FCC TEST REPORT

REPORT NO.: RF931120L01
MODEL NO.: HTBS-01
RECEIVED: Nov. 20, 2004
TESTED: Dec. 03 ~ Dec. 16, 2004
ISSUED: Dec. 21, 2004

APPLICANT: Teraoka Weigh-system Pte Ltd

ADDRESS: 4 Leng Kee Road, #05-02/03/04/05 &11, SIS Building, Singapore 159088

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.

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ACCREDITED
No. 2177-01

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1 CERTIFICATION

PRODUCT :	Hi-Touch Station
MODEL NO. :	HTBS-01
BRAND NAME :	DIGI
APPLICANT :	Teraoka Weigh-system Pte Ltd
TESTED :	Dec. 03 ~ Dec. 16, 2004
TEST SAMPLE :	ENGINEERING SAMPLE
STANDARDS :	FCC Part 15, Subpart C (Section 15.247), ANSI C63.4-2003

The above equipment has been tested by **Advance Data Technology Corporation**, 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 : Candice Chen , **DATE:** Dec. 21, 2004
(Candice Chen)

TECHNICAL ACCEPTANCE : Gary Chang , **DATE:** Dec. 21, 2004
Responsible for RF (Gary Chang)

APPROVED BY : , **DATE:** Dec. 21, 2004
(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 –10.37dB at 0.179MHz
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 –1.40dB at 2483.50MHz
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	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.55 dB
	200MHz ~1000MHz	3.58 dB
	1GHz ~ 18GHz	1.10 dB
	18GHz ~ 40GHz	0.91 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Hi-Touch Station
MODEL NO.	HTBS-01
POWER SUPPLY	5.0Vdc from host equipment
MODULATION TYPE	O-QPSK
RADIO TECHNOLOGY	DSSS
FREQUENCY RANGE	2405 ~ 2480MHz
NUMBER OF CHANNEL	16
OUTPUT POWER	0.557mW
ANTENNA TYPE	Printed antenna with 1.23dBi gain Patch antenna with 0.92dBi gain
DATA CABLE	NA
I/O PORTS	RS232
ASSOCIATED DEVICES	NA

NOTE:

1. 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

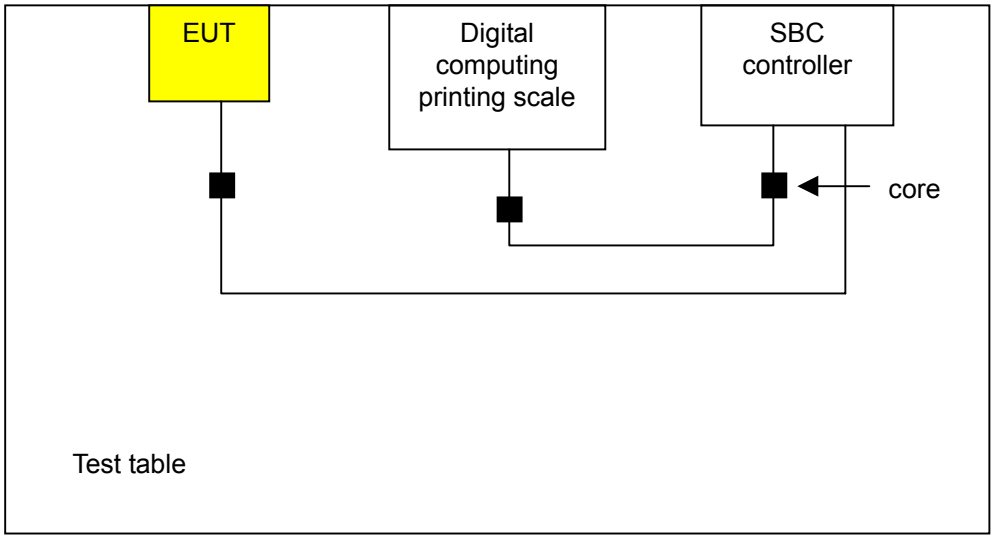
Operated in 2405 ~ 2480MHz Band:

16 channels for 2.4GHz were provided to this EUT

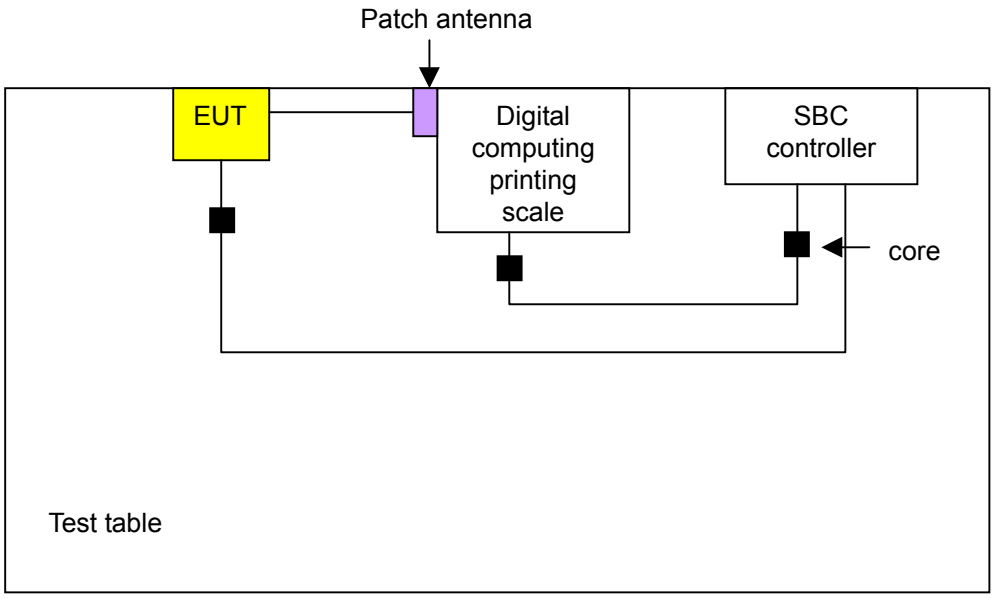
Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2405 MHz	9	2445 MHz
2	2410 MHz	10	2450 MHz
3	2415 MHz	11	2455 MHz
4	2420 MHz	12	2460 MHz
5	2425 MHz	13	2465 MHz
6	2430 MHz	14	2470 MHz
7	2435 MHz	15	2475 MHz
8	2440 MHz	16	2480 MHz

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Test Mode A (with internal antenna)



Test Mode B (with external antenna)



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
A	Note 1	x	x	Note 2	Internal antenna (Printed antenna)
B	Note 1	x	x	Note 2	External antenna (Patch antenna)

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

Note 1: After estimating only recorded worst case in the report.

Note 2: Power Line Conducted Emission is independent of antenna.

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.

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

EUT configure mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
B	1 to 16	1, 9, 16	DSSS	O-QPSK

Radiated Emission Test (Below 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.

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

EUT configure mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
A	1 to 16	1	DSSS	O-QPSK
B	1 to 16	1	DSSS	O-QPSK

Radiated Emission Test (Above 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.

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

EUT configure mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
A	1 to 16	1, 9, 16	DSSS	O-QPSK
B	1 to 16	1, 9, 16	DSSS	O-QPSK

Bandedge Measurement:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.

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

Available Channel	Tested Channel	Modulation Technology	Modulation Type
1 to 16	1, 16	DSSS	O-QPSK

Antenna Port Conducted Measurement:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.

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

Available Channel	Tested Channel	Modulation Technology	Modulation Type
1 to 16	1, 9, 16	DSSS	O-QPSK

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Hi-Touch Station. According to the specifications of the manufacturer, it must complies 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	SBC CONTROLLER	NA	SBC-710	04922283	FCC DoC Approved
2	DIGITAL COMPUTING PRINTING SCALE	NA	SM-710	NA	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	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	Nov. 06, 2005
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.

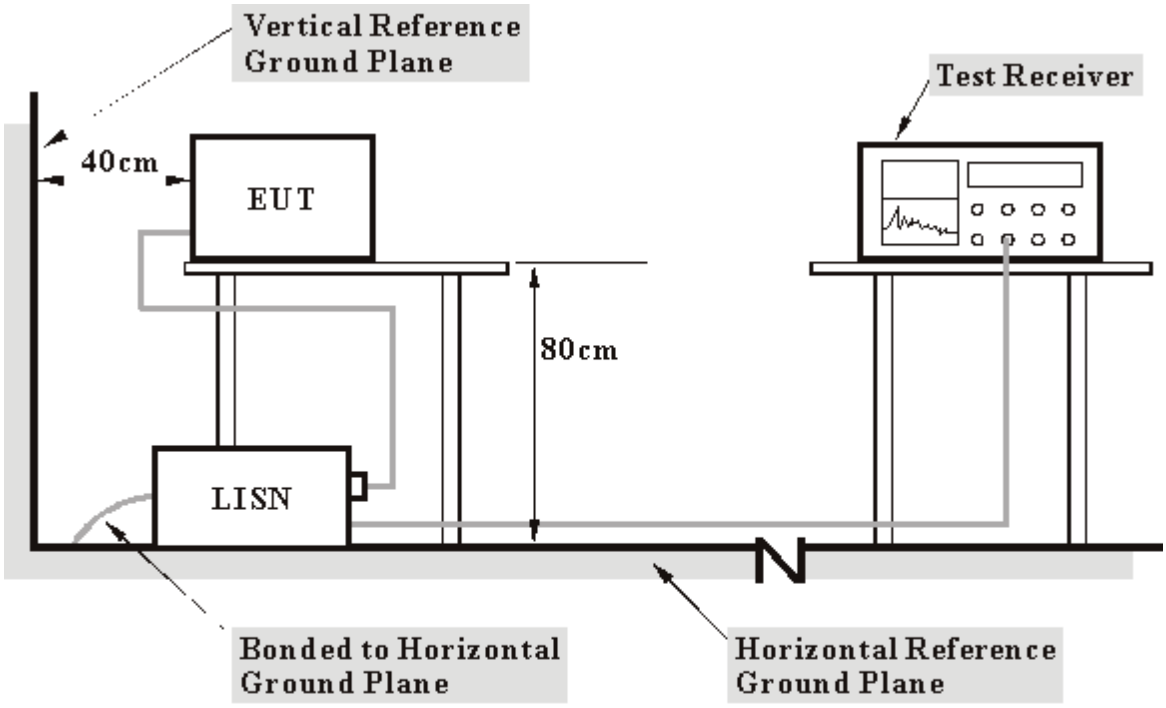
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels 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 LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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

4.1.6 EUT OPERATING CONDITIONS

Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

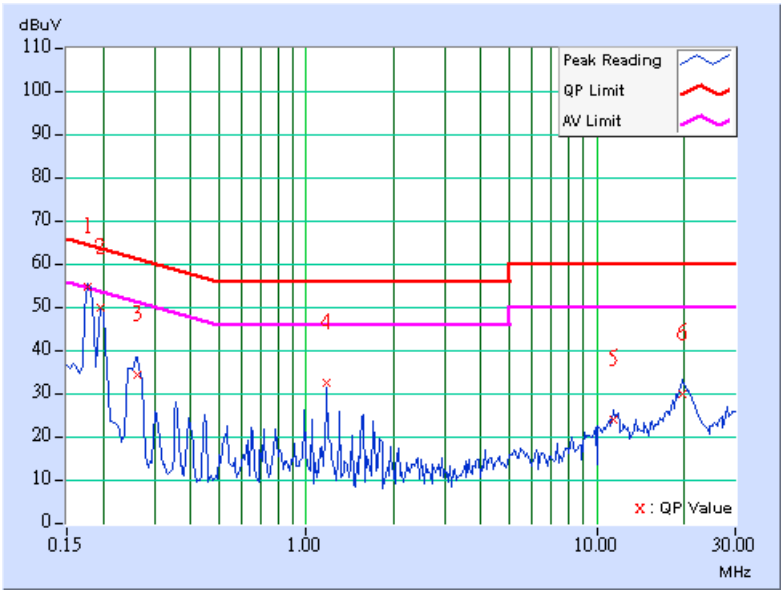
4.1.7 TEST RESULTS

Conducted Worst-Case Data

EUT	Hi-Touch Station	**MODEL**	HTBS-01
CHANNEL	Channel 1	**6dB BANDWIDTH**	9 kHz
MODULATION TYPE	O-QPSK	**PHASE**	Line (L)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24deg. C, 57%RH, 991hPa
TESTED BY	Kevin Chen		

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	0.177	0.10	53.82	-	53.92	-	64.61	54.61	-10.69	-
2	0.197	0.10	49.07	-	49.17	-	63.74	53.74	-14.57	-
3	0.263	0.10	33.39	-	33.49	-	61.33	51.33	-27.83	-
4	1.172	0.25	31.86	-	32.11	-	56.00	46.00	-23.89	-
5	11.465	0.58	23.31	-	23.89	-	60.00	50.00	-36.11	-
6	19.664	0.91	29.20	-	30.11	-	60.00	50.00	-29.89	-

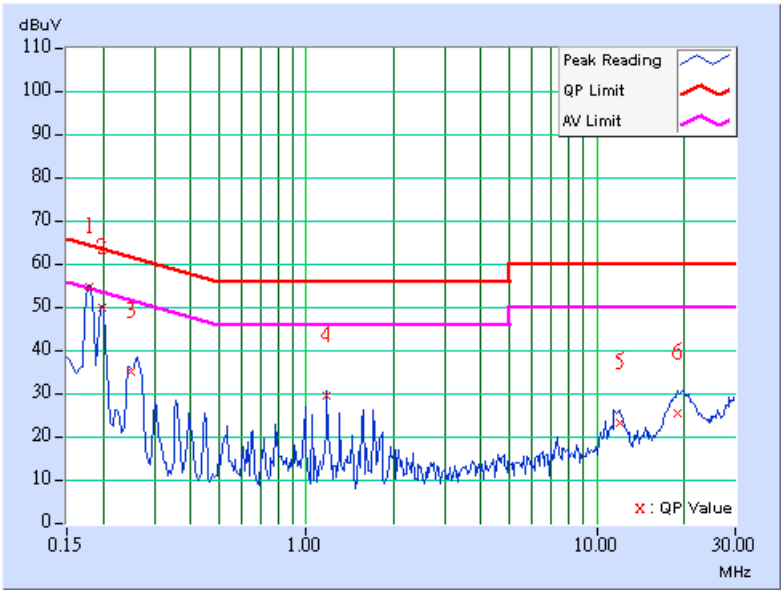
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	Hi-Touch Station	**MODEL**	HTBS-01
CHANNEL	Channel 1	**6dB BANDWIDTH**	9 kHz
MODULATION TYPE	O-QPSK	**PHASE**	Neutral (N)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24deg. C, 57%RH, 991hPa
TESTED BY	Kevin Chen		

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	**0.179**	**0.10**	**54.07**	**-**	**54.17**	**-**	**64.54**	**54.54**	**-10.37**	**-**
2	0.198	0.10	49.37	-	49.47	-	63.71	53.71	-14.24	-
3	0.250	0.10	34.52	-	34.62	-	61.77	51.77	-27.14	-
4	1.176	0.24	29.18	-	29.42	-	56.00	46.00	-26.58	-
5	11.993	0.52	22.61	-	23.13	-	60.00	50.00	-36.87	-
6	18.899	0.63	25.10	-	25.73	-	60.00	50.00	-34.27	-

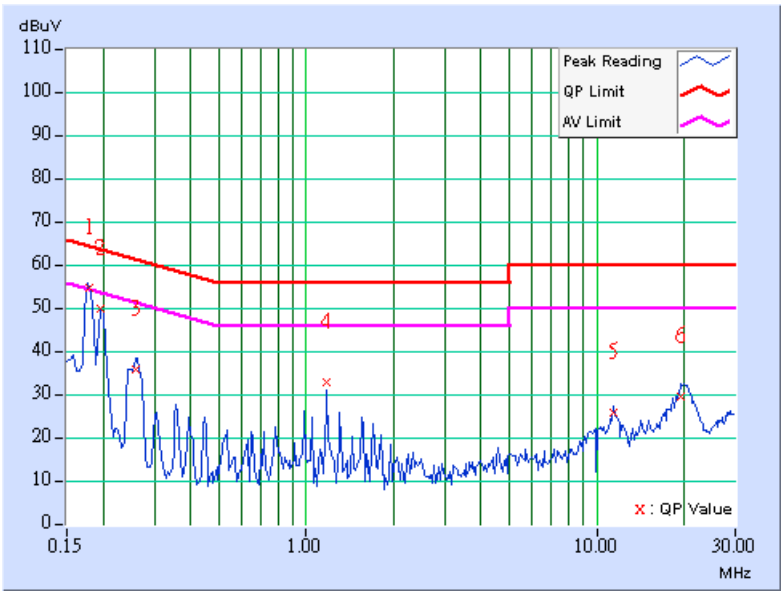
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	Hi-Touch Station	MODEL	HTBS-01
CHANNEL	Channel 9	6dB BANDWIDTH	9 kHz
MODULATION TYPE	O-QPSK	PHASE	Line (L)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg. C, 57%RH, 991hPa
TESTED BY	Kevin Chen		

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	0.179	0.10	54.07	-	54.17	-	64.55	54.55	-10.38	-
2	0.197	0.10	49.07	-	49.17	-	63.74	53.74	-14.57	-
3	0.259	0.10	35.06	-	35.16	-	61.45	51.45	-26.29	-
4	1.172	0.25	31.90	-	32.15	-	56.00	46.00	-23.85	-
5	11.465	0.58	25.08	-	25.66	-	60.00	50.00	-34.34	-
6	19.531	0.90	28.84	-	29.74	-	60.00	50.00	-30.26	-

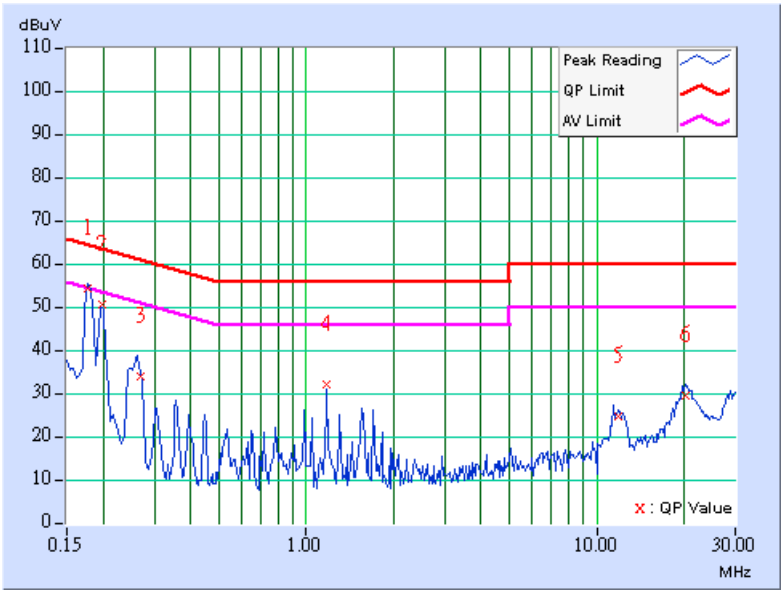
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	Hi-Touch Station	MODEL	HTBS-01
CHANNEL	Channel 9	6dB BANDWIDTH	9 kHz
MODULATION TYPE	O-QPSK	PHASE	Neutral (N)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg. C, 57%RH, 991hPa
TESTED BY	Kevin Chen		

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	0.178	0.10	53.95	-	54.05	-	64.59	54.59	-10.54	-
2	0.198	0.10	50.13	-	50.23	-	63.71	53.71	-13.48	-
3	0.268	0.10	33.36	-	33.46	-	61.19	51.19	-27.73	-
4	1.172	0.24	31.68	-	31.92	-	56.00	46.00	-24.08	-
5	11.855	0.52	24.04	-	24.56	-	60.00	50.00	-35.44	-
6	20.313	0.65	28.87	-	29.52	-	60.00	50.00	-30.48	-

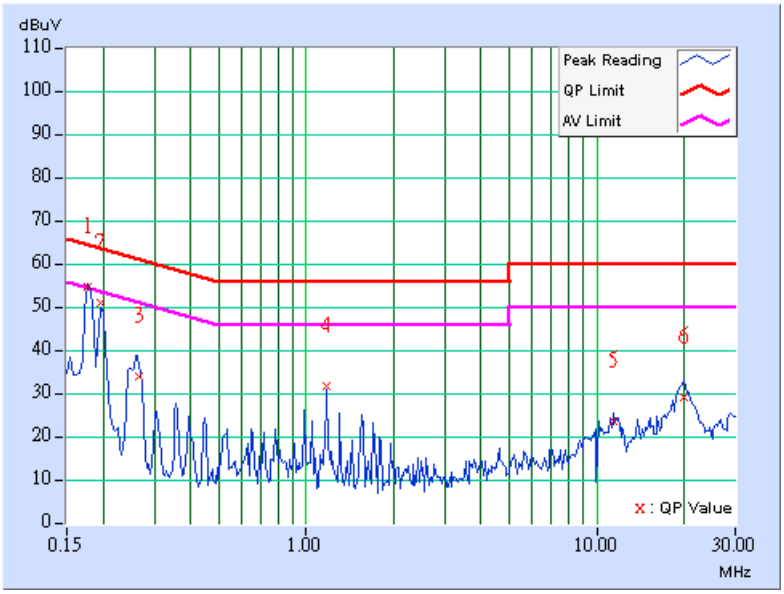
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	Hi-Touch Station	**MODEL**	HTBS-01
CHANNEL	Channel 16	**6dB BANDWIDTH**	9 kHz
MODULATION TYPE	O-QPSK	**PHASE**	Line (L)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24deg. C, 57%RH, 991hPa
TESTED BY	Kevin Chen		

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	0.177	0.10	53.78	-	53.88	-	64.61	54.61	-10.73	-
2	0.197	0.10	50.01	-	50.11	-	63.74	53.74	-13.63	-
3	0.266	0.10	33.23	-	33.33	-	61.25	51.25	-27.91	-
4	1.172	0.25	30.94	-	31.19	-	56.00	46.00	-24.81	-
5	11.461	0.58	22.94	-	23.52	-	60.00	50.00	-36.48	-
6	19.918	0.92	28.33	-	29.25	-	60.00	50.00	-30.75	-

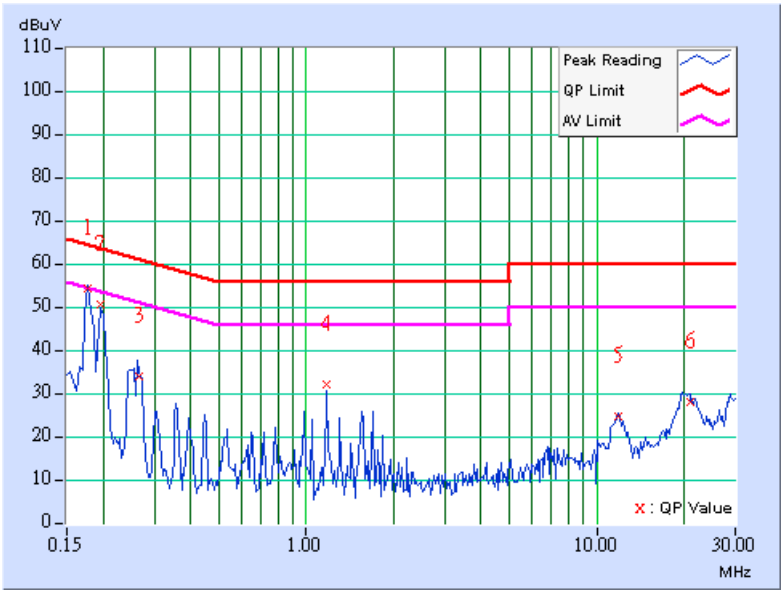
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	Hi-Touch Station	MODEL	HTBS-01
CHANNEL	Channel 16	6dB BANDWIDTH	9 kHz
MODULATION TYPE	O-QPSK	PHASE	Neutral (N)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg. C, 57%RH, 991hPa
TESTED BY	Kevin Chen		

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	0.177	0.10	53.72	-	53.82	-	64.61	54.61	-10.79	-
2	0.197	0.10	50.07	-	50.17	-	63.74	53.74	-13.57	-
3	0.267	0.10	33.43	-	33.53	-	61.22	51.22	-27.69	-
4	1.172	0.24	31.70	-	31.94	-	56.00	46.00	-24.06	-
5	11.855	0.52	24.00	-	24.52	-	60.00	50.00	-35.48	-
6	20.973	0.66	27.32	-	27.98	-	60.00	50.00	-32.02	-

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 UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	100033	Jun. 08, 2005
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Jun. 03, 2005
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	Nov. 09, 2005
Preamplifier Agilent	8449B	3008A01964	Nov. 06, 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 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.

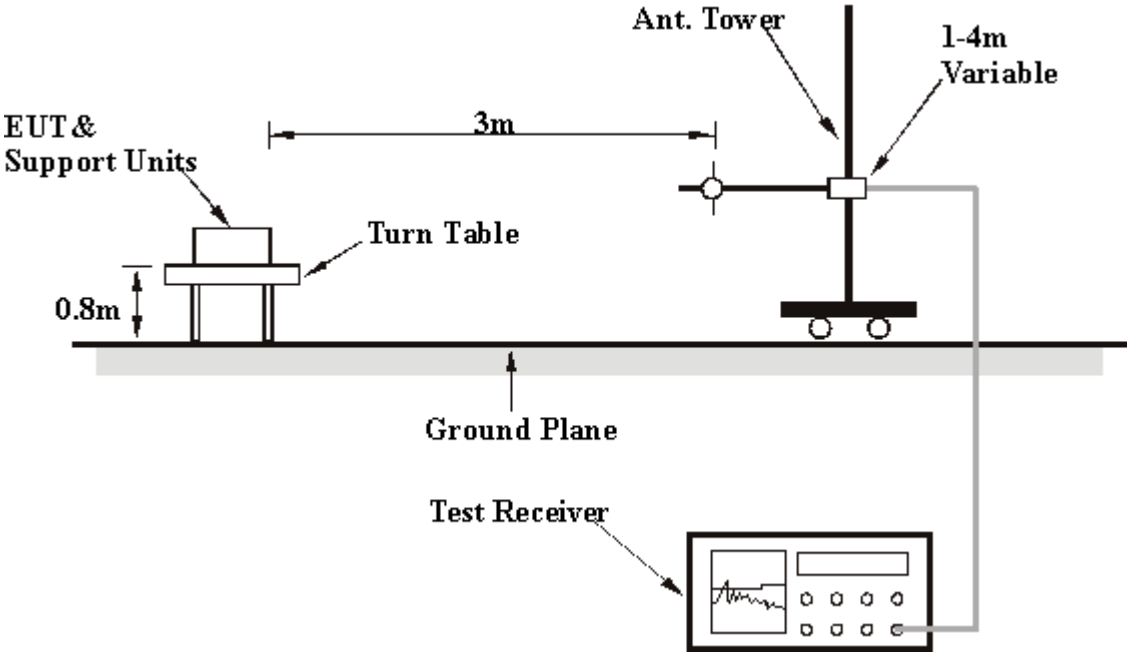
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for 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.

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 (Internal antenna)

EUT	Hi-Touch Station	**MODEL**	HTBS-01
CHANNEL	1	**FREQUENCY RANGE**	Below 1 GHz
MODULATION TYPE	O-QPSK	**DETECTOR FUNCTION**	Quasi-Peak
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24 deg. C, 64% RH, 991 hPa
TESTED BY	Long Chen	**TEST MODE**	A (Internal antenna)

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	99.98	36.18 QP	43.50	-7.32	3.00 H	364	25.04	11.14
2	201.06	34.60 QP	43.50	-8.90	1.75 H	115	23.11	11.49
3	342.97	40.94 QP	46.00	-5.06	1.00 H	361	25.23	15.71
4	399.34	34.70 QP	46.00	-11.30	2.00 H	139	17.75	16.95
5	440.16	36.71 QP	46.00	-9.29	1.75 H	22	18.82	17.88
6	914.47	39.91 QP	46.00	-6.09	3.00 H	163	14.50	25.41

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	53.33	35.42 QP	40.00	-4.58	1.00 V	241	20.52	14.91
2	99.98	36.52 QP	43.50	-6.98	1.00 V	31	25.38	11.14
3	199.12	33.52 QP	43.50	-9.98	1.00 V	34	21.99	11.53
4	342.97	36.79 QP	46.00	-9.21	2.50 V	10	21.07	15.71
5	440.16	37.96 QP	46.00	-8.04	1.25 V	232	20.08	17.88
6	599.56	36.16 QP	46.00	-9.84	1.00 V	94	14.93	21.24

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.

Below 1GHz Worst-Case Data (External antenna)

EUT	Hi-Touch Station	**MODEL**	HTBS-01
CHANNEL	1	**FREQUENCY RANGE**	Below 1 GHz
MODULATION TYPE	O-QPSK	**DETECTOR FUNCTION**	Quasi-Peak
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24 deg. C, 64% RH, 991 hPa
TESTED BY	Long Chen	**TEST MODE**	B (External antenna)

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	74.71	33.28 QP	40.00	-6.72	1.75 H	340	21.47	11.81
2	119.42	38.30 QP	43.50	-5.20	3.00 H	184	25.50	12.80
3	199.12	38.36 QP	43.50	-5.14	1.75 H	31	26.83	11.53
4	399.34	36.88 QP	46.00	-9.12	2.00 H	205	19.94	16.95
5	440.16	36.31 QP	46.00	-9.69	1.75 H	58	18.43	17.88
6	519.86	38.31 QP	46.00	-7.69	1.75 H	157	19.17	19.15

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	39.72	35.83 QP	40.00	-4.17	1.25 V	136	20.03	15.80
2	74.71	29.23 QP	40.00	-10.77	3.00 V	76	17.43	11.81
3	440.16	34.51 QP	46.00	-11.49	1.00 V	31	16.63	17.88
4	519.86	34.25 QP	46.00	-11.75	1.00 V	91	15.11	19.15
5	599.56	36.58 QP	46.00	-9.42	1.00 V	121	15.34	21.24
6	881.42	34.73 QP	46.00	-11.27	1.00 V	31	9.86	24.87

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.

1 ~ 25GHz Worst-Case Data (Internal antenna)

EUT	Hi-Touch Station	**MODEL**	HTBS-01
CHANNEL	1	**FREQUENCY RANGE**	1~25 GHz
MODULATION TYPE	O-QPSK	**DETECTOR FUNCTION**	Quasi-Peak
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24 deg. C, 64% RH, 991 hPa
TESTED BY	Long Chen	**TEST MODE**	A (Internal antenna)

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	2390.00	42.69 PK	74.00	-31.31	1.00 H	23	11.08	31.61
2	*2405.00	97.31 PK			1.00 H	23	65.65	31.66
2	*2405.00	87.21 AV			1.00 H	23	55.55	31.66
3	4810.00	65.86 PK	74.00	-8.14	1.05 H	356	28.30	37.56
3	4810.00	49.87 AV	54.00	-4.13	1.05 H	356	12.31	37.56
4	7215.00	57.74 PK	74.00	-16.26	1.20 H	20	13.66	44.09
4	7215.00	42.49 AV	54.00	-11.51	1.20 H	20	-1.59	44.09

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	2390.00	35.48 PK	74.00	-38.52	1.54 V	0	3.87	31.61
2	*2405.00	90.10 PK			1.54 V	0	58.44	31.66
2	*2405.00	80.00 AV			1.54 V	0	48.34	31.66
3	4810.00	59.21 PK	74.00	-14.79	1.02 V	323	21.65	37.56
3	4810.00	44.83 AV	54.00	-9.17	1.02 V	323	7.27	37.56
4	7215.00	56.73 PK	74.00	-17.27	1.48 V	329	12.65	44.09
4	7215.00	41.69 AV	54.00	-12.31	1.48 V	329	-2.39	44.09

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.

EUT	Hi-Touch Station	**MODEL**	HTBS-01
CHANNEL	9	**FREQUENCY RANGE**	1~25 GHz
MODULATION TYPE	O-QPSK	**DETECTOR FUNCTION**	Quasi-Peak
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24 deg. C, 64% RH, 991 hPa
TESTED BY	Long Chen	**TEST MODE**	A (Internal antenna)

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	*2445.00	95.94 PK			1.22 H	21	64.04	31.90
1	*2445.00	85.84 AV			1.22 H	21	53.94	31.90
2	4890.00	60.36 PK	74.00	-13.64	1.05 H	35	22.68	37.68
2	4890.00	49.70 AV	54.00	-4.30	1.05 H	35	12.02	37.68
3	7335.00	57.89 PK	74.00	-16.11	1.00 H	248	13.48	44.41
3	7335.00	43.62 AV	54.00	-10.38	1.00 H	248	-0.79	44.41

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	*2445.00	89.14 PK			1.21 V	8	57.24	31.90
1	*2445.00	79.04 AV			1.21 V	8	47.14	31.90
2	4890.00	54.00 PK	74.00	-20.00	1.00 V	324	16.32	37.68
2	4890.00	46.11 AV	54.00	-7.89	1.00 V	324	8.43	37.68
3	7335.00	55.25 PK	74.00	-18.75	1.36 V	247	10.84	44.41
3	7335.00	41.28 AV	54.00	-12.72	1.36 V	247	-3.13	44.41

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.

EUT	Hi-Touch Station	**MODEL**	HTBS-01
CHANNEL	16	**FREQUENCY RANGE**	1~25 GHz
MODULATION TYPE	O-QPSK	**DETECTOR FUNCTION**	Quasi-Peak
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24 deg. C, 64% RH, 991 hPa
TESTED BY	Long Chen	**TEST MODE**	A (Internal antenna)

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	*2480.00	96.13 PK			1.00 H	40	64.02	32.11
1	*2480.00	86.03 AV			1.00 H	40	53.92	32.11
2	2483.50	62.70 PK	74.00	-11.30	1.00 H	40	30.57	32.13
2	**2483.50**	**52.60 AV**	**54.00**	**-1.40**	**1.00 H**	**40**	**20.47**	**32.13**
3	4960.00	55.84 PK	74.00	-18.16	1.02 H	0	18.03	37.81
3	4960.00	50.50 AV	54.00	-3.50	1.02 H	0	12.69	37.81
4	7440.00	56.28 PK	74.00	-17.72	1.00 H	258	11.65	44.63
4	7440.00	42.51 AV	54.00	-11.49	1.00 H	258	-2.12	44.63

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	*2480.00	90.08 PK			1.47 V	6	57.97	32.11
1	*2480.00	79.98 AV			1.47 V	6	47.87	32.11
2	2483.50	56.65 PK	74.00	-17.35	1.47 V	6	24.52	32.13
2	2483.50	46.55 AV	54.00	-7.45	1.47 V	6	14.42	32.13
3	4960.00	54.15 PK	74.00	-19.85	1.02 V	35	16.34	37.81
3	4960.00	49.77 AV	54.00	-4.23	1.02 V	35	11.96	37.81
4	7440.00	54.58 PK	74.00	-19.42	1.36 V	287	9.95	44.63
4	7440.00	40.92 AV	54.00	-13.08	1.36 V	287	-3.71	44.63

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.

1 ~ 25GHz Worst-Case Data (External antenna)

EUT	Hi-Touch Station	**MODEL**	HTBS-01
CHANNEL	1	**FREQUENCY RANGE**	1~25 GHz
MODULATION TYPE	O-QPSK	**DETECTOR FUNCTION**	Quasi-Peak
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24 deg. C, 64% RH, 991 hPa
TESTED BY	Long Chen	**TEST MODE**	B (External antenna)

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	2390.00	41.65 PK	74.00	-32.35	1.18 H	76	10.04	31.61
1	2390.00	31.55 AV	54.00	-22.45	1.18 H	76	-0.06	31.61
2	*2405.00	96.27 PK			1.18 H	76	64.61	31.66
2	*2405.00	86.17 AV			1.18 H	76	54.51	31.66
3	4810.00	51.20 PK	74.00	-22.80	1.62 H	102	13.64	37.56
3	4810.00	41.10 AV	54.00	-12.90	1.62 H	102	3.54	37.56

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	2390.00	32.10 PK	74.00	-41.90	1.00 V	130	0.49	31.61
1	2390.00	21.00 AV	54.00	-33.00	1.00 V	130	-10.61	31.61
2	*2405.00	86.72 PK			1.00 V	130	55.06	31.66
2	*2405.00	76.62 AV			1.00 V	130	44.96	31.66
3	4810.00	49.66 PK	74.00	-24.34	1.46 V	63	12.10	37.56
3	4810.00	40.63 AV	54.00	-13.37	1.46 V	63	3.07	37.56

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.

EUT	Hi-Touch Station	**MODEL**	HTBS-01
CHANNEL	9	**FREQUENCY RANGE**	1~25 GHz
MODULATION TYPE	O-QPSK	**DETECTOR FUNCTION**	Quasi-Peak
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24 deg. C, 64% RH, 991 hPa
TESTED BY	Long Chen	**TEST MODE**	B (External antenna)

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	*2445.00	95.31 PK			1.00 H	95	63.41	31.90
1	*2445.00	85.21 AV			1.00 H	95	53.31	31.90
2	4890.00	54.28 PK	74.00	-19.72	1.68 H	95	16.60	37.68
2	4890.00	44.18 AV	54.00	-9.82	1.68 H	95	6.50	37.68

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	*2445.00	85.40 PK			1.59 V	296	53.50	31.90
1	*2445.00	75.30 AV			1.59 V	296	43.40	31.90
2	4890.00	51.10 PK	74.00	-22.90	1.39 V	34	13.42	37.68
2	4890.00	43.84 AV	54.00	-10.16	1.39 V	34	6.16	37.68

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.

EUT	Hi-Touch Station	MODEL	HTBS-01
CHANNEL	16	FREQUENCY RANGE	1~25 GHz
MODULATION TYPE	O-QPSK	DETECTOR FUNCTION	Quasi-Peak
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa
TESTED BY	Long Chen	TEST MODE	B (External antenna)

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	*2480.00	95.70 PK			1.56 H	75	63.59	32.11
1	*2480.00	85.60 AV			1.56 H	75	53.49	32.11
2	2483.50	62.27 PK	74.00	-11.73	1.56 H	75	30.14	32.13
2	2483.50	52.17 AV	54.00	-1.83	1.56 H	75	20.04	32.13
3	4960.00	55.31 PK	74.00	-18.69	1.42 H	56	17.50	37.81
3	4960.00	43.66 AV	54.00	-10.34	1.42 H	56	5.85	37.81

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	*2480.00	86.11 PK			1.55 V	15	54.00	32.11
1	*2480.00	76.01 AV			1.55 V	15	43.90	32.11
2	2483.50	52.68 PK	74.00	-21.32	1.55 V	15	20.55	32.13
2	2483.50	42.58 AV	54.00	-11.42	1.55 V	15	10.45	32.13
3	4960.00	54.90 PK	74.00	-19.10	1.37 V	23	17.09	37.81
3	4960.00	42.54 AV	54.00	-11.46	1.37 V	23	4.73	37.81

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.

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

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 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

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.

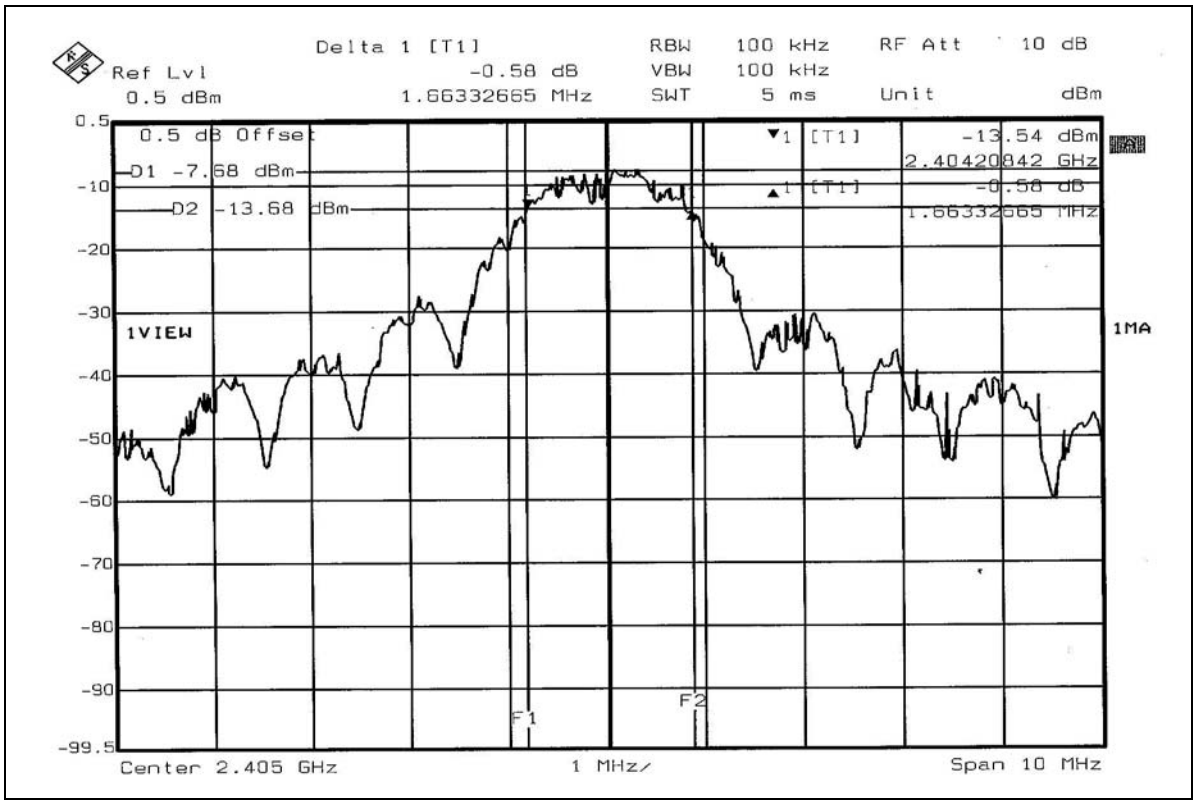
4.3.7 TEST RESULTS

DSSS modulation

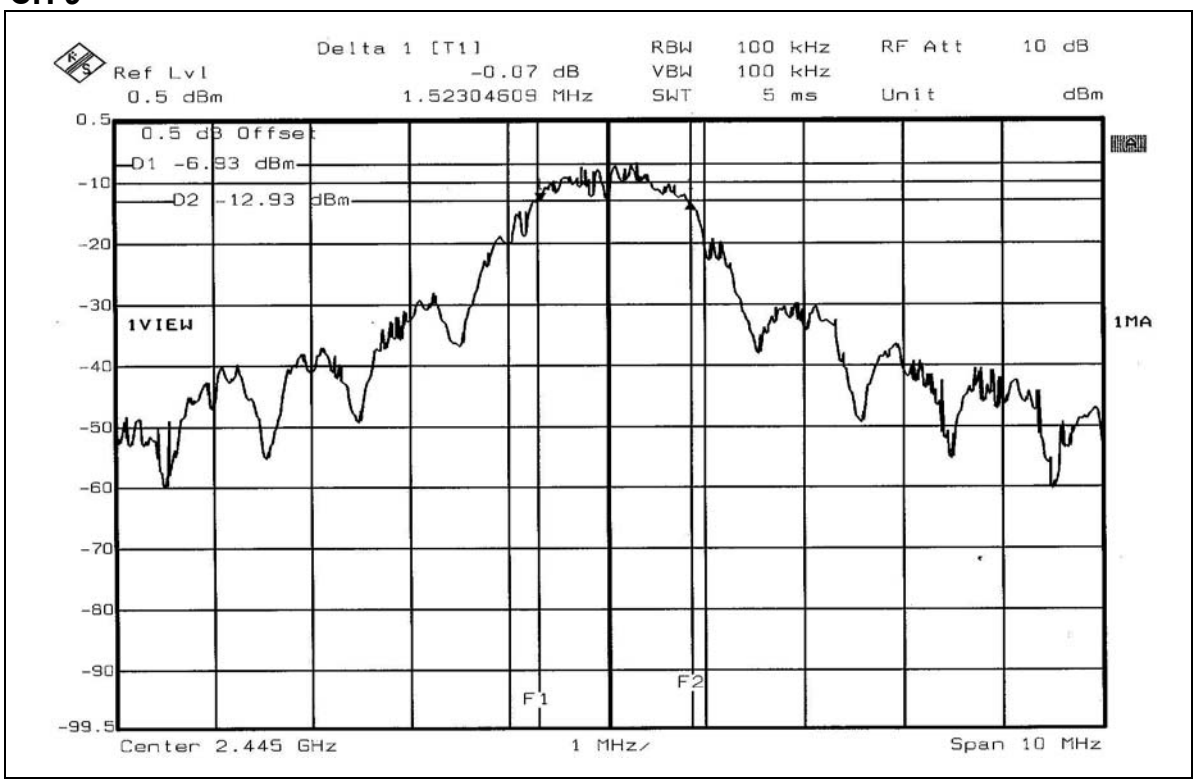
EUT	Hi-Touch Station	**MODEL**	HTBS-01
MODULATION TYPE	O-QPSK	**ENVIRONMENTAL CONDITIONS**	24 deg. C, 64% RH, 991 hPa
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	**TESTED BY**	Leo Hung

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2405	1.66	0.5	PASS
9	2445	1.52	0.5	PASS
16	2480	1.52	0.5	PASS

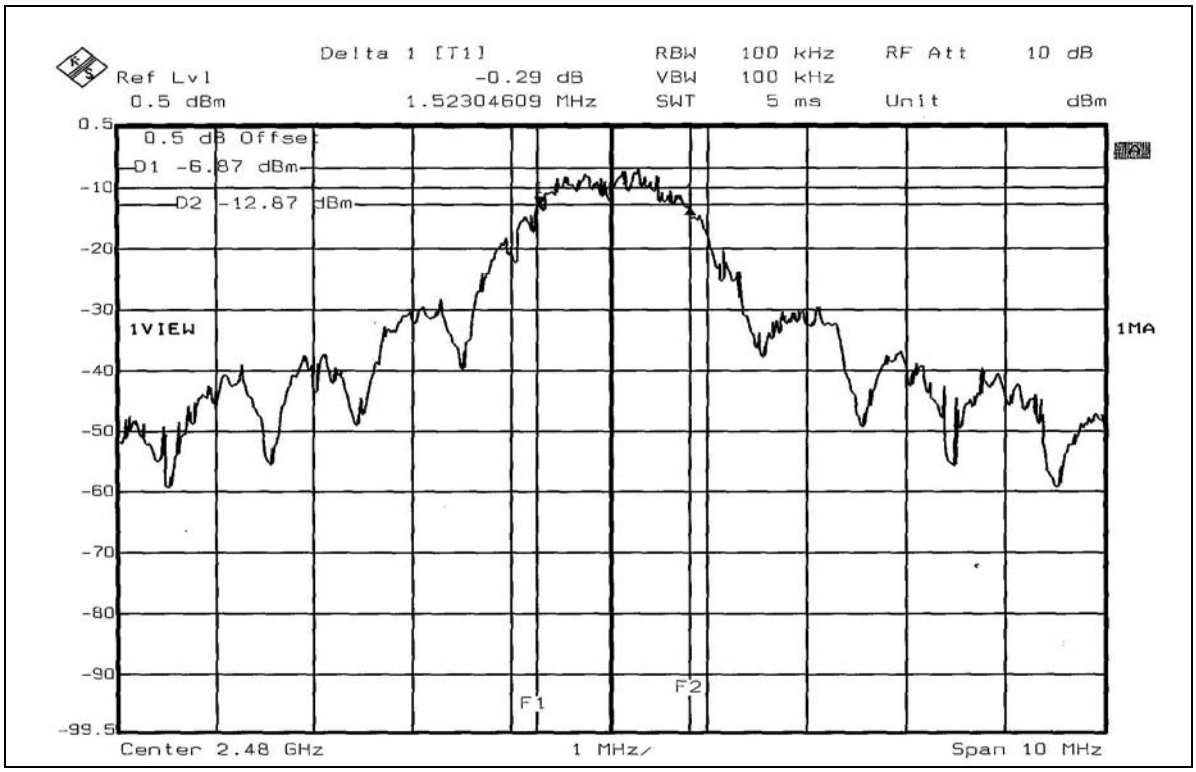
CH 1


Delta 1 [T1]
-0.58 dB
1.66332665 MHz
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
RF Att 10 dB
Unit dBm
Ref Lvl
0.5 dBm
0.5 dB Offset
D1 -7.68 dBm
D2 -13.68 dBm
1 [T1] -13.54 dBm
2.40420842 GHz
1 [T1] -0.58 dB
1.66332665 MHz
1VIEW
1MA
F1
F2
Center 2.405 GHz
1 MHz/
Span 10 MHz

CH 9


Delta 1 [T1]
-0.07 dB
1.52304609 MHz
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
RF Att 10 dB
Unit dBm
Ref Lvl
0.5 dBm
0.5 dB Offset
D1 -6.93 dBm
D2 -12.93 dBm
1VIEW
1MA
F1
F2
Center 2.445 GHz
1 MHz/
Span 10 MHz

CH 16


Delta 1 [T1]
Ref Lvl
0.5 dBm
-0.29 dB
1.52304609 MHz
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
RF Att 10 dB
Unit dBm
0.5 dB Offset
D1 -6.87 dBm
D2 -12.87 dBm
1VIEW
1MA
F1
F2
Center 2.48 GHz
1 MHz/
Span 10 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.

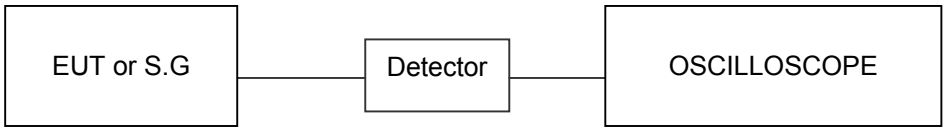
4.4.3 TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to read 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 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

DSSS modulation (Internal antenna)

EUT	Hi-Touch Station	MODEL	HTBS-01
MODULATION TYPE	O-QPSK	ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	TEST MODE	A (Internal antenna)
TESTED BY	Leo Hung		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2405	0.546	-2.63	30	PASS
9	2445	0.557	-2.54	30	PASS
16	2480	0.512	-2.91	30	PASS

DSSS modulation (External antenna)

EUT	Hi-Touch Station	MODEL	HTBS-01
MODULATION TYPE	O-QPSK	ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	TEST MODE	B (External antenna)
TESTED BY	Leo Hung		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2405	0.546	-2.63	30	PASS
9	2445	0.557	-2.54	30	PASS
16	2480	0.512	-2.91	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 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 3 kHz RBW and 30 kHz 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

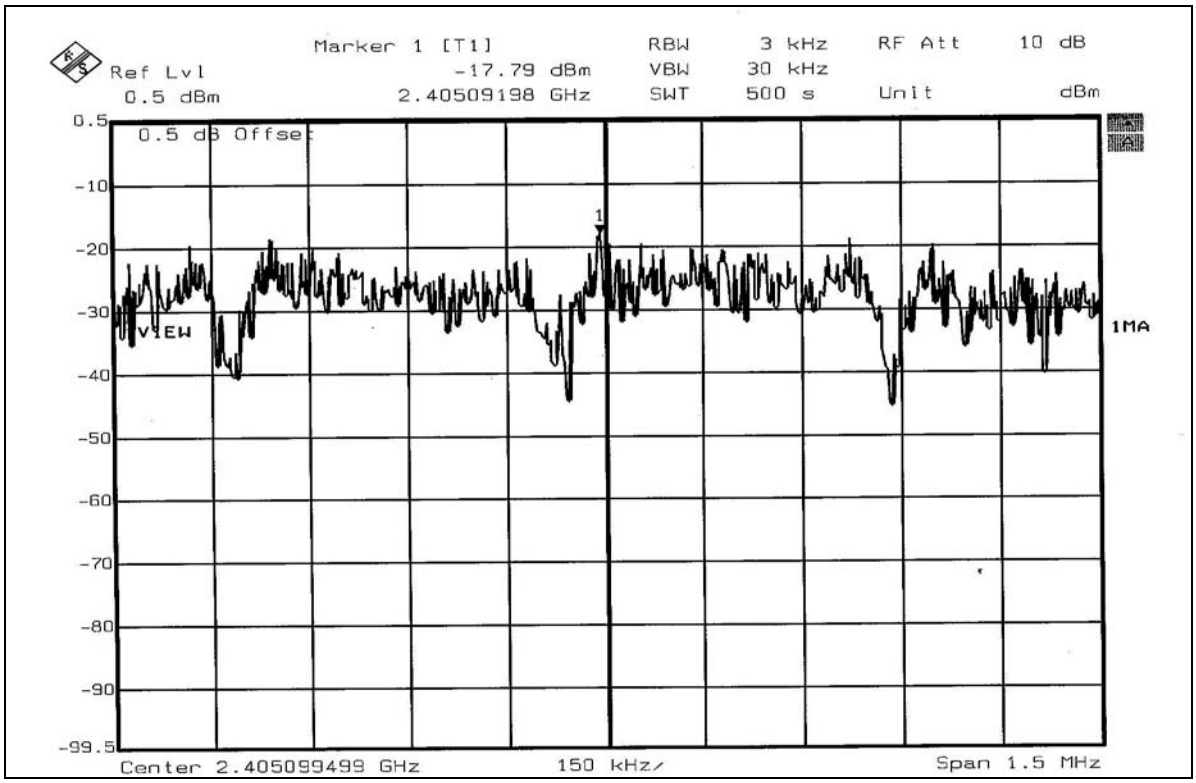
4.5.7 TEST RESULTS

DSSS modulation

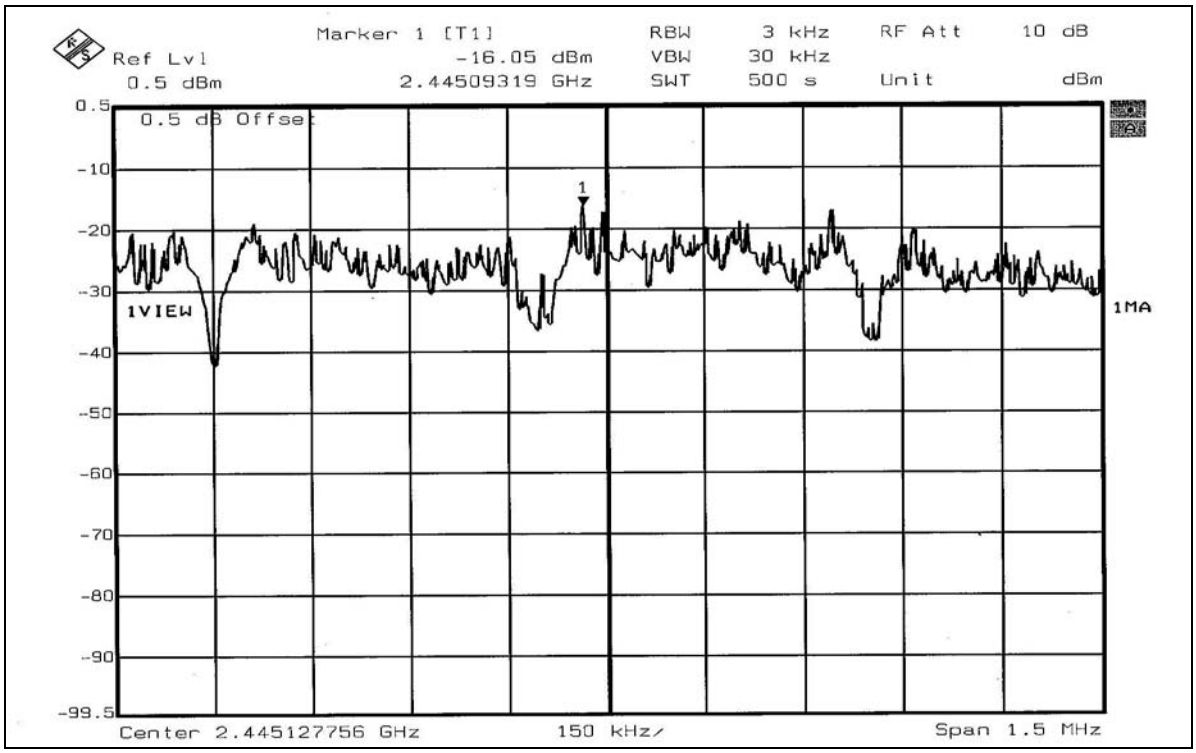
EUT	Hi-Touch Station	MODEL	HTBS-01
MODULATION TYPE	O-QPSK	ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	TESTED BY	Leo Hung

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2405	-17.79	8	PASS
9	2445	-16.05	8	PASS
16	2480	-17.26	8	PASS

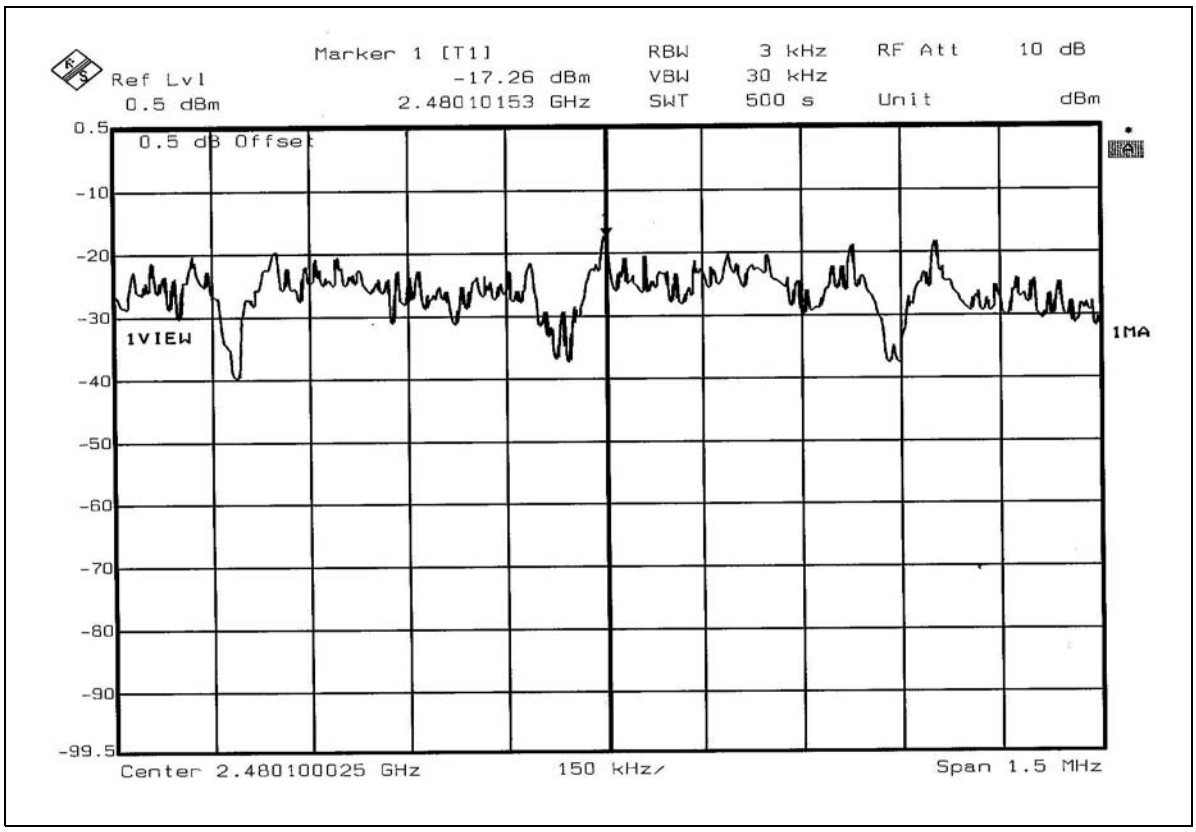
CH 1


Marker 1 [T1]
-17.79 dBm
2.40509198 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 10 dB
Unit dBm
Ref Lvl
0.5 dBm
0.5 dB Offset
1VIEW
1MA
Center 2.405099499 GHz
150 kHz/
Span 1.5 MHz

CH 9


Marker 1 [T1]
-16.05 dBm
2.44509319 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 10 dB
Unit dBm
Ref Lvl
0.5 dBm
0.5 dB Offset
1VIEW
1MA
Center 2.445127756 GHz
150 kHz/
Span 1.5 MHz

CH 16


Marker 1 [T1]
-17.26 dBm
2.48010153 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 10 dB
Unit dBm
Ref Lvl
0.5 dBm
0.5 dB Offset
1VIEW
1MA
0.5
-10
-20
-30
-40
-50
-60
-70
-80
-90
-99.5
Center 2.480100025 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 100 kHz and 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.
The spectrum plots (Peak and Average RBW=VBW=100kHz) 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 6 images. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).

4.6.7 TEST RESULTS

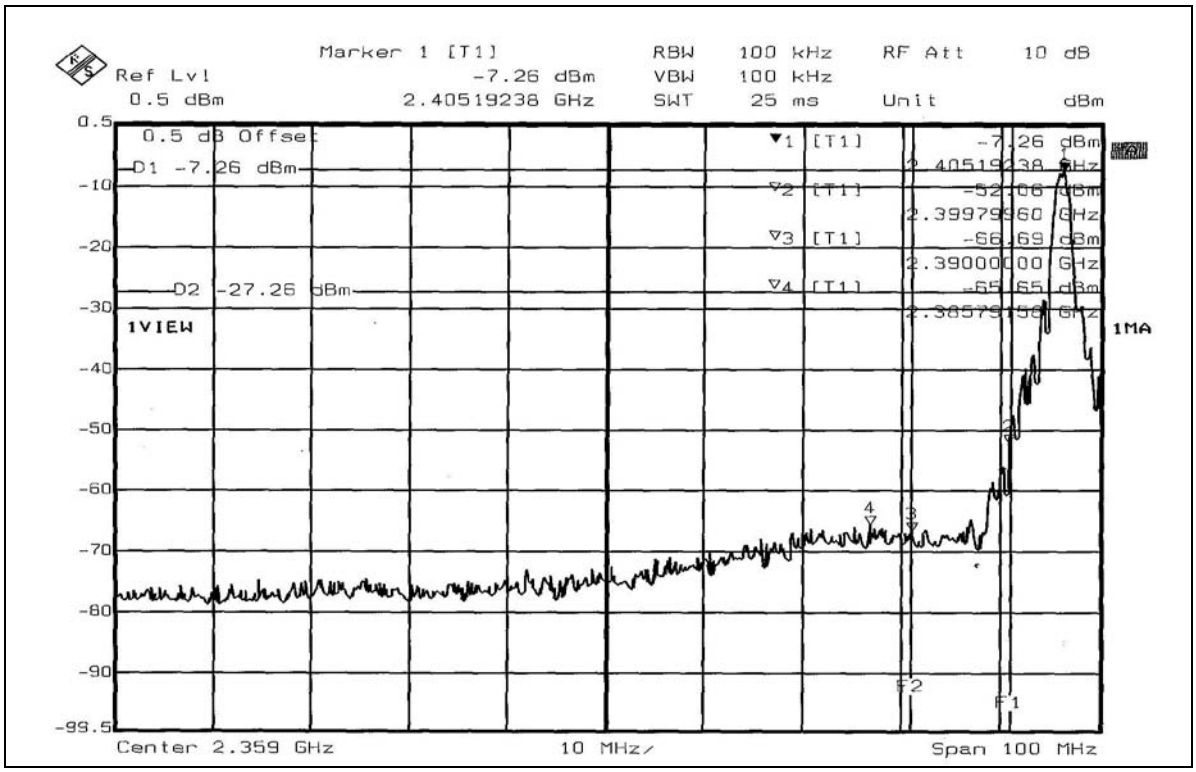
DSSS modulation

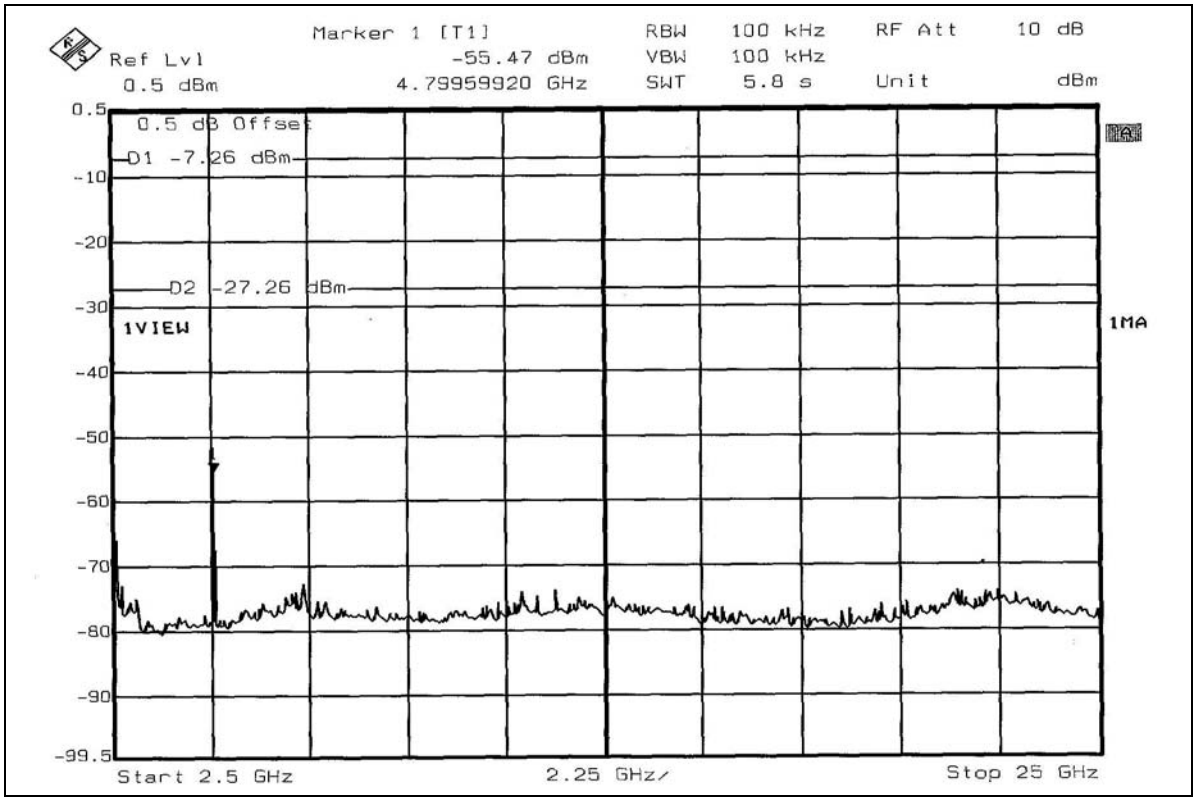
NOTE 1: The band edge emission plot on page 49 show 58.39dBc delta between carrier maximum power and local maximum emission in restrict band (2.3857GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 97.31dBuV/m (Peak), so the maximum field strength in restrict band is 97.31-58.39=38.92dBuV/m which is under 74dBuV/m limit.

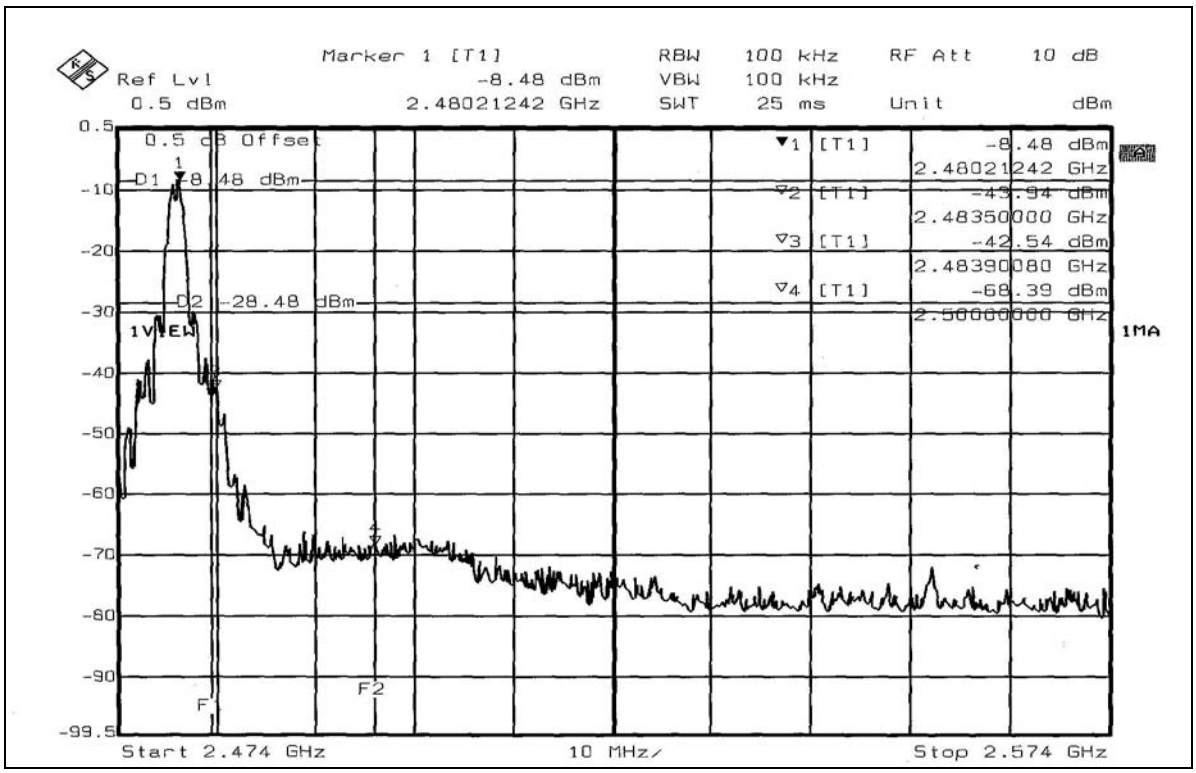
The band edge emission plot on page 49 show 58.39dBc delta between carrier maximum power and local maximum emission in restrict band (2.3857GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 87.21dBuV/m (Average), so the maximum field strength in restrict band is 87.21-58.39=28.82dBuV/m which is under 54dBuV/m limit.

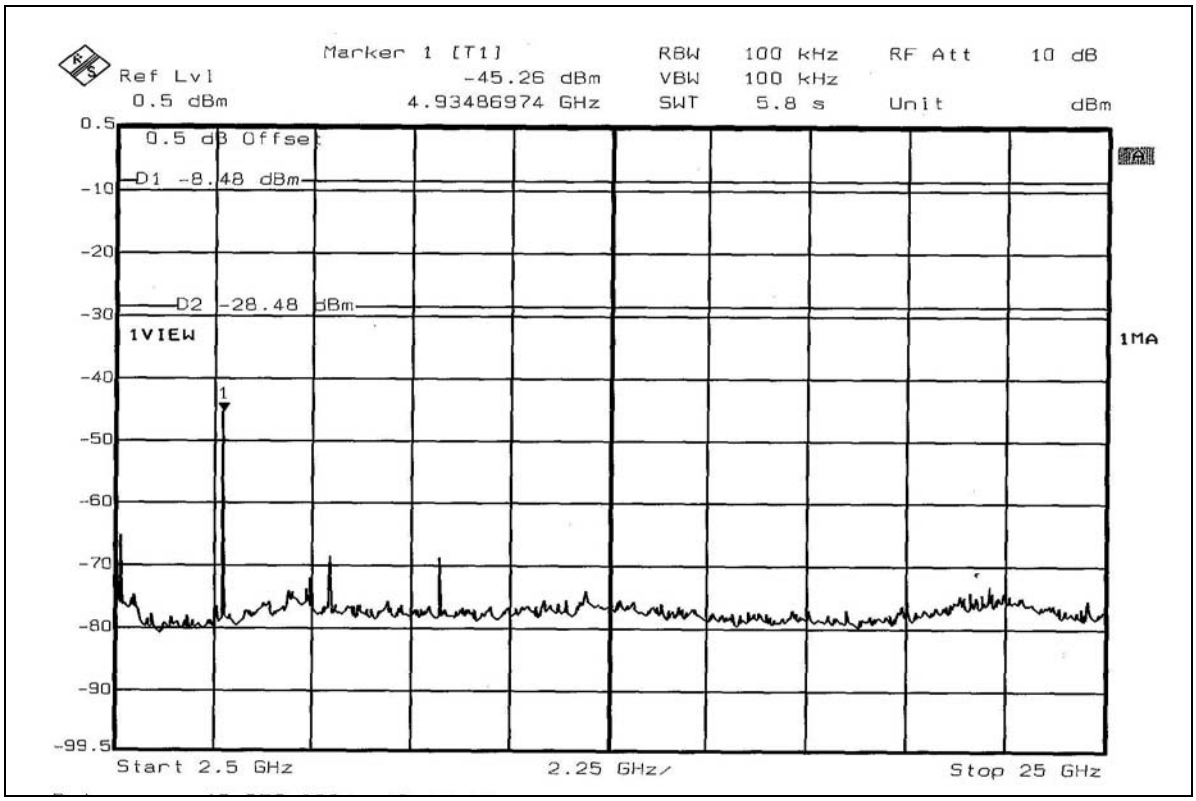
NOTE 2: The band edge emission plot on page 50 show 34.06dBc delta between carrier maximum power and local maximum emission in restrict band (2.4839GHz). The emission of carrier strength list in the test result of channel 16 at the item 4.2.7 is 96.13dBuV/m (Peak), so the maximum field strength in restrict band is 96.13-34.06=62.07dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on page 50 show 34.06dBc delta between carrier maximum power and local maximum emission in restrict band (2.4839GHz). The emission of carrier strength list in the test result of channel 16 at the item 4.2.7 is 86.03dBuV/m (Average), so the maximum field strength in restrict band is 86.03-34.06=51.97dBuV/m which is under 54dBuV/m limit.


Marker 1 [T1]
RBW 100 kHz
RF Att 10 dB
Ref Lvl
-7.26 dBm
VBW 100 kHz
0.5 dBm
2.40519238 GHz
SWT 25 ms
Unit dBm
0.5 dB Offset
D1 -7.26 dBm
D2 -27.26 dBm
1VIEW
1MA
Center 2.359 GHz
10 MHz/
Span 100 MHz


Marker 1 [T1]
RBW 100 kHz
RF Att 10 dB
Ref Lvl
-55.47 dBm
VBW 100 kHz
0.5 dBm
4.79959920 GHz
SWT 5.8 s
Unit dBm
0.5 dB Offset
D1 -7.26 dBm
D2 -27.26 dBm
1VIEW
1MA
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz


Marker 1 [T1]
RBW 100 kHz
RF Att 10 dB
Ref Lvl
-8.48 dBm
VBW 100 kHz
0.5 dBm
2.48021242 GHz
SWT 25 ms
Unit dBm
0.5 dB Offset
D1 -8.48 dBm
D2 -28.48 dBm
1VIEW
▼1 [T1] -8.48 dBm
2.48021242 GHz
▽2 [T1] -43.94 dBm
2.48350000 GHz
▽3 [T1] -42.54 dBm
2.48390080 GHz
▽4 [T1] -68.39 dBm
2.50000000 GHz
1MA
0.5
-10
-20
-30
-40
-50
-60
-70
-80
-90
-99.5
F1
F2
Start 2.474 GHz
10 MHz/
Stop 2.574 GHz


Marker 1 [T1]
RBW 100 kHz
RF Att 10 dB
Ref Lvl
-45.26 dBm
VBW 100 kHz
0.5 dBm
4.93486974 GHz
SWT 5.8 s
Unit dBm
0.5 dB Offset
D1 -8.48 dBm
D2 -28.48 dBm
1VIEW
1MA
0.5
-10
-20
-30
-40
-50
-60
-70
-80
-90
-99.5
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.

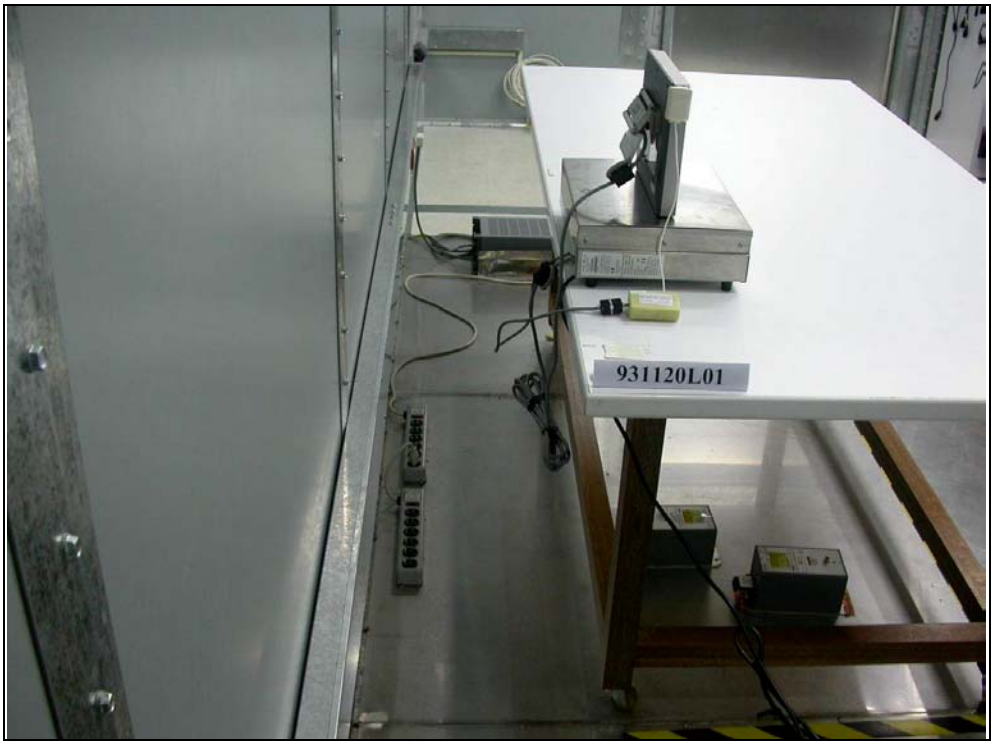
4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antennas used in this product are Internal Printed antenna without antenna connector and external Patch antenna with Reverse SMA antenna connector. And the maximum Gain of this antenna is 1.23dBi.

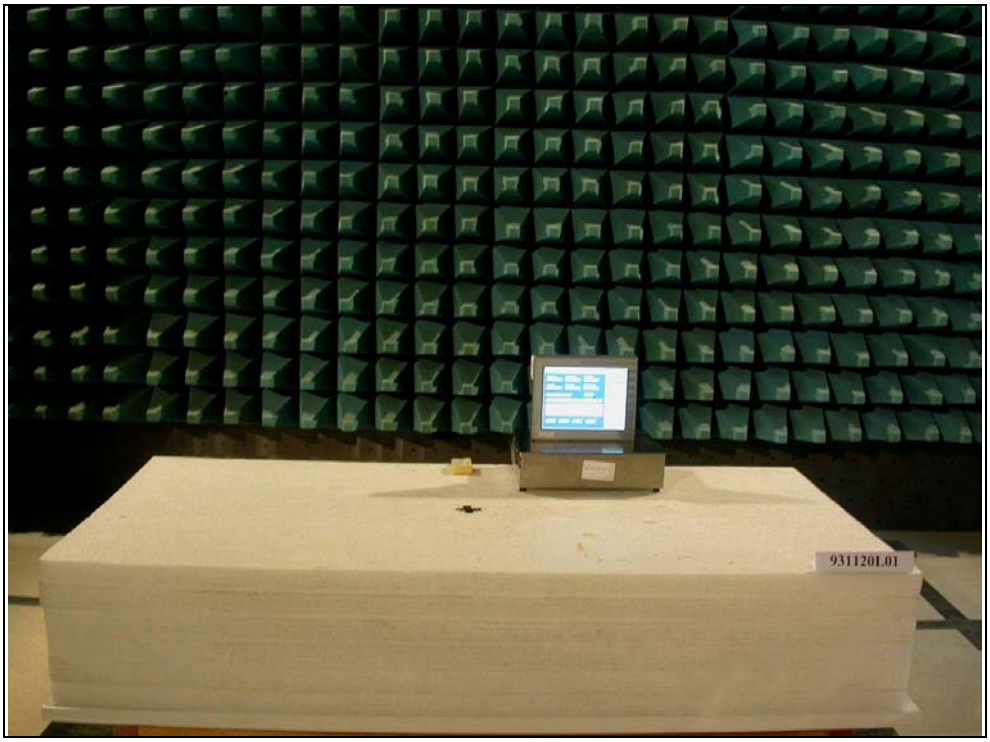
5 PHOTOGRAPHS OF THE TEST CONFIGURATION

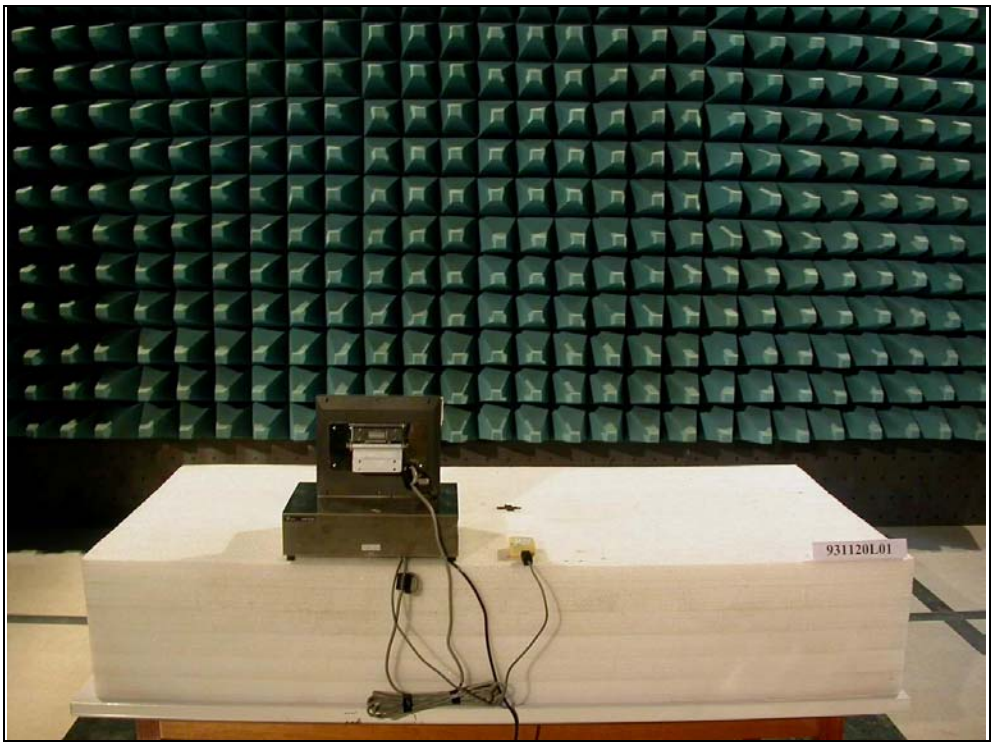
CONDUCTED EMISSION TEST
Test Mode A

Test Mode B

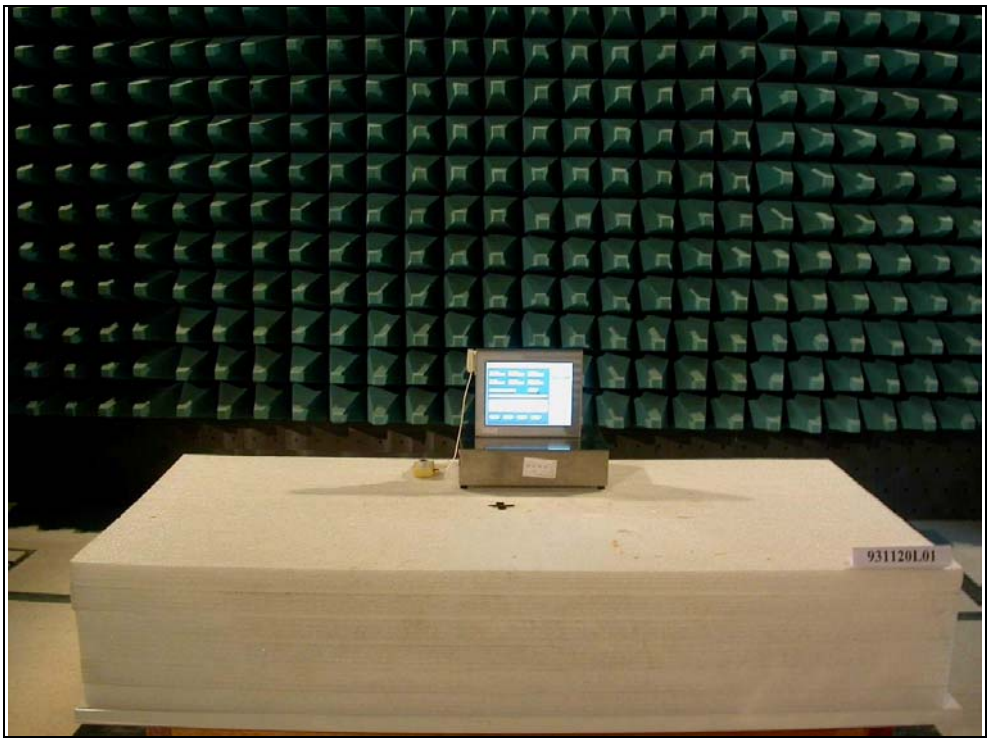


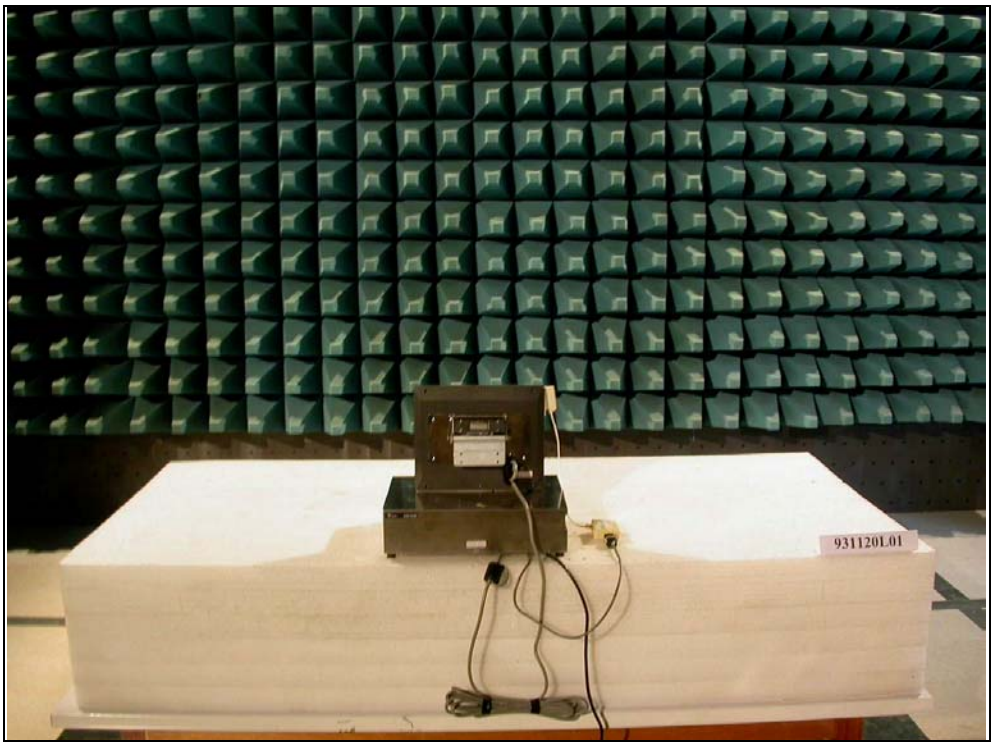
RADIATED EMISSION TEST
Test Mode A





Test Mode B





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.