

APPENDIX 2: Data of EMI test

6dB Bandwidth

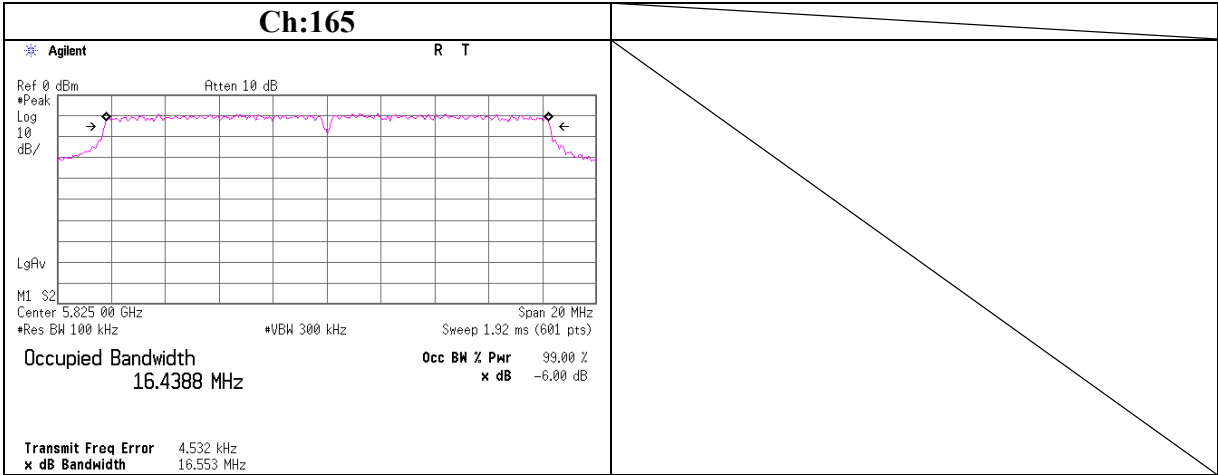
Company : KOITO INDUSTRIES, LTD.
Equipment : Wireless LAN Module
Model : KWM-DS540-N2
Sample No. : AH0029646
Power : DC 5.0V
Mode : Tx, 5825MHz, 24Mbps, PN9, AntB

UL Japan, Inc.
Head Office EMC Lab. No.2 Measurement Room

Test Report No. : 27LE0273-HO
Regulation : FCC15.247(a)(2)
Test distance : -
Date : 02/27/2008
Temperature : 25 deg.C.
Humidity : 32%
Engineer : Akio Hayashi

Ch	Freq.	6dB Bandwidth	Limit
	[MHz]	[MHz]	[kHz]
165	5825.0	16.553	>500

6dB Bandwidth



Maximum Peak Output Power

UL Japan, Inc.
Head Office EMC Lab. No.2 Measurement Room

Company : KOITO INDUSTRIES, LTD.
Equipment : Wireless LAN Module
Model : KWM-DS540-N2
Sample No : AH0029646
Power : DC 5.0V
Mode : Tx 5825MHz, 24Mbps, PN9

REPORT NO : 27LE0273-HO
REGULATION : FCC15.247(b)(3)
TEST DISTANCE : -
DATE : 02/27/2008
TEMPERATURE : 25deg.C
HUMIDITY : 32%
ENGINEER : Akio Hayashi

[IEEE802.11a:24Mbps:Antenna A]

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin
					[dBm]	[mW]	[dBm]	[mW]	
165	5825.0	12.35	0.00	10.04	22.39	173.38	30.00	1000	7.61

[IEEE802.11a:24Mbps:Antenna B]

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin
					[dBm]	[mW]	[dBm]	[mW]	
165	5825.0	12.47	0.00	10.04	22.51	178.24	30.00	1000	7.49

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

Radiated Spurious Emission (below 1GHz)
Tx 11a, Ch: 165 (5825MHz)

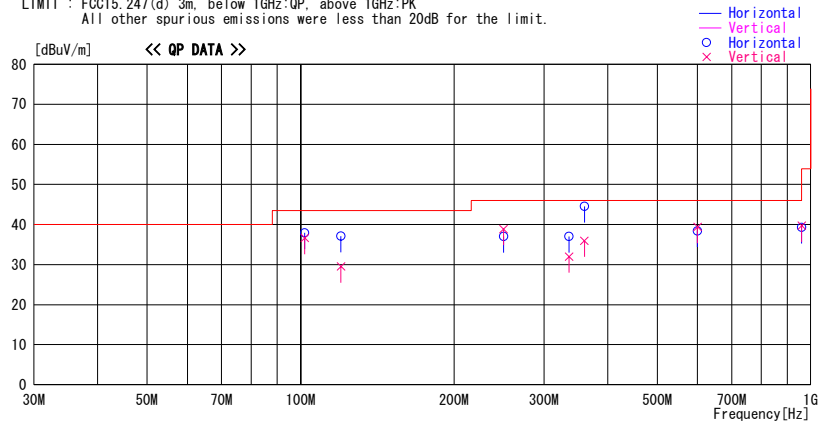
DATA OF RADIATED EMISSION TEST

UL Japan Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2008/02/26

Applicant : KOITO INDUSTRIES, LTD. Report No. : 27LE0273-H0
Kind of EUT : Wireless LAN Module Power : DC 5V
Model No. : KWM-DSS40-N2 Temp./ Humi. : 21 deg. C. / 30 %
Serial No. : AHO029646 Operator : Akio Hayashi

Mode / Remarks : Tx, 5825MHz, 24Mbps, PN9, AntB, EUT (Normal)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit	Margin	Comment
			Factor [dB/m]	Gain [dB]					[dBuV/m]	[dB]	
101.874	48.7	QP	10.2	-21.0	37.9	208	310	Hori.	43.5	5.6	
101.875	47.4	QP	10.2	-21.0	36.6	267	100	Vert.	43.5	6.9	
120.004	46.2	QP	11.8	-20.9	37.1	0	293	Hori.	43.5	6.4	
120.005	38.6	QP	11.8	-20.9	29.5	263	245	Vert.	43.5	14.0	
250.004	39.1	QP	17.1	-19.2	37.0	59	250	Hori.	46.0	9.0	
250.001	41.0	QP	17.1	-19.2	38.9	0	100	Vert.	46.0	7.1	
336.001	40.5	QP	15.6	-19.1	37.0	121	100	Hori.	46.0	9.0	
336.001	35.5	QP	15.6	-19.1	32.0	114	138	Vert.	46.0	14.0	
359.993	47.3	QP	16.3	-19.1	44.5	197	100	Hori.	46.0	1.5	
360.002	38.8	QP	16.3	-19.1	36.0	204	158	Vert.	46.0	10.1	
599.999	38.0	QP	19.2	-18.8	38.4	31	294	Hori.	46.0	7.6	
599.998	39.0	QP	19.2	-18.8	39.4	288	100	Vert.	46.0	6.6	
959.998	33.1	QP	22.5	-16.3	39.3	162	100	Hori.	46.0	6.7	
959.996	33.5	QP	22.5	-16.3	39.7	37	100	Vert.	46.0	6.3	

CHART:WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

*The test result is rounded off to one or two decimal place, so some differences might be observed.

Radiated Spurious Emission (above 1GHz)
Tx 11a, Ch: 165 (5825MHz)

		UL Japan, Inc.
Company	: KOITO INDUSTRIES, LTD.	Head Office EMC Lab. No.2 Semi Anechoic Chamber
Equipment	: Wireless LAN Module	Regulation : FCC15.247(d)
Model	: KWM-DS540-N2	Test Distance : 3m / 1m / 0.5m
S/N	: AH0029646	Date : 02/23/2008, 02/25/2008, 02/26/2008
Power	: DC 5.0V	Temperature : 22deg.C., 23deg.C., 21deg.C.
Mode	: Tx, 5825MHz, 24Mbps, PN9, AntB	Humidity : 36%, 32%, 30%
Position	: Normal Position	Engineer : Akio Hayashi
		On 02/23/2008 : 1-10GHz was tested.
		On 02/25/2008 : 10-26.5GHz was tested.
		On 02/26/2008 : 26.5-40GHz was tested.

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	1200.00	52.5	51.1	24.7	33.4	2.5	0.0	46.3	44.9	73.9	27.6	29.0
2	3883.38	47.3	46.1	29.2	31.7	4.7	0.0	49.5	48.3	73.9	24.4	25.6
3	5034.40	44.4	48.9	31.6	31.4	5.1	0.0	49.7	54.2	73.9	24.2	19.7
4	5850.00	45.8	58.9	32.1	31.1	5.7	0.0	52.5	65.6	73.9	21.4	8.3
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	11650.00	48.7	51.9	39.4	30.6	8.1	0.7	56.8	60.0	73.9	17.1	13.9
6	17475.00	43.8	45.0	44.4	29.6	9.5	1.2	59.8	61.0	73.9	14.1	12.9
7	23300.00	37.0	34.3	40.4	29.9	0.6	0.0	38.6	35.9	73.9	35.3	38.0
Test distance 0.5meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
8	29125.00	32.0	30.6	43.7	24.9	15.1	0.0	50.3	48.9	73.9	23.6	25.0
9	34950.00	37.4	36.8	43.1	25.1	16.3	0.0	56.1	55.5	73.9	17.8	18.4

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	1200.00	49.2	47.9	24.7	33.4	2.5	0.0	43.0	41.7	53.9	10.9	12.2
2	3883.38	42.0	40.3	29.2	31.7	4.7	0.0	44.2	42.5	53.9	9.7	11.4
3	5034.40	30.9	38.4	31.6	31.4	5.1	0.0	36.2	43.7	53.9	17.7	10.2
4	5850.00	32.7	40.4	32.1	31.1	5.7	0.0	39.4	47.1	53.9	14.5	6.8
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	11650.00	37.6	40.0	39.4	30.6	8.1	0.7	45.7	48.1	53.9	8.2	5.8
6	17475.00	32.2	31.9	44.4	29.6	9.5	1.2	48.2	47.9	53.9	5.7	6.0
7	23300.00	27.2	27.1	40.4	29.9	0.6	0.0	28.8	28.7	53.9	25.1	25.2
Test distance 0.5meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
8	29125.00	22.2	22.2	43.7	24.9	15.1	0.0	40.5	40.5	53.9	13.4	13.4
9	34950.00	27.4	27.5	43.1	25.1	16.3	0.0	46.1	46.2	53.9	7.8	7.7

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.54 dB

Test Distance 0.5m : Distance Factor(Dfac) = 20log(3/0.5) = 15.56 dB

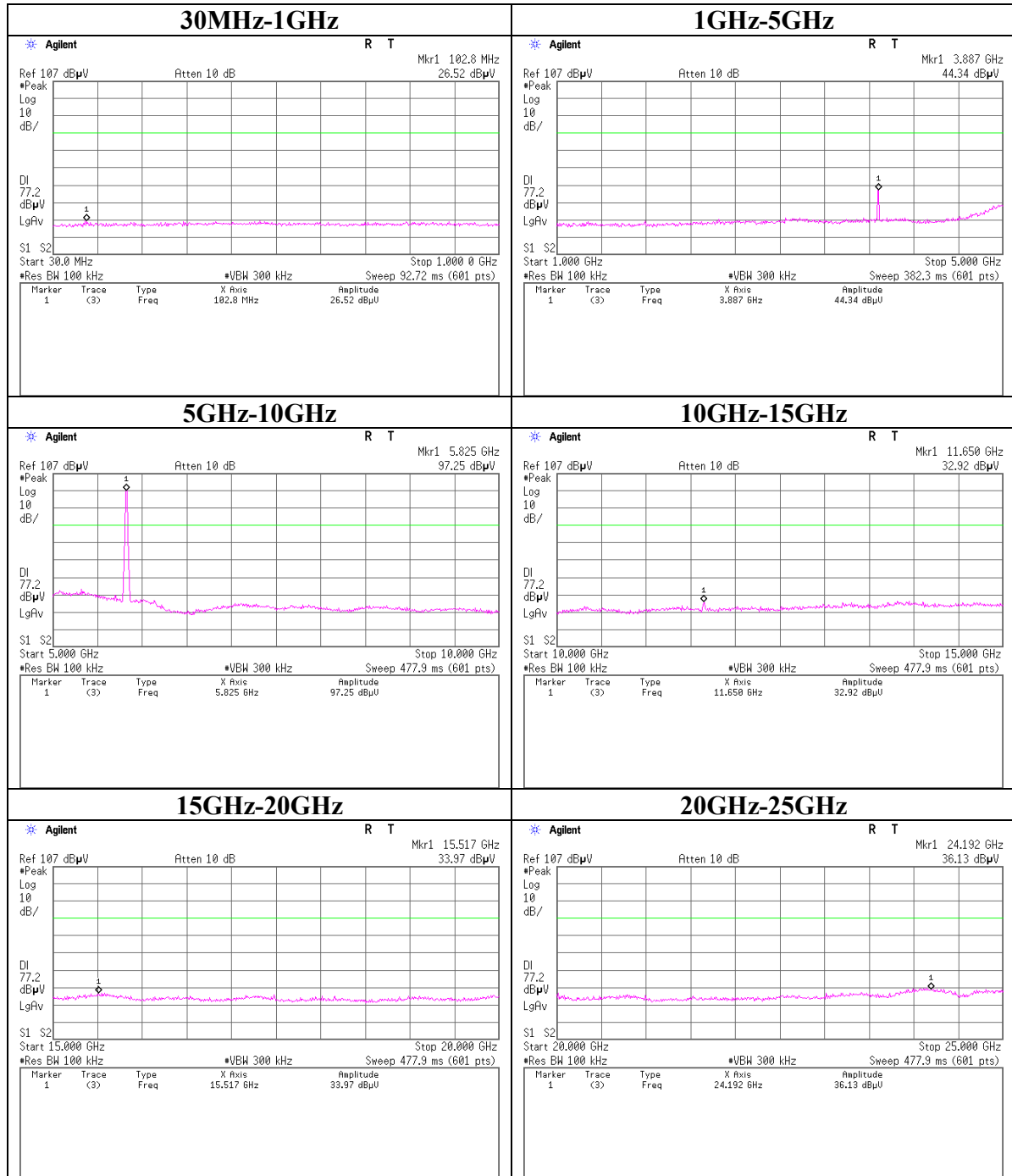
*Except for the above table : All other spurious emissions were less than 20dB for the limit.

*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

*The limit is rounded down to one decimal place.

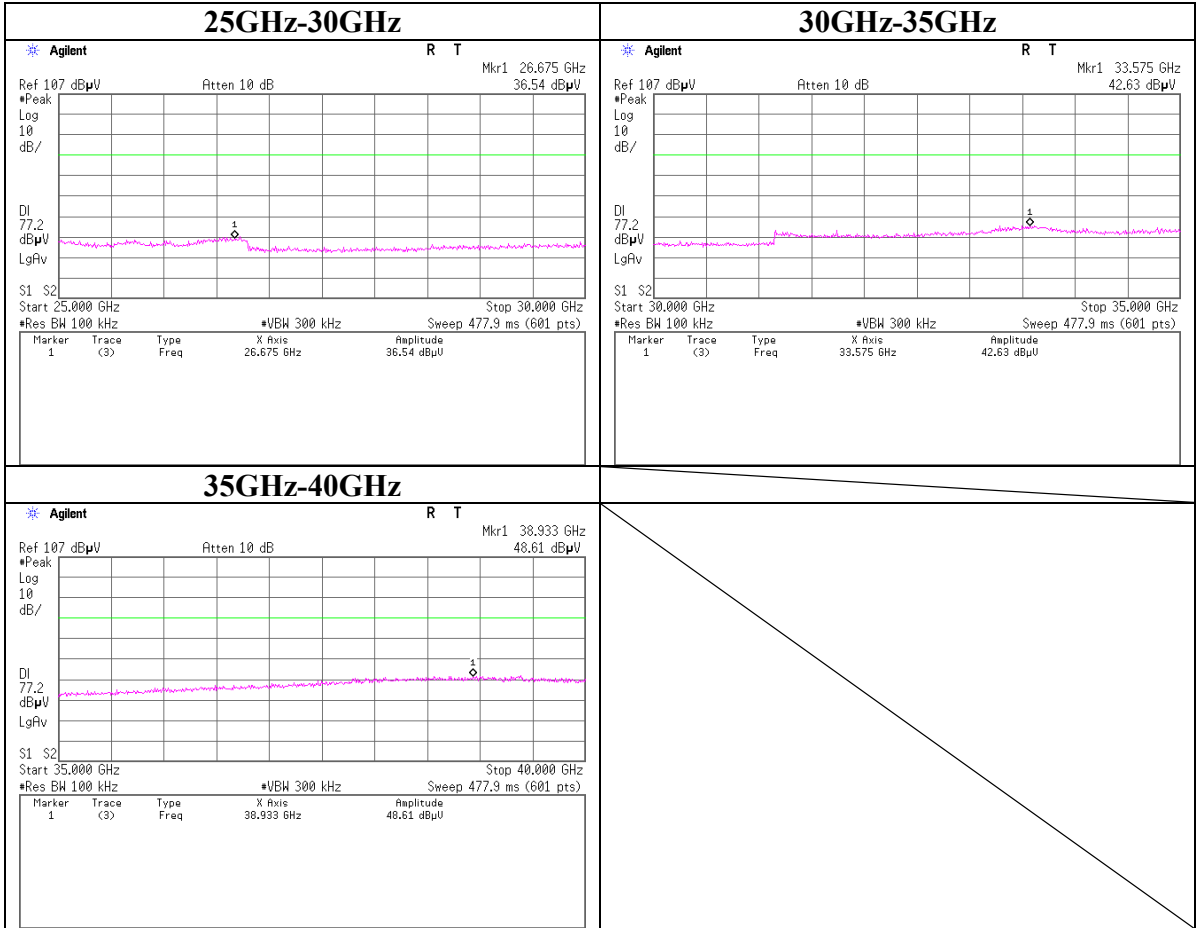
*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted Spurious Emission
Tx, 5825MHz, 24Mbps, PN9, AntB(1/2)

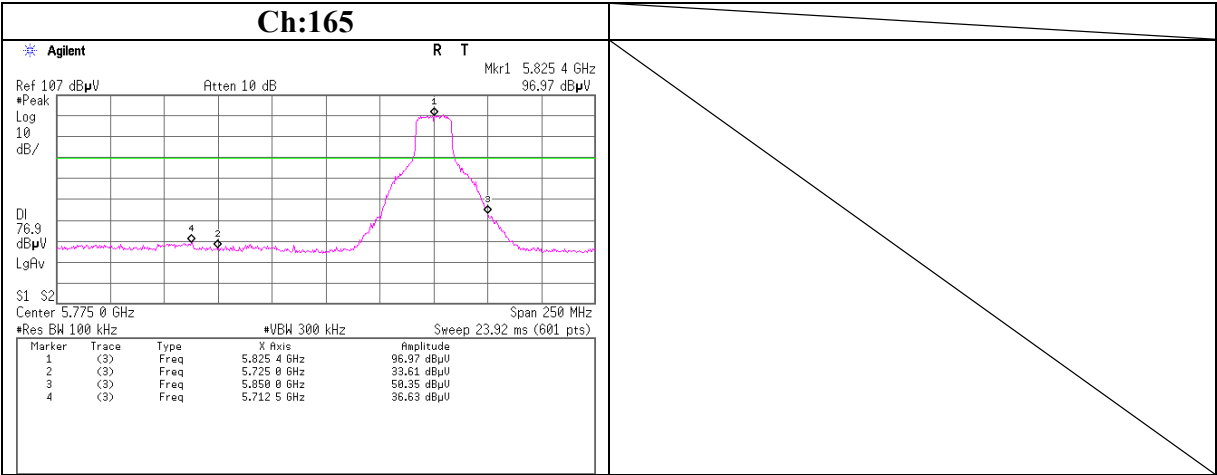


Conducted Spurious Emission

Tx, 5825MHz, 24Mbps, PN9, AntB(2/2)



Conducted emission Band Edge compliance



Power Density

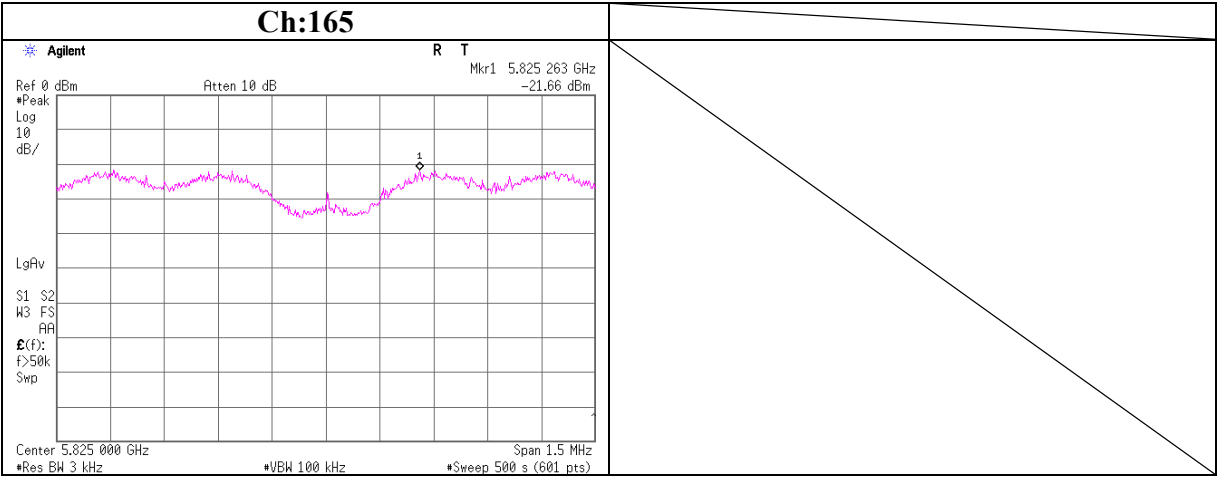
Company	: KOITO INDUSTRIES, LTD.	UL Japan, Inc.
Equipment	: Wireless LAN Module	Head Office EMC Lab. No.2 Measurement Room
Model	: KWM-DS540-N2	Test Report No. : 27LE0273-HO
Sample No.	: AH0029646	Regulation : FCC15.247(e)
Power	: DC 5.0V	Test distance : -
Mode	: Tx, 5825MHz, 24Mbps, PN9, AntB	Date : 02/27/2008
		Temperature : 25 deg.C.
		Humidity : 32%
		Engineer : Akio Hayashi

Ch	Freq.	Reading	Cable Loss	Atten.	Result	Limit	Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
165	5825.3	-21.66	1.9	10.0	-9.8	8.0	17.8

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

Power Density



APPENDIX 3:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-04	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2007/03/03 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	RE	2008/01/10 * 12
MJM-07	Measure	PROMART	SEN1955	RE	-
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	RE	-
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	RE	2007/04/14 * 12
MCC-57	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2007/03/30 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	RE	2007/03/12 * 12
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2007/04/02 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	RE	2007/06/20 * 12
MOS-02	Digital Humidity Indicator	N.T	NT-1800	RE	2007/11/12 * 12
MBM-09	Barometer	Sunoh	SBR121	RE	2007/12/27 * 36
MPA-10	Pre Amplifier	Agilent	8449B	RE	2007/09/27 * 12
MCC-47	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2007/08/28 * 12
MCC-16	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	RE	2008/02/08 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2008/01/19 * 12
MJM-05	Measure	PROMART	SEN1955	RE	-
MRENT-62	Spectrum Analyzer	Agilent	E4448A	RE/AT	2007/11/27 * 12
MCC-25	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2007/08/27 * 12
MHF-16	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCA	RE	2007/12/11 * 12
MCC-77	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2007/12/26 * 12
MHA-02	Horn Antenna	EMCO	3160-09	RE	2008/01/19 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	RE	2007/06/08 * 12
MPSU-04	Power Supply	Agilent	87421A	RE	Pre Check
MCC-54	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX101	RE	2007/03/08 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2007/10/21 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2007/10/21 * 12
MHA-04	Horn Antenna	EMCO	3160-10	RE	2008/01/19 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2007/11/13 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2008/02/15 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	RE	2007/06/08 * 12
MPA-09	Pre Amplifier	Agilent	8447D	RE	2007/09/13 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	AT	2007/12/27 * 12
MPM-09	Power Meter	Anritsu	ML2495A	AT	2007/09/22 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	AT	2007/09/22 * 12
MAT-22	Attenuator(10dB) DC-18GHz	Orient Microwave	BX10-0476-00	AT	2007/03/07 * 12
MCC-65	Microwave Cable 1G-40GHz	Schuer	SUCOFLEX102	AT	2007/04/03 * 12

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

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

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

Test Item: RE: Radiated Emission
AT: Antenna Terminal Conducted test

UL Japan, Inc.

Head Office EMC Lab.

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