

APPENDIX 2: Data of EMI test

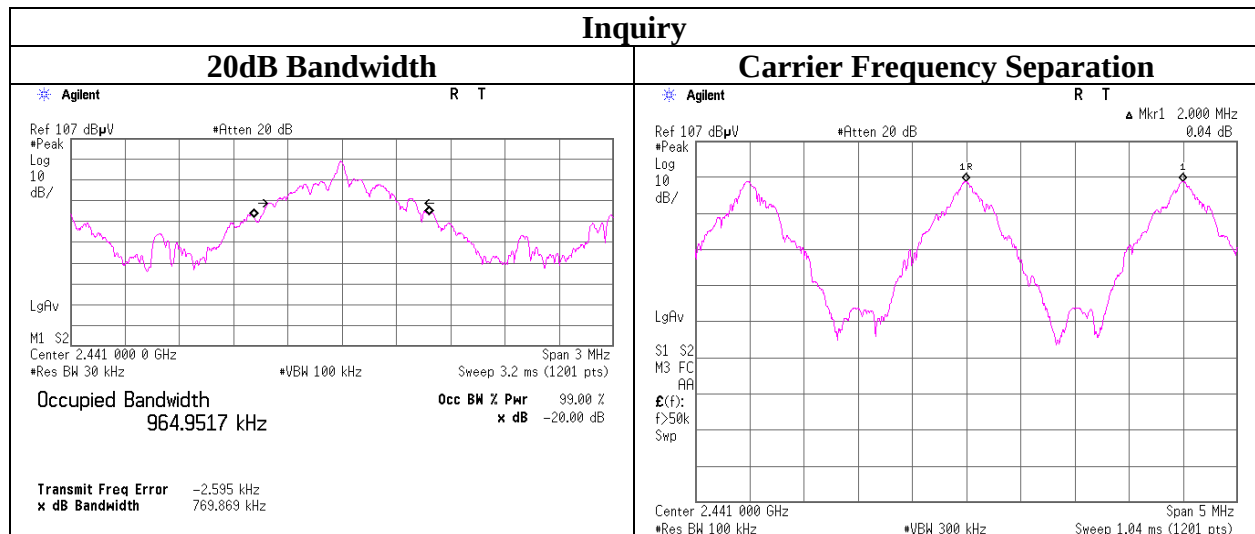
20dB Bandwidth and Carrier Frequency Separation

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	31FE0149-HO-01
Date	01/27/2011
Temperature/ Humidity	23 deg. C./ 26%
Engineer	Hironobu Ohnishi
Mode	Tx (Hopping on) DH5/3DH5/Inquiry

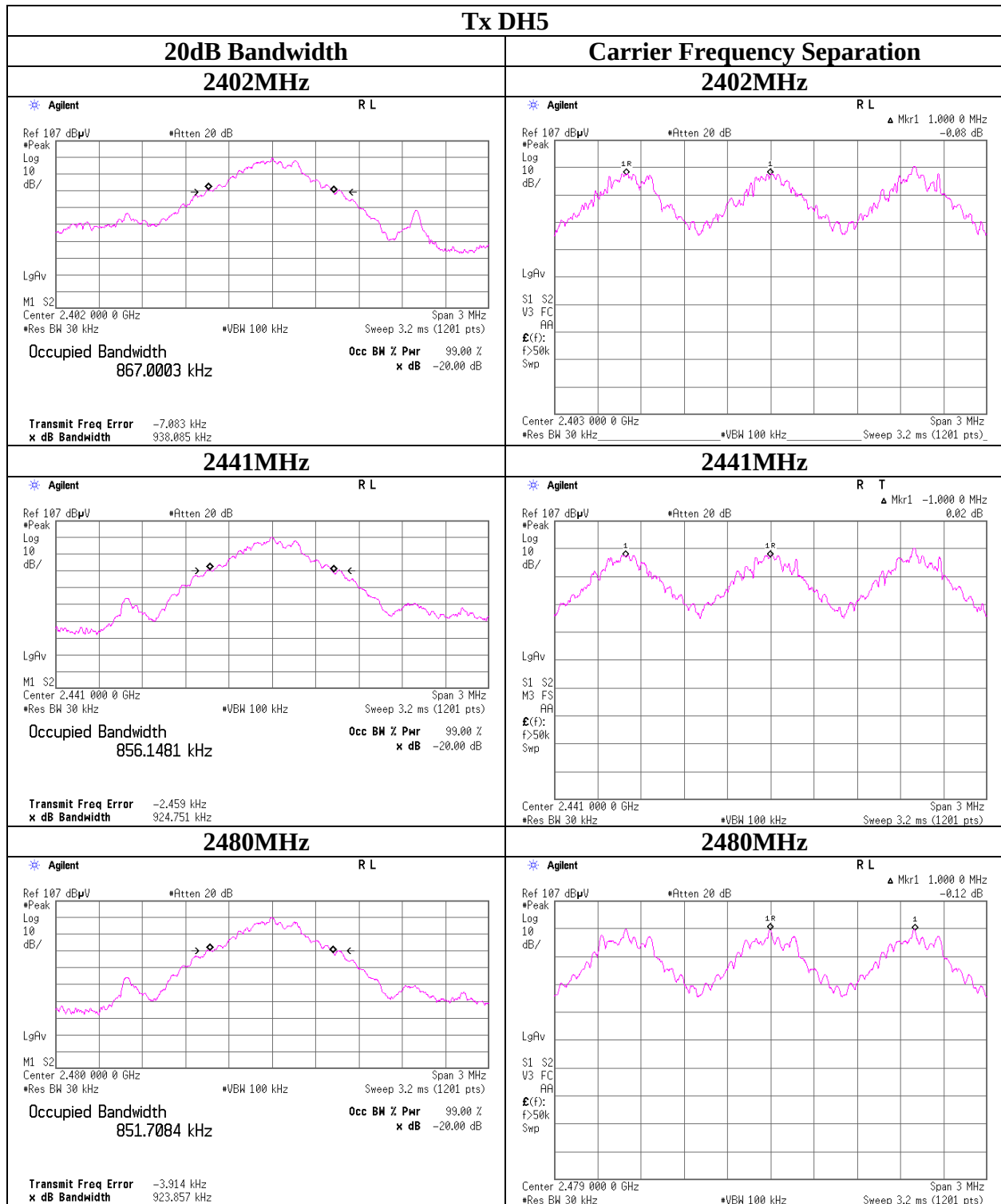
Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.938	1.000	>= 0.625
DH5	2441.0	0.925	1.000	>= 0.617
DH5	2480.0	0.924	1.000	>= 0.616
3DH5	2402.0	1.275	1.000	>= 0.850
3DH5	2441.0	1.268	1.000	>= 0.845
3DH5	2480.0	1.270	1.000	>= 0.847
Inquiry	2441.0	0.770	2.000	>= 0.513

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

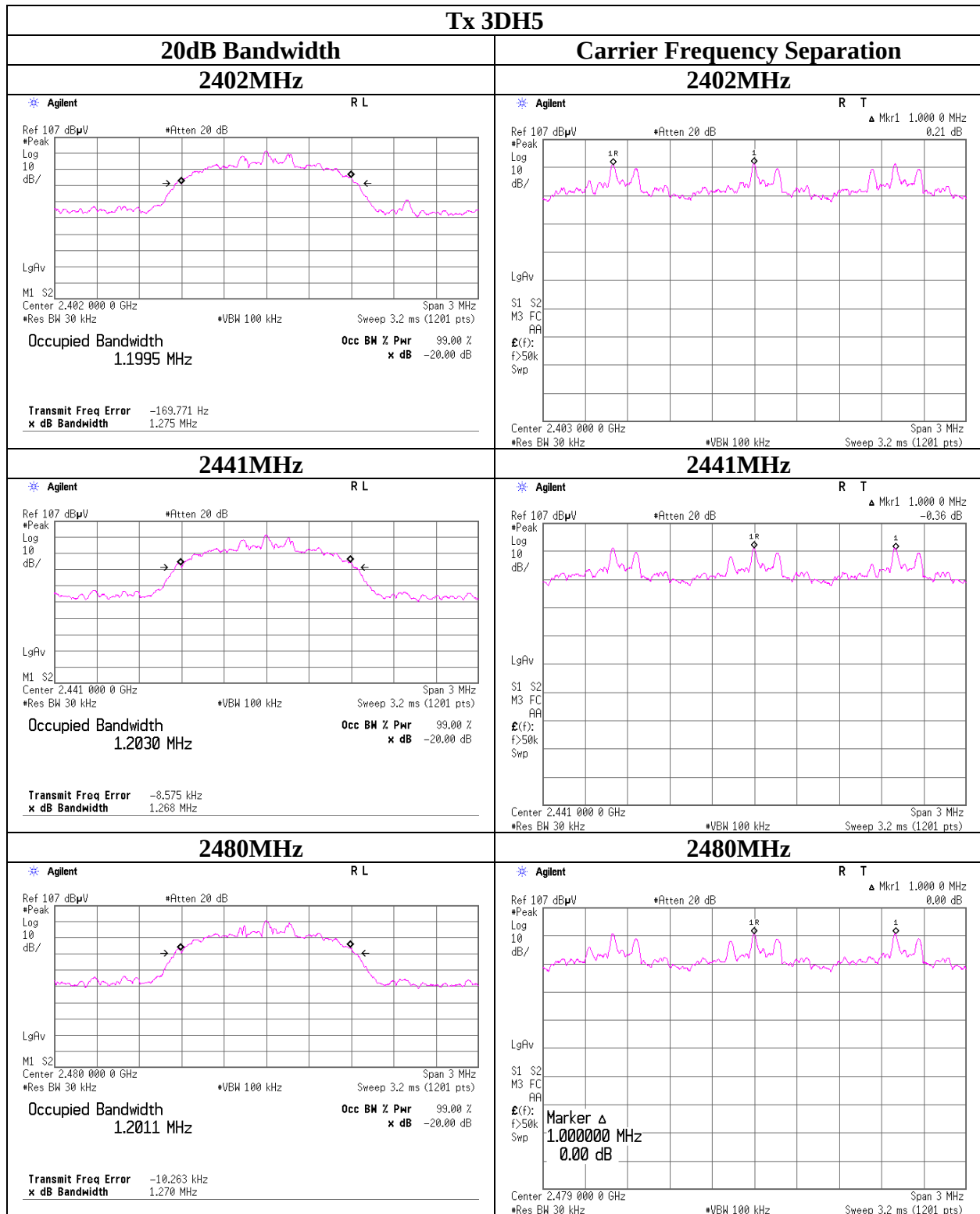
No limit applies to 20dB Bandwidth.



20dB Bandwidth and Carrier Frequency Separation



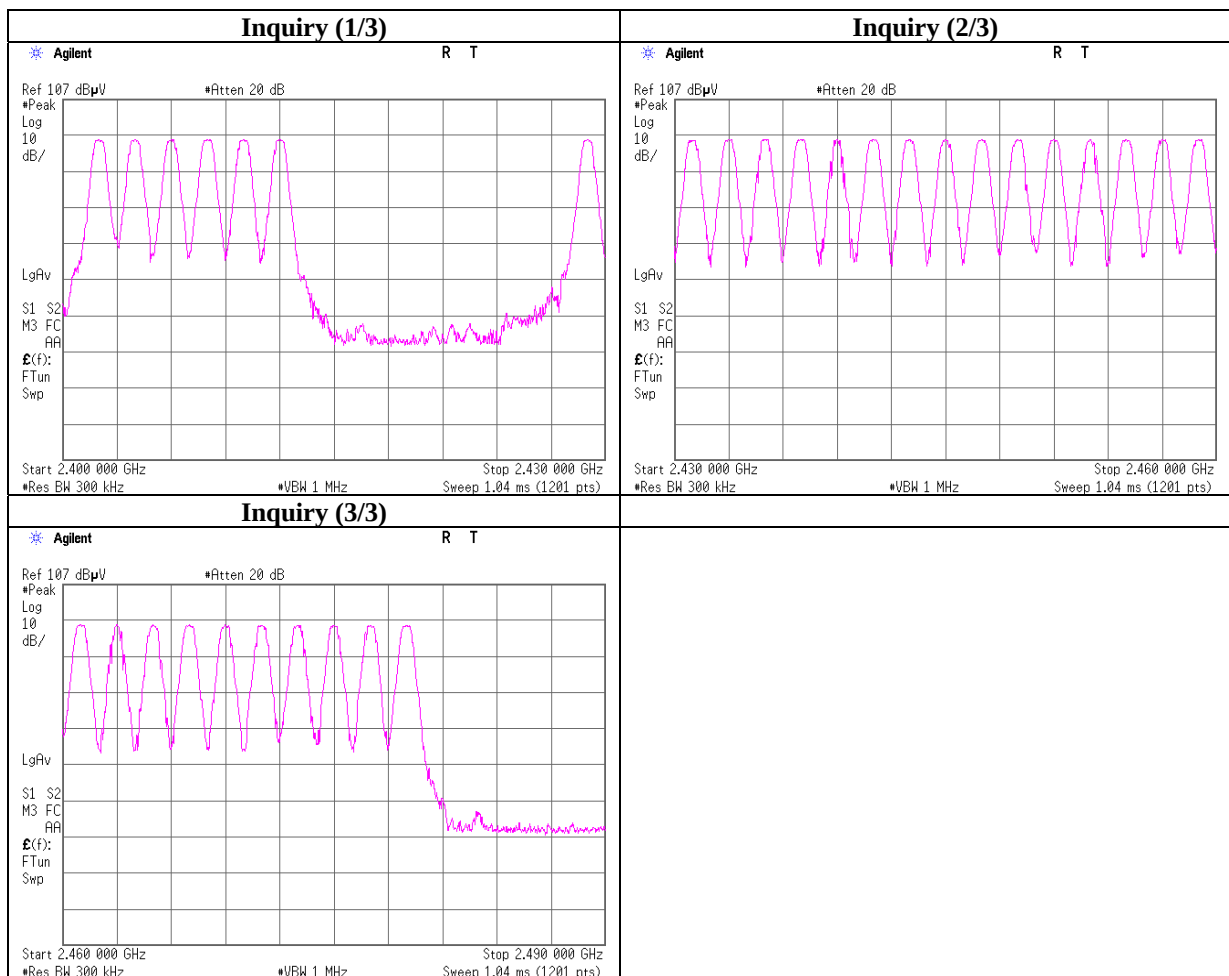
20dB Bandwidth and Carrier Frequency Separation



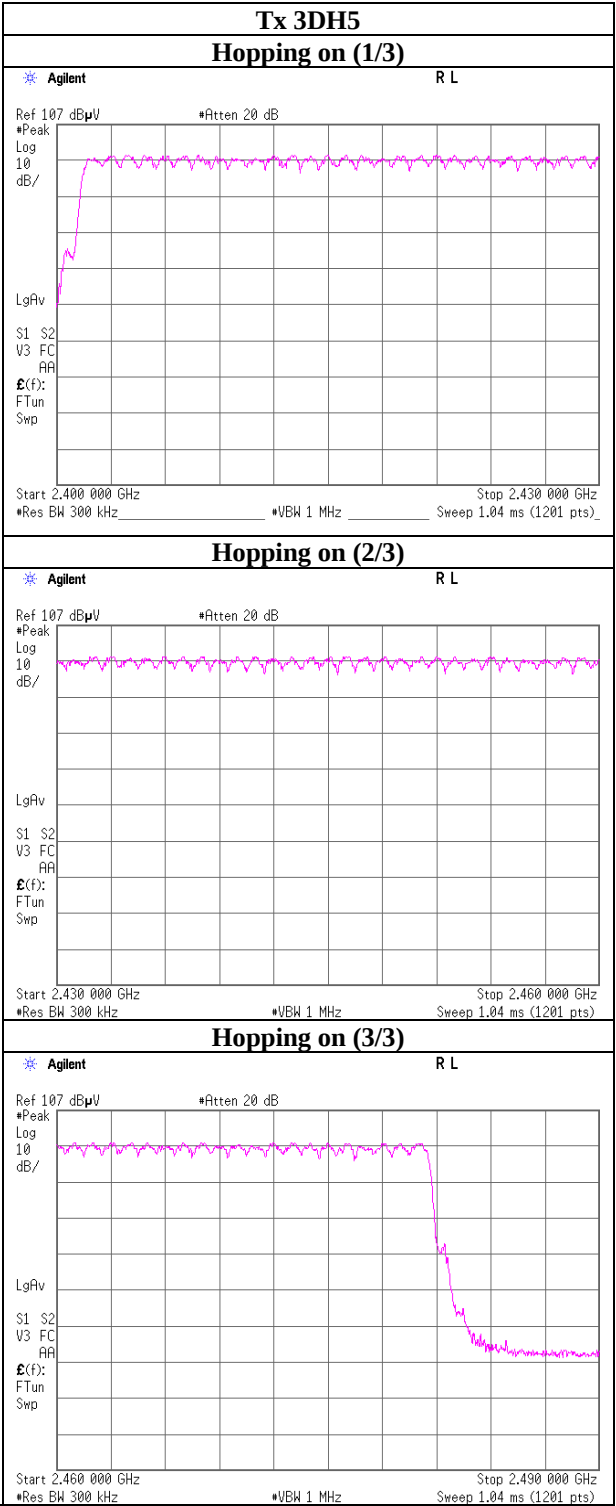
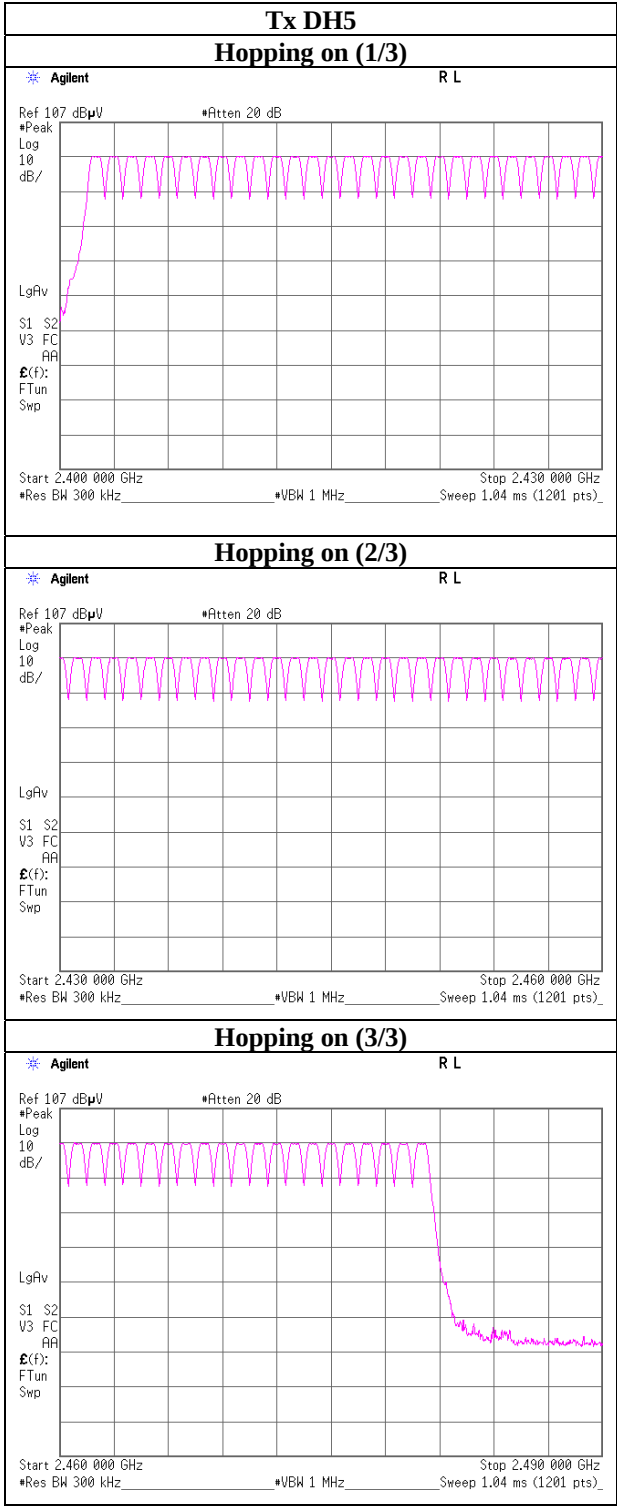
Number of Hopping Frequency

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	31FE0149-HO-01
Date	01/27/2011
Temperature/ Humidity	23 deg. C./ 26%
Engineer	Hironobu Ohnishi
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



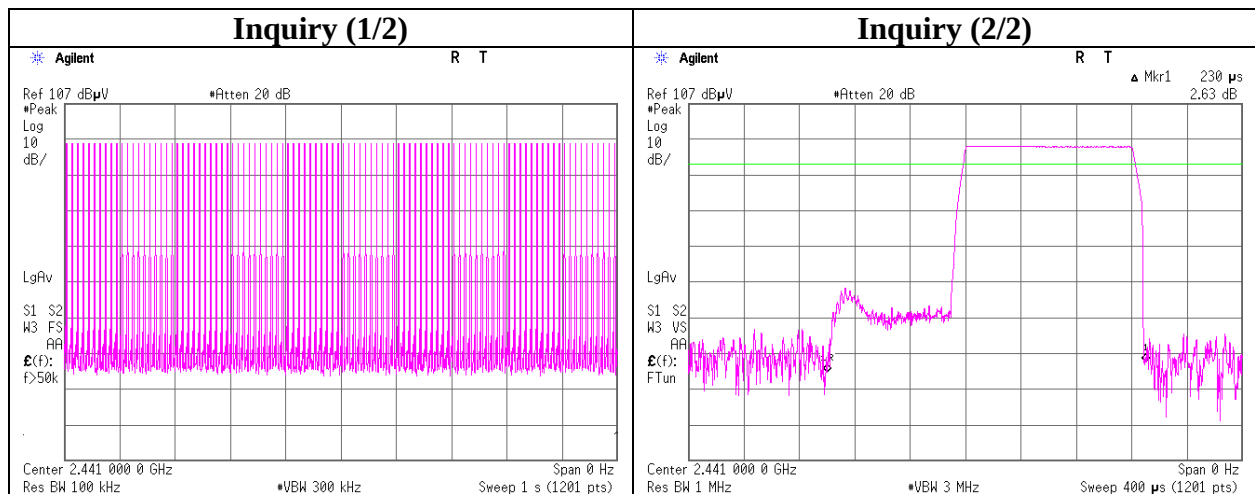
Dwell time

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	31FE0149-HO-01
Date	01/27/2011
Temperature/ Humidity	23 deg. C./ 26%
Engineer	Hironobu Ohnishi
Mode	Tx (Hopping on) DH5/3DH5/Inquiry

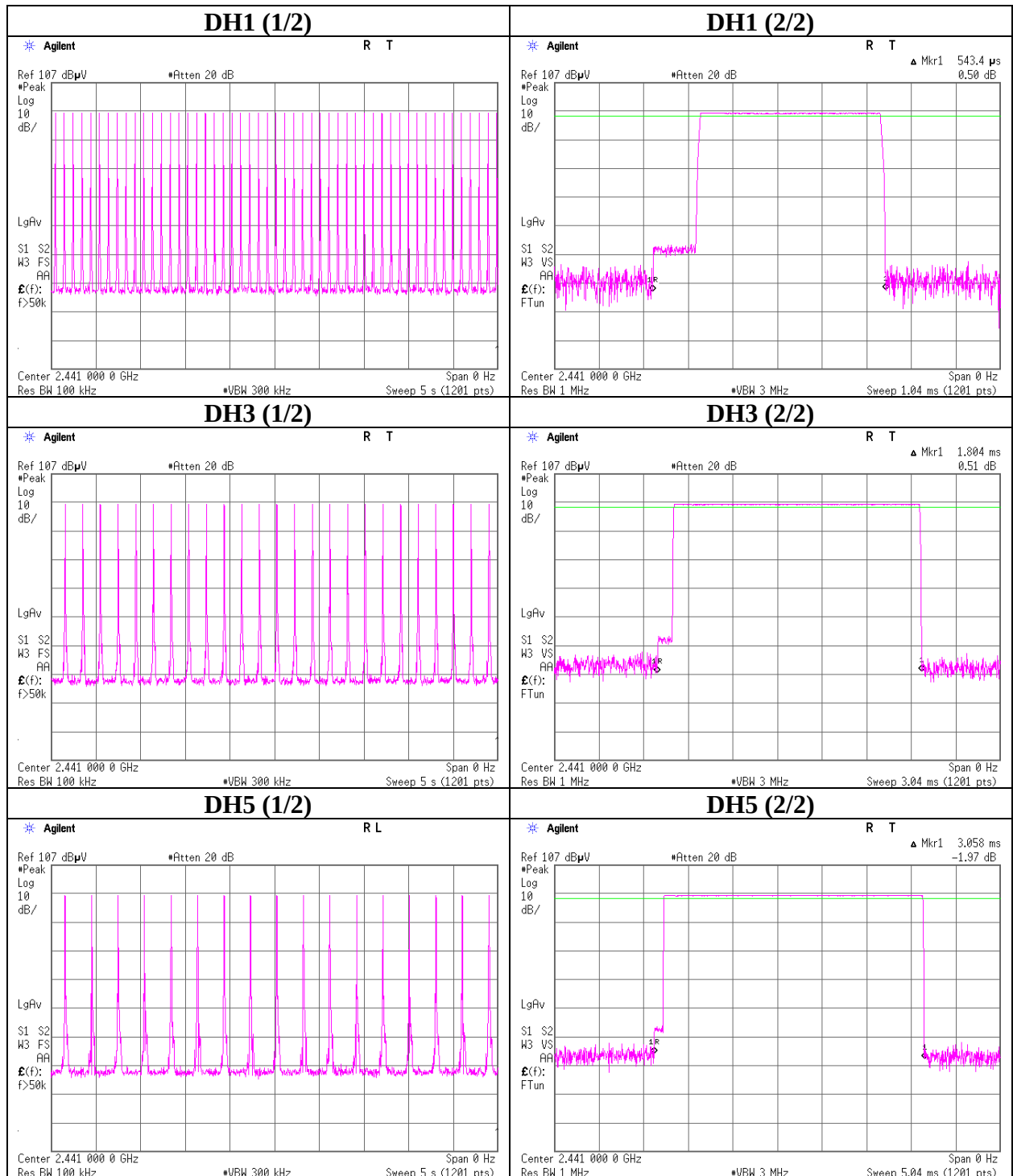
Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period				Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	51.0 times	/	5 sec. x	31.6 sec. = 323 times	0.543	176	400
DH3	25.0 times	/	5 sec. x	31.6 sec. = 158 times	1.804	285	400
DH5	17.0 times	/	5 sec. x	31.6 sec. = 108 times	3.058	330	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	1.816	287	400
3DH5	17.0 times	/	5 sec. x	31.6 sec. = 108 times	3.074	332	400
Inquiry	100.0 times	/	1 sec. x	12.8 sec. = 1280 times	0.230	294	400

Sample Calculation

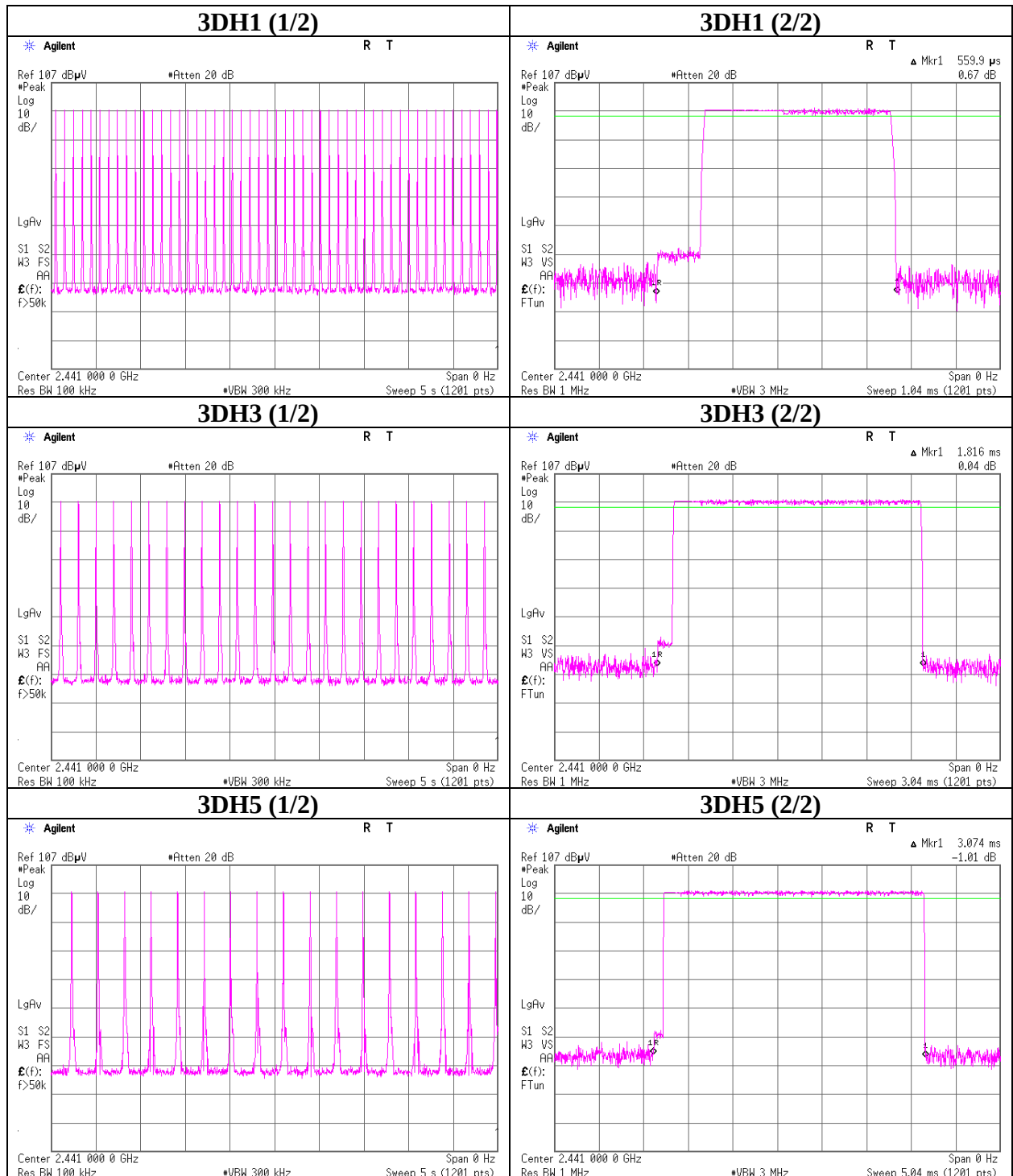
Result = Number of transmission x Length of transmission time



Dwell time



Dwell time



Maximum Peak Output Power

Test place Head Office EMC Lab. No.3 Measurement Room
Report No. 31FE0149-HO-01
Date 01/27/2011
Temperature/ Humidity 23 deg. C./ 26%
Engineer Hironobu Ohnishi
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	-9.19	0.50	10.08	1.39	1.38	20.97	125	19.58
DH5	2441.0	-9.53	0.50	10.08	1.05	1.27	20.97	125	19.92
DH5	2480.0	-9.86	0.50	10.08	0.72	1.18	20.97	125	20.25
3DH5	2402.0	-7.36	0.50	10.08	3.22	2.10	20.97	125	17.75
3DH5	2441.0	-7.63	0.50	10.08	2.95	1.97	20.97	125	18.02
3DH5	2480.0	-8.12	0.50	10.08	2.46	1.76	20.97	125	18.51
Inquiry	2441.0	-10.82	0.50	10.08	-0.24	0.95	20.97	125	21.21

Sample Calculation:

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

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

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 31FE0149-HO-01
Date 01/26/2011 01/27/2011
Temperature/ Humidity 22 deg. C./ 31% 23 deg. C./ 26%
Engineer Satofumi Matsuyama Satofumi Matsuyama

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	84.107	QP	50.8	7.3	7.8	32.1	33.8	40.0	6.2	
Hori	96.124	QP	43.8	9.6	7.9	32.0	29.3	43.5	14.2	
Hori	108.136	QP	42.0	11.5	8.0	32.0	29.5	43.5	14.0	
Hori	329.313	QP	36.4	16.3	9.9	31.9	30.7	46.0	15.3	
Hori	400.004	QP	33.4	17.5	10.3	31.9	29.3	46.0	16.7	
Hori	701.580	QP	32.8	22.1	12.1	32.2	34.8	46.0	11.2	
Hori	1563.534	PK	46.1	26.0	2.2	33.2	41.1	73.9	32.8	
Hori	2390.000	PK	43.3	27.2	2.8	32.1	41.2	73.9	32.7	
Hori	2400.000	PK	66.1	27.2	2.8	32.1	64.0	-	-	See 20dBc Data Sheet
Hori	4804.000	PK	48.9	30.8	5.5	31.4	53.8	73.9	20.1	
Hori	7206.000	PK	42.5	35.7	6.3	32.3	52.2	73.9	21.7	
Hori	9608.000	PK	45.2	37.8	6.9	33.0	56.9	73.9	17.0	
Hori	24020.000	PK	46.7	37.9	-1.4	31.7	51.5	73.9	22.4	
Hori	1563.534	AV	39.0	26.0	2.2	33.2	34.0	53.9	19.9	1M/10
Hori	2390.000	AV	31.5	27.2	2.8	32.1	29.4	53.9	24.5	1M/270
Hori	2400.000	AV	56.7	27.2	2.8	32.1	54.6	-	-	See 20dBc Data Sheet
Hori	4804.000	AV	44.6	30.8	5.5	31.4	49.5	53.9	4.4	1M/270
Hori	7206.000	AV	30.8	35.7	6.3	32.3	40.5	53.9	13.4	1M/10 NS
Hori	9608.000	AV	36.2	37.8	6.9	33.0	47.9	53.9	6.0	1M/270
Hori	24020.000	AV	34.4	37.9	-1.4	31.7	39.2	53.9	14.7	1M/10 NS
Vert	84.108	QP	47.1	7.3	7.8	32.1	30.1	40.0	9.9	
Vert	96.122	QP	39.7	9.6	7.9	32.0	25.2	43.5	18.3	
Vert	108.129	QP	39.9	11.5	8.0	32.0	27.4	43.5	16.1	
Vert	329.312	QP	32.0	16.3	9.9	31.9	26.3	46.0	19.7	
Vert	400.004	QP	33.6	17.5	10.3	31.9	29.5	46.0	16.5	
Vert	701.579	QP	27.4	22.1	12.1	32.2	29.4	46.0	16.6	
Vert	1563.518	PK	48.5	26.0	2.2	33.2	43.5	73.9	30.4	
Vert	2390.000	PK	44.2	27.2	2.8	32.1	42.1	73.9	31.8	
Vert	2400.000	PK	65.5	27.2	2.8	32.1	63.4	-	-	See 20dBc Data Sheet
Vert	4804.000	PK	48.4	30.8	5.5	31.4	53.3	73.9	20.6	
Vert	7206.000	PK	43.0	35.7	6.3	32.3	52.7	73.9	21.2	
Vert	9608.000	PK	45.7	37.8	6.9	33.0	57.4	73.9	16.5	
Vert	24020.000	PK	46.8	37.9	-1.4	31.7	51.6	73.9	22.3	
Vert	1563.518	AV	44.3	26.0	2.2	33.2	39.3	53.9	14.6	1M/10
Vert	2390.000	AV	31.7	27.2	2.8	32.1	29.6	53.9	24.3	1M/270
Vert	2400.000	AV	56.3	27.2	2.8	32.1	54.2	-	-	See 20dBc Data Sheet
Vert	4804.000	AV	43.7	30.8	5.5	31.4	48.6	53.9	5.3	1M/270
Vert	7206.000	AV	30.6	35.7	6.3	32.3	40.3	53.9	13.6	1M/10 NS
Vert	9608.000	AV	36.6	37.8	6.9	33.0	48.3	53.9	5.6	1M/270
Vert	24020.000	AV	34.4	37.9	-1.4	31.7	39.2	53.9	14.7	1M/10 NS

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

NS: No Signal Detect

Radiated Spurious Emission
20dBc Data Sheet

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 31FE0149-HO-01
Date 01/26/2011
Temperature/ Humidity 22 deg. C./ 31%
Engineer Satofumi Matsuyama

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	100.9	27.2	2.8	32.1	98.8	-	-	Carrier
Hori	2400.000	PK	58.2	27.2	2.8	32.1	56.1	78.8	22.7	
Vert	2402.000	PK	101.0	27.2	2.8	32.1	98.9	-	-	Carrier
Vert	2400.000	PK	57.3	27.2	2.8	32.1	55.2	78.9	23.7	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 31FE0149-HO-01
Date 01/26/2011 01/27/2011
Temperature/ Humidity 22 deg. C./ 31% 23 deg. C./ 26%
Engineer Satofumi Matsuyama Satofumi Matsuyama
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	84.106	QP	51.5	7.3	7.8	32.1	34.5	40.0	5.5	
Hori	96.122	QP	44.0	9.6	7.9	32.0	29.5	43.5	14.0	
Hori	108.135	QP	42.4	11.5	8.0	32.0	29.9	43.5	13.6	
Hori	329.313	QP	36.1	16.3	9.9	31.9	30.4	46.0	15.6	
Hori	400.003	QP	32.7	17.5	10.3	31.9	28.6	46.0	17.4	
Hori	701.582	QP	32.6	22.1	12.1	32.2	34.6	46.0	11.4	
Hori	1563.529	PK	46.6	26.0	2.2	33.2	41.6	73.9	32.3	
Hori	4882.000	PK	48.7	31.0	5.4	31.4	53.7	73.9	20.2	
Hori	7323.000	PK	42.2	35.9	6.4	32.4	52.1	73.9	21.8	
Hori	9764.000	PK	46.2	38.0	7.0	33.0	58.2	73.9	15.7	
Hori	24410.000	PK	45.4	37.9	-1.3	31.6	50.4	73.9	23.5	
Hori	1563.529	AV	38.8	26.0	2.2	33.2	33.8	53.9	20.1	1M/10
Hori	4882.000	AV	44.1	31.0	5.4	31.4	49.1	53.9	4.8	1M/270
Hori	7323.000	AV	30.3	35.9	6.4	32.4	40.2	53.9	13.7	1M/10 NS
Hori	9764.000	AV	36.9	38.0	7.0	33.0	48.9	53.9	5.0	1M/270
Hori	24410.000	AV	33.3	37.9	-1.3	31.6	38.3	53.9	15.6	1M/10 NS
Vert	84.106	QP	47.1	7.3	7.8	32.1	30.1	40.0	9.9	
Vert	96.121	QP	39.8	9.6	7.9	32.0	25.3	43.5	18.2	
Vert	108.138	QP	39.9	11.5	8.0	32.0	27.4	43.5	16.1	
Vert	329.313	QP	32.1	16.3	9.9	31.9	26.4	46.0	19.6	
Vert	400.004	QP	32.6	17.5	10.3	31.9	28.5	46.0	17.5	
Vert	701.583	QP	27.3	22.1	12.1	32.2	29.3	46.0	16.7	
Vert	1563.544	PK	48.8	26.0	2.2	33.2	43.8	73.9	30.1	
Vert	4882.000	PK	46.7	31.0	5.4	31.4	51.7	73.9	22.2	
Vert	7323.000	PK	42.4	35.9	6.4	32.4	52.3	73.9	21.6	
Vert	9764.000	PK	46.4	38.0	7.0	33.0	58.4	73.9	15.5	
Vert	24410.000	PK	45.4	37.9	-1.3	31.6	50.4	73.9	23.5	
Vert	1563.544	AV	44.4	26.0	2.2	33.2	39.4	53.9	14.5	1M/10
Vert	4882.000	AV	41.5	31.0	5.4	31.4	46.5	53.9	7.4	1M/270
Vert	7323.000	AV	30.7	35.9	6.4	32.4	40.6	53.9	13.3	1M/10 NS
Vert	9764.000	AV	36.9	38.0	7.0	33.0	48.9	53.9	5.0	1M/270
Vert	24410.000	AV	33.3	37.9	-1.3	31.6	38.3	53.9	15.6	1M/10 NS

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

NS: No Signal Detect

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 31FE0149-HO-01
Date 01/26/2011 01/27/2011
Temperature/ Humidity 22 deg. C./ 31% 23 deg. C./ 26%
Engineer Satofumi Matsuyama Satofumi Matsuyama
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	84.101	QP	51.5	7.3	7.8	32.1	34.5	40.0	5.5	
Hori	96.115	QP	43.8	9.6	7.9	32.0	29.3	43.5	14.2	
Hori	108.129	QP	42.4	11.5	8.0	32.0	29.9	43.5	13.6	
Hori	329.313	QP	36.3	16.3	9.9	31.9	30.6	46.0	15.4	
Hori	400.003	QP	32.6	17.5	10.3	31.9	28.5	46.0	17.5	
Hori	701.580	QP	31.7	22.1	12.1	32.2	33.7	46.0	12.3	
Hori	1563.569	PK	46.1	26.0	2.2	33.2	41.1	73.9	32.8	
Hori	2483.500	PK	49.6	27.2	2.8	32.1	47.5	73.9	26.4	
Hori	2484.686	PK	49.9	27.2	2.9	32.1	47.9	73.9	26.0	
Hori	4960.000	PK	47.5	31.3	5.4	31.4	52.8	73.9	21.1	
Hori	7440.000	PK	43.2	36.1	6.4	32.4	53.3	73.9	20.6	
Hori	9920.000	PK	44.9	38.2	7.0	33.0	57.1	73.9	16.8	
Hori	24800.000	PK	47.9	37.9	-1.1	31.5	53.2	73.9	20.7	
Hori	1563.569	AV	38.0	26.0	2.2	33.2	33.0	53.9	20.9	1M/10
Hori	2483.500	AV	38.1	27.2	2.8	32.1	36.0	53.9	17.9	1M/270
Hori	2484.686	AV	39.3	27.2	2.9	32.1	37.3	53.9	16.6	1M/270
Hori	4960.000	AV	42.6	31.3	5.4	31.4	47.9	53.9	6.0	1M/270
Hori	7440.000	AV	31.0	36.1	6.4	32.4	41.1	53.9	12.8	1M/10 NS
Hori	9920.000	AV	34.4	38.2	7.0	33.0	46.6	53.9	7.3	1M/270
Hori	24800.000	AV	35.8	37.9	-1.1	31.5	41.1	53.9	12.8	1M/10 NS
Vert	84.101	QP	48.1	7.3	7.8	32.1	31.1	40.0	8.9	
Vert	96.116	QP	39.9	9.6	7.9	32.0	25.4	43.5	18.1	
Vert	108.130	QP	40.1	11.5	8.0	32.0	27.6	43.5	15.9	
Vert	329.315	QP	32.3	16.3	9.9	31.9	26.6	46.0	19.4	
Vert	400.003	QP	33.6	17.5	10.3	31.9	29.5	46.0	16.5	
Vert	701.582	QP	27.2	22.1	12.1	32.2	29.2	46.0	16.8	
Vert	1563.558	PK	48.2	26.0	2.2	33.2	43.2	73.9	30.7	
Vert	2483.500	PK	49.0	27.2	2.8	32.1	46.9	73.9	27.0	
Vert	2484.698	PK	49.6	27.2	2.9	32.1	47.6	73.9	26.3	
Vert	4960.000	PK	45.3	31.3	5.4	31.4	50.6	73.9	23.3	
Vert	7440.000	PK	42.7	36.1	6.4	32.4	52.8	73.9	21.1	
Vert	9920.000	PK	46.3	38.2	7.0	33.0	58.5	73.9	15.4	
Vert	24800.000	PK	48.4	37.9	-1.1	31.5	53.7	73.9	20.2	
Vert	1563.558	AV	43.3	26.0	2.2	33.2	38.3	53.9	15.6	1M/10
Vert	2483.500	AV	37.1	27.2	2.8	32.1	35.0	53.9	18.9	1M/270
Vert	2484.698	AV	38.4	27.2	2.9	32.1	36.4	53.9	17.5	1M/270
Vert	4960.000	AV	37.8	31.3	5.4	31.4	43.1	53.9	10.8	1M/270
Vert	7440.000	AV	31.2	36.1	6.4	32.4	41.3	53.9	12.6	1M/10 NS
Vert	9920.000	AV	37.0	38.2	7.0	33.0	49.2	53.9	4.7	1M/270
Vert	24800.000	AV	35.8	37.9	-1.1	31.5	41.1	53.9	12.8	1M/10 NS

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

NS: No Signal Detect

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 31FE0149-HO-01
Date 01/26/2011 01/27/2011
Temperature/ Humidity 22 deg. C./ 31% 23 deg. C./ 26%
Engineer Satofumi Matsuyama Satofumi Matsuyama
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	84.103	QP	51.6	7.3	7.8	32.1	34.6	40.0	5.4	
Hori	96.116	QP	43.9	9.6	7.9	32.0	29.4	43.5	14.1	
Hori	108.130	QP	42.5	11.5	8.0	32.0	30.0	43.5	13.5	
Hori	329.313	QP	36.0	16.3	9.9	31.9	30.3	46.0	15.7	
Hori	400.003	QP	32.9	17.5	10.3	31.9	28.8	46.0	17.2	
Hori	701.579	QP	31.8	22.1	12.1	32.2	33.8	46.0	12.2	
Hori	1563.544	PK	46.8	26.0	2.2	33.2	41.8	73.9	32.1	
Hori	2390.000	PK	43.2	27.2	2.8	32.1	41.1	73.9	32.8	
Hori	2400.000	PK	71.7	27.2	2.8	32.1	69.6	-	-	See 20dBc Data Sheet
Hori	4804.000	PK	46.7	30.8	5.5	31.4	51.6	73.9	22.3	
Hori	7206.000	PK	42.1	35.7	6.3	32.3	51.8	73.9	22.1	
Hori	9608.000	PK	42.6	37.8	6.9	33.0	54.3	73.9	19.6	
Hori	24020.000	PK	47.0	37.9	-1.4	31.7	51.8	73.9	22.1	
Hori	1563.544	AV	39.1	26.0	2.2	33.2	34.1	53.9	19.8	1M/10
Hori	2390.000	AV	31.0	27.2	2.8	32.1	28.9	53.9	25.0	1M/270
Hori	2400.000	AV	59.0	27.2	2.8	32.1	56.9	-	-	See 20dBc Data Sheet
Hori	4804.000	AV	37.1	30.8	5.5	31.4	42.0	53.9	11.9	1M/270
Hori	7206.000	AV	30.5	35.7	6.3	32.3	40.2	53.9	13.7	1M/10 NS
Hori	9608.000	AV	31.6	37.8	6.9	33.0	43.3	53.9	10.6	1M/270
Hori	24020.000	AV	35.0	37.9	-1.4	31.7	39.8	53.9	14.1	1M/10 NS
Vert	84.101	QP	47.8	7.3	7.8	32.1	30.8	40.0	9.2	
Vert	96.115	QP	39.3	9.6	7.9	32.0	24.8	43.5	18.7	
Vert	108.129	QP	40.1	11.5	8.0	32.0	27.6	43.5	15.9	
Vert	329.314	QP	32.2	16.3	9.9	31.9	26.5	46.0	19.5	
Vert	400.003	QP	33.0	17.5	10.3	31.9	28.9	46.0	17.1	
Vert	701.581	QP	26.8	22.1	12.1	32.2	28.8	46.0	17.2	
Vert	1563.518	PK	48.7	26.0	2.2	33.2	43.7	73.9	30.2	
Vert	2390.000	PK	44.7	27.2	2.8	32.1	42.6	73.9	31.3	
Vert	2400.000	PK	74.6	27.2	2.8	32.1	72.5	-	-	See 20dBc Data Sheet
Vert	4804.000	PK	44.9	30.8	5.5	31.4	49.8	73.9	24.1	
Vert	7206.000	PK	42.2	35.7	6.3	32.3	51.9	73.9	22.0	
Vert	9608.000	PK	42.4	37.8	6.9	33.0	54.1	73.9	19.8	
Vert	24020.000	PK	46.8	37.9	-1.4	31.7	51.6	73.9	22.3	
Vert	1563.518	AV	44.2	26.0	2.2	33.2	39.2	53.9	14.7	1M/10
Vert	2390.000	AV	32.4	27.2	2.8	32.1	30.3	53.9	23.6	1M/270
Vert	2400.000	AV	62.1	27.2	2.8	32.1	60.0	-	-	See 20dBc Data Sheet
Vert	4804.000	AV	35.6	30.8	5.5	31.4	40.5	53.9	13.4	1M/270
Vert	7206.000	AV	30.6	35.7	6.3	32.3	40.3	53.9	13.6	1M/10 NS
Vert	9608.000	AV	31.4	37.8	6.9	33.0	43.1	53.9	10.8	1M/270
Vert	24020.000	AV	35.0	37.9	-1.4	31.7	39.8	53.9	14.1	1M/10 NS

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

NS: No Signal Detect

Radiated Spurious Emission
20dBc Data Sheet

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 31FE0149-HO-01
Date 01/26/2011
Temperature/ Humidity 22 deg. C./ 31%
Engineer Satofumi Matsuyama

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	98.0	27.2	2.8	32.1	95.9	-	-	Carrier
Hori	2400.000	PK	56.2	27.2	2.8	32.1	54.1	75.9	21.8	
Vert	2402.000	PK	101.2	27.2	2.8	32.1	99.1	-	-	Carrier
Vert	2400.000	PK	59.1	27.2	2.8	32.1	57.0	79.1	22.1	

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. 31FE0149-HO-01
Date 01/26/2011 01/27/2011
Temperature/ Humidity 22 deg. C./ 31% 23 deg. C./ 26%
Engineer Satofumi Matsuyama Satofumi Matsuyama

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	84.102	QP	51.8	7.3	7.8	32.1	34.8	40.0	5.2	
Hori	96.115	QP	43.9	9.6	7.9	32.0	29.4	43.5	14.1	
Hori	108.128	QP	42.6	11.5	8.0	32.0	30.1	43.5	13.4	
Hori	329.313	QP	36.1	16.3	9.9	31.9	30.4	46.0	15.6	
Hori	400.003	QP	33.0	17.5	10.3	31.9	28.9	46.0	17.1	
Hori	701.579	QP	31.8	22.1	12.1	32.2	33.8	46.0	12.2	
Hori	1563.529	PK	46.9	26.0	2.2	33.2	41.9	73.9	32.0	
Hori	4882.000	PK	45.5	31.0	5.4	31.4	50.5	73.9	23.4	
Hori	7323.000	PK	41.8	35.9	6.4	32.4	51.7	73.9	22.2	
Hori	9764.000	PK	43.5	38.0	7.0	33.0	55.5	73.9	18.4	
Hori	24410.000	PK	45.2	37.9	-1.3	31.6	50.2	73.9	23.7	
Hori	1563.529	AV	39.1	26.0	2.2	33.2	34.1	53.9	19.8	1M/10
Hori	4882.000	AV	36.4	31.0	5.4	31.4	41.4	53.9	12.5	1M/270
Hori	7323.000	AV	30.4	35.9	6.4	32.4	40.3	53.9	13.6	1M/10 NS
Hori	9764.000	AV	31.7	38.0	7.0	33.0	43.7	53.9	10.2	1M/270
Hori	24410.000	AV	33.3	37.9	-1.3	31.6	38.3	53.9	15.6	1M/10 NS
Vert	84.101	QP	47.9	7.3	7.8	32.1	30.9	40.0	9.1	
Vert	96.117	QP	39.8	9.6	7.9	32.0	25.3	43.5	18.2	
Vert	108.122	QP	40.2	11.5	8.0	32.0	27.7	43.5	15.8	
Vert	329.312	QP	32.4	16.3	9.9	31.9	26.7	46.0	19.3	
Vert	400.005	QP	32.8	17.5	10.3	31.9	28.7	46.0	17.3	
Vert	701.580	QP	27.6	22.1	12.1	32.2	29.6	46.0	16.4	
Vert	1563.544	PK	49.1	26.0	2.2	33.2	44.1	73.9	29.8	
Vert	4882.000	PK	44.6	31.0	5.4	31.4	49.6	73.9	24.3	
Vert	7323.000	PK	42.1	35.9	6.4	32.4	52.0	73.9	21.9	
Vert	9764.000	PK	43.3	38.0	7.0	33.0	55.3	73.9	18.6	
Vert	24410.000	PK	46.0	37.9	-1.3	31.6	51.0	73.9	22.9	
Vert	1563.544	AV	44.0	26.0	2.2	33.2	39.0	53.9	14.9	1M/10
Vert	4882.000	AV	35.2	31.0	5.4	31.4	40.2	53.9	13.7	1M/270
Vert	7323.000	AV	30.5	35.9	6.4	32.4	40.4	53.9	13.5	1M/10 NS
Vert	9764.000	AV	31.6	38.0	7.0	33.0	43.6	53.9	10.3	1M/270
Vert	24410.000	AV	33.3	37.9	-1.3	31.6	38.3	53.9	15.6	1M/10 NS

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

*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

NS: No Signal Detect

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 31FE0149-HO-01
Date : 01/26/2011 01/27/2011
Temperature/ Humidity : 22 deg. C./ 31% 23 deg. C./ 26%
Engineer : Satofumi Matsuyama Satofumi Matsuyama

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	84.101	QP	51.6	7.3	7.8	32.1	34.6	40.0	5.4	
Hori	96.117	QP	43.9	9.6	7.9	32.0	29.4	43.5	14.1	
Hori	108.127	QP	42.4	11.5	8.0	32.0	29.9	43.5	13.6	
Hori	329.314	QP	36.4	16.3	9.9	31.9	30.7	46.0	15.3	
Hori	400.001	QP	33.1	17.5	10.3	31.9	29.0	46.0	17.0	
Hori	701.581	QP	31.9	22.1	12.1	32.2	33.9	46.0	12.1	
Hori	1563.550	PK	46.6	26.0	2.2	33.2	41.6	73.9	32.3	
Hori	2483.500	PK	51.1	27.2	2.8	32.1	49.0	73.9	24.9	
Hori	2484.157	PK	50.2	27.2	2.9	32.1	48.2	73.9	25.7	
Hori	4960.000	PK	43.0	31.3	5.4	31.4	48.3	73.9	25.6	
Hori	7440.000	PK	42.6	36.1	6.4	32.4	52.7	73.9	21.2	
Hori	9920.000	PK	43.3	38.2	7.0	33.0	55.5	73.9	18.4	
Hori	24800.000	PK	48.4	37.9	-1.1	31.5	53.7	73.9	20.2	
Hori	1563.550	AV	38.5	26.0	2.2	33.2	33.5	53.9	20.4	1M/10
Hori	2483.500	AV	39.1	27.2	2.8	32.1	37.0	53.9	16.9	1M/270
Hori	2484.157	AV	37.9	27.2	2.9	32.1	35.9	53.9	18.0	1M/270
Hori	4960.000	AV	32.6	31.3	5.4	31.4	37.9	53.9	16.0	1M/270
Hori	7440.000	AV	31.1	36.1	6.4	32.4	41.2	53.9	12.7	1M/10 NS
Hori	9920.000	AV	31.0	38.2	7.0	33.0	43.2	53.9	10.7	1M/10 NS
Hori	24800.000	AV	35.8	37.9	-1.1	31.5	41.1	53.9	12.8	1M/10 NS
Vert	84.102	QP	47.8	7.3	7.8	32.1	30.8	40.0	9.2	
Vert	96.118	QP	39.8	9.6	7.9	32.0	25.3	43.5	18.2	
Vert	108.126	QP	40.2	11.5	8.0	32.0	27.7	43.5	15.8	
Vert	329.314	QP	32.4	16.3	9.9	31.9	26.7	46.0	19.3	
Vert	400.003	QP	32.8	17.5	10.3	31.9	28.7	46.0	17.3	
Vert	701.582	QP	26.9	22.1	12.1	32.2	28.9	46.0	17.1	
Vert	1563.525	PK	48.3	26.0	2.2	33.2	43.3	73.9	30.6	
Vert	2483.500	PK	51.3	27.2	2.8	32.1	49.2	73.9	24.7	
Vert	2484.149	PK	49.6	27.2	2.9	32.1	47.6	73.9	26.3	
Vert	4960.000	PK	41.4	31.3	5.4	31.4	46.7	73.9	27.2	
Vert	7440.000	PK	42.1	36.1	6.4	32.4	52.2	73.9	21.7	
Vert	9920.000	PK	42.4	38.2	7.0	33.0	54.6	73.9	19.3	
Vert	24800.000	PK	48.6	37.9	-1.1	31.5	53.9	73.9	20.0	
Vert	1563.525	AV	44.0	26.0	2.2	33.2	39.0	53.9	14.9	1M/10
Vert	2483.500	AV	38.9	27.2	2.8	32.1	36.8	53.9	17.1	1M/270
Vert	2484.149	AV	37.7	27.2	2.9	32.1	35.7	53.9	18.2	1M/270
Vert	4960.000	AV	30.4	31.3	5.4	31.4	35.7	53.9	18.2	1M/270
Vert	7440.000	AV	31.1	36.1	6.4	32.4	41.2	53.9	12.7	1M/10 NS
Vert	9920.000	AV	30.8	38.2	7.0	33.0	43.0	53.9	10.9	1M/10 NS
Vert	24800.000	AV	35.8	37.9	-1.1	31.5	41.1	53.9	12.8	1M/10 NS

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

NS: No Signal Detect

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 31FE0149-HO-01
Date 01/26/2011 01/27/2011
Temperature/ Humidity 22 deg. C./ 31% 23 deg. C./ 26%
Engineer Satofumi Matsuyama Satofumi Matsuyama
Mode Rx 2441MHz

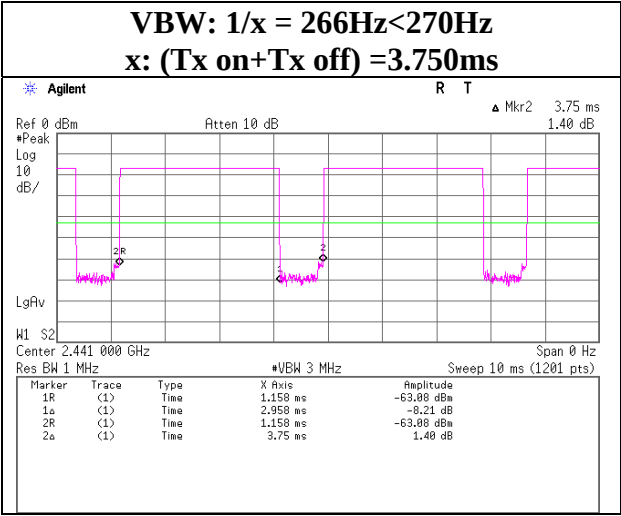
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	84.100	QP	51.5	7.3	7.8	32.1	34.5	40.0	5.5	
Hori	96.114	QP	43.9	9.6	7.9	32.0	29.4	43.5	14.1	
Hori	108.129	QP	42.5	11.5	8.0	32.0	30.0	43.5	13.5	
Hori	329.313	QP	36.3	16.3	9.9	31.9	30.6	46.0	15.4	
Hori	400.003	QP	33.0	17.5	10.3	31.9	28.9	46.0	17.1	
Hori	701.581	QP	31.9	22.1	12.1	32.2	33.9	46.0	12.1	
Hori	1563.485	PK	47.2	26.0	2.2	33.2	42.2	73.9	31.7	
Hori	2441.000	PK	43.0	27.2	2.8	32.1	40.9	73.9	33.0	
Hori	2442.583	PK	48.9	27.2	2.8	32.1	46.8	73.9	27.1	
Hori	1563.485	AV	38.8	26.0	2.2	33.2	33.8	53.9	20.1	1M/10
Hori	2441.000	AV	31.7	27.2	2.8	32.1	29.6	53.9	24.3	1M/10 NS
Hori	2442.583	AV	43.7	27.2	2.8	32.1	41.6	53.9	12.3	1M/10
Vert	84.101	QP	47.6	7.3	7.8	32.1	30.6	40.0	9.4	
Vert	96.115	QP	39.9	9.6	7.9	32.0	25.4	43.5	18.1	
Vert	108.128	QP	40.1	11.5	8.0	32.0	27.6	43.5	15.9	
Vert	329.314	QP	32.3	16.3	9.9	31.9	26.6	46.0	19.4	
Vert	400.004	QP	33.0	17.5	10.3	31.9	28.9	46.0	17.1	
Vert	701.581	QP	27.4	22.1	12.1	32.2	29.4	46.0	16.6	
Vert	1563.511	PK	49.5	26.0	2.2	33.2	44.5	73.9	29.4	
Vert	2441.000	PK	42.8	27.2	2.8	32.1	40.7	73.9	33.2	
Vert	2442.338	PK	48.9	27.2	2.8	32.1	46.8	73.9	27.1	
Vert	1563.511	AV	43.9	26.0	2.2	33.2	38.9	53.9	15.0	1M/10
Vert	2441.000	AV	31.7	27.2	2.8	32.1	29.6	53.9	24.3	1M/10 NS
Vert	2442.338	AV	44.6	27.2	2.8	32.1	42.5	53.9	11.4	1M/10

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

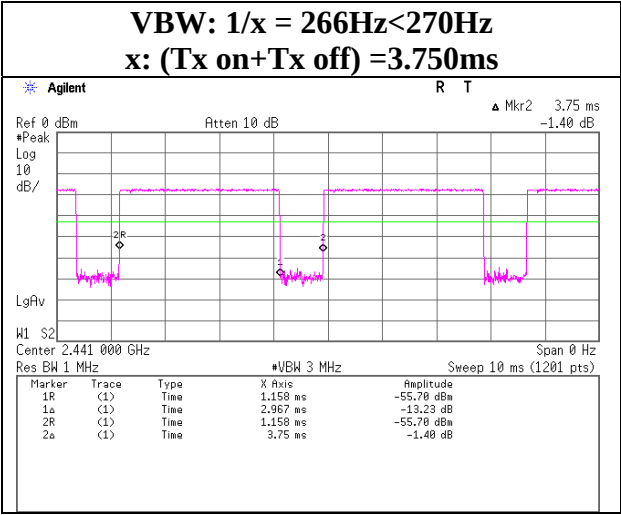
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

NS: No Signal Detect

VBW (AV) Calculation
DH5

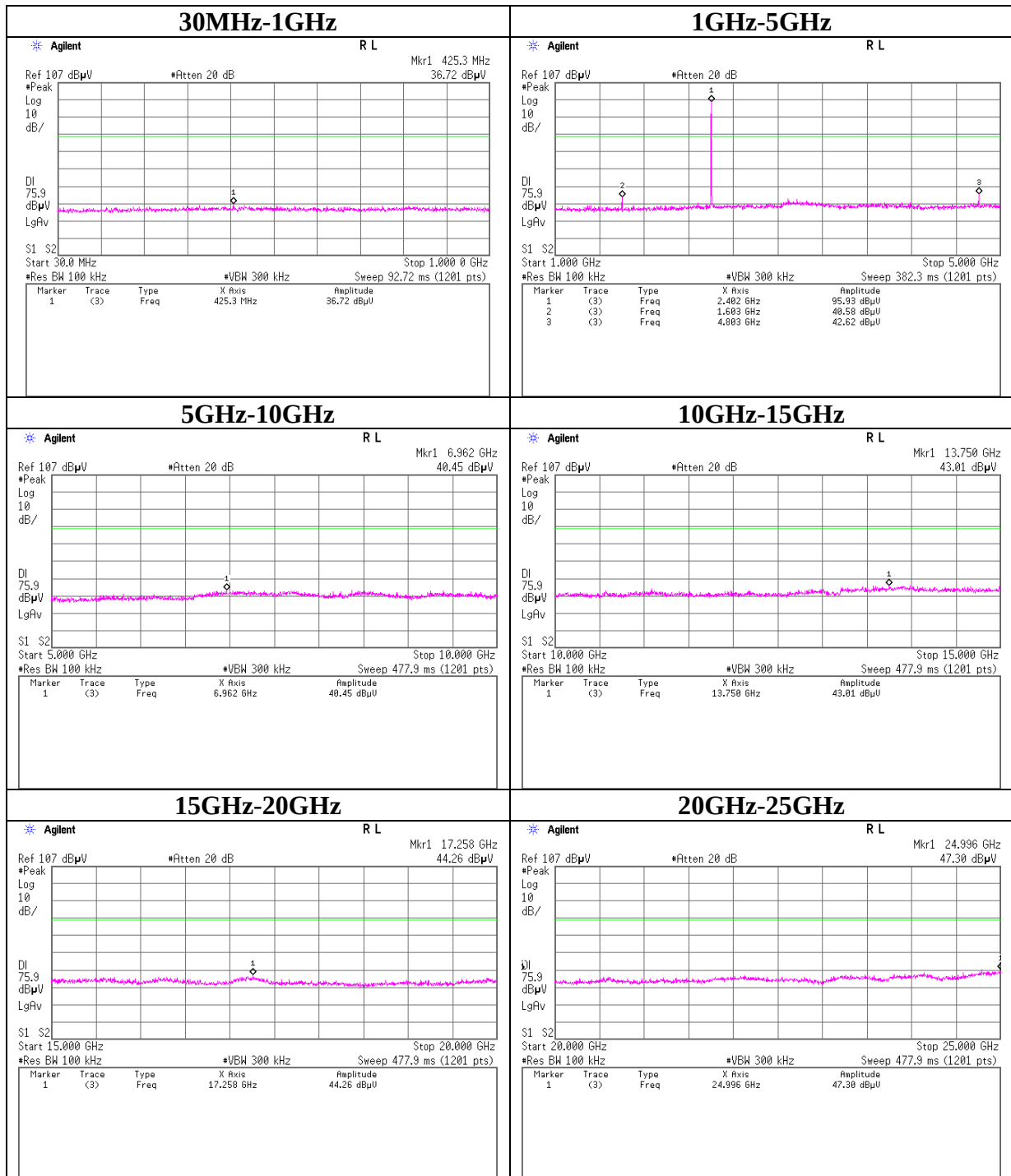


3DH5



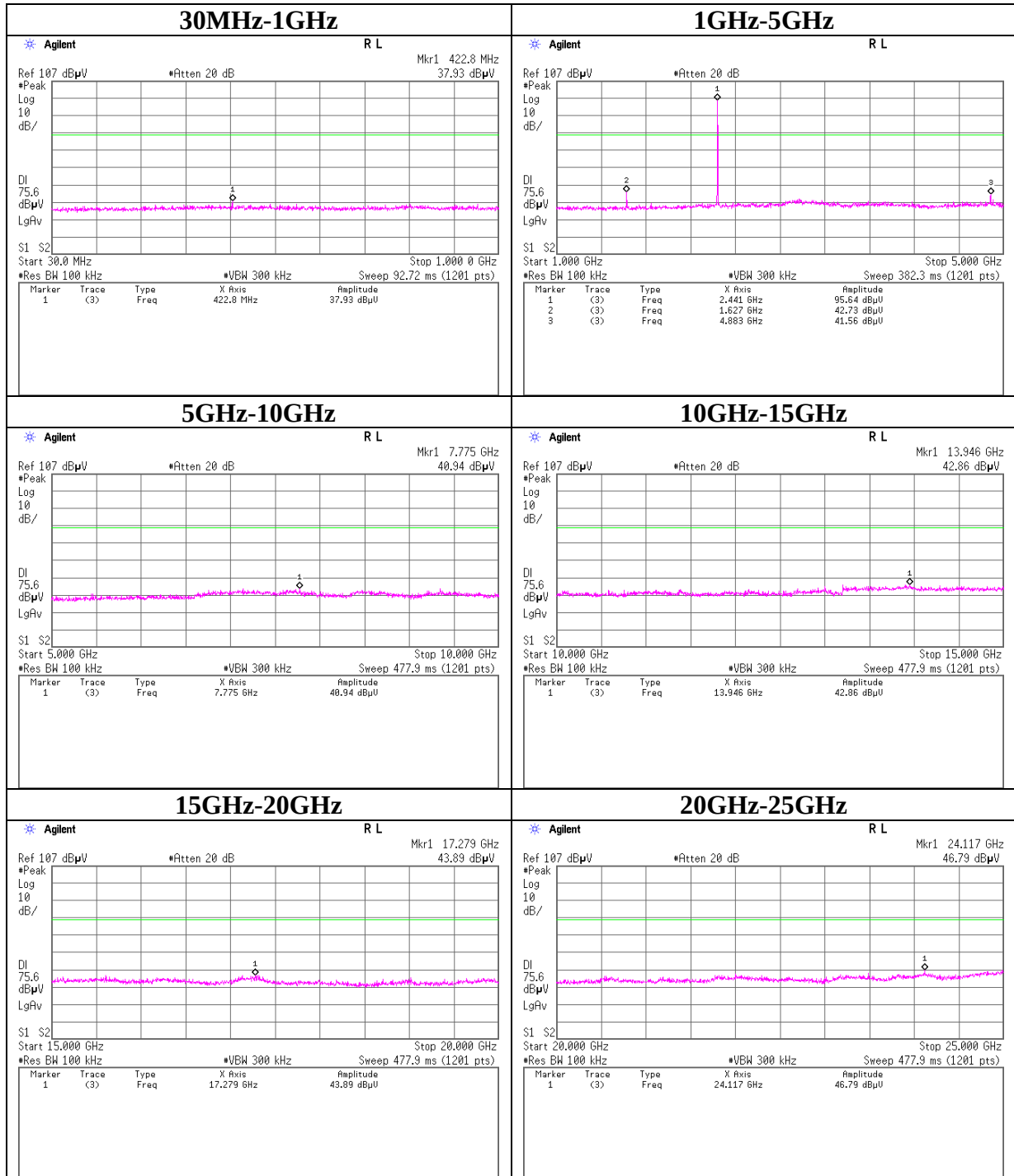
Conducted Spurious Emission

Tx DH5 2402MHz



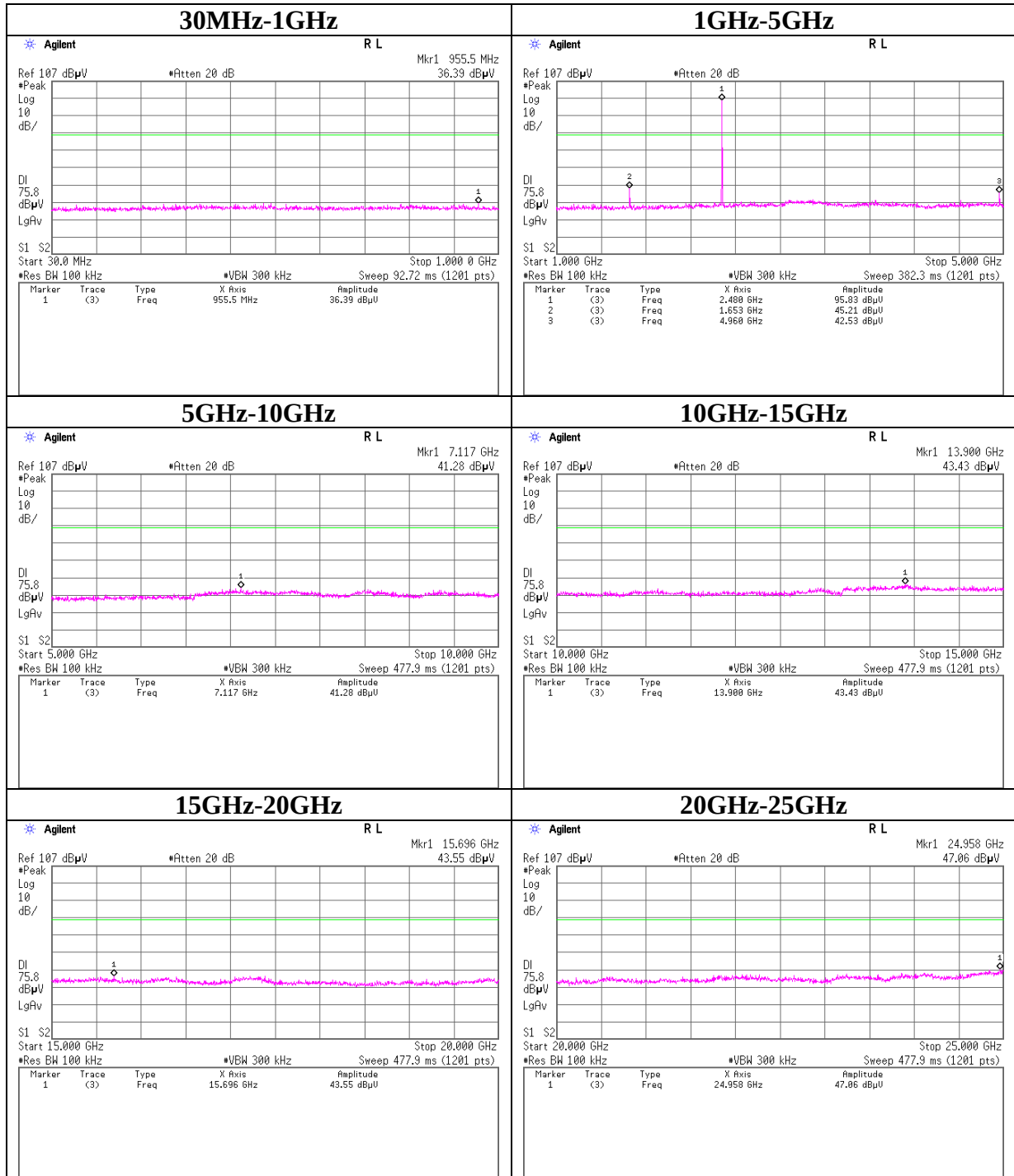
Conducted Spurious Emission

Tx DH5 2441MHz



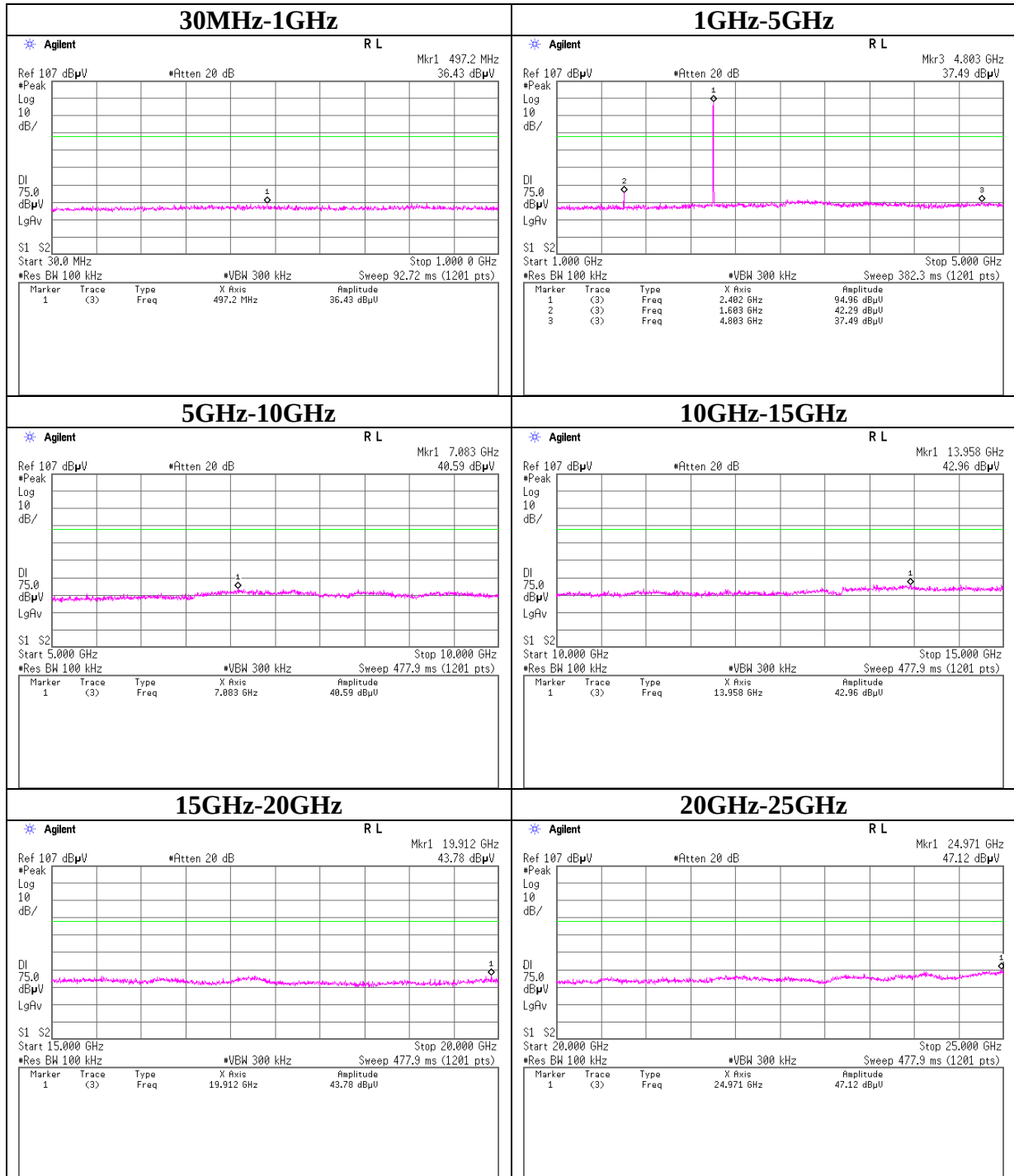
Conducted Spurious Emission

Tx DH5 2480MHz



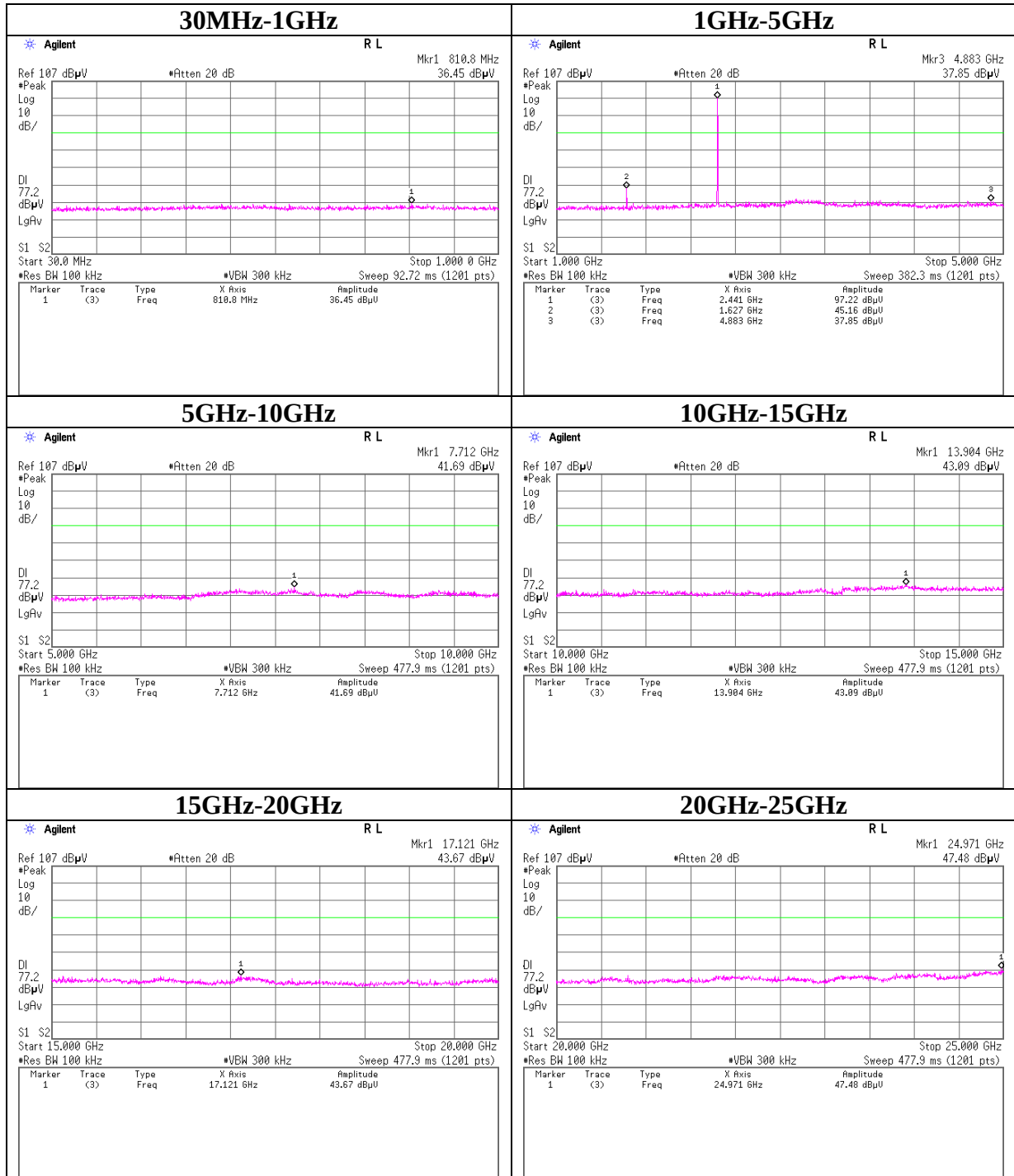
Conducted Spurious Emission

Tx 3DH5 2402MHz



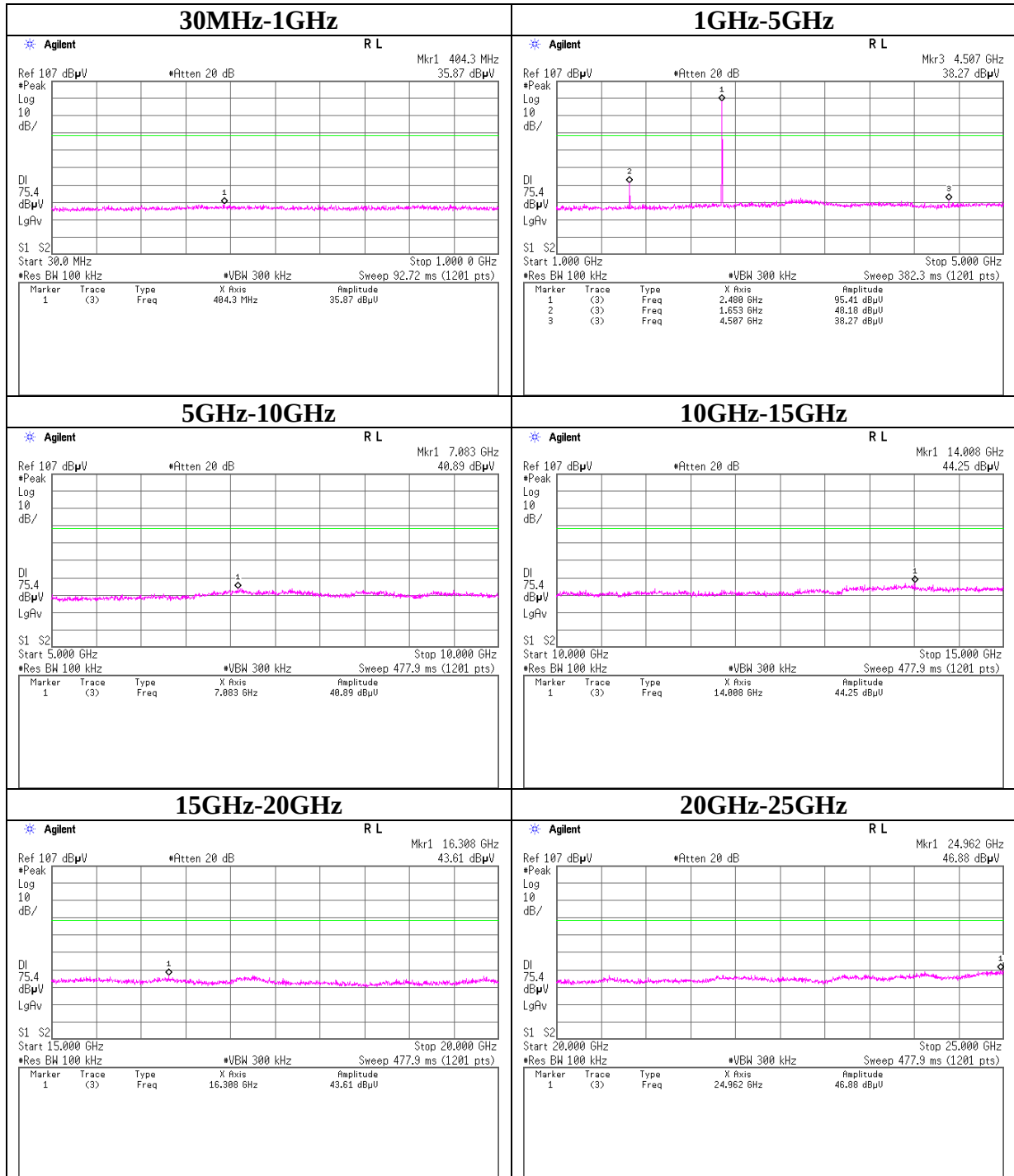
Conducted Spurious Emission

Tx 3DH5 2441MHz



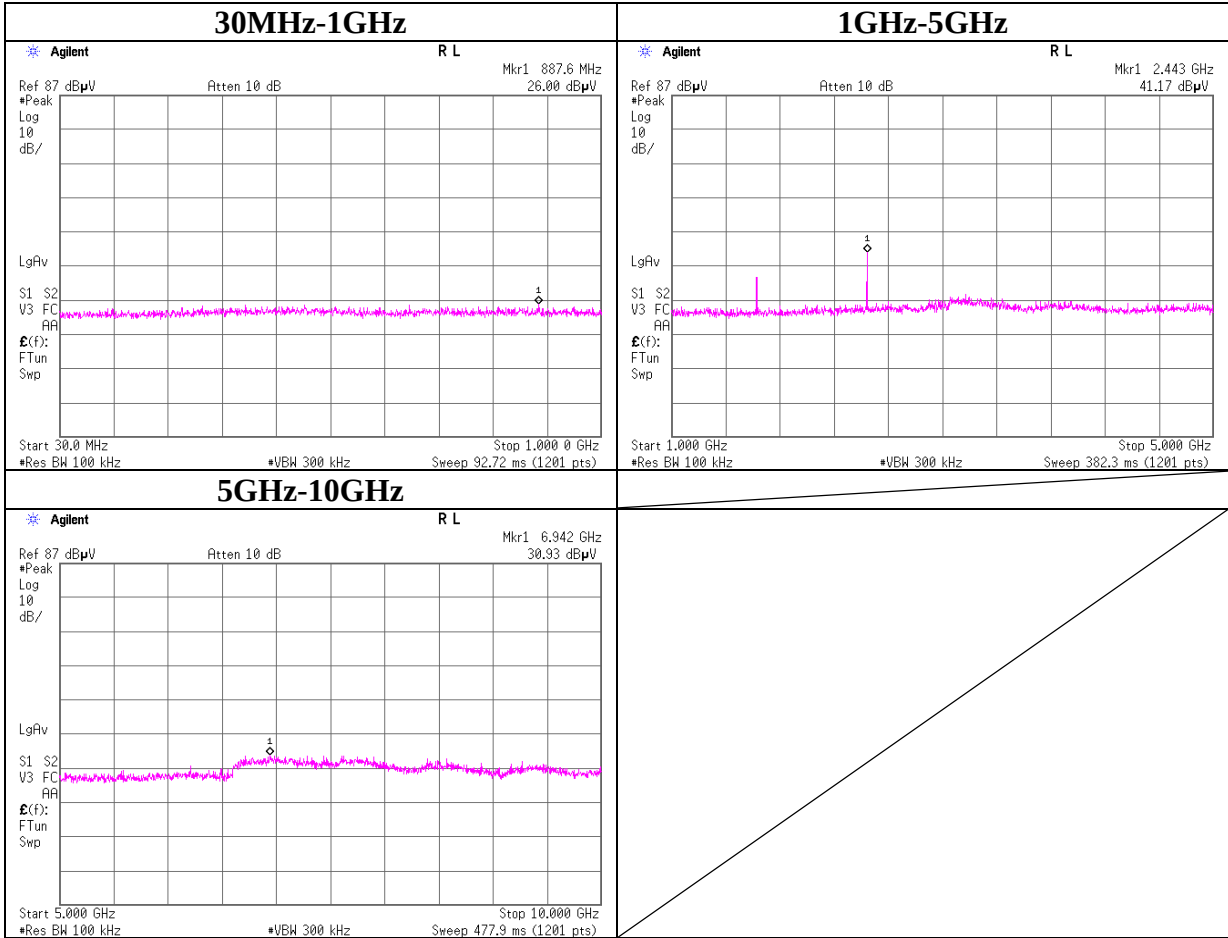
Conducted Spurious Emission

Tx 3DH5 2480MHz



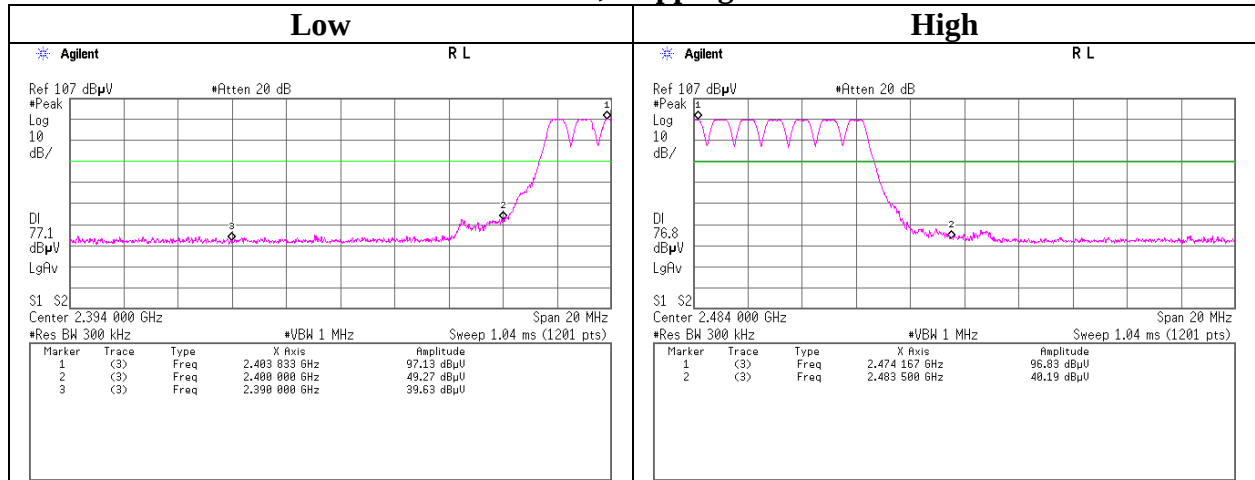
Conducted Spurious Emission

Rx 2441MHz

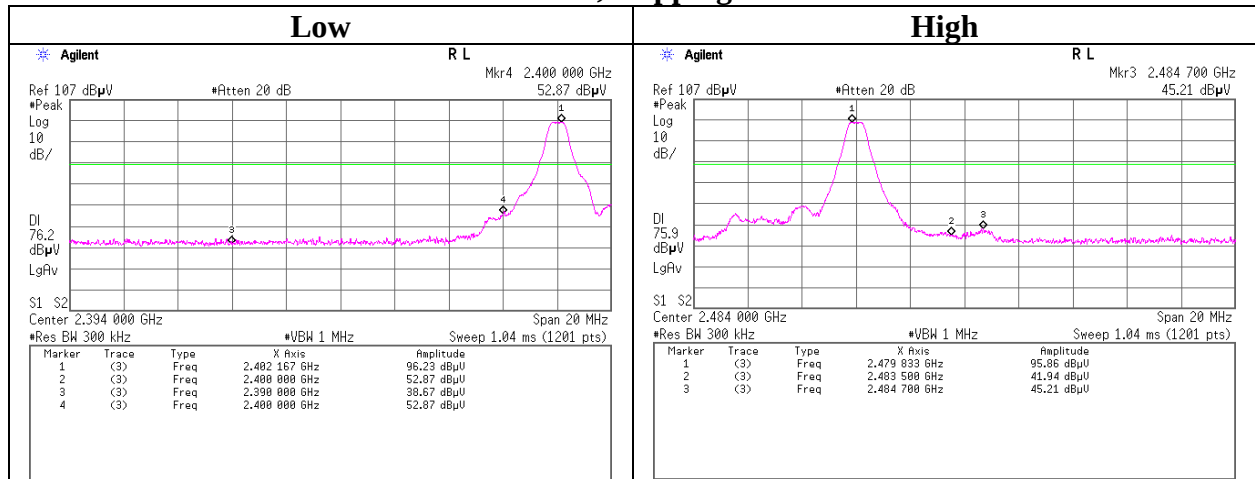


Conducted Emission Band Edge compliance

Tx DH5, Hopping on

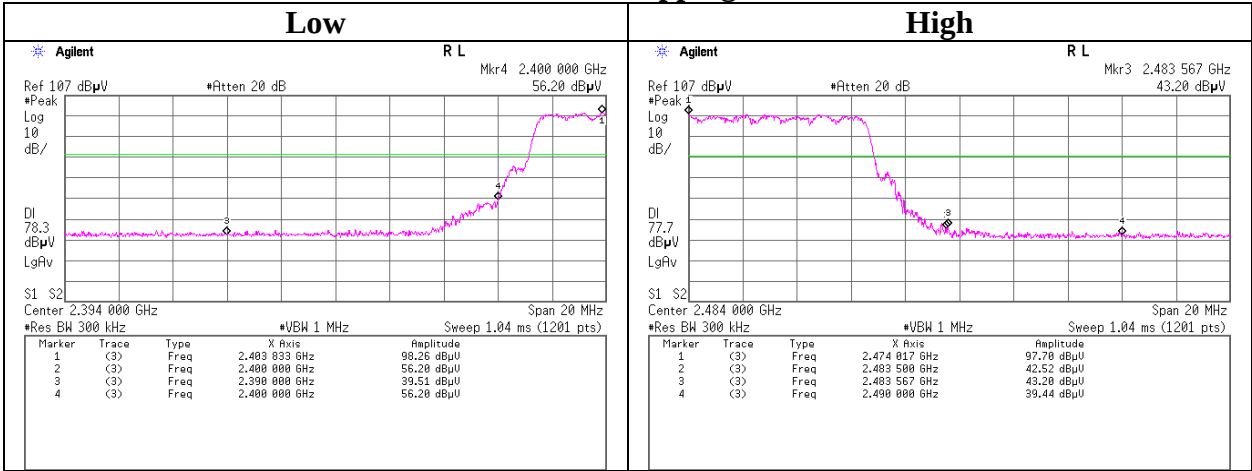


Tx DH5, Hopping off

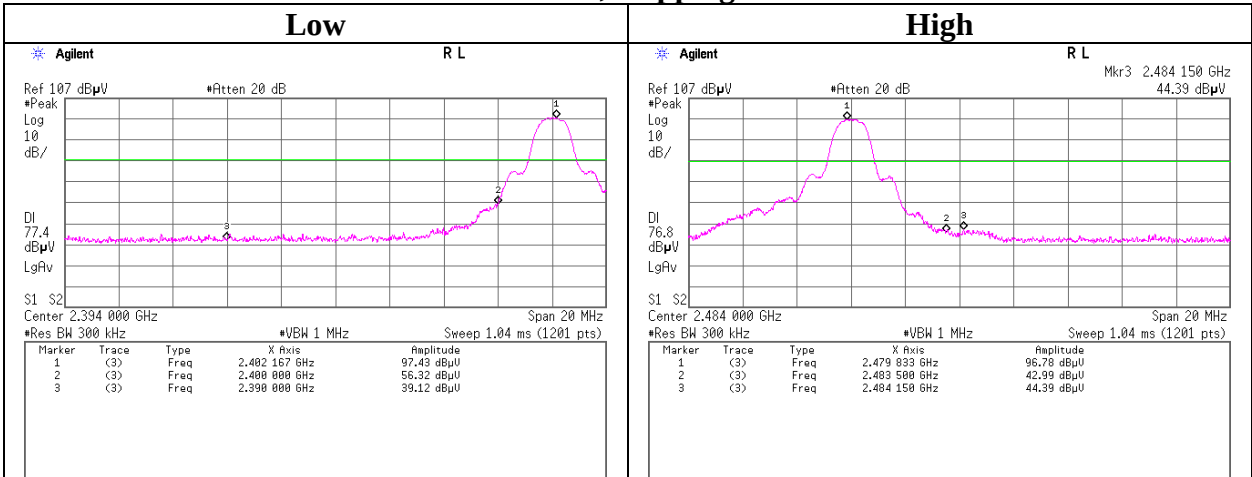


Conducted Emission Band Edge compliance

Tx 3DH5, Hopping on



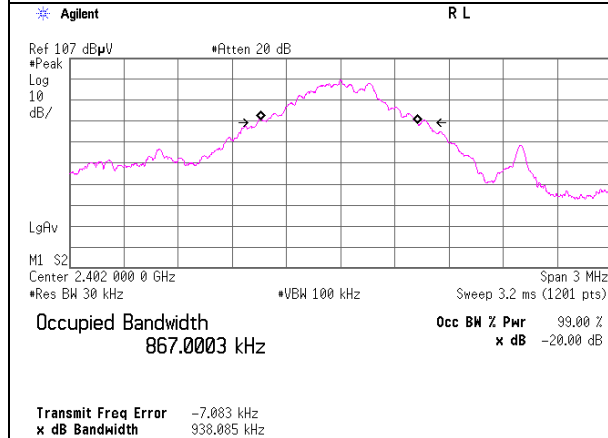
Tx 3DH5, Hopping off



99%Occupied Bandwidth

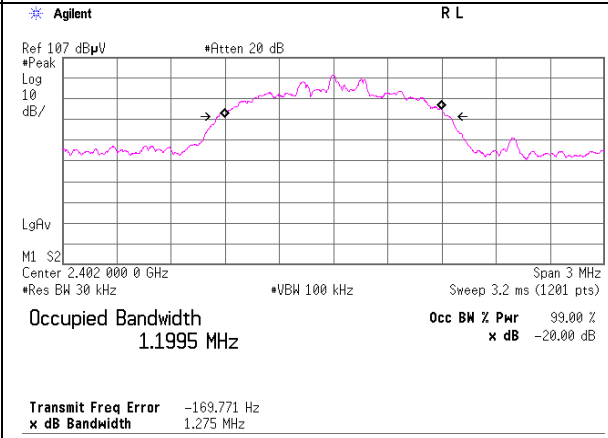
Tx DH5, Hopping off

2402MHz

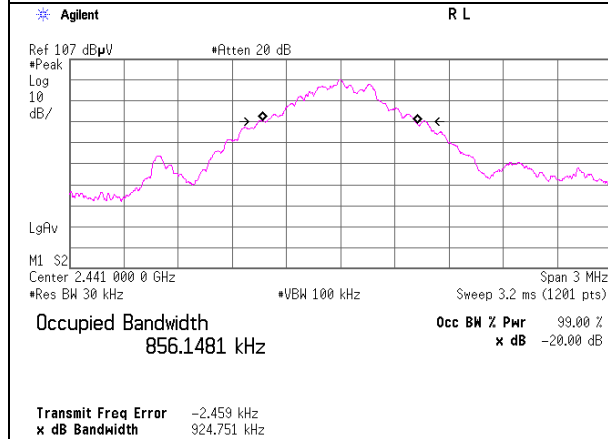


Tx 3DH5, Hopping off

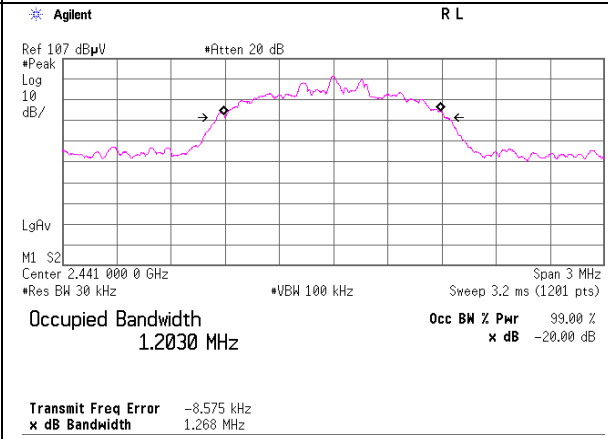
2402MHz



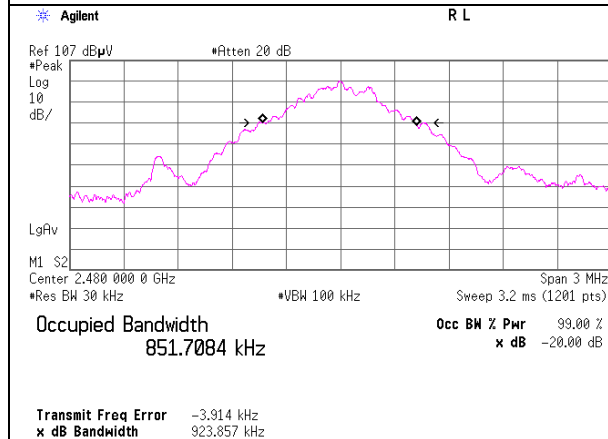
2441MHz



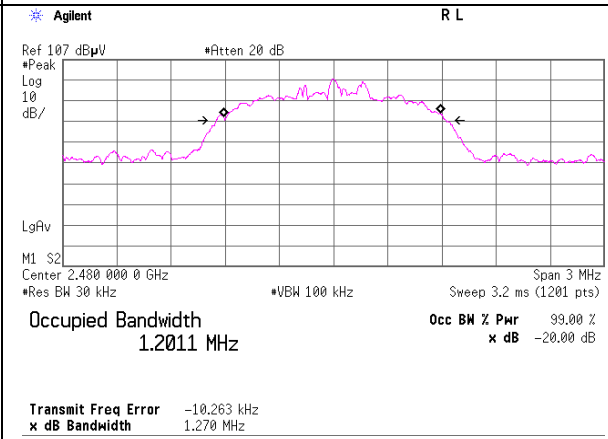
2441MHz



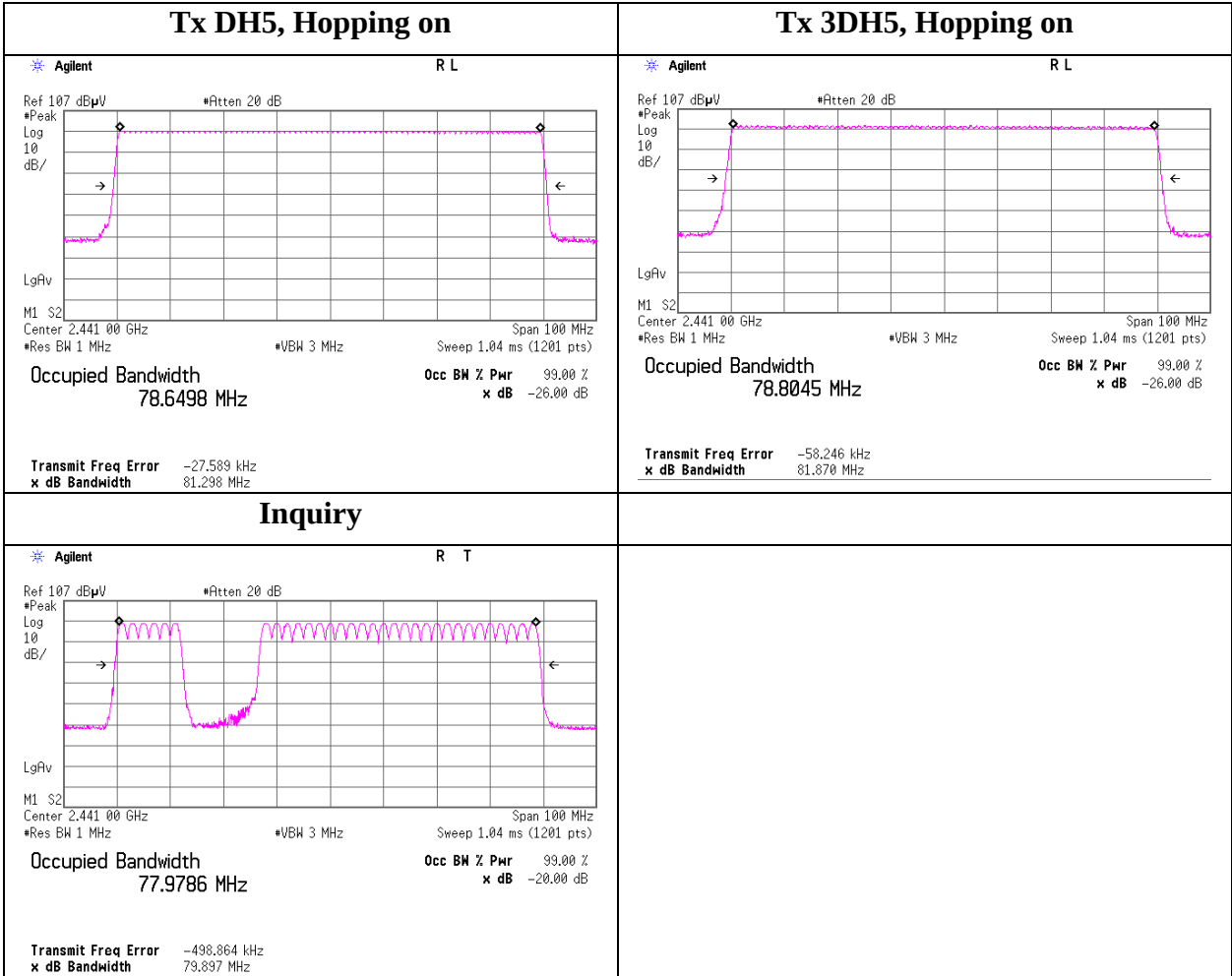
2480MHz



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)
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2010/02/02 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE	2010/02/09 * 12
MJM-07	Measure	PROMART	SEN1955	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE/AT	2010/02/03 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2010/08/08 * 12
MCC-56	Microwave Cable	Suhner	SUCOFLEX104	174410(1m) / 284655(5m)	RE	2011/01/18 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	RE	2010/03/16 * 12
MHF-20	High Pass Filter 3.5-18.0GHz	TOKIMEC	TF323DCC	607	RE	2010/09/21 * 12
MCC-79	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278923/4	RE	2010/12/02 * 12
MHA-17	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA917030 7	RE	2010/06/29 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	AT	2010/11/30 * 12
MCC-114	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	290212/4	AT	2010/08/05 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	AT	2010/11/30 * 12
MOS-23	Thermo-Hygrometer	Custom	CTH-201	0004	AT	2010/12/13 * 12
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	RE	2010/11/18 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	RE	2010/10/27 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2010/10/11 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2010/10/11 * 12
MCC-50	Coaxial cable	UL Japan	-	-	RE	2010/03/18 * 12
MAT-51	Attenuator(6dB)	Weinschel	2	AS3557	RE	2011/01/14 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2010/03/05 * 12
MOS-12	Thermo-Hygrometer	Custom	CTH-180	-	AT	2011/01/19 * 12
MAT-23	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2010/03/01 * 12
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2010/08/20 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2010/08/20 * 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.

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