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TEST REPORT

REFERENCE STANDARD: Germanischer Lloyd. Edición 2003.

Rules for classification and Construction.

VI Additional Rules and Guidelines.

7 Guidelines for the performance of Type Approvals.

2 Test Requirements for Electrical / Electronic Equipment and Systems.

NIE..... : 28859REM.001

Approved by Rafael López
 (name / position & signature) : EMC Manager

Elaboration date : 2009-07-21

Identification of item tested : BATTERYLESS AUTOFED TELEPHONE SYSTEM TYPE AU-MAG

Trademark : SCM

Model and/or type reference : PROTOTYPE

Serial number : See "Usage of samples"

Description : It was sent two equipments composed by:
 1st Delivery:
 Auto-fed telephone model AU-MAG-A, Serial number 0026/09.
 Auto-fed telephone model AU-MAG, Serial number 0073/09.
 Auto-fed telephone guest in a watertight box model AU-CJ-MAG Serial number 0037/09.
 Amplifier for auto-fed telephones model AU-ACM-A, Serial number 0022/09.
 Earphones for amplifier model ACM, Serial number 0022/09.
 2nd Delivery:
 Auto-fed telephone model AU-MAG-A without serial number.
 Auto-fed telephone model AU-MAG without serial number.

Applicant : SCM SISTEMAS

Address..... : C/ Libertad 14-2a
 P.C.: 33206. Gijón. Asturias.
 Spain

CIF/NIF/Passport..... : B-33826058

Contact person..... : Guillermo Florez / Luis Calleja

Telephone / Fax..... : +34 985 356 263 / +34 985 348 083

e-mail: : guillermo@scmsistemas.com

Test samples supplier	SCM SISTEMAS
Address.....	C/ Libertad 14-2a P.C.: 33206. Gijón. Asturias. Spain
CIF/NIF/Passport.....	B-33826058
Contact person:.....	Guillermo Florez / Luis Calleja
Telephone / Fax	+34 985 356 263 / +34 985 348 083
e-mail:.....	guillermo@scmsistemas.com
Manufacturer	SCM SISTEMAS
Address.....	C/ Libertad 14-2a P.C.: 33206. Gijón. Asturias. Spain
CIF/NIF/Passport.....	B-33826058
Telephone / Fax	+34 985 356 263 / +34 985 348 083
Standard.....	Germanischer Lloyd
Test Method requested.....	PEEM001; PEEM002; PEEM009; PEEM010; PEEM012; PEEM013; PEEM075.
Non-standardized test method	N/A
Report template No.	FDT08_11
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Competences and guarantees

AT4 wireless is a testing laboratory accredited by the National Accreditation Body (ENAC -Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 203.

AT4 wireless is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, AT4 wireless has a calibration and maintenance programme for its measurement equipment.

AT4 wireless guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at AT4 wireless at the time of performance of the test.

AT4 wireless is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of AT4 wireless.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of AT4 wireless and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the AT4 wireless internal document PODT000.

Usage of samples

Samples undergoing test have been selected by: SCM SISTEMAS

Sample S/01 is composed of the following elements:

<u>Control N°</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Model</u>	<u>Serial N°</u>	<u>Date of reception</u>
28859/06	Auto-fed telephone n° 3	SCM SISTEMAS	AU-CJ-MAG	0037/09	2009-01-27
28859/07	Earphones with microphone	SCM SISTEMAS	ACM	0022/09	2009-01-27
28859/08	Auto-fed telephone n° 2	SCM SISTEMAS	AU-MAG-A	0026/09	2009-01-27
28859/09	Auto-fed telephone n° 1	SCM SISTEMAS	AU-MAG	0073/09	2009-01-27

The sample S/02 is a new sample sent by the applicant composed by:

<u>Control N°</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Model</u>	<u>Serial N°</u>	<u>Date of reception</u>
28859/06	Auto-fed telephone n° 3	SCM SISTEMAS	AU-CJ-MAG	0037/09	2009-01-27
28859/07	Earphones with microphone	SCM SISTEMAS	ACM	0022/09	2009-01-27
28859/24	Auto-fed telephone	SCM SISTEMAS	AU-MAG-A	---	2009-02-11
28859/25	Auto-fed telephone	SCM SISTEMAS	AU-MAG	---	2009-02-11

The sample S/06 is the sample S/02 removing the earphones (element 07), the microphone and the amplifier, only is left the central box and the two auto-fed telephones.

The sample S/13 is the sample S/06 disconnecting the alarm light, adding a MURAT filter model BMX022-01 in the lamp power supply input & another equal filter in the principal general mains.

The sample S/14 is the sample S/13 adding another filter in the power supply (SCHAFNER RN112-4/02) and four varistors WÜRTH 820 55 400 1, one on the filter input, another one on the filter output, another one between the positive wire and ground in the filter output and the last between the negative wire of the filter output and ground.

Testing period

The performed test started on 2009-01-27 and finished on 2009-03-20..

The tests have been performed at AT4 wireless.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 80 %
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

In the semianechoic chamber (21 meters x 11 meters x 8 meters), the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 30 °C
Relative humidity	Min. = 45 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω
Normal site attenuation (NSA)	< ±4 dB at 10 m distance between item under test and receiver antenna, (30 MHz to 1000 MHz)
Field homogeneity	More than 75% of illuminated surface is between 0 and 6 dB (26 MHz to 1000 MHz).

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 30 °C
Relative humidity	Min. = 45 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

Summary

Considering the results of the performed test according to standard **Germanischer Lloyd, Rules for Classification and Construction, VI Additional Rules and Guidelines, 7 Guidelines for the Performance of Type Approvals, 2 Test Requirements for Electrical / Electronic Equipment and Systems**, the iteS/s under test is/are **IN COMPLIANCE** with the requested specifications specified in the standard.

NOTE: The results presented in this Test Report apply only to the particular item under test established in page 1 of this document, as presented for test on the date(s) shown in section, "USAGE OF SAMPLES, TESTING PERIOD AND ENVIRONMENTAL CONDITIONS".

Remarks and comments

The tests have been realized by the technical personnel: José Carlos Luque, Antonio Ruiz, José Manuel Márquez, José Manuel Gómez & Margarita Haro.

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 150 kHz to 30 MHz is $I = \pm 3.73$ dB for quasi-peak measurements, $I = \pm 3.61$ dB for peak measurements ($k = 2$).

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 30 MHz to 1000 MHz is $I = \pm 5.79$ dB for quasi-peak measurements, $I = \pm 5.71$ dB for peak measurements ($k = 2$).

Testing verdicts

Not applicable: NA

Pass.....: P

Fail: F

Not measured.....: NM

APPENDIX A

Test Result

APPENDIX A CONTENT:

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DESCRIPTION OF THE OPERATION MODES

The operation modes described in this paragraph constitute a functionality of the sample under test for himself. Every operation mode takes a failure criteria for the immunity test that they were applying to it and a monitoring to guarantee performance of the same ones.

In the following table appears the operation modes used by the samples tested to that it refers the present test report.

OPERATION MODE	DESCRIPTION
OM#01	EUT ON. All the telephones picked up and earphones with microphone fed. All in communication mode. Power supply input for earphones: 24 Vdc.
OM#03	EUT ON. Siren and call alarm light actives.

FAILS CRITERIA FOR IMMUNITY TEST

Fail Criteria A:

The apparatus or sub-system shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus or sub-system is used as intended.

Fail Criteria B:

The apparatus or sub-system shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus or sub-system is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed.

Fail criteria C:

Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls or by a operation specified on the user manual.

MONITORING FOR IMMUNITY TEST

For every operation mode applied to the EUT it's realizes a monitoring associated with each one of the immunity test, in accordance with the following table.

OPERATION MODE	CONTINUOUS PHENOMENA MONITORING	TRANSIENT PHENOMENA MONITORING
OM#01	A conversation is reproduced by the microphone of one of the telephones and there is verified that it is audible for the earphone of the other one terminal.	A conversation is reproduced by the microphone of one of the telephones and there is verified that it is audible for the earphone of the other one terminal.
OM#03	By means of a CCTV system it was monitored that the EUT remains in the selected mode.	By means of a CCTV system it was monitored that the EUT remains in the selected mode.

CONTINUOUS CONDUCTED EMISSION ON POWER LEADS

LIMITS:	Product standard :	Germanischer Lloyd Edition 2003 Rules for Classification and Construction VI Additional Rules Guidelines 7 Guidelines for the Performance of Type Approvals 2 Test Requirements for Electrical / Electronic Equipment and Systems
	Test standard :	CISPR 16-1 (1993), CISPR 16-2 (1996)

Emplacement	Frequency ranges	Limits
Bridge and open deck zone. - EMC 1	10 kHz – 150 kHz	96 dB μ V – 50 dB μ V
	150 kHz – 350 kHz	60 dB μ V – 50 dB μ V
	350 kHz – 30 MHz	50 dB μ V
Zone of general power distribution - EMC 2	10 kHz – 150 kHz	120 dB μ V – 69 dB μ V
	150 kHz – 500 kHz	79 dB μ V
	500 kHz – 30 MHz	73 dB μ V

TESTED SAMPLES:	S/06 & 13
TESTED OPERATION MODES:	OM#01 & 03
TEST RESULTS :	CCmmnnhh: CC, Conducted Condition; mm: Sample number; nn: Operation mode; hh: wire

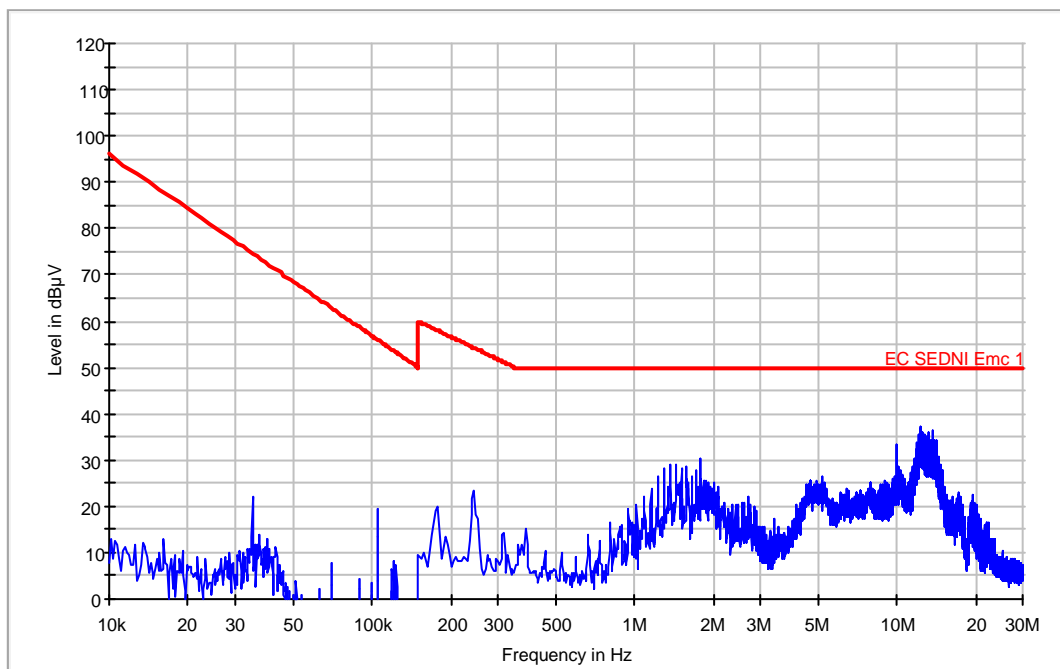
CCmmnnhh	Description	Result
CC0601PO	Positive wire noise.	P
CC0601NE	Negative wire noise	P
CC1303PO	Positive wire noise.	P
CC1303NE	Negative wire noise	P

Continuous Conducted emission : CC0601PO

Detector : Peak / Average / Cuasi-peak

Project: 28859Ciem001
 Company: SCM Sistemas
 Sample: S/06
 Operation Mode: OM#01
 Date: 2009-03-19 19:36
 Setup: EMI conducted
 Mode: EUT ON. Phones In communication mode. Positive wire noise.

EC SEDNI 10kHz-30MHz



Max PK-AVG

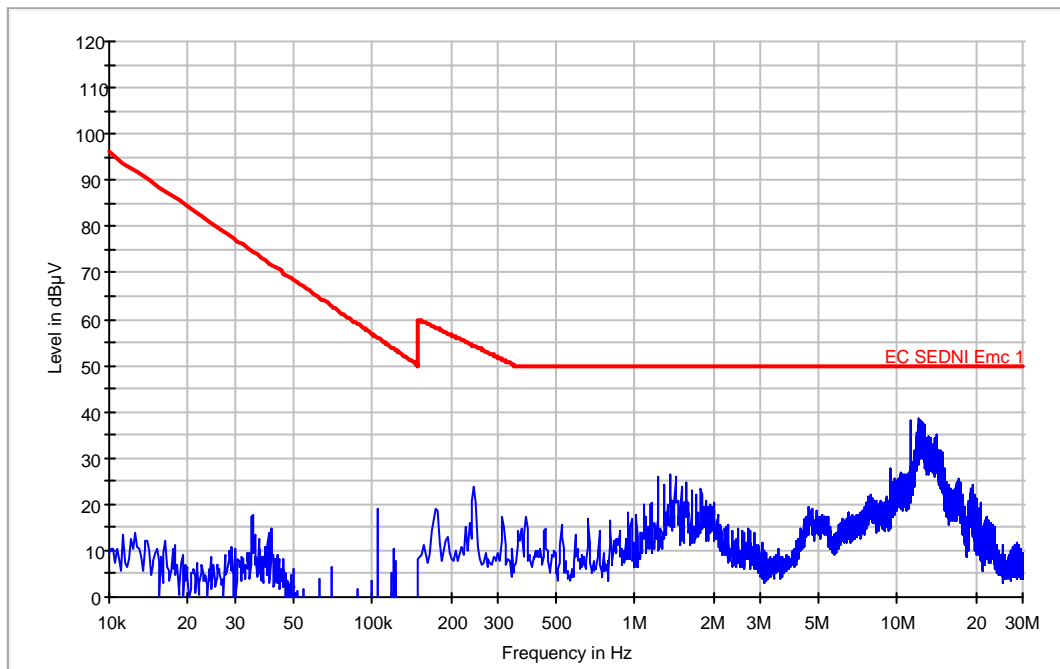
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)
12.090000	35.4
12.194000	35.7
12.230000	36.7
12.266000	37.1
12.302000	35.2
12.438000	35.3
12.510000	35.8
12.514000	35.5
12.794000	35.3
13.006000	35.0
13.074000	35.8
13.638000	36.2

Continuous Conducted emission : CC0601NE

Detector : Peak / Average / Cuasi-peak

Project: 28859Ciem001
 Company: SCM Sistemas
 Sample: S/06
 Operation Mode: OM#01
 Date: 2009-03-19 19:40
 Setup: EMI conducted
 Mode: EUT ON. Phones in communication modeNegative wire noise.

EC SEDNI 10kHz-30MHz



Max PK-AVG

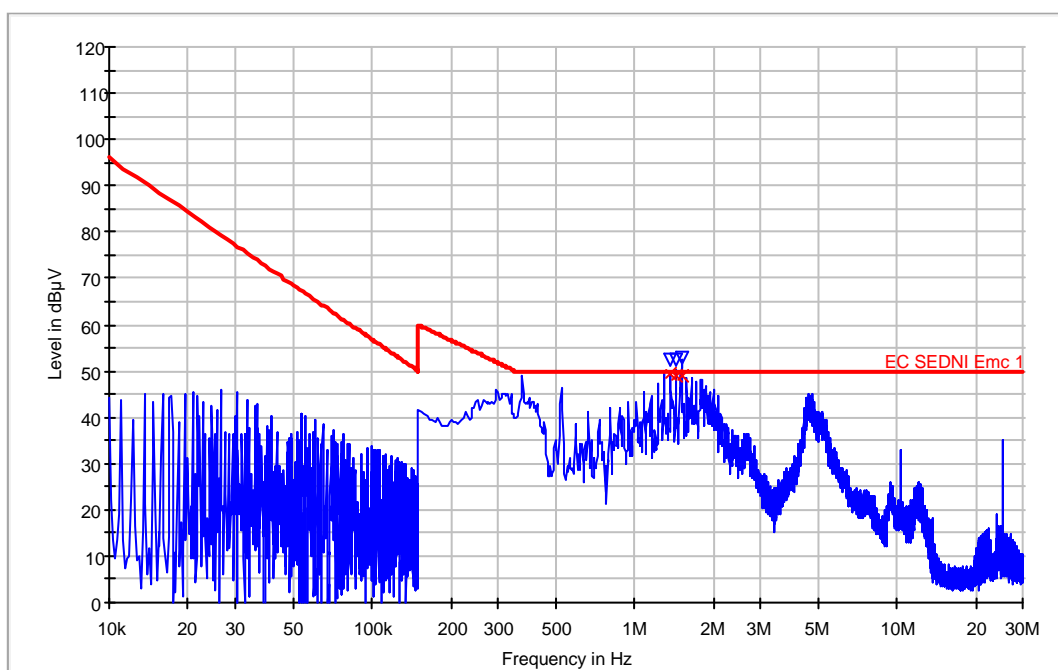
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)
11.250000	38.2
12.086000	37.0
12.090000	37.4
12.134000	37.3
12.138000	38.4
12.158000	36.6
12.230000	37.9
12.254000	37.3
12.302000	36.9
12.442000	36.6
12.466000	37.7
12.654000	37.4

Continuous Conducted emission : CC1303PO

Detector : Peak / Average / Cuasi-peak

Project: 28859Ciem001
 Company: SCM SISTEMAS
 Sample: S/13
 Operation Mode: OM#03
 Date: 2009-05-06 13:59
 Setup: EMI conducted
 Mode: EUT ON. Siren and alarm activated. Positive wire noise.

EC SEDNI 10kHz-30MHz



Max PK-AVG

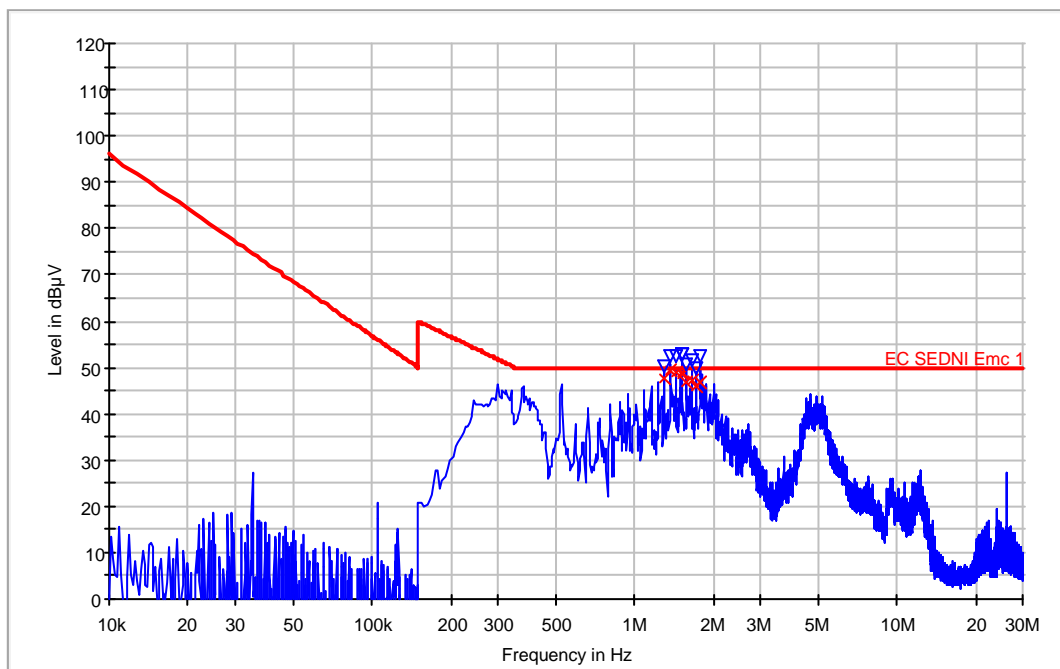
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Comment
0.526000	46.2	
1.226000	47.2	
1.298000	49.4	
1.366000	49.8	
1.438000	50.3	
1.510000	52.2	
1.578000	48.4	
1.646000	48.6	
1.718000	47.8	
1.794000	48.1	
1.858000	46.6	
2.006000	45.7	

Continuous Conducted emission : CC1303NE

Detector : Peak / Average / Cuasi-peak

Project: 28859Ciem001
 Company: SCM SISTEMAS
 Sample: S/13
 Operation Mode: OM#03
 Date: 2009-05-06 13:57
 Setup: EMI conducted
 Mode: EUT ON. Siren and alarm activated. Negative wire noise.

EC SEDNI 10kHz-30MHz



Max PK-AVG

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Comment
0.526000	46.3	
1.226000	47.0	
1.298000	48.9	
1.370000	50.5	
1.438000	49.8	
1.510000	51.4	
1.578000	50.0	
1.646000	49.7	
1.718000	48.8	
1.786000	51.2	
1.874000	46.3	
2.006000	46.5	

RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE.

LIMITS:	Product standard :	Germanischer Lloyd Edition 2003 Rules for Classification and Construction VI Additional Rules Guidelines 7 Guidelines for the Performance of Type Approvals 2 Test Requirements for Electrical / Electronic Equipment and Systems
	Test standard :	CISPR 16-1 (1993), CISPR 16-2 (1996)

Emplacement	Frequency ranges	Limits
Bridge and open deck zone. - EMC 1	150 kHz – 300 kHz	80 dB μ V/m – 52 dB μ V/m
	300 kHz – 30 MHz	52 dB μ V/m – 34 dB μ V/m
	30 MHz – 2 GHz	54 dB μ V/m
	except for: 156 MHz – 165 MHz	24 dB μ V/m
Zone of general power distribution - EMC 2	150 kHz – 30 MHz	80 dB μ V/m – 50 dB μ V/m
	30 kHz – 100 MHz	50 dB μ V/m – 54 dB μ V/m
	100 MHz – 2 GHz	54 dB μ V/m
	except for: 156 MHz – 165 MHz	24 dB μ V/m

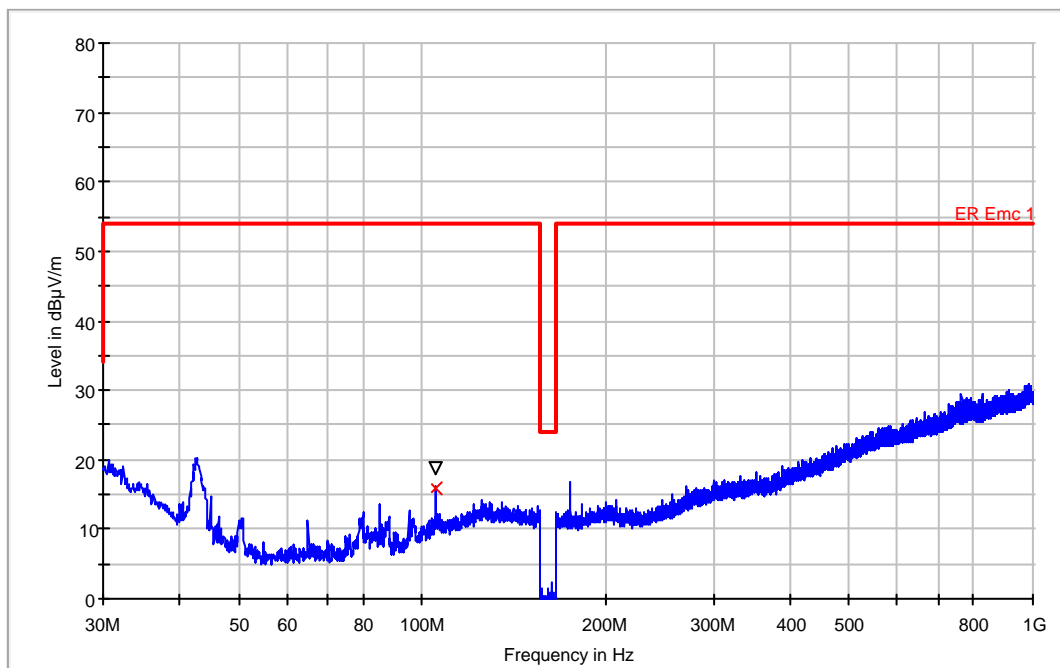
TESTED SAMPLES:	S/01
TESTED OPERATION MODES:	OM#01
TEST RESULTS :	CRmmnn: CR, Condición de Radiación; mm: Sample number; nn: Operation mode.

CRmmnn	Description	Result
CR0101	30 MHz - 1000 MHz	P
CR0101	150 kHz - 30 MHz X Axis	P
CR0101	150 kHz - 30 MHz Y Axis	P
CR0101	150 kHz - 30 MHz Z Axis	P
CR0101	1 GHz - 2 GHz Horizontal Polarization	P
CR0101	1 GHz - 2 GHz Vertical Polarization	P

Radiated Emission: CR0101 30-1000 MHz

Project: 28859Ciem.001
 Company: SCM Sistemas
 Sample: S/01
 Operation Mode: OM#01
 Date: 2009-01-27 17:17
 Setup: EMI radiated
 Mode: EUT ON. In communication mode

ESIB CISPR 16-1 30-1000MHz Bilog hibrid AMP2193 3m



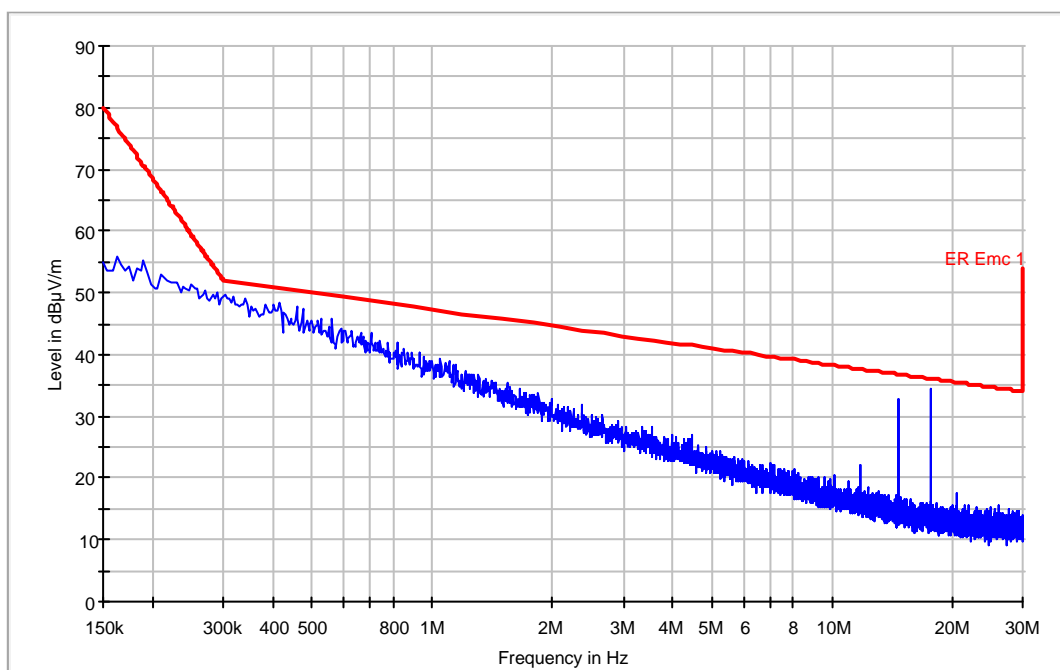
Maximized

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Antenna height (cm)	Polarity	Turntable position (deg)
105.011022	15.8	18.9	113.00	V	111.0

Radiated Emission: CR0101 150 kHz-30 MHz X axis

Project: 28859Ciem.001
 Company: SCM Sistemas
 Sample: S/01
 Operation Mode: OM#01
 Date: 2009-01-27 20:45
 Setup: EMI radiated
 Mode: EUT ON. In communication mode X axis.

ER CISPR 16-1 150k-30MHz (H field)



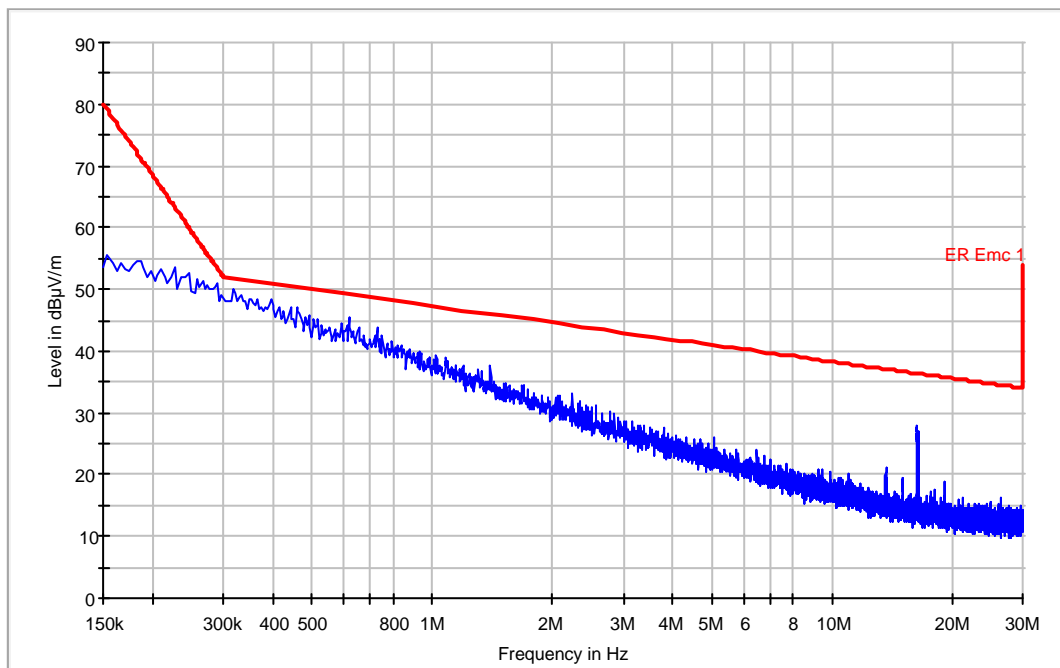
DataReduction Detector1

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)
0.162000	55.7
11.750000	22.0
14.690000	32.7
17.630000	34.6
20.566000	17.5
26.206000	15.6

Radiated Emission: CR0101 150 kHz-30 MHz Y axis

Project: 28859Ciem.001
 Company: SCM Sistemas
 Sample: S/01
 Operation Mode: OM#01
 Date: 2009-01-27 20:44
 Setup: EMI radiated
 Mode: EUT ON. In communication mode Y axis.

ER CISPR 16-1 150k-30MHz (H field)



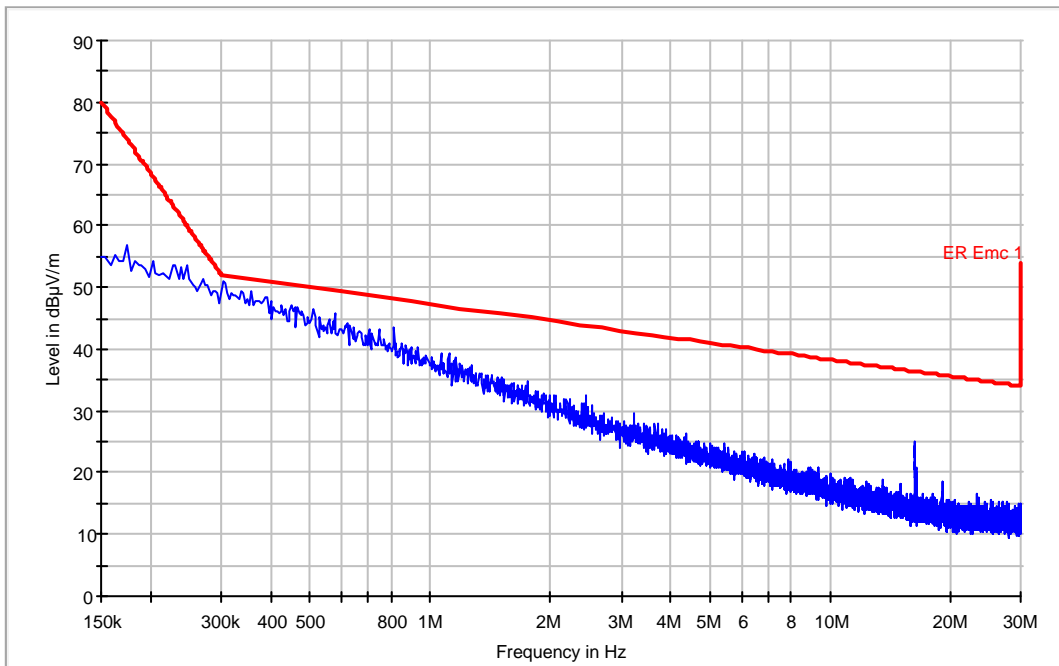
DataReduction Detector1

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)
0.154000	55.6
16.322000	27.8

Radiated Emission: CR0101 150 kHz-30 MHz Z axis

Project: 28859Ciem.001
 Company: SCM Sistemas
 Sample: S/01
 Operation Mode: OM#01
 Date: 2009-01-27 20:50
 Setup: EMI radiated
 Mode: EUT ON. In communication mode Z axis.

ER CISPR 16-1 150k-30MHz (H field)



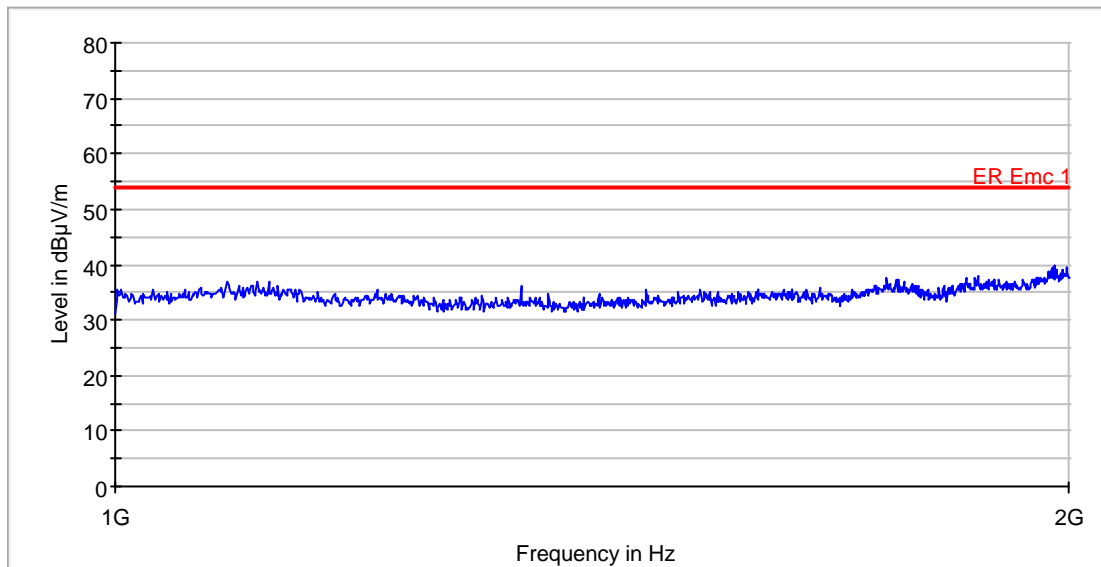
DataReduction Detector1

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)
0.174000	56.8
16.318000	24.9

Radiated Emission: CR0101 1 GHz-2 GHz Horizontal Polarization

Project: 28859CIEM.001
 Company: SCM Sistemas
 Sample: S/01
 Operation Mode: OM#01
 Date: 2009-01-27 19:58
 Setup: EMI radiated
 Mode: EUT ON. In communication mode Horizontal polarization.

ER CISPR 16-1 1-2GHz



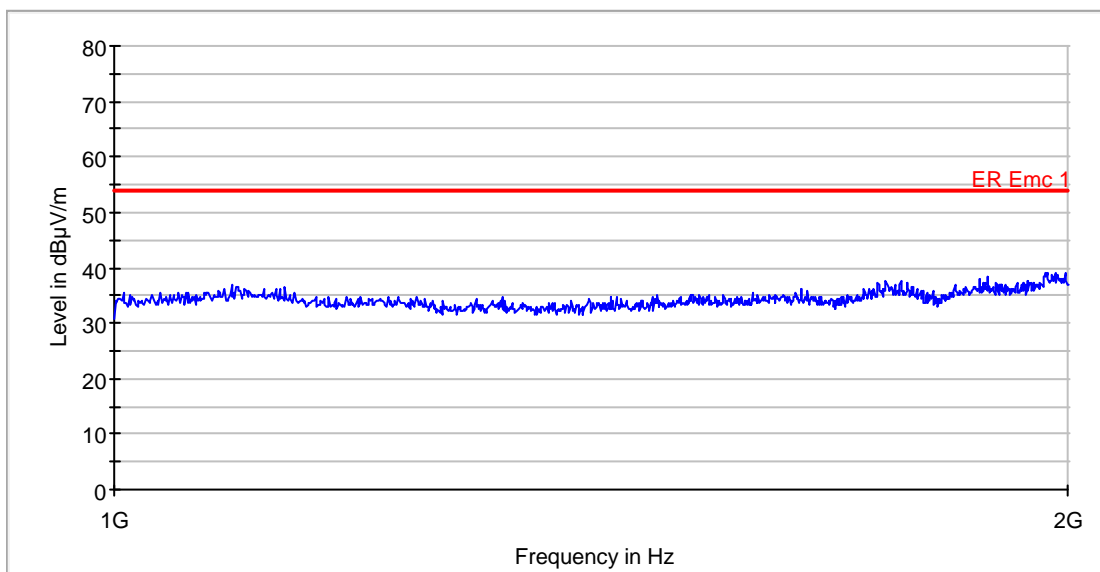
Maximum PK

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)	Polarity
1976.000000	39.5	H
1980.000000	39.6	H
1997.000000	39.3	H

Radiated Emission: CR0101 1 GHz-2 GHz Vertical Polarization

Project: 28859CIEM.001
 Company: SCM Sistemas
 Sample: S/01
 Operation Mode: OM#01
 Date: 2009-01-27 19:54
 Setup: EMI radiated
 Mode: EUT ON. In communication mode Vertical polarization.

ER CISPR 16-1 1-2GHz



Maximum PK

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)	Polarity
1971.000000	39.2	V
1982.000000	39.1	V
1996.000000	39.2	V

RADIATED RF ELECTROMAGNETIC FIELD IMMUNITY TEST

LIMITS:	Product standard :	Germanischer Lloyd Edition 2003 Rules for Classification and Construction VI Additional Rules Guidelines 7 Guidelines for the Performance of Type Approvals 2 Test Requirements for Electrical / Electronic Equipment and Systems
	Test standard :	EN 61000-4-3 (2006)

Severity level	3
Frequency range	80 MHz a 2 GHz
Steep	$< 1,5 \times 10^{-3} \text{ dec/s (1\% / 3s)}$
Field intensity	10 V/m
Modulation	AM 80 % 1000 Hz Senoidal
Polarization	Vertical and Horizontal

TESTED SAMPLES:	S/01
TESTED OPERATION MODES:	OM#01
FAIL CRITERIA AND MONITORING:	A
ZONES/COUPLING CABLES (ACPL):	

ACPL	DESCRIPTION
1	EUT frontal
2	EUT rear side
3	EUT left side
4	EUT right side

TEST RESULTS :	
-----------------------	--

ACPL	RANGES	S/	OM#	COMMENTS	RESULT
1	A	01	01	Ok, no fails detected	P
2	A	01	01	Ok, no fails detected	P
3	A	01	01	Ok, no fails detected	P
4	A	01	01	Ok, no fails detected	P

IMMUNITY TO HIG FREQUENCY CONDUCTED DISTURBANCES

LIMITS:	Product standard :	Germanischer Lloyd Edition 2003 Rules for Classification and Construction VI Additional Rules Guidelines 7 Guidelines for the Performance of Type Approvals 2 Test Requirements for Electrical / Electronic Equipment and Systems
	Test standard :	EN 61000-4-6 (2007)

Severity level	2
Coupling	Line / Ground
Carrier (Open circuit)	$3 V_{eff}^1$
A Range	150 kHz – 5 MHz
B Range	5 MHz – 80 MHz
C Range	2 MHz, 3 MHz, 4 MHz, 6,2 MHz, 8,2 MHz, 12,6 MHz, 16,5 MHz, 18,8 MHz, 22 MHz & 25 MHz.
D Range	50 Hz – 10 KHz
Modulation	AM 80% a 1000 Hz Senoidal ²
Sweep speed	$< 1,5 \times 10^{-3}$ dec/s (1% / 3s)

¹ For equipment installed on the bridge deck and deck zone the tests levels must be increase to 10 V_{eff} for random frequencies according with IEC 60945 in 2 MHz, 3 MHz, 4 MHz, 6,2 MHz, 8,2 MHz, 12,6 MHz, 16,5 MHz, 18,8 MHz, 22 MHz & 25 MHz.

² For test of equipments and input signals with a modulation frequency of 1000 Hz is necessary to choose a modulation frequency of 400Hz.

TESTED SAMPLES:	S/06
TESTED OPERATION MODES:	OM#01
FAIL CRITERIA AND MONITORING:	A
ZONES/COUPLING CABLES (ACPL):	

ACPL	DESCRIPTION
5	Telephones cables 1 (E/24). Wires 4-6-7 y 1 (Telephone 1 direction).
6	Telephones cables 1 (E/24). Wires 2-5-19 y 20 (Telephone direction).
7	Telephone cable 1 (E/24). Wire 7.
8	Telephone cable 3 (E/06). Wires 1-2-7-20.
9	Telephone cable 3 (E/06). Wires 3-4-5-6.
10	Telephone cable 3 (E/06). Wire 19.
11	Telephone cable 3 (E/06). Positive and negative wires of auxiliary DC power supply.

TEST RESULTS :	(See on next page)
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TEST RESULTS :					
ACPL	RANGE	S/	OM#	COMMENTS	RESULT
5	A	06	01	It is possible to hear an interference tone during almost the whole test, the communication is correct during the test.	P
5	B	06	01	It is possible to hear an interference tone during almost the whole test, the communication is correct during the test.	P
5	C	06	01	It is possible to hear an interference tone during almost the whole test, the communication is correct during the test.	P
6	A	06	01	It is possible to hear an interference tone from 150 kHz to 500 MHz.	P
6	B	06	01	Ok, no fails detected.	P
6	C	06	01	Ok, no fails detected.	P
7	A	06	01	It is possible to hear an interference tone from 150 kHz to 600 MHz.	P
7	B	06	01	Ok, no fails detected.	P
7	C	06	01	Ok, no fails detected.	P
8	A	06	01	It is possible to hear an interference tone during all the test, specially in 25 MHz.	P
8	B	06	01	It is possible to hear an interference tone from 150 kHz to 650 MHz.	P
8	C	06	01	Ok, no fails detected.	P
9	A	06	01	It is possible to hear an interference tone from 150 kHz to 350 MHz.	P
9	B	06	01	It is possible to hear an interference tone from 27 MHz to 29 MHz.	P
9	C	06	01	Ok, no fails detected.	P
10	A	06	01	It is possible to hear an interference tone from 150 kHz to 350 MHz.	P
10	B	06	01	Ok, no fails detected.	P
10	C	06	01	It is possible to hear an interference tone in 18,8; 22 & 25 MHz.	P
11	A	06	01	It is possible to hear an interference tone in 18,8; 22 & 25 MHz.	P
11	B	06	01	It is possible to hear an interference tone from 150 kHz to 350 MHz.	P
11	C	06	01	It is possible to hear an interference tone from 1 kHz to 10 kHz.	P

ELECTRICAL FAST TRANSIENT / BURST IMMUNITY TEST

LIMITS:	Product standard :	Germanischer Lloyd Edition 2003 Rules for Classification and Construction VI Additional Rules Guidelines 7 Guidelines for the Performance of Type Approvals 2 Test Requirements for Electrical / Electronic Equipment and Systems
	Test standard :	EN 61000-4-4 (2004)

	Power supply connections (Type 1)	Data connection, Communications and control (Type 2)
Severity level	3	
Coupling	Line / Ground	
Test Voltage (Open circuit)	2 kV	1 kV
Polarity	Positive / Negative	
Pulses repetition rate	5 kHz	5 kHz
Voltage Waveform	5 / 50 ns	
Duration	15 ms	
Period	300 ms	
Test duration by polarity and test point	5 Minutes	

TESTED SAMPLES:	S/13
TESTED OPERATION MODES:	OM#01
FAIL CRITERIA AND MONITORING:	B
ZONES/COUPLING CABLES (ACPL):	

ACPL	DESCRIPTION	TYPE
A	DC power supply line (PO = Positive wire).	1
B	DC power supply line (NE = Negative wire).	1
C	Communications cable of telephone 1	2
D	Communications cable of telephone 2	2

TEST RESULTS :	(See on next page)
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TEST RESULTS :				
ACPL	S/	OM#	COMMENTS	RESULT
A	13	01	OK, no fails detected.	P
B	13	01	OK, no fails detected.	P
C	13	01	OK, no fails detected.	P
D	13	01	OK, no fails detected.	P

SURGE IMMUNITY TEST

LIMITS:	Product standard :	Germanischer Lloyd Edition 2003 Rules for Classification and Construction VI Additional Rules Guidelines 7 Guidelines for the Performance of Type Approvals 2 Test Requirements for Electrical / Electronic Equipment and Systems
	Test standard :	EN 61000-4-5 (2006)

	Coupling	
	line / line (Type 1)	line / ground (Type 2)
Severity level	2	
Voltage test (open circuit)	0,5 kV	1 kV
Polarity	Positive / Negative	
Voltage Waveform	1,2 / 50 μ s	
Repetition rate	max. 1 pulse / minute	
Test duration by polarity and test point	min. 5 pulses / Polarity	

TESTED SAMPLES:	S/14
TESTED OPERATION MODES:	OM#01
FAIL CRITERIA AND MONITORING:	B
ZONES/COUPLING CABLES (ACPL):	

ACPL	DESCRIPTION	TYPE
A	DC power supply line. Symmetrical: PO→NE	1
B	DC power supply line. Asymmetrical: PO →PE.	2
C	DC power supply line. Asymmetrical: NE →PE.	2

TEST RESULTS :	
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ACPL	S/	OM#	COMMENTS	RESULT
A	14	01	OK, no fails detected.	P
B	14	01	OK, no fails detected.	P
C	14	01	OK, no fails detected.	P

ELECTROSTATIC DISCHARGE IMMUNITY TEST.

LIMITS:	Product standard :	Germanischer Lloyd Edition 2003 Rules for Classification and Construction VI Additional Rules Guidelines 7 Guidelines for the Performance of Type Approvals 2 Test Requirements for Electrical / Electronic Equipment and Systems
	Test standard :	EN 61000-4-2 (1995) / A1 (1998) / A2 (2001)

	Contact discharge	Air discharge
Severity level	3	
Voltage test	6 kV	8 kV
Duration for test point	min. 10 individual discharge by polarity	
Time between individual discharges	min. 1 second	
Waveform parameters		
- First current peak of the discharge	22,5 A	
- Raise time	0,7 a 1 ns	
- Current at 30 ns	12A	
- Current at 60 ns	6 A	

TESTED SAMPLES:	S/14
TESTED OPERATION MODES:	OM#01
MONITORING AND FAIL CRITERIA :	B
NUMBER OF DISCHARGES FOR POINT	10
ZONES/COUPLING CABLES (ACPL):	

ACPL	DESCRIPTION	COUPLING TYPE			
		ICH	ICV	DC	DA
1	Cabinet frontal (Telephone 3)	X			
2	Cabinet rear (Telephone 3)	X			
3	Cabinet right side (Telephone 3)	X			
4	Cabinet left side (Telephone 3)	X			
5	Frontal of telephone 1	X			

6	Rear of telephone 1	X			
7	Right side of telephone 1	X			
8	Left side of telephone 1	X			
9	Frontal enclosure of telephone 2	X			
10	Rear enclosure of telephone 2	X			
11	Right side enclosure of telephone 2	X			
12	Enclosure screws of telephone 1			X	
13	Enclosure screws of telephone 2			X	
14	Enclosure screws of telephone 3			X	
15	Cabinet screws (Telephone 3)			X	
16	Screws of the cabinet sonorous alarm			X	
17	Screws of the cabinet alarm light			X	
18	Support of the terminal strip			X	
19	Telephone 1 enclosures				X
20	Enclosure of the telephone 1 earphone				X
21	Chanel selector of telephone 1				X
22	Power supply crank of telephone 1				X
23	Spiral cable of telephone 1				X
24	Wall bushing of telephone 1				X
25	Enclosure of telephone 2				X
26	Enclosure of the telephone 2 earphone				X
27	Chanel selector of telephone 2				X
28	Power supply crank of telephone 2				X
29	Spiral cable of telephone 2				X
30	Wall bushing of telephone 2				X
31	Enclosure of telephone 3				X
32	Enclosure of the telephone 3 earphone				X
33	Chanel selector of telephone 3				X
34	Power supply crank of telephone 3				X
35	Spiral cable of telephone 3				X
36	Wall bushing of telephone 3				X

37	Enclosure of the telephone 3 cabinet				X
38	Wall bushing of the telephone 3 cabinet				X
39	Enclosure of the cabinet sonorous alarm				X
40	Enclosure of the cabinet alarm light				X

COUPLING RESUME : ICH (Indirect by contact on horizontal plane)
 ICV (Indirect by contact on vertical plane), DC (Direct by contact), DA (Direct by air)

TEST RESULTS :

ACPL	S/	OM#	COMMENTS	RESULT
1	14	01	Ok, no fails detected	P
2	14	01	Ok, no fails detected	P
3	14	01	Ok, no fails detected	P
4	14	01	Ok, no fails detected	P
5	14	01	Ok, no fails detected	P
6	14	01	Ok, no fails detected	P
7	14	01	Ok, no fails detected	P
8	14	01	Ok, no fails detected	P
9	14	01	Ok, no fails detected	P
10	14	01	Ok, no fails detected	P
11	14	01	Ok, no fails detected	P
12	14	01	Ok, no fails detected	P
13	14	01	Ok, no fails detected	P
14	14	01	Ok, no fails detected	P
15	14	01	Ok, no fails detected	P
16	14	01	Ok, no fails detected	P
17	14	01	Ok, no fails detected	P
18	14	01	Ok, no fails detected	P
19	14	01	Ok, no fails detected	P
20	14	01	Ok, no fails detected	P

ACPL	S/	OM#	COMMENTS	RESULT
21	14	01	Ok, no fails detected	P
22	14	01	Ok, no fails detected	P
23	14	01	Ok, no fails detected	P
24	14	01	Ok, no fails detected	P
25	14	01	Ok, no fails detected	P
26	14	01	Ok, no fails detected	P
27	14	01	Ok, no fails detected	P
28	14	01	Ok, no fails detected	P
29	14	01	Ok, no fails detected	P
30	14	01	Ok, no fails detected	P
31	14	01	Ok, no fails detected	P
32	14	01	Ok, no fails detected	P
33	14	01	Ok, no fails detected	P
34	14	01	Ok, no fails detected	P
35	14	01	Ok, no fails detected	P
36	14	01	Ok, no fails detected	P
37	14	01	Ok, no fails detected	P
38	14	01	Ok, no fails detected	P
39	14	01	Ok, no fails detected	P
40	14	01	Ok, no fails detected	P

APPENDIX B: Pictures



