



**TEST REPORT
FOR
ISO 7637-1/-2 (1990)**

Report No.: 06-04-MAS-045-03

Client: **Systems & Technology Corp.**
 Product: **GPS Vehicle Tracking Device**
 Model: **X1**
 Manufacturer/supplier: **Shuttle Inc.**
 Date test item received: 2006/04/06
 Date test campaign completed: 2006/05/22
 Date of issue: 2006/06/12

The test result only corresponds to the tested sample. It is not permitted to copy this report, in part or in full, without the permission of the test laboratory.

Total number of pages of this test report: 22 pages
Total number of pages of this test photos: 02 pages

Test Engineer Yi-Hone Cheng	Checked By Jerry Huang	Approved By Tsung-Ching Lin
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Laboratory Introduction: Electronics Testing Center, Taiwan is recognized, filed and mutual recognition arrangement as following:

- ① ISO9001: TüV Product Service
- ② ISO/IEC 17025: BSMI, CNLA, DGT, NVLAP, CCIBLAC, UL, Compliance
- ③ Filing: FCC, Industry Canada, VCCI
- ④ MRA: Australia, Hong Kong, New Zealand, Singapore, USA, Japan, Korea, China, APLAC through CNLA
- ⑤ FCC Registration Number: 90588, 91094, 91095

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1 TEST REPORT CERTIFICATION

Client : Systems & Technology Corp.
Address : 3F-7, No.79, Hsin Tai Wu Road, Sec.1, Hsichih, Taipei County, Taiwan, R.O.C.
Manufacturer : Shuttle Inc.
Address : No.30, Lane 76, Rei Kuang Rd., Nei-Hu Dist., Taipei, Taiwan, R.O.C.
EUT : GPS Vehicle Tracking Device
Trade Name : IntelliTrac
Model No. : X1
Regulation Applied : ISO 7637-1/-2 (1990)

The testing described in this report has been carried out to the best of our knowledge and ability, and our responsibility is limited to the exercise of reasonable care. This certification is not intended to believe the sellers from their legal and/or contractual obligations.



2 GENERAL INFORMATIONS

2.1 Description of EUT:

GPS Positioning, Vehicle Real-Time Tracking, Vehicle Fleet Management, Vehicle Security Monitoring System.

2.2 Related Informations of EUT:

Power Supply : DC Power 12/24Vdc

Power Line : Nonshielded Shielded None , length: 0.5 m

Signal Line : Nonshielded Shielded None , length: m

Ear. Line : Nonshielded Shielded None , length: m

TEL. Line : Nonshielded Shielded None , length: m

Data Line : Nonshielded Shielded None , length: m

2.3 Tested Configuration:

No devices were required.

Product	Manufacturer	Model No.	Serial No.	I/O Cable
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2.4 Deviation Record:

(If any deviation from additions to or exclusions from test method must be stated)

N/A

2.5 Modification Record:

No modifications were required. (That is the EUT complied with the requirement as tested.)

3 SUMMARY OF TEST RESULTS

3.1 ISO 7637-1/-2 (1990):

3.1.1 Classification of Functional Status:

All classifications given below are for the total device / system functional status.

Class A: All functions of a device / system perform as designed during and after exposure to disturbance.

Class B: All functions of a device / system perform as designed during exposure; however, one or more of them can go beyond specified tolerance. All function return automatically to within normal limits after exposure is removed. Memory functions shall remain Class A.

Class C: A function of a device / system does not perform as designed during exposure but returns automatically to normal operation after exposure is removed.

Class D: A function of a device / system does not perform as designed during exposure and does not return to normal operation until exposure is removed and the device system is reset by simple "operator / use" action.

Class E: One or more function of a device / system does not perform as designed during and after exposure and cannot be returned to proper operation without repairing or replacing the device / system.

3.1.2 Presentation of Results (ISO7637-1(1990)):**3.1.2.1 Test pulse 1:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --**3.1.2.2 Test pulse 2:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --**3.1.2.3 Test Pulse 3a:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --**3.1.2.4 Test Pulse 3b:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --**3.1.2.5 Test pulse 4:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --**3.1.2.6 Test pulse 5:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --**3.1.2.7 Test pulse 7:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --

3.1.3 Presentation of Results (ISO7637-2(1990)):**3.1.2.1 Test pulse 1a:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --**3.1.2.2 Test pulse 1b:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --**3.1.2.3 Test Pulse 2:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --**3.1.2.4 Test Pulse 3a:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --**3.1.2.5 Test pulse 3b:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --**3.1.2.6 Test pulse 4:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --**3.1.2.7 Test pulse 5:**

- Satisfies Class A
- Satisfies Class B
- Satisfies Class C

Requirement: --

4 TEST DATA & RELATED INFORMATIONS

4.1 ISO 7637-1 (1990):

4.1.1 Test Pulse 1 Test Data:

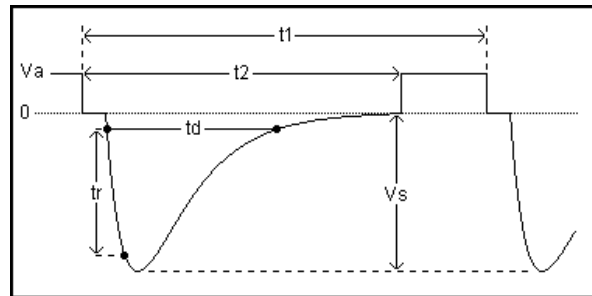
A. Operating Conditions of the EUT: GSM Link Mode

Test Date: May 06, 2006

Test Specification	ISO 7637-1 (1990) Test Pulse 1
Climatic Condition	Ambient Temperature : <u>25° C</u>
	Pressure : <u>983 mPa</u>
	Humidity : <u>48 %RH</u>
	Application : <u>12V System</u>

Test Procedure			
Test Generator:	UCS200M	Software No.:	000038
		Serial No.:	1004-14
Va (Alternator):	13.5 V	Current Limit:	30 A

Test Setup		
Vs:	-50	V
t1:	0.5	s
t2:	200	ms
tr:	1	us
td:	2000	us
Ri:	10	Ohm
Coupling:	Battery	
Events:	5000	
Test Duration:	00:41:40	h



Test Result	
Pulses:	5000
Result:	A function of a device / system does not perform as designed during exposure but returns automatically to normal operation after exposure is removed.

4.1.2 Test Pulse 2 Test Data:

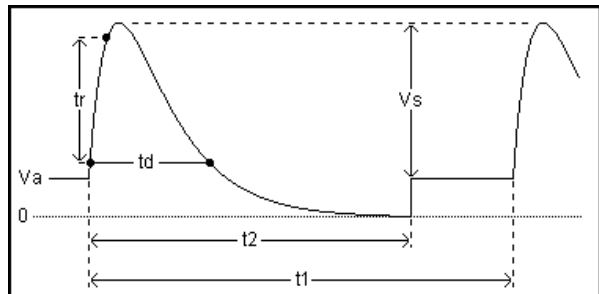
A. Operating Conditions of the EUT: GSM Link Mode

Test Date: May 06, 2006

Test Specification	ISO 7637-1 (1990) Test Pulse 2
Climatic Condition	Ambient Temperature : <u>25° C</u>
	Pressure : <u>983 mPa</u>
	Humidity : <u>48 %RH</u>
	Application : <u>12V System</u>

Test Procedure			
Test Generator:	UCS200M	Software No.:	000038
		Serial No.:	1004-14
Va (Alternator):	13.5 V	Current Limit:	30 A

Test Setup		
Vs:	+50	V
t1:	0.5	s
t2:	200	ms
tr:	1	us
td:	50	us
Ri:	10	Ohm
Coupling:	Battery	
Events:	5000	
Test Duration:	00:41:40	h



Test Result	
Pulses:	5000
Result:	A function of a device / system does not perform as designed during exposure but returns automatically to normal operation after exposure is removed.

4.1.3 Test Pulse 3a Test Data:

A. Operating Conditions of the EUT: GSM Link Mode

Test Date: May 06, 2006

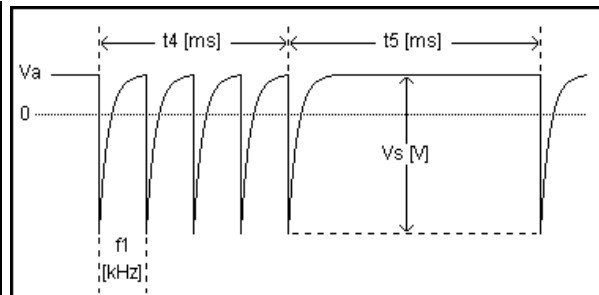
Test Specification	ISO 7637-1 (1990) Test Pulse 3a
Test Equipment	EM Test System
Climatic Condition	Ambient Temperature : <u>25° C</u>
	Pressure : <u>983 mPa</u>
	Humidity : <u>48 %RH</u>
	Application : <u>12V System</u>

Test Procedure

Test Generator:	UCS200M	Software No.:	000038
		Serial No.:	1004-14
Va (Alternator):	13.5 V	Current Limit:	30 A

Test Setup

Vs:	-50	V
f1:	10	kHz
t4:	10	ms
t5:	90	ms
tr:	5	ns
td:	100	ns
Ri:	50	Ohm
Coupling:	Battery	
Test Duration:	1	H



Test Result

Test Duration:	01:00:01 h
Result:	All functions of a device / system perform as designed during and after exposure to disturbance.

4.1.4 Test Pulse 3b Test Data:

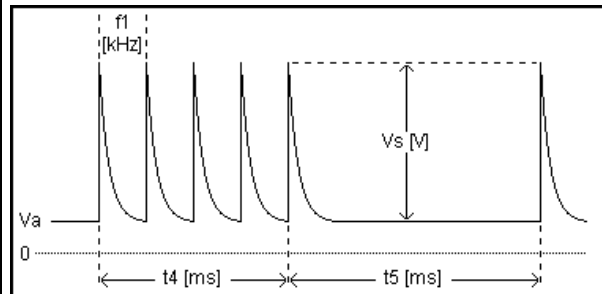
A. Operating Conditions of the EUT: GSM Link Mode

Test Date: May 06, 2006

Test Specification	ISO 7637-1 (1990) Test Pulse 3b
Climatic Condition	Ambient Temperature : <u>25° C</u>
	Pressure : <u>983 mPa</u>
	Humidity : <u>48 %RH</u>
	Application : <u>12V System</u>

Test Procedure			
Test Generator:	UCS200M	Software No.:	000038
		Serial No.:	1004-14
Va (Alternator):	13.5 V	Current Limit:	30 A

Test Setup		
Vs:	+50	V
f1:	10	kHz
t4:	10	ms
t5:	90	ms
tr:	5	ns
td:	100	ns
Ri:	50	Ohm
Coupling:	Battery	
Test Duration:	1	h



Test Result	
Test Duration:	01:00:01 h
Result:	All functions of a device / system perform as designed during and after exposure to disturbance.

4.1.5 Test Pulse 4 Test Data:

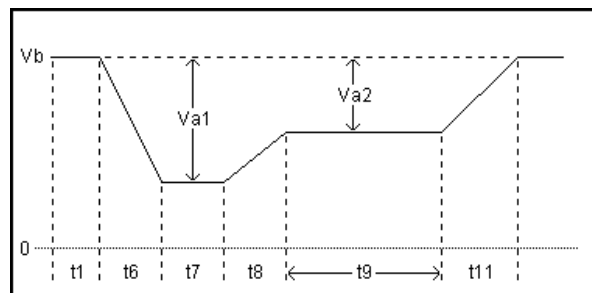
A. Operating Conditions of the EUT: GSM Link Mode

Test Date: May 06, 2006

Test Specification	ISO 7637-1 (1990) Test Pulse 4
Climatic Condition	Ambient Temperature : <u>25° C</u>
	Pressure : <u>983 mPa</u>
	Humidity : <u>48 %RH</u>
	Application : <u>12V System</u>

Test Procedure			
Test Generator:	VDS200B1	Software No.:	000367
		Serial No.:	0105-02
Coupling Network:	UCS200M	Serial No.:	1004-14
Vb (Battery):	12.0 V	Current Limit:	30 A

Test Setup		
Va1:	-5.0	V
Va2:	-2.5	V
t1:	55	s
t6:	5	ms
t7:	25	ms
t8:	50	ms
t9:	5	s
t11:	5	ms
Events:	1	
Test Duration:	00:01:01	h



Test Result	
Pulses:	1
Result:	All functions of a device / system perform as designed during and after exposure to disturbance.

4.1.6 Test Pulse 5 Test Data:

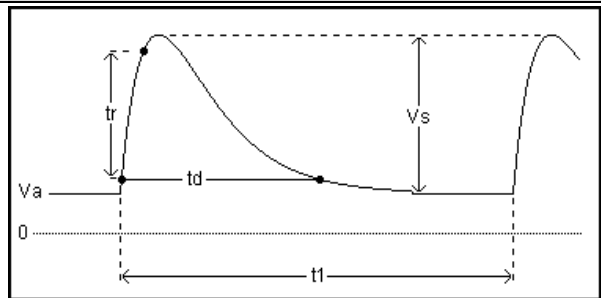
A. Operating Conditions of the EUT: GSM Link Mode

Test Date: May 06, 2006

Test Specification	ISO 7637-1 (1990) Test Pulse 5
Climatic Condition	Ambient Temperature : <u>25° C</u>
	Pressure : <u>983 mPa</u>
	Humidity : <u>48 %RH</u>
	Application : <u>12V System</u>

Test Procedure			
Test Generator:	LD200B	Software No.:	000228
		Serial No.:	0803-10
Va (Alternator):	13.5 V	Current Limit:	30 A

Test Setup		
Vs:	+47	V
t1:	45	s
td:	200	ms
tr:	10	ms
Ri:	0.5	Ohm
Events:	1	
Test Duration:	00:00:45	h



Test Result	
Pulses:	1
Result:	All functions of a device / system perform as designed during and after exposure to disturbance.

4.1.7 Test Pulse 7 Test Data:

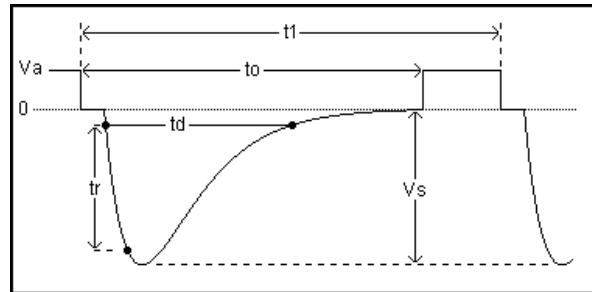
A. Operating Conditions of the EUT: GSM Link Mode

Test Date: May 06, 2006

Test Specification	ISO 7637-1 (1990) Test Pulse 7
Climatic Condition	Ambient Temperature : <u>25° C</u>
	Pressure : <u>983 mPa</u>
	Humidity : <u>48 %RH</u>
	Application : <u>12V System</u>

Test Procedure			
Test Generator:	LD200B	Software No.:	000228
		Serial No.:	0803-10
Va (Alternator):	13.5 V	Current Limit:	30 A

Test Setup		
Vs:	-40	V
t1:	45	s
td:	100	ms
to:	4	s
tr:	10	ms
Ri:	10	Ohm
Events:	1	
Test Duration:	00:00:49	h



Test Result	
Pulses:	1
Result:	All functions of a device / system perform as designed during and after exposure to disturbance.

4.2 ISO 7637-2 (1990):

4.2.1 Test Pulse 1a Test Data:

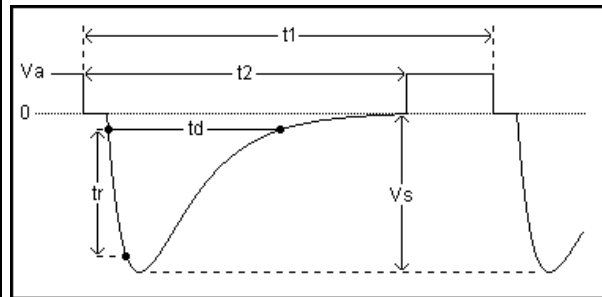
A. Operating Conditions of the EUT: GSM Link Mode

Test Date: Apr. 16, 2006

Test Specification	ISO 7637-2 (1990) Test Pulse 1a
Climatic Condition	Ambient Temperature : <u>24</u> °C
	Pressure : <u>983</u> mPa
	Humidity : <u>53</u> %RH
	Application : <u>24V</u> System

Test Procedure			
Test Generator:	UCS200M	Software No.:	000038
		Serial No.:	1004-14
Va (Alternator):	27.0 V	Current Limit:	30 A

Test Setup		
Vs:	-100	V
t1:	0.5	s
t2:	200	ms
tr:	3	us
td:	2000	us
Ri:	10	Ohm
Coupling:	Battery	
Events:	5000	
Test Duration:	00:41:40	h



Test Result	
Pulses:	5000
Result:	All functions of a device / system perform as designed during and after exposure to disturbance.

4.2.2 Test Pulse 1b Test Data:

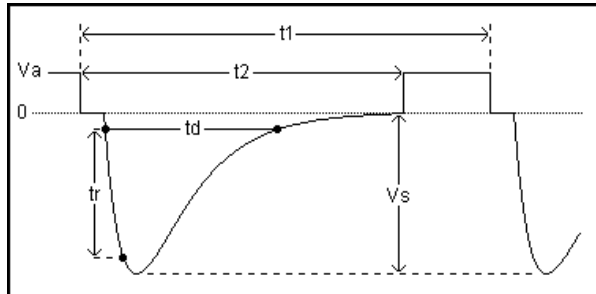
A. Operating Conditions of the EUT: GSM Link Mode

Test Date: May 06, 2006

Test Specification	ISO 7637-2 (1990) Test Pulse 1b
Climatic Condition	Ambient Temperature : <u>25° C</u>
	Pressure : <u>983 mPa</u>
	Humidity : <u>48 %RH</u>
	Application : <u>24V System</u>

Test Procedure			
Test Generator:	UCS200M	Software No.:	000038
		Serial No.:	1004-14
Va (Alternator):	27.0 V	Current Limit:	30 A

Test Setup		
Vs:	-550	V
t1:	1.0	s
t2:	200	ms
tr:	3	us
td:	1000	us
Ri:	50	Ohm
Coupling:	Battery	
Events:	5000	
Test Duration:	01:23:20	h



Test Result	
Pulses:	5000
Result:	A function of a device / system does not perform as designed during exposure but returns automatically to normal operation after exposure is removed.

4.2.3 Test Pulse 2 Test Data:

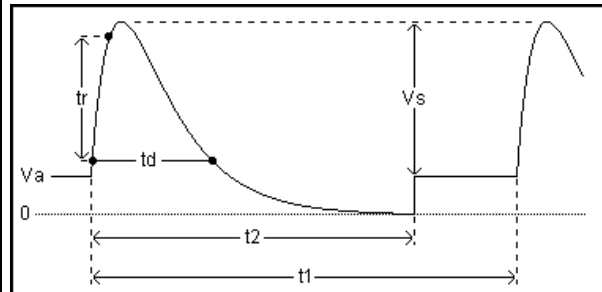
A. Operating Conditions of the EUT: GSM Link Mode

Test Date: May 22, 2006

Test Specification	ISO 7637-2 (1990) Test Pulse 2
Climatic Condition	Ambient Temperature : <u>22° C</u>
	Pressure : <u>993 mPa</u>
	Humidity : <u>52 %RH</u>
	Application : <u>24V System</u>

Test Procedure			
Test Generator:	UCS200M	Software No.:	000038
		Serial No.:	1004-14
Va (Alternator):	27.0 V	Current Limit:	30 A

Test Setup		
Vs:	+50	V
t1:	0.5	s
t2:	200	ms
tr:	1	us
td:	50	us
Ri:	10	Ohm
Coupling:	Battery	
Events:	5000	
Test Duration:	00:41:40	h



Test Result	
Pulses:	5000
Result:	A function of a device / system does not perform as designed during exposure but returns automatically to normal operation after exposure is removed.

4.2.4 Test Pulse 3a Test Data:

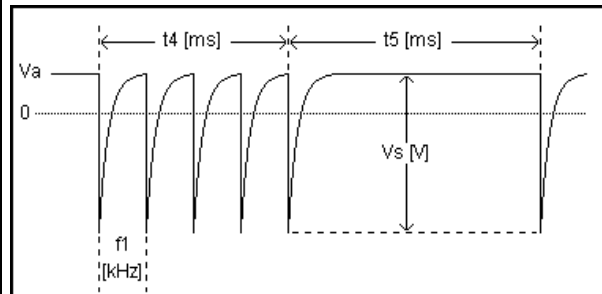
A. Operating Conditions of the EUT: GSM Link Mode

Test Date: May 22, 2006

Test Specification	ISO 7637-2 (1990) Test Pulse 3a
Climatic Condition	Ambient Temperature : <u>22° C</u>
	Pressure : <u>993 mPa</u>
	Humidity : <u>52 %RH</u>
	Application : <u>24V System</u>

Test Procedure			
Test Generator:	UCS200M	Software No.:	000038
		Serial No.:	1004-14
Va (Alternator):	27.0 V	Current Limit:	30 A

Test Setup		
Vs:	-70	V
f1:	10	kHz
t4:	10	ms
t5:	90	ms
tr:	5	ns
td:	100	ns
Ri:	50	Ohm
Coupling:	Battery	
Test Duration:	1	h



Test Result	
Test Duration:	01:00:01 h
Result:	All functions of a device / system perform as designed during and after exposure to disturbance.

4.2.5 Test Pulse 3b Test Data:

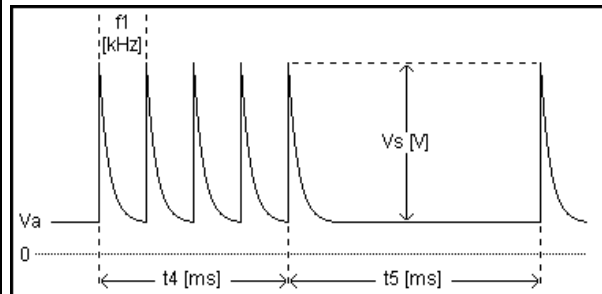
A. Operating Conditions of the EUT: GSM Link Mode

Test Date: May 22, 2006

Test Specification	ISO 7637-2 (1990) Test Pulse 3b
Climatic Condition	Ambient Temperature : <u>22° C</u>
	Pressure : <u>993</u> mPa
	Humidity : <u>52 %RH</u>
	Application : <u>24V</u> System

Test Procedure			
Test Generator:	UCS200M	Software No.:	000038
		Serial No.:	1004-14
Va (Alternator):	27.0 V	Current Limit:	30 A

Test Setup		
Vs:	+70	V
f1:	10	kHz
t4:	10	ms
t5:	90	ms
tr:	5	ns
td:	100	ns
Ri:	50	Ohm
Coupling:	Battery	
Test Duration:	1	h



Test Result	
Test Duration:	01:00:01 h
Result:	All functions of a device / system perform as designed during and after exposure to disturbance.

4.2.6 Test Pulse 4 Test Data:

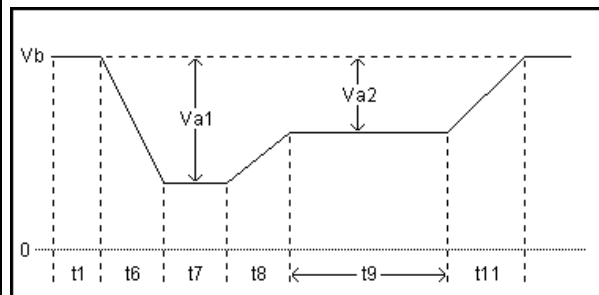
A. Operating Conditions of the EUT: GSM Link Mode

Test Date: May 22, 2006

Test Specification	ISO 7637-2 (1990) Test Pulse 4
Climatic Condition	Ambient Temperature : <u>22°</u> C
	Pressure : <u>993</u> mPa
	Humidity : <u>52</u> %RH
	Application : <u>24V</u> System

Test Procedure			
Test Generator:	VDS200B1	Software No.:	000367
		Serial No.:	0105-02
Coupling Network:	UCS200M	Serial No.:	1004-14
Vb (Battery):	24.0 V	Current Limit:	30 A

Test Setup		
Va1:	-10.0	V
Va2:	-5.0	V
t1:	55	s
t6:	10	ms
t7:	50	ms
t8:	50	ms
t9:	5.0	s
t11:	10	ms
Events:	1	
Test Duration:	00:01:01	h



Test Result	
Pulses:	1
Result:	All functions of a device / system perform as designed during and after exposure to disturbance.

4.2.7 Test Pulse 5 Test Data:

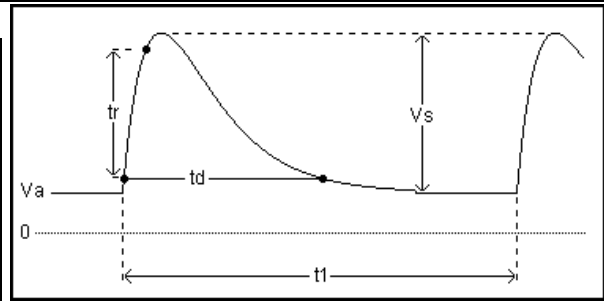
A. Operating Conditions of the EUT: GSM Link Mode

Test Date: Apr. 26, 2006

Test Specification	ISO 7637-2 (1990) Test Pulse 5
Climatic Condition	Ambient Temperature : <u>24</u> ° C
	Pressure : <u>983</u> mPa
	Humidity : <u>53</u> %RH
	Application : <u>24V</u> System

Test Procedure			
Test Generator:	LD200B	Software No.:	000228
		Serial No.:	0803-10
Va (Alternator):	27.0 V	Current Limit:	30 A

Test Setup		
Vs:	+113	V
t1:	90	s
td:	100	ms
tr:	10	ms
Ri:	1	Ohm
Events:	1	
Test Duration:	00:01:30	h



Test Result	
Pulses:	1
Result:	All functions of a device / system perform as designed during and after exposure to disturbance.



5 EQUIPMENTS LIST FOR TESTING

Item	Name	Manufacturer	Model	Calibration Date	Recommended Recal. Date
1	Load Dump Generator	EM TEST	LD 200 B	Jan. 25, 2006	Jan. 24, 2007
2	Voltage Drop Generator	EM TEST	VDS 200 B1	Jan. 25, 2006	Jan. 24, 2007
3	Ultra Compact Simulator	EM TEST	UCS 200 M	Jan. 25, 2006	Jan. 24, 2007

ANNEX A: PHOTOS

1. Test Setup Photo



2. Outside view 1 of EUT



3. Outside view 2 of EUT

