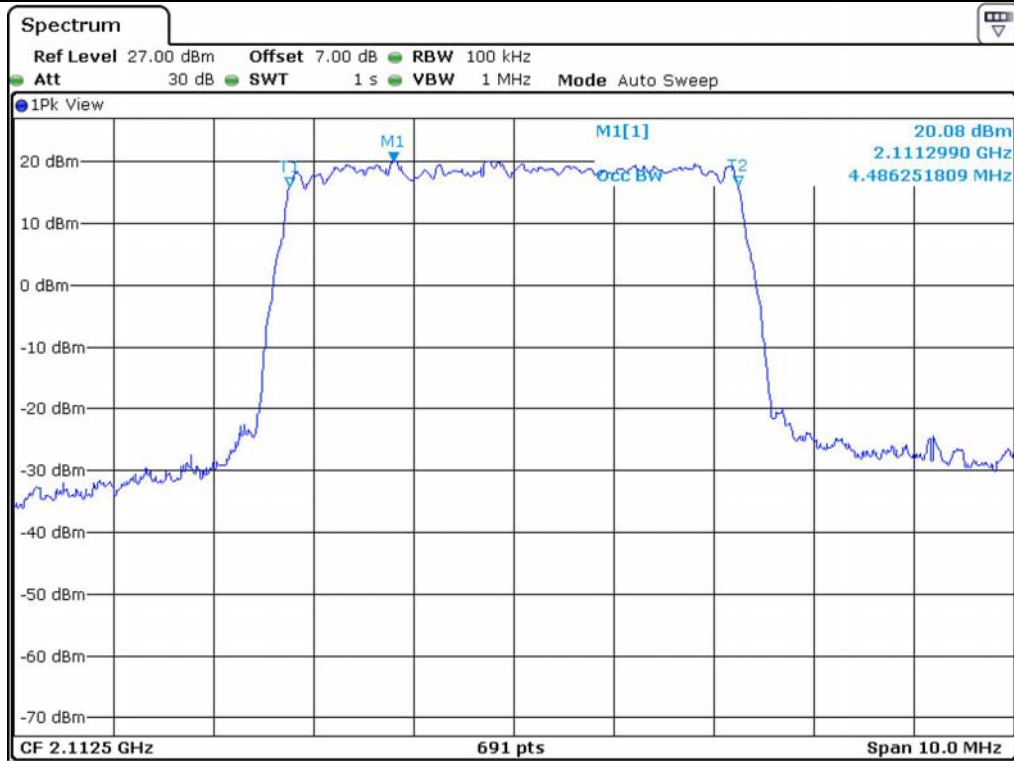
64 QAM – 99 % Occupied Bandwidth (Low Channel)



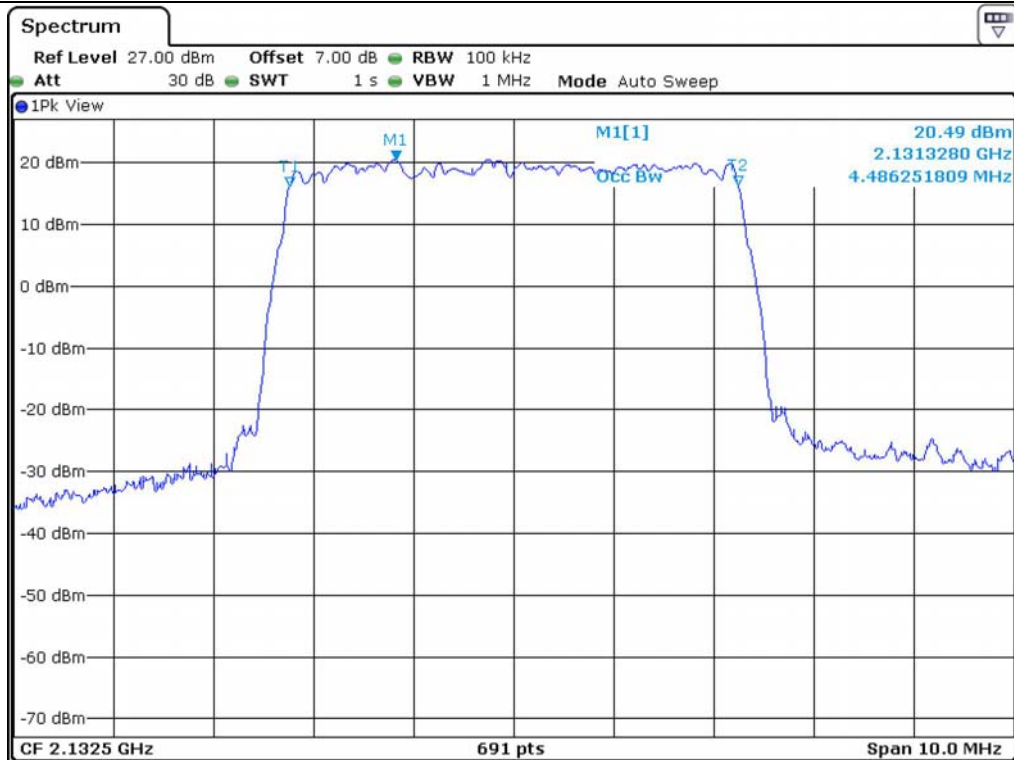
64 QAM – 99 % Occupied Bandwidth (Middle Channel)



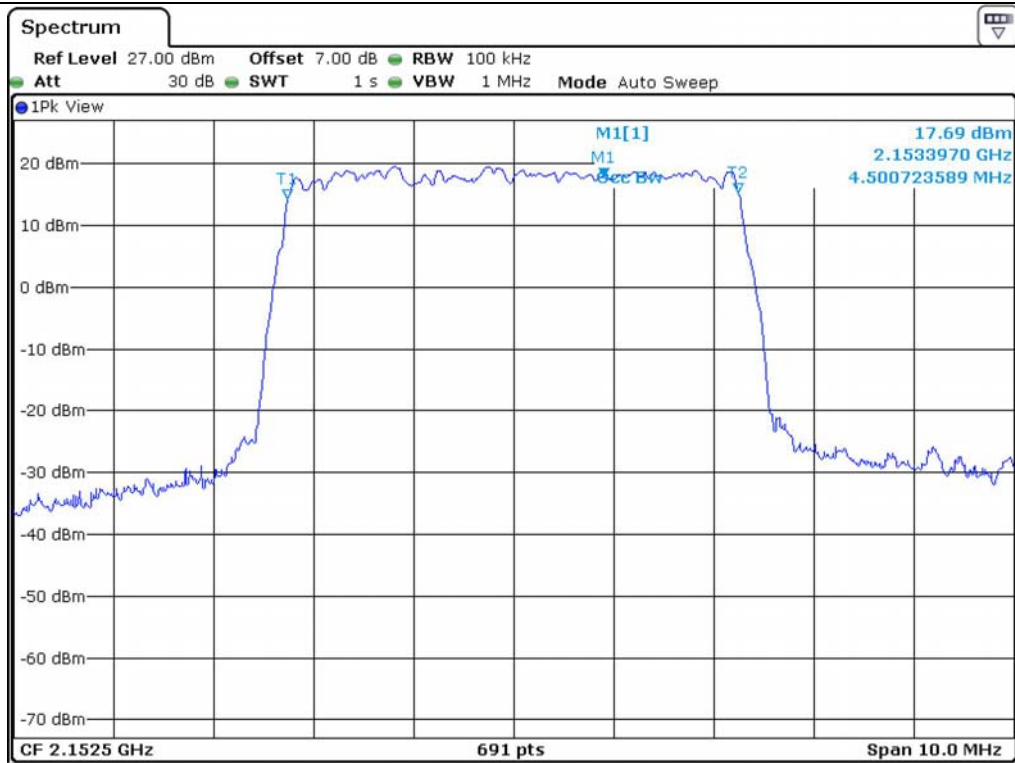
64 QAM – 99 % Occupied Bandwidth (High Channel)



QPSK – 99 % Occupied Bandwidth (Low Channel)



QPSK – 99 % Occupied Bandwidth (Middle Channel)



QPSK – 99 % Occupied Bandwidth (High Channel)

6.4.2 Test Result for Part 27 C (AWS-1, 10 MHz)

-. Test Date : October 08, 2013

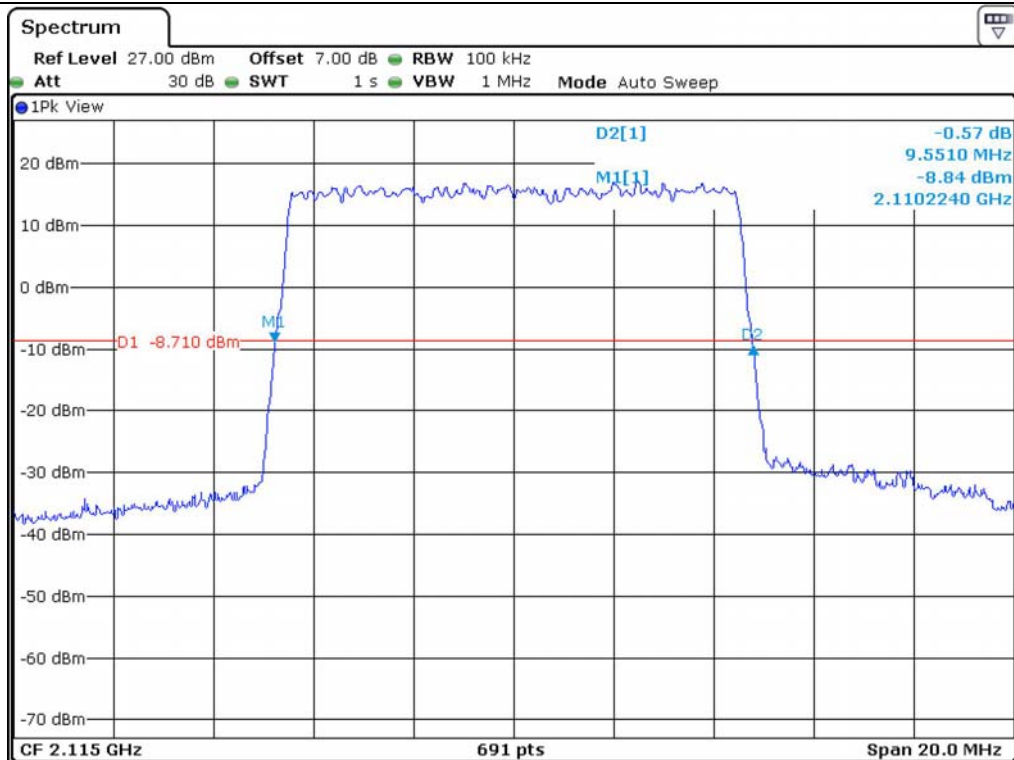
-. Test Result : Pass

Modulation	Channel	26 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)
16 QAM	Low	9.550	8.910
	Middle	9.550	8.910
	High	9.550	8.910
64 QAM	Low	9.610	8.970
	Middle	9.610	8.970
	High	9.610	8.970
QPSK	Low	9.580	8.940
	Middle	9.580	8.940
	High	9.550	8.940

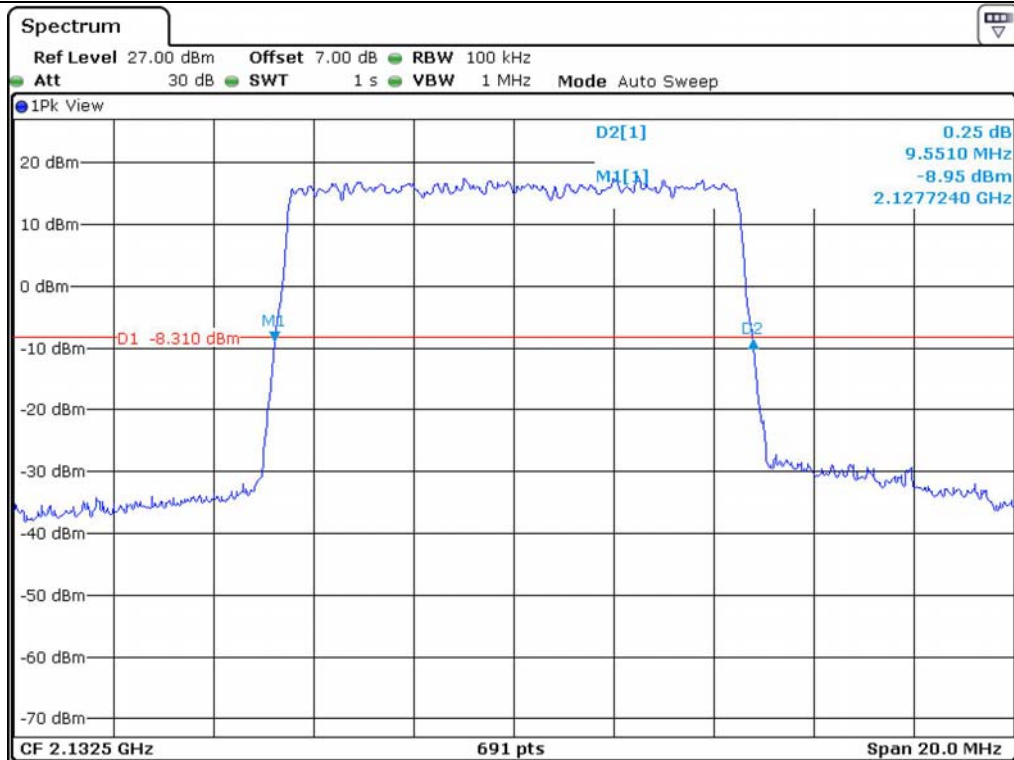
Remark: According to above result, the carrier frequency shall be within the frequency block edges.



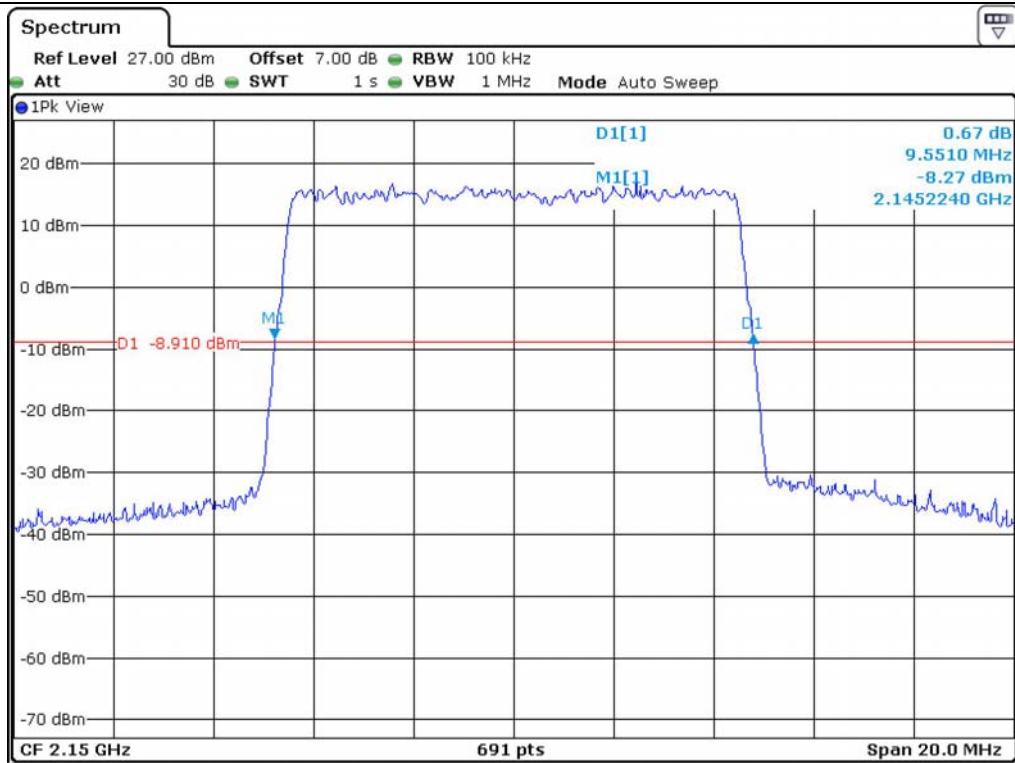
Tested by: Hong-Kyu, Lee/ Engineer



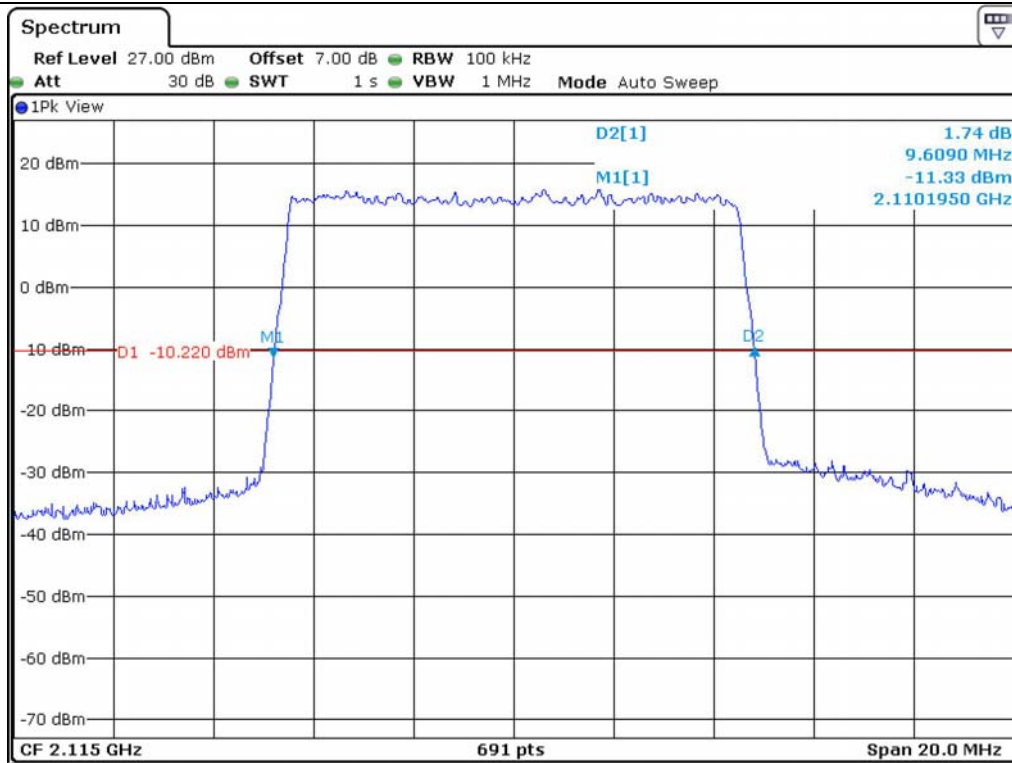
16 QAM – 26 dB Bandwidth (Low Channel)



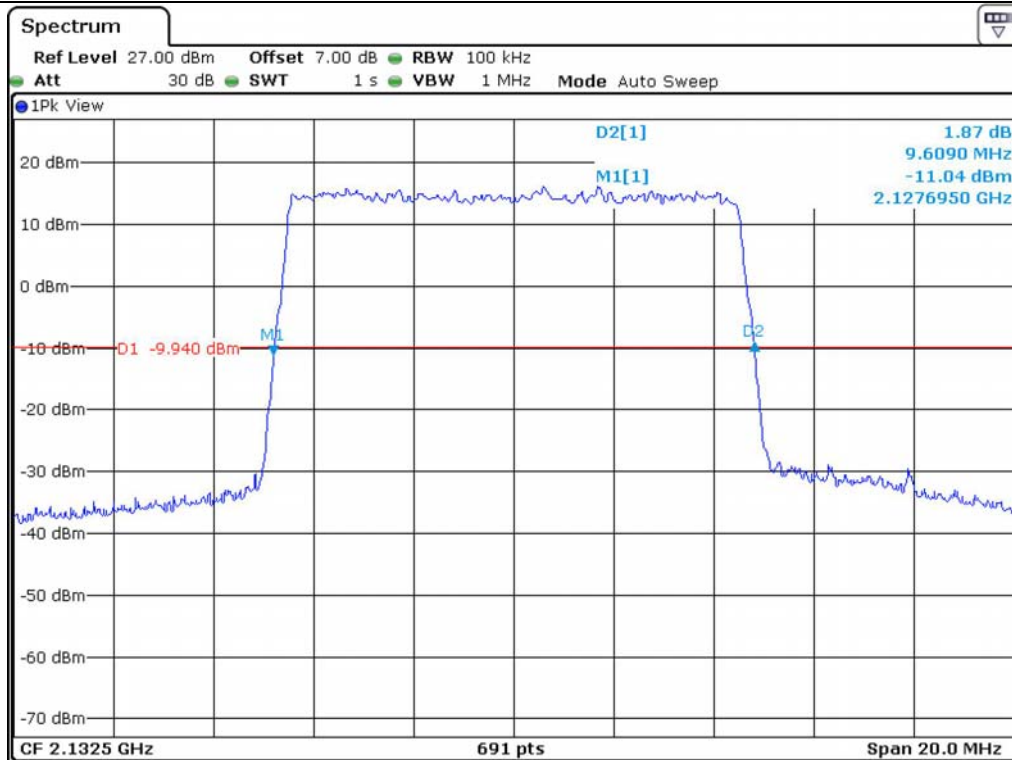
16 QAM – 26 dB Bandwidth (Middle Channel)



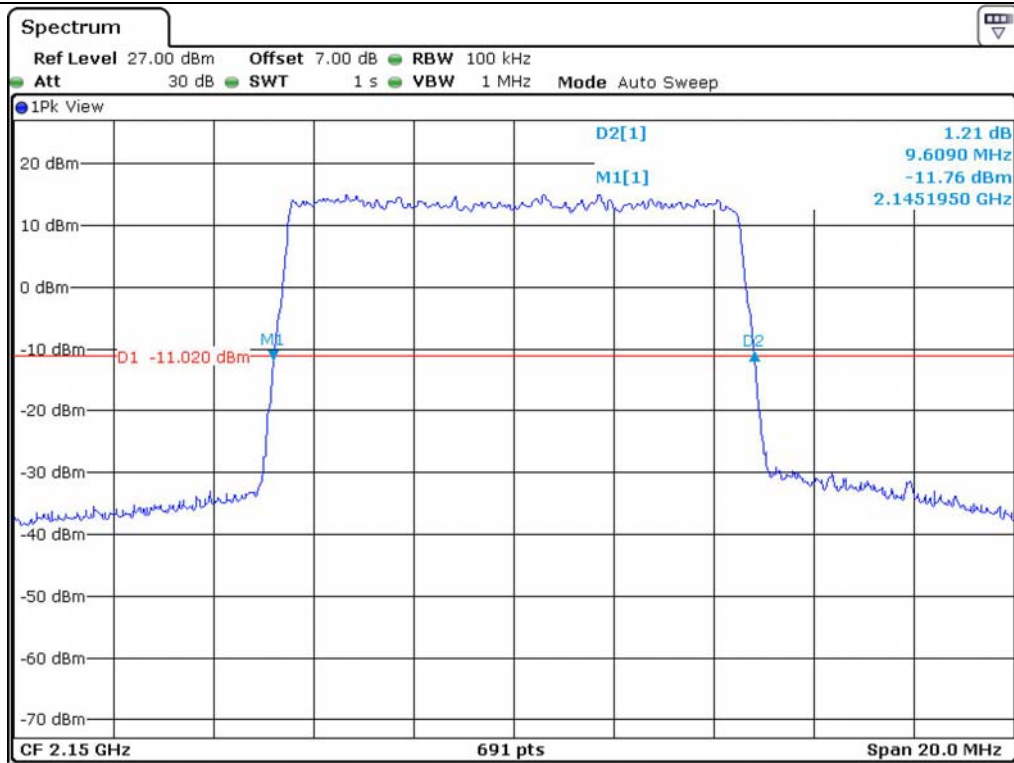
16 QAM – 26 dB Bandwidth (High Channel)



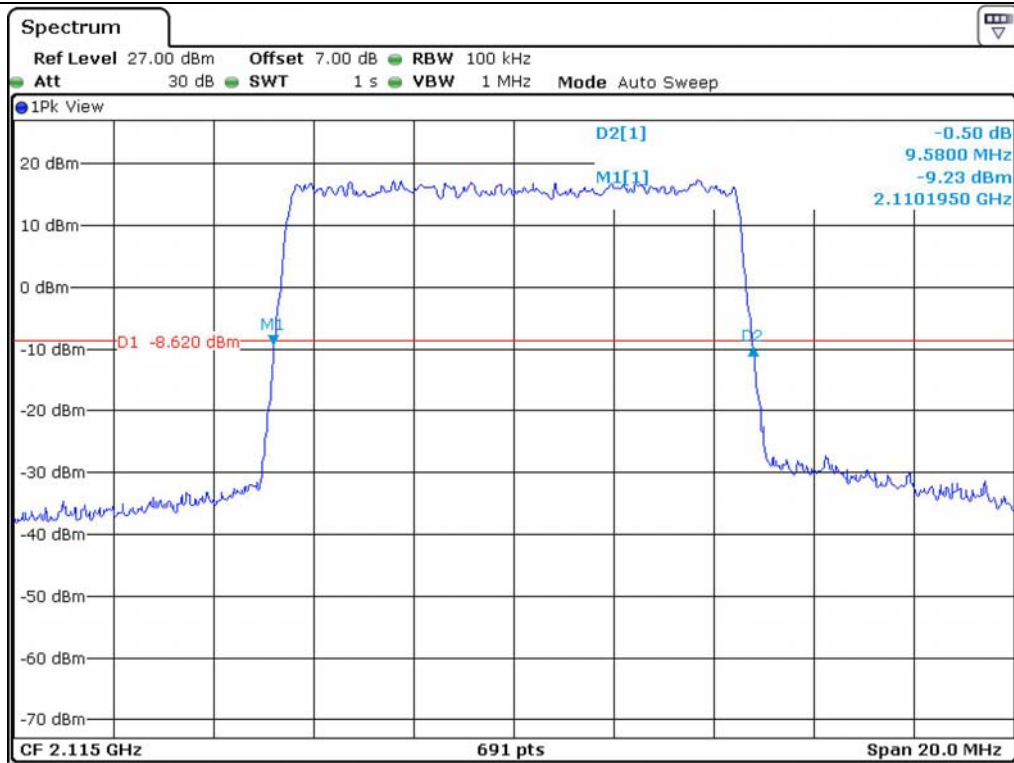
64 QAM – 26 dB Bandwidth (Low Channel)



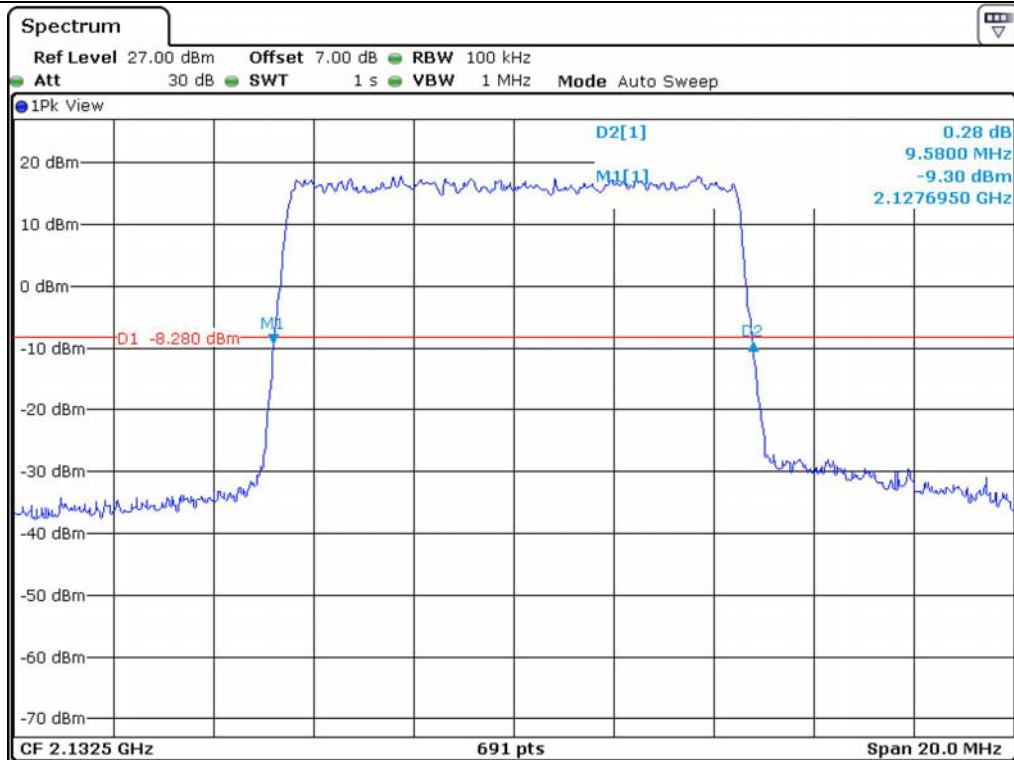
64 QAM – 26 dB Bandwidth (Middle Channel)



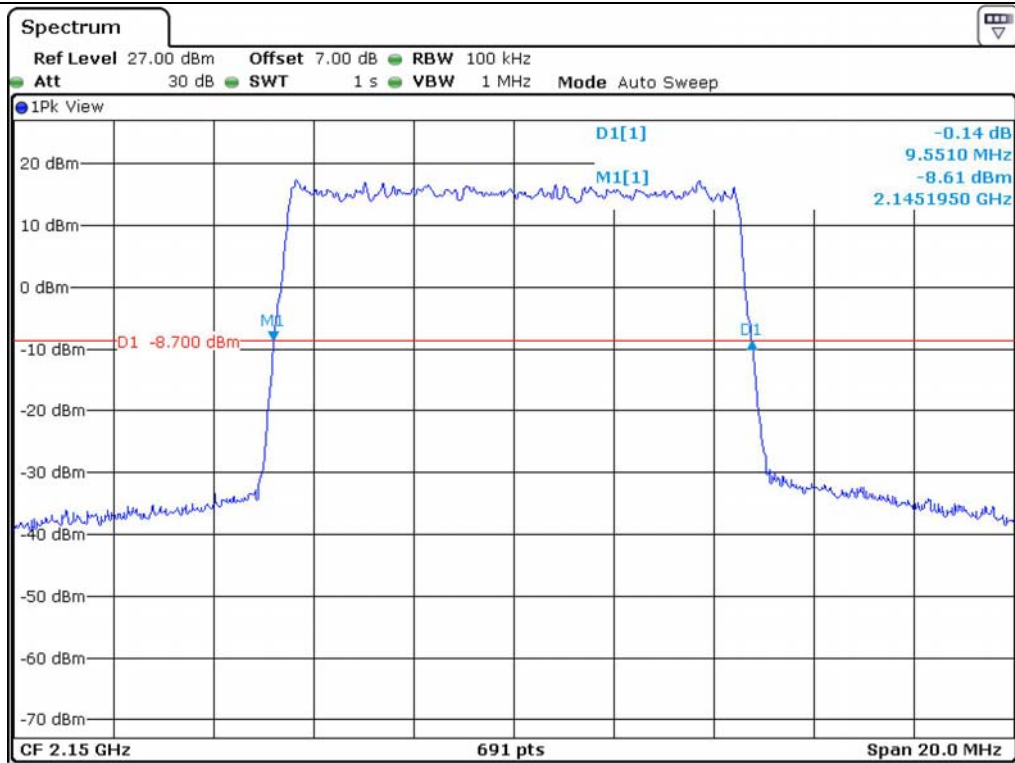
64 QAM – 26 dB Bandwidth (High Channel)



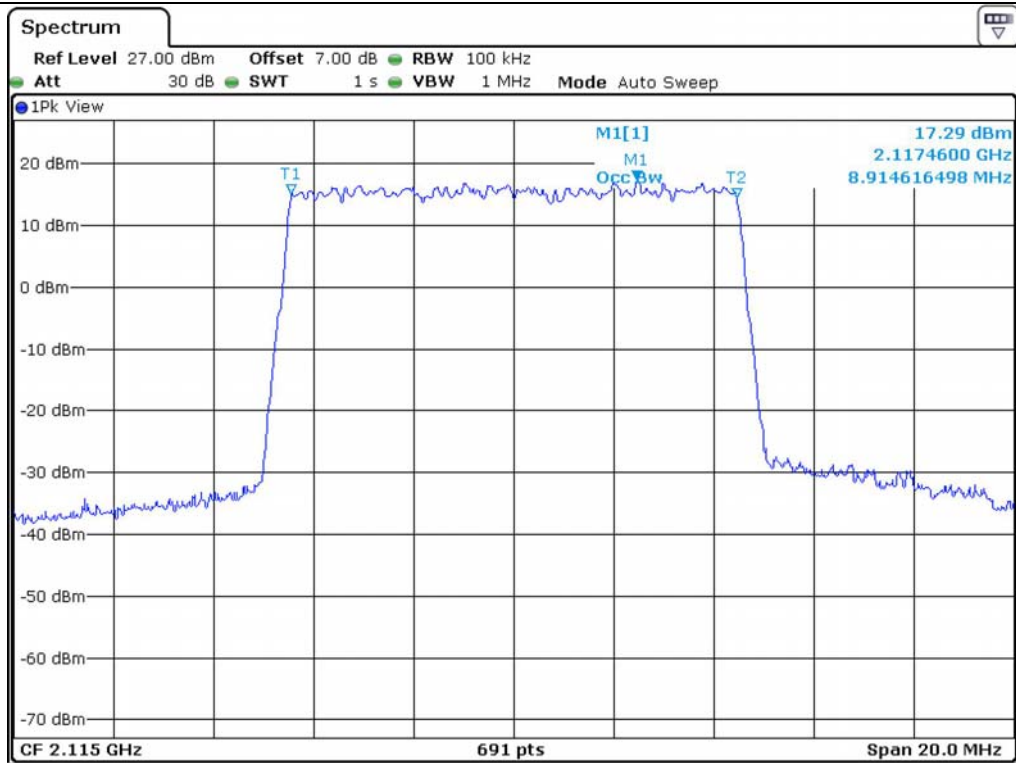
QPSK – 26 dB Bandwidth (Low Channel)



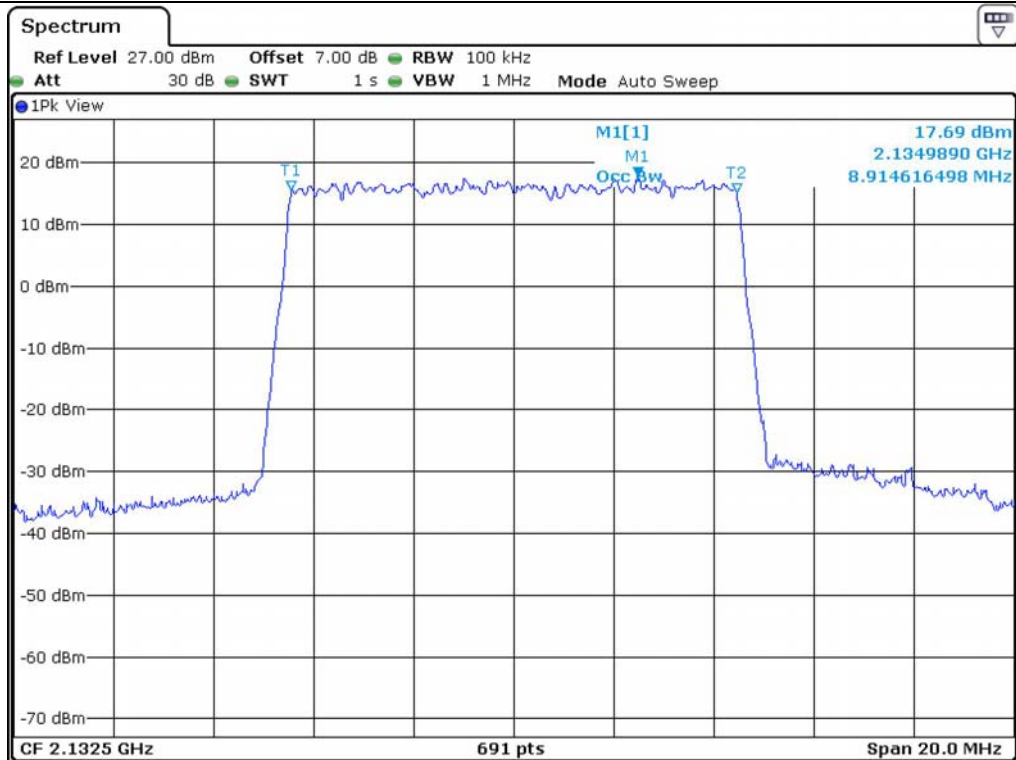
QPSK – 26 dB Bandwidth (Middle Channel)



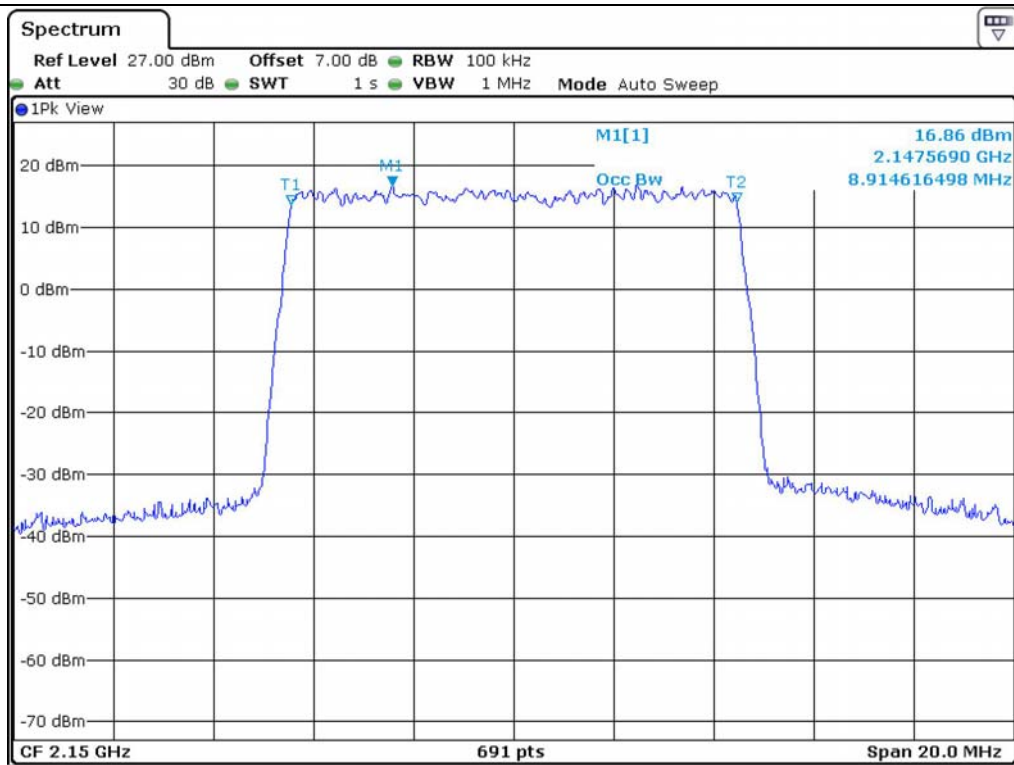
QPSK – 26 dB Bandwidth (High Channel)



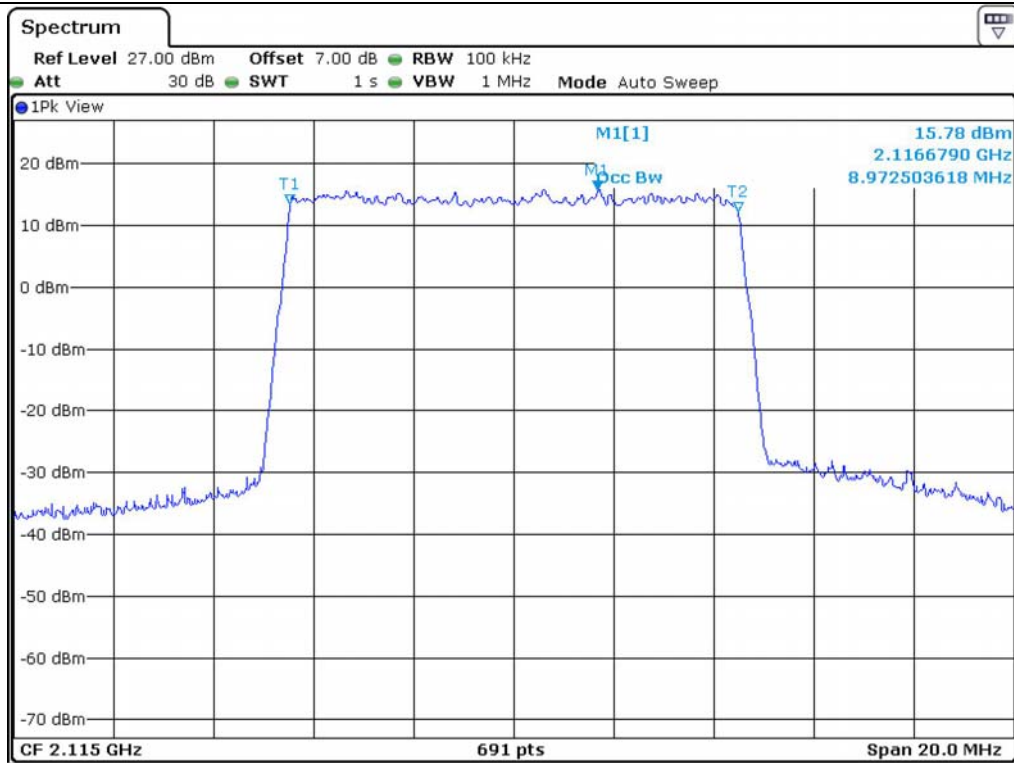
16 QAM – 99 % Occupied Bandwidth (Low Channel)



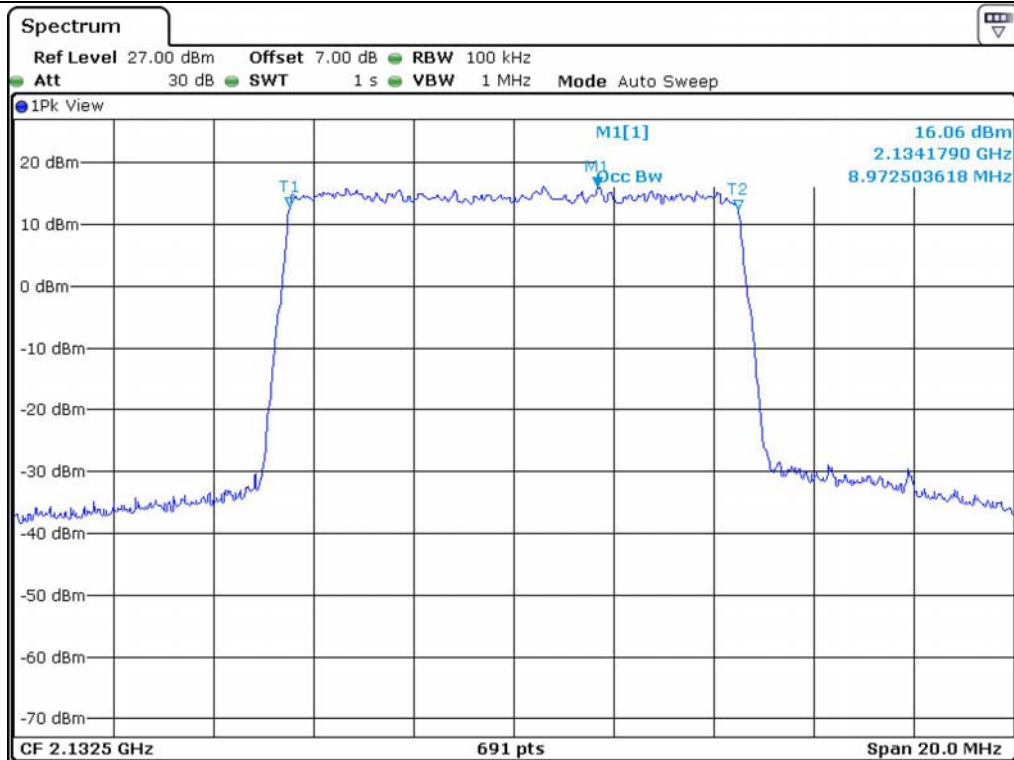
16 QAM – 99 % Occupied Bandwidth (Middle Channel)



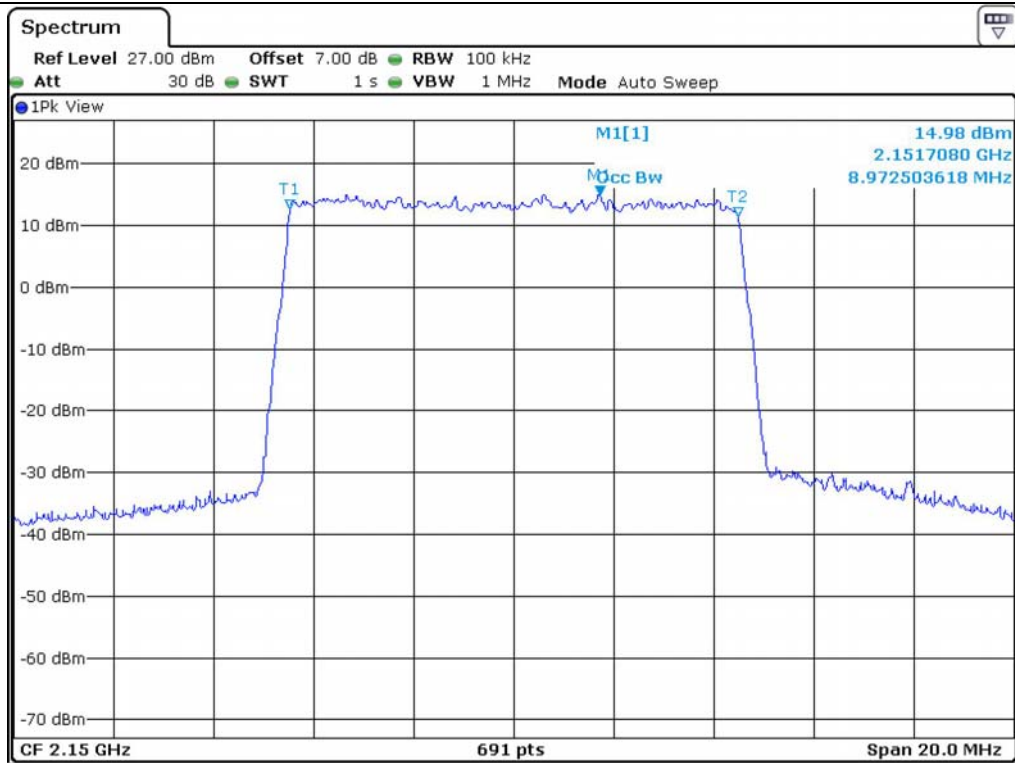
16 QAM – 99 % Occupied Bandwidth (High Channel)



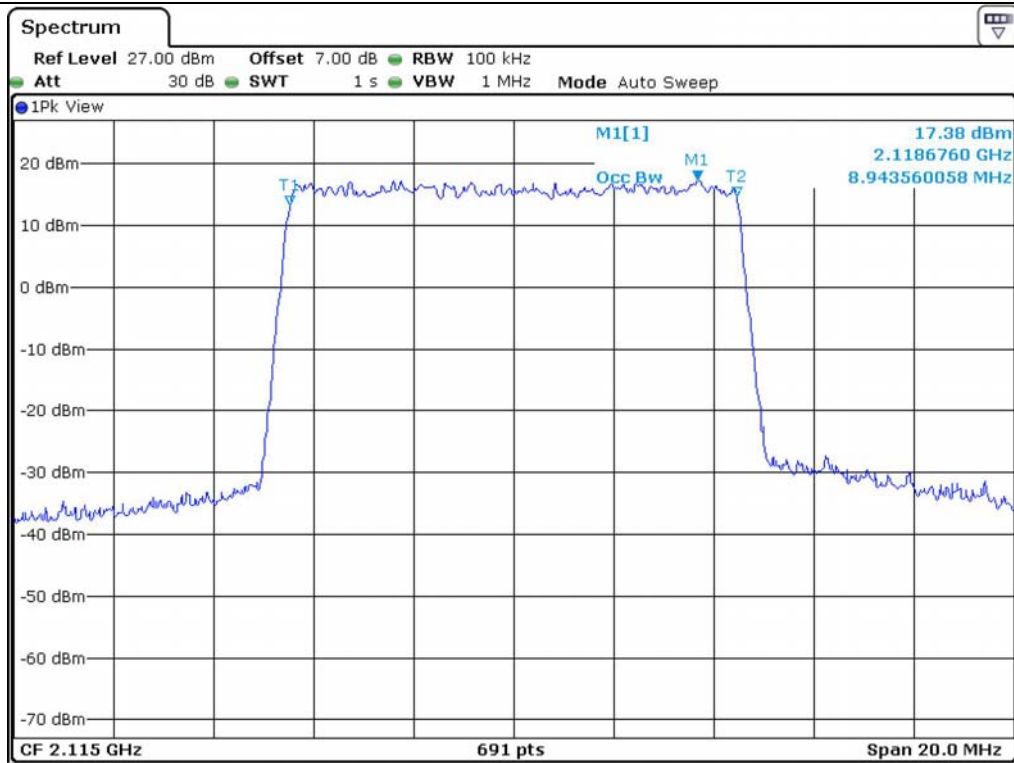
64 QAM – 99 % Occupied Bandwidth (Low Channel)



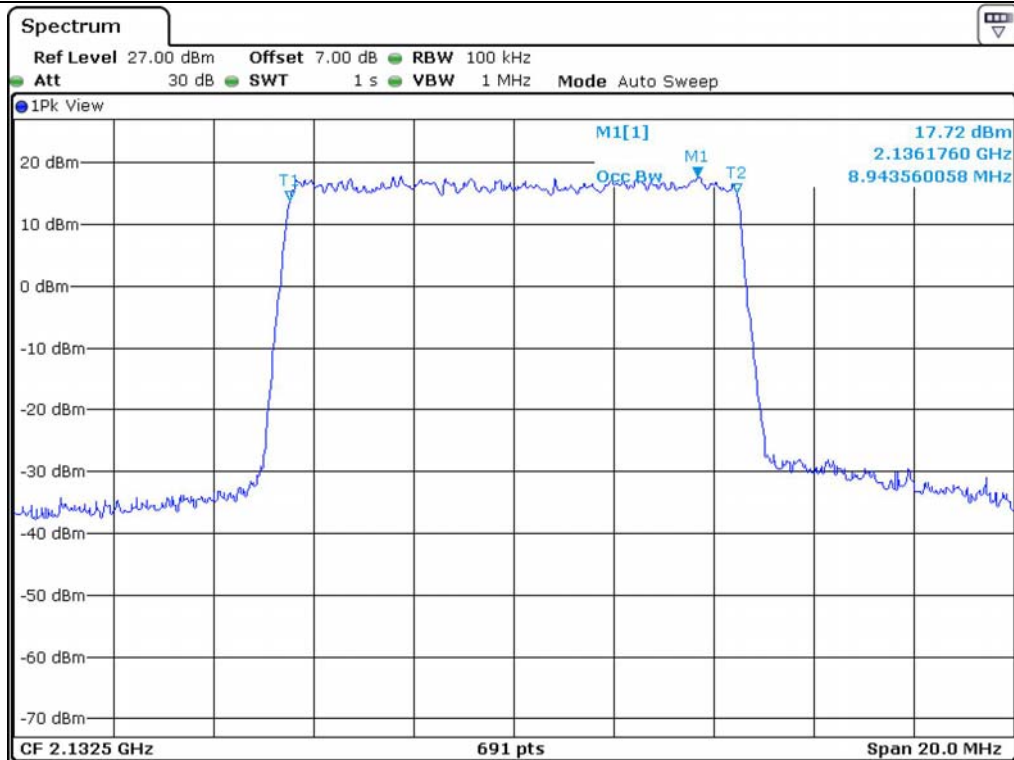
64 QAM – 99 % Occupied Bandwidth (Middle Channel)



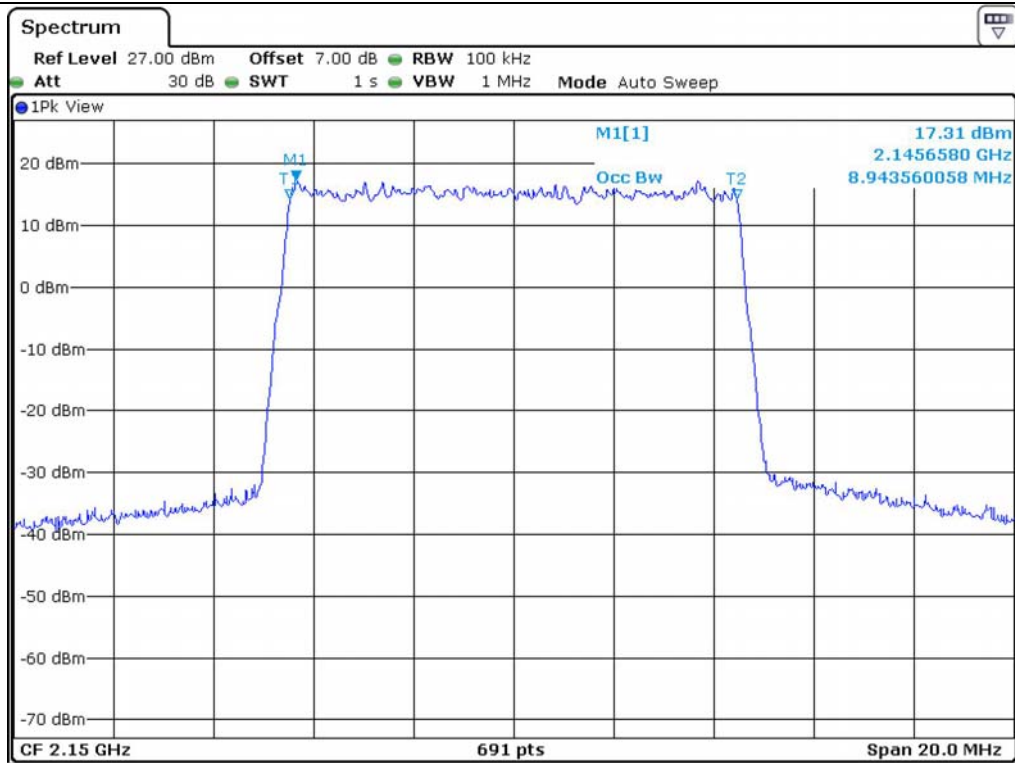
64 QAM – 99 % Occupied Bandwidth (High Channel)



QPSK – 99 % Occupied Bandwidth (Low Channel)



QPSK – 99 % Occupied Bandwidth (Middle Channel)



QPSK – 99 % Occupied Bandwidth (High Channel)

6.4.3 Test Result for Part 27 C (700LTE)

-. Test Date : October 07, 2013

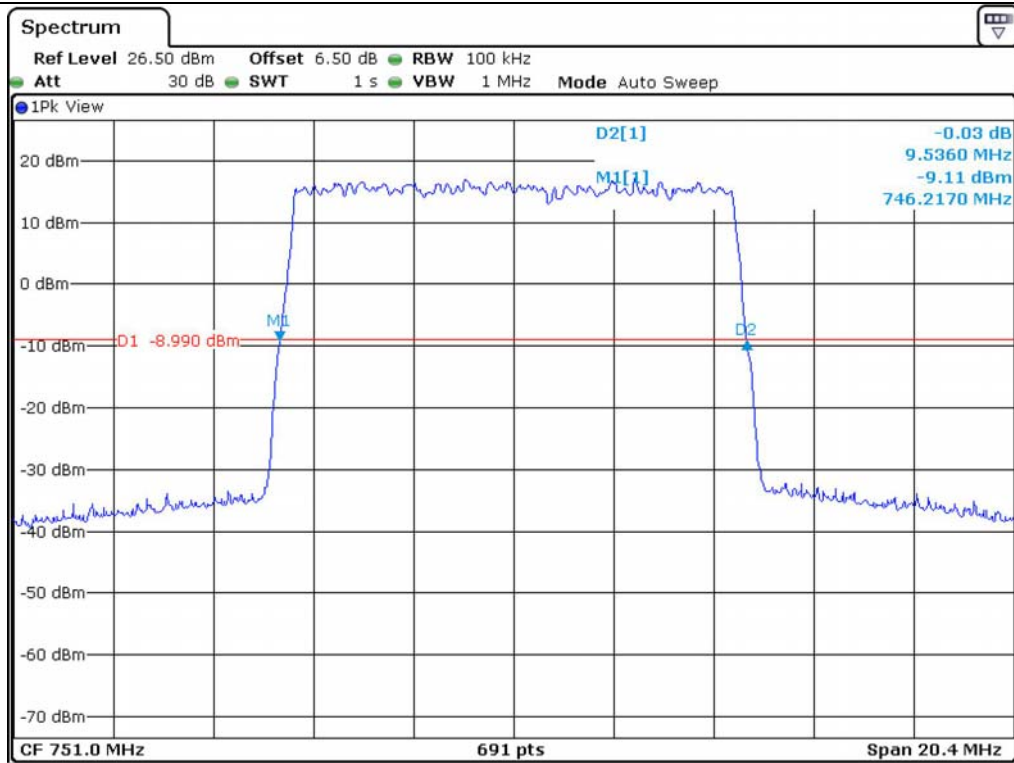
-. Test Result : Pass

Modulation	26 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)
16 QAM	9.540	8.950
64 QAM	9.600	8.940
QPSK	9.550	8.940

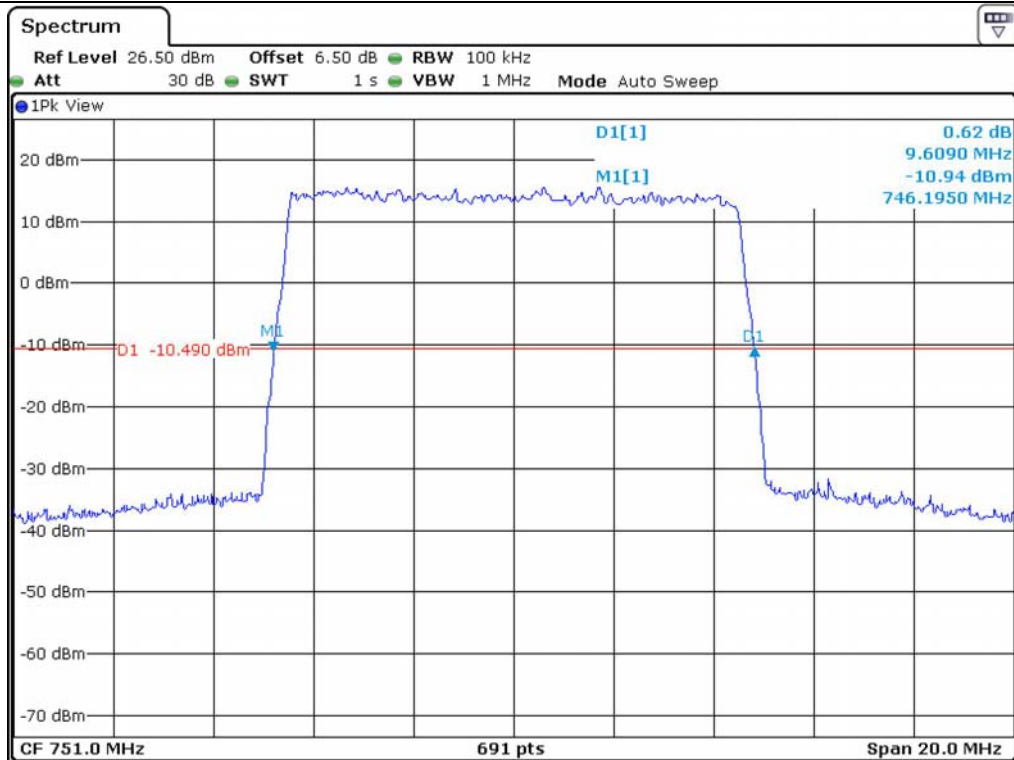
Remark: According to above result, the carrier frequency shall be within the frequency block edges.



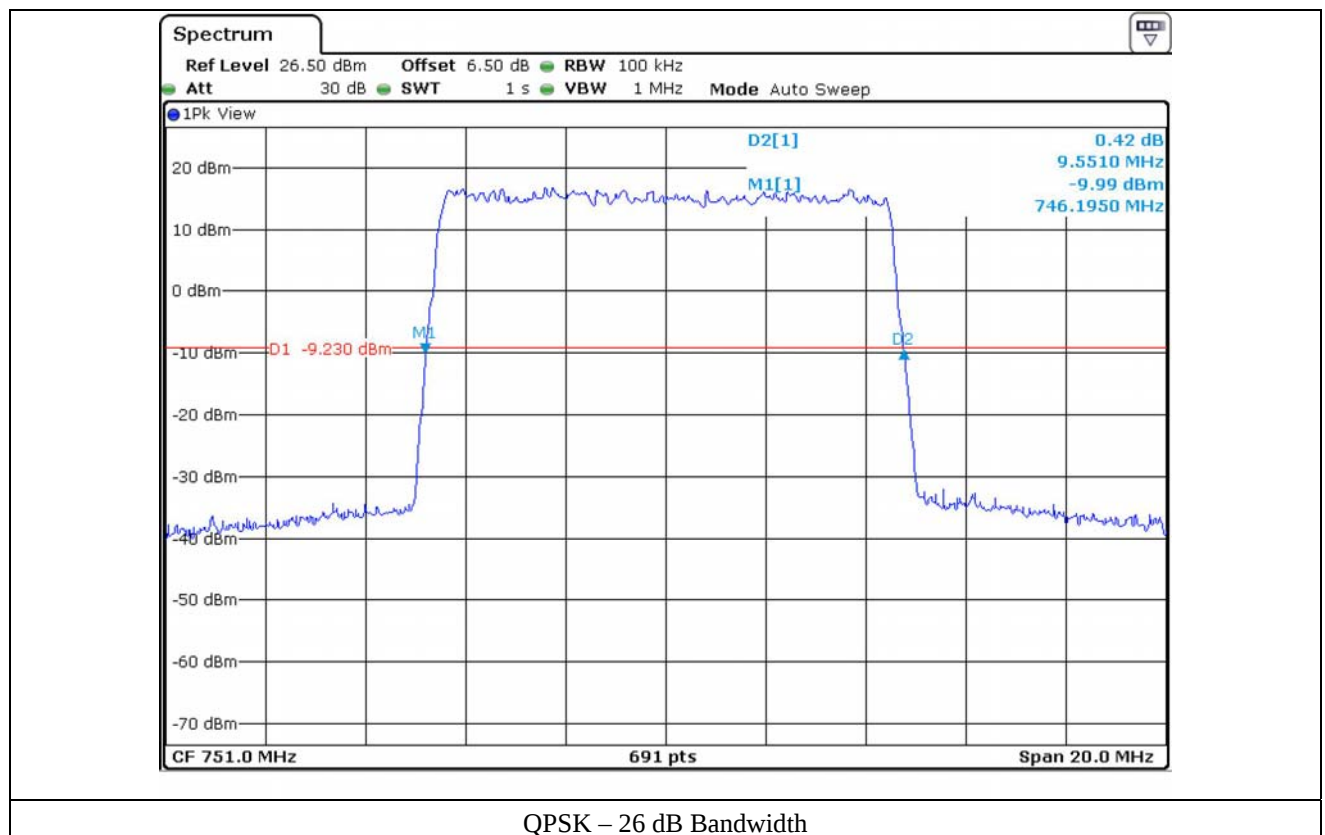
Tested by: Hong-Kyu, Lee/ Engineer

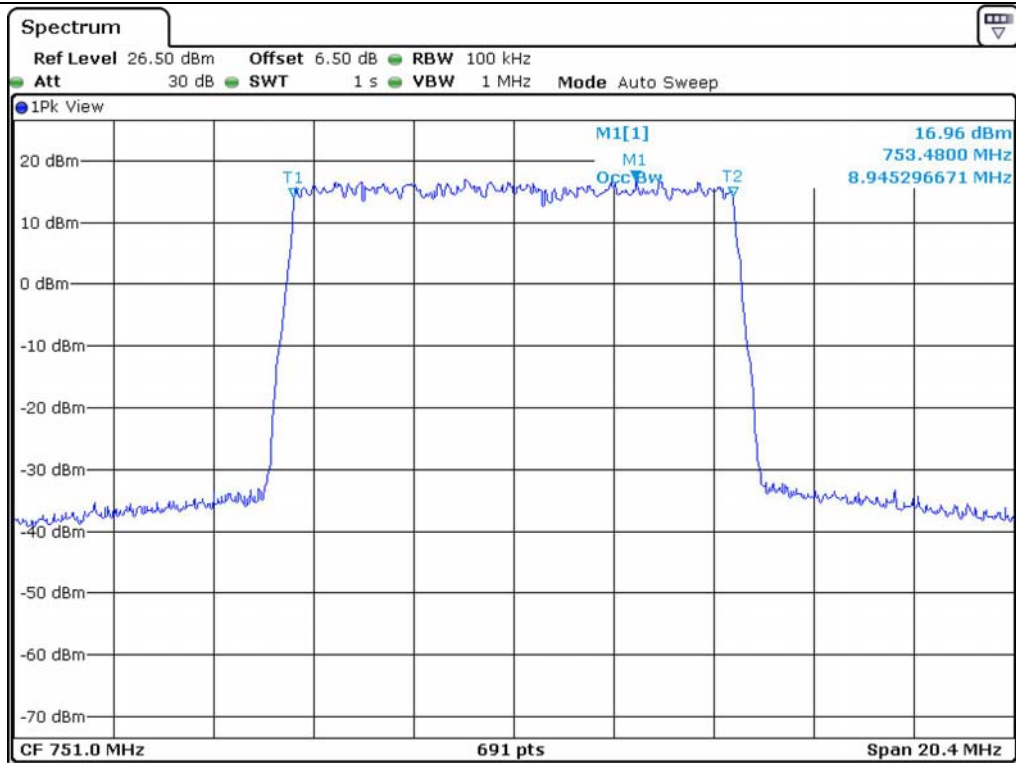


16 QAM – 26 dB Bandwidth

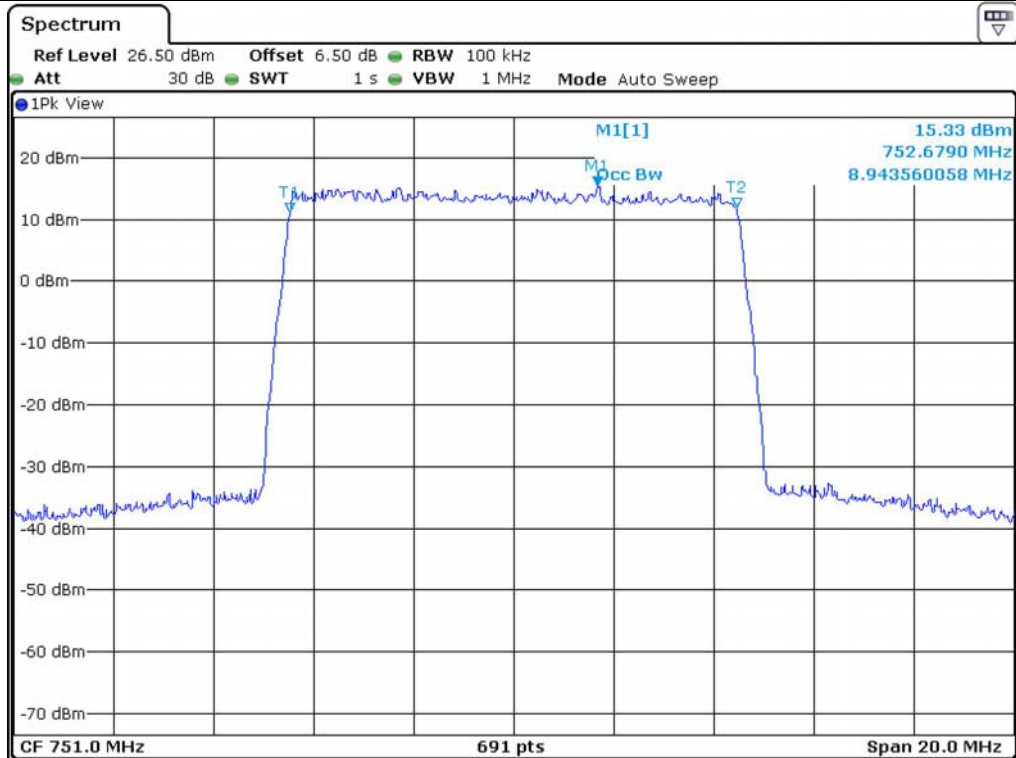


64 QAM – 26 dB Bandwidth

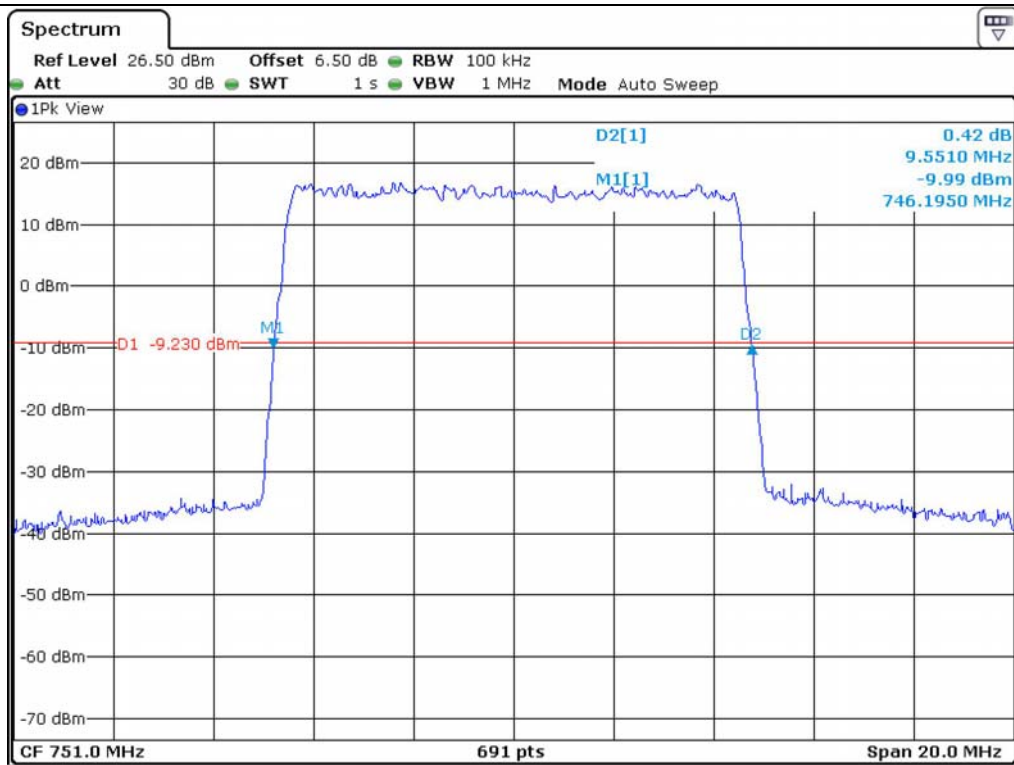




16 QAM – Occupied Bandwidth



64 QAM – Occupied Bandwidth



QPSK – Occupied Bandwidth

6.5 Test data for Output Port 1

6.5.1 Test Result for Part 27 C (AWS-1, 5 MHz)

-. Test Date : October 08, 2013

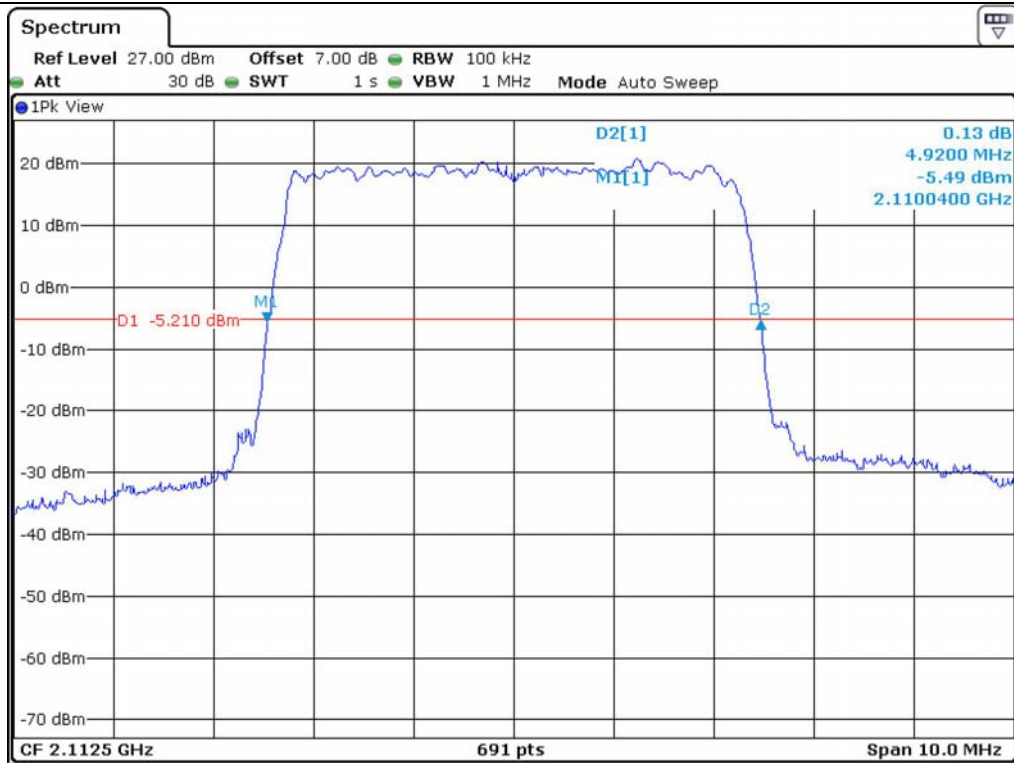
-. Test Result : Pass

Modulation	Channel	26 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)
16 QAM	Low	4.920	4.510
	Middle	4.920	4.510
	High	4.920	4.510
64 QAM	Low	4.960	4.500
	Middle	4.960	4.500
	High	4.960	4.500
QPSK	Low	4.950	4.510
	Middle	4.950	4.510
	High	4.940	4.510

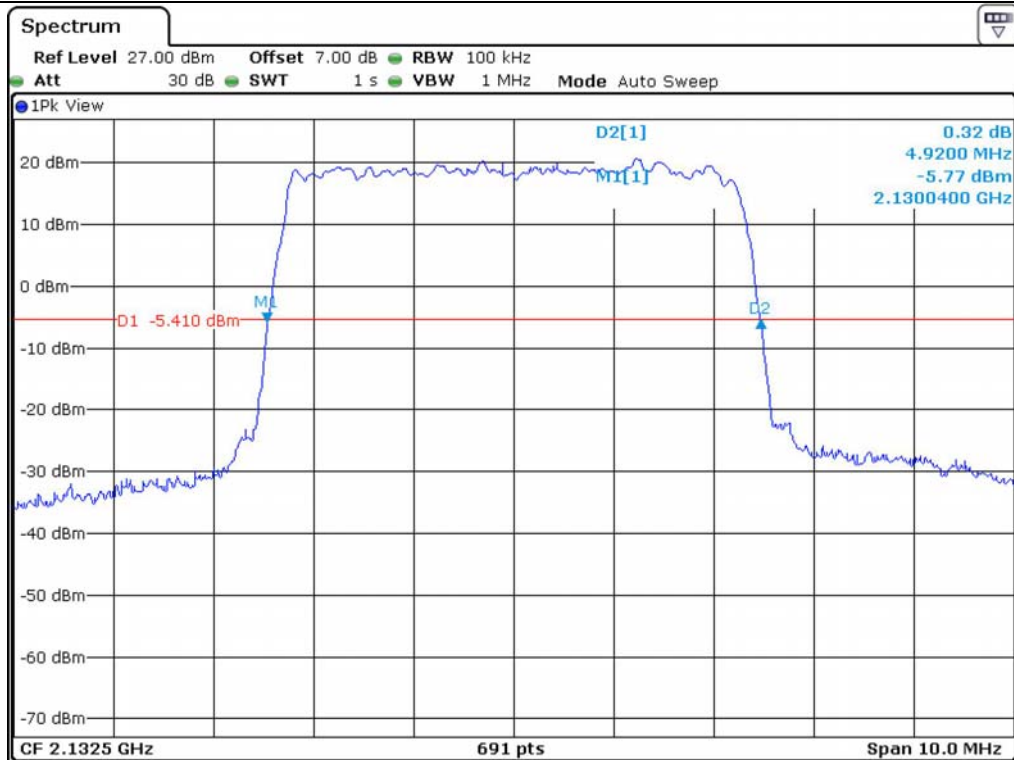
Remark: According to above result, the carrier frequency shall be within the frequency block edges.



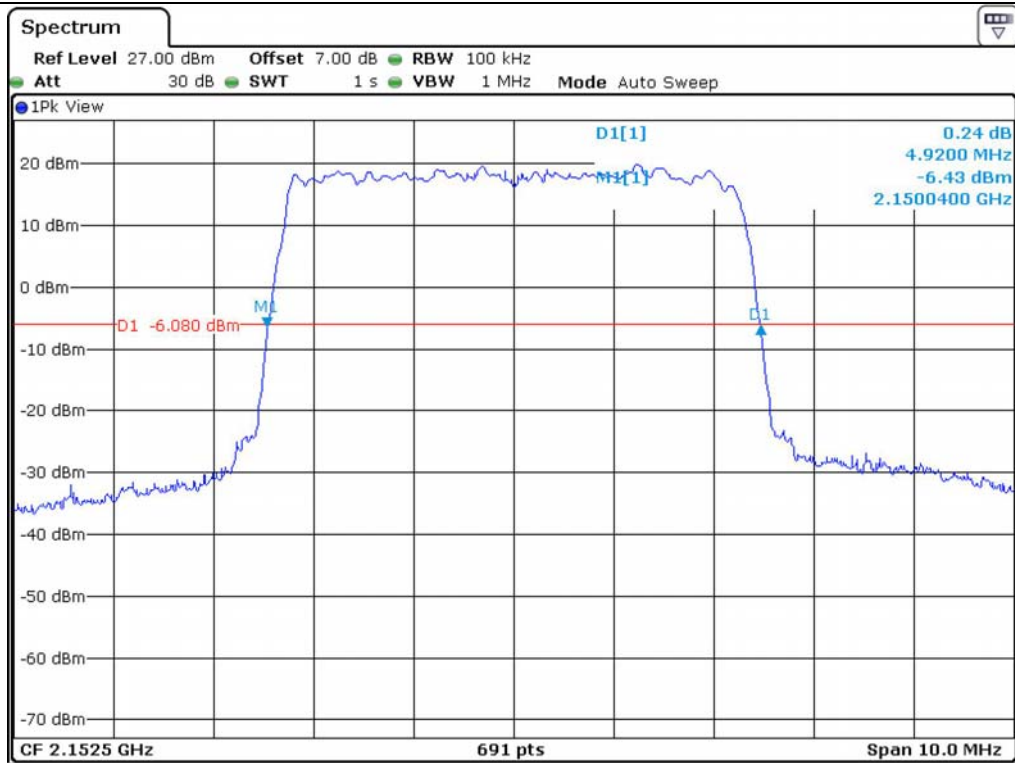
Tested by: Hong-Kyu, Lee/ Engineer



16 QAM – 26 dB Bandwidth (Low Channel)

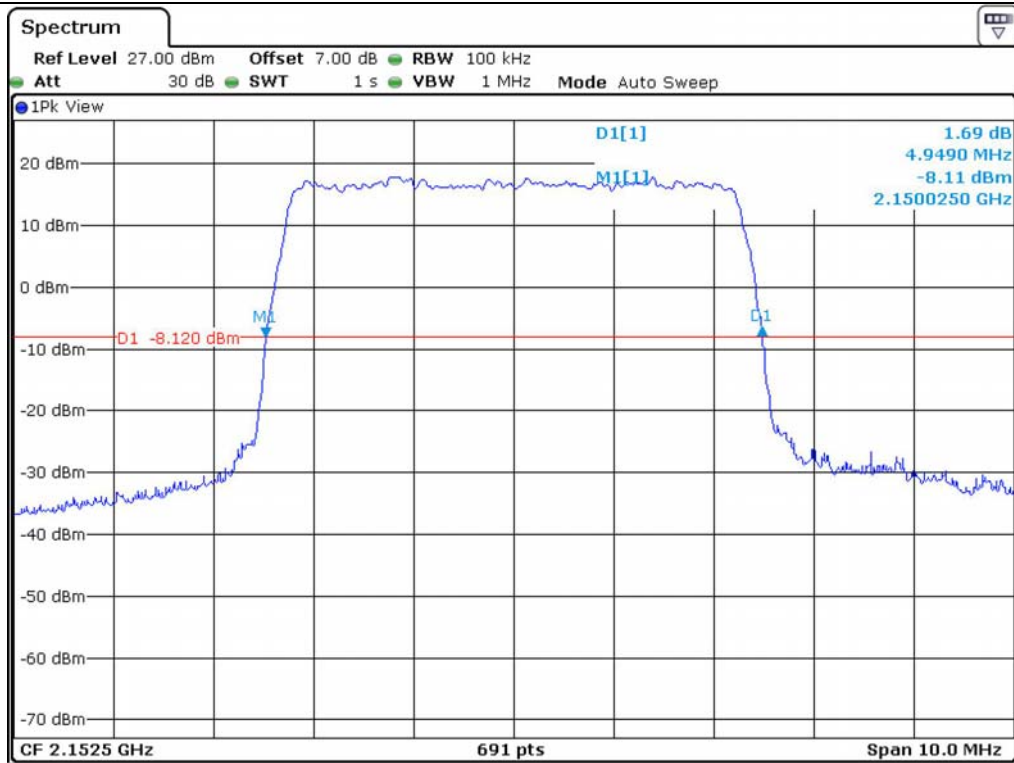


16 QAM – 26 dB Bandwidth (Middle Channel)

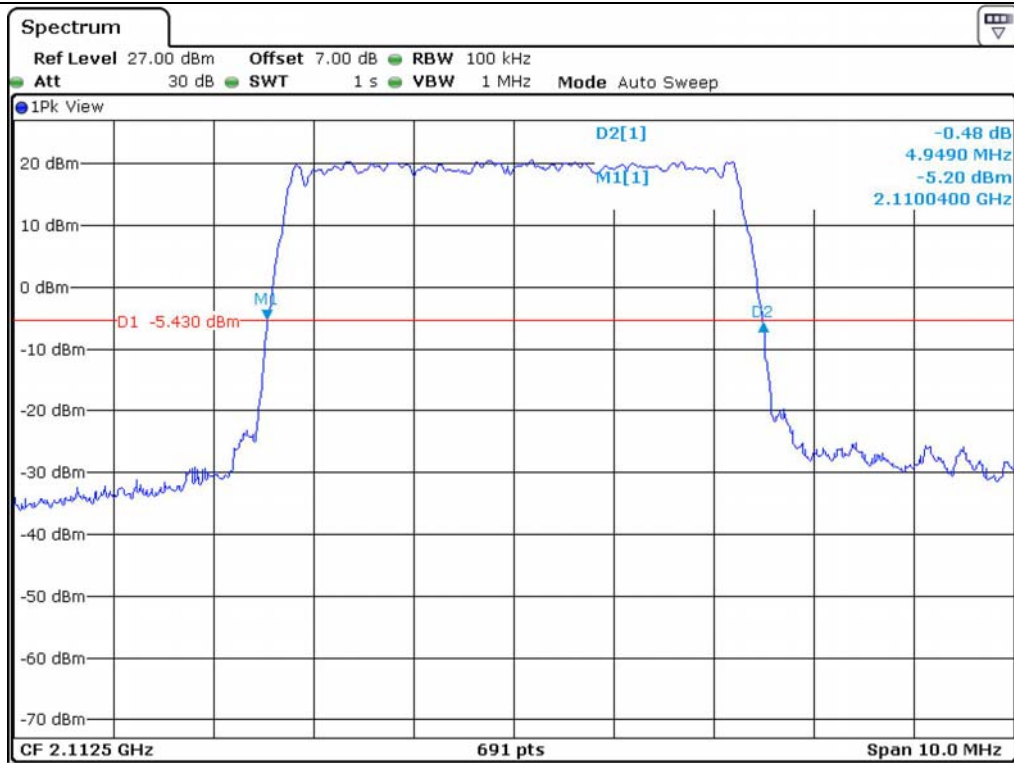


16 QAM – 26 dB Bandwidth (High Channel)

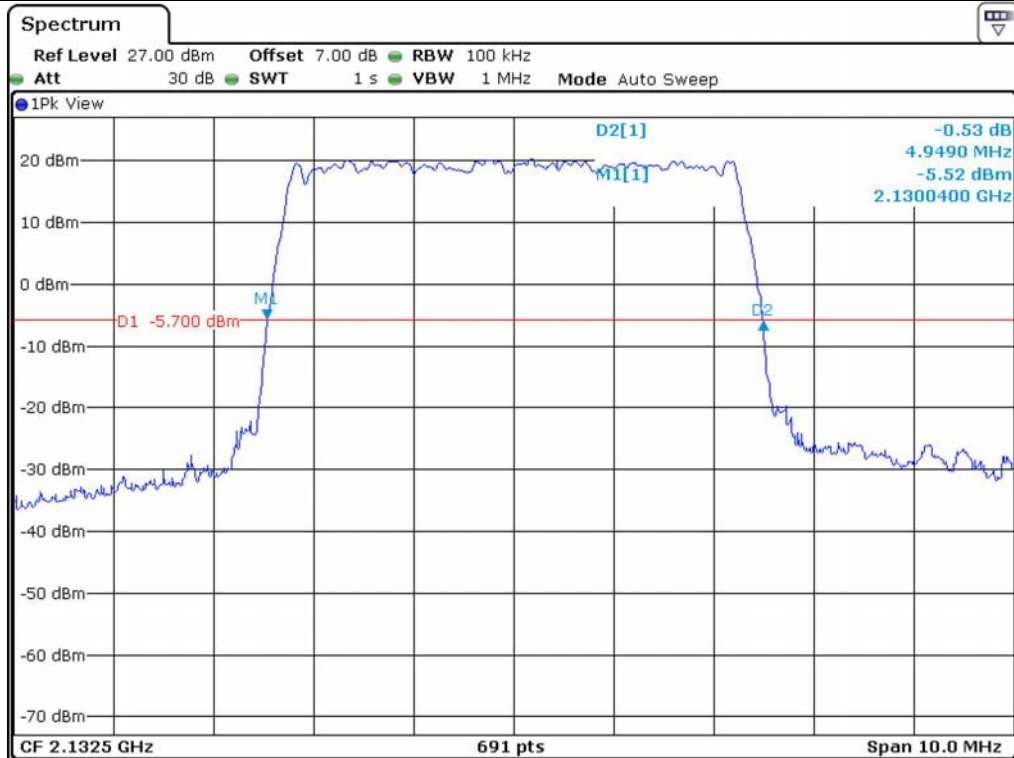




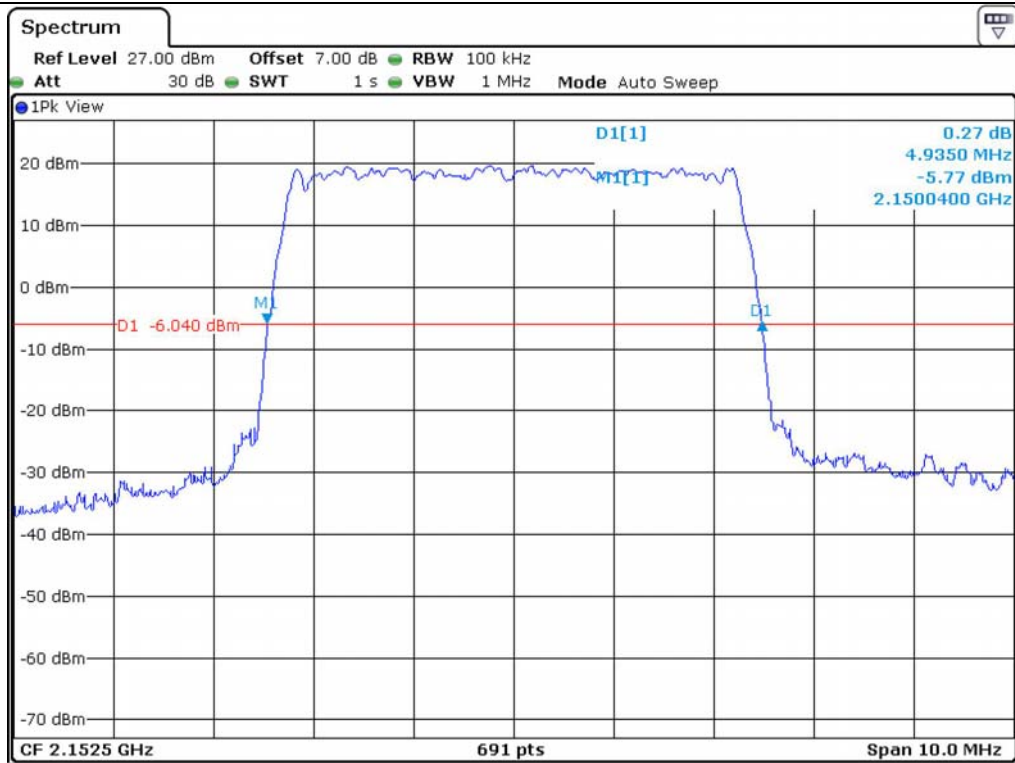
64 QAM – 26 dB Bandwidth (High Channel)



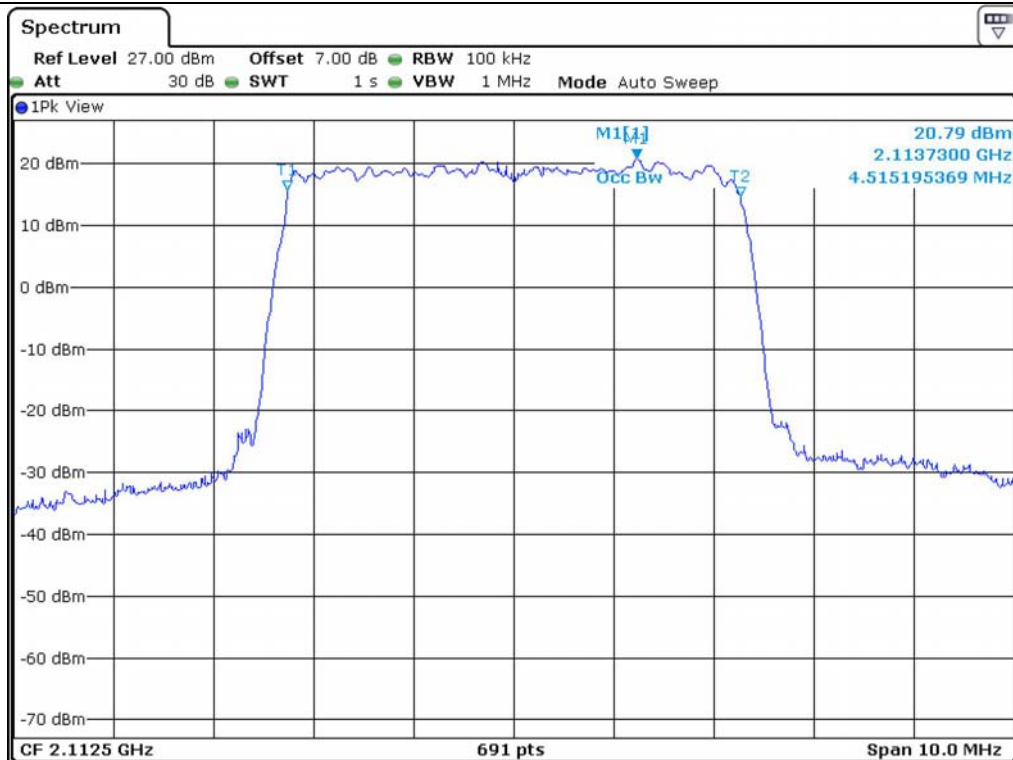
QPSK – 26 dB Bandwidth (Low Channel)



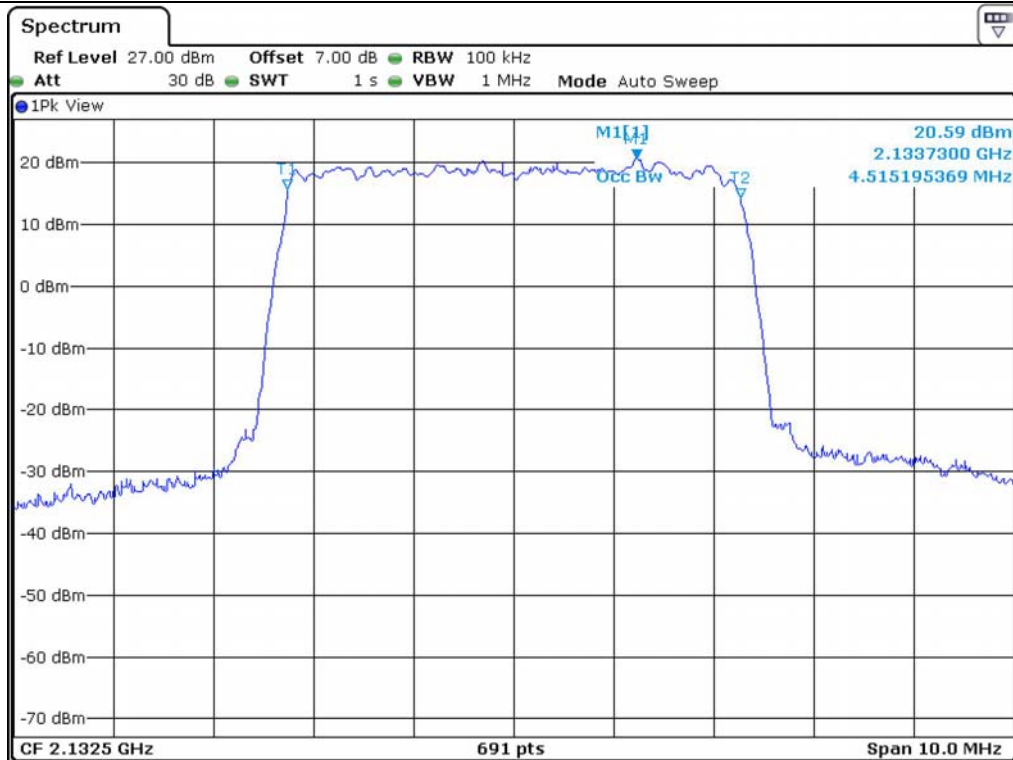
QPSK – 26 dB Bandwidth (Middle Channel)



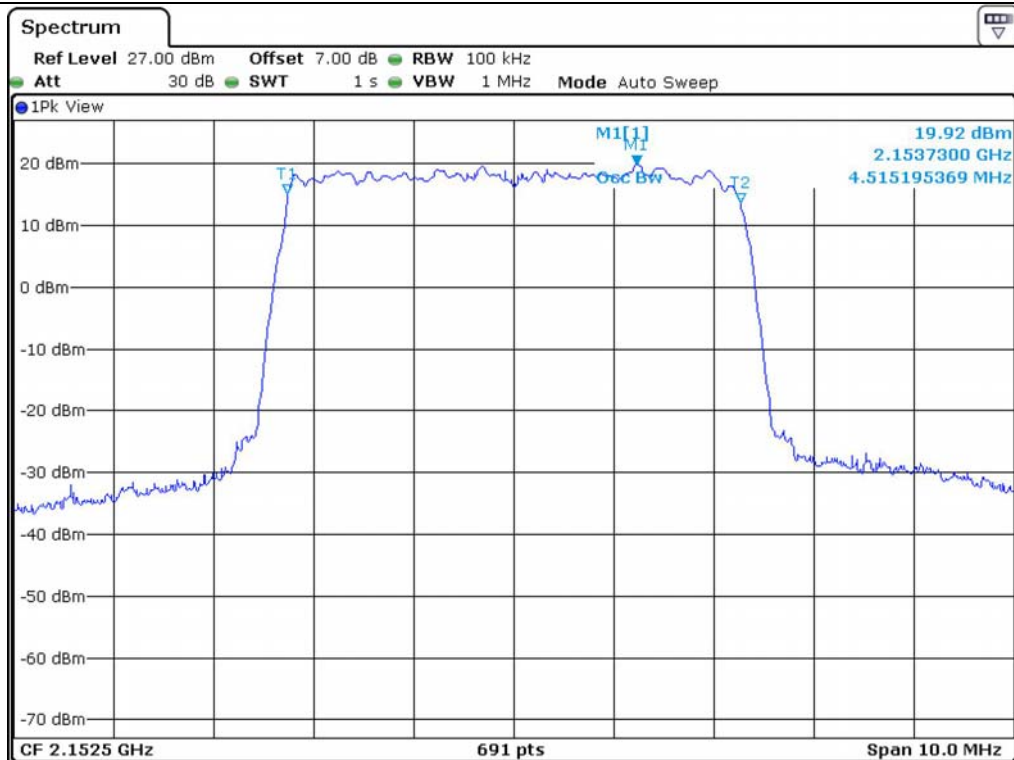
QPSK – 26 dB Bandwidth (High Channel)



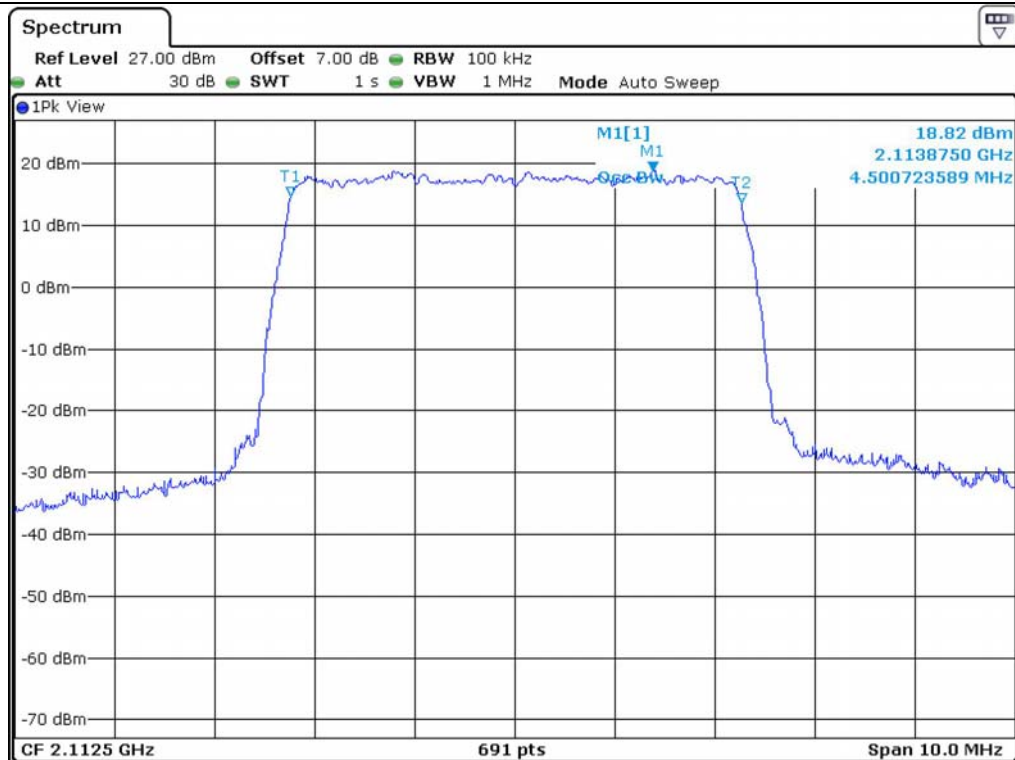
16 QAM – 99 % Occupied Bandwidth (Low Channel)



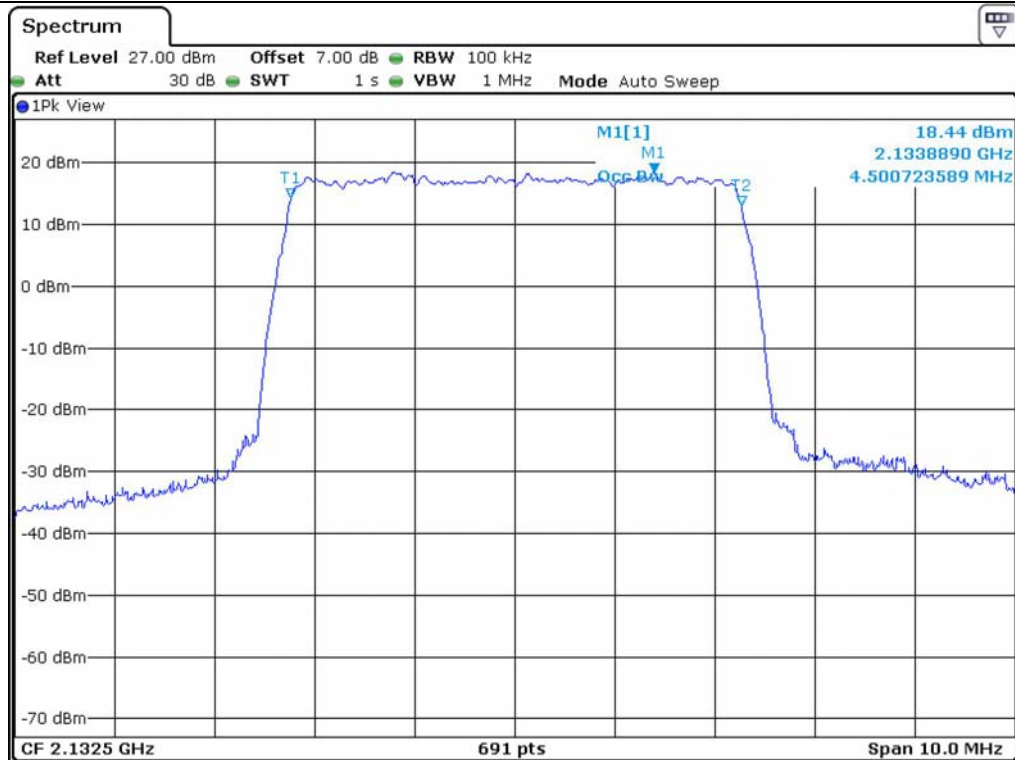
16 QAM – 99 % Occupied Bandwidth (Middle Channel)



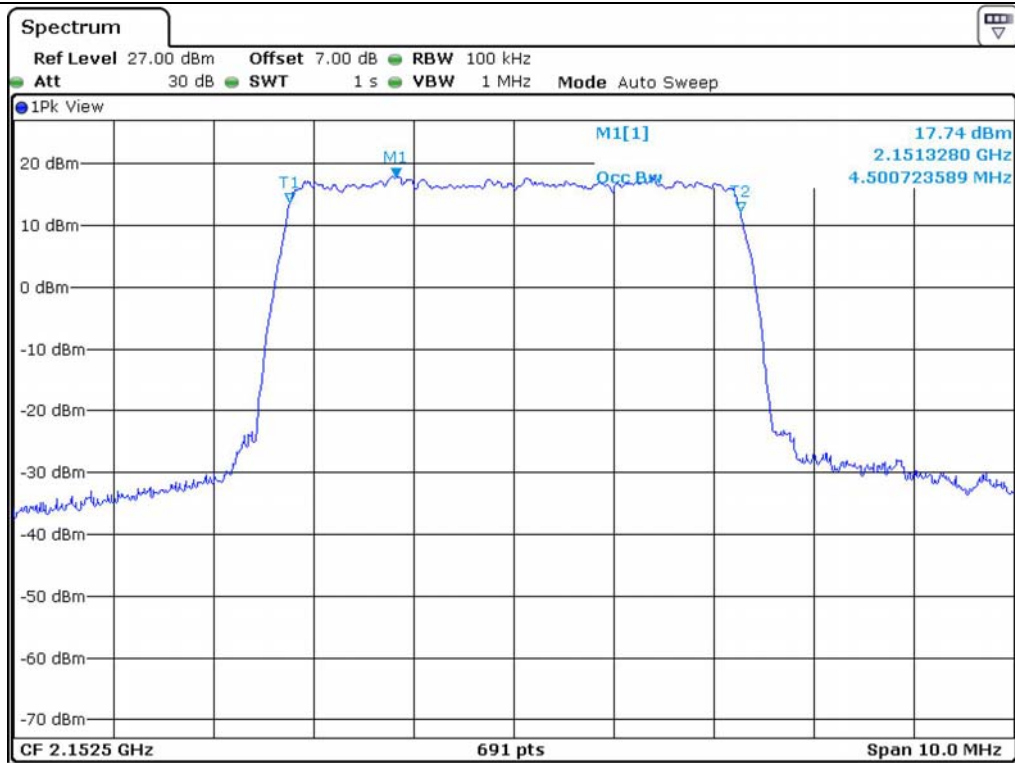
16 QAM – 99 % Occupied Bandwidth (High Channel)



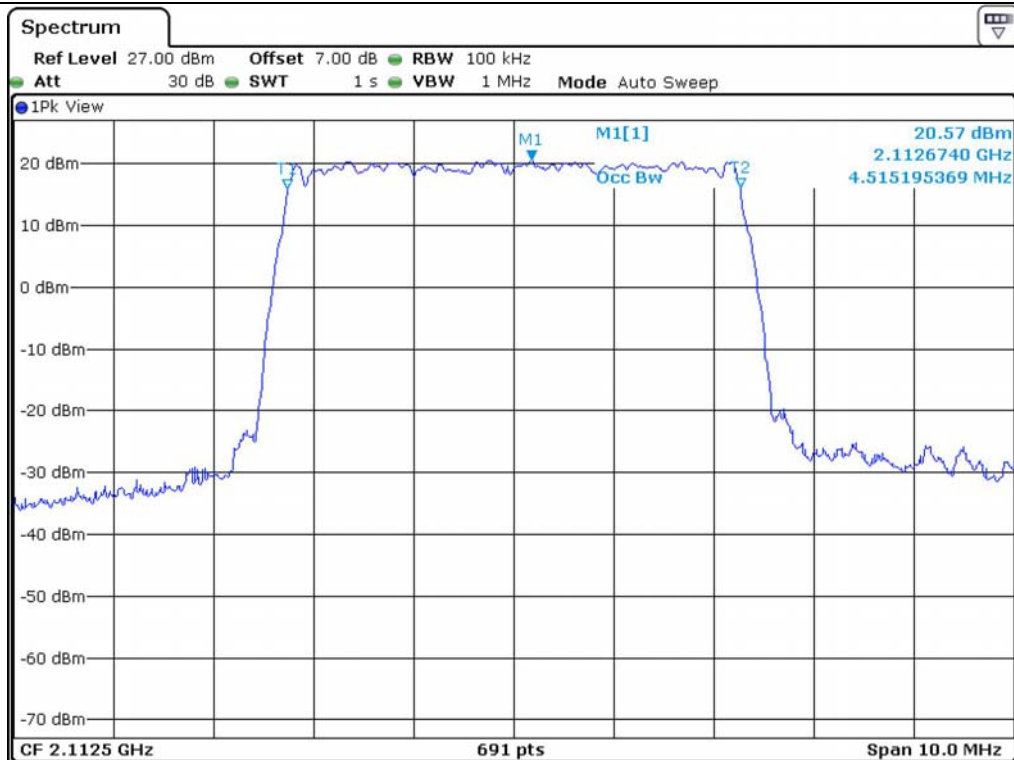
64 QAM – 99 % Occupied Bandwidth (Low Channel)



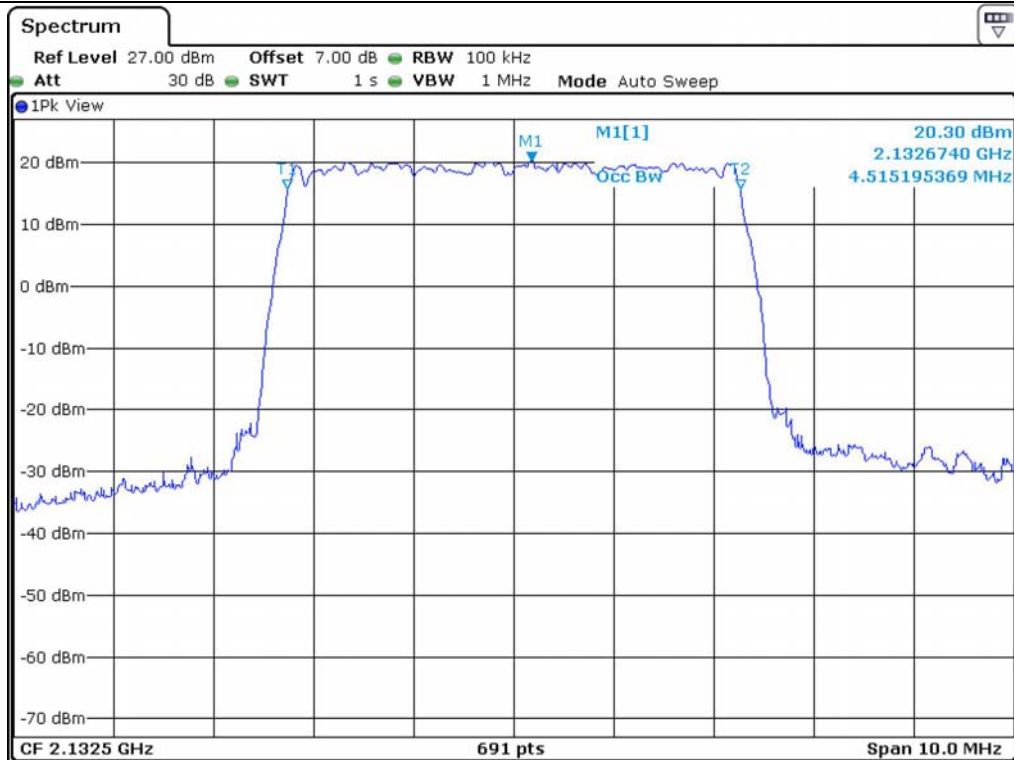
64 QAM – 99 % Occupied Bandwidth (Middle Channel)



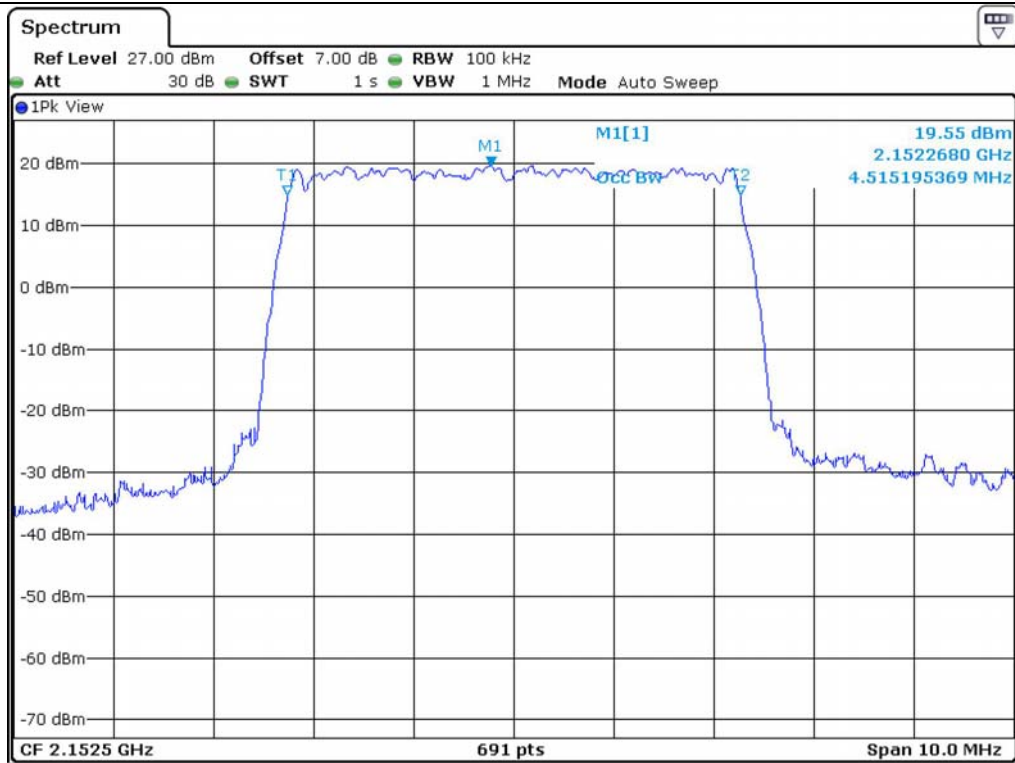
64 QAM – 99 % Occupied Bandwidth (High Channel)



QPSK – 99 % Occupied Bandwidth (Low Channel)



QPSK – 99 % Occupied Bandwidth (Middle Channel)



QPSK – 99 % Occupied Bandwidth (High Channel)

6.5.2 Test Result for Part 27 C (AWS-1, 10 MHz)

-. Test Date : October 08, 2013

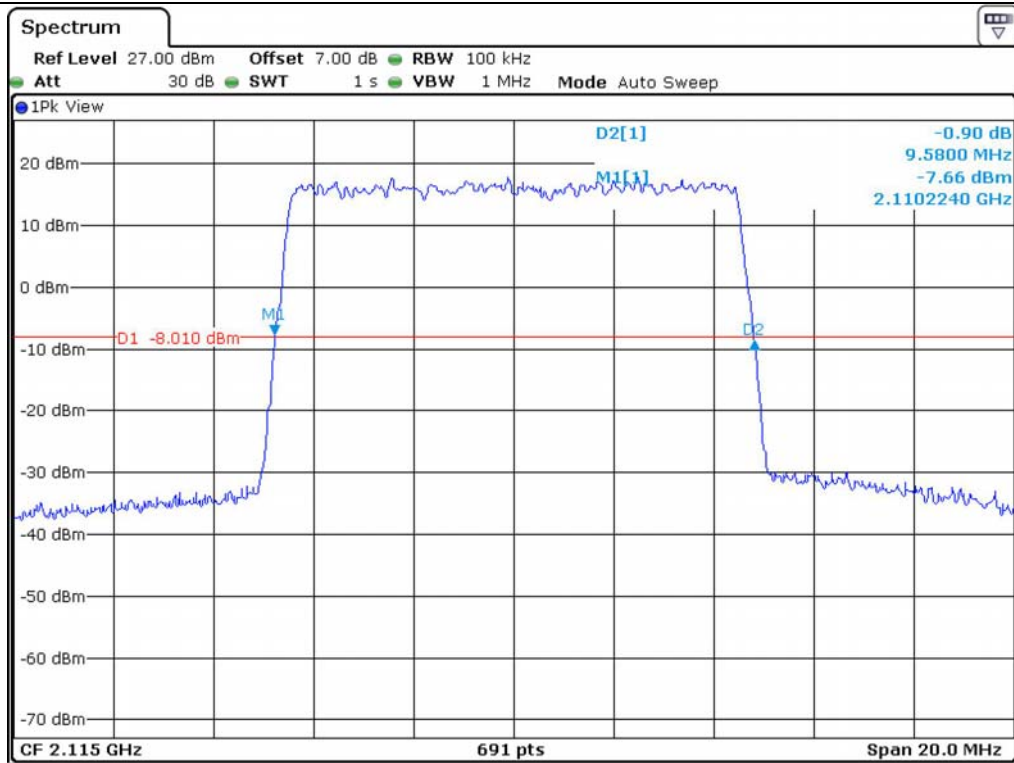
-. Test Result : Pass

Modulation	Channel	26 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)
16 QAM	Low	9.580	8.910
	Middle	9.580	8.910
	High	9.580	8.910
64 QAM	Low	9.610	8.970
	Middle	9.610	8.970
	High	9.610	8.940
QPSK	Low	9.550	8.940
	Middle	9.550	8.940
	High	9.550	8.940

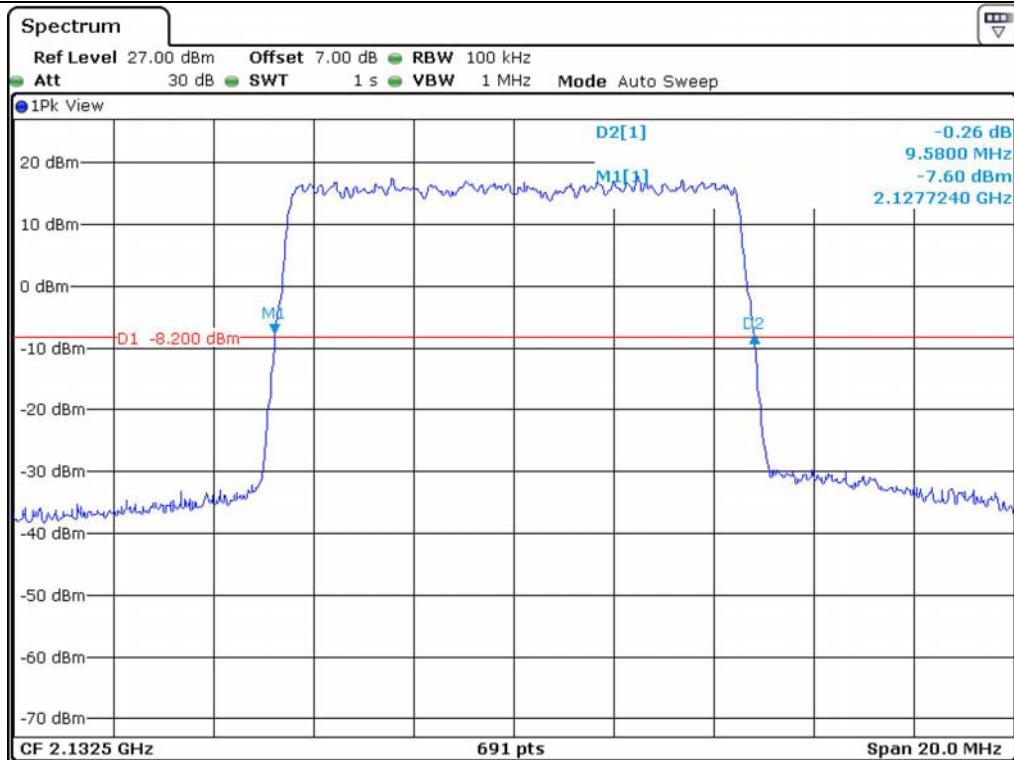
Remark: According to above result, the carrier frequency shall be within the frequency block edges.



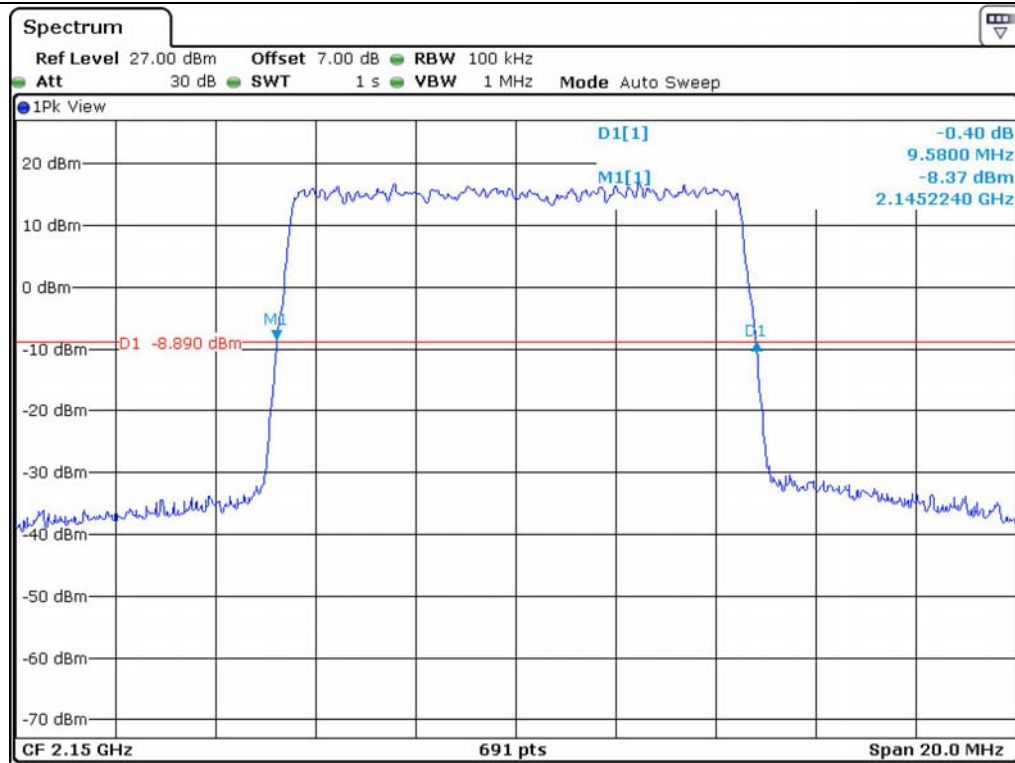
Tested by: Hong-Kyu, Lee/ Engineer



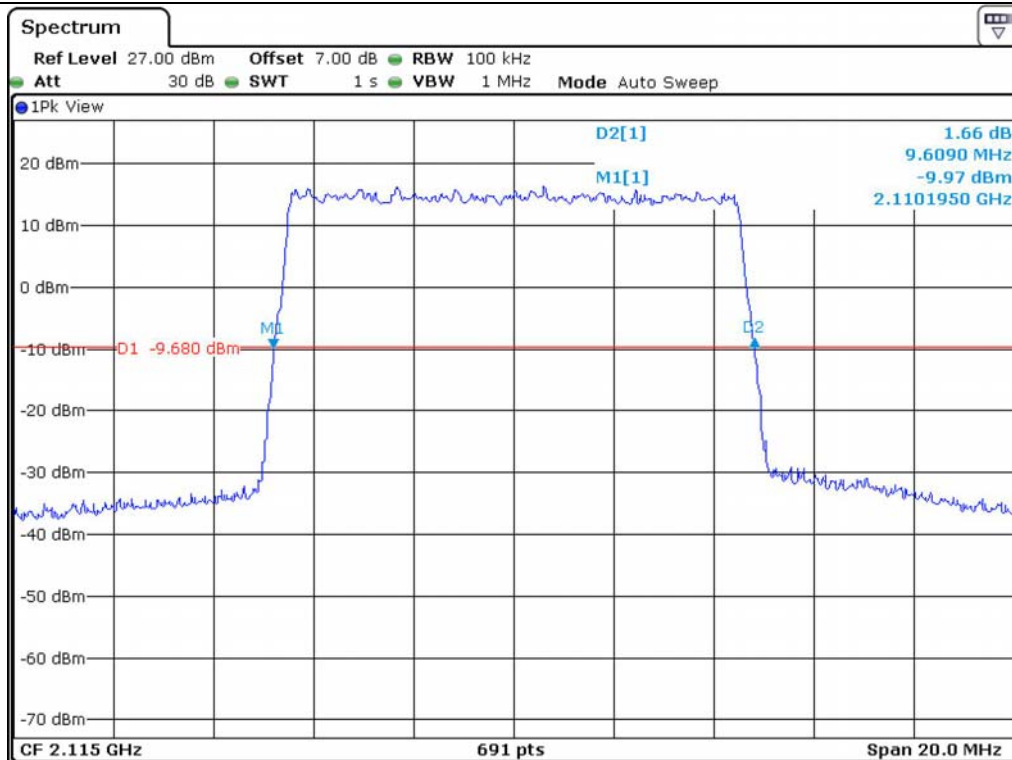
16 QAM – 26 dB Bandwidth (Low Channel)



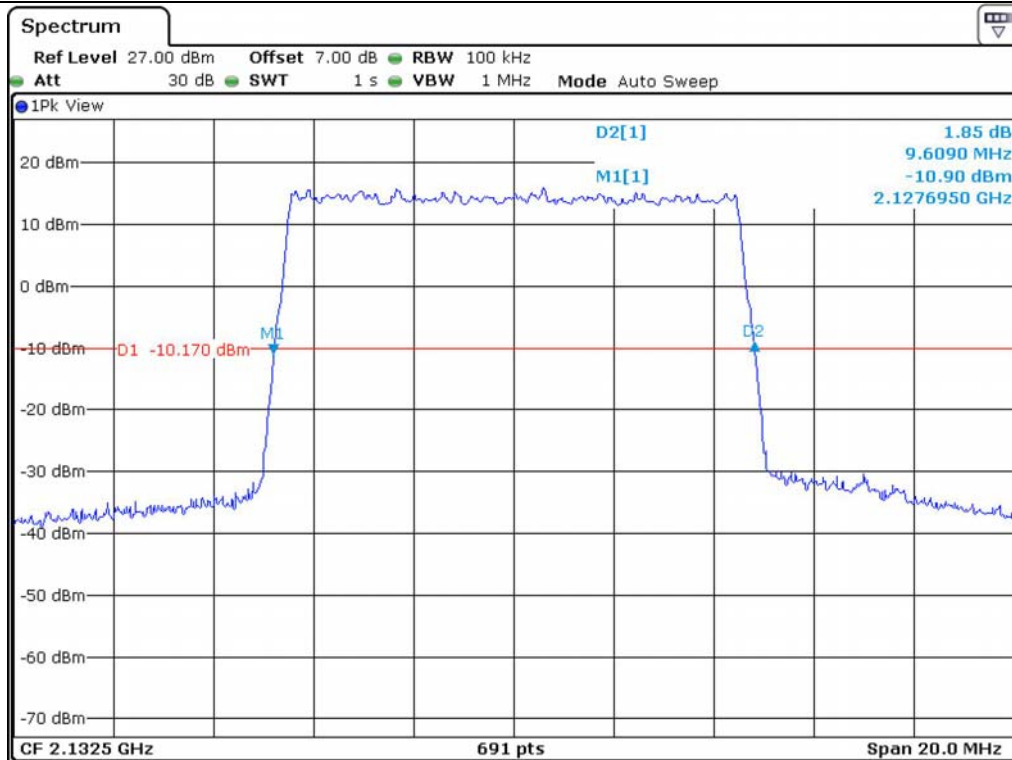
16 QAM – 26 dB Bandwidth (Middle Channel)



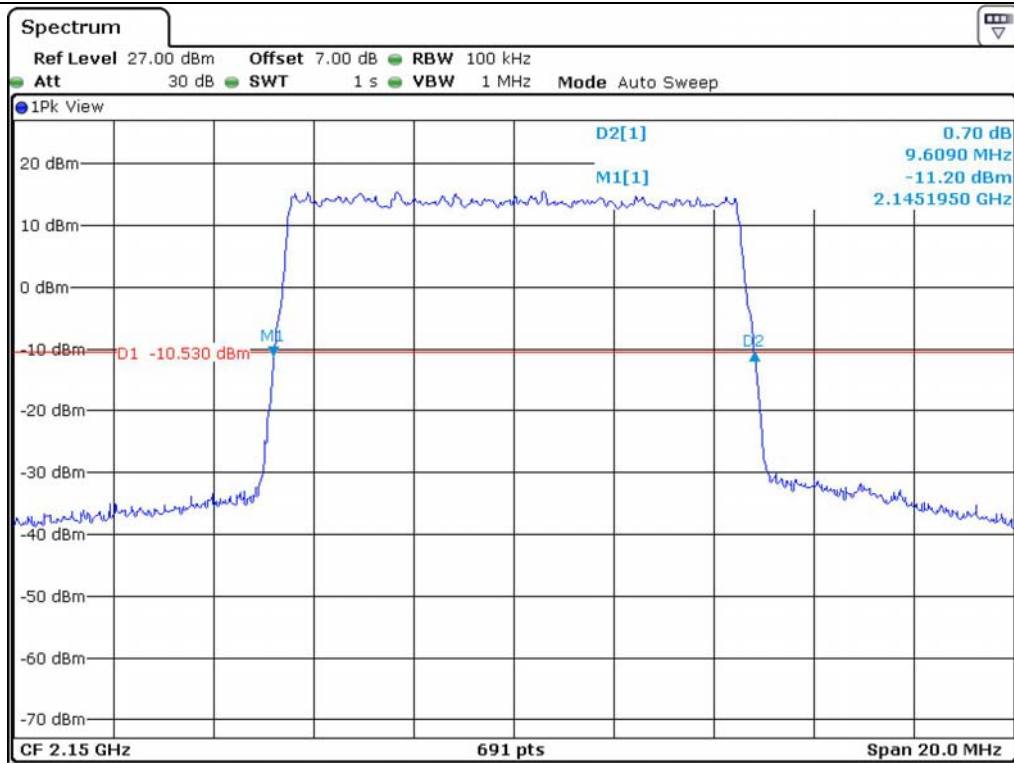
16 QAM – 26 dB Bandwidth (High Channel)



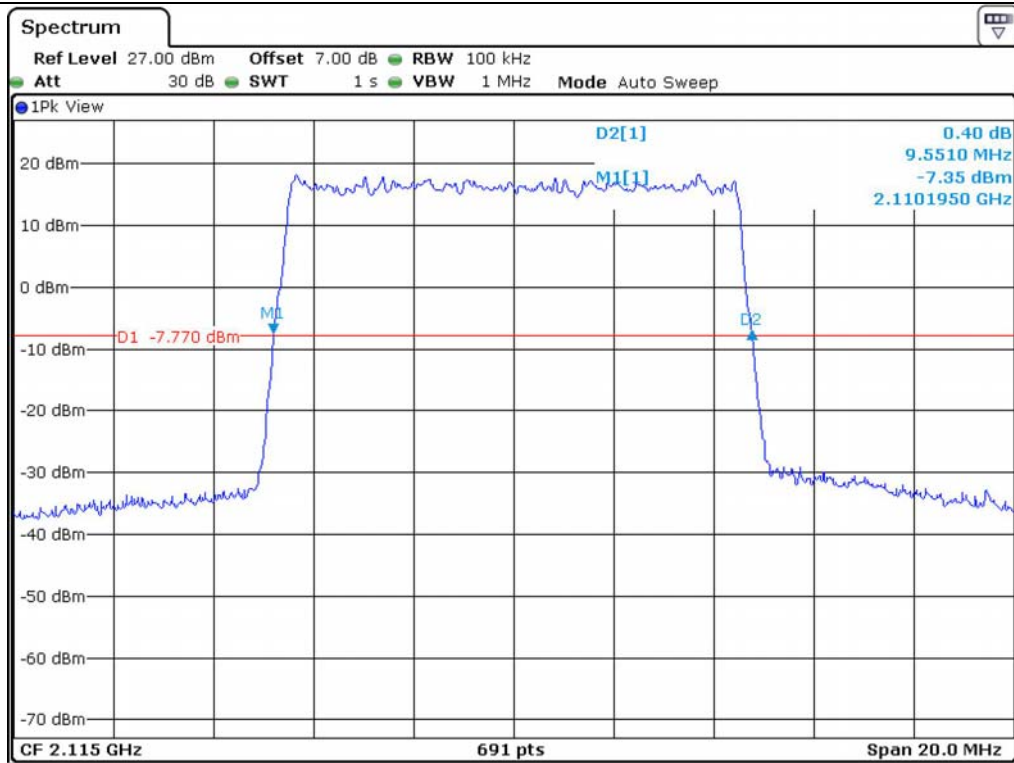
64 QAM – 26 dB Bandwidth (Low Channel)



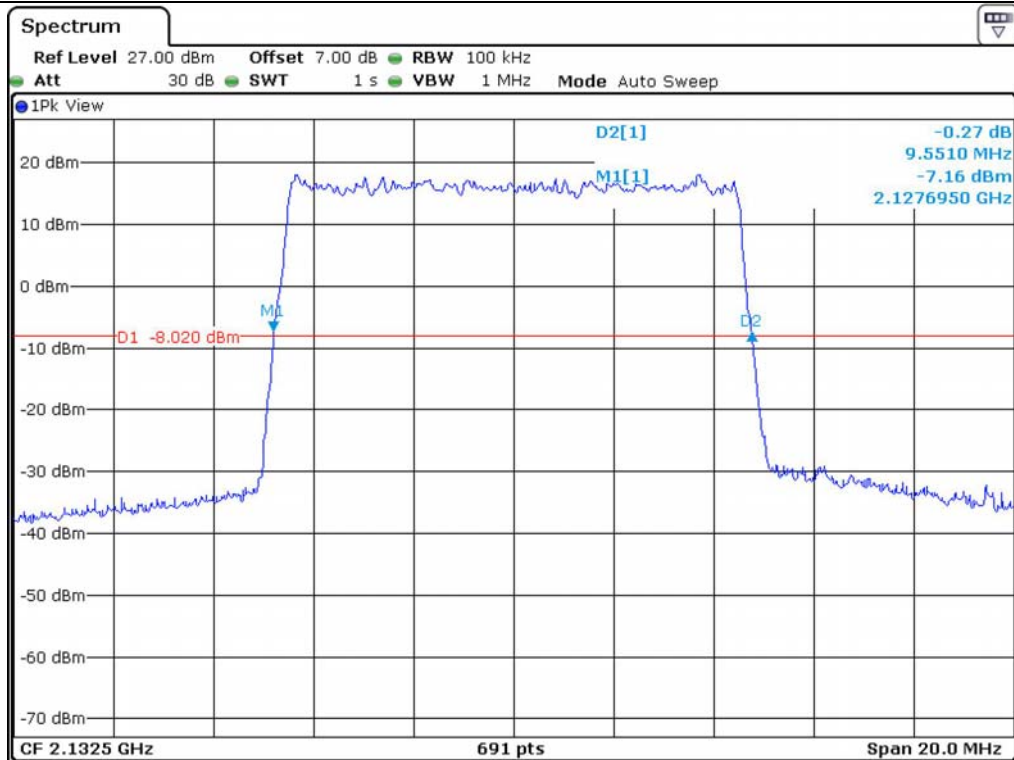
64 QAM – 26 dB Bandwidth (Middle Channel)



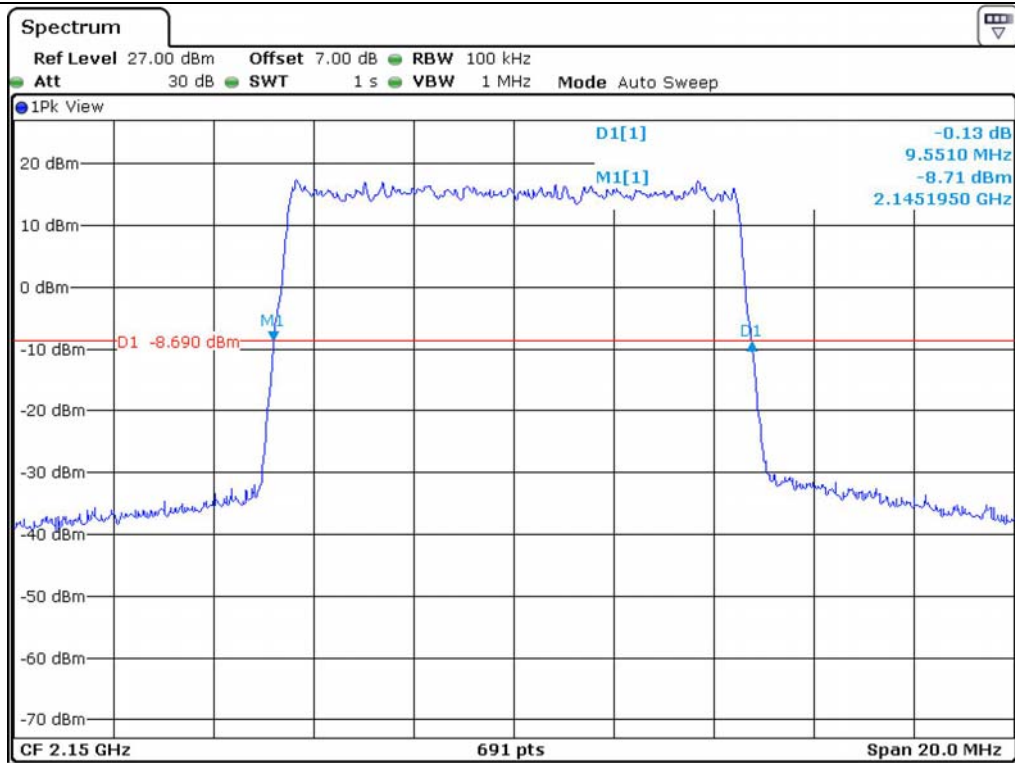
64 QAM – 26 dB Bandwidth (High Channel)



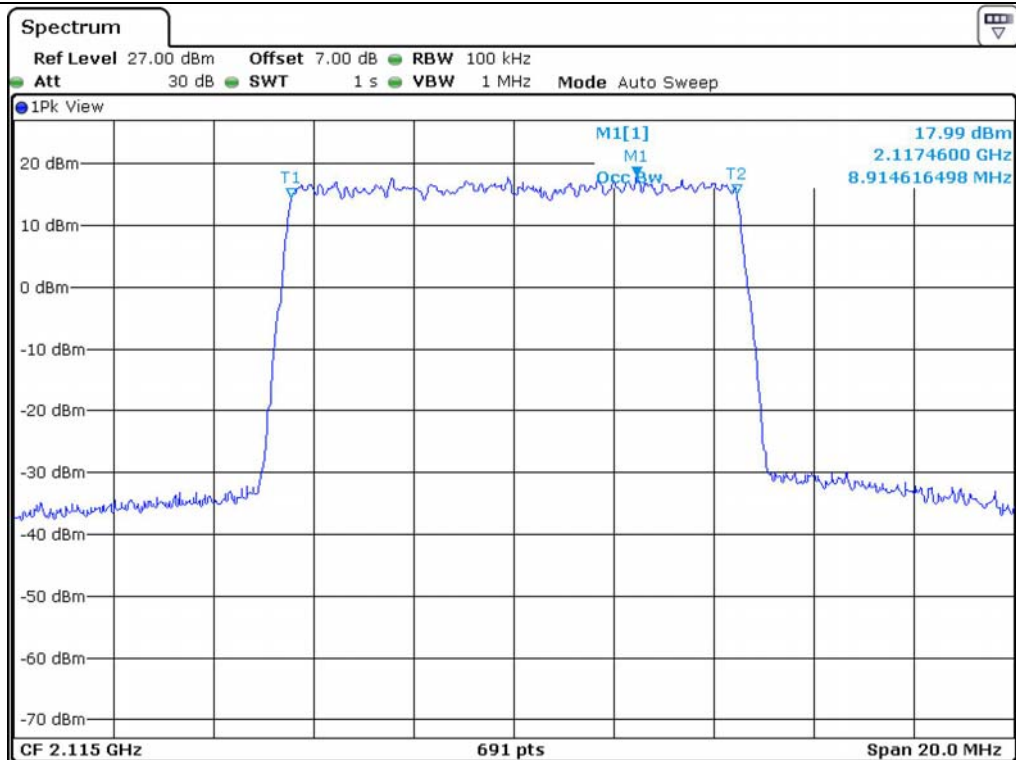
QPSK – 26 dB Bandwidth (Low Channel)



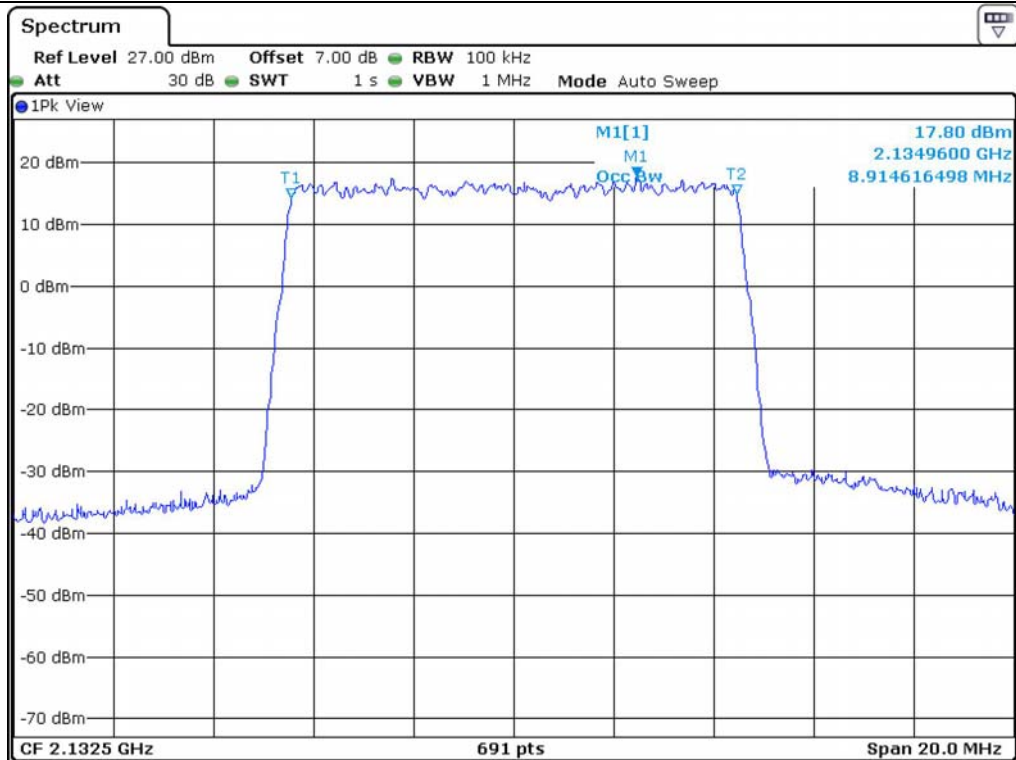
QPSK – 26 dB Bandwidth (Middle Channel)



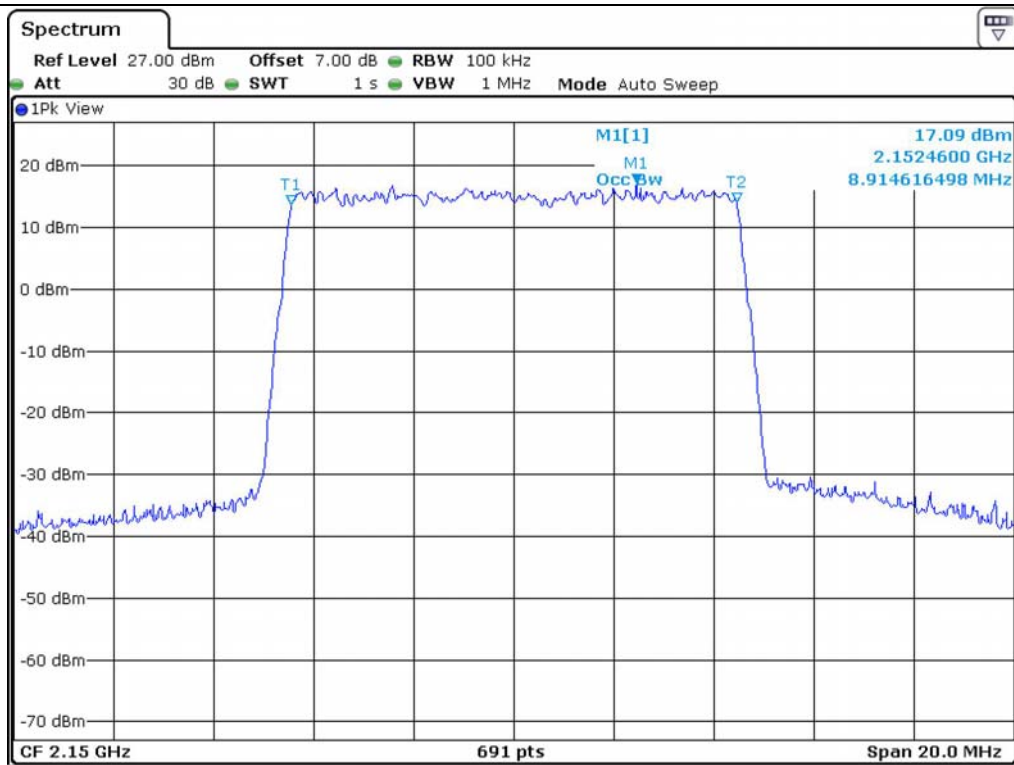
QPSK – 26 dB Bandwidth (High Channel)



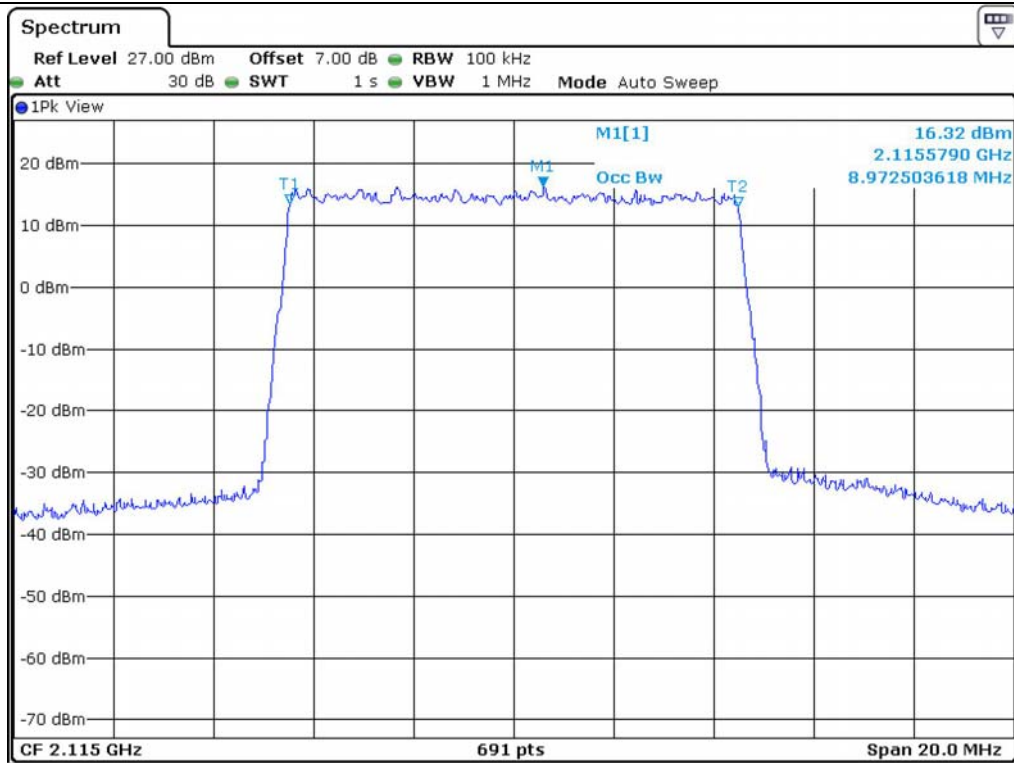
16 QAM – 99 % Occupied Bandwidth (Low Channel)



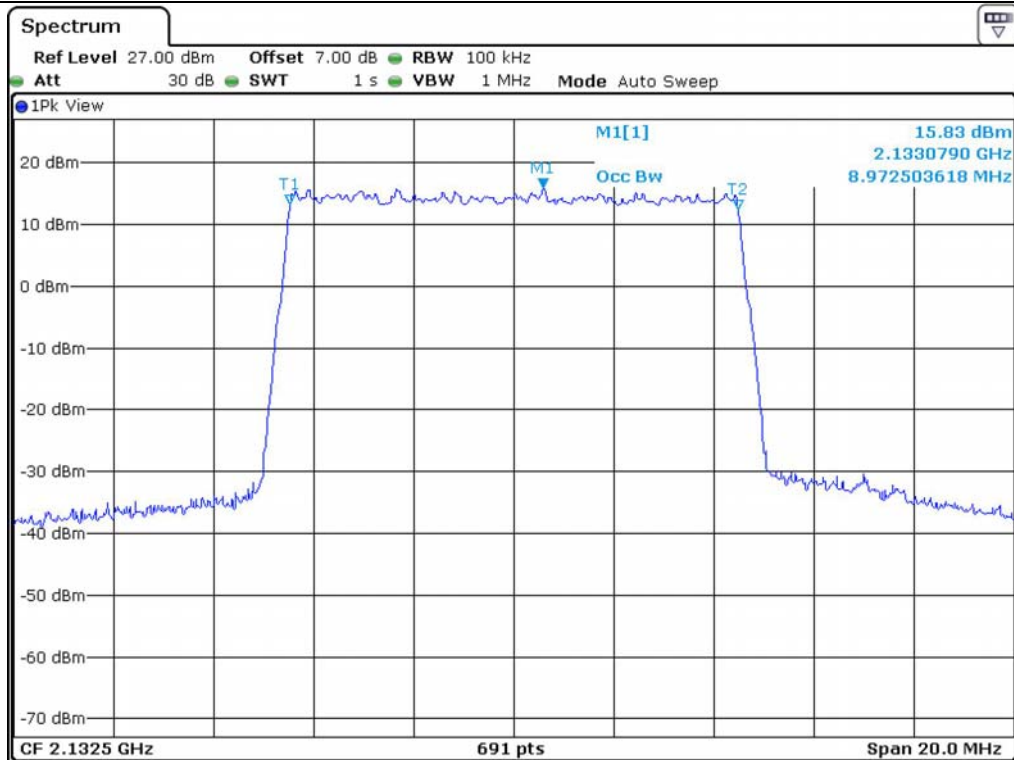
16 QAM – 99 % Occupied Bandwidth (Middle Channel)



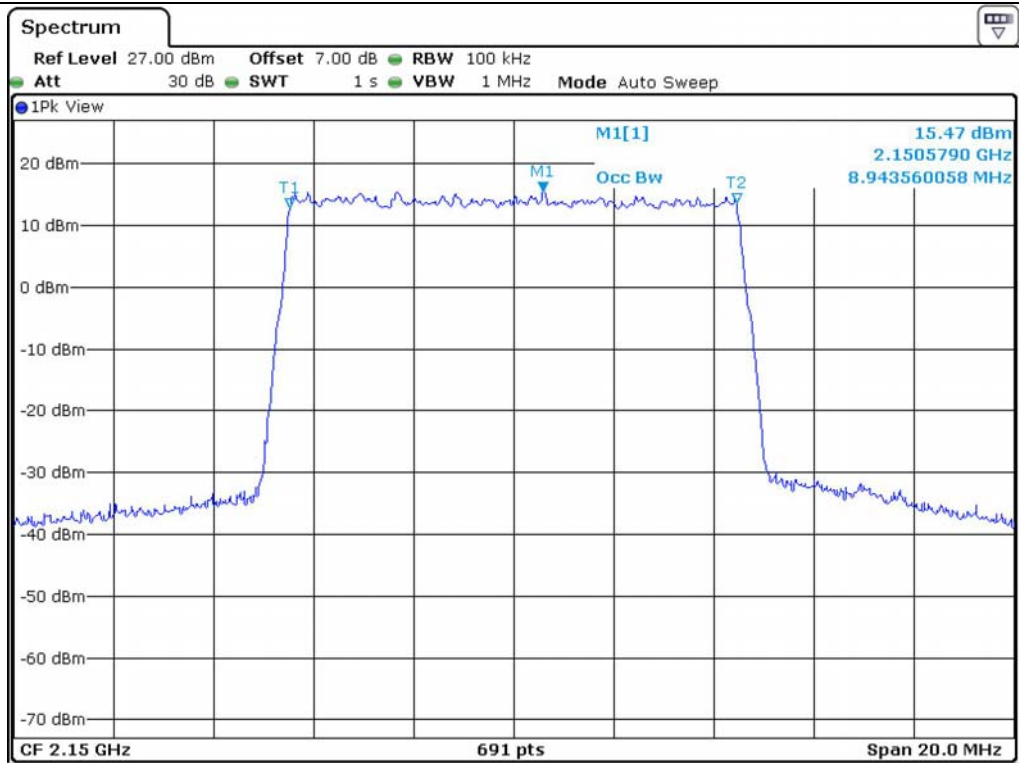
16 QAM – 99 % Occupied Bandwidth (High Channel)



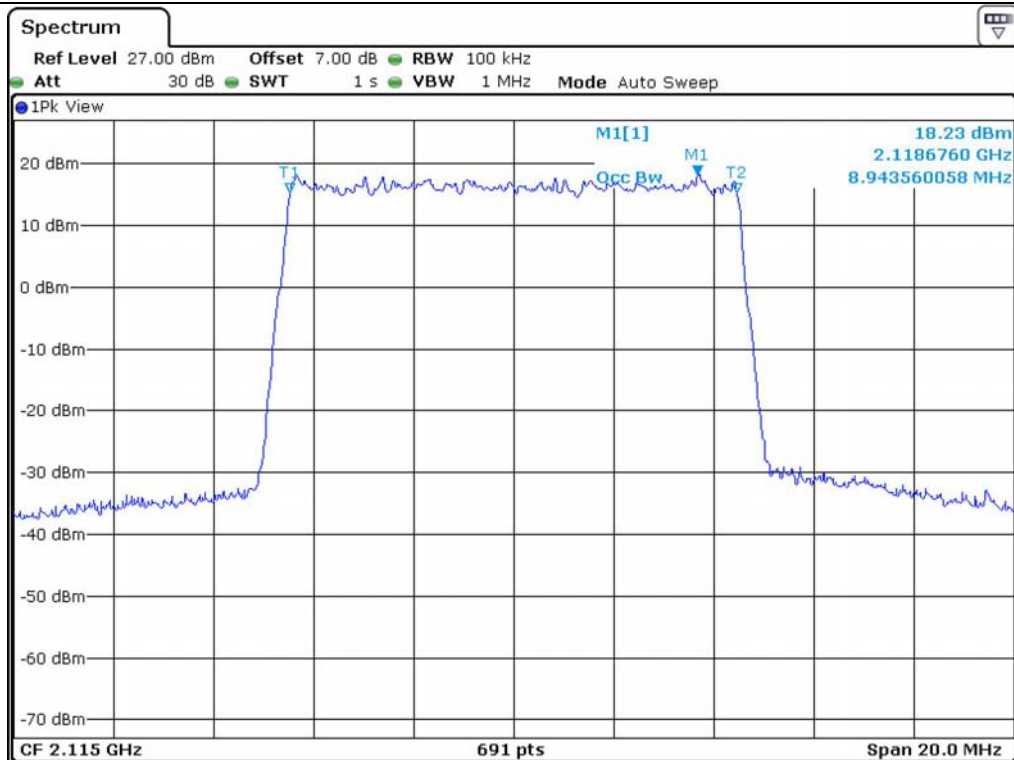
64 QAM – 99 % Occupied Bandwidth (Low Channel)



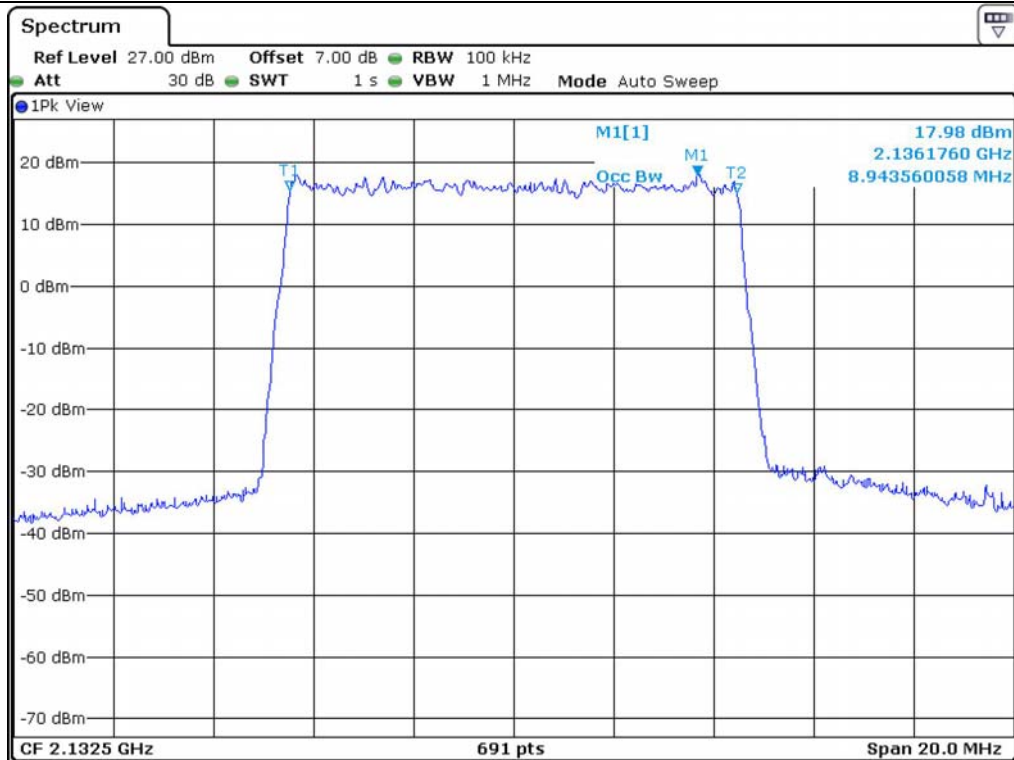
64 QAM – 99 % Occupied Bandwidth (Middle Channel)



64 QAM – 99 % Occupied Bandwidth (High Channel)



QPSK – 99 % Occupied Bandwidth (Low Channel)



QPSK – 99 % Occupied Bandwidth (Middle Channel)



6.5.3 Test Result for Part 27 C (700LTE)

-. Test Date : October 07, 2013

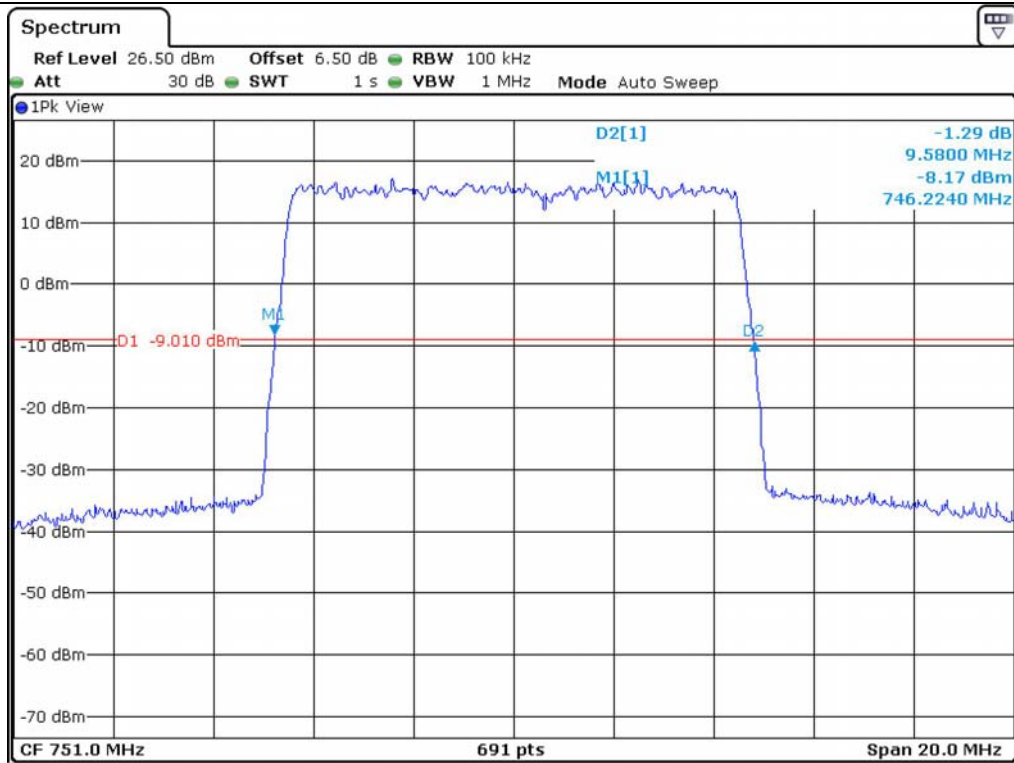
-. Test Result : Pass

Modulation	26 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)
16 QAM	9.540	8.950
64 QAM	9.580	8.940
QPSK	9.550	8.940

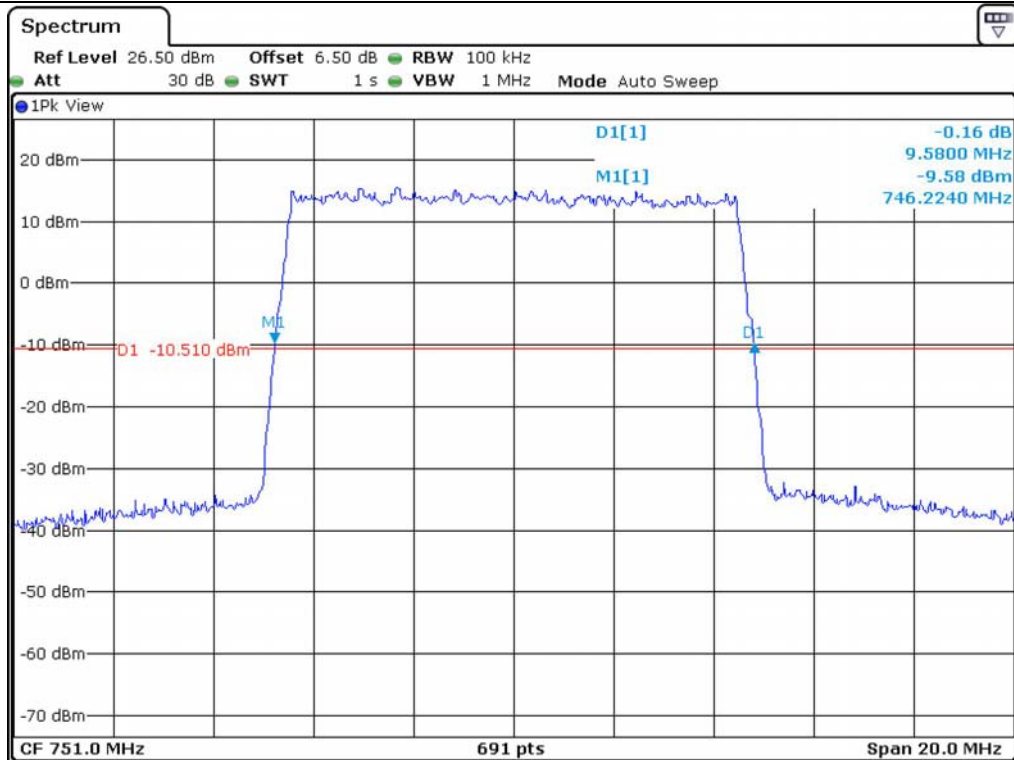
Remark: According to above result, the carrier frequency shall be within the frequency block edges.



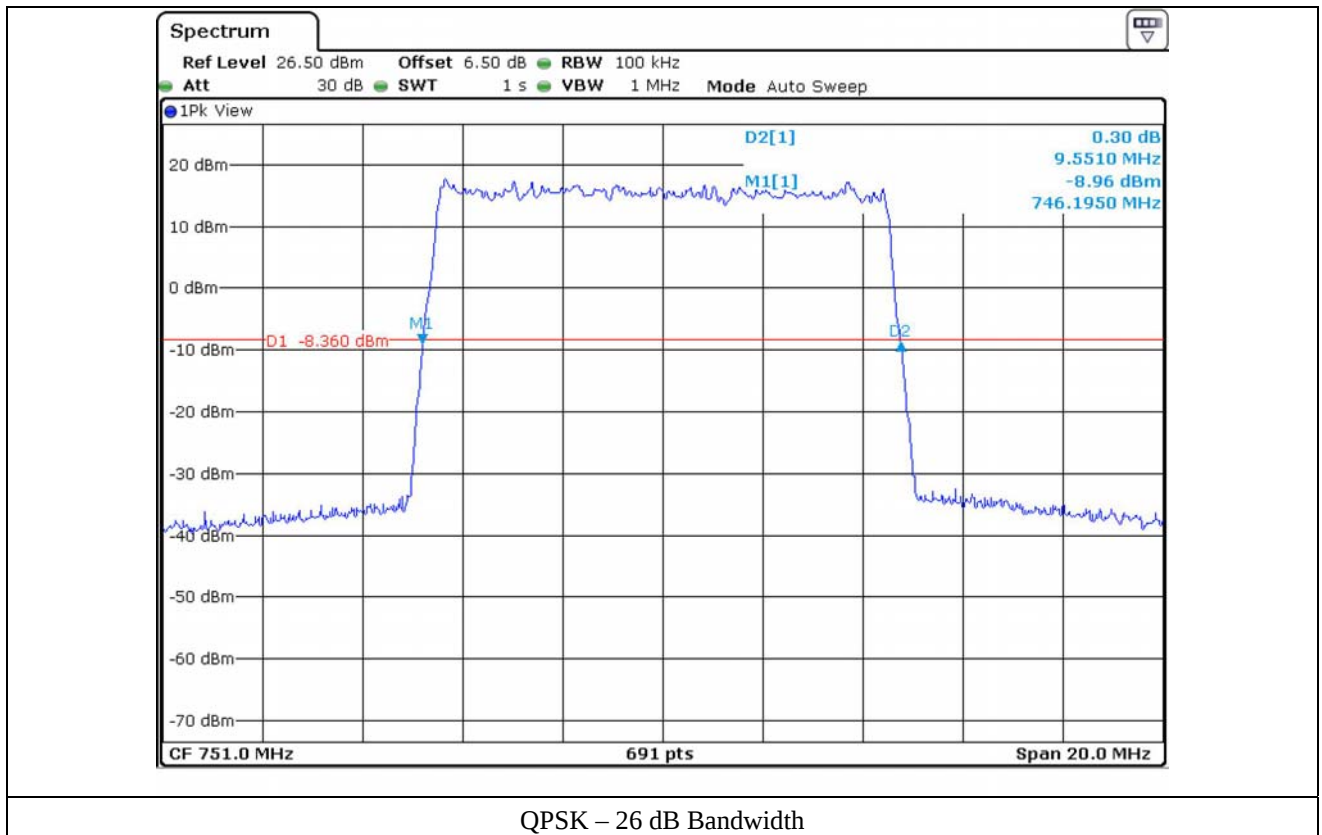
Tested by: Hong-Kyu, Lee/ Engineer

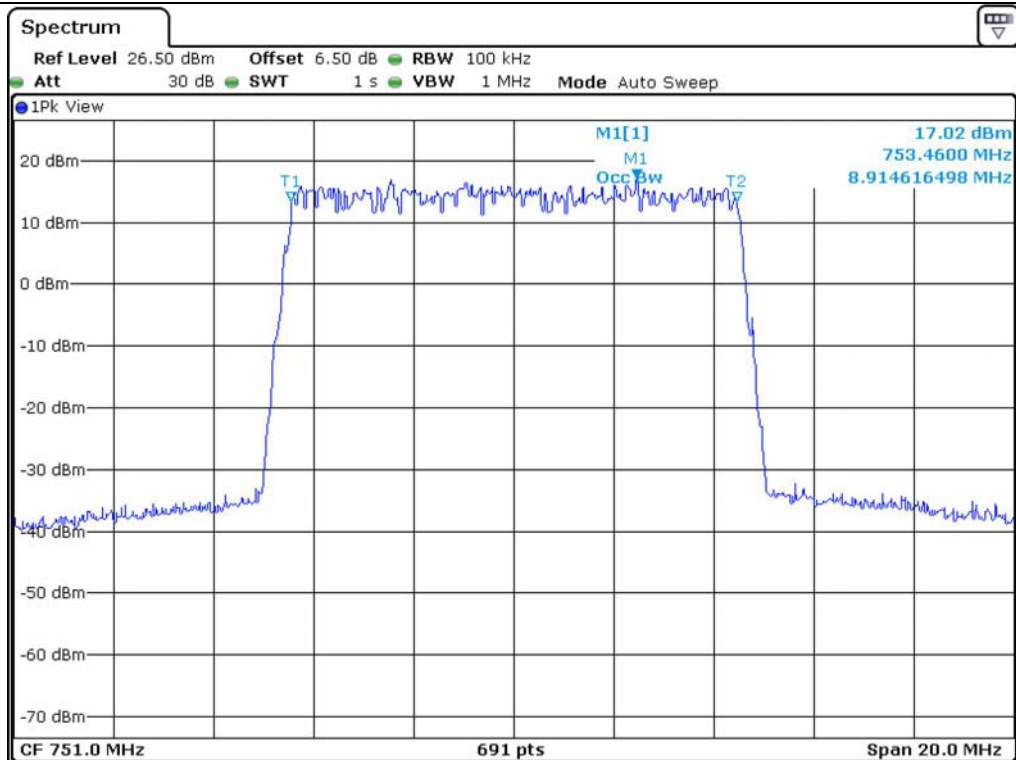


16 QAM- 26 dB Bandwidth

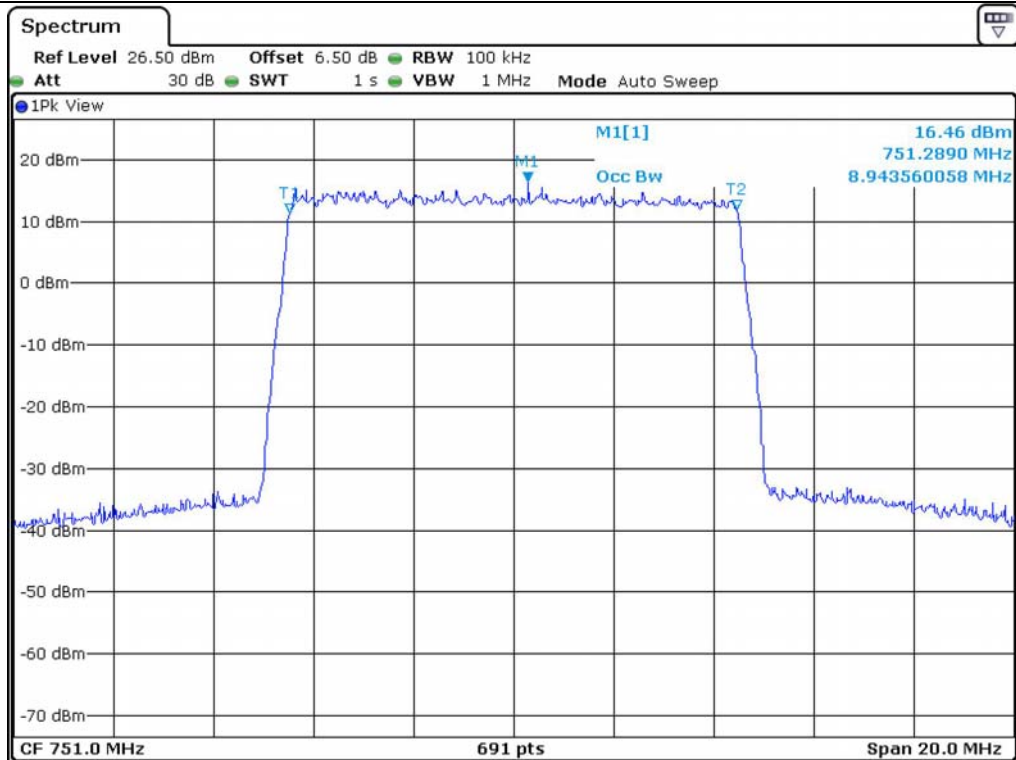


64 QAM - 26 dB Bandwidth





16 QAM – Occupied Bandwidth



64 QAM – Occupied Bandwidth