



RADIO TEST REPORT

Test Report No. : 10400800H-A-R2

Applicant : ALPINE Electronics, Inc.
Type of Equipment : CD Player with Radio Receiver
Model No. : CDE-W265BT
FCC ID : A269ZUA141
Test regulation : FCC Part 15 Subpart C: 2014
* Class II Permissive Change
* 99% Occupied Bandwidth and
Radiated Spurious Emission test only
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this 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.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 10400800H-A-R1. 10400800H-A-R1 is replaced with this report.

Date of test: August 19 to November 26, 2014

Representative test engineer:

Hiroshi Kukita
Engineer

Consumer Technology Division

Approved by:

Takayuki Shimada
Engineer

Consumer Technology Division



NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation. *As for the range of Accreditation in NVLAP, you may refer to the WEB address, <http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

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13-EM-F0429

CONTENTS	PAGE
SECTION 1: Customer information.....	4
SECTION 2: Equipment under test (E.U.T.).....	4
SECTION 3: Test specification, procedures & results.....	5
SECTION 4: Operation of E.U.T. during testing.....	8
SECTION 5: Radiated Spurious Emission	10
SECTION 6: Antenna Terminal Conducted Tests.....	11
APPENDIX 1: Data of EMI test.....	12
Radiated Spurious Emission	12
99% Occupied Bandwidth	21
APPENDIX 2: Test instruments	23
APPENDIX 3: Photographs of test setup	24
Radiated Spurious Emission	24

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SECTION 1: Customer information

Company Name : ALPINE Electronics, Inc.
Address : 20-1, Yoshima-Kogyodanchi, Iwaki-shi, Fukushima, 970-1192, Japan
Telephone Number : +81-246-36-4111
Facsimile Number : +81-246-36-6090
Contact Person : Mitsuru Yoshida

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

2.1 Identification of E.U.T.

Type of Equipment : CD Player with Radio Receiver
Model No. : CDE-W265BT
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 12V
Receipt Date of Sample : August 2, 2014
Country of Mass-production : Thailand
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product Description

General Specification

Clock frequency(ies) in the system : 62.4MHz
26MHz (Bluetooth circuit)

Radio Specification

[Bluetooth]

Radio Type : Transceiver
Frequency of Operation : 2402-2480MHz
Modulation : FHSS
Power Supply (radio part input) : DC 3.3/1.8V
Antenna type : PCB Meander antenna
Antenna Gain : Peak 1.58 (dBi)

<Contents of the change from original model>

CDE-W265BT, CDE-164BT are added for this application based on testing performed on the model CDE-154BT
Therefore only Radiated Spurious Emission test and 99% Occupied Bandwidth test were performed in this report.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2014, final revised on May 1, 2014 and effective June 2, 2014

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz

* The EUT complies with FCC Part 15 Subpart B: 2014, final revised on May 1, 2014 and effective June 2, 2014.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Spurious Emission & Band Edge Compliance	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 4.9	FCC: Section15.247(d) IC: RSS-210 A8.5 RSS-Gen 6 and 7.2.3	2.9dB 7206.000 MHz, Horizontal, AV	Complied	Radiated

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.

* In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

FCC Part 15.31 (e)

The test was performed with the New Battery (DC 12V) and the stable voltage was supplied to the EUT during the tests. Therefore, the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	IC: RSS-Gen 4.6.1	IC: RSS-Gen 4.6.1	N/A	-	Conducted

Other than above, 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)	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	4.0dB	5.1dB	5.0dB	5.1dB	6.0dB	4.9dB	4.3dB
No.2	3.9dB	5.2dB	5.0dB	4.9dB	5.9dB	4.7dB	4.2dB
No.3	4.3dB	5.1dB	5.2dB	5.2dB	6.0dB	4.8dB	4.2dB
No.4	4.6dB	5.2dB	5.0dB	5.2dB	6.0dB	5.7dB	4.2dB

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

Radiated emission test(3m)

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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3.5 Test Location

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	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	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	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	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	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	4.0 x 4.5 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 4.6 x 2.8m	2.4 x 2.4m	-
No.11 measurement room	-	6.2 x 4.7 x 3.0m	4.8 x 4.6m	-

* 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.

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

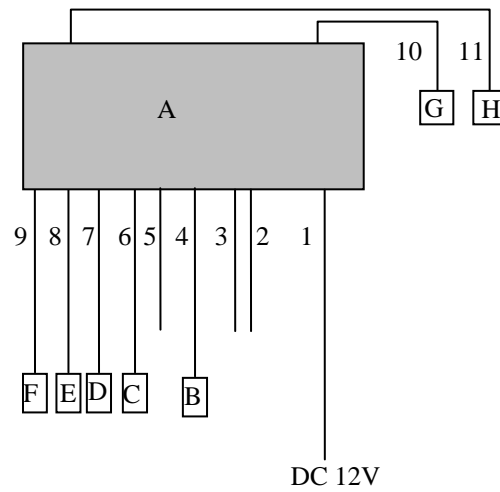
4.1 Operating Mode(s)

Bluetooth (BT): Transmitting (Tx), Payload: PRBS9
Inquiry

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Spurious Emission (Radiated)	Tx (Hopping off) DH5, 3DH5	2402MHz 2441MHz 2480MHz
99% Occupied Bandwidth	Tx DH5, 3DH5 -Hopping on -Hopping off	2402MHz 2441MHz 2480MHz
<p>*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test) *2DH mode (2Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative. *EUT has the power settings by the software as follows; Power settings: class2 2.5mW Software: HCI Tester2 version 1.0.0.1 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.</p>		

4.2 Configuration and peripherals



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remark
A	CD Player with Radio Receiver	CDE-W265BT	2	ALPINE Electronics, Inc.	-
B	Microphone	-	-	-	-
C	Terminator	-	-	-	-
D	Terminator	-	-	-	-
E	Terminator	-	-	-	-
F	Terminator	CT-01	-	TME	-
G	Portable CD Player	SL-CT520-A	WL7GA002317R	Panasonic	-
H	USB Memory	MB-RUF2-4GB	-	BUFFALO	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	2.8	Unshielded	Unshielded	-
2	Signal Cable	0.3	Unshielded	Unshielded	-
3	Signal Cable	0.3	Unshielded	Unshielded	-
4	Microphone Cable	4.0	Shielded	Shielded	-
5	Audio Cable	1.5	Shielded	Shielded	-
6	Audio Cable	1.0	Shielded	Shielded	-
7	Audio Cable	1.0	Shielded	Shielded	-
8	Audio Cable	1.0	Shielded	Shielded	-
9	Antenna Cable	1.5	Shielded	Shielded	-
10	Audio Cable	1.5	Shielded	Shielded	-
11	USB Cable	2.8	Shielded	Shielded	-

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SECTION 5: Radiated Spurious Emission

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

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 strength.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

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

Test Antennas are used as below;

Frequency	Below 30MHz	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

In any 100kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20dBc was applied to the frequency over the limit of FCC 15.209 / Table 5 of RSS-Gen 7.2.5 (IC) and outside the restricted band of FCC15.205 / Table 3 of RSS-Gen 7.2.2 (IC).

Frequency	Below 1GHz	Above 1GHz		20dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV	PK
IF Bandwidth	BW 120kHz	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 10Hz *1)	RBW: 100kHz VBW: 300kHz
Test Distance	3m	3m (below 10GHz), 1m*2) (above 10GHz)		3m (below 10GHz), 1m*2) (above 10GHz)

*1) Although 00-705 accepts VBW=10Hz for AV measurements, it was confirmed that superfluous smoothing was not performed.

*2) Distance Factor: $20 \times \log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

The test was made on EUT at the normal use position.

Measurement range : 30M-26.5GHz
Test data : APPENDIX
Test result : Pass

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SECTION 6: Antenna Terminal Conducted Tests

Test Procedure

The tests were made with below setting connected to the antenna port.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
99% Occupied Bandwidth	Enough width to display 20dB Bandwidth	1 to 3% of Span	Three times of RBW	Auto	Peak	Max Hold *1)	Spectrum Analyzer

*1) The measurement was performed with Max Hold since the duty cycle was not 100%.

The test results and limit are rounded off to two decimals place, so some differences might be observed.

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Data of EMI test

Radiated Spurious Emission

Report No.	10400800H		
Date	08/19/2014	08/20/2014	08/21/2014
Test place	Ise EMC Lab.	Ise EMC Lab.	Ise EMC Lab.
Temperature/ Humidity	No.2 semi Anechoic Chamber	No.2 semi Anechoic Chamber	No.4 semi Anechoic Chamber
Engineer	20 deg.C/ 62% RH Hiroshi Kukita (1-10GHz)	23 deg. C / 58% RH Hiroshi Kukita (10-26.5GHz)	22 deg. C / 59 % RH Hiroshi Kukita (30-1000MHz)
Mode	Tx, DH5 2402MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	268.560	QP	36.3	18.3	9.7	31.9	32.4	46.0	13.6	
Hori	288.000	QP	43.0	19.2	9.8	31.9	40.1	46.0	5.9	
Hori	353.273	QP	38.7	17.0	10.3	31.9	34.1	46.0	11.9	
Hori	432.000	QP	41.7	18.1	10.8	32.0	38.6	46.0	7.4	
Hori	471.821	QP	42.0	18.8	11.0	32.0	39.8	46.0	6.2	
Hori	720.000	QP	36.0	22.5	12.4	32.2	38.7	46.0	7.3	
Hori	864.000	QP	32.0	23.8	13.1	31.4	37.5	46.0	8.5	
Hori	960.000	QP	34.1	25.9	13.6	30.9	42.7	46.0	3.3	
Hori	1918.828	PK	54.8	27.3	2.1	34.9	49.3	73.9	24.6	
Hori	2390.000	PK	46.0	27.0	2.4	34.7	40.7	73.9	33.2	
Hori	4804.000	PK	44.0	31.8	4.5	33.9	46.4	73.9	27.5	
Hori	7206.000	PK	45.8	35.7	5.1	33.8	52.8	73.9	21.1	
Hori	9608.000	PK	43.0	38.0	6.0	34.4	52.6	73.9	21.3	
Hori	1918.828	AV	51.5	27.3	2.1	34.9	46.0	53.9	7.9	
Hori	2390.000	AV	31.9	27.0	2.4	34.7	26.6	53.9	27.3	
Hori	4804.000	AV	32.6	31.8	4.5	33.9	35.0	53.9	18.9	
Hori	7206.000	AV	44.0	35.7	5.1	33.8	51.0	53.9	2.9	
Hori	9608.000	AV	33.7	38.0	6.0	34.4	43.3	53.9	10.6	
Vert	144.000	QP	45.4	14.7	8.6	32.0	36.7	43.5	6.8	
Vert	181.480	QP	41.3	16.3	9.0	32.0	34.6	43.5	8.9	
Vert	216.000	QP	41.8	16.8	9.2	31.9	35.9	43.5	7.6	
Vert	266.166	QP	41.7	18.1	9.7	31.9	37.6	46.0	8.4	
Vert	288.000	QP	41.7	19.2	9.8	31.9	38.8	46.0	7.2	
Vert	432.000	QP	40.8	18.1	10.8	32.0	37.7	46.0	8.3	
Vert	474.215	QP	38.0	18.8	11.0	32.0	35.8	46.0	10.2	
Vert	960.000	QP	32.6	25.9	13.6	30.9	41.2	46.0	4.8	
Vert	1920.093	PK	55.0	27.3	2.1	34.9	49.5	73.9	24.4	
Vert	2390.000	PK	46.3	27.0	2.4	34.7	41.0	73.9	32.9	
Vert	4804.000	PK	43.4	31.8	4.5	33.9	45.8	73.9	28.1	
Vert	7206.000	PK	49.3	35.7	5.1	33.8	56.3	73.9	17.6	
Vert	9608.000	PK	43.4	38.0	6.0	34.4	53.0	73.9	20.9	
Vert	1920.093	AV	51.9	27.3	2.1	34.9	46.4	53.9	7.5	
Vert	2390.000	AV	32.3	27.0	2.4	34.7	27.0	53.9	26.9	
Vert	4804.000	AV	33.1	31.8	4.5	33.9	35.5	53.9	18.4	
Vert	7206.000	AV	41.5	35.7	5.1	33.8	48.5	53.9	5.4	
Vert	9608.000	AV	33.0	38.0	6.0	34.4	42.6	53.9	11.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission

Report No.	10400800H	
Date	08/19/2014	08/20/2014
Test place	Ise EMC Lab.	Ise EMC Lab.
	No.2 semi Anechoic Chamber	No.2 semi Anechoic Chamber
Temperature/ Humidity	20 deg.C/ 62% RH	23 deg. C / 58% RH
Engineer	Hiroshi Kukita (1-10GHz)	Hiroshi Kukita (10-26.5GHz)
Mode	Tx, DH5 2402MHz	

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	95.8	27.0	2.4	34.7	90.5	-	-	Carrier
Hori	2400.000	PK	54.8	27.0	2.4	34.7	49.5	70.5	21.0	
Vert	2402.000	PK	97.3	27.0	2.4	34.7	92.0	-	-	Carrier
Vert	2400.000	PK	56.3	27.0	2.4	34.7	51.0	72.0	21.0	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Date	08/19/2014	08/20/2014	08/21/2014
Test place	Ise EMC Lab.	Ise EMC Lab.	Ise EMC Lab.
Temperature/ Humidity	No.2 semi Anechoic Chamber	No.2 semi Anechoic Chamber	No.4 semi Anechoic Chamber
Engineer	20 deg.C/ 62% RH	23 deg. C / 58% RH	22 deg. C / 59 % RH
	Hiroshi Kukita	Hiroshi Kukita	Hiroshi Kukita
Mode	(1-10GHz)	(10-26.5GHz)	(30-1000MHz)
	Tx, DH5 2441MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	268.553	QP	36.8	18.3	9.7	31.9	32.9	46.0	13.1	
Hori	288.000	QP	44.0	19.2	9.8	31.9	41.1	46.0	4.9	
Hori	360.524	QP	39.5	17.1	10.3	31.9	35.0	46.0	11.0	
Hori	432.001	QP	44.2	18.1	10.8	32.0	41.1	46.0	4.9	
Hori	471.818	QP	41.2	18.8	11.0	32.0	39.0	46.0	7.0	
Hori	719.999	QP	36.1	22.5	12.4	32.2	38.8	46.0	7.2	
Hori	864.002	QP	32.2	23.8	13.1	31.4	37.7	46.0	8.3	
Hori	960.000	QP	34.3	25.9	13.6	30.9	42.9	46.0	3.1	
Hori	1920.011	PK	54.0	27.3	2.1	34.9	48.5	73.9	25.4	
Hori	4882.000	PK	43.2	32.0	4.4	33.9	45.7	73.9	28.2	
Hori	7323.000	PK	50.9	35.8	5.2	33.8	58.1	73.9	15.8	
Hori	9764.000	PK	44.0	38.3	6.2	34.5	54.0	73.9	19.9	
Hori	1920.011	AV	50.8	27.3	2.1	34.9	45.3	53.9	8.6	
Hori	4882.000	AV	32.9	32.0	4.4	33.9	35.4	53.9	18.5	
Hori	7323.000	AV	43.5	35.8	5.2	33.8	50.7	53.9	3.2	
Hori	9764.000	AV	34.3	38.3	6.2	34.5	44.3	53.9	9.6	
Vert	144.000	QP	45.6	14.7	8.6	32.0	36.9	43.5	6.6	
Vert	181.481	QP	41.6	16.3	9.0	32.0	34.9	43.5	8.6	
Vert	216.000	QP	40.7	16.8	9.2	31.9	34.8	43.5	8.7	
Vert	266.160	QP	41.6	18.1	9.7	31.9	37.5	46.0	8.5	
Vert	288.000	QP	42.3	19.2	9.8	31.9	39.4	46.0	6.6	
Vert	432.001	QP	41.0	18.1	10.8	32.0	37.9	46.0	8.1	
Vert	474.210	QP	37.8	18.8	11.0	32.0	35.6	46.0	10.4	
Vert	960.000	QP	31.7	25.9	13.6	30.9	40.3	46.0	5.7	
Vert	1920.117	PK	54.3	27.3	2.1	34.9	48.8	73.9	25.1	
Vert	4882.000	PK	43.6	32.0	4.4	33.9	46.1	73.9	27.8	
Vert	7323.000	PK	46.5	35.8	5.2	33.8	53.7	73.9	20.2	
Vert	9764.000	PK	43.4	38.3	6.2	34.5	53.4	73.9	20.5	
Vert	1920.117	AV	51.5	27.3	2.1	34.9	46.0	53.9	7.9	
Vert	4882.000	AV	33.3	32.0	4.4	33.9	35.8	53.9	18.1	
Vert	7323.000	AV	36.3	35.8	5.2	33.8	43.5	53.9	10.4	
Vert	9764.000	AV	32.3	38.3	6.2	34.5	42.3	53.9	11.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 20log(3.0m/0.5m)=15.6dB

Radiated Spurious Emission

Report No.	10400800H		
Date	08/19/2014	08/20/2014	08/21/2014
Test place	Ise EMC Lab.	Ise EMC Lab.	Ise EMC Lab.
	No.2 semi Anechoic Chamber	No.2 semi Anechoic Chamber	No.4 semi Anechoic Chamber
Temperature/ Humidity	20 deg.C/ 62% RH	23 deg. C / 58% RH	22 deg. C / 59 % RH
Engineer	Hiroshi Kukita	Hiroshi Kukita	Hiroshi Kukita
	(1-10GHz)	(10-26.5GHz)	(30-1000MHz)
Mode	Tx, DH5 2480MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	268.558	QP	36.3	18.3	9.7	31.9	32.4	46.0	13.6	
Hori	288.000	QP	43.7	19.2	9.8	31.9	40.8	46.0	5.2	
Hori	353.273	QP	39.9	17.0	10.3	31.9	35.3	46.0	10.7	
Hori	432.000	QP	42.7	18.1	10.8	32.0	39.6	46.0	6.4	
Hori	471.818	QP	42.2	18.8	11.0	32.0	40.0	46.0	6.0	
Hori	720.002	QP	36.0	22.5	12.4	32.2	38.7	46.0	7.3	
Hori	864.001	QP	33.1	23.8	13.1	31.4	38.6	46.0	7.4	
Hori	960.000	QP	34.0	25.9	13.6	30.9	42.6	46.0	3.4	
Hori	1919.942	PK	57.0	27.3	2.1	34.9	51.5	73.9	22.4	
Hori	2376.110	PK	46.6	27.0	2.4	34.7	41.3	73.9	32.6	
Hori	2483.500	PK	64.0	26.9	2.5	34.7	58.7	73.9	15.2	
Hori	4960.000	PK	43.5	32.2	4.4	34.0	46.1	73.9	27.8	
Hori	7440.000	PK	49.2	35.8	5.2	33.9	56.3	73.9	17.6	
Hori	9920.000	PK	46.0	38.7	6.2	34.5	56.4	73.9	17.5	
Hori	1919.942	AV	54.4	27.3	2.1	34.9	48.9	53.9	5.0	
Hori	2376.110	AV	36.0	27.0	2.4	34.7	30.7	53.9	23.2	
Hori	2483.500	AV	35.8	26.9	2.5	34.7	30.5	53.9	23.4	
Hori	4960.000	AV	32.7	32.2	4.4	34.0	35.3	53.9	18.6	
Hori	7440.000	AV	42.9	35.8	5.2	33.9	50.0	53.9	3.9	
Hori	9920.000	AV	35.3	38.7	6.2	34.5	45.7	53.9	8.2	
Vert	144.003	QP	45.3	14.7	8.6	32.0	36.6	43.5	6.9	
Vert	181.481	QP	41.7	16.3	9.0	32.0	35.0	43.5	8.5	
Vert	216.000	QP	42.2	16.8	9.2	31.9	36.3	43.5	7.2	
Vert	266.162	QP	40.7	18.1	9.7	31.9	36.6	46.0	9.4	
Vert	288.000	QP	42.0	19.2	9.8	31.9	39.1	46.0	6.9	
Vert	432.000	QP	40.0	18.1	10.8	32.0	36.9	46.0	9.1	
Vert	474.210	QP	38.7	18.8	11.0	32.0	36.5	46.0	9.5	
Vert	960.000	QP	32.8	25.9	13.6	30.9	41.4	46.0	4.6	
Vert	1920.005	PK	54.8	27.3	2.1	34.9	49.3	73.9	24.6	
Vert	2376.000	PK	48.8	27.0	2.4	34.7	43.5	73.9	30.4	
Vert	2483.500	PK	63.8	26.9	2.5	34.7	58.5	73.9	15.4	
Vert	4960.000	PK	43.9	32.2	4.4	34.0	46.5	73.9	27.4	
Vert	7440.000	PK	49.2	35.8	5.2	33.9	56.3	73.9	17.6	
Vert	9920.000	PK	44.7	38.7	6.2	34.5	55.1	73.9	18.8	
Vert	1920.005	AV	52.0	27.3	2.1	34.9	46.5	53.9	7.4	
Vert	2376.000	AV	37.7	27.0	2.4	34.7	32.4	53.9	21.5	
Vert	2483.500	AV	36.0	26.9	2.5	34.7	30.7	53.9	23.2	
Vert	4960.000	AV	33.0	32.2	4.4	34.0	35.6	53.9	18.3	
Vert	7440.000	AV	42.3	35.8	5.2	33.9	49.4	53.9	4.5	
Vert	9920.000	AV	33.5	38.7	6.2	34.5	43.9	53.9	10.0	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)
 *Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 20log(3.0m/0.5m)=15.6dB

Radiated Spurious Emission

Report No.	10400800H		
Date	08/19/2014	08/20/2014	08/21/2014
Test place	Ise EMC Lab.	Ise EMC Lab.	Ise EMC Lab.
	No.2 semi Anechoic Chamber	No.2 semi Anechoic Chamber	No.4 semi Anechoic Chamber
Temperature/ Humidity	20 deg.C/ 62% RH	23 deg. C / 58% RH	22 deg. C / 59 % RH
Engineer	Hiroshi Kukita	Hiroshi Kukita	Hiroshi Kukita
	(1-10GHz)	(10-26.5GHz)	(30-1000MHz)
Mode	Tx, 3DH5 2402MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	268.562	QP	36.0	18.3	9.7	31.9	32.1	46.0	13.9	
Hori	288.001	QP	43.2	19.2	9.8	31.9	40.3	46.0	5.7	
Hori	353.272	QP	38.5	17.0	10.3	31.9	33.9	46.0	12.1	
Hori	432.000	QP	41.2	18.1	10.8	32.0	38.1	46.0	7.9	
Hori	471.820	QP	42.1	18.8	11.0	32.0	39.9	46.0	6.1	
Hori	720.001	QP	36.3	22.5	12.4	32.2	39.0	46.0	7.0	
Hori	864.002	QP	32.2	23.8	13.1	31.4	37.7	46.0	8.3	
Hori	960.001	QP	34.3	25.9	13.6	30.9	42.9	53.9	11.0	
Hori	1919.007	PK	54.1	27.3	2.1	34.9	48.6	73.9	25.3	
Hori	2390.000	PK	47.4	27.0	2.4	34.7	42.1	73.9	31.8	
Hori	4804.000	PK	44.3	31.8	4.5	33.9	46.7	73.9	27.2	
Hori	7206.000	PK	50.2	35.7	5.1	33.8	57.2	73.9	16.7	
Hori	9608.000	PK	43.0	38.0	6.0	34.4	52.6	73.9	21.3	
Hori	1919.007	AV	51.2	27.3	2.1	34.9	45.7	53.9	8.2	
Hori	2390.000	AV	32.4	27.0	2.4	34.7	27.1	53.9	26.8	
Hori	4804.000	AV	32.3	31.8	4.5	33.9	34.7	53.9	19.2	
Hori	7206.000	AV	41.1	35.7	5.1	33.8	48.1	53.9	5.8	
Hori	9608.000	AV	34.0	38.0	6.0	34.4	43.6	53.9	10.3	
Vert	144.001	QP	45.0	14.7	8.6	32.0	36.3	43.5	7.2	
Vert	181.482	QP	41.1	16.3	9.0	32.0	34.4	43.5	9.1	
Vert	216.001	QP	41.2	16.8	9.2	31.9	35.3	46.0	10.7	
Vert	266.160	QP	41.4	18.1	9.7	31.9	37.3	46.0	8.7	
Vert	288.001	QP	41.4	19.2	9.8	31.9	38.5	46.0	7.5	
Vert	432.000	QP	40.4	18.1	10.8	32.0	37.3	46.0	8.7	
Vert	474.212	QP	38.2	18.8	11.0	32.0	36.0	46.0	10.0	
Vert	960.001	QP	32.5	25.9	13.6	30.9	41.1	53.9	12.8	
Vert	1920.013	PK	55.8	27.3	2.1	34.9	50.3	73.9	23.6	
Vert	2390.000	PK	45.8	27.0	2.4	34.7	40.5	73.9	33.4	
Vert	4804.000	PK	43.9	31.8	4.5	33.9	46.3	73.9	27.6	
Vert	7206.000	PK	47.5	35.7	5.1	33.8	54.5	73.9	19.4	
Vert	9608.000	PK	43.8	38.0	6.0	34.4	53.4	73.9	20.5	
Vert	1920.013	AV	51.7	27.3	2.1	34.9	46.2	53.9	7.7	
Vert	2390.000	AV	33.3	27.0	2.4	34.7	28.0	53.9	25.9	
Vert	4804.000	AV	32.3	31.8	4.5	33.9	34.7	53.9	19.2	
Vert	7206.000	AV	38.0	35.7	5.1	33.8	45.0	53.9	8.9	
Vert	9608.000	AV	32.8	38.0	6.0	34.4	42.4	53.9	11.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
20log(3.0m/0.5m)=15.6dB

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Ise EMC Lab.

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Radiated Spurious Emission

Report No.	10400800H		
Date	08/19/2014	08/20/2014	
Test place	Ise EMC Lab.	Ise EMC Lab.	
	No.2 semi Anechoic Chamber	No.2 semi Anechoic Chamber	
Temperature/ Humidity	20 deg.C/ 62% RH	23 deg. C / 58% RH	
Engineer	Hiroshi Kukita	Hiroshi Kukita	
	(1-10GHz)	(10-26.5GHz)	
Mode	Tx, 3DH5 2402MHz		

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	97.3	27.0	2.4	34.7	92.0	-	-	Carrier
Hori	2400.000	PK	56.0	27.0	2.4	34.7	50.7	72.0	21.3	
Vert	2402.000	PK	96.0	27.0	2.4	34.7	90.7	-	-	Carrier
Vert	2400.000	PK	55.0	27.0	2.4	34.7	49.7	70.7	21.0	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission

Report No. 10400800H
Date 08/20/2014 08/21/2014
Test place Ise EMC Lab. Ise EMC Lab.
No.2 semi Anechoic Chamber No.4 semi Anechoic Chamber
Temperature/ Humidity 23 deg. C / 58% RH 22 deg. C / 59 % RH
Engineer Hiroshi Kukita Hiroshi Kukita
(1-26.5GHz) (30-1000MHz)
Mode Tx, 3DH5 2480MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	268.555	QP	35.5	18.3	9.7	31.9	31.6	46.0	14.4	
Hori	288.000	QP	43.8	19.2	9.8	31.9	40.9	46.0	5.1	
Hori	360.000	QP	39.9	17.1	10.3	31.9	35.4	46.0	10.6	
Hori	432.000	QP	44.0	18.1	10.8	32.0	40.9	46.0	5.1	
Hori	471.815	QP	42.0	18.8	11.0	32.0	39.8	46.0	6.2	
Hori	720.000	QP	36.2	22.5	12.4	32.2	38.9	46.0	7.1	
Hori	864.002	QP	33.8	23.8	13.1	31.4	39.3	46.0	6.7	
Hori	960.000	QP	34.0	25.9	13.6	30.9	42.6	46.0	3.4	
Hori	1919.975	PK	56.5	27.3	2.1	34.9	51.0	73.9	22.9	
Hori	2375.996	PK	48.3	27.0	2.4	34.7	43.0	73.9	30.9	
Hori	2483.500	PK	63.2	26.9	2.5	34.7	57.9	73.9	16.0	
Hori	4960.000	PK	44.2	32.2	4.4	34.0	46.8	73.9	27.1	
Hori	7440.000	PK	49.8	35.8	5.2	33.9	56.9	73.9	17.0	
Hori	9920.000	PK	45.3	38.7	6.2	34.5	55.7	73.9	18.2	
Hori	1919.975	AV	54.0	27.3	2.1	34.9	48.5	53.9	5.4	
Hori	2375.996	AV	37.3	27.0	2.4	34.7	32.0	53.9	21.9	
Hori	2483.500	AV	37.8	26.9	2.5	34.7	32.5	53.9	21.4	
Hori	4960.000	AV	33.4	32.2	4.4	34.0	36.0	53.9	17.9	
Hori	7440.000	AV	42.5	35.8	5.2	33.9	49.6	53.9	4.3	
Hori	9920.000	AV	36.2	38.7	6.2	34.5	46.6	53.9	7.3	
Vert	144.002	QP	45.3	14.7	8.6	32.0	36.6	43.5	6.9	
Vert	181.484	QP	41.0	16.3	9.0	32.0	34.3	43.5	9.2	
Vert	216.000	QP	41.5	16.8	9.2	31.9	35.6	43.5	7.9	
Vert	266.155	QP	42.4	18.1	9.7	31.9	38.3	46.0	7.7	
Vert	288.000	QP	41.0	19.2	9.8	31.9	38.1	46.0	7.9	
Vert	432.002	QP	41.3	18.1	10.8	32.0	38.2	46.0	7.8	
Vert	474.208	QP	37.7	18.8	11.0	32.0	35.5	46.0	10.5	
Vert	960.000	QP	32.3	25.9	13.6	30.9	40.9	46.0	5.1	
Vert	1920.117	PK	54.4	27.3	2.1	34.9	48.9	73.9	25.0	
Vert	2376.000	PK	50.1	27.0	2.4	34.7	44.8	73.9	29.1	
Vert	2483.500	PK	65.3	26.9	2.5	34.7	60.0	73.9	13.9	
Vert	4960.000	PK	43.4	32.2	4.4	34.0	46.0	73.9	27.9	
Vert	7440.000	PK	50.1	35.8	5.2	33.9	57.2	73.9	16.7	
Vert	9920.000	PK	44.7	38.7	6.2	34.5	55.1	73.9	18.8	
Vert	1920.117	AV	51.5	27.3	2.1	34.9	46.0	53.9	7.9	
Vert	2376.000	AV	40.1	27.0	2.4	34.7	34.8	53.9	19.1	
Vert	2483.500	AV	39.3	26.9	2.5	34.7	34.0	53.9	19.9	
Vert	4960.000	AV	33.8	32.2	4.4	34.0	36.4	53.9	17.5	
Vert	7440.000	AV	42.0	35.8	5.2	33.9	49.1	53.9	4.8	
Vert	9920.000	AV	35.0	38.7	6.2	34.5	45.4	53.9	8.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
20log(3.0m/0.5m)=15.6dB

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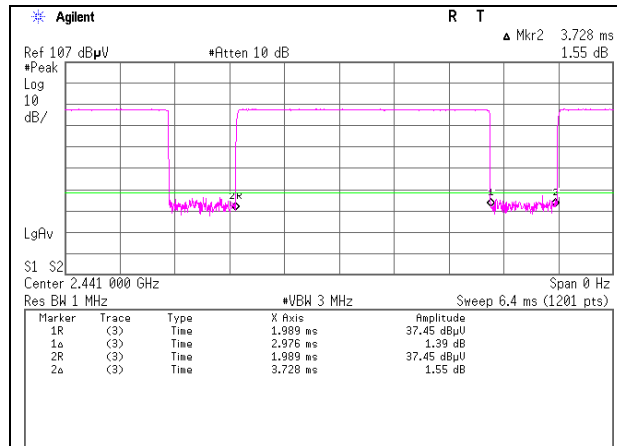
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

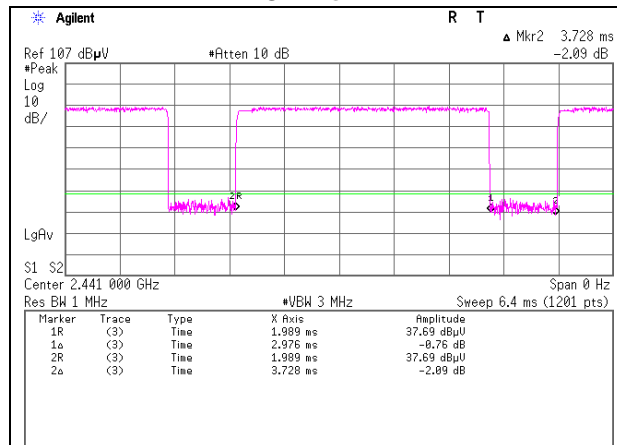
Burst Rate Confirmation

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10400800H
Date	08/20/2014
Temperature/ Humidity	23 deg. C / 58% RH
Engineer	Hiroshi Kukita
Mode	Tx (Hopping off) DH5/3DH5

DH5



3DH5



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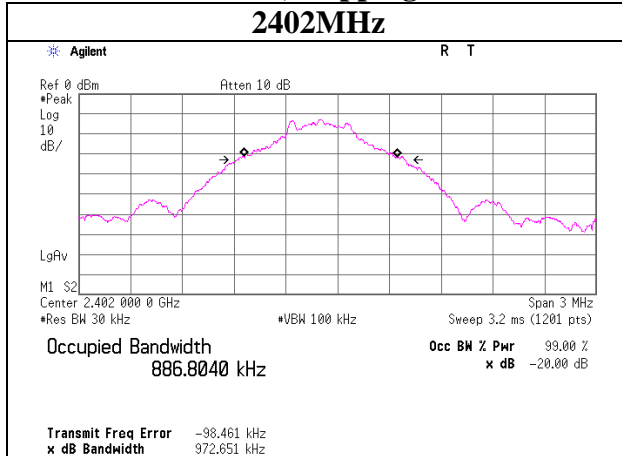
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

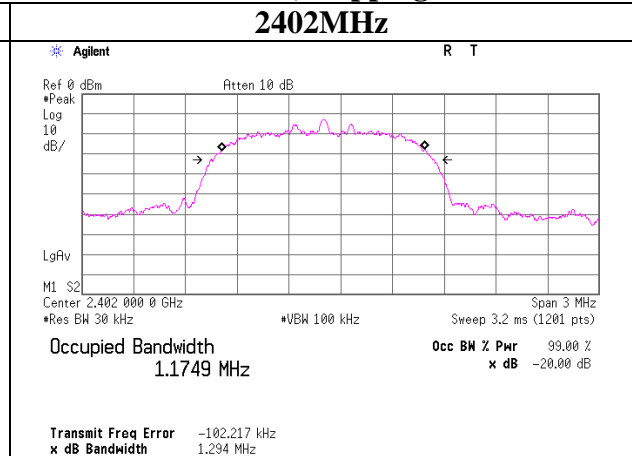
99%Occupied Bandwidth

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10400800H
Date	11/26/2014
Temperature/ Humidity	23 deg. C / 50% RH
Engineer	Hironobu Ohnishi
Mode	Tx (Hopping off) DH5/3DH5

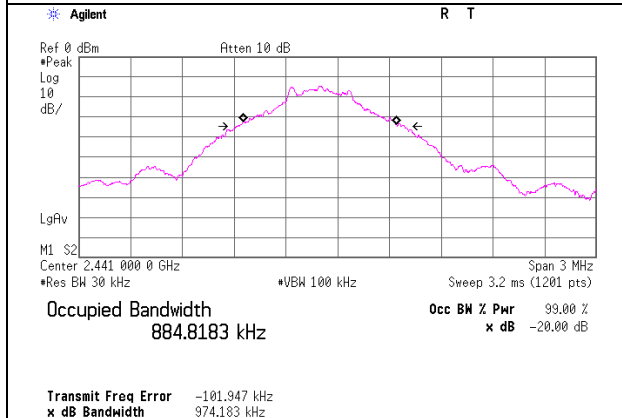
Tx DH5, Hopping off



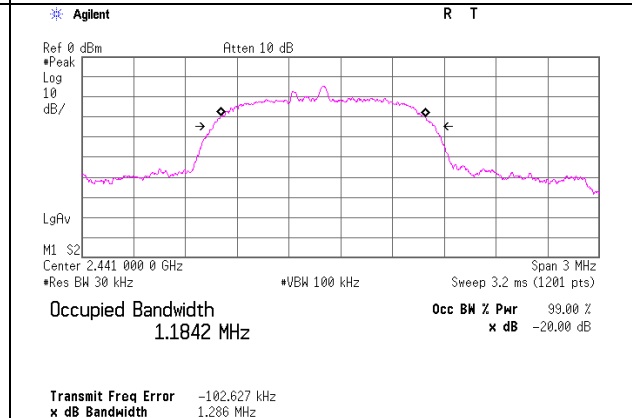
Tx 3DH5, Hopping off



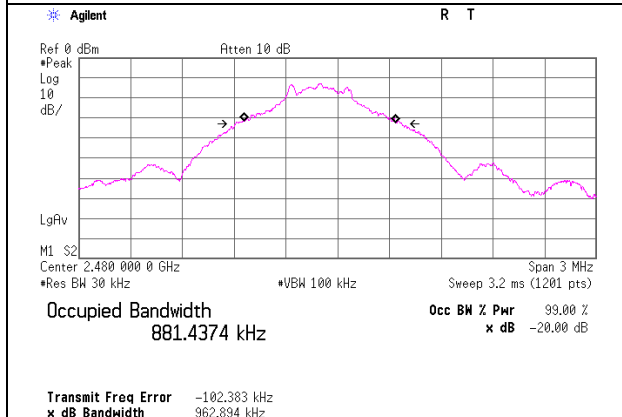
2441MHz



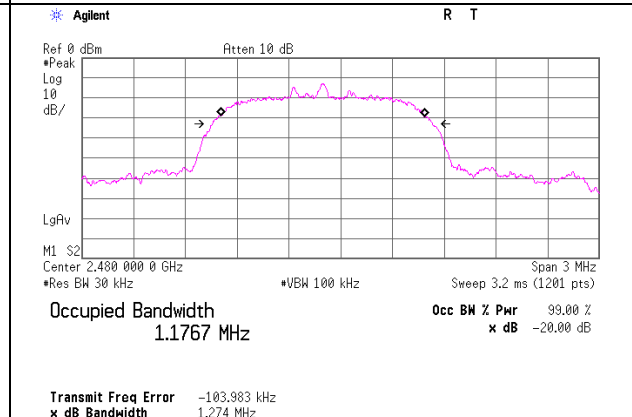
2441MHz



2480MHz

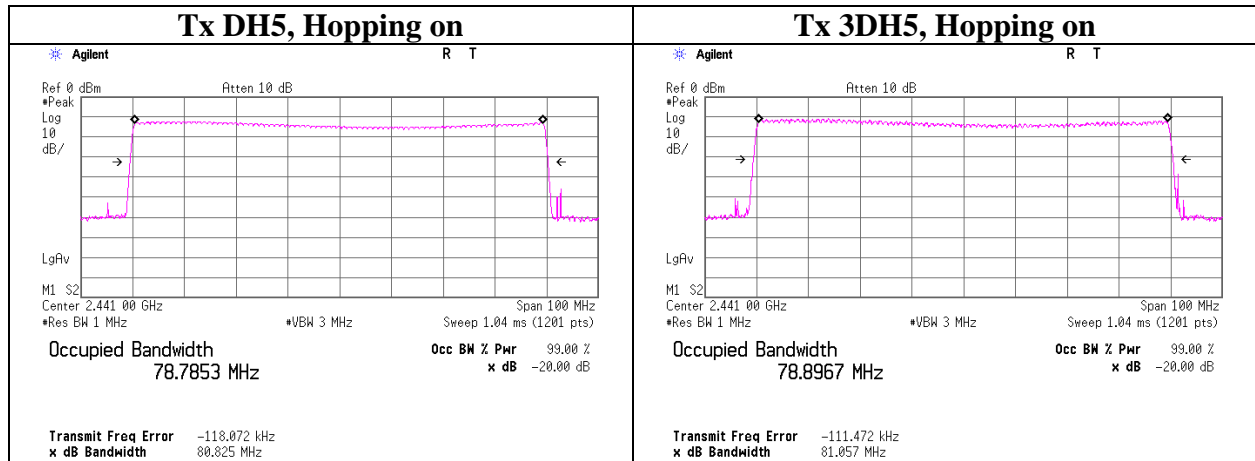


2480MHz



99% Occupied Bandwidth

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10400800H
Date	11/26/2014
Temperature/ Humidity	23 deg. C / 50% RH
Engineer	Hironobu Ohnishi
Mode	Tx (Hopping on) DH5/3DH5



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APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2014/06/25 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2014/02/20 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2013/11/25 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2014/02/21 * 12
MCC-166	Microwave Cable	Junkosha	MWX221	1303S120(1m) / 1311S167(5m)	RE	2013/11/27 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2014/01/21 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2014/05/21 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2014/02/21 * 12
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2014/02/28 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	1501	RE	2014/02/20 * 12
MJM-22	Measure	ASKUL	-	-	RE	-
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	100084	RE	2013/11/12 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2013/11/24 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2013/11/24 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2014/06/02 * 12
MAT-68	Attenuator	Anritsu	MP721B	6200961025	RE	2013/11/26 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2014/03/14 * 12
MSA-15	Spectrum Analyzer	Agilent	E4440A	MY46187105	AT	2013/11/11 * 12
MCC-66	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28636/2	AT	2014/04/09 * 12
MAT-56	Attenuator(10dB)	Suhner	6810.19.A	-	AT	2014/01/15 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2013/12/17 * 12

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:

RE: Radiated Emission

AT: Antenna Terminal Conducted test

UL Japan, Inc.

Ise EMC Lab.

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