



Spectrum Research & Testing Lab., Inc.
No. 101-10, Ling 8,
Shan-Tong Li, Chung-Li
City, Taoyuan, Taiwan

TEST REPORT

Reference No.: A11022404
Report No.: FCCA08041101-01
FCC ID: V8MTS300ZW
Page: 1 of 26
Date: Mar. 07, 2011

Product Name: US Z-Wave USB Interface
Model No.: 300ZWUS-W
Applicant: TrickleStar Limited
UNIT 801, 8TH GLOOR, PACIFIC HOUSE 20 QUEEN'S
ROAD, CENTRAL, HONG KONG.
Date of Receipt: Feb. 24, 2011
Finished date of Test: Mar. 07, 2011
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.

Tested By :

Shunm Wang
(Shunm Wang)

Date: Mar. 07, 2011

Approved By :

Johnson Ho
(Johnson Ho, Director)

Date: 3/7/2011



FMNG-059.10 REPORT



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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.
- AC power source, 120 Vac/60 Hz, was used during the test.

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	US Z-Wave USB Interface
MODEL NO.	300ZWUS-W
POWER SUPPLY	5V DC form PCI interface
CABLE	N/A
I/O PORT	USB
FREQUENCY BAND	ISM 902 ~ 928 MHz
CARRIER FREQUENCY	908.4 MHz at 40kbps ; 908.42 MHz at 9.6kbps
NUMBER OF CHANNEL	1
CHANNEL BANDWIDTH	20 dB channel bandwidth is about 150KHz for 40kbit
I.F. & L.O.	I.F : 40Kbit/s 908.6 MHz ~ 908.4 MHz :200KHz L.O : 908.6MHz
RATED RF OUTPUT POWER	0dBm
MODE OF OPERATION	Half Duplex
MODULATION TYPE	FSK
OPERATION BANDWIDTH RANGE	-5 ~ 50 °C
BIT RATE OF TRANSMISSION	40kbps , 9.6kbps
ANTENNA TYPE	Monopole
ANTENNA GAIN	2.42 dBi

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				



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2.3 DESCRIPTION OF TEST MODE

Frequency (MHz)
908.40
908.42

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	Notebook	DELL	PP21L	DOC	1.8m unshielded power cord

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

2.5 EUT OPERATING CONDITION

Under Windows XP ran "EMI TEST", and "ZwaveERTT" program or accessed the following peripherals directly or via EUT:

- Notebook

2.6 DESCRIPTION OF DIFFERENCE

	Original(300ZWUS-W)	NEW(300ZWUS-W)
Product and Model	○	○
External	○	×
RF Module	○	○
Lay out	○	○
Antenna	○	×
I/O	○	○



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3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a kind of 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.



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4. TECHNICAL CHARACTERISTICS TEST

4.1 CONDUCTED EMISSION TEST

4.1.1 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.

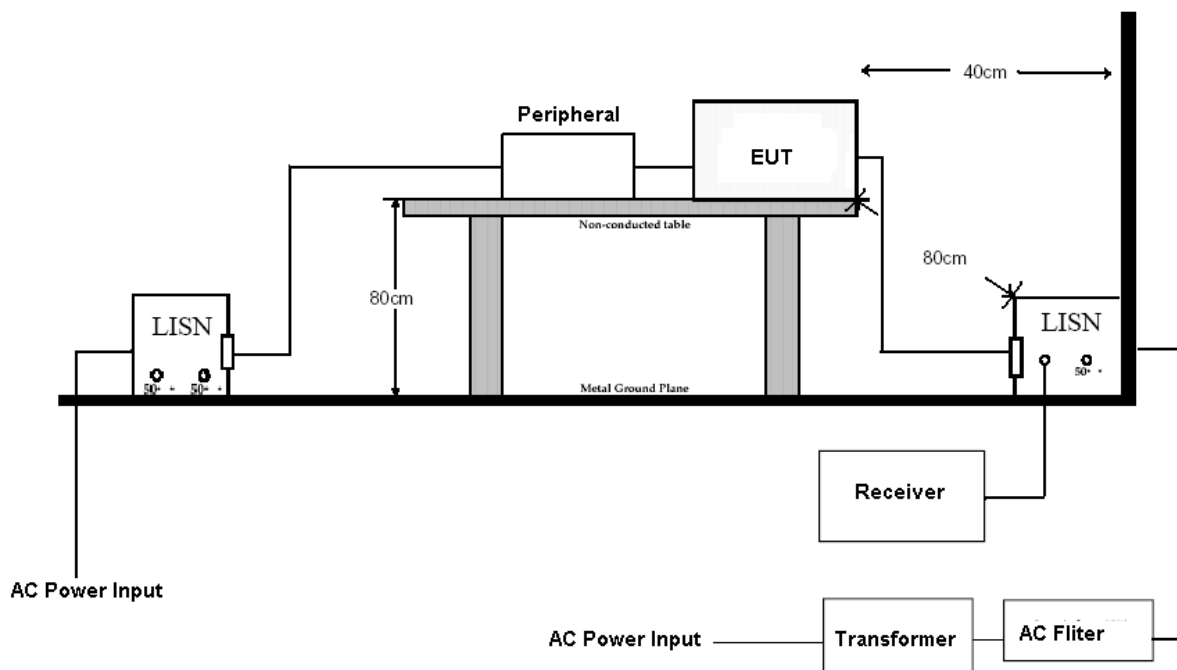
4.1.2 TEST EQUIPMENT

The following test equipment was used for the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	9kHz TO 2.75 GHz	ROHDE & SCHWARZ	ESHS30 / 826003/008	SEP.2011 ETC
LISN	50 μ H, 50 ohm	FCC	FCC-LISN-50-25-2 / 01017	JUL. 2011 ETC
LISN	50 μ H, 50 ohm	SOLAR	9252-50-R24-BNC / 951315	NOV. 2011 ETC
50 OHM TERMINATOR	50 ohm	HP	11593A / #2	MAY 2011 ETC
COAXIAL CABLE	5M	TIMES	RG214/U / #5M(L1TCAB013)	MAY. 2011 ETC
Filter	2 LINE, 30A	FIL.COIL	FC-943 / 771	NCR
GROUND PLANE	2M (H) x 3M (W)	SRT	N/A	NCR
GROUND PLANE	2.5M (H) x 3M (W)	SRT	N/A	NCR

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

4.1.3 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 (> 2mx2m).
2. For the actual test configuration, please refer to the photos of testing.
3. The serial no. of the LISN connected to EUT is 01017.
4. The serial no. of the LISN connected to support units is 01018.

4.1.4 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/50μH 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.



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4.1.5 TEST RESULT

Temperature:	17 °C	Humidity:	70 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Standby
Receiver Detector:	Q.P. and AV.	Modulation Type:	N/A
Tested By:	Shunm Wang		
Antenna Type:	Monopole	Tested Date:	Mar. 07, 2011

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.
0.159	0.39	48.81	25.15	49.20	25.54	65.74	55.74	-16.54	-30.20
0.162	0.39	48.51	25.17	48.90	25.56	65.66	55.66	-16.76	-30.10
1.110	0.18	31.37	28.47	31.55	28.65	56.00	46.00	-24.45	-17.35
3.685	0.19	25.44	15.22	25.63	15.41	56.00	46.00	-30.37	-30.59
4.210	0.19	30.46	17.41	30.65	17.60	56.00	46.00	-25.35	-28.40
5.264	0.20	23.57	13.97	23.77	14.17	60.00	50.00	-36.23	-35.83

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.
0.156	0.39	48.57	25.26	48.96	25.65	65.83	55.83	-16.87	-30.18
0.159	0.39	49.57	24.83	49.96	25.22	65.74	55.74	-15.78	-30.52
0.696	0.22	34.41	29.60	34.63	29.82	56.00	46.00	-21.37	-16.18
1.230	0.20	30.26	23.88	30.46	24.08	56.00	46.00	-25.54	-21.92
3.041	0.21	22.82	16.23	23.03	16.44	56.00	46.00	-32.97	-29.56
9.293	0.25	22.80	12.71	23.05	12.96	60.00	50.00	-36.95	-37.04

NOTE :

1. Measurement uncertainty is +/-2.0dB
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.



TEST REPORT

Temperature:	17 °C	Humidity:	70 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx
Receiver Detector:	Q.P. and AV.	Modulation Type:	N/A
Tested By:	Shunm Wang	Tested Frequency:	908.40 MHz
Antenna Type:	Monopole	Tested Date:	Mar. 07, 2011

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.
0.150	0.39	51.01	24.47	51.40	24.86	66.00	56.00	-14.60	-31.14
0.156	0.39	53.78	29.03	54.17	29.42	65.83	55.83	-11.66	-26.41
0.519	0.20	31.41	18.86	31.61	19.06	56.00	46.00	-24.39	-26.94
1.299	0.18	27.67	16.07	27.85	16.25	56.00	46.00	-28.15	-29.75
1.309	0.18	20.83	5.76	21.01	5.94	56.00	46.00	-34.99	-40.06
9.608	0.23	19.92	13.15	20.15	13.38	60.00	50.00	-39.85	-36.62

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.
0.150	0.39	47.27	21.86	47.66	22.25	66.00	56.00	-18.34	-33.75
0.153	0.39	53.46	25.81	53.85	26.20	65.91	55.91	-12.06	-29.71
0.706	0.22	35.05	31.74	35.27	31.96	56.00	46.00	-20.74	-14.05
3.833	0.22	30.94	18.37	31.16	18.59	56.00	46.00	-24.84	-27.41
4.180	0.22	21.00	11.81	21.22	12.03	56.00	46.00	-34.78	-33.97
9.537	0.26	18.15	8.25	18.41	8.51	60.00	50.00	-41.59	-41.49

NOTE :

1. Measurement uncertainty is +/-2.0dB
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.



TEST REPORT

Temperature:	17 °C	Humidity:	70 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Tx
Receiver Detector:	Q.P. and AV.	Modulation Type:	N/A
Tested By:	Shunm Wang	Tested Frequency:	908.42 MHz
Antenna Type:	Monopole	Tested Date:	Mar. 07, 2011

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.
0.162	0.39	49.13	25.54	49.52	25.93	65.66	55.66	-16.14	-29.73
0.165	0.39	47.17	28.03	47.56	28.42	65.57	55.57	-18.01	-27.15
0.528	0.20	31.06	24.05	31.26	24.25	56.00	46.00	-24.74	-21.75
3.744	0.19	27.83	20.43	28.02	20.62	56.00	46.00	-27.98	-25.38
4.368	0.19	22.88	9.44	23.07	9.63	56.00	46.00	-32.93	-36.37
5.091	0.20	24.70	14.36	24.90	14.56	60.00	50.00	-35.10	-35.44

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.
0.156	0.39	52.18	25.03	52.57	25.42	65.83	55.83	-13.26	-30.41
0.171	0.39	49.25	37.05	49.64	37.44	65.40	55.40	-15.76	-17.96
0.692	0.22	29.27	18.36	29.49	18.58	56.00	46.00	-26.51	-27.42
4.051	0.22	31.53	20.65	31.75	20.87	56.00	46.00	-24.25	-25.13
4.229	0.22	28.37	17.12	28.59	17.34	56.00	46.00	-27.41	-28.66
9.862	0.26	21.90	11.09	22.16	11.35	60.00	50.00	-37.84	-38.65

NOTE :

1. Measurement uncertainty is +/-2.0dB
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.



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4.2 RADIATED EMISSION TEST

4.2.1 LIMIT

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (dB μ V/m)
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
Above 960	3	54.0

NOTE :

1. In the emission tables above , the tighter limit applies at the band edges.
2. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.

FCC Part 15, Section15.35(b) limit of radiated emission for frequency above 1000 MHz

FREQUENCY (MHz)	Class A (dBUV/m) (at 3m)		Class B (dBUV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0

FCC Part 15, Section15.249(a) limit of radiated emission

Fundamental Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (mV/m)
902 ~ 928	50 or 94 (dBUV/m)	500 or 114 (dBUV/m)
2400 ~ 2483.5	50 or 94 (dBUV/m)	500 or 114 (dBUV/m)



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4.2.2 TEST EQUIPMENT

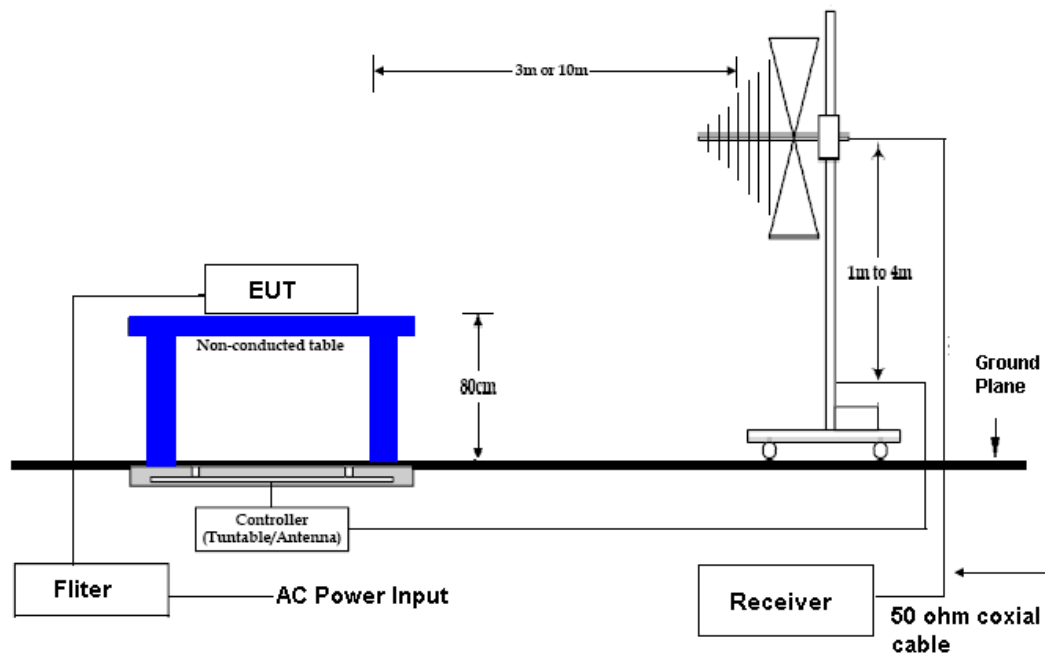
The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	20 MHz TO 1000 MHz	ROHDE & SCHWARZ	ESVS30 / 841977/003	DEC. 2011 ETC
BI-LOG ANTENNA	30 MHz TO 2 GHz	SCHAFFNER	CBL6141A / 4181	MAY. 2011 ETC
OATS	3 – 10 M MEASUREMENT	SRT	SRT-1	NOV. 2011 SRT
COAXIAL CABLE	30M	TIMES	LMR-400 / #30M	MAY. 2011 ETC
FILTER	2 LINE, 30A	FIL.COIL	FC-943 / 869	NCR
SPECTRUM ANALYZER	9K-40GHz	R&S	FSP40/ 100093	DEC. 2011 ETC
PRE-AMPLIFIER	1 GHz TO 26.5 GHz	HP	8449B/ 3008A01995	JAN. 2012 ETC
HORN ANTENNA	1 GHz TO 18 GHz	EMCO	3115/ 6881	NOV. 2011 ETC
HORN ANTENNA	1 GHz TO 18 GHz	EMCO	3115/ 9012-3619	MAY. 2011 ETC
HORN ANTENNA	18 GHz TO 40 GHz	EMCO	3116/ 00032255	JAN. 2012 ETC
K-TYPE CABLE	15M	HUBER SUHNER	SF 102-40/2*11/ 23932/2	MAY. 2011 ETC
K-TYPE CABLE	1M	HUBER SUHNER	SF 102-40/2*11/ 23934/2	NOV. 2011 ETC

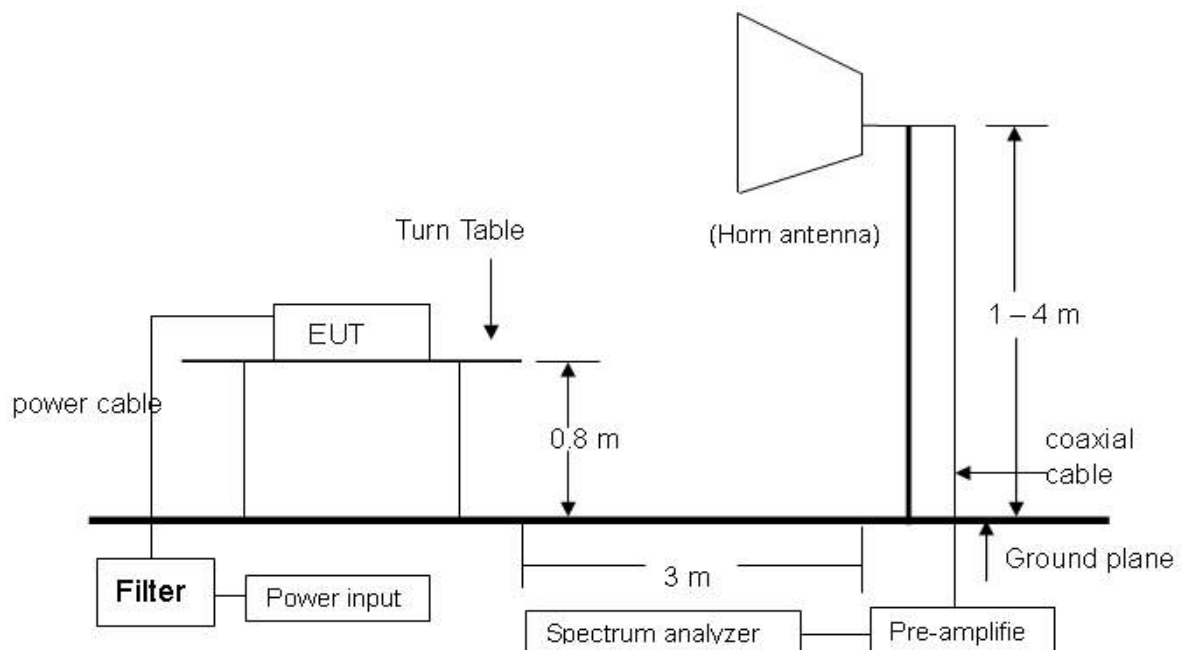
NOTE:

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

4.2.3 TEST SET-UP 30MHz ~ 1GHz



Above 1GHz



NOTE :

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



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4.2.4 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 above 1GHz. 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. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. 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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4.2.5 TEST RESULT

Temperature:	16 °C	Humidity:	69 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	Standby
Tested By:	Shunm Wang	Tested Date:	Mar. 07, 2011

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)
132.2500	1.62	12.62	15.3	29.5	43.5	-14.0	227	2.59
222.2600	2.02	13.10	12.1	27.2	46.0	-18.8	153	2.35
266.1500	2.26	13.34	10.9	26.5	46.0	-19.5	205	2.14
312.2500	2.45	14.19	14.6	31.2	46.0	-14.8	10	1.95
335.1700	2.54	14.74	11.2	28.5	46.0	-17.5	126	1.62
488.3200	3.15	17.83	8.7	29.7	46.0	-16.3	325	1.54

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)
172.0200	1.80	10.90	12.2	24.9	43.5	-18.6	151	1.27
192.3600	1.90	11.08	10.1	23.1	43.5	-20.4	39	1.35
230.5800	2.10	12.70	11.8	26.6	46.0	-19.4	147	1.11
266.2000	2.26	13.34	13.2	28.8	46.0	-17.2	285	1.28
312.3800	2.45	14.19	15.2	31.8	46.0	-14.2	119	1.40
335.6900	2.54	14.74	13.9	31.2	46.0	-14.8	14	1.14

NOTE :

1. Measurement uncertainty is +/-2.3dB.
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.



TEST REPORT

Temperature:	16 °C	Humidity:	69 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	Tx (908.40 MHz)
Tested By:	Shunm Wang	Tested Date:	Mar. 07, 2011

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)
178.5300	1.80	10.60	21.9	34.3	43.5	-9.2	274	2.62
222.0200	2.02	13.10	22.8	37.9	46.0	-8.1	265	2.34
265.5600	2.25	13.35	24.6	40.2	46.0	-5.8	293	2.41
312.2500	2.45	14.19	26.4	43.0	46.0	-3.0	285	2.19
335.9710	2.54	14.74	26.0	43.3	46.0	-2.7	36	1.81
488.5700	3.15	17.83	19.1	40.1	46.0	-5.9	271	1.59

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)
230.2510	2.10	12.70	14.9	29.7	46.0	-16.3	353	1.34
265.6500	2.25	13.35	16.8	32.4	46.0	-13.6	349	1.24
312.2520	2.45	14.19	23.7	40.3	46.0	-5.7	94	1.19
335.9690	2.54	14.74	23.2	40.5	46.0	-5.5	103	1.28
368.4800	2.67	15.53	19.9	38.1	46.0	-7.9	355	1.07
432.7500	2.93	16.94	16.2	36.1	46.0	-9.9	87	1.12

NOTE :

1. Measurement uncertainty is +/-2.3dB.
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.
5. (F) = Fundamental



TEST REPORT

Temperature:	16 °C	Humidity:	69 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	Tx (908.42 MHz)
Tested By:	Shunm Wang	Tested Date:	Mar. 07, 2011

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)
178.5320	1.80	10.60	22.0	34.4	43.5	-9.1	276	2.63
222.0210	2.02	13.10	22.7	37.8	46.0	-8.2	261	2.33
265.5660	2.25	13.35	24.8	40.4	46.0	-5.6	290	2.42
312.2520	2.45	14.19	26.5	43.1	46.0	-2.9	288	2.18
335.9700	2.54	14.74	26.2	43.5	46.0	-2.5	32	1.82
488.5710	3.15	17.83	19.0	40.0	46.0	-6.0	274	1.58

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)
230.2513	2.10	12.70	14.8	29.6	46.0	-16.4	356	1.35
265.6560	2.25	13.35	16.9	32.5	46.0	-13.5	351	1.23
312.2518	2.45	14.19	23.5	40.1	46.0	-5.9	99	1.28
335.9700	2.54	14.74	23.4	40.7	46.0	-5.3	108	1.27
368.4820	2.67	15.53	20.0	38.2	46.0	-7.8	352	1.06
432.7510	2.93	16.94	16.1	36.0	46.0	-10.0	85	1.13

NOTE :

1. Measurement uncertainty is +/-2.3dB.
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.
5. (F) = Fundamental



TEST REPORT

Temperature:	16 °C	Humidity:	69 %RH
Frequency Range:	1 – 10 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	Tx
		Tested Frequency:	908.40 MHz
Tested By:	Shunm Wang	Tested Date:	Mar. 07, 2011

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1025.36	-28.59	24.26	41.9	32.5	37.6	28.2	74.0	54.0	-36.4	-25.8	256	1.35
1263.17	-27.26	24.83	35.1	*	32.7	*	74.0	54.0	-41.3	*	114	1.49
1425.89	-26.35	25.22	36.4	*	35.3	*	74.0	54.0	-38.7	*	135	1.21
1722.32	-25.05	26.20	43.5	34.3	44.7	35.5	74.0	54.0	-29.3	-18.5	328	1.15
1954.14	-24.12	27.03	31.2	*	34.1	*	74.0	54.0	-39.9	*	65	1.08
2105.39	-23.63	27.43	*	*	*	*	74.0	54.0	*	*	154	1.14

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1333.25	-26.87	25.00	43.6	33.2	41.7	31.3	74.0	54.0	-32.3	-22.7	125	1.25
1525.74	-25.83	25.49	38.9	30.1	38.6	29.8	74.0	54.0	-35.4	-24.2	63	1.36
1608.25	-25.50	25.79	35.4	*	35.7	*	74.0	54.0	-38.3	*	177	1.27
1836.70	-24.59	26.61	40.1	32.5	42.1	34.5	74.0	54.0	-31.9	-19.5	358	1.11
2235.14	-23.24	27.72	37.4	*	41.9	*	74.0	54.0	-32.1	*	241	1.15
2310.85	-23.02	27.88	33.9	*	38.8	*	74.0	54.0	-35.2	*	108	1.01

NOTE :

1. Measurement uncertainty is +/-2.4dB.
2. "**": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



TEST REPORT

Temperature:	16 °C	Humidity:	69 %RH
Frequency Range:	1 – 10 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	Tx
		Tested Frequency:	908.42 MHz
Tested By:	Shunm Wang	Tested Date:	Mar. 07, 2011

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1025.36	-28.59	24.26	42.0	33.1	37.7	28.8	74.0	54.0	-36.3	-25.2	254	1.34
1263.17	-27.26	24.83	35.2	*	32.8	*	74.0	54.0	-41.2	*	116	1.48
1425.89	-26.35	25.22	36.7	*	35.6	*	74.0	54.0	-38.4	*	134	1.22
1722.32	-25.05	26.20	43.2	34.0	44.4	35.2	74.0	54.0	-29.6	-18.8	326	1.16
1954.14	-24.12	27.03	31.7	*	34.6	*	74.0	54.0	-39.4	*	67	1.07
2105.39	-23.63	27.43	*	*	*	*	74.0	54.0	*	*	152	1.15

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1333.25	-26.87	25.00	43.5	33.5	41.6	31.6	74.0	54.0	-32.4	-22.4	126	1.24
1525.74	-25.83	25.49	38.7	30.4	38.4	30.1	74.0	54.0	-35.6	-23.9	65	1.37
1608.25	-25.50	25.79	35.1	*	35.4	*	74.0	54.0	-38.6	*	174	1.26
1836.70	-24.59	26.61	40.5	32.3	42.5	34.3	74.0	54.0	-31.5	-19.7	2	1.12
2235.14	-23.24	27.72	37.2	*	41.7	*	74.0	54.0	-32.3	*	244	1.14
2310.85	-23.02	27.88	33.7	*	38.6	*	74.0	54.0	-35.4	*	112	1.02

NOTE :

1. Measurement uncertainty is +/-2.4dB.
2. "**": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



TEST REPORT

Temperature:	16°C	Humidity:	69 %RH
Frequency Range:	30 - 1000 MHz	Measured Distance:	3m
Receiver Detector:	QP	Tested Mode:	TX (Fundamental Frequency)
Tested Date:	Mar. 07, 2011	Tested Frequency:	908.40 MHz
Tested By:	Shunm Wang		

Fundamental frequency of transmitter

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
908.392	H	4.52	23.28	60.2	88.0	94.0	-6.0
908.392	V	4.52	23.28	50.9	78.7	94.0	-15.3

Receiver Detector: PEAK Tested Mode: TX (Harmonic)

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1816.78	H	-24.67	26.54	41.9	43.8	114.0	-70.2
2725.18	H	-21.93	29.11	30.1	37.3	114.0	-76.7
3633.57	H	-19.40	31.45	*	*	114.0	*
4541.96	H	-17.30	32.57	*	*	114.0	*
5450.35	H	-15.47	33.76	*	*	114.0	*
6358.74	H	-14.05	34.14	*	*	114.0	*
1816.78	V	-24.67	26.54	35.2	37.1	114.0	-76.9
2725.18	V	-21.93	29.11	*	*	114.0	*
3633.57	V	-19.40	31.45	*	*	114.0	*
4541.96	V	-17.30	32.57	*	*	114.0	*
5450.35	V	-15.47	33.76	*	*	114.0	*
6358.74	V	-14.05	34.14	*	*	114.0	*

NOTE :

1. Measurement uncertainty is less than +/- 2.3dB
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.



TEST REPORT

Temperature:	16°C	Humidity:	69 %RH
Frequency Range:	30 - 1000 MHz	Measured Distance:	3m
Receiver Detector:	QP	Tested Mode:	TX (Fundamental Frequency)
Tested Date:	Mar. 07, 2011		
Tested By:	Shunm Wang	Tested Frequency:	908.42 MHz

Fundamental frequency of transmitter

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
908.419	H	4.52	23.28	60.4	88.2	94.0	-5.9
908.419	V	4.52	23.28	51.3	79.1	94.0	-14.9

Receiver Detector:	PEAK	Tested Mode:	TX (Harmonic)
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Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1816.84	H	-24.67	26.54	42.1	44.0	114.0	-70.0
2725.26	H	-21.93	29.11	30.4	37.6	114.0	-76.4
3633.68	H	-19.40	31.45	*	*	114.0	*
4542.10	H	-17.30	32.58	*	*	114.0	*
5450.51	H	-15.47	33.76	*	*	114.0	*
6358.93	H	-14.05	34.14	*	*	114.0	*
1816.84	V	-24.67	26.54	35.4	37.3	114.0	-76.7
2725.26	V	-21.93	29.11	*	*	114.0	*
3633.68	V	-19.40	31.45	*	*	114.0	*
4542.10	V	-17.30	32.58	*	*	114.0	*
5450.51	V	-15.47	33.76	*	*	114.0	*
6358.93	V	-14.05	34.14	*	*	114.0	*

NOTE :

1. Measurement uncertainty is less than +/- 2.3dB
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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TEST REPORT

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6. 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