



## Test Report

Product Name : CBS 2.5GHz  
Model No. : BSMax-250  
FCC ID. : W93-BSMAX250

Applicant : FRC INTERNET PRODUCTS, LLC  
Address : 4421 SW 85th Way, Gainesville, Florida 32608, USA

Date of Receipt : 2011/12/14  
Issued Date : 2013/02/05  
Report No. : 11C277R-RFUSP35V01  
Report Version : V1.0



1313

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

# Test Report Certification

Issued Date : 2013/02/05

Report No. : 11C277R-RFUSP35V01



Product Name : CBS 2.5GHz

Applicant : FRC INTERNET PRODUCTS, LLC

Address : 4421 SW 85th Way, Gainesville, Florida 32608, USA

Model No. : BSMax-250

FCC ID. : W93-BSMAX250

EUT Voltage : AC 120V / 60Hz

Trade Name : FRC

Applicable Standard : FCC CFR Title 47 Part 2 and Part 27: 2010;  
ANSI/ TIA-603-C

Test Result : Complied

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of Quietek Corporation.

Documented By :

*Demi Chang*

( Demi Chang / Engineering Adm. Specialist )

Reviewed By :

*JuBo Shen*

( JuBo Shen / Engineer )

Approved By :

*Roy Wang*

( Roy Wang / Manager )

## Laboratory Information

We, **Quietek Corporation**, are an independent RF consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted (audited or listed) by the following related bodies in compliance with ISO 17025 specified testing scopes:

<b>Taiwan R.O.C.</b>	<b>:</b>	<b>TAF, Accreditation Number: 1313</b>
		<b>NCC, Certificate No : NCC-RCB-07</b>
<b>USA</b>	<b>:</b>	<b>FCC, Registration Number: 365520</b>
<b>Canada</b>	<b>:</b>	<b>IC, Submission No: 150981</b>

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site:<http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site :  
<http://www.quietek.com/>

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

### HsinChu Testing Laboratory:

No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.  
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : [service@quietek.com](mailto:service@quietek.com)

### Linkou Testing Laboratory:

No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.  
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : [service@quietek.com](mailto:service@quietek.com)

# TABLE OF CONTENTS

Description	Page
<b>1. General Information .....</b>	<b>6</b>
1.1. EUT Description .....	6
1.2. Operational Description .....	7
1.3. Test Mode .....	8
1.4. Tested System Details.....	10
1.5. Configuration of tested System .....	10
1.6. EUT Exercise Software.....	10
1.7. Summary of Test Result.....	11
<b>2. Maximum EIRP .....</b>	<b>12</b>
2.1. Test Equipment .....	12
2.2. Test Setup .....	12
2.3. Limits.....	12
2.4. Test Procedure .....	13
2.5. Uncertainty .....	13
2.6. Test Result .....	14
<b>3. Occupied Bandwidth .....</b>	<b>20</b>
3.1. Test Equipment .....	20
3.2. Test Setup .....	20
3.3. Limits.....	20
3.4. Test Procedure .....	20
3.5. Uncertainty .....	20
3.6. Test Result .....	21
<b>4. Channel Edge .....</b>	<b>33</b>
4.1. Test Equipment .....	33
4.2. Test Setup .....	33
4.3. Limits.....	33
4.4. Test Procedure .....	34
4.5. Uncertainty .....	34
4.6. Test Result .....	35
<b>5. Conducted Spurious Emission.....</b>	<b>47</b>
5.1. Test Equipment .....	47
5.2. Test Setup .....	47
5.3. Limits.....	48
5.4. Test Procedure .....	48
5.5. Uncertainty .....	48
5.6. Test Result .....	49
<b>6. Radiated Spurious Emission.....</b>	<b>109</b>
6.1. Test Equipment .....	109
6.2. Test Setup .....	110
6.3. Limits.....	111
6.4. Test Procedure .....	111
6.5. Uncertainty .....	111
6.6. Test Result .....	112
6.7. Test Photo .....	144

<b>7.</b>	<b>Frequency Stability Over Temperatures Variation .....</b>	<b>146</b>
7.1.	Test Equipment .....	146
7.2.	Test Setup .....	146
7.3.	Limits.....	146
7.4.	Test Procedure .....	146
7.5.	Uncertainty .....	146
7.6.	Test Result .....	147
<b>8.</b>	<b>Frequency Stability Over Voltage Variation .....</b>	<b>155</b>
8.1.	Test Equipment .....	155
8.2.	Test Setup .....	155
8.3.	Limits.....	155
8.4.	Test Procedure .....	156
8.5.	Uncertainty .....	156
8.6.	Test Result .....	157
Attachement.....		165
	EUT Photograph .....	165

## 1. General Information

### 1.1. EUT Description

Product Name	CBS 2.5GHz
Trade Name	FRC
Model No.	BSMax-250
Frequency Range	UL and DL: 3.5MHz: 2497.75 – 2688.25MHz 5MHz: 2498.5 - 2687.5MHz 7MHz: 2499.5 – 2686.5MHz 10MHz: 2501- 2685MHz
Modulation Type	UL: QPSK 1/2, 3/4; 16QAM 1/2, 3/4; 64QAM1/2, 2/3, 3/4, 5/6 DL: QPSK 1/2, 3/4; 16QAM 1/2, 3/4; 64QAM1/2, 2/3, 3/4, 5/6
Channel Bandwidth	3.5MHz, 5MHz, 7MHz, 10MHz
Antenna Gain	ANT0:16.5dBi ; ANT1:16.5dBi
Channel Control	Auto
Antenna Type	Panel Antenna-2Tx/2Rx

#### Note:

1. This device is a CBS 2.5GHz including a 2.5GHz receiving function.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 27 for WiMAX devices.
3. Regards to the frequency band operation; the highest rate that was included the lowest , middle and highest frequency of channel were selected to perform the test, and then shown on this report.
4. This device is a composite device in accordance with Part 15 regulations. The receiving function was measured and made a test report whose report number is 11C277R-RFUSP37V02 under Declaration of Conformity.
5. The EUT's information was declared by manufacturer. Refer to the specifications or user's manual for more detailed description.
6. The EUT incorporates a MIMO function that is providing two complete transmitters and two receivers.

### 1.3. Test Mode

The EUT has different channel bandwidths, modulation types and coding rates. Maximum transmitter output power was pre-tested by RF antenna conducted test and the worst mode in yellow as shown below.

#### ANT0+ANT1

Frequency	Transmitter Output Power (dBm)- 3.5MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2497.75	30.62	31.08	30.95	30.97	30.85	31.02	30.66	30.73
2593	30.75	31.4	31.39	31.05	31.01	31.2	30.88	30.8
2688.25	31.46	31.65	31.67	31.65	31.46	31.68	30.81	31.35

#### ANT0+ANT1

Frequency	Transmitter Output Power (dBm)- 5MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2498.5	31.12	31.19	30.8	30.66	31.08	30.91	31.32	31.18
2593	31.32	31.14	30.95	31.15	30.8	31.57	31.32	31.22
2687.5	32.04	31.58	31.63	31.43	31.36	31.65	32	31.29

#### ANT0+ANT1

Frequency	Transmitter Output Power (dBm)- 7MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2499.5	30.22	30.93	30.56	30.24	30.18	30.23	30.15	30.52
2593	30.98	30.69	30.19	30.23	30.79	30.86	30.42	30.68
2686.5	30.93	31.01	30.97	30.7	31.06	31.15	30.7	30.98

#### ANT0+ANT1

Frequency	Transmitter Output Power (dBm)- 10MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2501	31.01	31.09	31.01	31.08	30.52	31.06	30.18	30.8
2593	31.05	31.28	31.03	30.83	30.6	31.01	30.37	31.06
2685	31.69	31.56	31.33	31.08	31.04	31.74	30.83	31.18

According to the above table, find the worst cases of the transmitter that are defined corresponding to the most robust modulation and coding rate. These worst cases were selected for final test configuration and shown on test report.

Final Test Mode	
TX	Mode 1: Transmit (3.5MHz BW_64QAM_2/3) Mode 2: Transmit (5MHz BW_ QPSK-1/2) Mode 3: Transmit (7MHz BW_64QAM-2/3) Mode 4: Transmit (10MHz BW_64QAM-2/3)

Test Items	Mode	Channel	Antenna	Result
Maximum EIRP	All	L /M/ H	0 、 1	Complies
Occupied Bandwidth	1	L /M/ H	0 、 1	Complies
	2	L /M/ H	0 、 1	Complies
	3	L /M/ H	0 、 1	Complies
	4	L /M/ H	0 、 1	Complies
Channel Edge	1	L /M/ H	0 、 1	Complies
	2	L /M/ H	0 、 1	Complies
	3	L /M/ H	0 、 1	Complies
	4	L /M/ H	0 、 1	Complies
Conducted Spurious Emission	1	L /M/ H	0 、 1	Complies
	2	L /M/ H	0 、 1	Complies
	3	L /M/ H	0 、 1	Complies
	4	L /M/ H	0 、 1	Complies
Radiated Spurious Emission	1	L /M/ H	0 + 1	Complies
	2	L /M/ H	0 + 1	Complies
	3	L /M/ H	0 + 1	Complies
	4	L /M/ H	0 + 1	Complies
Frequency Stability Over Temperatures Variation	1	L /M/ H	0 、 1	Complies
	2	L /M/ H	0 、 1	Complies
	3	L /M/ H	0 、 1	Complies
	4	L /M/ H	0 、 1	Complies
Frequency Stability Over Voltage Variation	1	L /M/ H	0 、 1	Complies
	2	L /M/ H	0 、 1	Complies
	3	L /M/ H	0 、 1	Complies
	4	L /M/ H	0 、 1	Complies

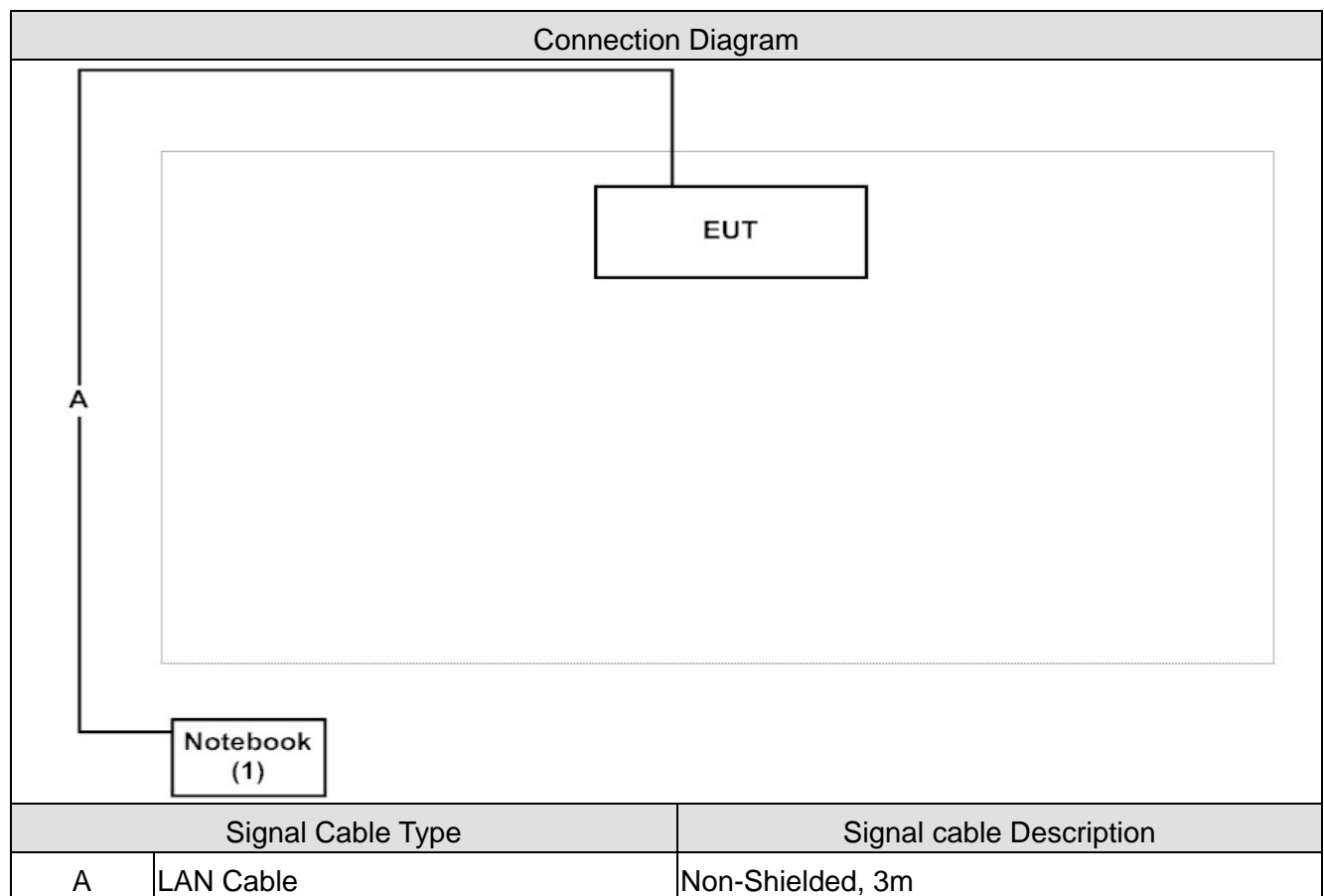


#### 1.4. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	Notebook	HP	HSTNN-I05C	CNU7020BXT	DoC	Non-Shielded, 1.8m

#### 1.5. Configuration of tested System



#### 1.6. EUT Exercise Software

1	Setup the EUT as shown in Section 5.
2	Use "telnet" command to control the EUT.
3	Configure the test bandwidth, the test modulation, and the channel.
4	The EUT will transmit the traffic data.
5	Verify that the EUT works properly.
6	Repeat the above procedure (3) to (5).

## 1.7. Summary of Test Result

FCC Rule	Test Item	Limit	Result
FCC PART 2.1033 FCC PART 27.50(h)(i)	Maximum EIRP	< 【33 dBW + 10log(X/Y) dBW】	PASS
FCC PART 2.1049 FCC PART 27.53(m)(6)	Occupied Bandwidth	N.A	PASS
FCC PART 2.1033 FCC PART 27.53(m)(6)	Channel Edge	< -13dBm	PASS
FCC PART 2.1051 FCC PART 27.53(m)(6)	Conducted Spurious Emission	< -13dBm	PASS
FCC PART 2.1053 FCC PART 27.53(m)(6)	Radiated Spurious Emission	< -13dBm	PASS
FCC PART 2.1055 FCC PART 27.54	Frequency Stability Over Temperature Variation	2.5 ppm	PASS
FCC PART 2.1055 FCC PART 27.54	Frequency Stability Over Voltage Variation	2.5 ppm	PASS

## 2. Maximum EIRP

### 2.1. Test Equipment

The following test equipments are used during the test:

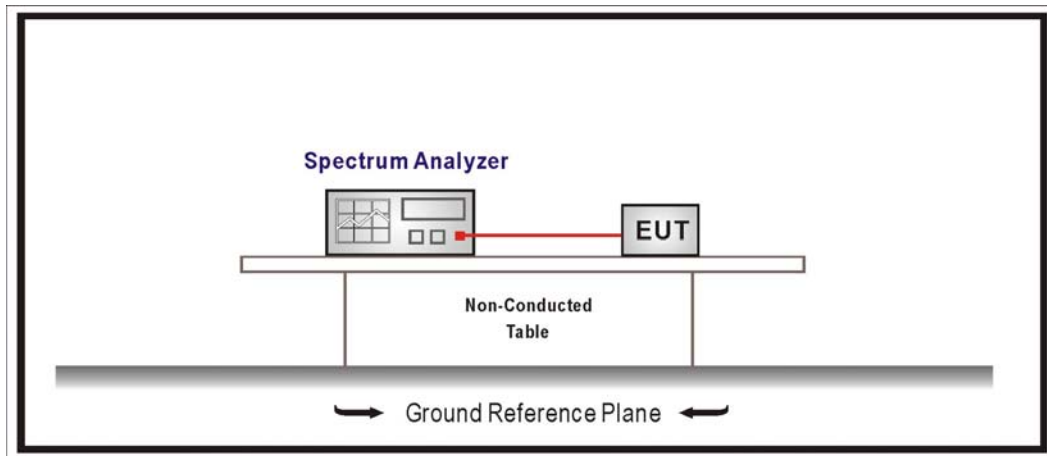
Maximum EIRP / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A	US47140172	2013/07/31

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

### 2.2. Test Setup

RF Conducted Measurement:



### 2.3. Limits

Main, booster and base stations. (i)The maximum EIRP of a main, booster or base station shall not exceed  $33 \text{ dBW} + 10\log(X/Y) \text{ dBW}$ , where X is the actual channel width in MHz and Y is 6 MHz.

The Maximum EIPR of 3.5MHz, 5MHz, 7MHz and 10MHz as below:

Bandwidth (MHz)	Maximum EIRP limit	
	dBW	dBm
3.5	30.65	60.65
5.0	32.20	62.20
7.0	33.66	63.66
10.0	35.21	65.21

## 2.4. Test Procedure

The EUT was tested according to KDB Publications 662911 D01 and 662911 D02 about MIMO test rules for compliance to FCC CFR Title 47 Part 27 requirements

Transmitter Output Power measurement:

The transmitter Output Power is measured using Spectrum Analyzer. The EUT was set up for the rated peak power. All measurements were done at 3 channels: low, middle and high within operational frequency range.

Transmit output power shall be measured over any interval of continuous transmission using instrumentation calibrated in terms of rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

**For this EUT, one of the transmitter outputs is a 90-degree phase-shifted replica of the other and the phase centers of the two antennas are co-located (as would be the case when creating a circularly polarized transmission using linearly polarized antennas), then the each of the two EIRPs must individually be below the limit**

Maximum EIRP= Transmitter Output Power + ANT Gain

## 2.5. Uncertainty

The conducted measurement uncertainty is defined as  $\pm 1.27$  dB .

## 2.6. Test Result

Product	CBS 2.5GHz		
Test Item	Maximum EIRP		
Test Mode	Transmit_3.5MHz		
Date of Test	2012/01/09	Test Site	SR7

Transmitter Output Power: ANT0

The worst test mode of different modulation /code rate is 16QAM\_3/4

Frequency	Transmitter Output Power (dBm)- 3.5MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2497.75	27.56	28.08	27.78	27.93	27.74	27.8	27.6	27.58
2593	27.38	28.64	28.08	28.12	28.07	28.15	27.97	27.76
2688.25	28.37	28.36	28.56	28.89	28.52	28.76	28.01	28.47

Transmitter Output Power: ANT1

The worst test mode of different modulation /code rate is QPSK\_3/4

Frequency	Transmitter Output Power (dBm)- 3.5MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2497.75	27.65	28.05	28.1	27.98	27.94	28.21	27.69	27.85
2593	28.08	28.12	28.66	27.95	27.92	28.22	27.76	27.81
2688.25	28.53	28.91	28.75	28.38	28.38	28.57	27.58	28.2

**Maximum EIRP = Transmitter Output Power (ANT 0) + ANT Gain (16.5dBi)**

Frequency (MHz)	Measured Level (dBm)	Maximum EIRP (dBm)	Limit (dBm)	Result
2497.75	27.93	44.43	60.65	Pass
2593	28.12	44.62	60.65	Pass
2688.25	28.89	45.39	60.65	Pass

**Maximum EIRP = Transmitter Output Power (ANT 1) + ANT Gain (16.5dBi)**

Frequency (MHz)	Measured Level (dBm)	Maximum EIRP (dBm)	Limit (dBm)	Result
2497.75	28.05	44.55	60.65	Pass
2593	28.12	44.62	60.65	Pass
2688.25	28.91	45.41	60.65	Pass

Product	CBS 2.5GHz		
Test Item	Maximum EIRP		
Test Mode	Transmit_5MHz BW		
Date of Test	2012/01/09	Test Site	SR7

Transmitter Output Power: ANT0

The worst test mode of different modulation /code rate is 64QAM-2/3

Frequency	Transmitter Output Power (dBm)- 5MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2498.5	28.23	27.95	27.61	27.39	28.16	28.33	28.57	28.18
2593	28.15	27.83	27.62	27.59	27.51	28.38	27.99	28.19
2687.5	28.77	28.57	28.72	28.47	28.38	28.93	28.78	28.21

Transmitter Output Power: ANT1

The worst test mode of different modulation /code rate is QPSK-1/2

Frequency	Transmitter Output Power (dBm)- 5MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2498.5	27.99	28.39	27.96	27.89	27.97	27.43	28.03	28.15
2593	28.47	28.41	28.24	28.62	28.05	28.73	28.61	28.22
2687.5	29.27	28.57	28.51	28.36	28.32	28.32	29.19	28.34

**Maximum EIRP = Transmitter Output Power (ANT 0) + ANT Gain (16.5dBi)**

Frequency (MHz)	Measured Level (dBm)	Maximum EIRP (dBm)	Limit (dBm)	Result
2498.5	28.33	44.83	62.2	Pass
2593	28.38	44.88	62.2	Pass
2687.5	28.93	45.43	62.2	Pass

**Maximum EIRP = Transmitter Output Power (ANT 1) + ANT Gain (16.5dBi)**

Frequency (MHz)	Measured Level (dBm)	Maximum EIRP (dBm)	Limit (dBm)	Result
2498.5	27.99	44.49	62.2	Pass
2593	28.47	44.97	62.2	Pass
2687.5	29.27	45.77	62.2	Pass

Product	CBS 2.5GHz		
Test Item	Maximum EIRP		
Test Mode	Transmit_7MHz		
Date of Test	2012/01/09	Test Site	SR7

Transmitter Output Power: ANT0

The worst test mode of different modulation /code rate is 64QAM\_1/2

Frequency	Transmitter Output Power (dBm)- 7MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2499.5	27.09	27.09	27.42	27.03	26.67	26.42	27.02	27.9
2593	27.4	27.25	27.07	27.09	27.27	28.05	27.49	28.15
2686.5	28.16	27.96	28.27	27.84	28.44	28.16	28.04	28.24

Transmitter Output Power: ANT1

The worst test mode of different modulation /code rate is QPSK\_3/4

Frequency	Transmitter Output Power (dBm)- 7MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2499.5	27.33	28.61	27.67	27.42	27.61	27.9	27.26	27.07
2593	28.47	28.07	27.29	27.35	28.24	27.64	27.33	27.13
2686.5	27.66	28.04	27.63	27.54	27.63	28.11	27.31	27.68

**Maximum EIRP = Transmitter Output Power (ANT 0) + ANT Gain (16.5dBi)**

Frequency (MHz)	Measured Level (dBm)	Maximum EIRP (dBm)	Limit (dBm)	Result
2499.5	26.67	43.17	63.66	Pass
2593	27.27	43.77	63.66	Pass
2686.5	28.44	44.94	63.66	Pass

**Maximum EIRP = Transmitter Output Power (ANT 1) + ANT Gain (16.5dBi)**

Frequency (MHz)	Measured Level (dBm)	Maximum EIRP (dBm)	Limit (dBm)	Result
2499.5	28.61	45.11	63.66	Pass
2593	28.07	44.57	63.66	Pass
2686.5	28.04	44.54	63.66	Pass

Product	CBS 2.5GHz		
Test Item	Maximum EIRP		
Test Mode	Transmit_10MHz		
Date of Test	2012/01/09	Test Site	SR7

Transmitter Output Power: ANT0

The worst test mode of different modulation /code rate is 64QAM\_2/3

Frequency	Transmitter Output Power (dBm)- 10MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2501	27.53	28.17	28.11	28.01	27.42	28.03	27.12	27.84
2593	28.2	28.56	27.93	27.74	27.91	28.18	27.48	28.11
2685	28.84	28.96	28.77	28.38	28.76	29.25	28.14	28.43

Transmitter Output Power: ANT1

The worst test mode of different modulation /code rate is QPSK\_1/2

Frequency	Transmitter Output Power (dBm)- 10MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2501	28.42	27.99	27.89	28.12	27.59	28.06	27.22	27.74
2593	27.88	27.96	28.11	27.9	27.24	27.81	27.24	27.99
2685	28.51	28.09	27.81	27.74	27.16	28.13	27.47	27.89

**Maximum EIRP = Transmitter Output Power (ANT 0) + ANT Gain (16.5dBi)**

Frequency (MHz)	Measured Level (dBm)	Maximum EIRP (dBm)	Limit (dBm)	Result
2501	28.03	44.53	65.21	Pass
2593	28.18	44.68	65.21	Pass
2685	29.25	45.75	65.21	Pass

**Maximum EIRP = Transmitter Output Power (ANT 1) + ANT Gain (16.5dBi)**

Frequency (MHz)	Measured Level (dBm)	Maximum EIRP (dBm)	Limit (dBm)	Result
2501	28.42	44.92	65.21	Pass
2593	27.88	44.38	65.21	Pass
2685	28.51	45.01	65.21	Pass



Product	CBS 2.5GHz		
Test Item	Maximum EIRP		
Test Mode	Transmit_10MHz		
Date of Test	2012/01/09	Test Site	SR7

Transmitter Output Power: ANT0+ANT1

Frequency	Transmitter Output Power (dBm)- 3.5MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2497.75	30.62	31.08	30.95	30.97	30.85	31.02	30.66	30.73
2593	30.75	31.4	31.39	31.05	31.01	31.20	30.88	30.8
2688.25	31.46	31.65	31.67	31.65	31.46	31.68	30.81	31.35

Transmitter Output Power: ANT0+ANT1

Frequency	Transmitter Output Power (dBm)- 5MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2498.5	31.12	31.19	30.8	30.66	31.08	30.91	31.32	31.18
2593	31.32	31.14	30.95	31.15	30.8	31.57	31.32	31.22
2687.5	32.04	31.58	31.63	31.43	31.36	31.65	32	31.29

Transmitter Output Power: ANT0+ANT1

Frequency	Transmitter Output Power (dBm)- 7MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2499.5	30.22	30.93	30.56	30.24	30.18	30.23	30.15	30.52
2593	30.98	30.69	30.19	30.23	30.79	30.86	30.42	30.68
2686.5	30.93	31.01	30.97	30.7	31.06	31.15	30.7	30.98

Transmitter Output Power: ANT0+ANT1

Frequency	Transmitter Output Power (dBm)- 10MHz Bandwidth							
(MHz)	Test Mode							
	QPSK_1/2	QPSK_3/4	16QAM_1/2	16QAM_3/4	64QAM_1/2	64QAM_2/3	64QAM_3/4	64QAM_5/6
2501	31.01	31.09	31.01	31.08	30.52	31.06	30.18	30.8
2593	31.05	31.28	31.03	30.83	30.6	31.01	30.37	31.06
2685	31.69	31.56	31.33	31.08	31.04	31.74	30.83	31.18

**Maximum EIRP = Transmitter Output Power (ANT 1+ ANT 2) + ANT Gain (16.5dBi) \_3.5MHz BW**

Frequency (MHz)	Measured Level (dBm)	Maximum EIRP (dBm)	Limit (dBm)	Result
2501	31.02	47.52	60.65	Pass
2593	31.20	47.7	60.65	Pass
2685	31.68	48.18	60.65	Pass

**Maximum EIRP = Transmitter Output Power (ANT 1+ ANT 2) + ANT Gain (16.5dBi) \_5MHz BW**

Frequency (MHz)	Measured Level (dBm)	Maximum EIRP (dBm)	Limit (dBm)	Result
2501	31.12	47.62	62.2	Pass
2593	31.32	47.82	62.2	Pass
2685	32.04	48.54	62.2	Pass

**Maximum EIRP = Transmitter Output Power (ANT 1+ ANT 2) + ANT Gain (16.5dBi) \_7MHz BW**

Frequency (MHz)	Measured Level (dBm)	Maximum EIRP (dBm)	Limit (dBm)	Result
2501	30.23	46.73	63.66	Pass
2593	30.86	47.36	63.66	Pass
2685	31.15	47.65	63.66	Pass

**Maximum EIRP = Transmitter Output Power (ANT 1+ ANT 2) + ANT Gain (16.5dBi) \_10MHz BW**

Frequency (MHz)	Measured Level (dBm)	Maximum EIRP (dBm)	Limit (dBm)	Result
2501	31.06	47.56	65.21	Pass
2593	31.01	47.51	65.21	Pass
2685	31.74	48.24	65.21	Pass

### 3. Occupied Bandwidth

#### 3.1. Test Equipment

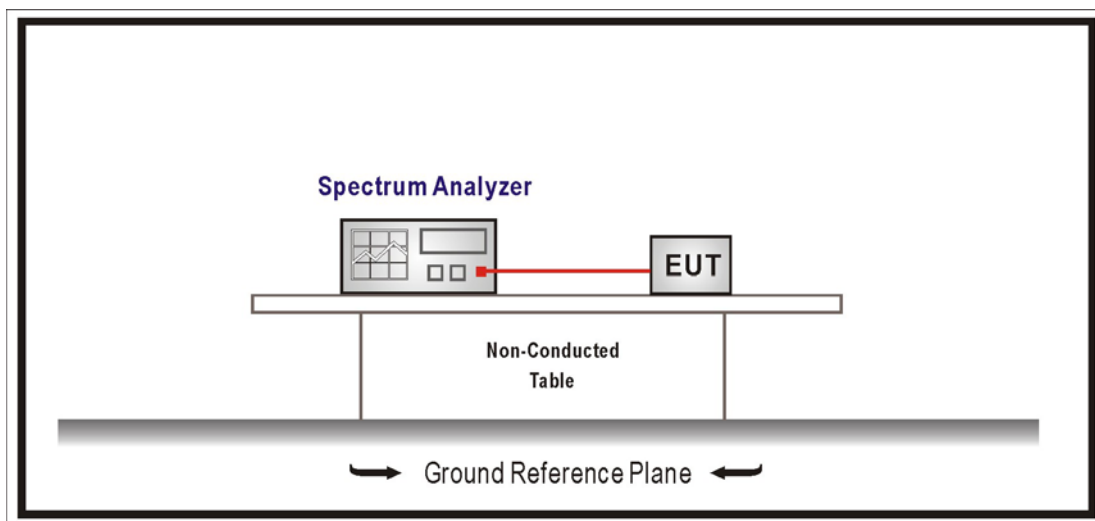
The following test equipments are used during the test:

Occupied Bandwidth/ SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A	US47140172	2013/07/31

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

#### 3.2. Test Setup



#### 3.3. Limits

N/A.

#### 3.4. Test Procedure

The measurement of the occupied bandwidth will be based on the built-in measurement function in the SA, set to measure the BW of the signal when 99% of the transmitted power, applied on a signal transmitted in an output power equivalent to maximum value which does not violates the spectral mask. Measurement of emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

#### 3.5. Uncertainty

The measurement uncertainty is defined as  $\pm 50$  kHz

### 3.6. Test Result

Product	CBS 2.5GHz		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit (3.5MHz BW_64QAM_2/3)		
Date of Test	2011/12/29	Test Site	SR7

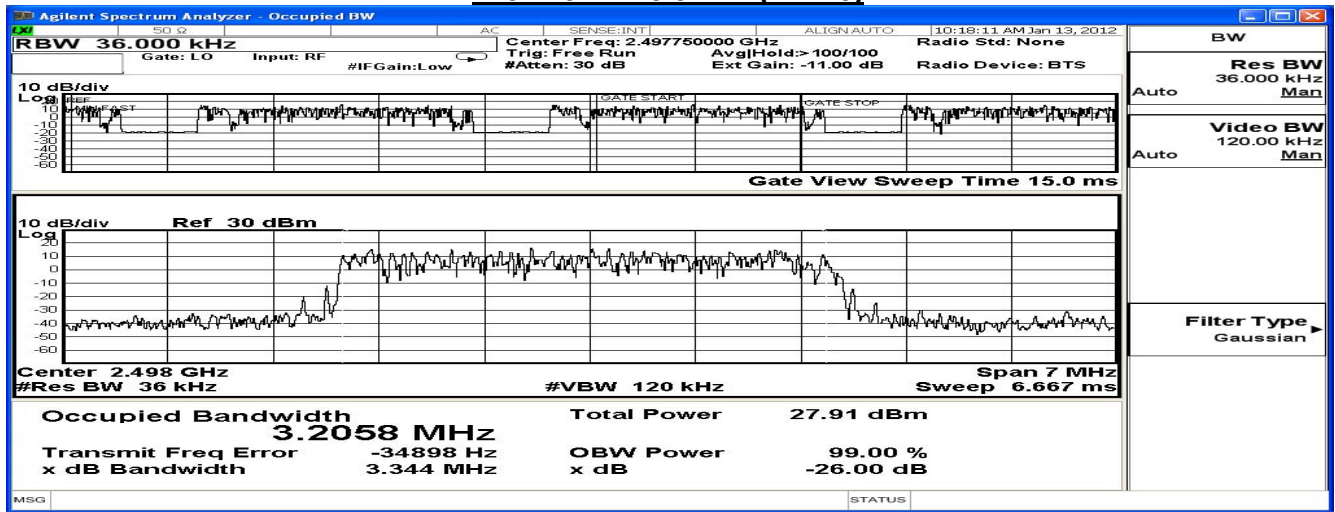
#### 3.5MHz BW\_64QAM\_2/3 (ANT 0)

Frequency (MHz)	Measured Level(MHz)		Limit (kHz)
	-26dB BW	99% BW	
2497.75	3.344	3.205	NA
2593	3.355	3.215	NA
2688.25	3.327	3.208	NA

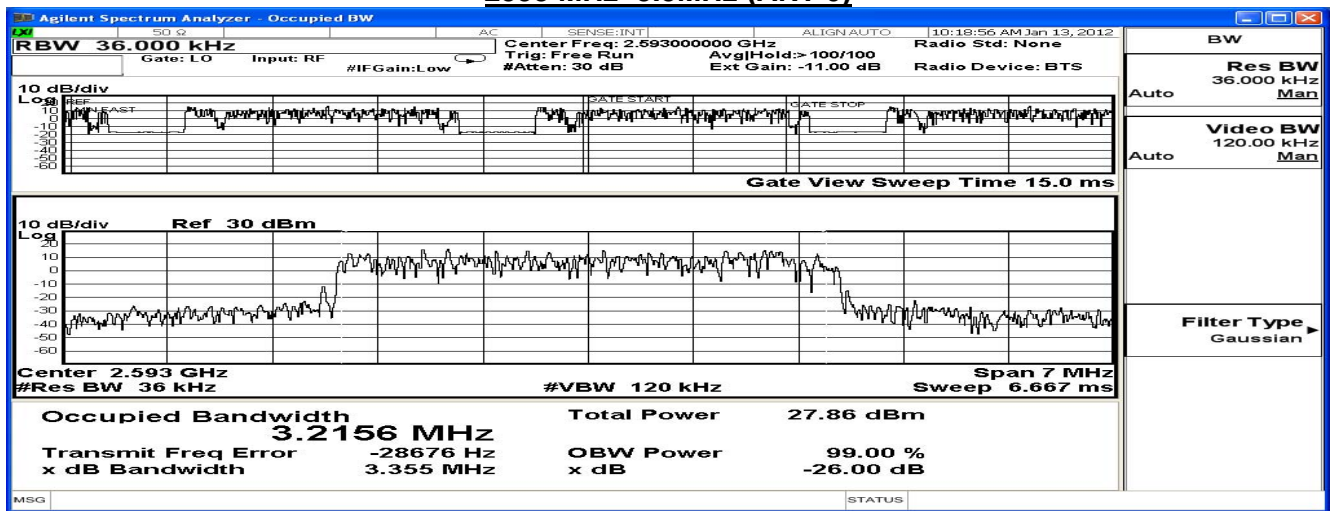
#### 3.5MHz BW\_64QAM\_2/3 (ANT 1)

Frequency (MHz)	Measured Level(MHz)		Limit (kHz)
	-26dB BW	99% BW	
2497.75	3.351	3.206	NA
2593	3.351	3.258	NA
2688.25	3.356	3.255	NA

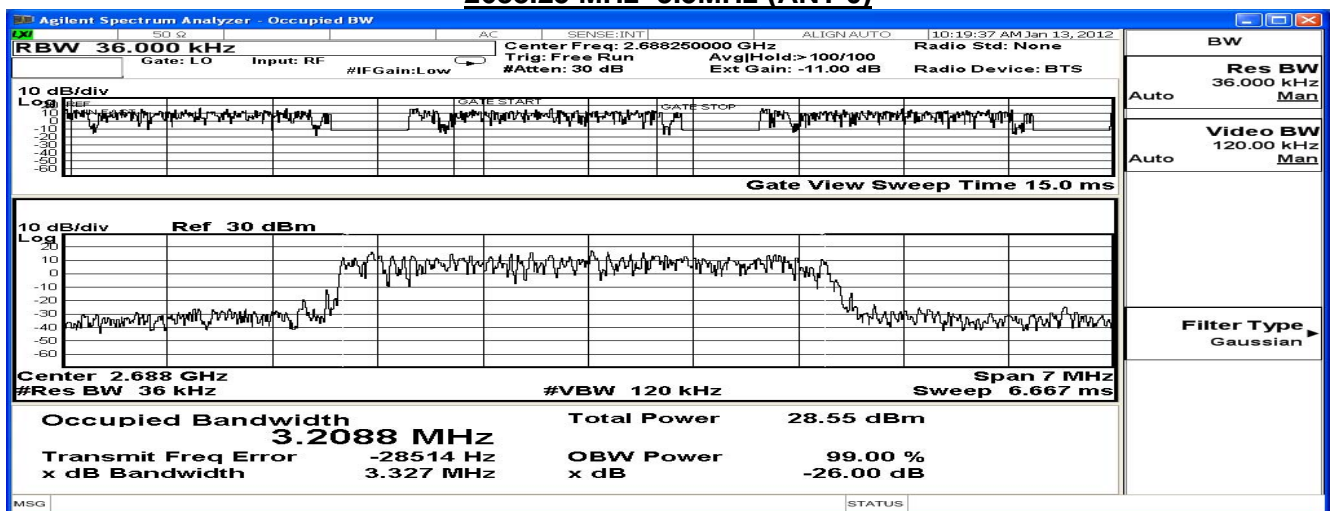
**2497.75MHz-3.5MHz-(ANT 0)**



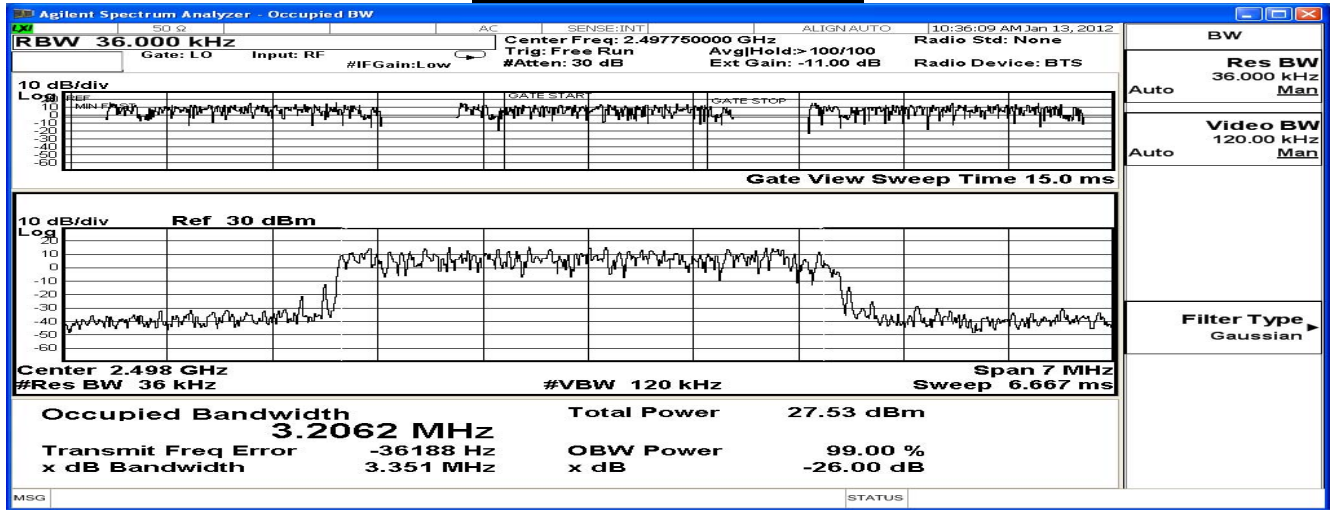
**2593 MHz -3.5MHz-(ANT 0)**



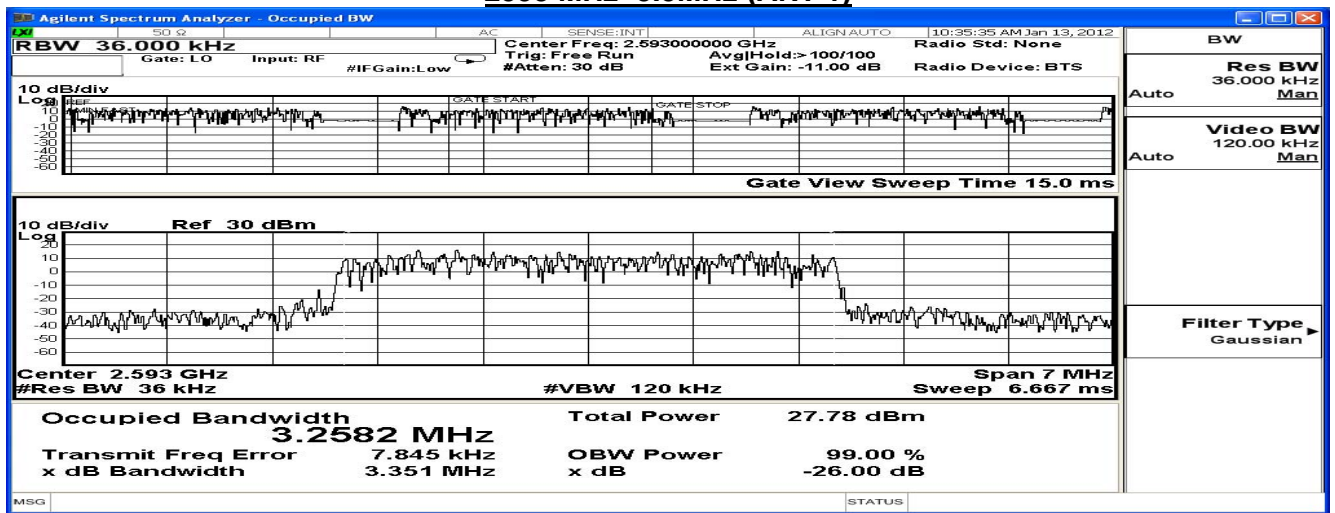
**2688.25 MHz -3.5MHz-(ANT 0)**



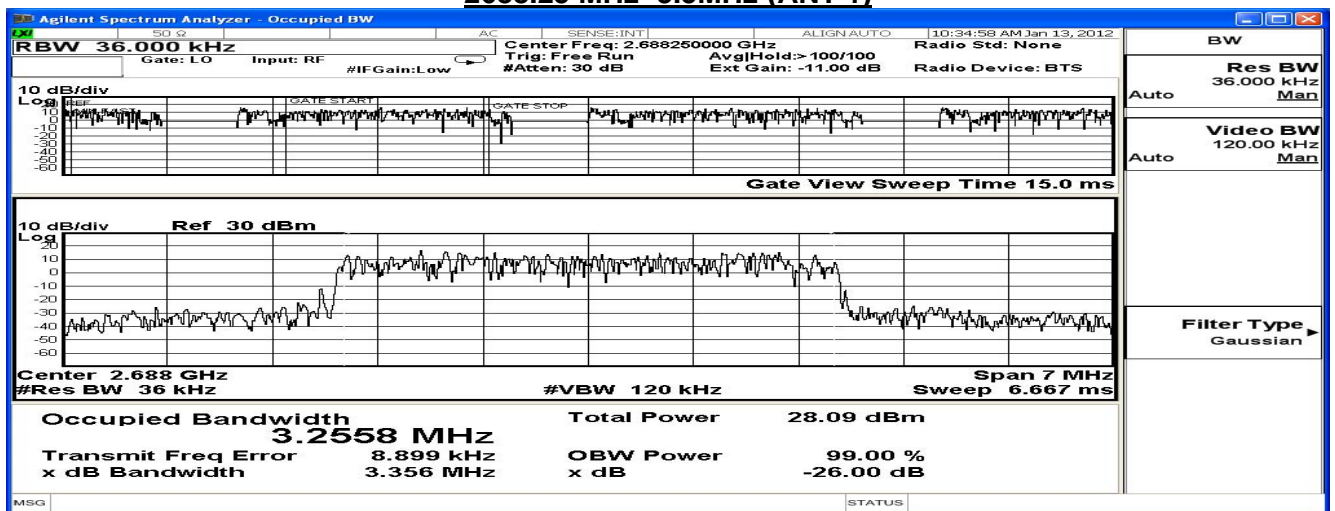
### 2497.75MHz-3.5MHz-(ANT 1)



### 2593 MHz -3.5MHz-(ANT 1)



### 2688.25 MHz -3.5MHz-(ANT 1)



Product	CBS 2.5GHz		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: Transmit (5MHz BW_ QPSK-1/2)		
Date of Test	2011/12/29	Test Site	SR7

## 5MHz BW\_ QPSK-1/2 (ANT 0)

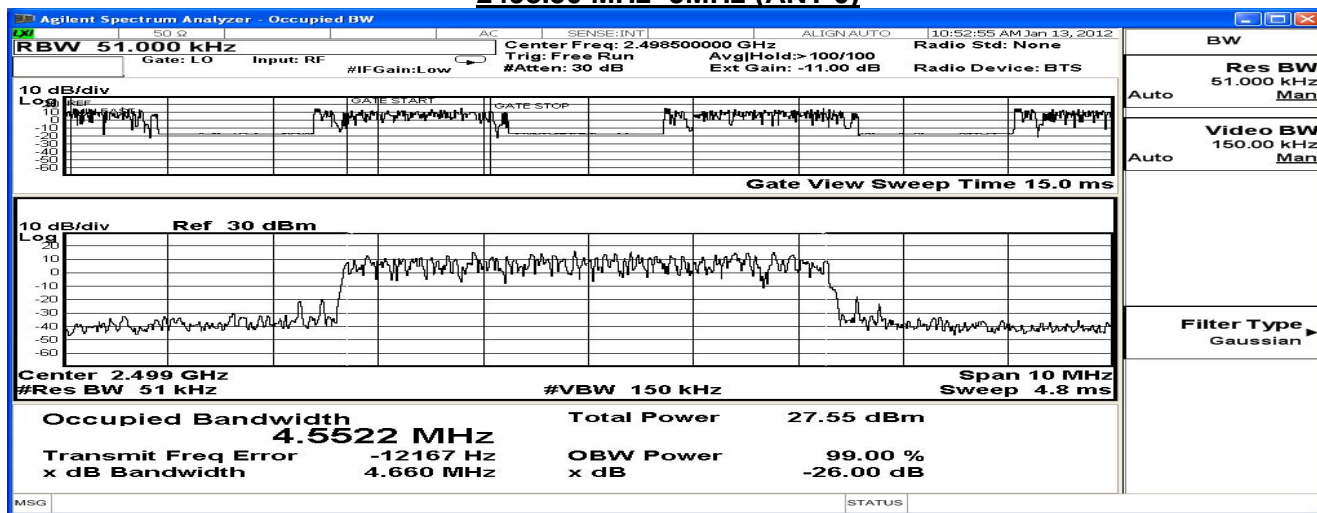
Frequency (MHz)	Measured Level(MHz)		Limit (kHz)
	-26dB BW	99% BW	
2498.50	4.660	4.552	NA
2593.00	4.717	4.499	NA
2687.50	4.728	4.494	NA

## 5MHz BW\_ QPSK-1/2 (ANT 1)

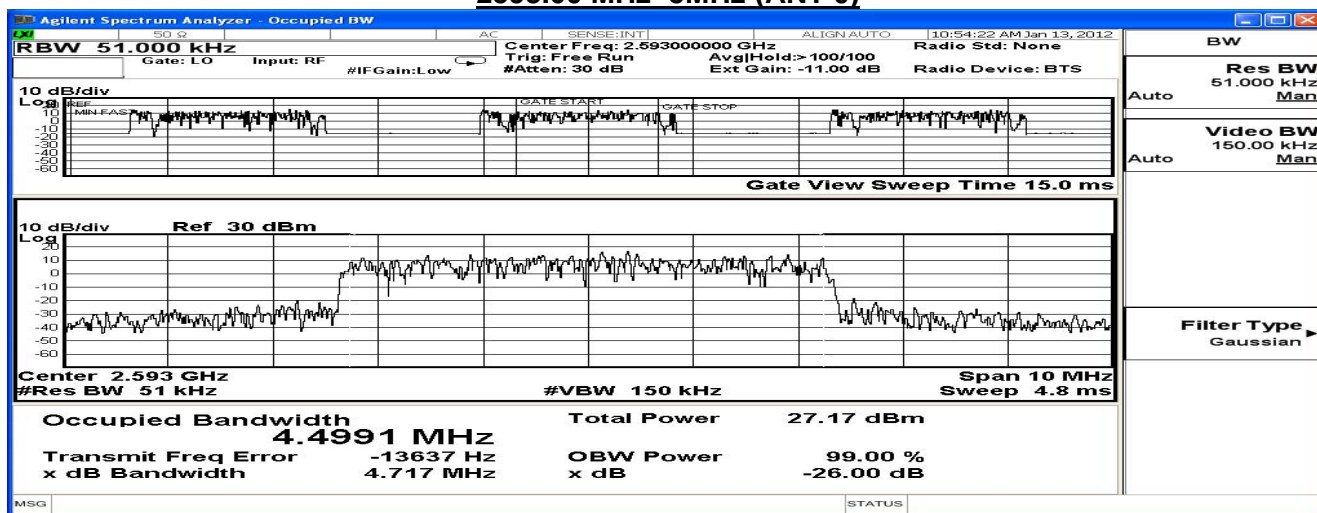
Frequency (MHz)	Measured Level(MHz)		Limit (kHz)
	-26dB BW	99% BW	
2498.50	4.686	4.484	NA
2593.00	4.715	4.503	NA
2687.50	4.690	4.547	NA



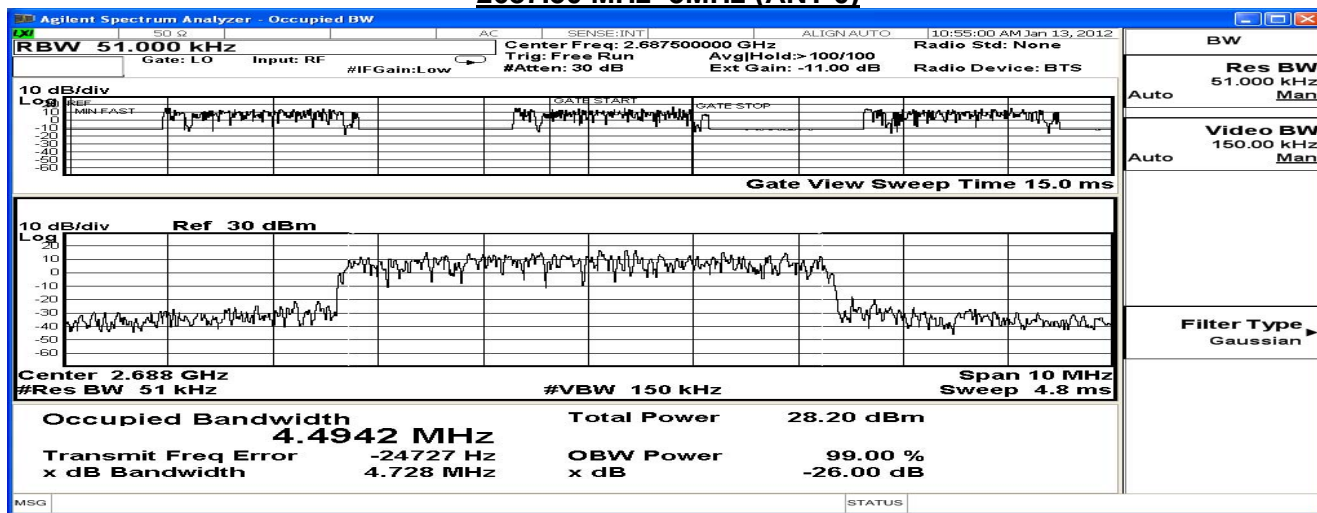
## 2498.50 MHz -5MHz-(ANT 0)



## 2593.00 MHz -5MHz-(ANT 0)

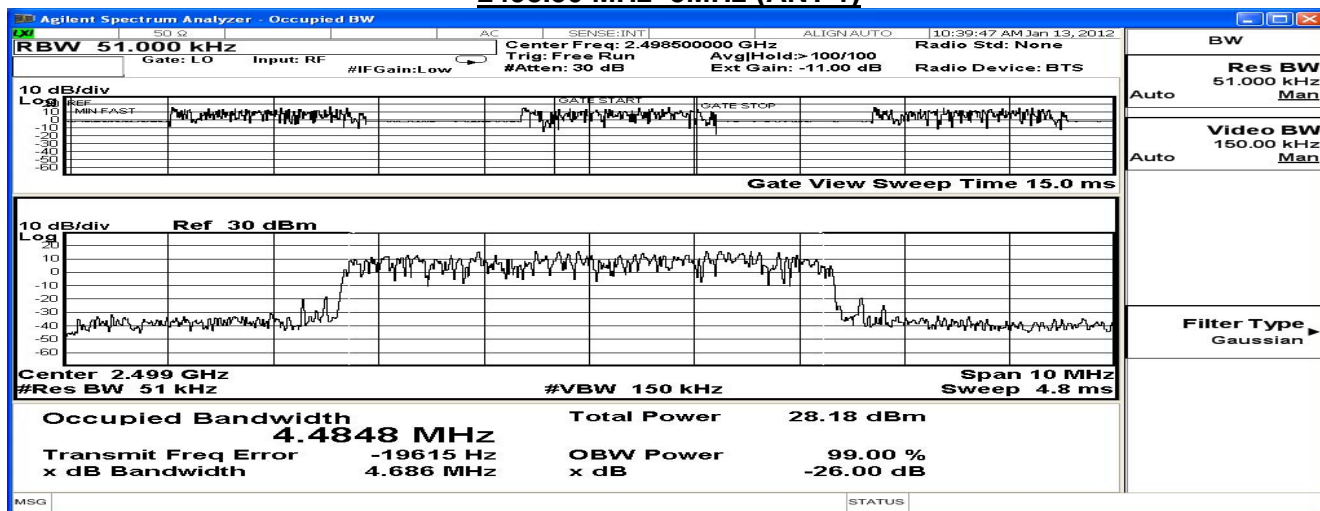


## 2687.50 MHz -5MHz-(ANT 0)

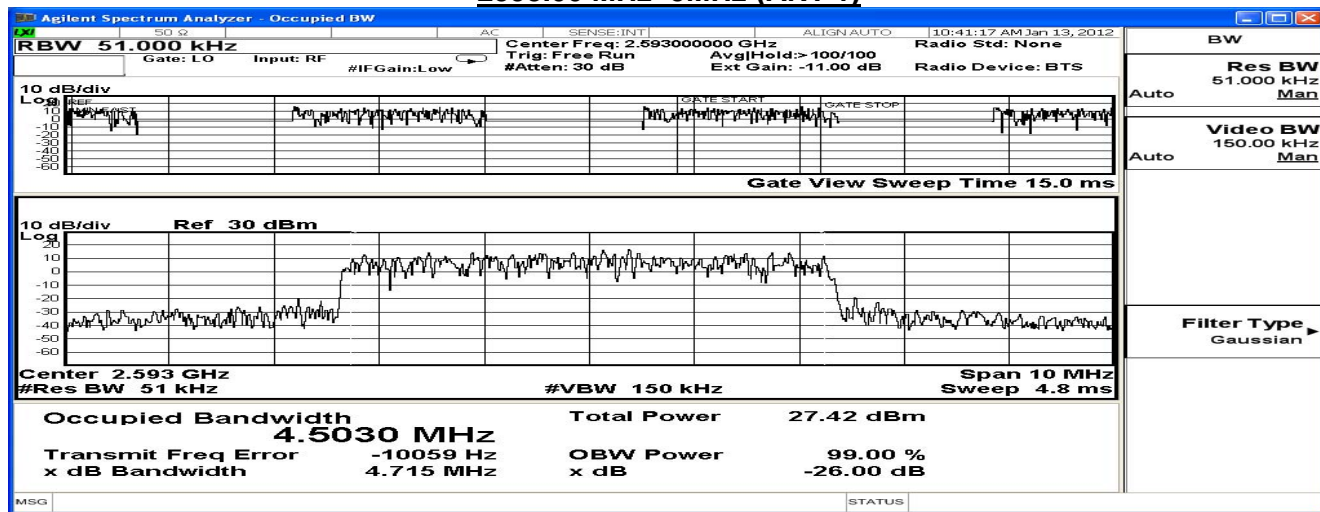




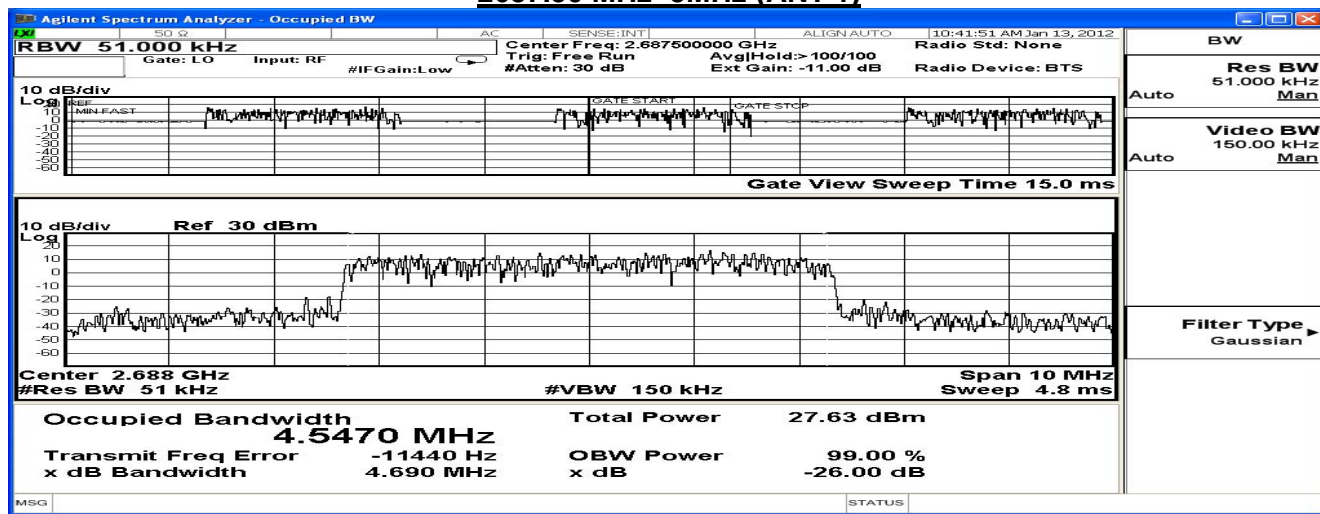
## 2498.50 MHz -5MHz-(ANT 1)



## 2593.00 MHz -5MHz-(ANT 1)



## 2687.50 MHz -5MHz-(ANT 1)



Product	CBS 2.5GHz		
Test Item	Occupied Bandwidth		
Test Mode	Mode 3: Transmit (7MHz BW_64QAM-2/3)		
Date of Test	2011/12/29	Test Site	SR7

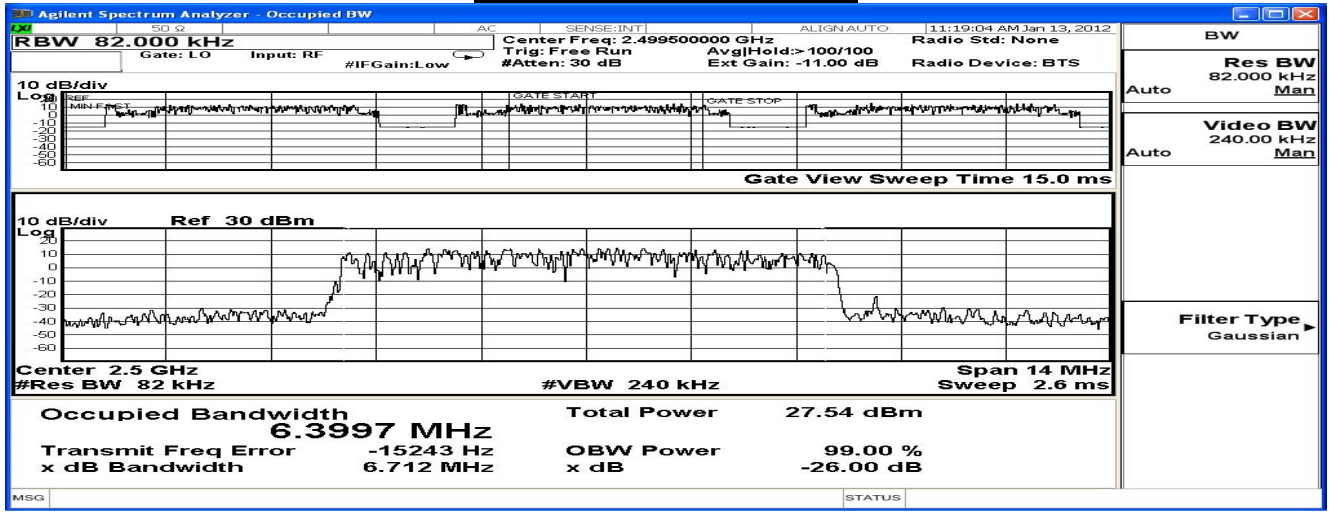
## 64QAM-2/3\_BW= 7MHz (ANT 0)

Frequency (MHz)	Measured Level(MHz)		Limit (kHz)
	-26dB BW	99% BW	
2499.50	6.712	6.399	NA
2593.00	6.653	6.411	NA
2686.50	6.657	6.268	NA

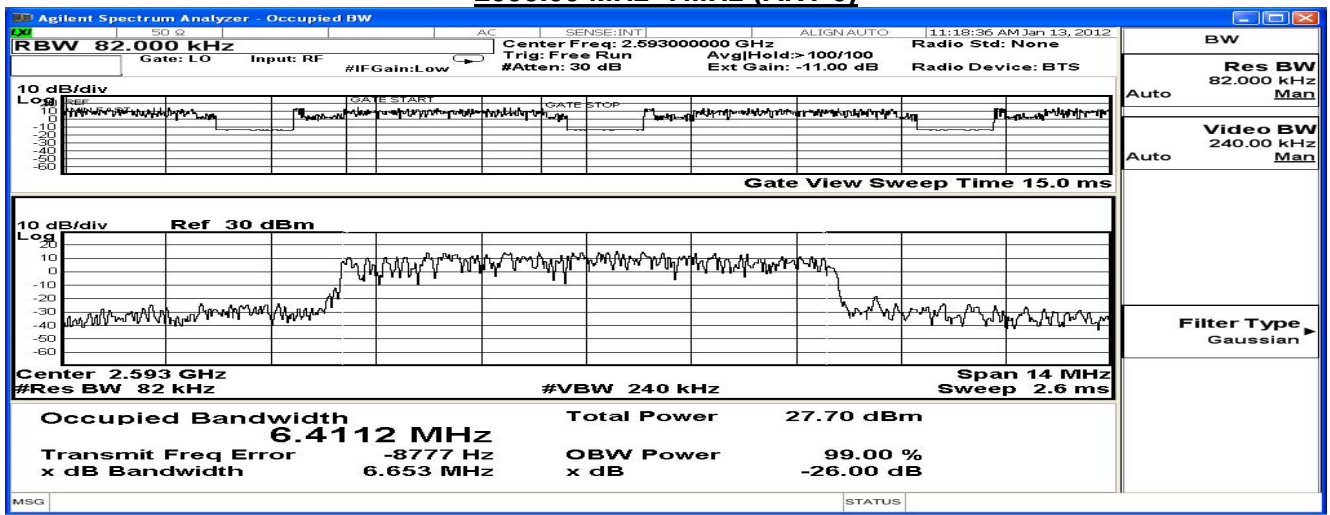
## 64QAM-2/3\_BW= 7MHz (ANT 1)

Frequency (MHz)	Measured Level(MHz)		Limit (kHz)
	-26dB BW	99% BW	
2499.50	6.672	6.317	NA
2593.00	6.661	6.627	NA
2686.50	6.689	6.296	NA

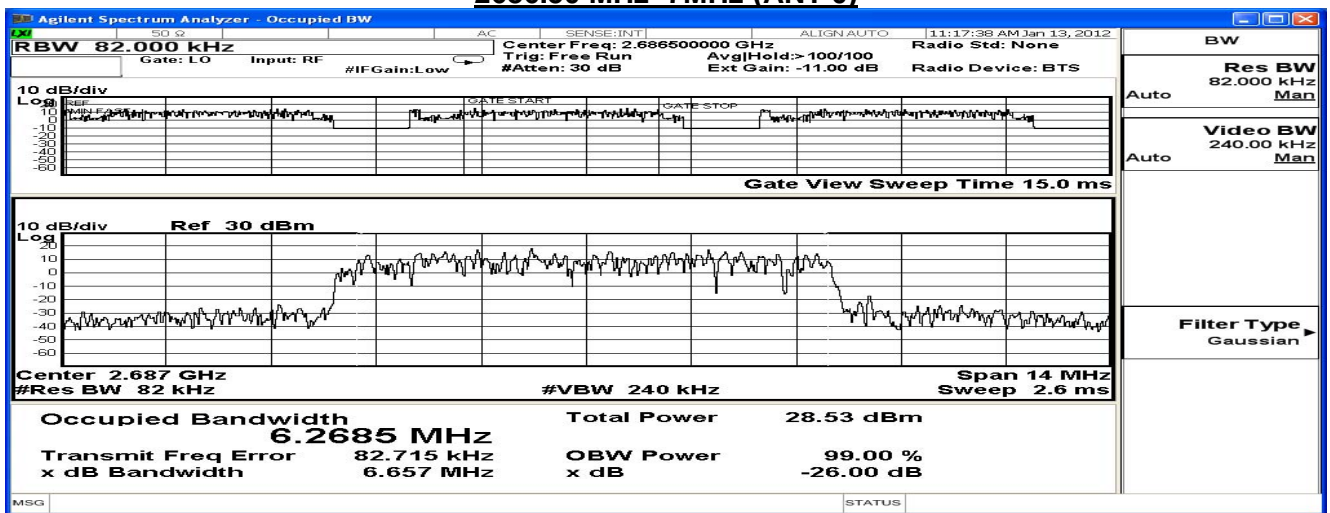
2499.50 MHz -7MHz-(ANT 0)



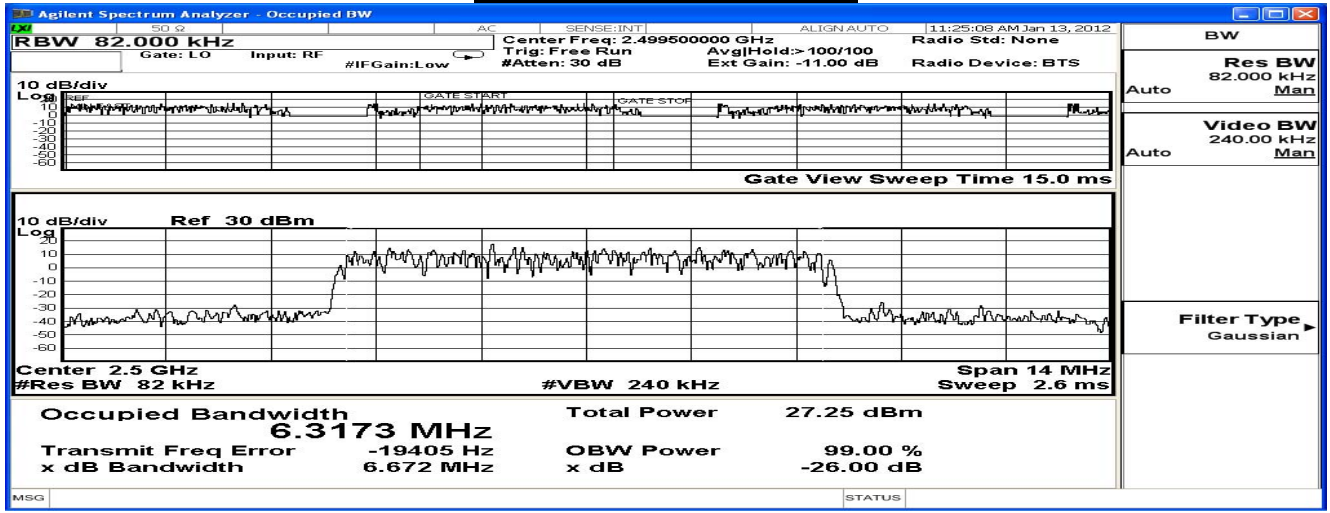
2593.00 MHz -7MHz-(ANT 0)



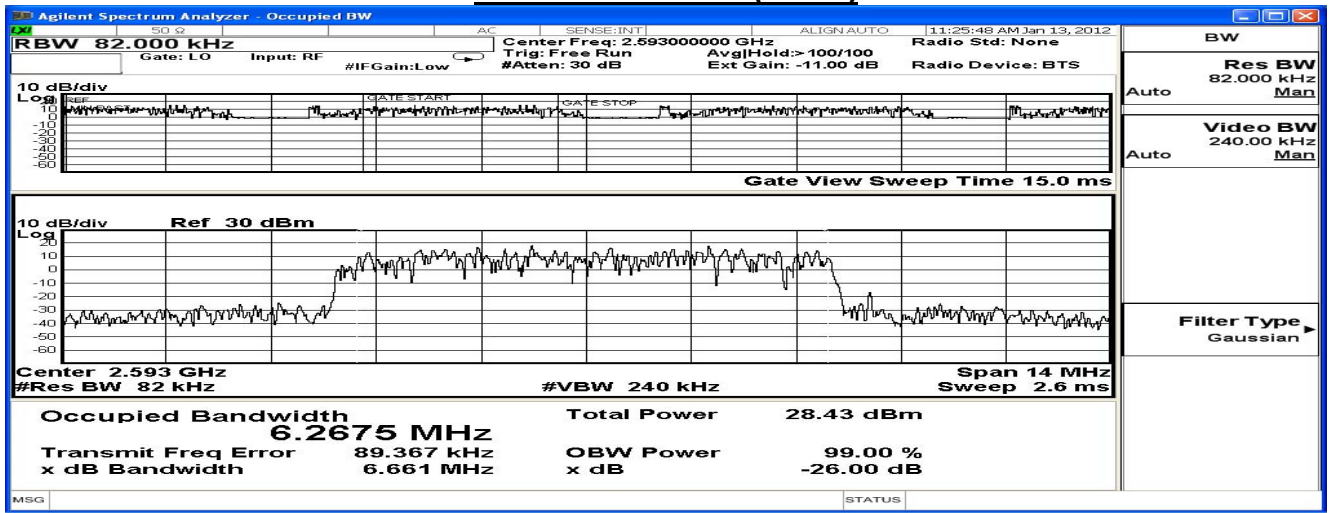
2686.50 MHz -7MHz-(ANT 0)



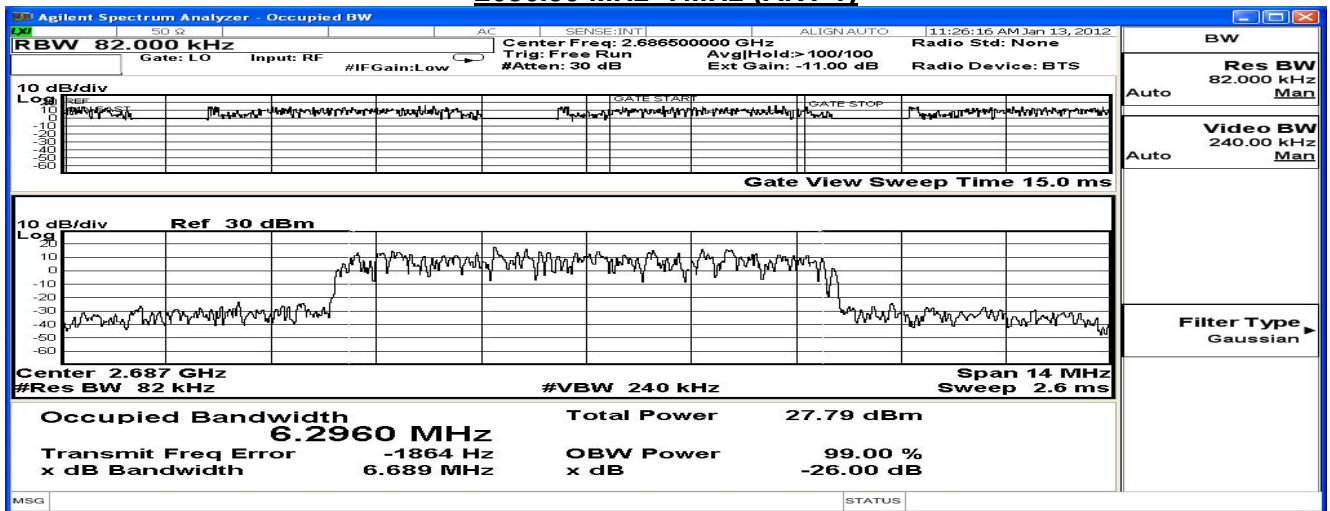
2499.50 MHz -7MHz-(ANT 1)



2593.00 MHz -7MHz-(ANT 1)



2686.50 MHz -7MHz-(ANT 1)



Product	CBS 2.5GHz		
Test Item	Occupied Bandwidth		
Test Mode	Mode 4: Transmit (10MHz BW_64QAM-2/3)		
Date of Test	2011/12/29	Test Site	SR7

## 64QAM-2/3\_BW= 10MHz (ANT 0)

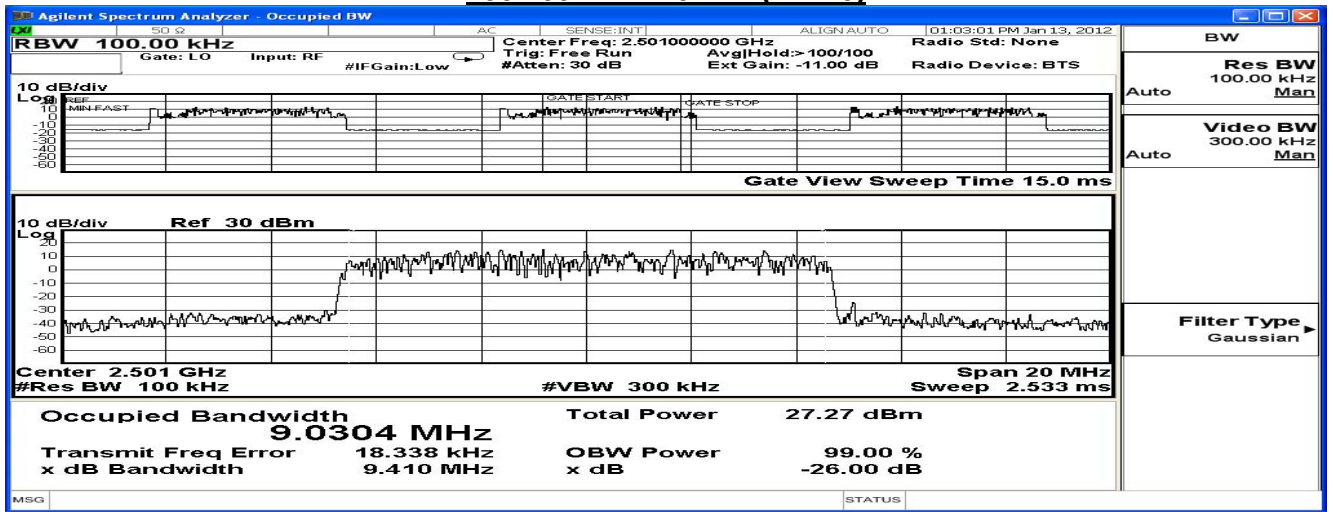
Frequency (MHz)	Measured Level(MHz)		Limit (kHz)
	-26dB BW	99% BW	
2501.00	9.410	9.030	NA
2593.00	9.327	9.096	NA
2685.00	9.377	8.839	NA

## 64QAM-2/3\_BW= 10MHz (ANT 1)

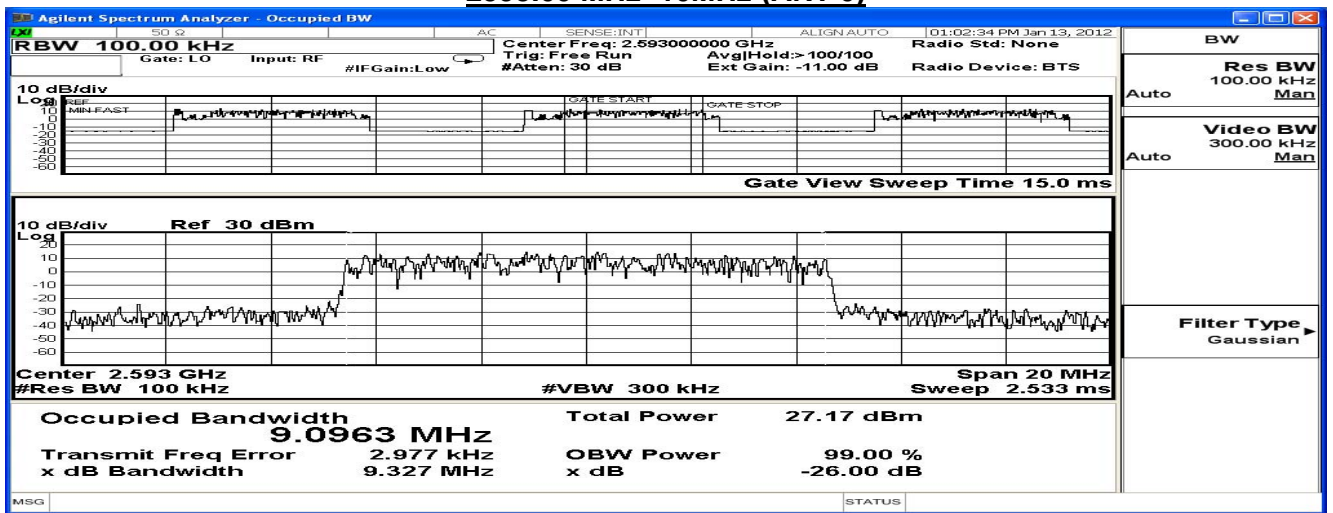
Frequency (MHz)	Measured Level(MHz)		Limit (kHz)
	-26dB BW	99% BW	
2501.00	9.401	9.022	NA
2593.00	9.368	9.005	NA
2685.00	9.354	9.040	NA



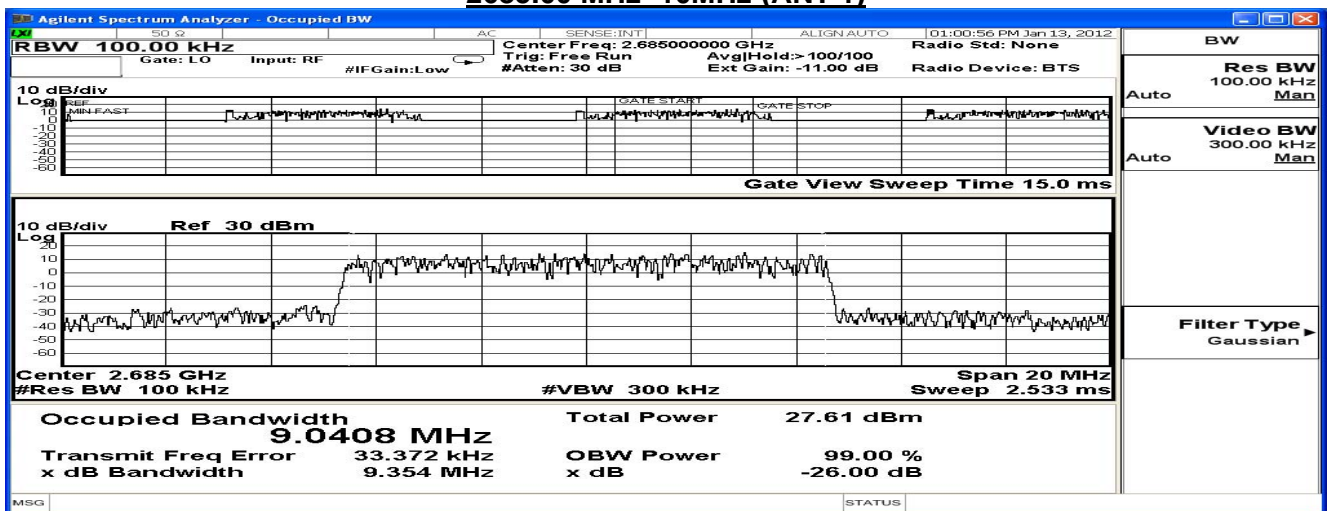
## 2501.00 MHz -10MHz-(ANT 0)



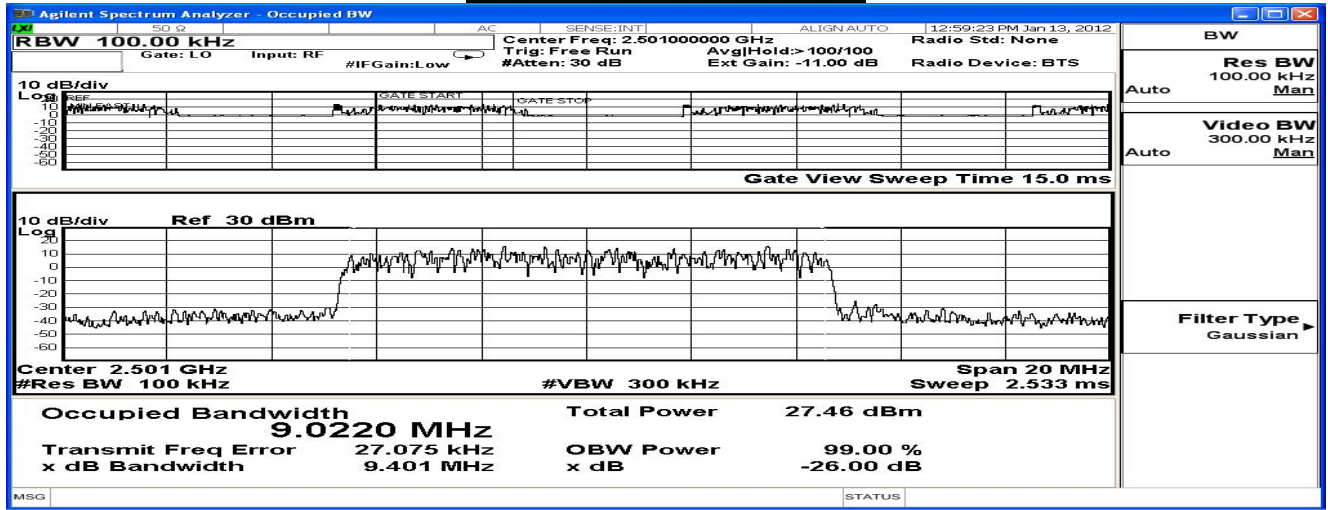
## 2593.00 MHz -10MHz-(ANT 0)



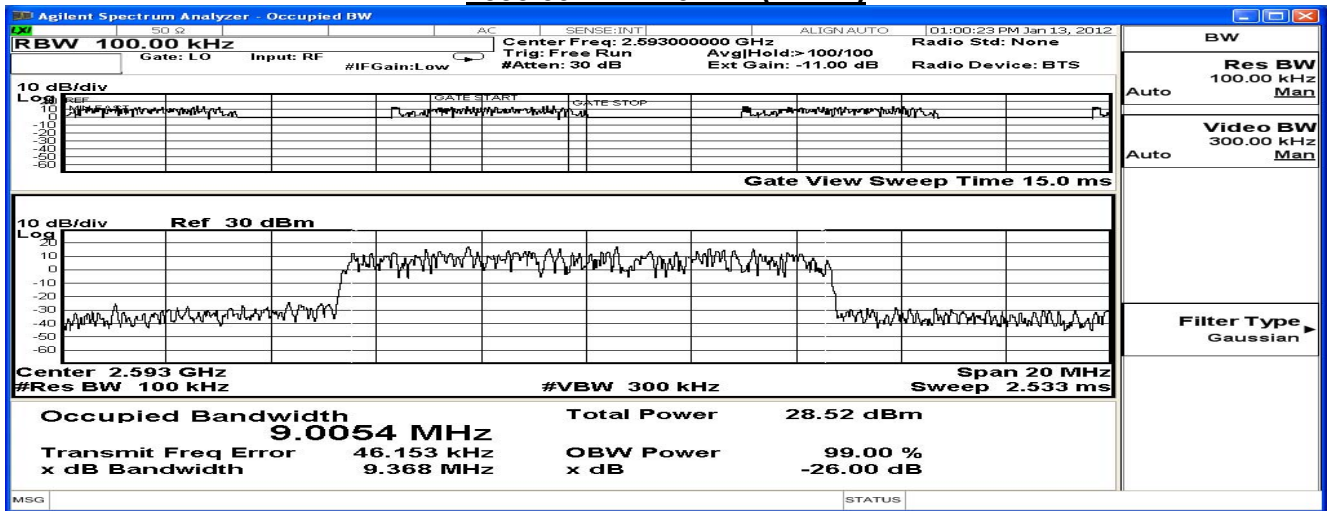
## 2685.00 MHz -10MHz-(ANT 1)



## 2501.00 MHz -10MHz-(ANT 1)



## 2593.00 MHz -10MHz-(ANT 1)



## 2685.00 MHz -10MHz-(ANT 0)

