TEST REPORT

according to

COMMISSION DIRECTIVE 2009/19/EC

Equipment : In Vehicle Computer

Model No. : VBOX-3200-XXXXX

Applicant : **SINTRONES TECHNOLOGY CORP.**
14F.-3, No.736, Zhongzheng Rd.,
Zhonghe Dist., New Taipei City 235, Taiwan

- The test result refers exclusively to the test presented test model / sample.
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- This test report is only applicable to European Community.

SPORTON International Inc.

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

Table of Contents

History of this test report

Original Report Issue Date: Sep. 23, 2011

▒ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No. : EE190775

CERTIFICATE OF COMPLIANCE

according to

COMMISSION DIRECTIVE 2009/19/EC

Equipment : In Vehicle Computer

Model No. : VBOX-3200-XXXXX

Applicant : **SINTRONES TECHNOLOGY CORP.**
14F.-3, No.736, Zhongzheng Rd.,
Zhonghe Dist., New Taipei City 235, Taiwan

I **HEREBY** CERTIFY THAT:

The measurements shown in this test report were made in accordance with the procedures given in **EUROPEAN COUNCIL DIRECTIVE 2009/19/EC.** The equipment was ***passed*** the test performed according to **EUROPEAN STANDARD CISPR 25:2008 and ISO 7637-2:2004.**

The test was carried out on ***Sep. 19, 2011*** at **SPORTON International Inc.** LAB.

Castries Huang
Supervisor

SPORTON International Inc.

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. General Description of Equipment under Test

1.1. Applicant

SINTRONES TECHNOLOGY CORP.
14F.-3, No.736, Zhongzheng Rd., Zhonghe Dist., New Taipei City 235, Taiwan

1.2. Manufacturer

Same as 1.1.

1.3. Basic Description of Equipment under Test

Equipment	: In Vehicle Computer
Model No.	: VBOX-3200-XXXXX
Trade Name	: SINTRONES
RJ45 Cable*2	: Non-Shielded, 10m
GPS ANT Cable	: Shielded, 5m
Power Supply Type	: From DC Source (Input: 110Vac; Output: 13Vdc or 26Vdc)

1.4. Feature of Equipment under Test

- Please refer to user manual.

2. Test Configuration of Equipment under Test

2.1. Test Manner

a. During testing, the interface cables and equipment positions were varied according to European Standard CISPR 25 and ISO 7637-2.

b. The complete test system included remote workstation, DELL PC, DELL LCD Monitor, DELL USB Mouse, DELL USB Keyboard, ACEEX Modem, A-DATA USB Flash, SONY USB Flash, KINYO Earphone, GW INSTEK DC Source and EUT for EMI test. The remote workstation included DELL PC, DELL LCD Monitor, DELL USB Mouse, DELL USB Keyboard, DELL Notebook PC.

c. The following modes were performed for CISRP 25 test:
   Mode 1. Narrow band, DC 13V
   Mode 2. Broad band, DC 13V
   Mode 3. Narrow band, DC 26V
   Mode 4. Broad band, DC 26V

d. The following modes were performed for ISO 7637-2 test:
   Mode 1. DC 13.5V
   Mode 2. DC 27V

e. Frequency range investigated: radiated 30 MHz to 1,000MHz.

2.2. Description of Test System

No.	Peripheral	Manufacturer	Model Number	FCC ID	Cable / Spec. Description	Placed
1	PC	DELL	DCTA	N/A	N/A	Local & Remote
2	LCD Monitor	DELL	2408WFPb	DoC	D-SUB Cable, D-Shielded, 1.8m	Local
3	USB Mouse	DELL	MO560C	DoC	USB Cable, AL-F-Shielded, 1.8m	Local & Remote
4	USB Keyboard	DELL	SK-8175	DoC	USB Cable, AL-F-Shielded, 1.8m	Local
5	Modem	ACEEX	DM1414	IFAXDM1414	RS-232 Cable, D-Shielded, 1.2m	Local
6	USB Flash	A-DATA	PD4	DoC	N/A	Local
7	USB Flash	SONY	USB8GLX	DoC	N/A	Local
8	Earphone	KINYO	EM-15	DoC	Non-Shielded, 1.8m	Local
9	DC Source	GW INSTEK	GPC-6030D	N/A	N/A	Local
10	LCD Monitor	DELL	E198WFPf	DoC	D-SUB Cable, D-Shielded, 1.8m	Remote
11	USB Keyboard	DELL	SK-8115	DoC	USB Cable, AL-F-Shielded, 1.8m	Remote
12	Notebook PC	DELL	PP01L	DoC	N/A	Remote

3. Test Setup

An executive program, EMCTEST.EXE under WIN 7, which generates a complete line of continuously repeating " H " pattern was used as the test software.

The program was executed as follows :

a. Turn on the power of all equipment.
b. The PC reads the test program from the hard disk drive and runs it.
c. The PC sends " H " messages to the monitor, and the monitor displays " H " patterns on the screen.
d. The PC sends " H " messages to the modem.
e. The PC sends " H " messages to the internal Hard Disk, and the Hard Disk reads and writes the message.
f. Repeat the steps from c to e.

At the same time, the following programs under WIN XP were executed:

- Executed " Winthrax.exe " to read and write data from USB flash.
- Executed " Media player " to play audio.
- Executed " Ping " to link with the remote workstation to receive and transmit data by RJ45 cable.
- Executed " GPS View EN3.1" to keep searching GPS signals.

4. General Information of Test

4.1. Test Facility

< EMI >

Test Site Location : No. 52, Hwa Ya 1St Road, Hwa Ya Technology Park,
Kwei-Shan Hsiang, TaoYuan Hsien, Taiwan, R.O.C.
TEL : 886-3-3273456
FAX : 886-3-3180055

Test Site No. : 03CH04-HY

< EMS >

Test Site Location : 3F, No.587, Tanmeu St., Neihu District,Taipei, Taiwan, R.O.C.
TEL : 886-2-2793-1705

Test Site No. : ISO01-BT

4.2. Test Voltage

DC 13V, DC 26V for CISRP 25
DC 13.5V, DC 27V for ISO 7637-2

4.3. Test in Compliance with

COMMISSION DIRECTIVE 2009/19/EC

4.4. Standard for Methods of Measurement

CISRP 25:2008	Radiated Emission Test
ISO 7637-2:2004	Voltage Transient Emission Test
	Transients Immunity Test

5. Radiated Emission Test

5.1. Limit

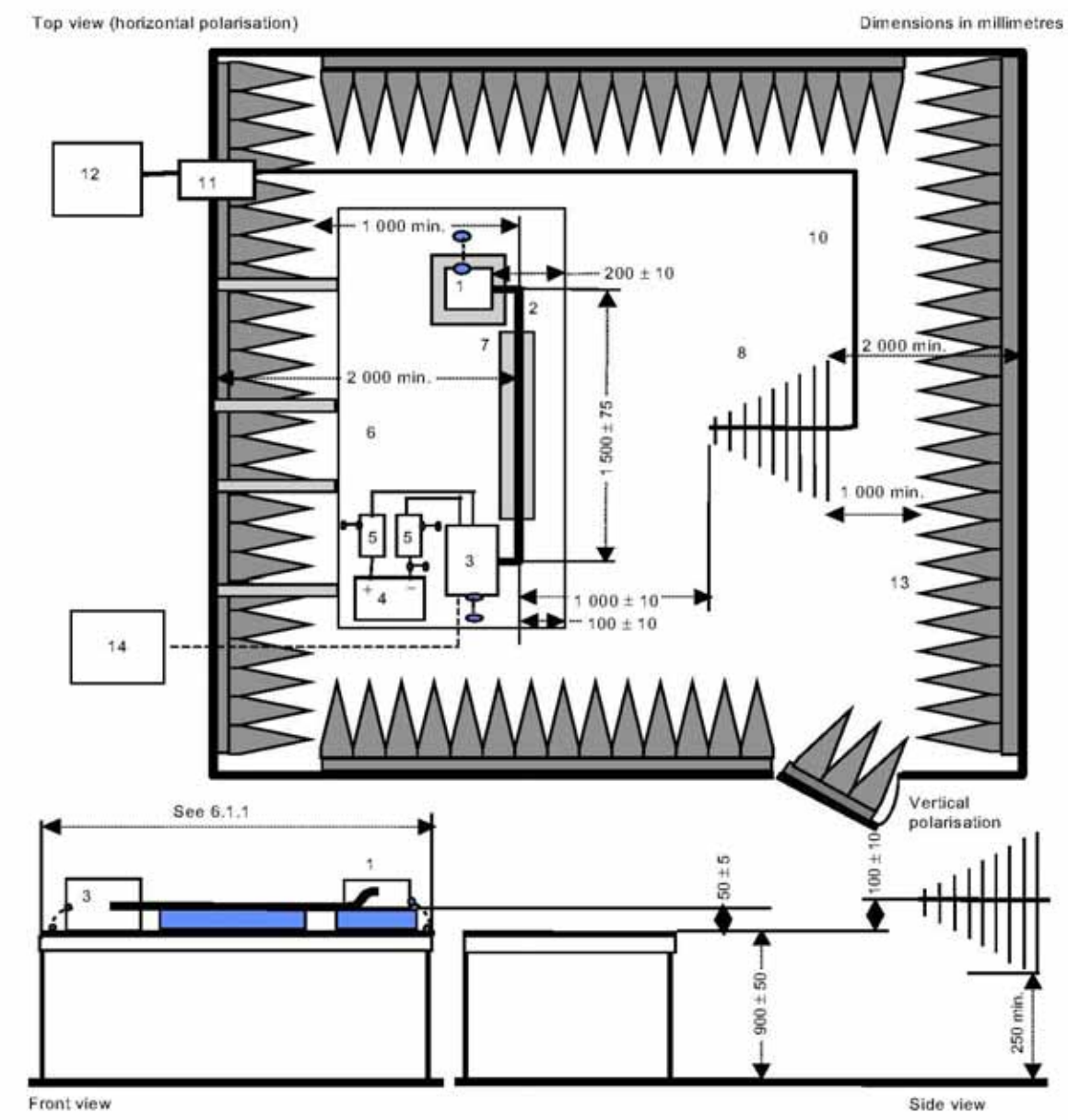
5.1.1. Broadband Reference Limits

Limit E (dBμV/m) at frequency F (MHz)		
30-75 MHz	75-400 MHz	400-1000 MHz
E = 62 – 25,13 log (F/30)	E = 52 + 15,13 log (F/75)	E = 63

5.1.2. Narrowband Reference Limits

Limit E (dBμV/m) at frequency F (MHz)		
30-75 MHz	75-400 MHz	400-1000 MHz
E = 52 – 25,13 log (F/30)	E = 42 + 15,13 log (F/75)	E = 53

5.2. Test Configuration



1	Equipment under test	8	Log-periodic antenna
2	Test harness	9	Monitoring device
3	Load simulator	10	High quality double-shielded coaxial cable (50 Ω)
4	Battery	11	Bulkhead connector
5	Artificial mains network (AN)	12	Measuring instrument
6	Ground plane	13	RF absorber material
7	Low relative permittivity support (εr ≤ 1.4)	14	Stimulation and monitoring system

5.3. Test Procedure

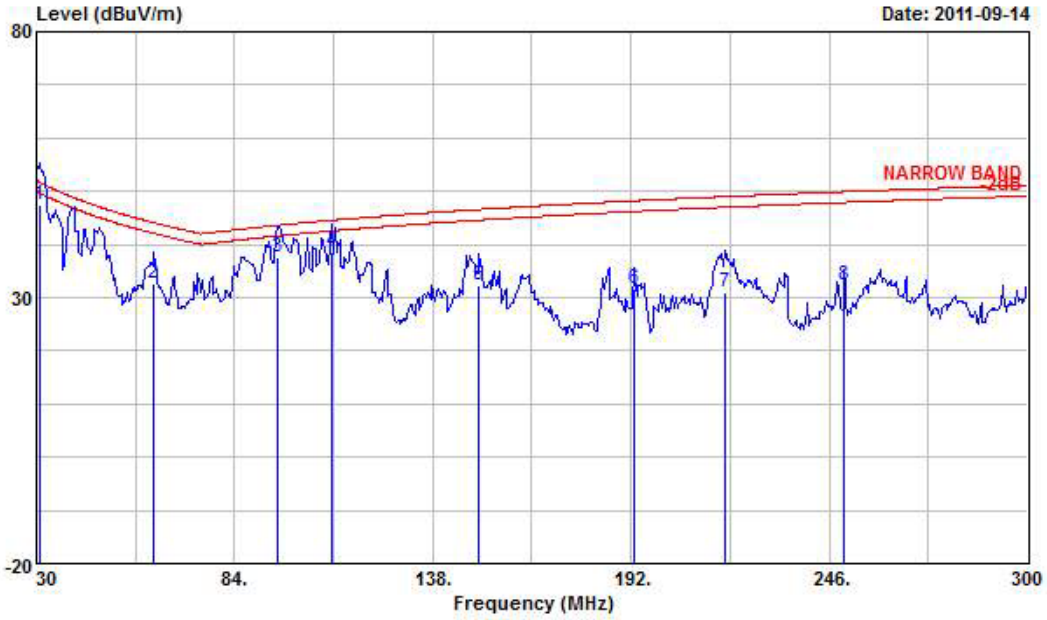
The immunity of ESA representative of its type shall be tested by the method(s) according to CISRP 25: as described in COMMISION DIRECTIVE 2009/19/EC.

5.4. Test Results

5.4.1. Test Mode: Mode 1

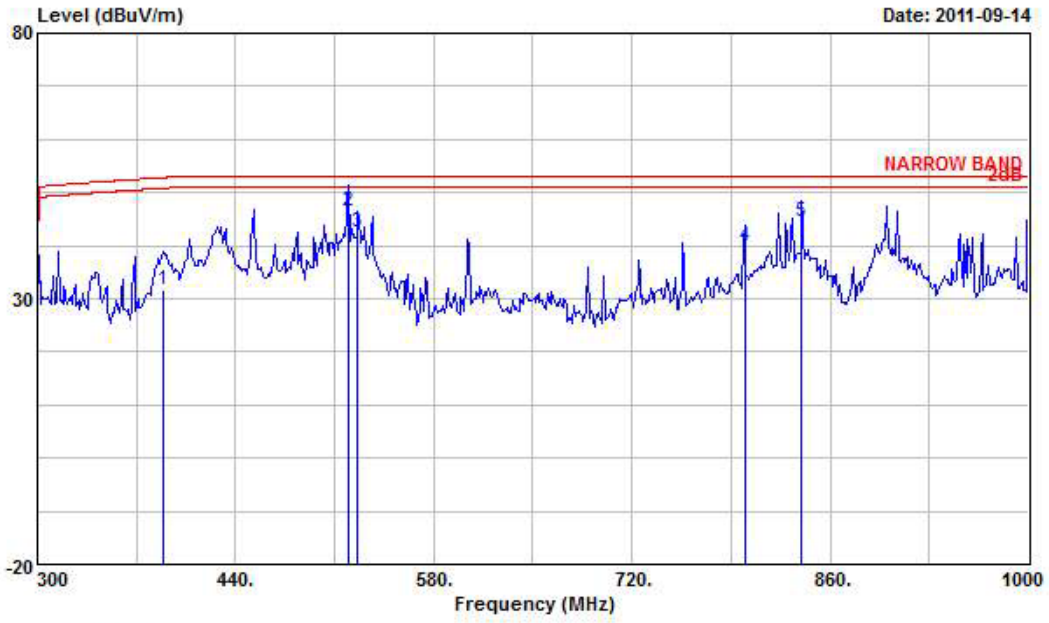
- Frequency Range of Test: from 30 MHz to 1000 MHz
- Temperature: 21 ℃
- Relative Humidity: 50 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

■ **The test was passed at the minimum margin that marked by a frame in the following data**



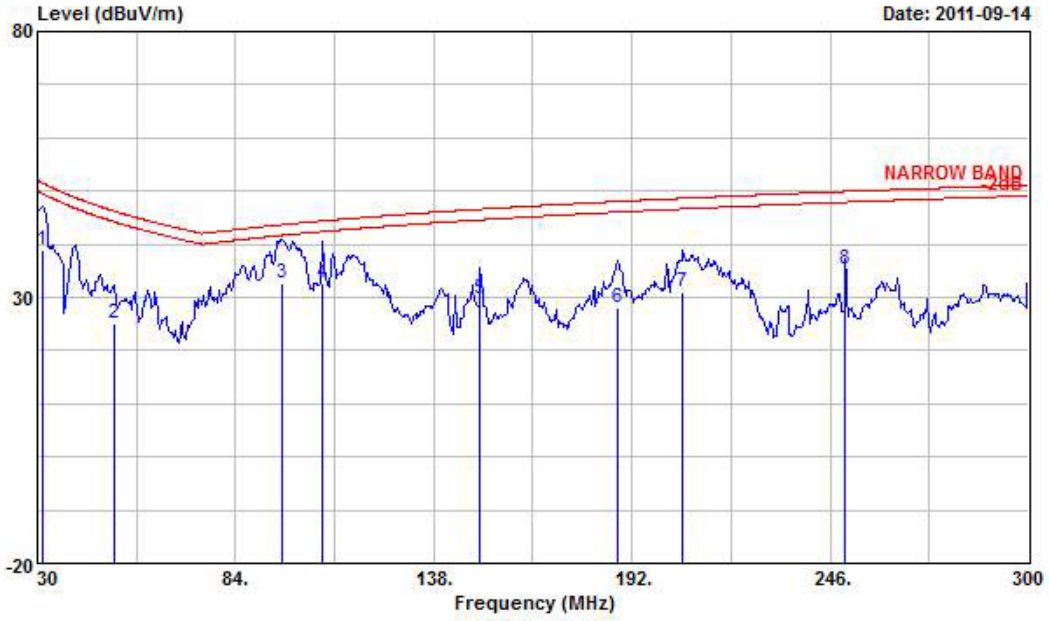
Site :03CH04-HY
Condition:NARROW BAND 1m ANT2724 VERTICAL
EUT :
MODEL :
POWER :13Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	30.810	47.34	-4.37	51.71	55.86	18.02	27.20	0.66	---	---	Average
2 @	62.130	32.70	-11.35	44.05	52.99	5.90	27.08	0.88	---	---	Average
3 @	95.610	37.61	-5.99	43.60	53.88	9.65	27.01	1.09	---	---	Average
4 @	110.460	38.69	-5.85	44.54	53.69	10.86	26.95	1.08	---	---	Average
5	150.690	32.16	-14.42	46.58	46.94	10.80	26.75	1.17	---	---	Average
6	192.810	31.50	-16.70	48.20	47.85	8.82	26.54	1.37	---	---	Average
7	217.650	30.86	-18.14	49.00	45.85	10.07	26.48	1.42	---	---	Average
8	250.050	32.26	-17.65	49.91	44.82	12.41	26.45	1.48	---	---	Average



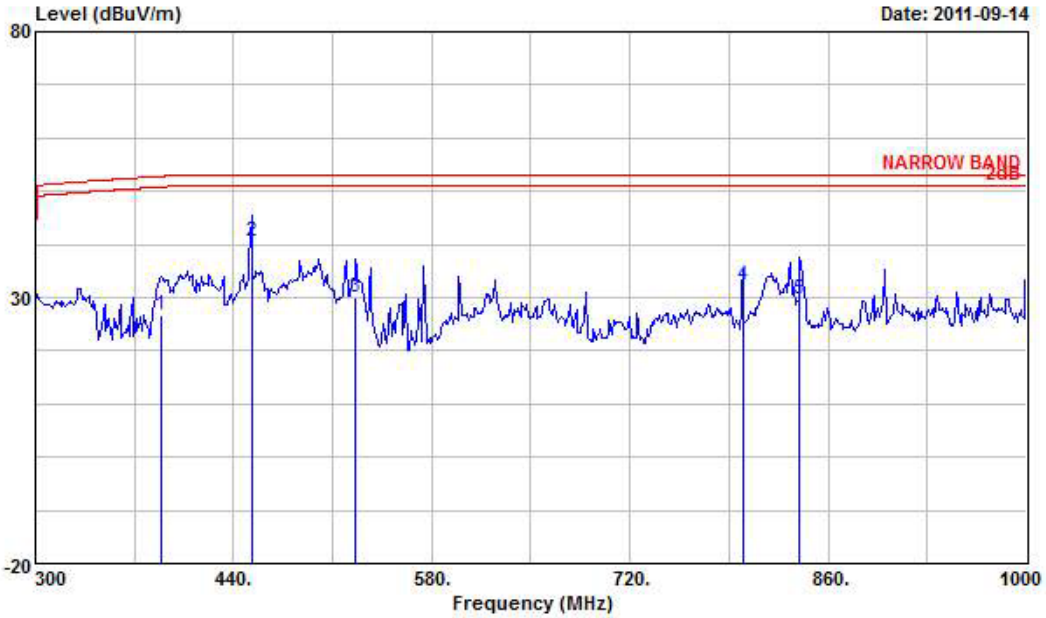
Site :03CH04-HY
Condition:NARROW BAND 1m ANT2724 VERTICAL
EUT :
MODEL :
POWER :13Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	388.900	31.80	-21.02	52.82	41.80	15.44	27.20	1.76	---	---	Average
2 @	519.800	46.51	-6.49	53.00	54.01	18.25	27.64	1.89	---	---	Average
3 @	526.100	42.49	-10.51	53.00	49.87	18.37	27.65	1.90	---	---	Average
4	799.800	39.81	-13.19	53.00	42.37	22.09	27.00	2.35	---	---	Average
5 @	839.700	44.38	-8.62	53.00	46.79	22.56	27.28	2.32	---	---	Average



Site :03CH04-HY
Condition:NARROW BAND 1m ANT2724 HORIZONTAL
EUT :
MODEL :
POWER :13Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	31.620	39.01	-12.42	51.43	48.09	17.46	27.19	0.66	---	---	Average
2	51.060	25.18	-21.02	46.20	43.40	7.99	27.10	0.89	---	---	Average
3 @	96.690	32.73	-10.94	43.67	48.82	9.83	27.01	1.09	---	---	Average
4 @	107.490	32.69	-11.68	44.37	47.84	10.73	26.96	1.08	---	---	Average
5	150.690	29.54	-17.04	46.58	44.32	10.80	26.75	1.17	---	---	Average
6	188.220	27.90	-20.15	48.05	44.30	8.82	26.56	1.35	---	---	Average
7	205.770	30.84	-17.79	48.63	46.69	9.24	26.49	1.40	---	---	Average
8	250.050	35.24	-14.67	49.91	47.80	12.41	26.45	1.48	---	---	Average



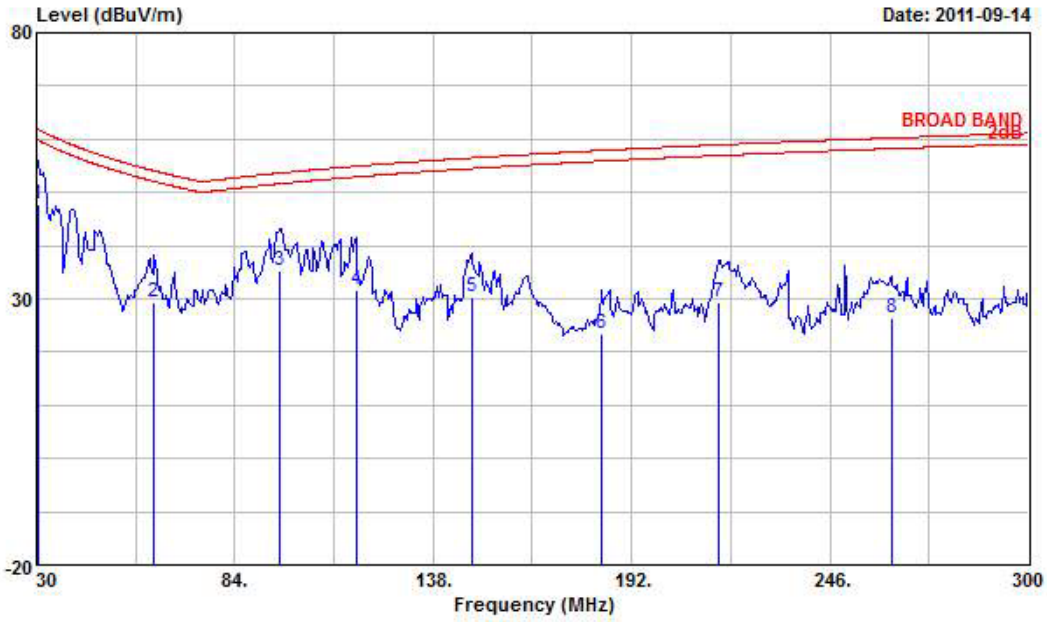
Site :03CH04-HY
Condition:NARROW BAND 1m ANT2724 HORIZONTAL
EUT :
MODEL :
POWER :13Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	388.900	26.86	-25.96	52.82	36.86	15.44	27.20	1.76	---	---	Average
2	452.600	40.41	-12.59	53.00	49.23	16.84	27.46	1.79	---	---	Average
3	526.100	30.09	-22.91	53.00	37.47	18.37	27.65	1.90	---	---	Average
4	799.800	32.32	-20.68	53.00	34.88	22.09	27.00	2.35	---	---	Average
5	839.700	29.51	-23.49	53.00	31.92	22.56	27.28	2.32	---	---	Average

5.4.2. Test Mode: Mode 2

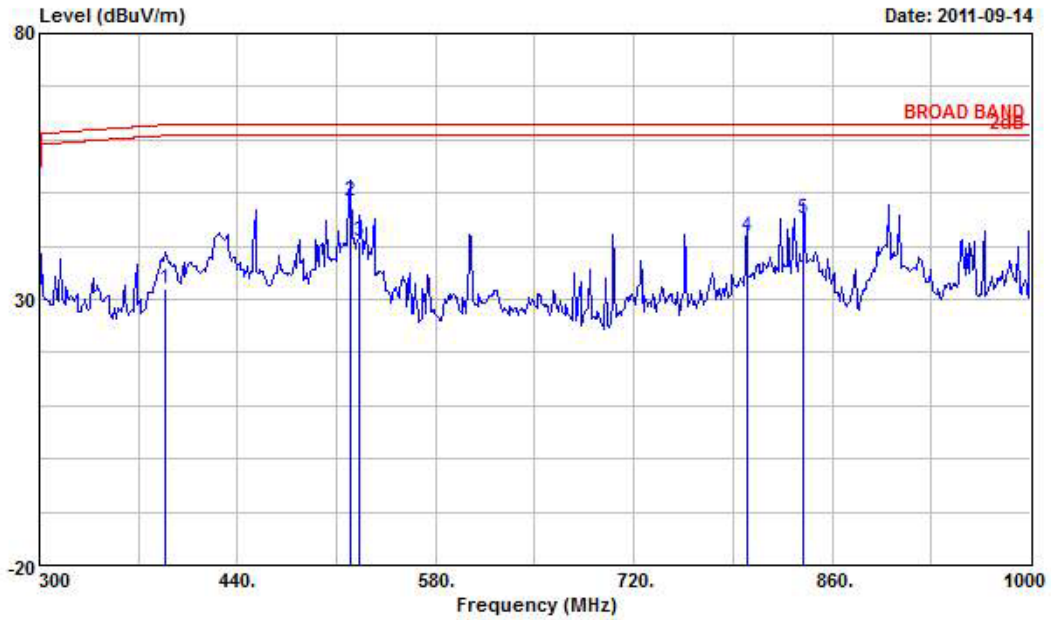
- Frequency Range of Test: from 30 MHz to 1000 MHz
- Temperature: 21 ℃
- Relative Humidity: 50 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test was passed at the minimum margin that marked by a frame in the following data



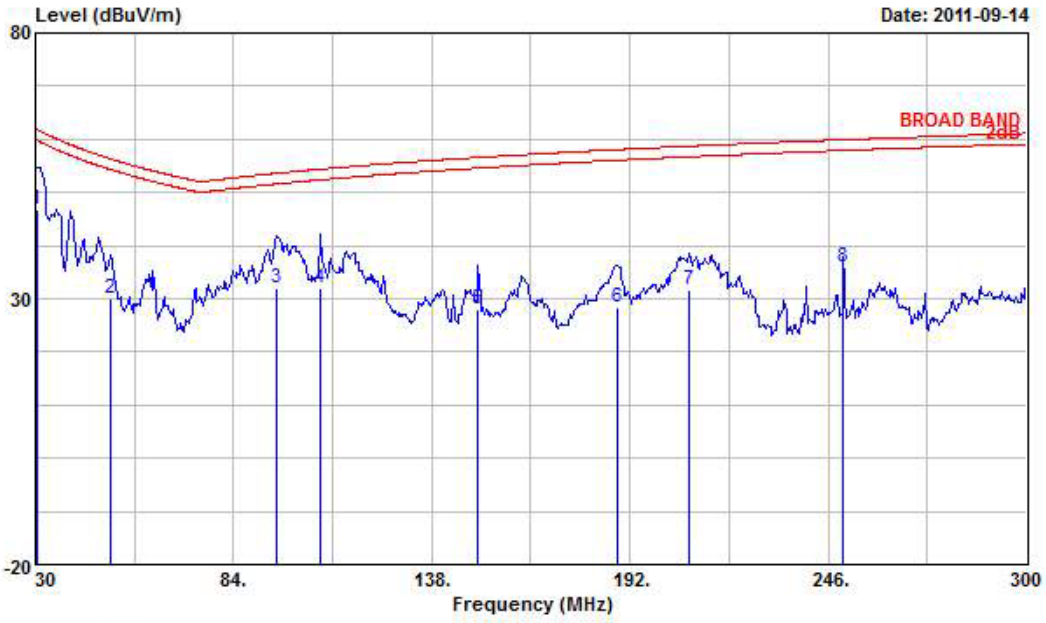
Site :03CH04-HY
Condition:BROAD BAND 1m ANT2724 VERTICAL
EUT :
MODEL :
POWER :13Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.540	47.90	-13.91	61.81	56.42	18.02	27.20	0.66	---	---	QP
2	62.130	29.21	-24.84	54.05	49.50	5.90	27.08	0.88	---	---	QP
3	96.420	35.17	-18.48	53.65	51.44	9.65	27.01	1.09	---	---	QP
4	116.940	31.60	-23.32	54.92	46.28	11.15	26.91	1.08	---	---	QP
5	148.530	30.43	-26.06	56.49	45.13	10.89	26.76	1.16	---	---	QP
6	183.900	23.54	-34.35	57.89	39.98	8.81	26.58	1.33	---	---	QP
7	215.490	29.33	-29.61	58.94	44.47	9.93	26.48	1.42	---	---	QP
8	262.740	26.24	-34.00	60.24	38.53	12.64	26.44	1.52	---	---	QP



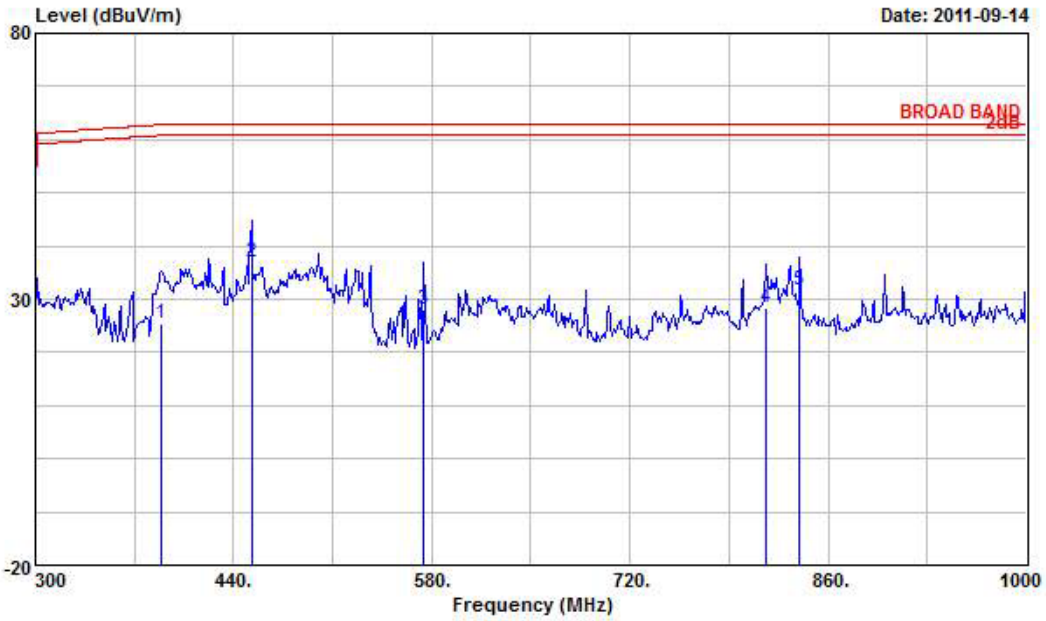
Site :03CH04-HY
Condition:BROAD BAND 1m ANT2724 VERTICAL
EUT :
MODEL :
POWER :13Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	388.900	31.85	-30.97	62.82	41.85	15.44	27.20	1.76	---	---	QP
2	519.800	48.42	-14.58	63.00	55.92	18.25	27.64	1.89	---	---	QP
3	526.100	40.88	-22.12	63.00	48.26	18.37	27.65	1.90	---	---	QP
4	799.800	41.79	-21.21	63.00	44.35	22.09	27.00	2.35	---	---	QP
5	839.700	45.13	-17.87	63.00	47.54	22.56	27.28	2.32	---	---	QP



Site :03CH04-HY
Condition:BROAD BAND 1m ANT2724 HORIZONTAL
EUT :
MODEL :
POWER :13Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.540	46.77	-15.04	61.81	55.29	18.02	27.20	0.66	---	---	QP
2	50.520	29.92	-26.39	56.31	47.90	8.23	27.10	0.89	---	---	QP
3	95.610	32.00	-21.60	53.60	48.27	9.65	27.01	1.09	---	---	QP
4	107.490	32.12	-22.25	54.37	47.27	10.73	26.96	1.08	---	---	QP
5	150.690	28.11	-28.47	56.58	42.89	10.80	26.75	1.17	---	---	QP
6	188.490	28.31	-29.75	58.06	44.71	8.82	26.56	1.35	---	---	QP
7	207.930	31.64	-27.06	58.70	47.35	9.38	26.49	1.41	---	---	QP
8	250.050	36.00	-23.91	59.91	48.56	12.41	26.45	1.48	---	---	QP



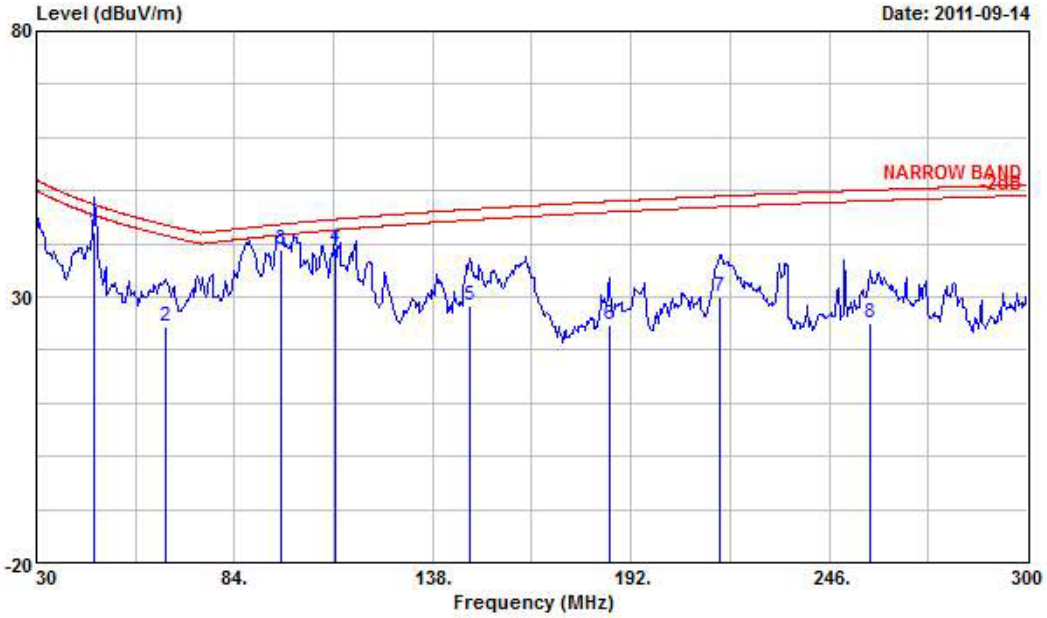
Site :03CH04-HY
Condition:BROAD BAND 1m ANT2724 HORIZONTAL
EUT :
MODEL :
POWER :13Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	388.900	25.28	-37.54	62.82	35.28	15.44	27.20	1.76	---	---	QP
2	452.600	36.77	-26.23	63.00	45.59	16.84	27.46	1.79	---	---	QP
3	573.700	27.90	-35.10	63.00	34.27	19.35	27.75	2.03	---	---	QP
4	816.600	28.46	-34.54	63.00	30.96	22.28	27.12	2.34	---	---	QP
5	839.700	31.78	-31.22	63.00	34.19	22.56	27.28	2.32	---	---	QP

5.4.3. Test Mode: Mode 3

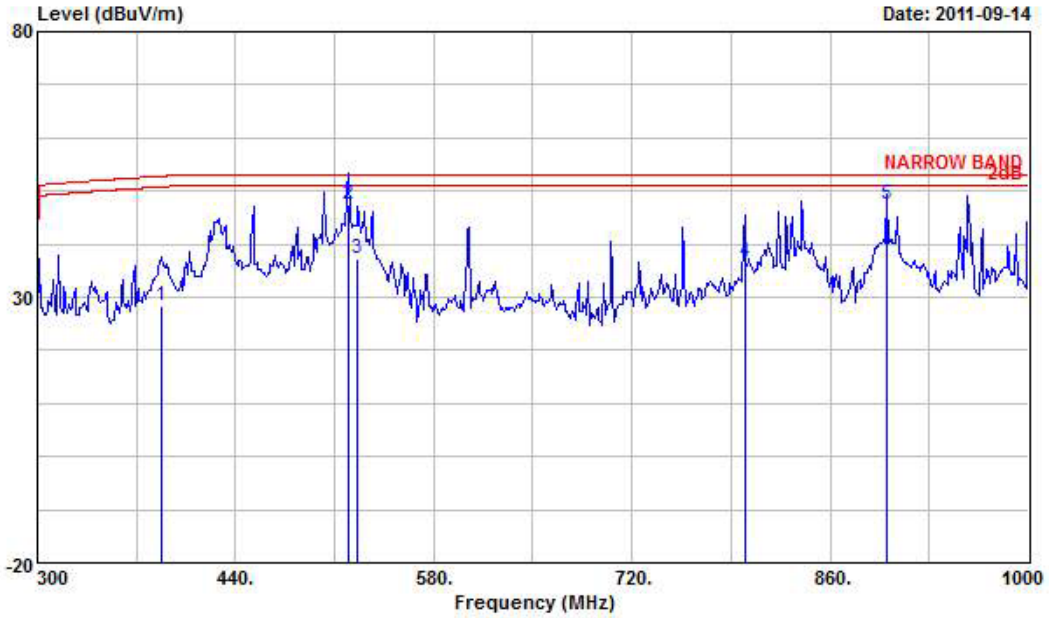
- Frequency Range of Test: from 30 MHz to 1000 MHz
- Temperature: 21 ℃
- Relative Humidity: 50 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test was passed at the minimum margin that marked by a frame in the following data



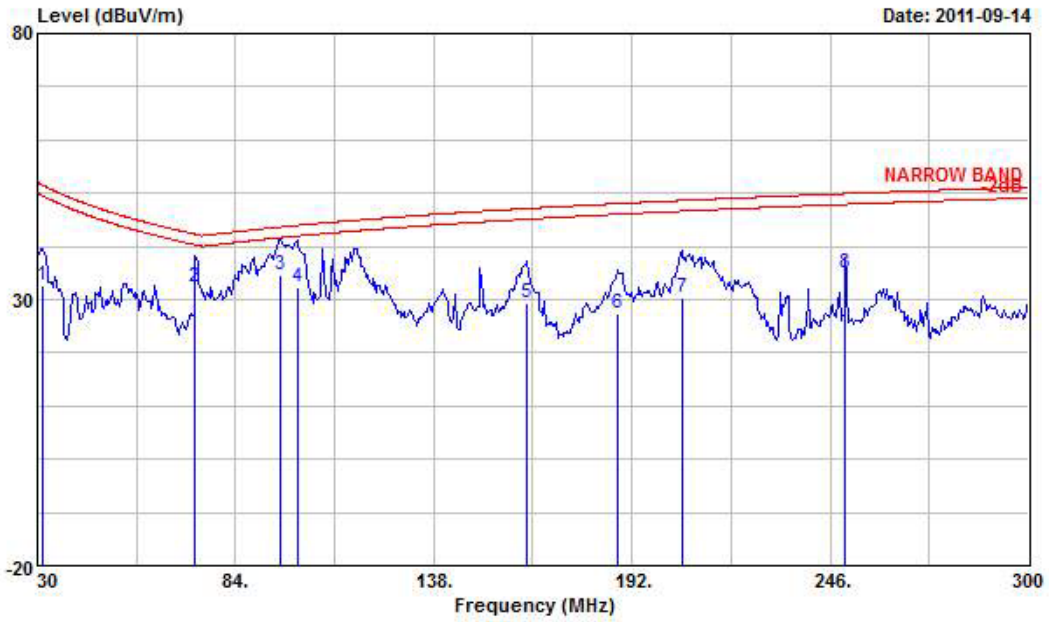
Site :03CH04-HY
Condition:NARROW BAND 1m ANT2724 VERTICAL
EUT :
MODEL :
POWER :26Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	45.930	42.27	-5.08	47.35	58.19	10.35	27.13	0.86	---	---	Average
2	65.100	24.41	-19.13	43.54	44.54	6.06	27.07	0.88	---	---	Average
3 @	96.690	38.83	-4.84	43.67	54.92	9.83	27.01	1.09	---	---	Average
4 @	111.540	39.17	-5.44	44.61	54.13	10.90	26.94	1.08	---	---	Average
5	148.260	28.25	-18.23	46.48	42.95	10.89	26.76	1.16	---	---	Average
6	186.060	24.63	-23.34	47.97	41.05	8.82	26.57	1.34	---	---	Average
7	216.300	30.02	-18.94	48.96	45.08	10.00	26.48	1.42	---	---	Average
8	257.340	24.93	-25.17	50.10	37.34	12.53	26.44	1.50	---	---	Average



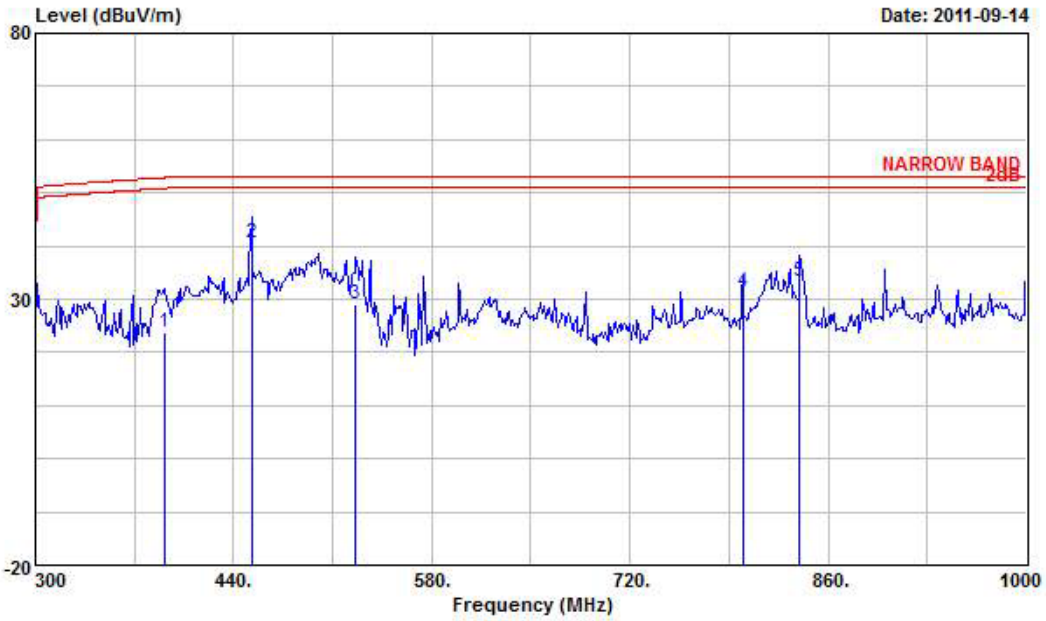
Site :03CH04-HY
Condition:NARROW BAND 1m ANT2724 VERTICAL
EUT :
MODEL :
POWER :26Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	388.200	28.47	-24.33	52.80	38.49	15.42	27.19	1.76	---	---	Average
2 @	519.800	47.33	-5.67	53.00	54.83	18.25	27.64	1.89	---	---	Average
3	526.100	37.19	-15.81	53.00	44.57	18.37	27.65	1.90	---	---	Average
4	799.800	36.53	-16.47	53.00	39.09	22.09	27.00	2.35	---	---	Average
5 @	900.600	47.31	-5.69	53.00	49.37	23.27	27.70	2.37	---	---	Average



Site :03CH04-HY
Condition:NARROW BAND 1m ANT2724 HORIZONTAL
EUT :
MODEL :
POWER :26Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	31.620	32.57	-18.86	51.43	41.65	17.46	27.19	0.66	---	---	Average
2 @	72.930	32.16	-10.15	42.31	51.68	6.59	27.05	0.95	---	---	Average
3 @	96.420	34.55	-9.10	43.65	50.82	9.65	27.01	1.09	---	---	Average
4 @	100.740	32.22	-11.72	43.94	47.72	10.41	27.00	1.09	---	---	Average
5	163.380	29.21	-17.91	47.12	44.66	10.01	26.68	1.22	---	---	Average
6	188.220	27.47	-20.58	48.05	43.87	8.82	26.56	1.35	---	---	Average
7	205.500	30.21	-18.41	48.62	46.06	9.24	26.49	1.40	---	---	Average
8	250.050	34.94	-14.97	49.91	47.50	12.41	26.45	1.48	---	---	Average



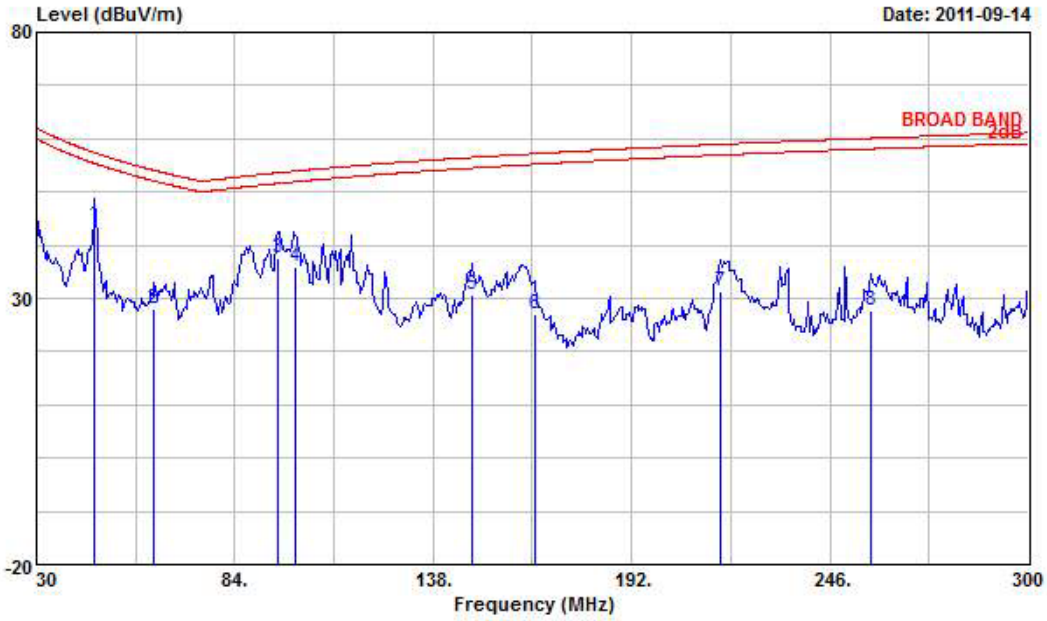
Site :03CH04-HY
Condition:NARROW BAND 1m ANT2724 HORIZONTAL
EUT :
MODEL :
POWER :26Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	391.000	23.81	-29.04	52.85	33.78	15.49	27.22	1.76	---	---	Average
2 @	452.600	40.42	-12.58	53.00	49.24	16.84	27.46	1.79	---	---	Average
3	526.100	29.05	-23.95	53.00	36.43	18.37	27.65	1.90	---	---	Average
4	799.800	31.43	-21.57	53.00	33.99	22.09	27.00	2.35	---	---	Average
5	839.700	33.15	-19.85	53.00	35.56	22.56	27.28	2.32	---	---	Average

5.4.4. Test Mode: Mode 4

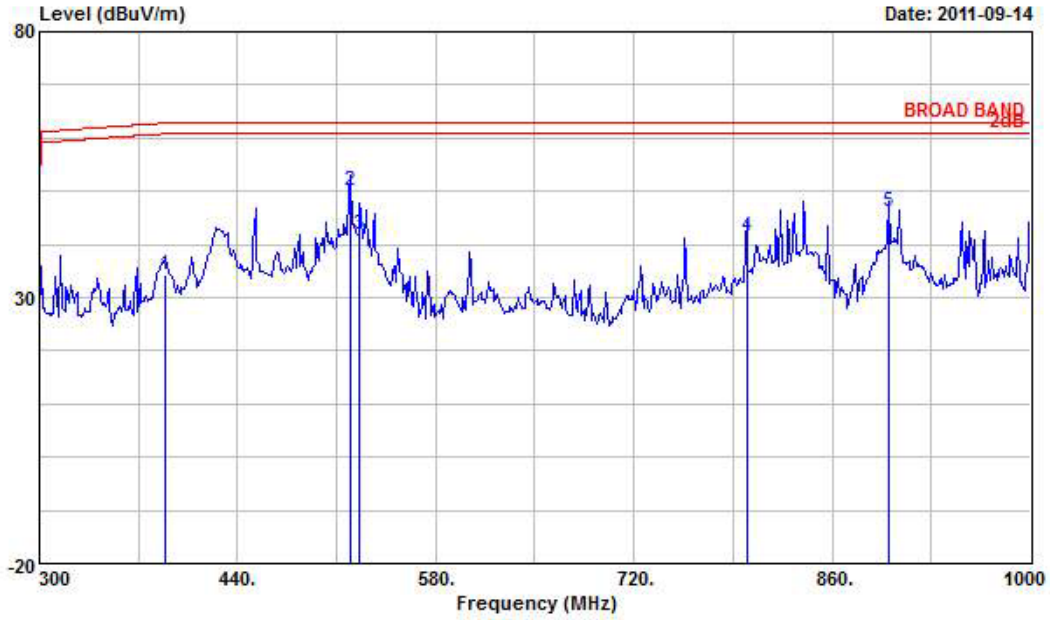
- Frequency Range of Test: from 30 MHz to 1000 MHz
- Temperature: 21 ℃
- Relative Humidity: 50 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test was passed at the minimum margin that marked by a frame in the following data



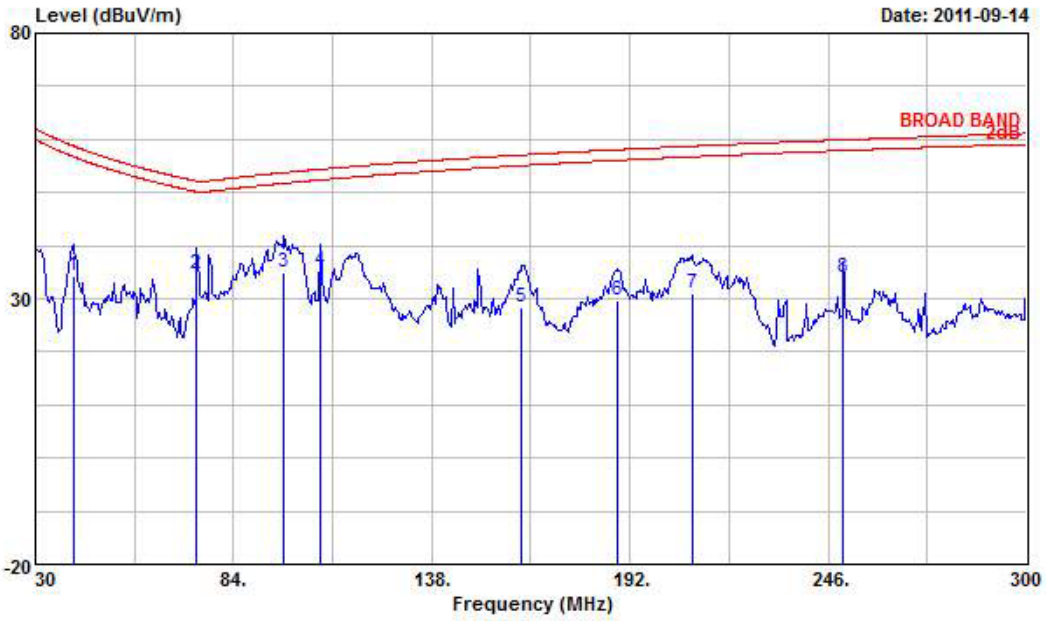
Site :03CH04-HY
Condition:BROAD BAND 1m ANT2724 VERTICAL
EUT :
MODEL :
POWER :26Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	45.930	43.88	-13.47	57.35	59.80	10.35	27.13	0.86	---	---	QP
2	62.130	28.11	-25.94	54.05	48.40	5.90	27.08	0.88	---	---	QP
3	95.610	37.55	-16.05	53.60	53.82	9.65	27.01	1.09	---	---	QP
4	100.470	35.93	-17.99	53.92	51.43	10.41	27.00	1.09	---	---	QP
5	148.530	30.57	-25.92	56.49	45.27	10.89	26.76	1.16	---	---	QP
6	165.540	27.20	-30.00	57.20	42.78	9.86	26.67	1.23	---	---	QP
7	216.300	31.19	-27.77	58.96	46.25	10.00	26.48	1.42	---	---	QP
8	257.340	27.59	-32.51	60.10	40.00	12.53	26.44	1.50	---	---	QP



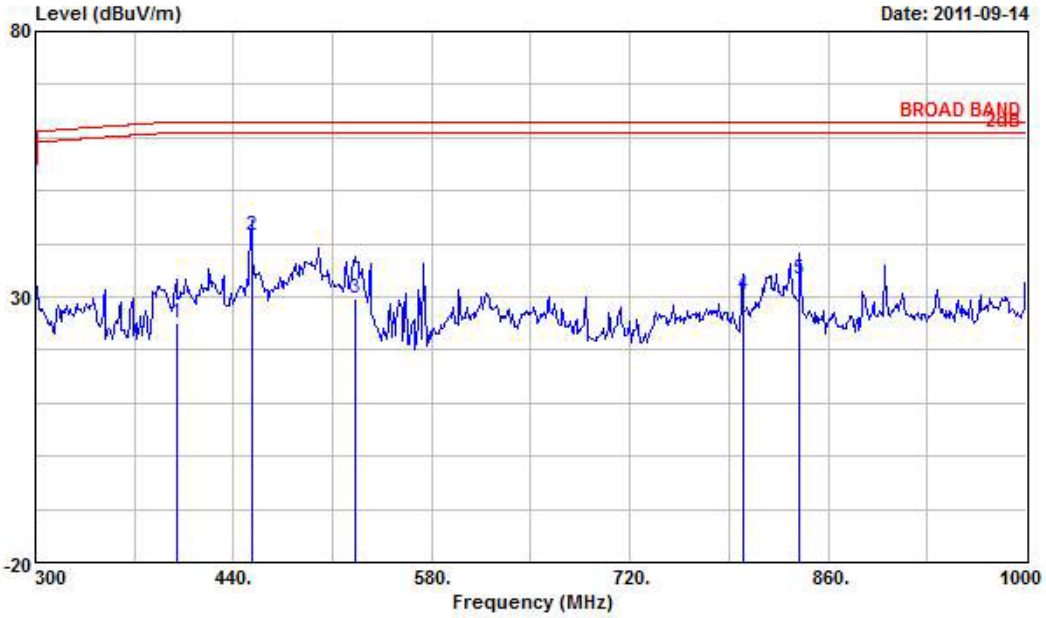
Site :03CH04-HY
Condition:BROAD BAND 1m ANT2724 VERTICAL
EUT :
MODEL :
POWER :26Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	388.900	34.31	-28.51	62.82	44.31	15.44	27.20	1.76	---	---	QP
2	519.800	50.02	-12.98	63.00	57.52	18.25	27.64	1.89	---	---	QP
3	526.100	41.93	-21.07	63.00	49.31	18.37	27.65	1.90	---	---	QP
4	799.800	41.36	-21.64	63.00	43.92	22.09	27.00	2.35	---	---	QP
5	900.600	46.26	-16.74	63.00	48.32	23.27	27.70	2.37	---	---	QP



Site :03CH04-HY
Condition:BROAD BAND 1m ANT2724 HORIZONTAL
EUT :
MODEL :
POWER :26Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	40.260	34.35	-24.44	58.79	47.84	12.85	27.15	0.81	---	---	QP
2	74.010	34.54	-17.61	52.15	53.95	6.68	27.05	0.96	---	---	QP
3	97.770	34.98	-18.76	53.74	50.89	10.00	27.00	1.09	---	---	QP
4	107.490	35.12	-19.25	54.37	50.27	10.73	26.96	1.08	---	---	QP
5	162.570	28.31	-28.77	57.08	43.70	10.09	26.69	1.22	---	---	QP
6	188.490	29.60	-28.46	58.06	46.00	8.82	26.56	1.35	---	---	QP
7	209.010	31.07	-27.66	58.73	46.63	9.52	26.49	1.41	---	---	QP
8	250.050	34.07	-25.84	59.91	46.63	12.41	26.45	1.48	---	---	QP

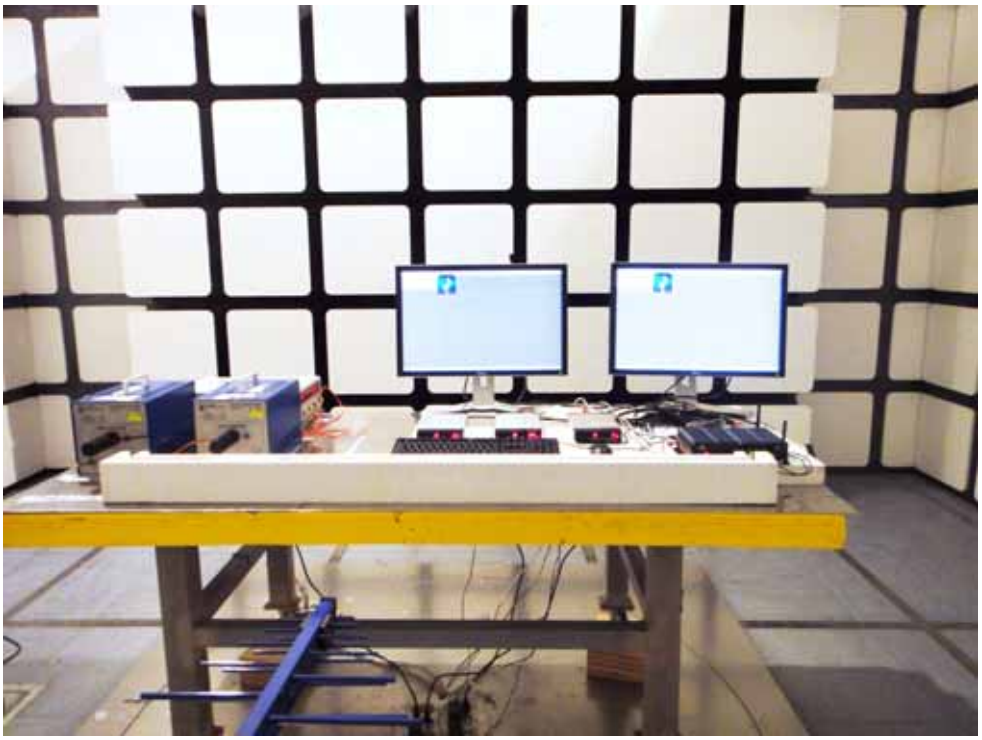


Site :03CH04-HY
Condition:BROAD BAND 1m ANT2724 HORIZONTAL
EUT :
MODEL :
POWER :26Vdc
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	399.400	25.16	-37.83	62.99	34.99	15.70	27.30	1.77	---	---	QP
2	452.600	41.62	-21.38	63.00	50.44	16.84	27.46	1.79	---	---	QP
3	525.400	29.67	-33.33	63.00	37.05	18.37	27.65	1.90	---	---	QP
4	799.800	30.43	-32.57	63.00	32.99	22.09	27.00	2.35	---	---	QP
5	839.700	33.20	-29.80	63.00	35.61	22.56	27.28	2.32	---	---	QP

5.5. Photographs of Radiated Emission Test

FRONT VIEW



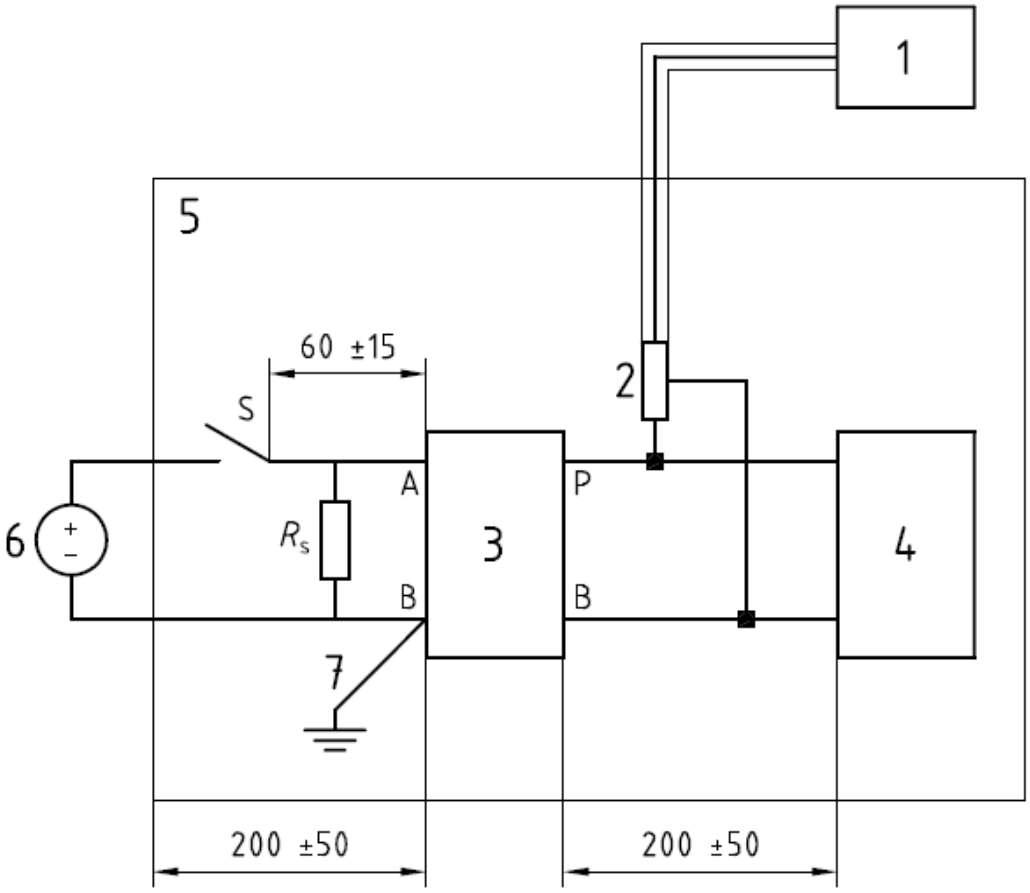
6. Voltage Transient Emissions Test

6.1. Limit

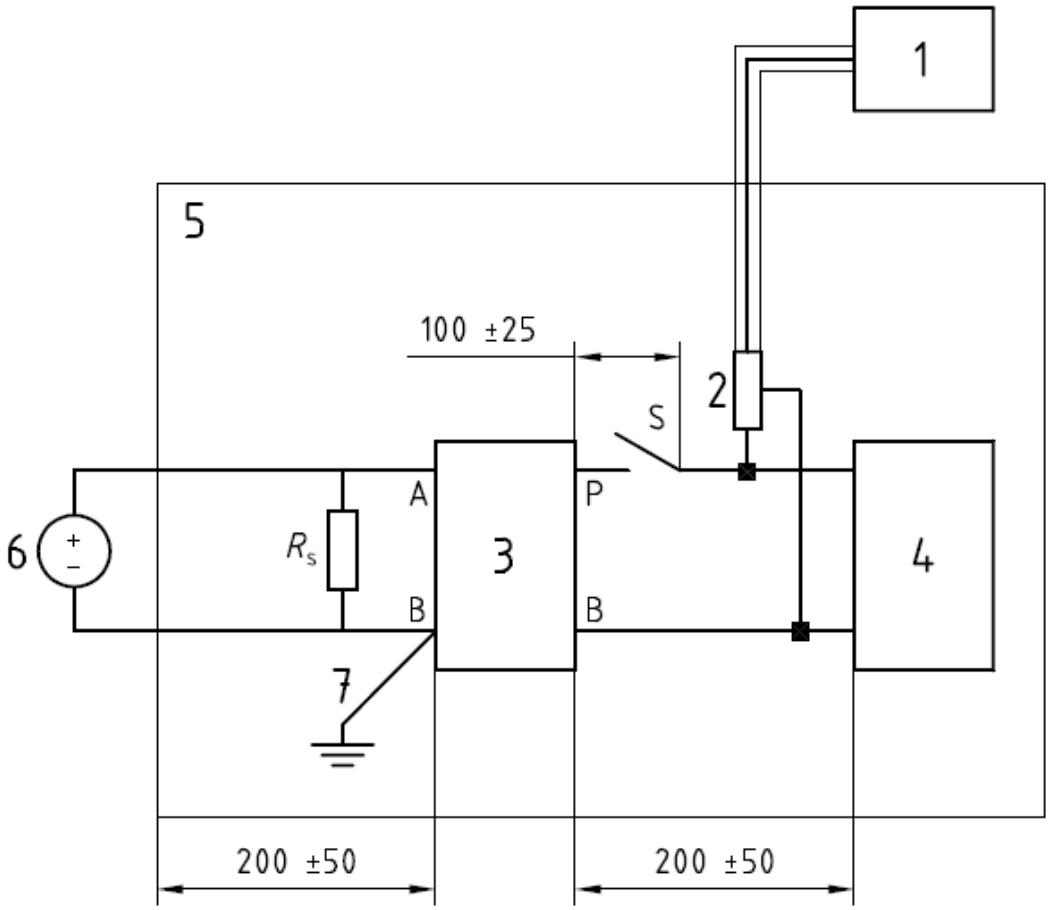
Polarity of pulse amplitude	Maximum allowed pulse amplitude for	
	Vehicles with 12V system	Vehicles with 24V system
Positive	+ 75	+ 150
Negative	- 100	- 450

6.2. Test Configuration

6.2.1. Slow Pulses (millisecond range or slower)



6.2.2. Fast Pulses (nanosecond-to-microsecond range)



1	oscilloscope or equivalent	5	ground plane
2	voltage probe	6	power supply
3	artificial network	7	Ground connection; length < 100 mm
4	DUT (source of transient)		

6.3. Test Results

6.3.1. Test Mode : Mode 1

- Final Test Result : **PASS**
- Product Standard : ISO 7637-2:2004
- Tested Voltage : DC 13.5 V
- Temperature : 25 ℃
- Relative Humidity : 46 %
- Atmospheric Pressure : 103 kPa
- Test Date : Sep. 19, 2011

7.4.2.1. Slow Pulse

Input Voltage：S-switch OFF-ON		
Positive	12.2 Volts	Pass
Negative	-4.8 Volts	Pass

7.4.2.2. Fast Pulse

Input Voltage： S-switch OFF-ON		
Positive	14.0 Volts	Pass
Negative	-2.8 Volts	Pass

6.3.2. Test Mode : Mode 2

- Final Test Result : **PASS**
- Product Standard : ISO 7637-2:2004
- Tested Voltage : DC 27 V
- Temperature : 25 ℃
- Relative Humidity : 46 %
- Atmospheric Pressure : 103 kPa
- Test Date : Sep. 19, 2011

7.4.2.3. Slow Pulse

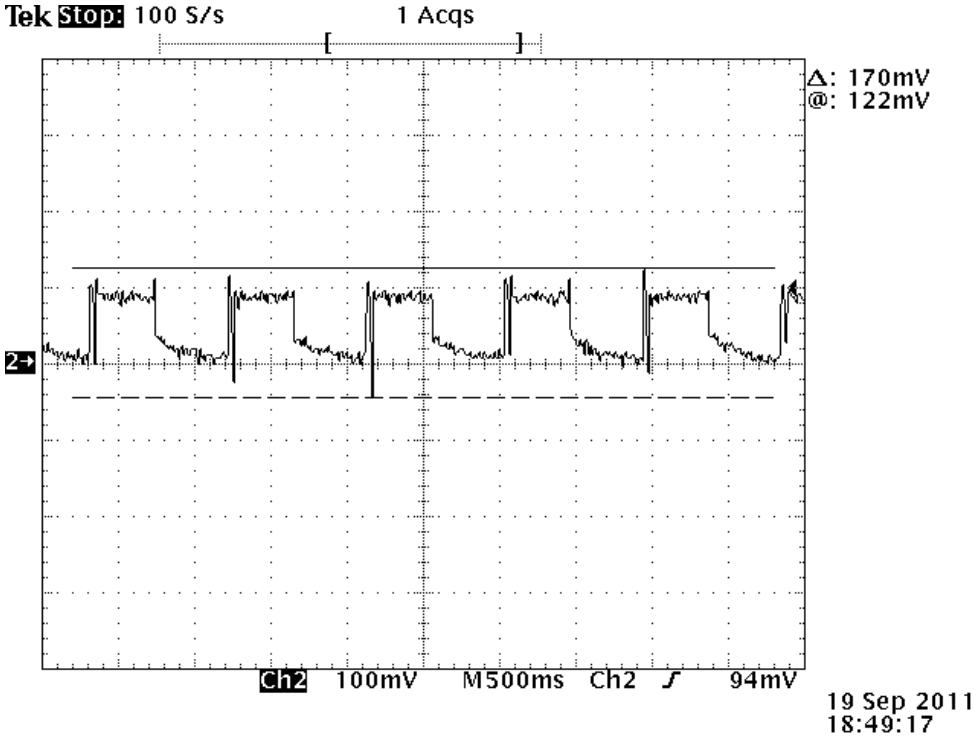
Input Voltage：S-switch OFF-ON		
Positive	23.2 Volts	Pass
Negative	-0.6 Volts	Pass

7.4.2.4. Fast Pulse

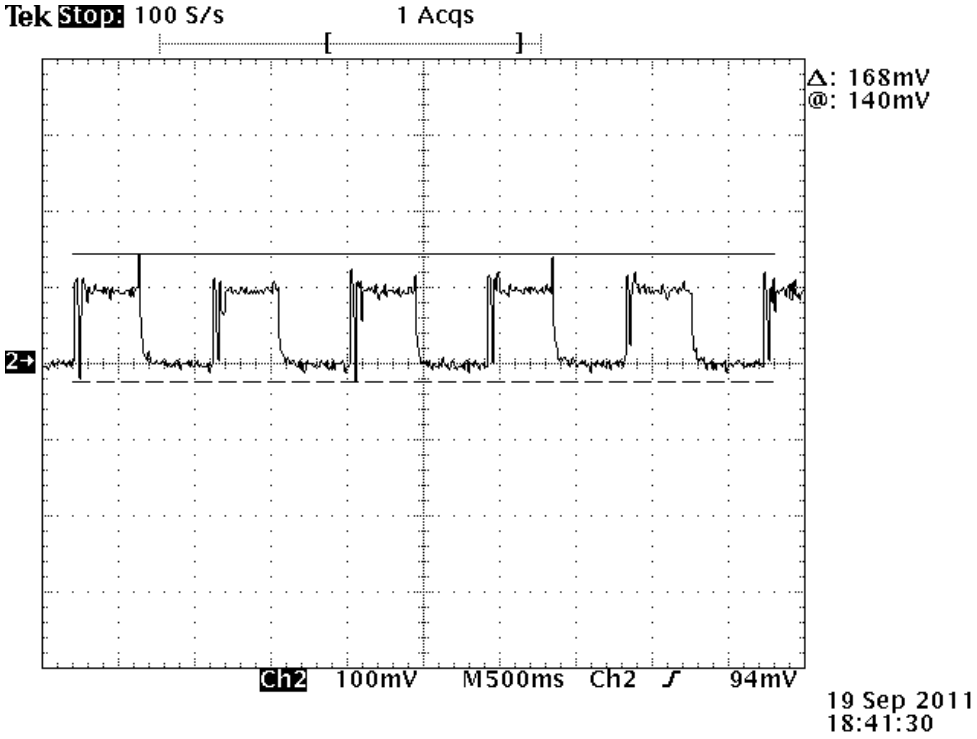
Input Voltage： S-switch OFF-ON		
Positive	29.2 Volts	Pass
Negative	-1.6 Volts	Pass

Test Mode: Mode 1

Slow pulses

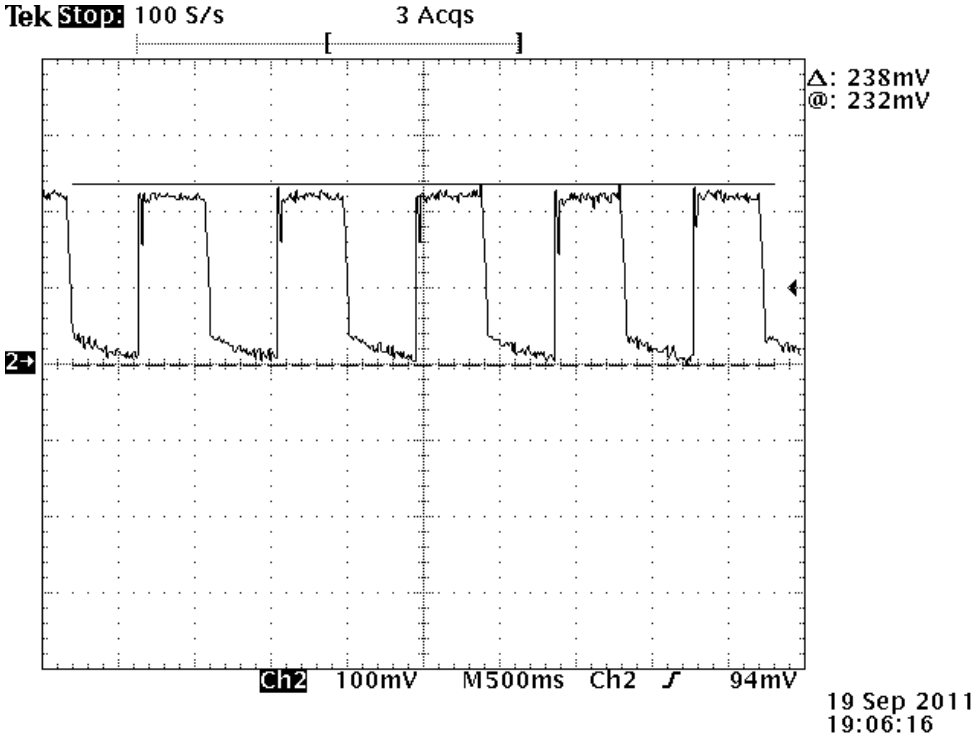


Fast pulses

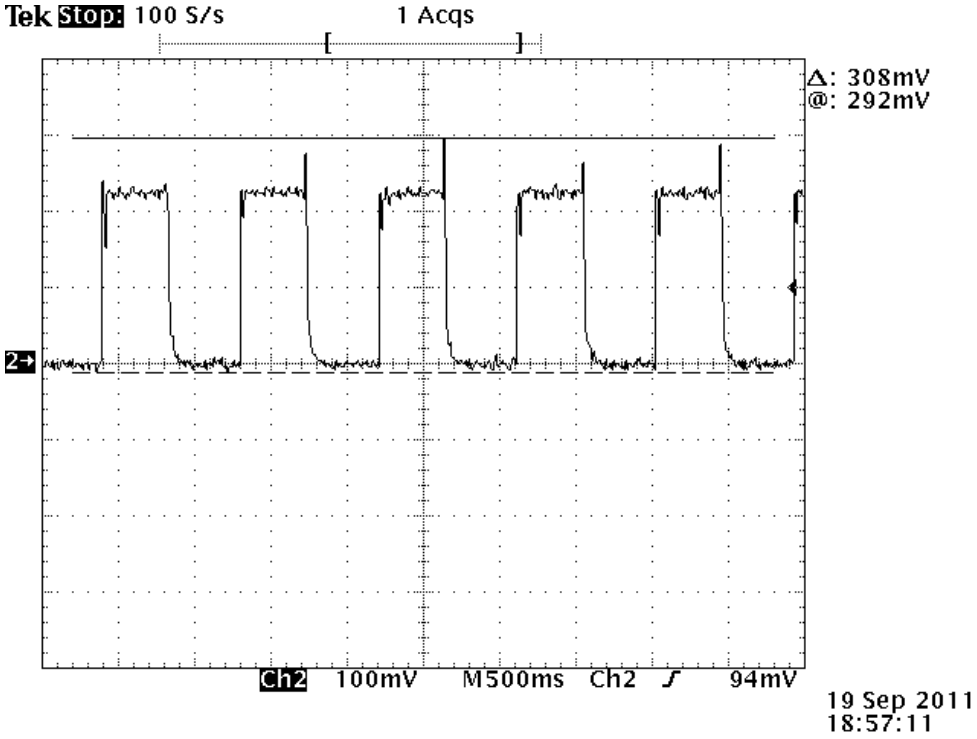


Test Mode: Mode 2

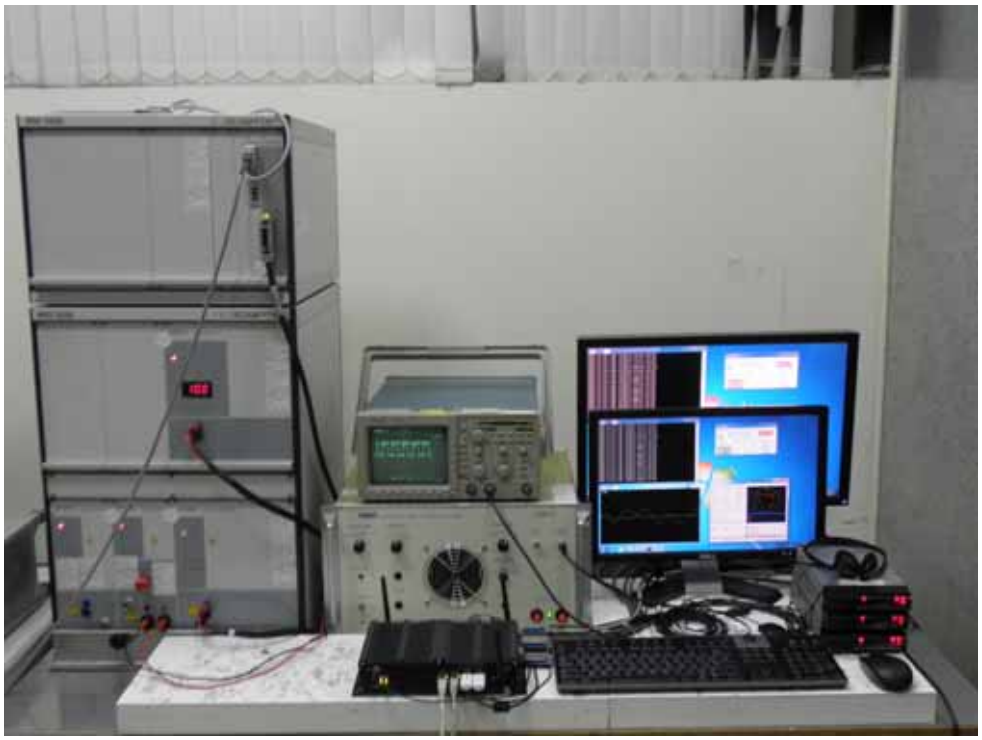
Slow pulses



Fast pulses



6.4. Photographs of Voltage Transient Emissions Test

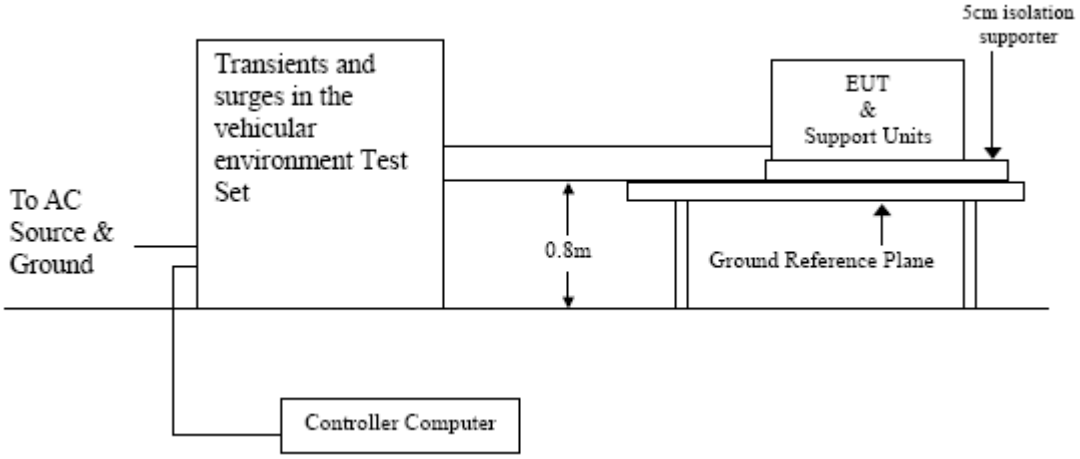


7. Transients Immunity Test

7.1. Limit

Test pulse number	Immunity test level	Functional status for systems	
		Related to immunity-related functions	Not related to immunity-related functions
1	III	C	D
2a	III	B	D
2b	III	C	D
3a/3b	III	A	D
4	III	B (for ESA which must be operational during engine start phases) C (for other ESA)	D

7.2. Test Configuration



7.3. Test Procedure

The immunity of ESA representative of its type shall be tested by the method(s) according to ISO 7637-2:2004 as described in COMMISION DIRECTIVE 2009/19/EC.

7.4. Test Results

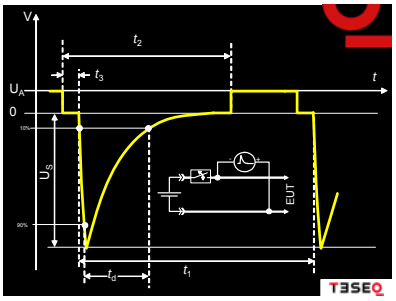
7.4.1. Test Mode : Mode 1

- Final Test Result : **PASS**
- Product Standard : ISO 7637-2:2004
- Tested voltage : DC 13.5 V
- Temperature : 25 ℃
- Relative Humidity : 46 %
- Atmospheric Pressure : 103 kPa
- Test Date : Sep. 16, 2011

Test Pulses	Test Level (V)	Test time	standard	Test Result	Observation
1	-75	5000 pulses	D	D	During the test, abnormal operation occurred to EUT, caused by interference. The EUT has to be reset to recover to normal operation.
2a	37	5000 pulses	D	A	Normal
2b	10	10 pulses	D	D	During the test, abnormal operation occurred to EUT, caused by interference. The EUT has to be reset to recover to normal operation.
3a	-112	1H	D	A	Normal
3b	75	1H	D	A	Normal
4	12	1 pulses	D	A	Normal

7.4.2.5. Test Pulse 1

Test Number 1	
Test Type	MT 5511 Pulse 1 ISO (Generic 2 and 6 ms transients)
Sequence Repetition	Count 5000
Test Status	D



Parameter	Operation	From	To	Step Size	Fail Value
Pulse Voltage (Us)	Static	-75 V	---	---	---
Pulse Period (t1)	Static	0.5 Secs	---	---	---

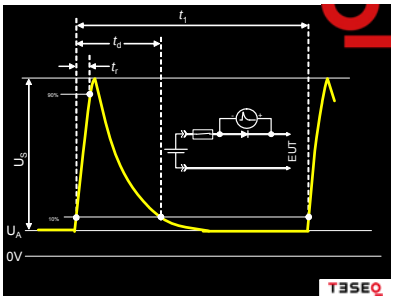
General	Value
Rise Time (tr)	1 us
Output Resistance (Ri)	10 ohms
Pulse Width (td)	2 ms
t2	200ms
Polarity/Coupling	Negative Parallel

Battery	
Battery State	UPC/Time
Voltage	13.5 V
Current Limit	25 A
End of Test Voltage	13.5 V

Comments

7.4.2.6. Test Pulses 2a

Test Number 2	
Test Type	MT 5511 Pulse 2 (Generic 50 us transients)
Sequence Repetition	Count 5000
Test Status	A



Parameter	Operation	From	To	Step Size	Fail Value
Pulse Voltage (Us)	Static	37 V	---	---	---
Pulse Period (t1)	Static	0.5 Secs	---	---	---

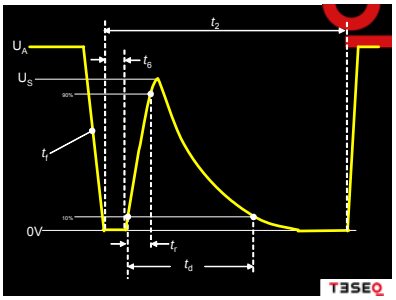
General	Value
Rise Time (tr)	1 us
Output Resistance (Ri)	2 ohms
Pulse Width (td)	50 us
t2	Not Applicable
Polarity/Coupling	Positive Serial

Battery	
Battery State	On
Voltage	13.5 V
Current Limit	25 A
End of Test Voltage	13.5 V

Comments

7.4.2.7. Test Pulses 2b

Test Number 3	
Test Type	NSG 5600 Pulse 2B (SVV)
Sequence Repetition	Count 10
Test Status	D



Voltage	
Ua	13.5 V
Us	10 V

Timing	
tf	1 mS
t6	1 mS
tr	1 mS
td	200 mS
t2	0.5 S
t1	5 S

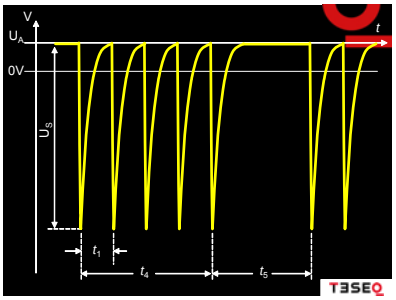
Resistance	
Resistance	0 ohms

Battery	
Current Limit	25 A
End of Test Voltage	13.5 V

Comments

7.4.2.8. Test Pulse 3a

Test Number 4	
Test Type	FT 5530 Pulse 3A/B (Burst)
Sequence Repetition	Hours 1
Test Status	A



Parameter	Operation	From	To	Step Size	Fail Value
Pulse Voltage (Us)	Static	-112 V	---	---	---
Pulse Freq (1/t1)	Static	10 kHz	---	---	---

General	Value
Rise Time (tr)	5 nS
Output Resistance (Ri)	50 ohms
Pulse Width (td)	100 ns nS
Burst Interval(t5)	0.09 Seconds
Output Mode	NORMAL

No Pulses (t4/t1)	
No of Pulses (Np)	100
Burst Duration (t4)	10 mS

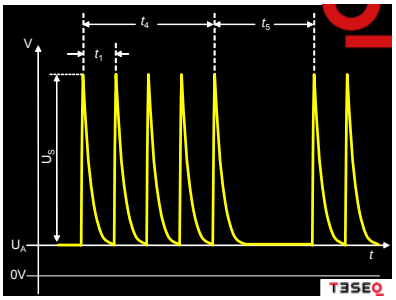
Battery	
Battery State	On
Voltage	13.5 V
Current Limit	25 A
End of Test Voltage	13.5 V

Polarity	
Polarity	Negative

Comments

7.4.2.9. Test Pulses 3b

Test Number 5	
Test Type	FT 5530 Pulse 3A/B (Burst)
Sequence Repetition	Hours 1
Test Status	A



Parameter	Operation	From	To	Step Size	Fail Value
Pulse Voltage (Us)	Static	75 V	---	---	---
Pulse Freq (1/t1)	Static	10 kHz	---	---	---

General	Value
Rise Time (tr)	5 nS
Output Resistance (Ri)	50 ohms
Pulse Width (td)	100 ns nS
Burst Interval(t5)	0.09 Seconds
Output Mode	NORMAL

No Pulses (t4/t1)	
No of Pulses (Np)	100
Burst Duration (t4)	10 mS

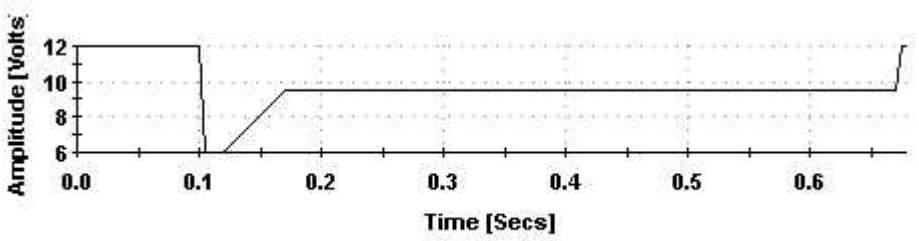
Battery	
Battery State	On
Voltage	13.5 V
Current Limit	25 A
End of Test Voltage	13.5 V

Polarity	
Polarity	Positive

Comments

7.4.2.10. Test Pulses 4

Test Number 6	
Test Type	Double Arb : Master -> NSG 5600 Pulse 4C (SVV)
Sequence Repetition	Count 1
Test Status	A



Segment Number # 1	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Static	12 Vpp	- - -
Parameter	Value		
Segment Duration	100 ms		
Segment Number # 2	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Linear	12 Vpp	6 Vpp
Parameter	Value		
Segment Duration	5 ms		
Segment Number # 3	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Static	6 Vpp	- - -
Parameter	Value		
Segment Duration	15 ms		

Segment Number # 4	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Linear	6 Vpp	9.5 Vpp
Parameter	Value		
Segment Duration	50 ms		
Segment Number # 5	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Static	9.5 Vpp	- - -
Parameter	Value		
Segment Duration	0.5 Seconds		
Segment Number # 6	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Linear	9.5 Vpp	12 Vpp
Parameter	Value		
Segment Duration	5 ms		
Segment Number # 7	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Static	12 Vpp	- - -
Parameter	Value		
Segment Duration	5 ms		
Battery:		End of Test:	
Current Limit:	25 A	Voltage:	12 V

Comments

General Conditions

Ambient Temperature : 25℃ Humidity : 46% Pressure : 103kPa

Tested by : CHUCK LU

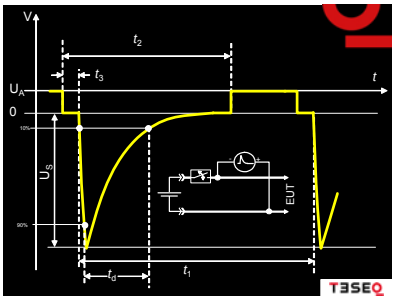
7.4.2. Test Mode : Mode 2

- Final Test Result : **PASS**
- Product Standard : ISO 7637-2:2004
- Tested voltage : DC 27 V
- Temperature : 25 ℃
- Relative Humidity : 46 %
- Atmospheric Pressure : 103 kPa
- Test Date : Sep. 16, 2011

Test Pulses	Test Level (V)	Test time	standard	Test Result	Observation
1	450	5000 pulses	D	D	During the test, abnormal operation occurred to EUT, caused by interference. The EUT has to be reset to recover to normal operation.
2a	50	5000 pulses	D	A	Normal
2b	20	10 pulses	D	D	During the test, abnormal operation occurred to EUT, caused by interference. The EUT has to be reset to recover to normal operation.
3a	150	1H	D	A	Normal
3b	150	1H	D	A	Normal
4	24	1 pulses	D	A	Normal

7.4.2.1. Test Pulse 1

Test Number 1	
Test Type	MT 5511 Pulse 1 ISO (Generic 2 and 6 ms transients)
Sequence Repetition	Count 5000
Test Status	D



Parameter	Operation	From	To	Step Size	Fail Value
Pulse Voltage (Us)	Static	-450 V	---	---	---
Pulse Period (t1)	Static	0.5 Secs	---	---	---

General	Value
Rise Time (tr)	3 us
Output Resistance (Ri)	50 ohms
Pulse Width (td)	1 ms
t2	200ms
Polarity/Coupling	Negative Parallel

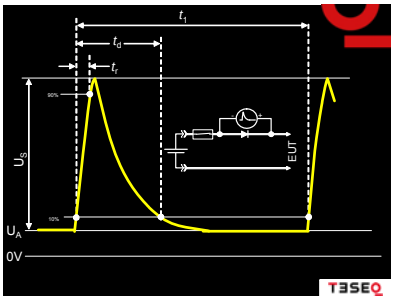
Battery	
Battery State	UPC/Time
Voltage	27 V
Current Limit	25 A
End of Test Voltage	27 V

Ext.Resistance (Ri)	
External Resistance	Inactive

Comments

7.4.2.2. Test Pulses 2a

Test Number 2	
Test Type	MT 5511 Pulse 2 (Generic 50 us transients)
Sequence Repetition	Count 5000
Test Status	A



Parameter	Operation	From	To	Step Size	Fail Value
Pulse Voltage (Us)	Static	50 V	---	---	---
Pulse Period (t1)	Static	0.5 Secs	---	---	---

General	Value
Rise Time (tr)	1 us
Output Resistance (Ri)	2 ohms
Pulse Width (td)	50 us
t2	Not Applicable
Polarity/Coupling	Positive Serial

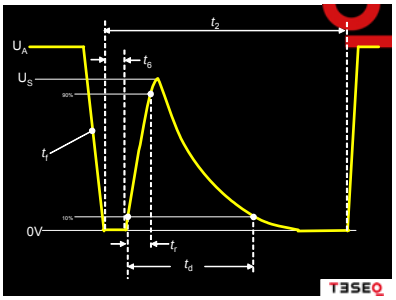
Battery	
Battery State	On
Voltage	27 V
Current Limit	25 A
End of Test Voltage	27 V

Ext.Resistance (Ri)	
External Resistance	Inactive

Comments

7.4.2.3. Test Pulses 2b

Test Number 3	
Test Type	NSG 5600 Pulse 2B (SVV)
Sequence Repetition	Count 10
Test Status	D



Voltage	
Ua	27 V
Us	20 V

Timing	
tf	1 mS
t6	1 mS
tr	1 mS
td	200 mS
t2	0.5 S
t1	5 S

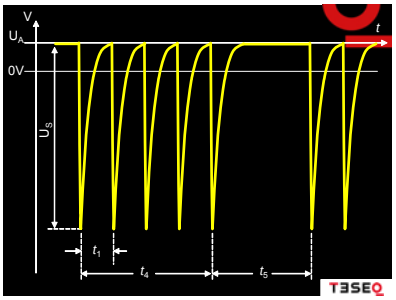
Resistance	
Resistance	0 ohms

Battery	
Current Limit	25 A
End of Test Voltage	27 V

Comments

7.4.2.4. Test Pulse 3a

Test Number 4	
Test Type	FT 5530 Pulse 3A/B (Burst)
Sequence Repetition	Hours 1
Test Status	A



Parameter	Operation	From	To	Step Size	Fail Value
Pulse Voltage (Us)	Static	-150 V	---	---	---
Pulse Freq (1/t1)	Static	10 kHz	---	---	---

General	Value
Rise Time (tr)	5 nS
Output Resistance (Ri)	50 ohms
Pulse Width (td)	100 ns nS
Burst Interval(t5)	0.09 Seconds
Output Mode	NORMAL

No Pulses (t4/t1)	
No of Pulses (Np)	100
Burst Duration (t4)	10 mS

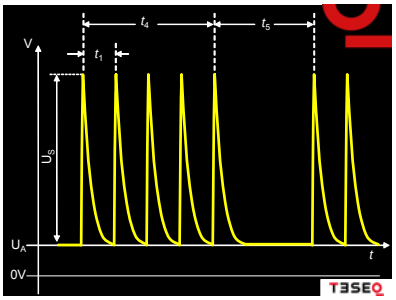
Battery	
Battery State	On
Voltage	27 V
Current Limit	25 A
End of Test Voltage	27 V

Polarity	
Polarity	Negative

Comments

7.4.2.5. Test Pulses 3b

Test Number 5	
Test Type	FT 5530 Pulse 3A/B (Burst)
Sequence Repetition	Hours 1
Test Status	A



Parameter	Operation	From	To	Step Size	Fail Value
Pulse Voltage (Us)	Static	150 V	---	---	---
Pulse Freq (1/t1)	Static	10 kHz	---	---	---

General	Value
Rise Time (tr)	5 nS
Output Resistance (Ri)	50 ohms
Pulse Width (td)	100 ns nS
Burst Interval(t5)	0.09 Seconds
Output Mode	NORMAL

No Pulses (t4/t1)	
No of Pulses (Np)	100
Burst Duration (t4)	10 mS

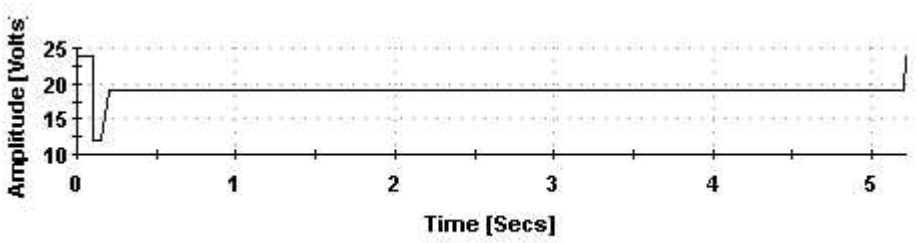
Battery	
Battery State	On
Voltage	27 V
Current Limit	25 A
End of Test Voltage	27 V

Polarity	
Polarity	Positive

Comments

7.4.2.6. Test Pulses 4

Test Number 6	
Test Type	Double Arb : Master -> NSG 5600 Pulse 4C (SVV)
Sequence Repetition	Count 1
Test Status	A



Segment Number # 1	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Static	24 Vpp	- - -
Parameter	Value		
Segment Duration	100 ms		
Segment Number # 2	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Linear	24 Vpp	12 Vpp
Parameter	Value		
Segment Duration	5 ms		
Segment Number # 3	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Static	12 Vpp	- - -
Parameter	Value		
Segment Duration	50 ms		

Segment Number # 4	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Linear	12 Vpp	19 Vpp
Parameter	Value		
Segment Duration	50 ms		
Segment Number # 5	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Static	19 Vpp	- - -
Parameter	Value		
Segment Duration	5 Seconds		
Segment Number # 6	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Linear	19 Vpp	24 Vpp
Parameter	Value		
Segment Duration	10 ms		
Segment Number # 7	RAMP		
Parameter	Mode	Initial Value	Final Value
Amplitude	Static	24 Vpp	- - -
Parameter	Value		
Segment Duration	10 ms		
Battery:		End of Test:	
Current Limit:	25 A	Voltage:	24 V

Comments

General Conditions

Ambient Temperature : 25℃ Humidity : 46% Pressure : 103kPa

Tested by : CHUCK LU

7.5. Photographs of Transients Immunity Test

FRONT VIEW

8. List of Measuring Equipment Used

< RADIATED EMISSION>

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH04-HY	30 MHz - 1 GHz 3m	Oct. 22, 2010	Radiation (03CH04-HY)
Amplifier	Agilent	8447D	2944A09073	0.1 MHz – 1.3 GHz	Nov. 07, 2010	Radiation (03CH04-HY)
Spectrum Analyzer	R&S	FSP 40	100004	9 kHz - 40 GHz	Oct. 06, 2010	Radiation (03CH04-HY)
Bilog Antenna	SCHAFFNER	CBL6112C	2724C	30 MHz - 1 GHz	Oct. 16, 2010	Radiation (03CH04-HY)
Turn Table	Chaintek	3000	*	0 - 360 degree	N/A	Radiation (03CH04-HY)
Antenna Mast	Chaintek	*	*	1 m - 4 m	N/A	Radiation (03CH04-HY)
RF Cable-R03m	Suhner Switzerland + RFIDEN	RG223/U +RG8/U	CB024	30 MHz - 1 GHz	Sep. 02, 2011	Radiation (03CH04-HY)
DC LISN	MESSTEC	AN20200	03/10219	100kHz – 108MHz	Oct. 19, 2010	Radiation (03CH04-HY)
DC LISN	MESSTEC	AN20200	03/10220	100kHz – 108MHz	Oct. 19, 2010	Radiation (03CH04-HY)

※ Calibration Interval of instruments listed above is one year.

< TRANSIENTS IMMUNITY>

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date
Impedance Module	SCHAFFNER	RM5505-750-057r01	41	Dec. 11, 2010
Power Amplifier 60V-75/25A	SCHAFFNER	PA5481-75	581-0023	Dec. 14, 2010
Function Generator	SCHAFFNER	FG5620-750-0051-00	84	Dec. 14, 2010
Micro Transient Generator	SCHAFFNER	MT5511-750-0062	45	Dec. 09, 2010
Burst Generator	SCHAFFNER	FT5530-750-003R01	138	Dec. 11, 2010
Load Dump Generator	SCHAFFNER	LD5505-750-0045r01	93	Dec. 11, 2010
LISN	TESEO	LISN2-S	D940	Feb. 02, 2010
OSCILLOSCOPE	Tektronix	TDS380	B016197	Jun. 28, 2010

※ Calibration Interval of instruments listed above is two year.

APPENDIX A. Photographs of EUT

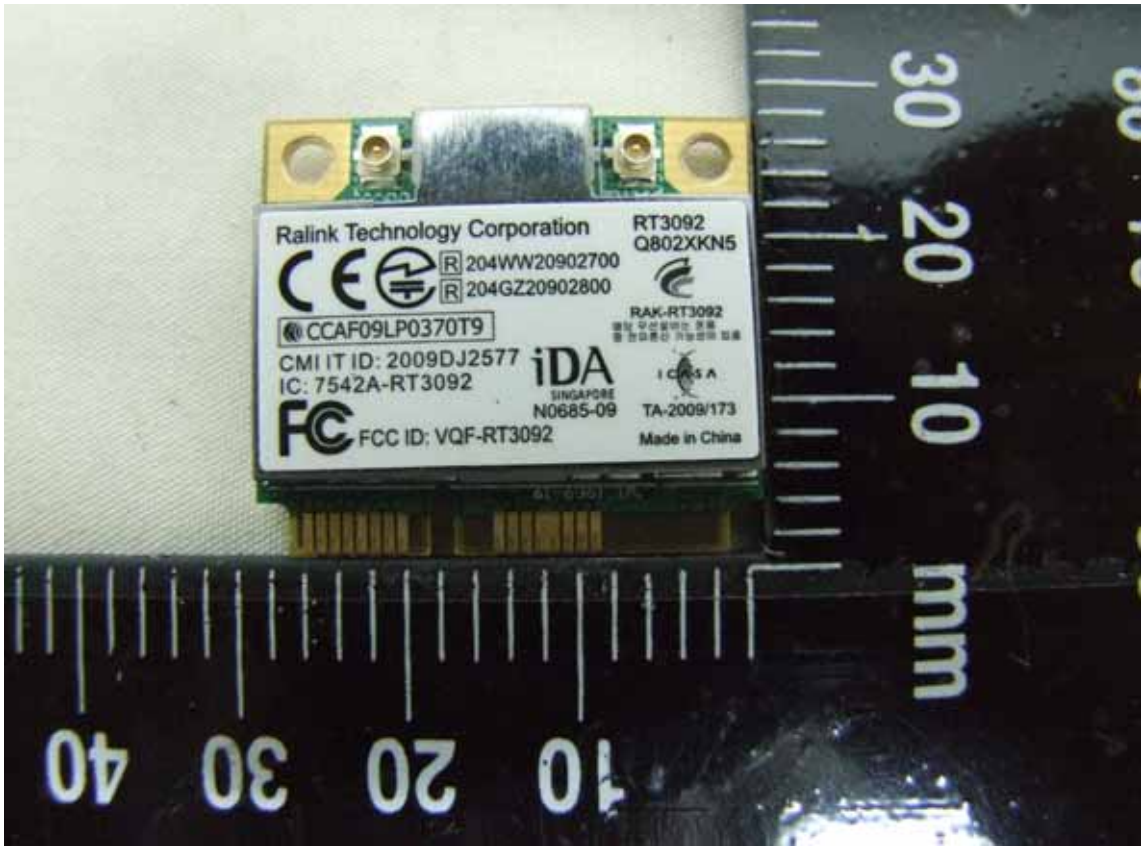

LAN1
LAN2
USB
USB
SIM CARD
HDD UPS
POWER
ACC WWAN


COM2
COM3
VGA / VIDEO INPUT
LINE OUT
COM1
DVI-I
12V DO1 DI1 DI3
GND DO2 DI2 DI4
DC 9V ~ 32V INPUT
IGN
FUSE


pqi
MFCBR402SA0103 DDR3-1066S 2GB
Warranty Void If Removed
Made In Taiwan
4 710765 061012
pqi
MFKCR402SA0101 DDR3-1333S 2GB
Warranty Void If Removed
Made In Taiwan
4 710765 061043


Q802XKN5
TQTB03301081
00 0D F0 87 85 E0


Q802XKN5
TQTB03301081
00 0D F0 87 85 E0
30
20
10
mm
10
20
30
40


Ralink Technology Corporation
RT3092
Q802XKN5
204WW20902700
204GZ20902800
RAK-RT3092
CCAF09LP0370T9
CMI IT ID: 2009DJ2577
IC: 7542A-RT3092
iDA
SINGAPORE
N0685-09
TA-2009/173
FCC ID: VQF-RT3092
Made in China
30
20
10
mm
10
20
30
40


MAIN
T77Z204.10 HF
REV: 04L4
MEID A1000004BC4B95
IMEI 357485040005052
Made in China
1101145
AUX
F13800RH
T77Z204T10 HF
41014701-04L4
QC PN: 20-VM173-P3


SIERRA WIRELESS
MC8355
FCC ID: N7NMC8355
IC: 2417C-MC8355
CCA1103G0180T0
CE 0168
ARG CNC: 17-8867
QUALCOMM® 3G
Product of China
N24480


Intel
WWN: 5001517ED8EFCB8
Model: SSDSA2M040G2GC 2.5"
3Gb/s SATA SSD 40G 5V 1A
Disclaimer: WARRANTY VOID IF ANY LABEL/
SCREW IS REMOVED OR BROKEN
D33025
N232
intel