



FCC Test Report

EQUIPMEN : 60GHz WirelessHD Source Module
BRAND NAME : Abocom
MODEL NO. : VM310T
FCC ID : MQ4-VM310T01
STANDARD : 47 CFR FCC Part 15.255
APPLICANT : Abocom Systems, Inc.
No.77, Yu-Yih Rd., Chu-Nan, Miao-Lih County
35059, Taiwan R.O.C.
MANUFACTURER : Abocom Systems, Inc.

The product sample received on Aug. 13, 2010 and completely tested on Sep. 03, 2010. 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 2010.9.21
Reviewed by: Jordan Hsiao



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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	-



SPORTON INTERNATIONAL INC.
TEL : 886-2-2696-2468
FAX : 886-2-2696-2255

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	
☒ 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:	22 dB

1.1.4 Antenna Information

Antenna Information	
☐ Equipment placed on the market without antennas	
☒ Integral antenna	
Integral antenna gain:	16.00 dBi for LRP 22.00 dBi for HRP
(Beam forming gain)	☐ 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
62.80	BPSK	20.337	12.09	28.13

(b) Worst Power Levels for HRP (Integrated Antenna)				
Applicable power levels:		☐ Conducted ☒ EIRP		
Integral antenna gain:		22.00 dBi		
Frequency (GHz)	Highest setting (P_{high}): (dBm)			
	Modulation	Data Rate (Gb/s)	AV Power	Peak Power
60.48	QPSK	0.952	34.36	40.89

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) 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:	☒ Yes ☐ No

1.2.2 Duty Cycle

Duty Cycle	
The transmitter is intended for:	☒ Continuous Duty 100 %
	☐ 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:

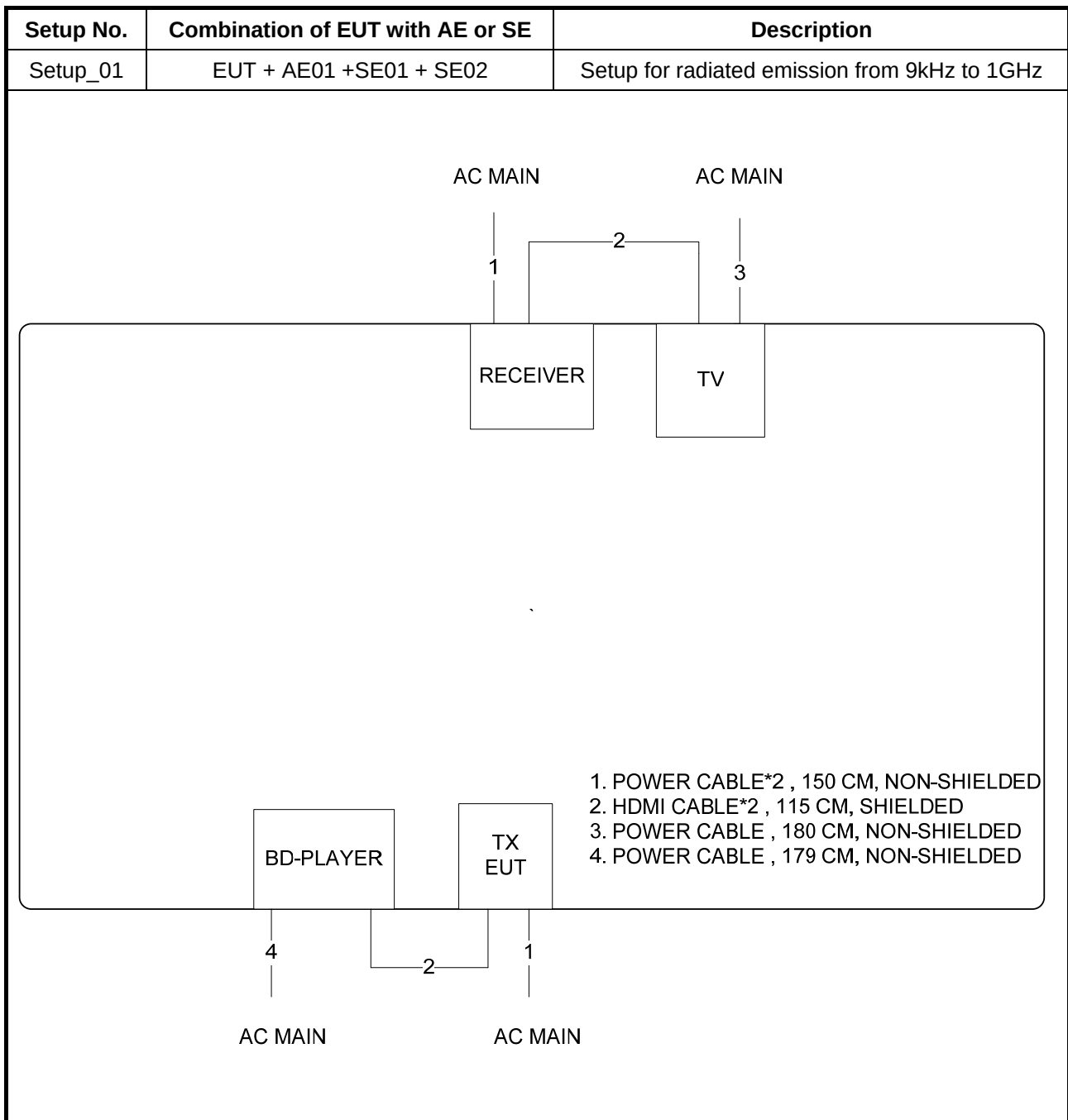
1.3 Ancillary and/or Support Equipment

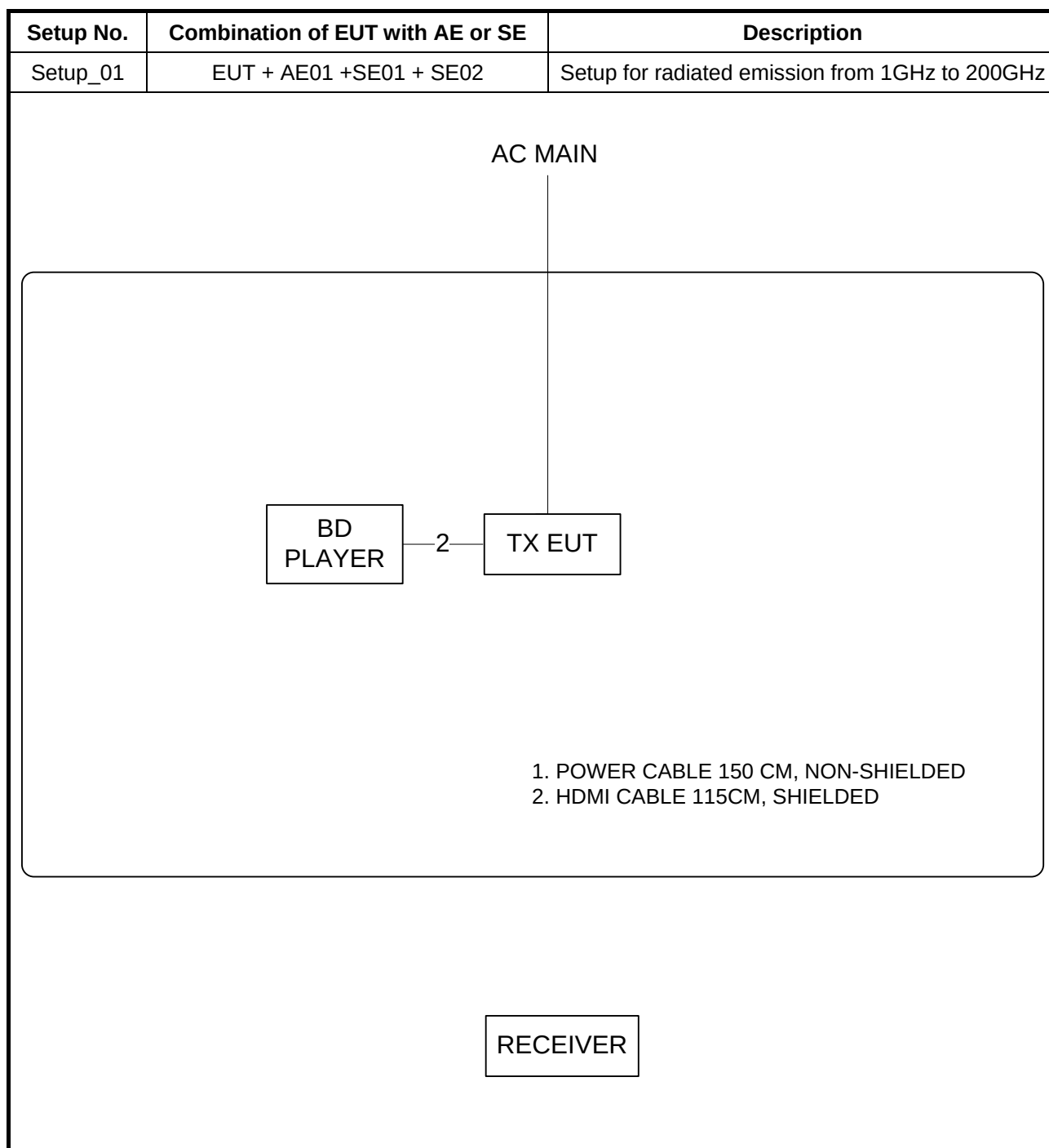
Ancillary Equipment (AE)				
Item	Equipment	Brand Name	Model Name	Serial No.
AE01	AC Power Adapter	DVE	DSA-12PFA-05 FUS	-

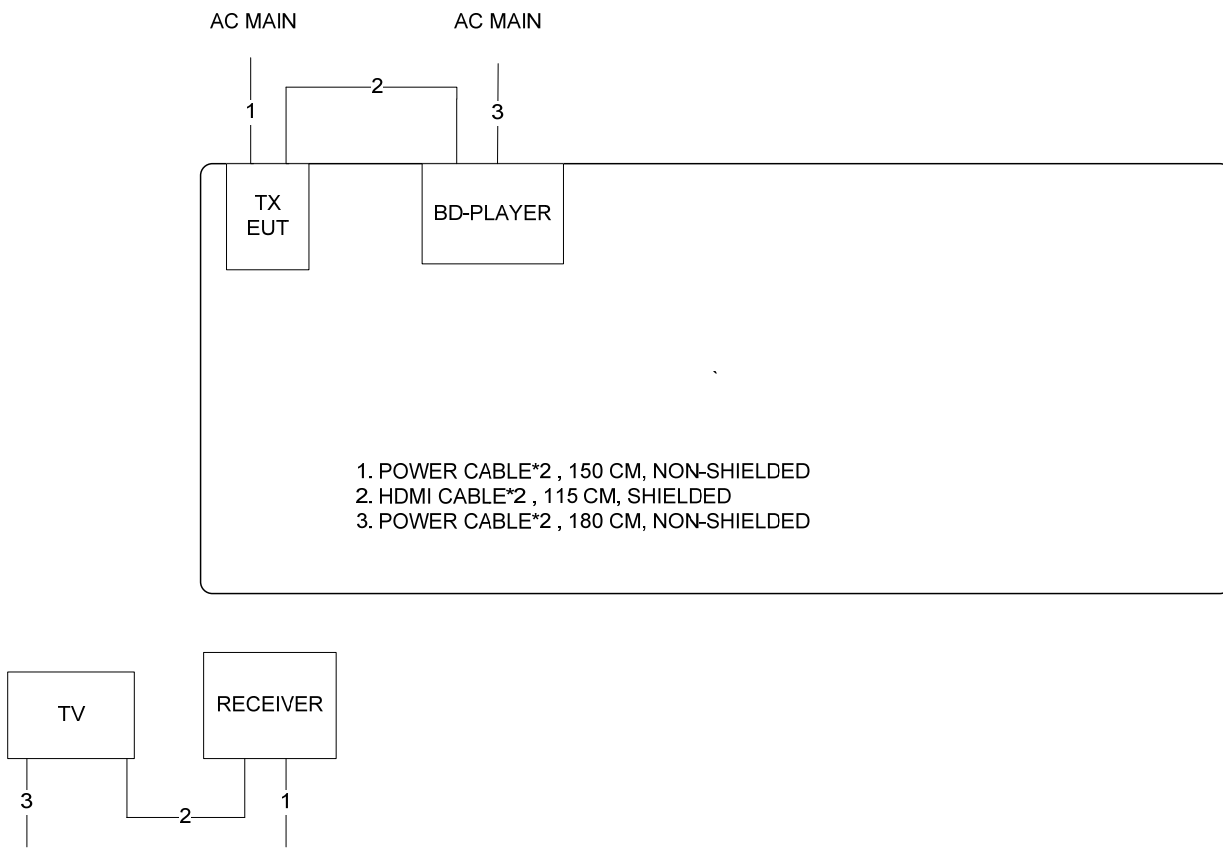
Support Equipment (SE)				
Item	Equipment	Brand Name	Model Name	Serial No.
SE01	LCD Monitor	DELL	2709wb	LM-D
SE02	BD-PLAYER	SONY	BDP-BX1	BD-A

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 +SE01 + SE02	Setup for AC power conducted emission
 1. POWER CABLE*2 , 150 CM, NON-SHIELDED 2. HDMI CABLE*2 , 115 CM, SHIELDED 3. POWER CABLE*2 , 180 CM, NON-SHIELDED		

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.			
05CH01-HY	03CH03-HY	-	-

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)
AC Power Conducted Emissions	-	F4
Occupied Bandwidth	F1, F2, F3	F4
Power Density	F1, F2, F3	F4
Peak Conducted Power	F1, F2, F3	F4
Transmitter Spurious Emissions	-	F4
Frequency Stability	-	F4
F1: The centre frequency of the lowest declared channel for every declared nominal bandwidth within this band. F2, F4: 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.

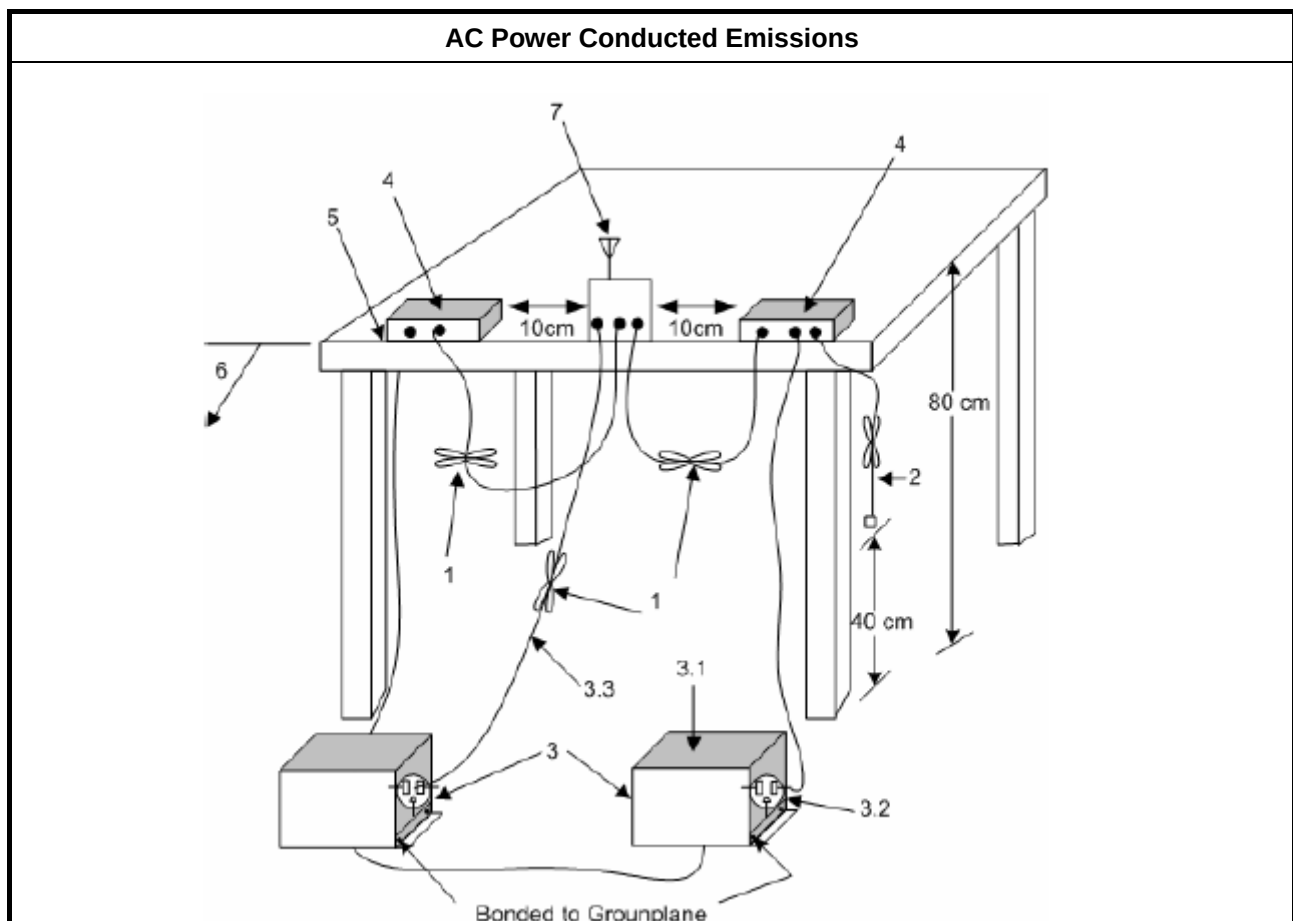
3.1.2 Measuring Instruments

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

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

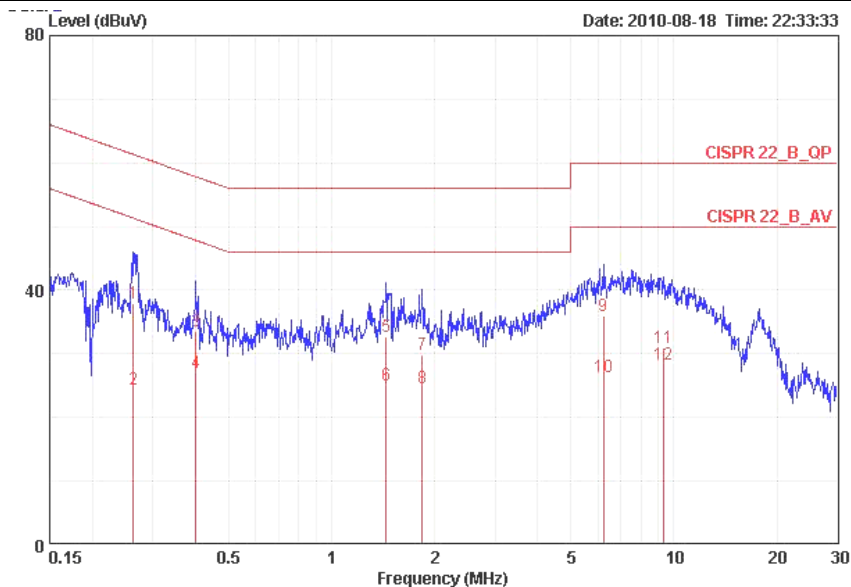
Test Setup: see ANSI C63.10, clause 6.2.3

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.

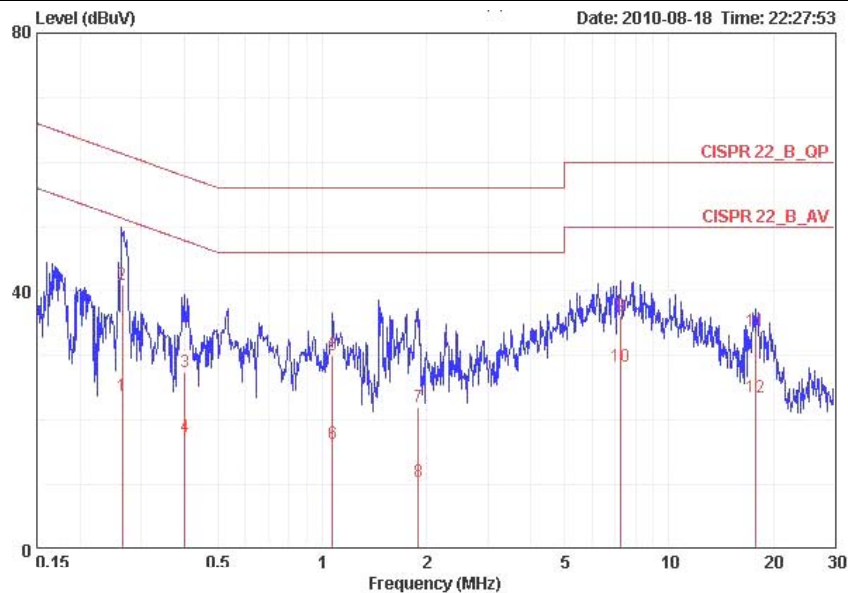
Temp:	23 °C	Humidity:	54%
Test Engineer:	Beck Wu	Phase:	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.26303	38.01	-23.33	61.34	37.73	0.08	0.20	QP
2	0.26303	24.36	-26.98	51.34	24.08	0.08	0.20	AVERAGE
3	0.40187	33.55	-24.26	57.81	33.28	0.07	0.20	QP
4 B	0.40187	27.06	-20.75	47.81	26.79	0.07	0.20	AVERAGE
5	1.441	32.60	-23.40	56.00	32.41	0.08	0.11	QP
6	1.441	25.07	-20.93	46.00	24.88	0.08	0.11	AVERAGE
7	1.839	29.96	-26.04	56.00	29.70	0.09	0.17	QP
8	1.839	24.56	-21.44	46.00	24.30	0.09	0.17	AVERAGE
9	6.219	36.00	-24.00	60.00	35.40	0.26	0.34	QP
10	6.219	26.35	-23.65	50.00	25.75	0.26	0.34	AVERAGE
11	9.352	31.03	-28.97	60.00	30.36	0.37	0.30	QP
12	9.352	28.37	-21.63	50.00	27.70	0.37	0.30	AVERAGE

Measurement uncertainty: ± 2.26 dB

Temp:	23 °C	Humidity:	54%
Test Engineer:	Beck Wu	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	0.26483	23.69	-27.59	51.28	23.45	0.04	0.20	AVERAGE
2	0.26483	41.04	-20.24	61.28	40.80	0.04	0.20	QP
3	0.40187	27.50	-30.31	57.81	27.27	0.03	0.20	QP
4	0.40187	17.43	-30.38	47.81	17.20	0.03	0.20	AVERAGE
5	1.071	29.99	-26.01	56.00	29.77	0.03	0.18	QP
6	1.071	16.30	-29.70	46.00	16.08	0.03	0.18	AVERAGE
7	1.888	21.98	-34.02	56.00	21.75	0.05	0.18	QP
8	1.888	10.57	-35.43	46.00	10.34	0.05	0.18	AVERAGE
9	7.252	36.18	-23.82	60.00	35.57	0.26	0.35	QP
10	7.252	28.29	-21.71	50.00	27.68	0.26	0.35	AVERAGE
11	17.755	33.71	-26.29	60.00	32.50	0.71	0.50	QP
12	17.755	23.52	-26.48	50.00	22.31	0.71	0.50	AVERAGE

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.

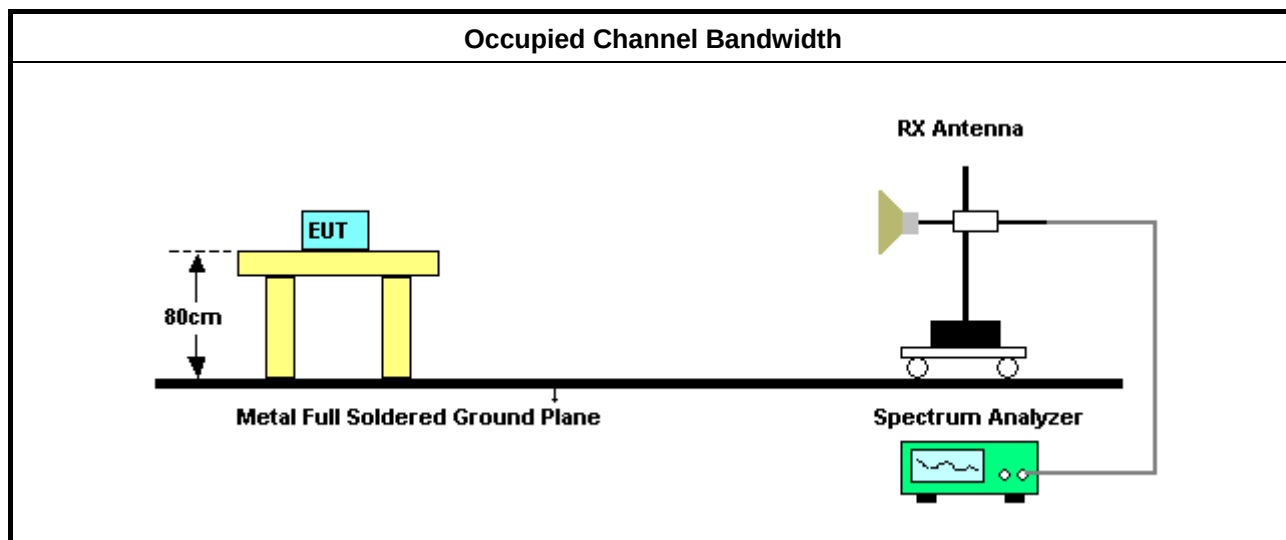
3.2.2 Measuring Instruments

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



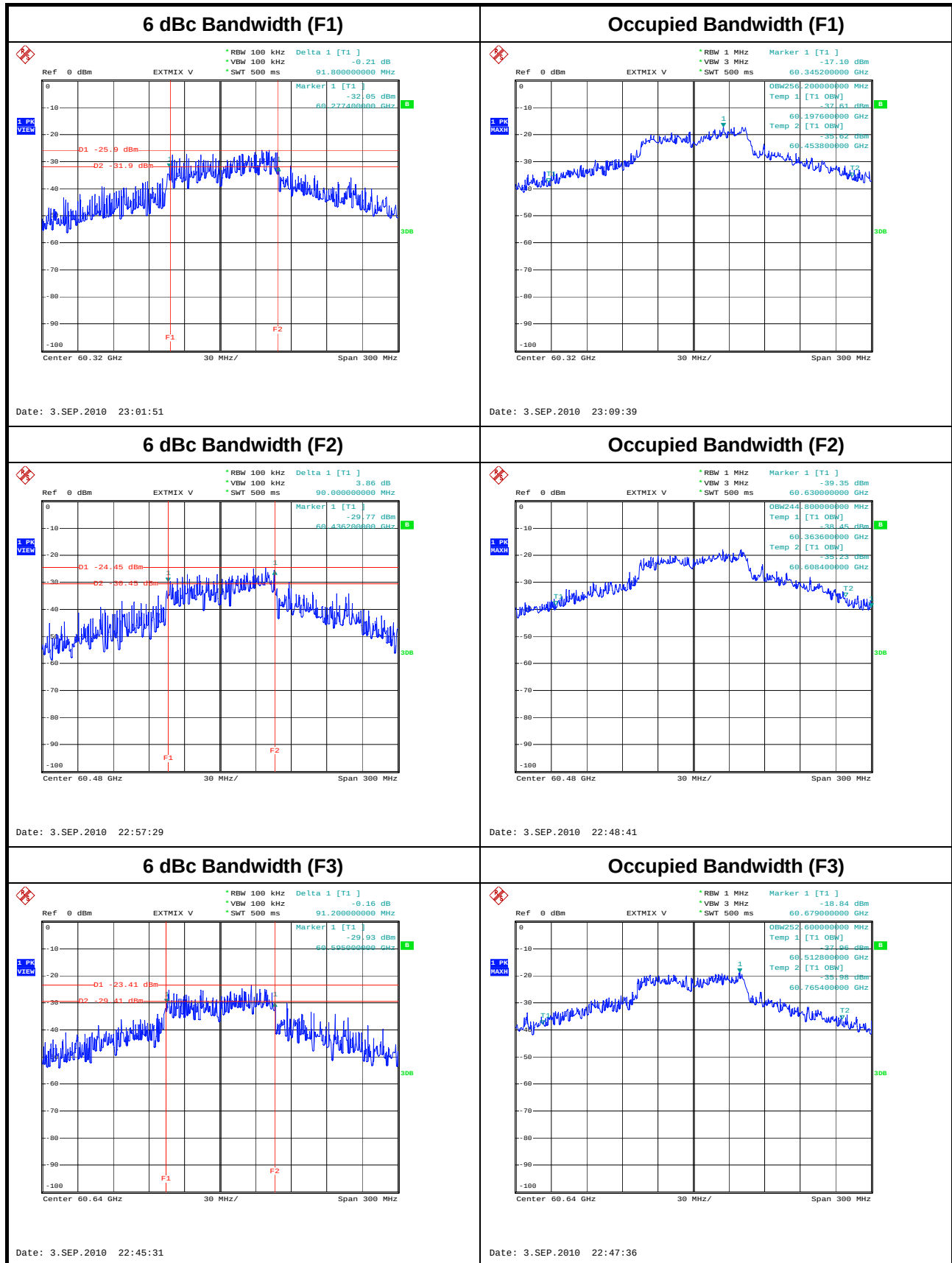
3.2.5 Test Result of Occupied Bandwidth

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 60.48 GHz / 62.64GHz (HRP) 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°C			
Test results							
Test Frequency:			6 dBc Bandwidth (MHz)	Occupied Bandwidth (MHz)	26 dBc Bandwidth (MHz)	Limit (MHz)	Margin (MHz)
F1	60.32	GHz	91.8	256.2	-	N/A	N/A
F2	60.48	GHz	90.0	244.8	-	N/A	N/A
F3	60.64	GHz	91.2	252.6	-	N/A	N/A
F4	60.48	GHz	1760.0	2736.0	4716.0	N/A	N/A
F1	62.48	GHz	91.8	252.0	-	N/A	N/A
F2	62.64	GHz	90.0	244.2	-	N/A	N/A
F3	62.80	GHz	90.6	259.8	-	N/A	N/A
F4	62.64	GHz	1700.0	2748.0	4308.0	N/A	N/A
Measurement uncertainty:			±8.5×10 ⁻⁸ Hz				

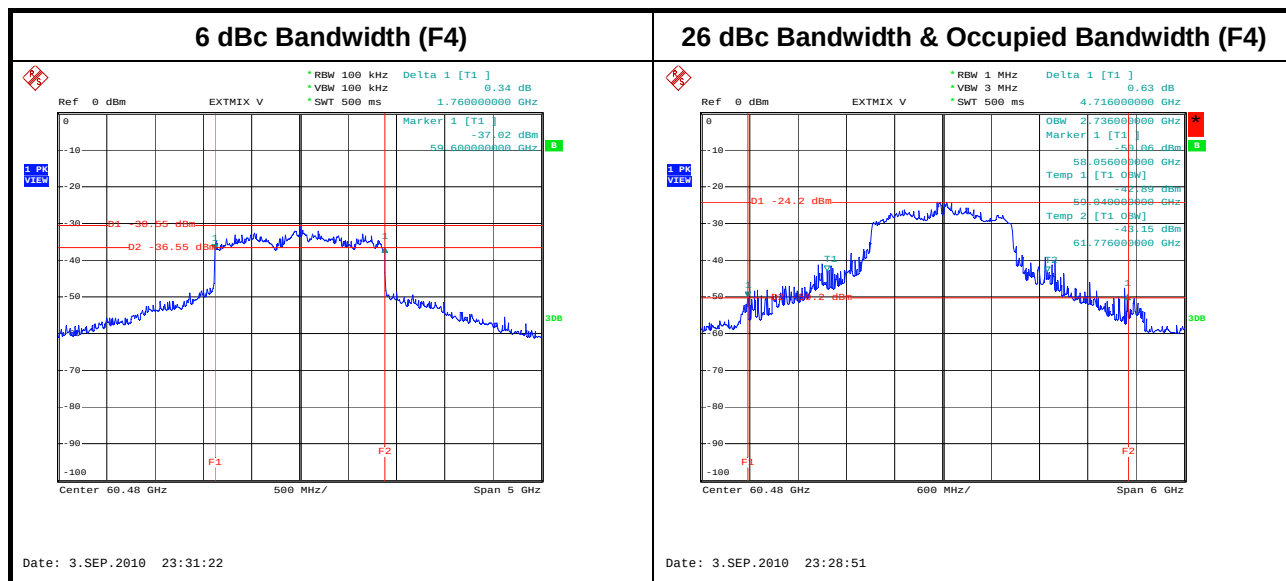


3.2.5.1 Bandwidth Plots for 60.32 – 60.64 GHz (LRP) Band

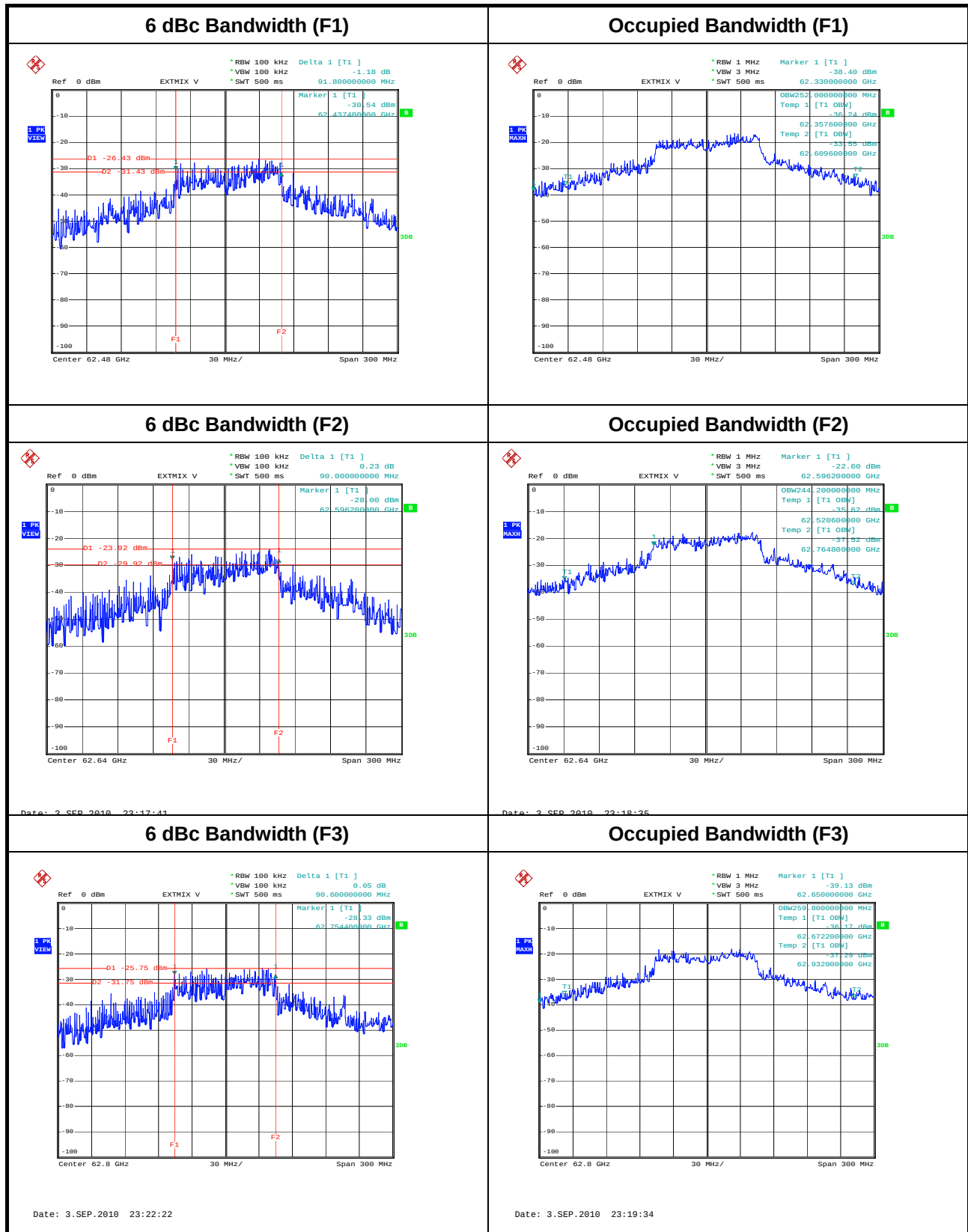




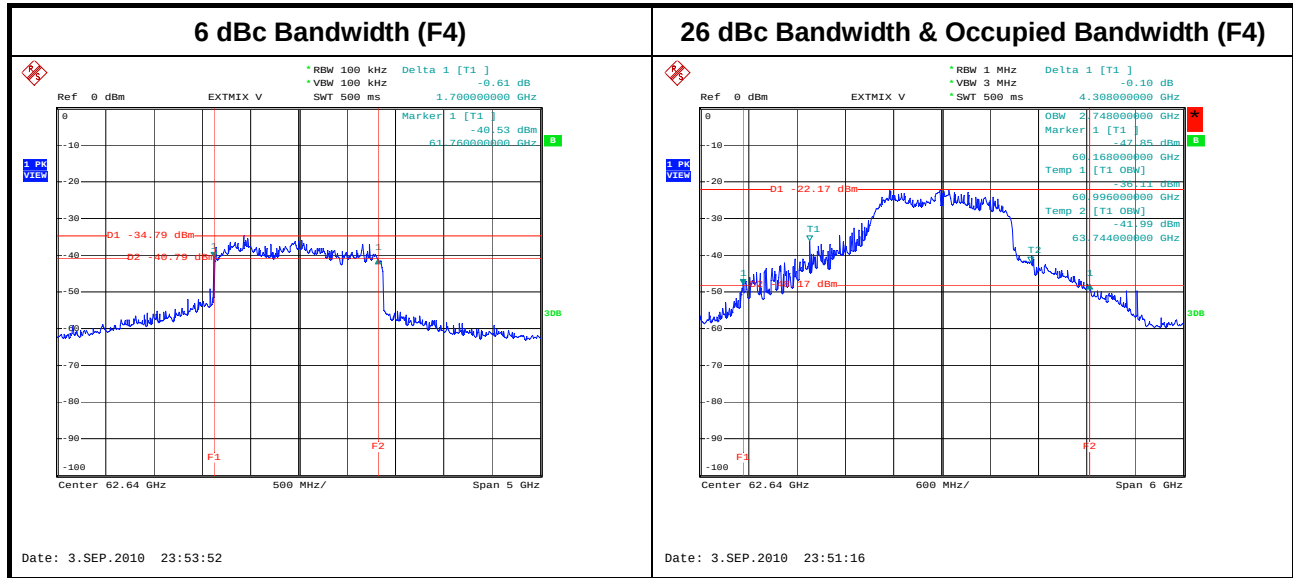
3.2.5.2 Bandwidth Plots for 60.48 GHz (HRP) Band



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



3.2.5.4 Bandwidth Plots for 62.64 GHz (HRP) Band



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)		

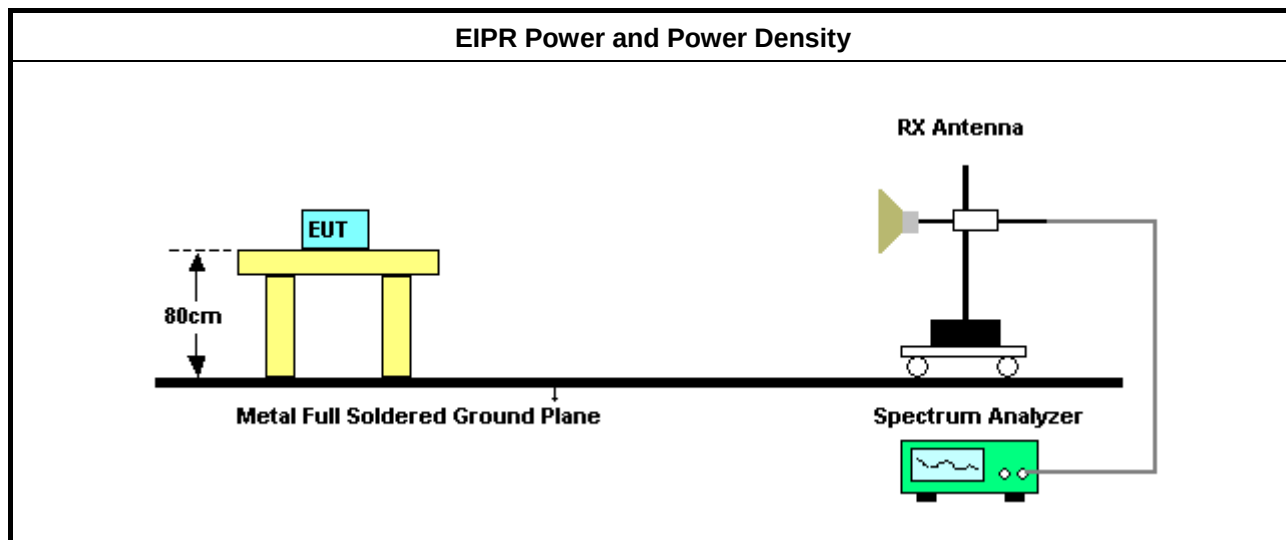
3.3.2 Measuring Instruments

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



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 60.48 GHz / 62.64GHz (HRP) 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.	

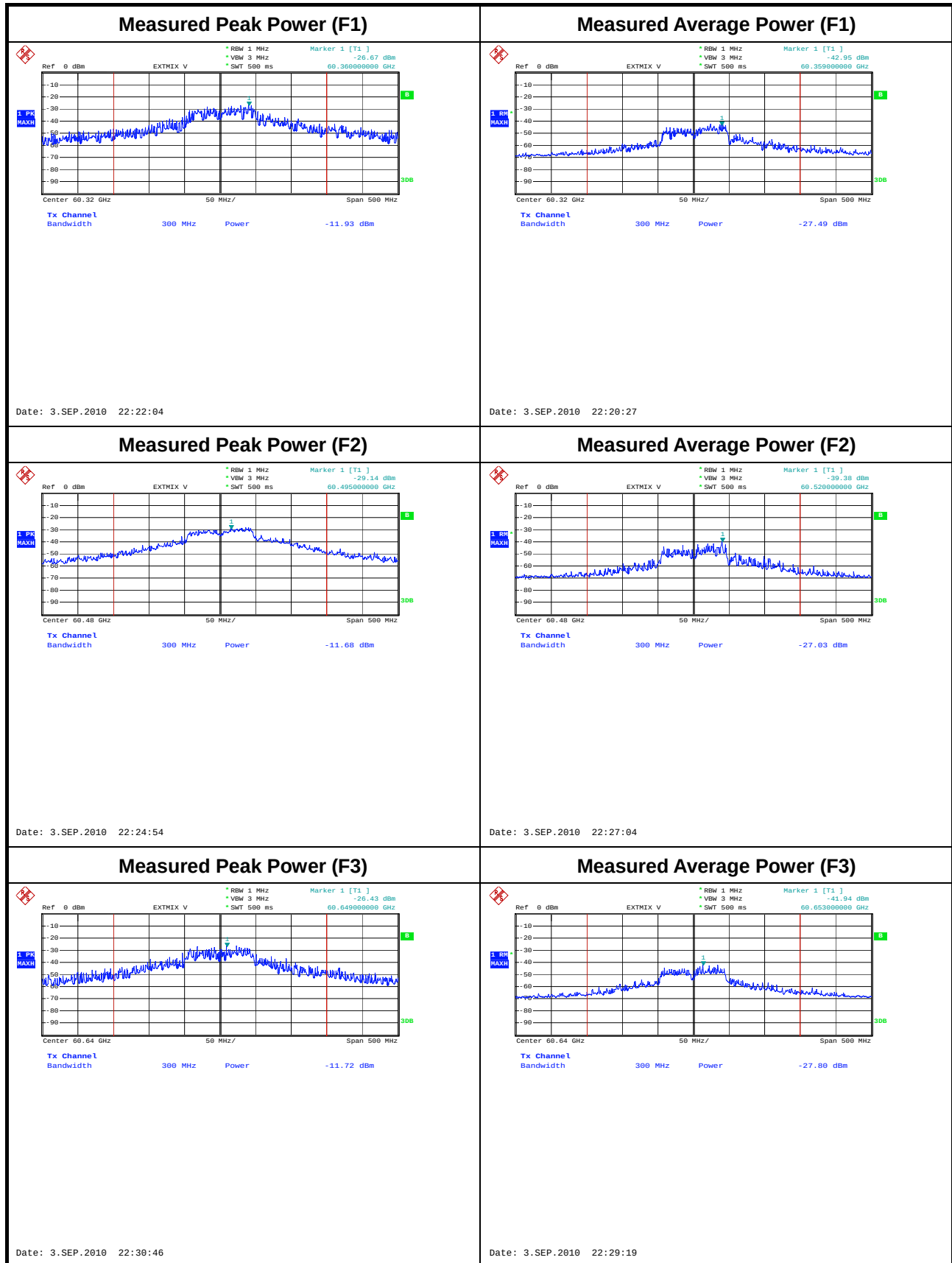
3.3.5.1 Test Result of EIRP Power

Maximum Antenna Gain:		16	dBi for 60.32 – 60.64 GHz /62.48 – 62.80(LRP) Band						
Maximum Antenna Gain:		22	dBi for 60.48 GHz / 62.64GHz (HRP) 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°C		
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	-27.49	-11.93	11.54	27.10	40.08	43.08	28.54	15.98
F2	60.48 GHz	-27.03	-11.68	12.02	27.37	40.08	43.08	28.06	15.71
F3	60.64 GHz	-27.8	-11.72	11.28	27.36	40.08	43.08	28.80	15.72
F4	60.48 GHz	-4.69	1.84	34.36	40.89	40.08	43.08	5.72	2.19
F1	62.48 GHz	-27.73	-11.82	11.61	27.52	40.08	43.08	28.47	15.56
F2	62.64 GHz	-27.62	-11.54	11.74	27.82	40.08	43.08	28.34	15.26
F3	62.80 GHz	-27.29	-11.25	12.09	28.13	40.08	43.08	27.99	14.95
F4	62.64 GHz	-4.07	1.3	35.29	40.66	40.08	43.08	4.79	2.42
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

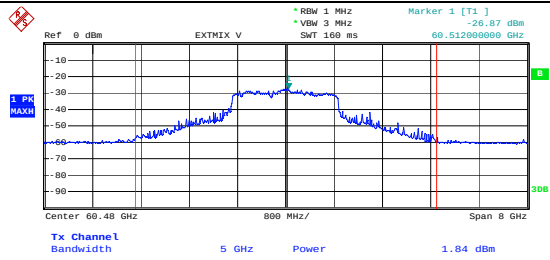
Maximum Antenna Gain:		16	dBi for 60.32 – 60.64 GHz /62.48 – 62.80(LRP) Band						
Maximum Antenna Gain:		22	dBi for 60.48 GHz / 62.64GHz (HRP) Band						
Equipment Use Condition:		☐	Fixed field disturbance sensors at 61-61.5GHz						
		☐	Except fixed field disturbance sensors at 61-61.5GHz						
		☒	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 (μW/cm²)		EIRP Power Density Limit (μW/cm²)		Margin (μW/cm²)	
		AV	Peak	AV	Peak	AV	Peak	AV	Peak
F1	60.32 GHz	11.57	27.10	0.013	0.454	9	18	8.987	17.546
F2	60.48 GHz	12.02	27.37	0.014	0.483	9	18	8.986	17.517
F3	60.64 GHz	11.28	27.36	0.012	0.481	9	18	8.988	17.519
F4	60.48 GHz	34.36	40.89	2.415	10.861	9	18	6.585	7.139
F1	62.48 GHz	11.61	27.52	0.013	0.499	9	18	8.987	17.501
F2	62.64 GHz	11.74	27.82	0.013	0.535	9	18	8.987	17.465
F3	62.80 GHz	12.09	28.13	0.014	0.575	9	18	8.986	17.425
F4	62.64 GHz	35.29	40.66	2.988	10.289	9	18	6.012	7.711
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 & 60.48 GHz (HRP) Band



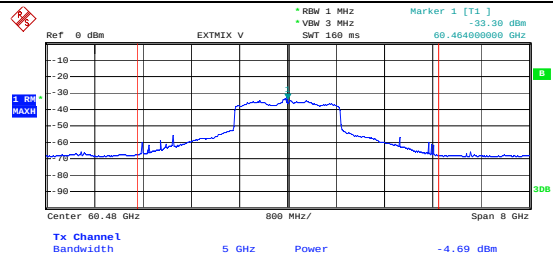


Measured Peak Power (F4)



Date: 3.SEP.2010 23:38:15

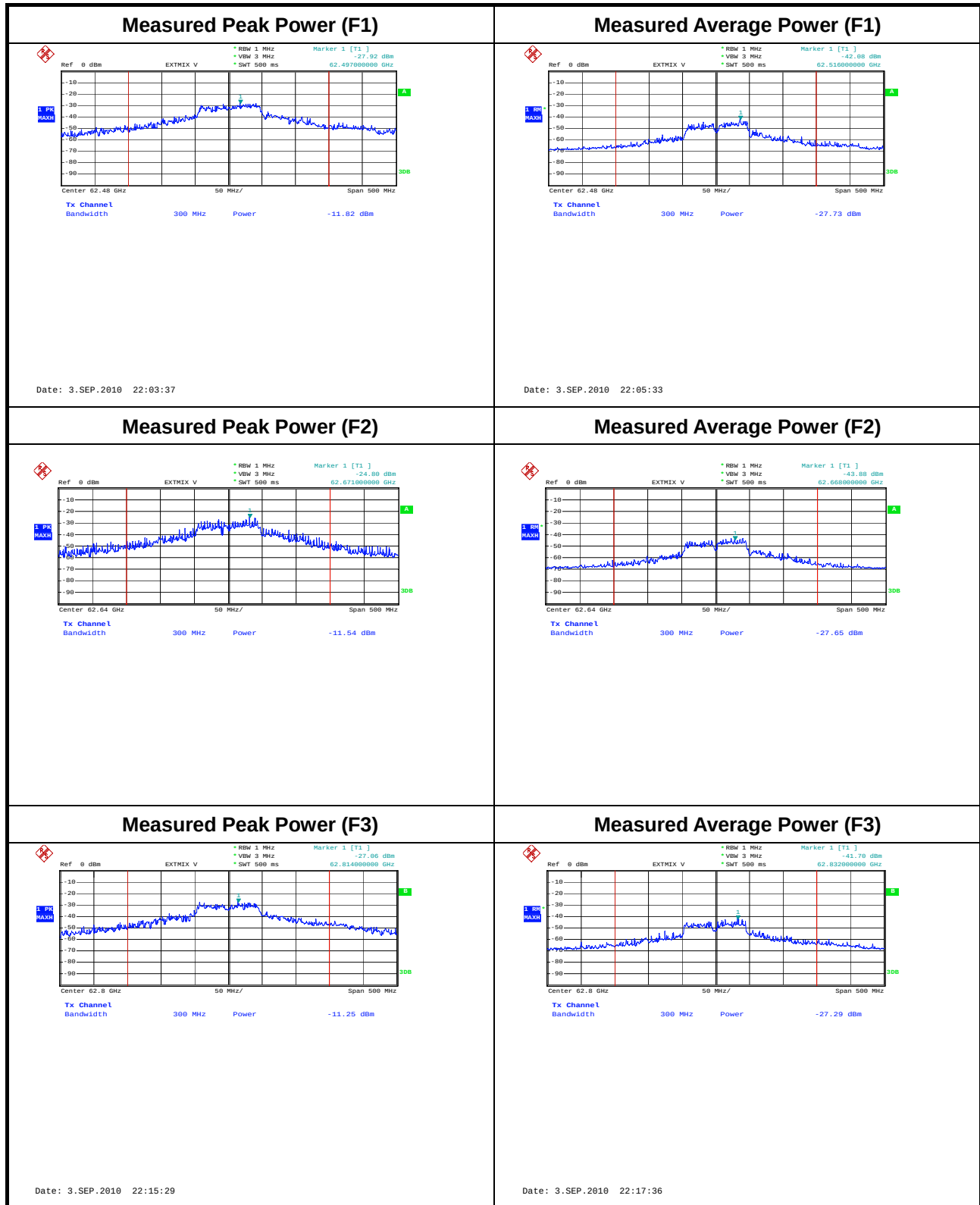
Measured Average Power (F4)



Date: 3.SEP.2010 23:39:24

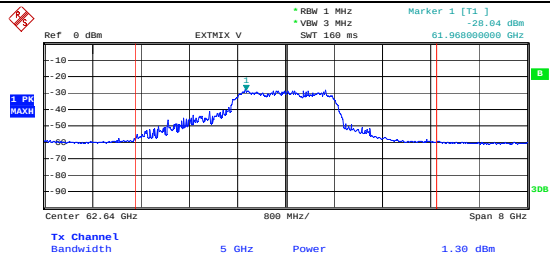


3.3.5.4 Measured Power Plots for 62.48 – 60.80 GHz (LRP) Band & 62.64 GHz (HRP) Band



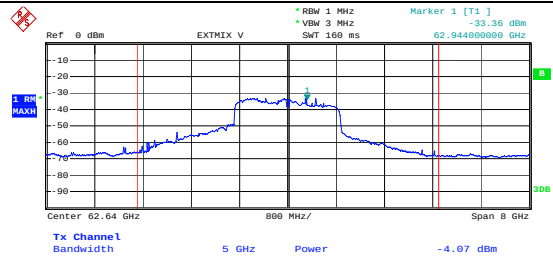


Measured Peak Power (F4)



Date: 3.SEP.2010 23:45:05

Measured Average Power (F4)



Date: 3.SEP.2010 23:42:28

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)	

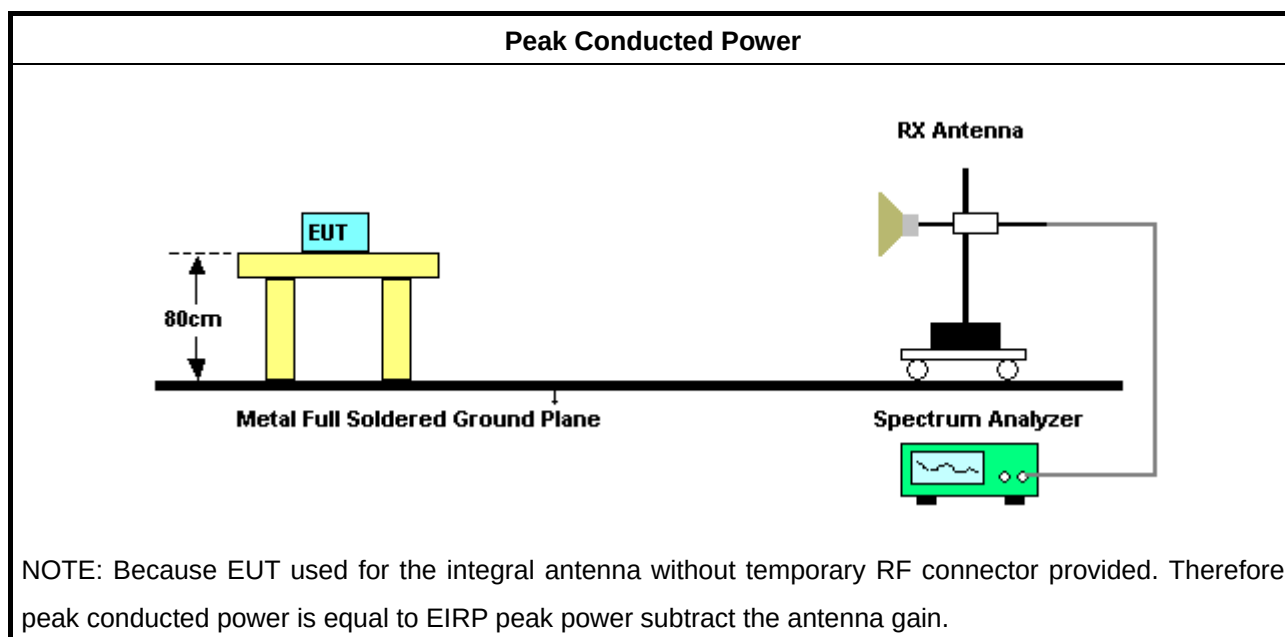
3.4.2 Measuring Instruments

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



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 60.48 GHz / 62.64GHz (HRP) 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 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	27.10	16	11.10	12.884	91.80	459.00	446.116
F2 60.48 GHz	27.37	16	11.37	13.720	90.00	450.00	436.280
F3 60.64 GHz	27.36	16	11.36	13.666	91.20	456.00	442.334
F4 60.48 GHz	40.89	22	18.89	77.507	1,760.00	500.00	422.493
F1 62.48 GHz	27.52	16	11.52	14.177	91.80	459.00	444.823
F2 62.64 GHz	27.82	16	11.82	15.199	90.00	450.00	434.801
F3 62.80 GHz	28.13	16	12.13	16.332	90.60	453.00	436.668
F4 62.64 GHz	40.66	22	18.66	73.421	1,700.00	500.00	426.579
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.	

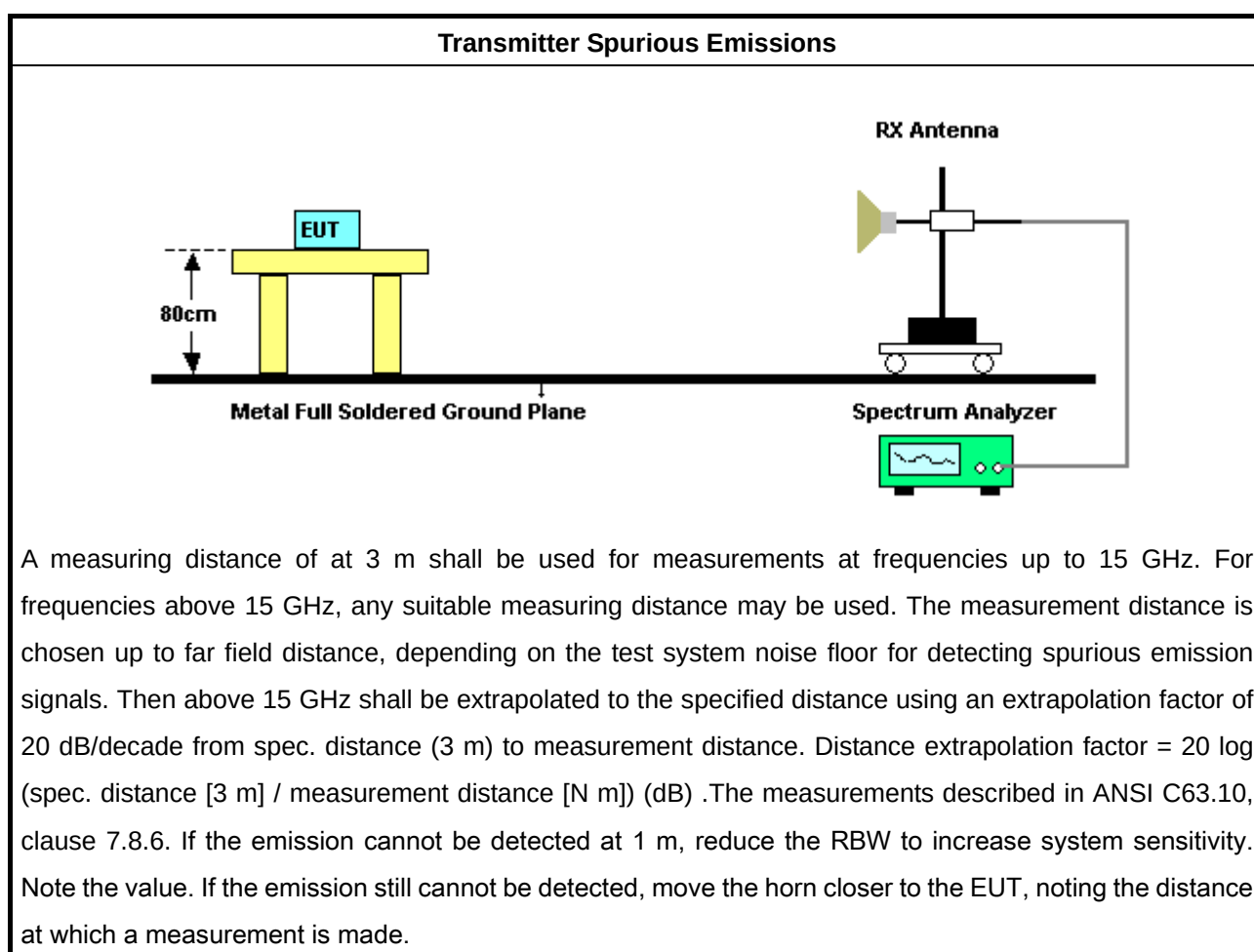
3.5.2 Measuring Instruments

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

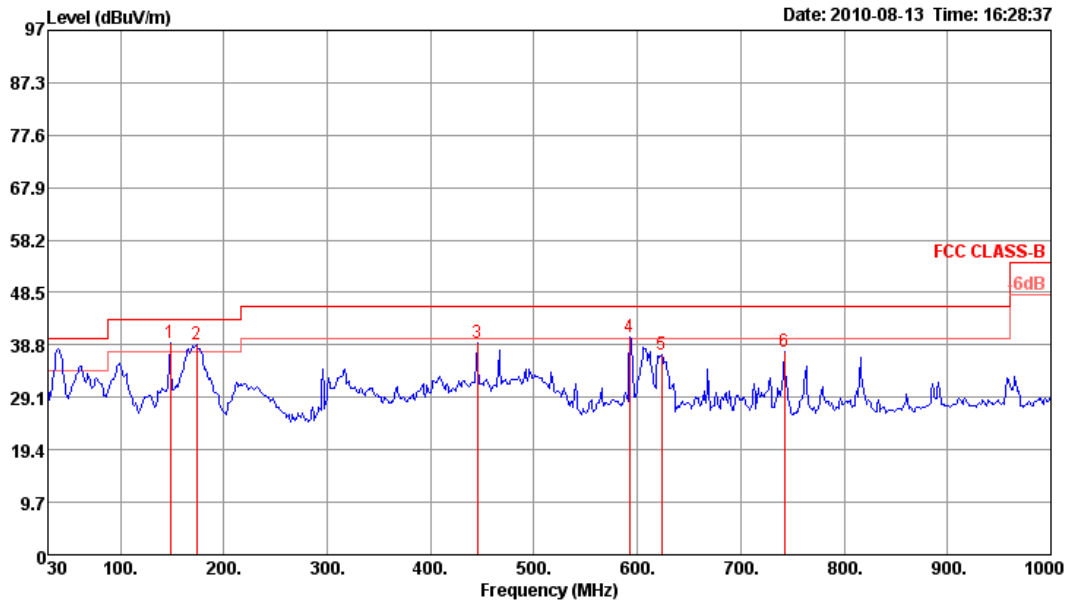


3.5.5 Test Result of Transmitter Spurious Emissions

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 (HRP) 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 (HRP) band, Test Frequency F4, Radiated Testing

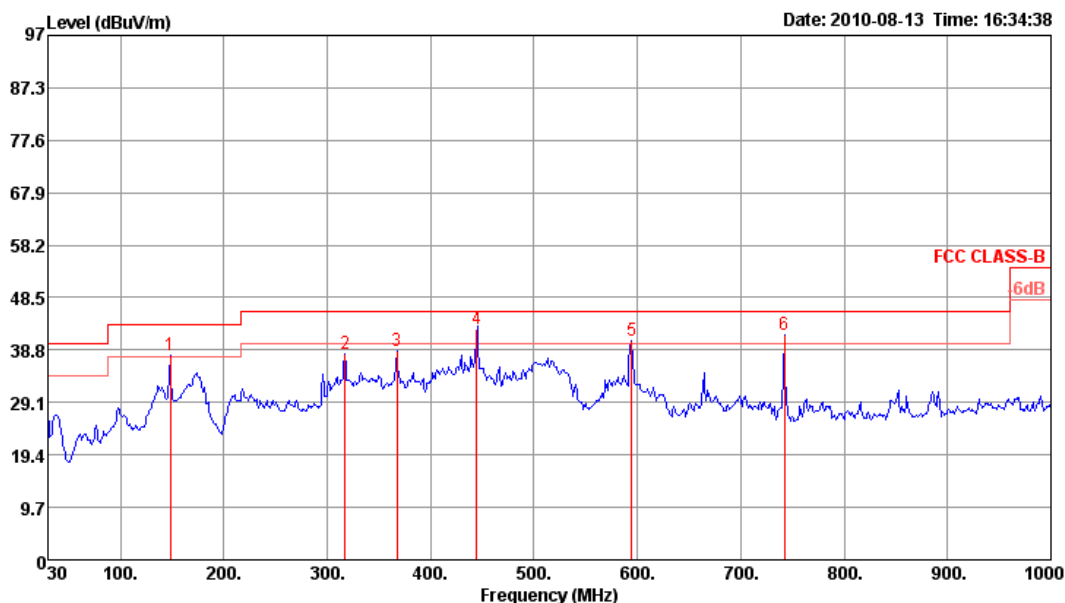
Test Conditions:	see ANSI C63.10, clause 5.11	Polarization:	Vertical
Test Engineer:	Sam Chen	Test Distance:	3 m
Test Range:	30 MHz – 1000 MHz		



	Freq	Level	Limit	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	148.34	39.21	43.50	-4.29	53.19	1.44	27.36	11.94	0	400	Peak	VERTICAL
2	173.56	38.85	43.50	-4.65	51.46	1.57	27.23	13.05	0	400	Peak	VERTICAL
3	445.16	39.29	46.00	-6.71	47.78	2.57	27.83	16.77	0	400	Peak	VERTICAL
4	592.60	40.22	46.00	-5.78	46.76	2.88	28.10	18.68	0	400	Peak	VERTICAL
5	623.64	37.14	46.00	-8.86	43.34	3.04	28.08	18.84	0	400	Peak	VERTICAL
6	741.98	37.67	46.00	-8.33	42.66	3.47	27.83	19.37	0	400	Peak	VERTICAL

Measurement uncertainty: ±2.7 dB

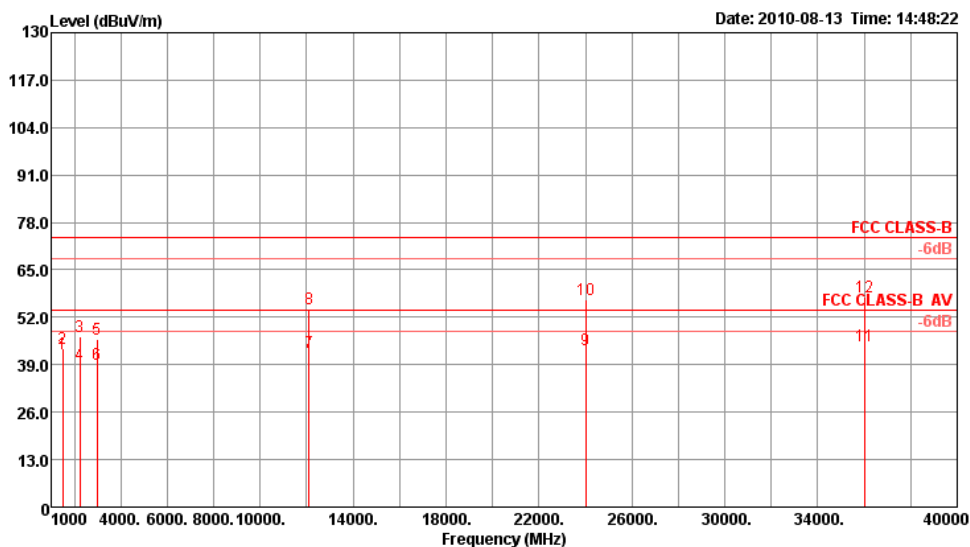
Test Conditions:	see ANSI C63.10, clause 5.11	Polarization:	Horizontal
Test Engineer:	Sam Chen	Test Distance:	3 m
Test Range:	30 MHz – 1000 MHz		



	Freq	Level	Limit	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	148.34	37.90	43.50	-5.60	51.88	1.44	27.36	11.94	0	100	Peak	HORIZONTAL
2	317.12	38.01	46.00	-7.99	49.07	2.13	27.02	13.83	0	100	Peak	HORIZONTAL
3	367.56	38.57	46.00	-7.43	48.52	2.24	27.38	15.19	0	100	Peak	HORIZONTAL
4	445.00	42.61	46.00	-3.39	51.09	2.57	27.82	16.77	3	100	QP	HORIZONTAL
5	594.54	40.54	46.00	-5.46	47.05	2.89	28.10	18.70	0	100	Peak	HORIZONTAL
6	741.98	41.65	46.00	-4.35	46.64	3.47	27.83	19.37	0	100	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:	1GHz – 40 GHz		

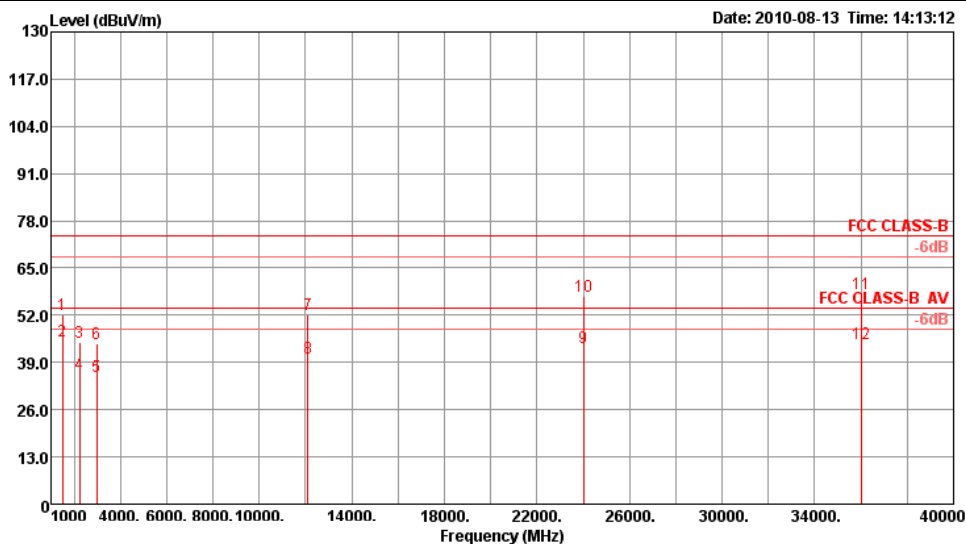


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase	Au Facto
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm			d
1	1483.53	41.83	54.00	-12.17	49.57	1.56	34.73	25.43	68	100	Average	VERTICAL	0.0
2	1483.62	43.50	74.00	-30.50	51.24	1.56	34.73	25.43	68	100	Peak	VERTICAL	0.0
3	2225.12	46.62	74.00	-27.38	51.26	1.96	34.74	28.14	154	100	Peak	VERTICAL	0.0
4	2225.31	39.03	54.00	-14.97	43.67	1.96	34.74	28.14	154	100	Average	VERTICAL	0.0
5	2966.97	46.05	74.00	-27.95	49.55	2.38	34.98	29.10	122	100	Peak	VERTICAL	0.0
6	2967.03	39.04	54.00	-14.96	42.54	2.38	34.98	29.10	122	100	Average	VERTICAL	0.0
7	12095.99	42.43	54.00	-11.57	33.31	5.61	35.13	38.64	187	100	Average	VERTICAL	0.0
8	12096.00	54.48	74.00	-19.52	45.36	5.61	35.13	38.64	187	100	Peak	VERTICAL	0.0
9	23999.54	42.94	54.00	-11.06	31.29	6.17	34.12	39.60	26	100	Average	VERTICAL	0.0
10	23999.65	56.91	74.00	-17.09	45.26	6.17	34.12	39.60	104	100	Peak	VERTICAL	0.0
11	36010.06	44.07	54.00	-9.93	34.85	6.58	39.56	42.20	82	100	Average	VERTICAL	0.0
12	36010.50	57.66	74.00	-16.34	48.44	6.58	39.56	42.20	82	100	Peak	VERTICAL	0.0

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:	1GHz – 40 GHz		



	Freq	Level	Limit	Over	Read	Cable	Preamp	Antenna	T/Pos	A/Pos	Remark	Pol/Phase	Au
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	deg	cm			Facto
1	1483.33	52.13	74.00	-21.87	59.87	1.56	34.73	25.43	235	100	Peak	HORIZONTAL	0.0
2	1483.55	44.88	54.00	-9.12	52.62	1.56	34.73	25.43	235	100	Average	HORIZONTAL	0.0
3	2225.29	44.55	74.00	-29.45	49.19	1.96	34.74	28.14	107	100	Peak	HORIZONTAL	0.0
4	2225.29	36.00	54.00	-18.00	40.64	1.96	34.74	28.14	107	100	Average	HORIZONTAL	0.0
5	2967.03	35.22	54.00	-18.78	38.72	2.38	34.98	29.10	232	100	Average	HORIZONTAL	0.0
6	2967.35	44.33	74.00	-29.67	47.83	2.38	34.98	29.10	232	100	Peak	HORIZONTAL	0.0
7	12095.91	52.24	74.00	-21.76	43.12	5.61	35.13	38.64	48	100	Peak	HORIZONTAL	0.0
8	12096.01	40.19	54.00	-13.81	31.07	5.61	35.13	38.64	48	100	Average	HORIZONTAL	0.0
9	23999.50	42.91	54.00	-11.09	31.26	6.17	34.12	39.60	238	100	Average	HORIZONTAL	0.0
10	24000.32	57.24	74.00	-16.76	45.59	6.17	34.12	39.60	238	100	Peak	HORIZONTAL	0.0
11	36009.80	57.78	74.00	-16.22	48.56	6.58	39.56	42.20	153	100	Peak	HORIZONTAL	0.0
12	36009.91	44.07	54.00	-9.93	34.85	6.58	39.56	42.20	153	100	Average	HORIZONTAL	0.0

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

Frequency (GHz)	Measurement Distance (m)	Peak Power (dBm)	Rx Antenna Gain (dBi)	EIRP (dBm)
48.384	0.5	-61.00	23	-23.88
EIRP (W)	Specification Distance (m)	Power Density (W/m ²)	Power Density (pW/cm ²)	Limit (pW/cm ²)
4.08809E-06	3	3.61E-08	36.14665	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.	

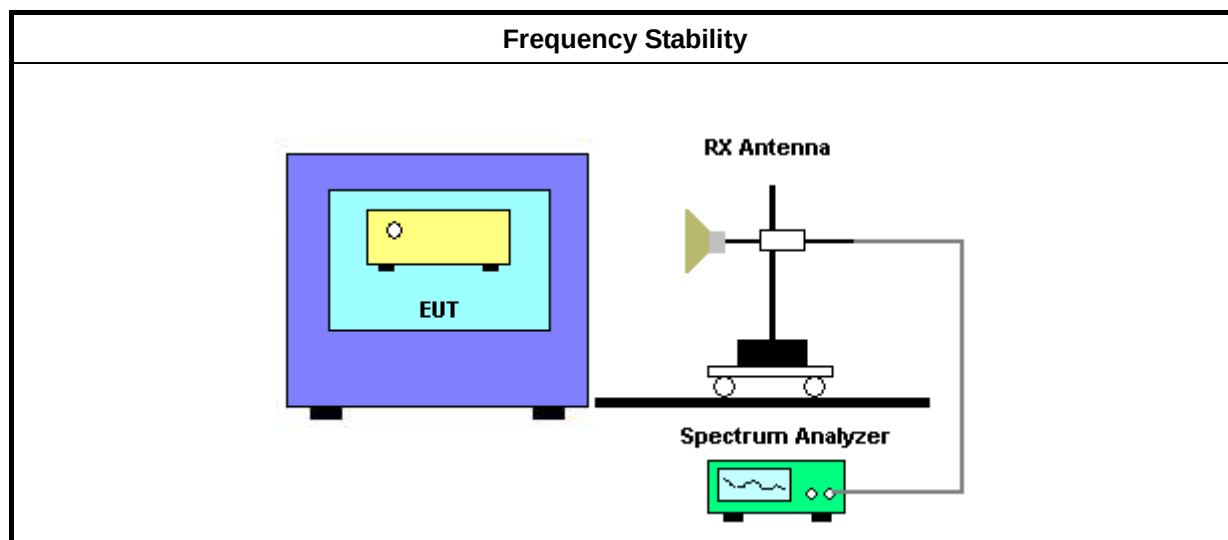
3.6.2 Measuring Instruments

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



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 (HRP) Band
Worse case modulation for this operating mode:	HRP – QPSK
Worse case data rate for this operating mode:	HRP – 0.952 Gb/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 results			
Test Temperature: (°C)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
0	60482.3	-450	within band
10	60482.5	-250	within band
20	60482.75	reference	within band
30	60482.5	-250	within band
40	60482.45	-300	within band
Measurement uncertainty: $\pm 8.5 \times 10^{-8}$ 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°C.			

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 results			
Test Voltage: (Vdc)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
4.25	60482.25	-500	within band
5	60482.75	reference	within band
5.75	60482.5	-250	within band
Measurement uncertainty: $\pm 8.5 \times 10^{-8}$ 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)	

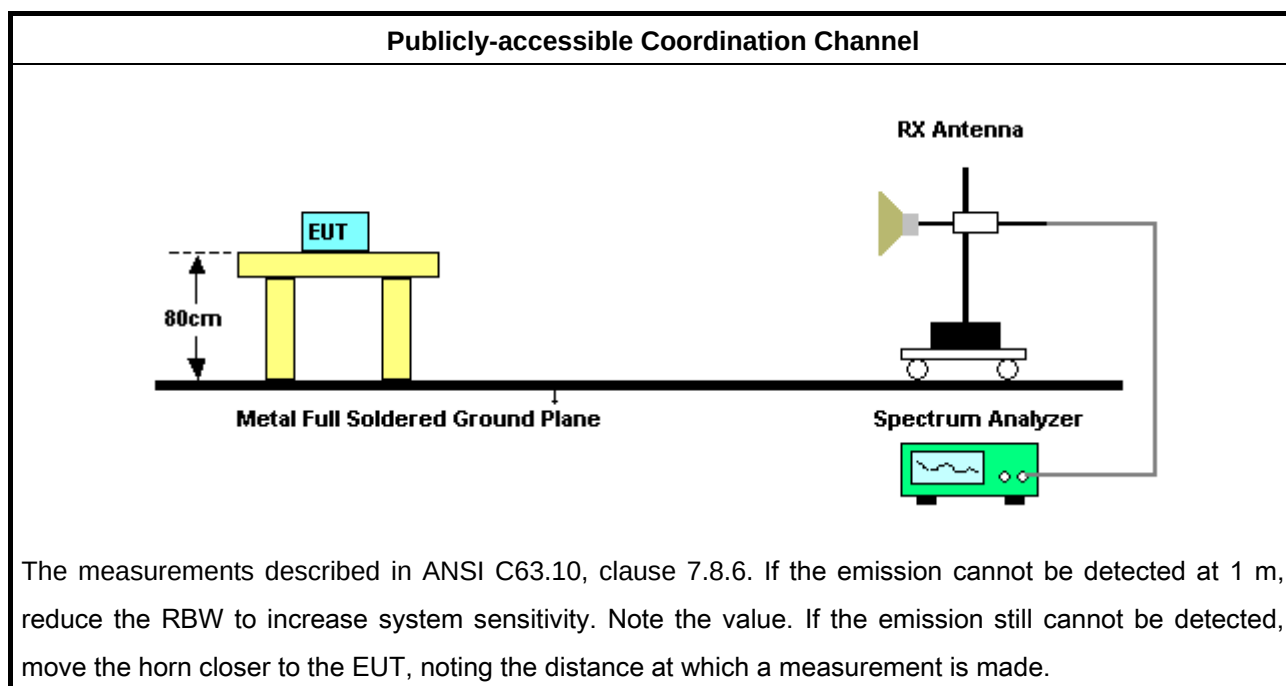
3.7.2 Measuring Instruments

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



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 (HRP) 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 (HRP) band, Test Frequency F4, 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 %				
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 be used on aircraft or satellites. Then user manual will include a statement to caution EUT is not permitted for use 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 $\geq 0.1\text{mW}$ (EIRP) or $3\text{nW}/\text{cm}^2$, 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/ cm ²)	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/ cm ²)	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

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

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

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

3.10.3 Result of Maximum Permissible Exposure

Exposure Environment: General Population / Uncontrolled Exposure						
Test 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 62.80 GHz	12.09	16.1821	0.003221	20	1.00	
HRP 60.48 GHz	35.29	3379.2474	0.672621	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
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 18, 2010	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	COA9231A	18667	9 kHz - 2 GHz	Jan. 24, 2010	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	Aug. 02, 2010	Radiation (03CH03-HY)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Nov. 17, 2009	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100004	9 kHz - 40 GHz	Oct. 03, 2009	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30 MHz ~ 1 GHz	Sep. 26, 2009	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	May 20, 2010	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	Jan.11, 2010	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz - 1 GHz	Jan. 05, 2010	Radiation (03CH03-HY)
RF Cable-high	Woken	High Cable-3	-	1 GHz - 40 GHz	Nov. 17, 2009	Radiation (03CH03-HY)
RF Cable-high	Woken	High Cable-4	-	1 GHz - 40 GHz	Nov. 17, 2009	Radiation (03CH03-HY)
Mixer	OML	M19HW/A	U91113-1	40 ~ 60 GHz	Nov. 16, 2009**	Radiation (03CH03-HY)
Mixer	OML	M15HW/A	V91113-1	50 ~ 75 GHz	Nov. 16, 2009**	Radiation (03CH03-HY)
Amplifier	HXI	HLNAV-361	2K911130	57~66GHz	Feb. 12, 2010	Radiation (03CH03-HY)
Isolator	HXI	HM15-385-60-4	2K911125	60~64GHz	Feb. 12, 2010	Radiation (03CH03-HY)
Diplexer	OML	DPL313B	-	40~200GHz	N.C.R	Radiation (03CH03-HY)
Mixer	OML	M12HW/A	E91113-1	60 ~ 90 GHz	Nov. 16, 2009**	Radiation (03CH03-HY)
Mixer	OML	M08HW/A	F91113-1	90 ~ 140 GHz	Nov. 16, 2009**	Radiation (03CH03-HY)
Mixer	OML	M05HW/A	G91113-1	140 ~ 220 GHz	Nov. 16, 2009**	Radiation (03CH03-HY)
Standard Horn Antenna	Custom Microwave	HO19R	U91113-A	40 ~ 60 GHz	N.C.R	Radiation (03CH03-HY)
Standard Horn Antenna	Custom Microwave	HO15R	V91113-A	50 ~ 75 GHz	N.C.R	Radiation (03CH03-HY)
Standard Horn Antenna	Custom Microwave	HO12R	E91113-A	60 ~ 90 GHz	N.C.R	Radiation (03CH03-HY)
Standard Horn Antenna	Custom Microwave	HO08R	F91113-A	90 ~ 140 GHz	N.C.R	Radiation (03CH03-HY)
Standard Horn Antenna	Custom Microwave	HO05R	G91113-A	140 ~ 220 GHz	N.C.R	Radiation (03CH03-HY)

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Remark
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Jan. 05, 2010	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 – 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Jul. 29, 2010*	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSU26.5	100015	20Hz ~ 26.5GHz	Oct. 29, 2009	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jul. 25, 2010	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100666	DC ~ 30GHz	Jul. 26, 2010	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jul. 25, 2010	Conducted (TH01-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	Jul. 26, 2010*	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Apr. 16, 2010	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-S	MAB0103-001	N/A	Aug. 06, 2009	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 02, 2009	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 02, 2009	Conducted (TH01-HY)
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Feb. 13, 2010	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 30, 2010	Conducted (TH01-HY)
Power Sensor	Anritsu	MA2411B	0917017	300MHz~40GHz	Dec. 03, 2009	Conducted (TH01-HY)
Power Meter	Anritsu	ML2495A	0949003	300MHz~40GHz	Dec. 03, 2009	Conducted (TH01-HY)

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

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

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

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

5 Certification of TAF Accreditation



Certificate No. : L1190-070110

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, 2007 to January 09, 2010
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


Jay-San Chen
President, Taiwan Accreditation Foundation
Date : January 10, 2007

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