DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2011/04/28

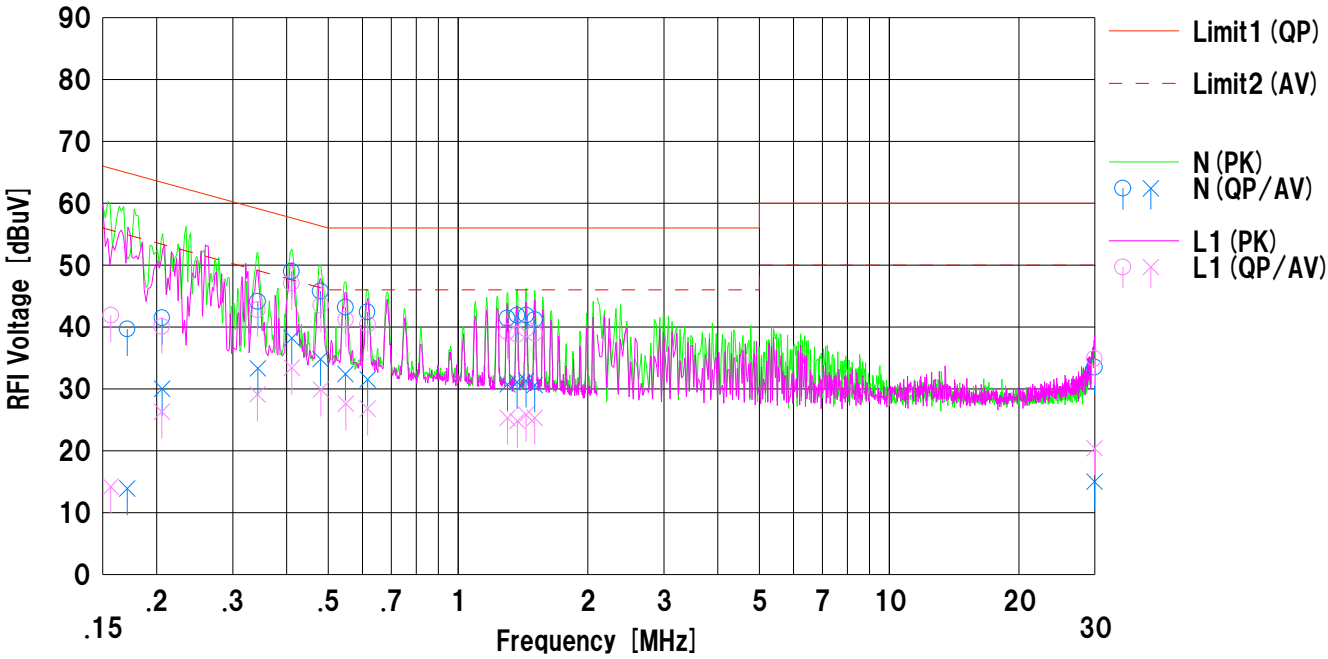
Company : Sony Corporation
Kind of EUT : Bluetooth Module
Model No. : A-1833-832-A
Serial No. : 71

Mode : Bluetooth, Tx, DH5, 2402MHz, PRBS9
Report No. : 31IE0189-SH-01-A
Power : AC120V / 60Hz (AC Adaptor)
Temp./Humi. : 25deg.C / 36%RH

Remarks : -

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Akio Hayashi



No.	Freq.	Reading <QP>	Reading <AV>	C.Fac	Results <QP>	Results <AV>	Limit <QP>	Limit <AV>	Margin <QP>	Margin <AV>	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.17075	27.0	1.2	12.7	39.7	13.9	64.9	54.9	25.2	41.0	N	
2	0.20570	28.9	17.4	12.6	41.5	30.0	63.3	53.3	21.8	23.3	N	
3	0.34303	31.4	20.6	12.7	44.1	33.3	59.1	49.1	15.0	15.8	N	
4	0.41098	36.3	25.5	12.7	49.0	38.2	57.6	47.6	8.6	9.4	N	
5	0.47947	33.1	22.1	12.7	45.8	34.8	56.3	46.3	10.5	11.5	N	
6	0.54780	30.6	19.8	12.6	43.2	32.4	56.0	46.0	12.8	13.6	N	
7	0.61644	29.8	18.9	12.6	42.4	31.5	56.0	46.0	13.6	14.5	N	
8	1.30082	28.6	17.9	12.8	41.4	30.7	56.0	46.0	14.6	15.3	N	
9	1.36950	29.1	18.3	12.8	41.9	31.1	56.0	46.0	14.1	14.9	N	
10	1.43784	29.1	18.5	12.8	41.9	31.3	56.0	46.0	14.1	14.7	N	
11	1.50606	28.4	17.8	12.8	41.2	30.6	56.0	46.0	14.8	15.4	N	
12	29.93620	19.6	1.1	13.9	33.5	15.0	60.0	50.0	26.5	35.0	N	
13	0.15660	29.2	1.5	12.7	41.9	14.2	65.6	55.6	23.7	41.4	L1	
14	0.20530	27.5	13.7	12.6	40.1	26.3	63.3	53.3	23.2	27.0	L1	
15	0.34238	30.1	16.4	12.7	42.8	29.1	59.1	49.1	16.3	20.0	L1	
16	0.41111	34.4	20.7	12.7	47.1	33.4	57.6	47.6	10.5	14.2	L1	
17	0.48040	30.8	17.2	12.7	43.5	29.9	56.3	46.3	12.8	16.4	L1	
18	0.54844	28.6	15.0	12.6	41.2	27.6	56.0	46.0	14.8	18.4	L1	
19	0.61678	27.8	14.2	12.6	40.4	26.8	56.0	46.0	15.6	19.2	L1	
20	1.30120	26.4	12.5	12.8	39.2	25.3	56.0	46.0	16.8	20.7	L1	
21	1.37138	26.0	12.0	12.8	38.8	24.8	56.0	46.0	17.2	21.2	L1	
22	1.43808	26.9	13.0	12.8	39.7	25.8	56.0	46.0	16.3	20.2	L1	
23	1.50642	26.2	12.5	12.8	39.0	25.3	56.0	46.0	17.0	20.7	L1	
24	29.93588	21.0	6.5	13.9	34.9	20.4	60.0	50.0	25.1	29.6	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+ATT+Cable) [dB]

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2011/04/28

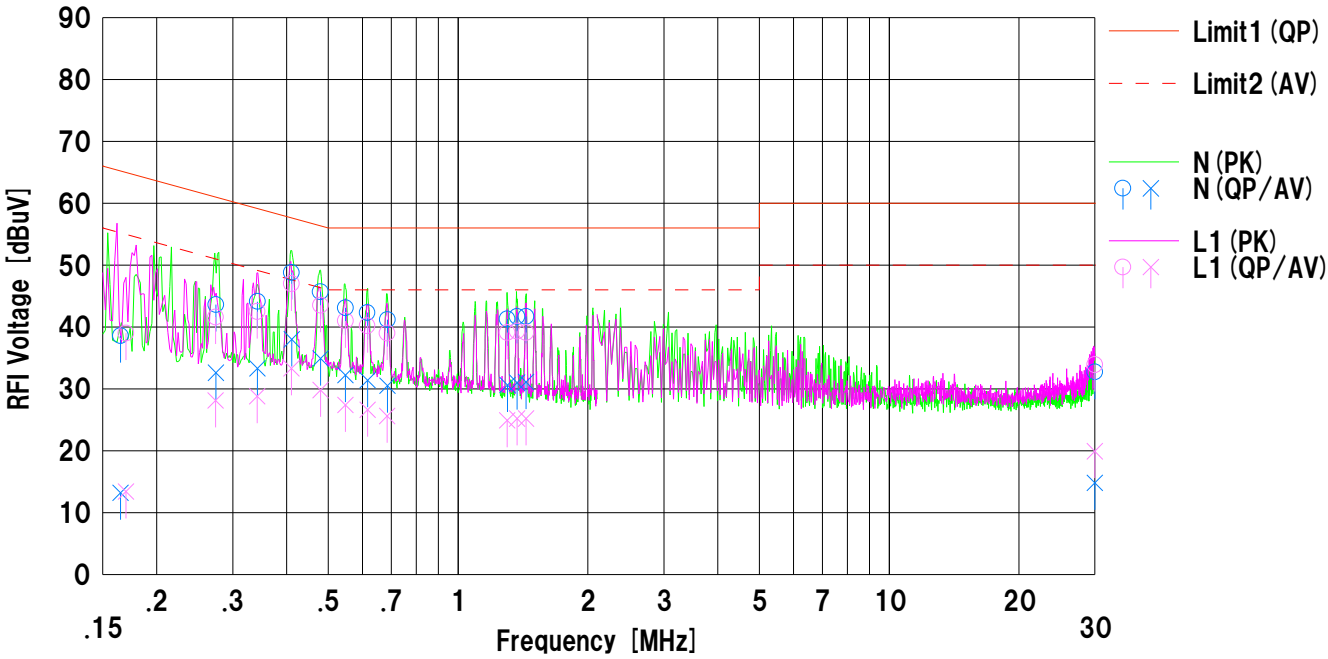
Company : Sony Corporation
Kind of EUT : Bluetooth Module
Model No. : A-1833-832-A
Serial No. : 71

Mode : Bluetooth, Tx, DH5, 2441MHz, PRBS9
Report No. : 31IE0189-SH-01-A
Power : AC120V / 60Hz (AC Adaptor)
Temp./Humi. : 25deg.C / 36%RH

Remarks : -

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Akio Hayashi



No.	Freq.	Reading <QP>	Reading <AV>	C.Fac	Results <QP>	Results <AV>	Limit <QP>	Limit <AV>	Margin <QP>	Margin <AV>	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.16475	25.9	0.5	12.7	38.6	13.2	65.2	55.2	26.6	42.0	N	
2	0.27435	31.0	20.0	12.6	43.6	32.6	60.9	50.9	17.3	18.3	N	
3	0.34265	31.4	20.6	12.7	44.1	33.3	59.1	49.1	15.0	15.8	N	
4	0.41106	36.1	25.3	12.7	48.8	38.0	57.6	47.6	8.8	9.6	N	
5	0.47933	33.0	22.2	12.7	45.7	34.9	56.3	46.3	10.6	11.4	N	
6	0.54814	30.5	19.6	12.6	43.1	32.2	56.0	46.0	12.9	13.8	N	
7	0.61636	29.7	18.8	12.6	42.3	31.4	56.0	46.0	13.7	14.6	N	
8	0.68532	28.5	17.8	12.7	41.2	30.5	56.0	46.0	14.8	15.5	N	
9	1.30103	28.5	17.8	12.8	41.3	30.6	56.0	46.0	14.7	15.4	N	
10	1.36948	28.9	18.2	12.8	41.7	31.0	56.0	46.0	14.3	15.0	N	
11	1.43777	28.9	18.3	12.8	41.7	31.1	56.0	46.0	14.3	14.9	N	
12	29.99929	18.8	0.9	13.9	32.7	14.8	60.0	50.0	27.3	35.2	N	
13	0.16960	26.3	0.7	12.7	39.0	13.4	64.9	54.9	25.9	41.5	L1	
14	0.27381	29.0	15.5	12.6	41.6	28.1	61.0	51.0	19.4	22.9	L1	
15	0.34184	29.8	16.1	12.7	42.5	28.8	59.1	49.1	16.6	20.3	L1	
16	0.41073	34.3	20.6	12.7	47.0	33.3	57.6	47.6	10.6	14.3	L1	
17	0.47988	30.8	17.1	12.7	43.5	29.8	56.3	46.3	12.8	16.5	L1	
18	0.54806	28.4	14.8	12.6	41.0	27.4	56.0	46.0	15.0	18.6	L1	
19	0.61640	27.6	14.0	12.6	40.2	26.6	56.0	46.0	15.8	19.4	L1	
20	0.68487	26.3	12.9	12.7	39.0	25.6	56.0	46.0	17.0	20.4	L1	
21	1.30009	26.3	12.1	12.8	39.1	24.9	56.0	46.0	16.9	21.1	L1	
22	1.36987	26.5	12.4	12.8	39.3	25.2	56.0	46.0	16.7	20.8	L1	
23	1.43791	26.3	12.4	12.8	39.1	25.2	56.0	46.0	16.9	20.8	L1	
24	29.99864	20.0	6.0	13.9	33.9	19.9	60.0	50.0	26.1	30.1	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+ATT+Cable) [dB]

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Date : 2011/04/28

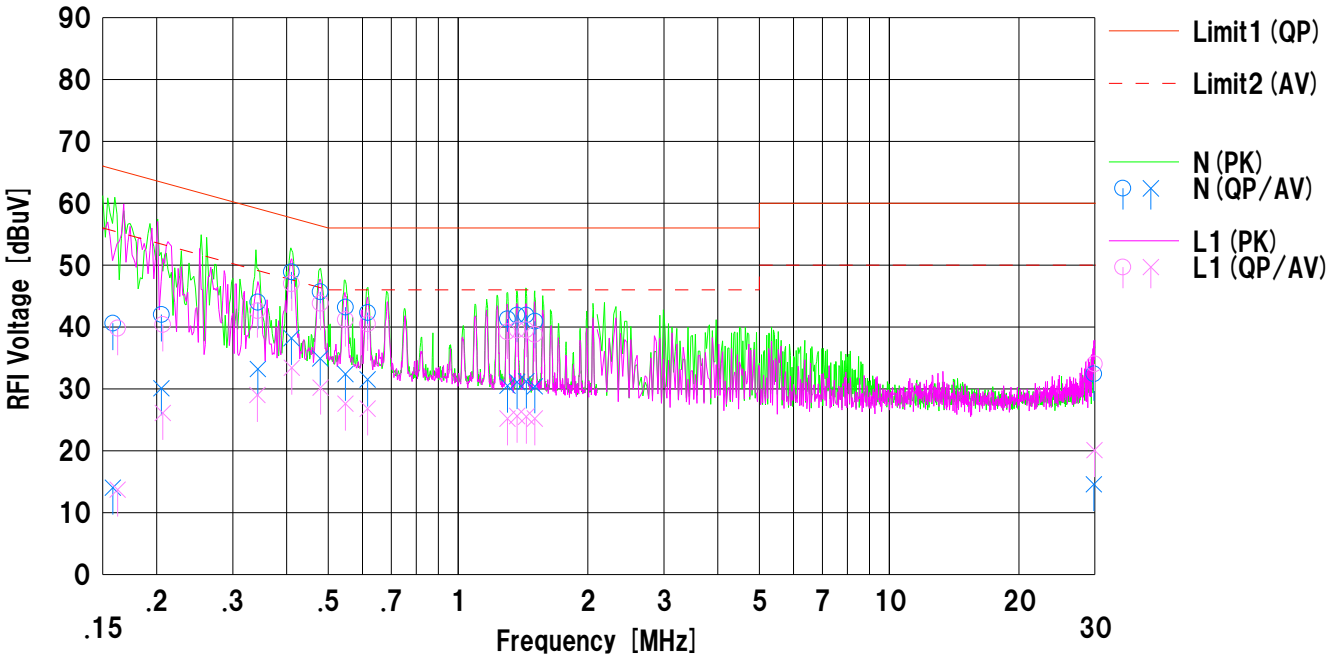
Company : Sony Corporation
Kind of EUT : Bluetooth Module
Model No. : A-1833-832-A
Serial No. : 71

Mode : Bluetooth, Tx, DH5, 2480MHz, PRBS9
Report No. : 31IE0189-SH-01-A
Power : AC120V / 60Hz (AC Adaptor)
Temp./Humi. : 25deg.C / 36%RH

Remarks : -

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Akio Hayashi



No.	Freq.	Reading <QP>	Reading <AV>	C.Fac	Results <QP>	Results <AV>	Limit <QP>	Limit <AV>	Margin <QP>	Margin <AV>	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15815	27.9	1.3	12.7	40.6	14.0	65.5	55.5	24.9	41.5	N	
2	0.20512	29.4	17.5	12.6	42.0	30.1	63.4	53.4	21.4	23.3	N	
3	0.34313	31.3	20.5	12.7	44.0	33.2	59.1	49.1	15.1	15.9	N	
4	0.41081	36.2	25.5	12.7	48.9	38.2	57.6	47.6	8.7	9.4	N	
5	0.47926	33.0	22.2	12.7	45.7	34.9	56.3	46.3	10.6	11.4	N	
6	0.54774	30.6	19.8	12.6	43.2	32.4	56.0	46.0	12.8	13.6	N	
7	0.61683	29.7	18.9	12.6	42.3	31.5	56.0	46.0	13.7	14.5	N	
8	1.30208	28.5	17.7	12.8	41.3	30.5	56.0	46.0	14.7	15.5	N	
9	1.36970	29.1	18.3	12.8	41.9	31.1	56.0	46.0	14.1	14.9	N	
10	1.43828	29.1	18.4	12.8	41.9	31.2	56.0	46.0	14.1	14.8	N	
11	1.50766	28.1	17.6	12.8	40.9	30.4	56.0	46.0	15.1	15.6	N	
12	29.87050	18.5	0.7	13.9	32.4	14.6	60.0	50.0	27.6	35.4	N	
13	0.16215	27.1	1.0	12.7	39.8	13.7	65.3	55.3	25.5	41.6	L1	
14	0.20641	27.8	13.5	12.6	40.4	26.1	63.3	53.3	22.9	27.2	L1	
15	0.34277	29.9	16.3	12.7	42.6	29.0	59.1	49.1	16.5	20.1	L1	
16	0.41108	34.3	20.7	12.7	47.0	33.4	57.6	47.6	10.6	14.2	L1	
17	0.47935	31.1	17.5	12.7	43.8	30.2	56.3	46.3	12.5	16.1	L1	
18	0.54796	28.6	15.0	12.6	41.2	27.6	56.0	46.0	14.8	18.4	L1	
19	0.61654	27.9	14.2	12.6	40.5	26.8	56.0	46.0	15.5	19.2	L1	
20	1.30071	26.4	12.4	12.8	39.2	25.2	56.0	46.0	16.8	20.8	L1	
21	1.37007	26.7	12.8	12.8	39.5	25.6	56.0	46.0	16.5	20.4	L1	
22	1.43899	26.7	12.7	12.8	39.5	25.5	56.0	46.0	16.5	20.5	L1	
23	1.50714	26.0	12.4	12.8	38.8	25.2	56.0	46.0	17.2	20.8	L1	
24	29.93744	20.1	6.2	13.9	34.0	20.1	60.0	50.0	26.0	29.9	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+ATT+Cable) [dB]

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Date : 2011/04/28

Company : Sony Corporation
Kind of EUT : Bluetooth Module
Model No. : A-1833-832-A
Serial No. : 71

Mode : Bluetooth, Tx, 3-DH5, 2402MHz, PRBS9
Report No. : 31IE0189-SH-01-A
Power : AC120V / 60Hz (AC Adaptor)
Temp./Humi. : 25deg.C / 36%RH

Remarks : -

Limit1 : FCC 15C (15.207) QP
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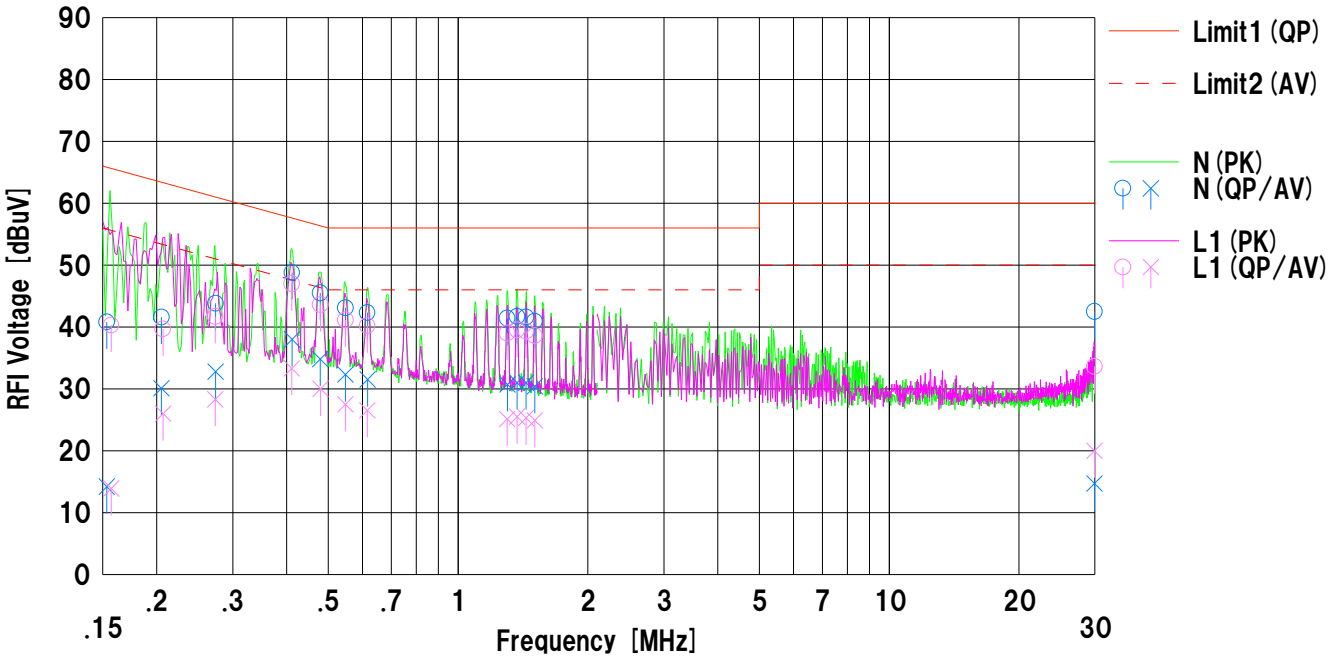
Engineer : Akio Hayashi



No.	Freq.	Reading <QP>	Reading <AV>	C.Fac	Results <QP>	Results <AV>	Limit <QP>	Limit <AV>	Margin <QP>	Margin <AV>	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15310	28.1	1.5	12.7	40.8	14.2	65.8	55.8	25.0	41.6	N	
2	0.20504	29.0	17.5	12.6	41.6	30.1	63.4	53.4	21.8	23.3	N	
3	0.27386	31.2	20.2	12.6	43.8	32.8	61.0	51.0	17.2	18.2	N	
4	0.41145	36.1	25.3	12.7	48.8	38.0	57.6	47.6	8.8	9.6	N	
5	0.47893	32.8	22.1	12.7	45.5	34.8	56.3	46.3	10.8	11.5	N	
6	0.54775	30.5	19.7	12.6	43.1	32.3	56.0	46.0	12.9	13.7	N	
7	0.61620	29.7	18.9	12.6	42.3	31.5	56.0	46.0	13.7	14.5	N	
8	1.30101	28.6	17.9	12.8	41.4	30.7	56.0	46.0	14.6	15.3	N	
9	1.37016	28.9	18.2	12.8	41.7	31.0	56.0	46.0	14.3	15.0	N	
10	1.43783	28.8	18.2	12.8	41.6	31.0	56.0	46.0	14.4	15.0	N	
11	1.50695	28.1	17.6	12.8	40.9	30.4	56.0	46.0	15.1	15.6	N	
12	29.93850	28.6	0.8	13.9	42.5	14.7	60.0	50.0	17.5	35.3	N	
13	0.15680	27.6	1.2	12.7	40.3	13.9	65.6	55.6	25.3	41.7	L1	
14	0.20668	27.1	13.4	12.6	39.7	26.0	63.3	53.3	23.6	27.3	L1	
15	0.27328	29.1	15.7	12.6	41.7	28.3	61.0	51.0	19.3	22.7	L1	
16	0.41123	34.3	20.6	12.7	47.0	33.3	57.6	47.6	10.6	14.3	L1	
17	0.47943	30.9	17.3	12.7	43.6	30.0	56.3	46.3	12.7	16.3	L1	
18	0.54777	28.5	14.9	12.6	41.1	27.5	56.0	46.0	14.9	18.5	L1	
19	0.61543	27.6	13.9	12.6	40.2	26.5	56.0	46.0	15.8	19.5	L1	
20	1.30046	26.2	12.3	12.8	39.0	25.1	56.0	46.0	17.0	20.9	L1	
21	1.36974	26.7	12.7	12.8	39.5	25.5	56.0	46.0	16.5	20.5	L1	
22	1.43745	26.5	12.5	12.8	39.3	25.3	56.0	46.0	16.7	20.7	L1	
23	1.50698	25.8	12.1	12.8	38.6	24.9	56.0	46.0	17.4	21.1	L1	
24	29.93879	19.7	6.1	13.9	33.6	20.0	60.0	50.0	26.4	30.0	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+ATT+Cable) [dB]

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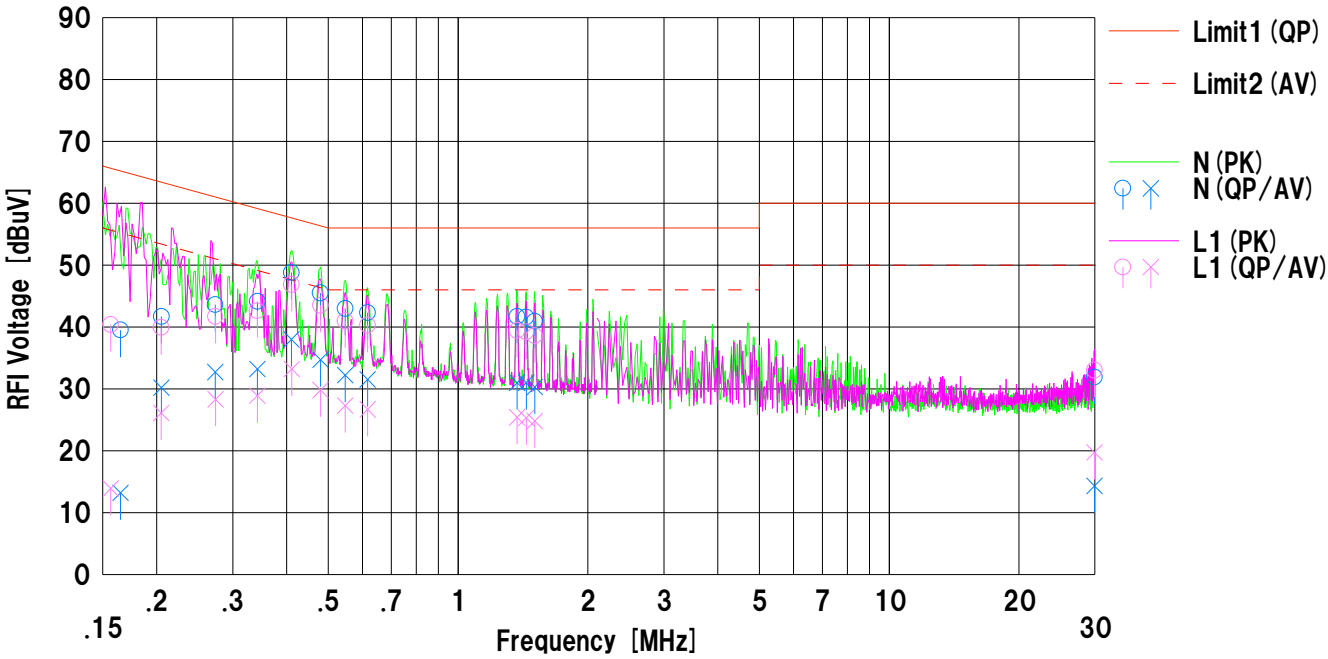

No.	Freq.	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.16490	26.8	0.5	12.7	39.5	13.2	65.2	55.2	25.7	42.0	N	
2	0.20523	29.1	17.6	12.6	41.7	30.2	63.3	53.3	21.6	23.1	N	
3	0.27343	31.0	20.1	12.6	43.6	32.7	61.0	51.0	17.4	18.3	N	
4	0.34276	31.4	20.5	12.7	44.1	33.2	59.1	49.1	15.0	15.9	N	
5	0.41054	36.1	25.3	12.7	48.8	38.0	57.6	47.6	8.8	9.6	N	
6	0.47948	32.8	22.0	12.7	45.5	34.7	56.3	46.3	10.8	11.6	N	
7	0.54753	30.4	19.6	12.6	43.0	32.2	56.0	46.0	13.0	13.8	N	
8	0.61671	29.7	18.9	12.6	42.3	31.5	56.0	46.0	13.7	14.5	N	
9	1.37012	28.9	18.2	12.8	41.7	31.0	56.0	46.0	14.3	15.0	N	
10	1.43850	28.8	18.2	12.8	41.6	31.0	56.0	46.0	14.4	15.0	N	
11	1.50645	28.1	17.5	12.8	40.9	30.3	56.0	46.0	15.1	15.7	N	
12	29.94087	18.0	0.4	13.9	31.9	14.3	60.0	50.0	28.1	35.7	N	
13	0.15640	27.7	1.2	12.7	40.4	13.9	65.6	55.6	25.2	41.7	L1	
14	0.20465	27.3	13.5	12.6	39.9	26.1	63.4	53.4	23.5	27.3	L1	
15	0.27356	29.1	15.7	12.6	41.7	28.3	61.0	51.0	19.3	22.7	L1	
16	0.34212	29.9	16.2	12.7	42.6	28.9	59.1	49.1	16.5	20.2	L1	
17	0.41090	34.2	20.5	12.7	46.9	33.2	57.6	47.6	10.7	14.4	L1	
18	0.47981	30.8	17.1	12.7	43.5	29.8	56.3	46.3	12.8	16.5	L1	
19	0.54730	28.4	14.7	12.6	41.0	27.3	56.0	46.0	15.0	18.7	L1	
20	0.61659	27.7	14.1	12.6	40.3	26.7	56.0	46.0	15.7	19.3	L1	
21	1.36949	26.6	12.6	12.8	39.4	25.4	56.0	46.0	16.6	20.6	L1	
22	1.43836	26.4	12.5	12.8	39.2	25.3	56.0	46.0	16.8	20.7	L1	
23	1.50669	25.8	12.0	12.8	38.6	24.8	56.0	46.0	17.4	21.2	L1	
24	29.94150	19.1	5.8	13.9	33.0	19.7	60.0	50.0	27.0	30.3	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+ATT+Cable) [dB]

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UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
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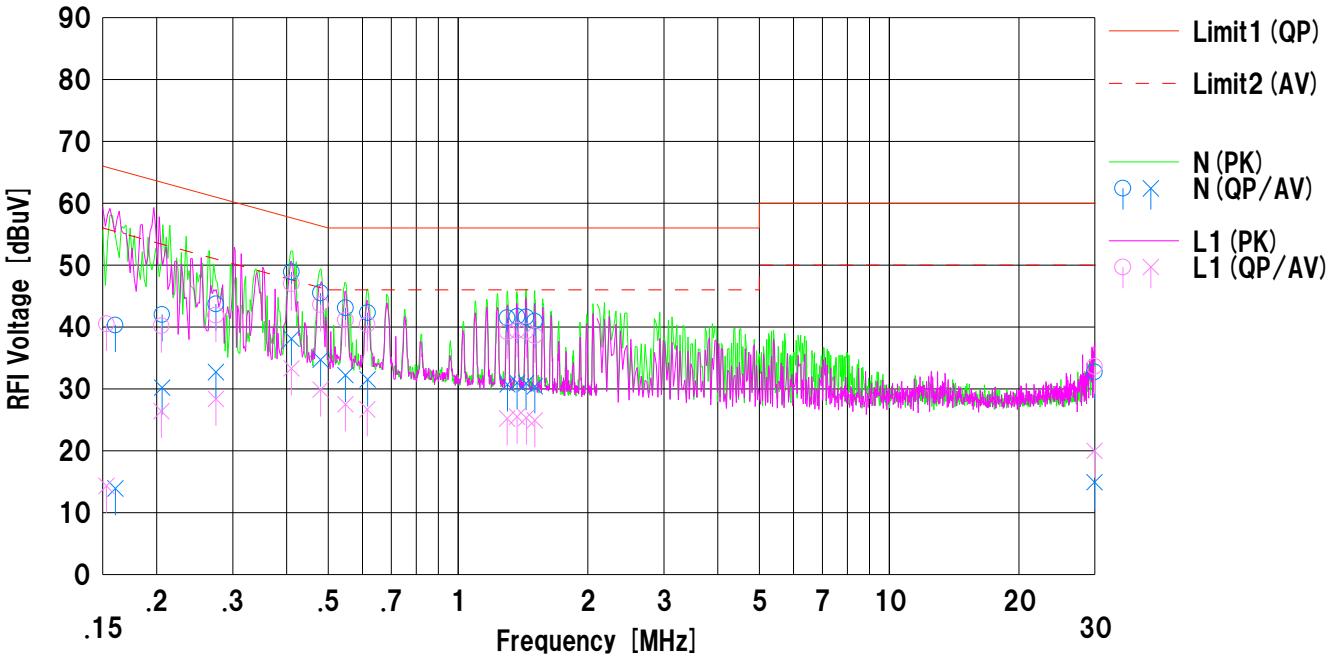
Model No. : A-1833-832-A
Serial No. : 71

Mode : Bluetooth, Tx, 3-DH5, 2480MHz, PRBS9
Report No. : 31IE0189-SH-01-A
Power : AC120V / 60Hz (AC Adaptor)
Temp./Humi. : 25deg.C / 36%RH

Remarks : -

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Akio Hayashi



No.	Freq.	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.16025	27.6	1.2	12.7	40.3	13.9	65.4	55.4	25.1	41.5	N	
2	0.20561	29.4	17.6	12.6	42.0	30.2	63.3	53.3	21.3	23.1	N	
3	0.27427	31.1	20.1	12.6	43.7	32.7	60.9	50.9	17.2	18.2	N	
4	0.41061	36.2	25.4	12.7	48.9	38.1	57.6	47.6	8.7	9.5	N	
5	0.47993	32.8	22.0	12.7	45.5	34.7	56.3	46.3	10.8	11.6	N	
6	0.54809	30.5	19.6	12.6	43.1	32.2	56.0	46.0	12.9	13.8	N	
7	0.61686	29.7	18.9	12.6	42.3	31.5	56.0	46.0	13.7	14.5	N	
8	1.30118	28.7	17.9	12.8	41.5	30.7	56.0	46.0	14.5	15.3	N	
9	1.36999	28.9	18.2	12.8	41.7	31.0	56.0	46.0	14.3	15.0	N	
10	1.43778	28.8	18.1	12.8	41.6	30.9	56.0	46.0	14.4	15.1	N	
11	1.50686	28.1	17.6	12.8	40.9	30.4	56.0	46.0	15.1	15.6	N	
12	29.94078	18.8	1.0	13.9	32.7	14.9	60.0	50.0	27.3	35.1	N	
13	0.15285	27.8	1.6	12.7	40.5	14.3	65.8	55.8	25.3	41.5	L1	
14	0.20497	27.6	13.8	12.6	40.2	26.4	63.4	53.4	23.2	27.0	L1	
15	0.27415	29.3	15.8	12.6	41.9	28.4	60.9	50.9	19.0	22.5	L1	
16	0.41048	34.3	20.6	12.7	47.0	33.3	57.6	47.6	10.6	14.3	L1	
17	0.47984	30.9	17.2	12.7	43.6	29.9	56.3	46.3	12.7	16.4	L1	
18	0.54825	28.5	14.9	12.6	41.1	27.5	56.0	46.0	14.9	18.5	L1	
19	0.61578	27.8	14.1	12.6	40.4	26.7	56.0	46.0	15.6	19.3	L1	
20	1.30012	26.4	12.4	12.8	39.2	25.2	56.0	46.0	16.8	20.8	L1	
21	1.37000	26.6	12.7	12.8	39.4	25.5	56.0	46.0	16.6	20.5	L1	
22	1.43886	26.5	12.5	12.8	39.3	25.3	56.0	46.0	16.7	20.7	L1	
23	1.50681	25.8	12.1	12.8	38.6	24.9	56.0	46.0	17.4	21.1	L1	
24	29.93976	19.7	6.1	13.9	33.6	20.0	60.0	50.0	26.4	30.0	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+ATT+Cable) [dB]

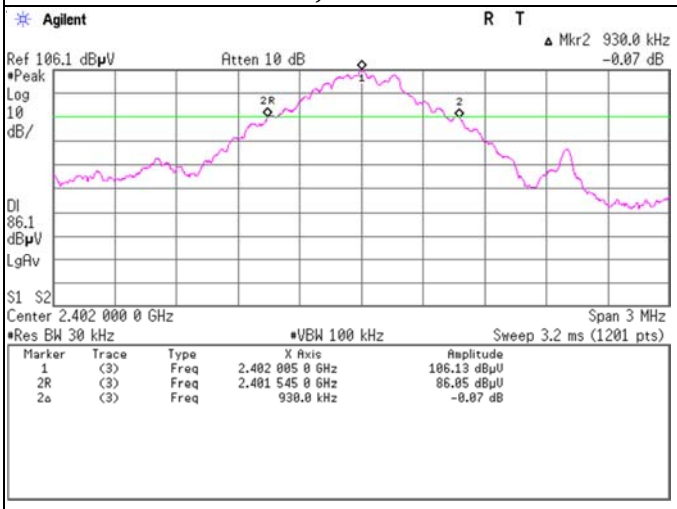
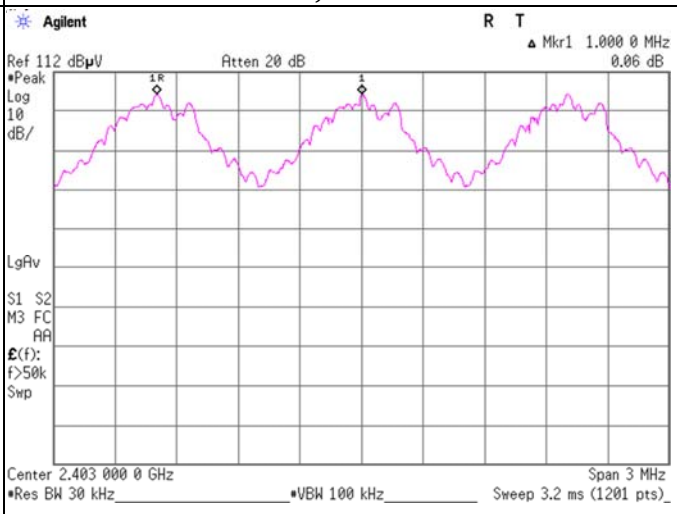
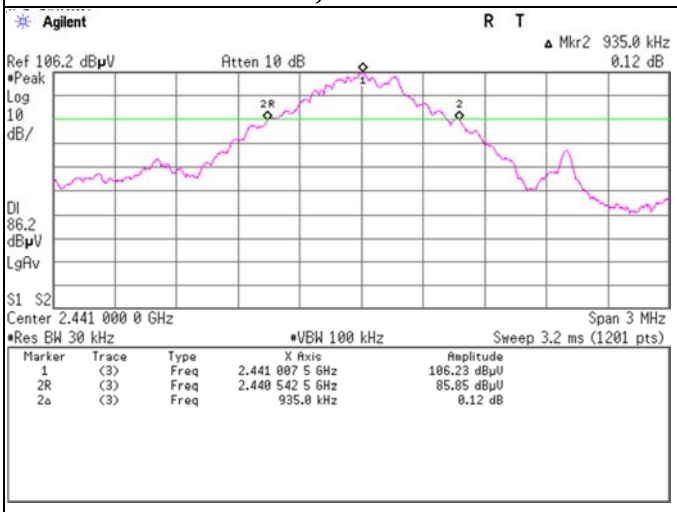
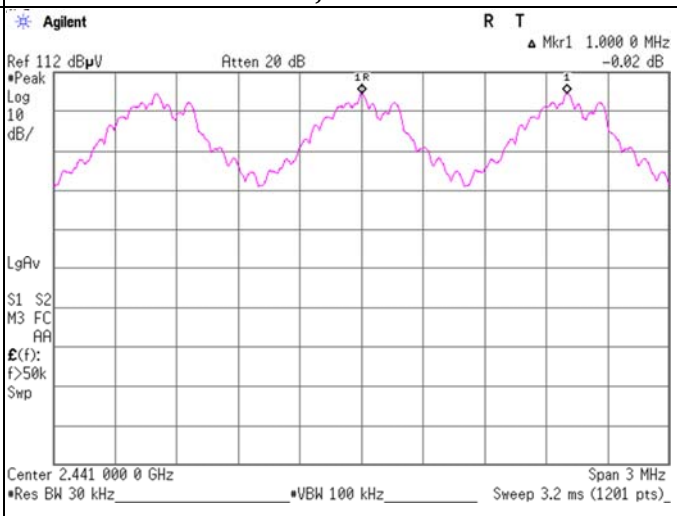
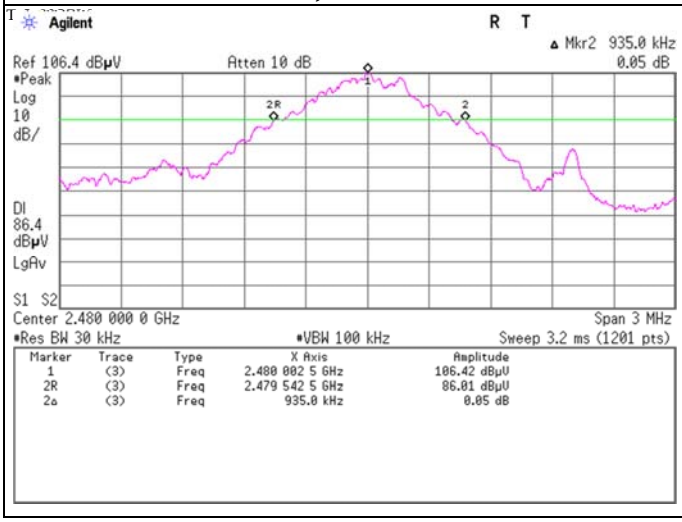
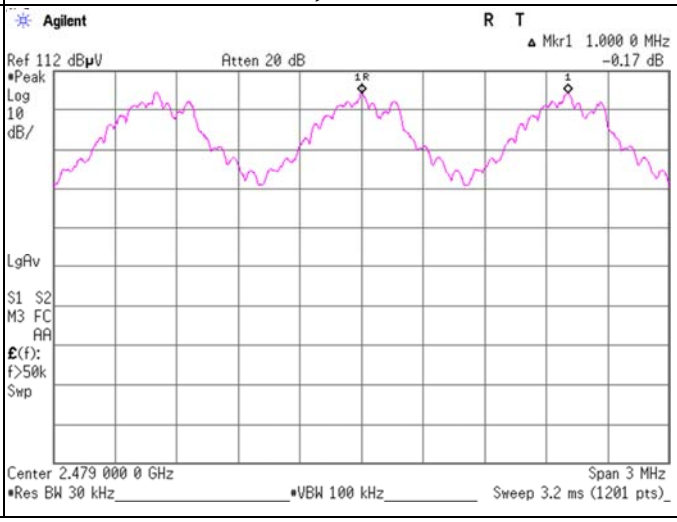
20dB Bandwidth and Carrier Frequency Separation

Test place	UL Japan, Inc. Shonan EMC Lab.		No.5 Shielded Room	
Date	2011/4/25		2011/5/12	
Temperature / Humidity	25deg.C	36% RH	26deg.C	53% RH
Engineer	Akio Hayashi		Tatsuya Arai	
Mode	Tx			

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
DH5	2402.0	0.930	1.000	>= 0.620
DH5	2441.0	0.935	1.000	>= 0.623
DH5	2480.0	0.935	1.000	>= 0.623
3DH5	2402.0	1.275	1.000	>= 0.850
3DH5	2441.0	1.277	1.000	>= 0.851
3DH5	2480.0	1.275	1.000	>= 0.850
Inquiry	2441.0	0.822	2.004	>= 0.548

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

20dB Bandwidth and Carrier Frequency Separation

DH5	
20dB Bandwidth	**Carrier Frequency Separation**
Tx, 2402MHz	**Tx, 2402MHz**
	
Tx, 2441MHz	**Tx, 2441MHz**
	
Tx, 2480MHz	**Tx, 2480MHz**
	

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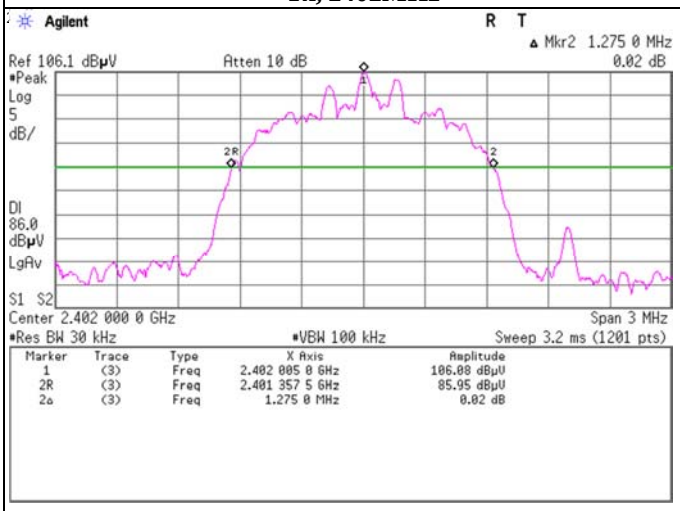
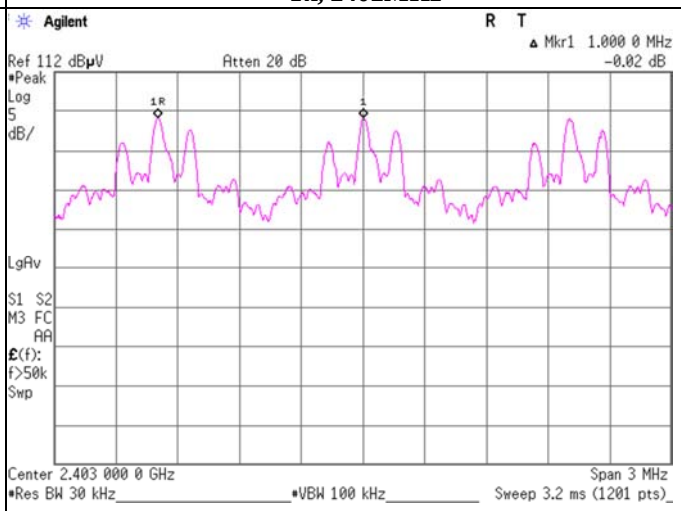
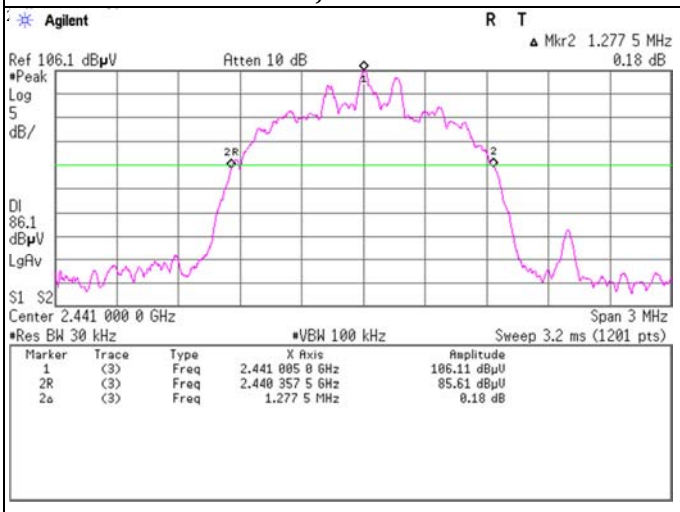
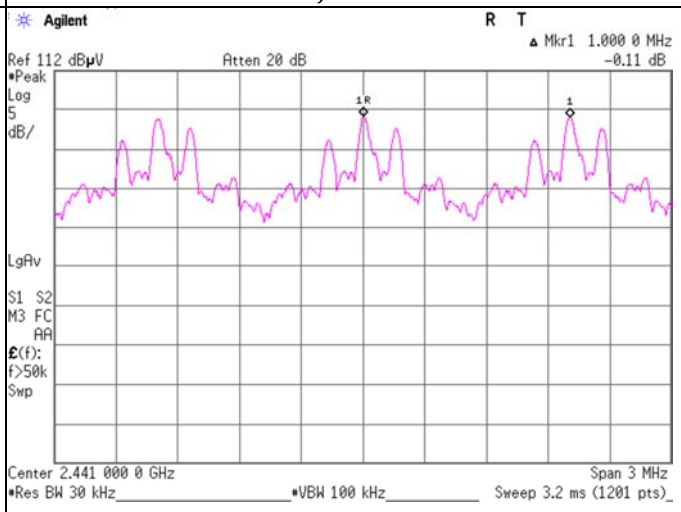
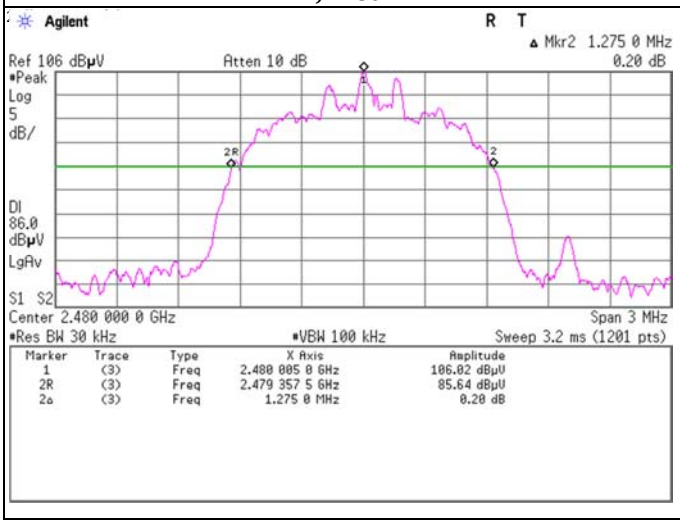
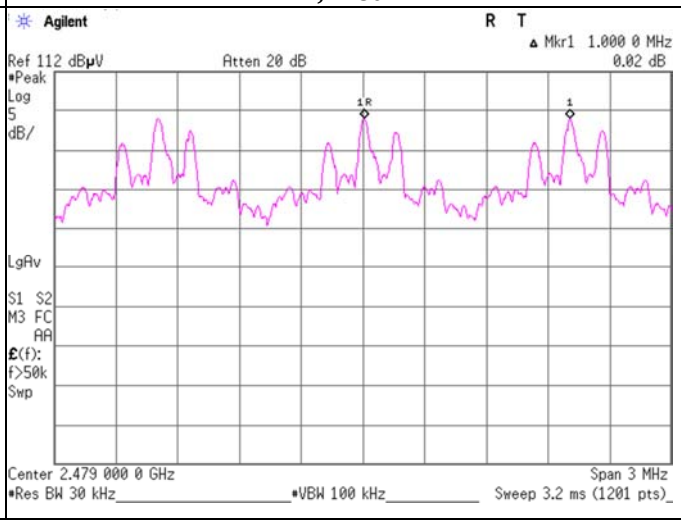
20dB Bandwidth and Carrier Frequency Separation

3-DH5	
20dB Bandwidth	**Carrier Frequency Separation**
Tx, 2402MHz	**Tx, 2402MHz**
	
Tx, 2441MHz	**Tx, 2441MHz**
	
Tx, 2480MHz	**Tx, 2480MHz**
	

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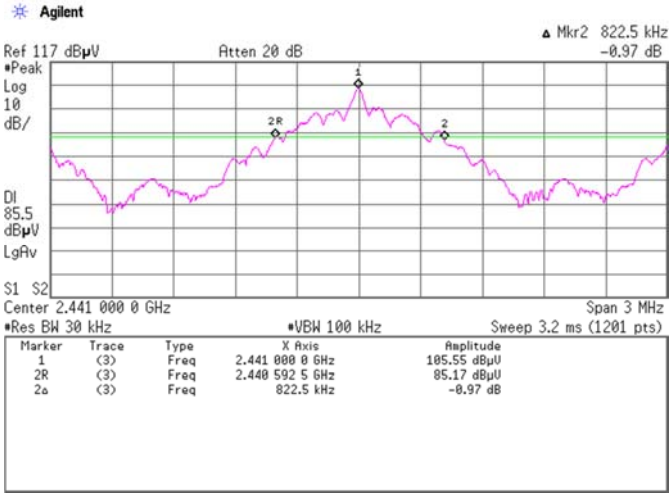
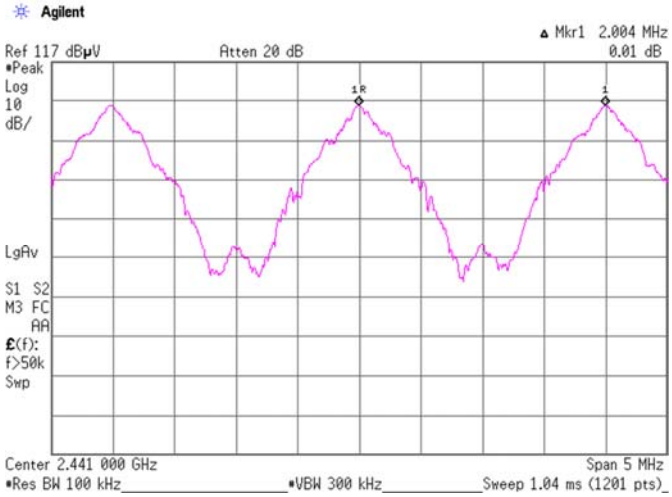
20dB Bandwidth and Carrier Frequency Separation

Inquiry	
20dB Bandwidth	**Carrier Frequency Separation**





Number of Hopping Frequency (Conducted)

Test place	UL Japan, Inc.	Shonan EMC Lab.	No.5 Shielded Room	
Date	2011/4/25		2011/5/12	
Temperature / Humidity	25deg.C	36% RH	26deg.C	53% RH
Engineer	Akio Hayashi		Tatsuya Arai	
Mode	Tx,			

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

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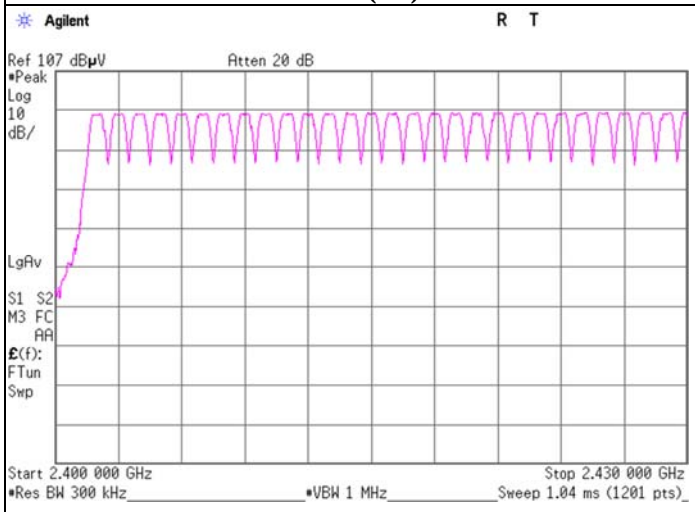
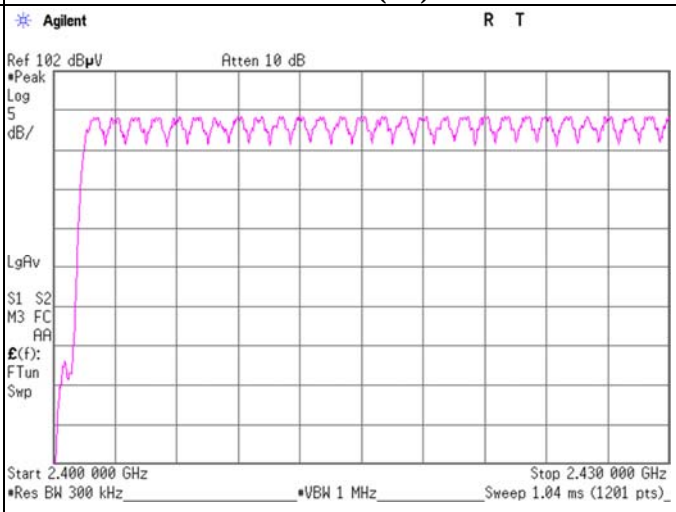
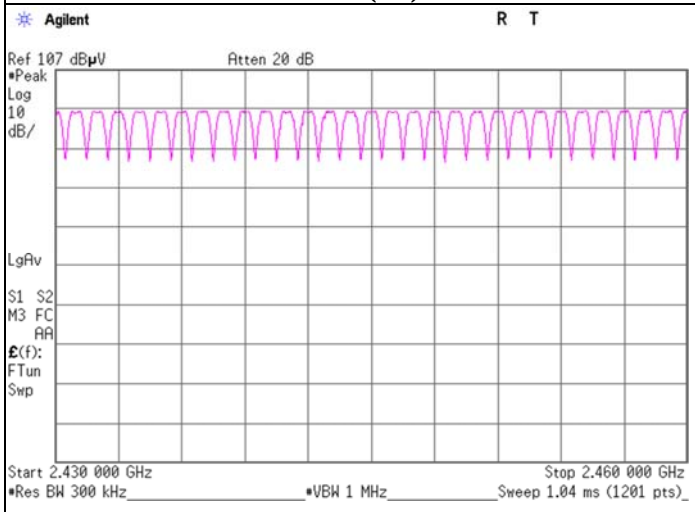
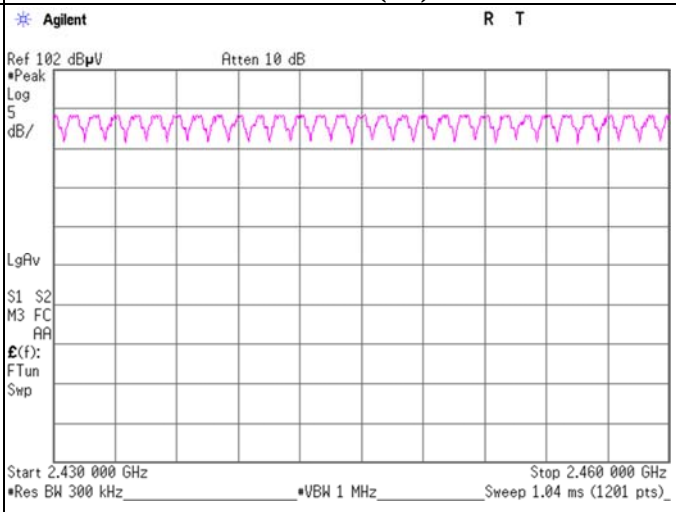
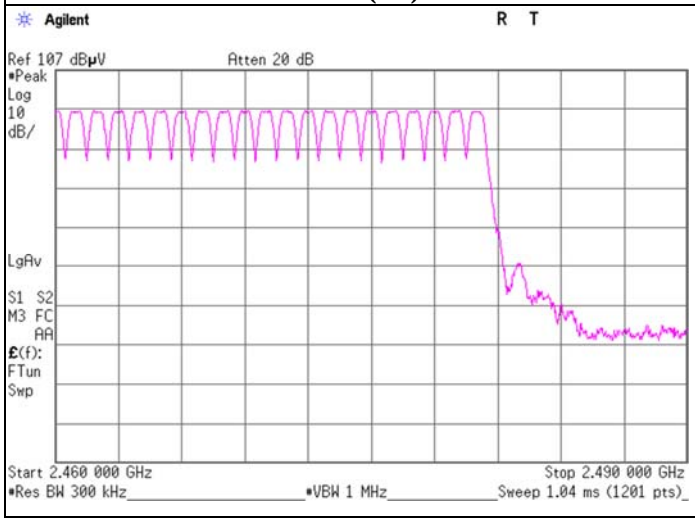
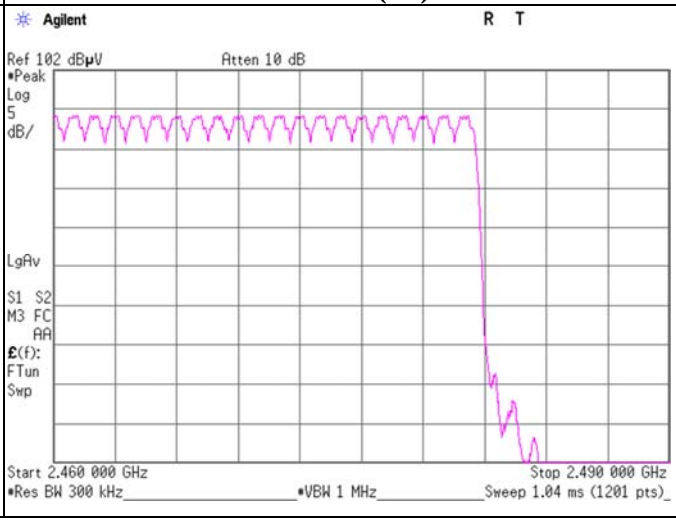
Number of Hopping Frequency

DH5 (1/3)	3-DH5 (1/3)
	
DH5 (2/3)	**3-DH5 (2/3)**
	
DH5 (3/3)	**3-DH5 (3/3)**
	

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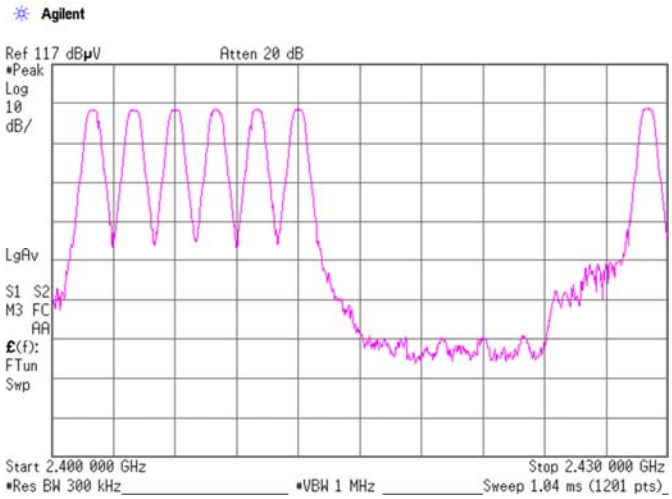
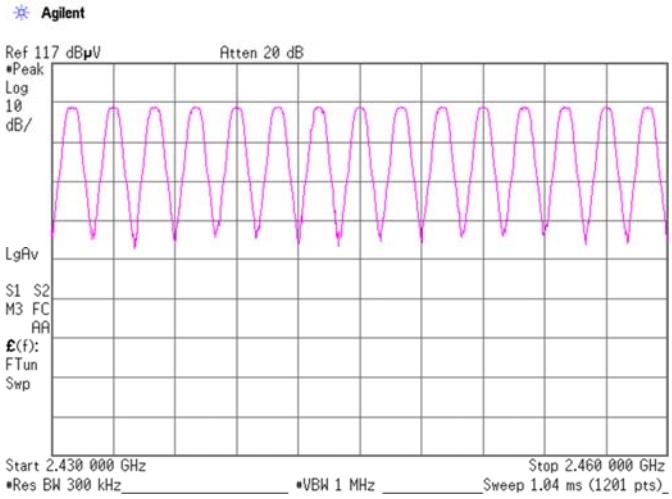
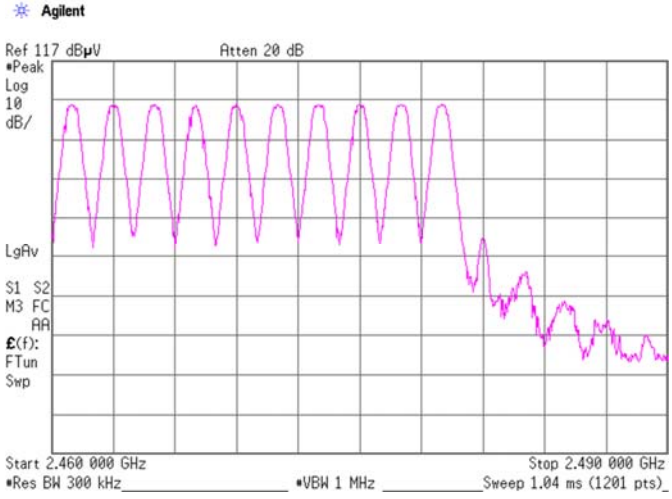
Number of Hopping Frequency

Inquiry (1/3)	
	
Inquiry (2/3)	
	
Inquiry (3/3)	
	

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Dwell Time (Conducted)

Test place	UL Japan, Inc. Shonan EMC Lab.		No.5 Shielded Room	
Date	2011/4/25		2011/5/12	
Temperature / Humidity	25deg.C	36% RH	26deg.C	53% RH
Engineer	Akio Hayashi		Tatsuya Arai	
Mode	Tx,			

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 / 5.0 sec. x 31.6 sec. = 323 times	0.400	129	400
DH3	17.0 times / 5.0 sec. x 31.6 sec. = 108 times	1.659	179	400
DH5	6.0 times / 5.0 sec. x 31.6 sec. = 38 times	2.911	111	400
3DH1	51.0 times / 5.0 sec. x 31.6 sec. = 323 times	0.414	134	400
3DH3	17.0 times / 5.0 sec. x 31.6 sec. = 108 times	1.667	180	400
3DH5	6.0 times / 5.0 sec. x 31.6 sec. = 38 times	2.919	111	400
Inquiry	100.0 times / 1.0 sec. x 12.8 sec. = 1280 times	0.102	130	400

Sample Calculation

Result = Number of transmission x Length of transmition time

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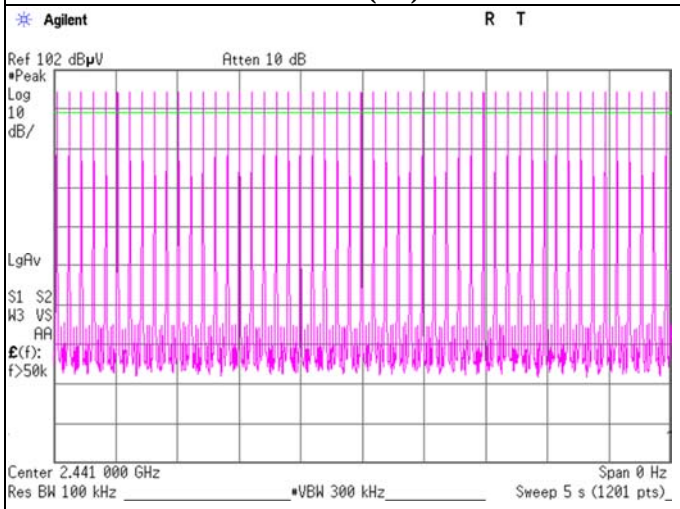
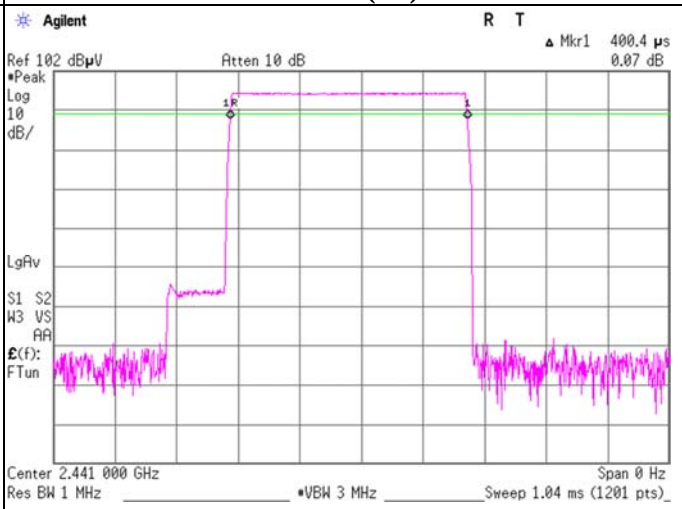
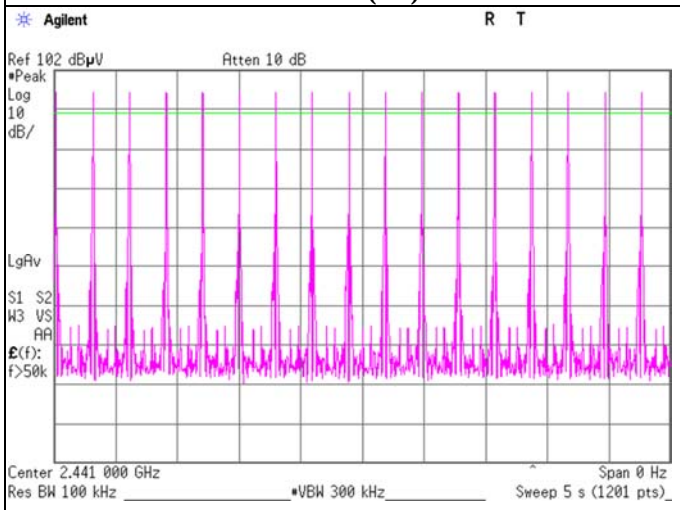
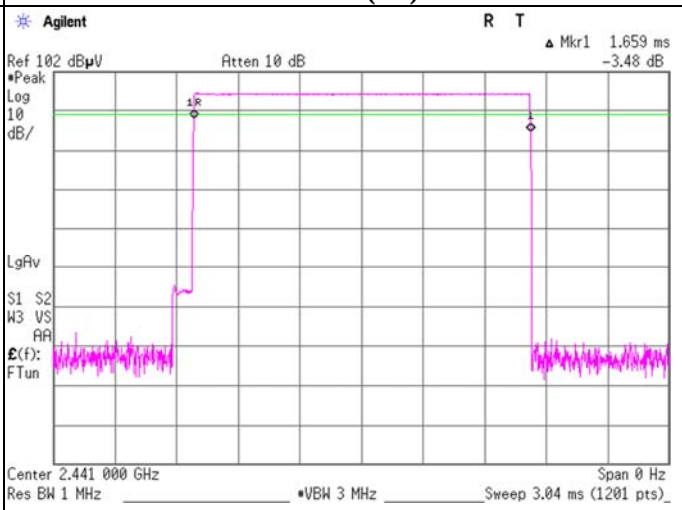
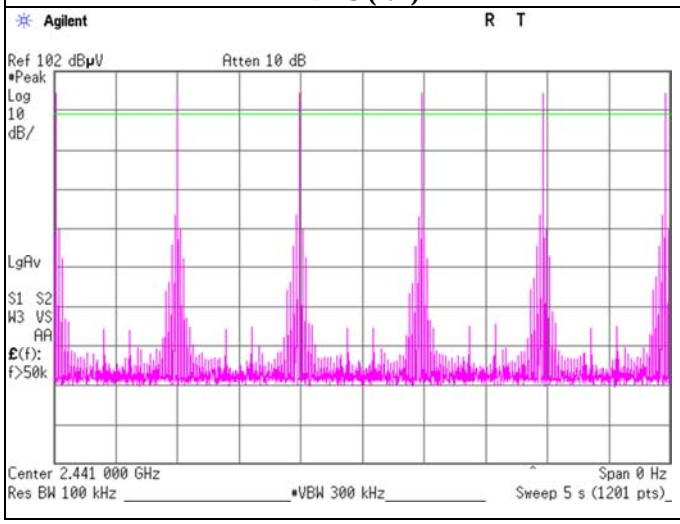
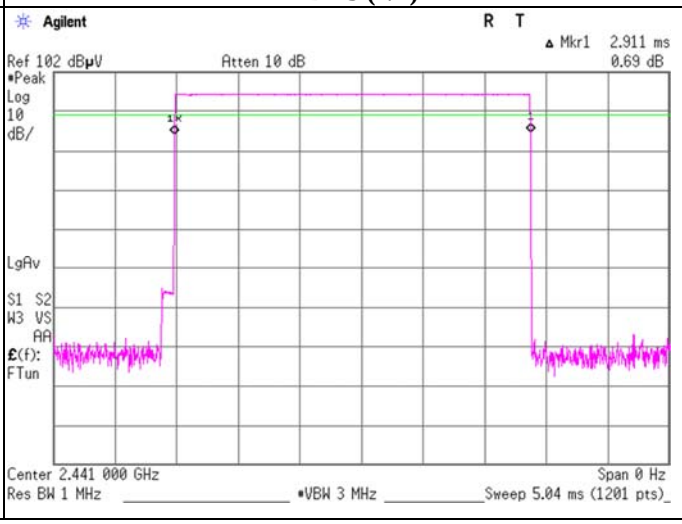
Dwell time

DH1 (1/2)	DH1 (2/2)
	
DH3 (1/2)	**DH3 (2/2)**
	
DH5 (1/2)	**DH5 (2/2)**
	

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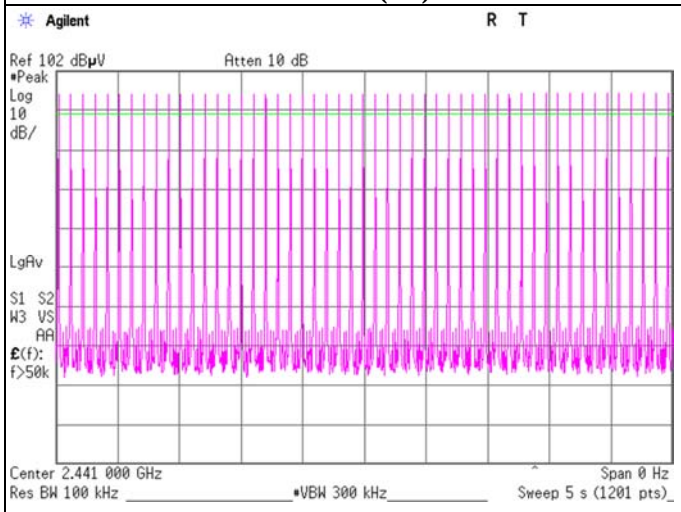
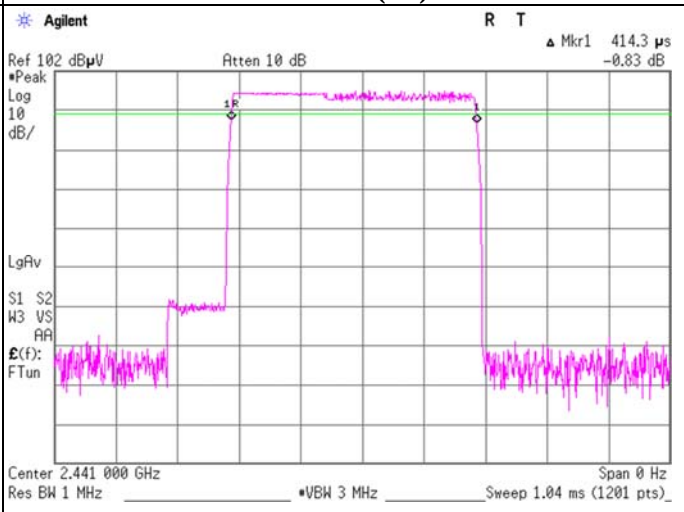
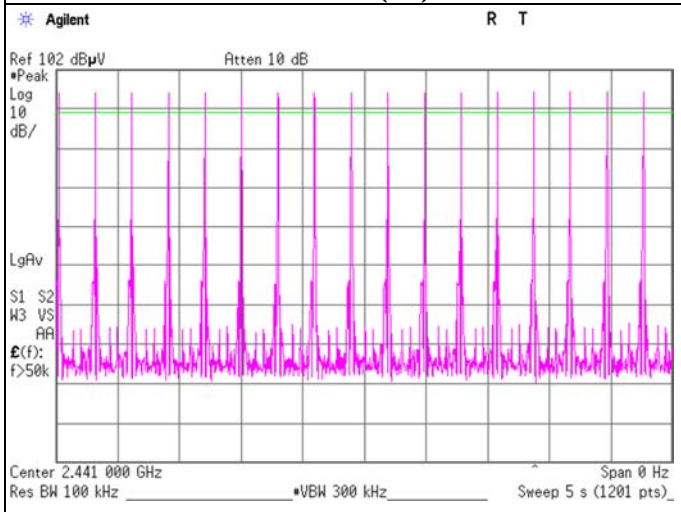
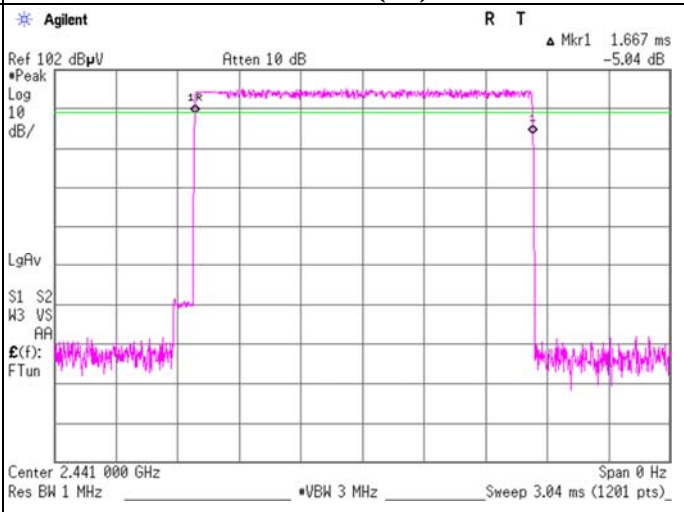
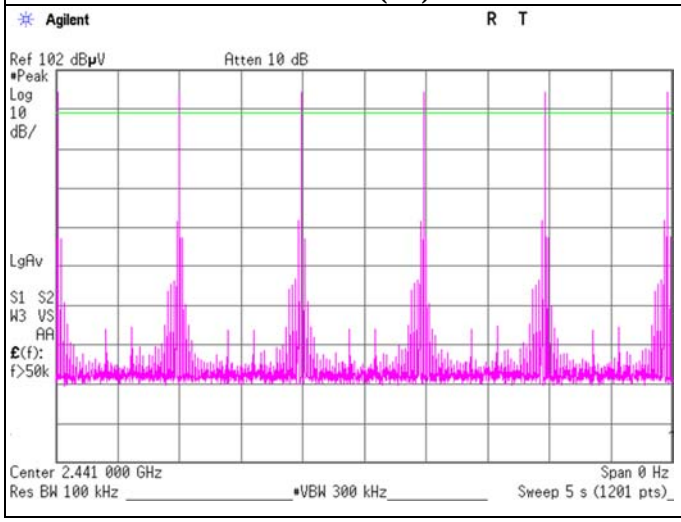
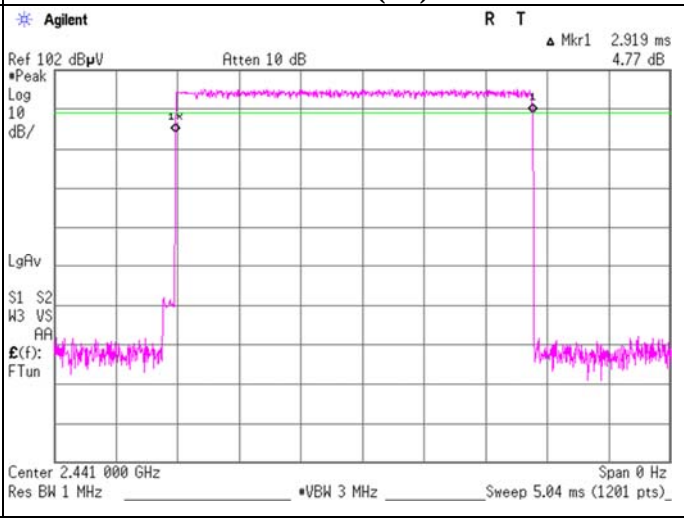
Dwell time

3-DH1 (1/2)	3-DH1 (2/2)
	
3-DH3 (1/2)	**3-DH3 (2/2)**
	
3-DH5 (1/2)	**3-DH5 (2/2)**
	

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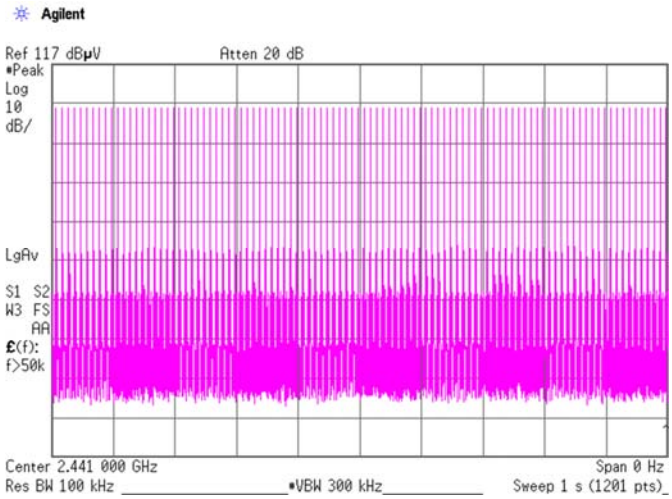
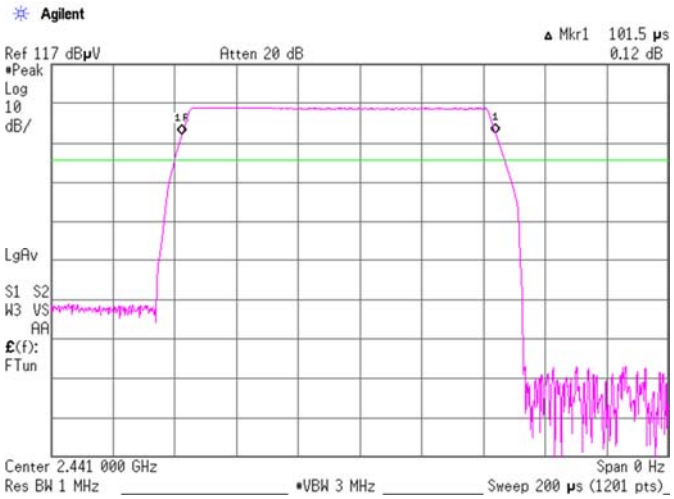
Dwell time

Inquiry (1/2)	Inquiry (2/2)
	

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Peak Output Power (Conducted)

Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date	2011/4/25
Temperature / Humidity	25deg.C 36% RH
Engineer	Akio Hayashi
Mode	Tx,

BDR (DH5)

Ch	Freq.	P/M (PK) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2402.0	-0.63	1.00	0.00	0.37	1.09	20.97	125	20.60
Mid	2441.0	-0.30	1.00	0.00	0.70	1.17	20.97	125	20.27
High	2480.0	-0.35	1.00	0.00	0.65	1.16	20.97	125	20.32

EDR (2-DH5)

Ch	Freq.	P/M (PK) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2402.0	0.23	1.00	0.00	1.23	1.33	20.97	125	19.74
Mid	2441.0	0.38	1.00	0.00	1.38	1.37	20.97	125	19.59
High	2480.0	0.11	1.00	0.00	1.11	1.29	20.97	125	19.86

EDR (3-DH5)

Ch	Freq.	P/M (PK) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2402.0	0.34	1.00	0.00	1.34	1.36	20.97	125	19.63
Mid	2441.0	0.55	1.00	0.00	1.55	1.43	20.97	125	19.42
High	2480.0	0.29	1.00	0.00	1.29	1.35	20.97	125	19.68

Sample Calculation:
Result = Reading + Cable Loss (supplied by customer) + Atten. Loss
* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.
*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		
Semi Anechoic Chamber	No.2		No.1
Date	2011/4/28	,	2011/4/29
Temperature / Humidity	25deg.C 45%RH	,	23deg.C 40%RH
Engineer	Akio Hayashi	,	Fumiaki Matsuo
	(above 1GHz)		(below 1GHz)
Mode	Tx, 2402 MHz		
	Bluetooth, DH5,		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	800.300	QP	23.2	21.0	9.3	31.9	21.6	46.0	24.4	100	246	X-axis
Hori.	1601.995	PK	47.1	25.7	12.9	38.4	47.3	73.9	26.6	100	214	Y-axis
Hori.	2390.000	PK	43.3	27.4	13.6	37.8	46.5	73.9	27.4	100	73	X-axis
Hori.	2399.500	PK	53.1	27.4	13.6	37.8	56.3	73.9	17.6	100	73	X-axis
Hori.	2400.000	PK	53.5	27.4	13.7	37.8	56.8	73.9	17.1	100	73	X-axis
Hori.	4804.000	PK	57.7	30.5	5.8	36.6	57.4	73.9	16.5	111	11	Z-axis
Hori.	7206.000	PK	44.0	36.2	7.1	38.4	48.9	73.9	25.0	100	0	X-axis
Hori.	9608.000	PK	41.5	38.3	8.3	37.1	51.0	73.9	22.9	100	0	X-axis
Hori.	12010.000	PK	42.3	39.4	9.3	37.9	53.1	73.9	20.8	100	0	X-axis
Hori.	1601.995	AV	40.5	25.7	12.9	38.4	40.7	53.9	13.2	100	214	Y-axis(VBW=10Hz)
Vert.	38.918	QP	37.2	15.1	7.0	31.8	27.5	40.0	12.5	100	66	X-axis
Vert.	40.818	QP	37.5	14.2	7.1	31.8	27.0	40.0	13.0	100	64	X-axis
Vert.	81.290	QP	39.2	6.8	7.6	31.8	21.8	40.0	18.2	106	65	X-axis
Vert.	1601.995	PK	46.5	25.7	12.9	38.4	46.7	73.9	27.2	110	200	Y-axis
Vert.	2390.000	PK	40.2	27.4	13.6	37.8	43.4	73.9	30.5	100	87	Z-axis
Vert.	2399.500	PK	53.9	27.4	13.6	37.8	57.1	73.9	16.8	100	87	Z-axis
Vert.	2400.000	PK	54.7	27.4	13.7	37.8	58.0	73.9	15.9	100	87	Z-axis
Vert.	4804.000	PK	56.6	30.5	5.8	36.6	56.3	73.9	17.6	100	111	X-axis
Vert.	7206.000	PK	42.9	36.2	7.1	38.4	47.8	73.9	26.1	100	0	X-axis
Vert.	9608.000	PK	41.0	38.3	8.3	37.1	50.5	73.9	23.4	100	0	X-axis
Vert.	12010.000	PK	42.9	39.4	9.3	37.9	53.7	73.9	20.2	100	0	X-axis
Vert.	1601.995	AV	36.8	25.7	12.9	38.4	37.0	53.9	16.9	110	200	Y-axis(VBW=10Hz)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amprifier)

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

*No noise was detected above the 5th order harmonics.

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	33.2	27.4	13.6	37.8	-24.6	11.8	53.9	42.1	X-axis(VBW=270Hz)
Hori.	2399.500	AV	45.6	27.4	13.6	37.8	-24.6	24.2	53.9	29.7	X-axis(VBW=270Hz)
Hori.	2400.000	AV	47.5	27.4	13.7	37.8	-24.6	26.2	53.9	27.7	X-axis(VBW=270Hz)
Hori.	4804.000	AV	56.0	30.5	5.8	36.6	-24.6	31.1	53.9	22.8	Z-axis(VBW=270Hz)
Hori.	7206.000	AV	33.3	36.2	7.1	38.4	-24.6	13.6	53.9	40.3	X-axis(VBW=270Hz)
Hori.	9608.000	AV	32.1	38.3	8.3	37.1	-24.6	17.0	53.9	36.9	X-axis(VBW=270Hz)
Hori.	12010.000	AV	32.3	39.4	9.3	37.9	-24.6	18.5	53.9	35.4	X-axis(VBW=270Hz)
Vert.	2390.000	AV	33.4	27.4	13.6	37.8	-24.6	12.0	53.9	41.9	Z-axis(VBW=270Hz)
Vert.	2399.500	AV	48.0	27.4	13.6	37.8	-24.6	26.6	53.9	27.3	Z-axis(VBW=270Hz)
Vert.	2400.000	AV	49.9	27.4	13.7	37.8	-24.6	28.6	53.9	25.3	Z-axis(VBW=270Hz)
Vert.	4804.000	AV	53.6	30.5	5.8	36.6	-24.6	28.7	53.9	25.2	X-axis(VBW=270Hz)
Vert.	7206.000	AV	33.3	36.2	7.1	38.4	-24.6	13.6	53.9	40.3	X-axis(VBW=270Hz)
Vert.	9608.000	AV	32.1	38.3	8.3	37.1	-24.6	17.0	53.9	36.9	X-axis(VBW=270Hz)
Vert.	12010.000	AV	32.3	39.4	9.3	37.9	-24.6	18.5	53.9	35.4	X-axis(VBW=270Hz)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter)
- Gain(Amprifier) + Dwell time factor (Refer to the data 'Caluculation of VBW and Dwell Time Factor')

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

*No noise was detected above the 5th order harmonics.

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		
Semi Anechoic Chamber	No.2		No.1
Date	2011/4/28	,	2011/4/29
Temperature / Humidity	25deg.C 45%RH	,	23deg.C 40%RH
Engineer	Akio Hayashi	,	Fumiaki Matsuo
	(above 1GHz)		(below 1GHz)
Mode	Tx, 2441 MHz		
	Bluetooth, DH5,		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	813.300	QP	23.1	21.2	9.4	31.8	21.9	46.0	24.1	100	240	X-axis
Hori.	1626.665	PK	46.7	25.8	12.9	38.4	47.0	73.9	26.9	100	210	Y-axis
Hori.	4882.000	PK	56.8	30.8	5.9	36.6	56.9	73.9	17.0	100	44	Z-axis
Hori.	7323.000	PK	43.0	36.4	7.2	38.4	48.2	73.9	25.7	100	0	Z-axis
Hori.	9764.000	PK	41.1	38.5	8.3	37.1	50.8	73.9	23.1	100	0	Z-axis
Hori.	12205.000	PK	43.6	39.4	9.5	38.0	54.5	73.9	19.4	100	0	Z-axis
Hori.	1626.665	AV	40.2	25.8	12.9	38.4	40.5	53.9	13.4	100	210	Y-axis(VBW:10Hz)
Vert.	38.753	QP	36.8	15.2	7.0	31.8	27.2	40.0	12.8	100	61	X-axis
Vert.	41.065	QP	37.3	14.1	7.1	31.8	26.7	40.0	13.3	100	67	X-axis
Vert.	80.274	QP	39.3	6.6	7.6	31.8	21.7	40.0	18.3	100	83	X-axis
Vert.	1626.665	PK	45.4	25.8	12.9	38.4	45.6	73.9	28.3	111	201	Y-axis
Vert.	4882.000	PK	58.7	30.8	5.9	36.6	58.8	73.9	15.1	100	36	X-axis
Vert.	7323.000	PK	43.5	36.4	7.2	38.4	48.7	73.9	25.2	100	0	X-axis
Vert.	9764.000	PK	40.8	38.5	8.3	37.1	50.5	73.9	23.4	100	0	X-axis
Vert.	12205.000	PK	43.3	39.4	9.5	38.0	54.2	73.9	19.7	100	0	X-axis
Vert.	1626.665	AV	36.2	25.8	12.9	38.4	36.5	53.9	17.4	111	201	Y-axis(VBW:10Hz)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amprifier)

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

*No noise was detected above the 5th order harmonics.

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4882.000	AV	54.4	30.8	5.9	36.6	-24.6	29.9	53.9	24.0	Z-axis(VBW:270Hz)
Hori.	7323.000	AV	32.2	36.4	7.2	38.4	-24.6	12.8	53.9	41.1	Z-axis(VBW:270Hz)
Hori.	9764.000	AV	31.3	38.5	8.3	37.1	-24.6	16.4	53.9	37.5	Z-axis(VBW:270Hz)
Hori.	12205.000	AV	32.5	39.4	9.5	38.0	-24.6	18.8	53.9	35.1	Z-axis(VBW:270Hz)
Vert.	4882.000	AV	56.6	30.8	5.9	36.6	-24.6	32.1	53.9	21.8	X-axis(VBW:270Hz)
Vert.	7323.000	AV	32.2	36.4	7.2	38.4	-24.6	12.8	53.9	41.1	X-axis(VBW:270Hz)
Vert.	9764.000	AV	31.0	38.5	8.3	37.1	-24.6	16.1	53.9	37.8	X-axis(VBW:270Hz)
Vert.	12205.000	AV	32.3	39.4	9.5	38.0	-24.6	18.6	53.9	35.3	X-axis(VBW:270Hz)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter)
- Gain(Amprifier) + Dwell time factor (Refer to the data 'Caluculation of VBW and Dwell Time Factor')

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

*No noise was detected above the 5th order harmonics.

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		
Semi Anechoic Chamber	No.2		No.1
Date	2011/4/28	,	2011/4/29
Temperature / Humidity	25deg.C 45%RH	,	23deg.C 40%RH
Engineer	Akio Hayashi	,	Fumiaki Matsuo
	(above 1GHz)		(below 1GHz)
Mode	Tx, 2480 MHz		
	Bluetooth, DH5,		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	826.200	QP	23.2	21.3	9.5	31.8	22.2	46.0	23.8	100	239	X-axis
Hori.	1653.000	PK	47.6	25.9	12.9	38.4	48.0	73.9	25.9	100	210	Y-axis
Hori.	2483.500	PK	47.8	27.4	13.6	37.6	51.2	73.9	22.7	140	197	X-axis
Hori.	2483.963	PK	47.7	27.4	13.6	37.6	51.1	73.9	22.8	140	197	X-axis
Hori.	2484.499	PK	47.3	27.4	13.6	37.6	50.7	73.9	23.2	140	197	X-axis
Hori.	4960.000	PK	54.6	31.0	5.9	36.5	55.0	73.9	18.9	119	352	Z-axis
Hori.	7440.000	PK	43.7	36.7	7.2	38.4	49.2	73.9	24.7	100	0	X-axis
Hori.	9920.000	PK	42.0	38.7	8.5	37.2	52.0	73.9	21.9	100	0	X-axis
Hori.	12400.000	PK	41.8	39.4	9.6	38.0	52.8	73.9	21.1	100	0	X-axis
Hori.	1653.000	AV	41.3	25.9	12.9	38.4	41.7	53.9	12.2	100	210	Y-axis(VBW=10Hz)
Vert.	38.754	QP	36.5	15.2	7.0	31.8	26.9	40.0	13.1	100	61	X-axis
Vert.	41.067	QP	37.9	14.1	7.1	31.8	27.3	40.0	12.7	100	62	X-axis
Vert.	80.197	QP	39.8	6.6	7.6	31.8	22.2	40.0	17.8	127	37	X-axis
Vert.	1653.000	PK	46.6	25.9	12.9	38.4	47.0	73.9	26.9	108	103	Y-axis
Vert.	2483.500	PK	51.0	27.4	13.6	37.6	54.4	73.9	19.5	115	128	Z-axis
Vert.	2484.000	PK	50.0	27.4	13.6	37.6	53.4	73.9	20.5	115	128	Z-axis
Vert.	2484.499	PK	48.9	27.4	13.6	37.6	52.3	73.9	21.6	115	128	Z-axis
Vert.	4960.000	PK	56.5	31.0	5.9	36.5	56.9	73.9	17.0	113	42	X-axis
Vert.	7440.000	PK	44.3	36.7	7.2	38.4	49.8	73.9	24.1	100	0	Z-axis
Vert.	9920.000	PK	41.7	38.7	8.5	37.2	51.7	73.9	22.2	100	0	Z-axis
Vert.	12400.000	PK	41.4	39.4	9.6	38.0	52.4	73.9	21.5	100	0	Z-axis
Vert.	1653.000	AV	38.1	25.9	12.9	38.4	38.5	53.9	15.4	108	103	Y-axis(VBW=10Hz)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amprifier)

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

*No noise was detected above the 5th order harmonics.

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	41.6	27.4	13.6	37.6	-24.6	20.4	53.9	33.5	X-axis(VBW=270Hz)
Hori.	2483.963	AV	39.4	27.4	13.6	37.6	-24.6	18.2	53.9	35.7	X-axis(VBW=270Hz)
Hori.	2484.499	AV	38.2	27.4	13.6	37.6	-24.6	17.0	53.9	36.9	X-axis(VBW=270Hz)
Hori.	4960.000	AV	51.1	31.0	5.9	36.5	-24.6	26.9	53.9	27.0	Z-axis(VBW=270Hz)
Hori.	7440.000	AV	33.4	36.7	7.2	38.4	-24.6	14.3	53.9	39.6	Z-axis(VBW=270Hz)
Hori.	9920.000	AV	31.5	38.7	8.5	37.2	-24.6	16.9	53.9	37.0	Z-axis(VBW=270Hz)
Hori.	12400.000	AV	31.2	39.4	9.6	38.0	-24.6	17.6	53.9	36.3	Z-axis(VBW=270Hz)
Vert.	2483.500	AV	42.8	27.4	13.6	37.6	-24.6	21.6	53.9	32.3	Z-axis(VBW=270Hz)
Vert.	2483.963	AV	40.5	27.4	13.6	37.6	-24.6	19.3	53.9	34.6	Z-axis(VBW=270Hz)
Vert.	2484.499	AV	39.5	27.4	13.6	37.6	-24.6	18.3	53.9	35.6	Z-axis(VBW=270Hz)
Vert.	4960.000	AV	54.1	31.0	5.9	36.5	-24.6	29.9	53.9	24.0	X-axis(VBW=270Hz)
Vert.	7440.000	AV	33.3	36.7	7.2	38.4	-24.6	14.2	53.9	39.7	X-axis(VBW=270Hz)
Vert.	9920.000	AV	31.3	38.7	8.5	37.2	-24.6	16.7	53.9	37.2	X-axis(VBW=270Hz)
Vert.	12400.000	AV	31.0	39.4	9.6	38.0	-24.6	17.4	53.9	36.5	X-axis(VBW=270Hz)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter)
- Gain(Amprifier) + Dwell time factor (Refer to the data 'Caluculation of VBW and Dwell Time Factor')

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

*No noise was detected above the 5th order harmonics.

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Telephone : +81 463 50 6400
Facsimile : +81 463 50 6401

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		
Semi Anechoic Chamber	No.2		No.1
Date	2011/4/28	,	2011/4/29
Temperature / Humidity	25deg.C 45%RH	,	23deg.C 40%RH
Engineer	Akio Hayashi	,	Fumiaki Matsuo
	(above 1GHz)		(below 1GHz)
Mode	Tx, 2402 MHz		
	Bluetooth, 3-DH5,		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	792.300	QP	23.3	21.0	9.3	31.9	21.7	46.0	24.3	100	250	X-axis
Hori.	1602.020	PK	50.3	25.7	12.9	38.4	50.5	73.9	23.4	100	217	Y-axis
Hori.	2390.000	PK	43.8	27.4	13.6	37.8	47.0	73.9	26.9	129	82	X-axis
Hori.	2399.642	PK	52.4	27.4	13.6	37.8	55.6	73.9	18.3	129	82	X-axis
Hori.	2400.000	PK	58.1	27.4	13.7	37.8	61.4	73.9	12.5	129	82	X-axis
Hori.	4804.000	PK	47.4	30.5	5.8	36.6	47.1	73.9	26.8	100	317	X-axis(AV/VBW=270Hz)
Hori.	7206.000	PK	46.6	36.2	7.1	38.4	51.5	73.9	22.4	100	0	X-axis(Not Detected)
Hori.	9608.000	PK	43.9	38.3	8.3	37.1	53.4	73.9	20.5	100	0	X-axis(Not Detected)
Hori.	12010.000	PK	46.0	39.4	9.3	37.9	56.8	73.9	17.1	100	0	X-axis(Not Detected)
Hori.	1602.020	AV	45.8	25.7	12.9	38.4	46.0	53.9	7.9	100	217	Y-axis(VBW=10Hz)
Vert.	38.874	QP	36.7	15.1	7.0	31.8	27.0	40.0	13.0	100	59	X-axis
Vert.	41.335	QP	37.2	14.0	7.1	31.8	26.5	40.0	13.5	103	59	X-axis
Vert.	81.311	QP	39.3	6.8	7.6	31.8	21.9	40.0	18.1	110	65	X-axis
Vert.	1602.020	PK	45.0	25.7	12.9	38.4	45.2	73.9	28.7	100	199	Y-axis
Vert.	2390.000	PK	43.0	27.4	13.6	37.8	46.2	73.9	27.7	100	79	Z-axis
Vert.	2399.642	PK	52.0	27.4	13.6	37.8	55.2	73.9	18.7	100	79	Z-axis
Vert.	2400.000	PK	57.9	27.4	13.7	37.8	61.2	73.9	12.7	100	79	Z-axis
Vert.	4804.000	PK	52.3	30.5	5.8	36.6	52.0	73.9	21.9	102	39	Y-axis
Vert.	7206.000	PK	45.9	36.2	7.1	38.4	50.8	73.9	23.1	100	0	Y-axis(Not Detected)
Vert.	9608.000	PK	43.2	38.3	8.3	37.1	52.7	73.9	21.2	100	0	Y-axis(Not Detected)
Vert.	12010.000	PK	45.8	39.4	9.3	37.9	56.6	73.9	17.3	100	0	Y-axis(Not Detected)
Vert.	1602.020	AV	37.3	25.7	12.9	38.4	37.5	53.9	16.4	100	199	Y-axis(VBW=10Hz)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amprifier)

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

*No noise was detected above the 5th order harmonics.

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	43.8	27.4	13.6	37.8	-24.6	22.4	53.9	31.5	X-axis(VBW=270Hz)
Hori.	2399.642	AV	52.4	27.4	13.6	37.8	-24.6	31.0	53.9	22.9	X-axis(VBW=270Hz)
Hori.	2400.000	AV	58.1	27.4	13.7	37.8	-24.6	36.8	53.9	17.1	X-axis(VBW=270Hz)
Hori.	4804.000	AV	47.4	30.5	5.8	36.6	-24.6	22.5	53.9	31.4	X-axis(VBW=270Hz)
Hori.	7206.000	AV	35.8	36.2	7.1	38.4	-24.6	16.1	53.9	37.8	X-axis(VBW=270Hz)
Hori.	9608.000	AV	32.8	38.3	8.3	37.1	-24.6	17.7	53.9	36.2	X-axis(VBW=270Hz)
Hori.	12010.000	AV	35.8	39.4	9.3	37.9	-24.6	22.0	53.9	31.9	X-axis(VBW=270Hz)
Vert.	2390.000	AV	33.4	27.4	13.6	37.8	-24.6	12.0	53.9	41.9	Z-axis(VBW=270Hz)
Vert.	2399.642	AV	44.2	27.4	13.6	37.8	-24.6	22.8	53.9	31.1	Z-axis(VBW=270Hz)
Vert.	2400.000	AV	48.1	27.4	13.7	37.8	-24.6	26.8	53.9	27.1	Z-axis(VBW=270Hz)
Vert.	4804.000	AV	45.0	30.5	5.8	36.6	-24.6	20.1	53.9	33.8	Y-axis(VBW=270Hz)
Vert.	7206.000	AV	35.7	36.2	7.1	38.4	-24.6	16.0	53.9	37.9	Y-axis(VBW=270Hz)
Vert.	9608.000	AV	32.7	38.3	8.3	37.1	-24.6	17.6	53.9	36.3	Y-axis(VBW=270Hz)
Vert.	12010.000	AV	35.3	39.4	9.3	37.9	-24.6	21.5	53.9	32.4	Y-axis(VBW=270Hz)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter)
- Gain(Amprifier) + Dwell time factor (Refer to the data 'Caluculation of VBW and Dwell Time Factor')

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

*No noise was detected above the 5th order harmonics.

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		
Semi Anechoic Chamber	No.2		No.1
Date	2011/4/28	,	2011/4/29
Temperature / Humidity	25deg.C 45%RH	,	23deg.C 40%RH
Engineer	Akio Hayashi	,	Fumiaki Matsuo
	(above 1GHz)		(below 1GHz)
Mode	Tx, 2441 MHz		
	Bluetooth, 3-DH5,		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	812.500	QP	23.2	21.1	9.4	31.8	21.9	46.0	24.1	100	247	X-axis
Hori.	1628.110	PK	47.2	25.8	12.9	38.4	47.5	73.9	26.4	100	214	Y-axis
Hori.	4882.000	PK	45.4	30.8	5.9	36.6	45.5	73.9	28.4	110	246	X-axis
Hori.	7323.000	PK	43.5	36.4	7.2	38.4	48.7	73.9	25.2	100	0	X-axis(Not Detected)
Hori.	9764.000	PK	41.5	38.5	8.3	37.1	51.2	73.9	22.7	100	0	X-axis(Not Detected)
Hori.	12205.000	PK	43.1	39.4	9.5	38.0	54.0	73.9	19.9	100	0	X-axis(Not Detected)
Hori.	1628.110	AV	41.2	25.8	12.9	38.4	41.5	53.9	12.4	100	214	Y-axis(VBW=10Hz)
Vert.	38.796	QP	36.9	15.2	7.0	31.8	27.3	40.0	12.7	100	66	X-axis
Vert.	41.070	QP	37.0	14.1	7.1	31.8	26.4	40.0	13.6	100	58	X-axis
Vert.	81.314	QP	39.5	6.8	7.6	31.8	22.1	40.0	17.9	121	60	X-axis
Vert.	1628.110	PK	46.2	25.8	12.9	38.4	46.5	73.9	27.4	109	201	Y-axis
Vert.	4882.000	PK	50.2	30.8	5.9	36.6	50.3	73.9	23.6	100	42	Y-axis
Vert.	7323.000	PK	42.3	36.4	7.2	38.4	47.5	73.9	26.4	100	0	Y-axis(Not Detected)
Vert.	9764.000	PK	42.0	38.5	8.3	37.1	51.7	73.9	22.2	100	0	Y-axis(Not Detected)
Vert.	12205.000	PK	43.8	39.4	9.5	38.0	54.7	73.9	19.2	100	0	Y-axis(Not Detected)
Vert.	1628.110	AV	37.5	25.8	12.9	38.4	37.8	53.9	16.1	109	201	Y-axis(VBW=10Hz)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amprifier)

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

*No noise was detected above the 5th order harmonics.

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4882.000	AV	38.0	30.8	5.9	36.6	-24.6	13.5	53.9	40.4	X-axis(VBW=270Hz)
Hori.	7323.000	AV	33.3	36.4	7.2	38.4	-24.6	13.9	53.9	40.0	X-axis(VBW=270Hz)
Hori.	9764.000	AV	31.5	38.5	8.3	37.1	-24.6	16.6	53.9	37.3	X-axis(VBW=270Hz)
Hori.	12205.000	AV	33.3	39.4	9.5	38.0	-24.6	19.6	53.9	34.3	X-axis(VBW=270Hz)
Vert.	4882.000	AV	42.6	30.8	5.9	36.6	-24.6	18.1	53.9	35.8	Y-axis(VBW=270Hz)
Vert.	7323.000	AV	33.5	36.4	7.2	38.4	-24.6	14.1	53.9	39.8	Y-axis(VBW=270Hz)
Vert.	9764.000	AV	31.4	38.5	8.3	37.1	-24.6	16.5	53.9	37.4	Y-axis(VBW=270Hz)
Vert.	12205.000	AV	33.2	39.4	9.5	38.0	-24.6	19.5	53.9	34.4	Y-axis(VBW=270Hz)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter)
- Gain(Amprifier) + Dwell time factor (Refer to the data 'Caluculation of VBW and Dwell Time Factor')

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

*No noise was detected above the 5th order harmonics.

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		
Semi Anechoic Chamber	No.2		No.1
Date	2011/4/28	,	2011/4/29
Temperature / Humidity	25deg.C 45%RH	,	23deg.C 40%RH
Engineer	Akio Hayashi	,	Fumiaki Matsuo
	(above 1GHz)		(below 1GHz)
Mode	Tx, 2480 MHz		
	Bluetooth, 3-DH5,		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	826.200	QP	23.3	21.3	9.5	31.8	22.3	46.0	23.7	100	251	X-axis
Hori.	1654.000	PK	48.5	25.9	12.9	38.4	48.9	73.9	25.0	100	214	Y-axis
Hori.	2483.500	PK	54.2	27.4	13.6	37.6	57.6	73.9	16.3	137	192	X-axis
Hori.	4960.000	PK	51.8	31.0	5.9	36.5	52.2	73.9	21.7	107	243	X-axis
Hori.	7440.000	PK	41.8	36.7	7.2	38.4	47.3	73.9	26.6	100	0	X-axis(Not Detected)
Hori.	9920.000	PK	42.2	38.7	8.5	37.2	52.2	73.9	21.7	100	0	X-axis(Not Detected)
Hori.	12400.000	PK	42.4	39.4	9.6	38.0	53.4	73.9	20.5	100	0	X-axis(Not Detected)
Hori.	1654.000	AV	43.0	25.9	12.9	38.4	43.4	53.9	10.5	100	214	Y-axis(VBW=10Hz)
Vert.	38.787	QP	36.5	15.2	7.0	31.8	26.9	40.0	13.1	100	65	X-axis
Vert.	40.922	QP	37.2	14.1	7.1	31.8	26.6	40.0	13.4	103	70	X-axis
Vert.	81.385	QP	39.3	6.8	7.6	31.8	21.9	40.0	18.1	119	65	X-axis
Vert.	1654.000	PK	47.2	25.9	12.9	38.4	47.6	73.9	26.3	112	94	Y-axis
Vert.	2483.500	PK	52.5	27.4	13.6	37.6	55.9	73.9	18.0	145	101	Z-axis
Vert.	4960.000	PK	50.1	31.0	5.9	36.5	50.5	73.9	23.4	122	304	Y-axis
Vert.	7440.000	PK	44.4	36.7	7.2	38.4	49.9	73.9	24.0	100	0	Y-axis(Not Detected)
Vert.	9920.000	PK	42.3	38.7	8.5	37.2	52.3	73.9	21.6	100	0	Y-axis(Not Detected)
Vert.	12400.000	PK	41.6	39.4	9.6	38.0	52.6	73.9	21.3	100	0	Y-axis(Not Detected)
Vert.	1654.000	AV	39.2	25.9	12.9	38.4	39.6	53.9	14.3	112	94	Y-axis(VBW=10Hz)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amprifier)

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

*No noise was detected above the 5th order harmonics.

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	44.5	27.4	13.6	37.6	-24.6	23.3	53.9	30.6	X-axis(VBW=270Hz)
Hori.	4960.000	AV	44.0	31.0	5.9	36.5	-24.6	19.8	53.9	34.1	X-axis(VBW=270Hz)
Hori.	7440.000	AV	33.3	36.7	7.2	38.4	-24.6	14.2	53.9	39.7	X-axis(VBW=270Hz)
Hori.	9920.000	AV	31.3	38.7	8.5	37.2	-24.6	16.7	53.9	37.2	X-axis(VBW=270Hz)
Hori.	12400.000	AV	31.4	39.4	9.6	38.0	-24.6	17.8	53.9	36.1	X-axis(VBW=270Hz)
Vert.	2483.500	AV	39.3	27.4	13.6	37.6	-24.6	18.1	53.9	35.8	Z-axis(VBW=270Hz)
Vert.	4960.000	AV	41.4	31.0	5.9	36.5	-24.6	17.2	53.9	36.7	Y-axis(VBW=270Hz)
Vert.	7440.000	AV	33.3	36.7	7.2	38.4	-24.6	14.2	53.9	39.7	Y-axis(VBW=270Hz)
Vert.	9920.000	AV	31.1	38.7	8.5	37.2	-24.6	16.5	53.9	37.4	Y-axis(VBW=270Hz)
Vert.	12400.000	AV	31.1	39.4	9.6	38.0	-24.6	17.5	53.9	36.4	Y-axis(VBW=270Hz)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter)
- Gain(Amprifier) + Dwell time factor (Refer to the data 'Caluculation of VBW and Dwell Time Factor')

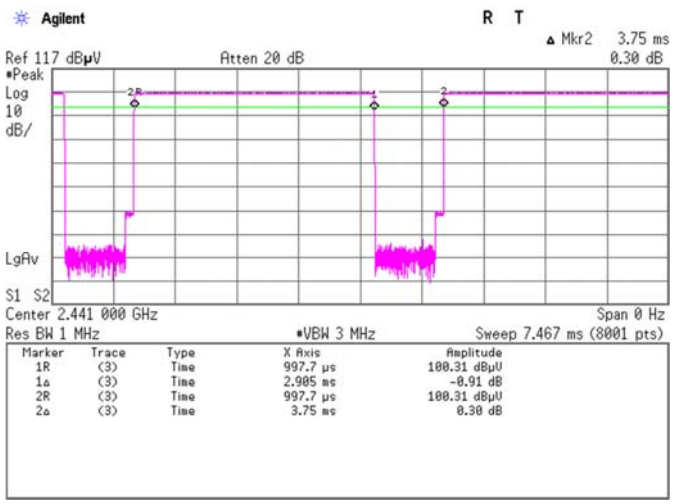
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

*No noise was detected above the 5th order harmonics.

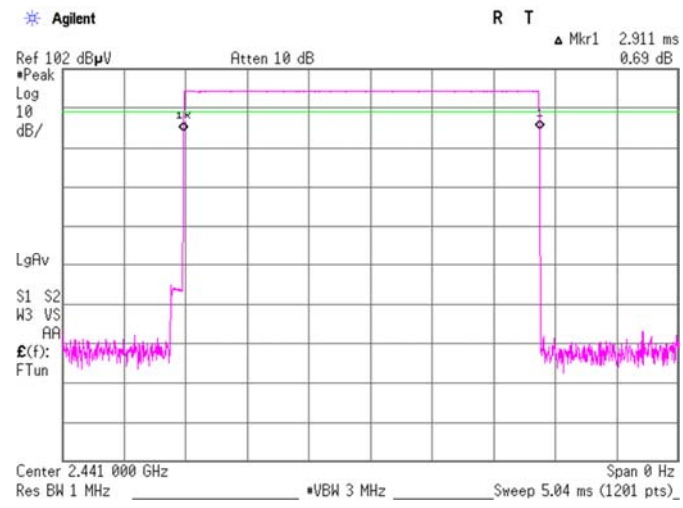
Caluculation of VBW and Dwell Time Factor

DH5,

VBW (AV) Calculation

VBW: 1/x = 266Hz<270Hz x: (Tx on+Tx off) =3.75ms	
	

Dwell Time Factor Calculation

Worst 100ms, Dwell time factor =20log(2.911*2/100) = -24.6dB	
	

ON time of some channel during 100ms: Twice
This is the worst case in hopping sequence of Bluetooth.

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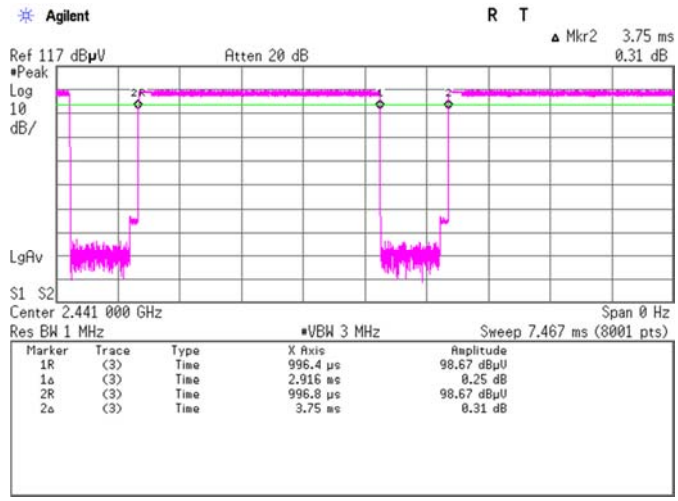
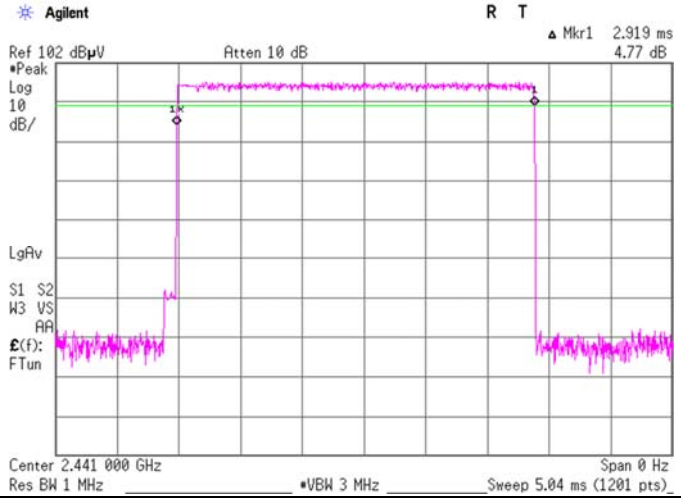
Caluculation of VBW and Dwell Time Factor

3-DH5,

VBW (AV) Calculation

VBW: 1/x = 266Hz<270Hz x: (Tx on+Tx off) =3.75ms	
	

Dwell Time Factor Calculation

Worst 100ms, Dwell time factor =20log(2.919*2/100) = -24.6dB	
	

ON time of some channel during 100ms: Twice
This is the worst case in hopping sequence of Bluetooth.

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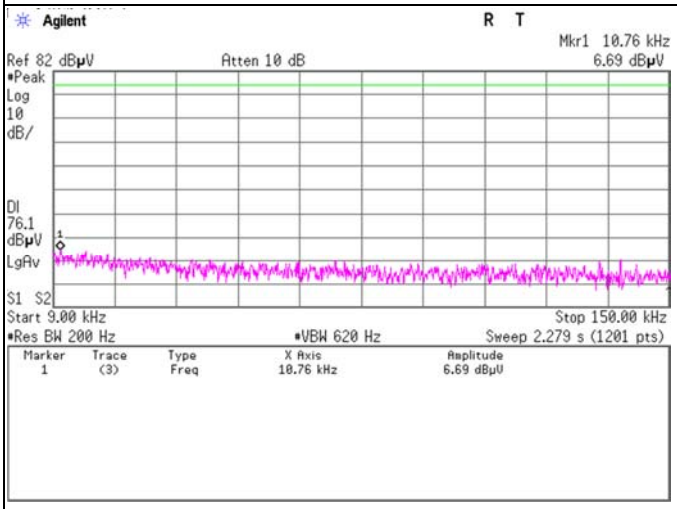
Spurious emission (Conducted)

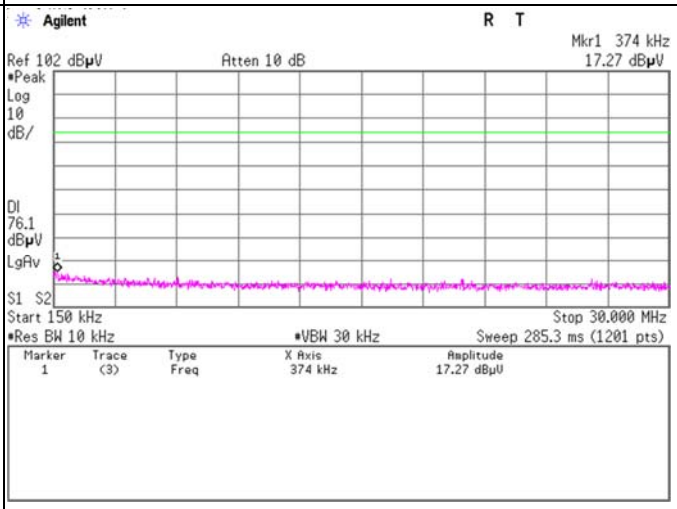
DH5,

Tx, 2402MHz

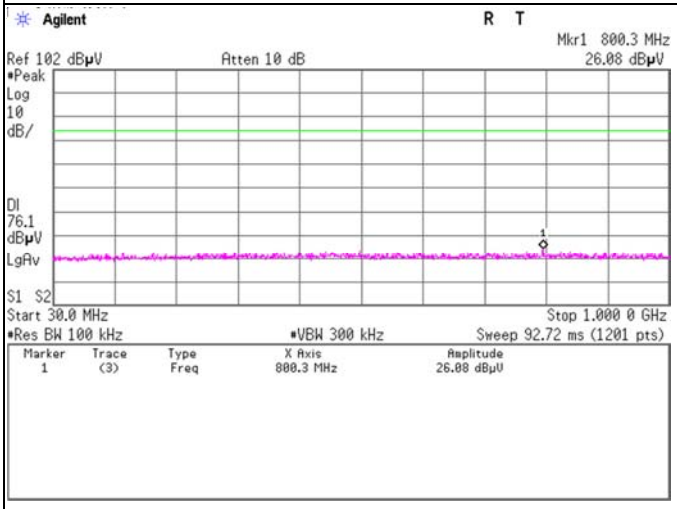
9kHz - 150kHz



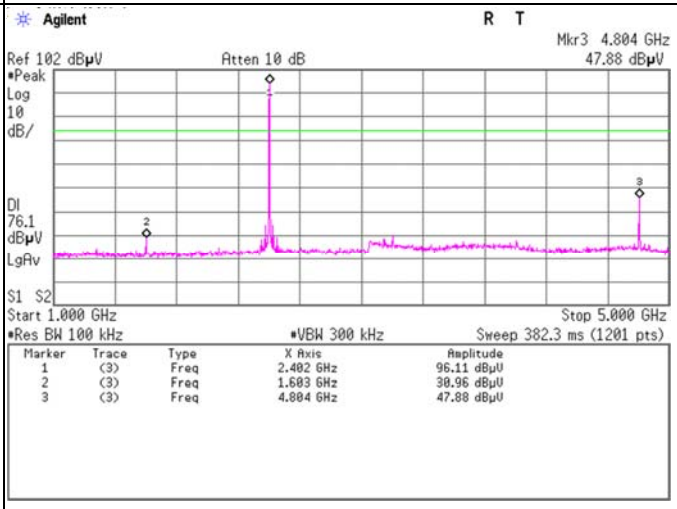
150kHz - 30MHz



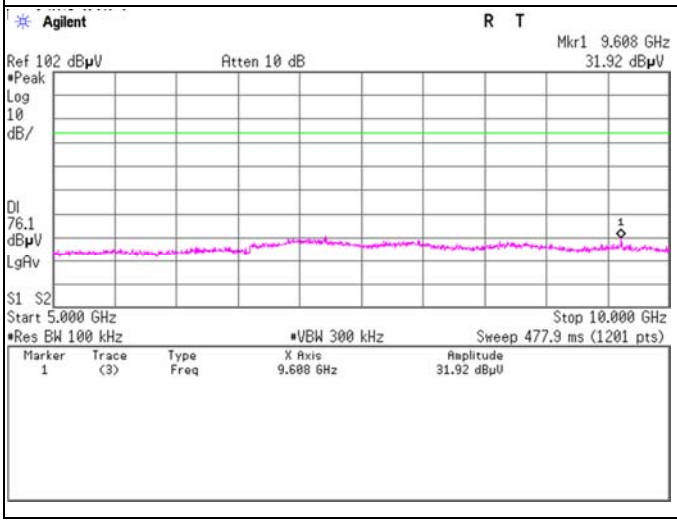
30MHz - 1GHz



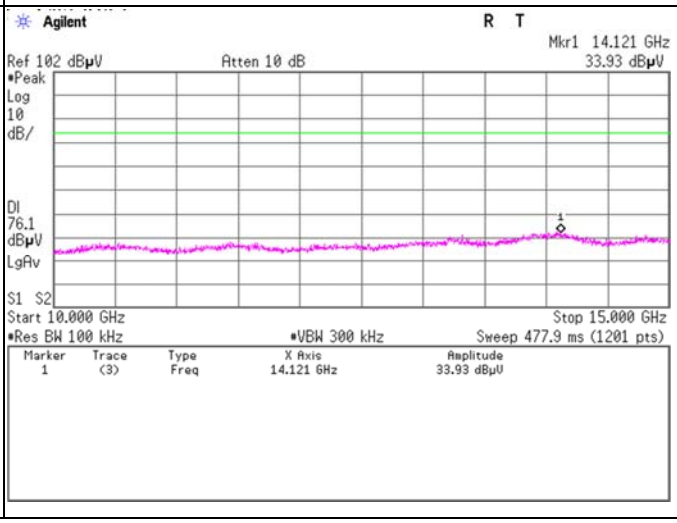
1GHz - 5GHz



5GHz - 10GHz



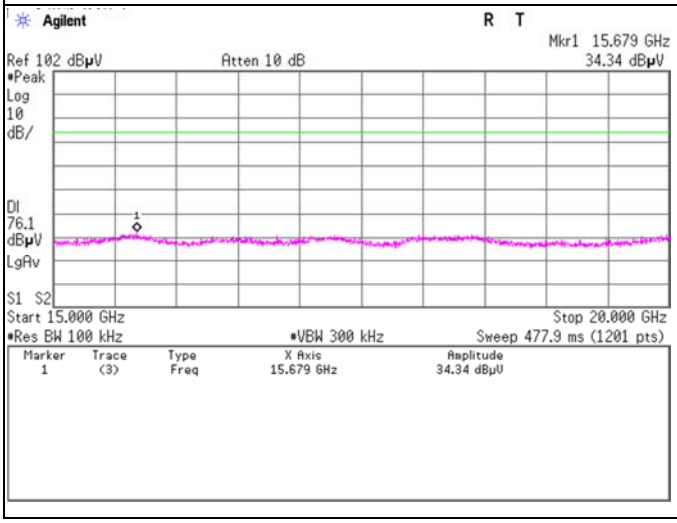
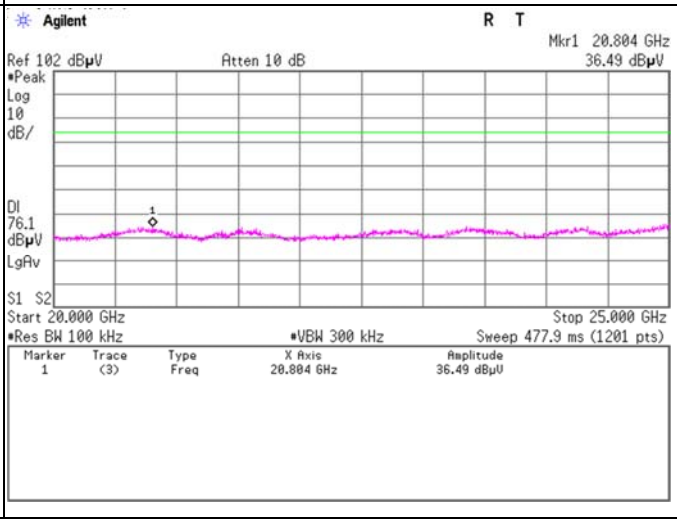
10GHz - 15GHz



Spurious emission (Conducted)

DH5,

Tx, 2402MHz

15GHz - 20GHz	20GHz - 25GHz
	

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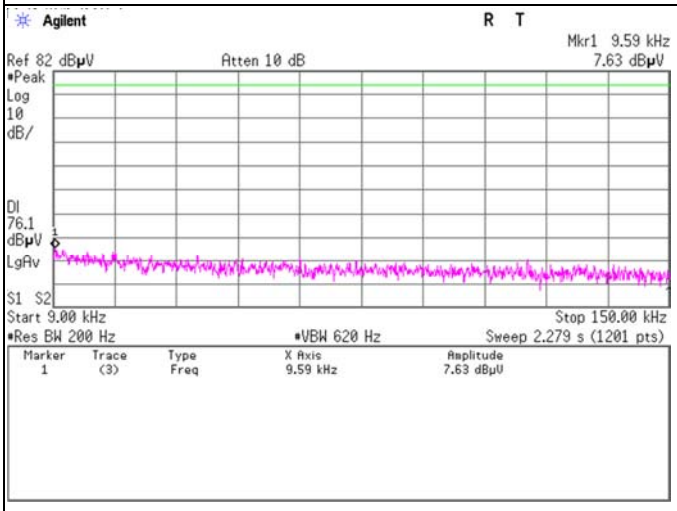
Spurious emission (Conducted)

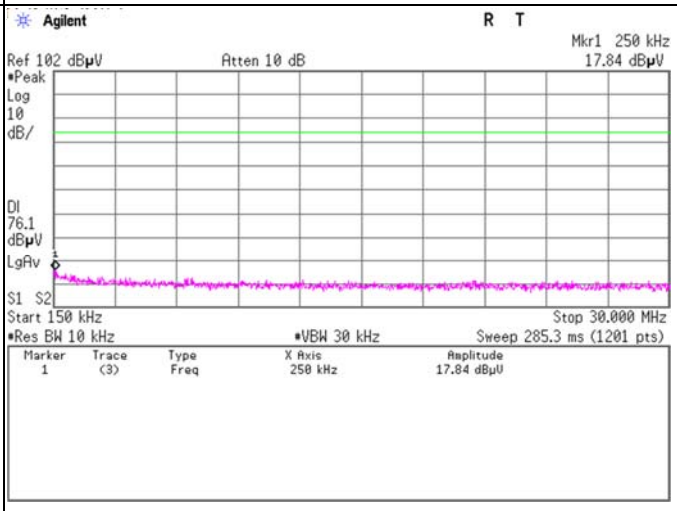
DH5,

Tx, 2441MHz

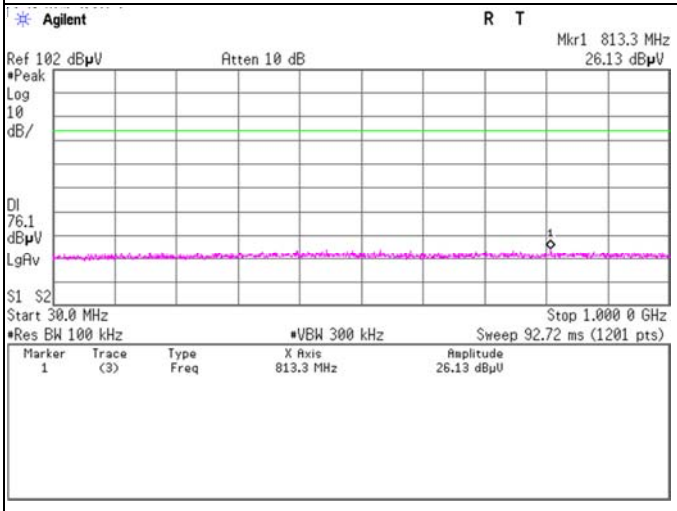
9kHz - 150kHz



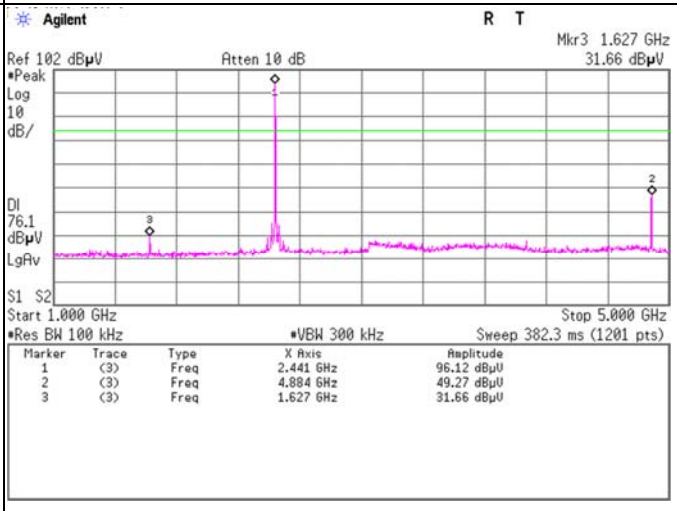
150kHz - 30MHz



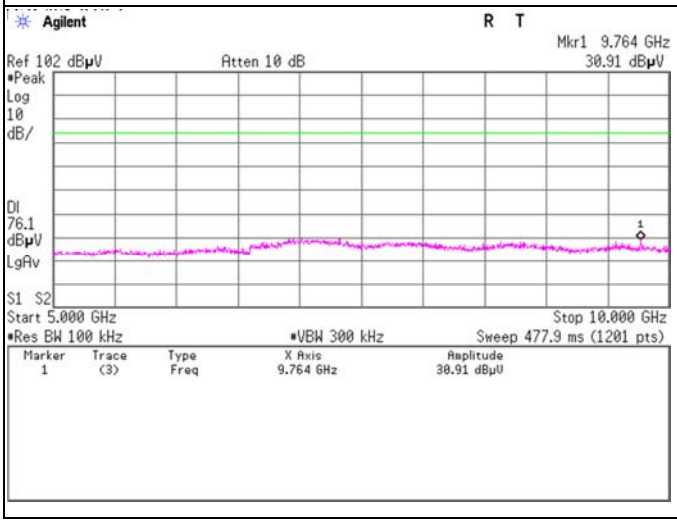
30MHz - 1GHz



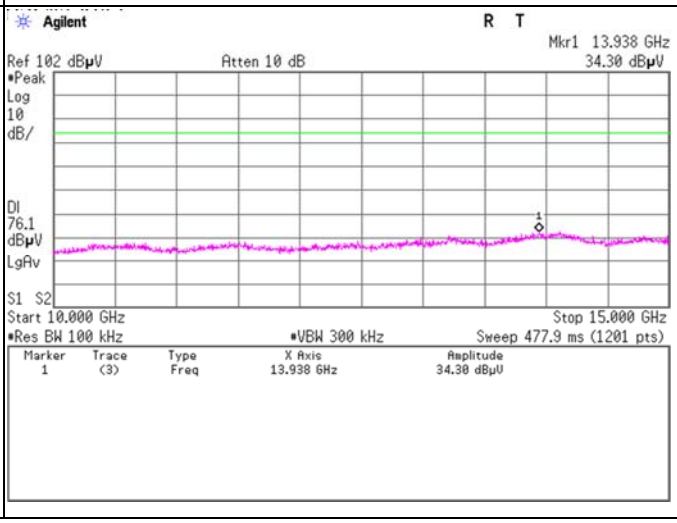
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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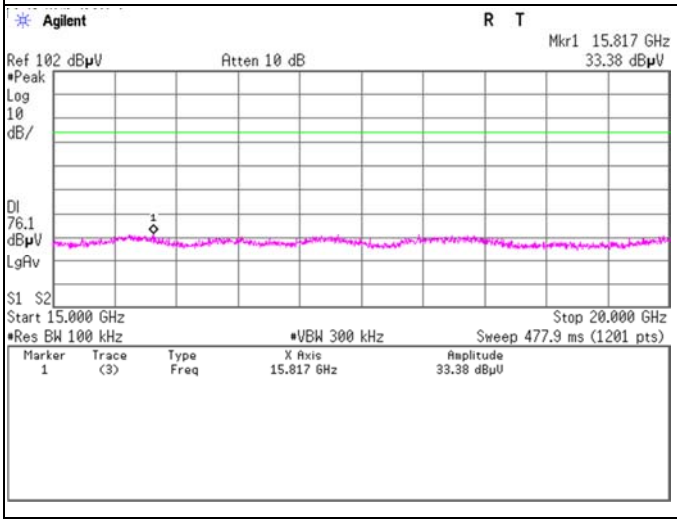
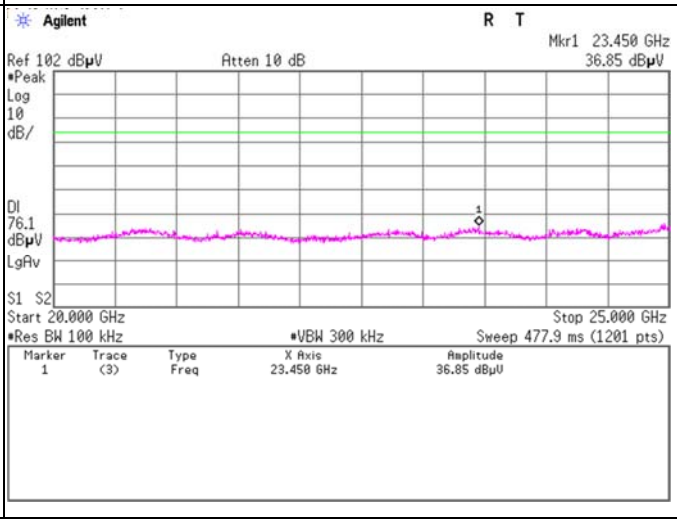
Spurious emission (Conducted)

DH5,

Tx, 2441MHz

15GHz - 20GHz	20GHz - 25GHz
	

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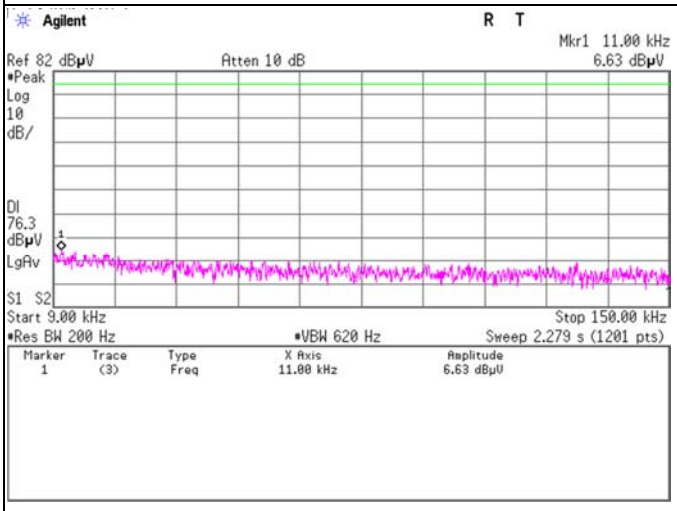
Spurious emission (Conducted)

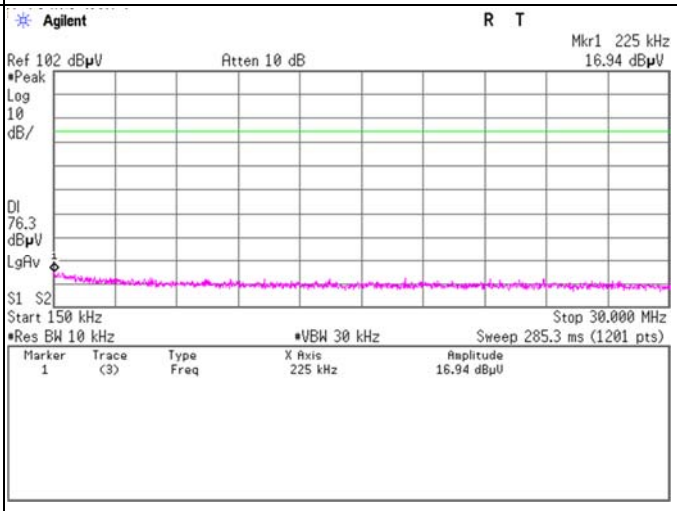
DH5,

Tx, 2480MHz

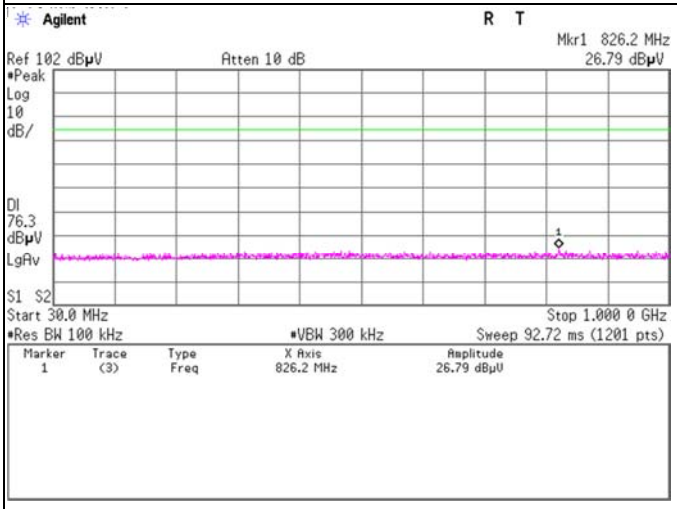
9kHz - 150kHz



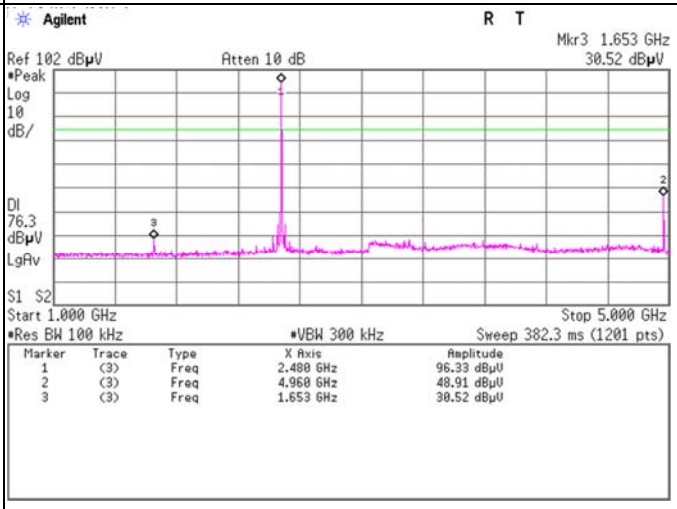
150kHz - 30MHz



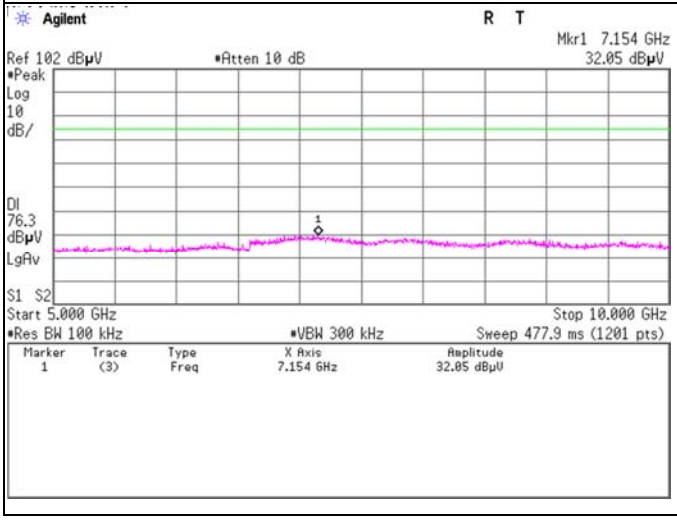
30MHz - 1GHz



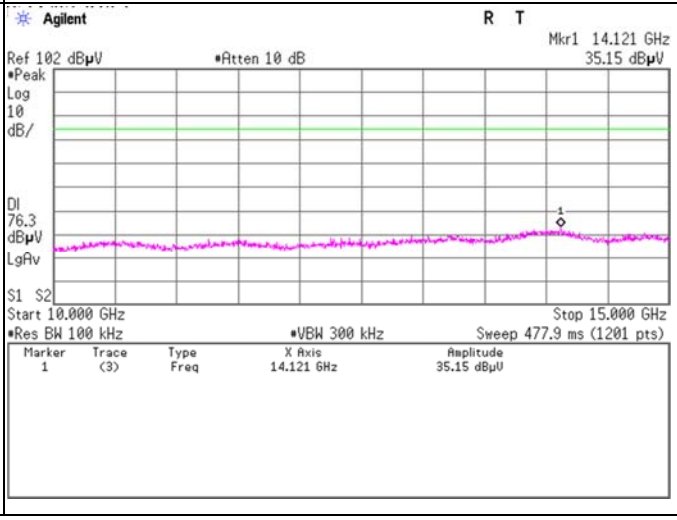
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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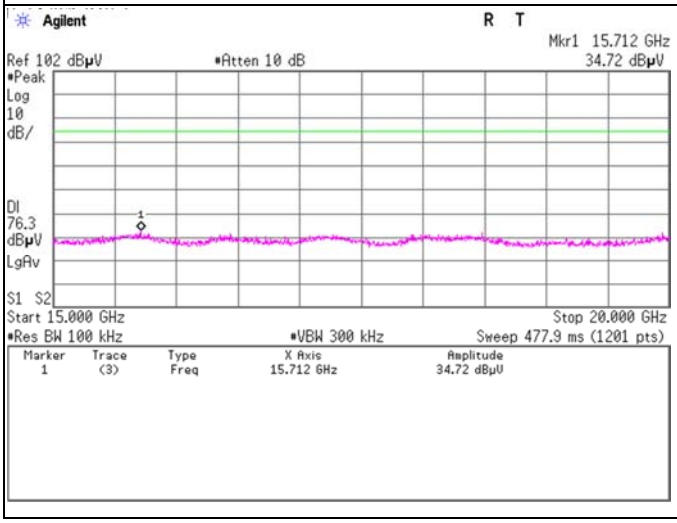
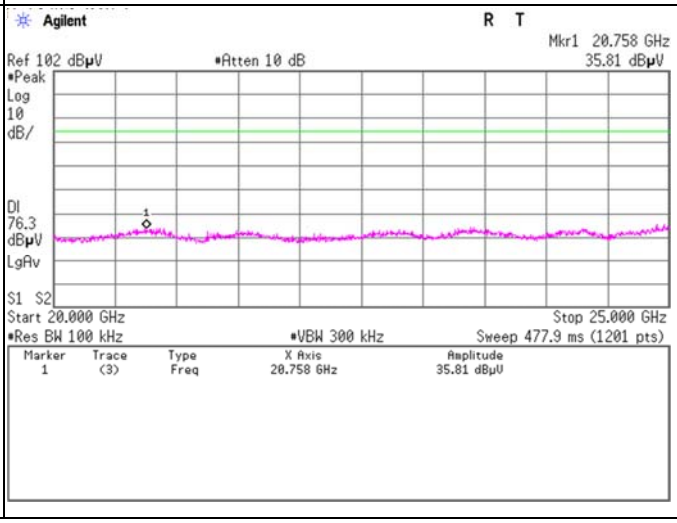
Spurious emission (Conducted)

DH5,

Tx, 2480MHz

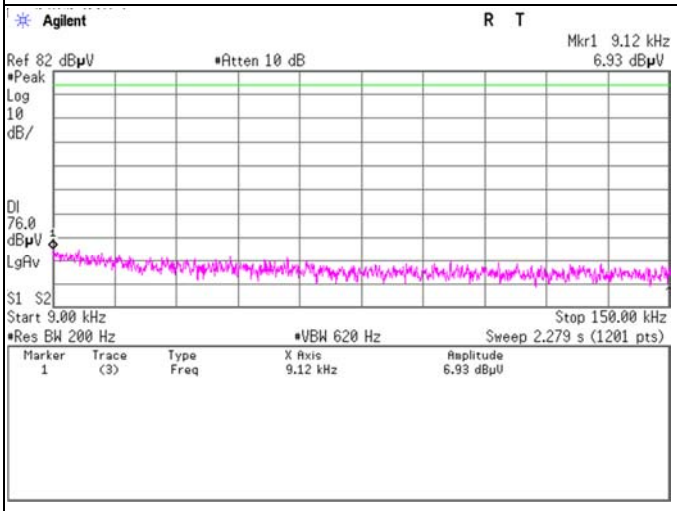
15GHz - 20GHz	20GHz - 25GHz
	

Spurious emission (Conducted)

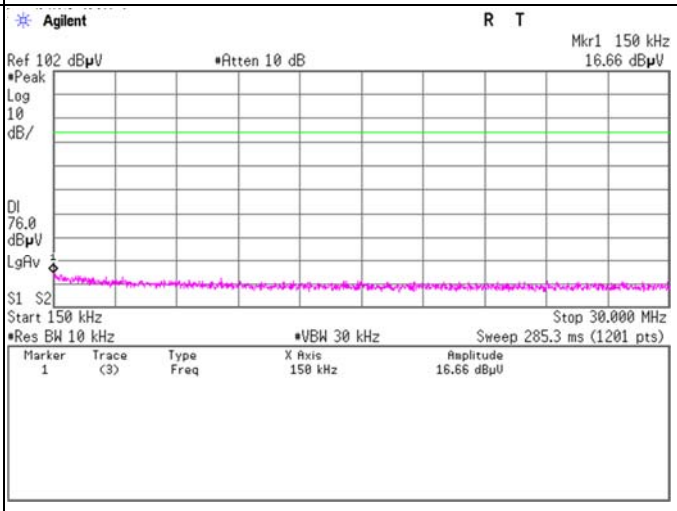
3-DH5,

Tx, 2402MHz

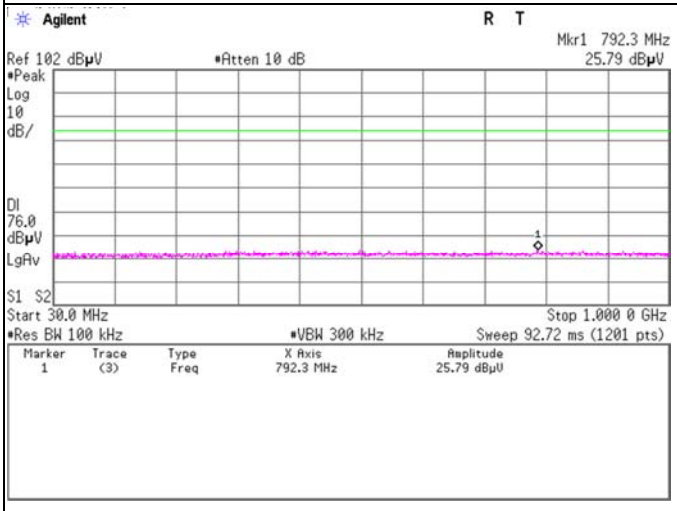
9kHz - 150kHz



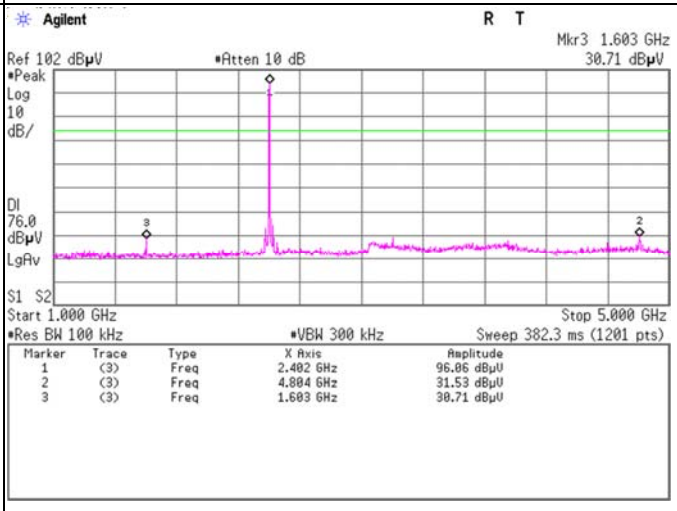
150kHz - 30MHz



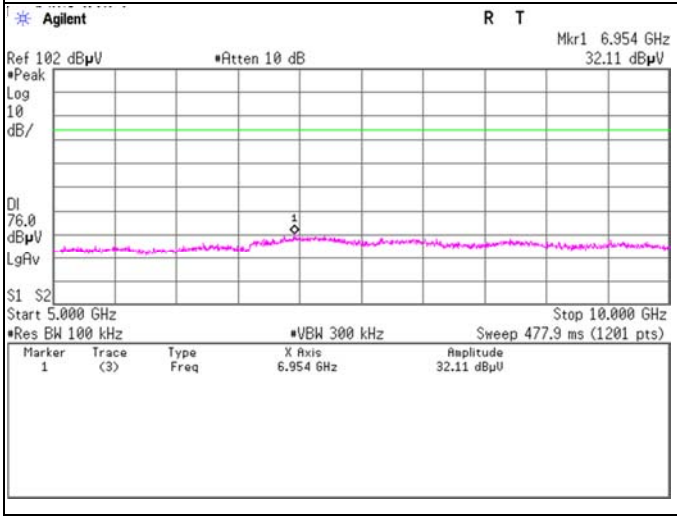
30MHz - 1GHz



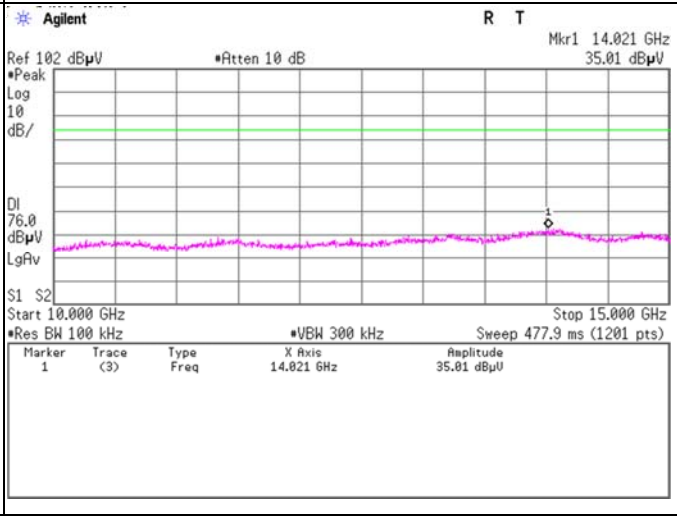
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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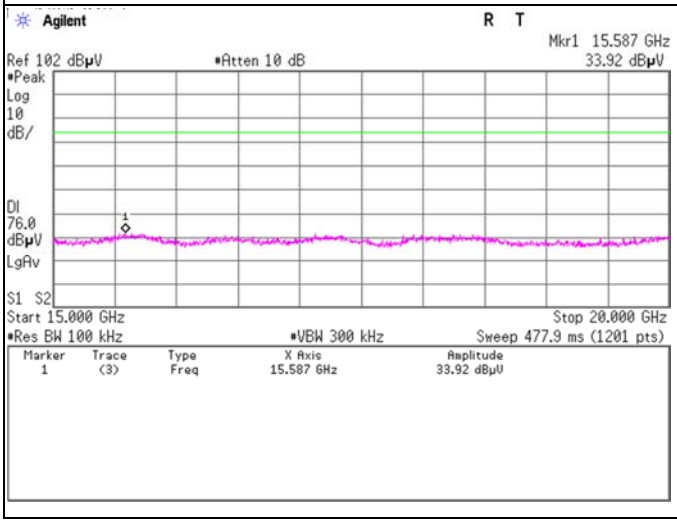
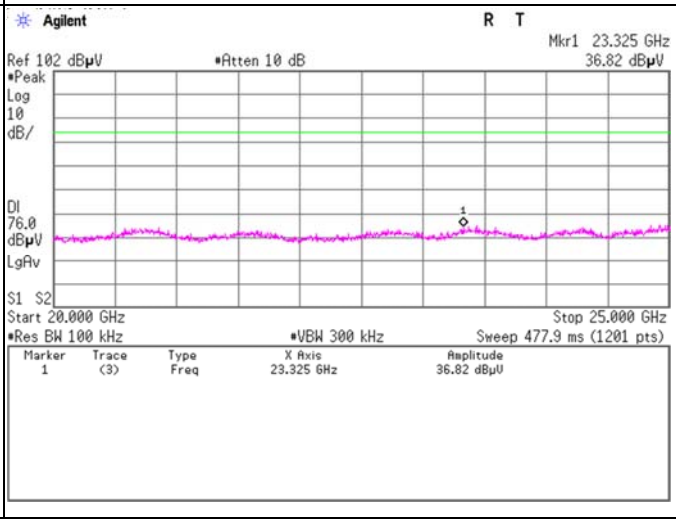
Spurious emission (Conducted)

3-DH5,

Tx, 2402MHz

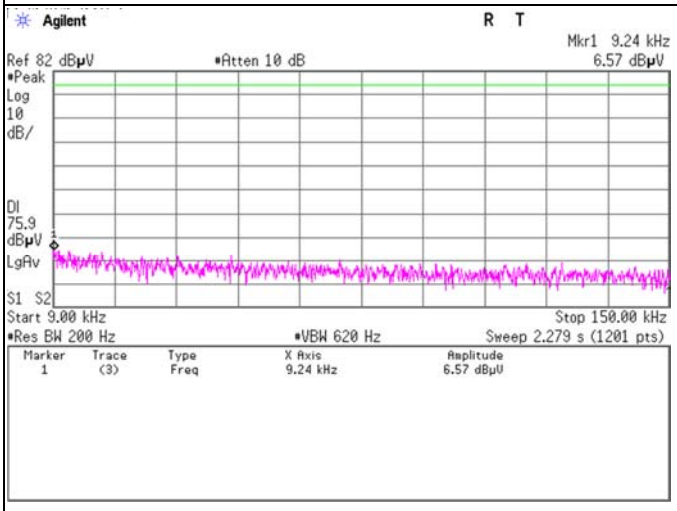
15GHz - 20GHz	20GHz - 25GHz
	

Spurious emission (Conducted)

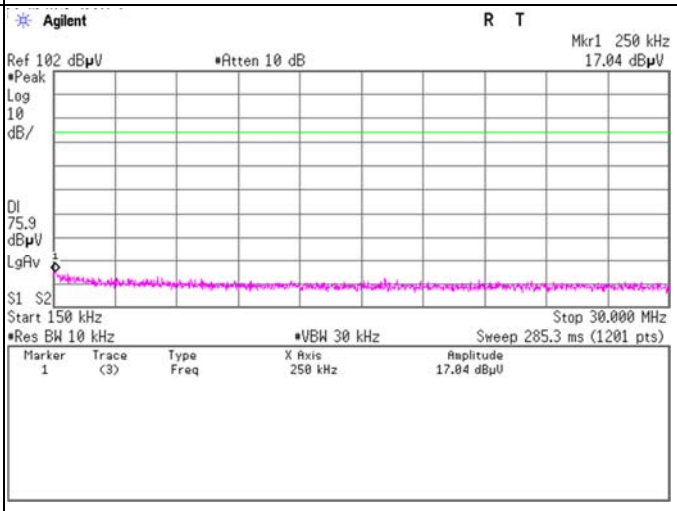
3-DH5,

Tx, 2441MHz

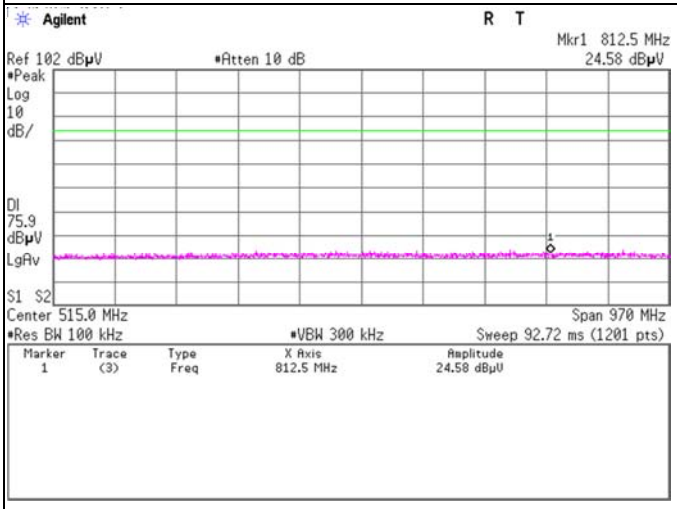
9kHz - 150kHz



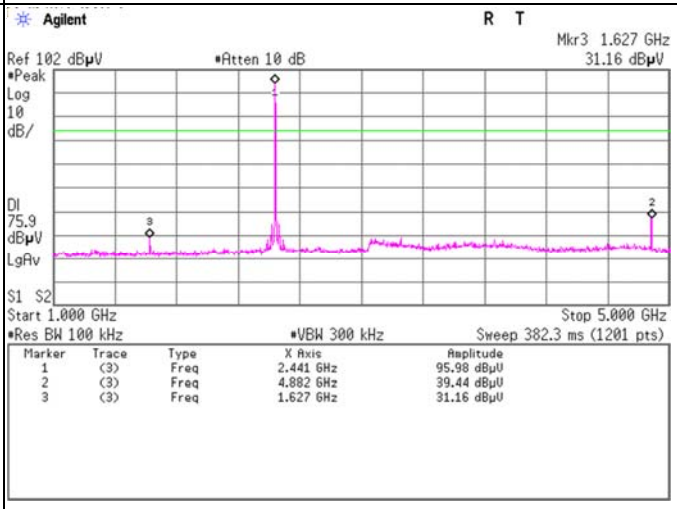
150kHz - 30MHz



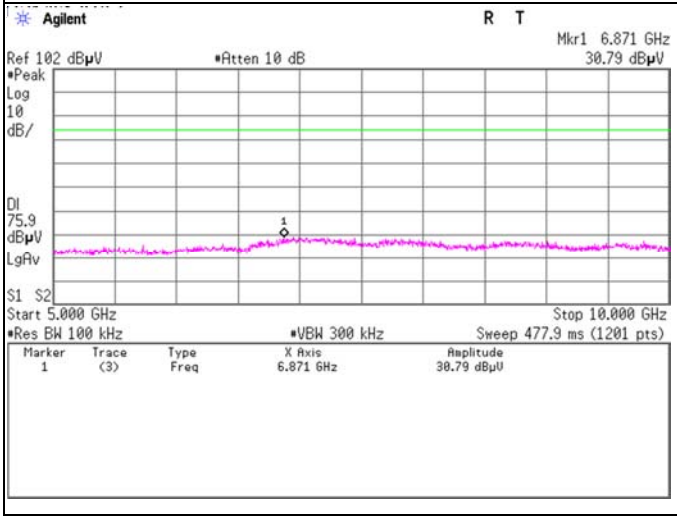
30MHz - 1GHz



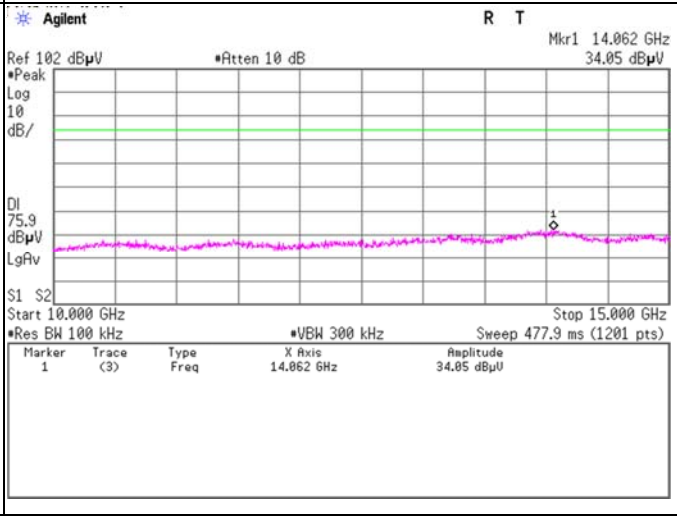
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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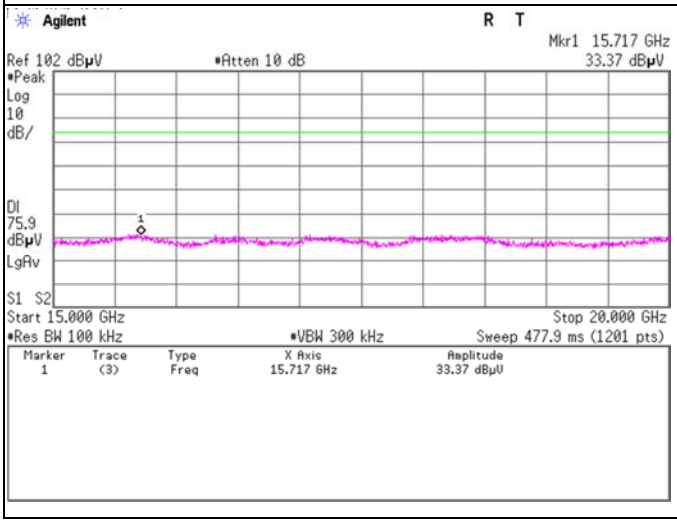
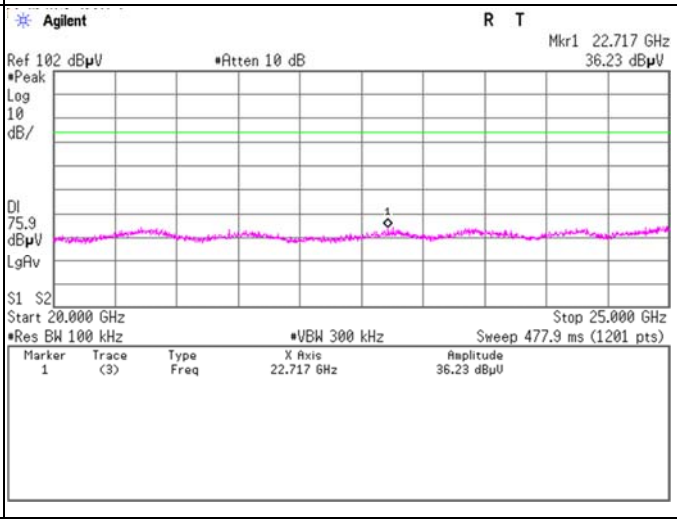
Spurious emission (Conducted)

3-DH5,

Tx, 2441MHz

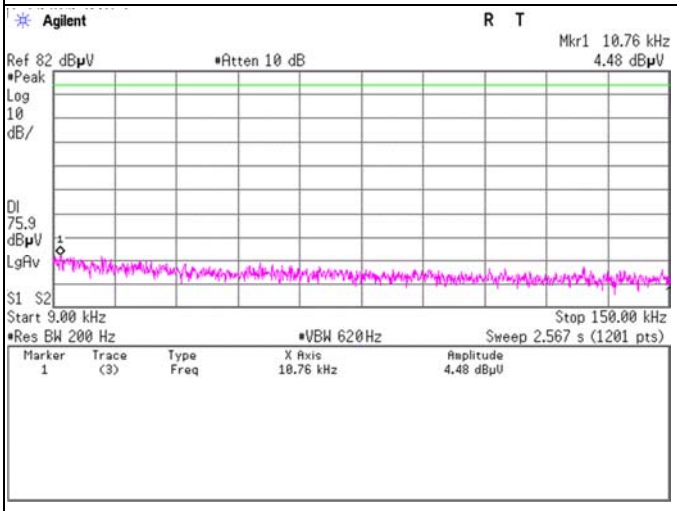
15GHz - 20GHz	20GHz - 25GHz
	

Spurious emission (Conducted)

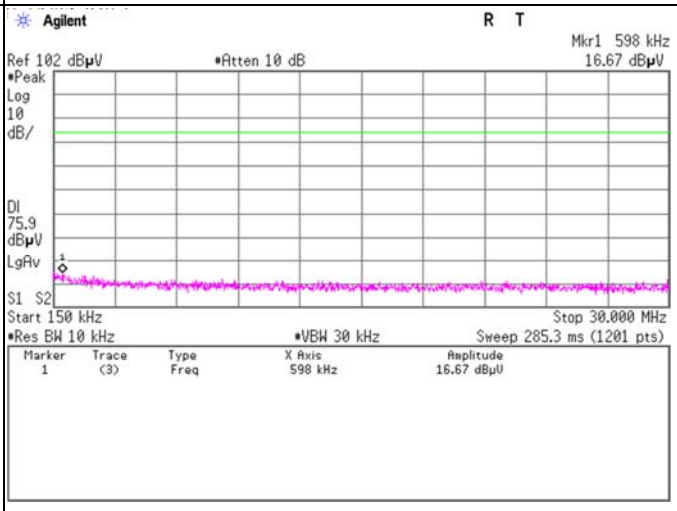
3-DH5,

Tx, 2480MHz

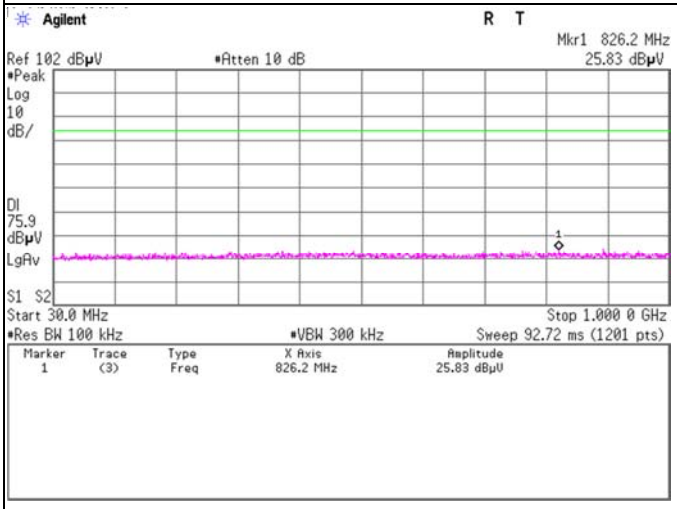
9kHz - 150kHz



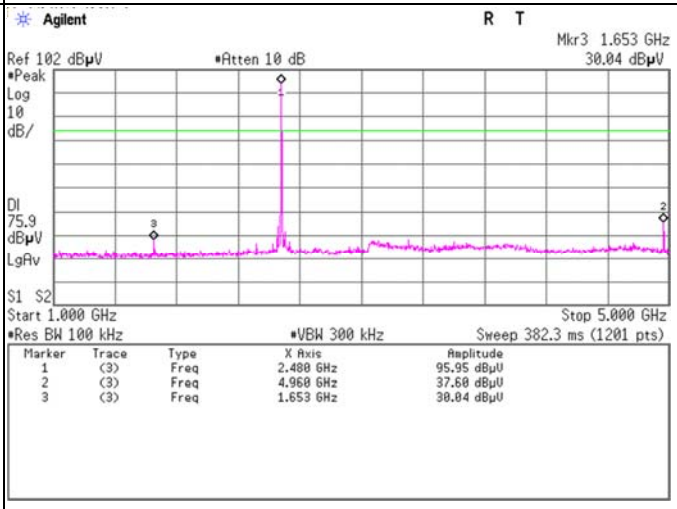
150kHz - 30MHz



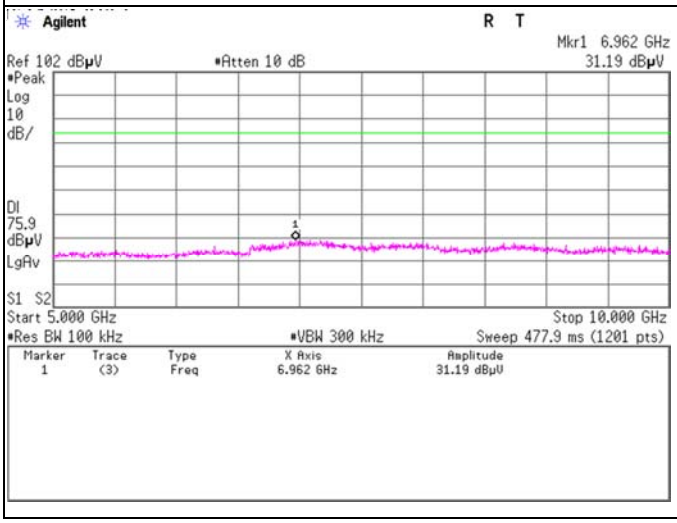
30MHz - 1GHz



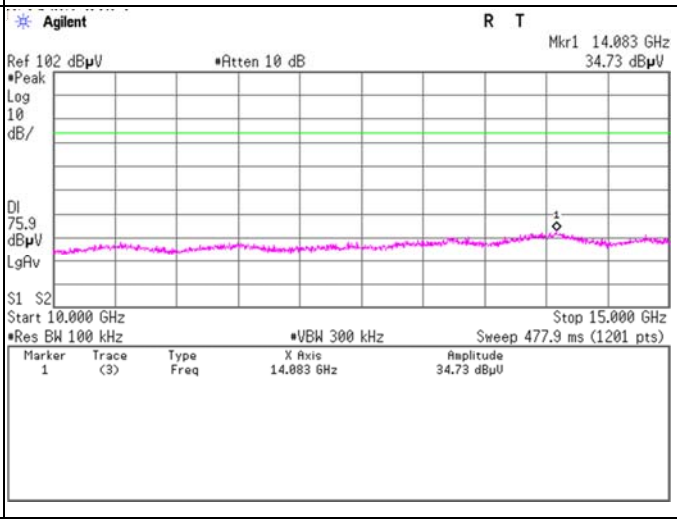
1GHz - 5GHz



5GHz - 10GHz



10GHz - 15GHz



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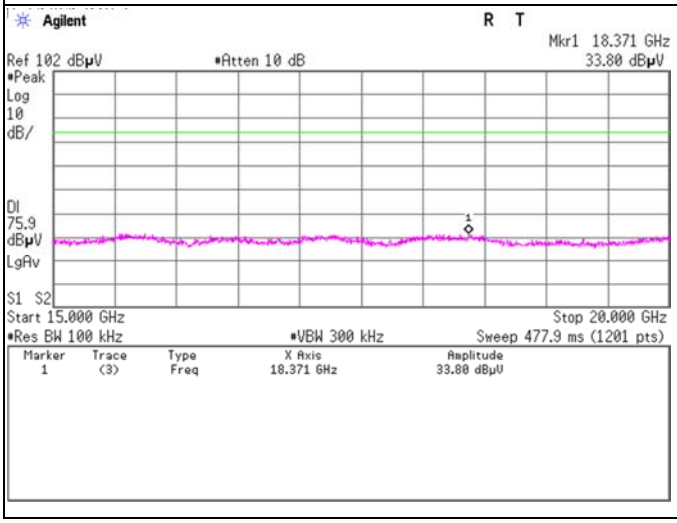
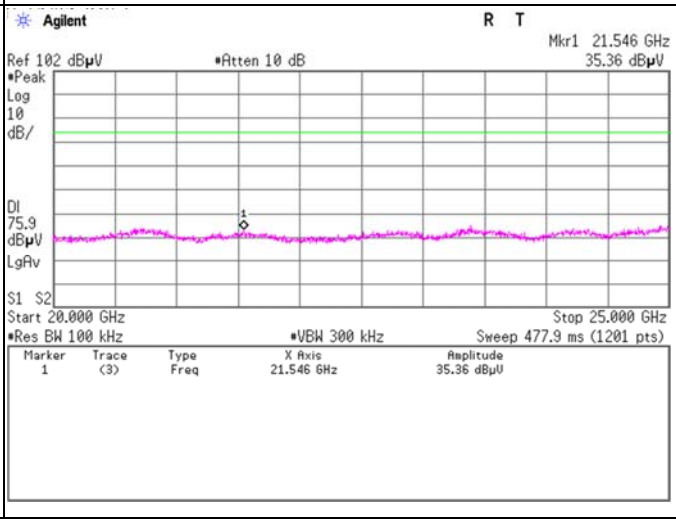
Spurious emission (Conducted)

3-DH5,

Tx, 2480MHz

15GHz - 20GHz	20GHz - 25GHz
	

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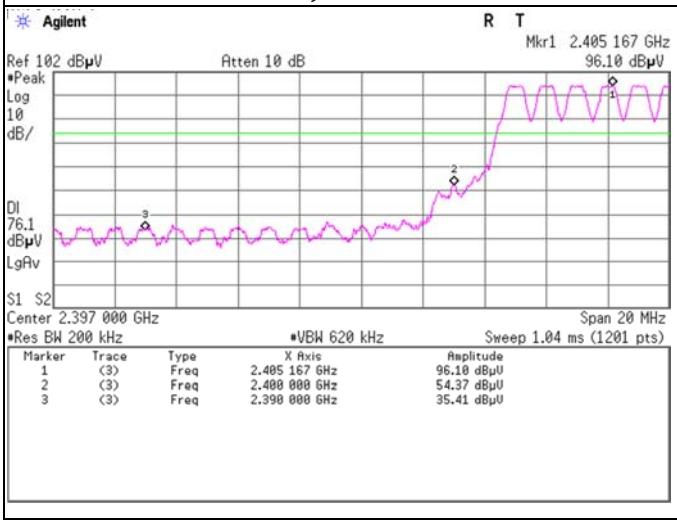
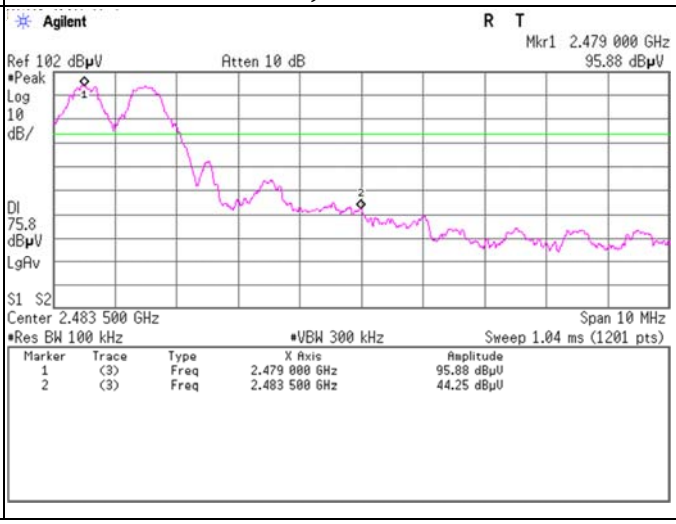
Spurious emission (Conducted)

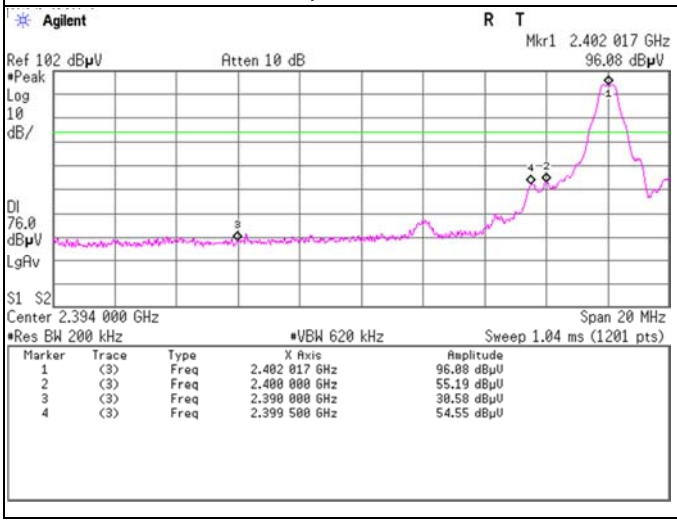
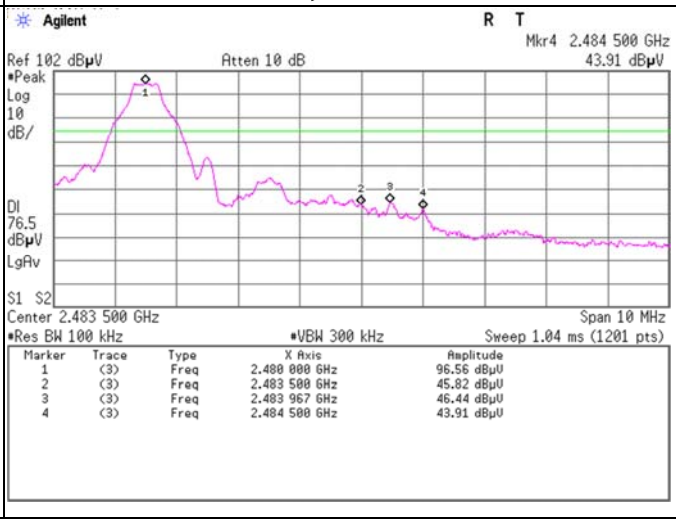
Band Edge compliance

DH5,

Hopping ON

Tx, 2402MHz	Tx, 2480MHz
	

Hopping OFF

Tx, 2402MHz	Tx, 2480MHz
	

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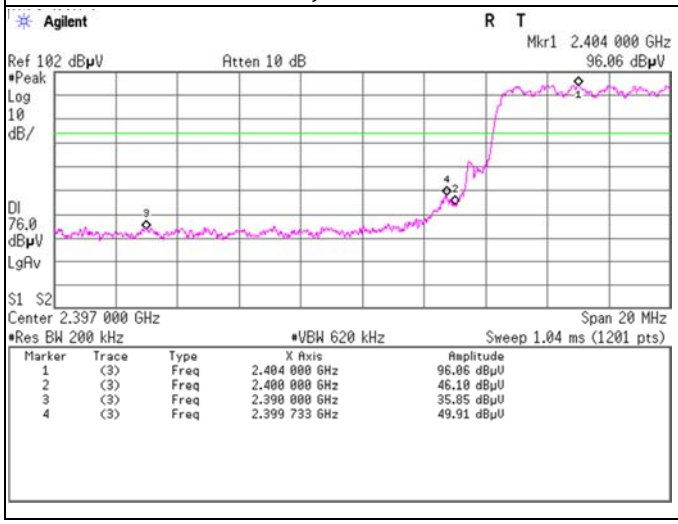
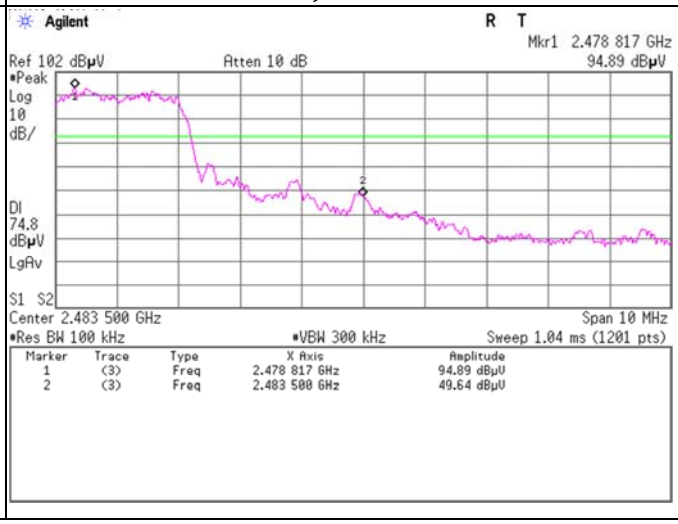
Spurious emission (Conducted)

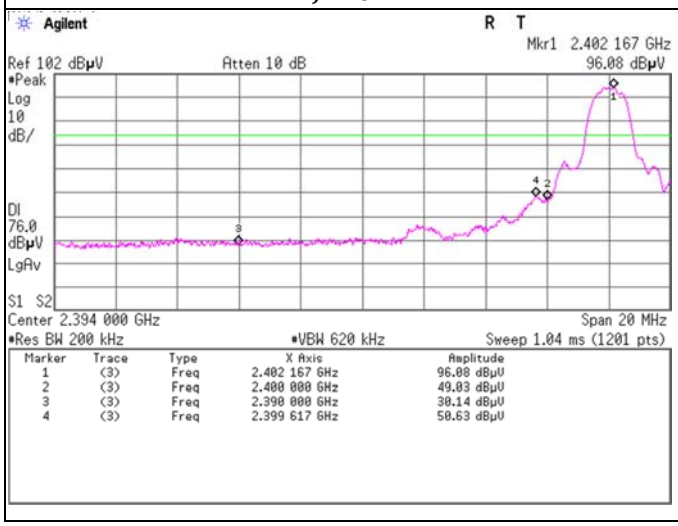
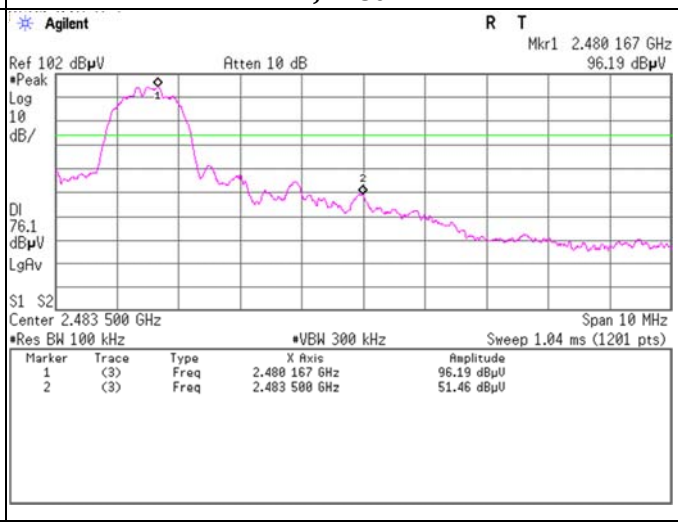
Band Edge compliance

3-DH5,

Hopping ON

Tx, 2402MHz	Tx, 2480MHz
	

Hopping OFF

Tx, 2402MHz	Tx, 2480MHz
	

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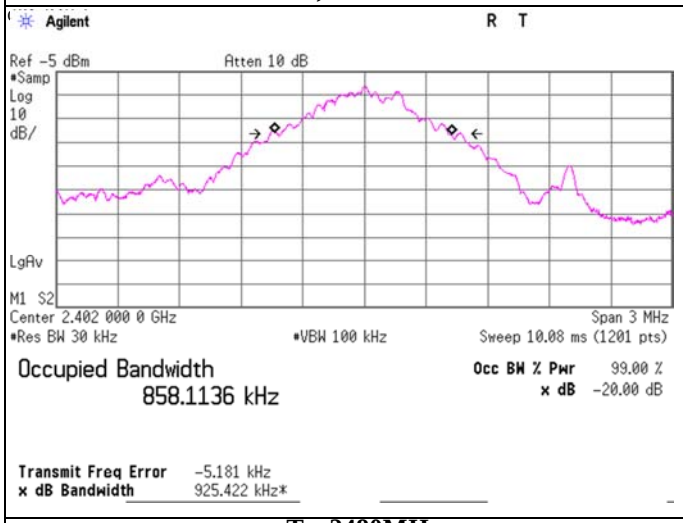
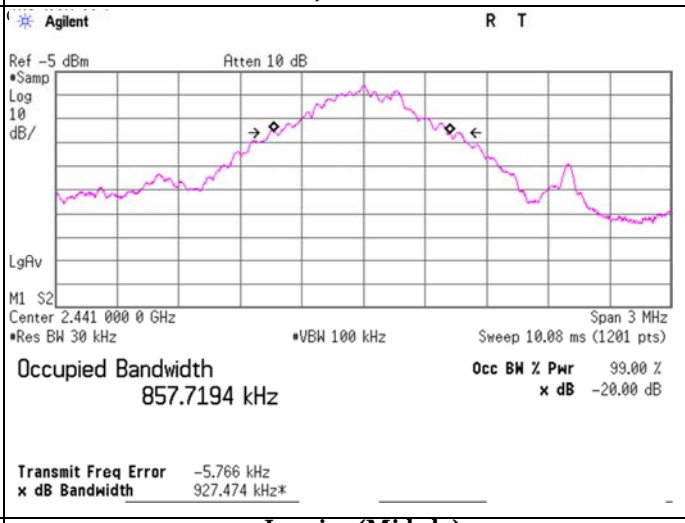
99% Occupied Bandwidth

DH5, Hopping Off

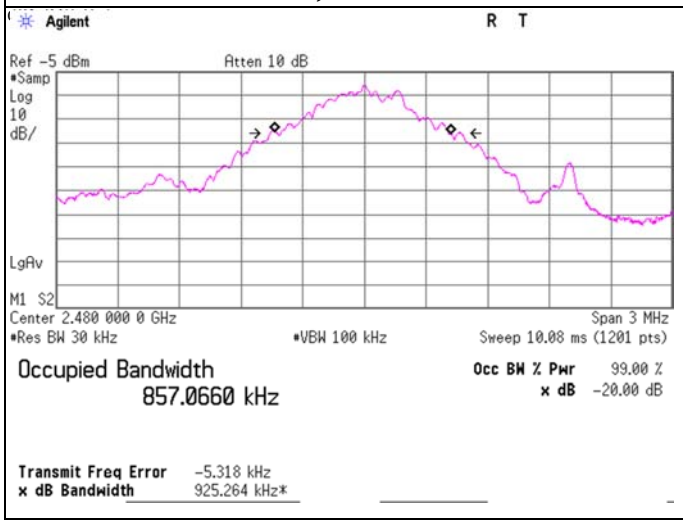
Tx, 2402MHz



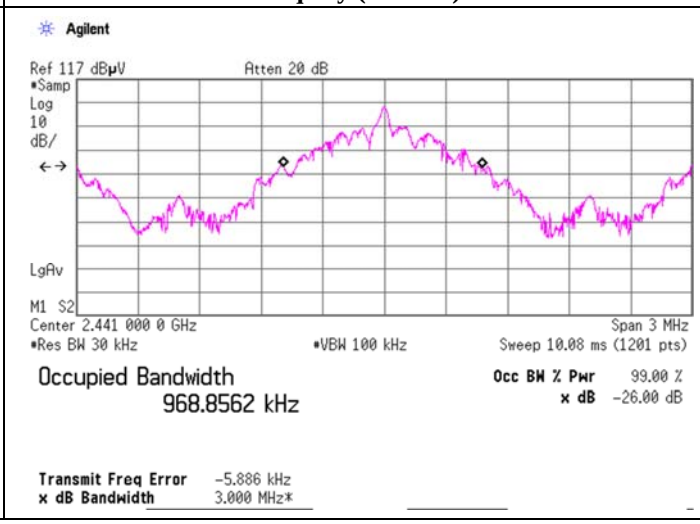
Tx, 2441MHz



Tx, 2480MHz

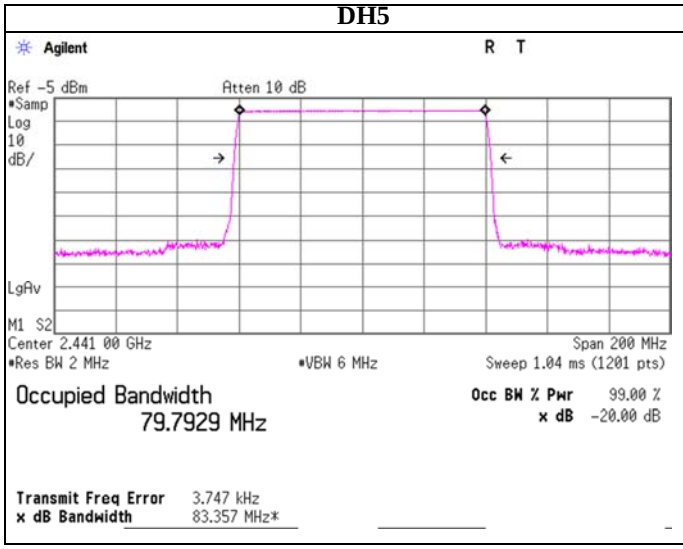


Inquiry (Mid ch.)



Hopping On

DH5



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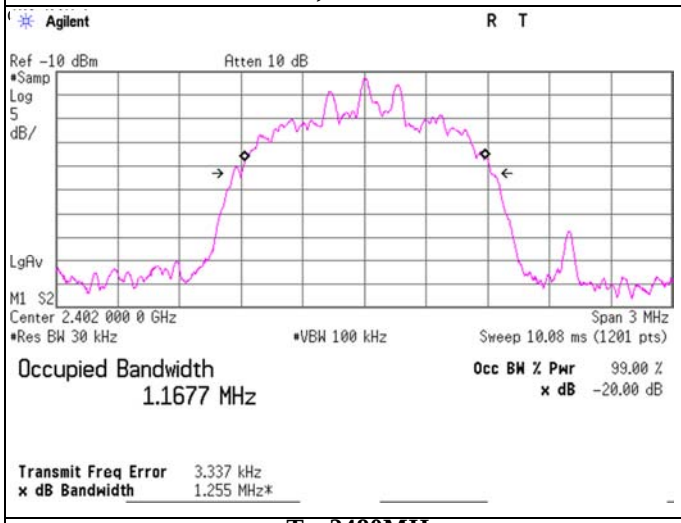
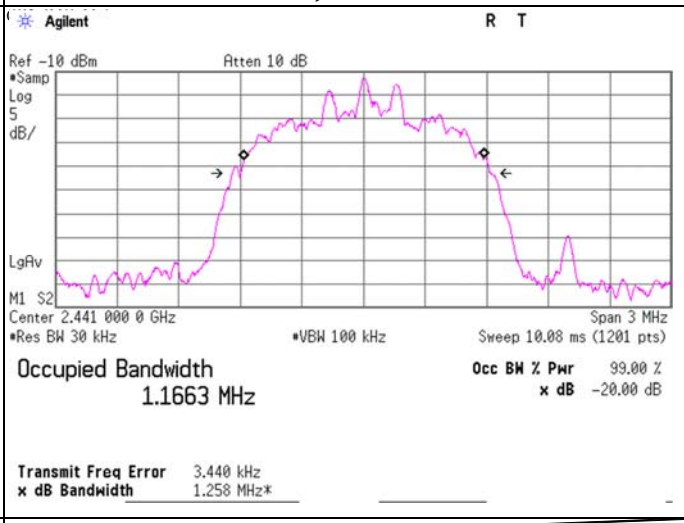
99% Occupied Bandwidth

3-DH5, Hopping Off

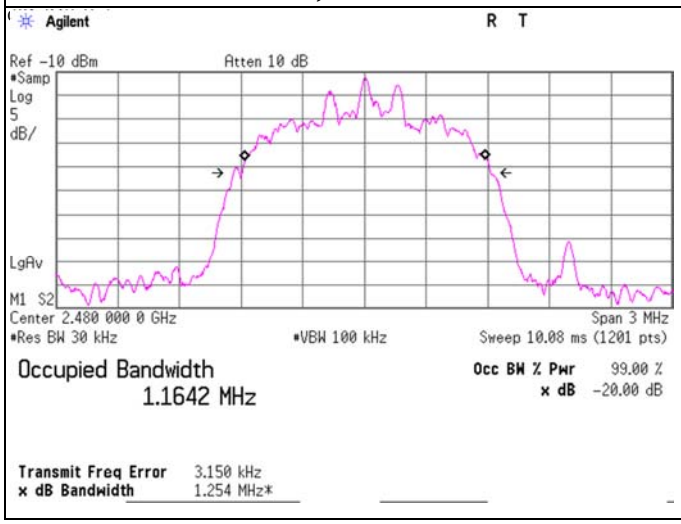
Tx, 2402MHz



Tx, 2441MHz

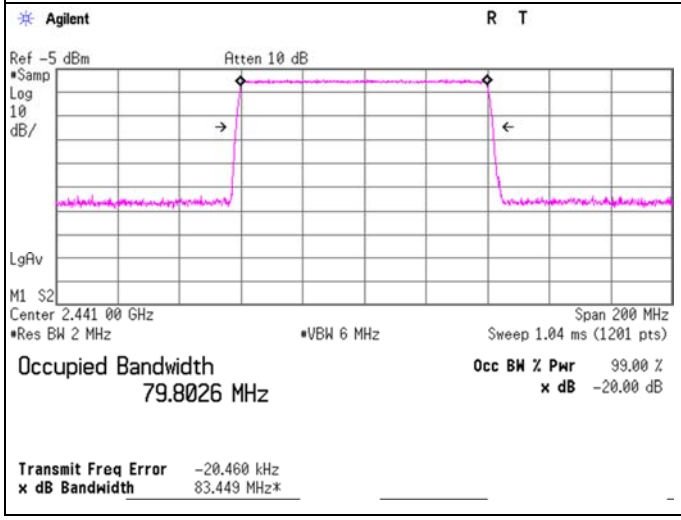


Tx, 2480MHz



Hopping On

3-DH5



APPENDIX 3
Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2011/03/02 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2011/04/12 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2011/04/12 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2010/11/16 * 12
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	AT	2010/12/15 * 12
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2011/03/23 * 12
SCC-G02	Coaxial Cable	Suhner	SUCOFLEX 104A	46498/4A	RE	2011/04/28 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2010/05/25 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2010/08/08 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2011/02/23 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2011/03/07 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFI,MF)	-	RE/CE	-
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2010/12/15 * 12
SAT10-04	Attenuator(above1GHz)	Agilent	8493C-010	74863	RE	2010/12/15 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2011/03/15 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2011/03/16 * 12
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	2011/03/16 * 12
SAF-01	Pre Amplifier	SONOMA	310N	290211	RE	2011/02/17 * 12
SAT6-01	Attenuator	JFW	50HF-006N	-	RE	2011/02/17 * 12
SAT3-04	Attenuator	JFW	50HF-003N	-	RE	2011/02/17 * 12
SBA-01	Biconical Antenna	Schwarzbeck	BBA9106	91032664	RE	2010/10/11 * 12
SCC-A1/A3/A5/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2011/04/28 * 12
SCC-A2/A4/A6/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2011/04/28 * 12
SLA-01	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0888	RE	2010/10/11 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2011/02/23 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE/CE	2010/10/29 * 12
SJM-12	Measure	PROMART	SEN1935	-	RE/CE	-
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2010/09/11 * 12
SCC-A12/A13/SRSE-01	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-269(RF Selector)	CE	2011/04/28 * 12
SLS-01	LISN	Rohde & Schwarz	ENV216	100511	CE	2011/02/22 * 12
SAT3-03	Attenuator	JFW	50HF-003N	-	CE	2011/02/17 * 12
SOS-02	Humidity Indicator	A&D	AD-5681	4063343	CE	2011/03/02 * 12

The expiration date of the calibration is the end of the expired month .
As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations .

All equipment is calibrated with traceable calibrations . Each calibration is traceable to the national or international standards .
Test Item :
CE: Conducted emission ,
RE: Radiated emission ,
AT: Antenna terminal disturbance voltage