DATA OF CONDUCTED EMISSION TEST

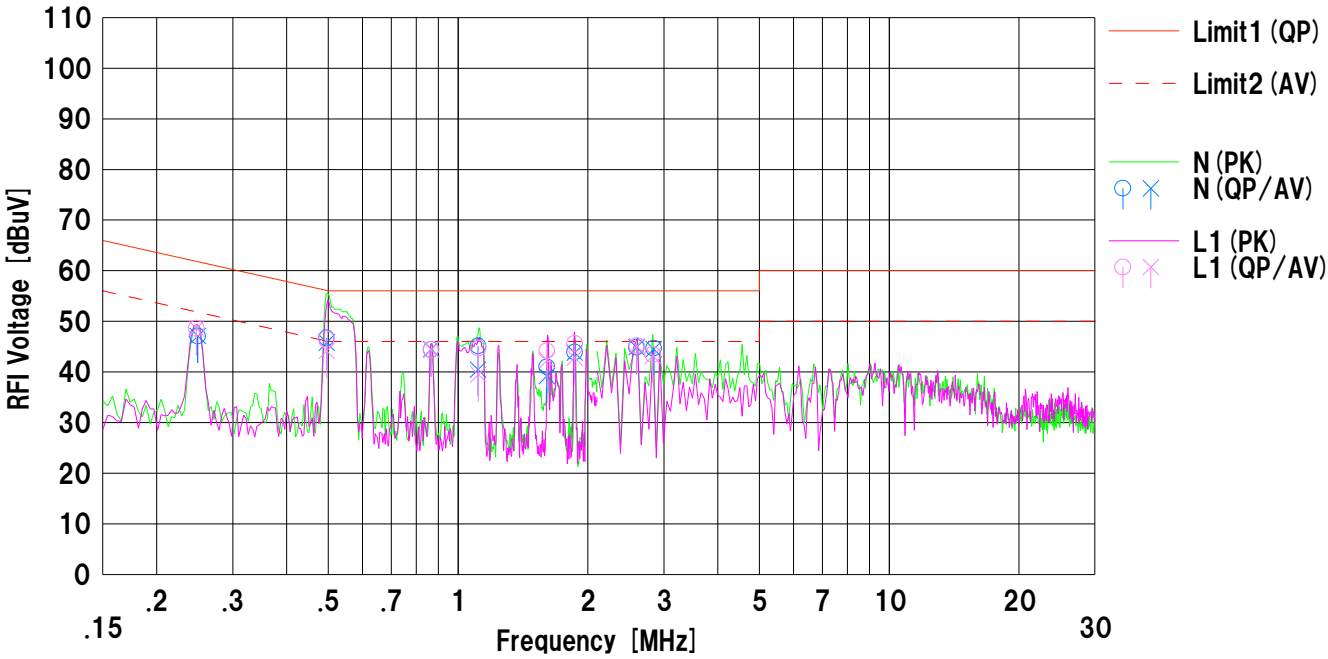
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2011/11/10

Company	: FUKUDA DENSHI CO., LTD.	Mode	: Transmitting 608.0125MHz
Kind of EUT	: TM XMTR Module	Report No.	: 32CE0136-SH-01-A
Model No.	: HLX-801	Power	: AC120V / 60Hz
Serial No.	: 1	Temp./Humi.	: 24deg.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	0.24900	34.6	34.6	12.5	47.1	47.1	61.7	51.7	14.6	4.6	N	
2	0.49500	34.1	33.2	12.6	46.7	45.8	56.0	46.0	9.3	0.2	N	
3	0.86600	31.8	31.9	12.6	44.4	44.5	56.0	46.0	11.6	1.5	N	
4	1.11200	32.5	27.9	12.6	45.1	40.5	56.0	46.0	10.9	5.5	N	
5	1.60700	28.4	26.6	12.6	41.0	39.2	56.0	46.0	15.0	6.8	N	
6	1.86464	31.2	31.1	12.7	43.9	43.8	56.0	46.0	12.1	2.2	N	
7	2.59400	32.2	32.2	12.7	44.9	44.9	56.0	46.0	11.1	1.1	N	
8	2.84200	32.0	31.8	12.7	44.7	44.5	56.0	46.0	11.3	1.5	N	
9	0.24700	36.1	36.1	12.5	48.6	48.6	61.8	51.8	13.2	3.2	L1	
10	0.49500	33.9	31.6	12.6	46.5	44.2	56.0	46.0	9.5	1.8	L1	
11	0.86717	31.8	31.8	12.6	44.4	44.4	56.0	46.0	11.6	1.6	L1	
12	1.11400	32.1	26.9	12.6	44.7	39.5	56.0	46.0	11.3	6.5	L1	
13	1.60800	31.6	29.7	12.6	44.2	42.3	56.0	46.0	11.8	3.7	L1	
14	1.86464	32.9	30.1	12.7	45.6	42.8	56.0	46.0	10.4	3.2	L1	
15	2.59600	32.5	32.4	12.7	45.2	45.1	56.0	46.0	10.8	0.9	L1	
16	2.82852	30.7	30.5	12.7	43.4	43.2	56.0	46.0	12.6	2.8	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+HighPassFilter) [dB]
LISN:SLS-03

DATA OF CONDUCTED EMISSION TEST

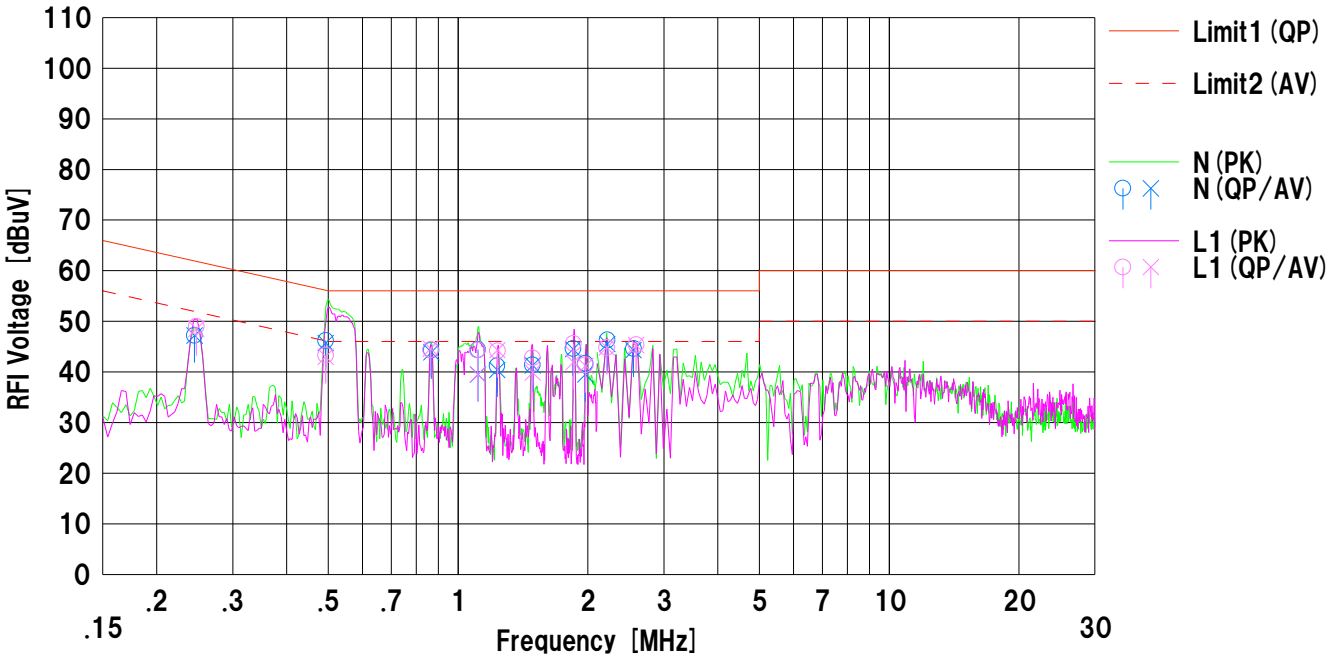
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2011/11/10

Company	: FUKUDA DENSHI CO., LTD.	Mode	: Transmitting 611.0000MHz
Kind of EUT	: TM XMTR Module	Report No.	: 32CE0136-SH-01-A
Model No.	: HLX-801	Power	: AC120V / 60Hz
Serial No.	: 1	Temp./Humi.	: 24deg.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	0.24477	34.7	34.7	12.5	47.2	47.2	61.9	51.9	14.7	4.7	N	
2	0.49300	33.6	33.1	12.6	46.2	45.7	56.1	46.1	9.9	0.4	N	
3	0.86626	31.7	31.3	12.6	44.3	43.9	56.0	46.0	11.7	2.1	N	
4	1.11100	31.8	26.9	12.6	44.4	39.5	56.0	46.0	11.6	6.5	N	
5	1.23200	28.6	27.8	12.6	41.2	40.4	56.0	46.0	14.8	5.6	N	
6	1.48832	28.8	28.7	12.6	41.4	41.3	56.0	46.0	14.6	4.7	N	
7	1.84900	31.9	31.8	12.7	44.6	44.5	56.0	46.0	11.4	1.5	N	
8	1.97300	29.0	26.8	12.7	41.7	39.5	56.0	46.0	14.3	6.5	N	
9	2.21900	33.6	32.8	12.7	46.3	45.5	56.0	46.0	9.7	0.5	N	
10	2.55399	31.9	31.6	12.7	44.6	44.3	56.0	46.0	11.4	1.7	N	
11	0.24700	36.5	36.0	12.5	49.0	48.5	61.8	51.8	12.8	3.3	L1	
12	0.49300	30.7	30.4	12.6	43.3	43.0	56.1	46.1	12.8	3.1	L1	
13	0.86400	31.8	32.0	12.6	44.4	44.6	56.0	46.0	11.6	1.4	L1	
14	1.11000	31.7	26.9	12.6	44.3	39.5	56.0	46.0	11.7	6.5	L1	
15	1.23400	31.6	31.7	12.6	44.2	44.3	56.0	46.0	11.8	1.7	L1	
16	1.48832	30.2	27.3	12.6	42.8	39.9	56.0	46.0	13.2	6.1	L1	
17	1.85100	32.9	29.2	12.7	45.6	41.9	56.0	46.0	10.4	4.1	L1	
18	1.97400	28.7	28.5	12.7	41.4	41.2	56.0	46.0	14.6	4.8	L1	
19	2.21204	32.1	32.1	12.7	44.8	44.8	56.0	46.0	11.2	1.2	L1	
20	2.59000	32.7	32.6	12.7	45.4	45.3	56.0	46.0	10.6	0.7	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+HighPassFilter) [dB]
LISN:SLS-03

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2011/11/10

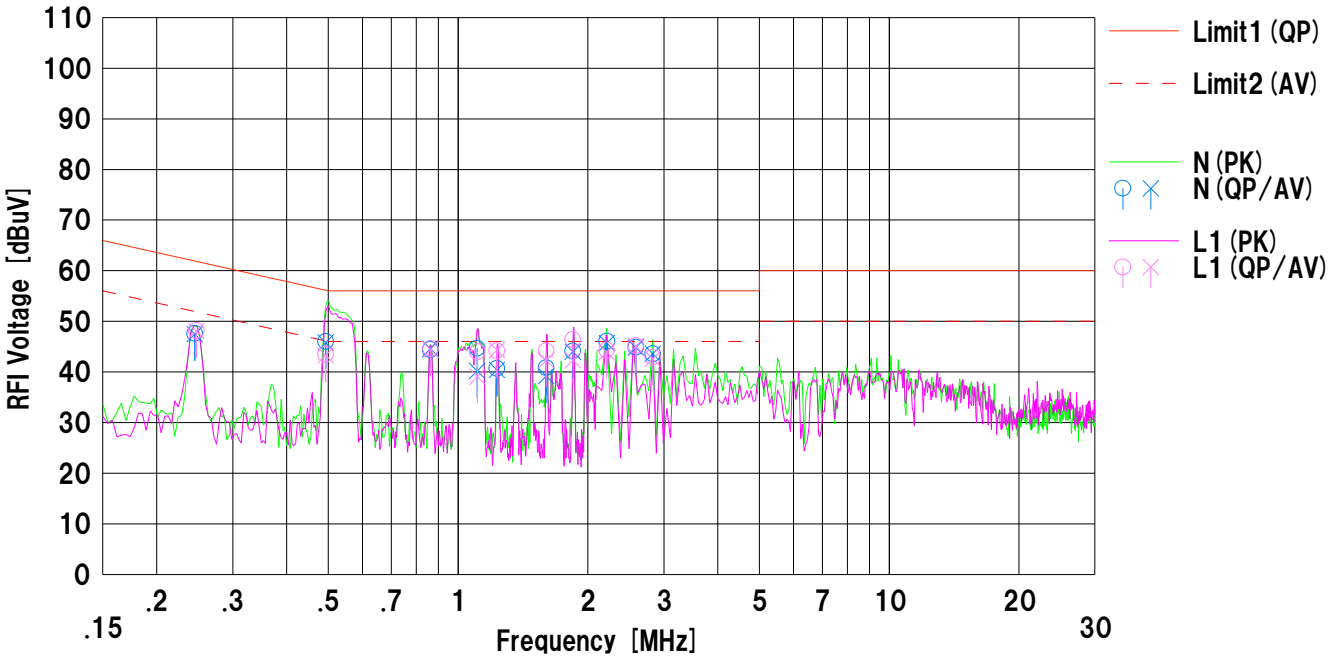
Company : FUKUDA DENSHI CO., LTD.
Kind of EUT : TM XMTR Module
Model No. : HLX-801
Serial No. : 1

Mode : Transmitting 613.9875MHz
Report No. : 32CE0136-SH-01-A
Power : AC120V/60Hz
Temp./Humi. : 24deg.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	0.24500	35.1	35.0	12.5	47.6	47.5	61.9	51.9	14.3	4.4	N	
2	0.49300	33.4	33.2	12.6	46.0	45.8	56.1	46.1	10.1	0.3	N	
3	0.86200	31.8	32.0	12.6	44.4	44.6	56.0	46.0	11.6	1.4	N	
4	1.10700	32.1	27.6	12.6	44.7	40.2	56.0	46.0	11.3	5.8	N	
5	1.23100	28.1	27.8	12.6	40.7	40.4	56.0	46.0	15.3	5.6	N	
6	1.60100	28.2	26.6	12.6	40.8	39.2	56.0	46.0	15.2	6.8	N	
7	1.84700	31.4	31.3	12.7	44.1	44.0	56.0	46.0	11.9	2.0	N	
8	2.21600	33.4	33.0	12.7	46.1	45.7	56.0	46.0	9.9	0.3	N	
9	2.58400	32.2	32.1	12.7	44.9	44.8	56.0	46.0	11.1	1.2	N	
10	2.82800	30.9	30.9	12.7	43.6	43.6	56.0	46.0	12.4	2.4	N	
11	0.24700	35.7	35.6	12.5	48.2	48.1	61.8	51.8	13.6	3.7	L1	
12	0.49300	30.9	30.7	12.6	43.5	43.3	56.1	46.1	12.6	2.8	L1	
13	0.86400	32.0	31.8	12.6	44.6	44.4	56.0	46.0	11.4	1.6	L1	
14	1.10900	31.4	26.5	12.6	44.0	39.1	56.0	46.0	12.0	6.9	L1	
15	1.23100	31.6	31.7	12.6	44.2	44.3	56.0	46.0	11.8	1.7	L1	
16	1.60100	31.6	29.7	12.6	44.2	42.3	56.0	46.0	11.8	3.7	L1	
17	1.84600	33.7	29.6	12.7	46.4	42.3	56.0	46.0	9.6	3.7	L1	
18	2.21400	31.6	31.2	12.7	44.3	43.9	56.0	46.0	11.7	2.1	L1	
19	2.58400	32.5	32.4	12.7	45.2	45.1	56.0	46.0	10.8	0.9	L1	
20	2.83000	30.2	29.9	12.7	42.9	42.6	56.0	46.0	13.1	3.4	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+HighPassFilter) [dB]
LISN:SLS-03

Frequency Stability

Test place	UL Japan, Inc. Shonan EMC Lab.		No.5 Shielded Room
Date	2011/11/10		
Temperature / Humidity	24deg.C.	52%RH	
Engineer	Akio Hayashi		
Mode	Transmitting		

Test Condition deg.C	Volts.	Test Timing	Measured frequency [MHz]	Frequency error [MHz]	Result [ppm]	Limit [+/- ppm]	Margin [ppm]
50deg.C	5V	Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-
40deg.C		Power on	608.012295	-0.000205	-0.34	2.50	2.16
		on 2min.	608.012296	-0.000204	-0.34	2.50	2.16
		on 5min.	608.012297	-0.000203	-0.33	2.50	2.17
		on 10min.	608.012298	-0.000202	-0.33	2.50	2.17
30deg.C		Power on	608.012362	-0.000138	-0.23	2.50	2.27
		on 2min.	608.012358	-0.000142	-0.23	2.50	2.27
		on 5min.	608.012350	-0.000150	-0.25	2.50	2.25
		on 10min.	608.012347	-0.000153	-0.25	2.50	2.25
20deg.C		Power on	608.012418	-0.000082	-0.13	2.50	2.37
		on 2min.	608.012420	-0.000080	-0.13	2.50	2.37
		on 5min.	608.012418	-0.000082	-0.13	2.50	2.37
		on 10min.	608.012417	-0.000083	-0.14	2.50	2.36
10deg.C		Power on	608.012390	-0.000110	-0.18	2.50	2.32
		on 2min.	608.012397	-0.000103	-0.17	2.50	2.33
		on 5min.	608.012401	-0.000099	-0.16	2.50	2.34
		on 10min.	608.012403	-0.000097	-0.16	2.50	2.34
0deg.C		Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-
-10deg.C		Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-
-20deg.C		Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-
-30deg.C		Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-

Limit : 608.0125 MHz +/-0.00025 % (+/- 2.5ppm) = +/- 0.001520 MHz

* The test on 50deg.C, 0deg.C, -10deg.C, -20deg.C, and -30deg.C were not apply, since the specification of operating temperature of EUT was 10deg.C to 40deg.C. (It used the manufacturer's specified conditions (refer to 95.1115(e))).
* The voltage test was only performed with DC5.0V from host device. Since the RF Module has its own regulator and the RF Module is constantly provided voltage (DC3.0V) through the regulator regardless of input voltage from host device, and voltage (DC 3.0V) in the RF Module had been the change in less than 1% when EUT input voltage (DC 5V) was changed from 85% to 115%.

Frequency Stability

Test place	UL Japan, Inc. Shonan EMC Lab.		No.5 Shielded Room
Date	2011/11/10		
Temperature / Humidity	24deg.C.	52%RH	
Engineer	Akio Hayashi		
Mode	Transmitting		

Test Condition deg.C	Volts.	Test Timing	Measured frequency [MHz]	Frequency error [MHz]	Result [ppm]	Limit [+/- ppm]	Margin [ppm]
50deg.C	5V	Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-
40deg.C		Power on	610.999793	-0.000207	-0.34	2.50	2.16
		on 2min.	610.999795	-0.000205	-0.34	2.50	2.16
		on 5min.	610.999797	-0.000203	-0.33	2.50	2.17
		on 10min.	610.999797	-0.000203	-0.33	2.50	2.17
30deg.C		Power on	610.999863	-0.000137	-0.22	2.50	2.28
		on 2min.	610.999858	-0.000142	-0.23	2.50	2.27
		on 5min.	610.999850	-0.000150	-0.25	2.50	2.25
		on 10min.	610.999845	-0.000155	-0.25	2.50	2.25
20deg.C		Power on	610.999200	-0.000800	-1.31	2.50	1.19
		on 2min.	610.999180	-0.000820	-1.34	2.50	1.16
		on 5min.	610.999170	-0.000830	-1.36	2.50	1.14
		on 10min.	610.999917	-0.000083	-0.14	2.50	2.36
10deg.C		Power on	610.999891	-0.000109	-0.18	2.50	2.32
		on 2min.	610.999896	-0.000104	-0.17	2.50	2.33
		on 5min.	610.999900	-0.000100	-0.16	2.50	2.34
		on 10min.	610.999902	-0.000098	-0.16	2.50	2.34
0deg.C		Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-
-10deg.C		Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-
-20deg.C		Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-
-30deg.C		Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-

Limit : 611.0000 MHz +/-0.00025 % (+/- 2.5ppm) = +/- 0.001528 MHz

* The test on 50deg.C, 0deg.C, -10deg.C, -20deg.C, and -30deg.C were not apply, since the specification of operating temperature of EUT was 10deg.C to 40deg.C. (It used the manufacturer's specified conditions (refer to 95.1115(e))).
* The voltage test was only performed with DC5.0V from host device. Since the RF Module has its own regulator and the RF Module is constantly provided voltage (DC3.0V) through the regulator regardless of input voltage from host device, and voltage (DC 3.0V) in the RF Module had been the change in less than 1% when EUT input voltage (DC 5V) was changed from 85% to 115%.

Frequency Stability

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date 2011/11/10
Temperature / Humidity 24deg.C. 52%RH
Engineer Akio Hayashi
Mode Transmitting

Test Condition deg.C	Volts.	Test Timing	Measured frequency [MHz]	Frequency error [MHz]	Result [ppm]	Limit [+/- ppm]	Margin [ppm]
50deg.C	5V	Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-
40deg.C		Power on	613.987293	-0.000207	-0.34	2.50	2.16
		on 2min.	613.987294	-0.000206	-0.34	2.50	2.16
		on 5min.	613.987294	-0.000206	-0.34	2.50	2.16
		on 10min.	613.987296	-0.000204	-0.33	2.50	2.17
30deg.C		Power on	613.987368	-0.000132	-0.21	2.50	2.29
		on 2min.	613.987359	-0.000141	-0.23	2.50	2.27
		on 5min.	613.987348	-0.000152	-0.25	2.50	2.25
		on 10min.	613.987344	-0.000156	-0.25	2.50	2.25
20deg.C		Power on	613.987418	-0.000082	-0.13	2.50	2.37
		on 2min.	613.987418	-0.000082	-0.13	2.50	2.37
		on 5min.	613.987416	-0.000084	-0.14	2.50	2.36
		on 10min.	613.987416	-0.000084	-0.14	2.50	2.36
10deg.C		Power on	613.987394	-0.000106	-0.17	2.50	2.33
		on 2min.	613.987395	-0.000105	-0.17	2.50	2.33
		on 5min.	613.987400	-0.000100	-0.16	2.50	2.34
		on 10min.	613.987402	-0.000098	-0.16	2.50	2.34
0deg.C		Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-
-10deg.C		Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-
-20deg.C		Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-
-30deg.C		Power on	-	-	-	-	-
		on 2min.	-	-	-	-	-
		on 5min.	-	-	-	-	-
		on 10min.	-	-	-	-	-

Limit : 613.9875 MHz +/-0.00025 % (+/- 2.5ppm) = +/- 0.001535 MHz

* The test on 50deg.C, 0deg.C, -10deg.C, -20deg.C, and -30deg.C were not apply, since the specification of operating temperature of EUT was 10deg.C to 40deg.C. (It used the manufacturer's specified conditions (refer to 95.1115(e))).
* The voltage test was only performed with DC5.0V from host device. Since the RF Module has its own regulator and the RF Module is constantly provided voltage (DC3.0V) through the regulator regardless of input voltage from host device, and voltage (DC 3.0V) in the RF Module had been the change in less than 1% when EUT input voltage (DC 5V) was changed from 85% to 115%.

-26dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	11/10/2011	
Temperature / Humidity	24deg.C. 52%RH	
Engineer	Akio Hayashi	
Mode	Transmitting	

Freq. [MHz]	-26dB Bandwidth [kHz]
608.0125	8.652
611.0000	8.840
613.9875	8.939

No limit applies to -26dB Bandwidth.

UL Japan, Inc.
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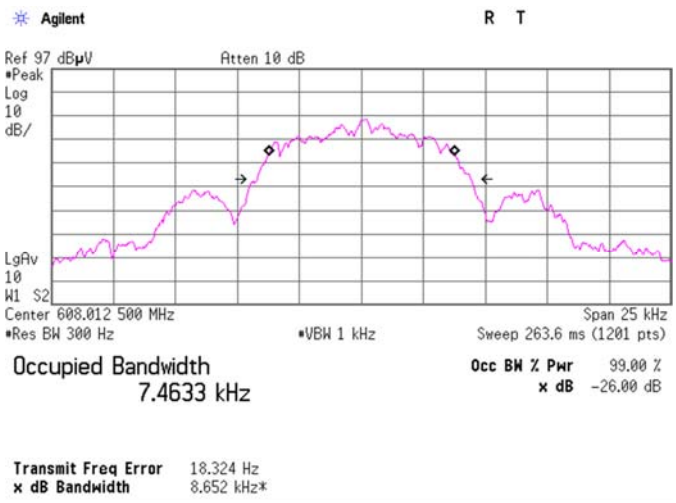
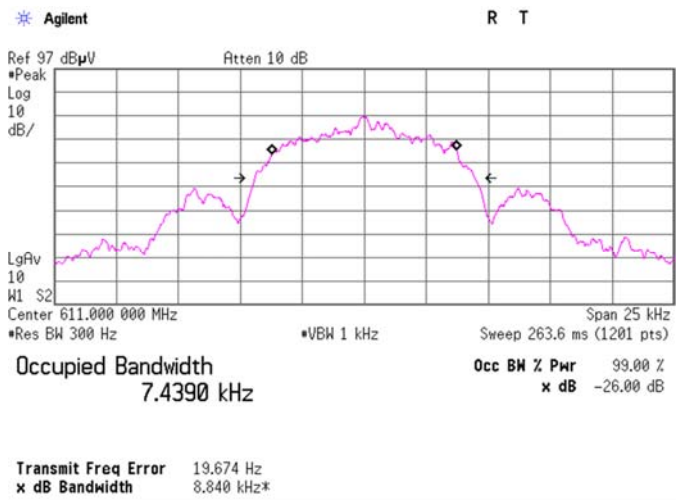
-26dB Bandwidth

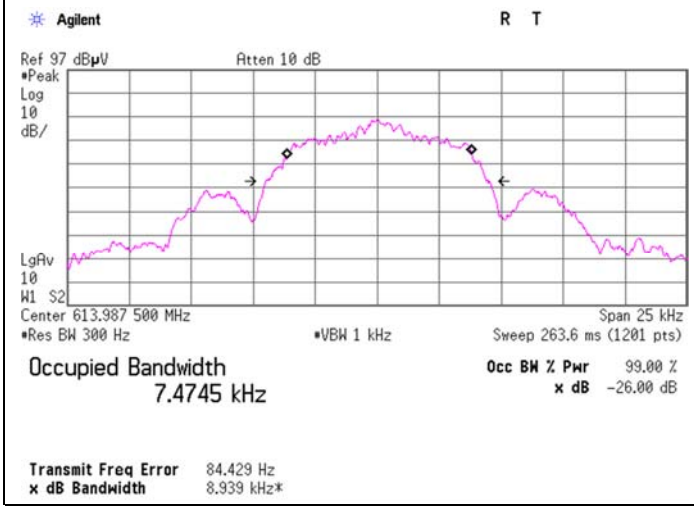
Transmitting(608.0125MHz)



Transmitting(611.0000MHz)



Transmitting(613.9875MHz)



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Field Strength(Electric Field Strength of Fundamental Emission , Spurious Emission and Band Edge Compliance)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber
Date	2011/11/9	
Temperature / Humidity	21deg.C , 43%RH	
Engineer	Akio Hayashi	
Mode	Tx, 608.0125 MHz	

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.	608.013	QP	85.9	19.1	22.8	31.9	95.6	106.0	10.1	152	15	Carrier , EUT:X , ANT:Y
Hori.	1216.025	AV	56.3	24.6	4.1	40.7	44.3	53.9	9.6	118	225	EUT:Hor_X , ANT:Z
Hori.	1824.037	AV	59.9	25.8	3.9	41.0	48.6	53.9	5.3	118	194	EUT:Hor_X , ANT:Z
Hori.	2432.050	AV	51.7	27.3	4.5	41.1	42.4	53.9	11.5	116	37	EUT:Hor_X , ANT:Z
Hori.	3040.063	AV	53.4	28.8	5.0	41.4	45.8	53.9	8.1	117	14	EUT:Hor_X , ANT:Z
Hori.	3648.075	AV	46.6	29.5	5.3	41.7	39.7	53.9	14.2	113	225	EUT:Hor_X , ANT:Z
Vert.	608.013	QP	83.8	19.1	22.8	31.9	93.8	106.0	12.2	100	327	Carrier , EUT:X , ANT:Y
Vert.	1216.025	AV	53.6	24.6	4.1	40.7	41.6	53.9	12.3	100	166	EUT:Hor_X , ANT:Y
Vert.	1824.037	AV	59.4	25.8	3.9	41.0	48.1	53.9	5.8	126	155	EUT:Hor_X , ANT:Y
Vert.	2432.050	AV	45.1	27.3	4.5	41.1	35.8	53.9	18.1	100	288	EUT:Hor_X , ANT:Y
Vert.	3040.063	AV	53.1	28.8	5.0	41.4	45.5	53.9	8.4	100	90	EUT:Hor_X , ANT:Y
Vert.	3648.075	AV	44.6	29.5	5.3	41.7	37.7	53.9	16.2	100	183	EUT:Hor_X , ANT:Y

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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

*The other harmonic were not seen so the result was its base noise level.

Marker Delta Method(Test distance 3meters)

		Polarity	Hor.		Ver.	
		RBW / VBW	[dBuV] Reading	[dBuV/m] Result	[dBuV] Reading	[dBuV/m] Result
Step1	Fundamental(608.0125MHz)	QP	85.9	95.9	83.8	93.8
Step2	Fundamental(608.0125MHz)	1k/3k	85.6	95.6	83.3	93.3
	Band-edge(608MHz)	1k/3k	32.3	42.3	30.5	40.5
	Amplitude delta	-	-	53.3	-	52.8
Step3	Field strength of band-edge	-	-	42.6	-	41.0
	Limit	-	-	46.0	-	46.0
	Margin	-	-	3.4	-	5.0

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

*1 Amplitude delta = Fundamental(RBW:1kHz,VBW:3kHz) - Band-edge(RBW:1kHz,VBW:3kHz)

*2 Field strength of band-edge = Fundamental(QP) - Amplitude delta

*As we started at section 6.5, we used RBW = 1kHz (greater than 1% bandwidth) to prevent to detect in-band emission. Refer to KDB 662683.

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Field Strength(Electric Field Strength of Fundamental Emission and Spurious Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber
Date	2011/11/9	
Temperature / Humidity	21deg.C , 43%RH	
Engineer	Akio Hayashi	
Mode	Tx, 611.0000 MHz	

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.	611.000	QP	85.7	19.2	22.8	31.9	95.8	106.0	10.2	139	179	Carrier , EUT:X , ANT:Y
Hori.	1222.000	AV	56.9	24.6	4.1	40.7	44.9	53.9	9.0	129	330	EUT:X , ANT:Z
Hori.	1833.000	AV	60.6	25.8	3.9	41.0	49.3	53.9	4.6	122	297	EUT:X , ANT:Z
Hori.	2444.000	AV	48.3	27.4	4.5	41.1	39.1	53.9	14.8	117	31	EUT:X , ANT:Z
Hori.	3055.000	AV	53.4	28.8	5.0	41.4	45.8	53.9	8.1	115	52	EUT:X , ANT:Z
Hori.	3666.000	AV	48.3	29.6	5.3	41.7	41.5	53.9	12.4	112	216	EUT:X , ANT:Z
Vert.	611.000	QP	84.2	19.2	22.8	31.9	94.3	106.0	11.7	100	306	Carrier , EUT:Z , ANT:X
Vert.	1222.000	AV	54.9	24.6	4.1	40.7	42.9	53.9	11.0	100	180	EUT:X , ANT:Y
Vert.	1833.000	AV	58.9	25.8	3.9	41.0	47.6	53.9	6.3	127	160	EUT:X , ANT:Y
Vert.	2444.000	AV	46.8	27.4	4.5	41.1	37.6	53.9	16.3	131	284	EUT:X , ANT:Y
Vert.	3055.000	AV	48.8	28.8	5.0	41.4	41.2	53.9	12.7	132	34	EUT:X , ANT:Y
Vert.	3666.000	AV	47.2	29.6	5.3	41.7	40.4	53.9	13.5	131	113	EUT:X , ANT:Y

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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

*The other harmonic were not seen so the result was its base noise level.

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Field Strength(Electric Field Strength of Fundamental Emission , Spurious Emission and Band Edge Compliance)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber
Date	2011/11/9	
Temperature / Humidity	21deg.C , 43%RH	
Engineer	Akio Hayashi	
Mode	Tx, 613.9875 MHz	

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.	613.988	QP	85.9	19.2	22.8	31.9	96.0	106.0	10.0	149	173	Carrier , EUT:X , ANT:Y
Hori.	1227.975	AV	57.6	24.6	4.1	40.7	45.6	53.9	8.3	128	151	EUT:X , ANT:Z
Hori.	1841.963	AV	63.1	25.9	3.9	41.1	51.8	53.9	2.1	120	302	EUT:X , ANT:Z
Hori.	2455.950	AV	50.6	27.4	4.5	41.1	41.4	53.9	12.5	115	40	EUT:X , ANT:Z
Hori.	3069.938	AV	53.8	28.8	5.0	41.4	46.2	53.9	7.7	114	52	EUT:X , ANT:Z
Hori.	3683.925	AV	49.8	29.6	5.4	41.7	43.1	53.9	10.8	110	217	EUT:X , ANT:Z
Vert.	613.988	QP	84.0	19.2	22.8	31.9	94.1	106.0	11.9	100	308	Carrier , EUT:X , ANT:Y
Vert.	1227.975	AV	54.8	24.6	4.1	40.7	42.8	53.9	11.1	158	281	EUT:X , ANT:Y
Vert.	1841.963	AV	61.7	25.9	3.9	41.1	50.4	53.9	3.5	164	117	EUT:X , ANT:Y
Vert.	2455.950	AV	46.7	27.4	4.5	41.1	37.5	53.9	16.4	107	27	EUT:X , ANT:Y
Vert.	3069.938	AV	50.4	28.8	5.0	41.4	42.8	53.9	11.1	125	325	EUT:X , ANT:Y
Vert.	3683.925	AV	49.8	29.6	5.4	41.7	43.1	53.9	10.8	107	146	EUT:X , ANT:Y

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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

*The other harmonic were not seen so the result was its base noise level.

Marker Delta Method(Test distance 3meters)

		Polarity	Hor.		Ver.	
		RBW / VBW	[dBuV] Reading	[dBuV/m] Result	[dBuV] Reading	[dBuV/m] Result
Step1	Fundamental(613.9875MHz)	QP	85.9	96.0	84.0	94.1
Step2	Fundamental(613.9875MHz)	1k/3k	85.6	95.7	83.8	93.9
	Band-edge(614MHz)	1k/3k	33.6	43.7	30.1	40.2
	Amplitude delta	-	-	52.0	-	53.7
Step3	Field strength of band-edge	-	-	44.0	-	40.4
	Limit	-	-	46.0	-	46.0
	Margin	-	-	2.0	-	5.6

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

*1 Amplitude delta = Fundamental(RBW:1kHz,VBW:3kHz) - Band-edge(RBW:1kHz,VBW:3kHz)

*2 Field strength of band-edge = Fundamental(QP) - Amplitude delta

*As we started at section 6.5, we used RBW = 1kHz (greater than 1% bandwidth) to prevent to detect in-band emission. Refer to KDB 662683.

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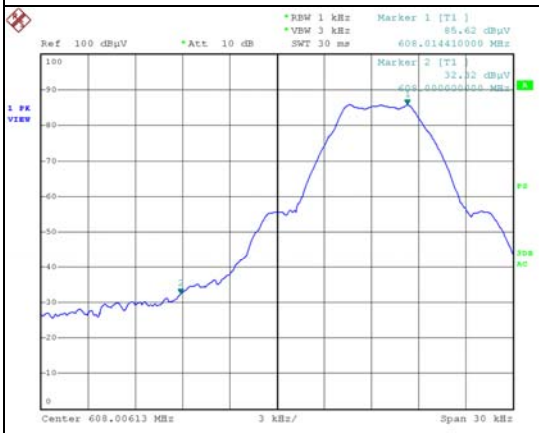
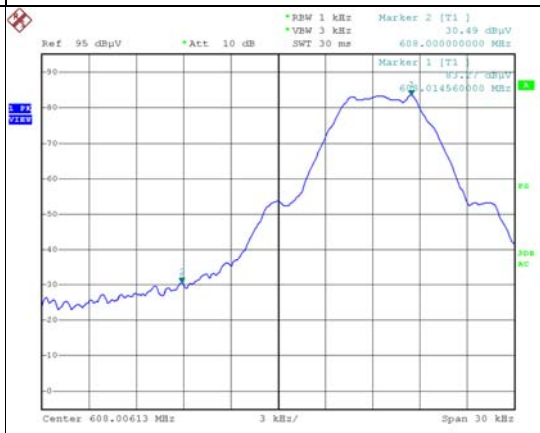
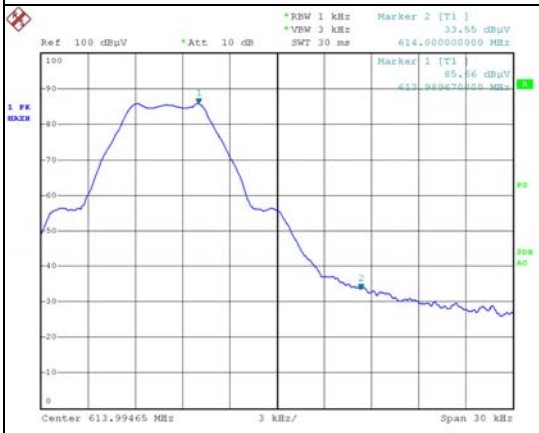
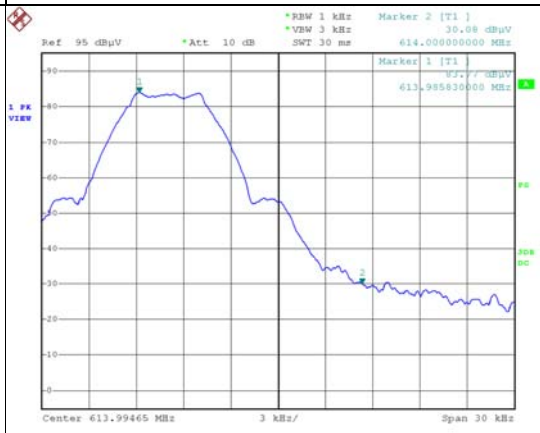
Field Strength(Electric Field Strength of Fundamental Emission , Spurious Emission and Band Edge Compliance)

Band Edge compliance(for Marker Delta Method)

Transmitting(608.0125MHz)	
Horizontal	**Vertical**
	

Transmitting(613.9875MHz)	
Horizontal	**Vertical**
	

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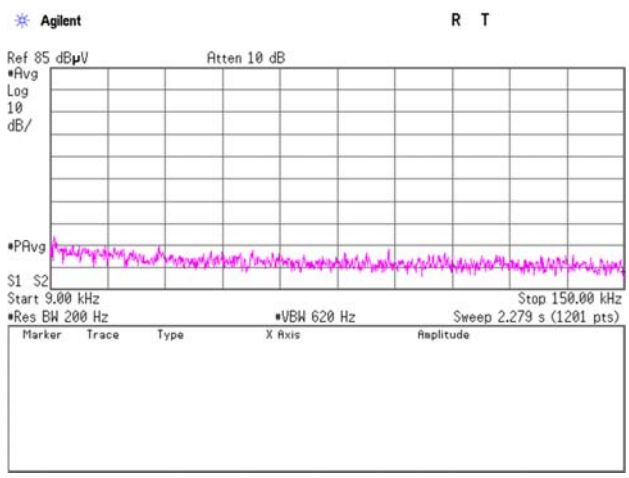
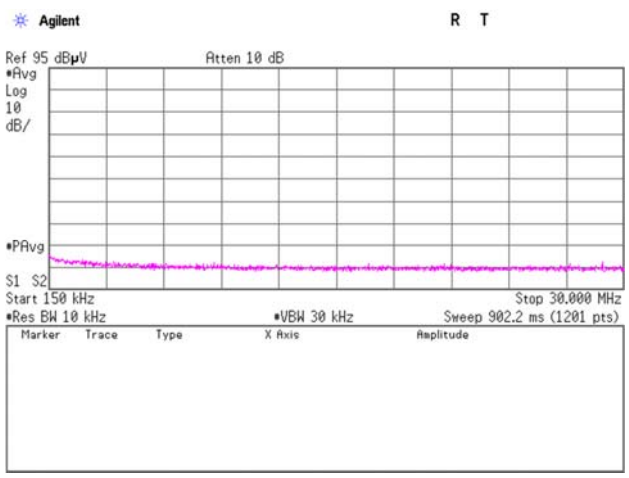
Spurious emissions at antenna terminals

Transmitting(608.0125MHz)

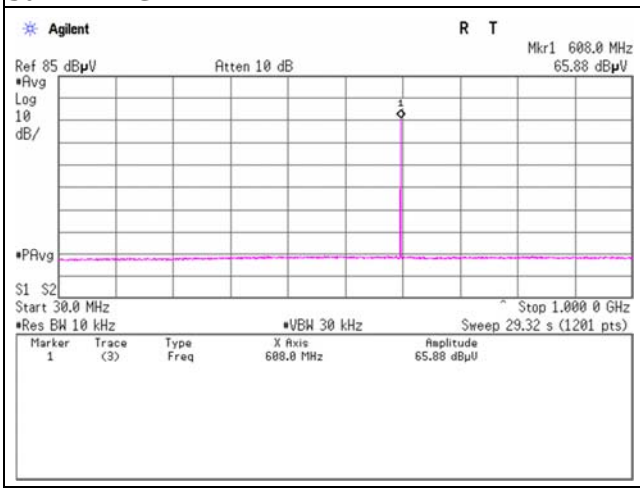
9kHz - 150kHz



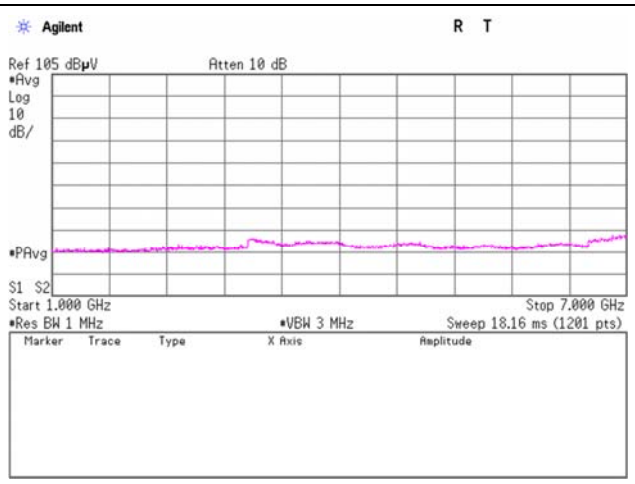
150kHz - 30MHz



30MHz - 1GHz



1GHz - 7GHz



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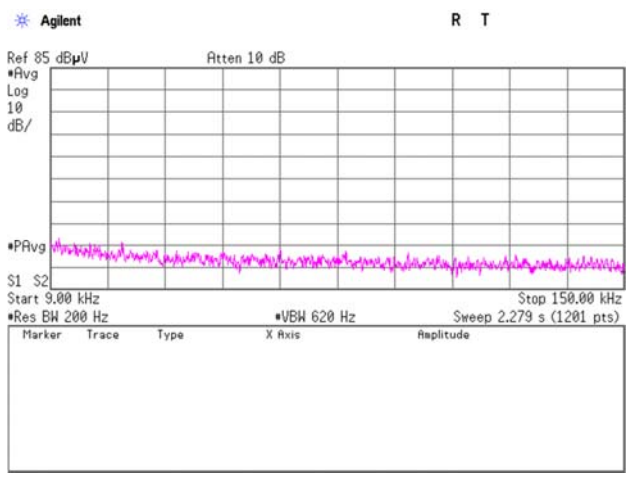
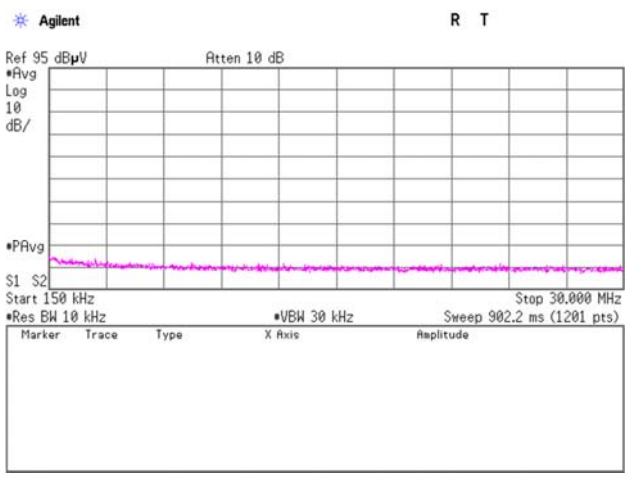
Spurious emissions at antenna terminals

Transmitting(611.0000MHz)

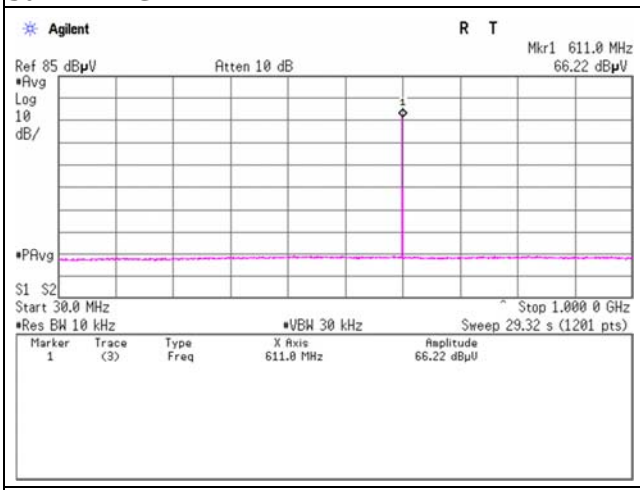
9kHz - 150kHz



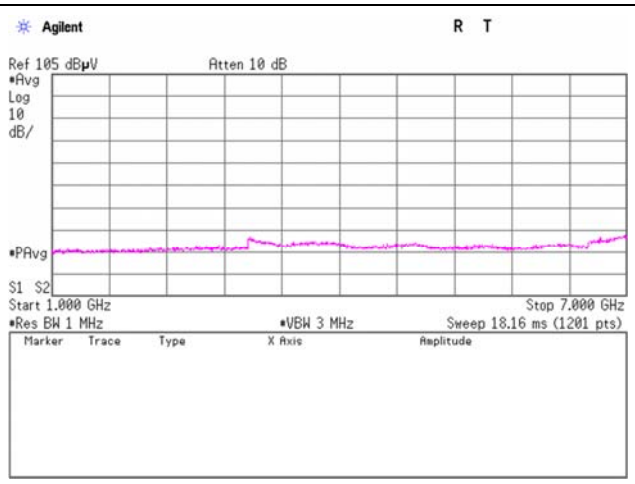
150kHz - 30MHz



30MHz - 1GHz



1GHz - 7GHz



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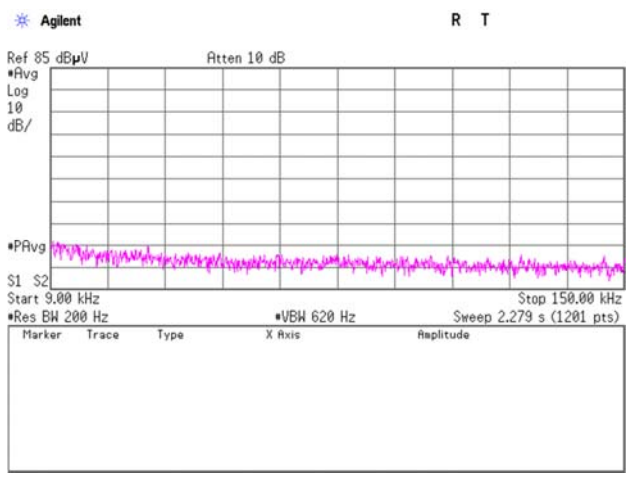
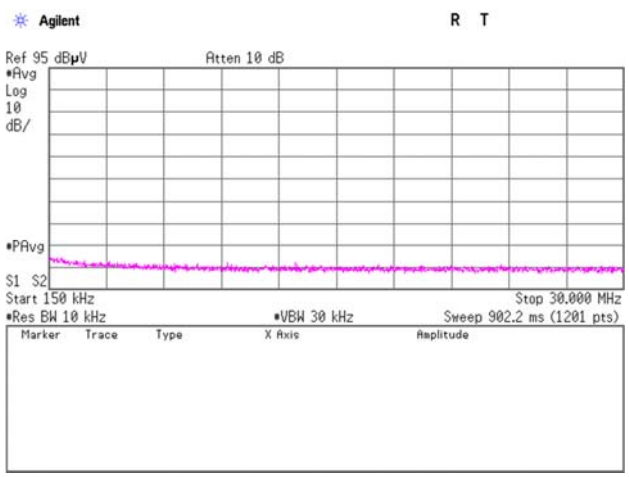
Spurious emissions at antenna terminals

Transmitting(613.9875MHz)

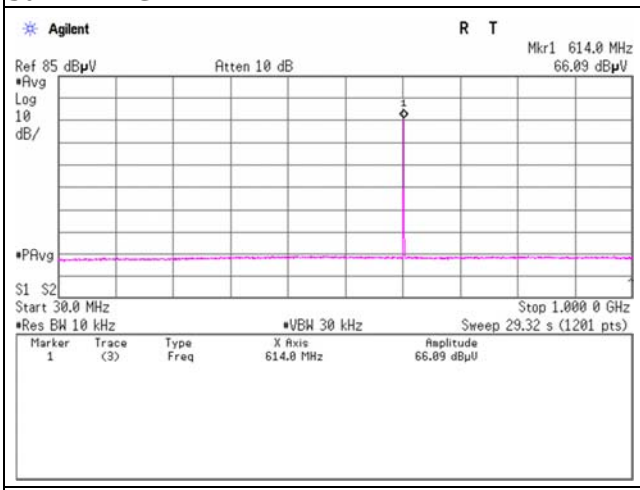
9kHz - 150kHz



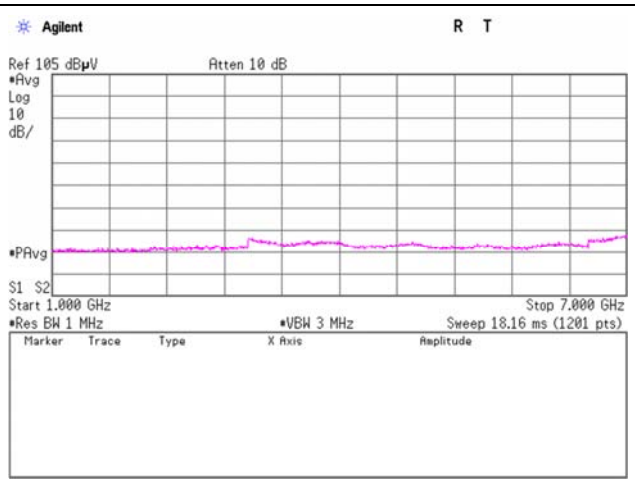
150kHz - 30MHz



30MHz - 1GHz



1GHz - 7GHz



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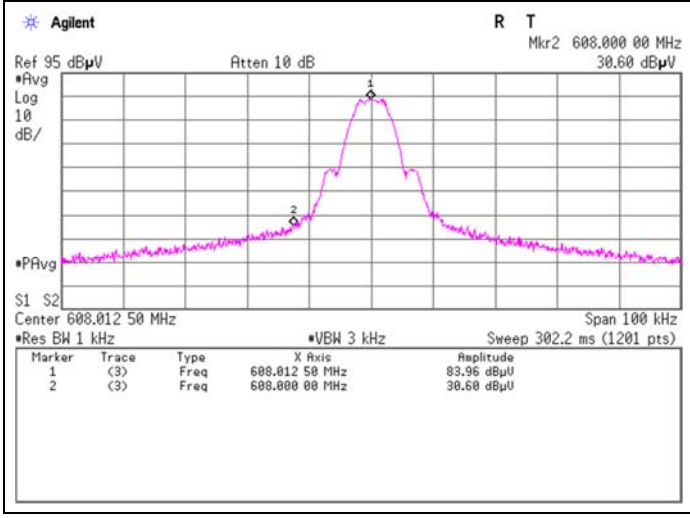
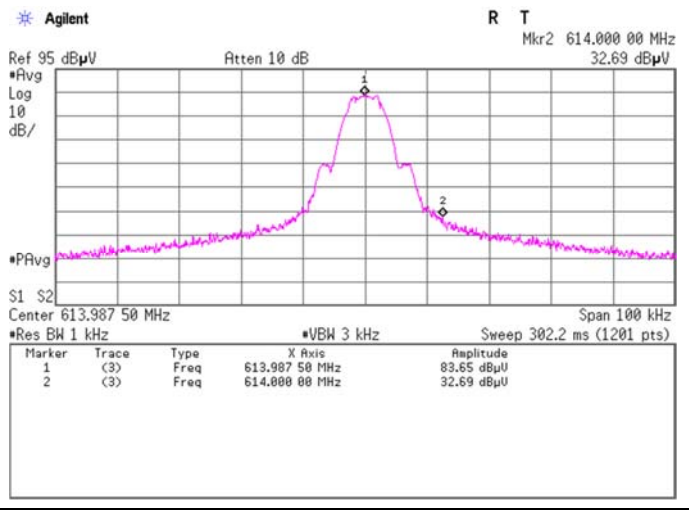
Spurious emissions at antenna terminals

Band Edge compliance

Transmitting(608.0125MHz)	Transmitting(613.9875MHz)
	

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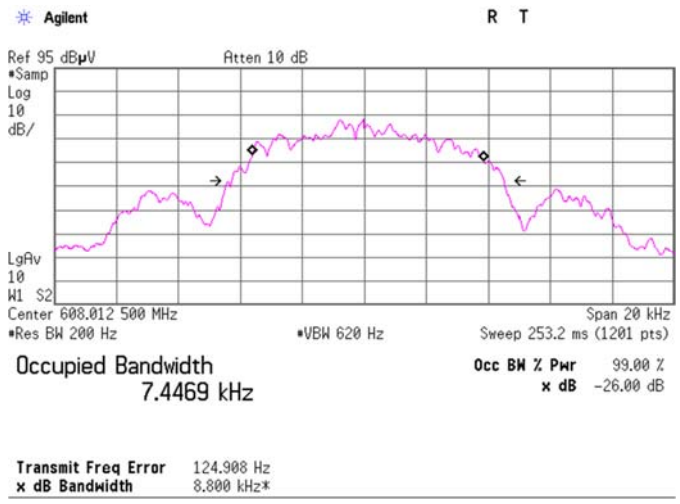
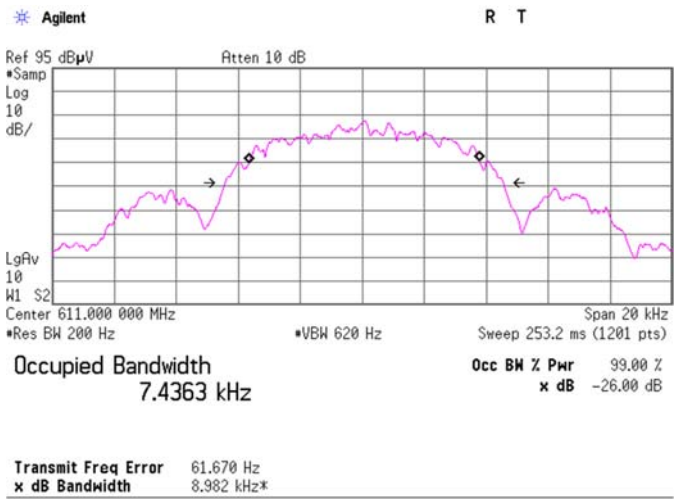
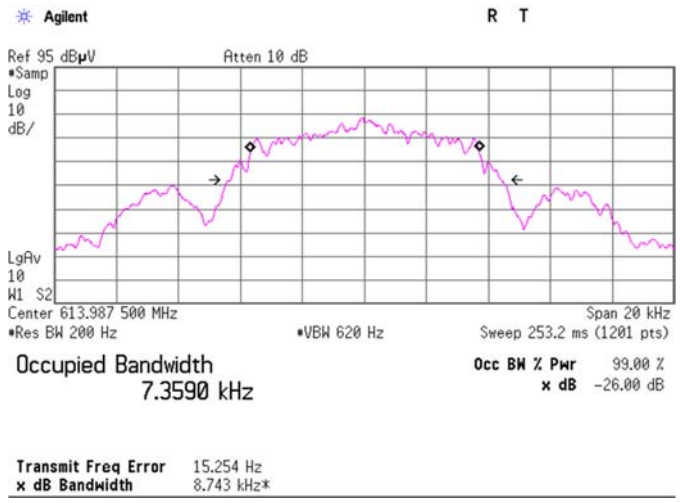
99% Occupied Bandwidth

Transmitting(608.0125MHz)	Transmitting(611.0000MHz)
	
Transmitting(613.9875MHz)	
	

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Peak Output Power (Conducted)

Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date	2/17/2012
Temperature / Humidity	23deg.C 38%RH
Engineer	Akio Hayashi
Mode	Transmitting

(* P/M: Power Meter with power sensor)

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]
Low	608.0125	-21.16	0.64	20.03	-0.49	0.89
Mid	611.0000	-21.15	0.64	20.03	-0.48	0.90
High	613.9875	-21.07	0.64	20.03	-0.40	0.91

Sample Calculation:
Result = Reading + Cable Loss + Atten. Loss

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APPENDIX 2
Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	02/17/2011 * 12
SAT6-03	Attenuator	JFW	50HF-006N	-	RE	02/17/2011 * 12
SAT13-01	Attenuator	JFW	50FP-013-H2 N	-	RE	02/17/2011 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	10/23/2011 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	04/28/2011 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	10/23/2011 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	02/23/2011 * 12
TR-09	Test Receiver	Rohde & Schwarz	ESCI	100769	RE	09/16/2011 * 12
SJM-10	Measure	PROMART	SEN1935	-	RE	-
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	09/23/2011 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE	-
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	07/19/2011 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	04/28/2011 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	05/27/2011 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	08/28/2011 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	02/02/2011 * 12
SFL-01	Highpass Filter	MICRO-TRONICS	HPM50115	001	RE	12/15/2010 * 12
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-271(RF Selector)	CE	04/28/2011 * 12
SLS-03	LISN	Rohde & Schwarz	ENV216	100513	CE	02/23/2011 * 12
SAT3-06	Attenuator	JFW	50HF-003N	-	CE	02/17/2011 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	03/02/2011 * 12
STM-05	Terminator	TME	CT-01 BP	-	CE	01/07/2011 * 12
STR-03	Test Receiver	Rohde & Schwarz	ESI40	100054/040	CE	07/28/2011 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	11/16/2010 * 12
SFC-01	Microwave Counter	Agilent	53151A	US40511493	FT	03/01/2011 * 12
SCC-G13	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	AT	03/23/2011 * 12
SAT20-02	Attenuator	Agilent	8493C-020	74890	AT	03/23/2011 * 12
SCH-01	Temperature and Humidity Chamber	Espec	PL-1KT	14020837	AT , FT	04/06/2011 * 12
SBM-09	Barometer	Sunoh	SBR121	001074	AT	02/05/2009 * 36
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT , FT	03/02/2011 * 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 valid calibrations . Each measurement data is traceable to the national or international standards .
Test Item :
CE: Conducted emission ,
RE: Radiated emission ,
FT: Frequency Tolerance
AT: Antenna Terminal