



## Test Report

Product Name	Full HD Video Wireless Transmitter Module
Model No	ZRF-31100F
FCC ID	YG7ZRF31100F

Applicant	ZINWELL CORPORATION
Address	7F 512, Yuan Shan Road, Chung Ho City, 235, Taipei Hsien, Taiwan

Date of Receipt	Oct. 14, 2010
Issued Date	Nov. 03, 2010
Report No.	10A253R-RFUSP46V01
Report Version	V1.0

The test results relate only to the samples tested.


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This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

# Test Report Certification

Issued Date: Nov. 03, 2010

Report No.: 10A253R-RFUSP46V01



Product Name	Full HD Video Wireless Transmitter Module	
Applicant	ZINWELL CORPORATION	
Address	7F 512, Yuan Shan Road, Chung Ho City, 235, Taipei Hsien, Taiwan	
Manufacturer	ZINWELL CORPORATION	
Model No.	ZRF-31100F	
FCC ID.	YG7ZRF31100F	
EUT Rated Voltage	AC 100-240V, 50-60Hz	
EUT Test Voltage	AC 120V/60Hz	
Trade Name	<b>ZINWELL</b> <sup>®</sup>	
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E: 2009 ANSI C63.4: 2003	 NVLAP Lab Code: 200533-0
Test Result	Complied	

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Documented By : Genie Chang  
( Senior Adm. Specialist / Genie Chang )



Tested By : Vincent chu  
( Assistant Engineer / Vincent Chu )



Approved By : [Signature]  
( Manager / Vincent Lin )

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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	Full HD Video Wireless Transmitter Module
Trade Name	<b>ZINWELL</b> <sup>®</sup>
Model No.	ZRF-31100F
FCC ID.	YG7ZRF31100F
Frequency Range	20MHz: 5180-5240MHz, 40MHz: 5190-5230MHz
Number of Channels	20MHz-BW: 4CH, 40MHz-BW: 2CH
Data Rate	20MHz mode: 31.5Mbps, 40MHz mode: 63Mbps
Channel separation	20MHz-BW: 20MHz, 40MHz-BW: 40MHz
Channel Control	Auto
Type of Modulation	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type	PIFA
Antenna Gain	Refer to the table “Antenna List”

#### Antenna List

	Manufacturer	Model No.	Peak Gain
Internal	ZINWELL	N/A	3.42dBi for 5.15~5.25GHz
External	INVAX	NB0169-B	-0.11dBi for 5.15~5.25GHz

NOTE: External Antenna only uses in receive mode.

All testing are use external antenna.

20MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 1:	5180 MHz	Channel 2:	5200 MHz	Channel 3:	5220 MHz	Channel 4:	5240 MHz

40MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 1:	5190 MHz	Channel 2:	5230 MHz				

Note:

1. This device is a Full HD Video Wireless Transmitter Module with a built-in 5GHz transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. The device is applied for modular approval.
4. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart E for Unlicensed National Information Infrastructure devices.

## 1.2. Operational Description

The EUT is a Full HD Video Wireless Transmitter Module with a built-in 5GHz transceiver, together with Full HD Video Wireless Receiver Module. It has a SIMO design of five channel and one slow rate output wireless channel, which generates an upstream channel for data content transmissions.

The data modulation is OFDM, using five antennas to support 4(Transmit) \* 1(Receive) technology. The device only provided one transmitting speed 31.5Mbps in 20MHz bandwidth mode and 63Mbps in 40MHz bandwidth mode.

Presents the ultimate solution for converting any High Definition (HD) system, including Full HD, into a wireless one. These add-on modules enable wireless A/V applications that fit easily into the living room and eliminate traditional A/V wiring. The perfect HD video and audio quality and the high robustness are unmatched by any other wireless technology and present a true alternative to cable. The WHDI system transmits uncompressed video and audio streams wirelessly and thus simplifies and eliminates system issues, such as: lip-sync, large buffers and other burdens like retransmissions or error propagation.

The device can transmit audio and video signal to associate equipment, device will receive signal form associate equipment when associate equipment request change operation frequency.

The AMN2120 WHDITM baseband transmitter chip is the heart of the ZRF31100 WHDI transmitter module. The AMN2120 interfaces the A/V source through the WHDI connector. The AMN2120 includes an internal microcontroller for controlling the physical level.

The AMN2120 is based on MIMO technology transmitting through up to four output channels. Four digital-to-analog converters and one analog-to-digital converter are embedded within the chip.

The AMN2120 internal PLL accepts an input clock frequency of 40MHz. The input frequency is multiplied and then used as an internal system clock. The AMN2120 also generates a 10 MHz reference clock, derived from 40 MHz for general use.

The AMN3110 is a fully-integrated direct conversion MIMO transmitter specifically designed for WHDI applications using OFDM modulation in single-band 4.9 GHz to 5.9 GHz. The device consists of:

- Four Complete Downlink Direct Conversion Transmitters.
- One Uplink Receiver.
- Integrated Synthesizer.
- Internal DC Servo Loops.
- RSSI.
- IQ Detector.
- RF and Baseband Control Interface.
- Power Management Unit.
- 3-Wire SPI Interface.

To complete the RF front-end solution, the AMN3110 uses external PA, RF switches, RF Band Pass Filters (BPF), RF BALUNs and a few passive components.

The device antenna are use five PIFA (4TX, 1RX) and printed on PCB, for receiver function there are support one external antenna which can instead of printed antenna.

The device is slave equipment and has not radar detection and not ad-hoc operation in the DFS band, another information please refer to user's manual.

Test Mode	Mode 1: Transmitter -20BW Mode 2: Transmitter -40BW
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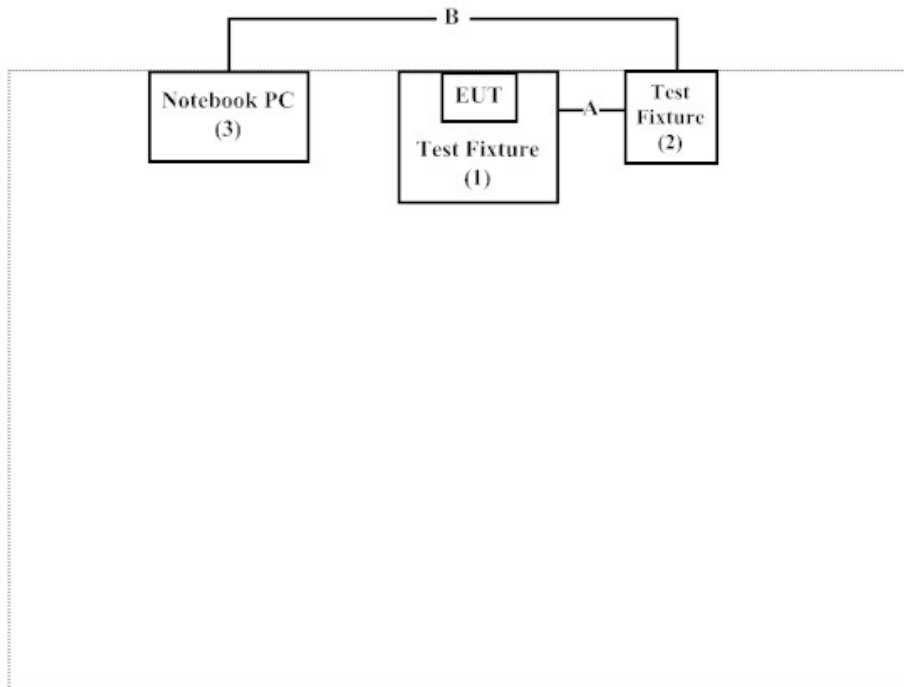
### 1.3. Tested System Details

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

Product	Manufacturer	Model No.	Serial No.	Power Cord
1	Test Fixture	N/A	N/A	N/A
2	Test Fixture	N/A	N/A	N/A
3	Notebook PC	DELL	PPT	N/A
				Non-Shielded, 0.8m

Signal Cable Type	Signal cable Description
A	Test Fixture Control Cable
	Non-Shielded, 0.2m
B	USB to RS-232 Cable
	Non-Shielded, 1.5m

### 1.4. Configuration of tested System



### 1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute the UART program on the EUT
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press “OK” to start the continuous Transmitter.
- (5) Verify that the EUT works properly.

**1.6. Test Facility**

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from

Quietek Corporation's Web Site : <http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web

site : <http://www.quietek.com/>

Site Description: File on  
 Federal Communications Commission  
 FCC Engineering Laboratory  
 7435 Oakland Mills Road  
 Columbia, MD 21046  
 Registration Number: 92195



Accreditation on NVLAP  
 NVLAP Lab Code: 200533-0



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 E-Mail : [service@quietek.com](mailto:service@quietek.com)

FCC Accreditation Number: TW1014



## 2. Conducted Emission

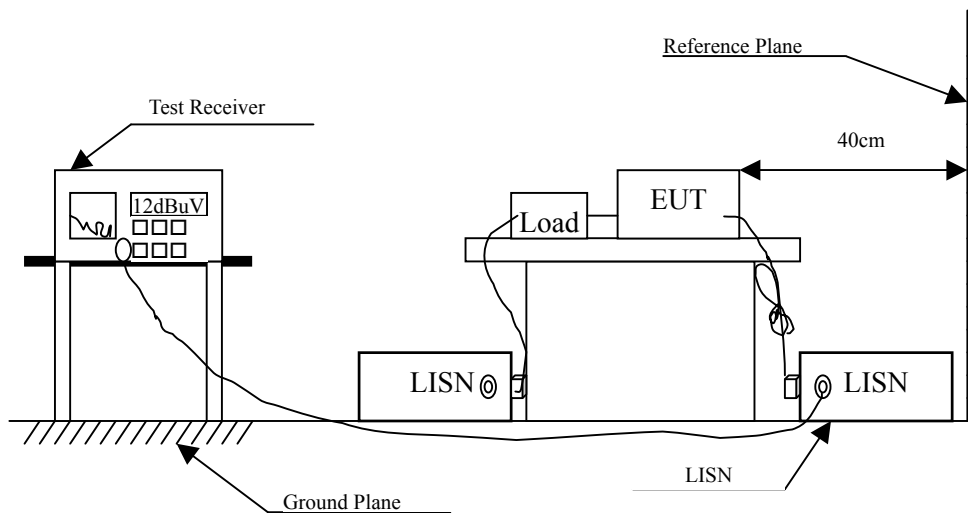
### 2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2010	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2010	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2010	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2010	
5	No.1 Shielded Room			N/A	

Note: All equipments are calibrated every one year.

### 2.2. Test Setup



### 2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

## 2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Aug 2002 DA 02-2138 for compliance to FCC 47CFR Subpart E requirements.

## 2.5. Uncertainty

± 2.26 dB

## 2.6. Test Result of Conducted Emission

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 2: Transmitter -40BW (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.189	9.714	25.360	35.074	-29.812	64.886
0.334	9.650	23.070	32.720	-28.023	60.743
0.377	9.650	24.870	34.520	-24.994	59.514
0.443	9.640	27.830	37.470	-20.159	57.629
0.505	9.640	33.240	42.880	-13.120	56.000
1.197	9.670	26.460	36.130	-19.870	56.000
<b>Average</b>					
0.189	9.714	20.340	30.054	-24.832	54.886
0.334	9.650	19.580	29.230	-21.513	50.743
0.377	9.650	21.590	31.240	-18.274	49.514
0.443	9.640	23.930	33.570	-14.059	47.629
0.505	9.640	29.750	39.390	-6.610	46.000
1.197	9.670	25.020	34.690	-11.310	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 2: Transmitter -40BW (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.193	9.721	36.230	45.951	-18.820	64.771
0.252	9.685	31.670	41.355	-21.731	63.086
0.443	9.645	34.750	44.395	-13.234	57.629
0.541	9.640	33.000	42.640	-13.360	56.000
0.822	9.670	27.200	36.870	-19.130	56.000
8.865	9.800	23.550	33.350	-26.650	60.000
<b>Average</b>					
0.193	9.721	32.830	42.551	-12.220	54.771
0.252	9.685	28.840	38.525	-14.561	53.086
0.443	9.645	31.630	41.275	-6.354	47.629
0.541	9.640	29.470	39.110	-6.890	46.000
0.822	9.670	24.110	33.780	-12.220	46.000
8.865	9.800	20.650	30.450	-19.550	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

### 3. Peak Transmit Power

#### 3.1. Test Equipment

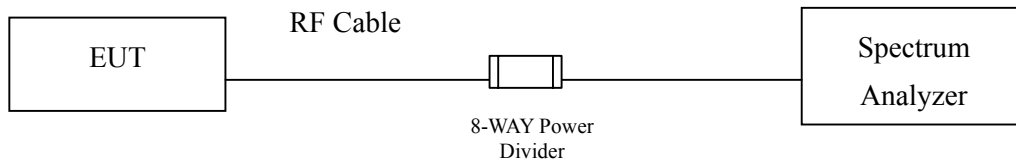
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2010
X	Power Sensor	Anritsu	MA2411B/0738448	Jun, 2010
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2010
X	8-WAY Power Divider	JFW	50PD-647 / 526770 0916	Apr., 2010

Note:

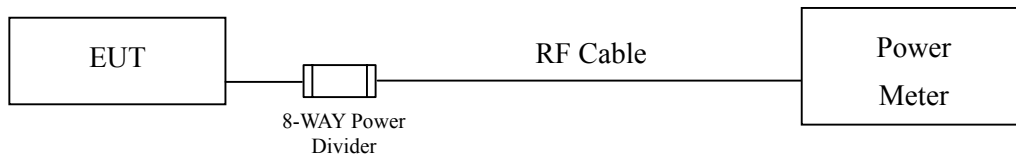
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

#### 3.2. Test Setup

##### 26dBc Occupied Bandwidth



##### Conducted Power Measurement



### 3.3. Limits

- (1) For the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50 mW or  $4 \text{ dBm} + 10\log B$ , where B is the 26-dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
- (2) For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW or  $11 \text{ dBm} + 10\log B$ , where B is the 26-dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
- (3) For the band 5.725-5.825 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 1W or  $17 \text{ dBm} + 10\log B$ , where B is the 26-dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.

### 3.4. Test Procedur

As an alternative to DA 02-2138, the EUT peak power was measured with a peak power meter employing a video bandwidth greater than 6dB BW of the emission under test. Peak output power was read directly from the meter across all data rates, and across three channels within each sub-band. Special care was used to make sure that the EUT was transmitting in continuous mode. This method exceeds the limitations of DA 02-2138, and provides more accurate measurements.

### 3.5. Uncertainty

$\pm 1.27 \text{ dB}$



### 3.6. Test Result of Peak Transmit Power

Product : Full HD Video Wireless Transmitter Module  
Test Item : Peak Transmit Power  
Test Site : No.3 OATS  
Test Mode : Mode 1: Transmitter -20BW

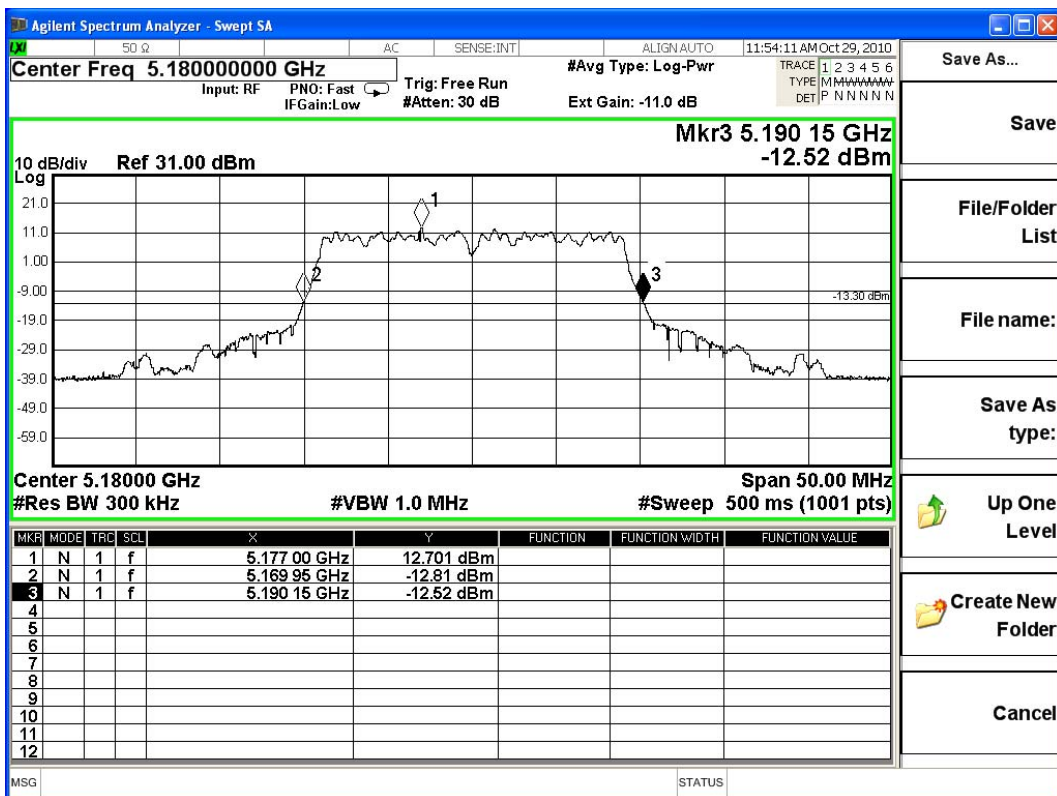
Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
01	5180	16.21	<17dBm	Pass
02	5200	16.03	<17dBm	Pass
04	5240	16.30	<17dBm	Pass

Note: 1. Peak Power Output Value = Reading value on peak power meter + cable loss  
2. Using 8-Way Power Divider (factor =10dB), to compensate in the spectrum.

**Peak Transmit Power Measurement:**

Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
01	5180	20.2	16.21	17	17.05	Pass

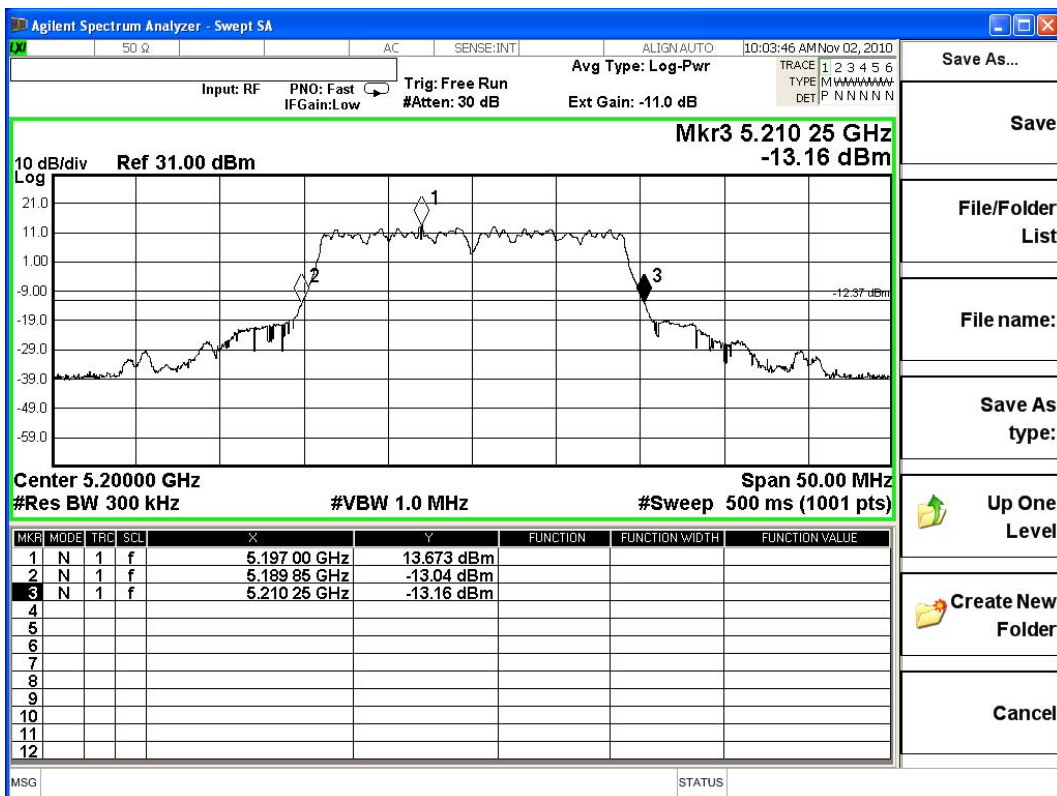
**26dBc Occupied Bandwidth:  
Channel 01**



**Peak Transmit Power Measurement:**

Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
03	5200	20.4	16.03	17	17.10	Pass

**26dBc Occupied Bandwidth:  
Channel 03**

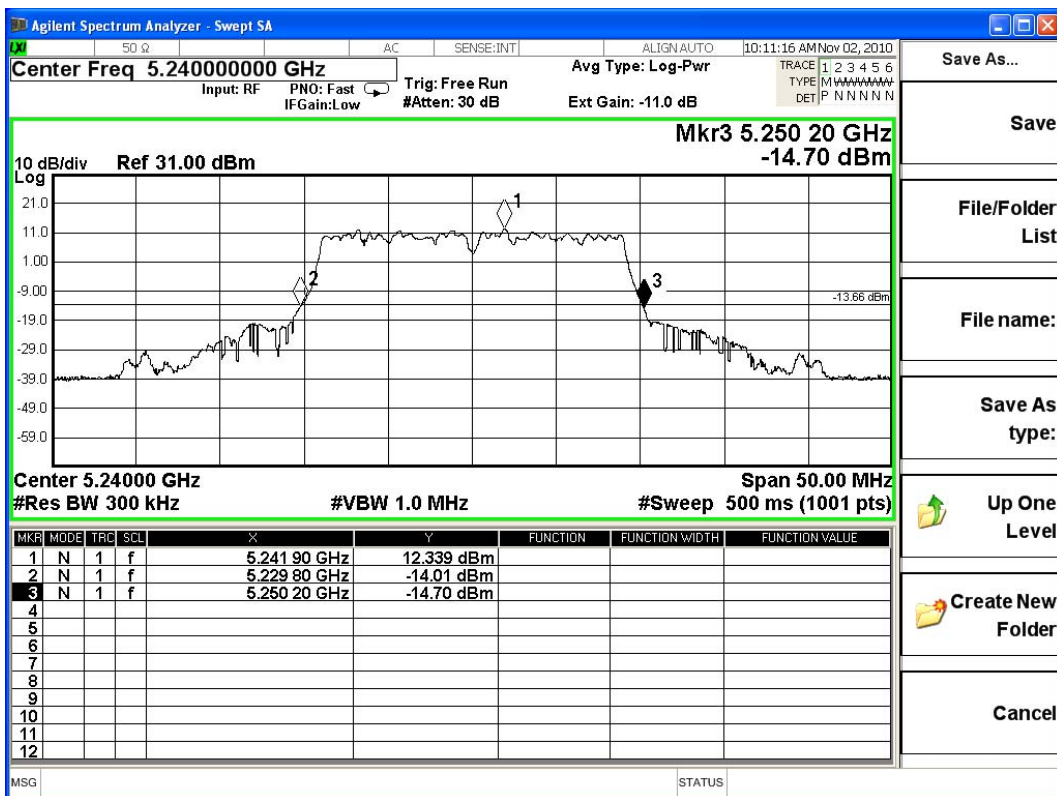


**Peak Transmit Power Measurement:**

Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
04	5240	20.4	16.3	17	17.10	Pass

**26dBc Occupied Bandwidth:**

**Channel 04**



Product : Full HD Video Wireless Transmitter Module  
Test Item : Peak Transmit Power  
Test Site : No.3 OATS  
Test Mode : Mode 2: Transmitter -40BW

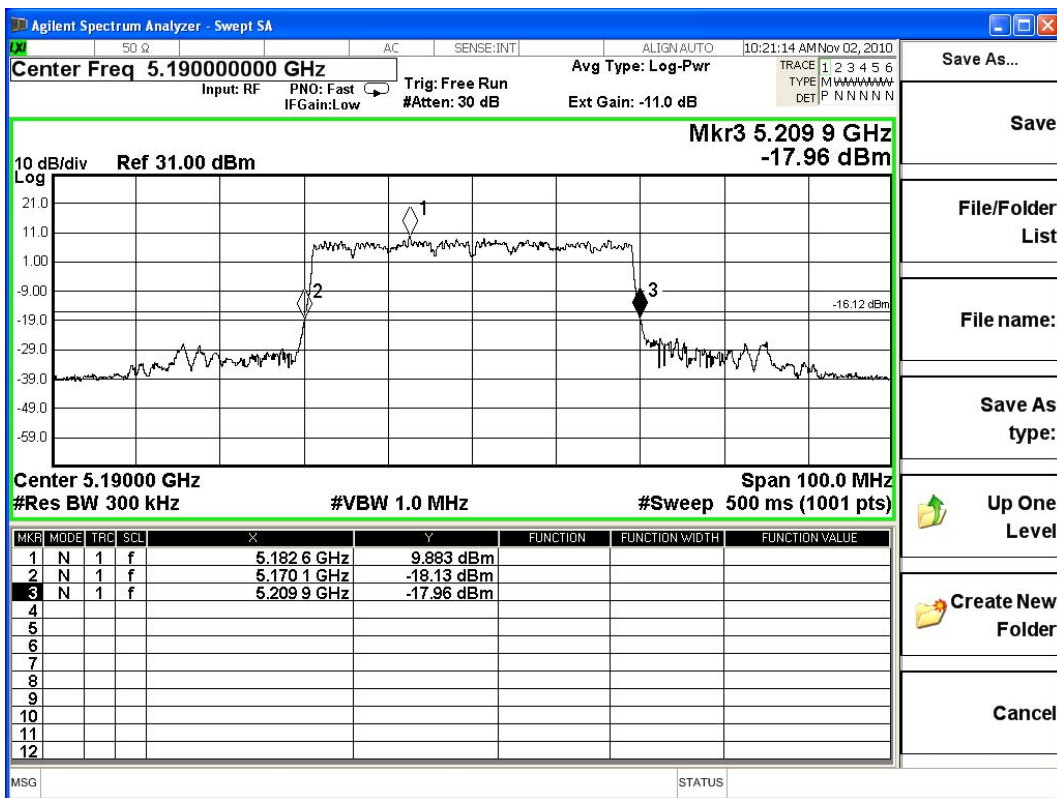
Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
01	5190	15.10	<17dBm	Pass
02	5230	16.11	<17dBm	Pass

Note: 1. Peak Power Output Value = Reading value on peak power meter + cable loss  
2. Using 8-Way Power Divider (factor =10dB), to compensate in the spectrum.

**Peak Transmit Power Measurement:**

Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
01	5190	39.8	15.1	17	20.00	Pass

**26dBc Occupied Bandwidth:  
Channel 01**

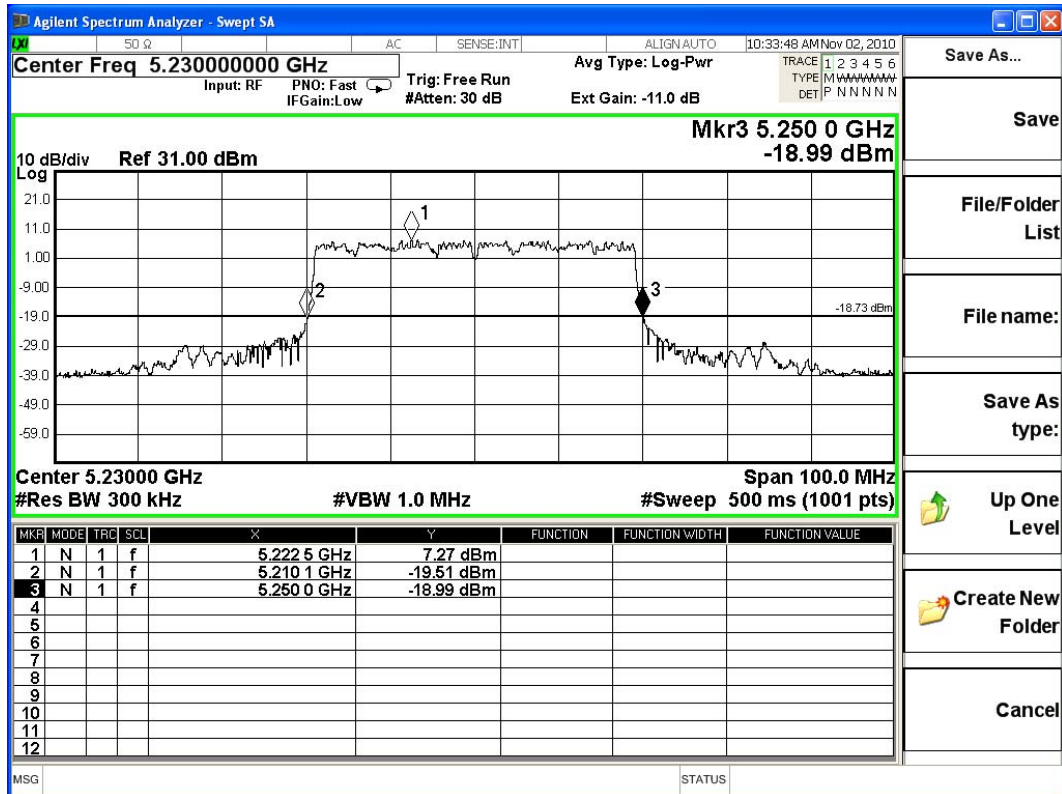


**Peak Transmit Power Measurement:**

Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
02	5230	39.9	16.11	17	20.01	Pass

**26dBc Occupied Bandwidth:**

**Channel 02**



## 4. Peak Power Spectral Density

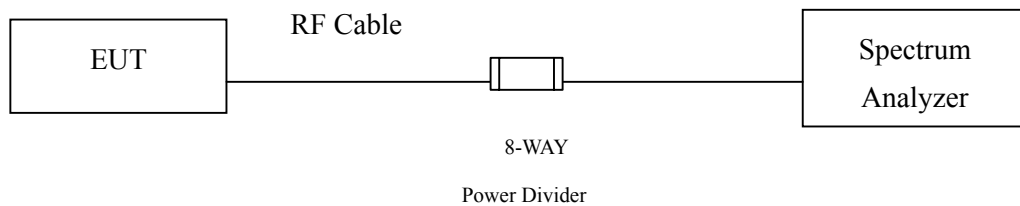
### 4.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2010
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2010
	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2010
X	8-WAY Power Divider	JFW	50PD-647 / 526770 0916	Apr., 2010

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.
3. The power combiner is used for measure 11n mode.

### 4.2. Test Setup



### 4.3. Limits

- (1) For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
- (2) For the band 5.25-5.35 GHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
- (3) For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.



#### **4.4. Test Procedure**

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Aug 2002 DA 02-2138 for compliance to FCC 47CFR Subpart E requirements.

#### **4.5. Uncertainty**

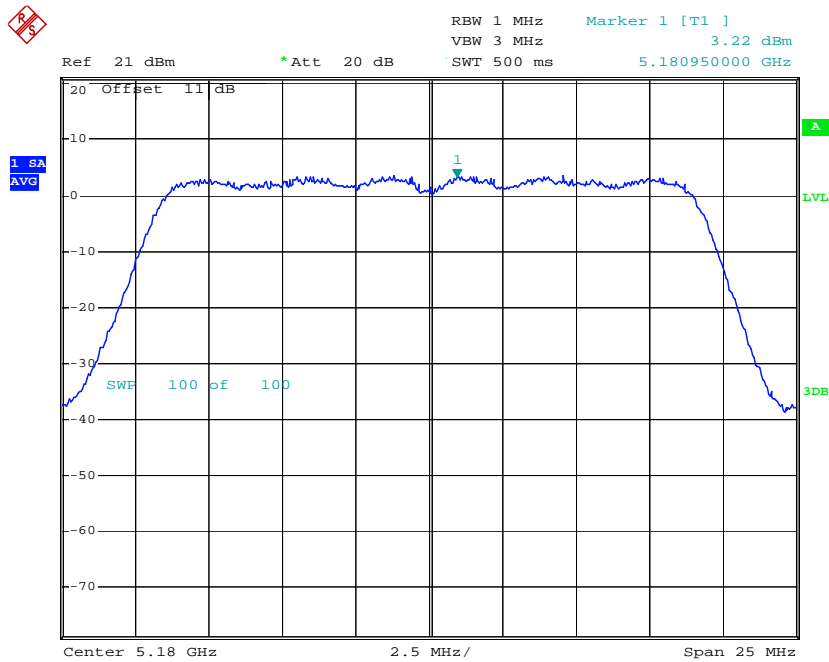
$\pm 1.27$  dB

#### 4.6. Test Result of Peak Power Spectral Density

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Peak Power Spectral Density  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -20BW

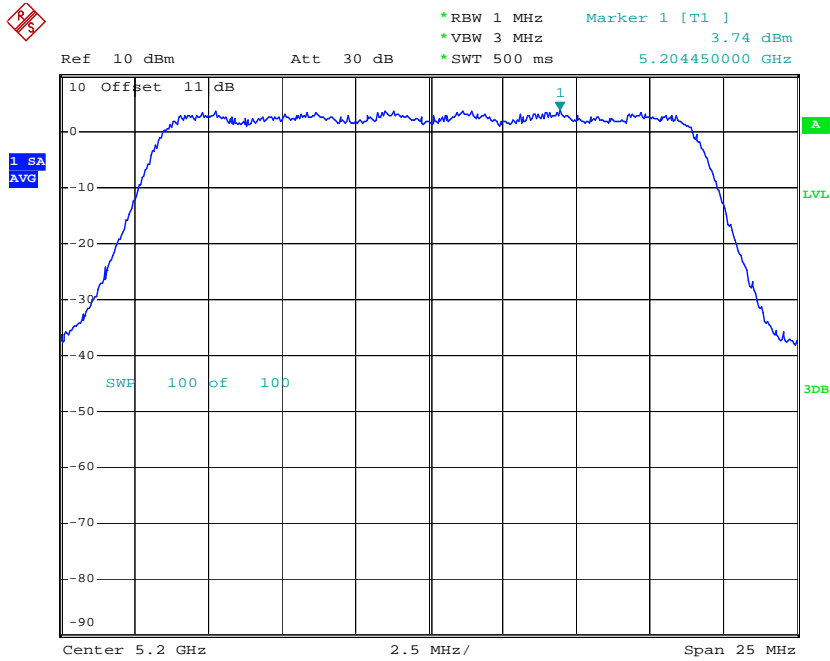
Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
01	5180	3.220	<4	Pass
02	5200	3.740	<4	Pass
04	5240	3.690	<4	Pass

**Channel 01:**



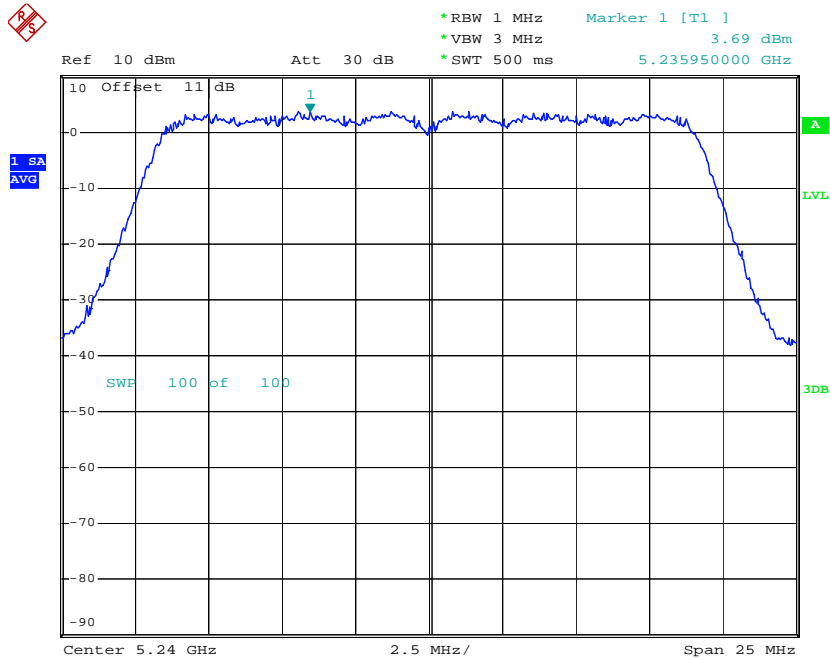
Date: 29.OCT.2010 13:53:21

Channel 02:



Date: 29.OCT.2010 14:13:23

Channel 04:

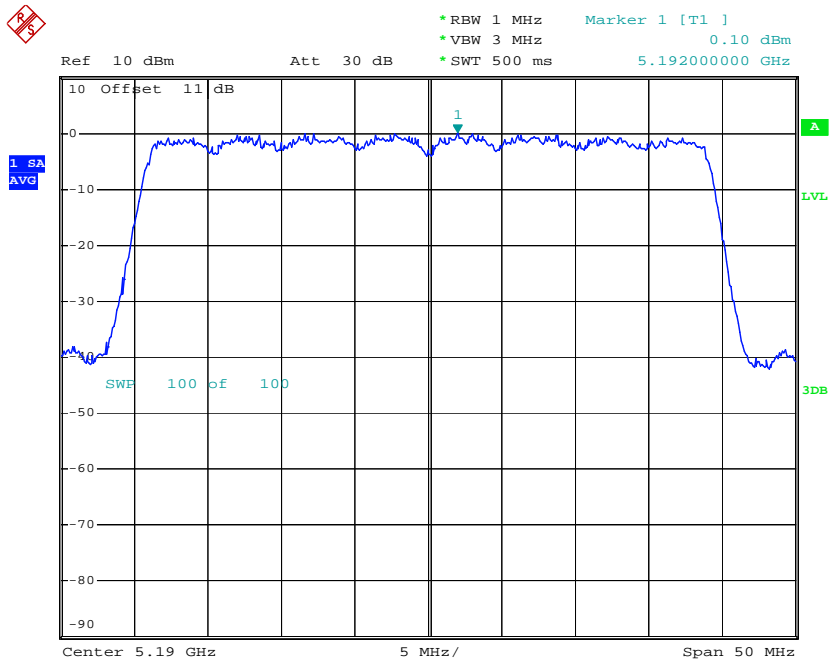


Date: 29.OCT.2010 14:19:51

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Peak Power Spectral Density  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter -40BW

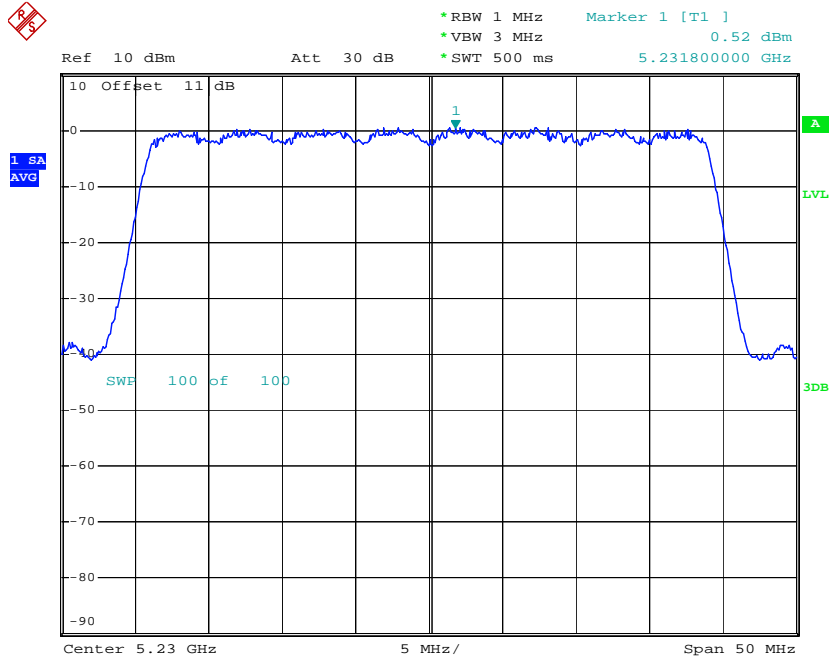
Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
01	5190	0.100	<4	Pass
02	5230	0.520	<4	Pass

**Channel 01:**



Date: 29.OCT.2010 14:33:02

### Channel 02:



Date: 29.OCT.2010 14:39:08

**5. Peak Excursion**

**5.1. Test Equipment**

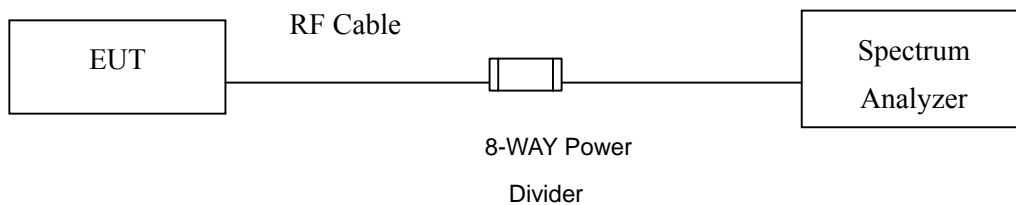
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2010
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2010
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2010
X	8-WAY Power Divider	JFW	50PD-647 / 526770 0916	Apr., 2010

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.
3. The power combiner is used for measure 11n mode.

**5.2. Test Setup**

**Conduction Power Measurement**



**5.3. Limits**

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

#### **5.4. Test Procedure**

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Aug 2002 DA 02-2138 for compliance to FCC 47CFR Subpart E requirements.

#### **5.5. Uncertainty**

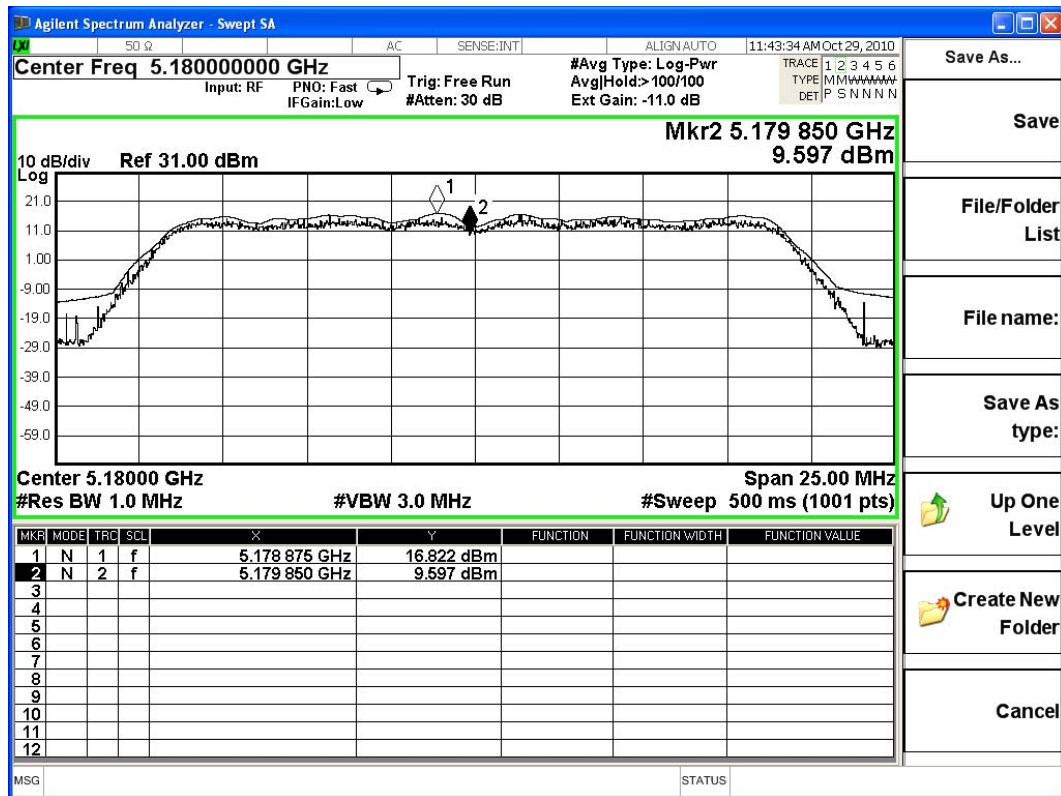
$\pm 1.27$  dB

### 5.6. Test Result of Peak Excursion

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Peak Excursion  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -20BW

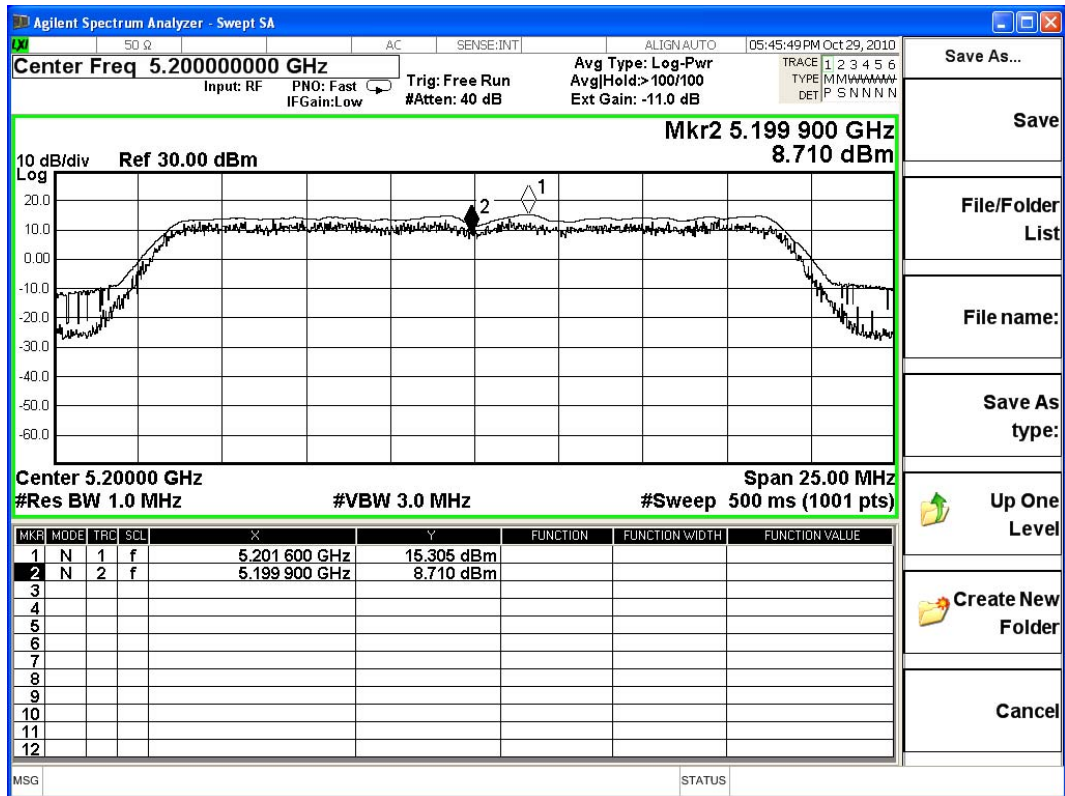
Channel No.	Frequency (MHz)	Measurement Level (dB)	Required Limit (dB)	Result
01	5180	7.23	<13	Pass
02	5200	6.60	<13	Pass
04	5240	5.63	<13	Pass

**Channel 01:**

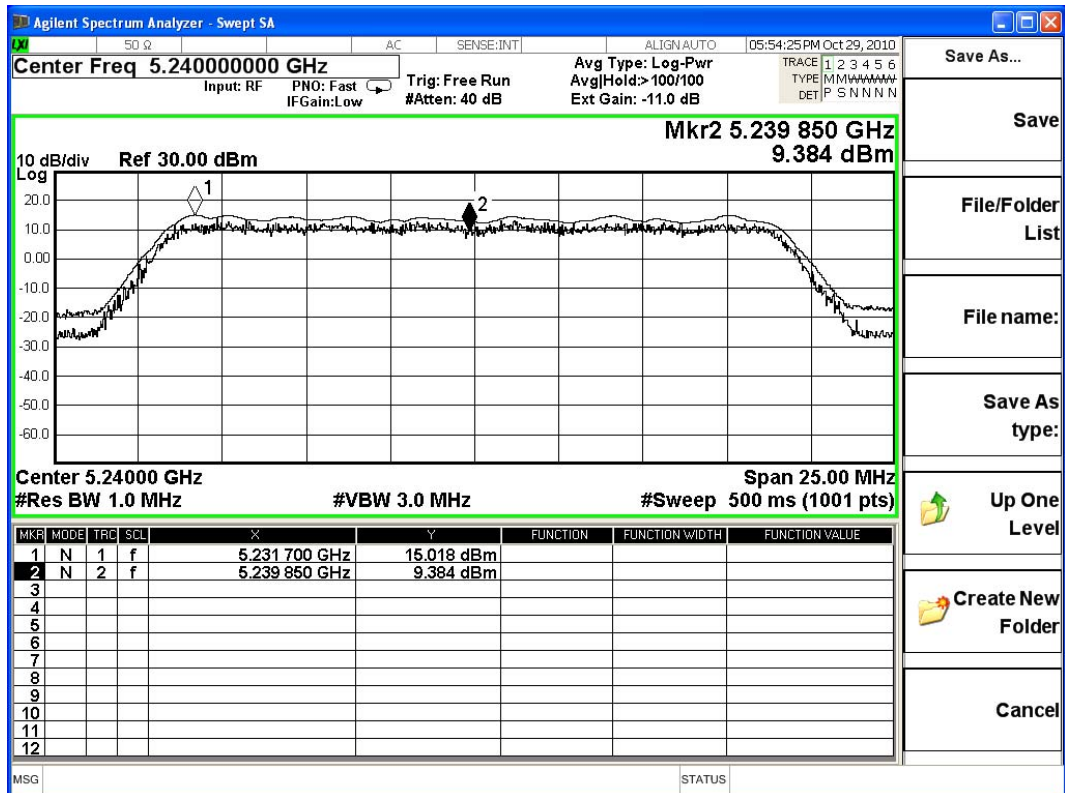




Channel 02:



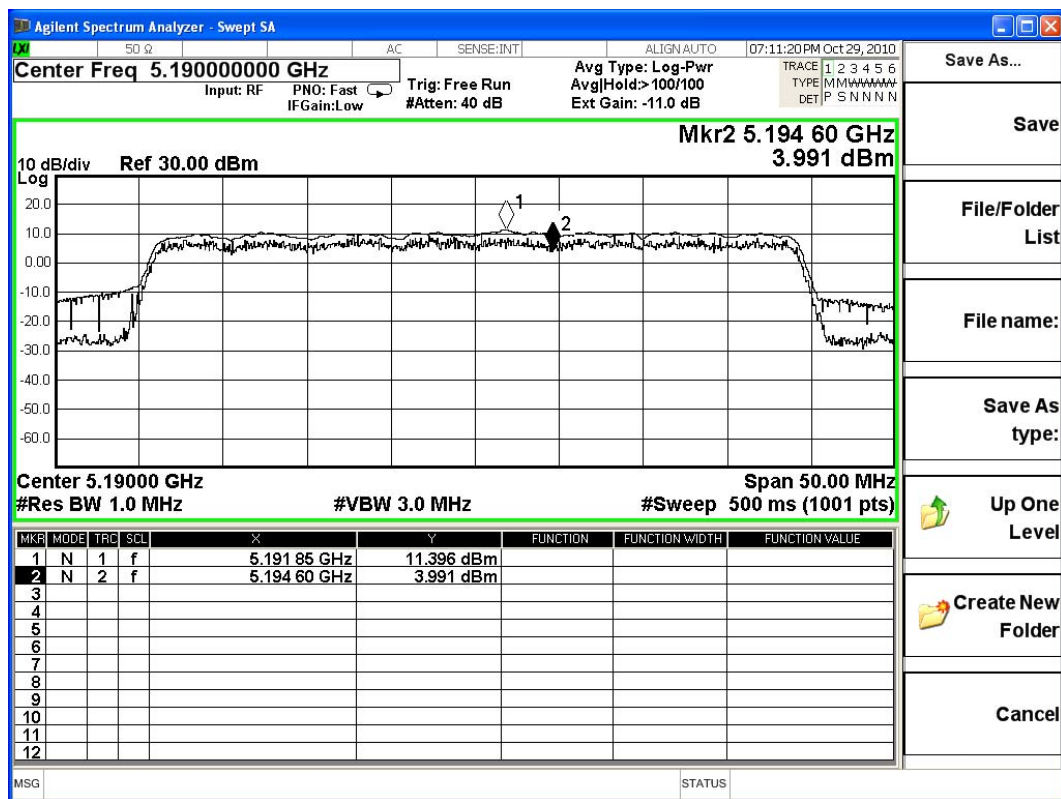
Channel 04:



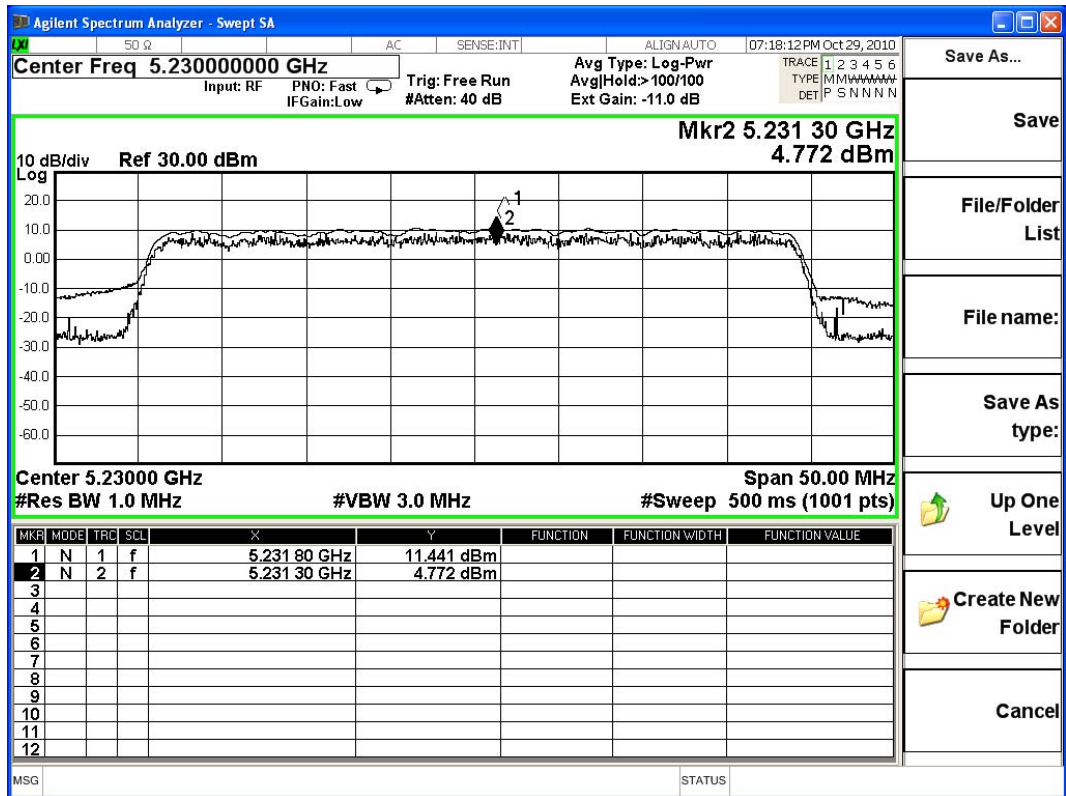
Product : Full HD Video Wireless Transmitter Module  
 Test Item : Peak Excursion  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter -40BW

Channel No.	Frequency (MHz)	Measurement Level (dB)	Required Limit (dB)	Result
01	5190	7.41	<13	Pass
02	5230	6.67	<13	Pass

**Channel 01:**



Channel 02:



## 6. Radiated Emission

### 6.1. Test Equipment

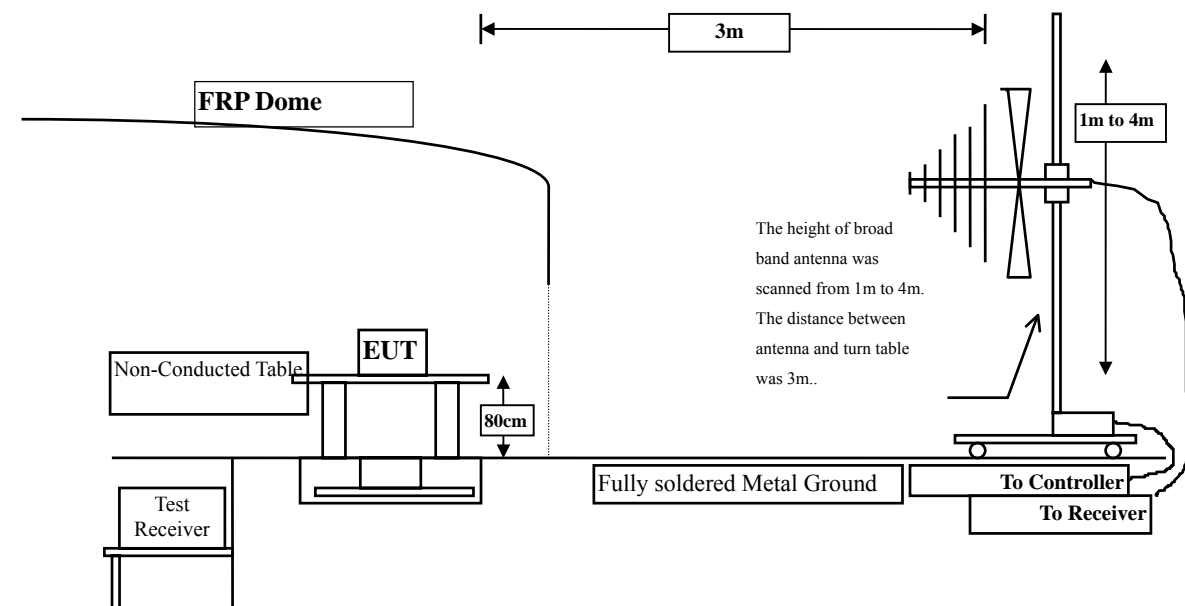
The following test equipments are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2010
	X Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2010
	X Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2010
	X Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2010
	X Pre-Amplifier	HP	8449B/3008A01123	July., 2010
	X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2010
	X Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2010
	X Coaxial Cable	Quietek	QTK-CABLE/ CAB5	Feb., 2010
	X Controller	Quietek	QTK-CONTROLLER/ CTRL3	N/A
	X Coaxial Switch	Anritsu	MP59B/6200265729	N/A

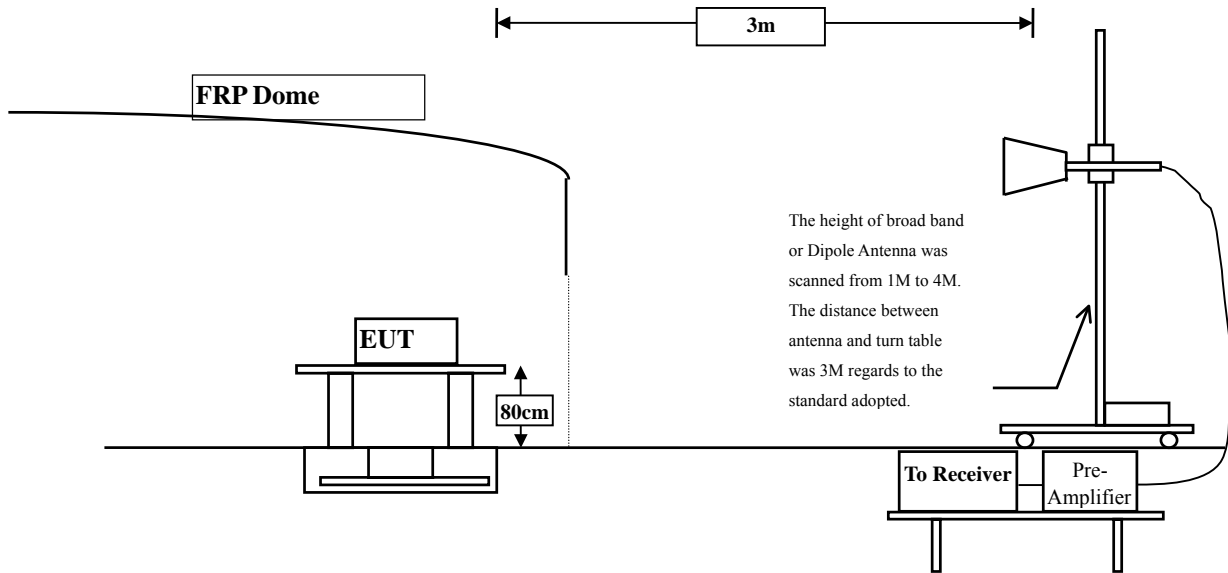
- Note: 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.  
 2. The test instruments marked with "X" are used to measure the final test results.

### 6.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



**6.3. Limits**

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks: E field strength (dBuV/m) = 20 log E field strength (uV/m)

#### **6.4. Test Procedure**

The EUT was setup according to ANSI C63.4, 2003 and tested according to FCC Public Notice DA 02-2138 test procedure for compliance to FCC 47CFR 15. 407 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2003 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range form 30MHz - 10th Harmonic of fundamental was investigated.

#### **6.5. Uncertainty**

± 3.8 dB below 1GHz

± 3.9 dB above 1GHz

## 6.6. Test Result of Radiated Emission

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -20BW (5180MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
10360.000	12.930	41.650	54.580	-13.640	68.220

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
7. The average measurement was not performed when the peak measured data under the limit of average detection.
8. The emission levels of other frequencies are very lower than the limit and not show in test report.
9. Out-of-band emission Limit=-27dBm=68.22dBuV

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -20BW (5180MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
10360.000	13.724	46.780	60.504	-7.716	68.220

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
7. The average measurement was not performed when the peak measured data under the limit of average detection.
8. The emission levels of other frequencies are very lower than the limit and not show in test report.
9. Out-of-band emission Limit=-27dBm=68.22dBuV



Product : Full HD Video Wireless Transmitter Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -20BW (5200MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
10400.000	12.959	44.130	57.089	-11.131	68.220

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
7. The average measurement was not performed when the peak measured data under the limit of average detection.
8. The emission levels of other frequencies are very lower than the limit and not show in test report.
9. Out-of-band emission Limit=-27dBm=68.22dBuV

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -20BW (5200MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
10400.000	13.877	46.340	60.217	-8.003	68.220

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
7. The average measurement was not performed when the peak measured data under the limit of average detection.
8. The emission levels of other frequencies are very lower than the limit and not show in test report.
9. Out-of-band emission Limit=-27dBm=68.22dBuV

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -20BW (5240MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
10480.000	13.693	46.060	59.754	-8.466	68.220

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
7. The average measurement was not performed when the peak measured data under the limit of average detection.
8. The emission levels of other frequencies are very lower than the limit and not show in test report.
9. Out-of-band emission Limit=-27dBm=68.22dBuV

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -20BW (5240MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
10480.000	14.620	45.580	60.201	-8.019	68.220

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
7. The average measurement was not performed when the peak measured data under the limit of average detection.
8. The emission levels of other frequencies are very lower than the limit and not show in test report.
9. Out-of-band emission Limit=-27dBm=68.22dBuV

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter -40BW (5190MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dBuV/m
	dB	dBuV	dBuV/m		
<b>Horizontal</b>					
<b>Peak Detector:</b>					
10380.000	12.939	43.800	56.739	-11.481	68.220

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
7. The average measurement was not performed when the peak measured data under the limit of average detection.
8. The emission levels of other frequencies are very lower than the limit and not show in test report.
9. Out-of-band emission Limit=-27dBm=68.22dBuV

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter -40BW (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
10380.000	13.796	47.460	61.256	-6.964	68.220

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
7. The average measurement was not performed when the peak measured data under the limit of average detection.
8. The emission levels of other frequencies are very lower than the limit and not show in test report.
9. Out-of-band emission Limit=-27dBm=68.22dBuV

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter -40BW (5230MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
10460.000	13.508	45.400	58.908	-9.312	68.220

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
7. The average measurement was not performed when the peak measured data under the limit of average detection.
8. The emission levels of other frequencies are very lower than the limit and not show in test report.
9. Out-of-band emission Limit=-27dBm=68.22dBuV

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter -40BW (5230MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
10460.000	14.433	45.190	59.623	-8.597	68.220

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
7. The average measurement was not performed when the peak measured data under the limit of average detection.
8. The emission levels of other frequencies are very lower than the limit and not show in test report.
9. Out-of-band emission Limit=-27dBm=68.22dBuV



Product : Full HD Video Wireless Transmitter Module  
 Test Item : General Radiated Emission  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -20BW (5200MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector</b>					
45.520	-7.280	39.641	32.361	-7.639	40.000
288.020	-4.579	44.392	39.813	-6.187	46.000
600.360	3.977	34.145	38.122	-7.878	46.000
666.320	2.031	36.237	38.269	-7.731	46.000
961.200	6.450	33.476	39.926	-14.074	54.000
1000.000	9.119	33.457	42.576	-11.424	54.000
<b>Vertical</b>					
<b>Peak Detector</b>					
59.100	-4.097	38.308	34.211	-5.789	40.000
158.040	-6.191	43.004	36.813	-6.687	43.500
299.660	-6.855	44.868	38.013	-7.987	46.000
344.280	-3.171	41.244	38.074	-7.926	46.000
961.200	7.260	33.917	41.177	-12.823	54.000
1000.000	4.329	37.684	42.013	-11.987	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. "█" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
5. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested.  
Only the worst case is shown on the report.

Product : Full HD Video Wireless Transmitter Module  
 Test Item : General Radiated Emission  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter -40BW (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector</b>					
30.000	2.120	29.276	31.396	-8.604	40.000
94.020	-8.189	44.156	35.966	-7.534	43.500
218.180	-10.619	51.084	40.464	-5.536	46.000
600.360	3.977	34.524	38.501	-7.499	46.000
961.200	6.450	33.853	40.303	-13.697	54.000
998.060	8.386	32.532	40.918	-13.082	54.000
<b>Vertical</b>					
<b>Peak Detector</b>					
41.640	-1.809	35.881	34.072	-5.928	40.000
154.160	-6.221	44.152	37.931	-5.569	43.500
301.600	-6.785	47.760	40.976	-5.024	46.000
666.320	-1.809	36.652	34.844	-11.156	46.000
961.200	7.260	33.334	40.594	-13.406	54.000
996.120	4.019	38.685	42.704	-11.296	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. "█" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
5. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested.  
Only the worst case is shown on the report.

## 7. Band Edge

### 7.1. Test Equipment

#### RF Conducted Measurement

The following test equipments are used during the band edge tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2010
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2010
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2010
X	8-WAY Power Divider	JFW	50PD-647 / 526770 0916	Apr., 2010

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.
3. The power combiner is used for measure 11n mode.

#### RF Radiated Measurement:

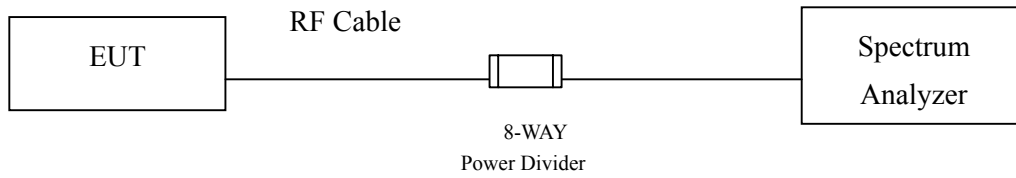
The following test equipments are used during the band edge tests:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.	
☒ Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2010
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2010
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2010
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2010
	X	Pre-Amplifier	HP	8449B/3008A01123	July., 2010
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2010
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2010
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2010
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

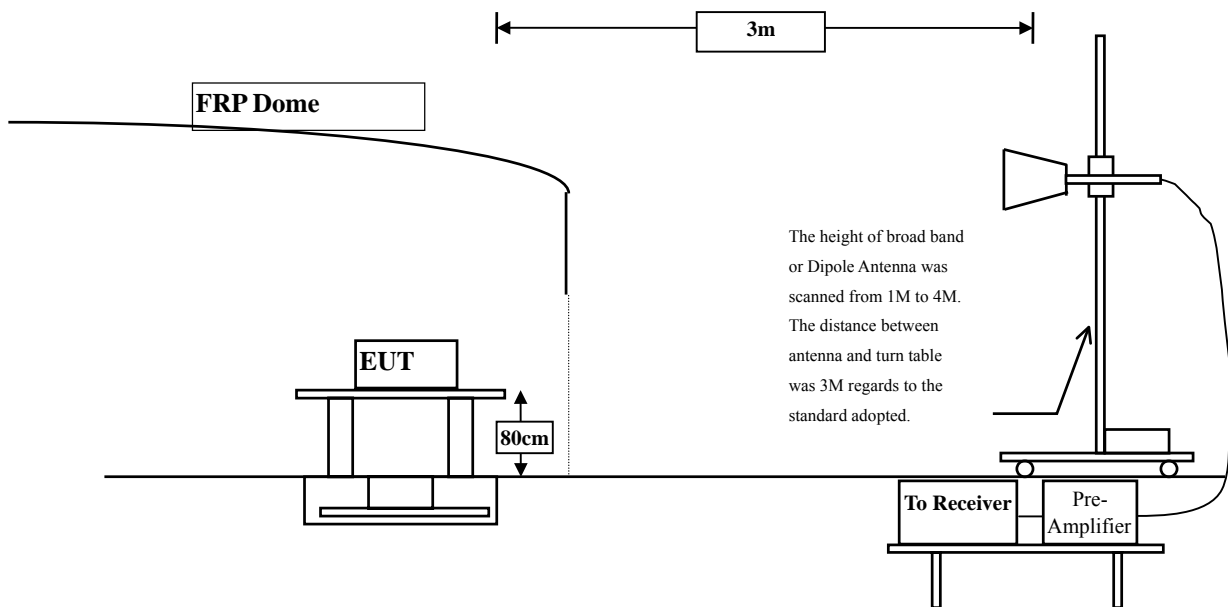
- Note:
1. All instruments are calibrated every one year.
  2. The test instruments marked by “X” are used to measure the final test results.

## 7.2. Test Setup

### RF Conducted Measurement



### RF Radiated Measurement:



**7.3. Limits**

The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209:

<b>FCC Part 15 Subpart C Paragraph 15.209 Limits</b>		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
  2. In the Above Table, the tighter limit applies at the band edges.
  3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

**7.4. Test Procedure**

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz, above 1GHz are 1 MHz. The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Aug 2002 DA 02-2138 for compliance to FCC 47CFR Subpart E requirements.

**7.5. Uncertainty**

- ± 3.8 dB below 1GHz
- ± 3.9 dB above 1GHz

## 7.6. Test Result of Band Edge

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -20BW -Channel 01

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dBuV]	Correction Factor [dB/m]	Emission Level [dBuV/m]	Detector
Horizontal	5180	35.962	72.41	108.371	Peak
Horizontal	5180	35.962	57.83	93.791	Average
Vertical	5180	36.739	66.25	102.988	Peak
Vertical	5180	36.739	52.19	88.928	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiment Limit (dBuV/m)	Detector
Horizontal	5148.4	108.371	50.417	57.954	74.000	Peak
Horizontal	5148.4	93.791	49.554	44.237	54.000	Average
Vertical	5148.4	102.988	50.417	52.571	74.000	Peak
Vertical	5148.4	88.928	49.554	39.374	54.000	Average

Note:

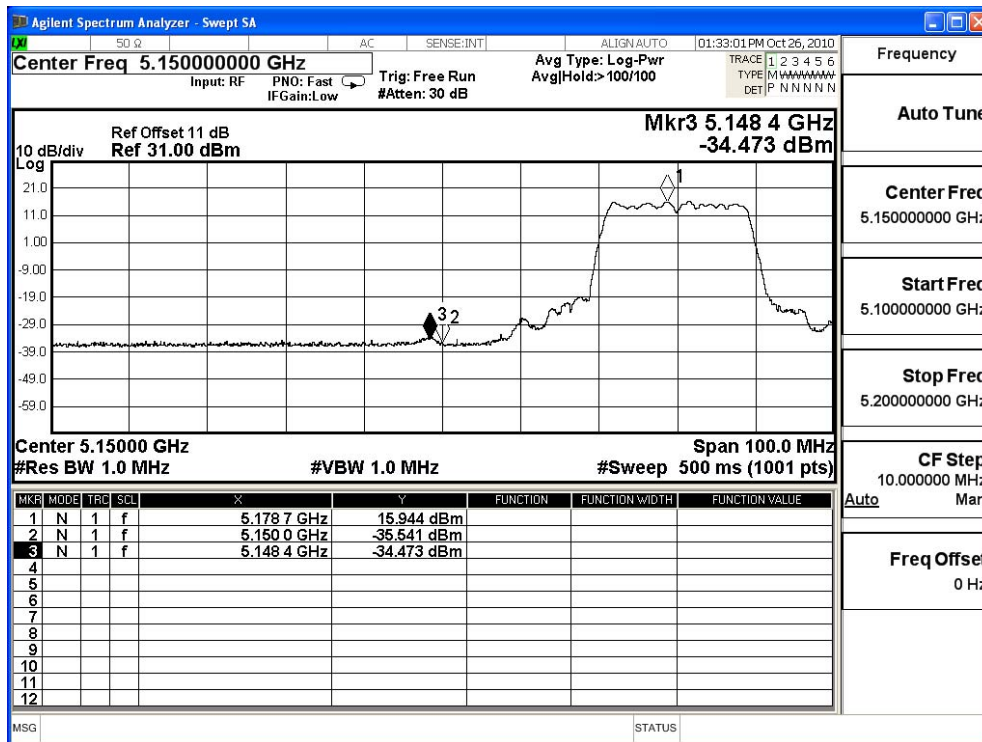
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

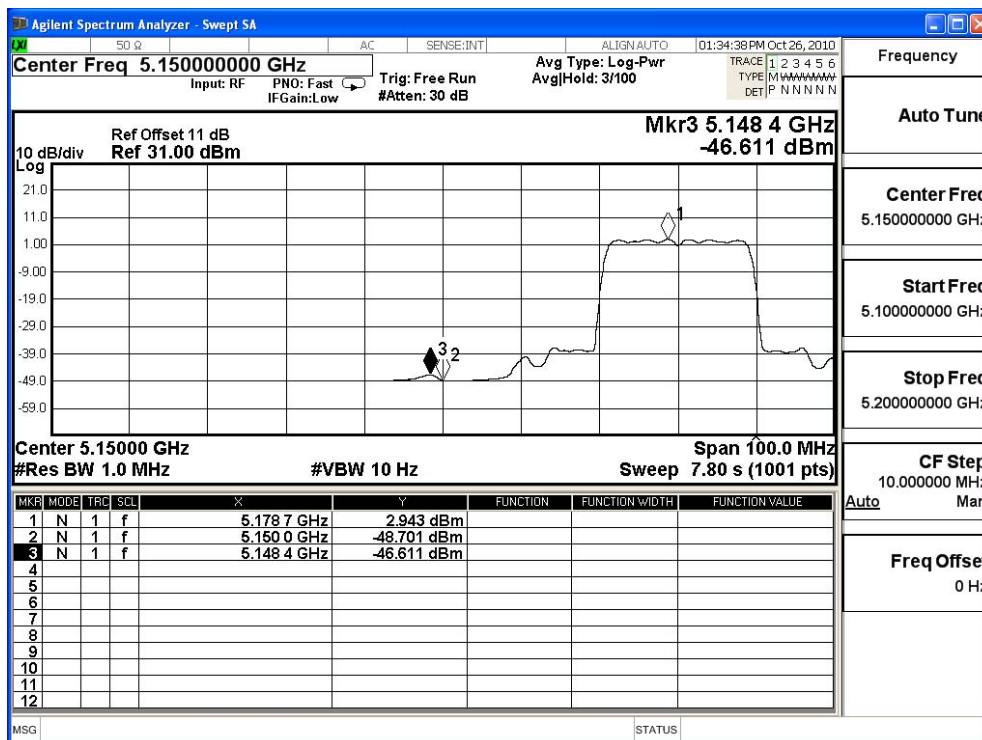
F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta



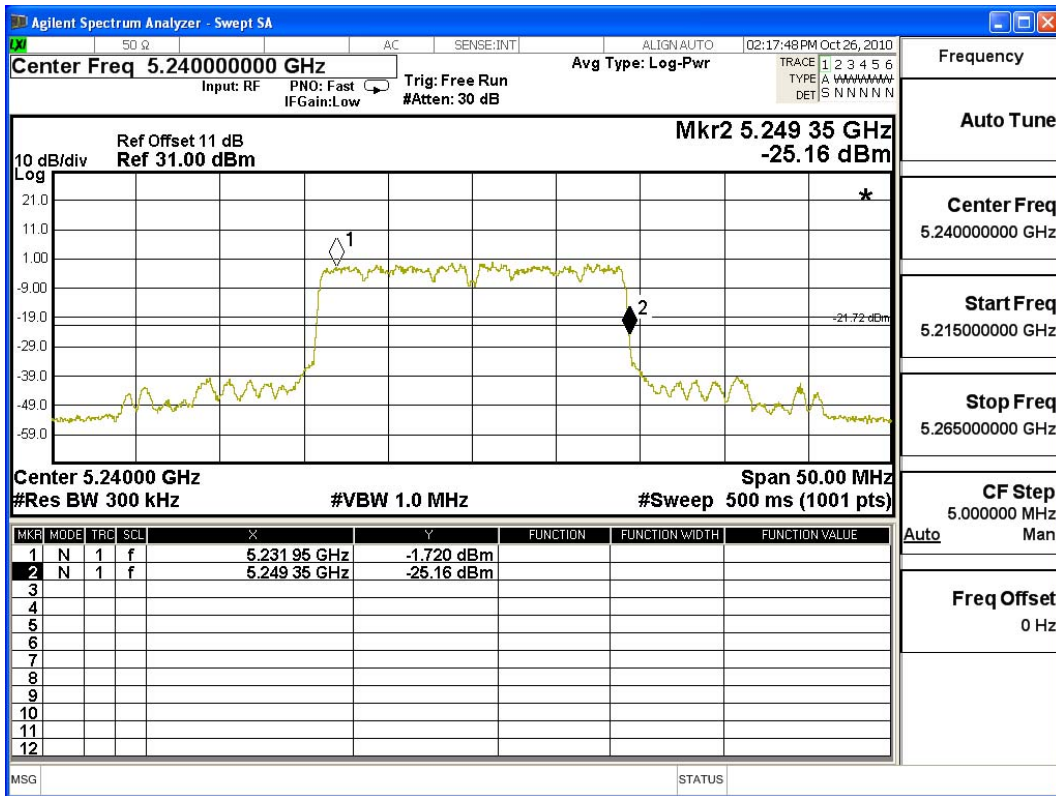
### Average Detector of conducted Band Edge Delta



Product : Full HD Video Wireless Transmitter Module  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -20BW -Channel 04

Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
5240	5249.35	<5250	PASS

NOTE: Accordance with 15.215 requirement.





Product : Full HD Video Wireless Transmitter Module  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter -40BW -Channel 01

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dBuV]	Correction Factor [dB/m]	Emission Level [dBuV/m]	Detector
Horizontal	5190	35.936	69.37	105.305	Peak
Horizontal	5190	35.936	55.16	91.095	Average
Vertical	5190	36.794	63.28	100.073	Peak
Vertical	5190	36.794	48.44	85.233	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiment Limit (dBuV/m)	Detector
Horizontal	5150	105.305	43.415	61.89	74.000	Peak
Horizontal	5150	91.095	43.978	47.117	54.000	Average
Vertical	5150	100.073	43.415	56.658	74.000	Peak
Vertical	5150	85.233	43.978	41.255	54.000	Average

Note:

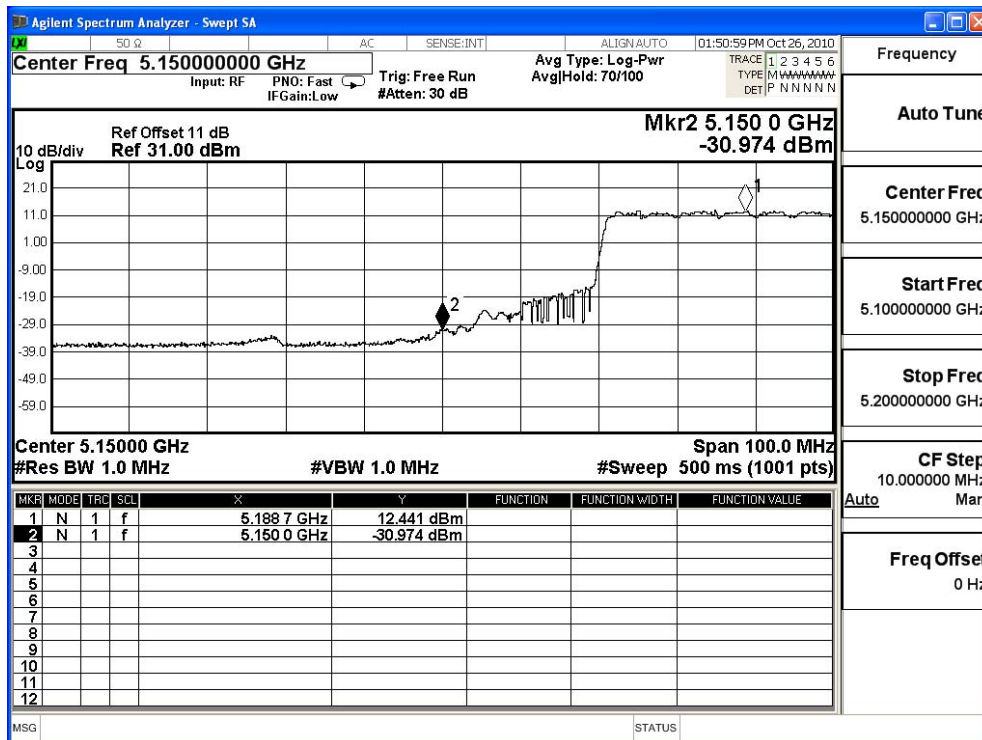
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

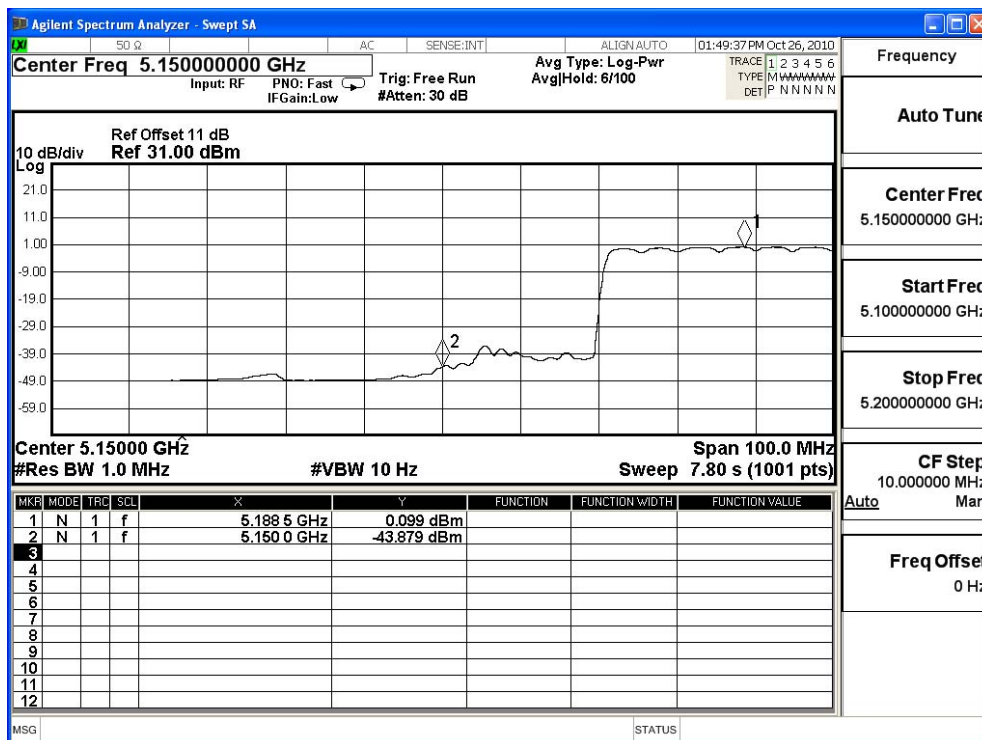
F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta



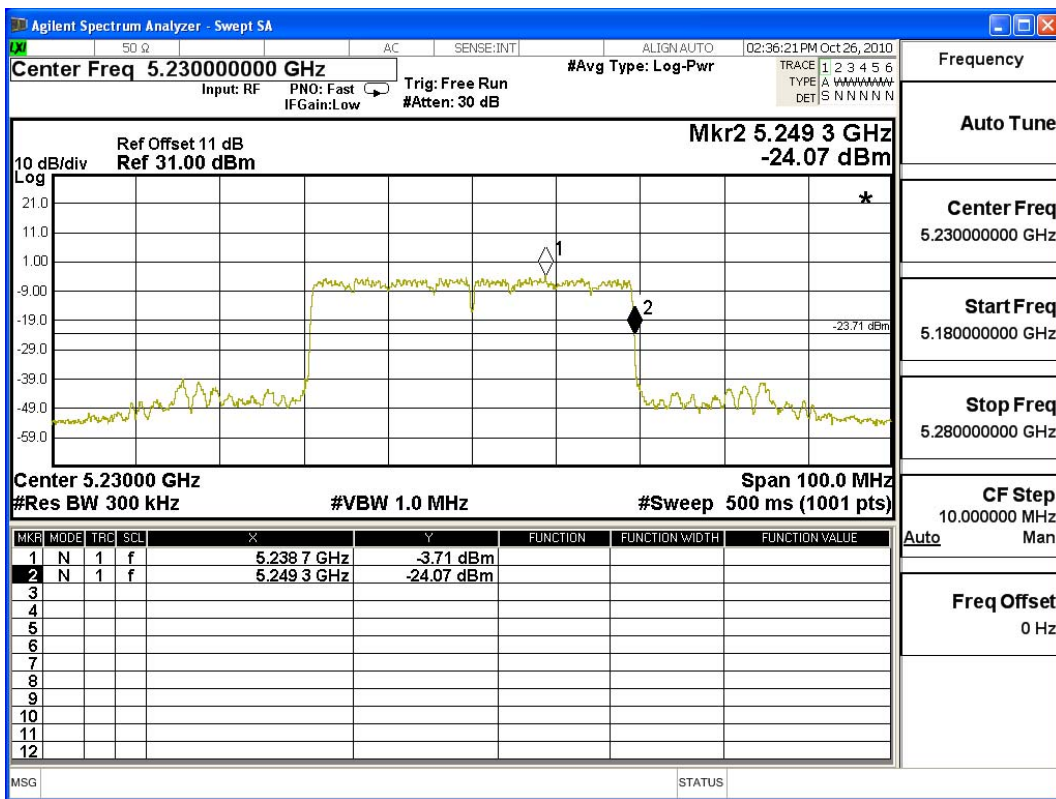
### Average Detector of conducted Band Edge Delta



Product : Full HD Video Wireless Transmitter Module  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter -40BW -Channel 02

Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
5230	5249.30	<5250	PASS

NOTE: Accordance with 15.215 requirement.



## 8. Frequency Stability

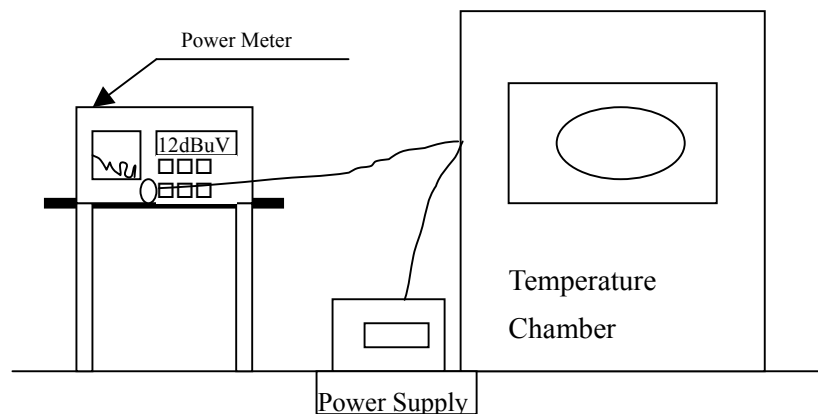
### 8.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2010
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2010
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2010

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

### 8.2. Test Setup



### 8.3. Limits

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified

### 8.4. Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Aug 2002 DA 02-2138 for compliance to FCC 47CFR Subpart E requirements.

### 8.5. Uncertainty

± 150 Hz

### 8.6. Test Result of Frequency Stability

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Frequency Stability  
 Test Site : Temperature Chamber  
 Test Mode : Carrier Wave (Beginning)

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (20) °C	Vnom (120)V	01	5180.00	5180.0010	-0.0010
		01	5190.00	5190.0075	-0.0075
		02	5200.00	5200.0085	-0.0085
		02	5230.00	5230.0015	-0.0015
		04	5240.00	5240.0085	-0.0085
Tmax (70) °C	Vnom (120)V	01	5180.00	5180.0125	-0.0125
		01	5190.00	5190.0089	-0.0089
		02	5200.00	5200.0097	-0.0097
		02	5230.00	5230.0150	-0.0150
		04	5240.00	5240.0150	-0.0150
Tmin (-10) °C	Vnom (120)V	01	5180.00	5180.0120	-0.0120
		01	5190.00	5190.0095	-0.0095
		02	5200.00	5200.0070	-0.0070
		02	5230.00	5230.0100	-0.0100
		04	5240.00	5240.0085	-0.0085

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Frequency Stability  
 Test Site : Temperature Chamber  
 Test Mode : Carrier Wave (AFTER 2mins)

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (20) °C	Vnom (120)V	01	5180.00	5180.0083	-0.0083
		01	5190.00	5190.0018	-0.0018
		02	5200.00	5200.0081	-0.0081
		02	5230.00	5230.0110	-0.0110
		04	5240.00	5240.0022	-0.0022
Tmax (70) °C	Vnom (120)V	01	5180.00	5180.0105	-0.0105
		01	5190.00	5190.0110	-0.0110
		02	5200.00	5200.0089	-0.0089
		02	5230.00	5230.0100	-0.0100
		04	5240.00	5240.0088	-0.0088
Tmin (-10) °C	Vnom (120)V	01	5180.00	5180.0100	-0.0100
		01	5190.00	5190.0091	-0.0091
		02	5200.00	5200.0035	-0.0035
		02	5230.00	5230.0038	-0.0038
		04	5240.00	5240.0002	-0.0002

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Frequency Stability  
 Test Site : Temperature Chamber  
 Test Mode : Carrier Wave (AFTER 5mins)

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (20) °C	Vnom (120)V	01	5180.00	5180.0102	-0.0102
		01	5190.00	5190.0107	-0.0107
		02	5200.00	5200.0088	-0.0088
		02	5230.00	5230.0100	-0.0100
		04	5240.00	5240.0121	-0.0121
Tmax (70) °C	Vnom (120)V	01	5180.00	5180.0105	-0.0105
		01	5190.00	5190.0075	-0.0075
		02	5200.00	5200.0074	-0.0074
		02	5230.00	5230.0100	-0.0100
		04	5240.00	5240.0038	-0.0038
Tmin (-10) °C	Vnom (120)V	01	5180.00	5180.0102	-0.0102
		01	5190.00	5190.0081	-0.0081
		02	5200.00	5200.0079	-0.0079
		02	5230.00	5230.0022	-0.0022
		04	5240.00	5240.0314	-0.0314

Product : Full HD Video Wireless Transmitter Module  
 Test Item : Frequency Stability  
 Test Site : Temperature Chamber  
 Test Mode : Carrier Wave (AFTER 10mins)

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (20) °C	Vnom (120)V	01	5180.00	5180.0101	-0.0101
		01	5190.00	5190.0085	-0.0085
		02	5200.00	5200.0017	-0.0017
		02	5230.00	5230.0104	-0.0104
		04	5240.00	5240.0103	-0.0103
Tmax (70) °C	Vnom (120)V	01	5180.00	5180.0100	-0.0100
		01	5190.00	5190.0104	-0.0104
		02	5200.00	5200.0091	-0.0091
		02	5230.00	5230.0101	-0.0101
		04	5240.00	5240.0107	-0.0107
Tmin (-10) °C	Vnom (120)V	01	5180.00	5180.0102	-0.0102
		01	5190.00	5190.0101	-0.0101
		02	5200.00	5200.0097	-0.0097
		02	5230.00	5230.0107	-0.0107
		04	5240.00	5240.0101	-0.0101



## **10 EMI Reduction Method During Compliance Testing**

No modification was made during testing.