

TEST REPORT

Report number: Z071C-11099

Issue Date: August 5, 2011

The device, as described herewith, was tested pursuant to applicable test procedure indicated below and complies with the requirements of;

FCC Part15 Subpart C

The test results are traceable to the international or national standards.

Applicant	: NEC Embedded Products,Ltd.
Equipment under test (EUT)	: Photo Printer
FCC ID	: ZQVMH250
Model Number	: MH250

Test procedure	: ANSI C63.4-2003
Date of test	: July 21, 28, 2011 August 1, 2011
Test place	: ZACTA Technology Corporation Yonezawa Testing Center 4149-7 Hachimanpara 5-chome Yonezawa-shi Yamagata 992-1128 Japan Phone: +81-238-28-2880 Fax: +81-238-28-2888
Test results	: Complied

Zacta Technology Corporation certifies that no party to the application is subject to a denial of federal benefits that include FCC benefits, pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988,21U.S.C. 853(a).

The results in this report are applicable only to the samples tested.

This report shall not be re-produced except in full without the written approval of ZACTA Technology Corporation.

This test report must not be used by client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Tested by:


Chiaki Kanno
Taiki Watanabe

Authorized by:


Jun Shimanuki

General Manager of Technical Division



NVLAP LAB CODE 200306-0

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1. Summary of Test

1.1 Purpose of test

It is the original test in order to verify conformance to standards listed in section 1.2.

1.2 Standards

CFR47 FCC Part 15 Subpart C

1.3 Summary of test results

Test Items Section	Test Items	Condition	Result
	Transmit mode [Tx]:		
RSS-Gen 4.6.1	99% Occupied Bandwidth	Conducted	Pass
15.209 15.225 (a)(b)(c)(d)	Operation within the band 13.110-14.010MHz	Radiated	Pass
15.209 15.225 (d)	Transmitter radiated spurious emissions	Radiated	Pass
15.225 (e)	Frequency tolerance	Conducted	Pass
15.207	AC power line Conducted Emissions	Conducted	Pass

1.4 Deviation from the standard

[AC power line Conducted Emissions]

This equipment (Photo Printer) is class A digital device. Therefore, the measurement applied FCC 15.107 class A limit.

To confirm the noise of the radio transmitter, it measured it in the following modes; RF on and RF off.

(Refer to clause 4.5.5)

1.5 Modification to the EUT by laboratory

None

2. Equipment description

2.1 General Description of equipment

EUT is the Photo Printer.

2.2 EUT information

Applicant	: NEC Embedded Products,Ltd. 1-26 HACHIMANPARA 1-CHOME YONEZAWA-SHI YAMAGATA 992-1128 JAPAN Phone: + 81-238-29-0371 Fax: + 81-238-29-0373
Equipment under test (EUT)	: Photo Printer
Trade name	: ALTECH
Model number	: MH250
Serial number	: N/A
EUT condition	: Pre-production
Max. frequency	: 133MHz
Power ratings	: AC 100-240V 50/60Hz 9.5-3.6A
Size	: (W) 429 × (D) 414 × (H) 732 mm (W) 639 × (D) 414 × (H) 732 mm (with Scrap Box)
Environment	: Indoor use
Thermal limitation	: 5°C to +35°C (Operating) -20°C to +60°C (Storage)
Operating mode	: Transmit mode
Variation of the family model(s)	: N/A
[RF Specification]	
Frequency range	: 13.56MHz
Modulation method	: ASK
Antenna type	: Loop antenna

2.3 Operating mode

【Transmit mode】

- i) Power ON
- ii) Select a test mode
Operating mode: RF Test
- iii) Start test mode

3. Configuration information

3.1 EUT and Peripheral(s) used

No.	Equipment	Company	Model No.	Serial No.	DoC / FCC ID	Comment
1	Photo Printer	NEC Embedded Products,Ltd.	MH250	N/A	ZQVMH250	EUT
2	Personal Computer	NEC	PC-VJ21AWZE1	73000581A	DoC	*
3	AC adapter for PC	NEC	PA-1900-23	725560LA	-	*
4	Modem	US. Robotics	Sport_Ster33.6kbps	000839032BK6YV4J	DoC	*
5	AC adapter for Modem	US. Robotics	N/A	N/A	-	*
6	Printer	HP	C4555A	US6BC212N	B94C4555X	*

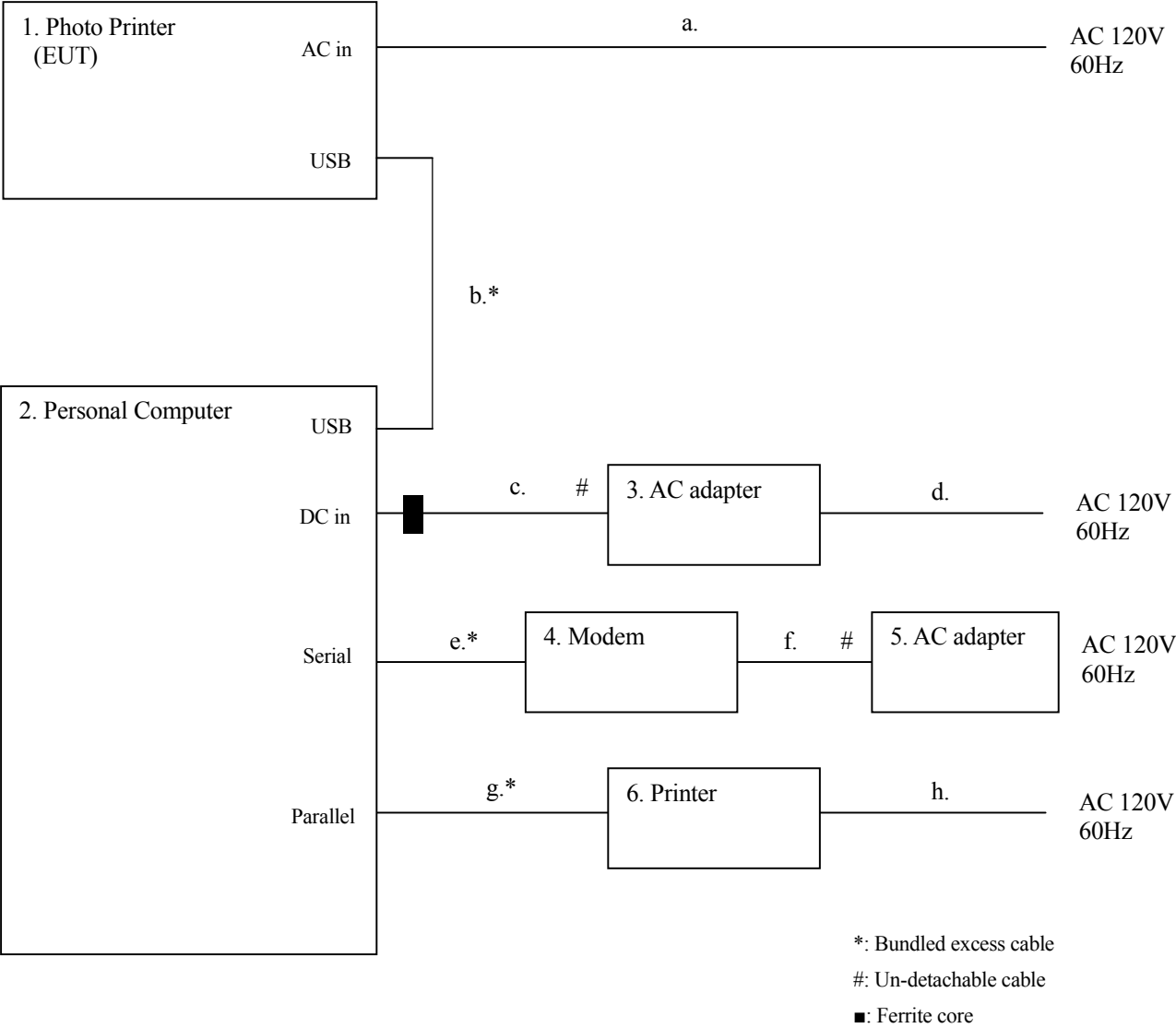
*: Conducted emission only.

3.2 Cable(s) information

No.	Cable	Length [m]	Shield	Connector	Comment
a	AC power cord	1.5	No	Plastic	Accessory
b	USB cable	1.5	Yes	Metal	Accessory
c	DC cable	1.8	No	Plastic	*
d	AC power cord for PC AC adapter	1.8	No	Plastic	*
e	Serial cable	2.0	Yes	Metal	*
f	DC cable for Modem AC adapter	1.7	No	Plastic	*
g	Parallel cable	2.1	Yes	Metal	*
h	AC power cord for Printer	2.7	No	Plastic	*

*: Conducted emission only.

3.3 System configuration



Note1: Numbers assigned to equipment or cables on this diagram are corresponded to the list in “3.1 EUT and Peripheral(s) used” and “3.2 Cable(s) information”.

Note2: DC cable (No.c) with one ferrite core is accessory for AC adapter (No.3).

4. Test Type and Results

4.1 99% Occupied Bandwidth

4.1.1 Test Procedure [IC RSS-Gen 4.6.1]

The transmitter output is connected to the spectrum analyzer.

The RBW is set to as close to 1% of the selected span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

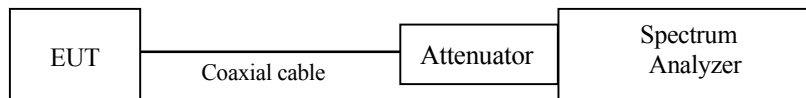
The spectrum analyzer is set to:

- RBW=1kHz, VBW=3kHz, Span=100kHz, Sweep=auto

The test mode of EUT is as follows.

- Transmit mode

4.1.2 Measurement Setup



4.1.3 Limit of 99% Occupied Bandwidth

None

4.1.4 Measurement Results

[Transmit mode]

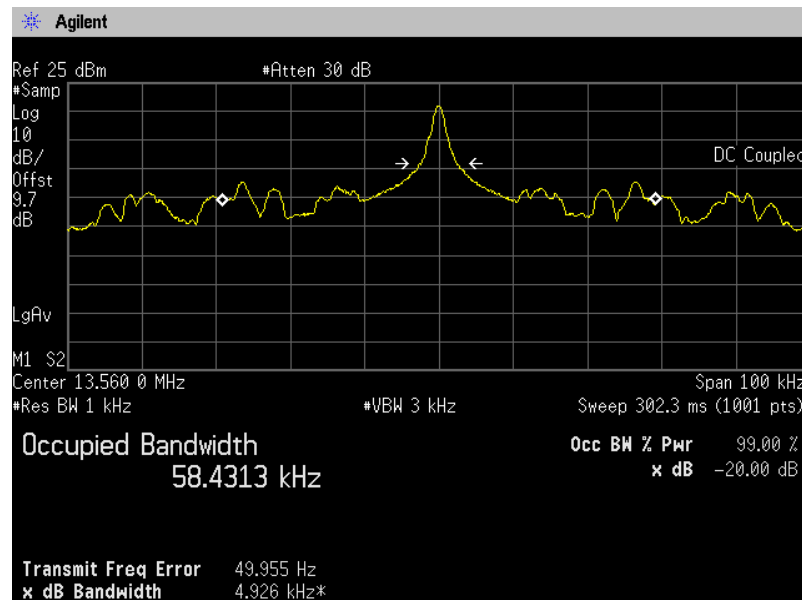
Frequency [MHz]	Occupied Bandwidth [kHz]
13.56	58.4313

4.1.5 Trace Data

Test Personnel:

Tested by: Chiaki Kanno

Date : Jul. 21, 2011
Temperature : 23.4 [°C]
Humidity : 45.3 [%]
Test place : Shielded room



4.2 Operation within the band 13.110-14.010MHz

4.2.1 Test Procedure [FCC 15.209 / 15.225 (a)(b)(c)(d)]

Radiated emission measurements are performed at 3m distance with the Loop antenna. The Loop antenna is positioned with its plane vertical, and the center of the Loop is 1.0meter above the ground plane. Frequency Range: 13MHz –14.12MHz is scanned and investigated with the test receiver, and with the spectrum analyzer.

The detector function of the test receiver is set to CISPR Quasi-peak mode and the bandwidth is set to 9kHz.

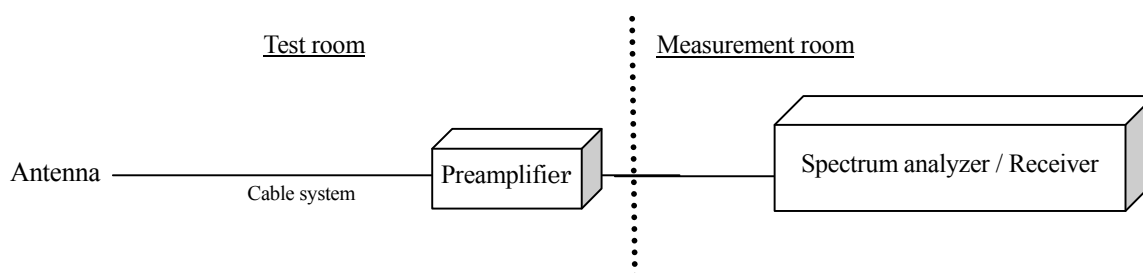
The EUT and support equipment are placed on a 1 meter x 2.0 meter surface, 0.8 meter height FRP table.

The turntable and the loop antenna are rotated by 360 degrees and stopped at azimuth of producing the maximum emission.

Interconnecting cables, which hanging closer than 40cm to the horizontal metal ground plane are bundled its excess in center. The test results represent the worst-case emission for each emission with manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation.

Sufficient time for the EUT, support equipment, and test equipment are allowed in order for them to warm up to their normal operating condition.

4.2.2 Measurement Setup



4.2.3 Limit of Operation within the band 13.110-14.010MHz

- (a) The field strength of any emissions within the band 13.553-13.567MHz shall not exceed 15,848uV/m at 30m.
- (b) Within the band 13.410-13.553MHz and 13.567-13.710MHz, the field strength of any emissions shall not exceed 334uV/m at 30m.
- (c) Within the band 13.110-13.410MHz and 13.710-14.010MHz, the field strength of any emissions shall not exceed 106uV/m at 30m.
- (d) The field strength of any emissions appearing outside of the 13.110-14.010MHz and shall not exceed the general radiated emission limits in FCC 15.209.

4.2.4 Measurement Results

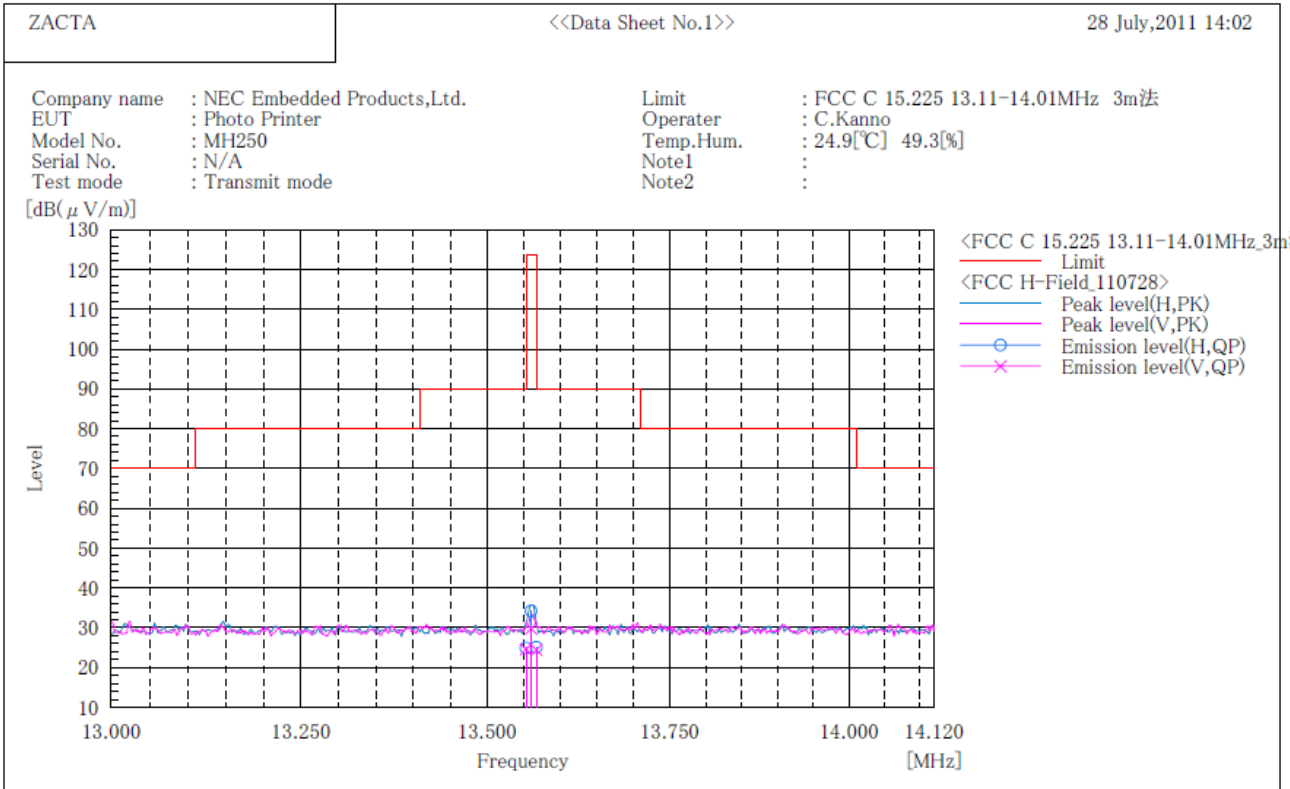
[Transmit mode]

Frequency range (MHz)	Frequency (MHz)	Level		Limit (dBuV/m)	Margin (dB)	Result
		Measured at 3m (dBuV/m)	Measured at 30m (dBuV/m)			
13.553-13.567	13.560	34.2	-5.8	84.0	89.8	PASS
13.41-13.553	13.553	24.9	-15.1	50.5	65.6	PASS
13.567-13.71	13.567	25.1	-14.9	50.5	65.4	PASS

Note. Measurements were corrected to 30m using $40\log(3/30) = -40.0\text{dB}$

4.2.5 Trace Data

***** RADIATED EMISSION *****
[10m Semi-anechoic chamber]



Final Result

No.	Frequency	(P)	Reading	c. f	Result	Limit	Margin	Height	Angle
	[MHz]		QP		QP		QP		
			[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[cm]	[°]
1	13.560	H	43.3	-9.1	34.2	123.5	89.3	100.0	317.0
2	13.553	H	34.0	-9.1	24.9	90.0	65.1	100.0	317.0
3	13.567	H	34.2	-9.1	25.1	90.0	64.9	100.0	317.0
4	13.560	V	38.9	-9.1	29.8	123.5	93.7	100.0	230.0
5	13.553	V	33.7	-9.1	24.6	90.0	65.4	100.0	230.0
6	13.567	V	33.5	-9.1	24.4	90.0	65.6	100.0	230.0

4.3 Transmitter Radiated Spurious Emissions (9kHz-1000MHz)

4.3.1 Test Procedure [FCC 15.209 / 15.225 (d)]

Radiated emission measurements are performed at 3m distance with the broadband antenna (Loop antenna, Biconical antenna and Log periodic antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1 to 4 meters and stopped at height producing the maximum emission. As for the Loop antenna, it is positioned with its plane vertical, and the center of the Loop is 1.0meter above the ground plane. Frequency Range: 9kHz –1GHz is scanned and investigated with the test receiver, and above 1GHz, with the spectrum analyzer. The detector function of the test receiver is set to CISPR Quasi-peak mode and the bandwidth is set to 200Hz (9kHz to 150kHz), 9kHz (150kHz to 30MHz) and 120kHz (above 30MHz).

The EUT and support equipment are placed on a 1 meter x 2.0 meter surface, 0.8 meter height FRP table.

The turntable and the loop antenna are rotated by 360 degrees and stopped at azimuth of producing the maximum emission.

Interconnecting cables, which hanging closer than 40cm to the horizontal metal ground plane are bundled its excess in center. The test results represent the worst-case emission for each emission with manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation.

Sufficient time for the EUT, support equipment, and test equipment are allowed in order for them to warm up to their normal operating condition.

Frequency range:

- 9kHz to 1000MHz

The Test receiver is set to:

Detector: Quasi-peak

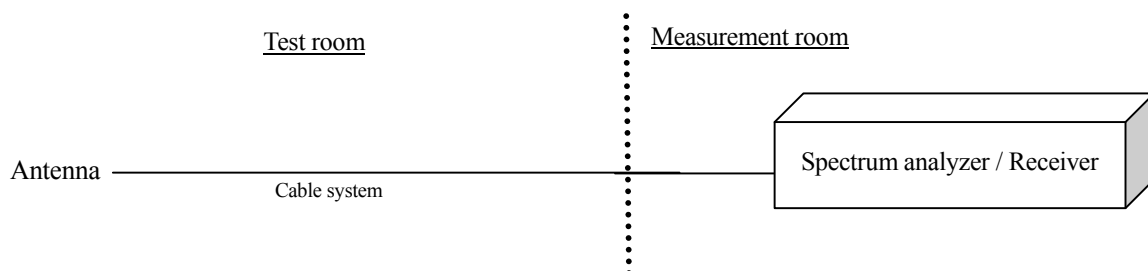
Bandwidth: 200Hz, 9kHz, 120kHz

The test mode of EUT is as follows.

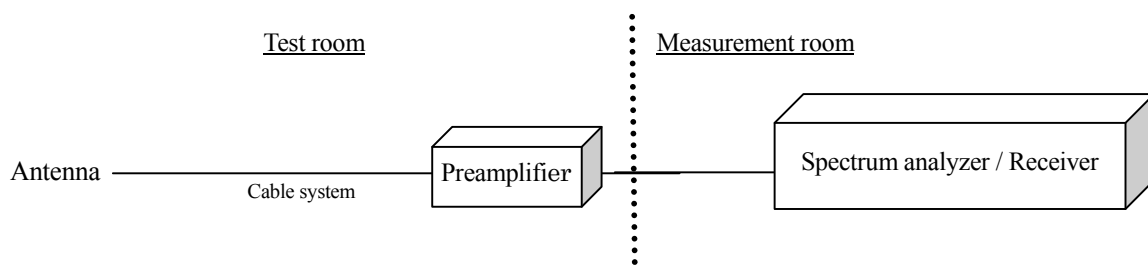
- Transmit mode

4.3.2 Measurement Setup

[9kHz to 150kHz]



[150kHz to 1000MHz]



4.3.3 Limit of Spurious Emissions Measurement

Frequency [MHz]	Field Strength		Distance [m]
	[uV/m]	[dBuV/m]	
0.009 – 0.490	2400 / F [kHz]	20logE [uV/m]	300
0.490 – 1.705	24000 / F [kHz]	20logE [uV/m]	30
1.705-30	30	29.5	30
30 – 88	100	40.0	3
88 – 216	150	43.5	3
216 – 960	200	46.0	3
Above 960	500	54.0	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level [dBuV/m] = 20 log Emission [uV/m]
3. Measurements were corrected to 300m using $40\log(3/300) = -80.0\text{dB}$
4. Measurements were corrected to 30m using $40\log(3/30) = -40.0\text{dB}$

4.3.4 Calculation Method

[9kHz to 150kHz]

Emission level = Reading + c.f.(Ant. factor + Cable system loss)

Margin = Limit – Emission level

[150kHz to 1000MHz]

Emission level = Reading + c.f.(Ant. factor + Cable system loss – Amp. Gain)

Margin = Limit – Emission level

4.3.5 Measurement Results

Test Personnel:

Tested by:

Chiaki Kanno

Date : Jul. 28, 2011
Temperature : 24.9 [°C]
Humidity : 49.3 [%]
Test place : 10m Semi-anechoic chamber

[Transmit mode 9kHz to 30MHz]

Frequency (MHz)	Level		Limit (dBuV/m)	Margin (dBuV/m)	Result
	Measured at 3m (dBuV/m)	Measured at 30m (dBuV/m)			
27.120	24.7	-15.3	29.5	44.8	PASS

[Transmit mode 30MHz to 1000MHz]

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c. f [dB(1/m)]	Result QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	310.800	H	34.9	-10.2	24.7	46.0	21.3	100.0	104.0
2	335.998	H	34.5	-9.9	24.6	46.0	21.4	100.0	76.0
3	399.591	V	36.9	-8.4	28.5	46.0	17.5	125.0	70.0
4	577.212	V	31.7	-4.9	26.8	46.0	19.2	100.0	0.0
5	665.994	V	33.1	-3.4	29.7	46.0	16.3	137.0	0.0
6	754.791	H	30.9	-2.4	28.5	46.0	17.5	149.0	32.0

4.4 Frequency Tolerance

4.4.1 Test Procedure [FCC 15.205 (e)]

The Frequency tolerance is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

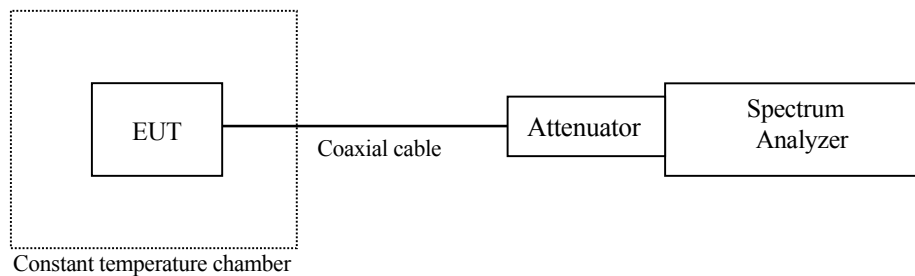
The spectrum analyzer is set to:

- RBW= 1kHz, VBW=30kHz, Span=100kHz, Sweep = auto

The test mode of EUT is as follows.

- Transmit mode

4.4.2 Measurement Setup



4.4.3 Limit of Frequency Tolerance

The Frequency tolerance of the carrier signal shall be maintained within +/- 0.01% over a temperature variation of -30 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

4.4.4 Measurement Results

Test Personnel:

Tested by: Chiaki Kanno

Date : Jul. 21, 2011
Temperature : 23.4 [°C]
Humidity : 45.3 [%]
Test place : Shielded room

Reference Frequency: EUT Channel 13.56MHz at 20°C Limit: $\pm 0.01\% = \pm 100\text{ppm} = \pm 0.135603\text{MHz}$					
Power Supply [V]	Temperature [°C]	Measurements Frequency [MHz]	Frequency Tolerance [ppm]	Limit [ppm]	Result
120	50	13.559900	-7.37463127	± 100	PASS
	40	13.560000	0	± 100	PASS
	30	13.560000	0	± 100	PASS
	20	13.560000	-	± 100	PASS
	10	13.560000	0	± 100	PASS
	0	13.560000	0	± 100	PASS
	-10	13.560000	0	± 100	PASS
	-20	13.560000	0	± 100	PASS
	-30	13.559900	-7.37463127	± 100	PASS
102	20	13.560000	0	± 100	PASS
138	20	13.560000	0	± 100	PASS

Note. Frequency Tolerance (ppm) = Measurements Frequency (MHz) – Reference Frequency (MHz) / Reference Frequency (MHz) x 1000000

4.5 AC power line Conducted Emissions

4.5.1 Test Procedure [FCC 15.207]

Conducted emission at AC mains port measurements are performed at open area test site according to ANSI C63.4 section 7.

EUT and support equipment are placed on FRP table of 2.0m(W) × 1.0m(D) × 0.8m(H) in size. EUT is connected to 50Ω/50μH Line impedance stabilization network (LISN) which is placed on reference ground plane, and was placed 80cm away from EUT. Excess of AC power cable is bundled in center. Vertical Metal Reference Plane 2.0m (W) × 3.0m (H) in size is placed 0.4m away from EUT. LISN for peripheral is terminated in 50Ω.

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Maximum emission configuration is determined by manipulating the EUT, support equipment, interconnecting cables. Then, emission measurements are performed with test receiver in above setting to each current-carrying conductor of the mains port. Sufficient time for EUT, support equipment and test equipment are provided in order for them to warm up to their normal operating condition.

Frequency range:

- 0.15MHz to 30MHz

The Test receiver is set to:

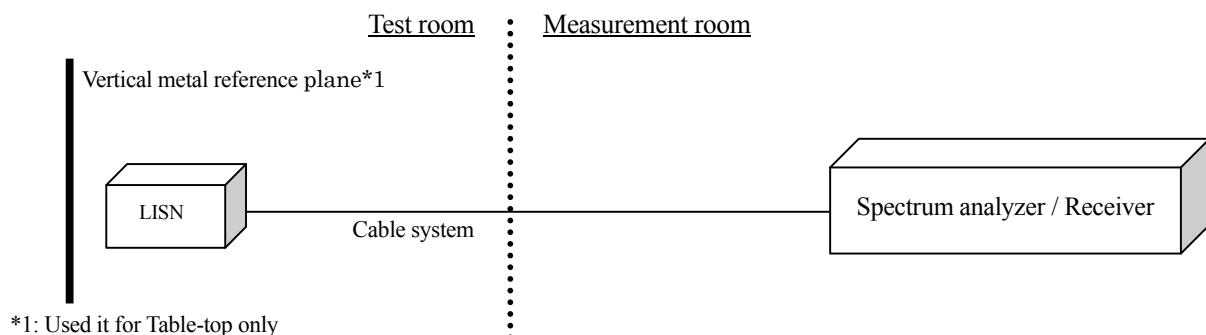
Detector: Quasi-peak, Average

Bandwidth: 9kHz

The test mode of EUT is as follows.

- Transmit mode

4.5.2 Measurement Setup



4.5.3 Limit of AC power line Conducted Emissions Measurement

Frequency	FCC 15.207 Limit		FCC 15.107 Class A Limit	
	QP(dBμV)	AV(dBμV)	QP(dBμV)	AV(dBμV)
0.15MHz to 0.5MHz	66 to 56*	56 to 46*	79	66
0.5MHz to 5MHz	56	46	73	60
5MHz to 30MHz	60	50	73	60

*: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

Note: This equipment (Photo Printer) is class A digital device. Therefore, the measurement applied FCC 15.107 class A limit.

4.5.4 Calculation method

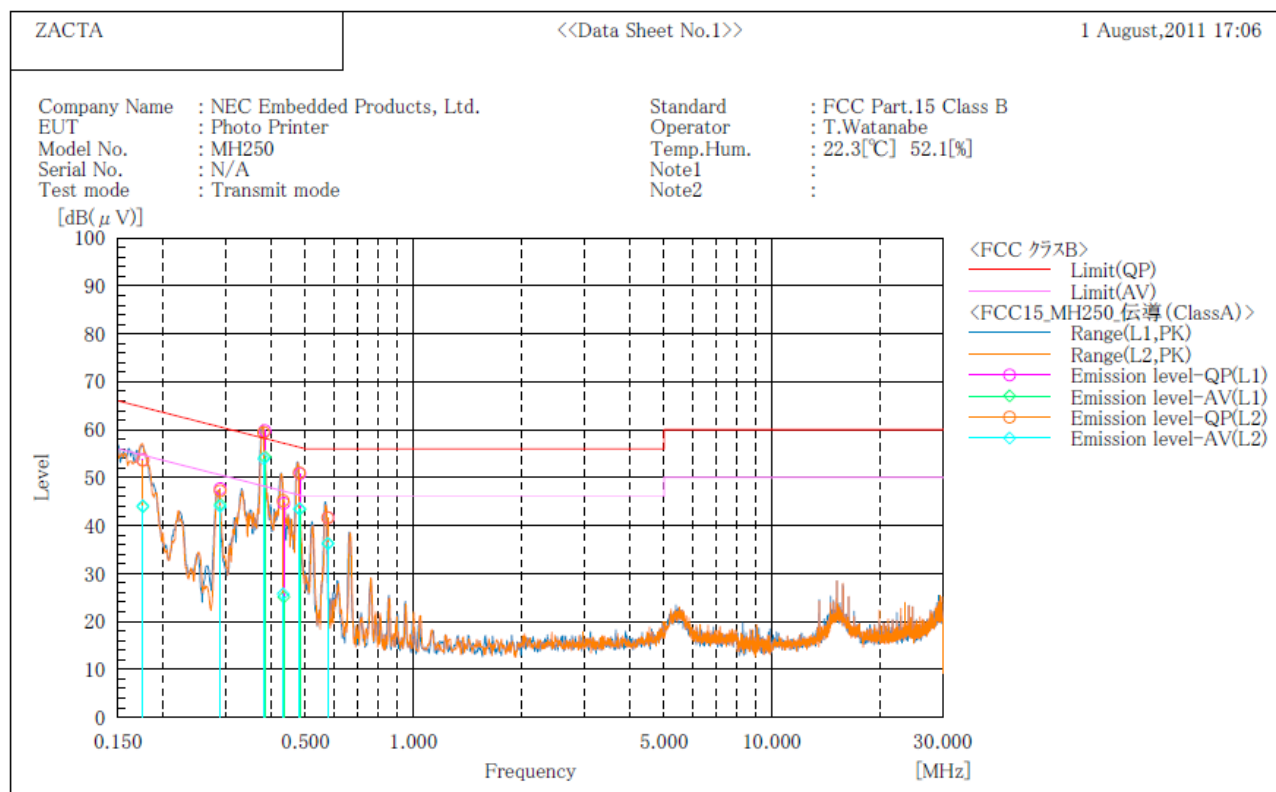
Emission level = Reading + (LISN. factor + Cable system loss)

Margin = Limit – Emission level

4.5.5 Measurement Results

[RF on]

***** CONDUCTED EMISSION at MAINS PORT *****
 << 3m Semi-anechoic chamber >>



Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.176	43.6	33.8	10.1	53.7	43.9	64.7	54.7	11.0	10.8
2	0.289	37.7	34.4	10.0	47.7	44.4	60.6	50.6	12.9	6.2
3	0.385	49.8	44.3	10.0	59.8	54.3	58.2	48.2	-1.6	-6.1 *
4	0.435	34.6	15.1	10.0	44.6	25.1	57.2	47.2	12.6	22.1
5	0.482	40.8	33.4	10.0	50.8	43.4	56.3	46.3	5.5	2.9
6	0.578	31.6	26.3	10.0	41.6	36.3	56.0	46.0	14.4	9.7

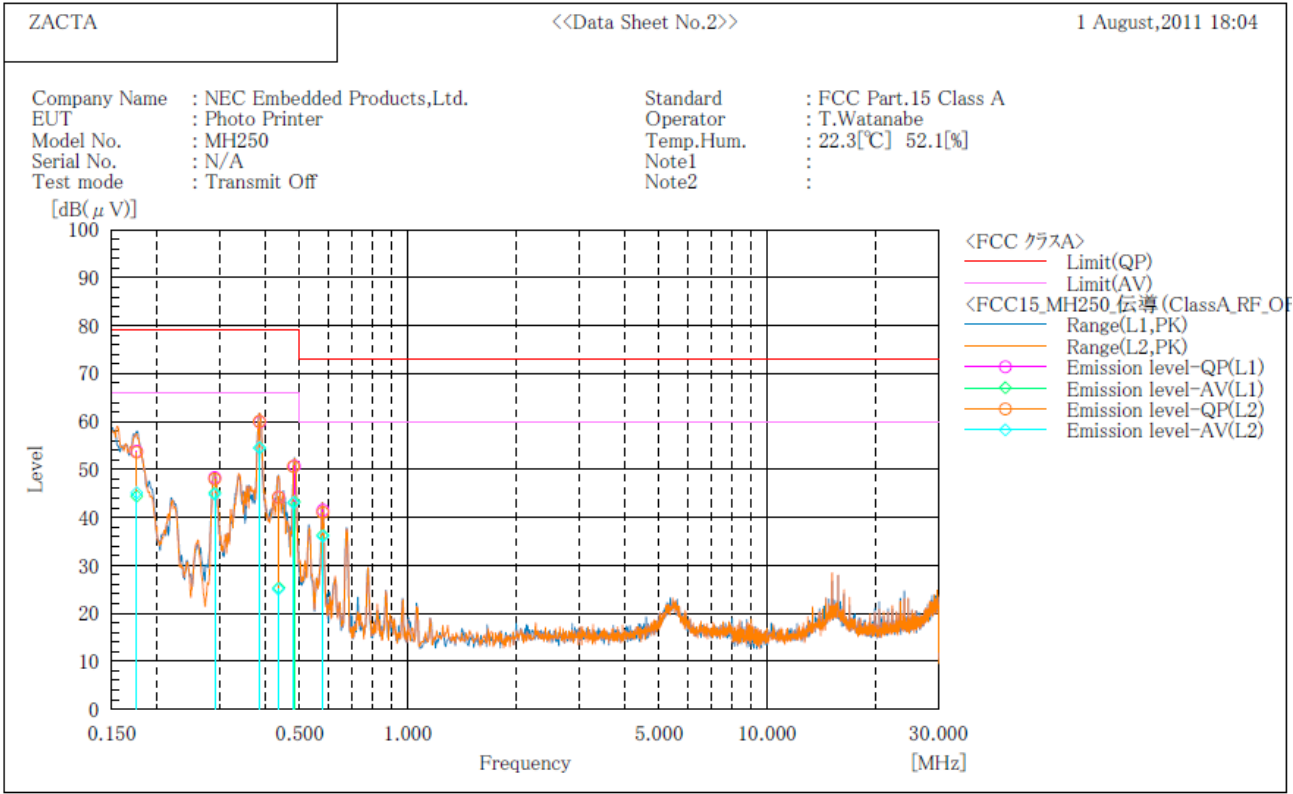
--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.176	43.5	34.0	10.1	53.6	44.1	64.7	54.7	11.1	10.6
2	0.289	37.2	34.0	10.0	47.2	44.0	60.6	50.6	13.4	6.6
3	0.382	49.4	43.9	10.0	59.4	53.9	58.2	48.2	-1.2	-5.7 *
4	0.433	35.2	15.7	10.0	45.2	25.7	57.2	47.2	12.0	21.5
5	0.480	41.0	33.5	10.0	51.0	43.5	56.3	46.3	5.3	2.8
6	0.577	31.6	26.2	10.0	41.6	36.2	56.0	46.0	14.4	9.8

Note: *= The limit of FCC 15.207 is exceeded. However, there are noise of the printer.

[RF off]

***** CONDUCTED EMISSION at MAINS PORT *****
 << 3m Semi-anechoic chamber >>



Final Result

--- L1 Phase ---										
No.	Frequency	Reading	Reading	c. f	Result	Result	Limit	Limit	Margin	Margin
	[MHz]	QP	AV		QP	AV	QP	AV	QP	AV
		[dB(μ V)]	[dB(μ V)]	[dB]	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB]	[dB]
1	0.176	43.7	34.3	10.1	53.8	44.4	79.0	66.0	25.2	21.6
2	0.290	38.3	35.1	10.0	48.3	45.1	79.0	66.0	30.7	20.9
3	0.387	49.9	44.5	10.0	59.9	54.5	79.0	66.0	19.1	11.5
4	0.437	34.2	15.3	10.0	44.2	25.3	79.0	66.0	34.8	40.7
5	0.483	40.7	33.2	10.0	50.7	43.2	79.0	66.0	28.3	22.8
6	0.580	31.5	26.3	10.0	41.5	36.3	73.0	60.0	31.5	23.7

--- L2 Phase ---										
No.	Frequency	Reading	Reading	c. f	Result	Result	Limit	Limit	Margin	Margin
	[MHz]	QP	AV		QP	AV	QP	AV	QP	AV
		[dB(μ V)]	[dB(μ V)]	[dB]	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB(μ V)]	[dB]	[dB]
1	0.176	43.5	35.0	10.1	53.6	45.1	79.0	66.0	25.4	20.9
2	0.290	38.0	34.8	10.0	48.0	44.8	79.0	66.0	31.0	21.2
3	0.386	50.0	44.5	10.0	60.0	54.5	79.0	66.0	19.0	11.5
4	0.436	34.2	15.0	10.0	44.2	25.0	79.0	66.0	34.8	41.0
5	0.480	40.6	33.0	10.0	50.6	43.0	79.0	66.0	28.4	23.0
6	0.580	31.0	26.0	10.0	41.0	36.0	73.0	60.0	32.0	24.0

Note: The results of RF on and RF off, the noise due to the Printer.

5. Uncertainty of measurement

Expanded uncertainties stated were calculated with a coverage Factor $k=2$.

Please note that these results are not taken into account when determining compliance or non-compliance with test result.

Test item	Measurement uncertainty
Conducted emission at mains port (150kHz - 30MHz)	$\pm 2.9\text{dB}$
Radiated emission (9kHz - 30MHz)	$\pm 4.4\text{dB}$
Radiated emission (30MHz – 1000MHz)	$\pm 4.5\text{dB}$
Radiated emission (1000MHz – 26GHz)	$\pm 3.9\text{dB}$

6. Laboratory description

1. Location: ZACTA Technology Corporation Yonezawa Testing Center
4149-7 Hachimanpara 5-chome Yonezawa-shi Yamagata 992-1128 Japan
Phone: +81-238-28-2880 Fax: +81-238-28-2888

2. Facility filing information:

1) NVLAP accreditation: NVLAP Lab. code: 200306-0

2) VLAC accreditation: Lab. code: VLAC-013

Site name	Radiated emission	Conducted Emission for mains port	Conducted emission for telecom port	Radiated Emission (CMAD)	Expiry Date
3m Semi-anechoic chamber	VLAC-013			VLAC-013	Jul. 3, 2013
10m Semi-anechoic chamber				-	
Shielded room No.1	-	VLAC-013		-	

3) FCC filing:

Site name	Registration Number	Expiry Date
Site 2, Site3	91065	November 19, 2011
3m Semi-anechoic chamber 10m Semi-anechoic chamber Shielded room No.1	540072	February 16, 2013

4) Industry Canada Oats site filing:

Site name	Sites on file:	Expiry Date
Site 2	4224A-2	February 16, 2012
Site 3	4224A-3	February 16, 2012
3m Semi-anechoic chamber	4224A-4	February 16, 2012
10m Semi-anechoic chamber	4224A-5	February 16, 2012

5) VCCI site filing:

Site name	Radiated emission	Conducted Emission for mains port	Expiry Date	Conducted emission for telecom port	Expiry Date
Site 2	R-137	C-133	Nov. 16, 2011	T-1477	Oct. 8, 2011
Site 3	R-138	C-134	Nov. 16, 2011	T-1478	Oct. 8, 2011

6) ETL SEMKO authorization: Authorized as an EMC test laboratory.

7) TUV Rheinland authorization: Authorized as an EMC test laboratory.

8) BUREAU VERITAS certification: Certified as an EMC test laboratory.

Appendix A: Test equipment

Antenna port Conducted Test

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. date
Spectrum Analyzer	Agilent Technologies	E4440A	US40420937	Oct. 2011	Oct. 13, 2010
Microwave cable	SUHNER	SUCOFLEX102	31648/2(2m)	Nov. 2011	Nov. 12, 2010
Attenuator	Weinschel	56-10	J4180	Nov. 2011	Nov. 12, 2010
Constant temperature chamber	Espec	PL-3KL	14016727	Apr. 2012	Apr. 8, 2011

*The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.

Radiated Emission

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100451	Jun. 2012	Jun. 3, 2011
Preamplifier	ANRITSU	MH648A	M08067	Jun. 2012	Jun. 12, 2011
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	891847/17	Feb. 2012	Feb. 21, 2011
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	1627	Jun. 2012	Jun. 12, 2011
Log periodic antenna	Schwarzbeck	UHALP9108A	0437	Jun. 2012	Jun. 12, 2011
Attenuator (6dB)	TME	CFA-01NPJ-6	N/A (S273)	Jun. 2012	Jun. 12, 2011
Attenuator (3dB)	TME	CFA-01NPJ-3	N/A (S270)	Jun. 2012	Jun. 12, 2011
Microwave cable	SUHNER	SUCOFLEX_104/9m	322082/4	Sep. 2011	Sep. 14, 2010
		SUCOFLEX_104/1m	322085/4	Sep. 2011	Sep. 14, 2010
		SUCOFLEX_104/1.5m	317222/4	Sep. 2011	Sep. 14, 2010
		SUCOFLEX_106/13m	41623/6	Sep. 2011	Sep. 14, 2010
PC	DELL	DIMENSION E521	85465BX	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V3.4	N/A	N/A
10m Semi an-echoic Chamber	TOKIN	N/A	N/A(9001-NSA3m)	Jun. 2012	Jun. 14, 2011

*The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.

Conducted Emission

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	Jun. 2012	Jun. 16, 2011
Coaxial cable	FUJIKURA	5D-2W/4m	N/A (S192)	Feb. 2012	Feb. 4, 2011
Coaxial cable	FUJIKURA	5D-2W/1m	N/A (S193)	Feb. 2012	Feb. 4, 2011
Coaxial cable	SUHNER	RG223/U/0.6m	N/A (S324)	Feb. 2012	Feb. 4, 2011
Line impedance Stabilization network for EUT	Kyoritsu Electrical Works, Ltd.	KNW-407F	8-2003-1	Mar. 2012	Mar. 10, 2011
Line impedance Stabilization network for peripheral	Kyoritsu Electrical Works, Ltd.	KNW-242F	8-1973-1	Mar. 2012	Mar. 10, 2011
Attenuator	TYC	BA-PJ-10	N/A (S345)	Apr. 2012	Apr. 26, 2011
50Ω terminator	SUHNER	65-BNC-50-0-7	N/A (S054)	Mar. 2012	Mar. 3, 2011
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/CE-AJ	0611193/V3.3	N/A	N/A

*The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.