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TEST REPORT

REPORT NO.: IS990301H01

MODEL NO.: GPS-4100M (CE)

RECEIVED: March 1, 2010

TESTED: March 19 ~ 30, 2010

ISSUED: March 31, 2010

APPLICANT: Mobility Sound Technology Ltd.

ADDRESS: 4F No. 287, Sec. 4, Cheng De Road, Taipei # 111,
Taiwan

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.)
Ltd., Taoyuan Branch

LAB LOCATION: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang,
Taipei Hsien 244, Taiwan

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1 CERTIFICATION

PRODUCT: GPSBox Series for 2 way Radio
BRAND NAME: Mobility Sound
MODEL NO.: GPS-4100M (CE)
APPLICANT: Mobility Sound Technology Ltd.
TESTED: March 19 ~ 30, 2010
TEST ITEM: ENGINEERING SAMPLE
STANDARDS: **EN 301 489-1 V1.8.1 (2008-04)**
ISO 7637-2: 2004

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Celia Chen , **DATE:** March 31, 2010
(Celia Chen / Senior Specialist)

**TECHNICAL
ACCEPTANCE :** Joyce Chen , **DATE:** March 31, 2010
(Joyce Chen / Senior Engineer)

APPROVED BY : Kenny Meng , **DATE:** March 31, 2010
(Kenny Meng / Assistant Manager)



2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	GPSBox Series for 2 way Radio
MODEL NO.	GPS-4100M (CE)
POWER SUPPLY	12Vdc from car charger
DATA CABLE SUPPLIED	N/A

NOTE:

1. The EUT is a GPSBox Series for 2 way Radio.
2. For more detailed features description, please refer to the manufacturer's specifications or User's Manual.



2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP04X	66SYW1S	FCC DoC Approved
2	GPS Antenna	GPS	SA-200	2008336	N/A

- NOTE:** (1) All power cords of the above support units are non shielded (1.8m).
(2) The EUT together with support unit 1 and communicated with support unit 2 (kept in a remote area) via wireless transmission.
(3) One USB cable (1.58m with one ferrite core) was connected from EUT to support unit 1, which was provided by client.

3 TRANSIENT IMMUNITY TEST

The EUT has been tested according to the following specifications:

ISO 7637-2		
Test Pulse	Result	Performance Criteria
Test Pulse 1	Pass	TT ; TR
Test Pulse 2a	Pass	TT ; TR
Test Pulse 2b	Pass	TT ; TR
Test Pulse 3a	Pass	CT ; CR
Test Pulse 3b	Pass	CT ; CR
Test Pulse 4	Pass	TT ; TR

Note: The information of measurement uncertainty is available upon the customer's request.

The Requirement of Performance Criteria	
1	Performance criteria for continuous phenomena applied to transmitters (CT)
2	Performance criteria for transient phenomena applied to transmitters (TT)
3	Performance criteria for continuous phenomena applied to receivers (CR)
4	Performance criteria for transient phenomena applied to receivers (TR)

4 ROAD VEHICLE-ELECTRICAL DISTURBANCE BY CONDUCTION AND COUPLING TEST

4.1.1 TEST INSTRUMENTS

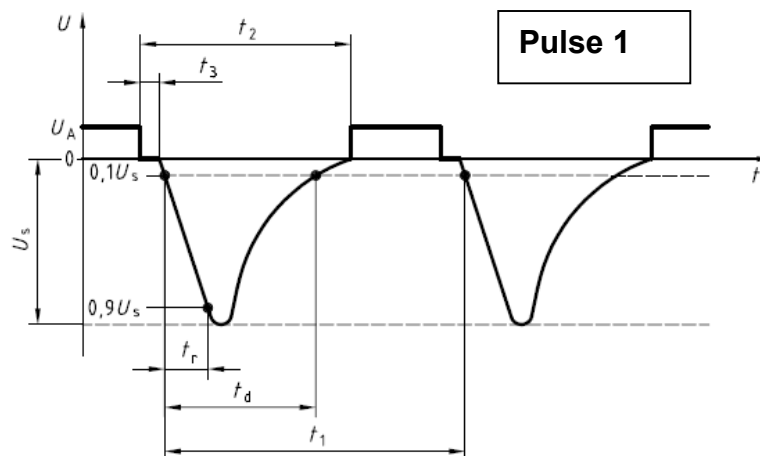
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
EM TEST, Voltage Drop Generator	VDS200B	V0718102464	Jul. 13, 2009	Jul. 12, 2010
EM TEST, Ultra Compact Simulator	UCS200MS5	V0718102465	Jul. 13, 2009	Jul. 12, 2010
EM TEST, Load Dump Generator	LD200B1	V0718102463	Jul. 14, 2009	Jul. 13, 2010
EM TEST, Capacitive Coupling Clamp	ACC	0107-59	N/A	N/A
EMTEST, Electronic Switch	BS200B	V0718102466	N/A	N/A
EM TEST, Software	ISMISO V 4.20	N/A	N/A	N/A
SCHWARZBECK, LISN	NNBM 8125	81251437	Aug. 05, 2009	Aug. 04, 2010
Agilent, Digital Phosphor Oscilloscope	DSO80204B	MY46001603	May 25, 2009	May 24, 2010

NOTE: 1. The test was performed in ISO 7637 Room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1.2 TEST PROCEDURE

a. For Test Pulse 1

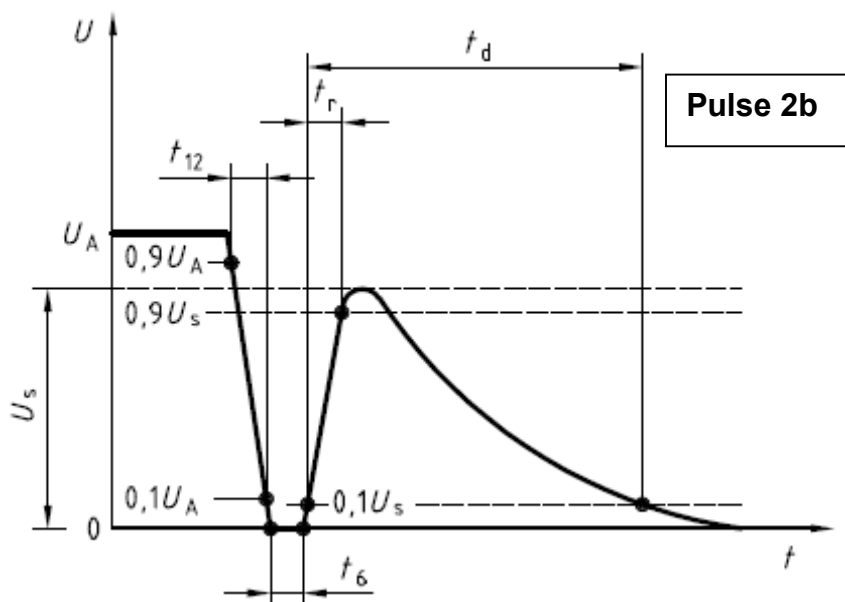
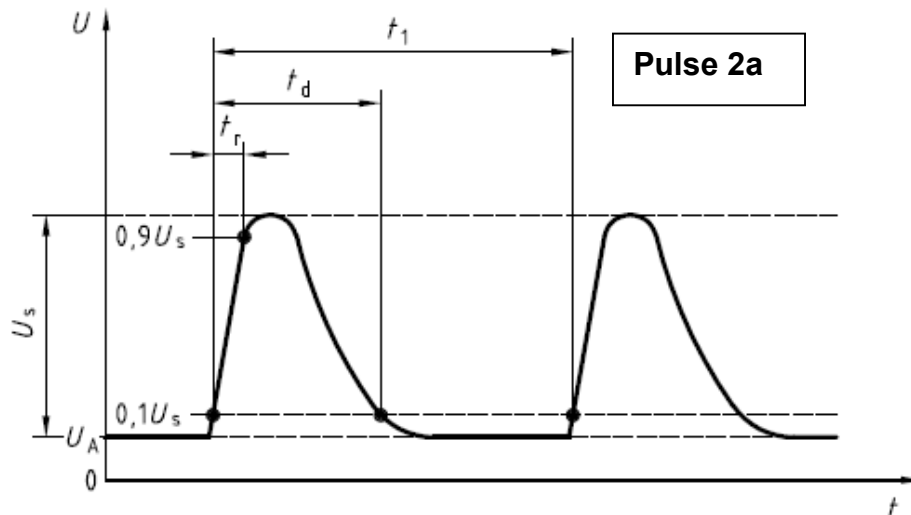
This test is a simulation of transients due to supply disconnection from inductive loads. It is applicable to device under test which, as used in the vehicle, remain connected directly in parallel with an inductive load.



b. For Test Pulse 2a and 2b

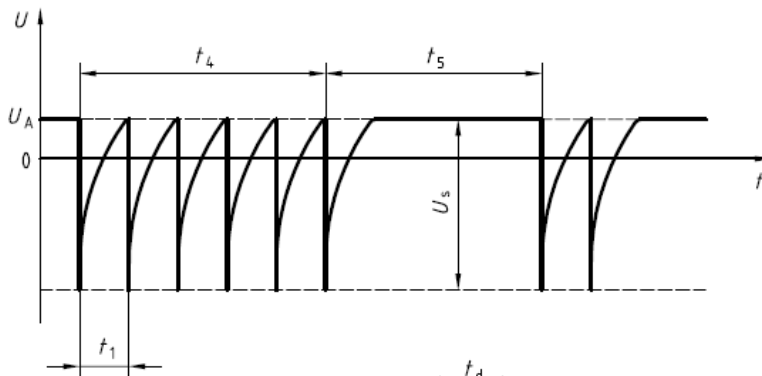
Pulse 2a simulates transients due to sudden interruption of currents in a device connected in parallel with the device under test due to the inductance of the wiring harness.

Pulse 2b simulates transients from d.c. motors acting as generators after the ignition is switched off.

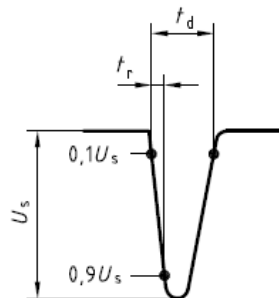


c. For Test Pulse 3a and 3b

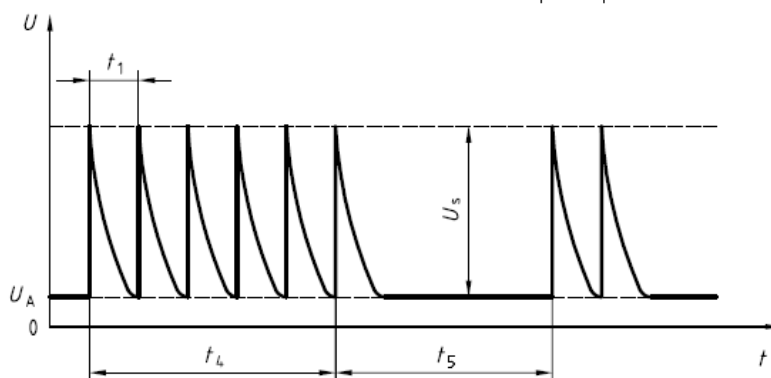
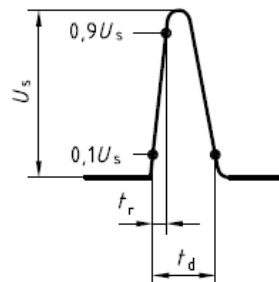
These test pulses are a simulation of transients which occur as a result of the switching processes. The characteristics of these transients are influenced by distributed capacitance and inductance of the wiring harness



Pulse 3a

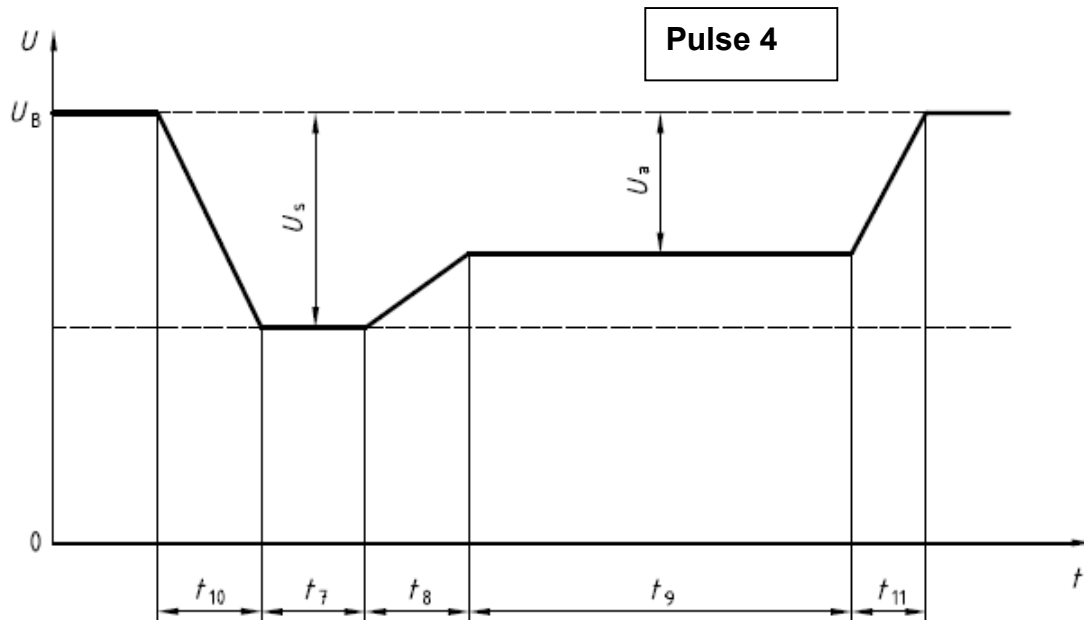


Pulse 3b



d. For Test Pulse 4

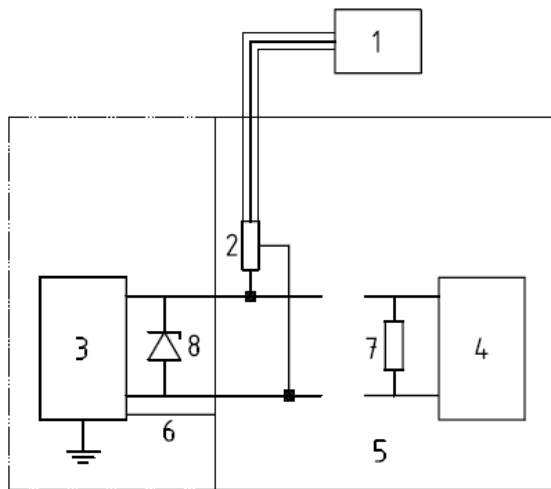
This pulse simulates supply voltage reduction caused by energizing the starter-motor circuits of internal combustion engines, excluding spikes associated with starting



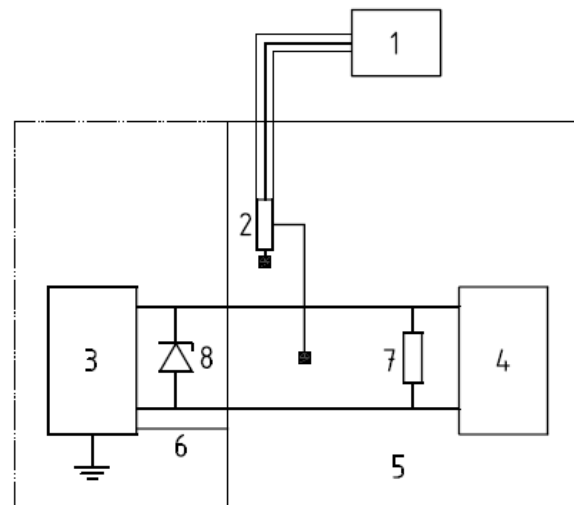
4.1.3 DEVIATION FROM TEST STANDARD

The requirement followed EN301489 test level.

4.1.4 TEST SETUP



a) Pulse adjustment



b) Pulse injection

Note:

- | | |
|--|---|
| 1. oscilloscope or equivalent | 5. ground plane |
| 2. voltage probe | 6. Ground connection
(maximum length for test pulse 3: 100 mm) |
| 3. test pulse generator with internal power supply
resistance R_i | 7. optional resistor (R_v) ^a |
| 4. DUT | 8. optional diode bridge ^b |

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration

4.1.5 EUT OPERATING CONDITIONS

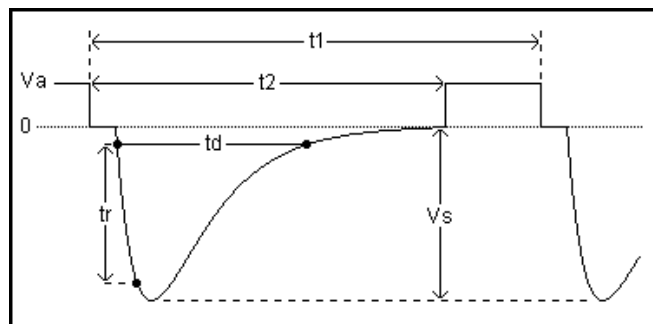
- a. Turned on the power of all equipment.
- b. EUT ran a test program to enable all functions.
- c. Set a GPS antenna in a remote area.
- d. The GPS antenna searched satellite signal and sent it to EUT via EUT's GPS antenna.
- e. EUT identified longitude & latitude.
- f. Notebook sent the position message to monitor via EUT and monitor displayed it on its screen.
- g. Steps d-g were repeated.

4.1.6 TEST RESULTS

PULSE TYPE	PULSE 1	INPUT POWER	DC 12V
ENVIRONMENTAL CONDITIONS	24deg. C, 71% RH, 1015hPa	TESTED BY: Jiannren Hsieh	

Parameters

$V_s = -75 \text{ V}$
 $t_1 = 0.5 \text{ s}$
 $t_2 = 200 \text{ ms}$
 $t_r = 1 \text{ } \mu\text{s}$
 $t_d = 2000 \text{ } \mu\text{s}$
 $R_i = 10 \text{ } \Omega$
Events = 10

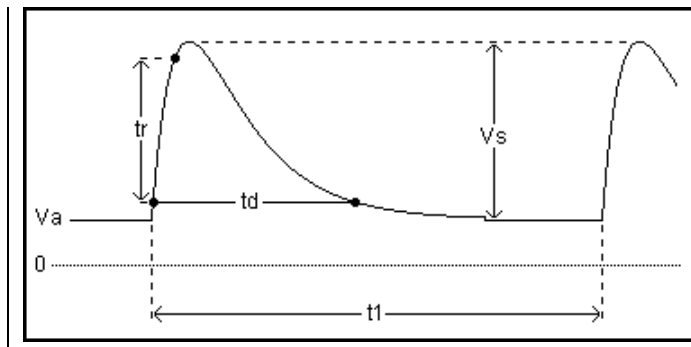


Result	CR: The test program hung up and shut down but could be restored by the operator. This permissive loss of performance is specified by the manufacturer.
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PULSE TYPE	PULSE 2a	INPUT POWER	DC 12V
ENVIRONMENTAL CONDITIONS	24deg. C, 71% RH, 1015hPa	TESTED BY: Jiannren Hsieh	

Parameters

$V_s = +37\text{ V}$
 $t_1 = 0.2\text{ s}$
 $t_r = 1\text{ }\mu\text{s}$
 $t_d = 50\text{ }\mu\text{s}$
 $R_i = 2\text{ }\Omega$
Events = 10

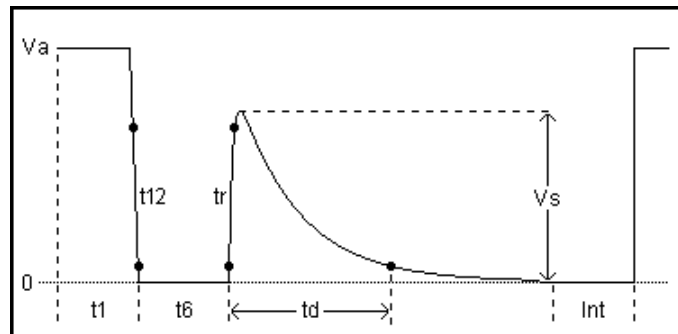


Result	CR: Normal
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PULSE TYPE	PULSE 2b	INPUT POWER	DC 12V
ENVIRONMENTAL CONDITIONS	24deg. C, 71% RH, 1015hPa	TESTED BY: Jiannren Hsieh	

Parameters

V_s = 10 V
 t_1 = 1 s
 t_6 = 1 ms
 t_d = 200 ms
 Int. = 1 s
 R_i = 0.05Ω
 t_{12} = 1 ms
 t_r = 1 ms
 Events = 10

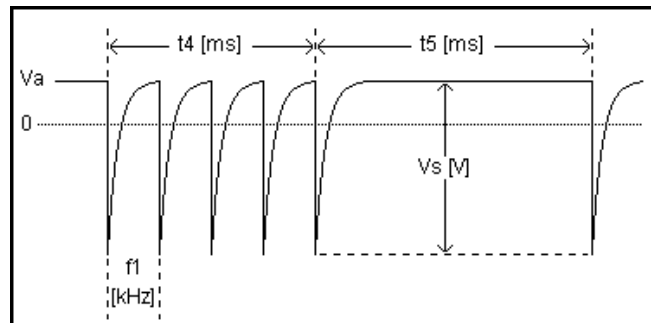


Result	CR: The test program hung up and shut down but could be restored by the operator. This permissive loss of performance is specified by the manufacturer.
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PULSE TYPE	PULSE 3a	INPUT POWER	DC 12V
ENVIRONMENTAL CONDITIONS	24deg. C, 71% RH, 1015hPa	TESTED BY: Jiannren Hsieh	

Parameters

V_s	=	-112 V
f_1	=	10 kHz
t_4	=	10 ms
t_5	=	90 ms
t_r	=	5 ns
t_d	=	100 ns
R_i	=	50 Ω
Test duration	=	20 min.

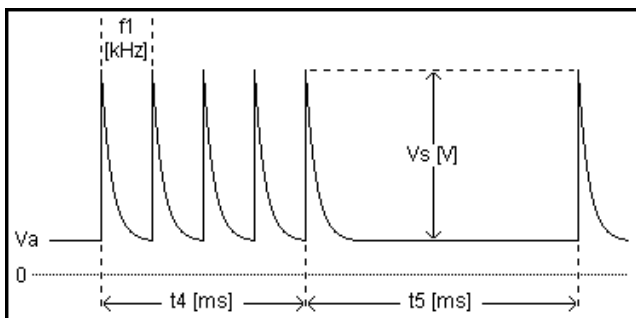


Result	CR: The test program hung up and shut down but could be restored by the operator. This permissive loss of performance is specified by the manufacturer.
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PULSE TYPE	PULSE 3b	INPUT POWER	DC 12V
ENVIRONMENTAL CONDITIONS	24deg. C, 71% RH, 1015hPa	TESTED BY: Jiannren Hsieh	

Parameters

V_s = +75 V
 f_1 = 10 kHz
 t_4 = 10 ms
 t_5 = 90 ms
 t_r = 5 ns
 t_d = 100 ns
 R_i = 50 Ω
 Test duration = 20 min.

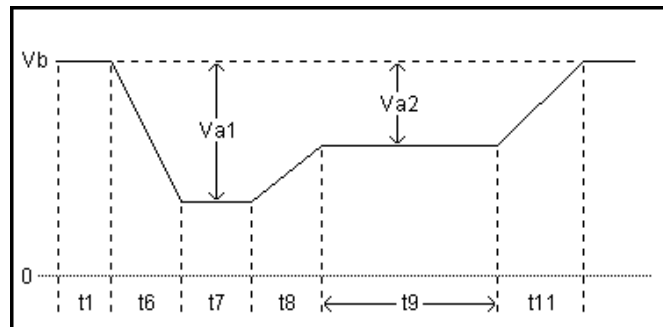


Result	CR: Normal
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PULSE TYPE	PULSE 4	INPUT POWER	DC 12V
ENVIRONMENTAL CONDITIONS	24deg. C, 71% RH, 1015hPa	TESTED BY: Jiannren Hsieh	

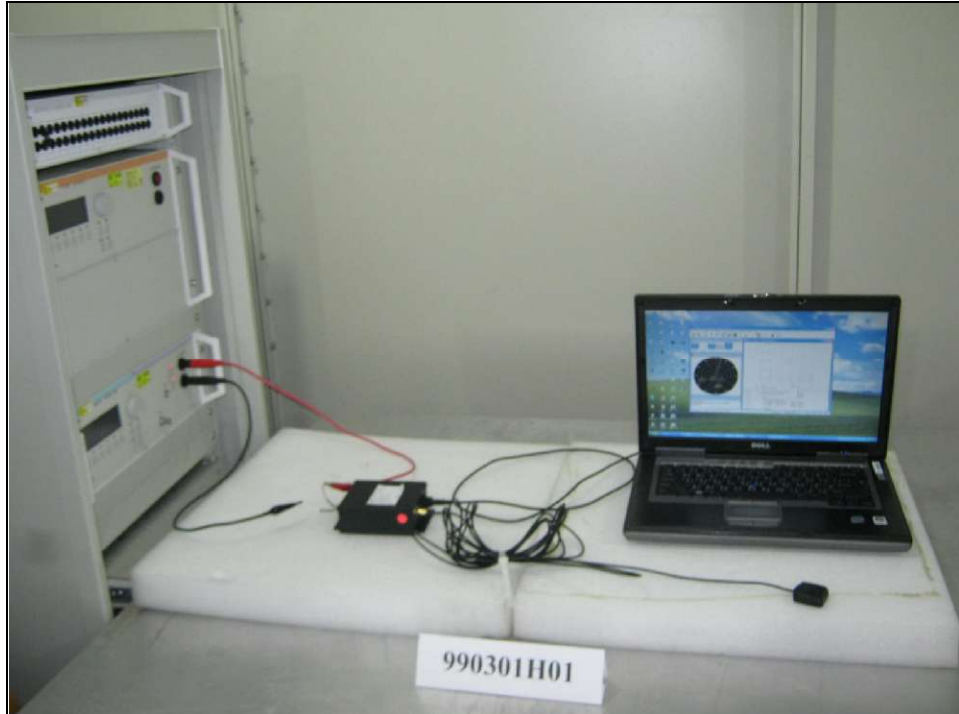
Parameters

V_{a1} = -6 V
 V_{a2} = -2.5 V
 t_1 = 1 s
 t_6 = 5 ms
 t_7 = 15 ms
 t_8 = 50 ms
 t_9 = 0.5 s
 t_{11} = 5 ms
Events = 10



Result	CR: Normal
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5 PHOTOGRAPHS OF THE TEST CONFIGURATION





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6 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

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Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:

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Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:

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Fax: 886-3-3185050

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also

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