FCC TEST REPORT

REPORT NO.:	RF980330H03
MODEL NO.:	SB1170
RECEIVED:	March 30, 2009
TESTED:	May 08 to 19, 2009
ISSUED:	June 11, 2009
APPLICANT:	Creative Technology Ltd
ADDRESS:	31 International Business Park, Creative Resource, Singapore 609921
ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
LAB ADDRESS:	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

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1. CERTIFICATION

PRODUCT:	Wireless Transmitter
TRADE NAME:	Creative Labs
MODEL NO.:	SB1170
TEST SAMPLE:	2P Samples
TESTED:	May 08 to 19, 2009
APPLICANT:	Creative Technology Ltd
STANDARDS:	FCC Part 15, Subpart C (Section 15.247), ANSI C63.4-2003

The above equipment (Model: SB1170) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, 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 : Carol Liao , **DATE:** June 11, 2009
(Carol Liao, Specialist)

TECHNICAL ACCEPTANCE : , **DATE:** June 11, 2009
Responsible for RF
(Hank Chung, Deputy Manager)

APPROVED BY : , **DATE:** June 11, 2009
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	**Test Type and Limit**	**Result**	**Remark**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -15.49dB at 0.173MHz
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)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.89dB at 4876.00MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB 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 16-4-2:

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

Measurement	Value
Conducted emissions	2.44 dB
Radiated emissions (30MHz-1GHz)	3.94 dB
Radiated emissions (1GHz -18GHz)	2.49 dB
Radiated emissions (18GHz -40GHz)	2.70 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless Transmitter
MODEL NO.	SB1170
FCC ID	IBAAVPSB1170
POWER SUPPLY	DC 5V from host equipment
MODULATION TYPE	QPSK for DSSS
MODULATION TECHNOLOGY	DSSS
TRANSFER RATE	22Mbps
OPERATING FREQUENCY	2412MHz, 2438MHz and 2464MHz
MAXIMUM OUTPUT POWER	39.628mW
ANTENNA TYPE	Dipole antenna with antenna gain 1.79 dBi
DATA CABLE	Headphone/ MIC cable x 1 (Unshielded, 1.9m)
I/O PORT	Headphone Port x 1 MIC Port x 1

NOTE:

1. The EUT, operates in the 2.4GHz frequency range. With its high-speed data transmissions of up to 22Mbps.
2. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Three channels are provided for EUT

Channel	Frequency
1	2412 MHz
2	2438 MHz
3	2464 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	PLC	RE < 1G	RE ³ 1G	APCM	
-	√	√	√	√	-

Where **PLC:** Power Line Conducted Emission **RE < 1G:** Radiated Emission below 1GHz

RE ³ 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)
DSSS	1 to 3	1	DSSS	QPSK	22

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)
DSSS	1 to 3	3	DSSS	QPSK	22

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 N TYPE	DATA RATE (Mbps)
DSSS	1 to 3	1, 2, 3	DSSS	QPSK	22

CONDUCTED OUT-BAND EMISSION 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)
DSSS	1 to 3	1, 3	DSSS	QPSK	22

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)
DSSS	1 to 3	1, 2, 3	DSSS	QPSK	22

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Wireless Transmitter. 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.

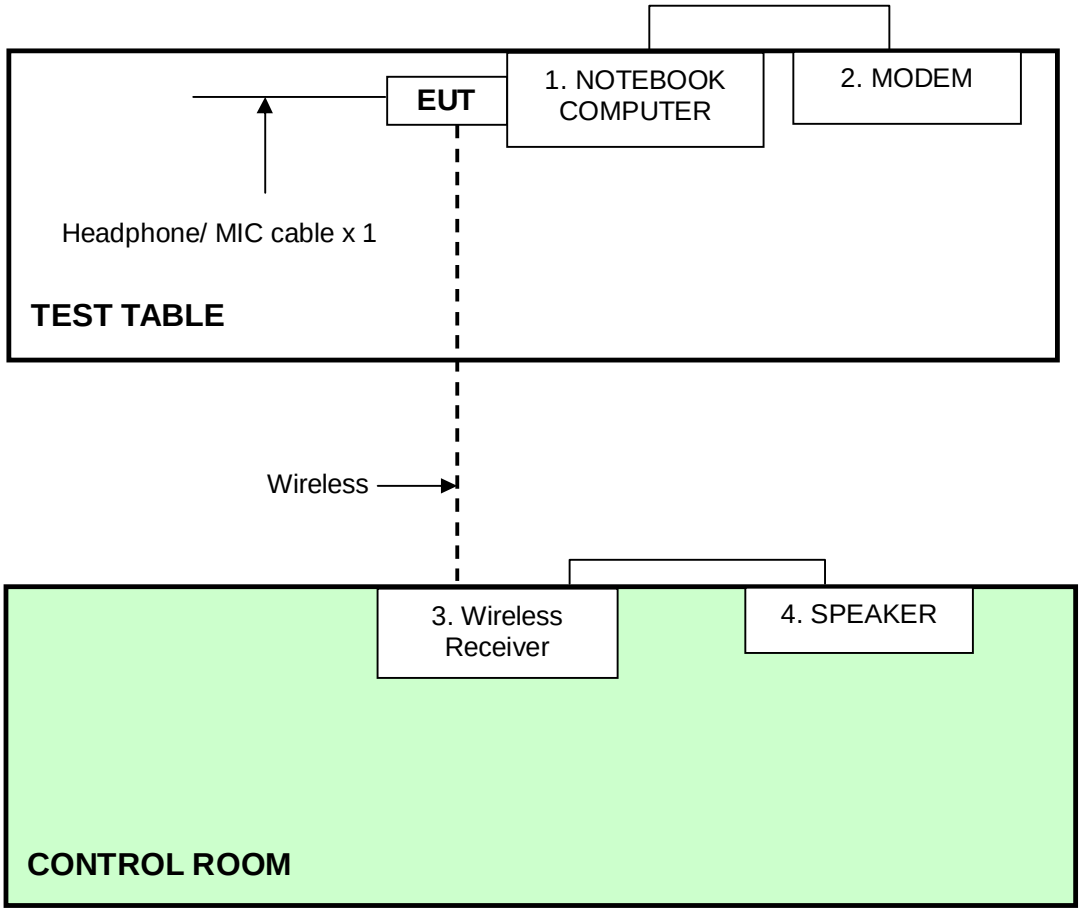
NO.	PRODUCT	TRADE	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP18L	6976685584	FCC DoC
2	MODEM	ACEEX	1414	0206026779	IFAXDM1414
3	Wireless Receiver	CREATIVE	SB1120	YDSB11208460003 77C	FCC DoC
4	SPEAKER	JS	JY2003	081202050	FCC DoC

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
3	NA
4	1.5 m wrapped shielded wire, terminated via drain wire, with 3.5 mm phone plug, w/o core.

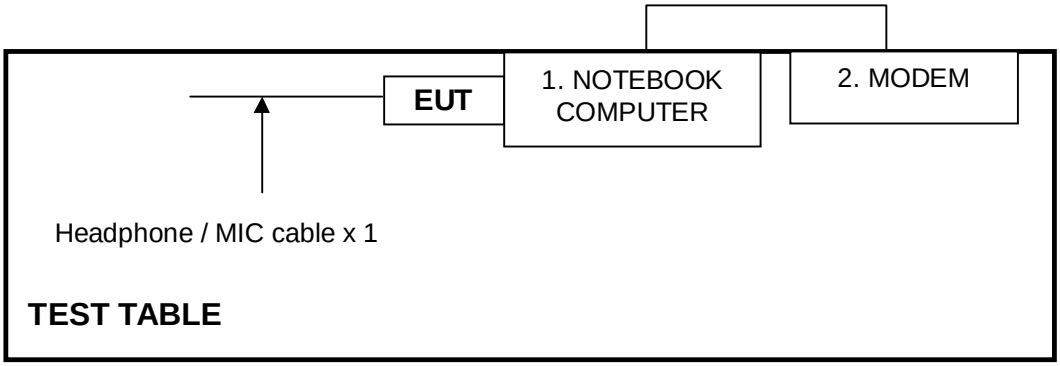
NOTE: All power cords of the above support units are non shielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted Test:



For Radiated Test:



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	66 to 56	56 to 46
0.5-5	56	46
5-30	60	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 DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 31, 2009	Mar. 30, 2010
Line-Impedance Stabilization Network (for EUT)	ENV-216	100071	Nov. 26, 2008	Nov. 25, 2009
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 05, 2008	Nov. 04, 2009
RF Cable (JYEBAO)	5DFB	COBCAB-001	Aug 15, 2008	Aug 14, 2009
50 ohms Terminator	50	3	Nov. 05, 2008	Nov. 04, 2009
Software	BV ADT_Cond_V7.3.7	NA	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 Shielded Room No. B.
3 The VCCI Con B Registration No. is C-2193.

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.

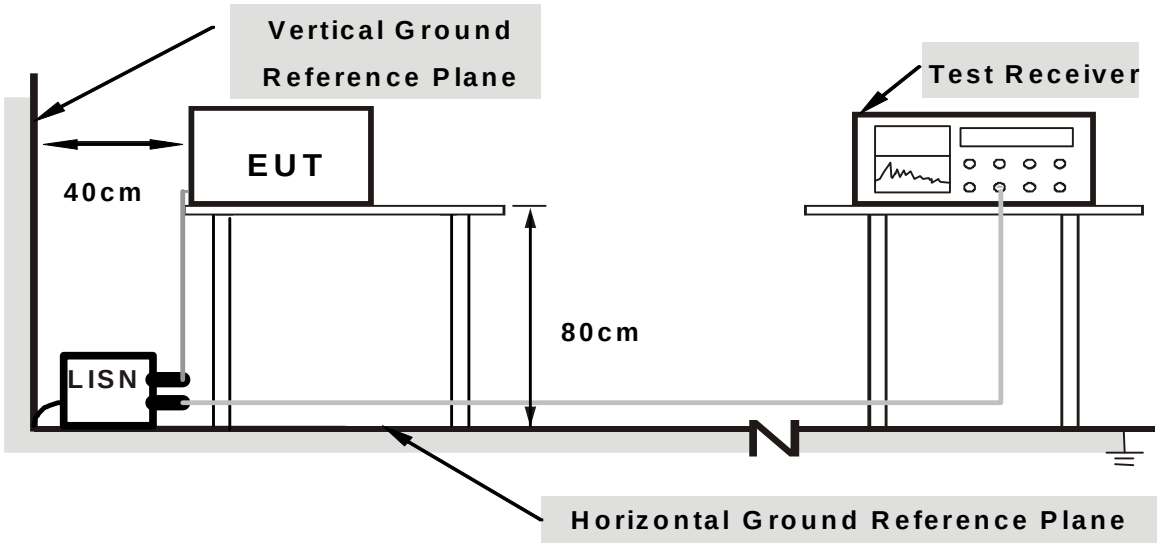
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 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. Plug the EUT into the support unit 1 (Notebook Computer) which placed on a testing table.

b. Support unit 1 (Notebook Computer) run test program "Windows Media Player" to enable EUT under transmission condition continuously at specific channel frequency.

c. Prepared other computer systems (support units 3 ~ 4) to act as communication partners and placed them outside of testing area.

d. The communication partners link with EUT via wireless transmission.

e. Support unit 3 (Wireless Receiver) reads audio messages from EUT and sends these messages to speaker.

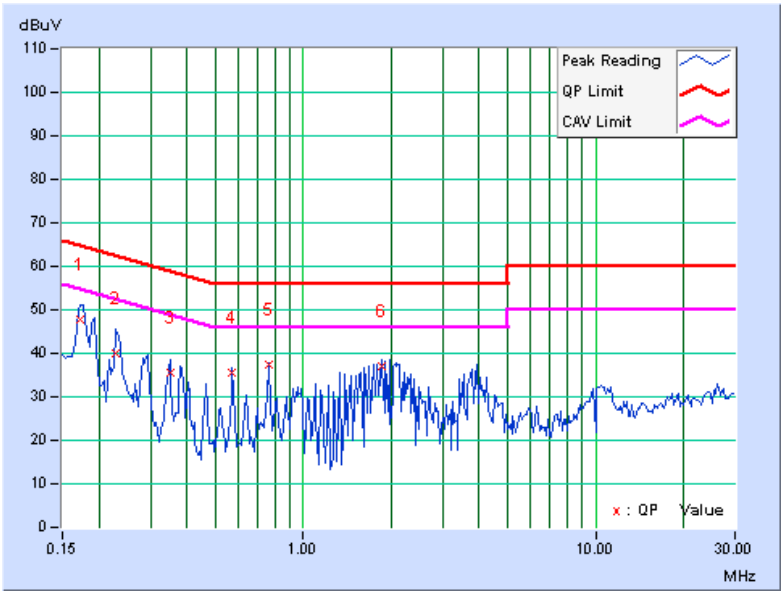
4.1.7 TEST RESULTS

DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line (L)
MODULATION TYPE	QPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	22Mbps	INPUT POWER	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 965hPa	TESTED BY	Kent Liu

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	0.172	0.20	47.73	-	47.93	-	64.88	54.88	-16.95	-
2	0.228	0.25	39.85	-	40.10	-	62.52	52.52	-22.41	-
3	0.349	0.40	35.29	-	35.69	-	58.98	48.98	-23.29	-
4	0.572	0.41	35.10	-	35.51	-	56.00	46.00	-20.49	-
5	0.763	0.36	36.93	-	37.29	-	56.00	46.00	-18.71	-
6	1.855	0.39	36.60	-	36.99	-	56.00	46.00	-19.01	-

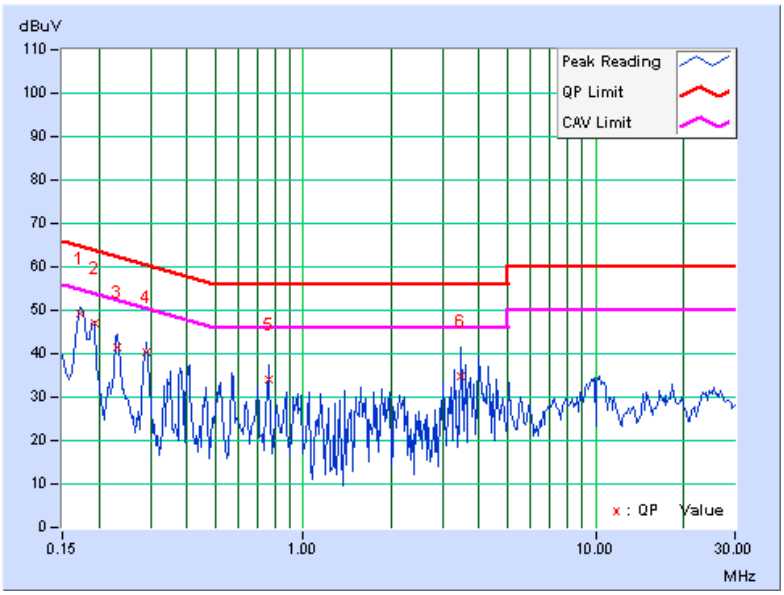
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Neutral (N)
MODULATION TYPE	QPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	22Mbps	INPUT POWER	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 965hPa	TESTED BY	Kent Liu

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	**0.173**	**0.13**	**49.17**	**-**	**49.30**	**-**	**64.79**	**54.79**	**-15.49**	**-**
2	0.193	0.15	46.99	-	47.14	-	63.91	53.91	-16.77	-
3	0.232	0.19	41.43	-	41.62	-	62.38	52.38	-20.76	-
4	0.291	0.26	40.21	-	40.47	-	60.51	50.51	-20.03	-
5	0.759	0.28	33.74	-	34.02	-	56.00	46.00	-21.98	-
6	3.477	0.46	34.20	-	34.66	-	56.00	46.00	-21.34	-

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.



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 DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 9, 2008	Dec. 8, 2009
HP Pre_Amplifier	8449B	3008A01923	Nov. 10, 2008	Nov. 9, 2009
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 9, 2008	Sep. 8, 2009
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	April 29, 2009	April 28, 2010
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 09, 2008	Dec. 08, 2009
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2009	Jan. 21, 2010
RF Switches	EMH-011	08009	Oct. 07, 2008	Oct. 06, 2009
RF CABLE (Chaintek)	SF106	28077	Aug. 15, 2008	Aug. 14, 2009
RF Cable	8DFB	STCCAB-30M-1GHz	Oct. 07, 2008	Oct. 06, 2009
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	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 horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-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 10 meter open area test site. 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 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

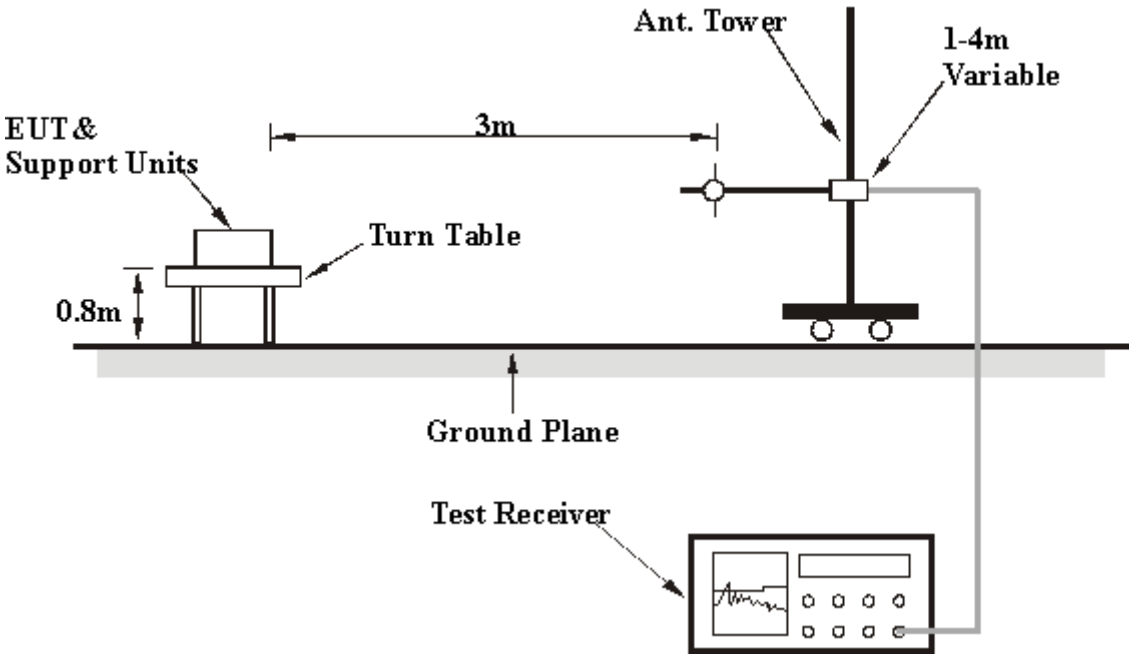
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection 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

a. Plug the EUT into the support unit 1 (Notebook Computer) which placed on a testing table.

b. Support unit 1 (Notebook Computer) run test program “Button.exe” to enable EUT under transmission condition continuously at specific channel frequency.

Below 1GHz Test Data

4.2.7 TEST RESULTS

DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	29deg. C, 54%RH 965hPa	TESTED BY	Duke Tseng

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	194.85	36.48 QP	43.50	-7.02	1.15 H	180	23.10	13.38
2	198.93	37.06 QP	43.50	-6.44	1.15 H	321	24.00	13.06
3	247.00	36.44 QP	46.00	-9.56	1.14 H	18	21.17	15.27
4	319.70	35.24 QP	46.00	-10.76	1.22 H	183	17.41	17.83
5	400.00	34.51 QP	46.00	-11.49	1.00 H	30	13.37	21.14
6	801.13	35.73 QP	46.00	-10.27	1.00 H	219	5.78	29.95
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	172.66	23.50 QP	43.50	-20.00	1.30 V	200	8.71	14.79
2	399.17	28.03 QP	46.00	-17.97	1.21 V	215	6.92	21.11
3	479.93	30.15 QP	46.00	-15.85	1.02 V	188	7.80	22.35
4	520.00	31.67 QP	46.00	-14.33	1.24 V	309	8.53	23.14
5	666.98	32.91 QP	46.00	-13.09	1.07 V	155	6.62	26.29
6	800.48	34.78 QP	46.00	-11.22	1.11 V	146	4.84	29.94

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.

Above 1GHz Test Data

4.2.8 TEST RESULTS

DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 64%RH 965hPa	TESTED BY	Eric Lee

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	#2153.50	58.57 PK	78.31	-19.74	1.34 H	194	29.16	29.41
2	#2153.50	45.78 AV	65.52	-19.74	1.34 H	194	16.37	29.41
3	2389.00	56.34 PK	74.00	-17.66	1.05 H	275	26.06	30.28
4	2389.00	43.55 AV	54.00	-10.45	1.05 H	275	13.27	30.28
5	*2412.00	98.31 PK			1.31 H	6	67.95	30.36
6	*2412.00	85.52 AV			1.31 H	6	55.16	30.36
7	4824.00	50.40 PK	74.00	-23.60	1.46 H	357	13.61	36.79
8	4824.00	37.61 AV	54.00	-16.39	1.46 H	357	0.82	36.79
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	#2153.17	66.14 PK	86.87	-20.73	1.06 V	357	36.73	29.41
2	#2153.17	53.35 AV	74.08	-20.73	1.06 V	357	23.94	29.41
3	2389.00	60.60 PK	74.00	-13.40	1.00 V	327	30.32	30.28
4	2389.00	47.81 AV	54.00	-6.19	1.00 V	327	17.53	30.28
5	*2412.00	106.87 PK			1.00 V	283	76.51	30.36
6	*2412.00	94.08 AV			1.00 V	283	63.72	30.36
7	#3216.00	46.52 PK	86.87	-40.35	1.22 V	85	13.89	32.63
8	#3216.00	33.73 AV	74.08	-40.35	1.22 V	85	1.10	32.63
9	4824.00	61.82 PK	74.00	-12.18	1.43 V	59	25.03	36.79
10	4824.00	49.03 AV	54.00	-4.97	1.43 V	59	12.24	36.79

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.
5. " * ": Fundamental frequency.
6. "#":The radiated frequency is out the restricted band.
7. Duty cycle = 22.9%
8. Average value = peak reading + 20log(duty cycle).

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 64%RH 965hPa	TESTED BY	Eric Lee

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	*2438.00	98.24 PK			1.32 H	9	67.78	30.46
2	*2438.00	85.45 AV			1.32 H	9	54.99	30.46
3	4876.00	57.68 PK	74.00	-16.32	1.52 H	264	20.75	36.93
4	4876.00	44.89 AV	54.00	-9.11	1.52 H	264	7.96	36.93
5	7314.00	52.35 PK	74.00	-21.65	1.22 H	245	9.22	43.13
6	7314.00	39.56 AV	54.00	-14.44	1.22 H	245	-3.57	43.13
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	*2438.00	104.98 PK			1.00 V	279	74.52	30.46
2	*2438.00	92.19 AV			1.00 V	279	61.73	30.46
3	#3250.00	46.10 PK	84.98	-38.88	1.42 V	205	13.44	32.66
4	#3250.00	33.31 AV	72.19	-38.88	1.42 V	205	0.65	32.66
5	4876.00	64.90 PK	74.00	-9.10	1.29 V	63	27.97	36.93
6	**4876.00**	**52.11 AV**	**54.00**	**-1.89**	**1.29 V**	**63**	**15.18**	**36.93**
7	7314.00	53.65 PK	74.00	-20.35	1.30 V	265	10.52	43.13
8	7314.00	40.86 AV	54.00	-13.14	1.30 V	265	-2.27	43.13

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.
5. " * ": Fundamental frequency.
6. "#":The radiated frequency is out the restricted band.
7. Duty cycle = 22.9%
8. Average value = peak reading + 20log(duty cycle).

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 64%RH 965hPa	TESTED BY	Eric Lee

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	*2464.00	96.06 PK			1.69 H	41	65.50	30.56
2	*2464.00	83.27 AV			1.69 H	41	52.71	30.56
3	2483.50	56.84 PK	74.00	-17.16	1.67 H	44	26.21	30.63
4	2483.50	44.05 AV	54.00	-9.95	1.67 H	44	13.42	30.63
5	4928.00	55.29 PK	74.00	-18.71	1.72 H	236	18.22	37.07
6	4928.00	42.50 AV	54.00	-11.50	1.72 H	236	5.43	37.07
7	7392.00	52.45 PK	74.00	-21.55	1.54 H	248	9.32	43.13
8	7392.00	39.66 AV	54.00	-14.34	1.54 H	248	-3.47	43.13
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	*2464.00	107.51 PK			1.00 V	37	76.95	30.56
2	*2464.00	94.72 AV			1.00 V	37	64.16	30.56
3	2483.50	60.86 PK	74.00	-13.14	1.00 V	27	30.23	30.63
4	2483.50	48.07 AV	54.00	-5.93	1.00 V	27	17.44	30.63
5	#3285.44	47.64 PK	87.51	-39.87	1.56 V	220	14.94	32.70
6	#3285.44	34.85 AV	74.72	-39.87	1.56 V	220	2.15	32.70
7	4928.00	59.72 PK	74.00	-14.28	1.11 V	1	22.65	37.07
8	4928.00	46.93 AV	54.00	-7.07	1.11 V	1	9.86	37.07
9	7392.00	53.39 PK	74.00	-20.61	1.08 V	299	10.26	43.13
10	7392.00	40.60 AV	54.00	-13.40	1.08 V	299	-2.53	43.13

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.
5. " * ": Fundamental frequency.
6. "#":The radiated frequency is out the restricted band.
7. Duty cycle = 22.9%
8. Average value = peak reading + 20log(duty cycle).

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 DATE	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 09, 2008	Dec. 08, 2009

NOTE:

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

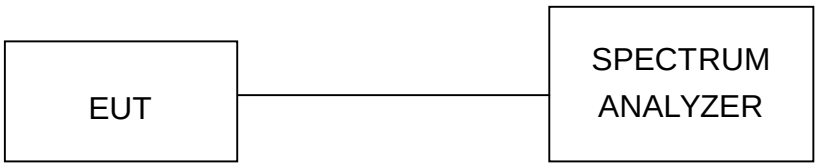
4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz 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



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.

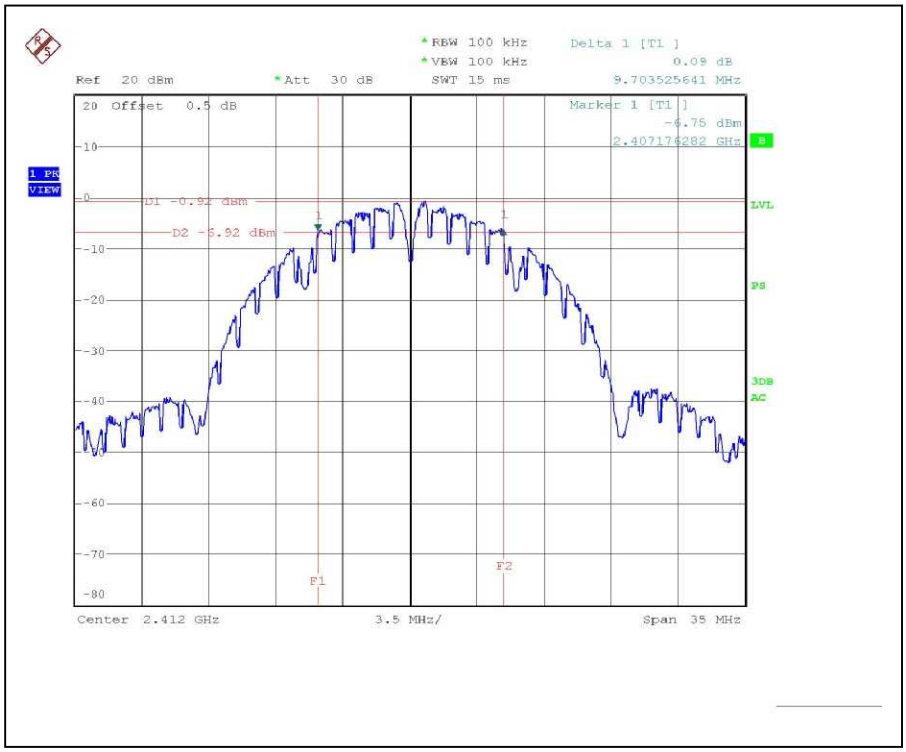
4.3.7 TEST RESULTS

DSSS MODULATION:

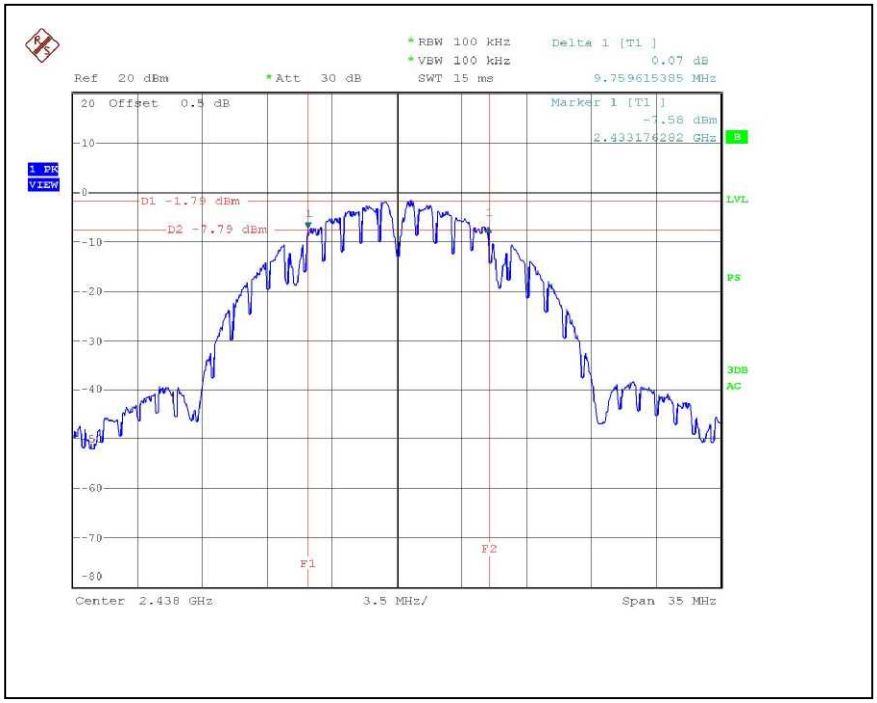
MODULATION TYPE	QPSK	TRANSFER RATE	22Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	9.70	0.5	PASS
2	2438	9.76	0.5	PASS
3	2464	9.70	0.5	PASS

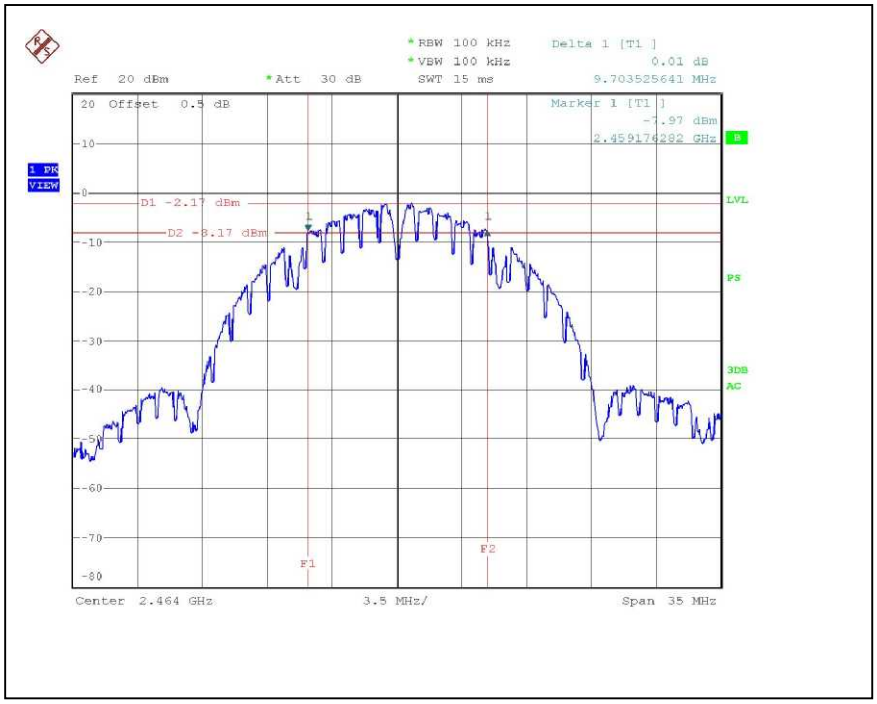
CH1



CH2


RBW 100 kHz
VBW 100 kHz
SWT 15 ms
Delta 1 [T1]
0.07 dB
9.759615385 MHz
Ref 20 dBm
Att 30 dB
20 Offset 0.5 dB
Marker 1 [T1]
-7.58 dBm
2.433176282 GHz
1 PK VIEW
D1 -1.79 dBm
D2 -7.79 dBm
LVL
PS
3DB
AC
F1
F2
Center 2.438 GHz
3.5 MHz/
Span 35 MHz

CH3


RBW 100 kHz
VBW 100 kHz
SWT 15 ms
Delta 1 [T1]
0.01 dB
9.703525641 MHz
Ref 20 dBm
Att 30 dB
20 Offset 0.5 dB
Marker 1 [T1]
-7.97 dBm
2.459176282 GHz
1 PK VIEW
D1 -2.17 dBm
D2 -8.17 dBm
LVL
PS
3DB
AC
F1
F2
Center 2.464 GHz
3.5 MHz/
Span 35 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 INSTRUMENTS

Description & Manufacturer	Model no.	Serial No.	Calibrated date	Calibrated Until
Anritsu Power Meter	ML2495A	0824006	June 14, 2008	June 13, 2009
Pulse Power Sensor	MA2411B	0738172	April 25, 2009	April 24, 2010

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

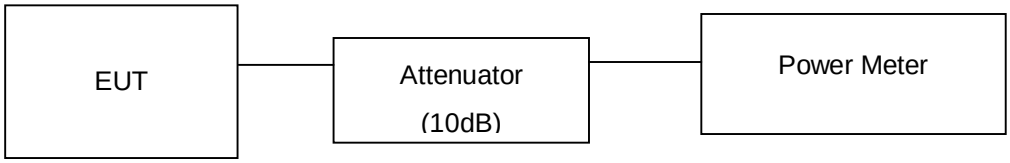
4.4.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator; the bandwidth of the fundamental frequency was measured with the power meter.
2. 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

DSSS MODULATION:

MODULATION TYPE	QPSK	TRANSFER RATE	22Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	39.628	15.98	30	PASS
2	2438	34.514	15.38	30	PASS
3	2464	29.376	14.68	30	PASS

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 DATE	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 09, 2008	Dec. 08, 2009

NOTE:

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

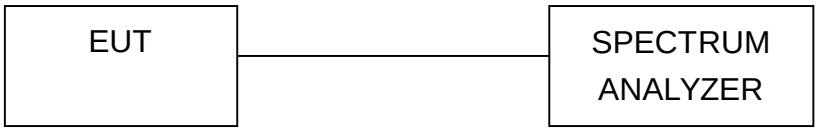
4.5.3 TEST PROCEDURE

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 CONDITION

Same as Item 4.3.6

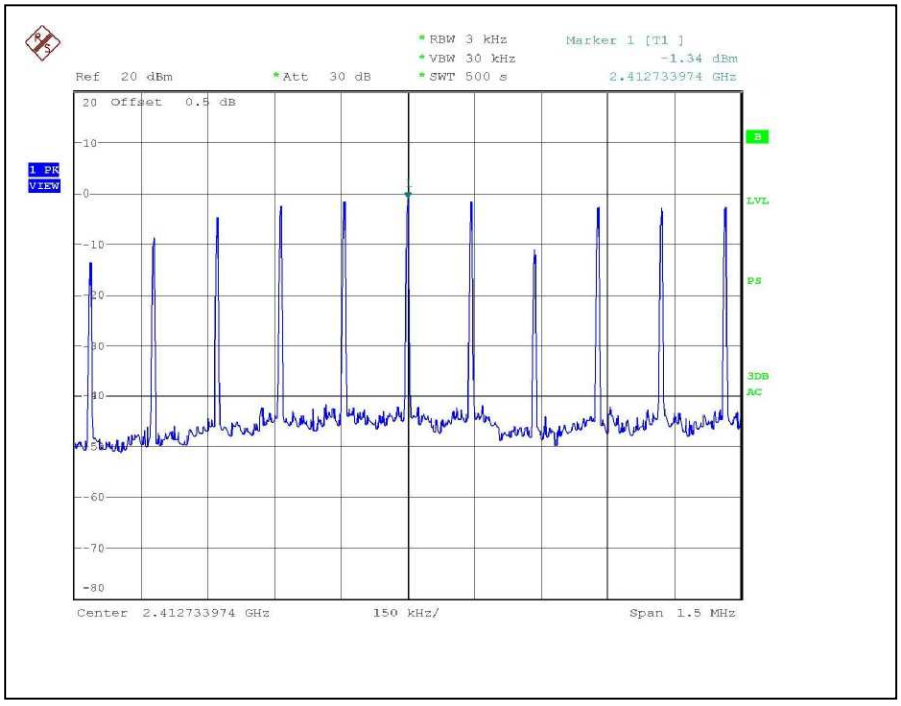
4.5.7 TEST RESULTS

DSSS MODULATION:

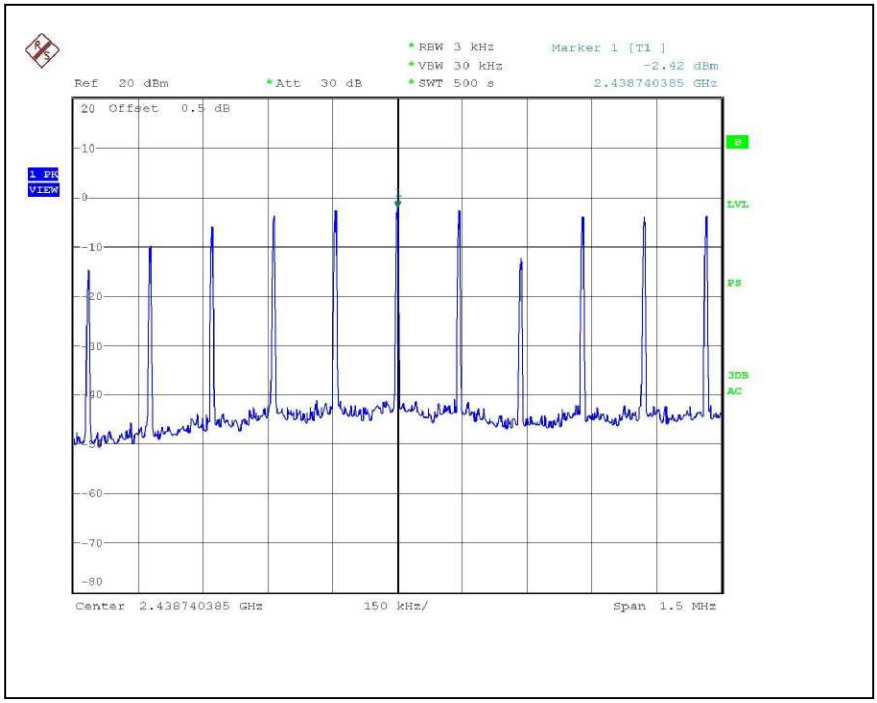
MODULATION TYPE	QPSK	TRANSFER RATE	22Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-1.34	8	PASS
2	2438	-2.42	8	PASS
3	2464	-2.82	8	PASS

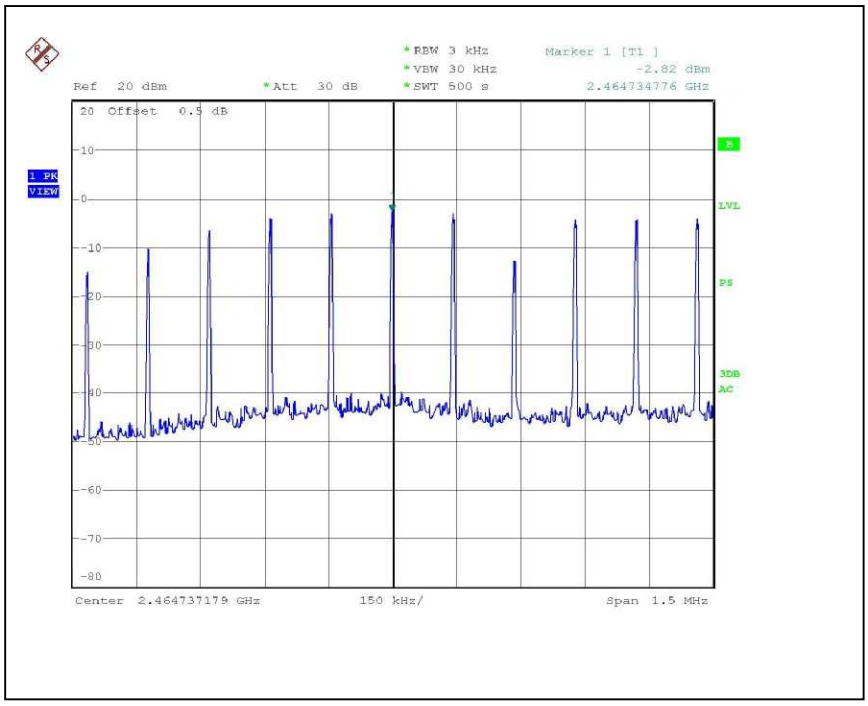
CH1



CH2


RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1]
-2.42 dBm
2.438740385 GHz
Ref 20 dBm
Att 30 dB
20 Offset 0.5 dB
1 PK VIEW
LVL
PS
3DB
AC
Center 2.438740385 GHz
150 kHz/
Span 1.5 MHz

CH3


RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1]
-2.82 dBm
2.464734776 GHz
Ref 20 dBm
Att 30 dB
20 Offset 0.5 dB
1 PK VIEW
LVL
PS
3DB
AC
Center 2.464737179 GHz
150 kHz/
Span 1.5 MHz

4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION 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 DATE	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 09, 2008	Dec. 08, 2009

NOTE:

2.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 of spectrum analyzer to 100kHz and VBW of spectrum analyzer to 300kHz with suitable frequency span including 100 MHz bandwidth from band edge. The conducted out-band emission was measured and recorded.

The spectrum plots (RBW = 100kHz, VBW = 300kHz) are attached on the following pages.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

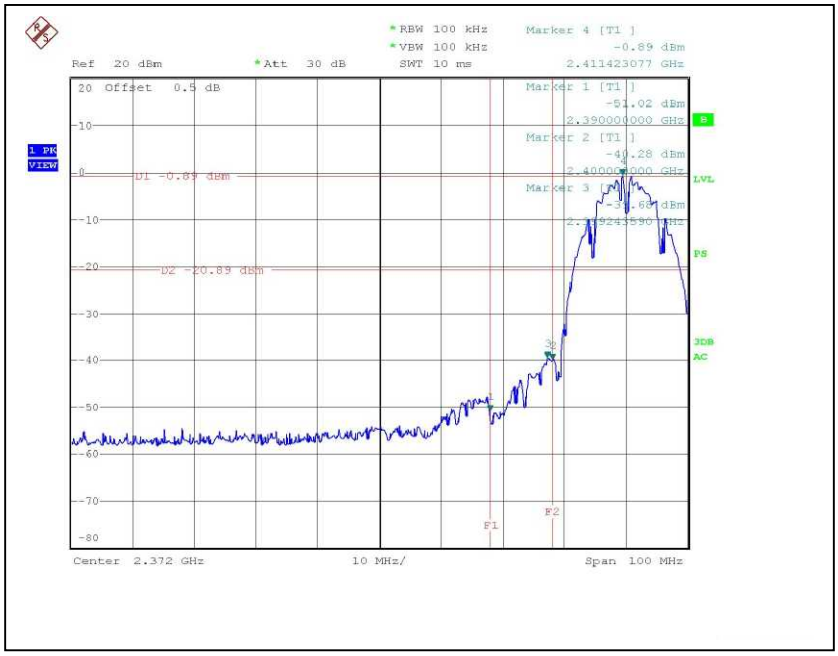
Same as Item 4.3.6

4.6.6 TEST RESULTS

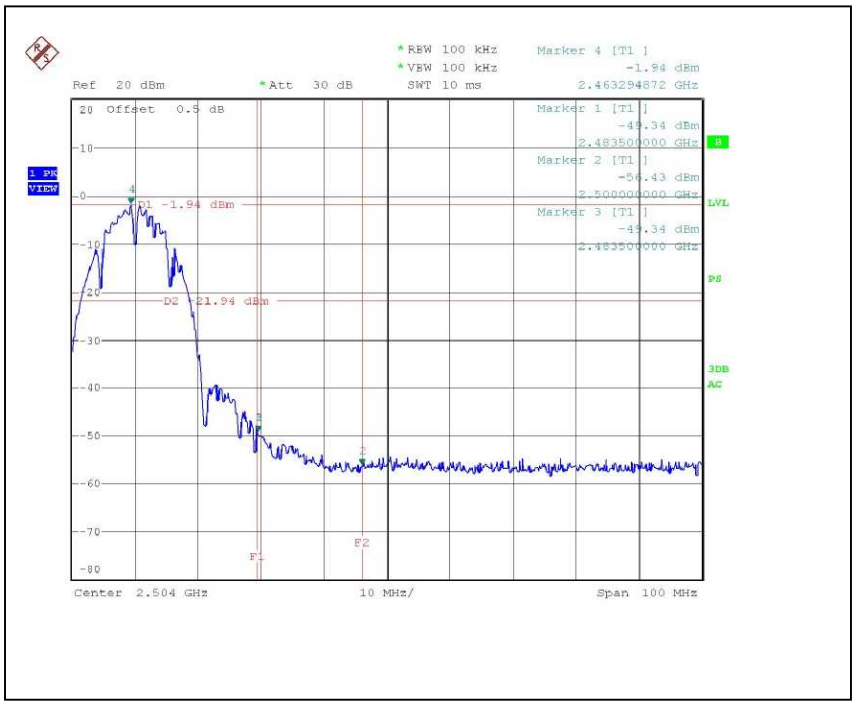
The spectrum plots are attached on the following below images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

DSSS MODULATION:

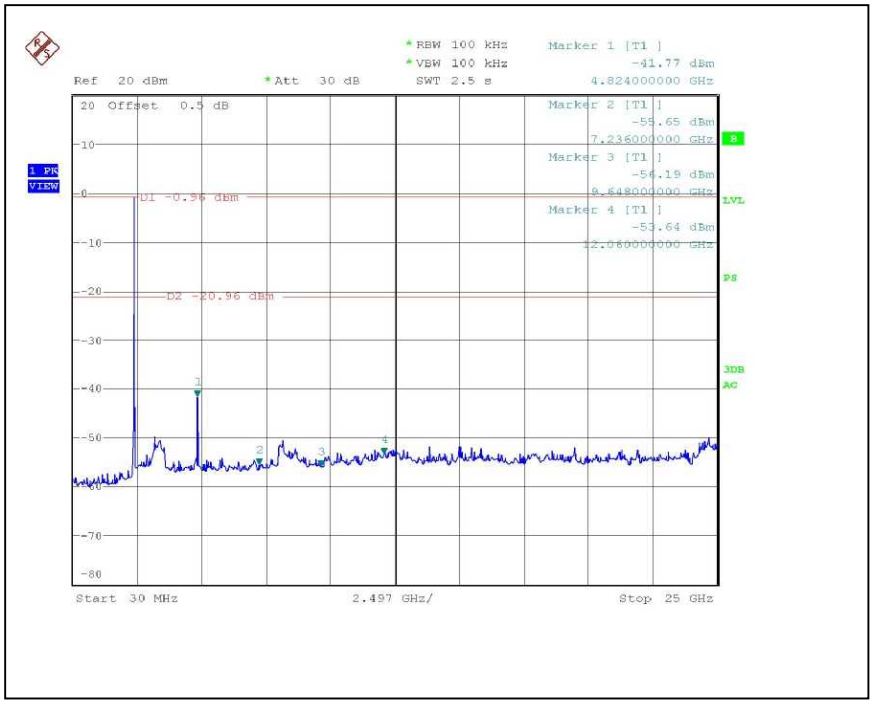
CH1



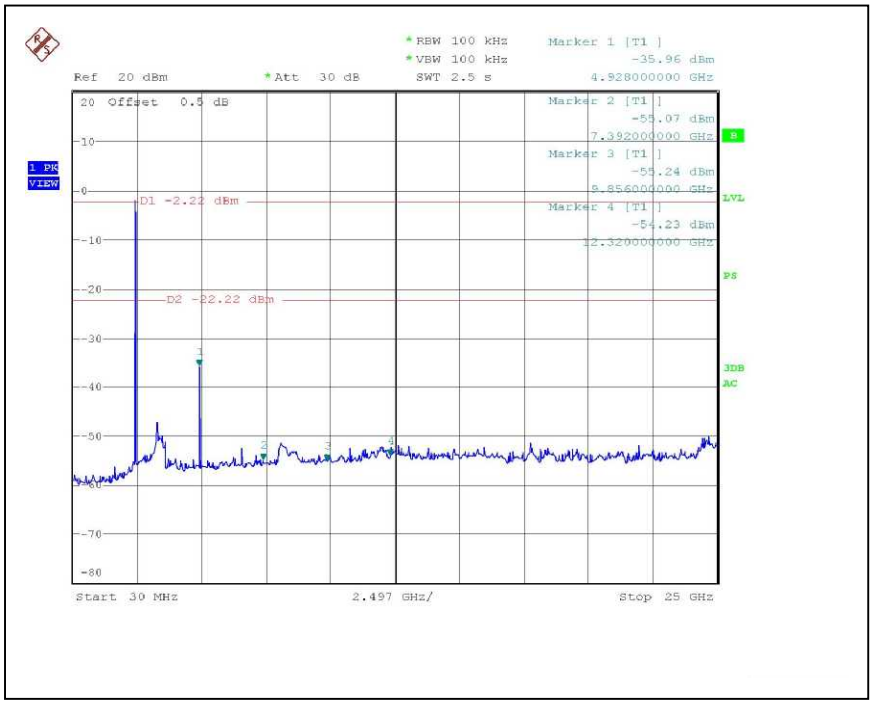
CH3



CH1


RBW 100 kHz
VBW 100 kHz
SWT 2.5 s
Ref 20 dBm
Att 30 dB
20 Offset 0.5 dB
Marker 1 [T1]
-41.77 dBm
4.824000000 GHz
Marker 2 [T1]
-55.65 dBm
7.236000000 GHz
Marker 3 [T1]
-56.19 dBm
9.648000000 GHz
Marker 4 [T1]
-53.64 dBm
12.060000000 GHz
D1 -0.96 dBm
D2 -20.96 dBm
1 PK
VIEW
Start 30 MHz
2.497 GHz/
Stop 25 GHz

CH3


RBW 100 kHz
VBW 100 kHz
SWT 2.5 s
Ref 20 dBm
Att 30 dB
20 Offset 0.5 dB
Marker 1 [T1]
-35.96 dBm
4.928000000 GHz
Marker 2 [T1]
-55.07 dBm
7.392000000 GHz
Marker 3 [T1]
-55.24 dBm
9.856000000 GHz
Marker 4 [T1]
-54.23 dBm
12.320000000 GHz
D1 -2.22 dBm
D2 -22.22 dBm
1 PK
VIEW
Start 30 MHz
2.497 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 Dipole antenna with I-PEX connector. The maximum Gain of the antenna is 1.79dBi.

5. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, 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
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA, CSA
R.O.C.	TAF, BSMI, NCC
Netherlands	Telefication
Singapore	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

Web Site: www.adt.com.tw

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

6. 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.

--- END ---