



<b>Prüfbericht - Nr.: 16800258 001</b>			Seite 1 von 58 Page 1 of 58		
<b>Auftraggeber:</b> <i>Client:</i>			KJC ENGINEERING INC Hecaocun Cundong Shilipu Zhen, Miyun District, Beijing 101500 P.R. China		
<b>Gegenstand der Prüfung:</b> <i>Test item:</i>			Bluetooth Module		
<b>Bezeichnung:</b> <i>Identification:</i>		3XBT	<b>Serien-Nr.:</b> <i>Serial No.:</i>		Engineering sample
<b>Wareneingangs-Nr.:</b> <i>Receipt No.:</i>		1143004706	<b>Eingangsdatum:</b> <i>Date of receipt:</i>		2010-10-19
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> <i>Condition of test item at delivery:</i>			The sample is ok for test and not damaged.		
<b>Prüfort:</b> <i>Testing location:</i>			Refer to section 1.1		
<b>Prüfgrundlage:</b> <i>Test specification:</i>			FCC Part 15 Subpart C Section 15.207 FCC Part 15 Subpart C Section 15.209 FCC Part 15 Subpart C Section 15.247		
<b>Prüfergebnis:</b> <i>Test Result:</i>			Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test item passed the test specification(s).</i>		
<b>Prüflaboratorium:</b> <i>Testing Laboratory:</i>			Refer to section 1.1		
<b>geprüft/ tested by:</b>			<b>kontrolliert/ reviewed by:</b>		
2012-5-25    Yang, Kai/PE 			2012-5-25    Sun, Lixun/Reviewer 		
<b>Datum</b> <i>Date</i>	<b>Name/Stellung</b> <i>Name/Position</i>	<b>Unterschrift</b> <i>Signature</i>	<b>Datum</b> <i>Date</i>	<b>Name/Stellung</b> <i>Name/Position</i>	<b>Unterschrift</b> <i>Signature</i>
<b>Sonstiges/ Other Aspects:</b>					
<b>Abkürzungen:</b> P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet			<b>Abbreviations:</b> P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested		
<b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b> <i>This test report relates to the a. m. test item. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>					

## TEST SUMMARY

**4.1.1 ANTENNA REQUIREMENT***RESULT: Passed***4.1.2 PEAK OUTPUT POWER***RESULT: Passed***4.1.3 OCCUPIED BANDWIDTH***RESULT: Passed***4.1.4 CONDUCTED SPURIOUS EMISSIONS IN 100kHz BANDWIDTH***RESULT: Passed***4.1.5 SPURIOUS EMISSION***RESULT: Passed***4.1.6 FREQUENCY SEPARATION***RESULT: Passed***4.1.7 NUMBER OF HOPPING FREQUENCY***RESULT: Passed***4.1.8 TIME OF OCCUPANCY***RESULT: Passed***4.1.9 RADIATED EMISSIONS***RESULT: Passed***4.1.10 CONDUCTED EMISSIONS***RESULT: Passed*

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## 1. Test Sites

### 1.1 Test Facilities

**Laboratory: Audix Technology (Shenzhen) Co., Ltd. (Registration Number: 90454)**

**Address: No.6 Ke Feng Road, Block 52, Shenzhen Science & Industry park Nantou, Shenzhen, Guangdong, China**

The used test equipment is in accordance with CISPR 16-1 for measurement of radio interference.

### 1.2 List of Test and Measurement Instruments

**Table 1: List of Test and Measurement Equipment**

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
<b>Spurious Radiated Emissions</b>				
Bi-log Antenna	Schaffner	CBL6111C	2598	2012-04-26
Horn Antenna	EMCO	3115	9607-4877	2013-01-01
Amplifier	HP	8557D	2648A04738	2012-05-08
Amplifier	Agilent	8449B	3008A00863	2012-05-08
Spectrum Analyzer	Agilent	E4407B	MY41440292	2012-05-08
<b>Radio Frequency Test Suite</b>				
Spectrum Analyzer	Agilent	E4407B	MY41440292	2012-05-08
<b>Conducted Emissions</b>				
Test Receiver	Rohde & Schwarz	ESHS10	838693/001	2013-11-03
L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	834066/011	2013-03-28
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100341	2013-05-08

## 1.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology P.R. China) or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

## 1.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

## 1.5 Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO/IEC 17025 are:

**Table 2: Measurement Uncertainty**

Items	Extended Uncertainty
RE (30-1000MHz)	4.2 dB, distance:3m,k=2, $\sigma=95\%$
RE (1-25GHz)	3.7 dB, distance:3m,k=2, $\sigma=95\%$
CE	3.2 dB, k=2, $\sigma=95\%$
Uncertainty for Radiated Spurious Emission test in RF chamber	3.57 dB, k=2, $\sigma=95\%$
Uncertainty for Conduction Spurious emission test	2.00 dB, k=2, $\sigma=95\%$
Uncertainty for Output power test	0.73 dB, k=2, $\sigma=95\%$
Uncertainty for Power density test	2.00 dB, k=2, $\sigma=95\%$
Uncertainty for Frequency range test	$7 \times 10^{-8}$ , k=2, $\sigma=95\%$
Uncertainty for Bandwidth test	83 kHz, k=2, $\sigma=95\%$

## 2. General Product Information

### 2.1 Product Function and Intended Use

The EUT(equipment under test) is a wireless module with bluetooth technology. For the further information refer to the User Manual and Circuit Diagram.

### 2.2 Ratings and System Details

**Table 3: Rating of EUT**

Kind of Equipment:	Bluetooth module
Type Designation:	3XBT
FCC ID	YZ3-3XBT
Rated Input Voltage	3.3V-5V

**Table 4: Technical Specification**

Item	Description
Operating Frequency band	2402-2480MHz
Channel Number	79
Channel Separation	1MHz
Modulation	GFSK
Antenna	Integrated Antenna, Non-User Replaceable
Antenna Gain (dBi)	0
RF output power level	Fix

## 2.3 Independent Operation Modes

The basic operation modes are:

- A. On, transmitting
  - 1. Low channel
  - 2. Middle channel
  - 3. High channel
- B. Off

## 2.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

## 2.5 Submitted Documents

- |                    |                      |
|--------------------|----------------------|
| - Bill of Material | - Circuit Diagram    |
| - PCB Layout       | - Instruction Manual |
| - Photo Document   | - Rating Label       |

## 3. Test Set-up and Operation Modes

### 3.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use. And prior to the measurements, the test object operated about 5 minutes (warm-up) in order to stabilize its operating conditions and to ensure reliable measurement values.

### 3.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.4: 2003.

As the sample has two antenna which with the same structure and characteristic, and there is only one antenna can transmit at one time, for all of the tests in this report, the both antennas' output were pre-tested, and the final test was performed on the larger antenna's output status to get the maximal value.

### 3.3 Special Accessories and Auxiliary Equipment

**Table 5: Test Auxiliary Equipments**

Description	Manufacturer	Model	Specification
Personal computer	Dell	Studio 540	Power Cord: Unshielded, Detachable, 1.8m Display Card: HD3450 (DVI+VGA+HDMI)
Monitor	Dell	1907FPt	Power Cord: Unshielded, Detachable, 1.8m VGA Cable: Shielded, Detachable, 2.0m (with two cores) DVI Cable: Shielded, Detachable, 2.0m (with two cores)
Keyboard	Dell	SK-8115	Power Cord: shielded, Undetachable, 2.0m
Mouse	Dell	M056UO	Power Cord: shielded, Undetachable, 1.8m
Program board	KJC	GN-170607-BTP-2000	Power by AC adaptor

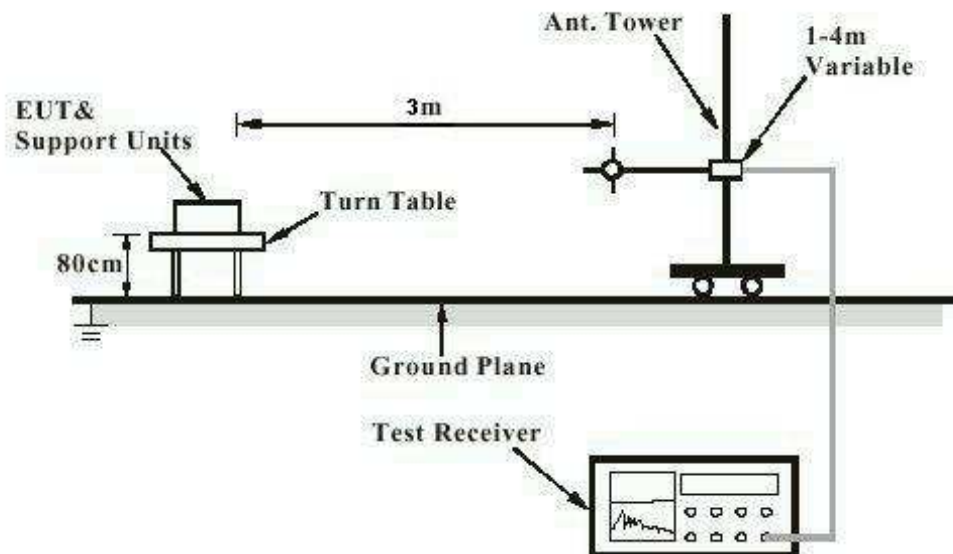


### 3.4 Countermeasures to achieve EMC Compliance

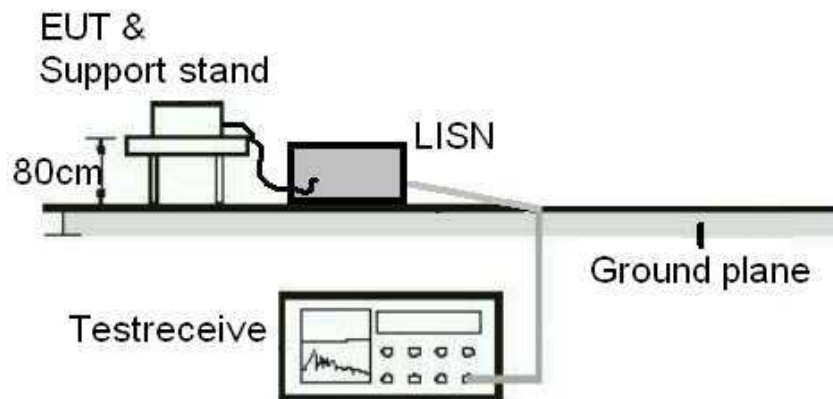
The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

### 3.5 Test Setup Diagram

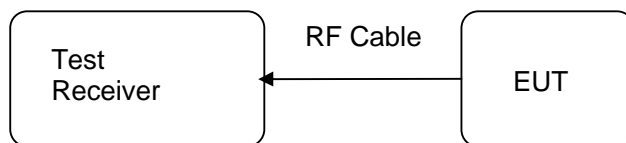
Diagram of Measurement Configuration for Radiation Test



### Diagram of Measurement Equipment Configuration for Conduction Measurement



### Diagram of Measurement Equipment Configuration for Transmitter Measurement



## 4. Test Results

### 4.1 Transmitter Requirement & Test Suites

#### 4.1.1 Antenna Requirement

**RESULT:****Passed**

Test date	:	2012-02-28
Test standard	:	FCC Part 15.247(b)(4) and Part 15.203
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has an internal antenna, the directional gain of antenna is 0 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

## 4.1.2 Peak Output Power

**RESULT:**
**Passed**

Test date : 2012-02-28  
 Test standard : FCC Part 15.247(b)(1)  
 Basic standard : ANSI C63.4: 2003  
 Limit : 125 mW  
 Kind of test site : Shielded room

**Test setup**

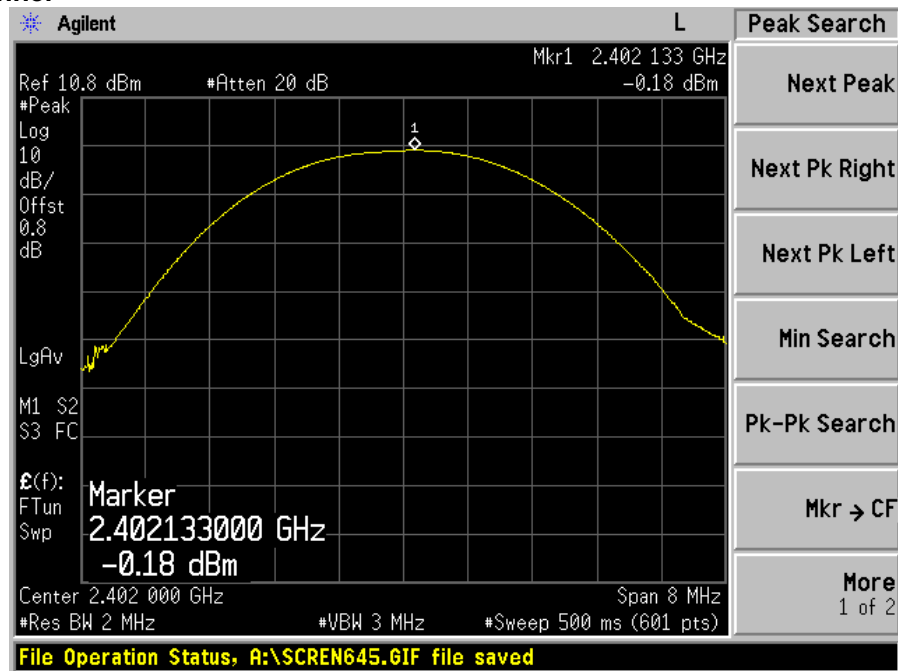
Test Channel : Low/ Middle/ High  
 Operation Mode : A  
 Ambient temperature : 23°C  
 Relative humidity : 54%  
 Atmospheric pressure : 101 kPa

**Table 6: Test result of Peak Output Power**

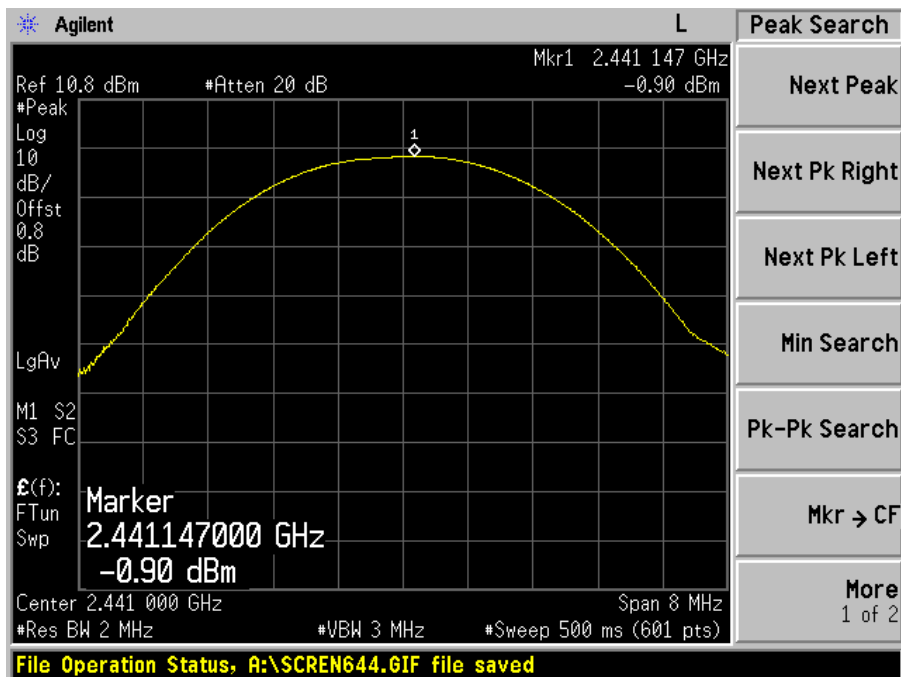
Channel	Channel Frequency (MHz)	Peak Output Power		Limit
		(dBm)	(mW)	(mW)
Low Channel	2402	-0.18	0.96	125
Middle Channel	2441	-0.90	0.81	125
High Channel	2480	-0.84	0.82	125

## Test Graph of Peak Output Power

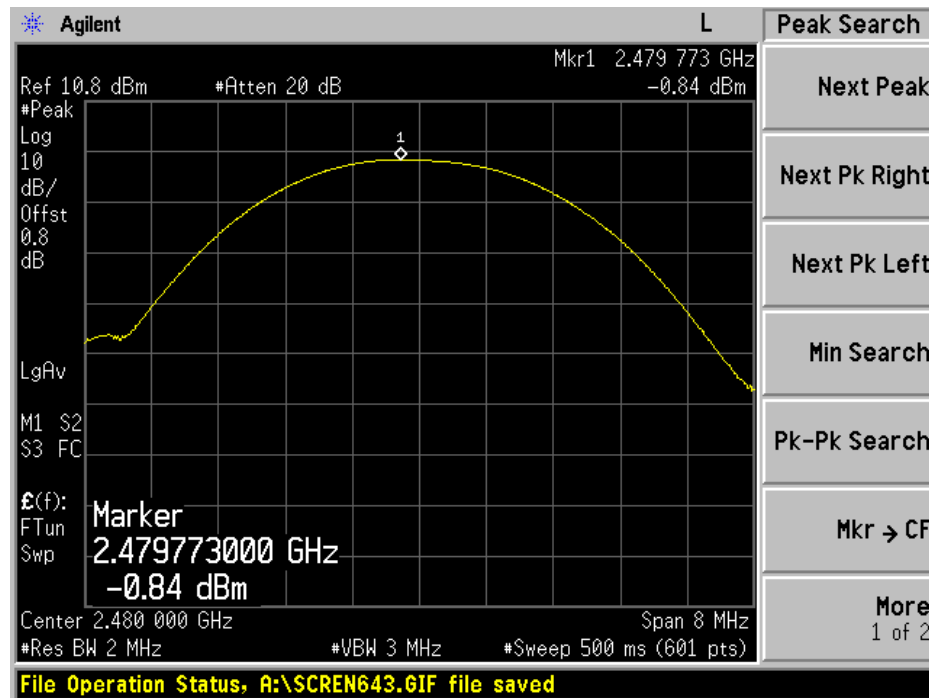
### Low Channel



### Middle Channel



## High Channel



### 4.1.3 Occupied Bandwidth

**RESULT:****Passed**

Date of testing : 2012-02-28  
Test standard : FCC Part 15.247(a)(1)  
Basic standard : ANSI C63.4: 2003  
Kind of test site : Shielded room

**Test setup**

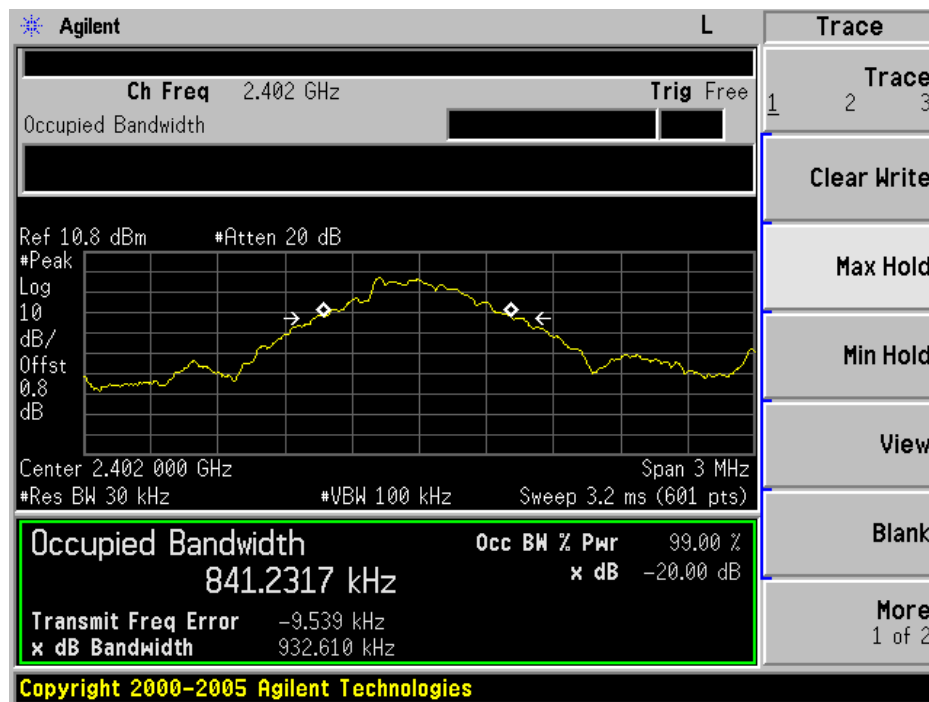
Test Channel : Low/ Middle/ High  
Operation Mode : A  
Ambient temperature : 23°C  
Relative humidity : 54%  
Atmospheric pressure : 101 kPa

**Table 7: Test result of occupied Bandwidth**

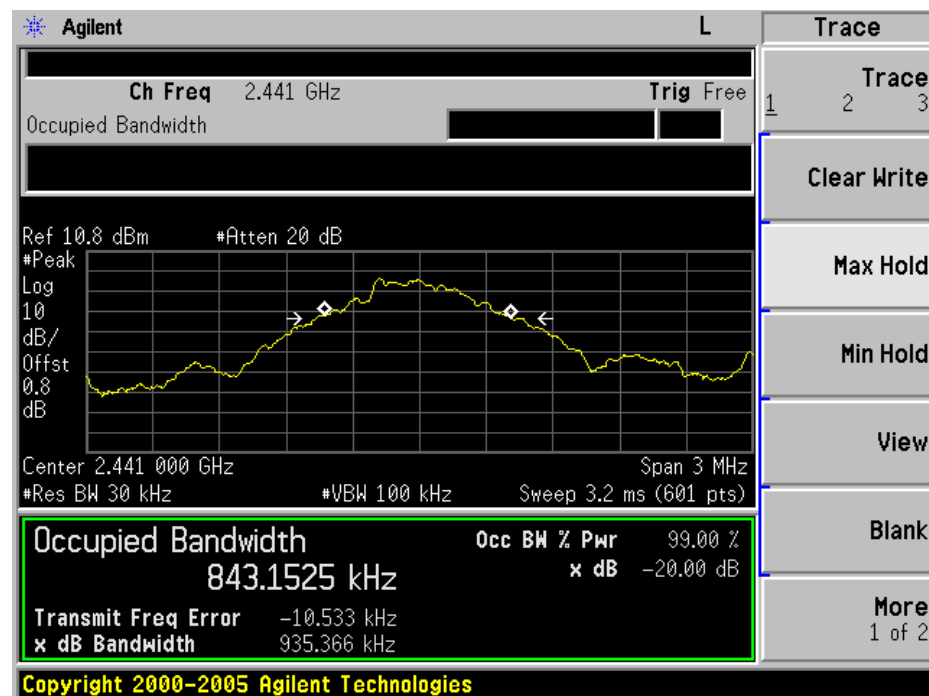
Channel	Channel Frequency (MHz)	Occupied Bandwidth (kHz)	Result
Low Channel	2402	841.2317	Passed
Mid Channel	2441	843.1525	Passed
High Channel	2480	841.0383	Passed

Notes: No specific occupied bandwidth requirement in part 15.247(a)(1).

## Test Graph of 20dB Bandwidth Low Channel

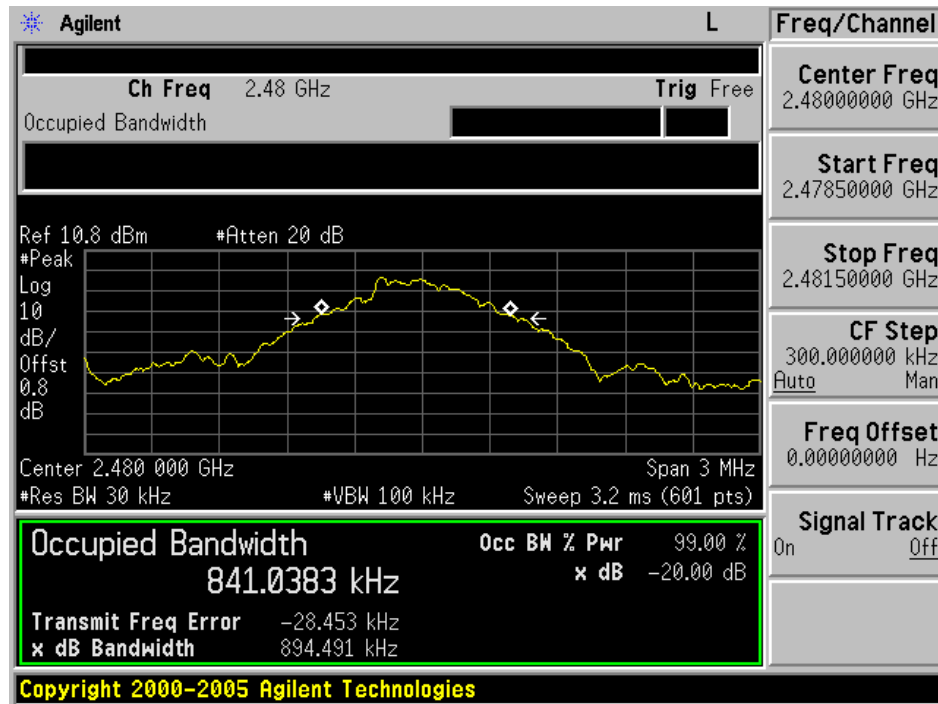


## Middle Channel





## High Channel



#### 4.1.4 Conducted Spurious Emissions in 100kHz Bandwidth

**RESULT:****Passed**

Date of testing	:	2012-02-28
Test standard	:	FCC part 15.247(d)
Basic standard	:	ANSI C63.4: 2003
Limit	:	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, must also comply with the radiated emission limits specified in 15.209(a)
Kind of test site	:	Shield room

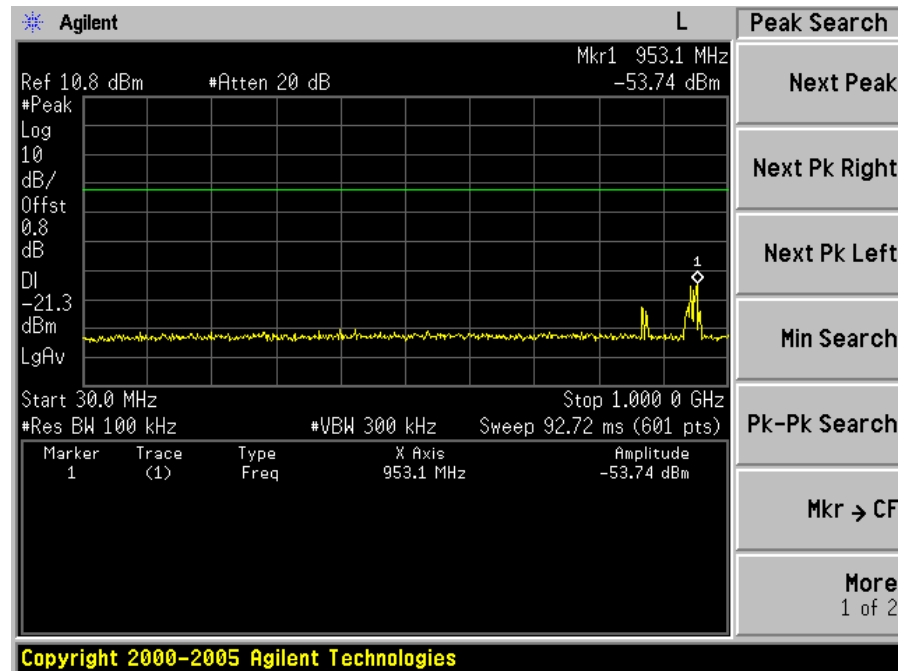
**Test setup**

Test Channel	:	Low/ High
Operation mode	:	A
Ambient temperature	:	23°C
Relative humidity	:	54%
Atmospheric pressure	:	101 kPa

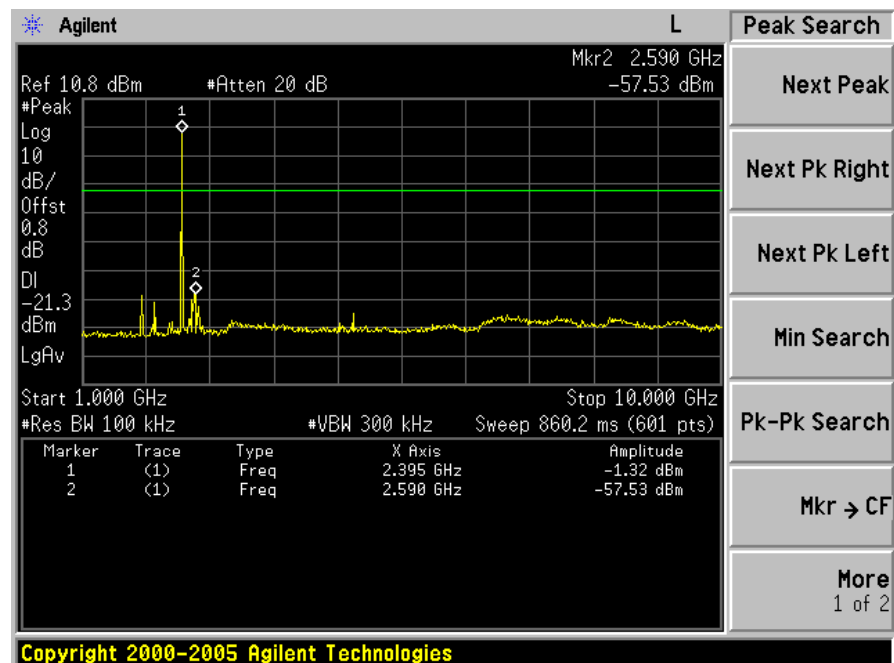
All emissions are more than 20dB below fundamental, details refer to following test Graph, and compliance is achieved as well.

## Test Graph of Conducted Spurious Emissions measured in 100kHz Bandwidth

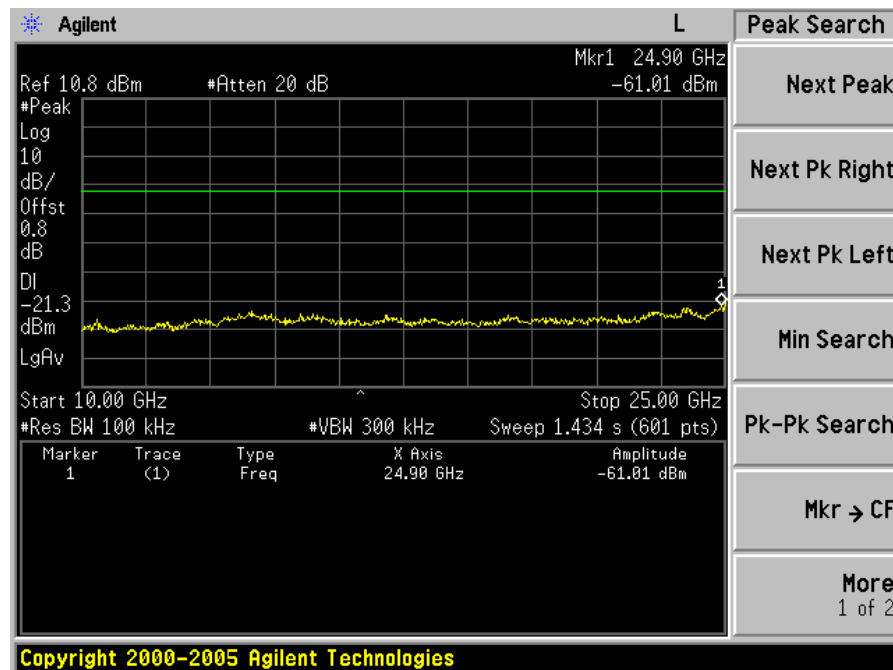
### Low Channel



### 30MHz-1GHz

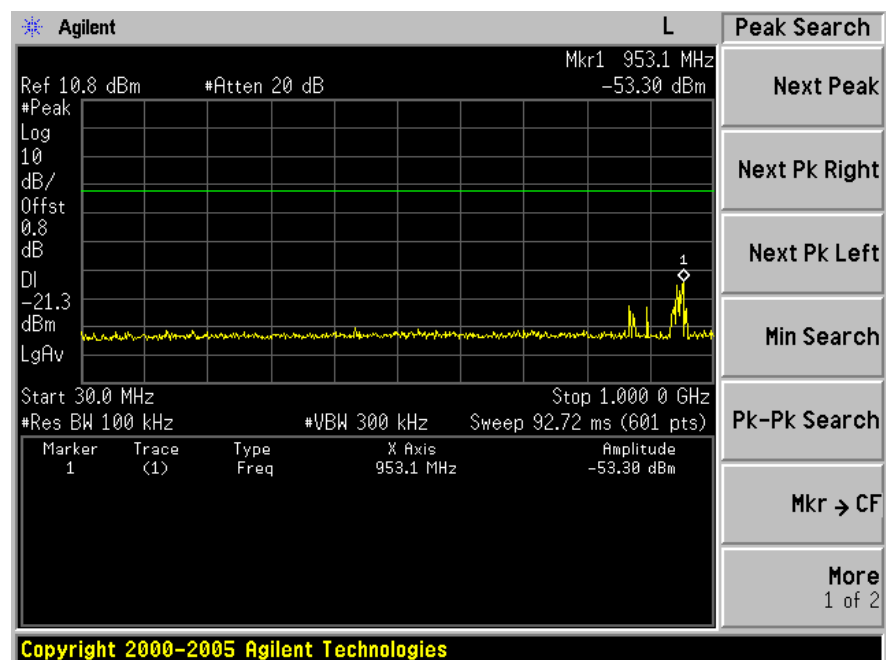


### 1GHz-10GHz

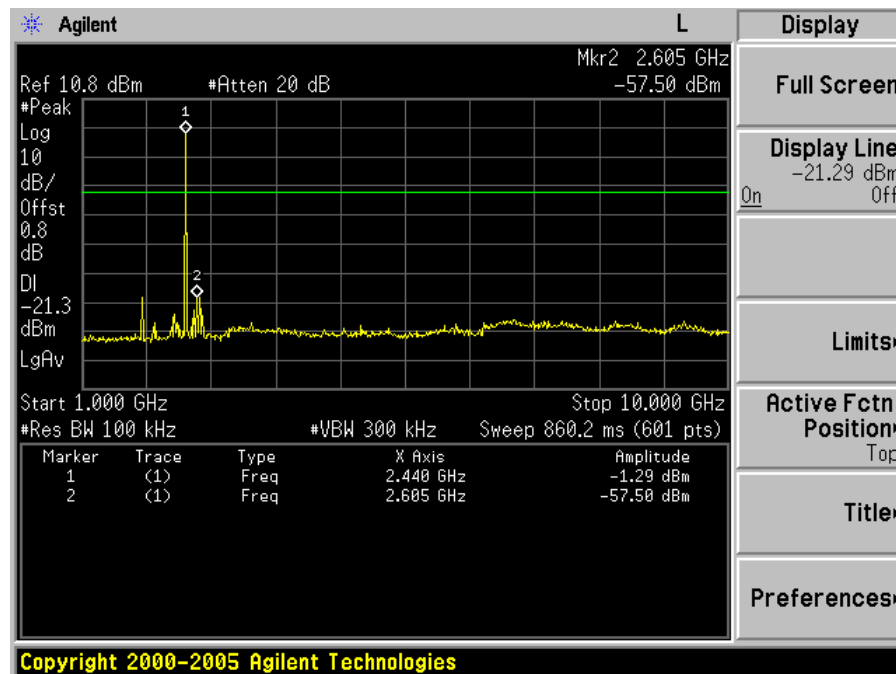


10GHz-25GHz

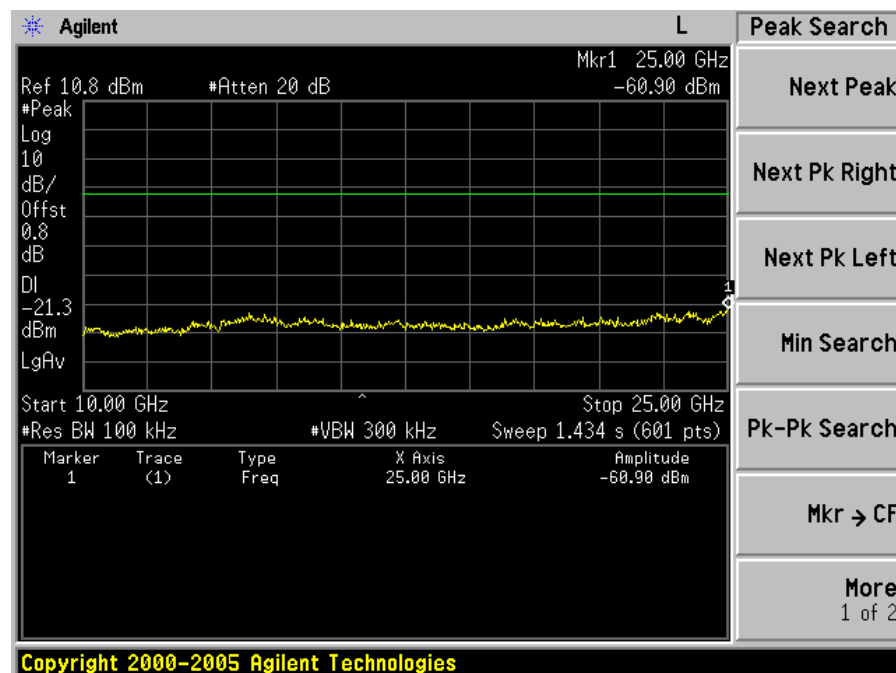
### Middle Channel



30MHz-1GHz

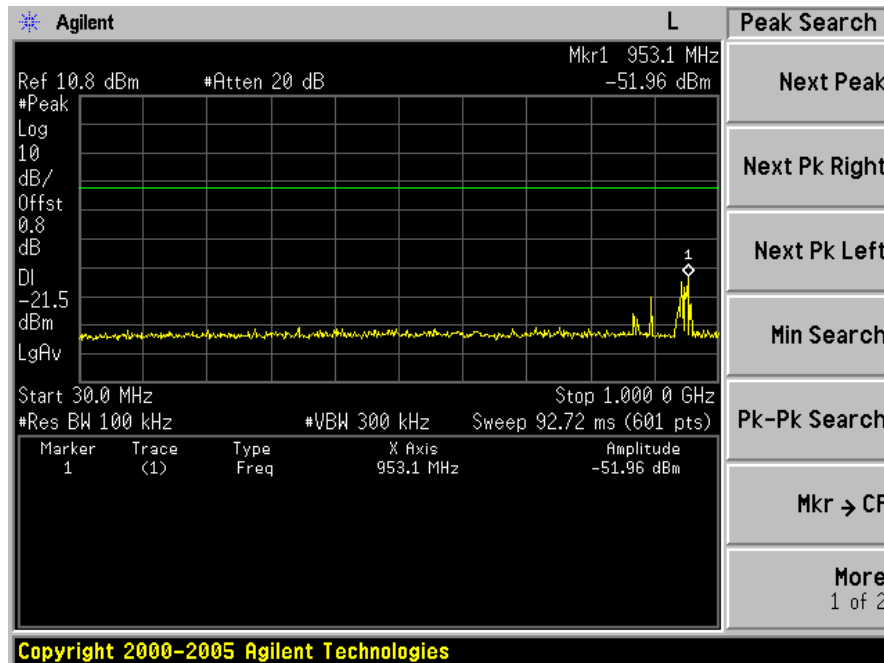


1GHz-10GHz

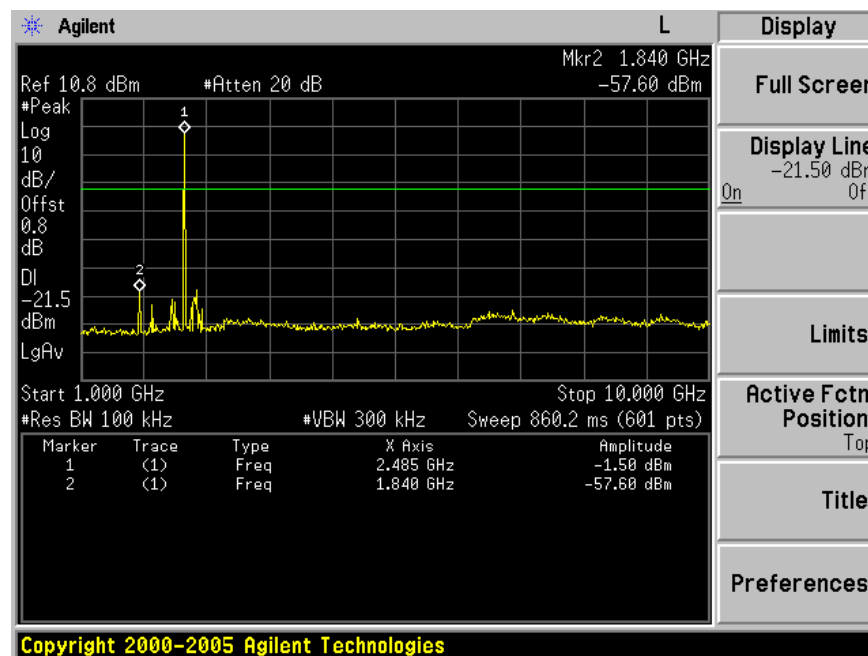


10GHz-25GHz

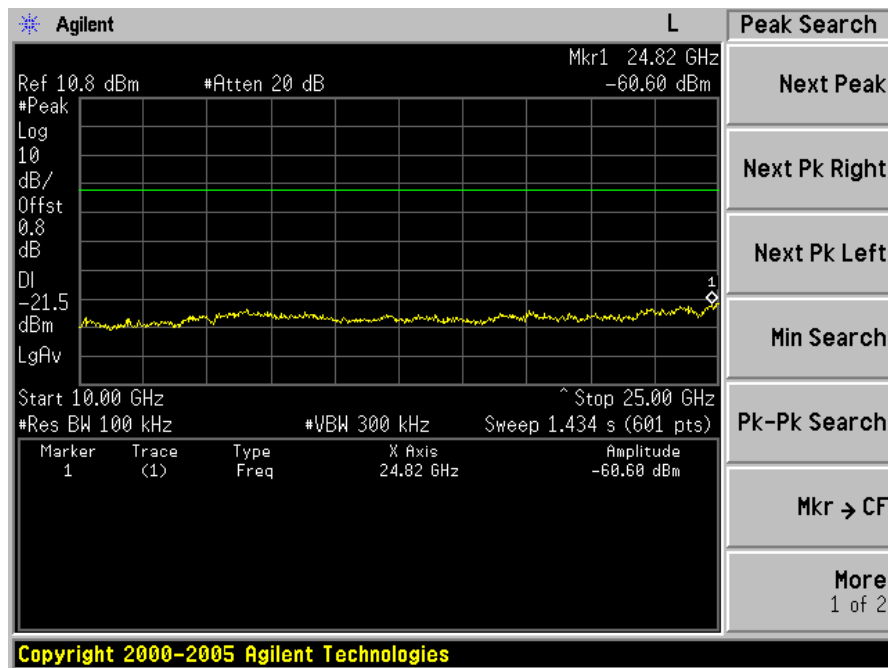
## High Channel



## 30MHz-1GHz



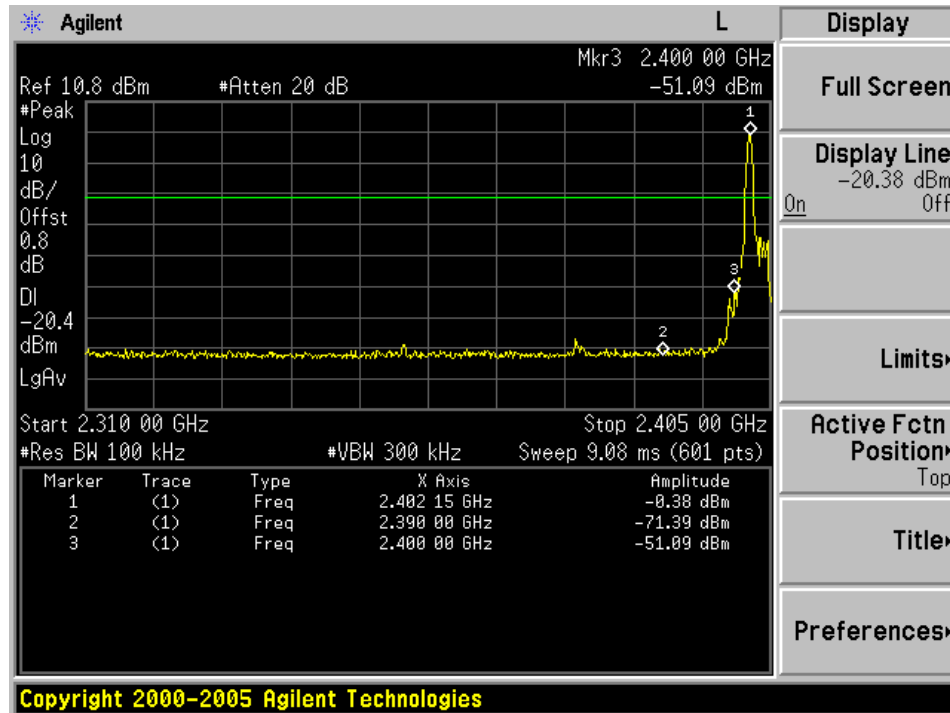
## 1GHz-10GHz



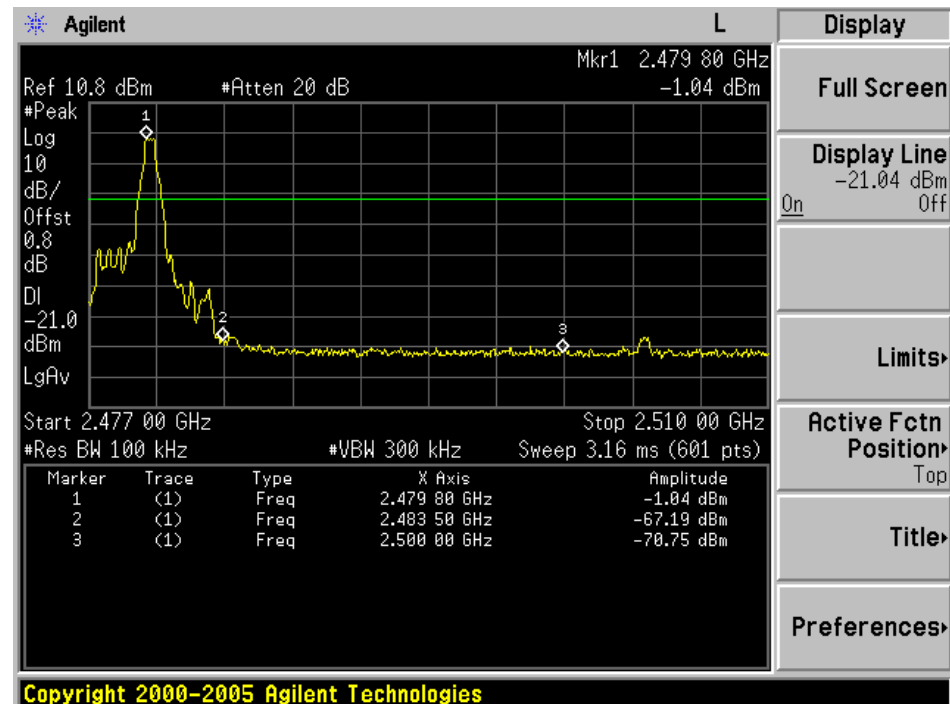
**10GHz-25GHz**

## Test Graph of Band Edge measured in 100kHz Bandwidth

### Low Channel



### High Channel





#### 4.1.5 Spurious Emission

**RESULT:****Passed**

Date of testing	:	2011-12-19
Test standard	:	FCC part 15.247(d)
Basic standard	:	ANSI C63.4: 2003
Limits	:	Refer to 15.209(a)
Frequency	:	1GHz-26.5GHz
range	:	
Kind of test site	:	3m Semi-Anechoic Chamber

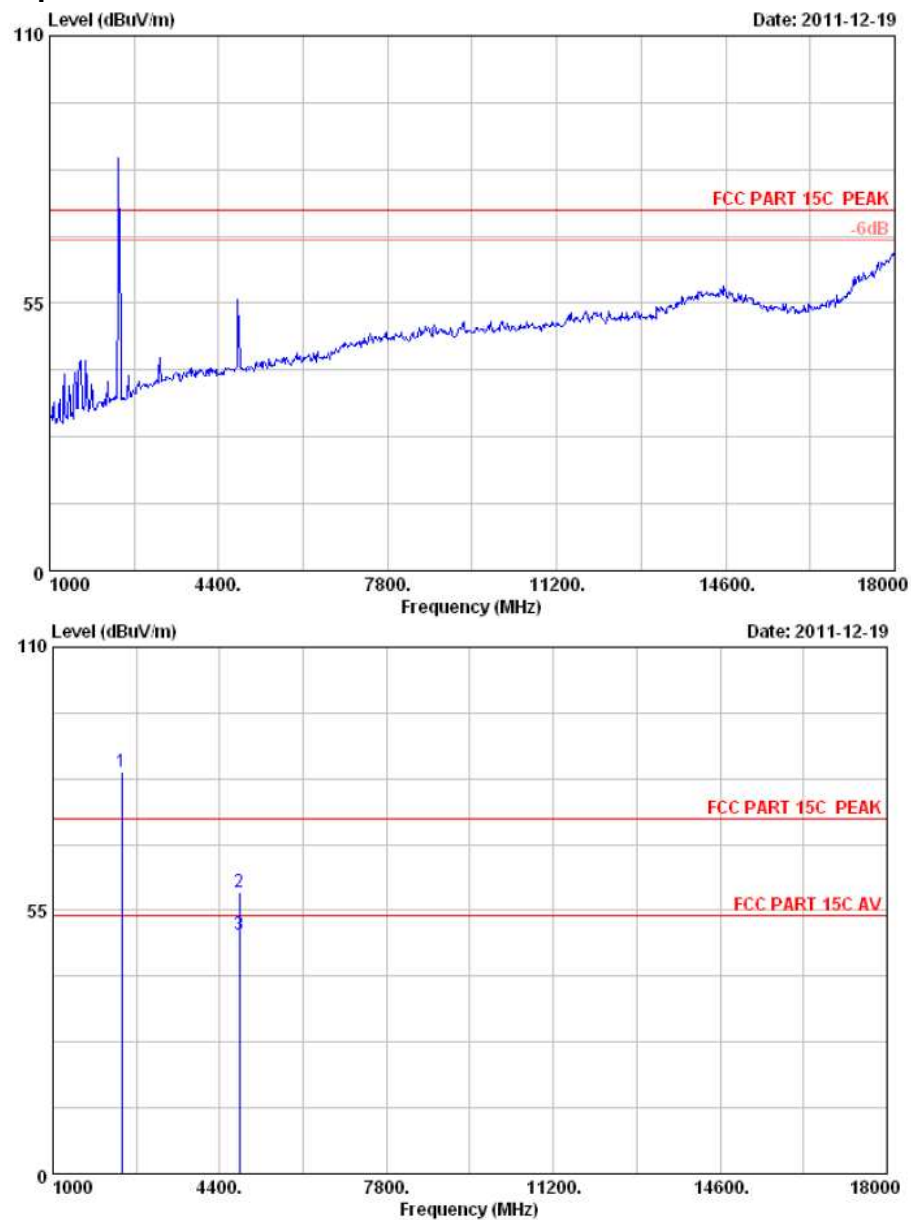
**Test setup**

Test Channel	:	Low/ Middle/ High
Operation mode	:	A
Ambient temperature	:	23°C
Relative humidity	:	51%
Atmospheric pressure	:	100 kPa

During the test, the wooden table was rotated 360° around and the antenna was varied from 1m to 4m to find the maximum disturbance. The test was performed with the antenna both in its horizontal and vertical polarizations.

The following figures and tables were those measured by an automatic measurement system. The vertical results are marked with red, and the horizontal ones are marked with blue. Plots of the band edge are also shown.

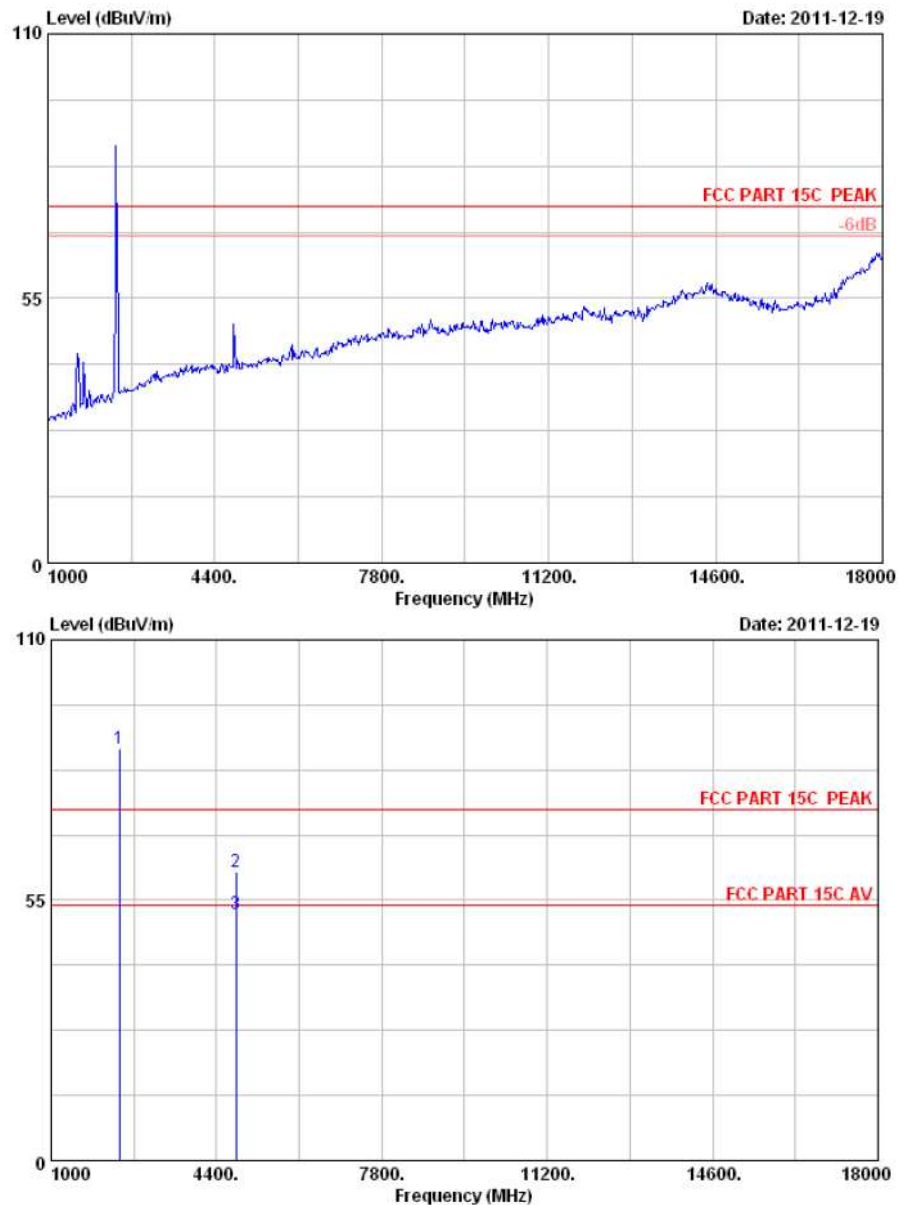
**Figure 1: Spurious emission measurement results, low channel, 1GHz-18GHz, horizontal polarization**



Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB
4804.00	H	Peak	74.0	58.91	15.09
4804.00	H	AV	54.0	49.84	4.16

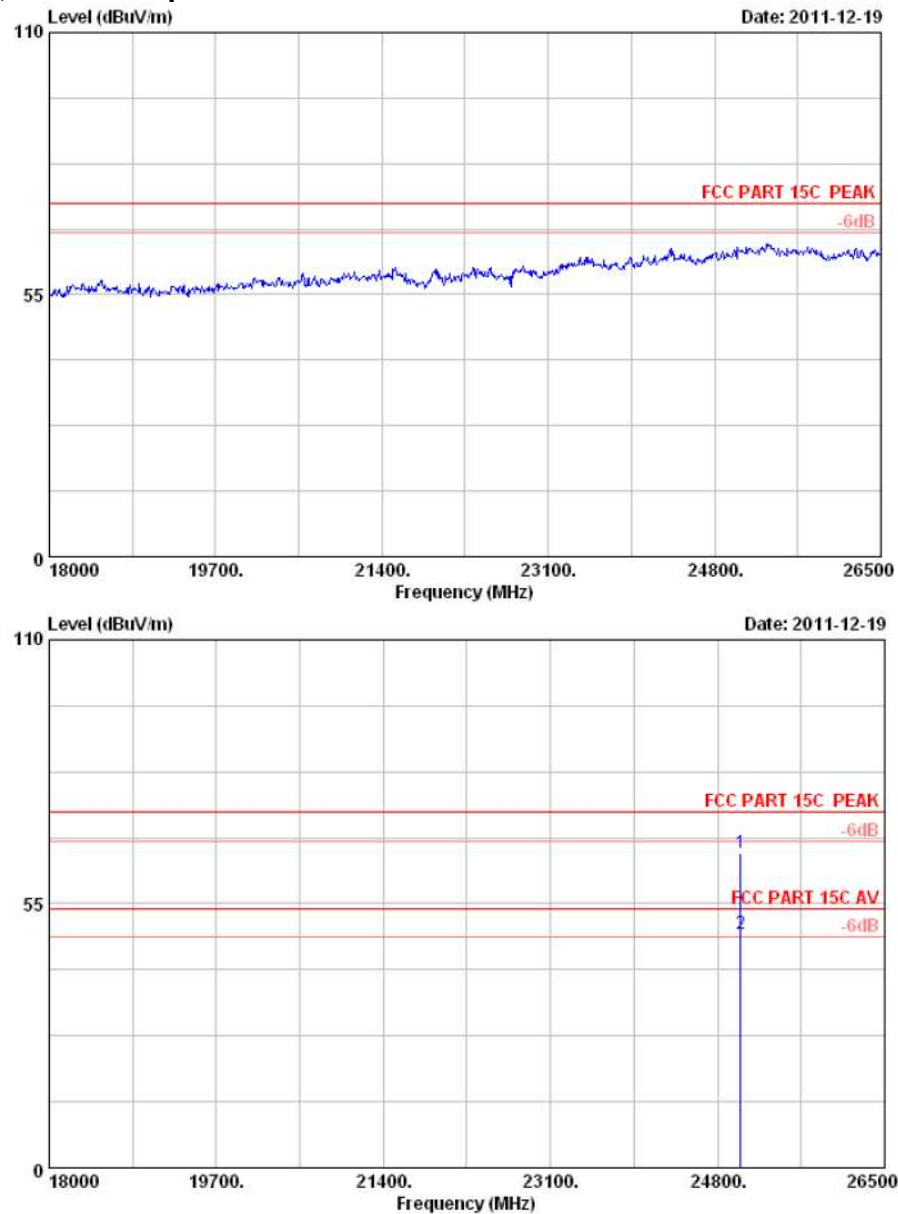
**Figure 2: Spurious emission measurement results, low channel, 1GHz -18GHz, vertical polarization**



Final measurement result:

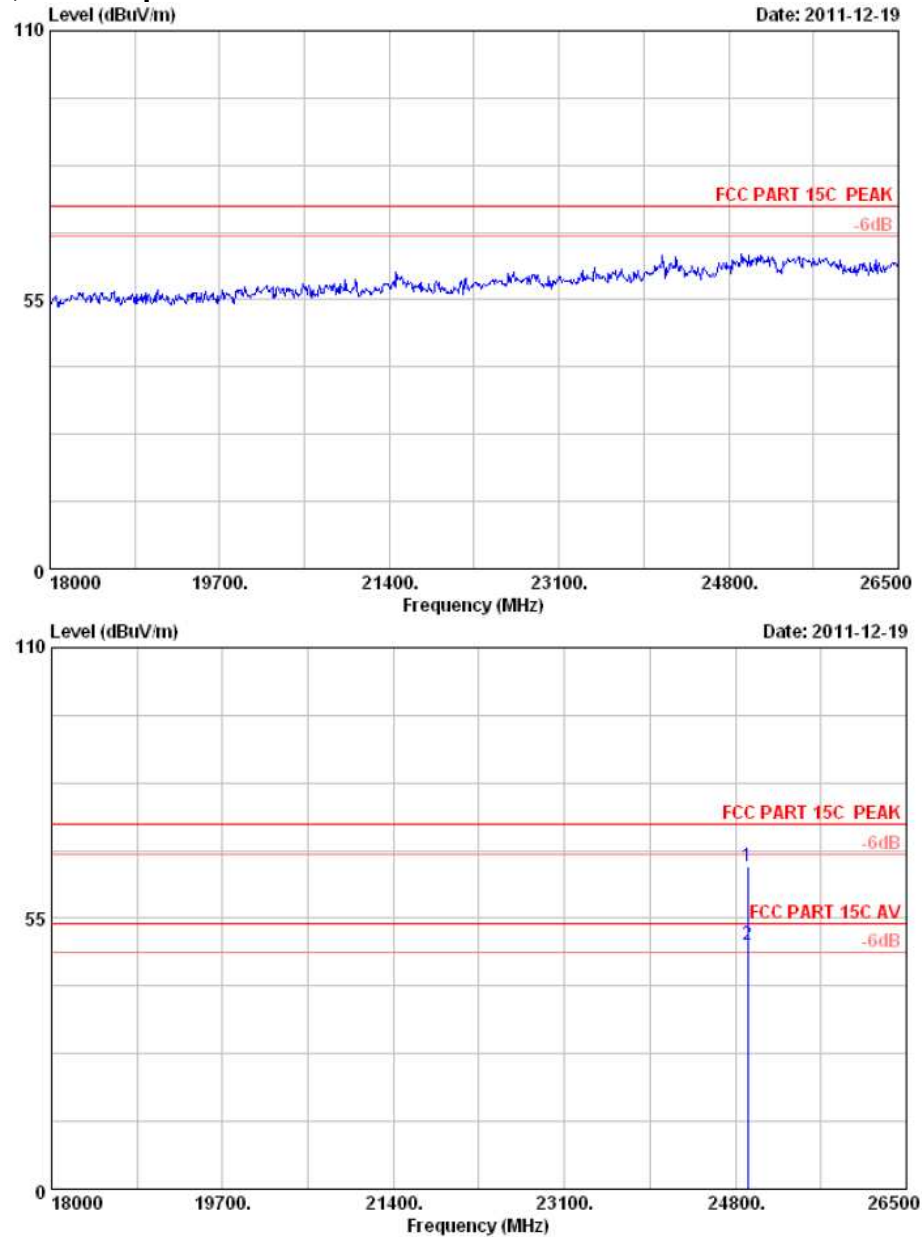
Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB
4804.00	V	Peak	74.0	61.06	12.94
4804.00	V	AV	54.0	52.00	2.00

**Figure 3: Spurious emission measurement results, low channel, 18GHz-26.5GHz, horizontal polarization**



Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB
25033.00	H	Peak	74.0	65.60	8.40
25033.00	H	AV	54.0	48.75	5.25

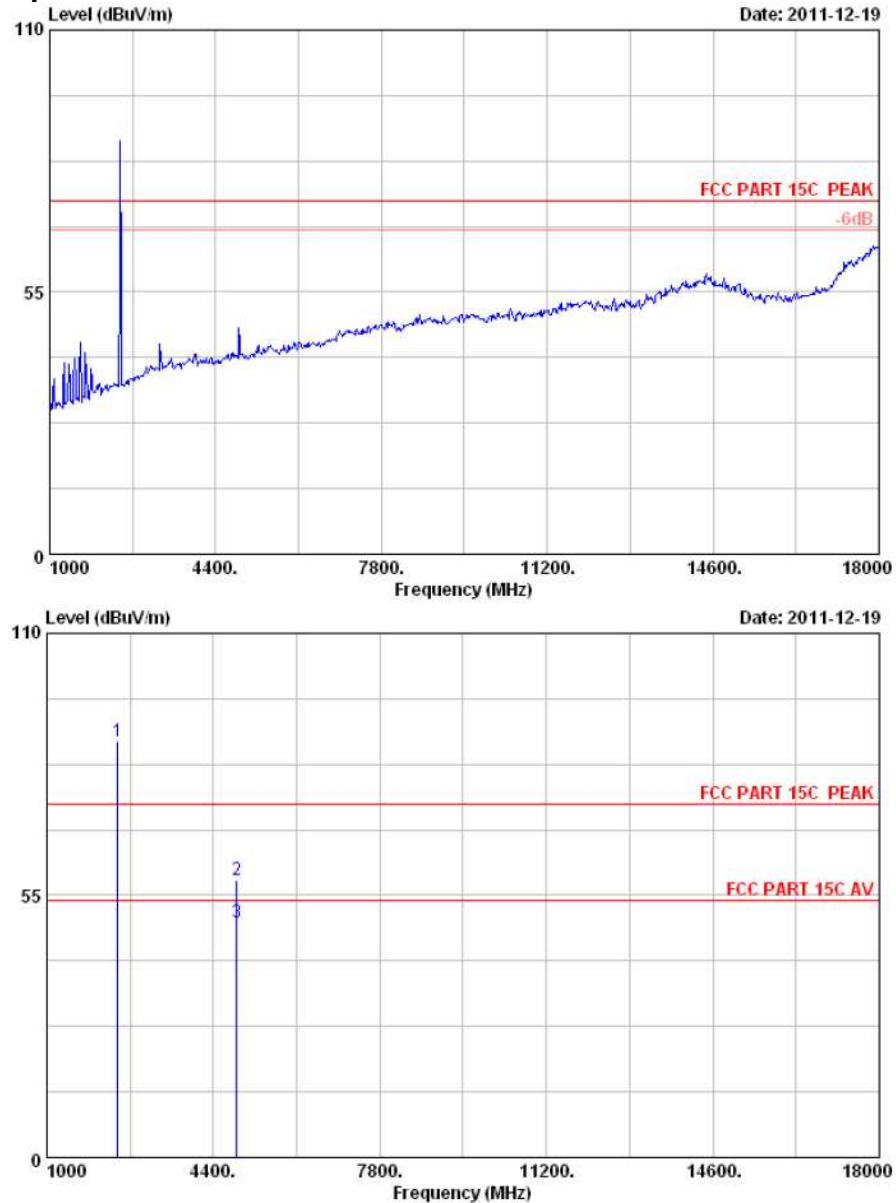
**Figure 4: Spurious emission measurement results, low channel, 18GHz-26.5GHz, vertical polarization**



Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB
24923.00	V	Peak	74.0	65.63	8.37
24923.00	V	AV	54.0	49.63	4.37

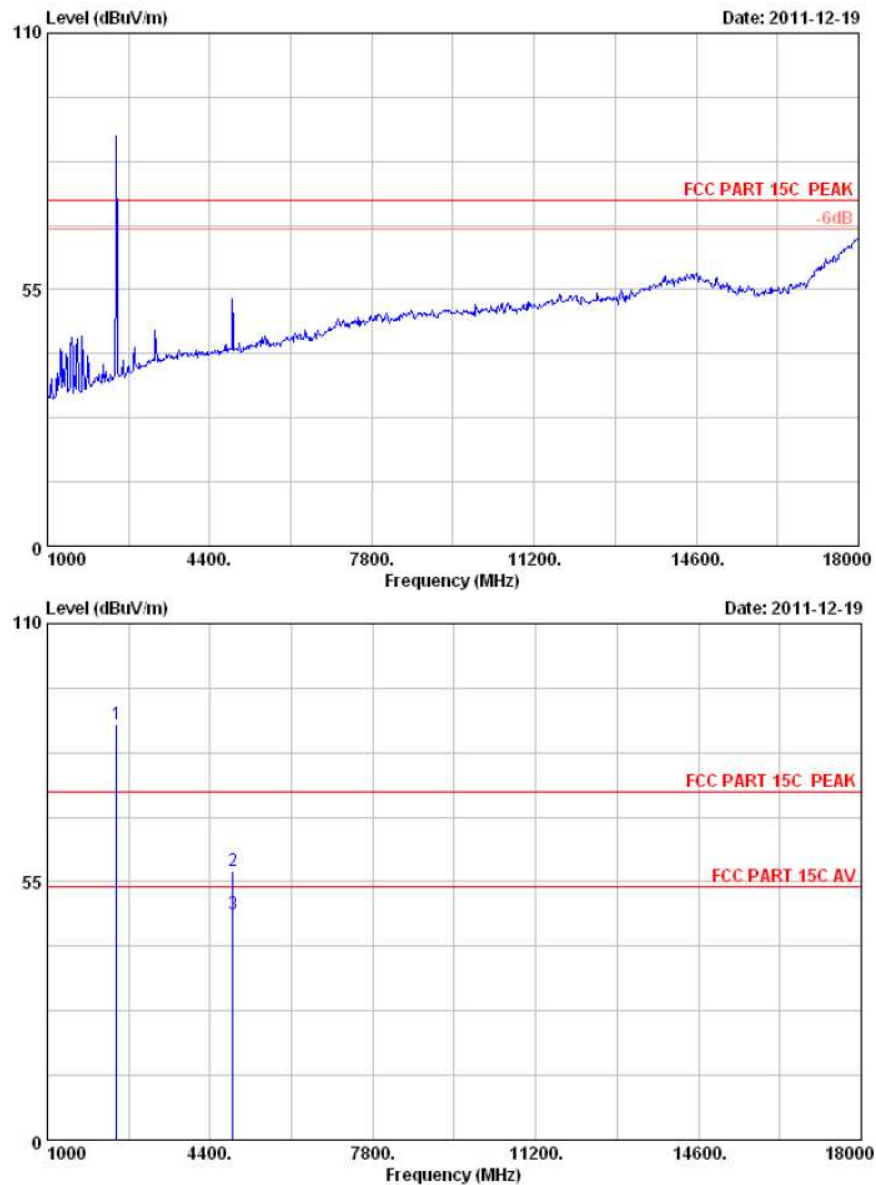
**Figure 5: Spurious emission measurement results, mid channel, 1GHz-18GHz, horizontal polarization**



Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB
4882.00	H	Peak	74.0	58.37	15.63
4882.00	H	AV	54.0	49.31	4.69

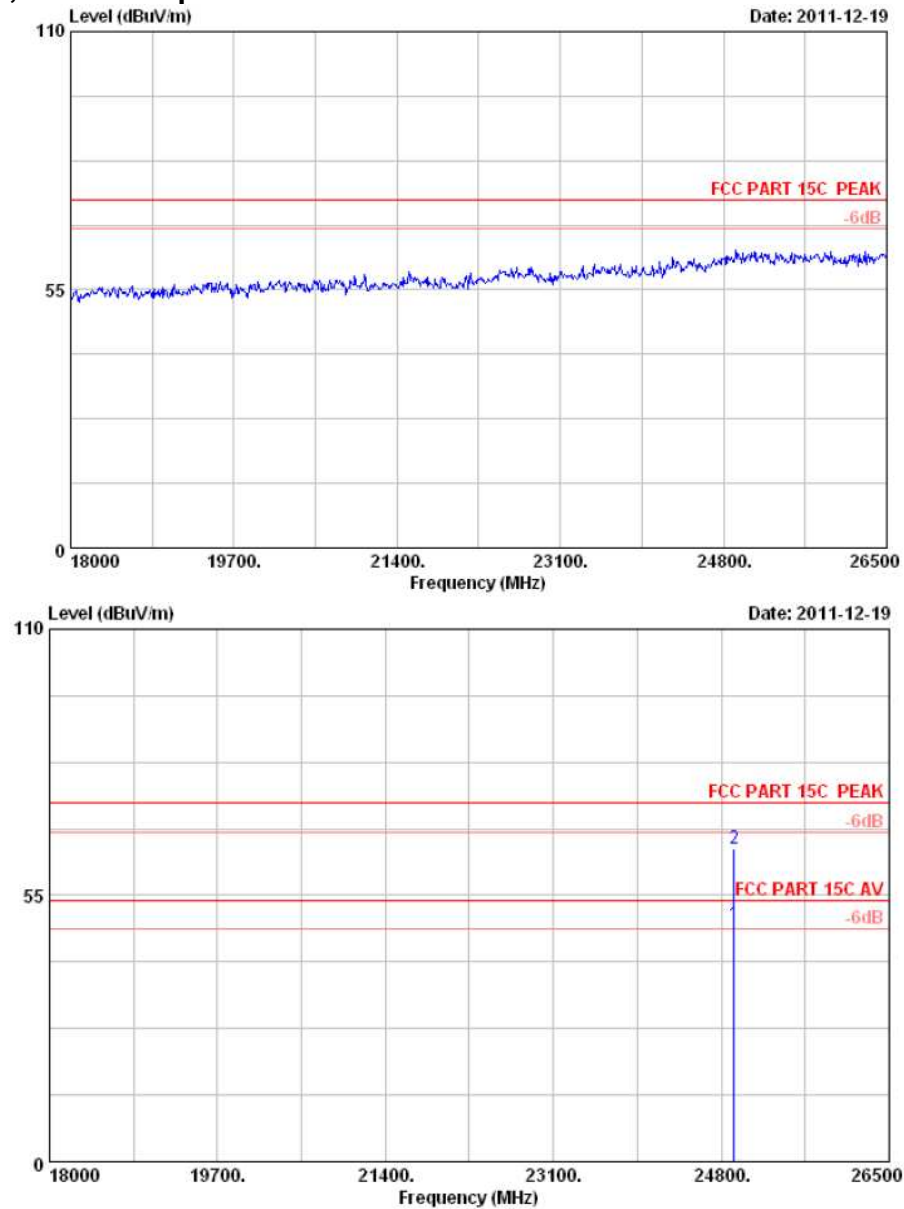
**Figure 6: Spurious emission measurement results, mid channel, 1GHz-18GHz, vertical polarization**



Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB
4882.00	V	Peak	74.0	57.18	16.82
4882.00	V	AV	54.0	48.12	5.88

**Figure 7: Spurious emission measurement results, mid channel, 18GHz-26.5GHz, horizontal polarization**

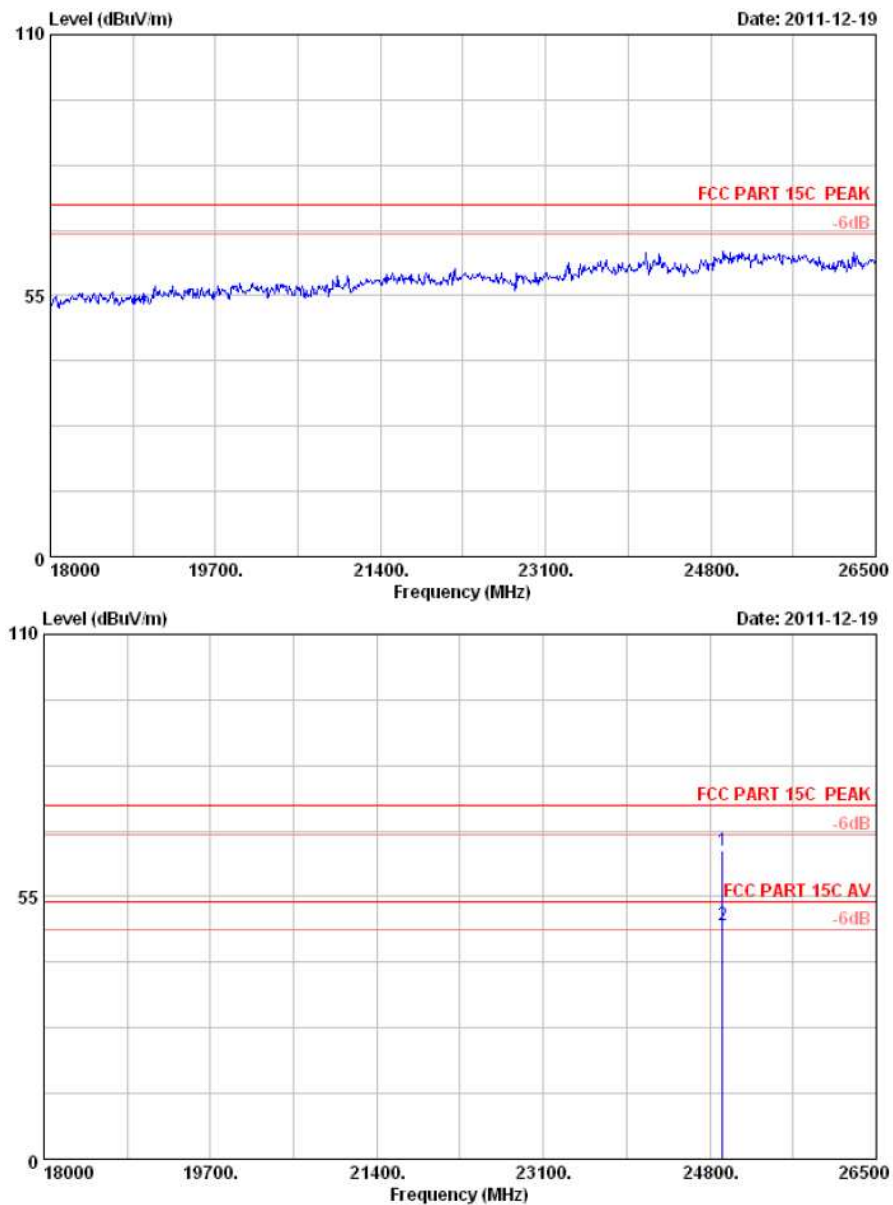


Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB
24928.00	H	Peak	74.0	64.53	9.47
24928.00	H	AV	54.0	49.16	4.84



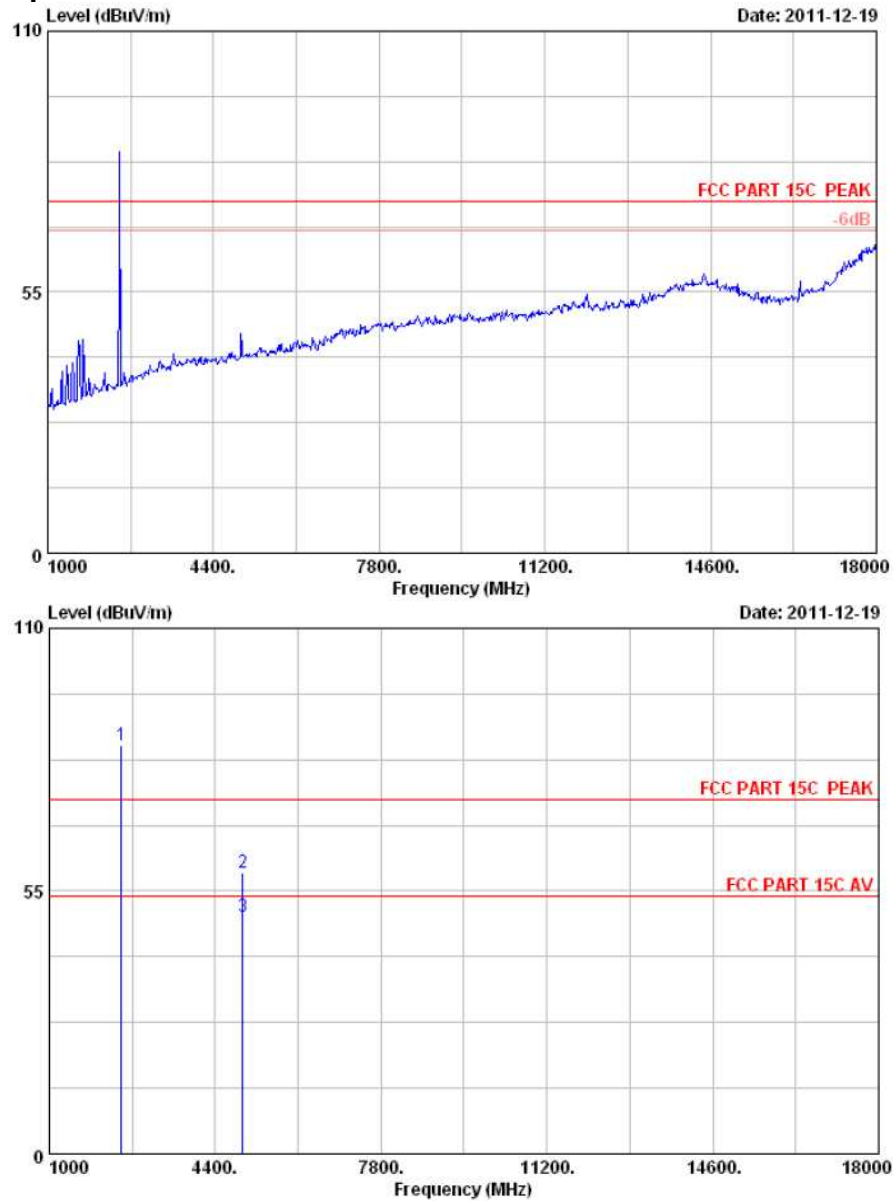
**Figure 8: Spurious emission measurement results, mid channel, 18GHz-26.5GHz, vertical polarization**



Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB
24928.00	V	Peak	74.0	64.50	9.50
24928.00	V	AV	54.0	48.88	5.12

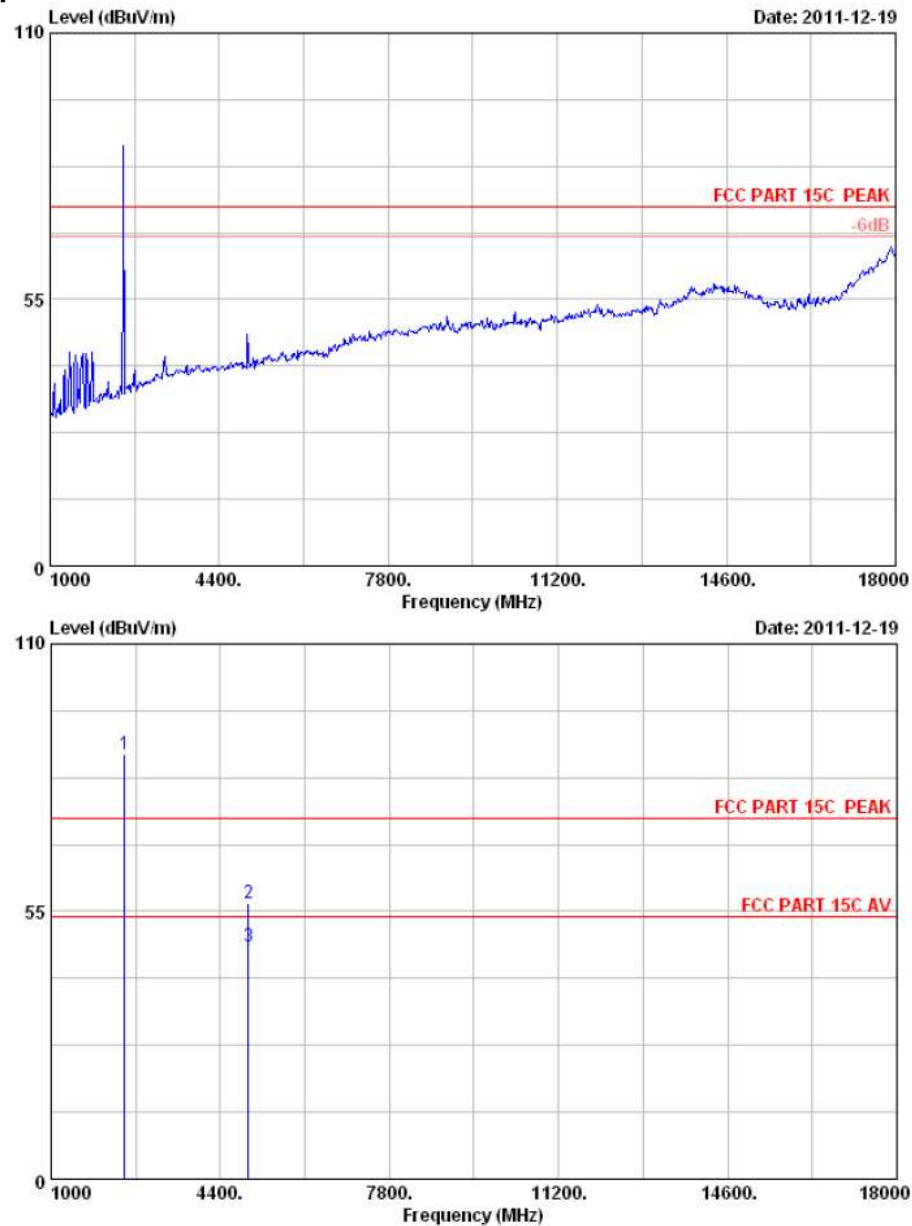
**Figure 9: Spurious emission measurement results, high channel, 1GHz-18GHz, horizontal polarization**



Final measurement result:

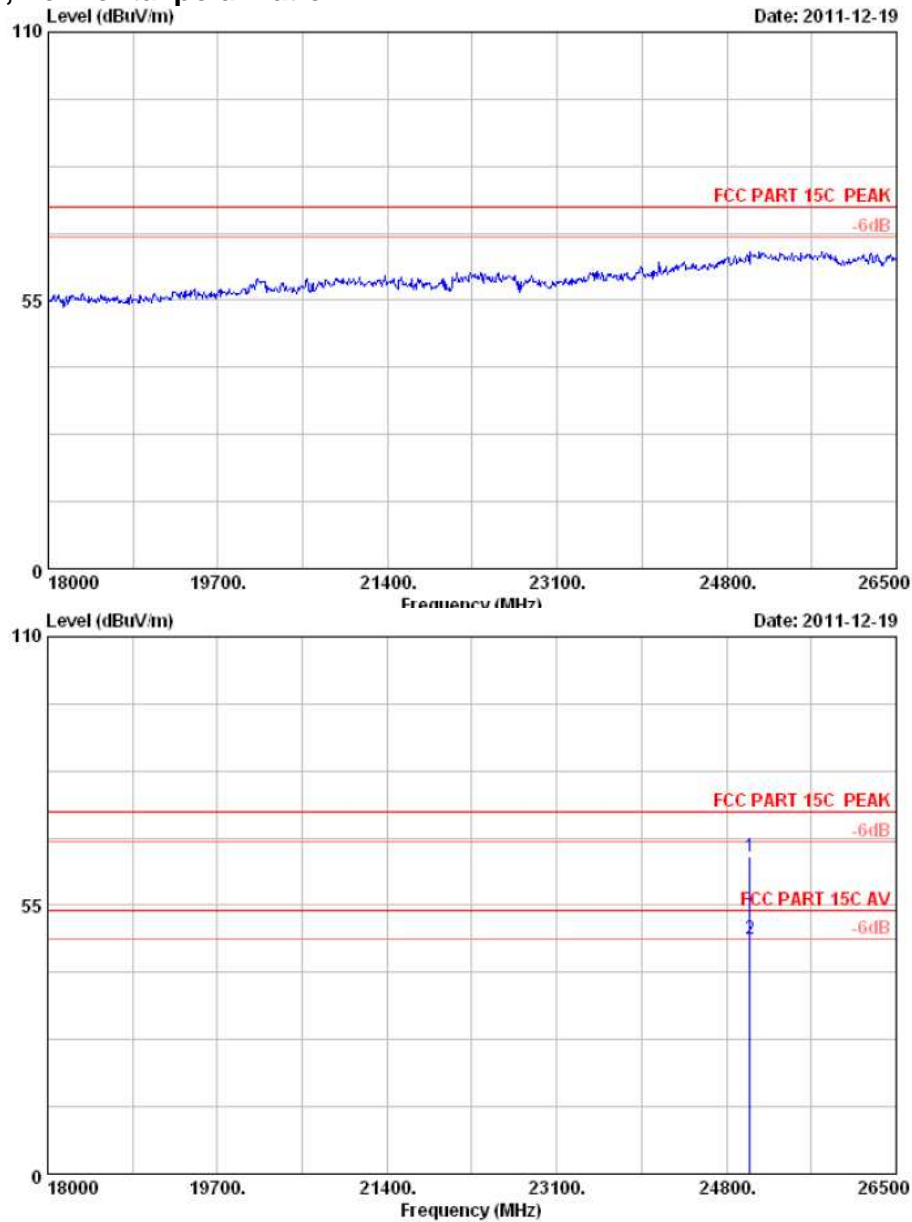
Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB
4960.00	H	Peak	74.0	58.76	15.24
4960.00	H	AV	54.0	49.70	4.30

**Figure 10: Spurious emission measurement results, high channel, 1GHz-18GHz, vertical polarization**



Final measurement result:

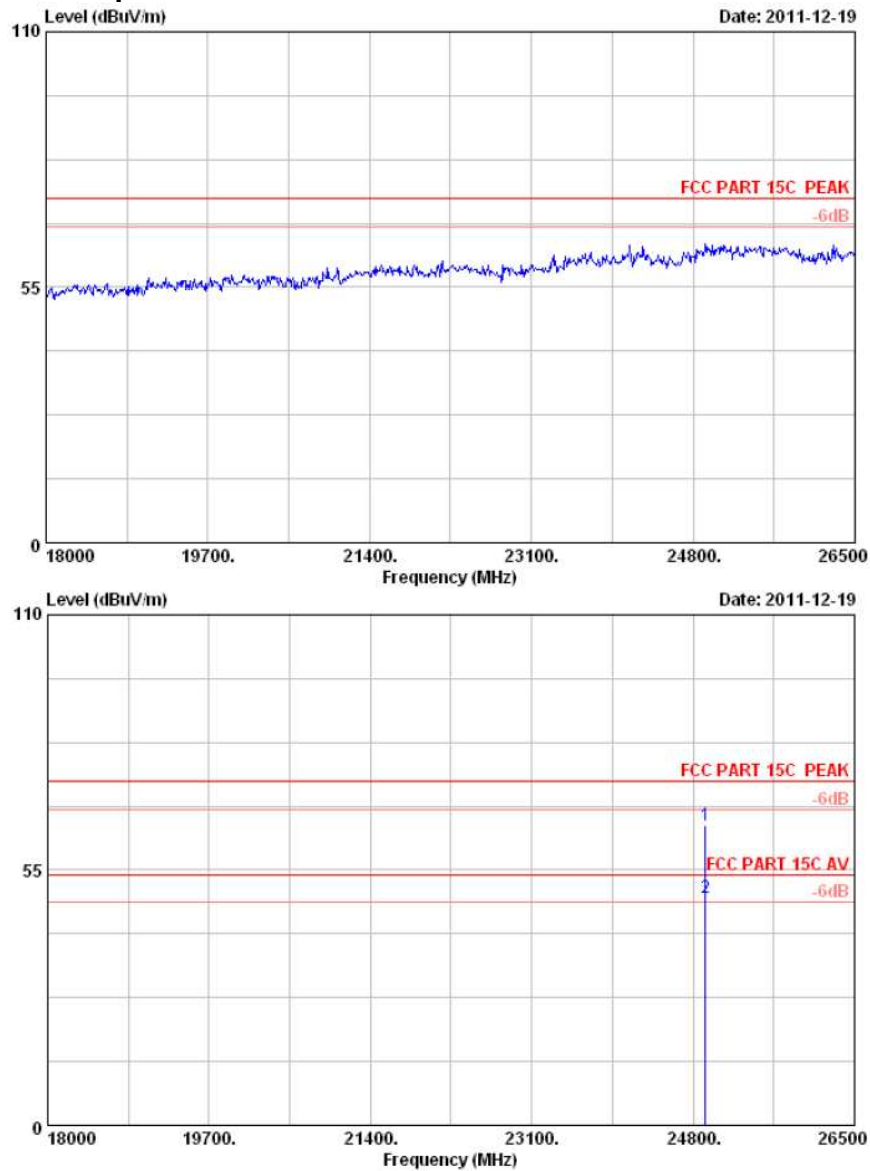
Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB
4960.00	V	Peak	74.0	56.72	17.28
4960.00	V	AV	54.0	47.66	6.34

**Figure 11: Spurious emission measurement results, high channel, 18GHz-26.5GHz, horizontal polarization**


Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBUV/m)	Level (dBUV/m)	Margin (QP) dB
25038.00	H	Peak	74.0	64.93	9.07
25038.00	H	AV	54.0	48.14	5.86

**Figure 12: Spurious emission measurement results, high channel, 18GHz-26.5GHz, vertical polarization**

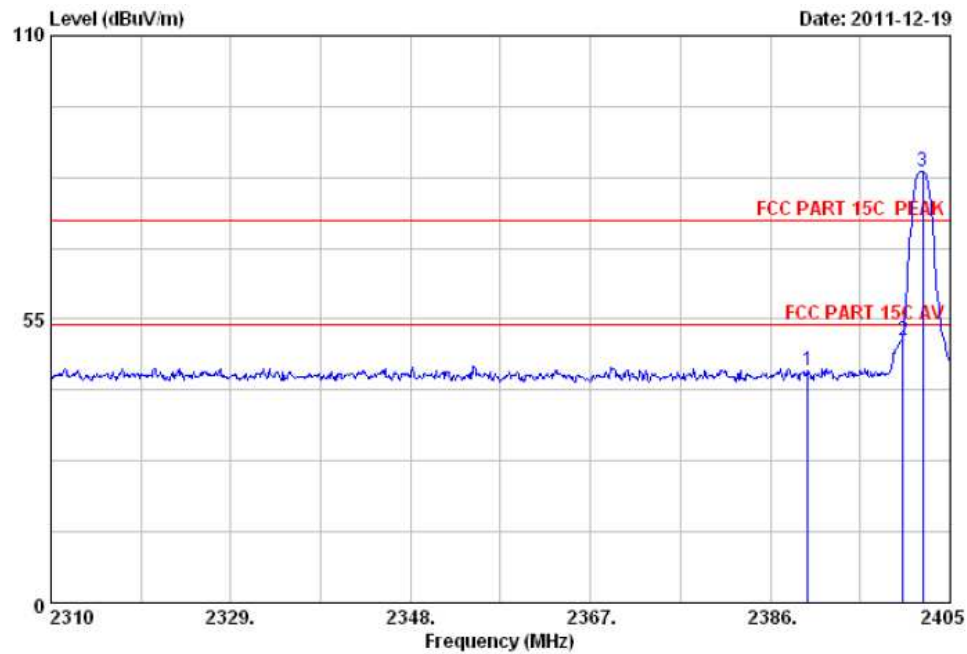


Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB
24928.00	V	Peak	74.0	64.50	9.50
24928.00	V	AV	54.0	48.88	5.12

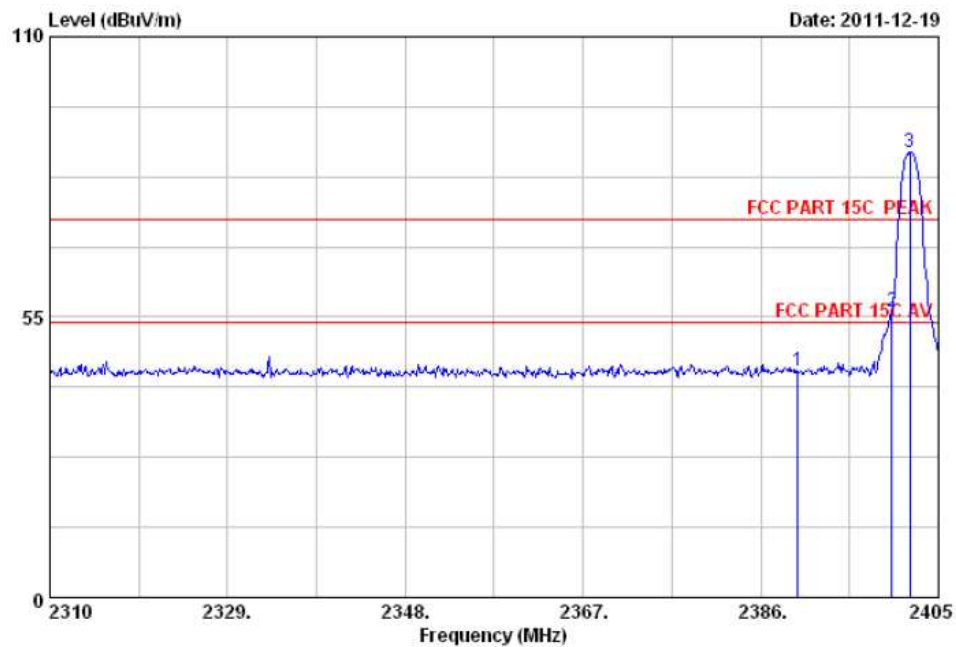
**Figure 13: Band Edge measurement results**

**Low Channel**



Final measurement result:

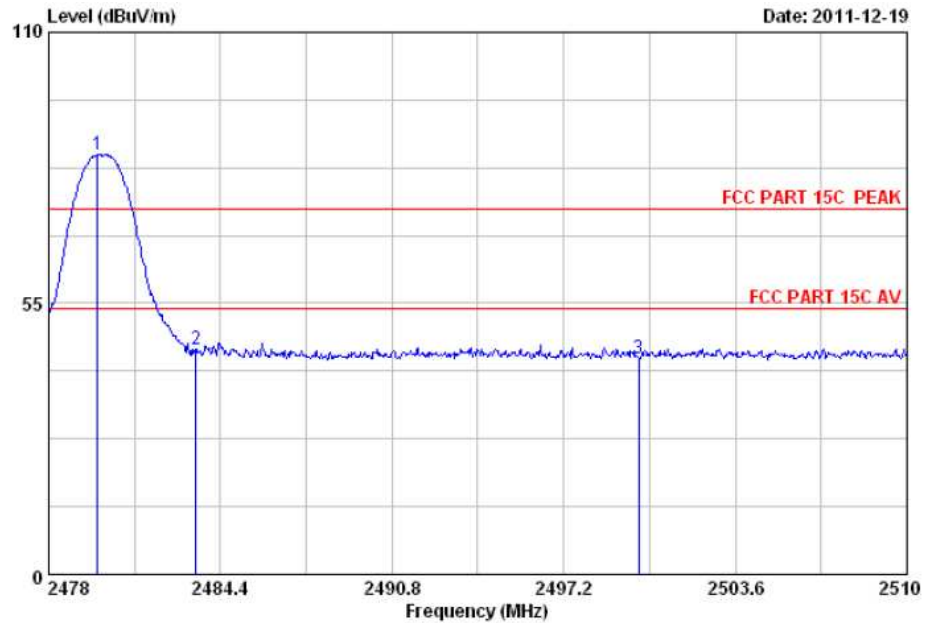
Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Level (dBuV/m)	Result
2402	H	Peak	83.58	--
2390	H	Peak	44.98	Passed
2400	H	Peak	50.97	Passed



Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Level (dBuV/m)	Result
2402	V	Peak	87.21	--
2390	V	Peak	44.57	Passed
2400	V	Peak	55.98	Passed

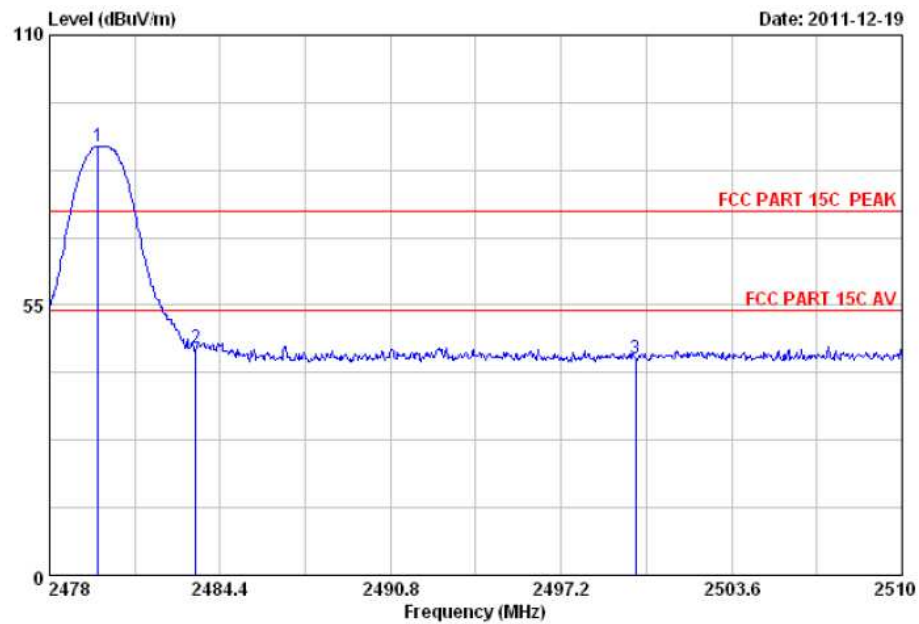
### High Channel



Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Level (dBuV/m)	Result
2479.824	H	Peak	85.08	--
2483.5	H	Peak	45.71	Passed
2500	H	Peak	43.94	Passed





Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Level (dBuV/m)	Result
2479.824	V	Peak	87.33	--
2483.5	V	Peak	46.38	Passed
2500	V	Peak	44.05	Passed

#### 4.1.6 Frequency Separation

**RESULT:****Passed**

Date of testing : 2012-02-28  
Test standard : FCC part 15.247(a)(1)  
Basic standard : ANSI C63.4: 2003  
Limit :  $\geq 25\text{kHz}$  or  $2/3$  of 20dB bandwidth, whichever is greater

**Test setup**

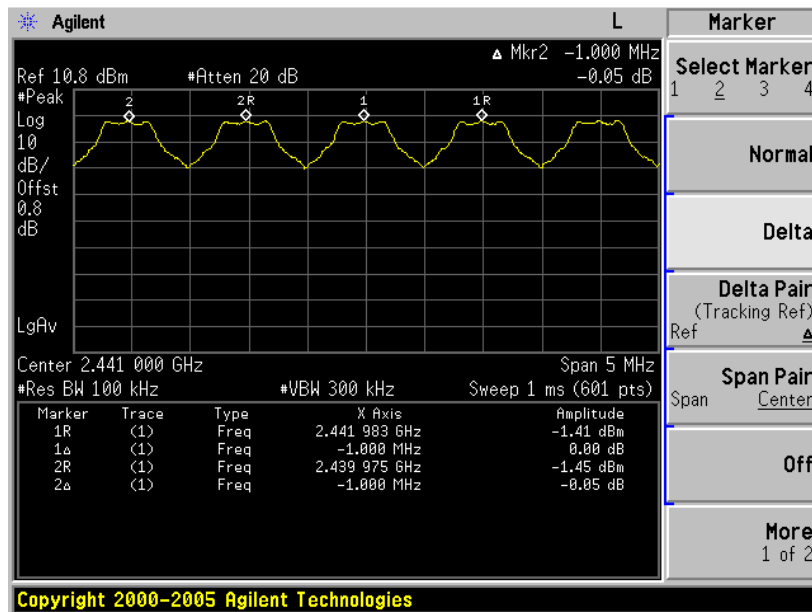
Test Channel : Low/ Middle/ High  
Operation Mode : A  
Ambient temperature :  $22^{\circ}\text{C}$   
Relative humidity : 52%  
Atmospheric pressure : 101 kPa

**Table 8: Test result of Frequency Separation**

Channel	Channel Frequency (MHz)	Measured Channel Separation (MHz)	Limit (kHz)	Result
Mid Channel	2441	1	$\geq 25\text{kHz}$ or $2/3$ of 20dB bandwidth	Passed
Adjacency Channel	2442			
Adjacency Channel	2440			

The frequency separation value that was found at the lowest and highest frequency is the same as the middle channel.

## Test Plot of Frequency Separation



**4.1.7 Number of hopping frequency****RESULT:****Passed**

Date of testing : 2012-02-28  
Test standard : FCC part 15.247(a)(1)(iii)  
Basic standard : ANSI C63.4: 2003  
Limits :  $\geq 15$  non-overlapping channels  
Kind of test site : Shield room

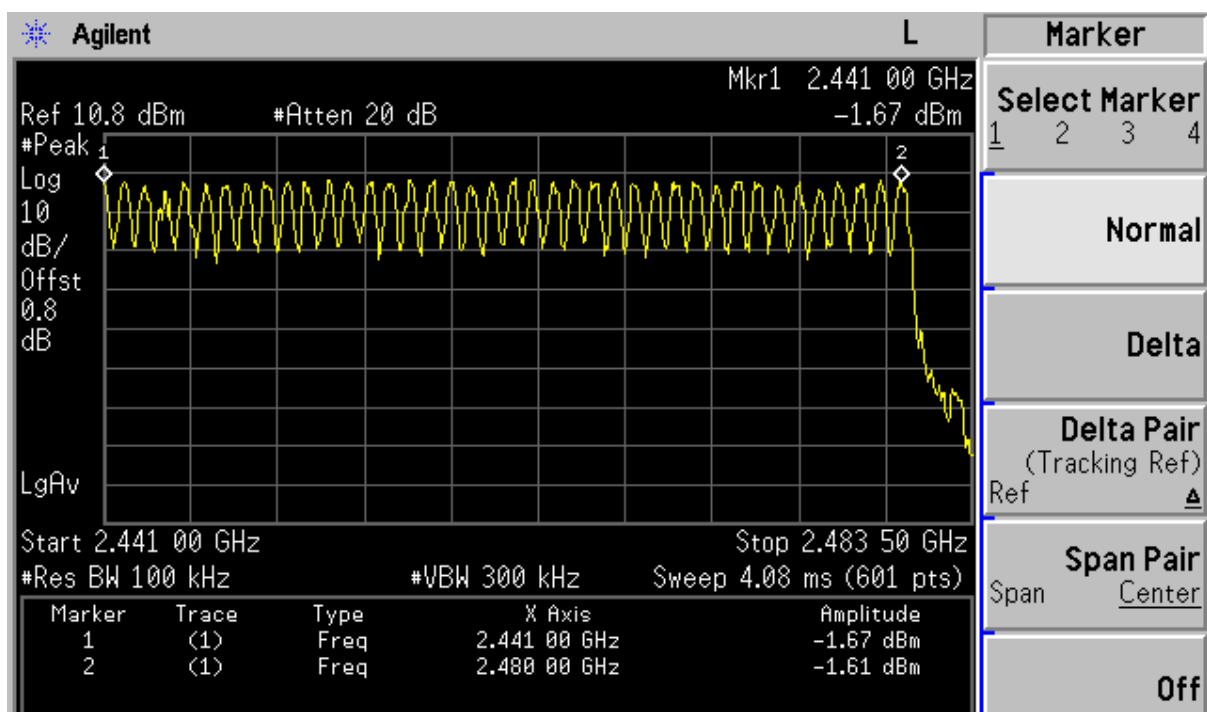
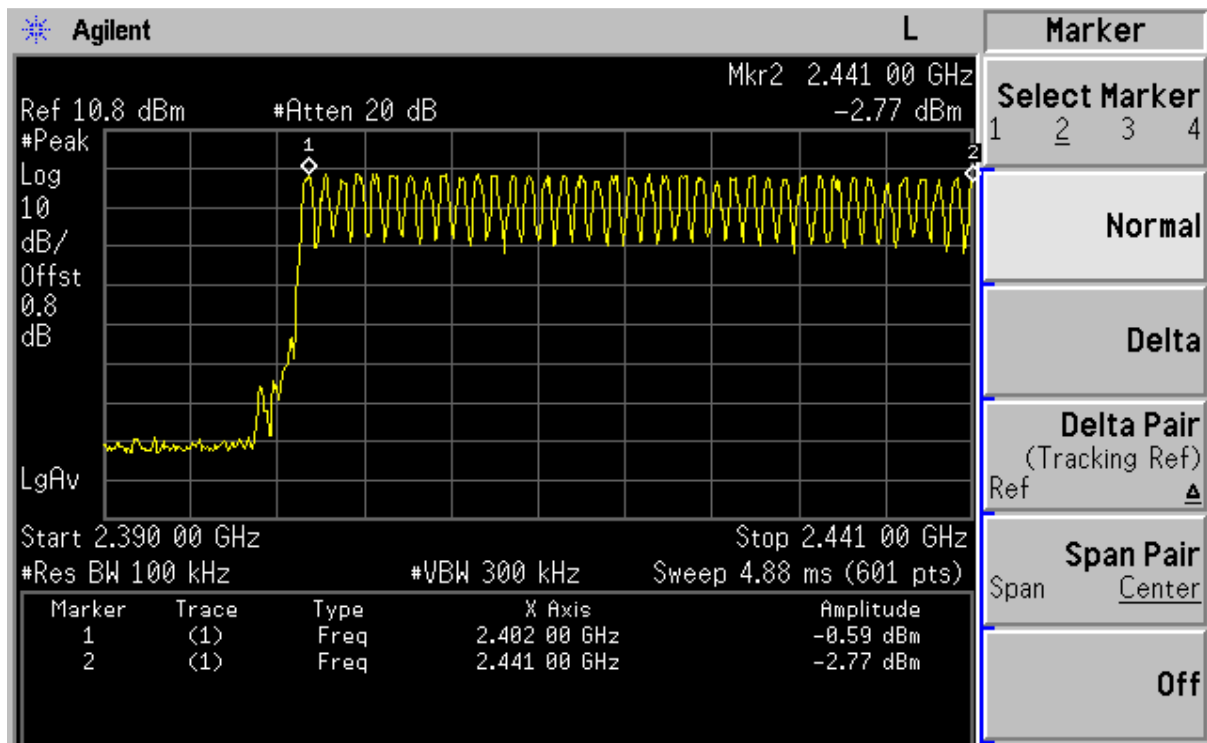
**Test setup**

Test Channel : Low/ Middle/ High  
Operation Mode : A  
Ambient temperature : 22°C  
Relative humidity : 52%  
Atmospheric pressure : 101 kPa

**Table 9: Test result of Number of hopping frequency**

Frequency Range	Measured Quantity of Hopping Channel	Limit	Result
<u>2400</u> to <u>2483.5</u> MHz	79	$\geq 15$	Passed

### Test Plot of Number of hopping frequencies



### 4.1.8 Time of Occupancy

**RESULT:**
**Passed**

Date of testing : 2012-02-28  
 Test standard : FCC part 15.247(a)(1)(iii)  
 Basic standard : ANSI C63.4: 2003  
 Limits : 0.4s  
 Kind of test site : Shield room

**Test setup**

Test Channel : Low/ Middle/ High  
 Operation Mode : A  
 Ambient temperature : 22°C  
 Relative humidity : 52%  
 Atmospheric pressure : 101 kPa

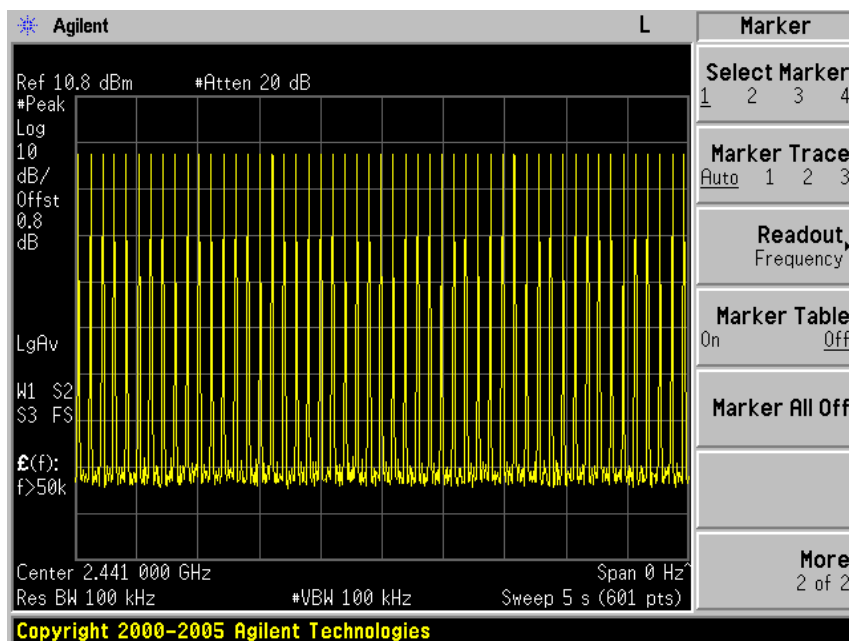
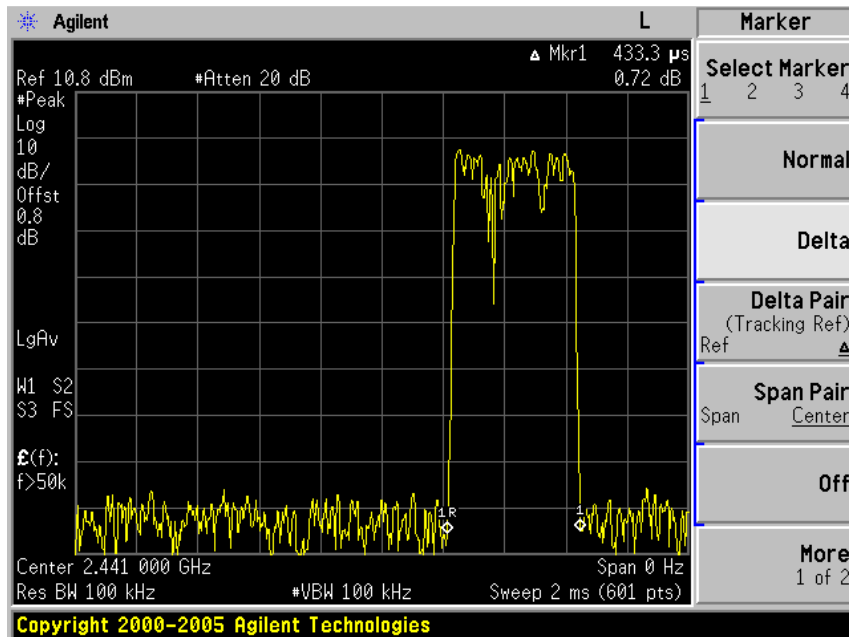
**Table 10: Test result of Time of Occupancy**

Data Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Pulse width (ms)	Measured Dwell time (s)	Limit (s)	Result
DH1	51 (times / 5 sec) * 6.32 = 322.32 times	0.433	0.1396	<0.4	Passed
DH3	17 (times / 5 sec) * 6.32 = 107.44 times	1.708	0.1835	<0.4	Passed
DH5	10 (times / 5 sec) * 6.32 = 63.2 times	3.017	0.1907	<0.4	Passed

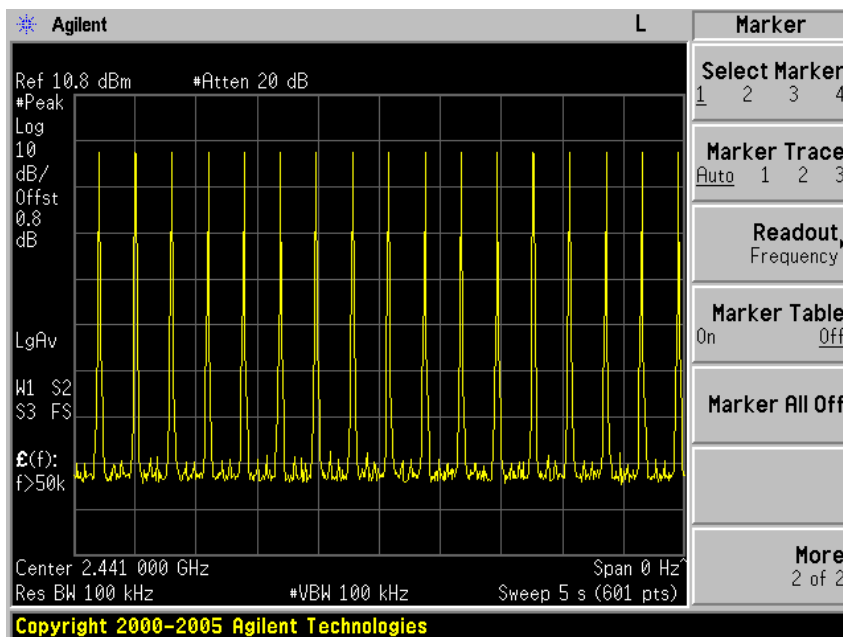
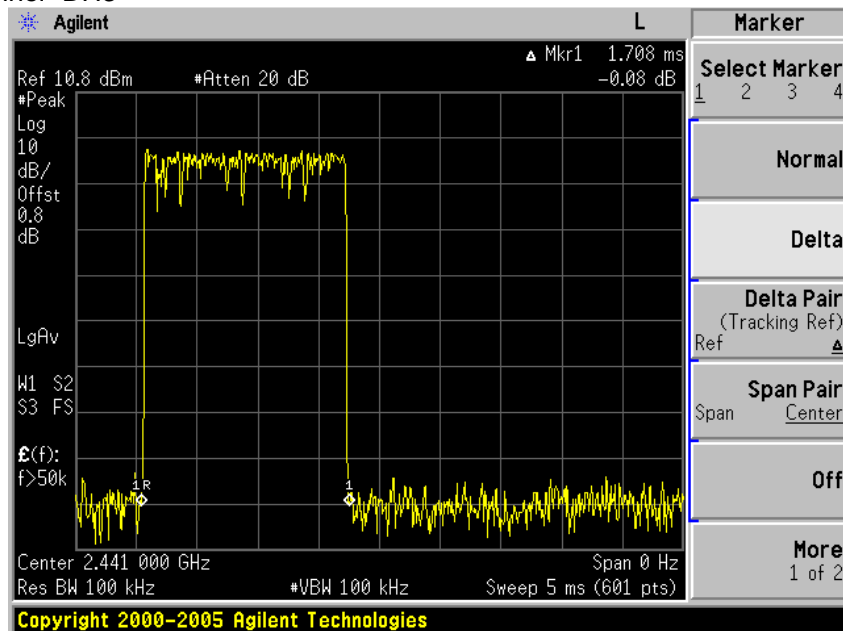
Note: The dwell time value that was found at the lowest and highest frequency is the same as the middle channel.

## Test Plot of Time of Occupancy

### Middle Channel- DH1

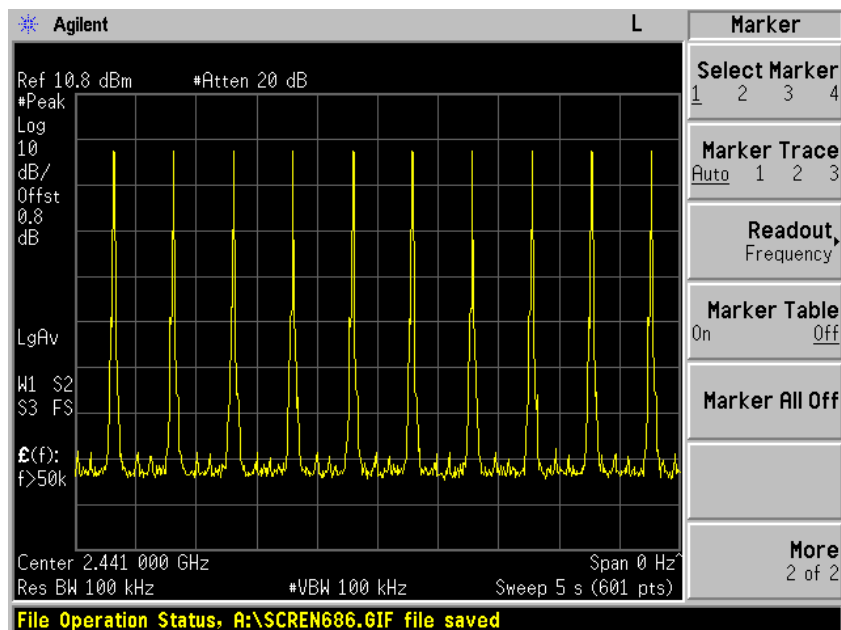
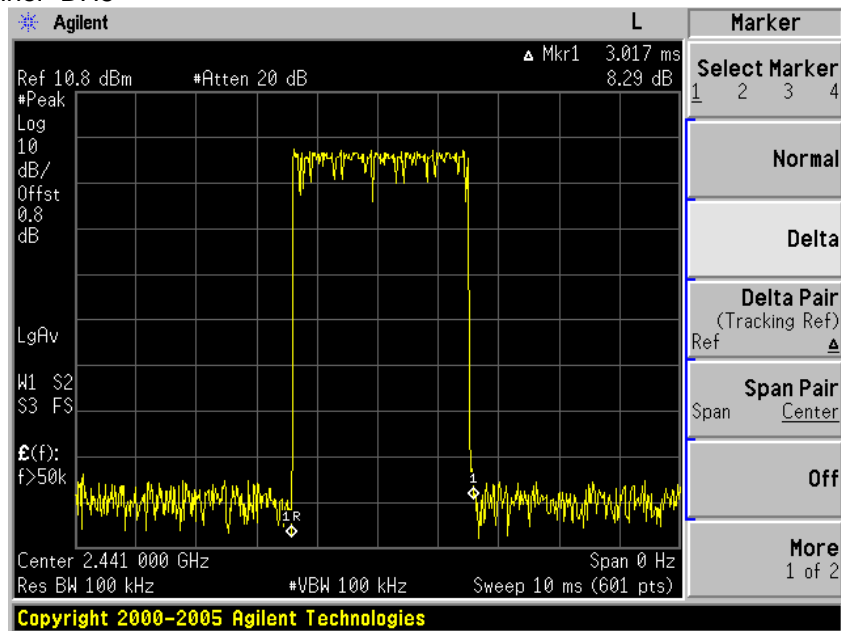


Middle Channel- DH3





Middle Channel- DH5



#### 4.1.9 Radiated emissions

**RESULT:****Passed**

Date of testing	:	2012-02-11
Test standard	:	FCC Part 15.109
Basic standard	:	ANSI C63.4: 2003
Frequency range	:	30 – 1000MHz
Limits	:	FCC Part 15.209(a)
Kind of test site	:	3m Semi-Anechoic Chamber

**Test Setup**

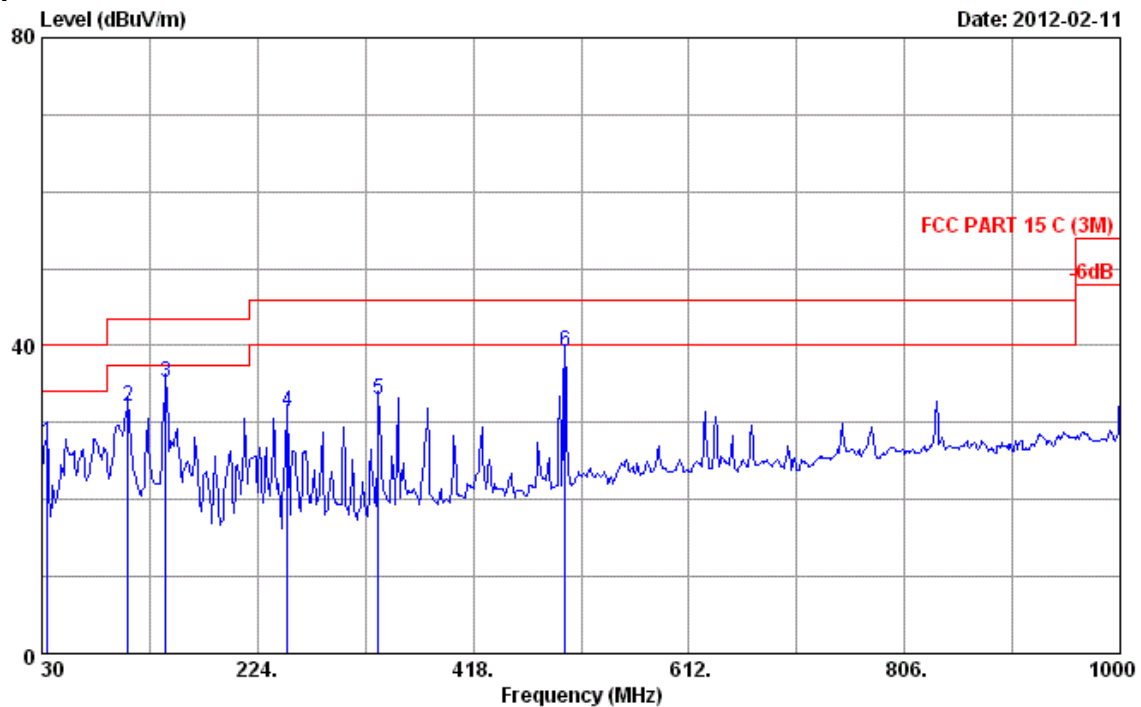
Input Voltage	:	DC 3.7V (via power supply unit)
Operation Mode	:	A
Earthing	:	Not Connected
Ambient temperature	:	24°C
Relative humidity	:	56%
Atmospheric pressure	:	100 kPa

The radiated disturbance test was carried out in a semi-anechoic chamber. The test distance from the receiving antenna to the EUT is 3m. The normalized site attenuation of the semi-anechoic chamber is regularly calibrated to ensure the radiated disturbance test results are valid.

During the test, the wooden table was rotated 360° around and the antenna was varied from 1m to 4m to find the maximum disturbance. The test was performed with the antenna both in its horizontal and vertical polarizations.

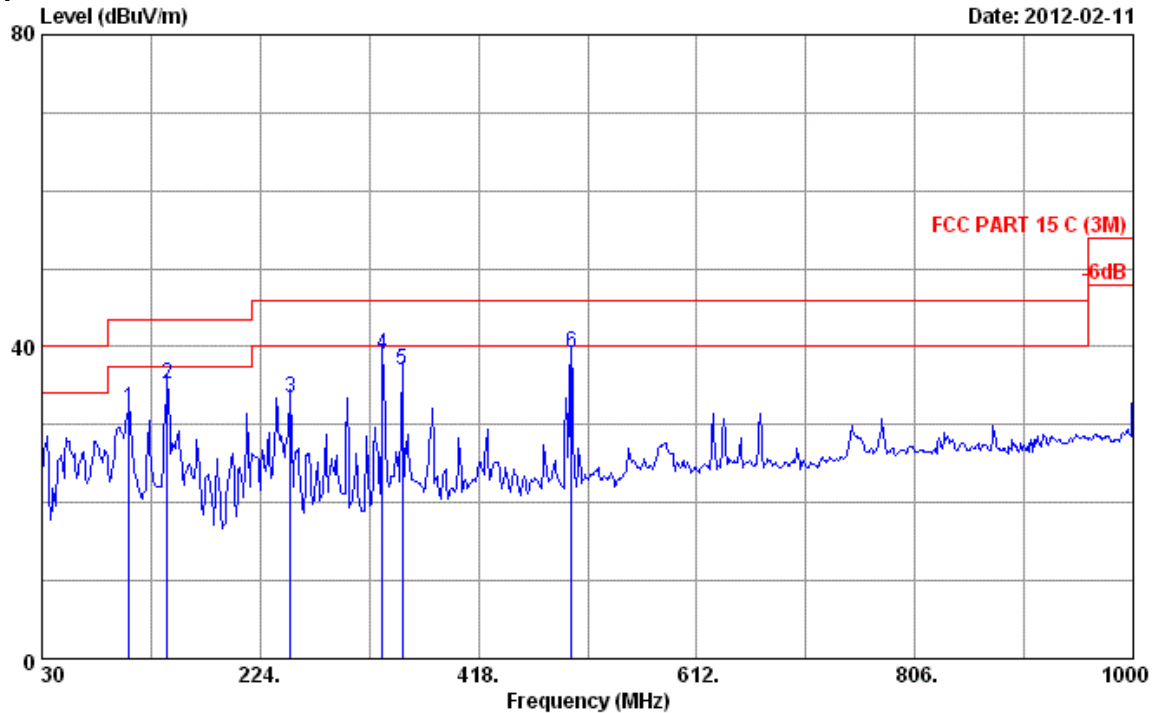
The following figures and tables were those measured by an automatic measurement system. A preview test was firstly performed with peak detector. The final test was performed with quasi-peak at those critical frequencies during the preview test.

The pre-tests were made in the condition of different channels(low,mid and high), and only the worst result was showed in this report.

**Figure 14: Radiated emission measurement results, 30-1000MHz, vertical polarization**


Final quasi-peak measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB
34.85	V	40.0	27.44	12.56
107.6	V	43.5	32.13	11.37
141.55	V	43.5	35.25	8.25
251.16	V	46.0	31.34	14.66
332.64	V	46.0	33.01	12.99
500.45	V	46.0	39.21	6.79

**Figure 15: Radiated emission measurement results, 30-1000MHz, horizontal polarization**


Final quasi-peak measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB
107.6	H	43.5	32.13	11.37
141.55	H	43.5	35.25	8.25
251.16	H	46.0	33.50	12.50
332.64	H	46.0	39.06	6.94
350.1	H	46.0	37.08	8.92
500.45	H	46.0	39.21	6.79

#### 4.1.10 Conducted emissions

**RESULT:****Passed**

Date of testing : 2012-02-25  
Test standard : FCC Part 15.207(a)  
Basic standard : ANSI C63.4: 2003  
Frequency range : 0.15 – 30MHz  
Limits : FCC Part 15.207(a)  
Kind of test site : Shield room

**Test setup**

Input Voltage : DC 3.7V (via power supply unit)  
Operation Mode : A  
Earthing : Not Connected  
Ambient temperature : 29.5°C  
Relative humidity : 55%  
Atmospheric pressure : 100 kPa

The measurement setup was made in a shielded room.

The measurement equipment like test receivers, quasi-peak detector, average detector and LISN are in compliance with CISPR 16-1 series standards and ANSI C63.4-2003. The tested object was operated under its rated voltage and its rated frequency. Prior to the measurements the test object operated about 5 minutes (warm-up) in order to stabilize its operating conditions and to ensure reliable measurement values.

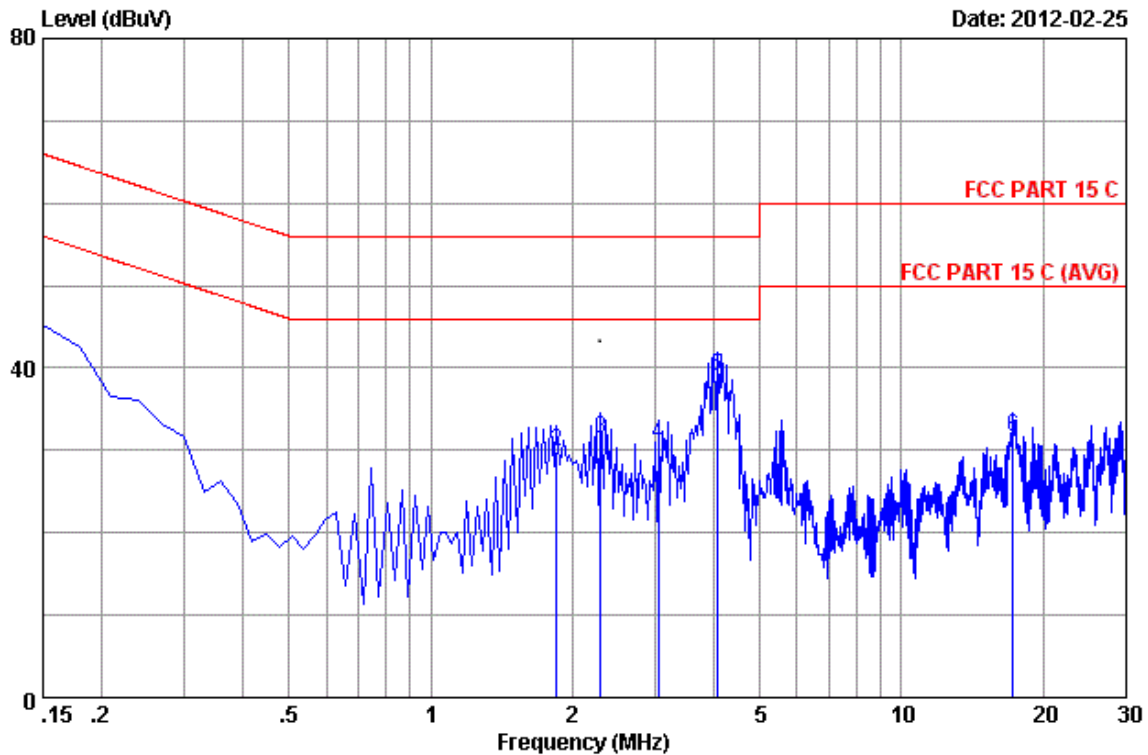
Furthermore an internal calibration with the test receiver was conducted prior to each measurement.

The EUT was set 0.8m away from the LISN. The cord longer than necessary to be connected to the LISN was folded forth and back parallel so as to form a bundle with a length between 0.3m and 0.4m.

The interference voltage was determined while measuring the line conductor by turns.

The test was carried out from DC 3.3V to 5V for the max. measurement results.

The following figures and tables were those measured by an automatic measuring system. A preview test was first made with peak detector. Final test with quasi-peak detector and average detector was only performed at these critical frequencies found via preview test.

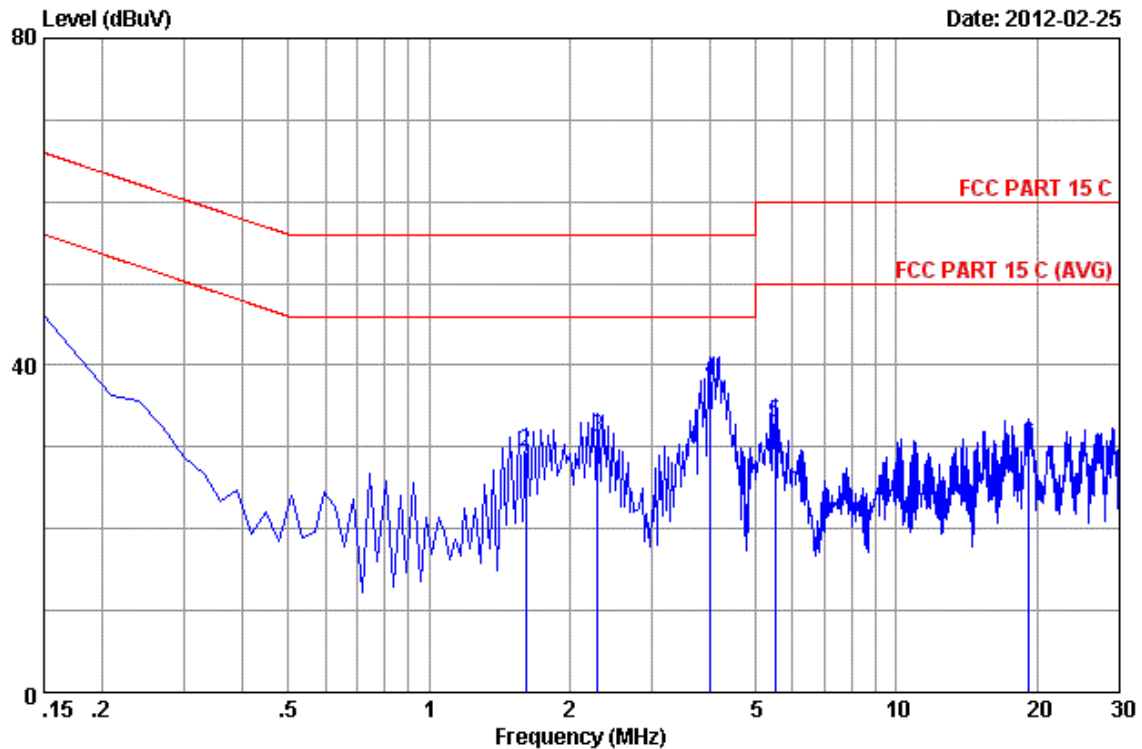
**Figure 16: Conducted emission measurement results, Line L**


Final quasi-peak measurement results:

Frequency(Hz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector	RBW(Hz)
150.0 k	42.15	66.00	23.85	QP	9.0 k
1.851 M	29.91	56.00	26.09	QP	9.0 k
2.299 M	31.48	56.00	24.52	QP	9.0 k
3.045 M	30.67	56.00	25.33	QP	9.0 k
4.060 M	38.96	56.00	17.04	QP	9.0 k
17.224 M	31.56	60.00	28.44	QP	9.0 k

Final average measurement results:

Note: If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.

**Figure 17: Conducted emission measurement results, Line N**


Final quasi-peak measurement results:

Frequency(Hz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector	RBW(Hz)
150.0 k	42.12	66.00	23.88	QP	9.0 k
1.613 M	29.42	56.00	26.58	QP	9.0 k
2.299 M	31.18	56.00	24.82	QP	9.0 k
4.001 M	38.08	56.00	17.92	QP	9.0 k
5.493 M	32.96	60.00	27.04	QP	9.0 k
19.224 M	30.37	60.00	29.63	QP	9.0 k

Final average measurement results:

Note: If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.

## 5. Photographs of the Test Set-Up

**Photograph 1: Set-up for Conducted Emissions**



**Photograph 2: Set-up for Spurious Emissions 30MHz – 1GHz**





**Photograph 3: Set-up for Spurious Emissions 1GHz – 26.5GHz**



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