FCC TEST REPORT

REPORT NO.:	RF931004L01C
MODEL NO.:	WL-685Z
RECEIVED:	NA
TESTED:	Oct. 18 ~ Oct. 19, 2004
ISSUED:	Dec. 06, 2005

APPLICANT:	SparkLAN Communications, Inc.
ADDRESS:	3Fl., No. 246, Sec. 1, Neihu Road., Neihu Chiu, Taipei Taiwan 114, R.O.C

ISSUED BY:	Advance Data Technology Corporation
LAB ADDRESS:	No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, Taiwan, R.O.C.
TEST LOCATION:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

ACCREDITED
No. 2177-01

CNLA
0528
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1 CERTIFICATION

PRODUCT :	802.11g WLAN Compact USB Adapter
BRAND NAME :	SparkLAN
MODEL NO. :	WL-685Z
APPLICANT :	SparkLAN Communications, Inc.
TEST SAMPLE :	ENGINEERING SAMPLE
STANDARDS :	FCC Part 15, Subpart C (Section 15.247), ANSI C63.4-2003

The above equipment (model no.: WL-685Z) is identical to model described in RF931004L01, which has been tested by **Advance Data Technology Corporation** from Oct. 18 ~ Oct. 19, 2004, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report

PREPARED BY : Rebecca Huang , **DATE:** Dec. 06, 2005
Rebecca Huang

TECHNICAL ACCEPTANCE : Gary Chang , **DATE:** Dec. 06, 2005
Responsible for RF
Gary Chang

APPROVED BY : , **DATE:** Dec. 06, 2005
Cody Chang / Deputy Manager

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	**Test Type and Limit**	**Result**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is –12.49dB at 0.213MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit : min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is –1.89dB at 9648.00MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

Measurement	Frequency	Uncertainty
Conducted emissions	9k~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.55 dB
	200MHz ~1000MHz	3.58 dB
	1GHz ~ 18GHz	2.20 dB
	18GHz ~ 40GHz	1.88 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	802.11g WLAN Compact USB Adapter
MODEL NO.	WL-685Z
POWER SUPPLY	5.0Vdc from host equipment
MODULATION TYPE	CCK, QPSK, BPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
RADIO TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
MAXIMUM OUTPUT POWER	11.169mW
ANTENNA TYPE	Chip antenna with 1.98dBi gain
DATA CABLE	NA
I/O PORTS	USB
ASSOCIATED DEVICES	NA

NOTE:

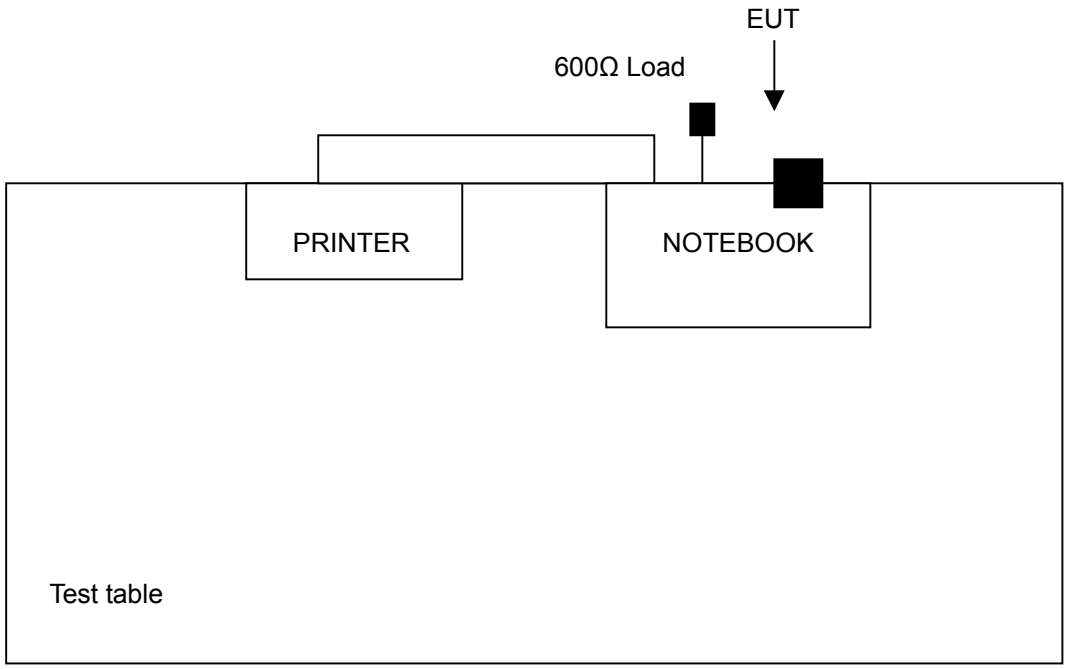
1. This is a duplicate report of RF931004L01, the differences are changing the model name, brand name, applicant, product name and outward appearance.
2. The EUT operates in the 2.4GHz frequency spectrum with throughput of up to 54Mbps.
3. The EUT complies with IEEE 802.11g standards and backwards compatible with IEEE 802.11b products.
4. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided to this EUT.

Channel	Frequency	Channel	Frequency
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT configure mode	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
-	√	√	√	√	NA

Where PLC: Power Line Conducted Emission RE<1G RE: Radiated Emission below 1GHz
RE≥1G: Radiated Emission above 1GHz APCM: Antenna Port Conducted Measurement

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6

Radiated Emission Test (Below 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11g	1 to 11	11	OFDM	BPSK	6

Radiated Emission Test (Above 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	CCK	11
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6

Bandedge Measurement:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1, 11	DSSS	CCK	11
802.11g	1 to 11	1, 11	OFDM	BPSK	6

Antenna Port Conducted Measurement:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	CCK	11
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C. (15.247)
ANSI C63.4-2003

All test items have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	Compaq	N800C	470048-515	FCC DoC Approved
2	PRINTER	EPSON	LQ-300+	DCGY054147	FCC DoC Approved
3	600Ω Load	NA	NA	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2m shielded cable without core
3	NA

NOTE: All power cords of the above support units are non shielded (1.8m).

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5 0.5-5 5-30	66 to 56 56 60	56 to 46 46 50

NOTE:
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Dec. 11, 2004
RF signal cable Woken	5D-FB	Cable-HyC02-01	Mar. 07, 2005
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Mar. 10, 2005
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Mar. 04, 2005
Software ADT	ADT_Cond_V3	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 2.
3. The VCCI Site Registration No. is C-2047.

4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

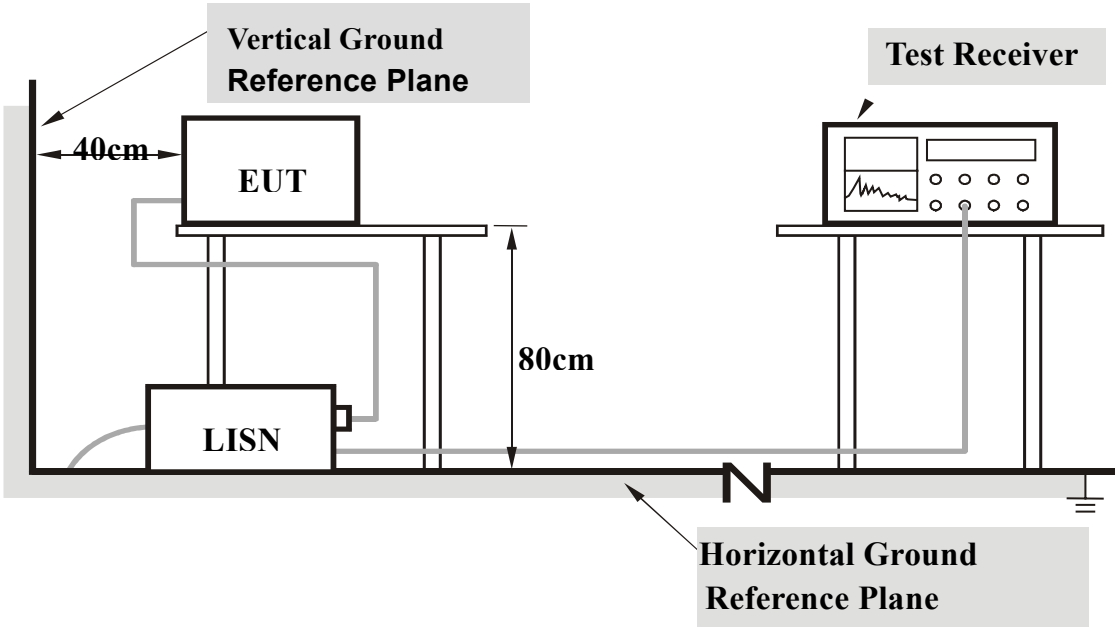
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under Limit - 20dB was not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1. Support units were connected to second
2. Both of LISNs (AMN) are 80 cm from EUT and at
from other units and other metal planes

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

a. Connected the EUT to a Notebook system placed on a testing table.
b. The Notebook system ran a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency.
c. The Notebook system sent "H" messages to its screen.
d. The Notebook system sent "H" messages to printer, and the printer printed them on paper.
e. Steps c ~ d were repeated.

4.1.7 TEST RESULTS

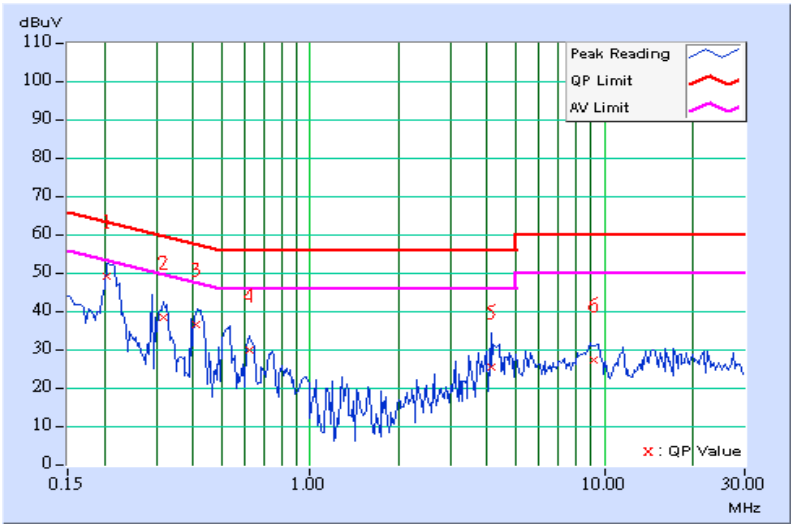
Conducted Worst-Case Data

EUT	802.11g WLAN Compact USB Adapter	MEASUREMENT DETAIL	
MODEL	WL-685Z	PHASE	Line 1
CHANNEL	Channel 1	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	24deg. C, 64% RH, 991 hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Leo Hung		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.205	0.10	48.65	-	48.75	-	63.42	53.42	-14.67	-
2	0.318	0.11	38.19	-	38.30	-	59.76	49.76	-21.46	-
3	0.408	0.12	36.34	-	36.46	-	57.69	47.69	-21.24	-
4	0.619	0.16	29.34	-	29.50	-	56.00	46.00	-26.50	-
5	4.113	0.32	25.03	-	25.35	-	56.00	46.00	-30.65	-
6	9.223	0.51	26.85	-	27.36	-	60.00	50.00	-32.64	-

*(The test data is in accordance with ADT Report No.: RF931004L01.)

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	802.11g WLAN Compact USB Adapter	MEASUREMENT DETAIL	
MODEL	WL-685Z	PHASE	Line 2
CHANNEL	Channel 1	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	24deg. C, 64% RH, 991 hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Leo Hung		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.10	50.60	-	50.70	-	63.26	53.26	-12.56	-
2	0.326	0.11	37.47	-	37.58	-	59.56	49.56	-21.98	-
3	0.423	0.12	36.49	-	36.61	-	57.38	47.38	-20.77	-
4	0.834	0.20	21.96	-	22.16	-	56.00	46.00	-33.84	-
5	4.430	0.32	27.67	-	27.99	-	56.00	46.00	-28.01	-
6	9.141	0.47	27.79	-	28.26	-	60.00	50.00	-31.74	-

*(The test data is in accordance with ADT Report No.: RF931004L01.)

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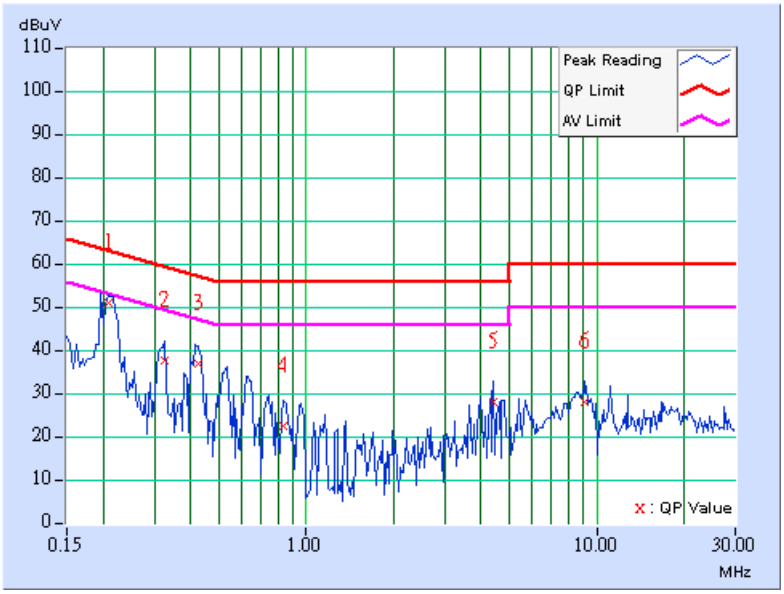
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	802.11g WLAN Compact USB Adapter	MEASUREMENT DETAIL	
MODEL	WL-685Z	PHASE	Line 1
CHANNEL	Channel 6	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	24deg. C, 64% RH, 991 hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Leo Hung		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.213	0.10	49.20	-	49.30	-	63.11	53.11	-13.81	-
2	0.326	0.11	36.30	-	36.41	-	59.56	49.56	-23.15	-
3	0.412	0.12	37.22	-	37.34	-	57.61	47.61	-20.28	-
4	0.619	0.16	30.79	-	30.95	-	56.00	46.00	-25.05	-
5	4.316	0.33	25.68	-	26.01	-	56.00	46.00	-29.99	-
6	9.113	0.50	27.03	-	27.53	-	60.00	50.00	-32.47	-

*(The test data is in accordance with ADT Report No.: RF931004L01.)

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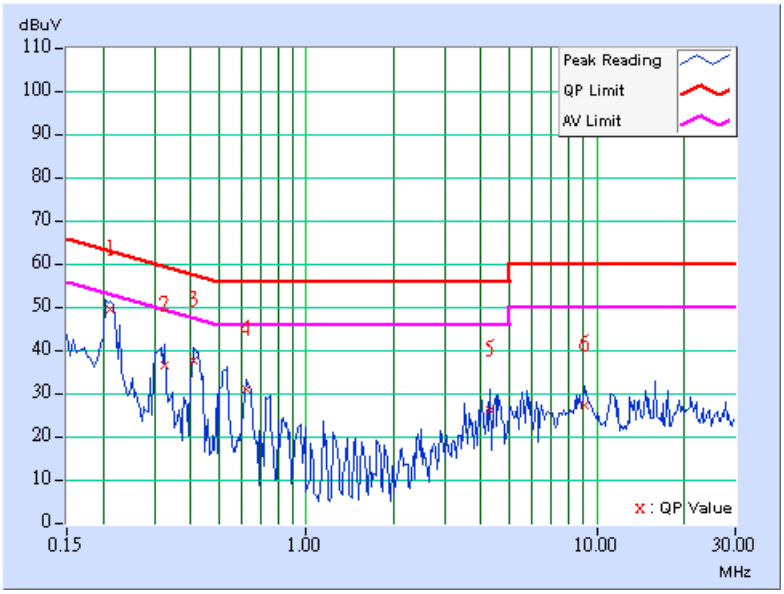
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	802.11g WLAN Compact USB Adapter	MEASUREMENT DETAIL	
MODEL	WL-685Z	PHASE	Line 2
CHANNEL	Channel 6	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	24deg. C, 64% RH, 991 hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Leo Hung		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.213**	**0.10**	**50.52**	**-**	**50.62**	**-**	**63.11**	**53.11**	**-12.49**	**-**
2	0.298	0.11	29.71	-	29.82	-	60.29	50.29	-30.47	-
3	0.619	0.16	32.00	-	32.16	-	56.00	46.00	-23.84	-
4	4.234	0.31	25.10	-	25.41	-	56.00	46.00	-30.59	-
5	9.078	0.47	27.44	-	27.91	-	60.00	50.00	-32.09	-
6	20.367	0.65	22.07	-	22.72	-	60.00	50.00	-37.28	-

*(The test data is in accordance with ADT Report No.: RF931004L01.)

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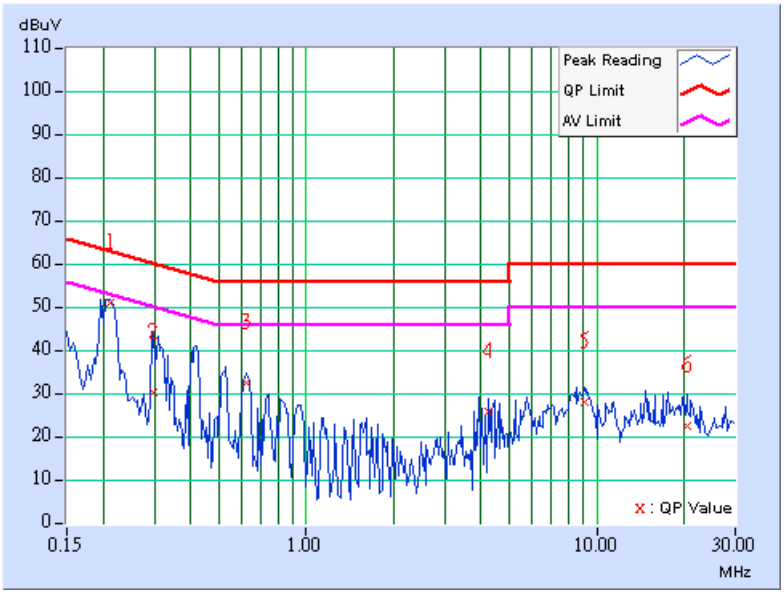

EUT	802.11g WLAN Compact USB Adapter	MEASUREMENT DETAIL	
MODEL	WL-685Z	PHASE	Line 1
CHANNEL	Channel 11	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	24deg. C, 64% RH, 991 hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Leo Hung		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.213	0.10	48.20	-	48.30	-	63.11	53.11	-14.81	-
2	0.287	0.11	28.74	-	28.85	-	60.62	50.62	-31.77	-
3	0.416	0.12	37.14	-	37.26	-	57.54	47.54	-20.28	-
4	0.736	0.19	26.06	-	26.25	-	56.00	46.00	-29.75	-
5	4.371	0.33	27.63	-	27.96	-	56.00	46.00	-28.04	-
6	8.957	0.50	26.94	-	27.44	-	60.00	50.00	-32.56	-

*(The test data is in accordance with ADT Report No.: RF931004L01.)

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
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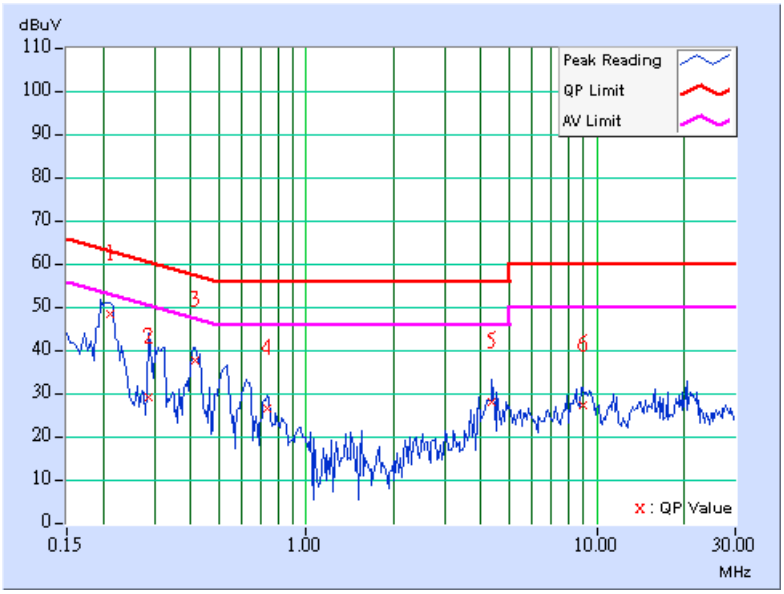

EUT	802.11g WLAN Compact USB Adapter	MEASUREMENT DETAIL	
MODEL	WL-685Z	PHASE	Line 2
CHANNEL	Channel 11	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	24deg. C, 64% RH, 991 hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Leo Hung		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.10	49.51	-	49.61	-	63.26	53.26	-13.65	-
2	0.500	0.14	23.40	-	23.54	-	56.00	46.00	-32.46	-
3	0.630	0.16	31.23	-	31.39	-	56.00	46.00	-24.61	-
4	0.963	0.23	25.14	-	25.37	-	56.00	46.00	-30.63	-
5	4.508	0.33	27.33	-	27.66	-	56.00	46.00	-28.34	-
6	9.266	0.47	27.45	-	27.92	-	60.00	50.00	-32.08	-

*(The test data is in accordance with ADT Report No.: RF931004L01.)

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
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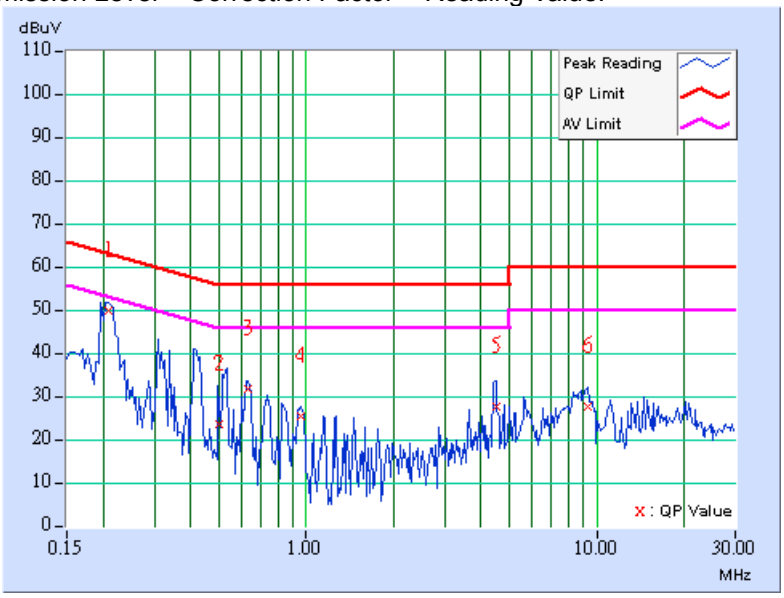


4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	100033	Jun, 08, 2005
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Dec. 15, 2004
BILOG Antenna SCHWARZBECK	VULB9168	9168-153	Feb. 03, 2005
HORN Antenna SCHWARZBECK	9120D	9120D-408	Feb. 03, 2005
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA 9170243	Feb. 23, 2005
Preamplifier Agilent	8447D	2944A10633	Jan. 15, 2005
Preamplifier Agilent	8449B	3008A01964	Jan. 27, 2005
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218183/4	Mar. 05, 2005
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218195/4	Mar. 05, 2005
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA
Turn Table ADT.	TT100.	TT93021703	NA
Turn Table Controller ADT.	SC100.	SC93021703	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 2.

3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

4. The IC Site Registration No. is IC4924-3.

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

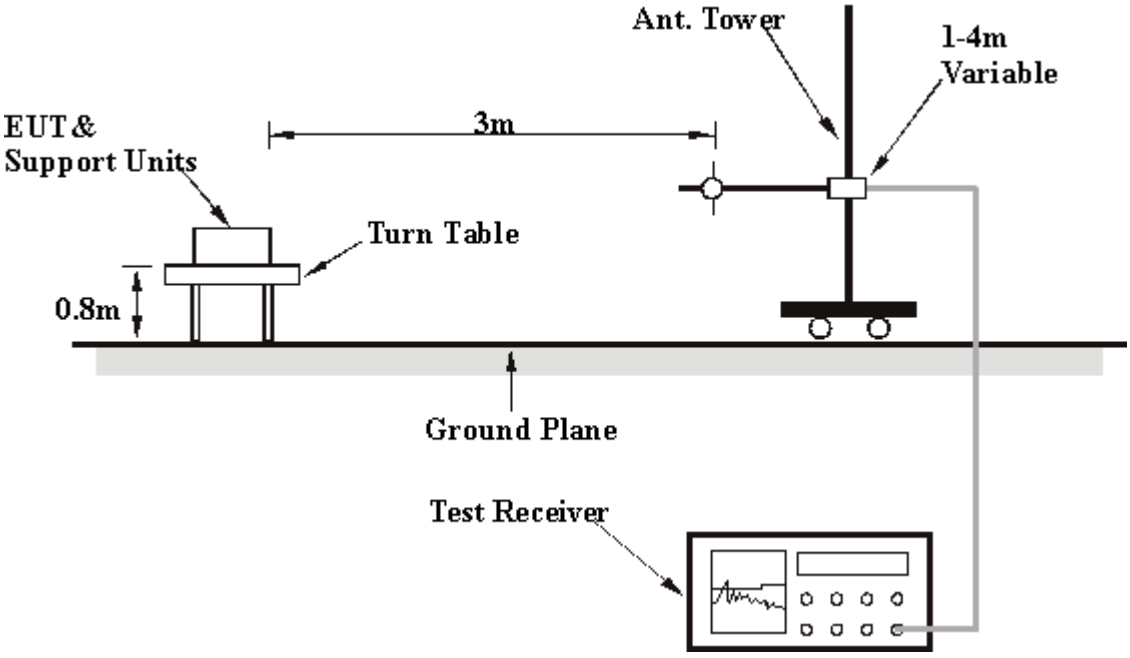
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

Below 1GHz Worst-Case Data

EUT	802.11g WLAN Compact USB Adapter	**MEASUREMENT DETAIL**	
MODEL	WL-685Z	**FREQUENCY RANGE**	Below 1000MHz
CHANNEL	Channel 11	**DETECTOR FUNCTION**	Quasi-Peak
MODULATION TYPE	BPSK	**ENVIRONMENTAL CONDITIONS**	23deg. C, 67%RH, 991hPa
TRANSFER RATE	6Mbps	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
TESTED BY	Long Chen		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	127.19	26.78 QP	43.50	-16.72	2.00 H	343	13.47	13.31
2	239.94	28.22 QP	46.00	-17.78	1.00 H	343	14.97	13.25
3	399.34	30.14 QP	46.00	-15.86	1.00 H	199	13.20	16.95
4	529.58	30.63 QP	46.00	-15.37	2.00 H	94	11.27	19.36
5	584.01	28.35 QP	46.00	-17.65	3.00 H	40	7.56	20.79
6	702.59	32.91 QP	46.00	-13.09	1.00 H	229	10.34	22.57
7	797.84	28.87 QP	46.00	-17.13	1.00 H	28	5.11	23.77
8	840.60	33.46 QP	46.00	-12.54	1.00 H	304	9.30	24.16

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	66.93	33.86 QP	40.00	-6.14	1.00 V	37	20.59	13.27
2	109.70	29.79 QP	43.50	-13.71	1.00 V	280	17.82	11.97
3	362.40	32.90 QP	46.00	-13.10	3.00 V	172	16.77	16.13
4	529.58	32.72 QP	46.00	-13.28	1.00 V	328	13.36	19.36
5	584.01	33.51 QP	46.00	-12.49	1.00 V	169	12.72	20.79
6	702.59	33.93 QP	46.00	-12.07	1.00 V	184	11.36	22.57

*(The test data is in accordance with ADT Report No.: RF931004L01.)

REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

802.11b DSSS modulation

EUT	802.11g WLAN Compact USB Adapter	**MEASUREMENT DETAIL**	
MODEL	WL-685Z	**FREQUENCY RANGE**	1 ~ 25GHz
CHANNEL	Channel 1	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
MODULATION TYPE	CCK	**ENVIRONMENTAL CONDITIONS**	23deg. C, 67%RH, 991hPa
TRANSFER RATE	11Mbps	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
TESTED BY	Long Chen		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1052.00	48.95 PK	74.00	-25.05	1.14 H	211	21.21	27.74
2	1080.00	46.28 PK	74.00	-27.72	1.48 H	107	18.43	27.85
3	2390.00	45.44 PK	74.00	-28.56	1.16 H	190	13.83	31.61
4	*2412.00	106.35 PK			1.16 H	190	74.65	31.70
4	*2412.00	98.88 AV			1.16 H	190	67.18	31.70
5	4824.00	54.85 PK	74.00	-19.15	1.23 H	30	17.27	37.58
5	4824.00	43.02 AV	54.00	-10.98	1.23 H	30	5.44	37.58
6	9648.00	62.89 PK	74.00	-11.11	1.10 H	306	14.52	48.37
6	**9648.00**	**52.11 AV**	**54.00**	**-1.89**	**1.10 H**	**306**	**3.74**	**48.37**

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1052.00	43.99 PK	74.00	-30.01	1.17 V	354	16.25	27.74
2	1080.00	42.39 PK	74.00	-31.61	1.40 V	307	14.54	27.85
3	2390.00	44.40 PK	74.00	-29.60	1.43 V	81	12.79	31.61
4	*2412.00	105.31 PK			1.43 V	81	73.61	31.70
4	*2412.00	97.97 AV			1.43 V	81	66.27	31.70
5	4824.00	52.91 PK	74.00	-21.09	1.37 V	5	15.33	37.58
5	4824.00	40.03 AV	54.00	-13.97	1.37 V	5	2.45	37.58
6	9648.00	58.96 PK	74.00	-15.04	1.65 V	358	10.59	48.37
6	9648.00	50.77 AV	54.00	-3.23	1.65 V	358	2.40	48.37

*(The test data is in accordance with ADT Report No.: RF931004L01.)

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.

EUT	802.11g WLAN Compact USB Adapter	MEASUREMENT DETAIL	
MODEL	WL-685Z	FREQUENCY RANGE	1 ~ 25GHz
CHANNEL	Channel 6	DETECTOR FUNCTION	Peak(PK) Average (AV)
MODULATION TYPE	CCK	ENVIRONMENTAL CONDITIONS	23deg. C, 67%RH, 991hPa
TRANSFER RATE	11Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Long Chen		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1052.00	46.85 PK	74.00	-27.15	1.33 H	139	19.11	27.74
2	1080.00	46.24 PK	74.00	-27.76	1.14 H	247	18.39	27.85
3	*2437.00	105.25 PK			1.16 H	183	73.40	31.85
3	*2437.00	97.29 AV			1.16 H	183	65.44	31.85
4	4874.00	52.68 PK	74.00	-21.32	1.08 H	19	15.02	37.66
4	4874.00	40.82 AV	54.00	-13.18	1.08 H	19	3.16	37.66

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1052.00	43.77 PK	74.00	-30.23	1.04 V	307	16.03	27.74
2	1080.00	41.58 PK	74.00	-32.42	1.17 V	348	13.73	27.85
3	*2437.00	103.73 PK			1.45 V	92	71.88	31.85
3	*2437.00	95.98 AV			1.45 V	92	64.13	31.85
4	4874.00	50.33 PK	74.00	-23.67	1.03 V	1	12.67	37.66

*(The test data is in accordance with ADT Report No.: RF931004L01.)

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.

EUT	802.11g WLAN Compact USB Adapter	**MEASUREMENT DETAIL**	
MODEL	WL-685Z	**FREQUENCY RANGE**	1 ~ 25GHz
CHANNEL	Channel 11	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
MODULATION TYPE	CCK	**ENVIRONMENTAL CONDITIONS**	23deg. C, 67RH, 991hPa
TRANSFER RATE	11Mbps	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
TESTED BY	Long Chen		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1052.00	47.69 PK	74.00	-26.31	1.17 H	109	19.94	27.74
2	1080.00	45.33 PK	74.00	-28.67	1.36 H	174	17.48	27.85
3	*2462.00	105.10 PK			1.34 H	82	73.10	32.00
3	*2462.00	97.24 AV			1.34 H	82	65.24	32.00
4	2483.50	43.26 PK	74.00	-30.74	1.34 H	82	11.13	32.13
5	4924.00	51.55 PK	74.00	-22.45	1.17 H	19	13.81	37.74
5	4924.00	38.92 AV	54.00	-15.08	1.17 H	19	1.18	37.74

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1052.00	45.01 PK	74.00	-28.99	1.43 V	349	17.27	27.74
2	1080.00	43.89 PK	74.00	-30.11	1.08 V	144	16.04	27.85
3	*2462.00	103.32 PK			1.14 V	181	71.32	32.00
3	*2462.00	95.48 AV			1.14 V	181	63.48	32.00
4	2483.50	41.48 PK	74.00	-32.52	1.14 V	181	9.35	32.13
5	4924.00	49.35 PK	74.00	-24.65	1.13 V	19	11.61	37.74

*(The test data is in accordance with ADT Report No.: RF931004L01.)

REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.

802.11G OFDM MODULATION

EUT	802.11g WLAN Compact USB Adapter	**MEASUREMENT DETAIL**	
MODEL	WL-685Z	**FREQUENCY RANGE**	1 ~ 25GHz
CHANNEL	Channel 1	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
MODULATION TYPE	BPSK	**ENVIRONMENTAL CONDITIONS**	23deg. C, 67RH, 991hPa
TRANSFER RATE	6Mbps	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
TESTED BY	Long Chen		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1052.00	43.30 PK	74.00	-30.70	1.51 H	251	15.55	27.74
2	1080.00	43.12 PK	74.00	-30.88	1.34 H	251	15.27	27.85
3	2390.00	60.11 PK	74.00	-13.89	1.44 H	89	28.50	31.61
3	2390.00	50.22 AV	54.00	-3.78	1.44 H	89	18.61	31.61
4	*2412.00	102.91 PK			1.44 H	89	71.21	31.70
4	*2412.00	96.02 AV			1.44 H	89	64.32	31.70
5	4824.00	52.53 PK	74.00	-21.47	1.06 H	19	14.95	37.58
5	4824.00	40.36 AV	54.00	-13.64	1.06 H	19	2.78	37.58

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1052.00	42.67 PK	74.00	-31.33	1.11 V	139	14.93	27.74
2	1080.00	41.02 PK	74.00	-32.98	1.30 V	142	13.17	27.85
3	2390.00	59.24 PK	74.00	-14.76	1.02 V	241	27.63	31.61
3	2390.00	49.97 AV	54.00	-4.03	1.02 V	241	18.36	31.61
4	*2412.00	104.64 PK			1.02 V	241	72.94	31.70
4	*2412.00	95.37 AV			1.02 V	241	63.67	31.70
5	4824.00	50.02 PK	74.00	-23.98	1.21 V	354	12.44	37.58

*(The test data is in accordance with ADT Report No.: RF931004L01.)

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.

EUT	802.11g WLAN Compact USB Adapter	MEASUREMENT DETAIL	
MODEL	WL-685Z	FREQUENCY RANGE	1 ~ 25GHz
CHANNEL	Channel 6	DETECTOR FUNCTION	Peak(PK) Average (AV)
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	23deg. C, 67RH, 991hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Long Chen		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1052.00	44.22 PK	74.00	-29.78	1.51 H	247	16.48	27.74
2	1080.00	43.55 PK	74.00	-30.45	1.13 H	247	15.70	27.85
3	*2437.00	104.80 PK			1.42 H	84	72.95	31.85
3	*2437.00	95.87 AV			1.42 H	84	64.02	31.85
4	4874.00	58.00 PK	74.00	-16.00	1.05 H	17	20.34	37.66
4	4874.00	45.38 AV	54.00	-8.62	1.05 H	17	7.72	37.66

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1052.00	42.89 PK	74.00	-31.11	1.19 V	135	15.15	27.74
2	1080.00	41.24 PK	74.00	-32.76	1.16 V	139	13.39	27.85
3	*2437.00	102.68 PK			1.54 V	234	70.83	31.85
3	*2437.00	94.09 AV			1.54 V	234	62.24	31.85
4	4874.00	54.69 PK	74.00	-19.31	1.02 V	141	17.03	37.66
4	4874.00	40.86 AV	54.00	-13.14	1.02 V	141	3.20	37.66

*(The test data is in accordance with ADT Report No.: RF931004L01.)

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.

EUT	802.11g WLAN Compact USB Adapter	MEASUREMENT DETAIL	
MODEL	WL-685Z	FREQUENCY RANGE	1 ~ 25GHz
CHANNEL	Channel 11	DETECTOR FUNCTION	Peak(PK) Average (AV)
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	23deg. C, 67RH, 991hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Long Chen		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1052.00	44.70 PK	74.00	-29.30	1.04 H	138	16.96	27.74
2	1080.00	45.89 PK	74.00	-28.11	1.39 H	227	18.04	27.85
3	*2462.00	104.21 PK			1.32 H	83	72.21	32.00
3	*2462.00	95.14 AV			1.32 H	83	63.14	32.00
4	2483.50	57.03 PK	74.00	-16.97	1.32 H	83	24.90	32.13
4	2483.50	47.96 AV	54.00	-6.04	1.32 H	83	15.83	32.13
5	4924.00	53.14 PK	74.00	-20.86	1.14 H	284	15.40	37.74
5	4924.00	40.69 AV	54.00	-13.31	1.14 H	284	2.95	37.74

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1052.00	42.39 PK	74.00	-31.61	1.42 V	338	14.65	27.74
2	1080.00	41.62 PK	74.00	-32.38	1.05 V	148	13.77	27.85
3	*2462.00	103.58 PK			1.00 V	242	71.58	32.00
3	*2462.00	93.18 AV			1.00 V	242	61.18	32.00
4	2483.50	56.40 PK	74.00	-17.60	1.00 V	242	24.27	32.13
4	2483.50	47.00 AV	54.00	-7.00	1.00 V	242	14.87	32.13
5	4924.00	50.73 PK	74.00	-23.27	1.12 V	37	12.99	37.74

*(The test data is in accordance with ADT Report No.: RF931004L01.)

REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

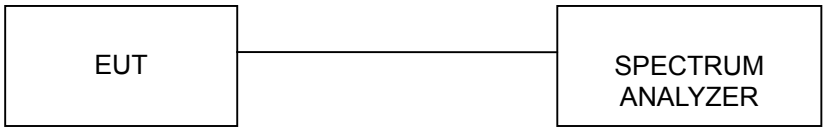
4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

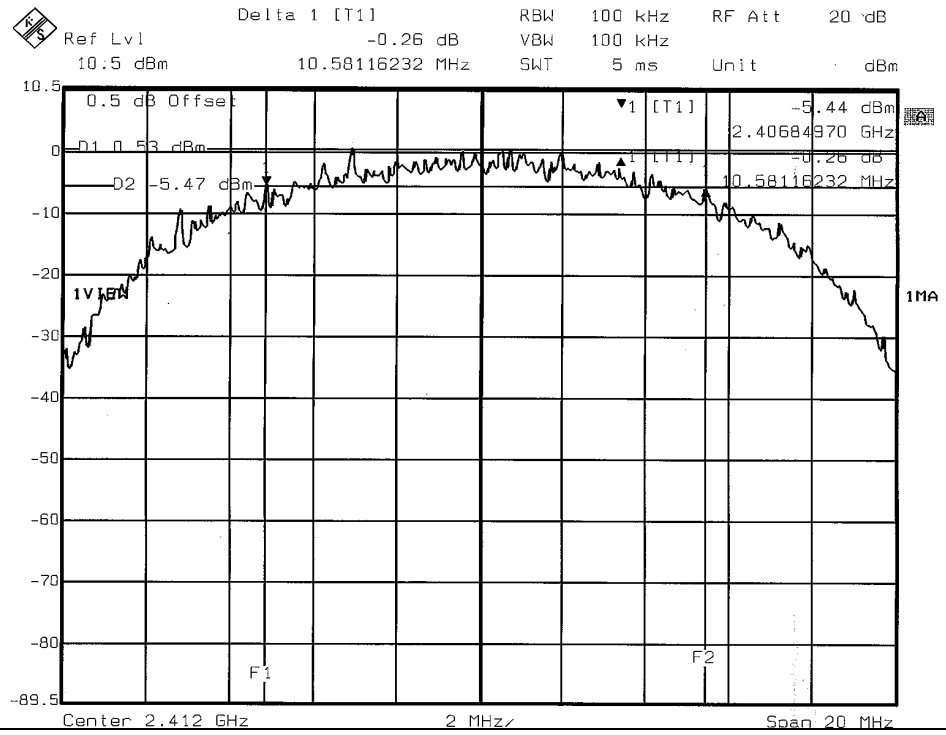
802.11b DSSS modulation

EUT	802.11g WLAN Compact USB Adapter	**MODEL**	WL-685Z
MODULATION TYPE	DSSS	**TRANSFER RATE**	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23deg.C, 67%RH, 991hPa
TESTED BY	Leo Hung		

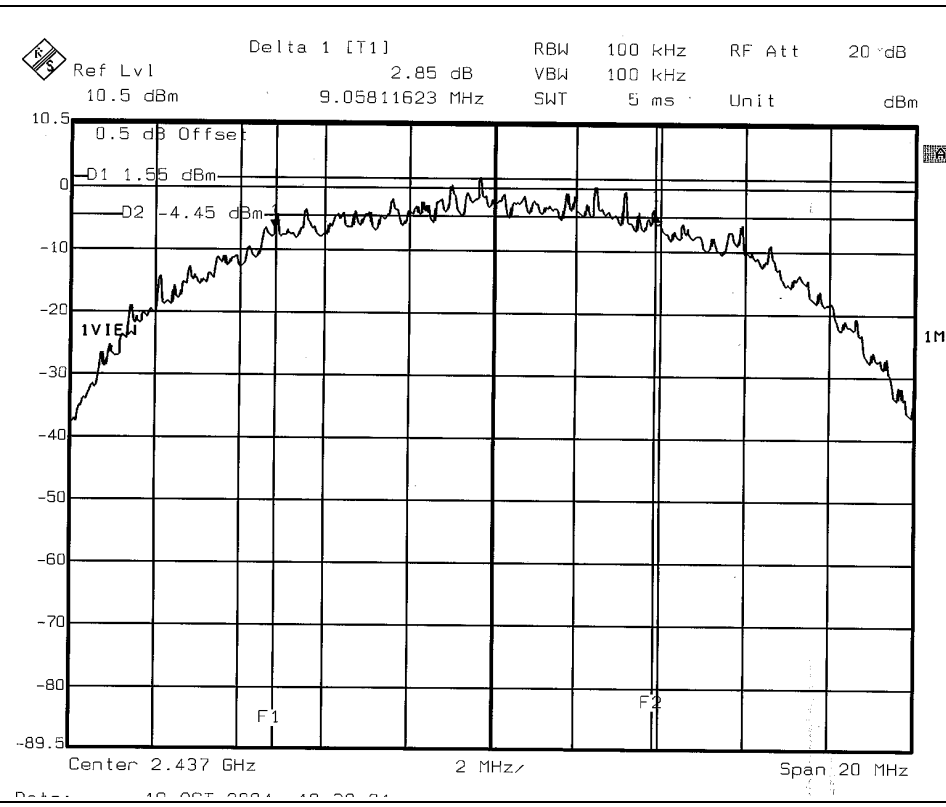
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.58	0.5	PASS
6	2437	9.05	0.5	PASS
11	2462	10.02	0.5	PASS

*(The test data is in accordance with ADT Report No.: RF931004L01.)

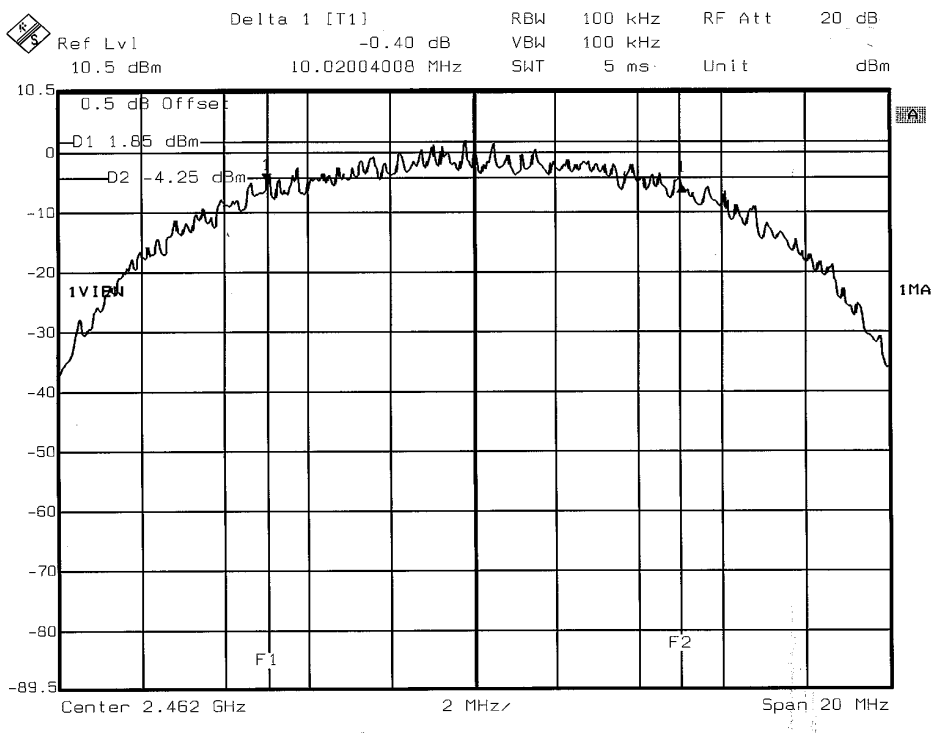
CH1


Delta 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-0.26 dB
VBW 100 kHz
10.5 dBm
10.58116232 MHz
SWT 5 ms
Unit dBm
0.5 dB Offset
1 [T1] -5.44 dBm
2.40684970 GHz
D1 0.53 dBm
1 [T1] -0.26 dB
D2 -5.47 dBm
10.58116232 MHz
1VIEW
1MA
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz

CH6


Delta 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
2.85 dB
VBW 100 kHz
10.5 dBm
9.05811623 MHz
SWT 5 ms
Unit dBm
0.5 dB Offset
D1 1.55 dBm
D2 -4.45 dBm
1VIEW
1MA
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

CH11


Delta 1 [T1]
Ref Lvl
10.5 dBm
-0.40 dB
10.02004008 MHz
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
RF Att 20 dB
Unit dBm
0.5 dB Offset
D1 1.85 dBm
D2 -4.25 dBm
1VIEW
1MA
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

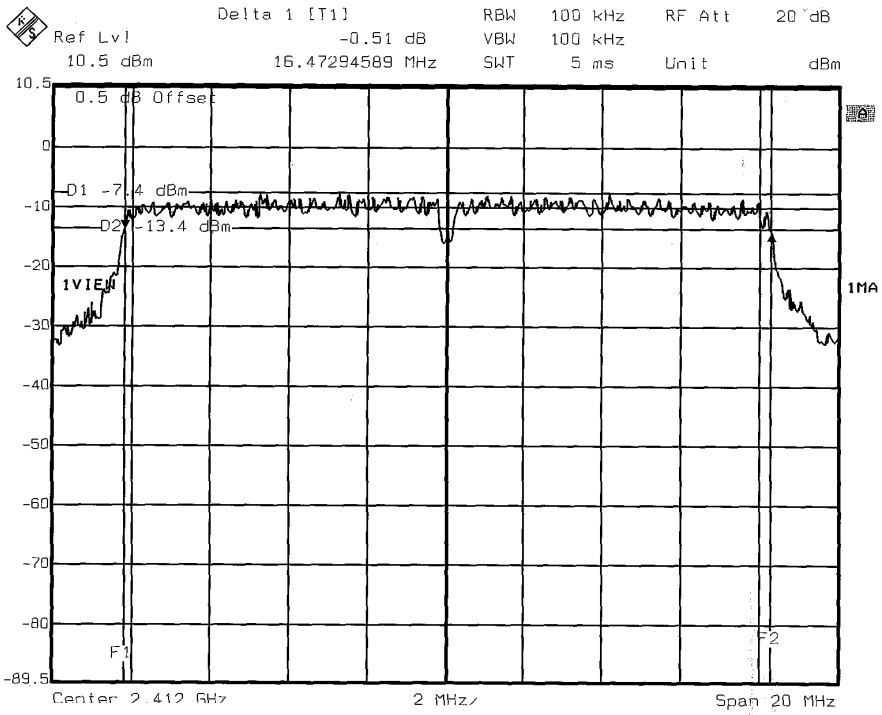
802.11g OFDM modulation

EUT	802.11g WLAN Compact USB Adapter	**MODEL**	WL-685Z
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23deg.C, 67%RH, 991hPa
TESTED BY	Leo Hung		

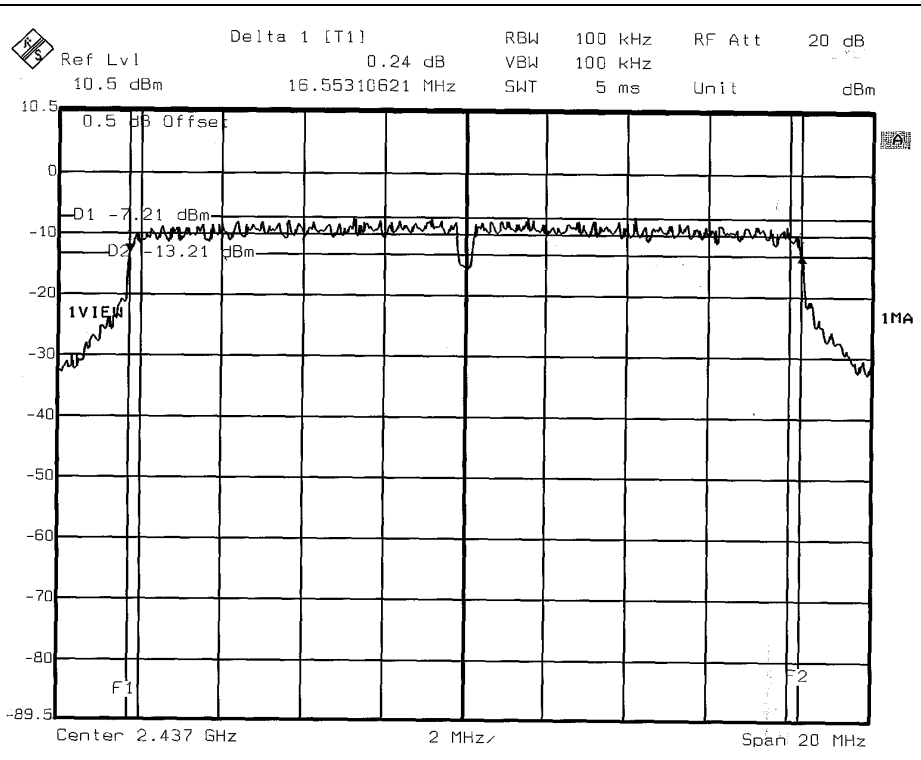
CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.47	0.5	PASS
6	2437	16.55	0.5	PASS
11	2462	16.55	0.5	PASS

*(The test data is in accordance with ADT Report No.: RF931004L01.)

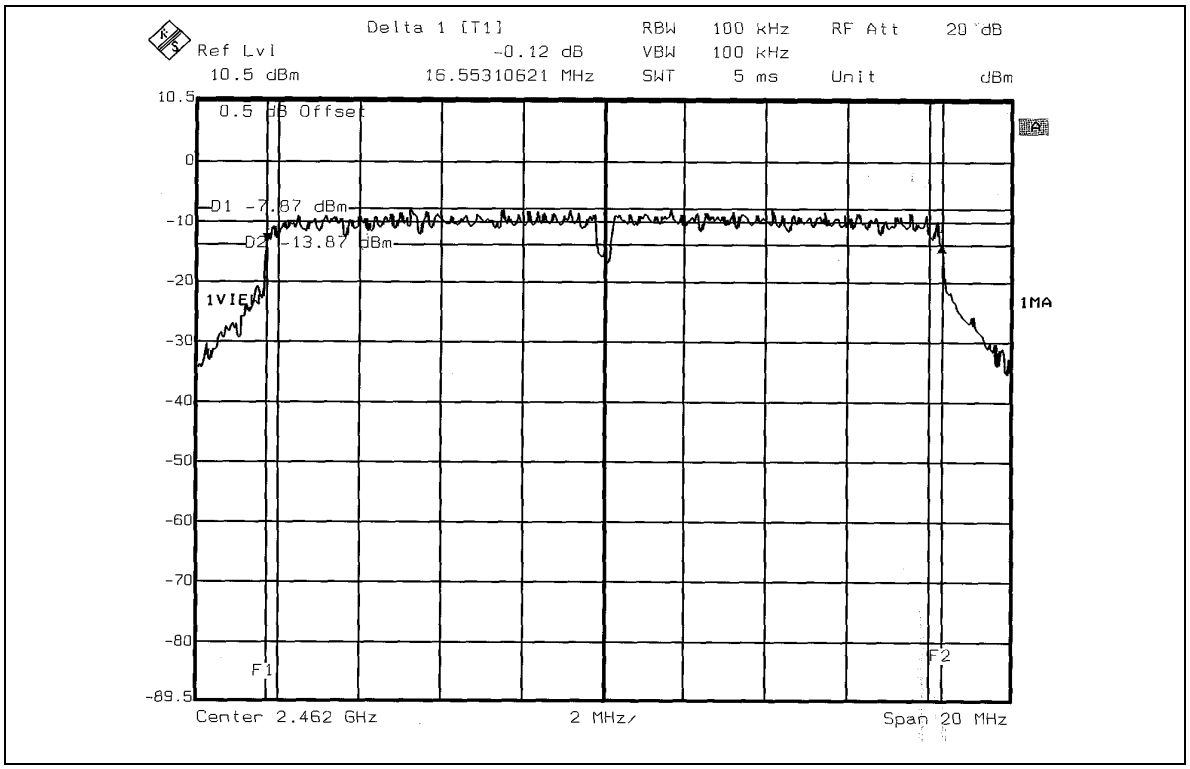
CH1


Delta 1 [T1]
Ref Lvl
10.5 dBm
-0.51 dB
16.47294589 MHz
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
RF Att 20 dB
Unit dBm
0.5 dB Offset
D1 -7.4 dBm
D2 -13.4 dBm
1VIEW
1MA
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz

CH6


Delta 1 [T1]
Ref Lvl
10.5 dBm
0.24 dB
16.55310621 MHz
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
RF Att 20 dB
Unit dBm
0.5 dB Offset
D1 -7.21 dBm
D2 -13.21 dBm
1VIEW
1MA
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

CH11


Delta 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-0.12 dB
VBW 100 kHz
10.5 dBm
16.55310621 MHz
SWT 5 ms
Unit dBm
0.5 dB Offset
D1 -7.87 dBm
D2 -13.87 dBm
1VIEW
1MA
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005
AGILENT SIGNAL GENERATOR	E8257C	MY43320668	Dec. 31, 2004
TEKTRONIX OSCILLOSCOPE	TDS 220	C019167	Feb. 01, 2005
NARDA DETECTOR	4503A	FSCM99899	NA

NOTE:

The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to peak the response of the detector.
2. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same peak reading on oscilloscope. Record the power level.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP

4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

802.11b DSSS modulation

EUT	802.11g WLAN Compact USB Adapter	**MODEL**	WL-685Z
MODULATION TYPE	CCK	**TRANSFER RATE**	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23deg.C, 67%RH, 991hPa
TESTED BY	Leo Hung		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	11.066	10.44	30	PASS
6	2437	11.092	10.45	30	PASS
11	2462	11.143	10.47	30	PASS

*(The test data is in accordance with ADT Report No.: RF931004L01.)

802.11g OFDM MODULATION

EUT	802.11g WLAN Compact USB Adapter	**MODEL**	WL-685Z
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23deg.C, 67%RH, 991hPa
TESTED BY	Leo Hung		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	11.143	10.47	30	PASS
6	2437	11.169	10.48	30	PASS
11	2462	11.169	10.48	30	PASS

*(The test data is in accordance with ADT Report No.: RF931004L01.)

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time=span/3kHz. The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP

4.5.6 EUT OPERATING CONDITIONS

Same as 4.3.6

4.5.7 TEST RESULTS

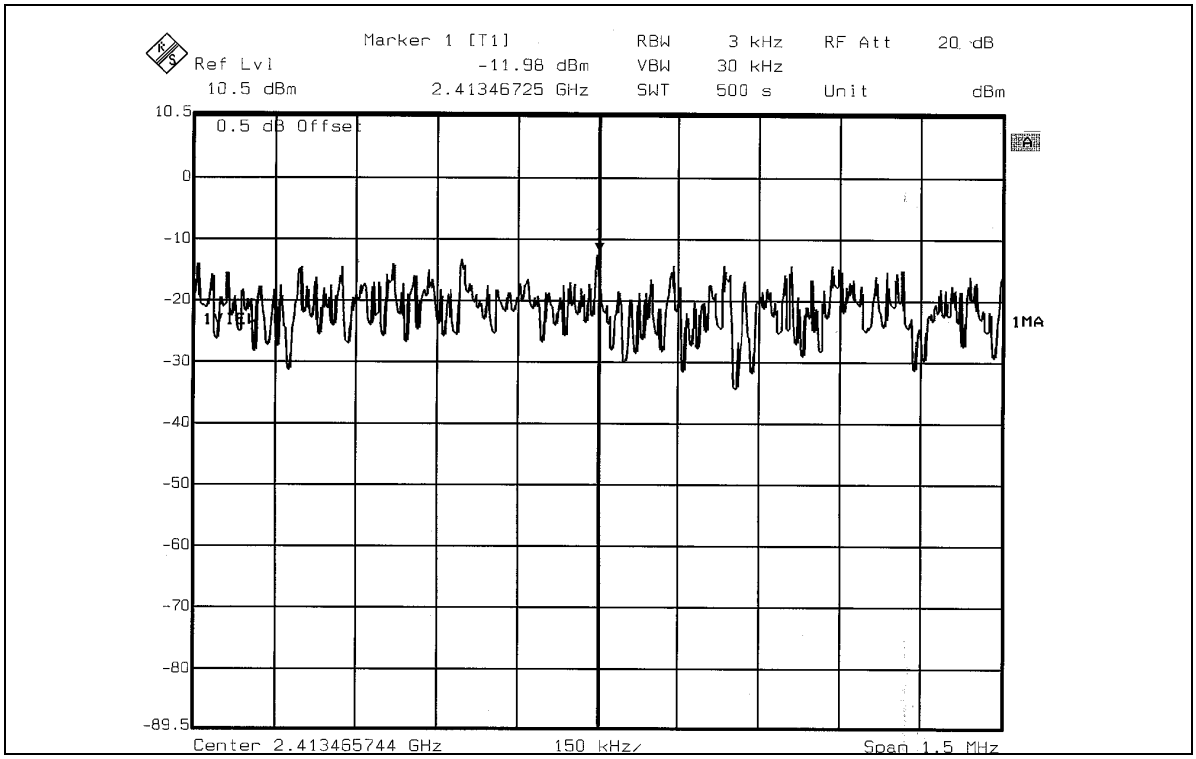
802.11b DSSS modulation

EUT	802.11g WLAN Compact USB Adapter	**MODEL**	WL-685Z
MODULATION TYPE	CCK	**TRANSFER RATE**	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23deg.C, 67%RH, 991hPa
TESTED BY	Leo Hung		

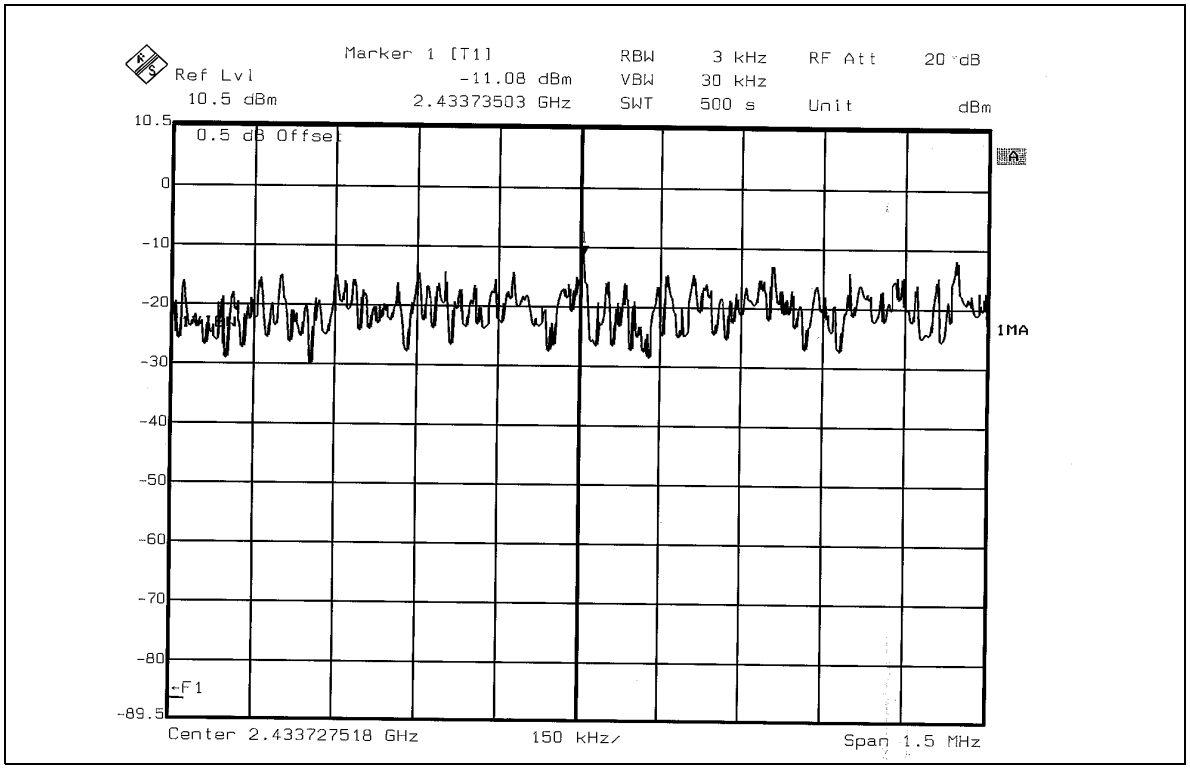
CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-11.98	8	PASS
6	2437	-11.08	8	PASS
11	2462	-10.34	8	PASS

*(The test data is in accordance with ADT Report No.: RF931004L01.)

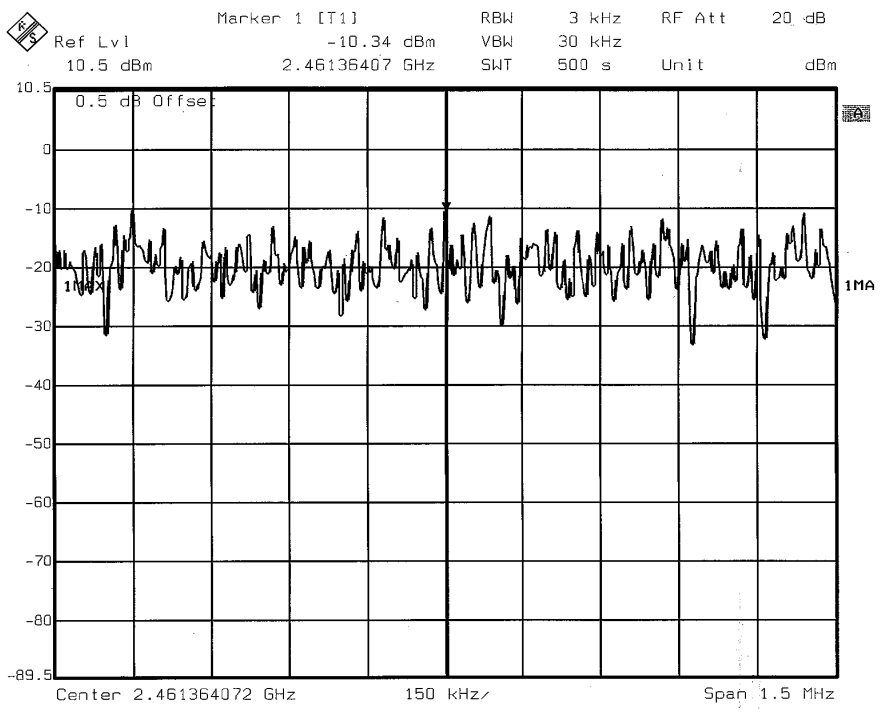
CH1


Marker 1 [T1]
RBW 3 kHz
RF Att 20 dB
Ref Lvl
-11.98 dBm
VBW 30 kHz
10.5 dBm
2.41346725 GHz
SWT 500 s
Unit dBm
10.5
0.5 dB Offset
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5
1MA
Center 2.413465744 GHz
150 kHz/
Span 1.5 MHz

CH6


Marker 1 [T1]
RBW 3 kHz
RF Att 20 dB
Ref Lvl
-11.08 dBm
VBW 30 kHz
10.5 dBm
2.43373503 GHz
SWT 500 s
Unit dBm
10.5
0.5 dB Offset
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5
1MA
Center 2.433727518 GHz
150 kHz/
Span 1.5 MHz

CH11


Marker 1 [T1]
Ref Lvl
10.5 dBm
-10.34 dBm
2.46136407 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 20 dB
Unit dBm
0.5 dB Offset
1MAX
1MA
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5
Center 2.461364072 GHz
150 kHz/
Span 1.5 MHz

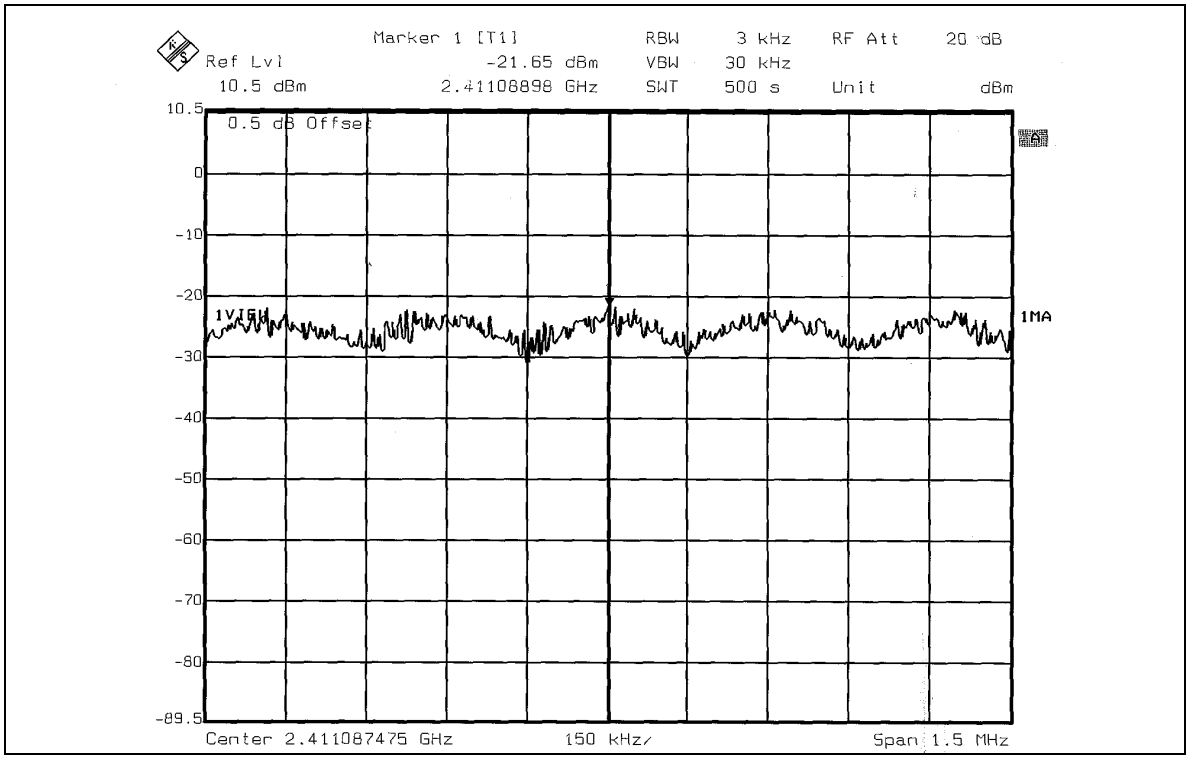
802.11g OFDM modulation

EUT	802.11g WLAN Compact USB Adapter	**MODEL**	WL-685Z
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23deg.C, 67%RH, 991hPa
TESTED BY	Leo Hung		

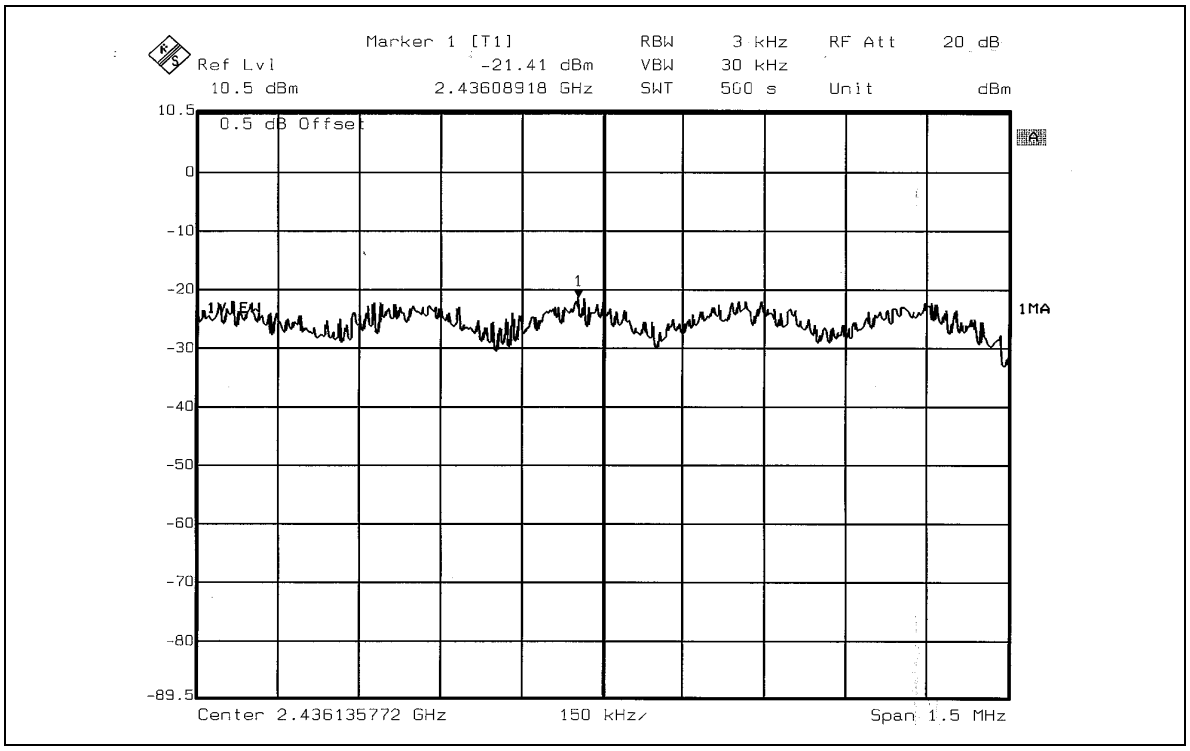
CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-21.65	8	PASS
6	2437	-21.41	8	PASS
11	2462	-21.97	8	PASS

*(The test data is in accordance with ADT Report No.: RF931004L01.)

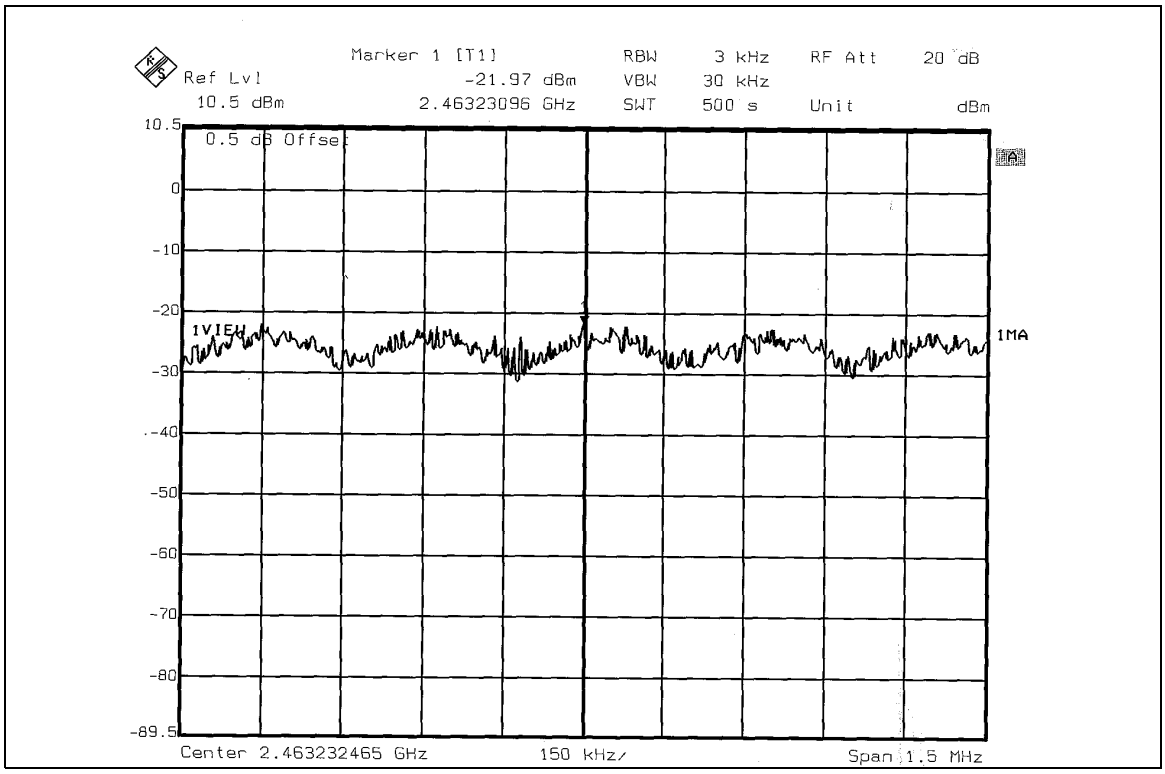
CH1


Marker 1 [T1]
RBW 3 kHz
RF Att 20 dB
Ref Lvl
-21.65 dBm
VBW 30 kHz
10.5 dBm
2.41108898 GHz
SWT 500 s
Unit dBm
0.5 dB Offset
1VIEW
1MA
Center 2.411087475 GHz
150 kHz/
Span 1.5 MHz

CH6


Marker 1 [T1]
RBW 3 kHz
RF Att 20 dB
Ref Lvl
-21.41 dBm
VBW 30 kHz
10.5 dBm
2.43608918 GHz
SWT 500 s
Unit dBm
0.5 dB Offset
1VIEW
1MA
Center 2.436135772 GHz
150 kHz/
Span 1.5 MHz

CH11


Marker 1 [T1]
RBW 3 kHz
RF Att 20 dB
Ref Lvl
-21.97 dBm
VBW 30 kHz
10.5 dBm
2.46323096 GHz
SWT 500 s
Unit dBm
10.5
0.5 dB Offset
0
-10
-20
1VIEW
1MA
-30
-40
-50
-60
-70
-80
-89.5
Center 2.463232465 GHz
150 kHz/
Span 1.5 MHz

4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded. The spectrum plots (Peak RBW=VBW=100kHz; Average RBW=1MHz, VBW=10kHz) are attached on the following pages.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.6 TEST RESULTS

The spectrum plots are attached on the following 12 images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

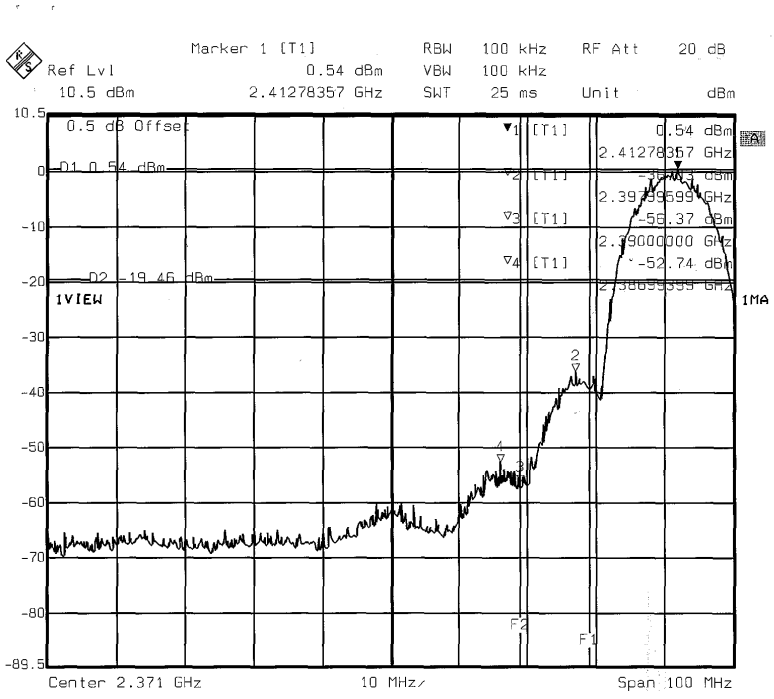
802.11b DSSS modulation

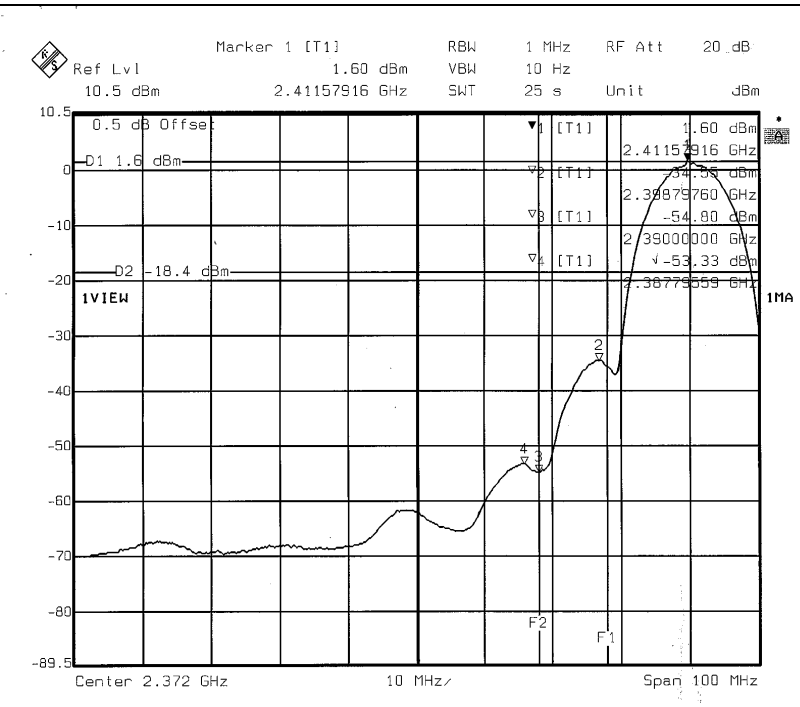
NOTE 1: The band edge emission plot of DSSS technique on page 52 shows 53.28dBc between carrier maximum power and local maximum emission in restrict band (2.3870GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 106.35dBuV/m (Peak), so the maximum field strength in restrict band is 106.35-53.28=53.07dBuV/m which is under 74dBuV/m limit.

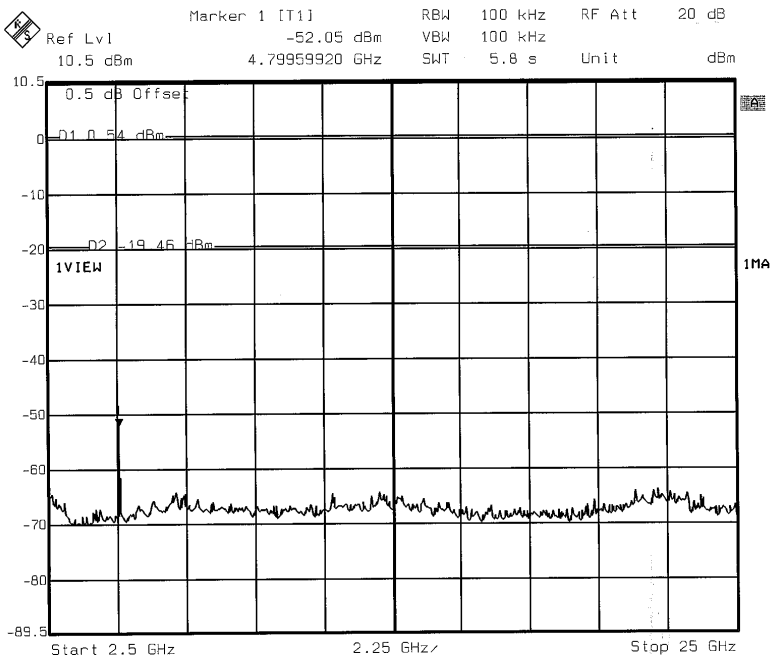
The band edge emission plot of DSSS technique on page 52 shows 54.93dBc between carrier maximum power and local maximum emission in restrict band (2.3878GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 98.88dBuV/m (Average), so the maximum field strength in restrict band is 98.88-54.93=43.95dBuV/m which is under 54dBuV/m limit.

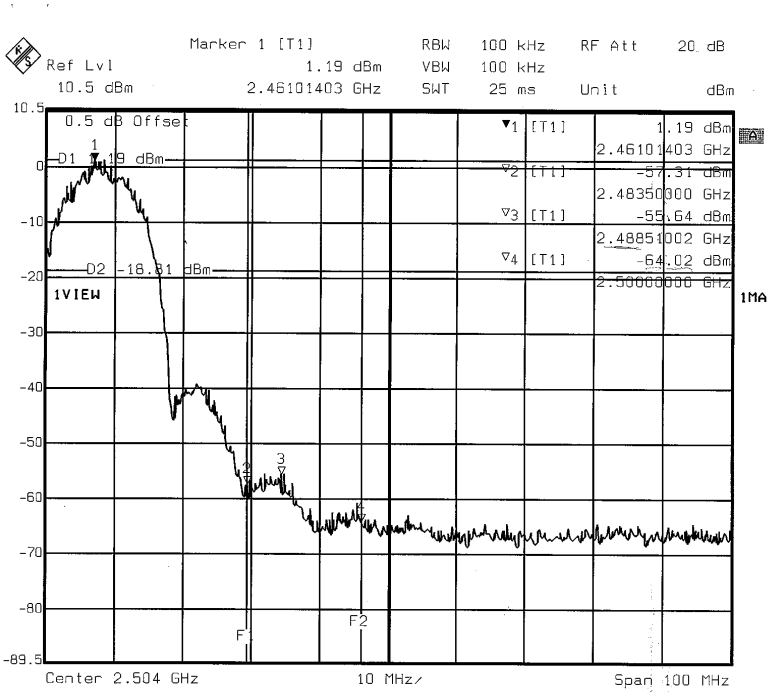
NOTE 2: The band edge emission plot of DSSS technique on page 53 shows 56.83dBc between carrier maximum power and local maximum emission in restrict band (2.4885GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 106.10dBuV/m (Peak), so the maximum field strength in restrict band is 106.10-56.83=49.27dBuV/m which is under 74dBuV/m limit.

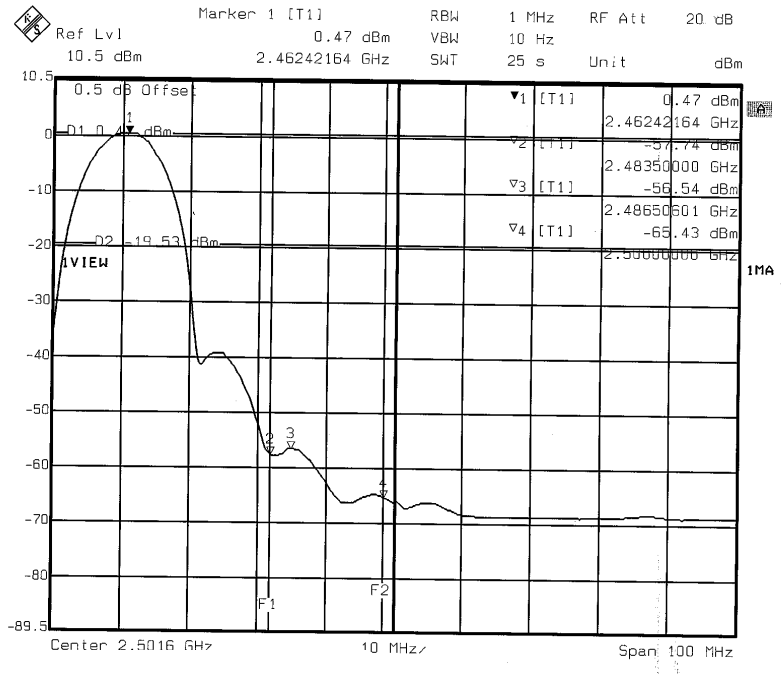
The band edge emission plot of DSSS technique on page 54 shows 57.01dBc between carrier maximum power and local maximum emission in restrict band (2.4865GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 97.24dBuV/m (Average), so the maximum field strength in restrict band is 97.24-57.01=40.23dBuV/m which is under 54dBuV/m limit.

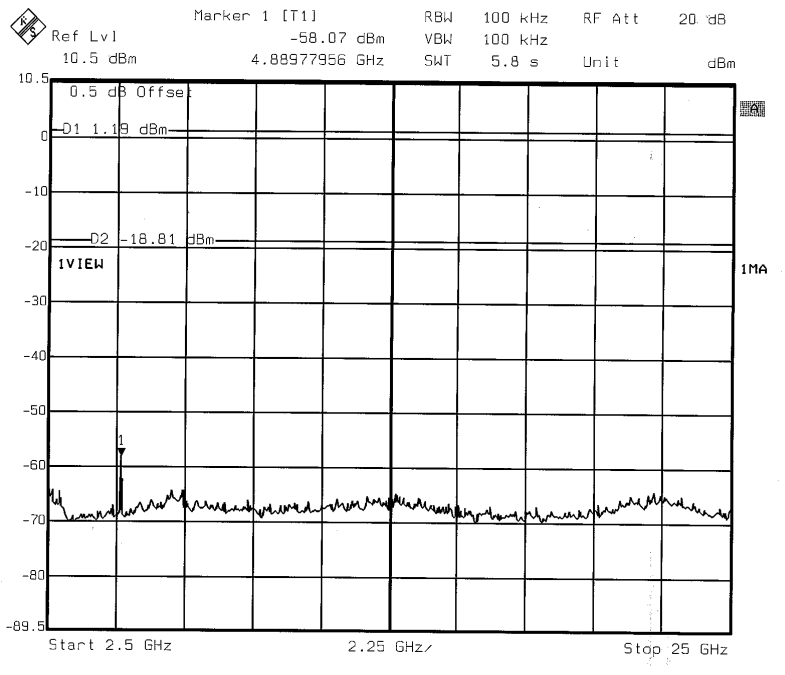

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
0.54 dBm
VBW 100 kHz
10.5 dBm
2.41278357 GHz
SWT 25 ms
Unit dBm
0.5 dB Offset
D1 0.54 dBm
D2 -19.46 dBm
1VIEW
1MA
Center 2.371 GHz
10 MHz/
Span 100 MHz


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
1.60 dBm
VBW 10 Hz
10.5 dBm
2.41157916 GHz
SWT 25 s
Unit dBm
0.5 dB Offset
D1 1.6 dBm
D2 -18.4 dBm
1VIEW
1MA
Center 2.372 GHz
10 MHz/
Span 100 MHz


Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-52.05 dBm
VBW 100 kHz
10.5 dBm
4.79959920 GHz
SWT 5.8 s
Unit dBm
0.5 dB Offset
D1 0.54 dBm
D2 -19.46 dBm
1VIEW
1MA
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz


Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
1.19 dBm
VBW 100 kHz
10.5 dBm
2.46101403 GHz
SWT 25 ms
Unit dBm
0.5 dB Offset
D1 1.19 dBm
D2 -18.81 dBm
1VIEW
1MA
▼1 [T1] 1.19 dBm
2.46101403 GHz
▽2 [T1] -57.31 dBm
2.48350000 GHz
▽3 [T1] -55.64 dBm
2.48851002 GHz
▽4 [T1] -64.02 dBm
2.50000000 GHz
F1
F2
Center 2.504 GHz
10 MHz/
Span 100 MHz


Marker 1 [T1]
Ref Lvl
10.5 dBm
0.47 dBm
2.46242164 GHz
RBW 1 MHz
VBW 10 Hz
SWT 25 s
RF Att 20 dB
Unit dBm
0.5 dB Offset
D1 0.47 dBm
D2 -19.53 dBm
1VIEW
1MA
▼1 [T1] 0.47 dBm 2.46242164 GHz
▽2 [T1] -57.74 dBm 2.48350000 GHz
▽3 [T1] -56.54 dBm 2.48650601 GHz
▽4 [T1] -65.43 dBm 2.50000000 GHz
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5
F1
F2
Center 2.5016 GHz
10 MHz/
Span 100 MHz


Marker 1 [T1]
Ref Lvl
10.5 dBm
-58.07 dBm
4.88977956 GHz
RBW 100 kHz
VBW 100 kHz
SWT 5.8 s
RF Att 20 dB
Unit dBm
0.5 dB Offset
D1 1.19 dBm
D2 -18.81 dBm
1VIEW
1MA
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz

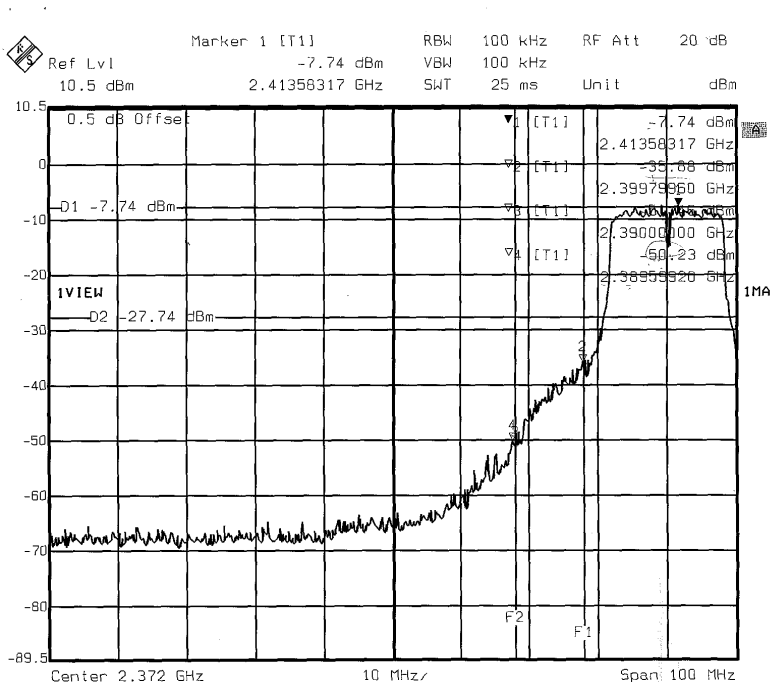
802.11g OFDM modulation

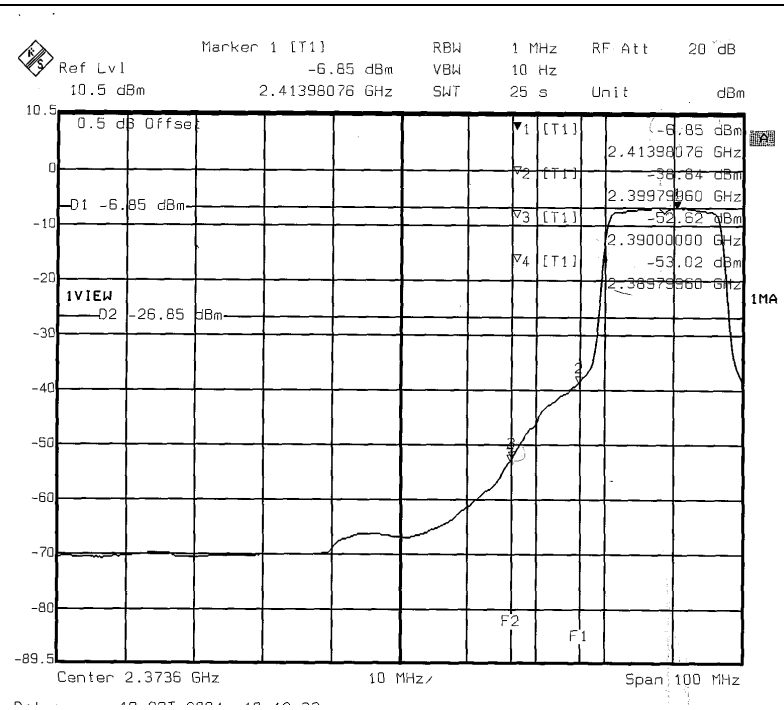
NOTE 1: The band edge emission plot of OFDM technique on page 56 shows 42.49dBc between carrier maximum power and local maximum emission in restrict band (2.3896GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 104.64dBuV/m (Peak), so the maximum field strength in restrict band is 104.64-42.49=62.15dBuV/m which is under 74dBuV/m limit.

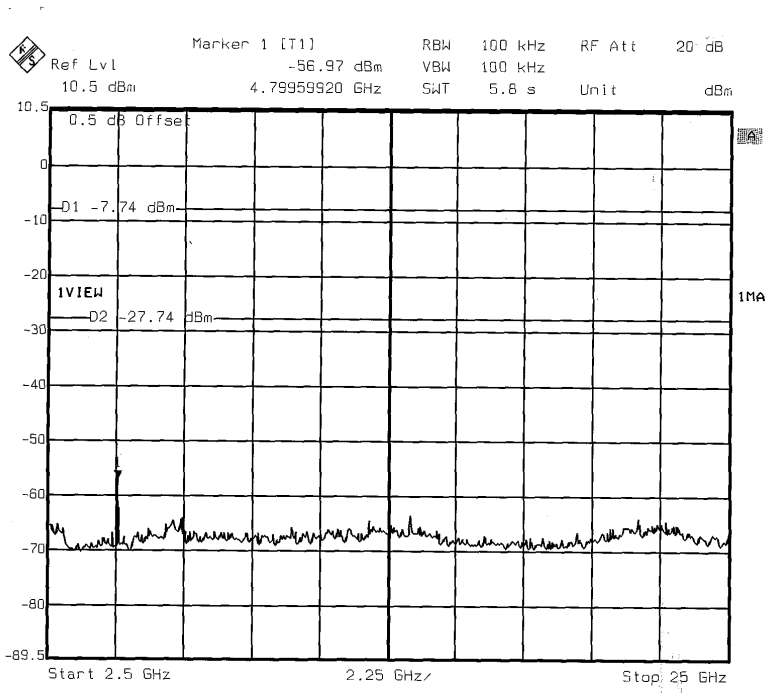
The band edge emission plot of OFDM technique on page 56 shows 45.77dBc between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 96.02dBuV/m (Average), so the maximum field strength in restrict band is 96.02-45.77=50.25dBuV/m which is under 54dBuV/m limit.

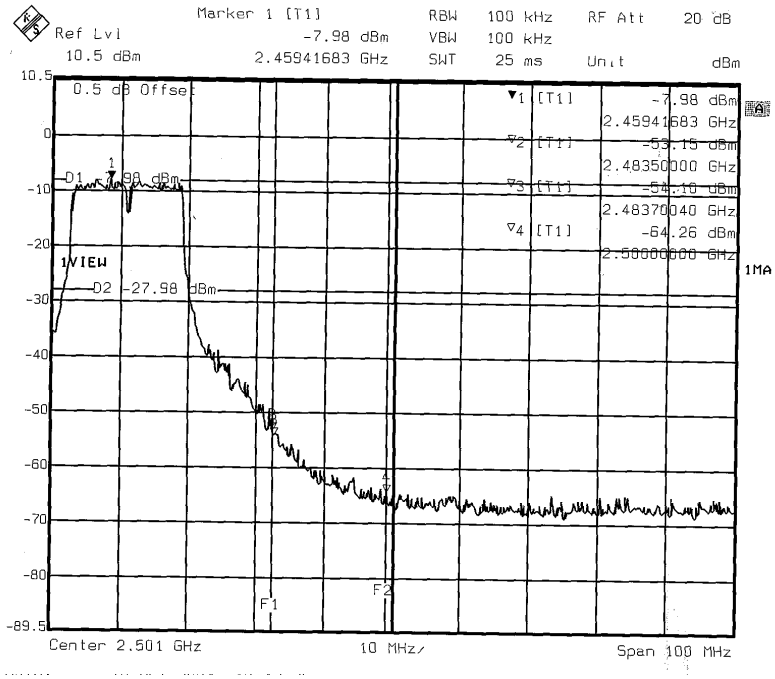
NOTE 2: The band edge emission plot of OFDM technique on page 57 shows 45.17dBc between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 104.21dBuV/m (Peak), so the maximum field strength in restrict band is 104.21-45.17=59.04dBuV/m which is under 74dBuV/m limit.

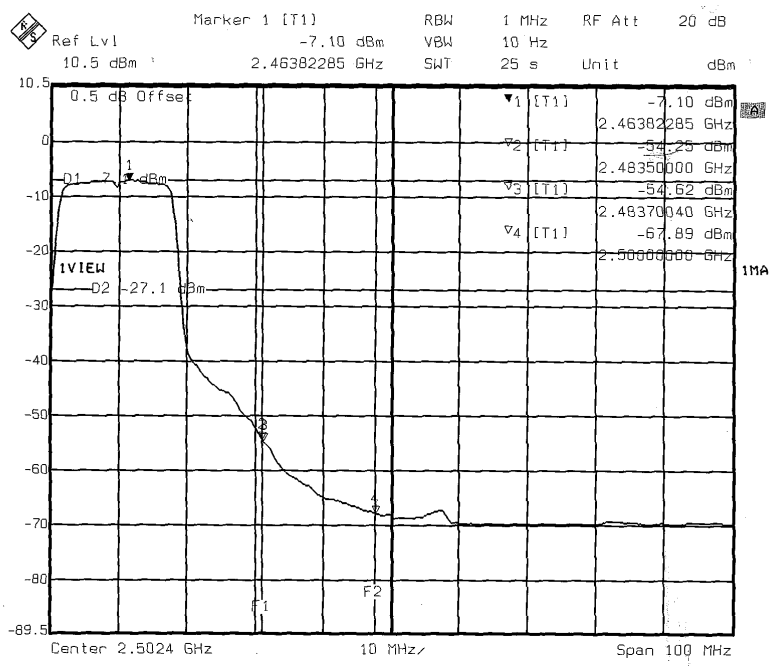
The band edge emission plot of OFDM technique on page 58 shows 47.15dBc between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 95.14dBuV/m (Average), so the maximum field strength in restrict band is 95.14-47.15=47.99dBuV/m which is under 54dBuV/m limit.

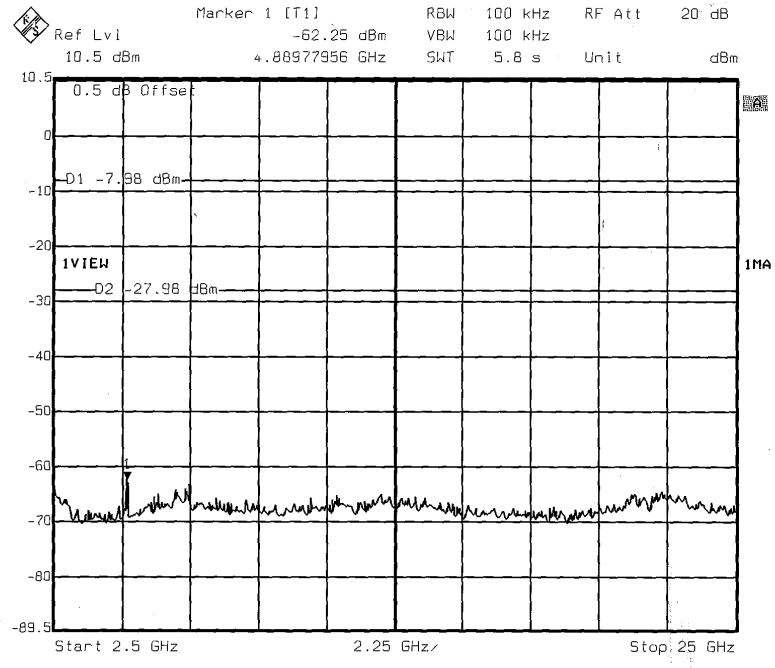

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-7.74 dBm
VBW 100 kHz
10.5 dBm
2.41358317 GHz
SWT 25 ms
Unit dBm
0.5 dB Offset
D1 -7.74 dBm
D2 -27.74 dBm
1VIEW
1MA
Center 2.372 GHz
10 MHz/
Span 100 MHz


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-6.85 dBm
VBW 10 Hz
10.5 dBm
2.41398076 GHz
SWT 25 s
Unit dBm
0.5 dB Offset
D1 -6.85 dBm
D2 -26.85 dBm
1VIEW
1MA
Center 2.3735 GHz
10 MHz/
Span 100 MHz


Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-56.97 dBm
VBW 100 kHz
10.5 dBm
4.79959920 GHz
SWT 5.8 s
Unit dBm
0.5 dB Offset
D1 -7.74 dBm
1VIEW
D2 -27.74 dBm
1MA
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz


Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-7.98 dBm
VBW 100 kHz
10.5 dBm
2.45941683 GHz
SWT 25 ms
Unit dBm
0.5 dB Offset
1 [T1] -7.98 dBm
2.45941683 GHz
2 [T1] -53.15 dBm
2.48350000 GHz
3 [T1] -54.10 dBm
2.48370040 GHz
4 [T1] -64.26 dBm
2.50000000 GHz
D1 -7.98 dBm
1VIEW
D2 -27.98 dBm
1MA
F1
F2
Center 2.501 GHz
10 MHz/
Span 100 MHz


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-7.10 dBm
VBW 10 Hz
10.5 dBm
2.46382285 GHz
SWT 25 s
Unit dBm
0.5 dB Offset
▼1 [T1] -7.10 dBm
2.46382285 GHz
▽2 [T1] -54.25 dBm
2.48350000 GHz
▽3 [T1] -54.62 dBm
2.48370040 GHz
▽4 [T1] -67.89 dBm
2.50000000 GHz
D1 -7.1 dBm
1VIEW
D2 -27.1 dBm
1MA
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5
F1
F2
Center 2.5024 GHz
10 MHz/
Span 100 MHz


Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-62.25 dBm
VBW 100 kHz
10.5 dBm
4.88977956 GHz
SWT 5.8 s
Unit dBm
0.5 dB Offset
D1 -7.98 dBm
1VIEW
D2 -27.98 dBm
1MA
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz

4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

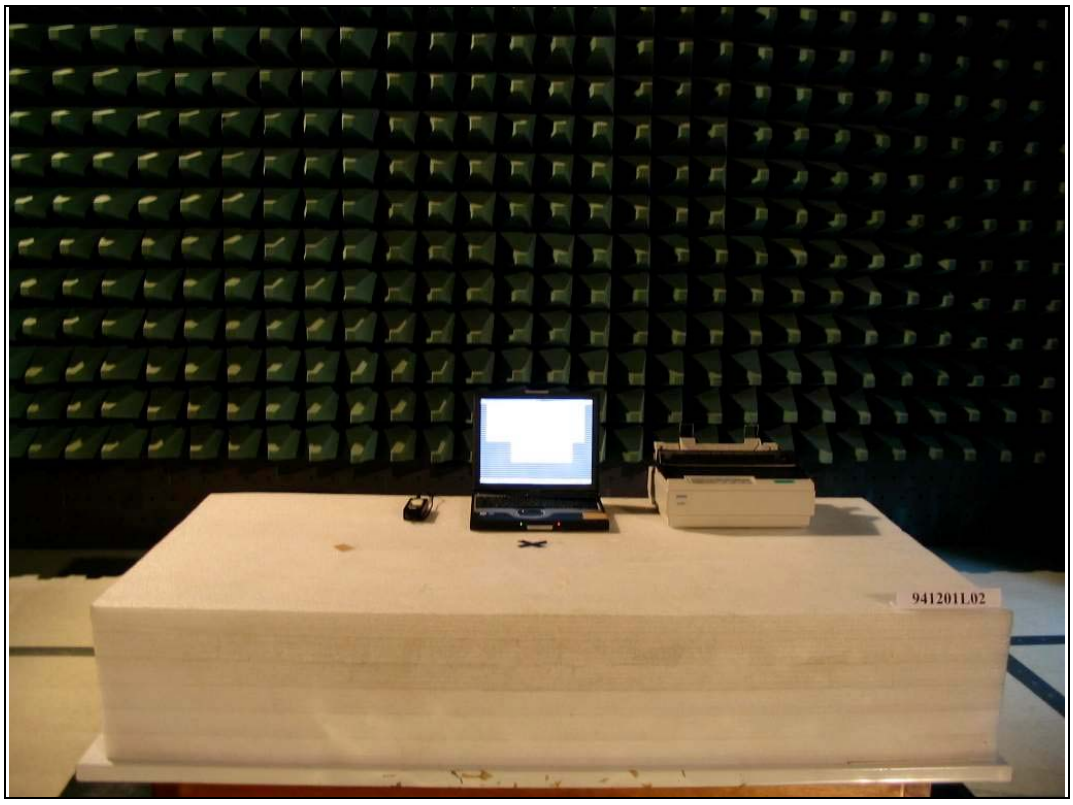
4.7.2 ANTENNA CONNECTED CONSTRUCTION

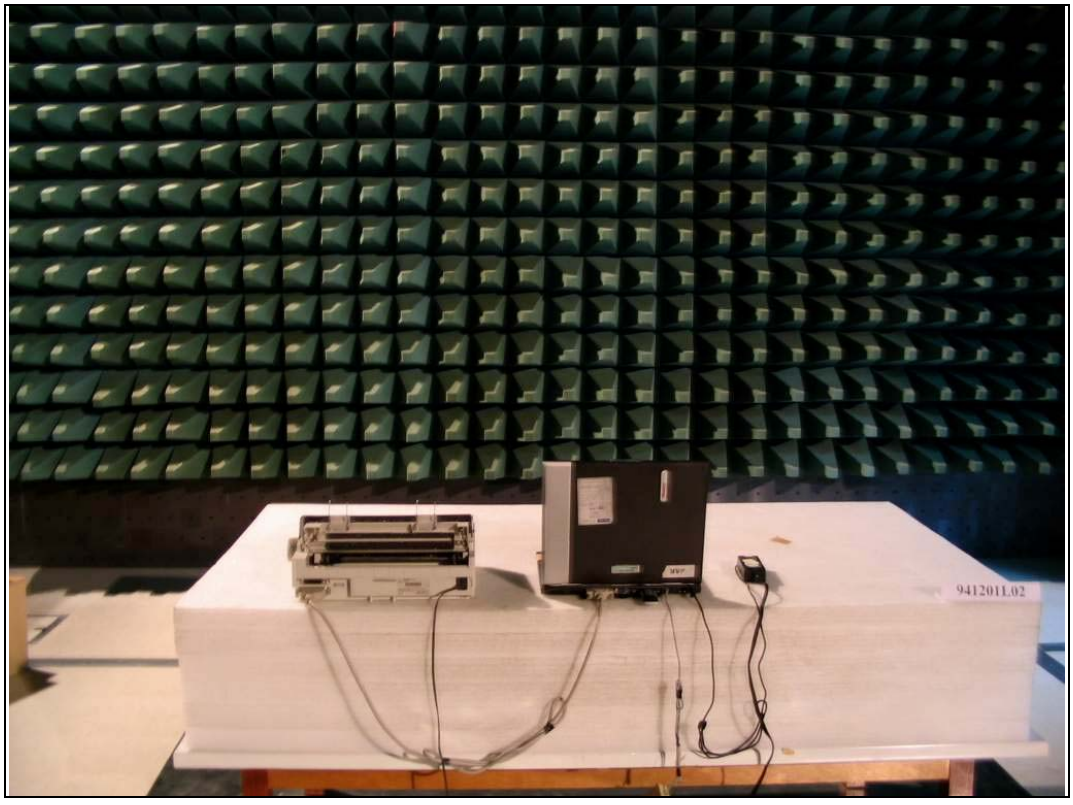
The antenna used in this product is chip antenna without connector. And the maximum Gain of this antenna is 1.98dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

RADIATED EMISSION TEST





6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025:

USA	FCC, NVLAP, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, DGT
Netherlands	Telefication
Singapore	PSB , GOST-ASIA(MOU)
Russia	CERTIS(MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3185050

Linko RF Lab.
Tel: 886-3-3270910
Fax: 886-3-3270892

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.

APPENDIX-A

MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.