



RADIO TEST REPORT

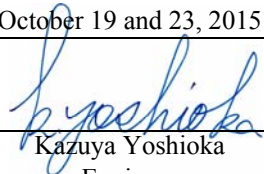
Test Report No. : 10990564H-A-R1

Applicant : FUJITSU TEN LIMITED
Type of Equipment : Car Audio
Model No. : FT0087A
FCC ID : BABFT0087A
Test regulation : FCC Part 15 Subpart C: 2015
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 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 10990564H. 10990564H is replaced with this report.

Date of test: October 19 and 23, 2015

Representative test engineer:


Kazuya Yoshioka
Engineer

Consumer Technology Division

Approved by:


Takahiro Hatakeda
Leader

Consumer Technology Division



NVLAP LAB CODE: 200572-0

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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	11
SECTION 6: Antenna Terminal Conducted Tests	12
APPENDIX 1: Test data	13
20dB Bandwidth and Carrier Frequency Separation	13
Number of Hopping Frequency	16
Dwell time	18
Maximum Peak Output Power.....	21
Average Output Power	22
Radiated Spurious Emission	24
Conducted Spurious Emission.....	35
Conducted Emission Band Edge compliance	47
99%Occupied Bandwidth	49
APPENDIX 2: Test instruments	51
APPENDIX 3: Photographs of test setup.....	52
Radiated Spurious Emission	52

SECTION 1: Customer information

Company Name	:	FUJITSU TEN LIMITED
Address	:	2-28, Gosho-dori 1-chome, Hyogo-ku, KOBE, 652-8510 JAPAN
Telephone Number	:	+81-78-682-2159
Facsimile Number	:	+81-78-671-7160
Contact Person	:	Daisuke Fukii

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

2.1 Identification of E.U.T.

Type of Equipment	:	Car Audio
Model No.	:	FT0087A
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 12 V
Receipt Date of Sample	:	October 17, 2015
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

Model: FT0087A (referred to as the EUT in this report) is a Car Audio.

General Specification

Clock frequency(ies) in the system	:	12.00 MHz (System Microcomputer), 24.00 MHz (Panel Microcomputer), 62.400MHz (DSP) 26 MHz (Crystal)
------------------------------------	---	---

Radio Specification

[Bluetooth (Ver. 2.1 with EDR function)]

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	FHSS
Power Supply (radio part input)	:	DC 3.3 V
Antenna type	:	Inverted-F PCB Antenna
Antenna Gain	:	2.12 dBi

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2015, final revised on September 8, 2015

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: 2015, final revised on June 12, 2015 and effective July 13, 2015

3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.4-2009 7. AC powerline conducted emission measurements IC: RSS-Gen 8.8	FCC: Section 15.207 IC: RSS-Gen 8.8	N/A	N/A *1)	-
Carrier Frequency Separation	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) IC: RSS-247 5.1 (2)	See data.	Complied	Conducted
20dB Bandwidth	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) IC: RSS-247 5.1 (1)		Complied	Conducted
Number of Hopping Frequency	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-247 5.1 (4)		Complied	Conducted
Dwell time	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-247 5.1 (4)		Complied	Conducted
Maximum Peak Output Power	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 6.12	FCC: Section15.247(a)(b)(1) IC: RSS-247 5.4 (2)		Complied	Conducted
Spurious Emission & Band Edge Compliance	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 6.13	FCC: Section15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	3.9 dB 4804.000 MHz, AV, Vertical	Complied	Conducted/ Radiated

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

*1)

* In case any questions arise about test procedure, ANSI C63.4: 2009 is also referred.

FCC Part 15.31 (e)

The EUT provides stable voltage (DC 3.3 V) constantly to the wireless transmitter regardless of input voltage. Instead of a new battery, DC power supply was used for the test. That does not affect the test result, 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 vehicle. 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 6.6	IC: -	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 $k = 2$.
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Test site (semi anechoic chamber)	Radiated emission Uncertainty (+/-)						
	Measurement distance: 3 m				1 m		0.5 m
	9 kHz - 30 MHz	30 MHz - 300 MHz	300 MHz - 1 GHz	1 GHz - 10 GHz	10 GHz - 18 GHz	18 GHz - 26.5 GHz	26.5 GHz - 40 GHz
No. 1	4.3 dB	5.1 dB	6.2 dB	5.5 dB	5.8 dB	5.8 dB	4.3 dB
No. 2	4.2 dB	5.1 dB	6.2 dB	5.4 dB	5.7 dB	5.9 dB	5.6 dB
No. 3	4.4 dB	5.1 dB	6.3 dB	5.2 dB	5.5 dB	5.8 dB	5.5 dB
No. 4	4.7 dB	5.3 dB	6.3 dB	5.3 dB	5.7 dB	5.9 dB	5.5 dB

Antenna terminal test Uncertainty (+/-)							
Power meter		Conducted emission and Power density			Conducted emission		Channel power
Below 1 GHz	Above 1 GHz	Below 1 GHz	1 GHz - 3 GHz	3 GHz - 18 GHz	18 GHz - 26.5 GHz	26.5 GHz - 40 GHz	
0.7 dB	1.5 dB	1.5 dB	1.7 dB	2.8 dB	2.8 dB	2.9 dB	2.6 dB

Radiated emission test

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

3.5 Test Location

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Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	2973C-1	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	2973C-2	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	2973C-3	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	2973C-4	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	-	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.6 shielded room	-	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	-	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	-	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	-	3.1 x 5.0 x 2.7	N/A	-	-
No.9 measurement room	-	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.11 measurement room	-	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

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

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Spurious Emission (Conducted/Radiated)	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
20dB Bandwidth	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx (Hopping On) DH5, 3DH5	-
Dwell time	Tx (Hopping On), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5	-
Maximum Peak Output Power	Tx (Hopping Off) DH5, 2DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2480 MHz
99% Occupied Bandwidth	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2441 MHz 2480 MHz
*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 does not have Inquiry mode. *EUT has the power settings by the software as follows; Power settings: BDR/EDR:Ext.=255,Int.=50 Software: CSR BlueSuite BlueTest3 Version 2.5.8 *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.		

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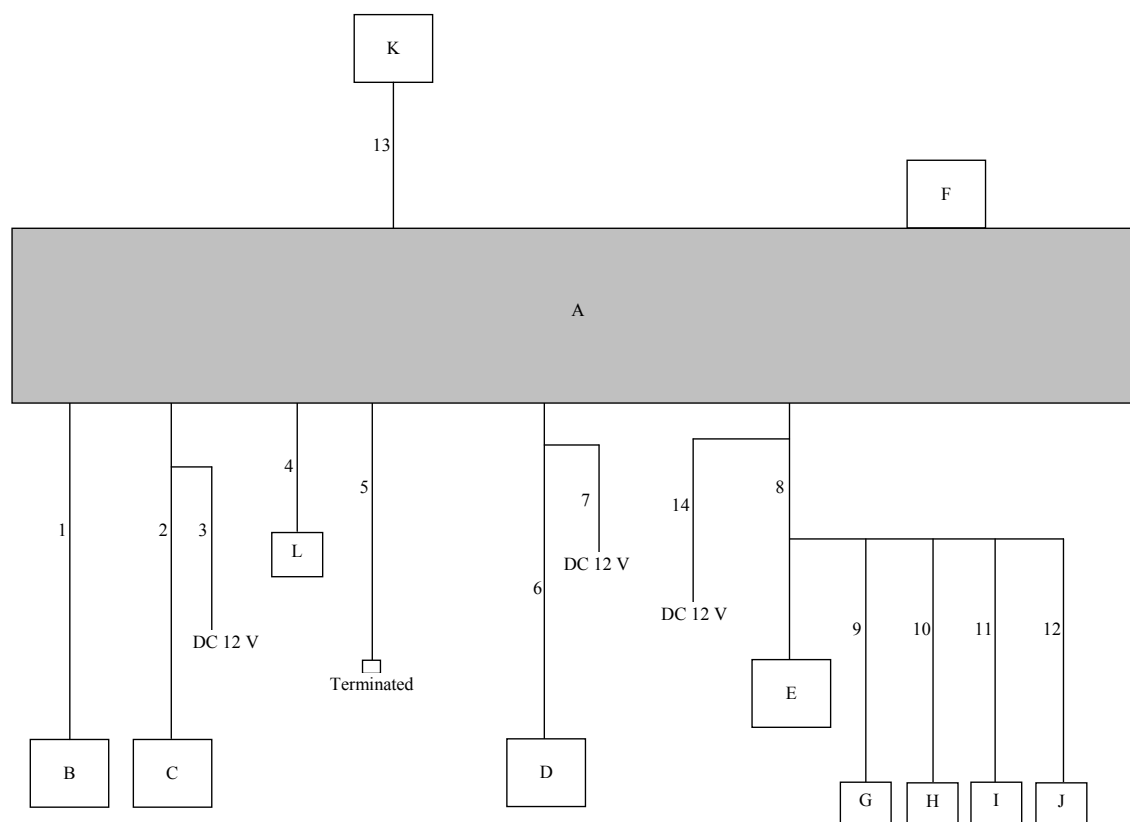
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4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Audio	FT0087A	BM800081 *1) BM800080 *2)	FUJITSU TEN	EUT
B	Rear Camera	PZ067-0K001	2250374B	TOYOTA	-
C	Front Camera	PZ067-0K001	2250375B	TOYOTA	-
D	Rear seat Entertainment	134001-4320A131	AF300409	FUJITSU TEN	-
E	Steering switch	-	-	FUJITSU TEN	-
F	USB Memory	Imation USB Mass Storage	-	UL Japan	-
G	Front Right Speaker	8 637 612 010	-	BLAUPUNKT	-
H	Front Left Speaker	8 637 612 010	-	BLAUPUNKT	-
I	Rear Right Speaker	8-97921-597-0	-	ISUZU	-
J	Rear Left Speaker	8-97921-597-0	-	ISUZU	-
K	ipod touch	A1367	C3RJ4SLADT75	Apple Inc.	-
L	Terminator	CT-1	-	TME	-

*1) Used for Radiated Emission test only.

*2) Used for Antenna Terminal test only.

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List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Signal Cable	12.4	Unshielded	Unshielded	-
2	Signal Cable	12.4	Unshielded	Unshielded	-
3	DC Cable	12.0	Unshielded	Unshielded	-
4	FM / AM Radio Antenna Cable	0.2	Shielded	Shielded	-
5	Reverse / Speed / Parking Cable	1.4	Unshielded	Unshielded	-
6	Signal Cable	1.5	Unshielded	Unshielded	-
7	Battery Cable	1.2	Unshielded	Unshielded	-
8	Signal Cable	1.1	Unshielded	Unshielded	-
9	Signal Cable	1.6	Unshielded	Unshielded	-
10	Signal Cable	1.6	Unshielded	Unshielded	-
11	Signal Cable	1.6	Unshielded	Unshielded	-
12	Signal Cable	1.6	Unshielded	Unshielded	-
13	Audio Cable	1.5	Shielded	Shielded	-
14	DC, Illumination, Accessory Cable	1.0	Unshielded	Unshielded	-

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SECTION 5: Radiated Spurious Emission

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m 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 m and 4 m 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	30 MHz to 300 MHz	300 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

In any 100 kHz 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 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9 (IC) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (IC).

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

*1) Although DA 00-705 accepts VBW = 10 Hz 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.

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

Measurement range : 30 M - 26.5 GHz
 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
20dB Bandwidth	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak Average *3)	-	Power Meter (Sensor: 50MHz BW)
Carrier Frequency Separation	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Number of Hopping Frequency	30 MHz	300 kHz	1 MHz	Auto	Peak	Max Hold	Spectrum Analyzer
Dwell Time	Zero Span	100 kHz, 1 MHz	300 kHz, 3 MHz	As necessary capture the entire dwell time per hopping channel	Peak	Clear Write	Spectrum Analyzer
Conducted Spurious Emission *2)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	9.1 kHz	27 kHz				
	30 MHz to 25 GHz	100 kHz	300 kHz				
Conducted Spurious Emission Band Edge compliance	10 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
*1) Peak hold was applied as Worst-case measurement. *2) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was low enough as shown in the chart. (9 kHz - 150 kHz: RBW = 200Hz, 150 kHz - 30 MHz: RBW = 9.1 kHz). *3) Reference data							

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: Test data

20dB Bandwidth and Carrier Frequency Separation

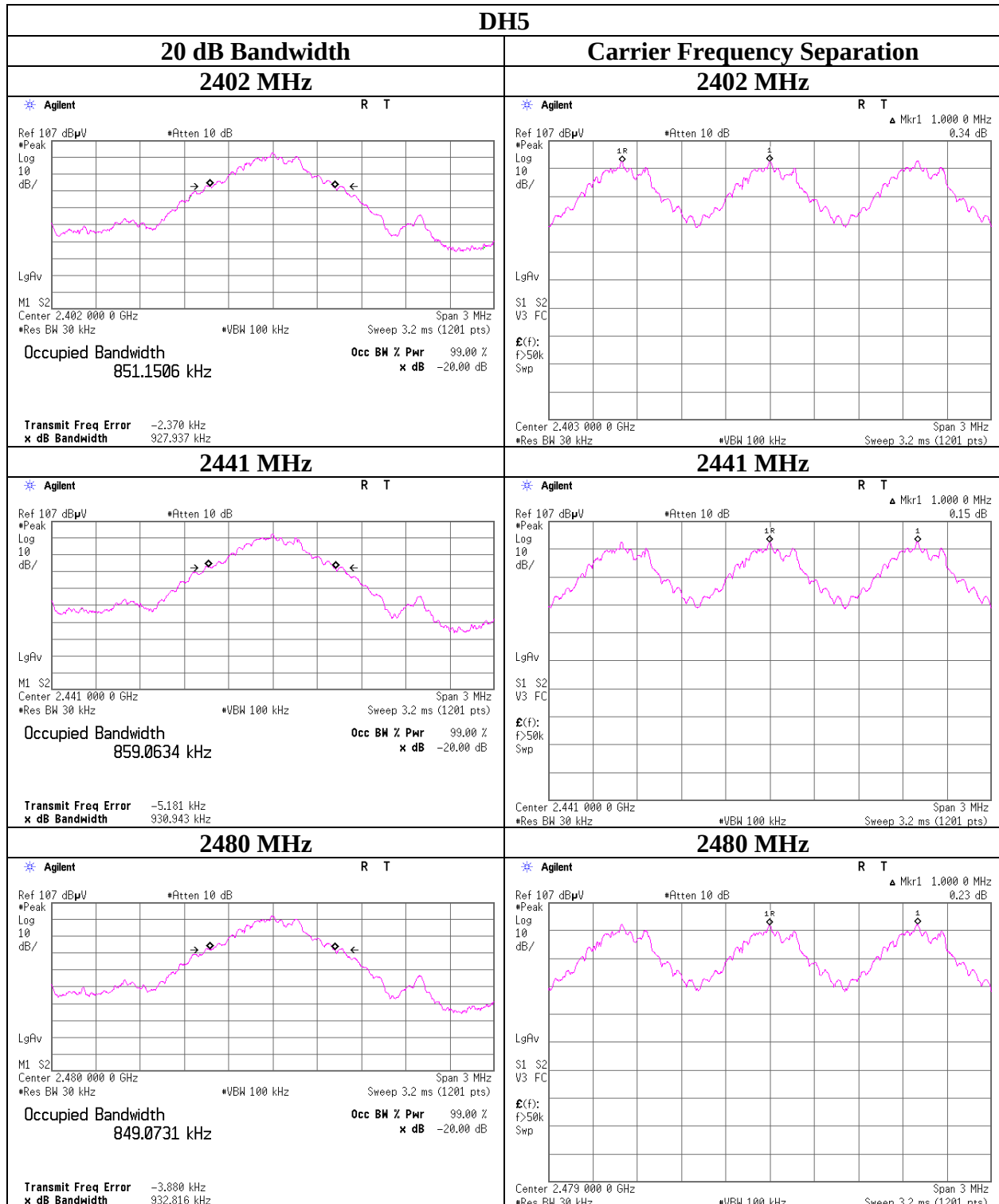
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10990564H
Date	October 19, 2015
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Kazuya Yoshioka
Mode	Tx, Hopping On/Off

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.928	1.000	≥ 0.619
DH5	2441.0	0.931	1.000	≥ 0.621
DH5	2480.0	0.933	1.000	≥ 0.622
3DH5	2402.0	1.297	1.000	≥ 0.865
3DH5	2441.0	1.281	1.000	≥ 0.854
3DH5	2480.0	1.255	1.000	≥ 0.837

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.

20dB Bandwidth and Carrier Frequency Separation



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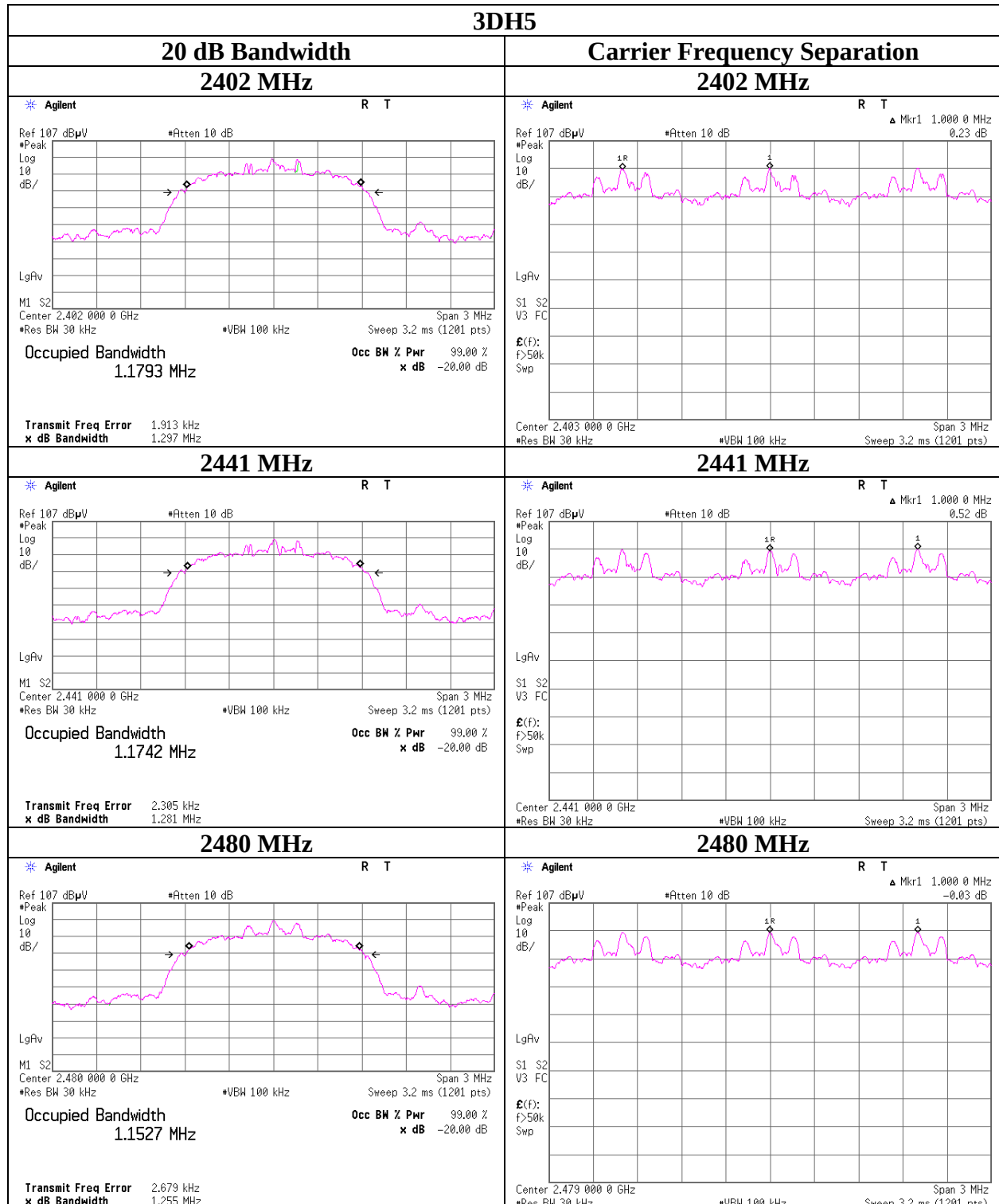
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20dB Bandwidth and Carrier Frequency Separation



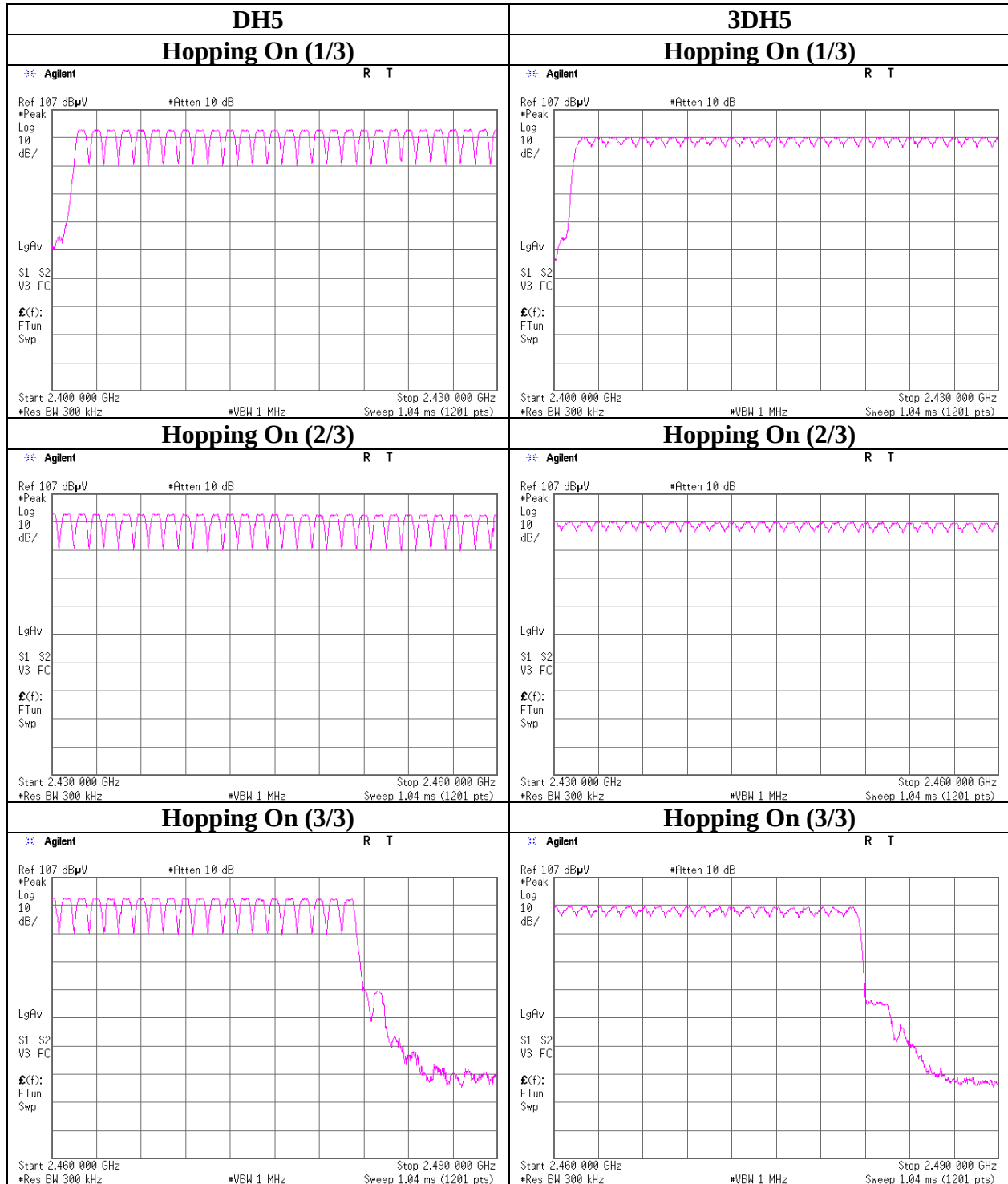
Number of Hopping Frequency

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 10990564H
Date October 19, 2015
Temperature / Humidity 23 deg. C / 45 % RH
Engineer Kazuya Yoshioka
Mode Tx, Hopping On

Mode	Number of channel [channels]	Limit [channels]
DH5	79	≥ 15
3DH5	79	≥ 15

Test was not performed at AFH mode whose number of hopping channel is 20 channels because this Bluetooth radio is in compliance of Bluetooth Specification.

Number of Hopping Frequency



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Dwell time

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 10990564H
Date October 19, 2015
Temperature / Humidity 23 deg. C / 45 % RH
Engineer Kazuya Yoshioka
Mode Tx, Hopping On

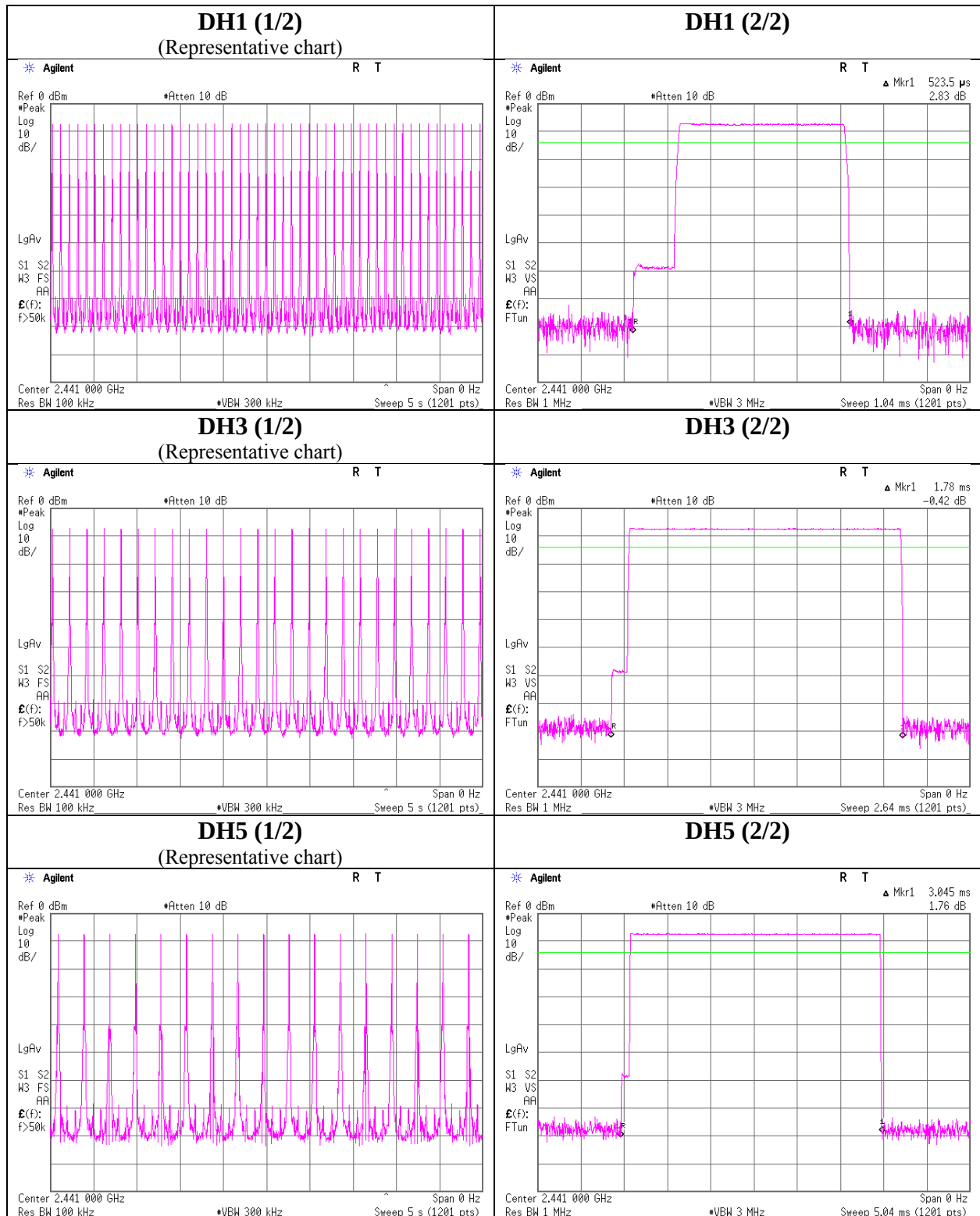
Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8 (32 Hopping x 0.4) second period				Length of transmission [msec]	Result [msec]	Limit [msec]
DH1	51.0 times	/	5 sec.	x 31.6 sec. = 323 times	0.524	169	400
DH3	26.0 times	/	5 sec.	x 31.6 sec. = 165 times	1.780	294	400
DH5	17.0 times	/	5 sec.	x 31.6 sec. = 108 times	3.045	329	400
3DH1	51.0 times	/	5 sec.	x 31.6 sec. = 323 times	0.541	175	400
3DH3	26.0 times	/	5 sec.	x 31.6 sec. = 165 times	1.797	297	400
3DH5	17.0 times	/	5 sec.	x 31.6 sec. = 108 times	3.053	330	400

Sample Calculation

Result = Number of transmission x Length of transmission

This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in $N \times 0.4s$, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than $0.4s$ regardless of packet size. This is confirmed in the test report for $N = 79$.

Dwell time



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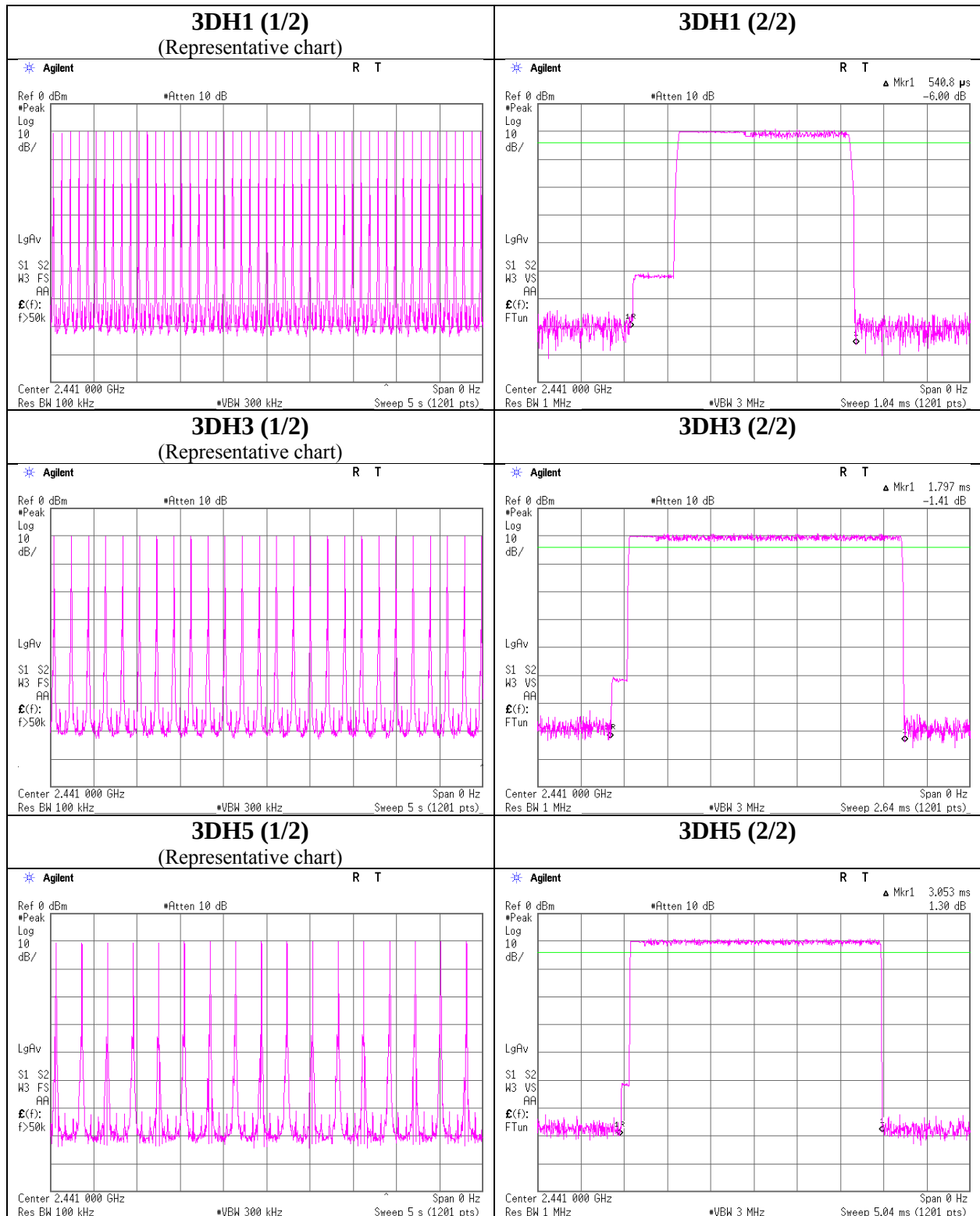
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Dwell time



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Maximum Peak Output Power

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10990564H
Date : October 19, 2015
Temperature / Humidity : 23 deg. C / 45 % RH
Engineer : Kazuya Yoshioka
Mode : Tx, Hopping Off

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
DH5	2402.0	-7.26	4.22	9.77	6.73	4.71	20.96	125	14.23
DH5	2441.0	-7.09	4.22	9.77	6.90	4.90	20.96	125	14.06
DH5	2480.0	-7.47	4.22	9.77	6.52	4.49	20.96	125	14.44
2DH5	2402.0	-8.57	4.22	9.77	5.42	3.48	20.96	125	15.54
2DH5	2441.0	-8.79	4.22	9.77	5.20	3.31	20.96	125	15.76
2DH5	2480.0	-9.37	4.22	9.77	4.62	2.90	20.96	125	16.34
3DH5	2402.0	-8.44	4.22	9.77	5.55	3.59	20.96	125	15.41
3DH5	2441.0	-8.64	4.22	9.77	5.35	3.43	20.96	125	15.61
3DH5	2480.0	-9.21	4.22	9.77	4.78	3.01	20.96	125	16.18

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT.

As this device had AFH mode and frequency separation could not meet the requirement of over 20dB BW without 2/3 relaxation, 125mW power limit was applied to it.

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Average Output Power
(Reference data for SAR testing)

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10990564H
Date : October 19, 2015
Temperature / Humidity : 23 deg. C / 45 % RH
Engineer : Kazuya Yoshioka
Mode : Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)	
					[dBm]	[mW]
DH5	2402.0	-8.55	4.22	9.77	5.44	3.50
DH5	2441.0	-8.36	4.22	9.77	5.63	3.66
DH5	2480.0	-8.74	4.22	9.77	5.25	3.35
2DH5	2402.0	-12.07	4.22	9.77	1.92	1.56
2DH5	2441.0	-12.24	4.22	9.77	1.75	1.50
2DH5	2480.0	-12.91	4.22	9.77	1.08	1.28
3DH5	2402.0	-11.99	4.22	9.77	2.00	1.58
3DH5	2441.0	-12.23	4.22	9.77	1.76	1.50
3DH5	2480.0	-12.89	4.22	9.77	1.10	1.29

Sample Calculation:

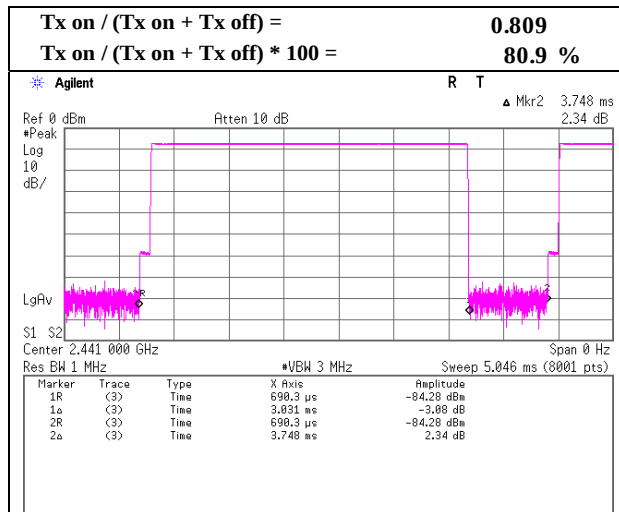
Result (Frame power) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

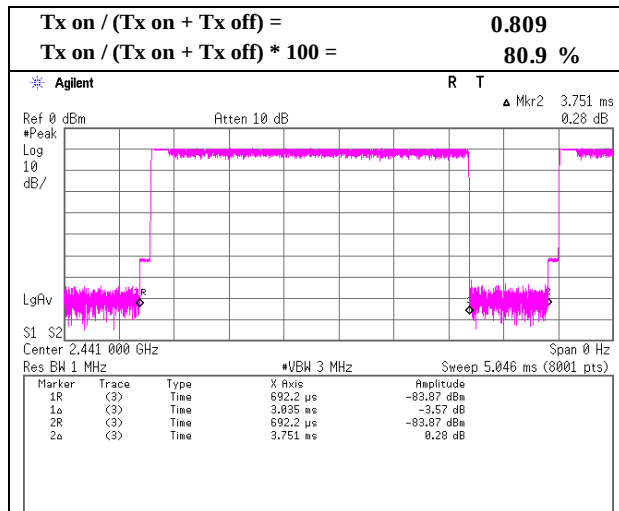
Burst Rate Confirmation

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10990564H
Date	October 19, 2015
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Kazuya Yoshioka
Mode	Tx, Hopping Off

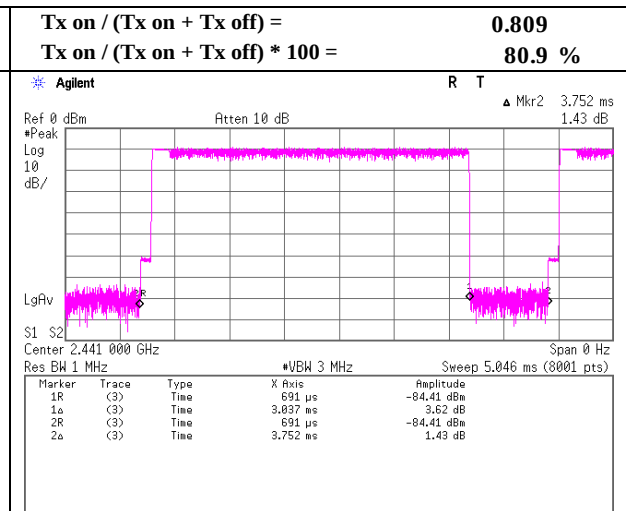
DH5



2DH5



3DH5



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Radiated Spurious Emission

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 10990564H
Date : October 23, 2015 October 23, 2015
Temperature / Humidity : 22 deg. C / 54 % RH 24 deg. C / 52 % RH
Engineer : Yutaka Yoshida Tsubasa Takayama
(1-10GHz) (Below 1GHz)
Mode : Tx, Hopping Off, DH5 2402 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.260	QP	47.6	8.2	7.5	32.0	31.3	40.0	8.7	
Hori	121.508	QP	39.6	12.8	8.4	32.0	28.8	43.5	14.7	
Hori	150.005	QP	45.6	15.0	8.7	31.9	37.4	43.5	6.1	
Hori	300.000	QP	43.3	19.7	9.9	31.8	41.1	46.0	4.9	
Hori	450.100	QP	40.0	18.8	10.9	31.9	37.8	46.0	8.2	
Hori	601.604	QP	35.3	20.2	11.8	32.1	35.2	46.0	10.8	
Hori	792.389	QP	30.0	23.1	12.8	31.7	34.2	46.0	11.8	
Hori	900.408	QP	29.8	24.5	13.3	31.2	36.4	46.0	9.6	
Hori	1602.023	PK	55.0	25.8	2.3	33.2	49.9	73.9	24.0	
Hori	2390.000	PK	44.6	27.9	2.7	32.1	43.1	73.9	30.9	
Hori	4804.000	PK	53.7	32.8	4.7	31.3	59.9	73.9	14.0	
Hori	7206.000	PK	41.6	36.8	5.6	32.6	51.4	73.9	22.5	NS
Hori	9608.000	PK	42.7	38.1	6.1	32.6	54.3	73.9	19.6	NS
Hori	1602.023	AV	53.0	25.8	2.3	33.2	47.9	53.9	6.0	
Hori	2390.000	AV	32.1	27.9	2.7	32.1	30.6	53.9	23.3	
Hori	4804.000	AV	38.6	32.8	4.7	31.3	44.8	53.9	9.1	
Hori	7206.000	AV	31.4	36.8	5.6	32.6	41.2	53.9	12.7	NS
Hori	9608.000	AV	32.2	38.1	6.1	32.6	43.8	53.9	10.1	NS
Vert	57.260	QP	49.4	8.2	7.5	32.0	33.1	40.0	6.9	
Vert	121.508	QP	42.4	12.8	8.4	32.0	31.6	43.5	11.9	
Vert	150.005	QP	43.4	15.0	8.7	31.9	35.2	43.5	8.3	
Vert	300.000	QP	41.2	19.7	9.9	31.8	39.0	46.0	7.0	
Vert	450.100	QP	37.3	18.8	10.9	31.9	35.1	46.0	10.9	
Vert	600.201	QP	32.4	20.1	11.8	32.1	32.2	46.0	13.8	
Vert	792.389	QP	33.6	23.1	12.8	31.7	37.8	46.0	8.2	
Vert	900.408	QP	32.8	24.5	13.3	31.2	39.4	46.0	6.6	
Vert	1602.023	PK	54.3	25.8	2.3	33.2	49.2	73.9	24.8	
Vert	2390.000	PK	44.6	27.9	2.7	32.1	43.1	73.9	30.8	
Vert	4804.000	PK	58.0	32.8	4.7	31.3	64.2	73.9	9.7	
Vert	7206.000	PK	41.2	36.8	5.6	32.6	51.0	73.9	22.9	NS
Vert	9608.000	PK	42.8	38.1	6.1	32.6	54.4	73.9	19.5	NS
Vert	1602.023	AV	52.2	25.8	2.3	33.2	47.1	53.9	6.8	
Vert	2390.000	AV	31.2	27.9	2.7	32.1	29.7	53.9	24.2	
Vert	4804.000	AV	43.8	32.8	4.7	31.3	50.0	53.9	3.9	
Vert	7206.000	AV	31.8	36.8	5.6	32.6	41.6	53.9	12.3	NS
Vert	9608.000	AV	32.2	38.1	6.1	32.6	43.8	53.9	10.1	NS

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

NS: No signal detected.

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	102.6	28.0	2.7	32.1	101.2	-	-	Carrier
Hori	2400.000	PK	59.0	28.0	2.7	32.1	57.6	81.2	23.6	
Vert	2402.000	PK	100.0	28.0	2.7	32.1	98.6	-	-	Carrier
Vert	2400.000	PK	56.9	28.0	2.7	32.1	55.5	78.6	23.1	

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

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Ise EMC Lab.

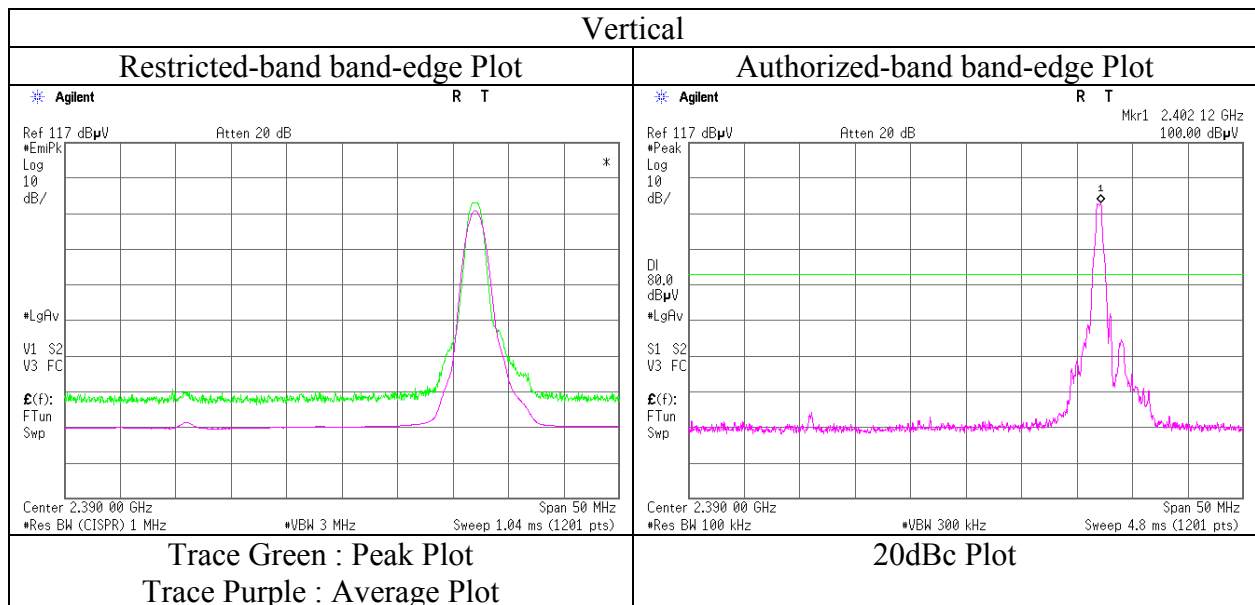
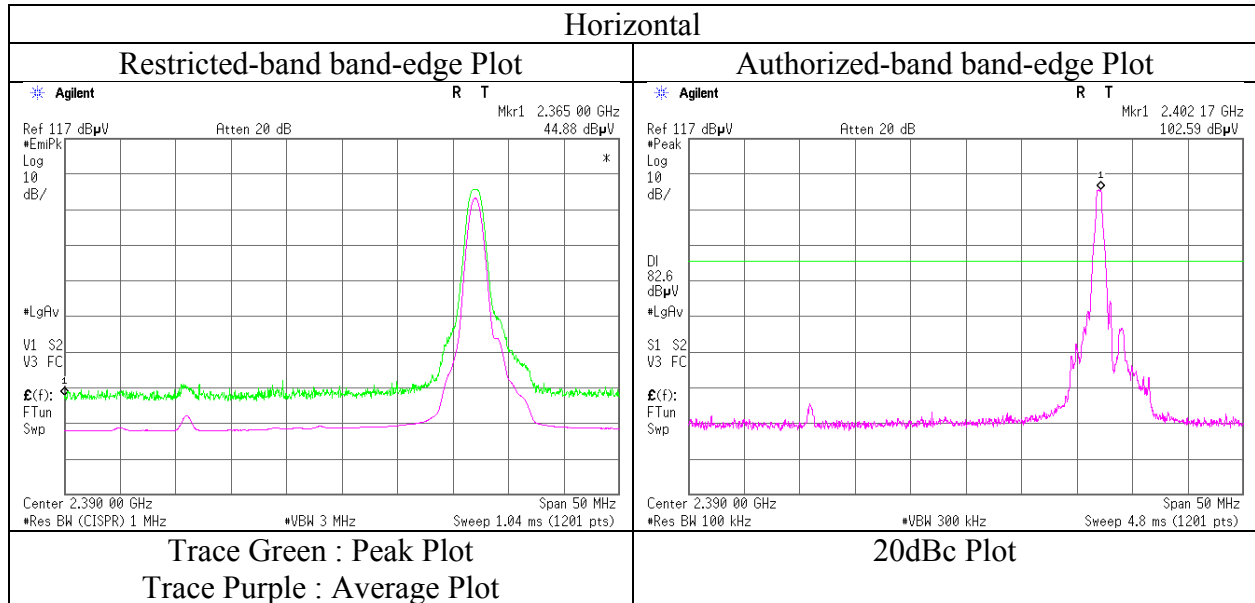
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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	10990564H
Date	October 23, 2015
Temperature / Humidity	22 deg. C / 54 % RH
Engineer	Yutaka Yoshida
Mode	Tx, Hopping Off, DH5 2402 MHz



* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 10990564H
Date : October 23, 2015 (Day) October 23, 2015 (Night)
Temperature / Humidity : 22 deg. C / 54 % RH 24 deg. C / 52 % RH
Engineer : Yutaka Yoshida Tsubasa Takayama
(1-10GHz) (Below 1GHz)
Mode : Tx, Hopping Off, DH5 2441 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.260	QP	47.6	8.2	7.5	32.0	31.3	40.0	8.7	
Hori	121.508	QP	40.5	12.8	8.4	32.0	29.7	43.5	13.8	
Hori	150.005	QP	41.5	15.0	8.7	31.9	33.3	43.5	10.2	
Hori	300.000	QP	43.3	19.7	9.9	31.8	41.1	46.0	4.9	
Hori	450.100	QP	40.2	18.8	10.9	31.9	38.0	46.0	8.0	
Hori	601.604	QP	35.6	20.2	11.8	32.1	35.5	46.0	10.5	
Hori	792.389	QP	30.0	23.1	12.8	31.7	34.2	46.0	11.8	
Hori	900.408	QP	29.7	24.5	13.3	31.2	36.3	46.0	9.7	
Hori	1626.700	PK	54.5	25.9	2.3	33.1	49.6	73.9	24.3	
Hori	4882.000	PK	55.6	33.1	4.8	31.3	62.2	73.9	11.7	
Hori	7323.000	PK	42.2	36.8	5.6	32.6	52.0	73.9	21.9	NS
Hori	9764.000	PK	43.4	38.2	6.2	32.7	55.1	73.9	18.8	NS
Hori	1626.700	AV	49.9	25.9	2.3	33.1	45.0	53.9	8.9	
Hori	4882.000	AV	40.4	33.1	4.8	31.3	47.0	53.9	6.9	
Hori	7323.000	AV	30.6	36.8	5.6	32.6	40.4	53.9	13.5	NS
Hori	9764.000	AV	32.2	38.2	6.2	32.7	43.9	53.9	10.0	NS
Vert	57.260	QP	49.2	8.2	7.5	32.0	32.9	40.0	7.1	
Vert	121.508	QP	42.4	12.8	8.4	32.0	31.6	43.5	11.9	
Vert	150.005	QP	41.2	15.0	8.7	31.9	33.0	43.5	10.5	
Vert	300.000	QP	42.2	19.7	9.9	31.8	40.0	46.0	6.0	
Vert	450.100	QP	37.6	18.8	10.9	31.9	35.4	46.0	10.6	
Vert	600.201	QP	33.2	20.1	11.8	32.1	33.0	46.0	13.0	
Vert	696.787	QP	33.4	22.3	12.3	32.2	35.8	46.0	10.2	
Vert	900.408	QP	33.0	24.5	13.3	31.2	39.6	46.0	6.4	
Vert	1626.700	PK	51.4	25.9	2.3	33.1	46.5	73.9	27.4	
Vert	4882.000	PK	55.9	33.1	4.8	31.3	62.5	73.9	11.4	
Vert	7323.000	PK	42.3	36.8	5.6	32.6	52.1	73.9	21.8	NS
Vert	9764.000	PK	43.9	38.2	6.2	32.7	55.6	73.9	18.3	NS
Vert	1626.700	AV	48.4	25.9	2.3	33.1	43.5	53.9	10.4	
Vert	4882.000	AV	40.8	33.1	4.8	31.3	47.4	53.9	6.5	
Vert	7323.000	AV	30.7	36.8	5.6	32.6	40.5	53.9	13.4	NS
Vert	9764.000	AV	32.3	38.2	6.2	32.7	44.0	53.9	9.9	NS

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

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10 GHz - 26.5 GHz $20\log(3.0\text{ m} / 1.0\text{ m}) = 9.5\text{ dB}$

NS: No signal detected.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	10990564H
Date	October 23, 2015 (Day) October 23, 2015 (Night)
Temperature / Humidity	22 deg. C / 54 % RH 24 deg. C / 52 % RH
Engineer	Yutaka Yoshida Tsubasa Takayama
	(1-10GHz) (Below 1GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.260	QP	47.8	8.2	7.5	32.0	31.5	40.0	8.5	
Hori	121.508	QP	41.0	12.8	8.4	32.0	30.2	43.5	13.3	
Hori	150.005	QP	41.2	15.0	8.7	31.9	33.0	43.5	10.5	
Hori	300.000	QP	43.4	19.7	9.9	31.8	41.2	46.0	4.8	
Hori	450.100	QP	40.0	18.8	10.9	31.9	37.8	46.0	8.2	
Hori	601.604	QP	35.2	20.2	11.8	32.1	35.1	46.0	10.9	
Hori	792.389	QP	30.4	23.1	12.8	31.7	34.6	46.0	11.4	
Hori	900.408	QP	30.0	24.5	13.3	31.2	36.6	46.0	9.4	
Hori	1652.658	PK	50.6	26.0	2.3	33.1	45.8	73.9	28.1	
Hori	2483.500	PK	50.9	28.1	2.8	32.1	49.7	73.9	24.2	
Hori	4960.000	PK	55.7	33.4	4.7	31.2	62.6	73.9	11.3	
Hori	7440.000	PK	42.7	36.8	5.6	32.7	52.4	73.9	21.5	NS
Hori	9920.000	PK	43.1	38.3	6.1	32.8	54.7	73.9	19.2	NS
Hori	1652.658	AV	49.3	26.0	2.3	33.1	44.5	53.9	9.4	
Hori	2483.500	AV	37.4	28.1	2.8	32.1	36.2	53.9	17.7	
Hori	4960.000	AV	37.8	33.4	4.7	31.2	44.7	53.9	9.2	
Hori	7440.000	AV	30.6	36.8	5.6	32.7	40.3	53.9	13.6	NS
Hori	9920.000	AV	32.0	38.3	6.1	32.8	43.6	53.9	10.3	NS
Vert	57.260	QP	49.1	8.2	7.5	32.0	32.8	40.0	7.2	
Vert	121.508	QP	42.5	12.8	8.4	32.0	31.7	43.5	11.8	
Vert	150.005	QP	41.2	15.0	8.7	31.9	33.0	43.5	10.5	
Vert	300.000	QP	42.4	19.7	9.9	31.8	40.2	46.0	5.8	
Vert	450.100	QP	38.0	18.8	10.9	31.9	35.8	46.0	10.2	
Vert	600.201	QP	33.4	20.1	11.8	32.1	33.2	46.0	12.8	
Vert	696.787	QP	33.2	22.3	12.3	32.2	35.6	46.0	10.4	
Vert	900.408	QP	33.0	24.5	13.3	31.2	39.6	46.0	6.4	
Vert	1652.658	PK	53.9	26.0	2.3	33.1	49.1	73.9	24.8	
Vert	2483.500	PK	47.8	28.1	2.8	32.1	46.6	73.9	27.3	
Vert	4960.000	PK	54.8	33.4	4.7	31.2	61.7	73.9	12.2	
Vert	7440.000	PK	41.7	36.8	5.6	32.7	51.4	73.9	22.5	NS
Vert	9920.000	PK	43.3	38.3	6.1	32.8	54.9	73.9	19.0	NS
Vert	1652.658	AV	50.8	26.0	2.3	33.1	46.0	53.9	7.9	
Vert	2483.500	AV	34.5	28.1	2.8	32.1	33.3	53.9	20.6	
Vert	4960.000	AV	36.8	33.4	4.7	31.2	43.7	53.9	10.2	
Vert	7440.000	AV	30.6	36.8	5.6	32.7	40.3	53.9	13.6	NS
Vert	9920.000	AV	32.1	38.3	6.1	32.8	43.7	53.9	10.2	NS

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

NS: No signal detected.

UL Japan, Inc.

Ise EMC Lab.

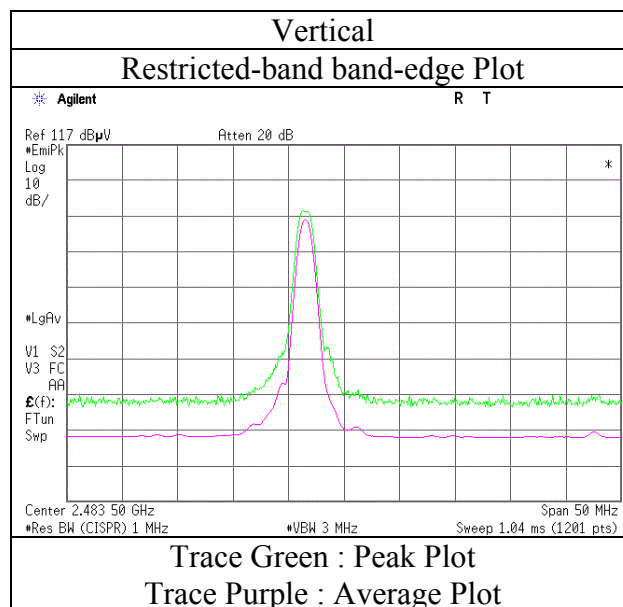
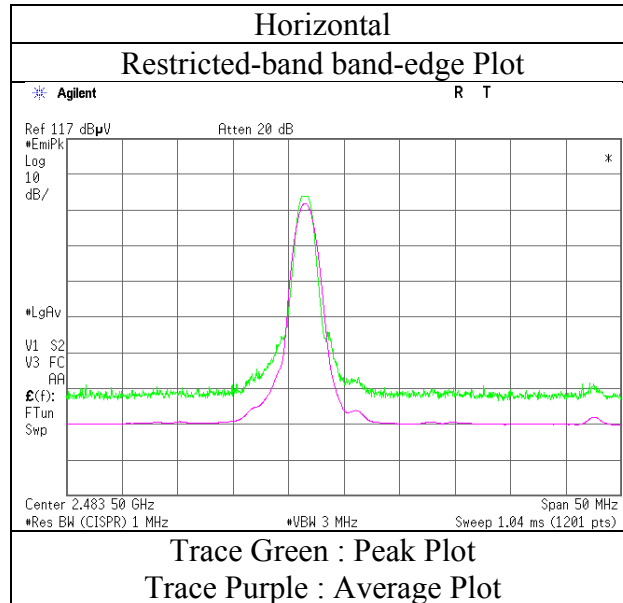
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	10990564H
Date	October 23, 2015
Temperature / Humidity	22 deg. C / 54 % RH
Engineer	Yutaka Yoshida
Mode	Tx, Hopping Off, DH5 2480 MHz



* Final result of restricted band edge was shown in tabular data.

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 10990564H
Date : October 23, 2015 (Day) October 23, 2015 (Night)
Temperature / Humidity : 23 deg. C / 54 % RH 24 deg. C / 52 % RH
Engineer : Yutaka Yoshida Tsubasa Takayama
(1-10GHz) (Below 1GHz)
Mode : Tx, Hopping Off, 3DH5 2402 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.260	QP	47.5	8.2	7.5	32.0	31.2	40.0	8.8	
Hori	121.508	QP	41.1	12.8	8.4	32.0	30.3	43.5	13.2	
Hori	150.005	QP	41.2	15.0	8.7	31.9	33.0	43.5	10.5	
Hori	300.000	QP	43.2	19.7	9.9	31.8	41.0	46.0	5.0	
Hori	450.100	QP	40.3	18.8	10.9	31.9	38.1	46.0	7.9	
Hori	601.604	QP	35.2	20.2	11.8	32.1	35.1	46.0	10.9	
Hori	792.389	QP	30.5	23.1	12.8	31.7	34.7	46.0	11.3	
Hori	900.408	QP	29.9	24.5	13.3	31.2	36.5	46.0	9.5	
Hori	1602.023	PK	56.2	25.8	2.3	33.2	51.1	73.9	22.8	
Hori	2390.000	PK	45.4	27.9	2.7	32.1	43.9	73.9	30.0	
Hori	4804.000	PK	50.3	32.8	4.7	31.3	56.5	73.9	17.4	
Hori	7206.000	PK	43.0	36.8	5.6	32.6	52.8	73.9	21.1	NS
Hori	9608.000	PK	44.1	38.1	6.1	32.6	55.7	73.9	18.2	NS
Hori	1602.023	AV	53.3	25.8	2.3	33.2	48.2	53.9	5.7	
Hori	2390.000	AV	33.0	27.9	2.7	32.1	31.5	53.9	22.4	
Hori	4804.000	AV	33.4	32.8	4.7	31.3	39.6	53.9	14.3	
Hori	7206.000	AV	31.3	36.8	5.6	32.6	41.1	53.9	12.8	NS
Hori	9608.000	AV	32.5	38.1	6.1	32.6	44.1	53.9	9.8	NS
Vert	57.260	QP	49.0	8.2	7.5	32.0	32.7	40.0	7.3	
Vert	121.508	QP	42.2	12.8	8.4	32.0	31.4	43.5	12.1	
Vert	150.005	QP	41.2	15.0	8.7	31.9	33.0	43.5	10.5	
Vert	300.000	QP	43.7	19.7	9.9	31.8	41.5	46.0	4.5	
Vert	450.100	QP	38.5	18.8	10.9	31.9	36.3	46.0	9.7	
Vert	600.201	QP	33.6	20.1	11.8	32.1	33.4	46.0	12.6	
Vert	696.787	QP	33.2	22.3	12.3	32.2	35.6	46.0	10.4	
Vert	900.408	QP	32.8	24.5	13.3	31.2	39.4	46.0	6.6	
Vert	1602.023	PK	50.9	25.8	2.3	33.2	45.8	73.9	28.1	
Vert	2390.000	PK	43.7	27.9	2.7	32.1	42.2	73.9	31.7	
Vert	4804.000	PK	52.6	32.8	4.7	31.3	58.8	73.9	15.1	
Vert	7206.000	PK	42.4	36.8	5.6	32.6	52.2	73.9	21.7	NS
Vert	9608.000	PK	44.5	38.1	6.1	32.6	56.1	73.9	17.8	NS
Vert	1602.023	AV	44.1	25.8	2.3	33.2	39.0	53.9	14.9	
Vert	2390.000	AV	31.5	27.9	2.7	32.1	30.0	53.9	23.9	
Vert	4804.000	AV	34.8	32.8	4.7	31.3	41.0	53.9	12.9	
Vert	7206.000	AV	31.4	36.8	5.6	32.6	41.2	53.9	12.7	NS
Vert	9608.000	AV	32.4	38.1	6.1	32.6	44.0	53.9	9.9	NS

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

NS: No signal detected.

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	102.1	28.0	2.7	32.1	100.7	-	-	Carrier
Hori	2400.000	PK	56.6	28.0	2.7	32.1	55.2	80.7	25.5	
Vert	2402.000	PK	98.2	28.0	2.7	32.1	96.8	-	-	Carrier
Vert	2400.000	PK	52.4	28.0	2.7	32.1	51.0	76.8	25.8	

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

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Ise EMC Lab.

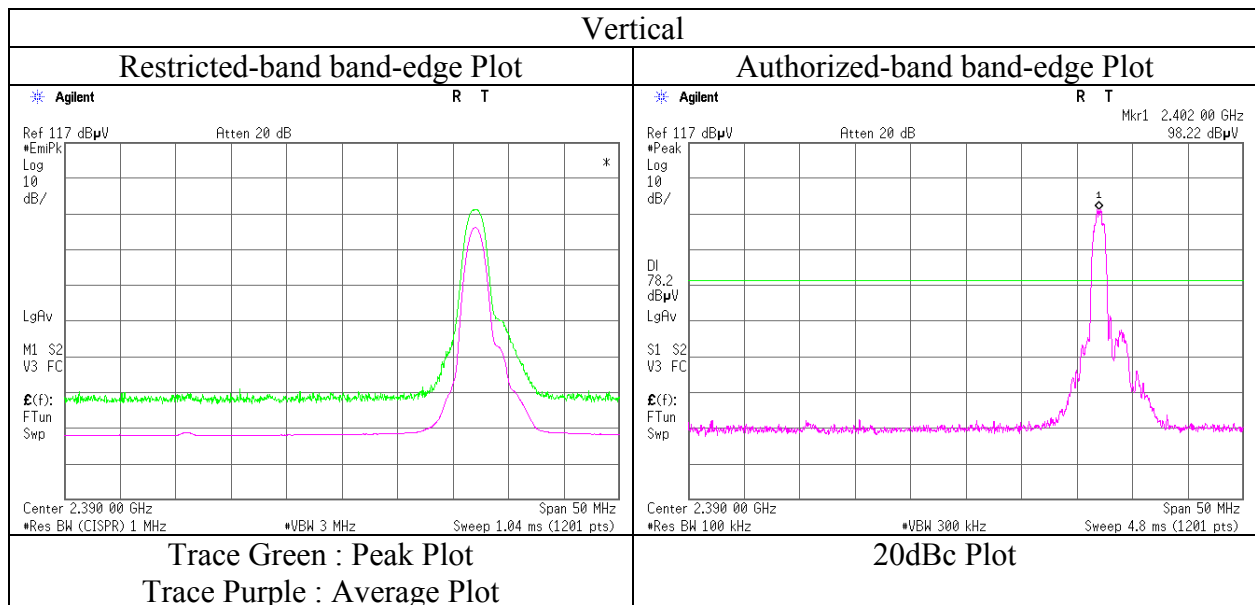
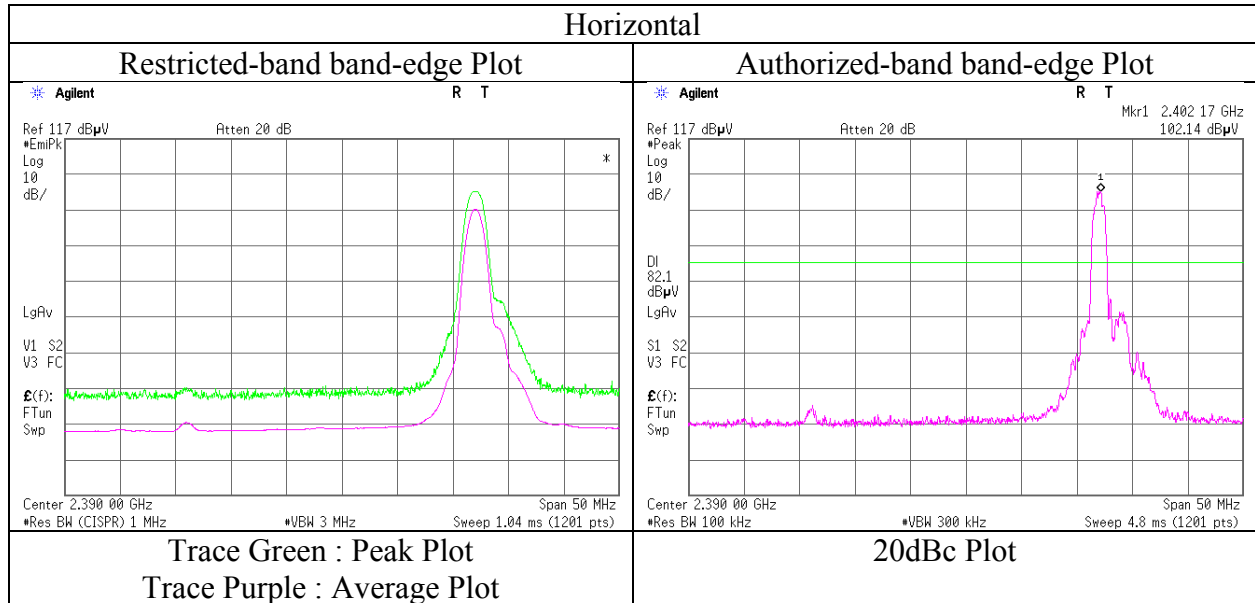
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	10990564H
Date	October 23, 2015
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Yutaka Yoshida
Mode	Tx, Hopping Off, 3DH5 2402 MHz



* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 10990564H
Date : October 23, 2015 (Day) October 23, 2015 (Night)
Temperature / Humidity : 22 deg. C / 52 % RH 24 deg. C / 52 % RH
Engineer : Yutaka Yoshida Tsubasa Takayama
(1-10GHz) (Below 1GHz)
Mode : Tx, Hopping Off, 3DH5 2441 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.260	QP	47.3	8.2	7.5	32.0	31.0	40.0	9.0	
Hori	121.508	QP	41.7	12.8	8.4	32.0	30.9	43.5	12.6	
Hori	150.005	QP	41.2	15.0	8.7	31.9	33.0	43.5	10.5	
Hori	300.000	QP	43.5	19.7	9.9	31.8	41.3	46.0	4.7	
Hori	450.100	QP	40.1	18.8	10.9	31.9	37.9	46.0	8.1	
Hori	601.604	QP	35.0	20.2	11.8	32.1	34.9	46.0	11.1	
Hori	792.389	QP	30.6	23.1	12.8	31.7	34.8	46.0	11.2	
Hori	900.408	QP	30.0	24.5	13.3	31.2	36.6	46.0	9.4	
Hori	1626.700	PK	53.3	25.9	2.3	33.1	48.4	73.9	25.5	
Hori	4882.000	PK	50.9	33.1	4.8	31.3	57.5	73.9	16.4	
Hori	7323.000	PK	42.9	36.8	5.6	32.6	52.7	73.9	21.2	NS
Hori	9764.000	PK	43.3	38.2	6.2	32.7	55.0	73.9	18.9	NS
Hori	1626.700	AV	50.1	25.9	2.3	33.1	45.2	53.9	8.7	
Hori	4882.000	AV	32.6	33.1	4.8	31.3	39.2	53.9	14.7	
Hori	7323.000	AV	30.7	36.8	5.6	32.6	40.5	53.9	13.4	NS
Hori	9764.000	AV	32.2	38.2	6.2	32.7	43.9	53.9	10.0	NS
Vert	57.260	QP	49.2	8.2	7.5	32.0	32.9	40.0	7.1	
Vert	121.508	QP	41.8	12.8	8.4	32.0	31.0	43.5	12.5	
Vert	150.005	QP	41.2	15.0	8.7	31.9	33.0	43.5	10.5	
Vert	300.000	QP	43.7	19.7	9.9	31.8	41.5	46.0	4.5	
Vert	450.100	QP	38.3	18.8	10.9	31.9	36.1	46.0	9.9	
Vert	600.201	QP	33.2	20.1	11.8	32.1	33.0	46.0	13.0	
Vert	696.787	QP	32.9	22.3	12.3	32.2	35.3	46.0	10.7	
Vert	900.408	QP	32.7	24.5	13.3	31.2	39.3	46.0	6.7	
Vert	1626.700	PK	50.6	25.9	2.3	33.1	45.7	73.9	28.3	
Vert	4882.000	PK	49.5	33.1	4.8	31.3	56.1	73.9	17.8	
Vert	7323.000	PK	42.4	36.8	5.6	32.6	52.2	73.9	21.7	NS
Vert	9764.000	PK	44.1	38.2	6.2	32.7	55.8	73.9	18.1	NS
Vert	1626.700	AV	46.8	25.9	2.3	33.1	41.9	53.9	12.0	
Vert	4882.000	AV	31.8	33.1	4.8	31.3	38.4	53.9	15.5	
Vert	7323.000	AV	30.7	36.8	5.6	32.6	40.5	53.9	13.4	NS
Vert	9764.000	AV	32.2	38.2	6.2	32.7	43.9	53.9	10.0	NS

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

NS: No signal detected.

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Ise EMC Lab.

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 10990564H
Date : October 23, 2015 (Day) October 23, 2015 (Night)
Temperature / Humidity : 22 deg. C / 52 % RH 24 deg. C / 52 % RH
Engineer : Yutaka Yoshida Tsubasa Takayama
(1-10GHz) (Below 1GHz)
Mode : Tx, Hopping Off, 3DH5 2480 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.260	QP	47.1	8.2	7.5	32.0	30.8	40.0	9.2	
Hori	121.508	QP	42.0	12.8	8.4	32.0	31.2	43.5	12.3	
Hori	150.005	QP	41.5	15.0	8.7	31.9	33.3	43.5	10.2	
Hori	300.000	QP	43.5	19.7	9.9	31.8	41.3	46.0	4.7	
Hori	450.100	QP	40.1	18.8	10.9	31.9	37.9	46.0	8.1	
Hori	601.604	QP	34.8	20.2	11.8	32.1	34.7	46.0	11.3	
Hori	792.389	QP	30.6	23.1	12.8	31.7	34.8	46.0	11.2	
Hori	900.408	QP	30.2	24.5	13.3	31.2	36.8	46.0	9.2	
Hori	1652.658	PK	51.2	26.0	2.3	33.1	46.4	73.9	27.5	
Hori	2483.500	PK	49.9	28.1	2.8	32.1	48.7	73.9	25.2	
Hori	4960.000	PK	49.9	33.4	4.7	31.2	56.8	73.9	17.1	
Hori	7440.000	PK	42.3	36.8	5.6	32.7	52.0	73.9	21.9	NS
Hori	9920.000	PK	44.1	38.3	6.1	32.8	55.7	73.9	18.2	NS
Hori	1652.658	AV	47.6	26.0	2.3	33.1	42.8	53.9	11.1	
Hori	2483.500	AV	37.9	28.1	2.8	32.1	36.7	53.9	17.2	
Hori	4960.000	AV	32.3	33.4	4.7	31.2	39.2	53.9	14.7	
Hori	7440.000	AV	32.2	36.8	5.6	32.7	41.9	53.9	12.0	NS
Hori	9920.000	AV	33.6	38.3	6.1	32.8	45.2	53.9	8.7	NS
Vert	57.260	QP	49.1	8.2	7.5	32.0	32.8	40.0	7.2	
Vert	121.508	QP	42.0	12.8	8.4	32.0	31.2	43.5	12.3	
Vert	150.005	QP	41.4	15.0	8.7	31.9	33.2	43.5	10.3	
Vert	300.000	QP	43.3	19.7	9.9	31.8	41.1	46.0	4.9	
Vert	450.100	QP	38.2	18.8	10.9	31.9	36.0	46.0	10.0	
Vert	600.201	QP	33.0	20.1	11.8	32.1	32.8	46.0	13.2	
Vert	696.787	QP	32.7	22.3	12.3	32.2	35.1	46.0	10.9	
Vert	900.408	QP	32.4	24.5	13.3	31.2	39.0	46.0	7.0	
Vert	1652.658	PK	54.3	26.0	2.3	33.1	49.5	73.9	24.4	
Vert	2483.500	PK	47.6	28.1	2.8	32.1	46.4	73.9	27.5	
Vert	4960.000	PK	53.2	33.4	4.7	31.2	60.1	73.9	13.8	
Vert	7440.000	PK	42.1	36.8	5.6	32.7	51.8	73.9	22.1	NS
Vert	9920.000	PK	43.8	38.3	6.1	32.8	55.4	73.9	18.5	NS
Vert	1652.658	AV	51.2	26.0	2.3	33.1	46.4	53.9	7.5	
Vert	2483.500	AV	35.7	28.1	2.8	32.1	34.5	53.9	19.4	
Vert	4960.000	AV	33.5	33.4	4.7	31.2	40.4	53.9	13.5	
Vert	7440.000	AV	32.1	36.8	5.6	32.7	41.8	53.9	12.1	NS
Vert	9920.000	AV	33.6	38.3	6.1	32.8	45.2	53.9	8.7	NS

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

NS: No signal detected.

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Ise EMC Lab.

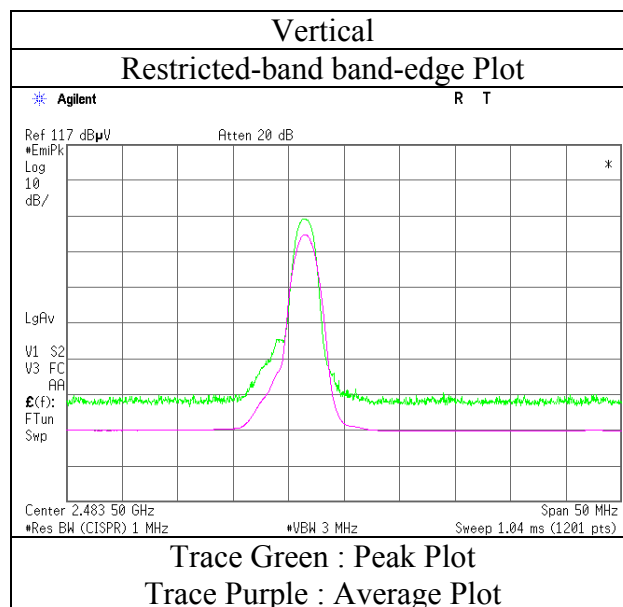
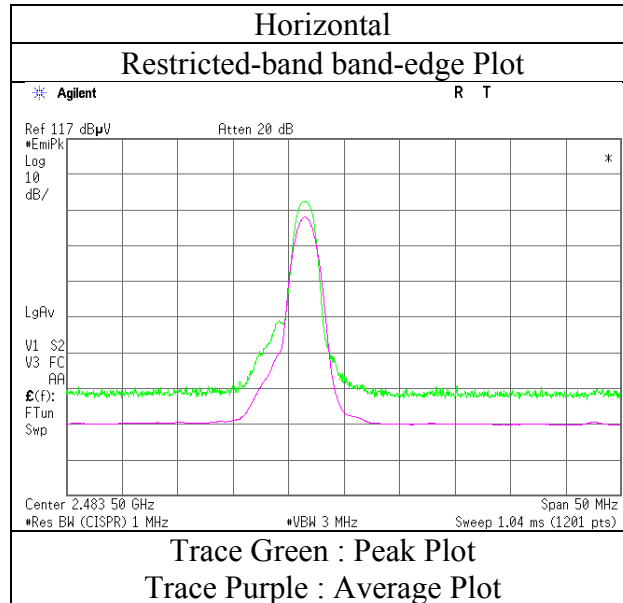
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	10990564H
Date	October 23, 2015
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Yutaka Yoshida
Mode	Tx, Hopping Off, 3DH5 2480 MHz



* Final result of restricted band edge was shown in tabular data.

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Ise EMC Lab.

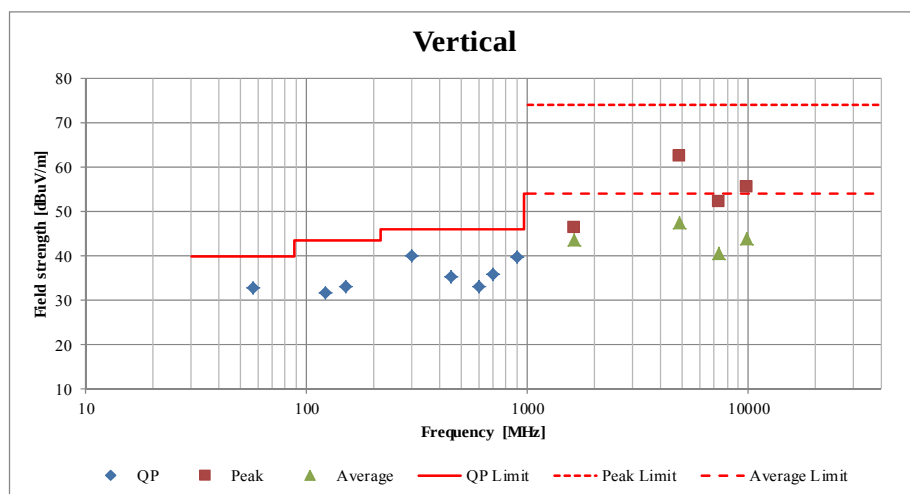
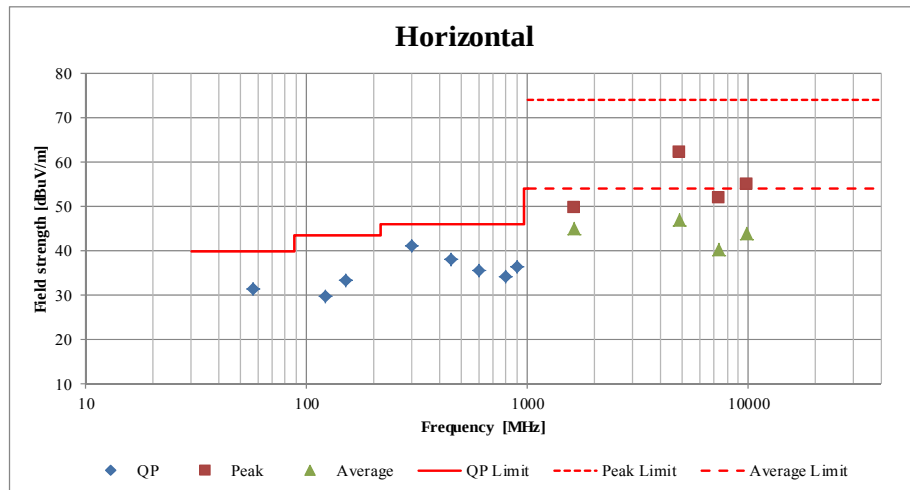
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission **(Plot data, Worst case)**

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber	
Report No.	10990564H	
Date	October 23, 2015	October 23, 2015
Temperature / Humidity	22 deg. C / 52 % RH	24 deg. C / 52 % RH
Engineer	Yutaka Yoshida	Tsubasa Takayama
Mode	Tx, Hopping Off, DH5 2441 MHz	

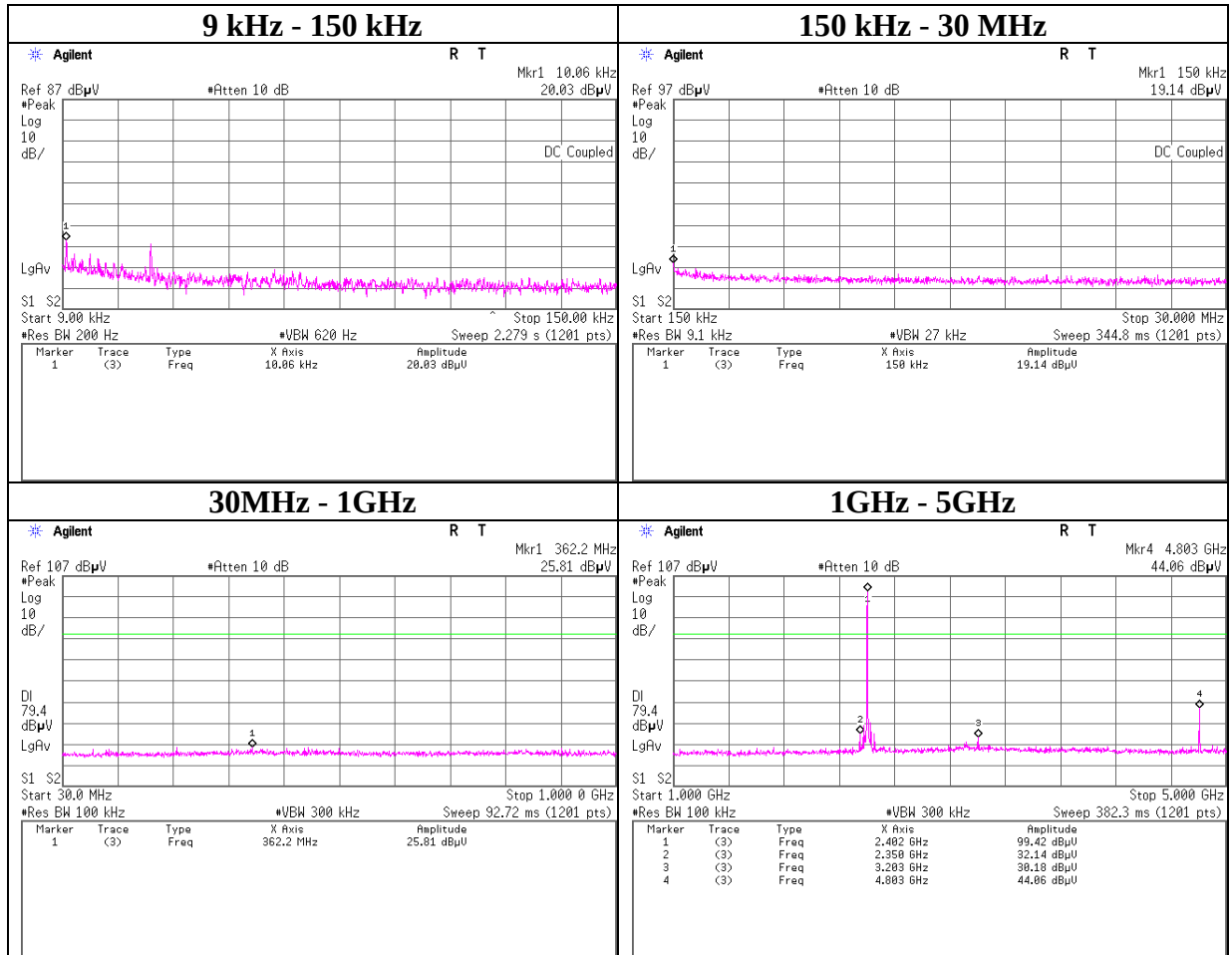


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10990564H
Date : October 19, 2015
Temperature / Humidity : 23 deg. C / 45 % RH
Engineer : Takayuki Shimada
Mode : Tx, Hopping Off, DH5

Tx DH5 2402 MHz



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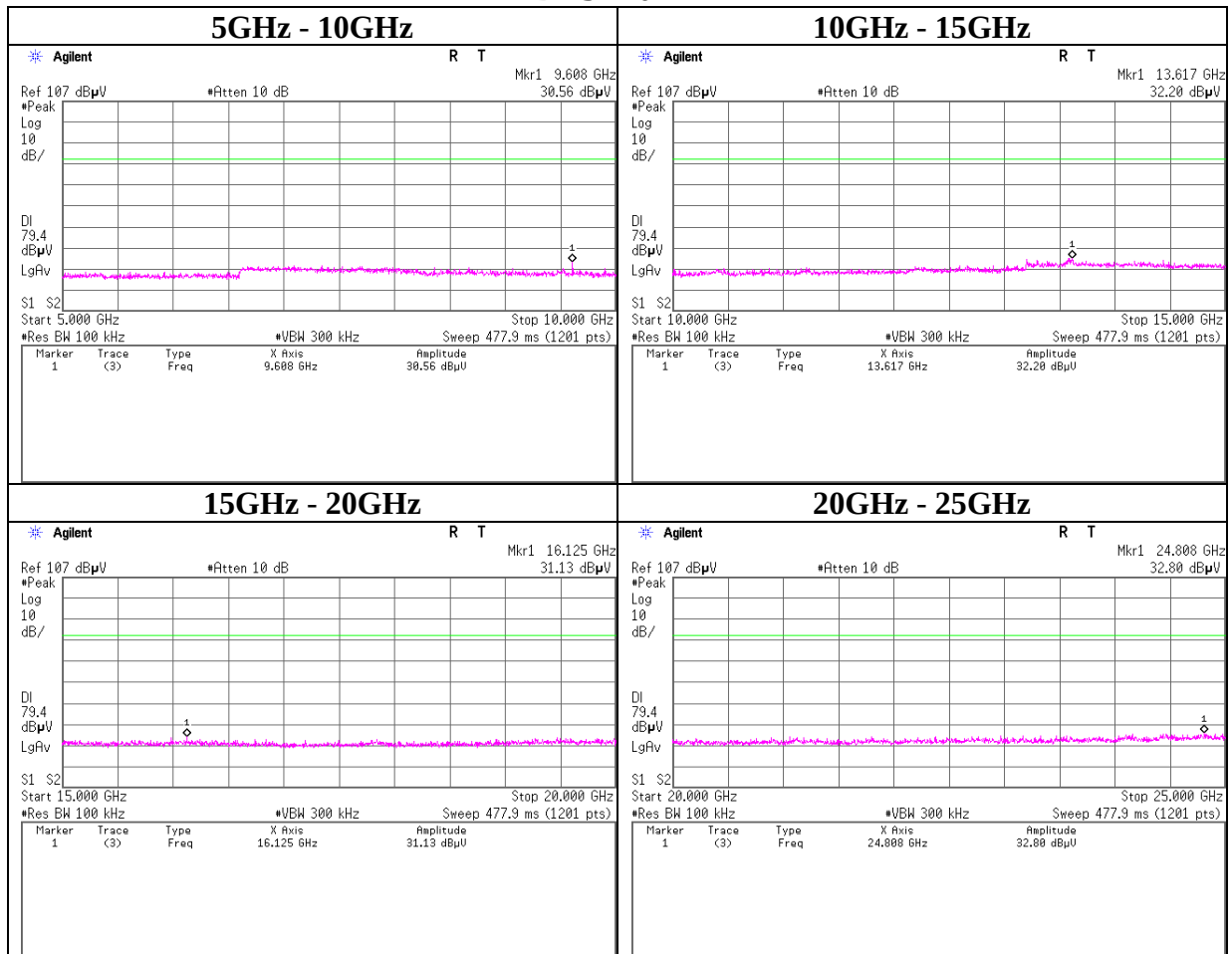
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10990564H
Date	October 19, 2015
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Kazuya Yoshioka
Mode	Tx, Hopping Off, DH5

Tx DH5 2402 MHz



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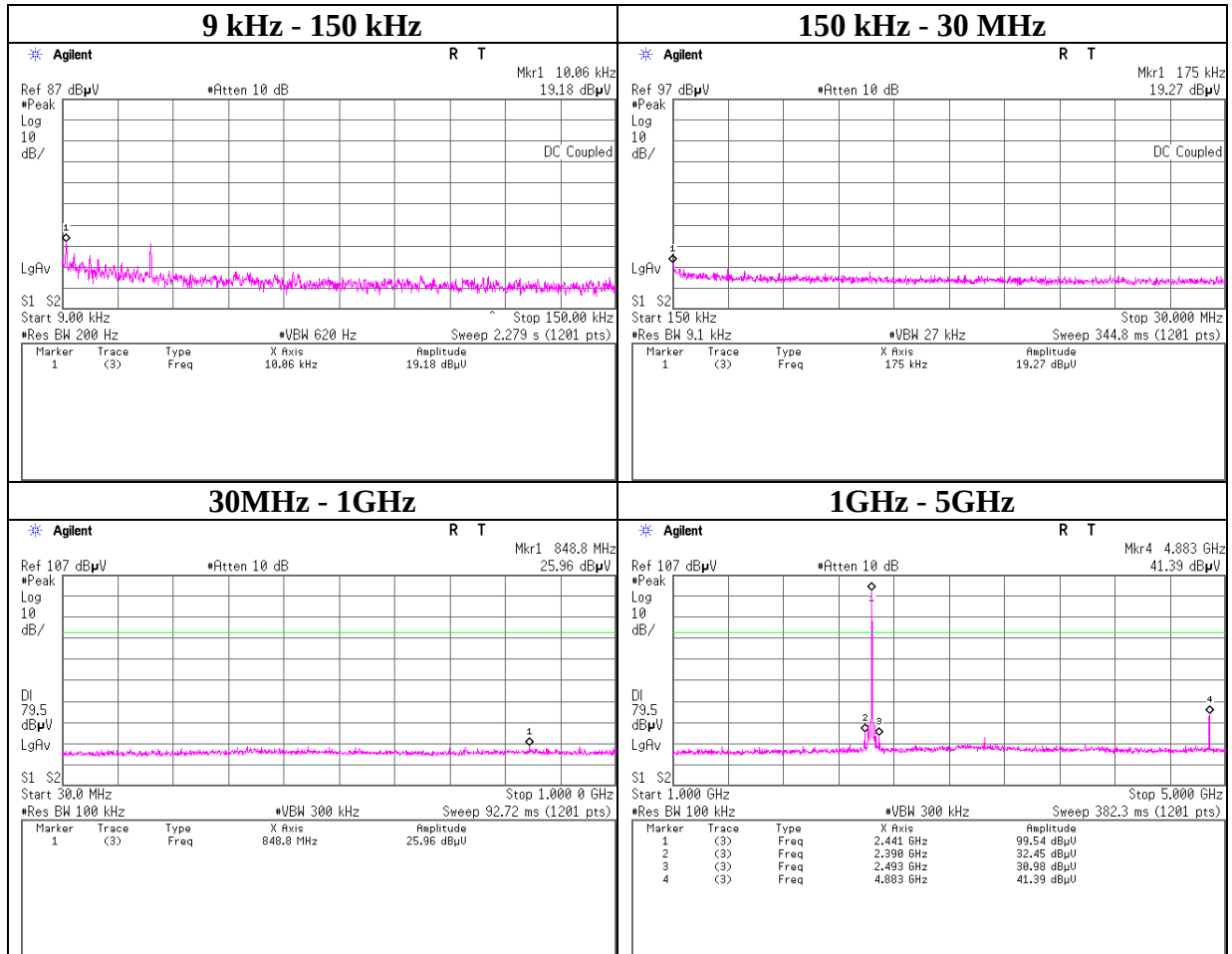
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10990564H
Date : October 19, 2015
Temperature / Humidity : 23 deg. C / 45 % RH
Engineer : Kazuya Yoshioka
Mode : Tx, Hopping Off, DH5

Tx DH5 2441 MHz



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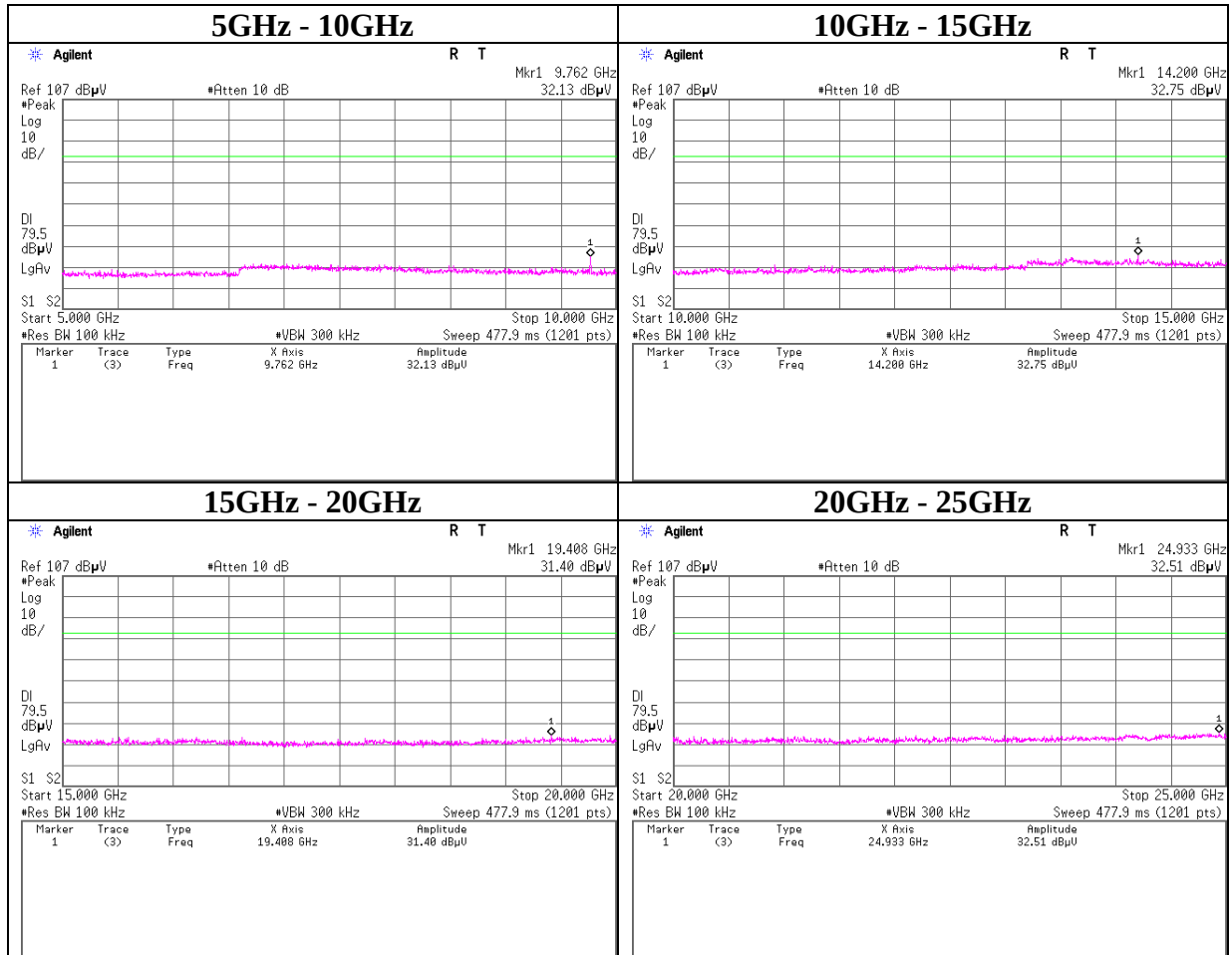
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10990564H
Date	October 19, 2015
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Kazuya Yoshioka
Mode	Tx, Hopping Off, DH5

Tx DH5 2441 MHz



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Ise EMC Lab.

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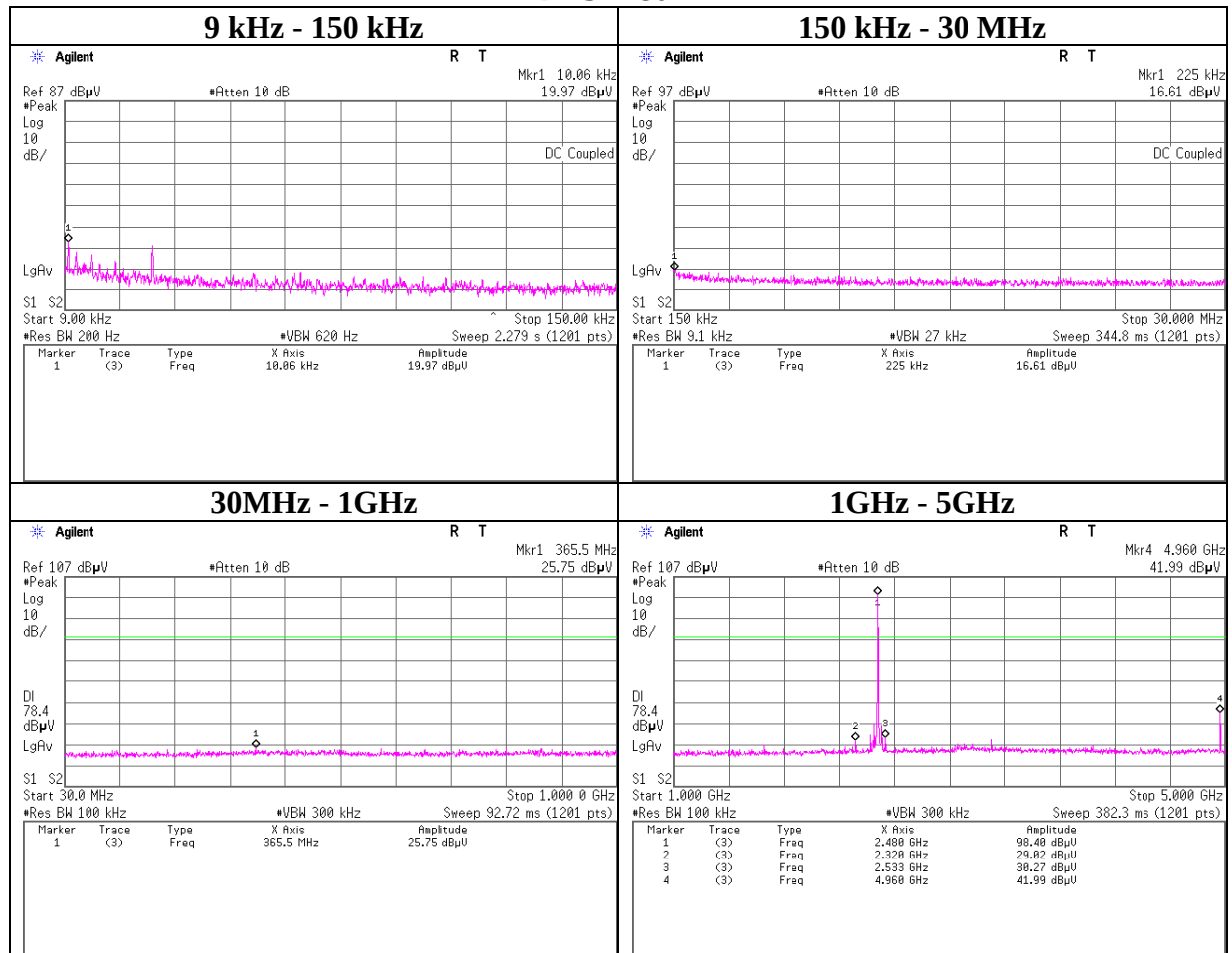
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10990564H
Date	October 19, 2015
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Kazuya Yoshioka
Mode	Tx, Hopping Off, DH5

Tx DH5 2480 MHz



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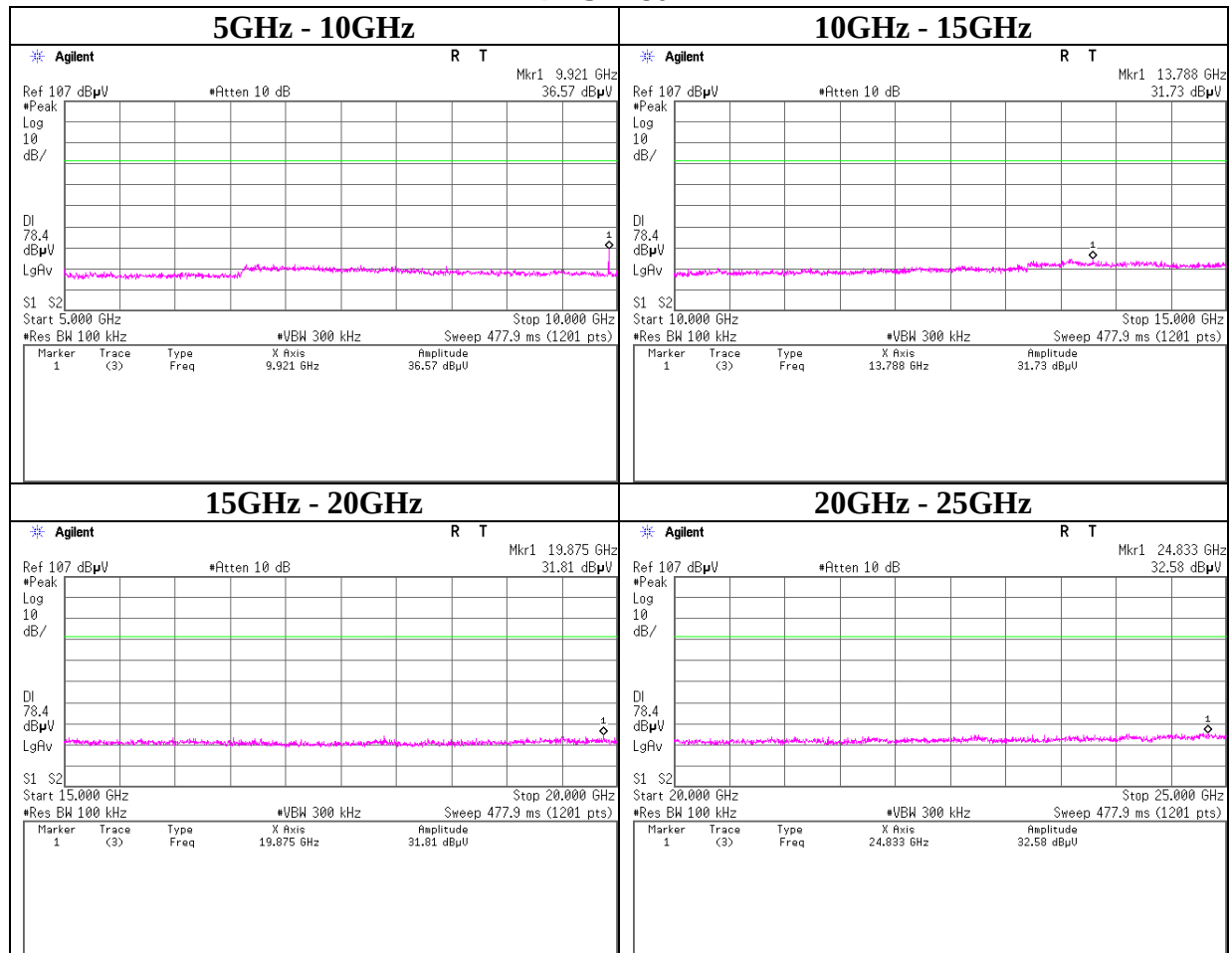
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10990564H
Date	October 19, 2015
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Kazuya Yoshioka
Mode	Tx, Hopping Off, DH5

Tx DH5 2480 MHz



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Ise EMC Lab.

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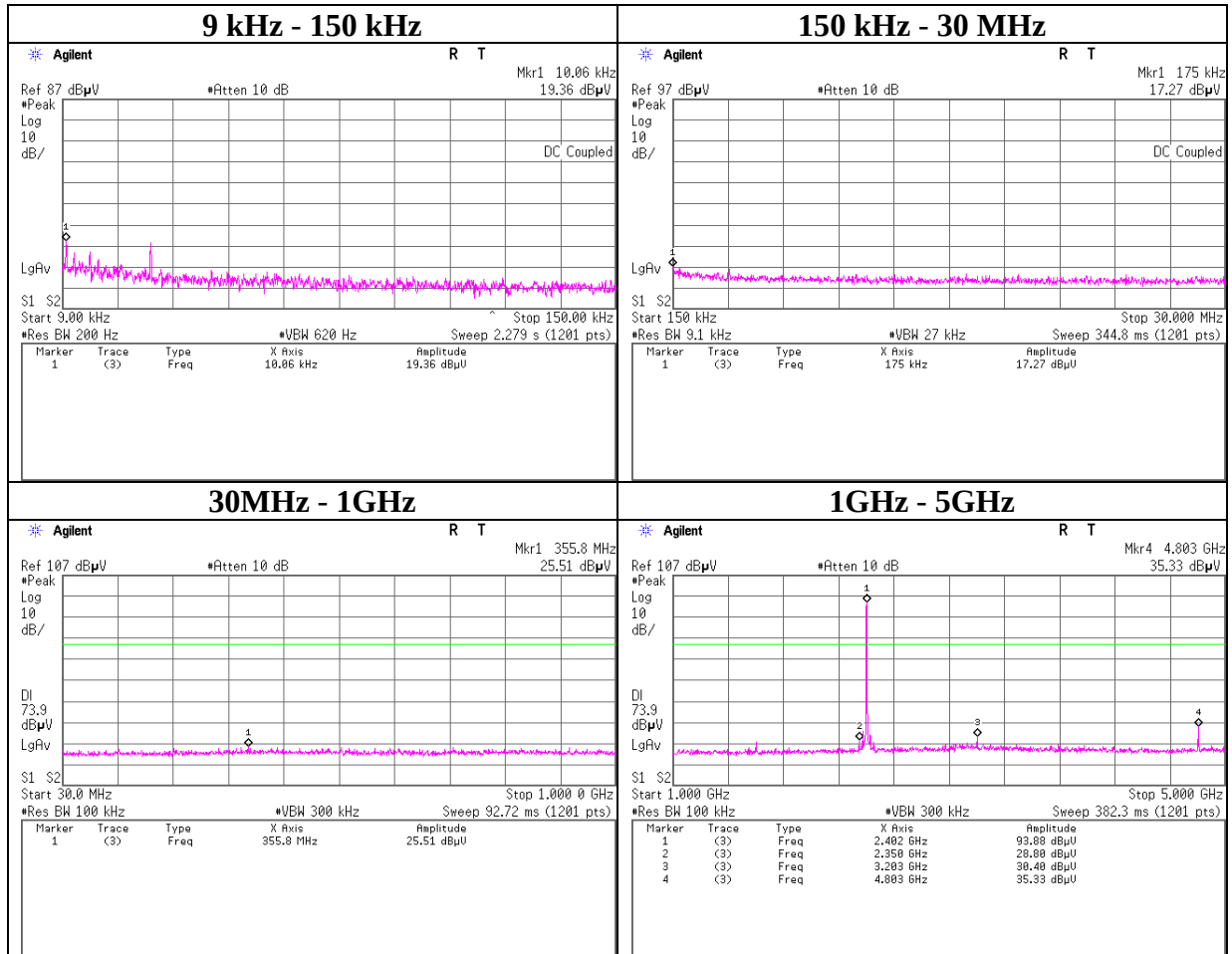
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10990564H
Date : October 19, 2015
Temperature / Humidity : 23 deg. C / 45 % RH
Engineer : Kazuya Yoshioka
Mode : Tx, Hopping Off, 3DH5

Tx 3DH5 2402 MHz



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Ise EMC Lab.

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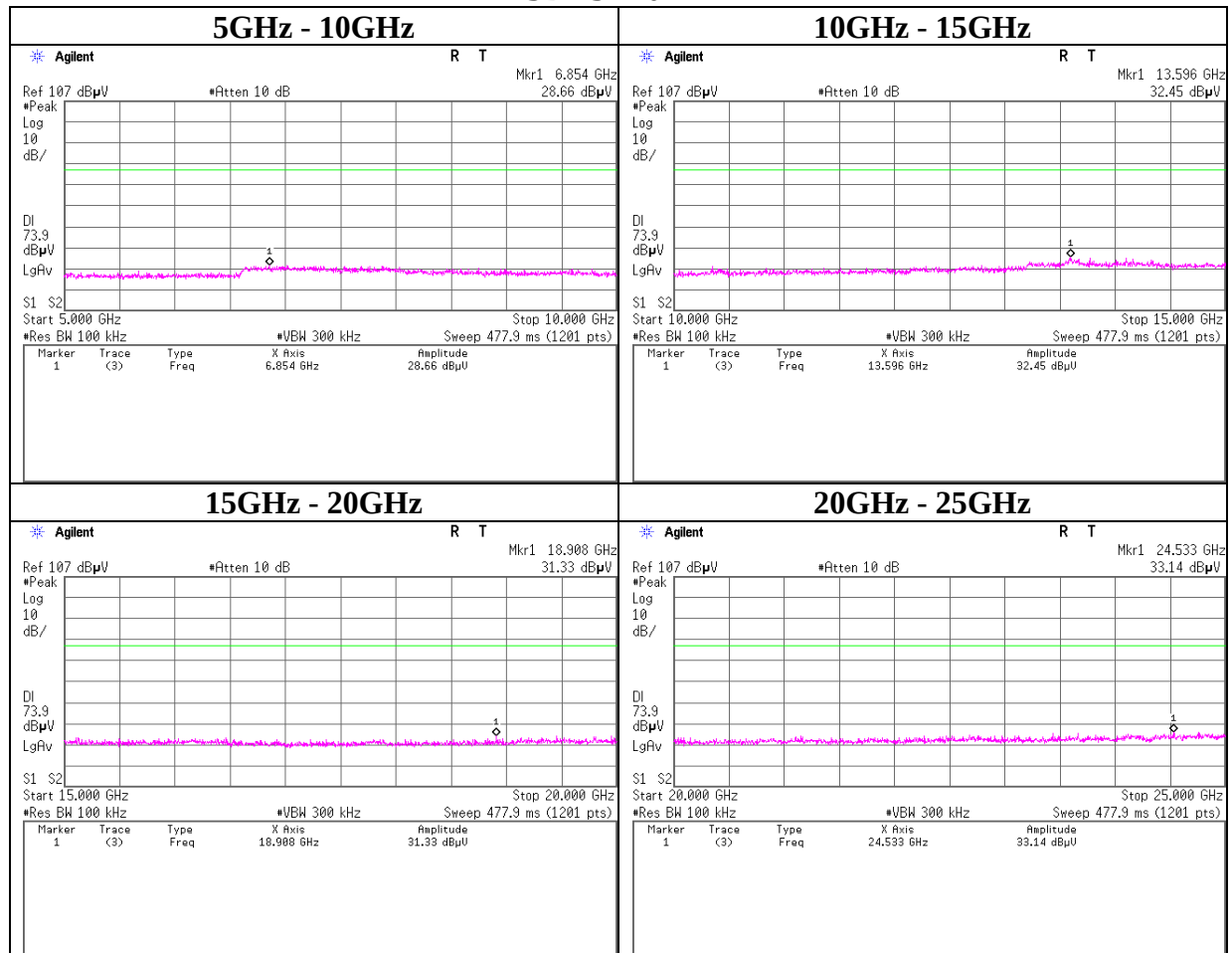
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10990564H
Date	October 19, 2015
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Kazuya Yoshioka
Mode	Tx, Hopping Off, 3DH5

Tx 3DH5 2402 MHz



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Ise EMC Lab.

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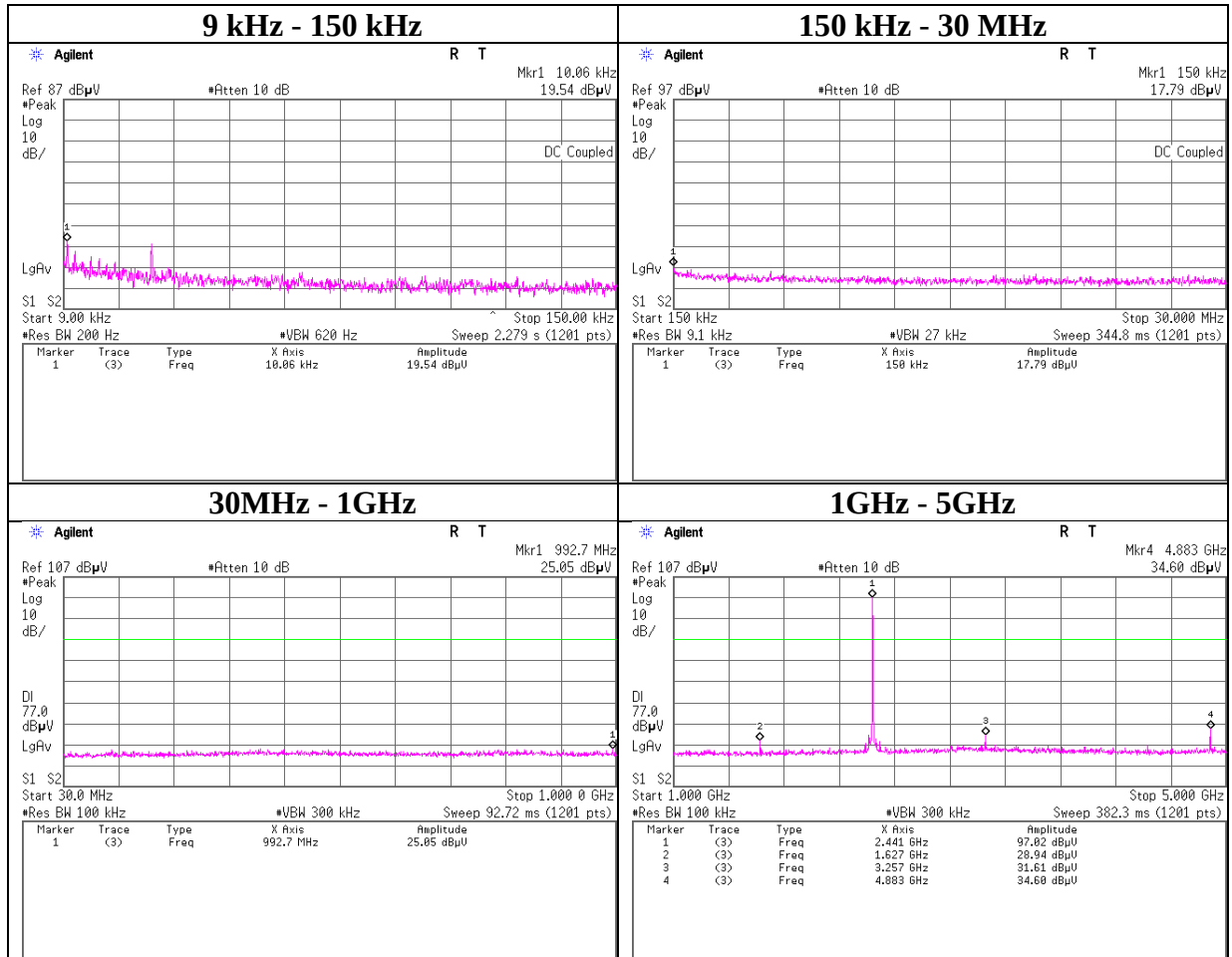
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10990564H
Date : October 19, 2015
Temperature / Humidity : 23 deg. C / 45 % RH
Engineer : Kazuya Yoshioka
Mode : Tx, Hopping Off, 3DH5

Tx 3DH5 2441 MHz



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Ise EMC Lab.

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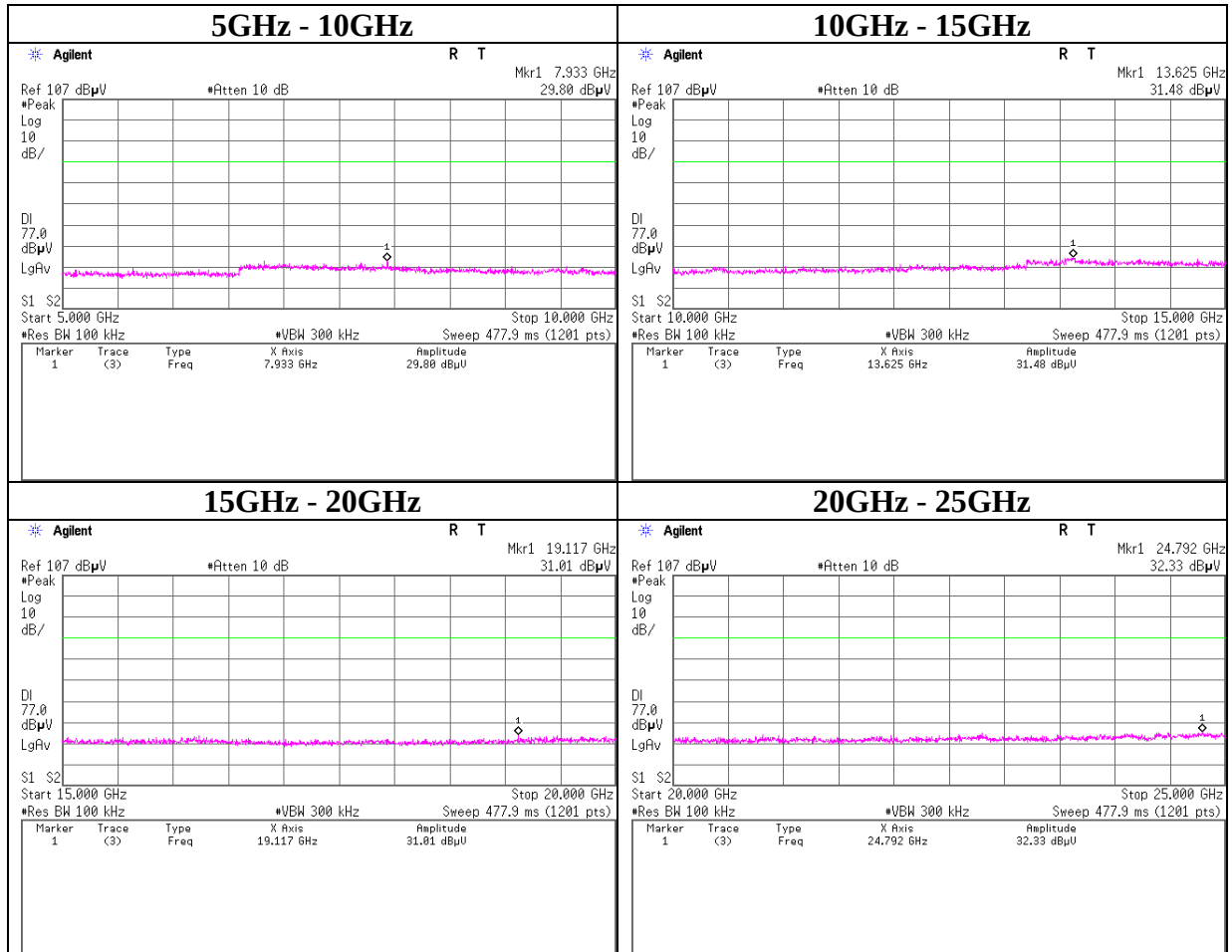
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10990564H
Date	October 19, 2015
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Kazuya Yoshioka
Mode	Tx, Hopping Off, 3DH5

Tx 3DH5 2441 MHz



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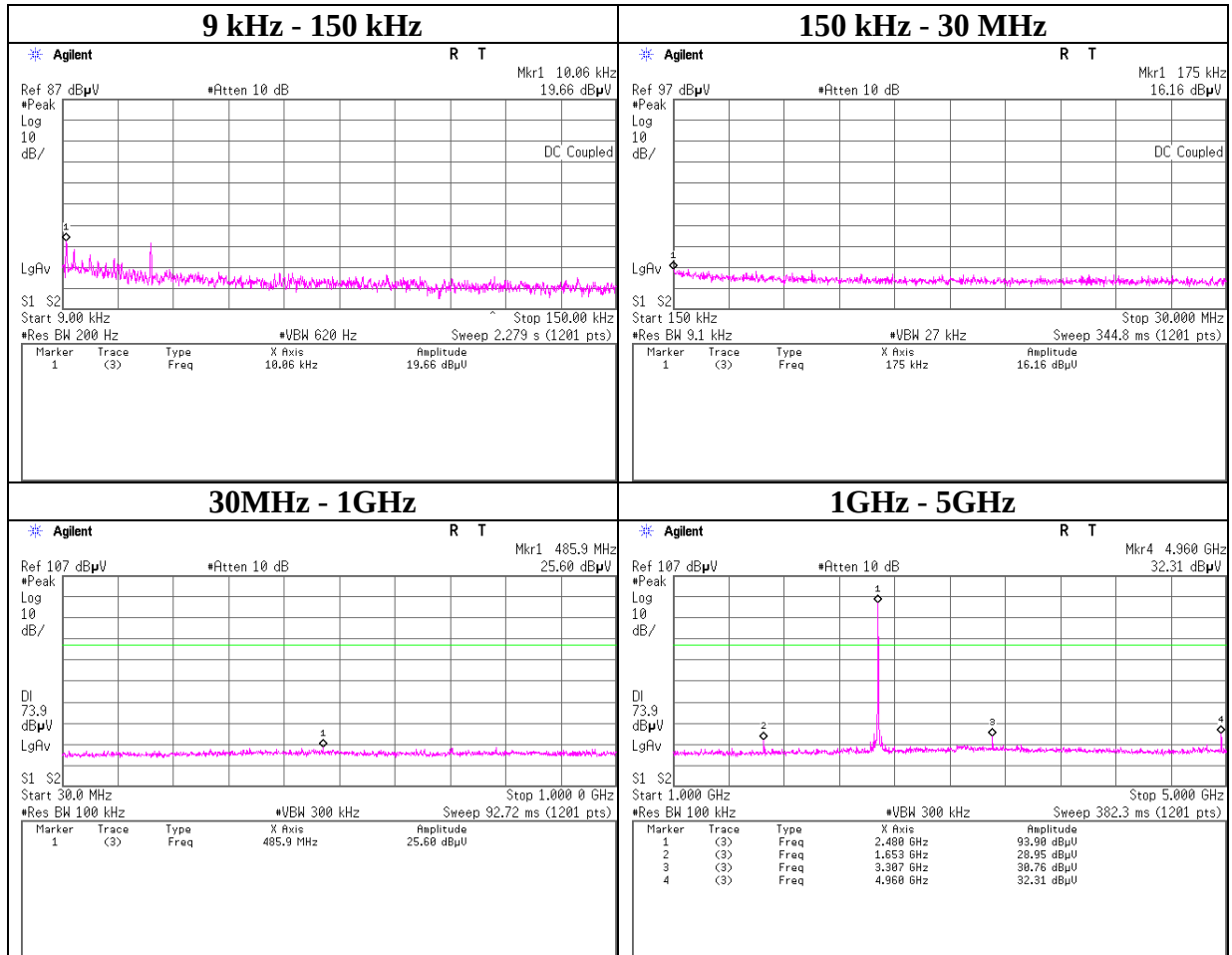
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10990564H
Date : October 19, 2015
Temperature / Humidity : 23 deg. C / 45 % RH
Engineer : Kazuya Yoshioka
Mode : Tx, Hopping Off, 3DH5

Tx 3DH5 2480 MHz



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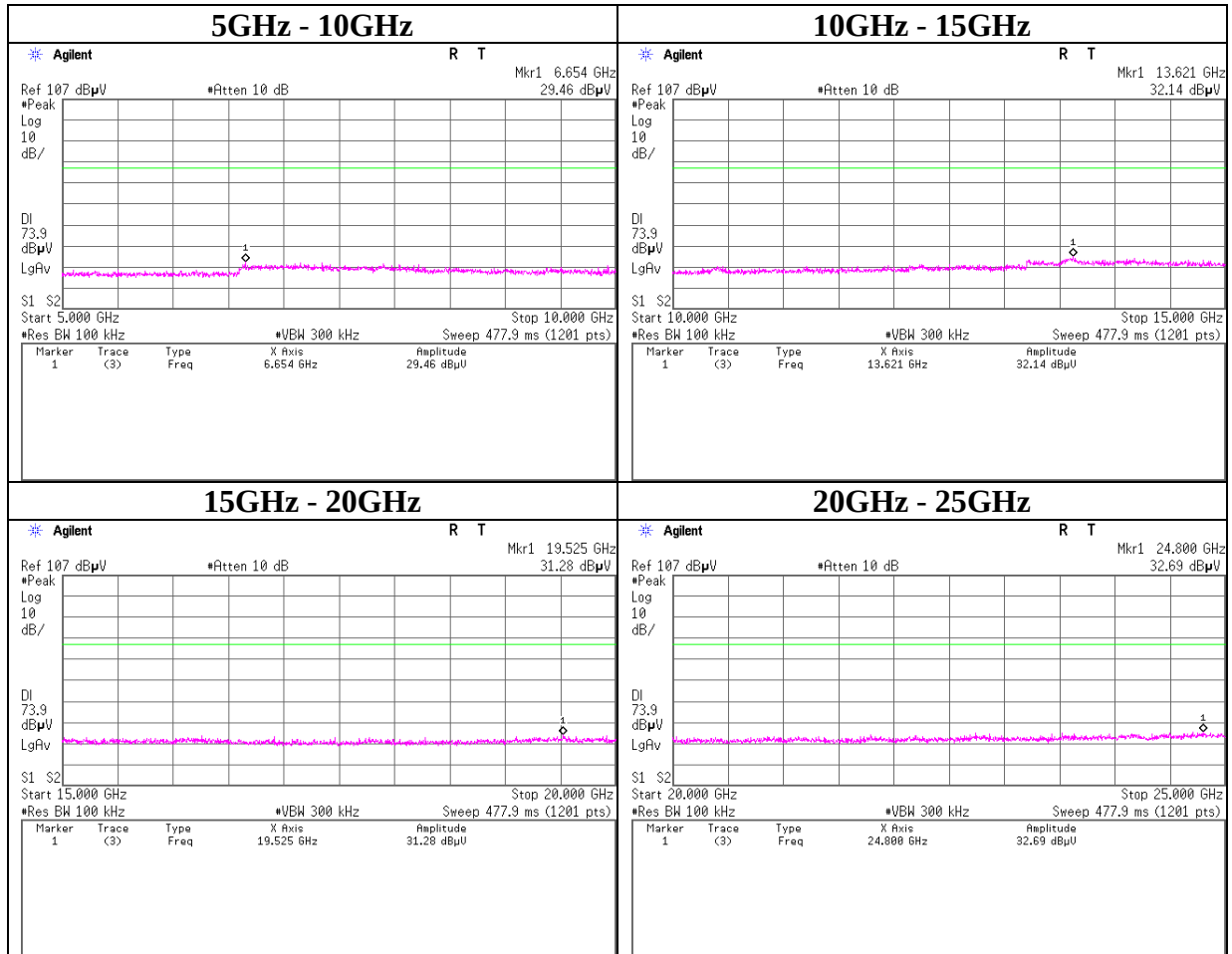
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10990564H
Date	October 19, 2015
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Kazuya Yoshioka
Mode	Tx, Hopping On, 3DH5

Tx 3DH5 2480 MHz



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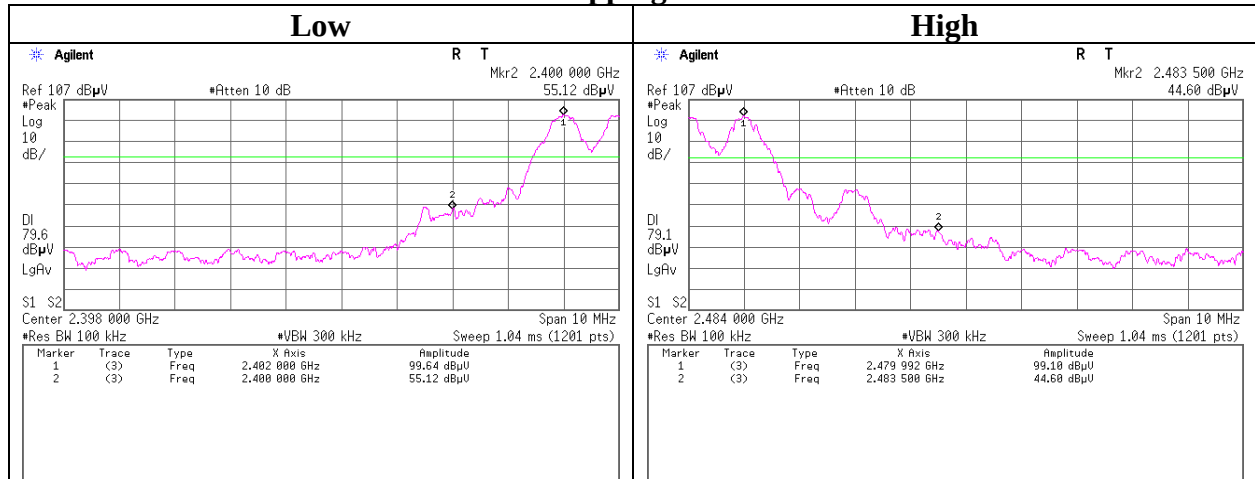
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

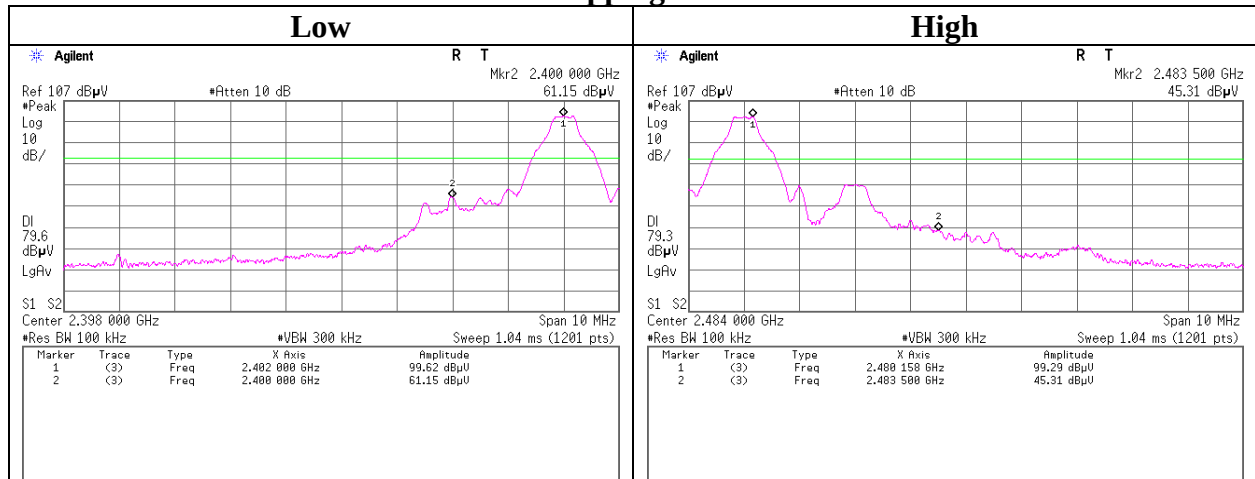
Conducted Emission Band Edge compliance

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10990564H
Date	October 19, 2015
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Kazuya Yoshioka
Mode	Tx DH5

Hopping On



Hopping Off



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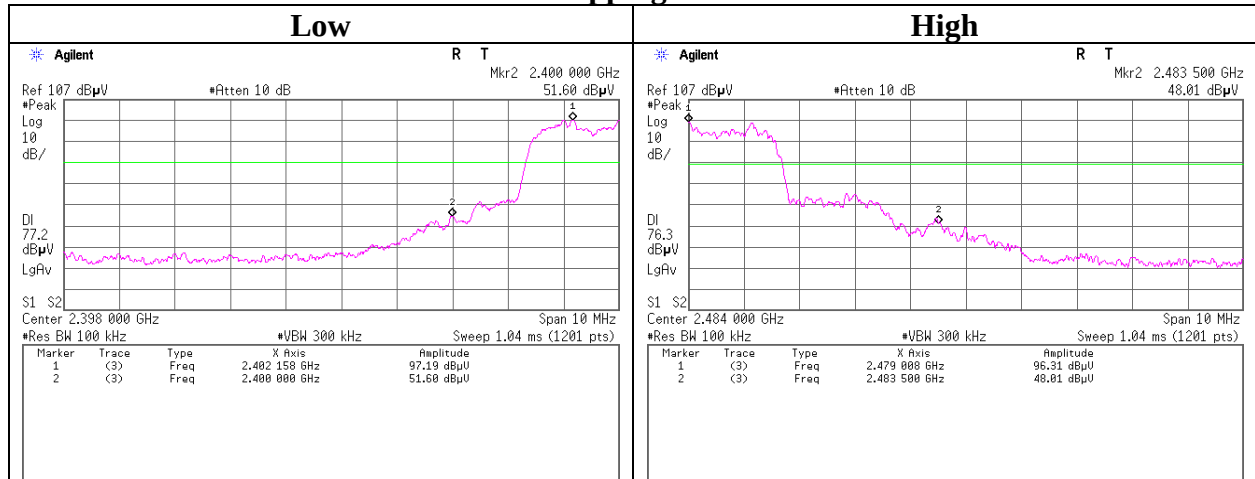
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

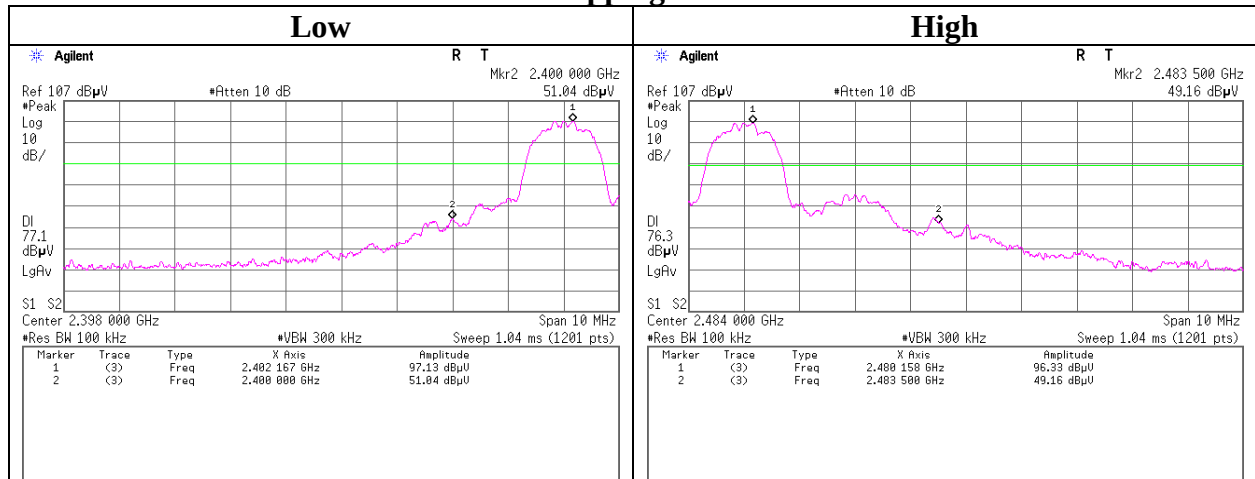
Conducted Emission Band Edge compliance

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10990564H
Date : October 19, 2015
Temperature / Humidity : 23 deg. C / 45 % RH
Engineer : Kazuya Yoshioka
Mode : Tx 3DH5

Hopping On



Hopping Off



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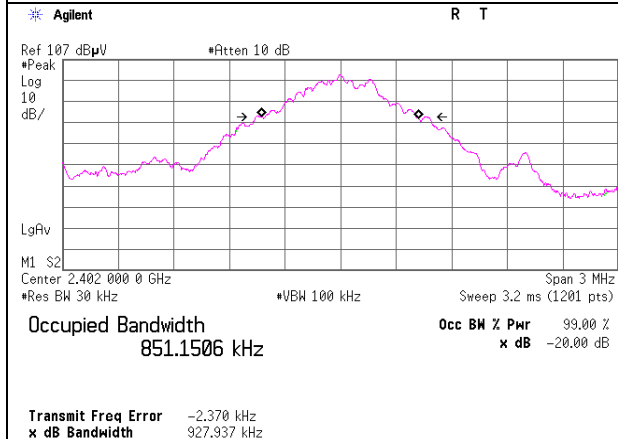
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

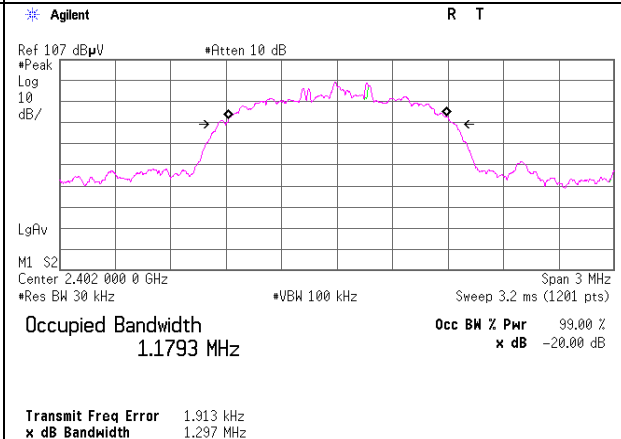
99% Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10990564H
Date	October 19, 2015
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Kazuya Yoshioka
Mode	Tx Hopping Off

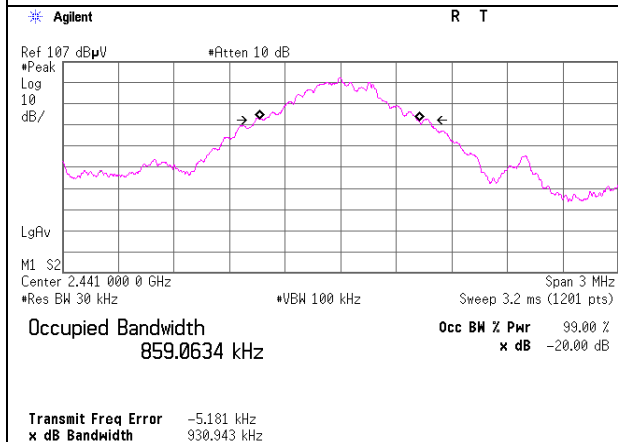
Hopping Off, DH5 2402 MHz



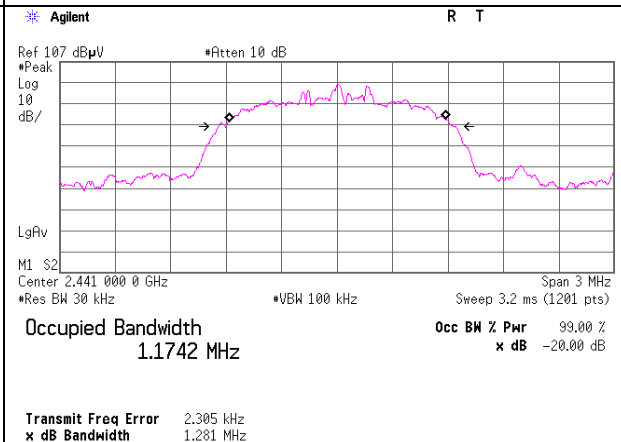
Hopping Off, 3DH5 2402 MHz



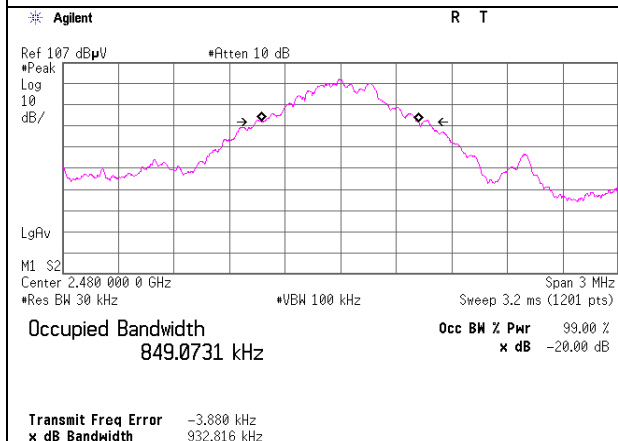
2441 MHz



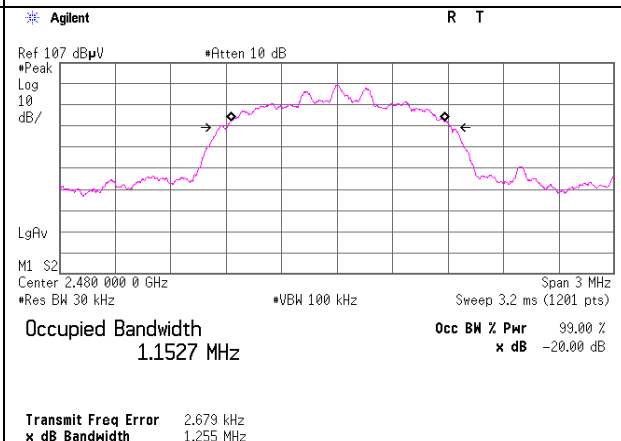
2441 MHz



2480 MHz



2480 MHz



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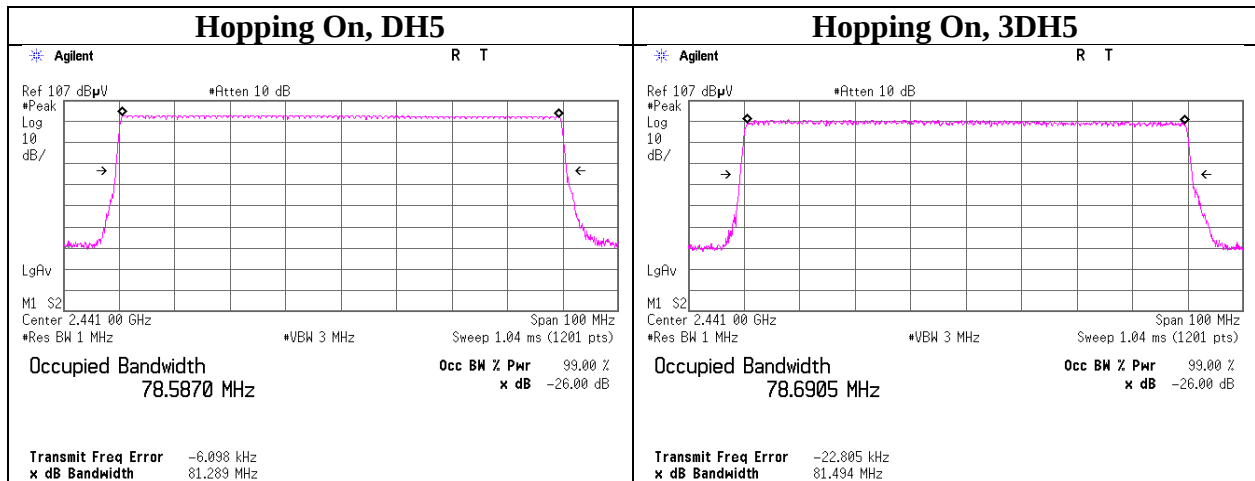
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Telephone : +81 596 24 8999

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99% Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10990564H
Date	October 19, 2015
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Kazuya Yoshioka
Mode	Tx Hopping On



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APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2015/10/02 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	1501	RE	2015/01/13 * 12
MJM-23	Measure	ASKUL	-	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2014/11/12 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2015/08/10 * 12
MCC-141	Microwave Cable	Junkosha	MWX221	1305S002R(1m) / 1405S146(5m)	RE	2015/06/22 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	00650	RE	2015/10/01 * 12
MHA-17	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170307	RE	2015/06/06 * 12
MMM-10	DIGITAL HiTESTER	Hioki	3805	051201148	RE	2015/01/16 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2015/05/15 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ES140	100084	RE	2014/11/10 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2014/11/22 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2014/11/22 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2015/06/19 * 12
MAT-68	Attenuator	Anritsu	MP721B	6200961025	RE	2014/11/11 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2015/03/09 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	1401	AT	2015/01/13 * 12
MMM-12	DIGITAL HiTESTER	Hioki	3805	060500120	AT	2015/02/05 * 12
MSA-15	Spectrum Analyzer	Agilent	E4440A	MY46187105	AT	2014/11/11 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2015/10/08 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2015/10/08 * 12
MAT-89	Attenuator	Weinschel Associates	WA56-10	56100305	AT	2015/06/01 * 12
MCC-171	Microwave Cable	Junkosha	MWX221	1409S494	AT	2015/03/04 * 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 test
AT: Antenna Terminal Conducted test

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