

TEST REPORT

FCC Rules Part 15.225

Report Reference No......: **MTWG2209350-R**

FCC ID..... : **2A397-HK578**

Compiled by

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Supervised by

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Approved by

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Date of issue.....: **October 18, 2022**

Representative Laboratory Name .: **Shenzhen Most Technology Service Co., Ltd.**

Address: No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park,
Nanshan, Shenzhen, Guangdong, China.

Applicant's name.....: **QINGDAO HISTONE INTELLIGENT COMMERCIAL SYSTEM CO., LTD.**

Address: Wisdom Valley, No.8 Shengshui Road, Laoshan District, Qingdao
City, China

Test specification/ Standard: **FCC Rules Part 15.225**

TRF Originator.....: Shenzhen Most Technology Service Co., Ltd.

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Test item description: POS COMPUTER

Trade Mark: Histone

Manufacturer: **QINGDAO HISTONE INTELLIGENT COMMERCIAL SYSTEM CO., LTD.**

Model/Type reference.....: HK578

Listed Models: HK578 J6412, HK650

Modulation Type: ASK

Operation Frequency.....: 13.56MHz

Hardware Version.....: HS-J6412

Software Version: MEHL0401

Rating: 24V~, 2.5A, 60W
(by Adapter 1: 100-240V~, 50-60Hz, 1.8A(FSP060-DAAN3))

24V~, 5A, 120W
(by Adapter 2: 100-240V~, 50-60Hz, 1.8A(FSP120-AAAN3))

24V~, 3.75A, 90W
(by Adapter 3: 100-240V~, 50/60Hz, 2.5A(GM95-240375-F))

Result.....: **PASS**

TEST REPORT

Equipment under Test : POS COMPUTER

Model /Type : HK578

Listed Models : HK578 J6412, HK650

Remark : All models are identical to each other, except model name.

Applicant : **QINGDAO HISTONE INTELLIGENT COMMERCIAL SYSTEM CO., LTD.**

Address : Wisdom Valley, No.8 Shengshui Road, Laoshan District, Qingdao City, China

Manufacturer : **QINGDAO HISTONE INTELLIGENT COMMERCIAL SYSTEM CO., LTD.**

Address : Wisdom Valley, No.8 Shengshui Road, Laoshan District, Qingdao City, China

Test Result:	PASS
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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. Revision History

Revision	Issue Date	Revisions	Revised By
00	2022.10.18	Initial Issue	Alisa Luo

2. TEST STANDARDS

The tests were performed according to following standards:

The tests were performed according to following standards:

FCC Rules Part 15.225: Operation within the band 13.110-14.010 MHz.

ANSI C63.10:2013 : American National Standard for Testing Unlicensed Wireless Devices

ANSI C63.4: 2014: –American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz
Range of 9 kHz to 40GHz

3. SUMMARY

3.1. General Remarks

Date of receipt of test sample	:	2022.09.22
Testing commenced on	:	2022.09.23
Testing concluded on	:	2022.10.16

3.2. Product Description

Product Name:	POS COMPUTER
Model/Type reference:	HK578
Power Supply:	24V~,2.5A,60W(by Adapter 1: 100-240V~,50-60Hz,1.8A(FSP060-DAAN3)) 24V~,5A,120W(by Adapter 2: 100-240V~, 50-60Hz,1.8A(FSP120-AAAN3)) 24V~,3.75A,90W(by Adapter 3: 100-240V~, 50/60Hz,2.5A(GM95-240375-F))
Testing sample ID:	MT22090216-7
Modulation:	ASK
Operation frequency:	13.56MHZ
Channel number:	1 (declared by the client)
Antenna type:	FPC Antenna
Antenna gain:	3 dBi

3.3. Equipment Under Test

Power supply system utilised

Power supply voltage	:	☐ 230V / 50 Hz	☐ 120V / 60Hz
		☐ 12 V DC	☐ 24 V DC
		☒ Other (specified in blank below)	

24V~,2.5A,60W(by Adapter 1: 100-240V~,50-60Hz,1.8A(FSP060-DAAN3))
24V~,5A,120W(by Adapter 2: 100-240V~, 50-60Hz,1.8A(FSP120-AAAN3))
24V~,3.75A,90W(by Adapter 3: 100-240V~, 50/60Hz,2.5A(GM95-240375-F))

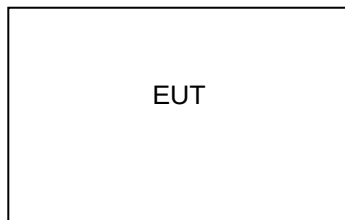
3.4. Short description of the Equipment under Test (EUT)

This is a POS COMPUTER For more details, refer to the user's manual of the EUT.

3.5. EUT operation mode

Channel	Freq.(MHz)	Note(Modulation Type)
1	13.56MHz	ASK

3.6. Block Diagram of Test Setup



3.7. Test Item (Equipment Under Test) Description*

Short designation	EUT Name	EUT Description	Serial number	Hardware status	Software status
EUT A	HK578(15 inch*10.4 inch)	POS COMPUTER	/	/	/
EUT B	HK578(15 inch*15 inch)	POS COMPUTER	/	/	/

*: declared by the applicant. According to customers information EUTs A and B are the same devices. Only the secondary screen size is different

3.8. Auxiliary Equipment (AE) Description

AE short designation	EUT Name (if available)	EUT Description	Serial number (if available)	Software (if used)
AE 1	/	/	/	/
AE 2	-	/	/	/

3.9 Antenna Information*

Short designation	Antenna Name	Antenna Type	Frequency Range	Serial number	Antenna Peak Gain
Antenna 1	---	FPC Antenna	13.56MHz	---	3 dBi
Antenna 2	/	/	/	/	/

*: declared by the applicant.

3.10. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - Supplied by the lab

●	ADAPTER	M/N:	24V~,2.5A,60W(by Adapter 1: 100-240V~,50-60Hz,1.8A(FSP060-DAAN3)) 24V~,5A,120W(by Adapter 2: 100-240V~, 50-60Hz,1.8A(FSP120-AAAN3)) 24V~,3.75A,90W(by Adapter 3: 100-240V~, 50/60Hz,2.5A(GM95-240375-F))
		Manufacturer:	Adapter 1: FPS GROUP INC. Adapter 2: FPS GROUP INC. Adapter 3: FOSHAN SHUNDE GUANYUDA POWER SUPPLY CO.,LTD

3.11. Modifications

No modifications were implemented to meet testing criteria.

4. TEST ENVIRONMENT

4.1. Address of the test laboratory

Shenzhen Most Technology Service Co., Ltd.

No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park, Nanshan, Shenzhen, Guangdong, China.
The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

Test Facility

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

FCC-Registration No.: 0031192610

Shenzhen Most Technology Service 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.

A2LA-Lab Cert. No.: 6343.01

Shenzhen Most Technology Service 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.

4.2. Environmental conditions

Radiated Emission:

Temperature:	23 ° C
Humidity:	48 %
Atmospheric pressure:	950-1050mbar

Conducted testing:

Temperature:	24 ° C
Humidity:	45 %
Atmospheric pressure:	950-1050mbar

4.3. Test Description

FCC and IC Requirements		
FCC Part 15.203	Antenna Requirement	PASS
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.209&15.205 (a) &15.225(a,b,c,d)	Spurious Emissions	PASS
FCC Part 15.215 (c) &15.225	20dB Occupied Bandwidth	PASS
FCC Part 15.225(e)	Frequency Tolerance	PASS

Remark:

1. The measurement uncertainty is not included in the test result.
2. NA = Not Applicable; NP = Not Performed

4.4. 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 Most Technology Service 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 Most Technology Service Co., Ltd. is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10 dB	(1)
Radiated Emission	1~18GHz	4.32 dB	(1)
Radiated Emission	18-40GHz	5.54 dB	(1)
Conducted Disturbance	0.15~30MHz	3.12 dB	(1)

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

4.5. Equipments Used during the Test

5.

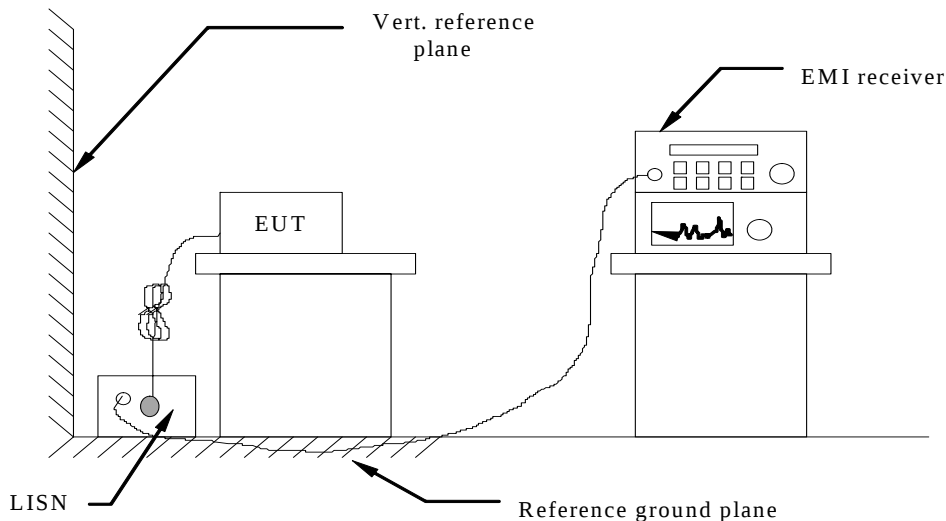
Item	Equipment	Manufacturer	Model No.	Serial No.	Firmware versions	Last Cal.	Cal. Interval
1.	L.I.S.N.	R&S	ENV216	100093	/	2022/04/18	1 Year
2	Three-phase artificial power network	Schwarzback Mess	NNLK8129	8129178	/	2022/04/18	1 Year
3.	Receiver	R&S	ESCI	100492	V3.0-10-2	2022/04/06	1 Year
4	Receiver	R&S	ESPI	101202	V3.0-10-2	2022/04/06	1 Year
5	Spectrum analyzer	Agilent	9020A	MT-E306	A14.16	2022/04/06	1 Year
6	Bilong Antenna	Sunol Sciences	JB3	A121206	/	2022/03/13	1 Year
7	Horn antenna	HF Antenna	HF Antenna	MT-E158	/	2022/04/06	1 Year
8	Loop antenna	Beijing Daze	ZN30900B	/	/	2022/04/15	1 Year
9	Horn antenna	R&S	OBH100400	26999002	/	2022/04/15	1 Year
10	Wireless Communication Test Set	R&S	CMW500	/	CMW-BASE-3.7.21	2022/04/14	1 Year
11	Spectrum analyzer	R&S	FSP	100019	V4.40 SP2	2022/04/14	1 Year
12	High gain antenna	Schwarzbeck	LB-180400KF	MT-E389	/	2022/03/13	1 Year
13	Preamplifier	Schwarzbeck	BBV 9743	MT-E390	/	2022/03/13	1 Year
14	Pre-amplifier	EMCI	EMC051845S E	MT-E391	/	2022/03/13	1 Year
15	Pre-amplifier	Agilent	83051A	MT-E392	/	2022/03/13	1 Year
16	High pass filter unit	Tonscend	JS0806-F	MT-E393	/	2022/03/13	1 Year
17	RF Cable(below1GHz)	Times	9kHz-1GHz	MT-E394	/	2022/03/13	1 Year
18	RF Cable(above 1GHz)	Times	1-40G	MT-E395	/	2022/03/13	1 Year
19	RF Cable (9KHz-40GHz)	Tonscend	170660	N/A	/	2022/03/13	1 Year

6. Note: The Cal.Interval was one year.

7. TEST CONDITIONS AND RESULTS

7.1. AC Power Conducted Emission

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 C63.10-2013.
- 2 Support equipment, if needed, was placed as per ANSI C63.10-2013
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013
- 4 The EUT received DC5V power, the adapter 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.

AC Power Conducted Emission Limit

For unintentional device, according to RSS Gen 8.8 and § 15.207(a) Line Conducted Emission Limits is as following:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	79	66
5-30	73	60

* Decreases with the logarithm of the frequency.

TEST RESULTS

Pass

Power Supply

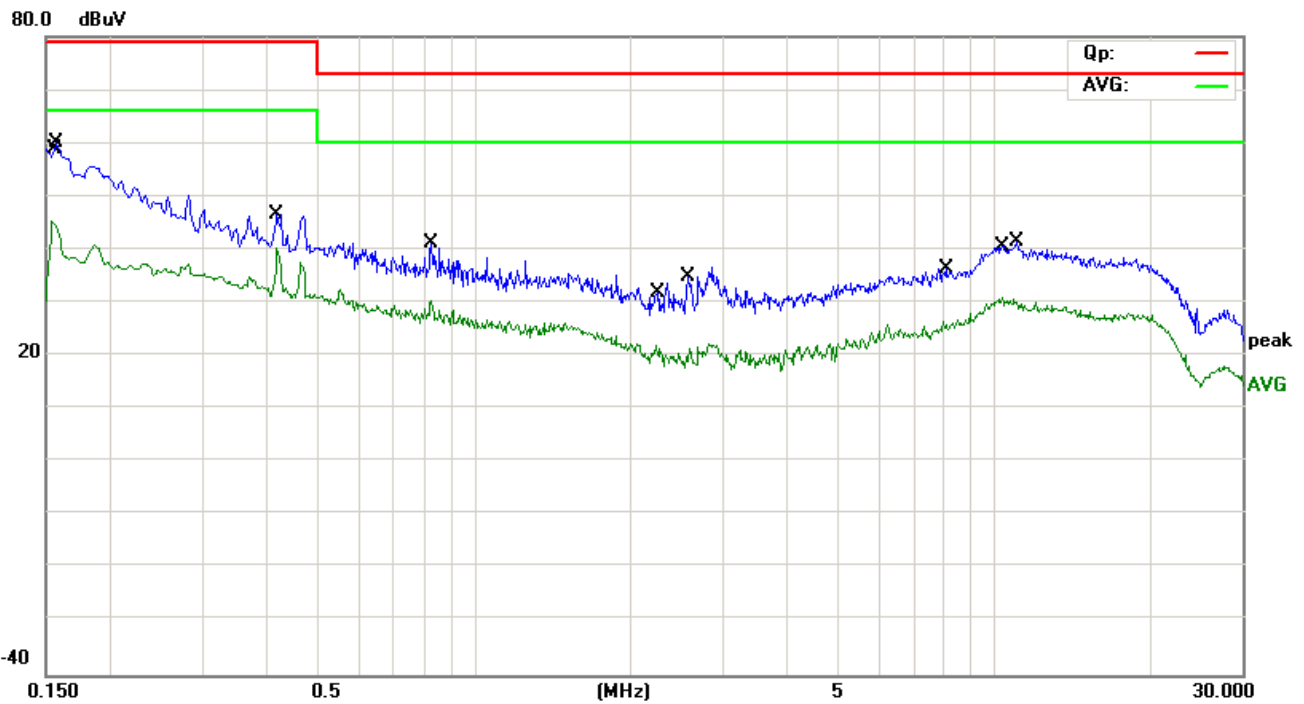
DC 24V by Adapter(Adapter1)

Line

L

M/N:

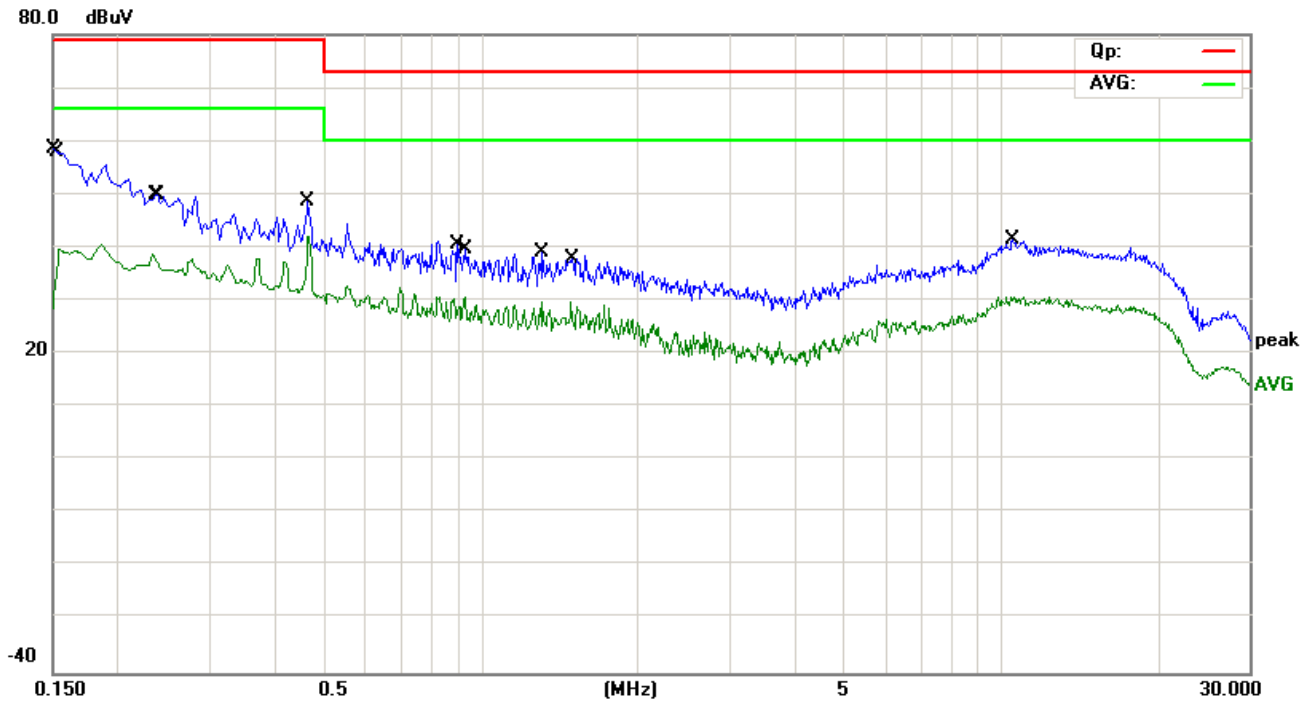
HK578(15 inch*10.4 inch)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1540	35.79	9.60	45.39	66.00	-20.61	AVG	
2	*	0.1580	50.37	9.60	59.97	79.00	-19.03	QP	
3		0.4180	36.99	9.59	46.58	79.00	-32.42	QP	
4		0.4180	30.59	9.59	40.18	66.00	-25.82	AVG	
5		0.8300	31.54	9.60	41.14	73.00	-31.86	QP	
6		0.8300	20.68	9.60	30.28	60.00	-29.72	AVG	
7		2.2380	12.35	9.60	21.95	60.00	-38.05	AVG	
8		2.5820	25.34	9.61	34.95	73.00	-38.05	QP	
9		7.9820	16.70	9.66	26.36	60.00	-33.64	AVG	
10		8.0820	26.79	9.66	36.45	73.00	-36.55	QP	
11		10.3580	21.15	9.69	30.84	60.00	-29.16	AVG	
12		11.0380	31.74	9.69	41.43	73.00	-31.57	QP	

*:Maximum data x:Over limit !:over margin

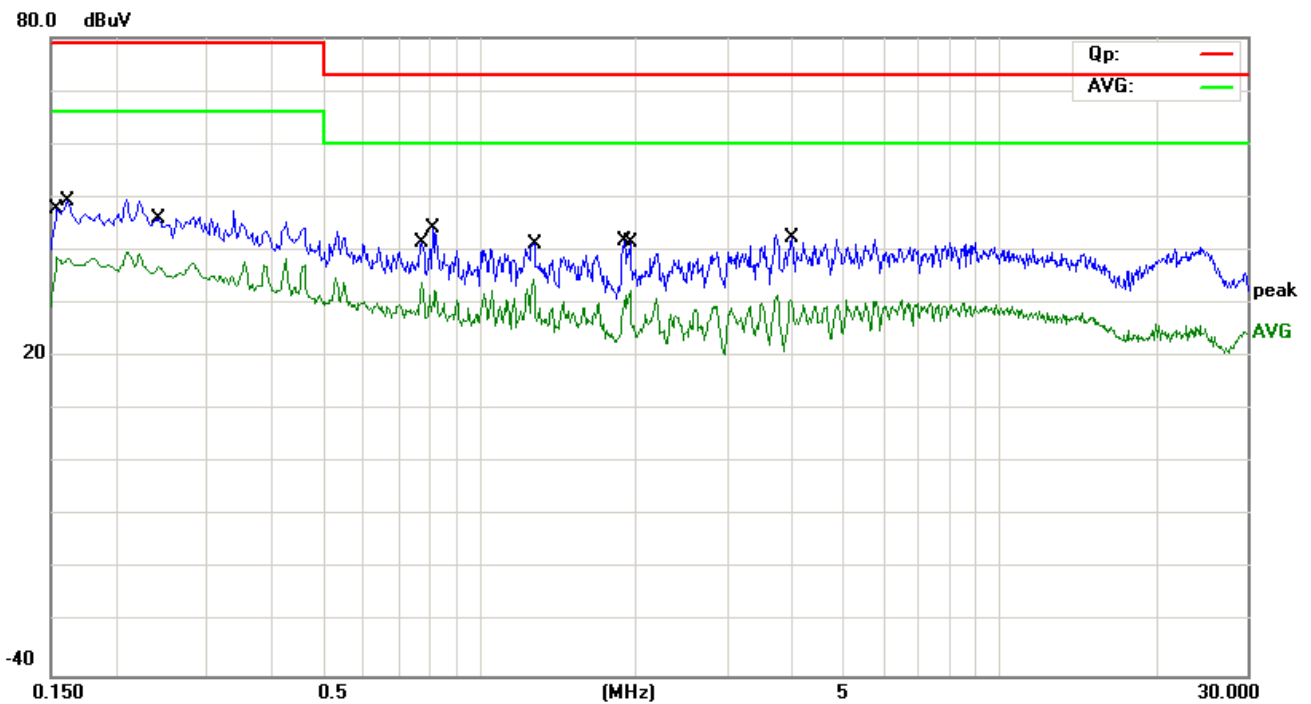
Power Supply	DC 24V by Adapter(Adapter1)	Line	N
M/N:	HK578(15 inch*10.4 inch)		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1500	49.05	9.60	58.65	79.00	-20.35	QP	
2		0.1540	30.06	9.60	39.66	66.00	-26.34	AVG	
3		0.2340	29.03	9.60	38.63	66.00	-27.37	AVG	
4		0.2380	40.35	9.60	49.95	79.00	-29.05	QP	
5		0.4660	38.91	9.59	48.50	79.00	-30.50	QP	
6		0.4660	32.53	9.59	42.12	66.00	-23.88	AVG	
7		0.9020	30.84	9.60	40.44	73.00	-32.56	QP	
8		0.9340	20.97	9.60	30.57	60.00	-29.43	AVG	
9		1.3140	29.40	9.60	39.00	73.00	-34.00	QP	
10		1.4900	20.13	9.60	29.73	60.00	-30.27	AVG	
11		10.4780	20.96	9.69	30.65	60.00	-29.35	AVG	
12		10.5300	31.72	9.69	41.41	73.00	-31.59	QP	

*:Maximum data x:Over limit l:over margin

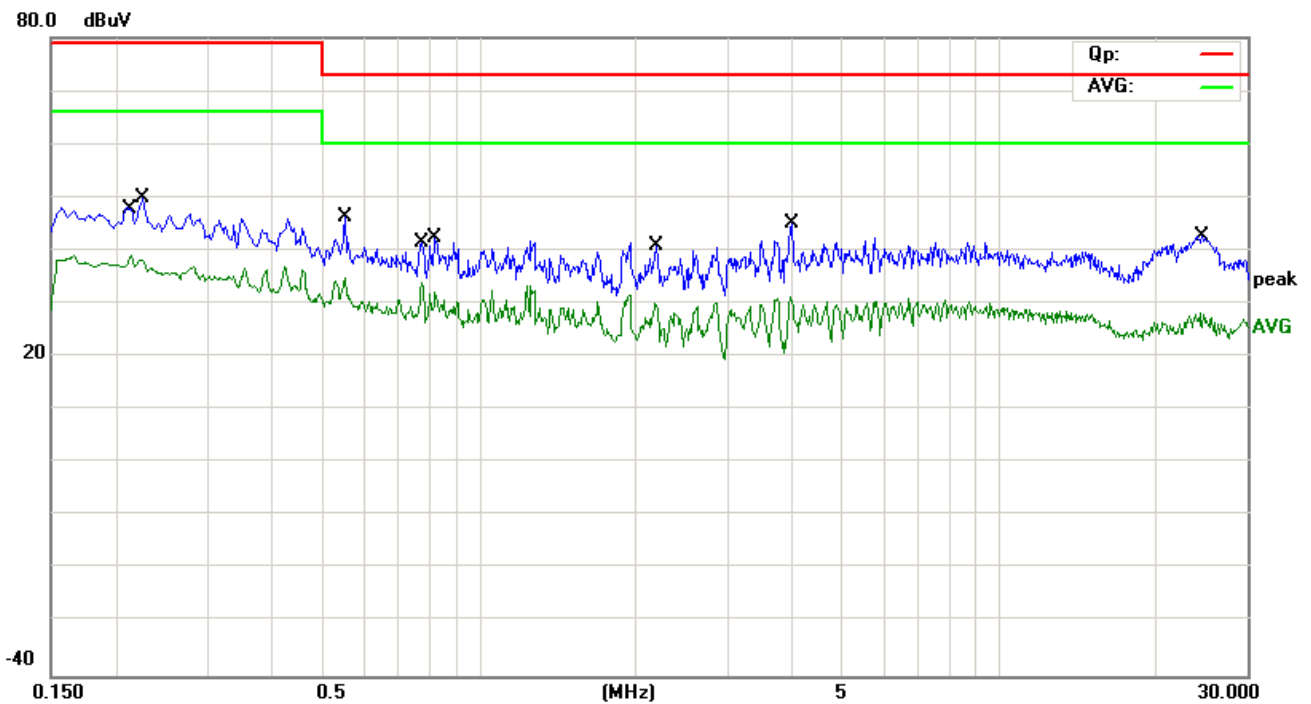
Power Supply	DC 24V by Adapter(Adapter2)	Line	L
M/N:	HK578(15 inch*10.4 inch)		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1540	29.10	9.60	38.70	66.00	-27.30	AVG	
2		0.1620	39.67	9.61	49.28	79.00	-29.72	QP	
3		0.2420	36.38	9.60	45.98	79.00	-33.02	QP	
4		0.2420	27.22	9.60	36.82	66.00	-29.18	AVG	
5		0.7780	24.20	9.60	33.80	60.00	-26.20	AVG	
6		0.8140	34.56	9.60	44.16	73.00	-28.84	QP	
7	*	1.2700	24.93	9.60	34.53	60.00	-25.47	AVG	
8		1.2780	31.64	9.60	41.24	73.00	-31.76	QP	
9		1.9060	32.30	9.60	41.90	73.00	-31.10	QP	
10		1.9500	22.72	9.60	32.32	60.00	-27.68	AVG	
11		3.9780	21.08	9.62	30.70	60.00	-29.30	AVG	
12		3.9980	32.85	9.62	42.47	73.00	-30.53	QP	

*:Maximum data x:Over limit !:over margin

Power Supply	DC 24V by Adapter(Adapter2)	Line	N
M/N:	HK578(15 inch*10.4 inch)		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2140	29.41	9.60	39.01	66.00	-26.99	AVG	
2		0.2260	40.11	9.60	49.71	79.00	-29.29	QP	
3		0.5540	36.76	9.59	46.35	73.00	-26.65	QP	
4	*	0.5540	25.25	9.59	34.84	60.00	-25.16	AVG	
5		0.7780	24.30	9.60	33.90	60.00	-26.10	AVG	
6		0.8260	32.74	9.60	42.34	73.00	-30.66	QP	
7		2.1860	20.33	9.60	29.93	60.00	-30.07	AVG	
8		2.1900	31.33	9.60	40.93	73.00	-32.07	QP	
9		3.9660	21.54	9.62	31.16	60.00	-28.84	AVG	
10		3.9900	35.39	9.62	45.01	73.00	-27.99	QP	
11		24.3220	18.46	9.75	28.21	60.00	-31.79	AVG	
12		24.5420	32.80	9.75	42.55	73.00	-30.45	QP	

*:Maximum data x:Over limit !:over margin

Power Supply

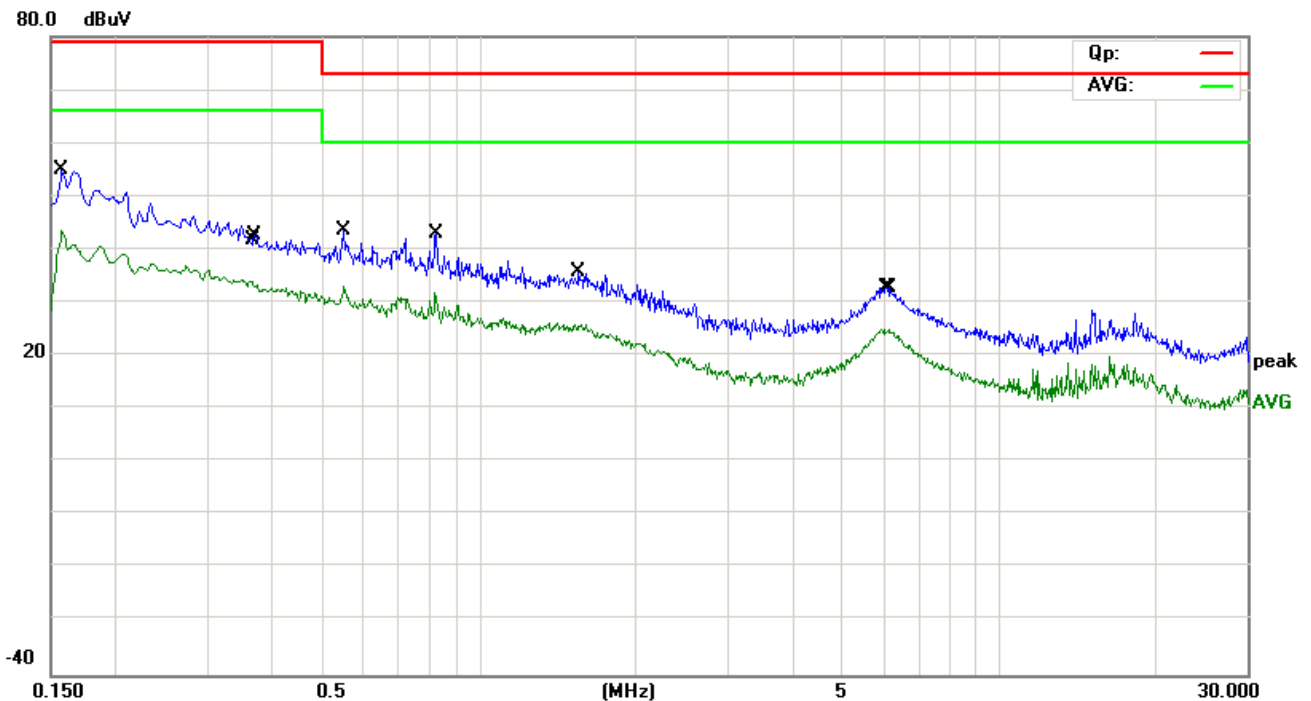
DC 24V by Adapter(Adapter3)

Line

L

M/N:

HK578(15 inch*10.4 inch)



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1		0.1580	45.43	9.60	55.03	79.00	-23.97	QP	
2	*	0.1580	33.90	9.60	43.50	66.00	-22.50	AVG	
3		0.3634	24.32	9.59	33.91	66.00	-32.09	AVG	
4		0.3700	33.10	9.59	42.69	79.00	-36.31	QP	
5		0.5500	33.83	9.59	43.42	73.00	-29.58	QP	
6		0.5500	23.33	9.59	32.92	60.00	-27.08	AVG	
7		0.8260	22.12	9.60	31.72	60.00	-28.28	AVG	
8		0.8300	33.43	9.60	43.03	73.00	-29.97	QP	
9		1.5340	16.32	9.60	25.92	60.00	-34.08	AVG	
10		1.5580	26.02	9.60	35.62	73.00	-37.38	QP	
11		6.0660	23.18	9.64	32.82	73.00	-40.18	QP	
12		6.1580	15.32	9.64	24.96	60.00	-35.04	AVG	

*:Maximum data x:Over limit l:over margin

Power Supply

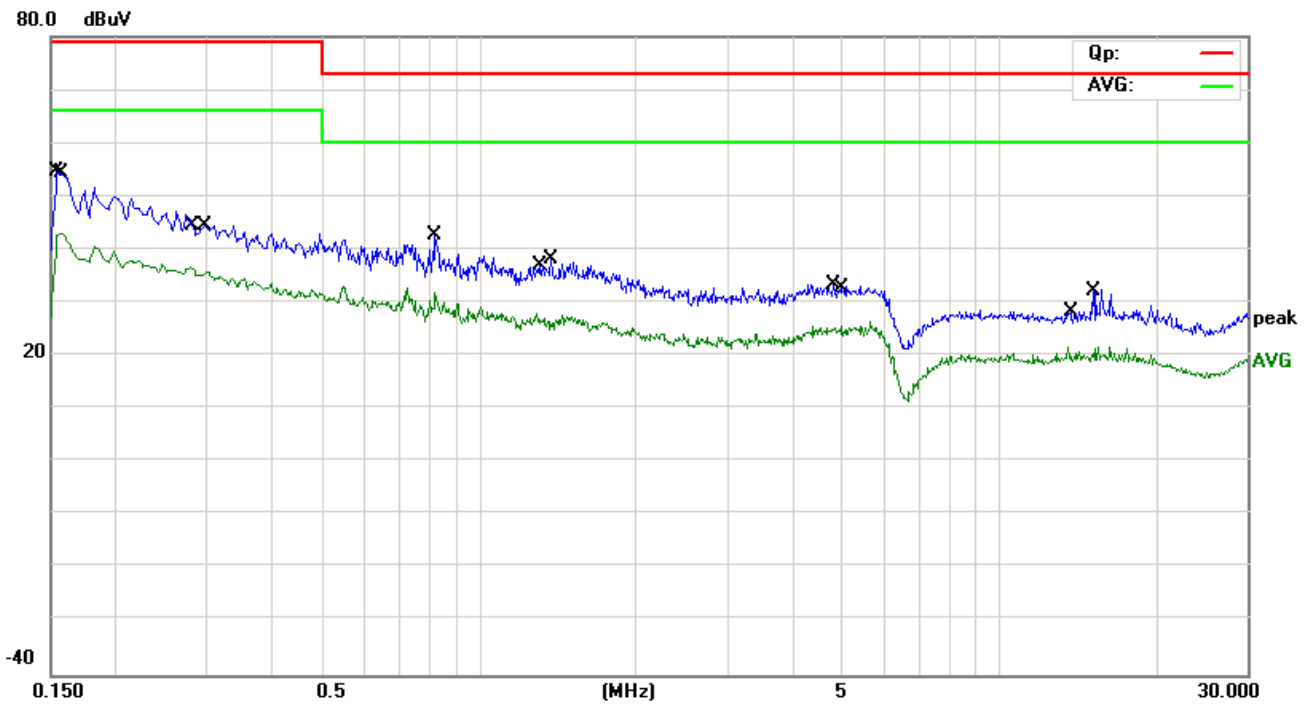
DC 24V by Adapter(Adapter3)

Line

N

M/N:

HK578(15 inch*10.4 inch)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1540	44.96	9.60	54.56	79.00	-24.44	QP	
2	*	0.1580	33.41	9.60	43.01	66.00	-22.99	AVG	
3		0.2820	26.74	9.59	36.33	66.00	-29.67	AVG	
4		0.2980	35.00	9.59	44.59	79.00	-34.41	QP	
5		0.8260	33.19	9.60	42.79	73.00	-30.21	QP	
6		0.8260	22.38	9.60	31.98	60.00	-28.02	AVG	
7		1.2900	18.35	9.60	27.95	60.00	-32.05	AVG	
8		1.3740	28.44	9.60	38.04	73.00	-34.96	QP	
9		4.8060	23.64	9.63	33.27	73.00	-39.73	QP	
10		4.9980	16.00	9.63	25.63	60.00	-34.37	AVG	
11		13.5780	11.93	9.70	21.63	60.00	-38.37	AVG	
12		15.1940	22.44	9.70	32.14	73.00	-40.86	QP	

*:Maximum data x:Over limit !:over margin

Power Supply

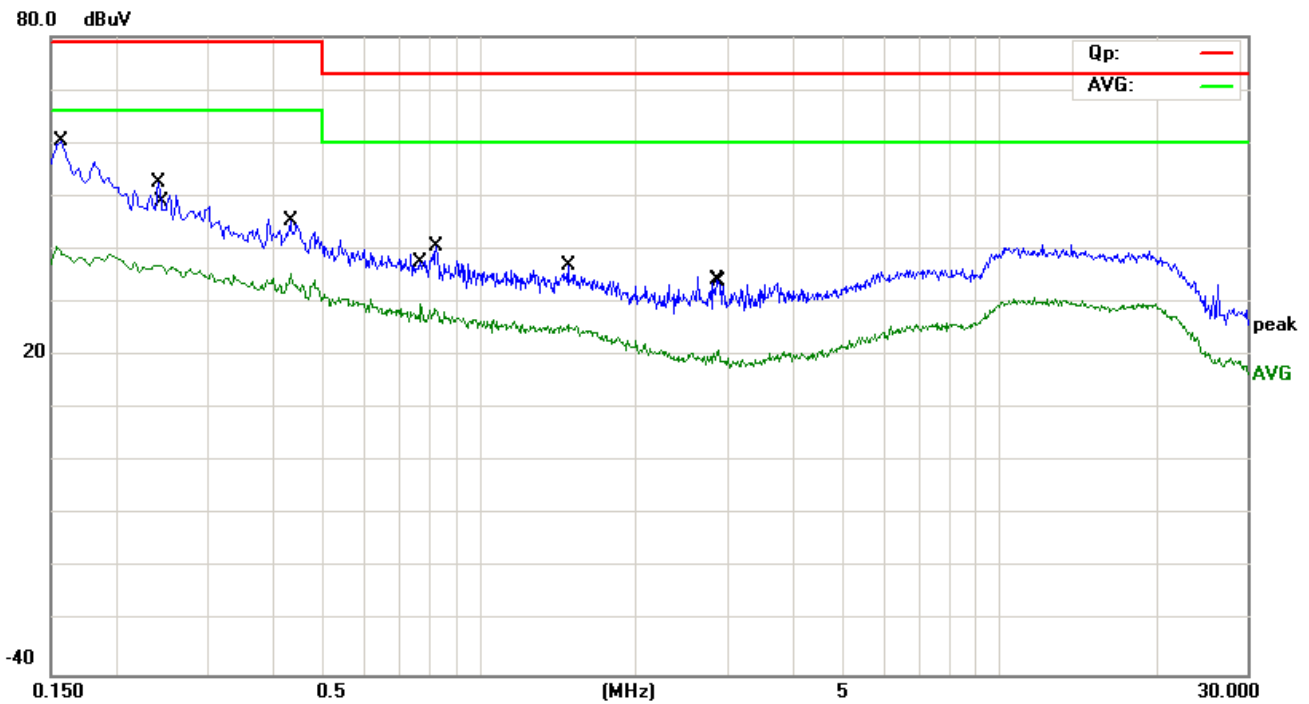
DC 24V by Adapter(Adapter1)

Line

L

M/N:

HK578(15 inch*15 inch)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1556	30.34	9.60	39.94	66.00	-26.06	AVG	
2	*	0.1580	50.68	9.60	60.28	79.00	-18.72	QP	
3		0.2420	42.82	9.60	52.42	79.00	-26.58	QP	
4		0.2460	27.50	9.60	37.10	66.00	-28.90	AVG	
5		0.4340	35.67	9.59	45.26	79.00	-33.74	QP	
6		0.4340	25.79	9.59	35.38	66.00	-30.62	AVG	
7		0.7740	20.20	9.60	29.80	60.00	-30.20	AVG	
8		0.8300	30.84	9.60	40.44	73.00	-32.56	QP	
9		1.4820	27.30	9.60	36.90	73.00	-36.10	QP	
10		1.4820	16.23	9.60	25.83	60.00	-34.17	AVG	
11		2.8580	24.69	9.61	34.30	73.00	-38.70	QP	
12		2.8940	11.37	9.61	20.98	60.00	-39.02	AVG	

*:Maximum data x:Over limit !:over margin

Power Supply

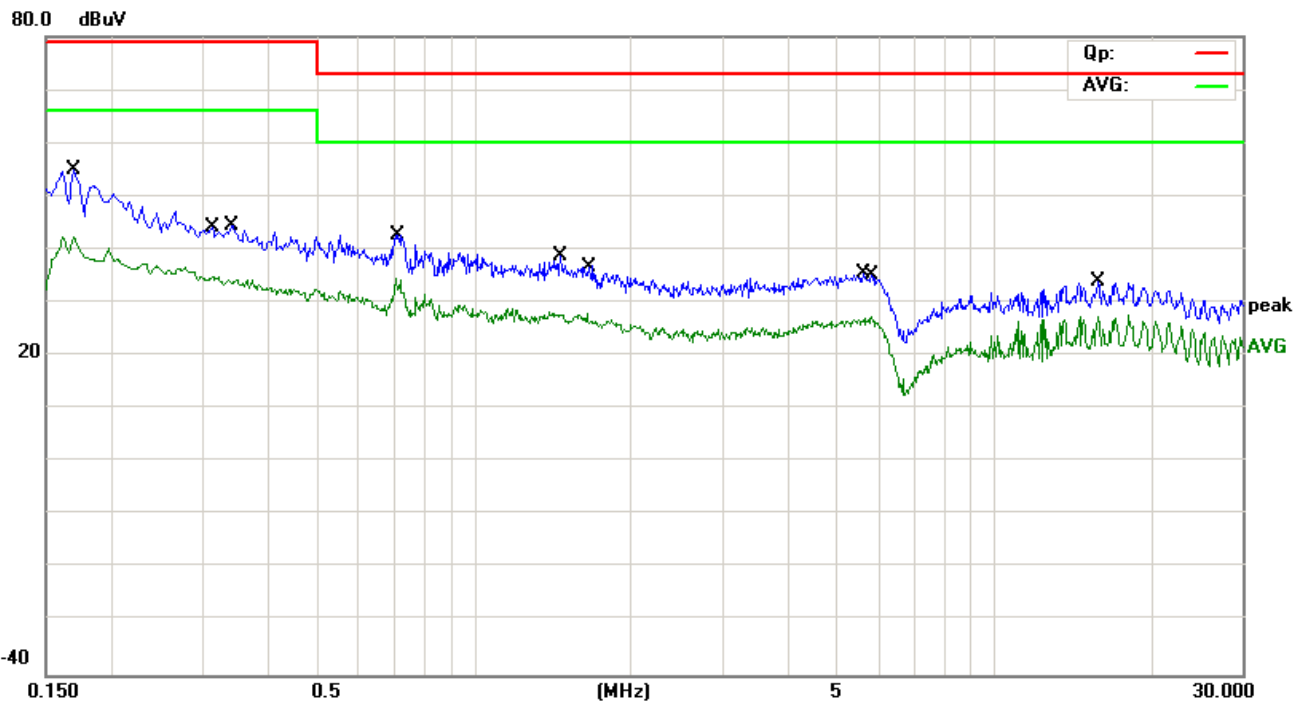
DC 24V by Adapter(Adapter1)

Line

N

M/N:

HK578(15 inch*15 inch)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1700	45.39	9.61	55.00	79.00	-24.00	QP	
2	*	0.1700	32.72	9.61	42.33	66.00	-23.67	AVG	
3		0.7140	33.18	9.60	42.78	73.00	-30.22	QP	
4		0.7060	24.87	9.60	34.47	60.00	-25.53	AVG	
5		1.4660	29.05	9.60	38.65	73.00	-34.35	QP	
6		1.6460	18.22	9.60	27.82	60.00	-32.18	AVG	
7		5.5980	25.78	9.64	35.42	73.00	-37.58	QP	
8		5.8140	17.69	9.64	27.33	60.00	-32.67	AVG	
9		15.8500	24.13	9.71	33.84	73.00	-39.16	QP	
10		15.8500	17.66	9.71	27.37	60.00	-32.63	AVG	
11		0.3420	34.83	9.59	44.42	79.00	-34.58	QP	
12		0.3140	25.22	9.59	34.81	66.00	-31.19	AVG	

*:Maximum data x:Over limit !:over margin

Power Supply

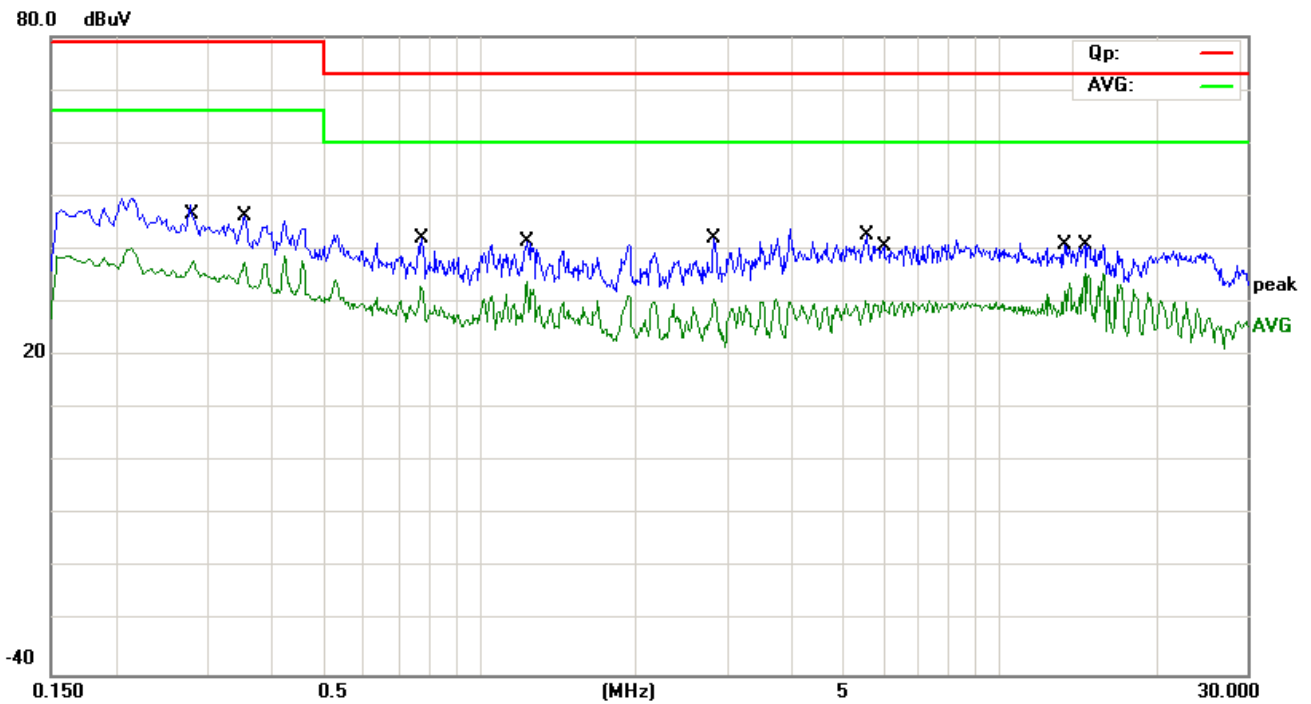
DC 24V by Adapter(Adapter2)

Line

L

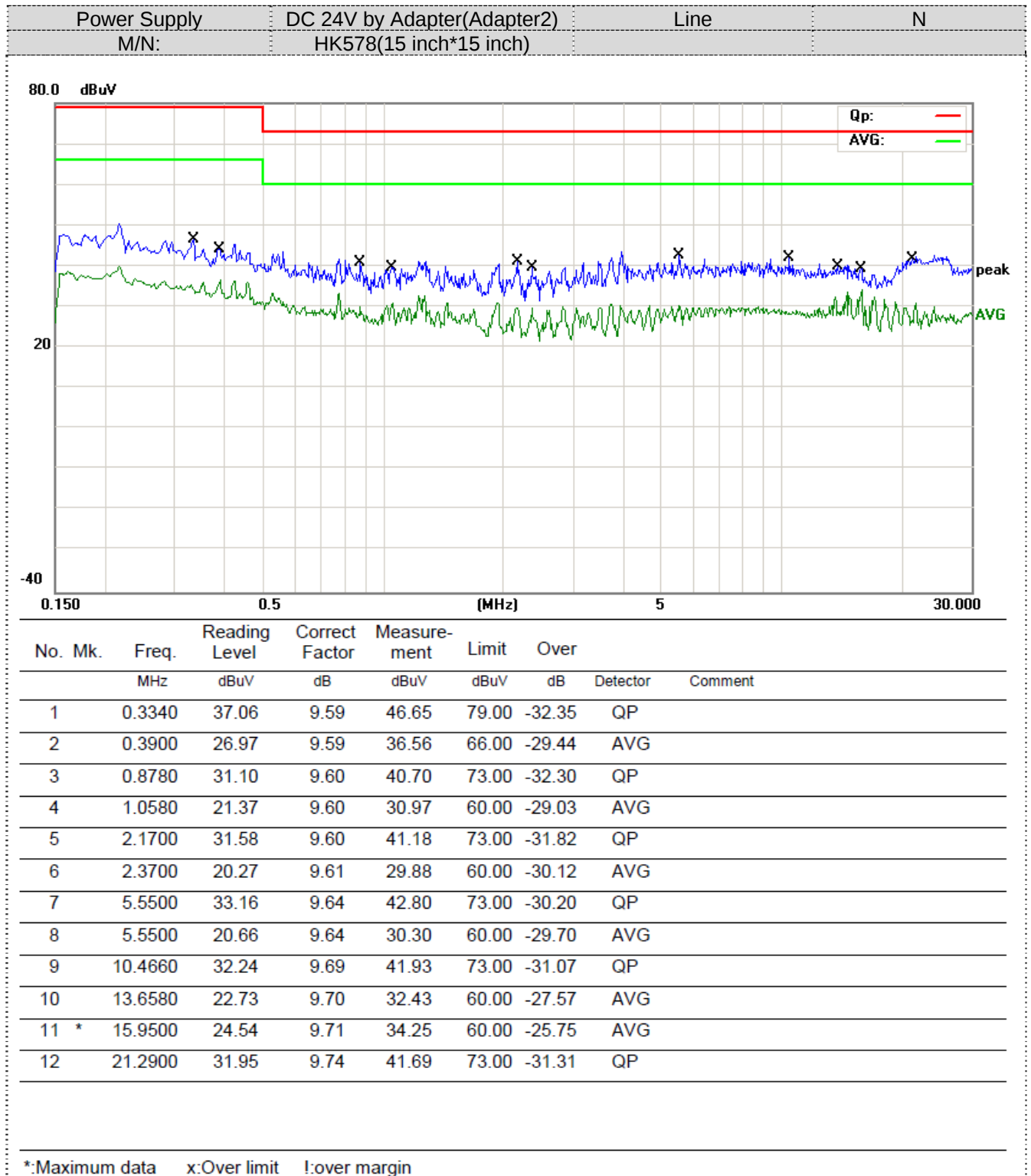
M/N:

HK578(15 inch*15 inch)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2820	28.31	9.59	37.90	66.00	-28.10	AVG	
2		0.3540	36.69	9.59	46.28	79.00	-32.72	QP	
3		0.7740	23.60	9.60	33.20	60.00	-26.80	AVG	
4		0.7780	32.47	9.60	42.07	73.00	-30.93	QP	
5		1.2380	31.94	9.60	41.54	73.00	-31.46	QP	
6		1.2380	24.36	9.60	33.96	60.00	-26.04	AVG	
7		2.8380	32.37	9.61	41.98	73.00	-31.02	QP	
8		2.8380	21.09	9.61	30.70	60.00	-29.30	AVG	
9		5.5740	32.90	9.64	42.54	73.00	-30.46	QP	
10		5.9860	20.63	9.64	30.27	60.00	-29.73	AVG	
11		13.3580	31.07	9.70	40.77	73.00	-32.23	QP	
12	*	14.6540	25.78	9.70	35.48	60.00	-24.52	AVG	

*:Maximum data x:Over limit !:over margin



Power Supply

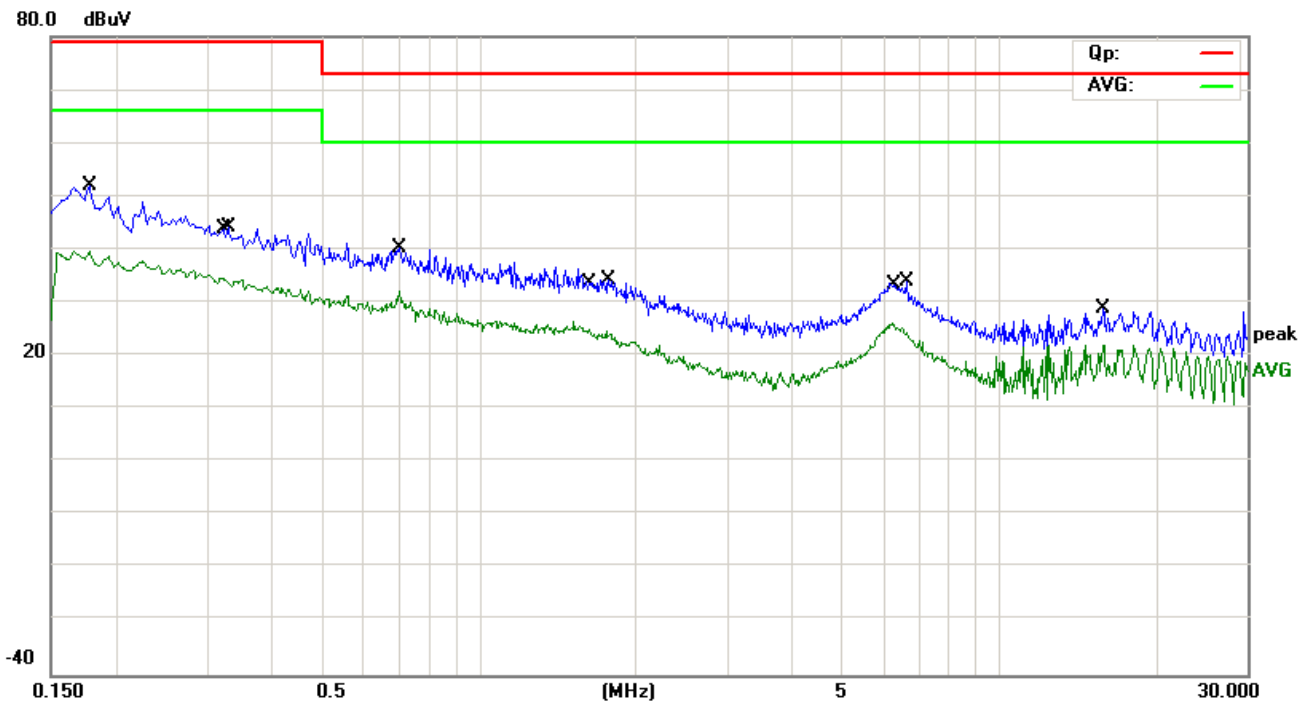
DC 24V by Adapter(Adapter3)

Line

L

M/N:

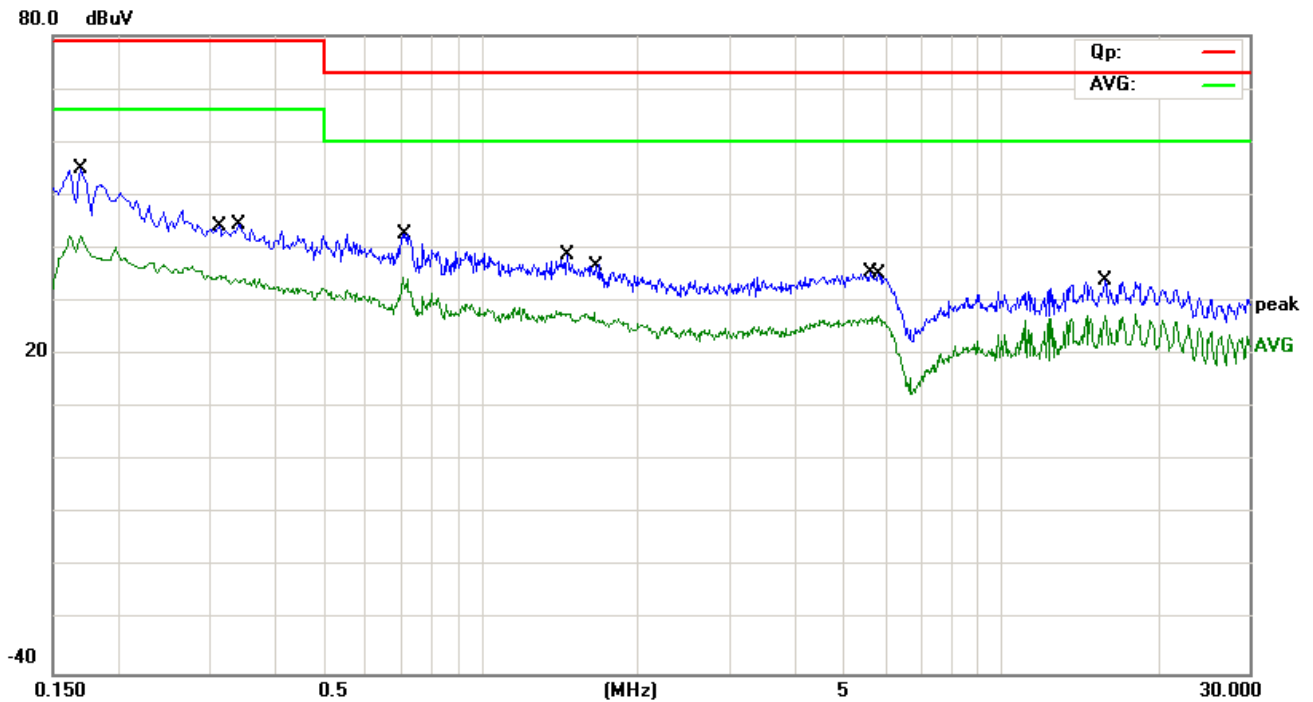
HK578(15 inch*15 inch)



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1		0.1780	42.45	9.61	52.06	79.00	-26.94	QP	
2	*	0.1780	30.02	9.61	39.63	66.00	-26.37	AVG	
3		0.3183	25.09	9.59	34.68	66.00	-31.32	AVG	
4		0.3300	34.49	9.59	44.08	79.00	-34.92	QP	
5		0.7020	30.73	9.60	40.33	73.00	-32.67	QP	
6		0.7020	22.69	9.60	32.29	60.00	-27.71	AVG	
7		1.6340	15.39	9.60	24.99	60.00	-35.01	AVG	
8		1.7740	24.59	9.60	34.19	73.00	-38.81	QP	
9		6.2420	16.54	9.64	26.18	60.00	-33.82	AVG	
10		6.6380	24.18	9.65	33.83	73.00	-39.17	QP	
11		15.8500	19.13	9.71	28.84	73.00	-44.16	QP	
12		15.8500	12.35	9.71	22.06	60.00	-37.94	AVG	

*:Maximum data x:Over limit !:over margin

Power Supply	DC 24V by Adapter(Adapter3)	Line	N
M/N:	HK578(15 inch*15 inch)		



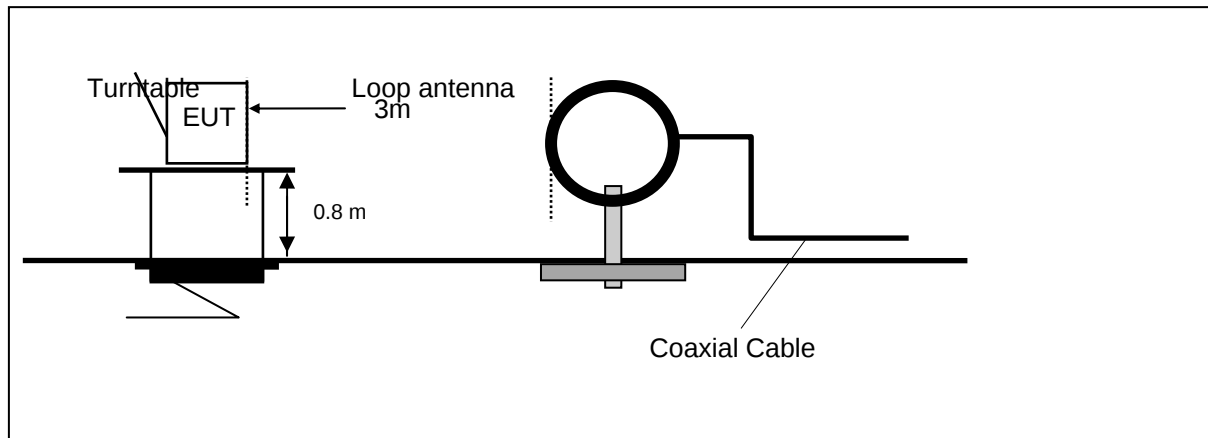
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1700	45.39	9.61	55.00	79.00	-24.00	QP	
2	*	0.1700	32.72	9.61	42.33	66.00	-23.67	AVG	
3		0.7140	33.18	9.60	42.78	73.00	-30.22	QP	
4		0.7060	24.87	9.60	34.47	60.00	-25.53	AVG	
5		1.4660	29.05	9.60	38.65	73.00	-34.35	QP	
6		1.6460	18.22	9.60	27.82	60.00	-32.18	AVG	
7		5.5980	25.78	9.64	35.42	73.00	-37.58	QP	
8		5.8140	17.69	9.64	27.33	60.00	-32.67	AVG	
9		15.8500	24.13	9.71	33.84	73.00	-39.16	QP	
10		15.8500	17.66	9.71	27.37	60.00	-32.63	AVG	
11		0.3420	34.83	9.59	44.42	79.00	-34.58	QP	
12		0.3140	25.22	9.59	34.81	66.00	-31.19	AVG	

*:Maximum data x:Over limit !:over margin

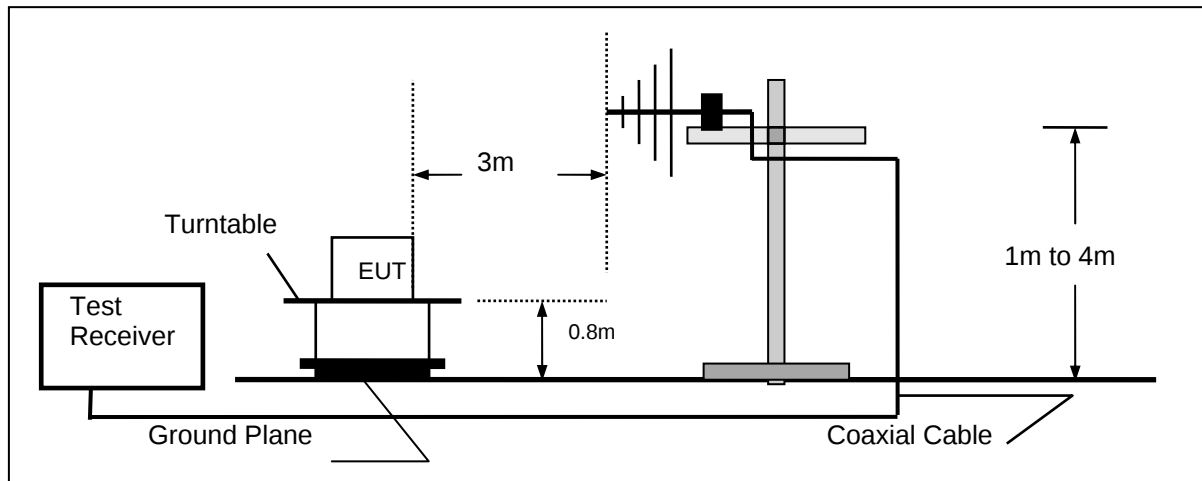
7.2. Radiated Emission

TEST CONFIGURATION

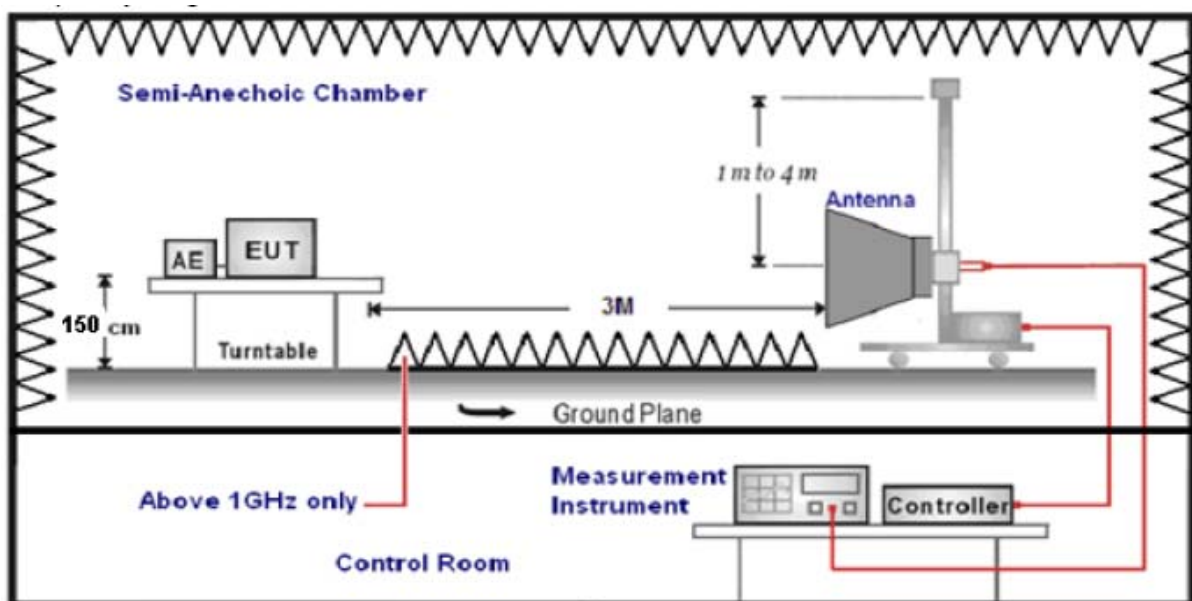
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –1GHz;the EUT was placed on a turn table which is 1.5m above ground plane when testing frequency range 1GHz – 25GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. The EUT minimum operation frequency was 32.768KHz and maximum operation frequency was 2480MHz.so radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Ultra-Broadband Antenna	3
1GHz-18GHz	Double Ridged Horn Antenna	3
18GHz-25GHz	Horn Antenna	1

7. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

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	

$$\text{Transd}=AF +CL-AG$$

RADIATION LIMIT

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in table below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission

Unwanted emissions that fall into restricted bands shall comply with the limits specified in RSS-Gen; and Unwanted emissions that do not fall within the restricted frequency bands shall comply either with the limits specified in the applicable RSS or with those specified in this RSS-Gen.

Frequency (MHz)	Distance (Meters)	Radiated (dBµV/m)	Radiated (µV/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$

1.705-30	3	$20\log(30) + 40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

According to FCC Part 15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

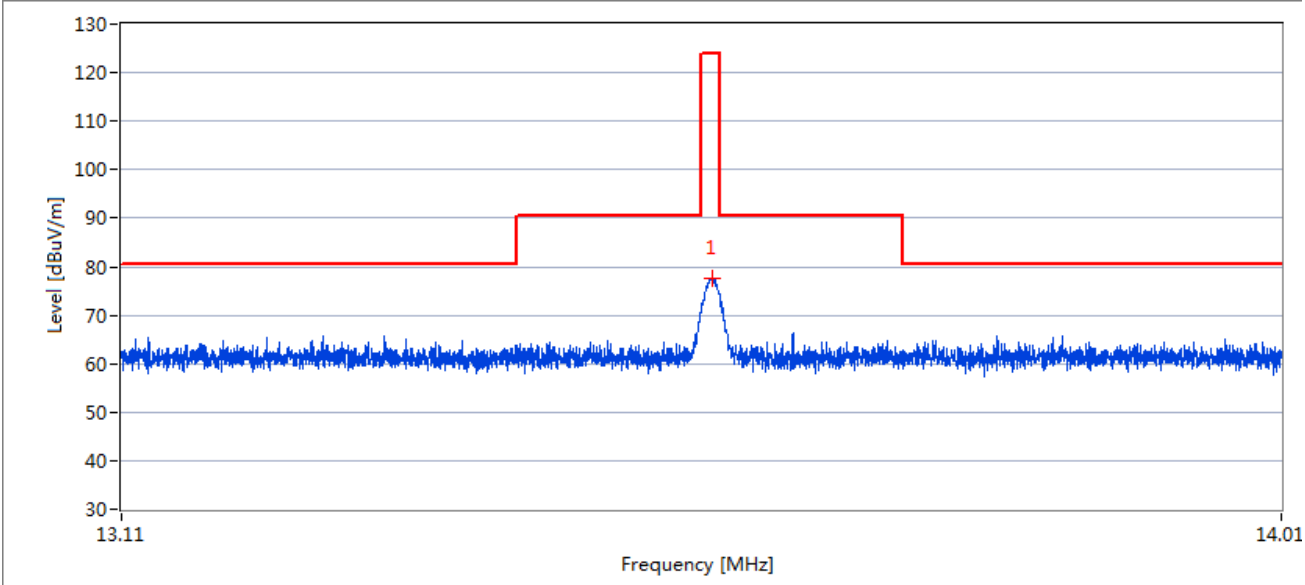
LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.225)

- (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters, equal to 124dBuV/m at 3 meters.
- (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters, equal to 90.5dBuV/m at 3 meters.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters, equal to 80.5dBuV/m at 3 meters..
- (d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

TEST RESULTS (BELOW 30MHz)

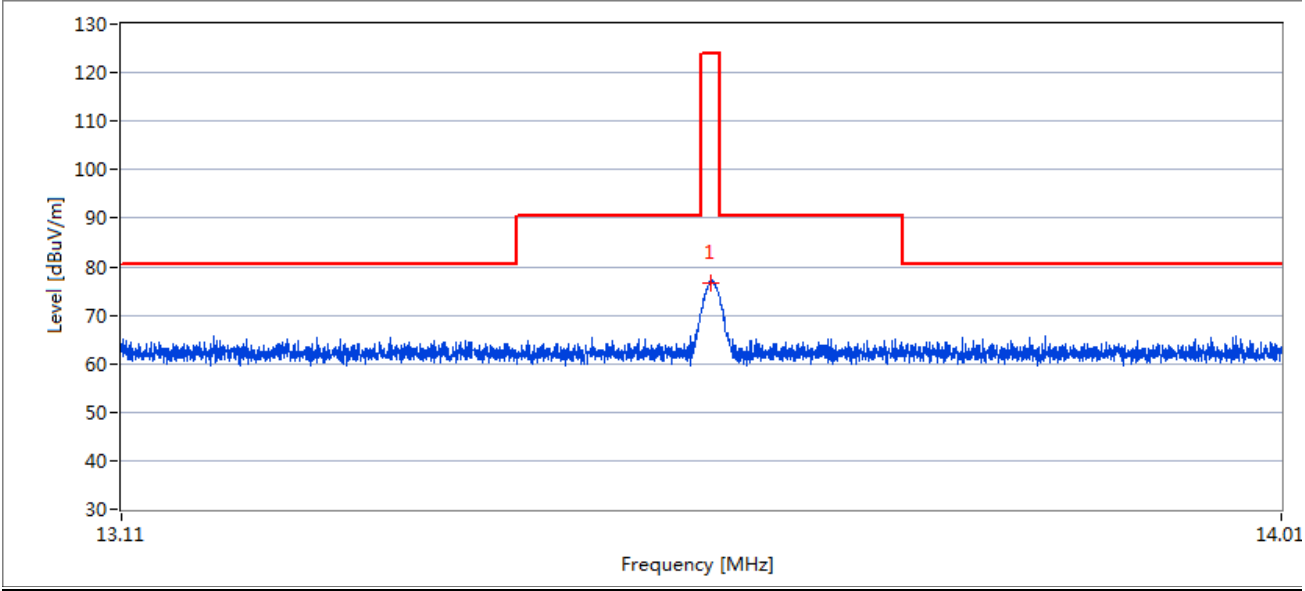
- 1: This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.
2: Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

X

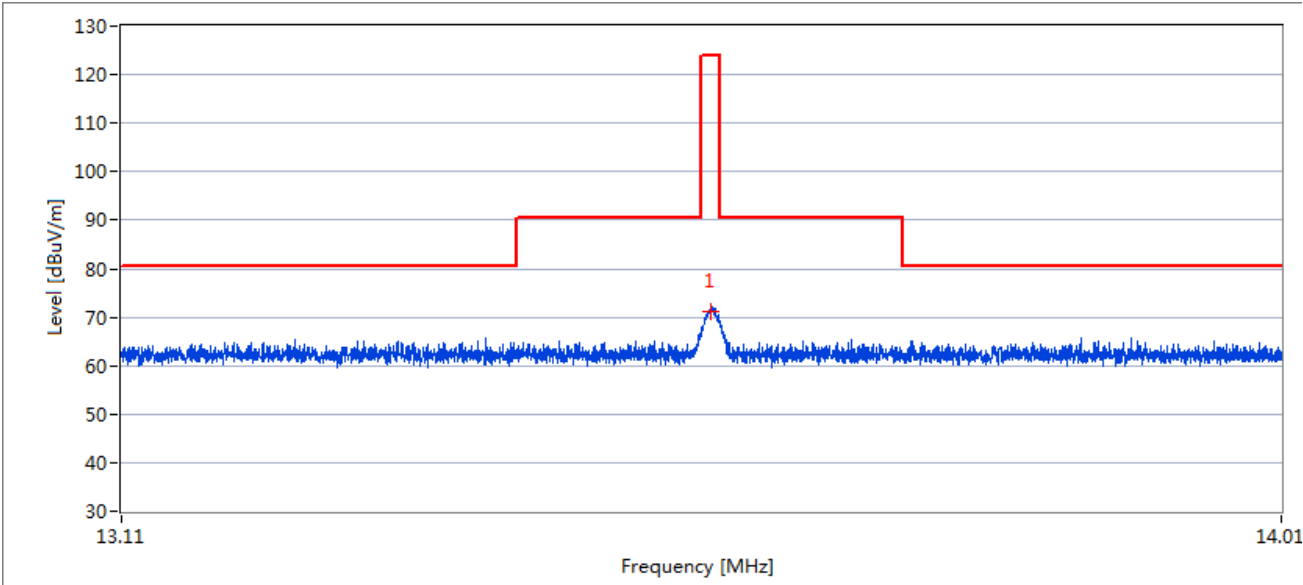


Frequency	Pre-scan Level MaxPeak	Final Test Level MaxPeak	Limit MaxPeak	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
13.56	78.1	78.1	124.0	45.9

Y



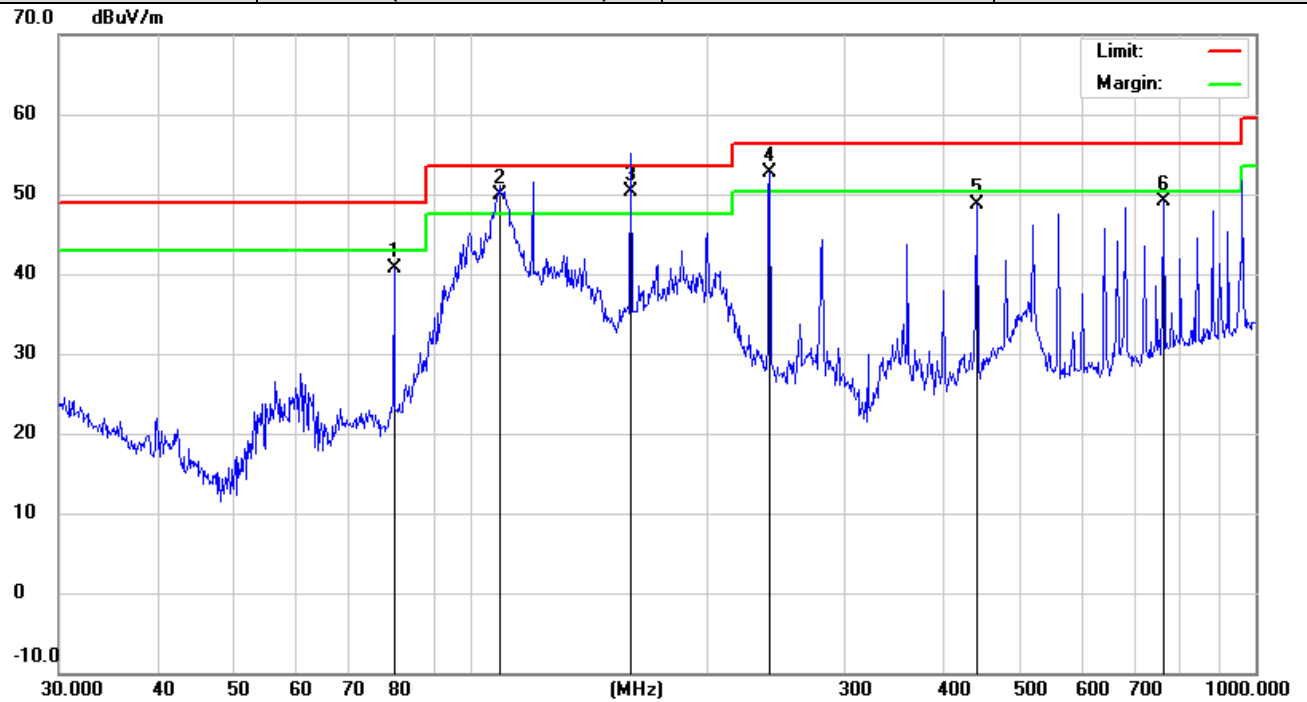
Frequency	Pre-scan Level MaxPeak	Final Test Level MaxPeak	Limit MaxPeak	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
13.56	76.8	77.3	124.0	46.7



Frequency	Pre-scan Level MaxPeak	Final Test Level MaxPeak	Limit MaxPeak	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
13.56	72.2	72.2	124.0	51.8

For 30MHz-1GHz

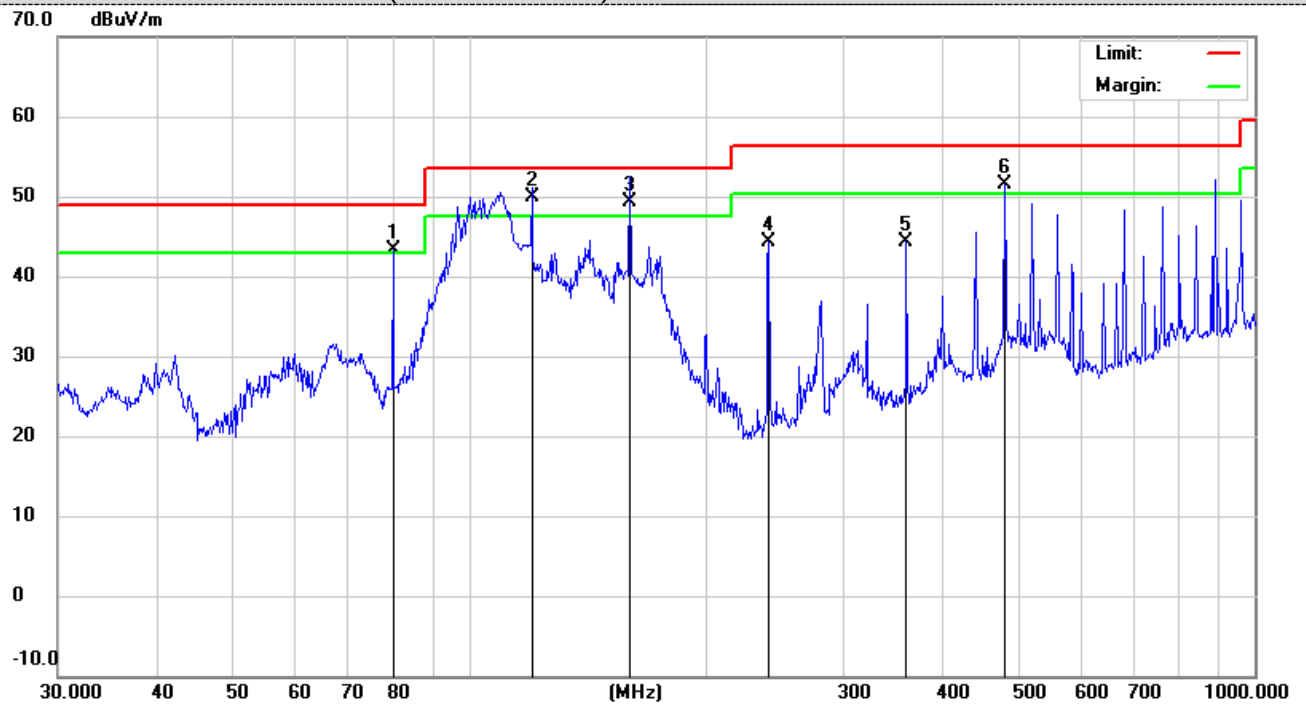
Power Supply	DC 24V by Adapter(Adapter1)	Polarization	Horizontal
M/N:	HK578(15 inch*10.4 inch)		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		80.0805	30.54	10.10	40.64	49.00	-8.36	QP	200	43
2	!	109.0286	35.40	14.59	49.99	53.50	-3.51	QP	200	96
3	*	160.3456	33.00	17.29	50.29	53.50	-3.21	QP	200	127
4	!	240.8303	38.60	14.06	52.66	56.40	-3.74	QP	200	164
5		441.7425	29.02	19.61	48.63	56.40	-7.77	QP	200	241
6		763.3757	22.31	26.87	49.18	56.40	-7.22	QP	200	293

*:Maximum data x:Over limit !:over margin

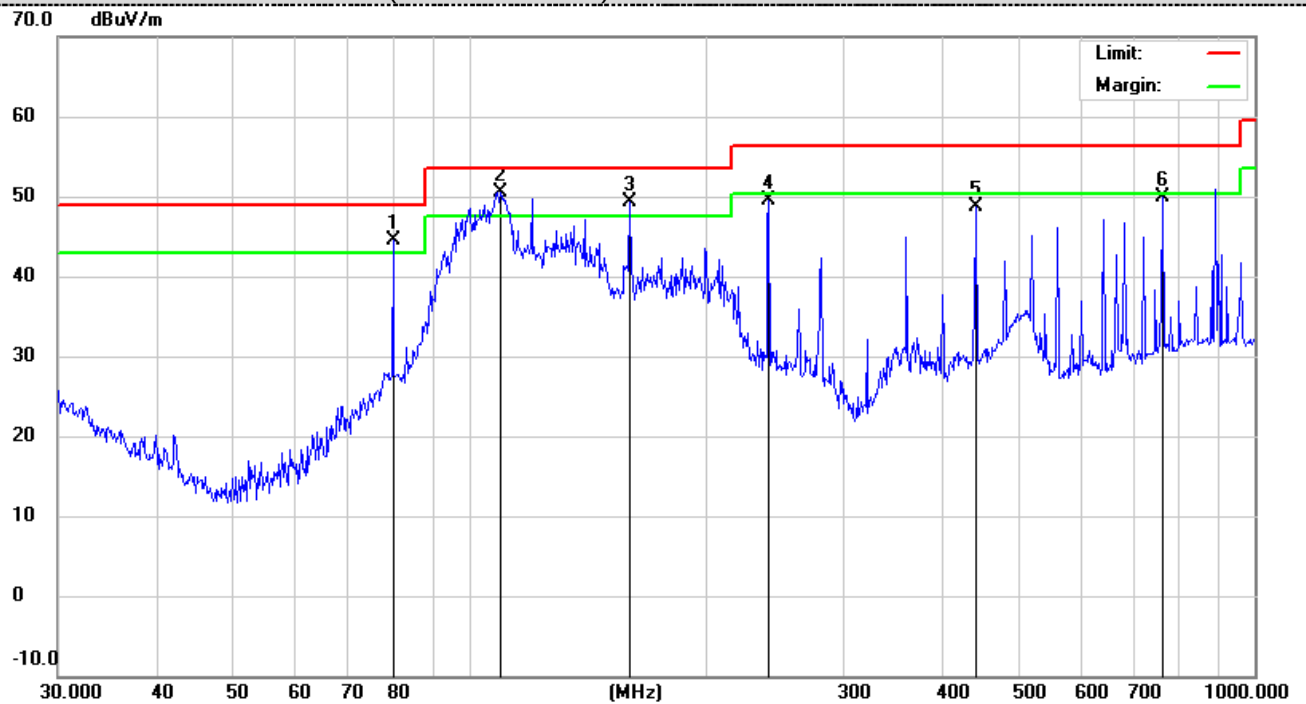
Power Supply DC 24V by Adapter(Adapter1) Polarization Vertical
M/N: HK578(15 inch*10.4 inch)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1	!	80.0805	33.11	10.10	43.21	49.00	-5.79	QP	100	34
2	*	120.2766	34.00	15.81	49.81	53.50	-3.69	QP	100	69
3	!	160.3456	32.10	17.29	49.39	53.50	-4.11	QP	100	105
4		240.8303	30.33	14.06	44.39	56.40	-12.01	QP	100	168
5		360.4476	27.72	16.65	44.37	56.40	-12.03	QP	100	231
6	!	480.5276	29.74	21.67	51.41	56.40	-4.99	QP	100	291

*:Maximum data x:Over limit !:over margin

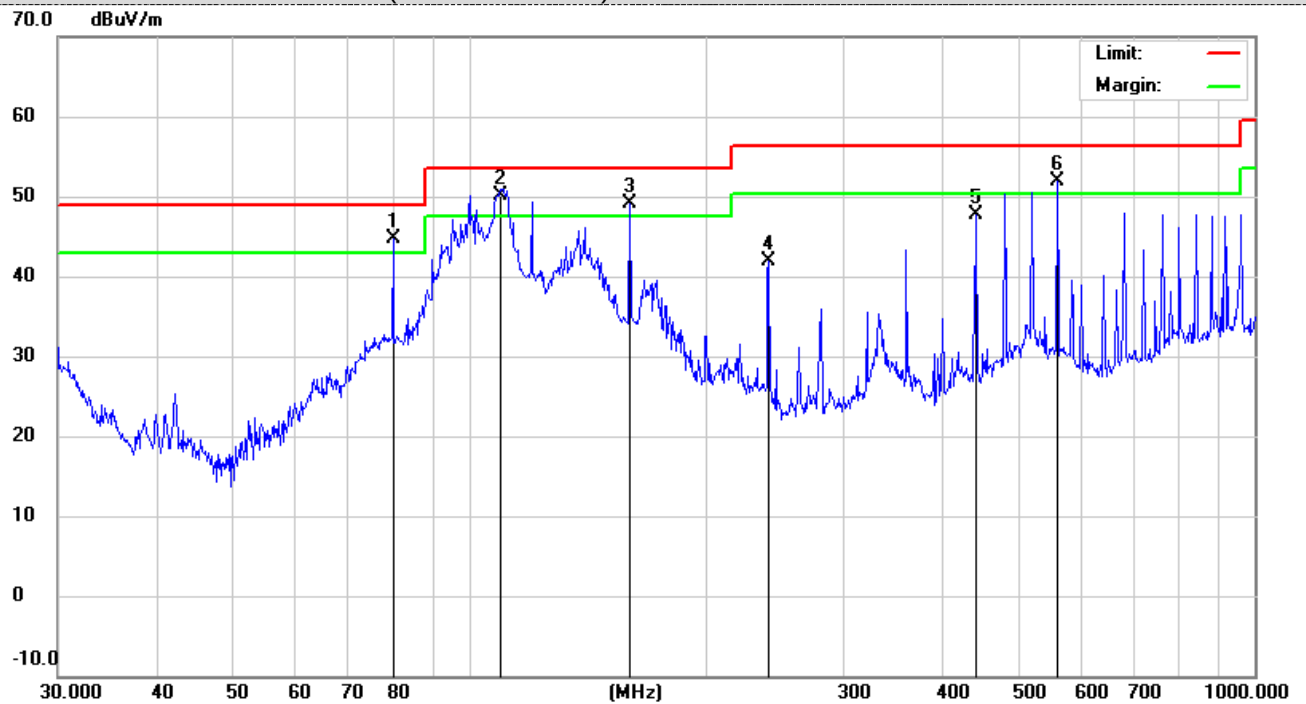
Power Supply DC 24V by Adapter(Adapter2) Polarization Horizontal
M/N: HK578(15 inch*10.4 inch)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1	!	80.0805	34.39	10.10	44.49	49.00	-4.51	QP	200	46
2	*	109.7959	35.80	14.68	50.48	53.50	-3.02	QP	200	94
3	!	160.3456	32.06	17.29	49.35	53.50	-4.15	QP	200	136
4		240.8303	35.44	14.06	49.50	56.40	-6.90	QP	200	197
5		441.7425	29.12	19.61	48.73	56.40	-7.67	QP	200	253
6		763.3757	23.05	26.87	49.92	56.40	-6.48	QP	200	296

*:Maximum data x:Over limit !:over margin

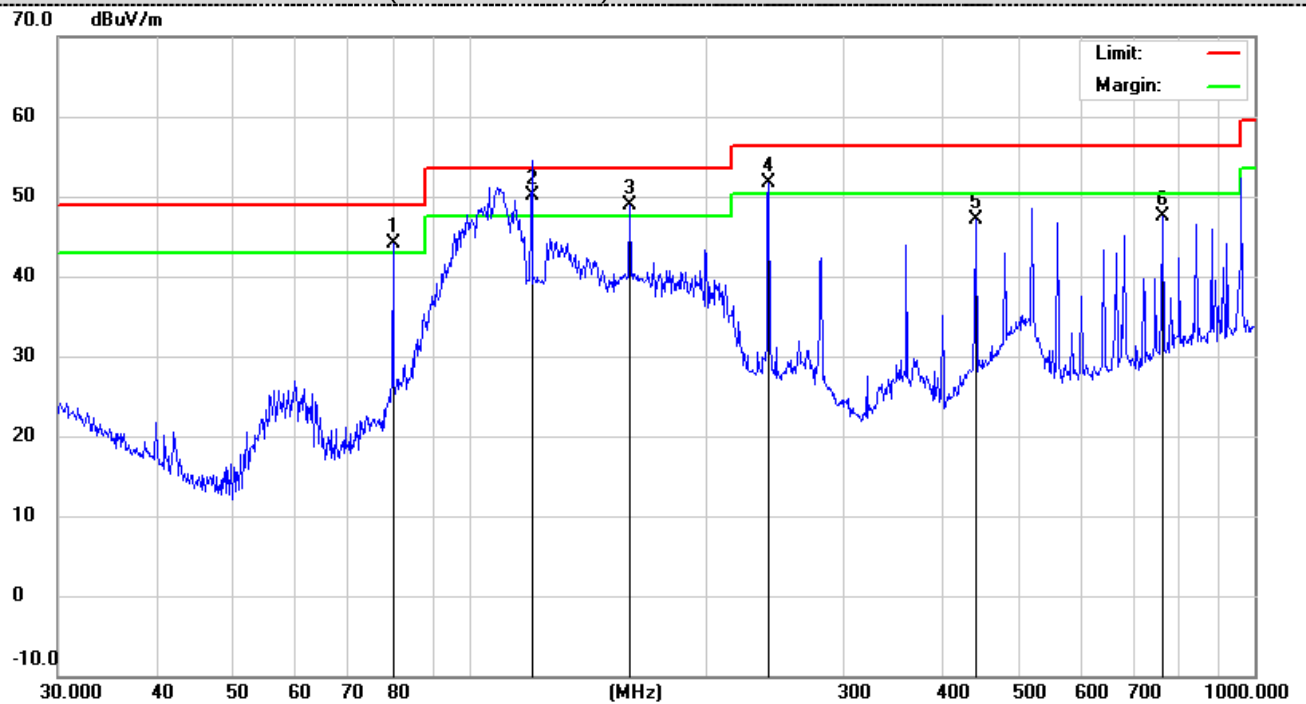
Power Supply DC 24V by Adapter(Adapter2) Polarization Vertical
M/N: HK578(15 inch*10.4 inch)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree	Comment
1	!	80.0805	34.55	10.10	44.65	49.00	-4.35	QP	100	42	
2	*	109.7959	35.50	14.68	50.18	53.50	-3.32	QP	100	94	
3	!	160.3456	31.87	17.29	49.16	53.50	-4.34	QP	100	135	
4		240.8303	27.87	14.06	41.93	56.40	-14.47	QP	100	192	
5		441.7425	28.12	19.61	47.73	56.40	-8.67	QP	100	234	
6	!	560.6928	28.49	23.37	51.86	56.40	-4.54	QP	100	293	

*:Maximum data x:Over limit !:over margin

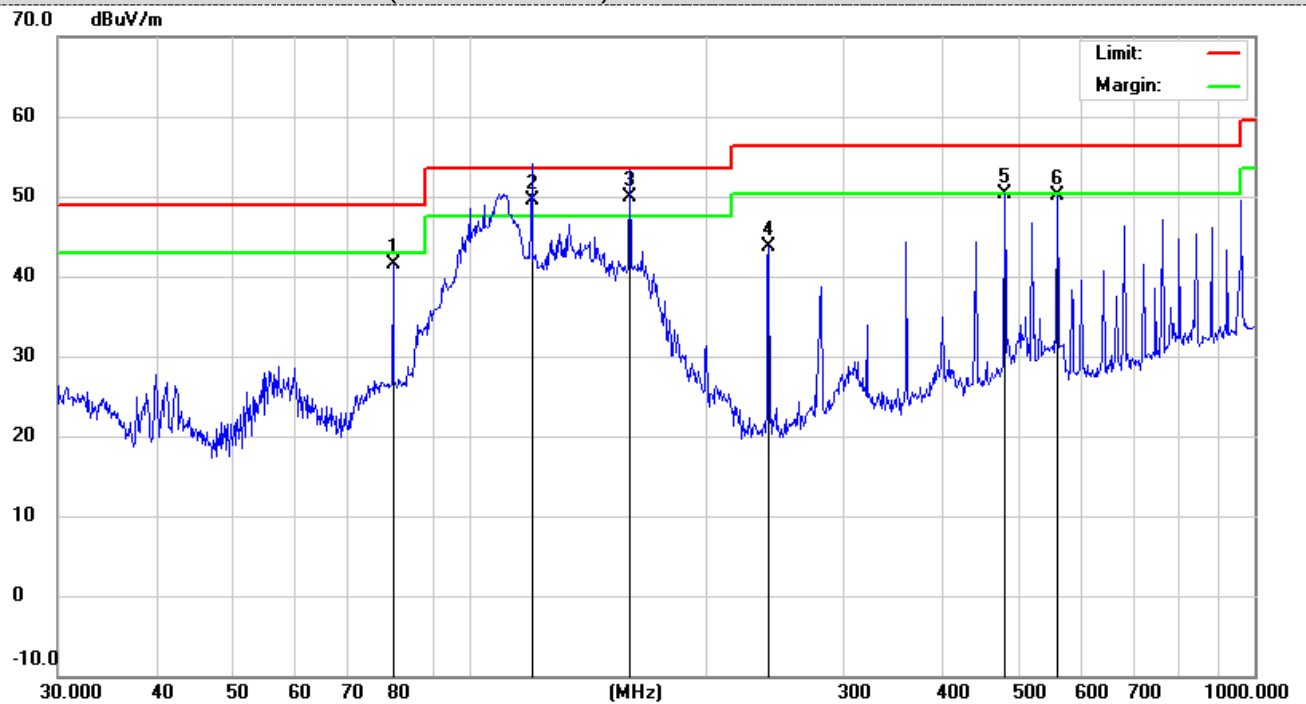
Power Supply	DC 24V by Adapter(Adapter3)	Polarization	Horizontal
M/N:	HK578(15 inch*10.4 inch)		



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	Comment
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	
1	!	80.0805	34.01	10.10	44.11	49.00	-4.89	QP	200	41
2	*	120.2766	34.20	15.81	50.01	53.50	-3.49	QP	200	92
3	!	160.3456	31.63	17.29	48.92	53.50	-4.58	QP	200	136
4	!	240.8303	37.59	14.06	51.65	56.40	-4.75	QP	200	198
5		441.7425	27.51	19.61	47.12	56.40	-9.28	QP	200	234
6		763.3757	20.60	26.87	47.47	56.40	-8.93	QP	200	286

*:Maximum data x:Over limit !:over margin

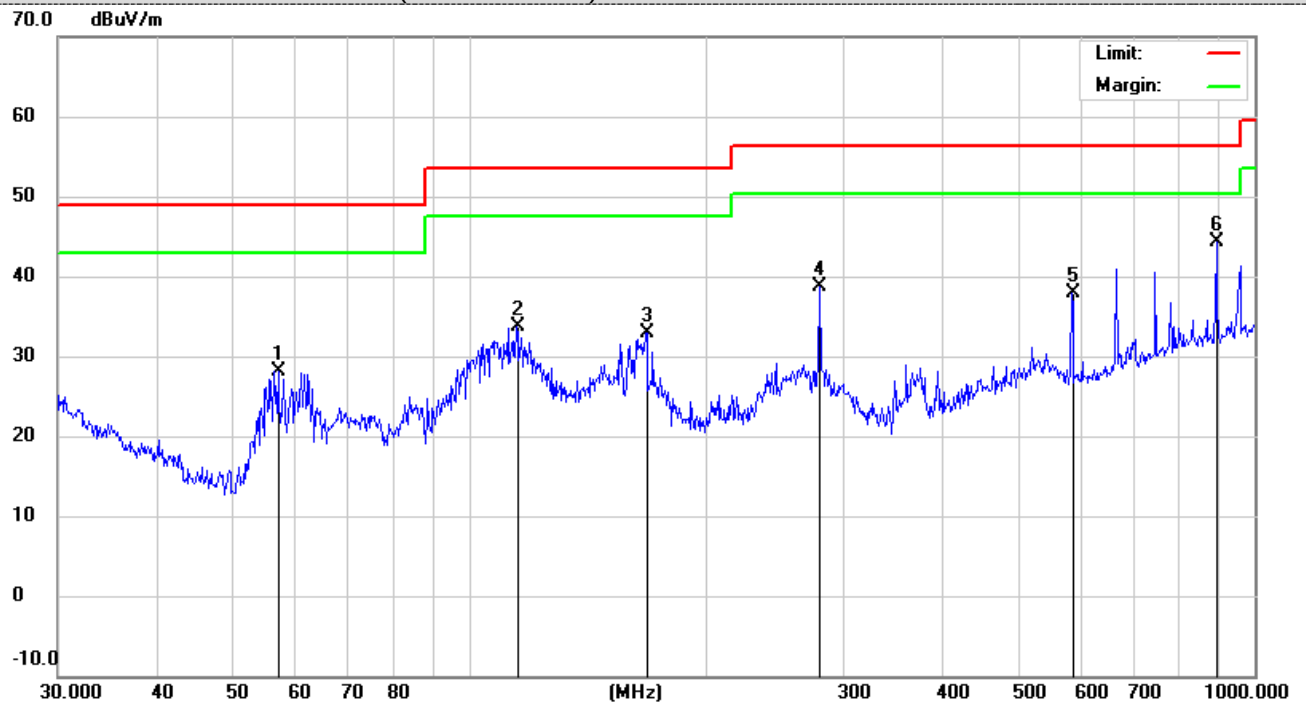
Power Supply DC 24V by Adapter(Adapter3) Polarization Vertical
M/N: HK578(15 inch*10.4 inch)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		80.0805	31.44	10.10	41.54	49.00	-7.46	QP	100	41
2	!	120.2766	33.60	15.81	49.41	53.50	-4.09	QP	100	83
3	*	160.3456	32.60	17.29	49.89	53.50	-3.61	QP	100	126
4		240.8303	29.69	14.06	43.75	56.40	-12.65	QP	100	182
5		480.5276	28.63	21.67	50.30	56.40	-6.10	QP	100	236
6		560.6928	26.65	23.37	50.02	56.40	-6.38	QP	100	297

*:Maximum data x:Over limit !:over margin

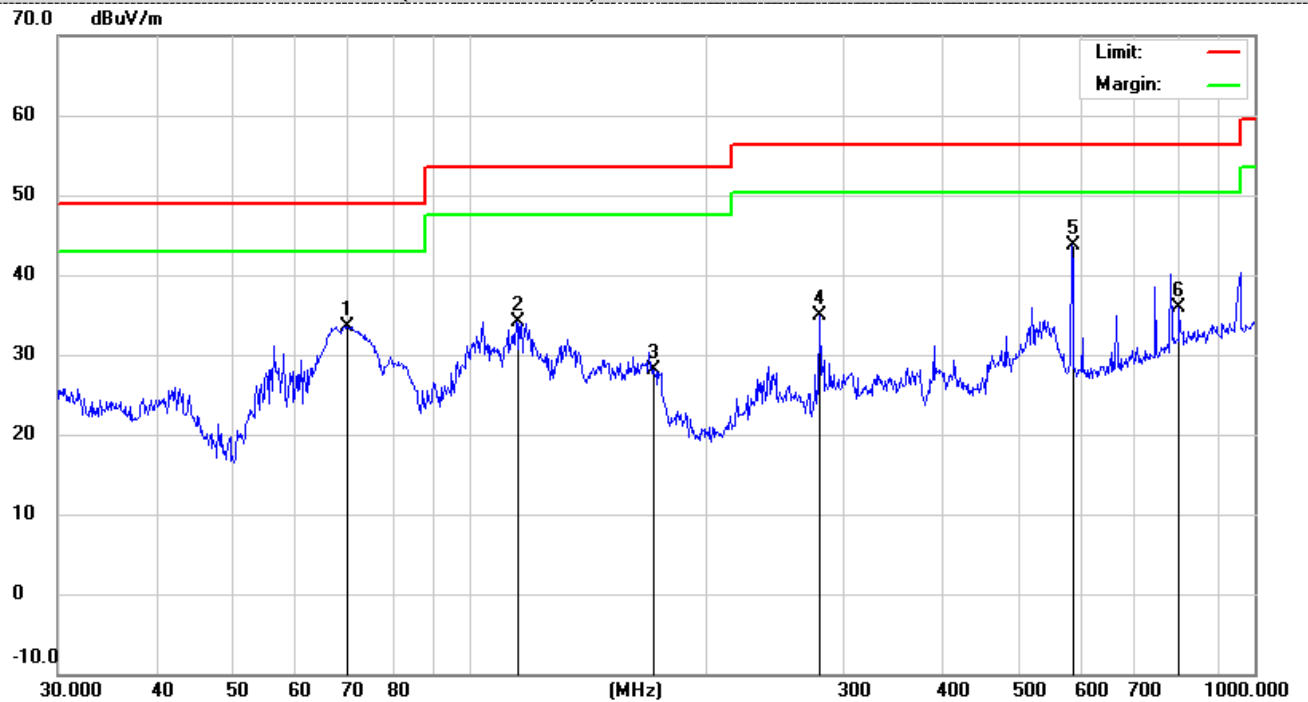
Power Supply DC 24V by Adapter(Adapter1) Polarization Horizontal
M/N: HK578(15 inch*15 inch)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		57.1914	19.69	8.46	28.15	49.00	-20.85	QP	200	26
2		114.9169	18.38	15.24	33.62	53.50	-19.88	QP	200	61
3		168.4138	15.97	17.02	32.99	53.50	-20.51	QP	200	108
4		280.0237	23.95	14.82	38.77	56.40	-17.63	QP	200	163
5		584.7895	14.18	23.63	37.81	56.40	-18.59	QP	200	192
6	*	893.8567	15.28	28.93	44.21	56.40	-12.19	QP	200	261

*:Maximum data x:Over limit !:over margin

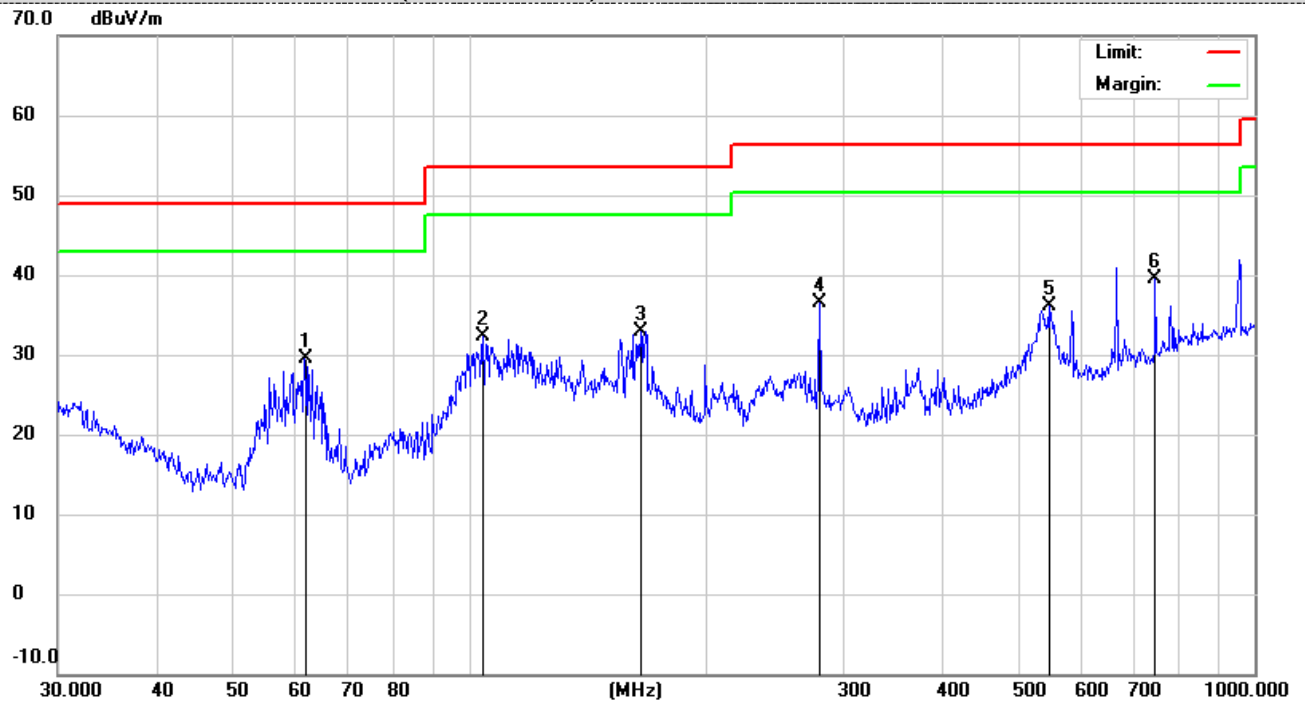
Power Supply DC 24V by Adapter(Adapter1) Polarization Vertical
M/N: HK578(15 inch*15 inch)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		69.8450	24.25	9.29	33.54	49.00	-15.46	QP	100	43
2		114.9169	18.95	15.24	34.19	53.50	-19.31	QP	100	98
3		171.9946	11.24	16.90	28.14	53.50	-25.36	QP	100	128
4		280.0237	20.07	14.82	34.89	56.40	-21.51	QP	100	163
5	*	584.7895	19.99	23.63	43.62	56.40	-12.78	QP	100	201
6		801.7863	8.07	27.92	35.99	56.40	-20.41	QP	100	283

*:Maximum data x:Over limit !:over margin

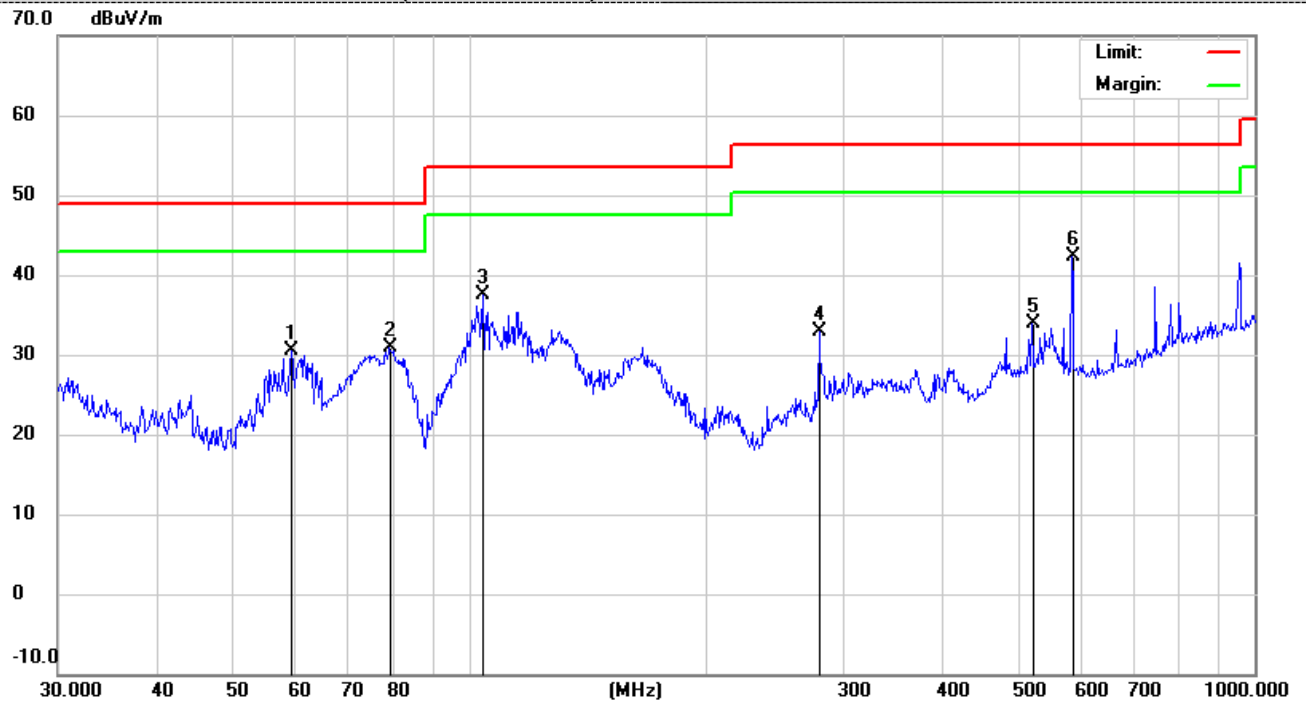
Power Supply DC 24V by Adapter(Adapter2) Polarization Horizontal
M/N: HK578(15 inch*15 inch)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree	Comment
1		61.7781	20.79	8.72	29.51	49.00	-19.49	QP	200	32	
2		104.1701	18.24	14.06	32.30	53.50	-21.20	QP	200	69	
3		165.4866	15.80	17.12	32.92	53.50	-20.58	QP	200	103	
4		279.0436	21.79	14.79	36.58	56.40	-19.82	QP	200	168	
5		547.0977	12.86	23.22	36.08	56.40	-20.32	QP	200	231	
6	*	747.4825	13.07	26.43	39.50	56.40	-16.90	QP	200	297	

*:Maximum data x:Over limit !:over margin

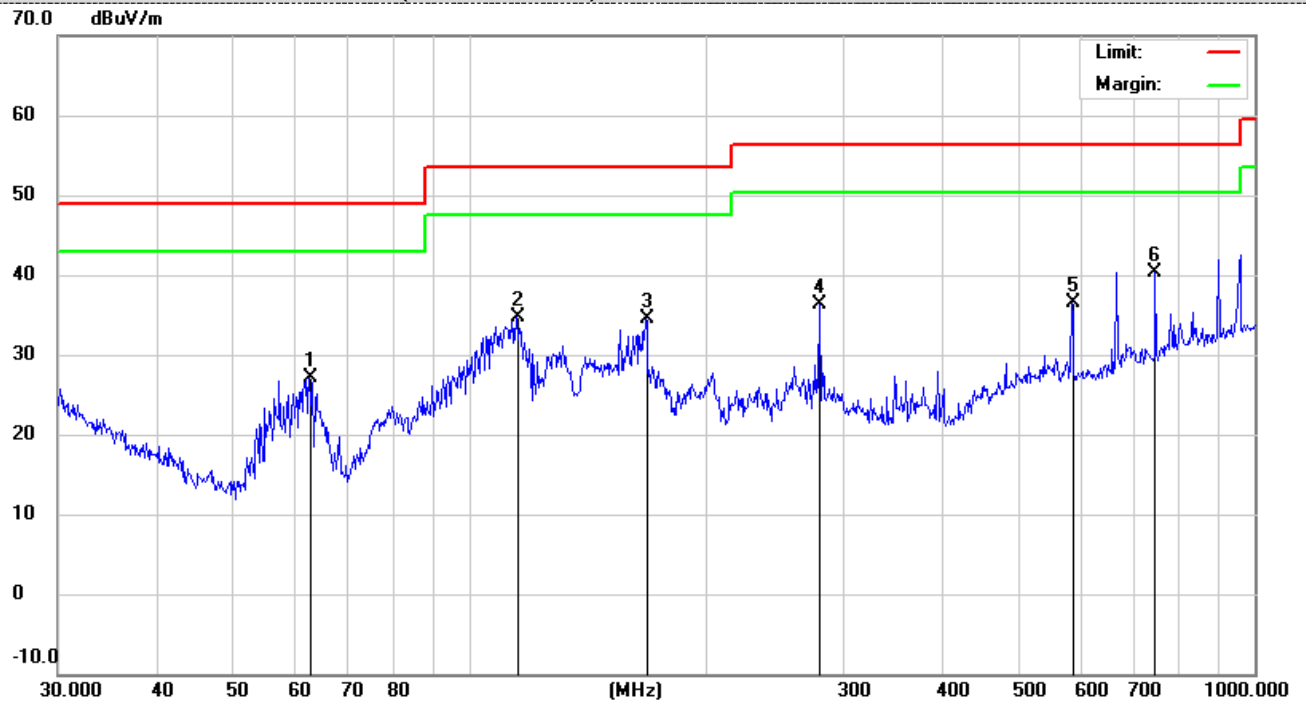
Power Supply DC 24V by Adapter(Adapter2) Polarization Vertical
M/N: HK578(15 inch*15 inch)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		59.4405	21.94	8.57	30.51	49.00	-18.49	QP	100	43
2		79.2426	20.89	10.04	30.93	49.00	-18.07	QP	100	96
3		104.1701	23.36	14.06	37.42	53.50	-16.08	QP	100	162
4		279.0436	18.19	14.79	32.98	56.40	-23.42	QP	100	198
5		520.8882	10.89	22.93	33.82	56.40	-22.58	QP	100	223
6	*	584.7895	18.64	23.63	42.27	56.40	-14.13	QP	100	268

*:Maximum data x:Over limit !:over margin

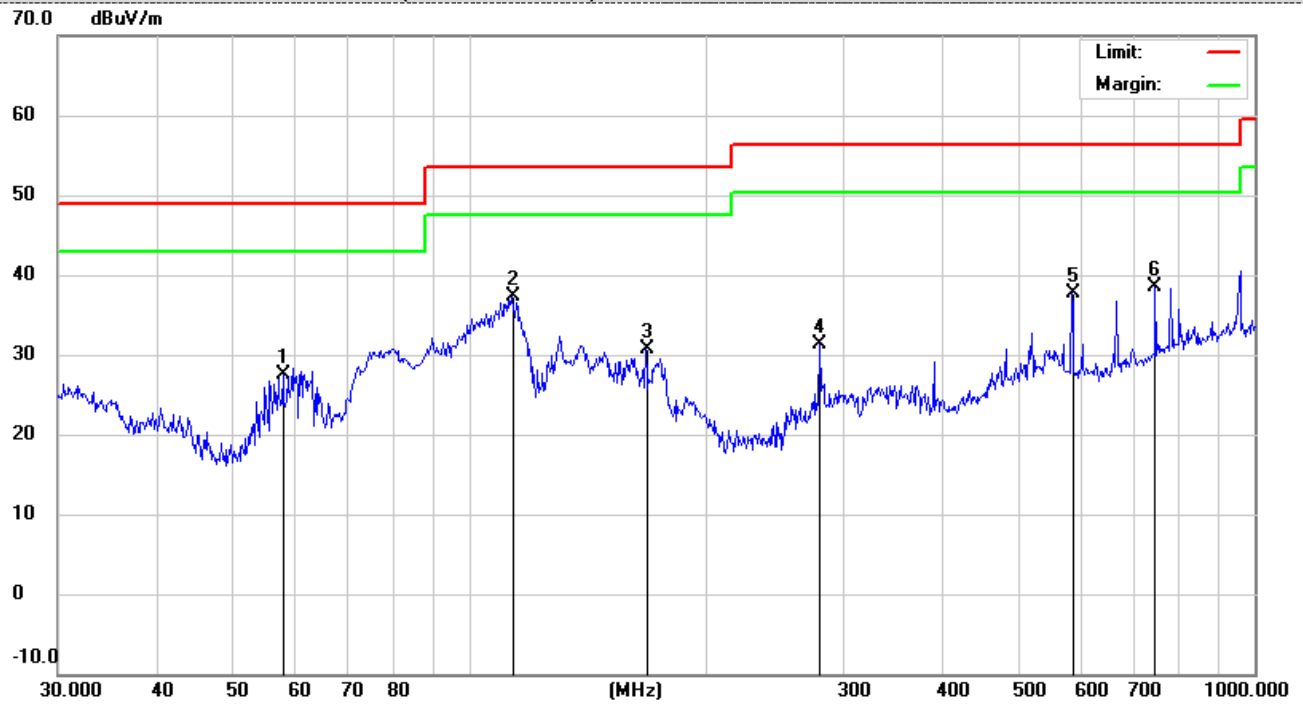
Power Supply DC 24V by Adapter(Adapter3) Polarization Horizontal
M/N: HK578(15 inch*15 inch)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree	Comment
1		62.6507	18.41	8.79	27.20	49.00	-21.80	QP	200	25	
2		114.9169	19.45	15.24	34.69	53.50	-18.81	QP	200	64	
3		167.8243	17.47	17.04	34.51	53.50	-18.99	QP	200	103	
4		279.0436	21.47	14.79	36.26	56.40	-20.14	QP	200	162	
5		584.7895	12.84	23.63	36.47	56.40	-19.93	QP	200	204	
6	*	747.4825	13.91	26.43	40.34	56.40	-16.06	QP	200	291	

*:Maximum data x:Over limit !:over margin

Power Supply DC 24V by Adapter(Adapter3) Polarization Vertical
M/N: HK578(15 inch*15 inch)

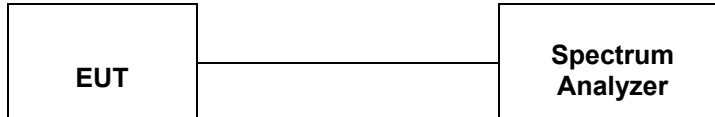


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree	Comment
1		57.9993	19.05	8.50	27.55	49.00	-21.45	QP	100	42	
2	*	113.3163	22.21	15.06	37.27	53.50	-16.23	QP	100	98	
3		167.8243	13.68	17.04	30.72	53.50	-22.78	QP	100	153	
4		280.0237	16.46	14.82	31.28	56.40	-25.12	QP	100	201	
5		584.7895	13.98	23.63	37.61	56.40	-18.79	QP	100	267	
6		747.4825	12.01	26.43	38.44	56.40	-17.96	QP	100	305	

*:Maximum data x:Over limit !:over margin

7.3. 20dB Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

The 20dB bandwidth and 99% bandwidth is measured with a spectrum analyzer connected via a receive antenna placed near the EUT while the EUT is operating in transmission mode.

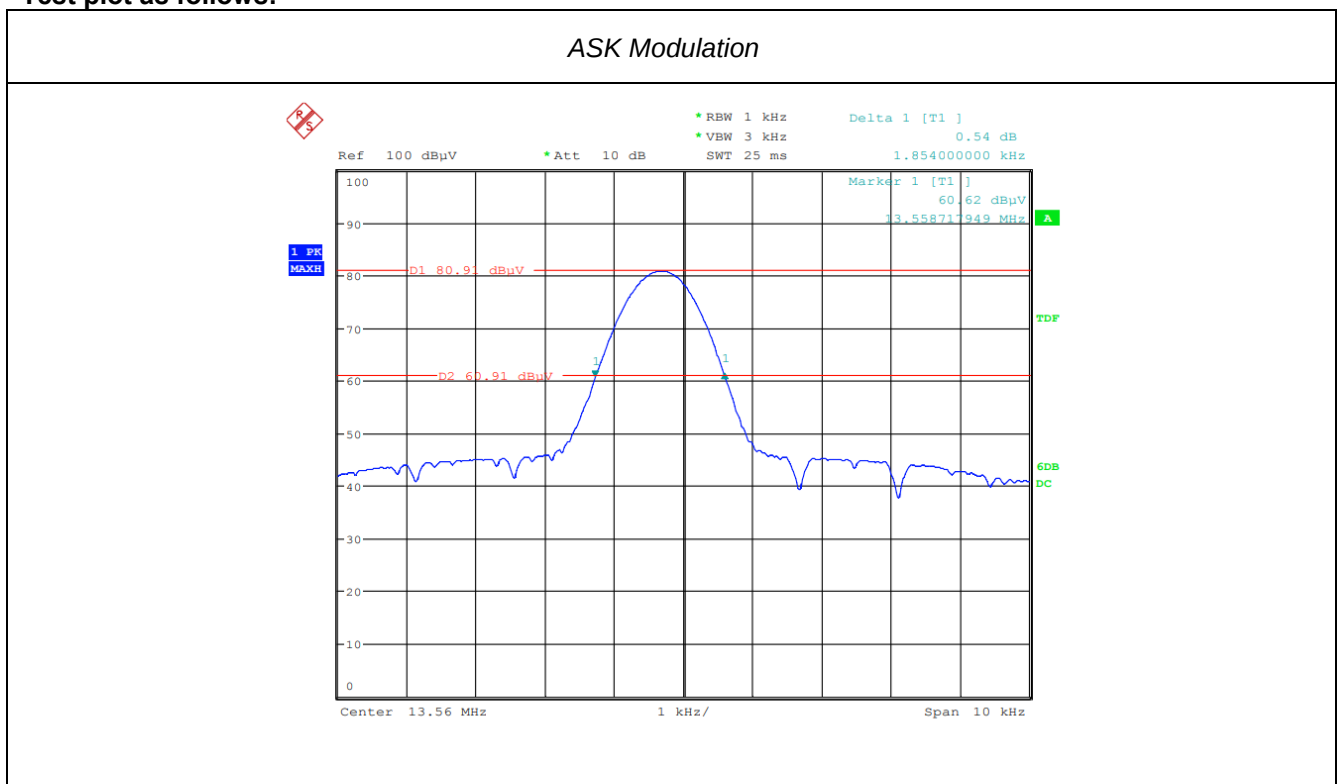
The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

The occupied bandwidth (OBW), that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission

TEST RESULTS

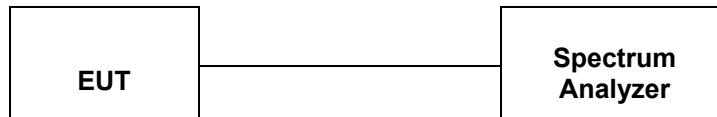
Modulation	Channel Frequency (MHz)	20dB bandwidth (KHz)	Result
ASK	13.56	1.854	Pass

Test plot as follows:



7.4. FREQUENCY TOLERANCE

TEST CONFIGURATION



TEST PROCEDURE

The EUT was placed on a turn table which is 0.8m above ground plane.

Set EUT as normal operation

Set SPA Center Frequency = fundamental frequency, RBW, VBW= 10kHz, Span=100K

Set SPA Max hold. Mark peak.

TEST RESULTS

Power Supply	Temperature(°C)	Measured Frequency (MHz)	Frequency Error (MHz)	Result(ppm)	Part 15.225 Limit
AC 240V	-20	13.56013	0.00013	9.59	+/- 0.01%(100ppm)
	20	13.56011	0.00011	8.11	+/- 0.01%(100ppm)
	50	13.56014	0.00014	10.32	+/- 0.01%(100ppm)
AC 120V	-20	13.56014	0.00014	10.32	+/- 0.01%(100ppm)
	20	13.56011	0.00011	8.11	+/- 0.01%(100ppm)
	50	13.56015	0.00015	11.06	+/- 0.01%(100ppm)
AC 100V	-20	13.56017	0.00017	12.54	+/- 0.01%(100ppm)
	20	13.56015	0.00015	11.06	+/- 0.01%(100ppm)
	50	13.56014	0.00014	10.32	+/- 0.01%(100ppm)

7.5. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Refer to statement below for compliance

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

The directional gain of the transmitting antenna is 3 dBi, and the antenna is FPC Antenna the PCB board, which meets the standard requirements and is not considered for replacement. See EUT photo for details

Results: Compliance.

8. Test Setup Photos of the EUT



HK578(15 inch*10.4 inch)



HK578(15 inch*10.4 inch)



HK578(15 inch*15 inch)



HK578(15 inch*15 inch)

9. External and Internal Photos of the EUT

See related photo report.

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