

EMC TEST REPORT


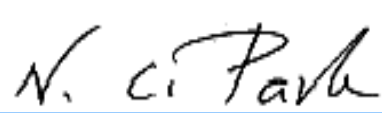

Project No.	LBE20100642	Issue No.	2
Applicant	Name of organization	Samsung Electronics Co., Ltd.	
	Address	416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do 443-742 Korea	
	Date of application	October 1, 2010	
EUT	Type of device	Class B digital devices, peripherals	
	Equipment authorization	<input type="checkbox"/> Declaration of Conformity <input checked="" type="checkbox"/> Certification <input type="checkbox"/> Verification	
	FCC ID	A3LML3710DW	
	Kind of product	Mono Laser Printer	
	Model No.	ML-3710DW	
		Variant Model No.	ML-3710ND, ML-3710D, ML-3712DW, ML-3712ND, ML-3712D
Manufacturer	1) Samsung Electronics Co., Ltd. 259, Gongdan-Dong, Gumi-City, Gyeongsangbuk-Do, Korea 730-030 2) Samsung Electronics (Shandong) Digital Printing Co., Ltd. 264209, Samsung Road, Weihai Hi-Tech. IDZ, Shandong Province, P.R.China 3) Weihai Shin Heung Digital Electronics Co., Ltd. 98, Samsung Road, Weihai Hi-Tech. IDZ, Shandong Province, P.R.China 4) Intops : Intops (Weihai) Electronics Co., Ltd., Keji Road-268-1 , Weihai Hi-Tech, Industries Development Zone Shandong Province , CHINA		
Applied Standards	FCC Part 15, Subpart B / ANSI C63.4-2003 ICES-003 issue 4		
Test Period	October 1, 2010 ~ October 4, 2010		
Issue date	October 5, 2010		
Test result : Complied			
The equipment under test has found to be compliant with the applied standards. (Refer to the attached test result for more detail.)			
Tested by : Young Hun Cheong		Reviewed by : No Cheon Park	
			
The test results in this report only apply to the tested sample. This report must not be reproduced, except in full, without written permission from CS & Environment Centre.			
			
416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 443-742 Korea Tel: 82 31 277 7752, Fax: 82 31 277 7753			

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1. Summary of test results

1.1 Emission

The EUT has been tested according to the following specifications:

Applied	Test type	Applied standard	Result	Remarks
<input checked="" type="checkbox"/>	Conducted Disturbance (Mains Port)	FCC Part 15 Subpart B ICES-003 issue 4	Complied	Meets Class B Limit
<input checked="" type="checkbox"/>	Radiated Disturbance		Complied	Meets Class B Limit

2. General Information

2.1 Test facility

The CS & Environment Centre is located on Samsung Electronics Co., Ltd. at 416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, South Korea.

All testing are performed in Semi-anechoic chambers conforming to the site attenuation Characteristics defined by ANSI C63.4, CISPR 22, 16-1 and 16-2. and Shielded rooms.

The CS & Environment Centre is operated as EMC testing laboratory in accordance with the requirements of ISO/IEC 17025:2005.

3. Test Setup configuration

3.1 Test Peripherals

The cables used for these peripherals are either permanently attached by the peripheral manufacturer or coupled with an assigned cable as defined below.

The following is a listing of the EUT and peripherals utilized during the performance of EMC test:

Description	Model No.	Serial No.	Manufacturer	FCC ID and/or DoC
Mono Laser Printer	ML-3710DW	-	Samsung	A3LML3710DW
Note book Computer	D410	JP-0NC428-71761-54J-D01C	DELL	DoC
Adapter	LA65NS1-00	CN-0YD637-71615-83C-0A0A	DELL	-
USB Mouse	M-UV69a	HCA45203099	LOGITECH	DoC
Headset	Axis-202	-	Labtec	DoC

3.2 EUT operating mode

To achieve compliance applied standard specification, the following mode(s) were made during compliance testing:

Operating Mode 1	Standby Mode
Operating Mode 2	Network Duplex Printing Mode
Operating Mode 3	USB Duplex Printing Mode
Operating Mode 4	Wireless LAN Simplex Printing Mode

3.3 Details of Sampling

Customer selected, single unit.

3.4 Used cable description

The EUT is configured, installed, arranged and operated in a manner consistent with typical applications. Interface cables/loads/devices are connected to at least one of each type of interface port of the EUT, and where practical, each cable shall be terminated in a device typical of actual usage. The type(s) of interconnecting cables to be used and the interface port (of the EUT) to which these were connected;

Connected cable	Length [m]	Shielded [Y/N]	Note
Power	1.8	No	For EUT
USB	1.8	Yes	EUT to Notebook PC
Power	1.8	No	For Note PC
USB	0.4	Yes	EUT to USB Mouse
Headset	1.6	No	From PC to Headset
LAN	5.0	No	From EUT to hub

3.5 EUT Description

The following features describe EUT represented by this report:

Item	Specification	Remarks
Processor	CHORUS4(600MHz)	-
Standard System memory	128MB DDR2 SDRAM	-
Resolution	True 600x600dpi (Up to 1,200x1,200dpi effective output)	-
Paper Handling	Paper Tray(standard) 250Sheets Manual Tray 50Sheet	-
Power Rating	110~127VAC, 6.5A, 50/60Hz	-
Power Consumption	Sleep mode : 2.5Watts Ready mode : 60Watts Printing mode: 550Watts	-
Printer Language	PostScript3, PCL6/5e, IBM ProPrinter, EPSON	-
PC Interfaces	USB2.0, NW, Wireless LAN	-
OS compatibility	Windows 2000/XP(32/64bits)/ Vista(32/64bits)/2003 Server(32/64bits)/2008 Server(32/64bits)/ 7(32/64bit)/2008 Server R2 Various Linux OS: Fedora Core 4, 5, 6 Fedora 7, 8, 9, 10, 11, 12 RedHat Enterprise Linux WS 4, 5 SuSE 10.0, 10.1 openSuSE 10.2, 10.3, 11.0, 11.1, 11.2 SuSE Linux Enterprise Desktop 10, 11 Debian 4.0, 5.0 Ubuntu 5.04, 5.10, 6.04, 6.10, 7.04, 7.10, 8.04, 8.10, 9.04, 9.10 Mandriva 2005LE, 2006, 2007, 2007.1, 2008, 2008.1, 2009, 2009.1	-
Modes of Operation	USB Printing, 1200dpi Printing, Network Printing, Wireless LAN Printing	-
Intended Class for Emissions	Class B	-

3.6 Clock Frequencies

Kind of Clocks	Frequency [MHz]	Kind of Clocks	Frequency [MHz]
Main Source	12	Video	22.137
CPU Internal	600	DDR2 SDRAM	300
USB Device	12	BUS Device	166

3.7 Test configuration and condition

Item	Model Name	P/N	Manufacturer
Main Board	PBA_MAIN_37	REV 0.4	Samsung
SMPS	PSPN-Type2-V1	REV 0.7	DONG YANG E&P
	PSPN-Type2-V1	X5	LITE-ON
HVPS	Magpie HVPS	REV 1.0	DONG YANG E&P, SYS HITEK
Toner Cartridge	MLT-D205E(10K) MLT-D205L(5K) MLT-D205S(2K)	-	Samsung
SCF	ML-S3710A	-	Samsung
Memory	CLP-MEM201	-	Samsung
	CLP-MEM202	-	Samsung

The system was configured for testing in typical fashion use. Cables were attached to each of the available I/O Ports. Where applicable, peripherals were attached to the I/O cables. Power source for the EUT operation was supplied by CVCF made by the Voltech Corp.

Three different types of SMPS, LITEON, Dongyang and Suntronics were applied during testing. Each SMPS was installed for testing, tested and reported.

- Configuration 1 : LITEON SMPS was applied. (Mains SMPS)
- Configuration 2 : Dongyang SMPS was applied.

- Test Voltage : AC 120 V, 60 Hz

3.8 Measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus: (According to CISPR 16-4 and UKAS Lab 34.)

3.8.1 Emission

Test type		Measurement uncertainty (C.L. 95 %, k = 2)
Conducted disturbance	Main terminal	3.00 dB
Radiated Disturbance (30MHz ~ 1GHz)	Horizontal	4.95 dB
	Vertical	4.99 dB
Radiated Disturbance (1GHz ~ 6GHz)	Horizontal	3.32 dB
	Vertical	3.32 dB

4. Results of individual test

4.1 Conducted disturbance

Both conducted lines are measured in Quasi-Peak and Average mode, including the worst-case data points for each tested configuration. The EUT measured in accordance with the methods described in standards.

Limits for conducted disturbance at the mains ports of class A ITE

Frequency range Limits MHz	Resolution Bandwidth	Limits dB(μ V)	
		Quasi-peak	Average
0,15 to 0,50	9 kHz	79	66
0,50 to 30	9 kHz	73	60

NOTE The lower limit shall apply at the transition frequency

Limits for conducted disturbance at the mains ports of class B ITE

Frequency range Limits MHz	Resolution Bandwidth	Limits dB(μ V)	
		Quasi-peak	Average
0,15 to 0,50	9 kHz	66 to 56	56 to 46
0,50 to 5	9 kHz	56	46
5 to 30	9 kHz	60	50

NOTE 1 The lower limit shall apply at the transition frequency
 NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.

4.1.1 Test instrumentation

Test instrumentation	Manufacturer	Model name	Serial or Firmware (No./Ver.)	Calibration	
				Date	Interval (Month)
Test Receiver	R&S	ESCI	100086	2009-11-19	12
Two-Line V-Network	R&S	ENV216	100117	2009-11-11	12
Two-Line V-Network	R&S	ENV216	100116	2010-07-05	12
Test software	EMC32	R&S	Ver 4.40.0	N/A	N/A

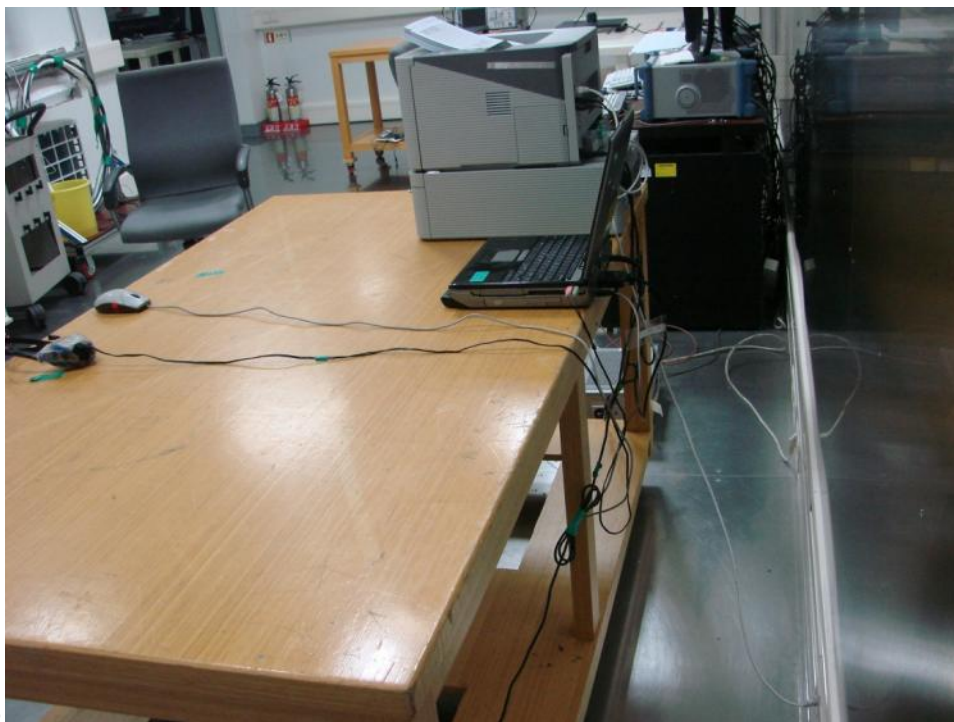
4.1.2 Temperature and humidity condition

Test date	October 1, 2010	Test engineer	Young Hun Cheong
Test place	Shielded Room #1		

4.1.3 Photograph of Test Setup



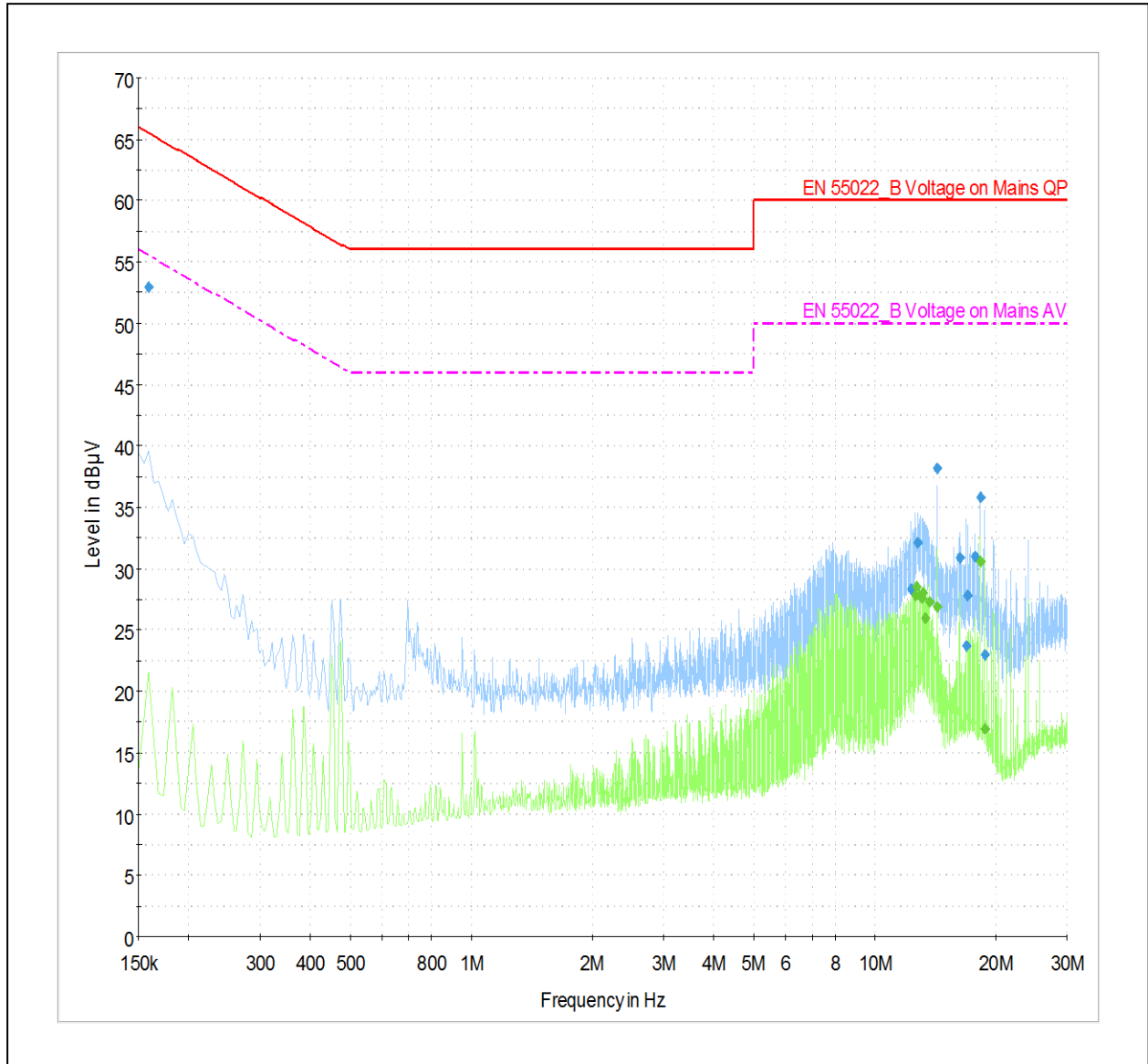
Front



Rear

4.1.4 Test results (mains port)

- Configuration 1 : Standby Mode



Note) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Test Results (Quasi-Peak and Average)

Quasi-peak final measurement results table

Frequency [MHz]	Quasi-Peak [dBuV]	Bandwidth [kHz]	Line	Factor [dB]	Margin [dB]	Limit [dBuV]
0.159	53.0	9.0	L1	9.7	12.5	65.5
12.304	28.4	9.0	L1	9.9	31.6	60.0
12.808	32.1	9.0	L1	9.9	27.9	60.0
14.253	38.2	9.0	L1	9.9	21.8	60.0
16.228	30.9	9.0	N	9.9	29.1	60.0
16.912	23.7	9.0	L1	10.0	36.3	60.0
17.007	27.9	9.0	L1	10.0	32.1	60.0
17.695	31.0	9.0	L1	10.0	29.0	60.0
18.253	35.8	9.0	L1	10.0	24.2	60.0
18.753	23.0	9.0	L1	10.0	37.0	60.0

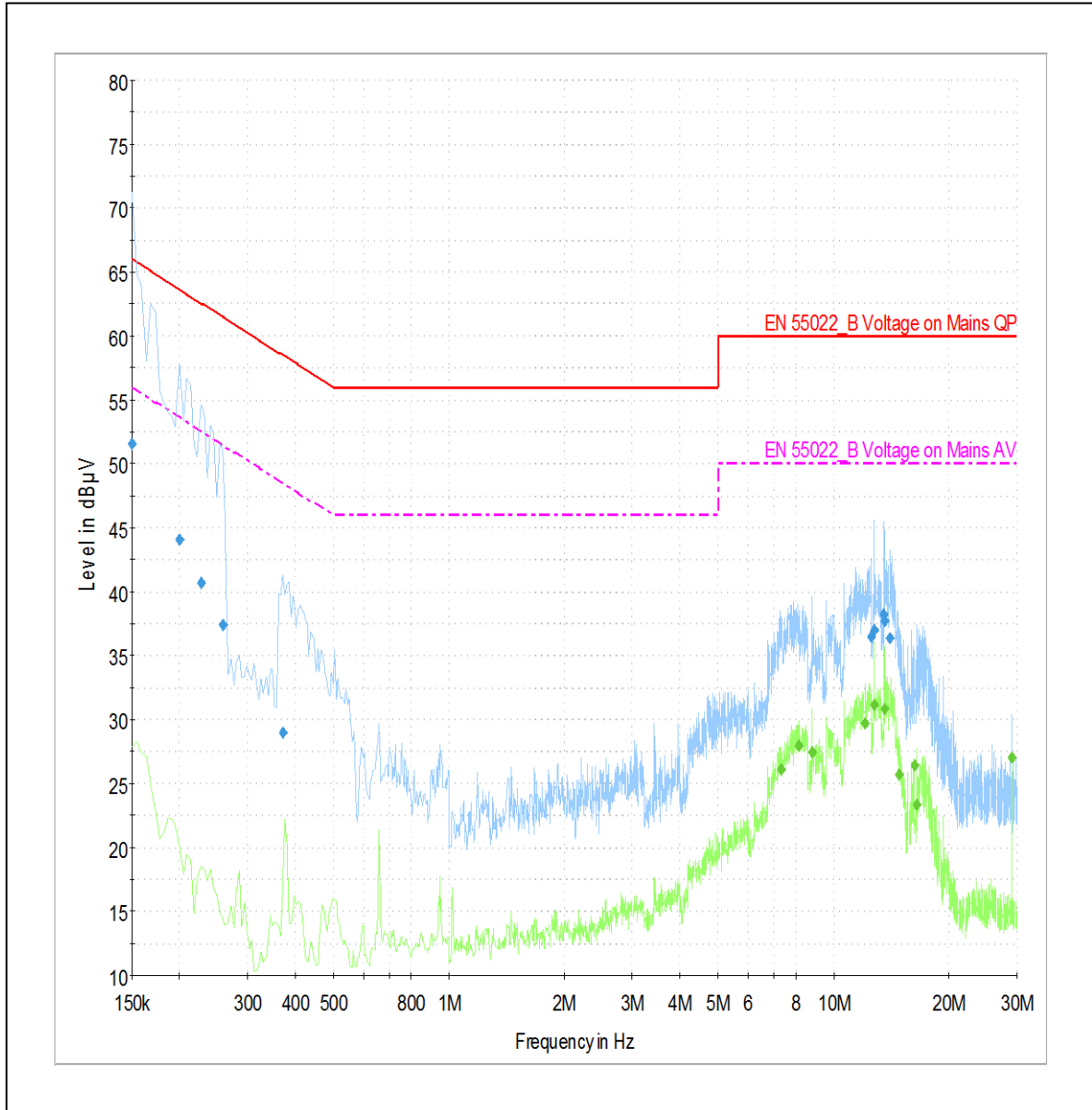
Average final measurement results table

Frequency [MHz]	Average [dBuV]	Bandwidth [kHz]	Line	Factor [dB]	Margin [dB]	Limit [dBuV]
12.651	27.8	9.0	L1	9.9	22.2	50.0
12.718	28.6	9.0	L1	9.9	21.4	50.0
12.898	27.8	9.0	L1	9.9	22.2	50.0
13.128	27.6	9.0	L1	9.9	22.4	50.0
13.150	28.0	9.0	L1	9.9	22.0	50.0
13.375	26.0	9.0	L1	9.9	24.0	50.0
13.645	27.3	9.0	L1	9.9	22.7	50.0
14.253	26.9	9.0	L1	9.9	23.1	50.0
18.253	30.6	9.0	L1	10.0	19.4	50.0
18.753	17.0	9.0	L1	10.0	33.0	50.0

Note) Level (Quasi-Peak and/or Average) = Meter Reading (Quasi-Peak and/or Average) + Factor (LISN Insertion Loss + Cable Loss)

Margin = Limit – Level (Quasi-Peak and/or Average)

- Configuration 1 : Network Duplex Printing Mode



Note) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Test Results (Quasi-Peak and Average)

Quasi-peak final measurement results table

Frequency [MHz]	Quasi-Peak [dBuV]	Bandwidth [kHz]	Line	Factor [dB]	Margin [dB]	Limit [dBuV]
0.150	51.5	9.0	N	9.7	14.5	66.0
0.200	44.1	9.0	L1	9.7	19.5	63.6
0.227	40.7	9.0	L1	9.7	21.9	62.6
0.258	37.5	9.0	L1	9.7	24.0	61.5
0.371	29.0	9.0	L1	9.7	29.5	58.5
12.507	36.5	9.0	L1	9.9	23.5	60.0
12.745	37.0	9.0	L1	9.9	23.0	60.0
13.542	38.2	9.0	L1	9.9	21.8	60.0
13.564	37.7	9.0	L1	9.9	22.3	60.0
14.037	36.3	9.0	L1	9.9	23.7	60.0

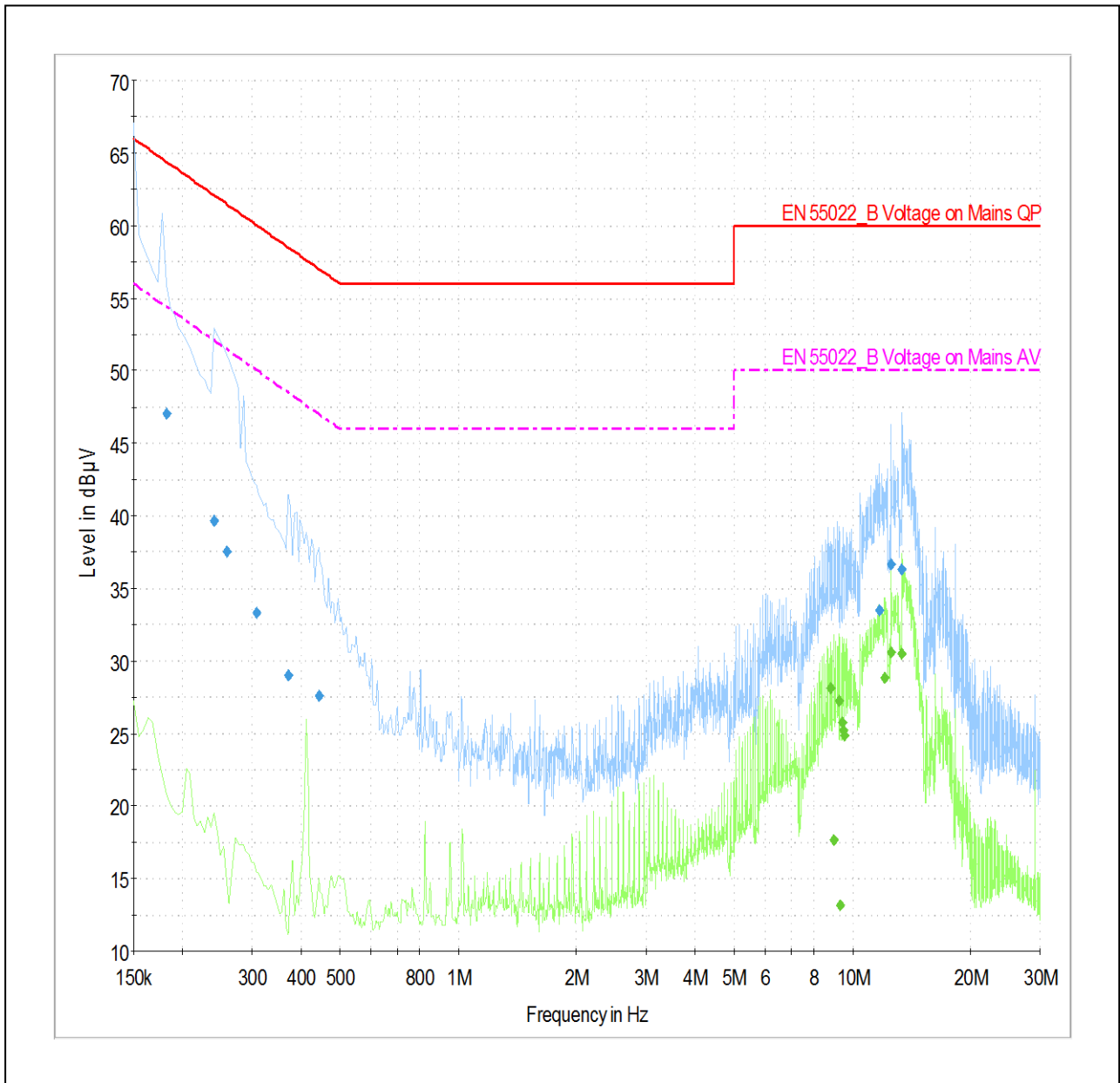
Average final measurement results table

Frequency [MHz]	Average [dBuV]	Bandwidth [kHz]	Line	Factor [dB]	Margin [dB]	Limit [dBuV]
7.300	26.2	9.0	L1	9.8	23.8	50.0
8.146	28.0	9.0	L1	9.8	22.0	50.0
8.803	27.4	9.0	L1	9.8	22.6	50.0
12.102	29.7	9.0	L1	9.9	20.3	50.0
12.745	31.1	9.0	L1	9.9	18.9	50.0
13.569	30.8	9.0	L1	9.9	19.2	50.0
14.860	25.7	9.0	L1	9.9	24.3	50.0
16.228	26.4	9.0	N	9.9	23.6	50.0
16.426	23.3	9.0	L1	10.0	26.7	50.0
29.134	27.0	9.0	L1	10.1	23.0	50.0

Note) Level (Quasi-Peak and/or Average) = Meter Reading (Quasi-Peak and/or Average) + Factor (LISN Insertion Loss + Cable Loss)

Margin = Limit – Level (Quasi-Peak and/or Average)

- Configuration 1 : USB Duplex Printing Mode



Note) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Test Results (Quasi-Peak and Average)

Quasi-peak final measurement results table

Frequency [MHz]	Quasi-Peak [dBuV]	Bandwidth [kHz]	Line	Factor [dB]	Margin [dB]	Limit [dBuV]
0.182	47.1	9.0	L1	9.7	17.3	64.4
0.240	39.6	9.0	L1	9.7	22.5	62.1
0.258	37.6	9.0	N	9.7	23.9	61.5
0.308	33.3	9.0	N	9.7	26.7	60.0
0.371	29.0	9.0	N	9.7	29.5	58.5
0.443	27.6	9.0	L1	9.7	29.4	57.0
11.683	33.5	9.0	L1	9.9	26.5	60.0
12.547	36.7	9.0	L1	9.9	23.3	60.0
13.348	36.3	9.0	L1	9.9	23.7	60.0

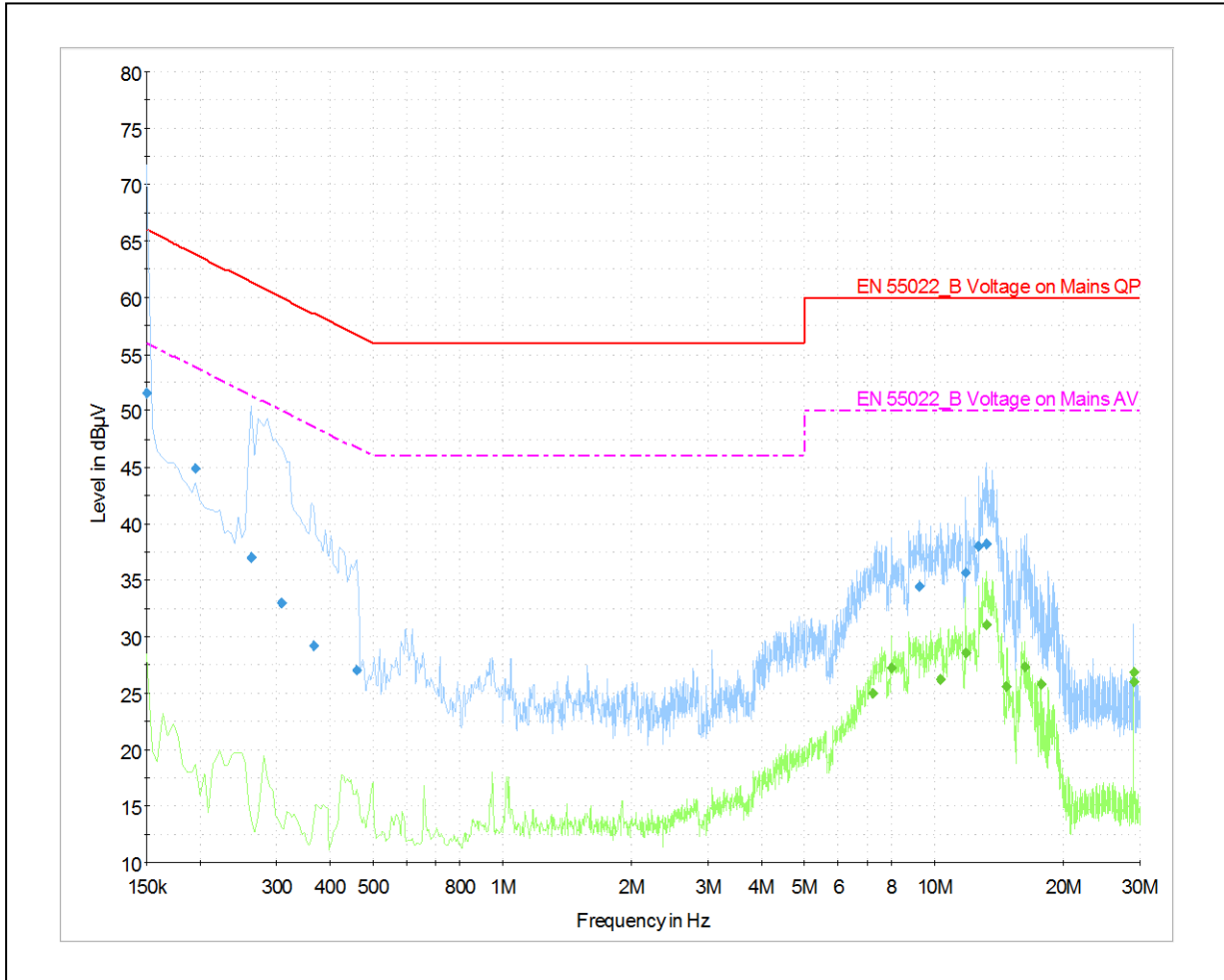
Average final measurement results table

Frequency [MHz]	Average [dBuV]	Bandwidth [kHz]	Line	Factor [dB]	Margin [dB]	Limit [dBuV]
8.808	28.2	9.0	L1	9.8	21.8	50.0
8.988	17.7	9.0	N	9.8	32.3	50.0
9.231	27.3	9.0	L1	9.8	22.7	50.0
9.325	13.1	9.0	N	9.8	36.9	50.0
9.402	25.8	9.0	L1	9.8	24.2	50.0
9.487	25.2	9.0	L1	9.8	24.8	50.0
9.568	24.9	9.0	L1	9.8	25.1	50.0
12.111	28.9	9.0	L1	9.9	21.1	50.0
12.547	30.6	9.0	L1	9.9	19.4	50.0
13.339	30.5	9.0	L1	9.9	19.5	50.0

Note) Level (Quasi-Peak and/or Average) = Meter Reading (Quasi-Peak and/or Average) + Factor (LISN Insertion Loss + Cable Loss)

Margin = Limit – Level (Quasi-Peak and/or Average)

- Configuration 1 : Wireless LAN Simplex Printing Mode



Note) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Test Results (Quasi-Peak and Average)

Quasi-peak final measurement results table

Frequency [MHz]	Quasi-Peak [dBuV]	Bandwidth [kHz]	Line	Factor [dB]	Margin [dB]	Limit [dBuV]
0.150	51.6	9.0	L1	9.7	14.4	66.0
0.195	44.9	9.0	N	9.7	18.9	63.8
0.263	37.0	9.0	N	9.7	24.4	61.4
0.308	33.0	9.0	L1	9.7	27.0	60.0
0.366	29.1	9.0	L1	9.7	29.5	58.6
0.461	27.0	9.0	L1	9.7	29.7	56.7
9.262	34.4	9.0	L1	9.8	25.6	60.0
11.881	35.7	9.0	L1	9.9	24.3	60.0
12.687	38.0	9.0	L1	9.9	22.0	60.0
13.236	38.3	9.0	L1	9.9	21.7	60.0

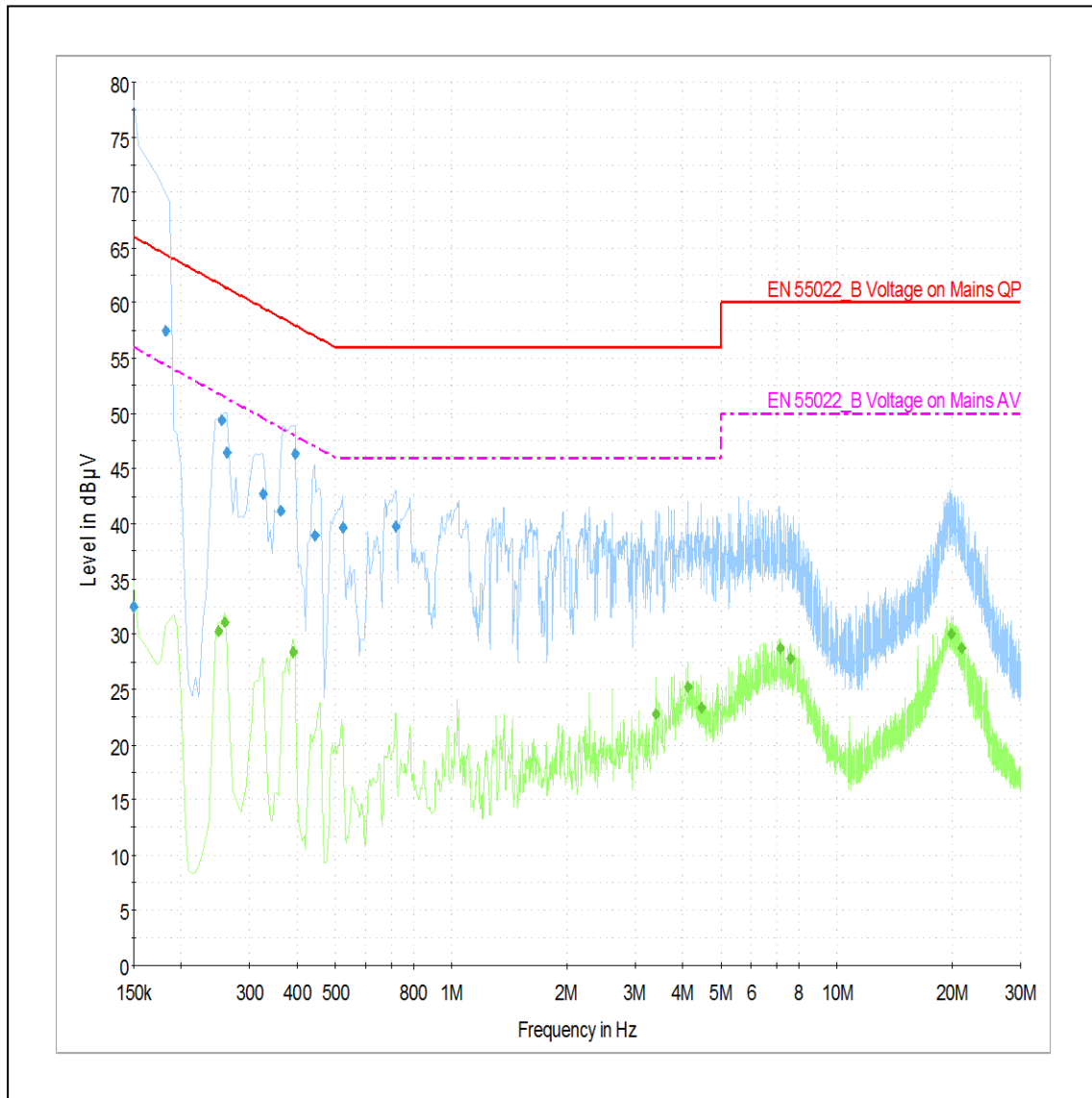
Average final measurement results table

Frequency [MHz]	Average [dBuV]	Bandwidth [kHz]	Line	Factor [dB]	Margin [dB]	Limit [dBuV]
7.237	25.0	9.0	L1	9.8	25.0	50.0
7.966	27.2	9.0	L1	9.8	22.8	50.0
10.356	26.2	9.0	L1	9.9	23.8	50.0
11.881	28.6	9.0	L1	9.9	21.4	50.0
13.227	31.0	9.0	L1	9.9	19.0	50.0
14.766	25.6	9.0	L1	9.9	24.4	50.0
16.228	27.4	9.0	L1	10.0	22.6	50.0
17.695	25.8	9.0	L1	10.0	24.2	50.0
29.071	26.0	9.0	L1	10.1	24.0	50.0
29.134	26.8	9.0	L1	10.1	23.2	50.0

Note) Level (Quasi-Peak and/or Average) = Meter Reading (Quasi-Peak and/or Average) + Factor (LISN Insertion Loss + Cable Loss)

Margin = Limit – Level (Quasi-Peak and/or Average)

- Configuration 2 : Standby Mode



Note) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Test Results (Quasi-Peak and Average)

Quasi-peak final measurement results table

Frequency [MHz]	Quasi-Peak [dBuV]	Bandwidth [kHz]	Line	Factor [dB]	Margin [dB]	Limit [dBuV]
0.150	32.5	9.0	L1	9.7	33.5	66.0
0.182	57.4	9.0	L1	9.7	7.0	64.4
0.254	49.3	9.0	L1	9.7	12.3	61.6
0.263	46.4	9.0	L1	9.7	15.0	61.4
0.326	42.6	9.0	L1	9.7	17.0	59.6
0.362	41.2	9.0	L1	9.7	17.5	58.7
0.393	46.3	9.0	L1	9.7	11.7	58.0
0.443	38.9	9.0	L1	9.7	18.1	57.0
0.524	39.6	9.0	L1	9.7	16.4	56.0
0.717	39.8	9.0	L1	9.7	16.2	56.0

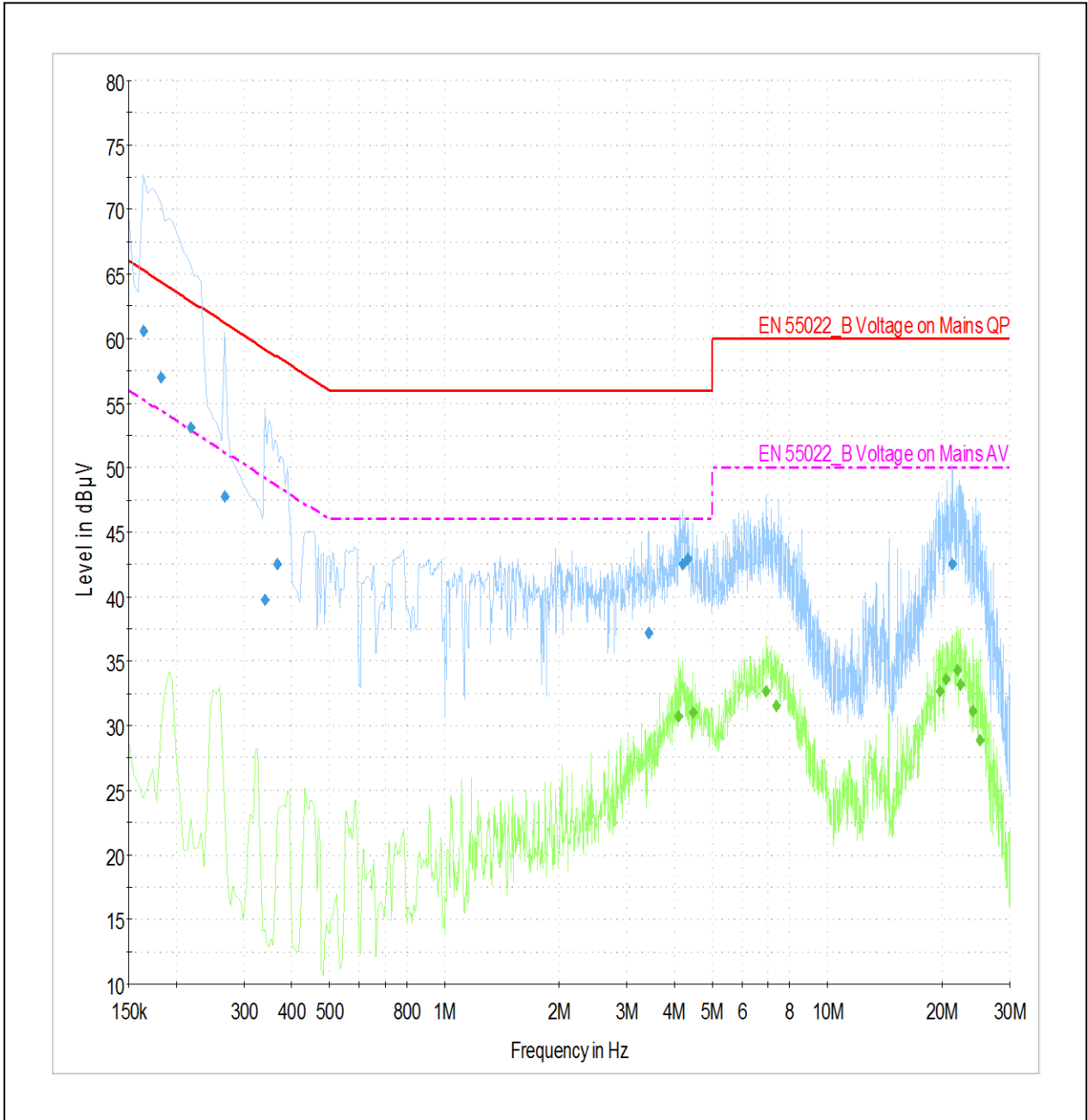
Average final measurement results table

Frequency [MHz]	Average [dBuV]	Bandwidth [kHz]	Line	Factor [dB]	Margin [dB]	Limit [dBuV]
0.249	30.2	9.0	L1	9.7	21.6	51.8
0.258	31.1	9.0	L1	9.7	20.4	51.5
0.389	28.4	9.0	L1	9.7	19.7	48.1
3.403	22.8	9.0	L1	9.8	23.2	46.0
4.123	25.2	9.0	N	9.7	20.8	46.0
4.452	23.3	9.0	N	9.7	22.7	46.0
7.134	28.7	9.0	L1	9.8	21.3	50.0
7.593	27.8	9.0	L1	9.8	22.2	50.0
19.761	30.0	9.0	L1	10.0	20.0	50.0
21.138	28.8	9.0	N	10.0	21.2	50.0

Note) Level (Quasi-Peak and/or Average) = Meter Reading (Quasi-Peak and/or Average) + Factor (LISN Insertion Loss + Cable Loss)

Margin = Limit – Level (Quasi-Peak and/or Average)

- Configuration 2 : USB 2.0 Duplex Printing Mode



Note) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Test Results (Quasi-Peak and Average)

Quasi-peak final measurement results table

Frequency [MHz]	Quasi-Peak [dBuV]	Bandwidth [kHz]	Line	Factor [dB]	Margin [dB]	Limit [dBuV]
0.164	60.6	9.0	N	9.7	4.7	65.3
0.182	57.0	9.0	N	9.7	7.4	64.4
0.218	53.1	9.0	L1	9.7	9.8	62.9
0.267	47.8	9.0	L1	9.7	13.4	61.2
0.339	39.7	9.0	N	9.7	19.5	59.2
0.366	42.5	9.0	N	9.7	16.1	58.6
3.408	37.2	9.0	L1	9.8	18.8	56.0
4.191	42.5	9.0	N	9.7	13.5	56.0
4.321	43.0	9.0	N	9.7	13.0	56.0
21.277	42.6	9.0	L1	10.1	17.4	60.0

Average final measurement results table

Frequency [MHz]	Average [dBuV]	Bandwidth [kHz]	Line	Factor [dB]	Margin [dB]	Limit [dBuV]
4.092	30.8	9.0	N	9.7	15.2	46.0
4.452	31.1	9.0	N	9.7	14.9	46.0
6.940	32.6	9.0	N	9.7	17.4	50.0
7.345	31.5	9.0	N	9.7	18.5	50.0
19.648	32.6	9.0	L1	10.0	17.4	50.0
20.490	33.6	9.0	N	10.0	16.4	50.0
21.921	34.4	9.0	L1	10.1	15.6	50.0
22.231	33.1	9.0	L1	10.1	16.9	50.0
23.959	31.1	9.0	L1	10.1	18.9	50.0
25.008	28.9	9.0	N	10.1	21.1	50.0

Note) Level (Quasi-Peak and/or Average) = Meter Reading (Quasi-Peak and/or Average) + Factor (LISN Insertion Loss + Cable Loss)

Margin = Limit – Level (Quasi-Peak and/or Average)

4.2 Radiated disturbance

Of those disturbances above ($L - 20\text{dB}$), where L is the limit level in logarithmic units, record at least the disturbance levels and the frequencies of the six highest disturbances.

The following data lists the significant emission frequencies, measured levels, correction factors (for antenna and cables), orientation of table, polarization and height of antenna, the corrected reading, the limit, and the amount of margin. All measurements were taken utilizing quasi-peak detection unless stated otherwise.

Measurements were performed at an antenna to EUT distance of 10 meters and elevated between 1 and 4 meters. Both vertical and horizontal antenna polarizations were measured.

Limits for radiated disturbance of ITE at a measuring distance of 10 m

Frequency range Limits MHz	Resolution Bandwidth	Quasi-peak Limits dB dB($\mu\text{V}/\text{m}$)	
		Class A	Class B
30 to 230	120 kHz	40	30
230 to 1000	120 kHz	47	37

NOTE 1 The lower limit shall apply at the transition frequency
 NOTE 2 Additional provisions may be required for cases where interference occurs.

Peak measurements were made over the changeable frequency range 1GHz to 40GHz in accordance with internal maximum operating frequency at a measurement distance of 3m for the following antenna and turntable arrangements:

Antenna Height (Cm)	Antenna Polarisation	Turntable position (degrees)
100	Horizontal, Vertical	Continuous

Limits for Class A equipment at a measurement distance of 3 m

Frequency range Limits MHz	Quasi-peak Limits dB(μ V/m)	Average Limits dB(μ V/m)
1 to 3	76	56
3 to 6	80	60
NOTE The lower limit shall apply at the transition frequency		

Limits for Class B equipment at a measurement distance of 3 m

Frequency range Limits MHz	Quasi-peak Limits dB(μ V/m)	Average Limits dB(μ V/m)
1 to 3	70	50
3 to 6	74	54
NOTE The lower limit shall apply at the transition frequency		

Antenna height was adjusted to 100cm to be parallel from EUT to antenna centre. Measurements within 20dB of the limit were then maximized by adjusting turntable position. Final measurements were made using a average detector.

Results checked manually; and points close to the limit line were re-measured.

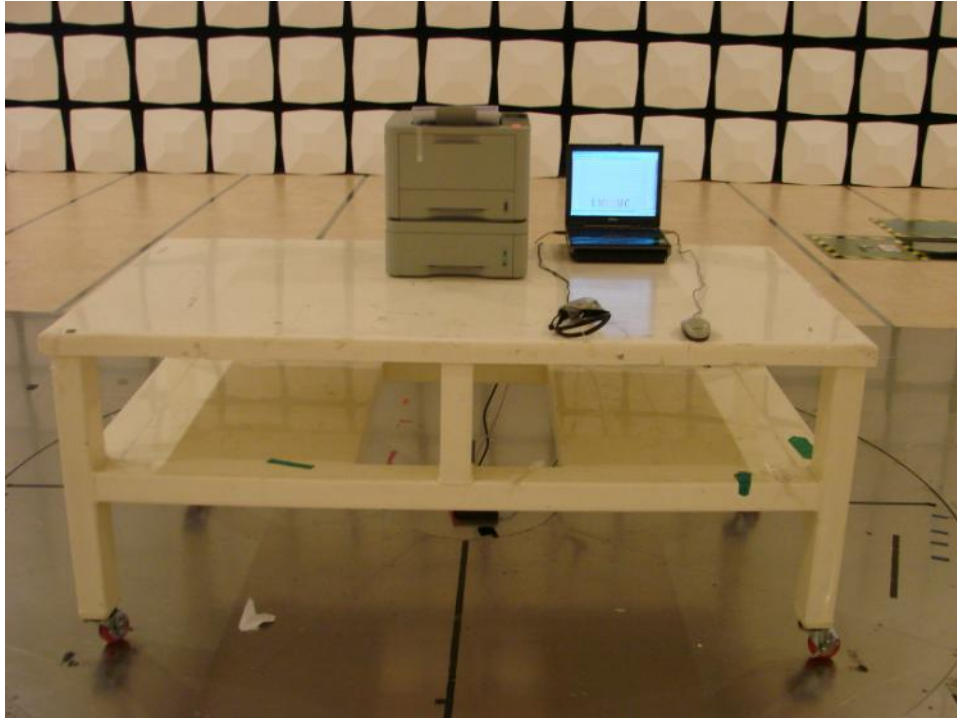
4.2.1 Test instrumentation

Test instrumentation	Manufacturer	Model name	Serial or Firmware (No./Ver.)	Calibration	
				Date	Interval (Month)
Bilog Antenna	Schaffner	CBL6112D	22602	2010-04-21	24
Bilog Antenna	Schaffner	CBL6112D	22604	2010-04-21	24
Horn Antenna	R&S	HF907	100016	2009-04-27	24
Test Receiver	R&S	ESIB-26	100147	2010-08-17	12
Test Receiver	R&S	ESIB-26	100288	2010-06-04	12
Amplifier	Sonoma	310N	185861	2010-01-28	12
Amplifier	Sonoma	310N	251676	2010-01-28	12
Amplifier	R&S	SCU_F018_G35_ASF42_CNN(F)	10001	2010-04-19	12
Antenna Mast	INN CO	MA4000	-	N/A	N/A
Antenna Mast	INN CO	MA4000	-	N/A	N/A
Antenna Mast	INN CO	MA2000	-	N/A	N/A
Mast Controller	INN CO	CO2000	-	N/A	N/A
Test software	TOYO	EP5/RE	VER 3.1.20	N/A	N/A
RF Selector	TOYO	NS4900	-	N/A	N/A

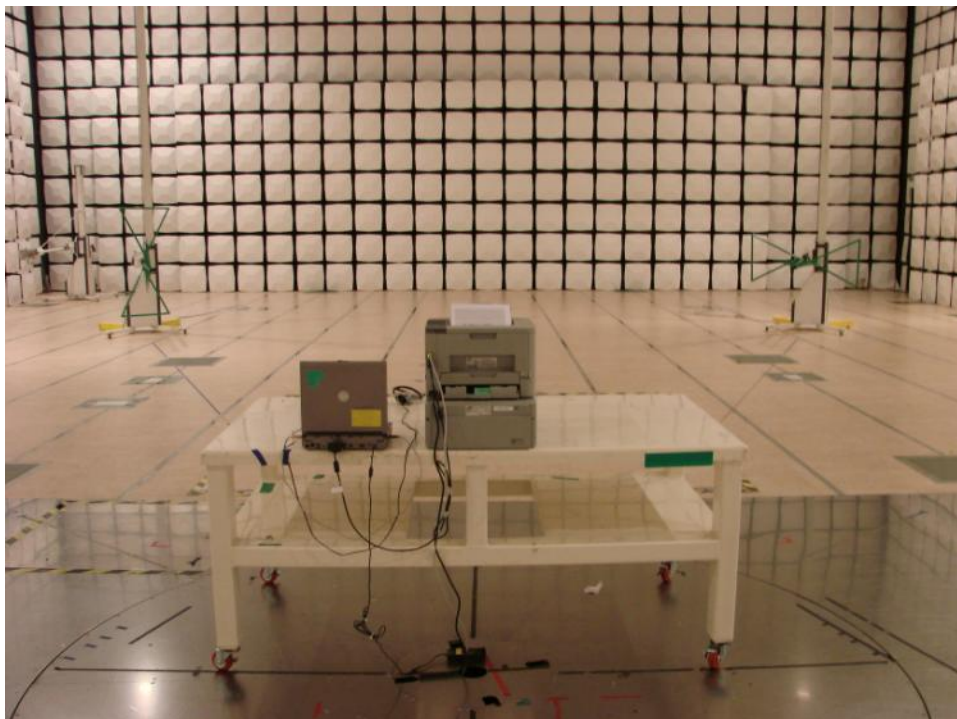
4.2.2 Temperature and humidity condition

Test date	October 1, 2010 ~ October 4, 2010	Test engineer	Young Hun Cheong
Test place	Semi-Anechoic Chamber		

4.2.3 Photograph of Test Setup(30 ~ 1 GHz)

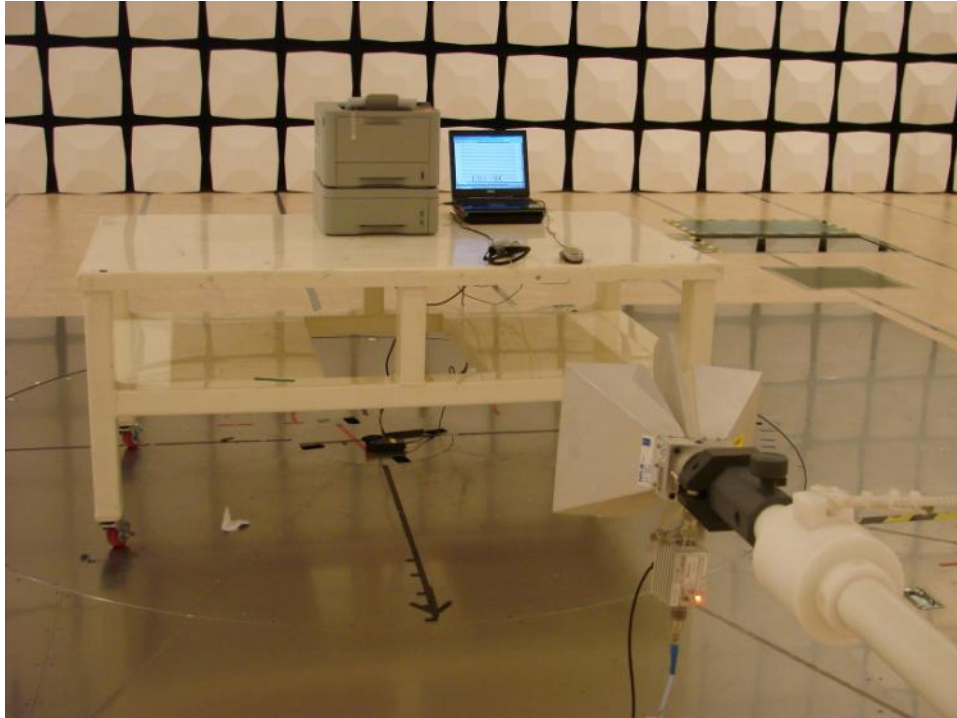


Front

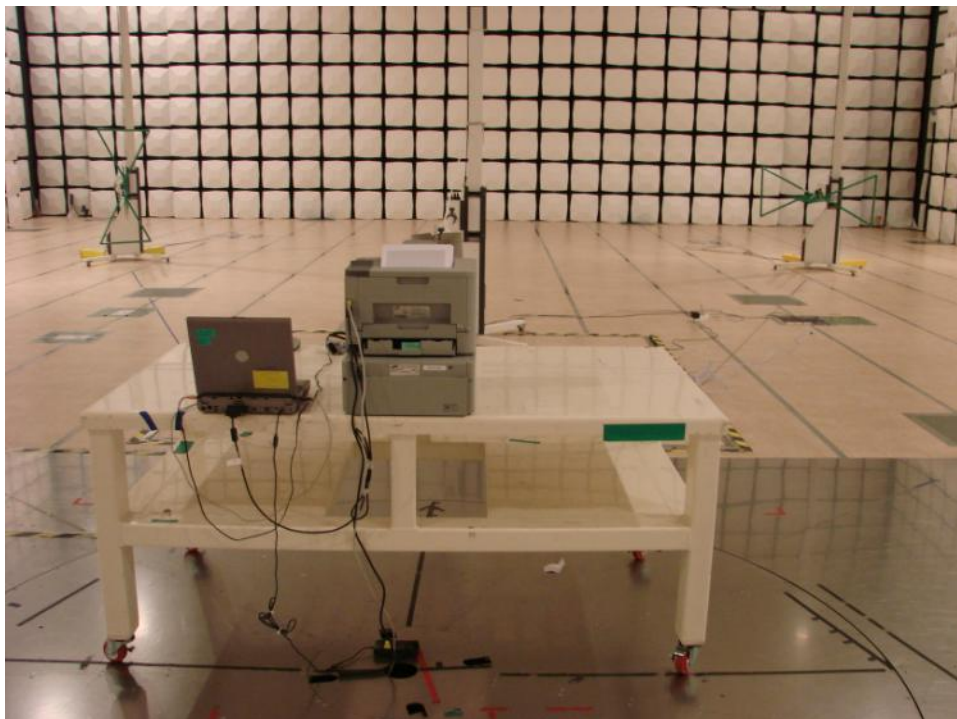


Rear

4.2.4 Photograph of Test Setup(1 ~ 2 GHz)



Front



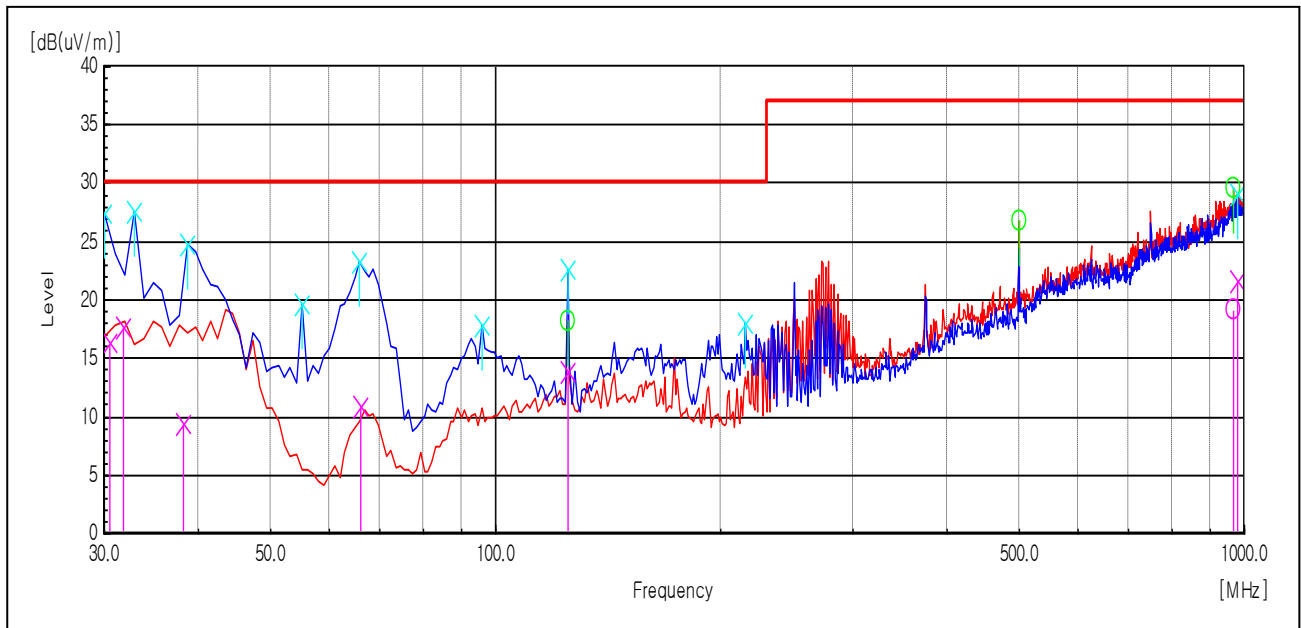
Rear

4.2.5 Test results

4.2.5.1 Below 1GHz results

- Configuration 1 : Standby Mode

Test Graph and Results



Frequency [MHz]	(P)	Reading QP [dB(uV)]	Factor [dB(1/m)]	Level QP [dB(uV/m)]	Limit [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
30.541	V	26.8	-10.5	16.3	30.0	13.7	134.0	98.7
31.840	V	29.5	-11.8	17.7	30.0	12.3	150.0	70.6
38.321	V	26.8	-17.4	9.4	30.0	20.6	287.0	123.5
66.142	V	35.7	-24.8	10.9	30.0	19.1	287.0	352.1
124.661	V	31.5	-17.6	13.9	30.0	16.1	108.0	140.7
966.654	H	20.1	-1.0	19.1	37.0	17.9	132.0	15.8
977.888	V	22.5	-0.8	21.7	37.0	15.3	369.0	123.5

Note) Receiving antenna polarization : Horizontal and/or Vertical

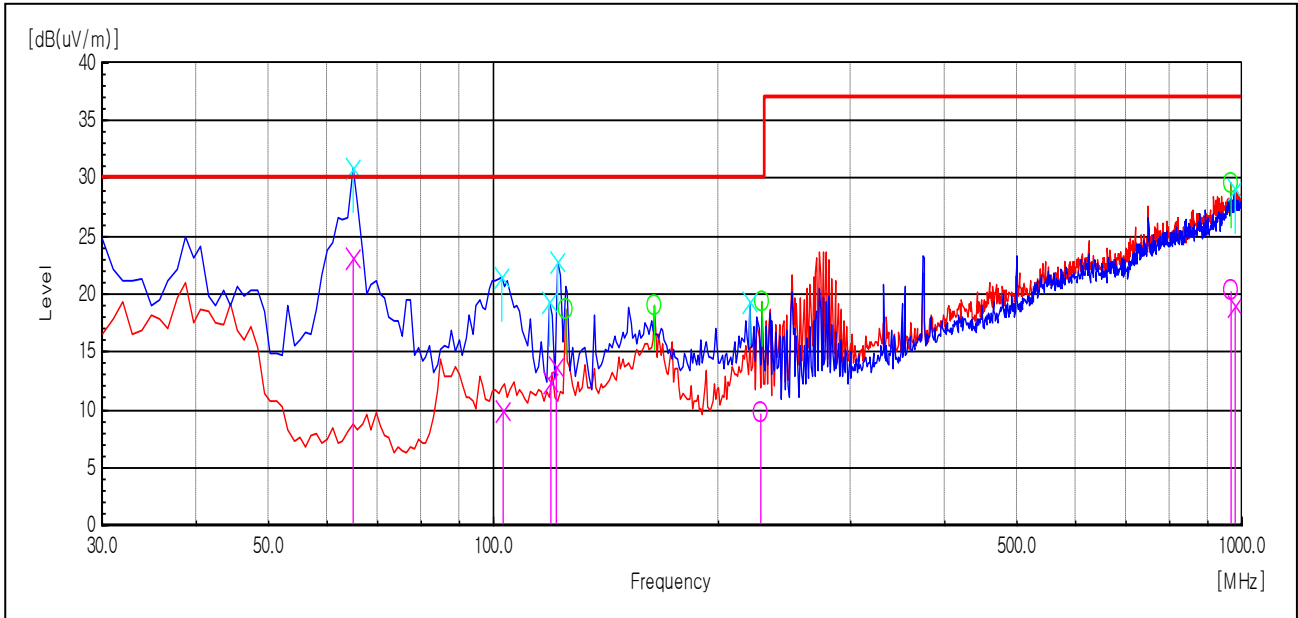
Test Distance : 10m, Antenna Height : 1 to 4 meters

Level QP (Quasi-Peak) = Reading QP + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Margin QP (Quasi-Peak) = Limit – Level QP

- Configuration 1 : Network Duplex Printing Mode

Test Graph and Results



Frequency [MHz]	(P)	Reading QP [dB(uV)]	Factor [dB(1/m)]	Level QP [dB(uV/m)]	Limit [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
64.962	V	48.0	-24.9	23.1	30.0	6.9	245.0	342.9
102.941	V	28.7	-18.7	10.0	30.0	20.0	123.0	298.7
119.321	V	30.0	-17.6	12.4	30.0	17.6	147.0	50.4
121.468	V	31.2	-17.5	13.7	30.0	16.3	107.0	50.8
227.814	H	28.6	-18.8	9.8	30.0	20.2	331.0	87.5
966.874	H	21.4	-1.0	20.4	37.0	16.6	198.0	30.5
977.888	V	19.8	-0.8	19.0	37.0	18.0	388.0	178.4

Note) Receiving antenna polarization : Horizontal and/or Vertical

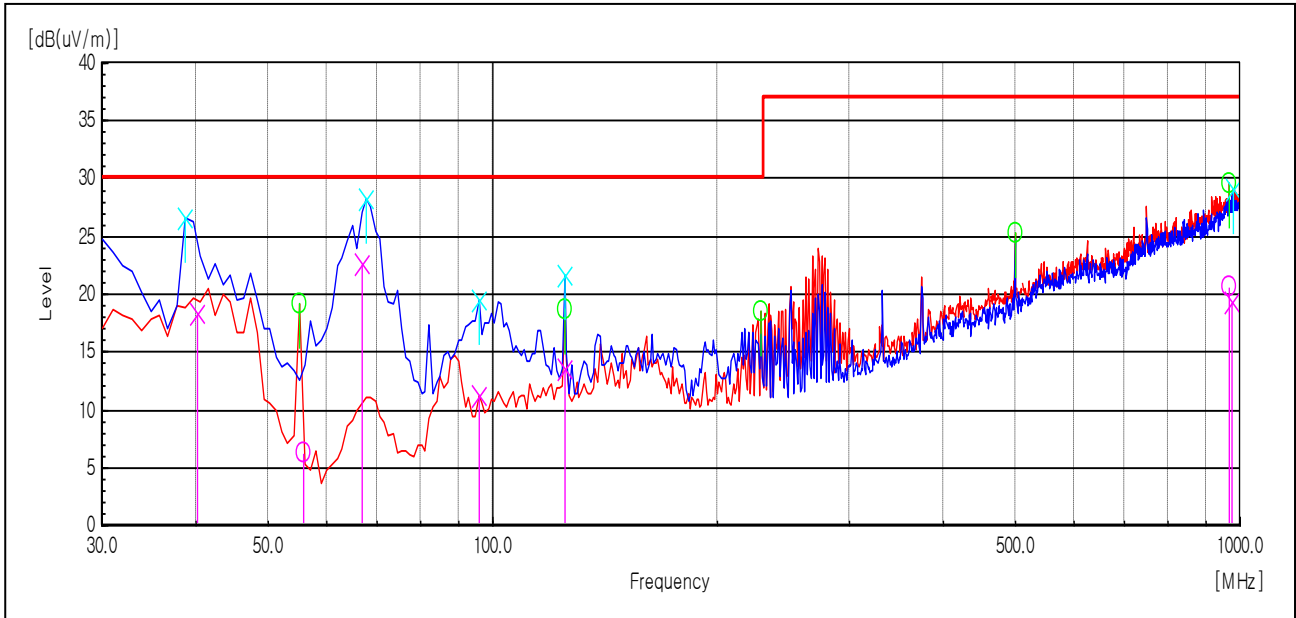
Test Distance : 10m, Antenna Height : 1 to 4 meters

Level QP (Quasi-Peak) = Reading QP + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Margin QP (Quasi-Peak) = Limit – Level QP

- Configuration 1 : USB Duplex Printing Mode

Test Graph and Results



Frequency [MHz]	(P)	Reading QP [dB(uV)]	Factor [dB(1/m)]	Level QP [dB(uV/m)]	Limit [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
40.186	V	37.0	-18.6	18.4	30.0	11.6	251.0	307.5
55.777	H	30.0	-23.7	6.3	30.0	23.7	274.0	130.5
66.739	V	47.5	-24.8	22.7	30.0	7.3	150.0	4.8
95.987	V	31.2	-19.9	11.3	30.0	18.7	174.0	45.4
124.661	V	31.1	-17.6	13.5	30.0	16.5	107.0	40.5
967.124	H	21.7	-1.0	20.7	37.0	16.3	188.0	30.5
977.157	V	20.1	-0.8	19.3	37.0	17.7	321.0	140.8

Note) Receiving antenna polarization : Horizontal and/or Vertical

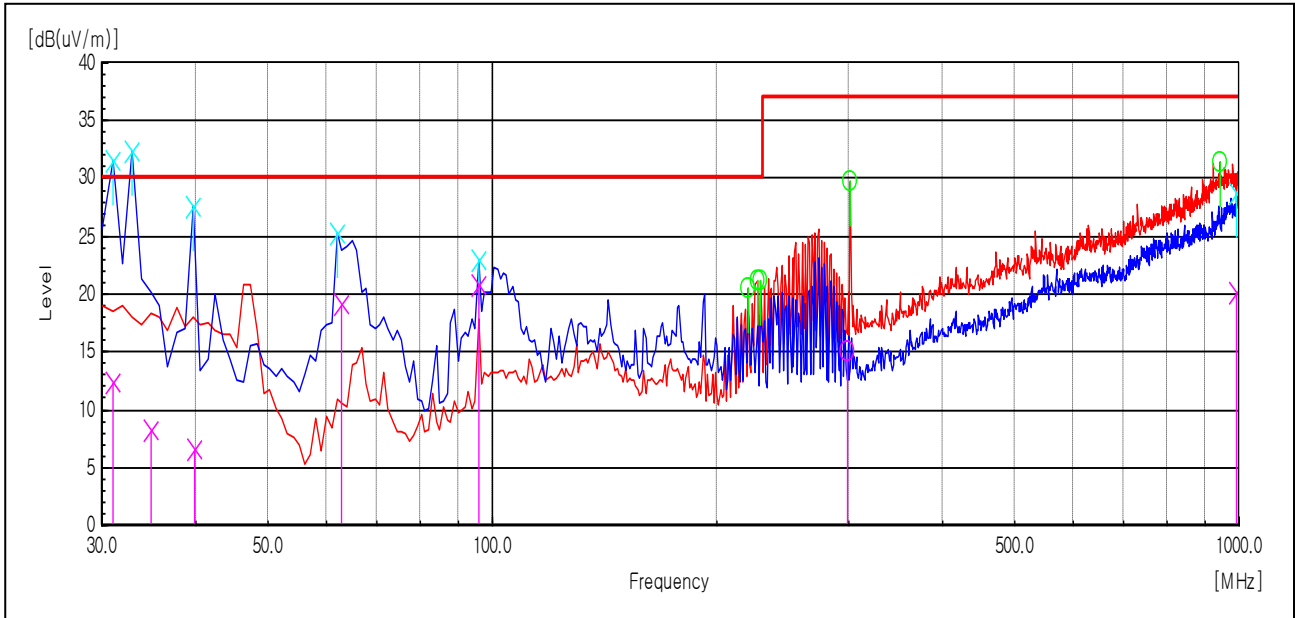
Test Distance : 10m, Antenna Height : 1 to 4 meters

Level QP (Quasi-Peak) = Reading QP + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Margin QP (Quasi-Peak) = Limit – Level QP

- Configuration 1 : Wireless LAN Simplex Printing Mode

Test Graph and Results



Frequency [MHz]	(P)	Reading QP [dB(uV)]	Factor [dB(1/m)]	Level QP [dB(uV/m)]	Limit [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
31.067	V	23.4	-11.0	12.4	30.0	17.6	369.0	80.4
34.892	V	23.0	-14.7	8.3	30.0	21.7	315.0	250.8
39.925	V	25.0	-18.4	6.6	30.0	23.4	347.0	60.8
62.808	V	44.2	-25.0	19.2	30.0	10.8	123.0	313.2
95.920	V	40.9	-20.0	20.9	30.0	9.1	169.0	367.0
299.181	H	29.8	-14.7	15.1	37.0	21.9	110.0	15.8
989.629	V	20.7	-0.6	20.1	37.0	16.9	324.0	210.5

Note) Receiving antenna polarization : Horizontal and/or Vertical

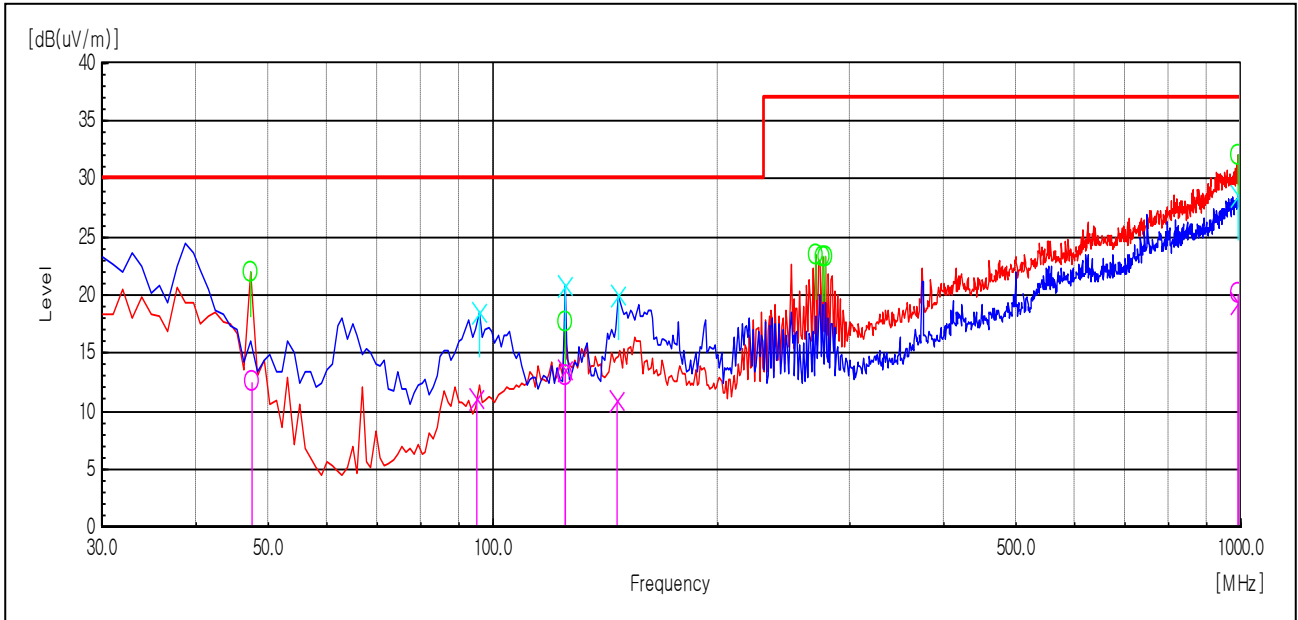
Test Distance : 10m, Antenna Height : 1 to 4 meters

Level QP (Quasi-Peak) = Reading QP + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Margin QP (Quasi-Peak) = Limit - Level QP

- Configuration 2 : Standby Mode

Test Graph and Results



Frequency [MHz]	(P)	Reading QP [dB(uV)]	Factor [dB(1/m)]	Level QP [dB(uV/m)]	Limit [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
47.562	H	28.7	-16.2	12.5	30.0	17.5	236.0	387.0
95.241	V	31.2	-20.1	11.1	30.0	18.9	110.0	341.5
124.661	V	31.2	-17.6	13.6	30.0	16.4	247.0	104.5
124.661	H	30.7	-17.7	13.0	30.0	17.0	394.0	5.7
146.321	V	29.4	-18.5	10.9	30.0	19.1	224.0	274.5
991.788	H	20.8	-0.7	20.1	37.0	16.9	134.0	70.8
992.455	V	19.9	-0.5	19.4	37.0	17.6	321.0	10.5

Note) Receiving antenna polarization : Horizontal and/or Vertical

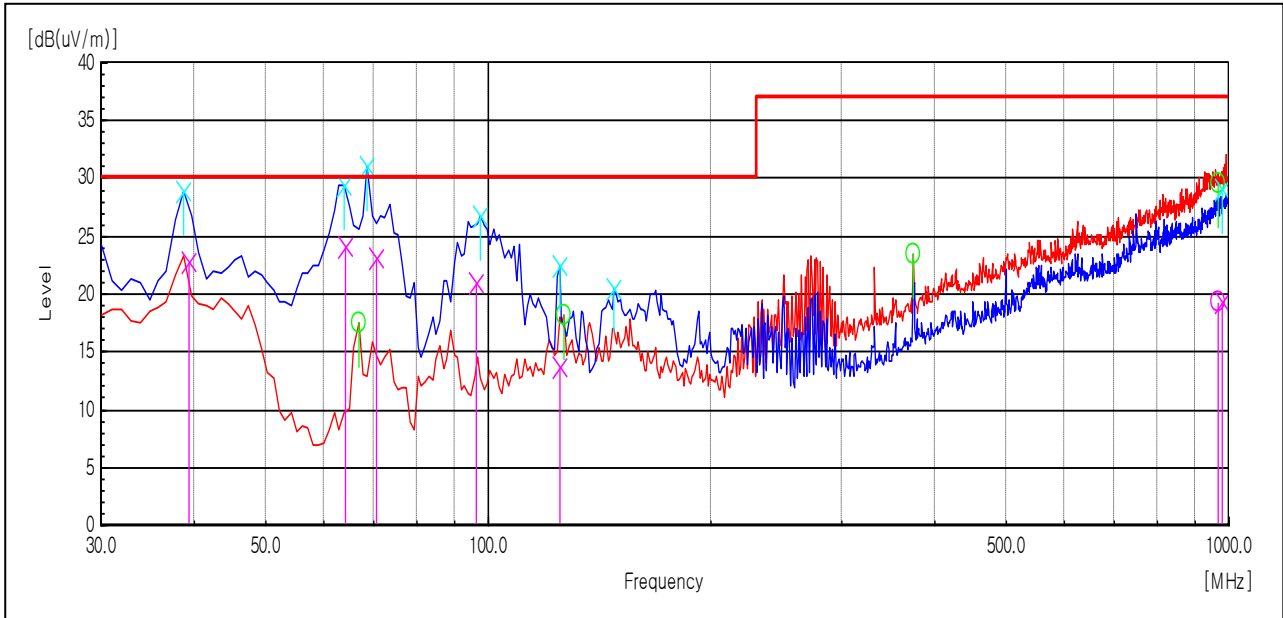
Test Distance : 10m, Antenna Height : 1 to 4 meters

Level QP (Quasi-Peak) = Reading QP + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Margin QP (Quasi-Peak) = Limit - Level QP

- Configuration 2 : USB 2.0 Duplex Printing Mode

Test Graph and Results



Frequency [MHz]	(P)	Reading QP [dB(uV)]	Factor [dB(1/m)]	Level QP [dB(uV/m)]	Limit [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
39.355	V	40.9	-18.1	22.8	30.0	7.2	251.0	356.0
64.093	V	49.1	-24.9	24.2	30.0	5.8	150.0	304.1
70.632	V	47.6	-24.5	23.1	30.0	6.9	150.0	92.3
96.297	V	40.9	-19.9	21.0	30.0	9.0	351.0	1.0
124.661	V	31.4	-17.6	13.8	30.0	16.2	107.0	115.8
966.874	H	20.4	-1.0	19.4	37.0	17.6	138.7	24.5
977.841	V	20.1	-0.8	19.3	37.0	17.7	321.0	170.8

Note) Receiving antenna polarization : Horizontal and/or Vertical

Test Distance : 10m, Antenna Height : 1 to 4 meters

Level QP (Quasi-Peak) = Reading QP + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Margin QP (Quasi-Peak) = Limit – Level QP

4.2.5.2 Above 1GHz results(1 ~ 5GHz)

- Configuration 1 : Standby Mode

Peak Measurement

Frequency [MHz]	POL	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit [dB(uV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1064.13	H	51.4	-14.9	36.5	74.0	37.5	100.0	16.6
1200.40	H	52.2	-13.7	38.5	74.0	35.5	100.0	359.6
1232.47	V	51.9	-13.5	38.4	74.0	35.6	100.0	26.5
1264.53	V	51.5	-13.2	38.3	74.0	35.7	100.0	26.5
1296.59	H	53.8	-12.9	40.9	74.0	33.1	100.0	8.0
1296.59	V	53.1	-12.9	40.2	74.0	33.8	100.0	42.3

Average Measurement

Frequency [MHz]	POL	Reading AV [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Limit [dB(uV/m)]	Margin AV [dB]	Height [cm]	Angle [deg]
1055.91	H	35.5	-14.9	20.6	54.0	33.4	100.0	15.9
1199.88	H	38.6	-13.7	24.9	54.0	29.1	100.0	358.8
1249.98	V	32.5	-13.3	19.2	54.0	34.8	100.0	27.0
1249.98	V	32.4	-13.3	19.1	54.0	34.9	100.0	27.0
1295.83	H	34.1	-12.9	21.2	54.0	32.8	100.0	8.5
1295.99	V	40.4	-12.9	27.5	54.0	26.5	100.0	41.7

Note1) Any emissions that do NOT exceed average limit were not tested with average detector mode.

Note2) Receiving antenna polarization : Horizontal and Vertical

Level P K(Peak) = Reading PK(Peak) + Factor(Antenna Factor + Cable Loss - Amp. Gain)

Level AV (Average) = Reading AV (Average) + Factor(Antenna Factor + Cable Loss - Amp. Gain)

Margin PK (Peak) = Limit – Level PK (Peak)

Margin AV (Average) = Limit – Level AV (Average)

- **Configuration 1 : Network Duplex Printing Mode**

Peak Measurement

Frequency [MHz]	POL	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit [dB(uV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1064.13	H	63.3	-14.9	48.4	74.0	25.6	100.0	7.6
1296.59	H	55.1	-12.9	42.2	74.0	31.8	100.0	31.7
1296.59	V	53.8	-12.9	40.9	74.0	33.1	100.0	40.9

Average Measurement

Frequency [MHz]	POL	Reading AV [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Limit [dB(uV/m)]	Margin AV [dB]	Height [cm]	Angle [deg]
1055.83	H	34.8	-14.9	19.9	54.0	34.1	100.0	6.9
1295.99	H	37.4	-12.9	24.5	54.0	29.5	100.0	31.3
1295.91	V	37.4	-12.9	24.5	54.0	29.5	100.0	40.3

Note1) Any emissions that do NOT exceed average limit were not tested with average detector mode.

Note2) Receiving antenna polarization : Horizontal and Vertical

Level P K(Peak) = Reading PK(Peak) + Factor(Antenna Factor + Cable Loss - Amp. Gain)

Level AV (Average) = Reading AV (Average) + Factor(Antenna Factor + Cable Loss - Amp. Gain)

Margin PK (Peak) = Limit – Level PK (Peak)

Margin AV (Average) = Limit – Level AV (Average)

- **Configuration 1 : USB Duplex Printing Mode**

Peak Measurement

Frequency [MHz]	POL	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit [dB(uV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1056.11	H	63.7	-14.9	48.8	74.0	25.2	100.0	0.9
2218.44	V	55.8	-4.9	50.9	74.0	23.1	100.0	56.8

Average Measurement

Frequency [MHz]	POL	Reading AV [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Limit [dB(uV/m)]	Margin AV [dB]	Height [cm]	Angle [deg]
1055.99	H	37.8	-14.9	22.9	54.0	31.1	100.0	0.3
2201.16	V	12.6	-5.1	7.5	54.0	46.5	100.0	56.3

Note1) Any emissions that do NOT exceed average limit were not tested with average detector mode.

Note2) Receiving antenna polarization : Horizontal and Vertical

Level P K(Peak) = Reading PK(Peak) + Factor(Antenna Factor + Cable Loss - Amp. Gain)

Level AV (Average) = Reading AV (Average) + Factor(Antenna Factor + Cable Loss - Amp. Gain)

Margin PK (Peak) = Limit – Level PK (Peak)

Margin AV (Average) = Limit – Level AV (Average)

- **Configuration 1 : Wireless LAN Simplex Printing Mode**

Peak Measurement

Frequency [MHz]	POL	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit [dB(uV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1064.13	H	63.3	-14.9	48.4	74.0	25.6	100.0	7.6
1296.59	H	55.1	-12.9	42.2	74.0	31.8	100.0	31.7
1296.59	V	53.8	-12.9	40.9	74.0	33.1	100.0	40.9

Average Measurement

Frequency [MHz]	POL	Reading AV [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Limit [dB(uV/m)]	Margin AV [dB]	Height [cm]	Angle [deg]
1055.91	H	38.1	-14.9	23.2	54.0	30.8	100.0	0.3
1295.99	V	30.8	-12.9	17.9	54.0	36.1	100.0	25.4
1296.07	H	34.4	-12.9	21.5	54.0	32.5	100.0	16.1

Note1) Any emissions that do NOT exceed average limit were not tested with average detector mode.

Note2) Receiving antenna polarization : Horizontal and Vertical

Level P K(Peak) = Reading PK(Peak) + Factor(Antenna Factor + Cable Loss - Amp. Gain)

Level AV (Average) = Reading AV (Average) + Factor(Antenna Factor + Cable Loss - Amp. Gain)

Margin PK (Peak) = Limit – Level PK (Peak)

Margin AV (Average) = Limit – Level AV (Average)

- **Configuration 2 : Standby Mode**

Peak Measurement

Frequency [MHz]	POL	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit [dB(uV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1056.11	H	53.0	-14.9	38.1	74.0	35.9	100.0	78.0
1200.40	H	51.6	-13.7	37.9	74.0	36.1	100.0	359.2
1232.47	V	51.4	-13.5	37.9	74.0	36.1	100.0	26.1
1296.59	V	53.6	-12.9	40.7	74.0	33.3	100.0	26.1
1296.59	H	51.7	-12.9	38.8	74.0	35.2	100.0	354.7

Average Measurement

Frequency [MHz]	POL	Reading AV [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Limit [dB(uV/m)]	Margin AV [dB]	Height [cm]	Angle [deg]
1055.83	H	20.7	-14.9	5.8	54.0	48.2	100.0	77.4
1199.88	H	38.8	-13.7	25.1	54.0	28.9	100.0	358.6
1248.06	V	25.3	-13.3	12.0	54.0	42.0	100.0	26.6
1296.31	V	26.2	-12.9	13.3	54.0	40.7	100.0	26.6
1295.91	H	41.4	-12.9	28.5	54.0	25.5	100.0	354.2

Note1) Any emissions that do NOT exceed average limit were not tested with average detector mode.

Note2) Receiving antenna polarization : Horizontal and Vertical

Level P K(Peak) = Reading PK(Peak) + Factor(Antenna Factor + Cable Loss - Amp. Gain)

Level AV (Average) = Reading AV (Average) + Factor(Antenna Factor + Cable Loss - Amp. Gain)

Margin PK (Peak) = Limit – Level PK (Peak)

Margin AV (Average) = Limit – Level AV (Average)

- **Configuration 2 : USB 2.0 Duplex Printing Mode**

Peak Measurement

Frequency [MHz]	POL	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level PK [dB(uV/m)]	Limit [dB(uV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]
1064.13	H	65.2	-14.9	50.3	74.0	23.7	100.0	352.2
1064.13	V	54.0	-14.9	39.1	74.0	34.9	100.0	94.5
1200.40	H	53.6	-13.7	39.9	74.0	34.1	100.0	359.6
1296.59	V	54.1	-12.9	41.2	74.0	32.8	100.0	78.6
1296.59	H	52.2	-12.9	39.3	74.0	34.7	100.0	0.5
1360.72	H	51.4	-12.3	39.1	74.0	34.9	100.0	0.5

Average Measurement

Frequency [MHz]	POL	Reading AV [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Limit [dB(uV/m)]	Margin AV [dB]	Height [cm]	Angle [deg]
1055.83	H	28.7	-14.9	13.8	54.0	40.2	100.0	352.7
1064.57	V	23.5	-14.9	8.6	54.0	45.4	100.0	95.0
1199.96	H	46.5	-13.7	32.8	54.0	21.2	100.0	359.2
1295.91	V	40.9	-12.9	28.0	54.0	26.0	100.0	79.0
1295.91	H	39.7	-12.9	26.8	54.0	27.2	100.0	0.9
1343.93	H	34.0	-12.5	21.5	54.0	32.5	100.0	0.9

Note1) Any emissions that do NOT exceed average limit were not tested with average detector mode.

Note2) Receiving antenna polarization : Horizontal and Vertical

Level P K(Peak) = Reading PK(Peak) + Factor(Antenna Factor + Cable Loss - Amp. Gain)

Level AV (Average) = Reading AV (Average) + Factor(Antenna Factor + Cable Loss - Amp. Gain)

Margin PK (Peak) = Limit – Level PK (Peak)

Margin AV (Average) = Limit – Level AV (Average)

Appendix – EUT photography



Front View



Rear View



Left View



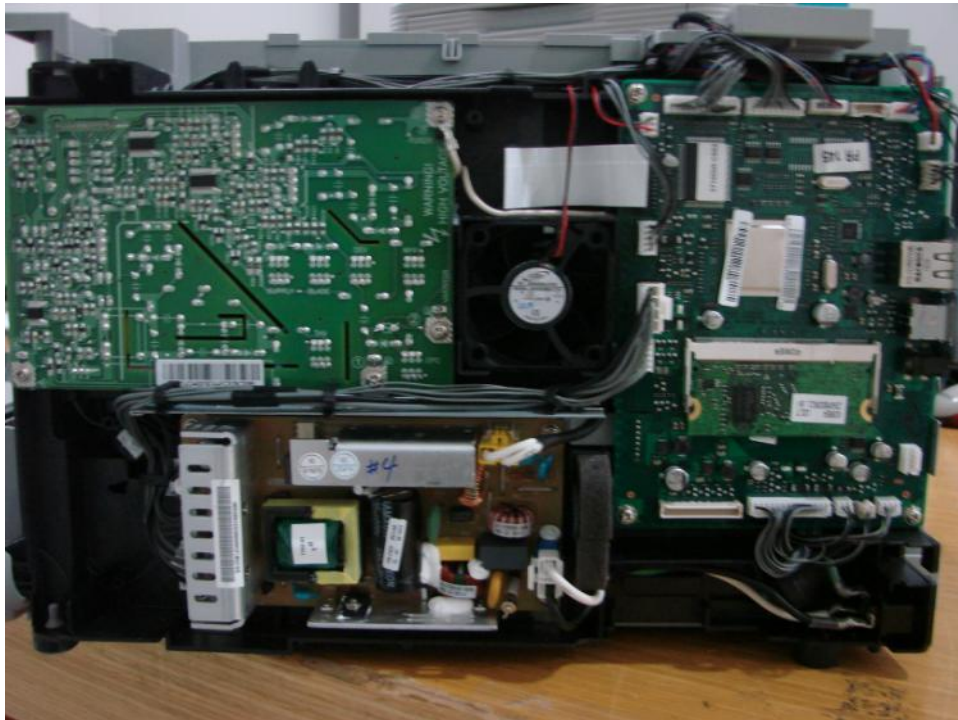
Right View



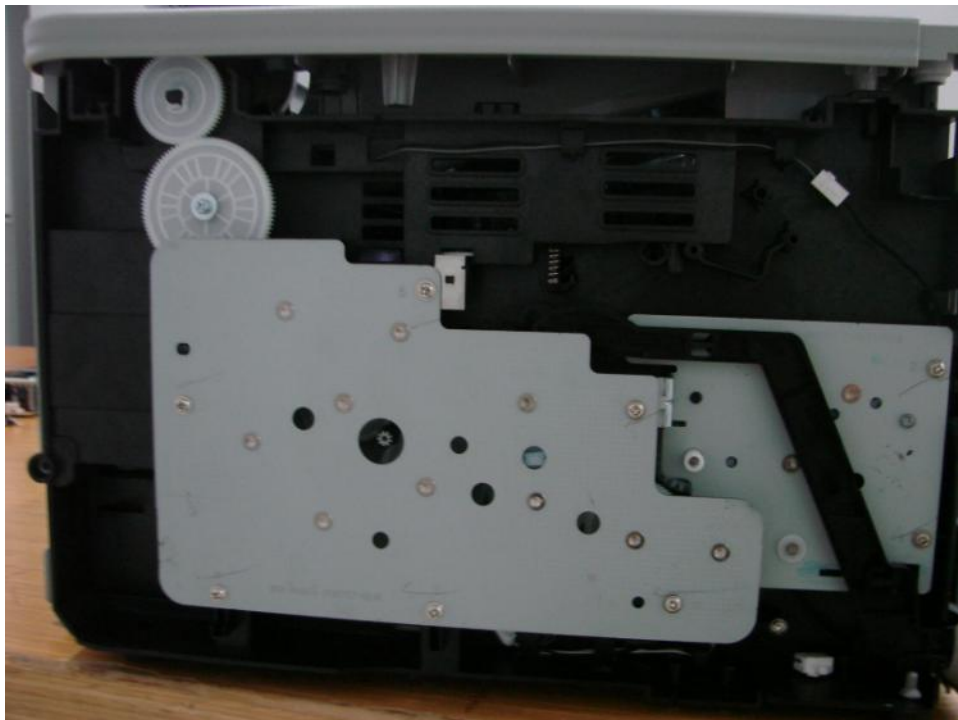
Inside View – Front



Inside View – Rear



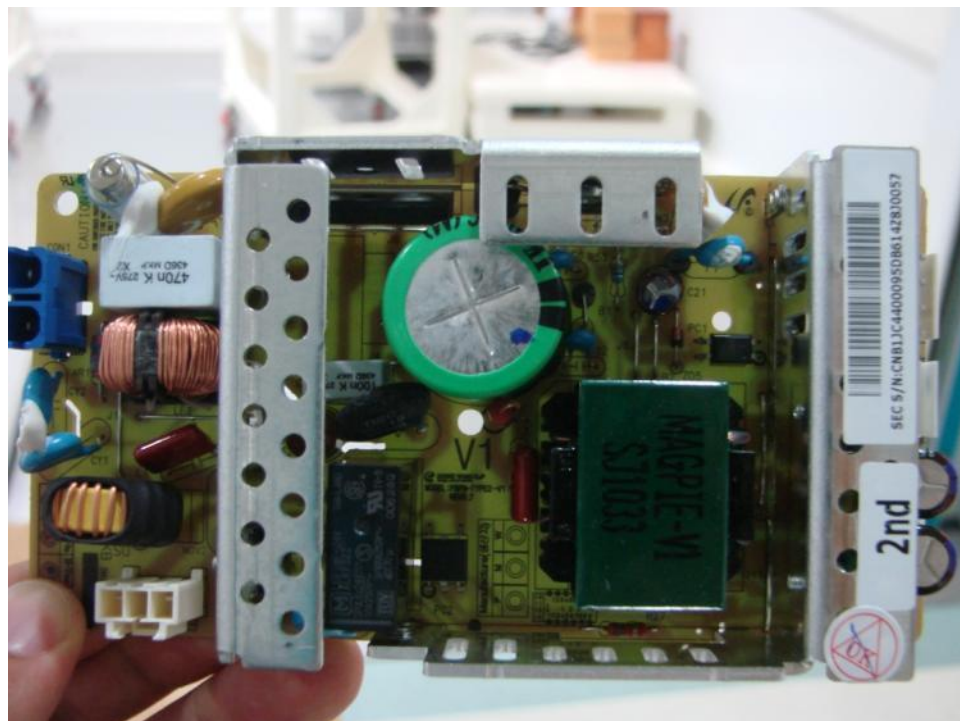
Inside View – Left



Inside View – Right





LITEON SMPS



Dongyang SMPS



Label Location

	Model: ML-3710DW Volts: AC 110-127V Hertz: 50/60 Hz Amps: 6.5A Manufactured:	FCC ID: A3LML3710DW (Printer) Contains FCC ID: MCLU98Z058 This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: i) This device may not cause harmful interference, and ii) This device must accept any interference received, including interference that may cause undesired operation. Contains IC: 2878D-U98Z058 This Class B digital apparatus complies with Canadian ICES-003 Cet appareil numérique de la classe B est Conforme à la norme NMB-003 du Canada. This product complies with 21 CFR Chapter 1, subchapter J.
Samsung Electronics Co., Ltd. Suwon, Korea, 443-742 Place: M259	 3UU7 E337632 I.T.E.	
Serial No.		Made In Korea Fabriqué en Corée REV.00

Label