

FCC TEST REPORT

For
Shenzhen Academy of Aerospace Technology

Active Fixed Reader
Model No.: SAAT-F526

Test Report Number : ESTSZ110401216F



EST COMPLIANCE LABORATORY LIMITED
4/F, 7th Building, Xinyuan Industrial Park, Xinguang Road,
Xili, Nanshan District, Shenzhen 518055, China
Tel:+86-755-26648640 Fax:+86-755-26648637

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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Shenzhen Academy of Aerospace Technology
Address of applicant: SZAAT Building, 10th Road Kejinan, Hi-Tech Park, Nanshan District, Shenzhen City, Guangdong Province of China
Manufacturer: Shenzhen Academy of Aerospace Technology
Address of manufacturer: SZAAT Building, 10th Road Kejinan, Hi-Tech Park, Nanshan District, Shenzhen City, Guangdong Province of China

General Description of E.U.T

EUT Description: Active Fixed Reader
Trade Name: N/A
Model No.: SAAT-F526
Rating: AC 100-240V, 50/60Hz
Test Power Supply: AC 120V, 60Hz
Frequency: 2405~2480 MHz (16 channels, 5MHz step size)

Remark: *The models of EUT are identical except appearance of equipment. Unless otherwise specified, all tests were performed on model SAAT-F526 to represent the other similar models.*

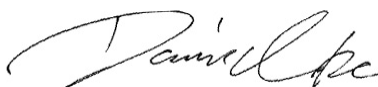
1.2 Test Standards

The following Declaration of Conformity report of EUT is prepared in accordance with
FCC Rules and Regulations Part 15 Subpart C 15.207 & 15.249: 2008

The objective of the manufacturer is to demonstrate compliance with the described above standards.
Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of EST COMPLIANCE LABORATORY LIMITED.

Date of Test : Apr. 21~26 , 2011

Prepared by :



(Engineer)

Reviewer :



(Project Manager)

Approved & Authorized Signer :



(Manager)

1.3 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.

The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

The maximum emission levels emanating from the device are compared to the FCC Part 15 Subpart C limits for radiation emissions and the measurement results contained in this test report show that EUT is to be technically compliant with FCC requirements.

Global United Technology Service Co., Ltd at 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, China

1.4 Test Facility

All measurement required was performed at laboratory of Global United Technology Service Co., Ltd at 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, China

The test facility is recognized, certified, or accredited by the following organizations:

FCC – Registration No.: 600491

Global United Technology Service Co., Ltd has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 600491.

The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

1.5 Test Equipment List and Details

Test equipments list of Global United Technology Service Co., Ltd

Equipment	Manufacturer	Model#	Serial #	Data of Cal.	Due Data
3m Semi-Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)*6.4(H)	GTS201	Mar. 30 2011	Mar. 30 2012
Control Room	ZhongYu Electron	6.2(L)*2.5(W)*2.4(H)	GTS202	N/A	N/A
EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Sept. 10 2010	Sept. 10 2011
EMI Test Software	AUDIX	E3	N/A	N/A	N/A
Coaxial Cable	GTS	N/A	GTS400	Apr. 01 2011	Apr. 01 2012
Coaxial Cable	GTS	N/A	GTS401	Apr. 01 2011	Apr. 01 2012
Coaxial Cable	GTS	N/A	GTS402	Apr. 01 2011	Apr. 01 2012
Coaxial Cable	GTS	N/A	GTS407	Apr. 01 2011	Apr. 01 2012
Coaxial Cable	GTS	N/A	GTS408	Apr. 01 2011	Apr. 01 2012
BiConiLog Antenna (26-3000MHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS204	Feb. 26 2011	Feb. 26 2012
Pre-amplifier(0.1-3000MHz)	HP	8347A	GTS210	Aug. 03 2010	Aug. 03 2011
Double-ridged horn (1-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS205	Jun. 30 2010	Jun. 30 2011
Pre-amplifier(1-18GHz)	Rohde & Schwarz	8349B	GTS224	Aug. 03 2010	Aug. 03 2011
Humidity/Temperature Indicator	Shanghai	ZJ1-2B	GTS250	Oct. 28 2010	Oct. 28 2011
Barometer	ChangChun	DYM3	GTS251	Jul. 11 2010	Jul. 11 2011
Shielding Room	ZhongYu Electron	7.0(L)*3.0(W)*3.0(H)	GTS206	Apr. 10 2011	Apr. 10 2012
EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS208	Sept. 14 2010	Sept. 14 2011
10dB Pulse Limiter	Rohde & Schwarz	N/A	GTS209	Sept. 14 2010	Sept. 14 2011
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS207	Apr. 14 2011	Apr. 14 2012
Coaxial Cable	GTS	N/A	GTS406	Apr. 01 2011	Apr. 01 2012

2 - Test Procedure

GENERAL: This report shall NOT be reproduced except in full without the written approval of Anbotek Compliance Laboratory Limited. The EUT was transmitting a test signal during the testing.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-2003 using a spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100KHz and the video bandwidth was 300KHz up to 1.0GHz and 1.0MHz with a video BW of 3.0MHz above 1.0GHz. The ambient temperature of the EUT was 74.3oF with a humidity of 69%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz) METER READING + ACF = FS
33 20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

3 - DISTURBANCE VOLTAGE AT THE MAINS TERMINALS

3.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.4 dB.

3.2 Limit of Disturbance Voltage at The Mains Terminals (FCC PART 15.207)

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150 ~ 0.500	66~56	56~46
0.500 ~ 5.000	56	46
5.000 ~ 30.00	60	50

Note: (1)The tighter limit shall apply at the edge between two frequency bands.
(2) Decreases with the logarithm of the frequency.

3.3 EUT Setup

The setup of EUT is according with ANSI C63.4-2003 measurement procedure. The specification used was the FCC Rules and Regulations Part 15.207 limits.

The EUT was placed center and the back edge of the test table.

The spacing between the peripherals was 10 cm.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

3.4 Instrument Setup

The test receiver was set with the following configurations:

Test Receiver Setting:

Frequency Range.....150 KHz to 30 MHz
 Detector.....Peak & Quasi-Peak & Average
 Sweep Speed.....Auto
 IF Band Width.....9 KHz

3.5 Test Procedure

During the conducted emission test, the EUT power cord was connected to the auxiliary outlet of the first Artificial Mains.

Maximizing procedure was performed on the highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the peak detection mode. Quasi-peak and Average readings were only performed when an emission was found to be marginal (within -10 dB μ V of specification limits). Quasi-peak readings are distinguished with a "**QP**". Average readings are distinguished with a "**AV**".

3.6 Test Situation

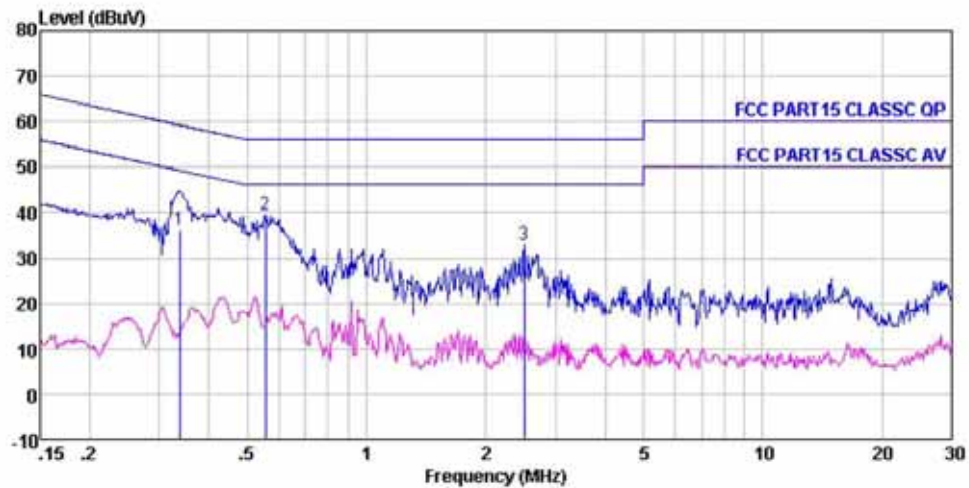
Temperature ()	22
Humidity (%RH)	58
Barometric Pressure (mbar)	1001
EUT	Active Fixed Reader
M/N	SAAT-F526
Operating Mode	PC Mode

Remark: (1) When PK reading is less than relevant limit 20dB, the QP reading and AV reading will not be recorded.
(2) Where QP reading is less than relevant AV limit, the AV reading will not be measured

3.7 Test Result

Pass

Details see the following pages.



Condition : FCC PART15 CLASSC QP LISN(2011) LINE

EUT : Active Fixed Reader

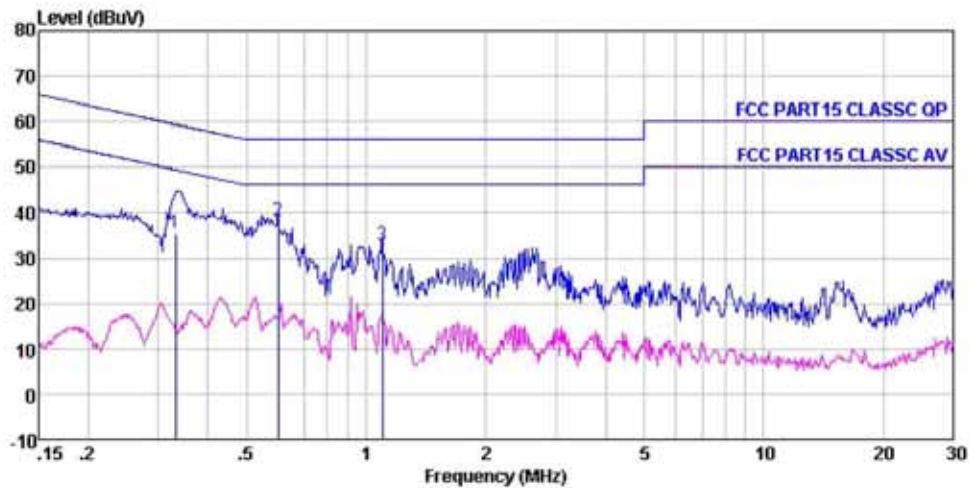
Model : SAAT-F526

Test mode:: PC

Power: : AC 120V/60Hz

Engineer: : David

	Read Freq	LISN Level	Cable Factor	Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.338	35.30	0.60	0.10	36.00	59.25	-23.25	QP
2	0.555	38.91	0.54	0.10	39.55	56.00	-16.45	QP
3	2.500	32.40	0.38	0.10	32.88	56.00	-23.12	QP



Condition : FCC PART15 CLASSC QP LISN(2011) NEUTRAL
 EUT : Active Fixed Reader
 Model : SAAT-F526
 Test mode:: PC
 Power: : AC 120V/60Hz
 Engineer: : David

	Read	LISN	Cable		Limit	Over	
Freq	Level	Factor	Loss	Level	Line	Limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.332	34.80	0.60	0.10	35.50	59.40	-23.90 QP
2	0.601	37.54	0.53	0.10	38.17	56.00	-17.83 QP
3	1.100	32.18	0.47	0.10	32.75	56.00	-23.25 QP

4 - Radiation Interference

4.1 Requirements (15.249, 15.209 & 15.35(b)):

FIELD STRENGTH of Fundamental: 902-928 MHz 2.4-2.4835 GHz 94 dB μ V/m @3m	FIELD STRENGTH of Harmonics 54 dB μ V/m @3m	S15.209 30 - 88 MHz 88 - 216 MHz 216 - 960 MHz ABOVE 960 MHz	40 dB μ V/m @3M 43.5 46 54dB μ V/m
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4.2 Test Results

PASS.

Please refer the following pages.

Data (From 30MHz ~ 1GHz):

Frequency (MHz)	Read Level (dB μ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dB μ V/m)	Limit Line (dB μ V/m)	Over Limit (dB)	Remark	Direction (H/V)
180.02	53.00	11.06	1.68	32.15	33.59	43.50	-9.91	QP	H
475.50	52.36	19.55	2.37	31.79	42.49	46.00	-3.51	QP	H
501.18	51.97	19.37	2.41	31.60	42.15	46.00	-3.85	QP	H
109.80	53.50	12.14	1.24	31.76	35.12	43.50	-8.38	QP	V
501.18	53.59	18.31	2.41	31.60	42.71	46.00	-3.29	QP	V
601.43	50.51	19.48	2.69	31.29	41.39	46.00	-4.61	QP	V

Emissions attenuated more than 20 dB below the permissible value are not reported.

FCC ID: ZJ9001

Data (Above 1GHz to the tenth Harmonic, Average):**CH Low(2405MHz)**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark	Direction (H/V)
2405	84.7	27.57	3.37	30.06	85.58	94	-8.42	Average	H
4810	32.5	31.79	5.34	24.09	45.54	54	-8.46	Average	H
7215	32.25	36.19	6.88	26.41	48.91	54	-5.09	Average	H
9620	27.99	38.07	8.96	25.37	49.65	54	-4.35	Average	H
2405	87.73	27.57	3.37	30.06	88.61	94	-5.39	Average	V
4810	36.15	31.79	5.34	24.09	49.19	54	-4.81	Average	V
7215	33.37	36.19	6.88	26.41	50.03	54	-3.97	Average	V
9620	27.44	38.07	8.96	25.37	49.1	54	-4.9	Average	V

CH Middle(2440MHz)

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark	Direction (H/V)
2440	85.28	27.48	3.43	29.99	86.2	94	-7.8	Average	H
4880	32.98	31.85	5.4	24.01	46.22	54	-7.78	Average	H
7320	31.94	36.37	6.91	26.62	48.6	54	-5.4	Average	H
9760	26.69	38.35	9.01	25.3	48.75	54	-5.25	Average	H
2440	88.85	27.48	3.43	29.99	89.77	94	-4.23	Average	V
4880	34.15	31.85	5.4	24.01	47.39	54	-6.61	Average	V
7320	32.98	36.37	6.91	26.62	49.64	54	-4.36	Average	V
9760	27.73	38.35	9.01	25.3	49.79	54	-4.21	Average	V

CH High(2480MHz)

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark	Direction (H/V)
2480	84.17	27.49	3.46	29.96	85.16	94	-8.84	Average	H
4960	32.67	31.91	5.46	23.94	46.1	54	-7.9	Average	H
7440	30.53	36.49	6.93	26.79	47.16	54	-6.84	Average	H
9920	26.6	38.72	9.06	25.24	49.14	54	-4.86	Average	H
2480	86.69	27.49	3.46	29.96	87.68	94	-6.32	Average	V
4960	33.68	31.91	5.46	23.94	47.11	54	-6.89	Average	V
7440	32.56	36.49	6.93	26.79	49.19	54	-4.81	Average	V
9920	27.12	38.72	9.06	25.24	49.66	54	-4.34	Average	V

Emissions attenuated more than 20 dB below the permissible value are not reported.

FCC ID: ZJ9001

Data (Above 1GHz to the tenth Harmonic, Peak):**CH Low(2405MHz)**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark	Direction (H/V)
2405	111.38	27.57	3.37	30.06	112.26	114	-1.74	Peak	H
4810	43.15	31.79	5.34	24.09	56.19	74	-17.81	Peak	H
7215	43.01	36.19	6.88	26.41	59.67	74	-14.33	Peak	H
9620	40.23	38.07	8.96	25.37	61.89	74	-12.11	Peak	H
2405	105.98	27.57	3.37	30.06	106.86	114	-7.14	Peak	V
4810	45.09	31.79	5.34	24.09	58.13	74	-15.87	Peak	V
7215	45.31	36.19	6.88	26.41	61.97	74	-12.03	Peak	V
9620	42.04	38.07	8.96	25.37	63.7	74	-10.3	Peak	V

CH Middle(2440MHz)

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark	Direction (H/V)
2440	105.48	27.48	3.43	29.99	106.4	114	-7.6	Peak	H
4880	41.73	31.85	5.4	24.01	54.97	74	-19.03	Peak	H
7320	42.8	36.37	6.91	26.62	59.46	74	-14.54	Peak	H
9760	40.4	38.35	9.01	25.3	62.46	74	-11.54	Peak	H
2440	109.68	27.48	3.43	29.99	110.6	114	-3.4	Peak	V
4880	44.03	31.85	5.4	24.01	57.27	74	-16.73	Peak	V
7320	45.01	36.37	6.91	26.62	61.67	74	-12.33	Peak	V
9760	42.48	38.35	9.01	25.3	64.54	74	-9.46	Peak	V

CH High(2480MHz)

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark	Direction (H/V)
2480	106.51	27.49	3.46	29.96	107.5	114	-6.5	Peak	H
4960	41.79	31.91	5.46	23.94	55.22	74	-18.78	Peak	H
7440	41.77	36.49	6.93	26.79	58.4	74	-15.6	Peak	H
9920	38	38.72	9.06	25.24	60.54	74	-13.46	Peak	H
2480	109.58	27.49	3.46	29.96	110.57	114	-3.43	Peak	V
4960	44.34	31.91	5.46	23.94	57.77	74	-16.23	Peak	V
7440	44.07	36.49	6.93	26.79	60.7	74	-13.3	Peak	V
9920	40.79	38.72	9.06	25.24	63.33	74	-10.67	Peak	V

Emissions attenuated more than 20 dB below the permissible value are not reported.

5 - Occupied Bandwidth

5.1 Requirements (15.249):

The field strength of any emissions appearing outside the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 50 dB below the level of the carrier or to the general limits of 15.249.

5.2 Test Results

Pass.
Please refer the following page.

CH Low(2405MHz)

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark	Direction (H/V)
2394.89	45.97	27.59	3.33	30.1	46.79	74	-27.21	Peak	H
2400	53.69	27.58	3.37	30.1	54.54	74	-19.46	Peak	H
2394.89	35.97	27.59	3.33	30.1	36.79	54	-17.21	Average	H
2400	41.68	27.58	3.37	30.1	42.53	54	-11.47	Average	H
2394.89	48.62	27.59	3.33	30.1	49.44	74	-24.56	Peak	V
2400	56.49	27.58	3.37	30.1	57.34	74	-16.66	Peak	V
2394.89	38.62	27.59	3.33	30.1	39.44	54	-14.56	Average	V
2400	43.59	27.58	3.37	30.1	44.44	54	-9.56	Average	V

CH High(2480MHz)

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark	Direction (H/V)
2483.5	50.18	27.53	3.49	29.93	51.27	74	-22.73	Peak	H
2486.58	47.06	27.53	3.49	29.93	48.15	74	-25.85	Peak	H
2483.5	42.81	27.53	3.49	29.93	43.9	54	-10.1	Average	H
2486.58	37.43	27.53	3.49	29.93	38.52	54	-15.48	Average	H
2483.5	54.68	27.53	3.49	29.93	55.77	74	-18.23	Peak	V
2486.58	49.58	27.53	3.49	29.93	50.67	74	-23.33	Peak	V
2483.5	43.69	27.53	3.49	29.93	44.78	54	-9.22	Average	V
2486.58	39.08	27.53	3.49	29.93	40.17	54	-13.83	Average	V