

Test report No. 06/0012-00

Manufacturer : GETRONIC S.r.l.,
I-21026 Gavirate (VA)

Type : GT904



Page 1

TEST REPORT

No. 06/0012-00

issued by

FAKT S.r.l.

Via Lithos, 53 I-25086 Rezzato (BS)

(Tests according to relevant request of VW 801 01 dated June 2005
and "Konzern-Lastenheft CAN" KOM_Last_V14.PDF)

1. General information's

- | | |
|--|---|
| 1.0. <u>Equipment under test:</u> | Vehicle Alarm System with radio siren |
| 1.1. <u>Trade mark:</u> | GT ALARM |
| 1.2. <u>Type:</u> | GT904 |
| 1.2.1. Versions: | one: GT904 |
| 1.3. <u>Identification:</u> | GT904 |
| 1.3.1. Series number: | -- |
| 1.4. <u>Manufacturer's name and address:</u> | GETRONIC S.r.l.
Via Calcinante, 12
21026 Gavirate (VA)
Italy |
| 1.5. <u>Date of receipt of the test object:</u> | sample 3 - 4 : 21.03.2006 |
| 1.6. <u>Customer represented during the test by the following person(s):</u> | none |
| 1.7. <u>Remarks:</u> | - |

2. Test sequence:

The customer Getronic S.r.l. has requested the following test:

- Short distance interference suppression acc. to VW TL 965:
- Conducted interference acc. to VW TL 82066:
- Radiated interference acc. to VW TL 82166:
- Coupled interference on sensor cables acc. to VW TL 82366:
- Immunity against electrostatic discharge acc. to VW TL 82466

The tests were carried out on 23.03.2006 – 24.03.2006 with the following test sample :

Type:	GT904
Version:	GT904
Sample:	3 and 4
Manufacturer:	GETRONIC S.r.l. I - 21026 Gavirate (VA)

2.1 Short distance interference suppression acc. to VW TL 965:

2.1.1	Method of measurement:	Test carried out according to the method described in the norm VW TL 965
2.1.2	Performance criteria:	see specification requirements mentioned in.
2.1.3	Test results:	Limits kept: see attached test results in enclosure 1 (7 pages)
2.1.4	Date of test:	23.03.2006 – 24.03.2006
2.1.5	Place of test:	Senton GmbH - Germany

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Type : GT904

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- 2.1.6 Remarks: Sample tested in normal working condition
- 2.1.7 Test sample: 4
- 2.2 Conducted Interference acc. to VW TL 82066:
- 2.2.1 Method of measurement: Test carried out according to the method described in the norm VW TL 82066
- 2.2.2 Performance criteria: The criteria's as indicated in the relative test sheet have been applied. During the exposure, with system in normal working condition, the continuous monitoring of the CAN communication lines have been performed; the unit must work correctly after the test.
- 2.2.3 Test results: No false signal; no uncontrolled behaviour on CAN communication lines, function conform to the applicable criteria during each test pulse exposure; after the test the unit work as designed; the test results are attached in enclosure 2 (7 pages)
- 2.2.4 Date of test: 23.03.2006
- 2.2.5 Place of test: Senton GmbH - Germany
- 2.2.6 Remarks: Sample tested in normal working condition
- 2.2.7 Test sample: 3

2.3 Radiated Interference acc. to VW TL 82166:

2.3.1 Method of measurement: Test carried out according to the method described in the norm VW TL 82166

2.3.2 Performance criteria: Applicable criteria C for the system in armed state at maximum field strength required, A criteria for the system in normal working condition and with reduced field strength in arming condition, constant monitor of the CAN communication lines during the exposure with system in both possible working condition, the unit must work correctly after the test.

2.3.3 Test results: No false signal; no uncontrolled behaviour on CAN communication lines, function conform to the applicable criteria during each test status of the system; after the test the unit work as designed; the test results are attached in enclosure 3 (5 pages)

2.3.4 Date of test: 23.03.2006

2.3.5 Place of test: Senton GmbH - Germany

2.3.6 Remarks: -

2.3.7 Test sample: 4

2.4 Coupled interference on sensor cables acc. to VW TL 82366:

2.4.1 Method of measurement: Test carried out according to the method described in the norm VW TL 82366

2.4.2 Performance criteria: Applicable criteria A for the system in normal working condition, constant monitor of the CAN communication lines during the exposure, the unit must work correctly after the test.

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Type : GT904

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2.4.3 Test results: No false signal; no uncontrolled behaviour on CAN communication lines, function conform to the applicable criteria during the test of the system; after the test the unit work as designed; the test results are attached in enclosure 4 (6 pages)

2.4.4 Date of test: 24.03.2006

2.4.5 Place of test: Senton GmbH - Germany

2.4.6 Remarks: --

2.4.7 Test sample: 3

2.5 Immunity against electrostatic discharge acc. to VW TL 82466:

2.5.1 Method of measurement: Test carried out according to the method described in the norm VW TL 82466

2.5.2 Performance criteria: Applicable criteria B for the system in storage condition and with the system in normal working condition, the unit must works correctly after the test.

2.5.3 Test results: No false signal; no uncontrolled behaviour, function conform to the applicable criteria during the test of the system; after the test the unit work as designed; the test results are attached in enclosure 5 (3 pages)

2.5.4 Date of test: 24.03.2006

2.5.5 Place of test: Senton GmbH - Germany

2.5.6 Remarks: --

2.5.7 Test sample: 3

3. **Summary:**

After the tests all the tested systems work correctly as designed; the CAN communication lines haven't exhibit any malfunction during the exposure to the interferences.

4. **Enclosures:**

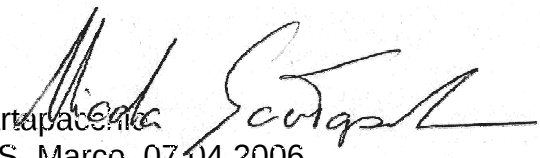
1 – 5 Test protocol (28 pages)

The test results indicated in this test report refer exclusively to the equipment under test. It is not permitted to transfer the results to other systems or configurations.

The publication or duplication of this test report with enclosures, or Part of this test report with enclosures, without a written consent of the test laboratory is not permitted.

This report includes 6 pages and the enclosures from 1 to 5

The Responsible for the tests

A handwritten signature in black ink, appearing to read "N. Scartapace".

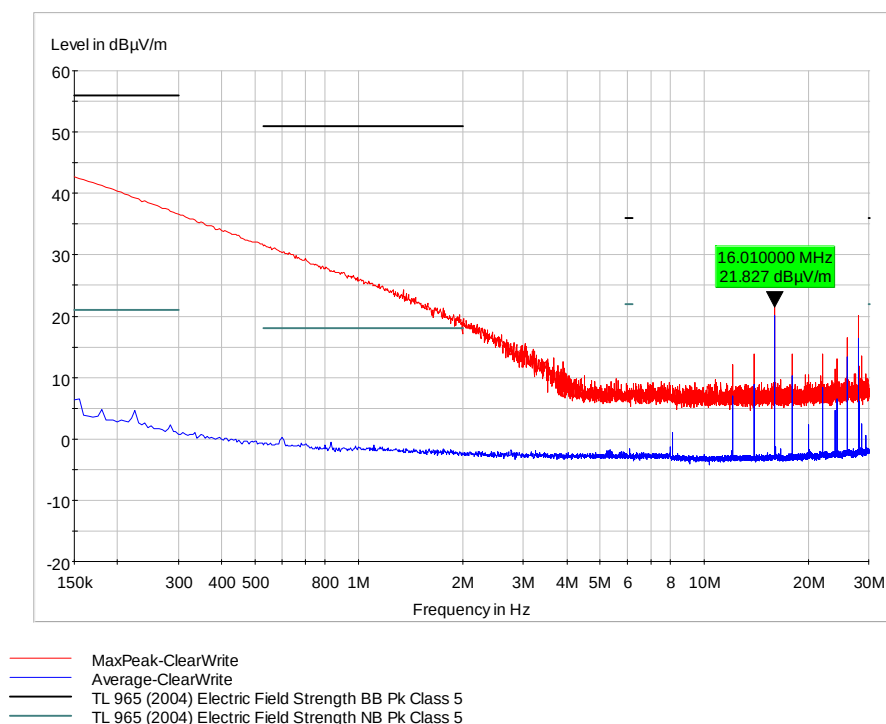
N. Scartapace
Ponte S. Marco, 07.04.2006
ah/ns

Measurement of radiated emission 150 KHz - 30 MHz acc. to VW TL 965 (following CISPR 25)

EUT: GT 904
 applicant: Getronic S.r.l.
 test location: anechoic chamber no. 6, Senton GmbH
 tester: R. Markl
 test date: 23.03.06
 antenna polarisation: measurement distance 1 meter, Rod antenna
 specification, operation mode: +15 on, CAN communication working
 result: limits kept

subrange	detector	bandwidth	stepwidth	measurement time	transducer
150 kHz - 30 MHz	MaxPeak Average	9 kHz	5 kHz	0,02 s	HFH2-Z6
30 MHz - 1 GHz	MaxPeak Average	120 kHz	60 kHz	0,02 s	VULB 9163 (1m)
1 GHz - 1,7 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3161
1,7 GHz - 2,5 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3160

SCANTABELLE: „CISPR 25 VULB 9163“

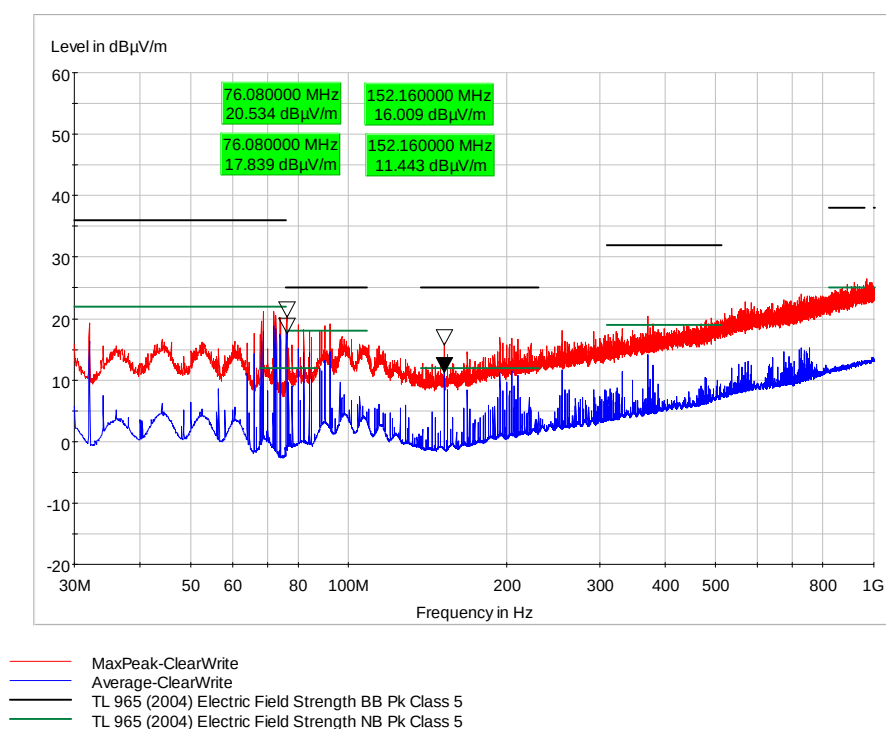


Measurement of radiated emission 30 MHz - 1000 MHz acc. to VW TL 965 (following CISPR 25)

EUT: GT 904
 applicant: Getronic S.r.l.
 test location: anechoic chamber no. 6, Senton GmbH
 tester: R. Markl
 test date: 24.03.06
 antenna polarisation: measurement distance 1 meter, horizontal
 specification, operation mode: +15 on, CAN communication working
 result: limits kept

subrange	detector	bandwidth	stepwidth	measurement time	transducer
150 kHz - 30 MHz	MaxPeak Average	9 kHz	5 kHz	0,02 s	HFH2-Z6
30 MHz - 1 GHz	MaxPeak Average	120 kHz	60 kHz	0,02 s	VULB 9163 (1m)
1 GHz - 1,7 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3161
1,7 GHz - 2,5 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3160

SCANTABELLE: „CISPR 25 VULB 9163“

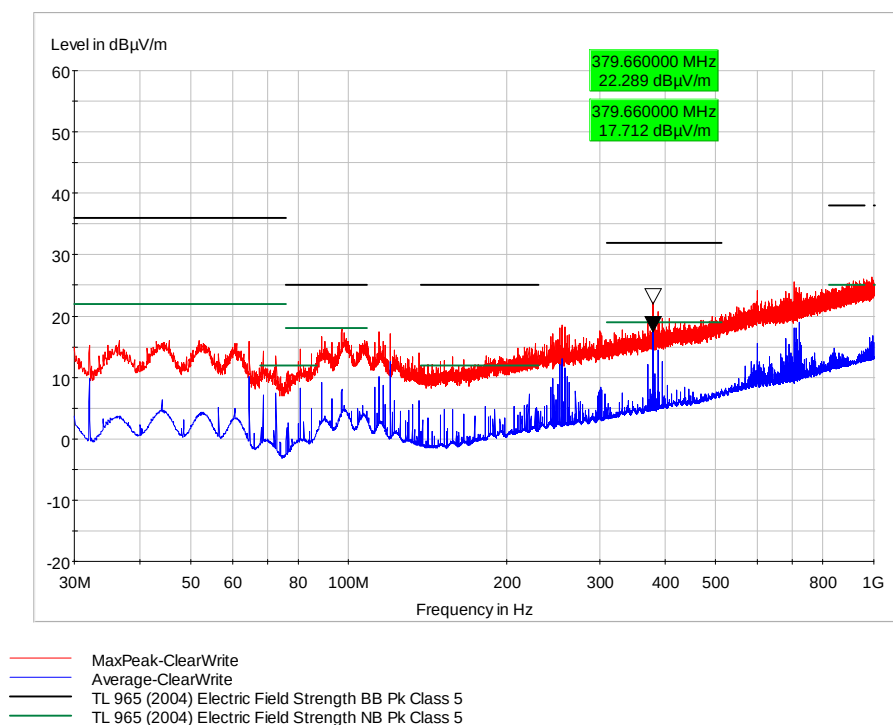


Measurement of radiated emission 30 MHz - 1000 MHz acc. to VW TL 965 (following CISPR 25)

EUT: GT 904
 applicant: Getronic S.r.l.
 test location: anechoic chamber no. 6, Senton GmbH
 tester: R. Markl
 test date: 24.03.06
 antenna polarisation: measurement distance 1 meter, vertical
 specification, operation mode: +15 on, CAN communication working
 result: limits kept

subrange	detector	bandwidth	stepwidth	measurement time	transducer
150 kHz - 30 MHz	MaxPeak Average	9 kHz	5 kHz	0,02 s	HFH2-Z6
30 MHz - 1 GHz	MaxPeak Average	120 kHz	60 kHz	0,02 s	VULB 9163 (1m)
1 GHz - 1,7 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3161
1,7 GHz - 2,5 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3160

SCANTABELLE: „CISPR 25 VULB 9163“

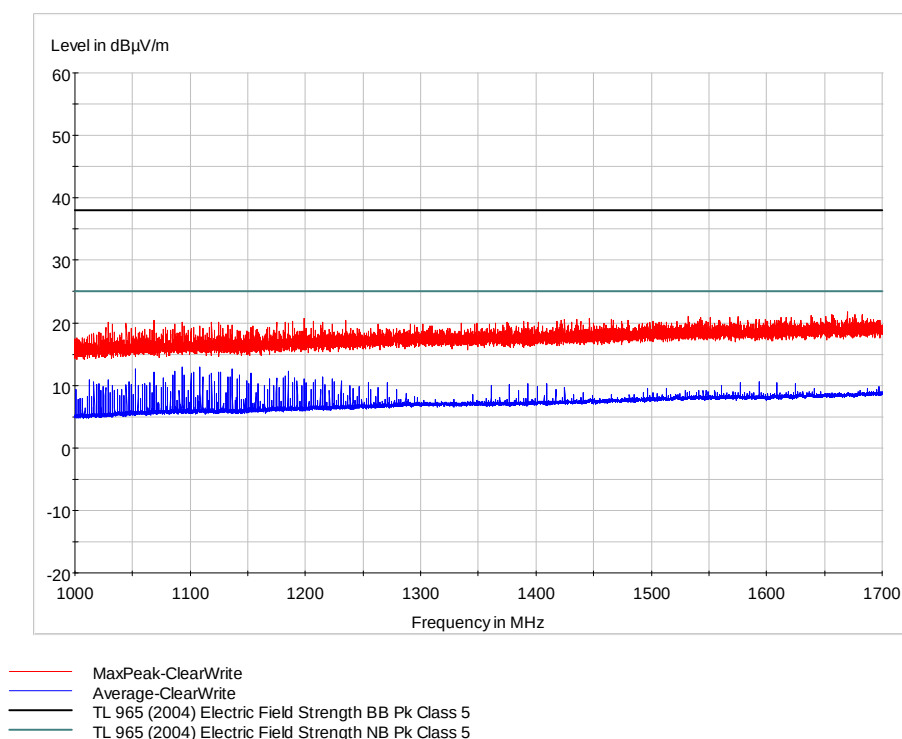


Measurement of radiated emission 1000 MHz - 1700 MHz acc. to VW TL 965 (following CISPR 25)

EUT: GT 904
 applicant: Getronic S.r.l.
 test location: anechoic chamber no. 6, Senton GmbH
 tester: R. Markl
 test date: 23.03.06
 antenna polarisation: measurement distance 1 meter, horizontal
 specification, operation mode: +15 on, CAN communication working
 result: limits kept

subrange	detector	bandwidth	stepwidth	measurement time	transducer
150 kHz - 30 MHz	MaxPeak Average	9 kHz	5 kHz	0,02 s	HFH2-Z6
30 MHz - 1 GHz	MaxPeak Average	120 kHz	60 kHz	0,02 s	VULB 9163 (1m)
1 GHz - 1,7 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3161
1,7 GHz - 2,5 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3160

SCANTABELLE: „CISPR 25 VULB 9163“

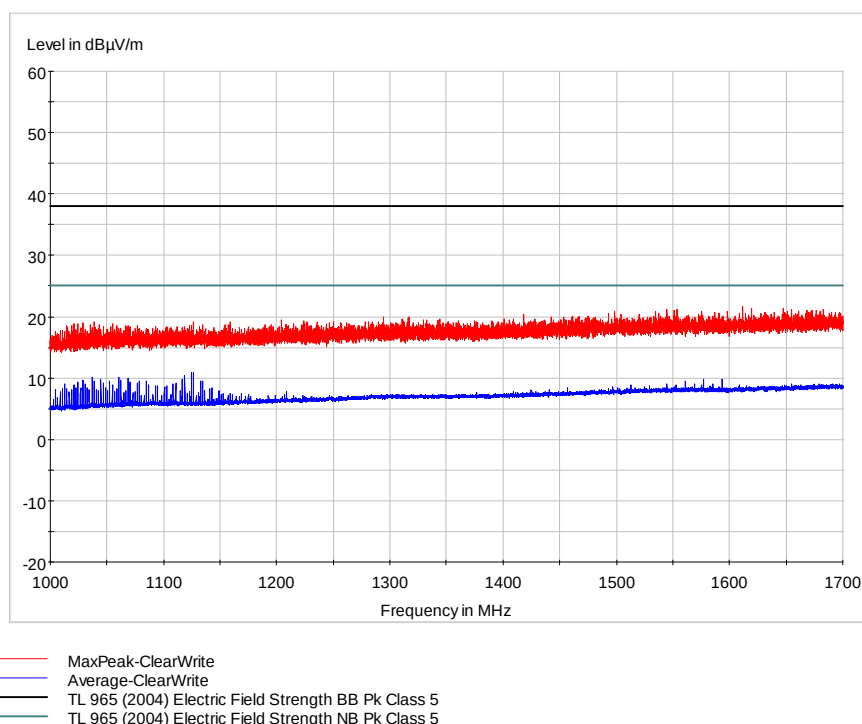


Measurement of radiated emission 1000 MHz - 1700 MHz acc. to VW TL 965 (following CISPR 25)

EUT: GT 904
 applicant: Getronic S.r.l.
 test location: anechoic chamber no. 6, Senton GmbH
 tester: R. Markl
 test date: 23.03.06
 antenna polarisation: measurement distance 1 meter, vertical
 specification, operation mode: +15 on, CAN communication working
 result: limits kept

subrange	detector	bandwidth	stepwidth	measurement time	transducer
150 kHz - 30 MHz	MaxPeak Average	9 kHz	5 kHz	0,02 s	HFH2-Z6
30 MHz - 1 GHz	MaxPeak Average	120 kHz	60 kHz	0,02 s	VULB 9163 (1m)
1 GHz - 1,7 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3161
1,7 GHz - 2,5 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3160

SCANTABELLE: „CISPR 25 VULB 9163“

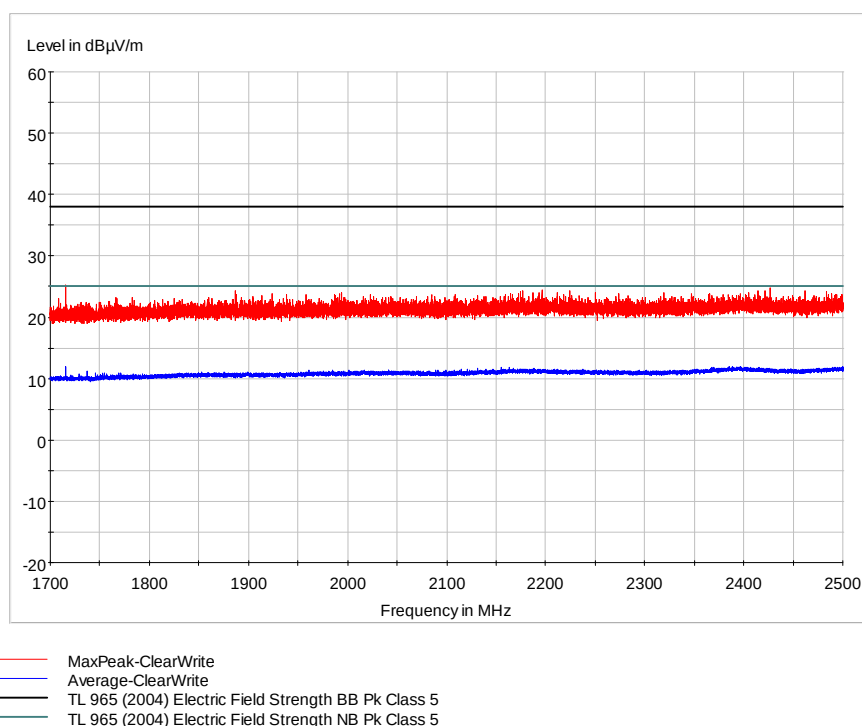


Measurement of radiated emission 1700 MHz - 2500 MHz acc. to VW TL 965 (following CISPR 25)

EUT: GT 904
applicant: Getronic S.r.l.
test location: anechoic chamber no. 6, Senton GmbH
tester: R. Markl
test date: 23.03.06
antenna polarisation: measurement distance 1 meter, horizontal
specification, operation mode: +15 on, CAN communication working
result: limits kept

subrange	detector	bandwidth	stepwidth	measurement time	transducer
150 kHz - 30 MHz	MaxPeak Average	9 kHz	5 kHz	0,02 s	HFH2-Z6
30 MHz - 1 GHz	MaxPeak Average	120 kHz	60 kHz	0,02 s	VULB 9163 (1m)
1 GHz - 1,7 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3161
1,7 GHz - 2,5 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3160

SCANTABELLE: „CISPR 25 VULB 9163“

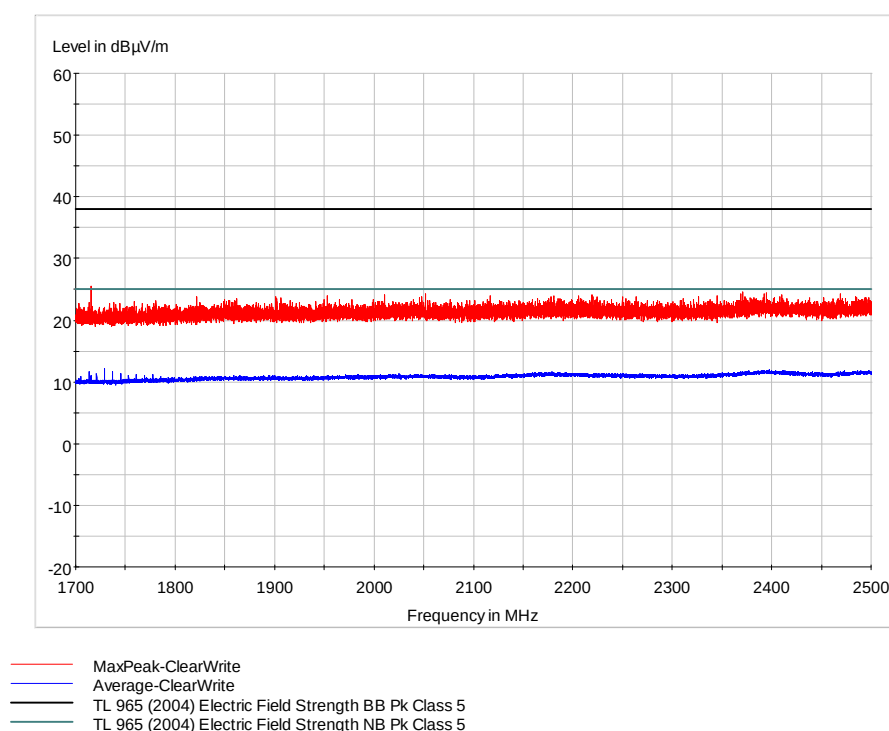


Measurement of radiated emission 1700 MHz - 2500 MHz acc. to VW TL 965 (following CISPR 25)

EUT: GT 904
 applicant: Getronic S.r.l.
 test location: anechoic chamber no. 6, Senton GmbH
 tester: R. Markl
 test date: 23.03.06
 antenna polarisation: measurement distance 1 meter, vertical
 specification, operation mode: +15 on, CAN communication working
 result: limits kept

subrange	detector	bandwidth	stepwidth	measurement time	transducer
150 kHz - 30 MHz	MaxPeak Average	9 kHz	5 kHz	0,02 s	HFH2-Z6
30 MHz - 1 GHz	MaxPeak Average	120 kHz	60 kHz	0,02 s	VULB 9163 (1m)
1 GHz - 1,7 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3161
1,7 GHz - 2,5 GHz	MaxPeak Average	120 kHz	60 kHz	0,01 s	EMCO 3160

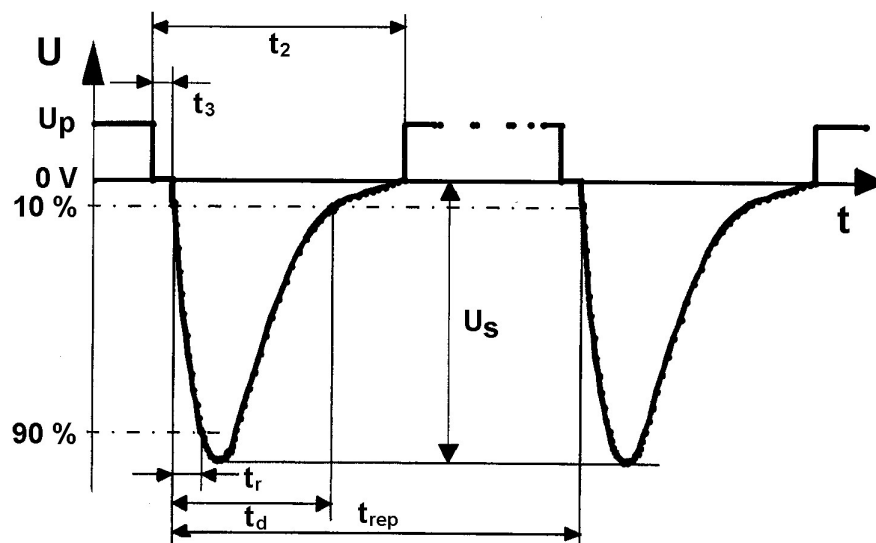
SCANTABELLE: „CISPR 25 VULB 9163“



Test report

Immunity to conducted disturbances - Pulse 1

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation	+15 on	
Environmental conditions:	Bar. pressure:	975 hPa
	Ambient temperature:	20 °C
	Relative humidity:	40 %
Regulation(s):	VW TL82066	
Coupling mode:	Coupling onto DC supply lines	

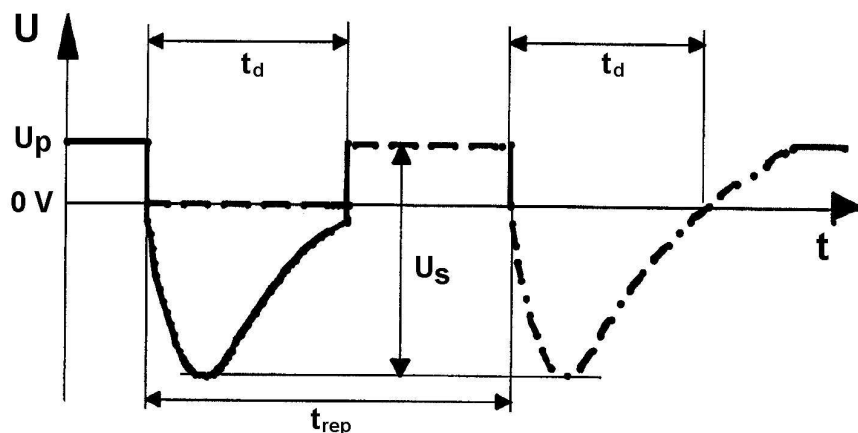
Specifications for Pulse 1:

Pulse voltage U_s :	-100 V	t_r :	1 μ s
Impedance R_i :	4 Ohm	t_d :	2 ms
Pulse count:	5000	t_{rep} :	2 s
		t_2 :	200 ms
Supply voltage U_p :	13.5 V	t_3 :	< 100 μ s

Performance criteria:	Criterion C according to VW TL82066
Test result:	Short reset detected
Classification:	Test passed
Date of test:	23.03.2006
Tested by:	Reinhold Markl

Test report Immunity to conducted disturbances - Pulse 1b

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation	+15 on	
Environmental conditions:	Bar. pressure:	975 hPa
	Ambient temperature:	22 °C
	Relative humidity:	35 %
Regulation(s):	VW TL82066	
Coupling mode:	Coupling onto DC supply lines	

Specifications for Pulse 1b:

Pulse voltage U_s :	0 to -50 V	t_r :	1 μ s
Impedance R_i :	4 Ohm	t_d :	50 μ s
Test duration:	1 minute	t_{rep} :	0.2 s

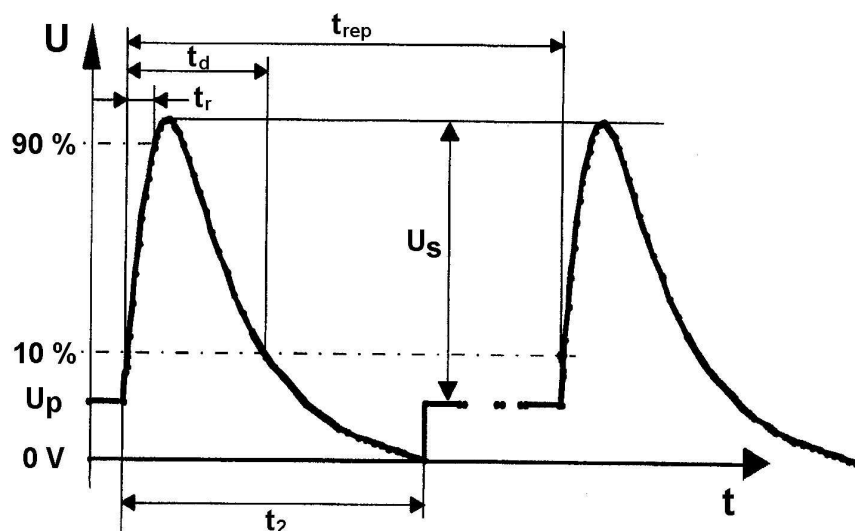
Supply voltage U_p : 13.5 V

Performance criteria:	Criterion A according to VW TL82066
Test result:	No influence detected
Classification:	Test passed
Date of test:	23.03.2006
Tested by:	Reinhold Markl

Test report

Immunity to conducted disturbances - Pulse 2

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation	+15 on	
Environmental conditions:	Bar. pressure:	975 hPa
	Ambient temperature:	20 °C
	Relative humidity:	40 %
Regulation(s):	VW TL82066	
Coupling mode:	Coupling onto DC supply lines	

Specifications for Pulse 2:

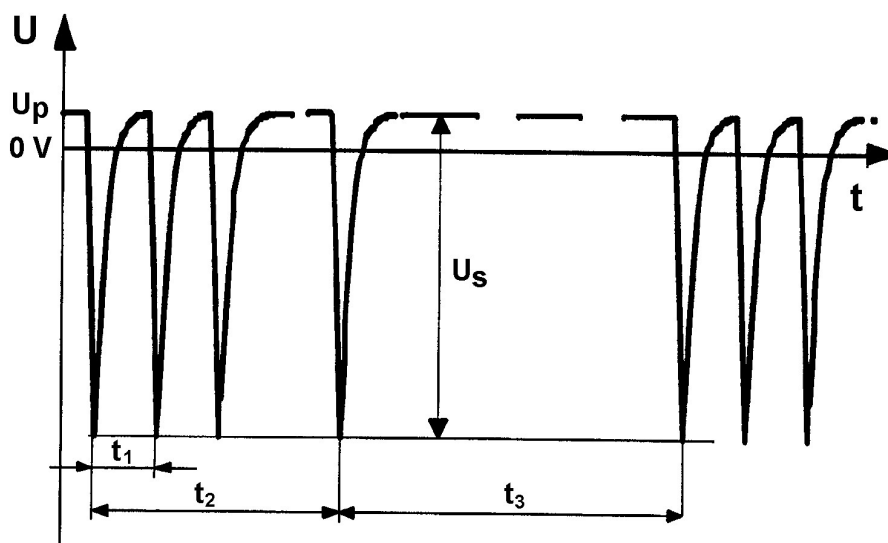
Pulse voltage U_s :	+50 V	t_r :	1 μ s
Impedance R_i :	4 Ohm	t_d :	50 μ s
Pulse count:	5000	t_{rep} :	0.2 s
		t_2 :	200 ms
Supply voltage U_p :	13.5 V		

Performance criteria:	Criterion C according to VW TL82066
Test result:	No influence detected
Classification:	Test passed
Date of test:	23.03.2006
Tested by:	Reinhold Markl

Test report

Immunity to conducted disturbances - Pulse 3a

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation	+15 on	
Environmental conditions:	Bar. pressure:	975 hPa
	Ambient temperature:	20 °C
	Relative humidity:	40 %
Regulation(s):	VW TL82066	
Coupling mode:	Coupling onto DC supply lines	

Specifications for Pulse 3a:

Pulse voltage U_s :	-150 V	t_r :	5 ns
Impedance R_i :	50 Ohm	t_d :	0.1 μ s
Test duration:	2 h	t_{rep} :	100 ms
		t_1 :	100 μ s
		t_2 :	10 ms
		t_3 :	90 ms

Performance criteria:	Criterion A according to VW TL82066
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Test result:	No influence detected
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Classification:	Test passed
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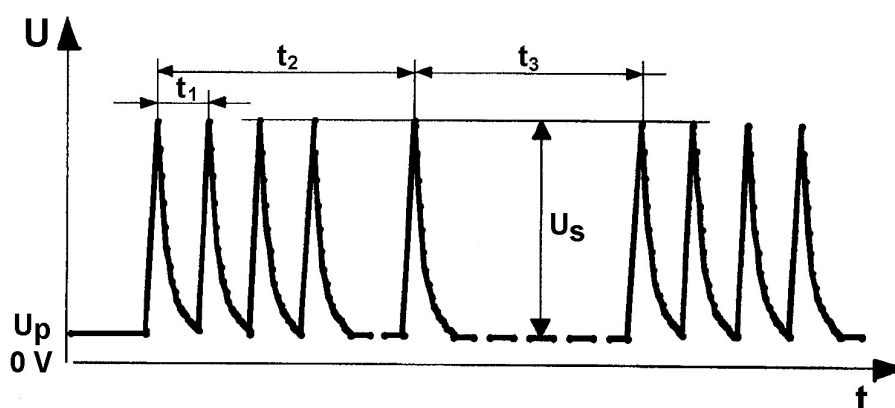
Date of test:	23.03.2006
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Tested by:	Reinhold Markl
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Test report

Immunity to conducted disturbances - Pulse 3b

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation	+15 on	
Environmental conditions:	Bar. pressure:	975 hPa
	Ambient temperature:	20 °C
	Relative humidity:	40 %
Regulation(s):	VW TL82066	
Coupling mode:	Coupling onto DC supply lines	

Specifications for Pulse 3b:

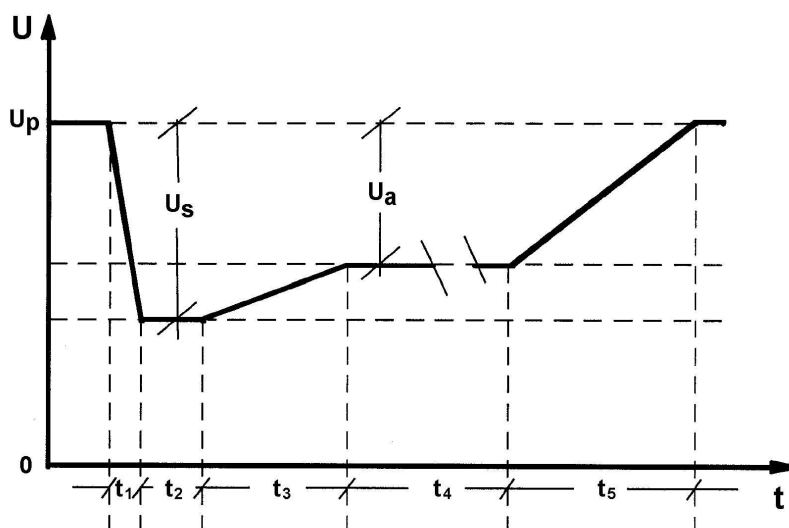
Pulse voltage U_s :	+100 V	t_r :	5 ns
Impedance R_i :	50 Ohm	t_d :	0.1 μ s
Test duration:	2h	t_{rep} :	100 ms
		t_1 :	100 μ s
		t_2 :	10 ms
Supply voltage U_p :	13.5 V	t_3 :	90 ms

Performance criteria:	Criterion A according to VW TL82066
Test result:	No influence detected
Classification:	Test passed
Date of test:	23.03.2006
Tested by:	Reinhold Markl

Test report

Immunity to conducted disturbances - Pulse 4

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation	+15 on	
Environmental conditions:	Bar. pressure:	975 hPa
	Ambient temperature:	20 °C
	Relative humidity:	40 %
Regulation(s):	VW TL82066	
Coupling mode:	Coupling onto DC supply lines	

Specifications for Pulse 4:

Supply voltage U_p :	12 V	t_1 :	≤ 5 ms
Voltage U_s :	7 V	t_2 :	15 ms
Voltage U_a :	5.5 V	t_3 :	50 ms
		t_4 :	2000 ms
Pulse count:	10	t_5 :	100 ms

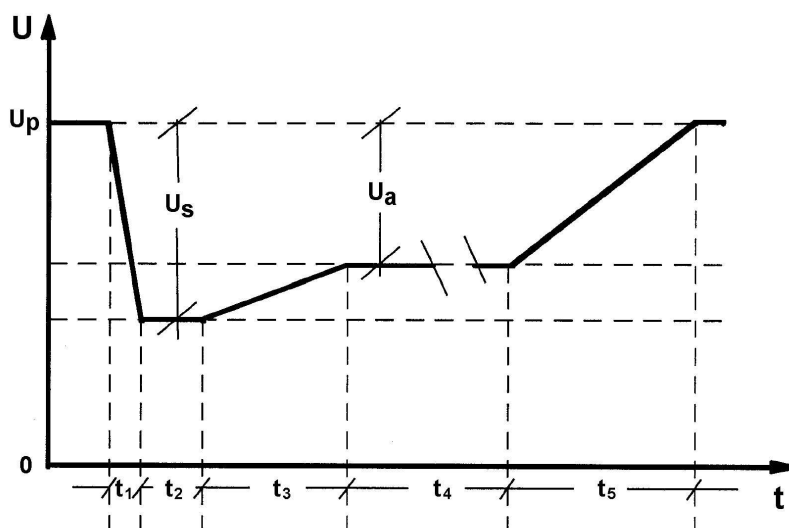
Performance criteria:	Criterion B according to VW TL82066
Test result:	Short reset detected
Classification:	Test passed
Date of test:	23.03.2006
Tested by:	Reinhold Markl

Test report

Immunity to conducted disturbances - Pulse 4b

Model:	GT 904
Applicant:	Getronic s.r.l.
Mode of operation	+15 on
Environmental conditions:	Bar. pressure: 975 hPa Ambient temperature: 20 °C Relative humidity: 40 %
Regulation(s):	VW TL82066
Coupling mode:	Coupling onto DC supply lines

Specifications for Pulse 4b:



Supply voltage U_p :	12 V	t_1 :	≤ 5 ms
Voltage U_s :	9 V	t_2 :	15 ms
Voltage U_a :	7 V	t_3 :	50 ms
		t_4 :	1000 ms
Pulse count:	10	t_5 :	100 ms

Performance criteria:	Criterion B according to VW TL82066
Test result:	Short reset detected
Classification:	Test passed
Date of test:	23.03.2006
Tested by:	Reinhold Markl

Test report No. 06/0012-00

Manufacturer : GETRONIC S.r.l.,
I-21026 Gavirate (VA)

Type : GT904



Enclosure 3

Page 1

Test report
Immunity to radio frequency electromagnetic fields

Model:	GT 904		
Applicant:	Getronic s.r.l.		
Mode of operation:	+15 on / +15 off system set (CAN communication lines active in both cases)		
Bar. pressure:	975 hPa	Rel. humidity:	40 %
		Amb. temperature:	20°C
Regulation(s):	VW TL 82166		
Requirements:	Bulk Current Injektion (BCI) 20 - 80 MHz: 150 mA		
Interfering signal:	Modulation:	AM	
	Modulation depth:	80 %	
	Modulation frequency:	1 kHz	
	Polarization:	---	
	Step size:	>20 to 200	1 MHz
		>200 to 400	2 MHz
		>400 to 1000	5 MHz
		>1000 to 3000	10 MHz
Dwell time:	1 s		
Position of BCI:	120 mm, 450 mm, 750 mm from EUT		
Performance criteria:	Criterion A according to VW TL 82166		
Test result:	No influence detected		
Classification:	Test passed		
Date of test:	23.03.2006		
Tested by:	Reinhold Markl		

Test report No. 06/0012-00

Manufacturer : GETRONIC S.r.l.,
I-21026 Gavirate (VA)

Type : GT904



Enclosure 3

Page 2

Test report
Immunity to radio frequency electromagnetic fields

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation:	+15 on / +15 off system set (CAN communication lines active in both cases)	
Bar. pressure:	975 hPa	Rel. humidity: 40 %
		Amb. temperature: 20°C
Regulation(s):	VW TL 82166	
Requirements:	Antenna 80 - 1000 MHz: 100 V/m	
Interfering signal:	Modulation:	AM
	Modulation depth:	80 %
	Modulation frequency:	1 kHz
	Polarization:	horizontal (>400 MHz) / vertical
	Step size:	>20 to 200 1 MHz
		>200 to 400 2 MHz
		>400 to 1000 5 MHz
		>1000 to 3000 10 MHz
	Dwell time:	1 s
Position of cable trunk:	1 m in front of the antenna	
Performance criteria:	Criterion A according to VW TL 82166	
Test result:	No influence detected	
Classification:	Test passed	
Date of test:	23.03.2006	
Tested by:	Reinhold Markl	

Test report No. 06/0012-00

Manufacturer : GETRONIC S.r.l.,
I-21026 Gavirate (VA)

Type : GT904



Enclosure 3

Page 3

Test report
Immunity to radio frequency electromagnetic fields

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation:	+15 on / +15 off system set (CAN communication lines active in both cases)	
Bar. pressure:	975 hPa	Rel. humidity: 40 %
		Amb. temperature: 20°C
Regulation(s):	VW TL 82166	
Requirements:	Antenna 1000 - 3000 MHz:50 /100V/m	
Interfering signal:	Modulation:	AM
	Modulation depth:	80 %
	Modulation frequency:	1 kHz
	Polarization:	horizontal (>400 MHz) / vertical
	Step size:	>20 to 200 1 MHz
		>200 to 400 2 MHz
		>400 to 1000 5 MHz
		>1000 to 3000 10 MHz
	Dwell time:	1 s
Position of cable trunk:	1 m in front of the antenna	
Performance criteria:	Criterion A according to VW TL 82166 with 50 V/m Criterion C according to VW TL 82166 with 100 V/m	
Test result:	No influence detected at 50 V/m, return automatically to normal operating state after removal of the interferences of 100 V/m	
Classification:	Test passed	
Date of test:	23.03.2006	
Tested by:	Reinhold Markl	

Test report No. 06/0012-00

Manufacturer : GETRONIC S.r.l.,
I-21026 Gavirate (VA)

Type : GT904



Enclosure 3

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Test report
Immunity to radio frequency electromagnetic fields

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation:	+15 on / +15 off system set (CAN communication lines active in both cases)	
Bar. pressure:	975 hPa	Rel. humidity: 40 %
		Amb. temperature: 20°C
Regulation(s):	VW TL 82166	
Requirements:	Antenna 800 - 1000 MHz: 100 V/m	
Interfering signal:	Modulation:	PM
	Frequency:	217 Hz
	Duty cycle:	50 %
	Polarization:	vertical / horizontal
	Step size:	>20 to 200 1 MHz
		>200 to 400 2 MHz
		>400 to 1000 5 MHz
		>1000 to 3000 10 MHz
	Dwell time:	1 s
Position of cable trunk:	1 m in front of the antenna	
Performance criteria:	Criterion A according to VW TL 82166	
Test result:	No influence detected	
Classification:	Test passed	
Date of test:	23.03.2006	
Tested by:	Reinhold Markl	

Test report No. 06/0012-00

Manufacturer : GETRONIC S.r.l.,
I-21026 Gavirate (VA)

Type : GT904



Enclosure 3

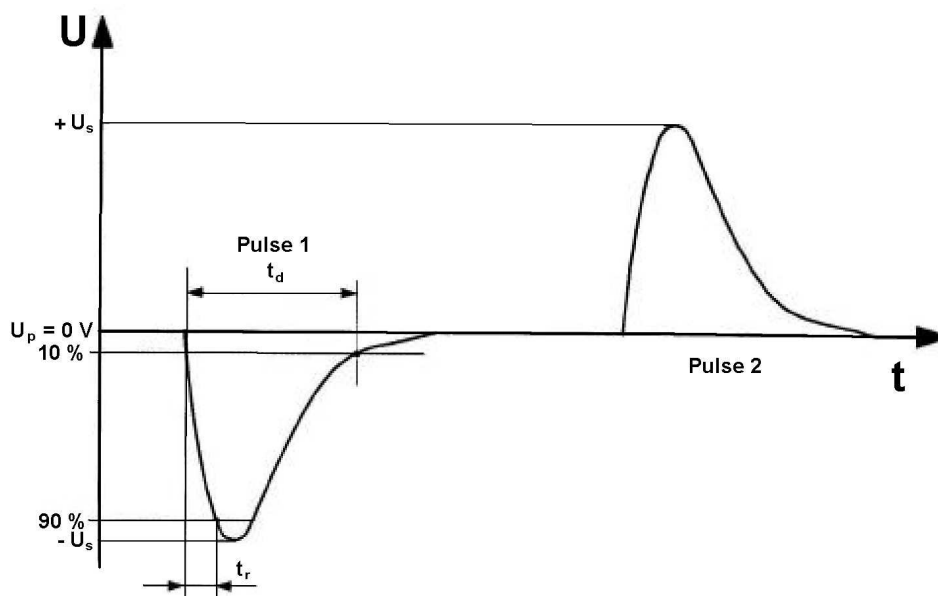
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Test report
Immunity to radio frequency electromagnetic fields

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation:	+15 on / +15 off system set (CAN communication lines active in both cases)	
Bar. pressure:	975 hPa	Rel. humidity: 40 %
		Amb. temperature: 20°C
Regulation(s):	VW TL 82166	
Requirements:	Antenna 1000 - 3000 MHz: 50 V/m	
Interfering signal:	Modulation:	PM
	Frequency:	217 Hz
	Duty cycle:	50 %
	Polarization:	vertical / horizontal
	Step size:	>20 to 200 1 MHz
		>200 to 400 2 MHz
		>400 to 1000 5 MHz
		>1000 to 3000 10 MHz
	Dwell time:	1 s
Position of cable trunk:	1 m in front of the antenna	
Performance criteria:	Criterion A according to VW TL 82166	
Test result:	No influence detected	
Classification:	Test passed	
Date of test:	23.03.2006	
Tested by:	Reinhold Markl	

Test report Immunity to conducted disturbances - Pulse 1

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation	+15 on	
Environmental conditions:	Bar. pressure:	975 hPa
	Ambient temperature:	22 °C
	Relative humidity:	35 %
Regulation(s):	VW TL 823 66:March 2002	
Coupling mode:	Coupling onto signal-, sensor-, buslines via current clamp F-120-9B	

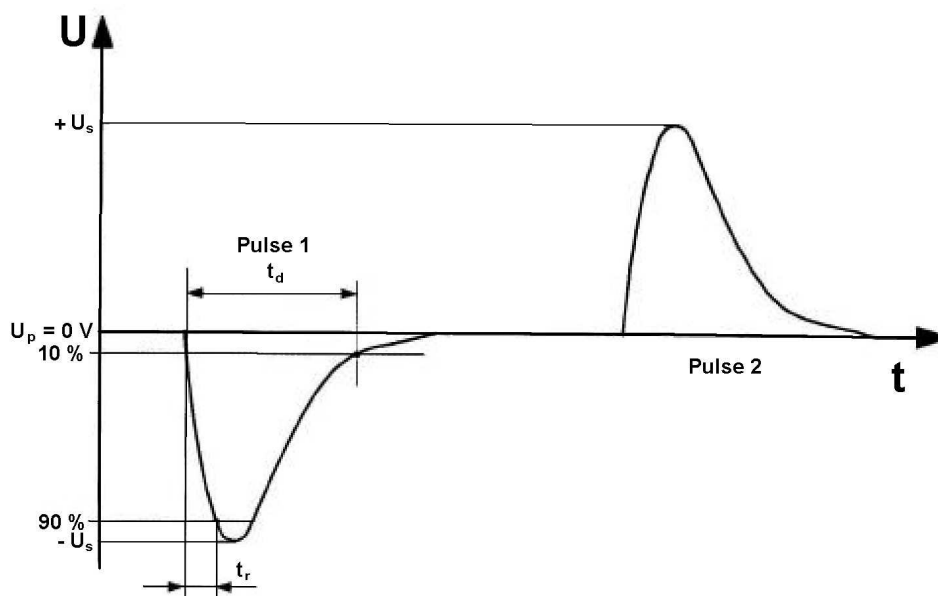
Specifications for Pulse 1:

Induced voltage U_s :	- 5 V	t_r :	1 μ s
Impedance R_i :	10 Ohm	t_d :	50 μ s
Pulse count:	500	t_{rep} :	0.5 s
Performance criteria:	Criterion A according to VW TL 823 66		
Test result:	No influence detected		
Classification:	Test passed.		
Date of test:	24.03.2006		
Tested by:	Reinhold Markl		

Test report Immunity to conducted disturbances - Pulse 2

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation	+15 on	
Environmental conditions:	Bar. pressure:	975 hPa
	Ambient temperature:	22 °C
	Relative humidity:	35 %
Regulation(s):	VW TL 823 66:March 2002	
Coupling mode:	Coupling onto signal-, sensor-, buslines via current clamp F-120-9B	

Specifications for Pulse 2:

Induced voltage U_s : + 5 VImpedance R_i : 10 Ohm

Pulse count: 500

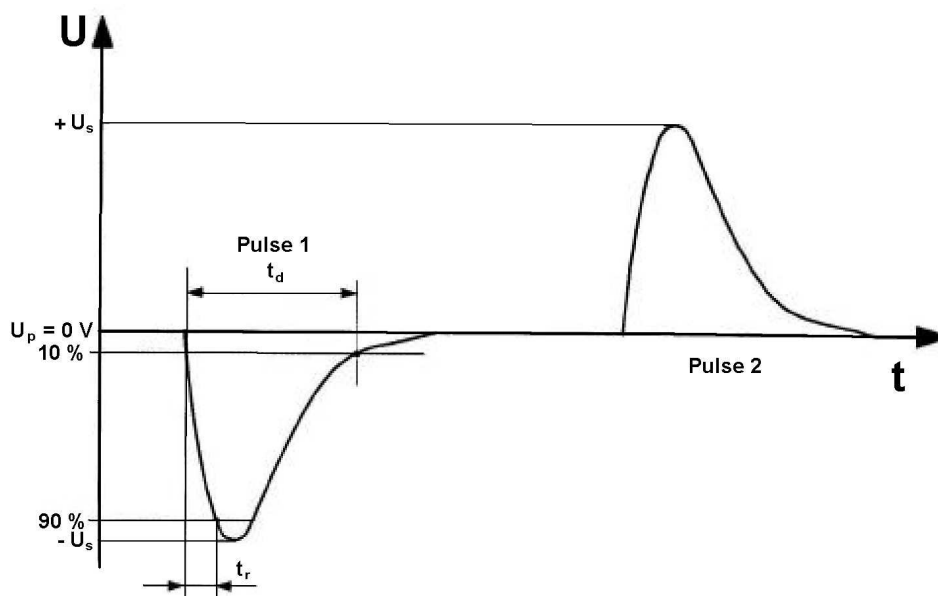
 t_r : 1 μ s t_d : 50 μ s t_{rep} : 0.5 s

Performance criteria:	Criterion A according to VW TL 823 66
Test result:	No influence detected
Classification:	Test passed.
Date of test:	24.03.2006
Tested by:	Reinhold Markl

Test report Immunity to conducted disturbances - Pulse 1

Model:	GT 904
Applicant:	Getronic s.r.l.
Mode of operation	+15 on
Environmental conditions:	Bar. pressure: 975 hPa Ambient temperature: 22 °C Relative humidity: 35 %
Regulation(s):	VW TL 823 66:March 2002
Coupling mode:	Coupling onto signal-, sensor-, buslines via capacitive coupling clamp

Specifications for Pulse 1:

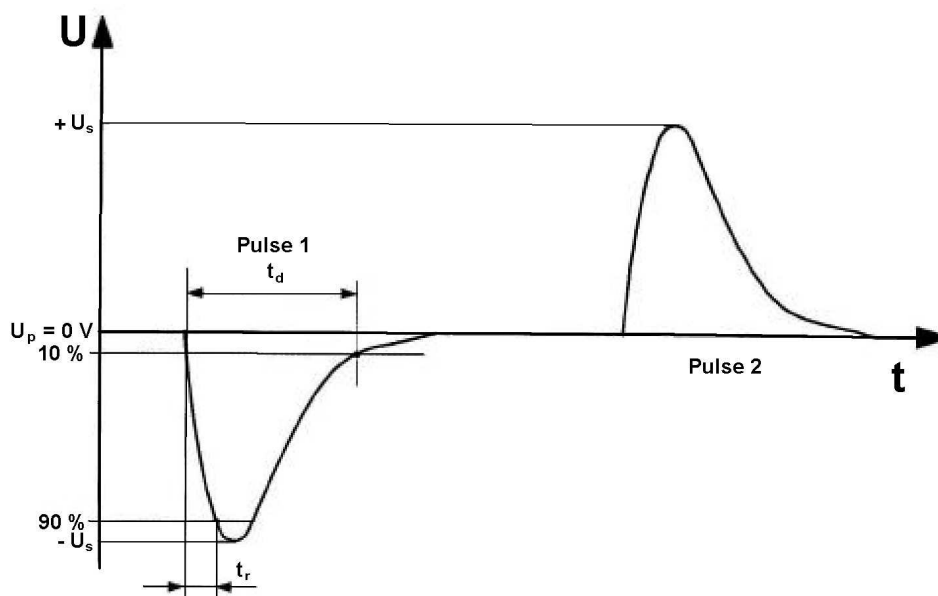


Induced voltage U_s :	-100 V	t_r :	1 μs
Impedance R_i :	10 Ohms	t_d :	50 μs
Pulse count:	500	t_{rep} :	0.5 s

Performance criteria:	Criterion A according to VW TL 823 66
Test result:	No influence detected
Classification:	Test passed.
Date of test:	24.03.2006
Tested by:	Reinhold Markl

Test report Immunity to conducted disturbances - Pulse 2

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation	+15 on	
Environmental conditions:	Bar. pressure:	975 hPa
	Ambient temperature:	22 °C
	Relative humidity:	35 %
Regulation(s):	VW TL 823 66:March 2002	
Coupling mode:	Coupling onto signal-, sensor-, buslines via capacitive coupling clamp	

Specifications for Pulse 2:

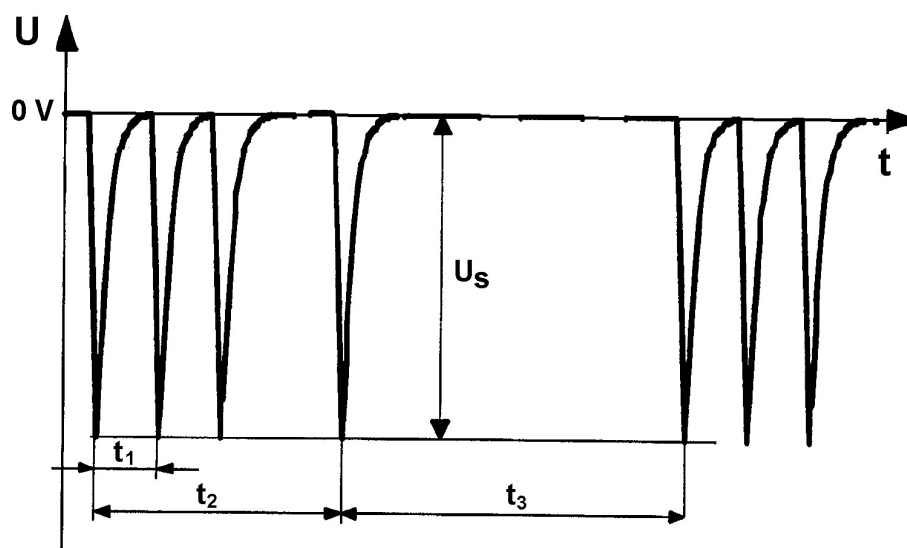
Induced voltage U_s :	+100 V	t_r :	1 μ s
Impedance R_i :	10 Ohms	t_d :	50 μ s
Pulse count:	500	t_{rep} :	0.5 s

Performance criteria:	Criterion A according to VW TL 823 66
Test result:	No influence detected
Classification:	Test passed.
Date of test:	24.03.2006
Tested by:	Reinhold Markl

Test report Immunity to conducted disturbances - Pulse 3a

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation	+15 on	
Environmental conditions:	Bar. pressure:	975 hPa
	Ambient temperature:	22 °C
	Relative humidity:	35 %
Regulation(s):	VW TL 823 66:March 2002	
Coupling mode:	Coupling onto signal-, sensor-, buslines via capacitive coupling clamp	

Specifications for Pulse 3a:



Pulse voltage U_s : -120 V
 Impedance R_i : 50 Ohm
 Test duration: 10 min

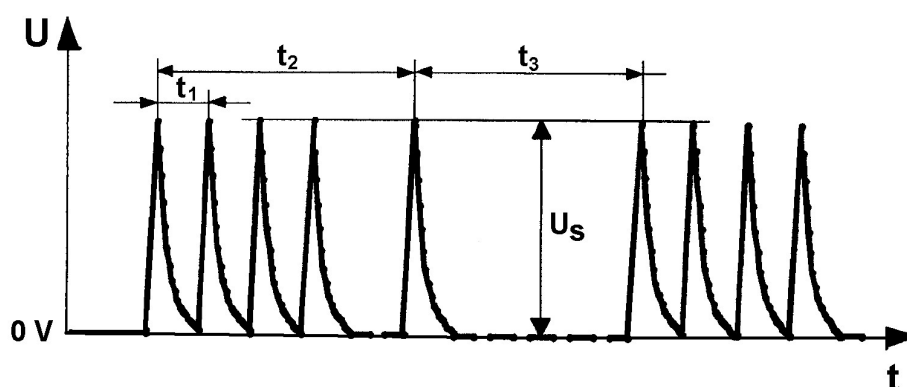
t_r : 5 ns
 t_d : 0.1 μ s
 t_{rep} : 100 ms
 t_1 : 100 μ s
 t_2 : 10 ms
 t_3 : 90 ms

Performance criteria:	Criterion A according to VW TL 823 66
Test result:	No influence detected
Classification:	Test passed.
Date of test:	24.03.2006
Tested by:	Reinhold Markl

Test report Immunity to conducted disturbances - Pulse 3b

Model:	GT 904	
Applicant:	Getronic s.r.l.	
Mode of operation	+15 on	
Environmental conditions:	Bar. pressure:	957 hPa
	Ambient temperature:	22 °C
	Relative humidity:	35 %
Regulation(s):	VW TL 823 66:March 2002	
Coupling mode:	Coupling onto signal-, sensor-, buslines via capacitive coupling clamp	

Specifications for Pulse 3b:



Pulse voltage U_s :	+120 V	t_r :	5 ns
Impedance R_i :	50 Ohm	t_d :	0.1 μ s
Test duration:	10 min	t_{rep} :	100 ms
		t_1 :	100 μ s
		t_2 :	10 ms
		t_3 :	90 ms

Performance criteria:	Criterion A according to VW TL 823 66
Test result:	No influence detected
Classification:	Test passed.
Date of test:	24.03.2006
Tested by:	Reinhold Markl

Test report

Immunity to electrostatic discharges

Model:	GT 904									
Applicant:	Getronic S.r.l.									
Mode of operation:	Storage mode									
Bar. pressure: 1018 hPa Rel. humidity: 45 % Amb. temperature: 20°C										
Regulation(s):	VW TL 824 66:February 2005 EN 61000-4-2:1995 +A1:1998+A2:2001									
Performed Test:	☒ Direct contact discharge ☐ Indirect contact discharge ☐ Direct air discharge ☐ Indirect air discharge									
Locations of discharge:	All conductive parts of EUT accessible to normal user									
Tested severity level / Voltage	+	1	2	3	4	5	6	7	8	kV
		9	10	11	12	13	14	15	16	kV
	-	1	2	3	4	5	6	7	8	kV
		9	10	11	12	13	14	15	16	kV
Locations of discharge:	Several points on horizontal coupling plane									
Tested severity level / Voltage	+	1	2	3	4	5	6	7	8	kV
		9	10	11	12	13	14	15	16	kV
	-	1	2	3	4	5	6	7	8	kV
		9	10	11	12	13	14	15	16	kV
Performance criteria:	Criterion B (Functional test after application)									
Test result:	No inadmissible effects detected									
Classification:	Test passed									
Date of test:	24.03.2006									
Tested by:	Reinhold Markl									

Test report No. 06/0012-00

Manufacturer : GETRONIC S.r.l.,
I-21026 Gavirate (VA)

Type : GT904



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Test report
Immunity to electrostatic discharges

Model:	GT 904									
Applicant:	Getronic S.r.l.									
Mode of operation:	Storage mode									
Bar. pressure: 1018 hPa Rel. humidity: 45 % Amb. temperature: 20°C										
Regulation(s):	TL 824 66:February 2005 EN 61000-4-2:1995+A1:1998+A2:2001									
Performed Test:	☐ Direct contact discharge ☐ Indirect contact discharge ☒ Direct air discharge ☐ Indirect air discharge									
Locations of discharge:	All non conductive parts of EUT accessible to normal user									
Tested severity level / Voltage	+	1	2	3	4	5	6	7	8	kV
		9	10	11	12	13	14	15	25	kV
	-	1	2	3	4	5	6	7	8	kV
		9	10	11	12	13	14	15	25	kV
Performance criteria:	Criterion B (Functional test after application)									
Test result:	No inadmissible effects detected									
Classification:	Test passed									
Date of test:	24.03.2006									
Tested by:	Reinhold Markl									

Test report

Immunity to electrostatic discharges

Model:	GT 904									
Applicant:	Getronic S.r.l.									
Mode of operation:	+15 on									
Bar. pressure: 1018 hPa	Rel. humidity: 45 %		Amb. temperature: 20°C							
Regulation(s):	TL 824 66:February 2005 EN 61000-4-2:1995+A1:1998+A2:2001									
Performed Test:	☒ Direct contact discharge ☐ Indirect contact discharge ☒ Direct air discharge ☐ Indirect air discharge									
Locations of discharge:	All conductive parts of EUT accessible to normal user									
Tested severity level / Voltage	+	1	2	3	4	5	6	7	8	kV
		9	10	11	12	13	14	15	25	kV
	-	1	2	3	4	5	6	7	8	kV
		9	10	11	12	13	14	15	25	kV
Locations of discharge:	Several points on horizontal coupling plane									
Tested severity level / Voltage	+	1	2	3	4	5	6	7	8	kV
		9	10	11	12	13	14	15	25	kV
	-	1	2	3	4	5	6	7	8	kV
		9	10	11	12	13	14	15	25	kV
Performance criteria:	Criterion B (Functional test after application)									
Test result:	No inadmissible effects detected									
Classification:	Test passed									
Date of test:	24.03.2006									
Tested by:	Reinhold Markl									