Lab Code: 200707-0

FCC PART 15.249
EMI MEASUREMENT AND TEST REPORT

For

Shanghai Super Electronic Technology Co. Ltd

333 Hongqiao Road Jiaotong University High Technology Center Suite 608

FCC ID: UNOSPS100

This Report Concerns:	Equipment Type:
☒ Original Report	CF reader

Test Engineer:	Deny Xiong
Report No.:	RSC06092556
Test Date:	2006-11-08
Report Date:	2006-11-16
Reviewed By:	EMC Manager: Boni Baniqued
Prepared By:	Bay Area Compliance Laboratory Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China Tel: +86-755-33320018 Fax: +86-755-33320008

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Shanghai Super Electronic Technology Co. Ltd*'s product, model number: *SP-S100* or the "EUT" as referred to in this report is a *CF reader.* The EUT is measured approximately 4.3 cm L x 6.4 cm W x 1.0 cm H, rated input voltage: DC 3.3V Battery.

** The test data gathered are from production sample, serial number: 0601128 provided by the manufacturer, we received EUT on 2006-9-25.*

Objective

This Type approval report is prepared on behalf of *Shanghai Super Electronic Technology Co. Ltd* in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

No Related Submittals.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratory Corp. (Shenzhen) to collect radiated and conducted emission measurement data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China.

Test site at Bay Area Compliance Laboratory Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratory Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0). The current scope of accreditations can be found at http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

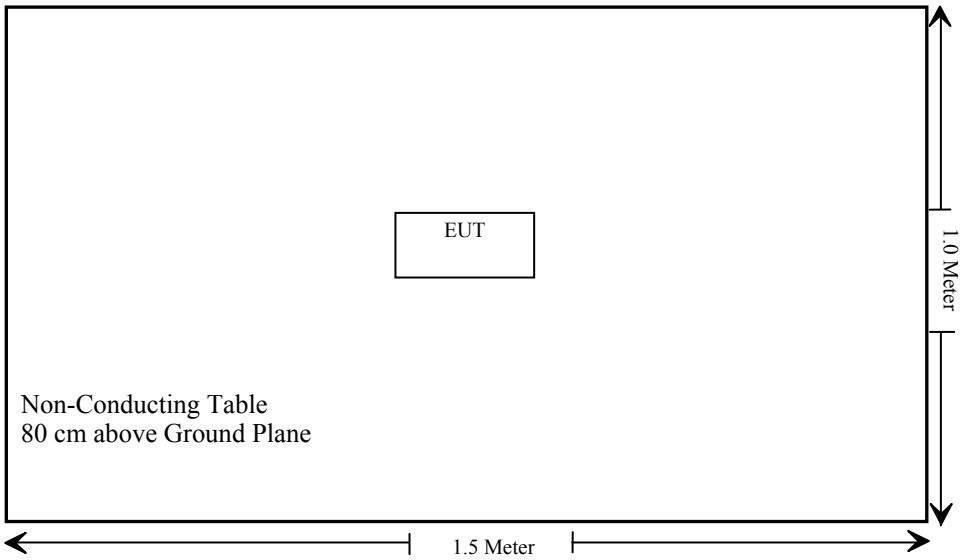
Equipment Modifications

Bay Area Compliance Laboratory Corp. (Shenzhen) has not done any modification on the EUT.

Configuration of Test Setup

EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.205(a), §15.209(a), §15.249(a)	Radiated Emission	Compliant
§15.249(d)	Out of band emission	Compliant

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

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

Antenna Connector Construction

The EUT has a permanently attached antenna, which in accordance to section 15.203, is considered sufficient to comply with the provisions of this section.

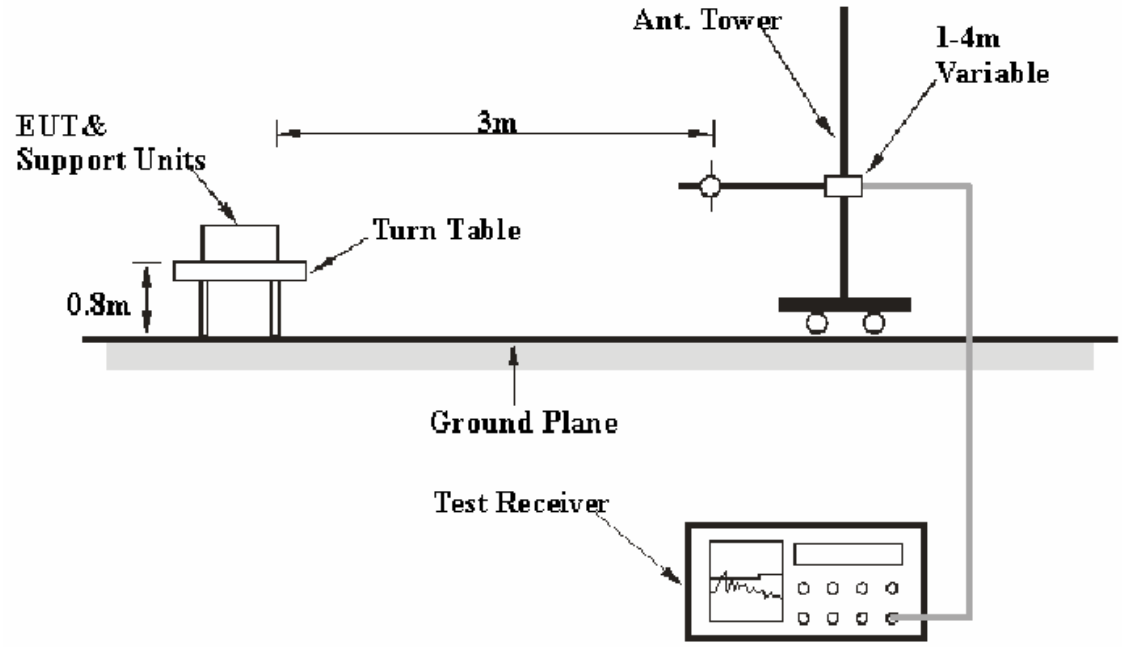
§15.205 §15.209(a) §15.249(a) - RADIATED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ±4.0 dB.

EUT Setup



The radiated emission and out of band emission tests were performed in the 3 meters chamber A&B, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 and FCC 15.249 limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 25000 MHz.

During the radiated emission and out of band emission test, the test receiver was set with the following configurations:

Frequency Range	***RBW***	***Video B/W***
30 – 1000 MHz	100 kHz	300 kHz
1000 MHz – 25000 MHz	1MHz	3 MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2006-8-17	2007-8-17
HP	Amplifier	HP8447E	1937A01046	2006-8-17	2007-8-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2006-4-28	2007-4-28
Agilent	Spectrum Analyzer	8564E	3943A01781	2005-12-8	2006-12-8
HP	Preamplifier	8449B	3008A00277	2006-8-17	2007-8-17
SUNOL SCIENCES	Horn Antenna	DRH-118	A052604	2006-7-20	2007-7-20

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the peak and average detection mode.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corr. Ampl. = Meter Reading + Antenna Loss + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Limit

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 & 15.249, with the worst margin reading of:

Above 1 GHz:

Transmitting (Low channel): **-10.95 dB** at **9608 MHz** in the **Vertical** polarization
Transmitting (Middle channel): **-9.45 dB** at **9764 MHz** in the **Vertical** polarization
Transmitting (High channel): **-10.04 dB** at **9920 MHz** in the **Vertical** polarization

30 MHz - 1000 MHz:

19.8 dB at **30.150679 MHz** in the **Vertical** polarization

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	53%
ATM Pressure:	1000mbar

The testing was performed by Deny Xiong on 2006-11-8.

Test mode: Transmitting (Low channel)

Frequency	Meter Reading	Detector	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier Gain	Corr. Ampl.	FCC Part 15.209 & 15.249		
MHz	dBuV/m	PK/QP/AV	Degree	Meter	H / V	dB	dB	dB	dBuV/m	Limit dBuV/m	Margin dB	Comment
Low Channel												
9608	34.20	AV	158	1.3	V	37.6	5.35	34.1	43.05	54	-10.95	Harmonic
9608	33.83	AV	238	1.5	H	37.6	5.35	34.1	42.68	54	-11.32	Harmonic
7206	35.00	AV	261	1.0	H	35.4	4.51	33.7	41.21	54	-12.79	Harmonic
7206	35.00	AV	90	1.2	V	35.4	4.51	33.7	41.21	54	-12.79	Harmonic
4804	56.50	PK	49	1.2	H	31.3	4.64	32.5	59.94	74	-14.06	Harmonic
4804	53.80	PK	250	1.0	V	31.3	4.64	32.5	57.24	74	-16.76	Harmonic
4804	32.00	AV	180	1.6	V	31.3	4.64	32.5	35.44	54	-18.56	Harmonic
4804	31.83	AV	270	1.6	H	31.3	4.64	32.5	35.27	54	-18.73	Harmonic
7206	47.83	PK	180	1.3	H	35.4	4.51	33.7	54.04	74	-19.96	Harmonic
9608	45.00	PK	158	1.3	V	37.6	5.35	34.1	53.85	74	-20.15	Harmonic
9608	44.33	PK	158	1.6	H	37.6	5.35	34.1	53.18	74	-20.82	Harmonic
7206	46.50	PK	180	1.0	V	35.4	4.51	33.7	52.71	74	-21.29	Harmonic
2402	81.67	PK	18	1.6	V	27.4	3.61	35.0	77.68	114	-36.32	Fundamental
2402	79.50	PK	20	1.2	H	27.4	3.61	35.0	75.51	114	-38.49	Fundamental
2402	54.50	AV	263	1.4	H	27.4	3.61	35.0	50.51	94	-43.49	Fundamental
2402	54.37	AV	45	1.0	V	27.4	3.61	35.0	50.38	94	-43.62	Fundamental

Test mode: Transmitting (Middle channel)

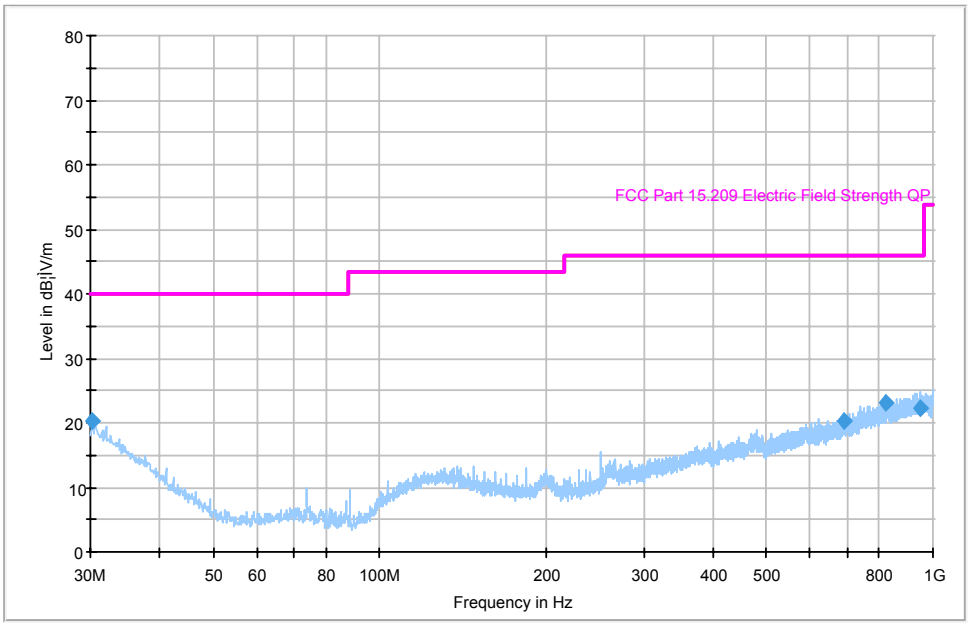
Frequency	Meter Reading	Detector	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier Gain	Corr. Ampl.	FCC Part 15.209 & 15.249		
MHz	dBuV/m	PK/QP/AV	Degree	Meter	H / V	dB	dB	dB	dBuV/m	Limit dBuV/m	Margin dB	Comment
Middle Channel												
9764	34.68	AV	130	1.3	V	38.2	5.77	34.1	44.55	54	-9.45	Harmonic
9764	34.50	AV	256	1.5	H	38.2	5.77	34.1	44.37	54	-9.63	Harmonic
7323	36.00	AV	45	1.0	H	35.3	4.75	33.7	42.35	54	-11.65	Harmonic
7323	35.67	AV	90	1.2	V	35.3	4.75	33.7	42.02	54	-11.98	Harmonic
4882	57.83	PK	45	1.0	V	31.3	4.64	33.4	60.37	74	-13.63	Harmonic
4882	57.33	PK	109	1.2	H	31.3	4.64	33.4	59.87	74	-14.13	Harmonic
7323	50.67	PK	180	1.0	H	35.3	4.75	33.7	57.02	74	-16.98	Harmonic
9764	46.83	PK	130	1.3	V	38.2	5.77	34.1	56.70	74	-17.30	Harmonic
9764	46.67	PK	256	1.5	H	38.2	5.77	34.1	56.54	74	-17.46	Harmonic
4882	32.50	AV	180	1.6	V	31.3	4.64	33.4	35.04	54	-18.96	Harmonic
4882	32.33	AV	109	1.2	H	31.3	4.64	33.4	34.87	54	-19.13	Harmonic
7323	48.00	PK	90	1.2	V	35.3	4.75	33.7	54.35	74	-19.65	Harmonic
2441	83.17	PK	182	1.2	V	27.4	3.61	35.0	79.18	114	-34.82	Fundamental
2441	82.17	PK	197	1.6	H	27.4	3.61	35.0	78.18	114	-35.82	Fundamental
2441	54.50	AV	182	1.2	V	27.4	3.61	35.0	50.51	94	-43.49	Fundamental
2441	54.17	AV	197	1.6	H	27.4	3.61	35.0	50.18	94	-43.82	Fundamental

Test mode: Transmitting (High channel)

Frequency	Meter Reading	Detector	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier Gain	Corr. Ampl.	FCC Part 15.209 & 15.249		
MHz	dBuV/m	PK/QP/AV	Degree	Meter	H / V	dB	dB	dB	dBuV/m	Limit dBuV/m	Margin dB	Comment
High Channel												
9920	34.83	AV	259	1.2	V	38.0	5.23	34.1	43.96	54	-10.04	Harmonic
9920	34.67	AV	147	1.6	H	38.0	5.23	34.1	43.80	54	-10.20	Harmonic
7440	36.33	AV	90	1.2	V	35.3	4.75	33.7	42.68	54	-11.32	Harmonic
7440	36.17	AV	45	1.0	H	35.3	4.75	33.7	42.52	54	-11.48	Harmonic
4960	57.50	PK	109	1.2	H	32.0	4.55	33.4	60.65	74	-13.35	Harmonic
4960	55.30	PK	45	1.0	V	32.0	4.55	33.4	58.45	74	-15.55	Harmonic
7440	50.33	PK	90	1.2	V	35.3	4.75	33.7	56.68	74	-17.32	Harmonic
4960	32.68	AV	109	1.2	H	32.0	4.55	33.4	35.83	54	-18.17	Harmonic
4960	32.67	AV	180	1.6	V	32.0	4.55	33.4	35.82	54	-18.18	Harmonic
9920	46.33	PK	259	1.2	V	38.0	5.23	34.1	55.46	74	-18.54	Harmonic
9920	46.00	PK	147	1.6	H	38.0	5.23	34.1	55.13	74	-18.87	Harmonic
7440	48.50	PK	180	1.0	H	35.3	4.75	33.7	54.85	74	-19.15	Harmonic
2480	86.67	PK	182	1.2	V	27.4	3.61	35.0	82.68	114	-31.32	Fundamental
2480	82.83	PK	197	1.6	H	27.4	3.61	35.0	78.84	114	-35.16	Fundamental
2480	55.67	AV	182	1.2	V	27.4	3.61	35.0	51.68	94	-42.32	Fundamental
2480	54.83	AV	197	1.6	H	27.4	3.61	35.0	50.84	94	-43.16	Fundamental

30 MHz-1000 MHz:

Auto Test(FCC 15.209)



Frequency (MHz)	Quasi Peak (dB µ V/m)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Limit (dB µ V/m)	Margin (dB)
30.150679	20.2	396.0	V	28.0	-6.1	40.0	19.8
821.694375	23.1	396.0	V	194.0	-3.3	46.0	22.9
949.944225	22.3	372.0	H	194.0	-1.8	46.0	23.7
691.663000	20.2	396.0	H	31.0	-5.7	46.0	25.8

§15.249(d) – OUT OF BAND EMISSION

Standard Applicable

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 100KHz and VBW to 300KHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Spectrum Analyzer	8564E	3943A01781	2005-12-8	2006-12-8

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	55%
ATM Pressure:	1006mbar

The testing was performed by Deny Xiong on 2006-11-08.

Test Mode: Transmitting

Frequency (MHz)	Reading (dBuV/m)	Antenna Factor (dB)	Cable loss (dB)	Amplifier (dB)	Correct Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2399.9	35.6	27.4	3.61	35.0	31.61	54	-22.39
2483.6	36.3	27.4	3.61	35.0	32.31	54	-21.69