



RADIO TEST REPORT

Test Report No. : 32IE0169-HO-A

Applicant : SAMSUNG ELECTRONICS CO., LTD.
Type of Equipment : GSM/GPRS1900 Phone with bluetooth
Model No. : SHW-A350K
FCC ID : A3LSHWA350K
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: April 16 to 23 2012

Representative test engineer:

T. Shimada

Takumi Shimada

Engineer of WiSE Japan,
UL Verification Service

Approved by:

T. Hataheda

Takahiro Hataheda

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 : 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 : GSM/GPRS1900 Phone with bluetooth
Model No. : SHW-A350K
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC3.7V
Receipt Date of Sample : April 11, 2012
Modification of EUT : No Modification by the test lab

2.2 Product Description

Radio Specification

Bluetooth

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Type	FPCB type
Antenna Gain	-6.8dBi

GSM

Equipment Type	Transceiver
Frequency of Operation	[Up Link] PCS: 1850 – 1910MHz [Down Link] PCS: 1930 – 1990MHz
Type of Modulation	GMSK
Emission Designator	PCS: 250KGWX
Antenna Type	Cap type
Antenna Gain	-4.54dBi

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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 February 1, 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 20.2dB, 0.47838MHz, N AV 21.9dB, 0.47838MHz, 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	4.2dB 2483.500MHz, PK, 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	5.6dB	5.9dB	4.4dB	4.3dB
No.2	4.1dB	5.2dB	5.1dB	5.7dB	5.8dB	4.3dB	4.2dB
No.3	4.5dB	5.0dB	5.2dB	5.7dB	5.8dB	4.5dB	4.2dB
No.4	4.7dB	5.2dB	5.2dB	5.7dB	5.8dB	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

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	4.75 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 DH5, 3DH5	2402MHz 2441MHz 2480MHz
Carrier Frequency Separation 20dB Bandwidth	Tx (Hopping on/off) 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, 3DH5 Inquiry	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	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.
Software: HW: REV0.4
SW: FD02 (Used for Antenna Terminal conducted test)
SW: FD03 (Used for Conducted Emission test and Radiated Emission test)

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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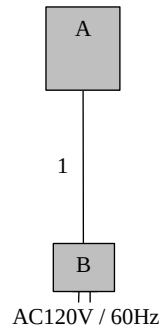
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4.2 Configuration and peripherals



* 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	GSM/GPRS1900 Phone with bluetooth	SHW-A350K	FJ-111-A *1) #01 *2)	SAMSUNG	EUT
B	AC Adapter	ETA0K01KBK	DKIC3I3TS/94	SAMSUNG	EUT

*1) Used for Conducted Emission test and Radiated Emission test

*2) Used for Antenna Terminal conducted test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	1.5	Shielded	Shielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, 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	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	5MHz / 3MHz	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

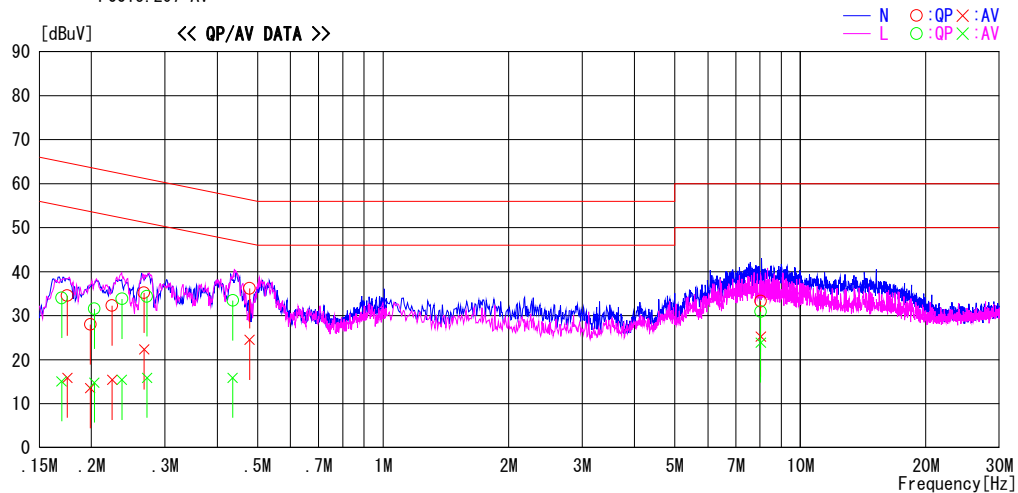
UL Japan, Inc. Head Office EMC Lab. No. 3 Semi Anechoic Chamber
Date : 2012/04/17

Report No. : 32IE0169-H0

Temp./Humi. : 22deg. C / 43% RH
Engineer : Takumi Shimada

Mode / Remarks : BT Tx DH5 2402MHz

LIMIT : FCC15.207 QP
FCC15.207 AV

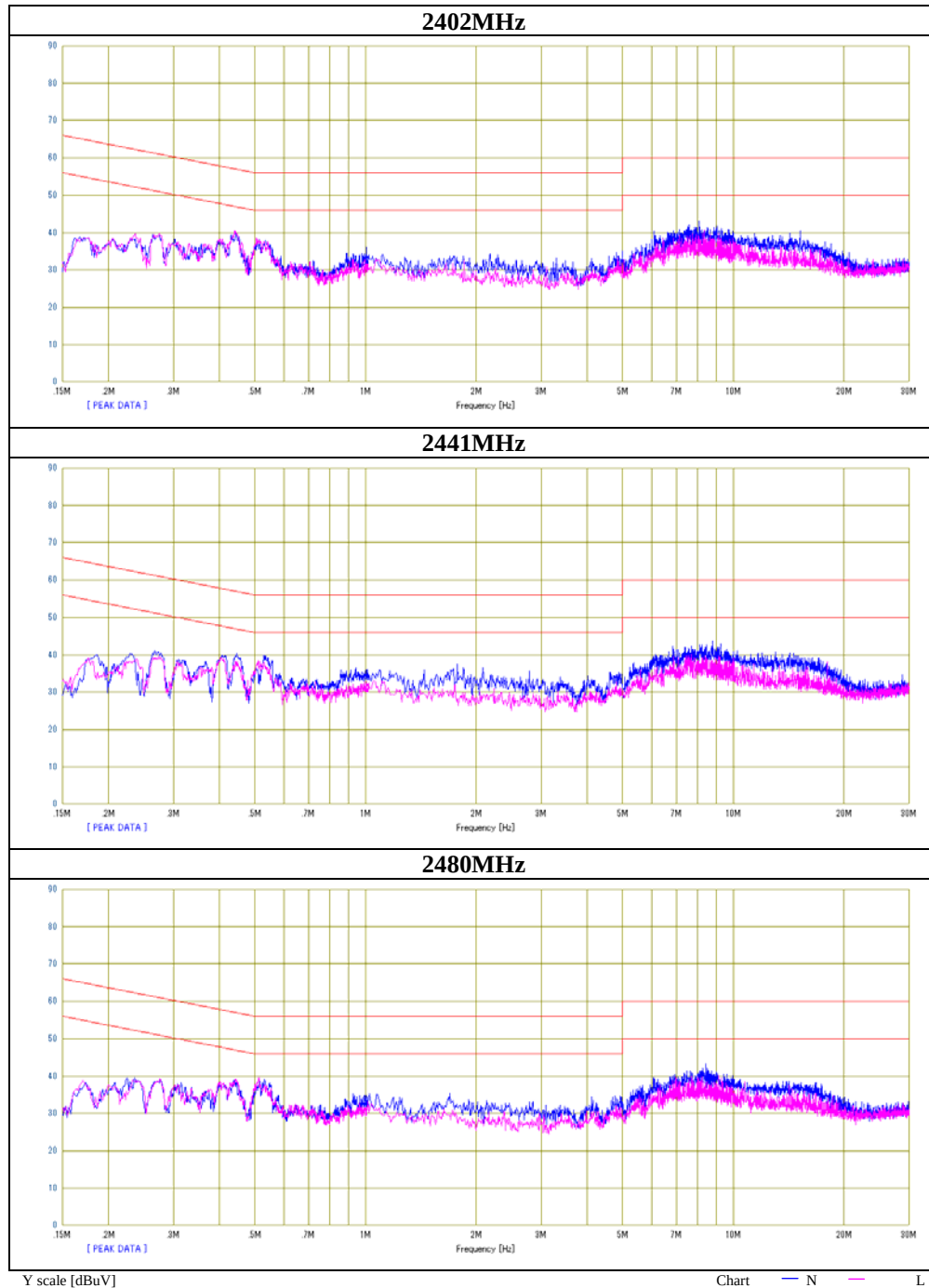


Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.17502	21.3	2.6	13.3	34.6	15.9	64.7	54.7	30.1	38.8	N	
0.19873	14.7	0.2	13.3	28.0	13.5	63.7	53.7	35.7	40.2	N	
0.22418	19.0	2.1	13.3	32.3	15.4	62.7	52.7	30.4	37.3	N	
0.26750	21.8	8.9	13.4	35.2	22.3	61.2	51.2	26.0	28.9	N	
0.47838	22.8	11.1	13.4	36.2	24.5	56.4	46.4	20.2	21.9	N	
8.03689	18.6	10.5	14.7	33.3	25.2	60.0	50.0	26.7	24.8	N	
0.16959	20.7	1.8	13.3	34.0	15.1	65.0	55.0	31.0	39.9	L	
0.20331	18.3	1.5	13.3	31.6	14.8	63.5	53.5	31.9	38.7	L	
0.23677	20.4	2.0	13.4	33.8	15.4	62.2	52.2	28.4	36.8	L	
0.27155	21.0	2.5	13.4	34.4	15.9	61.1	51.1	26.7	35.2	L	
0.43621	20.1	2.5	13.4	33.5	15.9	57.1	47.1	23.6	31.2	L	
8.03749	16.2	9.2	14.7	30.9	23.9	60.0	50.0	29.1	26.1	L	

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

Conducted Emission

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	32IE0169-HO
Date	04/17/2012
Temperature/ Humidity	22 deg.C / 43% RH
Engineer	Takumi Shimada
Mode	BT Tx DH5



Conducted Emission

DATA OF CONDUCTED EMISSION TEST

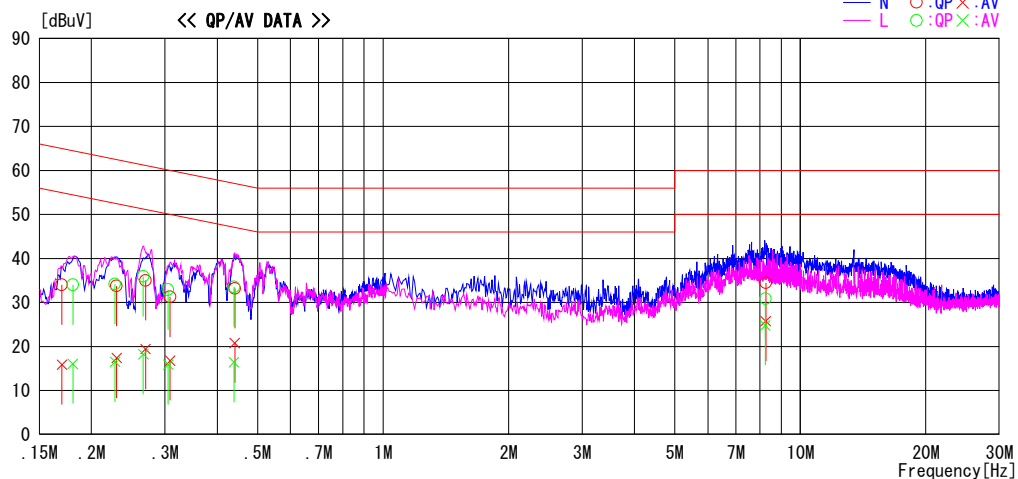
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/04/17

Report No. : 32IE0169-H0

Temp./Humi. : 22deg. C / 43% RH
Engineer : Takumi Shimada

Mode / Remarks : BT Tx 3DH5 2480MHz

LIMIT : FCC15.207 QP
FCC15.207 AV

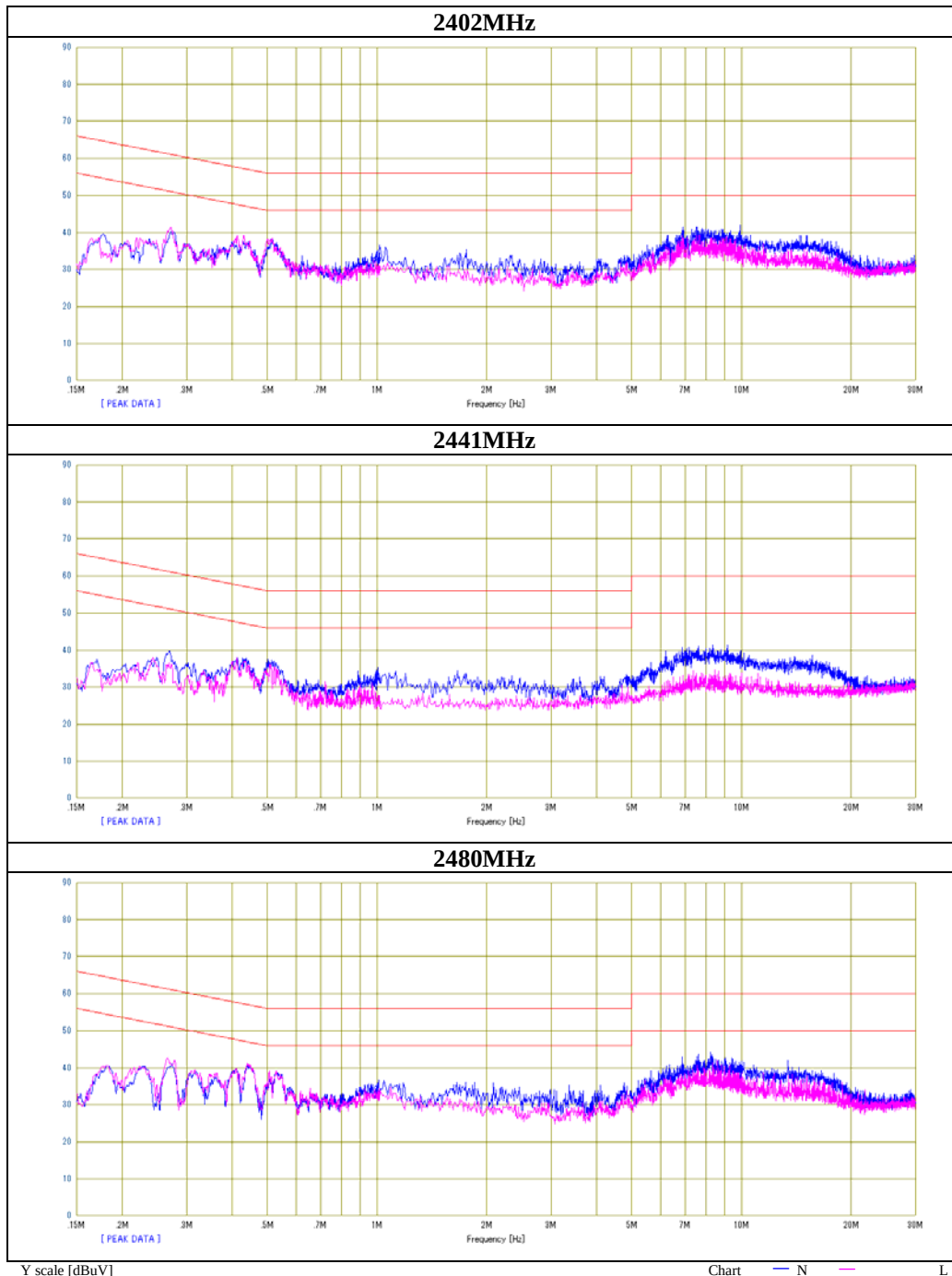


Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.16985	20.7	2.6	13.3	34.0	15.9	65.0	55.0	31.0	39.1	N	
0.22981	20.3	4.0	13.4	33.7	17.4	62.5	52.5	28.8	35.1	N	
0.26962	21.6	6.0	13.4	35.0	19.4	61.1	51.1	26.1	31.7	N	
0.30890	17.9	3.4	13.4	31.3	16.8	60.0	50.0	28.7	33.2	N	
0.44070	19.8	7.4	13.4	33.2	20.8	57.0	47.0	23.8	26.2	N	
8.26580	19.8	11.1	14.7	34.5	25.8	60.0	50.0	25.5	24.2	N	
0.18045	20.7	2.8	13.3	34.0	16.1	64.5	54.5	30.5	38.4	L	
0.22774	20.9	3.2	13.3	34.2	16.5	62.5	52.5	28.3	36.0	L	
0.26620	22.5	4.8	13.4	35.9	18.2	61.2	51.2	25.3	33.0	L	
0.30551	19.5	2.5	13.4	32.9	15.9	60.1	50.1	27.2	34.2	L	
0.43910	20.2	3.0	13.4	33.6	16.4	57.1	47.1	23.5	30.7	L	
8.24240	16.1	10.1	14.7	30.8	24.8	60.0	50.0	29.2	25.2	L	

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

Conducted Emission

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	32IE0169-HO
Date	04/17/2012
Temperature/ Humidity	22 deg.C / 43% RH
Engineer	Takumi Shimada
Mode	BT Tx 3DH5



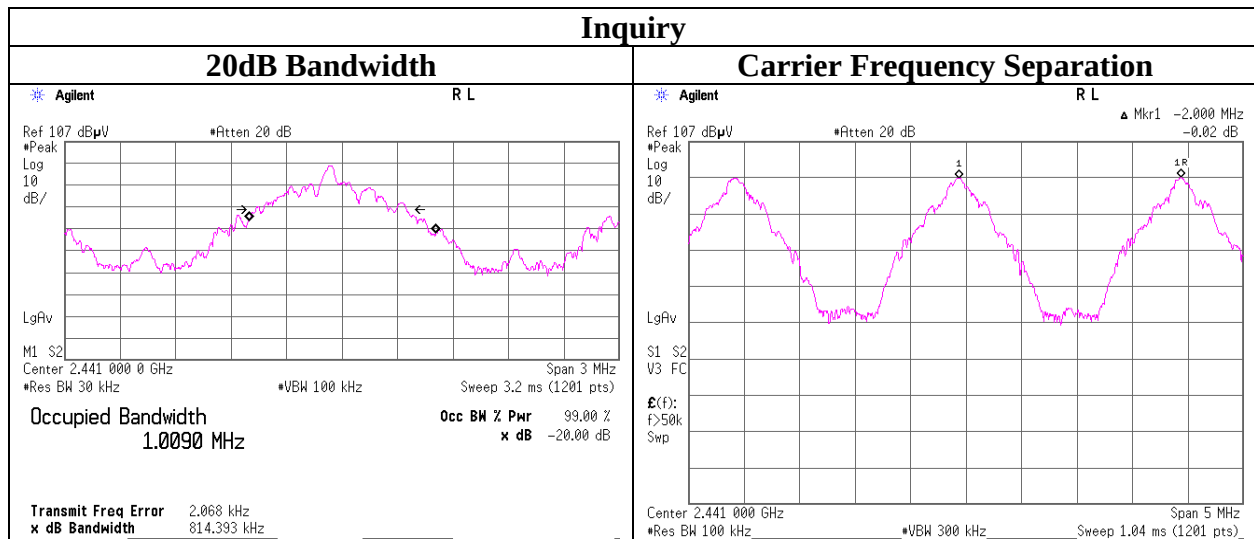
20dB Bandwidth and Carrier Frequency Separation

Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	32IE0169-HO
Date	04/23/2012
Temperature/ Humidity	24 deg.C/ 55% RH
Engineer	Tomohisa Nakagawa
Mode	Tx (Hopping on/off) DH5/3DH5/Inquiry

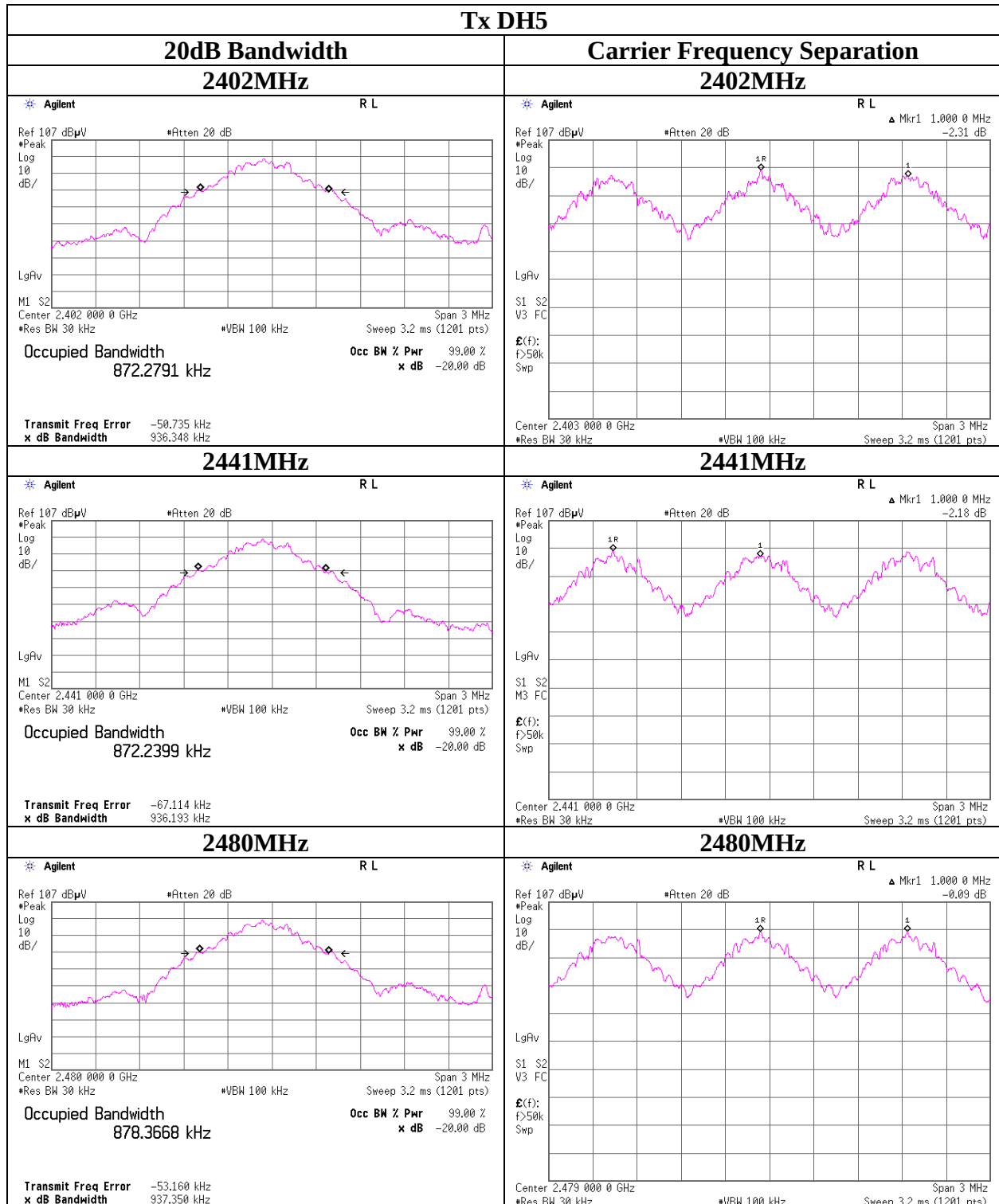
Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.936	1.000	>= 0.624
DH5	2441.0	0.936	1.000	>= 0.624
DH5	2480.0	0.937	1.000	>= 0.625
3DH5	2402.0	1.281	1.000	>= 0.854
3DH5	2441.0	1.266	1.000	>= 0.844
3DH5	2480.0	1.269	1.000	>= 0.846
Inquiry	2441.0	0.814	2.000	>= 0.543

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

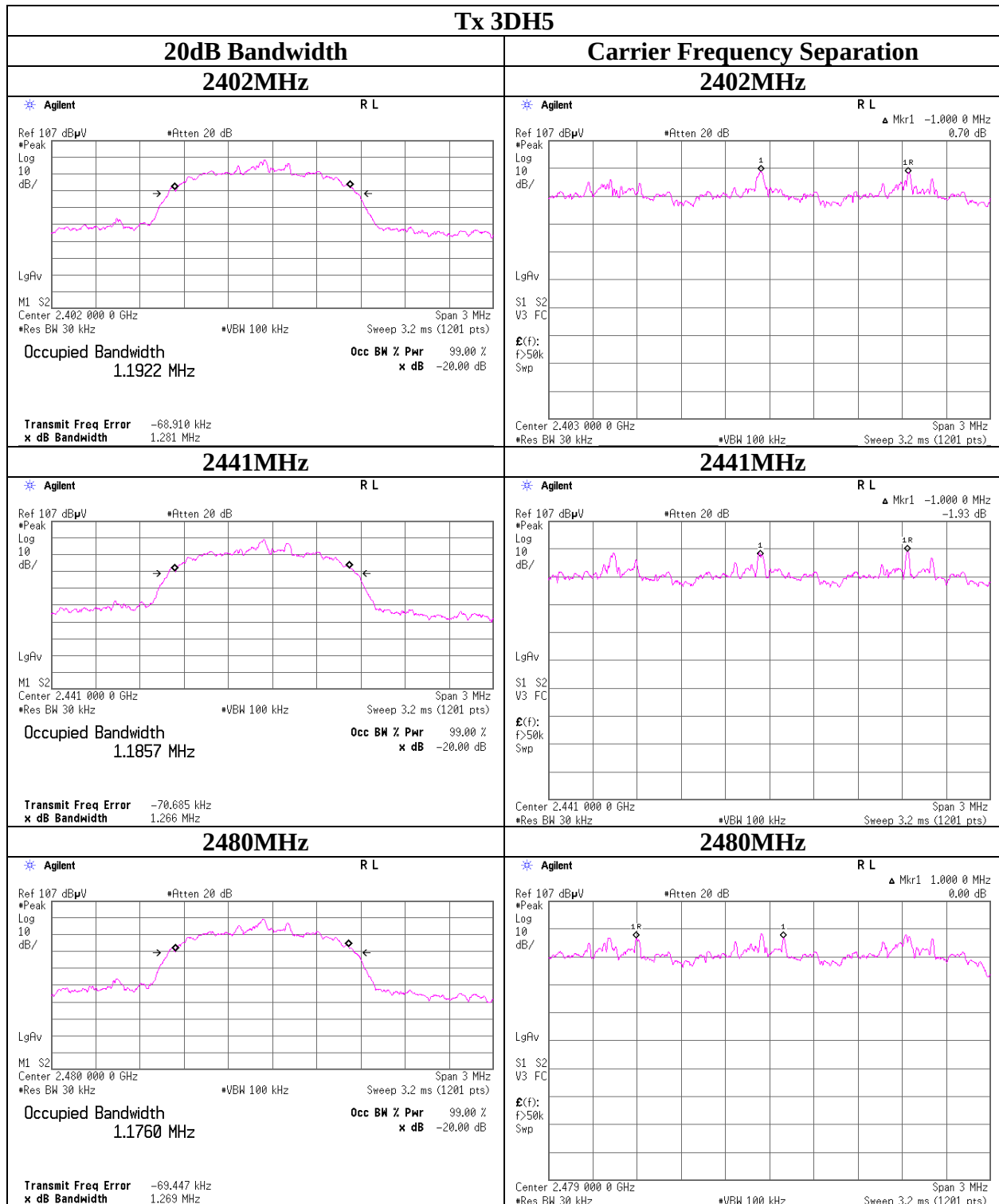
No limit applies to 20dB Bandwidth.



20dB Bandwidth and Carrier Frequency Separation



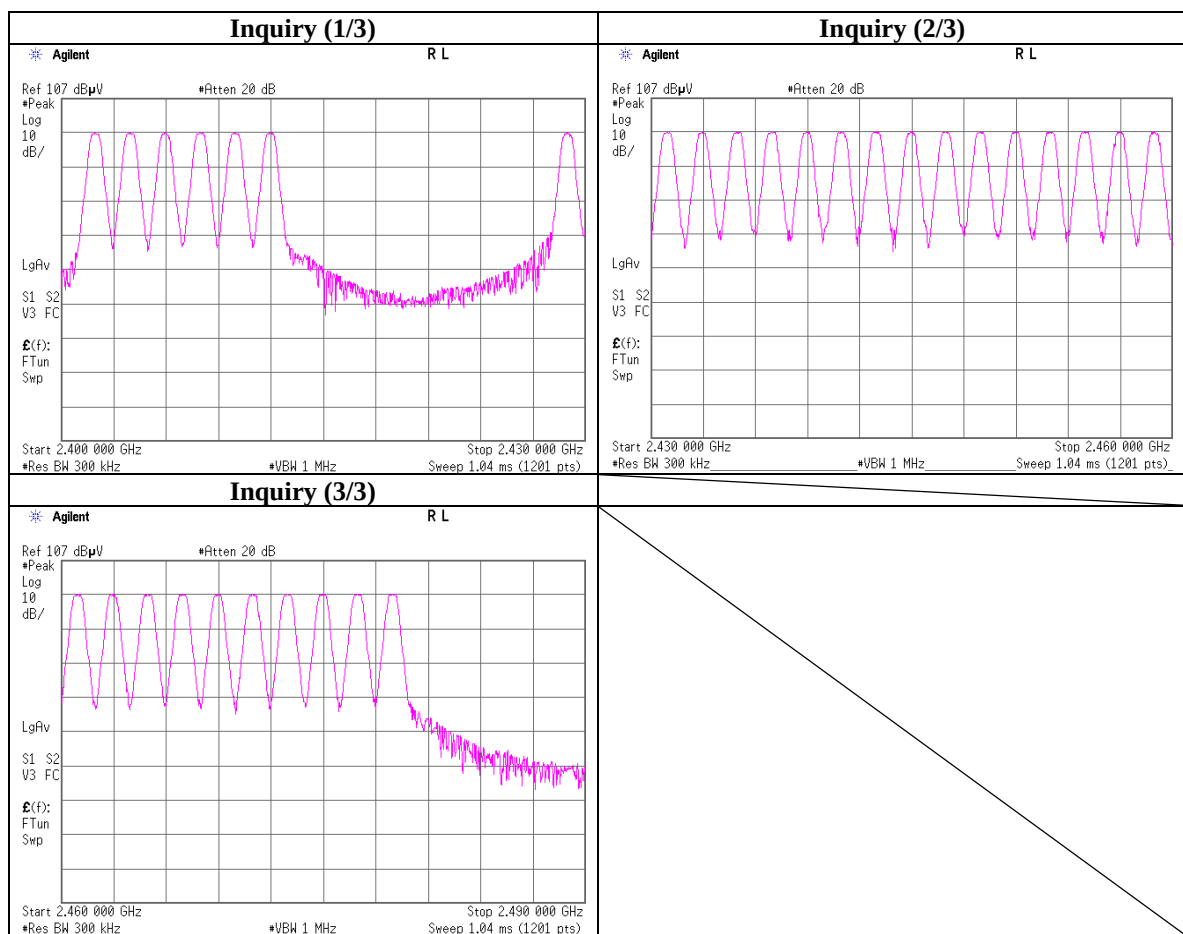
20dB Bandwidth and Carrier Frequency Separation



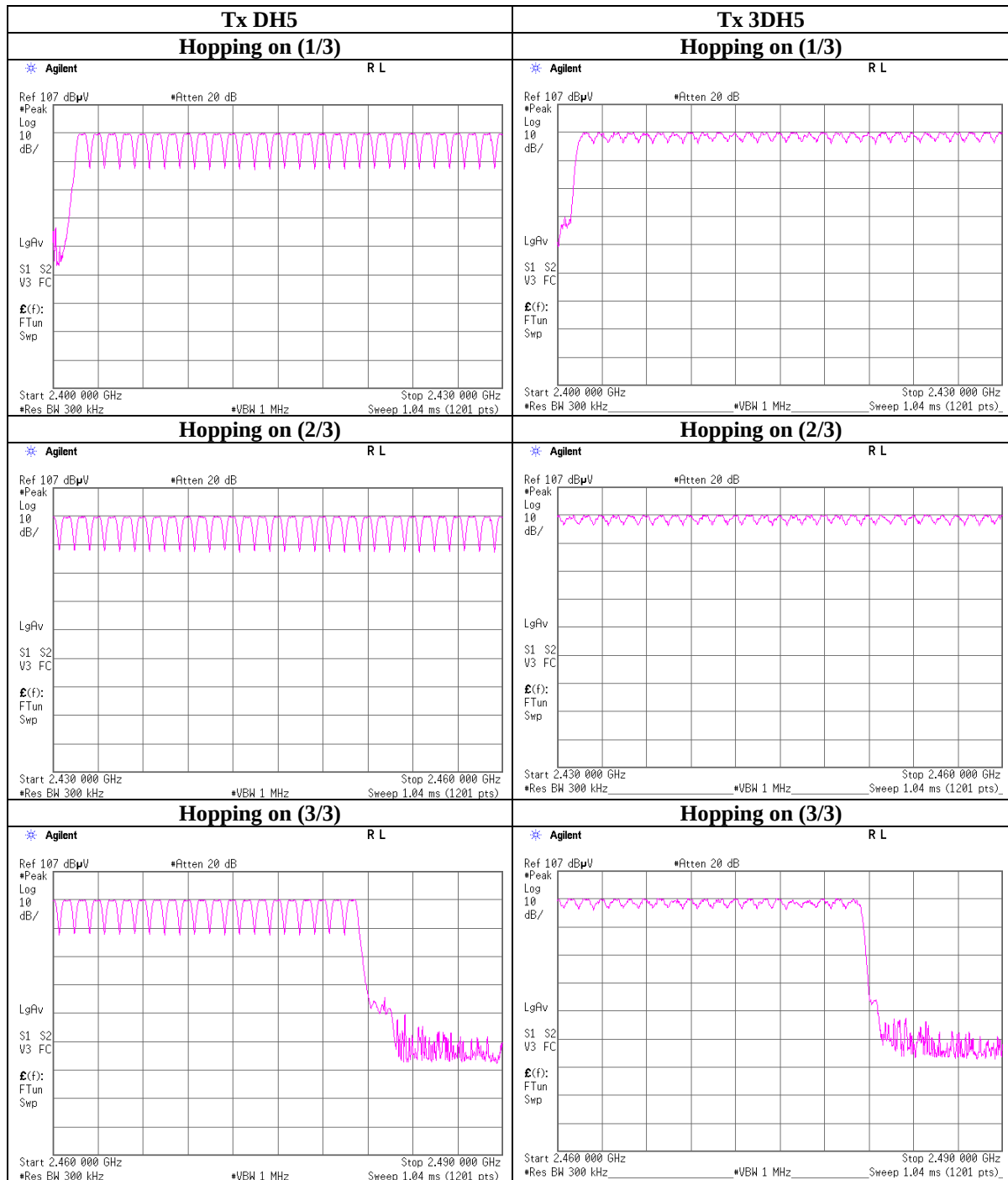
Number of Hopping Frequency

Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	32IE0169-HO
Date	04/23/2012
Temperature/ Humidity	24 deg.C/ 55% RH
Engineer	Tomohisa Nakagawa
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.4 Measurement Room
Report No. 32IE0169-HO
Date 04/23/2012
Temperature/ Humidity 24 deg. C / 55% RH
Engineer Tomohisa Nakagawa
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	0.429	138	400
DH3	23.2 times	/	5 sec. x	31.6 sec. = 147 times	1.685	248	400
DH5	18.6 times	/	5 sec. x	31.6 sec. = 118 times	2.933	346	400
3DH1	50.6 times	/	5 sec. x	31.6 sec. = 320 times	0.440	141	400
3DH3	24.6 times	/	5 sec. x	31.6 sec. = 156 times	1.693	264	400
3DH5	17.2 times	/	5 sec. x	31.6 sec. = 109 times	2.947	321	400
Inquiry	100.0 times	/	1 sec. x	12.8 sec. = 1280 times	0.130	166	400

Sample Calculation

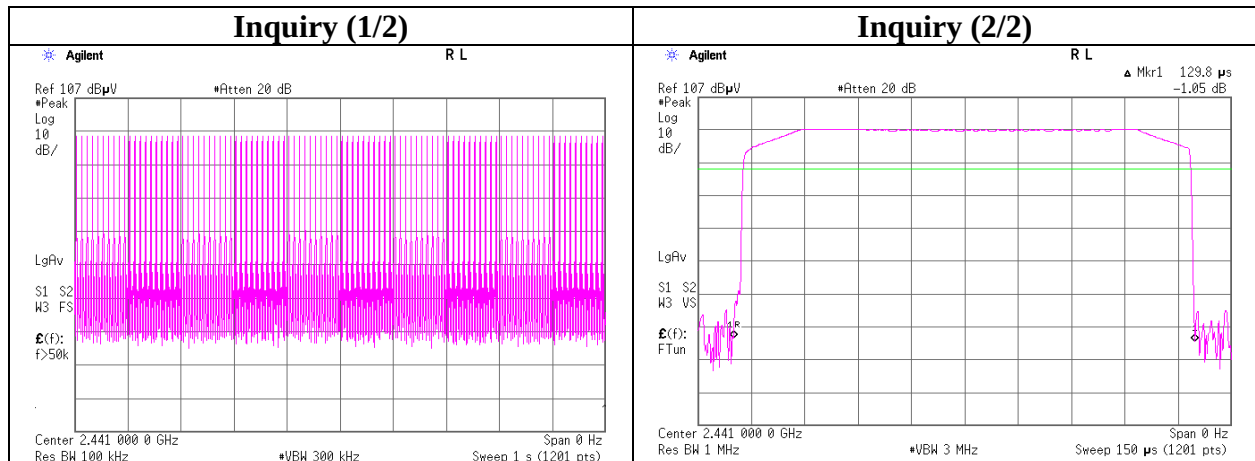
Result = Number of transmission x Length of transmission time

*Average data of 5 tests.(except Inquiry)

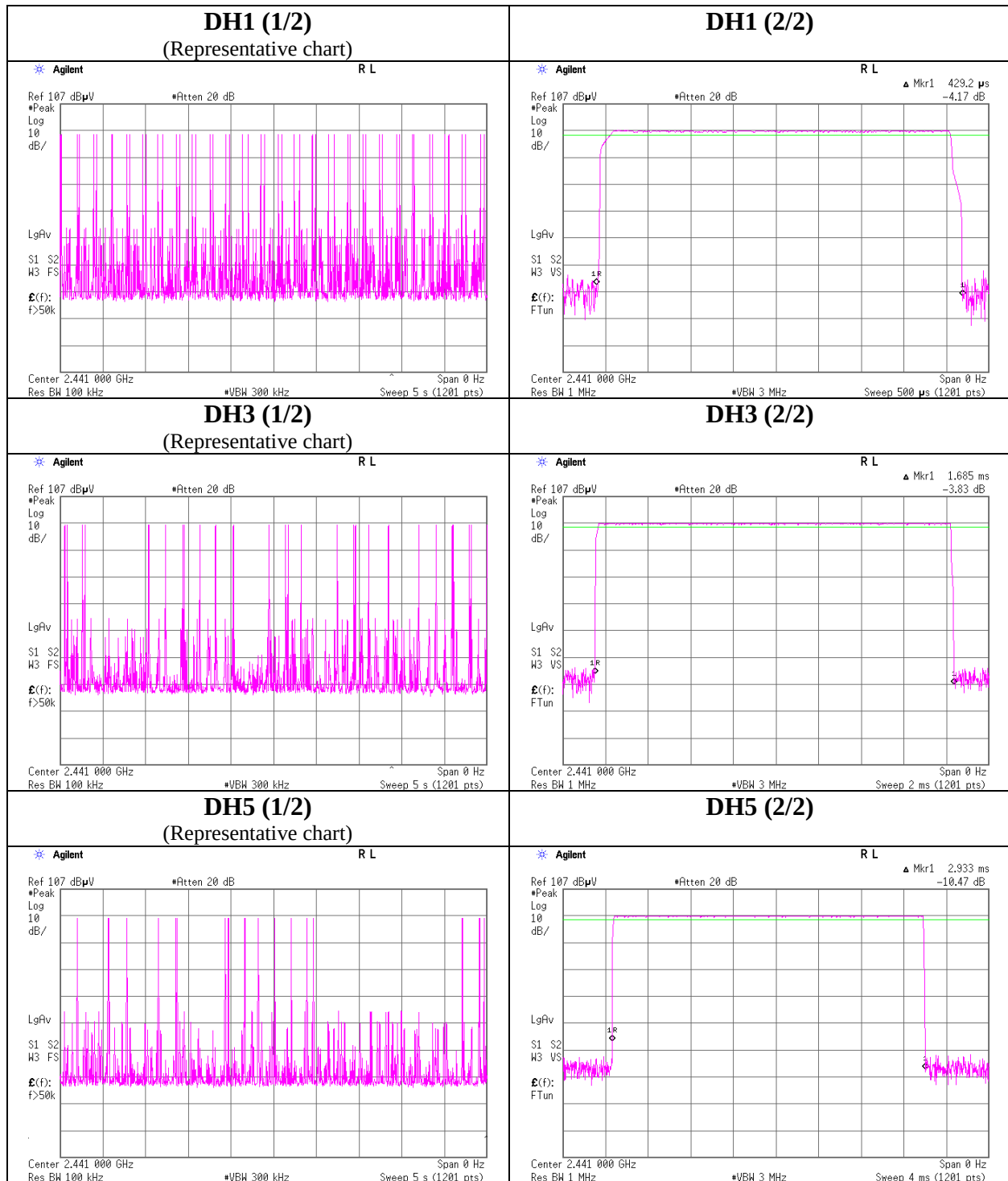
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	50	51	52	51	50	50.8
DH3	25	21	21	24	25	23.2
DH5	18	15	21	19	20	18.6
3DH1	50	51	50	52	50	50.6
3DH3	21	24	26	26	26	24.6
3DH5	19	20	17	14	16	17.2

Sample Calculation

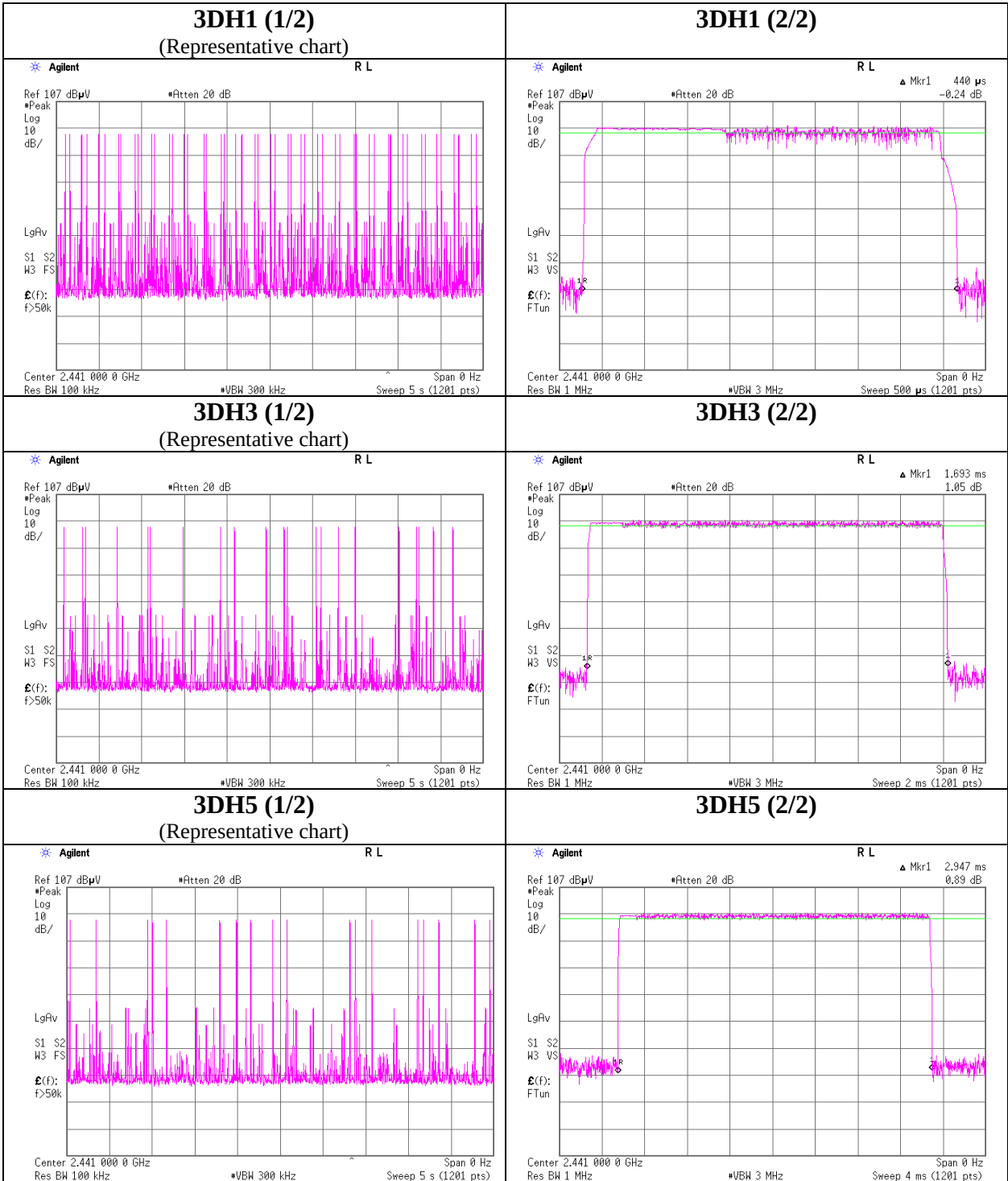
Average= Summation(Sampling 1 to 5) / 5



Dwell time



Dwell time



Maximum Peak Output Power

Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	32IE0169-HO
Date	04/23/2012
Temperature/ Humidity	24 deg. C / 55% RH
Engineer	Tomohisa Nakagawa
Mode	Tx (Hopping off) DH5/3DH5/Inquiry

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-9.87	2.00	16.05	8.18	6.58	20.96	125	12.78
DH5	2441.0	-9.83	2.00	16.05	8.22	6.64	20.96	125	12.74
DH5	2480.0	-9.89	2.00	16.05	8.16	6.55	20.96	125	12.80
3DH5	2402.0	-9.87	2.00	16.05	8.18	6.58	20.96	125	12.78
3DH5	2441.0	-9.87	2.00	16.05	8.18	6.58	20.96	125	12.78
3DH5	2480.0	-9.92	2.00	16.05	8.13	6.50	20.96	125	12.83
Inquiry	2441.0	-9.87	2.00	16.05	8.18	6.58	20.96	125	12.78

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.

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.

Radiated Spurious Emission

Test place Head Office EMC Lab. No. 3 Semi Anechoic Chamber
Report No. 32IE0169-HO
Date 04/16/2012 04/17/2012
Temperature/ Humidity 23 deg. C / 37% RH 22 deg. C / 43% RH
Engineer Takumi Shimada Takumi Shimada
(1-26.5GHz) (30-1000MHz)
Mode 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	49.142	QP	27.4	11.3	7.5	32.2	14.0	40.0	26.0	
Hori	77.196	QP	24.5	6.4	7.9	32.1	6.7	40.0	33.3	
Hori	95.778	QP	27.1	9.4	8.1	32.3	12.3	43.5	31.2	
Hori	101.861	QP	27.4	10.3	8.2	32.3	13.6	43.5	29.9	
Hori	153.120	QP	20.5	15.0	8.7	32.2	12.0	43.5	31.5	
Hori	400.000	QP	20.2	17.7	10.7	32.1	16.5	46.0	29.5	
Hori	2390.000	PK	60.7	26.4	2.2	32.4	56.9	73.9	17.0	
Hori	2399.942	PK	78.6	26.5	2.2	34.8	72.5	-	-	- See 20dBc Data Sheet
Hori	2400.000	PK	73.9	26.4	2.2	32.4	70.1	-	-	- See 20dBc Data Sheet
Hori	4804.000	PK	46.2	30.4	3.9	31.4	49.1	73.9	24.8	
Hori	7206.000	PK	42.4	35.2	4.5	32.4	49.7	73.9	24.2	
Hori	9608.000	PK	42.4	38.1	5.3	33.0	52.8	73.9	21.1	
Hori	24020.000	PK	43.7	38.5	-1.8	31.1	49.3	73.9	24.6	
Hori	2390.000	AV	30.7	26.4	2.2	32.4	26.9	53.9	27.0	
Hori	2399.942	AV	51.6	26.5	2.2	34.8	45.5	-	-	- See 20dBc Data Sheet
Hori	2400.000	AV	47.8	26.4	2.2	32.4	44.0	-	-	- See 20dBc Data Sheet
Hori	4804.000	AV	39.0	30.4	3.9	31.4	41.9	53.9	12.1	
Hori	7206.000	AV	30.2	35.2	4.5	32.4	37.5	53.9	16.5	
Hori	9608.000	AV	30.2	38.1	5.3	33.0	40.6	53.9	13.3	
Hori	24020.000	AV	32.3	38.5	-1.8	31.1	37.9	53.9	16.0	
Vert	49.147	QP	31.7	11.3	7.5	32.2	18.3	40.0	21.7	
Vert	77.246	QP	33.2	6.4	7.9	32.1	15.7	40.0	24.3	
Vert	95.773	QP	31.1	9.4	8.1	32.3	16.5	43.5	27.0	
Vert	101.868	QP	30.9	10.3	8.2	32.3	17.1	43.5	26.4	
Vert	155.674	QP	25.9	15.1	8.8	32.2	17.7	43.5	25.8	
Vert	400.000	QP	20.2	17.7	10.7	32.1	16.5	46.0	29.5	
Vert	2390.000	PK	59.2	26.4	2.2	32.4	55.4	73.9	18.5	
Vert	2399.942	PK	77.8	26.5	2.2	34.8	71.7	-	-	- See 20dBc Data Sheet
Vert	2400.000	PK	72.7	26.4	2.2	32.4	68.9	-	-	- See 20dBc Data Sheet
Vert	4804.000	PK	43.3	30.4	3.9	31.4	46.2	73.9	27.7	
Vert	7206.000	PK	42.6	35.2	4.5	32.4	49.9	73.9	24.0	
Vert	9608.000	PK	42.2	38.1	5.3	33.0	52.6	73.9	21.3	
Vert	24020.000	PK	44.1	38.5	-1.8	31.1	49.7	73.9	24.2	
Vert	2390.000	AV	30.3	26.4	2.2	32.4	26.5	53.9	27.4	
Vert	2399.942	AV	52.3	26.5	2.2	34.8	46.2	-	-	- See 20dBc Data Sheet
Vert	2400.000	AV	46.0	26.4	2.2	32.4	42.2	-	-	- See 20dBc Data Sheet
Vert	4804.000	AV	33.9	30.4	3.9	31.4	36.8	53.9	17.1	
Vert	7206.000	AV	31.3	35.2	4.5	32.4	38.6	53.9	15.3	
Vert	9608.000	AV	30.2	38.1	5.3	33.0	40.6	53.9	13.3	
Vert	24020.000	AV	32.1	38.5	-1.8	31.1	37.7	53.9	16.2	

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

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

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

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

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	106.2	26.4	2.2	32.4	102.4	-	-	Carrier
Hori	2400.000	PK	60.6	26.4	2.2	32.4	56.8	82.4	25.6	
Hori	2399.942	PK	66.2	26.5	2.2	34.8	60.1	82.4	22.3	
Vert	2402.000	PK	105.6	26.4	2.2	32.4	101.8	-	-	Carrier
Vert	2400.000	PK	59.2	26.4	2.2	32.4	55.4	81.8	26.4	
Vert	2399.942	PK	62.4	26.5	2.2	34.8	56.3	81.8	25.5	

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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No. 3 Semi Anechoic Chamber	
Report No.	32IE0169-HO	
Date	04/16/2012	04/17/2012
Temperature/ Humidity	23 deg. C / 37% RH	22 deg. C / 43% RH
Engineer	Takumi Shimada (1-26.5GHz)	Takumi Shimada (30-1000MHz)
Mode	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	49.135	QP	27.7	11.3	7.5	32.2	14.3	40.0	25.7	
Hori	77.499	QP	23.0	6.4	7.9	32.1	5.2	40.0	34.8	
Hori	95.775	QP	26.7	9.4	8.1	32.3	11.9	43.5	31.6	
Hori	101.867	QP	25.0	10.3	8.2	32.3	11.2	43.5	32.3	
Hori	156.334	QP	21.6	15.2	8.8	32.2	13.4	43.5	30.1	
Hori	400.000	QP	20.2	17.7	10.7	32.1	16.5	46.0	29.5	
Hori	4882.000	PK	46.2	30.5	3.8	31.4	49.1	73.9	24.8	
Hori	7323.000	PK	42.3	35.2	4.5	32.5	49.5	73.9	24.4	
Hori	9764.000	PK	43.4	38.3	5.4	33.0	54.1	73.9	19.8	
Hori	24410.000	PK	43.5	38.8	-1.8	30.9	49.6	73.9	24.3	
Hori	4882.000	AV	37.3	30.5	3.8	31.4	40.2	53.9	13.8	
Hori	7323.000	AV	32.6	35.2	4.5	32.5	39.8	53.9	14.1	
Hori	9764.000	AV	30.5	38.3	5.4	33.0	41.2	53.9	12.7	
Hori	24410.000	AV	31.5	38.8	-1.8	30.9	37.6	53.9	16.3	
Vert	49.135	QP	32.0	11.3	7.5	32.2	18.6	40.0	21.4	
Vert	74.952	QP	34.0	6.5	7.8	32.1	16.3	40.0	23.7	
Vert	95.779	QP	32.6	9.4	8.1	32.3	18.0	43.5	25.5	
Vert	101.877	QP	29.9	10.3	8.2	32.3	16.1	43.5	27.4	
Vert	156.369	QP	27.0	15.2	8.8	32.2	18.9	43.5	24.6	
Vert	400.000	QP	20.2	17.7	10.7	32.1	16.5	46.0	29.5	
Vert	4882.000	PK	45.5	30.5	3.8	31.4	48.4	73.9	25.5	
Vert	7323.000	PK	45.0	35.2	4.5	32.5	52.2	73.9	21.7	
Vert	9764.000	PK	44.0	38.3	5.4	33.0	54.7	73.9	19.2	
Vert	24410.000	PK	43.7	38.8	-1.8	30.9	49.8	73.9	24.1	
Vert	4882.000	AV	36.7	30.5	3.8	31.4	39.6	53.9	14.3	
Vert	7323.000	AV	33.8	35.2	4.5	32.5	41.0	53.9	12.9	
Vert	9764.000	AV	32.1	38.3	5.4	33.0	42.8	53.9	11.1	
Vert	24410.000	AV	31.3	38.8	-1.8	30.9	37.4	53.9	16.5	

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

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

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Radiated Spurious Emission

Test place Head Office EMC Lab. No. 3 Semi Anechoic Chamber
Report No. 32IE0169-HO
Date 04/16/2012 04/17/2012
Temperature/ Humidity 23 deg. C / 37% RH 22 deg. C / 43% RH
Engineer Takumi Shimada Takumi Shimada
(1-26.5GHz) (30-1000MHz)
Mode 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	49.160	QP	27.2	11.3	7.5	32.2	13.8	40.0	26.2	
Hori	77.694	QP	23.3	6.4	7.9	32.1	5.5	40.0	34.5	
Hori	95.779	QP	26.7	9.4	8.1	32.3	11.9	43.5	31.6	
Hori	101.883	QP	25.3	10.3	8.2	32.3	11.5	43.5	32.0	
Hori	156.548	QP	21.5	15.2	8.8	32.2	13.3	43.5	30.2	
Hori	400.000	QP	20.2	17.7	10.7	32.1	16.5	46.0	29.5	
Hori	2483.500	PK	73.3	26.5	2.2	32.3	69.7	73.9	4.2	
Hori	4960.000	PK	44.3	30.6	3.8	31.4	47.3	73.9	26.6	
Hori	7440.000	PK	45.6	35.1	4.6	32.6	52.7	73.9	21.2	
Hori	9920.000	PK	43.0	38.6	5.4	33.1	53.9	73.9	20.1	
Hori	24800.000	PK	44.6	39.0	-1.7	30.8	51.1	73.9	22.8	
Hori	2483.500	AV	38.4	26.5	2.2	32.3	34.8	53.9	19.1	
Hori	4960.000	AV	35.3	30.6	3.8	31.4	38.3	53.9	15.7	
Hori	7440.000	AV	34.0	35.1	4.6	32.6	41.1	53.9	12.8	
Hori	9920.000	AV	30.0	38.6	5.4	33.1	40.9	53.9	13.0	
Hori	24800.000	AV	32.9	39.0	-1.7	30.8	39.4	53.9	14.5	
Vert	49.143	QP	31.6	11.3	7.5	32.2	18.2	40.0	21.8	
Vert	74.952	QP	33.4	6.5	7.8	32.1	15.7	40.0	24.3	
Vert	95.766	QP	31.6	9.4	8.1	32.3	17.0	43.5	26.5	
Vert	101.875	QP	29.8	10.3	8.2	32.3	16.0	43.5	27.5	
Vert	156.634	QP	26.6	15.2	8.8	32.2	18.5	43.5	25.0	
Vert	400.000	QP	20.1	17.7	10.7	32.1	16.4	46.0	29.6	
Vert	2483.500	PK	73.1	26.5	2.2	32.3	69.5	73.9	4.4	
Vert	4960.000	PK	42.5	30.6	3.8	31.4	45.5	73.9	28.4	
Vert	7440.000	PK	44.1	35.1	4.6	32.6	51.2	73.9	22.7	
Vert	9920.000	PK	42.0	38.6	5.4	33.1	52.9	73.9	21.0	
Vert	24800.000	PK	44.6	39.0	-1.7	30.8	51.1	73.9	22.8	
Vert	2483.500	AV	38.8	26.5	2.2	32.3	35.2	53.9	18.8	
Vert	4960.000	AV	33.2	30.6	3.8	31.4	36.2	53.9	17.7	
Vert	7440.000	AV	33.8	35.1	4.6	32.6	40.9	53.9	13.0	
Vert	9920.000	AV	30.8	38.6	5.4	33.1	41.7	53.9	12.2	
Vert	24800.000	AV	32.6	39.0	-1.7	30.8	39.1	53.9	14.8	

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

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

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Radiated Spurious Emission

Test place	Head Office EMC Lab. No. 3 Semi Anechoic Chamber	
Report No.	32IE0169-HO	
Date	04/16/2012	04/17/2012
Temperature/ Humidity	23 deg. C / 37% RH	22 deg. C / 43% RH
Engineer	Takumi Shimada	Takumi Shimada
	(1-26.5GHz)	(30-1000MHz)
Mode	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	49.156	QP	27.3	11.3	7.5	32.2	13.9	40.0	26.1	
Hori	77.631	QP	23.6	6.4	7.9	32.1	5.8	40.0	34.2	
Hori	95.775	QP	26.5	9.4	8.1	32.3	11.7	43.5	31.8	
Hori	101.879	QP	25.4	10.3	8.2	32.3	11.6	43.5	31.9	
Hori	156.558	QP	21.6	15.2	8.8	32.2	13.4	43.5	30.1	
Hori	400.000	QP	20.3	17.7	10.7	32.1	16.6	46.0	29.4	
Hori	2390.000	PK	60.8	26.4	2.2	32.4	57.0	73.9	16.9	
Hori	2399.950	PK	77.5	26.5	2.2	34.8	71.4	-	-	See 20dBc Data Sheet
Hori	2400.000	PK	75.2	26.4	2.2	32.4	71.4	-	-	See 20dBc Data Sheet
Hori	4804.000	PK	44.4	30.4	3.9	31.4	47.3	73.9	26.7	
Hori	7206.000	PK	42.0	35.2	4.5	32.4	49.3	73.9	24.6	
Hori	9608.000	PK	42.6	38.1	5.3	33.0	53.0	73.9	20.9	
Hori	24020.000	PK	43.9	38.5	-1.8	31.1	49.5	73.9	24.4	
Hori	2390.000	AV	31.4	26.4	2.2	32.4	27.6	53.9	26.3	
Hori	2399.950	AV	65.5	26.5	2.2	34.8	59.4	-	-	See 20dBc Data Sheet
Hori	2400.000	AV	61.5	26.4	2.2	32.4	57.7	-	-	See 20dBc Data Sheet
Hori	4804.000	AV	34.6	30.4	3.9	31.4	37.5	53.9	16.4	
Hori	7206.000	AV	30.3	35.2	4.5	32.4	37.6	53.9	16.3	
Hori	9608.000	AV	30.7	38.1	5.3	33.0	41.1	53.9	12.8	
Hori	24020.000	AV	32.2	38.5	-1.8	31.1	37.8	53.9	16.1	
Vert	49.147	QP	31.8	11.3	7.5	32.2	18.4	40.0	21.6	
Vert	76.574	QP	33.3	6.5	7.9	32.1	15.8	40.0	24.2	
Vert	95.772	QP	31.7	9.4	8.1	32.3	17.1	43.5	26.4	
Vert	101.883	QP	29.9	10.3	8.2	32.3	16.1	43.5	27.4	
Vert	156.612	QP	26.7	15.2	8.8	32.2	18.6	43.5	24.9	
Vert	400.000	QP	20.2	17.7	10.7	32.1	16.5	46.0	29.5	
Vert	2390.000	PK	60.1	26.4	2.2	32.4	56.3	73.9	17.6	
Vert	2399.950	PK	78.0	26.5	2.2	34.8	71.9	-	-	See 20dBc Data Sheet
Vert	2400.000	PK	73.0	26.4	2.2	32.4	69.1	-	-	See 20dBc Data Sheet
Vert	4804.000	PK	43.3	30.4	3.9	31.4	46.2	73.9	27.8	
Vert	7206.000	PK	41.1	35.2	4.5	32.4	48.4	73.9	25.5	
Vert	9608.000	PK	42.2	38.1	5.3	33.0	52.6	73.9	21.3	
Vert	24020.000	PK	44.2	38.5	-1.8	31.1	49.8	73.9	24.1	
Vert	2390.000	AV	30.6	26.4	2.2	32.4	26.8	53.9	27.1	
Vert	2399.950	AV	66.6	26.5	2.2	34.8	60.5	-	-	See 20dBc Data Sheet
Vert	2400.000	AV	58.7	26.4	2.2	32.4	54.9	-	-	See 20dBc Data Sheet
Vert	4804.000	AV	31.9	30.4	3.9	31.4	34.8	53.9	19.1	
Vert	7206.000	AV	30.3	35.2	4.5	32.4	37.6	53.9	16.3	
Vert	9608.000	AV	30.5	38.1	5.3	33.0	40.9	53.9	13.0	
Vert	24020.000	AV	32.0	38.5	-1.8	31.1	37.6	53.9	16.3	

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

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

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

Distance factor:
10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	107.7	26.4	2.2	32.4	103.9	-	-	Carrier
Hori	2400.000	PK	65.0	26.4	2.2	32.4	61.2	83.9	22.7	
Hori	2399.950	PK	69.0	26.5	2.2	34.8	62.9	83.9	21.0	
Vert	2402.000	PK	105.1	26.4	2.2	32.4	101.3	-	-	Carrier
Vert	2400.000	PK	62.8	26.4	2.2	32.4	59.0	81.3	22.3	
Vert	2399.950	PK	71.4	26.5	2.2	34.8	65.3	81.3	16.0	

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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No. 3 Semi Anechoic Chamber	
Report No.	32IE0169-HO	
Date	04/16/2012	04/17/2012
Temperature/ Humidity	23 deg. C / 37% RH	22 deg. C / 43% RH
Engineer	Takumi Shimada	Takumi Shimada
	(1-26.5GHz)	(30-1000MHz)
Mode	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	49.140	QP	27.7	11.3	7.5	32.2	14.3	40.0	25.7	
Hori	77.583	QP	22.4	6.4	7.9	32.1	4.6	40.0	35.4	
Hori	95.767	QP	28.4	9.4	8.1	32.3	13.6	43.5	29.9	
Hori	101.868	QP	27.6	10.3	8.2	32.3	13.8	43.5	29.7	
Hori	156.603	QP	21.9	15.2	8.8	32.2	13.7	43.5	29.8	
Hori	400.000	QP	20.9	17.7	10.7	32.1	17.2	46.0	28.8	
Hori	4882.000	PK	43.0	30.5	3.8	31.4	45.9	73.9	28.0	
Hori	7323.000	PK	42.1	35.2	4.5	32.5	49.3	73.9	24.6	
Hori	9764.000	PK	42.4	38.3	5.4	33.0	53.1	73.9	20.8	
Hori	24410.000	PK	43.4	38.8	-1.8	30.9	49.5	73.9	24.4	
Hori	4882.000	AV	33.2	30.5	3.8	31.4	36.1	53.9	17.8	
Hori	7323.000	AV	30.7	35.2	4.5	32.5	37.9	53.9	16.0	
Hori	9764.000	AV	30.8	38.3	5.4	33.0	41.5	53.9	12.4	
Hori	24410.000	AV	31.6	38.8	-1.8	30.9	37.7	53.9	16.2	
Vert	49.153	QP	32.7	11.3	7.5	32.2	19.3	40.0	20.7	
Vert	76.530	QP	29.4	6.5	7.9	32.1	11.9	40.0	28.1	
Vert	95.777	QP	32.3	9.4	8.1	32.3	17.7	43.5	25.8	
Vert	101.878	QP	31.5	10.3	8.2	32.3	17.7	43.5	25.8	
Vert	156.573	QP	26.7	15.2	8.8	32.2	18.6	43.5	24.9	
Vert	400.000	QP	21.0	17.7	10.7	32.1	17.3	46.0	28.7	
Vert	4882.000	PK	42.5	30.5	3.8	31.4	45.4	73.9	28.5	
Vert	7323.000	PK	43.0	35.2	4.5	32.5	50.2	73.9	23.7	
Vert	9764.000	PK	43.1	38.3	5.4	33.0	53.8	73.9	20.1	
Vert	24410.000	PK	43.6	38.8	-1.8	30.9	49.7	73.9	24.3	
Vert	4882.000	AV	32.2	30.5	3.8	31.4	35.1	53.9	18.8	
Vert	7323.000	AV	31.6	35.2	4.5	32.5	38.8	53.9	15.1	
Vert	9764.000	AV	30.9	38.3	5.4	33.0	41.6	53.9	12.3	
Vert	24410.000	AV	31.3	38.8	-1.8	30.9	37.4	53.9	16.5	

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

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

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Radiated Spurious Emission

Test place Head Office EMC Lab. No. 3 Semi Anechoic Chamber
Report No. 32IE0169-HO
Date 04/16/2012 04/17/2012
Temperature/ Humidity 23 deg. C / 37% RH 22 deg. C / 43% RH
Engineer Takumi Shimada Takumi Shimada
(1-26.5GHz) (30-1000MHz)
Mode 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	49.149	QP	28.4	11.3	7.5	32.2	15.0	40.0	25.0	
Hori	77.612	QP	22.5	6.4	7.9	32.1	4.7	40.0	35.3	
Hori	95.762	QP	28.2	9.4	8.1	32.3	13.4	43.5	30.1	
Hori	101.858	QP	27.3	10.3	8.2	32.3	13.5	43.5	30.0	
Hori	156.605	QP	21.6	15.2	8.8	32.2	13.4	43.5	30.1	
Hori	400.000	QP	21.3	17.7	10.7	32.1	17.6	46.0	28.4	
Hori	2483.500	PK	69.6	26.5	2.2	32.3	66.0	73.9	7.9	
Hori	4960.000	PK	43.5	30.6	3.8	31.4	46.5	73.9	27.4	
Hori	7440.000	PK	43.9	35.1	4.6	32.6	51.0	73.9	22.9	
Hori	9920.000	PK	42.7	38.6	5.4	33.1	53.6	73.9	20.3	
Hori	24800.000	PK	44.7	39.0	-1.7	30.8	51.2	73.9	22.7	
Hori	2483.500	AV	46.4	26.5	2.2	32.3	42.8	53.9	11.1	
Hori	4960.000	AV	32.7	30.6	3.8	31.4	35.7	53.9	18.2	
Hori	7440.000	AV	31.6	35.1	4.6	32.6	38.7	53.9	15.2	
Hori	9920.000	AV	30.3	38.6	5.4	33.1	41.2	53.9	12.7	
Hori	24800.000	AV	33.0	39.0	-1.7	30.8	39.5	53.9	14.4	
Vert	49.146	QP	32.2	11.3	7.5	32.2	18.8	40.0	21.2	
Vert	76.544	QP	29.4	6.5	7.9	32.1	11.9	40.0	28.1	
Vert	95.764	QP	32.7	9.4	8.1	32.3	18.1	43.5	25.4	
Vert	101.873	QP	31.4	10.3	8.2	32.3	17.6	43.5	25.9	
Vert	156.556	QP	24.3	15.2	8.8	32.2	16.2	43.5	27.3	
Vert	400.000	QP	21.4	17.7	10.7	32.1	17.7	46.0	28.3	
Vert	2483.500	PK	68.8	26.5	2.2	32.3	65.2	73.9	8.7	
Vert	4960.000	PK	42.7	30.6	3.8	31.4	45.7	73.9	28.3	
Vert	7440.000	PK	44.3	35.1	4.6	32.6	51.4	73.9	22.5	
Vert	9920.000	PK	42.5	38.6	5.4	33.1	53.4	73.9	20.5	
Vert	24800.000	PK	44.5	39.0	-1.7	30.8	51.0	73.9	22.9	
Vert	2483.500	AV	43.3	26.5	2.2	32.3	39.7	53.9	14.2	
Vert	4960.000	AV	31.8	30.6	3.8	31.4	34.8	53.9	19.1	
Vert	7440.000	AV	33.2	35.1	4.6	32.6	40.3	53.9	13.6	
Vert	9920.000	AV	30.7	38.6	5.4	33.1	41.6	53.9	12.3	
Vert	24800.000	AV	32.5	39.0	-1.7	30.8	39.0	53.9	15.0	

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

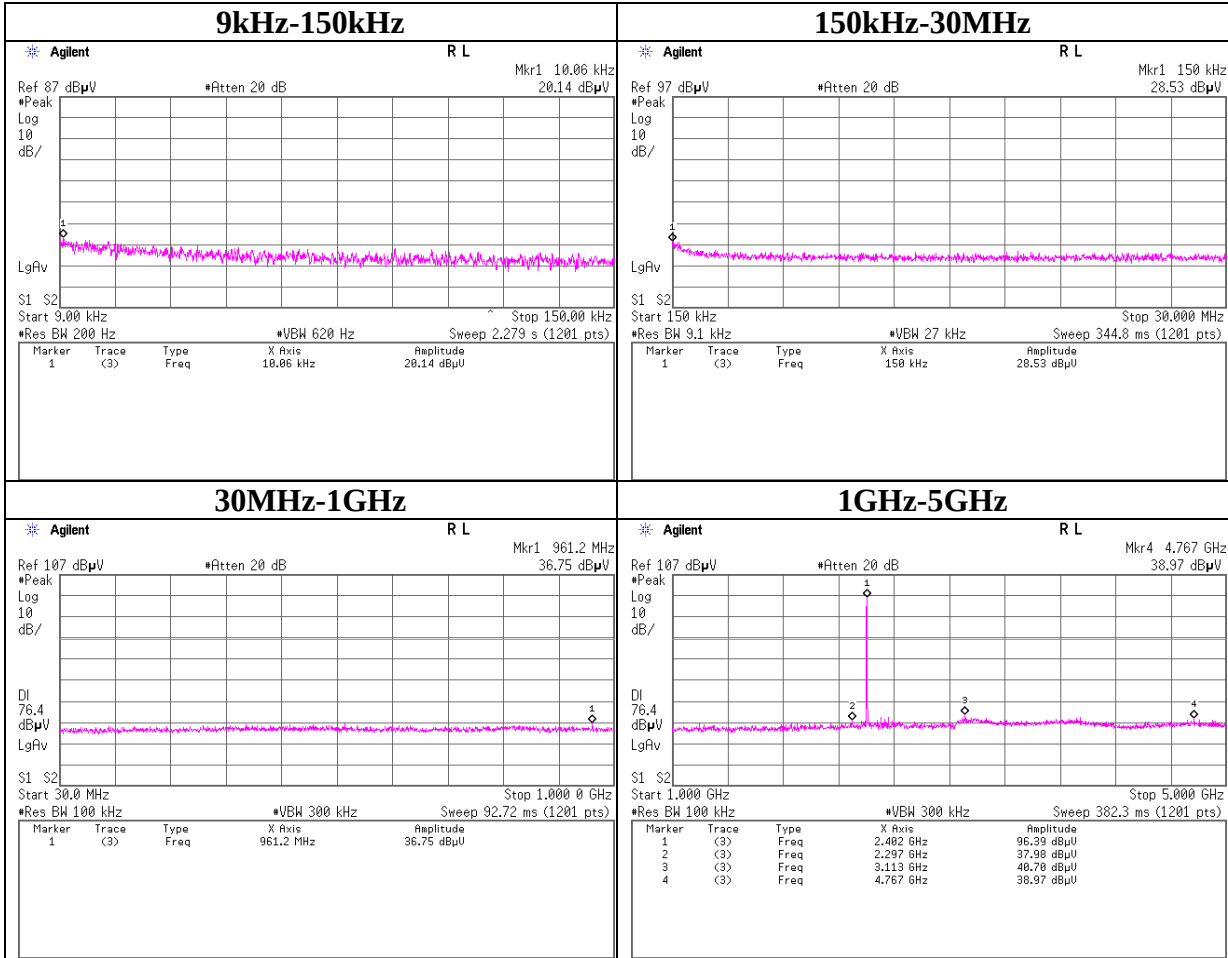
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

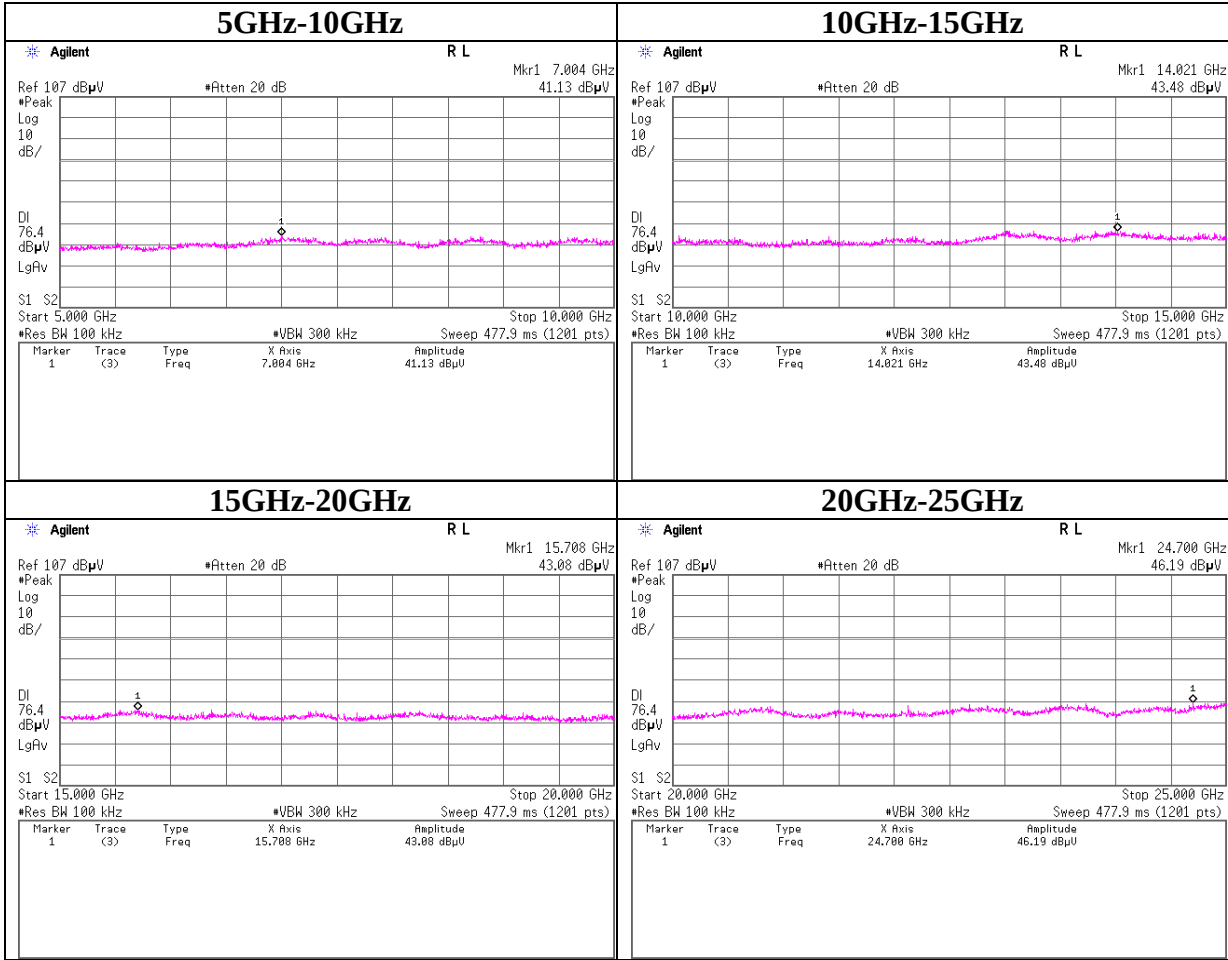
Conducted Spurious Emission

Tx DH5 2402MHz



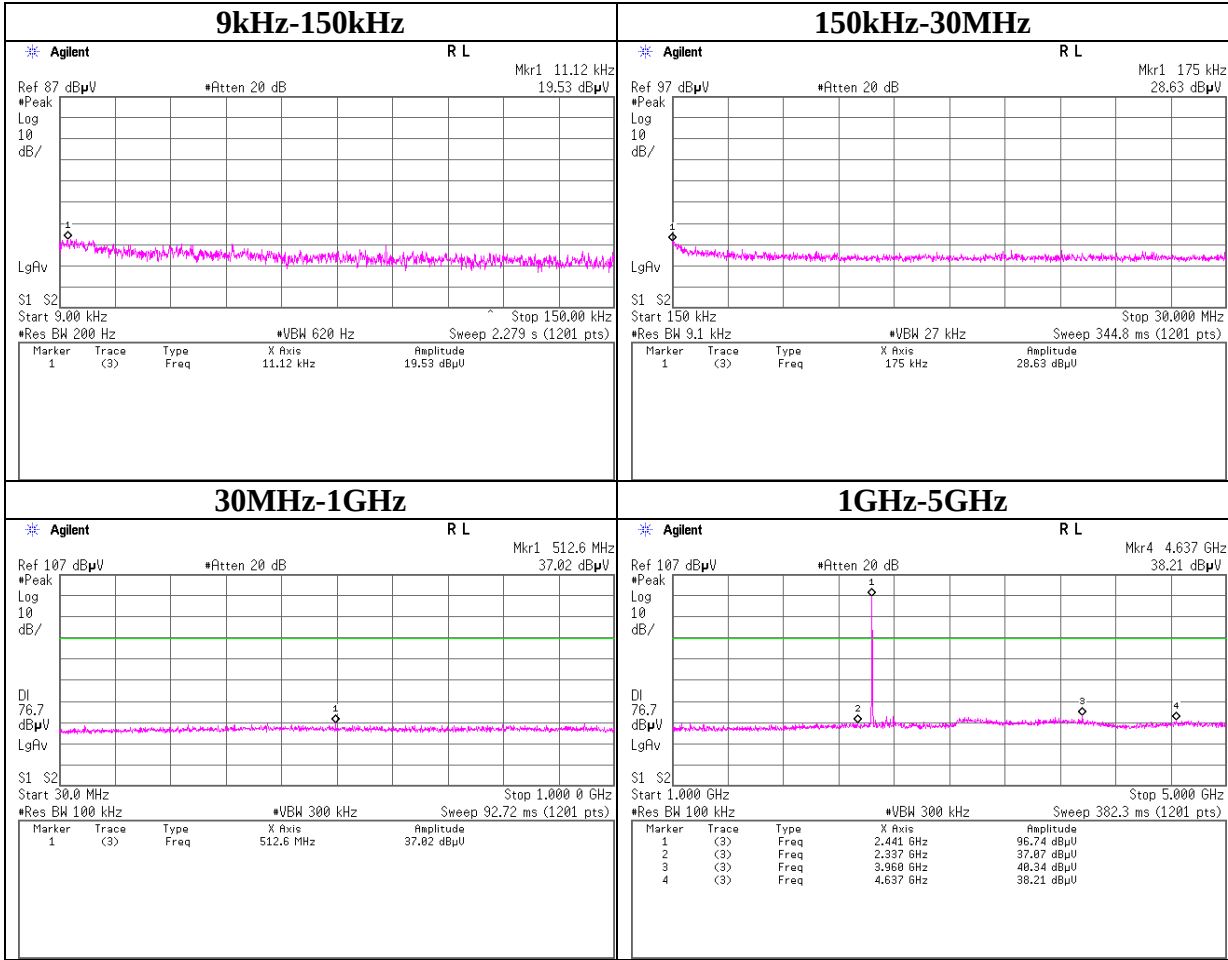
Conducted Spurious Emission

Tx DH5 2402MHz



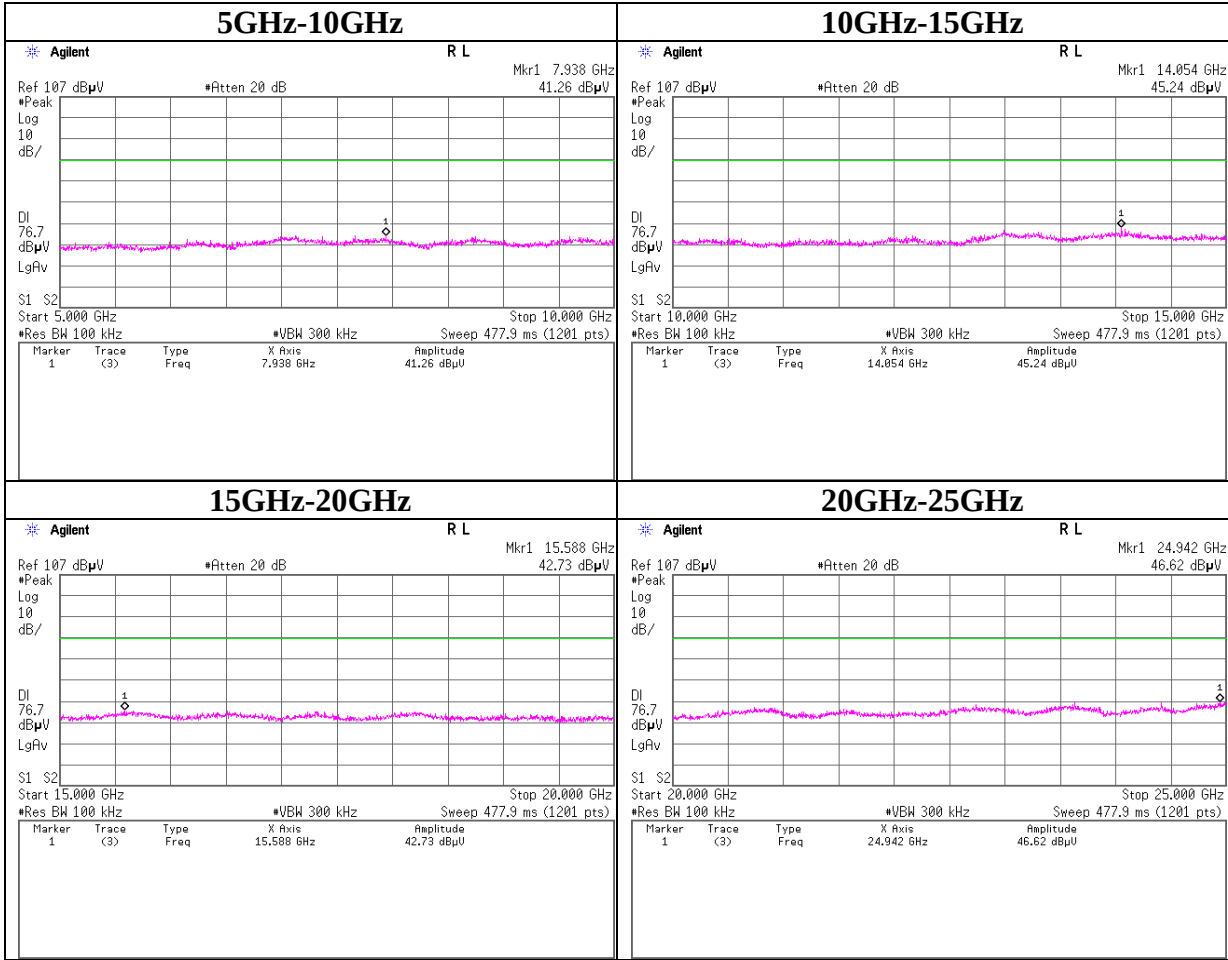
Conducted Spurious Emission

Tx DH5 2441MHz



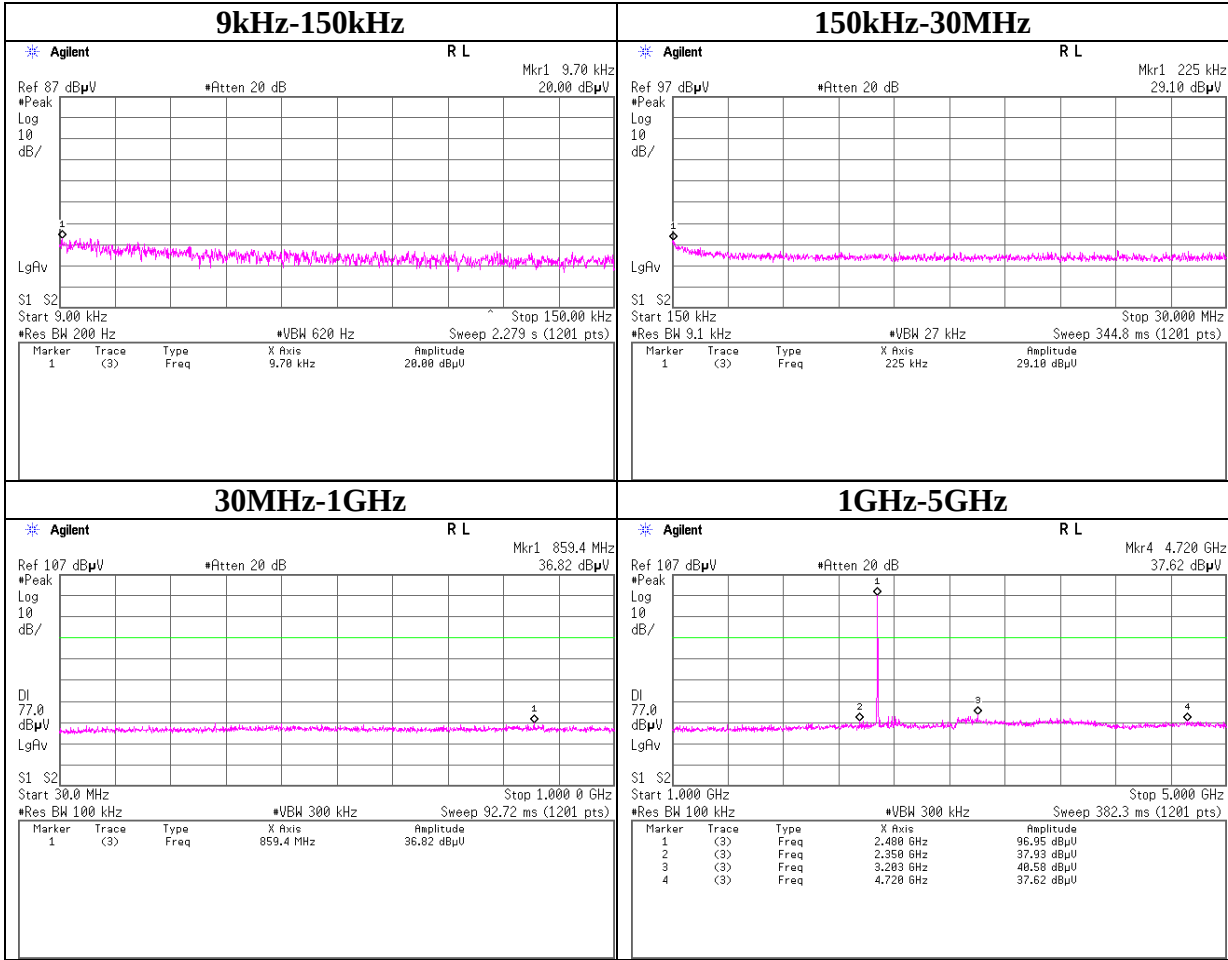
Conducted Spurious Emission

Tx DH5 2441MHz



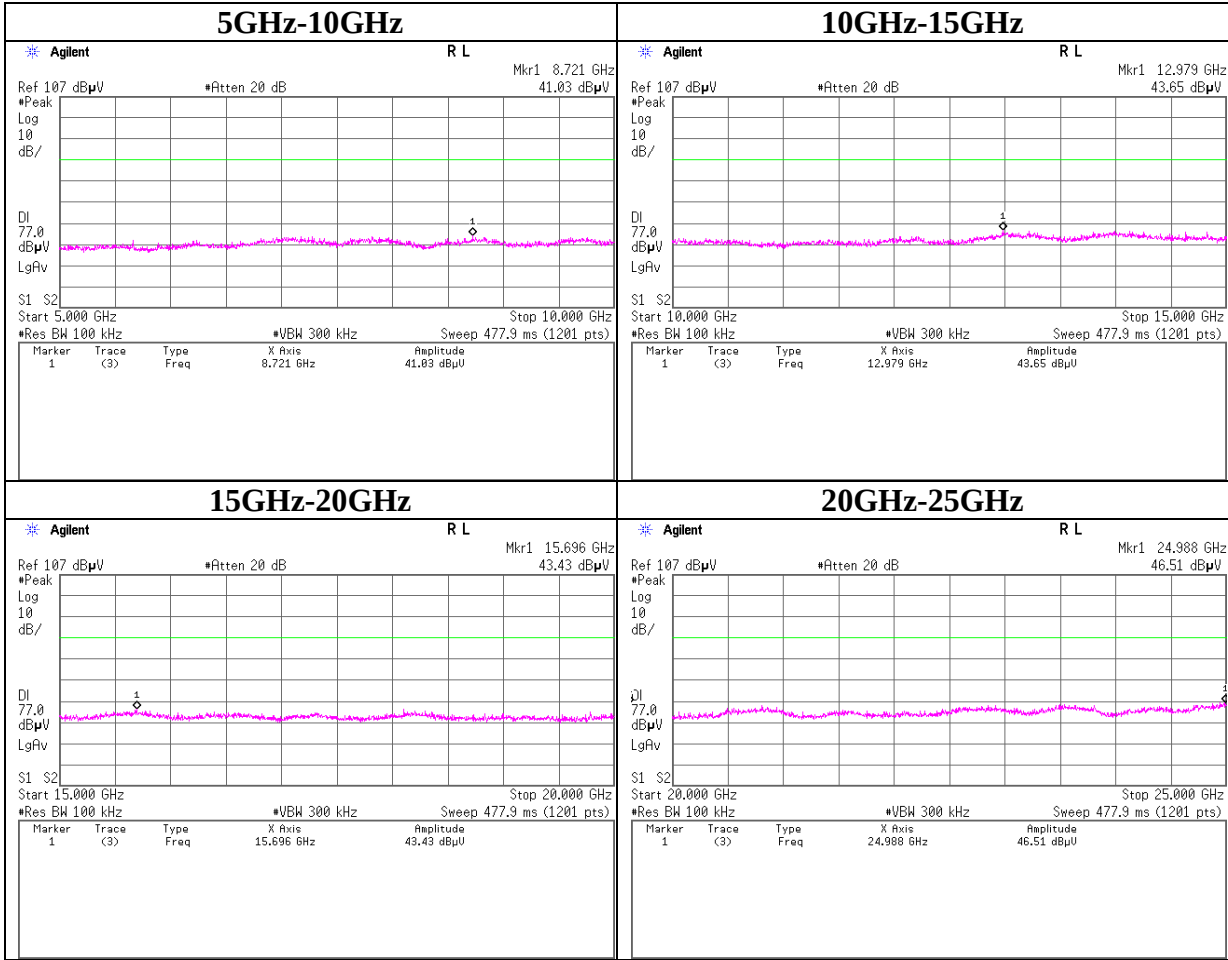
Conducted Spurious Emission

Tx DH5 2480MHz



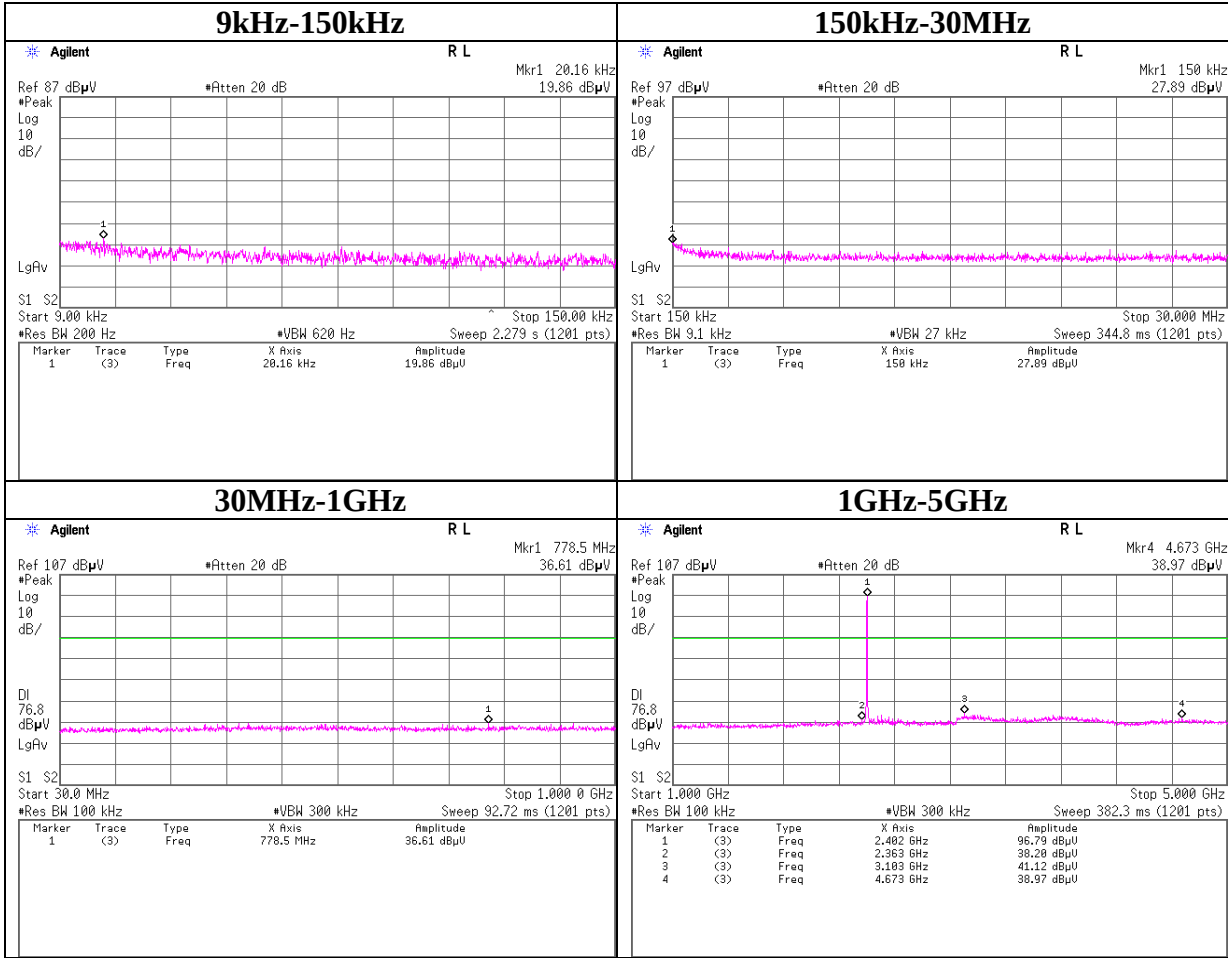
Conducted Spurious Emission

Tx DH5 2480MHz



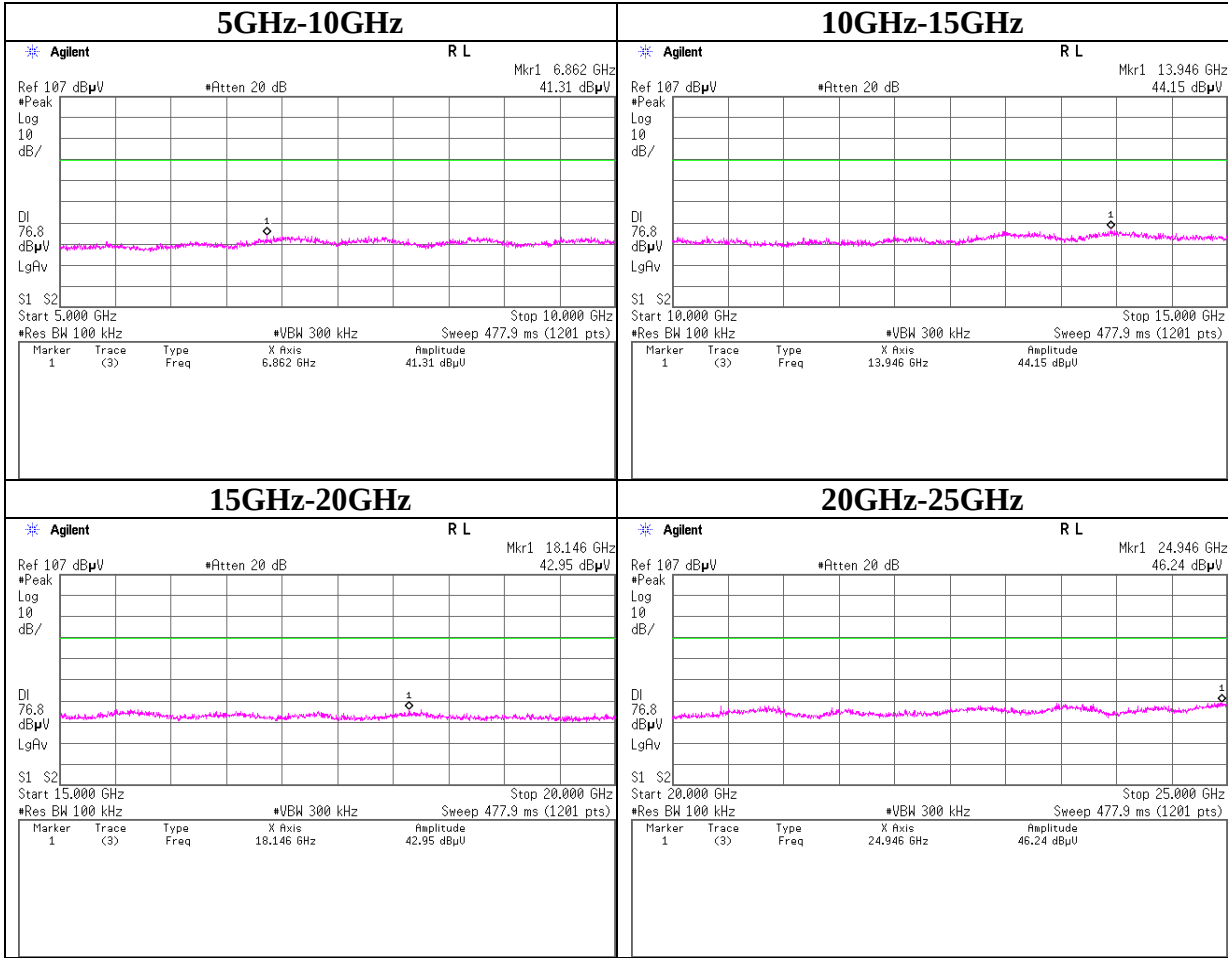
Conducted Spurious Emission

Tx 3DH5 2402MHz



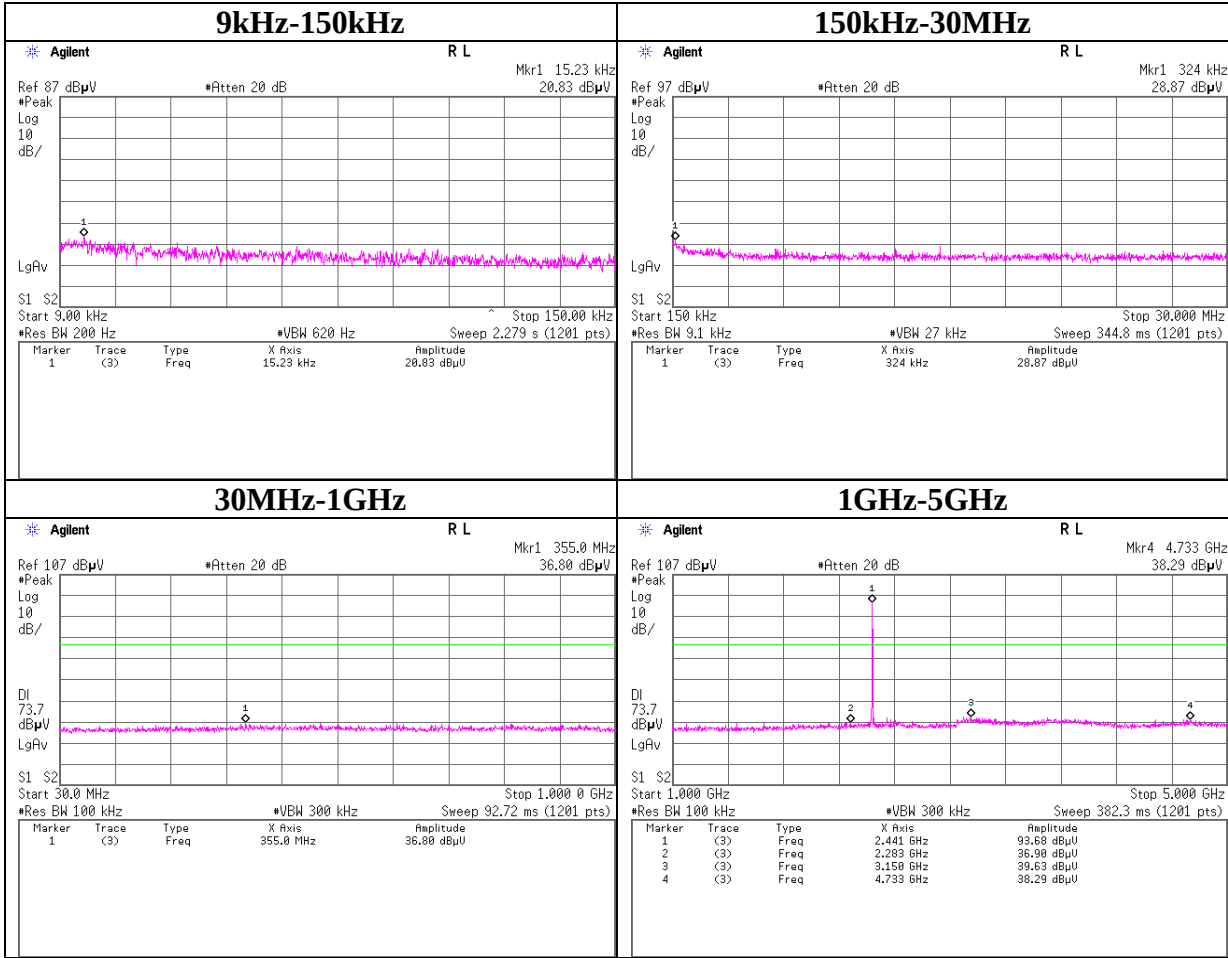
Conducted Spurious Emission

Tx 3DH5 2402MHz



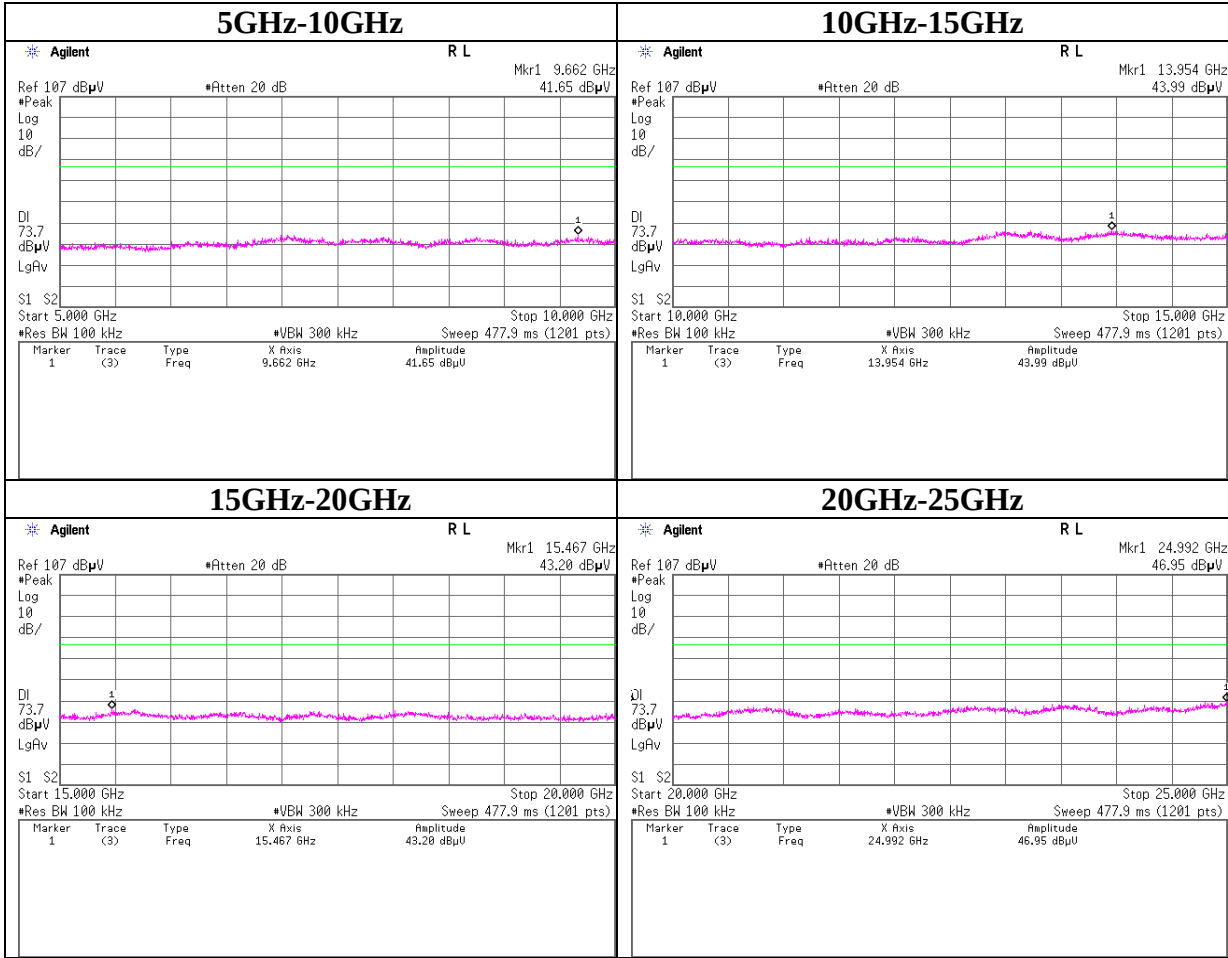
Conducted Spurious Emission

Tx 3DH5 2441MHz



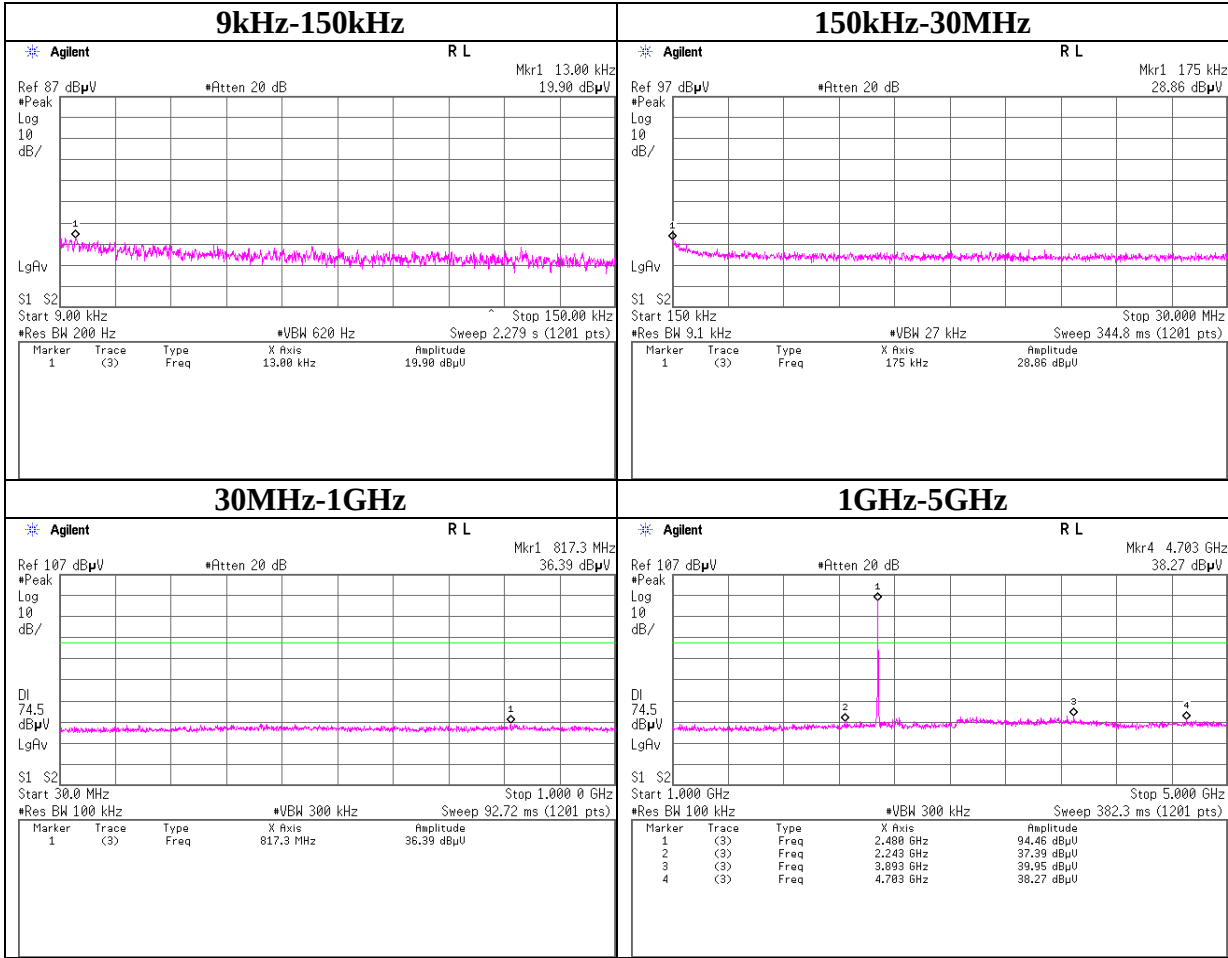
Conducted Spurious Emission

Tx 3DH5 2441MHz



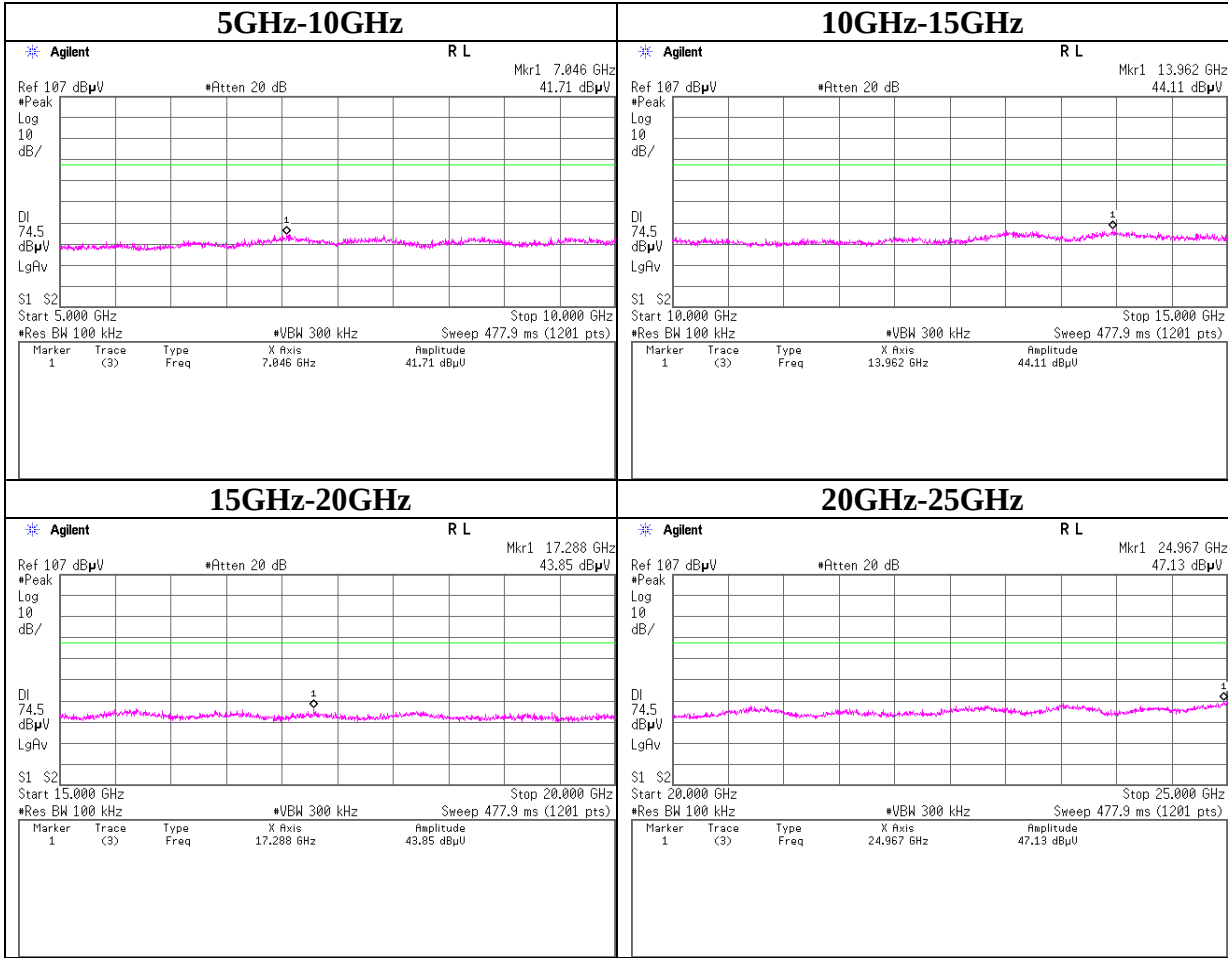
Conducted Spurious Emission

Tx 3DH5 2480MHz



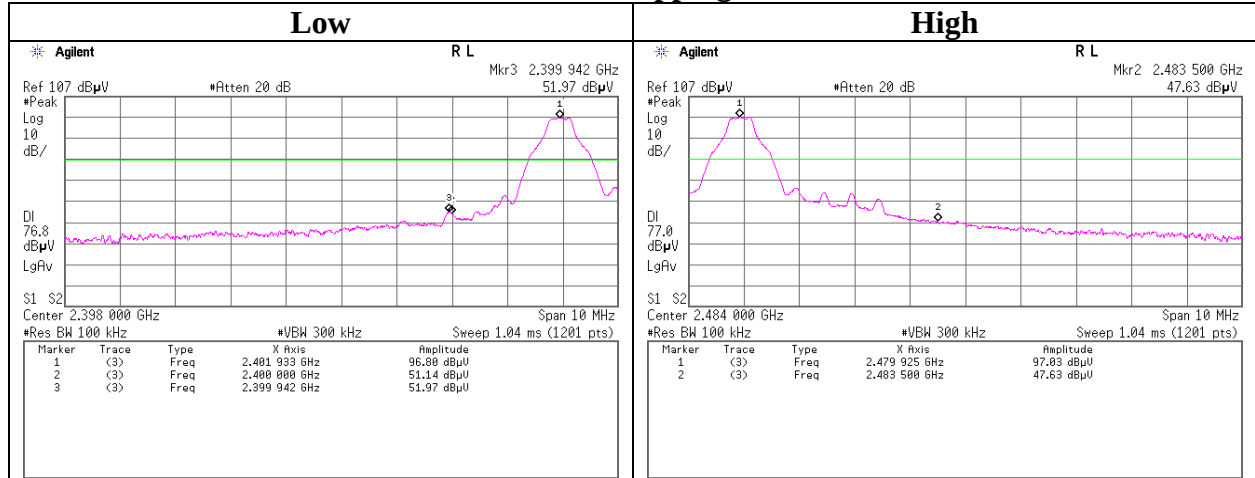
Conducted Spurious Emission

Tx 3DH5 2480MHz

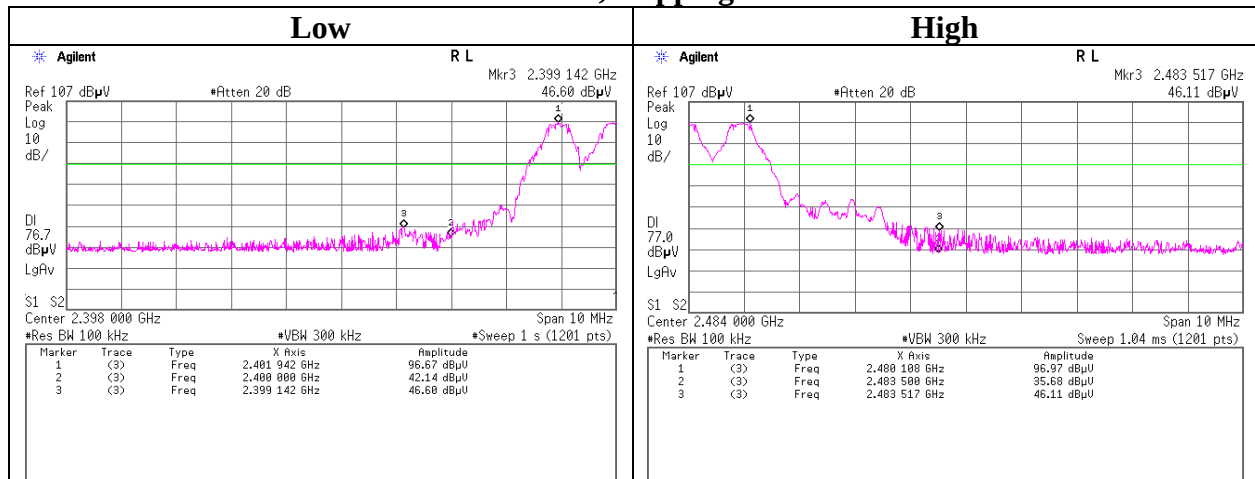


Conducted Emission Band Edge compliance

Tx DH5, Hopping off

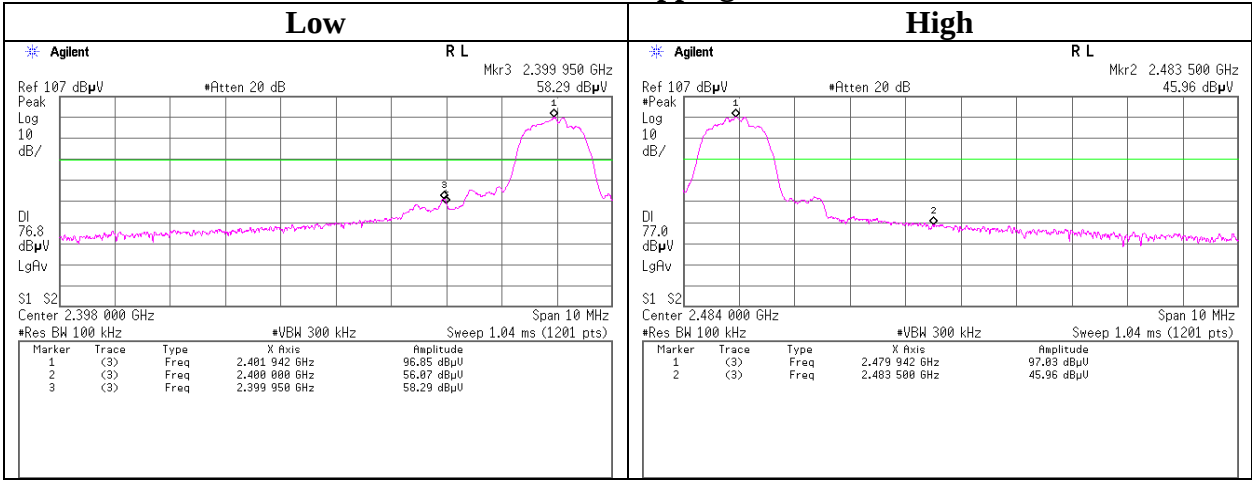


Tx DH5, Hopping on

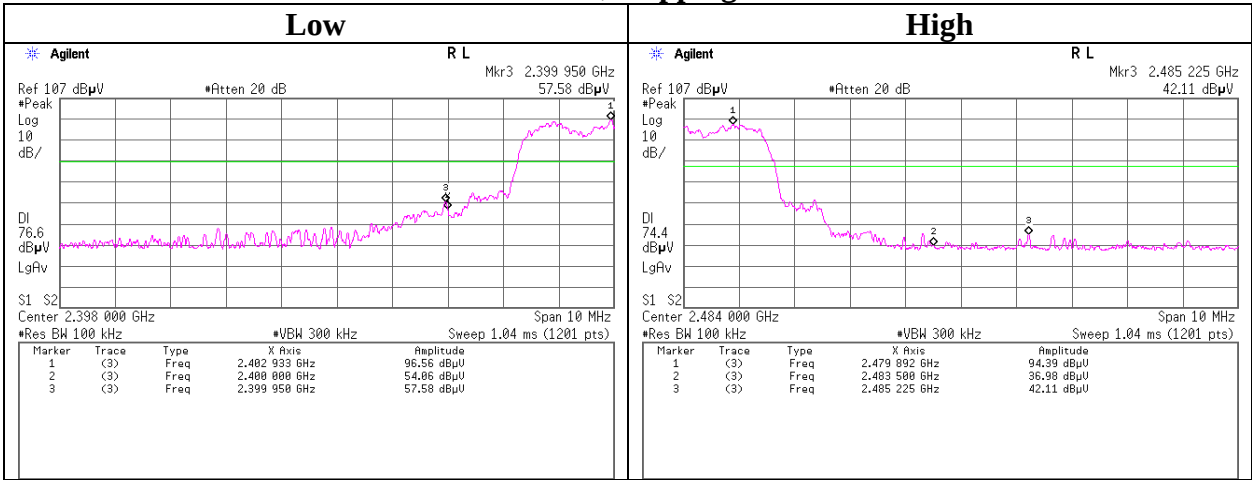


Conducted Emission Band Edge compliance

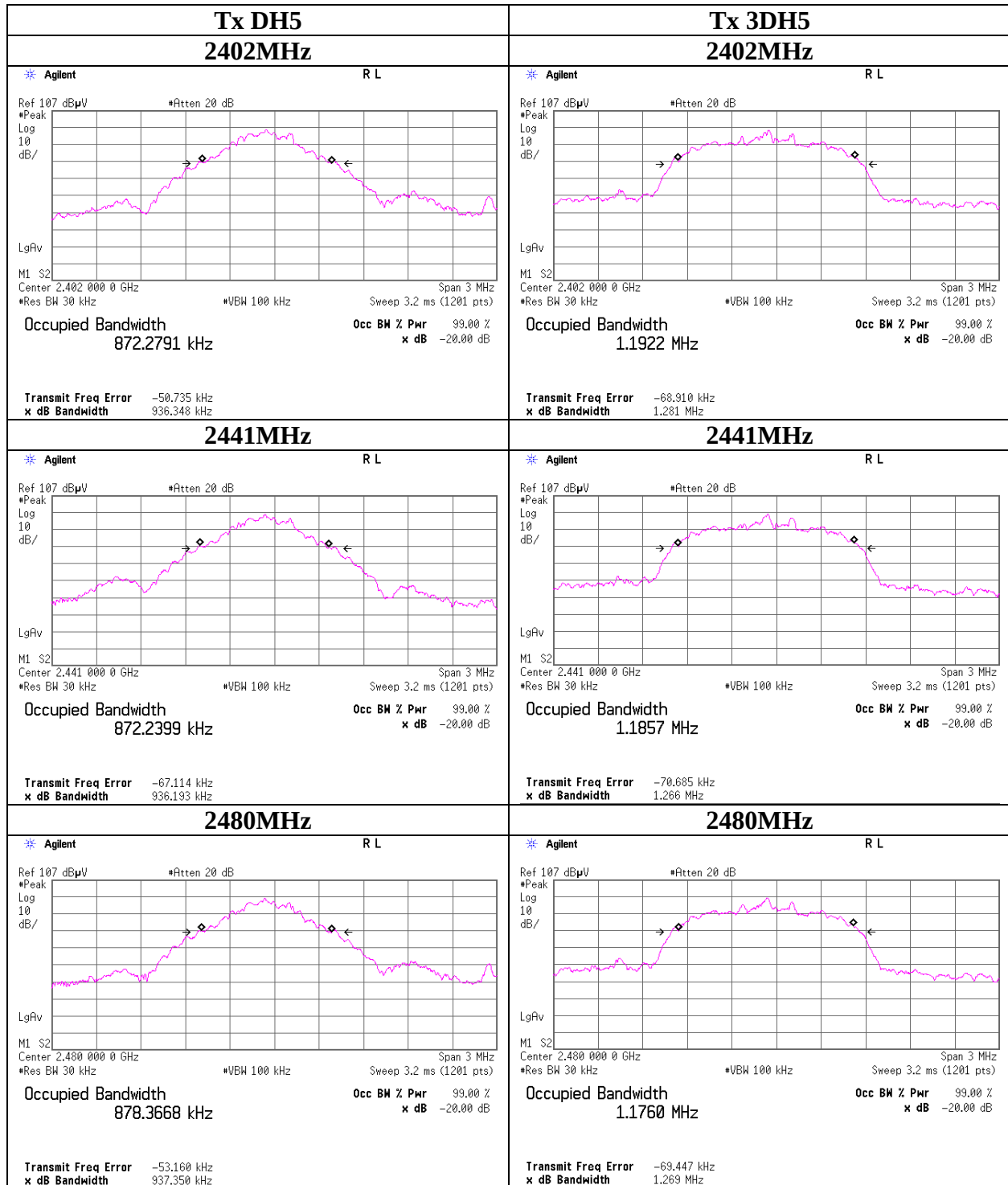
Tx 3DH5, Hopping off



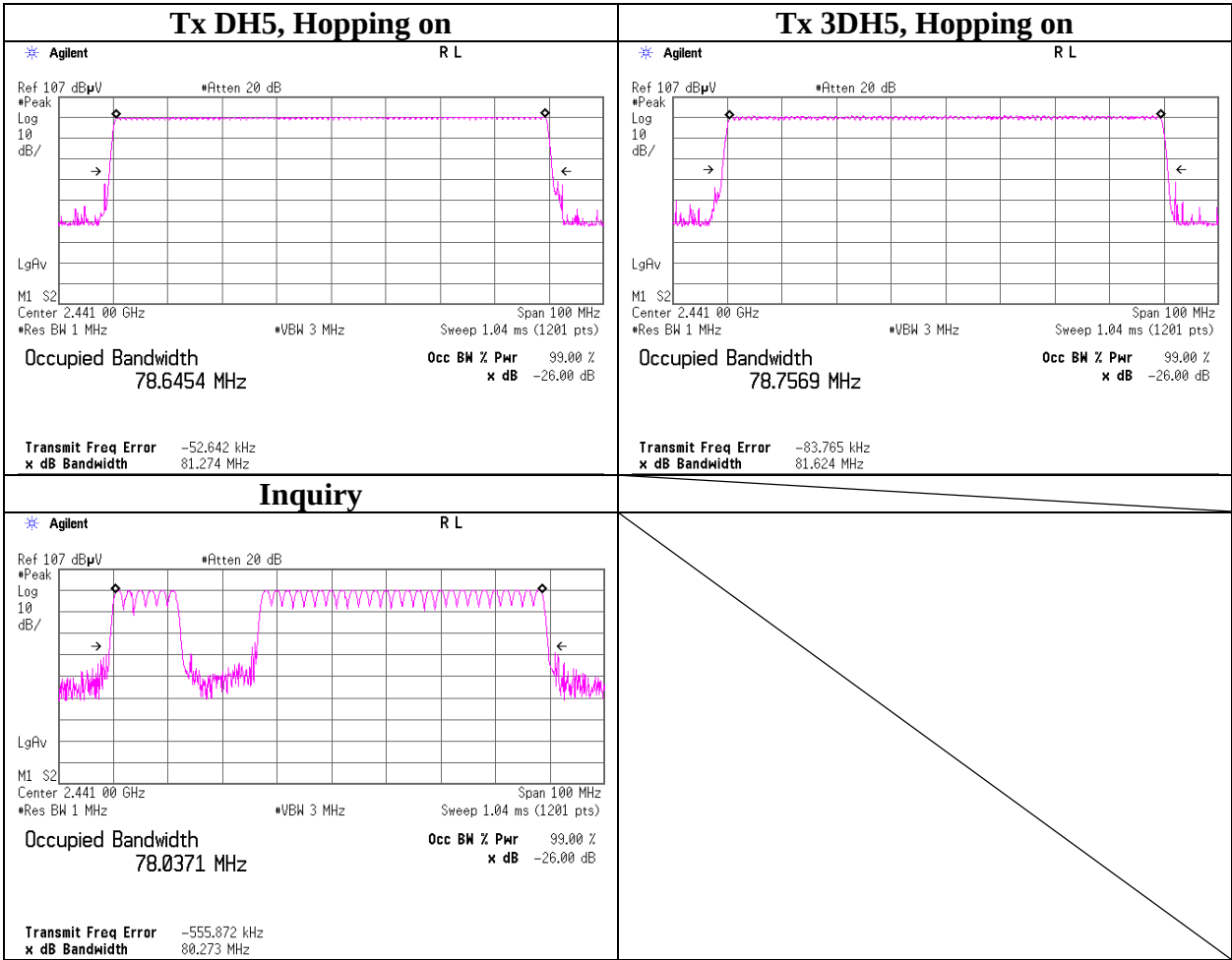
Tx 3DH5, Hopping on



99% Occupied Bandwidth



99% Occupied Bandwidth



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2012/02/24 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE/CE	2012/02/06 * 12
MJM-06	Measure	PROMART	SEN1955	-	RE/CE	
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	RE	2011/06/30 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2011/05/23 * 12
MCC-134	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336167/4(1m) / 340641(5m)	RE	2011/09/07 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2012/03/29 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2011/05/23 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2011/05/16 * 12
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	RE	2011/11/23 * 12
APRCV05	Test Receiver	Rohde & Schwarz	ESS	840456/008	RE	2012/01/16 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2011/10/15 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2011/10/15 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2011/07/15 * 12
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2011/11/02 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2012/03/16 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE(EUT)	2012/02/06 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(3m)/sucoform141-PE(1m)/421-010(1.5m)/RFM-E321(Switcher)	-/00640	CE	2011/07/15 * 12
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28 * 12
MOS-12	Thermo-Hygrometer	Custom	CTH-180	-	AT	2012/01/06 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	AT	2012/04/06 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	AT	2011/09/12 * 12
MPM-09	Power Meter	Anritsu	ML2495A	6K00003348	AT	2011/09/12 * 12
MPD-02	Power Divider DC-12.4GHz	SUHNER	4901.19.A	-	AT	2011/05/23 * 12
MAT-24	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71389	AT	2011/06/23 * 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

UL Japan, Inc.

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