Test Report

Product Name ： CPE 2.5GHz Outdoor
Model No. ： CPEMax-OD250
FCC ID. ： W93-CPEMAXOD250

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

Date of Receipt ： 2011/12/14
Issued Date ： 2013/01/31
Report No. ： 11C280R-RFUSP35V01
Report Version ： V1.0

Testing Laboratory
1313

Test Report Certification

Issued Date : 2013/01/31
Report No. : 11C280R-RFUSP35V01

Product Name	:	CPE 2.5GHz Outdoor
Applicant	:	FRC INTERNET PRODUCTS, LLC
Address	:	4421 SW 85th Way, Gainesville, Florida 32608, USA
Model No.	:	CPEMax-OD250
FCC ID.	:	W93-CPEMAXOD250
EUT Voltage	:	AC 120V / 60Hz
Trade Name	:	FRC
Applicable Standard	:	FCC CFR Title 47 Part 2 and Part 27: 2010
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:

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

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

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

TABLE OF CONTENTS

1. General Information

1.1. EUT Description

Product Name	CPE 2.5GHz Outdoor
Trade Name	FRC
Model No.	CPEMax-OD250
Frequency Range	UL and DL: 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	5MHz, 7MHz, 10MHz
Antenna Gain	16dBi
Channel Control	Auto
Antenna Type	Panel Antenna- 1Tx/2Rx

Note:

1. This device is a CPE 2.5GHz Outdoor 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 11C280R-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 MISO function that is providing one complete transmit 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 and showed as below table:

5MHz Bandwidth:

Frequency (MHz)	Transmitter Output Power (dBm)							
	Modulation type and coding rate							
	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	22.06	22.08	22.15	21.83	21.69	21.94	21.84	22.21
2593	22.48	22.39	22.29	21.97	21.95	22.3	22.04	22.46
2687.5	22.4	22.43	22.06	21.96	22.03	22.42	22.06	22.53

7MHz Bandwidth:

Frequency (MHz)	Transmitter Output Power (dBm)							
	Modulation type and coding rate							
	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	21.74	21.8	21.54	21.54	21.28	21.68	21.04	21.82
2593	21.98	21.98	21.88	21.77	21.48	21.95	21.23	22.01
2686.5	22.07	22.07	21.96	21.8	21.56	21.94	21.37	22.05

10MHz Bandwidth:

Frequency (MHz)	Transmitter Output Power (dBm)							
	Modulation type and coding rate							
	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	21.01	21.76	21.87	21.73	21.39	21.94	21.4	21.62
2593	21.58	21.64	22.02	21.74	21.78	22.14	21.59	21.86
2685	21.71	21.75	22.21	22.09	21.85	22.26	21.66	21.94

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 (5MHz BW_64QAM-5/6) Mode 2: Transmit (7MHz BW_QPSK-3/4) Mode 3: Transmit (10MHz BW_64QAM-2/3)

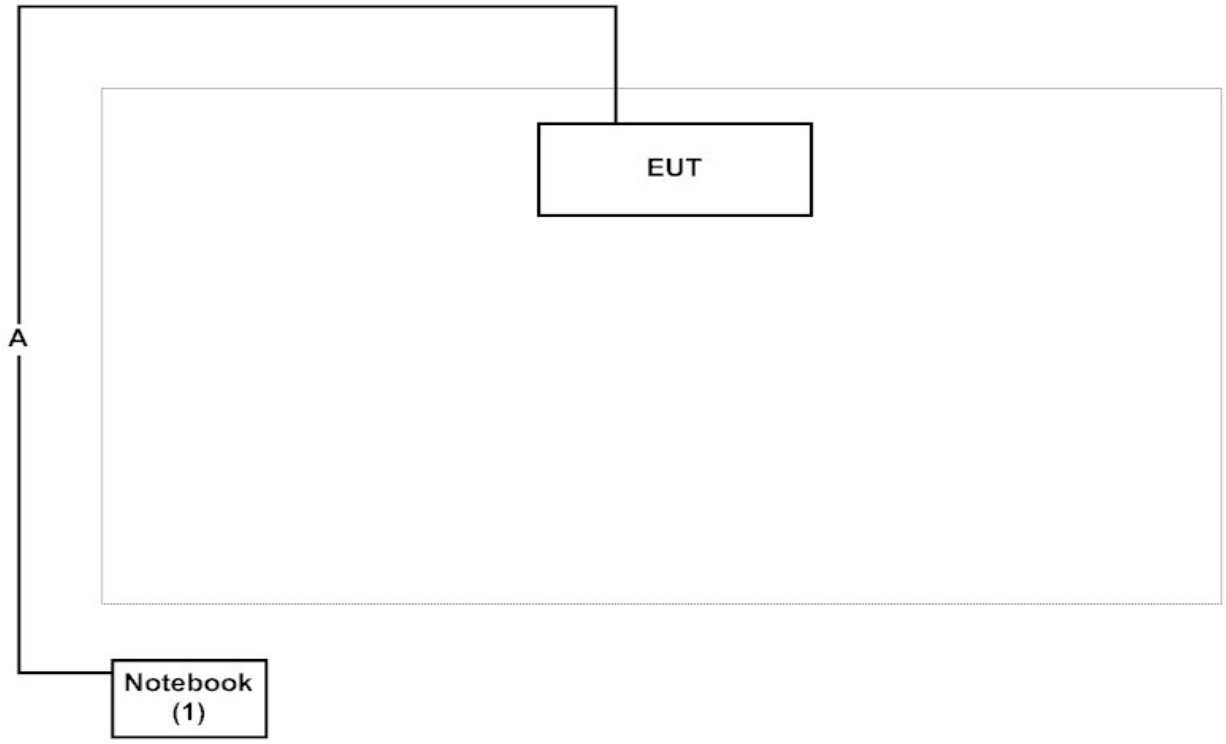
1.4. Tested System Details

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

Connection Diagram



Signal Cable Type		Signal cable Description
A	LAN Cable	Non-Shielded, 3m

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)	Transmitter Output Power	< 2 Watts	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. Transmitter Output Power

2.1. Test Equipment

The following test equipments are used during the test:

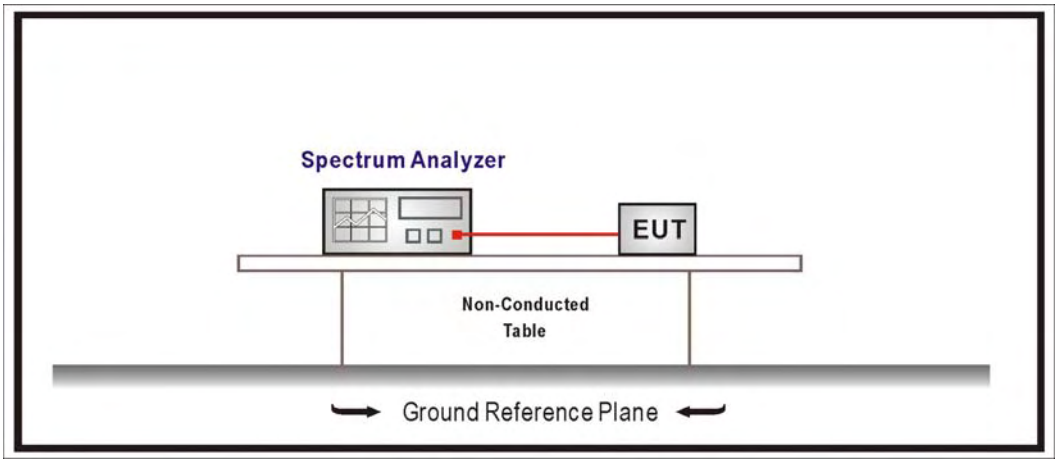
Peak EIRP Power Density / SR7

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

For Mobile stations transmitting are limited to 2.0 watts EIRP and **all user stations are limited to 2.0 watts(33dBm) transmitter output power.**

2.4. Test Procedure

Conducted transmitter power measurement:
The conducted transmitter output power is measured using Spectrum Analyzer. The EUT was set up for the rated power. All measurements were done at 3 channels: low, middle and high within operational frequency range.
Peak transmit 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.

2.5. Uncertainty

The conducted measurement uncertainty is defined as ±1.27 dB .

2.6. Test Result

Product	CPE 2.5GHz Outdoor		
Test Item	Transmitter Output Power		
Test Mode	Transmit		
Date of Test	2011/12/23	Test Site	SR7

5MHz Bandwidth:

Frequency (MHz)	Transmitter Output Power (dBm)							
	Modulation type and coding rate							
	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	22.06	22.08	22.15	21.83	21.69	21.94	21.84	22.21
2593	22.48	22.39	22.29	21.97	21.95	22.3	22.04	22.46
2687.5	22.4	22.43	22.06	21.96	22.03	22.42	22.06	22.53

7MHz Bandwidth:

Frequency (MHz)	Transmitter Output Power (dBm)							
	Modulation type and coding rate							
	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	21.74	21.8	21.54	21.54	21.28	21.68	21.04	21.82
2593	21.98	21.98	21.88	21.77	21.48	21.95	21.23	22.01
2686.5	22.07	22.07	21.96	21.8	21.56	21.94	21.37	22.05

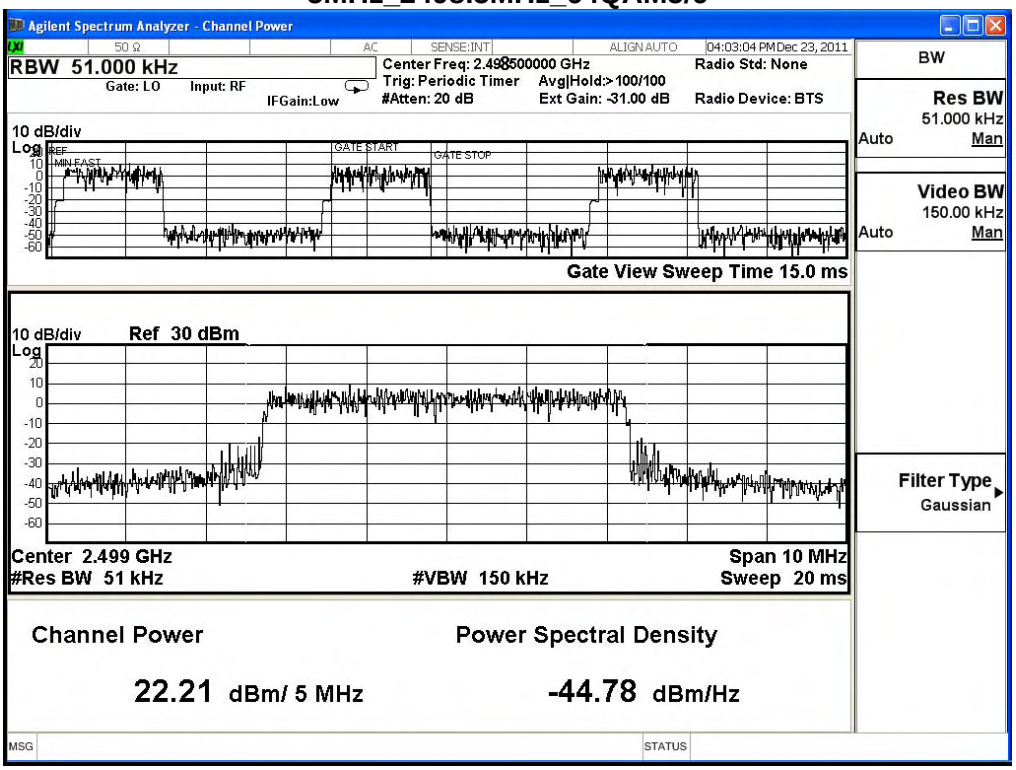
10MHz Bandwidth:

Frequency (MHz)	Transmitter Output Power (dBm)							
	Modulation type and coding rate							
	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	21.01	21.76	21.87	21.73	21.39	21.94	21.4	21.62
2593	21.58	21.64	22.02	21.74	21.78	22.14	21.59	21.86
2685	21.71	21.75	22.21	22.09	21.85	22.26	21.66	21.94

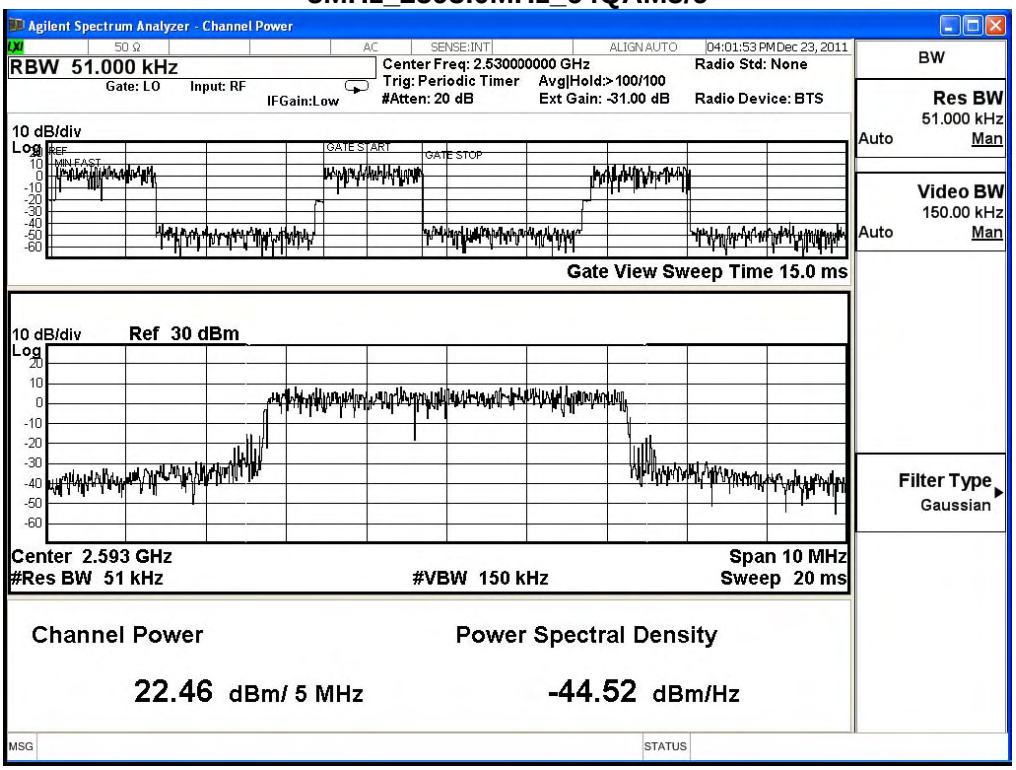
Product	CPE 2.5GHz Outdoor		
Test Item	Transmitter Output Power		
Test Mode	Mode 1: Transmit (5MHz BW_64QAM-5/6)		
Date of Test	2011/12/23	Test Site	SR7

Frequency (MHz)	Modulation	Emission Level (dBm)	Limit (dBm)
2498.5	64QAM5/6	22.21	33
2593.0	64QAM5/6	22.46	33
2687.5.5	64QAM5/6	22.53	33

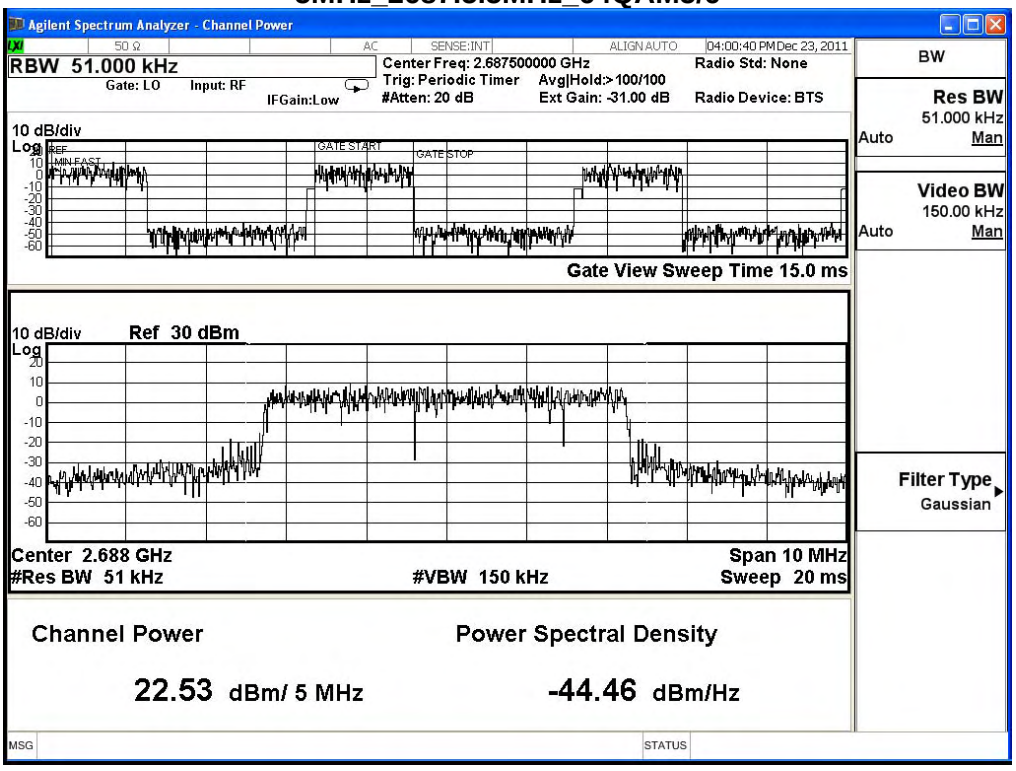
5MHz_2498.5MHz_64QAM5/6



5MHz_2593.0MHz_64QAM5/6



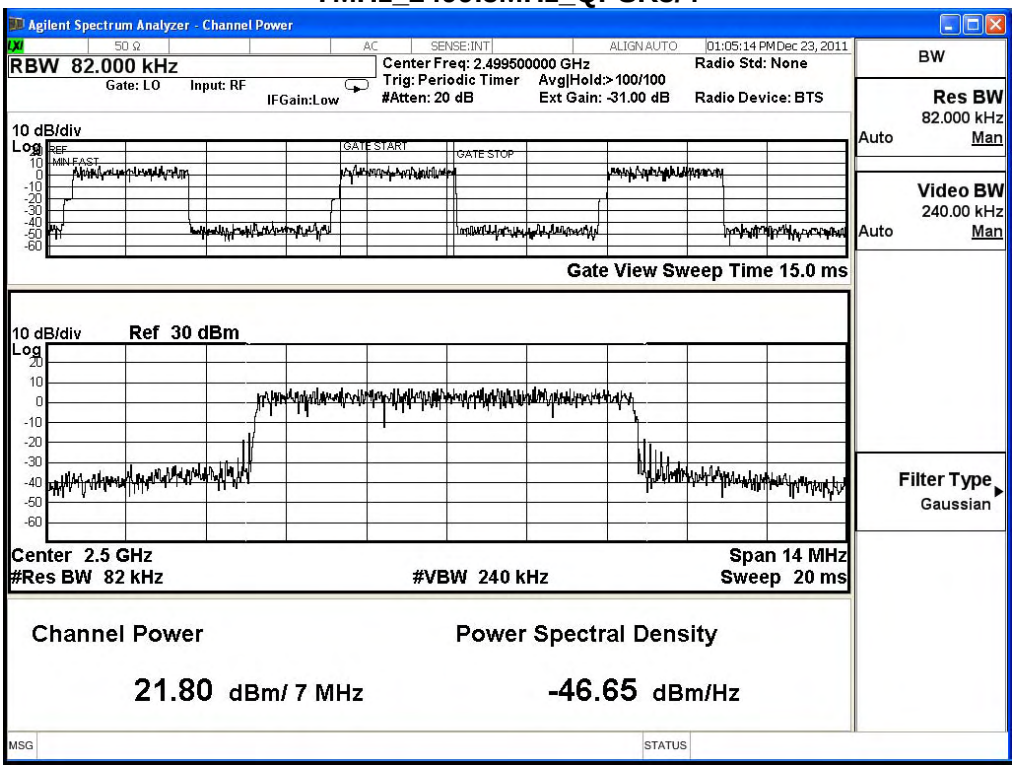
5MHz_2687.5.5MHz_64QAM5/6



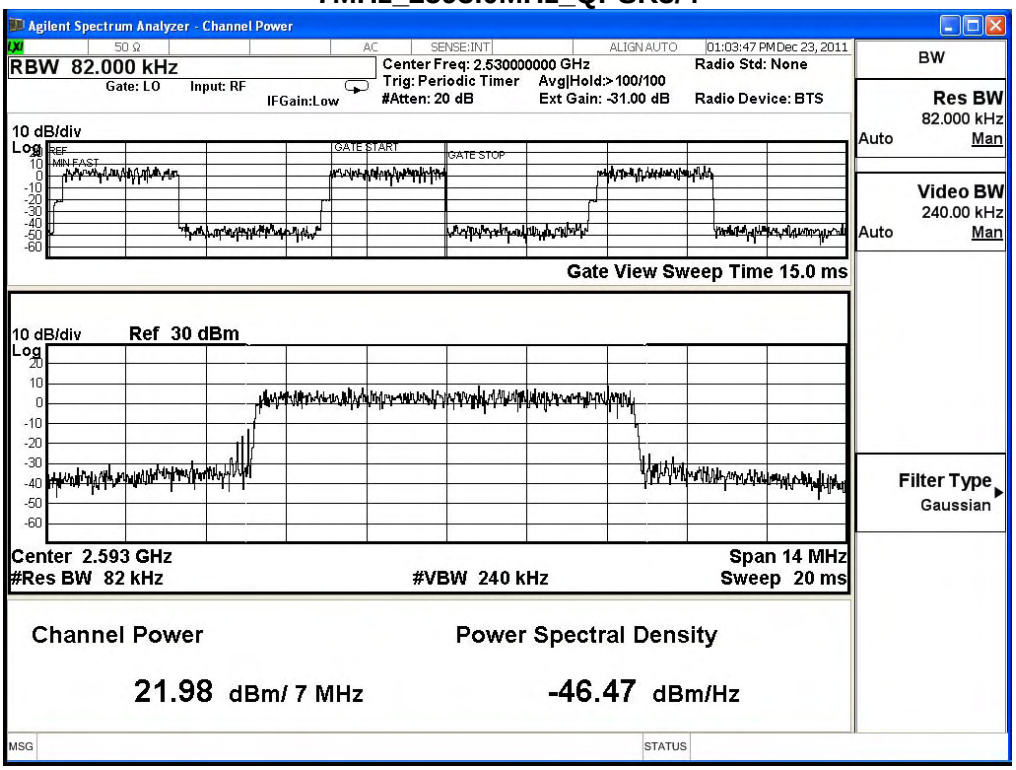
Product	CPE 2.5GHz Outdoor		
Test Item	Transmitter Output Power		
Test Mode	Mode 2: Transmit (7MHz BW_QPSK-3/4)		
Date of Test	2011/12/23	Test Site	SR7

Frequency (MHz)	Modulation	Measured Level (dBm)	Limit (dBm)
2499.5	QPSK3/4	21.80	33
2593.0	QPSK3/4	21.98	33
2686.5	QPSK3/4	22.07	33

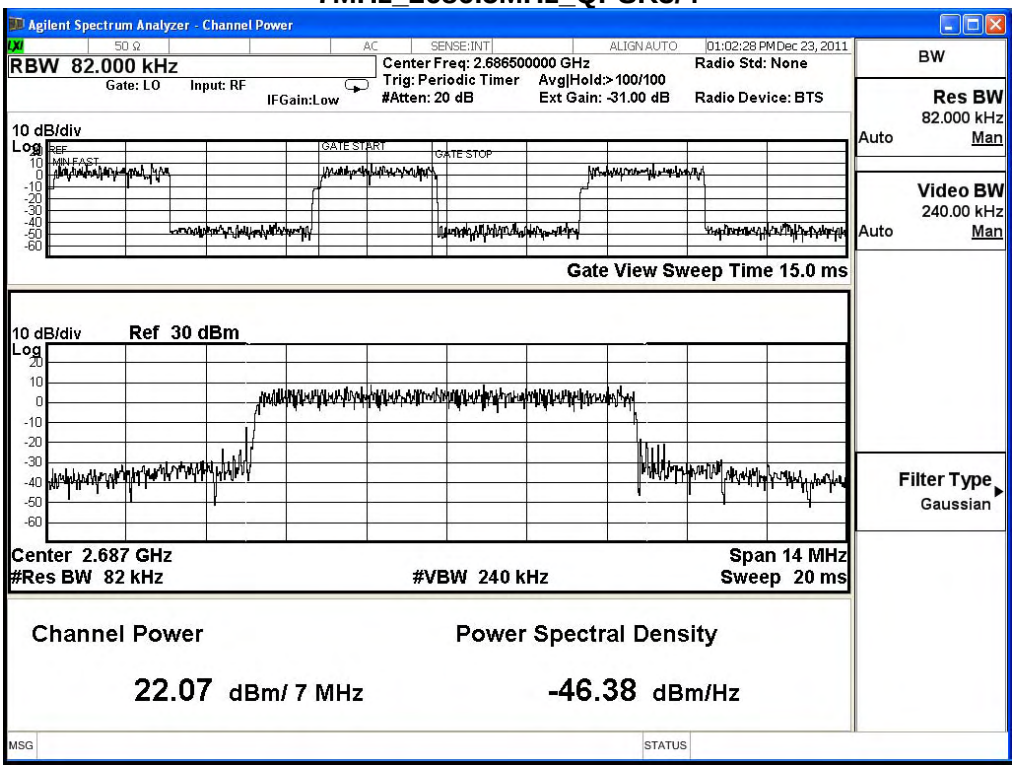
7MHz_2499.5MHz_QPSK3/4



7MHz_2593.0MHz_QPSK3/4



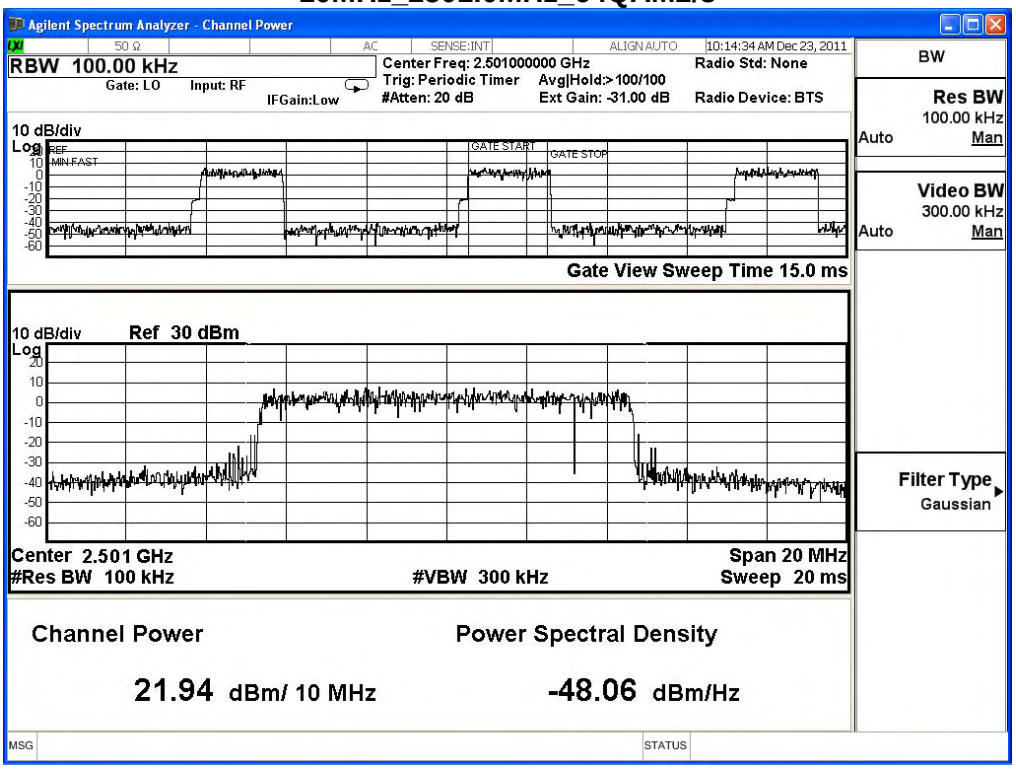
7MHz_2686.5MHz_QPSK3/4



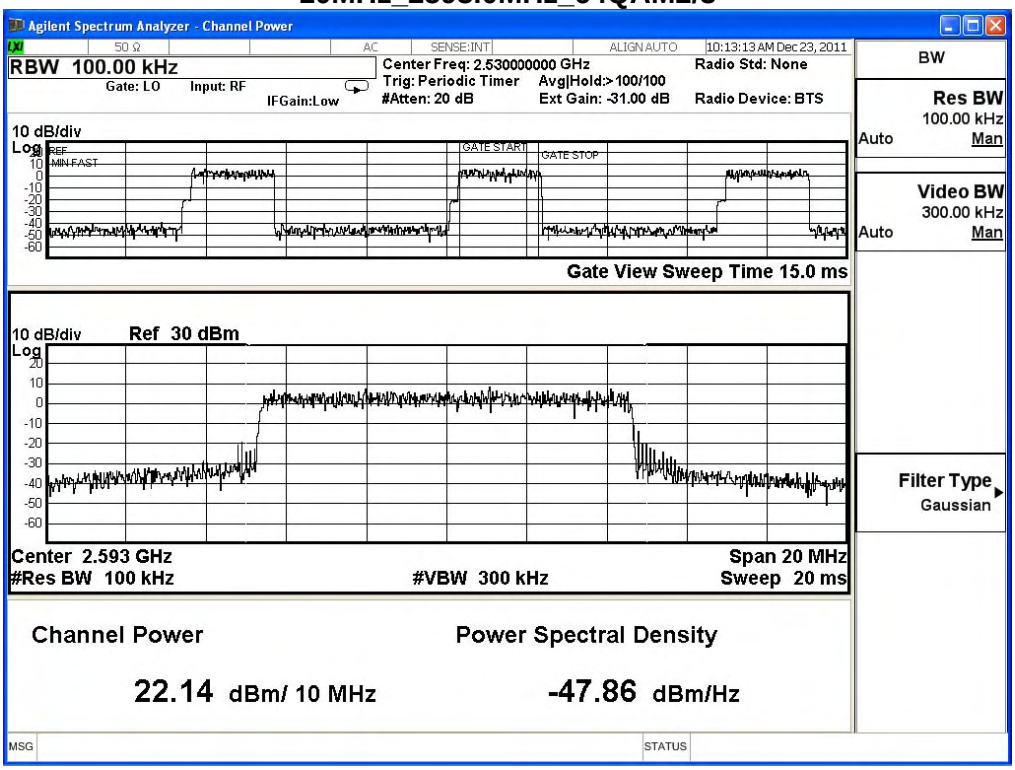
Product	CPE 2.5GHz Outdoor		
Test Item	Transmitter Output Power		
Test Mode	Mode 3: Transmit (10MHz BW_64QAM-2/3)		
Date of Test	2011/12/23	Test Site	SR7

Frequency (MHz)	Modulation	Emission Level (dBm)	Limit (dBm)
2501.0	64QAM2/3	21.94	33
2593.0	64QAM2/3	22.14	33
2685.0	64QAM2/3	22.26	33

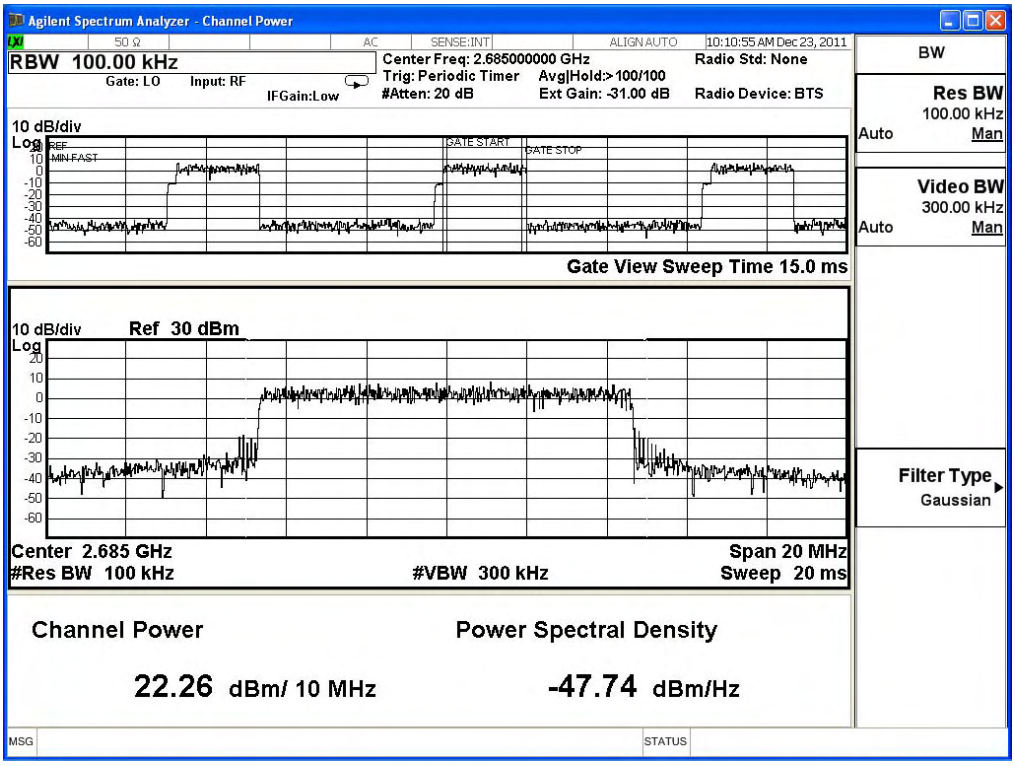
10MHz_2501.0MHz_64QAM2/3



10MHz_2593.0MHz_64QAM2/3



10MHz_2685.0MHz_64QAM2/3



3. Occupied Bandwidth

3.1. Test Equipment

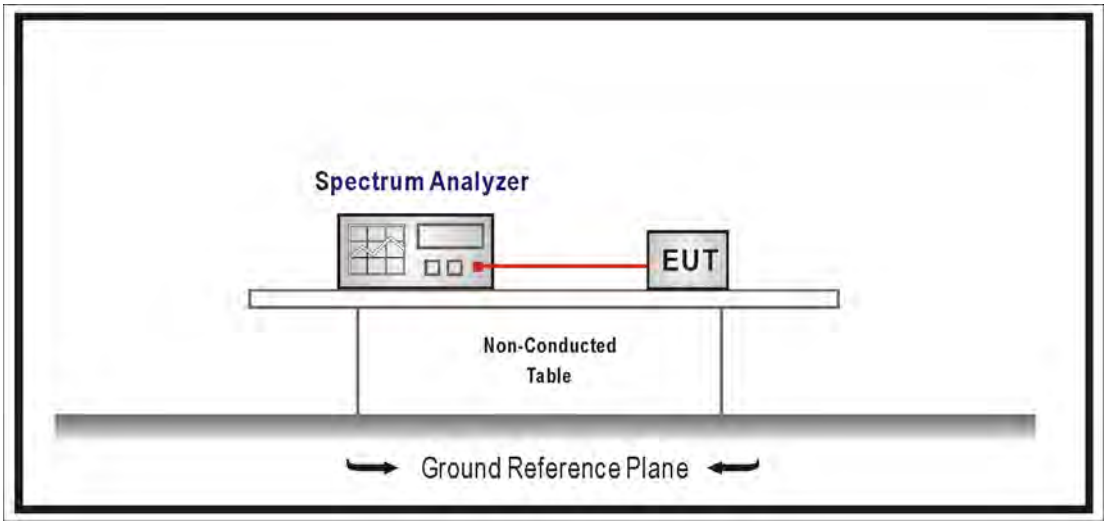
The following test equipments are used during the test:

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

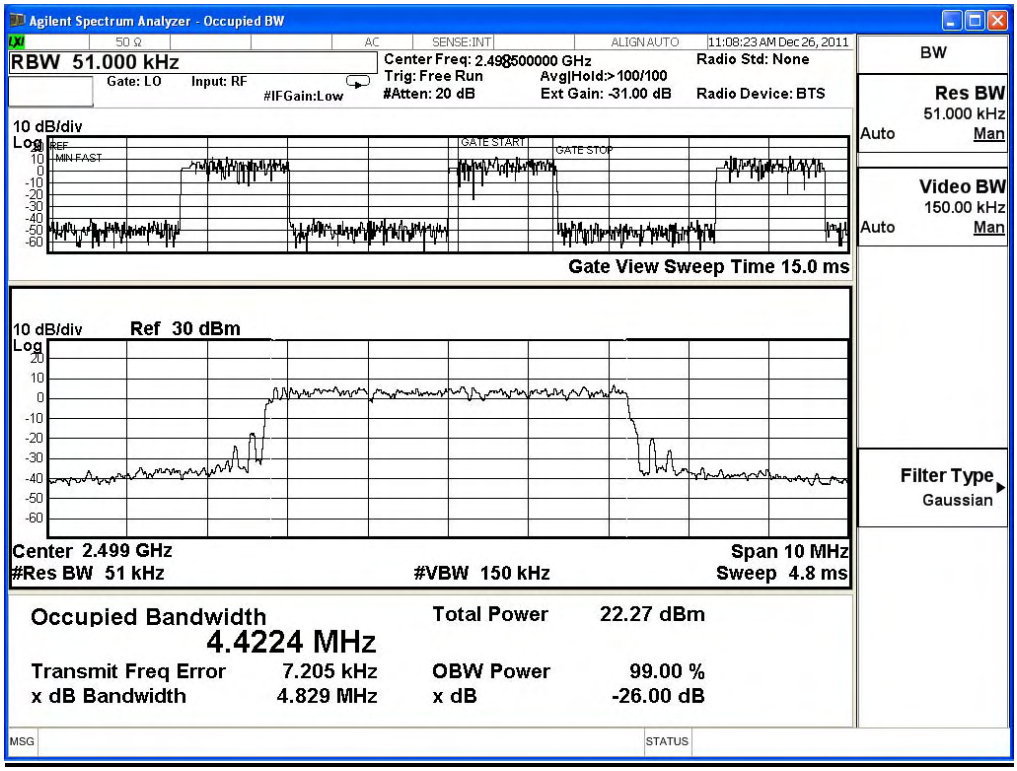
The measurement uncertainty is defined as ±50 kHz

3.6. Test Result

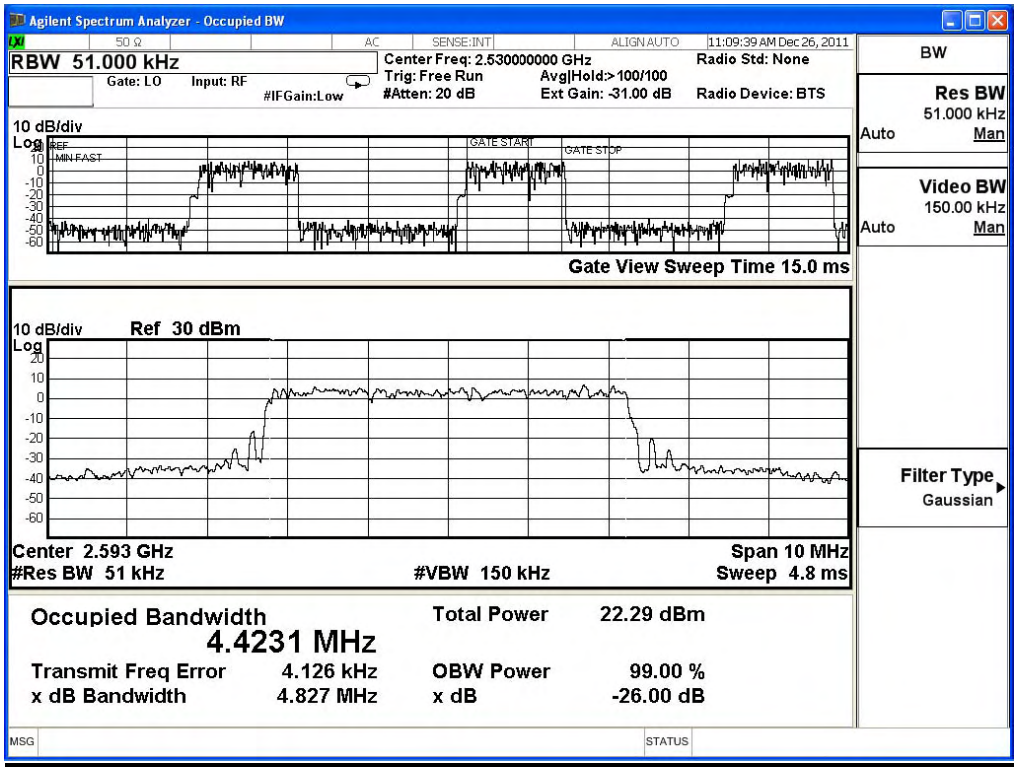
Product	CPE 2.5GHz Outdoor		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit (5MHz BW_64QAM-5/6)		
Date of Test	2011/12/29	Test Site	SR7

Frequency (MHz)	Measured Level (MHz)		Limit (kHz)
	-26dB BW	99% BW	
2498.50	4.829	4.422	N/A
2593.00	4.827	4.423	N/A
2687.50	5.023	4.402	N/A

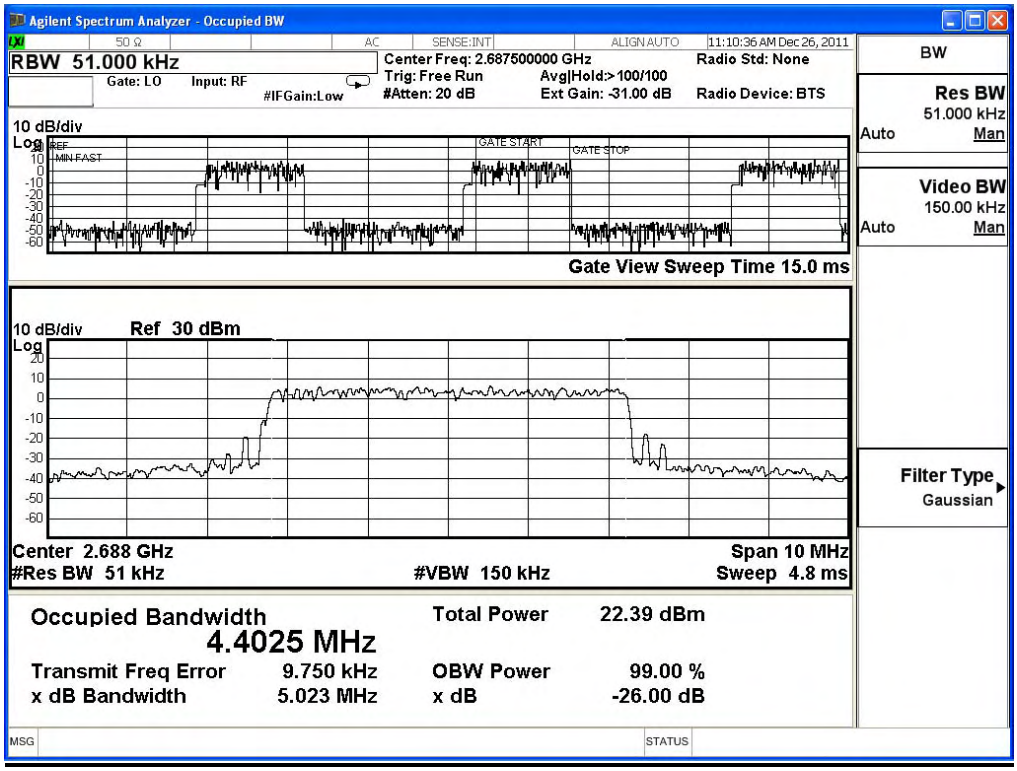
2498.5MHz



2593.0MHz



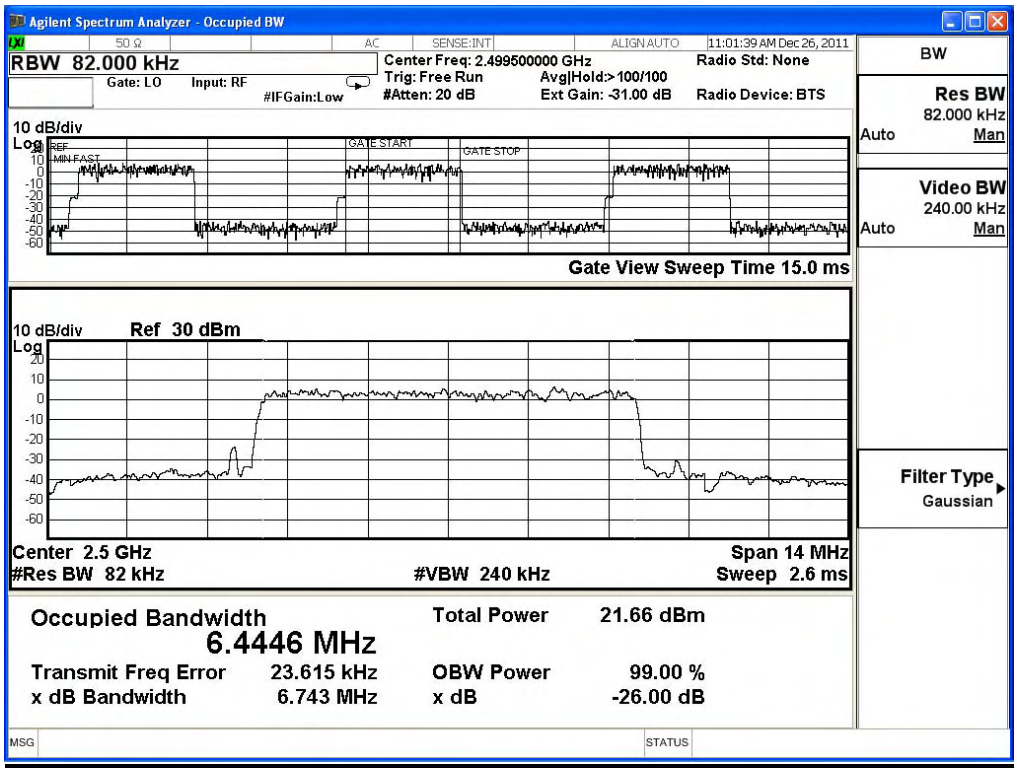
2687.5MHz



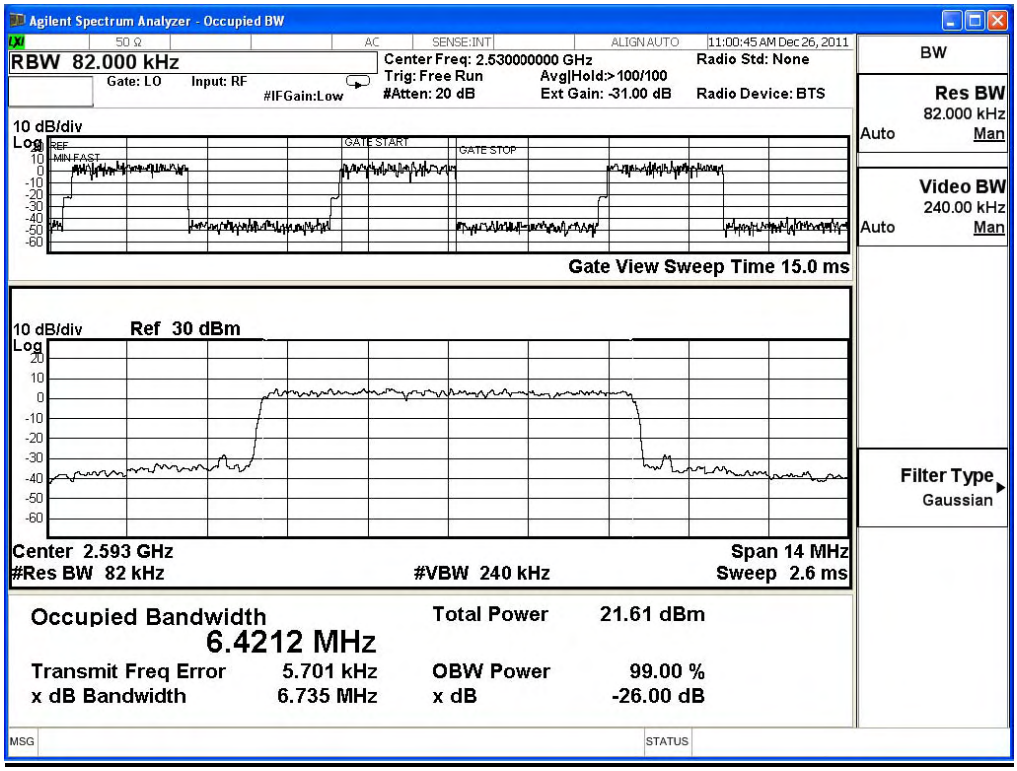
Product	CPE 2.5GHz Outdoor		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: Transmit (7MHz BW_QPSK-3/4)		
Date of Test	2011/12/29	Test Site	SR7

Frequency (MHz)	Measured Level (MHz)		Limit (kHz)
	-26dB BW	99% BW	
2499.50	6.743	6.444	N/A
2593.00	6.735	6.421	N/A
2686.50	6.805	6.476	N/A

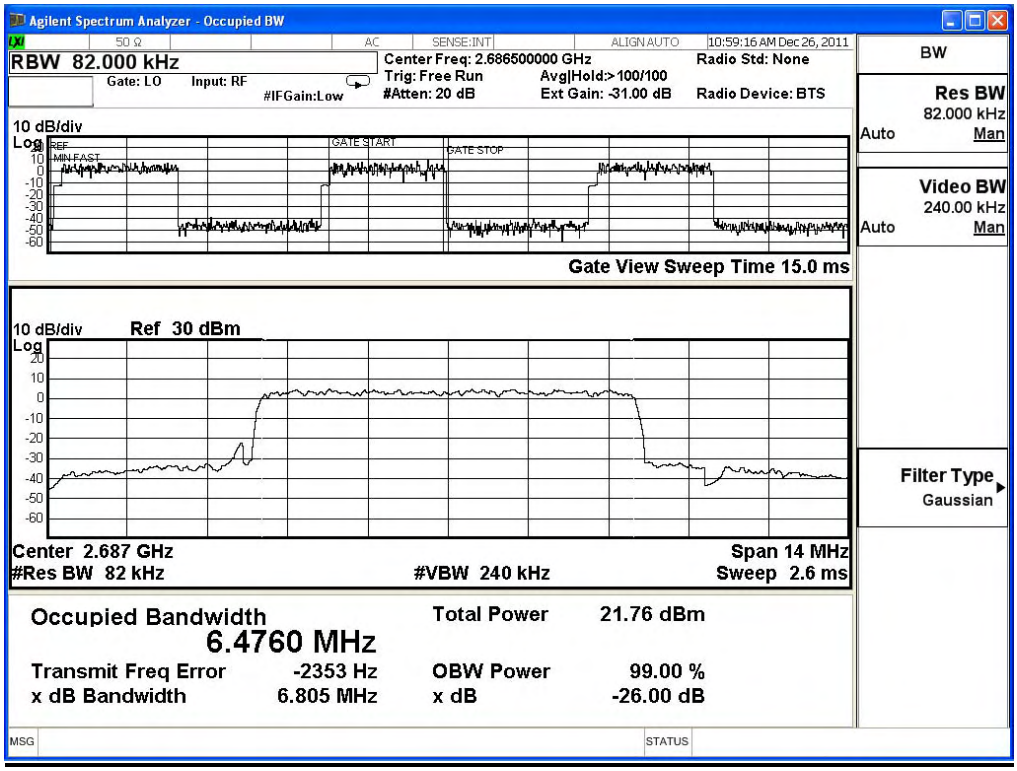
2499.5MHz



2593.0MHz



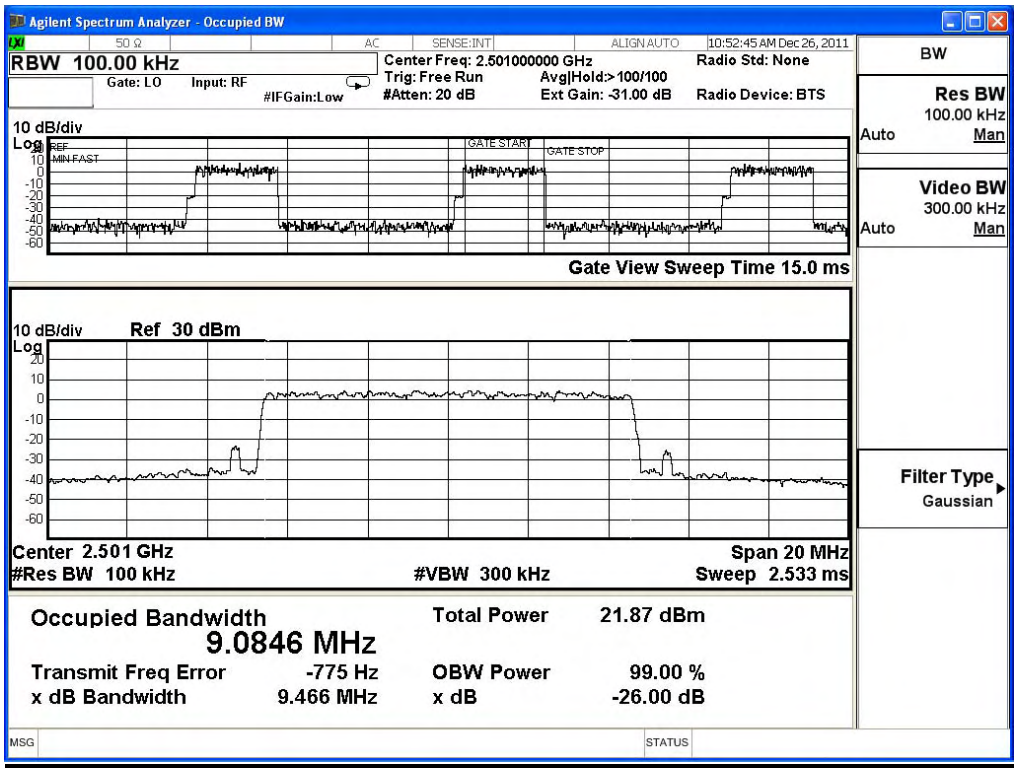
2686.5MHz



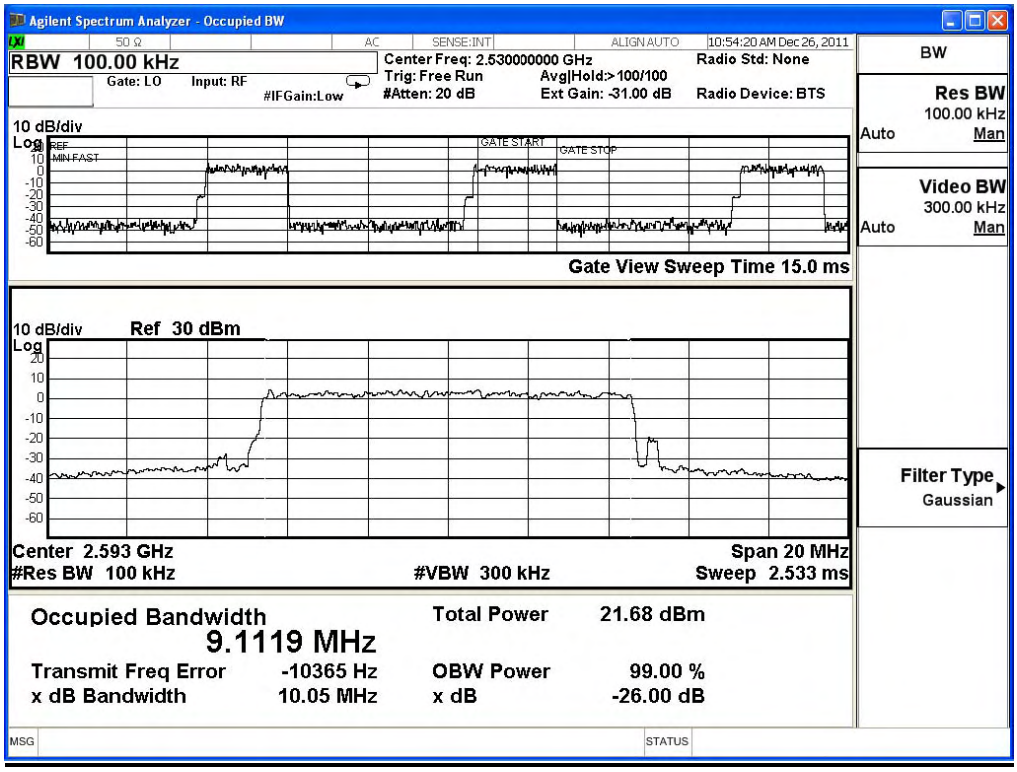
Product	CPE 2.5GHz Outdoor		
Test Item	Occupied Bandwidth		
Test Mode	Mode 3: Transmit (10MHz BW_64QAM-2/3)		
Date of Test	2011/12/29	Test Site	SR7

Frequency (MHz)	Measured Level (MHz)		Limit (kHz)
	-26dB BW	99% BW	
2501.00	9.466	9.084	N/A
2593.00	10.05	9.111	N/A
2685.00	10.04	9.084	N/A

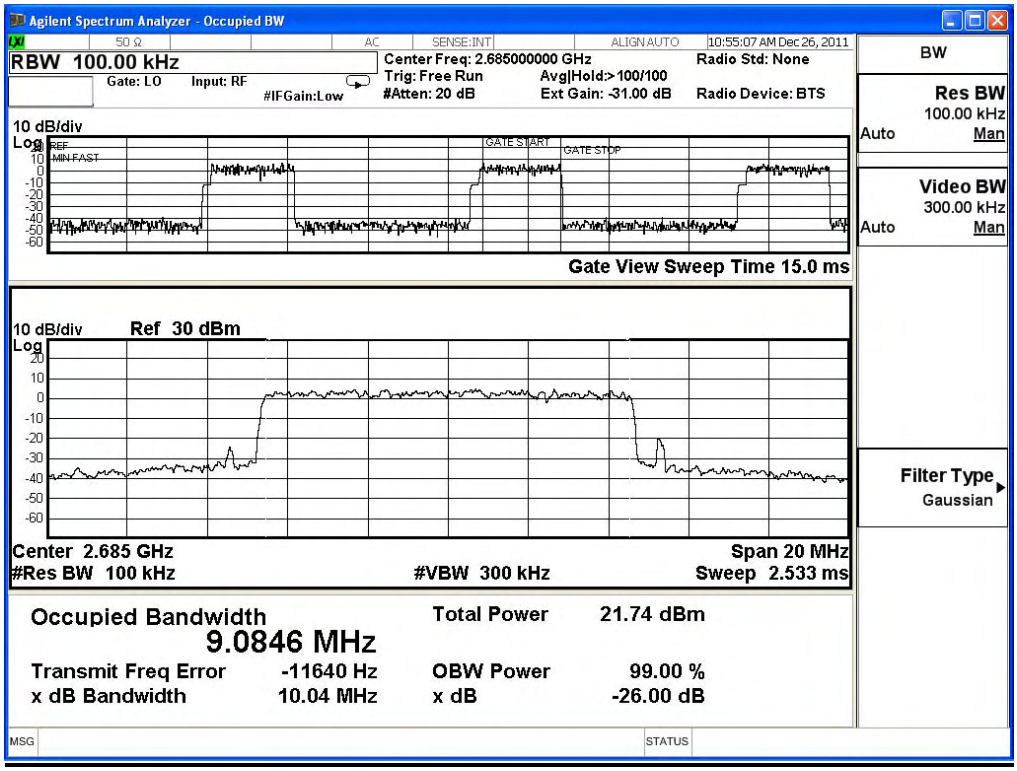
2501MHz



2593MHz



2685MHz



4. Channel Edge

4.1. Test Equipment

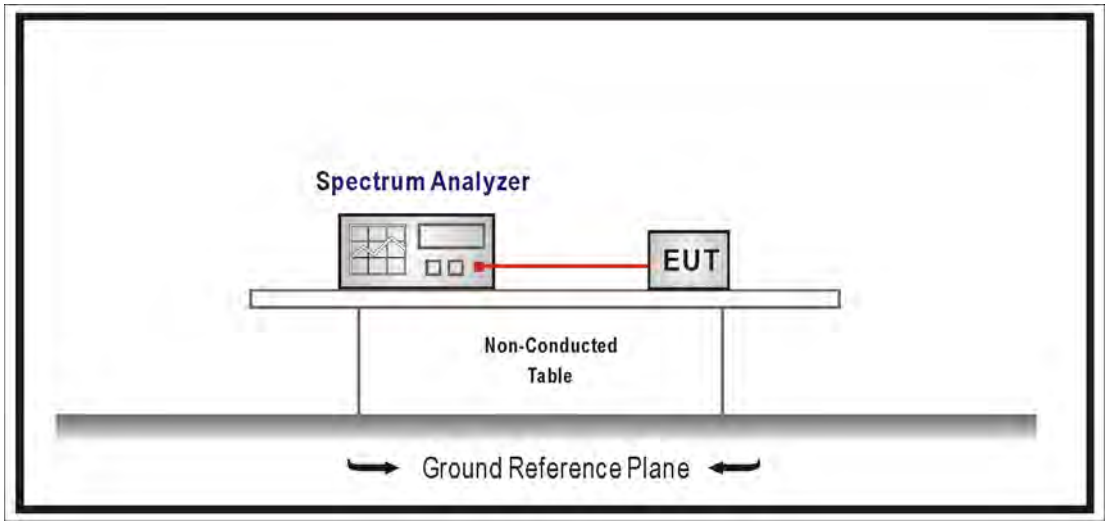
The following test equipments are used during the test:

Channel Edge/ 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.

4.2. Test Setup



4.3. Limits

(1) Fixed and Temporary Fixed Digital Stations: not less than 43 + log (P) dB

(2) Mobile Digital Stations: not less than 43 + log (P) dB at the channel edge and 55 + log (P) dB at 5.5 MHz from the channel edges

Calculation:

Assume the EUT Output Power is 2 W = 33 dBm

43 + log (P) dB

43 + log (2) = 46 dB

33 dBm – 46 dB = -13 dBm

55 + log (2) = 58 dB

33 dBm – 58 dB = -25 dBm

4.4. Test Procedure

Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed

All measurements were done at 3 channels: low, middle and high operational frequency.
Record the max trace plot into the test report.

4.5. Uncertainty

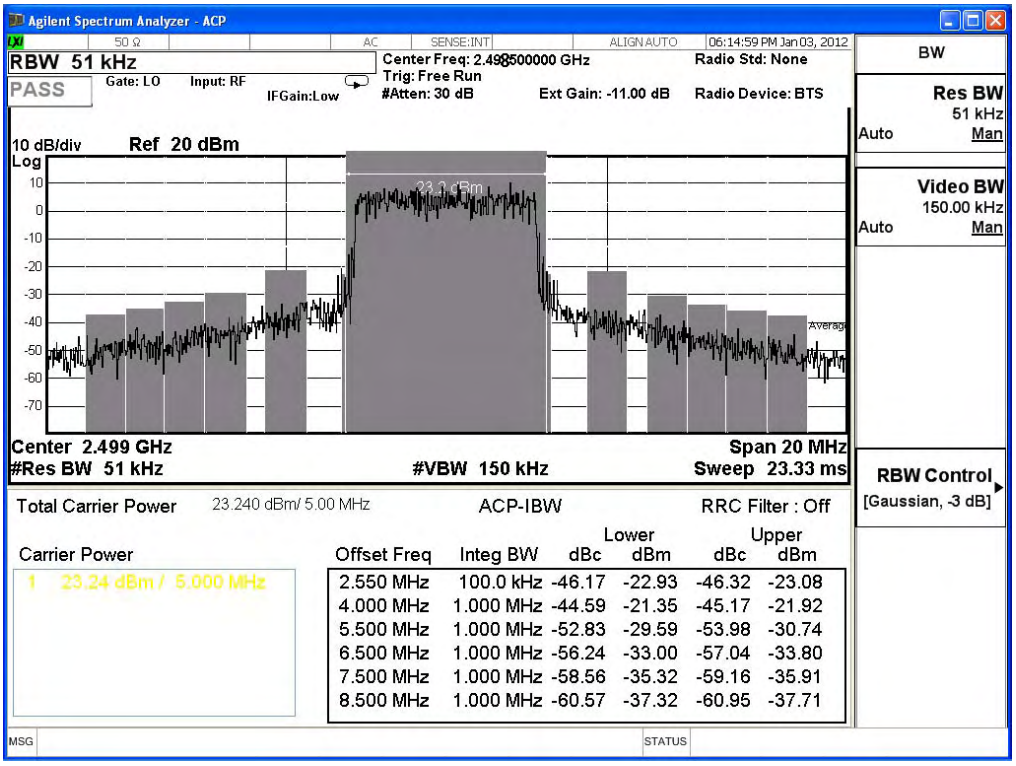
The measurement uncertainty: Conducted is defined as ±1.27dB

4.6. Test Result

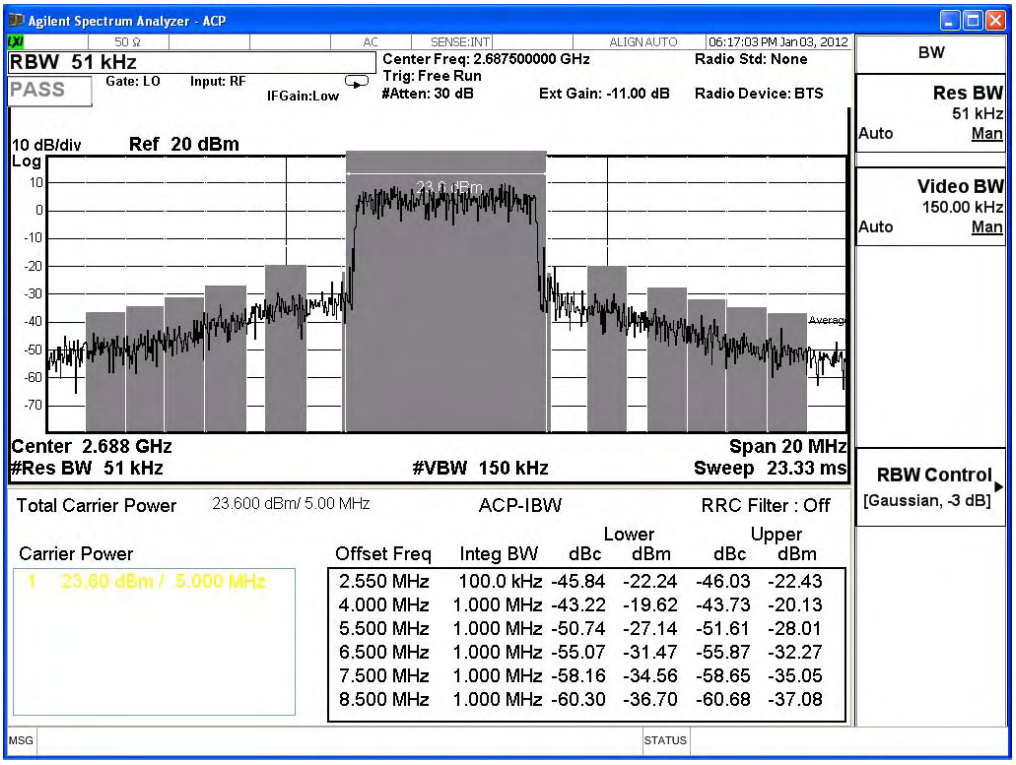
Product	CPE 2.5GHz Outdoor		
Test Item	Channel Edge		
Test Mode	Mode 1: Transmit (5MHz BW_64QAM-5/6)		
Date of Test	2011/12/28	Test Site	SR7

5MHz 64QAM5/6		
Frequency (MHz)	**Measured Level – Worst (dBm)**	**Limit (dBm)**
2498.5	-21.35	-13
2593.0	-19.62	-13
2687.5	-20.16	-13

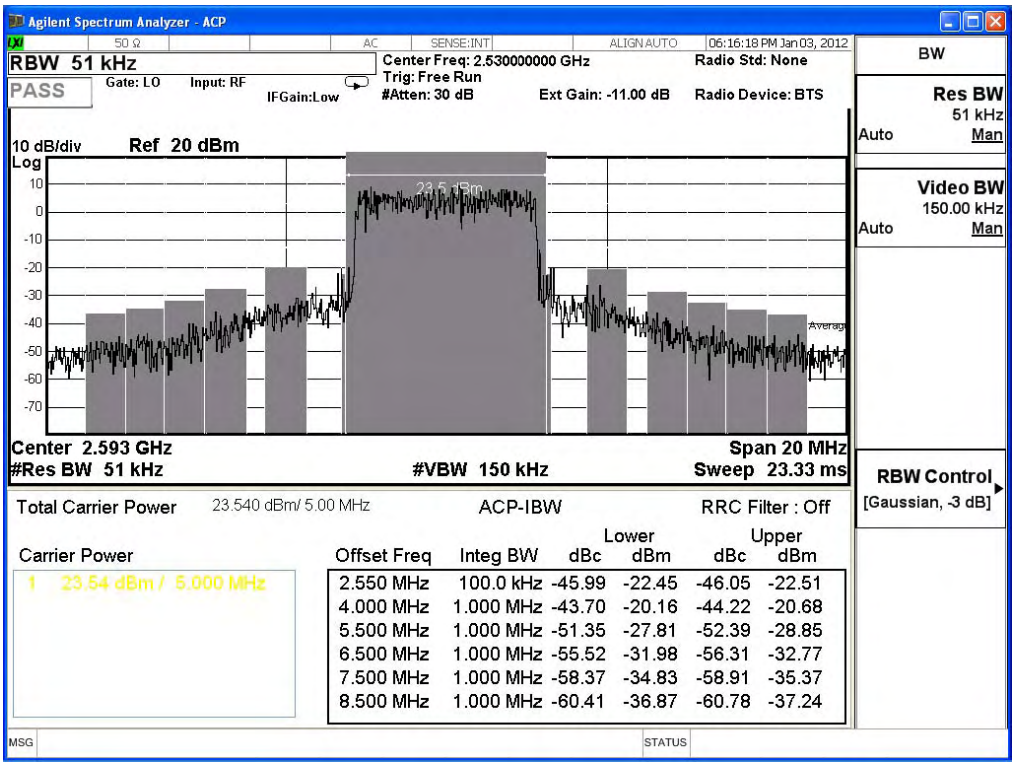
5MHz_2498.5MHz_64QAM5/6



5MHz_2593.0MHz_64QAM5/6



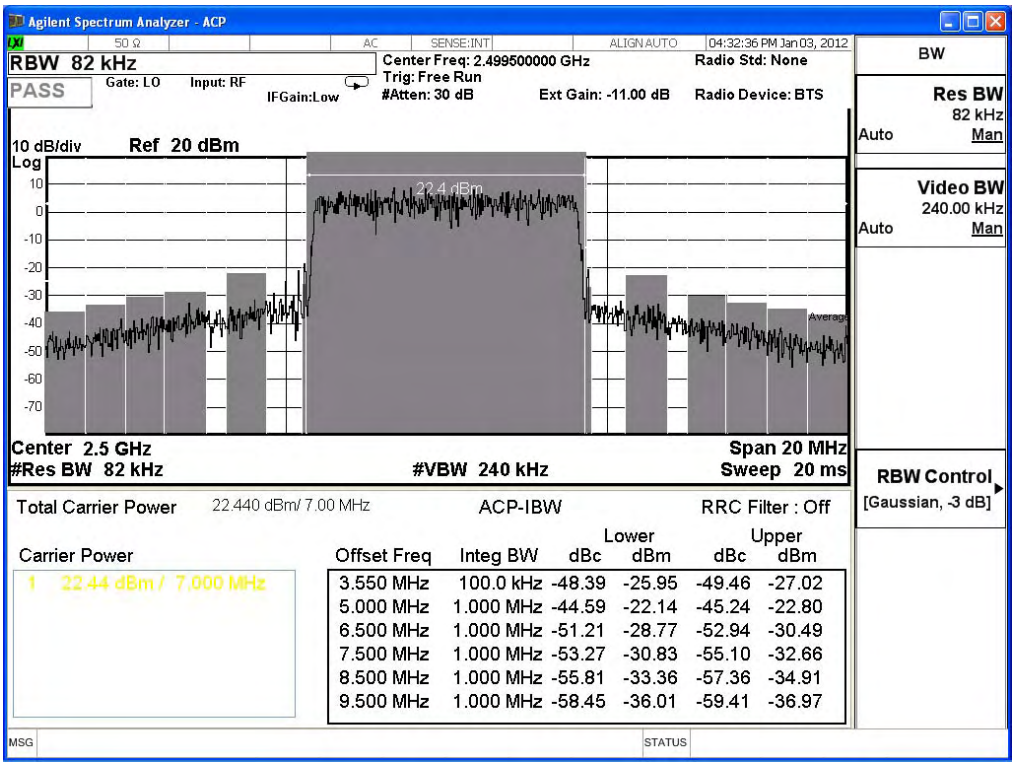
5MHz_2687.5.5MHz_64QAM5/6



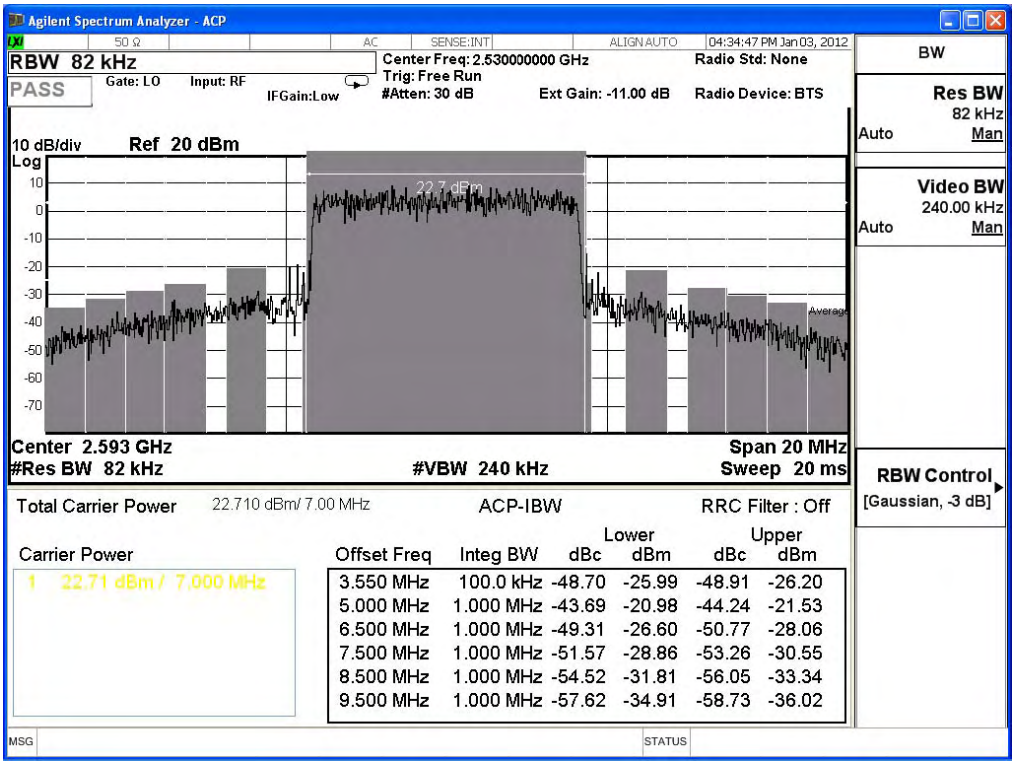
Product	CPE 2.5GHz Outdoor		
Test Item	Channel Edge		
Test Mode	Mode 2: Transmit (7MHz BW_QPSK-3/4)		
Date of Test	2011/12/28	Test Site	SR7

7MHz BW_ QPSK3/4		
Frequency (MHz)	**Measured Level – Worst (dBm)**	**Limit (dBm)**
2499.5	-22.14	-13
2593.0	-20.98	-13
2686.5	-20.64	-13

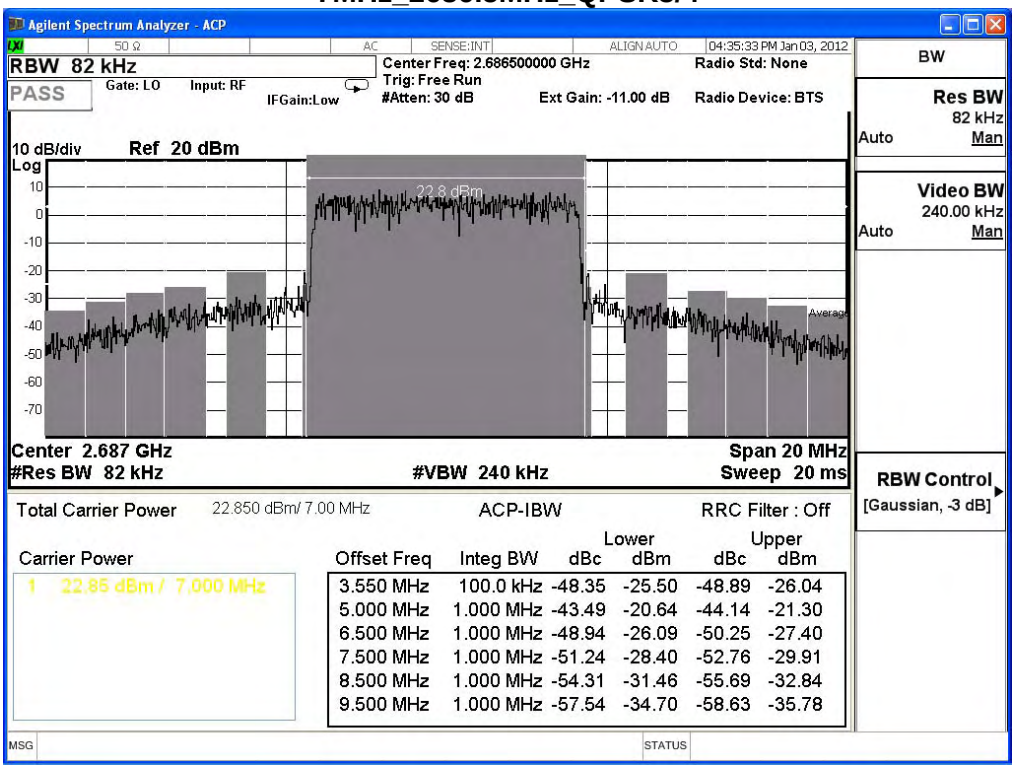
7MHz_2499.5MHz_QPSK3/4



7MHz_2593.0MHz_QPSK3/4



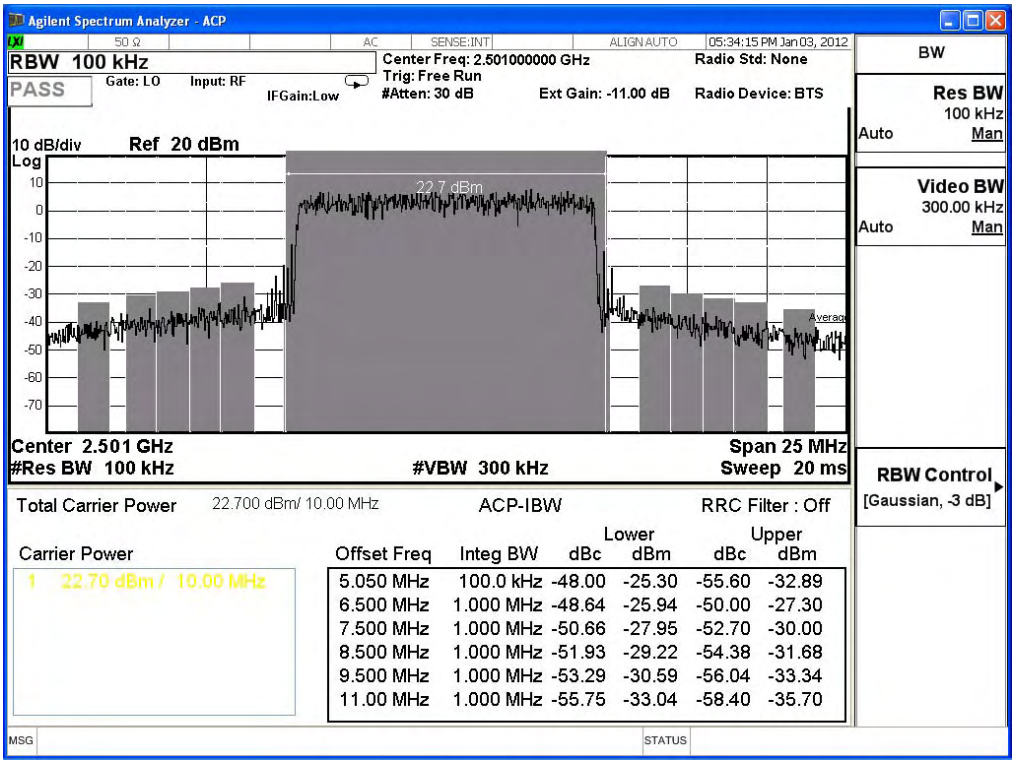
7MHz_2686.5MHz_QPSK3/4



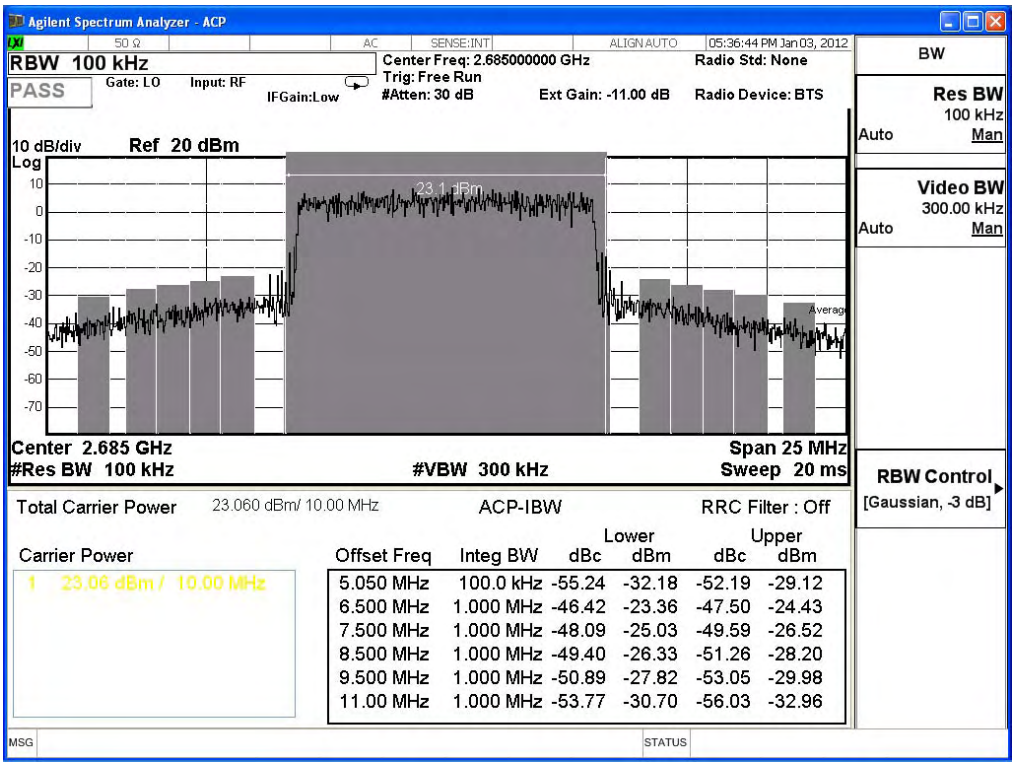
Product	CPE 2.5GHz Outdoor		
Test Item	Channel Edge		
Test Mode	Mode 3: Transmit (10MHz BW_64QAM-2/3)		
Date of Test	2011/12/28	Test Site	SR7

10MHz BW_64QAM2/3		
Frequency (MHz)	**Measured Level – Worst (dBm)**	**Limit (dBm)**
2501.0	-25.30	-13
2593.0	-23.36	-13
2685.0	-24.09	-13

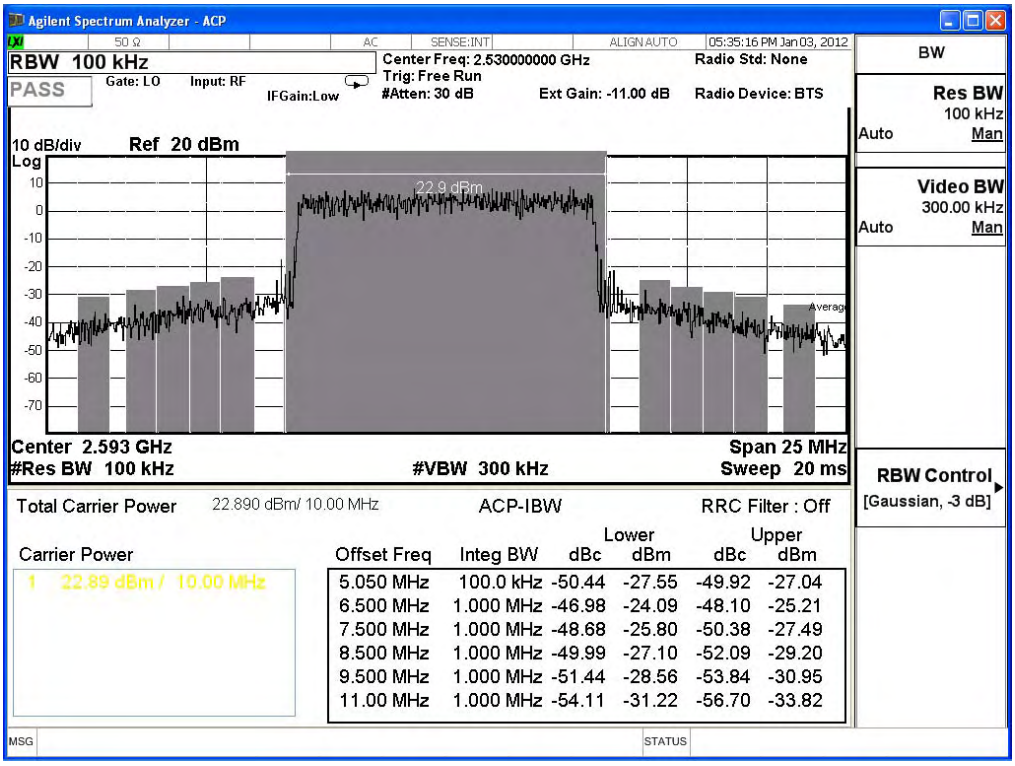
10MHz_2501.0MHz_64QAM2/3



10MHz_2685.0MHz_64QAM2/3



10MHz_2593.0MHz_64QAM2/3



5. Conducted Spurious Emission

5.1. Test Equipment

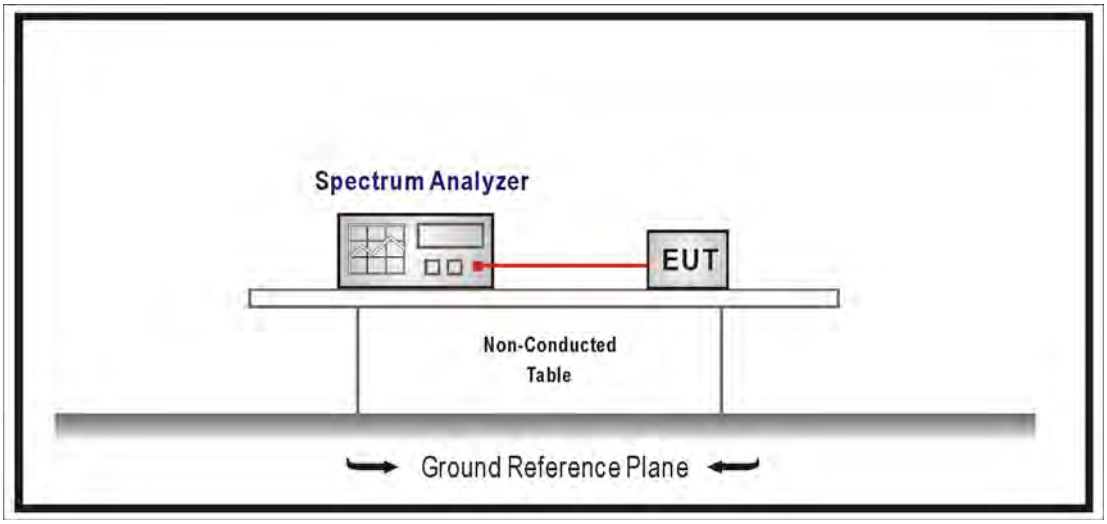
The following test equipments are used during the test:

Conducted Spurious Emission/ SR7

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

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

5.2. Test Setup



5.3. Limits

(1) Fixed and Temporary Fixed Digital Stations: not less than 43 + log (P) dB
(2) Mobile Digital Stations: not less than 43 + log (P) dB at the channel edge and 55 + log (P) dB at 5.5 MHz from the channel edges

Calculation:
Assume the EUT Output Power is 2 W = 33 dBm
43 + log (P) dB
43 + log (2) = 46 dB
33 dBm – 46 dB = -13 dBm

55 + log (2) = 58 dB
33 dBm – 58 dB = -25 dBm

5.4. Test Procedure

Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed

All measurements were done at 3 channels: low, middle and high operational frequency.
Record the max trace plot into the test report.

5.5. Uncertainty

The measurement uncertainty is defined as ±1.27 dB

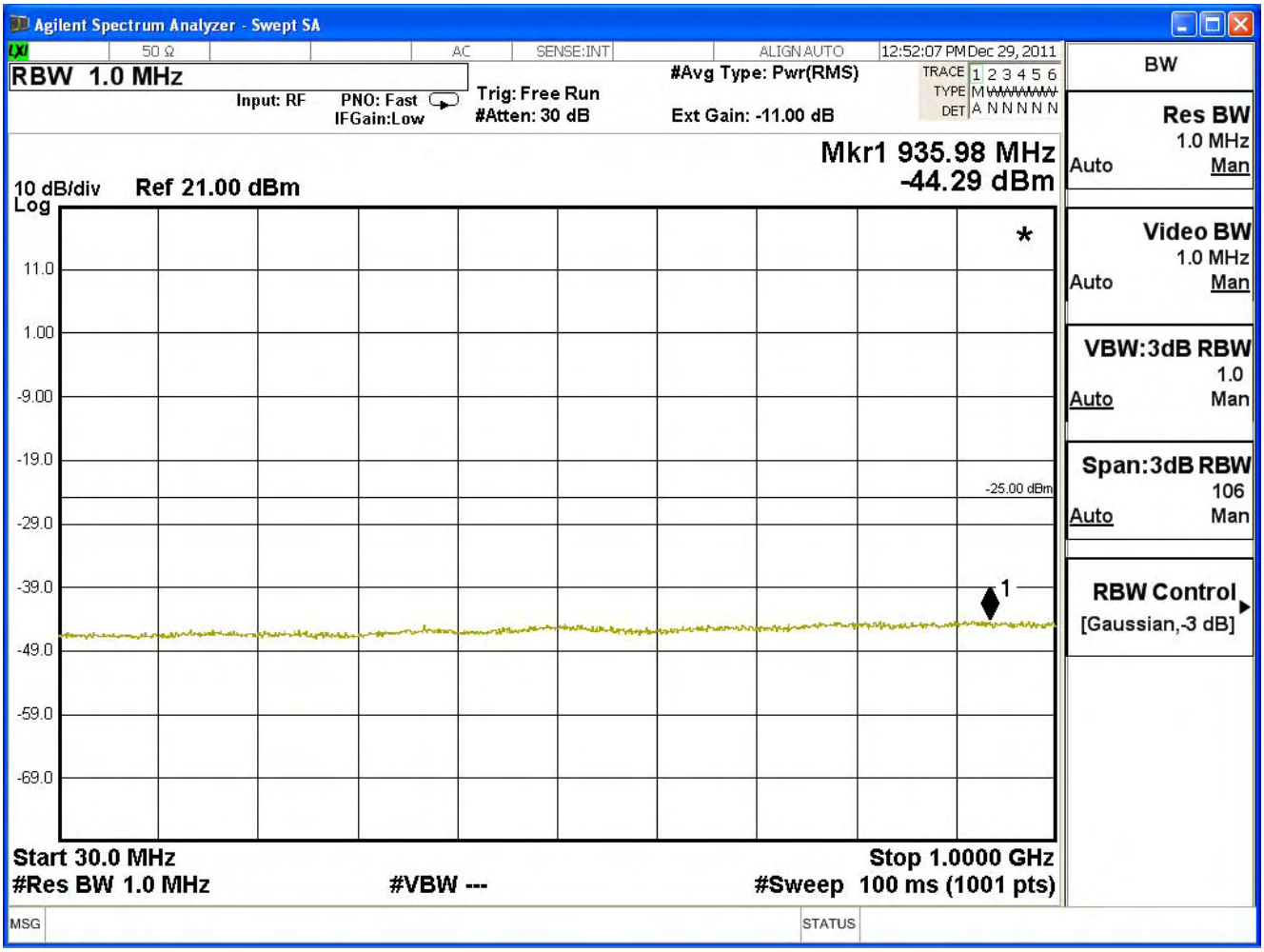
5.6. Test Result

Product	CPE 2.5GHz Outdoor		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1: Transmit (5MHz BW_64QAM-5/6)		
Date of Test	2011/12/29	Test Site	SR7

5MHz 64QAM-5/6

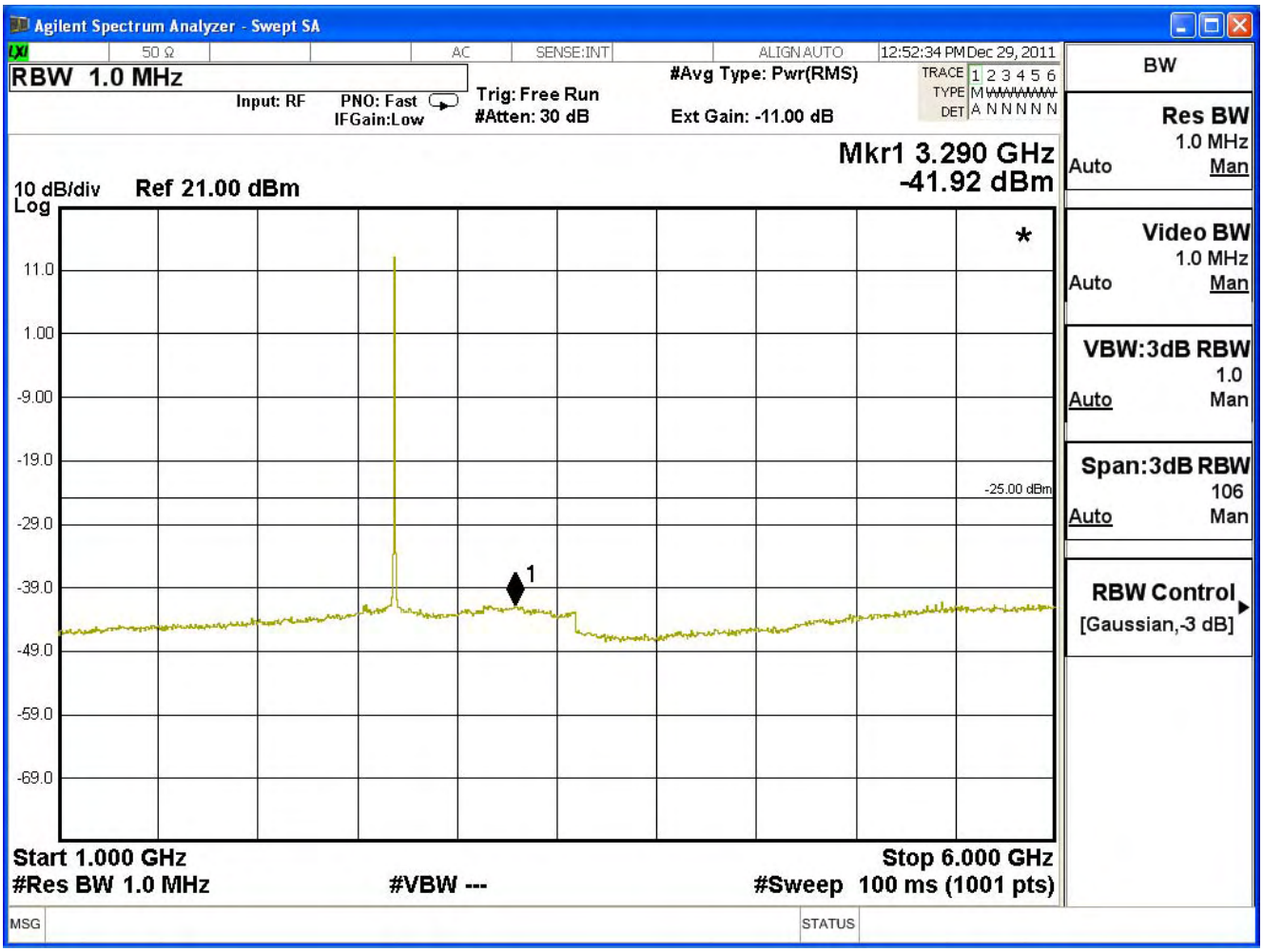
Test Frequency: 2687.5MHz			
Frequency Band (MHz)	**Frequency (MHz)**	**Measured Level (dBm)**	**Limit (dBm)**
30-1000	935.98	-44.29	≦-13
1000-6000	3290	-41.92	≦-13
6000-18000	16752	-39.86	≦-13
18000-26500	25973	-32.91	≦-13

30 – 1000 MHz



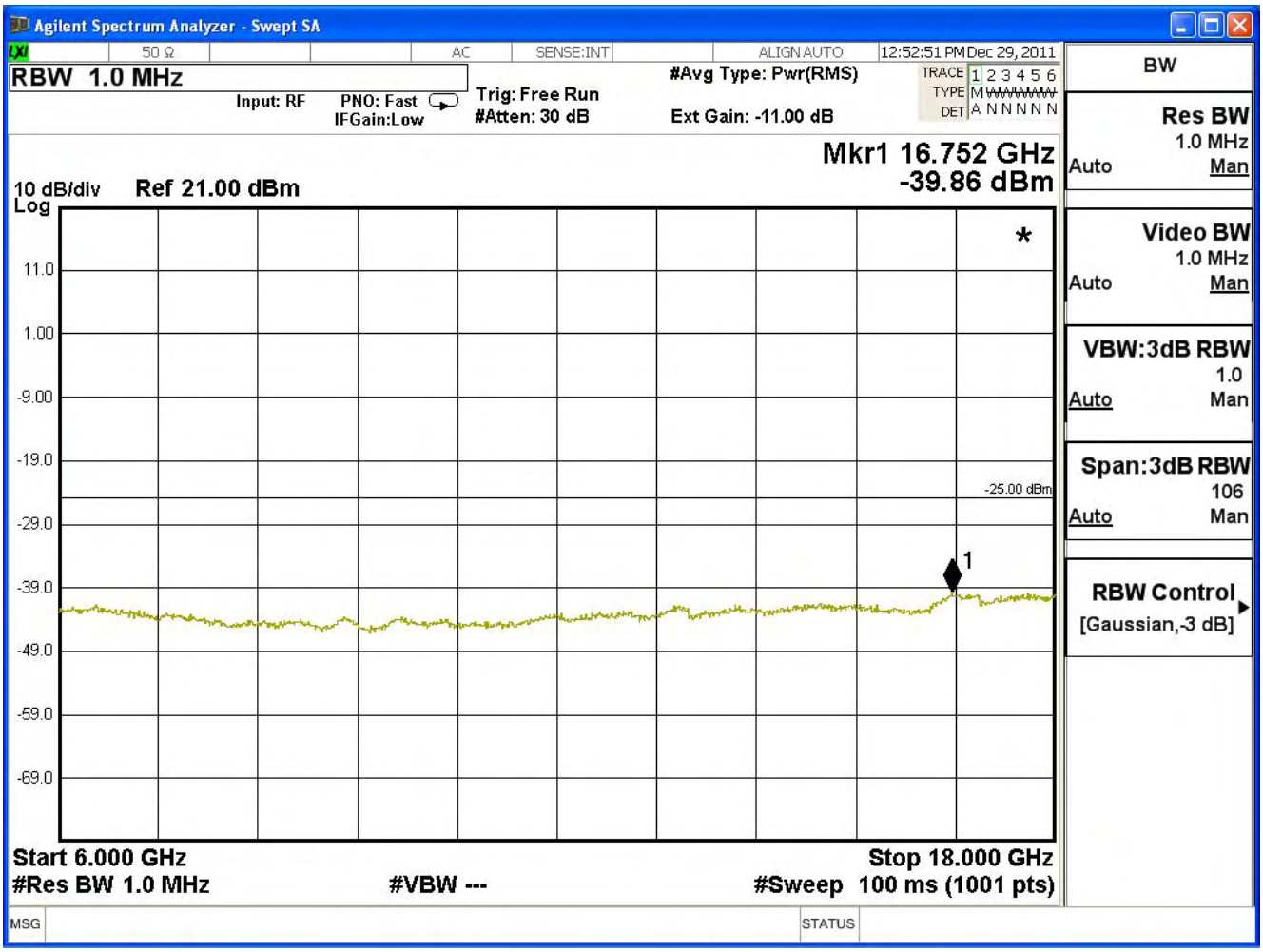
The search value is under the technical standard value, do not need to measure by measuring mode.

1000– 6000 MHz



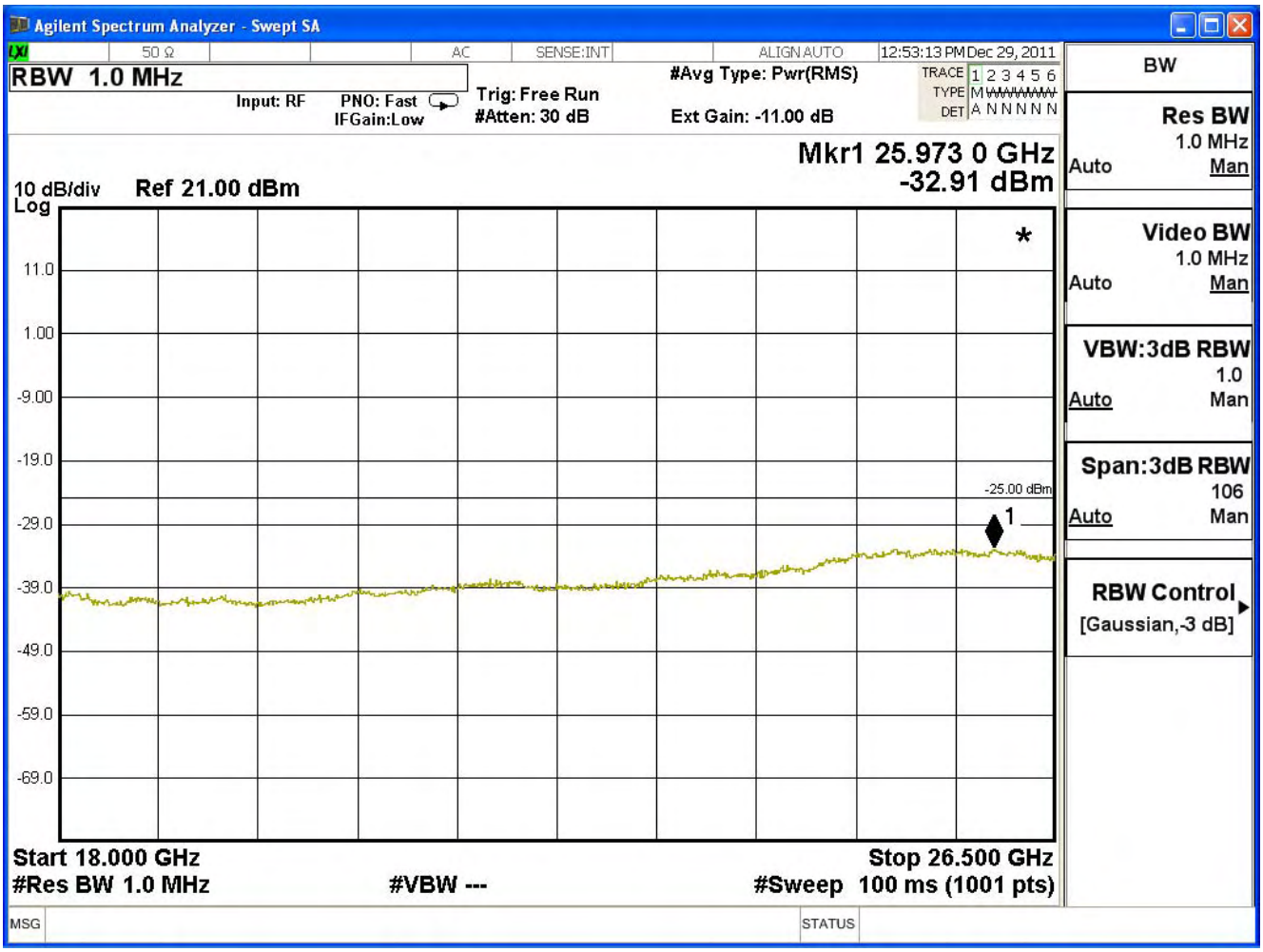
The search value is under the technical standard value, do not need to measure by measuring mode.

6000 – 18000 MHz



The search value is under the technical standard value, do not need to measure by measuring mode.

18000 – 26500 MHz



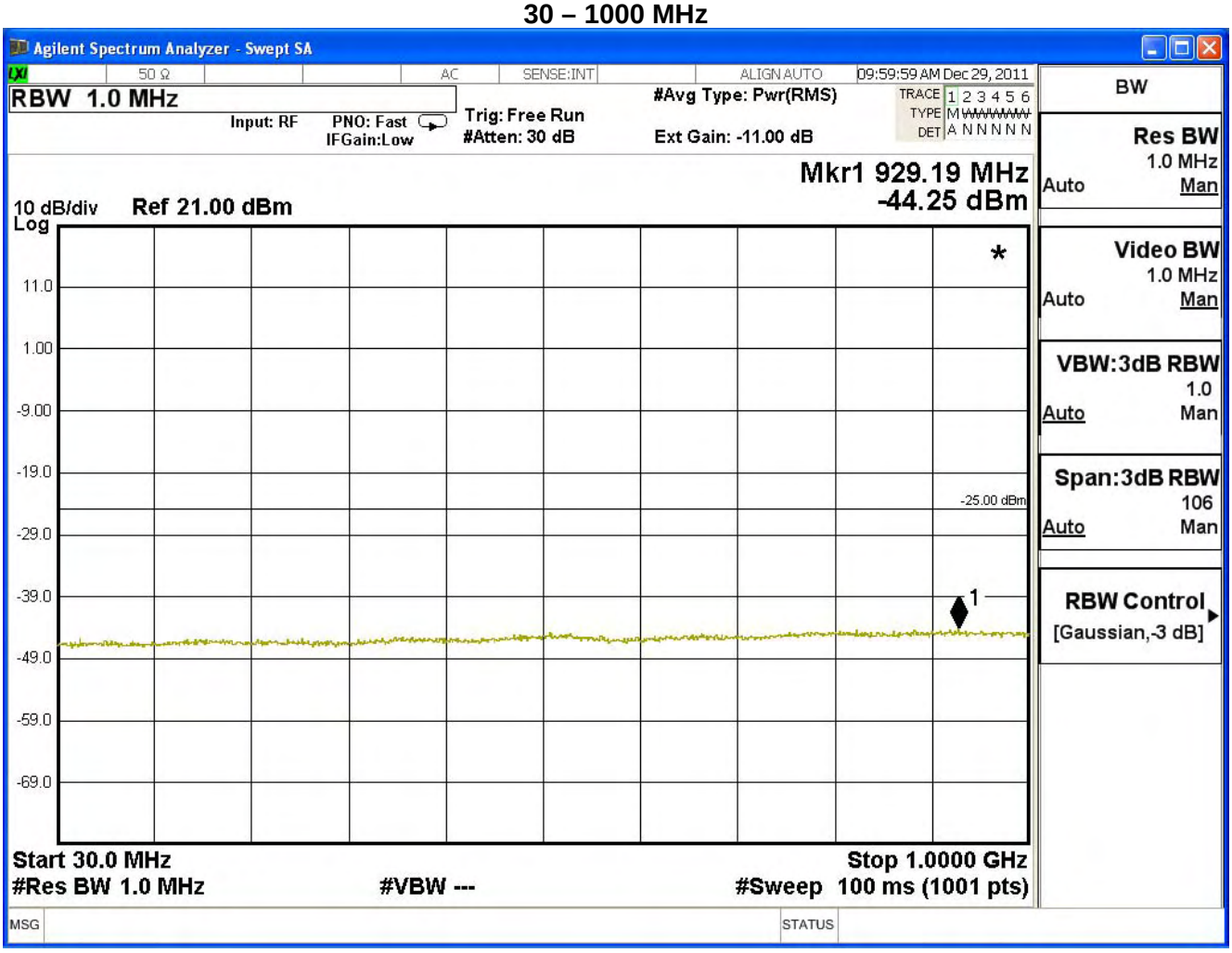
The search value is under the technical standard value, do not need to measure by measuring mode.

Product	CPE 2.5GHz Outdoor		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 2: Transmit (7MHz BW_QPSK-3/4)		
Date of Test	2011/12/29	Test Site	SR7

7MHz QPSK-3/4

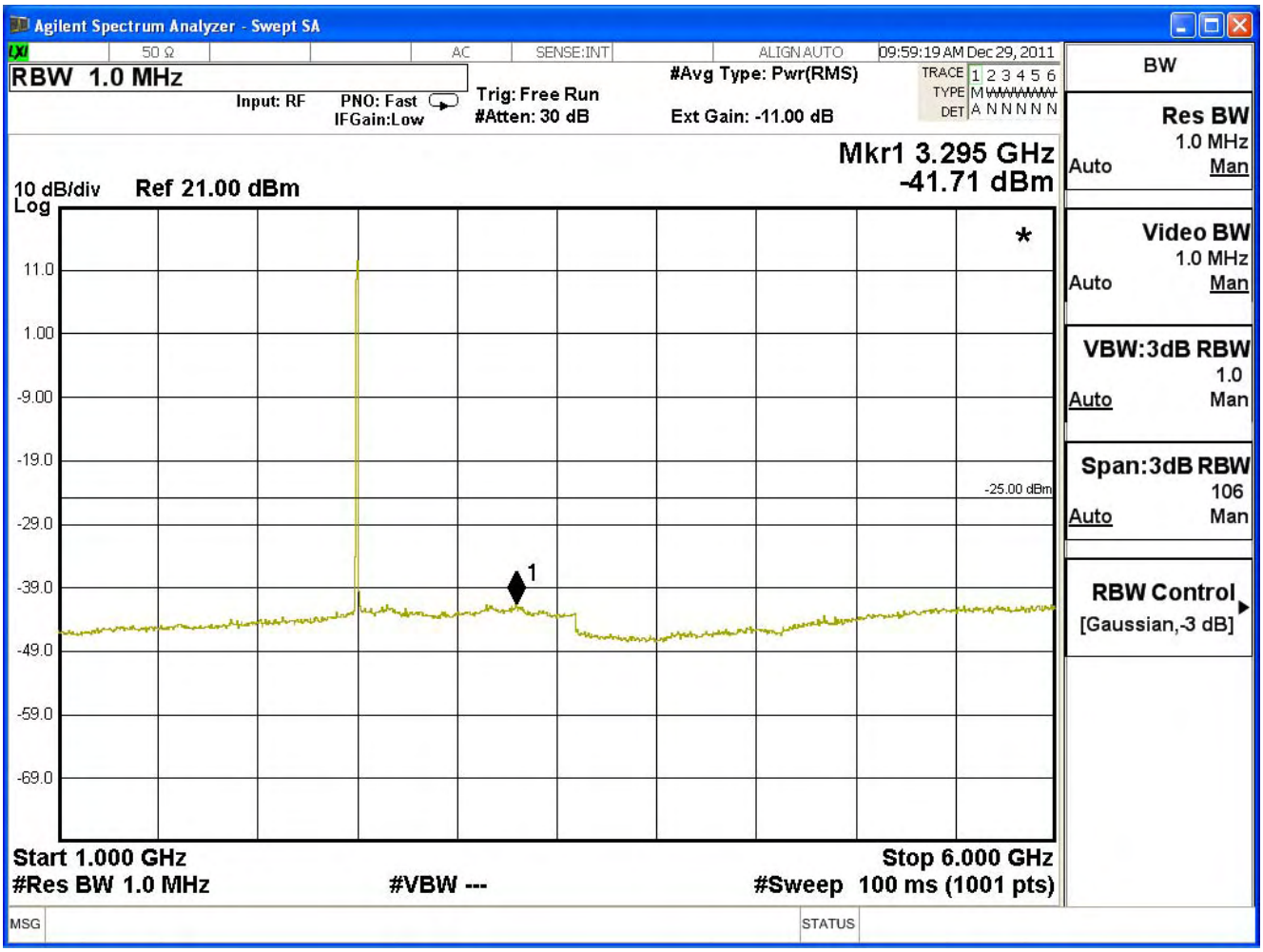
Test Frequency: 2499.5MHz			
Frequency Band (MHz)	**Frequency (MHz)**	**Measured Level (dBm)**	**Limit (dBm)**
30-1000	929.19	-44.25	≦-13
1000-6000	3295	-41.71	≦-13
6000-18000	17652	-40.02	≦-13
18000-26500	25658.5	-32.7	≦-13

30 – 1000 MHz



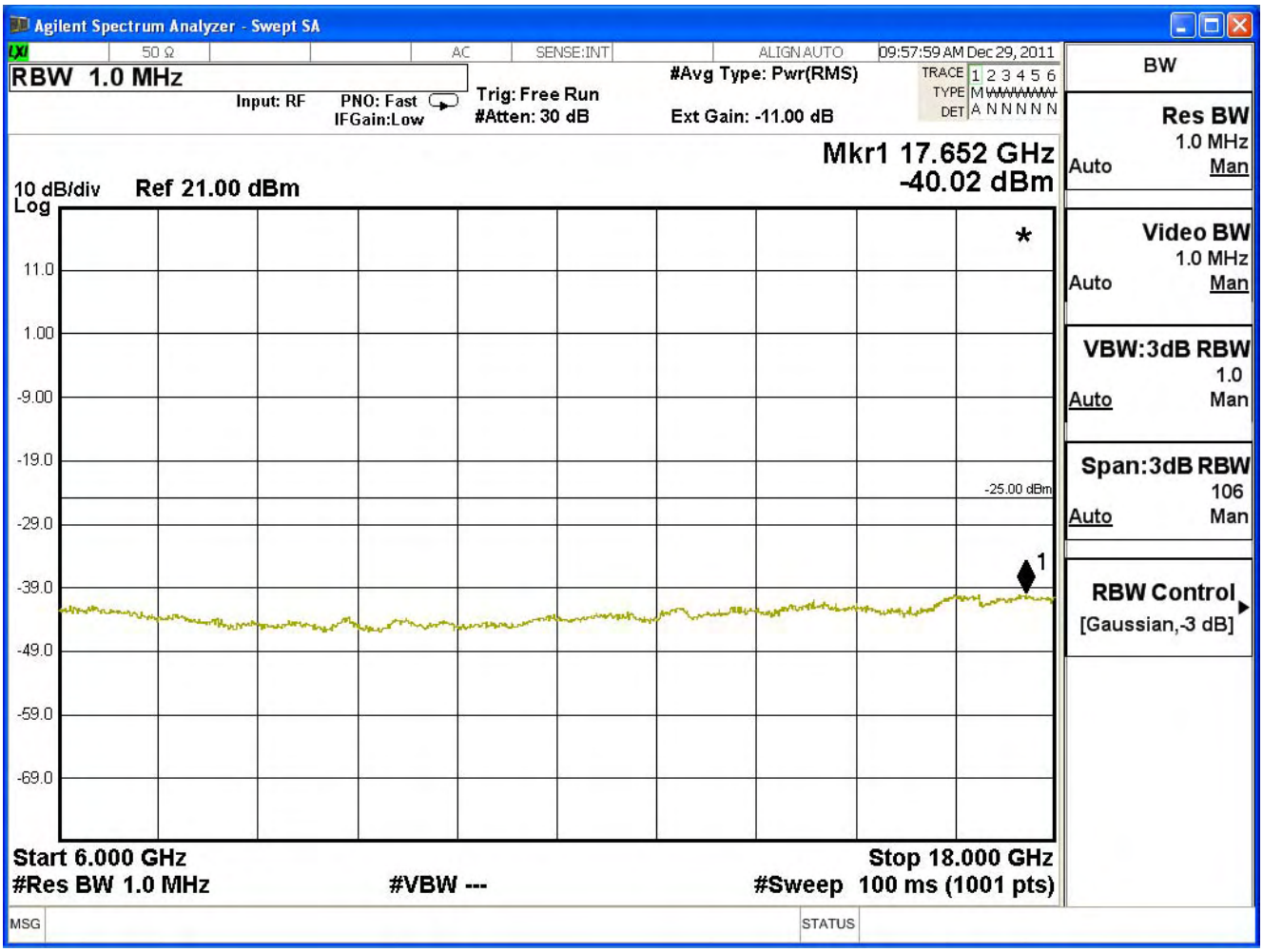
The search value is under the technical standard value, do not need to measure by measuring mode.

1000– 6000 MHz



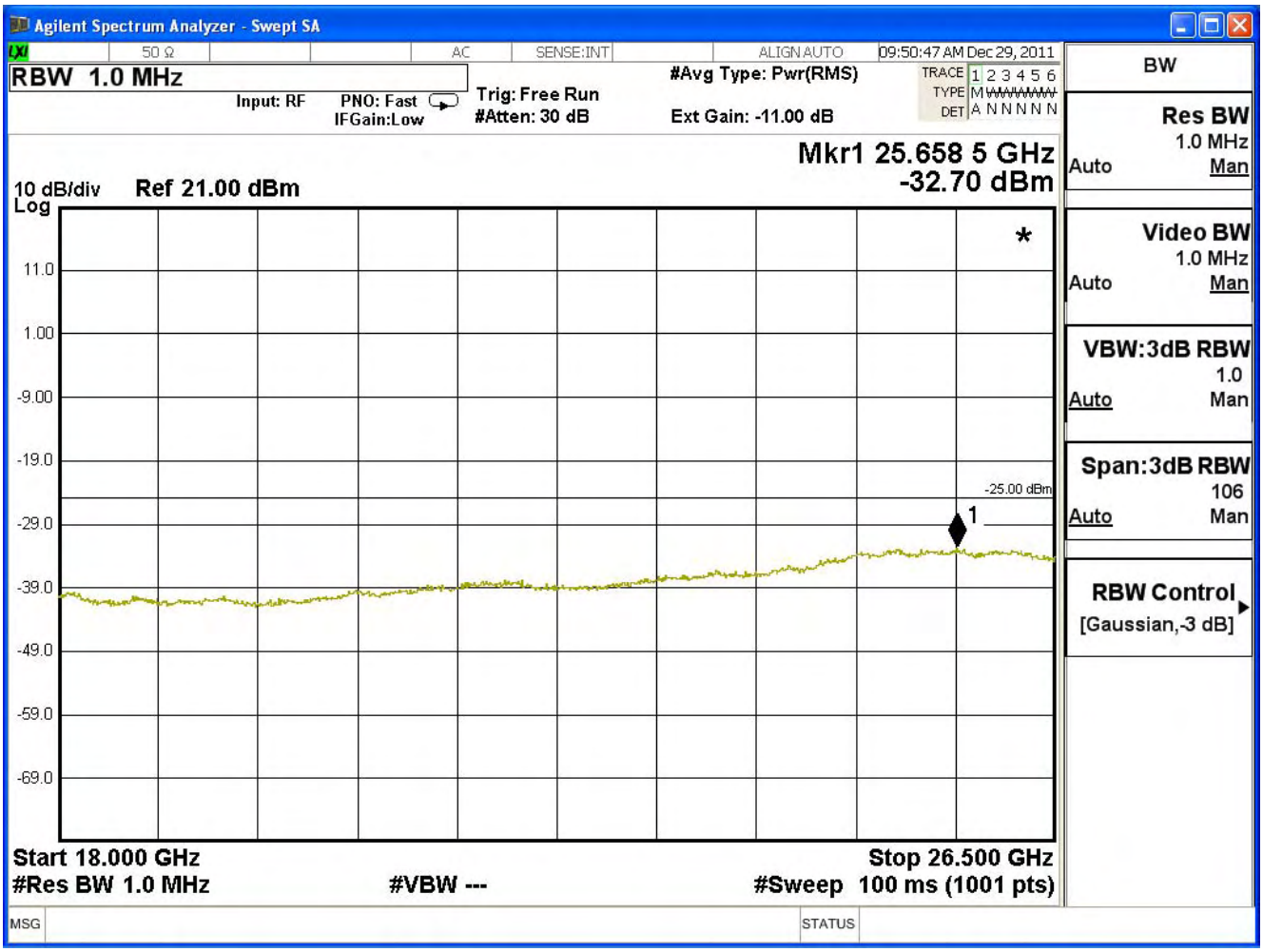
The search value is under the technical standard value, do not need to measure by measuring mode.

6000 – 18000 MHz



The search value is under the technical standard value, do not need to measure by measuring mode.

18000 – 26500 MHz



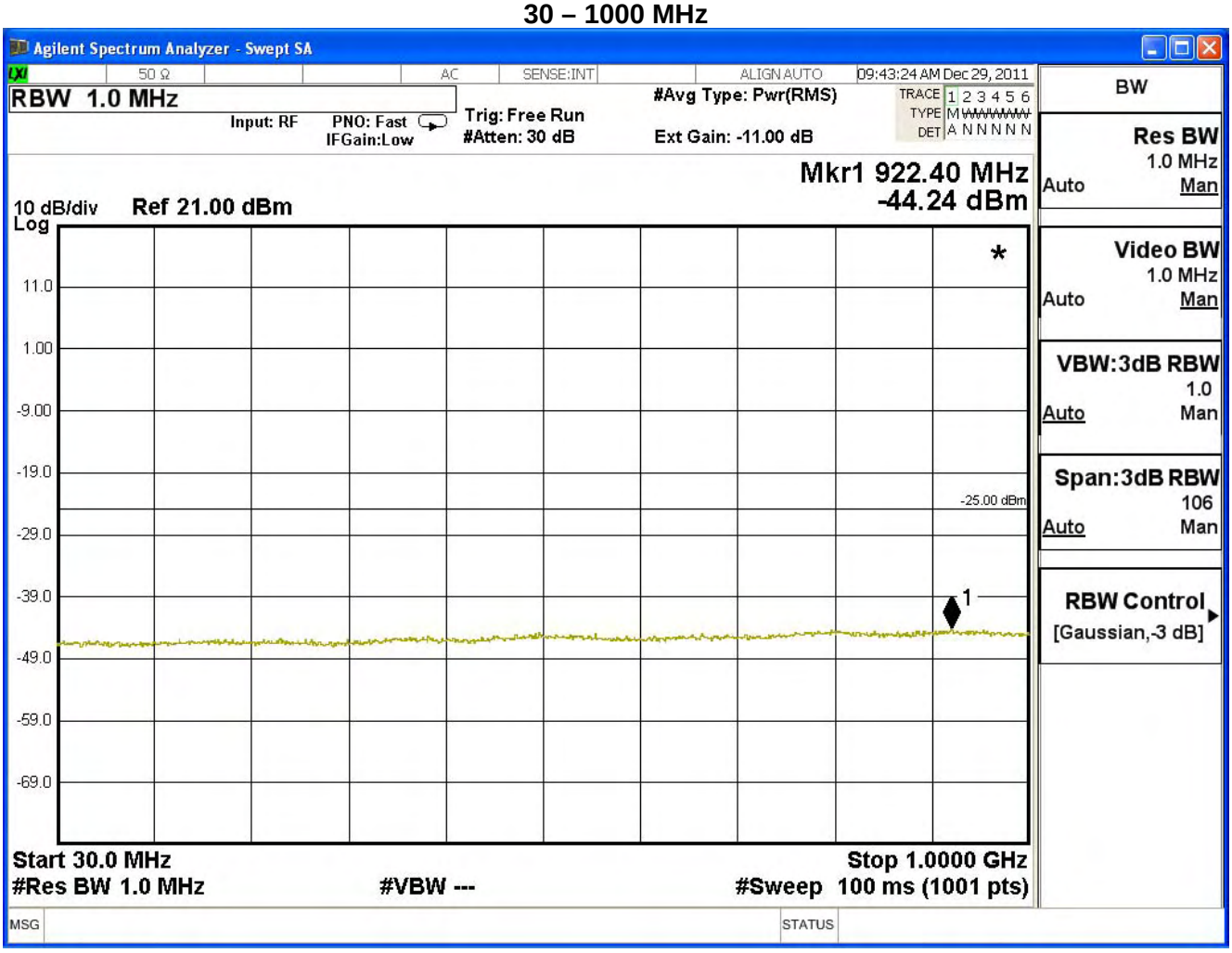
The search value is under the technical standard value, do not need to measure by measuring mode.

Product	CPE 2.5GHz Outdoor		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 3: Transmit (10MHz BW_64QAM-2/3)		
Date of Test	2011/12/29	Test Site	SR7

10MHz 64QAM-2/3

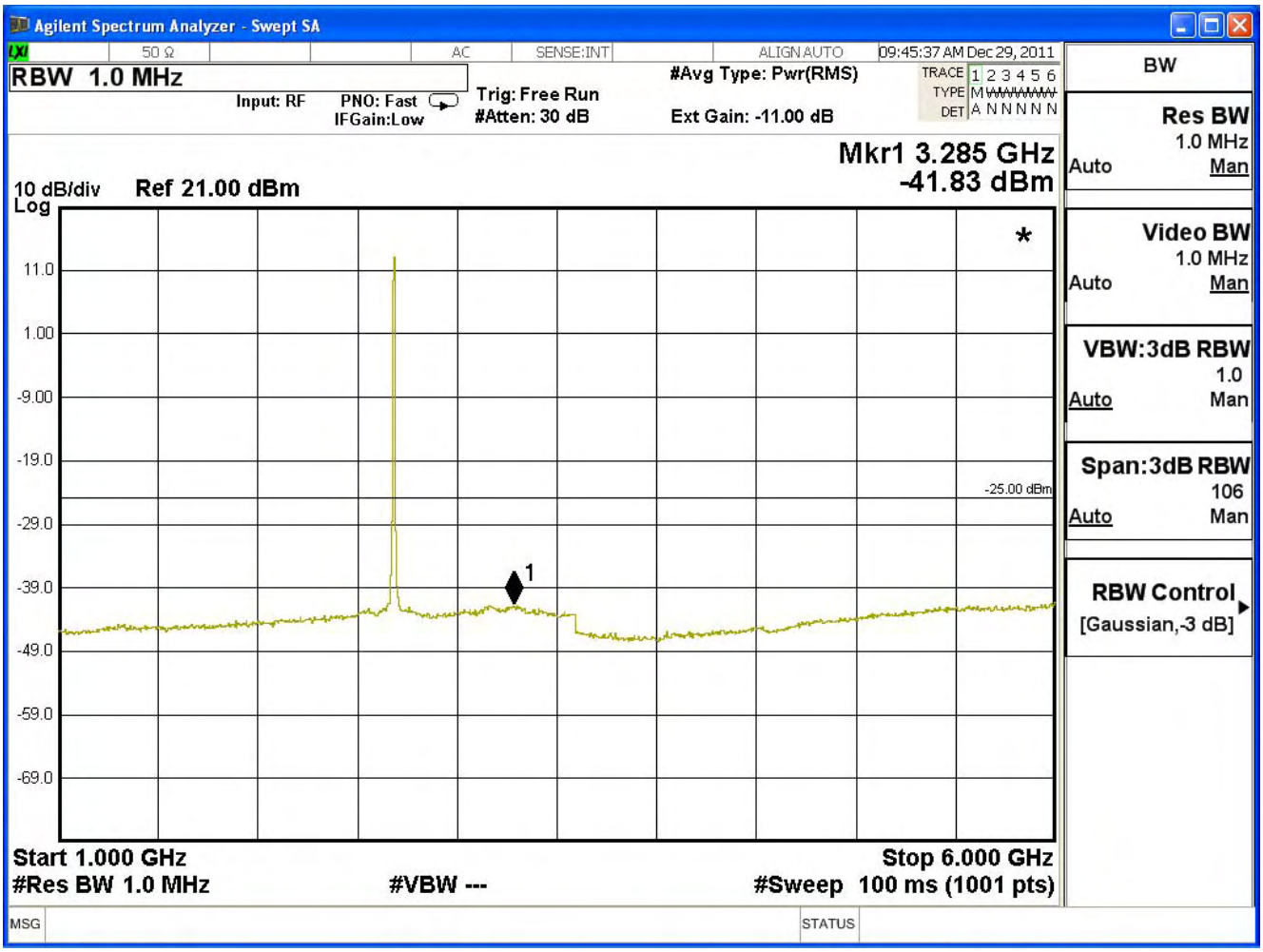
Test Frequency: 2499.5MHz			
Frequency Band (MHz)	**Frequency (MHz)**	**Measured Level (dBm)**	**Limit (dBm)**
30-1000	922.4	-44.24	≦-13
1000-6000	3285	-41.83	≦-13
6000-18000	17040	-39.99	≦-13
18000-26500	25106	-33	≦-13

30 – 1000 MHz



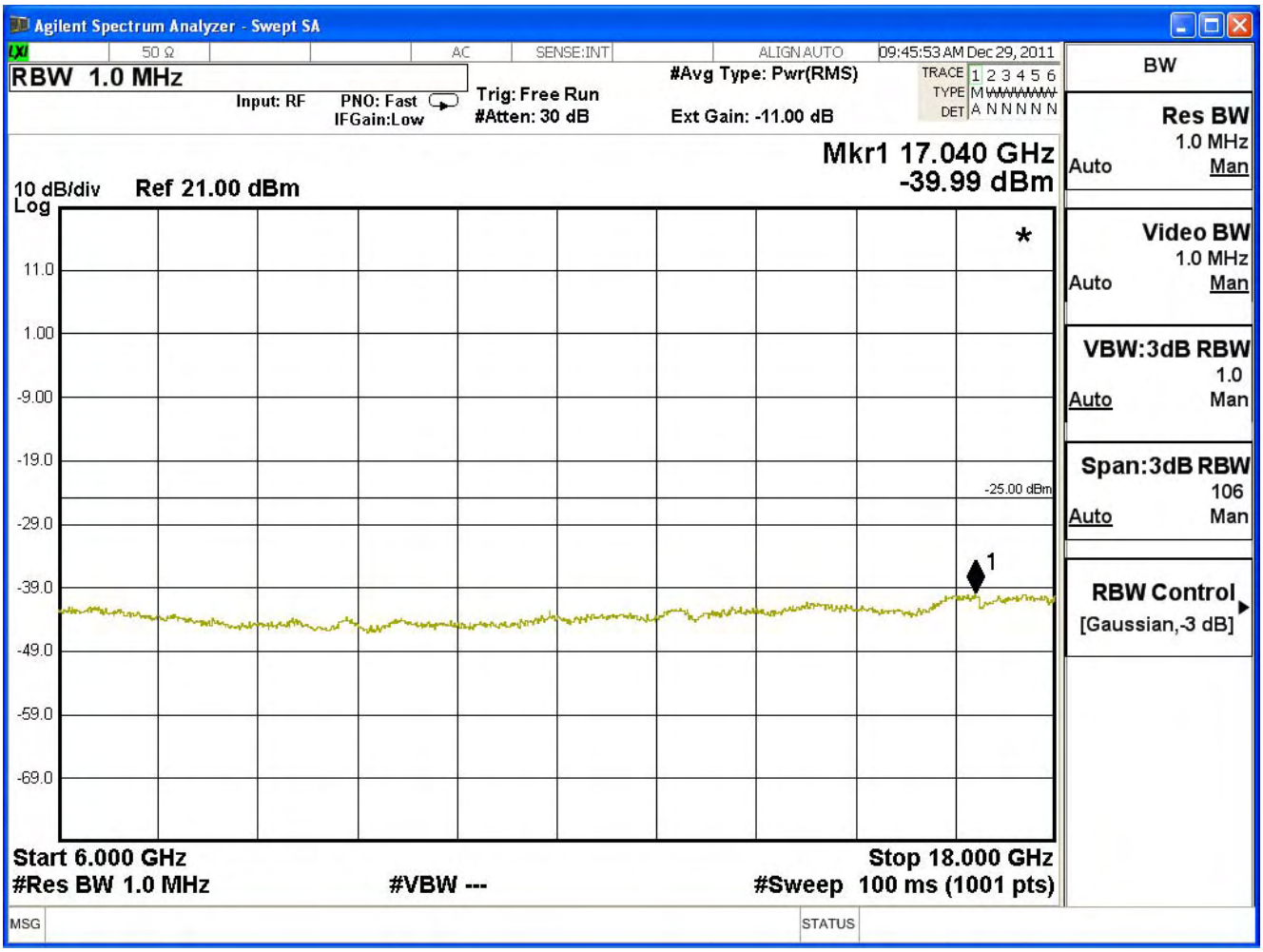
The search value is under the technical standard value, do not need to measure by measuring mode.

1000– 6000 MHz



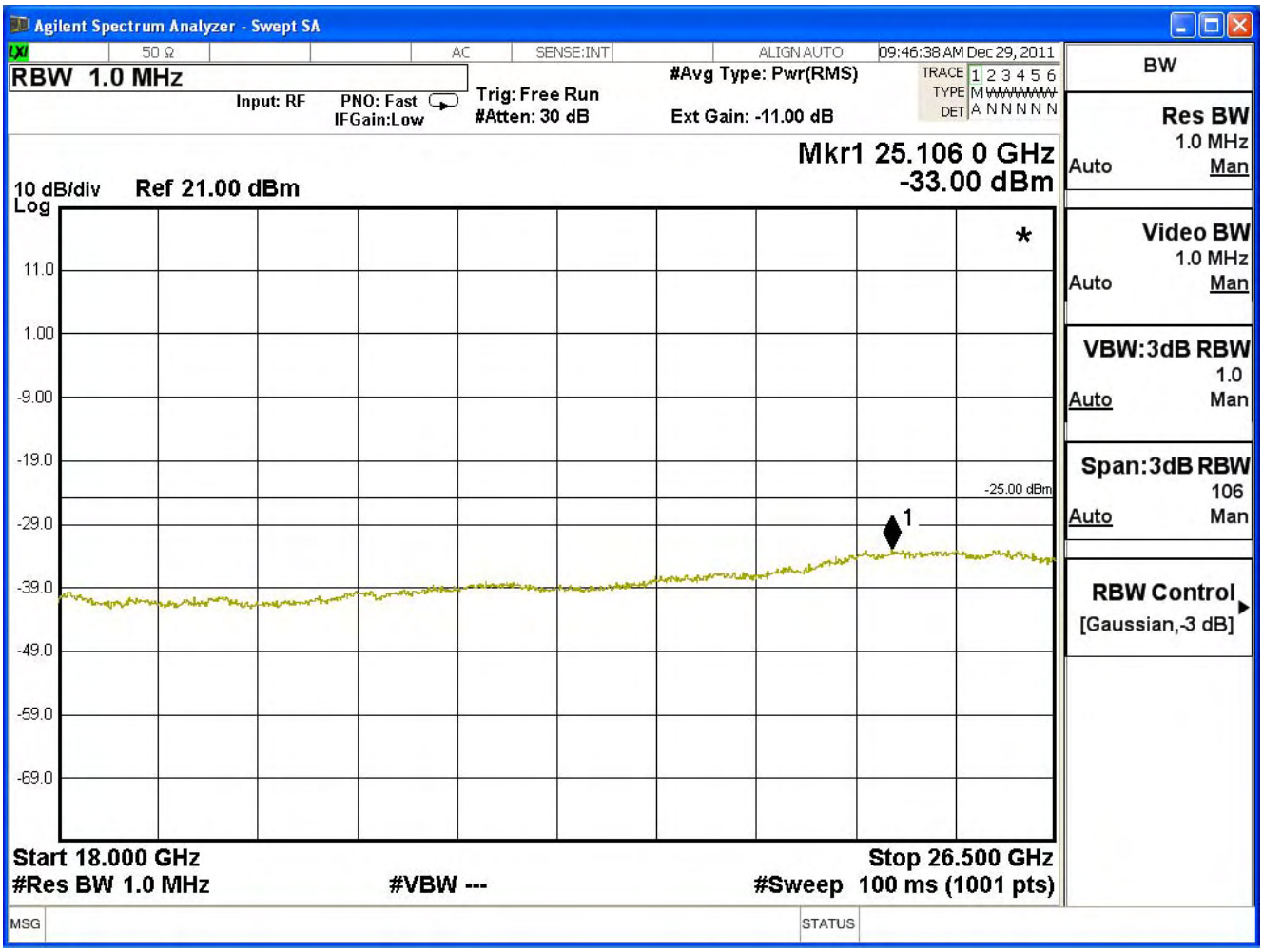
The search value is under the technical standard value, do not need to measure by measuring mode.

6000 – 18000 MHz



The search value is under the technical standard value, do not need to measure by measuring mode.

18000 – 26500 MHz



The search value is under the technical standard value, do not need to measure by measuring mode.

6. Radiated Spurious Emission

6.1. Test Equipment

The following test equipments are used during the test:

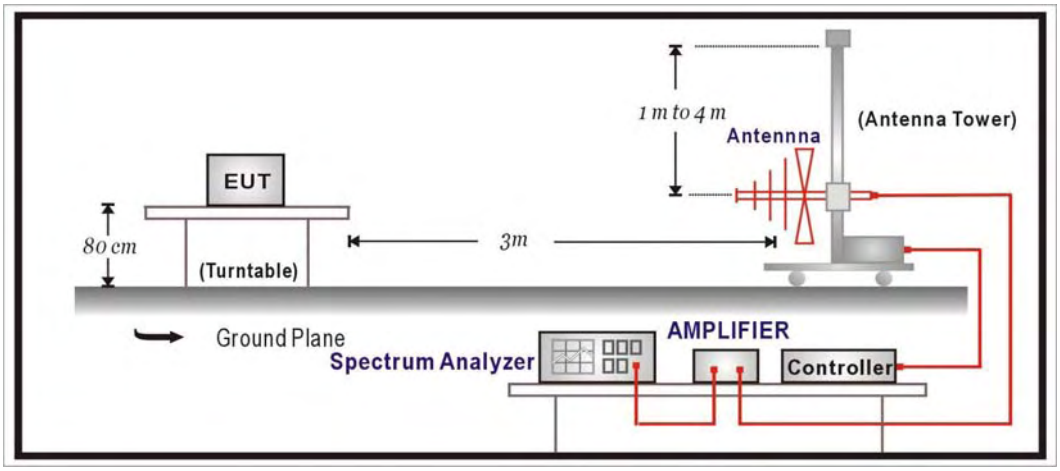
Radiated Spurious Emission / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Bilog Antenna	SCHAFFNER	CBL6112B	2895	2013/08/14
Double Ridged Guide Horn Antenna	Schwarzback	BBHA 9120D	743	2014/02/17
Pre-Amplifier	MITEQ	AMF-4D-005180-24-10P	888003	2013/12/02
Pre-Amplifier	QuieTek	AP-025C	CHM-0706049	2014/02/19
Spectrum Analyzer	Agilent	E4440A	MY46187335	2014/01/27
Coaxial Cable	Huber+Suhner AG	Sucoflex 102	25623/2	2013/03/04

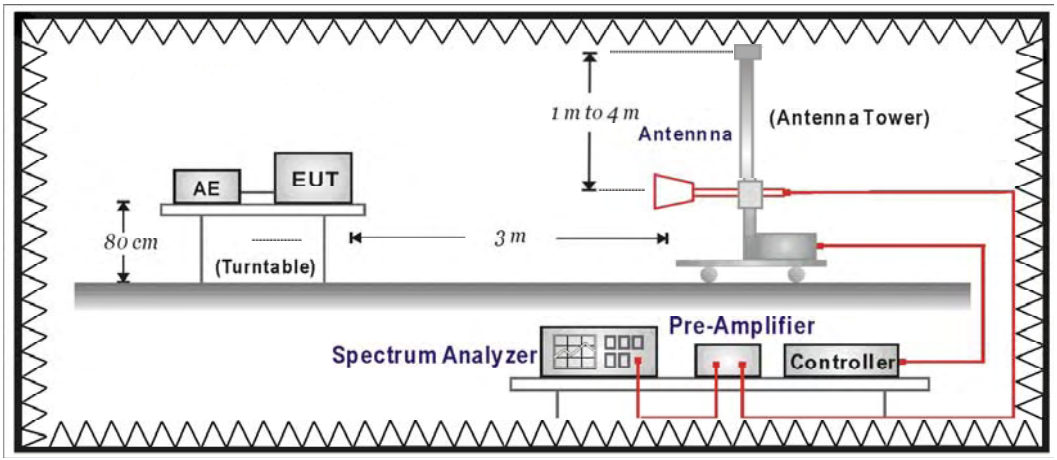
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

6.2. Test Setup

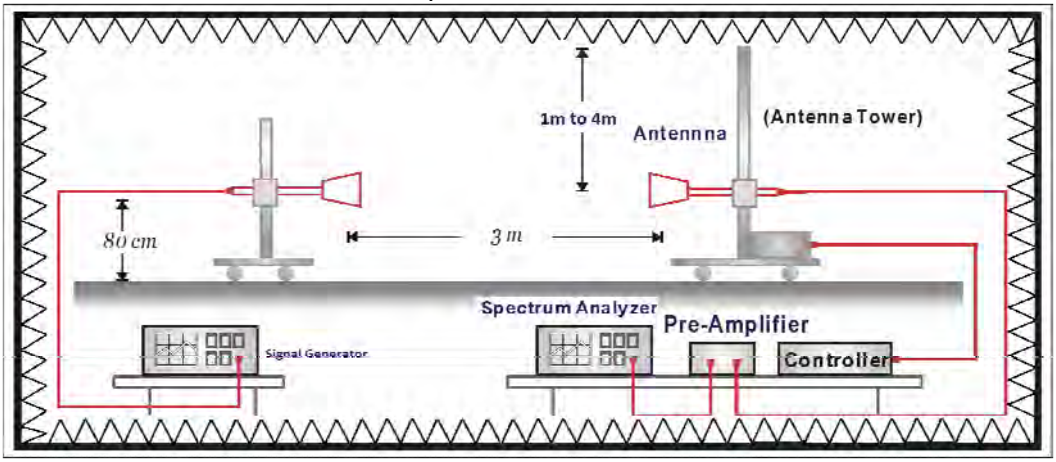
Under 1GHz Test Setup:



Above 1GHz Test Setup: RF Radiated Measurement:



Substitution Measurement Setup:



Measured Level= Signal Generator-Cable Loss + Antenna Gain

6.3. Limits

(1) Fixed and Temporary Fixed Digital Stations: not less than 43 + log (P) dB.
(2) Mobile Digital Stations: not less than 43 + log (P) dB at the channel edge and 55 + log (P) dB at 5.5 MHz from the channel edges.

Calculation:
Assume the EUT Output Power is 2 W = 33 dBm
43 + log (P) dB
43 + log (2) = 46 dB
33 dBm – 46 dB = -13 dBm

55 + log (2) = 58 dB
33 dBm – 58 dB = -25 dBm

6.4. Test Procedure

For measuring E.I.R.P peak power, EUT was placed on the turn-table which was rotated around 360 degrees to search the maximum radiation power and receiver antenna was rotated vertical and horizontal polarization to find the maximum polarization radiated power.

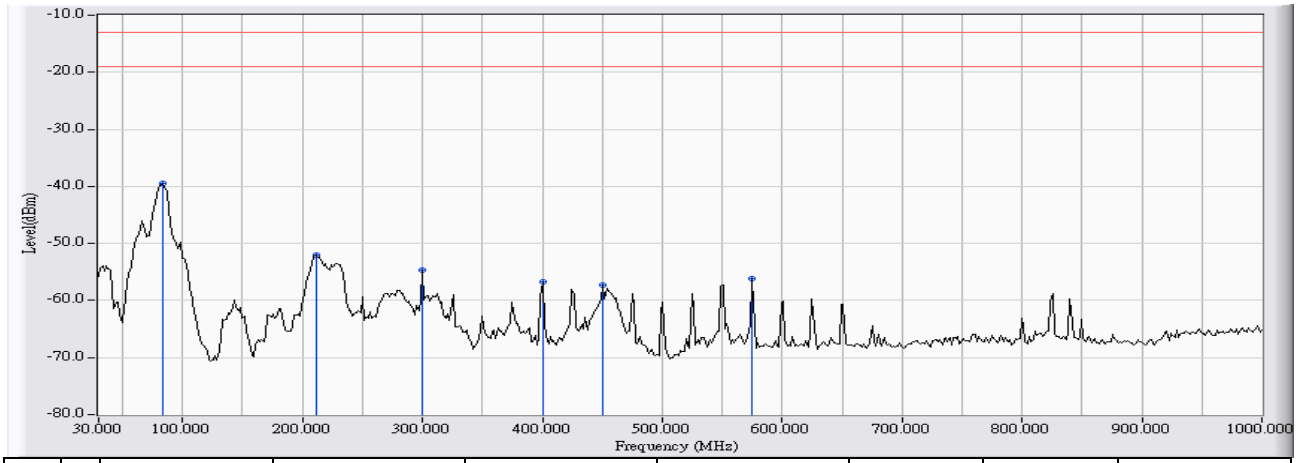
The EUT is replaced by a horn antenna connected to a signal generator tuned to the frequency of emission and level of signal generator adjusted to same level of emission. Both horizontal and vertical polarization of the antenna are set on measurement.
On any frequency, the limits shown are based on measuring equipment employing a peak detector function. The resolution bandwidth of spectrum analyzer is 1MHz. and video bandwidth is 3MHz.
The radiated E.I.R.P power was calculated via the Correct factor, Reading Level, and Antenna gain as follows:
E.I.R.P = Reading Level + Correct Factor = S.G. – Cable Loss + Antenna Gain

6.5. Uncertainty

The measurement uncertainty
30MHz～1GHz as ±3.19dB
1GHz～27GHz as ±3.9dB

6.6. Test Result

Site : CB1	Time : 2011/12/29 - 17:28
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_30-1G-1_0901 - HORIZONTAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : Mode 1: Transmit (5MHz BW_64QAM-5/6)

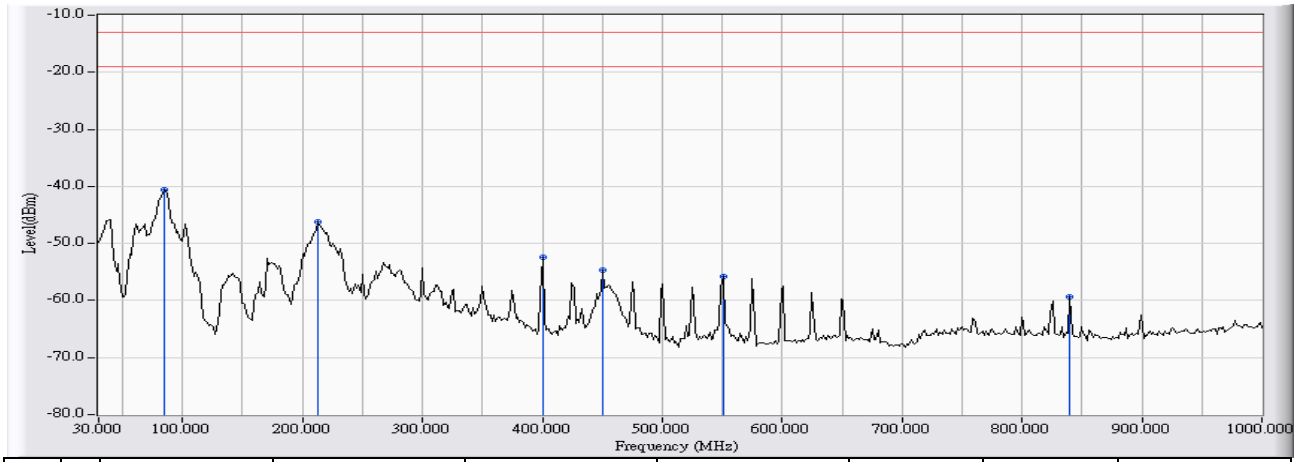


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	83.350	2.423	-41.855	-39.432	-26.432	-13.000	PEAK
2		211.067	-3.289	-48.697	-51.986	-38.986	-13.000	PEAK
3		299.983	0.635	-55.298	-54.663	-41.663	-13.000	PEAK
4		400.217	2.922	-59.651	-56.728	-43.728	-13.000	PEAK
5		450.333	4.126	-61.483	-57.357	-44.357	-13.000	PEAK
6		574.817	6.797	-62.934	-56.137	-43.137	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. " * ", means this data is the worst emission level.
3. Measured Level= Reading Level + Correct Factor

Site : CB1	Time : 2011/12/29 - 17:22
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_30-1G-1_0901 - VERTICAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : Mode 1: Transmit (5MHz BW_64QAM-5/6)

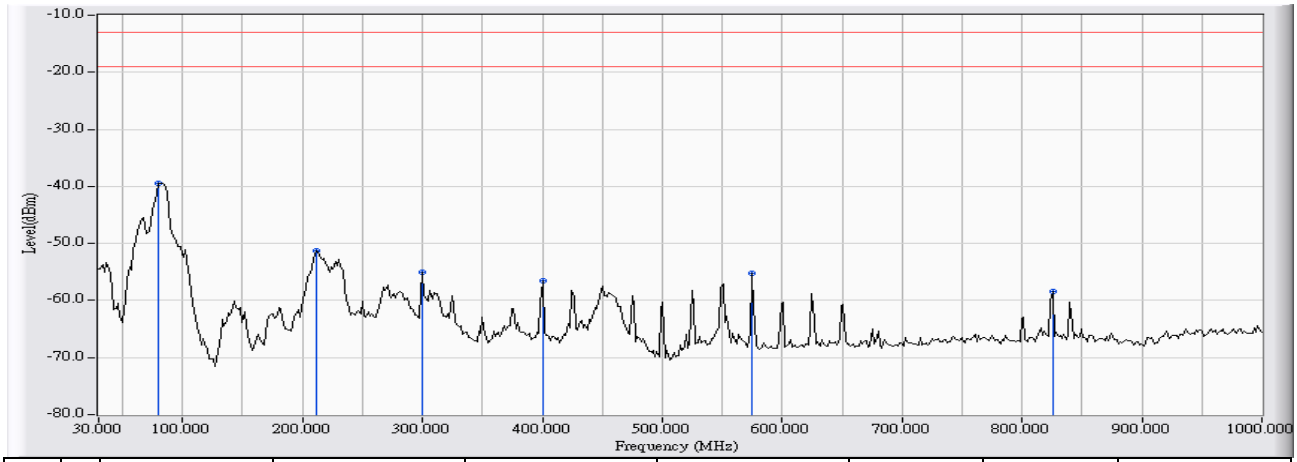


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	84.967	2.319	-42.885	-40.566	-27.566	-13.000	PEAK
2		212.683	0.155	-46.388	-46.234	-33.234	-13.000	PEAK
3		400.217	4.648	-57.054	-52.406	-39.406	-13.000	PEAK
4		450.333	4.511	-59.246	-54.735	-41.735	-13.000	PEAK
5		550.567	7.091	-62.862	-55.772	-42.772	-13.000	PEAK
6		839.950	8.956	-68.397	-59.441	-46.441	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. " * ", means this data is the worst emission level.
3. Measured Level= Reading Level + Correct Factor

Site : CB1	Time : 2011/12/29 - 16:33
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_30-1G-1_0901 - HORIZONTAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : Mode 2: Transmit (7MHz BW_QPSK-3/4)

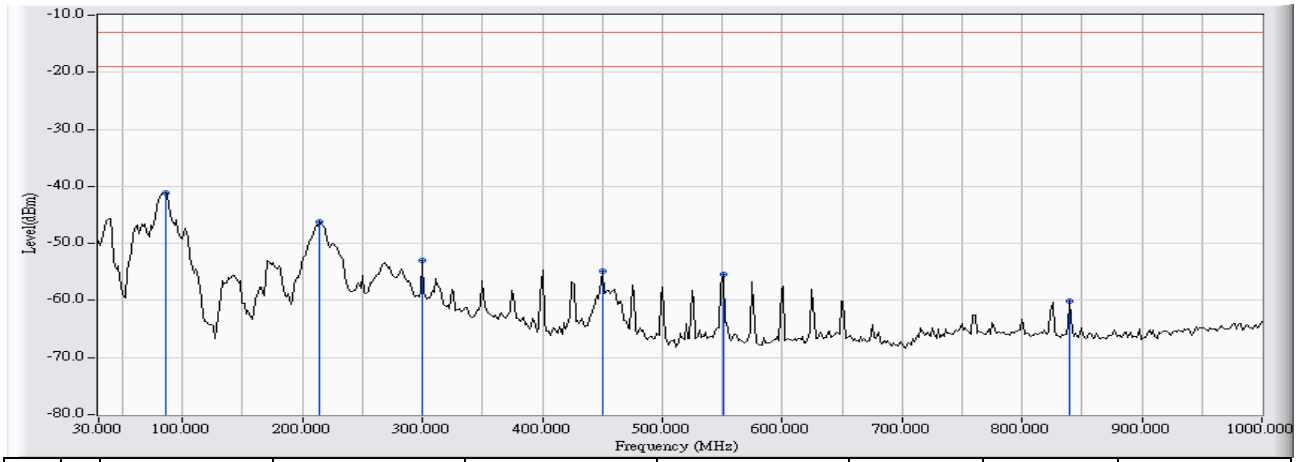


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	80.117	2.334	-41.820	-39.485	-26.485	-13.000	PEAK
2		211.067	-3.289	-48.008	-51.297	-38.297	-13.000	PEAK
3		299.983	0.635	-55.761	-55.126	-42.126	-13.000	PEAK
4		400.217	2.922	-59.398	-56.475	-43.475	-13.000	PEAK
5		574.817	6.797	-61.932	-55.135	-42.135	-13.000	PEAK
6		825.400	8.301	-66.767	-58.466	-45.466	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. " * ", means this data is the worst emission level.
3. Measured Level= Reading Level + Correct Factor

Site : CB1	Time : 2011/12/29 - 16:27
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_30-1G-1_0901 - VERTICAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : Mode 2: Transmit (7MHz BW_QPSK-3/4)

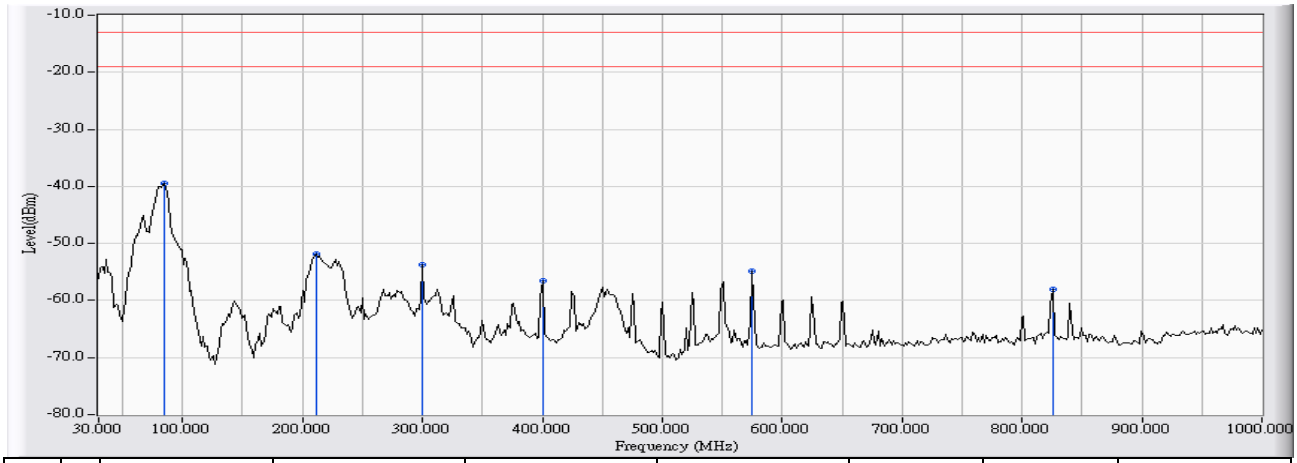


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	86.583	2.480	-43.621	-41.141	-28.141	-13.000	PEAK
2		214.300	0.149	-46.424	-46.275	-33.275	-13.000	PEAK
3		299.983	0.136	-53.087	-52.952	-39.952	-13.000	PEAK
4		450.333	4.511	-59.428	-54.917	-41.917	-13.000	PEAK
5		550.567	7.091	-62.557	-55.467	-42.467	-13.000	PEAK
6		839.950	8.956	-69.025	-60.069	-47.069	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. " * ", means this data is the worst emission level.
3. Measured Level= Reading Level + Correct Factor

Site : CB1	Time : 2011/12/29 - 16:22
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_30-1G-1_0901 - HORIZONTAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : Mode 3: Transmit (10MHz BW_64QAM-2/3)

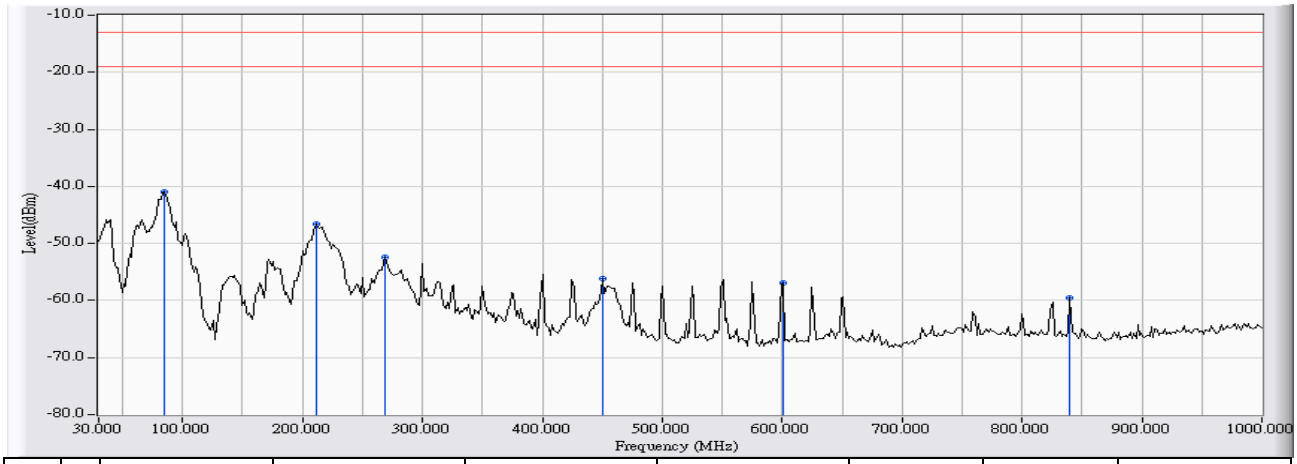


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	84.967	2.457	-41.984	-39.527	-26.527	-13.000	PEAK
2		211.067	-3.289	-48.594	-51.883	-38.883	-13.000	PEAK
3		299.983	0.635	-54.343	-53.708	-40.708	-13.000	PEAK
4		400.217	2.922	-59.403	-56.480	-43.480	-13.000	PEAK
5		574.817	6.797	-61.679	-54.882	-41.882	-13.000	PEAK
6		825.400	8.301	-66.283	-57.982	-44.982	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. " * ", means this data is the worst emission level.
3. Measured Level= Reading Level + Correct Factor

Site : CB1	Time : 2011/12/29 - 16:16
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_30-1G-1_0901 - VERTICAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : Mode 3: Transmit (10MHz BW_64QAM-2/3)



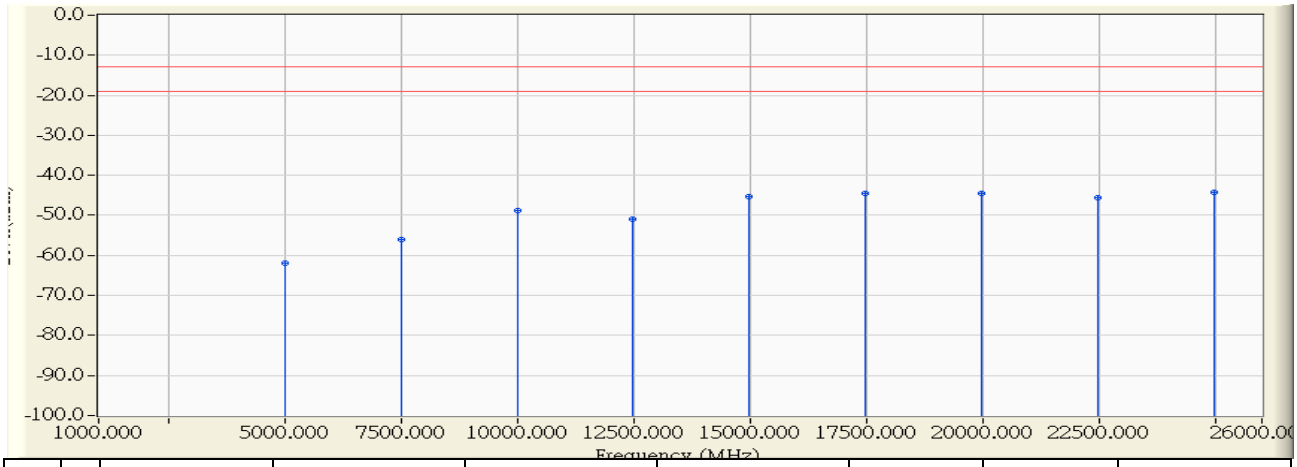
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	84.967	2.319	-43.202	-40.883	-27.883	-13.000	PEAK
2		211.067	0.160	-46.805	-46.645	-33.645	-13.000	PEAK
3		269.267	-0.048	-52.354	-52.402	-39.402	-13.000	PEAK
4		450.333	4.511	-60.708	-56.197	-43.197	-13.000	PEAK
5		600.683	7.541	-64.526	-56.985	-43.985	-13.000	PEAK
6		839.950	8.956	-68.428	-59.472	-46.472	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. " * ", means this data is the worst emission level.
3. Measured Level= Reading Level + Correct Factor

1 GHz – 26 GHz Spurious:

Site : CB1	Time : 2012/01/02 - 11:35
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - HORIZONTAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2498.5MHz, Mode 1: Transmit (5MHz BW_64QAM-5/6)

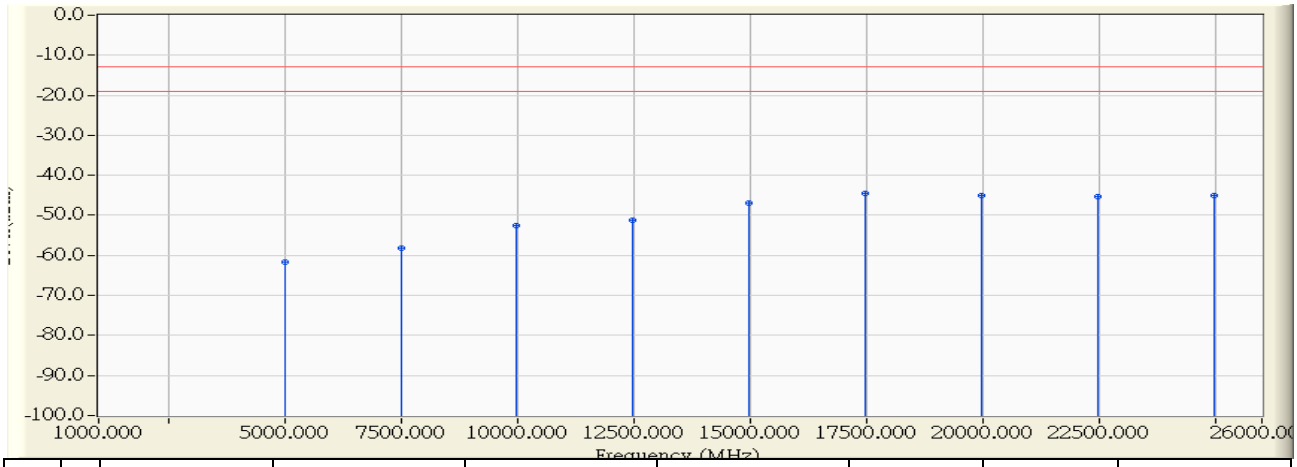


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		4994.780	14.773	-76.800	-62.027	-49.027	-13.000	PEAK
2		7492.640	20.449	-76.420	-55.971	-42.971	-13.000	PEAK
3		9990.640	21.945	-70.810	-48.865	-35.865	-13.000	PEAK
4		12486.740	27.180	-78.190	-51.010	-38.010	-13.000	PEAK
5		14987.020	28.427	-73.690	-45.263	-32.263	-13.000	PEAK
6		17482.640	31.435	-75.870	-44.434	-31.434	-13.000	PEAK
7		19979.500	31.900	-76.320	-44.420	-31.420	-13.000	PEAK
8		22477.640	31.900	-77.440	-45.540	-32.540	-13.000	PEAK
9	*	24975.100	31.900	-76.150	-44.250	-31.250	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2012/01/02 - 11:30
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - VERTICAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2498.5MHz, Mode 1: Transmit (5MHz BW_64QAM-5/6)

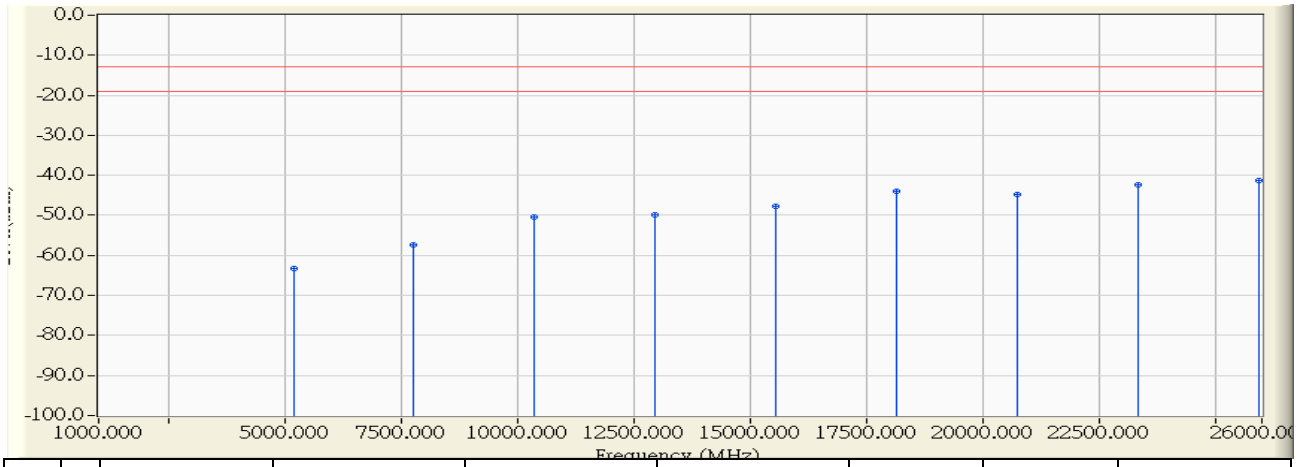


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		4993.840	14.292	-75.990	-61.698	-48.698	-13.000	PEAK
2		7492.060	20.161	-78.370	-58.210	-45.210	-13.000	PEAK
3		9989.580	22.723	-75.200	-52.477	-39.477	-13.000	PEAK
4		12486.140	26.974	-78.300	-51.326	-38.326	-13.000	PEAK
5		14986.280	27.716	-74.680	-46.964	-33.964	-13.000	PEAK
6	*	17483.240	30.764	-75.140	-44.376	-31.376	-13.000	PEAK
7		19980.260	31.300	-76.230	-44.930	-31.930	-13.000	PEAK
8		22479.920	31.300	-76.670	-45.370	-32.370	-13.000	PEAK
9		24974.440	31.300	-76.210	-44.910	-31.910	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2012/01/02 - 11:41
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - HORIZONTAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2593MHz, Mode 1: Transmit (5MHz BW_64QAM-5/6)

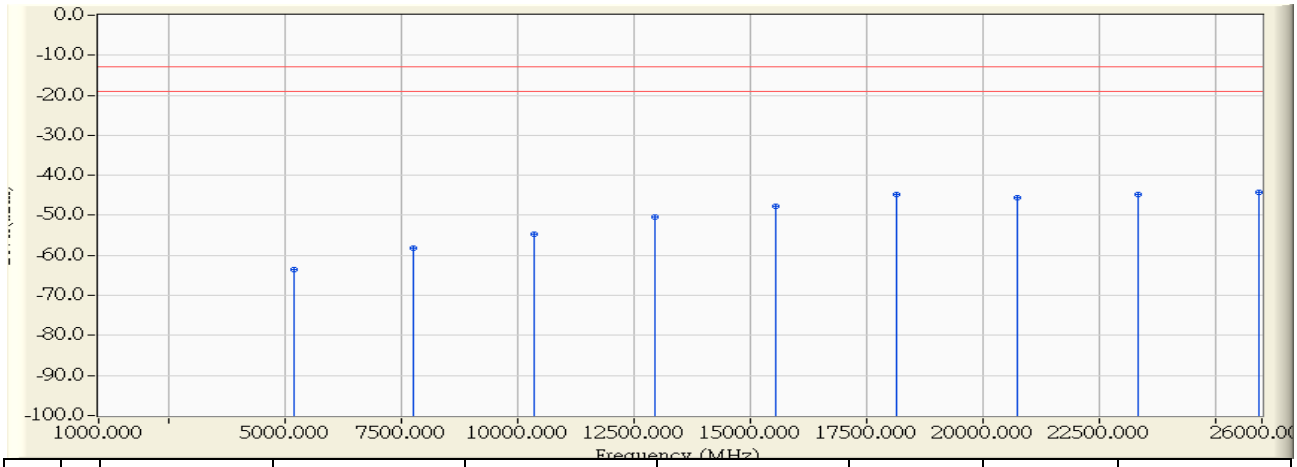


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5185.760	15.047	-78.250	-63.204	-50.204	-13.000	PEAK
2		7776.220	20.610	-78.000	-57.391	-44.391	-13.000	PEAK
3		10369.580	22.726	-73.210	-50.484	-37.484	-13.000	PEAK
4		12963.040	28.119	-78.100	-49.982	-36.982	-13.000	PEAK
5		15552.400	27.351	-75.050	-47.699	-34.699	-13.000	PEAK
6		18146.620	31.900	-75.930	-44.030	-31.030	-13.000	PEAK
7		20739.700	31.900	-76.550	-44.650	-31.650	-13.000	PEAK
8		23331.180	31.900	-74.370	-42.470	-29.470	-13.000	PEAK
9	*	25920.900	31.900	-73.150	-41.250	-28.250	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2012/01/02 - 11:38
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - VERTICAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2593MHz, Mode 1: Transmit (5MHz BW_64QAM-5/6)

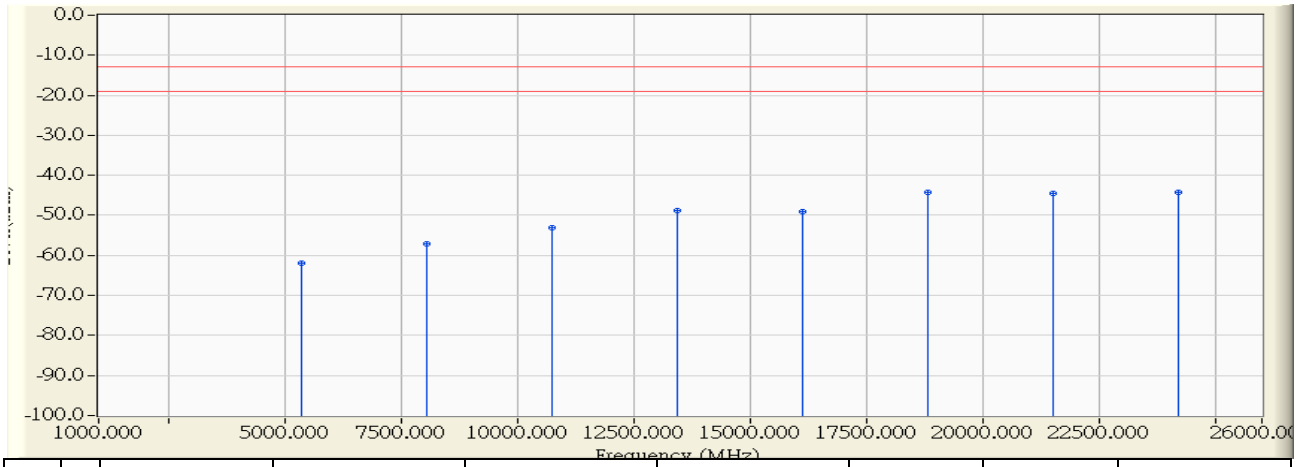


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5184.060	14.487	-78.010	-63.523	-50.523	-13.000	PEAK
2		7777.400	20.201	-78.270	-58.069	-45.069	-13.000	PEAK
3		10368.560	22.951	-77.640	-54.689	-41.689	-13.000	PEAK
4		12962.240	27.899	-78.180	-50.282	-37.282	-13.000	PEAK
5		15554.600	27.091	-74.860	-47.769	-34.769	-13.000	PEAK
6		18146.720	31.300	-76.070	-44.770	-31.770	-13.000	PEAK
7		20739.960	31.300	-77.010	-45.710	-32.710	-13.000	PEAK
8		23333.700	31.300	-76.080	-44.780	-31.780	-13.000	PEAK
9	*	25925.960	31.300	-75.540	-44.240	-31.240	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2012/01/02 - 11:50
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - HORIZONTAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2687.5MHz, Mode 1: Transmit (5MHz BW_64QAM-5/6)

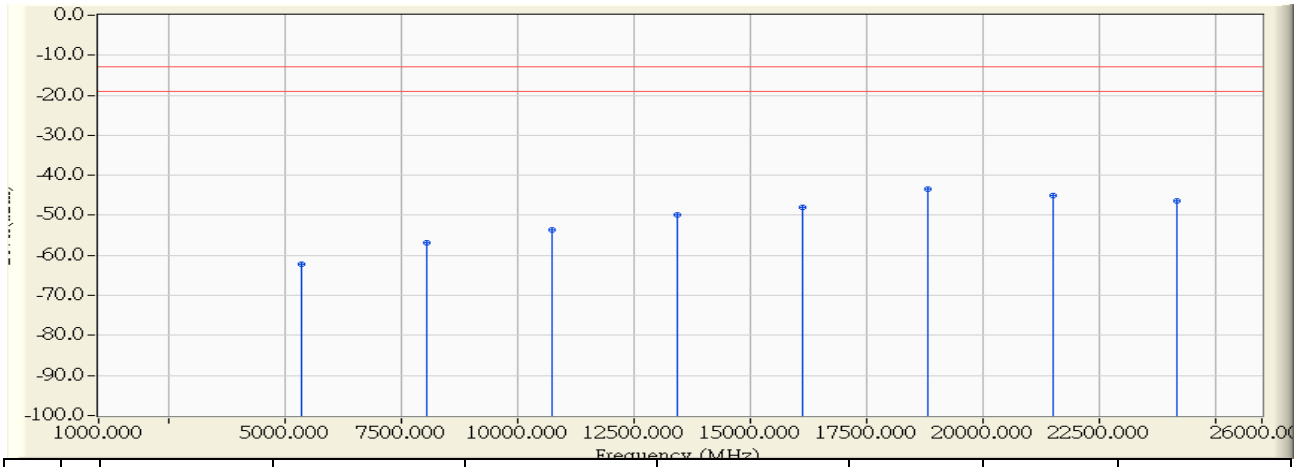


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5374.760	15.307	-77.250	-61.943	-48.943	-13.000	PEAK
2		8061.940	20.737	-77.810	-57.073	-44.073	-13.000	PEAK
3		10747.820	24.284	-77.370	-53.086	-40.086	-13.000	PEAK
4		13437.740	29.486	-78.340	-48.854	-35.854	-13.000	PEAK
5		16127.260	27.826	-76.820	-48.994	-35.994	-13.000	PEAK
6	*	18811.820	31.900	-76.090	-44.190	-31.190	-13.000	PEAK
7		21499.760	31.900	-76.520	-44.620	-31.620	-13.000	PEAK
8		24189.880	31.900	-76.130	-44.230	-31.230	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2012/01/02 - 11:44
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - VERTICAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2687.5MHz, Mode 1: Transmit (5MHz BW_64QAM-5/6)

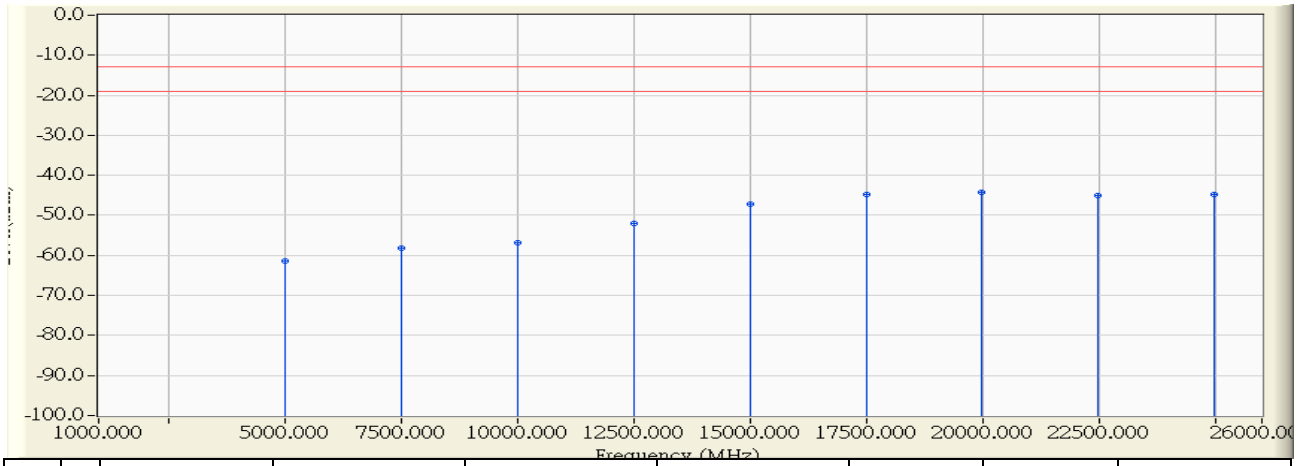


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5373.100	14.668	-76.950	-62.282	-49.282	-13.000	PEAK
2		8061.500	20.337	-77.070	-56.733	-43.733	-13.000	PEAK
3		10750.080	24.246	-77.950	-53.705	-40.705	-13.000	PEAK
4		13437.640	29.231	-79.170	-49.940	-36.940	-13.000	PEAK
5		16123.980	27.928	-75.870	-47.942	-34.942	-13.000	PEAK
6	*	18812.680	31.300	-74.840	-43.540	-30.540	-13.000	PEAK
7		21498.000	31.300	-76.270	-44.970	-31.970	-13.000	PEAK
8		24187.400	31.300	-77.690	-46.390	-33.390	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2011/12/30 - 16:57
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - HORIZONTAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2499.5MHz, Mode 2: Transmit (7MHz BW_QPSK-3/4)

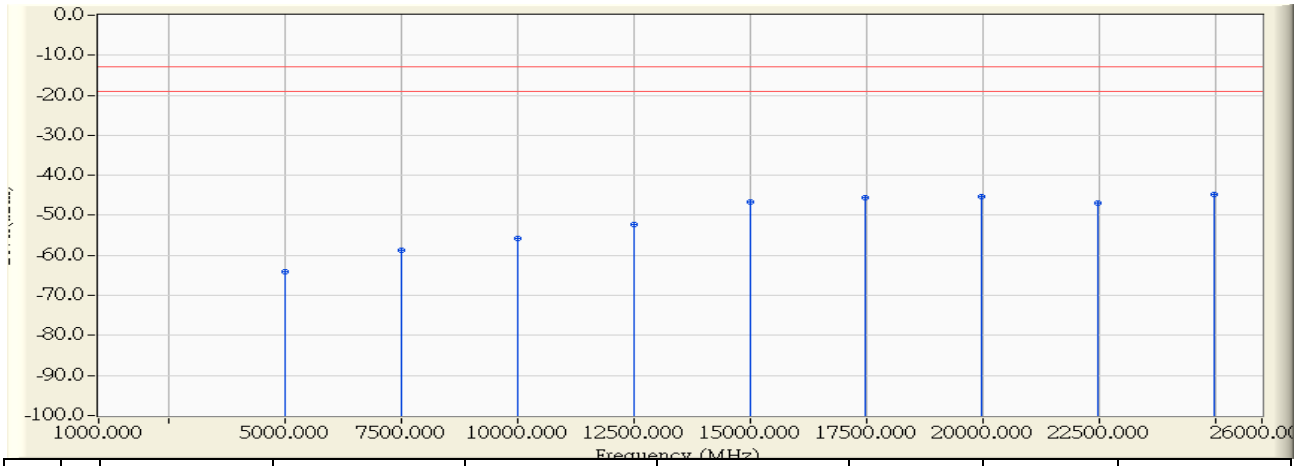


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		4997.300	14.778	-76.270	-61.492	-48.492	-13.000	PEAK
2		7495.020	20.452	-78.680	-58.228	-45.228	-13.000	PEAK
3		9994.190	21.948	-78.850	-56.902	-43.902	-13.000	PEAK
4		12492.240	27.196	-79.330	-52.134	-39.134	-13.000	PEAK
5		14991.280	28.427	-75.530	-47.102	-34.102	-13.000	PEAK
6		17490.480	31.468	-76.300	-44.831	-31.831	-13.000	PEAK
7	*	19987.412	31.900	-76.230	-44.330	-31.330	-13.000	PEAK
8		22487.032	31.900	-76.920	-45.020	-32.020	-13.000	PEAK
9		24985.860	31.900	-76.570	-44.670	-31.670	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2011/12/30 - 16:55
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - VERTICAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2499.5MHz, Mode 2: Transmit (7MHz BW_QPSK-3/4)

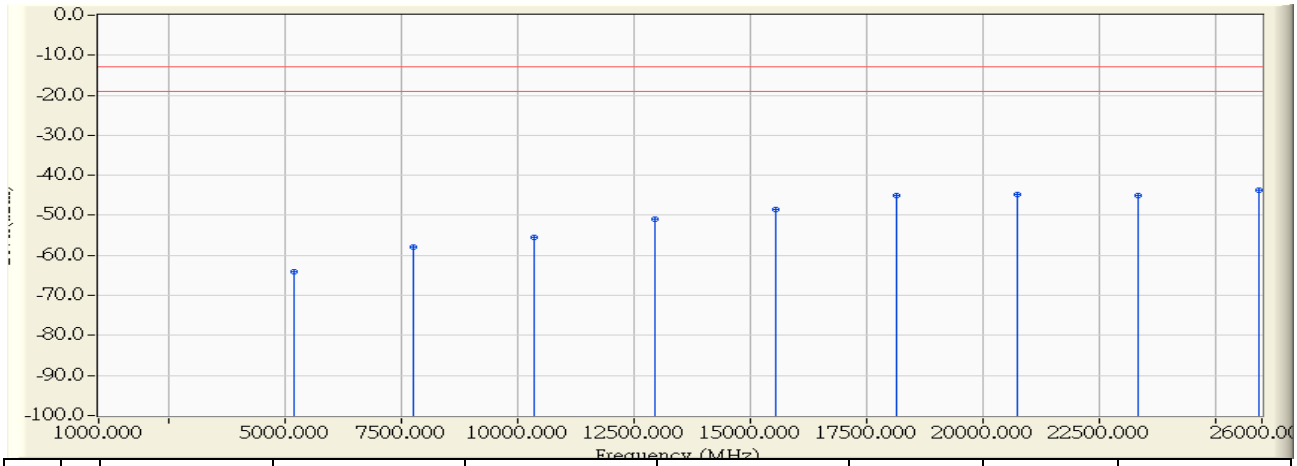


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		4997.160	14.299	-78.320	-64.022	-51.022	-13.000	PEAK
2		7493.590	20.165	-78.790	-58.624	-45.624	-13.000	PEAK
3		9993.580	22.725	-78.570	-55.845	-42.845	-13.000	PEAK
4		12493.220	26.996	-79.390	-52.393	-39.393	-13.000	PEAK
5		14991.560	27.725	-74.390	-46.665	-33.665	-13.000	PEAK
6		17489.610	30.777	-76.380	-45.602	-32.602	-13.000	PEAK
7		19988.250	31.300	-76.510	-45.210	-32.210	-13.000	PEAK
8		22486.520	31.300	-78.140	-46.840	-33.840	-13.000	PEAK
9	*	24986.200	31.300	-76.190	-44.890	-31.890	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2011/12/30 - 17:02
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - HORIZONTAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2593MHz, Mode 2: Transmit (7MHz BW_QPSK-3/4)

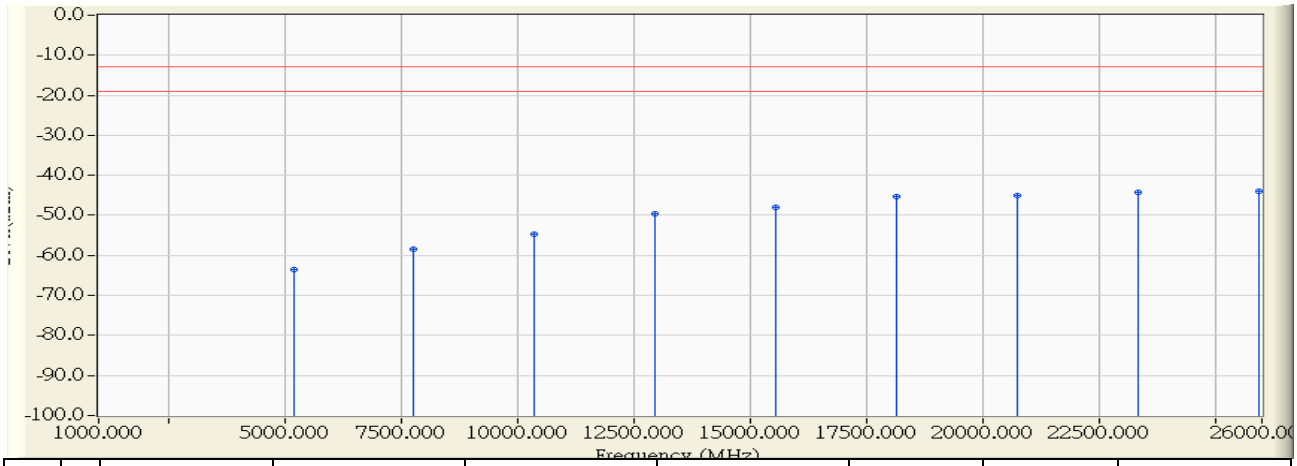


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5185.810	15.047	-79.030	-63.984	-50.984	-13.000	PEAK
2		7778.110	20.610	-78.420	-57.810	-44.810	-13.000	PEAK
3		10370.750	22.728	-78.247	-55.518	-42.518	-13.000	PEAK
4		12962.380	28.118	-79.130	-51.013	-38.013	-13.000	PEAK
5		15555.300	27.353	-75.800	-48.447	-35.447	-13.000	PEAK
6		18147.612	31.900	-76.980	-45.080	-32.080	-13.000	PEAK
7		20739.720	31.900	-76.640	-44.740	-31.740	-13.000	PEAK
8		23332.750	31.900	-76.880	-44.980	-31.980	-13.000	PEAK
9	*	25925.280	31.900	-75.610	-43.710	-30.710	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2011/12/30 - 17:00
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - VERTICAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2593MHz, Mode 2: Transmit (7MHz BW_QPSK-3/4)

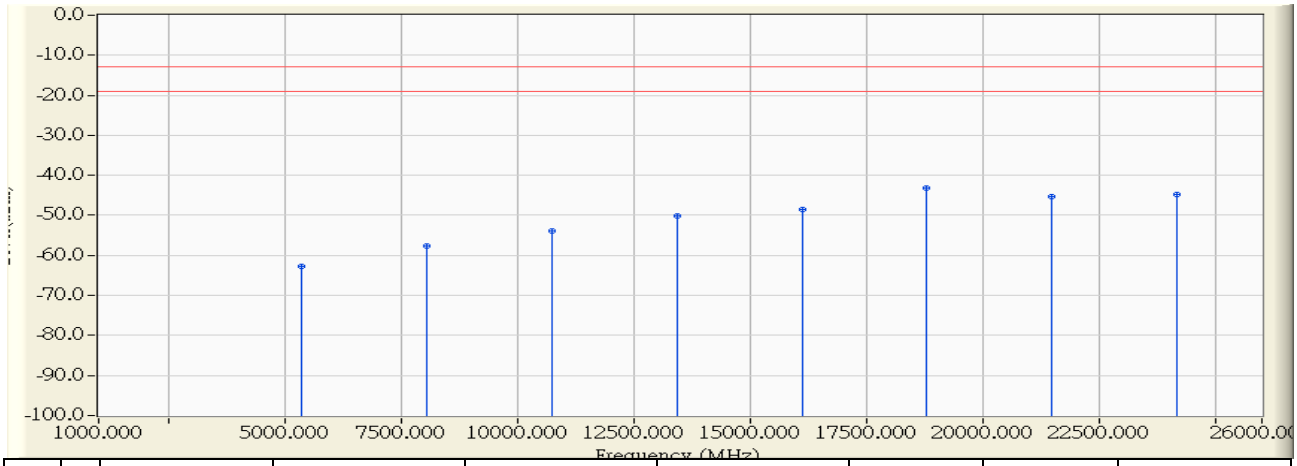


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5184.880	14.487	-78.030	-63.543	-50.543	-13.000	PEAK
2		7777.580	20.202	-78.520	-58.319	-45.319	-13.000	PEAK
3		10369.880	22.952	-77.600	-54.648	-41.648	-13.000	PEAK
4		12962.970	27.900	-77.400	-49.500	-36.500	-13.000	PEAK
5		15556.200	27.092	-75.030	-47.937	-34.937	-13.000	PEAK
6		18147.240	31.300	-76.730	-45.430	-32.430	-13.000	PEAK
7		20740.420	31.300	-76.210	-44.910	-31.910	-13.000	PEAK
8		23332.380	31.300	-75.590	-44.290	-31.290	-13.000	PEAK
9	*	25925.280	31.300	-75.180	-43.880	-30.880	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2011/12/30 - 17:09
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - HORIZONTAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2686.5MHz, Mode 2: Transmit (7MHz BW_QPSK-3/4)

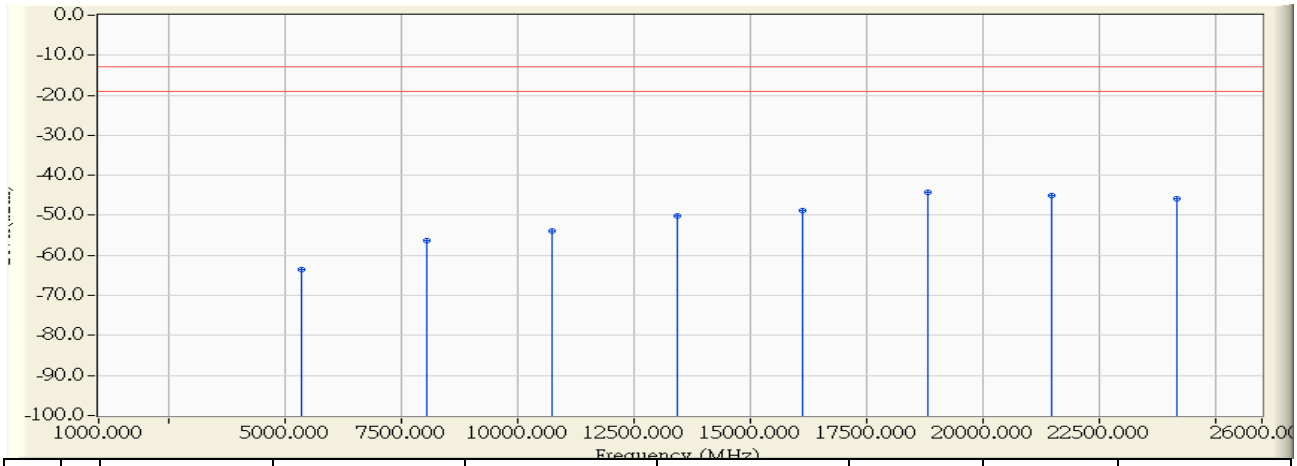


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5373.750	15.305	-78.170	-62.864	-49.864	-13.000	PEAK
2		8060.030	20.737	-78.300	-57.563	-44.563	-13.000	PEAK
3		10745.740	24.273	-78.130	-53.857	-40.857	-13.000	PEAK
4		13432.300	29.470	-79.730	-50.260	-37.260	-13.000	PEAK
5		16119.360	27.814	-76.300	-48.487	-35.487	-13.000	PEAK
6	*	18803.930	31.900	-75.160	-43.260	-30.260	-13.000	PEAK
7		21492.700	31.900	-77.150	-45.250	-32.250	-13.000	PEAK
8		24177.720	31.900	-76.780	-44.880	-31.880	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2011/12/30 - 17:07
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - VERTICAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2686.5MHz, Mode 2: Transmit (7MHz BW_QPSK-3/4)

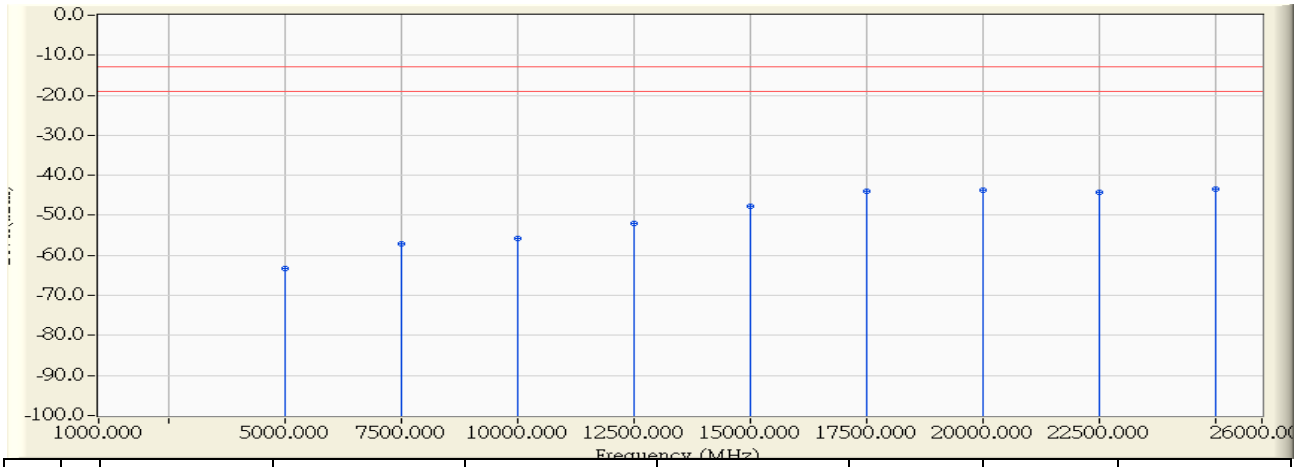


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5373.840	14.668	-78.130	-63.461	-50.461	-13.000	PEAK
2		8060.590	20.335	-76.600	-56.265	-43.265	-13.000	PEAK
3		10746.810	24.230	-78.210	-53.981	-40.981	-13.000	PEAK
4		13433.110	29.217	-79.460	-50.243	-37.243	-13.000	PEAK
5		16119.950	27.919	-76.800	-48.881	-35.881	-13.000	PEAK
6	*	18805.520	31.300	-75.660	-44.360	-31.360	-13.000	PEAK
7		21493.140	31.300	-76.420	-45.120	-32.120	-13.000	PEAK
8		24178.100	31.300	-77.170	-45.870	-32.870	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2011/12/30 - 16:28
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - HORIZONTAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2501MHz, Mode 3: Transmit (10MHz BW_64QAM-2/3)

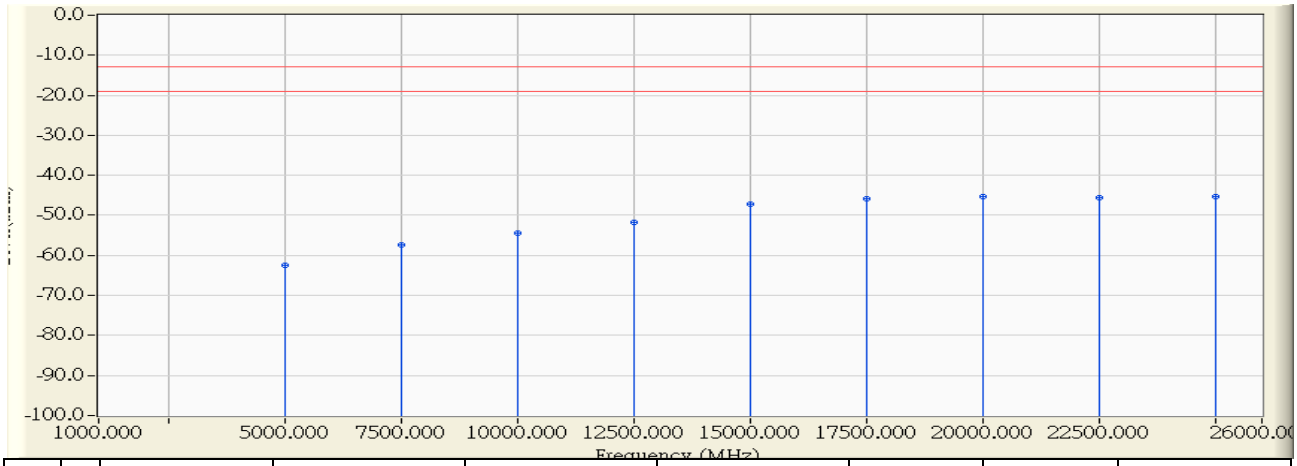


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5000.280	14.785	-78.040	-63.256	-50.256	-13.000	PEAK
2		7498.960	20.456	-77.650	-57.194	-44.194	-13.000	PEAK
3		10000.840	21.958	-77.760	-55.802	-42.802	-13.000	PEAK
4		12501.080	27.218	-79.100	-51.882	-38.882	-13.000	PEAK
5		15000.320	28.420	-76.020	-47.601	-34.601	-13.000	PEAK
6		17499.320	31.494	-75.370	-43.876	-30.876	-13.000	PEAK
7		19999.300	31.900	-75.540	-43.640	-30.640	-13.000	PEAK
8		22503.320	31.900	-76.020	-44.120	-31.120	-13.000	PEAK
9	*	25000.480	31.900	-75.450	-43.550	-30.550	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2011/12/30 - 16:26
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - VERTICAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2501MHz, Mode 3: Transmit (10MHz BW_64QAM-2/3)

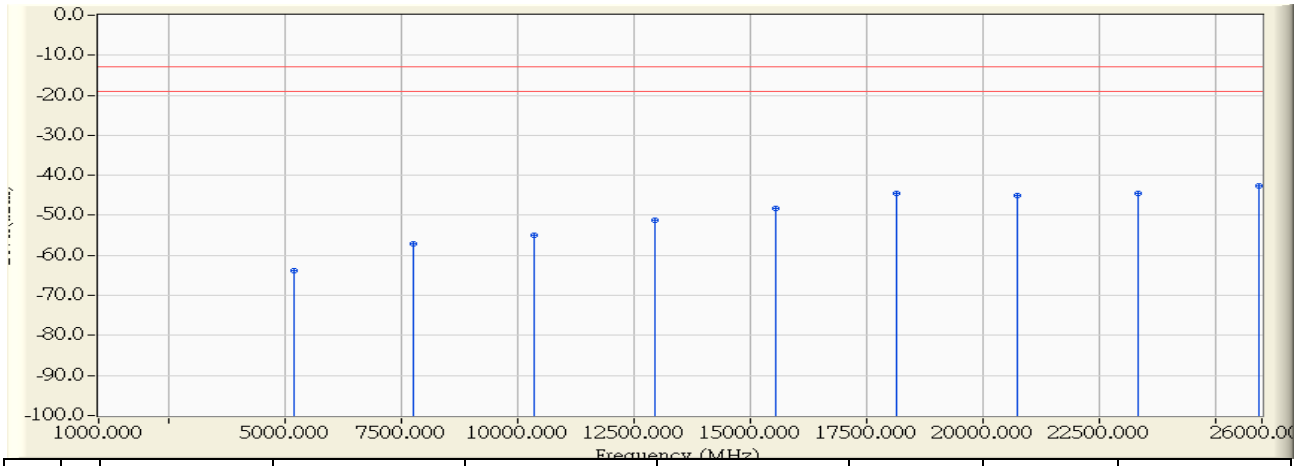


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5000.480	14.304	-76.800	-62.496	-49.496	-13.000	PEAK
2		7499.040	20.175	-77.470	-57.296	-44.296	-13.000	PEAK
3		9999.600	22.730	-77.180	-54.451	-41.451	-13.000	PEAK
4		12501.760	27.019	-78.850	-51.831	-38.831	-13.000	PEAK
5		15000.200	27.727	-75.020	-47.293	-34.293	-13.000	PEAK
6		17500.240	30.796	-76.610	-45.814	-32.814	-13.000	PEAK
7		20002.480	31.300	-76.600	-45.300	-32.300	-13.000	PEAK
8		22498.480	31.300	-76.880	-45.580	-32.580	-13.000	PEAK
9	*	25000.720	31.300	-76.530	-45.230	-32.230	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2011/12/30 - 16:36
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - HORIZONTAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2593MHz, Mode 3: Transmit (10MHz BW_64QAM-2/3)

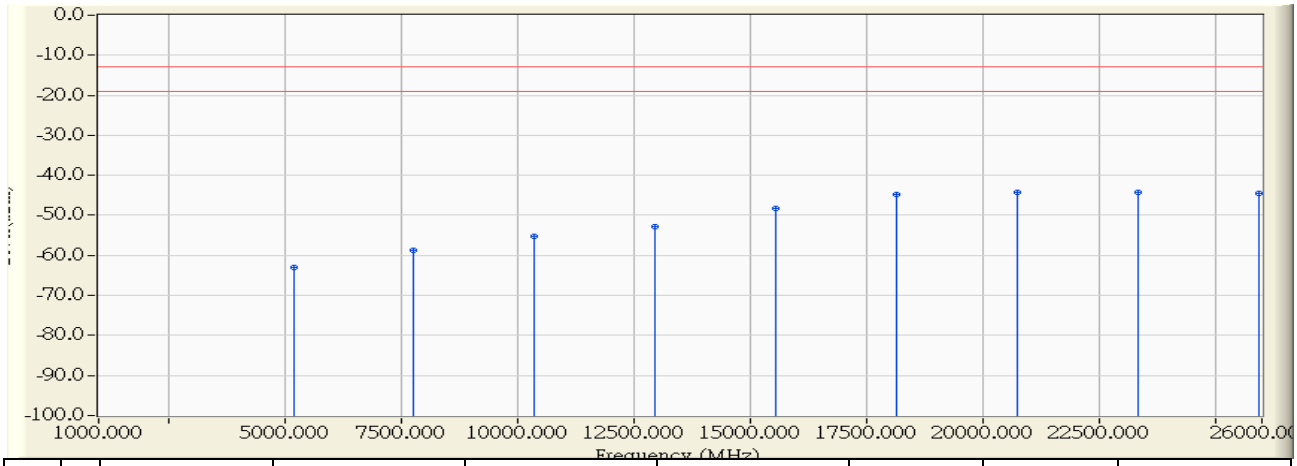


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5184.560	15.045	-78.960	-63.915	-50.915	-13.000	PEAK
2		7777.740	20.610	-77.710	-57.100	-44.100	-13.000	PEAK
3		10369.720	22.726	-77.770	-55.044	-42.044	-13.000	PEAK
4		12961.940	28.116	-79.300	-51.184	-38.184	-13.000	PEAK
5		15554.720	27.353	-75.530	-48.177	-35.177	-13.000	PEAK
6		18147.700	31.900	-76.330	-44.430	-31.430	-13.000	PEAK
7		20740.640	31.900	-76.810	-44.910	-31.910	-13.000	PEAK
8		23333.580	31.900	-76.360	-44.460	-31.460	-13.000	PEAK
9	*	25925.120	31.900	-74.610	-42.710	-29.710	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2011/12/30 - 16:32
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - VERTICAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2593MHz, Mode 3: Transmit (10MHz BW_64QAM-2/3)

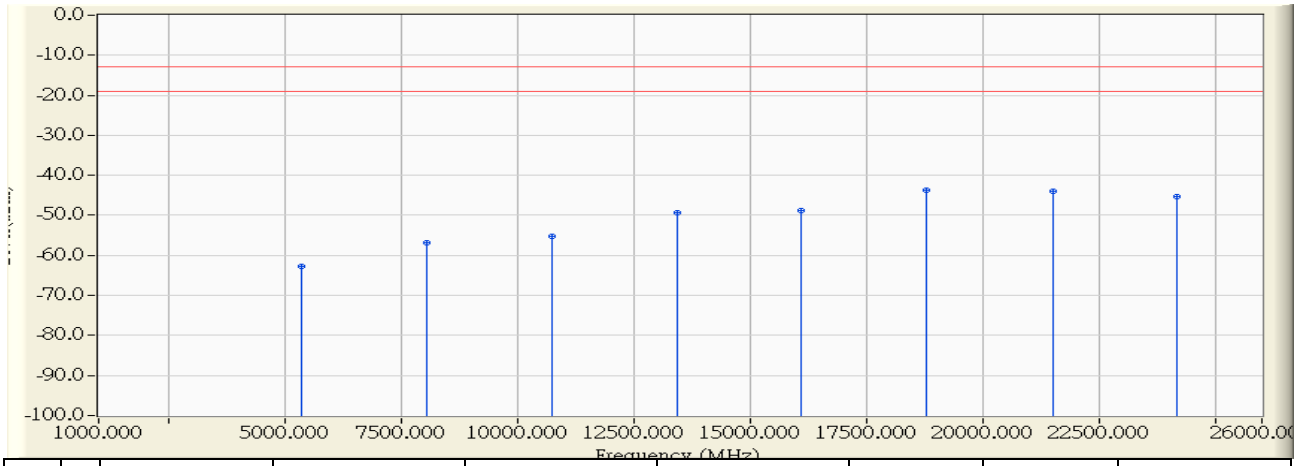


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5187.240	14.491	-77.380	-62.890	-49.890	-13.000	PEAK
2		7777.940	20.201	-78.840	-58.639	-45.639	-13.000	PEAK
3		10371.880	22.953	-78.250	-55.297	-42.297	-13.000	PEAK
4		12962.460	27.899	-80.780	-52.881	-39.881	-13.000	PEAK
5		15556.880	27.093	-75.380	-48.286	-35.286	-13.000	PEAK
6		18146.580	31.300	-76.120	-44.820	-31.820	-13.000	PEAK
7		20741.000	31.300	-75.610	-44.310	-31.310	-13.000	PEAK
8	*	23332.580	31.300	-75.500	-44.200	-31.200	-13.000	PEAK
9		25927.080	31.300	-75.690	-44.390	-31.390	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2011/12/30 - 16:45
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - HORIZONTAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2685MHz, Mode 3: Transmit (10MHz BW_64QAM-2/3)

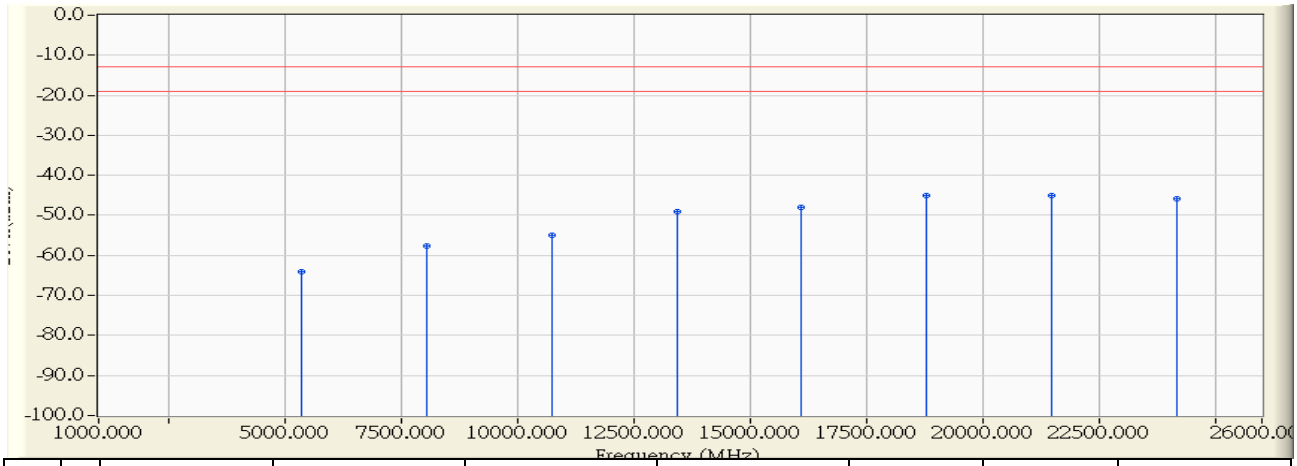


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5373.160	15.305	-77.970	-62.665	-49.665	-13.000	PEAK
2		8056.920	20.736	-77.590	-56.853	-43.853	-13.000	PEAK
3		10740.640	24.246	-79.470	-55.223	-42.223	-13.000	PEAK
4		13428.200	29.457	-78.860	-49.403	-36.403	-13.000	PEAK
5		16108.760	27.796	-76.470	-48.674	-35.674	-13.000	PEAK
6	*	18795.200	31.900	-75.600	-43.700	-30.700	-13.000	PEAK
7		21499.520	31.900	-75.930	-44.030	-31.030	-13.000	PEAK
8		24161.880	31.900	-77.160	-45.260	-32.260	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

Site : CB1	Time : 2011/12/30 - 16:43
Limit : PART90(WiMAX)_00M_PK	Margin : 6
Probe : CB1_CE_Sub_1-18G(2011-08) - VERTICAL	Power : AC 120V/60Hz
EUT : CPE 2.5GHz Outdoor	Note : TX-2685MHz, Mode 3: Transmit (10MHz BW_64QAM-2/3)



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1		5370.400	14.665	-78.660	-63.994	-50.994	-13.000	PEAK
2		8055.280	20.324	-77.940	-57.616	-44.616	-13.000	PEAK
3		10740.680	24.199	-79.260	-55.060	-42.060	-13.000	PEAK
4		13427.440	29.201	-78.170	-48.969	-35.969	-13.000	PEAK
5		16108.880	27.896	-75.780	-47.884	-34.884	-13.000	PEAK
6		18794.840	31.300	-76.350	-45.050	-32.050	-13.000	PEAK
7	*	21480.120	31.300	-76.280	-44.980	-31.980	-13.000	PEAK
8		24164.240	31.300	-77.170	-45.870	-32.870	-13.000	PEAK

Note:

1. All Reading Levels are Peak value.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. " * ", means this data is the worst emission level.
4. Measured Level= Reading Level + Correct Factor.

7. Frequency Stability Over Temperatures Variation

7.1. Test Equipment

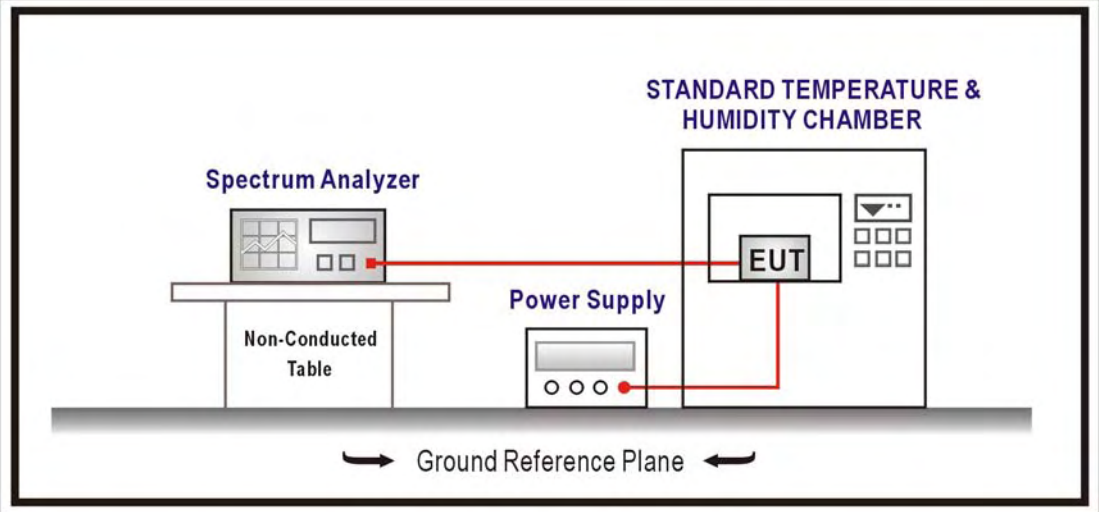
The following test equipments are used during the test:

Frequency Stability Over Temperatures Variation/ SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A	US47140172	2013/07/31
Standard Temperature & Humidity Chamber	WIT	TH-1S-B	1082101	2014/01/27

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

7.2. Test Setup



7.3. Limits

The frequency stability shall be measured with variation of ambient temperature as follows: From -30° to +50° centigrade for all equipment. Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range.

The test results should be within +/- 2.5ppm of the nominal frequency.

7.4. Test Procedure

Power must be turned off when changing from one temperature to another. Power warm up is at least 15 min and power applied should perform before recording frequency error. The temperature range step is 10 degrees in this test items. All temperature levels shall be holding the ± 0.5℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

7.5. Uncertainty

The measurement uncertainty is defined as ±10KHz

7.6. Test Result

Product	CPE 2.5GHz Outdoor		
Test Item	Frequency Stability Over Temperatures Variation		
Test Mode	Mode 1: Transmit_Carrier Signal		
Date of Test	2011/12/30	Test Site	SR7

2498.5 MHz

Temperature(°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-30	120	2498.494	-2.4014	Pass
-20		2498.494	-2.4014	Pass
-10		2498.495	-2.0012	Pass
0		2498.494	-2.4014	Pass
10		2498.494	-2.4014	Pass
20		2498.494	-2.4014	Pass
30		2498.495	-2.0012	Pass
40		2498.494	-2.4014	Pass
50		2498.494	-2.4014	Pass

2593 MHz

Temperature(°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-30	120	2592.994	-2.3139	Pass
-20		2592.994	-2.3139	Pass
-10		2592.994	-2.3139	Pass
0		2592.995	-1.9283	Pass
10		2592.995	-1.9283	Pass
20		2592.994	-2.3139	Pass
30		2592.994	-2.3139	Pass
40		2592.995	-1.9283	Pass
50		2592.995	-1.9283	Pass

2687.5 MHz

Temperature(°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-30	120	2687.495	-1.8605	Pass
-20		2687.496	-1.4884	Pass
-10		2687.496	-1.4884	Pass
0		2687.495	-1.8605	Pass
10		2687.496	-1.4884	Pass
20		2687.496	-1.4884	Pass
30		2687.495	-1.8605	Pass
40		2687.496	-1.4884	Pass
50		2687.496	-1.4884	Pass

Product	CPE 2.5GHz Outdoor		
Test Item	Frequency Stability Over Temperatures Variation		
Test Mode	Mode 2: Transmit_Carrier Signal		
Date of Test	2011/12/30	Test Site	SR7

2499.5 MHz

Temperature(°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-30	120	2499.496	-1.6003	Pass
-20		2499.496	-1.6003	Pass
-10		2499.496	-1.6003	Pass
0		2499.495	-2.0004	Pass
10		2499.496	-1.6003	Pass
20		2499.496	-1.6003	Pass
30		2499.495	-2.0004	Pass
40		2499.496	-1.6003	Pass
50		2499.496	-1.6003	Pass

2593 MHz

Temperature(°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-30	120	2592.995	-1.9283	Pass
-20		2592.995	-1.9283	Pass
-10		2592.994	-2.3139	Pass
0		2592.995	-1.9283	Pass
10		2592.995	-1.9283	Pass
20		2592.994	-2.3139	Pass
30		2592.994	-2.3139	Pass
40		2592.995	-1.9283	Pass
50		2592.995	-1.9283	Pass

2686.5 MHz

Temperature(°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-30	120	2686.495	-1.8612	Pass
-20		2686.495	-1.8612	Pass
-10		2686.496	-1.4889	Pass
0		2686.495	-1.8612	Pass
10		2686.495	-1.8612	Pass
20		2686.495	-1.8612	Pass
30		2686.495	-1.8612	Pass
40		2686.495	-1.8612	Pass
50		2686.495	-1.8612	Pass

Product	CPE 2.5GHz Outdoor		
Test Item	Frequency Stability Over Temperatures Variation		
Test Mode	Mode 3: Transmit_Carrier Signal		
Date of Test	2011/12/30	Test Site	SR7

2501 MHz

Temperature(°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-30	120	2500.994	-2.3990	Pass
-20		2500.994	-2.3990	Pass
-10		2500.995	-1.9992	Pass
0		2500.994	-2.3990	Pass
10		2500.995	-1.9992	Pass
20		2500.994	-2.3990	Pass
30		2500.994	-2.3990	Pass
40		2500.994	-2.3990	Pass
50		2500.994	-2.3990	Pass

2593 MHz

Temperature(°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-30	120	2592.995	-1.9283	Pass
-20		2592.995	-1.9283	Pass
-10		2592.995	-1.9283	Pass
0		2592.994	-2.3139	Pass
10		2592.995	-1.9283	Pass
20		2592.994	-2.3139	Pass
30		2592.995	-1.9283	Pass
40		2592.995	-1.9283	Pass
50		2592.995	-1.9283	Pass

2685 MHz

Temperature(°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-30	120	2684.995	-1.8622	Pass
-20		2684.995	-1.8622	Pass
-10		2684.996	-1.4898	Pass
0		2684.995	-1.8622	Pass
10		2684.995	-1.8622	Pass
20		2684.995	-1.8622	Pass
30		2684.995	-1.8622	Pass
40		2684.995	-1.8622	Pass
50		2684.995	-1.8622	Pass

8. Frequency Stability Over Voltage Variation

8.1. Test Equipment

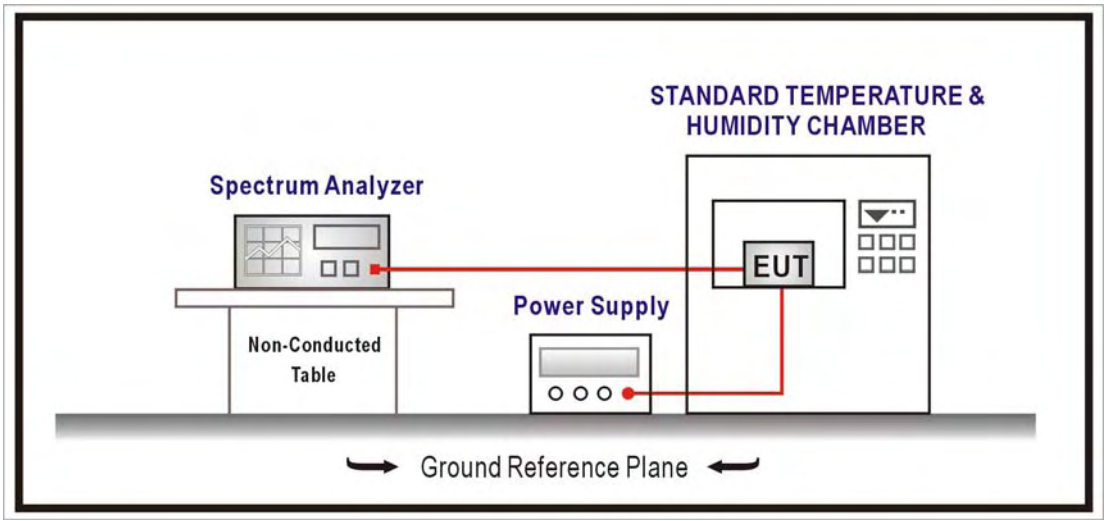
The following test equipments are used during the test:

Frequency Stability Over Temperatures Variation/ SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A	US47140172	2013/07/31
Standard Temperature & Humidity Chamber	WIT	TH-1S-B	1082101	2014/01/27

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

8.2. Test Setup



8.3. Limits

The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

(3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

The test results should be within +/- 2.5ppm of the nominal frequency.

8.4. Test Procedure

Power must be removed when changing from one voltage to another voltage. Power warm up is at least 15 min and power applied should perform before recording frequency error.

EUT is connected the external power supply to control the AC input power. The various Volts set from the minimum 102 Volts to138 Volts. Each step shall be record the frequency error rate.

8.5. Uncertainty

The measurement uncertainty is defined as ±10kHz.

8.6. Test Result

Product	CPE 2.5GHz Outdoor		
Test Item	Frequency Stability Over Voltage Variation		
Test Mode	Mode 1: Transmit_Carrier Signal		
Date of Test	2011/12/30	Test Site	SR7

2498.5 MHz				
Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	2498.496	-1.6010	Pass
	120	2498.495	-2.0012	Pass
	138	2498.496	-1.6010	Pass

2593 MHz				
Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	2592.996	-1.5426	Pass
	120	2592.996	-1.5426	Pass
	138	2592.996	-1.5426	Pass

2687.5 MHz				
Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	2687.495	-1.8605	Pass
	120	2687.496	-1.4884	Pass
	138	2687.496	-1.4884	Pass

Product	CPE 2.5GHz Outdoor		
Test Item	Frequency Stability Over Voltage Variation		
Test Mode	Mode 2: Transmit_Carrier Signal		
Date of Test	2011/12/30	Test Site	SR7

2499.5 MHz				
Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	2499.496	-1.6003	Pass
	120	2499.496	-1.6003	Pass
	138	2499.495	-2.0004	Pass

2593 MHz				
Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	2592.997	-1.1570	Pass
	120	2592.996	-1.5426	Pass
	138	2592.997	-1.1570	Pass

2686.5 MHz				
Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	2686.495	-1.8612	Pass
	120	2686.496	-1.4889	Pass
	138	2686.495	-1.8612	Pass

Product	CPE 2.5GHz Outdoor		
Test Item	Frequency Stability Over Voltage Variation		
Test Mode	Mode 3: Transmit_Carrier Signal		
Date of Test	2011/12/30	Test Site	SR7

2501 MHz				
Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	2500.994	-2.3990	Pass
	120	2500.994	-2.3990	Pass
	138	2500.994	-2.3990	Pass

2593 MHz				
Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	2592.994	-2.3139	Pass
	120	2592.995	-1.9283	Pass
	138	2592.995	-1.9283	Pass

2685 MHz				
Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	2684.995	-1.8622	Pass
	120	2684.995	-1.8622	Pass
	138	2684.995	-1.8622	Pass