



FCC Test Report

EQUIPMENT : Wireless HDMI Transmitter
BRAND NAME : VIZIO
MODEL NO. : XWH1TX
FCC ID : MXF-XWH1TX
STANDARD : 47 CFR FCC Part 15.255
APPLICANT : Gemtek Technology Co., Ltd.
No.15-1 Zhonghua Road, Hsinchu Industrial
Park, Hukou, Hsinchu, Taiwan, 30352
MANUFACTURER Gemtek Technology Co., Ltd.

The product sample received on Apr. 12, 2011 and completely tested on Sep. 14, 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.

Leo Huang 2011.9.15
Reviewed by: *Leo Huang* Manager





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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(c)	Transmitter Spurious Emissions	Complied	-

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
High rate PHY (HRP) Band	60.48 GHz / 62.64GHz

1.1.2 Transmit Operating Modes

The Different Transmit Operating Modes	
<input checked="" type="checkbox"/>	Operating mode 1: Smart Antenna Systems - with beam forming
<input type="checkbox"/>	Operating mode 2: Smart Antenna Systems - without beam forming
<input type="checkbox"/>	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:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> In case of beam forming, the maximum beam forming gain:	22 dB

1.1.4 Antenna Information

Antenna Information	
<input type="checkbox"/>	Equipment placed on the market without antennas
<input checked="" type="checkbox"/>	Integral antenna
Integral antenna gain:	16.00 dBi for LRP 22.00 dBi for HRP
(Beam forming gain)	<input type="checkbox"/> Temporary RF connector provided
	<input checked="" type="checkbox"/> No temporary RF connector provided
<input type="checkbox"/>	External antenna (dedicated antennas)
	<input type="checkbox"/> Single power level with corresponding antenna(s)
	<input type="checkbox"/> Multiple power settings and corresponding antenna(s)



1.1.5 Type of Equipment

Type of Equipment	
<input checked="" type="checkbox"/>	Stand-alone
<input type="checkbox"/>	Combined Equipment (The radio part is fully integrated within another type of equipment)
<input type="checkbox"/>	Plug-in radio device (Equipment intended for a variety of host systems)
<input type="checkbox"/>	Other:

1.1.6 Power Levels

(a) Worst Power Levels for LRP (Integrated Antenna)			
Applicable power levels:	<input type="checkbox"/> Conducted	<input checked="" type="checkbox"/> EIRP	
Integral antenna gain:	16.00 dBi		
Frequency (GHz)	Highest setting (P _{high}): (dBm)		
	Modulation	Data Rate (Mb/s)	AV Power(dBm)
60.64	BPSK	20.337	15.90
Frequency (GHz)	Modulation	Data Rate (Mb/s)	Peak Power(dBm)
60.48	BPSK	20.337	31.46

(b) Worst Power Levels for HRP (Integrated Antenna)			
Applicable power levels:	<input type="checkbox"/> Conducted	<input checked="" type="checkbox"/> EIRP	
Integral antenna gain:	22.00 dBi		
Frequency (GHz)	Highest setting (P _{high}): (dBm)		
	Modulation	Data Rate (Gb/s)	AV Power(dBm)
60.48	QPSK	0.952	30.71
Frequency (GHz)	Modulation	Data Rate (Gb/s)	Peak Power(dBm)
62.64	QPSK	0.952	39.64



1.1.7 Extreme Operating

The Extreme Operating Temperature Range that Apply to the Equipment			
<input type="checkbox"/> -20 °C to +50 °C			
<input checked="" type="checkbox"/> 0 °C to +40 °C			
<input type="checkbox"/> 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:	<input checked="" type="checkbox"/> stand-alone equipment		
	<input type="checkbox"/> combined (or host) equipment		
	<input type="checkbox"/> test jig		
Supply Voltage	<input type="checkbox"/> AC mains	State AC voltage	V
Supply Voltage	<input checked="" type="checkbox"/> DC	State DC voltage	5 V
In case of DC, indicate the type of power source:			
<input type="checkbox"/> Internal Power Supply			
<input checked="" type="checkbox"/> External Power Supply or AC/DC adapter			
<input type="checkbox"/> Battery	<input type="checkbox"/> Nickel Cadmium		
	<input type="checkbox"/> Alkaline		
	<input type="checkbox"/> Nickel-Metal Hydride		
	<input type="checkbox"/> Lithium-Ion		
	<input type="checkbox"/> Lead acid (Vehicle regulated)		
	<input type="checkbox"/> Other:		

1.1.8 Equipment Use Condition

Equipment Use Condition
<input type="checkbox"/> Fixed field disturbance sensors at 61-61.5GHz
<input type="checkbox"/> Except fixed field disturbance sensors at 61-61.5GHz
<input checked="" type="checkbox"/> 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) HRP – QPSK at 0.952 Gb/s (Quarter Rate), QPSK at 1.904 Gb/s (Half Rate) D1D (16QAM), OFDM HRP – 16-QAM at 3.807 Gb/s (Full Rate)
Can the transmitter operate un-modulated:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

1.2.2 Duty Cycle

Duty Cycle	
The transmitter is intended for:	<input checked="" type="checkbox"/> Continuous Duty 100 %
	<input type="checkbox"/> Intermittent Duty: %
	<input type="checkbox"/> Continuous operation possible for testing purposes

1.2.3 About the EUT

About the EUT	
<input checked="" type="checkbox"/>	The equipment submitted are representative production models.
<input type="checkbox"/>	If not, the equipment submitted are pre-production models
<input type="checkbox"/>	If pre-production equipment is submitted, the final production equipment will be identical in all respects with the equipment tested.
<input type="checkbox"/>	If not, supply full details:

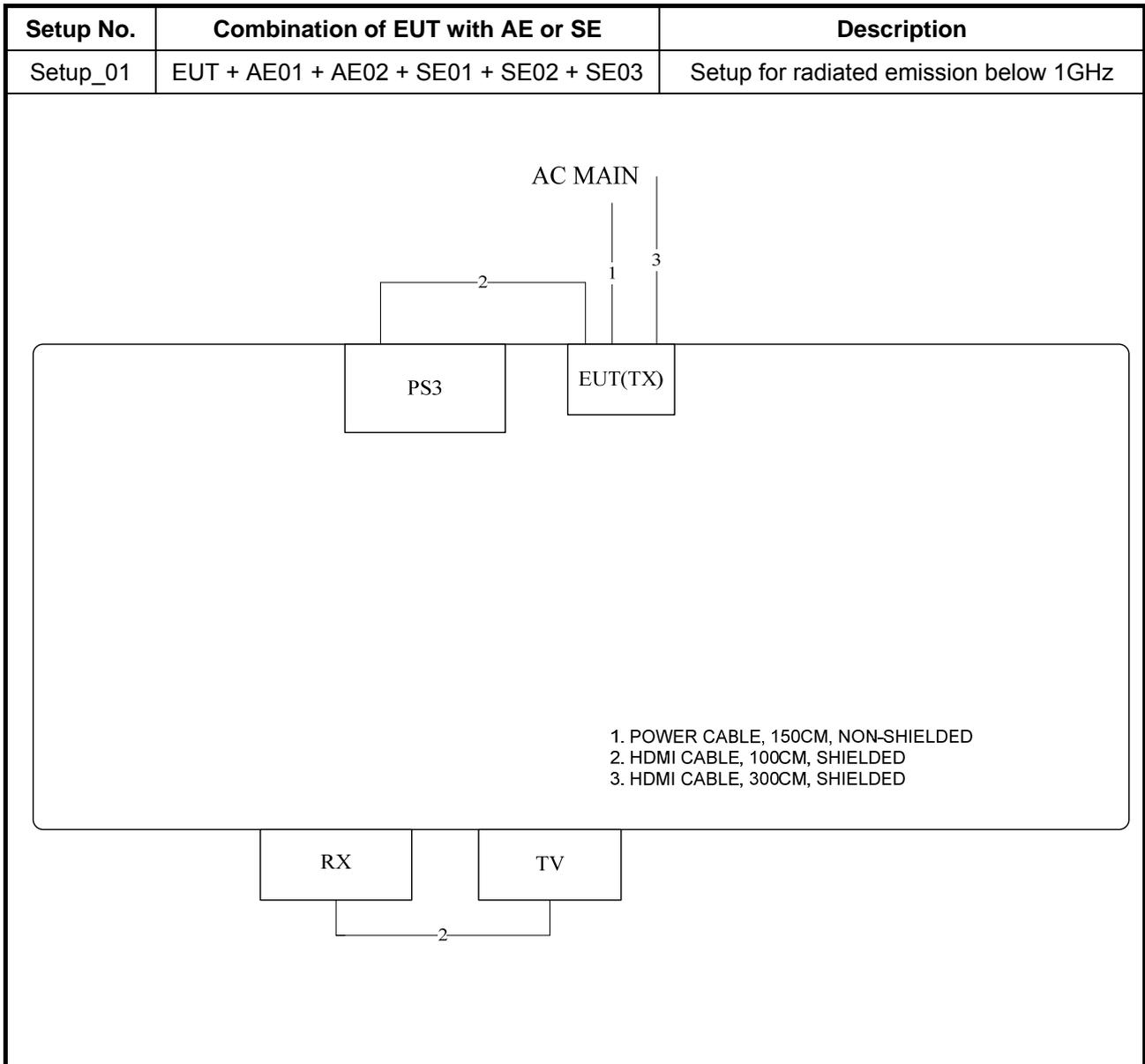
1.3 Ancillary and/or Support Equipment

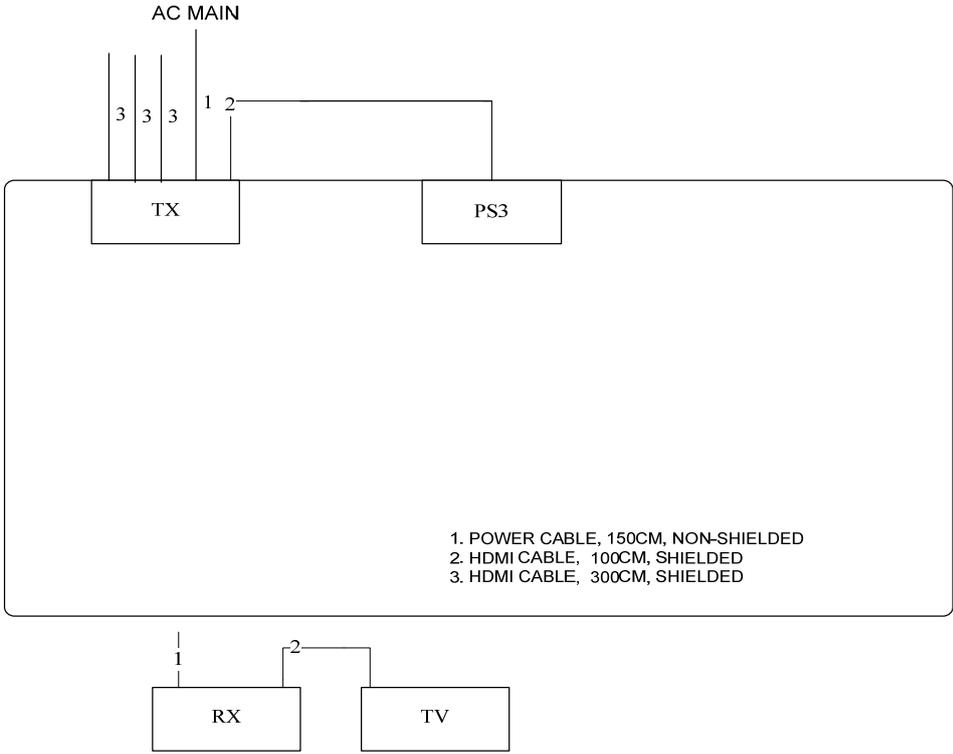
Ancillary Equipment (AE)				
Item	Equipment	Brand Name	Model Name	Serial No.
AE01	AC Power Adapter	DVE	DSA-12PFA-05 FUS 050200	-

Support Equipment (SE)				
Item	Equipment	Brand Name	Model Name	Serial No.
SE01	LCD Monitor	DELL	1704FPTt	LM-A
SE02	PS3	SONY	CECH-2007A	-
SE03	Wireless HDMI Receiver	VIZIO	XWH1RX	-

1.4 EUT Setups

High Definition Audio / Video in the 1080p format was sent from the TX device to the receiver via the wireless link. A Blu-Ray player furnished HD A/V to the TX device. The receiver 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_02	EUT + AE01 + AE02 + SE01 +SE02+SE03	Setup for AC power conducted emission
 <p>1. POWER CABLE, 150CM, NON-SHIELDED 2. HDMI CABLE, 100CM, SHIELDED 3. HDMI CABLE, 300CM, SHIELDED</p>		

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			
<input type="checkbox"/>	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	
<input checked="" type="checkbox"/>	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.			
CO01-CB	TH01-CB	03CH01-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
- ♦ HRP: High 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)
60.48 GHz	2 (HRP)	-	60.48 GHz (F4)	-
62.48 – 62.80 GHz	3 (LRP)	62.48 GHz (F1)	62.64 GHz (F2)	62.80 GHz (F3)
62.64 GHz	4 (HRP)	-	62.64 GHz (F4)	-

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)	HRP – Channel Plan 2&4 (60.48 GHz)/(62.64GHz)
Transmitter Spurious Emissions	-	F4
<p>F1: The centre frequency of the lowest declared channel for every declared nominal bandwidth within this band.</p> <p>F2, F4: The centre frequency of the middle declared channel for every declared nominal bandwidth within this band.</p> <p>F3: The centre frequency of the highest declared channel for every declared nominal bandwidth within this band.</p>		

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.

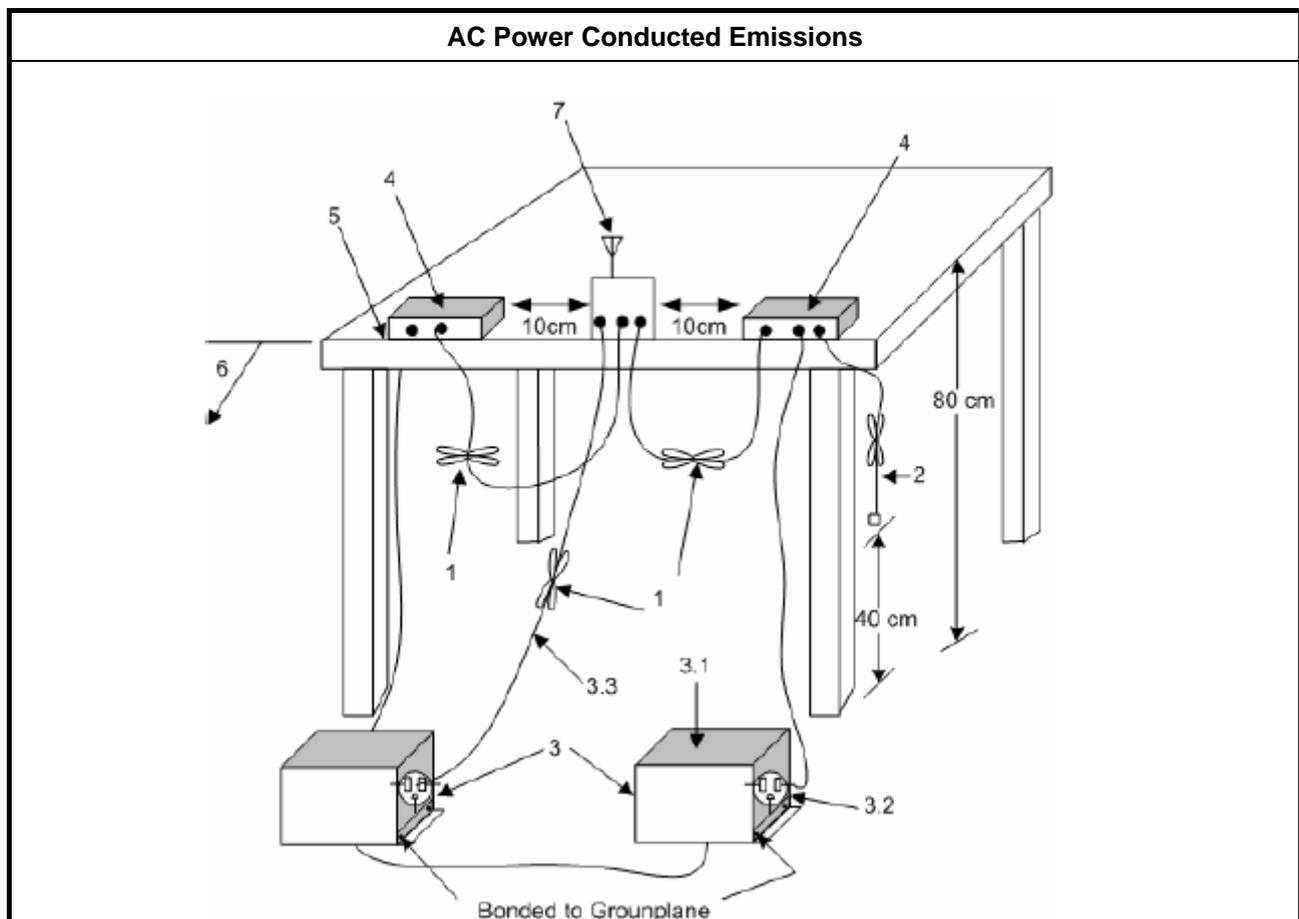
3.1.2 Measuring Instruments

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

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

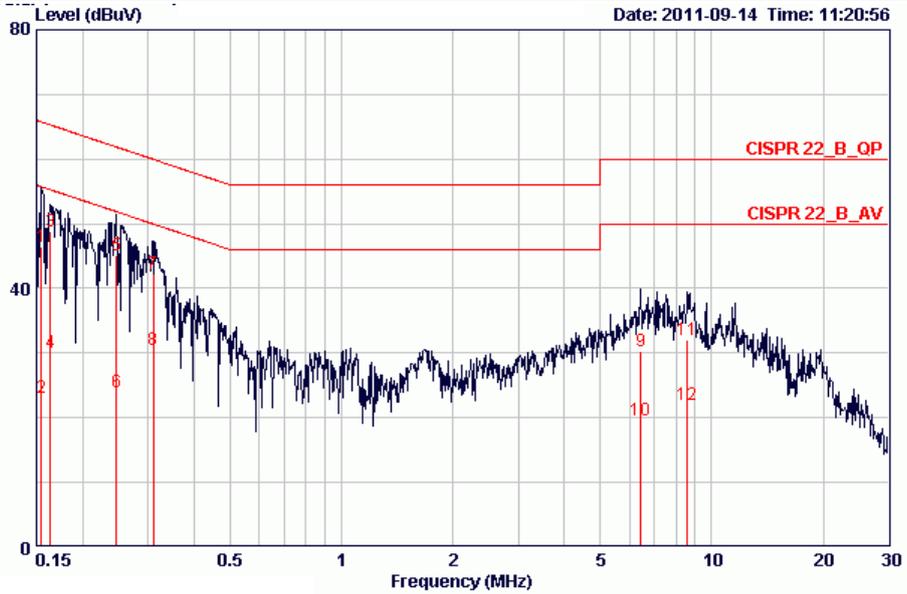
Test Frequency Band: 60.48 GHz (HRP) Band

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:	54%
Test Engineer:	Sin Chang	Phase:	Line
Configuration	Normal Link		

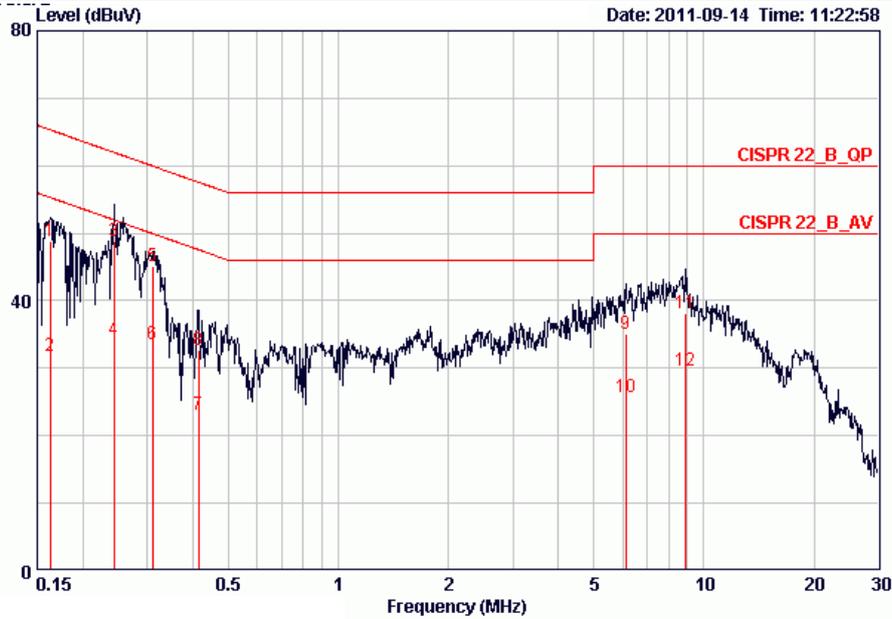


	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.15485	46.49	-19.24	65.74	46.22	0.07	0.20	QP
2	0.15485	23.06	-32.67	55.74	22.79	0.07	0.20	AVERAGE
3	0.16327	48.86	-16.44	65.30	48.59	0.07	0.20	QP
4	0.16327	30.10	-25.20	55.30	29.83	0.07	0.20	AVERAGE
5	0.24682	45.16	-16.70	61.86	44.92	0.04	0.20	QP
6	0.24682	23.96	-27.90	51.86	23.72	0.04	0.20	AVERAGE
7	0.30998	42.27	-17.70	59.97	42.03	0.04	0.20	QP
8	0.30998	30.60	-19.37	49.97	30.36	0.04	0.20	AVERAGE
9	6.420	30.26	-29.74	60.00	29.65	0.23	0.39	QP
10	6.420	19.69	-30.31	50.00	19.08	0.23	0.39	AVERAGE
11	8.592	32.05	-27.95	60.00	31.44	0.31	0.30	QP
12	8.592	21.99	-28.01	50.00	21.38	0.31	0.30	AVERAGE

Measurement uncertainty: ±2.26 dB



Temp:	23 °C	Humidity:	54%
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	0.16241	48.85	-16.49	65.34	48.55	0.10	0.20	QP
2	0.16241	31.82	-23.52	55.34	31.52	0.10	0.20	AVERAGE
3	0.24293	48.85	-13.15	62.00	48.57	0.08	0.20	QP
4	0.24293	34.23	-17.77	52.00	33.95	0.08	0.20	AVERAGE
5	0.30998	45.04	-14.93	59.97	44.77	0.07	0.20	QP
6	0.30998	33.61	-16.36	49.97	33.34	0.07	0.20	AVERAGE
7	0.41485	23.07	-24.48	47.55	22.80	0.07	0.20	AVERAGE
8	0.41485	32.75	-24.80	57.55	32.48	0.07	0.20	QP
9	6.121	35.08	-24.92	60.00	34.50	0.26	0.33	QP
10	6.121	25.80	-24.20	50.00	25.22	0.26	0.33	AVERAGE
11	8.869	38.18	-21.82	60.00	37.52	0.36	0.30	QP
12	8.869	29.62	-20.38	50.00	28.96	0.36	0.30	AVERAGE

Measurement uncertainty: ±2.26 dB

3.2 Transmitter Spurious Emissions

3.2.1 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.	

3.2.2 Measuring Instruments

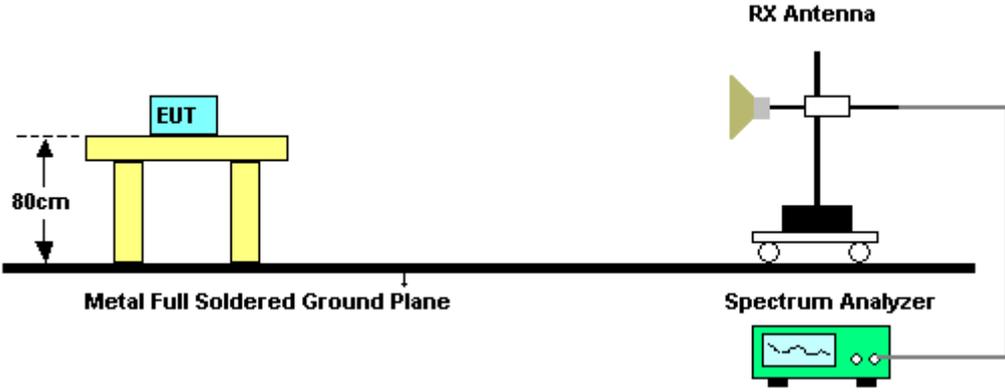
Refer a measuring instruments list in this test report.

3.2.3 Test Procedures

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

3.2.4 Test Setup

Transmitter Spurious Emissions

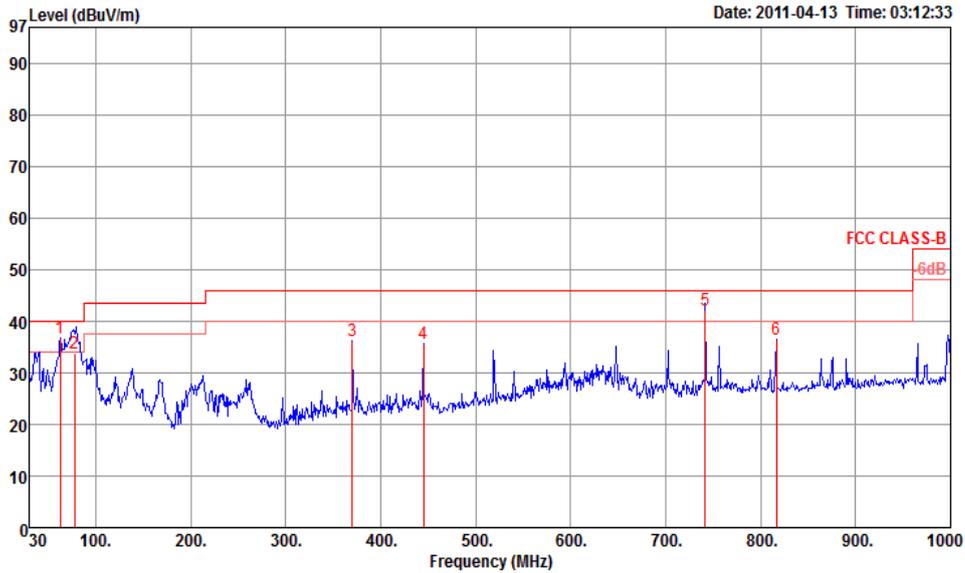


A measuring distance of at 3 m shall be used for measurements at frequencies up to 15 GHz. For frequencies above 15 GHz, any suitable measuring distance may be used. The measurement distance is chosen up to far field distance, depending on the test system noise floor for detecting spurious emission signals. 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.



3.2.4.1 60.48 GHz (HRP) band, Test Frequency F4, Radiated Testing

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

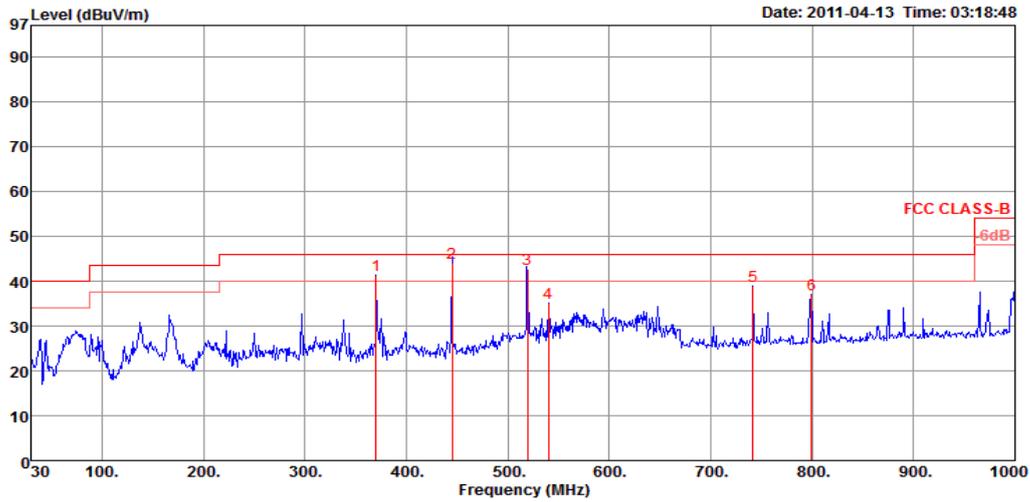


	Freq	Level	Limit	Over	Read	Cable	Preamp	Antenna	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	p	62.98	36.73	40.00	-3.27	57.34	0.86	27.75	6.28	0	400 Peak	VERTICAL
2		77.57	33.85	40.00	-6.15	53.60	1.07	27.68	6.86	336	100 QP	VERTICAL
3		370.47	36.13	46.00	-9.87	45.87	2.24	27.39	15.41	0	400 Peak	VERTICAL
4		445.16	35.62	46.00	-10.38	44.05	2.57	27.83	16.83	0	400 Peak	VERTICAL
5	q	741.75	42.12	46.00	-3.88	46.90	3.47	27.83	19.58	152	100 QP	VERTICAL
6		816.67	36.59	46.00	-9.41	40.41	3.33	27.57	20.42	0	400 Peak	VERTICAL

Measurement uncertainty: ±2.7 dB



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



	Freq	Level	Limit	Over	Read	Cable	Preamp	Antenna	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	370.47	41.24	46.00	-4.76	50.98	2.24	27.39	15.41	0	100	Peak	HORIZONTAL
2	445.05	43.97	46.00	-2.03	52.40	2.57	27.83	16.83	328	100	QP	HORIZONTAL
3	519.23	42.75	46.00	-3.25	50.30	2.74	28.10	17.81	19	100	QP	HORIZONTAL
4	540.22	35.19	46.00	-10.81	42.44	2.78	28.10	18.07	0	100	Peak	HORIZONTAL
5	741.98	38.96	46.00	-7.04	43.74	3.47	27.83	19.58	0	100	Peak	HORIZONTAL
6	799.21	36.98	46.00	-9.02	41.03	3.30	27.61	20.26	0	100	Peak	HORIZONTAL

Measurement uncertainty: ±2.7 dB

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Remark
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Oct. 17, 2010	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 13, 2010	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 10, 2010	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP	100304	9kHz ~ 40GHz	Nov. 06, 2010	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 06, 2011	Radiation (03CH01-CB)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Jul. 28, 2010*	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	-	30 MHz - 1 GHz	Nov. 06, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	-	1 GHz – 26.5 GHz	Nov. 06, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	-	1 GHz – 26.5 GHz	Nov. 06, 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)
EMI Test Receiver	R&S	ESCS 30	100377	9kHz ~ 2.75GHz	Sep. 01, 2011	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16 -2	04083	150kHz ~ 100MHz	Oct. 28, 2010	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127-478	9K ~ 30MHz	Nov. 16, 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)

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

Calibration Interval of instruments listed above is two year.

5 Certification of TAF Accreditation



Certificate No. : L1190-110702

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 Road, 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 Arrangement with Foreign Authorities


Jay-San Chen
President, Taiwan Accreditation Foundation
Date : July 02, 2011

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