ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT AND INDUSTRY CANADA RSS-210

OF

Product Name:	**CellSensorTM**
Brand Name:	**CellSensorTM System**
Model Number:	**07-001**
FCC ID: **IC:**	**VTD-CSS001** **7557A-CSS001**
Report Number:	**ER/2007/B0010~11**
Issue Date:	**Jan. 07, 2008**
Rule Part:	**FCC Part 15C:2005, §15.247,** **RSS-210 issue 7:2007, Annex 8**
Prepared for:	**Outotec Oy** **Riihitontuntie 7 C, PO Box 86, FI-02201 Espoo, Finland**
Prepared by:	**SGS Taiwan Ltd.** **Electronics & Communication Laboratory** **No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.**

VERIFICATION OF COMPLIANCE

Applicant:	Outotec Oy Riihitontuntie 7 C, PO Box 86, FI-02201 Espoo, Finland
Product Name:	CellSensorTM
Brand Name:	CellSensorTM System
Model Number:	07-001
Model Difference:	N/A
FCC ID:	VTD-CSS001
IC:	7557A-CSS001
File Number:	ER/2007/B00010~11
Date of test:	Dec. 20, 2007 ~ Jan. 04, 2008
Date of EUT Received:	Dec. 20, 2007

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd., Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15C, §15.247 and RSS-210 issue 7: 2007 Annex 8.

The test results of this report relate only to the tested sample identified in this report.

Test By:	Jazz Huang	***Date***	Jan. 07, 2008
	Jazz Huang/Engineer		
Prepared By:	Elisa Chen	***Date***	Jan. 07, 2008
	Elisa Chen/Asst. Supervisor		
Approved By:	Vincent Su	***Date***	Jan. 07, 2008
	Vincent Su/Manager		

Version

Version No.	Date
00	Jan. 07, 2008

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1. GENERAL INFORMATION

Product Name:	CellSensorTM
Brand Name:	CellSensorTM System
Model Number:	07-001
Model Difference:	N/A
Power Supply:	3.6Vdc from re-chargeable battery or 110Vdc power supply.

Frequency Range & Channel number:	2405mHz – 2480MHz, 16 channels, 5MHz step.
Rated Power:	1.22 dBm
Modulation type:	DSSS
Transition Rate:	250kbps
Antenna Designation:	Micro-strip Antenna, -5dBi

1.1 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section 15.247 of the FCC Part 15C, Subpart C Rules. And to comply with Industry Canada RSS-210 issue 7: 2007 Annex 8. The composite system (receiver) is compliance with Subpart B is authorized under a DoC procedure.

1.2 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003) and RSS-Gen issue 2: 2007. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.3 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county,which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

1.4 Special Accessories

Not available for this EUT intended for grant.

1.5 Equipment Modifications

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003 and RSS-Gen: 2005. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003 and RSS-Gen issue 2:2007.

2.4 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	DC Power Supply	Topward	3303A	715856	N/A	Un-sheilded

3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)/ RSS-Gen	AC Power Line Conducted Emission	N/A
§15.247(b)/ §RSS-210, A8.4(4)	Peak Output Power	Compliant
§15.247(b)/ §RSS-210, A8.2	6dB Bandwidth	Compliant
§15.247(c) §RSS-210, A8.5	100 KHz Bandwidth Of Frequency Band Edges	Compliant
§15.247(c) §RSS-210, A8.5	Spurious Emission	Compliant
§15.247 §RSS-210, A8.2(2)	Peak Power Density	Compliant
RSS-Gen§4.6.1	99% Power Bandwidth	Compliant
§15.203 §RSS-210, A8.4	Antenna Requirement	Compliant

4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.
Test program was used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low (2405MHz)、mid (2440MHz) and high (2480MHz) with highest data rate are chosen for full testing.

5. CONDUCTED EMISSION TEST

5.1 Standard Applicable

According to §15.207. frequency within 150KHz to 30MHz shall not exceed the Limit table as below.

According to section RSS-Gen 7.2.2, Transmitter AC Wire line Conducted Emissions. Limits is as following.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

5.2 EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-2003.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The LISN was connected with 110Vac/60Hz power source.

5.3 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

5.4 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMC Analyzer	HP	8594EM	3624A00203	09/02/2007	09/03/2008
EMI Test Receiver	R&S	ESCS30	828985/004	06/09/2007	06/10/2008
Transient Limiter	HP	11947A	3107A02062	09/02/2007	09/03/2008
LISN	Rolf-Heine	NNB-2/16Z	99012	08/30/2007	08/29/2008
LISN	Rolf-Heine	NNB-2/16Z	99013	08/30/2007	08/29/2008
Coaxial Cables	N/A	No. 3, 4	N/A	11/30/2007	11/29/2008

5.5 Measurement Result

N/A, the device is power by either battery or DC power supply.

6 PEAK OUTPUT POWER MEASUREMENT

6.1 Standard Applicable

According to §15.247(a)(2), (b)

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(c) Operation with directional antenna gains greater than 6 dBi.

(1) Fixed point-to-point operation:

(i) Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

(ii) Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

According to§RSS-210, A8.4(4), For the band 2400-2483.5 MHz, the transmitter output power shall not ex ceed 1.0 watt. See (d) below for special conditions. For the bands 902-928 MHz and 5725-5850 MHz, the transmitter output power shall not exceed 1.0 watt and the EIRP shall not exceed 4 watts. However, point-to-point systems in the 5725-5850 MHz band are permitted any EIRP necessary for satisfactory operation by increase in antenna gain. Point-to-multipoint systems and multiple co-located transmitters transmitting the same information are **prohibited** from using this high EIRP category. However, remote stations of point-to-multipoint systems shall be permitted to operate at the point-to-point EIRP limit provided that the higher EIRP is achieved by employing higher gain directional antennas and not higher transmitter output powers

6.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (Channel power function, RBW= 8MHz, VBW = 8MHz, integrated Bandwidth=26dB occupied Bandwidth)
3. Record the max. reading.
4. Repeat above procedures until all frequency measured were complete.

6.3 Measurement Equipment Used:

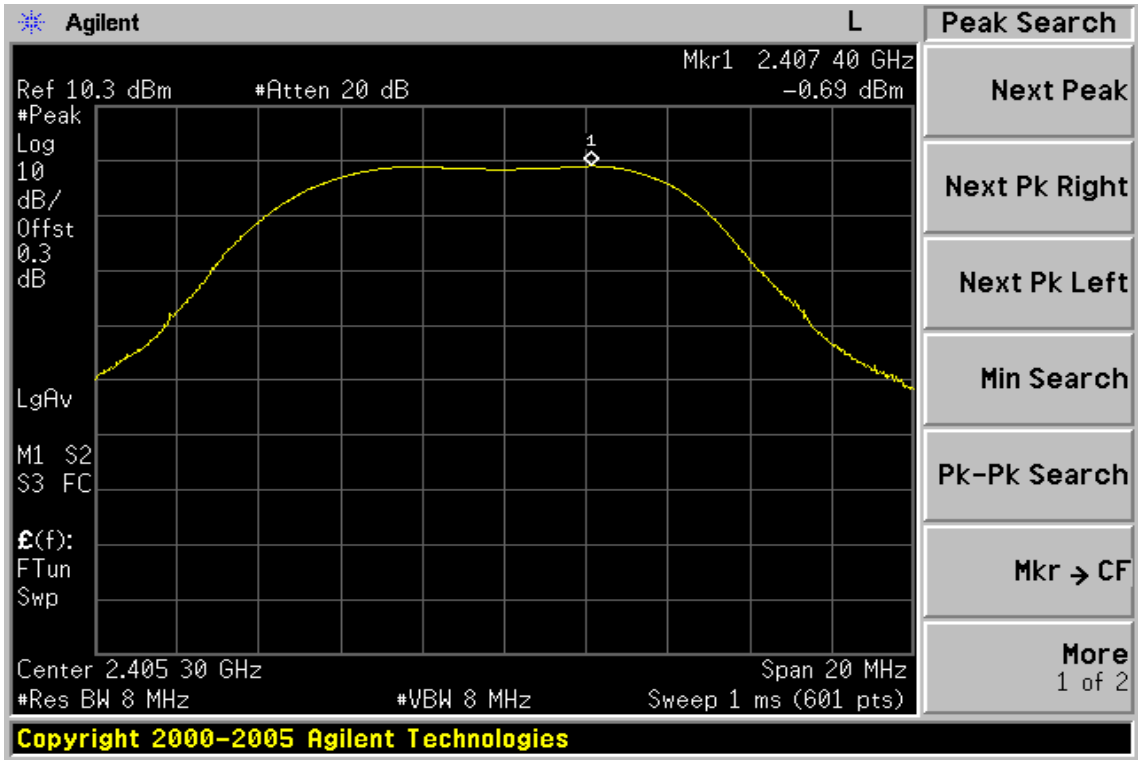
Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/27/2007	04/26/2008
Spectrum Analyzer	Agilent	7405A	US41160416	07/04/2007	07/03/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2007	07/04/2008
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2007	07/04/2008
Splitter	Agilent	Power Divider	51818	07/05/2007	07/04/2008

6.4 Measurement Result

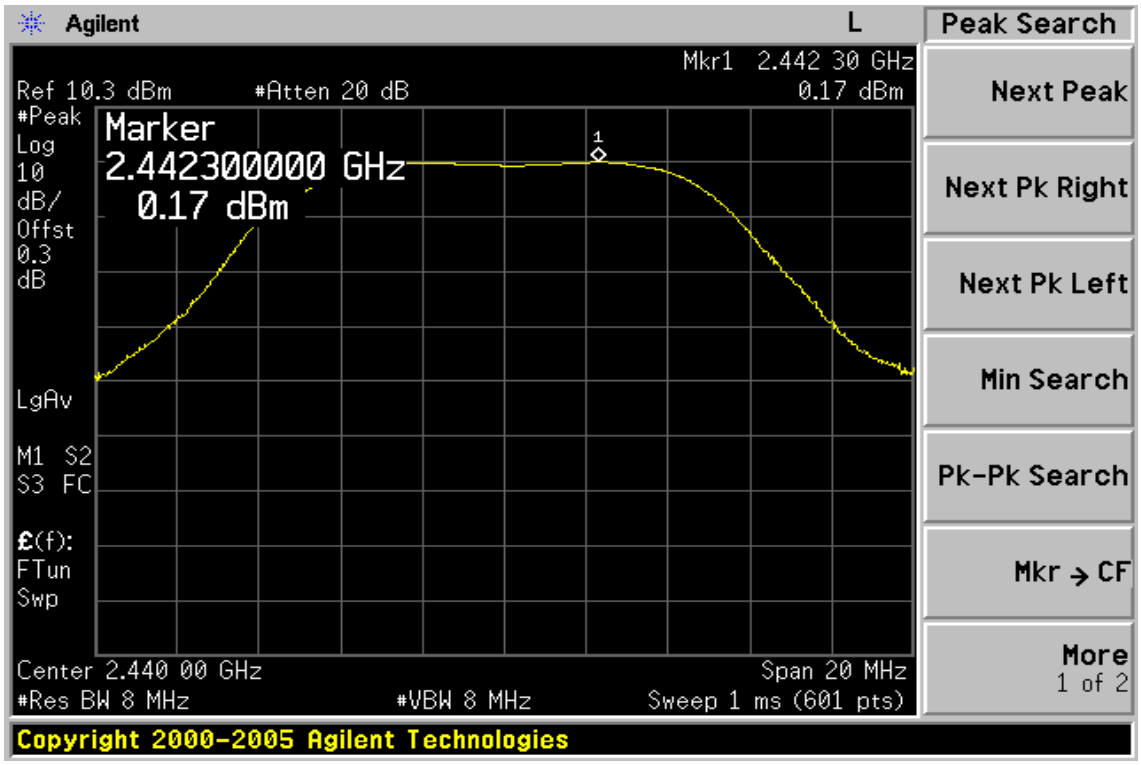
CH	Frequency (MHz)	Reading Power (dBm)	Cable Loss (dB)	Output Power (dBm)	Limit (dBm)	Result
LOW	2405.00	-0.69	0.00	-0.69	30	PASS
MID	2440.00	0.17	0.00	0.17	30	PASS
HIGH	2480.00	1.22	0.00	1.22	30	PASS

**Note: Offset 0.3dB*

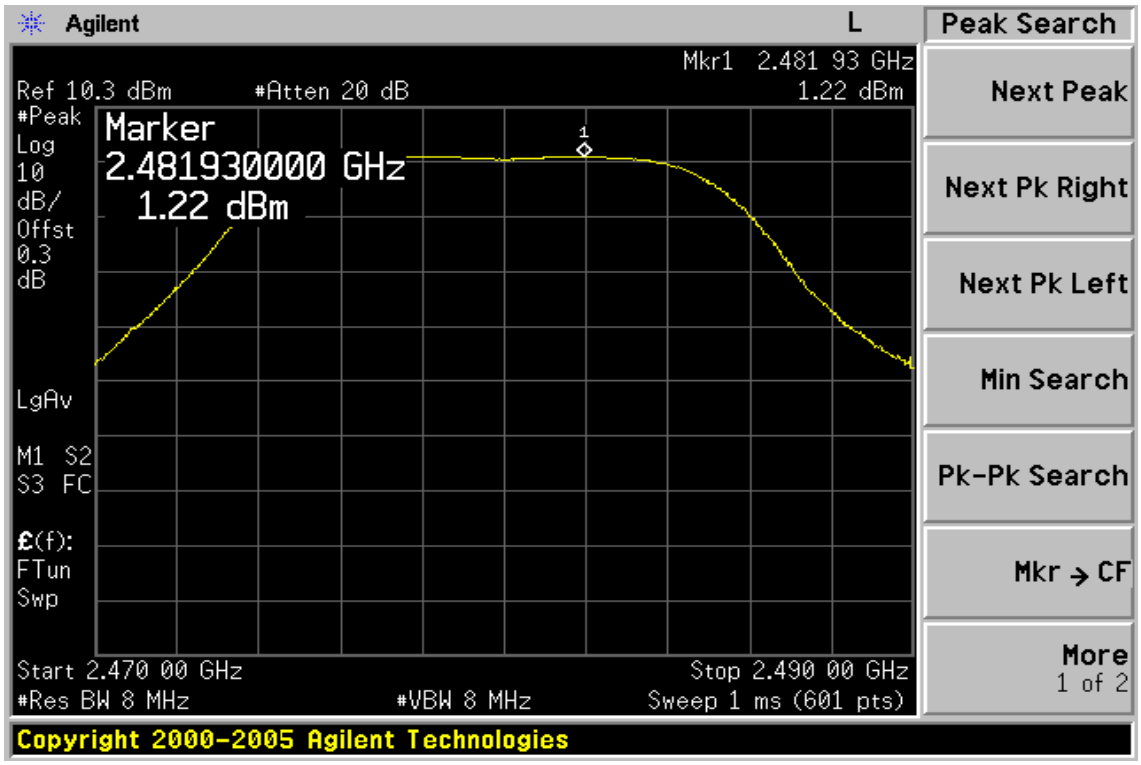
Peak Power Output Data Plot (CH Low)



Peak Power Output Data Plot (CH Mid)



Peak Power Output Data Plot (CH High)



7. 6dB Bandwidth

7.1 Standard Applicable

According to §15.247(a)(2) and RSS-210, Annex 8.2, Systems using digital modulation techniques may operate in the 902 - 928 MHz,2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500kHz..

7.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the 3.antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100KHz, VBW = 300KHz, Span= 50MHz, Sweep=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

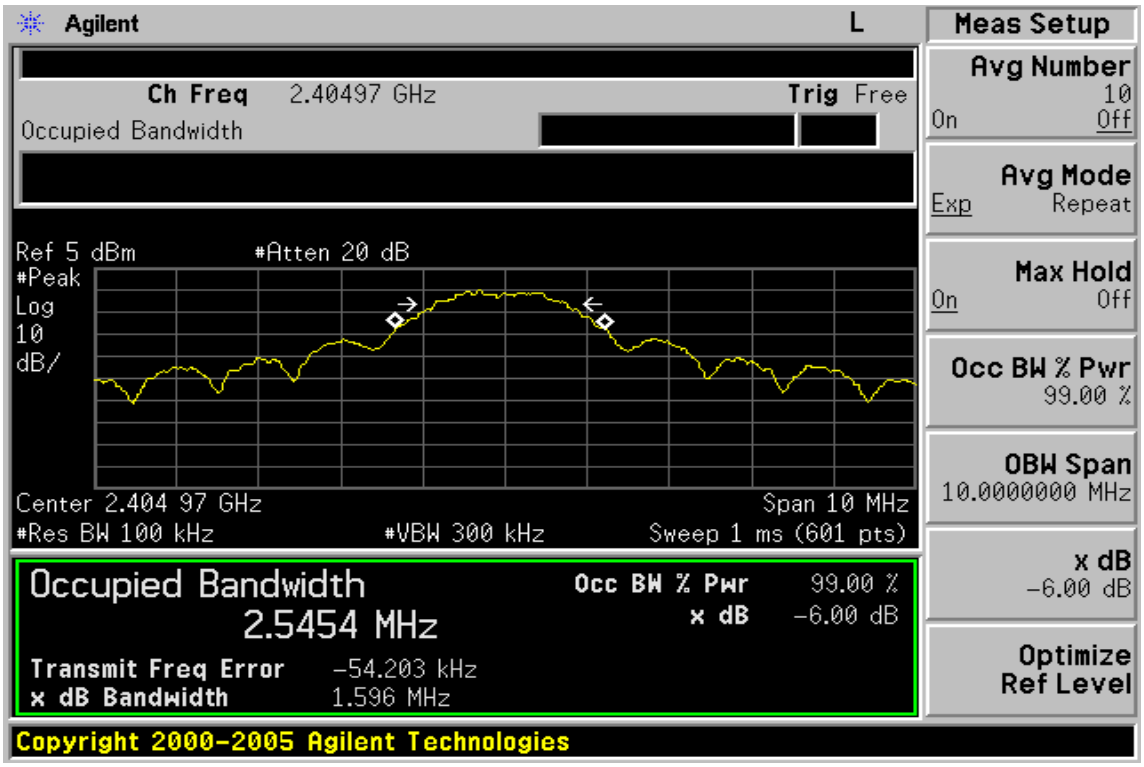
7.3 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/27/2007	04/26/2008
Spectrum Analyzer	Agilent	7405A	US41160416	07/04/2007	07/03/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2007	07/04/2008
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2007	07/04/2008
Splitter	Agilent	Power Biviber	51818	07/05/2007	07/04/2008

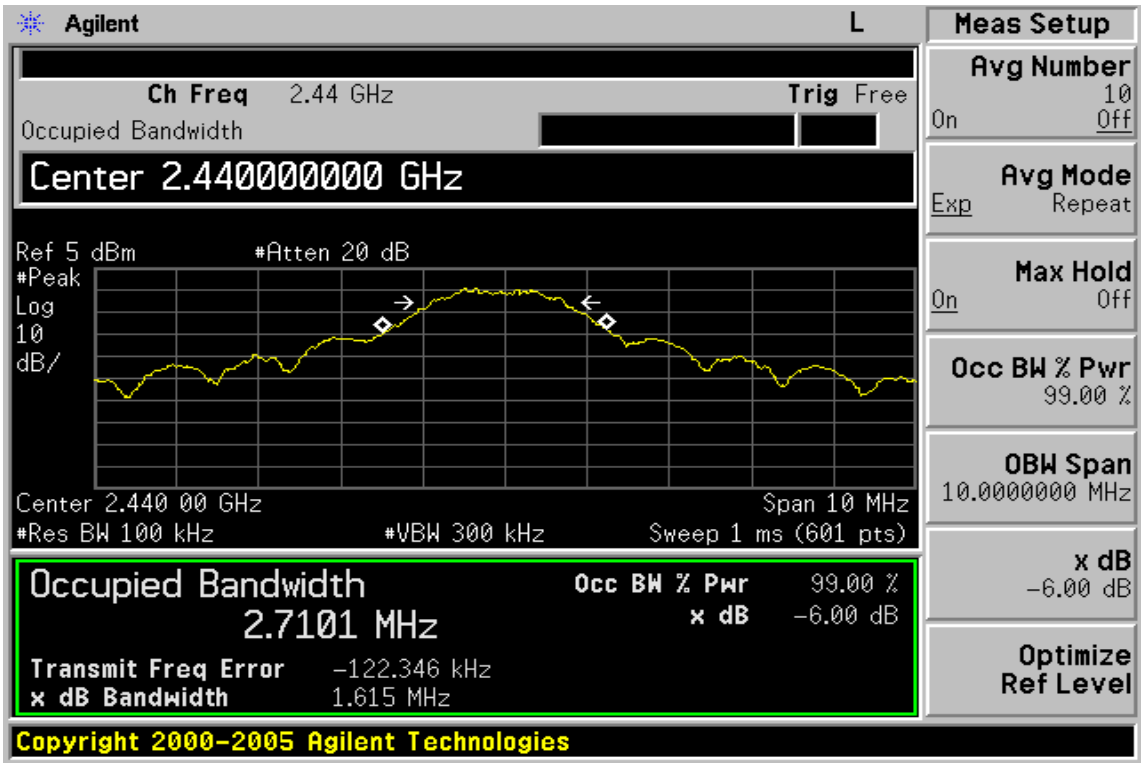
7.4 Measurement Result

CH	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
2405	1.596	> 500	PASS
2440	1.615	> 500	PASS
2480	1.506	> 500	PASS

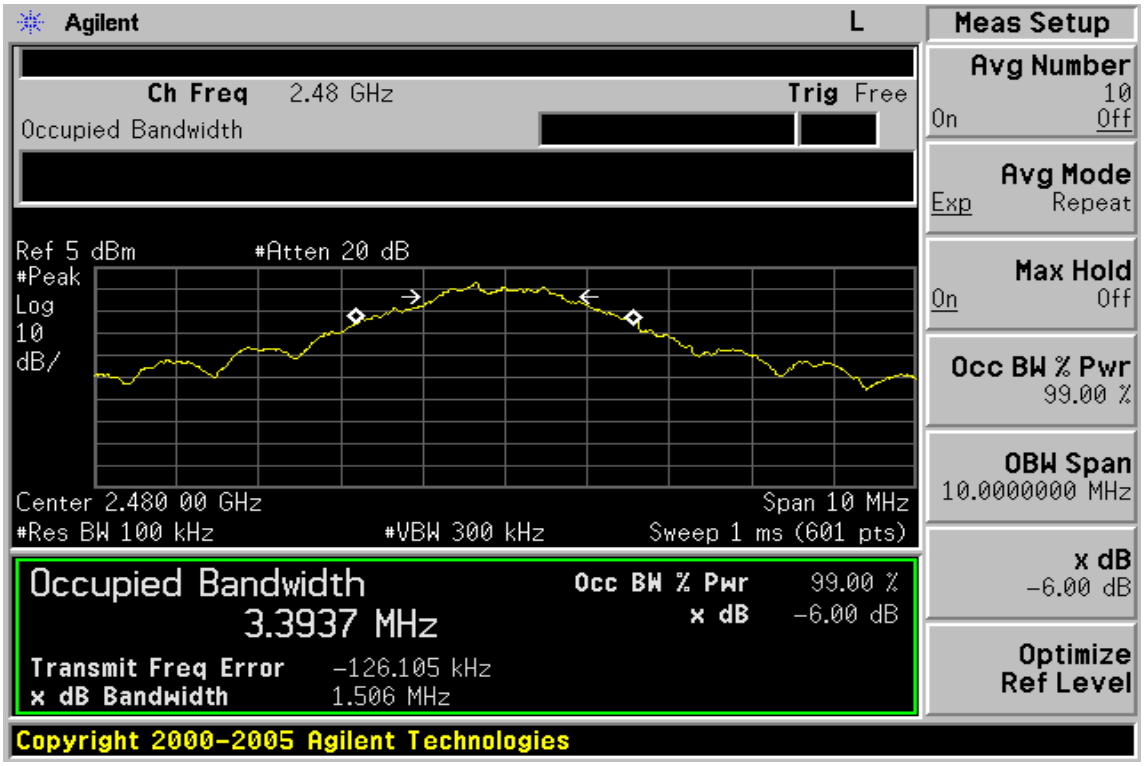
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High



8. 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

8.1 Standard Applicable

According to §15.247(c), in any 100 KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

According to §RSS-210 Annex8.5: In any 100 kHz bandwidth outside the operating frequency bands, between 30 MHz and 5 times the carrier frequency, the unwanted emission spectral density shall be either at least 20 dB below the inband spectral density, or shall not exceed the levels specified in Table 3, whichever is less stringent. Note: For frequency hopping systems, the inband density Si shall be measured with the hopping sequence stopped at the lowest channel and the highest channel in turn, as well as with the hopping running normally. The 20 dB shall be with reference to the lowest of the three Si values.

8.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=100KHz, Span=25MHz, Sweep = auto
5. Mark Peak, 2.390GHz and 2.4835GHz and record the max. level.
6. Repeat above procedures until all frequency measured were complete.

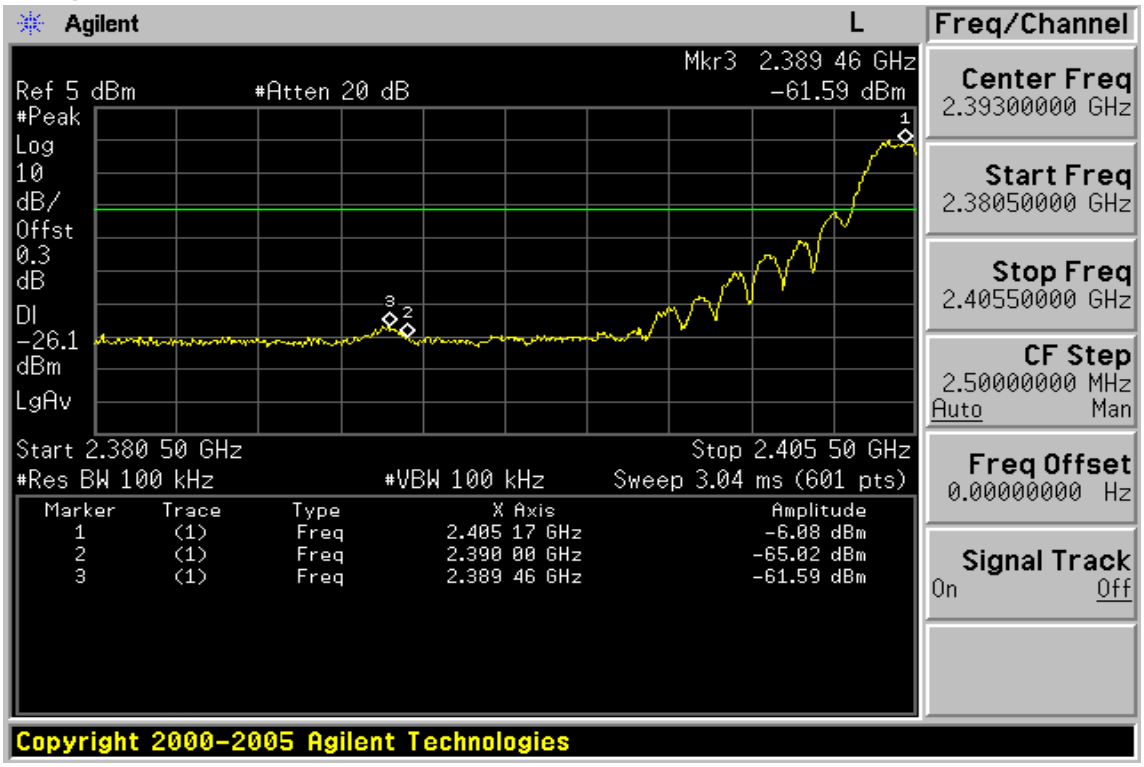
8.3 Measurement Result

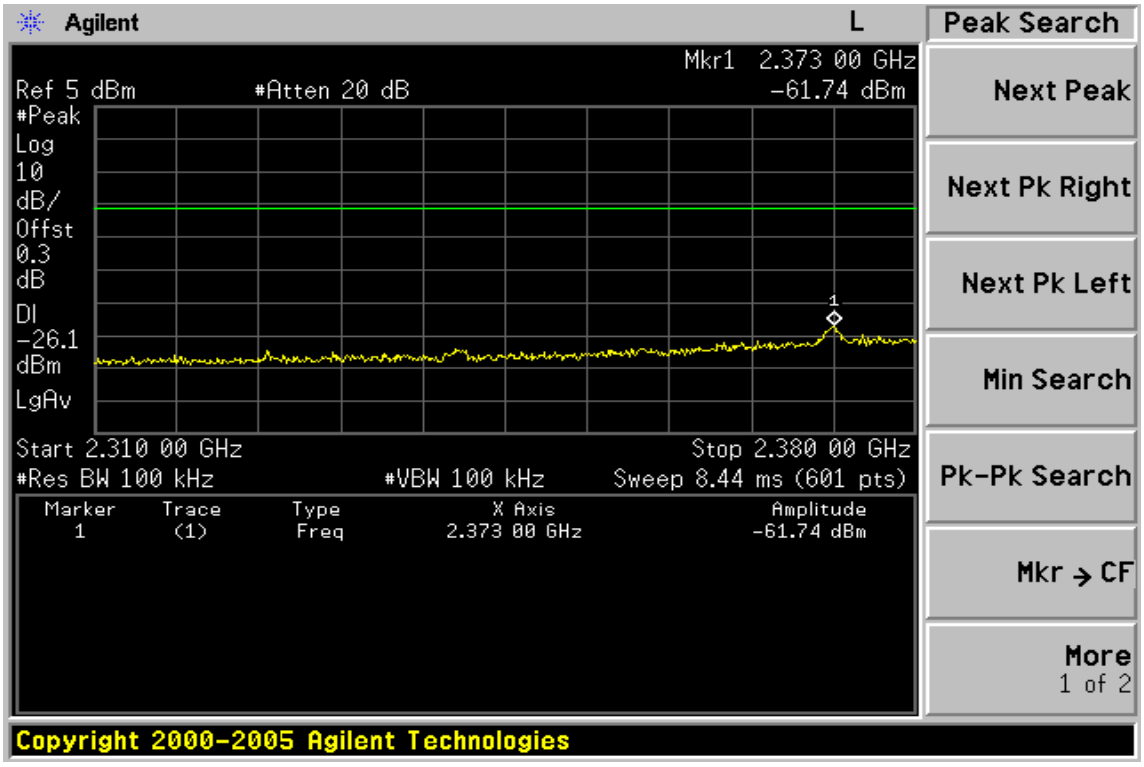
Refer to attach spectrum analyzer data chart.

8.4 Measurement Equipment Used:

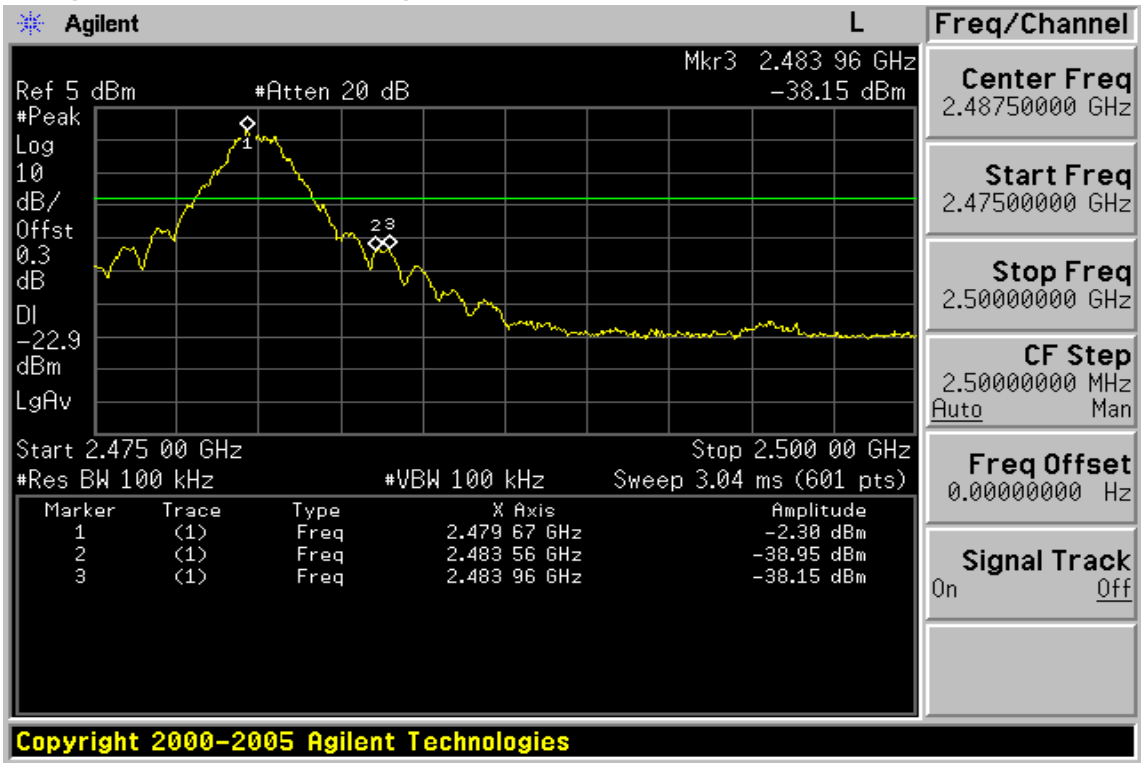
Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/27/2007	04/26/2008
Spectrum Analyzer	Agilent	7405A	US41160416	07/04/2007	07/03/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2007	07/04/2008
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2007	07/04/2008
Splitter	Agilent	Power Biviber	51818	07/05/2007	07/04/2008

Band Edges Test Data CH-Low





Band Edges Test Data CH-High



Radiated Emission: The Worst Mode

Operation Mode	TX CH Low	Test Date	Dec. 26, 2007
Fundamental Frequency	2405 MHz	Test By	Jazz
Temperature	25℃	Pol	Ver.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2389.46	35.52	---	-1.40	34.12	---	74.00	54.00	-19.88	Peak
2390.00	34.50	---	-1.39	33.11	---	74.00	54.00	-20.89	Peak

Operation Mode	TX CH Low	Test Date	Dec. 26, 2007
Fundamental Frequency	2405 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Hor.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2389.46	35.76	---	-1.40	34.36	---	74.00	54.00	-19.64	Peak
2390.00	34.77	---	-1.39	33.38	---	74.00	54.00	-20.62	Peak

Remark：

(1) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。When measured Peak value is under AV Limit, It doesn't need to measure AV value again.

(3) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(4) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Emission: The Worst Mode

Operation Mode	TX CH High	Test Date	Dec. 26, 2007
Fundamental Frequency	2480 MHz	Test By	Jazz
Temperature	25℃	Pol	Ver.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2483.56	46.51	---	-0.92	45.59	---	74.00	54.00	-8.41	Peak
2483.96	45.63	---	-0.92	44.71	---	74.00	54.00	-9.29	Peak

Operation Mode	TX CH High	Test Date	Dec. 26, 2007
Fundamental Frequency	2480 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Hor.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2483.56	47.99	---	-0.92	47.07	---	74.00	54.00	-6.93	Peak
2483.96	46.48	---	-0.92	45.56	---	74.00	54.00	-8.44	Peak

Remark：

(1) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。When measured Peak value is under AV Limit, It doesn't need to measure AV value again.

(3) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(4) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

9. SPURIOUS RADIATED EMISSION TEST

9.1 Standard Applicable

According to §15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in §15.209(a). And according to §15.33(a)(1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

According to §6.2.2(o) (e1)**:** In any 100 kHz bandwidth outside the operating frequency bands, between 30 MHz and 5 times the carrier frequency, the unwanted emission spectral density shall be either at least 20 dB below the inband spectral density, or shall not exceed the levels specified in Table 3, whichever is less stringent. Note: For frequency hopping systems, the inband density Si shall be measured with the hopping sequence stopped at the lowest channel and the highest channel in turn, as well as with the hopping running normally. The 20 dB shall be with reference to the lowest of the three Si values.

9.2 EUT Setup

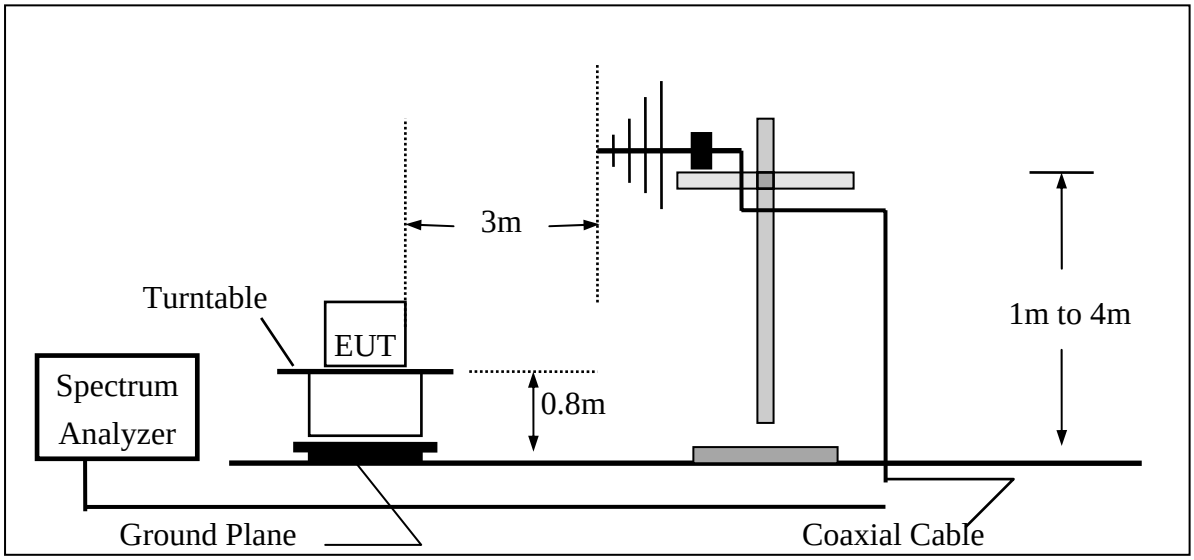
1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.4-2003.
2. The EUT was put in the front of the test table. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The spacing between the peripherals was 10 centimeters.
4. External I/O cables were draped along the edge of the test table and bundle when necessary.

9.3 Measurement Procedure

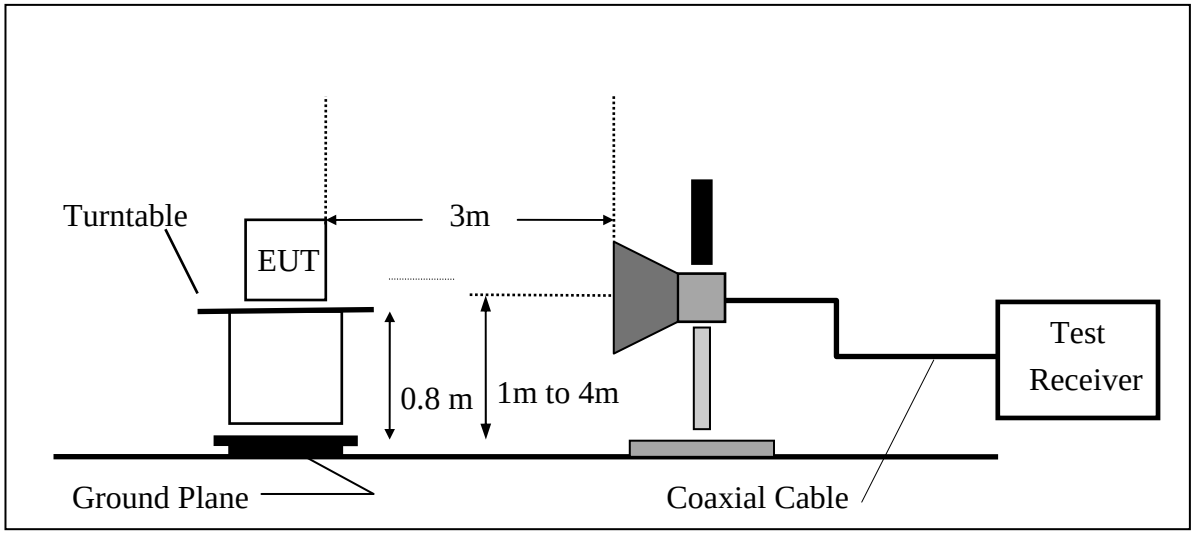
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured were complete.

9.4 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



9.5 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/27/2007	04/26/2008
Spectrum Analyzer	Agilent	E7405A	US41160416	07/04/2007	07/03/2008
Bilog Antenna	SCHWAZBECK	VULB9160	152	10/17/2006	10/16/2008
Horn antenna	Schwarzbeck	BBHA 9120D	309/320	04/11/2007	04/10/2008
Horn antenna	Schwarzbeck	BBHA 9170	184/185	12/13/2007	12/12/2008
Pre-Amplifier	HP	8447D	2944A09469	07/19/2007	07/18/2008
Pre-Amplifier	HP	8494B	3008A00578	02/26/2007	02/25/2008
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	10/09/2007	10/08/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	10/09/2007	10/08/2008
Site NSA	SGS	966 chamber	N/A	11/17/2006	11/16/2008

9.6 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

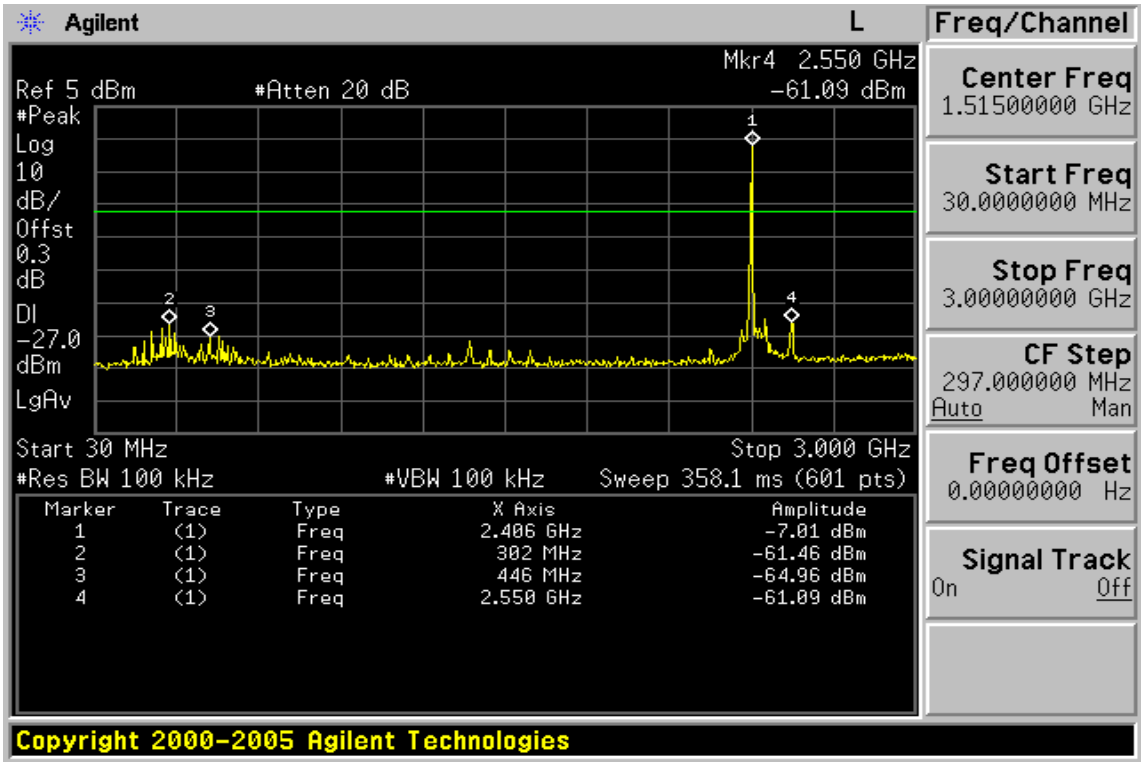
Where FS = Field Strength		CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude		AG = Amplifier Gain
AF = Antenna Factor		

9.7 Measurement Result

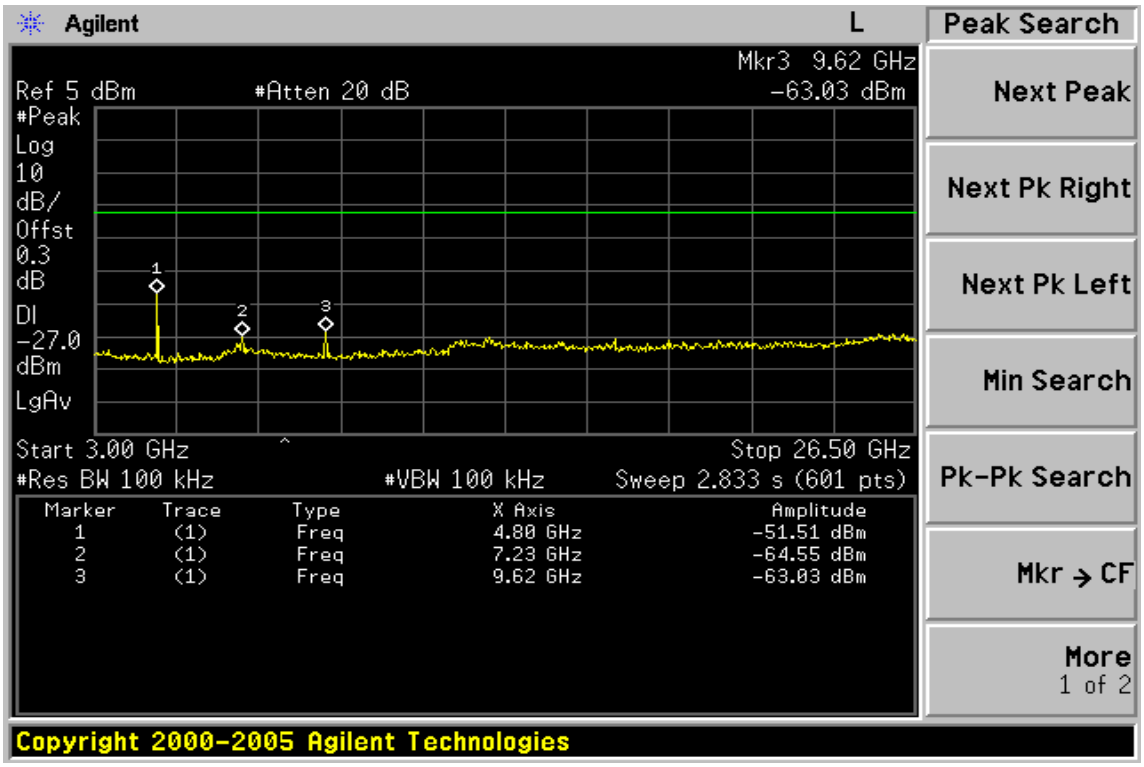
Refer to attach tabular data sheets.

Conducted Spurious Emission Measurement Result

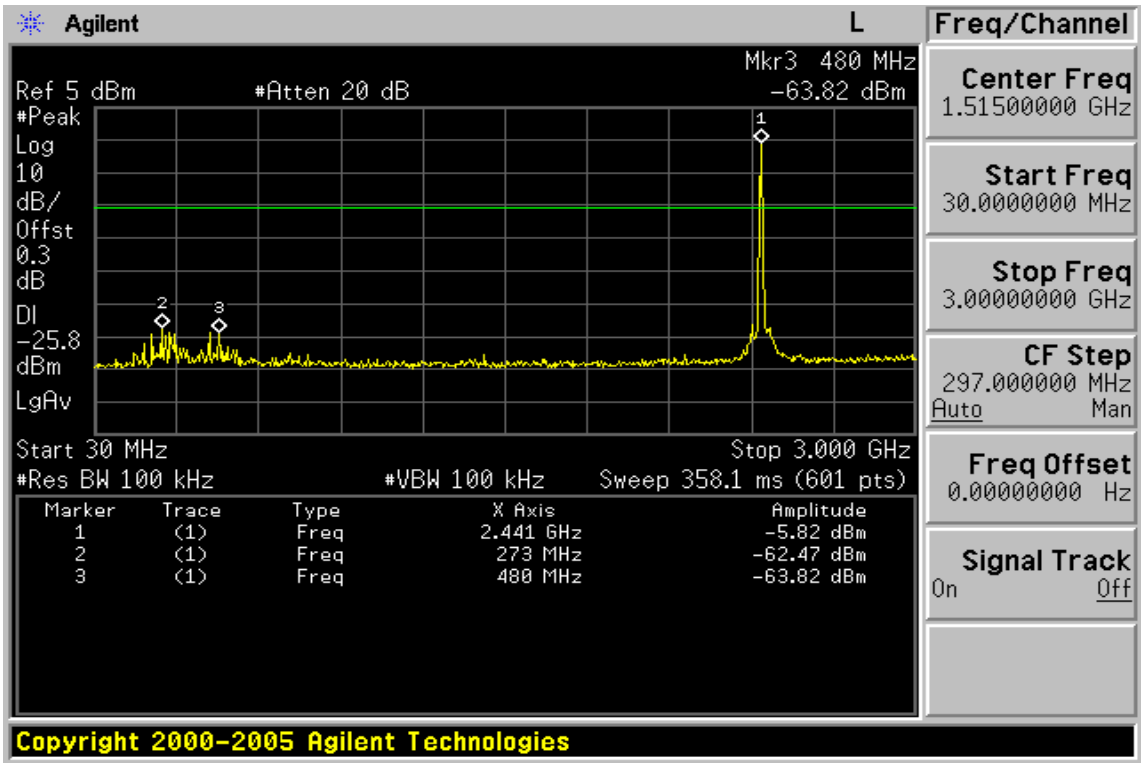
Ch Low 30MHz – 3GHz



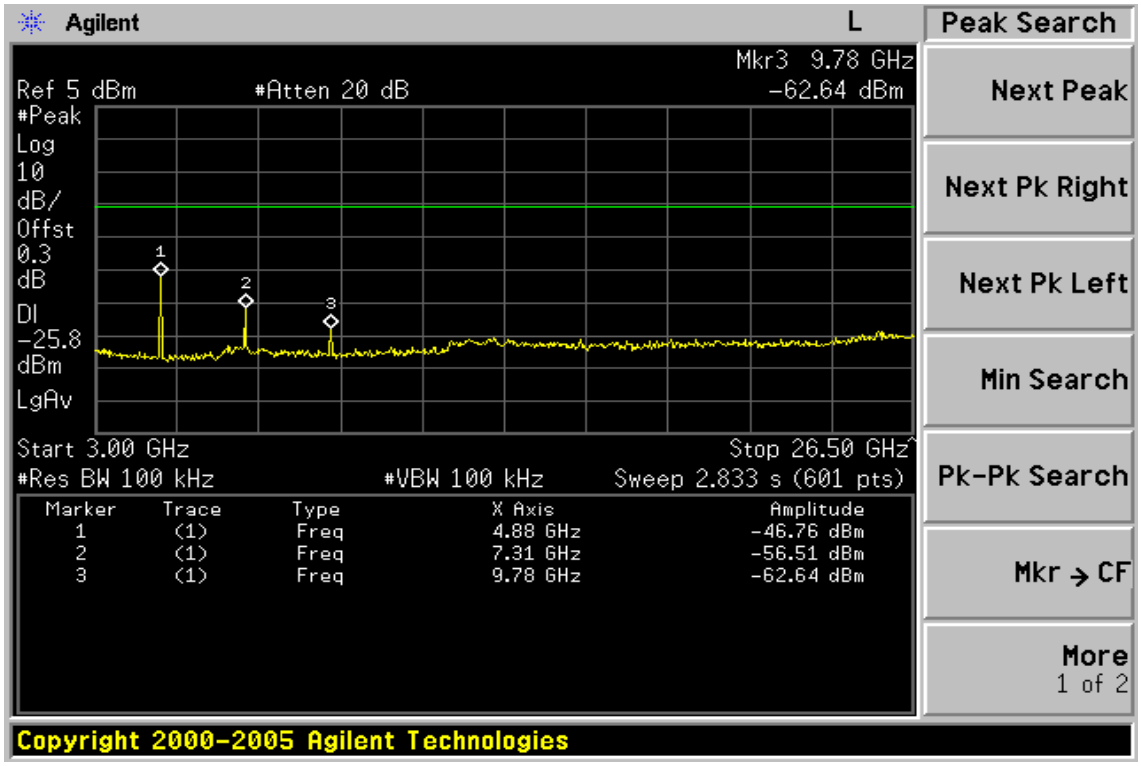
Ch Low 3GHz – 26.5GHz



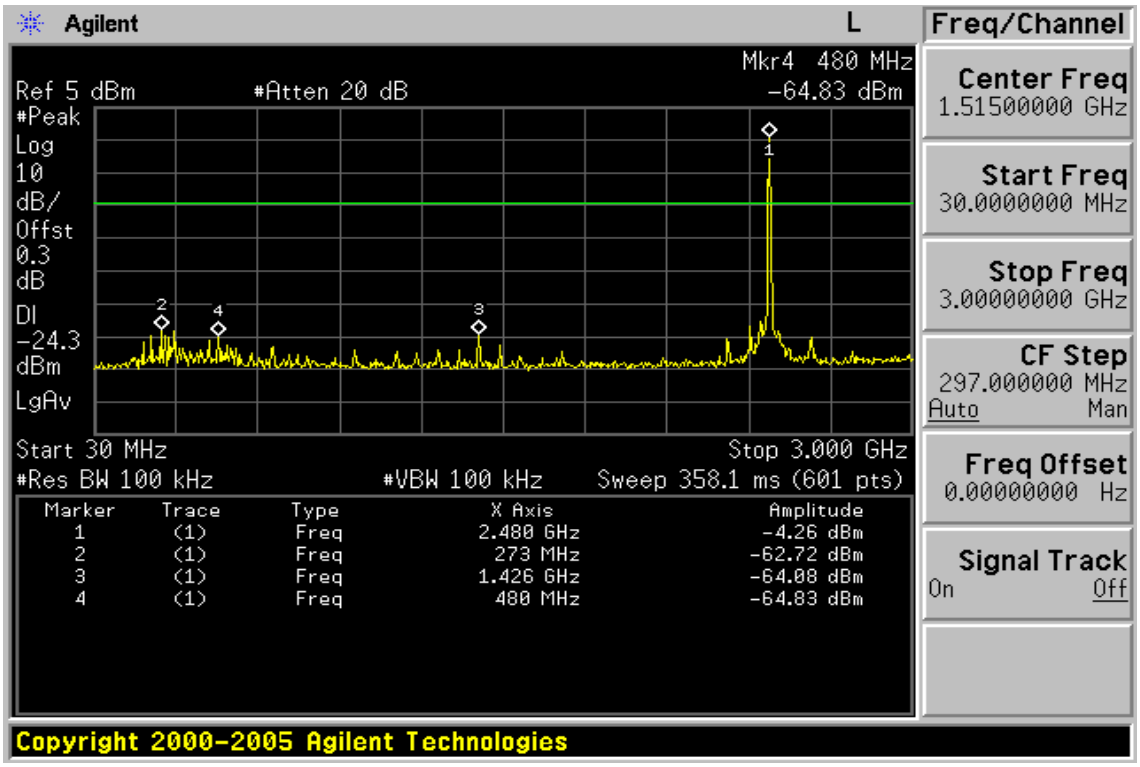
Ch Mid 30MHz – 3GHz



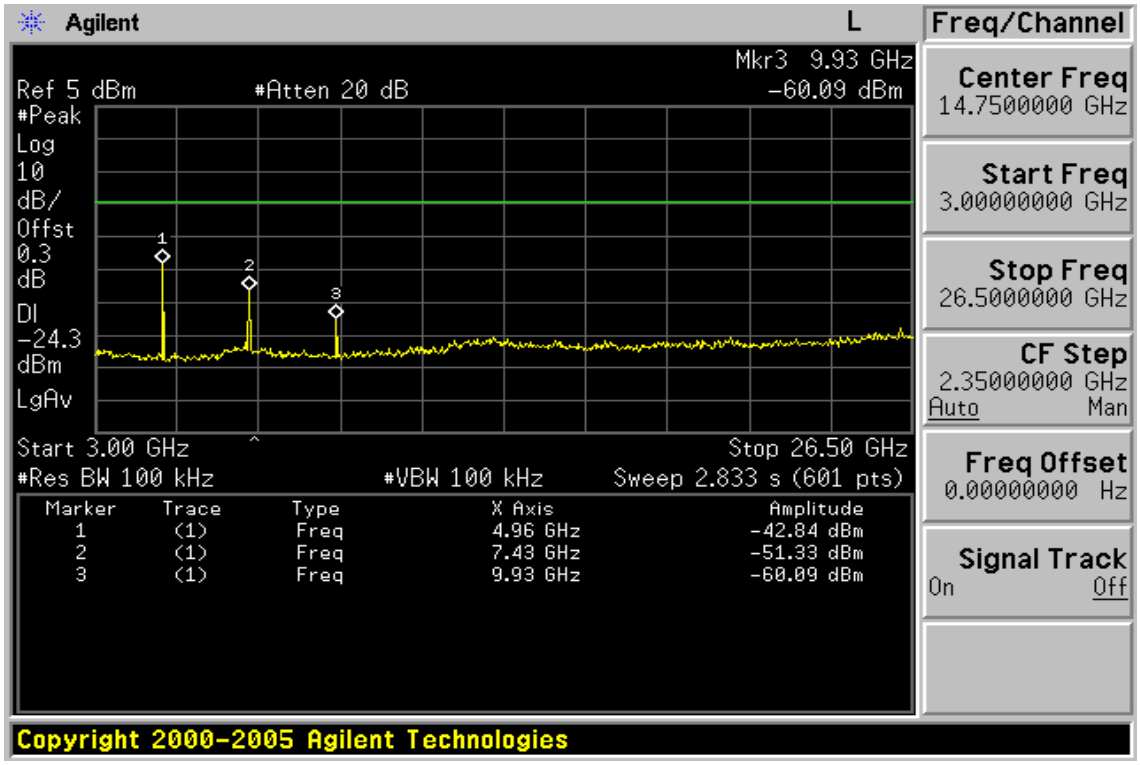
Ch Mid 3GHz – 26.5GHz



Ch High 30MHz – 3GHz



Ch High 3GHz – 26.5GHz



Radiated Spurious Emission Measurement Result (below 1GHz), The worst mode

Operation Mode	TX CH Low	Test Date	Dec. 26, 2007
Fundamental Frequency	2405MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
77.53	V	Peak	47.51	-17.46	30.05	40.00	-9.95
90.14	V	Peak	58.99	-17.62	41.37	43.50	-2.13
119.24	V	Peak	49.07	-15.32	33.75	43.50	-9.75
159.98	V	Peak	42.13	-13.40	28.73	43.50	-14.77
227.88	V	Peak	38.71	-14.54	24.17	46.00	-21.83
96.93	H	Peak	42.46	-17.16	25.30	43.50	-18.20
237.58	H	Peak	38.72	-14.22	24.50	46.00	-21.50
264.74	H	Peak	39.84	-13.59	26.25	46.00	-19.75

Remark：

1 Measuring frequencies from 30 MHz to the 1GHz。

2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.

3 Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH Mid	Test Date	Dec. 26, 2007
Fundamental Frequency	2440MHz	Test By	Jazz
Temperature	25℃	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
58.13	V	Peak	42.29	-14.66	27.63	40.00	-12.37
90.14	V	Peak	43.58	-17.62	25.96	43.50	-17.54
114.39	V	Peak	38.39	-15.87	22.52	43.50	-20.98
269.59	V	Peak	35.19	-13.55	21.64	46.00	-24.36
82.38	H	Peak	43.66	-17.93	25.73	40.00	-14.27
94.99	H	Peak	42.95	-17.26	25.69	43.50	-17.81
130.88	H	Peak	47.63	-14.40	33.23	43.50	-10.27
155.13	H	Peak	36.08	-13.12	22.96	43.50	-20.54

Remark：

1 Measuring frequencies from 30 MHz to the 1GHz。

2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.

3 Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH High	Test Date	Dec. 26, 2007
Fundamental Frequency	2480MHz	Test By	Jazz
Temperature	25℃	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
58.13	V	Peak	40.64	-14.66	25.98	40.00	-14.02
90.14	V	Peak	43.38	-17.62	25.76	43.50	-17.74
150.28	V	Peak	32.90	-12.83	20.07	43.50	-23.43
77.53	H	Peak	47.14	-17.46	29.68	40.00	-10.32
96.93	H	Peak	42.48	-17.16	25.32	43.50	-18.18
126.03	H	Peak	37.82	-14.78	23.04	43.50	-20.46
198.78	H	Peak	36.84	-15.56	21.28	43.50	-22.22
255.04	H	Peak	35.69	-13.69	22.00	46.00	-24.00

Remark：

1 Measuring frequencies from 30 MHz to the 1GHz。

2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.

3 Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Low	Test Date	Dec. 26, 2007
Fundamental Frequency	2405 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	
4810.0	31.78	--	6.04	37.82	--	74.00	54.00	-16.18	Peak
7215.0	----								
9620.0	----								
12025.0	----								
14430.0	----								
16835.0	----								
19240.0	----								
21645.0	----								
24050.0	----								

Remark：

(1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。When measured Peak value is under AV Limit, It doesn't need to measure AV value again.

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Low	Test Date	Dec. 26, 2007
Fundamental Frequency	2405 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Hor
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	
4810.0	34.20	--	6.04	40.24	--	74.00	54.00	-13.76	Peak
7215.0	----								
9620.0	----								
12025.0	----								
14430.0	----								
16835.0	----								
19240.0	----								
21645.0	----								
24050.0	----								

Remark：

(1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。When measured Peak value is under AV Limit, It doesn't need to measure AV value again.

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Mid	Test Date	Dec. 26, 2007
Fundamental Frequency	2440 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	
4880.0	33.56	--	6.17	39.73	--	74.00	54.00	-14.27	Peak
7320.0	----								
9760.0	----								
12200.0	----								
14640.0	----								
17080.0	----								
19520.0	----								
21960.0	----								
24400.0	----								

Remark：

(1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。When measured Peak value is under AV Limit, It doesn't need to measure AV value again.

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Mid	Test Date	Dec. 26, 2007
Fundamental Frequency	2440 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Hor
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	
4880.0	33.85	--	6.17	40.02	--	74.00	54.00	-13.98	Peak
7320.0	----								
9760.0	----								
12200.0	----								
14640.0	----								
17080.0	----								
19520.0	----								
21960.0	----								
24400.0	----								

Remark：

(1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。When measured Peak value is under AV Limit, It doesn't need to measure AV value again.

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH High	Test Date	Dec. 26, 2007
Fundamental Frequency	2480 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	
4960.0	34.62	--	6.36	40.98	--	74.00	54.00	-13.02	Peak
7440.0	----								
9920.0	----								
12400.0	----								
14880.0	----								
17360.0	----								
19840.0	----								
22320.0	----								
24800.0	----								

Remark：

(1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。When measured Peak value is under AV Limit, It doesn't need to measure AV value again.

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH High	Test Date	Dec. 26, 2007
Fundamental Frequency	2480 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Hor
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	
4960.0	34.38	--	6.36	40.74	--	74.00	54.00	-13.26	Peak
7428.5	----								
7440.0	----								
9920.0	----								
12400.0	----								
14880.0	----								
17360.0	----								
19840.0	----								
22320.0	----								
24800.0	----								

Remark：

(1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。When measured Peak value is under AV Limit, It doesn't need to measure AV value again.

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	RX CH Low	Test Date	Dec. 26, 2007
Fundamental Frequency	2405MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
58.13	V	Peak	45.15	-15.09	30.06	40.00	-9.94
90.14	V	Peak	46.16	-15.17	30.99	43.50	-12.51
114.39	V	Peak	39.15	-15.06	24.09	43.50	-19.41
196.84	V	Peak	36.30	-8.55	27.75	43.50	-15.75
94.99	H	Peak	46.45	-17.26	29.19	43.50	-14.31
119.24	H	Peak	45.36	-15.32	30.04	43.50	-13.46
148.34	H	Peak	38.01	-12.90	25.11	43.50	-18.39
216.24	H	Peak	42.09	-15.05	27.04	46.00	-18.96

Remark：

1 Measuring frequencies from 30 MHz to the 1GHz。

2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.

3 Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	RX CH Mid	Test Date	Dec. 26, 2007
Fundamental Frequency	2440MHz	Test By	Jazz
Temperature	25℃	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
77.53	V	Peak	45.95	-17.46	28.49	40.00	-11.51
90.14	V	Peak	43.16	-17.62	25.54	43.50	-17.96
172.59	V	Peak	38.90	-14.10	24.80	43.50	-18.70
284.14	V	Peak	34.86	-13.28	21.58	46.00	-24.42
77.53	H	Peak	49.94	-17.46	32.48	40.00	-7.52
96.93	H	Peak	41.09	-17.16	23.93	43.50	-19.57
116.33	H	Peak	38.40	-15.72	22.68	43.50	-20.82

Remark：

1 Measuring frequencies from 30 MHz to the 1GHz。

2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.

3 Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	RX CH High	Test Date	Dec. 26, 2007
Fundamental Frequency	2480MHz	Test By	Jazz
Temperature	25℃	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
58.13	V	Peak	42.13	-14.66	27.47	40.00	-12.53
90.14	V	Peak	43.11	-17.62	25.49	43.50	-18.01
140.58	V	Peak	33.84	-13.65	20.19	43.50	-23.31
96.93	H	Peak	42.69	-17.16	25.53	43.50	-17.97
124.09	H	Peak	39.17	-14.94	24.23	43.50	-19.27
225.94	H	Peak	34.65	-14.61	20.04	46.00	-25.96

Remark：

1 Measuring frequencies from 30 MHz to the 1GHz。

2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.

3 Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	RX CH Low	Test Date	Dec. 26, 2007
Fundamental Frequency	2405 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)

4810.0	----							
7215.0	----							
9620.0	----							
12025.0	----							
14430.0	----							
16835.0	----							
19240.0	----							
21645.0	----							
24050.0	----							

Remark：

(1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。When measured Peak value is under AV Limit, It doesn't need to measure AV value again.

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	RX CH Low	Test Date	Dec. 26, 2007
Fundamental Frequency	2405 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Hor
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)

4810.0	----							
7215.0	----							
9620.0	----							
12025.0	----							
14430.0	----							
16835.0	----							
19240.0	----							
21645.0	----							
24050.0	----							

Remark：

(1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。When measured Peak value is under AV Limit, It doesn't need to measure AV value again.

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	RX CH Mid	Test Date	Dec. 26, 2007
Fundamental Frequency	2440 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)

4880.0	----							
7320.0	----							
9760.0	----							
12200.0	----							
14640.0	----							
17080.0	----							
19520.0	----							
21960.0	----							
24400.0	----							

Remark：

(1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

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(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	RX CH Mid	Test Date	Dec. 26, 2007
Fundamental Frequency	2440 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Hor
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)

4880.0	----							
7320.0	----							
9760.0	----							
12200.0	----							
14640.0	----							
17080.0	----							
19520.0	----							
21960.0	----							
24400.0	----							

Remark：

(1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。When measured Peak value is under AV Limit, It doesn't need to measure AV value again.

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	RX CH High	Test Date	Dec. 26, 2007
Fundamental Frequency	2480 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Ver
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)

4960.0	----							
7440.0	----							
9920.0	----							
12400.0	----							
14880.0	----							
17360.0	----							
19840.0	----							
22320.0	----							
24800.0	----							

Remark：

(1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。When measured Peak value is under AV Limit, It doesn't need to measure AV value again.

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	RX CH High	Test Date	Dec. 26, 2007
Fundamental Frequency	2480 MHz	Test By	Jazz
Temperature	25 ℃	Pol	Hor
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)

4960.0	----							
7440.0	----							
9920.0	----							
12400.0	----							
14880.0	----							
17360.0	----							
19840.0	----							
22320.0	----							
24800.0	----							

Remark：

(1) Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。When measured Peak value is under AV Limit, It doesn't need to measure AV value again.

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

10. Peak Power Spectral Density

10.1 Standard Applicable

According to §15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

According to RSS-Annex 8.2(2) The transmitter power spectral density (into the antenna) shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission or over 1.0 second if the transmission exceeds 1.0 second duration.

10.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 3KHz, VBW = 10KHz, Span = 1.5MHz, Sweep=100s
4. Record the max. reading.
5. Repeat above procedures until all frequency measured were complete.

10.3 Measurement Equipment Used:

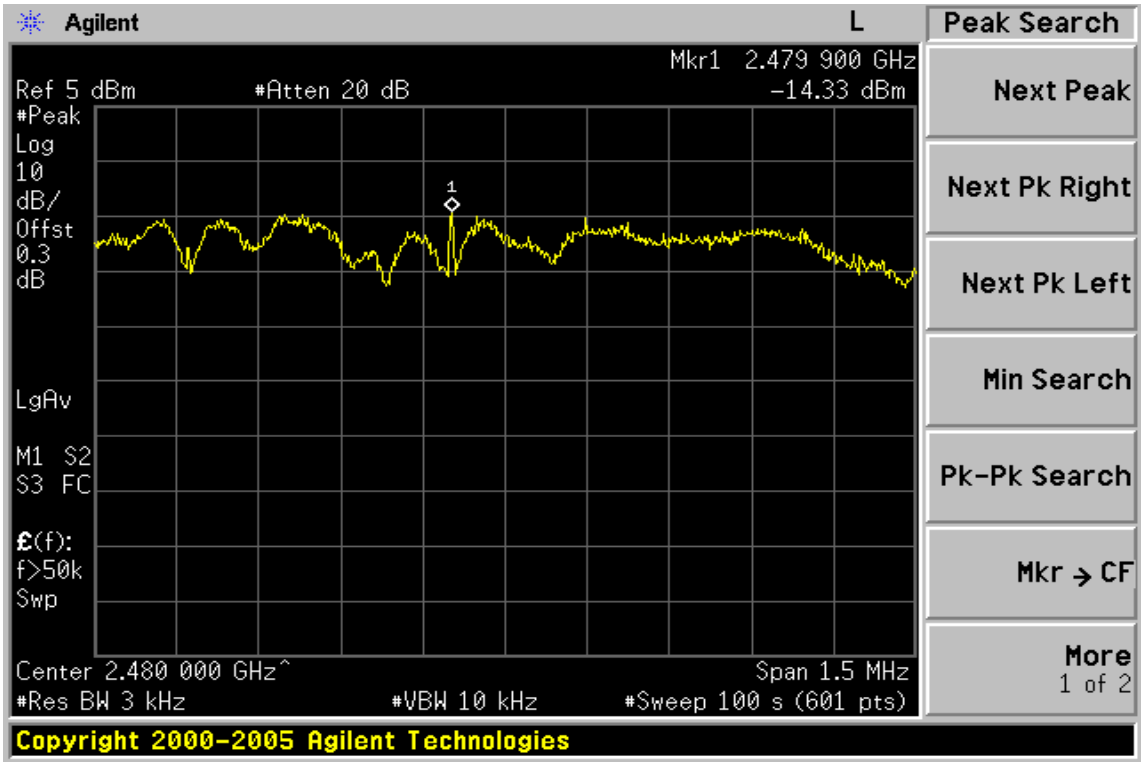
Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/27/2007	04/26/2008
Spectrum Analyzer	Agilent	7405A	US41160416	07/04/2007	07/03/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2007	07/04/2008
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2007	07/04/2008
Splitter	Agilent	Power Biviber	51818	07/05/2007	07/04/2008

10.4 Measurement Result

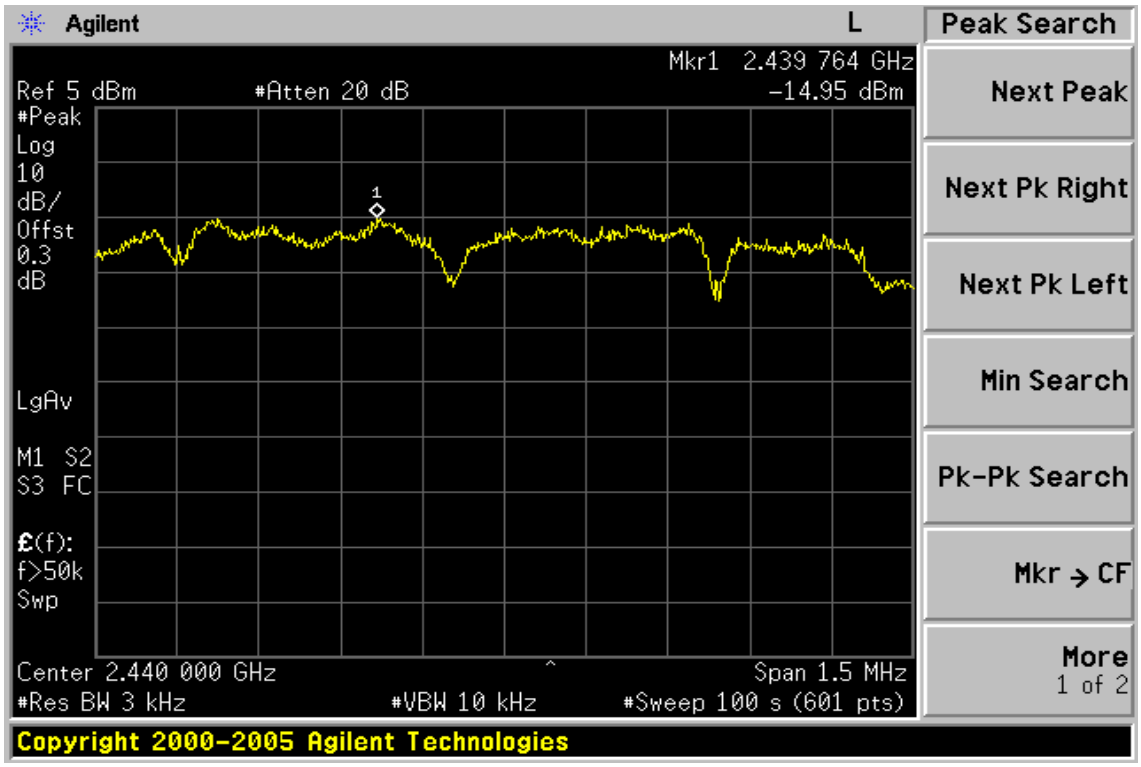
CH	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
Low	-14.33	0.00	-14.33	8
Mid	-14.95	0.00	-14.95	8
High	-13.98	0.00	-13.98	8

**Note: Offset 0.3dB*

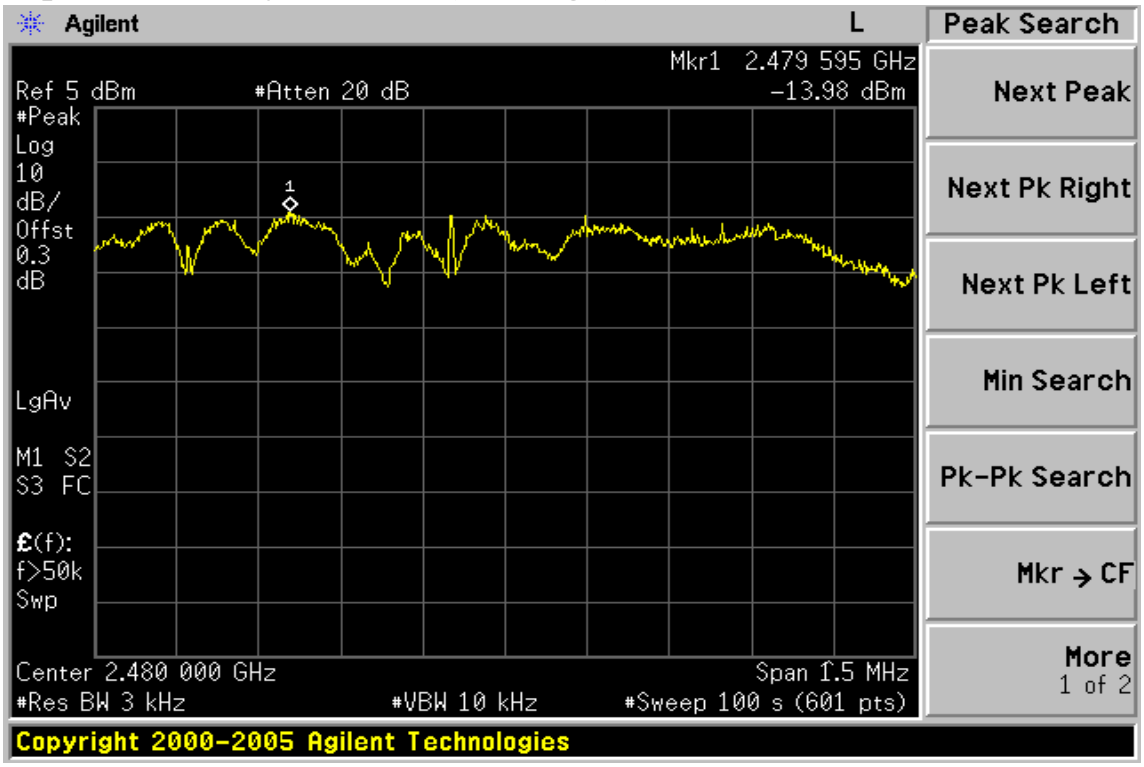
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



11. 99% Bandwidth Measurement

11.1 Standard Applicable

RSS-Gen , section 4.4.1, An alternative to the 20 dB bandwidth is the 99% emission bandwidth. This bandwidth is determined such that below the lower and above the upper frequency limits, the mean powers emitted are each equal to 0.5% of the total mean power of the emission.

11.2 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/27/2007	04/26/2008
Spectrum Analyzer	Agilent	7405A	US41160416	07/04/2007	07/03/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2007	07/04/2008
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2007	07/04/2008
Splitter	Agilent	Power Biviber	51818	07/05/2007	07/04/2008

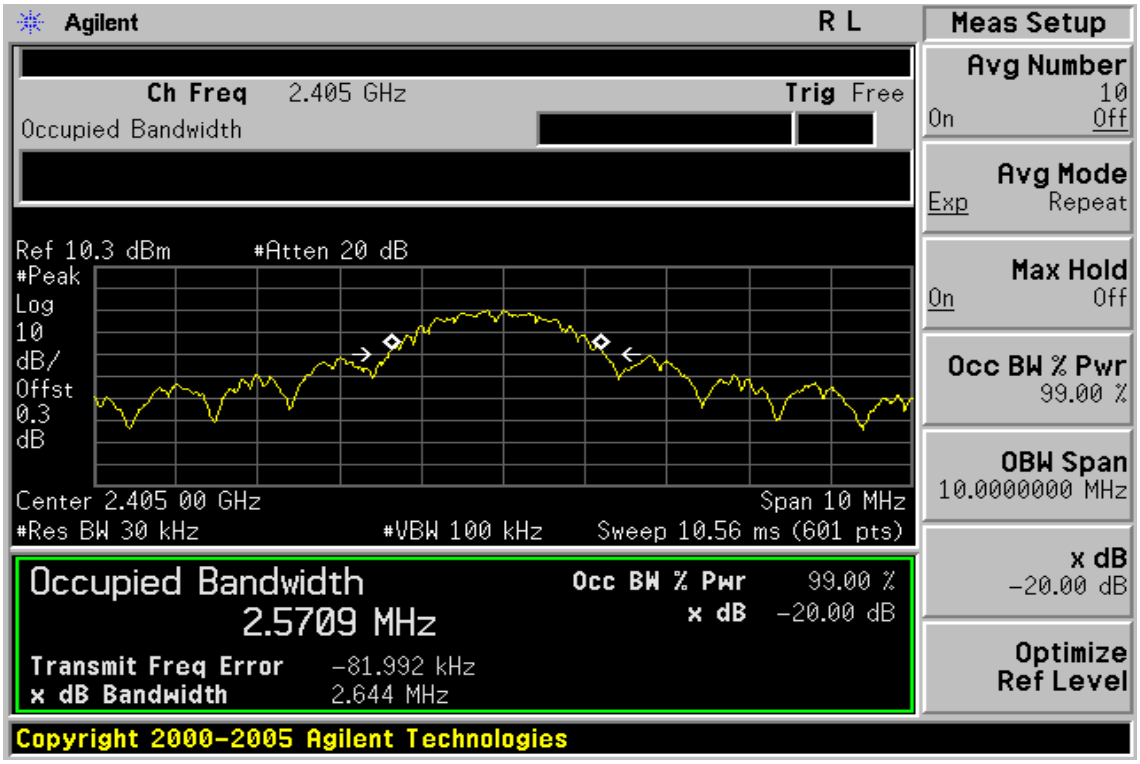
11.3 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=1% of the approximate emission bandwidth, VBW = 3 times RBW, Span= approximately 20dB below the peak level. Sweep=auto
4. Turn on the 99% bandwidth function, max reading..
5. Repeat above procedures until all frequency measured were complete.

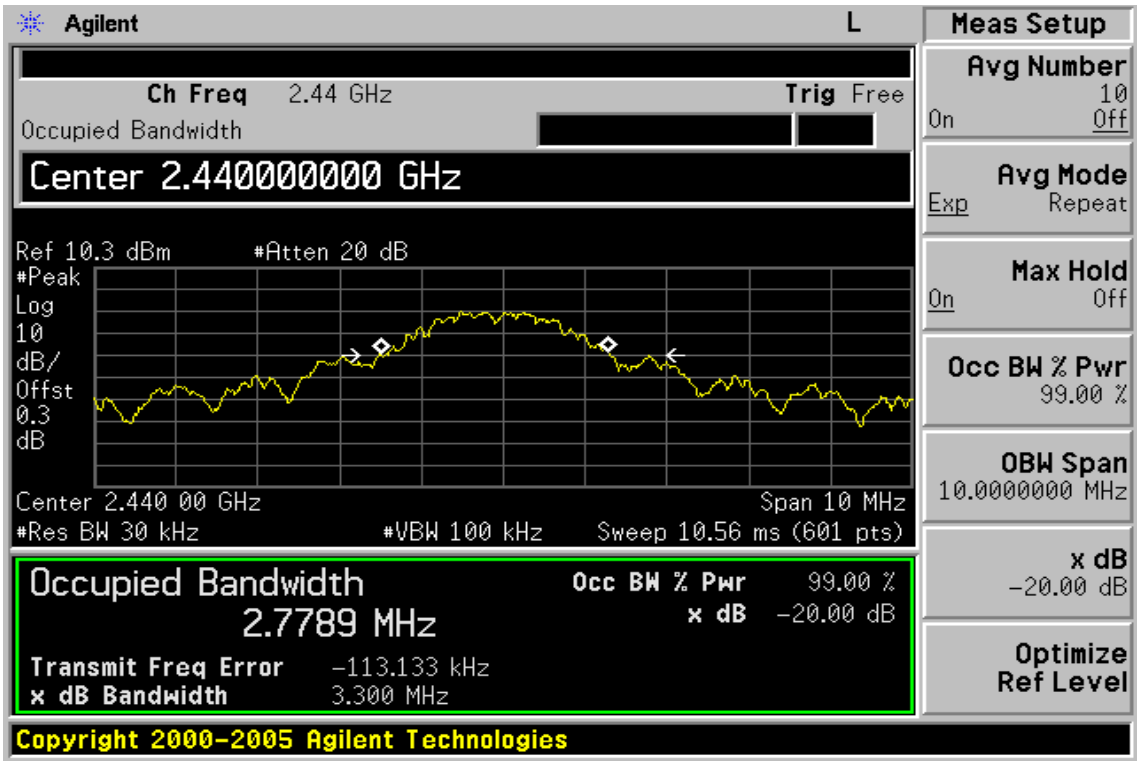
11.4 Measurement Result

CH	Bandwidth (MHz)
Lower	2.5709
Mid	2.7789
Higher	3.4192

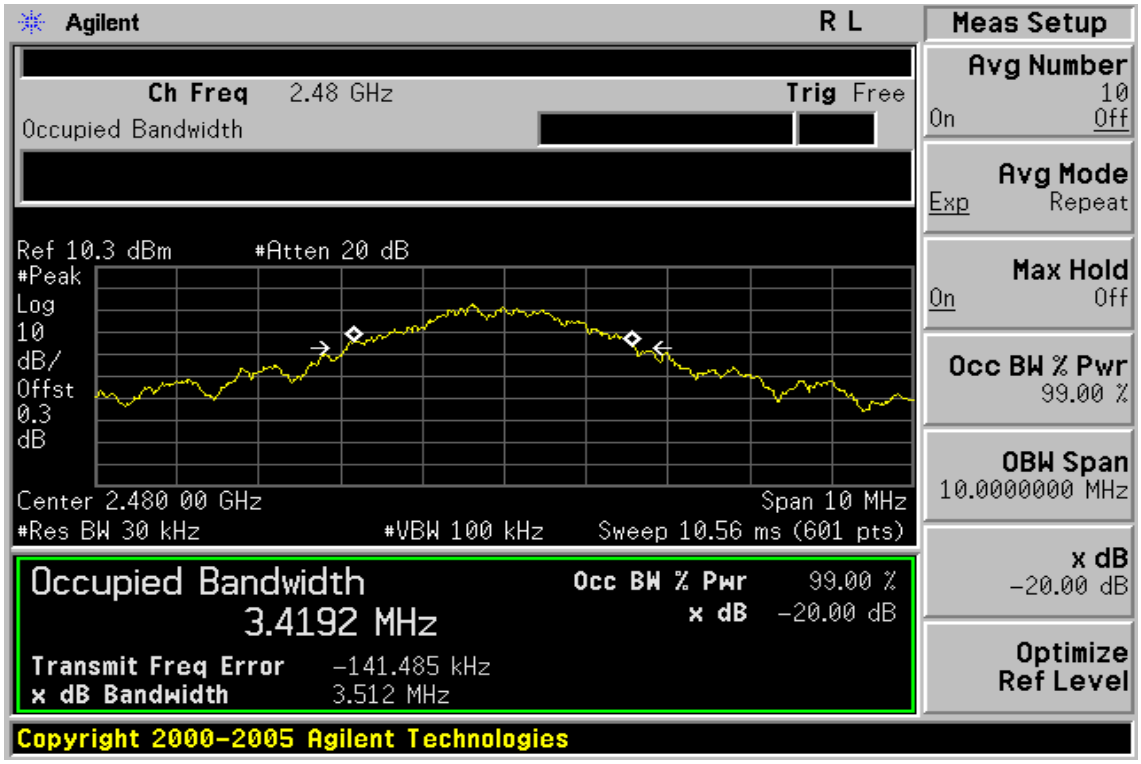
99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid



99% Band Width Test Data CH-High



12. ANTENNA REQUIREMENT

12.1. Standard Applicable

According to §15.203, Antenna requirement.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

According to §RSS- 210, Annex 8.4: Note that special antenna connectors are required for spread spectrum systems (with respect to section 5.5. section 5.5, The transmitter antenna shall be integral with the device, or the antenna coupling be so designed that no antenna other than that furnished by the party responsible for compliance shall be used.

Example: Special antenna connectors not readily available in retail shops in Canada may be acceptable. The antenna design may be such as to allow a broken antenna to be replaced by the user, but the use of a standard jack or electrical connector is prohibited. The special antenna connector requirement does not apply to 6.2.2 (a), 6.2.2 (b), and 8.1 to 8.5. Further, this requirement does not apply to transmitters that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to transmitters which require unwanted emission measurements after installation (section 5.15). In the installation/ **user manual**, the user shall be notified that a proper type of antenna must be employed and of the RF field limits to be met. When the standard limits the antenna gain to N dB, this limit applies only to the transmitting antenna system net gain, i.e. antenna gain minus its cabling loss.

When a measurement at the antenna connector (section 10) is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in this Standard for devices of RF output powers 10 milliwatts or less. In the case of devices of output powers more than 10 milliwatts, the total antenna gain shall be added, except for the case of 6.2.2 (o) on spread spectrum systems.

User Manual (for transmitter with detachable antenna): The user manual of transmitter devices equipped with a detachable antenna shall contain the following information in a conspicuous location: *"This device has been designed to operate with an antenna having a maximum gain of [x] dB. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is [y] ohms."* Equipment manufacturer shall provide proper values of x and y to comply with the

12.2. Antenna Connected Construction

The antenna is designed as integrated and no consideration of replacement by the end user.
Please find the antenna specification for details, The directional gains of antenna used for transmitting is -5dBi.