

#### Shenzhen Huatongwei International Inspection Co., Ltd.

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Verome lus Yingihun shan Wenting



#### **FCC TEST REPORT**

# 47 CFR FCC Part 15 Subpart B

Report Reference No...... TRE13110001 R/C:45684

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Date of issue...... Nov 12, 2013

Testing Laboratory Name ............ Shenzhen Huatongwei International Inspection Co., Ltd

Address ...... Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

Applicant's name...... Asoka USA Corporation .

Test specification .....:

ANSI C63.4: 2009

Master TRF...... Dated 2006-06

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Test item description ...... PlugLink HD AV Adapter

Trade Mark ...... /

Model/Type reference...... PL9660-Q1

Operation Frequency...... From 2MHz to 30MHz

Listed Models .....

Result..... PASS

# TEST REPORT

Test Report No. :	TRE13110001	Nov 12, 2013
rest Report No	IKEISII0001	Date of issue

Equipment under Test : PlugLink HD AV Adapter

Model /Type : PL9660-Q1

Listed Models : /

Applicant : Asoka USA Corporation.

Address : 2620 Augustine Drive Suite 230, Santa Clara City, CA

95054

Manufacturer : ASOKA Shenzhen Limited.

Address : Room 1701,17/F., Fiyta Hi Tech Building, Gao-Xin Rd,

South, Shenzhen, PR China

Test Result	PASS

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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# 1. TEST STANDARDS

The tests were performed according to following standards:

47 CFR FCC Part 15 Subpart B - Unintentional Radiators

ANSI C63.4: 2009 – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in theRange of 9 kHz to 40GHz

# 2. SUMMARY

#### 2.1. General Remarks

Date of receipt of test sample	:	Aug 24, 2012
Testing commenced on	:	Aug 24, 2012
Testing concluded on	:	Nov 12,2013

# 2.2. Equipment Under Test

## Power supply system utilised

Power supply voltage	:	•	120V / 60 Hz	0	115V / 60Hz
		0	12 V DC	0	24 V DC
		0	Other (specified in blank bel	ow	

1

# 2.3. Short description of the Equipment under Test (EUT)

The EUT PlugLink HD AV Adapter is an In-House BPL device.

For more details, refer to the user's manual of the EUT.

Sample Type: Prototype

### 2.4. EUT operation mode

The EUT has been tested under typical operating condition.

# 2.5. Related Submittal(s) / Grant (s)

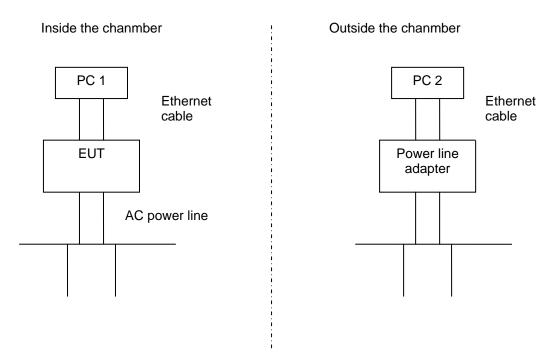
This submittal(s) (test report) is intended for FCC ID: **T37PL9660-Q1** filling to comply with the FCC Part 15, Subpart B Rules.

#### 2.6. Modifications

No modifications were implemented to meet testing criteria.

# 2.7. Configuration of Tested System

# **Configuration of Tested System**



**Equipment Used in Tested System** 

No.	Equipment	Manufacturer Model No.		Serial No.	Notes
1	PC	DELL	DIMENSION E520	1RNN42X	
2	Notebook PC	DELL	D600	CN-0X2034-48643-428-1379	
3	Printer	EPSON	L101	NFVK023719	
4	PlugLink HD AV Adapter	ASOKA	PL9660-Q1	1	

### 2.8. Product Information

As the product operation frequency band from 2MHz to 30MHz.

#### **Product:**

Series Number:Y12086600144 Operation frequency:2MHz-30MHz; Report No.: TRE13110001 Page 7 of 25 Issued: 2013-11-12

# 3. TEST ENVIRONMENT

# 3.1. Address of the test laboratory

Shenzhen Huatongwei International Inspection Co., Ltd Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China Phone: 86-755-26715686 Fax: 86-755-26748089

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2009) and CISPR Publication 22.

#### 3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

#### CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: Mar. 01, 2009. Valid time is until Feb. 28, 2015.

#### A2LA-Lab Cert. No. 2243.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until Sep. 30, 2015.

#### FCC-Registration No.: 662850

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 662850, Renewal date Jun. 01, 2012, valid time is until Jun. 01, 2015.

#### IC-Registration No.: 5377A

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A on Jan. 25, 2011, valid time is until Jan. 24, 2014.

#### ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

#### VCCI

The 3m Semi-anechoic chamber  $(12.2m\times7.95m\times6.7m)$  and Shielded Room  $(8m\times4m\times3m)$  of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-292. Date of Registration: Dec. 24, 2010. Valid time is until Dec. 23, 2013.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: Dec. 20, 2009. Valid time is until Dec. 19, 2012.

Telecommunication Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-1837. Date of Registration: May 07, 2010. Valid time is until May 06, 2013.

#### DNV

Shenzhen Huatongwei International Inspection Co., Ltd. has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025 (2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until Aug. 24, 2015.

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#### 3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 950-1050mbar

# 3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods — Part 4: Uncertainty in EMC Measurements" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.24 dB	(1)
Radiated Emission	1~18GHz	5.16 dB	(1)
Radiated Emission	18-40GHz	5.54 dB	(1)
Conducted Disturbance	0.15~30MHz	3.39 dB	(1)

<sup>(1)</sup> This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

#### 3.5. Equipments Used during the Test

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	
1	EMI TEST RECEIVER	Rohde & Schwarz	ESCI	100106	2013/10/26	
2	ARTIFICIAL MAINS	Rohde & Schwarz	ESH2-Z5	100028	2013/10/26	
3	PULSE LIMITER	Rohde & Schwarz	ESHSZ2	100044	2013/10/26	
4	EMI TEST Software	Rohde & Schwarz	ES-K1	N/A	N/A	

Radia	adiated Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.		
1	ULTRA-BROADBAND ANTENNA	Rohde & Schwarz	HL562	100015	2013/10/26		
2	EMI TEST RECEIVER	Rohde & Schwarz	ESI 26	100009	2013/10/26		
3	RF TEST PANEL	Rohde & Schwarz	TS / RSP	335015/0017	N/A		
4	TURNTABLE	ETS	2088	2149	N/A		
5	ANTENNA MAST	ETS	2075	2346	N/A		
6	EMI TEST Software	Rohde & Schwarz	ESK1	N/A	N/A		
7	HORN ANTENNA	Rohde & Schwarz	HF906	100039	2013/10/26		
8	Amplifer	Sonoma	310N	E009-13	2013/10/26		
9	JS amplifer	Rohde & Schwarz	JS4-00101800- 28-5A	F201504	2013/10/26		
10	High pass filter	Compliance Direction systems	BSU-6	34202	2013/10/26		

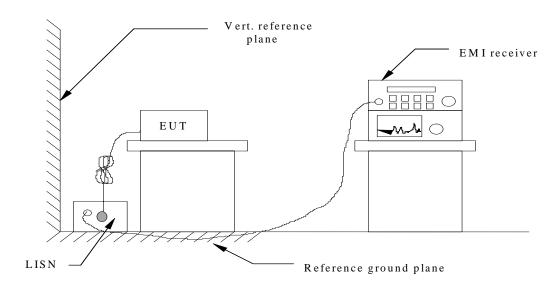
The calibration interval was one year.

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# 4. TEST CONDITIONS AND RESULTS

#### 4.1. Conducted Emissions Test

#### **TEST CONFIGURATION**



#### **TEST PROCEDURE**

- 1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4-2009.
- 2. Support equipment, if needed, was placed as per ANSI C63.4-2009.
- 3 . All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4-2009.
- 4. The EUT received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5. All support equipments received AC power from a second LISN, if any.
- 6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 . Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.

#### **CONDUCTED POWER LINE EMISSION LIMIT**

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following:

Eroguanav	Maximum RF Line Voltage (dBμV)					
Frequency (MHz)	CLA	SS A	CLASS B			
(IVITIZ)	Q.P.	Ave.	Q.P.	Ave.		
0.15 - 0.50	79	66	66-56*	56-46*		
0.50 - 5.00	73	60	56	46		
5.00 - 30.0	73	60	60	50		

For unintentional device, according to § 15.107(c) Line Conducted Emission Limits is as following:

Frequency (KHz)	Maximum RF	Line Voltage
535-1705	1000μV	60dBµV

For In-House BPL devices operating as unintentional radiators below 30 MHz, the conducted emissions shall be measured in the 535 – 1705 kHz band as specified in Section 15.107(c). For In- House BPL devices operating as unintentional radiators above 30 MHz, the conducted emissions shall be measured as specified in Section 15.107(a).

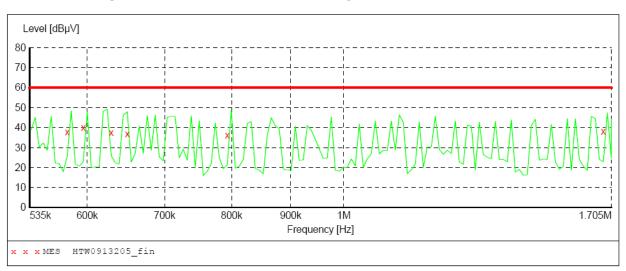
#### **TEST CONDITION**

The data rate was set at the maximum rate used by the EUT, and the operating frequency of the EUT as unintentional radiator was blow 30MHz.

#### **TEST RESULTS**

#### Operating frequency blow 30MHz

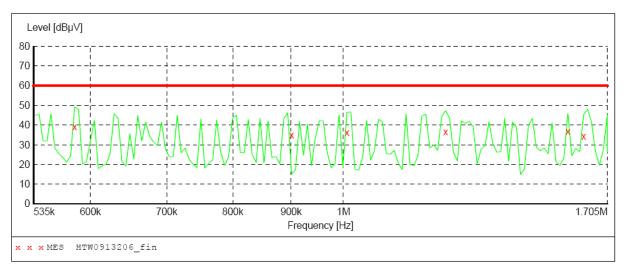
SCAN TABLE: "FCC-ASO(150K-30M)FIN"
Short Description: 150K-30M Voltage



#### MEASUREMENT RESULT: "HTW0913205 fin"

9	/13/2012 9:4 Frequency MHz		Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
	0.576660	37.70	9.8	60	22.3	QP	N	GND
	0.595330	39.90	9.8	60	20.1	QP	N	GND
	0.629480	37.60	9.8	60	22.4	QP	N	GND
	0.649868	36.90	9.8	60	23.1	QP	N	GND
	0.793120	36.10	9.8	60	23.9	QP	N	GND
	1 677380	38 20	a a	60	21.8	ΩD	M	CND

# SCAN TABLE: "FCC-ASO(150K-30M)FIN" Short Description: 150K-30M Voltage



Issued: 2013-11-12

#### MEASUREMENT RESULT: "HTW0913206 fin"

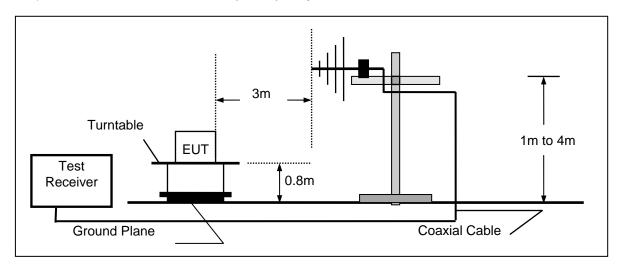
9/13/2012 9:4 Frequency MHz	9AM Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.581273 0.900970 1.007290 1.229337 1.573790 1.624760	39.00 35.00 36.30 36.40 37.00 34.30	9.8 9.9 9.9 9.9	60 60 60 60	21.0 25.0 23.7 23.6 23.0 25.7	QP QP QP QP QP OP	L1 L1 L1 L1 L1	GND GND GND GND GND GND

Remark:	
(1)	Measuring frequencies from 0.15 MHz to the 30 MHz.
, ,	Data of measurement within this frequency range shown " " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(3)	The IF bandwidth of EMI Test Receiver was 9KHz for measuring from 0.15 MHz to 30MHz

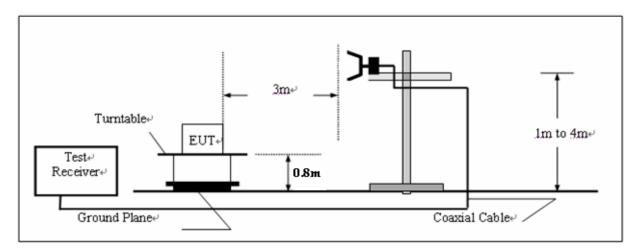
#### 4.2. Radiated Emission Test

#### **TEST CONFIGURATION**

a) Radiated Emission Test Set-Up, Frequency below 1000MHz



b) Radiated Emission Test Set-Up, Frequency above 1000MHz



#### **TEST PROCEDURE**

- 1. The EUT is placed on a turntable, which is 0.8m above ground plane.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Repeat above procedures until the measurements for all frequencies are complete.

#### FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

For example

Frequency	FS (dBµV/m)	RA	AF	CL	AG	Transd
(MHz)		(dBµV/m)	(dB)	(dB)	(dB)	(dB)
300.00	40	58.1	12.2	1.6	31.90	-18.1

Transd=AF +CL-AG

#### **RADIATION LIMIT**

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dBµV/m)	Radiated (µV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

#### **TEST CONDITION**

The data rate was set at the maximum rate used by the EUT.

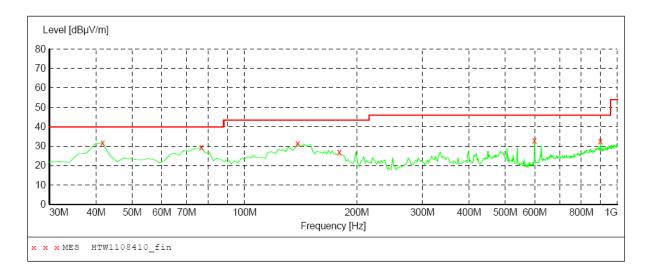
The highest fundamental frequency of the EUT is 166MHz, according to § 15.33(a), the radiated emission test was performed within the frequency band 9KHz – 2000MHz. The unintentional operating frequency range is 2MHz – 30MHz.

#### **TEST RESULTS**

# SCAN TABLE: "test Field(30M-1G)QP"

Short Description: Field Strength(30M-1G)
Start Stop Step Detector Meas. IF Transcription: Time Bandw.
30.0 MHz 1.0 GHz 60.0 kHz QuasiPeak 1.0 s 120 kHz HL562 Transducer

SWEEP TABLE: "test (30M-1G)"
Short Description: Field Strength



#### MEASUREMENT RESULT: "HTW1108410 fin"

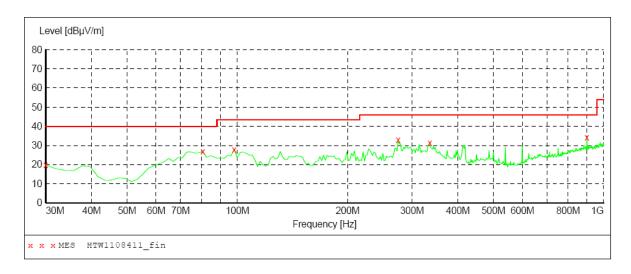
11/8/2013 8:	58AM							
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
41.663327 76.653307 138.857715 179.679359	31.70 29.40 31.40 26.90	-16.2 -20.6 -19.8 -20.5	40.0 40.0 43.5 43.5	8.3 10.6 12.1 16.6	QΡ	100.0 100.0 100.0	229.00 311.00 157.00 71.00	VERTICAL VERTICAL VERTICAL VERTICAL
599.559118 900.861723	32.90 32.50	-10.6 -4.8	46.0	13.1 13.5	QP QP	100.0	76.00 132.00	VERTICAL VERTICAL

#### SCAN TABLE: "test Field(30M-1G)QP"

Field Strength(30M-1G) Short Description:

Transducer

SWEEP TABLE: "test (30M-1G)"
Short Description: Field Strength



#### MEASUREMENT RESULT: "HTW1108411 fin"

11/8/2013 9:0	01AM							
Frequency MHz	Level dBµV/m		Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	19.70	-10.0	40.0	20.3	QP	100.0	138.00	HORIZONTAL
80.541082	26.80	-20.1	40.0	13.2	QP	300.0	174.00	HORIZONTAL
98.036072	28.00	-18.5	43.5	15.5	QΡ	300.0	179.00	HORIZONTAL
274.929860	32.80	-16.3	46.0	13.2	QP	100.0	163.00	HORIZONTAL
335.190381	31.40	-14.6	46.0	14.6	QΡ	100.0	107.00	HORIZONTAL
900.861723	34.20	-4.8	46.0	11.8	~	300.0	307.00	HORIZONTAL

#### Remark:

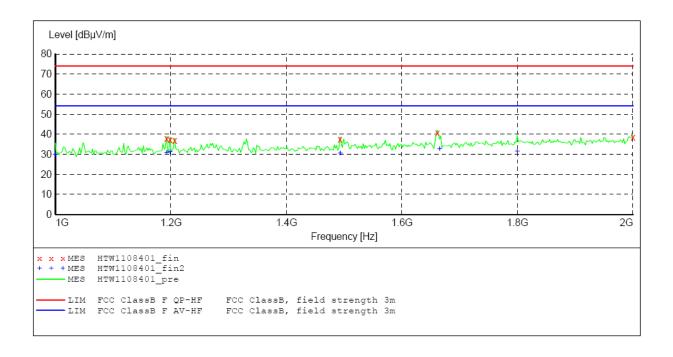
- (1)Measuring frequencies from 30 MHz to the 1 GHz.
- (2) Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3)The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz

#### Sweep TABLE: "test Field(1G-2G)QP"

Short Description: Field Strength(1G-2G)

Start Stop Detector IF Transducer

Frequency Frequency Bandw.
1.0 GHz 2.0 GHz MaxPeak 1 MHz HF906



### MEASUREMENT RESULT: "HTW1108401\_ fin"

11/08/2013 10 Frequency MHz	0:26AM Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1192.384770	39.00	-11.3	74.0	35.0	PK	100.0	99.00	HORIZONTAL
1198.396794	38.60	-11.3	74.0	35.4	PK	100.0	92.00	HORIZONTAL
1206.412826	38.10	-11.3	74.0	35.9	PK	100.0	202.00	HORIZONTAL
1492.985972	38.70	-10.1	74.0	35.3	PK	100.0	62.00	HORIZONTAL
1661.322645	42.00	-8.8	74.0	32.0	PK	100.0	35.00	HORIZONTAL
2000.000000	39.70	-6.6	74.0	34.3	PK	100.0	220.00	HORIZONTAL

### MEASUREMENT RESULT: "HTW1108401 fin2 "

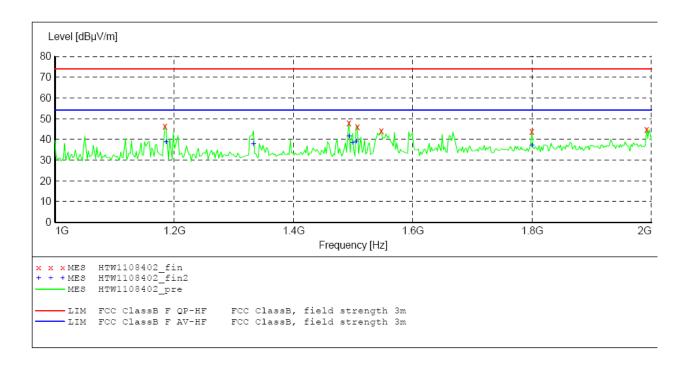
11/08/2013 10	:26AM							
Frequency	Level	Transd	Limit	Margin	Det.	Height	Azimuth	Polarization
MHz	dBµV/m	dB	dBµV/m	dB		cm	deg	
			·				_	
1000.000000	31.10	-12.3	54.0	22.9	AV	100.0	119.00	HORIZONTAL
1192.384770	32.10	-11.3	54.0	21.9	AV	100.0	99.00	HORIZONTAL
1198.396794	32.50	-11.3	54.0	21.5	AV	100.0	92.00	HORIZONTAL
1492.985972	31.90	-10.1	54.0	22.1	AV	100.0	62.00	HORIZONTAL
1665.330661	34.00	-8.8	54.0	20.0	AV	100.0	35.00	HORIZONTAL
1799.599198	32.90	-7.9	54.0	21.1	AV	100.0	3.00	HORIZONTAL

Short Description: Field Strength(1G-2G)

Start Stop Detector IF Transducer

Frequency Frequency Bandw.

1.0 GHz 2.0 GHz MaxPeak 1 MHz HF906



#### MEASUREMENT RESULT: "HTW1108402 fin"

11/08/2013 10 Frequency MHz	1:28AM Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1184.368737	46.90	-11.4	74.0	27.1	PK	100.0	0.00	VERTICAL
1492.985972	48.70	-10.1	74.0	25.3	PK	100.0	13.00	VERTICAL
1507.014028	46.70	-10.0	74.0	27.3	PK	100.0	352.00	VERTICAL
1547.094188	44.70	-9.7	74.0	29.3	PK	100.0	359.00	VERTICAL
1799.599198	44.50	-7.9	74.0	29.5	PK	100.0	51.00	VERTICAL
1991.983968	45.40	-6.7	74.0	28.6	PK	100.0	321.00	VERTICAL

#### MEASUREMENT RESULT: "HTW1108402 fin2"

11/08/2013 10 Frequency MHz	1:28AM Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1186.372745 1332.665331 1492.985972 1498.997996 1505.010020 1799.599198	39.30 38.50 42.40 39.00 39.60 37.80	-11.3 -10.7 -10.1 -10.1 -10.0 -7.9	54.0 54.0 54.0 54.0 54.0 54.0	14.7 15.5 11.6 15.0 14.4 16.2	AV AV AV AV AV	100.0 100.0 100.0 100.0 100.0	0.00 196.00 359.00 352.00 0.00 51.00	VERTICAL VERTICAL VERTICAL VERTICAL VERTICAL VERTICAL VERTICAL

#### Remark:

- (1) Measuring frequencies from 1 GHz to the 2 GHz.
- (2) Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) The RBW of EMI Test Receiver was 1MHz and the VBW was 3MHz for measuring from 1 GHz to 2 GHz.

# 5. Test Setup Photos of the EUT







6. External and Internal Photos of the EUT

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# **External Photos**

Orignal:



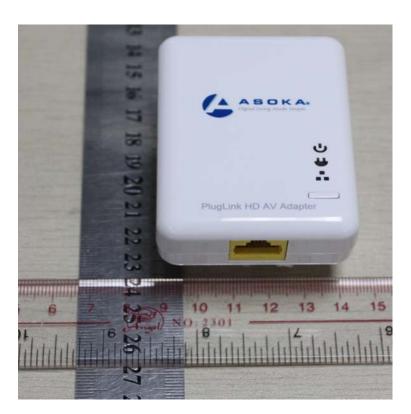








New:





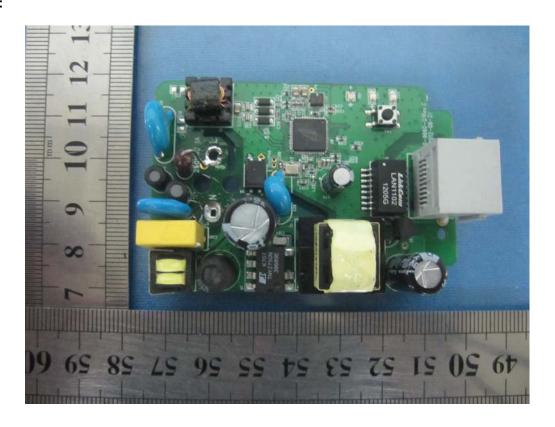


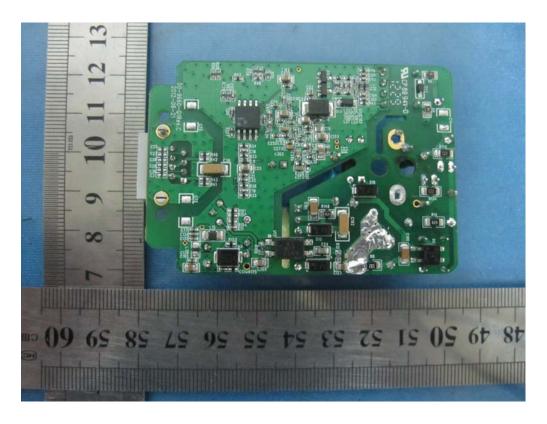




# **Internal Photos**

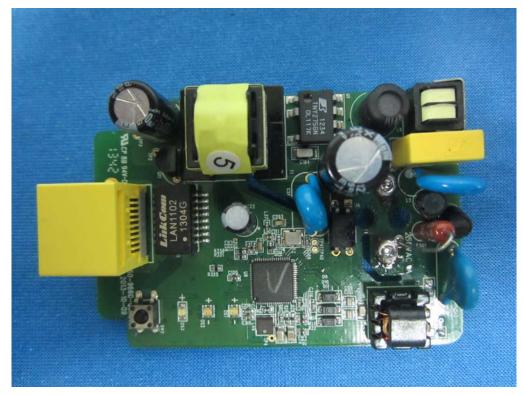
# Orignal:

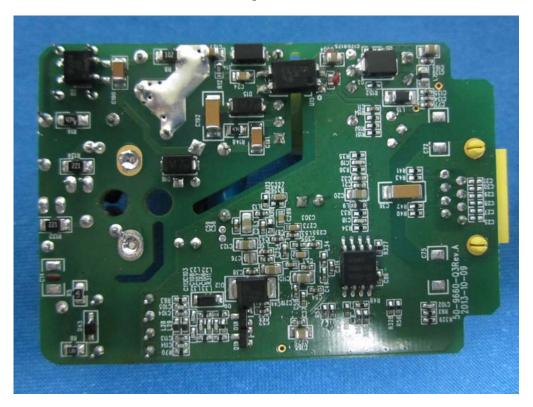




New:







.....End of Report.....