

FCC RADIO TEST REPORT

according to

47 CFR FCC Part 27 M

Equipment : **Pocket PC Phone**
Model No. : **QUAR100**
Filing Type : **New Application**
Applicant : **HTC Corporation**
No. 23, Xinghua Rd., Taoyuan City, Taiwan
FCC ID : **NM8QUAR100**
Manufacturer : **HTC Corporation**
1F, No. 6-3, Baoqiang Rd, Xindian City, Taipei, Taiwan.
Received Date : Feb. 18, 2009
Final Test Date : Apr. 21, 2009

Statement

Test result included is only for the IEEE 802.16e part of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 27 Subpart M**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.



SPORTON International Inc.

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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History of This Test Report

Original Issue Date: Apr. 21, 2009

Report No.: FW920713

- No additional attachment.
- Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

according to

47 CFR FCC Part 27 M

Equipment : Pocket PC Phone
Model No. : QUAR100
Applicant : HTC Corporation
No. 23, Xinghua Rd., Taoyuan City, Taiwan

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Feb. 18, 2009 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.



Sam Lee / Supervisor

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 27 Subpart M				
Part	Rule Section	Description of Test	Result	Under Limit
3.1	27.50 / 2.1046	Max. Output Power & Band Edge Emissions	Complies	-
3.2	27.53 / 2.1049	Emissions Bandwidth	Complies	-
3.3	27.53 / 2.1051	Conducted Spurious Emissions	Complies	-
3.4	27.53 / 2.1053	Radiated Spurious Emissions	Complies	
3.5	27.54 / 2.1055	Frequency Stability	Complies	-

Test Items	Uncertainty	Remark
Maximum Conducted Output Power	±0.8dB	Confidence levels of 95%
Maximum EIRP Output Power	±2.1dB	Confidence levels of 95%
Emissions Bandwidth	±8.5×10 ⁻⁸	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

2. GENERAL INFORMATION

2.1. Product Details

EUT is a Pocket PC Phone with IEEE 802.16e radio function. Only the radio detail of WiMax is shown in the table below. For more detailed features description, please refer to the manufacturer’s specifications or user’s manual.

Items	Description
Modulation	OFDMA (QPSK / 16QAM)
Frequency Range	2496~2690 MHz
Channel BandWidth	10MHz
Conducted Power	10MHz : 21.25 dBm (QPSK) ; 10MHz : 21.36 dBm (16QAM)
EIRP Power	10MHz : 20.70 dBm (QPSK) ; 10MHz : 22.05 dBm (16QAM)
Emission Designator	10MHz: 9M2G7D (QPSK) ; 10MHz: 9M2W7D (16QAM)

2.2. Table for Filed Antenna

Ant.	Antenna Type	Connector	Gain (dBi)
1	Internal Antenna	Fixed	0.5

2.3. Table for Carrier Frequencies

Frequency Band	Channel	Frequency	BandWidth
2496~2690 MHz	Low Channel	2501 MHz	10MHz
	Middle Channel	2593 MHz	10MHz
	High Channel	2685 MHz	10MHz

2.4. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Antenna
Maximum Output Power	10MHz QPSK / 16QAM	NA
Band Edge Emissions	2501 MHz / 2593 MHz / 2685 MHz	
Occupied Emissions Bandwidth		
Conducted Spurious Emissions		
Band Edge Emissions	10MHz QPSK / 16QAM	NA
	2501 MHz / 2593 MHz / 2685 MHz	

2.5. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH03-HY	SAC	Hwa Ya	643075	IC 4086B-1	-
CO05-HY	Conduction	Hwa Ya	TW1022	IC 4086B-1	-
TH01-HY	OVEN Room	Hwa Ya	-	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

2.6. Table for Supporting Units

CO05-HY

Support Unit	Brand	Model	FCC ID
System Simulator	R&S	CMU200	N/A
BT Base Station	Anritus	8852B	N/A
WLAN AP	D-Link	DWL-7100AP	KA22003040018-1
BT Earphone	Nokia	BH-100	PYA1YH
GPS Station	T&E	GS-50	N/A

03CH03-HY

Support Unit	Brand	Model	FCC ID
WiMax Base Station (Remote Workstation)	Agilent	E6651	N/A

2.7. Table for Parameters of Test Software Setting

All measurement was only performed on “Normal Operating Condition”.

DUT’s modulation type (QPSK, 16QAM), DUT’s bandwidth 10MHz, worst DL: UL ratio (29:18) for SAR measurement had been controlled by WiMAX Base Station (Agilent E6651A).

WiMAX Base Station (Agilent E6651A) requires DUT to deliver the “maximum output power” during test.

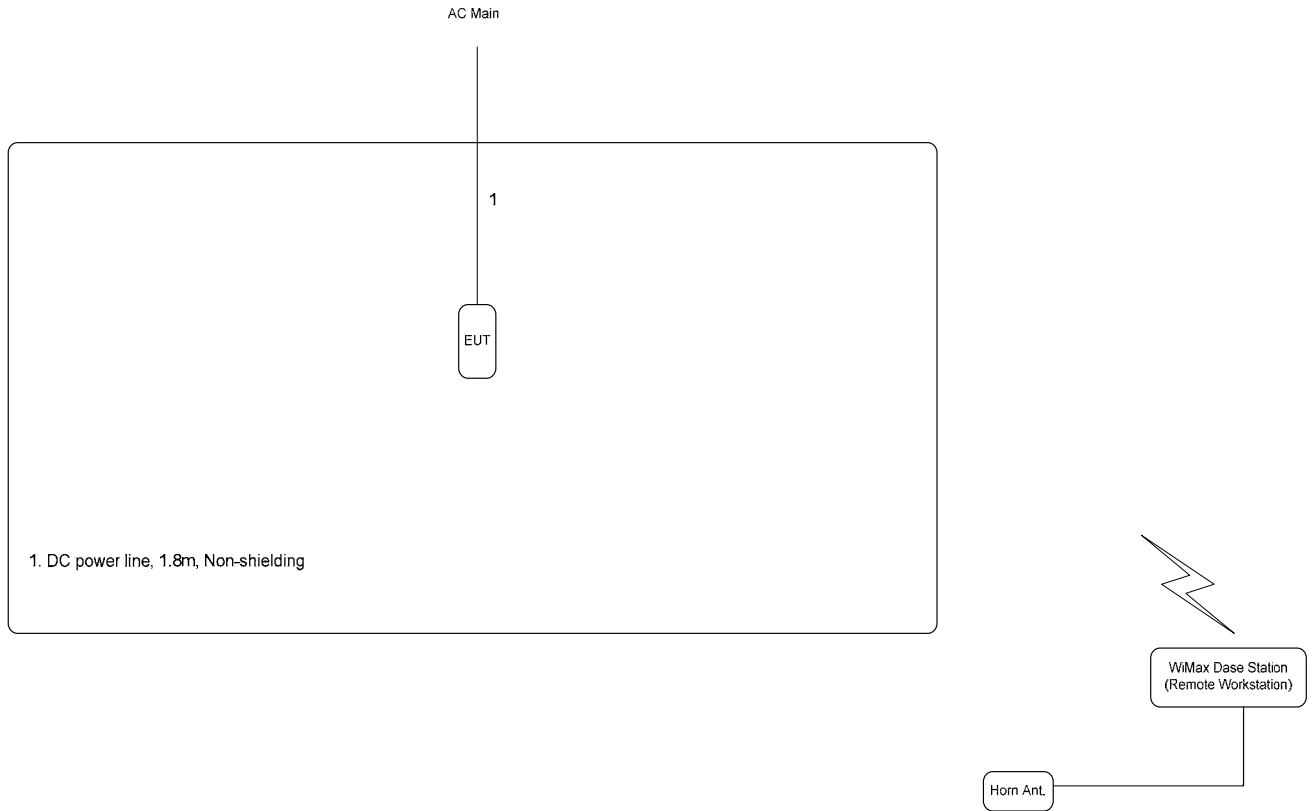
DUT is limited by firmware and the corresponding WiMAX system to operate at or below this maximum duty factor (DL/UL symbol ratio of 29:18). Therefore, the maximum transmission duty factor (DL/UL symbol ratio of 26:21) supported by this chipset is not applicable for this DUT.

Agilent BSE E6651A Tx Pwr Parameter

Bandwidth	10MHz		
	2501 MHz	2593 MHz	2685 MHz
QPSK	-1	-3	-2
16QAM	-1.5	-3	-2

2.8. Test Configurations

2.8.1. Radiation Emissions Test Configuration



3. TEST RESULT

3.1. Maximum Output Power & Band Edge Emissions Measurement

3.1.1. Limit

For mobile and other user stations, mobile stations are limited to 2.0 watts EIRP and all user stations are limited to 2.0 watts transmitter output power. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (p) by a factor of mobile digital stations, the attenuation factor shall be not less than $43 + 10 \log (P)$ dB at the channel edge and $55 + 10 \log (P)$ dB at 5.5 MHz from the channel edges.

3.1.2. Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	100 kHz
VB	300 kHz
Detector	rms
Trace	Max Hold
Sweep Time	1s

3.1.3. Test Procedures

Conducted Power and Band Edge Emissions Measurement

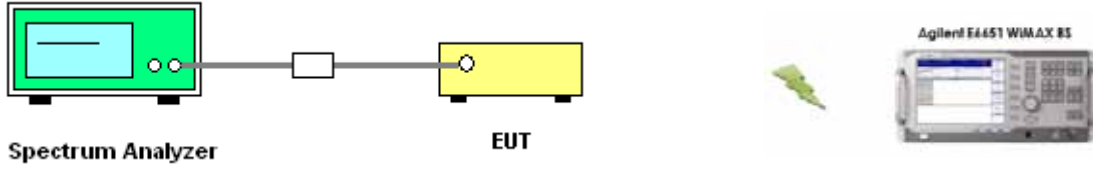
The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

EIRP Power Measurement

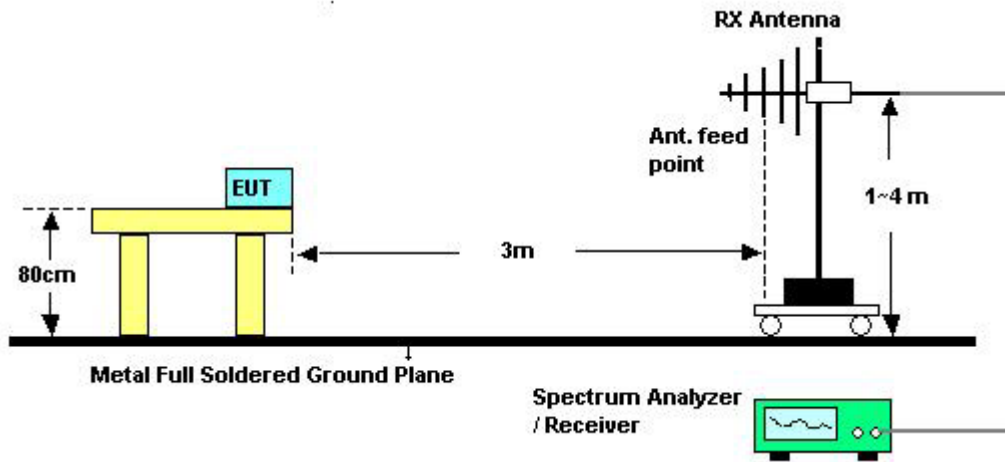
1. The EUT was placed on the top of the turntable in anechoic chamber.
2. The receiving Horn antenna was placed 0.8 meters far away from the turntable.
3. The test shall be made in the transmitting mode. The turntable was rotated by 360 degrees and the receiving antenna scanned from 1-4m in order to capture the maximum power emission. Recorded suspected value is indicated as Read Level (Raw).
4. Replace the EUT by standard antenna and feed the RF port by signal generator.
5. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.
6. Adjust the power level (B) of the signal generator to reach the same reading with Read Level (Raw).
7. The power level (B) plus the gain of the standard antenna in dBi and the cable loss used between the signal generator and the standard antenna.

3.1.4. Test Setup Layout

Conducted Power and Band Edge Emissions Measurement



EIRP Power Measurement



3.1.5. Test Deviation

There is no deviation with the original standard.

3.1.6. Test Result of Maximum EIRP Output Power

Final Test date	Feb. 20, 2009	Test Site No.	03CH03-HT
Temperature	28	Humidity	58%
Test Engineer	Tom	Configurations	802.16e

Configuration 10MHz / QPSK

Channel	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
Low Channel	-19.77	40.20	20.43	33 dBm
Middle Channel	-19.50	40.20	20.70	33 dBm
High Channel	-19.70	40.20	20.50	33 dBm

Factor=Cable Loss + Antenna Gain

EIRP=SG Level + Cable Loss + Antenna Gain

Configuration 10MHz / 16QAM

Channel	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
Low Channel	-18.10	40.20	22.05	33 dBm
Middle Channel	-18.33	40.20	21.87	33 dBm
High Channel	-19.87	40.20	20.33	33 dBm

Factor=Cable Loss + Antenna Gain

EIRP=SG Level + Cable Loss + Antenna Gain

3.1.7. Test Result of Maximum Conducted Output Power & Band Edge Emissions

Final Test date	Feb. 18, 2009	Test Site No.	TH01-HY
Temperature	28	Humidity	58%
Test Engineer	Tom	Configurations	802.16e

Configuration 10MHz / QPSK

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
Low Channel	2501 MHz	20.69	33 dBm	Complies
Middle Channel	2593 MHz	21.25	33 dBm	Complies
High Channel	2685 MHz	20.89	33 dBm	Complies

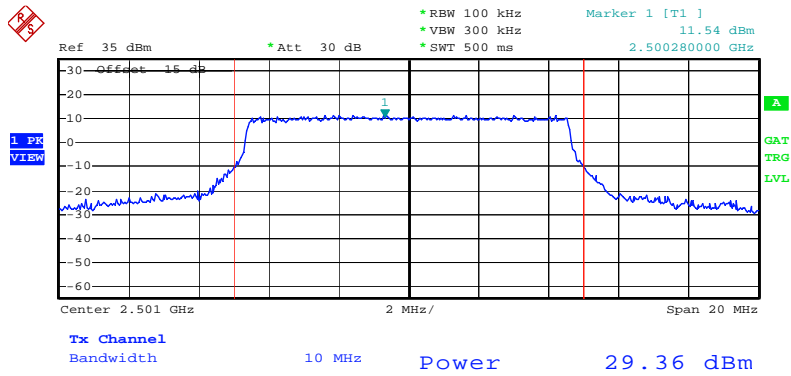
Channel Band-width (MHz)	Frequency	Conducted Power (dBm)		Peak-to-Average Ratio
		Peak	Average	
10	2501 MHz	29.36	20.69	8.67
	2593 MHz	29.98	21.25	8.73
	2685 MHz	29.61	20.89	8.72

Configuration 10MHz / 16QAM

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
Low Channel	2501 MHz	20.73	33 dBm	Complies
Middle Channel	2593 MHz	21.36	33 dBm	Complies
High Channel	2685 MHz	21.00	33 dBm	Complies

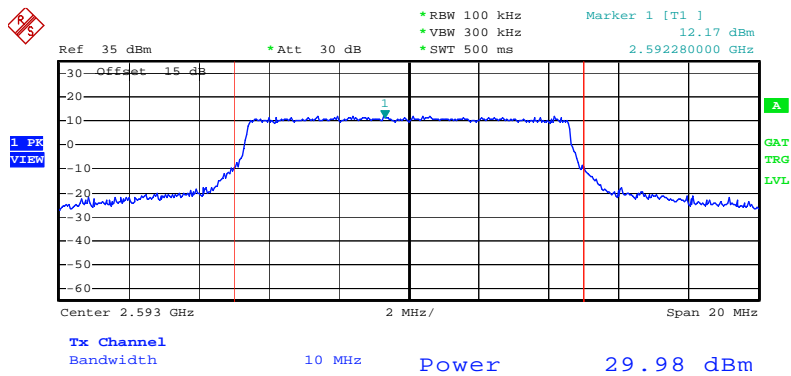
Channel Band-width (MHz)	Frequency	Conducted Power (dBm)		Peak-to-Average Ratio
		Peak	Average	
10	2501 MHz	29.26	20.73	8.53
	2593 MHz	30.09	21.36	8.73
	2685 MHz	29.72	21.00	8.72

Configuration 10MHz / QPSK / 2501 MHz Peak



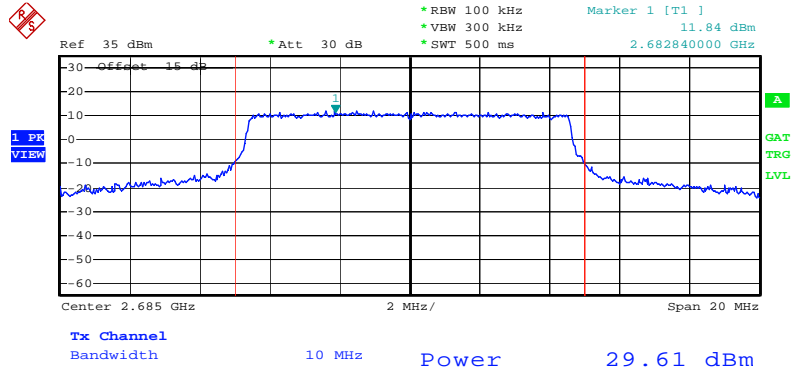
Date: 18.FEB.2009 15:29:15

Configuration 10MHz / QPSK / 2593 MHz Peak



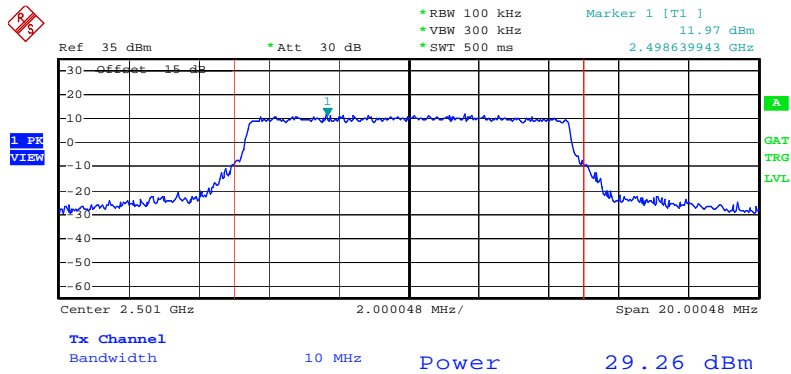
Date: 18.FEB.2009 15:30:55

Configuration 10MHz / QPSK / 2685 MHz Peak



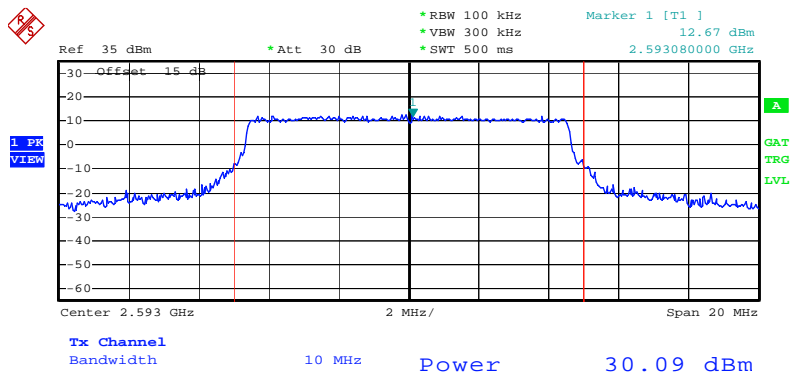
Date: 18.FEB.2009 15:05:23

Configuration 10MHz / 16QAM / 2501 MHz Peak



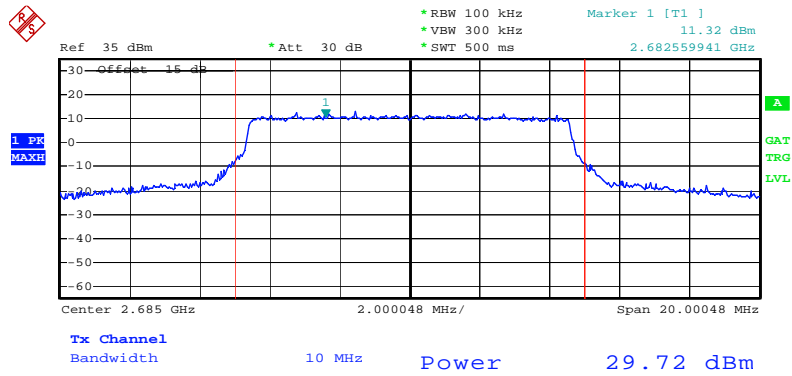
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Configuration 10MHz / 16QAM / 2593 MHz Peak



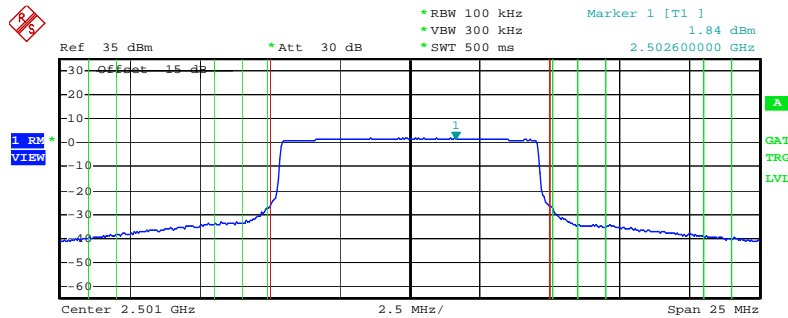
Date: 18.FEB.2009 16:00:24

Configuration 10MHz / 16QAM / 2685 MHz Peak



Date: 18.FEB.2009 14:30:46

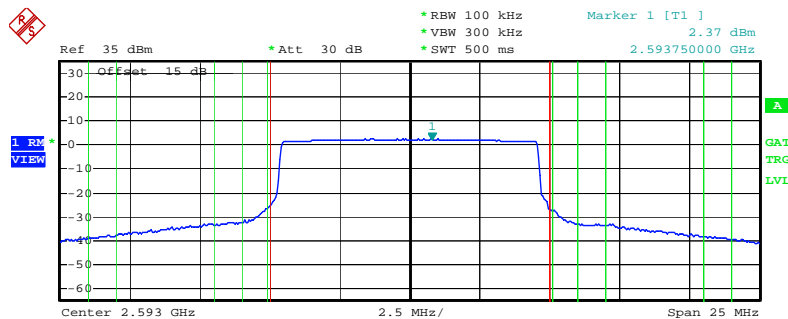
Configuration 10MHz / QPSK / 2501 MHz Average



Tx Channel	Bandwidth	10 MHz	Power	20.69 dBm	
Adjacent Channel	Bandwidth	100 kHz	Lower	-27.56 dBm	Bandedge limit: -13dBm
	Spacing	5.05 MHz	Upper	-27.36 dBm	
Alternate Channel	Bandwidth	1 MHz	Lower	-24.05 dBm	Bandedge limit: -13dBm
	Spacing	6.5 MHz	Upper	-25.14 dBm	
2nd Alternate Channel	Bandwidth	1 MHz	Lower	-29.55 dBm	Bandedge limit: -25dBm
	Spacing	11 MHz	Upper	-30.03 dBm	

Date: 18.FEB.2009 13:25:11

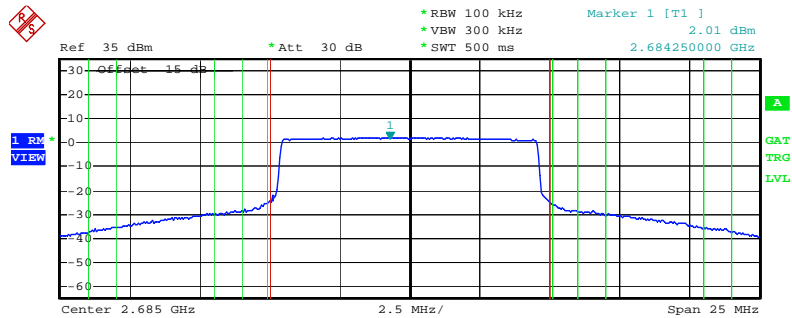
Configuration 10MHz / QPSK / 2593 MHz Average



Tx Channel	Bandwidth	10 MHz	Power	21.25 dBm	
Adjacent Channel	Bandwidth	100 kHz	Lower	-26.52 dBm	Bandedge limit: -13dBm
	Spacing	5.05 MHz	Upper	-27.04 dBm	
Alternate Channel	Bandwidth	1 MHz	Lower	-23.29 dBm	Bandedge limit: -13dBm
	Spacing	6.5 MHz	Upper	-23.84 dBm	
2nd Alternate Channel	Bandwidth	1 MHz	Lower	-28.78 dBm	Bandedge limit: -25dBm
	Spacing	11 MHz	Upper	-29.22 dBm	

Date: 18.FEB.2009 13:23:11

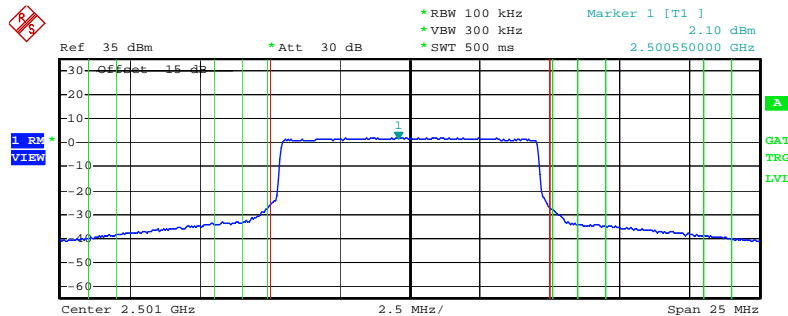
Configuration 10MHz / QPSK / 2685 MHz Average



Tx Channel		Bandwidth	10 MHz	Power	20.89 dBm
Adjacent Channel		Bandwidth	100 kHz	Lower	-25.34 dBm
	Spacing	5.05 MHz	Upper	-25.45 dBm	Bandedge limit: -13dBm
Alternate Channel		Bandwidth	1 MHz	Lower	-19.63 dBm
	Spacing	6.5 MHz	Upper	-19.66 dBm	Bandedge limit: -13dBm
2nd Alternate Channel		Bandwidth	1 MHz	Lower	-26.65 dBm
	Spacing	11 MHz	Upper	-26.65 dBm	Bandedge limit: -25dBm

Date: 18.FEB.2009 13:20:47

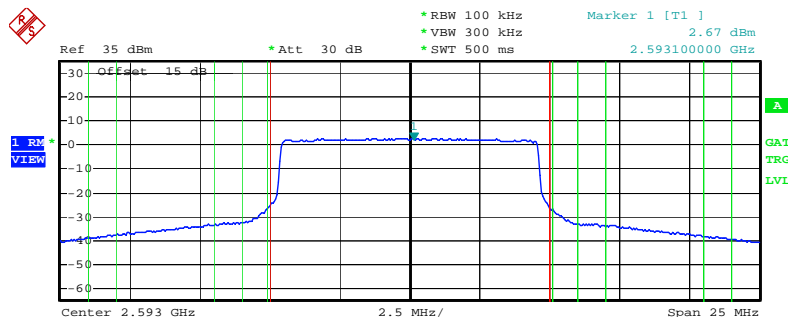
Configuration 10MHz / 16QAM / 2501 MHz Average



Tx Channel	Bandwidth	10 MHz	Power	20.73 dBm	
Adjacent Channel	Bandwidth	100 kHz	Lower	-27.33 dBm	Bandedge limit: -13dBm
	Spacing	5.05 MHz	Upper	-27.86 dBm	
Alternate Channel	Bandwidth	1 MHz	Lower	-24.03 dBm	Bandedge limit: -13dBm
	Spacing	6.5 MHz	Upper	-24.98 dBm	
2nd Alternate Channel	Bandwidth	1 MHz	Lower	-29.57 dBm	Bandedge limit: -25dBm
	Spacing	11 MHz	Upper	-29.87 dBm	

Date: 18.FEB.2009 14:17:19

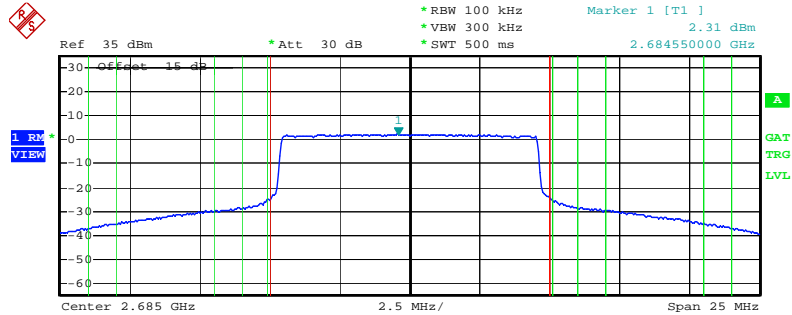
Configuration 10MHz / 16QAM / 2593 MHz Average



Tx Channel	Bandwidth	10 MHz	Power	21.36 dBm	
Adjacent Channel	Bandwidth	100 kHz	Lower	-26.36 dBm	Bandedge limit: -13dBm
	Spacing	5.05 MHz	Upper	-26.94 dBm	
Alternate Channel	Bandwidth	1 MHz	Lower	-23.29 dBm	Bandedge limit: -13dBm
	Spacing	6.5 MHz	Upper	-23.71 dBm	
2nd Alternate Channel	Bandwidth	1 MHz	Lower	-28.72 dBm	Bandedge limit: -25dBm
	Spacing	11 MHz	Upper	-29.21 dBm	

Date: 18.FEB.2009 14:19:38

Configuration 10MHz / 16QAM / 2685 MHz Average



Tx Channel	Bandwidth	10 MHz	Power	21.00 dBm	
Adjacent Channel	Bandwidth	100 kHz	Lower	-25.36 dBm	Bandedge limit: -13dBm
	Spacing	5.05 MHz	Upper	-25.15 dBm	
Alternate Channel	Bandwidth	1 MHz	Lower	-19.67 dBm	Bandedge limit: -13dBm
	Spacing	6.5 MHz	Upper	-19.54 dBm	
2nd Alternate Channel	Bandwidth	1 MHz	Lower	-26.38 dBm	Bandedge limit: -25dBm
	Spacing	11 MHz	Upper	-26.44 dBm	

Date: 18.FEB.2009 14:23:05

3.2. Emissions Bandwidth Measurement

3.2.1. Limit

The 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. The designated emission bandwidth using a resolution bandwidth of at least 1% of the emission bandwidth of the fundamental emission and a video bandwidth is more than resolution bandwidth.

3.2.2. Measuring Instruments and Setting

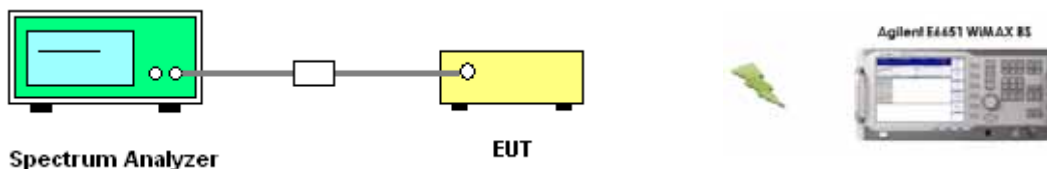
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	100 kHz
VB	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.2.3. Test Procedures

1. The EUT transmitter was connected to a spectrum analyzer through an appropriate 50 ohm attenuator. Measure the 99% occupied bandwidth and 26dB down of the fundamental emission bandwidth.
2. The reference level for the mask was set using the highest transmit power of the fundamental emission measured across the channel bandwidth using a RBW of at least 1% of the emission bandwidth of the fundamental emission and a video bandwidth is more than resolution bandwidth.

3.2.4. Test Setup Layout



3.2.5. Test Deviation

There is no deviation with the original standard.

3.2.6. Test Result of Power Spectral Density

Final Test date	Apr. 20, 2009	Test Site No.	TH01-HY
Temperature	28	Humidity	58%
Test Engineer	Tom	Configurations	802.16e

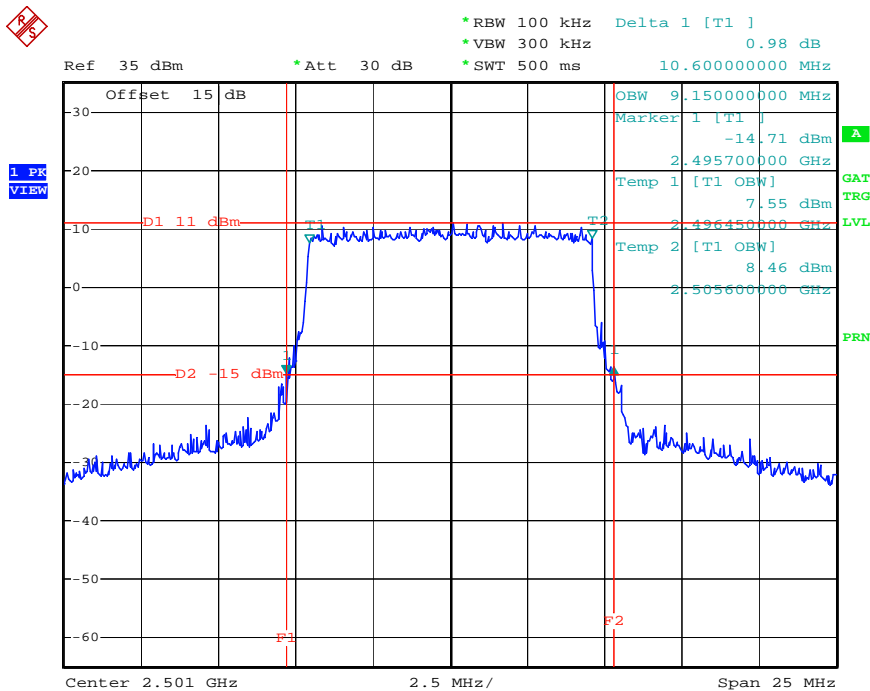
Configuration 10MHz / QPSK

Channel	Frequency	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low Channel	2501 MHz	10.60	9.15
Middle Channel	2593 MHz	10.55	9.15
High Channel	2685 MHz	11.10	9.20

Configuration 10MHz / 16QAM

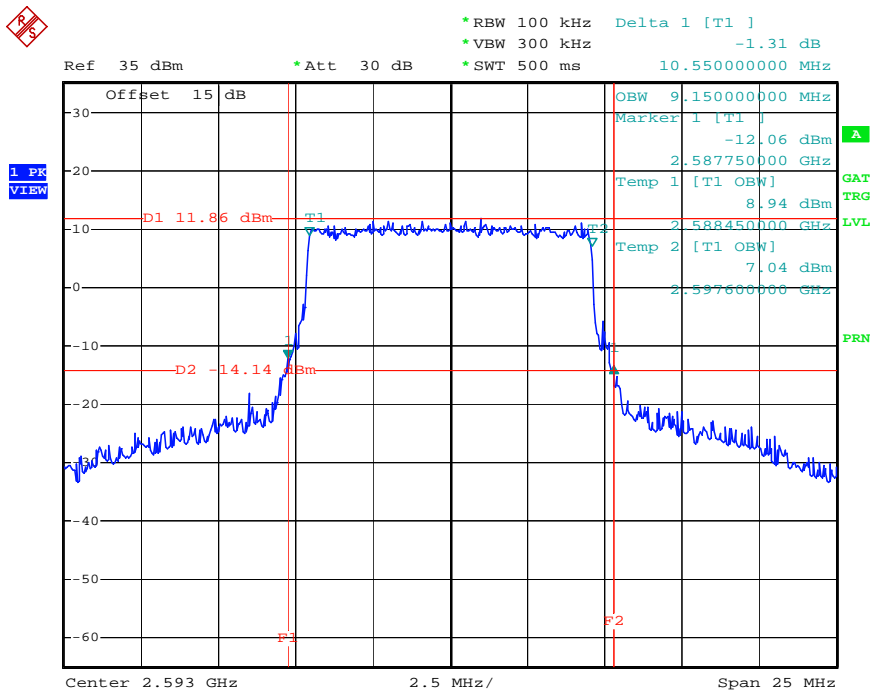
Channel	Frequency	26dB Bandwidth (MHz)	Bandwidth (MHz)
Low Channel	2501 MHz	10.45	9.20
Middle Channel	2593 MHz	10.40	9.15
High Channel	2685 MHz	10.50	9.15

Configuration 99% & 26dB Bandwidth 10MHz / QPSK / 2501 MHz



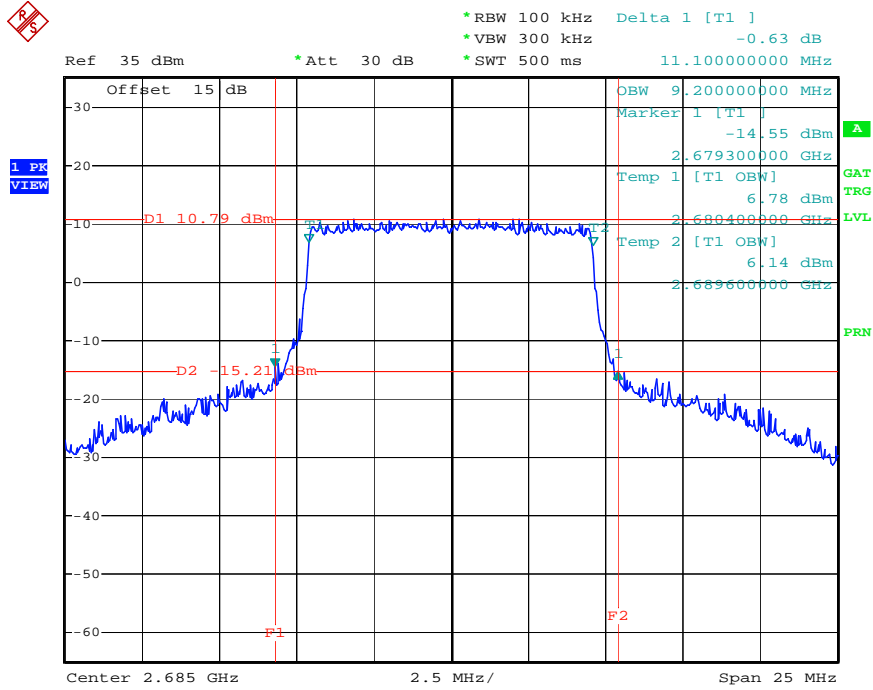
Date: 20.APR.2009 18:59:11

Configuration 99% & 26dB Bandwidth 10MHz / QPSK / 2593 MHz



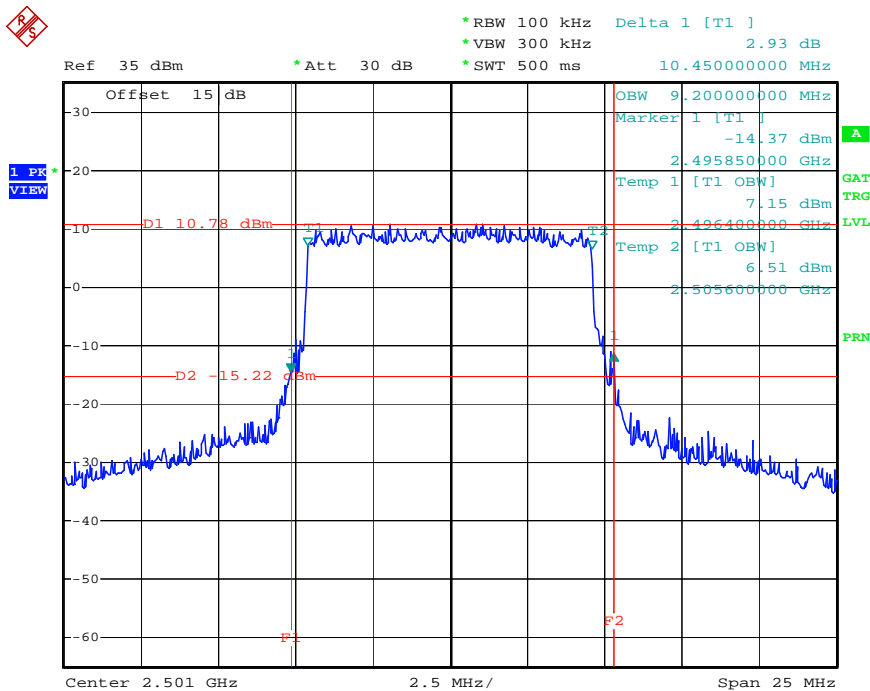
Date: 20.APR.2009 19:02:27

Configuration 99% & 26dB Bandwidth 10MHz / QPSK / 2685 MHz



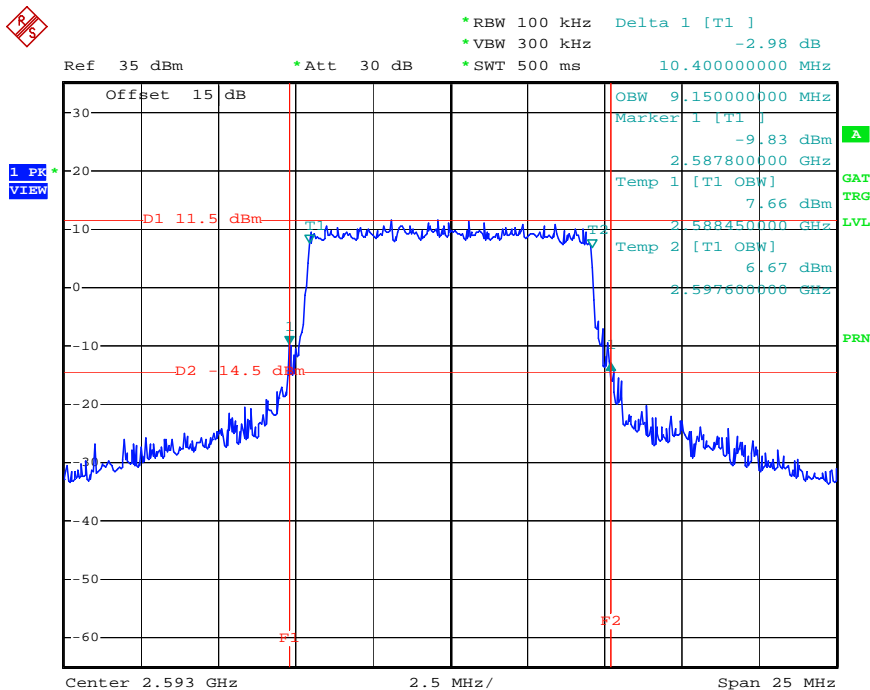
Date: 20.APR.2009 19:07:01

Configuration 99% & 26dB Bandwidth 10MHz / 16QAM / 2501 MHz



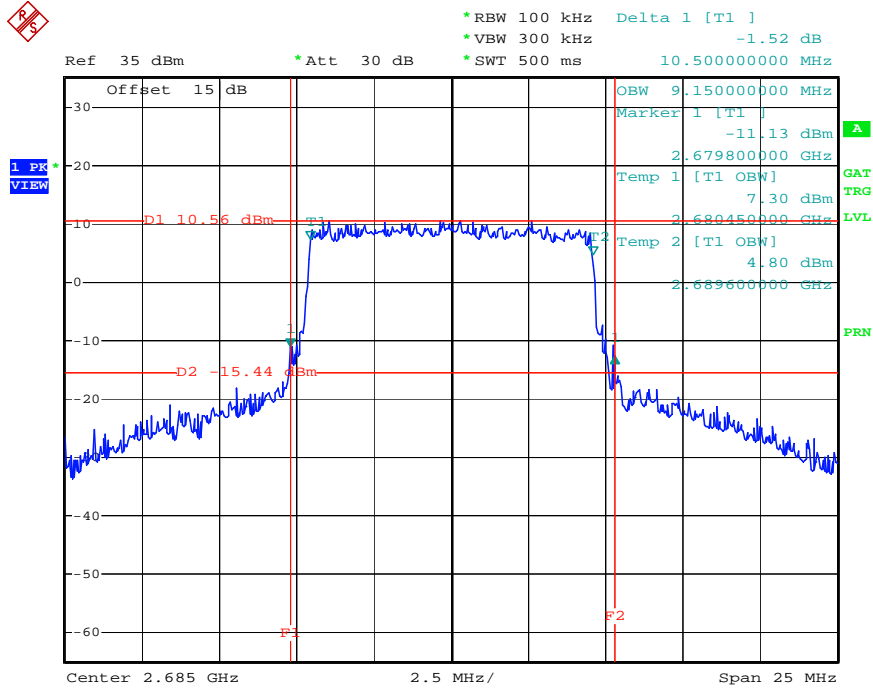
Date: 20.APR.2009 19:10:37

Configuration 99% & 26dB Bandwidth 10MHz / 16QAM / 2593 MHz



Date: 20.APR.2009 19:26:33

Configuration 99% & 26dB Bandwidth 10MHz / 16QAM / 2685 MHz



Date: 20.APR.2009 19:29:26

3.3. Conducted Spurious Emissions Measurement

3.3.1. Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (p) by a factor of mobile digital stations, the attenuation factor shall be not less than $43 + 10 \log (P)$ dB at the channel edge and $55 + 10 \log (P)$ dB at 5.5 MHz from the channel edges.

3.3.2. Measuring Instruments and Setting

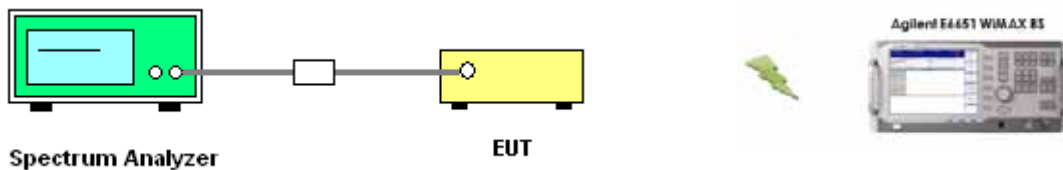
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
RB	1MHz
VB	3MHz
Detector	RMS
Trace	Max Hold
Sweep Time	Auto

3.3.3. Test Procedures

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

3.3.4. Test Setup Layout



3.3.5. Test Deviation

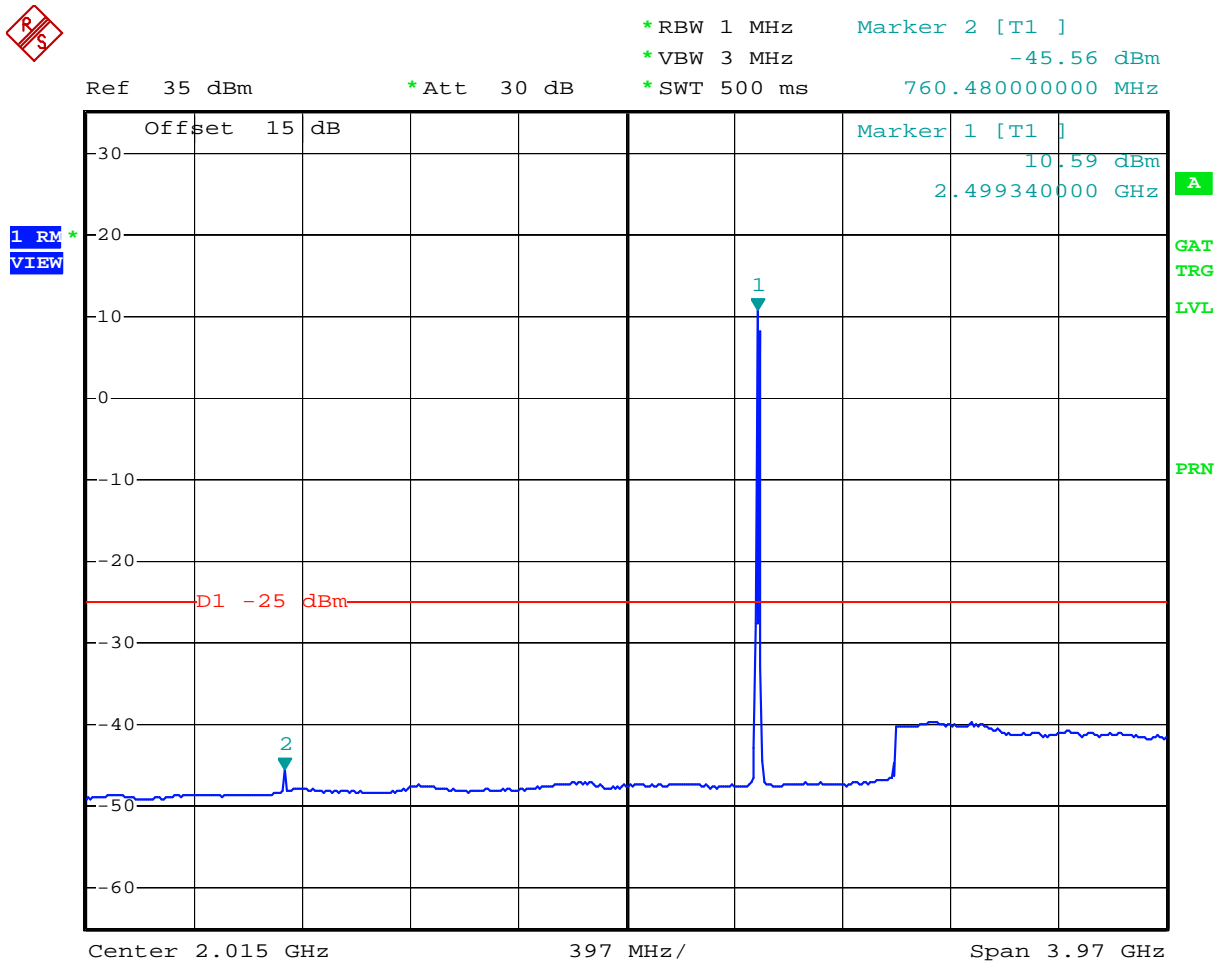
There is no deviation with the original standard.

3.3.6. Test Result of Conducted Spurious Emissions

Final Test date	Apr. 21, 2009	Test Site No.	TH01-HY
Temperature	28	Humidity	58%
Test Engineer	Tom	Configurations	802.16e

Configuration 10MHz / QPSK / 2501 MHz

2.015G -3.97G



Date: 21.APR.2009 17:29:14

4G-18G

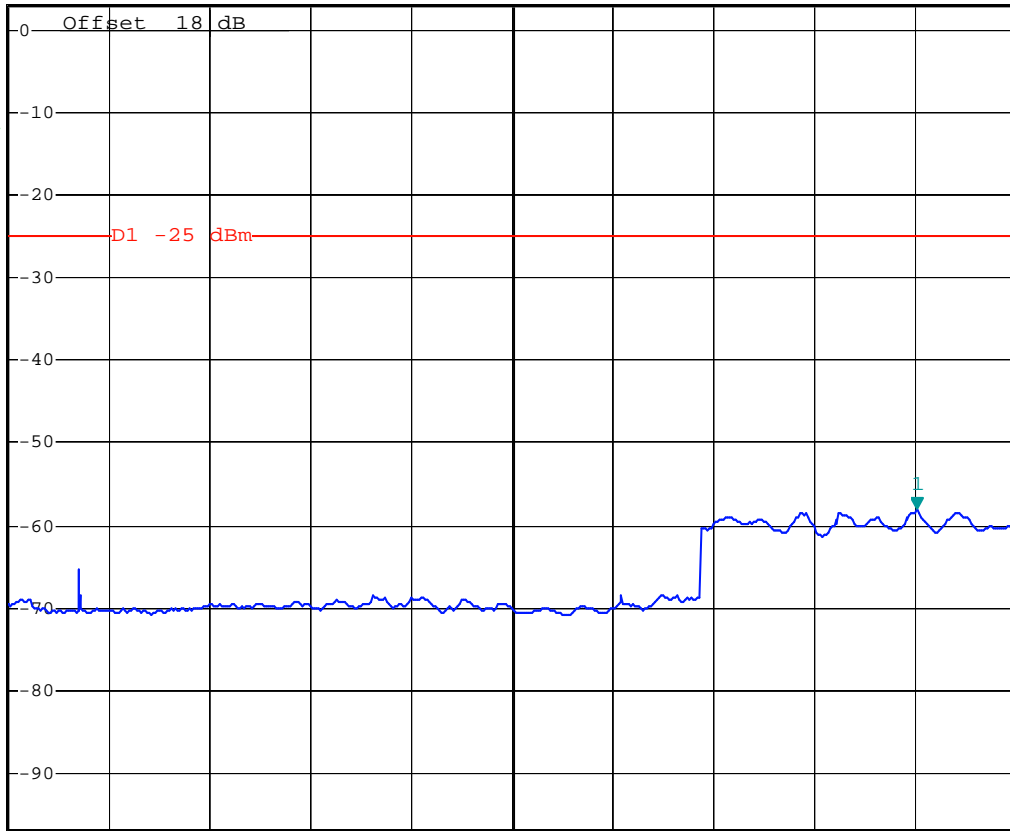


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -58.14 dBm
*SWT 500 ms 16.62800000 GHz

Ref 3 dBm

*Att 0 dB

1 RM*
VIEW



Start 4 GHz 1.4 GHz/ Stop 18 GHz

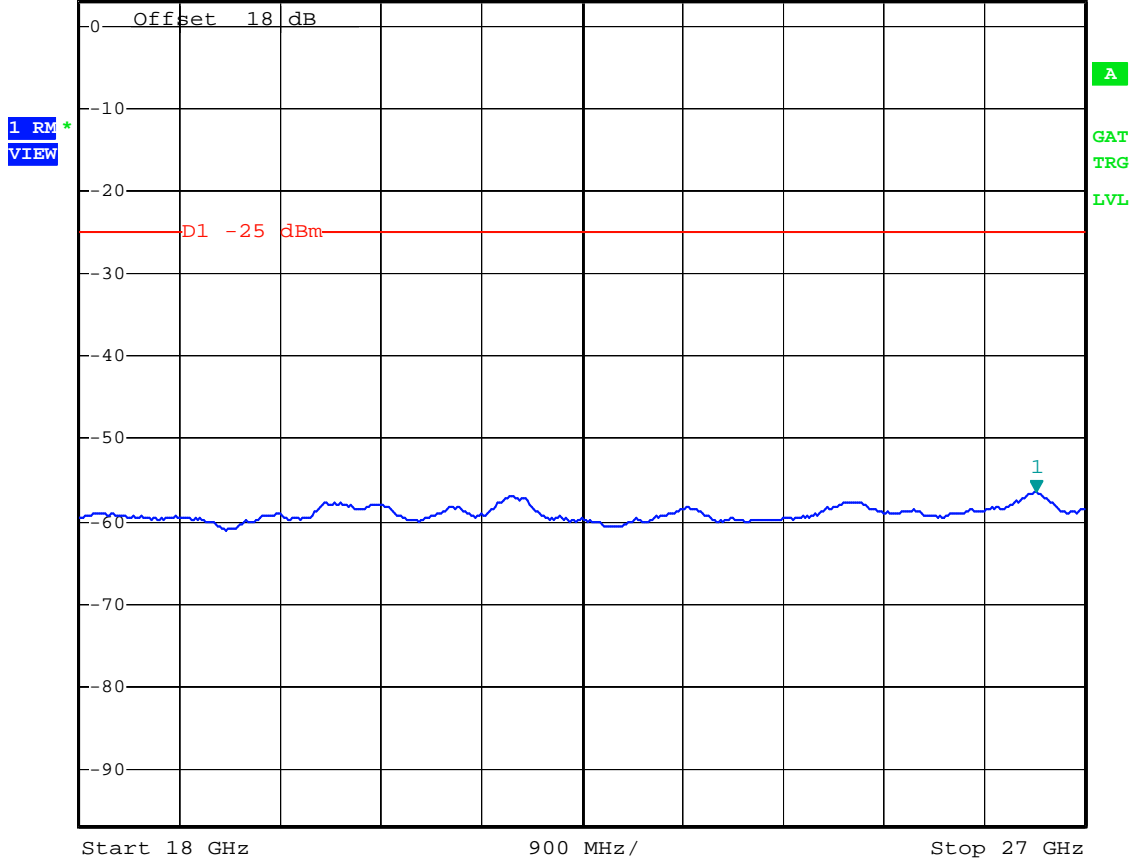
Date: 18.FEB.2009 17:20:58

18G-27G



*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -56.36 dBm
*SWT 500 ms 26.56800000 GHz

Ref 3 dBm *Att 0 dB



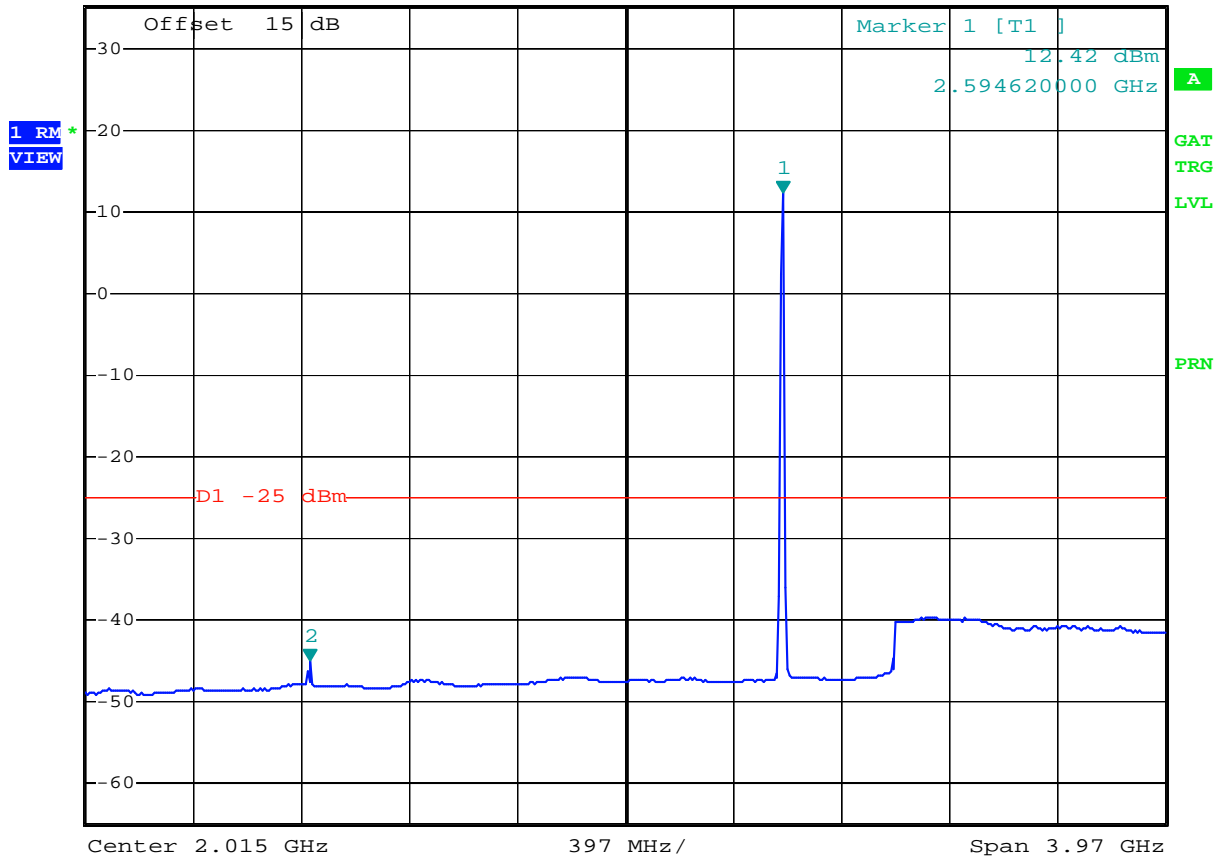
Date: 18.FEB.2009 17:41:34

Configuration 10MHz / QPSK / 2593 MHz

2.015G -3.97G



Ref 35 dBm *Att 30 dB *RBW 1 MHz Marker 2 [T1]
 *VBW 3 MHz -44.94 dBm
 *SWT 500 ms 855.76000000 MHz



Date: 21.APR.2009 17:21:45

4G-18G

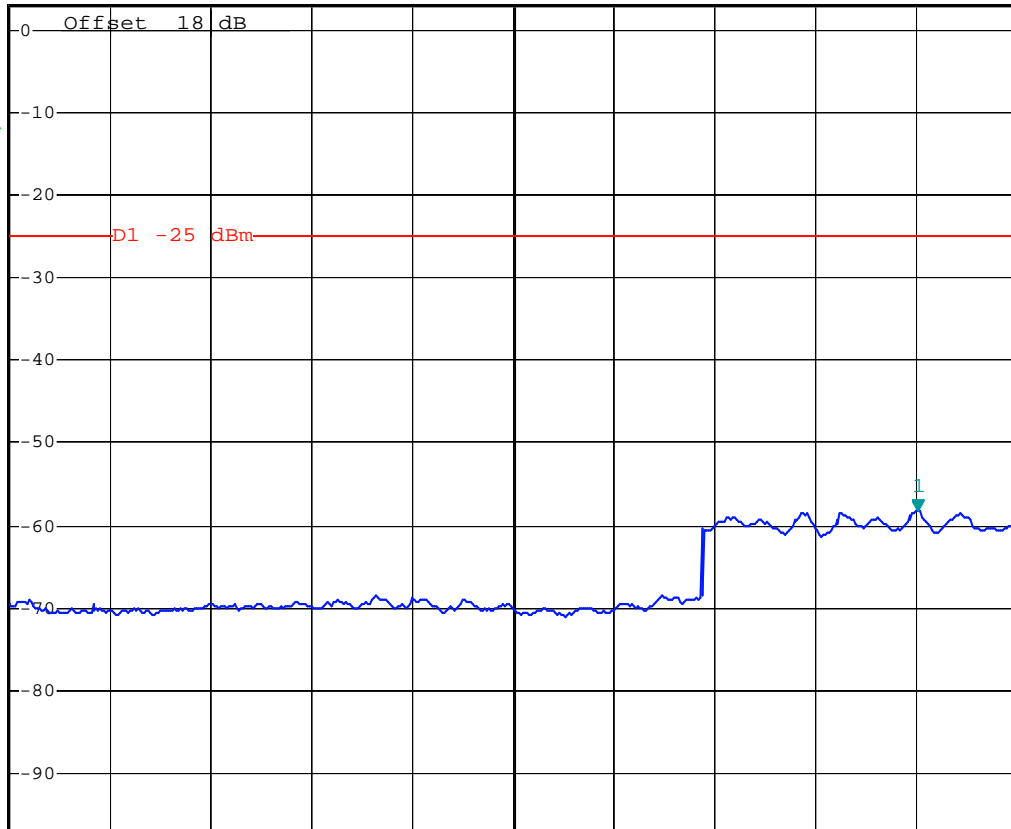


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -58.17 dBm
*SWT 500 ms 16.62800000 GHz

Ref 3 dBm

*Att 0 dB

1 RM*
VIEW



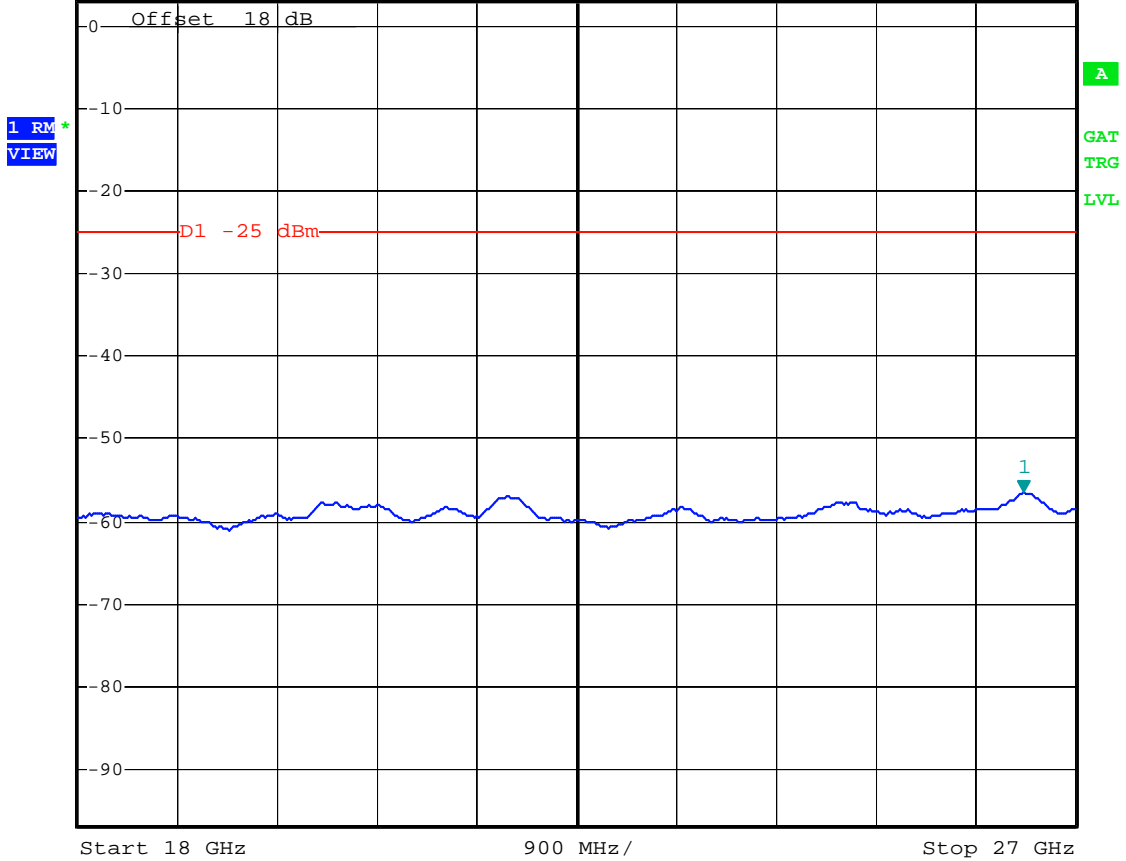
Start 4 GHz 1.4 GHz/ Stop 18 GHz

Date: 18.FEB.2009 17:23:11

18G-27G

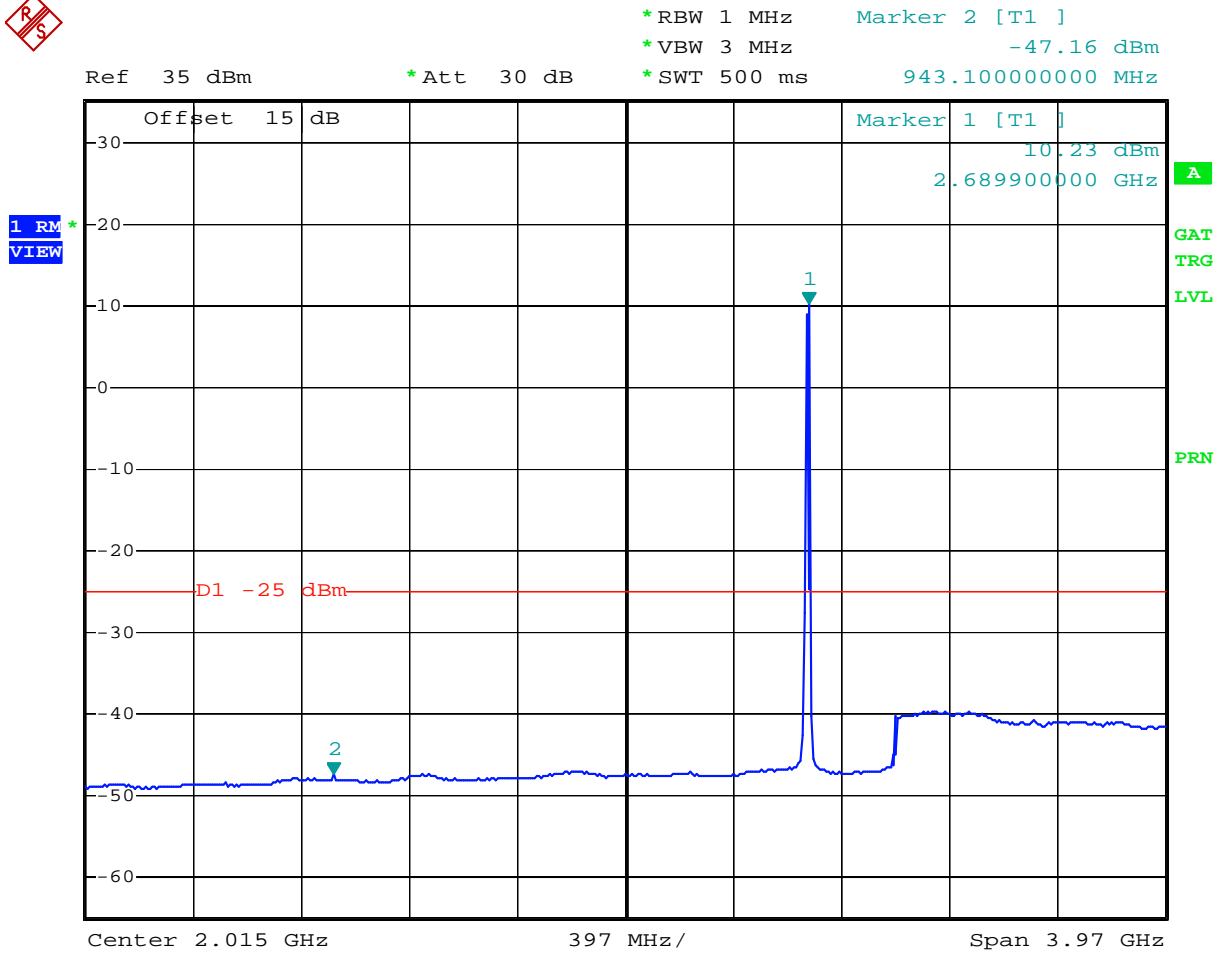


Ref 3 dBm *Att 0 dB *RBW 1 MHz *VBW 3 MHz *SWT 500 ms Marker 1 [T1]
-56.39 dBm
26.53200000 GHz



Date: 18.FEB.2009 17:43:39

Configuration 10MHz / QPSK / 2685 MHz
2.015G -3.97G



Date: 21.APR.2009 17:23:13

4G-18G

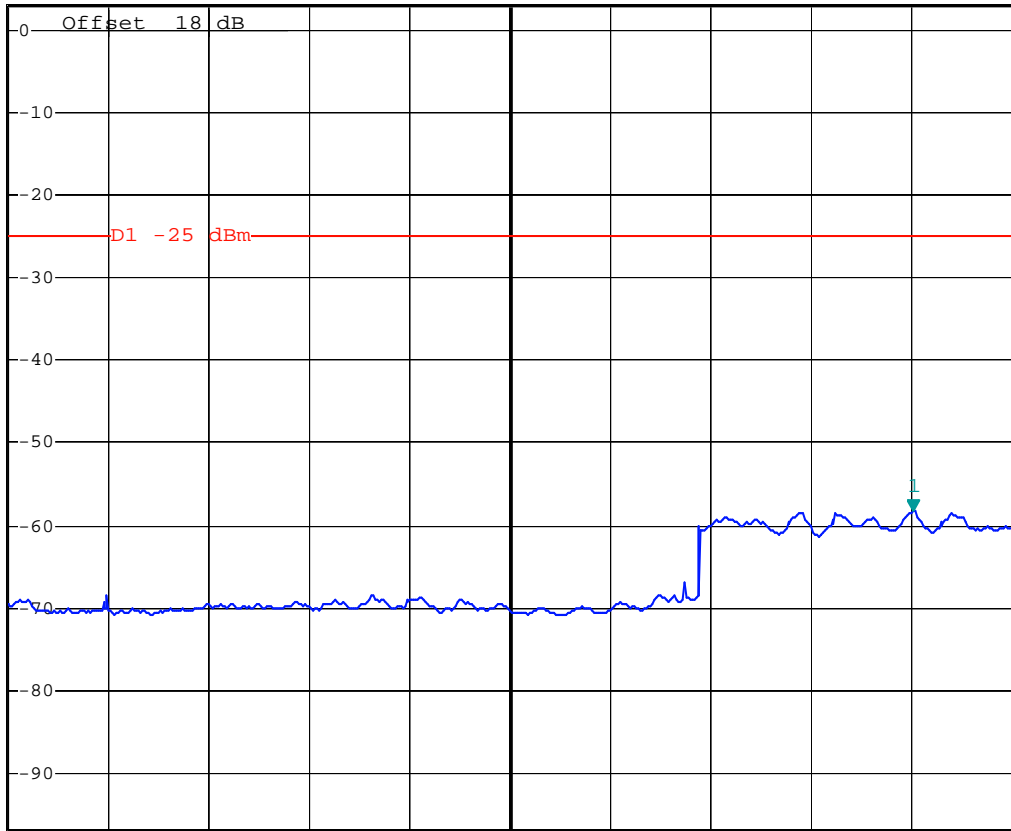


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -58.32 dBm
*SWT 500 ms 16.62800000 GHz

Ref 3 dBm

*Att 0 dB

1 RM*
VIEW



Start 4 GHz 1.4 GHz/ Stop 18 GHz

Date: 18.FEB.2009 17:19:15

18G-27G

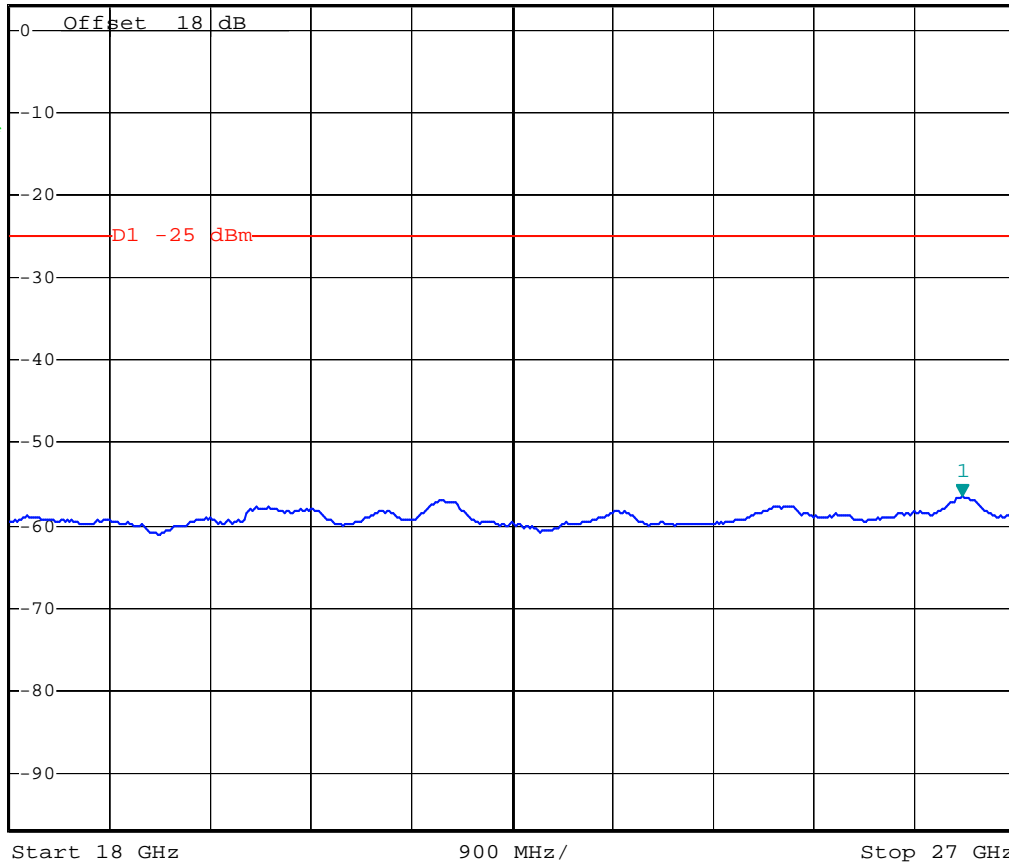


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -56.55 dBm
*SWT 500 ms 26.53200000 GHz

Ref 3 dBm

*Att 0 dB

1 RM*
VIEW



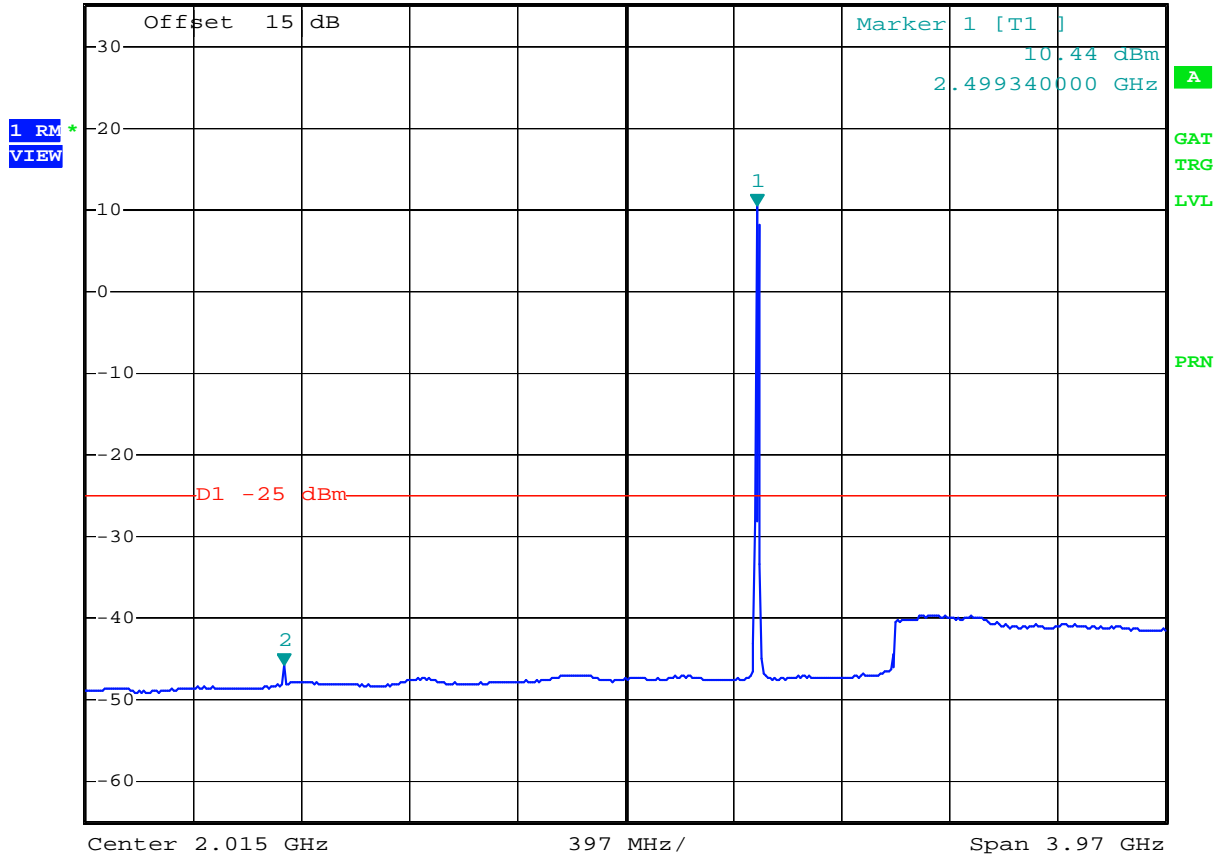
Date: 18.FEB.2009 17:39:43

Configuration 10MHz / 16QAM / 2501 MHz

2.015G -3.97G



Ref 35 dBm *Att 30 dB *RBW 1 MHz Marker 2 [T1]
*VBW 3 MHz -45.80 dBm
*SWT 500 ms 760.48000000 MHz



Date: 21.APR.2009 17:28:10

4G-18G

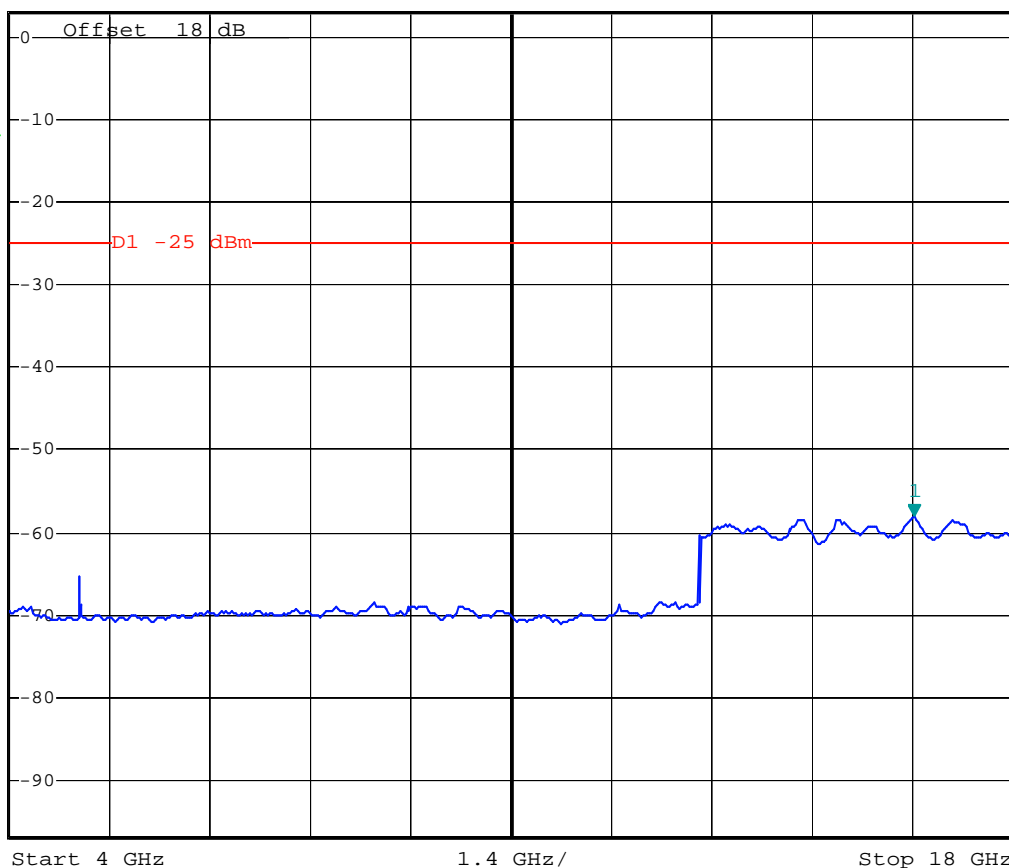


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -58.14 dBm
*SWT 500 ms 16.62800000 GHz

Ref 3 dBm

*Att 0 dB

1 RM*
VIEW



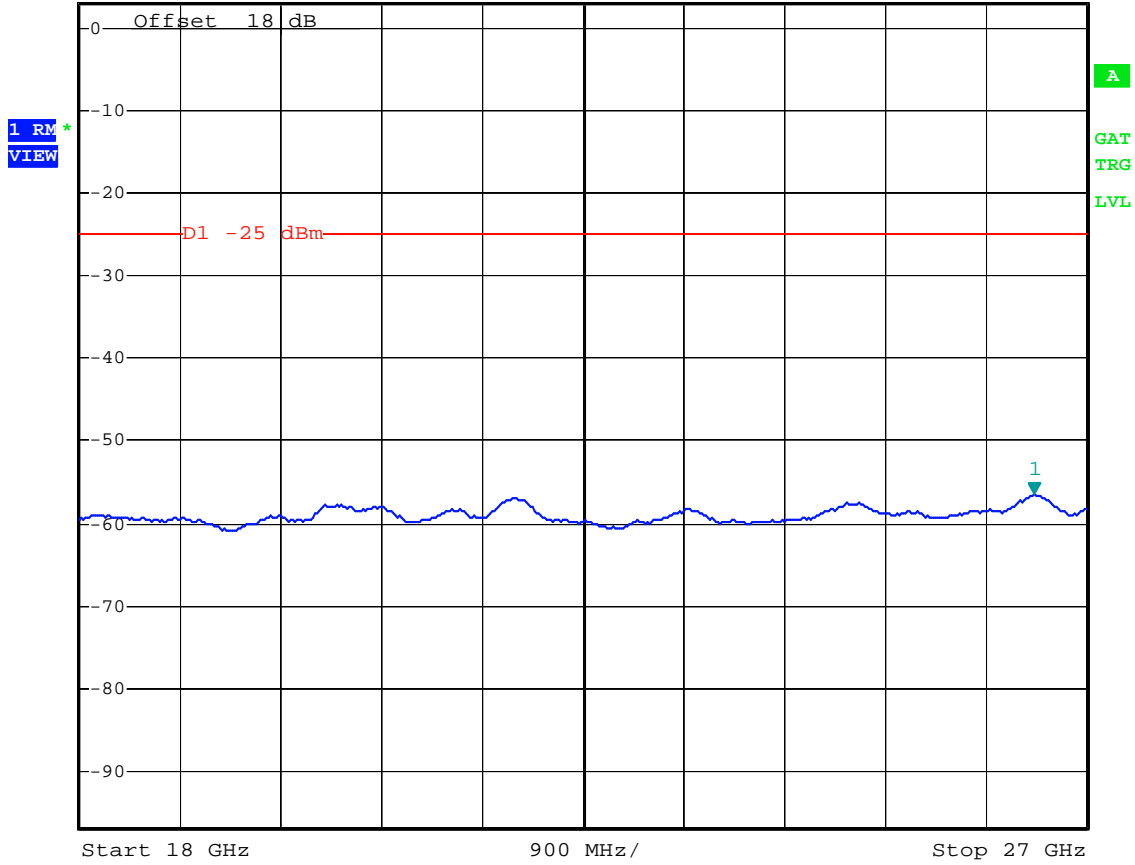
A
GAT
TRG
LVL

Date: 18.FEB.2009 17:29:00

18G-27G



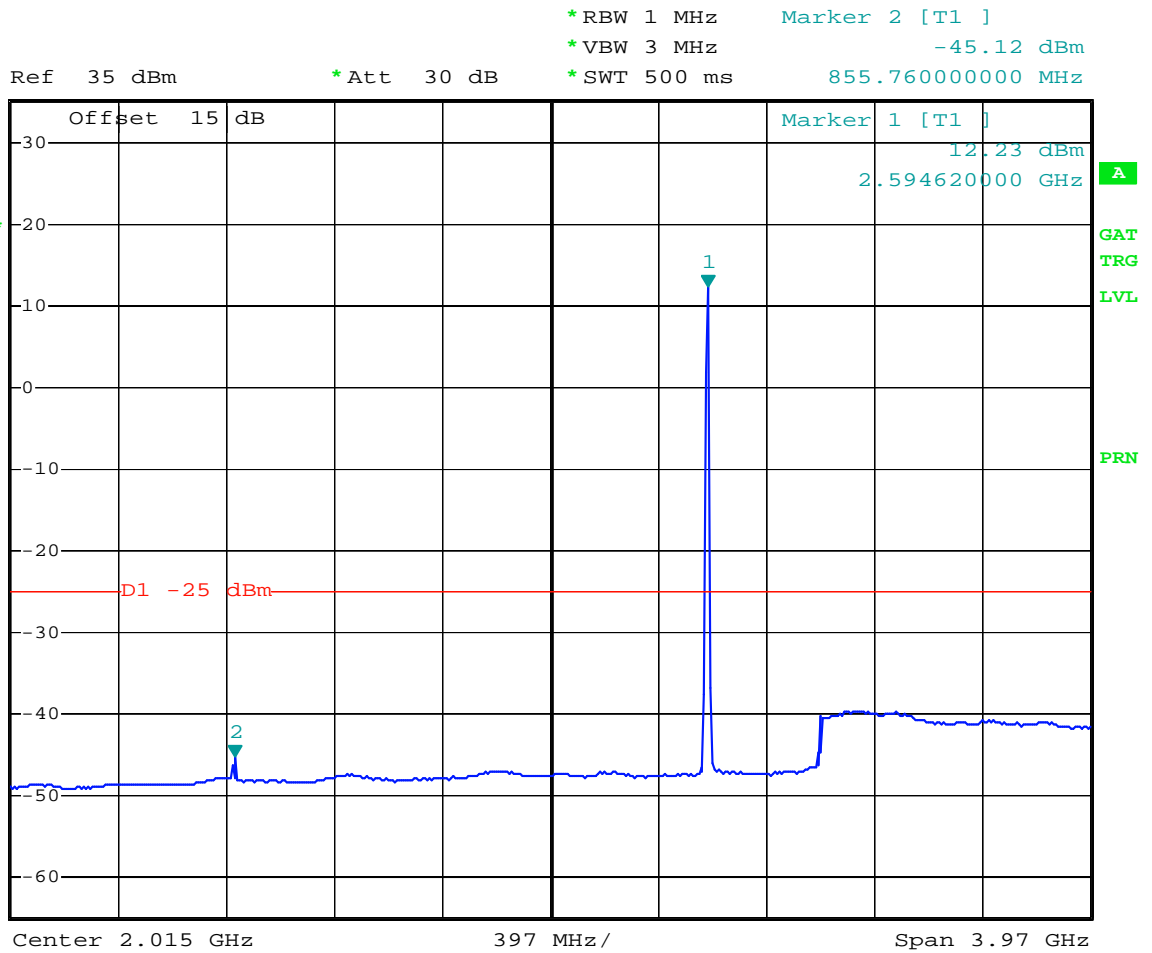
Ref 3 dBm *Att 0 dB *RBW 1 MHz Marker 1 [T1] -56.51 dBm
*VBW 3 MHz 26.53200000 GHz
*SWT 500 ms



Date: 18.FEB.2009 17:34:48

Configuration 10MHz / 16QAM / 2593 MHz

2.015G -3.97G

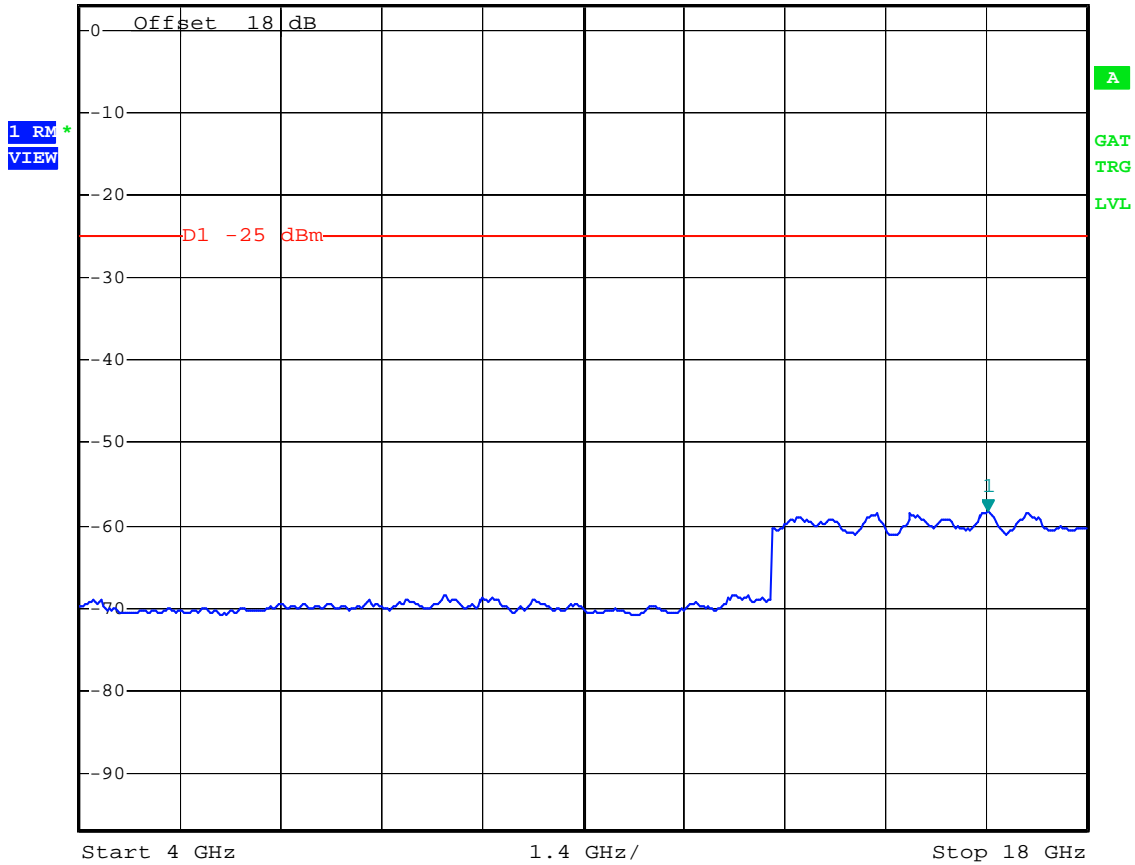


Date: 21.APR.2009 17:26:48

4G-18G



Ref 3 dBm *Att 0 dB *RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -58.25 dBm
*SWT 500 ms 16.62800000 GHz



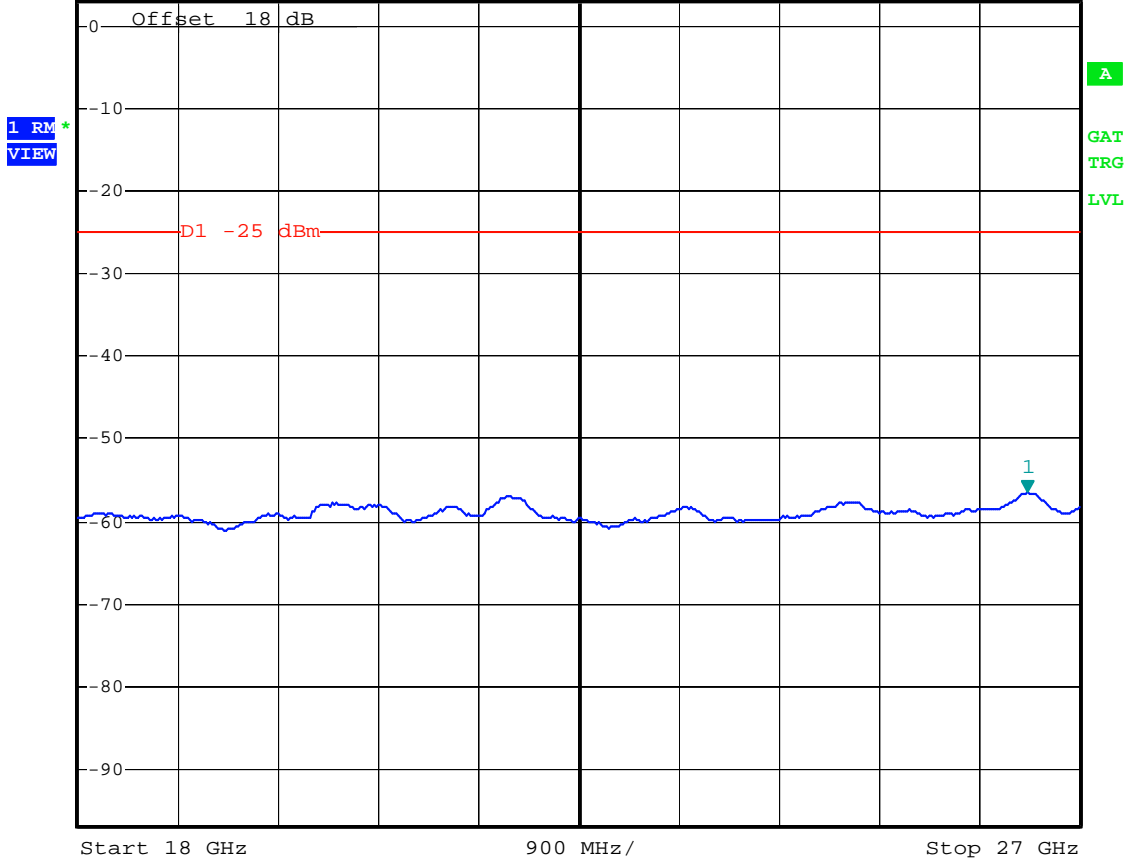
Date: 18.FEB.2009 17:25:10

18G-27G



*RBW 1 MHz Marker 1 [T1]
 *VBW 3 MHz -56.47 dBm
 *SWT 500 ms 26.53200000 GHz

Ref 3 dBm *Att 0 dB



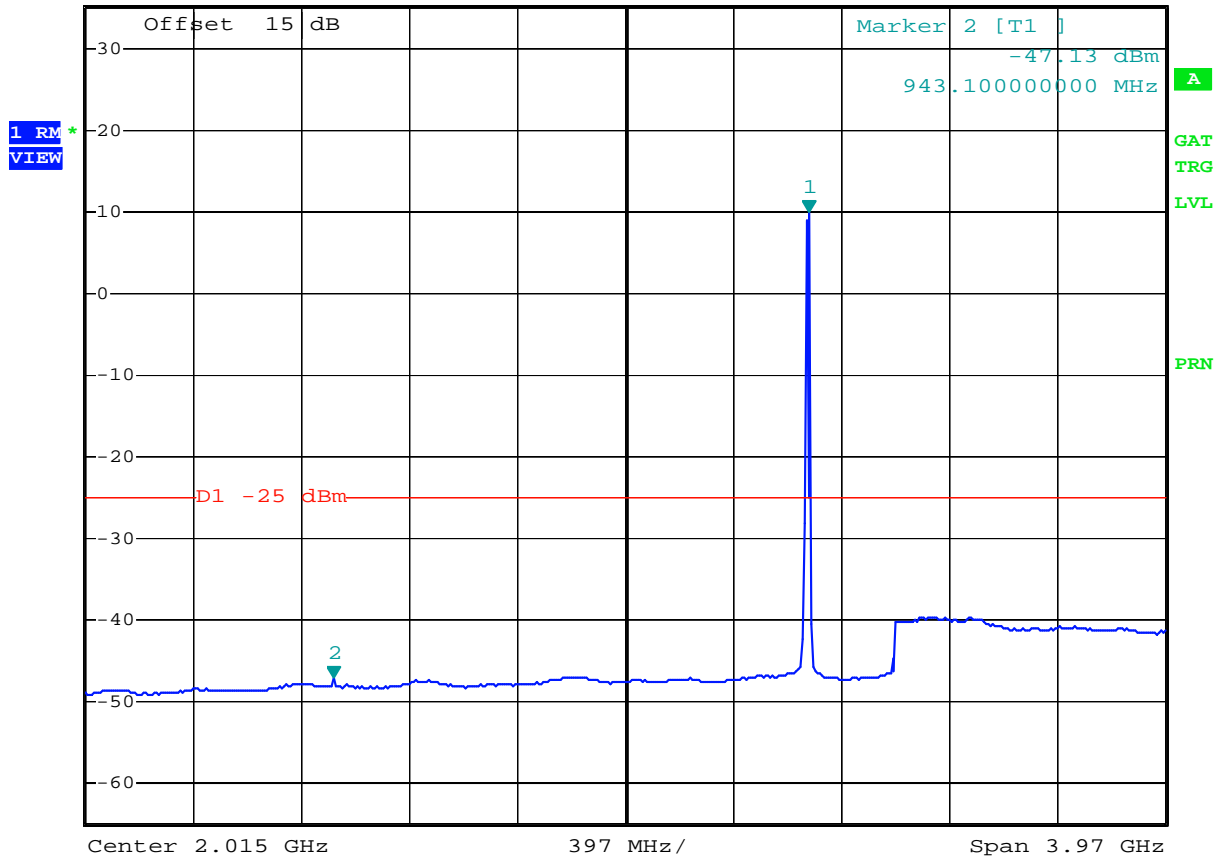
Date: 18.FEB.2009 17:36:04

Configuration 10MHz / 16QAM / 2685 MHz

2.015G -3.97G



Ref 35 dBm *Att 30 dB *RBW 1 MHz Marker 1 [T1] 10.04 dBm
*VBW 3 MHz 2.689900000 GHz
*SWT 500 ms

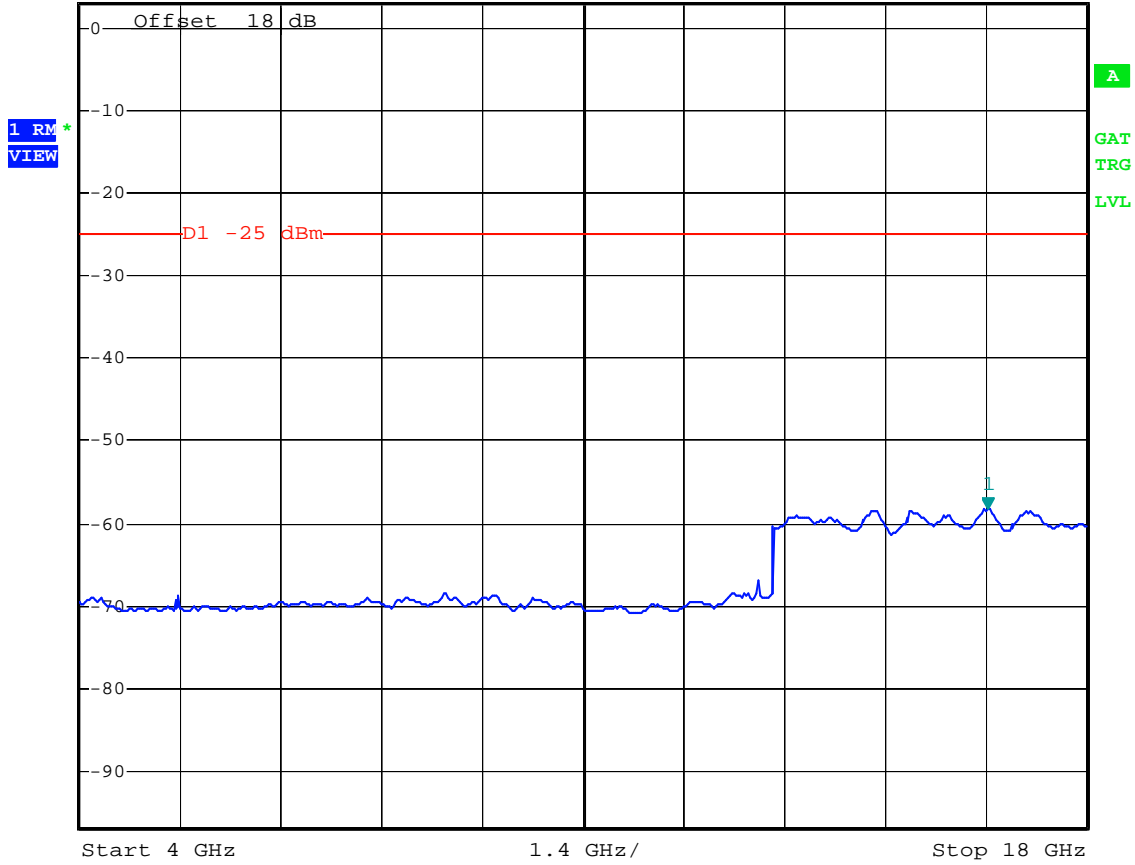


Date: 21.APR.2009 17:25:23

4G-18G



Ref 3 dBm *Att 0 dB *RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -58.26 dBm
*SWT 500 ms 16.62800000 GHz



Date: 18.FEB.2009 17:27:22

18G-27G

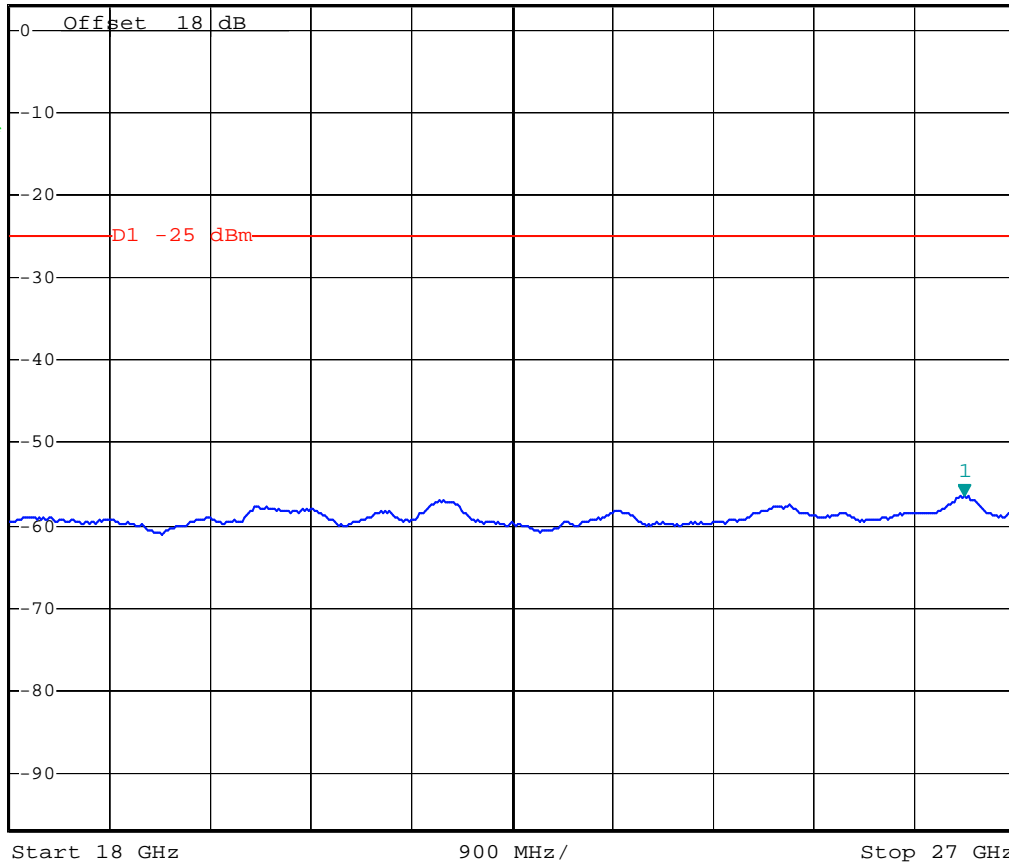


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -56.46 dBm
*SWT 500 ms 26.55000000 GHz

Ref 3 dBm

*Att 0 dB

1 RM*
VIEW



Date: 18.FEB.2009 17:37:58

3.4. Radiated Emissions Measurement

3.4.1. Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (p) by a factor of mobile digital stations, the attenuation factor shall be not less than 43 + 10 log (P) dB at the channel edge and 55 + 10 log (P) dB at 5.5 MHz from the channel edges.

3.4.2. Measuring Instruments and Setting

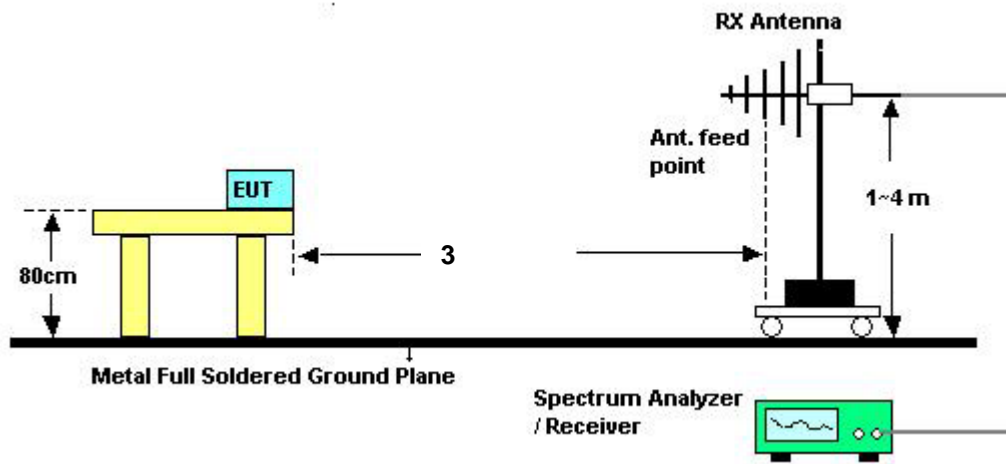
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	30 MHz
Stop Frequency	10th carrier harmonic
RB / VB	1MHz / 1MHz

3.4.3. Test Procedures

1. The EUT was placed on the top of the turntable in anechoic chamber.
2. The receiving Horn antenna was placed 0.8 meters far away from the turntable.
3. The test shall be made in the transmitting mode. The turntable was rotated by 360 degrees and the receiving antenna scanned from 1-4m in order to capture the maximum power emission. Recorded suspected value is indicated as Read Level (Raw).
4. Replace the EUT by standard antenna and feed the RF port by signal generator.
5. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.
6. Adjust the power level (B) of the signal generator to reach the same reading with Read Level (Raw).
7. The power level (B) plus the gain of the standard antenna in dBi and the cable loss used between the signal generator and the standard antenna.

3.4.4. Test Setup Layout

For radiated emissions above 30MHz



3.4.5. Test Deviation

There is no deviation with the original standard.

3.4.6. Results of Radiated Emissions

Final Test date	Feb. 20, 2009	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	10MHz QPSK / 2501 MHz

Horizontal

Configuration 10MHz / QPSK

Freq. (MHz)	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
30	-66.5	7.93	-58.52	-25
5004	-62.9	16.56	-46.34	-25
7503	-67.3	20.11	-47.16	-25

Factor=Cable Loss + Antenna Gain – Power Amplifier

EIRP=SG Level + Cable Loss + Antenna Gain – Power Amplifier

Vertical

Configuration 10MHz / QPSK

Freq. (MHz)	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
30	-51.2	-4.36	-55.60	-25
5000	-60.4	15.26	-45.10	-25
7503	-55.7	8.81	-46.92	-25

Factor=Cable Loss + Antenna Gain – Power Amplifier

EIRP=SG Level + Cable Loss + Antenna Gain – Power Amplifier

Final Test date	Feb. 20, 2009	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	10MHz QPSK / 2593 MHz

Horizontal

Configuration 10MHz / QPSK

Freq. (MHz)	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
30	-66.5	7.93	-58.52	-25
5188	-61.7	16.99	-44.71	-25
7779	-65.5	21.27	-44.21	-25

Factor=Cable Loss + Antenna Gain – Power Amplifier

EIRP=SG Level + Cable Loss + Antenna Gain – Power Amplifier

Vertical

Configuration 10MHz / QPSK

Freq. (MHz)	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
30	-51.2	-4.36	-55.60	-25
5188	-59.6	15.62	-43.96	-25
7779	-65.5	19.31	-46.14	-25

Factor=Cable Loss + Antenna Gain – Power Amplifier

EIRP=SG Level + Cable Loss + Antenna Gain – Power Amplifier

Final Test date	Feb. 20, 2009	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	10MHz QPSK / 2685 MHz

Horizontal

Configuration 10MHz / QPSK

Freq. (MHz)	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
30	-66.5	7.93	-58.52	-25
5372	-66.2	17.42	-48.73	-25
8055	-65.6	22.14	-43.49	-25

Factor=Cable Loss + Antenna Gain – Power Amplifier

EIRP=SG Level + Cable Loss + Antenna Gain – Power Amplifier

Vertical

Configuration 10MHz / QPSK

Freq. (MHz)	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
30	-51.2	-4.36	-55.60	-25
5376	-68.6	15.80	-52.75	-25
8055	-66.0	20.05	-45.99	-25

Factor=Cable Loss + Antenna Gain – Power Amplifier

EIRP=SG Level + Cable Loss + Antenna Gain – Power Amplifier

Final Test date	Feb. 20, 2009	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	10MHz 16QAM / 2501 MHz

Horizontal

Configuration 10MHz / 16QAM

Freq. (MHz)	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
30	-74.6	7.93	-66.65	-25
5002	-61.4	16.56	-44.87	-25
7503	-66.5	20.11	-46.43	-25

Factor=Cable Loss + Antenna Gain – Power Amplifier

EIRP=SG Level + Cable Loss + Antenna Gain – Power Amplifier

Vertical

Configuration 10MHz / 16QAM

Freq. (MHz)	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
30	-45.0	-4.36	-49.32	-25
5004	-63.1	15.26	-47.82	-25
7503	-53.8	8.81	-45.03	-25

Factor=Cable Loss + Antenna Gain – Power Amplifier

EIRP=SG Level + Cable Loss + Antenna Gain – Power Amplifier

Final Test date	Feb. 20, 2009	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	10MHz 16QAM / 2593 MHz

Horizontal

Configuration 10MHz / 16QAM

Freq. (MHz)	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
30	-74.6	7.93	-66.65	-25
5188	-57.7	16.99	-40.75	-25
7779	-66.1	21.27	-44.81	-25

Factor=Cable Loss + Antenna Gain – Power Amplifier

EIRP=SG Level + Cable Loss + Antenna Gain – Power Amplifier

Vertical

Configuration 10MHz / 16QAM

Freq. (MHz)	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
30	-45.0	-4.36	-49.32	-25
5184	-59.7	15.62	-44.12	-25
7779	-65.0	19.31	-45.65	-25

Factor=Cable Loss + Antenna Gain – Power Amplifier

EIRP=SG Level + Cable Loss + Antenna Gain – Power Amplifier

Final Test date	Feb. 20, 2009	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	10MHz 16QAM / 2685 MHz

Horizontal

Configuration 10MHz / 16QAM

Freq. (MHz)	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
30	-74.6	7.93	-66.65	-25
5372	-68.0	17.42	-50.62	-25
8055	-67.6	22.14	-45.44	-25

Factor=Cable Loss + Antenna Gain – Power Amplifier

EIRP=SG Level + Cable Loss + Antenna Gain – Power Amplifier

Vertical

Configuration 10MHz / 16QAM

Freq. (MHz)	SG Level (dBm)	Factor (dB)	EIRP Power (dBm)	Max. Limit (dBm)
30	-45.0	-4.36	-49.32	-25
5372	-68.0	15.80	-52.20	-25
8055	-65.4	20.05	-45.33	-25

Factor=Cable Loss + Antenna Gain – Power Amplifier

EIRP=SG Level + Cable Loss + Antenna Gain – Power Amplifier

3.5. Frequency Stability Measurement

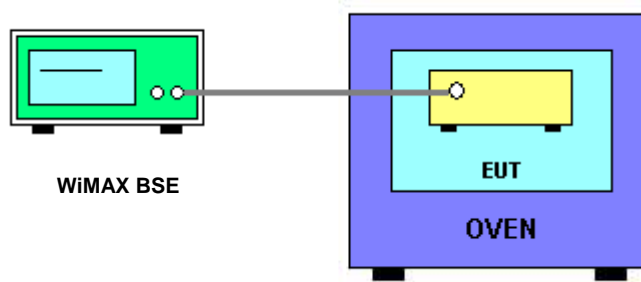
3.5.1. Limit

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency band. For equipment authorization purposes, this is a reporting requirement only.

3.5.2. Test Procedures

1. The transmitter output (antenna port) was connected to the WiMAX BSE.
2. EUT have transmitted modulation signal and WiMAX BSE measure EVM & Frequency error
3. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
4. Extreme temperature rule is -30°C~50°C.

3.5.3. Test Setup Layout



3.5.4. Test Deviation

There is no deviation with the original standard.

3.5.5. Test Result of Frequency Stability

Configuration 10MHz / 2593 MHz

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	2593
5.75	2593.000041
5	2593.000053
4.25	2593.000040
Max. Deviation (MHz)	0.000053
Max. Deviation (ppm)	0.02

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
()	2593
50	2593.000029
40	2593.000031
30	2593.000038
20	2593.000043
10	2593.000049
0	2593.000041
-10	2593.000043
-20	2593.000051
-30	2592.999966
Max. Deviation (MHz)	0.000051
Max. Deviation (ppm)	0.02

4. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100356	9kHz – 2.75GHz	Aug. 01, 2008	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9kHz – 30MHz	Nov. 26, 2008	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9kHz – 30MHz	Nov. 26, 2008	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Conduction (CO05-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP30	100023	9kHz ~ 30GHz	Jan. 09, 2009	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jul. 11, 2008	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100458	DC ~ 30GHz	Jul. 11, 2008	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jul. 11, 2008	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 13, 2008	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 13, 2009	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-S	MAB0103-001	N/A	Jul. 18, 2008	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 01, 2008	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 01, 2008	Conducted (TH01-HY)
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Dec. 14, 2008	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 10, 2008	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 25, 2009	Conducted (TH01-HY)
Oscilloscope	Tektonix	TDS380	B016197	400MHz/ 2GS/s	Jun. 27, 2008	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 14, 2008	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	COA9231A	18667	9 kHz - 2 GHz	Jan. 23, 2009	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	Jul. 21, 2008	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100004	9 kHz - 30 GHz	Oct. 06, 2008	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30 MHz – 1 GHz	Jul. 12, 2008	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	Apr. 29, 2008	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	Jan.16, 2009	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz - 1 GHz	Jan. 05, 2009	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Jan. 05, 2009	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 – 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Jul 28, 2008*	Radiation (03CH03-HY)
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5 GHz - 40 GHz	Jan. 21, 2008*	Radiation (03CH03-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	May 30, 2008*	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is two year.

5. TEST LOCATION

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. TEL : 886-2-2696-2468 FAX : 886-2-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
LINKOU	ADD : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C TEL : 886-2-2601-1640 FAX : 886-2-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 886-2-2631-4739 FAX : 886-2-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 886-2-8227-2020 FAX : 886-2-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 nd Rd., Taipei 114, Taiwan, R.O.C. TEL : 886-2-2794-8886 FAX : 886-2-2794-9777
JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

6. TAF CERTIFICATE OF ACCREDITATION



Certificate No. : I.1190-081212

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.

EMC & Wireless Communications Laboratory

No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,
Taiwan, R.O.C.

is accredited in respect of laboratory

- Accreditation Criteria** : ISO/IEC 17025:2005
- Accreditation Number** : 1190
- Originally Accredited** : December 15, 2003
- Effective Period** : January 10, 2007 to January 09, 2010
- Accredited Scope** : Testing Field, see described in the Appendix
- Specific Accreditation Program** : Accreditation Program for Designated Testing Laboratory for Commodities Inspection
Accreditation Program for Telecommunication Equipment Testing Laboratory
Accreditation Program for BSMI Mutual Recognition Arrangement with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : December 12, 2008

PI, total 18 pages