



RADIO TEST REPORT

Test Report No. : 33BE0179-HO-A

Applicant : SAMSUNG ELECTRONICS CO., LTD.

Type of Equipment : Smart phone with GSM/GPRS/EDGE850/1900 and WCDMA850/1900, BT(EDR, LE), NFC, 802.11a/b/g/n(mobile hot spot)

Model No. : GT-I9105P

FCC ID : A3LGTI9105P

Test regulation : FCC Part 15 Subpart C: 2012

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.

Date of test: November 4 and 7, 2012

Representative test engineer: 
Yutaka Yoshida
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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SECTION 1: Customer information

Company Name : SAMSUNG ELECTRONICS CO., LTD.
Address : 416, MAETAN 3-DONG, YEONGTONG-GU SUWON-CITY,
GYEONGGI-DO 443-742, SOUTH KOREA

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

2.1 Identification of E.U.T.

Type of Equipment : Smart phone with GSM/GPRS/EDGE850/1900 and WCDMA850/1900,
BT(EDR, LE), NFC, 802.11a/b/g/n(mobile hot spot)
Model No. : GT-I9105P
Serial No. : Refer to Section 4, Clause 4.2
Rating : AC120V/60Hz (AC Adapter)
DC3.7V/1650mAh, 6.11Wh (Battery)
Receipt Date of Sample : October 24, 2012
Modification of EUT : No Modification by the test lab

2.2 Product Description

Radio Specification

NFC

Equipment Type	Transceiver
Frequency of Operation	13.56MHz
Type of Modulation	ASK
Antenna Type	FPCB

Bluetooth (BDR/EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Type	LDS
Antenna Gain	-1.2dBi

Bluetooth (Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	DSSS
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Type	LDS
Antenna Gain	-1.2dBi

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

Equipment Type	Transceiver	
Frequency of Operation	2412-2462MHz	5180-5240MHz 5260-5320MHz 5500-5700MHz 5745-5825MHz
Type of Modulation	DSSS, OFDM	OFDM
Bandwidth & Channel spacing	20MHz & 5MHz	20MHz & 20MHz
Antenna Type	LDS	
Antenna Gain	2.4G: -1.2dBi	5G: 0.68dBi

GSM

Equipment Type	Transceiver	
Frequency of Operation	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz	
Type of Modulation	GMSK , 8PSK	
Emission Designator	GSM850: 248KGXW, 254KG7W PCS: 248KGXW, 257KG7W	
Antenna Type	MID	
Antenna Gain	GSM850: -7.11dBi PCS: -4.38dBi	

W-CDMA

Equipment Type	Transceiver	
Frequency of Operation	[Up Link] Band V: 824 – 849MHz Band II: 1850 – 1910MHz [Down Link] Band V: 869 – 894MHz Band II: 1930 – 1990MHz	
Type of Modulation	QPSK	
Emission Designator	Band V: 4M15F9W Band II: 4M14F9W	
Antenna Type	MID	
Antenna Gain	Band V: -7.11dBi Band II: -4.38dBi	

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2012, final revised on August 13, 2012 and effective September 12, 2012

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

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	QP 13.8dB, 0.49075MHz, L AV 13.8dB, 2.32539MHz, N	Complied	-
Carrier Frequency Separation	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) IC: RSS-210 A8.1 (b)	See data.	Complied	Conducted
20dB Bandwidth	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) IC: RSS-210 A8.1 (a)		-	Conducted
Number of Hopping Frequency	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-210 A8.1 (d)		Complied	Conducted
Dwell time	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(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: Section15.247(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: Section15.247(d) IC: RSS-210 A8.5 RSS-Gen 6 and 7.2.3	9.1dB 9920.000MHz, AV, Horizontal	Complied	Conducted/ Radiated

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

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

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)	Conducted emission (+dB)
	150kHz-30MHz
No.1	3.5dB
No.2	3.6dB
No.3	3.6dB
No.4	3.6dB

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

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

Power meter (+dB)	
Below 1GHz	Above 1GHz
1.0dB	1.0dB

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	
1.0dB	1.1dB	2.7dB	3.2dB	3.3dB	1.5dB

Conducted Emission test

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

Radiated emission test (3m)

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

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3.5 Test Location

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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	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

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

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

Refer to APPENDIX.

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

4.1 Operating Mode(s)

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

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Conducted Emission, Spurious Emission (Conducted/Radiated)	Tx (Hopping off) DH5, 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	-
Maximum Peak Output Power	Tx (Hopping off) DH5, 2DH5, 3DH5	2402MHz 2441MHz 2480MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping on -Hopping off	2402MHz 2480MHz
99% Occupied Bandwidth	Tx DH5, 3DH5 -Hopping on -Hopping off Inquiry	2402MHz 2441MHz 2480MHz
*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) *The EUT support AFH with a minimum of 20 channels, following the Bluetooth protocol to ensure compliance with the pseudo-hopping sequence and dwell time requirements of FCC 15.247.		

***Power of the EUT was set by the software as follows:**

Power settings: Maximum power of the EUT was transmitted on Bluetooth testing mode.

H/W version : REV1.1

S/W version : I9105P.001

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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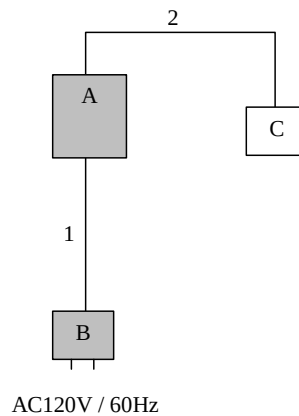
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4.2 Configuration and peripherals



* 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	Smart phone with GSM/GPRS/EDGE850/1900 and WCDMA850/1900, BT(EDR, LE), NFC, 802.11a/b/g/n (mobile hot spot)	GT-I9105P	FJ-289-D *1) FJ-289-A *2)	SAMSUNG	EUT
B	AC Adapter	ETA0U10EBE	-	SAMSUNG	EUT
C	Ear phone	-	-	SAMSUNG	-

*1) Used for Antenna Terminal conducted test

*2) Used for Conducted Emission and Radiated Emission tests

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	1.5	Unshielded	Unshielded	-
2	Ear phone Cable	1.2	Unshielded	Unshielded	-

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SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. All unused 50ohm connectors of the LISN(AMN) were resistivity terminated in 50ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

Detector	: QP and AV
Measurement range	: 0.15-30MHz
Test data	: APPENDIX
Test result	: Pass

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SECTION 6: Radiated Spurious Emission

Test Procedure

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, 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 carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

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

Measurement range	: 30M-25GHz
Test data	: APPENDIX
Test result	: Pass

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SECTION 7: 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 mode)	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	-	Power Meter (Sensor: 50MHz BW)
Carrier Frequency Separation	3MHz 5MHz (Inquiry mode)	30kHz, 100kHz	100kHz, 300kHz	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	Max Hold	Spectrum Analyzer
Conducted Spurious Emission *1)	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) 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 not detected as shown in the chart.(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz)

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

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Data of EMI test

Conducted Emission

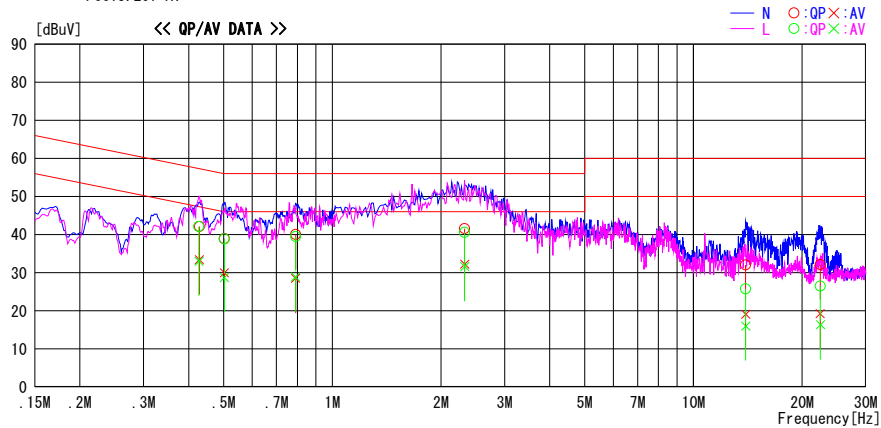
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2012/11/07

Report No. : 33BE0179-H0
Power : AC 120V / 60Hz
Temp./Humi. : 22deg. C / 44% RH
Engineer : Tomotaka Sasagawa

Mode / Remarks : BT DH5 2402MHz

LIMIT : FCC15.207 QP
FCC15.207 AV

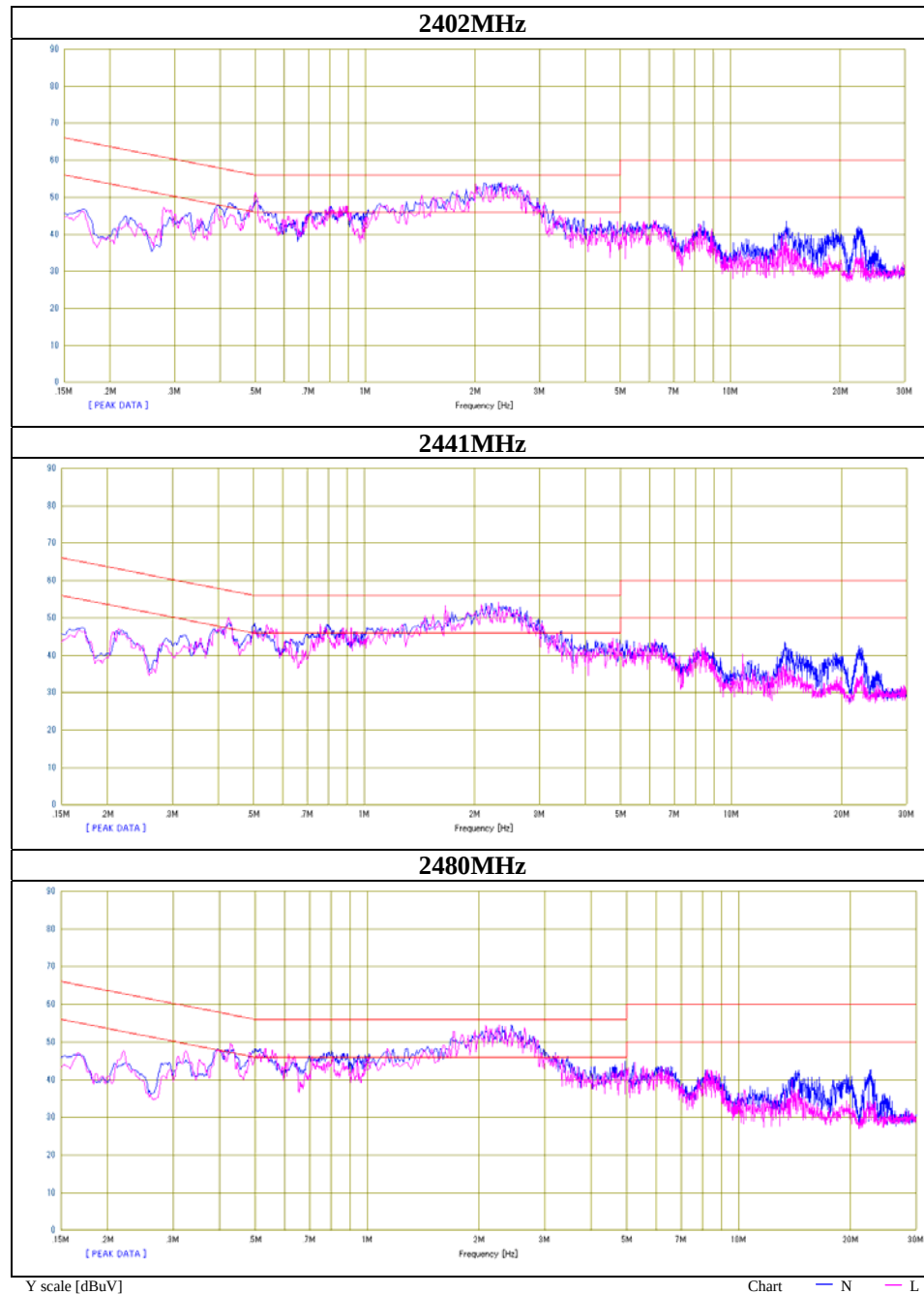


Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.42840	28.9	20.2	13.2	42.1	33.4	57.3	47.3	15.2	13.9	N	
0.50235	25.7	16.8	13.2	38.9	30.0	56.0	46.0	17.1	16.0	N	
0.79090	26.7	15.2	13.3	40.0	28.5	56.0	46.0	16.0	17.5	N	
2.32539	28.2	18.8	13.4	41.6	32.2	56.0	46.0	14.4	13.8	N	
13.96001	17.2	4.3	14.8	32.0	19.1	60.0	50.0	28.0	30.9	N	
22.44786	16.8	3.9	15.3	32.1	19.2	60.0	50.0	27.9	30.8	N	
0.42695	28.9	19.8	13.2	42.1	33.0	57.3	47.3	15.2	14.3	L	
0.50235	25.6	15.5	13.2	38.8	28.7	56.0	46.0	17.2	17.3	L	
0.79090	26.2	15.6	13.3	39.5	28.9	56.0	46.0	16.5	17.1	L	
2.32539	27.2	18.2	13.4	40.6	31.6	56.0	46.0	15.4	14.4	L	
13.96001	10.9	1.2	14.8	25.7	16.0	60.0	50.0	34.3	34.0	L	
22.48128	11.2	1.0	15.3	26.5	16.3	60.0	50.0	33.5	33.7	L	

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT=READING+C.F (PROBE LOSS + CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Conducted Emission

Test place	Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No.	33BE0179-HO
Date	11/04/2012
Temperature/ Humidity	22 deg. C / 44% RH
Engineer	Tomotaka Sasagawa
Mode	Tx DH5



Conducted Emission

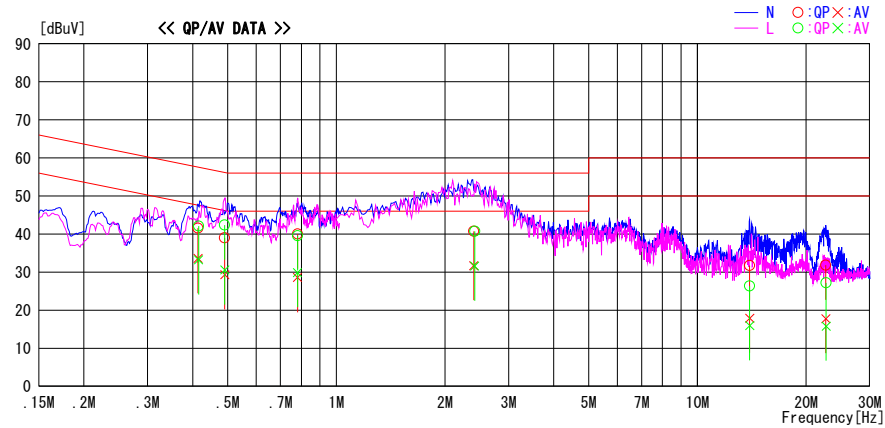
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2012/11/07

Report No. : 33BE0179-HO
Power : AC 120V / 60Hz
Temp./Humi. : 22deg. C / 44% RH
Engineer : Tomotaka Sasagawa

Mode / Remarks : BT 3DH5 2402MHz

LIMIT : FCC15.207 QP
FCC15.207 AV

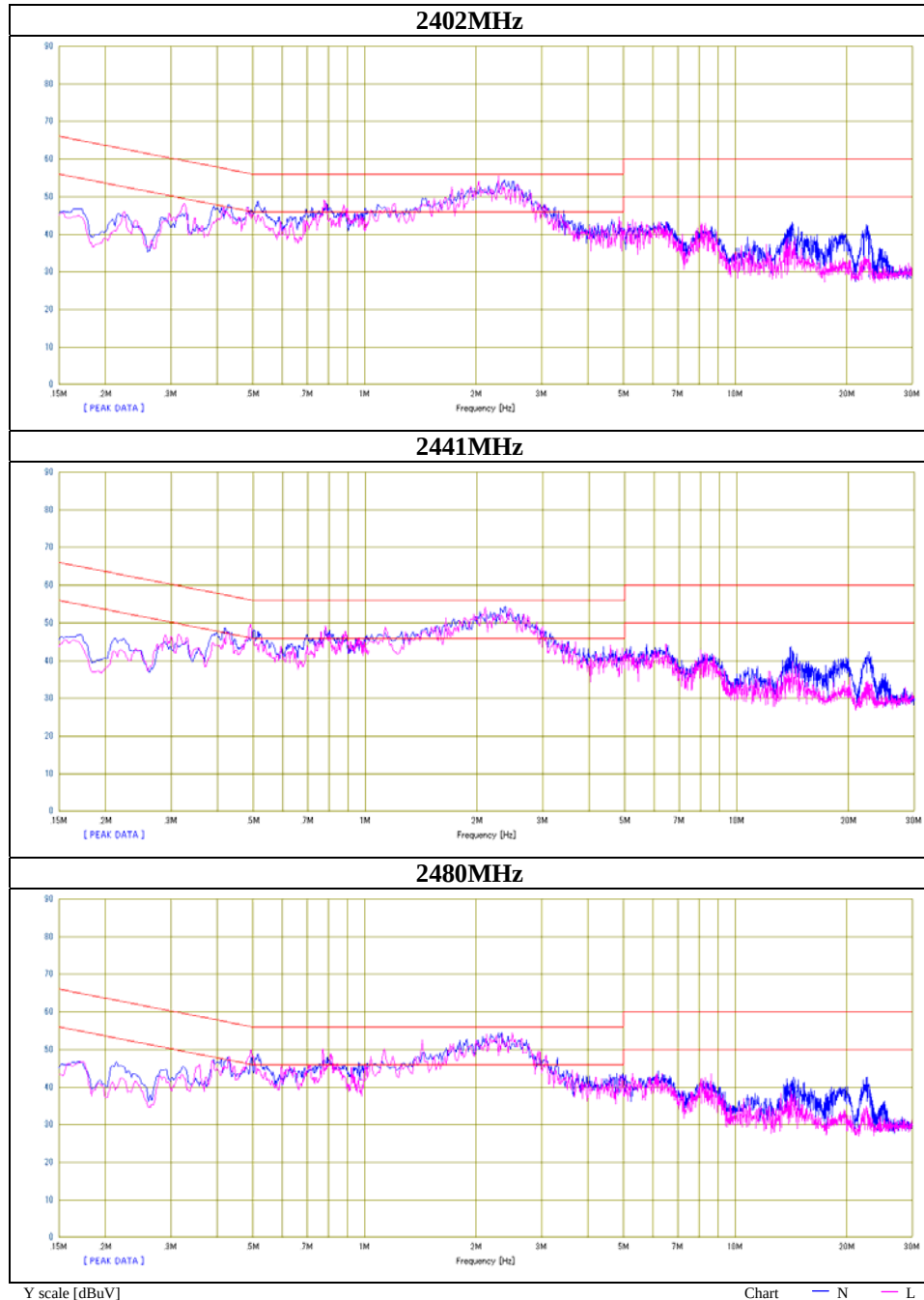


Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.41390	28.2	20.2	13.4	41.6	33.6	57.6	47.6	16.0	14.0	N	
0.49075	25.6	15.9	13.4	39.0	29.3	56.2	46.2	17.2	16.9	N	
0.78075	26.6	15.2	13.4	40.0	28.6	56.0	46.0	16.0	17.4	N	
2.40097	27.2	18.2	13.5	40.7	31.7	56.0	46.0	15.3	14.3	N	
13.96001	17.2	3.4	14.5	31.7	17.9	60.0	50.0	28.3	32.1	N	
22.68178	16.9	2.9	14.9	31.8	17.8	60.0	50.0	28.2	32.2	N	
0.41535	28.7	19.8	13.4	42.1	33.2	57.5	47.5	15.4	14.3	L	
0.49075	29.0	17.2	13.4	42.4	30.6	56.2	46.2	13.8	15.6	L	
0.78075	26.2	16.5	13.4	39.6	29.9	56.0	46.0	16.4	16.1	L	
2.41609	27.2	18.1	13.5	40.7	31.6	56.0	46.0	15.3	14.4	L	
13.96001	11.9	1.5	14.5	26.4	16.0	60.0	50.0	33.6	34.1	L	
22.71520	12.3	0.9	14.9	27.2	15.8	60.0	50.0	32.8	34.2	L	

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT=READING+C.F (PROBE LOSS + CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Conducted Emission

Test place	Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No.	33BE0179-HO
Date	11/04/2012
Temperature/ Humidity	22 deg. C / 44% RH
Engineer	Tomotaka Sasagawa
Mode	Tx 3DH5

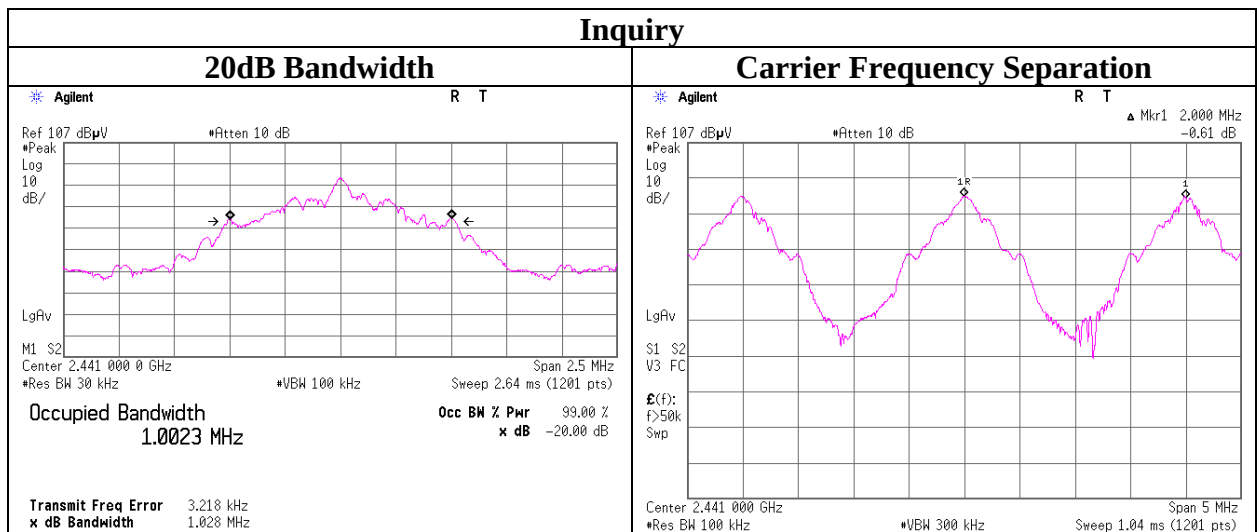


20dB Bandwidth and Carrier Frequency Separation

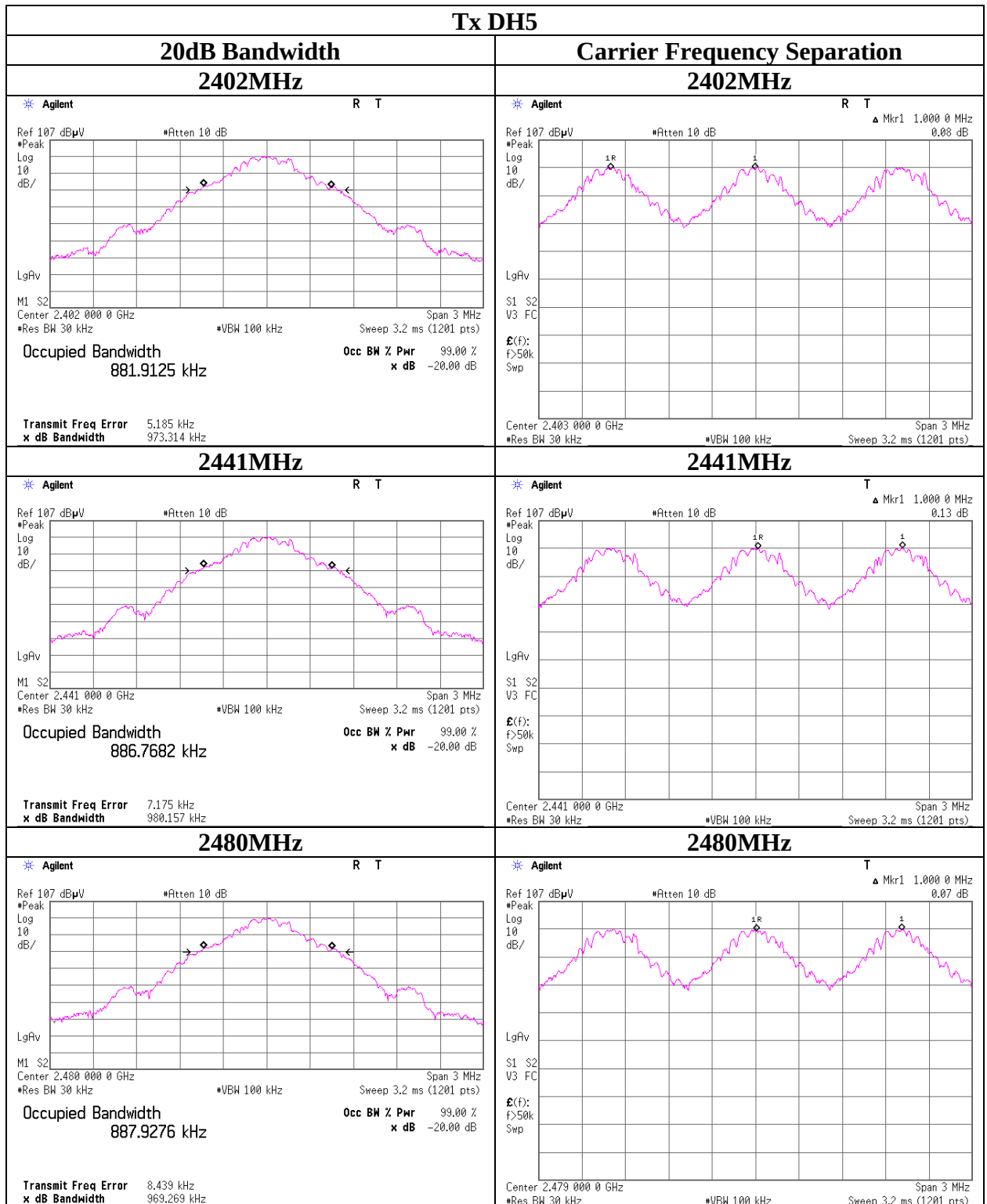
Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 33BE0179-HO
Date 11/07/2012
Temperature/ Humidity 29deg. C / 26% RH
Engineer Yutaka Yoshida
Mode Tx (Hopping on) DH5/3DH5/Inquiry

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.973	1.000	≥ 0.649
DH5	2441.0	0.980	1.000	≥ 0.653
DH5	2480.0	0.969	1.000	≥ 0.646
3DH5	2402.0	1.327	1.000	≥ 0.885
3DH5	2441.0	1.332	1.000	≥ 0.888
3DH5	2480.0	1.321	1.000	≥ 0.881
Inquiry	2441.0	1.028	2.000	≥ 0.685

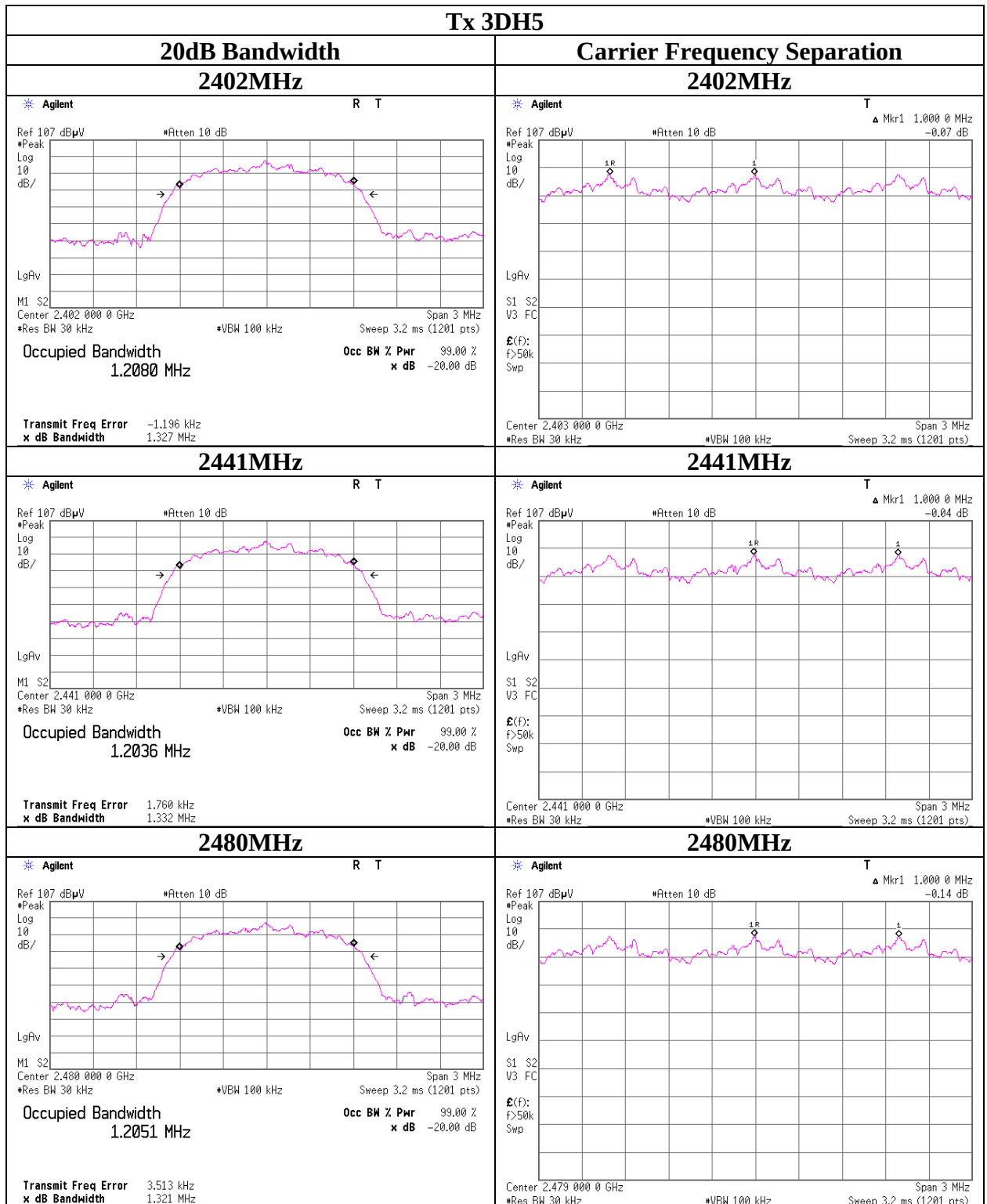
Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).
No limit applies to 20dB Bandwidth.



20dB Bandwidth and Carrier Frequency Separation



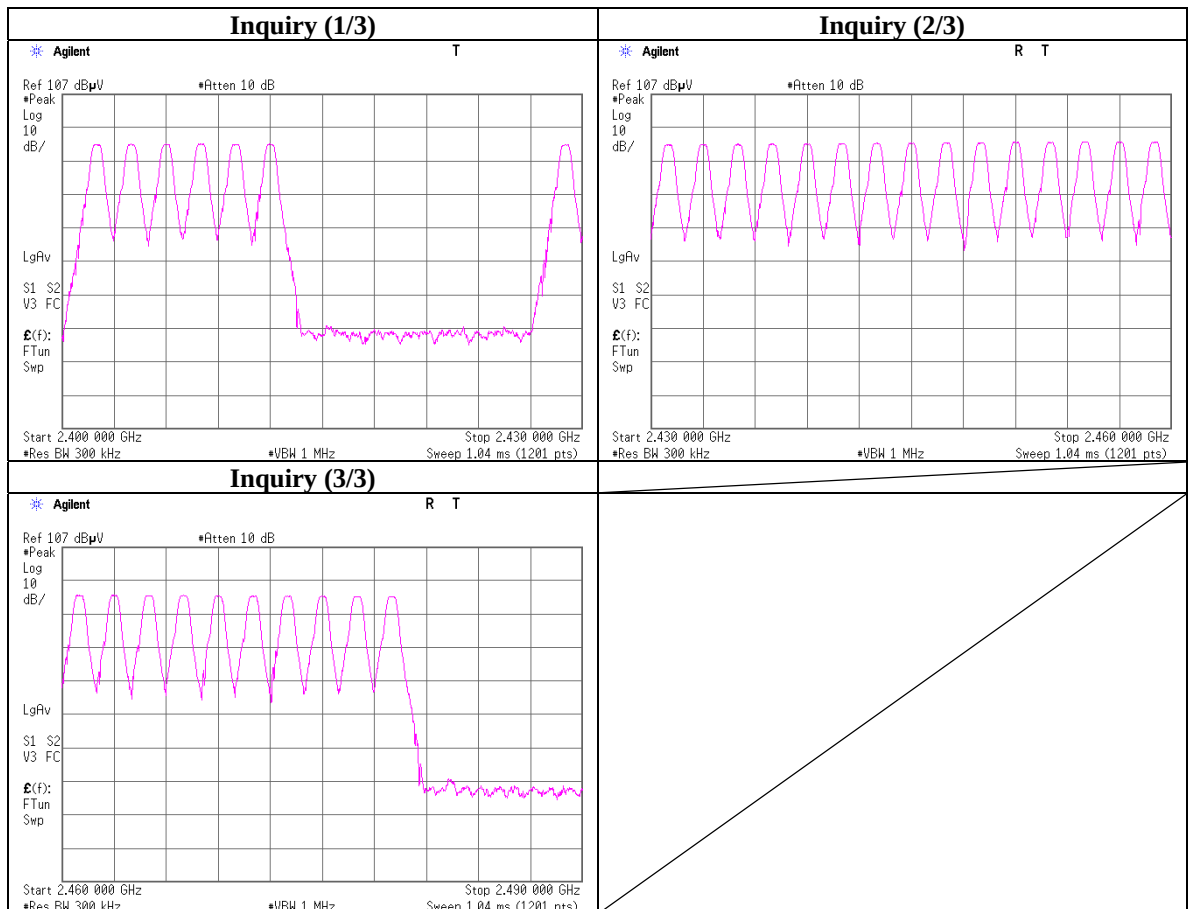
20dB Bandwidth and Carrier Frequency Separation



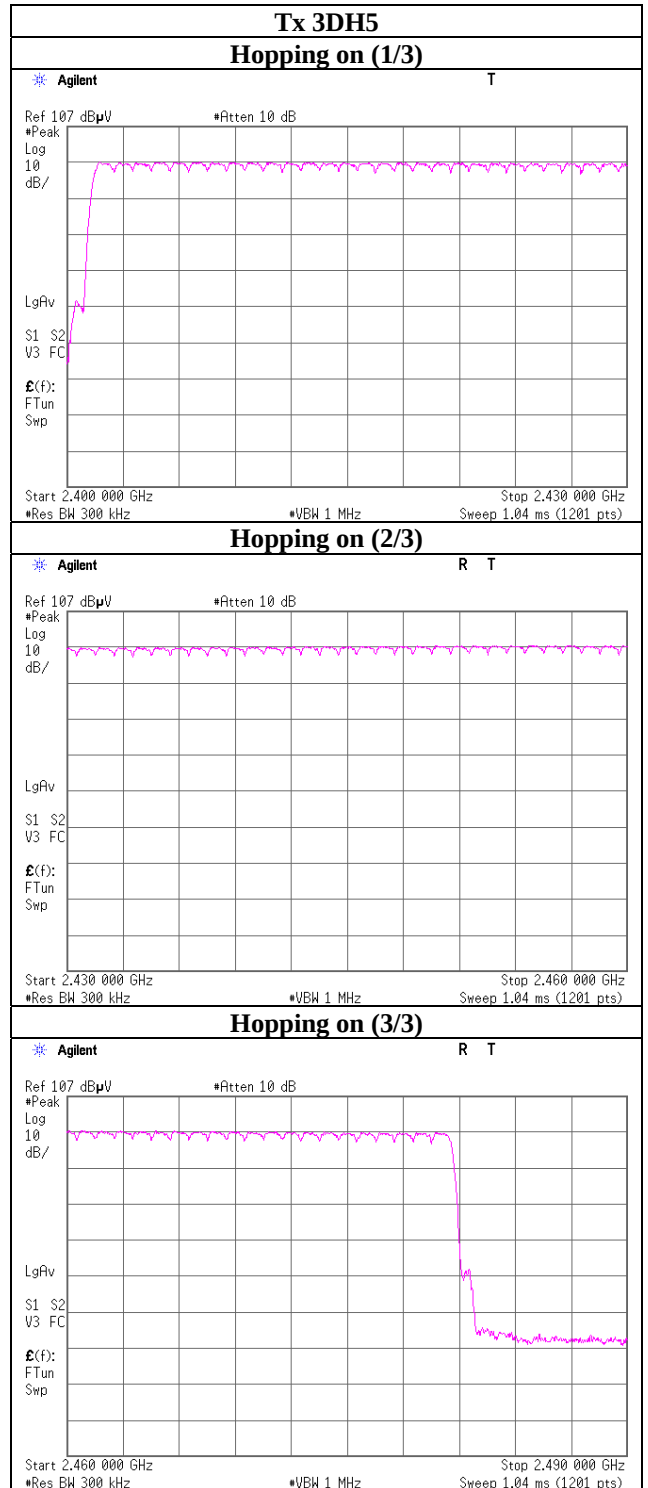
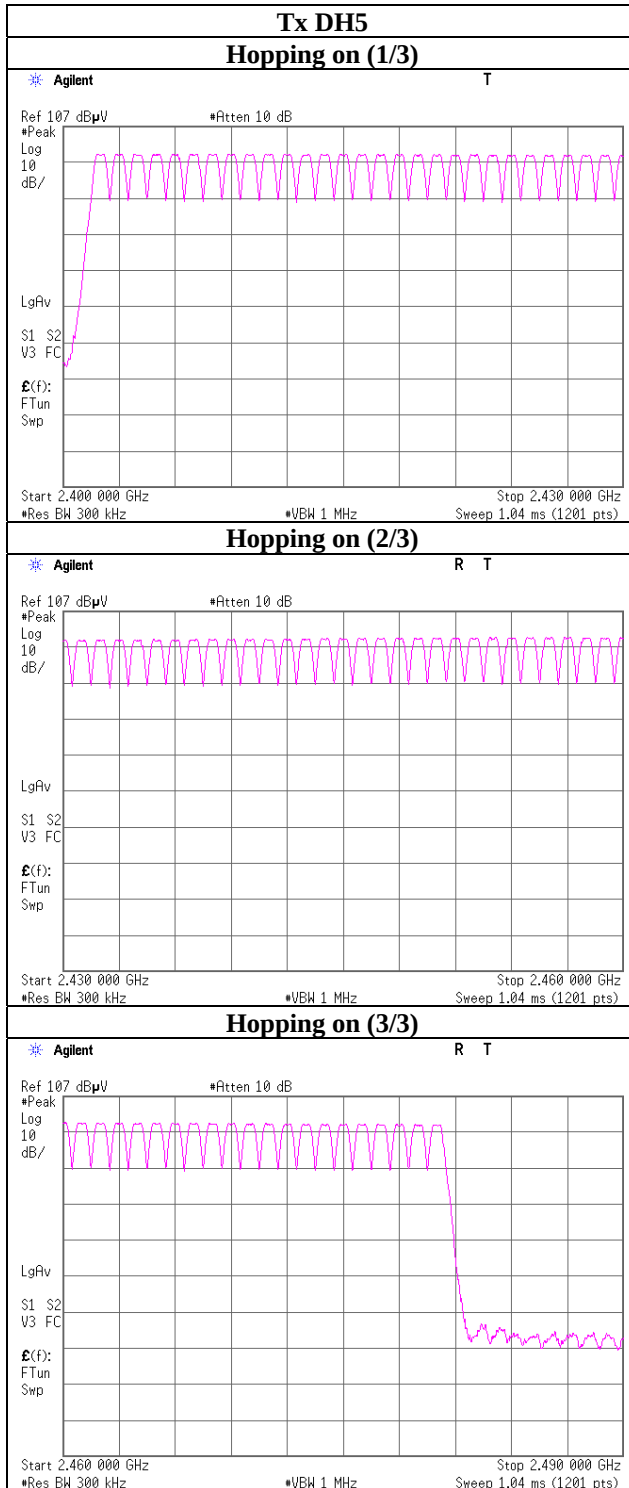
Number of Hopping Frequency

Test place	Head Office EMC Lab. No.11 Measurement Room
Report No.	32BE0179-HO
Date	11/07/2012
Temperature/ Humidity	29deg. C / 26% RH
Engineer	Yutaka Yoshida
Mode	Tx (Hopping on) DH5/3DH5/Inquiry

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



Number of Hopping Frequency



Dwell time

Test place	Head Office EMC Lab. No.11 Measurement Room
Report No.	33BE0179-HO
Date	11/07/2012
Temperature/ Humidity	29deg. C / 26% 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	50.8 times	/	5 sec.	x 31.6 sec. = 322 times	0.393	126	400
DH3	26.2 times	/	5 sec.	x 31.6 sec. = 166 times	1.651	274	400
DH5	17.6 times	/	5 sec.	x 31.6 sec. = 112 times	2.902	325	400
3DH1	50.0 times	/	5 sec.	x 31.6 sec. = 316 times	0.399	126	400
3DH3	25.8 times	/	5 sec.	x 31.6 sec. = 164 times	1.651	271	400
3DH5	18.0 times	/	5 sec.	x 31.6 sec. = 114 times	2.912	332	400
Inquiry	101.0 times	/	1 sec.	x 12.8 sec. = 1293 times	0.094	122	400

Sample Calculation

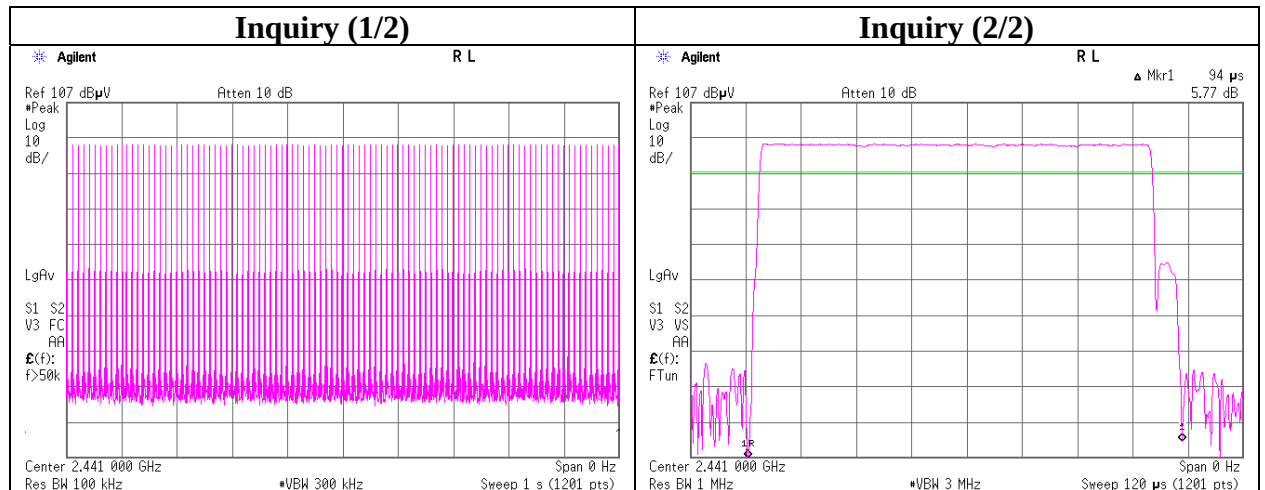
Result = Number of transmission x Length of transmission time

*Average data of 5 tests.(except Inquiry)

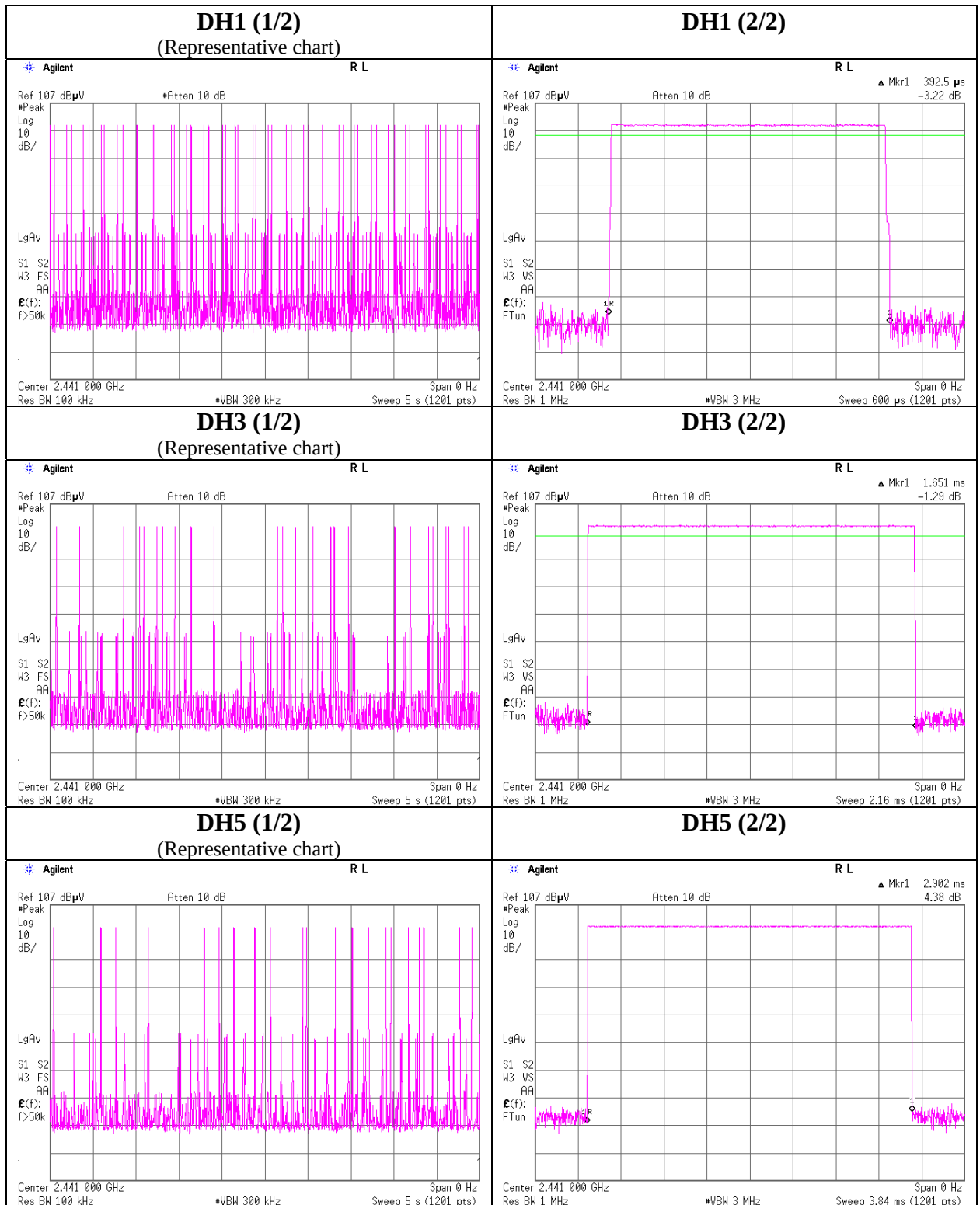
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	51	52	50	50	51	50.8
DH3	25	25	27	29	25	26.2
DH5	22	16	15	16	19	17.6
3DH1	50	50	49	50	51	50.0
3DH3	28	25	27	24	25	25.8
3DH5	16	22	19	18	15	18.0

Sample Calculation

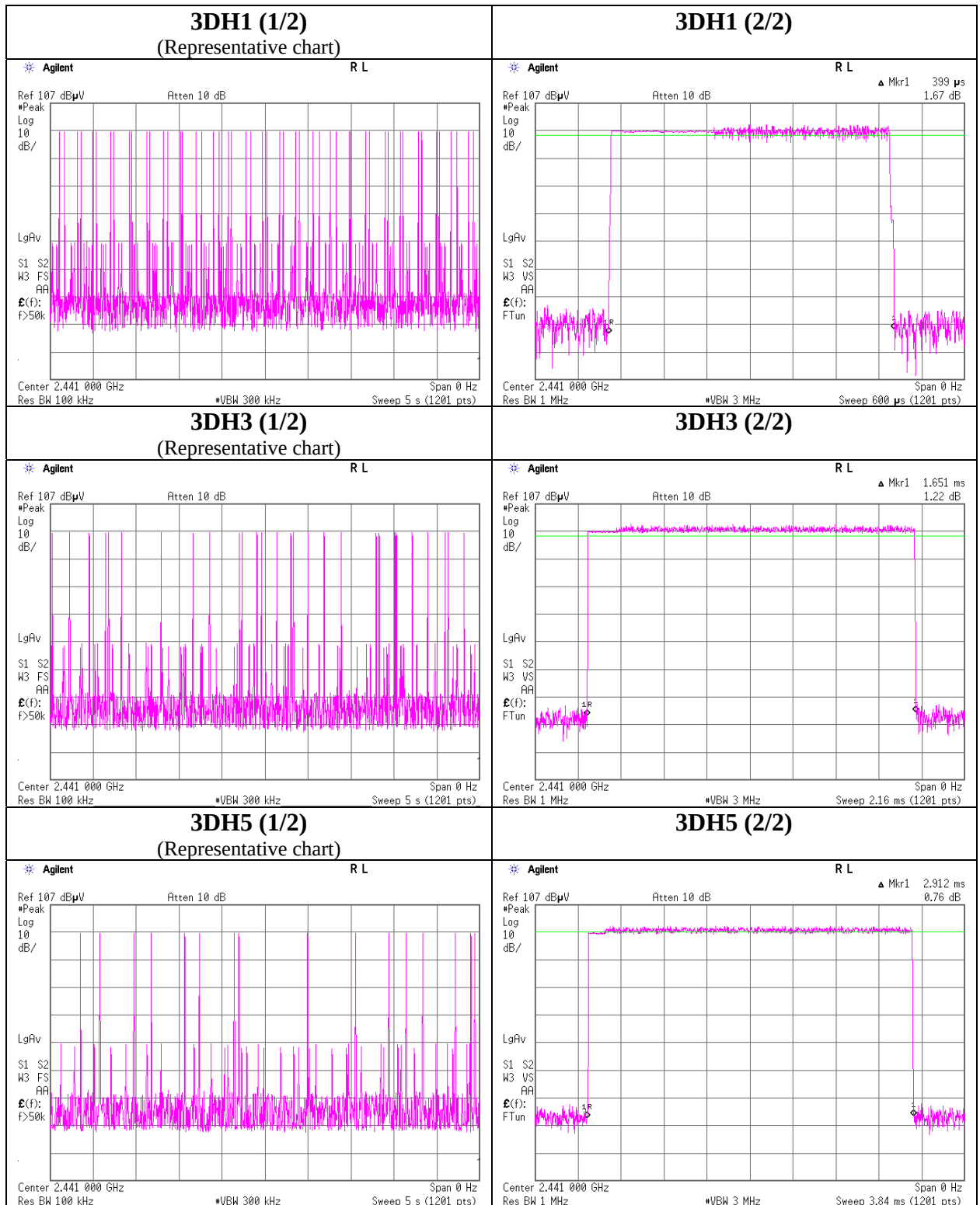
Average= Summation(Sampling 1 to 5) / 5



Dwell time



Dwell time



Maximum Peak Output Power

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 33BE0179-HO
Date 11/07/2012
Temperature/ Humidity 29deg. C / 26% RH
Engineer Yutaka Yoshida
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	-7.95	0.35	16.21	8.61	7.26	20.97	125	12.36
DH5	2441.0	-7.98	0.36	16.21	8.59	7.23	20.97	125	12.38
DH5	2480.0	-8.17	0.36	16.21	8.40	6.92	20.97	125	12.57
2DH5	2402.0	-7.95	0.35	16.21	8.61	7.26	20.97	125	12.36
2DH5	2441.0	-8.00	0.36	16.21	8.57	7.19	20.97	125	12.40
2DH5	2480.0	-8.16	0.36	16.21	8.41	6.93	20.97	125	12.56
3DH5	2402.0	-7.52	0.35	16.21	9.04	8.02	20.97	125	11.93
3DH5	2441.0	-7.57	0.36	16.21	9.00	7.94	20.97	125	11.97
3DH5	2480.0	-7.53	0.36	16.21	9.04	8.02	20.97	125	11.93

Sample Calculation:

Result = Reading + Cable Loss + 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.

Frequency separation could not meet the requirement of over 20dB BW without 2/3 relaxation, 125mW power limit was applied to it.

Average Output Power (Reference data for SAR testing)

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 33BE0179-HO
Date 11/07/2012
Temperature/ Humidity 29deg. C / 26% RH
Engineer Yutaka Yoshida
Mode Tx (Hopping off) DH5/2DH5/3DH5

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm]	[mW]
DH5	2402.0	-9.44	0.35	16.21	7.12	5.15
DH5	2441.0	-9.52	0.36	16.21	7.05	5.07
DH5	2480.0	-9.74	0.36	16.21	6.83	4.82
2DH5	2402.0	-11.67	0.35	16.21	4.89	3.08
2DH5	2441.0	-11.70	0.36	16.21	4.87	3.07
2DH5	2480.0	-11.89	0.36	16.21	4.68	2.94
3DH5	2402.0	-11.66	0.35	16.21	4.90	3.09
3DH5	2441.0	-11.69	0.36	16.21	4.88	3.08
3DH5	2480.0	-11.66	0.36	16.21	4.91	3.10

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/04/2012
Temperature/ Humidity 22 deg. C / 43% RH
Engineer Tomotaka Sasagawa

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	75.450	QP	28.2	6.5	7.8	32.1	10.4	40.0	29.6	
Hori	78.150	QP	25.6	6.5	7.8	32.1	7.8	40.0	32.2	
Hori	652.334	QP	28.9	21.3	11.7	32.1	29.8	46.0	16.2	
Hori	716.502	QP	28.1	22.3	12.0	32.1	30.3	46.0	15.7	
Hori	792.336	QP	28.1	23.5	12.4	31.7	32.3	46.0	13.7	
Hori	863.504	QP	26.8	24.0	12.7	31.4	32.1	46.0	13.9	
Hori	2390.000	PK	45.6	27.5	2.4	32.3	43.2	73.9	30.7	
Hori	4804.000	PK	44.3	31.3	4.9	31.5	49.0	73.9	24.9	
Hori	7206.000	PK	44.2	35.8	5.9	32.5	53.4	73.9	20.5	
Hori	9808.000	PK	43.9	38.5	7.1	33.0	56.5	73.9	17.4	
Hori	2390.000	AV	32.4	27.5	2.4	32.3	30.0	53.9	23.9	
Hori	4804.000	AV	31.4	31.3	4.9	31.5	36.1	53.9	17.8	
Hori	7206.000	AV	32.1	35.8	5.9	32.5	41.3	53.9	12.6	
Hori	9808.000	AV	30.9	38.5	7.1	33.0	43.5	53.9	10.4	
Vert	75.450	QP	27.4	6.5	7.8	32.1	9.6	40.0	30.4	
Vert	78.150	QP	28.2	6.5	7.8	32.1	10.4	40.0	29.6	
Vert	652.334	QP	27.8	21.3	11.7	32.1	28.7	46.0	17.3	
Vert	716.502	QP	27.4	22.3	12.0	32.1	29.6	46.0	16.4	
Vert	792.336	QP	27.5	23.5	12.4	31.7	31.7	46.0	14.3	
Vert	863.504	QP	27.2	24.0	12.7	31.4	32.5	46.0	13.5	
Vert	2390.000	PK	46.3	27.5	2.4	32.3	43.9	73.9	30.0	
Vert	4804.000	PK	44.3	31.3	4.9	31.5	49.0	73.9	24.9	
Vert	7206.000	PK	43.9	35.8	5.9	32.5	53.1	73.9	20.8	
Vert	9808.000	PK	44.0	38.5	7.1	33.0	56.6	73.9	17.3	
Vert	2390.000	AV	32.8	27.5	2.4	32.3	30.4	53.9	23.5	
Vert	4804.000	AV	31.9	31.3	4.9	31.5	36.6	53.9	17.3	
Vert	7206.000	AV	31.5	35.8	5.9	32.5	40.7	53.9	13.2	
Vert	9808.000	AV	31.0	38.5	7.1	33.0	43.6	53.9	10.3	

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

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

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/04/2012
Temperature/ Humidity 22 deg. C / 43% RH
Engineer Tomotaka Sasagawa

Mode Tx, DH5 2402MHz

20dBc Data Sheet

Polarity	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
Hori	2402.000	PK	102.0	27.5	2.4	32.3	99.6	-	-	Carrier
Hori	2305.050	PK	44.8	27.6	2.4	32.3	42.5	79.6	37.1	
Hori	2398.504	PK	42.8	27.5	2.4	32.3	40.4	79.6	39.2	
Hori	2400.000	PK	39.8	27.5	2.4	32.3	37.4	79.6	42.2	
Hori	2526.334	PK	48.4	27.6	2.5	32.2	46.3	79.6	33.3	
Hori	3203.992	PK	44.7	28.7	2.8	31.9	44.3	79.6	35.3	
Vert	2402.000	PK	103.3	27.5	2.4	32.3	100.9	-	-	Carrier
Vert	2301.498	PK	51.2	27.6	2.3	32.3	48.8	80.9	32.1	
Vert	2391.610	PK	44.5	27.5	2.4	32.3	42.1	80.9	38.8	
Vert	2400.000	PK	41.9	27.5	2.4	32.3	39.5	80.9	41.4	
Vert	2545.333	PK	49.9	27.6	2.5	32.2	47.8	80.9	33.1	
Vert	3197.658	PK	46.7	28.7	2.8	31.9	46.3	80.9	34.6	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/04/2012
Temperature/ Humidity 22 deg. C / 43% RH
Engineer Tomotaka Sasagawa

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	75.320	QP	27.8	6.5	7.8	32.1	10.0	40.0	30.0	
Hori	78.421	QP	25.7	6.5	7.8	32.1	7.9	40.0	32.1	
Hori	652.432	QP	28.7	21.3	11.7	32.1	29.6	46.0	16.4	
Hori	716.241	QP	28.4	22.3	12.0	32.1	30.6	46.0	15.4	
Hori	792.342	QP	28.1	23.5	12.4	31.7	32.3	46.0	13.7	
Hori	863.421	QP	27.2	24.0	12.7	31.4	32.5	46.0	13.5	
Hori	2390.000	PK	45.9	27.5	2.4	32.3	43.5	73.9	30.4	
Hori	2483.500	PK	53.2	27.5	2.4	32.2	50.9	73.9	23.0	
Hori	4884.000	PK	44.1	31.6	5.0	31.5	49.2	73.9	24.7	
Hori	7326.000	PK	44.0	35.8	5.9	32.5	53.2	73.9	20.7	
Hori	9768.000	PK	44.2	38.4	7.1	33.0	56.7	73.9	17.2	
Hori	2390.000	AV	32.8	27.5	2.4	32.3	30.4	53.9	23.5	
Hori	2483.500	AV	39.8	27.5	2.4	32.2	37.5	53.9	16.4	
Hori	4884.000	AV	31.9	31.6	5.0	31.5	37.0	53.9	16.9	
Hori	7326.000	AV	31.5	35.8	5.9	32.5	40.7	53.9	13.2	
Hori	9768.000	AV	31.8	38.4	7.1	33.0	44.3	53.9	9.6	
Vert	75.231	QP	28.2	6.5	7.8	32.1	10.4	40.0	29.6	
Vert	78.321	QP	29.1	6.5	7.8	32.1	11.3	40.0	28.7	
Vert	652.323	QP	28.2	21.3	11.7	32.1	29.1	46.0	16.9	
Vert	716.241	QP	28.2	22.3	12.0	32.1	30.4	46.0	15.6	
Vert	792.242	QP	27.6	23.5	12.4	31.7	31.8	46.0	14.2	
Vert	863.543	QP	27.8	24.0	12.7	31.4	33.1	46.0	12.9	
Vert	2390.000	PK	46.4	27.5	2.4	32.3	44.0	73.9	29.9	
Vert	2483.500	PK	52.1	27.5	2.4	32.2	49.8	73.9	24.1	
Vert	4884.000	PK	44.0	31.6	5.0	31.5	49.1	73.9	24.8	
Vert	7326.000	PK	44.2	35.8	5.9	32.5	53.4	73.9	20.5	
Vert	9768.000	PK	44.3	38.4	7.1	33.0	56.8	73.9	17.1	
Vert	2390.000	AV	31.9	27.5	2.4	32.3	29.5	53.9	24.4	
Vert	2483.500	AV	40.5	27.5	2.4	32.2	38.2	53.9	15.7	
Vert	4884.000	AV	31.8	31.6	5.0	31.5	36.9	53.9	17.0	
Vert	7326.000	AV	32.1	35.8	5.9	32.5	41.3	53.9	12.6	
Vert	9768.000	AV	31.5	38.4	7.1	33.0	44.0	53.9	9.9	

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

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

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/04/2012
Temperature/ Humidity 22 deg. C / 43% RH
Engineer Tomotaka Sasagawa

Mode Tx, DH5 2441MHz

20dBc Data Sheet

Polarity	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
Hori	2441.000	PK	102.0	27.5	2.4	32.2	99.7	-	-	Carrier
Hori	2305.432	PK	44.5	27.6	2.4	32.3	42.2	79.7	37.5	
Hori	2398.777	PK	43.2	27.5	2.4	32.3	40.8	79.7	38.9	
Hori	2400.000	PK	41.2	27.5	2.4	32.3	38.8	79.7	40.9	
Hori	2526.334	PK	48.0	27.6	2.5	32.2	45.9	79.7	33.8	
Hori	3254.310	PK	44.5	28.8	2.8	31.9	44.2	79.7	35.5	
Vert	2441.000	PK	101.9	27.5	2.4	32.2	99.6	-	-	Carrier
Vert	2301.497	PK	51.4	27.6	2.3	32.3	49.0	79.6	30.6	
Vert	2391.651	PK	44.8	27.5	2.4	32.3	42.4	79.6	37.2	
Vert	2400.000	PK	42.1	27.5	2.4	32.3	39.7	79.6	39.9	
Vert	2545.231	PK	48.9	27.6	2.5	32.2	46.8	79.6	32.8	
Vert	3254.231	PK	46.9	28.8	2.8	31.9	46.6	79.6	33.0	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/04/2012
Temperature/ Humidity 22 deg. C / 43% RH
Engineer Tomotaka Sasagawa

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	75.421	QP	28.2	6.5	7.8	32.1	10.4	40.0	29.6	
Hori	78.312	QP	26.2	6.5	7.8	32.1	8.4	40.0	31.6	
Hori	652.413	QP	28.9	21.3	11.7	32.1	29.8	46.0	16.2	
Hori	716.210	QP	28.7	22.3	12.0	32.1	30.9	46.0	15.1	
Hori	792.000	QP	27.6	23.5	12.4	31.7	31.8	46.0	14.2	
Hori	863.421	QP	27.6	24.0	12.7	31.4	32.9	46.0	13.1	
Hori	2390.000	PK	45.3	27.5	2.4	32.3	42.9	73.9	31.0	
Hori	2483.500	PK	53.4	27.5	2.4	32.2	51.1	73.9	22.8	
Hori	3307.843	PK	44.5	28.8	2.9	31.9	44.3	73.9	29.6	
Hori	4960.000	PK	44.1	31.8	5.0	31.5	49.4	73.9	24.5	
Hori	7440.000	PK	43.9	35.9	6.0	32.6	53.2	73.9	20.7	
Hori	9920.000	PK	44.1	38.6	7.1	33.0	56.8	73.9	17.1	
Hori	2390.000	AV	32.8	27.5	2.4	32.3	30.4	53.9	23.5	
Hori	2483.500	AV	39.8	27.5	2.4	32.2	37.5	53.9	16.4	
Hori	3307.843	AV	33.8	28.8	2.9	31.9	33.6	53.9	20.3	
Hori	4960.000	AV	32.1	31.8	5.0	31.5	37.4	53.9	16.5	
Hori	7440.000	AV	31.9	35.9	6.0	32.6	41.2	53.9	12.7	
Hori	9920.000	AV	32.1	38.6	7.1	33.0	44.8	53.9	9.1	
Vert	75.455	QP	27.5	6.5	7.8	32.1	9.7	40.0	30.3	
Vert	78.231	QP	28.9	6.5	7.8	32.1	11.1	40.0	28.9	
Vert	652.243	QP	28.9	21.3	11.7	32.1	29.8	46.0	16.2	
Vert	716.452	QP	27.8	22.3	12.0	32.1	30.0	46.0	16.0	
Vert	792.421	QP	28.2	23.5	12.4	31.7	32.4	46.0	13.6	
Vert	863.521	QP	27.9	24.0	12.7	31.4	33.2	46.0	12.8	
Vert	2390.000	PK	46.9	27.5	2.4	32.3	44.5	73.9	29.4	
Vert	2483.500	PK	52.4	27.5	2.4	32.2	50.1	73.9	23.8	
Vert	3307.883	PK	46.5	28.8	2.9	31.9	46.3	73.9	27.6	
Vert	4960.000	PK	44.1	31.8	5.0	31.5	49.4	73.9	24.5	
Vert	7440.000	PK	43.9	35.9	6.0	32.6	53.2	73.9	20.7	
Vert	9920.000	PK	44.2	38.6	7.1	33.0	56.9	73.9	17.0	
Vert	2390.000	AV	33.1	27.5	2.4	32.3	30.7	53.9	23.2	
Vert	2483.500	AV	40.2	27.5	2.4	32.2	37.9	53.9	16.0	
Vert	3307.883	AV	38.9	28.8	2.9	31.9	38.7	53.9	15.2	
Vert	4960.000	AV	31.2	31.8	5.0	31.5	36.5	53.9	17.4	
Vert	7440.000	AV	31.8	35.9	6.0	32.6	41.1	53.9	12.8	
Vert	9920.000	AV	31.4	38.6	7.1	33.0	44.1	53.9	9.8	

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

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

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/04/2012
Temperature/ Humidity 22 deg. C / 43% RH
Engineer Tomotaka Sasagawa
Mode Tx, DH5 2480MHz

20dBc Data Sheet

Polarity	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
Hori	2480.000	PK	102.5	27.5	2.4	32.2	100.2	-	-	Carrier
Hori	2305.421	PK	45.2	27.6	2.4	32.3	42.9	80.2	37.3	
Hori	2398.763	PK	43.1	27.5	2.4	32.3	40.7	80.2	39.5	
Hori	2400.000	PK	40.2	27.5	2.4	32.3	37.8	80.2	42.4	
Hori	2532.232	PK	48.9	27.6	2.5	32.2	46.8	80.2	33.4	
Vert	2480.000	PK	102.5	27.5	2.4	32.2	100.2	-	-	Carrier
Vert	2302.313	PK	51.4	27.6	2.4	32.3	49.1	80.2	31.1	
Vert	2392.231	PK	44.8	27.5	2.4	32.3	42.4	80.2	37.8	
Vert	2400.000	PK	42.1	27.5	2.4	32.3	39.7	80.2	40.5	
Vert	2545.742	PK	50.2	27.6	2.5	32.2	48.1	80.2	32.1	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/04/2012
Temperature/ Humidity 22 deg. C / 43% RH
Engineer Tomotaka Sasagawa

Mode Tx, 3DH5 2402MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	75.642	QP	28.5	6.5	7.8	32.1	10.7	40.0	29.3	
Hori	78.421	QP	26.8	6.5	7.8	32.1	9.0	40.0	31.0	
Hori	652.321	QP	28.6	21.3	11.7	32.1	29.5	46.0	16.5	
Hori	716.210	QP	29.0	22.3	12.0	32.1	31.2	46.0	14.8	
Hori	792.521	QP	28.1	23.5	12.4	31.7	32.3	46.0	13.7	
Hori	863.421	QP	28.1	24.0	12.7	31.4	33.4	46.0	12.6	
Hori	2390.000	PK	45.2	27.5	2.4	32.3	42.8	73.9	31.1	
Hori	2483.500	PK	46.2	27.5	2.4	32.2	43.9	73.9	30.0	
Hori	4804.000	PK	43.7	31.3	4.9	31.5	48.4	73.9	25.5	
Hori	7206.000	PK	43.4	35.8	5.9	32.5	52.6	73.9	21.3	
Hori	9808.000	PK	43.7	38.5	7.1	33.0	56.3	73.9	17.6	
Hori	2390.000	AV	33.1	27.5	2.4	32.3	30.7	53.9	23.2	
Hori	2483.500	AV	34.6	27.5	2.4	32.2	32.3	53.9	21.6	
Hori	4804.000	AV	35.7	31.3	4.9	31.5	40.4	53.9	13.5	
Hori	7206.000	AV	34.2	35.8	5.9	32.5	43.4	53.9	10.5	
Hori	9808.000	AV	31.2	38.5	7.1	33.0	43.8	53.9	10.1	
Vert	75.613	QP	27.6	6.5	7.8	32.1	9.8	40.0	30.2	
Vert	78.532	QP	29.2	6.5	7.8	32.1	11.4	40.0	28.6	
Vert	652.243	QP	29.2	21.3	11.7	32.1	30.1	46.0	15.9	
Vert	716.241	QP	28.2	22.3	12.0	32.1	30.4	46.0	15.6	
Vert	792.321	QP	27.9	23.5	12.4	31.7	32.1	46.0	13.9	
Vert	863.432	QP	28.1	24.0	12.7	31.4	33.4	46.0	12.6	
Vert	2390.000	PK	46.4	27.5	2.4	32.3	44.0	73.9	29.9	
Vert	2483.500	PK	45.6	27.5	2.4	32.2	43.3	73.9	30.6	
Vert	4804.000	PK	43.9	31.3	4.9	31.5	48.6	73.9	25.3	
Vert	7206.000	PK	44.0	35.8	5.9	32.5	53.2	73.9	20.7	
Vert	9808.000	PK	43.8	38.5	7.1	33.0	56.4	73.9	17.5	
Vert	2390.000	AV	32.2	27.5	2.4	32.3	29.8	53.9	24.1	
Vert	2483.500	AV	35.1	27.5	2.4	32.2	32.8	53.9	21.1	
Vert	4804.000	AV	32.1	31.3	4.9	31.5	36.8	53.9	17.1	
Vert	7206.000	AV	31.9	35.8	5.9	32.5	41.1	53.9	12.8	
Vert	9808.000	AV	32.0	38.5	7.1	33.0	44.6	53.9	9.3	

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

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

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

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 33BE0179-HO
Date : 11/04/2012
Temperature/ Humidity : 22 deg. C / 43% RH
Engineer : Tomotaka Sasagawa
Mode : Tx, 3DH5 2402MHz

20dBc Data Sheet

Polarity	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
Hori	2402.000	PK	96.3	27.5	2.4	32.3	93.9	-	-	Carrier
Hori	2305.321	PK	45.2	27.6	2.4	32.3	42.9	73.9	31.0	
Hori	2398.665	PK	42.8	27.5	2.4	32.3	40.4	73.9	33.5	
Hori	2400.000	PK	44.1	27.5	2.4	32.3	41.7	73.9	32.2	
Hori	2526.222	PK	48.4	27.6	2.5	32.2	46.3	73.9	27.6	
Hori	3201.231	PK	45.2	28.7	2.8	31.9	44.8	73.9	29.1	
Vert	2402.000	PK	96.4	27.5	2.4	32.3	94.0	-	-	Carrier
Vert	2301.512	PK	51.3	27.6	2.3	32.3	48.9	74.0	25.1	
Vert	2391.425	PK	44.8	27.5	2.4	32.3	42.4	74.0	31.6	
Vert	2400.000	PK	43.8	27.5	2.4	32.3	41.4	74.0	32.6	
Vert	2545.231	PK	48.8	27.6	2.5	32.2	46.7	74.0	27.3	
Vert	3201.421	PK	47.2	28.7	2.8	31.9	46.8	74.0	27.2	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/04/2012
Temperature/ Humidity 22 deg. C / 43% RH
Engineer Tomotaka Sasagawa

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	75.634	QP	28.4	6.5	7.8	32.1	10.6	40.0	29.4	
Hori	78.324	QP	26.4	6.5	7.8	32.1	8.6	40.0	31.4	
Hori	652.342	QP	27.8	21.3	11.7	32.1	28.7	46.0	17.3	
Hori	716.514	QP	27.9	22.3	12.0	32.1	30.1	46.0	15.9	
Hori	792.321	QP	28.5	23.5	12.4	31.7	32.7	46.0	13.3	
Hori	863.410	QP	28.4	24.0	12.7	31.4	33.7	46.0	12.3	
Hori	2390.000	PK	45.9	27.5	2.4	32.3	43.5	73.9	30.4	
Hori	2483.500	PK	46.2	27.5	2.4	32.2	43.9	73.9	30.0	
Hori	4884.000	PK	43.9	31.6	5.0	31.5	49.0	73.9	24.9	
Hori	7326.000	PK	44.1	35.8	5.9	32.5	53.3	73.9	20.6	
Hori	9768.000	PK	43.8	38.4	7.1	33.0	56.3	73.9	17.6	
Hori	2390.000	AV	32.1	27.5	2.4	32.3	29.7	53.9	24.2	
Hori	2483.500	AV	34.5	27.5	2.4	32.2	32.2	53.9	21.7	
Hori	4884.000	AV	32.1	31.6	5.0	31.5	37.2	53.9	16.7	
Hori	7326.000	AV	31.9	35.8	5.9	32.5	41.1	53.9	12.8	
Hori	9768.000	AV	31.5	38.4	7.1	33.0	44.0	53.9	9.9	
Vert	75.321	QP	27.8	6.5	7.8	32.1	10.0	40.0	30.0	
Vert	78.532	QP	28.7	6.5	7.8	32.1	10.9	40.0	29.1	
Vert	652.321	QP	28.6	21.3	11.7	32.1	29.5	46.0	16.5	
Vert	716.241	QP	28.4	22.3	12.0	32.1	30.6	46.0	15.4	
Vert	792.432	QP	28.2	23.5	12.4	31.7	32.4	46.0	13.6	
Vert	863.442	QP	29.0	24.0	12.7	31.4	34.3	46.0	11.7	
Vert	2390.000	PK	46.3	27.5	2.4	32.3	43.9	73.9	30.0	
Vert	2483.500	PK	45.9	27.5	2.4	32.2	43.6	73.9	30.3	
Vert	4884.000	PK	43.9	31.6	5.0	31.5	49.0	73.9	24.9	
Vert	7326.000	PK	43.8	35.8	5.9	32.5	53.0	73.9	20.9	
Vert	9768.000	PK	44.2	38.4	7.1	33.0	56.7	73.9	17.2	
Vert	2390.000	AV	32.1	27.5	2.4	32.3	29.7	53.9	24.2	
Vert	2483.500	AV	35.2	27.5	2.4	32.2	32.9	53.9	21.0	
Vert	4884.000	AV	31.4	31.6	5.0	31.5	36.5	53.9	17.4	
Vert	7326.000	AV	31.8	35.8	5.9	32.5	41.0	53.9	12.9	
Vert	9768.000	AV	31.9	38.4	7.1	33.0	44.4	53.9	9.5	

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

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

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

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 33BE0179-HO
Date : 11/04/2012
Temperature/ Humidity : 22 deg. C / 43% RH
Engineer : Tomotaka Sasagawa
Mode : Tx, 3DH5 2441MHz

20dBc Data Sheet

Polarity	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
Hori	2441.000	PK	96.3	27.5	2.4	32.2	94.0	-	-	Carrier
Hori	2305.241	PK	44.8	27.6	2.4	32.3	42.5	74.0	31.5	
Hori	2398.504	PK	43.2	27.5	2.4	32.3	40.8	74.0	33.2	
Hori	2400.000	PK	36.4	27.5	2.4	32.3	34.0	74.0	40.0	
Hori	2526.241	PK	47.9	27.6	2.5	32.2	45.8	74.0	28.2	
Hori	3254.774	PK	44.8	28.8	2.8	31.9	44.5	74.0	29.5	
Vert	2441.000	PK	96.4	27.5	2.4	32.2	94.1	-	-	Carrier
Vert	2301.421	PK	48.9	27.6	2.3	32.3	46.5	74.1	27.6	
Vert	2391.241	PK	44.9	27.5	2.4	32.3	42.5	74.1	31.6	
Vert	2400.000	PK	35.1	27.5	2.4	32.3	32.7	74.1	41.4	
Vert	2544.231	PK	48.9	27.6	2.5	32.2	46.8	74.1	27.3	
Vert	3255.412	PK	46.5	28.8	2.8	31.9	46.2	74.1	27.9	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/04/2012
Temperature/ Humidity 22 deg. C / 43% RH
Engineer Tomotaka Sasagawa

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	75.443	QP	27.8	6.5	7.8	32.1	10.0	40.0	30.0	
Hori	78.432	QP	27.2	6.5	7.8	32.1	9.4	40.0	30.6	
Hori	652.410	QP	27.5	21.3	11.7	32.1	28.4	46.0	17.6	
Hori	716.231	QP	28.1	22.3	12.0	32.1	30.3	46.0	15.7	
Hori	792.321	QP	28.4	23.5	12.4	31.7	32.6	46.0	13.4	
Hori	863.321	QP	27.4	24.0	12.7	31.4	32.7	46.0	13.3	
Hori	2390.000	PK	44.5	27.5	2.4	32.3	42.1	73.9	31.8	
Hori	2483.500	PK	45.0	27.5	2.4	32.2	42.7	73.9	31.2	
Hori	3302.432	PK	44.8	28.8	2.9	31.9	44.6	73.9	29.3	
Hori	4960.000	PK	43.8	31.8	5.0	31.5	49.1	73.9	24.8	
Hori	7440.000	PK	44.1	35.9	6.0	32.6	53.4	73.9	20.5	
Hori	9920.000	PK	44.3	38.6	7.1	33.0	57.0	73.9	16.9	
Hori	2390.000	AV	32.1	27.5	2.4	32.3	29.7	53.9	24.2	
Hori	2483.500	AV	33.9	27.5	2.4	32.2	31.6	53.9	22.3	
Hori	3302.432	AV	33.4	28.8	2.9	31.9	33.2	53.9	20.7	
Hori	4960.000	AV	32.1	31.8	5.0	31.5	37.4	53.9	16.5	
Hori	7440.000	AV	31.9	35.9	6.0	32.6	41.2	53.9	12.7	
Hori	9920.000	AV	31.5	38.6	7.1	33.0	44.2	53.9	9.7	
Vert	75.321	QP	28.1	6.5	7.8	32.1	10.3	40.0	29.7	
Vert	78.421	QP	28.2	6.5	7.8	32.1	10.4	40.0	29.6	
Vert	652.310	QP	27.9	21.3	11.7	32.1	28.8	46.0	17.2	
Vert	716.241	QP	28.2	22.3	12.0	32.1	30.4	46.0	15.6	
Vert	792.321	QP	27.8	23.5	12.4	31.7	32.0	46.0	14.0	
Vert	863.445	QP	28.0	24.0	12.7	31.4	33.3	46.0	12.7	
Vert	2390.000	PK	45.9	27.5	2.4	32.3	43.5	73.9	30.4	
Vert	2483.500	PK	45.1	27.5	2.4	32.2	42.8	73.9	31.1	
Vert	3307.887	PK	45.3	28.8	2.9	31.9	45.1	73.9	28.8	
Vert	4960.000	PK	44.2	31.8	5.0	31.5	49.5	73.9	24.4	
Vert	7440.000	PK	43.9	35.9	6.0	32.6	53.2	73.9	20.7	
Vert	9920.000	PK	44.1	38.6	7.1	33.0	56.8	73.9	17.1	
Vert	2390.000	AV	32.4	27.5	2.4	32.3	30.0	53.9	23.9	
Vert	2483.500	AV	35.1	27.5	2.4	32.2	32.8	53.9	21.1	
Vert	3307.887	AV	37.8	28.8	2.9	31.9	37.6	53.9	16.3	
Vert	4960.000	AV	32.1	31.8	5.0	31.5	37.4	53.9	16.5	
Vert	7440.000	AV	31.9	35.9	6.0	32.6	41.2	53.9	12.7	
Vert	9920.000	AV	31.5	38.6	7.1	33.0	44.2	53.9	9.7	

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

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

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/04/2012
Temperature/ Humidity 22 deg. C / 43% RH
Engineer Tomotaka Sasagawa

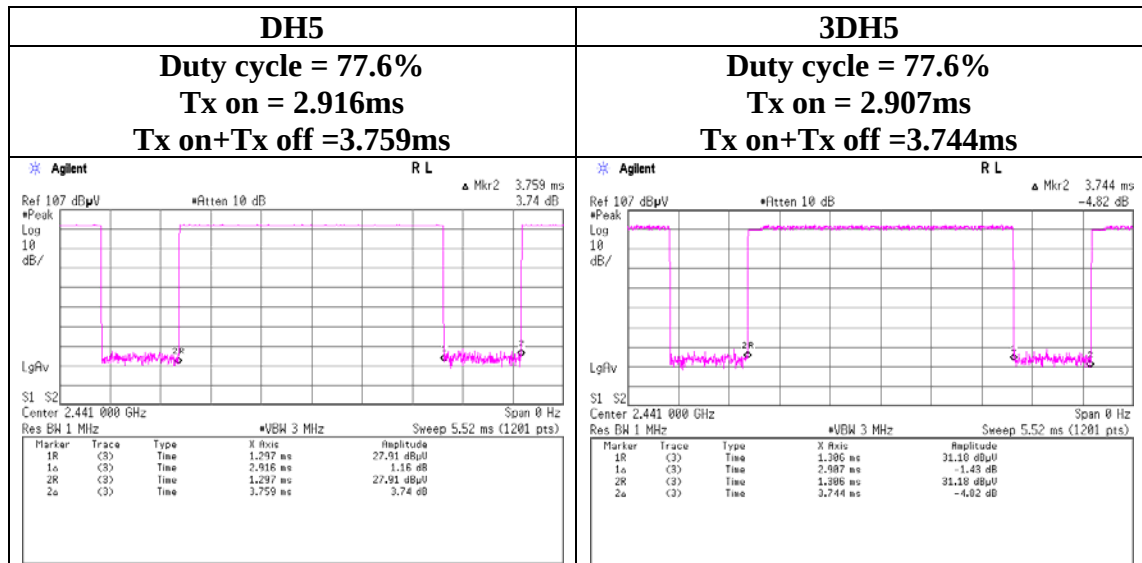
Mode Tx, 3DH5 2480MHz

20dBc Data Sheet

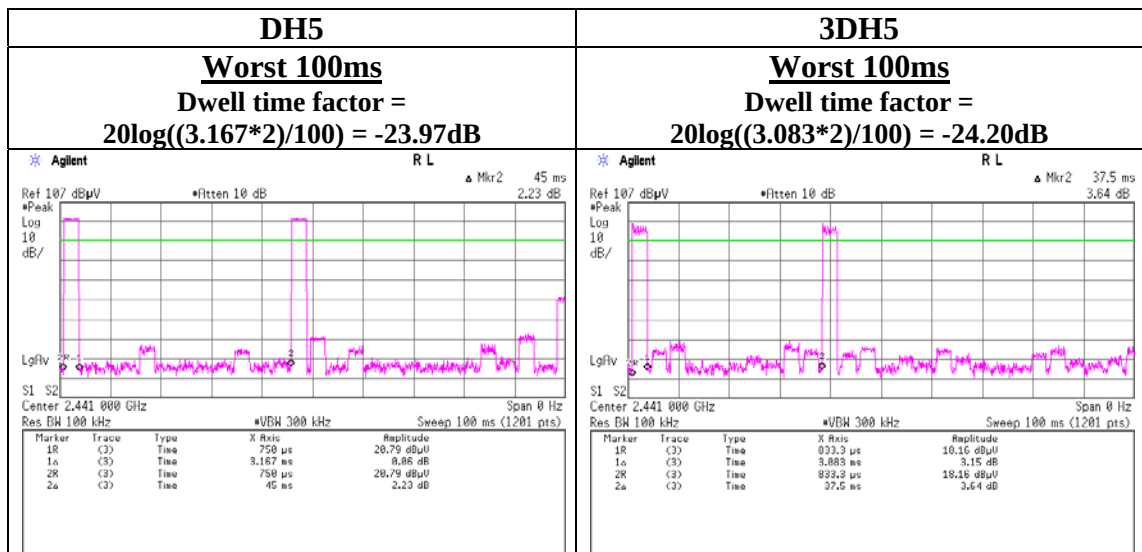
Polarity	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
Hori	2480.000	PK	96.3	27.5	2.4	32.2	94.0	-	-	Carrier
Hori	2304.542	PK	43.5	27.6	2.4	32.3	41.2	74.0	32.8	
Hori	2392.311	PK	41.2	27.5	2.4	32.3	38.8	74.0	35.2	
Hori	2400.000	PK	36.2	27.5	2.4	32.3	33.8	74.0	40.2	
Hori	2524.321	PK	48.9	27.6	2.5	32.2	46.8	74.0	27.2	
Vert	2480.000	PK	96.4	27.5	2.4	32.2	94.1	-	-	Carrier
Vert	2301.455	PK	50.9	27.6	2.3	32.3	48.5	74.1	25.6	
Vert	2392.321	PK	44.2	27.5	2.4	32.3	41.8	74.1	32.3	
Vert	2400.000	PK	35.2	27.5	2.4	32.3	32.8	74.1	41.3	
Vert	2544.254	PK	48.2	27.6	2.5	32.2	46.1	74.1	28.0	

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

Burst rate confirmation



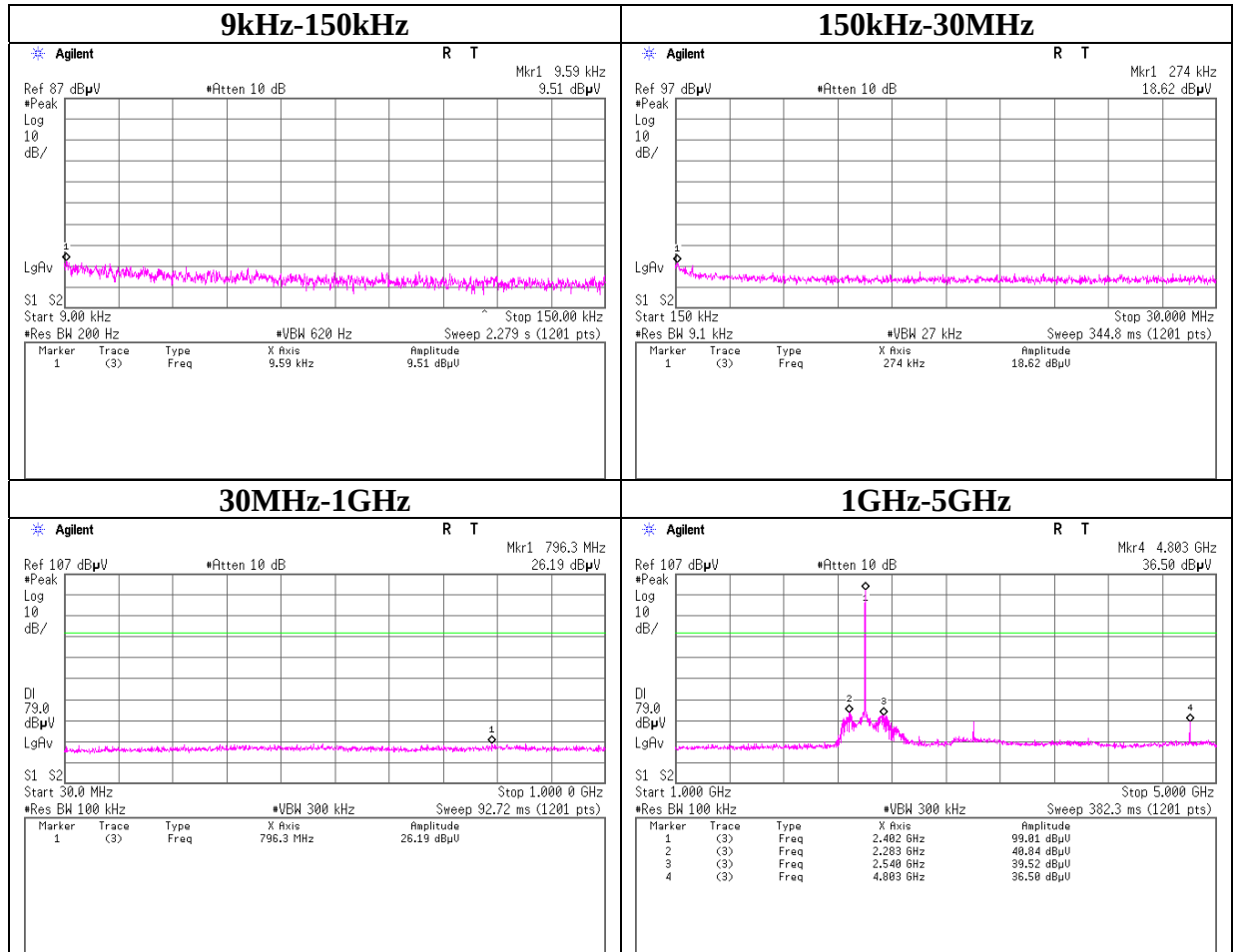
Dwell time factor



*The dwell time factor was not used for radiated emission test (AV).

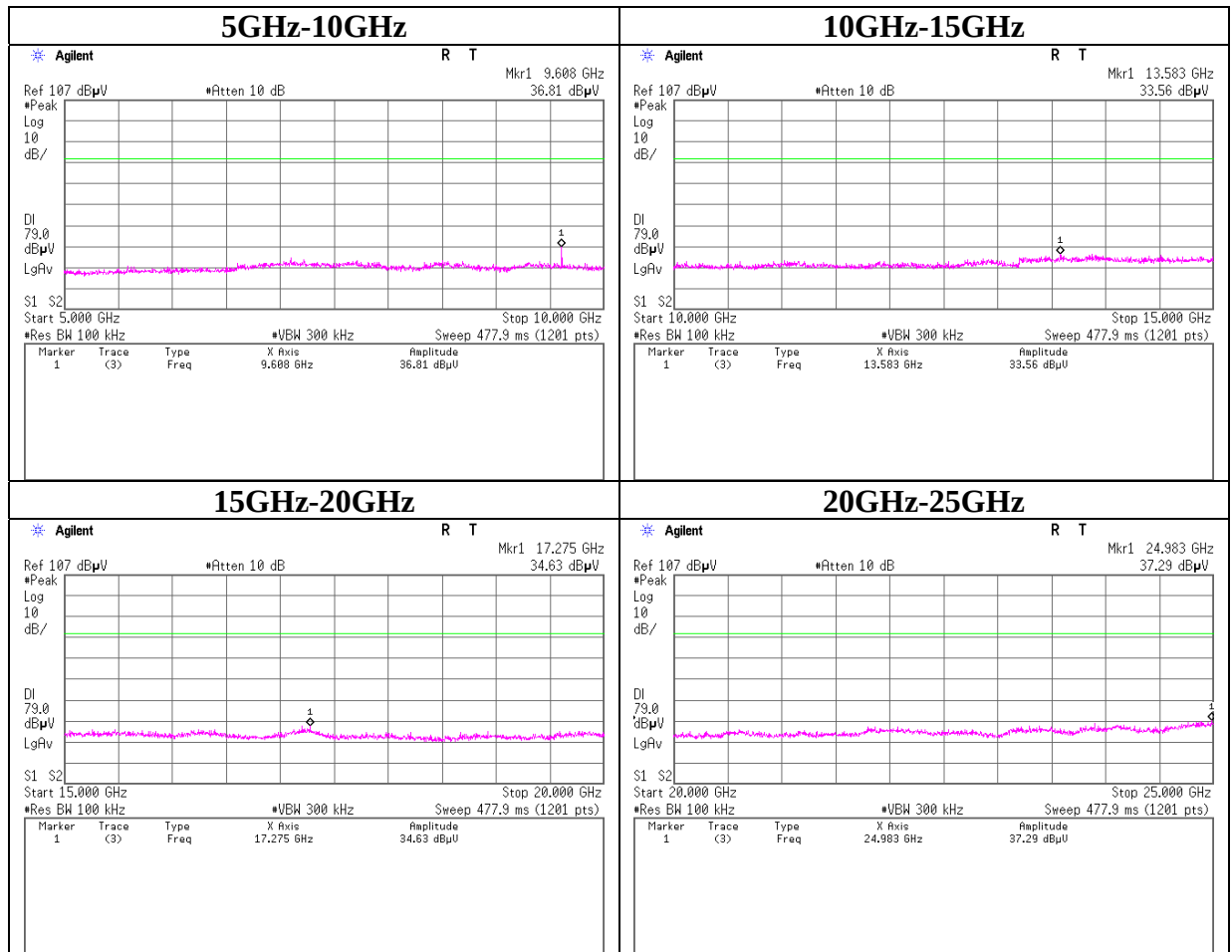
Conducted Spurious Emission

Tx DH5 2402MHz



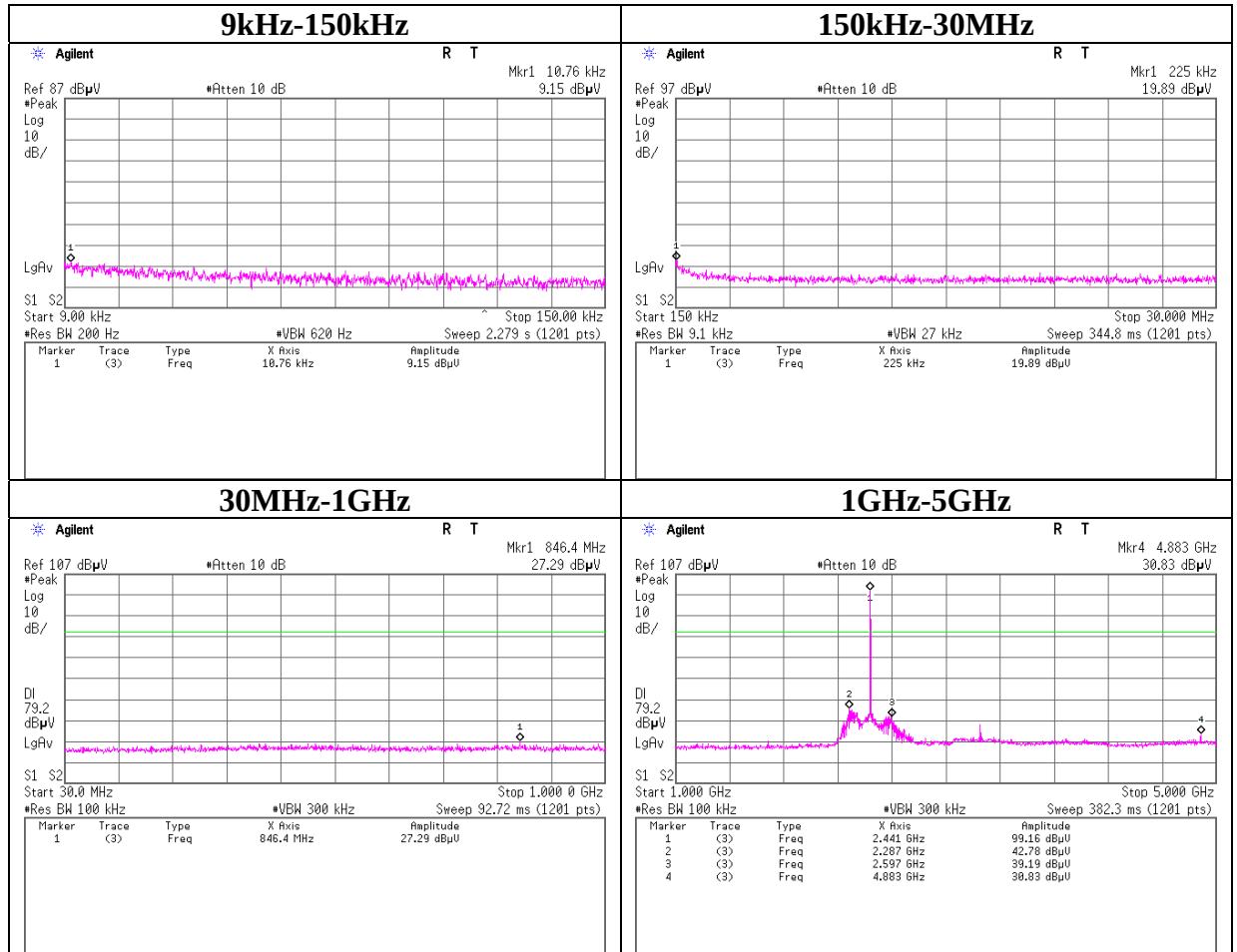
Conducted Spurious Emission

Tx DH5 2402MHz



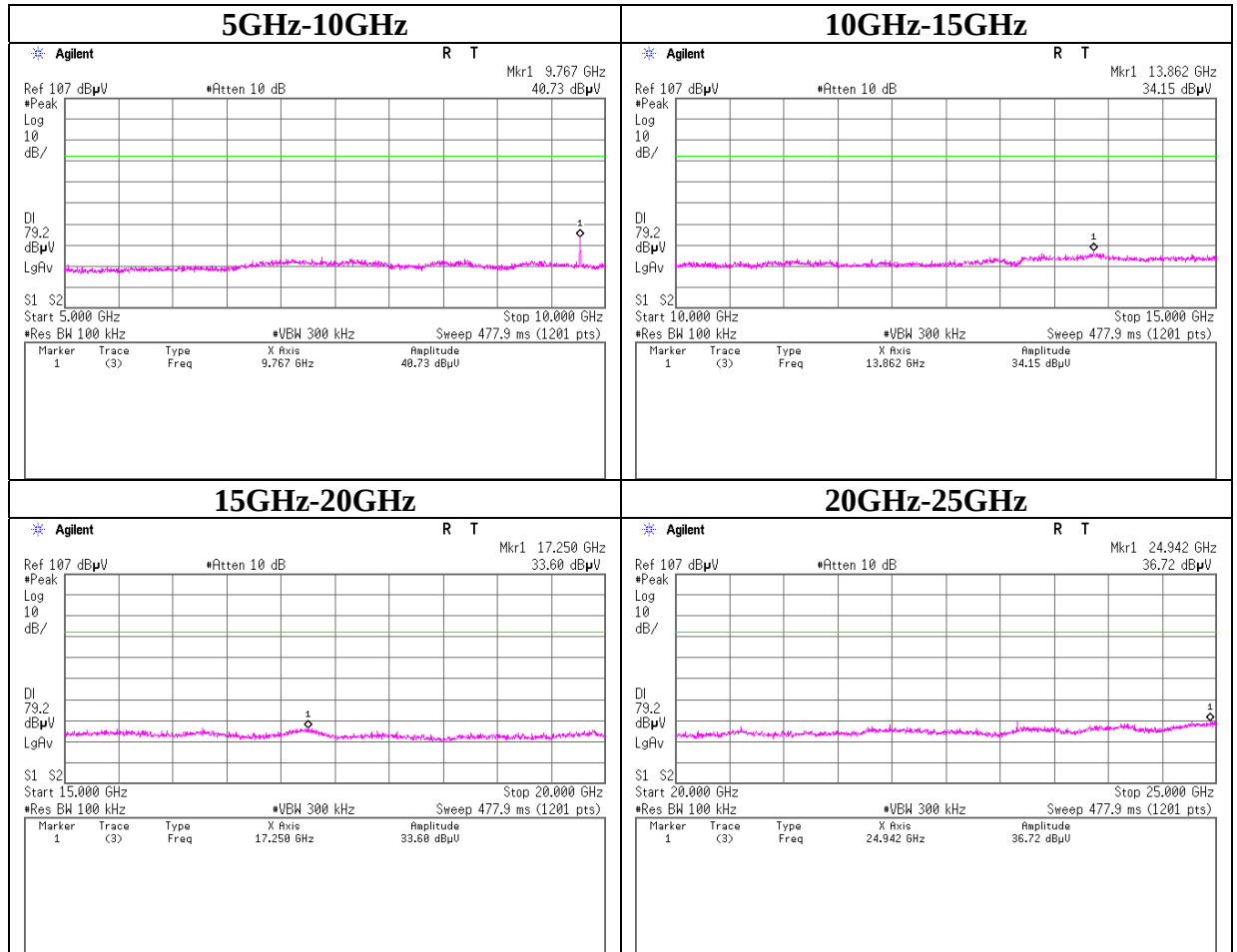
Conducted Spurious Emission

Tx DH5 2441MHz



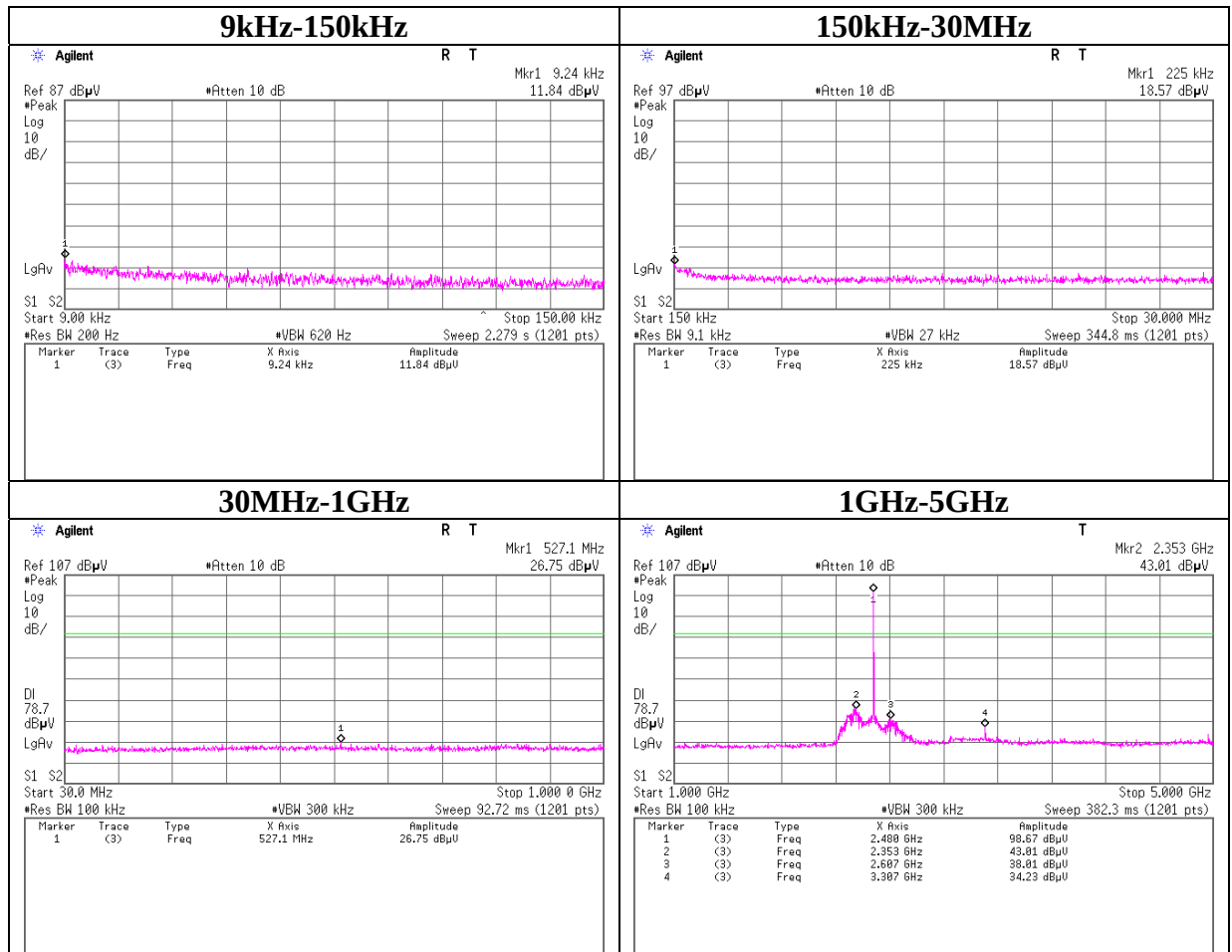
Conducted Spurious Emission

Tx DH5 2441MHz



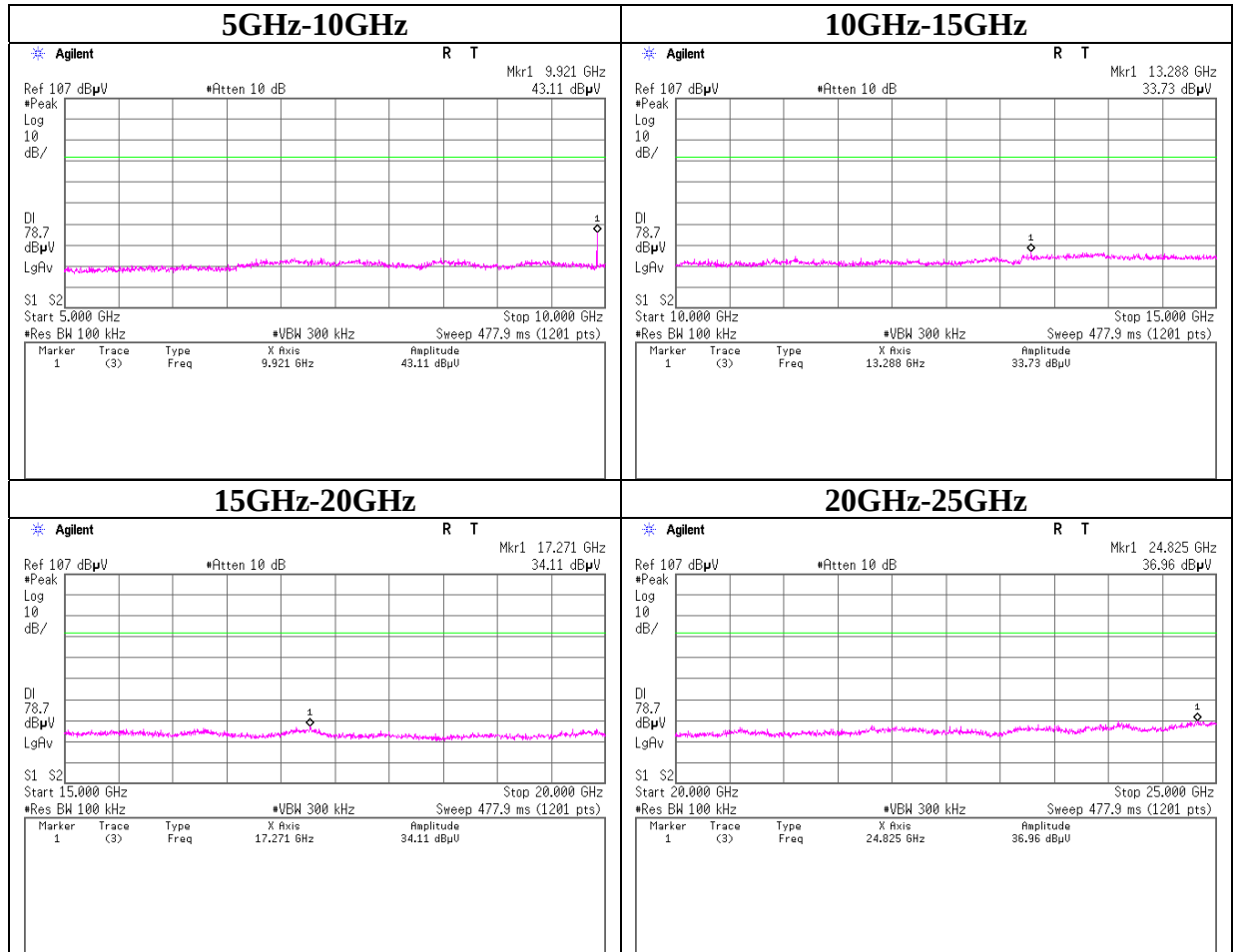
Conducted Spurious Emission

Tx DH5 2480MHz



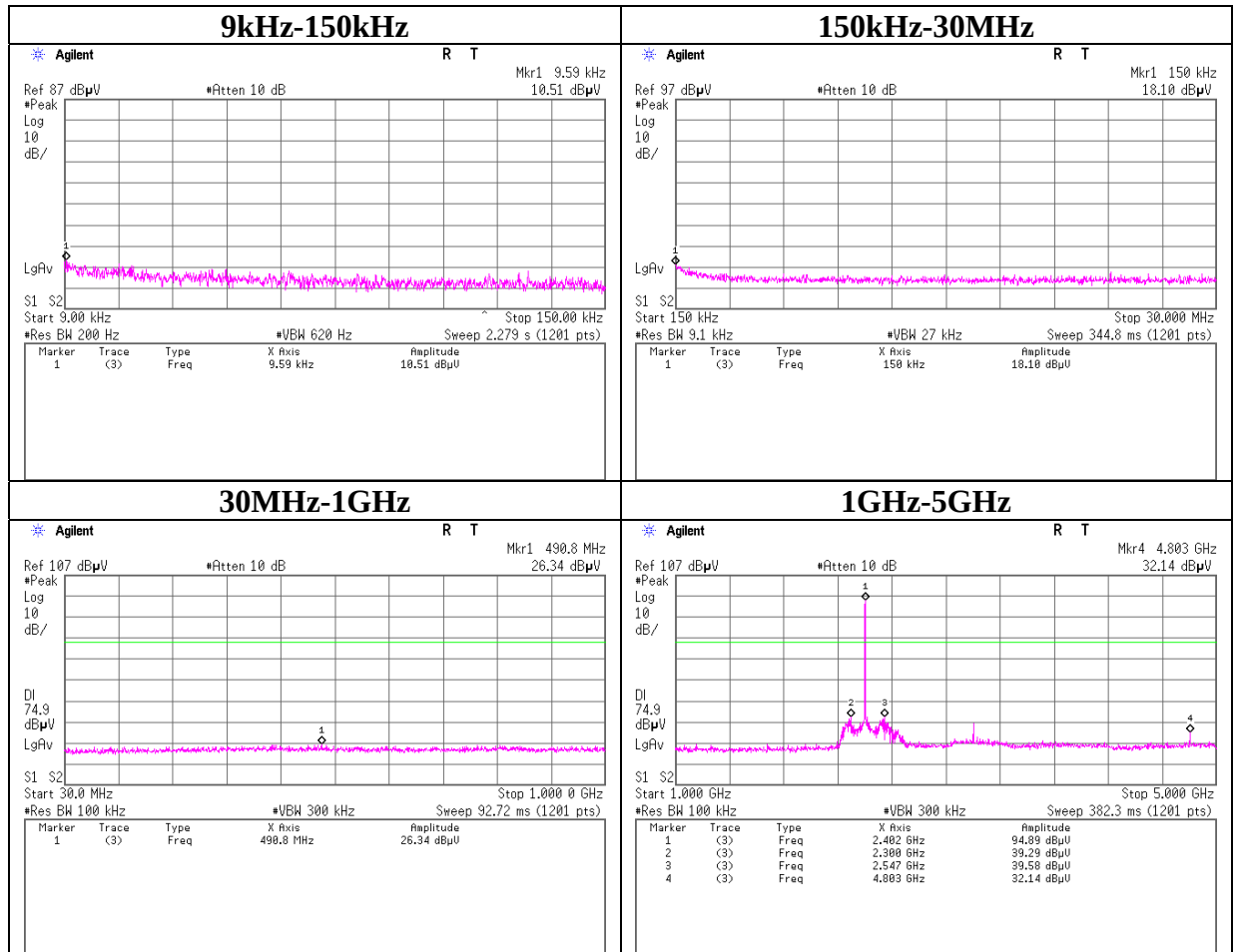
Conducted Spurious Emission

Tx DH5 2480MHz



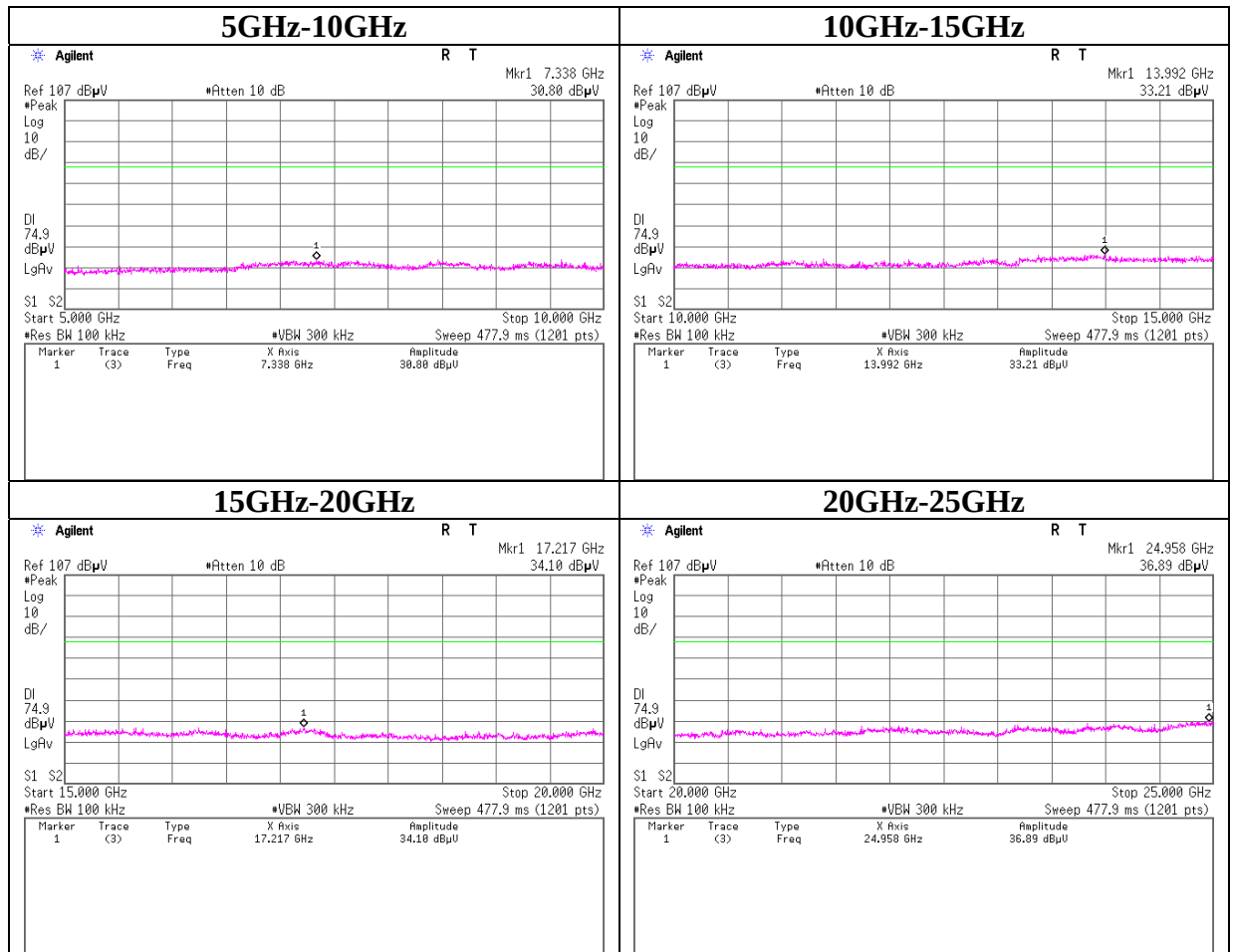
Conducted Spurious Emission

Tx 3DH5 2402MHz



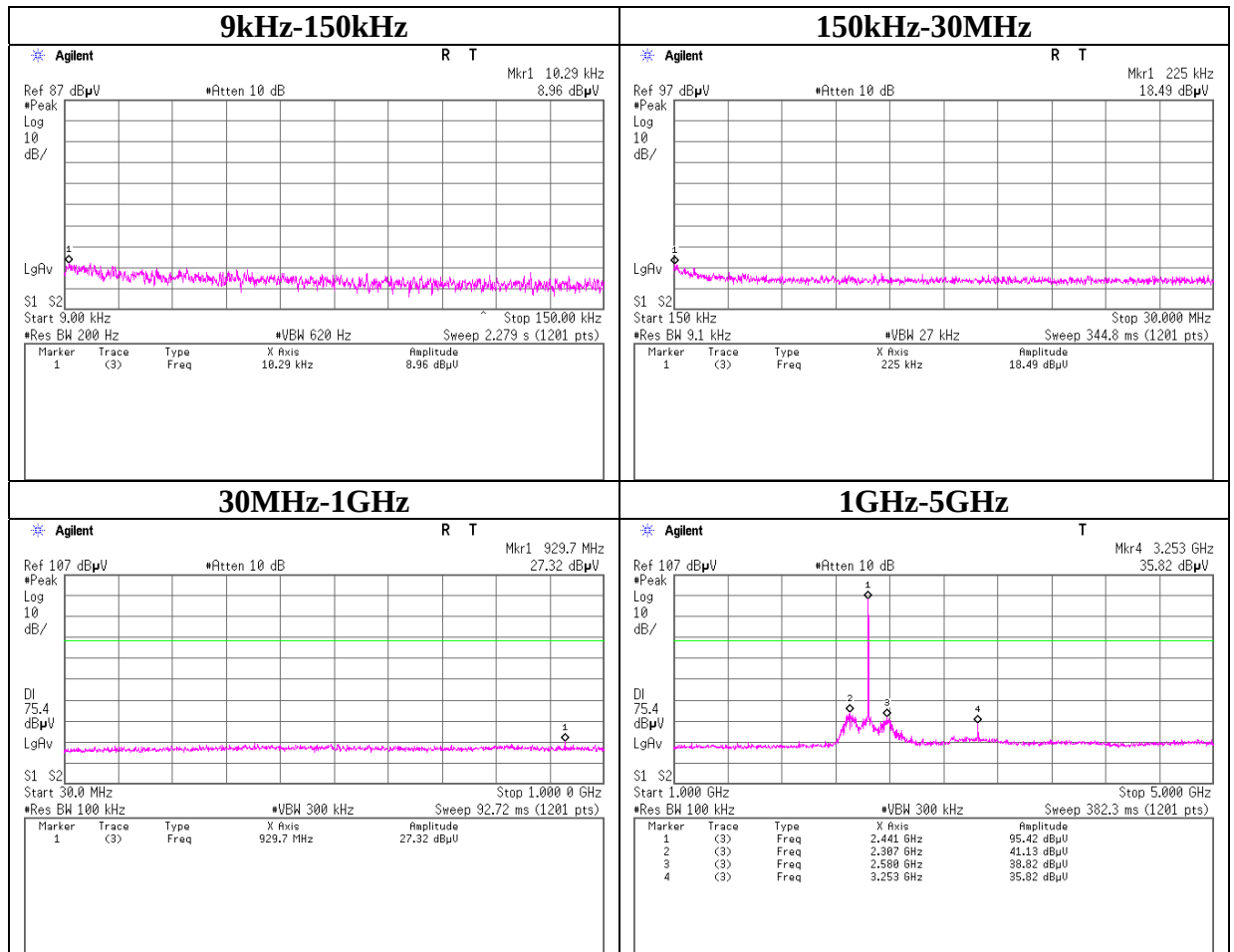
Conducted Spurious Emission

Tx 3DH5 2402MHz



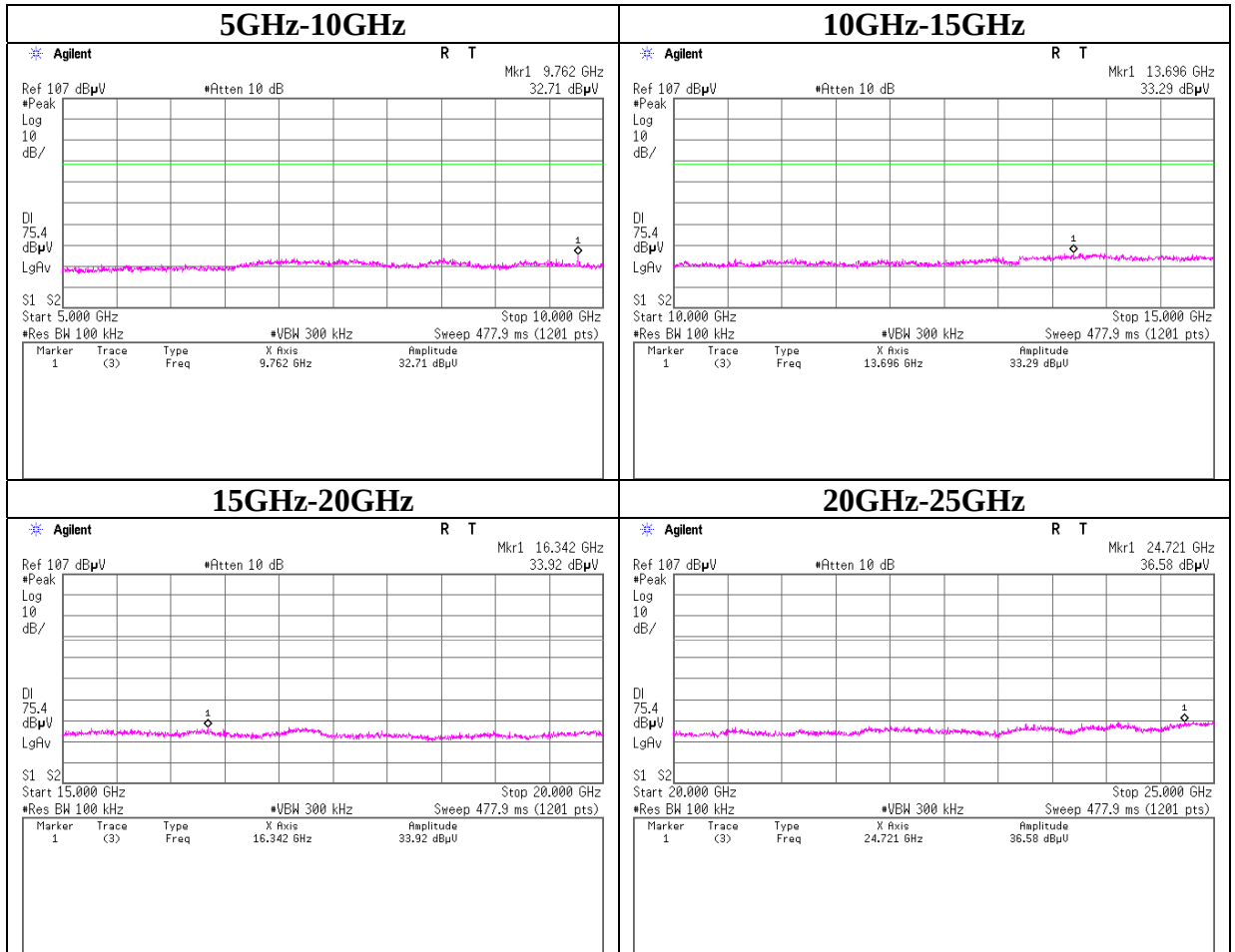
Conducted Spurious Emission

Tx 3DH5 2441MHz



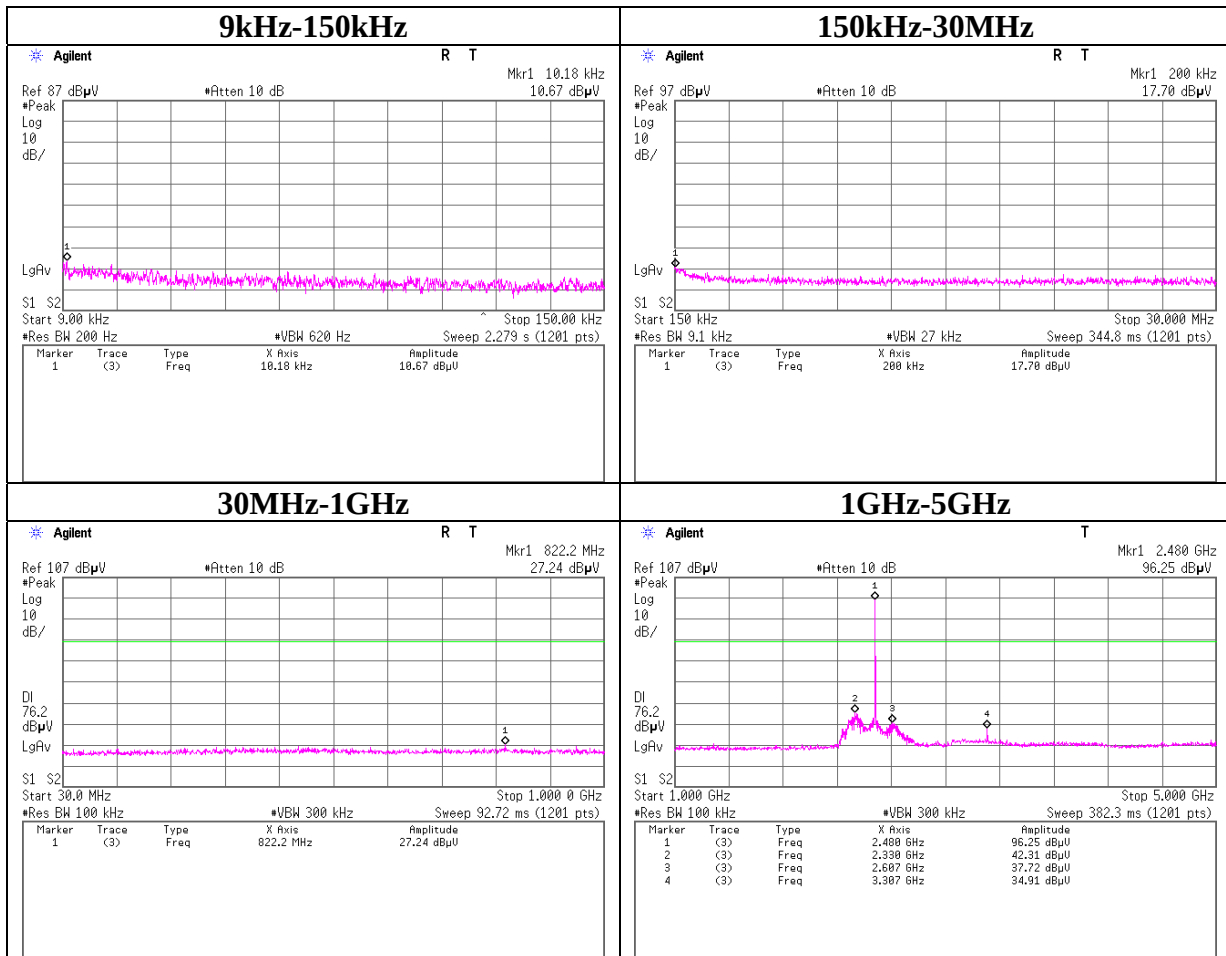
Conducted Spurious Emission

Tx 3DH5 2441MHz



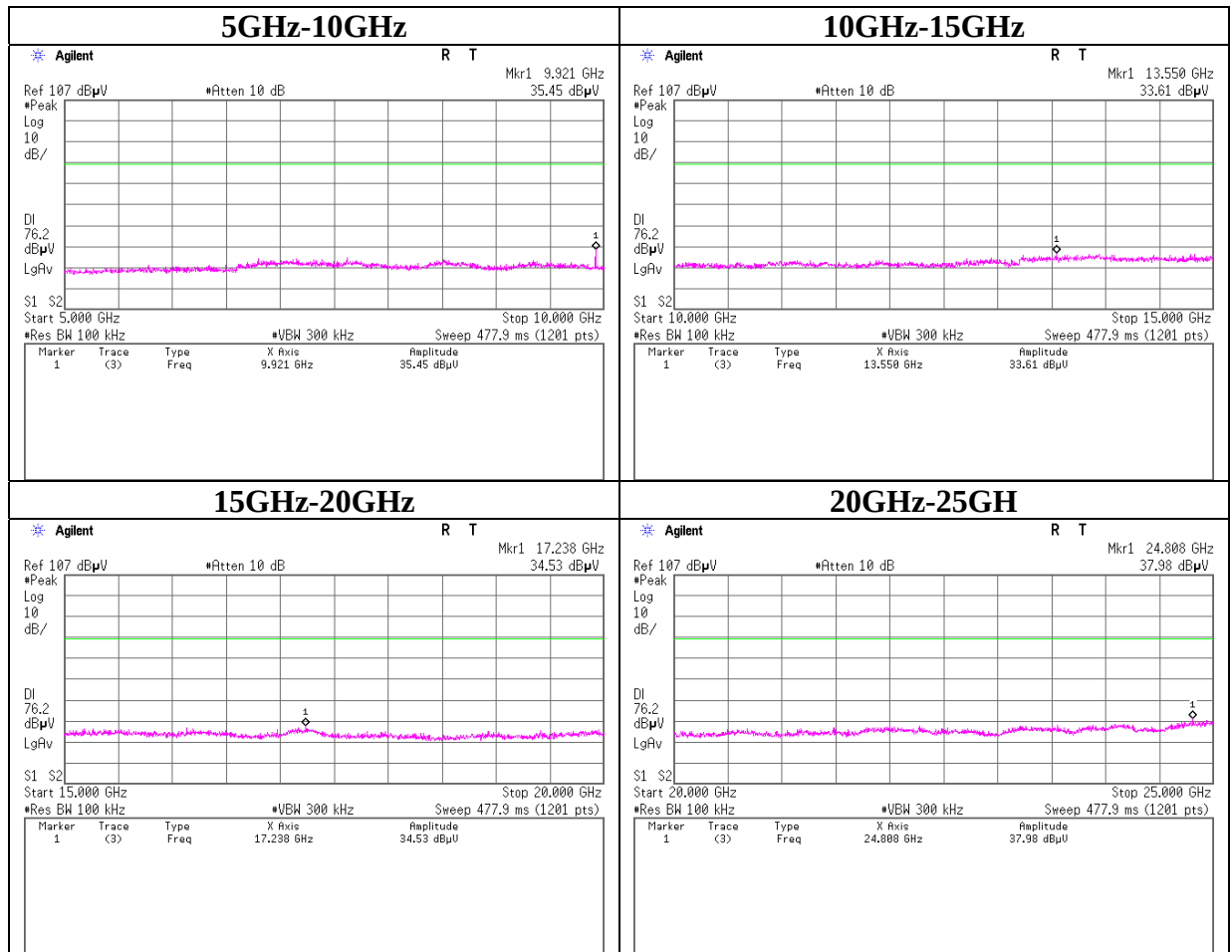
Conducted Spurious Emission

Tx 3DH5 2480MHz



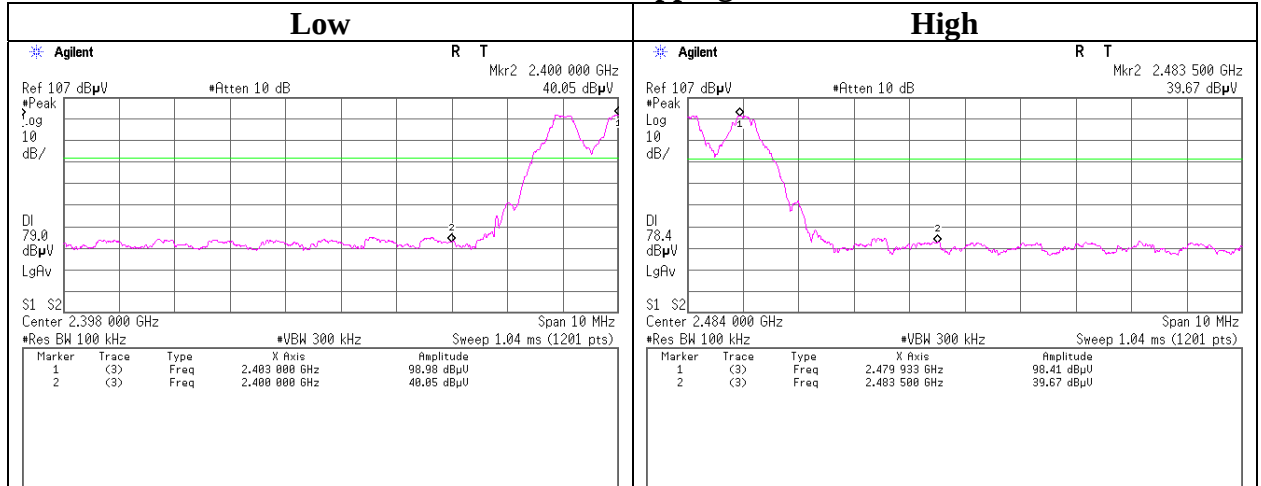
Conducted Spurious Emission

Tx 3DH5 2480MHz

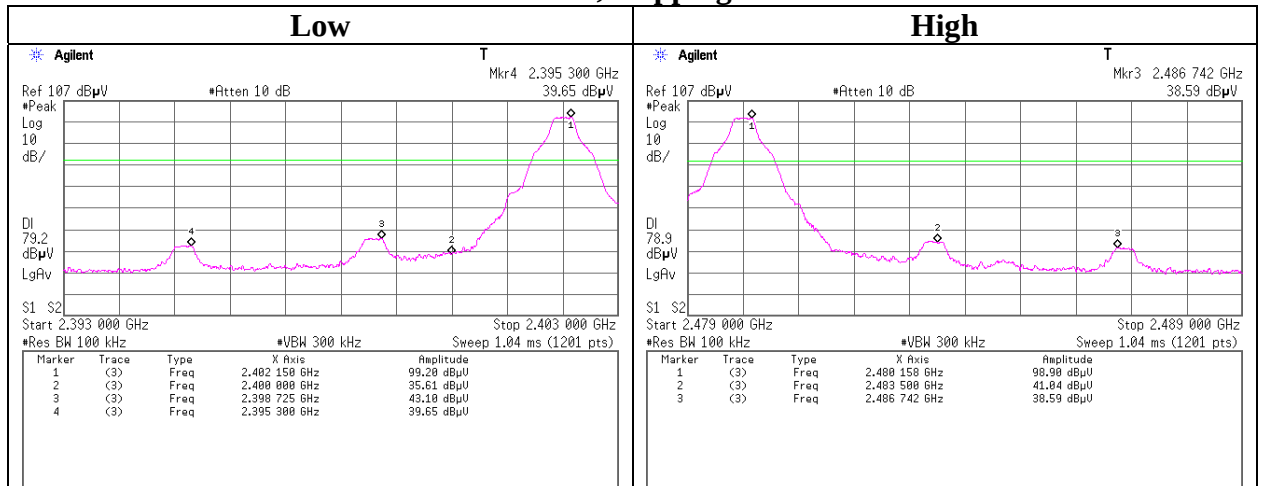


Conducted Emission Band Edge compliance

Tx DH5, Hopping on

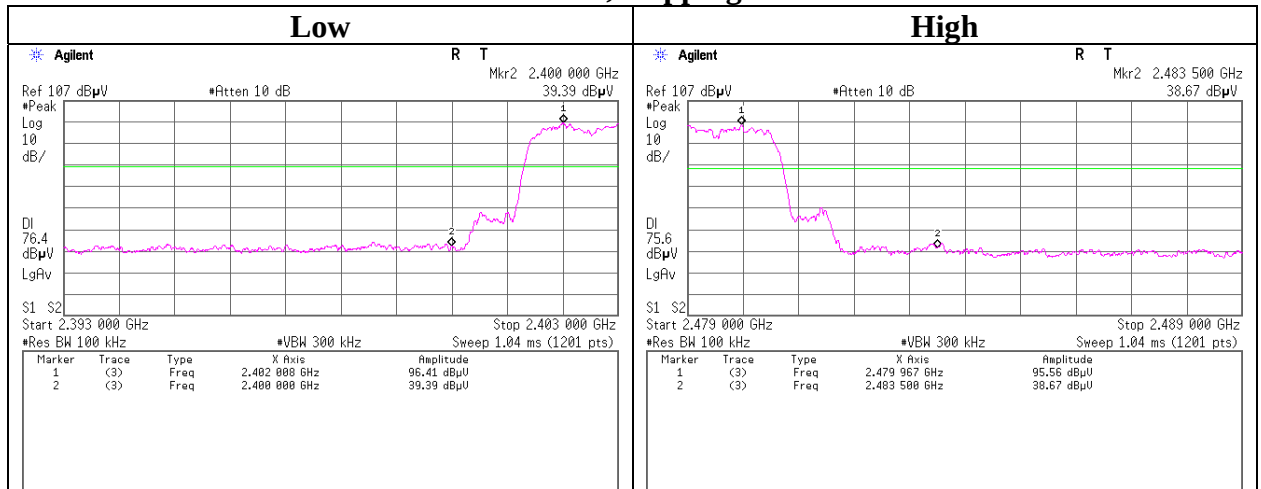


Tx DH5, Hopping off

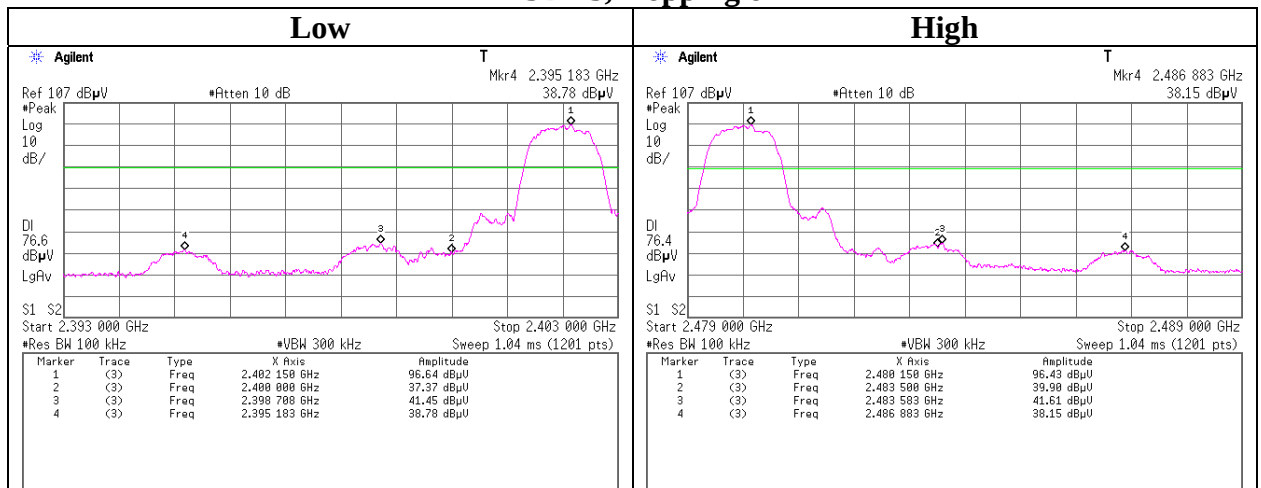


Conducted Emission Band Edge compliance

Tx 3DH5, Hopping on

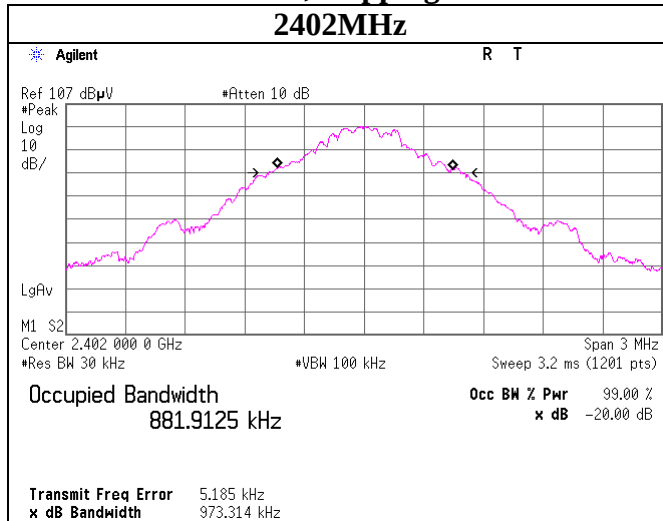


Tx 3DH5, Hopping off

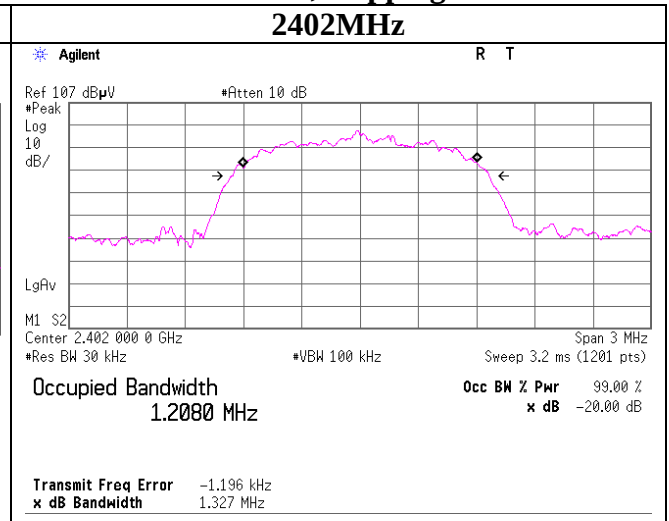


99% Occupied Bandwidth

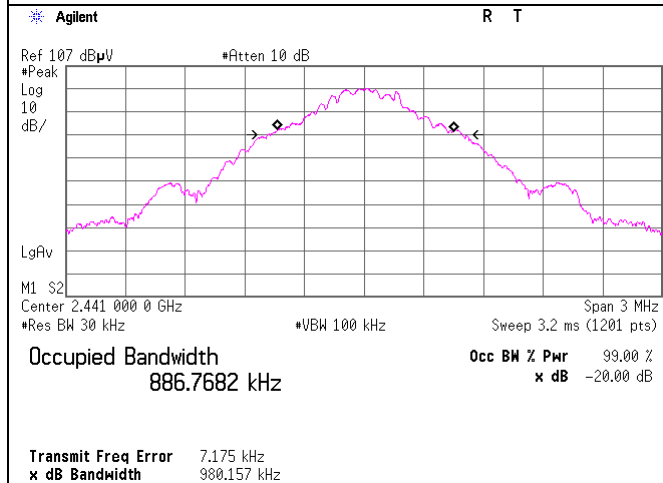
Tx DH5, Hopping off



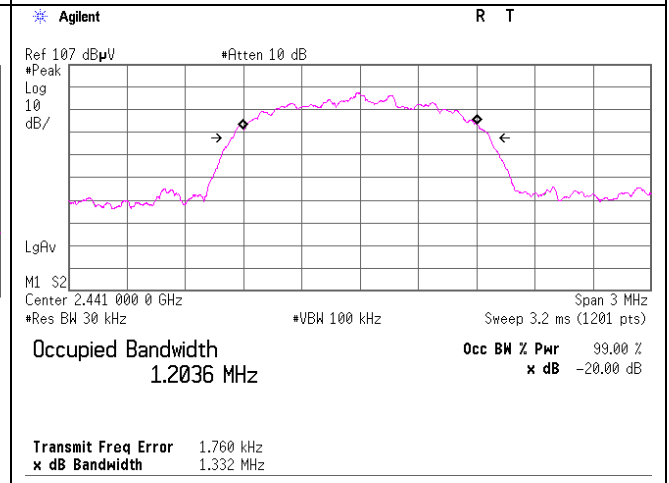
Tx 3DH5, Hopping off



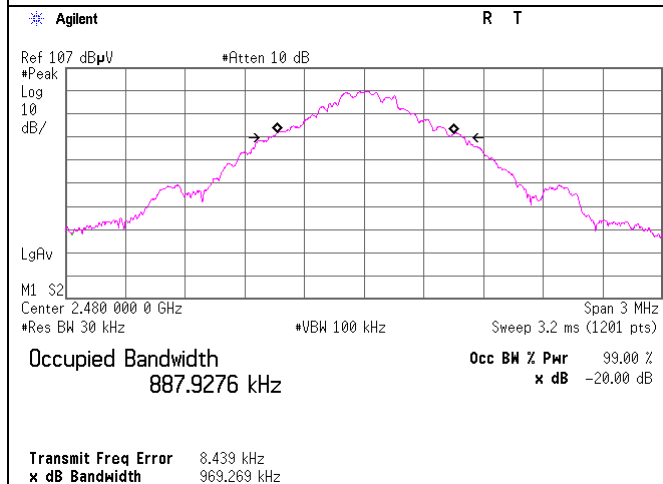
2441MHz



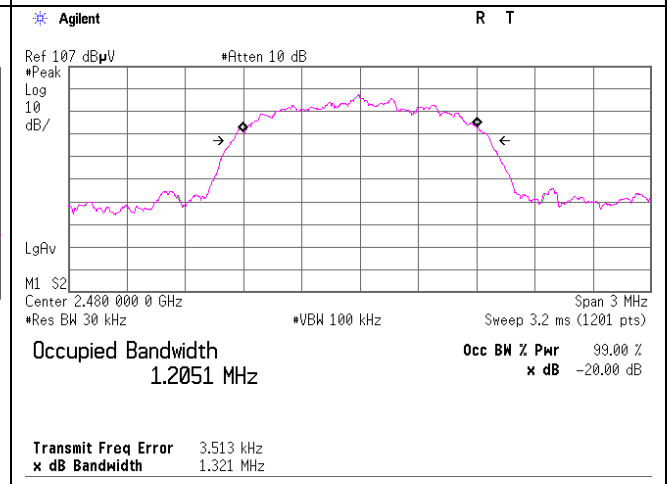
2441MHz



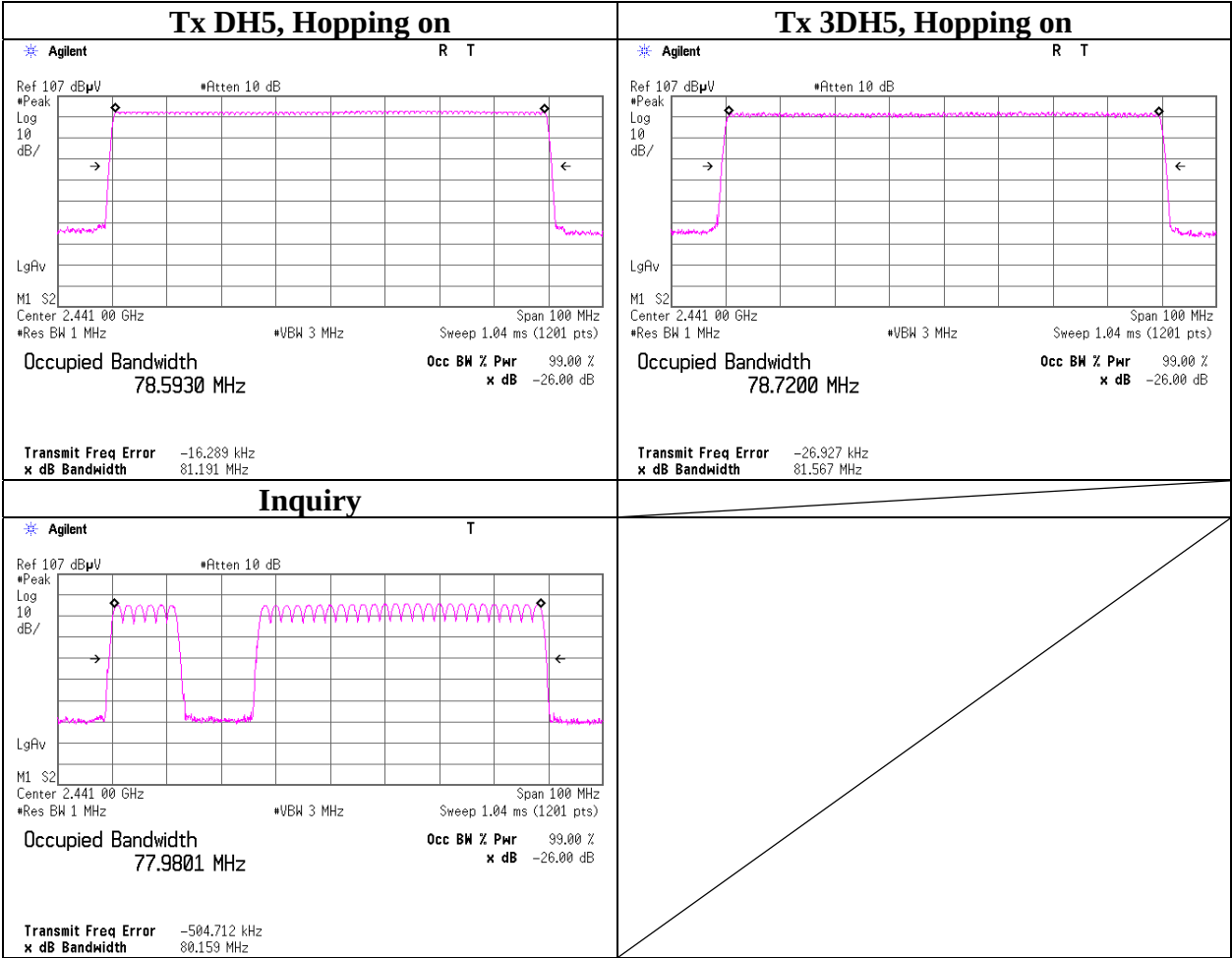
2480MHz



2480MHz



99% Occupied Bandwidth



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	AT	2011/11/23 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2012/03/27 * 12
MCC-99	Microwave Cable 1G-40GHz	Schner	SUCOFLEX102	30820/2	AT	2012/05/09 * 12
MPD-01	PowerDivider DC to 26.5GHz	Agilent	11636B	52258	AT	2012/03/27 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2012/10/08 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2012/10/08 * 12
MBTR15	CBT Bluetooth Tester	Rohde & Schwarz	CBT	100401	AT	2011/05/25 * 24
MCC-137	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37954/2	AT	2012/10/19 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2011/12/09 * 12
MMM-16	DIGITAL HiTESTER	Hioki	3805	070900532	AT	2012/01/13 * 12
MDPS-12	DC Power Supply	Kikusui	PAK35-10A	LF002314	AT	Pre Check
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	CE	2012/02/29 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	CE	2012/02/06 * 12
MJM-07	Measure	PROMART	SEN1955	-	CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	CE	-
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	CE	2011/11/23 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	CE	2012/04/05 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE (EUT or AE)	2012/02/06 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	8127364	CE (EUT or AE)	2012/02/09 * 12
MTA-31	Terminator	TME	CT-01	-	CE	2012/01/11 * 12
MAT-67	Attenuator	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28 * 12
MCC-113	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/ SFM141(5m)/ 421-010(1m)/ sucoform141-PE(1m)/ RFM-E121(Switcher)	-/04178	CE	2012/07/12 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2011/11/16 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2011/11/16 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2012/06/01 * 12
AT-38	Attenuator	Anritsu	MP721B	6200961025	RE	2011/12/08 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2012/03/05 * 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: CE: Conducted Emission
RE: Radiated Emission
AT: Antenna Terminal Conducted test

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