

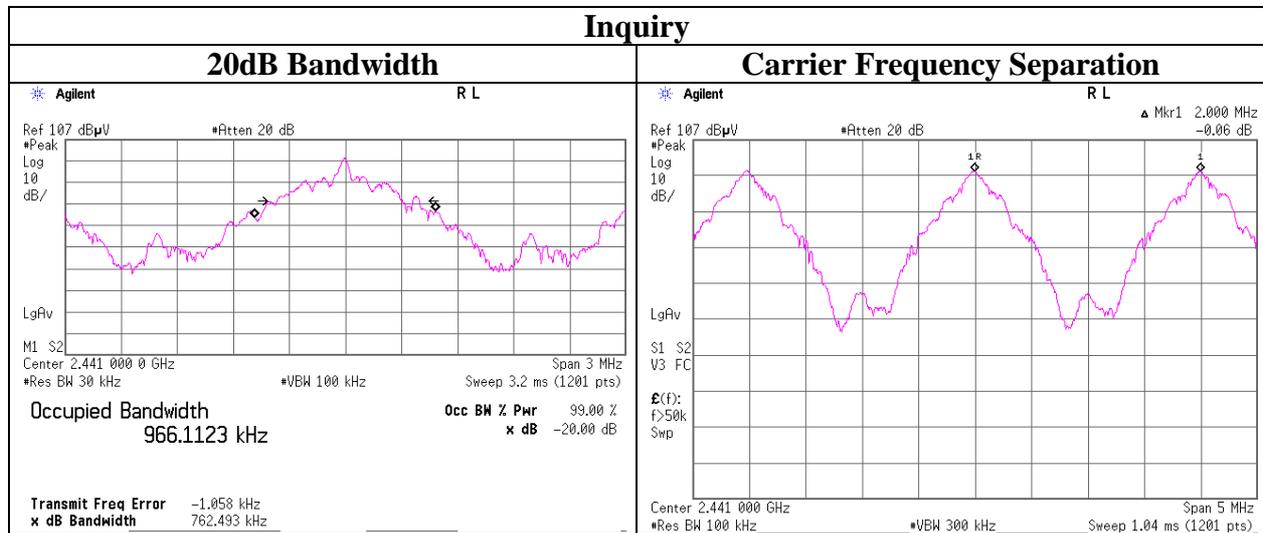
APPENDIX 2: Data of EMI test

20dB Bandwidth and Carrier Frequency Separation

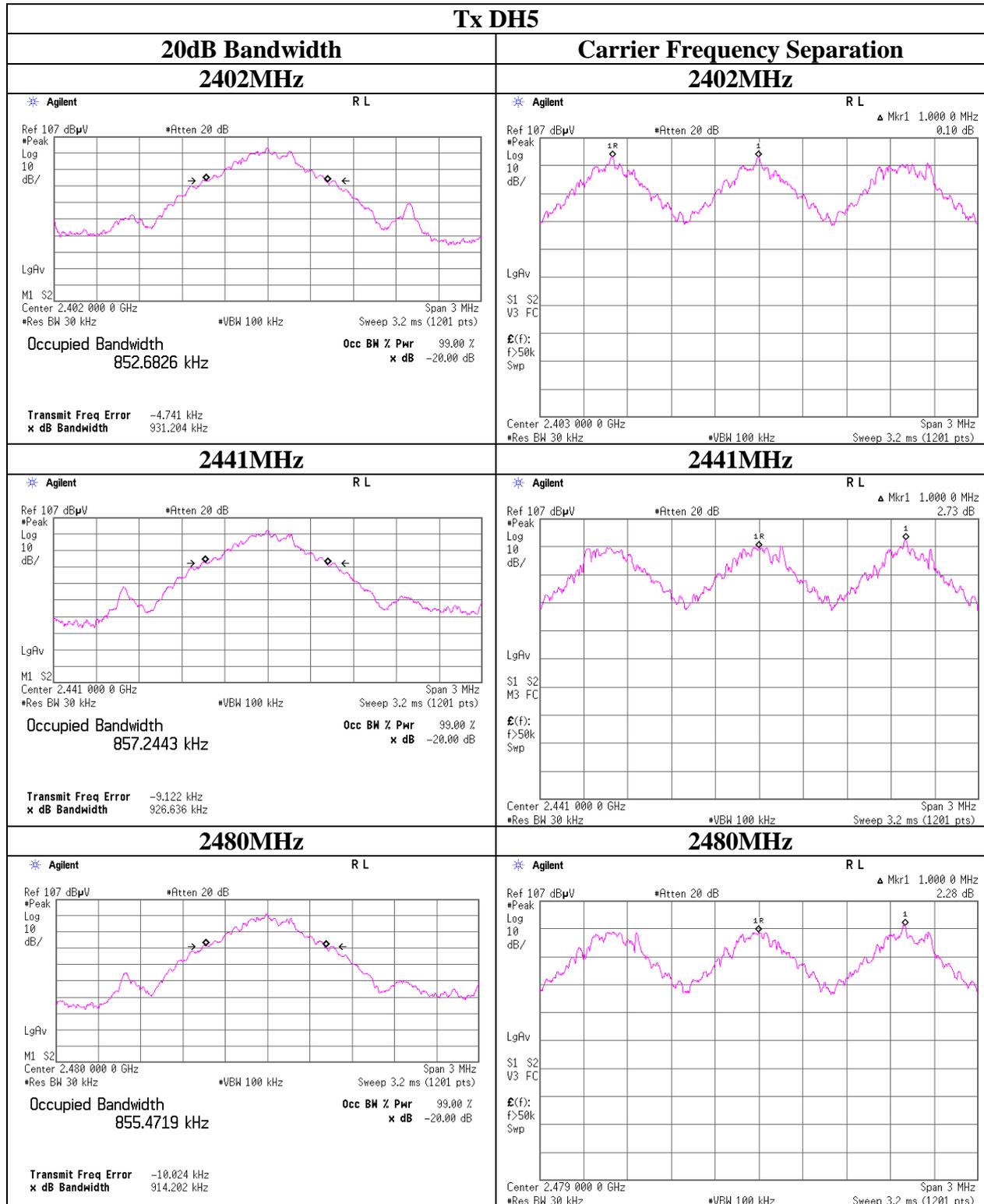
Test place Head Office EMC Lab. No.11 Measurement Room
 Report No. 311E0258-HO-01
 Date 05/12/2011
 Temperature/ Humidity 21deg. C / 71% RH
 Engineer Yutaka Yoshida
 Mode Tx (Hopping on) DH5/3DH5/Inquiry

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.931	1.000	≥ 0.621
DH5	2441.0	0.927	1.000	≥ 0.618
DH5	2480.0	0.914	1.000	≥ 0.609
3DH5	2402.0	1.267	1.000	≥ 0.845
3DH5	2441.0	1.260	1.000	≥ 0.840
3DH5	2480.0	1.257	1.000	≥ 0.838
Inquiry	2441.0	0.762	2.000	≥ 0.508

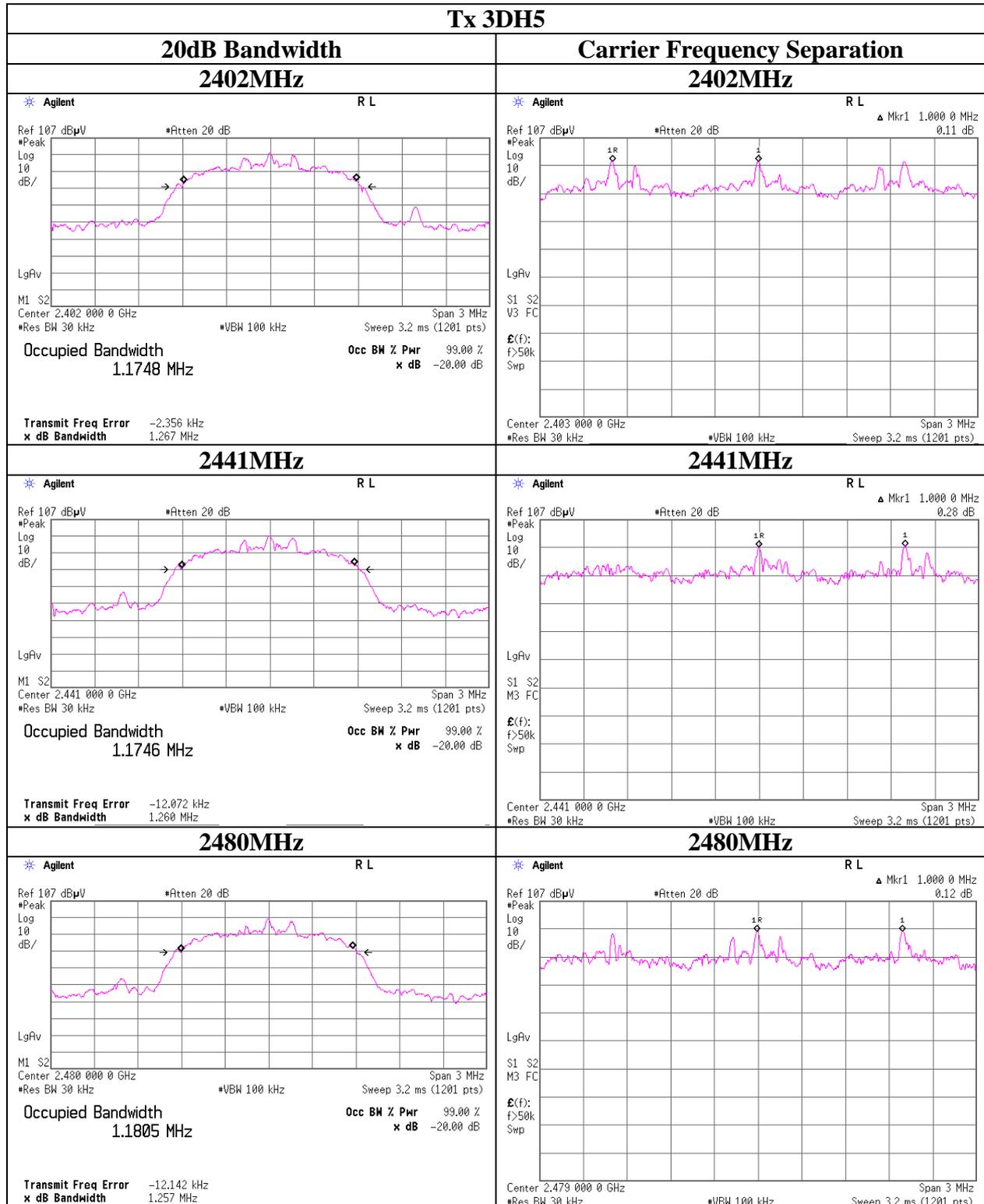
Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).
 No limit applies to 20dB Bandwidth.



20dB Bandwidth and Carrier Frequency Separation



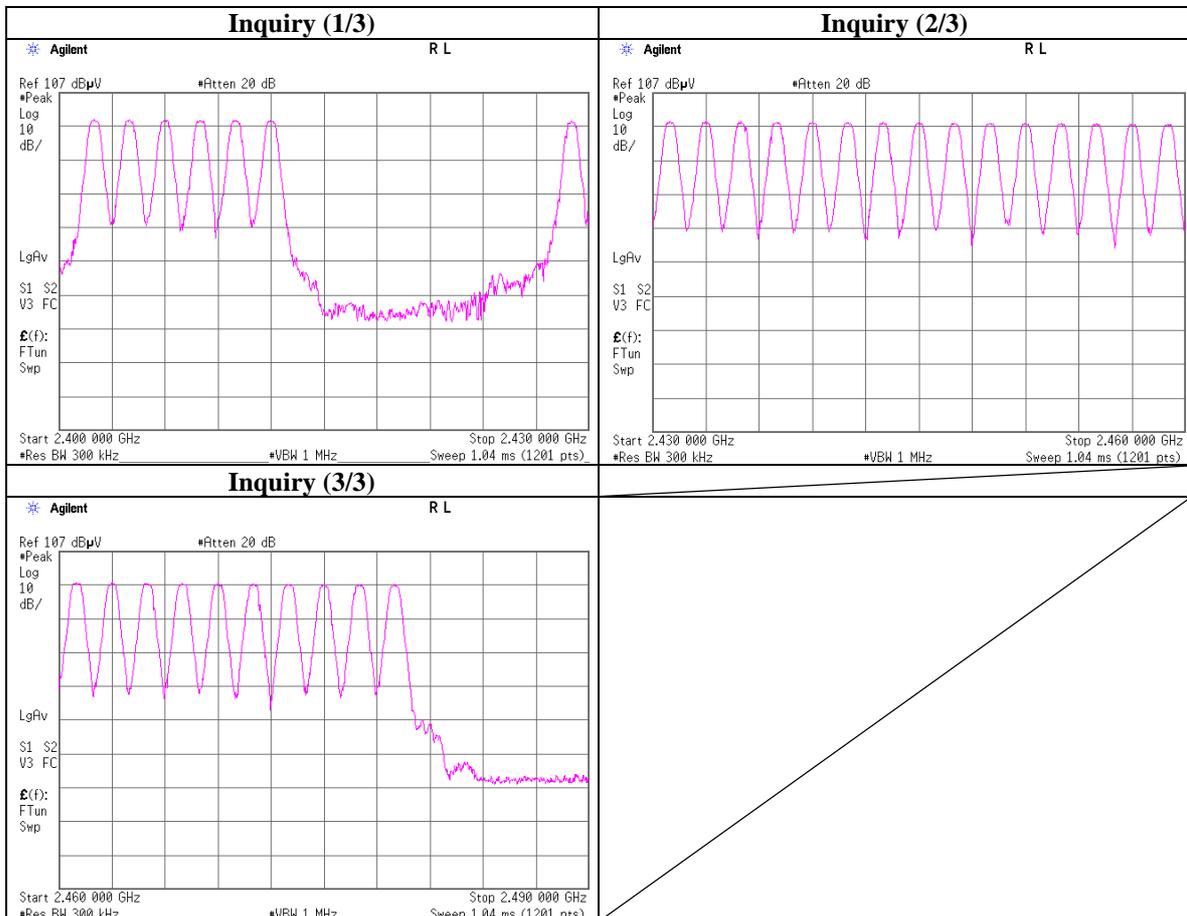
20dB Bandwidth and Carrier Frequency Separation



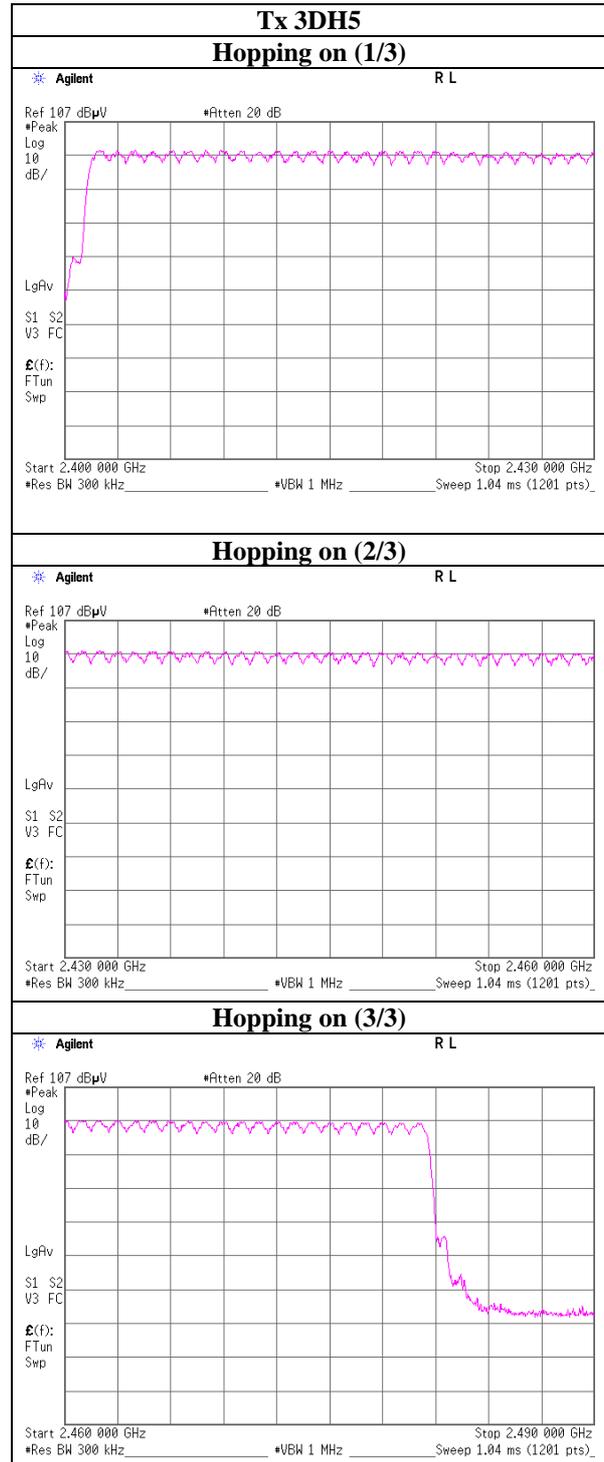
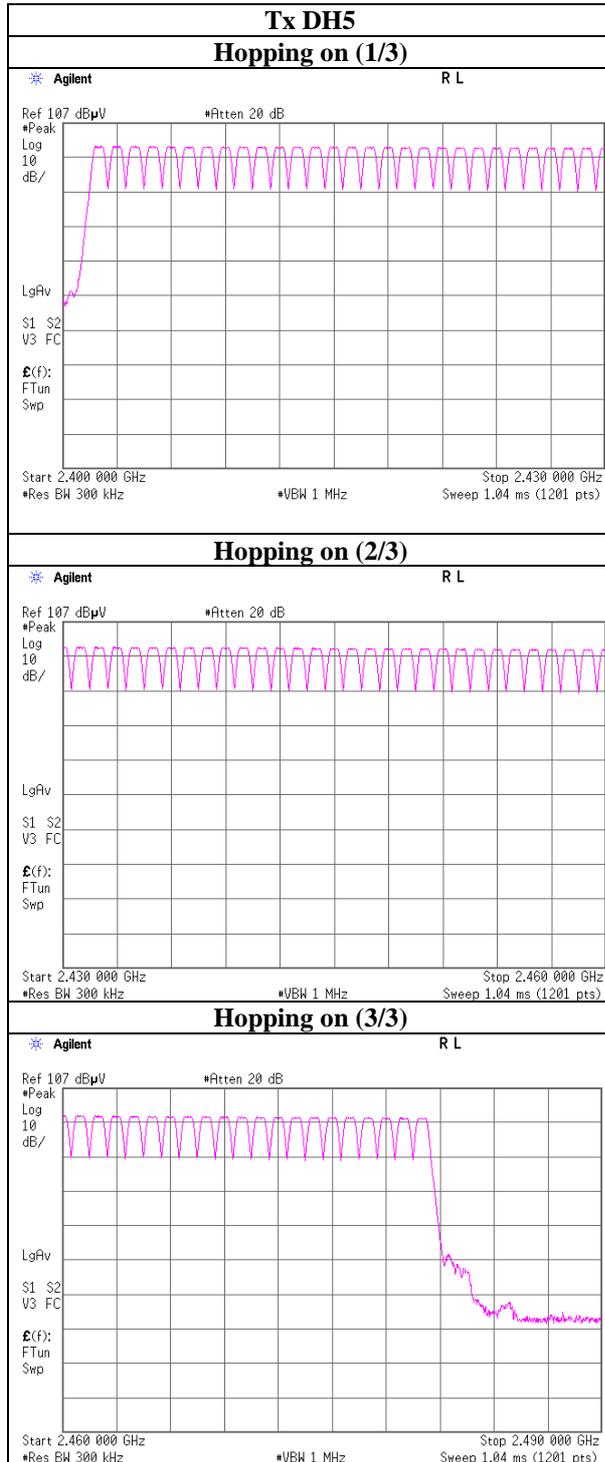
Number of Hopping Frequency

Test place	Head Office EMC Lab. No.11 Measurement Room
Report No.	311E0258-HO-01
Date	05/12/2011
Temperature/ Humidity	21deg. 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



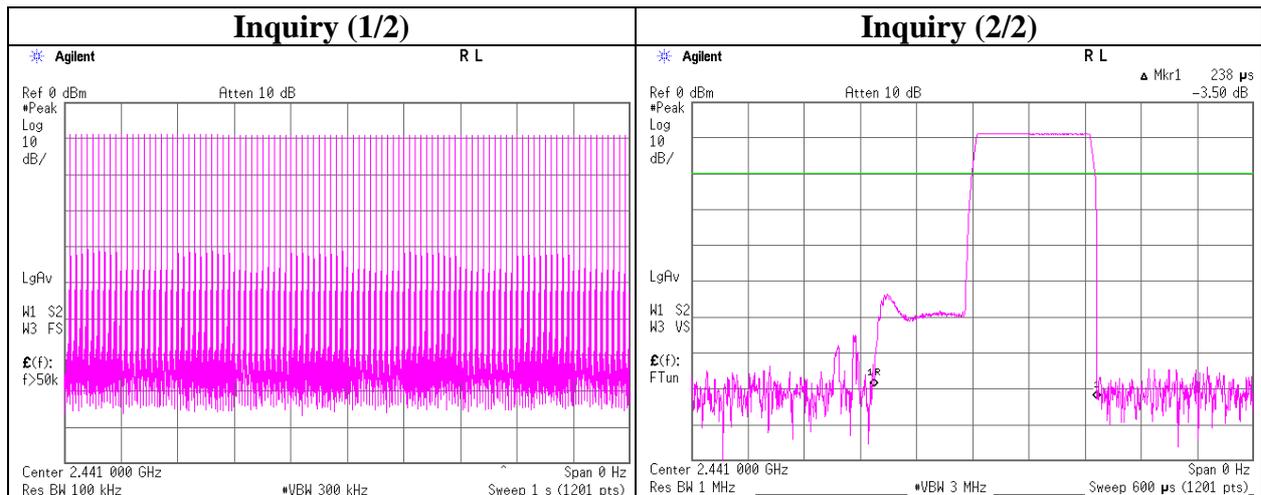
Dwell time

Test place	Head Office EMC Lab. No.11 Measurement Room
Report No.	311E0258-HO-01
Date	05/12/2011
Temperature/ Humidity	21deg. C / 26% RH
Engineer	Yutaka Yoshida
Mode	Tx (Hopping on) DH5/3DH5/Inquiry

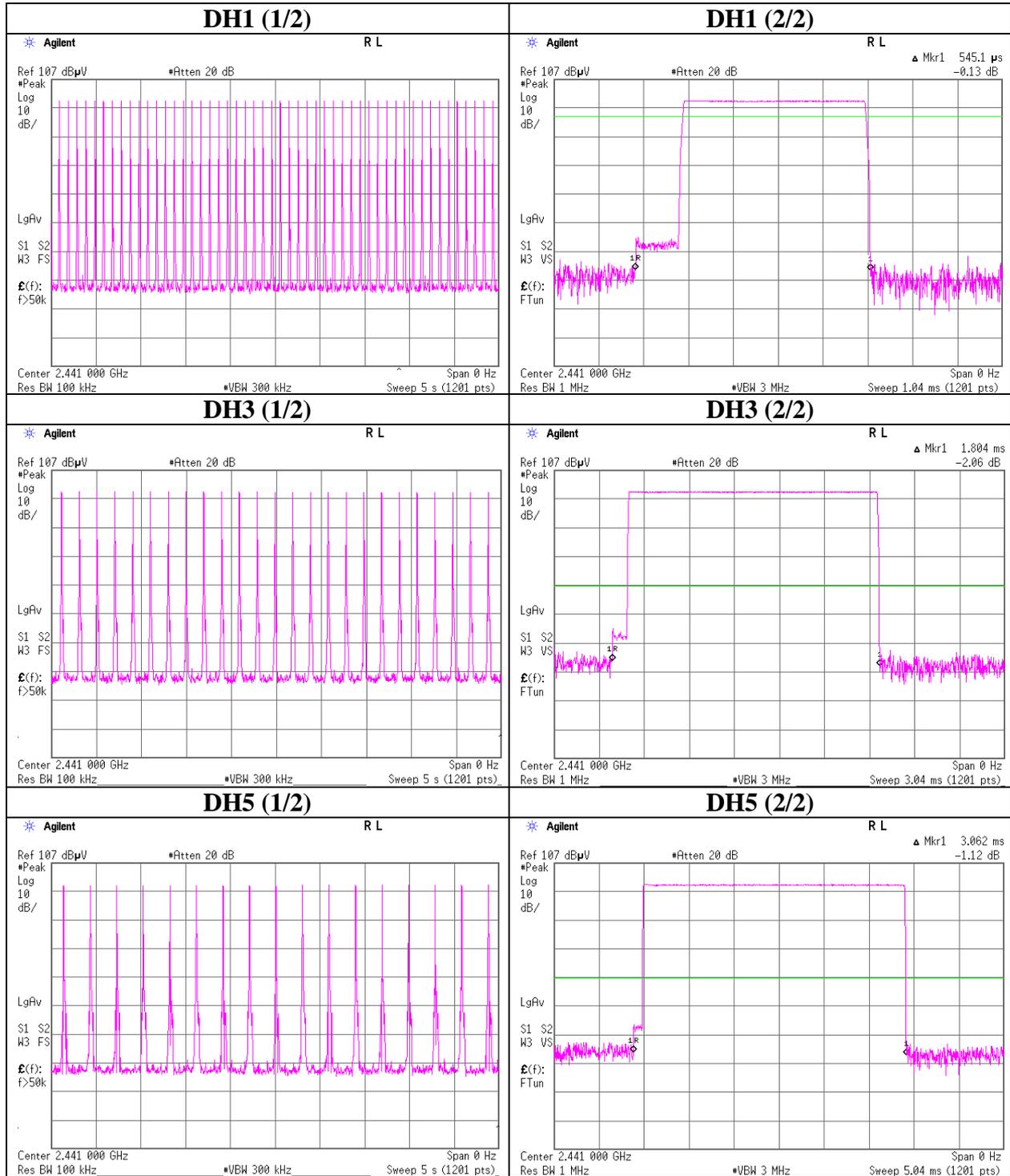
Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	50.0 times / 5 sec. x 31.6 sec. = 316 times	0.545	172	400
DH3	25.0 times / 5 sec. x 31.6 sec. = 158 times	1.804	285	400
DH5	17.0 times / 5 sec. x 31.6 sec. = 108 times	3.062	331	400
3DH1	51.0 times / 5 sec. x 31.6 sec. = 323 times	0.560	181	400
3DH3	25.0 times / 5 sec. x 31.6 sec. = 158 times	1.811	286	400
3DH5	17.0 times / 5 sec. x 31.6 sec. = 108 times	3.074	332	400
Inquiry	99.0 times / 1 sec. x 12.8 sec. = 1268 times	0.238	302	400

Sample Calculation

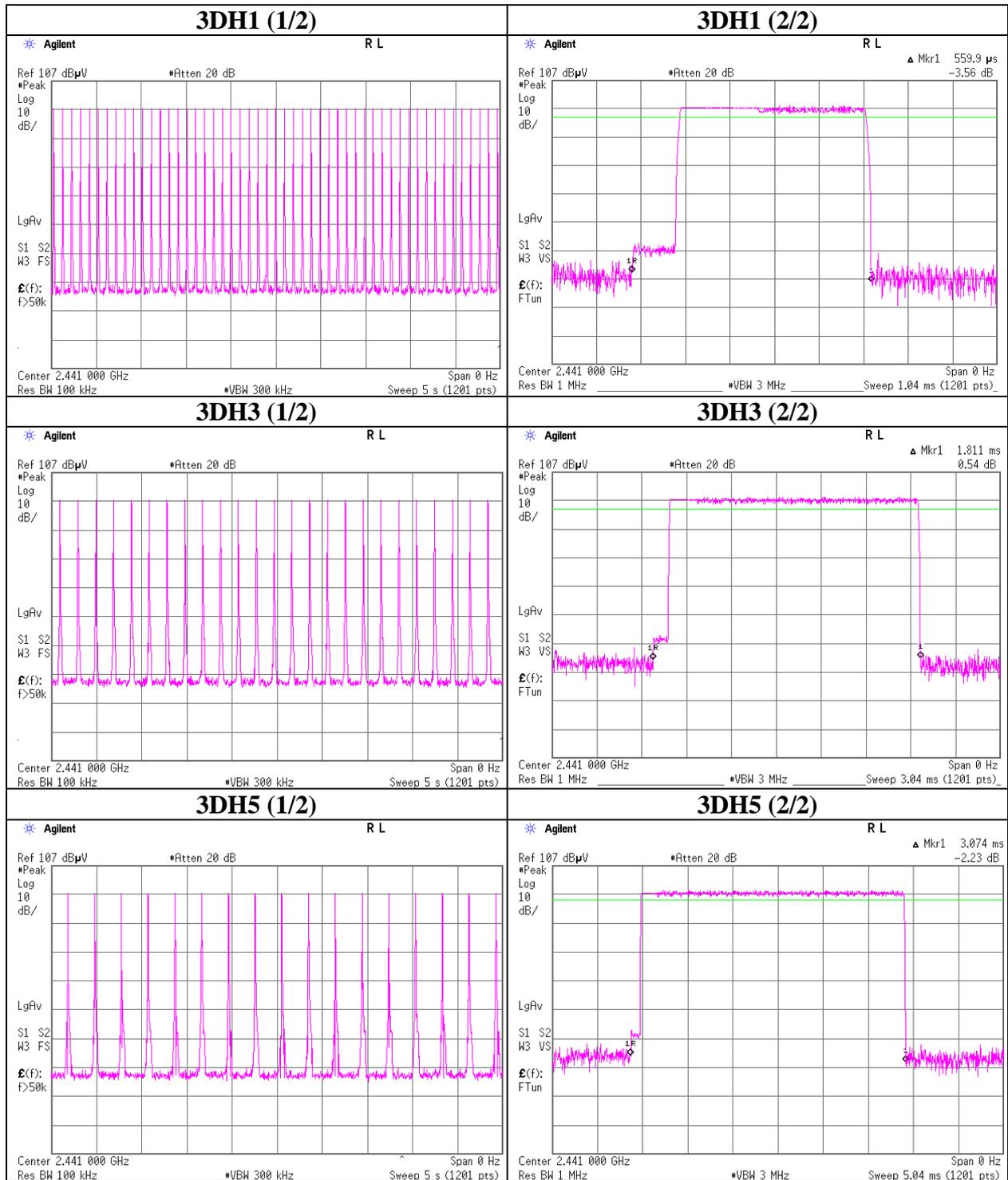
Result = Number of transmission x Length of transmission time



Dwell time



Dwell time



Radiated Spurious Emission
20dBc Data Sheet

Test place : Head Office EMC Lab. No.2 Semi Anechoic Chamber
 Report No. : 31IE0258-HO-01
 Date : 05/11/2011
 Temperature/ Humidity : 23 deg. C / 57% RH
 Engineer : Tomohisa Nakagawa
 Mode : Tx, DH5 2402MHz

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	98.3	27.4	6.0	32.4	99.3	-	-	Carrier
Hori	2400.000	PK	60.2	27.4	6.0	32.4	61.2	79.3	18.1	
Vert	2402.000	PK	99.4	27.4	6.0	32.4	100.4	-	-	Carrier
Vert	2400.000	PK	60.5	27.4	6.0	32.4	61.5	80.4	18.9	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 31IE0258-HO-01
Date 05/11/2011 05/12/2011
Temperature/ Humidity 23 deg. C / 57% RH 24 deg. C / 59% RH
Engineer Tomohisa Nakagawa
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	84.123	QP	49.8	7.6	7.3	28.5	36.2	40.0	3.8	
Hori	96.139	QP	42.1	9.6	7.4	28.5	30.6	43.5	12.9	
Hori	108.157	QP	33.4	11.4	7.5	28.4	23.9	43.5	19.6	
Hori	379.342	QP	26.1	16.8	9.2	28.2	23.9	46.0	22.1	
Hori	480.078	QP	31.4	17.9	9.7	28.8	30.2	46.0	15.8	
Hori	814.100	QP	21.3	21.8	11.0	28.2	25.9	46.0	20.1	
Hori	1627.000	PK	44.8	25.8	5.2	32.9	42.9	73.9	31.0	
Hori	4067.000	PK	40.7	30.2	7.8	31.6	47.1	73.9	26.9	
Hori	4882.000	PK	41.5	31.5	9.5	31.3	51.2	73.9	22.7	
Hori	7323.000	PK	40.8	35.7	11.4	31.6	56.3	73.9	17.6	
Hori	9764.000	PK	40.1	38.5	6.6	31.8	53.4	73.9	20.5	
Hori	24410.000	PK	46.3	37.9	-1.0	29.5	53.7	73.9	20.2	
Hori	1627.000	AV	34.7	25.8	5.2	32.9	32.8	53.9	21.1	
Hori	4067.000	AV	28.9	30.2	7.8	31.6	35.3	53.9	18.6	
Hori	4882.000	AV	29.2	31.5	9.5	31.3	38.9	53.9	15.0	
Hori	7323.000	AV	29.1	35.7	11.4	31.6	44.6	53.9	9.3	
Hori	9764.000	AV	29.4	38.5	6.6	31.8	42.7	53.9	11.2	
Hori	24410.000	AV	34.1	37.9	-1.0	29.5	41.5	53.9	12.4	
Vert	84.121	QP	43.7	7.6	7.3	28.5	30.1	40.0	9.9	
Vert	96.133	QP	35.6	9.6	7.4	28.5	24.1	43.5	19.4	
Vert	108.158	QP	29.1	11.4	7.5	28.4	19.6	43.5	23.9	
Vert	379.010	QP	28.9	16.8	9.2	28.2	26.7	46.0	19.3	
Vert	498.723	QP	30.0	18.0	9.8	28.9	28.9	46.0	17.1	
Vert	814.100	QP	21.3	21.8	11.0	28.2	25.9	46.0	20.1	
Vert	1627.000	PK	44.8	25.8	5.2	32.9	42.9	73.9	31.0	
Vert	4067.000	PK	40.3	30.2	7.8	31.6	46.7	73.9	27.2	
Vert	4882.000	PK	43.6	31.5	9.5	31.3	53.3	73.9	20.6	
Vert	7323.000	PK	42.7	35.7	11.4	31.6	58.2	73.9	15.7	
Vert	9764.000	PK	40.5	38.5	6.6	31.8	53.8	73.9	20.1	
Vert	24410.000	PK	45.6	37.9	-1.0	29.5	53.0	73.9	20.9	
Vert	1627.000	AV	38.2	25.8	5.2	32.9	36.3	53.9	17.6	
Vert	4067.000	AV	28.8	30.2	7.8	31.6	35.2	53.9	18.7	
Vert	4882.000	AV	31.4	31.5	9.5	31.3	41.1	53.9	12.8	
Vert	7323.000	AV	32.9	35.7	11.4	31.6	48.4	53.9	5.5	
Vert	9764.000	AV	29.4	38.5	6.6	31.8	42.7	53.9	11.2	
Vert	24410.000	AV	34.1	37.9	-1.0	29.5	41.5	53.9	12.4	

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

*For the band edge of the carrier and the harmonics that emission was found, the test was performed with VBW of the average detector set at 270Hz. For other average detectors, VBW was set at 10Hz.

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 31IE0258-HO-01
Date 05/11/2011 05/12/2011
Temperature/ Humidity 23 deg. C / 57% RH 24 deg. C / 59% RH
Engineer Tomohisa Nakagawa
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	84.121	QP	49.7	7.6	7.3	28.5	36.1	40.0	3.9	
Hori	96.140	QP	42.0	9.6	7.4	28.5	30.5	43.5	13.0	
Hori	108.159	QP	33.4	11.4	7.5	28.4	23.9	43.5	19.6	
Hori	379.260	QP	26.9	16.8	9.2	28.2	24.7	46.0	21.3	
Hori	480.077	QP	31.9	17.9	9.7	28.8	30.7	46.0	15.3	
Hori	827.800	QP	21.4	21.9	11.0	28.2	26.1	46.0	19.9	
Hori	1653.000	PK	42.8	25.9	5.2	32.9	41.0	73.9	33.0	
Hori	2483.500	PK	46.9	27.6	6.1	32.4	48.2	73.9	25.7	
Hori	2484.700	PK	45.9	27.6	6.1	32.4	47.2	73.9	26.7	
Hori	3423.000	PK	41.5	29.1	7.2	32.0	45.8	73.9	28.1	
Hori	4960.000	PK	40.5	31.7	9.6	31.3	50.5	73.9	23.4	
Hori	7440.000	PK	41.1	35.8	11.6	31.7	56.8	73.9	17.1	
Hori	9920.000	PK	42.0	38.7	6.7	31.8	55.6	73.9	18.3	
Hori	24800.000	PK	48.1	38.0	-1.0	29.4	55.7	73.9	18.2	
Hori	1653.000	AV	34.5	25.9	5.2	32.9	32.7	53.9	21.2	
Hori	2483.500	AV	35.2	27.6	6.1	32.4	36.5	53.9	17.4	
Hori	2484.700	AV	36.1	27.6	6.1	32.4	37.4	53.9	16.5	
Hori	3423.000	AV	29.3	29.1	7.2	32.0	33.6	53.9	20.3	
Hori	4960.000	AV	29.3	31.7	9.6	31.3	39.3	53.9	14.6	
Hori	7440.000	AV	29.4	35.8	11.6	31.7	45.1	53.9	8.8	
Hori	9920.000	AV	30.4	38.7	6.7	31.8	44.0	53.9	9.9	
Hori	24800.000	AV	36.1	38.0	-1.0	29.4	43.7	53.9	10.2	
Vert	84.123	QP	43.7	7.6	7.3	28.5	30.1	40.0	9.9	
Vert	96.142	QP	36.0	9.6	7.4	28.5	24.5	43.5	19.0	
Vert	108.159	QP	29.0	11.4	7.5	28.4	19.5	43.5	24.0	
Vert	379.390	QP	29.6	16.8	9.2	28.2	27.4	46.0	18.6	
Vert	498.723	QP	29.7	18.0	9.8	28.9	28.6	46.0	17.4	
Vert	827.800	QP	21.4	21.9	11.0	28.2	26.1	46.0	19.9	
Vert	1653.000	PK	45.6	25.9	5.2	32.9	43.8	73.9	30.1	
Vert	2483.500	PK	50.4	27.6	6.1	32.4	51.7	73.9	22.2	
Vert	2484.700	PK	49.2	27.6	6.1	32.4	50.5	73.9	23.4	
Vert	3423.000	PK	41.3	29.1	7.2	32.0	45.6	73.9	28.3	
Vert	4960.000	PK	44.3	31.7	9.6	31.3	54.3	73.9	19.6	
Vert	7440.000	PK	42.1	35.8	11.6	31.7	57.8	73.9	16.1	
Vert	9920.000	PK	41.7	38.7	6.7	31.8	55.3	73.9	18.6	
Vert	24800.000	PK	48.2	38.0	-1.0	29.4	55.8	73.9	18.1	
Vert	1653.000	AV	39.2	25.9	5.2	32.9	37.4	53.9	16.5	
Vert	2483.500	AV	39.1	27.6	6.1	32.4	40.4	53.9	13.5	
Vert	2484.700	AV	40.9	27.6	6.1	32.4	42.2	53.9	11.7	
Vert	3423.000	AV	29.3	29.1	7.2	32.0	33.6	53.9	20.3	
Vert	4960.000	AV	37.0	31.7	9.6	31.3	47.0	53.9	6.9	
Vert	7440.000	AV	32.3	35.8	11.6	31.7	48.0	53.9	5.9	
Vert	9920.000	AV	30.3	38.7	6.7	31.8	43.9	53.9	10.0	
Vert	24800.000	AV	36.1	38.0	-1.0	29.4	43.7	53.9	10.2	

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

*For the band edge of the carrier and the harmonics that emission was found, the test was performed with VBW of the average detector set at 270Hz. For other average detectors, VBW was set at 10Hz.

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 31IE0258-HO-01
Date 05/11/2011 05/12/2011
Temperature/ Humidity 23 deg. C / 57% RH 24 deg. C / 59% RH
Engineer Tomohisa Nakagawa
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	84.234	QP	50.1	7.6	7.3	28.5	36.5	40.0	3.5	
Hori	96.137	QP	42.4	9.6	7.4	28.5	30.9	43.5	12.6	
Hori	108.152	QP	32.9	11.4	7.5	28.4	23.4	43.5	20.1	
Hori	379.320	QP	31.4	16.8	9.2	28.2	29.2	46.0	16.8	
Hori	480.072	QP	30.6	17.9	9.7	28.8	29.4	46.0	16.6	
Hori	800.300	QP	24.6	21.8	11.0	28.3	29.1	46.0	16.9	
Hori	1603.000	PK	44.0	25.8	5.2	33.0	42.0	73.9	31.9	
Hori	2390.000	PK	41.9	27.4	6.0	32.4	42.9	73.9	31.0	
Hori	2399.717	PK	55.4	27.4	6.0	32.4	56.4	73.9	17.5	
Hori	2400.000	PK	61.0	27.4	6.0	32.4	62.0	-	-	See 20dBc Data Sheet
Hori	3203.000	PK	42.2	28.7	6.9	32.2	45.6	73.9	28.3	
Hori	4804.000	PK	40.9	31.3	9.5	31.4	50.3	73.9	23.6	
Hori	7206.000	PK	41.2	35.5	11.3	31.6	56.4	73.9	17.5	
Hori	9608.000	PK	40.1	38.4	6.6	31.9	53.2	73.9	20.7	
Hori	24020.000	PK	46.6	37.8	-0.9	29.6	53.9	73.9	20.0	
Hori	1603.000	AV	35.0	25.8	5.2	33.0	33.0	53.9	20.9	
Hori	2390.000	AV	29.1	27.4	6.0	32.4	30.1	53.9	23.8	
Hori	2399.717	AV	44.6	27.4	6.0	32.4	45.6	53.9	8.3	
Hori	2400.000	AV	47.8	27.4	6.0	32.4	48.8	-	-	See 20dBc Data Sheet
Hori	3203.000	AV	29.6	28.7	6.9	32.2	33.0	53.9	20.9	
Hori	4804.000	AV	28.8	31.3	9.5	31.4	38.2	53.9	15.7	
Hori	7206.000	AV	29.3	35.5	11.3	31.6	44.5	53.9	9.4	
Hori	9608.000	AV	29.4	38.4	6.6	31.9	42.5	53.9	11.4	
Hori	24020.000	AV	34.9	37.8	-0.9	29.6	42.2	53.9	11.7	
Vert	84.112	QP	44.2	7.6	7.3	28.5	30.6	40.0	9.4	
Vert	96.150	QP	35.4	9.6	7.4	28.5	23.9	43.5	19.6	
Vert	108.172	QP	28.6	11.4	7.5	28.4	19.1	43.5	24.4	
Vert	379.400	QP	30.9	16.8	9.2	28.2	28.7	46.0	17.3	
Vert	498.860	QP	29.9	18.0	9.8	28.9	28.8	46.0	17.2	
Vert	800.300	QP	21.4	21.8	11.0	28.3	25.9	46.0	20.1	
Vert	1603.000	PK	45.7	25.8	5.2	33.0	43.7	73.9	30.2	
Vert	2390.000	PK	43.3	27.4	6.0	32.4	44.3	73.9	29.6	
Vert	2399.717	PK	54.8	27.4	6.0	32.4	55.8	73.9	18.1	
Vert	2400.000	PK	60.9	27.4	6.0	32.4	61.9	-	-	See 20dBc Data Sheet
Vert	3203.000	PK	41.5	28.7	6.9	32.2	44.9	73.9	29.0	
Vert	4804.000	PK	40.4	31.3	9.5	31.4	49.8	73.9	24.1	
Vert	7206.000	PK	42.1	35.5	11.3	31.6	57.3	73.9	16.6	
Vert	9608.000	PK	41.1	38.4	6.6	31.9	54.2	73.9	19.7	
Vert	24020.000	PK	46.8	37.8	-0.9	29.6	54.1	73.9	19.8	
Vert	1603.000	AV	37.2	25.8	5.2	33.0	35.2	53.9	18.7	
Vert	2390.000	AV	30.0	27.4	6.0	32.4	31.0	53.9	22.9	
Vert	2399.717	AV	44.4	27.4	6.0	32.4	45.4	53.9	8.5	
Vert	2400.000	AV	54.4	27.4	6.0	32.4	55.4	-	-	See 20dBc Data Sheet
Vert	3203.000	AV	29.7	28.7	6.9	32.2	33.1	53.9	20.8	
Vert	4804.000	AV	28.7	31.3	9.5	31.4	38.1	53.9	15.8	
Vert	7206.000	AV	29.4	35.5	11.3	31.6	44.6	53.9	9.3	
Vert	9608.000	AV	29.0	38.4	6.6	31.9	42.1	53.9	11.8	
Vert	24020.000	AV	34.9	37.8	-0.9	29.6	42.2	53.9	11.7	

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

*For the band edge of the carrier and the harmonics that emission was found, the test was performed with VBW of the average detector set at 270Hz. For other average detectors, VBW was set at 10Hz.

Radiated Spurious Emission
20dBc Data Sheet

Test place : Head Office EMC Lab. No.2 Semi Anechoic Chamber
 Report No. : 31IE0258-HO-01
 Date : 05/11/2011
 Temperature/ Humidity : 23 deg. C / 57% RH
 Engineer : Tomohisa Nakagawa
 Mode : Tx, 3DH5 2402MHz

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	94.3	27.4	6.0	32.4	95.3	-	-	Carrier
Hori	2400.000	PK	48.9	27.4	6.0	32.4	49.9	75.3	25.4	
Vert	2402.000	PK	94.3	27.4	6.0	32.4	95.3	-	-	Carrier
Vert	2400.000	PK	48.6	27.4	6.0	32.4	49.6	75.3	25.7	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 31IE0258-HO-01
Date 05/11/2011 05/12/2011
Temperature/ Humidity 23 deg. C / 57% RH 24 deg. C / 59% RH
Engineer Tomohisa Nakagawa

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	84.132	QP	49.9	7.6	7.3	28.5	36.3	40.0	3.7	
Hori	96.137	QP	42.1	9.6	7.4	28.5	30.6	43.5	12.9	
Hori	108.152	QP	32.8	11.4	7.5	28.4	23.3	43.5	20.2	
Hori	378.820	QP	25.9	16.8	9.2	28.2	23.7	46.0	22.3	
Hori	480.078	QP	31.9	17.9	9.7	28.8	30.7	46.0	15.3	
Hori	814.100	QP	21.3	21.8	11.0	28.2	25.9	46.0	20.1	
Hori	1627.000	PK	43.6	25.8	5.2	32.9	41.7	73.9	32.2	
Hori	3253.000	PK	41.2	28.8	6.9	32.1	44.8	73.9	29.1	
Hori	4882.000	PK	41.8	31.5	9.5	31.3	51.5	73.9	22.4	
Hori	7323.000	PK	40.7	35.7	11.4	31.6	56.2	73.9	17.7	
Hori	9764.000	PK	40.7	38.5	6.6	31.8	54.0	73.9	19.9	
Hori	24410.000	PK	46.1	37.9	-1.0	29.5	53.5	73.9	20.4	
Hori	1627.000	AV	34.0	25.8	5.2	32.9	32.1	53.9	21.8	
Hori	3253.000	AV	30.0	28.8	6.9	32.1	33.6	53.9	20.3	
Hori	4882.000	AV	28.8	31.5	9.5	31.3	38.5	53.9	15.4	
Hori	7323.000	AV	28.9	35.7	11.4	31.6	44.4	53.9	9.5	
Hori	9764.000	AV	29.6	38.5	6.6	31.8	42.9	53.9	11.0	
Hori	24410.000	AV	34.2	37.9	-1.0	29.5	41.6	53.9	12.3	
Vert	84.112	QP	44.2	7.6	7.3	28.5	30.6	40.0	9.4	
Vert	96.134	QP	36.0	9.6	7.4	28.5	24.5	43.5	19.0	
Vert	108.172	QP	28.8	11.4	7.5	28.4	19.3	43.5	24.2	
Vert	378.900	QP	28.5	16.8	9.2	28.2	26.3	46.0	19.7	
Vert	498.920	QP	29.4	18.0	9.8	28.9	28.3	46.0	17.7	
Vert	814.100	QP	21.3	21.8	11.0	28.2	25.9	46.0	20.1	
Vert	1627.000	PK	45.0	25.8	5.2	32.9	43.1	73.9	30.8	
Vert	3253.000	PK	41.5	28.8	6.9	32.1	45.1	73.9	28.8	
Vert	4882.000	PK	40.2	31.5	9.5	31.3	49.9	73.9	24.0	
Vert	7323.000	PK	40.8	35.7	11.4	31.6	56.3	73.9	17.6	
Vert	9764.000	PK	40.3	38.5	6.6	31.8	53.6	73.9	20.3	
Vert	24410.000	PK	46.1	37.9	-1.0	29.5	53.5	73.9	20.4	
Vert	1627.000	AV	37.1	25.8	5.2	32.9	35.2	53.9	18.7	
Vert	3253.000	AV	29.6	28.8	6.9	32.1	33.2	53.9	20.7	
Vert	4882.000	AV	28.7	31.5	9.5	31.3	38.4	53.9	15.5	
Vert	7323.000	AV	29.1	35.7	11.4	31.6	44.6	53.9	9.3	
Vert	9764.000	AV	29.5	38.5	6.6	31.8	42.8	53.9	11.1	
Vert	24410.000	AV	34.2	37.9	-1.0	29.5	41.6	53.9	12.3	

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

*For the band edge of the carrier and the harmonics that emission was found, the test was performed with VBW of the average detector set at 270Hz. For other average detectors, VBW was set at 10Hz.

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 31IE0258-HO-01
Date 05/11/2011 05/12/2011
Temperature/ Humidity 23 deg. C / 57% RH 24 deg. C / 59% RH
Engineer Tomohisa Nakagawa

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	84.124	QP	49.1	7.6	7.3	28.5	35.5	40.0	4.5	
Hori	96.320	QP	41.9	9.6	7.4	28.5	30.4	43.5	13.1	
Hori	108.159	QP	32.7	11.4	7.5	28.4	23.2	43.5	20.3	
Hori	377.840	QP	27.6	16.8	9.2	28.2	25.4	46.0	20.6	
Hori	480.055	QP	30.9	17.9	9.7	28.8	29.7	46.0	16.3	
Hori	827.800	QP	21.5	21.9	11.0	28.2	26.2	46.0	19.8	
Hori	1653.000	PK	44.4	25.9	5.2	32.9	42.6	73.9	31.3	
Hori	2483.500	PK	51.7	27.6	6.1	32.4	53.0	73.9	20.9	
Hori	3263.000	PK	41.5	28.8	6.9	32.1	45.1	73.9	28.8	
Hori	4960.000	PK	40.7	31.7	9.6	31.3	50.7	73.9	23.2	
Hori	7440.000	PK	41.5	35.8	11.6	31.7	57.2	73.9	16.7	
Hori	9920.000	PK	42.0	38.7	6.7	31.8	55.6	73.9	18.3	
Hori	24800.000	PK	48.1	38.0	-1.0	29.4	55.7	73.9	18.2	
Hori	1653.000	AV	34.5	25.9	5.2	32.9	32.7	53.9	21.2	
Hori	2483.500	AV	37.4	27.6	6.1	32.4	38.7	53.9	15.2	
Hori	3263.000	AV	29.6	28.8	6.9	32.1	33.2	53.9	20.7	
Hori	4960.000	AV	28.9	31.7	9.6	31.3	38.9	53.9	15.0	
Hori	7440.000	AV	29.3	35.8	11.6	31.7	45.0	53.9	8.9	
Hori	9920.000	AV	29.7	38.7	6.7	31.8	43.3	53.9	10.6	
Hori	24800.000	AV	36.1	38.0	-1.0	29.4	43.7	53.9	10.2	
Vert	84.118	QP	44.0	7.6	7.3	28.5	30.4	40.0	9.6	
Vert	96.148	QP	36.5	9.6	7.4	28.5	25.0	43.5	18.5	
Vert	108.160	QP	29.3	11.4	7.5	28.4	19.8	43.5	23.7	
Vert	379.530	QP	29.4	16.8	9.2	28.2	27.2	46.0	18.8	
Vert	498.720	QP	29.1	18.0	9.8	28.9	28.0	46.0	18.0	
Vert	827.800	QP	21.6	21.9	11.0	28.2	26.3	46.0	19.7	
Vert	1653.000	PK	45.7	25.9	5.2	32.9	43.9	73.9	30.0	
Vert	2483.500	PK	51.2	27.6	6.1	32.4	52.5	73.9	21.4	
Vert	3263.000	PK	41.0	28.8	6.9	32.1	44.6	73.9	29.4	
Vert	4960.000	PK	41.4	31.7	9.6	31.3	51.4	73.9	22.5	
Vert	7440.000	PK	41.9	35.8	11.6	31.7	57.6	73.9	16.3	
Vert	9920.000	PK	42.2	38.7	6.7	31.8	55.8	73.9	18.1	
Vert	24800.000	PK	48.2	38.0	-1.0	29.4	55.8	73.9	18.1	
Vert	1653.000	AV	38.2	25.9	5.2	32.9	36.4	53.9	17.5	
Vert	2483.500	AV	39.4	27.6	6.1	32.4	40.7	53.9	13.2	
Vert	3263.000	AV	29.6	28.8	6.9	32.1	33.2	53.9	20.7	
Vert	4960.000	AV	28.6	31.7	9.6	31.3	38.6	53.9	15.3	
Vert	7440.000	AV	29.3	35.8	11.6	31.7	45.0	53.9	8.9	
Vert	9920.000	AV	29.7	38.7	6.7	31.8	43.3	53.9	10.6	
Vert	24800.000	AV	36.1	38.0	-1.0	29.4	43.7	53.9	10.2	

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).

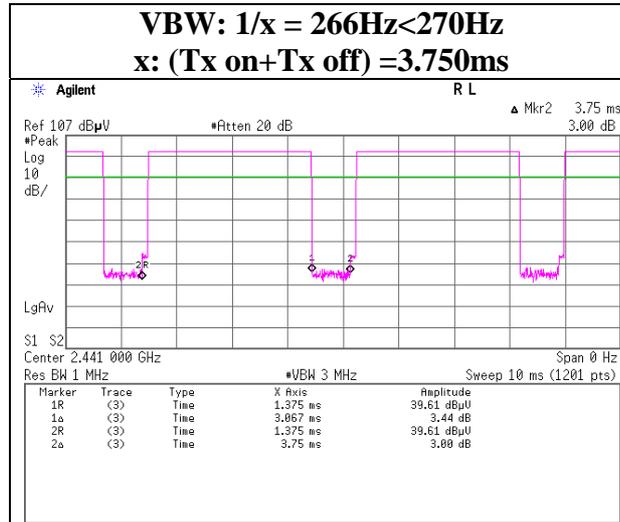
*The 10th harmonic was not seen so the result was its base noise level.

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

*For the band edge of the carrier and the harmonics that emission was found, the test was performed with VBW of the average detector set at 270Hz. For other average detectors, VBW was set at 10Hz.

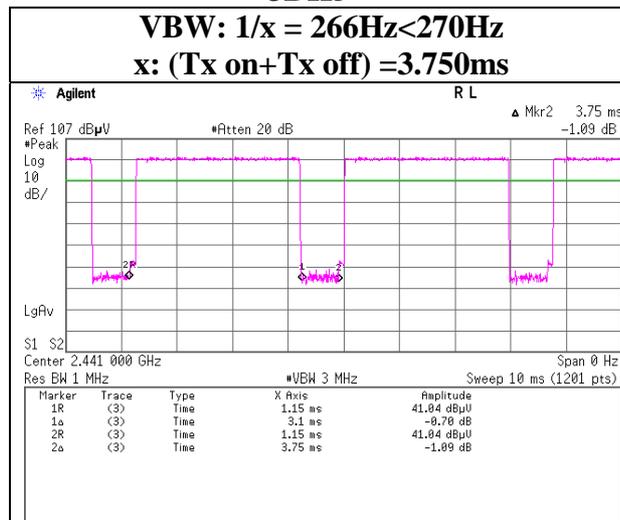
VBW (AV) Calculation DH5

VBW: $1/x = 266\text{Hz} < 270\text{Hz}$
x: (Tx on+Tx off) = 3.750ms



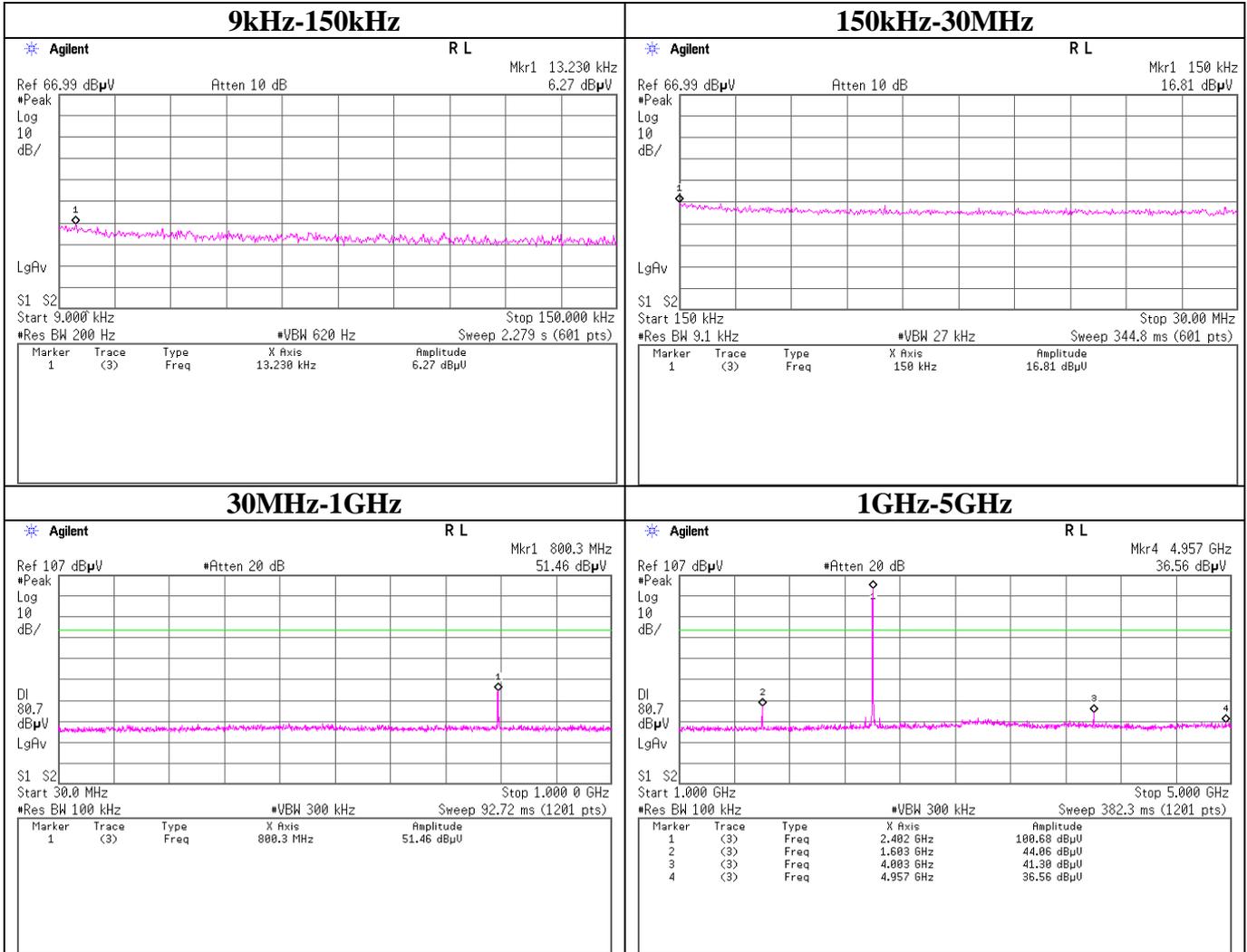
3DH5

VBW: $1/x = 266\text{Hz} < 270\text{Hz}$
x: (Tx on+Tx off) = 3.750ms

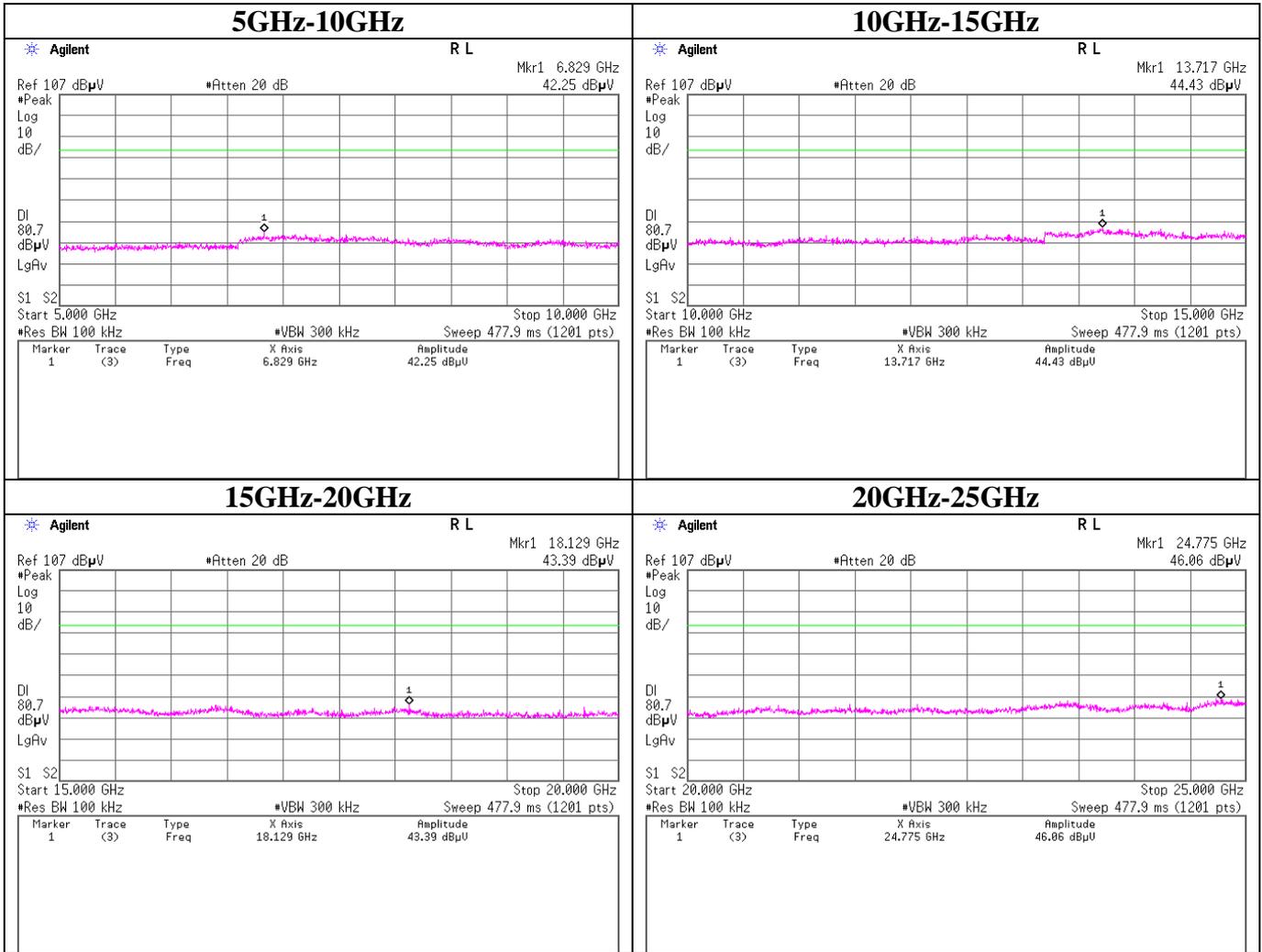


Conducted Spurious Emission

Tx DH5 2402MHz

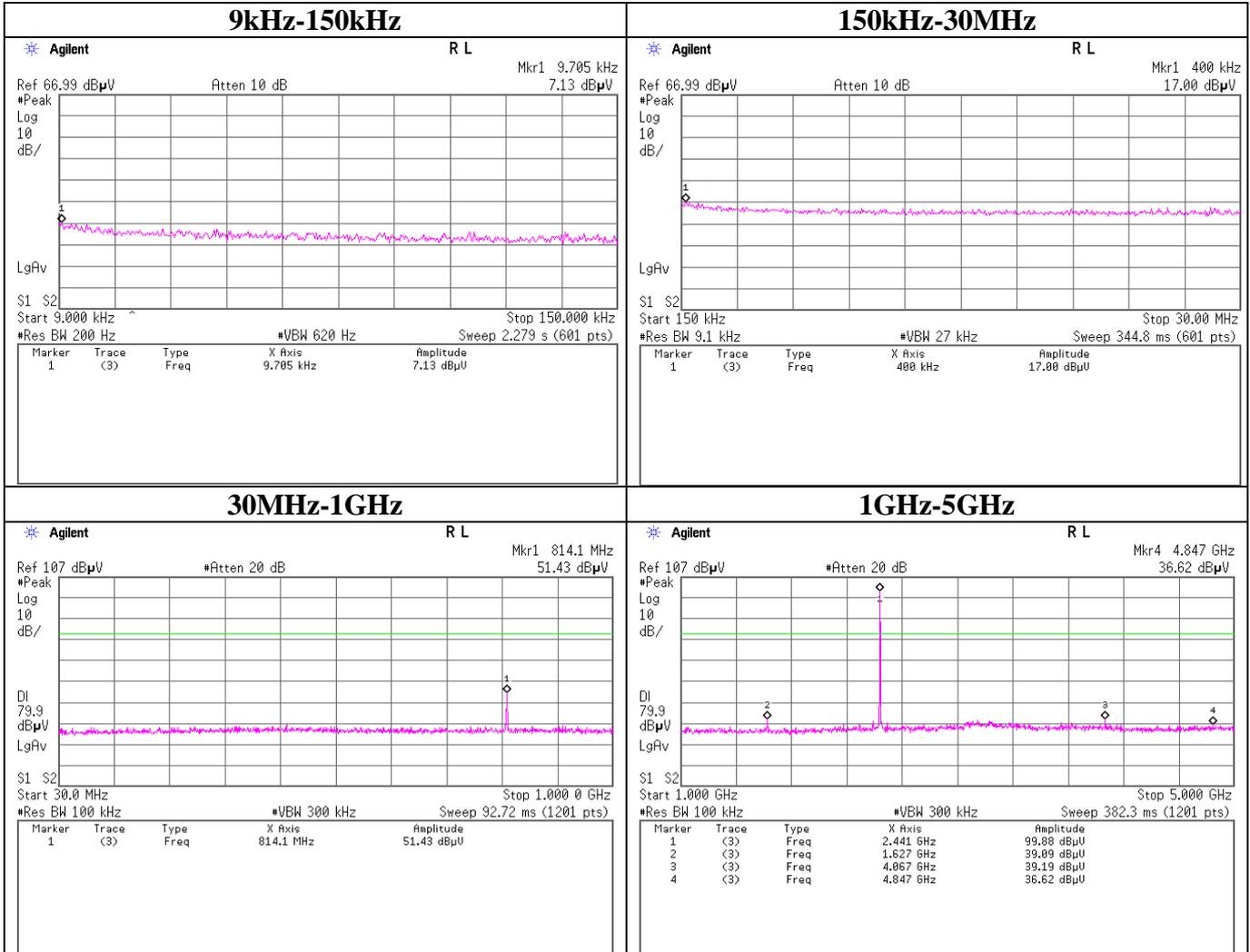


Tx DH5 2402MHz

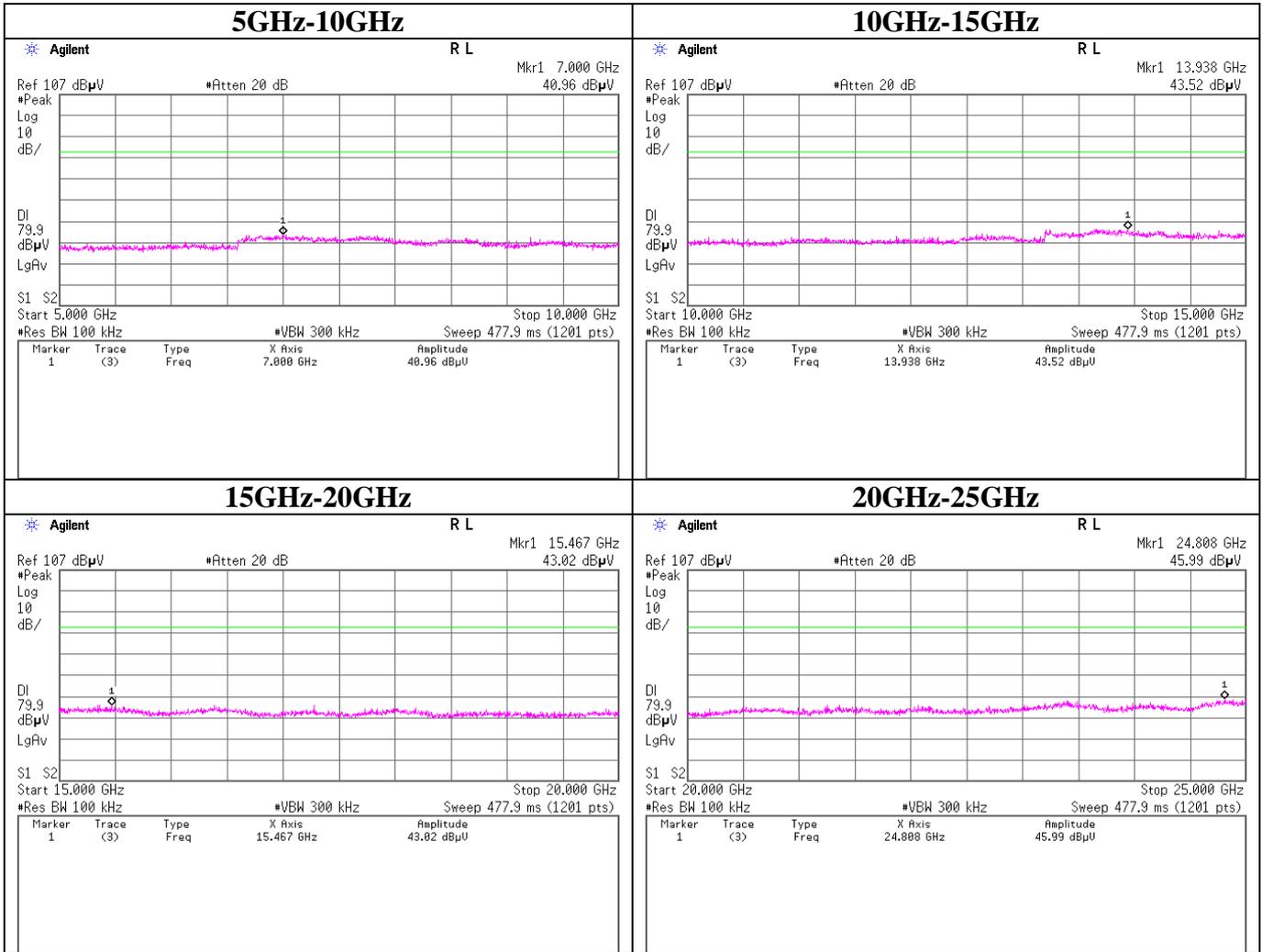


Conducted Spurious Emission

Tx DH5 2441MHz

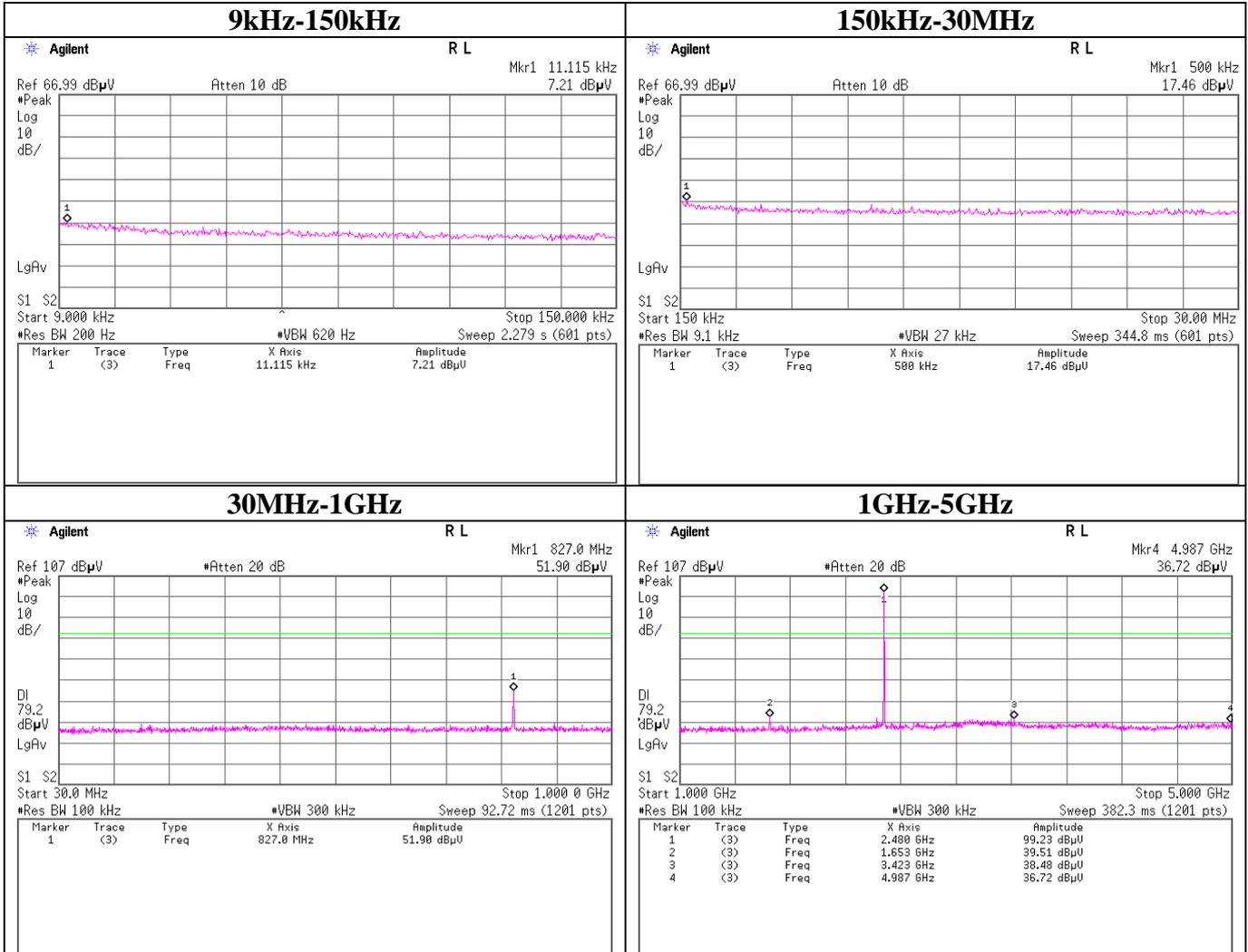


Tx DH5 2441MHz

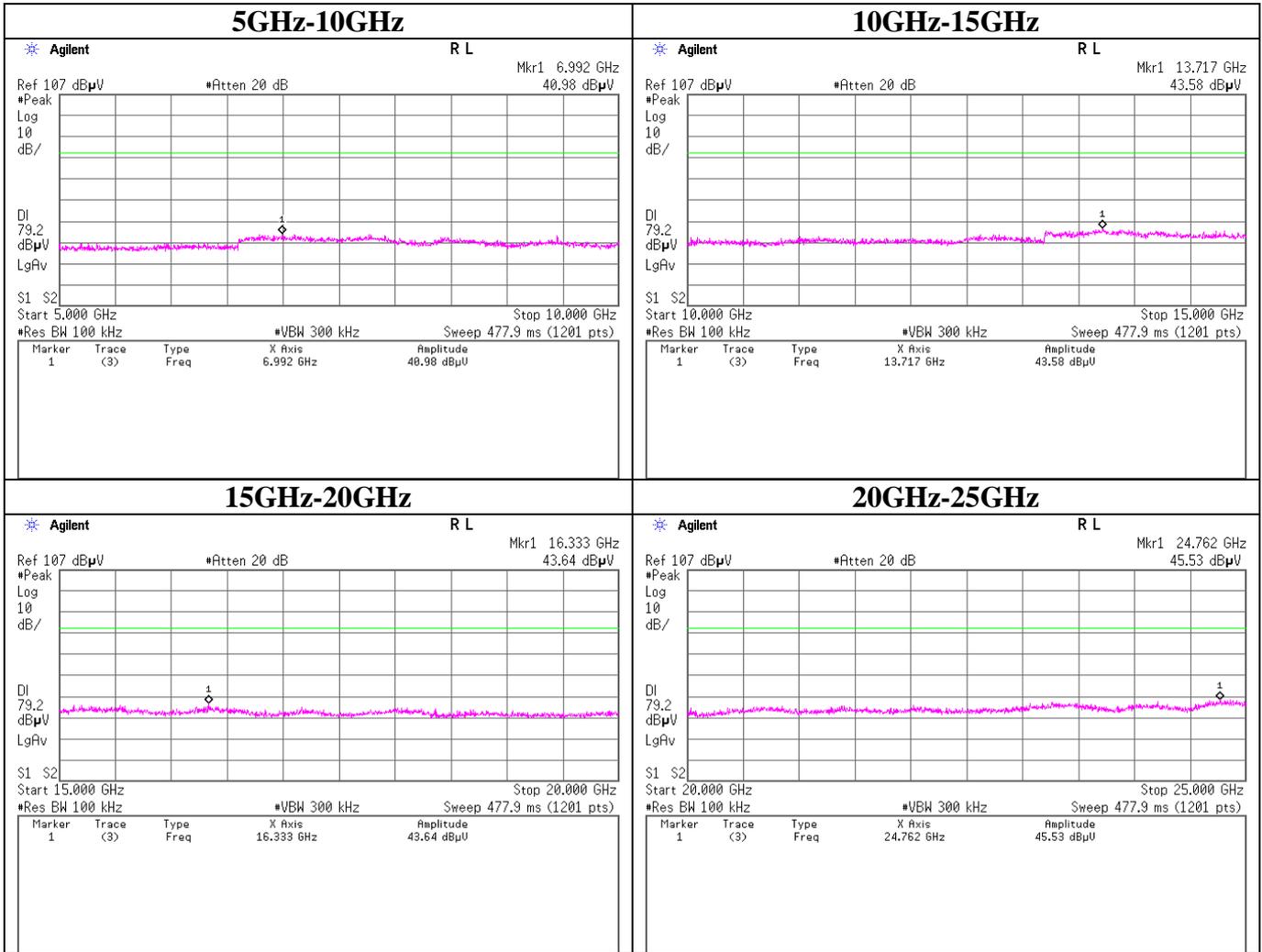


Conducted Spurious Emission

Tx DH5 2480MHz

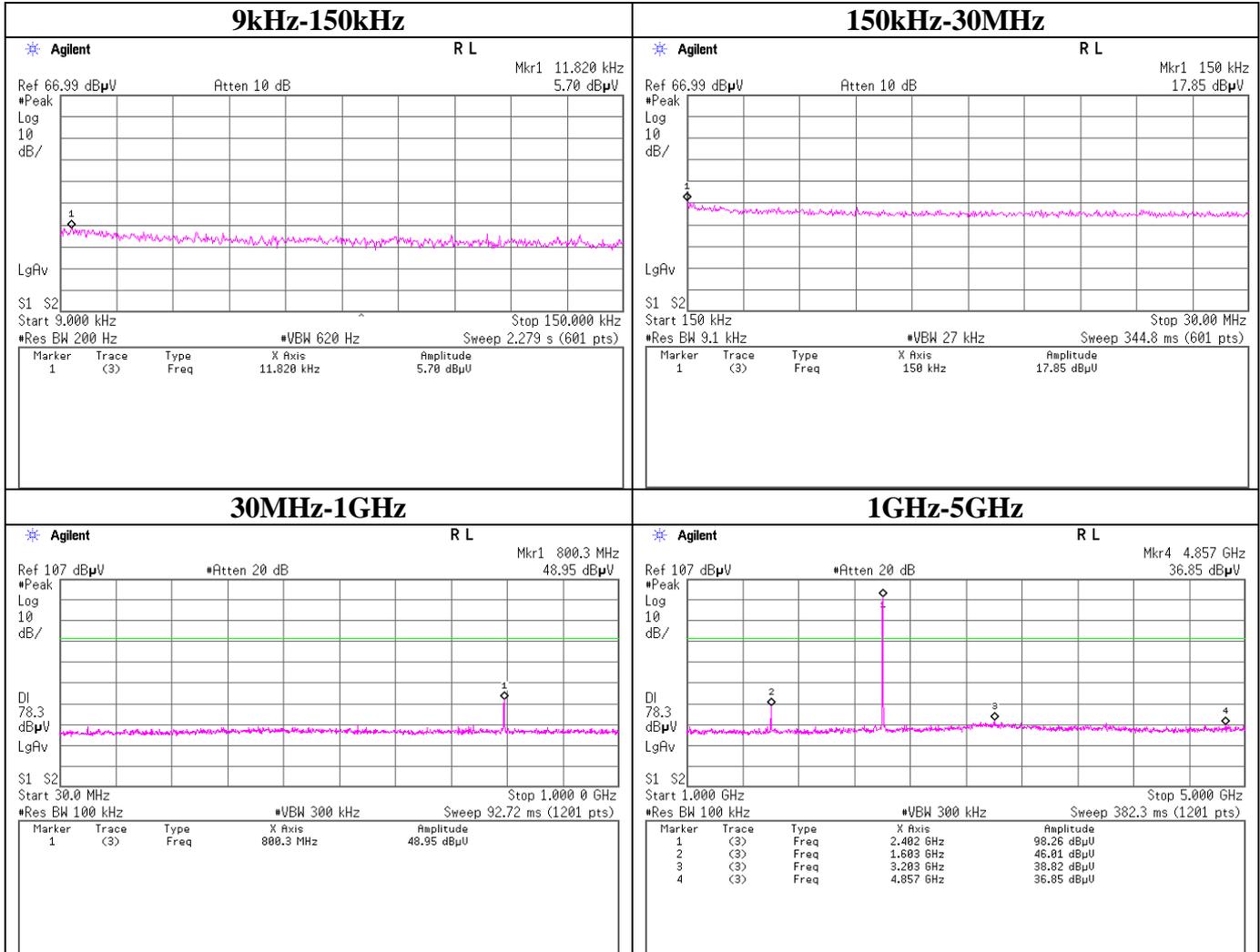


Tx DH5 2480MHz

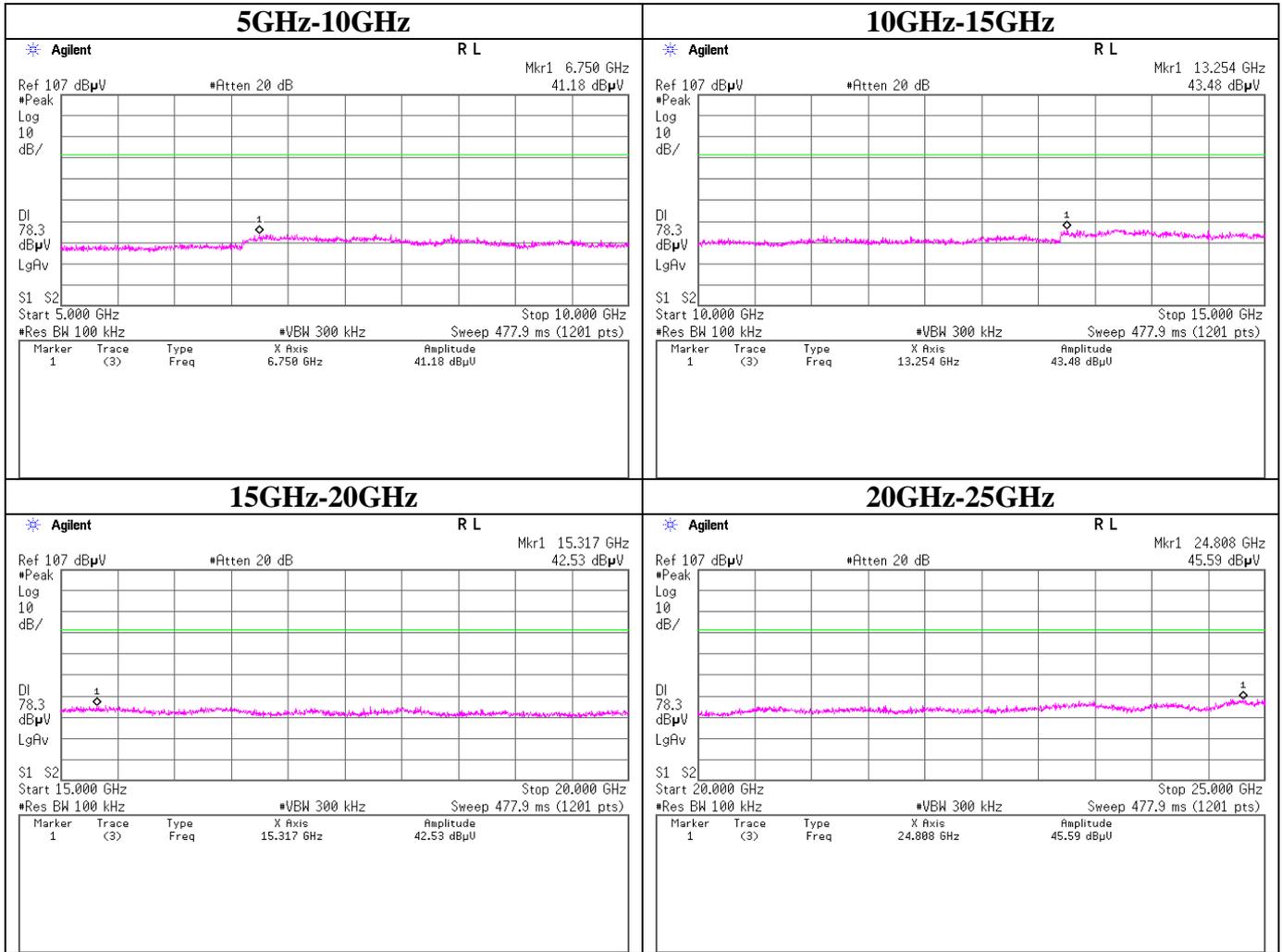


Conducted Spurious Emission

Tx 3DH5 2402MHz

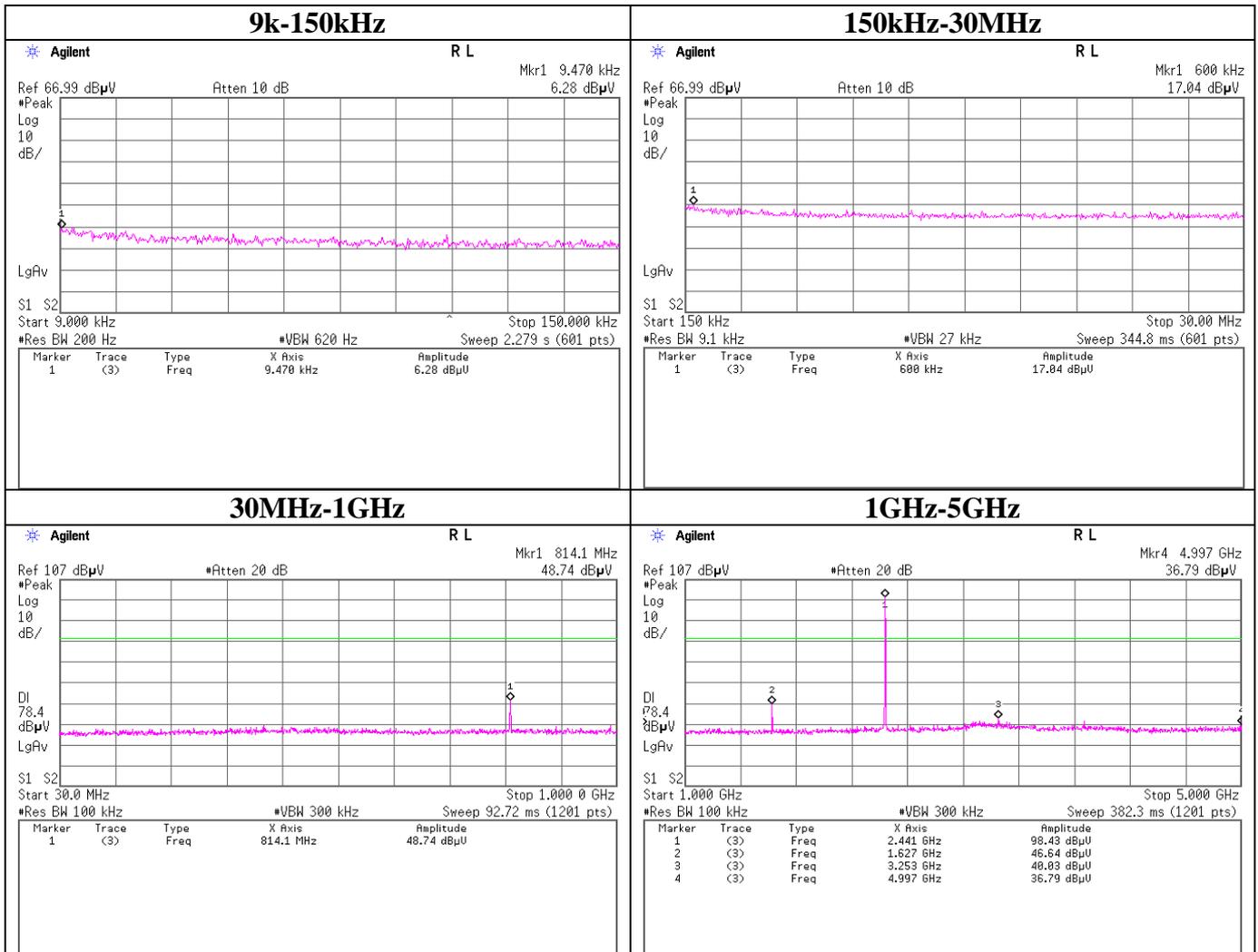


Tx 3DH5 2402MHz

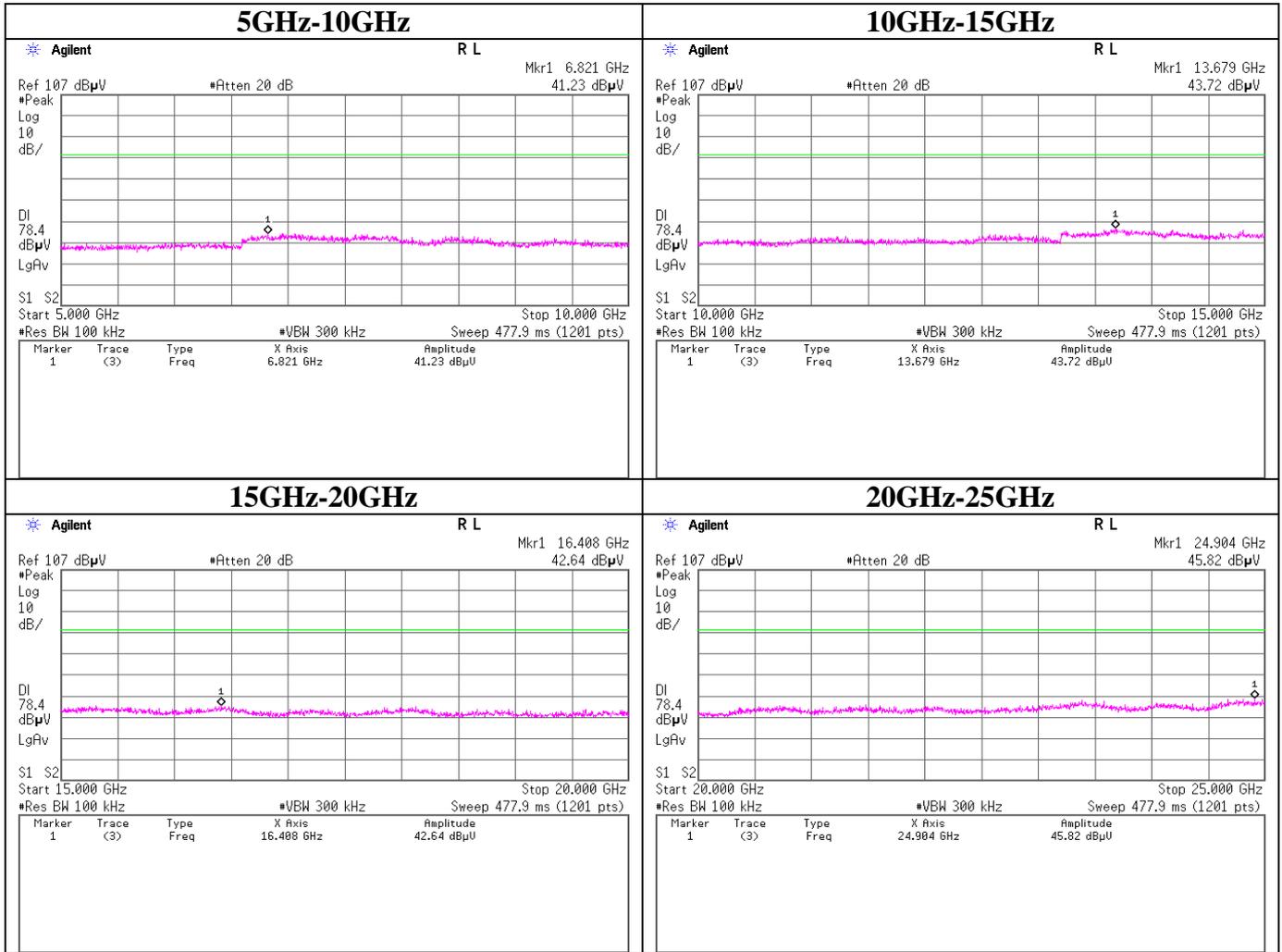


Conducted Spurious Emission

Tx 3DH5 2441MHz

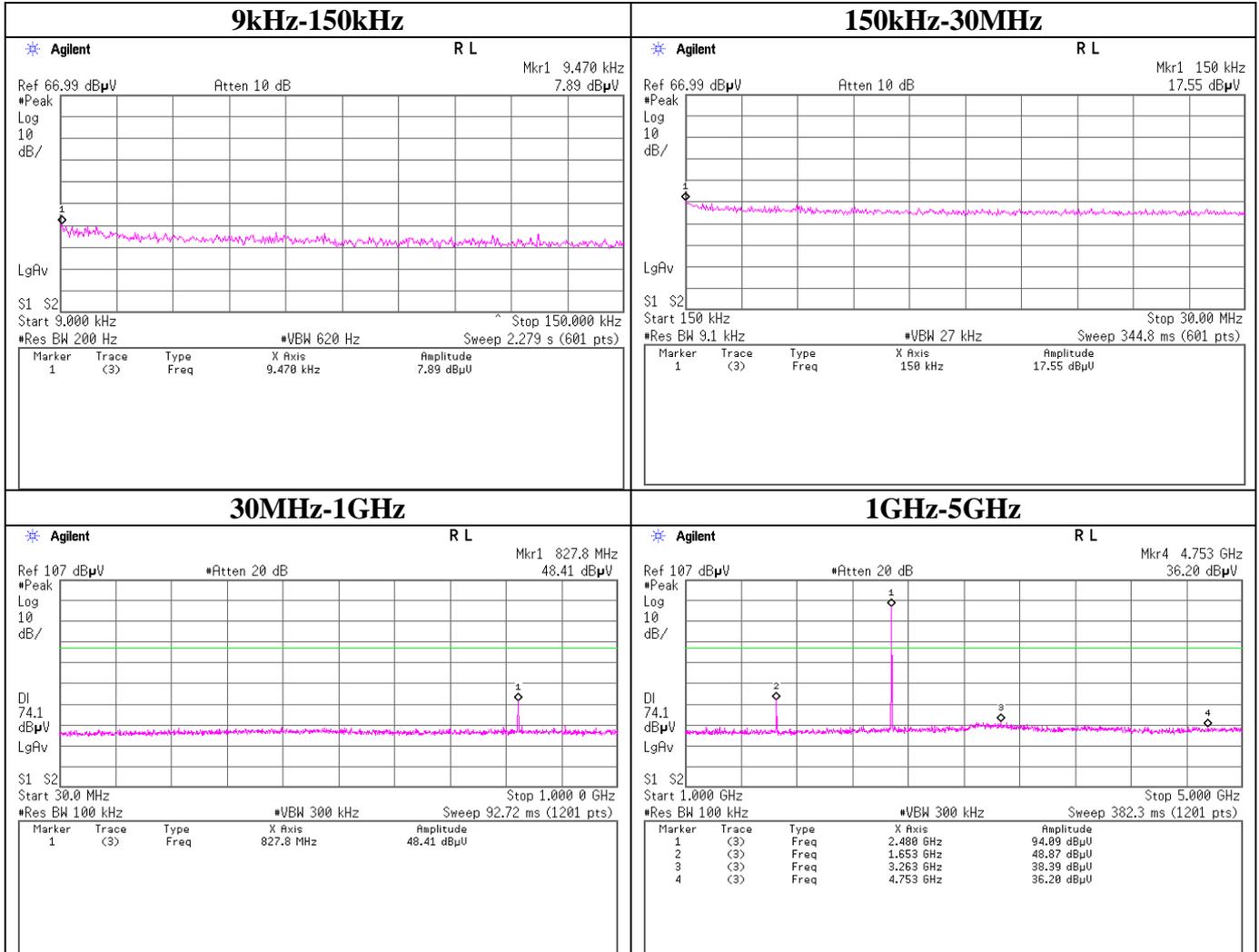


Tx 3DH5 2441MHz

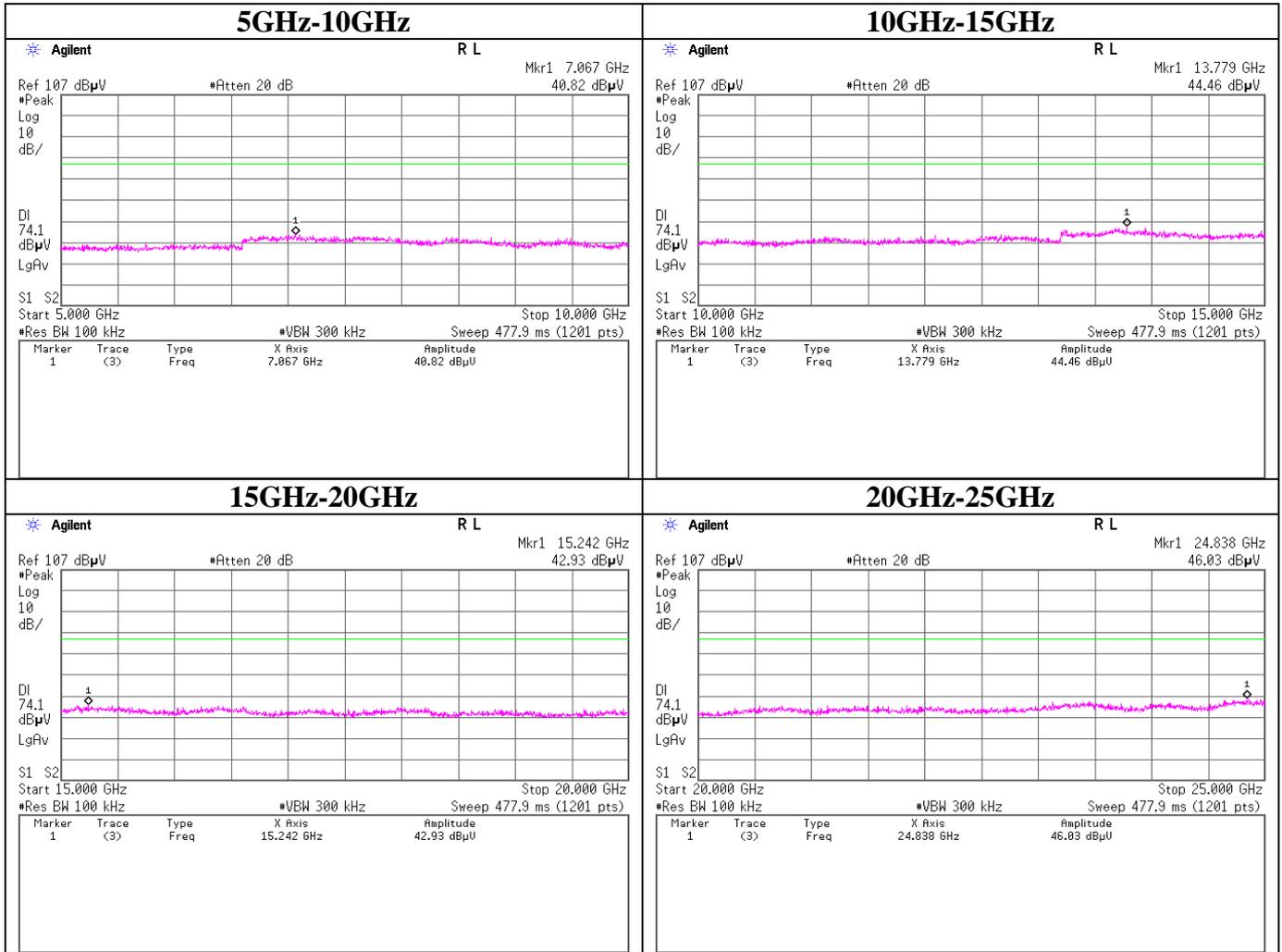


Conducted Spurious Emission

Tx 3DH5 2480MHz

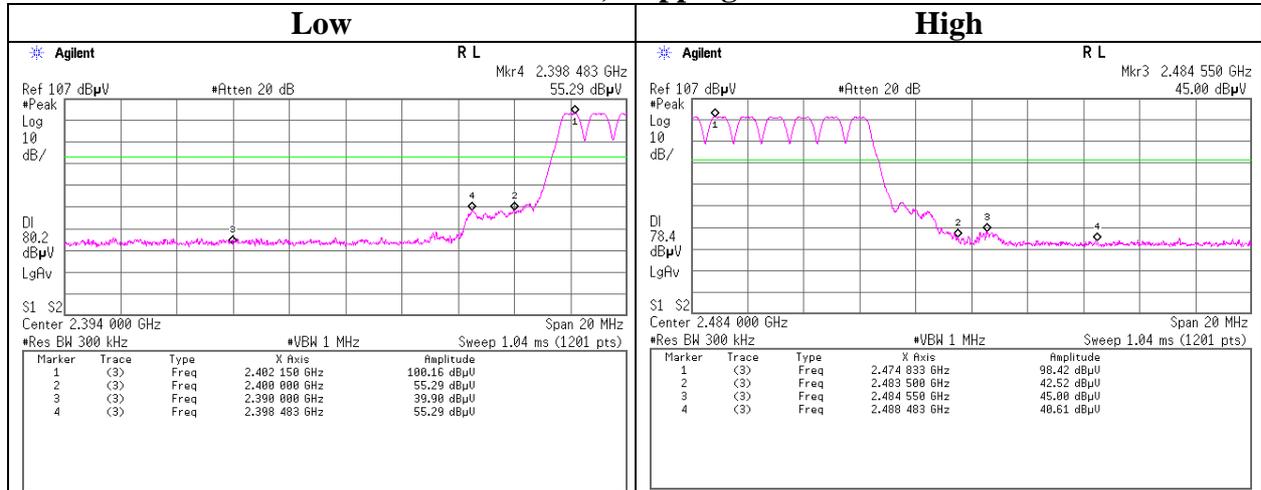


Tx 3DH5 2480MHz

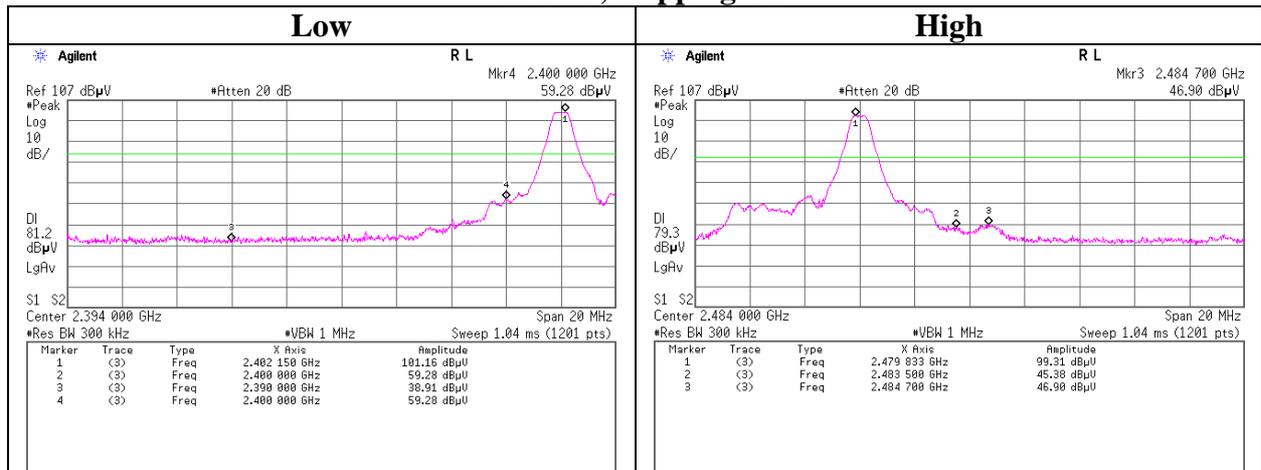


Conducted Emission Band Edge compliance

Tx DH5, Hopping on

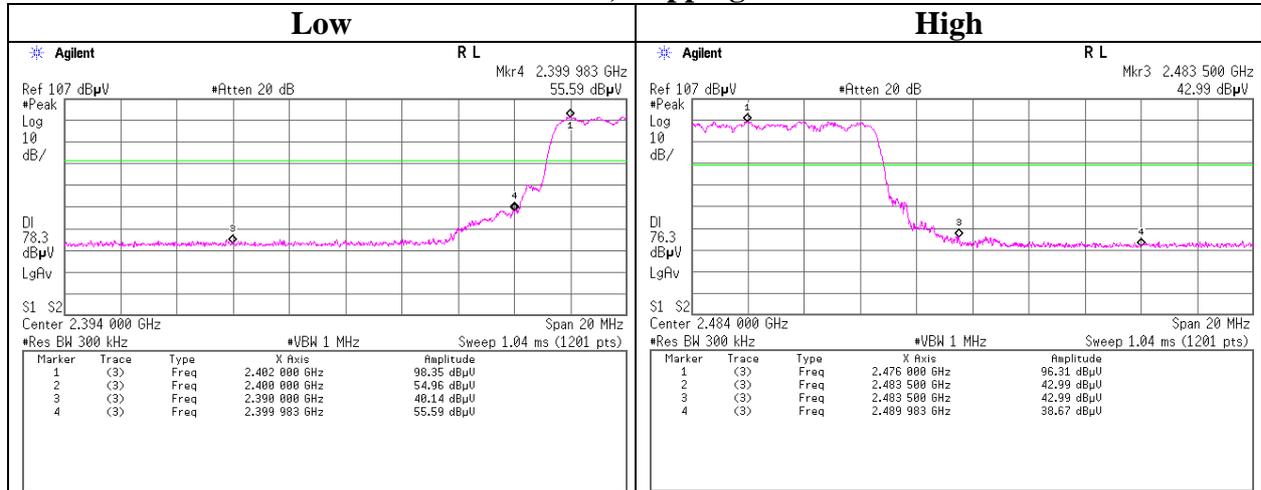


Tx DH5, Hopping off

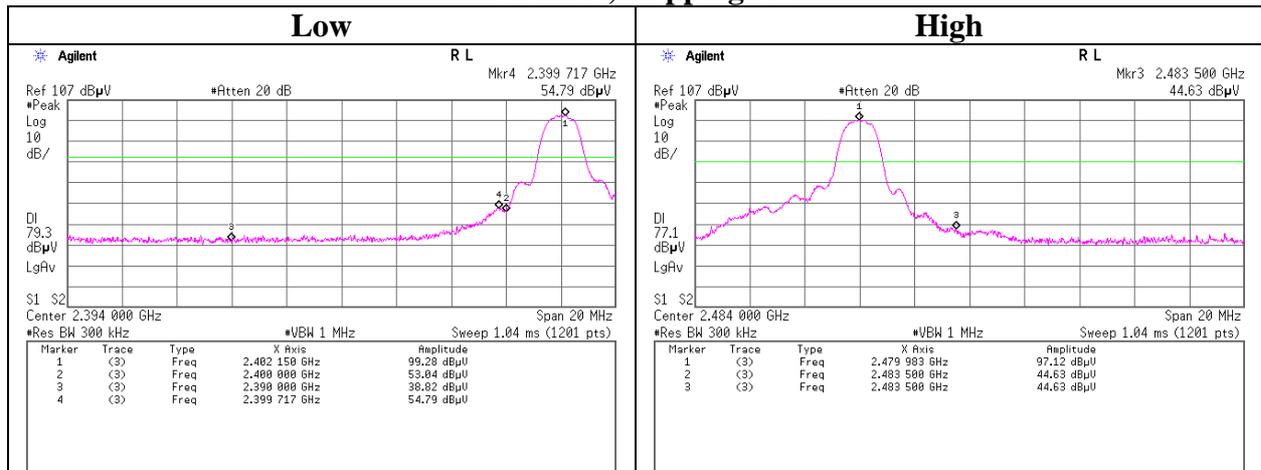


Conducted Emission Band Edge compliance

Tx 3DH5, Hopping on



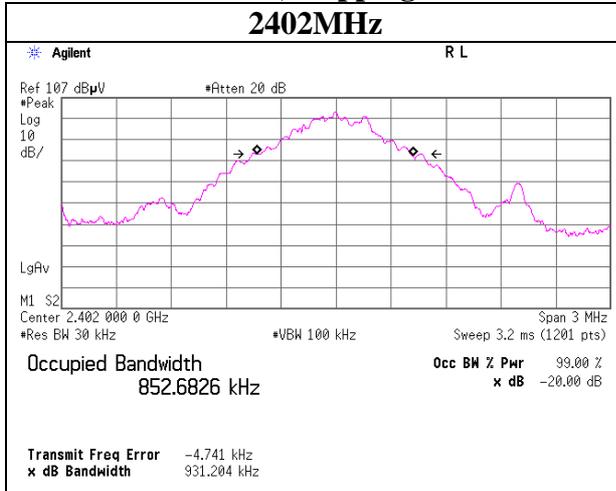
Tx 3DH5, Hopping off



99% Occupied Bandwidth

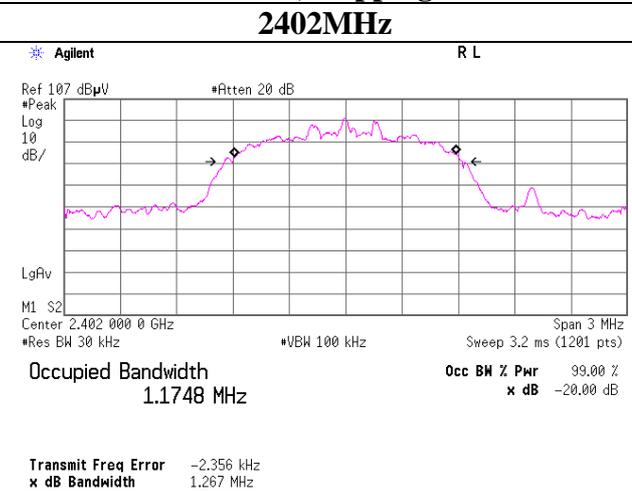
Tx DH5, Hopping off

2402MHz

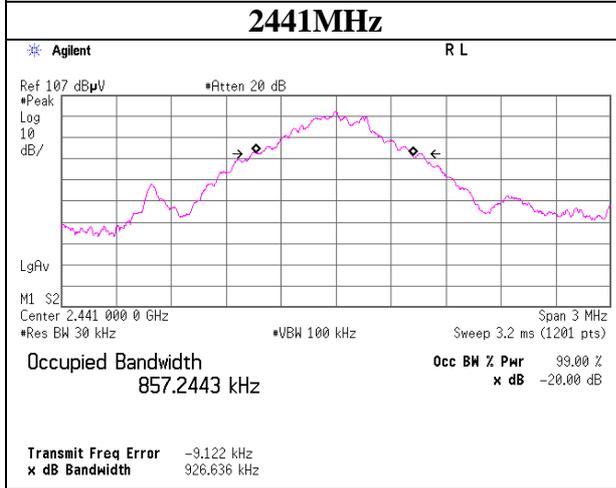


Tx 3DH5, Hopping off

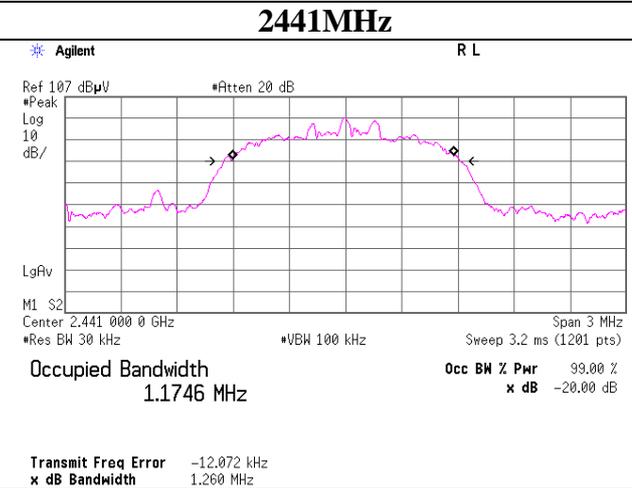
2402MHz



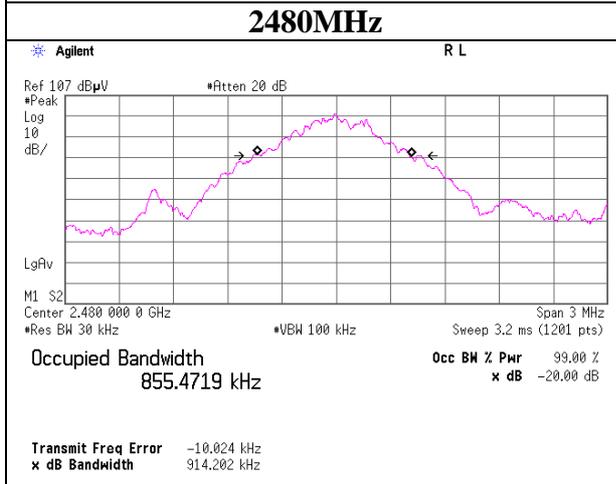
2441MHz



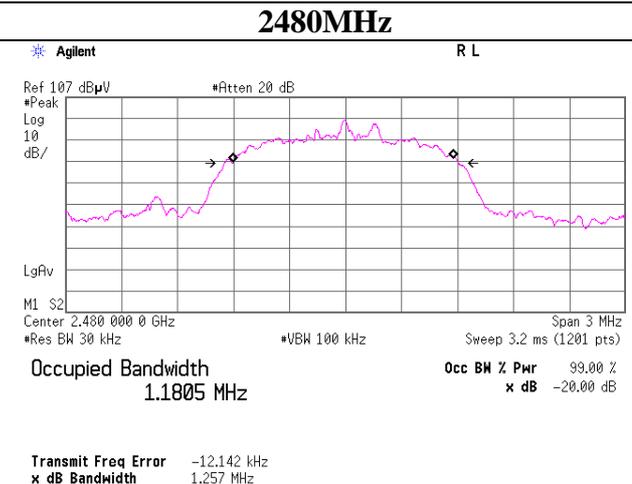
2441MHz



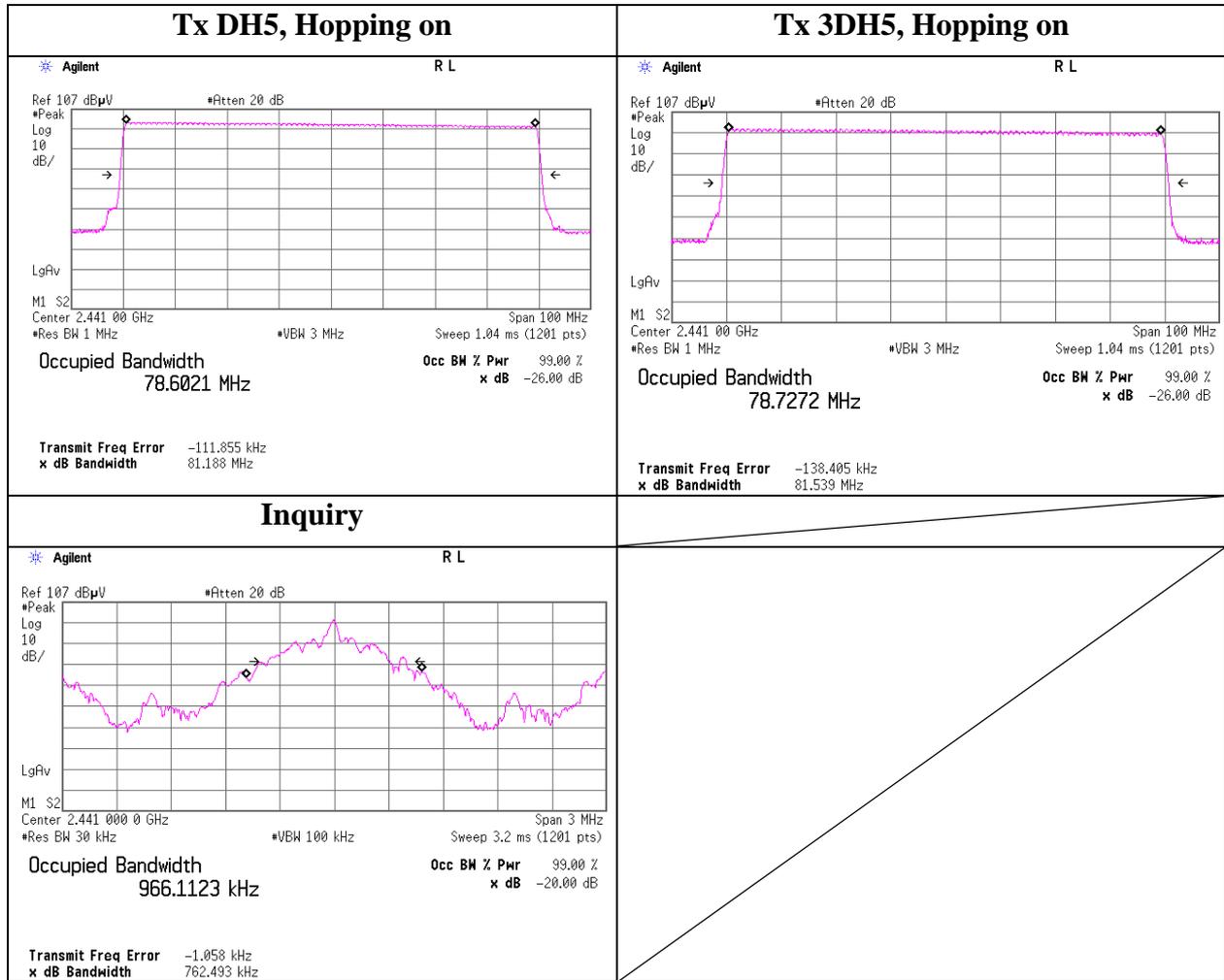
2480MHz



2480MHz



99% Occupied Bandwidth



APPENDIX 3: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2010/12/13 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2011/02/15 * 12
MAT-24	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71389	AT	2010/06/14 * 12
MCC-116	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	290221/4	AT	2010/08/05 * 12
MPM-13	Power Meter	Anritsu	ML2495A	0824014	AT	2010/11/01 * 12
MPSE-18	Power sensor	Anritsu	MA2411B	0738174	AT	2010/11/01 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2010/09/01 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2011/02/23 * 12
MJM-05	Measure	PROMART	SEN1955	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2010/11/30 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2011/01/16 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2010/09/30 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2010/05/07 * 12
MCC-114	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	290212/4	RE	2010/08/05 * 12
MCC-48	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX102	23771/2	RE	2010/08/16 * 12
MCC-18	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	148048-143(1m) / 292410(5m)	RE	2010/09/30 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2011/04/15 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2010/10/11 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2010/10/11 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2011/02/18 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2010/11/05 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2010/09/09 * 12

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item: RE: Radiated Emission

AT: Antenna Terminal Conducted test

UL Japan, Inc.

Head Office EMC Lab.

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

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124