FCC Test Report

EQUIPMENT	:	WirelessHD Module
BRAND NAME	:	AzureWave
MODEL NO.	:	AW-WH029
FCC ID	:	TLZ-WH029
STANDARD	:	47 CFR FCC Part 15.255
APPLICANT	:	AzureWave Technologies, Inc. 8F., No. 94, Baozhong Rd., Xindian, Taipei Taiwan 231 R.O.C.
MANUFACTURER		AzureWave Technologies, Inc.

The product sample received on Nov. 20, 2010 and completely tested on Jul. 12, 2011. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Jordan Hsiao 2011.7.26
Reviewed by: Jordan Hsiao

Testing Laboratory
1190

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SUMMARY OF TEST RESULT

FCC Standard Requirements and Conformance Test Specifications				
Report Clause	**Ref. Std. Clause**	**Description**	**Result**	**Remark**
3.1	15.207	AC Power Conducted Emissions	Complied	-
3.2	15.255(e)	Occupied Bandwidth	Complied	-
3.3	15.255(b)(1)	EIRP Power and Power Density	Complied	-
3.4	15.255(e)	Peak Conducted Power	Complied	-
3.5	15.255(c)	Transmitter Spurious Emissions	Complied	-
3.6	15.255(f)	Frequency Stability	Complied	-
3.7	15.255(d)	Publicly-accessible Coordination Channel	Complied	-
3.8	15.255(a),(h)	Operation Restriction and Group Installation	Complied	-
3.9	15.255(i)	Transmitter Identification	Complied	-
3.10	15.255(g)	Maximum Permissible Exposure	Complied	-

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR0N2003	Rev. 01	Initial issue of report	Jul. 12, 2011

1 General Description

1.1 Information

1.1.1 The Channel Plan(s)

The Channel Plan(s)	
Low-rate PHY (LRP) Band	60.32 – 60.64 GHz/ 62.48-62.80GHz
LRP Channel List:	60.32 +n x 0.16 (n=0, 1, 2) GHz / 62.48 +n x 0.16 (n=0, 1, 2) GHz

1.1.2 Transmit Operating Modes

The Different Transmit Operating Modes
☒ Operating mode 1: Smart Antenna Systems - with beam forming
☐ Operating mode 2: Smart Antenna Systems - without beam forming
☐ Operating mode 3: Single Antenna Equipment

1.1.3 Smart Antenna Systems

In Case of Smart Antenna Systems		
The number of Receive chains:	4	
The number of Transmit chains:	31	
Equal power distribution among the transmit chains:	☒ Yes ☐ No	
☒ In case of beam forming, the maximum beam forming gain:	16 dB	

1.1.4 Antenna Information

Antenna Information	
☐ Equipment placed on the market without antennas	
☒ Integral antenna	
Integral antenna gain: (Beam forming gain)	16.00 dBi for LRP
	☐ Temporary RF connector provided
	☒ No temporary RF connector provided
☐ External antenna (dedicated antennas)	
	☐ Single power level with corresponding antenna(s)
	☐ Multiple power settings and corresponding antenna(s)

1.1.5 Type of Equipment

Type of Equipment
☒ Stand-alone
☐ Combined Equipment (The radio part is fully integrated within another type of equipment)
☐ Plug-in radio device (Equipment intended for a variety of host systems)
☐ Other:

1.1.6 Power Levels

(a) Worst Power Levels for LRP (Integrated Antenna)				
Applicable power levels:	☐ Conducted	☒ EIRP		
Integral antenna gain:	16.00 dBi			
Frequency (GHz)	Highest setting (P_{high}): (dBm)			
	Modulation	Data Rate (Mb/s)	AV Power	Peak Power
60.32	BPSK	20.337	21.87	27.13
62.80	BPSK	20.337	22.17	26.75

1.1.7 Extreme Operating

The Extreme Operating Temperature Range that Apply to the Equipment				
☐ -20 °C to +50 °C				
☒ 0 °C to +40 °C				
☐ Other:				
The nominal voltages of the stand-alone radio equipment or the nominal voltages of the combined (host) equipment or test jig in case of plug-in devices.				
Details provided are for the:	☒ stand-alone equipment			
	☐ combined (or host) equipment			
	☐ test jig			
Supply Voltage	☐ AC mains	State AC voltage		V
Supply Voltage	☒ DC	State DC voltage	5	V
In case of DC, indicate the type of power source:				
☐ Internal Power Supply				
☒ External Power Supply or AC/DC adapter				
☐ Battery	☐ Nickel Cadmium			
	☐ Alkaline			
	☐ Nickel-Metal Hydride			
	☐ Lithium-Ion			
	☐ Lead acid (Vehicle regulated)			
	☐ Other:			

1.1.8 Equipment Use Condition

Equipment Use Condition
☐ Fixed field disturbance sensors at 61-61.5GHz
☐ Except fixed field disturbance sensors at 61-61.5GHz
☒ Except fixed field disturbance sensors

1.2 Additional Information Provided by the Submitter

1.2.1 Modulation

Modulation	
ITU Class of emission	G1D (BPSK, QPSK), OFDM LRP – BPSK at 20.337 Mb/s (FEC 1/3)
Can the transmitter operate un-modulated:	☒ Yes ☐ No

1.2.2 Duty Cycle

Duty Cycle		
The transmitter is intended for:	☒	Continuous Duty 97.09 %
	☐	Intermittent Duty: %
	☐	Continuous operation possible for testing purposes

1.2.3 About the EUT

About the EUT	
☒	The equipment submitted are representative production models.
☐	If not, the equipment submitted are pre-production models
☐	If pre-production equipment is submitted, the final production equipment will be identical in all respects with the equipment tested.
☐	If not, supply full details:

1.3 Ancillary and/or Support Equipment

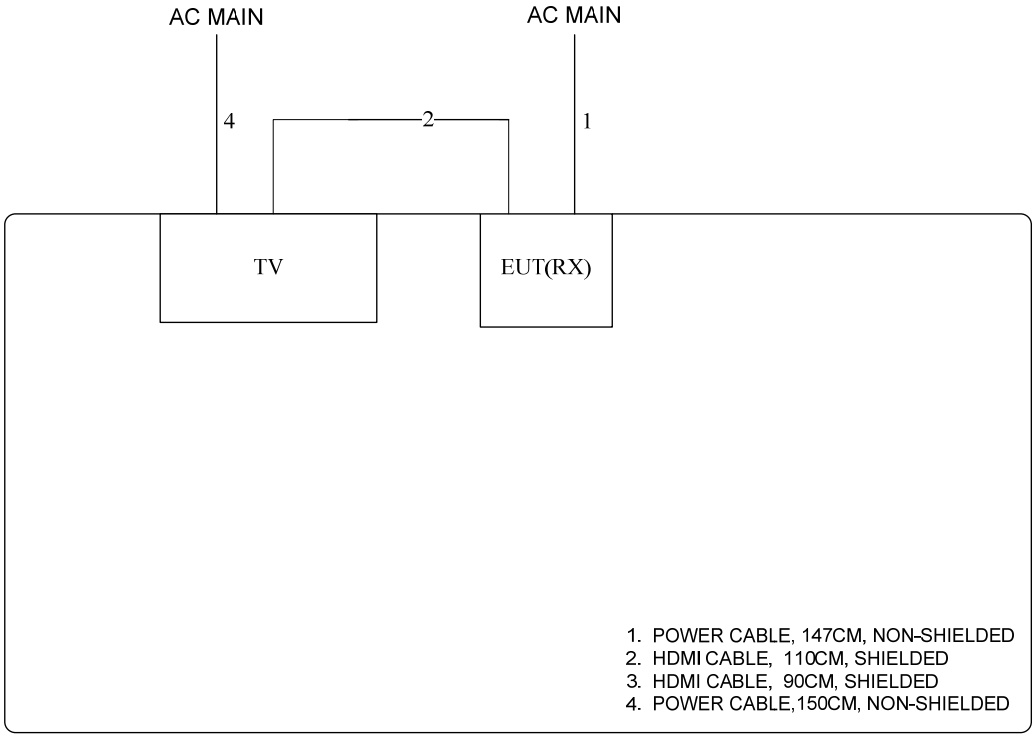
Ancillary Equipment (AE)				
Item	**Equipment**	**Brand Name**	**Model Name**	**Serial No.**
-	-	-	-	-

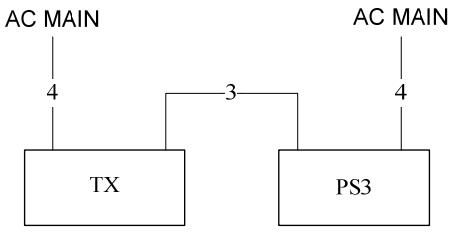
Support Equipment (SE)				
Item	**Equipment**	**Brand Name**	**Model Name**	**Serial No.**
SE01	LCD Monitor	DELL	1704FPTt	LM-A
SE02	PS3	SONY	PS3	-
SE03	AC Power Adapter	Bestec	BT-AG1005AE	-
SE04	WirelessHD Box	AzureWave	AW-WH036	-

1.4 EUT Setups

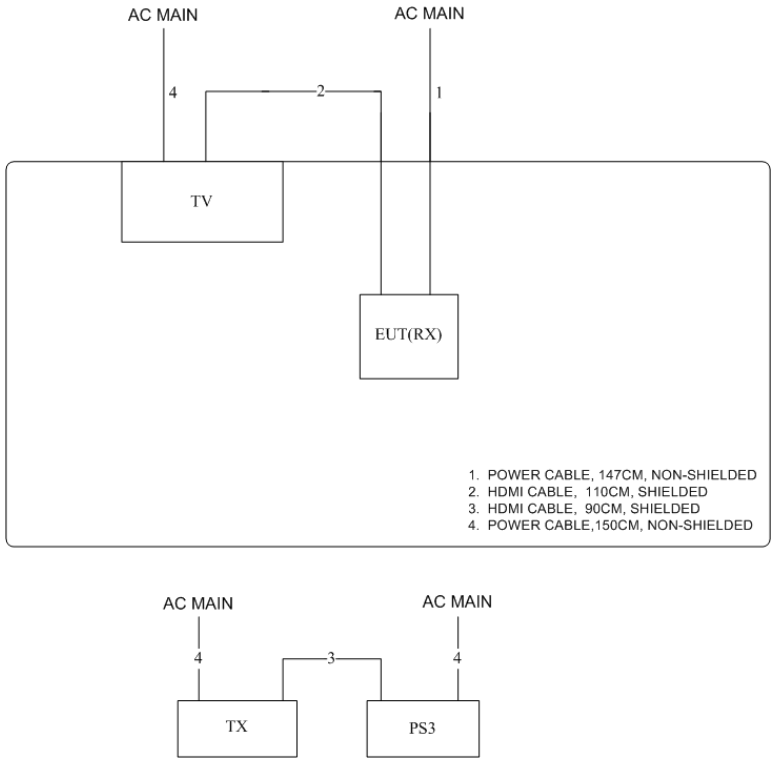
High Definition Audio / Video in the 1080p format was sent from transmitter to the RX device via the wireless link. A Blu-Ray player furnished HD A/V to the transmitter. The RX device furnished HD A/V to the television. The television was placed outside the chamber. A laptop computer with test software was utilized to vary the radio configuration and antenna beam orientation for testing purposes. This computer was not connected during measurements. For Extreme environmental tests, an external Variable DC power supply was utilized in place of the AC/DC adapter to furnish power to the EUT.

Setup No.	Combination of EUT with AE or SE	Description
Setup_01	EUT + SE01 +SE02 + SE03+ SE04	Setup for radiated emission from 9kHz to 1GHz

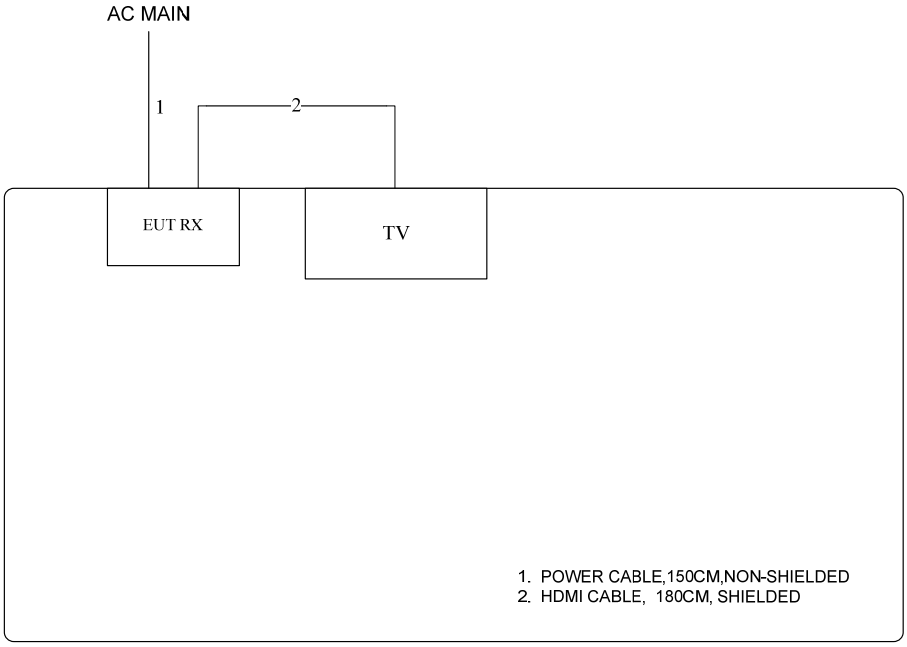


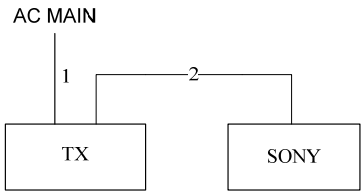


Setup No.	Combination of EUT with AE or SE	Description
Setup_01	EUT + SE01 +SE02 + SE03+ SE04	Setup for radiated emission from 1GHz to 200GHz



Setup No.	Combination of EUT with AE or SE	Description
Setup_02	EUT + SE01 +SE02 + SE03+ SE04	Setup for AC power conducted emission





1.5 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15.255
- ANSI C63.10-2009

1.6 Testing Location

Testing Location					
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055			
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085			
Testing Site No.					
TH01-CB		03CH01-CB		CO01-CB	-

1.7 Abbreviations Used for the Test Report

- Test Channel: B (Bottom channel), M (Middle channel), and T (Top channel).
- EUT: Equipment under Test.
- AE: EUT's Ancillary Equipment
- SE: Testing Support Equipment
- LRP: Low-rate PHY

2 Test Configuration of Equipment under Test

2.1 Test Channel Frequencies

Nominal Channel Bandwidth 1				
Frequency Band	**Channel Plan**	**B (Bottom channel)**	**M (Middle channel)**	**T (Top channel)**
60.32 – 60.64 GHz	1 (LRP)	60.32 GHz (F1)	60.48 GHz (F2)	60.64 GHz (F3)
62.48 – 62.80 GHz	3 (LRP)	62.48 GHz (F1)	62.64 GHz (F2)	62.80 GHz (F3)

2.2 Conformance Tests and Related Test Frequencies

Test	**Test frequencies (MHz)**
	LRP – Channel Plan 1&3 (60.32 GHz to 60.64 GHz)/ (62.48GHz to 62.80GHz)
AC Power Conducted Emissions	F2
Occupied Bandwidth	F1, F2, F3
Power Density	F1, F2, F3
Peak Conducted Power	F1, F2, F3
Transmitter Spurious Emissions	F2
Frequency Stability	F2
F1: The centre frequency of the lowest declared channel for every declared nominal bandwidth within this band. F2: The centre frequency of the middle declared channel for every declared nominal bandwidth within this band. F3: The centre frequency of the highest declared channel for every declared nominal bandwidth within this band.	

3 Transmitter Test Result

3.1 AC Power Conducted Emissions

3.1.1 Limit of AC Power Conducted Emissions

AC Power Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

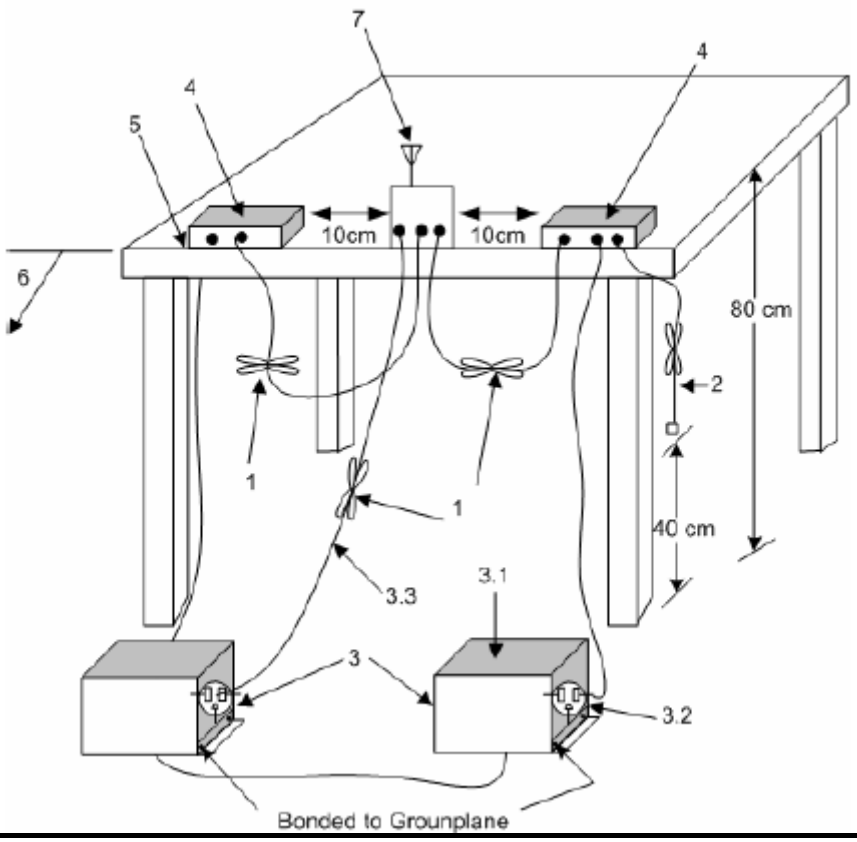
Refer a measuring instruments list in this test report.

3.1.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clause 6.2.

3.1.4 Test Setup

AC Power Conducted Emissions



AC Power Conducted Emissions
1. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long (see ANSI C63.10, clause 6.2.3.1).
2. I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m (see ANSI C63.10, clause 6.2.2).
3. EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 ohm loads. LISN can be placed on top of, or immediately beneath, reference ground plane (see ANSI C63.10, clauses 6.2.2 and 6.2.3). 3.1. All other equipment powered from additional LISN(s). 3.2. A multiple-outlet strip can be used for multiple power cords of non-EUT equipment. 3.3. LISN at least 80 cm from nearest part of EUT chassis.
4. Non-EUT components of EUT system being tested.
5. Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop (see ANSI C63.10, clause 6.2.3.1).
6. Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane (see ANSI C63.10, clause 6.2.2 for options).
7. Antenna may be integral or detachable. If detachable, the antenna shall be attached for this test.

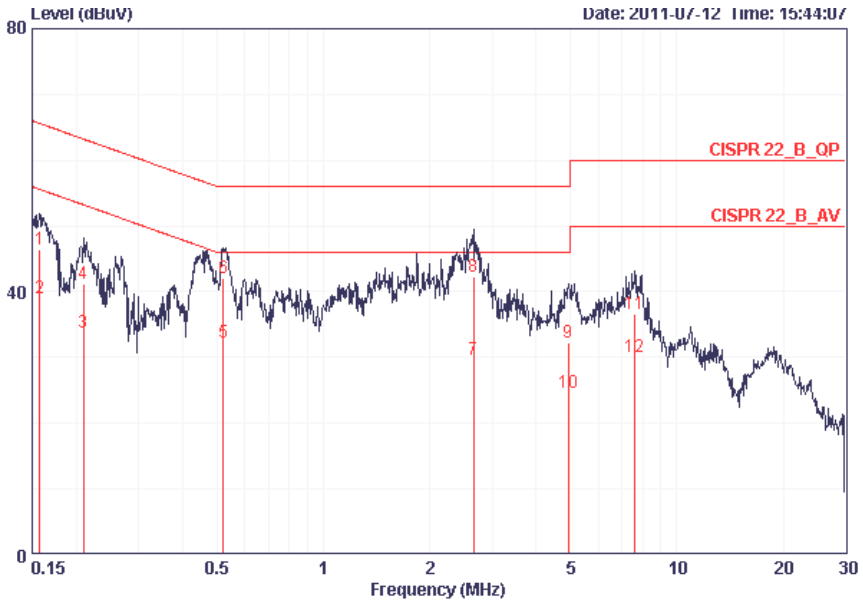
3.1.5 Test Result of AC Power Conducted Emissions

Test Conditions:	see ANSI C63.10, clause 5.11
Test Setup:	see ANSI C63.10, clause 6.2.3
Test Frequency Band:	60.48 GHz (LRP) Band

NOTE 1: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes. If equipment having different transmit operating modes (see test report clause 1.1.2), the measurements are uninfluenced by different transmit operating modes, may not need to be repeated for all the operating modes. Similar, if the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.12 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worse case combination to be used for the conformance testing.

NOTE 2: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.1.

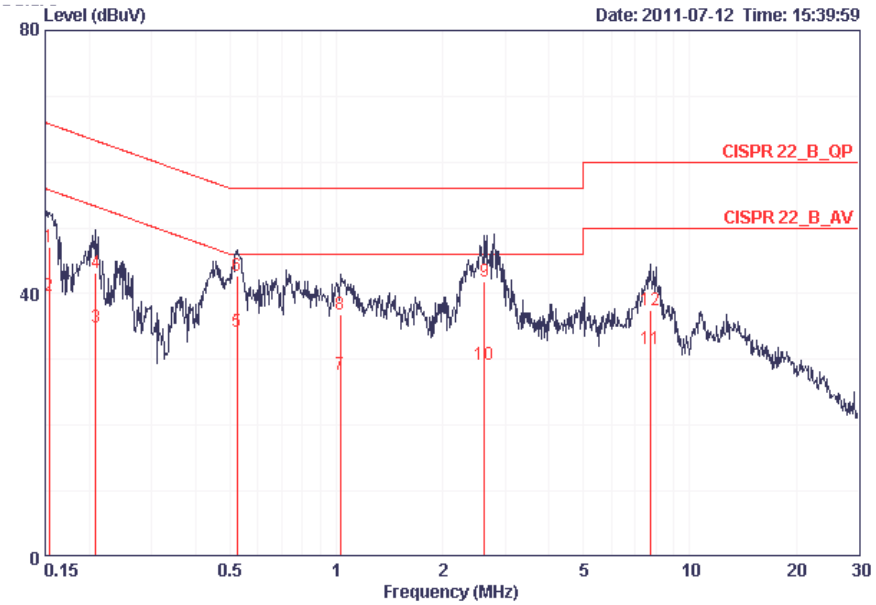
Temp:	23 °C	Humidity:	58%
Test Engineer:	Sin Chang	Phase:	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15733	46.45	-19.15	65.60	46.15	0.10	0.20	QP
2	0.15733	39.00	-16.60	55.60	38.70	0.10	0.20	AVERAGE
3	0.20944	33.85	-19.38	53.23	33.57	0.08	0.20	AVERAGE
4	0.20944	41.18	-22.05	63.23	40.90	0.08	0.20	QP
5	0.52100	32.21	-13.79	46.00	31.94	0.07	0.20	AVERAGE
6	0.52100	42.02	-13.98	56.00	41.75	0.07	0.20	QP
7	2.664	29.56	-16.44	46.00	29.25	0.11	0.20	AVERAGE
8	2.664	42.27	-13.73	56.00	41.96	0.11	0.20	QP
9	4.926	32.25	-23.75	56.00	31.75	0.20	0.30	QP
10	4.926	24.61	-21.39	46.00	24.11	0.20	0.30	AVERAGE
11	7.606	36.51	-23.49	60.00	35.80	0.32	0.40	QP
12	7.606	30.13	-19.87	50.00	29.42	0.32	0.40	AVERAGE

Measurement uncertainty: ±2.26 dB

Temp:	23 °C	Humidity:	58%
Test Engineer:	Sin Chang	Phase:	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15403	47.13	-18.65	65.78	46.86	0.07	0.20	QP
2	0.15403	39.76	-16.02	55.78	39.49	0.07	0.20	AVERAGE
3	0.20833	34.95	-18.32	53.27	34.70	0.05	0.20	AVERAGE
4	0.20833	43.15	-20.12	63.27	42.90	0.05	0.20	QP
5	0.52376	34.18	-11.82	46.00	33.95	0.03	0.20	AVERAGE
6	0.52376	42.72	-13.28	56.00	42.49	0.03	0.20	QP
7	1.027	27.69	-18.31	46.00	27.47	0.03	0.19	AVERAGE
8	1.027	36.88	-19.12	56.00	36.66	0.03	0.19	QP
9	2.622	41.91	-14.09	56.00	41.64	0.07	0.20	QP
10	2.622	29.16	-16.84	46.00	28.89	0.07	0.20	AVERAGE
11	7.728	31.51	-18.49	50.00	30.83	0.28	0.40	AVERAGE
12	7.728	37.53	-22.47	60.00	36.85	0.28	0.40	QP

Measurement uncertainty: ±2.26 dB

3.2 Occupied Bandwidth

3.2.1 Limit of Occupied Bandwidth

6dBc Bandwidth (see Note 1)	None
26dBc Bandwidth	None
99% Occupied Bandwidth (see Note 2)	None

NOTE 1: Refer as FCC 15.255(e). The 6dBc bandwidth is the frequency bandwidth of the signal power at the -6 dBc points when measured with a 100 kHz resolution bandwidth. These measurements shall also be performed at normal test conditions.

NOTE 2: The 99% occupied bandwidth is the frequency bandwidth of the signal power at the 99% channel power of occupied bandwidth when resolution bandwidth should be approximately 1 % to 5 % of the occupied bandwidth (OBW). These measurements shall also be performed at normal test conditions.

3.2.2 Measuring Instruments

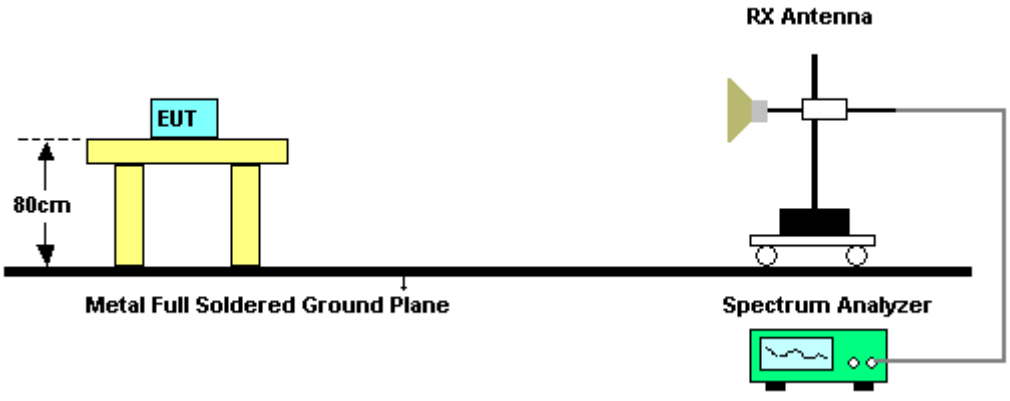
Refer a measuring instruments list in this test report.

3.2.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clauses 6.9.1 and 7.8.5.

3.2.4 Test Setup

Occupied Channel Bandwidth



3.2.5 Test Result of Occupied Bandwidth

Test Conditions:	see ANSI C63.10, clause 5.11
Test Setup:	see ANSI C63.10, clause 7.8.5
Test Frequency Band:	60.32 – 60.64 GHz /62.48 – 62.80(LRP) Band
NOTE: If equipment having different transmit operating modes (see test report clause 1.1.2), the measurements are uninfluenced by different transmit operating modes, may not need to be repeated for all the operating modes. Similar, if the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.12 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worse case combination to be used for the conformance testing. Refer as ANSI C63.10, clause 6.9.1, observe and record with plotted graphs or photographs the worst-case (i.e., widest) occupied bandwidth produced by these different modulation sources.	

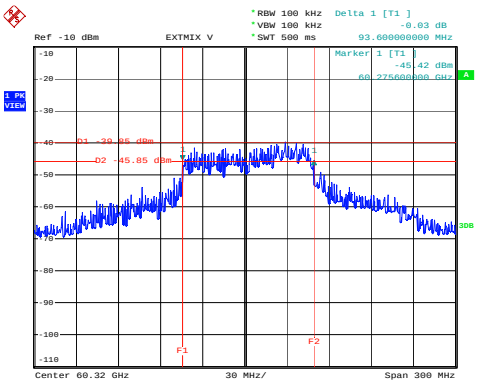
Test Conditions:	see ANSI C63.10, clause 5.12	**Rel. Humidity:**	65 %
Test Engineer:	Sam Chen	**Ambient Temp.:**	25℃
Test Date:	Jul. 02, 2011	**Test Conditions:**	0.5 m

Test results

Test Frequency:	6 dBc Bandwidth (MHz)	Occupied Bandwidth (MHz)	26 dBc Bandwidth (MHz)	Limit (MHz)	Margin (MHz)
F1 60.32 GHz	93.6	230.0000	334	N/A	N/A
F2 60.48 GHz	91.8	212.0000	288	N/A	N/A
F3 60.64 GHz	91.8	212.0000	309	N/A	N/A
F1 62.48 GHz	91.8	245.0000	353	N/A	N/A
F2 62.64 GHz	90.6	205.0000	298	N/A	N/A
F3 62.80 GHz	90	246.0000	356	N/A	N/A
Measurement uncertainty:	$\pm 8.5\times10^{-8}$ Hz				

3.2.5.1 Bandwidth Plots for 60.32 – 60.64 GHz (LRP) Band

6 dBc Bandwidth (F1)



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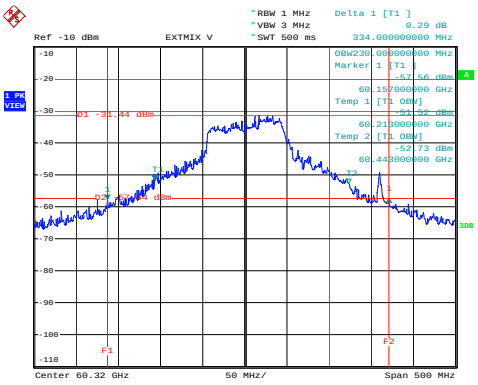
26dBc Bandwidth & Occupied Bandwidth (F1)



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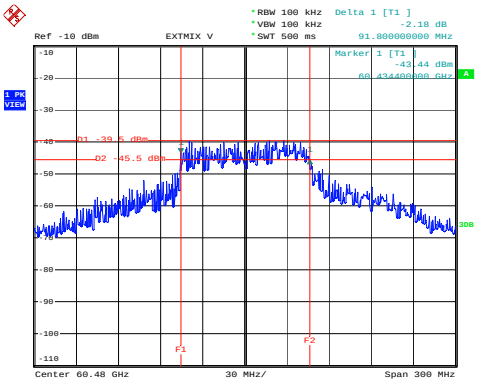
6 dBc Bandwidth (F2)



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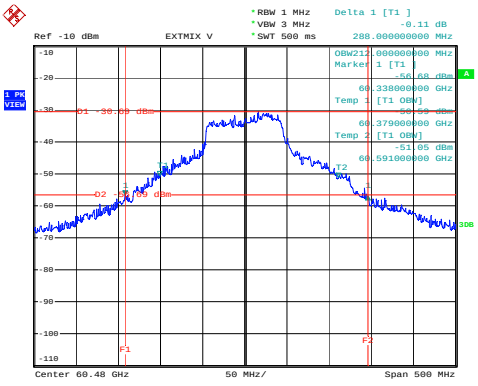

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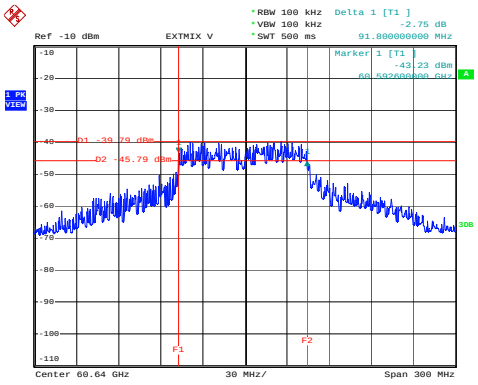
6 dBc Bandwidth (F3)



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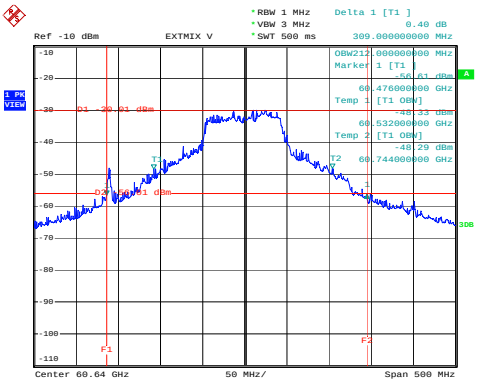
26dBc Bandwidth & Occupied Bandwidth (F3)



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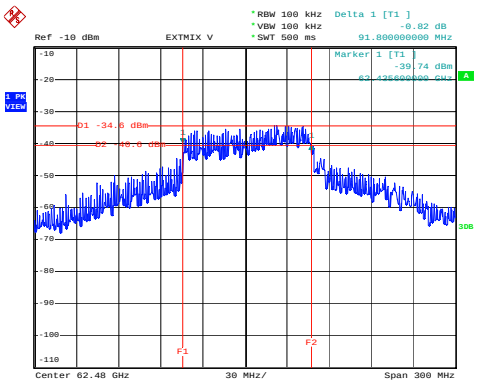
3.2.5.2 Bandwidth Plots for 62.48 – 62.80 GHz (LRP) Band

6 dBc Bandwidth (F1)



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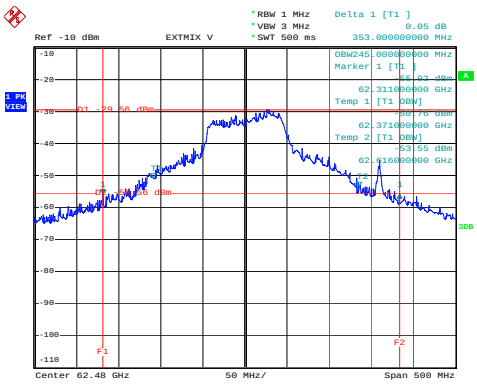
26dBc Bandwidth & Occupied Bandwidth (F1)



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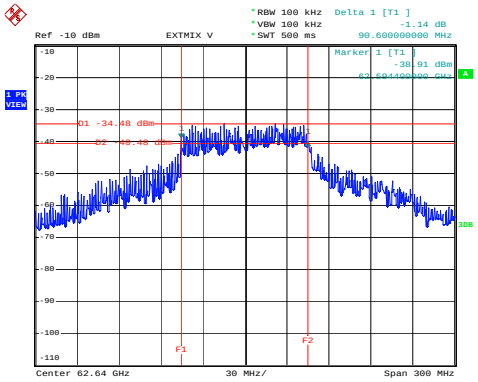
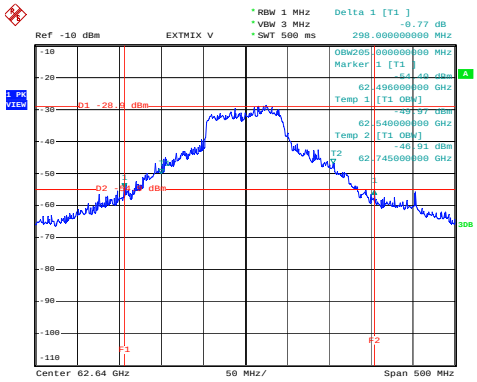
6 dBc Bandwidth (F2)



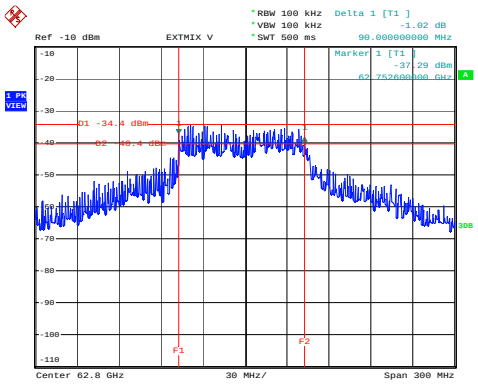
Date: 2.JUL.2011 14:33:37

26dBc Bandwidth & Occupied Bandwidth (F2)



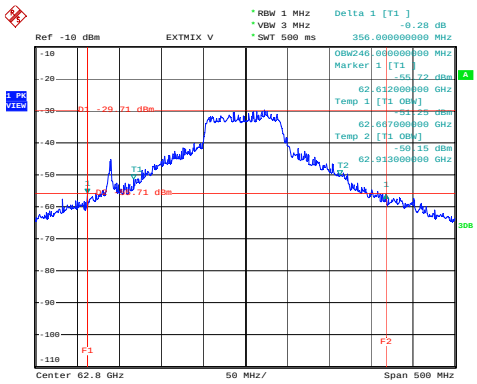
Date: 2.JUL.2011 15:15:25

6 dBc Bandwidth (F3)



Date: 2.JUL.2011 14:32:27

26dBc Bandwidth & Occupied Bandwidth (F3)



Date: 2.JUL.2011 15:16:23

3.3 EIRP Power and Power Density

3.3.1 Limit of EIRP Power and Power Density

Power Density Limit		
Use Condition	**EIRP Average Power Density**	**EIRP Peak Power Density**
Fixed field disturbance sensors at 61-61.5GHz	9 nW/cm^2 equivalent 10.2 mW (10.08 dBm)	18 nW/cm^2 equivalent 10.2 mW (13.09 dBm)
Except fixed field disturbance sensors at 61-61.5GHz	N/A	9 nW/cm^2 equivalent 10.2 mW (10.08 dBm)
Except fixed field disturbance sensors	9 μW/cm^2 equivalent 10.2 mW (40.08 dBm)	18 μW/cm^2 equivalent 10.2 mW (43.08 dBm)
NOTE: For the applicable limit, see FCC 15.255 (b)		

3.3.2 Measuring Instruments

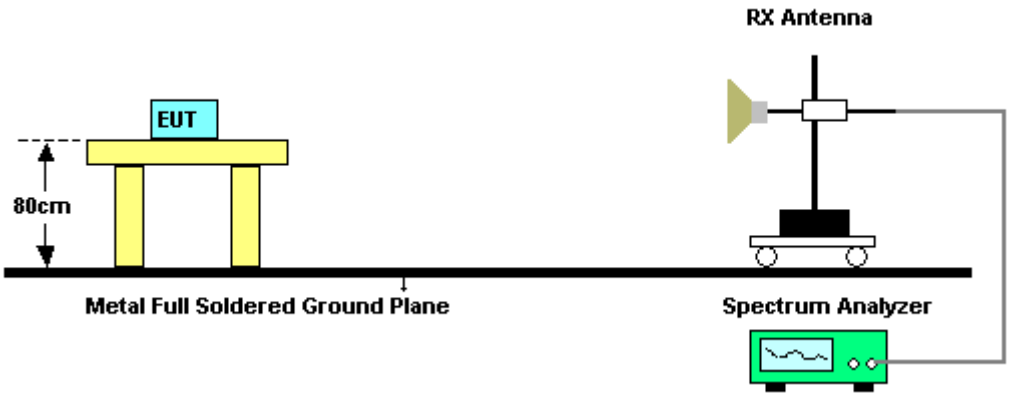
Refer a measuring instruments list in this test report.

3.3.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clauses 7.8.3 and 7.8.6.

3.3.4 Test Setup

EIPR Power and Power Density



3.3.5 Test Result of EIRP Power and Power Density

Test Conditions:	see ANSI C63.10, clause 5.11
Test Setup:	see ANSI C63.10, clause 7.8.6
Test Frequency Band:	60.32 – 60.64 GHz /62.48 – 62.80(LRP) Band
NOTE: If the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.12 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worse case combination to be used for the conformance testing.	

3.3.5.1 Test Result of EIRP Power

Maximum Antenna Gain:	16	dBi for 60.32 – 60.64 GHz /62.48 – 62.80(LRP) Band
Equipment Use Condition:	☐	Fixed field disturbance sensors at 61-61.5GHz
	☐	Except fixed field disturbance sensors at 61-61.5GHz
	☒	Except fixed field disturbance sensors

Test Conditions: 0.5 m	**Rel. Humidity:** 65 %
Test Engineer: Sam Chen	**Ambient Temp.:** 25℃
Test Date: Jul. 02, 2011	

Test results

Test Frequency:	Measured Power (dBm)		EIRP (dBm)		EIRP Limit (dBm) (note 2)		Margin (dB)	
	AV	Peak	AV	Peak	AV	Peak	AV	Peak
F1 60.32 GHz	-23.18	-11.9	21.87	27.13	40.08	43.08	18.21	15.95
F2 60.48 GHz	-23.27	-12.26	21.80	26.79	40.08	43.08	18.28	16.29
F3 60.64 GHz	-22.73	-12.24	22.37	26.84	40.08	43.08	17.71	16.24
F1 62.48 GHz	-23.67	-12.75	21.69	26.59	40.08	43.08	18.39	16.49
F2 62.64 GHz	-23.14	-12.83	22.24	26.53	40.08	43.08	17.84	16.55
F3 62.80 GHz	-23.23	-12.63	22.17	26.75	40.08	43.08	17.91	16.33

Measurement uncertainty: ±2.7 dB

The measured power level is converted to EIRP using the Friis equation:

$EIRP = P_T * G_T = (P_R / G_R) * (4 * Pi * D / \lambda)^2$

P_R = measured channel power

G_R = 23 dBi, The gain of the receive measurement antenna

D = 0.5 m, The measurement distance

λ = The wavelength.

NOTE 2: For the applicable limit, see FCC 15.255(b)

NOTE 3: AV is average EIRP power.

3.3.5.2 Test Result of EIRP Power Density

Maximum Antenna Gain:	16	dBi for 60.32 – 60.64 GHz /62.48 – 62.80(LRP) Band
Equipment Use Condition:	☐	Fixed field disturbance sensors at 61-61.5GHz
	☐	Except fixed field disturbance sensors at 61-61.5GHz
	☒	Except fixed field disturbance sensors

Test Conditions: 0.5 m	**Rel. Humidity:** 65 %
Test Engineer: Sam Chen	**Ambient Temp.:** 25℃

Test results

Test Frequency:	EIRP Power (dBm) (note 1)		EIRP Power Density ($\mu W/cm^2$)		EIRP Power Density Limit ($\mu W/cm^2$)		Margin ($\mu W/cm^2$)	
	AV	Peak	AV	Peak	AV	Peak	AV	Peak
F1 60.32 GHz	21.87	27.13	0.14	0.46	9.00	18.00	8.86	17.54
F2 60.48 GHz	21.80	26.79	0.13	0.42	9.00	18.00	8.87	17.58
F3 60.64 GHz	22.37	26.84	0.15	0.43	9.00	18.00	8.85	17.57
F1 62.48 GHz	21.69	26.59	0.13	0.40	9.00	18.00	8.87	17.60
F2 62.64 GHz	22.24	26.53	0.15	0.40	9.00	18.00	8.85	17.60
F3 62.80 GHz	22.17	26.75	0.15	0.42	9.00	18.00	8.85	17.58

Measurement uncertainty: ±2.7 dB

NOTE 1: The EIRP is converted to Power Density using the equation:

$PD = EIRP / (4 * Pi * D_S^2)$

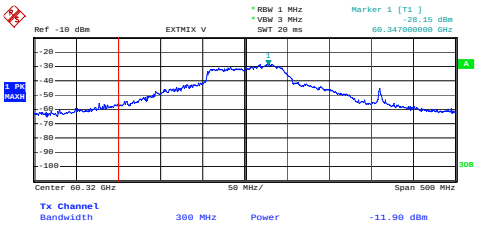
D_S = 3m, the specification distance

NOTE 2: For the applicable limit, see FCC 15.255(b)

NOTE 3: AV is average power density.

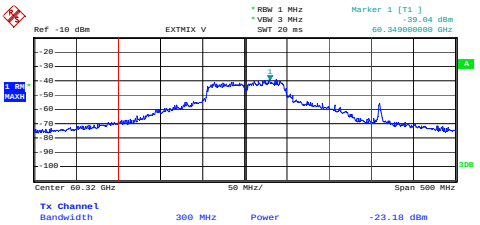
3.3.5.3 Measured Power Plots for 60.32 – 60.64 GHz (LRP) Band

Measured Peak Power (F1)



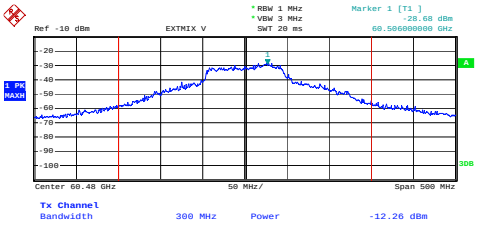
Date: 2.JUL.2011 14:01:37

Measured Average Power (F1)



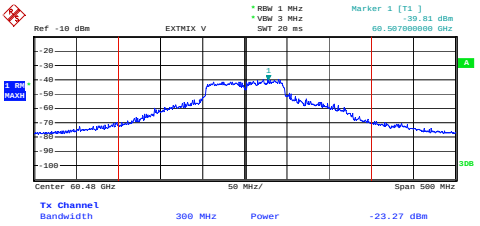
Date: 2.JUL.2011 14:03:01

Measured Peak Power (F2)



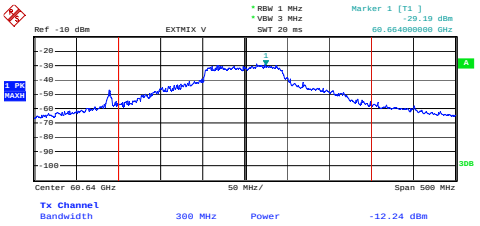
Date: 2.JUL.2011 14:12:29

Measured Average Power (F2)



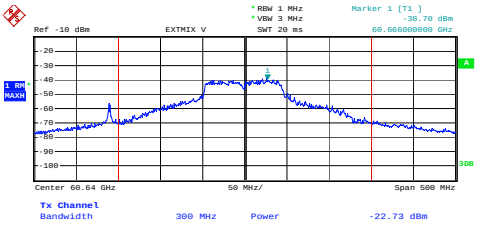
Date: 2.JUL.2011 14:12:40

Measured Peak Power (F3)



Date: 2.JUL.2011 14:17:04

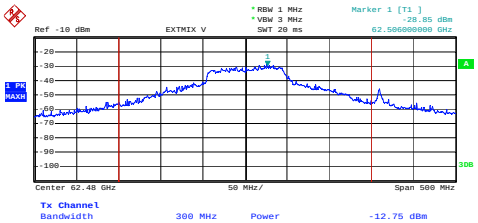
Measured Average Power (F3)



Date: 2.JUL.2011 14:15:50

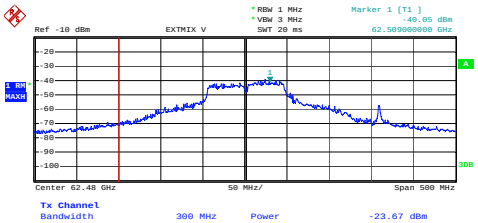
3.3.5.4 Measured Power Plots for 62.48 – 60.80 GHz (LRP) Band

Measured Peak Power (F1)



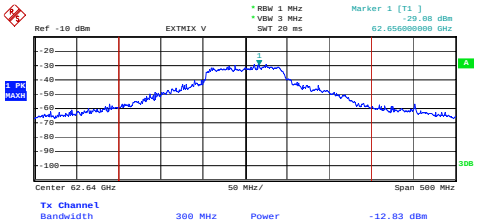
Date: 2.JUL.2011 14:39:58

Measured Average Power (F1)



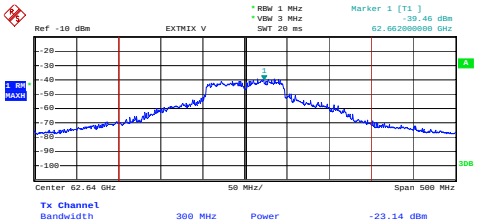
Date: 2.JUL.2011 14:39:14

Measured Peak Power (F2)



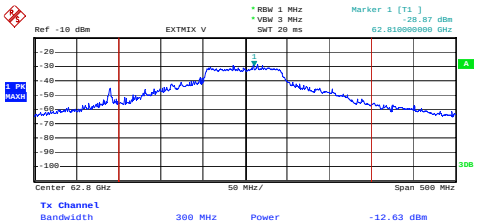
Date: 2.JUL.2011 14:41:09

Measured Average Power (F2)



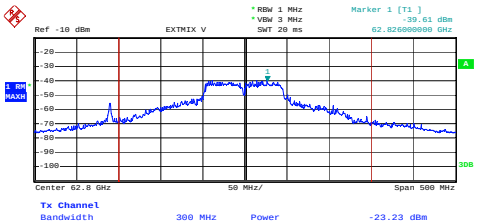
Date: 2.JUL.2011 14:42:23

Measured Peak Power (F3)



Date: 2.JUL.2011 14:46:31

Measured Average Power (F3)



Date: 2.JUL.2011 14:45:37

3.4 Peak Conducted Power

3.4.1 Limit of Peak Conducted Power

Peak Conducted Power Limit	
6dBc Bandwidth	**Peak Conducted Power (note 1)**
> 100MHz	500mW
≤ 100MHz	500mW x (B/100) (see note 2)
NOTE 1: For the applicable limit, see FCC 15.255(e) NOTE 2: B= 6dB bandwidth (measured at RBW 100kHz)	

3.4.2 Measuring Instruments

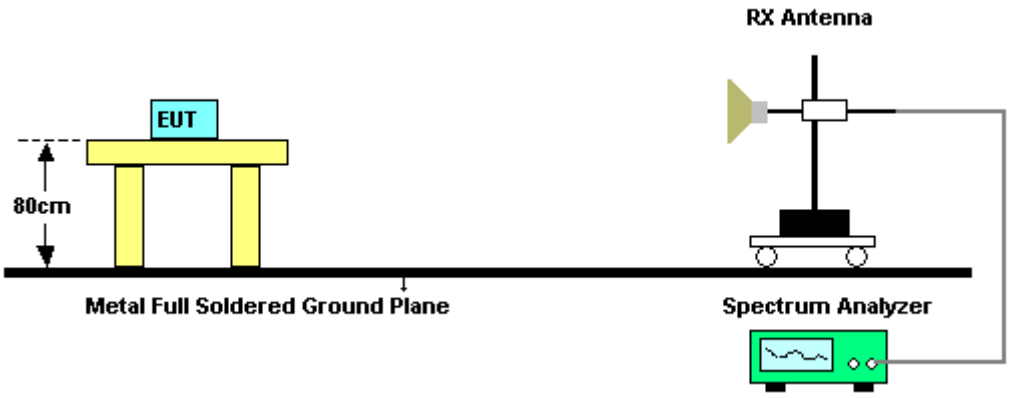
Refer a measuring instruments list in this test report.

3.4.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clauses 7.8.3 and 7.8.6.

3.4.4 Test Setup

Peak Conducted Power



NOTE: Because EUT used for the integral antenna without temporary RF connector provided. Therefore peak conducted power is equal to EIRP peak power subtract the antenna gain.

3.4.5 Test Result of Peak Conducted Power

Test Conditions:	see ANSI C63.10, clause 5.11
Test Setup:	see ANSI C63.10, clause 7.8.6
Test Frequency Band:	60.32 – 60.64 GHz /62.48 – 62.80(LRP) Band
NOTE: If the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.12 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worse case combination to be used for the conformance testing.	

3.4.5.1 Peak Conducted Power

Test Conditions: 0.5 m				**Rel. Humidity:** 65 %				
Test Engineer: Sam Chen				**Ambient Temp.:** 25℃				
Test Date: Jul. 02, 2011								
Test results								
Test Frequency:		**EIRP (dBm)**	**Max. Ant. Gain**	**Peak Power (dBm) (note 1)**	**Peak Power (mW)**	**6dBc BW (MHz) (note 2)**	**Peak Power Limit (mW) (note 3)**	**Margin (mW)**
F1	**60.32 GHz**	27.13	13.00	14.13	25.88	93.60	468.00	442.12
F2	**60.48 GHz**	26.79	13.00	13.79	23.95	91.80	459.00	435.05
F3	**60.64 GHz**	26.84	13.00	13.84	24.19	91.80	459.00	434.81
F1	**62.48 GHz**	26.59	13.00	13.59	22.84	91.80	459.00	436.17
F2	**62.64 GHz**	26.53	13.00	13.53	22.53	90.60	453.00	430.47
F3	**62.80 GHz**	26.75	13.00	13.75	23.72	90.00	450.00	426.28
Measurement uncertainty: ±2.7 dB								

NOTE 1: Because EUT used for the integral antenna without temporary RF connector provided. Therefore peak conducted power is equal to EIRP power subtract the antenna gain.

NOTE 2: For the 6dBc bandwidth, see test report clause 3.2.5.

NOTE 3: For the applicable limit, see FCC 15.255(e)

3.5 Transmitter Spurious Emissions

3.5.1 Limit of Transmitter Spurious Emissions

Frequency Range	Limit
Radiated emissions below 40 GHz	FCC Part 15.209
Radiated emissions above 40 GHz – 200GHz	90 pW/cm^2 @ 3 m (Equivalent EIRP 102 μW, -9.91dBm)
NOTE: Spurious emissions shall not exceed the level of the fundamental emission.	

3.5.2 Measuring Instruments

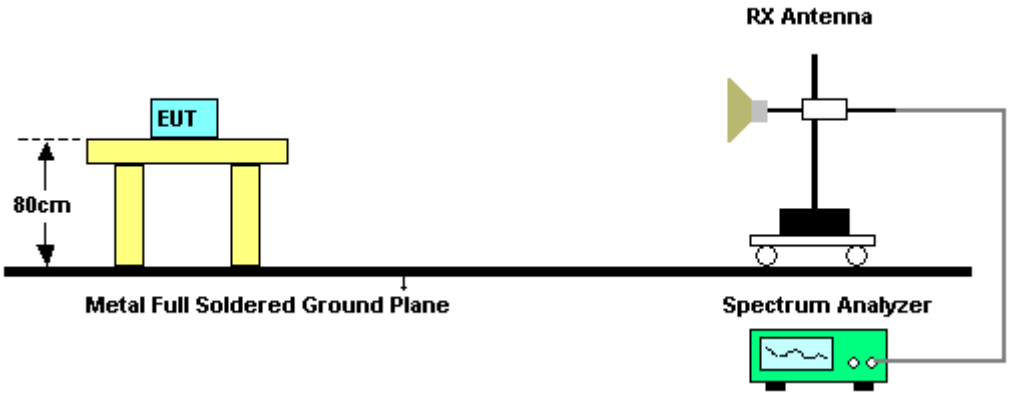
Refer a measuring instruments list in this test report.

3.5.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clauses 6.3, 6.4, 6.5, 6.6 and 7.8.6.

3.5.4 Test Setup

Transmitter Spurious Emissions



A measuring distance of at 3 m shall be used for measurements at frequencies up to 15 GHz. For frequencies above 15 GHz, any suitable measuring distance may be used. The measurement distance is chosen up to far field distance, depending on the test system noise floor for detecting spurious emission signals. Then above 15 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from spec. distance (3 m) to measurement distance. Distance extrapolation factor = 20 log (spec. distance [3 m] / measurement distance [N m]) (dB) .The measurements described in ANSI C63.10, clause 7.8.6. If the emission cannot be detected at 1 m, reduce the RBW to increase system sensitivity. Note the value. If the emission still cannot be detected, move the horn closer to the EUT, noting the distance at which a measurement is made.

3.5.5 Test Result of Transmitter Spurious Emissions

Test Conditions:	see ANSI C63.10, clause 5.11
Test Setup:	see ANSI C63.10, clauses 6.3, 6.4, 6.5, 6.6 and 7.8.6
Test Frequency Band:	60.48 GHz (LRP) Band
NOTE: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes.	

3.5.5.1 60.48 GHz (LRP) band, Test Frequency F2, Radiated Testing

Test Conditions:	see ANSI C63.10, clause 5.11	**Polarization:**	Vertical
Test Engineer:	Sam Chen	**Test Distance:**	3 m
Test Range:	9kHz~30MHz		

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

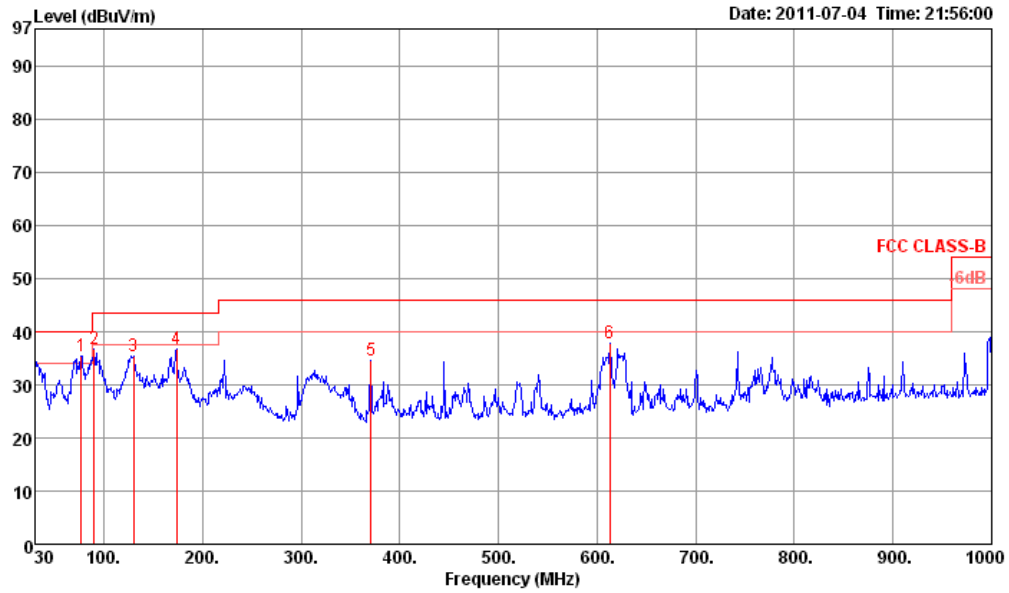
Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

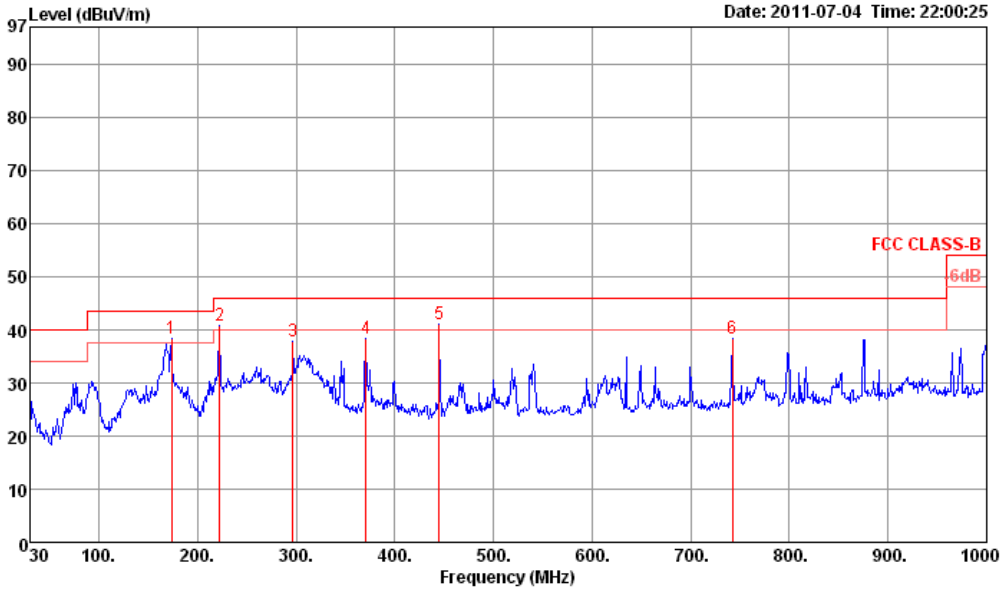
Test Conditions:	see ANSI C63.10, clause 5.11	**Polarization:**	Vertical
Test Engineer:	Sam Chen	**Test Distance:**	3 m
Test Range:	30 MHz – 1000 MHz		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		
1	76.56	35.47	40.00	-4.53	55.22	0.97	6.98	27.70	Peak	VERTICAL
2	90.14	36.79	43.50	-6.71	54.35	1.10	8.98	27.64	Peak	VERTICAL
3	129.91	35.32	43.50	-8.18	49.21	1.30	12.26	27.45	Peak	VERTICAL
4	173.56	36.75	43.50	-6.75	49.36	1.57	13.05	27.23	Peak	VERTICAL
5	370.47	34.50	46.00	-11.50	44.38	2.24	15.27	27.39	Peak	VERTICAL
6	612.97	37.75	46.00	-8.25	44.05	2.98	18.81	28.09	Peak	VERTICAL

Measurement uncertainty: ±2.7 dB

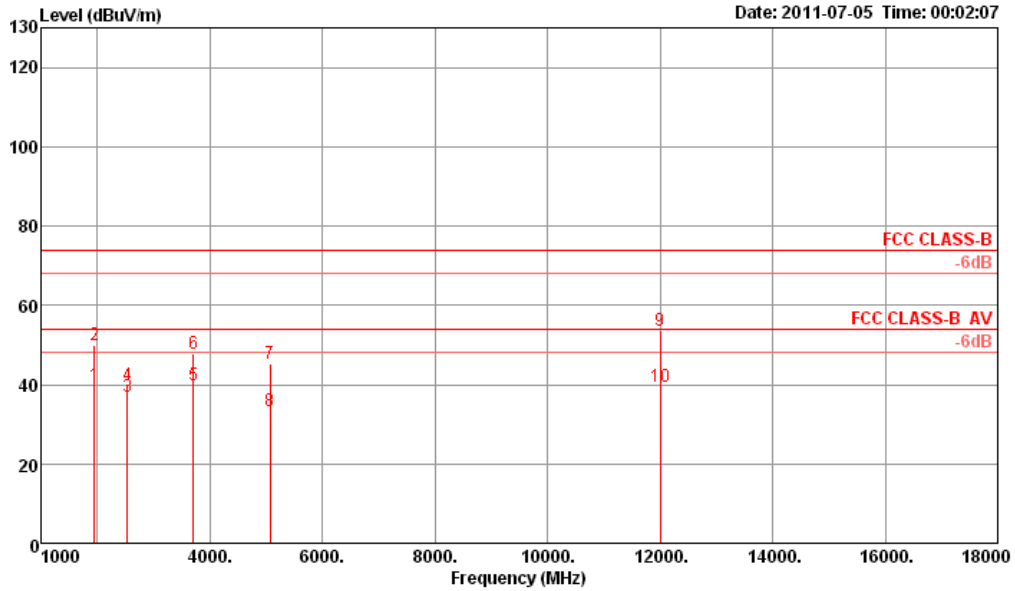
Test Conditions:	see ANSI C63.10, clause 5.11	Polarization:	Horizontal
Test Engineer:	Sam Chen	Test Distance:	3 m
Test Range:	30 MHz – 1000 MHz		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		
1	173.56	38.37	43.50	-5.13	50.98	1.57	13.05	27.23	Peak	HORIZONTAL
2	222.06	40.87	46.00	-5.13	55.43	1.79	10.70	27.05	Peak	HORIZONTAL
3	296.75	37.96	46.00	-8.04	49.45	2.09	13.33	26.91	Peak	HORIZONTAL
4	370.47	38.34	46.00	-7.66	48.22	2.24	15.27	27.39	Peak	HORIZONTAL
5	445.16	40.97	46.00	-5.03	49.46	2.57	16.77	27.83	Peak	HORIZONTAL
6	741.98	38.39	46.00	-7.61	43.38	3.47	19.37	27.83	Peak	HORIZONTAL

Measurement uncertainty: ±2.7 dB

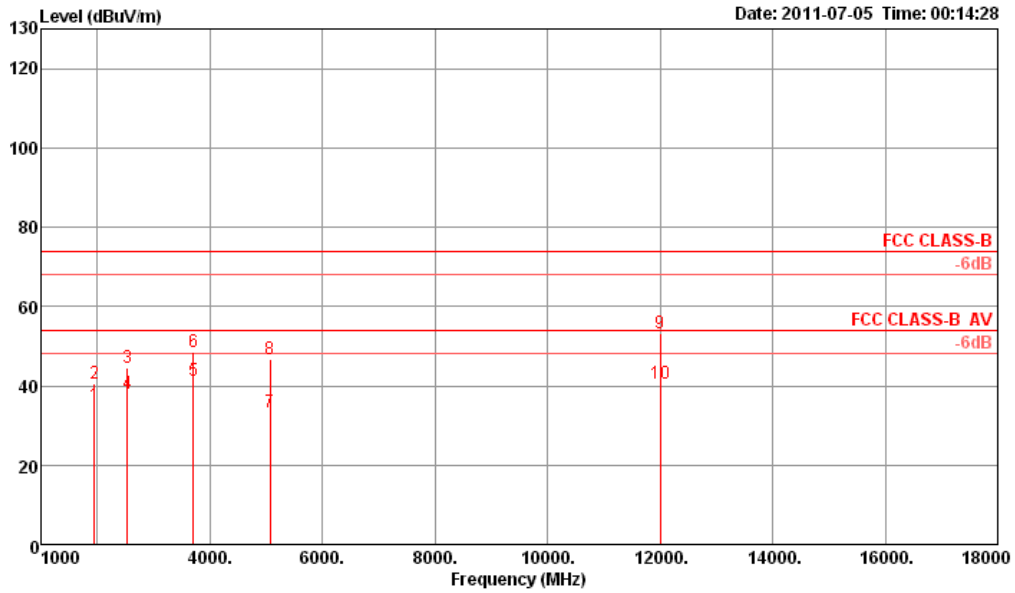
Test Conditions:	see ANSI C63.10, clause 5.11	Polarization:	Vertical
Test Engineer:	Sam Chen	Test Distance:	3 m
Test Range:	1 GHz –18 GHz		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		
1	1944.66	39.87	54.00	-14.13	45.28	2.55	26.94	34.90	Average	VERTICAL
2	1945.12	49.84	74.00	-24.16	55.25	2.55	26.94	34.90	Peak	VERTICAL
3	2537.97	36.85	74.00	-37.15	40.46	2.95	28.46	35.02	Peak	VERTICAL
4	2538.01	39.72	54.00	-14.28	43.33	2.95	28.46	35.02	Average	VERTICAL
5	3708.66	39.89	54.00	-14.11	40.02	3.43	31.64	35.20	Average	VERTICAL
6	3708.79	47.87	74.00	-26.13	48.00	3.43	31.64	35.20	Peak	VERTICAL
7	5073.64	45.21	74.00	-28.79	42.10	4.47	33.84	35.20	Peak	VERTICAL
8	5074.27	33.23	54.00	-20.77	30.12	4.47	33.84	35.20	Average	VERTICAL
9	11999.55	53.77	74.00	-20.23	42.53	6.94	39.30	35.00	Peak	VERTICAL
10	11999.88	39.53	54.00	-14.47	28.29	6.94	39.30	35.00	Average	VERTICAL

Measurement uncertainty: ±2.7 dB

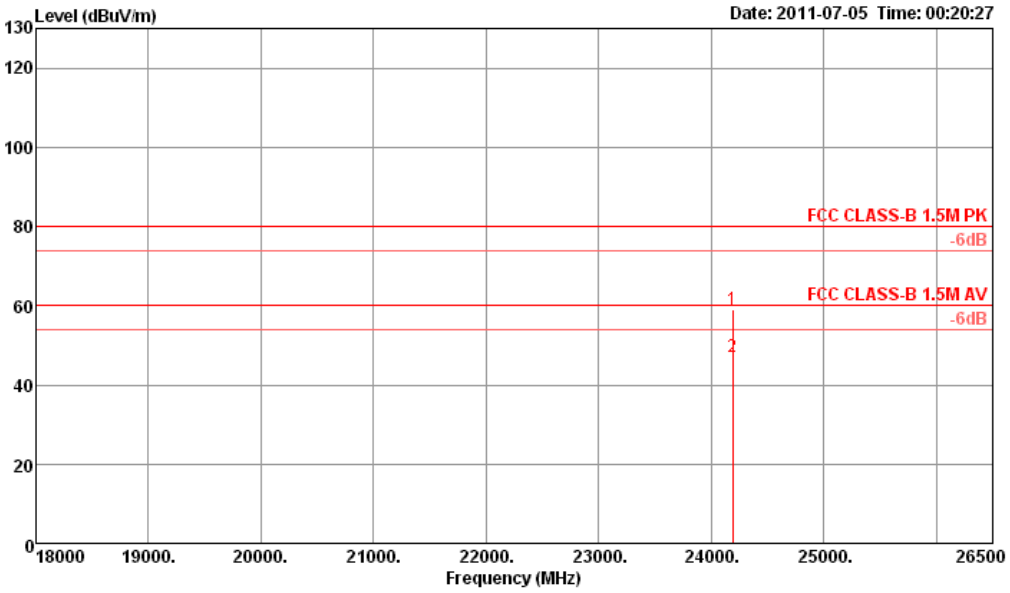
Test Conditions:	see ANSI C63.10, clause 5.11	Polarization:	Horizontal
Test Engineer:	Sam Chen	Test Distance:	3 m
Test Range:	1 GHz – 18 GHz		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		
1	1944.82	35.10	54.00	-18.90	40.51	2.55	26.94	34.90	Average	HORIZONTAL
2	1944.87	40.50	74.00	-33.50	45.91	2.55	26.94	34.90	Peak	HORIZONTAL
3	2537.99	44.66	74.00	-29.34	48.27	2.95	28.46	35.02	Peak	HORIZONTAL
4	2538.03	38.17	54.00	-15.83	41.78	2.95	28.46	35.02	Average	HORIZONTAL
5	3708.73	41.27	54.00	-12.73	41.40	3.43	31.64	35.20	Average	HORIZONTAL
6	3709.00	48.47	74.00	-25.53	48.60	3.43	31.64	35.20	Peak	HORIZONTAL
7	5074.14	33.25	54.00	-20.75	30.14	4.47	33.84	35.20	Average	HORIZONTAL
8	5074.40	46.75	74.00	-27.25	43.64	4.47	33.84	35.20	Peak	HORIZONTAL
9	12000.38	53.36	74.00	-20.64	42.12	6.94	39.30	35.00	Peak	HORIZONTAL
10	12000.46	40.43	54.00	-13.57	29.19	6.94	39.30	35.00	Average	HORIZONTAL

Measurement uncertainty: ±2.7 dB

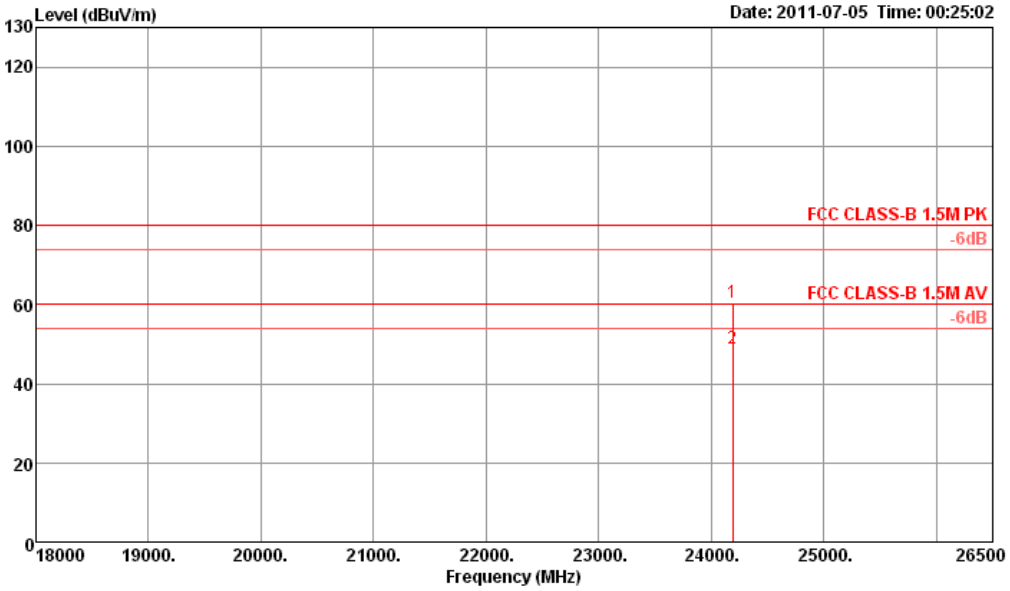
Test Conditions:	see ANSI C63.10, clause 5.11	Polarization:	Vertical
Test Engineer:	Sam Chen	Test Distance:	1.5 m
Test Range:	18 GHz – 26.5 GHz		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		
1	24191.78	58.96	80.00	-21.04	44.91	9.77	39.54	35.26	Peak	VERTICAL
2	24191.99	46.93	60.00	-13.07	32.88	9.77	39.54	35.26	Average	VERTICAL

Measurement uncertainty: ±2.7 dB

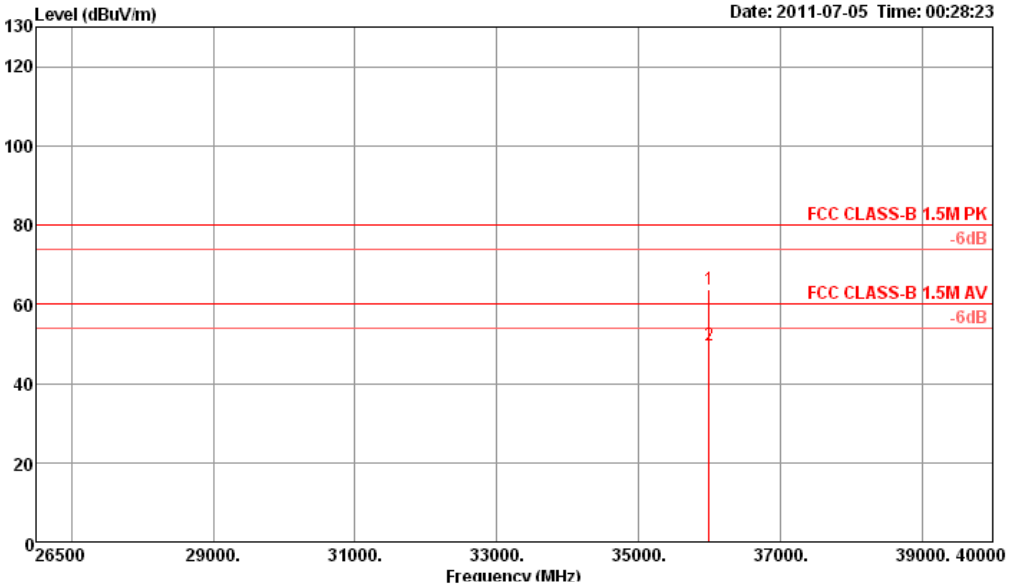
Test Conditions:	see ANSI C63.10, clause 5.11	Polarization:	Horizontal
Test Engineer:	Sam Chen	Test Distance:	1.5 m
Test Range:	18 GHz – 26.5 GHz		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		
1	24191.84	60.36	80.00	-19.64	46.31	9.77	39.54	35.26	Peak	HORIZONTAL
2	24191.89	48.93	60.00	-11.07	34.88	9.77	39.54	35.26	Average	HORIZONTAL

Measurement uncertainty: ±2.7 dB

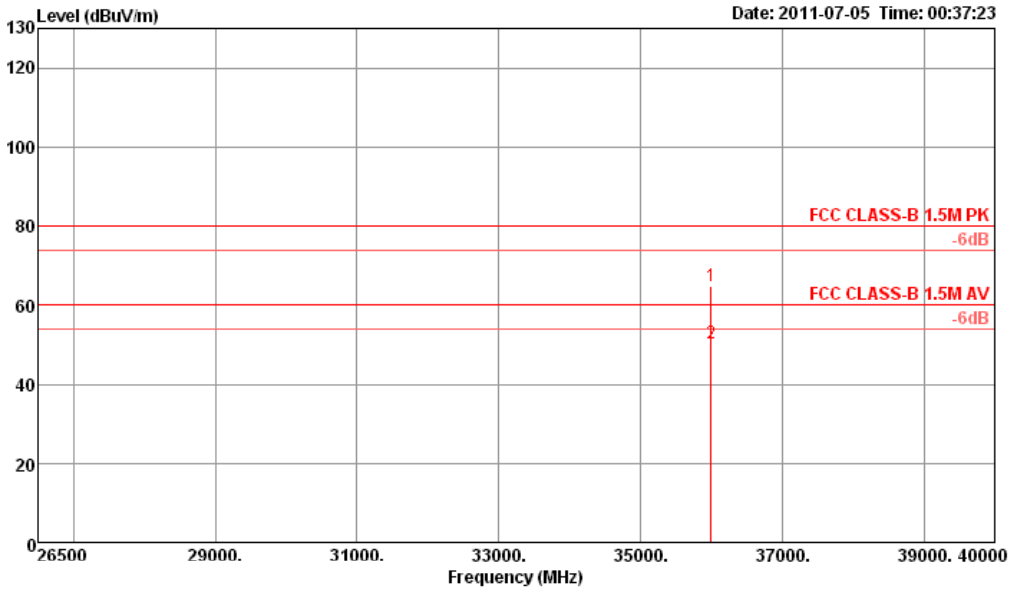
Test Conditions:	see ANSI C63.10, clause 5.11	Polarization:	Vertical
Test Engineer:	Sam Chen	Test Distance:	1.5 m
Test Range:	26.5 GHz – 40 GHz		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		
1	36000.16	63.67	80.00	-16.33	45.17	15.84	42.20	39.54	Peak	VERTICAL
2	36000.36	49.59	60.00	-10.41	31.09	15.84	42.20	39.54	Average	VERTICAL

Measurement uncertainty: ±2.7 dB

Test Conditions:	see ANSI C63.10, clause 5.11	Polarization:	Horizontal
Test Engineer:	Sam Chen	Test Distance:	1.5 m
Test Range:	26.5 GHz – 40 GHz		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		
1	35999.50	64.68	80.00	-15.32	46.18	15.84	42.20	39.54	Peak	HORIZONTAL
2	36000.32	50.42	60.00	-9.58	31.92	15.84	42.20	39.54	Average	HORIZONTAL

Measurement uncertainty: ±2.7 dB

Test Conditions:	see ANSI C63.10, clause 5.11	**Test Range:**	40GHz – 200GHz
Test Engineer:	Sam Chen	**Test Distance:**	0.5 m
Test Date:	Jul. 02, 2011		

Frequency (GHz)	**Measurement Distance (m)**	**Peak Power (dBm)**	**Rx Antenna Gain (dBi)**	**EIRP (dBm)**
48.51	0.5	-61.66	23	-24.52
EIRP (W)	**Specification Distance (m)**	**Power Density (W/m^2)**	**Power Density (pW/cm^2)**	**Limit (pW/cm^2)**
3.53004E-06	3	3.12E-08	31.21239	90.00

Note: The peak density is less than the average limit.

3.6 Frequency Stability

3.6.1 Limit of Frequency Stability

Frequency Stability	Limit
Refer as FCC 15.255(f)	within the frequency bands
Note: These measurements shall also be performed at normal and extreme test conditions.	

3.6.2 Measuring Instruments

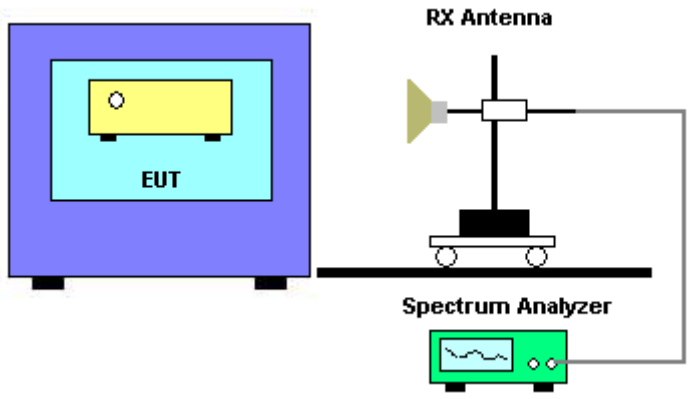
Refer a measuring instruments list in this test report.

3.6.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clauses 6.8 and 7.8.7.

3.6.4 Test Setup

Frequency Stability



3.6.5 Test Result of Frequency Stability

Test Conditions:	see ANSI C63.10, clause 5.11
Test Setup:	see ANSI C63.10, clauses 6.8 and 7.8.7
Test Frequency Band:	60.48 GHz (LRP) Band
Worse case modulation for this operating mode:	LRP –BPSK
Worse case data rate for this operating mode:	LRP –20.337 Mb/s (Quarter Rate)
NOTE: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes.	

3.6.5.1 Frequency Stability with Respect to Ambient Temperature

Frequency Stability with Respect to Ambient Temperature			
Test Conditions:	see ANSI C63.10, clause 5.11		
Test Engineer:	Sam Chen		
Test Date:	Jul. 02, 2011		
Test results			
Test Temperature: (°C)	**Measured Frequency (MHz)**	**Delta Frequency (kHz)**	**Limit (±kHz)**
0	60480.098	-63	within band
10	60480.142	-19	within band
20	60480.161	reference	within band
30	60480.234	73	within band
40	60480.198	37	within band
Measurement uncertainty:	$\pm 8.5\times10^{-8}$ Hz		
NOTE: 1. For the applicable limit, see FCC 15.255(f). 2. The EUT is intended for indoor use only with a manufacturer's specified temperature range of 0 to 40℃.			

3.6.5.2 Frequency Stability When Varying Supply Voltage

Frequency Stability When Varying Supply Voltage			
Test Conditions: see ANSI C63.10, clause 5.11			
Test Engineer: Sam Chen			
Test Date: Jul. 02, 2011			
Test results			
Test Voltage: (Vdc)	**Measured Frequency (MHz)**	**Delta Frequency (kHz)**	**Limit (±kHz)**
4.25	60480.164	35	within band
5	60480.129	reference	within band
5.75	60480.114	114	within band
Measurement uncertainty: $\pm 8.5\times10^{-8}$ Hz			
NOTE: For the applicable limit, see FCC 15.255(f).			

3.7 Publicly-accessible Coordination Channel

3.7.1 Limit of Publicly-accessible Coordination Channel

Frequency Range	Limit
57 GHz-57.05 GHz	No emissions appear in the range 57-57.05 GHz
NOTE: For the applicable limit, see FCC 15.255(d)	

3.7.2 Measuring Instruments

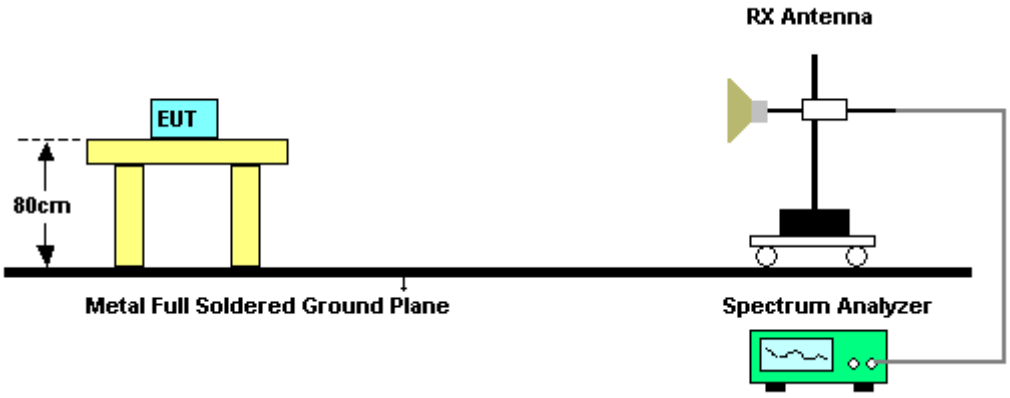
Refer a measuring instruments list in this test report.

3.7.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clauses 6.3, 6.4, 6.5, 6.6 and 7.8.6.

3.7.4 Test Setup

Publicly-accessible Coordination Channel



The measurements described in ANSI C63.10, clause 7.8.6. If the emission cannot be detected at 1 m, reduce the RBW to increase system sensitivity. Note the value. If the emission still cannot be detected, move the horn closer to the EUT, noting the distance at which a measurement is made.

3.7.5 Test Result of Publicly-accessible Coordination Channel

Test Conditions:	see ANSI C63.10, clause 5.11
Test Setup:	see ANSI C63.10, clauses 6.3, 6.4, 6.5, 6.6 and 7.8.6
Test Frequency Band:	60.48 GHz (LRP) Band
NOTE: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes.	

3.7.5.1.1 60.48 GHz (LRP) band, Test Frequency F2, Radiated Testing

Test Conditions:	see ANSI C63.10, clause 5.11	**Test Range:**	57 GHz-57.05 GHz
Test Engineer:	Sam Chen	**Test Distance:**	0.5 m
Duty Cycle:	50 %	**Test Date:**	Jul. 02, 2011
Rel. Humidity:	61 %		

Test Results

Test Range	Emission Frequency (MHz)	Emission Observed (dBm)	Limit (dBm)	Margin (dB)	Remark
57 GHz-57.05 GHz	N/F	N/F	-9.91	N/F	

Measurement uncertainty: ±2.7 dB

NOTE 1: “N/F” means Nothing Found (No spurious emissions were detected.)

3.8 Operation Restriction and Group Installation

3.8.1 Limit of Operation Restriction and Group Installation

Item	Limit
Operation Restriction	Operation is not permitted for the following products: ♦ Equipment used on aircraft or satellites. (Refer as FCC 15.255 (a)) ♦ Field disturbance sensors, including vehicle radar systems, unless the field disturbance sensors are employed for fixed operation. (Refer as FCC 15.255 (a))
Group Installation	Operation is not permitted for the following products: ♦ External phase-locking (Refer as FCC Part 15.255 (h))

3.8.2 Result of Operation Restriction

Manufacturer declares that EUT will not been used on aircraft or satellites. Then user manual will include a statement to caution EUT is not permitted for used on aircraft or satellites. EUT is a wireless video area network (WVAN) for the connection of consumer electronic (CE) audio and video devices.

3.8.3 Result of Group Installation

The frequency, amplitude and phase of the transmit signal are set within the EUT. There are no external phase-locking inputs or any other means of combining two or more units together to realize a beam-forming array.

3.9 Transmitter Identification

3.9.1 Limit of Transmitter Identification

Item	Limit
Transmitter Identification	Indoor use and transmitter emanate directed outside the building and peak power ≥ 0.1mW (EIRP) or 3nW/cm^2, transmitter identification data block must provide the following fields: FCC ID, Serial Number, information at least 24 bytes data
NOTE: For the applicable limit, see FCC 15.255(i)	

3.9.2 Result of Transmitter Identification

EUT's application is the WirelessHD targets the wireless video area network (WVAN). All units of the WVAN are for indoor operation only. There are no outdoor units therefore no transmissions are directed outside the building. EUT is not applicable for transmitter Identification.

3.10 Maximum Permissible Exposure

3.10.1 Limit of Maximum Permissible Exposure

Limits for Occupational / Controlled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/ cm²)**	**Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)**
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6
Limits for General Population / Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/ cm²)**	**Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)**
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30
NOTE 1: f = frequency in MHz ; *Plane-wave equivalent power density				
NOTE 2: For the applicable limit, see FCC 1.1310				

3.10.2 MPE Calculation Method

$$E\ (V/m) = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density:} \quad Pd\ (W/m^2) = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$\boldsymbol{Pd} = \frac{30 \times P \times G}{377 \times d^2}$$

3.10.3 Result of Maximum Permissible Exposure

Exposure Environment:	General Population / Uncontrolled Exposure				
Test Date:	Jul. 02, 2011				
Test results					
Maximum EIPR Power of Test Frequency:	**Average EIRP Power (dBm)**	**Average EIRP Power (mW)**	**Power Density (S) (mW/cm²)**	**Separation Distance (cm)**	**Limit of Power Density (S) (mW/cm²)**
LRP 62.48 GHz	22.32	170.6472	0.033966	20	1.00
Measurement uncertainty:	±2.7 dB				
NOTE: For the applicable limit, see FCC 1.1310					

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100377	9kHz ~ 2.75GHz	Sep. 01,2010	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Oct. 28,2010	Conduction (CO01-CB)
PULSE LIMITER	R&S	ESH3-Z2	100430	9K~30MHz	Jan. 04, 2011	Conduction (CO01-CB)
COND Cable	-	Cable	-	0.15MHz~30MHz	Dec.4, 2010	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127-478	9K ~ 30MHz	Nov. 16, 2010	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Oct. 17, 2010	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 22, 2010	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Oct. 08, 2010	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 17, 2010	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 23, 2010	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Nov. 17, 2010	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP	100304	9kHz ~ 40GHz	Nov. 22, 2010	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 22, 2011	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Sep. 09, 2010*	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N/A	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N/A	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	101026	9KHz~30GHz	July. 23,2010	Conducted (TH01-CB)
Temp. and Humidity	TEN BILLION	TTH-D3SP	TBN-931011	-30~100℃	May. 20, 2011	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Remark
Chamber						
Signal Generator	R&S	SMR40	100302	10MHz-40GHz	Nov. 25, 2010	Conducted (TH01-CB)
RF Power Divider	HP	11636A	00306	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)
RF Power Splitter	Anaren	44100	1839	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)
RF Power Splitter	Anaren	42100	17930	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 06, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 06, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 06, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 06, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 06, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-12	-	1 GHz – 26.5 GHz	Nov. 06, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-13	-	1 GHz – 26.5 GHz	Nov. 06, 2010	Conducted (TH01-CB)

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

Note: For “*”Calibration Interval of instruments listed above is two year.

Note: N.C.R. means Non-Calibration required.

5 Certification of TAF Accreditation

Certificate No. : L1190-091230

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

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	:	ISO/IEC 17025:2005
Accreditation Number	:	1190
Originally Accredited	:	December 15, 2003
Effective Period	:	January 10, 2010 to January 09, 2013
Accredited Scope	:	Testing Field, see described in the Appendix
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : December 30, 2009

P1, total 22 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix