

TEST REPORT

Report Number : A-003-14-C

Date of Issue: 3 October 2014

FCC Rules and Regulations Part 15 Subpart C Intentional Radiators.

This test report is to certify that the device was tested according to the requirements of the above.
The results of this report should not be construed to imply compliance of devices other than the sample tested.
Without the laboratory approval by the documents, this report should not be copied in part.

1. Applicant

Company Name : Panasonic Corporation
Mailing Address : 1-15, Matsuo-cho, Kadoma-shi, Osaka, Japan

2. Identification of Tested Device

Type of Device : Transmitter
FCC ID : ACJ-LB-DM9A
Device Name : Data Archiver
Model Number : LB-DM9
Serial Number : Sample2
Trade Name : Panasonic
Type of Test : ☐ Production ☐ Pre-production ☒ Prototype

3. Test Items

AC Power Line Conducted Emission Measurement	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input type="checkbox"/> N/A
Radiated Emission (The Frequency Range of 9kHz to 30MHz)	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input type="checkbox"/> N/A
Radiated Emission (The Frequency Range of above 30MHz)	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input type="checkbox"/> N/A
20dB Bandwidth Measurement	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input type="checkbox"/> N/A
Frequency Tolerance of Carrier Signal	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input type="checkbox"/> N/A

Refer the below reason(s) with respect to the decision and justification not to test.

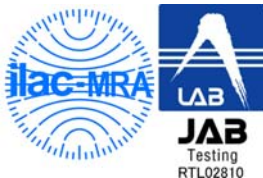
(*1) EUT Specifications (*2) Request of Applicant (*3) According to Test Plan

KEC Electronic Industry Development Center Testing Division
3-2-2, Hikari-dai, Seika-cho, Soraku-gun, Kyoto 619-0237 Japan

Test Engineer(s)



Naoki Norimoto

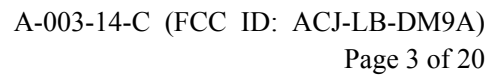


Approved by

Ikuya Minematsu / Group Manager

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[illegible]

1. LABORATORY INFORMATION

1.1. Laboratory Accreditation

The KEC has been accredited by the following organizations based on their criteria for testing laboratory (ISO/IEC 17025).

- | | |
|---|----------------------------------|
| (1) Japan Accreditation Board for Conformity Assessment (JAB) | : Accreditation Number: RTL02810 |
| (2) Voluntary EMC Laboratory Accreditation Center Inc. (VLAC) | : Accreditation Number: VLAC-005 |

1.2. Test Facility

All tests described in this report were performed by:

Name: KEC Electronic Industry Development Center
Testing Division

Address: 3-2-2, Hikari-dai, Seika-cho, Soraku-gun, Kyoto 619-0237 Japan

Anechoic Chamber	:	<input type="checkbox"/> No.1	<input type="checkbox"/> No.2	<input checked="" type="checkbox"/> No.3	<input type="checkbox"/> No.6	<input type="checkbox"/> No.7
		<input type="checkbox"/> No.8	<input type="checkbox"/> No.9	<input type="checkbox"/> No.10	<input type="checkbox"/> No.11	<input type="checkbox"/> No.12
Shielded Room	:	<input type="checkbox"/> No.1	<input type="checkbox"/> No.7	<input type="checkbox"/> No.8	<input checked="" type="checkbox"/> No.9	<input type="checkbox"/> No.10
Harmonic Current Meas. Room	:	<input type="checkbox"/>				

1.3. Measurement Uncertainty

The result of a measurement is only an approximation or estimate of the value of a specific quantity.

And thus the measurand is complete only when a statement of uncertainty is given.

KEC quotes Measurement Uncertainty (U) as follows.

Conducted Disturbance at Mains Port (150kHz-30MHz)	+2.5 / -2.8 dB
Conducted Disturbance at Mains Port (9kHz-30MHz)	+2.9 / -3.4 dB
Conducted Disturbance at Telecommunication Ports ISN method (None-Shield type)	+2.5 / -2.8 dB
Conducted Disturbance at Telecommunication Ports ISN method (Shield type)	+2.4 / -2.6 dB
Conducted Disturbance at Telecommunication Ports Current Probe method	+2.2 / -2.7dB
Conducted Disturbance at Telecommunication Ports 150Ω Load voltage method (using a 150Ω Load to the out side surface of the shield)	+1.8 / -2.4 dB
Conducted Disturbance at Telecommunication Ports None Invasive method (using a combination of current probe and capacitive voltage probe)	+2.7 / -3.8 dB
Conducted Disturbance at Lead Terminals and Additional Terminals	+2.0 / -2.4 dB
Disturbance Power (30MHz -300MHz)	+3.1 / -4.0 dB
Radiated Disturbance at Frequency Range from 9kHz up to 30MHz 60cm Loop Antenna method	+3.6 / -4.1 dB
Radiated Disturbance at Frequency Range from 9kHz up to 30MHz LLA method	+2.1 / -2.7 dB
Radiated Disturbance at Frequency Range from 30MHz up to 300MHz 3m method	+3.1 / -4.5 dB
Radiated Disturbance at Frequency Range from 300MHz up to 1GHz 3m method	+3.4 / -3.6 dB
Radiated Disturbance at Frequency Range from 30MHz up to 300MHz 10m method	+3.4 / -3.6 dB
Radiated Disturbance at Frequency Range from 300MHz up to 1GHz 10m method	+3.8 / -3.9 dB
Radiated Disturbance at Frequency Range from 30MHz up to 1GHz 10m method (Hybrid Antenna used measurement)	+4.2 / -5.1 dB
Radiated Disturbance at Frequency Range from 1GHz up to 6GHz 3m method	+4.6 / -5.7 dB
Radiated Disturbance at Frequency Range from 6GHz up to 26.5GHz 3m method	+4.6 / -5.2 dB
Harmonics Currents Emissions	+/-4.4%
Voltage Change, Voltage Fluctuations and Flicker	+5.0 / -5.1%

Expiration Date : 2014/9/30

The above values are calculated as Expanded Uncertainty (k=2 [95%]).

[Note]

If the measured result is below the specification limit and a margin is less than the above measurement uncertainty, it is impossible to determine compliance at a level of confidence of 95%. However, the measured result indicates high probability that the tested device complies with the specification limit.

2. GENERAL INFORMATION

2.1. Product Description

(1) Technical Specifications

· maximum data size	: 108TB
· maximum data rate	: 216MB/s (RAID0)
· optical disc drive	: 12 optical disk drives
· medium	: magazine
· magazine drawer	: 2
· magazine stack	: 1-10 magazine stack
· magazine	: 1-90 magazine

(2) Maximum Oscillators Frequency

· SYSTEM ON MODULE CLK	: 667MHz
------------------------	----------

(3) Radio Specifications

· Tx Operating Frequency	: 13.56MHz
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(4) Software Version

· ASPI	: 1.27G
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(5) Firmware Version

: 06.00

(6) Interface and Provide Terminal

· LAN	: Web Interface/10Mbit/100Mbit/1Gbit x2
· USB	: Maintenance/USB2.0 x2
· PM BUS	: Power supply surveillance
· Built-in Serial port (Use I/O board SAS for test software)	: Host interface

(7) Rated Power Supply

: AC100~240V 50/60Hz(DC24V)
(Test for AC 120V 60Hz(DC24V))

(8) Environment Condition

Environmetal condition of EUT	
Temperature	10 deg C to 40deg C
Humidity	20 % to 80 % RH

3. TESTED SYSTEM

3.1. Reference Rule and Specification

(1) Reference Rule and Regulation	: FCC Rule Part 15 Subpart C, Section 15.225 Operation within the band 13.110-14.010 MHz <input checked="" type="checkbox"/> Section 15.205 <input checked="" type="checkbox"/> Section 15.207 <input checked="" type="checkbox"/> Section 15.209 <input checked="" type="checkbox"/> Section 15.215 <input checked="" type="checkbox"/> Section 15.225
(2) Test Procedure	: ANSI C63.4-2003

3.2. Date of Test

Receipt of Test Sample : 23 June 2014
Condition of Test Sample : ☒ Damage is not found on the set.
☐ Damage is found on the set. (Details are described in this report)

Test Completed on : 8 July 2014
Condition of Test Sample : ☒ Damage is not found on the set.
☐ Damage is found on the set. (Details are described in this report)

3.3. Deviation of Standard

☒ without deviation, ☐ with deviation (details are found inside of this report)

3.4. Test Mode

Test items	Test mode	Test frequency
AC Power Line Conducted Emission	Continuous transmission	13.56MHz
Radiated Emission (9kHz to 30MHz)		
Radiated Emission (above 30MHz)		
20dB Emission Bandwidth		
Frequency Tolerance of Carrier Signal		

[Note]

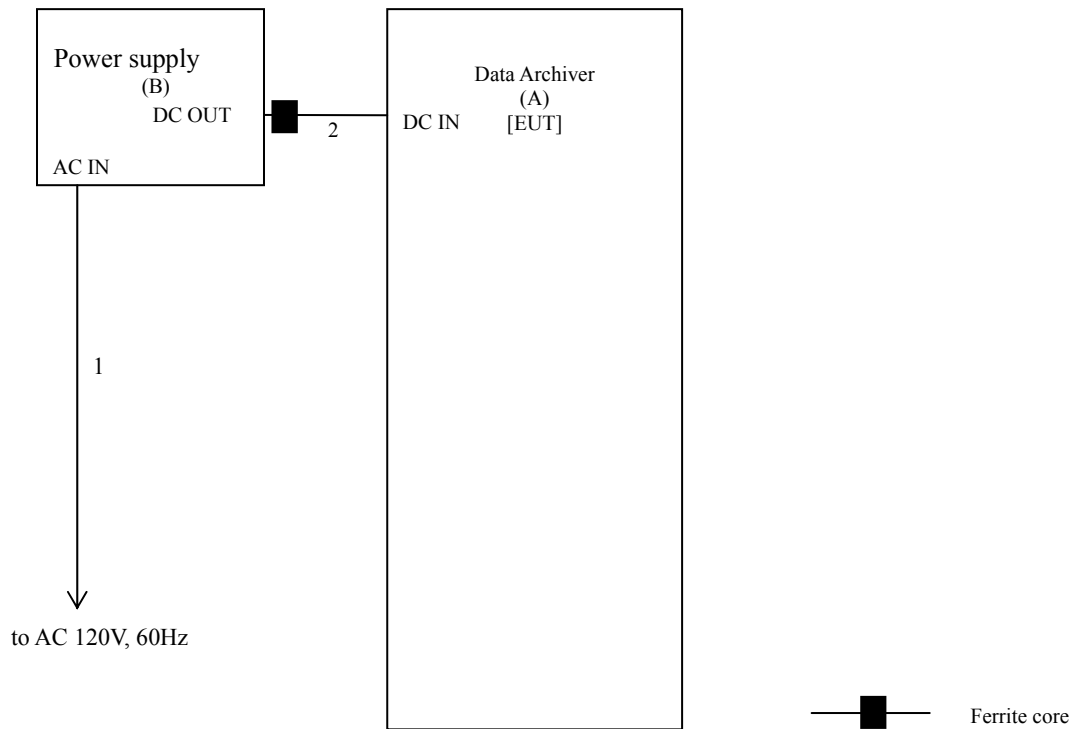
- (1) The test program was prepared by applicant.
- (2) The test modes were confirmed with and without tag, and the test was made without tag that was worst condition.

Extreme test condition	
Temperature	10 deg C to 40 deg C
Voltage	AC 102 V to 138 V

[Note]

The tests at 50 deg C, 0 deg C, -10 deg C and -20 deg C were not applied since the specification of operating temperature of EUT was 10 deg C to 40 deg C and the EUT was only used in this temperature range. (Specification see Clause 2.1.)

3.5. Block Diagram of TEST System



3.6. List of Test System

No.	Device Name	Model Number	Serial Number	Trade Name	Note
A	Data Archiver	LB-DM9	Sample2	Panasonic	EUT
B	Power supply	HFE1600	0011W2511	TDK-Lambda	

[Note]

(1): Option of EUT

3.7. List of Cables

No.	Cable Name	Shielded (Y/N)	Length (m)	Note
1	AC Power Cord	N	2.0	(3)
2	DC Power Cord	Y	3.1	With one ferrite core (2-turn) (2)

[Note]

(1) : Undetachable cable type

(2) : Accessories cable of EUT

(3) : 3-wires type, earth plug is grounded

(4) : 2-wires type



4. AC POWER LINE CONDUCTED EMISSION MEASUREMENT

4.1. Test Procedure

- (1) The EUT is placed in accordance with ANSI C63.4-2003 section 7.
- (2) The EUT is activated as to simulate an actual operation.
- (3) Connect the EUT's AC power cord to one Line Impedance Stabilization Network (LISN).
- (4) Any other power cord of other equipment is connected to a LISN different from the LISN used for the EUT.
- (5) Connect the spectrum analyzer (*1) to the measuring port of the LISN for the EUT, using a calibrated coaxial cable.
- (6) To find out the maximum emission of the configuration of the EUT System, the operation mode and the position of the cables are changed, then preliminary conducted measurement are performed.
- (7) The spectrums are scanned from 150kHz to 30MHz and collect the six highest emissions minimum on the spectrum analyzer relative to the limits in the whole range.
- (8) The test receiver (*2) is connected to the LISN for the EUT, and the six highest emissions minimum recorded above are measured.

[Note]

(*1) Spectrum Analyzer Set Up Conditions

Frequency range	: 150kHz – 30MHz
Resolution bandwidth	: 10kHz
Video bandwidth	: 1MHz
Detector function	: Peak mode

(*2) Test Receiver Set Up Conditions

Detector function	: Quasi – Peak / Average (if necessary)
IF bandwidth	: 10kHz



4.2. Test Results

Measured Frequency (MHz)	LISN Factor (dB)	Meter Reading				Maximum RF Voltage		Limit		Margin for Limit	
		Q-Peak		Average		Q-Peak (dBμV)	Average (dBμV)	Q-Peak (dBμV)	Average (dBμV)	Q-Peak (dB)	Average (dB)
		Va (dBμV)	Vb (dBμV)	Va (dBμV)	Vb (dBμV)						
0.150	10.4	39.5	39.8	28.7	29.8	50.2	40.2	66.0	56.0	15.8	15.8
0.206	10.3	30.1	28.2	23.1	20.0	40.4	33.4	63.4	53.4	23.0	20.0
0.251	10.3	26.4	27.4	24.5	25.9	37.7	36.2	61.7	51.7	24.0	15.5
0.291	10.2	28.3	19.9	17.5	9.7	38.5	27.7	60.5	50.5	22.0	22.8
0.757	10.2	17.4	16.7	13.2	12.7	27.6	23.4	56.0	46.0	28.4	22.6
4.050	10.3	21.8	17.8	13.5	9.7	32.1	23.8	56.0	46.0	23.9	22.2
13.560	10.7	16.3	14.1	11.2	9.0	27.0	21.9	60.0	50.0	33.0	28.1
27.120	11.3	11.2	11.5	5.6	6.2	22.8	17.5	60.0	50.0	37.2	32.5

[Note]

LISN Factor includes the cable loss and attenuator loss.

[Calculation method]

Maximum RF Voltage (dBμV)

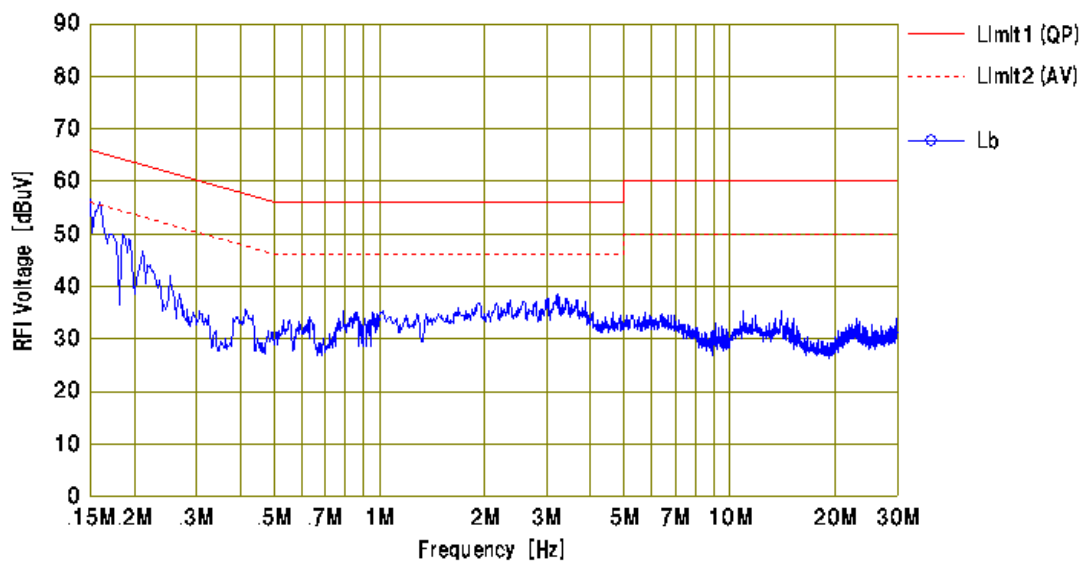
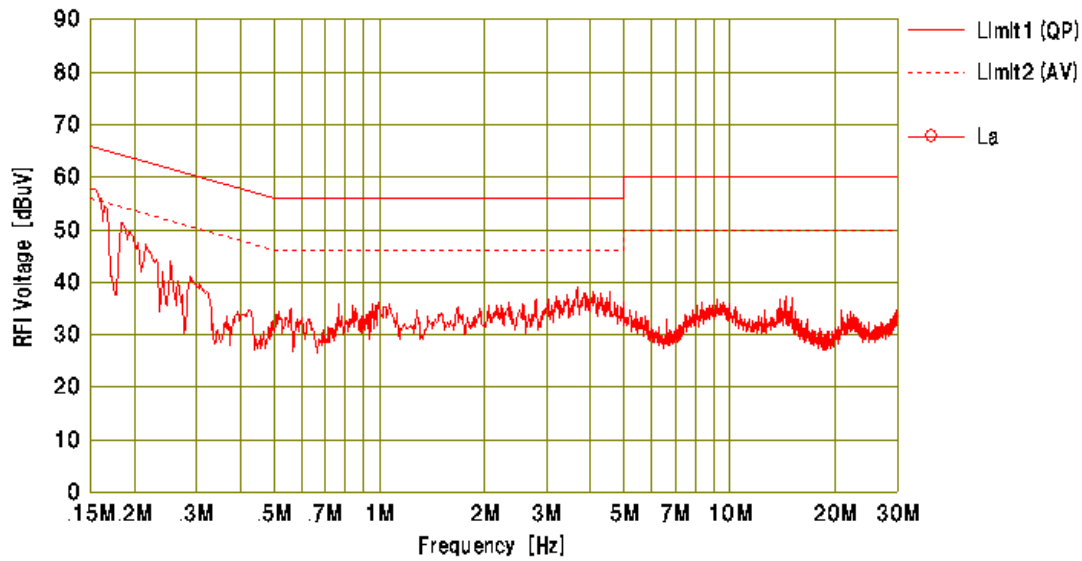
= Meter Reading (at maximum level of Va or Vb) (dBμV) + LISN Factor (dB)

At the next page, the result of exploratory conducted emission measurement by using the spectrum analyzer is shown by the spectrum chart.

Tested Date	Environment	
	Temperature	Humidity
26 June 2014	23 °C	35 %



Test Results in Graph



5. Radiated Emission (The Frequency Range of 9kHz to 30MHz)

5.1. Test Procedure

- (1) The EUT is placed in accordance with ANSI C63.4-2003 section 8.
- (2) The EUT is activated as to simulate an actual operation.
- (3) To find out the maximum emission of the configuration of the EUT System, the operation mode and the position of the cables are changed, then preliminary radiated measurement are performed using the spectrum analyzer (*1) and the loop antenna.
- (4) The emissions recorded are measured at the specified distance using the loop antenna and the test receiver (*2).
- (5) If the emission level is low and not detected at the specified distance, compliance test is performed at a closer distance and judged from calculating field strength at specified distance by using the measured data at a closer distance.

[Note]

- (*1) Spectrum Analyzer Set Up Conditions
- | | |
|----------------------|----------------------------------|
| Frequency range | : 9kHz – 150kHz / 150kHz – 30MHz |
| Resolution bandwidth | : 300Hz / 10kHz |
| Detector function | : Peak mode |
- (*2) Test Receiver Set Up Conditions
- | | |
|-------------------|--------------------------|
| Detector function | : Quasi – Peak |
| IF bandwidth | : 200Hz (9kHz – 150kHz) |
| | : 10kHz (150kHz – 30MHz) |

5.2. Test Results

1) Field Strength at 300m

Measured Frequency (MHz)	Antenna Factor (dB)	Meter Reading including 20dB Constant Antenna Factor (dBμV/m)	Maximum Field Strength at 3m (dBμV/m)	Conversion Factor 3m to 300m (dB)	Maximum Field Strength at 300m (dBμV/m)	Limit at 300m (dBμV/m)	Margin for Limit (dB)
0.09690	0.4	35.7	36.1	-80.0	-43.9	27.8	71.7

2) Field Strength at 30m

Measured Frequency (MHz)	Antenna Factor (dB)	Meter Reading including 20dB Constant Antenna Factor (dBμV/m)	Maximum Field Strength at 3m (dBμV/m)	Conversion Factor 3m to 30m (dB)	Maximum Field Strength at 30m (dBμV/m)	Limit at 30m (dBμV/m)	Margin for Limit (dB)
13.11000	1.7	23.7	25.4	-40.0	-14.6	29.5	44.1
13.41000	1.7	24.0	25.7	-40.0	-14.3	40.5	54.8
13.55300	1.7	26.7	28.4	-40.0	-11.6	50.4	62.0
13.56000	1.7	39.3	41.0	-40.0	1.0	83.9	82.9
13.56700	1.7	25.7	27.4	-40.0	-12.6	50.4	63.0
13.71000	1.7	24.0	25.7	-40.0	-14.3	40.5	54.8
14.01000	1.8	24.0	25.8	-40.0	-14.2	29.5	43.7
20.79000	2.7	29.2	31.9	-40.0	-8.1	29.5	37.6
27.12000	3.7	22.0	25.7	-40.0	-14.3	29.5	43.8

[Note]

- (1) Antenna Factor includes the cable loss.
- (2) Measurement Distance : 3m
- (3) Conversion Factor : FCC Part 15 Subpart A Section 15.31(f) (2) is applied.

[Calculation method]

Maximum Field Strength (dBμV/m) = Meter Reading (dBμV/m) + Antenna Factor (dB) + Conversion Factor (dB)

Tested Date	Environment	
	Temperature	Humidity
25 June 2014	23°C	50 %

6. Radiated Emission (The Frequency Range of above 30MHz)

6.1. Test Procedure

- (1) The EUT is placed in accordance with ANSI C63.4-2003 section 8.
- (2) The EUT is activated as to simulate an actual operation.
- (3) To find out the maximum emission of the configuration of the EUT System, the operation mode and the position of the cables are changed, then preliminary radiated measurement are performed using the spectrum analyzer (*1) and the broad band antenna.
- (4) The spectrums are scanned from 30MHz to 1GHz, and collect the highest emissions on the spectrum analyzer relative to the limits in the whole range.
In the frequency above 1GHz, it is performed using the spectrum analyzer (*2) and the horn antenna.
- (5) The highest emissions are measured at the specified distance using the test receiver (*3) and the broad band antenna or the tuned dipole. In the frequency above 1GHz, they are measured using the spectrum analyzer (*4) and the horn antenna.

[Note]

(*1) Spectrum Analyzer Set Up Conditions

Frequency range : 30MHz – 1GHz
Resolution bandwidth : 100kHz
Detector function : Peak mode

(*2) Spectrum Analyzer Set Up Conditions (Pre-measurement)

Frequency range : 1GHz – Upper frequency of measurement range
Resolution bandwidth : 1MHz

(*3) Test Receiver Set Up Conditions

Detector function : Quasi – Peak
IF bandwidth : 120kHz

(*4) Spectrum Analyzer Set Up Conditions

Center Frequency : Measurement Frequency
Resolution bandwidth : 1MHz
Video bandwidth : 1MHz (Peak measurement)
10Hz or 30Hz (Average measurement)
Attenuator : 10dB
Y axis : Linear (Average measurement)

6.2. Test Results

Measured Frequency (MHz)	Antenna Factor (dB/m)	Meter Reading		Maximum Field Strength (dBμV/m)	Limit (dBμV/m)	Margin for Limit (dB)
		Horizontal Polarization (dBμV)	Vertical Polarization (dBμV)			
65.71	14.8	12.0	13.1	27.9	40.0	12.1
138.62	22.8	9.5	2.6	32.3	43.5	11.2
515.28	22.8	6.8	2.4	29.6	46.0	16.4
569.52	23.9	12.6	3.4	36.5	46.0	9.5
596.64	24.4	13.0	3.1	37.4	46.0	8.6
623.76	24.8	15.2	8.8	40.0	46.0	6.0
650.88	25.2	5.2	3.2	30.4	46.0	15.6

[Note]

- (1) ☐ Antenna Factor includes the cable loss, attenuator loss and pre-amplifier gain.
☒ Antenna Factor includes the cable loss and attenuator loss.
Above 1000MHz, the antenna factor includes the cable loss and pre-amplifier gain.

- (2) * mark in Measured Frequency : Measured with the tuned dipole antenna.
no mark in Measured Frequency : Measured with the broadband antenna.

- (3) Upper Frequency : ☒ 1GHz ☐ 2GHz ☐ 5GHz
☐ 5th harmonic of the highest frequency ☐ 40GHz

The emissions were checked to the upper frequency, and the lower emissions than the listed emissions in the above tables were omitted.

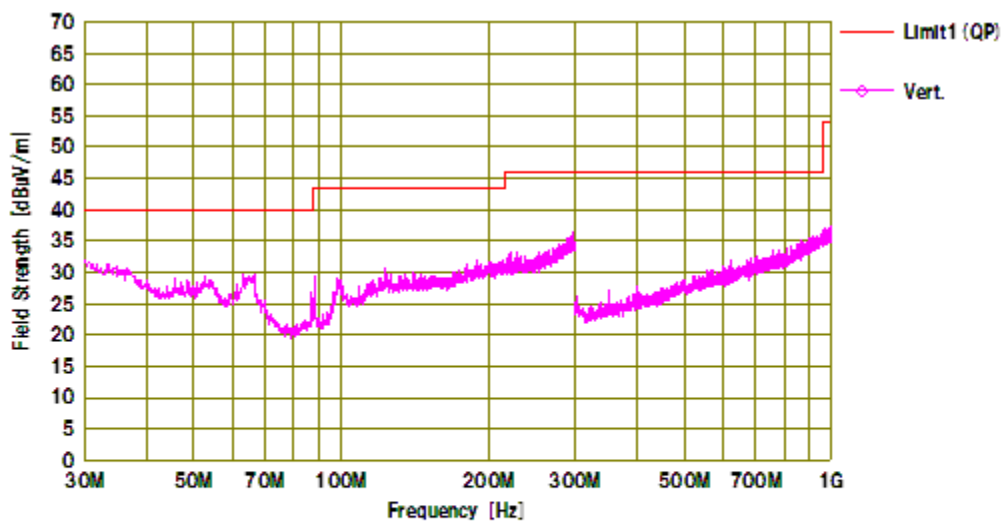
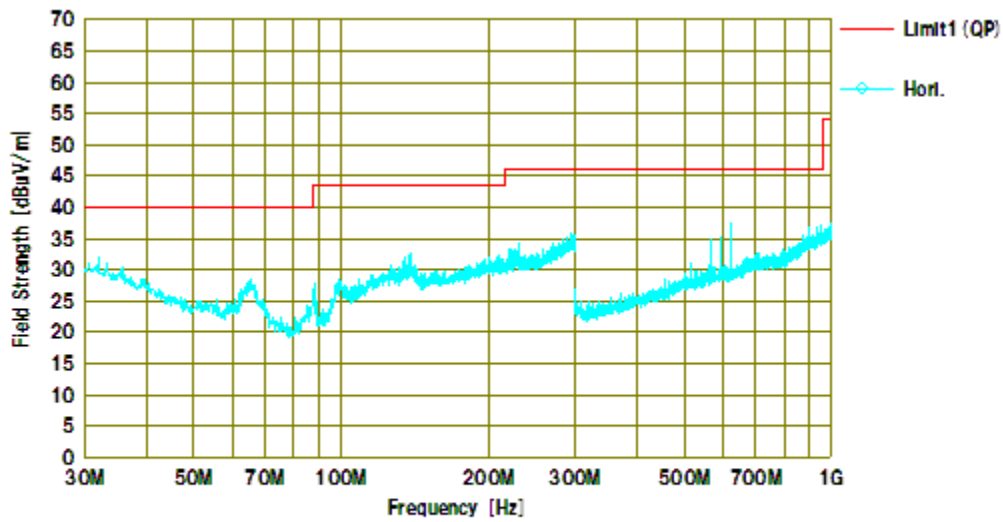
- (4) Measurement Distance : <below 1GHz> ☒ 3m ☐ 10m
<above 1GHz> ☐ 3m ☐ 10m

[Calculation method]

Maximum Field Strength (dBμV/m)
= Meter Reading (at maximum level of Horizontal or Vertical) (dBμV) + Antenna Factor (dB/m)

Tested Date	Environment	
	Temperature	Humidity
24 June 2014	23°C	50 %

Test Results in Graph



7. 20dB BANDWIDTH MEASUREMENT

7.1. Test Procedure

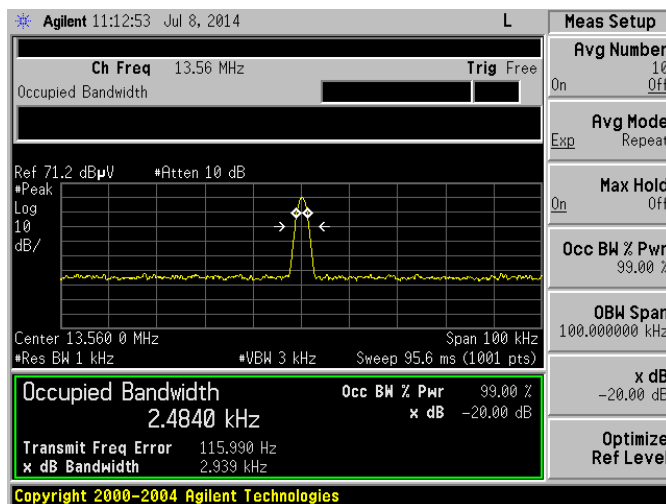
- (1) Connect the EUT RF output port to spectrum analyzer (*1) via calibrated coaxial cable and suitable attenuator (if necessary).
- (2) Activates the EUT System and execute the software prepared for test, if necessary.
- (3) To find out the maximum emission condition, the transmitting data rate of EUT is set to maximum data rate.
- (4) 20dB Bandwidth is measured using the function of spectrum analyzer.

[Note]

(*1) Spectrum Analyzer Set Up Conditions

Frequency Span : 1kHz
Resolution bandwidth : 3kHz
Video bandwidth : \geq RBW
Detector function : Peak
x dB : -20dB

7.2. Test Results



Test Items	Result(kHz)
20dB Bandwidth	2.939
99% Occupied Bandwidth	2.484

Tested Date	Environment	
	Temperature	Humidity
8 July 2014	20 °C	33 %

8. FREQUENCY TOLERANCE OF CARRIER SIGNAL

8.1. Test Procedure

- (1) Connect the EUT RF output port to spectrum analyzer via calibrated coaxial cable and suitable attenuator (if necessary).
- (2) Activates the EUT System and execute the software prepared for test, if necessary.
- (3) To find out the maximum emission condition, the transmitting data rate of EUT is set to maximum data rate.
- (4) The operating frequency measured by using frequency counter function of spectrum analyzer (*1) .

[Note]

(*1) Spectrum Analyzer Set Up Conditions

Center Frequency	: Equal to operating frequency of EUT
Resolution bandwidth	: 3 kHz
Video bandwidth	: 100 Hz
Sweep	: Auto
Function	: Frequency counter

8.2. Test Results

[Temperature : 40deg.C]

Test Condition	Original Frequency (MHz)	Measured Frequency (MHz)	Tolerance (kHz)	Tolerance (%)	Limit (%)
startup	13.56	13.560153	0.153	0.0011	±0.01
after 2minutes	13.56	13.560146	0.146	0.0011	±0.01
after 5minutes	13.56	13.560143	0.143	0.0011	±0.01
after 10minutes	13.56	13.560142	0.142	0.0010	±0.01

[Temperature : 30deg.C]

Test Condition	Original Frequency (MHz)	Measured Frequency (MHz)	Tolerance (kHz)	Tolerance (%)	Limit (%)
startup	13.56	13.560187	0.187	0.0014	±0.01
after 2minutes	13.56	13.560176	0.176	0.0013	±0.01
after 5minutes	13.56	13.560172	0.172	0.0013	±0.01
after 10minutes	13.56	13.560171	0.171	0.0013	±0.01

[Temperature : 20deg.C]

Test Condition	Original Frequency (MHz)	Measured Frequency (MHz)	Tolerance (kHz)	Tolerance (%)	Limit (%)
startup	13.56	13.560222	0.222	0.0016	±0.01
after 2minutes	13.56	13.560211	0.211	0.0016	±0.01
after 5minutes	13.56	13.560207	0.207	0.0015	±0.01
after 10minutes	13.56	13.560205	0.205	0.0015	±0.01

[Temperature : 10deg.C]

Test Condition	Original Frequency (MHz)	Measured Frequency (MHz)	Tolerance (kHz)	Tolerance (%)	Limit (%)
startup	13.56	13.560256	0.256	0.0019	±0.01
after 2minutes	13.56	13.560247	0.247	0.0018	±0.01
after 5minutes	13.56	13.560243	0.243	0.0018	±0.01
after 10minutes	13.56	13.560242	0.242	0.0018	±0.01

[Temperature : 20deg.C, Voltage : AC102V(85%)]

Test Condition	Original Frequency (MHz)	Measured Frequency (MHz)	Tolerance (kHz)	Tolerance (%)	Limit (%)
startup	13.56	13.560223	0.223	0.0016	±0.01
after 2minutes	13.56	13.560211	0.211	0.0016	±0.01
after 5minutes	13.56	13.560207	0.207	0.0015	±0.01
after 10minutes	13.56	13.560205	0.205	0.0015	±0.01

[Temperature : 20deg.C, Voltage : AC138V(115%)]

Test Condition	Original Frequency (MHz)	Measured Frequency (MHz)	Tolerance (kHz)	Tolerance (%)	Limit (%)
startup	13.56	13.560223	0.223	0.0016	±0.01
after 2minutes	13.56	13.560211	0.211	0.0016	±0.01
after 5minutes	13.56	13.560207	0.207	0.0015	±0.01
after 10minutes	13.56	13.560205	0.205	0.0015	±0.01



[Calculation method]

Tolerance (kHz) = Result – Channel Frequency

Tolerance (%) = (Tolerance (kHz) / Channel Frequency (kHz)) $\times 10^2$

Tested Date	Environment	
	Temperature	Humidity
8 July 2014	20°C	33 %

9. TEST EQUIPMENT

· AC Power Line Conducted Emission Measurement

KEC No.	Equipment	Manufacturer	Model No.	Last Cal.	Next Cal.
AT-144	Low Power Attenuator	HUBER+SUHNER	6810.01.A	2013/09	2014/09
FL-107	LISN	KYORITSU	KNW-407	2013/09	2014/09
FS-083	Test Receiver	ROHDE & SCHWARZ	ESHS10	2013/12	2014/12
FS-103	Test Receiver	Schwarzbeck	FCKL1528	2013/12	2014/12
MM-252	RF Relay Matrix	TSJ	RFM-E121	2013/09	2014/09
SA-049	Spectrum Analyzer	Agilent	E4403B	2013/11	2014/11

· Radiated Emission (9kHz to 30MHz)

KEC No.	Equipment	Manufacturer	Model No.	Last Cal.	Next Cal.
AN-054	Loop Antenna	ROHDE & SCHWARZ	HFH2-Z2	2014/04	2016/04
FS-062	Test Receiver	ROHDE & SCHWARZ	ESS	2013/08	2014/08
SA-063	Test Receiver	Agilent	N9038A	2014/05	2015/05

· Radiated Emission (above 30MHz)

KEC No.	Equipment	Manufacturer	Model No.	Last Cal.	Next Cal.
AM-093	Pre-Amplifier	MITEQ	MLA-10K01-B01-40	2014/04	2015/04
AN-248	Biconical Antenna	Schwarzbeck	VHA9103B	2014/04	2015/04
AN-250	LPDA Antenna	Schwarzbeck	UHALP9108A	2014/04	2015/04
AT-157	Fixed Attenuator	Anritsu	MP721B	2014/03	2015/04
FS-062	Test Receiver	ROHDE & SCHWARZ	ESS	2013/08	2014/08
MM-300	RF Relay Matrix Unit	TSJ	RFM-E421	2014/04	2015/04
SA-063	Test Receiver	Agilent	N9038A	2014/05	2015/05

· 20dB Bandwidth Measurement

· Frequency Tolerance of Carrier Signal

KEC No.	Equipment	Manufacturer	Model No.	Last Cal.	Next Cal.
AT-148	Fixed Attenuator	Anritsu	41KC-10	2014/04	2015/04
SA-052	Spectrum Analyzer	Agilent	E4446A	2013/10	2014/10
SF-093	Temperature Chamber	ESPEC CORP.	SH-641	2013/07	2014/07

Note : (*1) We check the performance, before using this device.

The overall program of calibration and verification of equipment is designed and operated so as to ensure that measurements made by KEC are traceable to national standards of measurement or equivalent abroad.