

EMC TEST REPORT For

SHENZHEN JOYETECH CO., LTD.

JOYETECH ELECTRONIC CIGARETTE

Model No.: eCab

Prepared for : SHENZHEN JOYETECH CO., LTD.
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Date of Test : June 21, 2012 to June 25, 2012
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APPENDIX (Photos of EUT) (1 Page)

TEST REPORT DESCRIPTION

Applicant : SHENZHEN JOYETECH CO., LTD.
Trade Mark : Joyetech
EUT : JOYETECH ELECTRONIC CIGARETTE
Model No. : eCab
Rating : AC 230V/50Hz

Measurement Procedure Used:

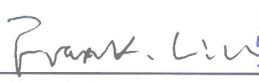
EN 55022: 2010
EN 61000-3-2:2006+A1:2009+A2:2009
EN 61000-3-3:2008
EN 55024:2010
(IEC 61000-4-2:2008, IEC 61000-4-3:2006+A1:2007+A2:2010, IEC 61000-4-4:2004+Cor 1 :2006+Cor 2 :2007, IEC 61000-4-5:2005, IEC 61000-4-6:2008, IEC 61000-4-8:2009, IEC 61000-4-11:2004)

The device described above is tested by SHENZHEN EMTEK CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and SHENZHEN EMTEK CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN55022, EN61000-3-2, EN61000-3-3 and EN55024 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN EMTEK CO., LTD.

Date of Test : June 21, 2012 to June 25, 2012

Prepared by : 
Lesley Zhang/Editor

Reviewer : 
Frank Liu/Supervisor

Approved & Authorized Signer : 
Lisa Wang/Manager



Modified History

Rev.	Summary	Date of Rev.	Report No.
V1.1	Original Report	2012-06-25	ES120621121E

1. SUMMARY OF TEST RESULT

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted Disturbance at Mains Terminals	EN 55022:2010	Class B	Pass
Radiated Disturbance	EN 55022:2010	Class B	Pass
Harmonic Current Emissions	EN 61000-3-2:2006 +A1:2009+A2:2009	Class A	N/A
Voltage Fluctuation and Flicker	EN 61000-3-3:2008	Section 5	Pass
IMMUNITY (EN 55024:2010)			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008	B	Pass
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3:2006+A1:2007 +A2:2010	A	Pass
EFT/B Immunity	IEC 61000-4-4:2004+Cor 1 :2006+Cor 2 :2007	B	Pass
Surge Immunity	IEC 61000-4-5:2005	B	Pass
Conducted RF Immunity	IEC 61000-4-6:2008	A	Pass
Power Frequency Magnetic Field	IEC 61000-4-8:2009	A	Pass
Voltage Dips, >95% Reduction	IEC 61000-4-11:2004	B	Pass
Voltage Dips, 30% Reduction		C	Pass
Voltage Interruptions		C	Pass
Note: N/A is an abbreviation for Not Applicable.			

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT	:	JOYETECH ELECTRONIC CIGARETTE
Model Number	:	eCab
Adapter	:	Model: Joyetech-01 Input: AC 100-240V, 50-60Hz, 100mA Output: DC5.0V, 500mA
Test Voltage	:	AC 230V/50Hz
Applicant	:	SHENZHEN JOYETECH CO., LTD.
Address	:	4/F, 9 th Blvd. Changxing High New Tech. Industry Zone, Shajing, Baoan, Shenzhen, China
Manufacturer	:	SHENZHEN JOYETECH CO., LTD.
Address	:	4/F, 9 th Blvd. Changxing High New Tech. Industry Zone, Shajing, Baoan, Shenzhen, China
Date of Received	:	June 21, 2012
Date of Test	:	June 21, 2012 to June 25, 2012

2.2. Description of Test Facility

Site Description EMC Lab.	:	Accredited by CNAS, 2010.10.29 The certificate is valid until 2013.10.28 The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2005) The Certificate Registration Number is L2291. Accredited by TUV Rheinland Shenzhen 2010.5.25 The Laboratory has been assessed according to the requirements ISO/IEC 17025. Accredited by FCC, October 28, 2010 The Certificate Registration Number is 406365. Accredited by Industry Canada, March 5, 2010 The Certificate Registration Number is 46405-4480.
Name of Firm	:	SHENZHEN EMTEK CO., LTD.
Site Location	:	Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

2.3.Measurement Uncertainty

Conducted Emission Uncertainty	: 2.8dB
Radiated Emission Uncertainty	: 3.3dB (30M~1GHz Polarize: H) 3.2dB (30M~1GHz Polarize: V)
Uncertainty for Flicker test	: 0.07%
Uncertainty for Harmonic test	: 1.8%
Uncertainty for C/S Test	: 1.45(Using CDN Test) 2.37(Using EM Clamp Test)
Uncertainty for R/S Test	: 2.10dB(80MHz-200MHz) 1.76dB(200MHz-1000MHz)
Uncertainty for test site temperature and humidity	: 0.6℃ 4%

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Power Line Conducted Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS30	100162	May 29, 2012	1 Year
2.	L.I.S.N.	Rohde & Schwarz	ENV216	3560.6550.12	May 29, 2012	1 Year
3.	50Ω Coaxial Switch	Anritsu	MP59B	6100214550	N/A	N/A
4.	Voltage Probe	Rohde & Schwarz	TK9416	N/A	May 29, 2012	1 Year
5.	I.S.N	Rohde & Schwarz	ENY22	1109.9508.02	May 29, 2012	1 Year

3.2. For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	May 29, 2012	1 Year
2.	Pre-Amplifier	HP	8447D	2944A07999	May 29, 2012	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB9163	142	May 29, 2012	1 Year
4.	Loop Antenna	ARA	PLA-1030/B	1029	May 29, 2012	1 Year
5.	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	May 29, 2012	1 Year
6.	Horn Antenna	Schwarzbeck	BBHA 9120	D143	May 29, 2012	1 Year
7.	Cable	Schwarzbeck	AK9513	ACRX1	May 29, 2012	1 Year
8.	Cable	Rosenberger	N/A	FP2RX2	May 29, 2012	1 Year
9.	Cable	Schwarzbeck	AK9513	CRPX1	May 29, 2012	1 Year
10.	Cable	Schwarzbeck	AK9513	CRRX2	May 29, 2012	1 Year

3.3. For Harmonic Current / Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	AC Power Source	California Instruments	5001iX-CTS-400-413	72795	May 29, 2012	1 Year
2.	PC	N/A	P2L97	N/A	May 29, 2012	N/A

3.4. For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	TESEQAG	NSG 437	000409	May 29, 2012	1 Year

3.5. For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 29, 2012	1 Year
2.	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	May 29, 2012	1 Year
3.	Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120 L3F	332	May 29, 2012	1 Year
4.	Power Amplifier	PRANA	AP32MT215	N/A	May 29, 2012	1 Year
5.	Power Amplifier	MILMEGA	AS0102-55	N/A	May 29, 2012	1 Year

6.	Signal Generator	AEROFLEX	2023B	N/A	May 29, 2012	1 Year
7.	Field Strength Meter	HOLADAY	HI-6005	N/A	May 29, 2012	1 Year
8.	RS232 Fiber Optic Modem	HOLADAY	HI-4413P	N/A	May 29, 2012	1 Year
9.	Log.-Per. Antenna	SCHWARZBECK	VULP 9118E	N/A	May 29, 2012	1 Year

3.6. For Electrical Fast Transient / Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Burst Tester	HAEFELY	PEFT4010	080981-16	May 29, 2012	1 Year
2.	Coupling Clamp	HAEFELY	IP-4A	147147	May 29, 2012	1 Year

3.7. For Surge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Controller	HAEFELY	Psurge 8000	174031	May 29, 2012	1 Year
2.	Impulse Module	HAEFELY	PIM 100	174124	May 29, 2012	1 Year
3.	Coupling Decoupling Filter	HAEFELY	PCD 130	172181	May 29, 2012	1 Year
4.	Coupling Module	HAEFELY	PCD122	174354	May 29, 2012	1 Year
5.	Surge Impulse Module	HAEFELY	PIM 120	174435	May 29, 2012	1 Year
6.	Coupling Module	HAEFELY	PCD 126A	174387	May 29, 2012	1 Year
7.	Impulse Module	HAEFELY	PIM 110	174391	May 29, 2012	1 Year

3.8. For Injected Current Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Simulator	EMTEST	CWS500C	0900-12	May 29, 2012	1 Year
2.	CDN	EMTEST	CDN-M2	5100100100	May 29, 2012	1 Year
3.	CDN	EMTEST	CDN-M3	0900-11	May 29, 2012	1 Year
4.	Injection Clamp	EMTEST	F-2031-23MM	368	May 29, 2012	1 Year
5.	Attenuator	EMTEST	ATT6	0010222A	May 29, 2012	1 Year

3.9. For Magnetic Field Immunity Test

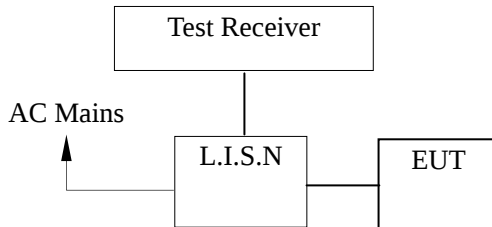
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Magnetic Field Tester	HAEFELY	MAG100	250040.1	May 29, 2012	1 Year

3.10. For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Dips Tester	HAEFELY	Pline1610	083732-12	May 29, 2012	1 Year

4. POWER LINE CONDUCTED EMISSION MEASUREMENT

4.1. Block Diagram of Test Setup



(EUT: JOYETECH ELECTRONIC CIGARETTE)

4.2. Measuring Standard

EN 55022:2010

4.3. Power Line Conducted Emission Limits (Class B)

Frequency (MHz)	Limit (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0
NOTE1-The lower limit shall apply at the transition frequencies. NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

4.4. EUT Configuration on Measurement

The following equipments are installed on Conducted Emission Measurement to meet EN 55022 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

EUT : JOYETECH ELECTRONIC CIGARETTE
Model Number : eCab

4.5. Operating Condition of EUT

4.5.1. Setup the EUT as shown on Section 4.1.

4.5.2. Turn on the power of all equipments.

4.5.3. Let the EUT work in measuring mode (Charging) and measure it.

4.6. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN55022 regulations during conducted emission measurement.

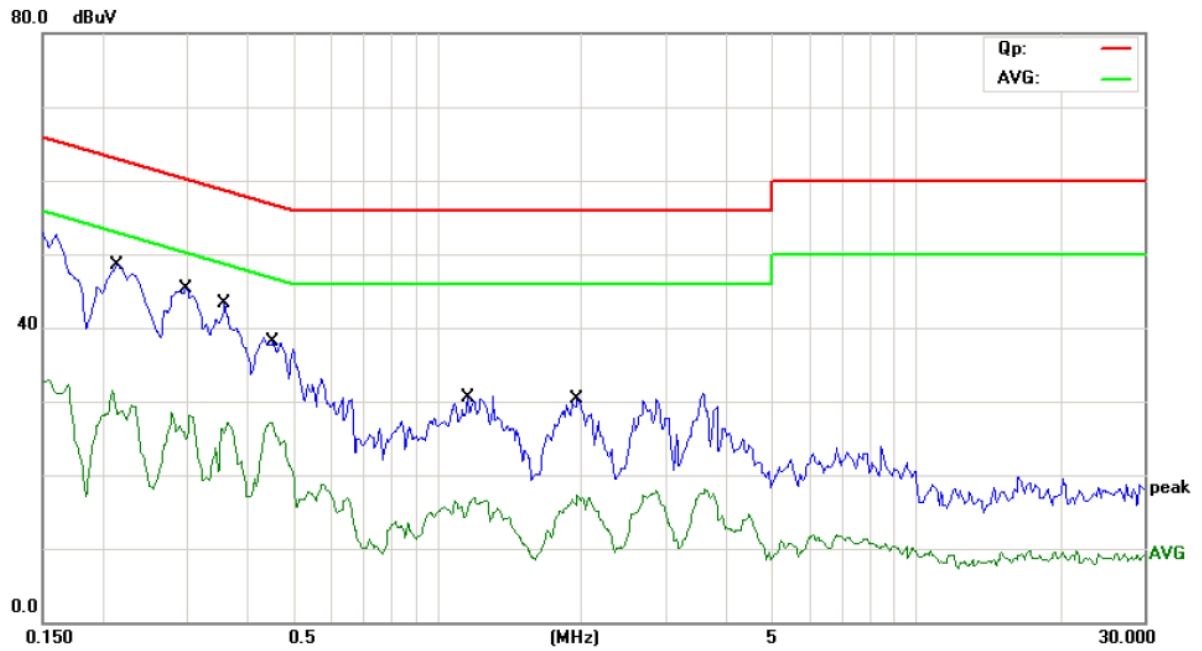
The bandwidth of the field strength meter (R&S Test Receiver ESCS30) is set at 9kHz in 150kHz~30MHz and 200Hz in 9kHz~150kHz.

The frequency range from 150kHz to 30MHz is investigated.

4.7. Measuring Results

PASS.

Please reference to the following pages.



Site Conduction #1

Phase: **L1**

Temperature: 26

Limit: (CE)EN55022 class B_QP

Power: AC 230V/50Hz

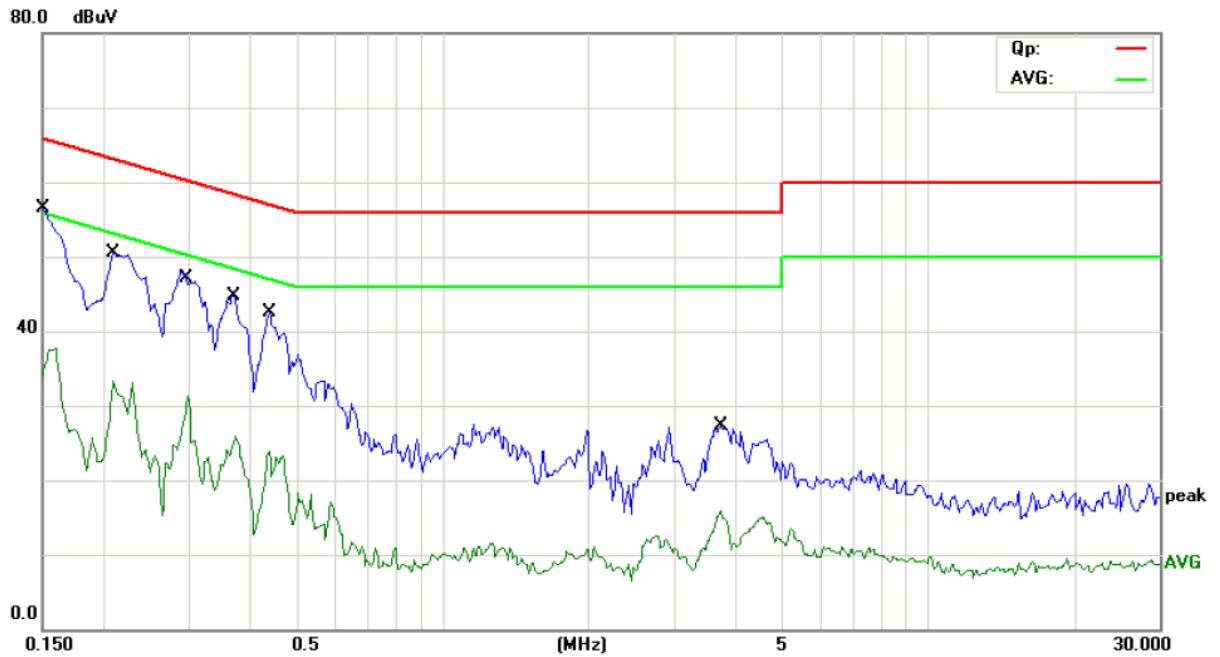
Humidity: 60 %

Mode: Charging

Note: .

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.2150	48.59	0.00	48.59	63.01	-14.42	QP	
2		0.2150	31.49	0.00	31.49	53.01	-21.52	AVG	
3		0.3000	45.30	0.00	45.30	60.24	-14.94	QP	
4		0.3000	28.54	0.00	28.54	50.24	-21.70	AVG	
5		0.3600	43.26	0.00	43.26	58.73	-15.47	QP	
6		0.3600	27.03	0.00	27.03	48.73	-21.70	AVG	
7		0.4550	38.15	0.00	38.15	56.78	-18.63	QP	
8		0.4550	27.14	0.00	27.14	46.78	-19.64	AVG	
9		1.1650	30.47	0.00	30.47	56.00	-25.53	QP	
10		1.1650	16.95	0.00	16.95	46.00	-29.05	AVG	
11		1.9650	30.26	0.00	30.26	56.00	-25.74	QP	
12		1.9650	17.28	0.00	17.28	46.00	-28.72	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: XU



Site Conduction #1

Phase: **N**

Temperature: 26

Limit: (CE)EN55022 class B_QP

Power: AC 230V/50Hz

Humidity: 60 %

Mode: Charging

Note: .

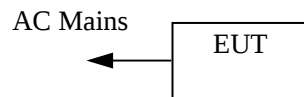
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1	*	0.1500	56.58	0.00	56.58	66.00	-9.42	QP	
2		0.1500	37.66	0.00	37.66	56.00	-18.34	AVG	
3		0.2100	50.55	0.00	50.55	63.21	-12.66	QP	
4		0.2100	33.20	0.00	33.20	53.21	-20.01	AVG	
5		0.3000	48.25	0.00	48.25	60.24	-11.99	QP	
6		0.3000	31.33	0.00	31.33	50.24	-18.91	AVG	
7		0.3750	44.83	0.00	44.83	58.39	-13.56	QP	
8		0.3750	25.97	0.00	25.97	48.39	-22.42	AVG	
9		0.4400	42.48	0.00	42.48	57.06	-14.58	QP	
10		0.4400	24.00	0.00	24.00	47.06	-23.06	AVG	
11		3.7400	27.28	0.00	27.28	56.00	-28.72	QP	
12		3.7400	15.89	0.00	15.89	46.00	-30.11	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: XU

5. RADIATED EMISSION MEASUREMENT

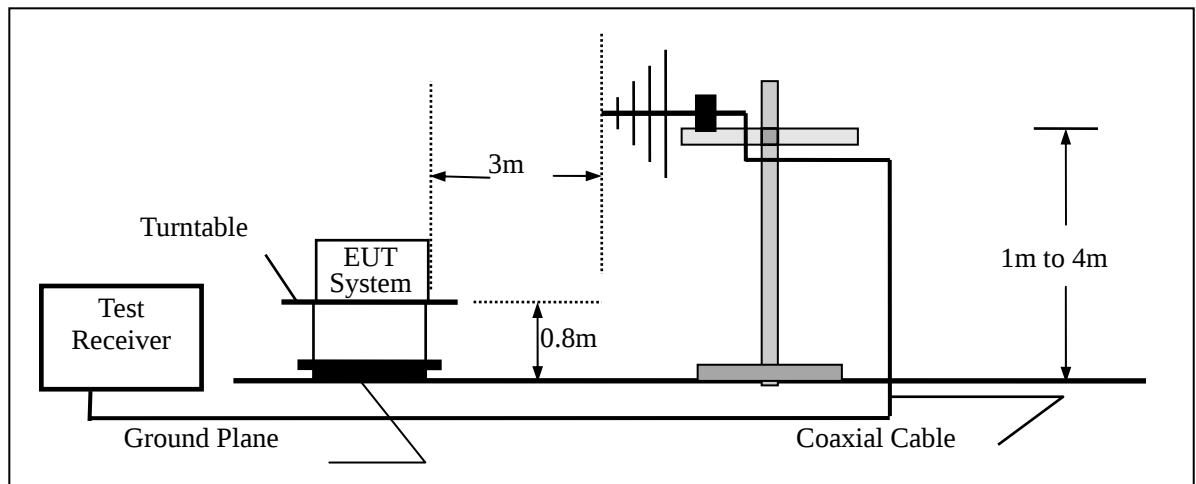
5.1. Block Diagram of Test Setup

5.1.1. Block diagram of EUT System



(EUT: JOYETECH ELECTRONIC CIGARETTE)

5.1.2. Block diagram of test setup (In chamber)



(EUT: JOYETECH ELECTRONIC CIGARETTE)

5.2. Measuring Standard

EN 55022:2010

5.3. Radiated Emission Limits (Class B)

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dB μ V/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note: (1) The smaller limit shall apply at the combination point between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

5.4. EUT Configuration on Measurement

The EN 55022 regulations test method must be used to find the maximum emission during radiated emission measurement.

EUT : JOYETECH ELECTRONIC CIGARETTE
Model Number : eCab

5.5. Operating Condition of EUT

5.5.1. Setup the EUT as shown on Section 5.1.

5.5.2. Turn on the power of all equipments.

5.5.3. Let the EUT work in measuring mode (Charging, Discharging) and measure it.

5.6. Test Procedure

The EUT is placed on a turntable which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna that is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

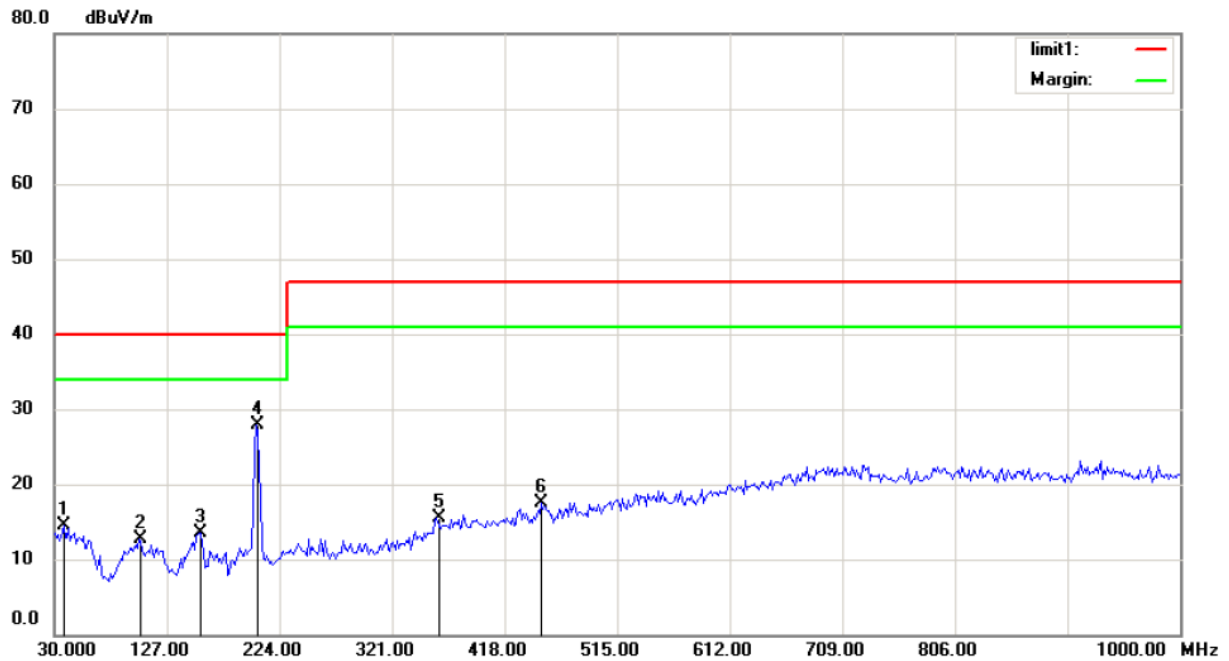
The bandwidth of the Receiver (ESU26) is set at 120kHz.
All the scanning curves are attached in the following pages.

5.7. Measuring Results

PASS.

The frequency range from 30MHz to 1000MHz is investigated.

Please reference to the following pages.



Site site #1

Polarization: **Horizontal**

Temperature: 26

Limit: (RE)EN55022 class B

Power: AC 230V/50Hz

Humidity: 60 %

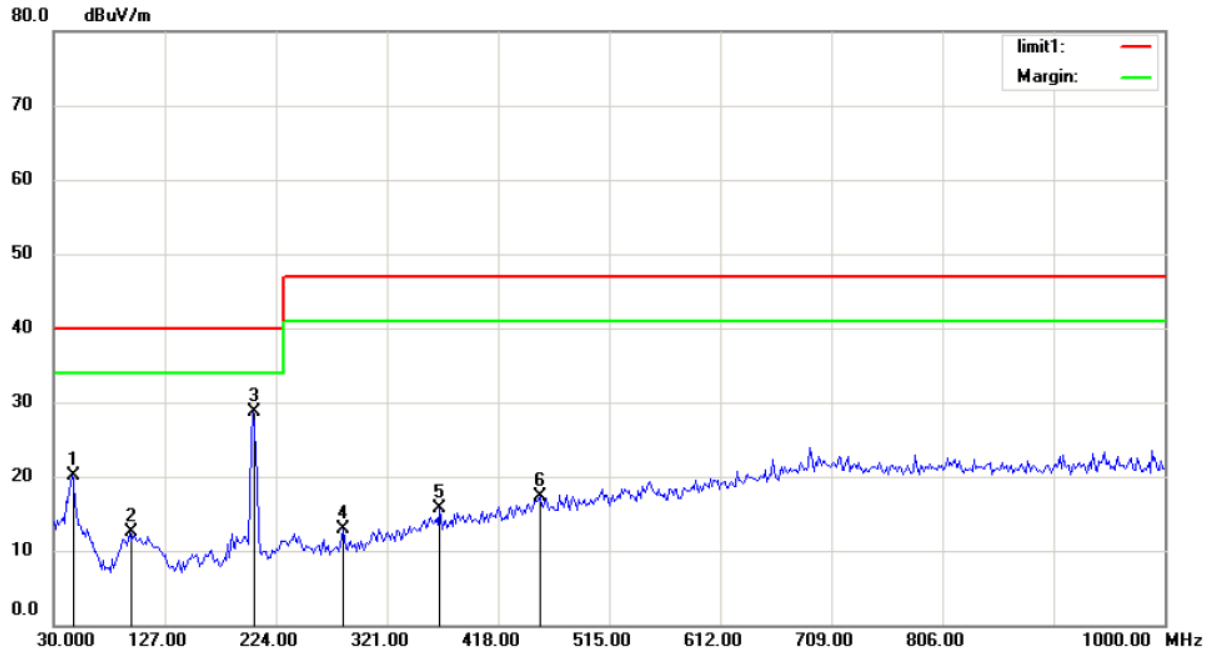
Mode:CHARGING

Note: .

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		37.7724	0.28	14.17	14.45	40.00	-25.55	QP		
2		103.0610	-0.65	13.42	12.77	40.00	-27.23	QP		
3		154.3590	4.39	9.13	13.52	40.00	-26.48	QP		
4	*	204.1026	14.87	13.05	27.92	40.00	-12.08	QP		
5		359.5513	-0.91	16.47	15.56	47.00	-31.44	QP		
6		449.7115	-1.41	18.88	17.47	47.00	-29.53	QP		

*:Maximum data x:Over limit !:over margin

Operator: GIGGS



Site site #1

Polarization: **Vertical**

Temperature: 26

Limit: (RE)EN55022 class B

Power: AC 230V/50Hz

Humidity: 60 %

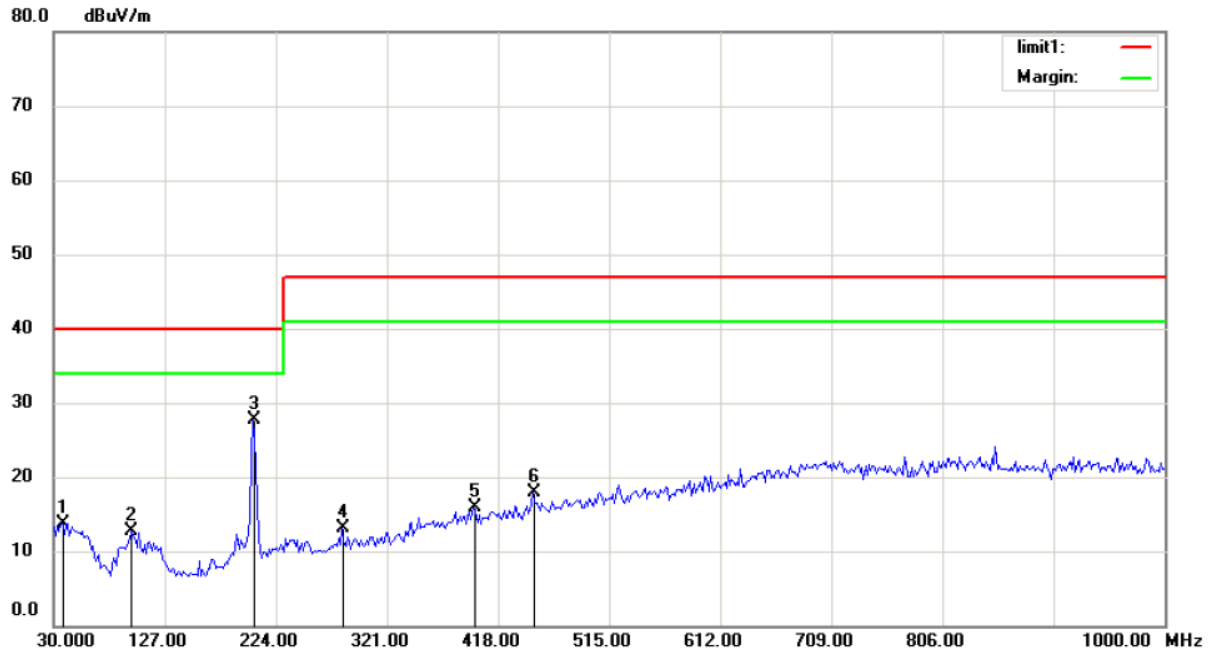
Mode: CHARGING

Note: .

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		45.5450	6.05	14.10	20.15	40.00	-19.85	QP		
2		96.8430	-0.89	13.34	12.45	40.00	-27.55	QP		
3	*	204.1026	15.65	13.05	28.70	40.00	-11.30	QP		
4		283.3814	-0.64	13.50	12.86	47.00	-34.14	QP		
5		367.3236	-0.46	16.15	15.69	47.00	-31.31	QP		
6		454.3750	-1.19	18.56	17.37	47.00	-29.63	QP		

*:Maximum data x:Over limit !:over margin

Operator: GIGGS

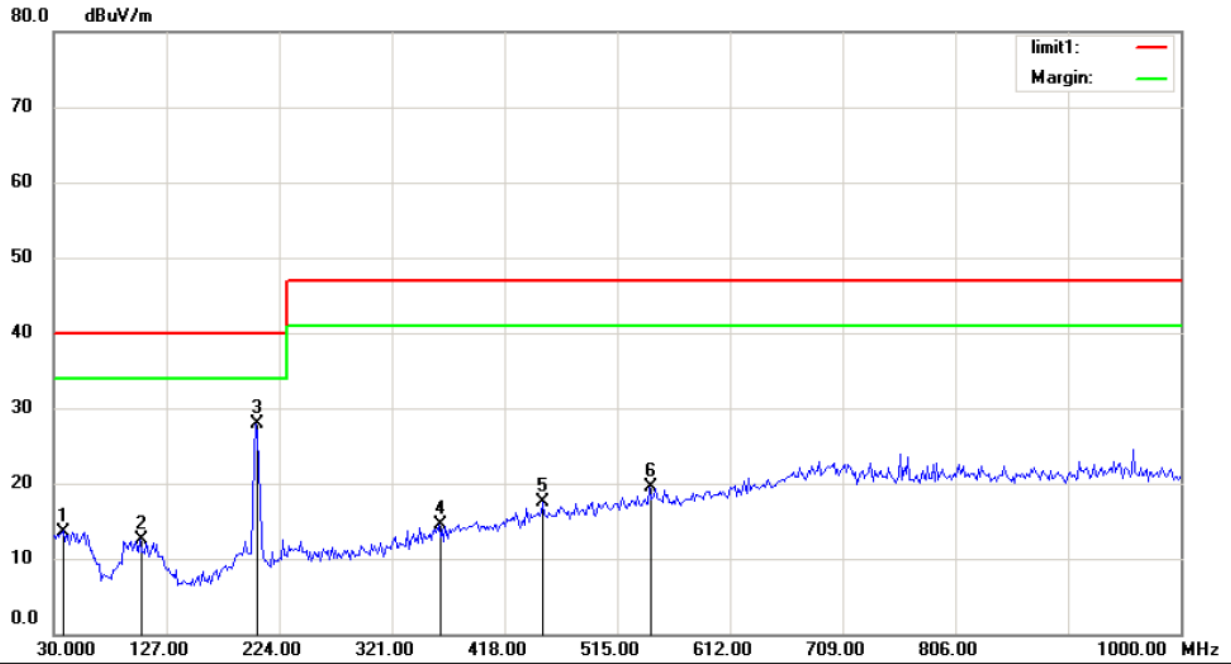


Site site #1 Polarization: **Horizontal** Temperature: 26
Limit: (RE)EN55022 class B Power: Humidity: 60 %
Mode: DISCHARGING
Note: .

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		37.7724	-0.37	14.17	13.80	40.00	-26.20			QP
2		98.3974	-0.78	13.54	12.76	40.00	-27.24			QP
3	*	204.1026	14.57	13.05	27.62	40.00	-12.38			QP
4		281.8270	-0.39	13.46	13.07	47.00	-33.93			QP
5		396.8590	-1.13	16.97	15.84	47.00	-31.16			QP
6		448.1571	-0.82	18.65	17.83	47.00	-29.17			QP

*:Maximum data x:Over limit !:over margin

Operator: GIGGS



Site site #1 Polarization: Vertical Temperature: 26
Limit: (RE)EN55022 class B Power: Humidity: 60 %
Mode: DISCHARGING
Note: .

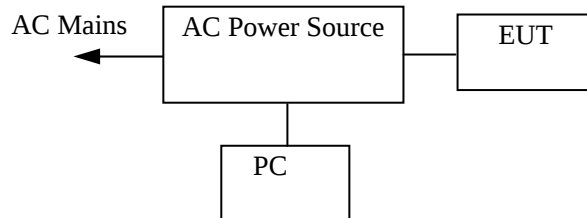
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		37.7724	-0.57	14.17	13.60	40.00	-26.40	QP		
2		104.6154	-0.72	13.26	12.54	40.00	-27.46	QP		
3	*	204.1026	14.80	13.05	27.85	40.00	-12.15	QP		
4		361.1058	-1.99	16.45	14.46	47.00	-32.54	QP		
5		451.2660	-1.25	18.81	17.56	47.00	-29.44	QP		
6		542.9808	-0.47	19.94	19.47	47.00	-27.53	QP		

*:Maximum data x:Over limit !:over margin

Operator: GIGGS

6. HARMONIC CURRENT EMISSION MEASUREMENT

6.1. Block Diagram of Test Setup



(EUT: JOYETECH ELECTRONIC CIGARETTE)

6.2. Measuring Standard

EN 61000-3-2:2006+A1:2009+A2:2009 CLASS A

6.3. Operation Condition of EUT

- 6.3.1. Setup the EUT as shown on Section 6.1.
- 6.3.2. Turn on the power of all equipments.
- 6.3.3. Let the EUT work in measuring mode (Charging) and measure it.

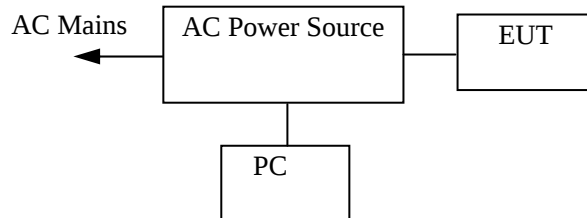
6.4. Measuring Results

Not Applicable.

Because power of EUT less than 75W, According standard EN 61000-3-2, Harmonic current unnecessary to test.

7. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

7.1. Block Diagram of Test Setup



(EUT: JOYETECH ELECTRONIC CIGARETTE)

7.2. Measuring Standard

EN 61000-3-3:2008

7.3. Operation Condition of EUT

- 7.3.1. Setup the EUT as shown on Section 7.1.
- 7.3.2. Turn on the power of all equipments.
- 7.3.3. Let the EUT work in measuring mode (Charging) and measure it.

7.4. Measuring Results

PASS.

Please see the attached page.

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

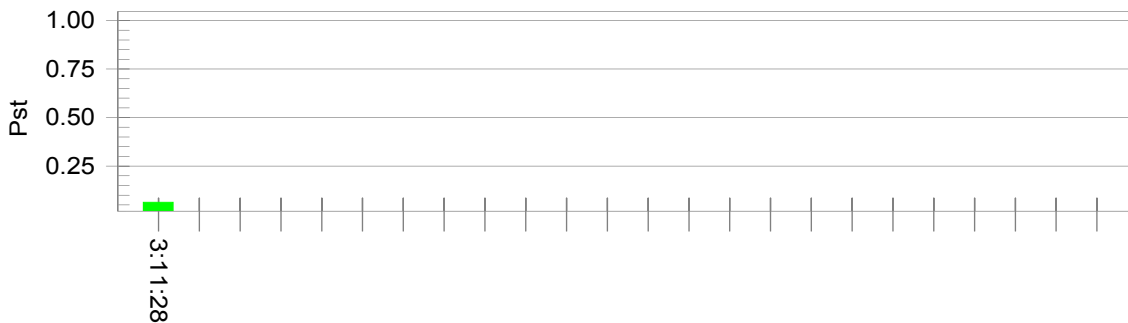
EUT: JOYETECH ELECTRONIC CIGARETTE(eCab) Tested by: XU
Test category: All parameters (European limits) Test Margin: 100
Test date: 2012-6-22 Start time: 3:01:08 End time: 3:11:29
Test duration (min): 10 Data file name: F-000079.cts_data
Comment: Charging
Customer: Joyetech

Test Result: Pass

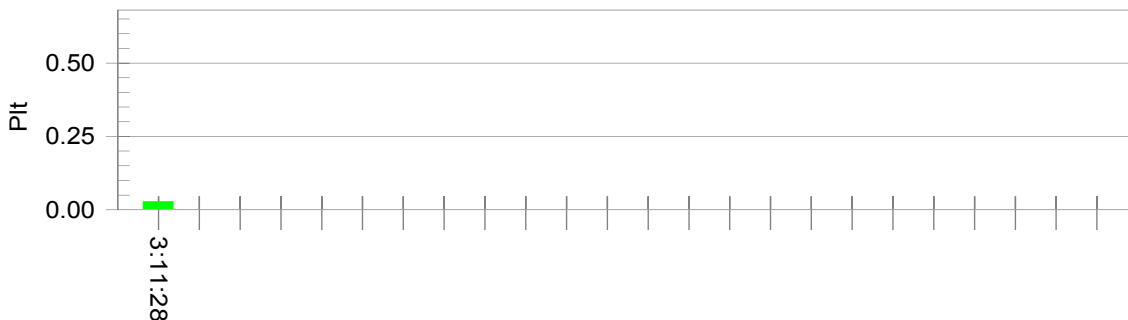
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



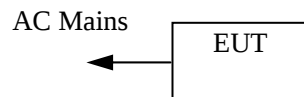
Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.87		
Highest dt (%):	0.00	Test limit (%):	3.30 Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.00	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650 Pass

8. ELECTROSTATIC DISCHARGE IMMUNITY TEST

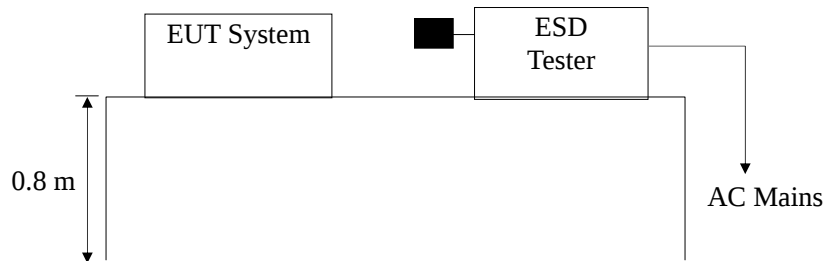
8.1. Block Diagram of Test Setup

8.1.1. Block diagram of EUT System



(EUT: JOYETECH ELECTRONIC CIGARETTE)

8.1.2. Block diagram of ESD test setup



(EUT: JOYETECH ELECTRONIC CIGARETTE)

8.2. Test Standard

EN 55024:2010

(IEC 61000-4-2:2008 Severity Level: 3 / Air Discharge: ± 8 kV
Level: 2 / Contact Discharge: ± 4 kV)

8.3. Severity Levels and Performance Criterion

8.3.1. Severity level

Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)
1	± 2	± 2
2	± 4	± 4
3	± 6	± 8
4	± 8	± 15
X	Special	Special

8.3.2. Performance criterion: B

8.4. Operating Condition of EUT

8.4.1. Setup the EUT as shown on Section 8.1.

8.4.2. Turn on the power of all equipments.

8.4.3. Let the EUT work in measuring mode (Charging, Discharging) and measure it.

8.5. Test Procedure

8.5.1. Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

8.5.2. Contact Discharge:

All the procedure shall be same as Section 8.5.1. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

8.5.3. Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

8.5.4. Indirect discharge for vertical coupling plane

At least 10 singles discharge (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m×0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

8.6. Test Results

PASS.

Please refer to the following page.

Electrostatic Discharge Test Results

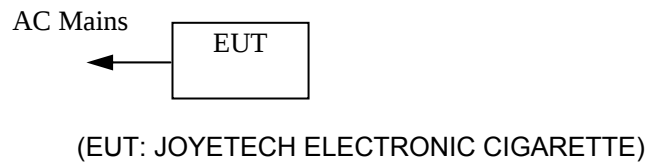
SHENZHEN EMTEK CO., LTD.

Applicant	: SHENZHEN JOYETECH CO., LTD.		
EUT	: JOYETECH ELECTRONIC CIGARETTE	Test Date	: June 25, 2012
M/N	: eCab	Temperature	: 20℃
Power Supply	: AC 230V/50Hz	Humidity	: 50%
Air discharge	: ± 8.0kV	Test Mode	: Charging, Discharging
Contact discharge	: ± 4.0kV	Criterion	: B
Location		Kind A-Air Discharge C-Contact Discharge	Result
Metal		C	PASS
Button		A	PASS
HCP		C	PASS
VCP of front		C	PASS
VCP of rear		C	PASS
VCP of left		C	PASS
VCP of right		C	PASS
Note:			

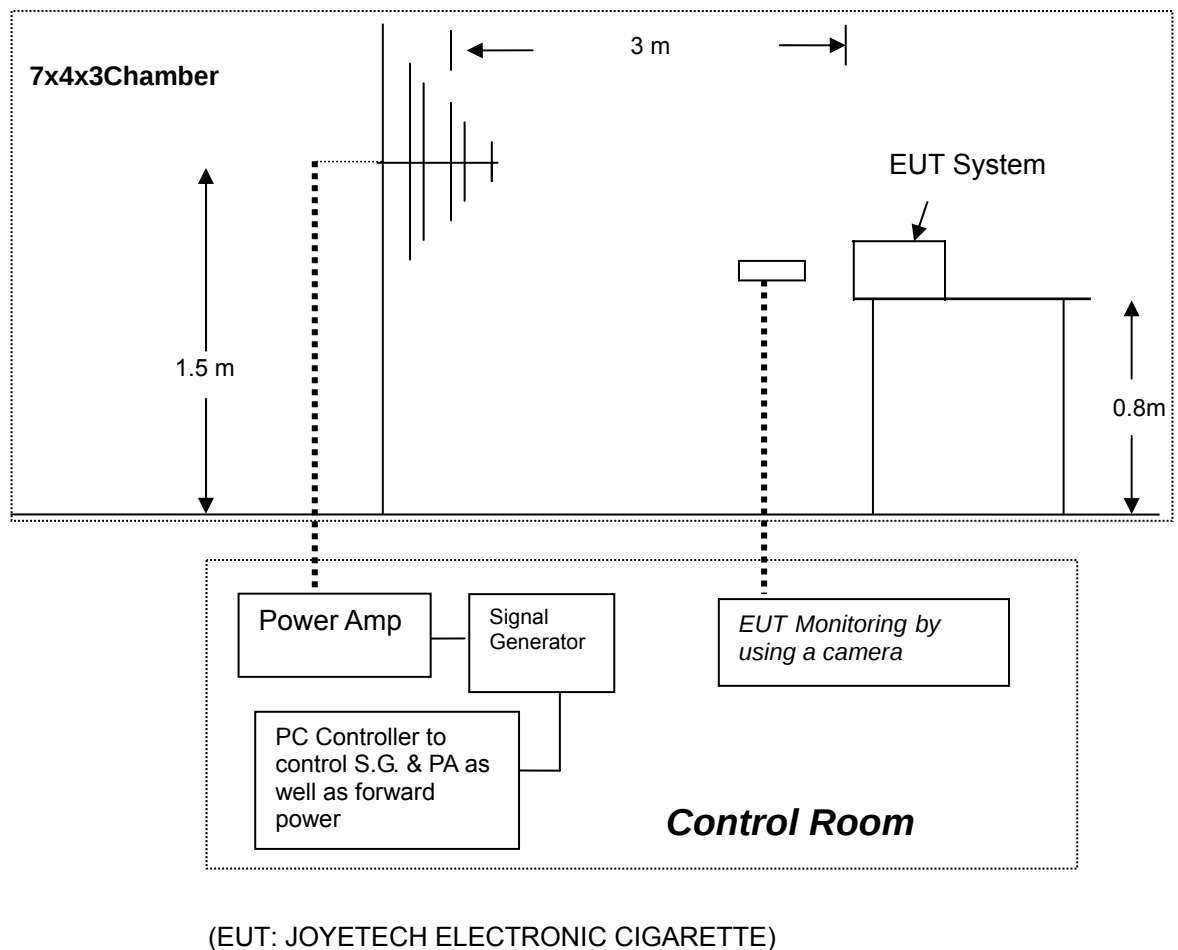
9. RF FIELD STRENGTH SUSCEPTIBILITY TEST

9.1. Block Diagram of Test Setup

9.1.1. Block diagram of EUT System



9.1.2. Block diagram of RS test setup



9.2. Test Standard

EN 55024:2010
 (IEC 61000-4-3:2006+A1:2007+A2:2010, Severity Level: 2, 3 V/m)

9.3. Severity Levels and Performance Criterion

9.3.1. Severity Levels

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

9.3.2. Performance Criterion: A

9.4. Operating Condition of EUT

9.4.1. Setup the EUT as shown on Section 9.1.

9.4.2. Turn on the power of all equipments.

9.4.3. Let the EUT work in measuring mode (Charging, Discharging) and measure it.

9.5. Test Procedure

The EUT are placed on a table that is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna that is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a CCD camera and a multimeter are used to monitor it. All the scanning conditions are as following:

Condition of Test	Remark
1. Fielded Strength	3 V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80-1000MHz
4. Sweep time of radiated	0.0015 Decade/s
5. Dwell Time	1 Sec.

9.6. Test Results

PASS.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

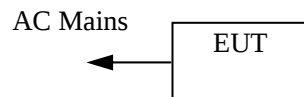
SHENZHEN EMTEK CO., LTD.

Applicant : SHENZHEN JOYETECH CO., LTD.				
EUT : JOYETECH ELECTRONIC CIGARETTE		Test Date : June 25, 2012		
M/N : eCab		Temperature : 22°C		
Field Strength : 3 V/m		Humidity : 50%		
Power Supply : AC 230V/50Hz		Criterion : A		
Test Mode : Charging, Discharging		Frequency Range : 80 MHz to 1000 MHz		
Modulation:		☐ None ☐ Pulse ☒ AM 1kHz 80%		
		Frequency Rang 1: 80~ 1000 MHz		Frequency Rang 2: N/A
Steps	1%			
	Horizontal	Vertical	Horizontal	Vertical
Front	PASS	PASS		
Right	PASS	PASS		
Rear	PASS	PASS		
Left	PASS	PASS		
Test Equipment: 1. Signal Generator: 2023B (AEROFLEX) 2. Power Amplifier: AS0102-55 (MILMEGA) & AP32MT215 (PRANA) 3. Log.-Per. Antenna: VULP9118E (SCHWARZBECK) 4. Broad-Band Horn Antenna: BBHA 9120L3F (SCHWARZBECK) 5. RF Power Meter. Dual Channel: 4232A (BOONTON) 6. Field Strength Meter: HI-6005 (HOLADAY)				
Note:				

10. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

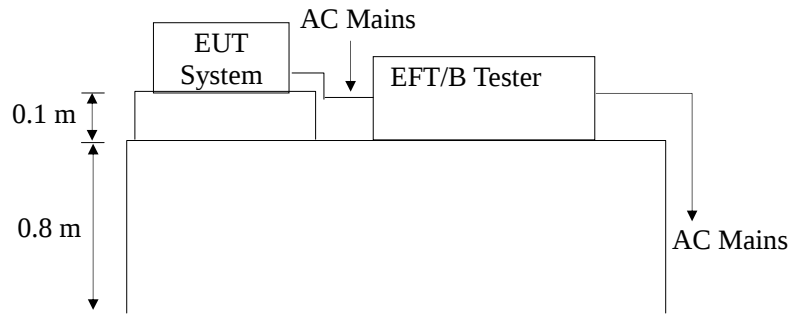
10.1. Block Diagram of Test Setup

10.1.1. Block Diagram of EUT System



(EUT: JOYETECH ELECTRONIC CIGARETTE)

10.1.2. EFT Test Setup



(EUT: JOYETECH ELECTRONIC CIGARETTE)

10.2. Test Standard

EN 55024:2010

(IEC 61000-4-4:2004+Cor 1 :2006+Cor 2 :2007, Severity Level: 2: 1kV)

10.3. Severity Levels and Performance Criterion

10.3.1. Severity level

Level	Open Circuit Output Test Voltage $\pm 10\%$	
	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special

10.3.2. Performance criterion: B

10.4. Operating Condition of EUT

- 10.4.1. Setup the EUT as shown on Section 10.1.
- 10.4.2. Turn on the power of all equipments.
- 10.4.3. Let the EUT work in measuring mode (Charging) and measure it.

10.5. Test Procedure

The EUT is put on the table that is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

- 10.5.1. For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device that couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

- 10.5.2. For signal lines and control lines ports:

No I/O ports. It's unnecessary to test.

- 10.5.3. For DC output line ports:

It's unnecessary to test.

10.6. Test Results

PASS.

Please refer to the following page.

Electrical Fast Transient/Burst Test Results

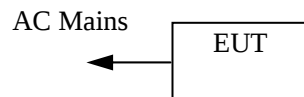
SHENZHEN EMTEK CO., LTD.

Standard: ☒ IEC 61000-4-4		Result: ☒ PASS / ☐ FAIL	
Applicant : <u>SHENZHEN JOYETECH CO., LTD.</u> EUT : <u>JOYETECH ELECTRONIC CIGARETTE</u> M/N : <u>eCab</u> Power Supply: <u>AC 230V/50Hz</u> Criterion: B Ambient Condition : <u>22°C</u> <u>50%RH</u>			
Operation Mode: Charging			
Line : ☒ AC Mains		Line : ☐ Signal line ☐ DC line	
Coupling : ☒ Direct		Coupling : ☐ Capacitive	
Test Time : 120s			
Line	Test Voltage	Result(+)	Result(-)
L	1kV	PASS	PASS
N	1kV	PASS	PASS
PE			
L、N	1kV	PASS	PASS
L、PE			
N、PE			
L、N、PE			
Signal Line			
DC Line			
Note:			

11. SURGE IMMUNITY TEST

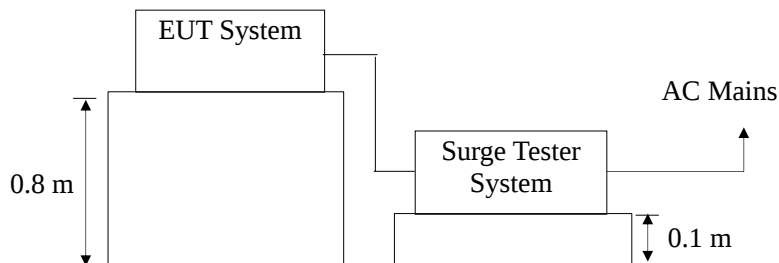
11.1. Block Diagram of Test Setup

11.1.1. Block Diagram of EUT System



(EUT: JOYETECH ELECTRONIC CIGARETTE)

11.1.2. Surge Test Setup



(EUT: JOYETECH ELECTRONIC CIGARETTE)

11.2. Test Standard

EN 55024:2010

(IEC 61000-4-5:2005, Severity Level: Line to Line: Level 2, 1.0kV;
Line to earth, Level 3, 2.0kV)

11.3. Severity Levels and Performance Criterion

11.3.1. Severity level

Severity Level	Open-Circuit Test Voltage kV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

11.3.2. Performance criterion: B

11.4. Operating Condition of EUT

- 11.4.1. Setup the EUT as shown on Section 11.1.
- 11.4.2. Turn on the power of all equipments.
- 11.4.3. Let the EUT work in measuring mode (Charging) and measure it.

11.5. Test Procedure

- 1) Set up the EUT and test generator as shown on Section 11.1.2.
- 2) For line to line coupling mode, provide a 1.0 kV 1.2/50us voltage surge
For line to earth coupling mode, provide a 2.0 kV 1.2/50us voltage surge.
(At open-circuit condition) and 8/20us current surge to EUT selected points.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

11.6. Test Results

PASS.

Please refer to the following page.

Surge Immunity Test Results

SHENZHEN EMTEK CO., LTD.

Applicant: SHENZHEN JOYETECH CO., LTD.

EUT: JOYETECH ELECTRONIC CIGARETTE

Test Date : June 25, 2012

M/N: eCab

Temperature: 22°C

Power Supply: AC 230V/50Hz

Humidity: 50%

Test Mode: Charging

Criterion: B

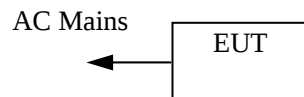
Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (kV)	Result
L-N	+	0°	5	1.0	PASS
	+	90°	5	1.0	PASS
	+	180°	5	1.0	PASS
	+	270°	5	1.0	PASS
	-	0°	5	1.0	PASS
	-	90°	5	1.0	PASS
	-	180°	5	1.0	PASS
	-	270°	5	1.0	PASS
L-PE					
N-PE					

Remark:

12. INJECTED CURRENTS SUSCEPTIBILITY TEST

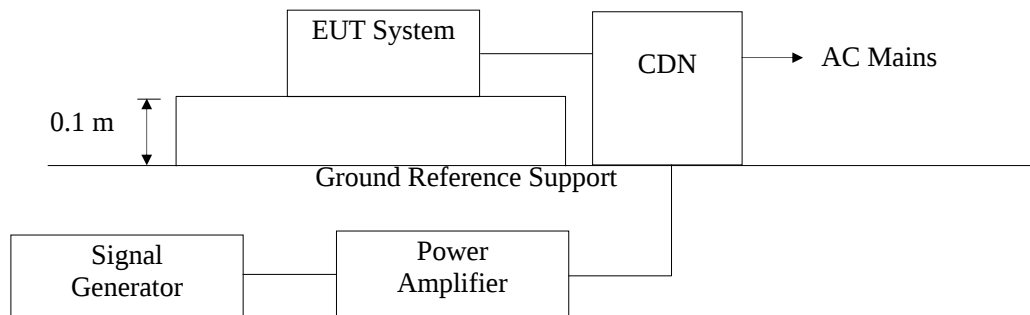
12.1. Block Diagram of Test Setup

12.1.1. Block Diagram of EUT System



(EUT: JOYETECH ELECTRONIC CIGARETTE)

12.1.2. Block Diagram of Test Setup



(EUT: JOYETECH ELECTRONIC CIGARETTE)

12.2. Test Standard

EN 55024:2010

(IEC 61000-4-6:2008, Severity Level: Level 2, 3V (r.m.s.), 0.15MHz ~ 80MHz)

12.3. Severity Levels and Performance Criterion

12.3.1. Severity level

Level	Field Strength V
1	1
2	3
3	10
X	Special

12.3.2. Performance criterion: A

12.4. Operating Condition of EUT

12.4.1. Setup the EUT as shown on Section 12.1.

12.4.2. Turn on the power of all equipments.

12.4.3. Let the EUT work in measuring mode (Charging) and measure it.

12.5. Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 12.1.2.
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150kHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. where the frequency is swept incrementally; the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

12.6. Test Results

PASS.

Please refer to the following page.

Injected Currents Susceptibility Test Results

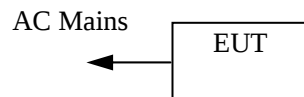
SHENZHEN EMTEK CO., LTD.

Applicant : <u>SHENZHEN JOYETECH CO., LTD.</u>				
EUT : <u>JOYETECH ELECTRONIC CIGARETTE</u>			Test Date: <u>June 25, 2012</u>	
M/N : <u>eCab</u>			Temperature : <u>23°C</u>	
Power Supply : <u>AC 230V / 50Hz</u>			Humidity : <u>50%</u>	
Test Engineer : <u>XY</u>				
Test Mode: Charging				
Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 80	AC Mains	3V	A	PASS
Test Mode : N/A				
Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
Remark : 1. Modulation Signal:1kHz 80% AM Measurement Equipment : Simulator: CWS 500 (SWITZERLAND EMTEST) CDN : ☒ CDN-M2 (SWITZERLAND EMTEST) ☐ CDN-M3 (SWITZERLAND EMTEST)			Note:	

13. MAGNETIC FIELD SUSCEPTIBILITY TEST

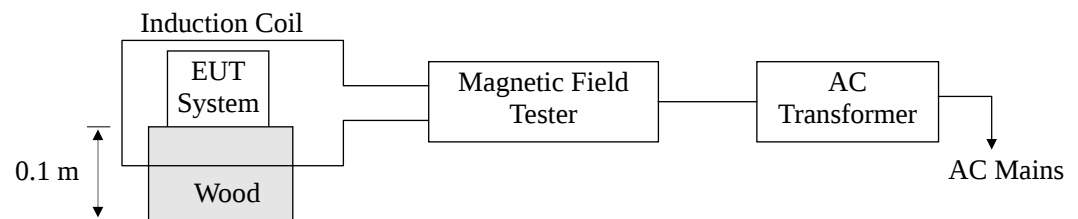
13.1. Block Diagram of Test Setup

13.1.1. Block diagram of EUT System



(EUT: JOYETECH ELECTRONIC CIGARETTE)

13.1.2. Magnetic field test setup



(EUT: JOYETECH ELECTRONIC CIGARETTE)

13.2. Test Standard

EN 55024:2010
(IEC 61000-4-8:2009, Severity Level: Level 1, 1 A/m)

13.3. Severity Levels and Performance Criterion

13.3.1. Severity Levels

Level	Field Strength A/m
1	1
2	3
3	10
4	30
5	100
X	Special

13.3.2. Performance Criterion: A

13.4. Operating Condition of EUT

13.4.1. Setup the EUT as shown on Section 7.1.

13.4.2. Turn on the power of all equipments.

13.4.3. Let the EUT work in measuring mode (Charging, Discharging) and measure it.

13.5. Test Procedure

The EUT is placed in the middle of a induction coil (1*1m), under which is a 1*1*0.1m (high) table, this small table is also placed on a larger table, 0.8 m above the ground. Both horizontal and vertical polarization of the induction coil is set on test, so that each side of the EUT is affected by the magnetic field. Also can reach the same aim by change the position of the EUT.

13.6. Test Results

PASS.

Please refer to the following page.

Magnetic Field Immunity Test Results

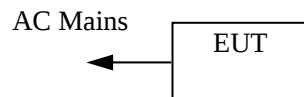
SHENZHEN EMTEK CO., LTD.

Standard: ☒ IEC 61000-4-8	Result: ☒ PASS / ☐ FAIL			
Applicant: <u>SHENZHEN JOYETECH CO., LTD.</u>				
EUT : <u>JOYETECH ELECTRONIC CIGARETTE</u>				
M/N : <u>eCab</u>				
Test Voltage: <u>AC 230V, 50Hz</u>				
Date of Test: <u>June 25, 2012</u>	Test Engineer: <u>XY</u>			
Ambient Condition: Temp : <u>22°C</u>	Humid : <u>50%</u>			
Criterion: A				
Operation Mode: Charging, Discharging				
Test Level (A/m)	Testing Duration	Coil Orientation	Criterion	Result
1	5 mins	X	A	PASS
1	5 mins	Y	A	PASS
1	5 mins	Z	A	PASS
Operation Mode: N/A				
Test Level (A/m)	Testing Duration	Coil Orientation	Criterion	Result
Test Equipment	Magnetic Field Test: HEAFELY MAG 100.1			
Note:				

14. VOLTAGE DIPS AND INTERRUPTIONS TEST

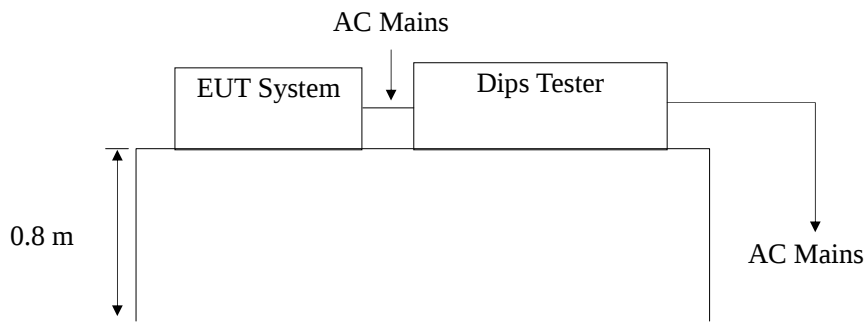
14.1. Block Diagram of Test Setup

14.1.1. Block Diagram of EUT System



(EUT: JOYETECH ELECTRONIC CIGARETTE)

14.1.2. Dips Test Setup



(EUT: JOYETECH ELECTRONIC CIGARETTE)

14.2. Test Standard

EN 55024:2010 (IEC 61000-4-11:2004)

14.3. Severity Levels and Performance Criterion

14.3.1. Severity level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5 1 5 10 25 50 *
70	30	
0	100	

14.3.2. Performance criterion: B&C

14.4. Operating Condition of EUT

- 14.4.1. Setup the EUT as shown on Section 14.1.
- 14.4.2. Turn on the power of all equipments.
- 14.4.3. Let the EUT work in measuring mode (Charging) and measure it.

14.5. Test Procedure

- 1) Set up the EUT and test generator as shown on Section 14.1.2.
- 2) The interruption is introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

14.6. Test Results

PASS.

Please refer to the following page.

Voltage Dips and Interruptions Test Results

SHENZHEN EMTEK CO., LTD.

Applicant : SHENZHEN JOYETECH CO., LTD.

EUT : JOYETECH ELECTRONIC CIGARETTE

Test Date : June 25, 2012

M/N : eCab

Temperature : 22°C

Power Supply : AC 230V / 50Hz

Humidity : 50%

Test Mode: Charging

Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in periods)	Criterion ☐ A ☒ B ☒ C ☐ D	Result P=PASS F=FAIL
0	100	0.5P	B	P
70	30	25P	C	P
0	100	250P	C	P

Test Mode : N/A

Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in periods)	Criterion ☐ A ☐ B ☐ C ☐ D	Result P=PASS F=FAIL

Note:

15. PHOTOGRAPHS

15.1.Photo of Conducted Emission Measurement



15.2.Photo of Radiation Emission Measurement



15.3.Photo of Harmonic / Flicker Measurement



15.4.Photo of Electrostatic Discharge Test



15.5.Photo of RF Strength Susceptibility Test



15.6.Photo of Electrical Fast Transient / Burst Test



15.7.Photo of Surge Test



15.8.Photo of Injected Currents Susceptibility Test



15.9.Photo of Magnetic Field Immunity Test



15.10.Photo of Voltage Dips and Interruption Immunity Test



APPENDIX (Photos of EUT)

