



Spectrum Research & Testing Lab., Inc.
No. 167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

TEST REPORT

Reference No.: A12050903
Report No.: FCCA12050903
FCC ID : WQJ-IDCA-12X1
Page: 1 of 22
Date: Jun. 15, 2012

Product Name: Xpress CM100 reader
Model No.: IDCA-120x
Applicant: ID TECH TAIWAN Co.
10721 Walker Street, Cypress, CA 90630, USA
Date of Receipt: May. 09, 2012
Finished date of Test: Jun. 15, 2012
Applicable Standards: 47 CFR Part 15, Subpart C
47 CFR Part 15, Subpart B
ANSI C63.4: 2003

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

This report compared to original Report No. : FCCA11060401 issued on Jul. 29, 2011 differs in class II change support unit (IDCA-1261, IDCA-1221, FCC ID is WQJ-IDCA-12X1).

Tested By : Richard Lin , Date: 6/15/2012
(Richard Lin)

Approved By : [Signature] , Date: 6/15/2012
(Johnson Ho, Director)





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1. DOCUMENT POLICY AND TEST STATEMENT

1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.

1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- DC power source from (ID TECH Sign & Pay) : 5Vdc.

1.3 EUT MODIFICATION

- No modification in SRT Lab.



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2. DESCRIPTION OF EUT AND TEST MODE

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Xpress CM100 reader
MODEL NO.	IDCA-120x
POWER SUPPLY	DC power source from (ID TECH Sign & Pay) : 5Vdc
CABLE	NA
FREQUENCY BAND	13.553 MHz ~ 13.567 MHz
CARRIER FREQUENCY	13.56 MHz
NUMBER OF CHANNEL	1
RATED RF OUTPUT POWER	69.21 dBuV/m
MODULATION TYPE	ASK
ANTENNA TYPE	PCB Printed
ANTENNA GAIN	3 dBi
OPERATING TEMPERATURE RANGE	-30 ~ 80°C

NOTE : For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

2.2 DESCRIPTION OF EUT INTERNAL DEVICE

DEVICE	BRAND / MAKER	MODEL #	FCC ID / DOC	REMARK
N/A				

2.3 DESCRIPTION OF TEST MODE

Mode	
1	Tx

NOTE : The axis X,Y and Z we evaluate in chamber, the X axis is worst case.

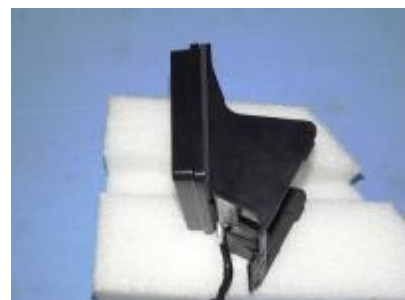
X axis:



Y axis:



Z axis:





2.4 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.4:2003. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

NO	DEVICE	BRAND	MODEL #	FCC ID /DOC	CABLE
1	PC	ACER	Aspire SA85	DoC	1.5m unshielded power cable
2	CRT Monitor	SAMSUNG	757NF	DoC	1.5m shielded data cable. 1.8m unshielded power cord
3	Keyboard	WinTEK	WM530	DoC	1.8m unshielded data cable.
4	Mouse	WinTEK	WSS30	DoC	1.5m unshielded data cable.
5	Printer	EPSON	STYLUS C20SX	N/A	1.5m unshielded power cord 1.2m shielded data cable.
6	SHANGHAI PUBLIC TRANSPORTATION CARD	Shanghai Public Transportation Card Co., Ltd	C54351833331	N/A	N/A
7	Sign & Pay	ID TECH	IDCA-3153	DoC	N/A
8	Switching adapter	DVE	DSC-6PFA-05	DoC	Input : 100-240V ~ 50/60Hz 0.2A Output : +5V, 1A

NOTE : For the actual test configuration, please refer to the photos of testing.

2.5 EUT OPERATING CONDITION

1. Setup the EUT and all peripheral devices .
2. Turn on the power of all equipment and EUT.
3. Set the EUT under continuous transmission condition or standby.
4. The EUT was set to the highest available power level.



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2.6 DESCRIPTION OF MODEL DIFFERENCE

The new model IDCA-120x was FCCID:WQJ-IDCA-12X1 Class II change application model.

Project \ Model	IDCA-1261 (Original)	IDCA-1221 (Original)	IDCA-120x (Class II change)
RF Module	○	○	○
Lay out	○	○	○
Antenna	○	○	○
I/O Port	○	○	○
Software	○	○	○
Power supply	× USB DC +5V	× External power adapter : DC +5V for RS232 model used	× DC power source from (ID TECH Sign & Pay) : 5Vdc
Base stand	○	○	× The new model was included base stand..
Main Board	○	○	○
Packing	○	○	○
Color	○	○	○

NOTE : ○ is same , × is different

The new model was included base stand.

DC power source from (ID TECH Sign & Pay) : 5Vdc



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3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a wireless product. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C

47 CFR Part 15, Subpart B

ANSI C63.4: 2003

All tests have been performed and recorded as the above standards.

3.1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

STANDARD SECTION	TEST TYPE AND LIMIT RESULTS	RESULTS
15.207	AC Power Conducted Emission	Pass
15.225(a)(b)(c)(d)	Radiated Emission (9kHz ~ 30MHz)	Pass
15.225(d), 15.209	Radiated Emission (30MHz ~ 1GHz)	Pass
15.225(e)	Frequency stability	Pass



4. FREQUENCY TOLERANCE

4.1 PROCEDURE

The frequency stability of the transmitter is measured by:

- (a) Temperature: The temperature is varied from -20°C to +50°C using an environmental chamber.
- (b) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the voltage normally input to the device or at the power supply terminals if cables are not normally supplied.

The frequency tolerance of the carrier shall be maintained within $\pm 0.01\%$ of the operating frequency.

4.2 TEST EQUIPMENT

The following test equipment was used for the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
TEMPERATURE & HUMIDITY CHAMBER	-40 to 150°C 20 to 95%	KSON	THS-D4C-180-LN2/ 3324	JUN. 2012 ETC
POWER METER	N/A	BOONTON	4232A / 115702	NOV. 2012 ETC
POWER SENSOR	DC-18GHz 0.3 μ W-100mW 50 Ω	BOONTON	51015(5E) / 32964	MAR. 2013 ETC
SPECTRUM ANALYZER	9 kHz TO 40 GHz	ROHDE & SCHWARZ	FSP40 / 100093	DEC. 2012 ETC

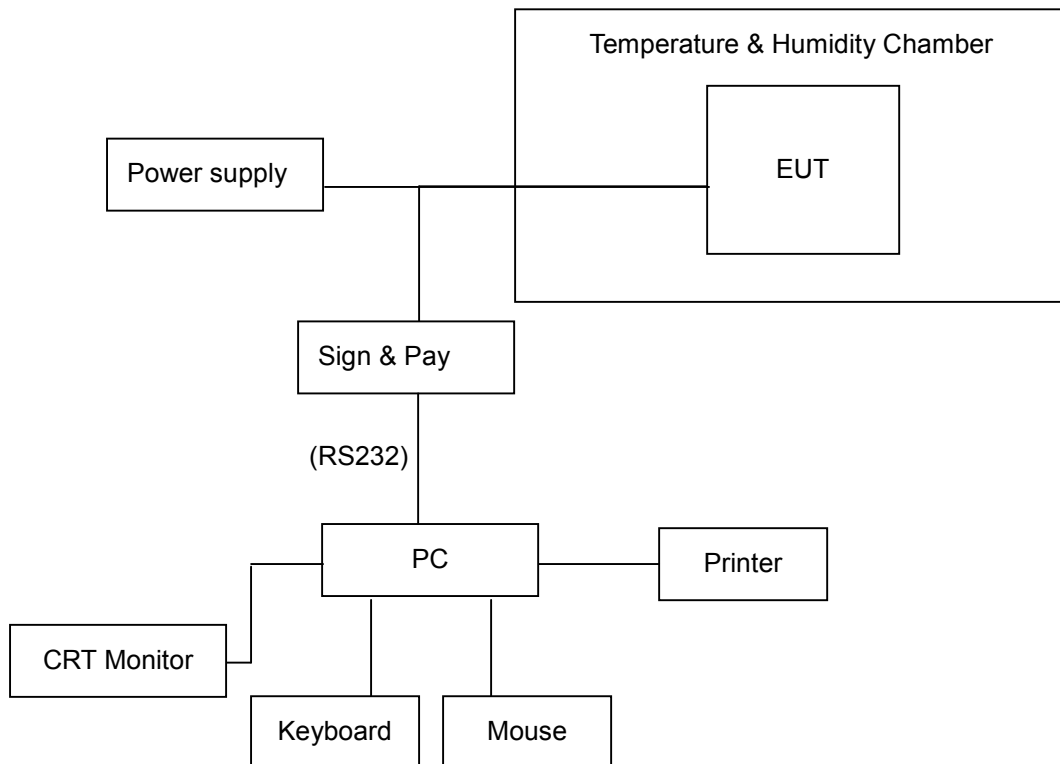
NOTE : The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



4.3 TEST SETUP

The tested unit was stayed in a Temperature & Humidity chamber and supplied with a power source for extreme condition (see configure below). It was adjusted to the maximum output power during the test.

Tx :





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4.4 TEST RESULT

Operating Frequency : 13.56 MHz
 Reference Voltage : 5Vdc
 Deviatin Limit : ±0.01%

Temperature: 24°C Humidity: 58 %RH
 Test Mode: Tx Tested By: Richard Lin
 Test result: Pass Tested Date: May. 23, 2012

Voltage (%)	Power (VDC)	Temperature (°C)	Frequency (MHz)	Deviation (%)
100	5	+20°C (Ref)	13.559573	0.0031490
100		-20	13.559689	0.0022935
100		-10	13.559674	0.0024041
100		0	13.559653	0.0025590
100		10	13.559622	0.0027876
100		25	13.559585	0.0030605
100		30	13.559558	0.0032596
100		40	13.559547	0.0033407
100		50	13.559552	0.0033038
85		4.25	20	13.559576
115	5.75	20	13.559594	0.0029941



5. TECHNICAL CHARACTERISTICS TEST

5.1 CONDUCTED EMISSION TEST

5.1.1 LIMIT

Frequency (MHz)	Class A (dB μ V)		Class B (dB μ V)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	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.

5.1.2 TEST EQUIPMENT

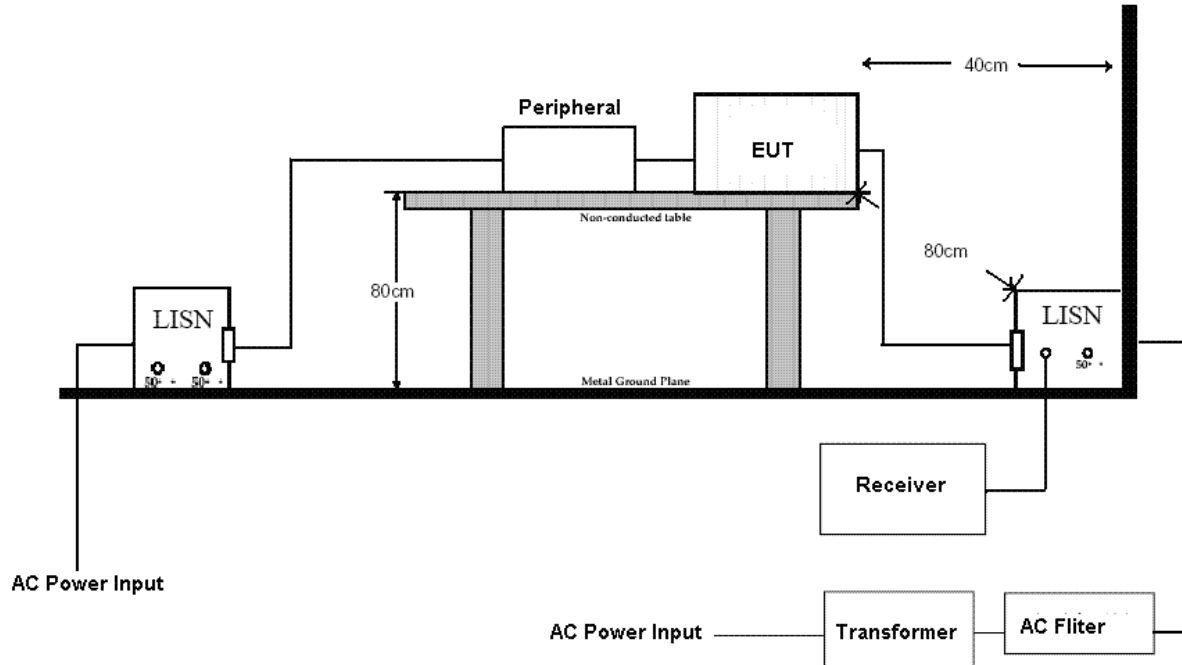
The following test equipment was used for the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	9 kHz ~ 2.75 GHz	ROHDE & SCHWARZ	ESCS30 / 100376	DEC. 2012 ETC
EMI TEST RECEIVER	9 kHz ~ 30 MHz	ROHDE & SCHWARZ	ESHS30 / 826003/008	FEB. 2013 ETC
LISN	50 μ H, 50 ohm	FCC	FCC-LISN-50-25-2 / 01017	JUN. 2012 ETC
LISN	50 μ H, 50 ohm	SOLAR	9252-50-R-24-BNC/ 951315	OCT. 2012 ETC
LISN	50 μ H, 50 ohm	EMCO	3825/2/ 9204-1952	JUN. 2012 ETC
50 OHM TERMINATOR	50 ohm	HP	11593A / #3	NOV. 2012 ETC
COAXIAL CABLE	5 M	TIMES	RG214/U / #5M(L1TCAB013)	MAY. 2012 ETC
Filter	2 LINE, 30 A	FIL.COIL	FC-943 / 771	NCR
GROUND PLANE	2 M (H) x 3 M (W)	SRT	N/A	NCR
GROUND PLANE	2.5 M (H) x 3 M (W)	SRT	N/A	NCR
PULSE LIMITER	0 MHz ~ 30 MHz	ROHDE & SCHWARZ	ESH3Z2/ 357.8810.52	MAR. 2013 ETC

NOTE : The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



5.1.3 TEST SETUP



NOTE :

1. The EUT was put on a wooden table with 0.8m heights above ground plane, and 0.4m away from reference ground plane (> 2m x 2m).
2. For the actual test configuration, please refer to the photos of testing.

5.1.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR22:2003. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm/50 μ H as specified. All readings were quasi-peak and average values with 10 kHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. Both lines of the power mains of EUT were measured and the cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.



5.1.5 TEST RESULT

Temperature:	23 °C	Humidity:	56 %RH
Tested By:	Richard Lin	Tested Mode:	Tx
Receiver Detector:	Q.P. and AV.	Modulation Type:	ASK
Frequency Range:	0.15 – 30 MHz	Tested Date:	May. 22, 2012

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.263	0.06	43.80	30.80	43.86	30.86	62.76	52.76	-18.90	-21.90
0.423	-0.03	42.60	29.40	42.57	29.37	58.19	48.19	-15.62	-18.82
0.783	-0.03	38.50	21.50	38.47	21.47	56.00	46.00	-17.53	-24.53
1.220	-0.02	37.10	23.50	37.08	23.48	56.00	46.00	-18.92	-22.52
13.560	0.24	50.60	44.00	50.84	44.24	60.00	50.00	-9.16	-5.76
28.220	0.53	42.90	36.50	43.43	37.03	60.00	50.00	-16.57	-12.97

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dB μ V)		Emission Level (dB μ V)		Limit (dB μ V)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.244	0.48	42.00	26.90	42.48	27.38	63.32	53.32	-20.84	-25.94
0.361	0.45	37.00	25.80	37.45	26.25	59.97	49.97	-22.52	-23.72
0.822	0.39	31.20	18.20	31.59	18.59	56.00	46.00	-24.41	-27.41
1.248	0.38	29.10	18.90	29.48	19.28	56.00	46.00	-26.52	-26.72
13.560	0.61	44.60	38.60	45.21	39.21	60.00	50.00	-14.79	-10.79
27.123	0.94	43.70	38.40	44.64	39.34	60.00	50.00	-15.36	-10.66

NOTE :

1. Measurement uncertainty is ± 3.61 dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



5.2 RADIATED EMISSION TEST

5.2.1 LIMIT

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength @30m (uV/m)	Field strength @30m (dBuV/m)	Field strength @3m (dBuV/m)
Below 13.110	30	29.5	69.5
13.110 ~13.410	106	40.5	80.5
13.410~13.553	334	50.5	90.5
13.553~13.567	15,848	84	124
13.567~13.710	334	50.5	90.5
13.710~14.010	106	40.5	80.5
Above 14.010	30	29.5	69.5

NOTE :

1. dBuV/m = 20*log(uV/m)
2. Distance factor = 40dB / decade(15.31(f))

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below 1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (dBμV/m)
0.009 - 0.490	300	2400/F(KHz)
0.490 - 1.705	30	24000/F(KHz)
1.705 - 30	30	30
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
Above 960	3	54.0



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5.2.2 TEST EQUIPMENT

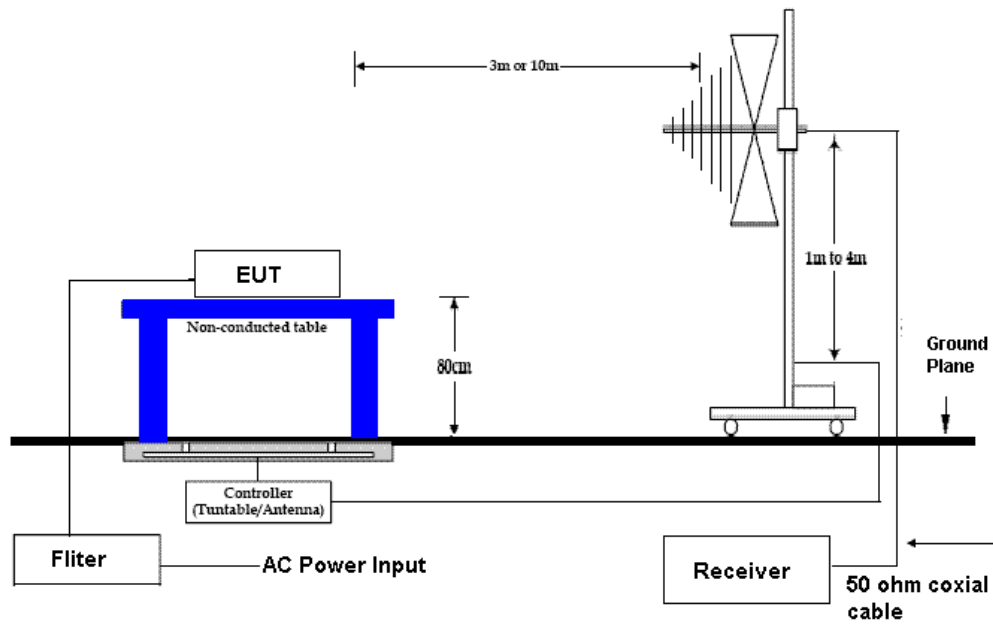
The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	20 MHz – 1000 MHz	ROHDE & SCHWARZ	ESVS30 / 841977/003	Dec. 2012 ETC
BI-LOG ANTENNA	30 MHz ~ 2 GHz	SCHAFFNER	CBL6141A / 4181	JUN. 2012 ETC
OPEN AREA TEST SITE	3 – 10 M MEASUREMENT	SRT	A02 / SRT002	JUN. 2012 SRT
COAXIAL CABLE	30 M	TIMES	LMR-400 / #30M (L1TCAB014)	MAY. 2013 ETC
FILTER	2 LINE, 30 A	FIL.COIL	FC-943 / 869	May. 2012 ETC
CDN	0.15 MHz ~ 300 MHz	LUTHI	CDN L-801 M2/M3 / 2790	MAY. 2013 ETC
Loop Antenna	9 KHz TO 30 MHz	ETS.LINDGREN	6512/ 00063889	JUN. 2012 ETC

NOTE : The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



5.2.3 TEST SET-UP Below 1GHz



NOTE :

1. The EUT system was put on a wooden table with 0.8m heights above a ground plane. For the actual test configuration, please refer to the photos of testing.

5.2.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR 22:2003. The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz. When the frequency spectrum measured started from 10 MHz to 30 MHz, then use antenna is a loop antenna. When the frequency spectrum measured started from 30 MHz. Under 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency. First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.



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5.2.5 TEST RESULT

Temperature:	23 °C	Humidity:	62 %RH
Tested By:	Richard Lin	Tested Mode:	Tx
Receiver Detector:	Q.P. or AV.	Modulation Type:	ASK
Frequency Range:	9K – 30MHz	Tested Date:	Jun. 05, 2012

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
13.56	0.59	34.12	34.50	69.21	124.00	-54.79

NOTE :

1. Below 30Mhz was applied Average Detector.
2. There was no detected Restricted bands and Radiated suprious emission below 30MHz.
3. The 30m limit was converted to 3m Limit using square factor(x) as it was found by measurements as follows;

$$3 \text{ m Limit(dBuV/m)} = 20\log(X)+40\log(30/3)= 20\log(15848)+40\log(30/3) = 124\text{dBuV}$$



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Tested By:	Richard Lin	Tested Mode:	Tx
Receiver Detector:	Q.P. or AV.	Modulation Type:	ASK
Frequency Range:	30M – 1GHz	Tested Date:	Jun. 05, 2012

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
69.32	1.29	7.98	16.45	25.72	40.0	-14.28	97	3.58
87.49	1.43	8.35	17.83	27.61	40.0	-12.39	125	3.09
121.07	1.66	11.77	19.81	33.24	43.5	-10.26	238	2.91
172.93	1.97	10.90	24.11	36.98	43.5	-6.52	106	2.64
199.55	2.13	11.50	26.37	40.00	43.5	-3.51	75	2.33
530.89	3.86	18.24	11.14	33.24	46.0	-12.76	196	1.85

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
44.26	1.07	17.14	11.66	29.87	40.0	-10.13	301	1.88
68.33	1.28	8.26	19.92	29.46	40.0	-10.54	254	2.12
96.57	1.49	9.28	23.58	34.35	43.5	-9.15	173	2.47
134.86	1.74	12.44	20.63	34.81	43.5	-8.69	135	2.68
172.93	1.97	10.90	24.46	37.33	43.5	-6.17	228	2.99
199.55	2.13	11.50	22.58	36.21	43.5	-7.30	317	3.45

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "***": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



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6. Antenna application

6.1 Antenna requirement

The EUT's antenna is met the requirement of FCC part15C section15.203 and 15.204.

6.2 Result

The EUT's antenna used a PCB printed. Gain of antenna types is 3dBi that meet the requirement.



7. PHOTOS OF TESTING

- Radiated test (below 3M , Tx)





Spectrum Research & Testing Lab., Inc.
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TEST REPORT

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- Radiated test (below 1G , Tx)





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8. TERMS OF ABBREVIATION

AV.	Average detection
AZ(°)	Turn table azimuth
Correct.	Correction
EL(m)	Antenna height (meter)
EUT	Equipment Under Test
Horiz.	Horizontal direction
LISN	Line Impedance Stabilization Network
NSA	Normalized Site Attenuation
Q.P.	Quasi-peak detection
SRT Lab	Spectrum Research & Testing Laboratory, Inc.
Vert.	Vertical direction