



EMI TEST REPORT

Test Report No. : 32GE0273-HO-01-C

Applicant : NEC Corporation of America
Type of Equipment : Digital Portable Cellular Telephone
Model No. : KMP7R4E1-2A
FCC ID : A98-ROV0164
Test standard : FCC Part 15 Subpart B: 2012 Class B
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Date of test: April 9, 2012

Representative test engineer:

Katsunori Okai
Engineer of WiSE Japan,
UL Verification Service

Approved by:

Takahiro Hatakeda
Leader of WiSE Japan,
UL Verification Service



NVLAP LAB CODE: 200572-0

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<http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

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13-EM-F0429

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SECTION 1: Customer information

Company Name : NEC Corporation of America
Address : Radio Communications Systems Division
6535N. State Highway 161, Irving, TX 75039-2402 USA
Telephone Number : +1 214 262 4241
Facsimile Number : +1 214 262 4225
Contact Person : Sanjay Wadhwa

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : Digital Portable Cellular Telephone
Model No. : KMP7R4E1-2A
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 3.8V
Receipt Date of Sample : March 27, 2012
Country of Mass-production : Japan
Condition of EUT : Production prototype
Modification of EUT : No Modification by the test lab

2.2 Product description

Model No: KMP7R4E1-2A, (referred to as the EUT in this report), is the Digital Portable Cellular Telephone.

Radio Specification [1/2]

Bluetooth (Ver.2.1 + EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Other Clock Frequency	48MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Connector Type	Integrated antenna

Low Energy (Ver.4.0)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Other Clock Frequency	48MHz
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Connector Type	Integrated antenna

WLAN (IEEE802.11b/g/n (SISO/HT20))

Equipment Type	Transceiver
Frequency of Operation	2412-2462MHz
Other Clock Frequency	48MHz
Type of Modulation	DSSS, OFDM
Antenna Connector Type	Integrated antenna

GSM

Equipment Type	Transceiver
Frequency of Operation	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz
Other Clock Frequency	19.2MHz
Type of Modulation	GMSK
Channel spacing	200kHz
Antenna Connector Type	Integrated antenna

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Radio Specification [2/2]

WCDMA

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band V: 824 – 849MHz [Down Link] Band V: 869 – 894MHz
Other Clock Frequency	19.2MHz
Type of Modulation	HPSK
Channel spacing	5MHz
Antenna Connector Type	Integrated antenna

GPS

Equipment Type	Receiver
Receiver Type	Direct Downconversion
Frequency of Operation	1575.42MHz
Other Clock Frequency	57.6MHz
Antenna Connector Type	Integrated antenna

RFID

Equipment Type	Transceiver
Frequency of Operation	13.56MHz
Type of Modulation	ASK
Antenna Connector Type	Integrated antenna

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test Specification : FCC Part 15 Subpart B: 2012, final revised on February 1, 2012

Title : FCC 47CFR Part15 Radio Frequency Device
Subpart B Unintentional Radiators

3.2 Procedures and results

Item	Test Procedure	Limits	Deviation	Worst margin	Result
Conducted emission	FCC: ANSI C63.4: 2003 7. AC powerline conducted emission measurements	Class B	N/A	[QP] 15.2dB 0.15000MHz, N [AV] 13.4dB 0.50349MHz, N	Complied
Radiated emission	FCC: ANSI C63.4: 2003 8. Radiated emission measurements	Class B	N/A	5.2dB 729.008MHz, QP Vertical (Chassis's color: Pink) 5.1dB 729.003MHz, QP Vertical	Complied
*Note: UL Japan, Inc's EMI Work Procedure 13-EM-W0420.					

3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

EMI

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Test room (semi-anechoic chamber)	Conducted emission (+dB)
	150kHz-30MHz
No.1	3.5dB
No.2	3.6dB
No.3	3.6dB
No.4	3.6dB

Test room (semi-anechoic chamber)	Radiated emission						
	(3m*)(+dB)				(1m*)(+dB)		(0.5m*)(+dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.2dB	5.0dB	5.1dB	4.7dB	5.7dB	4.4dB	4.3dB
No.2	4.1dB	5.2dB	5.1dB	4.8dB	5.6dB	4.3dB	4.2dB
No.3	4.5dB	5.0dB	5.2dB	4.8dB	5.6dB	4.5dB	4.2dB
No.4	4.7dB	5.2dB	5.2dB	4.8dB	5.6dB	5.1dB	4.2dB

*3m/1m/0.5m = Measurement distance

Conducted Emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test(3m)

The data listed in this test report has enough margin, more than the site margin.

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3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Data of EMI, Test instruments, and Test set up

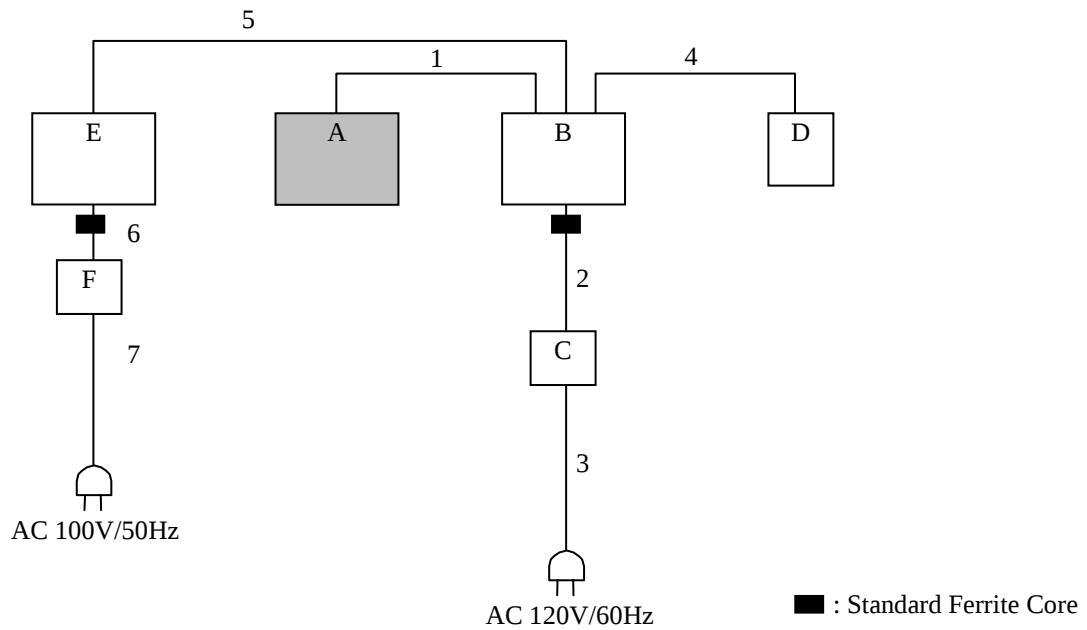
Refer to APPENDIX.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating modes

Mode	Remarks
USB Communication mode	*EUT copied the data that was into the Micro SD memory onto laptop PC through the USB cable.

4.2 Configuration and peripherals



*Cabling and setup were taken into consideration and test data was taken under worse case conditions.
*It was preliminary confirmed that there was no difference in emission level due to a standard ferrite core.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Digital Portable Cellular Telephone	KMP7R4E1-2A	004401200900054 *1) 004401200900062 *2)	NEC Corporation of America	EUT
B	Laptop PC	2373T49	L316W54	IBM	DoC
C	AC Adaptor	02K6757	11S02K6750Z1Z2UP3 561HY	IBM	DoC
D	Mouse	MOC5UO	-	DELL	DoC
E	Printer	Desk Jet 840C	CN0B11C1H2	Hewlett Packard	DoC
F	AC Adapter	C6409-60014	0049R0D	Hewlett Packard	DoC

*1) Used for Conducted Emission and Radiated Emission tests

*2) Used for Radiated Emission test (Chassis's color: Pink)

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	USB Cable	2.0	Shielded	Shielded	-
2	DC Cable	1.8	Unshielded	Unshielded	-
3	AC Cable	0.9	Unshielded	Unshielded	-
4	Mouse Cable	1.8	Shielded	Shielded	-
5	Printer Cable	3.0	Shielded	Shielded	-
6	DC Cable	2.0	Unshielded	Unshielded	-
7	AC Cable	1.0	Unshielded	Unshielded	-

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SECTION 5: Conducted Emission

5.1 Operating environment

Test place : No.3 semi anechoic chamber.
Temperature : See data
Humidity : See data

5.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT and its peripherals was aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from the LISN/AMN and excess AC cable was bundled in center. I/O cables that were connected to the other peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN/AMN to the input power source. All unused 50 ohm connectors of the LISN/AMN were resistivity terminated in 50 ohm when not connected to the measuring equipment. Photographs of the set up are shown in Appendix 3.

Frequency range : 0.15 MHz-30MHz
EUT position : Table top
EUT operation mode : See Clause 4.1

5.3 Test procedure

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT within a semi anechoic chamber. The EUT was connected to a Line Impedance Stabilization Network (LISN)/ Artificial Mains network (AMN). An overview sweep with peak detection has been performed. The measurements have been performed with a quasi-peak detector and if required, with an average detector.

The conducted emission measurements were made with the following detector function of the test receiver.

Detector Type : Quasi-Peak and Average
IF Bandwidth : 9 kHz

5.4 Test result

Summary of the test results: Pass

Date: April 9, 2012

Test engineer: Katsunori Okai

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SECTION 6: Radiated Emission

6.1 Operating environment

Test place : No.3 semi anechoic chamber
Temperature : See data
Humidity : See data

6.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane. The EUT was set on the center of the tabletop.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.
Photographs of the set up are shown in Appendix 3.

6.3 Test conditions

Frequency range : 30MHz-300MHz (Biconical antenna) / 300MHz-1000MHz (Logperiodic antenna)
1000MHz -13000MHz (Horn antenna)
Test distance : 3m
EUT position : Table top
EUT operation mode : See Clause 4.1

6.4 Test procedure

The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The radiated emission measurements were made with the following detector function of the test receiver and the Spectrum analyzer.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
IF Bandwidth	QP: BW 120kHz	PK: RBW:1MHz/VBW: 3MHz AV *1): RBW:1MHz/VBW:10Hz

*1) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

- The noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

6.5 Test result

Summary of the test results: Pass

Date: April 9, 2012

Test engineer: Katsunori Okai

Radiated Emission

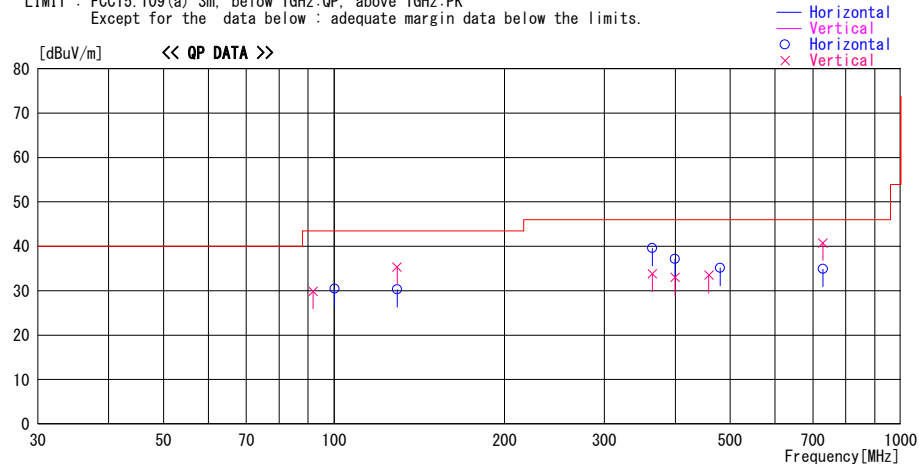
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/04/09

Report No. : 32GE0273-HO-01
Power : AC 120V / 60Hz
Temp./Humi. : 24deg. C / 34% RH
Engineer : Katsunori Okai

Mode / Remarks : USB Communication Mode

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
			Factor	Gain							
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
91.821	45.2	QP	8.7	-24.3	29.6	171	100	Vert.	43.5	13.9	
100.212	44.6	QP	10.1	-24.2	30.5	334	300	Hori.	43.5	13.0	
129.173	45.7	QP	13.6	-23.8	35.5	349	100	Vert.	43.5	8.0	
129.175	40.5	QP	13.6	-23.8	30.3	244	240	Hori.	43.5	13.2	
364.501	44.7	QP	16.6	-21.7	39.6	256	100	Hori.	46.0	6.4	
364.503	38.9	QP	16.6	-21.7	33.8	318	100	Vert.	46.0	12.2	
399.844	36.7	QP	17.7	-21.4	33.0	318	160	Vert.	46.0	13.0	
399.846	40.9	QP	17.7	-21.4	37.2	1	100	Hori.	46.0	8.8	
458.452	36.4	QP	18.1	-21.0	33.5	182	136	Vert.	46.0	12.5	
479.976	37.8	QP	18.2	-20.8	35.2	81	100	Hori.	46.0	10.8	
729.004	33.1	QP	21.0	-19.2	34.9	41	100	Hori.	46.0	11.1	
729.008	39.0	QP	21.0	-19.2	40.8	349	100	Vert.	46.0	5.2	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The limit is rounded down to one decimal place.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission
(Chassis's color: Pink)

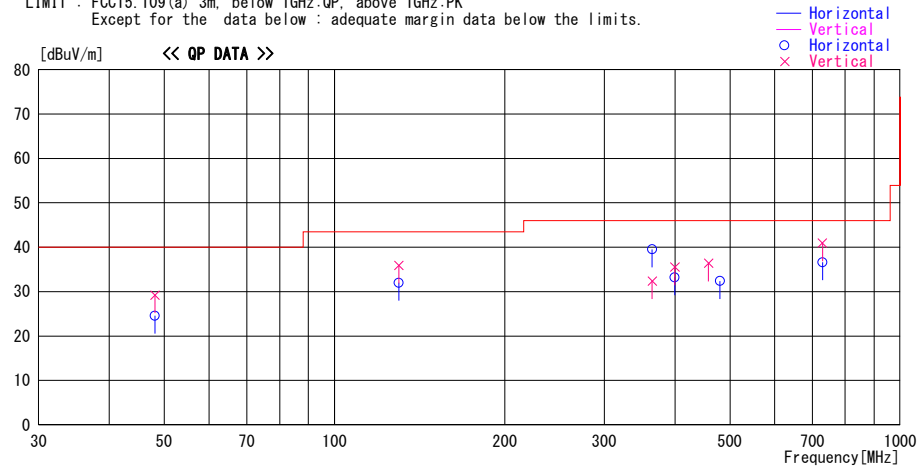
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UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/04/09

Report No. : 32GE0273-HO-01
Power : AC 120V / 60Hz
Temp./Humi. : 24deg. C / 34% RH
Engineer : Katsunori Okai

Mode / Remarks : USB Communication Mode

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
			Factor	Gain							
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
48.156	42.3	QP	11.7	-24.8	29.2	298	100	Vert.	40.0	10.8	
48.158	37.7	QP	11.7	-24.8	24.6	203	300	Hori.	40.0	15.4	
130.043	42.1	QP	13.7	-23.8	32.0	264	237	Hori.	43.5	11.5	
130.044	46.1	QP	13.7	-23.8	36.0	349	100	Vert.	43.5	7.5	
364.502	44.6	QP	16.6	-21.7	39.5	243	100	Hori.	46.0	6.5	
364.504	37.5	QP	16.6	-21.7	32.4	316	100	Vert.	46.0	13.6	
399.828	36.9	QP	17.7	-21.4	33.2	0	100	Hori.	46.0	12.8	
399.848	39.2	QP	17.7	-21.4	35.5	312	100	Vert.	46.0	10.5	
458.444	39.3	QP	18.1	-21.0	36.4	192	100	Vert.	46.0	9.6	
479.977	35.0	QP	18.2	-20.8	32.4	76	100	Hori.	46.0	13.6	
729.001	34.8	QP	21.0	-19.2	36.6	283	100	Hori.	46.0	9.4	
729.003	39.1	QP	21.0	-19.2	40.9	353	100	Vert.	46.0	5.1	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

*The limit is rounded down to one decimal place.

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Radiated Emission

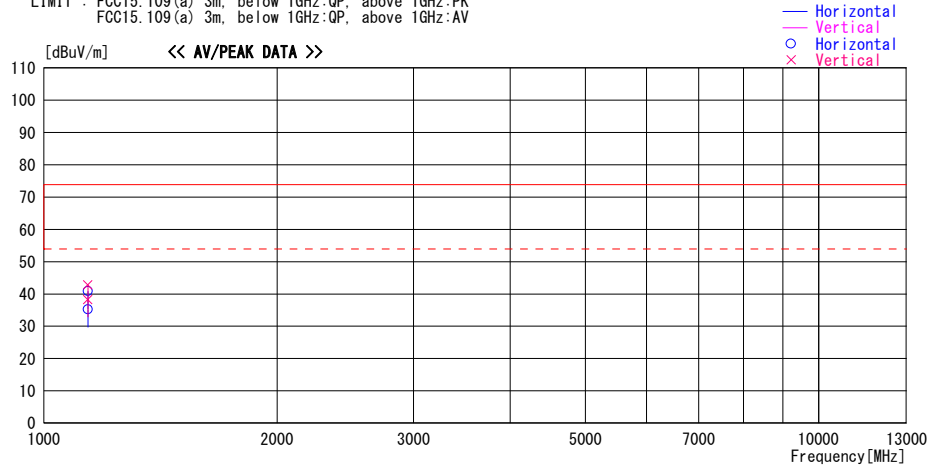
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Engineer : Katsunori Okai

Mode / Remarks : USB Communication Mode

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Gain [dB]							
1140.002	49.8	PK	24.2	-33.1	40.9	0	121	Hori.	73.9	33.0	
1140.002	44.1	AV	24.2	-33.1	35.2	0	121	Hori.	53.9	18.7	
1140.008	51.8	PK	24.2	-33.1	42.9	185	103	Vert.	73.9	31.0	
1140.008	47.2	AV	24.2	-33.1	38.3	185	103	Vert.	53.9	15.6	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

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Radiated Emission (Chassis's color: Pink)

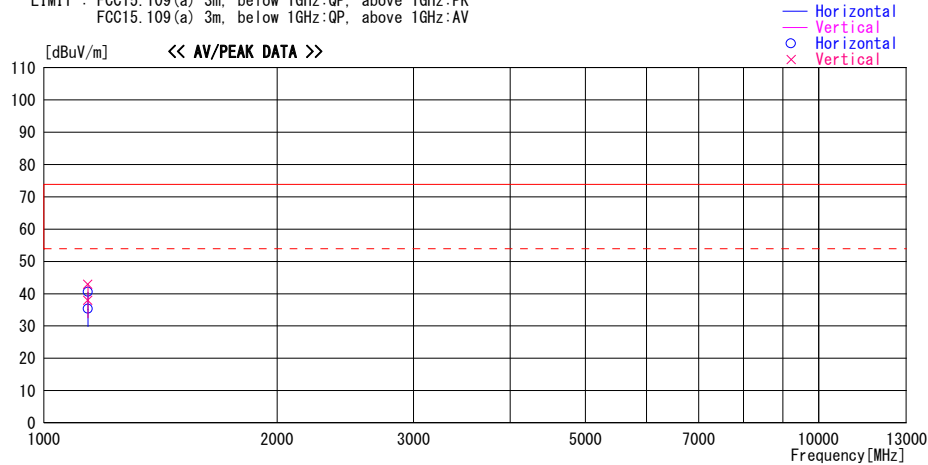
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Temp./Humi. : 24deg. C / 34% RH
Engineer : Katsunori Okai

Mode / Remarks : USB Communication Mode

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
1139.998	49.5	PK	24.2	-33.1	40.6	101	123	Hori.	73.9	33.3	
1139.998	44.2	AV	24.2	-33.1	35.3	101	123	Hori.	53.9	18.6	
1139.999	51.9	PK	24.2	-33.1	43.0	205	103	Vert.	73.9	30.9	
1139.999	46.9	AV	24.2	-33.1	38.0	205	103	Vert.	53.9	15.9	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The limit is rounded down to one decimal place.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date	Expiration date of the calibration
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2012/02/24	2013/02/28
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE/CE	2012/02/06	2013/02/28
MJM-06	Measure	PROMART	SEN1955	-	RE/CE		
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE/CE	2012/02/03	2013/02/28
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2012/04/03	2013/04/30
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2011/10/15	2012/10/31
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2011/10/15	2012/10/31
MCC-51	Coaxial cable	UL Japan	-	-	RE	2011/07/15	2012/07/31
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2011/11/02	2012/11/30
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2012/03/16	2013/03/31
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE	2012/02/06	2013/02/28
MLS-03	LISN(AMN)	Schwarzbeck	NSLK8127	8127384	CE	2012/03/01	2013/03/31
MTA-30	Terminator	TME	CT-01	-	CE	2012/01/11	2013/01/31
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(3m)/sucoform141-PE(1m)/421-010(1.5m)/RFM-E321(Switcher)	-/00640	CE	2011/07/15	2012/07/31
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28	2013/01/31
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2011/05/23	2012/05/31
MCC-134	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336167/4(1m) / 340641(5m)	RE	2011/09/07	2012/09/30
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2012/03/29	2013/03/31

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item:

CE: Conducted emission

RE: Radiated emission

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