FCC 47 CFR PART 15 SUBPART B TEST REPORT

for

Tablet computer

MODEL: TA-H10L-B; TA-S10L-B

Test Report Number:
T131220L02-D

Issued for

Sharp Corporation
2-13-1, HACHIHONMATSU-IIDA, HIGASHI-HIROSHIMA-SHI HIROSHIMA PREFECTURE 739-0192, JAPAN

Issued By:

Compliance Certification Services Inc.
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Issued Date: January 2, 2014

Testing Laboratory
0363

ACCREDITED
TESTING CERT #0824.01

Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		January 2, 2014		Initial Issue	All	Juno Hsu

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1 TEST RESULT CERTIFICATION

Product:	Tablet computer
Model:	TA-H10L-B; TA-S10L-B
Brand:	Sharp
Applicant:	**Sharp Corporation** 2-13-1, HACHIHONMATSU-IIDA, HIGASHI-HIROSHIMA-SHI HIROSHIMA PREFECTURE 739-0192, JAPAN
Tested:	December 23 ~ 28, 2013
Test Voltage:	120VAC, 60Hz

EMISSION			
Standard	**Item**	**Result**	**Remarks**
FCC 47 CFR Part 15 Subpart B ICES-003 Issue 5: 2012 ANSI C63.4 2009	Conducted (Main Port)	PASS	Meet Class B limit
	Radiated	PASS	Meet Class B limit

Note: 1. The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.
2. The information of measurement uncertainty is available upon the customer's request.

Deviation from Applicable Standard
None

The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Bill Cheng
Section Manager

Reviewed by:

Angel Hu
Section Manager

2 EUT DESCRIPTION

Product	Tablet computer		
Brand Name	Sharp		
Model	TA-H10L-B; TA-S10L-B		
Applicant	Sharp Corporation		
Manufacturer	**1. COMPAL INFORMATION (KUNSHAN) CO. LTD.** NO. 15, THIRD AVENUE, A ZONE, KUNSHAN COMPREHENSIVE FREE TRADE ZONE, KUNSHAN, JIANGSU, CHINA **2. COMPAL ELECTRONICS TECHNOLOGY (KUNSHAN) CO., LTD.** NO. 25, THIRD AVENUE, A ZONE, KUNSHAN COMPREHENSIVE FREE TRADE ZONE, KUNSHAN, JIANGSU, CHINA **3. COMPAL INFORMATION TECHNOLOGY (KUNSHAN) CO., LTD.** NO.58, FIRST AVENUE, A ZONE, KUNSHAN COMPREHENSIVE FREE TRADE ZONE, KUNSHAN, JIANGSU, CHINA **4. COMPAL DIGITAL TECHNOLOGY (KUNSHAN) CO., LTD.** NO.9, SECOND AVENUE, A ZONE, KUNSHAN COMPREHENSIVE FREE TRADE ZONE, KUNSHAN, JIANGSU, CHINA **5. COMPALEAD ELETRÔNICA DO BRASIL INDÚSTRIA E COMÉRCIO LTDA** RUA KANEBO 175, GALPÕES C1, C2, C3, C4, C5 C6 E C12, BAIRRO DISTRITO INDUSTRIAL JUNDIAÍ BUSINESS PARK, CEP 13213-090, JUNDIAÍ - SÃO PAULO, BRASIL **6. COMPAL (VIETNAM) CO., LTD.** BA THIEN INDUSTRIAL ZONE, BA HIEN COMMUNE BINH XUYEN COUNTY, VINH PHUC PROVINCE, VIET NAM **7. COMPAL ELECTRONICS (CHENGDU) CO., LTD.** NO. 88, SEC.1, ZONGBAO AVENUE, CHENGDU HI-TECH COMPREHENSIVE BONDED ZONE (SHUANGLIU), SHUANGLIU COUNTY, CHENGDU CITY, SICHUAN, CHINA **8. COMPAL ELECTRONICS (CHONGQING) CO., LTD.** NO. D01, ZONE D, AIR PORT SECTION OF LIANGLU CUNTAN FREE TRADE PORT AREA, YUBEI DISTRICT, CHONGQING, CHINA **9. FOXCONN CMMSG INDUSTRIA DE ELECTRONICOS LTDA.** AV. MARGINAL RODOVIA DOS BANDEIRANTES, 800 BAIRRO ENGORDADOURO, JUNDIAI - SP - BRAZIL		
Serial Number	T131220L02		
Received Date	December 20, 2013		
EUT Power Rating	12VDC, 2.0A		
Power Adapter Manufacturer	TAMURA	**Model**	PEW120200UU95-1G
AC Power Adapter Rating	I/P: 100-240VAC, 50/60Hz, 0.6A O/P: 12VDC, 2.0A		
AC Power Cord Type	Unshielded, 0.9m (Detachable) to Power Adapter		
DC Power Cable Type	Unshielded, 1.8m (Non-detachable) at Power Adapter		
USB Cable	Shielded, 0.24m		

CPU Manufacturer	Intel	**Model**	Z3770 1.46GHz
Memory Manufacturer	LPDDR3 1600MHz (4GB)		
Main Board Manufacturer	Compal	**Model**	LA-A581
10.1" Panel Manufacturer	Sharp	**Model**	LQ101R1JX02
eMMC Manufacturer	SanDisk	**Model**	SDIN8DE4-64G (64GB)
Battery Pack Manufacturer	WTE	**Model**	EECM051K2002
Wireless LAN + BT Manufacturer	Foxconn	**Model**	T77H462.03
LTE Manufacturer	ANT	**Model**	ANT30MO-01-C
CCD Manufacturer Mian 8MP(w/AF)	Liteon	**Model**	CAMERA M 13P2BA845
	NAMUGA	**Model**	CAMERA M NSM-C008
CCD Manufacturer Sub 2MP(FHD)	Liteon	**Model**	CAMERA M 13P2SF230
	NAMUGA	**Model**	CAMERA M NSM-C012
Cradle Manufacturer	Compal	**Model**	TA-CR01
		Model	TA-CR02

I/O PORT (For EUT)

I/O PORT TYPES	Q'TY	TESTED WITH
1).Memory Card Reader	1	1
2).SIM Card Slot	1	1
3).Audio Port	1	1
4).Micro USB 3.0 Port	1	1

I/O PORT (For Cradle / TA-CR02)

I/O PORT TYPES	Q'TY	TESTED WITH
1).USB 2.0 Port	3	3
2).LAN Port	1	1
3).HDMI Port	1	1

Note: *1. The EUT is including a Touch Pen for sale.*
2. All the model numbers (list on this report) are identical just for marketing purpose only.
3. Client consigns only one model sample (Model number: TA-H10L-B) to test. Therefore testing Lab. just guarantees the units, which have been tested.

3 TEST METHODOLOGY

3.1. DECISION OF FINAL TEST MODE

1. The following test mode(s) were scanned during the preliminary test:

Pre-Test Mode											
Mode	Panel	CPU	eMMC	RAM	Wifi	LTE	Battery	Adaptor	CCD	Cradle	Main board
1	Sharp LQ101R1JX02	Intel Z3770 1.46GHz	SanDisk SDIN8DE4-64G 64GB	4GB	FOXCONN T77H462.03	ANT ANT30MO-01-C	WTE EECM051K2002	TAMURA PEW120200UU95-1G	Liteon CAMERA M 13P2SF230 + Liteon CAMERA M 13P2BA845	N/A	Compal LA-A581
2	Sharp LQ101R1JX02	Intel Z3770 1.46GHz	SanDisk SDIN8DE4-64G 64GB	4GB	FOXCONN T77H462.03	ANT ANT30MO-01-C	WTE EECM051K2002	TAMURA PEW120200UU95-1G	NAMUGA CAMERA M NSM-C012 + NAMUGA CAMERA M NSM-C008	Compal TA-CR01	Compal LA-A581
3	Sharp LQ101R1JX02	Intel Z3770 1.46GHz	SanDisk SDIN8DE4-64G 64GB	4GB	FOXCONN T77H462.03	ANT ANT30MO-01-C	WTE EECM051K2002	TAMURA PEW120200UU95-1G	Liteon CAMERA M 13P2SF230 + Liteon CAMERA M 13P2BA845	Compal TA-CR02	Compal LA-A581

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode		
Emission	Conducted Emission	**Mode 1 (2560 x 1600 Resolution)** **Mode 3 (1920 x 1080 Resolution)**
	Radiated Emission	**Mode 1 (2560 x 1600 Resolution)** **Mode 3 (1920 x 1080 Resolution)**

Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.

Remark: The EUT consumes power from host, which designed with AC power supply of rating 100-240VAC, 50/60Hz. For radiated emission evaluation, 230Vac/50Hz, 120Vac/60Hz and 100Vac/50Hz had been covered during the pre-test. The worst radiated emission 30MHz ~ 1GHz was found at 100Vac/50Hz and recorded in the applies test report.

3.2. EUT SYSTEM OPERATION

1	Setup the EUT and simulators as shown on 4.2.
2	Turn on the power of all equipment.
3	The module device driver was exercised to play music.
4	Operates the CCD and WLAN+BT functions of EUT.
5	EUT will read data from hard disk and then writes the data into hard disk, same as external Hard Disk.
6	The EMI (File name: Burn In) test program was loaded from EUT and executed in “Windows 8” mode.
7	EUT will sends “H” pattern to monitor, the monitor will show “H” pattern on the screen.
8	Repeat the above procedure (3) to (7).

Note: *Test program is self-repeating throughout the test.*

4 SETUP OF EQUIPMENT UNDER TEST

4.1. DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

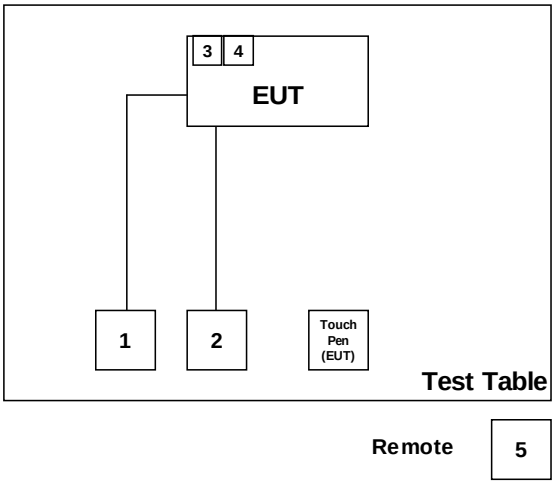
Mode 1							
No.	**Equipment**	**Model No.**	**Serial No.**	**FCC ID**	**Trade Name**	**Data Cable**	**Power Cord**
1	USB Mouse	M100	N/A	FCC DoC	Logitech	Unshielded, 1.8m	N/A
2	Multimedia Headset	EPM-662	N/A	N/A	i-gota	Unshielded, 1.2m	N/A
3	SIM Card	N/A	N/A	N/A	VIBO	N/A	N/A
4	SD Card	WARRANT YVOIOIF REMOVED	N/A	N/A	A-DATA	N/A	N/A
5	AP (Remote)	LM-RT210W	12442028770	H8N-RT210W	LEMEL	N/A	Unshielded, 1.8m

Mode 3							
No.	**Equipment**	**Model No.**	**Serial No.**	**FCC ID**	**Trade Name**	**Data Cable**	**Power Cord**
1	LCD Monitor	2407WFPb	CN-0FC255-4663 3-675-25THS	FCC DoC	DELL	HDMI Cable Shielded, 1.8m	Unshielded, 1.8m
2	USB Keyboard	SK-8115	CN-0DJ325-7161 6-93R-077W	FCC DoC	DELL	Unshielded, 1.8m	N/A
3	USB Mouse	M100	N/A	FCC DoC	Logitech	Unshielded, 1.8m	N/A
4	Multimedia Headset	EPM-662	N/A	N/A	i-gota	Unshielded, 1.2m	N/A
5	USB External HDD	WDBACY5000ABK -PESN	WX71A8193446	FCC DoC	WD	Shielded, 1.2m	N/A
6	USB External HDD	WDBACY5000ABK -PESN	WX41A71T6658	FCC DoC	WD	Shielded, 1.2m	N/A
7	SIM Card	N/A	N/A	N/A	VIBO	N/A	N/A
8	SD Card	WARRANT YVOIOIF REMOVED	N/A	N/A	A-DATA	N/A	N/A
9	Notebook PC (Remote)	TP00013A	LR-9XH2K	FCC DOC	LENOVO	LAN Cable: Unshielded, 10m	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
10	AP (Remote)	LM-RT210W	12442028770	H8N-RT210W	LEMEL	N/A	Unshielded, 1.8m

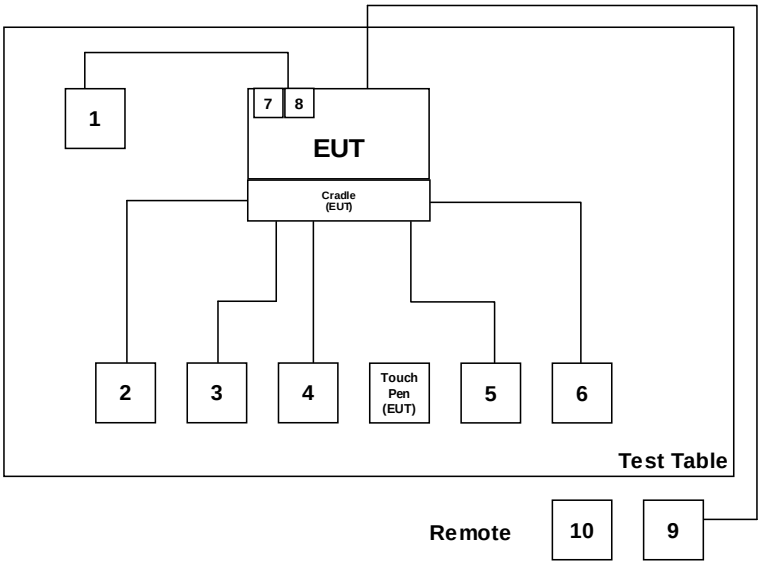
Note: Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.2. CONFIGURATION OF SYSTEM UNDER TEST

Mode 1		
1. USB Mouse	2. Multimedia Headset	3. SIM Card
4. SD Card	5. AP	--



Mode 3		
1. LCD Monitor	2. USB Keyboard	3. USB Mouse
4. Multimedia Headset	5. USB External HDD	6. USB External HDD
7. SIM Card	8. SD Card	9. Notebook PC
10. AP	--	--



5 FACILITIES AND ACCREDITATIONS

5.1. FACILITIES

All measurement facilities used to collect the measurement data are located at No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, Taiwan, R.O.C.

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4, CISPR 16-1-5 and CISPR 16-2-3.

5.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

Taiwan	TAF
USA	A2LA

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
Norway	Nemko
Japan	VCCI
Taiwan	BSMI
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, http:///www.ccsrf.com

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz~30MHz	± 0.9203
Radiated emissions	30~200MHz	± 3.8071
	200~1000MHz	± 3.7872
	1~8GHz	± 2.5873
	8~18GHz	± 2.6646
	18~26GHz	± 2.9617
	26~40GHz	± 3.4250

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Consistent with industry standard (e.g. CISPR 22: 2006, clause 11, Measurement Uncertainty) determining compliance with the limits shall be base on the results of the compliance measurement. Consequently the measure emissions being less than the maximum allowed emission result in this be a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is base on conducted and radiated emissions being less than U_{CISPR} which is 3.6dB and 5.2dB respectively. CCS values (called U_{Lab} in CISPR 16-4-2) is less than U_{CISPR} as shown in the table above. Therefore, MU need not be considered for compliance.

6 CONDUCTED EMISSION MEASUREMENT

6.1. LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE:

(1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range 0.15 to 0.50 MHz.
(3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

6.2. TEST INSTRUMENTS

Conducted Emission Room # 4				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI Test Receiver	R&S	ESCI	100782	06/14/2014
LISN	R&S	ENV216	100066	09/01/2014
LISN	R&S	ENV 4200	830326/016	05/30/2014
ISN	FCC	FCC-TLISN-T2-02	20587	08/01/2014
ISN	TESEQ	ISN-T8	30843	08/16/2014
Current Probe	FCC	F-35	506	07/19/2014
ISN	TESEQ	ISN ST08	27907	09/30/2014
Test S/W	EZ-EMC			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

6.3. TEST PROCEDURES (please refer to measurement standard or CCS SOP PA-031)

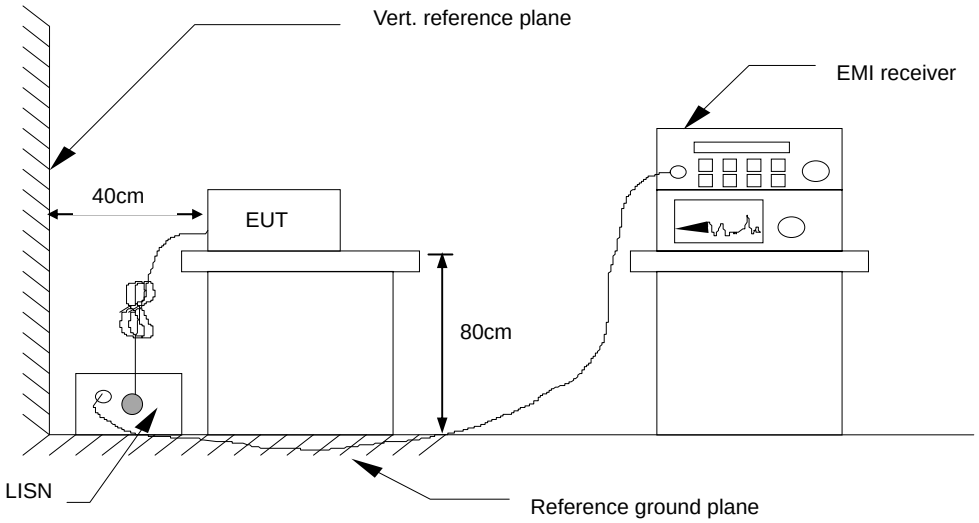
Procedure of Preliminary Test

- The EUT and support equipment, if needed, were set up as per the test configuration to simulate typical usage per the user's manual. When 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 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor standing equipment, it is placed on the ground plane, which has a 12 mm non-conductive covering to insulate the EUT from the ground plane.
- All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- The test equipment EUT installed by AC main power, through a Line Impedance Stabilization Network (LISN), which was supplied power source and was grounded to the ground plane.
- All support equipment power by from a second LISN.
- The test program of the EUT was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.

Procedure of Final Test

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- The test data of the worst-case condition(s) was recorded.

6.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

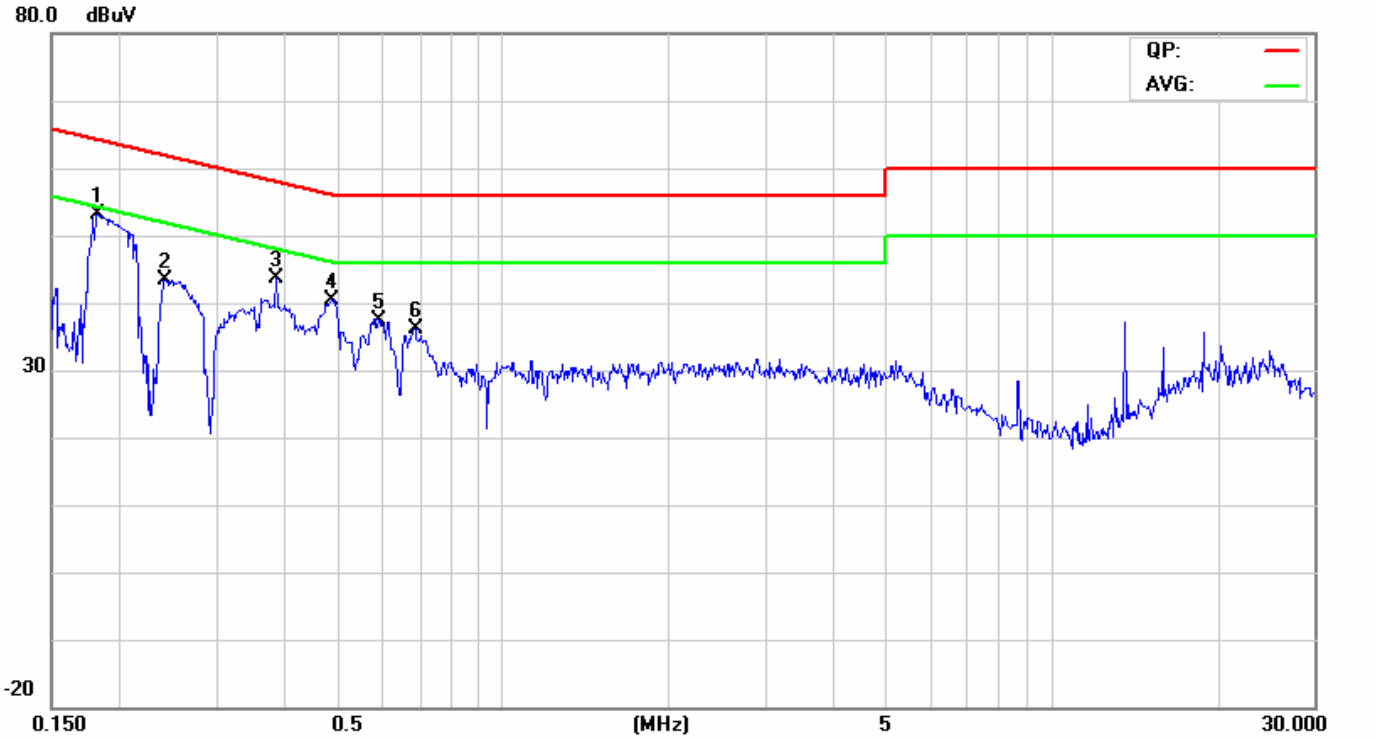
6.5. DATA SAMPLE:

Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correctrion factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak. limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
x.xx	43.95	33.00	10.00	53.95	43.00	56.00	46.00	-2.05	-3.00	Pass

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer/Receiver reading + Insertion loss of LISN, if it > 0.5 dB
Correction Factor (dB) = LISN Factor + Cable Loss
Result (dBuV) = Raw reading converted to dBuV and CF added
Limit (dBuV) = Limit stated in standard
Margin (dB) = Result (dBuV) – Limit (dBuV)

6.6. TEST RESULTS

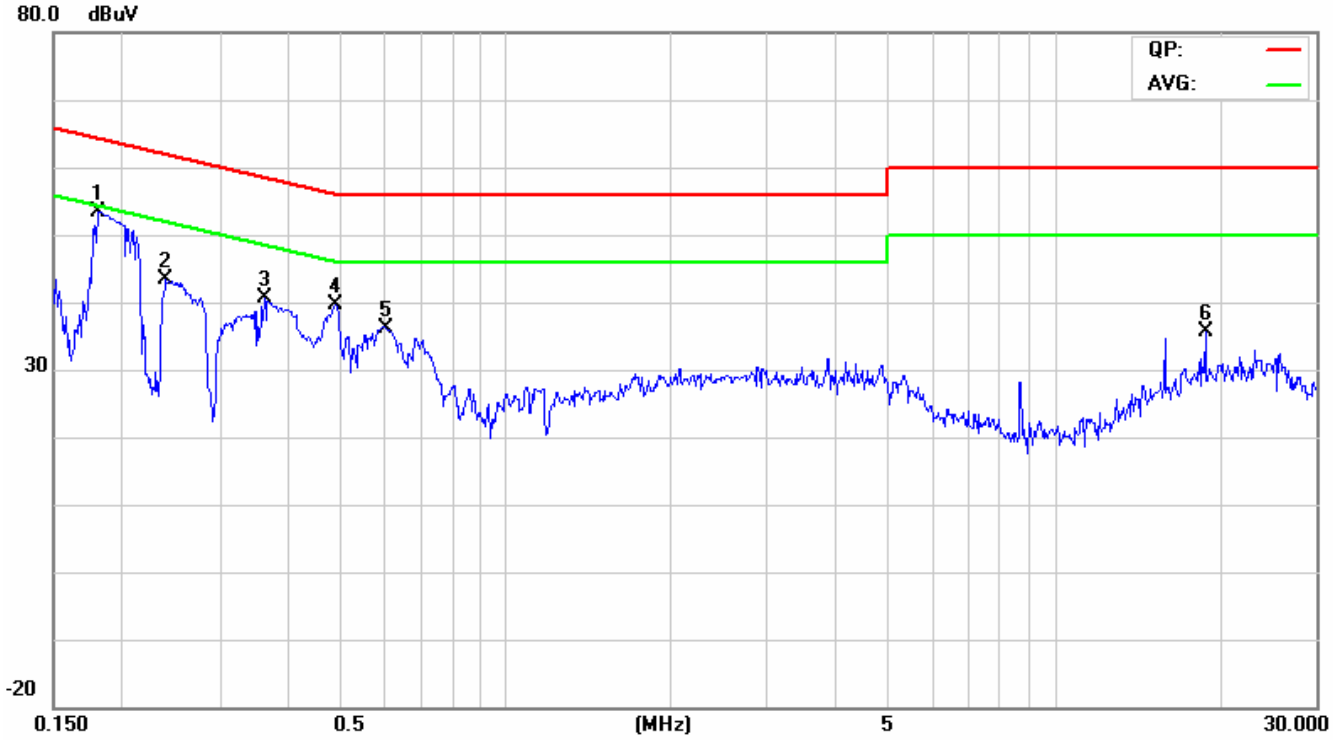
Model No.	TA-H10L-B	**6dB Bandwidth**	9 kHz
Environmental Conditions	25°C, 57% RH	**Test Mode**	Mode 1
Tested By	Johnny Chen	**Line**	L1
Standard	FCC Class B Limit		



NO.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	(Pass/Fail)
1*	0.1802	39.41	20.09	9.68	49.09	29.77	64.48	54.48	-15.39	-24.71	Pass
2	0.2419	31.06	12.98	9.69	40.75	22.67	62.03	52.03	-21.28	-29.36	Pass
3	0.3850	25.82	11.52	9.68	35.50	21.20	58.17	48.17	-22.67	-26.97	Pass
4	0.4870	27.45	14.33	9.66	37.11	23.99	56.22	46.22	-19.11	-22.23	Pass
5	0.5917	25.70	10.19	9.67	35.37	19.86	56.00	46.00	-20.63	-26.14	Pass
6	0.6971	23.95	8.67	9.68	33.63	18.35	56.00	46.00	-22.37	-27.65	Pass

REMARKS: L1 = Line One (Live Line)

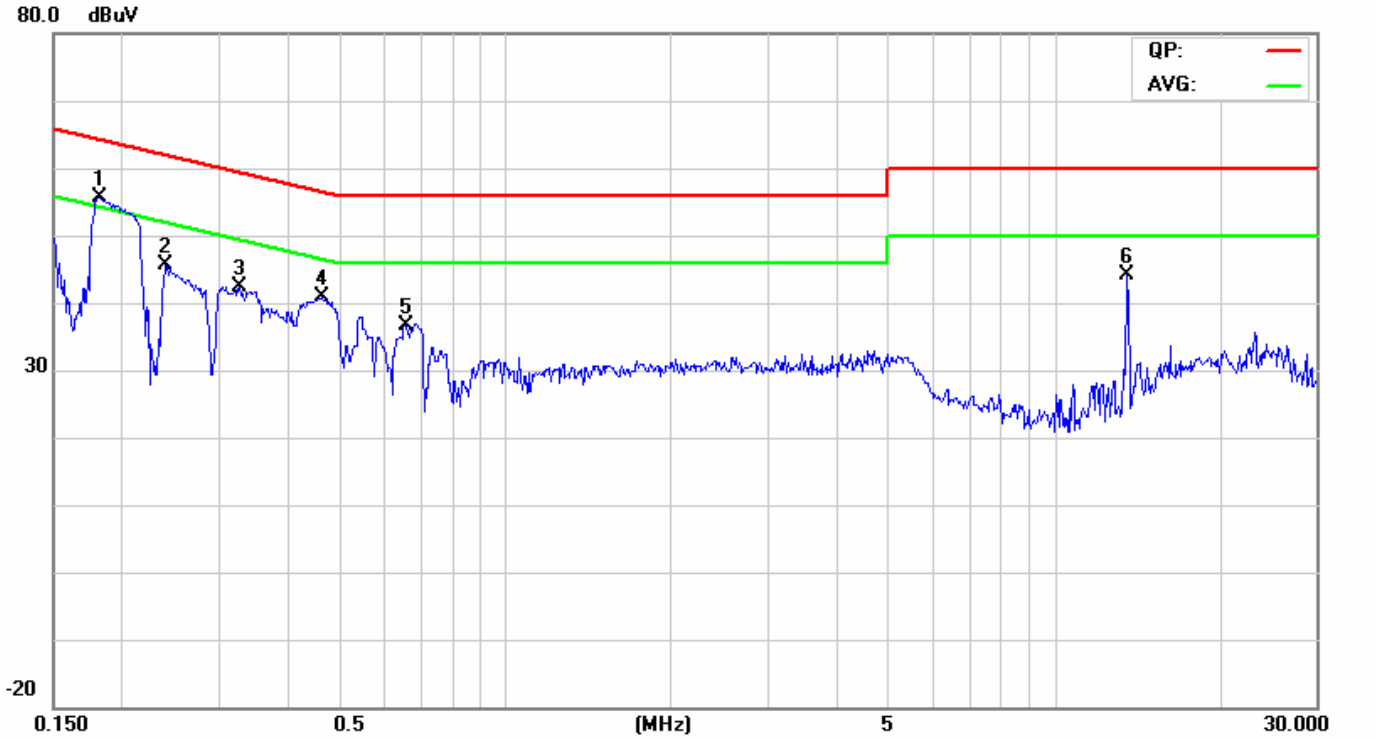
Model No.	TA-H10L-B	**6dB Bandwidth**	9 kHz
Environmental Conditions	25°C, 57% RH	**Test Mode**	Mode 1
Tested By	Johnny Chen	**Line**	L2
Standard	FCC Class B Limit		



NO.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	(Pass/Fail)
1*	0.1809	40.10	21.18	9.69	49.79	30.87	64.44	54.44	-14.65	-23.57	Pass
2	0.2408	30.54	10.74	9.70	40.24	20.44	62.07	52.07	-21.83	-31.63	Pass
3	0.3612	26.29	8.81	9.70	35.99	18.51	58.70	48.70	-22.71	-30.19	Pass
4	0.4894	25.74	11.81	9.67	35.41	21.48	56.18	46.18	-20.77	-24.70	Pass
5	0.6105	24.80	12.04	9.68	34.48	21.72	56.00	46.00	-21.52	-24.28	Pass
6	18.7567	26.21	24.98	10.12	36.33	35.10	60.00	50.00	-23.67	-14.90	Pass

REMARKS: L2 = Line Two (Neutral Line)

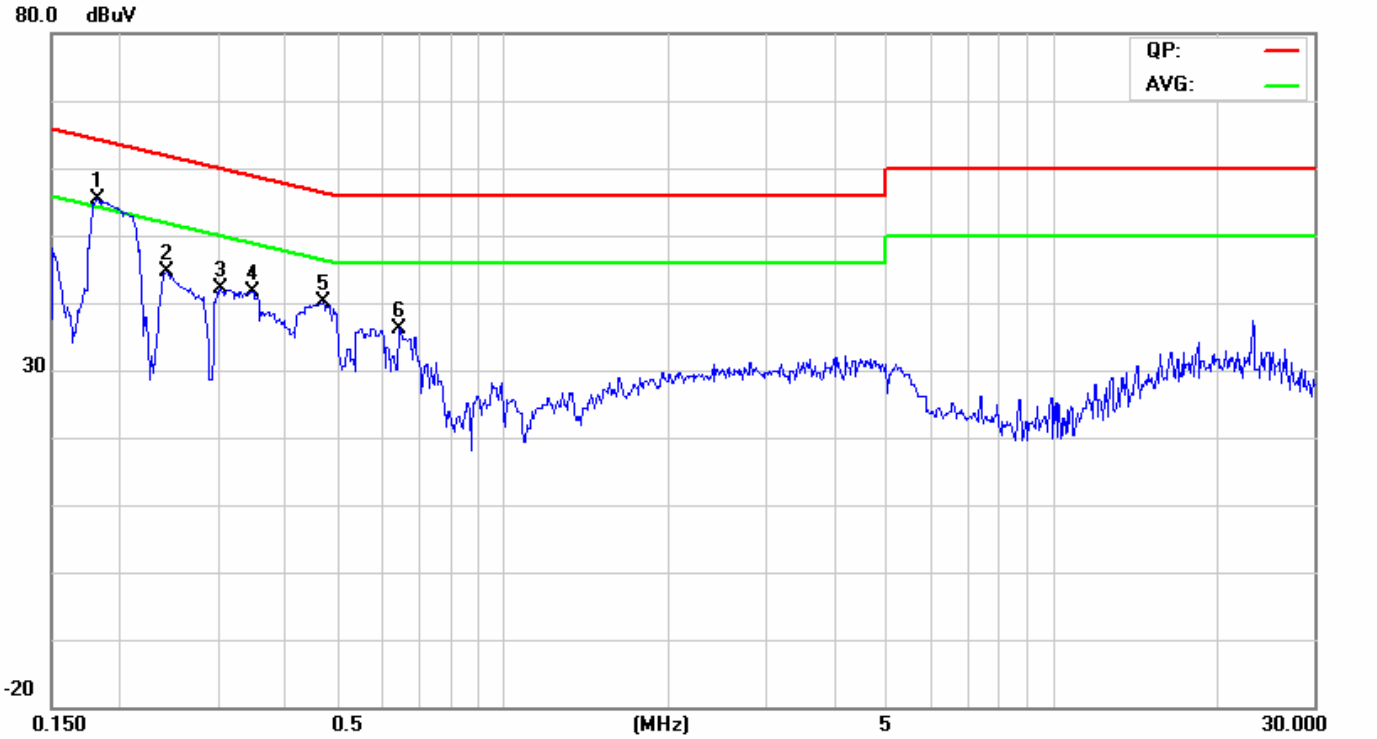
Model No.	TA-H10L-B	**6dB Bandwidth**	9 kHz
Environmental Conditions	25°C, 57% RH	**Test Mode**	Mode 3
Tested By	Johnny Chen	**Line**	L1
Standard	FCC Class B Limit		



NO.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	(Pass/Fail)
1*	0.1810	42.43	23.91	9.68	52.11	33.59	64.44	54.44	-12.33	-20.85	Pass
2	0.2404	31.49	11.03	9.69	41.18	20.72	62.08	52.08	-20.90	-31.36	Pass
3	0.3265	27.33	11.69	9.69	37.02	21.38	59.54	49.54	-22.52	-28.16	Pass
4	0.4606	27.07	10.82	9.67	36.74	20.49	56.68	46.68	-19.94	-26.19	Pass
5	0.6659	24.85	11.45	9.67	34.52	21.12	56.00	46.00	-21.48	-24.88	Pass
6	13.5577	25.78	10.75	10.03	35.81	20.78	60.00	50.00	-24.19	-29.22	Pass

REMARKS: L1 = Line One (Live Line)

Model No.	TA-H10L-B	**6dB Bandwidth**	9 kHz
Environmental Conditions	25°C, 57% RH	**Test Mode**	Mode 3
Tested By	Johnny Chen	**Line**	L2
Standard	FCC Class B Limit		



NO.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	(Pass/Fail)
1*	0.1802	41.77	22.77	9.69	51.46	32.46	64.48	54.48	-13.02	-22.02	Pass
2	0.2409	31.33	11.02	9.70	41.03	20.72	62.07	52.07	-21.04	-31.35	Pass
3	0.3040	27.92	11.17	9.71	37.63	20.88	60.13	50.13	-22.50	-29.25	Pass
4	0.3484	27.37	10.97	9.70	37.07	20.67	59.00	49.00	-21.93	-28.33	Pass
5	0.4650	26.09	9.30	9.68	35.77	18.98	56.60	46.60	-20.83	-27.62	Pass
6	0.6460	21.24	4.76	9.68	30.92	14.44	56.00	46.00	-25.08	-31.56	Pass

REMARKS: L2 = Line Two (Neutral Line)

7 RADIATED EMISSION MEASUREMENT

7.1. LIMITS OF RADIATED EMISSION MEASUREMENT

Below 1GHz (for digital device)

FREQUENCY (MHz)	dBuV/m (At 10m)	
	Class A	Class B
30 ~ 230	40	30
230 ~ 1000	47	37

Below 1GHz (for non-digital device)

Class A Radiated Emission limit at 10m (for others)

Frequency (MHZ)	Field Strength Limit (uV/m)Q.P.	Field Strength Limit (dBuV/m)Q.P.
30 - 88	90	39
88 - 216	150	43.5
216 – 960	210	46.4
Above 960	300	49.5

Class B Radiated Emission limit at 3m (for others)

Frequency (MHZ)	Field Strength Limit (uV/m)Q.P.	Field Strength Limit (dBuV/m)Q.P.
30 - 88	100	40
88 - 216	150	43.5
216 – 960	200	46
Above 960	500	54

Above 1GHz(for all device)

Frequency (MHZ)	Class A (dBuV/m) (At 10m)		Class B (dBuV/m) (At 3m)	
	Average	Peak	Average	Peak
Above 1000	49.5	69.5	54	74

NOTE: 1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. The measurement above 1GHz is at close-in distances 3m,and determine the limit **L_2** corresponding to the close-in distance **d_2** by applying the following relation: **$L_2 = L_1 (d_1/d_2)$**, where **L_1** is the specified limit in microvolts per metre (**uV/m**) at the distance **d_1** (**10m**), **L_2** is the new limit for distance **d_2** (**3m**).
So the new Class A limit above 1GHz at 3m is as following table:

Frequency (MHZ)	Class A (dBuV/m) (At 3m)	
	Average	Peak
Above 1000	60	80

According to FCC Part 15.33 (b), for an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or in which the device operated or tunes (MHz)	**Upper frequency of measurement range (MHz)**
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5^{th} harmonic of the highest frequency or 40GHz, whichever is lower

7.2. TEST INSTRUMENTS

Open Area Test Site # 2				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4411B	US41062825	N.C.R
EMI Test Receiver	R&S	ESCS30	845552/030	06/20/2014
Pre-Amplifier	Agilent	8447D	2944A08780	04/28/2014
Bilog Antenna	CHASE	CBL6112A	2307	09/12/2014
Turn Table	Chance Most	CM-T003-1	T807-6	N.C.R
Antenna Tower	Chance Most	CM-A003-1	A807-6	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
RF Switch	Anritsu	MP59B	10953	N.C.R
Test S/W	EZ-EMC			

3 Meter Chamber				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY48250064	01/13/2014
Pre-Amplifier	EMEC	EM01M26G	060570	07/25/2014
Pre-Amplifier	MITEQ	AMF-6F-260400-40-8P	985646	08/08/2014
Horn Antenna	EMCO	3115	9602-4659	06/16/2014
Horn Antenna	EMCO	3116	00026370	01/07/2014
Low Loss Cable	Huber+Suhner	104PEA	24815/4PEA	04/26/2014
Low Loss Cable	Huber+Suhner	104PEA	30956/4PEA	04/26/2014
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Bore-Sight Antenna Tower	CCS	CCS-BORESIGHT	001	N.C.R
Test S/W	EZ-EMC			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. N.C.R = No Calibration Request.

7.3. TEST PROCEDURES (please refer to measurement standard or CCS SOP PA-031)

Procedure of Preliminary Test

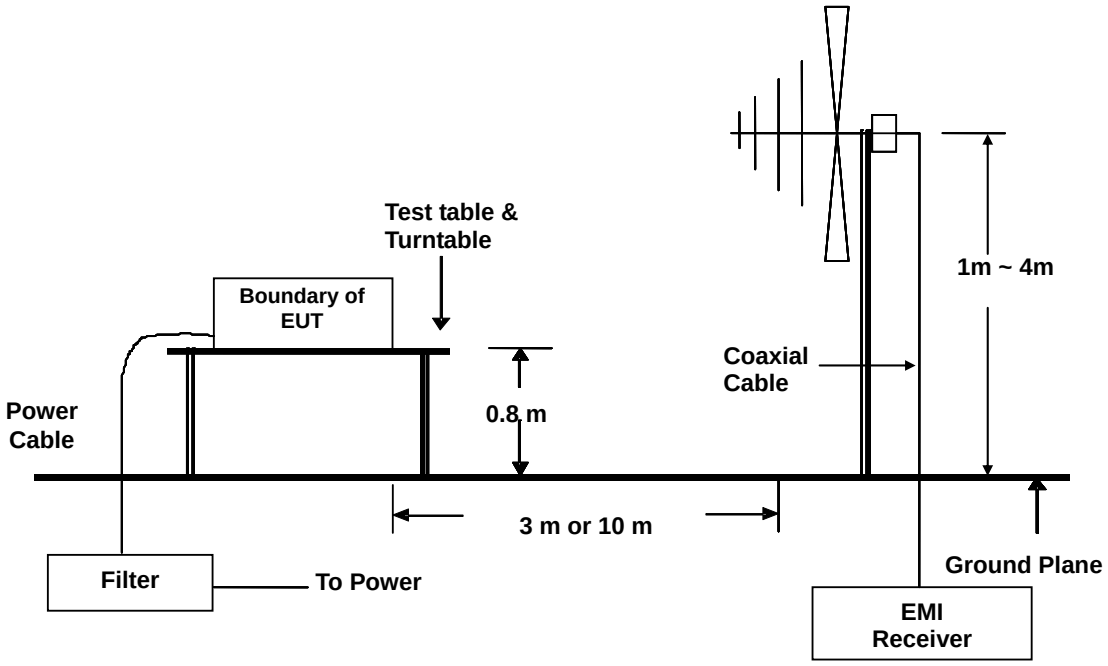
- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per ANSI C63.4.
- All I/O cables were positioned to simulate typical usage as per ANSI C63.4.
- The EUT received AC power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
- The antenna was placed at 3 or 10 meter away from the EUT as stated in ANSI C63.4. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 40GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level (For Below 1GHz) and keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response (For Above 1GHz).
- The test mode(s) described in Item 3.1 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.

Procedure of Final Test

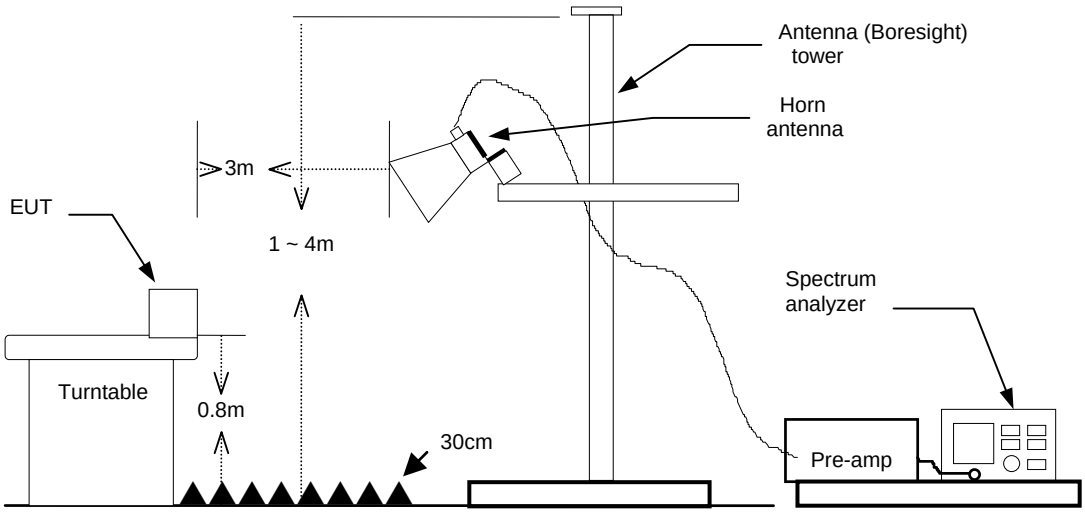
- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 40GHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 or 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recording at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P. (For Below 1GHz) or Peak/Average (For Above 1GHz) reading is presented.
- The test data of the worst-case condition(s) was recorded.

7.4. TEST SETUP

Below 1GHz



Above 1GHz



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.5. DATA SAMPLE:

Below 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (◦)	Height (cm)	Remark
xx.xx	16.49	9.86	26.35	30.00	-3.65	116.00	101.00	QP

Above 1GHz

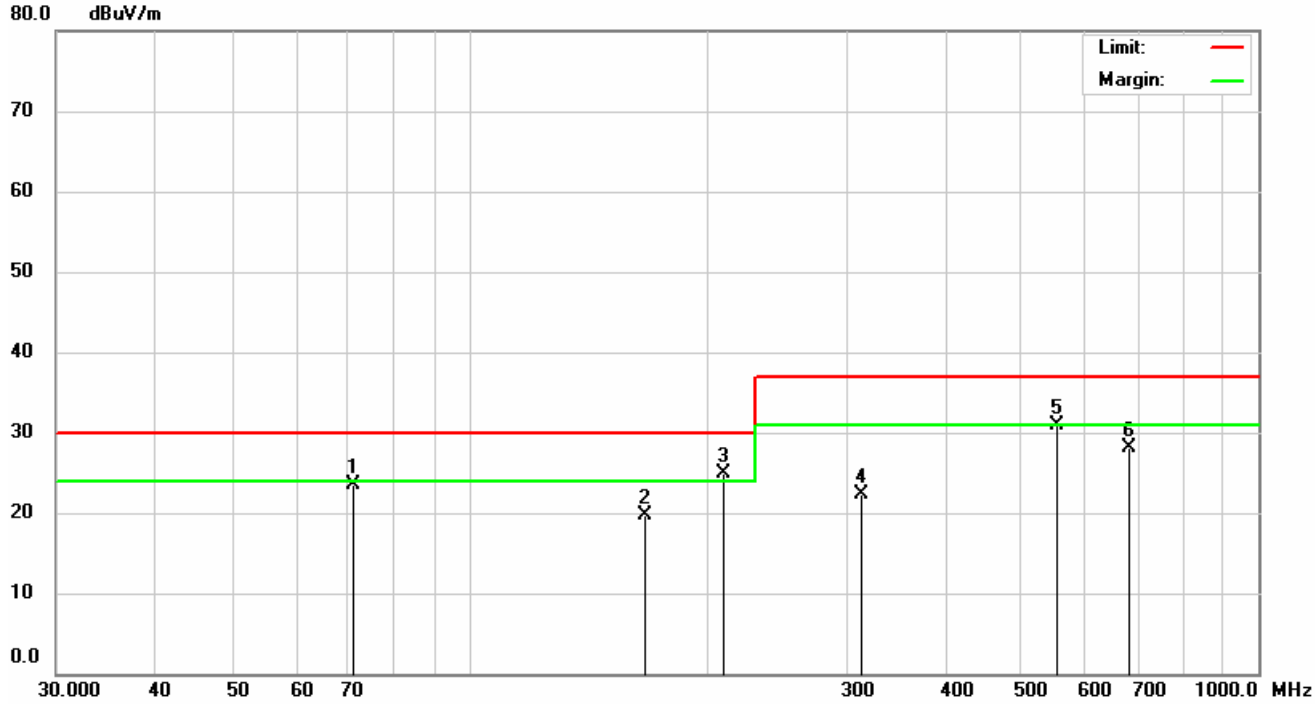
Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
XX	54.08	-11.80	42.28	74.00	-31.72	100	185	peak
XX	34.80	-11.80	23.00	54.00	-31.00	100	185	AVG

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer / Receiver reading
Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
Q.P. = Quasi-Peak

7.6. TEST RESULTS

Below 1GHz

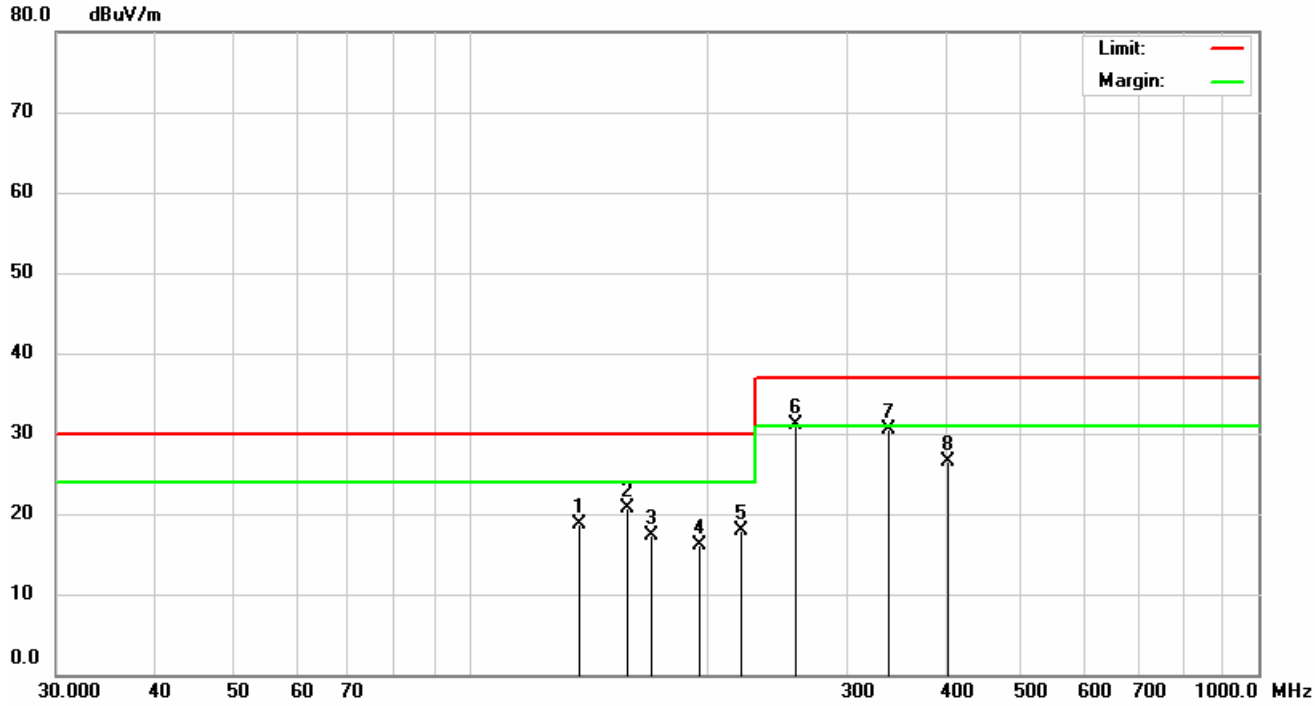
Model No.	TA-H10L-B	**Test Mode**	Mode 1
Environmental Conditions	26°C, 60% RH	**6dB Bandwidth**	120 kHz
Antenna Pole	Vertical	**Antenna Distance**	10m
Detector Function:	Quasi-peak.	**Tested By**	Kevin Liao
Standard	FCC Class B with CISPR 22 Class B Limit		



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	71.3000	40.42	-16.85	23.57	30.00	-6.43	100	17	QP
2	166.2500	32.51	-12.83	19.68	30.00	-10.32	100	112	QP
3	208.4000	37.92	-13.04	24.88	30.00	-5.12	100	334	QP
4	312.3000	30.24	-7.99	22.25	37.00	-14.75	300	273	QP
5	551.0000	32.42	-1.50	30.92	37.00	-6.08	150	191	QP
6	682.3000	29.41	-1.23	28.18	37.00	-8.82	120	124	QP

REMARKS: 1. 30MHz to 1000MHz test is Applicable CISPR 22 standard.
2. The other emission levels were very low against the limit.

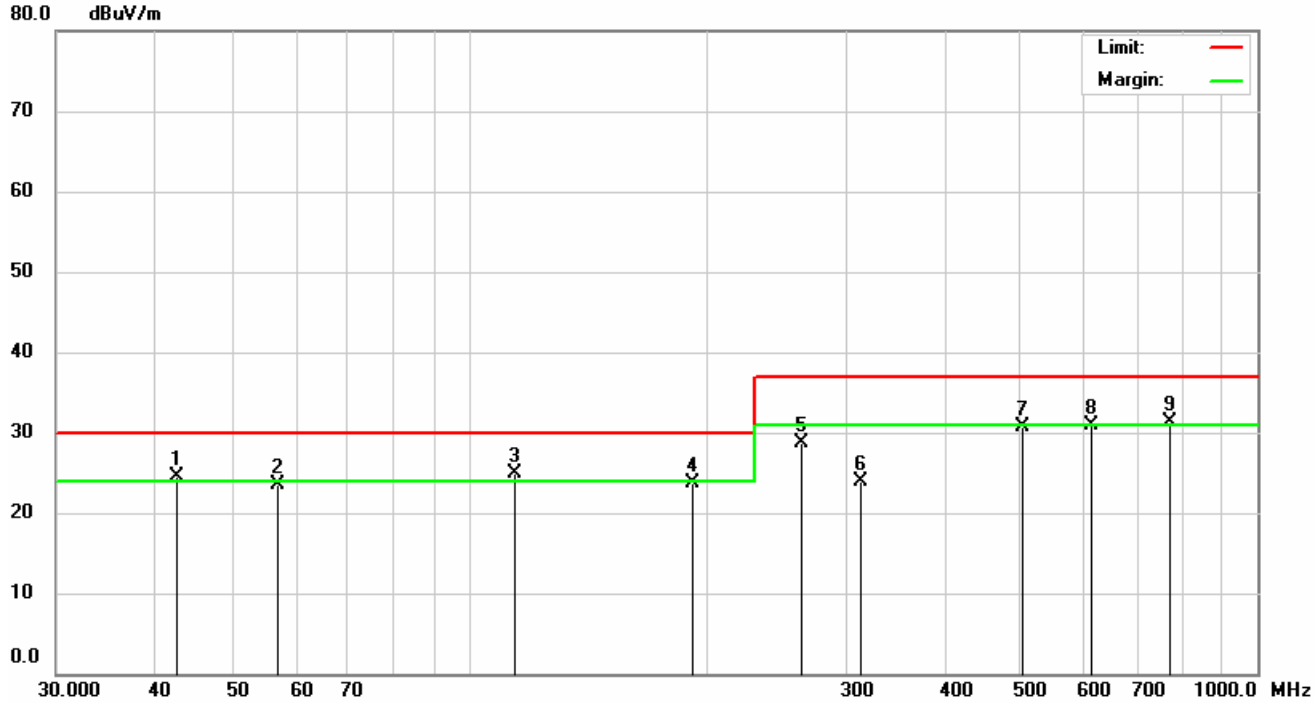
Model No.	TA-H10L-B	**Test Mode**	Mode 1
Environmental Conditions	26°C, 60% RH	**6dB Bandwidth**	120 kHz
Antenna Pole	Horizontal	**Antenna Distance**	10m
Detector Function:	Quasi-peak.	**Tested By**	Kevin Liao
Standard	FCC Class B with CISPR 22 Class B Limit		



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	137.6500	29.66	-11.01	18.65	30.00	-11.35	400	270	QP
2	158.1500	33.04	-12.37	20.67	30.00	-9.33	400	36	QP
3	169.9500	30.27	-13.01	17.26	30.00	-12.74	400	51	QP
4	194.7000	29.35	-13.30	16.05	30.00	-13.95	400	300	QP
5	220.6300	30.59	-12.75	17.84	30.00	-12.16	400	43	QP
6	257.1000	39.17	-8.02	31.15	37.00	-5.85	400	281	QP
7	339.8000	37.59	-7.03	30.56	37.00	-6.44	300	46	QP
8	404.3000	31.54	-5.09	26.45	37.00	-10.55	200	156	QP

REMARKS: 1. 30MHz to 1000MHz test is Applicable CISPR 22 standard.
2. The other emission levels were very low against the limit.

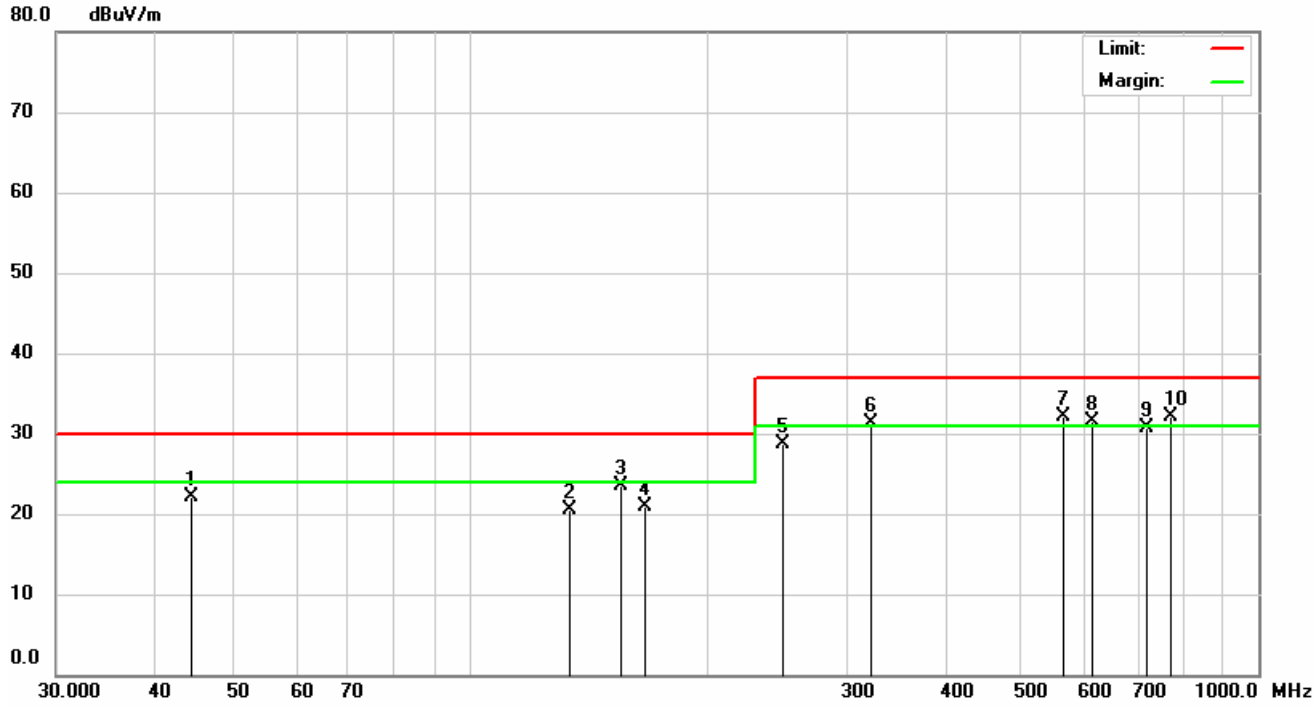
Model No.	TA-H10L-B	**Test Mode**	Mode 3
Environmental Conditions	26°C, 60% RH	**6dB Bandwidth**	120 kHz
Antenna Pole	Vertical	**Antenna Distance**	10m
Detector Function:	Quasi-peak.	**Tested By**	Kevin Liao
Standard	FCC Class B with CISPR 22 Class B Limit		



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	42.3000	37.40	-12.91	24.49	30.00	-5.51	100	62	QP
2	57.0500	40.10	-16.50	23.60	30.00	-6.40	100	268	QP
3	113.9700	35.41	-10.56	24.85	30.00	-5.15	100	2	QP
4	191.8500	37.02	-13.34	23.68	30.00	-6.32	100	238	QP
5	262.1000	36.37	-7.74	28.63	37.00	-8.37	100	63	QP
6	311.8000	31.89	-8.00	23.89	37.00	-13.11	300	279	QP
7	504.3000	33.98	-3.36	30.62	37.00	-6.38	150	199	QP
8	615.8000	33.04	-2.20	30.84	37.00	-6.16	120	76	QP
9	770.0000	30.60	0.79	31.39	37.00	-5.61	100	5	QP

REMARKS: 1. 30MHz to 1000MHz test is Applicable CISPR 22 standard.
2. The other emission levels were very low against the limit.

Model No.	TA-H10L-B	**Test Mode**	Mode 3
Environmental Conditions	26°C, 60% RH	**6dB Bandwidth**	120 kHz
Antenna Pole	Horizontal	**Antenna Distance**	10m
Detector Function:	Quasi-peak.	**Tested By**	Kevin Liao
Standard	FCC Class B with CISPR 22 Class B Limit		



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	44.2500	35.57	-13.47	22.10	30.00	-7.90	400	69	QP
2	134.2500	31.30	-10.83	20.47	30.00	-9.53	400	314	QP
3	155.1500	35.72	-12.16	23.56	30.00	-6.44	400	119	QP
4	165.9500	33.77	-12.81	20.96	30.00	-9.04	400	317	QP
5	248.7500	37.87	-9.16	28.71	37.00	-8.29	400	211	QP
6	321.5000	38.94	-7.68	31.26	37.00	-5.74	300	206	QP
7	563.5000	34.03	-1.97	32.06	37.00	-4.94	200	5	QP
8	616.0000	33.70	-2.19	31.51	37.00	-5.49	120	129	QP
9	720.0000	31.44	-0.80	30.64	37.00	-6.36	100	93	QP
10	770.0000	31.40	0.79	32.19	37.00	-4.81	100	191	QP

REMARKS: 1. 30MHz to 1000MHz test is Applicable CISPR 22 standard.
2. The other emission levels were very low against the limit.

Above 1GHz

Model No.	TA-H10L-B	**Test Mode**	Mode 1
Environmental Conditions	26°C, 56% RH	**Upper frequency**	7300MHz
Antenna Pole	Vertical	**Antenna Distance**	3m
Highest frequency generated or used	1.46GHz	**6dB Bandwidth**	1 MHz
Detector Function:	Peak/Average	**Tested By**	James Ho
Standard	FCC Class B Limit		

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	2135.000	64.56	-19.40	45.16	74.00	-28.84	100	118	peak
2	2195.000	60.85	-19.24	41.61	74.00	-32.39	104	187	peak
3	2680.000	60.28	-17.82	42.46	74.00	-31.54	100	98	peak
4	2950.000	60.93	-16.97	43.96	74.00	-30.04	108	203	peak
5	3125.000	61.31	-16.65	44.66	74.00	-29.34	100	41	peak
6	3630.000	62.32	-15.51	46.81	74.00	-27.19	100	348	peak

REMARKS: 1. The other emission levels were very low against the limit.

2. "--", means the average measurement was not performed when the measured peak data under the limit of average detection.

Model No.	TA-H10L-B	**Test Mode**	Mode 1
Environmental Conditions	26°C, 56% RH	**Upper frequency**	7300MHz
Antenna Pole	Horizontal	**Antenna Distance**	3m
Highest frequency generated or used	1.46GHz	**6dB Bandwidth**	1 MHz
Detector Function:	Peak/Average	**Tested By**	James Ho
Standard	FCC Class B Limit		

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	2135.000	60.46	-19.40	41.06	74.00	-32.94	100	286	peak
2	2655.000	60.21	-17.90	42.31	74.00	-31.69	105	153	peak
3	2930.000	60.52	-17.03	43.49	74.00	-30.51	100	355	peak
4	3125.000	61.01	-16.63	44.38	74.00	-29.62	103	338	peak
5	3865.000	62.18	-14.23	47.95	74.00	-26.05	100	226	peak
6	4320.000	60.91	-12.91	48.00	74.00	-26.00	100	52	peak

REMARKS: 1. The other emission levels were very low against the limit.

2. "--", means the average measurement was not performed when the measured peak data under the limit of average detection.

Model No.	TA-H10L-B	**Test Mode**	Mode 3
Environmental Conditions	26°C, 56% RH	**Upper frequency**	7300MHz
Antenna Pole	Vertical	**Antenna Distance**	3m
Highest frequency generated or used	1.46GHz	**6dB Bandwidth**	1 MHz
Detector Function:	Peak/Average	**Tested By**	James Ho
Standard	FCC Class B Limit		

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	1325.000	64.55	-22.82	41.73	74.00	-32.27	100	89	peak
2	1520.000	66.71	-22.40	44.31	74.00	-29.69	106	189	peak
3	1550.000	67.11	-22.23	44.88	74.00	-29.12	100	201	peak
4	1595.000	71.87	-21.98	49.89	74.00	-24.11	100	185	peak
5	2130.000	63.50	-19.42	44.08	74.00	-29.92	108	157	peak
6	3080.000	62.62	-16.71	45.91	74.00	-28.09	100	185	peak

REMARKS: 1. The other emission levels were very low against the limit.

2. "--", means the average measurement was not performed when the measured peak data under the limit of average detection.

Model No.	TA-H10L-B	**Test Mode**	Mode 3
Environmental Conditions	26°C, 56% RH	**Upper frequency**	7300MHz
Antenna Pole	Horizontal	**Antenna Distance**	3m
Highest frequency generated or used	1.46GHz	**6dB Bandwidth**	1 MHz
Detector Function:	Peak/Average	**Tested By**	James Ho
Standard	FCC Class B Limit		

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	1120.000	66.74	-23.22	43.52	74.00	-30.48	100	105	peak
2	1250.000	66.16	-22.97	43.19	74.00	-30.81	100	162	peak
3	1290.000	66.13	-22.90	43.23	74.00	-30.77	104	117	peak
4	1380.000	66.24	-22.72	43.52	74.00	-30.48	100	194	peak
5	1850.000	64.43	-20.59	43.84	74.00	-30.16	106	210	peak
6	2135.000	62.52	-19.40	43.12	74.00	-30.88	100	348	peak

REMARKS: 1. The other emission levels were very low against the limit.

2. "--", means the average measurement was not performed when the measured peak data under the limit of average detection.