



## SGS-CSTC Standards Technical Services Co., Ltd.

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Report No.: GZEM131100527901  
Page: 1 of 28

# TEST REPORT

Application No:	GZEM1311005279TX
Applicant:	Smart Team Holdings Limited
Product Name:	USB Car charger With Rotary USB
Product Description:	Car Charger
Model No:	PCC2013
Standards:	EN 50498:2010
Date of Receipt:	2013-11-12
Date of Test:	2013-11-20 to 2013-12-02
Date of Issue:	2013-12-05
Test Result :	Pass*

\* In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives.



The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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## 2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2013-12-05		Original

Authorized for issue by:				
Tested By				2013-11-20 to 2013-12-02
	(Evan Huang) /Project Engineer			Date
Prepared By				2013-12-04
	(Karon Yang) /Clerk			Date
Checked By				2013-12-05
	(Guitar Huang) /Reviewer			Date



### 3 Test Summary

Electromagnetic Interference (EMI)				
Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emissions (30 MHz to 1 GHz)	EN 50498:2010	2004/104/EC Clause 6.5 and 6.6	Table 1 for broad band Table 2 for narrow band	PASS
Transient Conducted Emissions	EN 50498:2010	2004/104/EC & ISO 7637-2:2004	Table 3	N/A
Electromagnetic Susceptibility (EMS)				
Test	Test Requirement	Test Method	Class / Severity	Result
Transient Conducted Immunity	EN 50498:2010	2004/104/EC & ISO 7637-2:2004	Table 4	PASS ①
N/A: Not applicable, please refer to section 7.2 of this report for details.				
① The EUT passed Transient Conducted Immunity test after the modification.				



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## 5 General Information

### 5.1 Client Information

Applicant: Smart Team Holdings Limited  
Address of Applicant: FLAT A01, 5/F, Great Wall Fty Bldg., 11 Cheung Shun Street, Lai Chi Kwok, Kowloon, HK

### 5.2 General Description of E.U.T.

Product Name: USB Car charger With Rotary USB  
Product Description: Car Charger  
Model No: PCC2013

### 5.3 Details of E.U.T.

Rated Supply (Voltage): Input: DC 12-24V  
Output: DC 5V 1A  
Power Cable: N/A

### 5.4 Description of Support Units

The EUT has been tested with DC 12V batteries as power and current-meter as monitor.

### 5.5 Deviation from Standards

None.

### 5.6 General Test Climate During Testing

Temperature: 18-28 °C Humidity: 30-70 %RH Atmospheric Pressure: 860-1060 mbar

### 5.7 Abnormalities from Standard Conditions

None

### 5.8 Monitoring of EUT for All Immunity Test

Audio: N/A  
Visual: Current meter

### 5.9 Test Location

All tests were performed at:  
SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory,  
198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,  
Guangzhou, China 510663  
Tel: +86 20 82155555 Fax: +86 20 82075059  
No tests were sub-contracted.

## 5.10 Test Facility

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

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

- **FCC (Registration No.: 282399)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory 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 282399, May 31, 2002.

- **Industry Canada (Registration No.: 4620B-1)**

The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering of Industry Canada for radio equipment testing with Registration No. 4620B-1.

- **VCCI (Registration No.: R-2460, C-2584, G-449 and T-1179)**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2460, C-2584, G-449 and T-1179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IEC 61010-1:2006-10 and Rules of procedure IEC 61010-2:2006-10, and the relevant IEC 61010-2 Scheme Operational documents.



## 6 Equipment Used during Test

RE in Chamber (for automotive)						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date	Calibration Interval
					(YYYY-MM-DD)	
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2014-08-30	2Y
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2014-05-06	1Y
N/A	EMI Test Software	Audix	E3	N/A	N/A	N/A
EMC0514	Coaxial cable	SGS	N/A	N/A	2013-12-28	2Y
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	2016-08-31	3Y
EMC2065	Amplifier	HP	8447F	N/A	2014-08-31	1Y
EMC1801	Artificial Mains Network	Schwarzbeck	NNBM 8125	81251342	2014-03-04	1Y
EMC1802	Artificial Mains Network	Schwarzbeck	NNBM 8125	81251345	2014-03-04	1Y

ISO7637-2 Transient Conducted Immunity						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date	Calibration Interval
					(YYYY-MM-DD)	
EMC1804	Ultra Compact Simulator	EM Test/AG	UCS 200M	V0725102618	2014-08-31	1Y
EMC1805	Voltage Drop Generator	EM Test/AG	VDS 200 B2	V0725102619	2014-08-31	1Y

General used equipment						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date	Calibration Interval
					(YYYY-MM-DD)	
EMC0006	DMM	Fluke	73	70681569	2014-09-13	1Y
EMC0007	DMM	Fluke	73	70671122	2014-09-13	1Y

## 7 EMI and EMS Test Results (EN50498)

### 7.1 Radiated Emissions, 30 MHz to 1 GHz

Test Requirement:	EN 50498
Test Method:	Clause 6.5 and 6.6 of 2004/104/EC
Test Date:	2013-11-20
Test Voltage:	DC 13.5V and DC 27V
Frequency Range:	30 MHz to 1 GHz
Measurement Distance:	1 meter
Limits:	Table 1 of EN 50498 (for broadband emissions)

Frequency range F MHz	Limits Quasi peak dB $\mu$ V/m
30 to 75	62 – 52 <sup>a</sup>
75 to 400	52 – 63 <sup>b</sup>
400 to 1 000	63
<sup>a</sup> Decreasing linearly with the log of the frequency.	
<sup>b</sup> Increasing linearly with the log of the frequency.	

Table 2 of EN 50498 (for narrowband emissions)

Frequency range F MHz	Limits Average dB $\mu$ V/m
30 to 75	52 – 42 <sup>a</sup>
75 to 400	42 – 53 <sup>b</sup>
400 to 1 000	53
<sup>a</sup> Decreasing linearly with the log of the frequency.	
<sup>b</sup> Increasing linearly with the log of the frequency.	

Detector:	Peak for pre-scan (120 kHz resolution bandwidth)
	Quasi-Peak for broadband emissions
	Average for narrowband emissions



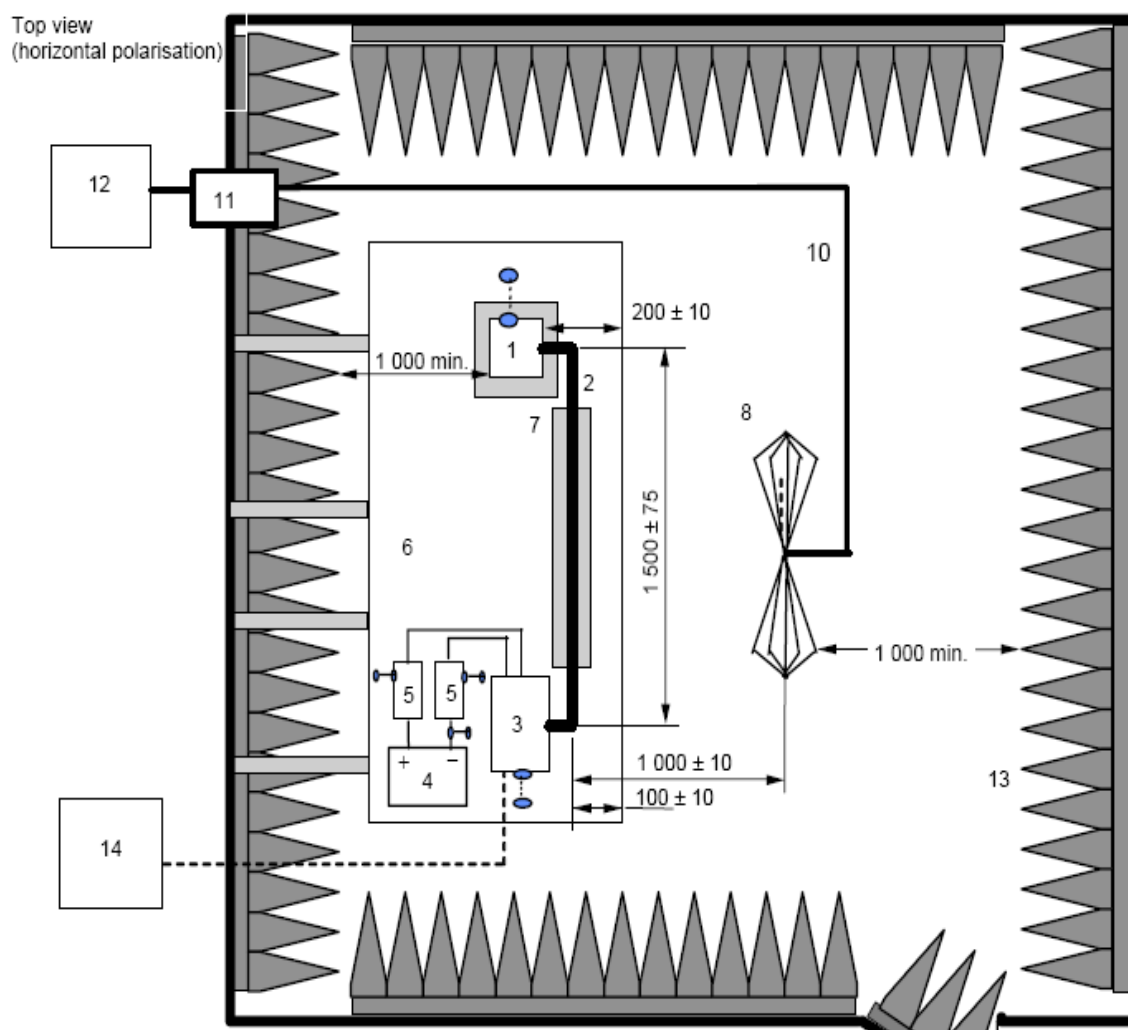


### **7.1.1 E.U.T. Operation**

EUT Operation:     Mode 1: Test the EUT in charging mode with half load and DC 12V battery.  
                             Mode 2: Test the EUT in charging mode with full load and DC 12V battery.  
                             Mode 3: Test the EUT in charging mode with half load and DC 24V batteries.  
                             Mode 4: Test the EUT in charging mode with full load and DC 24V batteries.  
                             A pre-test was performed on the EUT in mode 1 - 4 in order to find the worst case.  
                             Test the EUT in mode 4 for the compliance test as the worst case was found.  
                             Before test, the voltage of the vehicle batteries is 13.5V and 27V.  
                             After test, the voltage of the vehicle batteries is 13.2V and 26.8V.

## 7.1.2 Test Setup and Procedure

The EUT was insulated placed 50 mm above the ground plane, the ground plan was in a height of 1 m to the reference plane of semi-anechoic chamber and with electrical connection. No additional electric connection was made between the EUT and ground plane as the EUT will not be intended to be bonded to the bodywork of the vehicle. The EUT was powered by 12 V vehicle batteries through 5  $\mu$ H/50 ohm LISN.



### Key

1. EUT (grounded locally if required in test plan)	8. Antenna
2. Test harness	10. High-quality coaxial cable
3. Load simulator	11. Bulkhead connector
4. Power supply (location optional)	12. Measuring instrument
5. Artificial network (AN)	13. RF absorber material
6. Ground plane (bonded to shielded enclosure)	14. Stimulation and monitoring system
7. Low relative permittivity support	

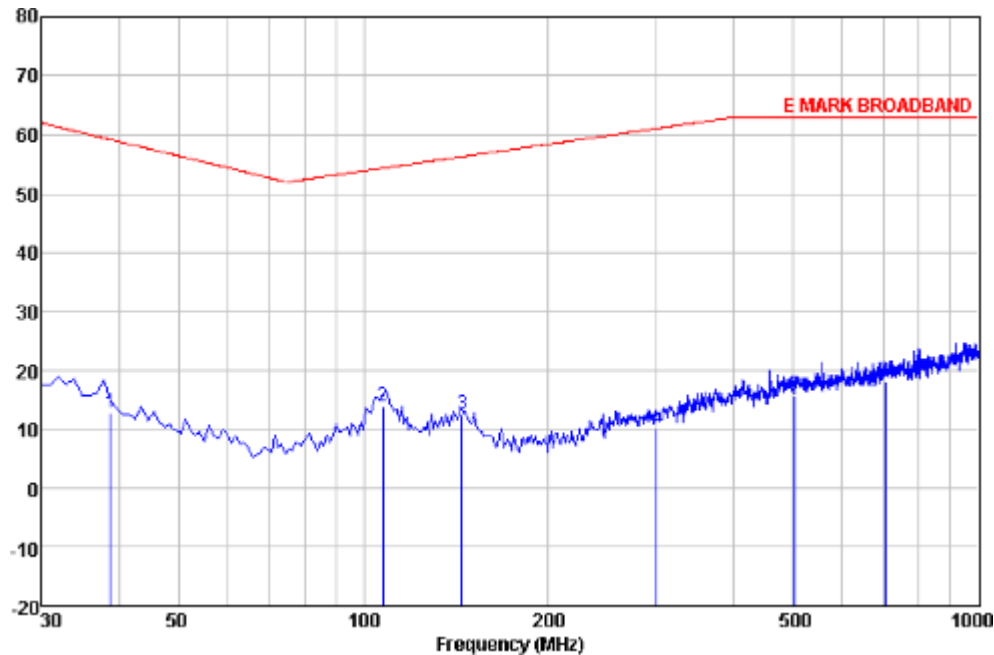
### 7.1.3 Measurement Data

Polarization:

Horizontal:

Peak scan

Level (dBμV/m)



QP measurement for Broadband emissions.

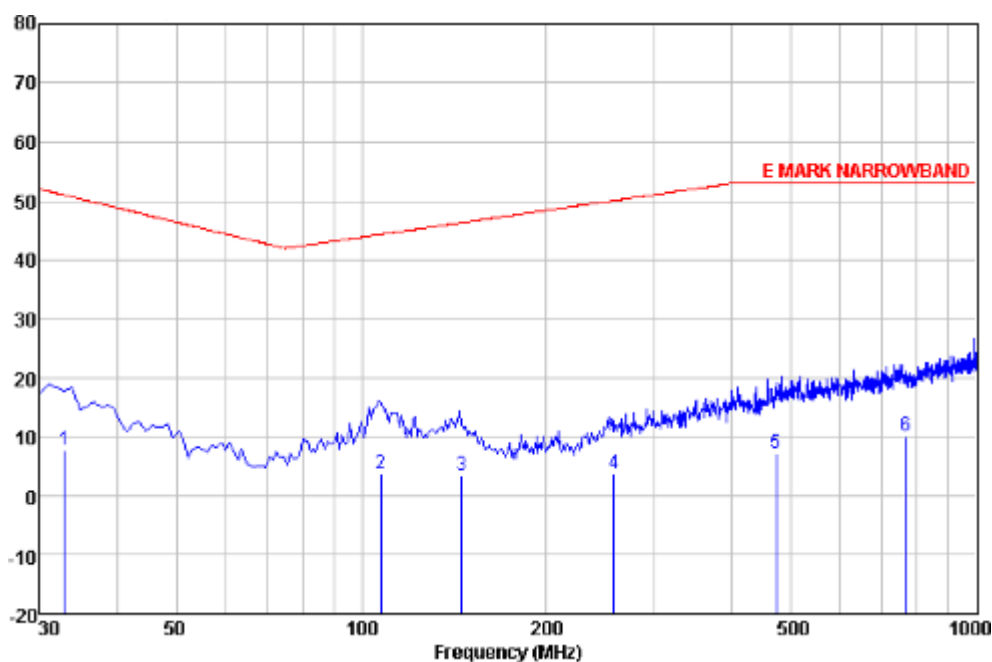
Freq	ReadAntenna	Cable	Preamp	Limit	Over		
Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
38.730	24.50	15.00	0.20	26.77	12.93	59.21	-46.28 QP
107.600	28.47	11.75	0.23	26.56	13.89	54.37	-40.48 QP
144.460	28.15	10.27	0.47	26.39	12.50	56.31	-43.81 QP
298.690	22.37	12.60	0.99	25.82	10.14	61.08	-50.94 QP
500.450	23.79	17.35	1.59	27.01	15.72	63.00	-47.28 QP
705.120	24.21	19.05	1.87	27.07	18.06	63.00	-44.94 QP

Polarization:

Horizontal

Peak scan

Level (dB $\mu$ V/m)



Average measurement for Narrowband emissions.

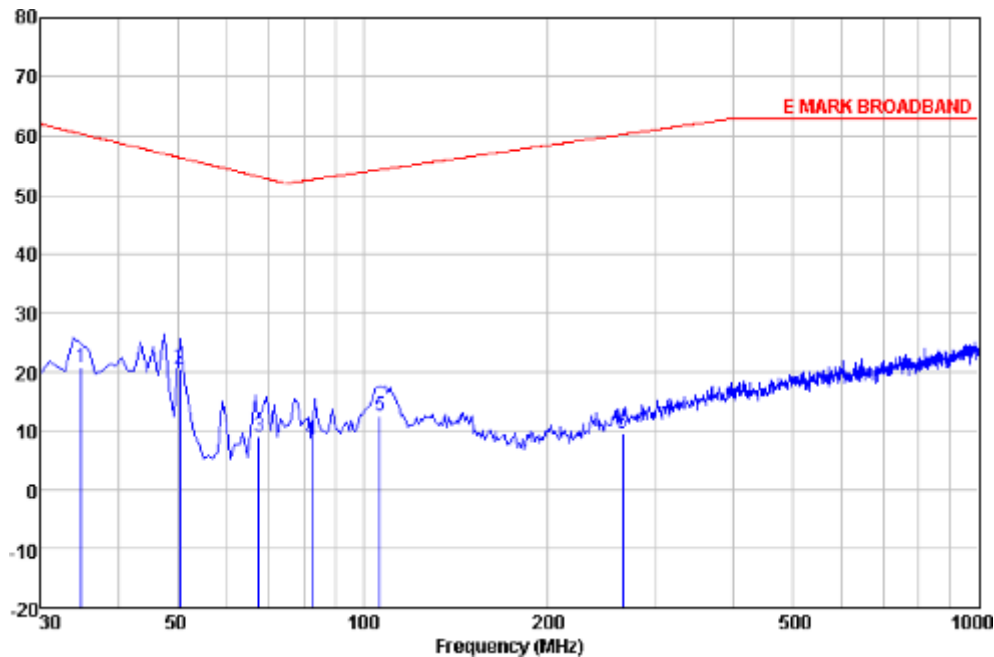
Freq	ReadAntenna	Cable	Preamp	Limit	Over			
MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
32.910	16.05	18.51	0.07	26.80	7.83	50.99	-43.16	Average
107.600	18.20	11.75	0.23	26.56	3.62	44.37	-40.75	Average
145.430	19.15	10.13	0.47	26.38	3.37	46.35	-42.98	Average
256.980	16.75	12.20	0.79	25.98	3.76	50.09	-46.33	Average
472.320	15.69	17.13	1.43	26.94	7.31	53.00	-45.69	Average
767.200	15.51	19.90	1.81	27.08	10.14	53.00	-42.86	Average

Polarization:

Vertical:

Peak scan

Level (dBμV/m)



QP measurement for Broadband emissions.

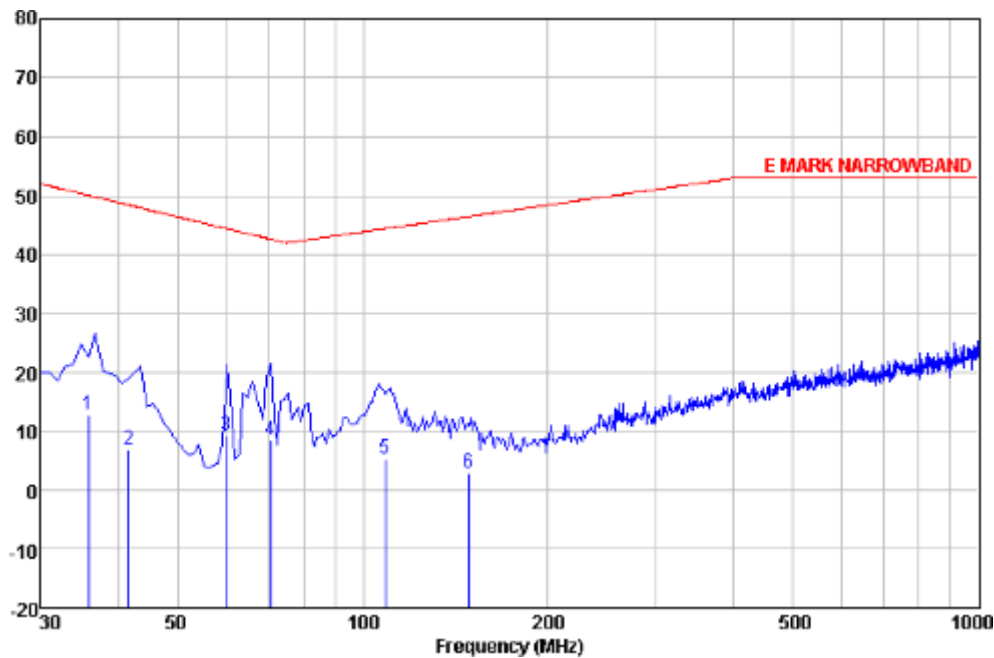
Freq	ReadAntenna	Cable	Preamp		Limit	Over	
Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
34.850	29.98	17.42	0.12	26.79	20.73	60.36	-39.63 QP
50.370	41.45	5.87	0.02	26.71	20.63	56.34	-35.71 QP
67.830	31.13	4.56	0.15	26.66	9.18	53.10	-43.92 QP
82.380	27.90	6.91	0.22	26.62	8.41	52.62	-44.21 QP
106.630	27.25	11.71	0.23	26.57	12.62	54.31	-41.69 QP
263.770	22.45	12.34	0.81	25.96	9.64	60.26	-50.62 QP

Polarization:

Vertical:

Peak scan

Level (dB $\mu$ V/m)



Average measurement for Narrowband emissions.

Freq	ReadAntenna	Cable	Preamp	Limit	Over			
MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dB $\mu$ V	dB/m	dB	dB	dB $\mu$ V/m	dB $\mu$ V/m	dB	
35.820	22.55	16.87	0.14	26.79	12.77	50.06	-37.29	Average
41.640	20.56	12.90	0.19	26.76	6.89	48.42	-41.53	Average
60.070	30.75	4.90	0.23	26.68	9.20	44.42	-35.22	Average
70.740	30.38	4.69	0.14	26.66	8.55	42.64	-34.09	Average
108.570	19.85	11.81	0.24	26.56	5.34	44.43	-39.09	Average
148.340	19.16	9.71	0.48	26.37	2.98	46.48	-43.50	Average



## **7.2 Transient Conducted Emissions Test**

There is no need for Transient conducted emission test to be performed on this product in accordance with 7.3 of this Standard (EN 50498):

“ESAs that are not switched, contain no switches or do not include inductive loads need not be tested for conducted emission and shall be deemed to comply with paragraph 7.3 of this Standard (EN 50498).”



**Performance Criteria Description in A.4 of ISO 7637-2**

**Criterion A:**

all functions of a device/system perform as designed during and after exposure to disturbance.

**Criterion B:**

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

**Criterion C:**

one or more functions of a device/system do not perform as designed during exposure but return automatically to normal operation after exposure is removed.

**Criterion D:**

one or more functions of a device/system do not perform as designed during exposure and do not return to normal operation until exposure is removed and the device/system is reset by simple "operator/use" action.

**Criterion E:**

one or more functions of a device/system do not perform as designed during and after exposure and cannot be returned to proper operation without repairing or replacing the device/system.



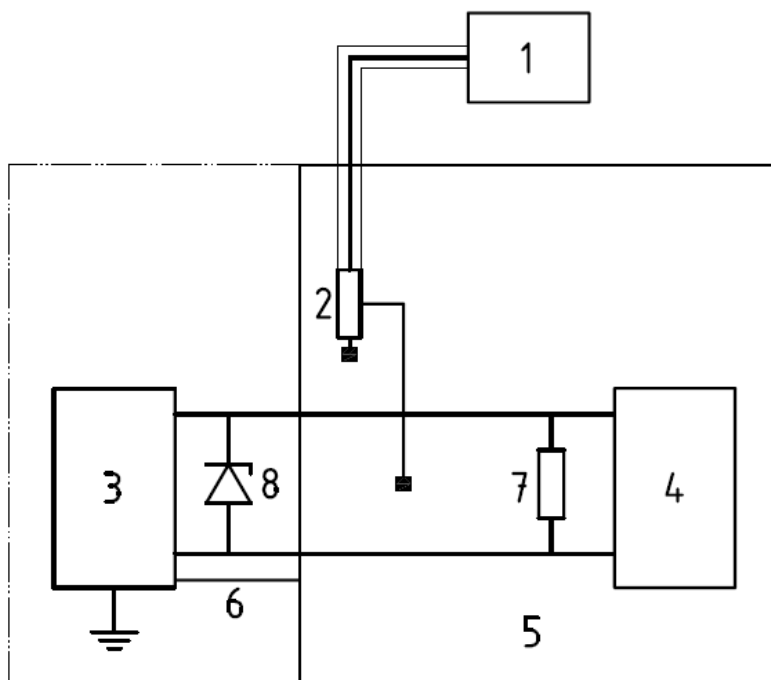
### 7.3 Transient Conducted Immunity

Test Requirement:	EN 50498
Test Method:	Clause 6.8 2004/104/EC & ISO 7637-2
Test Date:	2013-11-21 (initial test) 2013-12-02 (test after modification)
Test Voltage:	DC 13.5V and DC 27V
Test Limit:	Table 4 of EN50498

#### 7.3.1 E.U.T. Operation

EUT Operation: Mode 1: Test the EUT in charging mode with half load and DC 12V battery.  
Mode 2: Test the EUT in charging mode with full load and DC 12V battery.  
Mode 3: Test the EUT in charging mode with half load and DC 24V batteries.  
Mode 4: Test the EUT in charging mode with full load and DC 24V batteries.  
A pre-test was performed on the EUT in mode 1 - 4 in order to find the worst case.  
Test the EUT in mode 1 for the compliance test as the worst case was found.

#### 7.3.2 Test Setup



#### Key

1. oscilloscope	5. ground plane
2. voltage probe	6. Ground connection
3. test pulse generator with internal power supply resistance $R_i$	7. optional resistor ( $R_v$ ) <sup>a</sup>
4. EUT	8. optional diode bridge <sup>b</sup>

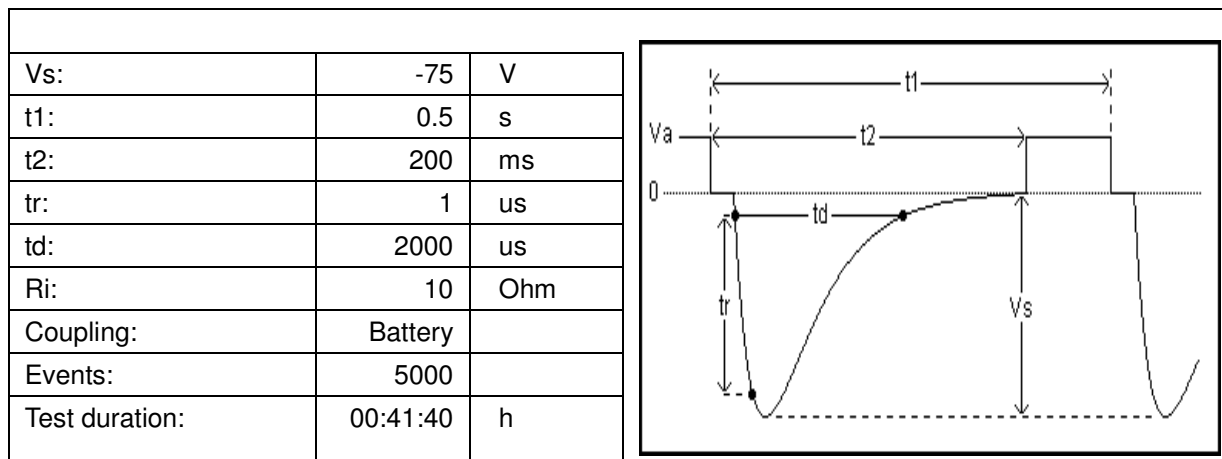
a For simulation of vehicle system loading for load dump test pulses 5a and 5b only. If used, the value of  $R_v$  shall be specified in the test plan (typical value 0,7  $\Omega$  to 40  $\Omega$ ).

b For simulation of load dump waveform for alternator with centralized load dump suppression for pulse 5b only

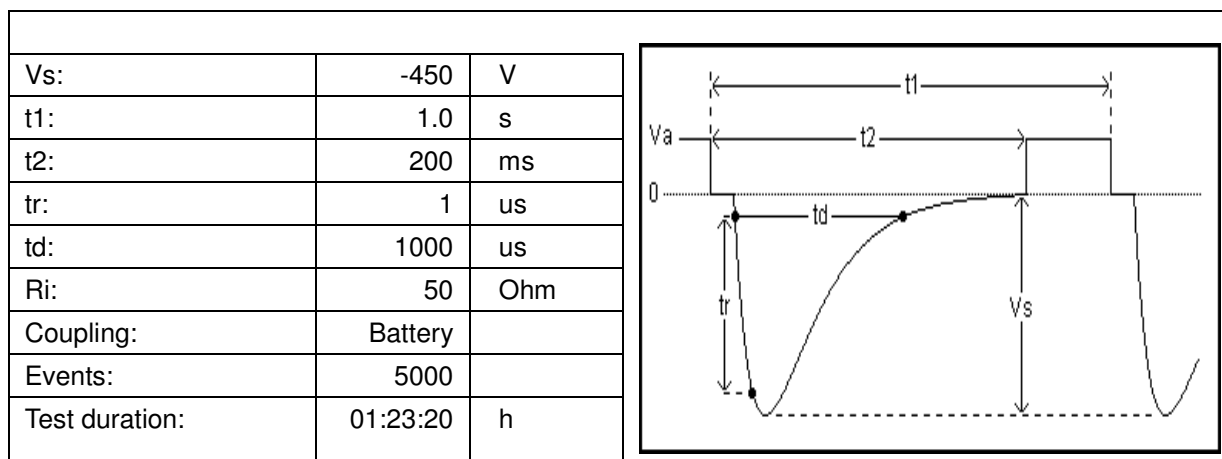
### 7.3.3 Measurement Data

Pulse 1

12V

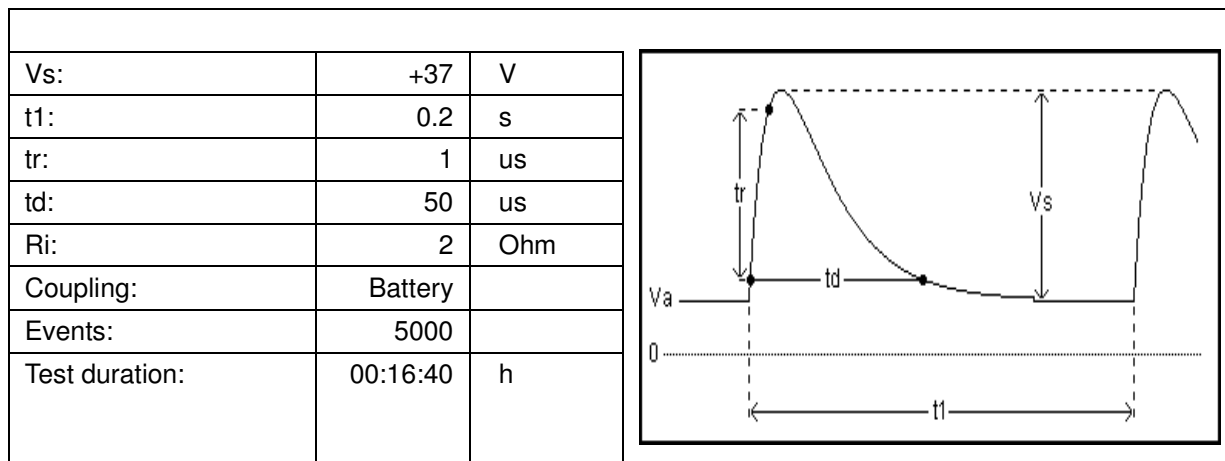


24V

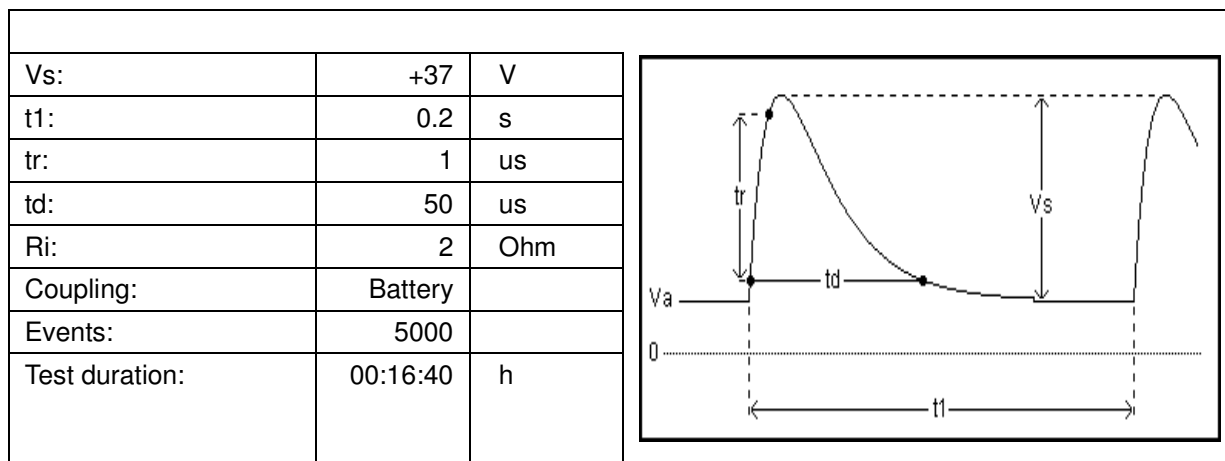


Pulse 2a

12V

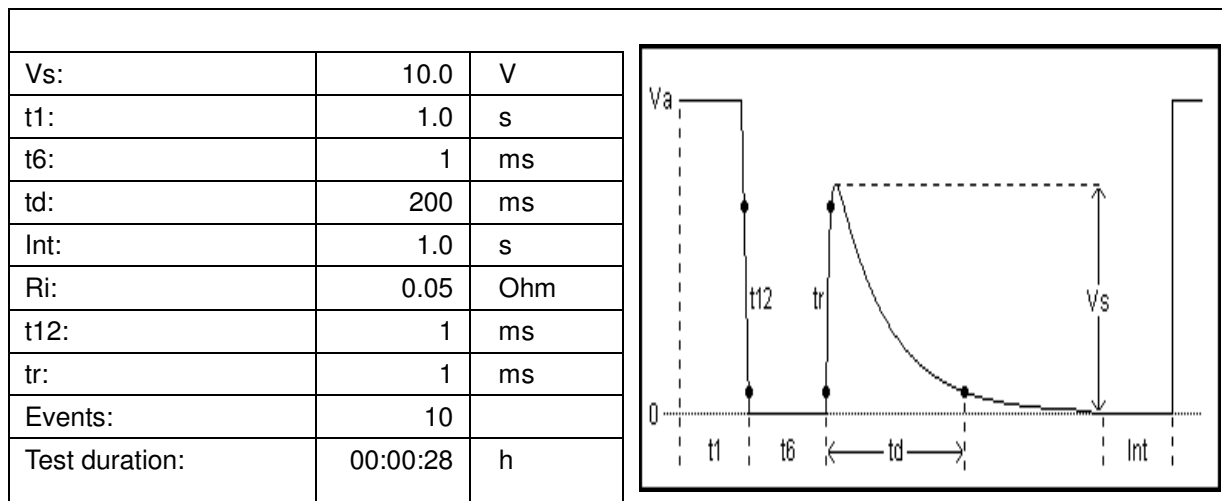


24V

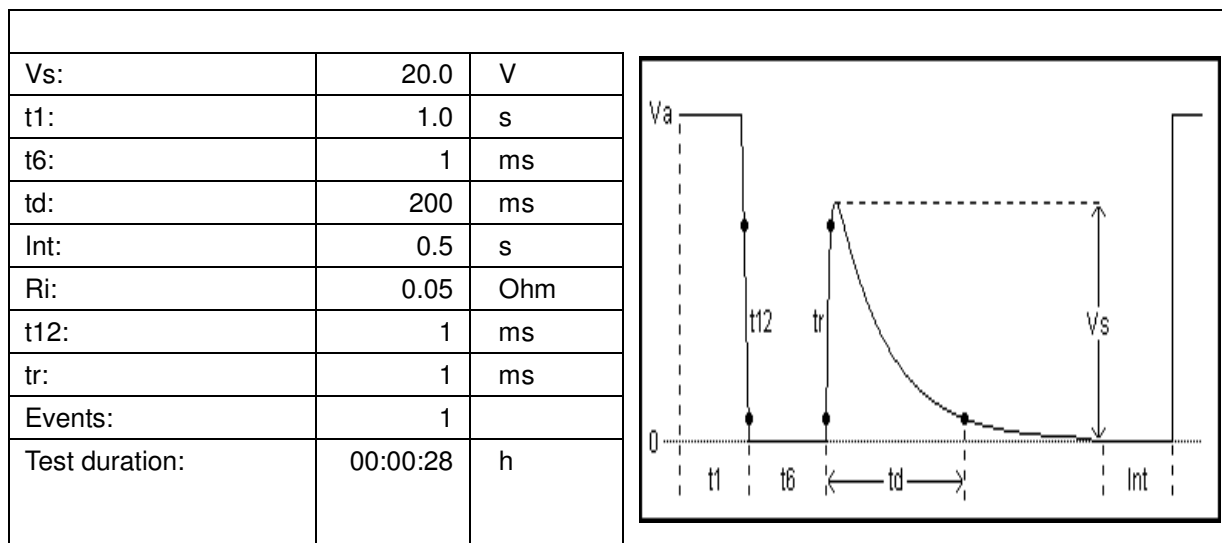


## Pulse 2b

12V



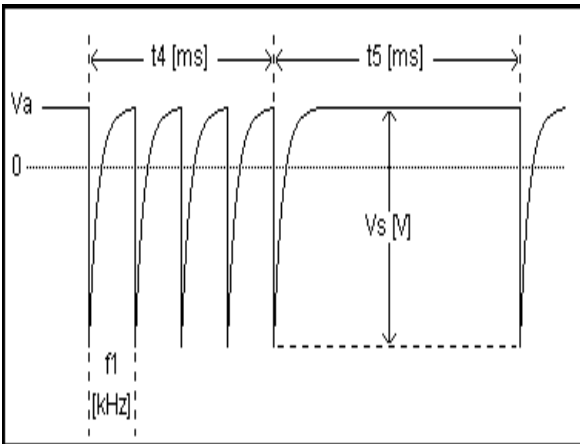
## 24V



## Pulse 3a

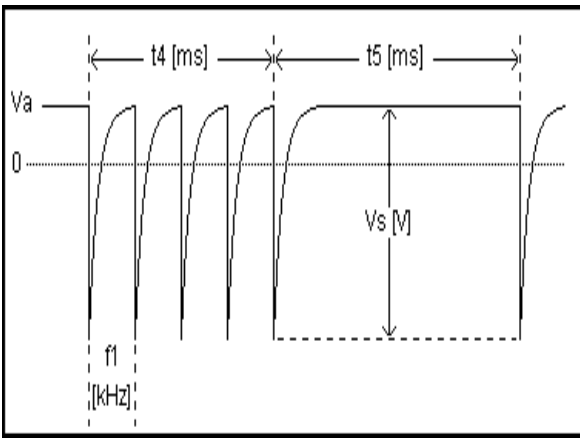
12V

Vs:	-112	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



## 24V

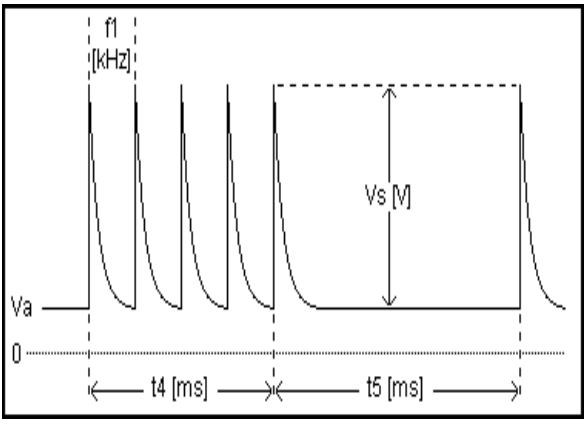
Vs:	-150	V
f1:	10	kHz
t4:	10	ms
t5:	90	ms
tr:	5	ns
td:	100	ns
Ri:	50	Ohm
Coupling:	Battery	
Test duration:	1	h



## Pulse 3b

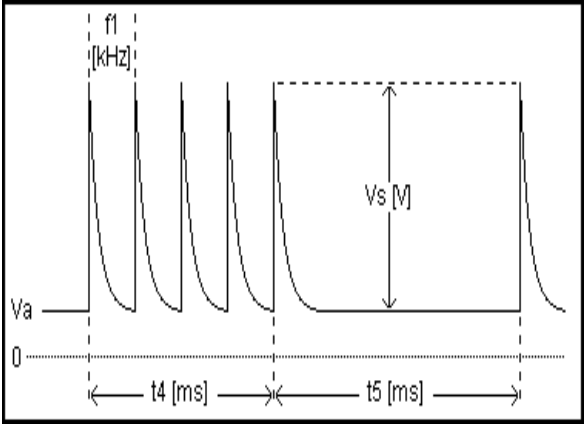
12V

Vs:	+75	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



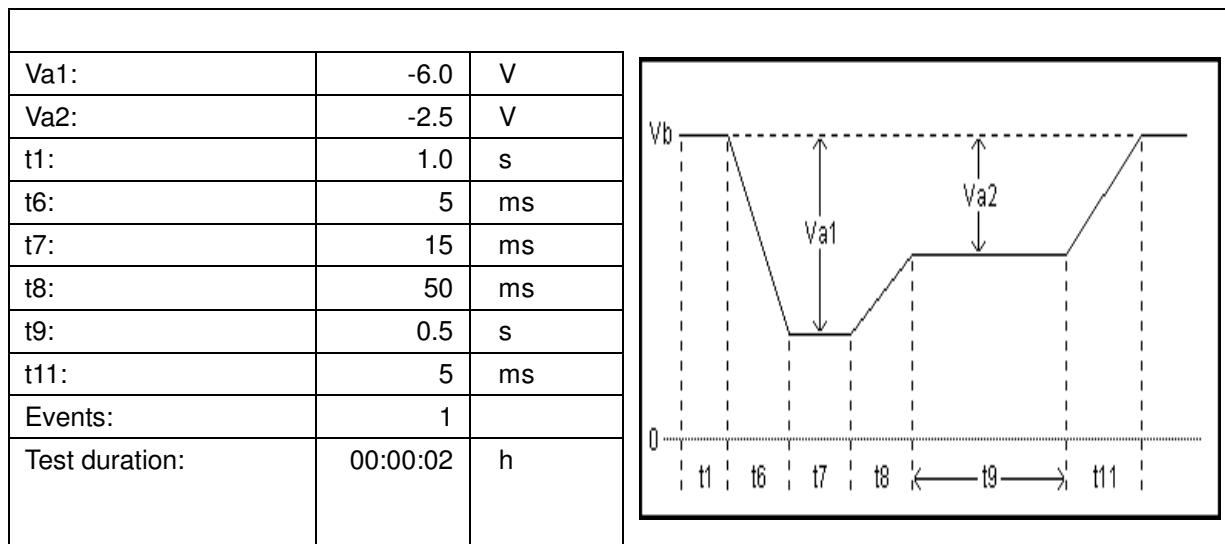
## 24V

Vs:	+150	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

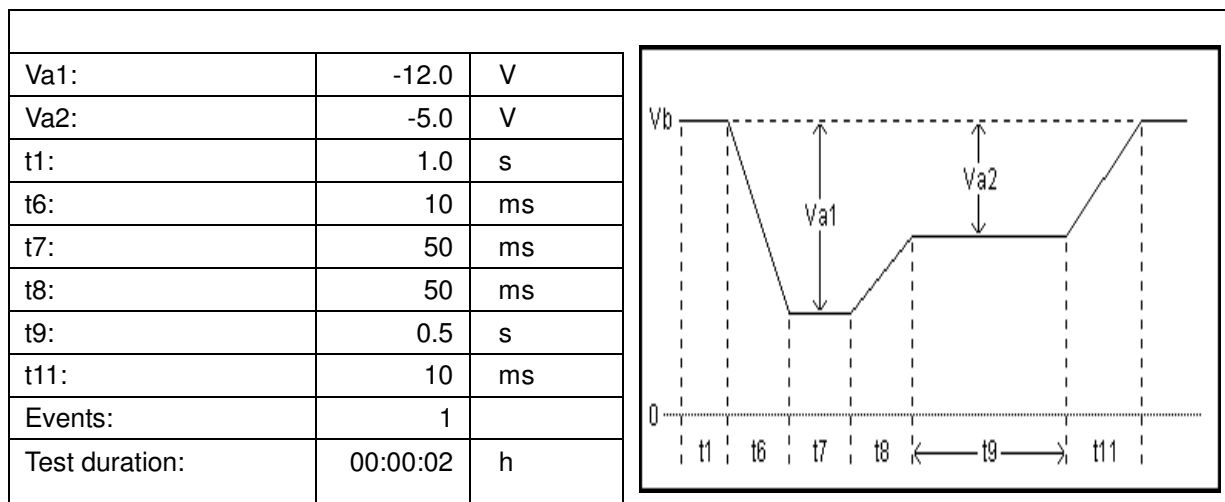


## Pulse 4

12V



## 24V





12V

Test Results:

Test Pulse Number	Immunity Test Level for 12V (min. voltage)	Performance Criterion required	Performance under test
		not immunity- related	
1	III (-75)	D	(C)
2 a	III (+37)	D	(A)
2 b	III (+10)	D	(C)
3 a	III (-112)	D	(A)
3 b	III (+75)	D	(A)
4	III (-6)	D	(A)

**Remark:**

**EUT is not immunity- related product.**

(A): No degradation in the performance of the EUT was observed.

(C): During the test the EUT was power off, after the test it could recover automatically.

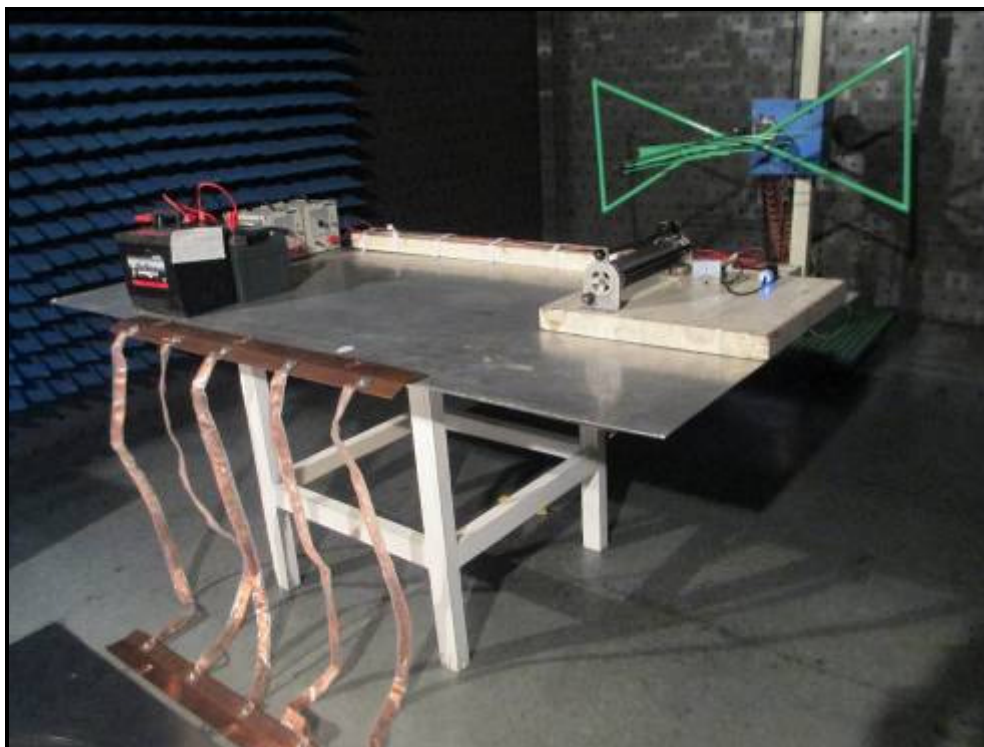
**Conclusion:**

The EUT can meet the requirements of the standard.



## 8 Photographs

### 8.1 Radiated Emission Test Setup

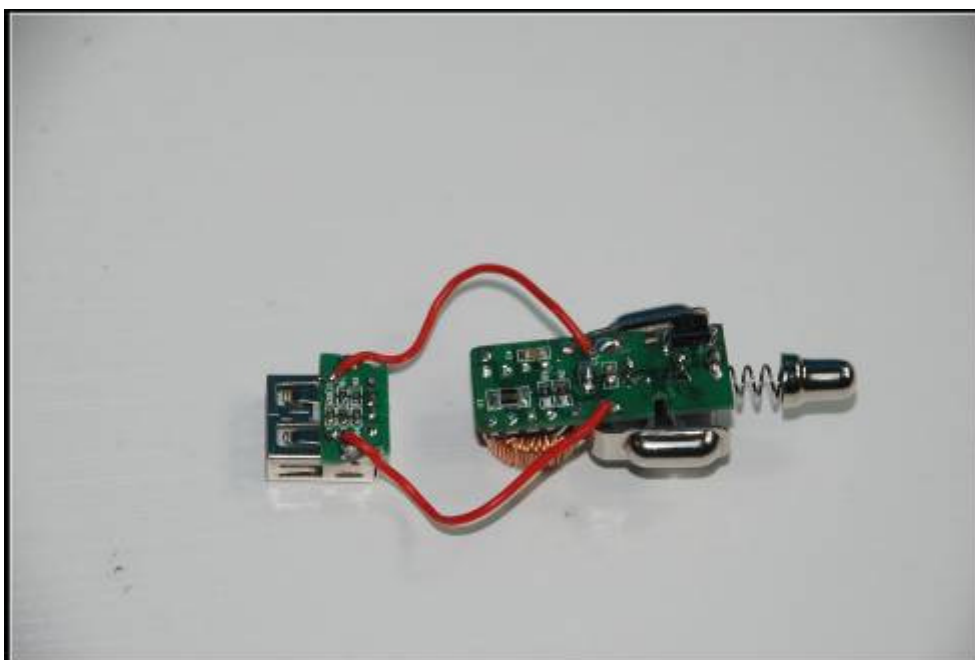
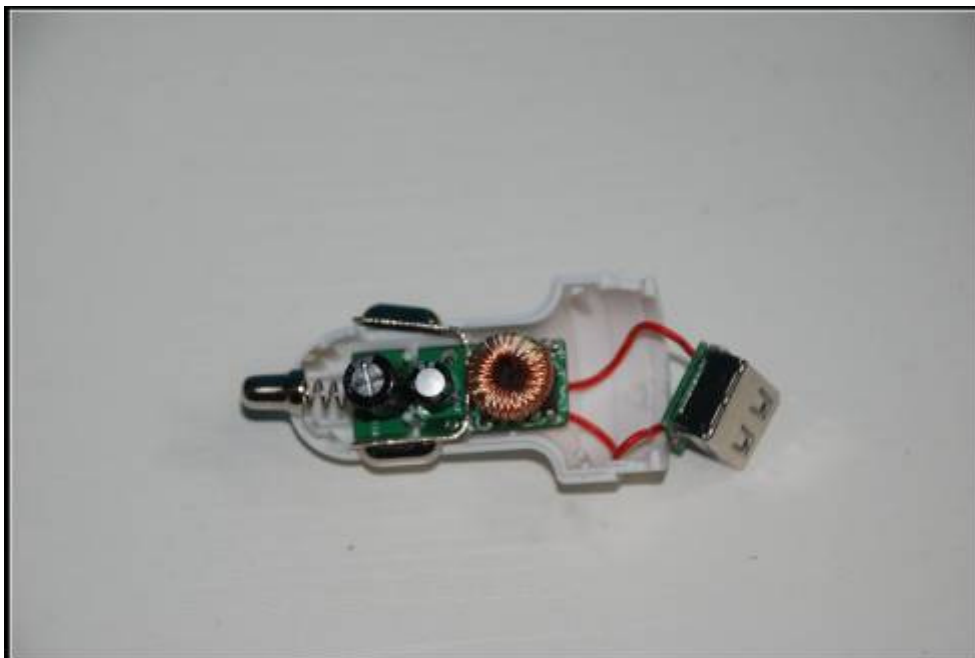


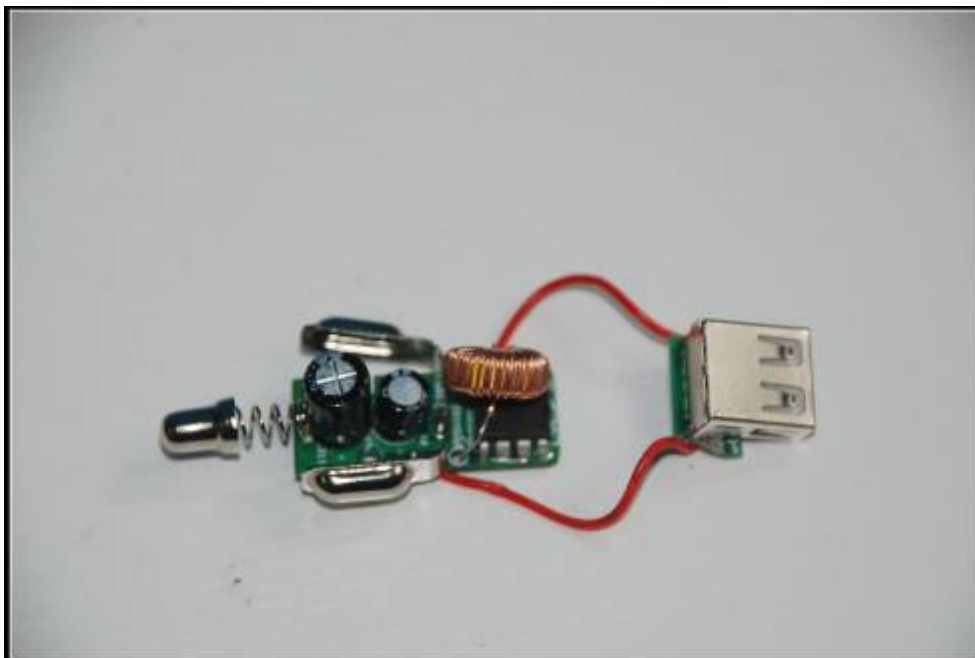
### 8.2 Transient Conducted Immunity Test Setup



### 8.3 EUT Constructional Details







--End of Report--