



RADIO TEST REPORT

Test Report No. : 10075507H-G-R1

Applicant : FUJITSU TEN LIMITED
Type of Equipment : Car Audio
Model No. : FT0056A
FCC ID : BABFT0056A
Test regulation : FCC Part 15 Subpart C: 2013
*Bluetooth part
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 report is a revised version of 10075507H-G. 10075507H-G is replaced with this report.

Date of test: October 9 to 17 and December 16, 2013

Representative test engineer:

Tsubasa Takayama
Engineer of WiSE Japan,
UL Verification Service

Approved by:

Takahiro Hatakeda
Leader of WiSE Japan,
UL Verification Service



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

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SECTION 1: Customer information

Company Name : FUJITSU TEN LIMITED
Address : 2-28, Goshō-dori 1-Chome, Hyogo-ku, Kobe, 652-8510 JAPAN
Telephone Number : +81-78-682-2159
Facsimile Number : +81-78-671-7160
Contact Person : YO SHOTATSU

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

2.1 Identification of E.U.T.

Type of Equipment : Car Audio
Model No. : FT0056A
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 12.0V
Rated range : DC 10.0 to 16.0V
Receipt Date of Sample : October 7, 2013
Country of Mass-production : China, Spain
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 : 625MHz

Radio Specification

[WLAN (IEEE802.11b/g/n-20)]

Radio Type : Transceiver
Frequency of Operation : 2412-2462MHz
Modulation : DSSS / OFDM
Power Supply (radio part input) : DC 3.3V
Antenna type : Multilayer Chip Antenna
Antenna Gain : -5.7dBi (MAX)

[Bluetooth (Ver. 3.0 with EDR function)]

Radio Type : Transceiver
Frequency of Operation : 2402-2480MHz
Modulation : FHSS
Power Supply (radio part input) : DC 3.3V
Antenna type : Multilayer Chip Antenna
Antenna Gain : -5.7dBi (MAX)

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[GPS]

Radio Type : Receiver
Frequency of Operation : 1575.42MHz
Modulation : DSS
Power Supply (radio part input) : DC 3.3V
Antenna type : Antenna ASSY with LNA
Antenna Gain : 30dBi

*The model: FT0056A has a variant model.

In this report, FT0056A is described as variation 1, and the variant model as variation 2.

The difference between two models is a design of the front panel and assembly plant only.

The radio specification is identical between two models. Therefore, only spurious emission test was performed with both Variation 1 and 2.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2013, final revised on September 30, 2013 and effective October 30, 2013

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 revision on September 30, 2013 does not affect the test specification applied to the EUT.

* The EUT complies with FCC Part 15 Subpart B: 2013, final revised on September 30, 2013 and effective October 30, 2013.

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3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.4:2003 7. AC powerline conducted emission measurements IC: RSS-Gen 7.2.4	FCC: Section 15.207 ----- IC: RSS-Gen 7.2.4	N/A	N/A *1)	-
Carrier Frequency Separation	FCC: FCC Public Notice DA 00-705 ----- IC: -	FCC: Section 15.247(a)(1) ----- IC: RSS-210 A8.1 (b)	See data.	Complied	Conducted
20dB Bandwidth	FCC: FCC Public Notice DA 00-705 ----- IC: -	FCC: Section 15.247(a)(1) ----- IC: RSS-210 A8.1 (a)		Complied	Conducted
Number of Hopping Frequency	FCC: FCC Public Notice DA 00-705 ----- IC: -	FCC: Section 15.247(a)(1)(iii) ----- IC: RSS-210 A8.1 (d)		Complied	Conducted
Dwell time	FCC: FCC Public Notice DA 00-705 ----- IC: -	FCC: Section 15.247(a)(1)(iii) ----- IC: RSS-210 A8.1 (d)		Complied	Conducted
Maximum Peak Output Power	FCC: FCC Public Notice DA 00-705 ----- IC: RSS-Gen 4.8	FCC: Section 15.247(a)(b)(1) ----- IC: RSS-210 A8.4 (2)		Complied	Conducted
Spurious Emission & Band Edge Compliance	FCC: FCC Public Notice DA 00-705 ----- IC: RSS-Gen 4.9	FCC: Section 15.247(d) ----- IC: RSS-210 A8.5 RSS-Gen 6 and 7.2.3		[Variation 1] 2.2dB 7323.000MHz, AV, Hori. [Variation 2] 3.1dB 687.262, QP, Vert.	Complied

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

*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.

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

FCC 15.31 (e)

The EUT is a battery-operated device and test was performed with the full-charged battery. Therefore, this 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

Power meter (+dB)	
Below 1GHz	Above 1GHz
0.7dB	1.5dB

Antenna terminal conducted emission and Power density (+dB)			Antenna terminal conducted emission (+dB)		Channel power (+dB)
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.5dB	1.7dB	2.8dB	2.8dB	2.9dB	2.6dB

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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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.0 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	2.4 x 3.4m	-

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

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

Refer to APPENDIX.

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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	2402MHz 2441MHz 2480MHz
Maximum Peak Output Power	Tx (Hopping off) DH5, 2DH5, 3DH5	2402MHz 2441MHz 2480MHz
Carrier Frequency Separation 20dB Bandwidth	Tx (Hopping on) DH5, 3DH5 Inquiry	2402MHz 2441MHz 2480MHz
Number of Hopping Frequency	Tx (Hopping on) DH5, 3DH5 Inquiry	-
Dwell time	Tx (Hopping on), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5 Inquiry	-
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping on -Hopping off	2402MHz 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) *We removed 2DH mode (2 Mb/s EDR: pi/4DQPSK) except 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: Same as production model Software: Diag. mode(BT Certification mode) *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>		

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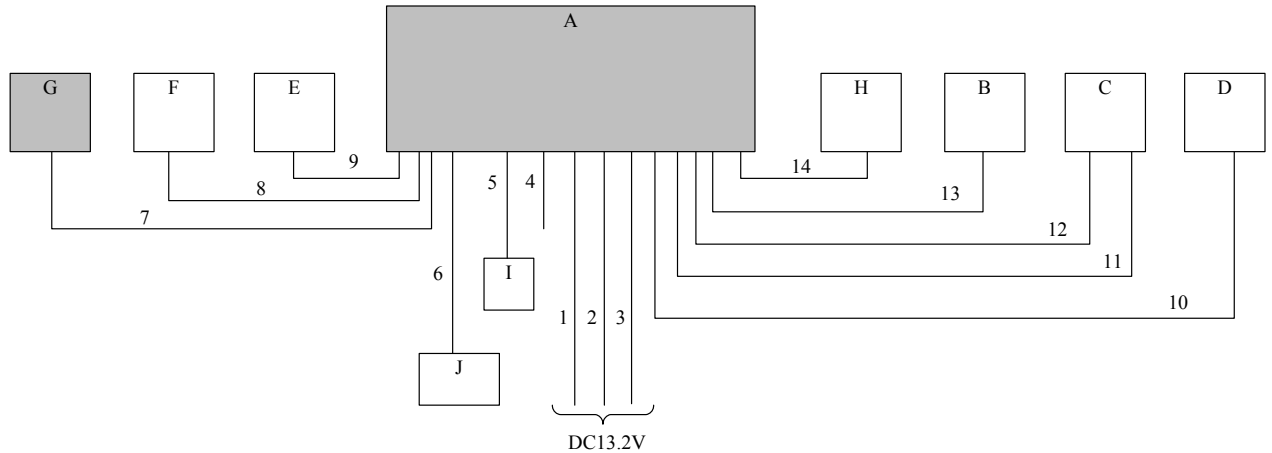
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4.2 Configuration and peripherals



*Cabling and setup 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	FT0056A (Variation 1)	2	FUJITSU TEN	EUT
		FT0056A (Variation 2)	4		
B	Dummy Load	GH40W	-	JRM	-
C	Dummy Load	GH30W	-	JRM	4ohm x 2
D	USB Memory	JET Flash	13728529430618	FUJITSU TEN	-
E	USB Memory	JET Flash	13728529430618	FUJITSU TEN	-
F	MIC ASSY	39180-T8VA- 12010-M1	00107	FUJITSU TEN	-
G	GPS Antenna	-	11870116	FUJITSU TEN	EUT
H	Dummy Load	G30W	-	JRM	-
I	Dummy Load	HP909D	63745	HP	-
J	Dummy Load	-	-	FUJITSU TEN	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Battery Cable	3.6	Unshielded	Unshielded	-
2	ACC Cable	3.6	Unshielded	Unshielded	-
3	GND Cable	3.6	Unshielded	Unshielded	-
4	I/O Cable	0.2	Unshielded	Unshielded	-
5	DUB Antenna Cable	0.2	Shielded	Shielded	-
6	FM Antenna Cable	0.25	Shielded	Shielded	-
7	GPS Cable	4.8	Shielded	Shielded	-
8	MIC ASSY Cable	0.5	Unshielded	Unshielded	-
9	USB Cable	1.0	Shielded	Shielded	-
10	USB Cable	1.0	Shielded	Shielded	-
11	FR SP Cable	0.5	Unshielded	Unshielded	-
12	FL SP Cable	0.5	Unshielded	Unshielded	-
13	RL SP Cable	0.3	Unshielded	Unshielded	-
14	RR SP Cable	0.3	Unshielded	Unshielded	-

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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	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	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(T/R)	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 10Hz *1)	RBW: 100kHz VBW: 300kHz (S/A)
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.

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

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
20dB Bandwidth	3MHz/2.5MHz(Inquiry)	30kHz	100kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	Enough width to display 20dB Bandwidth	1 to 3% of Span	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *1)	-	Power Meter (Sensor: 50MHz BW)
Carrier Frequency Separation	3MHz	30kHz	100kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Number of Hopping Frequency	30MHz	300kHz	1MHz	Auto	Peak	Max Hold	Spectrum Analyzer
Dwell Time	Zero Span	100kHz, 1MHz	300kHz, 3MHz	As necessary capture the entire dwell time per hopping channel	Peak	Clear Write	Spectrum Analyzer
Conducted Spurious Emission *2)	9kHz to 150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1kHz	27kHz				
	30MHz to 25GHz (Less or equal to 5GHz)	100kHz	300kHz				
Conducted Spurious Emission Band Edge compliance	10MHz	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer

*1) Reference data
*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 (9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz). The EUT complies with the limit of FCC15.209.

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

Test data : **APPENDIX**
Test result : **Pass**

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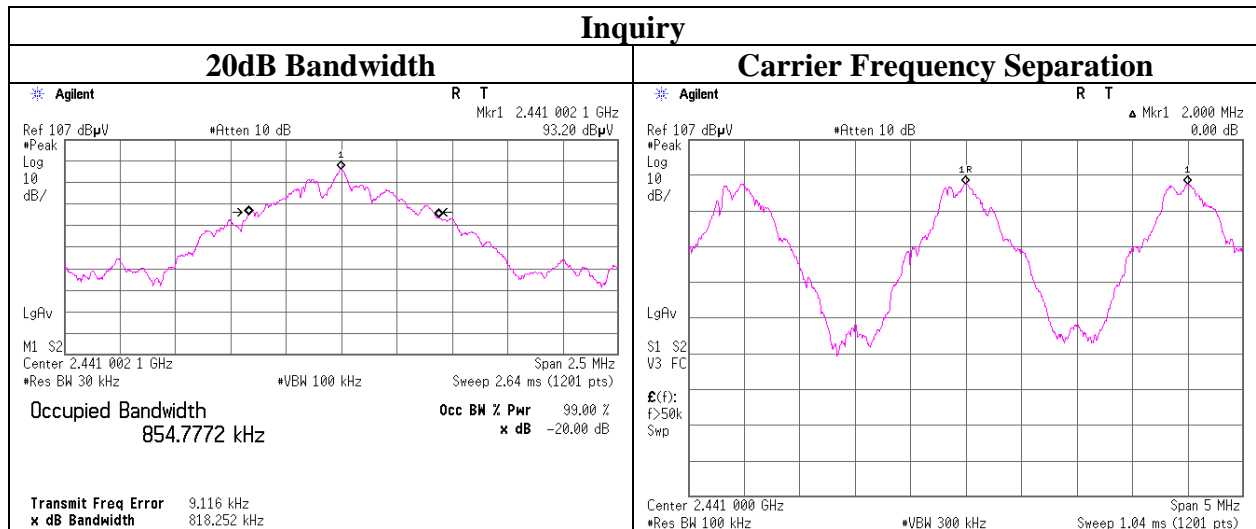
APPENDIX 1: Data of EMI test

20dB Bandwidth and Carrier Frequency Separation

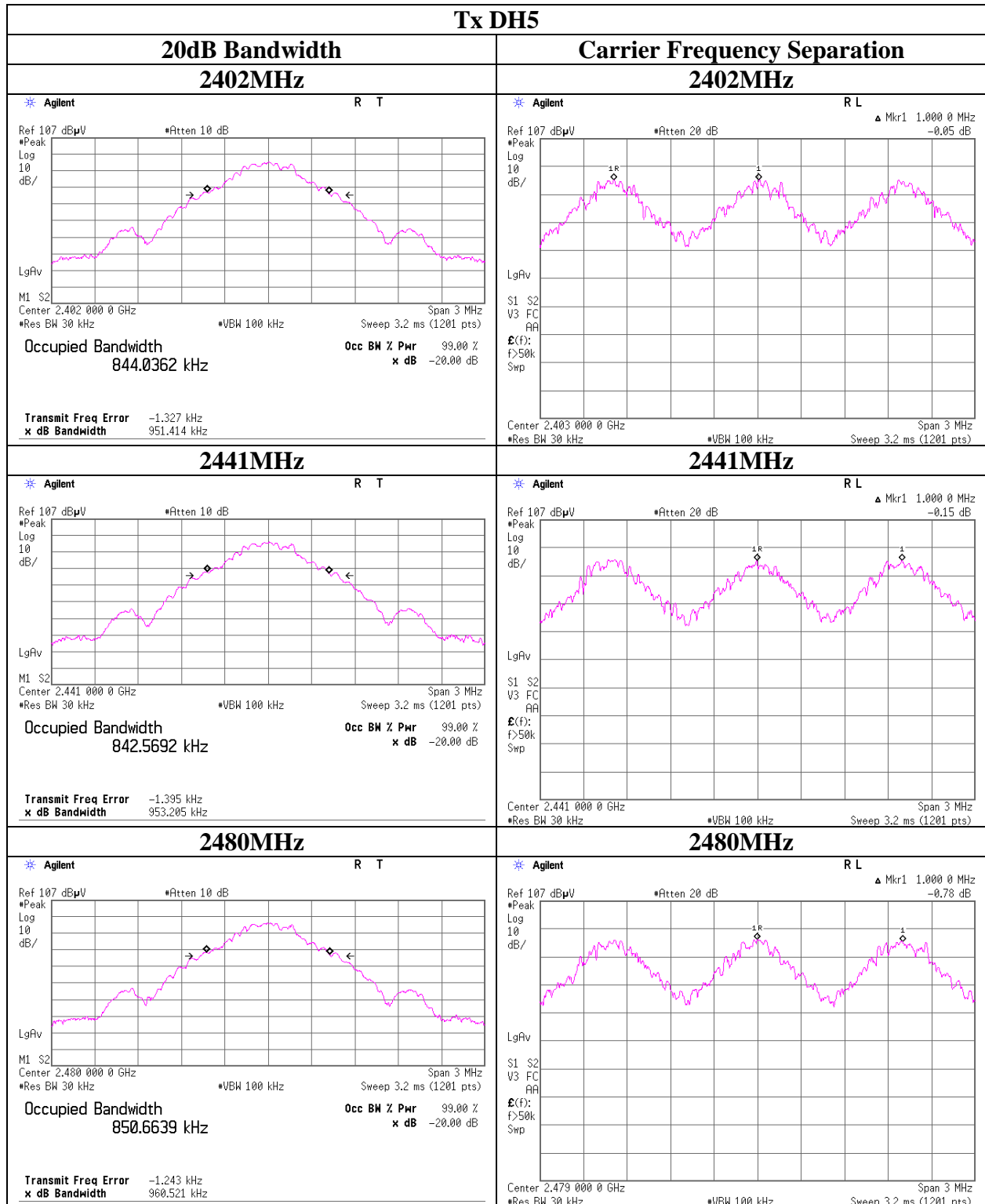
Test place Head Office EMC Lab. No.11 Measurement Room
 Report No. 10075507H
 Date 10/10/2013 10/11/2013
 Temperature/ Humidity 26deg. C / 43% RH 26deg. C / 62% RH
 Engineer Yutaka Yoshida Yutaka Yoshida
 Mode Tx (Hopping on) DH5/3DH5/Inquiry

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.951	1.000	≧ 0.634
DH5	2441.0	0.953	1.000	≧ 0.635
DH5	2480.0	0.961	1.000	≧ 0.641
3DH5	2402.0	1.313	1.000	≧ 0.875
3DH5	2441.0	1.316	1.000	≧ 0.877
3DH5	2480.0	1.318	1.000	≧ 0.879
Inquiry	2441.0	0.818	2.000	≧ 0.546

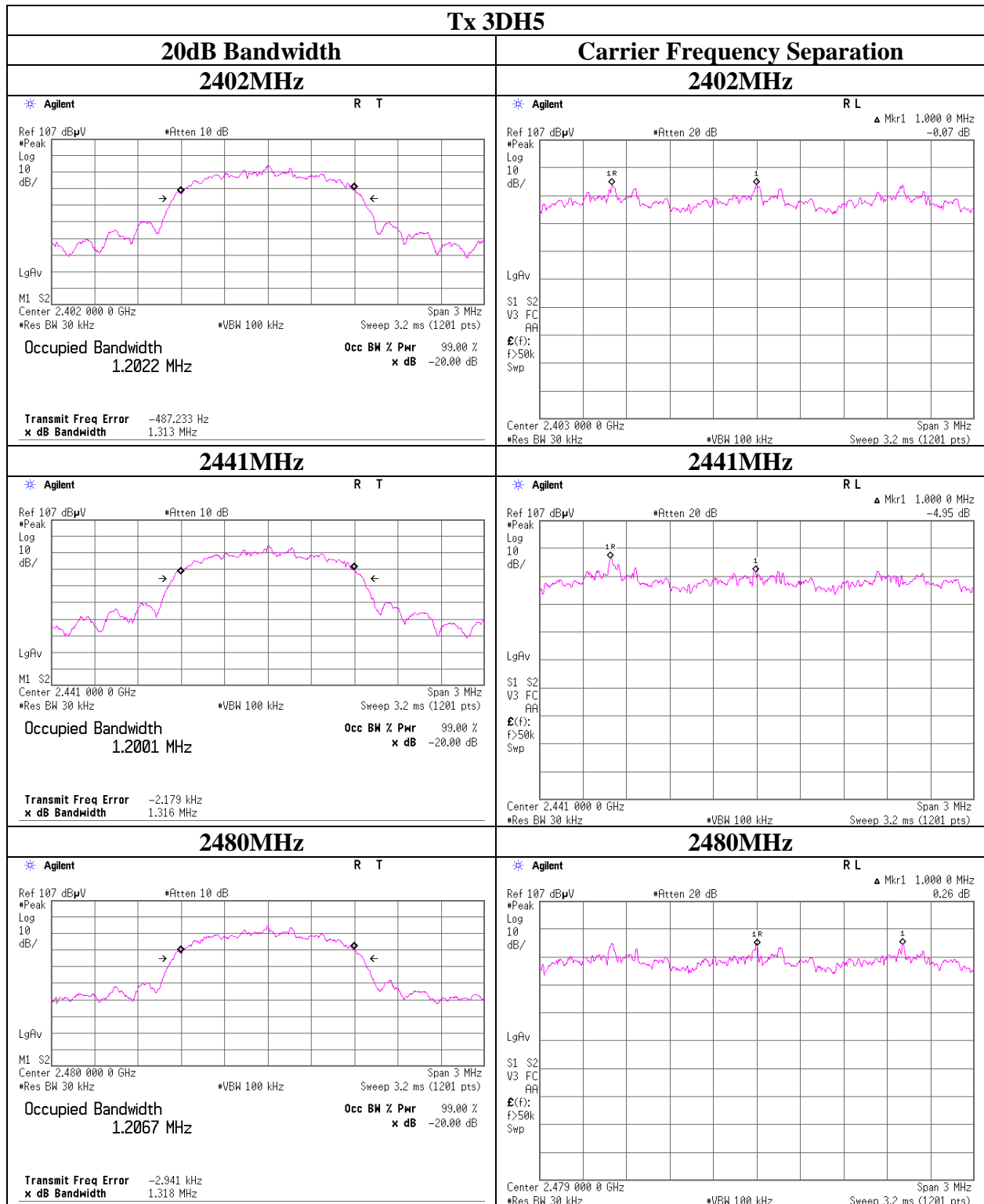
Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).
 No limit applies to 20dB Bandwidth.



20dB Bandwidth and Carrier Frequency Separation



20dB Bandwidth and Carrier Frequency Separation

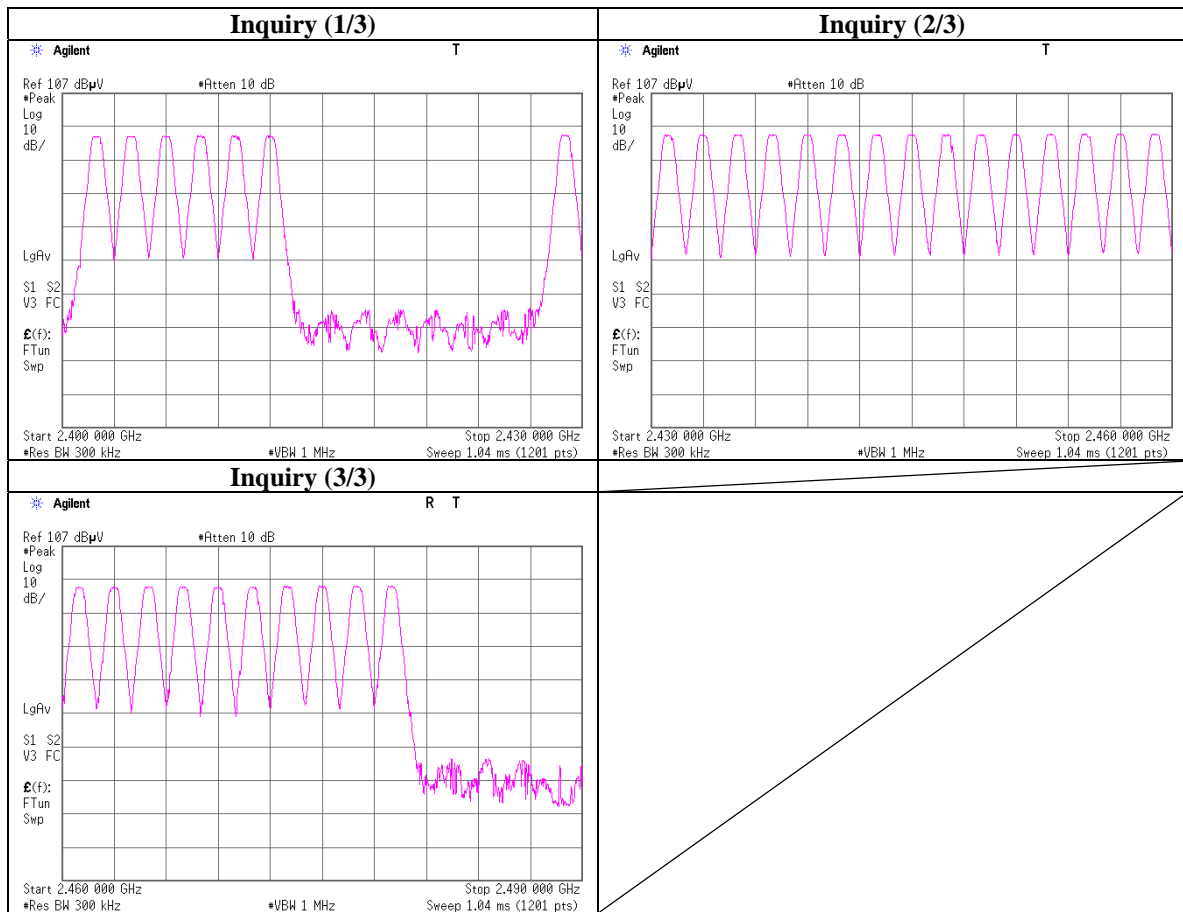


Number of Hopping Frequency

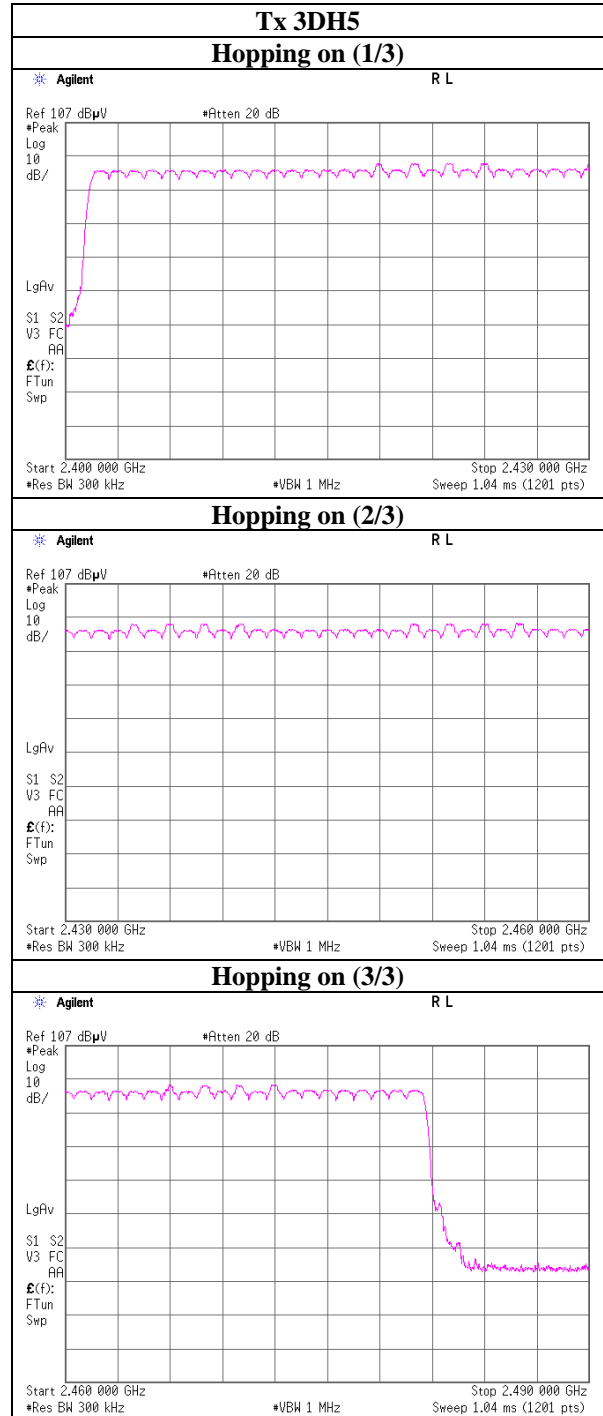
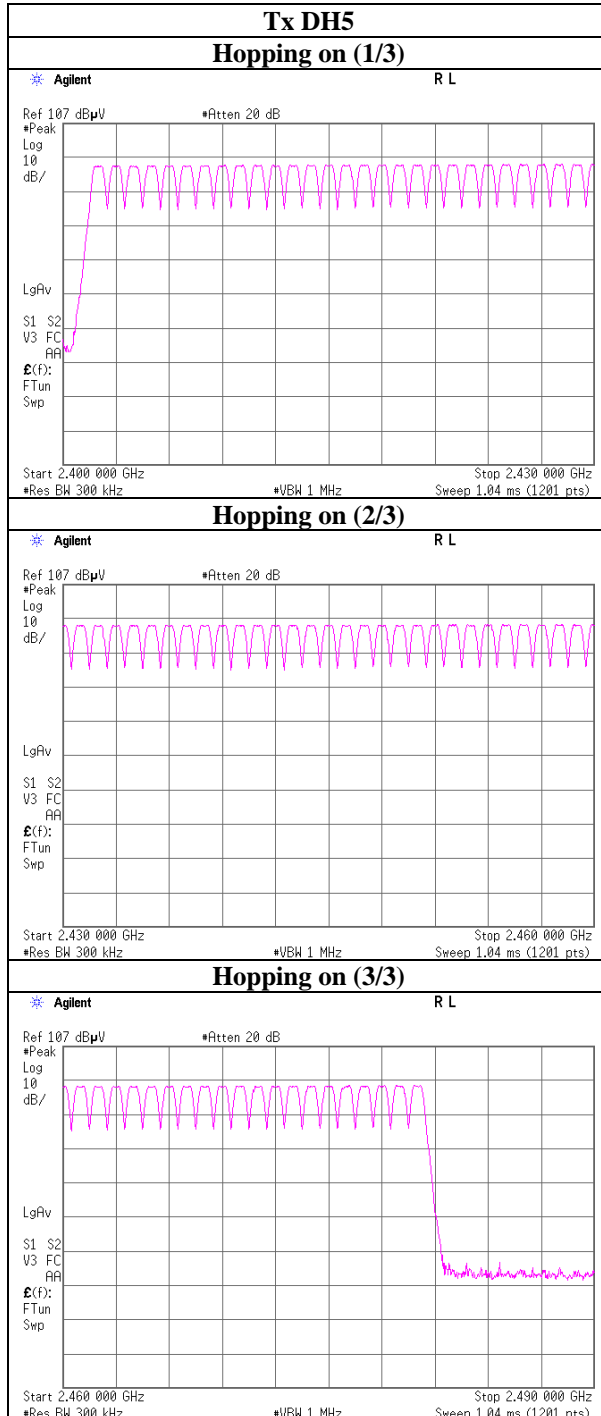
Test place	Head Office EMC Lab. No.11 Measurement Room	
Report No.	10075507H	
Date	10/10/2013	10/11/2013
Temperature/ Humidity	26deg. C / 43% RH	26deg. C / 62% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	Tx (Hopping on) DH5/3DH5	

Mode	Number of channel [times]	Limit [times]
DH5	79	>= 15
3DH5	79	>= 15
Inquiry	32	>= 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



Dwell time

Test place	Head Office EMC Lab. No.11 Measurement Room
Report No.	10075507H
Date	10/11/2013
Temperature/ Humidity	26deg. C / 62% RH
Engineer	Yutaka Yoshida
Mode	Tx (Hopping on) DH5/3DH5/Inquiry

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 time [msec]	Result [msec]	Limit [msec]
DH1	49.4 times / 5 sec. x 31.6 sec. = 313 times	0.396	124	400
DH3	24.4 times / 5 sec. x 31.6 sec. = 155 times	1.658	257	400
DH5	17.4 times / 5 sec. x 31.6 sec. = 110 times	2.920	321	400
3DH1	49.6 times / 5 sec. x 31.6 sec. = 314 times	0.434	136	400
3DH3	26.2 times / 5 sec. x 31.6 sec. = 166 times	1.686	280	400
3DH5	15.6 times / 5 sec. x 31.6 sec. = 99 times	2.944	291	400
Inquiry	100.0 times / 1 sec. x 12.8 sec. = 1280 times	0.096	123	400

Sample Calculation

Result = Number of transmission x Length of transmission time

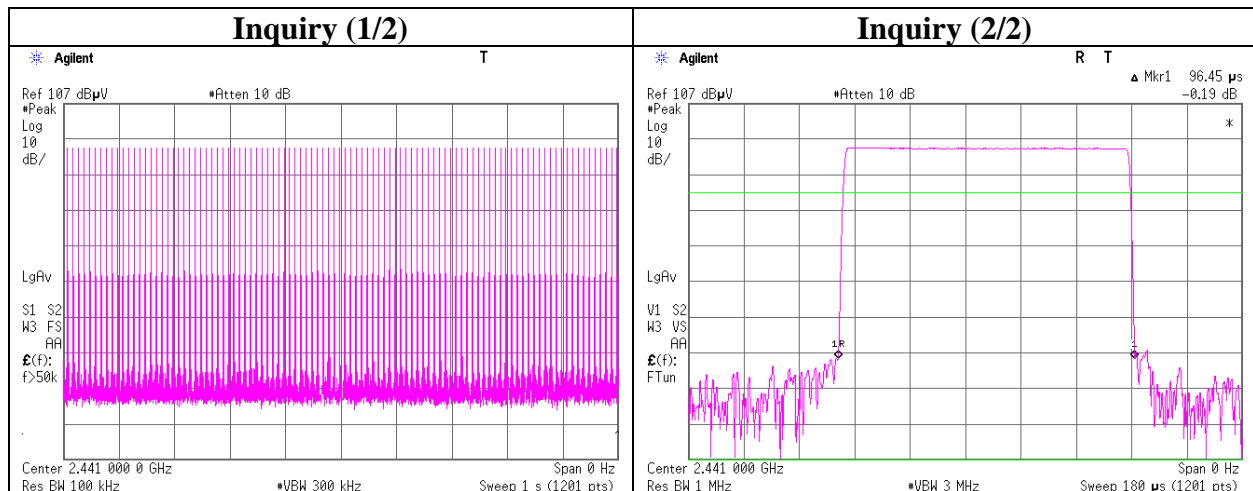
*Average data of 5 tests.(except Inquiry)

Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	49	50	50	49	49	49.4
DH3	22	25	27	26	22	24.4
DH5	17	15	16	18	21	17.4
3DH1	49	49	50	50	50	49.6
3DH3	25	26	25	26	29	26.2
3DH5	16	16	10	19	17	15.6

Sample Calculation

Average= Summation(Sampling 1 to 5) / 5

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 $N=79$.



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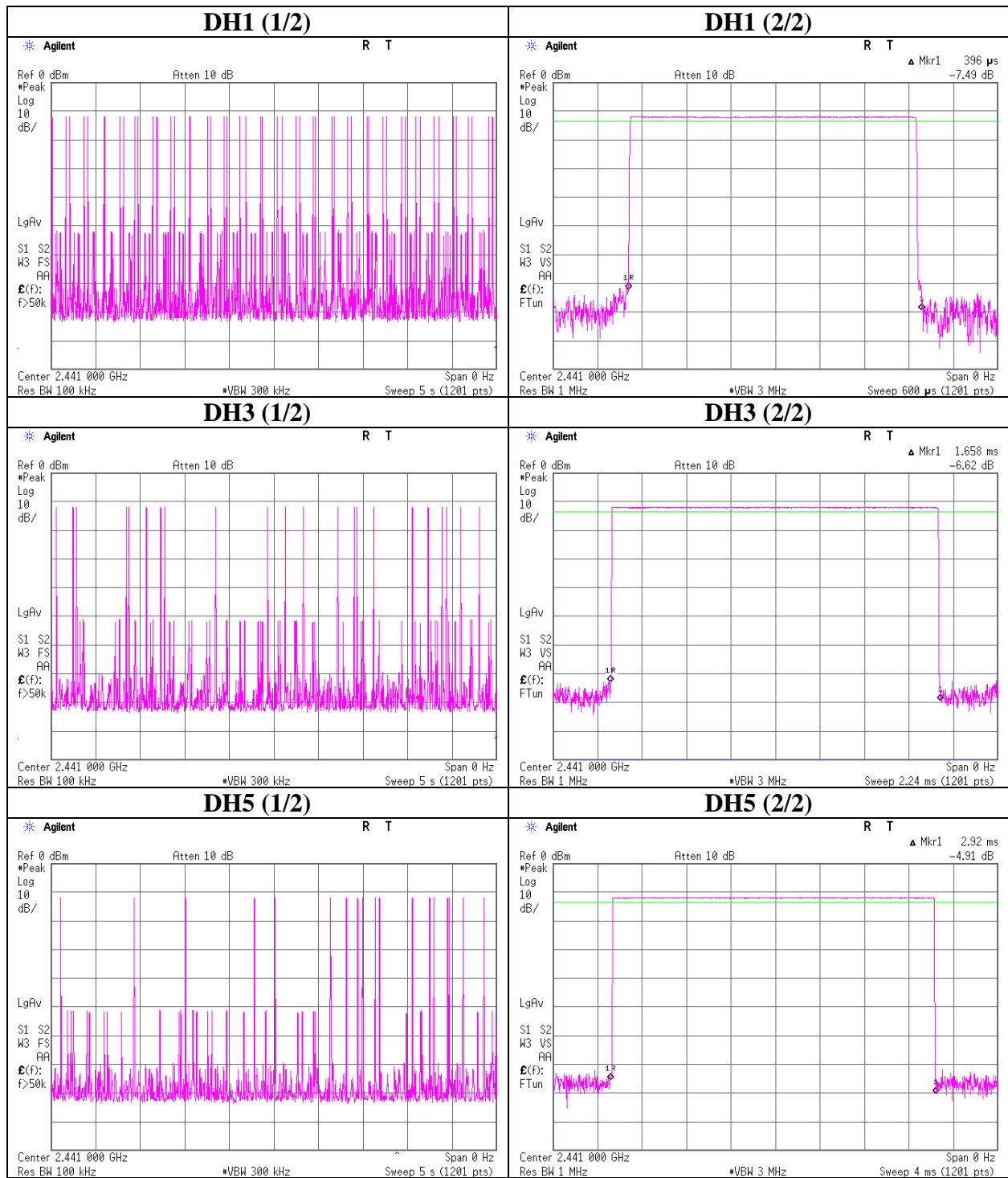
Head Office EMC Lab.

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

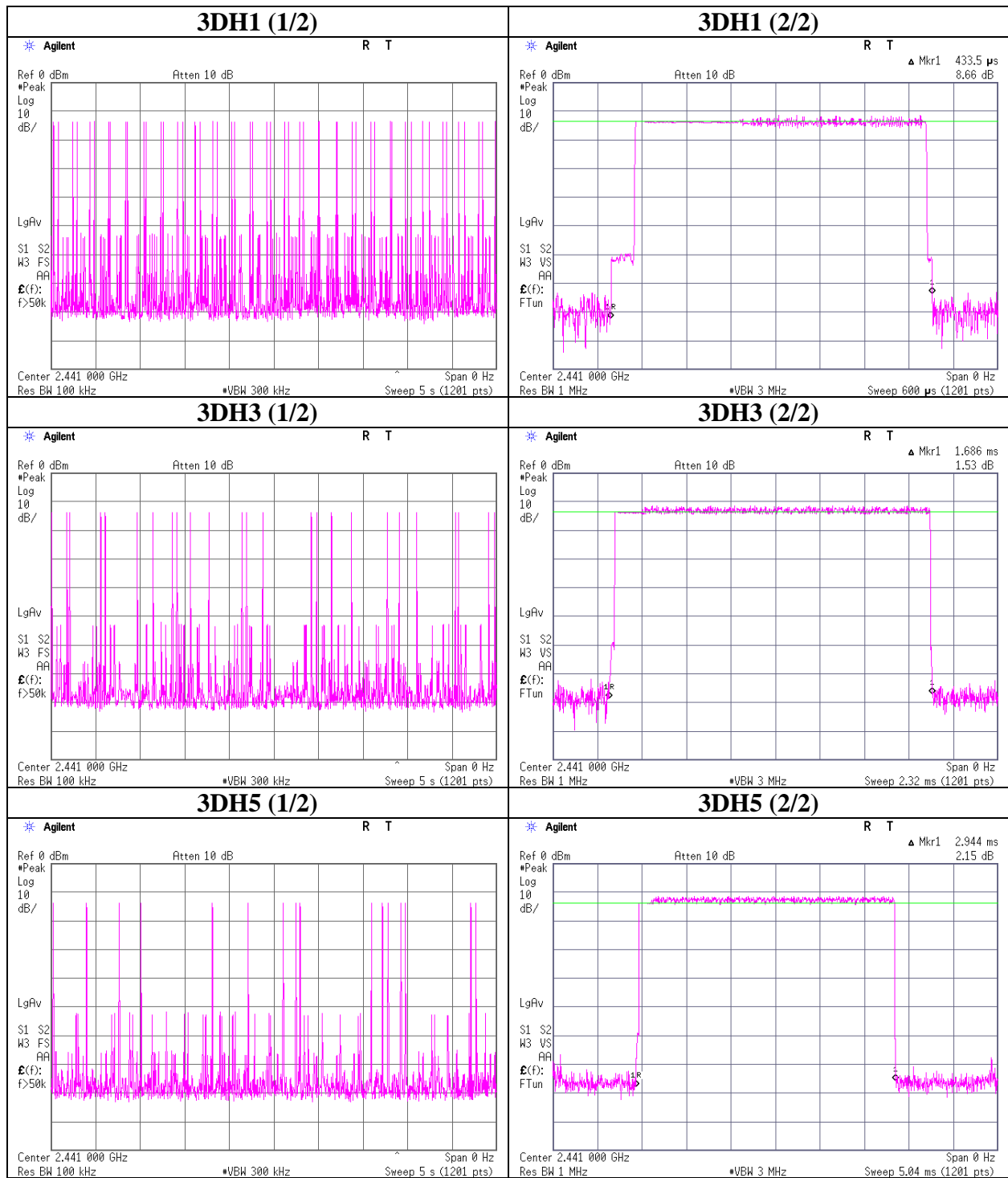
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Dwell time



Dwell time



Maximum Peak Output Power

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 10075507H
Date 10/09/2013 12/16/2013
Temperature/ Humidity 23 deg. C / 51% RH 24 deg. C / 40% RH
Engineer Shinya Watanabe Takumi Shimada
Mode Tx (Hopping off) DH5/2DH5/3DH5

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-12.34	2.29	10.08	0.03	1.01	20.96	125	20.93
DH5	2441.0	-11.92	2.30	10.08	0.46	1.11	20.96	125	20.50
DH5	2480.0	-11.55	2.31	10.08	0.84	1.21	20.96	125	20.12
2DH5	2402.0	-11.80	2.29	10.08	0.57	1.14	20.96	125	20.39
2DH5	2441.0	-11.28	2.30	10.08	1.10	1.29	20.96	125	19.86
2DH5	2480.0	-11.11	2.31	10.08	1.28	1.34	20.96	125	19.68
3DH5	2402.0	-11.37	2.29	10.08	1.00	1.26	20.96	125	19.96
3DH5	2441.0	-10.91	2.30	10.08	1.47	1.40	20.96	125	19.49
3DH5	2480.0	-10.73	2.31	10.08	1.66	1.46	20.96	125	19.30

Sample Calculation:

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

Average Output Power (for reporting purpose only)

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 10075507H
Date 10/09/2013 12/16/2013
Temperature/ Humidity 23 deg. C / 51% RH 24 deg. C / 40% RH
Engineer Shinya Watanabe Takumi Shimada
Mode Tx (Hopping off) DH5/2DH5/3DH5

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm]	[mW]
DH5	2402.0	-13.71	2.29	10.08	-1.34	0.73
DH5	2441.0	-13.32	2.30	10.08	-0.94	0.80
DH5	2480.0	-12.51	2.31	10.08	-0.12	0.97
2DH5	2402.0	-15.67	2.29	10.08	-3.30	0.47
2DH5	2441.0	-15.15	2.30	10.08	-2.77	0.53
2DH5	2480.0	-14.79	2.31	10.08	-2.40	0.57
3DH5	2402.0	-15.66	2.29	10.08	-3.29	0.47
3DH5	2441.0	-15.15	2.30	10.08	-2.77	0.53
3DH5	2480.0	-14.78	2.31	10.08	-2.39	0.58

Sample Calculation:

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

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.

UL Japan, Inc.

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Radiated Spurious Emission
Variation 1

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10075507H
Date 10/10/2013 10/17/2013
Temperature/ Humidity 25 deg. C / 34% RH 24 deg. C / 56% RH
Engineer Takumi Shimada Tsubasa Takayama
(Above 1GHz) (Below 1GHz)
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.	59.986	QP	36.5	7.9	7.5	32.2	19.7	40.0	20.3	
Hori.	72.000	QP	43.5	6.5	7.7	32.2	25.5	40.0	14.5	
Hori.	99.968	QP	38.4	10.1	8.0	32.1	24.4	43.5	19.1	
Hori.	108.374	QP	39.9	11.3	8.1	32.1	27.2	43.5	16.3	
Hori.	199.914	QP	43.5	16.7	9.1	32.1	37.2	43.5	6.3	
Hori.	325.100	QP	39.9	15.2	10.0	32.0	33.1	46.0	12.9	
Hori.	328.300	QP	24.2	15.3	10.0	32.0	17.5	46.0	28.5	
Hori.	480.020	QP	38.4	17.9	11.0	32.0	35.3	46.0	10.7	
Hori.	614.120	QP	34.4	19.4	11.8	32.1	33.5	46.0	12.5	
Hori.	687.250	QP	33.2	20.2	12.2	32.2	33.4	46.0	12.6	
Hori.	2390.000	PK	42.3	28.1	3.1	32.4	41.1	73.9	32.8	
Hori.	3145.597	PK	47.1	29.1	3.6	32.0	47.8	73.9	26.1	
Hori.	4804.000	PK	41.6	30.5	5.3	31.4	46.0	73.9	27.9	
Hori.	7206.000	PK	43.5	35.8	6.7	32.3	53.7	73.9	20.2	
Hori.	9608.000	PK	44.9	39.0	7.3	33.0	58.2	73.9	15.7	
Hori.	2390.000	AV	29.8	28.1	3.1	32.4	28.6	53.9	25.3	
Hori.	3145.597	AV	41.5	29.1	3.6	32.0	42.2	53.9	11.7	
Hori.	4804.000	AV	28.9	30.5	5.3	31.4	33.3	53.9	20.6	
Hori.	7206.000	AV	30.6	35.8	6.7	32.3	40.8	53.9	13.1	
Hori.	9608.000	AV	32.1	39.0	7.3	33.0	45.4	53.9	8.5	
Vert.	59.986	QP	45.8	7.9	7.5	32.2	29.0	40.0	11.0	
Vert.	72.000	QP	40.2	6.5	7.7	32.2	22.2	40.0	17.8	
Vert.	99.968	QP	35.0	10.1	8.0	32.1	21.0	43.5	22.5	
Vert.	108.374	QP	32.0	11.3	8.1	32.1	19.3	43.5	24.2	
Vert.	199.914	QP	44.7	16.7	9.1	32.1	38.4	43.5	5.1	
Vert.	325.100	QP	35.9	15.2	10.0	32.0	29.1	46.0	16.9	
Vert.	328.300	QP	23.4	15.3	10.0	32.0	16.7	46.0	29.3	
Vert.	480.020	QP	35.2	17.9	11.0	32.0	32.1	46.0	13.9	
Vert.	614.120	QP	36.3	19.4	11.8	32.1	35.4	46.0	10.6	
Vert.	687.250	QP	41.2	20.2	12.2	32.2	41.4	46.0	4.6	
Vert.	2390.000	PK	42.7	28.1	3.1	32.4	41.5	73.9	32.4	
Vert.	3145.940	PK	46.2	29.1	3.6	32.0	46.9	73.9	27.0	
Vert.	4804.000	PK	41.2	30.5	5.3	31.4	45.6	73.9	28.3	
Vert.	7206.000	PK	43.7	35.8	6.7	32.3	53.9	73.9	20.0	
Vert.	9608.000	PK	44.6	39.0	7.3	33.0	57.9	73.9	16.0	
Vert.	2390.000	AV	33.9	28.1	3.1	32.4	32.7	53.9	21.2	
Vert.	3145.940	AV	38.9	29.1	3.6	32.0	39.6	53.9	14.3	
Vert.	4804.000	AV	29.4	30.5	5.3	31.4	33.8	53.9	20.1	
Vert.	7206.000	AV	31.0	35.8	6.7	32.3	41.2	53.9	12.7	
Vert.	9608.000	AV	32.3	39.0	7.3	33.0	45.6	53.9	8.3	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)
Distance factor : 15GHz-40GHz : 20log(3.0m/1.0m)= 9.5dB

20dBc Data Sheet (RBW 100kHz, VBW 300kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	81.9	28.2	3.1	32.4	80.8	-	-	100k/300k
Hori.	2400.000	PK	34.3	28.2	3.1	32.4	33.2	60.8	27.6	100k/300k
Vert.	2402.000	PK	86.7	28.2	3.1	32.4	85.6	-	-	100k/300k
Vert.	2400.000	PK	34.3	28.2	3.1	32.4	33.2	65.6	32.4	100k/300k

Result = Reading + Ant.Fac. + Loss(Cable+Attenuator+Filter) - Gain(Amplifier)

Radiated Spurious Emission Variation 1

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10075507H
Date 10/10/2013 10/17/2013
Temperature/ Humidity 25 deg. C / 34% RH 24 deg. C / 56% RH
Engineer Takumi Shimada Tsubasa Takayama
(Above 1GHz) (Below 1GHz)
Mode 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.	59.986	QP	36.4	7.9	7.5	32.2	19.6	40.0	20.4	
Hori.	72.000	QP	43.7	6.5	7.7	32.2	25.7	40.0	14.3	
Hori.	99.968	QP	38.2	10.1	8.0	32.1	24.2	43.5	19.3	
Hori.	108.374	QP	40.0	11.3	8.1	32.1	27.3	43.5	16.2	
Hori.	199.914	QP	43.2	16.7	9.1	32.1	36.9	43.5	6.6	
Hori.	325.100	QP	39.2	15.2	10.0	32.0	32.4	46.0	13.6	
Hori.	480.020	QP	38.5	17.9	11.0	32.0	35.4	46.0	10.6	
Hori.	614.120	QP	35.0	19.4	11.8	32.1	34.1	46.0	11.9	
Hori.	687.250	QP	33.2	20.2	12.2	32.2	33.4	46.0	12.6	
Hori.	858.500	QP	24.8	22.0	13.1	31.3	28.6	46.0	17.4	
Hori.	3145.640	PK	46.0	29.1	3.6	32.0	46.7	73.9	27.2	
Hori.	4882.000	PK	41.1	30.6	5.3	31.4	45.6	73.9	28.3	
Hori.	7323.000	PK	42.0	36.0	6.8	32.4	52.4	73.9	21.5	
Hori.	9764.000	PK	44.3	39.4	7.3	33.0	58.0	73.9	15.9	
Hori.	3145.640	AV	37.6	29.1	3.6	32.0	38.3	53.9	15.6	
Hori.	4882.000	AV	29.0	30.6	5.3	31.4	33.5	53.9	20.4	
Hori.	7323.000	AV	30.2	36.0	6.8	32.4	40.6	53.9	13.3	
Hori.	9764.000	AV	32.7	39.4	7.3	33.0	46.4	53.9	7.5	
Vert.	59.986	QP	45.9	7.9	7.5	32.2	29.1	40.0	10.9	
Vert.	72.000	QP	40.5	6.5	7.7	32.2	22.5	40.0	17.5	
Vert.	99.968	QP	35.3	10.1	8.0	32.1	21.3	43.5	22.2	
Vert.	108.374	QP	32.2	11.3	8.1	32.1	19.5	43.5	24.0	
Vert.	199.914	QP	44.5	16.7	9.1	32.1	38.2	43.5	5.3	
Vert.	325.100	QP	35.9	15.2	10.0	32.0	29.1	46.0	16.9	
Vert.	480.020	QP	35.3	17.9	11.0	32.0	32.2	46.0	13.8	
Vert.	614.120	QP	36.3	19.4	11.8	32.1	35.4	46.0	10.6	
Vert.	687.250	QP	41.0	20.2	12.2	32.2	41.2	46.0	4.8	
Vert.	858.500	QP	24.2	22.0	13.1	31.3	28.0	46.0	18.0	
Vert.	3145.644	PK	48.8	29.1	3.6	32.0	49.5	73.9	24.4	
Vert.	4882.000	PK	42.0	30.6	5.3	31.4	46.5	73.9	27.4	
Vert.	7323.000	PK	42.5	36.0	6.8	32.4	52.9	73.9	21.0	
Vert.	9764.000	PK	44.6	39.4	7.3	33.0	58.3	73.9	15.6	
Vert.	3145.644	AV	43.2	29.1	3.6	32.0	43.9	53.9	10.0	
Vert.	4882.000	AV	28.8	30.6	5.3	31.4	33.3	53.9	20.6	
Vert.	7323.000	AV	30.1	36.0	6.8	32.4	40.5	53.9	13.4	
Vert.	9764.000	AV	32.0	39.4	7.3	33.0	45.7	53.9	8.2	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission
Variation 2

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10075507H
Date 10/11/2013 10/17/2013
Temperature/ Humidity 25 deg. C / 34% RH 24 deg. C / 56% RH
Engineer Motoya Imura Tsubasa Takayama
(Above 1GHz) (Below 1GHz)
Mode 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.	59.998	QP	36.0	7.9	7.5	32.2	19.2	40.0	20.8	
Hori.	72.000	QP	44.4	6.5	7.7	32.2	26.4	40.0	13.6	
Hori.	108.374	QP	43.2	11.3	8.1	32.1	30.5	43.5	13.0	
Hori.	199.904	QP	44.6	16.7	9.1	32.1	38.3	43.5	5.2	
Hori.	325.132	QP	38.3	15.2	10.0	32.0	31.5	46.0	14.5	
Hori.	480.000	QP	41.2	17.9	11.0	32.0	38.1	46.0	7.9	
Hori.	614.120	QP	37.4	19.4	11.8	32.1	36.5	46.0	9.5	
Hori.	687.262	QP	41.0	20.2	12.2	32.2	41.2	46.0	4.8	
Hori.	858.500	QP	23.6	22.0	13.1	31.3	27.4	46.0	18.6	
Hori.	3145.481	PK	46.8	29.1	3.6	32.0	47.5	73.9	26.4	
Hori.	4882.000	PK	41.6	30.6	5.3	31.4	46.1	73.9	27.8	
Hori.	7323.000	PK	42.3	36.0	6.8	32.4	52.7	73.9	21.2	
Hori.	9764.000	PK	44.2	39.4	7.3	33.0	57.9	73.9	16.0	
Hori.	3145.481	AV	41.5	29.1	3.6	32.0	42.2	53.9	11.7	
Hori.	4882.000	AV	29.3	30.6	5.3	31.4	33.8	53.9	20.1	
Hori.	7323.000	AV	30.5	36.0	6.8	32.4	40.9	53.9	13.0	
Hori.	9764.000	AV	32.4	39.4	7.3	33.0	46.1	53.9	7.8	
Vert.	59.998	QP	41.2	7.9	7.5	32.2	24.4	40.0	15.6	
Vert.	72.000	QP	40.9	6.5	7.7	32.2	22.9	40.0	17.1	
Vert.	108.374	QP	33.1	11.3	8.1	32.1	20.4	43.5	23.1	
Vert.	199.904	QP	45.4	16.7	9.1	32.1	39.1	43.5	4.4	
Vert.	325.132	QP	35.6	15.2	10.0	32.0	28.8	46.0	17.2	
Vert.	480.000	QP	37.2	17.9	11.0	32.0	34.1	46.0	11.9	
Vert.	614.120	QP	36.0	19.4	11.8	32.1	35.1	46.0	10.9	
Vert.	687.262	QP	42.4	20.2	12.2	32.2	42.6	46.0	3.4	
Vert.	858.500	QP	23.4	22.0	13.1	31.3	27.2	46.0	18.8	
Vert.	3145.607	PK	46.6	29.1	3.6	32.0	47.3	73.9	26.6	
Vert.	4882.000	PK	41.5	30.6	5.3	31.4	46.0	73.9	27.9	
Vert.	7323.000	PK	42.3	36.0	6.8	32.4	52.7	73.9	21.2	
Vert.	9764.000	PK	44.6	39.4	7.3	33.0	58.3	73.9	15.6	
Vert.	3145.607	AV	41.5	29.1	3.6	32.0	42.2	53.9	11.7	
Vert.	4882.000	AV	29.2	30.6	5.3	31.4	33.7	53.9	20.2	
Vert.	7323.000	AV	30.6	36.0	6.8	32.4	41.0	53.9	12.9	
Vert.	9764.000	AV	32.6	39.4	7.3	33.0	46.3	53.9	7.6	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission
Variation 2

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10075507H
Date 10/11/2013 10/17/2013
Temperature/ Humidity 25 deg. C / 34% RH 24 deg. C / 56% RH
Engineer Motoya Imura Tsubasa Takayama
(Above 1GHz) (Below 1GHz)
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.	59.998	QP	35.9	7.9	7.5	32.2	19.1	40.0	20.9	
Hori.	72.000	QP	45.2	6.5	7.7	32.2	27.2	40.0	12.8	
Hori.	108.374	QP	44.1	11.3	8.1	32.1	31.4	43.5	12.1	
Hori.	199.904	QP	44.2	16.7	9.1	32.1	37.9	43.5	5.6	
Hori.	325.132	QP	38.5	15.2	10.0	32.0	31.7	46.0	14.3	
Hori.	480.000	QP	41.6	17.9	11.0	32.0	38.5	46.0	7.5	
Hori.	614.120	QP	37.5	19.4	11.8	32.1	36.6	46.0	9.4	
Hori.	687.262	QP	41.2	20.2	12.2	32.2	41.4	46.0	4.6	
Hori.	844.800	QP	23.2	22.0	13.0	31.3	26.9	46.0	19.1	
Hori.	2483.500	PK	43.2	28.4	3.1	32.3	42.4	73.9	31.5	
Hori.	3145.734	PK	46.4	29.1	3.6	32.0	47.1	73.9	26.8	
Hori.	4960.000	PK	41.5	30.7	5.4	31.4	46.2	73.9	27.7	
Hori.	7440.000	PK	42.3	36.2	6.7	32.4	52.8	73.9	21.1	
Hori.	9920.000	PK	43.9	39.8	7.4	33.1	58.0	73.9	15.9	
Hori.	2483.500	AV	31.6	28.4	3.1	32.3	30.8	53.9	23.1	
Hori.	3145.734	AV	40.9	29.1	3.6	32.0	41.6	53.9	12.3	
Hori.	4960.000	AV	29.3	30.7	5.4	31.4	34.0	53.9	19.9	
Hori.	7440.000	AV	30.4	36.2	6.7	32.4	40.9	53.9	13.0	
Hori.	9920.000	AV	32.0	39.8	7.4	33.1	46.1	53.9	7.8	
Vert.	59.998	QP	41.7	7.9	7.5	32.2	24.9	40.0	15.1	
Vert.	72.000	QP	41.2	6.5	7.7	32.2	23.2	40.0	16.8	
Vert.	108.374	QP	33.3	11.3	8.1	32.1	20.6	43.5	22.9	
Vert.	199.904	QP	45.4	16.7	9.1	32.1	39.1	43.5	4.4	
Vert.	325.132	QP	35.4	15.2	10.0	32.0	28.6	46.0	17.4	
Vert.	480.000	QP	37.5	17.9	11.0	32.0	34.4	46.0	11.6	
Vert.	614.120	QP	35.8	19.4	11.8	32.1	34.9	46.0	11.1	
Vert.	687.262	QP	42.7	20.2	12.2	32.2	42.9	46.0	3.1	
Vert.	844.800	QP	23.7	22.0	13.0	31.3	27.4	46.0	18.6	
Vert.	2483.500	PK	43.9	28.4	3.1	32.3	43.1	73.9	30.8	
Vert.	3145.608	PK	46.0	29.1	3.6	32.0	46.7	73.9	27.2	
Vert.	4960.000	PK	41.2	30.7	5.4	31.4	45.9	73.9	28.0	
Vert.	7440.000	PK	42.5	36.2	6.7	32.4	53.0	73.9	20.9	
Vert.	9920.000	PK	44.5	39.8	7.4	33.1	58.6	73.9	15.3	
Vert.	2483.500	AV	30.7	28.4	3.1	32.3	29.9	53.9	24.0	
Vert.	3145.608	AV	38.5	29.1	3.6	32.0	39.2	53.9	14.7	
Vert.	4960.000	AV	29.4	30.7	5.4	31.4	34.1	53.9	19.8	
Vert.	7440.000	AV	30.3	36.2	6.7	32.4	40.8	53.9	13.1	
Vert.	9920.000	AV	32.1	39.8	7.4	33.1	46.2	53.9	7.7	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission
Variation 2

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
 Report No. 10075507H
 Date 10/11/2013 10/17/2013
 Temperature/ Humidity 25 deg. C / 34% RH 24 deg. C / 56% RH
 Engineer Motoya Imura Tsubasa Takayama
 (Above 1GHz) (Below 1GHz)
 Mode Tx, 3DH5 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.	60.003	QP	37.0	7.9	7.5	32.2	20.2	40.0	19.8	
Hori.	72.018	QP	45.6	6.5	7.7	32.2	27.6	40.0	12.4	
Hori.	108.381	QP	43.2	11.3	8.1	32.1	30.5	43.5	13.0	
Hori.	199.921	QP	45.5	16.7	9.1	32.1	39.2	43.5	4.3	
Hori.	325.132	QP	38.4	15.2	10.0	32.0	31.6	46.0	14.4	
Hori.	480.000	QP	42.0	17.9	11.0	32.0	38.9	46.0	7.1	
Hori.	614.120	QP	37.6	19.4	11.8	32.1	36.7	46.0	9.3	
Hori.	687.261	QP	41.7	20.2	12.2	32.2	41.9	46.0	4.1	
Hori.	814.100	QP	23.5	21.9	12.8	31.5	26.7	46.0	19.3	
Hori.	3145.603	PK	46.7	29.1	3.6	32.0	47.4	73.9	26.5	
Hori.	4882.000	PK	41.5	30.6	5.3	31.4	46.0	73.9	27.9	
Hori.	7323.000	PK	42.5	36.0	6.8	32.4	52.9	73.9	21.0	
Hori.	9764.000	PK	44.4	39.4	7.3	33.0	58.1	73.9	15.8	
Hori.	3145.603	AV	41.4	29.1	3.6	32.0	42.1	53.9	11.8	
Hori.	4882.000	AV	29.3	30.6	5.3	31.4	33.8	53.9	20.1	
Hori.	7323.000	AV	30.4	36.0	6.8	32.4	40.8	53.9	13.1	
Hori.	9764.000	AV	32.5	39.4	7.3	33.0	46.2	53.9	7.7	
Vert.	60.003	QP	41.5	7.9	7.5	32.2	24.7	40.0	15.3	
Vert.	72.020	QP	40.5	6.5	7.7	32.2	22.5	40.0	17.5	
Vert.	108.372	QP	34.9	11.3	8.1	32.1	22.2	43.5	21.3	
Vert.	199.911	QP	45.4	16.7	9.1	32.1	39.1	43.5	4.4	
Vert.	325.132	QP	35.6	15.2	10.0	32.0	28.8	46.0	17.2	
Vert.	480.000	QP	37.3	17.9	11.0	32.0	34.2	46.0	11.8	
Vert.	614.120	QP	36.4	19.4	11.8	32.1	35.5	46.0	10.5	
Vert.	687.262	QP	41.9	20.2	12.2	32.2	42.1	46.0	3.9	
Vert.	814.100	QP	23.3	21.9	12.8	31.5	26.5	46.0	19.5	
Vert.	3145.602	PK	46.3	29.1	3.6	32.0	47.0	73.9	26.9	
Vert.	4882.000	PK	41.5	30.6	5.3	31.4	46.0	73.9	27.9	
Vert.	7323.000	PK	42.4	36.0	6.8	32.4	52.8	73.9	21.1	
Vert.	9764.000	PK	44.5	39.4	7.3	33.0	58.2	73.9	15.7	
Vert.	3145.602	AV	41.2	29.1	3.6	32.0	41.9	53.9	12.0	
Vert.	4882.000	AV	29.3	30.6	5.3	31.4	33.8	53.9	20.1	
Vert.	7323.000	AV	30.6	36.0	6.8	32.4	41.0	53.9	12.9	
Vert.	9764.000	AV	32.5	39.4	7.3	33.0	46.2	53.9	7.7	

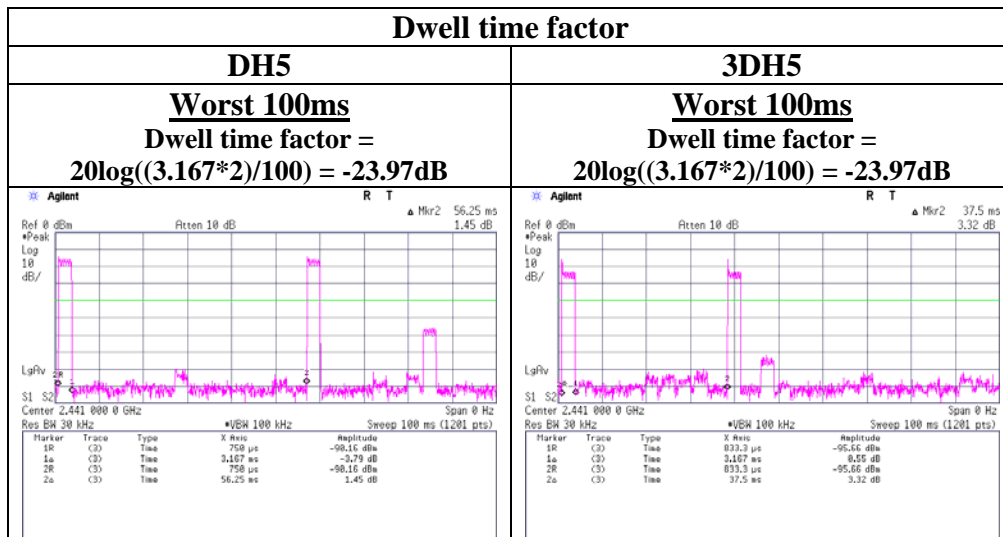
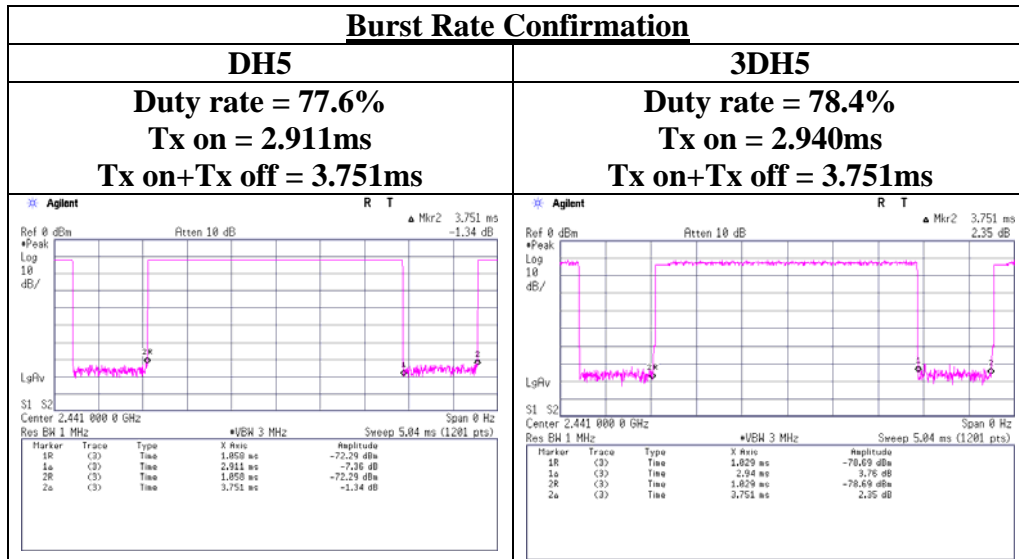
Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)
 Distance factor : 15GHz-40GHz : 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission
Variation 2

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10075507H
Date 10/11/2013 10/17/2013
Temperature/ Humidity 25 deg. C / 34% RH 24 deg. C / 56% RH
Engineer Motoya Imura Tsubasa Takayama
(Above 1GHz) (Below 1GHz)
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.	60.003	QP	37.2	7.9	7.5	32.2	20.4	40.0	19.6	
Hori.	72.018	QP	45.3	6.5	7.7	32.2	27.3	40.0	12.7	
Hori.	108.381	QP	42.1	11.3	8.1	32.1	29.4	43.5	14.1	
Hori.	199.921	QP	45.3	16.7	9.1	32.1	39.0	43.5	4.5	
Hori.	325.132	QP	38.4	15.2	10.0	32.0	31.6	46.0	14.4	
Hori.	480.000	QP	41.8	17.9	11.0	32.0	38.7	46.0	7.3	
Hori.	614.230	QP	37.9	19.4	11.8	32.1	37.0	46.0	9.0	
Hori.	687.231	QP	41.6	20.2	12.2	32.2	41.8	46.0	4.2	
Hori.	818.900	QP	23.5	21.9	12.9	31.5	26.8	46.0	19.2	
Hori.	2483.500	PK	43.2	28.4	3.1	32.3	42.4	73.9	31.5	
Hori.	3145.734	PK	46.4	29.1	3.6	32.0	47.1	73.9	26.8	
Hori.	4960.000	PK	41.5	30.7	5.4	31.4	46.2	73.9	27.7	
Hori.	7440.000	PK	42.3	36.2	6.7	32.4	52.8	73.9	21.1	
Hori.	9920.000	PK	43.9	39.8	7.4	33.1	58.0	73.9	15.9	
Hori.	2483.500	AV	31.6	28.4	3.1	32.3	30.8	53.9	23.1	
Hori.	3145.734	AV	40.9	29.1	3.6	32.0	41.6	53.9	12.3	
Hori.	4960.000	AV	29.3	30.7	5.4	31.4	34.0	53.9	19.9	
Hori.	7440.000	AV	30.4	36.2	6.7	32.4	40.9	53.9	13.0	
Hori.	9920.000	AV	32.0	39.8	7.4	33.1	46.1	53.9	7.8	
Vert.	60.003	QP	41.3	7.9	7.5	32.2	24.5	40.0	15.5	
Vert.	72.020	QP	41.0	6.5	7.7	32.2	23.0	40.0	17.0	
Vert.	108.372	QP	35.3	11.3	8.1	32.1	22.6	43.5	20.9	
Vert.	199.911	QP	45.4	16.7	9.1	32.1	39.1	43.5	4.4	
Vert.	325.132	QP	35.6	15.2	10.0	32.0	28.8	46.0	17.2	
Vert.	480.000	QP	37.6	17.9	11.0	32.0	34.5	46.0	11.5	
Vert.	614.230	QP	36.3	19.4	11.8	32.1	35.4	46.0	10.6	
Vert.	687.231	QP	41.4	20.2	12.2	32.2	41.6	46.0	4.4	
Vert.	818.900	QP	23.6	21.9	12.9	31.5	26.9	46.0	19.1	
Vert.	2483.500	PK	43.9	28.4	3.1	32.3	43.1	73.9	30.8	
Vert.	3145.608	PK	46.0	29.1	3.6	32.0	46.7	73.9	27.2	
Vert.	4960.000	PK	41.2	30.7	5.4	31.4	45.9	73.9	28.0	
Vert.	7440.000	PK	42.5	36.2	6.7	32.4	53.0	73.9	20.9	
Vert.	9920.000	PK	44.5	39.8	7.4	33.1	58.6	73.9	15.3	
Vert.	2483.500	AV	30.7	28.4	3.1	32.3	29.9	53.9	24.0	
Vert.	3145.608	AV	38.5	29.1	3.6	32.0	39.2	53.9	14.7	
Vert.	4960.000	AV	29.4	30.7	5.4	31.4	34.1	53.9	19.8	
Vert.	7440.000	AV	30.3	36.2	6.7	32.4	40.8	53.9	13.1	
Vert.	9920.000	AV	32.1	39.8	7.4	33.1	46.2	53.9	7.7	

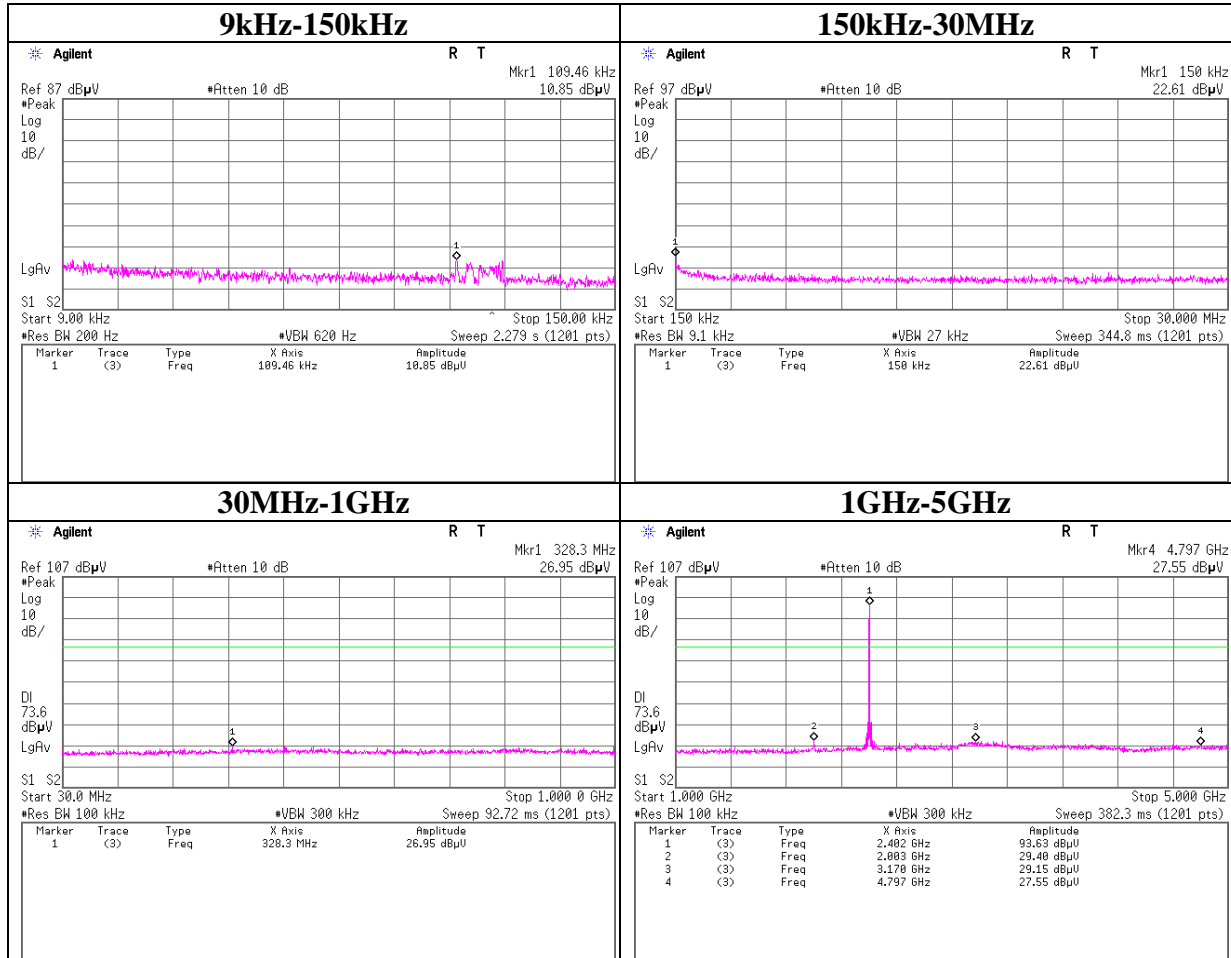
Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)
Distance factor : 15GHz-40GHz : 20log(3.0m/1.0m)= 9.5dB



* Dwell time factor was not used for Radiated emission.

Conducted Spurious Emission

Tx DH5 240MHz



UL Japan, Inc.

Head Office EMC Lab.

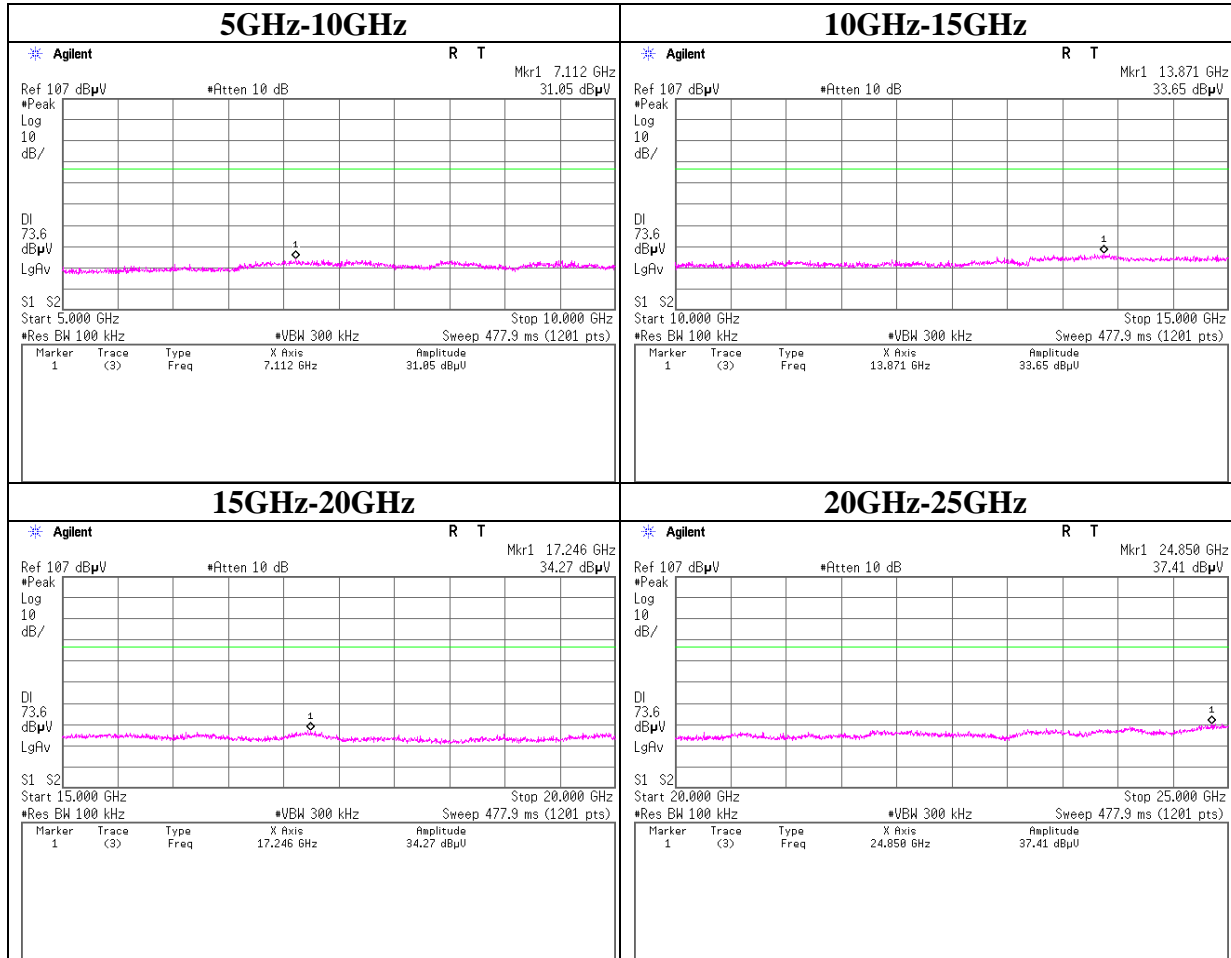
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Tx DH5 2402MHz



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Head Office EMC Lab.

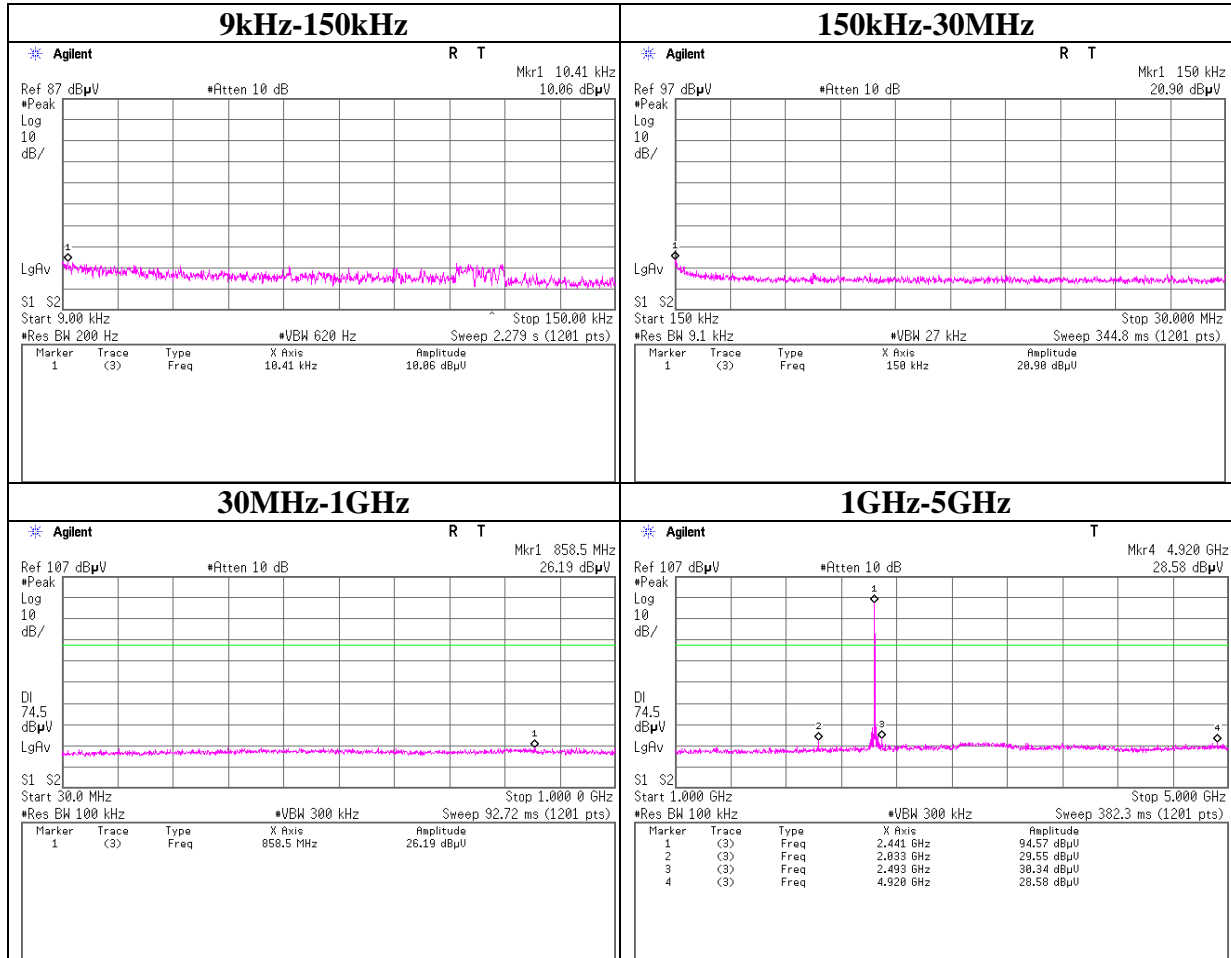
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Facsimile : +81 596 24 8124

Conducted Spurious Emission

Tx DH5 2441MHz



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Head Office EMC Lab.

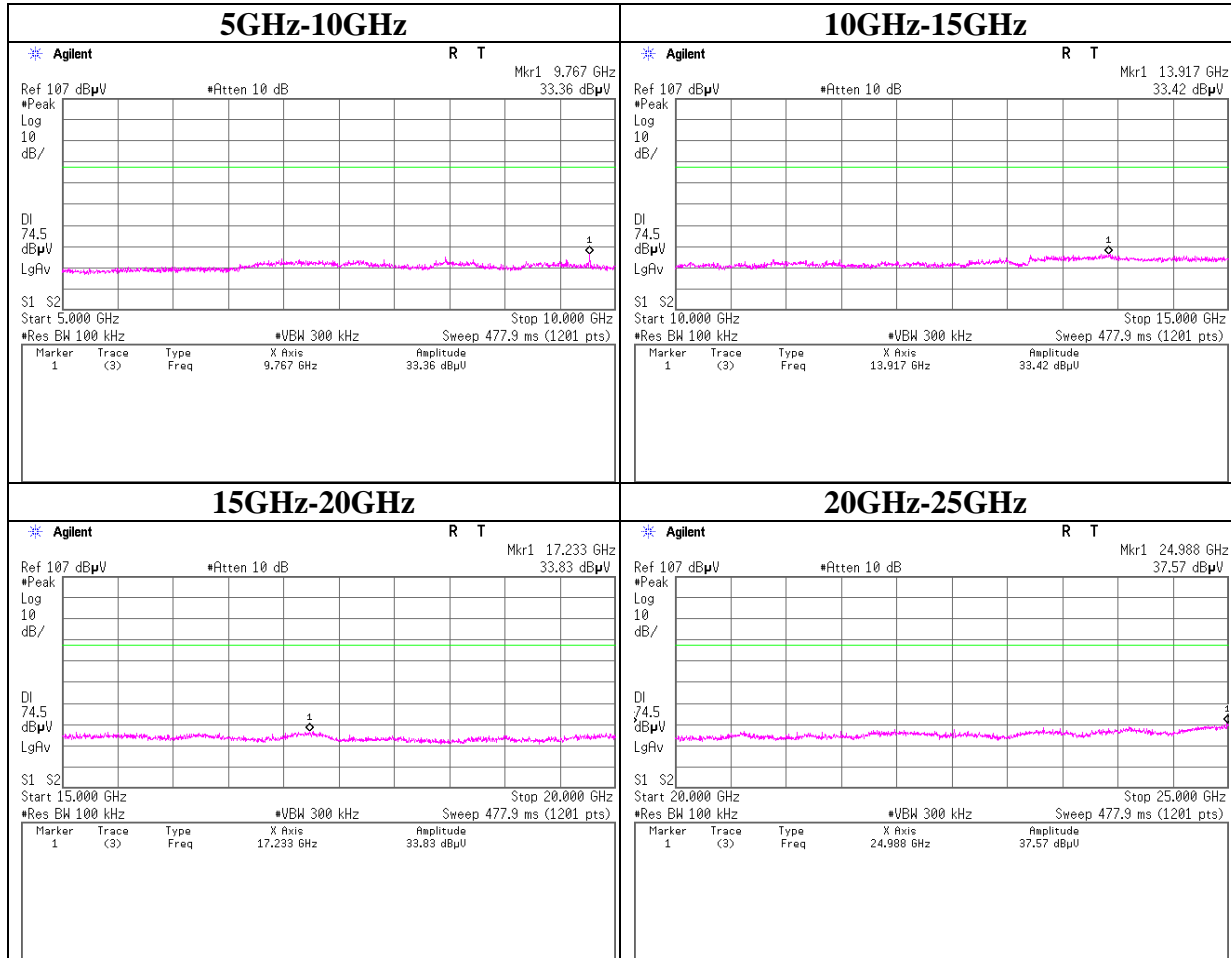
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

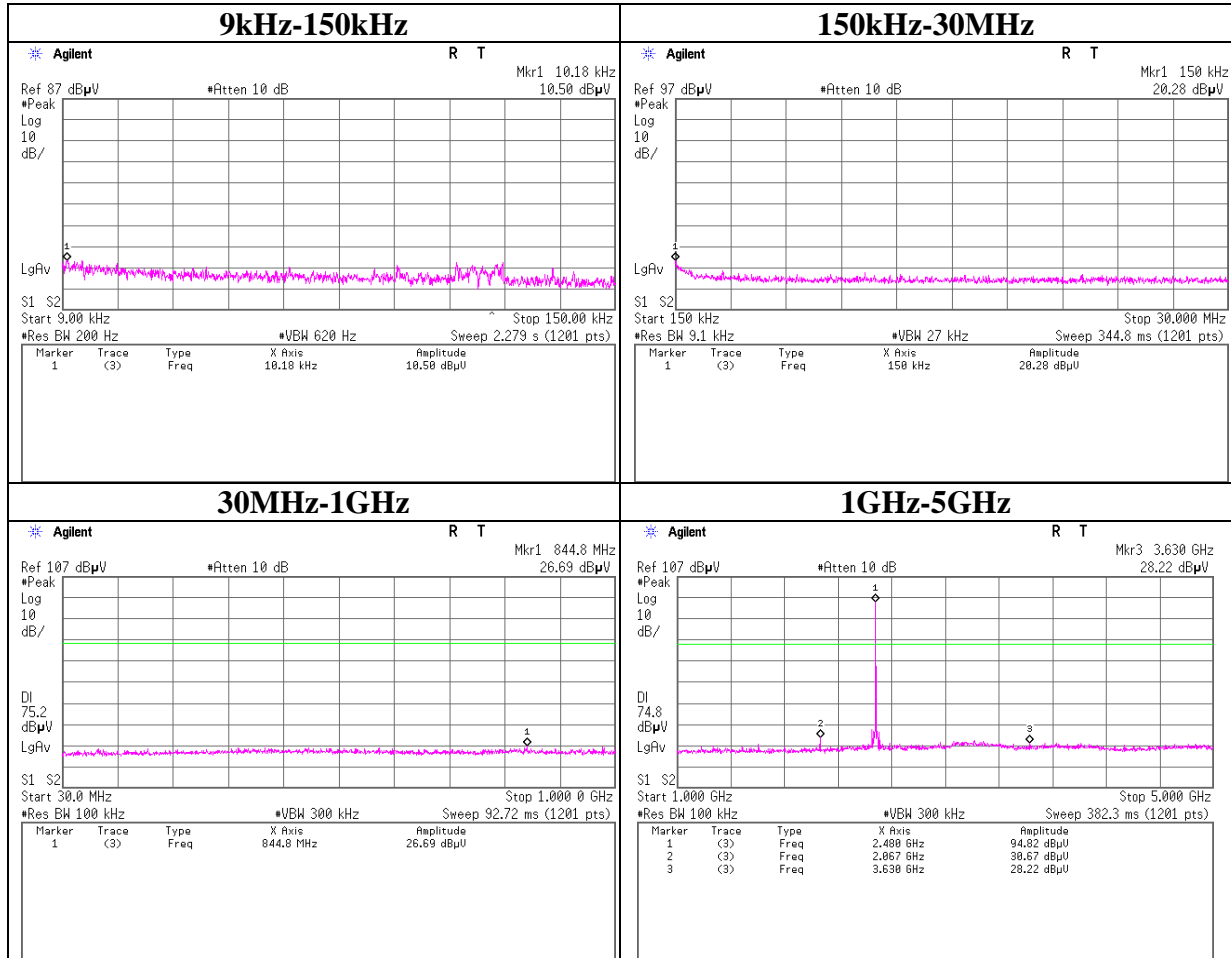
Conducted Spurious Emission

Tx DH5 2441MHz



Conducted Spurious Emission

Tx DH5 2480MHz



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Head Office EMC Lab.

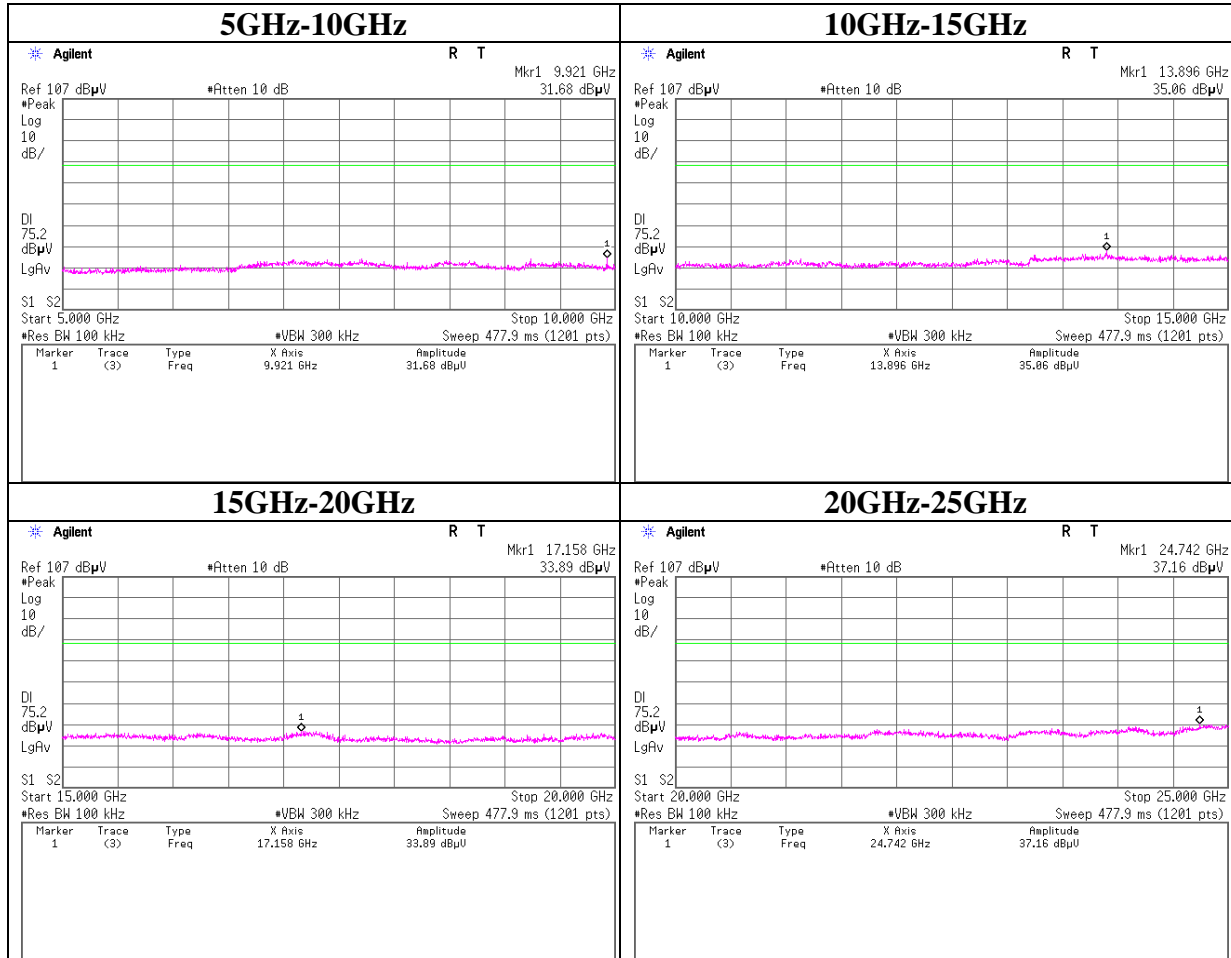
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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Facsimile : +81 596 24 8124

Conducted Spurious Emission

Tx DH5 2480MHz



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Head Office EMC Lab.

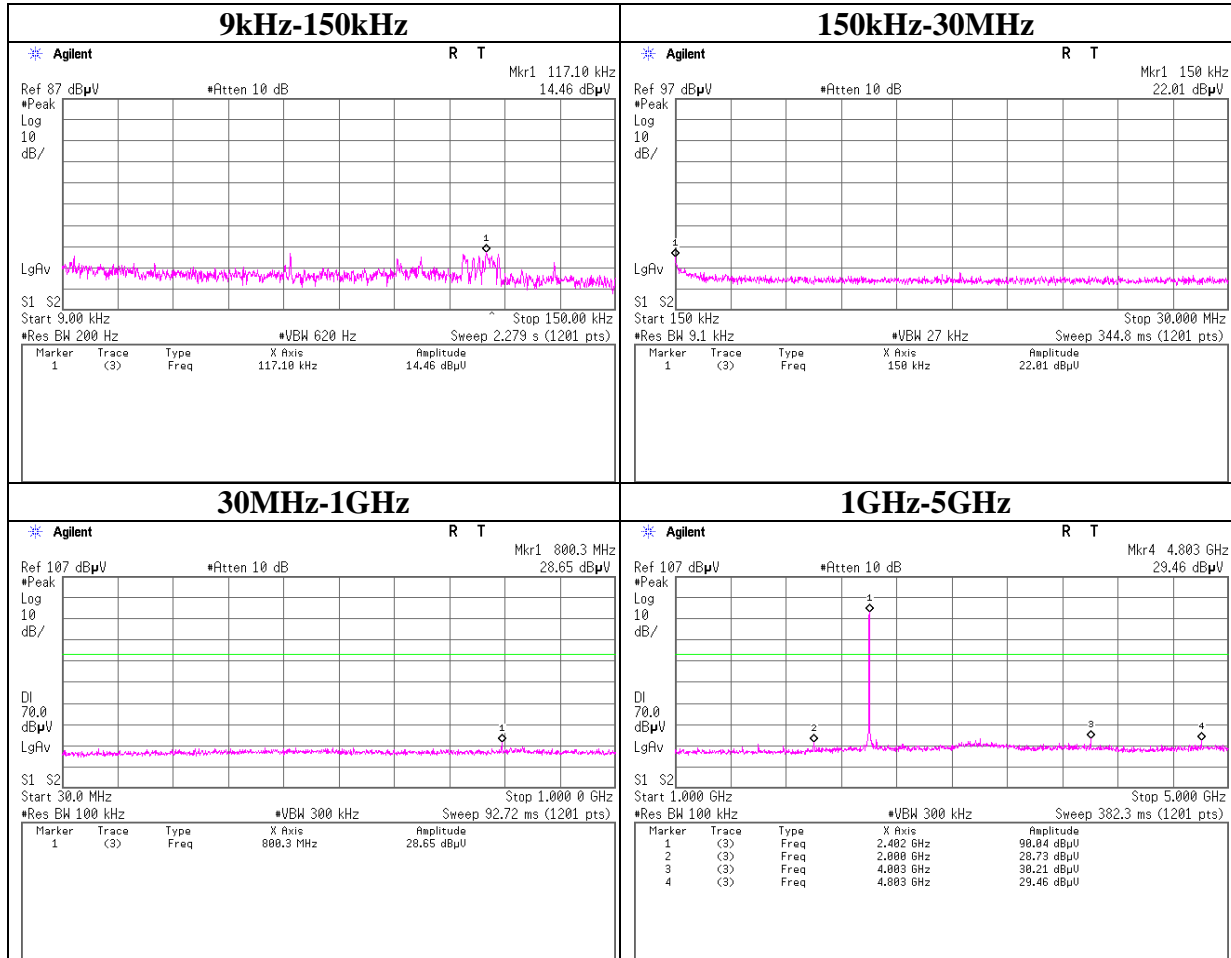
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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Facsimile : +81 596 24 8124

Conducted Spurious Emission

Tx 3DH5 2402MHz



UL Japan, Inc.

Head Office EMC Lab.

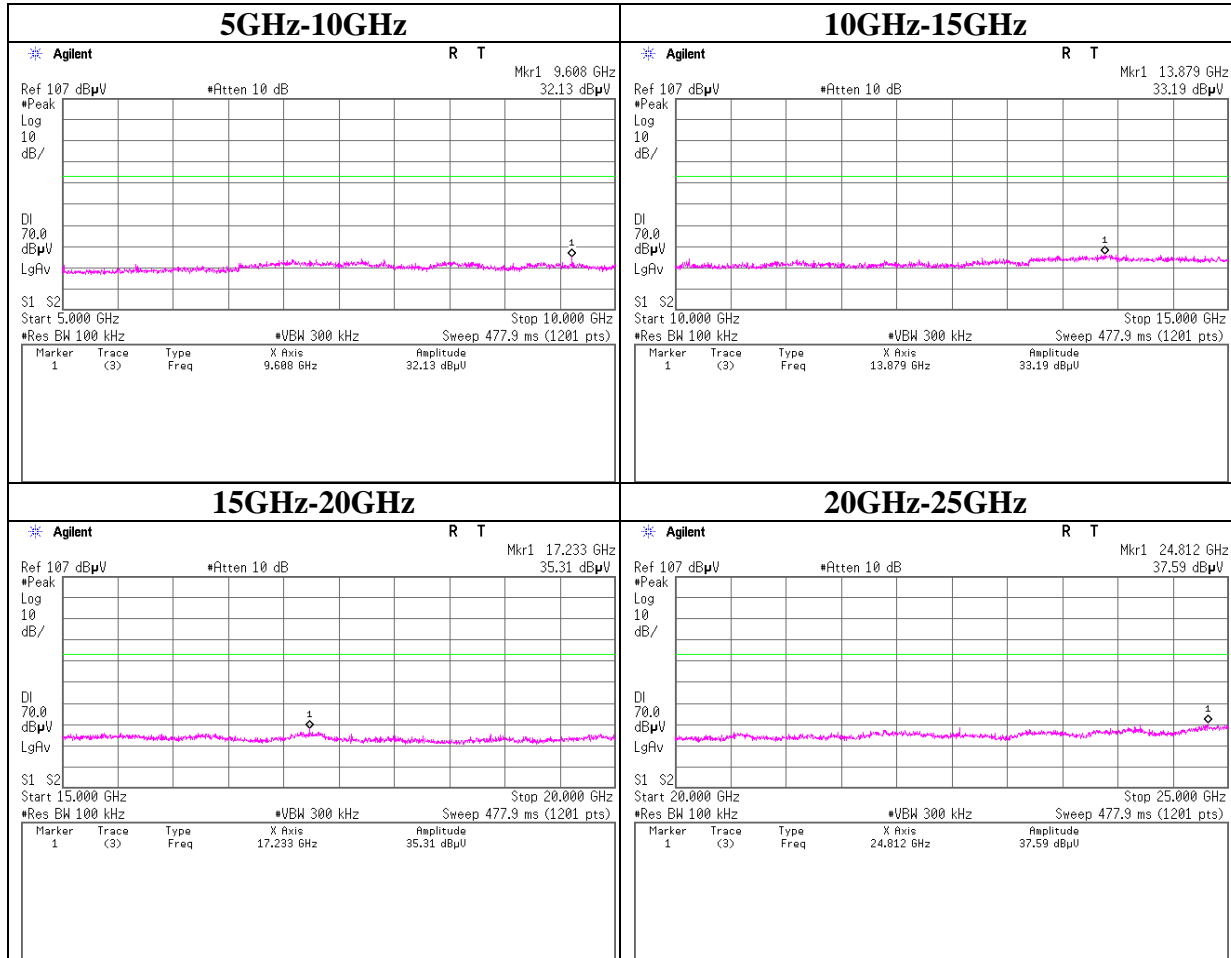
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

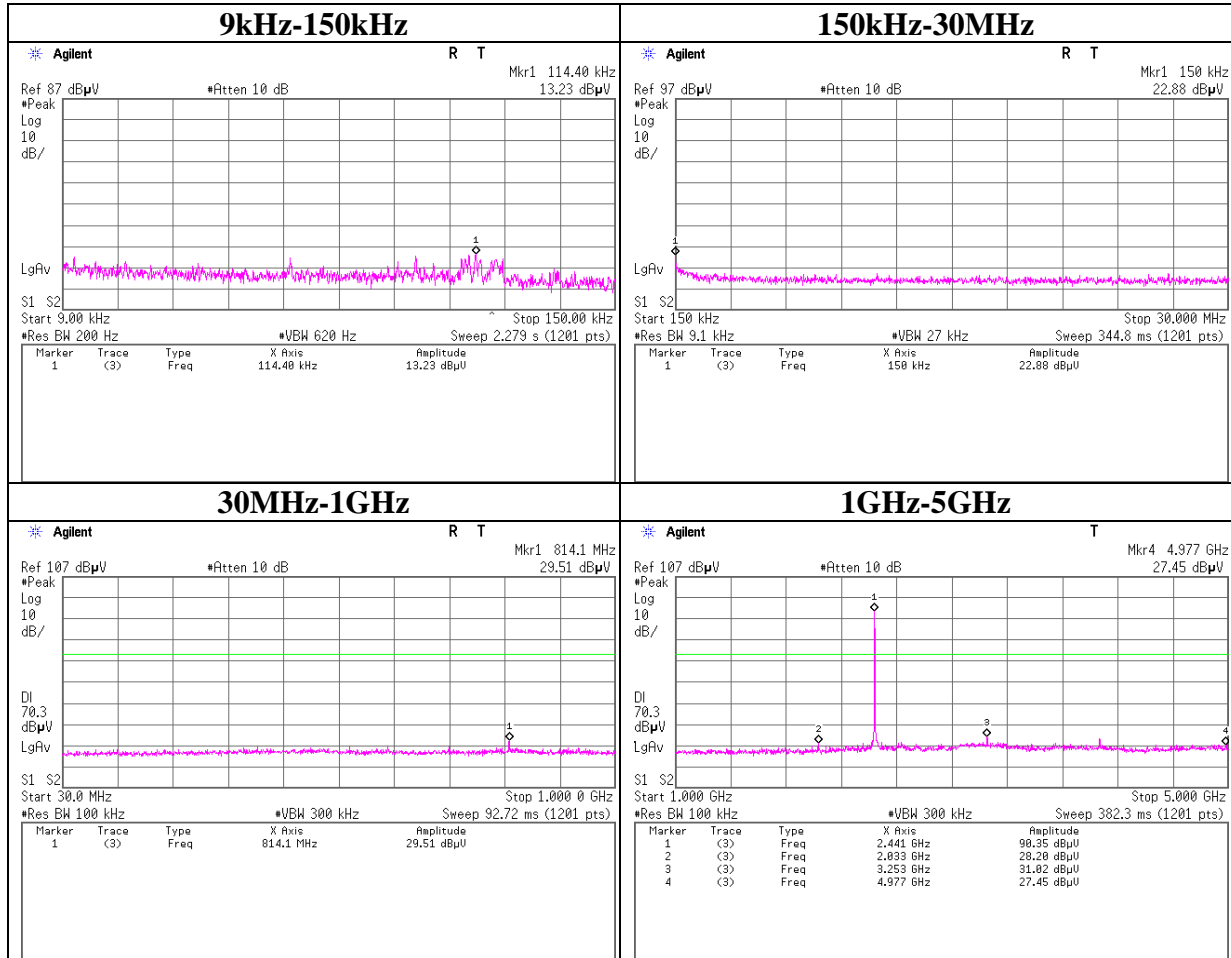
Conducted Spurious Emission

Tx 3DH5 2402MHz



Conducted Spurious Emission

Tx 3DH5 2441MHz



UL Japan, Inc.

Head Office EMC Lab.

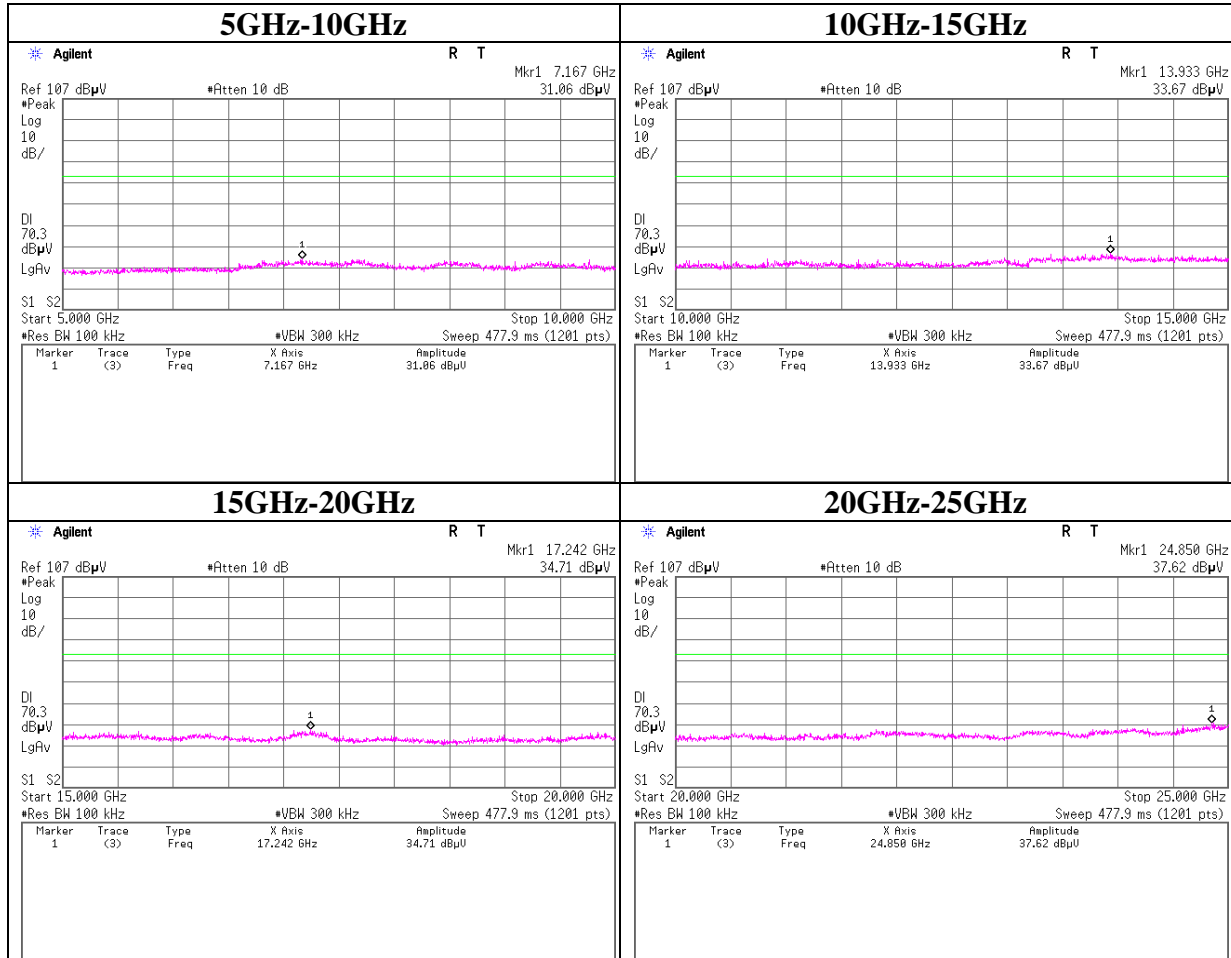
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

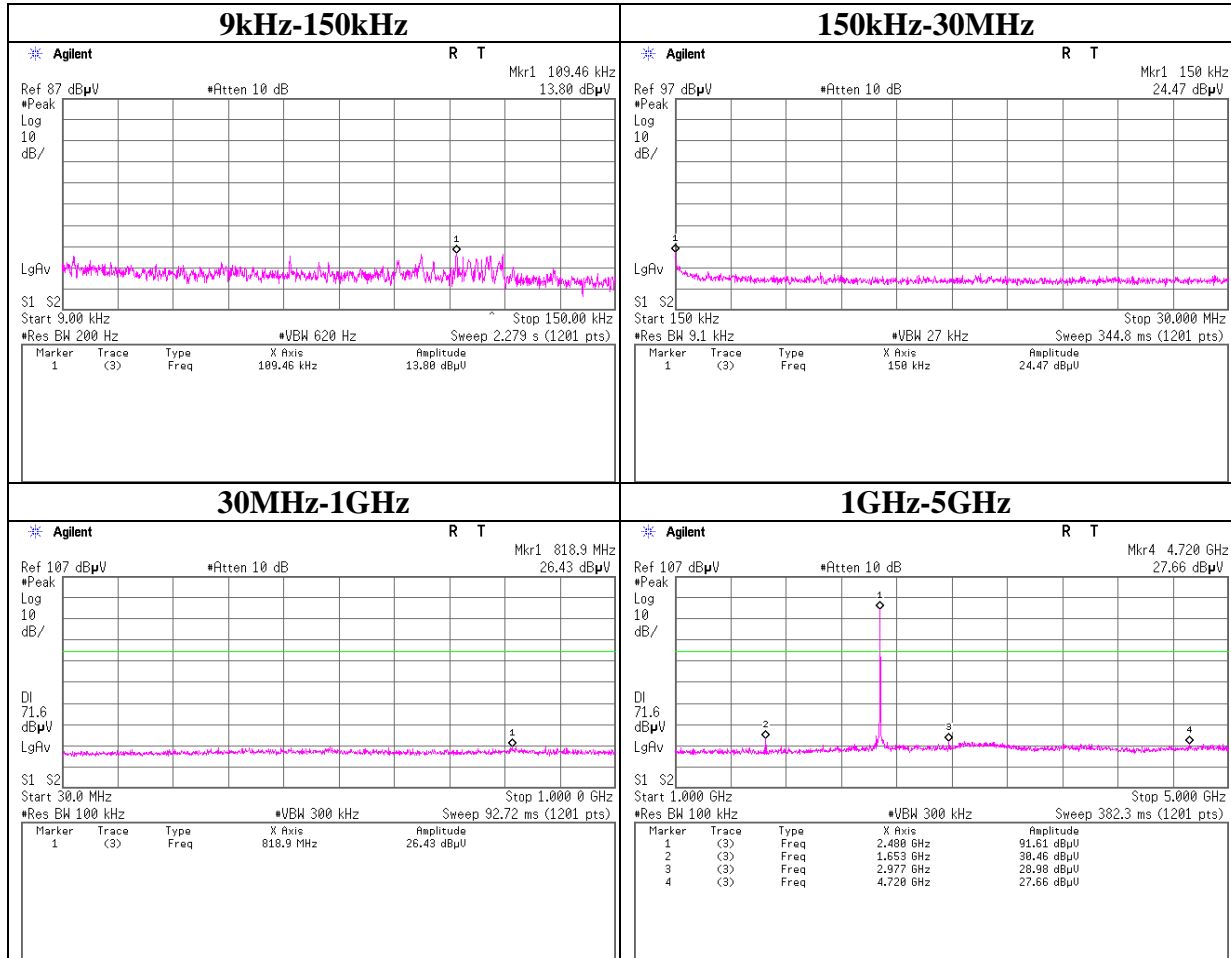
Conducted Spurious Emission

Tx 3DH5 2441MHz



Conducted Spurious Emission

Tx 3DH5 2480MHz



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Head Office EMC Lab.

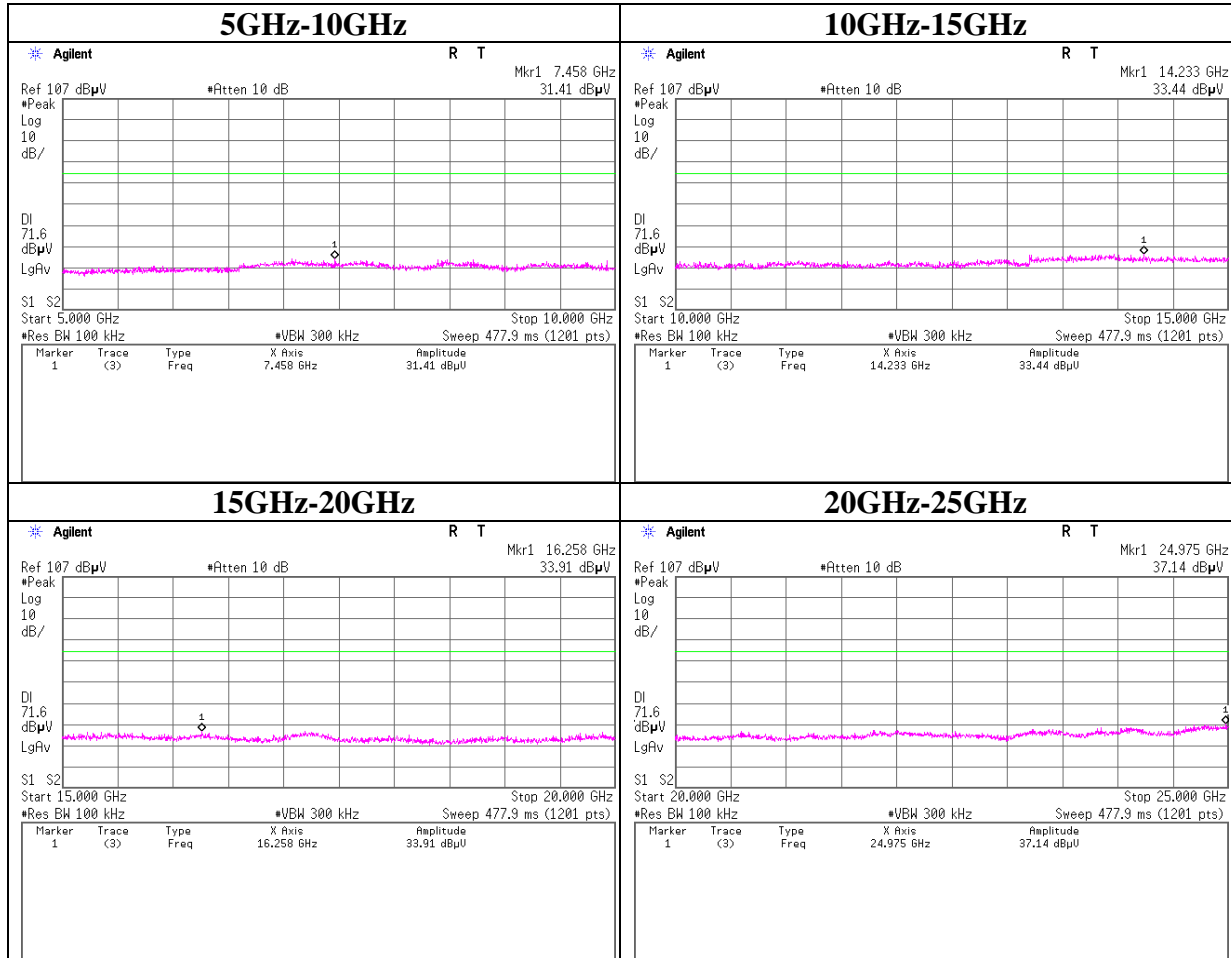
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Conducted Spurious Emission

Tx 3DH5 2480MHz



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Head Office EMC Lab.

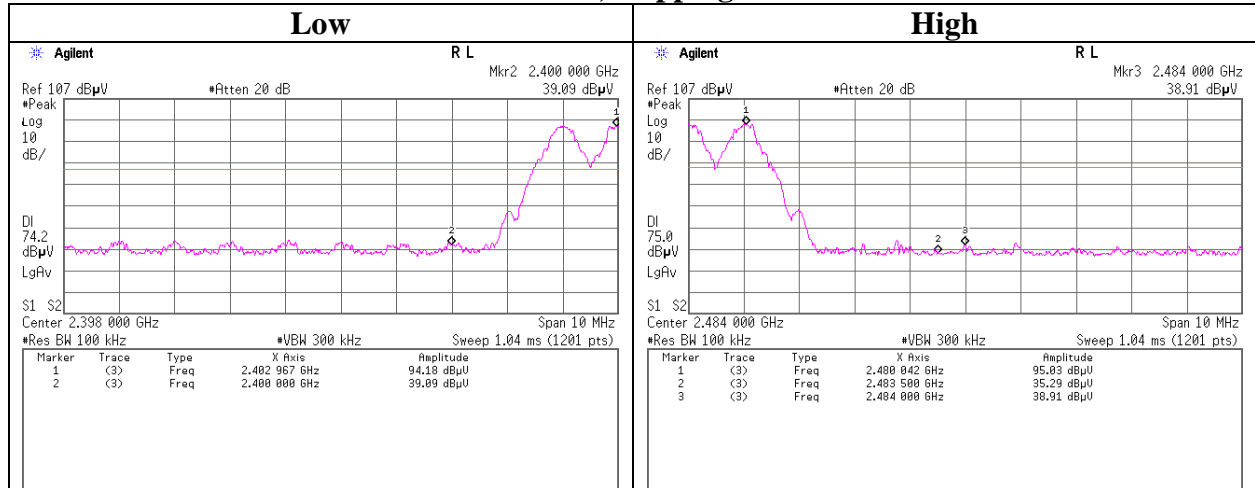
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

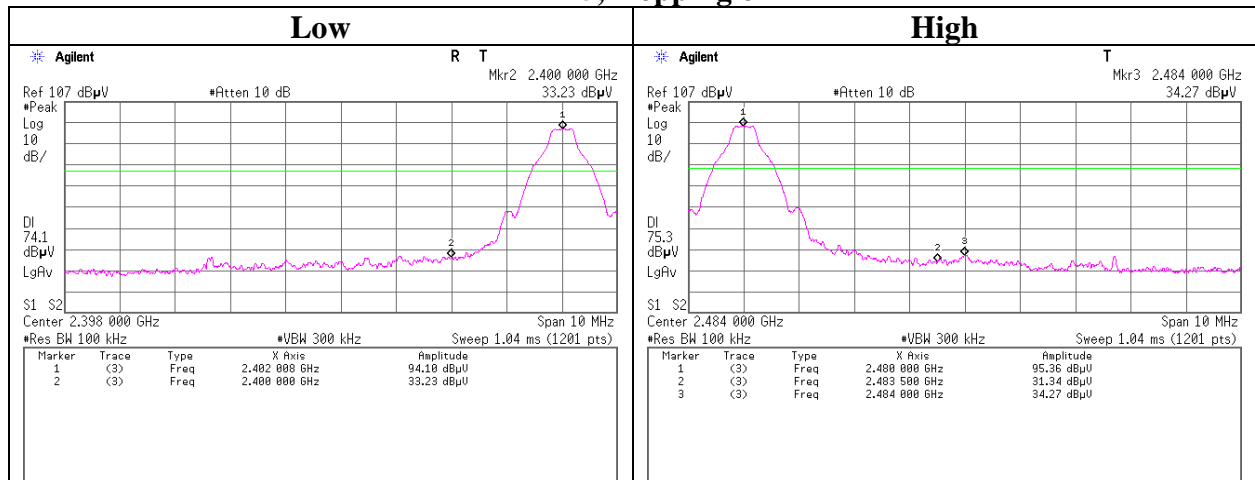
Facsimile : +81 596 24 8124

Conducted Emission Band Edge compliance

Tx DH5, Hopping on



Tx DH5, Hopping off



UL Japan, Inc.

Head Office EMC Lab.

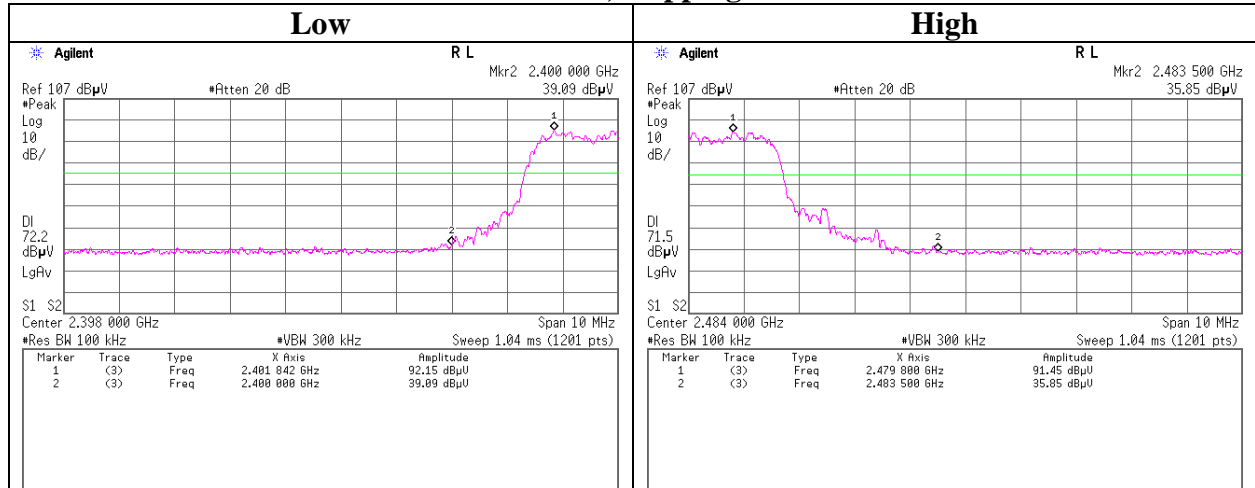
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

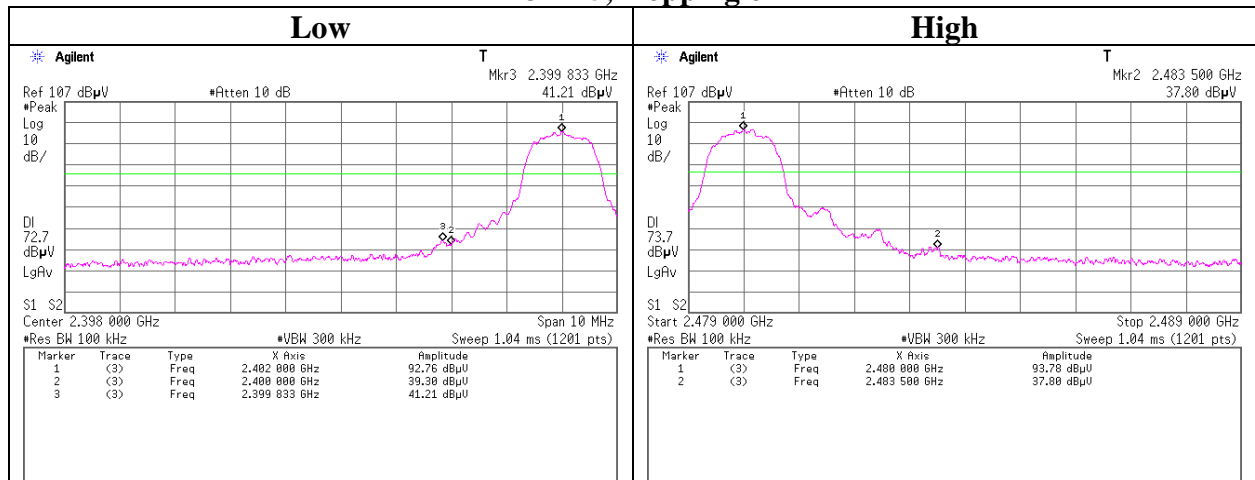
Facsimile : +81 596 24 8124

Conducted Emission Band Edge compliance

Tx 3DH5, Hopping on



Tx 3DH5, Hopping off



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Head Office EMC Lab.

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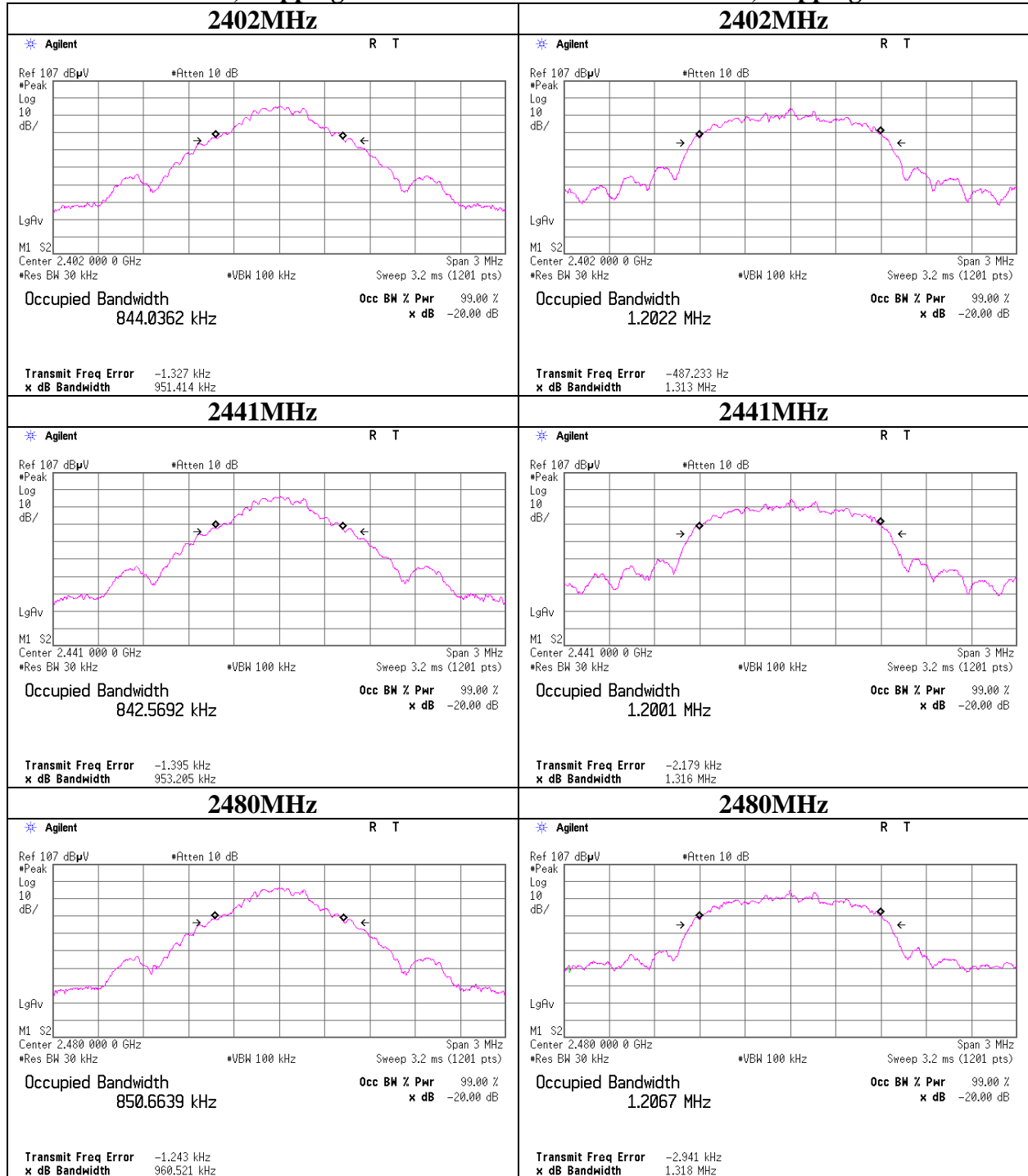
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

Tx DH5, Hopping off

Tx 3DH5, Hopping off



UL Japan, Inc.

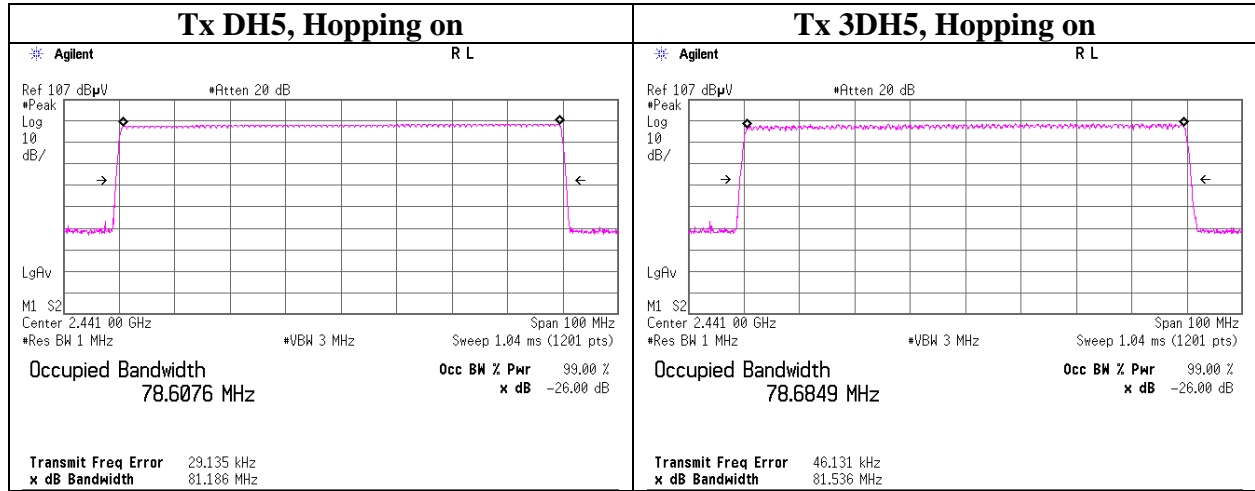
Head Office EMC Lab.

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99% Occupied Bandwidth



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2012/12/25 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	AT	2012/11/20 * 12 *1)
MCC-66	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28636/2	AT	2013/04/17 * 12
MAT-23	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2013/03/21 * 12
MPM-09	Power Meter	Anritsu	ML2495A	6K00003348	AT	2013/10/21 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	AT	2013/10/21 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2013/02/28 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2013/02/26 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2012/11/20 * 12 *1)
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2013/08/20 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2012/10/08 * 12 *1)
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2012/10/08 * 12 *1)
MCC-51	Coaxial cable	UL Japan	-	-	RE	2013/07/23 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2013/04/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2013/03/12 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2013/05/17 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2013/09/27 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2013/03/12 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2013/05/17 * 12

***1) This test equipment was used for the tests before the expiration date of the calibration.**

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.

Head Office EMC Lab.

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

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