Test Report

No. 300076.001
for KFM19_e AC

Test Laboratory:	Kontron Embedded Computers AG
	Oskar von Miller Straße 1 85386 Eching Germany
Applicant:	Kontron Embedded Computers AG
Purpose of Testing:	To show compliance with:
CE	EN 55022: 1998+ A1: 2000 + A2: 2003
CE	EN 61000-3-2: 1995 + A12: 1996 + A1: 1998 + A2: 1998 + A14: 2000
CE	EN 61000-3-3: 1995 + A1: 2001
CE	EN 61000-4-2: 1995 + A1: 1998 + A2: 2001
CE	EN 61000-4-4: 1995 + A1: 2001 + A2: 2001
CE	EN 61000-4-5: 1995 + A1: 2001
CE	EN 61000-4-6: 1996 + A1: 2001
CE	EN 61000-4-8: 1993 + A1: 2001
CE	EN 61000-4-11: 1994 + A1: 2001
Special Measurement:	none
	(see section "Reference Standards" for identical national standards)

Note:
The test data of this report relate only to the individual item tested.
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1. Table of Contents

2. Administrative Data

Equipment under test:	KFM19_e
optional Equipment under test:	none
Options/accessories:	none
Serial number:	prototype
Version of EUT:	AC

Applicant (full address):	Kontron Embedded Computers AG
Contract identification:	
Contact person:	Kuncl P.
Manufacturer:	Kontron Embedded Computers AG

Receipt of EUT:	1.3.2005
Date of test:	1.3.2005 ÷ 14.3.2005
Date of report	1.7.2005

Tested by:	Vesely P.
Test report by:	Vesely P.

3. Summary of Test Results

The tested sample fully fulfils the requirements set forth in:

EN 55022: 1998 + A1: 2000 + A2: 2003

EN 61000-3-2: 2000

EN 61000-3-3: 1995 + A1: 2001

EN 61000-4-2: 1995 + A1: 1998 + A2: 2001

EN 61000-4-4: 1995 + A1: 2001 + A2: 2001

EN 61000-4-5: 1995 + A1: 2001

EN 61000-4-6: 1996 + A1: 2001

EN 61000-4-8: 1993 + A1: 2001

EN 61000-4-11: 1994 + A1: 2001

(see section "Reference Standards" for identical national standards)

Ehrmeier A.
Technical Manager

Vesely P.
Test Engineer

4. Data of Operation Mode and Configuration of EUT

4.1 Operation Mode

Special Susceptibility tests:	
Susceptibility tests:	BitPro v3.2 and v4.0

4.2 Configuration of Cables of EUT

Shielded data cables connected.

4.3 Configuraion of EUT

Video-Controller:	Kontron CRTtoLCD2 - JILI
Display:	Fujitsu FLC48SXC8V-11AA
Touch-Controller:	DMC TSC-10/RSA
Backlight Inverter:	Green CC GH115A
Power supply:	Bicker SNP-Z107
EMC Filter:	Schaffner FN321-1/05

4.4 Configuration of Peripherals of EUT

Keyboard (< 1m):	none
Mouse (≤ 1m):	none
Monitor:	none
PC-Card (PCMCIA)	none
Monitor optional:	none
Configuration optional	none

Cables:	
VGA (shielded):	10m
DVI (shielded):	3m
Power optional	none
Ethernet1 (shielded):	none
Ethernet2 (shielded):	none
Ethernet3 (shielded):	none
Ethernet4 (shielded):	none
LPT1:	none
COM1:	1,5m
COM2:	none
USB1:	none
USB2:	none
USB3:	none
USB4:	none
HeadSet:	none
SCSI 1:	none
SCSI 2:	none
Alarmboard:	none
S-Video	1,5m
C-Video	1,5m

5. Performed Tests and Results

Test	Classification/Result-CE	Note
EN 55022: 1998 + A1: 2000 + A2: 2003	The requirements are fulfilled for CE certification see point 6.	Conducted emissions – Class B Radiated emissions – Class A
EN 61000-3-2: 2000	The requirements are fulfilled for CE certification see point 6.	PASS
EN 61000-3-3: 1995 + A1: 2001	The requirements are fulfilled for CE certification see point 6.	PASS
EN 61000-4-2: 1995 + A1: 1998 + A2: 2001	The requirements are fulfilled for CE certification see point 6.	Temporary degradation or loss of function or performance (criterion B according to EN 61000-6-3:2001/ EN 61000-6-2:2001)
EN 61000-4-4: 1995 + A1: 2001 + A2: 2001	The requirements are fulfilled for CE certification see point 6.	Temporary degradation or loss of function or performance (criterion B according to EN 61000-6-3:2001/ EN 61000-6-2:2001)
EN 61000-4-5: 1995 + A1: 2001	The requirements are fulfilled for CE certification see point 6.	Temporary degradation or loss of function or performance (criterion B according to EN 61000-6-3:2001/ EN 61000-6-2:2001)
EN 61000-4-6: 1996 + A1: 2001	The requirements are fulfilled for CE certification see point 6.	No temporary degradation or loss of function or performance (criterion A according to EN 61000-6-3:2001/ EN 61000-6-2:2001)
EN 61000-4-8: 1993 + A1: 2001	The requirements are fulfilled for CE certification see point 6.	No temporary degradation or loss of function or performance (criterion A according to EN 61000-6-3:2001/ EN 61000-6-2:2001)
EN 61000-4-11: 1994 + A1: 2001	The requirements are fulfilled for CE certification see point 6.	Temporary degradation or loss of function or performance (criterion B & C according to EN 61000-6-3:2001/ EN 61000-6-2:2001)

6. Annotations to Performed Tests and to CE certification

EMC-CE Basic Standards

EN 61000-6-3 + EN 61000-6-4 … Generic emission standards

EN 61000-6-1 + EN 61000-6-2 … Generic immunity standards

IEC 61000-3-2 (EN 61000-3-2)

Limits for harmonic current emissions (equipment input current less than or equal to 16 A per phase; ≤75W) PowerFactorCorrector

IEC 61000 PT3-3 (EN 61000-3-3)

Limits for voltage fluctuation and flicker for equipment with rated current ≤ 16 A / ≤ 75 W PowerFactorCorrector

IEC 61000 PT4-2, ESD (EN 61000-4-2)

±4 kV Contact, ±8 kV Air, Criterion B

IEC 61000 PT4-4, BURST (EN 61000-4-4)

±2 kV DC/DC PSUs, Criterion B

±2 kV AC/DC PSUs, Criterion B

±1 kV data and control cables longer than 3 m (KONTRON longer than 1.5m), Criterion B

IEC 61000 PT4-5, SURGE (EN61000-4-5)

With AC input/output lines, the EUT undergoes five positive as well as five negative impulses

DC In/Output ±0.5 kV common and differential mode

AC Input port: ±1 kV differential / ±2 kV common mode

data cables ±1kV common mode, all cables longer than 30m (KONTRON longer than 3m), criterion B

(symmetrically and asymmetrically) at 90°, the same at 180° and at 270°.

IEC 61000 PT4-6, Radio-frequency common mode (EN 61000-4-6)

Refers to the conducted immunity requirements of electrical and electronic equipment to electromagnetic disturbance from intended radio-frequency (RF) transmitters in frequency range 150 kHz to 230MHz. Does not include equipment not having at least one conducting cable (i.e. mains supply, signal line or earth connection) which can couple the equipment to the disturbing RF.

Power lines and data lines: 10 V, 0.15-230 MHz, 80% AM, 150 Ω, Criterion A

IEC 61000 PT4-8, Magnetic field (EN 61000-4-8)

50 Hz, 30 A/m only for system which have parts, they can be influenced by magnetic field. Criterion A (for Monitor H>3A/m Criterion A)

IEC 61000 PT4-11, Voltage dips (EN61000-4-11)

Voltage dips, short interruptions and voltage variations immunity tests

AC Input: 30% - 10ms reduction, Criterion B

60% - 100ms and 1000ms reduction, Criterion C

>95% - 5000ms reduction, Criterion C

EN 55022

Conducted Emission (at the mains)

Class A:	**0,15 - 0,50 MHz**	**QP: 79**	**AV: 66 dBµV**
	0,50 - 30,0 MHz	**QP: 73**	**AV: 60 dBµV**
Class B:	**0,15 - 0,50 MHz**	**QP: 66-56**	**AV: 56-46 dBµV**
	0,50 - 5,0 MHz	**QP: 56**	**AV: 46 dBµV**
	5,0 - 30,0 MHz	**QP: 60**	**AV: 50 dBµV**

Conducted Emission (at the telecom terminal port))

Class A:	**0,15 - 0,50 MHz**	**QP: 97-87**	**AV: 84-74 dBµV**
	0,50 - 30,0 MHz	**QP: 87**	**AV: 74 dBµV**
Class B:	**0,15 - 0,50 MHz**	**QP: 84-74**	**AV: 74-64 dBµV**
	0,50 - 30,0 MHz	**QP: 74**	**AV: 64 dBµV**

Radiated Emission (for the 1m KONTRON distance, hitch with +10 dB (µV/m) **)**

Class A:	**30 - 230 MHz**	**40 dB(µV/m)/58,5**	**10m/1m**
	230 - 1000 MHz	**47 dB(µV/m)/58,5**	**10m/1m**
Class B:	**30 - 230 MHz**	**30 dB(µV/m)/48,5**	**10m/1m**
	230 - 1000 MHz	**37 dB(µV/m)/48,5**	**10m/1m**

Performed

ESD

At each test point 10 positive and 10 negative pulses are applied with a recovery time of at least 1 s.

Burst

Each AC/DC input/output line of the EUT undergoes with each single line and also all lines together of one port (N, L1, PE, GND) positive as well as negative impulses for 2 minutes each.

Each DATA line of the EUT undergoes positive as well as negative impulses for 2 minutes each.

The test procedure is executed for every test level up to the highest test level. Test is executed up to the highest specified test level (250 V or 500 V or 1000 V or 2000 V or 4000 V). Higher levels include all lower levels, i.e. if a 2000 V test is performed, a 250 V, a 500 V and a 1000 V test must also be performed.

Surge

With AC input/output lines, the EUT undergoes five positive as well as five negative impulses (symmetrically and asymmetrically) at 90°, the same at 180° and at 270°.

DC input/output lines, data lines and shielded lines undergo five positive as well as five negative impulses. DC input/output lines and data lines are tested symmetrically and asymmetrically.

The test procedure is executed for every test level up to the highest test level. Test is executed up to the highest specified test level (500 V or 1000 V or 2000 V or 4000 V). Higher levels include all lower levels, i.e. if a 2000 V test is performed, a 500 V and a 1000 V test must also be performed. Recovery time between the pulses is 60 seconds.

7. Referenced Regulations

(see section "Reference Standards" for identical national standards)

Regulation	Comment
EN 55022: 1998 + A1: 2000 + A2: 2003	Limits & methods of measurement of radio disturbance characteristics of information technology equipment
EN 61000-3-2: 2000	Electromagnetic compatibility (EMC) Part 3: Limits Section 2: Limits for harmonic current emissions (Equipment input current less than or equal to 16 A per phase) PowerFactorCorrector
EN 61000-3-3: 1995 + A1: 2001	Electromagnetic compatibility (EMC) Part 3: Limits Section 3: Limits for voltage fluctuation and flicker for equipment with rated current ≤ 16 A PowerFactorCorrector
EN 61000-4-2: 1995 + A1: 1998 + A2: 2001	Electromagnetic compatibility (EMC) Part 4: Testing and measuring techniques Section 2: Electrostatic discharge immunity test
EN 61000-4-4: 1995 + A1: 2001 + A2: 2001	Electromagnetic compatibility (EMC) Part 4: Testing and measuring techniques Section 4: Electrical fast transients/Burst immunity test
EN 61000-4-5: 1995 + A1: 2001	Electromagnetic compatibility (EMC) Part 4: Testing and measuring techniques Section 5: Surge immunity test
EN 61000-4-6: 1996 + A1: 2001	Electromagnetic compatibility (EMC) Part 4: Testing and measuring techniques Section 6: Immunity to conducted disturbances induced by radio frequency fields
EN 61000-4-8: 1993 + A1: 2001	Electromagnetic compatibility (EMC) Part 4: Testing and measuring techniques Section 8: Power frequency magnetic field immunity test
EN 61000-4-11: 1994 + A1: 2001	Electromagnetic compatibility (EMC) Part 4: Testing and measuring techniques Section 11:Voltage dips, short interruptions and voltage variations immunity tests
Special standard	

8. List of Test Equipment

8.1 Radio Interference Emission Testing

	Type	Model	Equipment No.	Manufacturer
✓	EMI test receiver	ESMI	PM-EM-3158-1	Rohde & Schwarz
✓	LISN	ESH3-Z5	PM-EM-3142-1	Rohde & Schwarz
	LISN	ESH3-Z5	PM-EM-7561-1	Rohde & Schwarz
	LISN	ESH3-Z6	PM-EM-3136-1	Rohde & Schwarz
	LISN	ESH3-Z6	PM-EM-3137-1	Rohde & Schwarz
	LISN	ENV4200	PM-EM-7562-1	Rohde & Schwarz
✓	Pulse limiter	ESH3-Z2	PM-EM-3180-1	Rohde & Schwarz
	Pulse limiter	ESH3-Z2	PM-EM-7563-1	Rohde & Schwarz
	Current clamp	ESH2-Z1	PM-EM-3140-1	Rohde & Schwarz
	Current clamp	ESV-Z1	PM-EM-3140-1	Rohde & Schwarz
	Current clamp	F-61	PM-EM-7554-1	FCC
	Current clamp	F-65-A	PM-EM-8543-1	FCC
	Current clamp	F-36-4	PM-EM-6173-1	FCC
	Current clamp	F-2000	PM-EM-6171-1	FCC
✓	RF relays matrix	PSU	PM-EM-6101-1	Rohde & Schwarz
✓	HF room 10 kHz to 18 GHz	Shielded room	PM-EM-6172-1	Siemens Matsushita
	Drive quali. comp.	----------	PM-EM-8500-1	Kontron Elektronik

✓ (check mark in 1st column) = tested

8.2 Immunity Testing

	Type	Model	Equipment No.	Manufacturer
✓	Hybrid generator	NSG 650	PM-EM-3148-1	Schaffner
✓	Coupling/decoupling network for NSG 650	CDN 110	PM-EM-3149-1	Schaffner
✓	Coupling network for NSG 650 & CDN110	INA 202	PM-EM-4134-1	Schaffner
✓	Coupling network for NSG 650 & CDN110	INA 204	PM-EM-4136-1	Schaffner
✓	Coupling network for NSG 650 & CDN110	INA 206	PM-EM-4138-1	Schaffner
	Coupling/decoupling network for NSG 650 (data line)	CDN 115	PM-EM-4140-1	Schaffner
	40 Ω resistor for NSG 650 & CDN115	INA 110-40	PM-EM-7519-1	Schaffner
✓	HF room 10 kHz to18 GHz	Shielded room	PM-EM-6172-1	Siemens Matsushita
✓	ESD generator	NSG 435	PM-EM-9014	Schaffner
✓	19" Rack EN61000- 3-2/3-3/ 4-8/4-11/4-13	PHE5000/ PAS	PM-EM-6519-1	Spitzenberger & SPIES
✓	Burst generator	NSG 2025	PM-EM-6162-1	Schaffner
✓	Capacitive coupling clamp	CDN 8014	PM-EM-3147-1	Schaffner
	Oscilloscope	HM203-7	PM-EM-3184-1	Hameg
	Digital multimeter	Fluke 83	PM-EM-7560-1	FLUKE
	Coupling/decoupling network, coaxial lines	FCC-801-C1-N-50	PM-EM-7527-1	FCC
	Coupling/decoupling network, coaxial lines	FCC-801-C1-N-50	PM-EM-7529-1	FCC
	Coupling/decoupling network, single pole	FCC-801-M1-25	PM-EM-7531-1	FCC

✓ (check mark in 1st column) = tested

List of Test Equipment: Immunity Testing (continued)

	Type	Model	Equipment No.	Manufacturer
	Coupling/decoupling network, single pole	FCC-801-M2-25	PM-EM-7543-1	FCC
✓	Coupling/decoupling network, single pole	FCC-801-M3-25	PM-EM-7544-1	FCC
	EM clamp	F-203I-32mm	PM-EM-7534-1	FCC
	Decoupling clamp for EM clamp	F-203I-DCN-32mm	PM-EM-7535-1	FCC
✓	Current clamp 100 kHz to 230 MHz	F-120-9A	PM-EM-7546-1	FCC
✓	19" rack test system EN 61000-4-6	61000-4-6	PM-EM-7542-1	NeWeTec
	Current clamp	F-61	PM-EM-7554-1	FCC
	Current clamp	F-65A	PM-EM-7554-1	FCC
	Drive quali. comp.	----------	PM-EM-8500-1	Kontron Elektronik

✓ (check mark in 1st column) = tested

9. Photographs of EUT and Test Setup

9.1 Test Setup EN 55022, conducted & radiated emission

Limits & methods of measurement of radio disturbance characteristics of information technology equipment

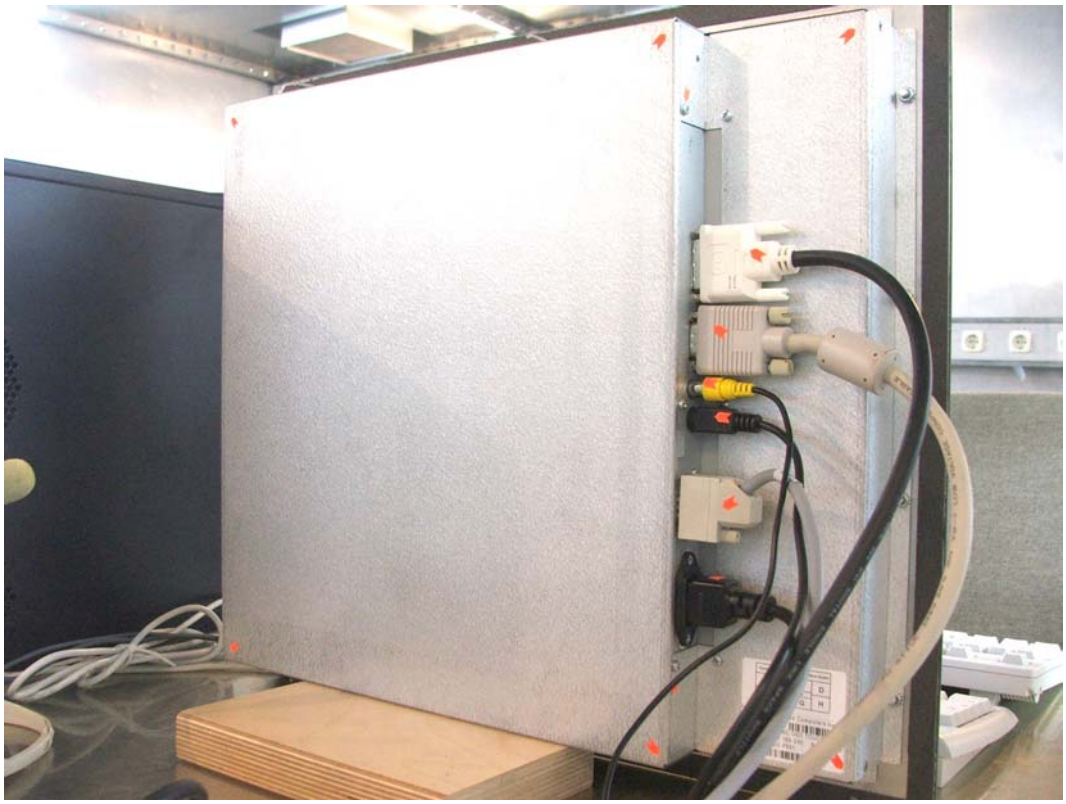
Radiated and Conducted Emissions Test (test distance 1m)

9.2 Test Setup EN 61000-4-2

Electrostatic discharge immunity test

Electrostatic discharge immunity test – pulses location

Electrostatic discharge immunity test – pulses location



9.3 Test Setup EN 61000-4-4

Burst immunity test

9.4 Test Setup EN 61000-4-5

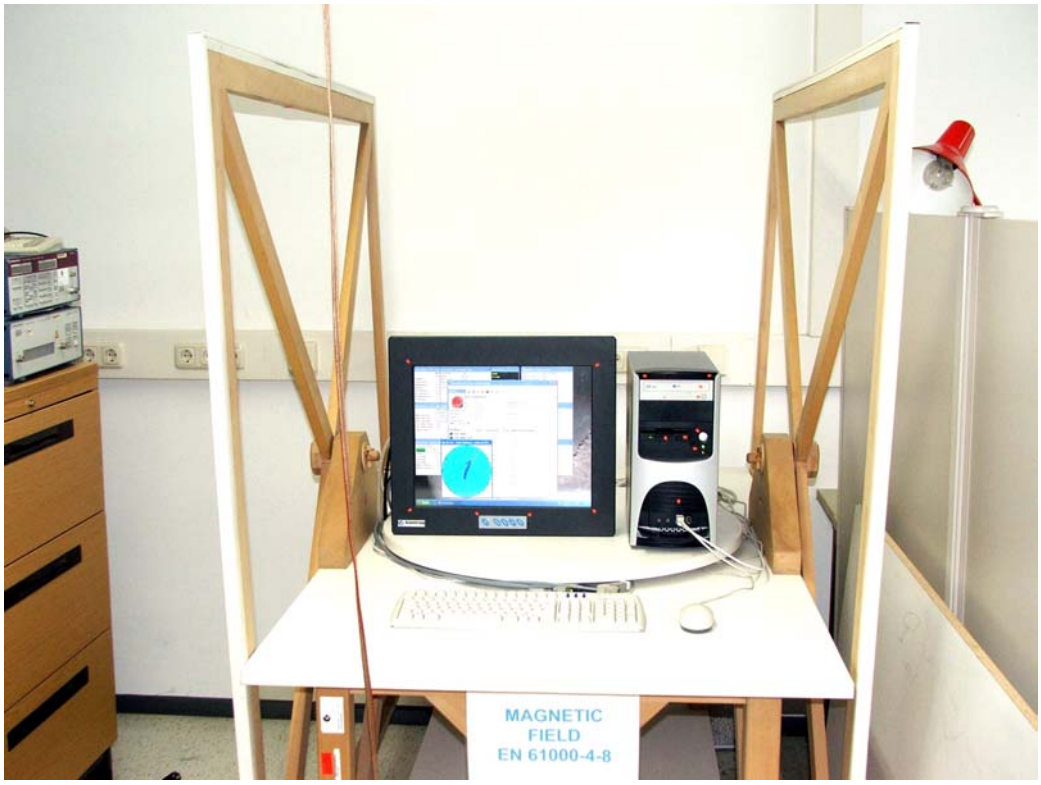
Surge immunity test

9.5 Test Setup EN 61000-4-6

Immunity to conducted disturbances induced by radio frequency fields test

9.6 Test Setup EN 61000-4-8

Power frequency magnetic field immunity test



9.7 Test Setup EN 61000-3-2; 3-3; 4-11

Harmonic current emissions, voltage fluctuations and flicker, voltage dips, short interruption and voltage variations immunity test

10. Test Report (Forms)

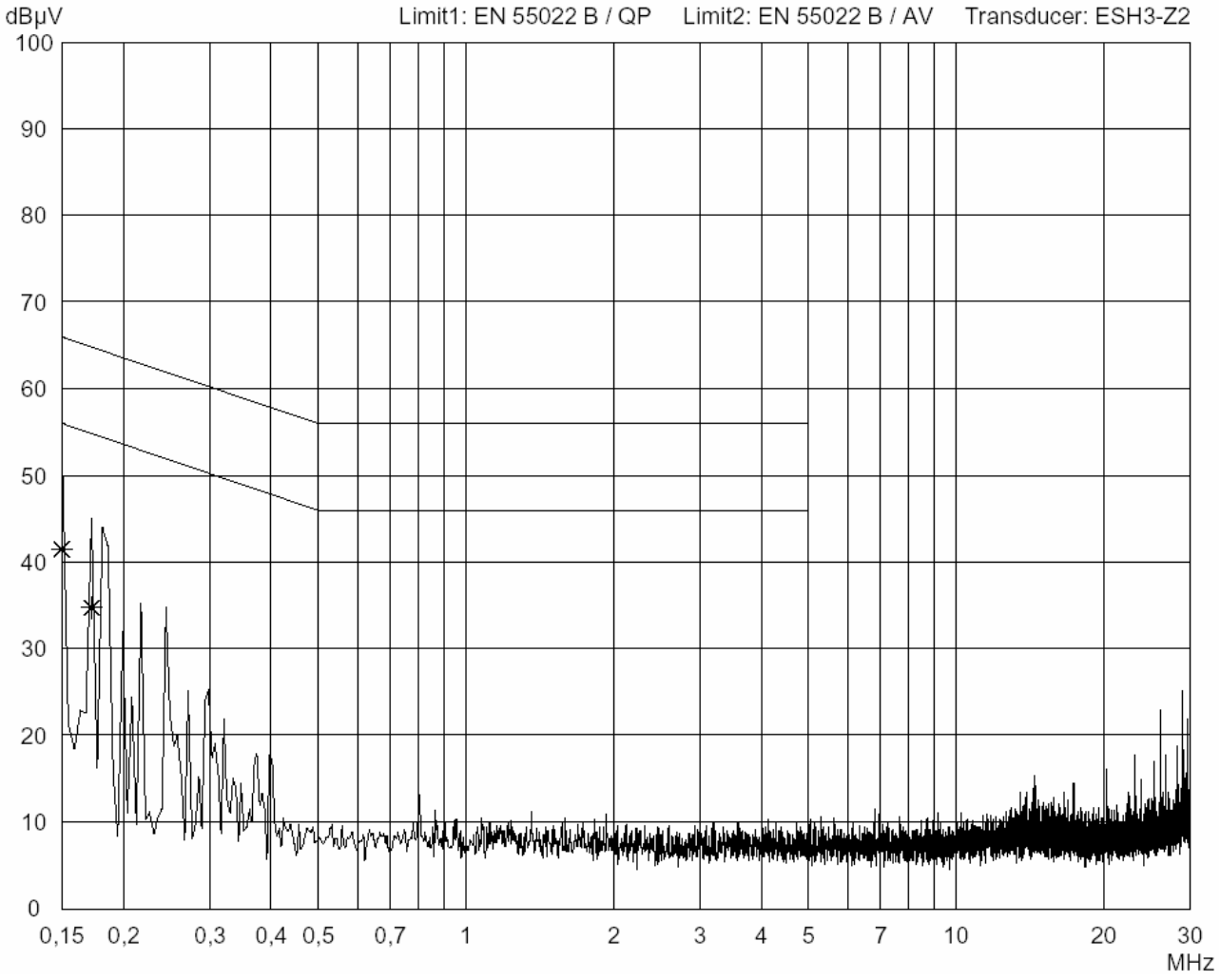
10.1 Test Report EN 55022

Radiated emissions – Class A

Conducted emissions – Class B

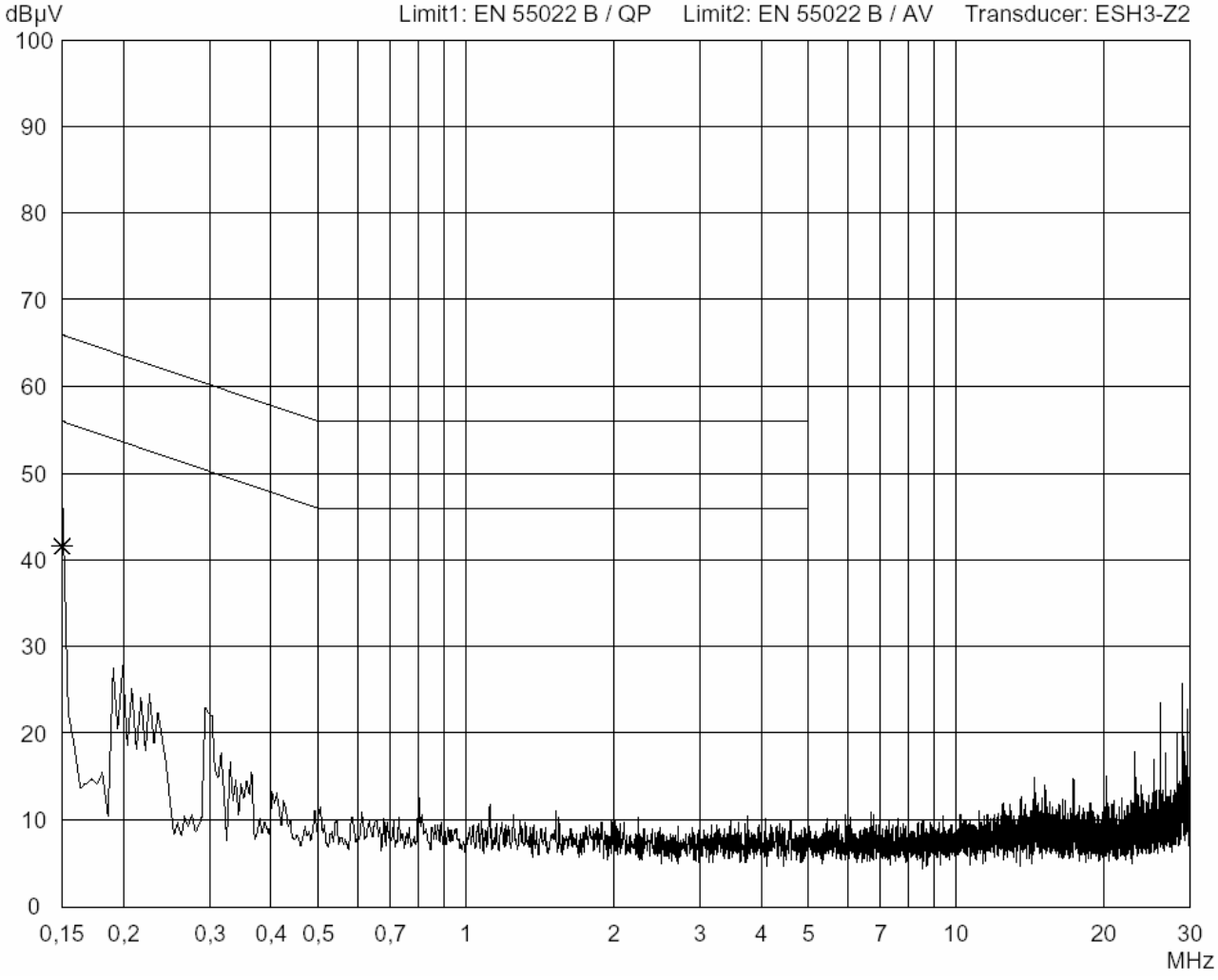
Conducted Emission Test 150 kHz - 30 MHz acc. to EN 55022 Class B / CISPR 22

Model: BSC813 & KFM19_e	Comment: KFM19_e - with cables - front side (0°)
Serial no.: prototypes	
Applicant: G. Dumsky	
Test site: Shielded room PM-EM-6172-1	
Tested on: Linecord Phase L	
Date of test: 03/14/2005 / Operator: P. Vesely	
Test performed: automatically / File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin 50 Subranges



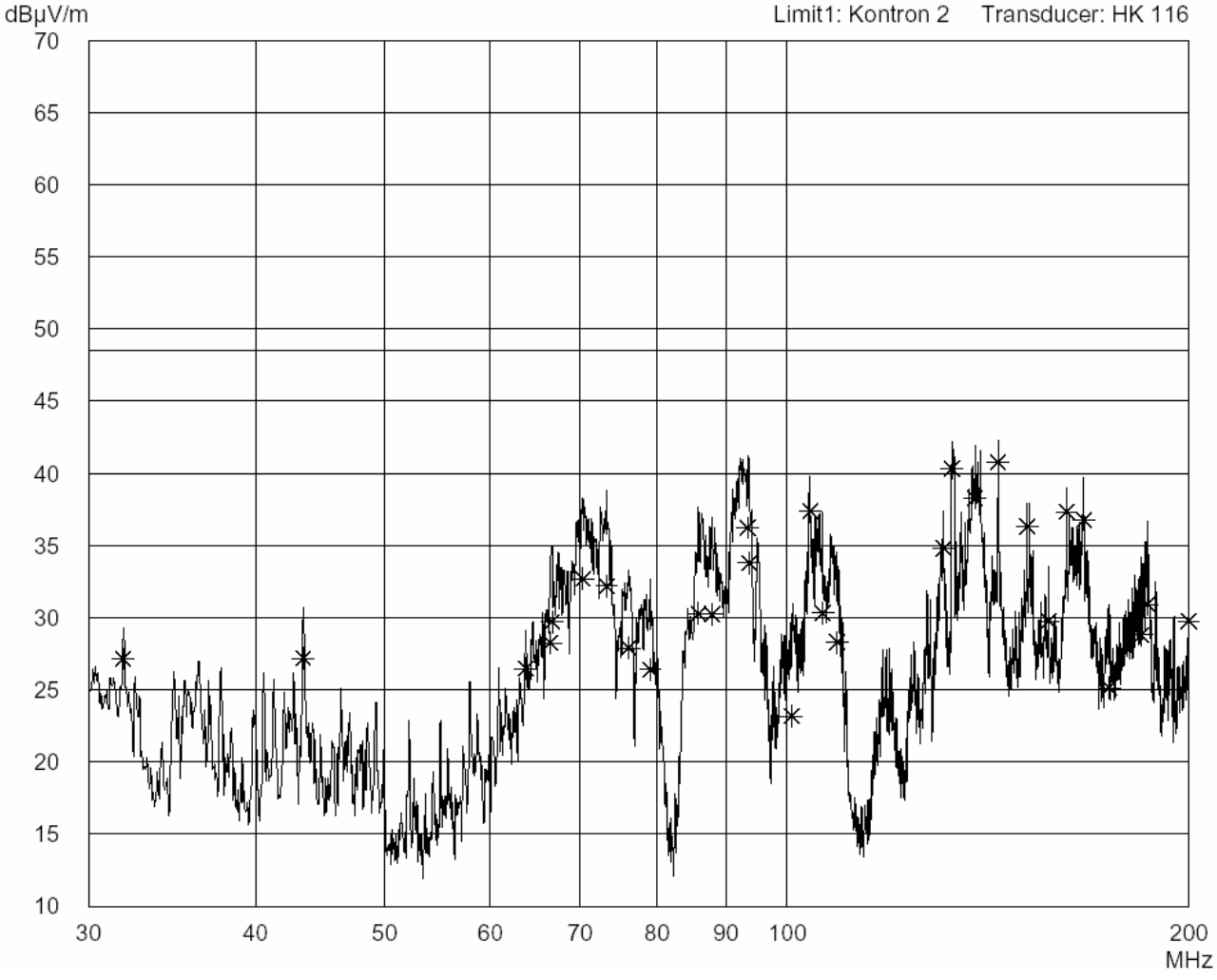
Conducted Emission Test 150 kHz - 30 MHz
acc. to EN 55022 Class B / CISPR 22

Model: BSC813 & KFM19_e	Comment: KFM19_e - with cables - front side (0°)
Serial no.: prototypes	
Applicant: G. Dumsky	
Test site: Shielded room PM-EM-6172-1	
Tested on: Linecord Phase N	
Date of test: 03/14/2005 / Operator: P. Vesely	
Test performed: automatically / File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin 50 Subranges



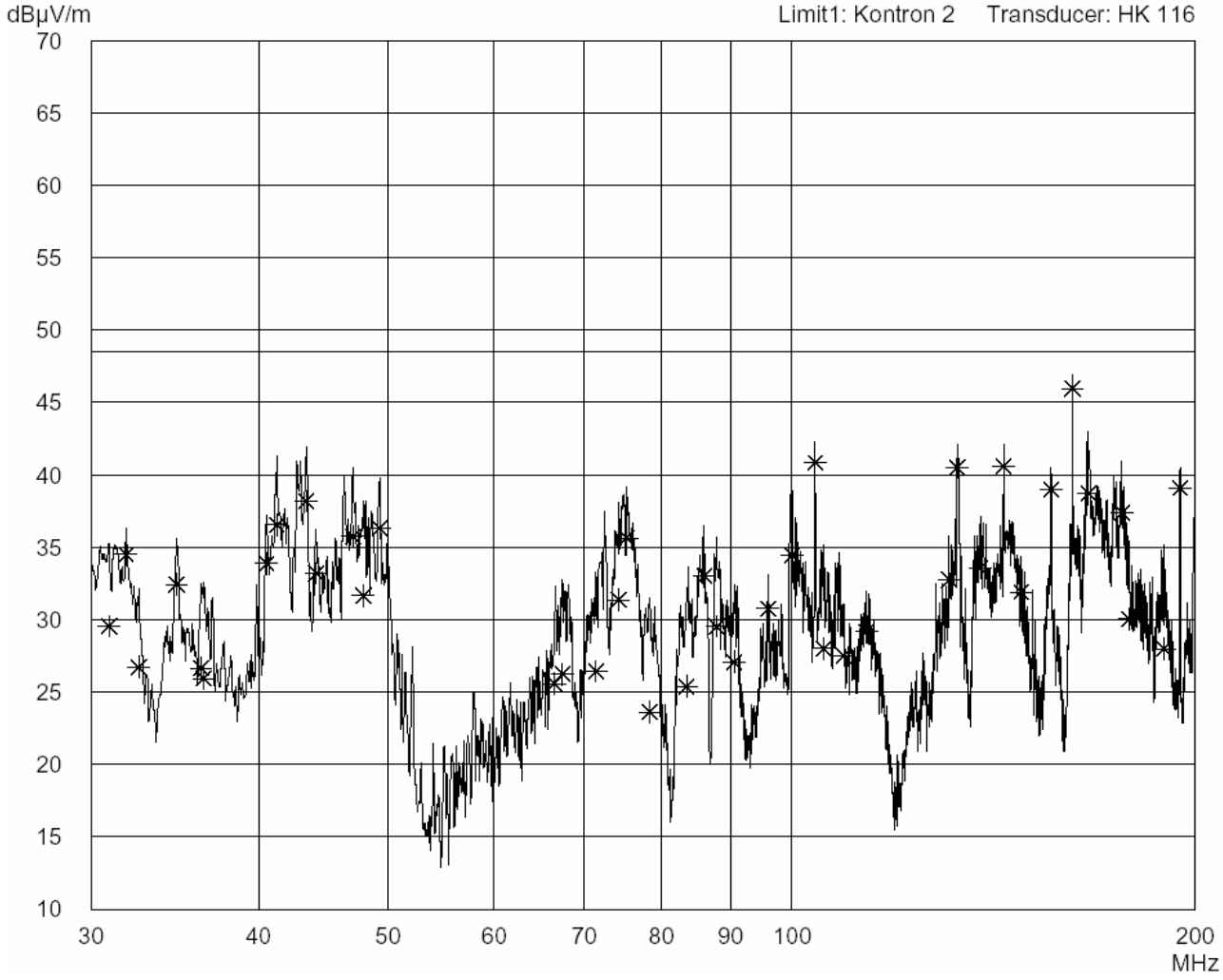
Radiated Emission Test 30 MHz - 200 MHz
acc. to KE_30MHz-200MHz

Model: BSC813 & KFM19_e	Comment: KFM19_e - with cables - front side (0°)
Serial no.: prototypes	
Applicant: G. Dumsky	
Test site: Shielded room PM-EM-6172-1	
Tested on: Distance 1m Horizontal Polarization	
Date of test: 03/14/2005 — Operator: P. Vesely	
Test performed: automatically — File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin — 50 Subranges



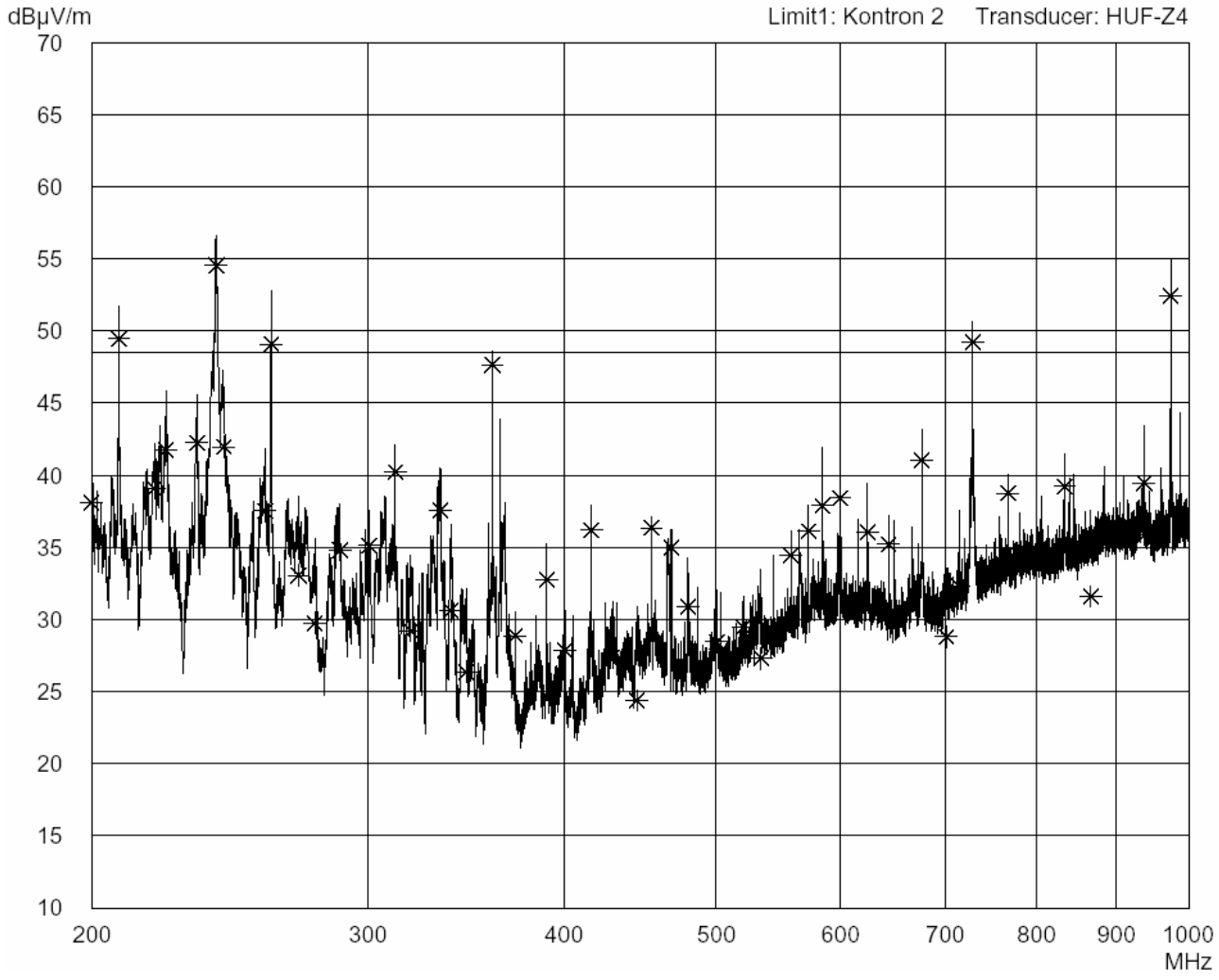
Radiated Emission Test 30 MHz - 200 MHz
acc. to KE_30MHz-200MHz

Model: BSC813 & KFM19_e	Comment: KFM19_e - with cables - front side (0°)
Serial no.: prototypes	
Applicant: G. Dumsky	
Test site: Shielded room PM-EM-6172-1	
Tested on: Distance 1m Vertical Polarization	
Date of test: 03/14/2005 — Operator: P. Vesely	
Test performed: automatically — File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin — 50 Subranges



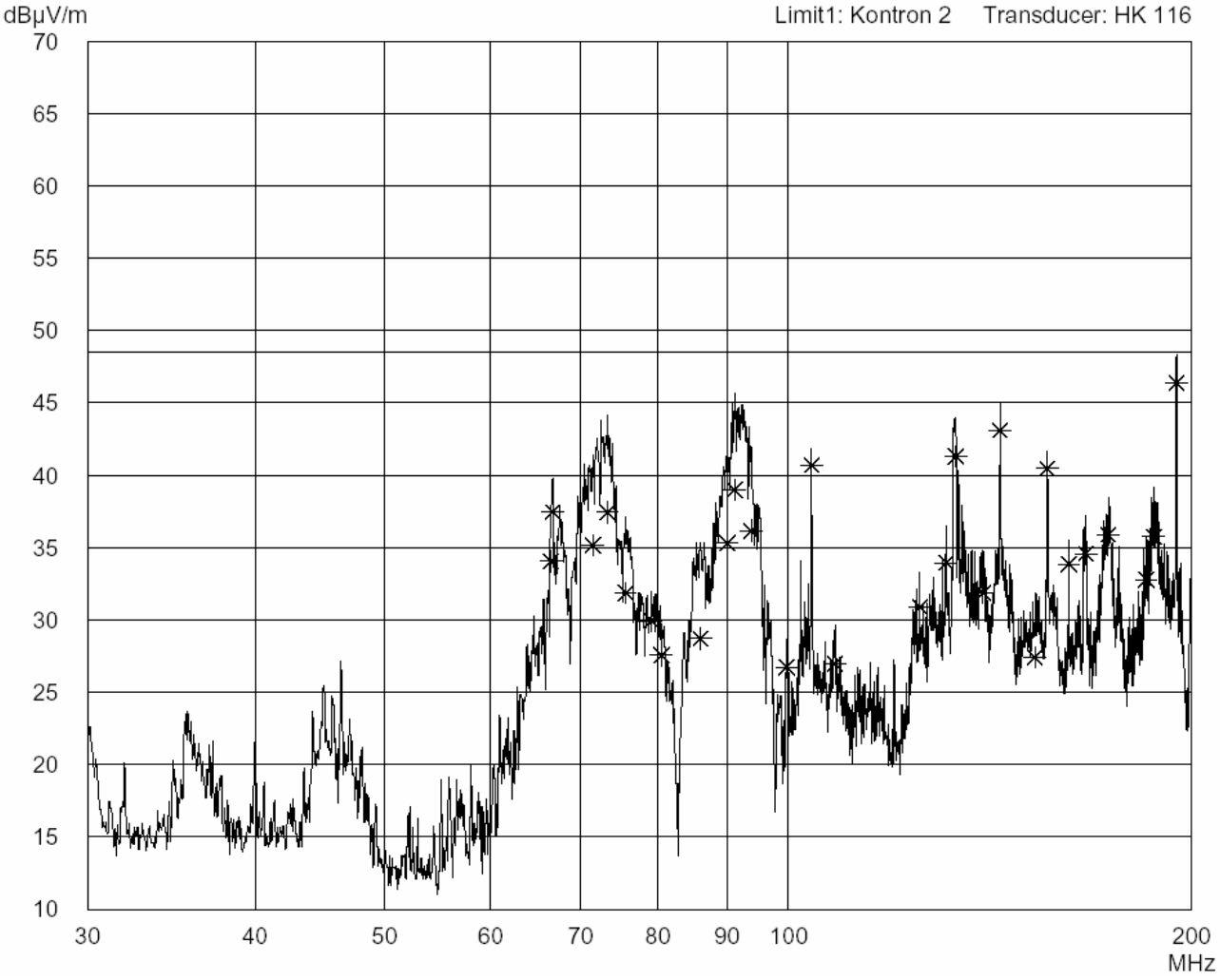
Radiated Emission Test 200 MHz - 1 GHz
acc. to KE_200MHz-2gHz

Model: BSC813 & KFM19_e	Comment: KFM19_e - with cables - front side (0°)
Serial no.: prototypes	
Applicant: G. Dumsky	
Test site: Shielded room PM-EM-6172-1	
Tested on: Distance 1m Circular Polarization	
Date of test: 03/14/2005 — Operator: P. Vesely	
Test performed: automatically — File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin — 50 Subranges



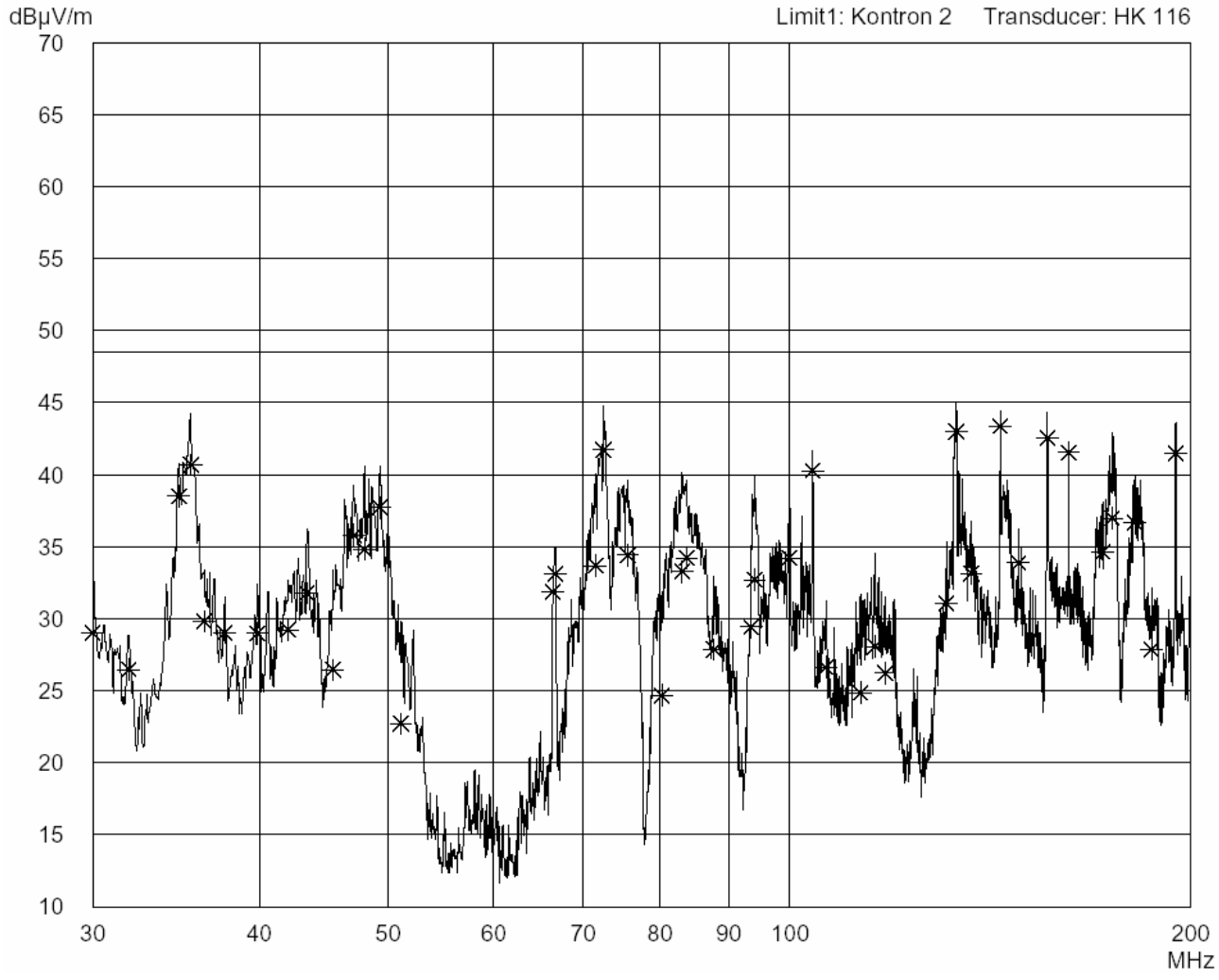
Radiated Emission Test 30 MHz - 200 MHz
acc. to KE_30MHz-200MHz

Model: BSC813 & KFM19_e	Comment: KFM19_e - with cables - right side (90°)
Serial no.: prototypes	
Applicant: G. Dumsky	
Test site: Shielded room PM-EM-6172-1	
Tested on: Distance 1m Horizontal Polarization	
Date of test: 03/14/2005 — Operator: P. Vesely	
Test performed: automatically — File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin — 50 Subranges



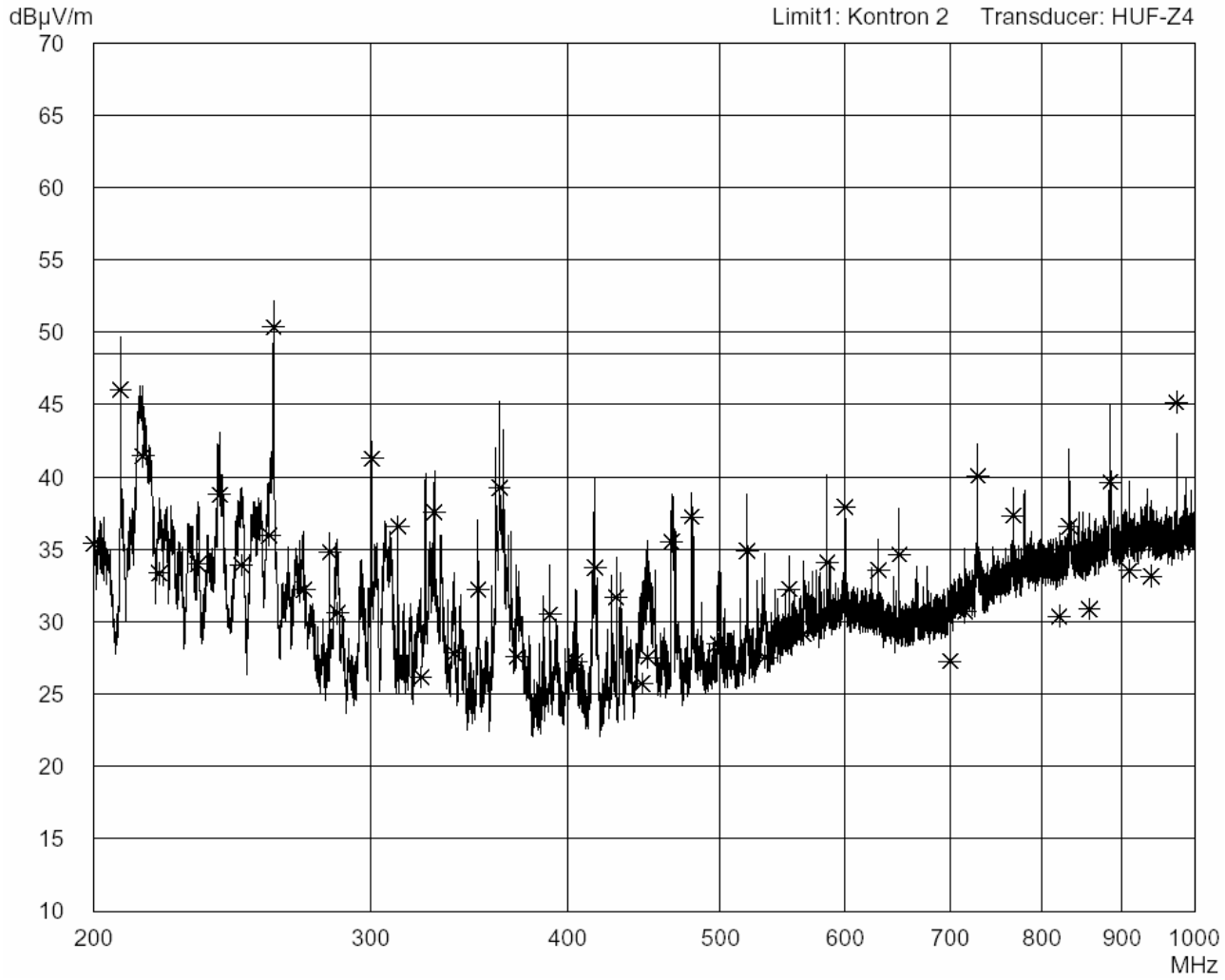
Radiated Emission Test 30 MHz - 200 MHz
acc. to KE_30MHz-200MHz

Model: BSC813 & KFM19_e	Comment: KFM19_e - with cables - right side (90°)
Serial no.: prototypes	
Applicant: G. Dumsky	
Test site: Shielded room PM-EM-6172-1	
Tested on: Distance 1m Vertical Polarization	
Date of test: 03/14/2005 — Operator: P. Vesely	
Test performed: automatically — File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin — 50 Subranges



Radiated Emission Test 200 MHz - 1 GHz
acc. to KE_200MHz-2gHz

Model: BSC813 & KFM19_e	Comment: KFM19_e - with cables - right side (90°)
Serial no.: prototypes	
Applicant: G. Dumsky	
Test site: Shielded room PM-EM-6172-1	
Tested on: Distance 1m Circular Polarization	
Date of test: 03/14/2005 — Operator: P. Vesely	
Test performed: automatically — File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin — 50 Subranges



10.2 Test Report EN 61000-3-2

Limits for harmonic current emissions

(Equipment input current less than or equal to 16 A per phase)
PowerFactorCorrector

Model:	KFM19_e AC
Applicant:	Kontron Embedded Computers AG
Operation mode:	Test software: see Point 4.1 (Operation Mode)
Regulation(s):	EN 61000-3-2: 2000
Requirements:	Harmonic n = 40; Unit: _Arms
Test result:	PASS
Classification:	The requirements are fulfilled
Date of test:	month: 03 day: 08 year: 2005
Tested by:	P. Vesely

Spitzenberger + Spies
Viechtach

Name:	Vesely P.	Serial no:	prototype
Department:	RD-V	Operating modes:	WIN XP; BurnIn Pro. 3.2
Company:	Kontron EC GmbH	Comment1:	-
Test report no:	300076.001	Comment2:	-
Device:	KFM19_e AC	Comment3:	-
Specimen:		Comment4:	-
Manufacturer:		Date:	08.03.2005
Type:		Test date:	08.03.2005

Maximum RMS current and corresponding values in timewindow 1:

Voltage:	229.90 Vrms		THD=0.06 %	THV=0.147 V	POHV=0.026 V
Current:	0.244 Arms	-0.333 Apk	THD=21.47 %	THC=0.044 A	POHC=0.004 A
Power:	43.9 W	P1=43.9 W	56.1 VA		
Powerfactor:	0.783	CosPhi1: 0.947			

Testconditions: EN 61000-3-2 / A14, f=50 Hz, Phase=1, Range=0.80 A, Rated power: 100.0 W

HARMONIC ANALYSIS: Test PASS
Tobs = entire measurement POHC: avg=0.004 A, limits=0.000 A Rated power exceeded and changed to 43.92 W

Ha	Entire measurement (0.320 s = 1 time window(s))						Worst 2.5 min		Average		PASS	FAIL
	Maximum	Window	EN61000-3-2 Class D 75W	Margin in MaxWin	100 to 150%	Ex-ceeded	100 to 150%	Ex-ceeded	Value	Ex-ceeded		
DC	0.0055 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	-0.0055 A	0	X	
1	0.2017 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.2017 A	0	X	
2	0.0053 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0053 A	0	X	
3	0.0340 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0340 A	0	X	
4	0.0011 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0011 A	0	X	
5	0.0253 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0253 A	0	X	
6	0.0010 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0010 A	0	X	
7	0.0075 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0075 A	0	X	
8	0.0004 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0004 A	0	X	
9	0.0042 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0042 A	0	X	
10	0.0005 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0005 A	0	X	
11	0.0054 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0054 A	0	X	
12	0.0004 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0004 A	0	X	
13	0.0011 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0011 A	0	X	
14	0.0005 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0005 A	0	X	
15	0.0025 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0025 A	0	X	
16	0.0004 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0004 A	0	X	
17	0.0034 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0034 A	0	X	
18	0.0003 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0003 A	0	X	
19	0.0010 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0010 A	0	X	
20	0.0001 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0001 A	0	X	
21	0.0027 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0027 A	0	X	
22	0.0002 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0002 A	0	X	
23	0.0020 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0020 A	0	X	
24	0.0002 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0002 A	0	X	
25	0.0013 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0013 A	0	X	
26	0.0004 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0004 A	0	X	
27	0.0014 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0014 A	0	X	
28	0.0001 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0001 A	0	X	
29	0.0014 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0014 A	0	X	
30	0.0002 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0002 A	0	X	
31	0.0004 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0004 A	0	X	
32	0.0000 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0000 A	0	X	
33	0.0007 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0007 A	0	X	
34	0.0001 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0001 A	0	X	
35	0.0007 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0007 A	0	X	
36	0.0002 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0002 A	0	X	
37	0.0002 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0002 A	0	X	
38	0.0002 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0002 A	0	X	
39	0.0006 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0006 A	0	X	
40	0.0003 A	1	-.- - - -	- - - . -	0	0	n.e.	n.e.	0.0003 A	0	X	

Spitzenberger + Spies
Viechtach

Name:	Vesely P.	Serial no:	prototype
Department:	RD-V	Operating modes:	WIN XP; BurnIn Pro. 3.2
Company:	Kontron EC GmbH	Comment1:	-
Test report no:	300076.001	Comment2:	-
Device:	KFM19_e AC	Comment3:	-
Specimen:		Comment4:	-
Manufacturer:		Date:	08.03.2005
Type:		Test date:	08.03.2005

Voltage:	229.90 Vrms		THD=0.06 %	THV=0.147 V	POHV=0.026 V
Current:	0.244 Arms	-0.333 Apk	THD=21.47 %	THC=0.044 A	POHC=0.004 A
Power:	43.9 W	P1=43.9 W	56.1 VA		
Powerfactor:	0.783	CosPhi1: 0.947			

Testconditions: EN 61000-3-2 / A14, f=50 Hz, Phase=1, Range=0.80 A, Rated power: 100.0 W

HARMONIC ANALYSIS: Test PASS in Timewindow 1 of 1
Rated power exceeded and changed to 43.92 W

Ha	Value	Percent	Angle	EN61000-3-2 Class D 75W	Margin	PASS	FAIL
DC	-0.0055 A	-2.74 %	- - - . - Deg	- . - - - -	- - - . -	X	
1	0.2017 A	100.00 %	18.7 Deg	- . - - - -	- - - . -	X	
2	0.0053 A	2.64 %	125.1 Deg	- . - - - -	- - - . -	X	
3	0.0340 A	16.84 %	-139.0 Deg	- . - - - -	- - - . -	X	
4	0.0011 A	0.56 %	-98.7 Deg	- . - - - -	- - - . -	X	
5	0.0253 A	12.53 %	-157.0 Deg	- . - - - -	- - - . -	X	
6	0.0010 A	0.51 %	39.1 Deg	- . - - - -	- - - . -	X	
7	0.0075 A	3.73 %	-155.0 Deg	- . - - - -	- - - . -	X	
8	0.0004 A	0.22 %	113.3 Deg	- . - - - -	- - - . -	X	
9	0.0042 A	2.09 %	50.8 Deg	- . - - - -	- - - . -	X	
10	0.0005 A	0.27 %	-35.3 Deg	- . - - - -	- - - . -	X	
11	0.0054 A	2.68 %	29.6 Deg	- . - - - -	- - - . -	X	
12	0.0004 A	0.21 %	48.1 Deg	- . - - - -	- - - . -	X	
13	0.0011 A	0.55 %	-9.1 Deg	- . - - - -	- - - . -	X	
14	0.0005 A	0.26 %	-171.0 Deg	- . - - - -	- - - . -	X	
15	0.0025 A	1.22 %	-143.4 Deg	- . - - - -	- - - . -	X	
16	0.0004 A	0.18 %	-79.8 Deg	- . - - - -	- - - . -	X	
17	0.0034 A	1.70 %	-161.1 Deg	- . - - - -	- - - . -	X	
18	0.0003 A	0.16 %	44.9 Deg	- . - - - -	- - - . -	X	
19	0.0010 A	0.50 %	146.0 Deg	- . - - - -	- - - . -	X	
20	0.0001 A	0.03 %	-86.4 Deg	- . - - - -	- - - . -	X	
21	0.0027 A	1.33 %	74.2 Deg	- . - - - -	- - - . -	X	
22	0.0002 A	0.12 %	-25.7 Deg	- . - - - -	- - - . -	X	
23	0.0020 A	0.98 %	49.5 Deg	- . - - - -	- - - . -	X	
24	0.0002 A	0.11 %	149.5 Deg	- . - - - -	- - - . -	X	
25	0.0013 A	0.62 %	0.8 Deg	- . - - - -	- - - . -	X	
26	0.0004 A	0.20 %	-145.9 Deg	- . - - - -	- - - . -	X	
27	0.0014 A	0.68 %	-71.5 Deg	- . - - - -	- - - . -	X	
28	0.0001 A	0.07 %	0.2 Deg	- . - - - -	- - - . -	X	
29	0.0014 A	0.72 %	-78.8 Deg	- . - - - -	- - - . -	X	
30	0.0002 A	0.11 %	90.8 Deg	- . - - - -	- - - . -	X	
31	0.0004 A	0.22 %	-71.0 Deg	- . - - - -	- - - . -	X	
32	0.0000 A	0.02 %	-115.5 Deg	- . - - - -	- - - . -	X	
33	0.0007 A	0.35 %	129.4 Deg	- . - - - -	- - - . -	X	
34	0.0001 A	0.06 %	33.2 Deg	- . - - - -	- - - . -	X	
35	0.0007 A	0.34 %	165.7 Deg	- . - - - -	- - - . -	X	
36	0.0002 A	0.11 %	157.0 Deg	- . - - - -	- - - . -	X	
37	0.0002 A	0.08 %	-110.4 Deg	- . - - - -	- - - . -	X	
38	0.0002 A	0.08 %	-72.2 Deg	- . - - - -	- - - . -	X	
39	0.0006 A	0.32 %	-80.8 Deg	- . - - - -	- - - . -	X	
40	0.0003 A	0.14 %	26.3 Deg	- . - - - -	- - - . -	X	

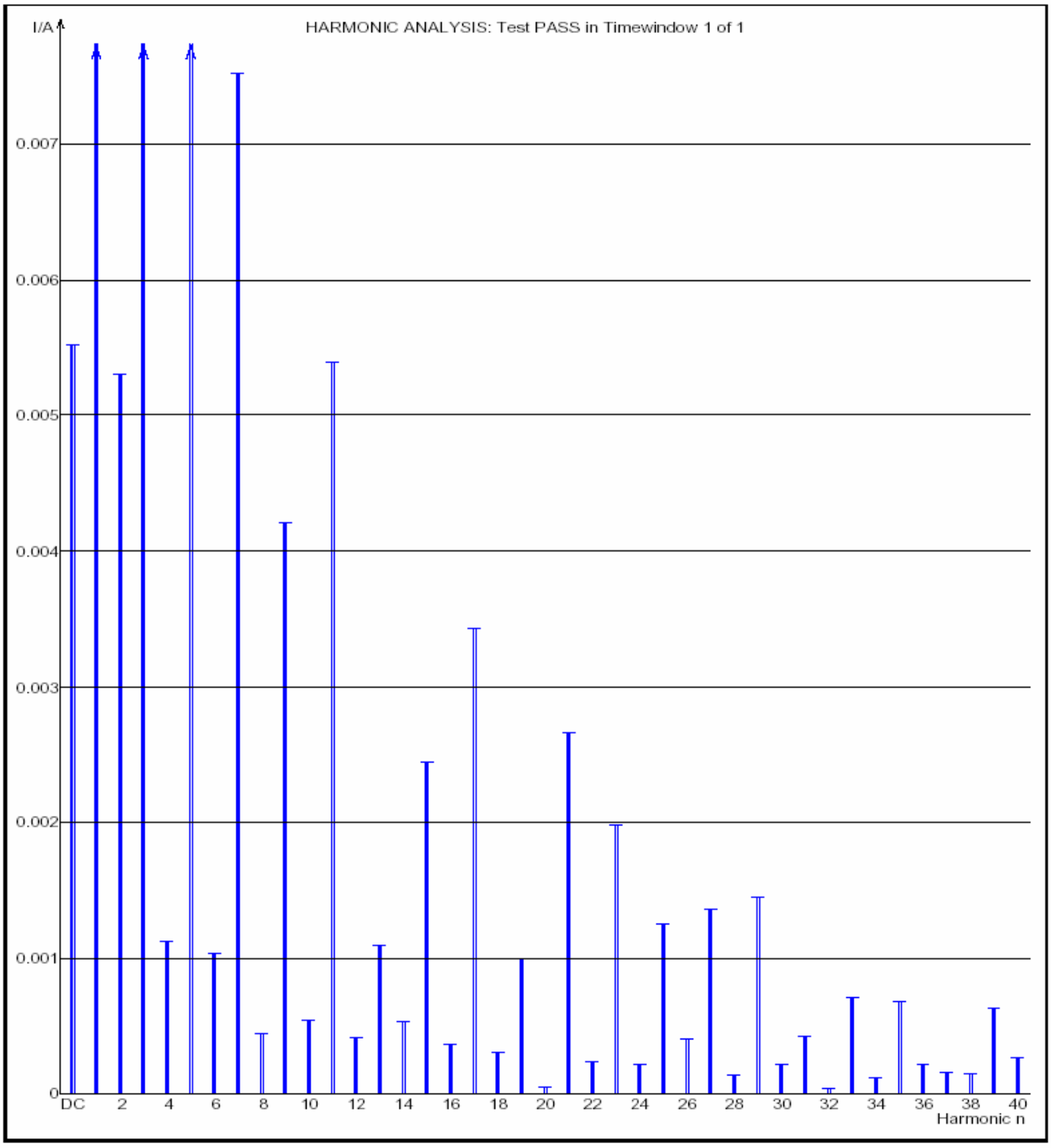
Spitzenberger + Spies
Viechtach

Name:	Vesely P.	Serial no:	prototype
Department:	RD-V	Operating modes:	WIN XP; BurnIn Pro. 3.2
Company:	Kontron EC GmbH	Comment1:	-
Test report no:	300076.001	Comment2:	-
Device:	KFM19_e AC	Comment3:	-
Specimen:		Comment4:	-
Manufacturer:		Date:	08.03.2005
Type:		Test date:	08.03.2005

Voltage:	229.90 Vrms		THD=0.06 %	THV=0.147 V	POHV=0.026 V
Current:	0.244 Arms	-0.333 Apk	THD=21.47 %	THC=0.044 A	POHC=0.004 A
Power:	43.9 W	P1=43.9 W	56.1 VA		
Powerfactor:	0.783	CosPhi1: 0.947			

Testconditions: EN 61000-3-2 / A14, f=50 Hz, Phase=1, Range=0.80 A

Spectrum Timewindow 1 of 1 - EN61000-3-2 Class D 75W



10.3 Test Report EN 61000-3-3

Limits for Voltage Fluctuation and Flicker

(Equipment input current less than or equal to 16 A per phase)

Model:	KFM19_e AC
Applicant:	Kontron Embedded Computers AG
Operation mode:	Test software: see Point 4.1 (Operation Mode)
Regulation(s):	EN 61000-3-3: 1995 + A1: 2001
Requirements:	Short-time flicker $P_{st} \leq 1$ (Observations 1x10 min) sliding $P_{lt} \leq 0{,}65$; $d_C \leq$ 3,3 (%); $d_{max} \leq 4$ (%); $d(t) > 3{,}3\%$ (Sec)
Test result:	PASS
Classification:	The requirements are fulfilled.
Date of test:	month: 03 day: 08 year: 2005
Tested by:	P. Vesely

Spitzenberger + Spies
Viechtach

Name:	Vesely P.	Serial no:	prototype
Department:	RD-V	Operating modes:	WIN XP; BurnIn Pro. 3.2
Company:	Kontron EC GmbH	Comment1:	-
Test report no:	300076.001	Comment2:	-
Device:	KFM19_e AC	Comment3:	-
Specimen:		Comment4:	-
Manufacturer:		Date:	08.03.2005
Type:		Test date:	08.03.2005

Testconditions: 230 V / 50 Hz / Phase: 1 / Observations: 1 x 10 min

FLICKER: Test PASS!

Time	Pmax	Pst	Sliding Plt	d(t)>3.30% [s]	dmax [%]	dc [%]	PASS	FAIL
11:28:14	0.001	0.0300	- . - - - -	0.000	0.078	- . - - -	X	
Limits:		1.000	0.650	0.500	4.000	3.300		
Plt: 0.030000								
Evaluated: PST, dc, dmax, d(t)								

FLICKER: Source test PASS!

Time	Pmax	Pst	Sliding Plt	d(t)>3.30% [s]	dmax [%]	dc [%]	PASS	FAIL
11:28:14	0.000	0.0080	- . - - - -	0.000	0.033	- . - - -	X	
Plt: 0.008000								
Evaluated: PST <= 0.4 dmax < 20% dmax1								

10.4 Test Report EN 61000-4-2

Electrostatic Discharge Immunity test – Indirect action

Model:	KFM19_e AC																		
Applicant:	Kontron Embedded Computers AG																		
Operation mode:	Test software: see Point 4.1 (Operation Mode)																		
Regulation(s):	EN 61000-4-2: 1995 + A1: 1998 + A2: 2001																		
Performed test:	Contact discharge										Air discharge								
Locations of discharge:	Several points close to EUT at horizontal coupling plate																		
Tested severity level/	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		kV
voltage:	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		kV
Locations of discharge:	Several points close to EUT at vertical coupling plate																		
Tested severity level/	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		kV
voltage:	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		kV
Performance criteria:	Temporary degradation or loss of function or performance (criterion B)																		
Test result:	No errors detected.																		
Classification:	The requirements are fulfilled.																		
Date of test:	month: 03 day: 01 year: 2005																		
Tested by:	P. Vesely																		

1 tested

1 not tested

10.5 Test Report EN 61000-4-2

Electrostatic Discharge Immunity test – Direct action

Model:	KFM19_e AC										
Applicant:	Kontron Embedded Computers AG										
Operation mode:	Test software: see Point 4.1 (Operation Mode)										
Regulation(s):	EN 61000-4-2: 1995 + A1: 1998 + A2: 2001										
Performed test:	Contact discharge					Air discharge					
Locations of discharge:	Whole surface of the EUT										
Tested severity level/	-	1	2	3	4	5	6	7	8		kV
voltage:	+	1	2	3	4	5	6	7	8		kV
Locations of discharge:	All conductive parts of EUT accessible to normal user										
Tested severity level/	-	1	2	3	4	5	6	7	8		kV
voltage:	+	1	2	3	4	5	6	7	8		kV
Performance criteria:	Temporary degradation or loss of function or performance (criterion B)										
Test result:	No errors detected.										
Classification:	The requirements are fulfilled.										
Date of test:	month: 03 day: 01 year: 2005										
Tested by:	P. Vesely										

1 tested 1 not tested

10.6 Test Report EN 61000-4-4

Electrical Fast Transients/Burst Immunity test - Power Lines (Coupling Filter)

Model:	KFM19_e AC							
Applicant:	Kontron Embedded Computers AG							
Operation mode:	Test software: see Point 4.1 (Operation Mode)							
Regulation(s):	EN 61000-4-4: 1995 + A1: 2001 + A2: 2001							
Performed test:	Capacitive coupling with coupling/decoupling network							
Coupling via:	Coupling filter							
Coupling to:	Power Line: N							
Tested severity level/	+		0.5	1.0	2.0	4.0		kV
pulse amplitude:	-		0.5	1.0	2.0	4.0		kV
Coupling to:	Power Line: L							
Tested severity level/	+		0.5	1.0	2.0	4.0		kV
pulse amplitude:	-		0.5	1.0	2.0	4.0		kV
Coupling to:	Power Line: PE							
Tested severity level/	+		0.5	1.0	2.0	4.0		kV
pulse amplitude	-		0.5	1.0	2.0	4.0		kV
Coupling to:	Power Line: N, L, PE							
Tested severity level/	+		0.5	1.0	2.0	4.0		kV
pulse amplitude:	-		0.5	1.0	2.0	4.0		kV
Performance criteria:	Temporary degradation or loss of function or performance (criterion B)							
Test result:	No inadmissible errors detected.							
Classification:	The requirements are fulfilled.							
Date of test:	month: 03 day: 03 year: 2005							
Tested by:	P. Vesely							
1 tested	1 not tested							

10.7 Test Report EN 61000-4-4

Electrical Fast Transients/Burst Immunity test - Data Lines (Coupling Clamp)

Model:	KFM19_e AC							
Applicant:	Kontron Embedded Computers AG							
Operation mode:	Test software: see Point 4.1 (Operation Mode)							
Regulation(s):	EN 61000-4-4: 1995							
Performed test:	Capacitive coupling with capacitive coupling clamp							
Coupling via:	Capacitive coupling clamp							
Coupling to:	Data Line: Coupling onto S-Video Test Cable							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude:	-	0.25	0.5	1.0	2.0	4.0		kV
Coupling to:	Data Line: Coupling onto C-Video Test Cable							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude	-	0.25	0.5	1.0	2.0	4.0		kV
Coupling to:	Data Line: Coupling onto COM1 Test Cable							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude	-	0.25	0.5	1.0	2.0	4.0		kV
Coupling to:	Data Line: Coupling onto VGA and DVI Test Cables							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude:	-	0.25	0.5	1.0	2.0	4.0		kV
Performance criteria:	Temporary degradation or loss of function or performance (criterion B)							
Test result:	No inadmissible errors detected.							
Classification:	The requirements are fulfilled.							
Date of test:	month: 03 day: 03 year: 2005							
Tested by:	P. Vesely							

1	tested	1	not tested

10.8 Test Report EN 61000-4-5

Surge Immunity test - Power Lines

Model:	KFM19_e AC							
Applicant:	Kontron Embedded Computers AG							
Operation mode:	Test software: see Point 4.1 (Operation Mode)							
Regulation(s):	EN 61000-4-5: 1995 + A1: 2001							
Performed test:	Capacitive coupling with coupling/decoupling network							
Coupling to:	Symmetrical coupling between L1 and L2							
Tested severity level/	+		0.5	1.0	2.0	4.0		kV
pulse amplitude:	-		0.5	1.0	2.0	4.0		kV
Coupling to:	Asymmetrical coupling onto L1							
Tested severity level/	+		0.5	1.0	2.0	4.0		kV
pulse amplitude:	-		0.5	1.0	2.0	4.0		kV
Coupling to:	Asymmetrical coupling onto L2							
Tested severity level/	+		0.5	1.0	2.0	4.0		kV
pulse amplitude:	-		0.5	1.0	2.0	4.0		kV
Performance criteria:	Temporary degradation or loss of function or performance (criterion B)							
Test result:	No inadmissible errors detected.							
Classification:	The requirements are fulfilled.							
Date of test:	month: 03 day: 08 year: 2005							
Tested by:	P. Vesely							

1 tested 1 not tested

10.9 Test Report EN 61000-4-5

Surge Immunity test - Shielded Data Lines

Model:	KFM19_e AC							
Applicant:	Kontron Embedded Computers AG							
Operation mode:	Test software: see Point 4.1 (Operation Mode)							
Regulation(s):	EN 61000-4-5: 1995 + A1: 2001							
Performed test:	coupling direct onto shield							
Coupling to:	Data Line: Coupling onto S-Video Test Cable							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude:	-	0.25	0.5	1.0	2.0	4.0		kV
Coupling to:	Data Line: Coupling onto C-Video Test Cable							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude:	-	0.25	0.5	1.0	2.0	4.0		kV
Coupling to:	Data Line: Coupling onto COM1 Test Cable							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude:	-	0.25	0.5	1.0	2.0	4.0		kV
Coupling to:	Data Line: Coupling onto VGA and DVI Test Cables							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude:	-	0.25	0.5	1.0	2.0	4.0		kV
Performance criteria:	Temporary degradation or loss of function or performance (criterion B)							
Test result:	No inadmissible errors detected.							
Classification:	The requirements are fulfilled.							
Date of test:	month: 03 day: 08 year: 2005							
Tested by:	P. Vesely							

1 tested 1 not tested

10.10 Test Report EN 61000-4-6

Immunity to Conducted Disturbances Induced by RF Fields – Power Lines

Model:	KFM19_e AC
Applicant:	Kontron Embedded Computers AG
Operation mode:	Test software: see Point 4.1 (Operation Mode)
Regulation(s):	EN 61000-4-6: 1996 + A1: 2001
Requirements:	150 kHz to 80 MHz : 10 V_{eff}
Interfering signal:	Modulation: AM Modulation depth: 80 % Modulation frequency: 1 kHz Step size: 1 % Dwell time: 1 s
Coupling to:	Power cables
Coupling with:	CDN: FCC-M3; S/N: 9720; PM-EM-7544-41
Performance criteria:	No temporary degradation or loss of function or performance (criterion A)
Test result:	No inadmissible errors detected.
Classification:	The requirements are fulfilled.
Date of test:	month: 03 day: 02 year: 2005
Tested by:	P. Vesely

10.11 Test Report EN 61000-4-6

Immunity to Conducted Disturbances Induced by RF Fields – Data Lines

Model:	KFM19_e AC
Applicant:	Kontron Embedded Computers AG
Operation mode:	Test software: see Point 4.1 (Operation Mode)
Regulation(s):	EN 61000-4-6: 1996 + A1: 2001
Requirements:	150 kHz to 80 MHz : 10 V_{eff}
Interfering signal:	Modulation: AM Modulation depth: 80 % Modulation frequency: 1 kHz Step size: 1 % Dwell time: 1 s
Coupling to:	COM1, S-Video, C-Video, VGA, DVI Test Cables
Coupling with:	F 120-9A; S/N: 20; PM-EM-7546-1
Performance criteria:	No temporary degradation or loss of function or performance (criterion A)
Test result:	No inadmissible errors detected.
Classification:	The requirements are fulfilled.
Date of test:	month: 03 day: 02 year: 2005
Tested by:	P. Vesely

10.12 Test Report EN 61000-4-8

Power Frequency Magnetic Field Immunity Test

Model:	KFM19_e AC
Applicant:	Kontron Embedded Computers AG
Operation mode:	Test software: see Point 4.1 (Operation Mode)
Regulation(s):	EN 61000-4-8: 1993 + A1: 2001
Requirements:	50 Hz; 30 A/m
Performance criteria:	No temporary degradation or loss of function or performance (criterion A)
Test result:	No inadmissible errors detected.
Classification:	The requirements are fulfilled.
Date of test:	month: 03 day: 10 year: 2005
Tested by:	P. Vesely

10.13 Test Report EN 61000-4-11

Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests

Model:	KFM19_e AC
Applicant:	Kontron Embedded Computers AG
Operation mode:	Test software: see Point 4.1 (Operation Mode)
Regulation(s):	EN 61000-4-11: 1994 + A1: 2001
Requirements:	AC input: 30% - 10ms reduction
Performance criteria:	Temporary degradation or loss of function or performance (criterion B)
Test result:	No errors detected.
Classification:	The requirements are fulfilled.
Date of test:	month: 03 day: 09 year: 2005
Tested by:	P. Vesely

10.14 Test Report EN 61000-4-11

Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests

Model:	KFM19_e AC
Applicant:	Kontron Embedded Computers AG
Operation mode:	Test software: see Point 4.1 (Operation Mode)
Regulation(s):	EN 61000-4-11: 1994 + A1: 2001
Requirements:	AC input: 60% - 100ms reduction and 60% - 1000ms reduction
Performance criteria:	Temporary degradation or loss of function or performance (criterion C)
Test result:	No errors detected.
Classification:	The requirements are fulfilled.
Date of test:	month: 03 day: 09 year: 2003
Tested by:	P. Vesely

10.15 Test Report EN 61000-4-11

Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests

Model:	KFM19_e AC
Applicant:	Kontron Embedded Computers AG
Operation mode:	Test software: see Point 4.1 (Operation Mode)
Regulation(s):	EN 61000-4-11: 1994 + A1: 2001
Requirements:	AC input: > 95% - 5000ms reduction
Performance criteria:	Temporary degradation or loss of function or performance (criterion C)
Test result:	No errors detected.
Classification:	The requirements are fulfilled.
Date of test:	month: 03 day: 09 year: 2005
Tested by:	P. Vesely

11. Measurement Uncertainty Values:

11.1 Emission Testing

Used measuring instrument	Unit	Tolerance
Test Receiver ESMI		< 1,5dB
LISN ESH3-Z5		≤ ± 20%
LISN ESH3-Z6		≤ ± 20%
LISN ENV4200		≤ ± 20%
Pulse Limiter ESH3-Z3		≤ ± 0,2dB
Cable attenuation incl. PSU 10kHz - 30MHz 30MHz - 200MHz 200MHz - 1GHz		 ≤ ± 0,5dB ≤ ± 1,5dB ≤ ± 2,7dB
Pre Amplifier ESMI-Z7		max. + 2dB/-1dB
Current Clamp -ESH2-Z1	uA	≤ ± 1dB
Current Clamp -ESV-Z1	uA	≤ ± 0,5dB
Current Clamp -F61	uA	≤ ± 1,8dB
Current Clamp F-65A	uA	≤ ± 1,8dB
Current Clamp F-36-4	uA	≤ ± 1,8dB
Current Clamp F-2000	uA	≤ ± 1,8dB

11.2 Immunity Testing

Used measuring instrument	Unit	Tolerance
Harmonics current PHE5000/PAS	Measured current	± 1 %
Flicker PHE5000/PAS	Higher than specified by IEC868 + AMD 1	
PHE5000/PAS	Adjusted voltage	± 1 %
ESD generator NSG 435	Air discharge	± 5 %
	Contact discharge	± 5 %
Burst generator NSG 2025	Test level voltage	± 10 %
	Frequency	± 2 %
	Phase angle	± 2°
	Pulse rise time: BNC output below 1500V BNC output above 1500V	 ± 30 % ± 20 %
	Mains output	± 30 %
	Pulse width:	± 30 %
	Generator impedance:	± 10 %
Surge generator NSG 650	Test level voltage	± 10 %
	Phase angle	V ≤ 4 kV ± 15° V > 4 kV ± 25°
Current Clamp -F61	uA	≤ ± 1,8dB
Current Clamp F-65A	uA	≤ ± 1,8dB
Current Clamp F-120-9A	uA	≤ ± 1,8dB
EM-Clamp	uA	≤ ± 1,8dB
19“ Rack EN61000-4-6	Frequency	≤ ± 0,1Hz
	Output Level	≤ ± 2dB

12. Reference Standards

Tested standard	Reference standards (identical/similar to)
EN 55022: 1998	DIN EN 55022: 1998 CISPR 22: 1997 NBN EN 55022: 1998 NEN EN 55022: 1995 NFC 91-022: 1987 NF EN 55022: 1994 + (AMD 1: 1996) SS EN 55022: 1994 + (AMD 1: 1995) VDE 0878(PT22): 1995 + (AMD 1: 1995)
EN 61000-3-2: 1995	BS EN 61000 PT3-2: 1995 DIN EN 61000 PT3-2: 1996 IEC 1000 PT3-2: 1995 NEN 11000-3-2: 1995 NF EN 61000-3-2: 1995 SS EN 61000-3-2: 1996 VDE 0838(PT2): 1996
EN 61000-3-3: 1995	BS EN 61000 PT3-3: 1995 DIN EN 61000 PT3-3: 1996 IEC 1000 PT3-3: 1994 NEN 11000-3-3: 1995 NF EN 61000-3-3: 1995 SS EN 61000-3-3: 1995 VDE 0838(PT3): 1996
EN 61000-4-2: 1995	IEC 1000-4-2: 1995 BS EN 61000-4-2: 1995 N EN 11000-4-2: 1995 NF EN 61000-4-2: 1995 DIN EN 61000-4-2: 1996 VDE 0847-4-2: 1996
EN 61000-4-4: 1995	BS EN 61000 PT4-4: 1995 DIN EN 61000 PT4-4: 1996 IEC 1000 PT4-4: 1995 NEN 11000-4-4: 1995 NF EN 61000-4-4: 1995 SS EN 61000-4-4: 1996 VDE 0847(PT4-4)+ AMD 1: 1997

Tested standard *continued*	**Reference standards (identical/similar to)** *continued*
EN 61000-4-5: 1995	IEC 1000-4-5: 1995 BS EN 61000-4-5: 1996 N EN 11000-4-5: 1995 NF EN 61000-4-5: 1995 SS EN 61000-4-5: 1996 DIN EN 61000-4-5: 1996 VDE 0847-4-5: 1996
EN 61000-4-6: 1996	BS EN 61000 PT4-6: 1997 DIN EN 61000 PT4-6: 1997 IEC 1000 PT4-6: 1996 NF EN 61000-4-6: 1997 SS EN 61000-4-6: 1996 VDE 0847(PT4-6): 1997
EN 61000-4-8: 1993	BS EN 61000 PT4-8: 1994 DIN EN 61000 PT4-8: 1994 IEC 1000 PT4-8: 1993 NBN EN 61000-4-8: 1995 NEN 11000-4-8: 1994 NF EN 61000-4-8: 1994 SS EN 61000-4-8: 1994 VDE 0847(PT4-8): 1994
EN 61000-4-11: 1994	BS EN 61000 PT4-11: 1994 DIN EN 61000 PT4-11: 1995 IEC 1000 PT4-11: 1994 NBN EN 61000-4-11: 1995 NF EN 61000-4-11: 1995 SS EN 61000-4-11: 1995 VDE 0847(PT4-11): 1995

Test Report

No. 300076.002
for KFM19_e DC

Test Laboratory:	Kontron Embedded Computers AG
	Oskar von Miller Straße 1 85386 Eching Germany
Applicant:	Kontron Embedded Computers AG
Purpose of Testing:	To show compliance with:
CE	EN 55022: 1998+ A1: 2000 + A2: 2003
CE	EN 61000-3-2: 1995 + A12: 1996 + A1: 1998 + A2: 1998 + A14: 2000
CE	EN 61000-3-3: 1995 + A1: 2001
CE	EN 61000-4-2: 1995 + A1: 1998 + A2: 2001
CE	EN 61000-4-4: 1995 + A1: 2001 + A2: 2001
CE	EN 61000-4-5: 1995 + A1: 2001
CE	EN 61000-4-6: 1996 + A1: 2001
CE	EN 61000-4-8: 1993 + A1: 2001
CE	EN 61000-4-11: 1994 + A1: 2001
Special Measurement:	none
	(see section "Reference Standards" for identical national standards)

Note:
The test data of this report relate only to the individual item tested.
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1. Table of Contents

2. Administrative Data

Equipment under test:	KFM19_e
optional Equipment under test:	none
Options/accessories:	none
Serial number:	prototype
Version of EUT:	DC

Applicant (full address):	Kontron Embedded Computers AG
Contract identification:	
Contact person:	Kuncl P.
Manufacturer:	Kontron Embedded Computers AG

Receipt of EUT:	1.3.2005
Date of test:	1.3.2005 ÷ 12.5.2005
Date of report	1.7.2005

Tested by:	Vesely P.
Test report by:	Vesely P.

3. Summary of Test Results

The tested sample fully fulfils the requirements set forth in:

EN 55022: 1998 + A1: 2000 + A2: 2003

EN 61000-3-2: 2000

EN 61000-3-3: 1995 + A1: 2001

EN 61000-4-2: 1995 + A1: 1998 + A2: 2001

EN 61000-4-4: 1995 + A1: 2001 + A2: 2001

EN 61000-4-5: 1995 + A1: 2001

EN 61000-4-6: 1996 + A1: 2001

EN 61000-4-8: 1993 + A1: 2001

EN 61000-4-11: 1994 + A1: 2001

(see section "Reference Standards" for identical national standards)

Ehrmeier A.
Technical Manager

Vesely P.
Test Engineer

4. Data of Operation Mode and Configuration of EUT

4.1 Operation Mode

Special Susceptibility tests:	
Susceptibility tests:	BitPro v3.2 and v4.0

4.2 Configuration of Cables of EUT

Shielded data cables connected.

4.3 Configuraion of EUT

Video-Controller:	Kontron CRTtoLCD2 - JILI
Display:	Fujitsu FLC48SXC8V-11AA
Touch-Controller:	DMC TSC-10/RSA
Backlight Inverter:	Green CC GH115A
Power supply:	Kontron 9-1130-3503
EMC Filter:	Schaffner FN2010-3-06

4.4 Configuration of Peripherals of EUT

Keyboard (< 1m):	none
Mouse (≤ 1m):	none
Monitor:	none
PC-Card (PCMCIA)	none
Monitor optional:	none
Configuration optional	none

Cables:	
VGA (shielded):	10m
DVI (shielded):	3m
Power optional	none
Ethernet1 (shielded):	none
Ethernet2 (shielded):	none
Ethernet3 (shielded):	none
Ethernet4 (shielded):	none
LPT1:	none
COM1:	1,5m
COM2:	none
USB1:	none
USB2:	none
USB3:	none
USB4:	none
HeadSet:	none
SCSI 1:	none
SCSI 2:	none
Alarmboard:	none
S-Video	1,5m
C-Video	1,5m

5. Performed Tests and Results

Test	Classification/Result-CE	Note
EN 55022: 1998 + A1: 2000 + A2: 2003	The requirements are fulfilled for CE certification see point 6.	Radiated emissions – Class A
EN 61000-3-2: 2000	The requirements are fulfilled for CE certification see point 6.	Not significant
EN 61000-3-3: 1995 + A1: 2001	The requirements are fulfilled for CE certification see point 6.	Not significant
EN 61000-4-2: 1995 + A1: 1998 + A2: 2001	The requirements are fulfilled for CE certification see point 6.	Temporary degradation or loss of function or performance (criterion B according to EN 61000-6-3:2001/ EN 61000-6-2:2001)
EN 61000-4-4: 1995 + A1: 2001 + A2: 2001	The requirements are fulfilled for CE certification see point 6.	Temporary degradation or loss of function or performance (criterion B according to EN 61000-6-3:2001/ EN 61000-6-2:2001)
EN 61000-4-5: 1995 + A1: 2001	The requirements are fulfilled for CE certification see point 6.	Temporary degradation or loss of function or performance (criterion B according to EN 61000-6-3:2001/ EN 61000-6-2:2001)
EN 61000-4-6: 1996 + A1: 2001	The requirements are fulfilled for CE certification see point 6.	No temporary degradation or loss of function or performance (criterion A according to EN 61000-6-3:2001/ EN 61000-6-2:2001)
EN 61000-4-8: 1993 + A1: 2001	The requirements are fulfilled for CE certification see point 6.	No temporary degradation or loss of function or performance (criterion A according to EN 61000-6-3:2001/ EN 61000-6-2:2001)
EN 61000-4-11: 1994 + A1: 2001	The requirements are fulfilled for CE certification see point 6.	Temporary degradation or loss of function or performance (criterion B & C according to EN 61000-6-3:2001/ EN 61000-6-2:2001)

6. Annotations to Performed Tests and to CE certification

EMC-CE Basic Standards

EN 61000-6-3 + EN 61000-6-4 … Generic emission standards

EN 61000-6-1 + EN 61000-6-2 … Generic immunity standards

IEC 61000-3-2 (EN 61000-3-2)

Limits for harmonic current emissions (equipment input current less than or equal to 16 A per phase; ≤75W) PowerFactorCorrector

IEC 61000 PT3-3 (EN 61000-3-3)

Limits for voltage fluctuation and flicker for equipment with rated current ≤ 16 A / ≤ 75 W PowerFactorCorrector

IEC 61000 PT4-2, ESD (EN 61000-4-2)

±4 kV Contact, ±8 kV Air, Criterion B

IEC 61000 PT4-4, BURST (EN 61000-4-4)

±2 kV DC/DC PSUs, Criterion B

±2 kV AC/DC PSUs, Criterion B

±1 kV data and control cables longer than 3 m (KONTRON longer than 1.5m), Criterion B

IEC 61000 PT4-5, SURGE (EN61000-4-5)

With AC input/output lines, the EUT undergoes five positive as well as five negative impulses

DC In/Output ±0.5 kV common and differential mode

AC Input port: ±1 kV differential / ±2 kV common mode

data cables ±1kV common mode, all cables longer than 30m (KONTRON longer than 3m), criterion B

(symmetrically and asymmetrically) at 90°, the same at 180° and at 270°.

IEC 61000 PT4-6, Radio-frequency common mode (EN 61000-4-6)

Refers to the conducted immunity requirements of electrical and electronic equipment to electromagnetic disturbance from intended radio-frequency (RF) transmitters in frequency range 150 kHz to 230MHz. Does not include equipment not having at least one conducting cable (i.e. mains supply, signal line or earth connection) which can couple the equipment to the disturbing RF.

Power lines and data lines: 10 V, 0.15-230 MHz, 80% AM, 150 Ω, Criterion A

IEC 61000 PT4-8, Magnetic field (EN 61000-4-8)

50 Hz, 30 A/m only for system which have parts, they can be influenced by magnetic field. Criterion A (for Monitor H>3A/m Criterion A)

IEC 61000 PT4-11, Voltage dips (EN61000-4-11)

Voltage dips, short interruptions and voltage variations immunity tests

AC Input: 30% - 10ms reduction, Criterion B

60% - 100ms and 1000ms reduction, Criterion C

>95% - 5000ms reduction, Criterion C

EN 55022

Conducted Emission (at the mains)

Class A:	**0,15 - 0,50 MHz**	**QP: 79**	**AV: 66 dBµV**
	0,50 - 30,0 MHz	**QP: 73**	**AV: 60 dBµV**
Class B:	**0,15 - 0,50 MHz**	**QP: 66-56**	**AV: 56-46 dBµV**
	0,50 - 5,0 MHz	**QP: 56**	**AV: 46 dBµV**
	5,0 - 30,0 MHz	**QP: 60**	**AV: 50 dBµV**

Conducted Emission (at the telecom terminal port))

Class A:	**0,15 - 0,50 MHz**	**QP: 97-87**	**AV: 84-74 dBµV**
	0,50 - 30,0 MHz	**QP: 87**	**AV: 74 dBµV**
Class B:	**0,15 - 0,50 MHz**	**QP: 84-74**	**AV: 74-64 dBµV**
	0,50 - 30,0 MHz	**QP: 74**	**AV: 64 dBµV**

Radiated Emission (for the 1m KONTRON distance, hitch with +10 dB (µV/m) **)**

Class A:	**30 - 230 MHz**	**40 dB(µV/m)/58,5**	**10m/1m**
	230 - 1000 MHz	**47 dB(µV/m)/58,5**	**10m/1m**
Class B:	**30 - 230 MHz**	**30 dB(µV/m)/48,5**	**10m/1m**
	230 - 1000 MHz	**37 dB(µV/m)/48,5**	**10m/1m**

Performed

ESD

At each test point 10 positive and 10 negative pulses are applied with a recovery time of at least 1 s.

Burst

Each AC/DC input/output line of the EUT undergoes with each single line and also all lines together of one port (N, L1, PE, GND) positive as well as negative impulses for 2 minutes each.

Each DATA line of the EUT undergoes positive as well as negative impulses for 2 minutes each.

The test procedure is executed for every test level up to the highest test level. Test is executed up to the highest specified test level (250 V or 500 V or 1000 V or 2000 V or 4000 V). Higher levels include all lower levels, i.e. if a 2000 V test is performed, a 250 V, a 500 V and a 1000 V test must also be performed.

Surge

With AC input/output lines, the EUT undergoes five positive as well as five negative impulses (symmetrically and asymmetrically) at 90°, the same at 180° and at 270°.

DC input/output lines, data lines and shielded lines undergo five positive as well as five negative impulses. DC input/output lines and data lines are tested symmetrically and asymmetrically.

The test procedure is executed for every test level up to the highest test level. Test is executed up to the highest specified test level (500 V or 1000 V or 2000 V or 4000 V). Higher levels include all lower levels, i.e. if a 2000 V test is performed, a 500 V and a 1000 V test must also be performed. Recovery time between the pulses is 60 seconds.

7. Referenced Regulations

(see section "Reference Standards" for identical national standards)

Regulation	Comment
EN 55022: 1998 + A1: 2000 + A2: 2003	Limits & methods of measurement of radio disturbance characteristics of information technology equipment
EN 61000-3-2: 2000	Electromagnetic compatibility (EMC) Part 3: Limits Section 2: Limits for harmonic current emissions (Equipment input current less than or equal to 16 A per phase) PowerFactorCorrector
EN 61000-3-3: 1995 + A1: 2001	Electromagnetic compatibility (EMC) Part 3: Limits Section 3: Limits for voltage fluctuation and flicker for equipment with rated current ≤ 16 A PowerFactorCorrector
EN 61000-4-2: 1995 + A1: 1998 + A2: 2001	Electromagnetic compatibility (EMC) Part 4: Testing and measuring techniques Section 2: Electrostatic discharge immunity test
EN 61000-4-4: 1995 + A1: 2001 + A2: 2001	Electromagnetic compatibility (EMC) Part 4: Testing and measuring techniques Section 4: Electrical fast transients/Burst immunity test
EN 61000-4-5: 1995 + A1: 2001	Electromagnetic compatibility (EMC) Part 4: Testing and measuring techniques Section 5: Surge immunity test
EN 61000-4-6: 1996 + A1: 2001	Electromagnetic compatibility (EMC) Part 4: Testing and measuring techniques Section 6: Immunity to conducted disturbances induced by radio frequency fields
EN 61000-4-8: 1993 + A1: 2001	Electromagnetic compatibility (EMC) Part 4: Testing and measuring techniques Section 8: Power frequency magnetic field immunity test
EN 61000-4-11: 1994 + A1: 2001	Electromagnetic compatibility (EMC) Part 4: Testing and measuring techniques Section 11:Voltage dips, short interruptions and voltage variations immunity tests
Special standard	

8. List of Test Equipment

8.1 Radio Interference Emission Testing

	Type	Model	Equipment No.	Manufacturer
✓	EMI test receiver	ESMI	PM-EM-3158-1	Rohde & Schwarz
✓	LISN	ESH3-Z5	PM-EM-3142-1	Rohde & Schwarz
	LISN	ESH3-Z5	PM-EM-7561-1	Rohde & Schwarz
	LISN	ESH3-Z6	PM-EM-3136-1	Rohde & Schwarz
	LISN	ESH3-Z6	PM-EM-3137-1	Rohde & Schwarz
	LISN	ENV4200	PM-EM-7562-1	Rohde & Schwarz
✓	Pulse limiter	ESH3-Z2	PM-EM-3180-1	Rohde & Schwarz
	Pulse limiter	ESH3-Z2	PM-EM-7563-1	Rohde & Schwarz
	Current clamp	ESH2-Z1	PM-EM-3140-1	Rohde & Schwarz
	Current clamp	ESV-Z1	PM-EM-3140-1	Rohde & Schwarz
	Current clamp	F-61	PM-EM-7554-1	FCC
	Current clamp	F-65-A	PM-EM-8543-1	FCC
	Current clamp	F-36-4	PM-EM-6173-1	FCC
	Current clamp	F-2000	PM-EM-6171-1	FCC
✓	RF relays matrix	PSU	PM-EM-6101-1	Rohde & Schwarz
✓	HF room 10 kHz to 18 GHz	Shielded room	PM-EM-6172-1	Siemens Matsushita
	Drive quali. comp.	----------	PM-EM-8500-1	Kontron Elektronik

✓ (check mark in 1st column) = tested

8.2 Immunity Testing

	Type	Model	Equipment No.	Manufacturer
✓	Hybrid generator	NSG 650	PM-EM-3148-1	Schaffner
✓	Coupling/decoupling network for NSG 650	CDN 110	PM-EM-3149-1	Schaffner
✓	Coupling network for NSG 650 & CDN110	INA 202	PM-EM-4134-1	Schaffner
✓	Coupling network for NSG 650 & CDN110	INA 204	PM-EM-4136-1	Schaffner
✓	Coupling network for NSG 650 & CDN110	INA 206	PM-EM-4138-1	Schaffner
	Coupling/decoupling network for NSG 650 (data line)	CDN 115	PM-EM-4140-1	Schaffner
	40 Ω resistor for NSG 650 & CDN115	INA 110-40	PM-EM-7519-1	Schaffner
✓	HF room 10 kHz to18 GHz	Shielded room	PM-EM-6172-1	Siemens Matsushita
✓	ESD generator	NSG 435	PM-EM-9014	Schaffner
✓	19" Rack EN61000- 3-2/3-3/ 4-8/4-11/4-13	PHE5000/ PAS	PM-EM-6519-1	Spitzenberger & SPIES
✓	Burst generator	NSG 2025	PM-EM-6162-1	Schaffner
✓	Capacitive coupling clamp	CDN 8014	PM-EM-3147-1	Schaffner
	Oscilloscope	HM203-7	PM-EM-3184-1	Hameg
	Digital multimeter	Fluke 83	PM-EM-7560-1	FLUKE
	Coupling/decoupling network, coaxial lines	FCC-801-C1-N-50	PM-EM-7527-1	FCC
	Coupling/decoupling network, coaxial lines	FCC-801-C1-N-50	PM-EM-7529-1	FCC
	Coupling/decoupling network, single pole	FCC-801-M1-25	PM-EM-7531-1	FCC

✓ (check mark in 1st column) = tested

List of Test Equipment: Immunity Testing (continued)

	Type	Model	Equipment No.	Manufacturer
✓	Coupling/decoupling network, single pole	FCC-801-M2-25	PM-EM-7543-1	FCC
	Coupling/decoupling network, single pole	FCC-801-M3-25	PM-EM-7544-1	FCC
	EM clamp	F-203I-32mm	PM-EM-7534-1	FCC
	Decoupling clamp for EM clamp	F-203I-DCN-32mm	PM-EM-7535-1	FCC
✓	Current clamp 100 kHz to 230 MHz	F-120-9A	PM-EM-7546-1	FCC
✓	19" rack test system EN 61000-4-6	61000-4-6	PM-EM-7542-1	NeWeTec
	Current clamp	F-61	PM-EM-7554-1	FCC
	Current clamp	F-65A	PM-EM-7554-1	FCC
	Drive quali. comp.	----------	PM-EM-8500-1	Kontron Elektronik

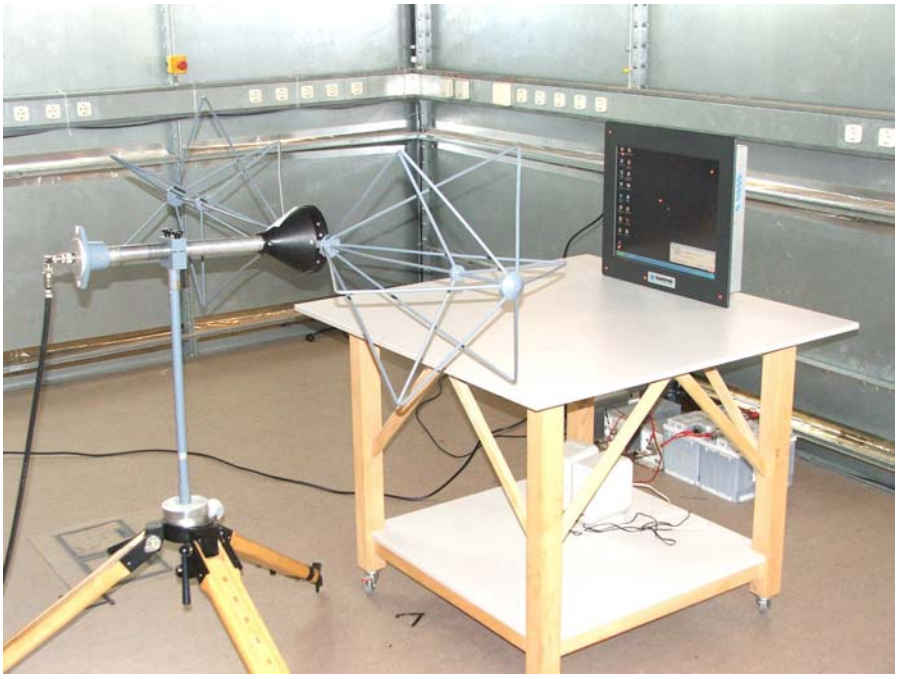
✓ (check mark in 1st column) = tested

9. Photographs of EUT and Test Setup

9.1 Test Setup EN 55022, conducted & radiated emission

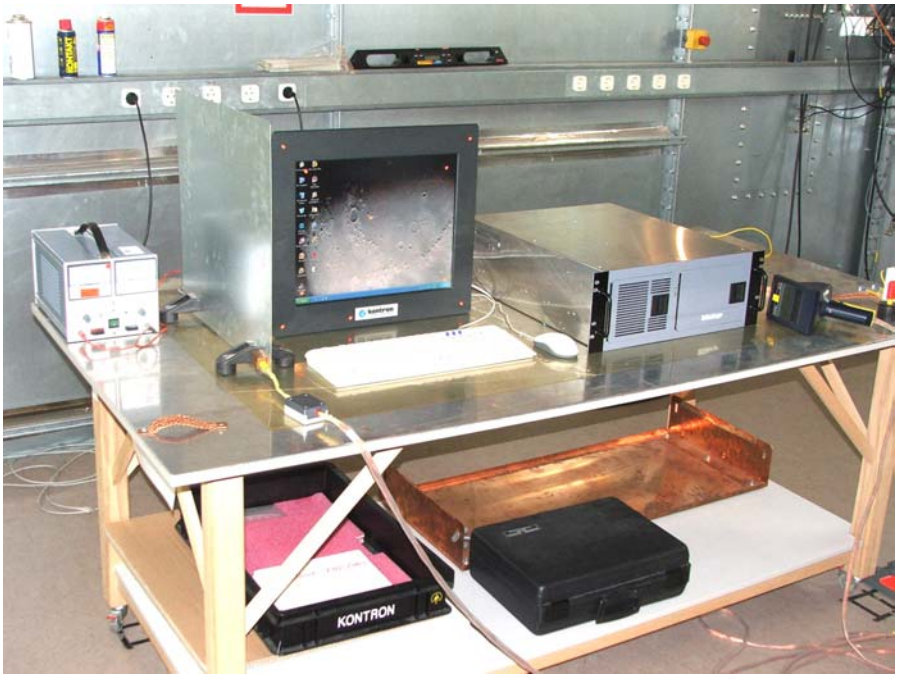
Limits & methods of measurement of radio disturbance characteristics of information technology equipment

Radiated and Conducted Emissions Test (test distance 1m)



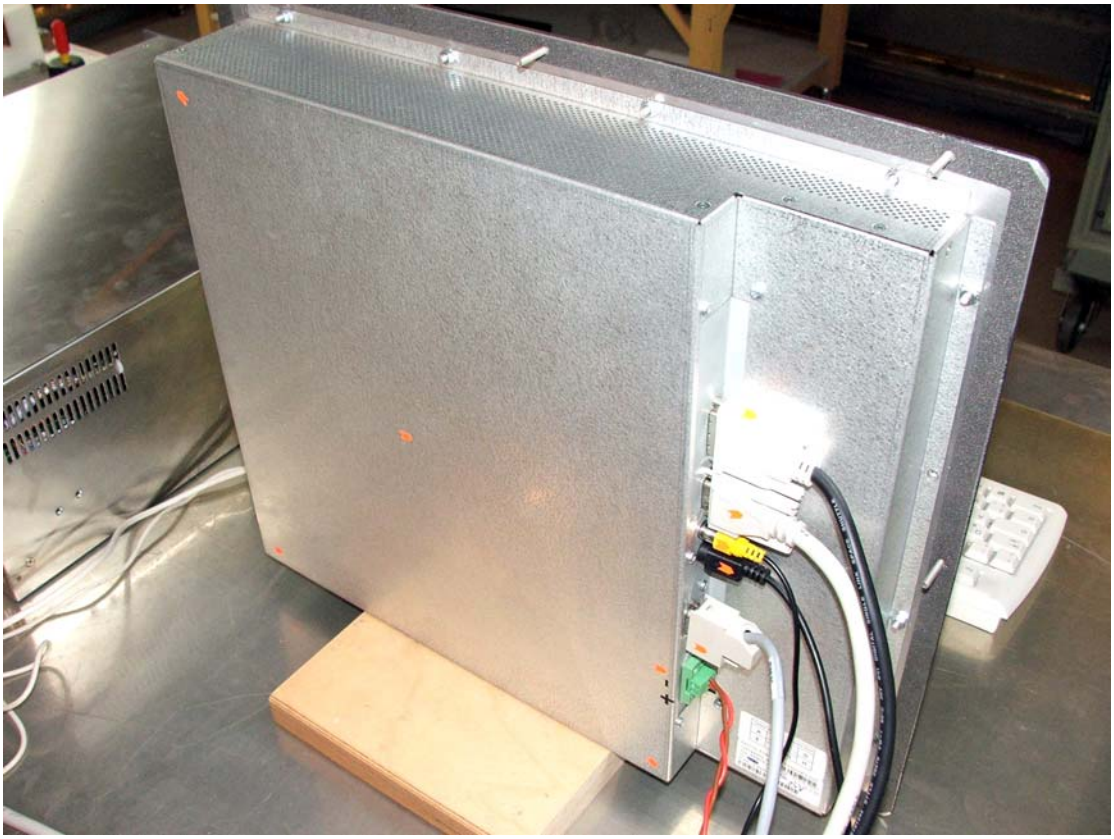
9.2 Test Setup EN 61000-4-2

Electrostatic discharge immunity test



Electrostatic discharge immunity test – pulses location

Electrostatic discharge immunity test – pulses location



9.3 Test Setup EN 61000-4-4

Burst immunity test

9.4 Test Setup EN 61000-4-5

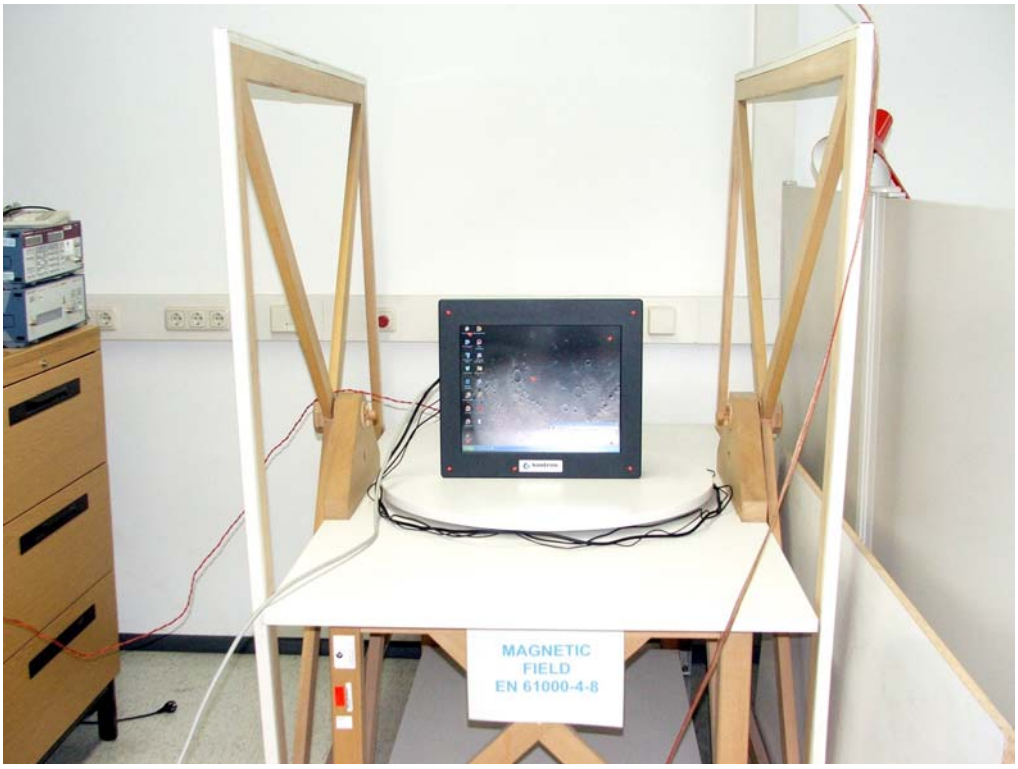
Surge immunity test

9.5 Test Setup EN 61000-4-6

Immunity to conducted disturbances induced by radio frequency fields test

9.6 Test Setup EN 61000-4-8

Power frequency magnetic field immunity test



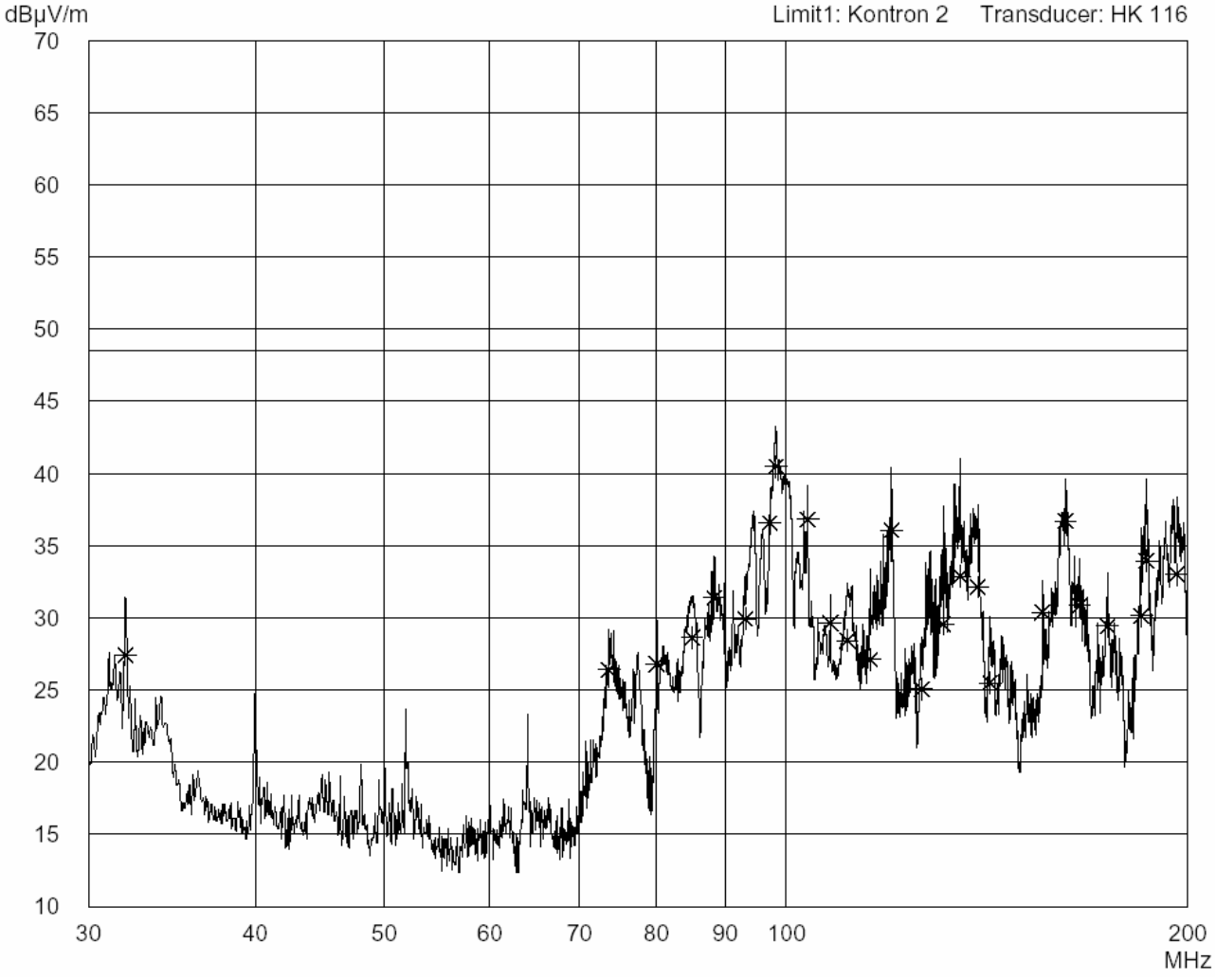
10. Test Report (Forms)

10.1 Test Report EN 55022

Radiated emissions – Class A

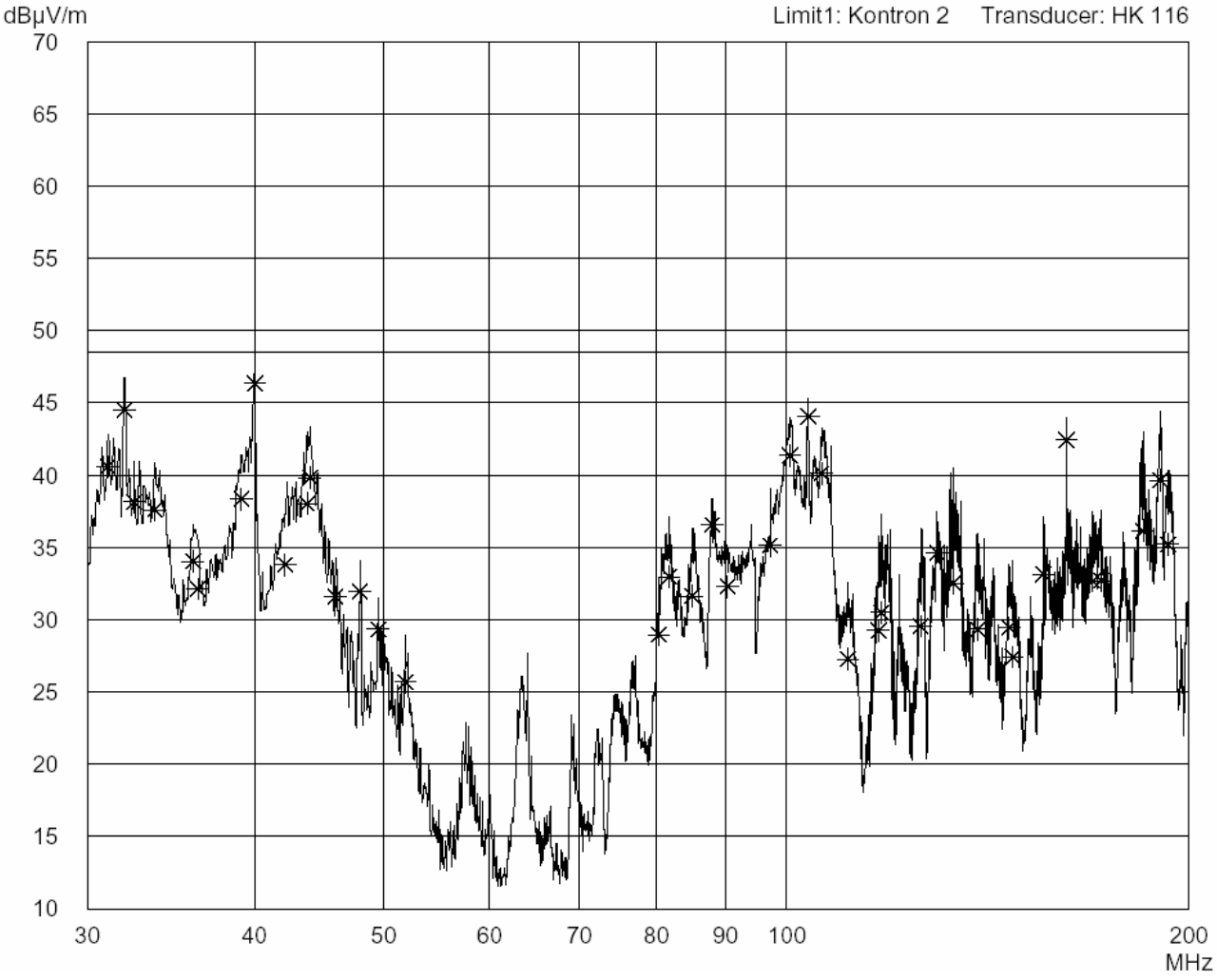
Radiated Emission Test 30 MHz - 200 MHz
acc. to KE_30MHz-200MHz

Model: KFM19_e DC	Comment: WinXP screen - power from car battery - front side (0°) - with cables
Serial no.: prototype	
Applicant: P. Kuncl	
Test site: Shielded room PM-EM-6172-1	
Tested on: Distance 1m Horizontal Polarization	
Date of test: 05/12/2005 — Operator: P. Vesely	
Test performed: automatically — File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin — 50 Subranges



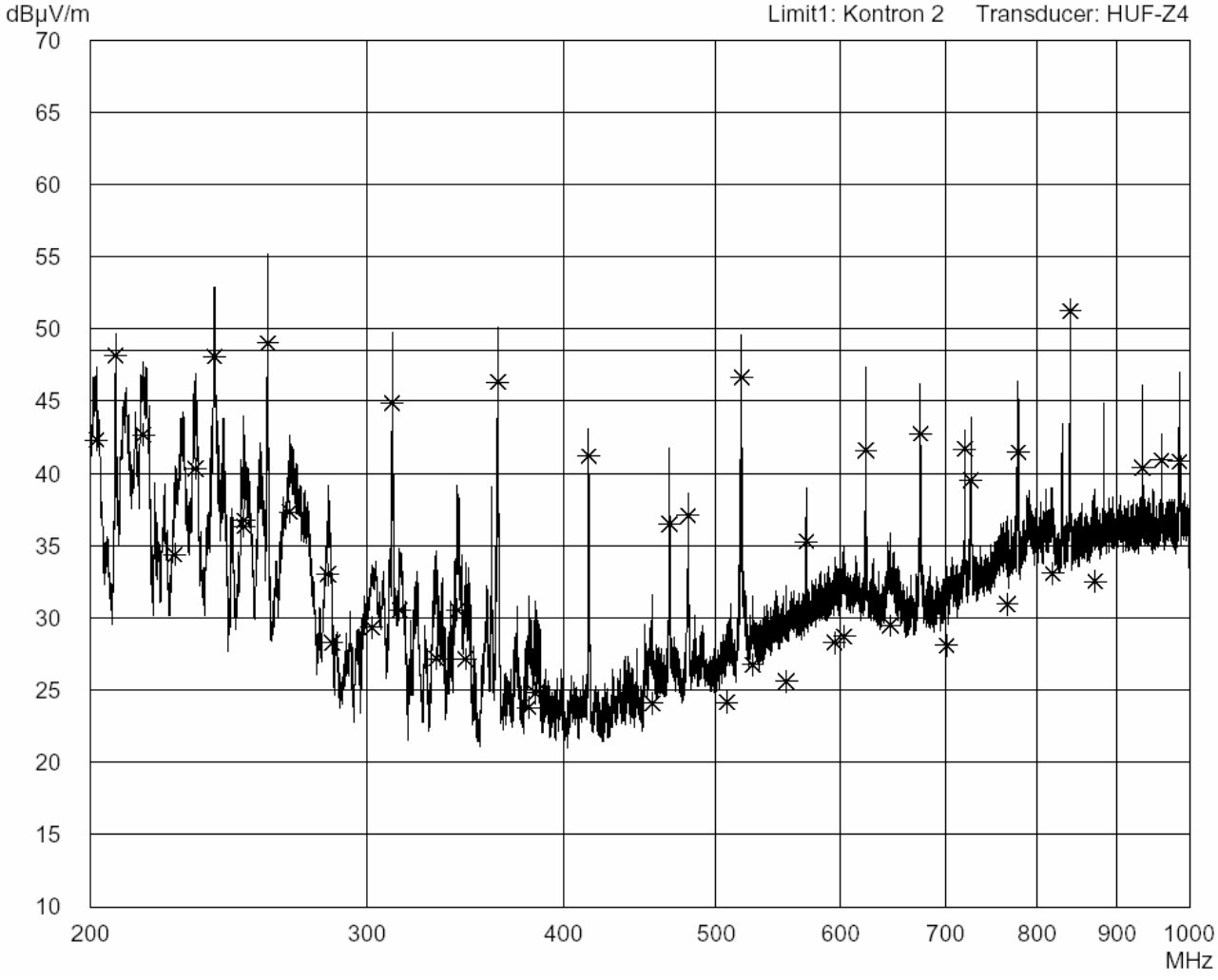
Radiated Emission Test 30 MHz - 200 MHz
acc. to KE_30MHz-200MHz

Model: KFM19_e DC	Comment: WinXP screen - power from car battery - front side (0°) - with cables
Serial no.: prototype	
Applicant: P. Kuncl	
Test site: Shielded room PM-EM-6172-1	
Tested on: Distance 1m Vertical Polarization	
Date of test: 05/12/2005 — Operator: P. Vesely	
Test performed: automatically — File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin — 50 Subranges



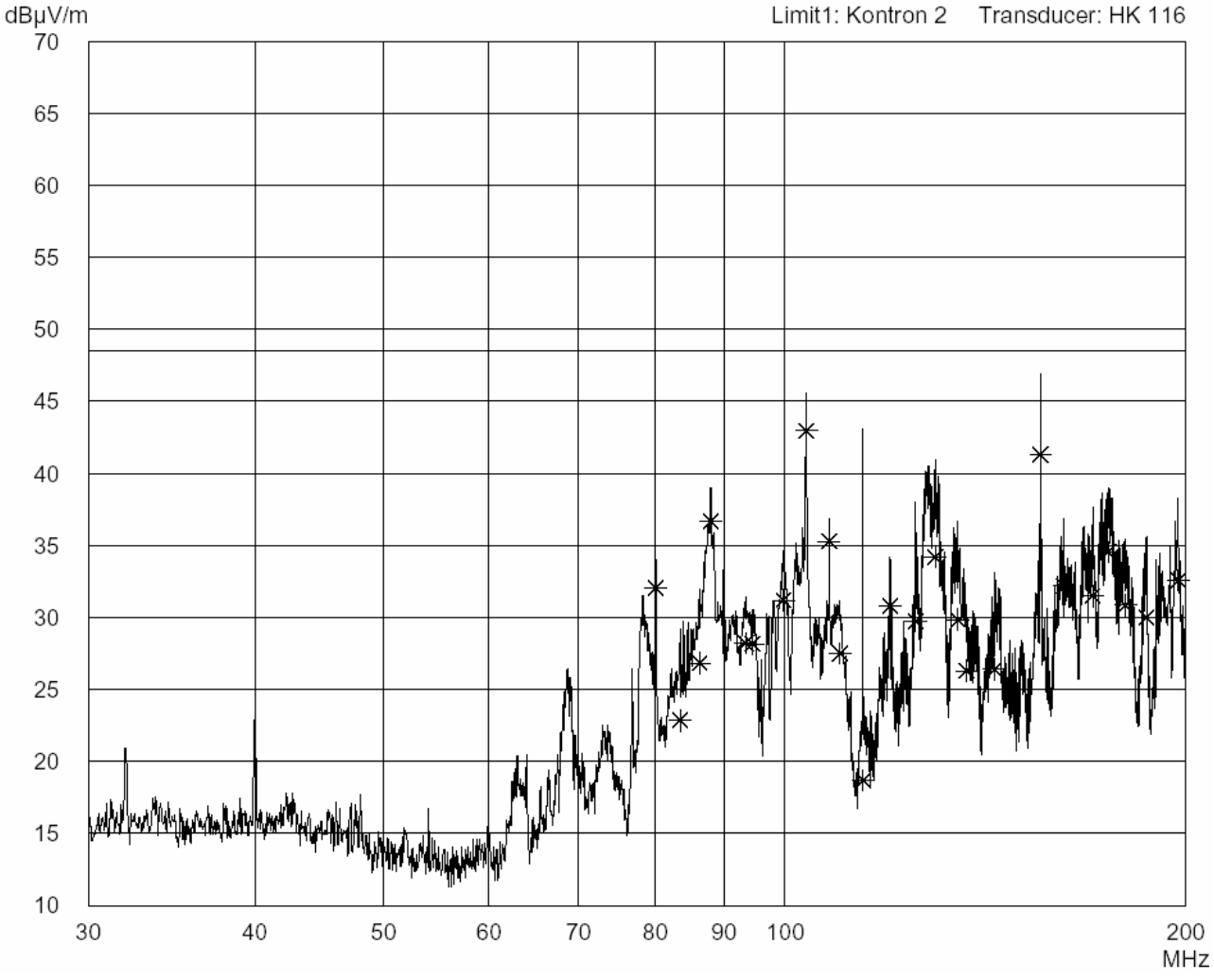
Radiated Emission Test 200 MHz - 1 GHz
acc. to KE_200MHz-2gHz

Model: KFM19_e DC	Comment: WinXP screen - power from car battery - front side (0°) - with cables
Serial no.: prototype	
Applicant: P. Kuncl	
Test site: Shielded room PM-EM-6172-1	
Tested on: Distance 1m Circular Polarization	
Date of test: 05/12/2005 — Operator: P. Vesely	
Test performed: automatically — File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin — 50 Subranges



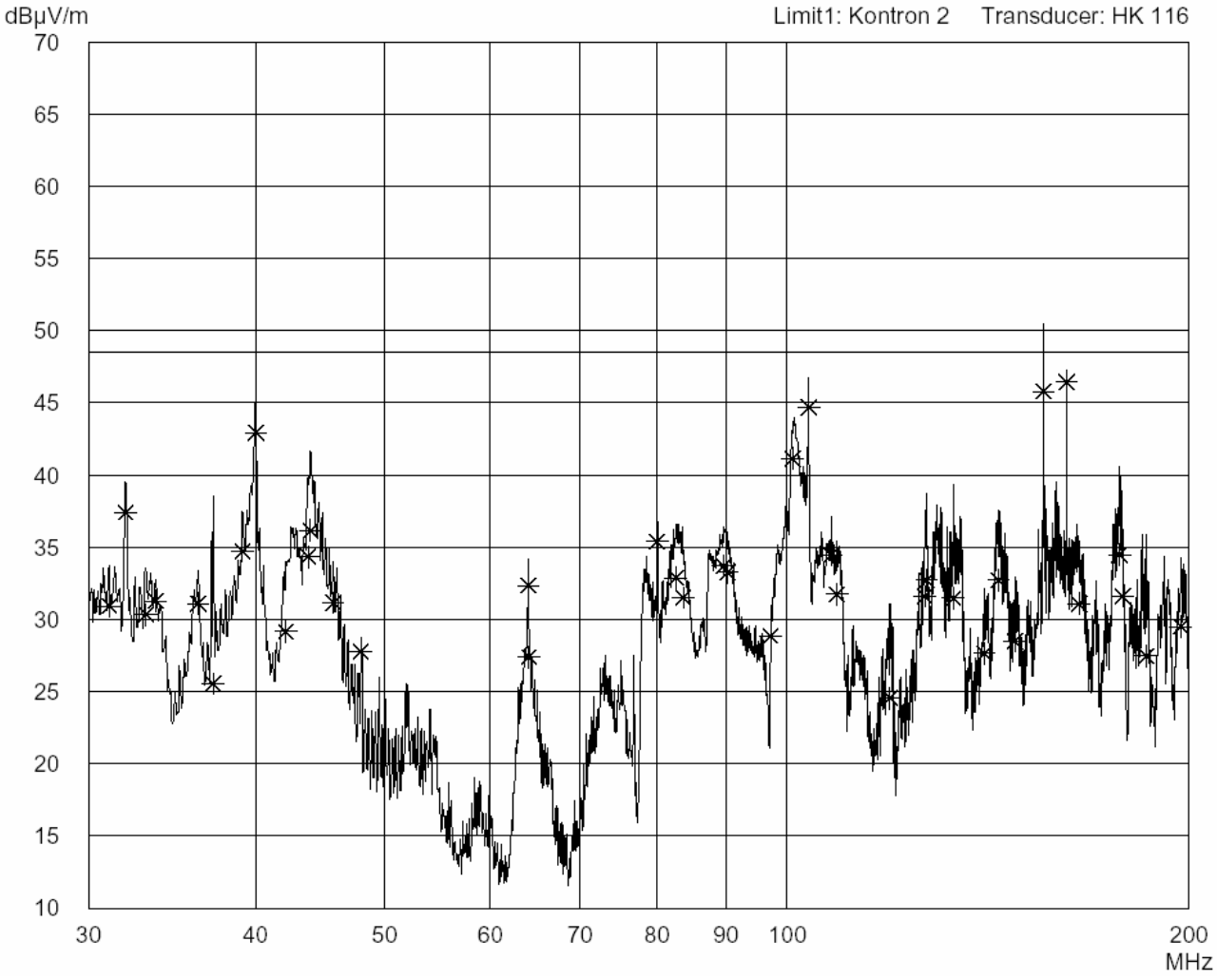
Radiated Emission Test 30 MHz - 200 MHz
acc. to KE_30MHz-200MHz

Model: KFM19_e DC	Comment: WinXP screen - power from car battery - left side (270°) - with cables
Serial no.: prototype	
Applicant: P. Kuncl	
Test site: Shielded room PM-EM-6172-1	
Tested on: Distance 1m Horizontal Polarization	
Date of test: 05/12/2005 — Operator: P. Vesely	
Test performed: automatically — File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin — 50 Subranges



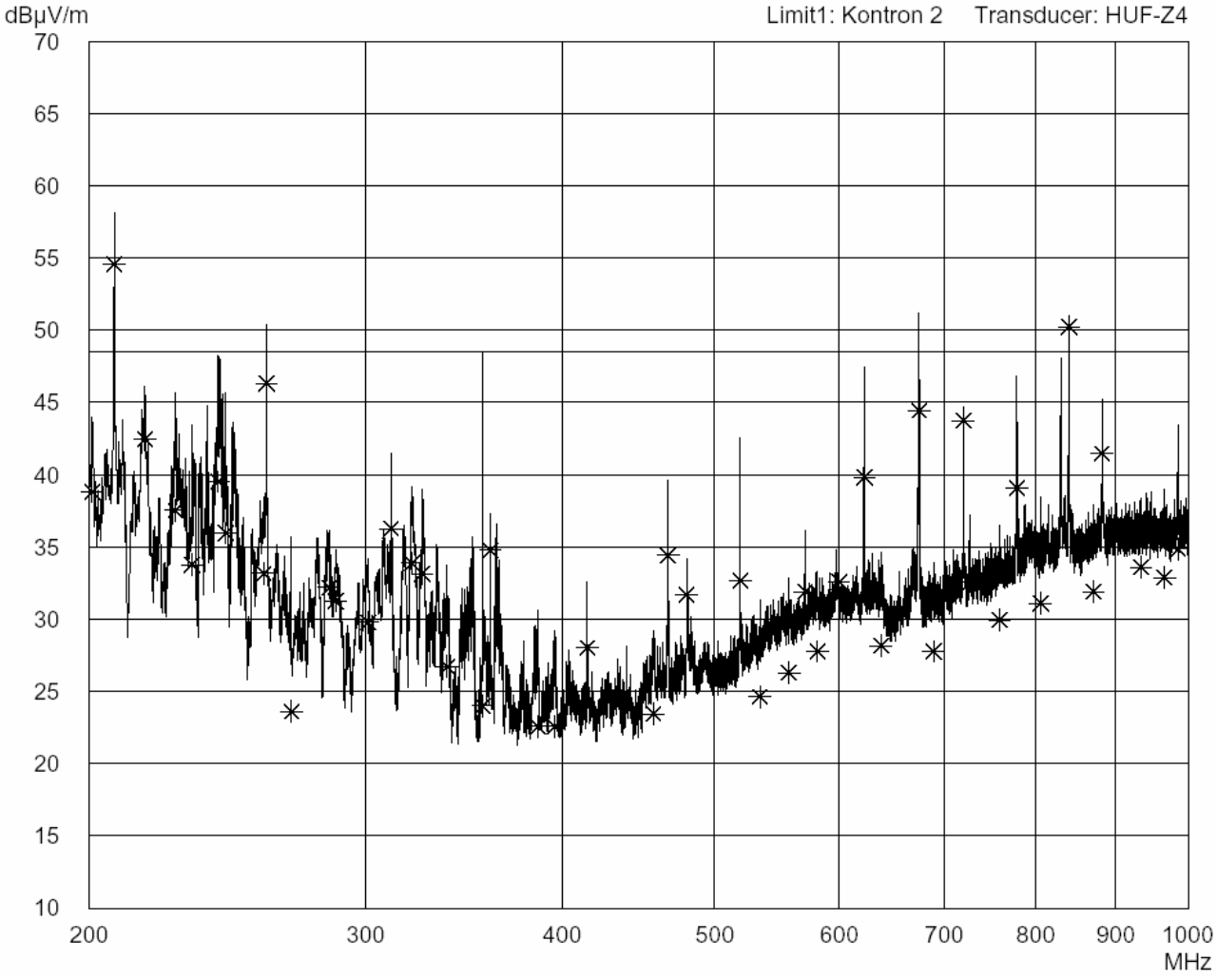
Radiated Emission Test 30 MHz - 200 MHz
acc. to KE_30MHz-200MHz

Model: KFM19_e DC	Comment: WinXP screen - power from car battery - left side (270°) - with cables
Serial no.: prototype	
Applicant: P. Kuncl	
Test site: Shielded room PM-EM-6172-1	
Tested on: Distance 1m Vertical Polarization	
Date of test: 05/12/2005 — Operator: P. Vesely	
Test performed: automatically — File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin — 50 Subranges



Radiated Emission Test 200 MHz - 1 GHz
acc. to KE_200MHz-2gHz

Model: KFM19_e DC	Comment: WinXP screen - power from car battery - left side (270°) - with cables
Serial no.: prototype	
Applicant: P. Kuncl	
Test site: Shielded room PM-EM-6172-1	
Tested on: Distance 1m Circular Polarization	
Date of test: 05/12/2005 Operator: P. Vesely	
Test performed: automatically File name:	
Detector: Peak / Final Results: QP	Final results: 20 dB Margin 50 Subranges



10.2 Test Report EN 61000-4-2

Electrostatic Discharge Immunity test – Indirect action

Model:	KFM19_e DC																		
Applicant:	Kontron Embedded Computers AG																		
Operation mode:	Test software: see Point 4.1 (Operation Mode)																		
Regulation(s):	EN 61000-4-2: 1995 + A1: 1998 + A2: 2001																		
Performed test:	Contact discharge										Air discharge								
Locations of discharge:	Several points close to EUT at horizontal coupling plate																		
Tested severity level/	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		kV
voltage:	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		kV
Locations of discharge:	Several points close to EUT at vertical coupling plate																		
Tested severity level/	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		kV
voltage:	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		kV
Performance criteria:	Temporary degradation or loss of function or performance (criterion B)																		
Test result:	No errors detected.																		
Classification:	The requirements are fulfilled.																		
Date of test:	month: 05 day: 11 year: 2005																		
Tested by:	P. Vesely																		

1 tested

1 not tested

10.3 Test Report EN 61000-4-2

Electrostatic Discharge Immunity test – Direct action

Model:	KFM19_e DC										
Applicant:	Kontron Embedded Computers AG										
Operation mode:	Test software: see Point 4.1 (Operation Mode)										
Regulation(s):	EN 61000-4-2: 1995 + A1: 1998 + A2: 2001										
Performed test:	Contact discharge					Air discharge					
Locations of discharge:	Whole surface of the EUT										
Tested severity level/	-	1	2	3	4	5	6	7	8		kV
voltage:	+	1	2	3	4	5	6	7	8		kV
Locations of discharge:	All conductive parts of EUT accessible to normal user										
Tested severity level/	-	1	2	3	4	5	6	7	8		kV
voltage:	+	1	2	3	4	5	6	7	8		kV
Performance criteria:	Temporary degradation or loss of function or performance (criterion B)										
Test result:	No errors detected.										
Classification:	The requirements are fulfilled.										
Date of test:	month: 05 day: 11 year: 2005										
Tested by:	P. Vesely										

1 tested 1 not tested

10.4 Test Report EN 61000-4-4

Electrical Fast Transients/Burst Immunity test - Data Lines (Coupling Clamp)

Model:	KFM19_e DC							
Applicant:	Kontron Embedded Computers AG							
Operation mode:	Test software: see Point 4.1 (Operation Mode)							
Regulation(s):	EN 61000-4-4: 1995							
Performed test:	Capacitive coupling with capacitive coupling clamp							
Coupling via:	Capacitive coupling clamp							
Coupling to:	Data Line: Coupling onto S-Video Test Cable							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude:	-	0.25	0.5	1.0	2.0	4.0		kV
Coupling to:	Data Line: Coupling onto C-Video Test Cable							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude	-	0.25	0.5	1.0	2.0	4.0		kV
Coupling to:	Data Line: Coupling onto COM1 Test Cable							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude	-	0.25	0.5	1.0	2.0	4.0		kV
Coupling to:	Data Line: Coupling onto VGA and DVI Test Cables							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude:	-	0.25	0.5	1.0	2.0	4.0		kV
Performance criteria:	Temporary degradation or loss of function or performance (criterion B)							
Test result:	No inadmissible errors detected.							
Classification:	The requirements are fulfilled.							
Date of test:	month: 05 day: 10 year: 2005							
Tested by:	P. Vesely							

1	tested	1	not tested

10.5 Test Report EN 61000-4-5

Surge Immunity test - Shielded Data Lines

Model:	KFM19_e DC							
Applicant:	Kontron Embedded Computers AG							
Operation mode:	Test software: see Point 4.1 (Operation Mode)							
Regulation(s):	EN 61000-4-5: 1995 + A1: 2001							
Performed test:	coupling direct onto shield							
Coupling to:	Data Line: Coupling onto S-Video Test Cable							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude:	-	0.25	0.5	1.0	2.0	4.0		kV
Coupling to:	Data Line: Coupling onto C-Video Test Cable							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude:	-	0.25	0.5	1.0	2.0	4.0		kV
Coupling to:	Data Line: Coupling onto COM1 Test Cable							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude:	-	0.25	0.5	1.0	2.0	4.0		kV
Coupling to:	Data Line: Coupling onto VGA and DVI Test Cables							
Tested severity level/	+	0.25	0.5	1.0	2.0	4.0		kV
pulse amplitude:	-	0.25	0.5	1.0	2.0	4.0		kV
Performance criteria:	Temporary degradation or loss of function or performance (criterion B)							
Test result:	No inadmissible errors detected.							
Classification:	The requirements are fulfilled.							
Date of test:	month: 03 day: 08 year: 2005							
Tested by:	P. Vesely							

1 tested 1 not tested

10.6 Test Report EN 61000-4-6

Immunity to Conducted Disturbances Induced by RF Fields – Power Lines

Model:	KFM19_e DC
Applicant:	Kontron Embedded Computers AG
Operation mode:	Test software: see Point 4.1 (Operation Mode)
Regulation(s):	EN 61000-4-6: 1996 + A1: 2001
Requirements:	150 kHz to 80 MHz : 10 V_{eff}
Interfering signal:	Modulation: AM Modulation depth: 80 % Modulation frequency: 1 kHz Step size: 1 % Dwell time: 1 s
Coupling to:	Power cables
Coupling with:	CDN: FCC-M2; S/N: 9712; PM-EM-7543-1
Performance criteria:	No temporary degradation or loss of function or performance (criterion A)
Test result:	No inadmissible errors detected.
Classification:	The requirements are fulfilled.
Date of test:	month: 05 day: 11 year: 2005
Tested by:	P. Vesely

10.7 Test Report EN 61000-4-6

Immunity to Conducted Disturbances Induced by RF Fields – Data Lines

Model:	KFM19_e DC
Applicant:	Kontron Embedded Computers AG
Operation mode:	Test software: see Point 4.1 (Operation Mode)
Regulation(s):	EN 61000-4-6: 1996 + A1: 2001
Requirements:	150 kHz to 80 MHz : 10 V_{eff}
Interfering signal:	Modulation: AM Modulation depth: 80 % Modulation frequency: 1 kHz Step size: 1 % Dwell time: 1 s
Coupling to:	COM1, S-Video, C-Video, VGA, DVI Test Cables
Coupling with:	F 120-9A; S/N: 20; PM-EM-7546-1
Performance criteria:	No temporary degradation or loss of function or performance (criterion A)
Test result:	No inadmissible errors detected.
Classification:	The requirements are fulfilled.
Date of test:	month: 05 day: 11 year: 2005
Tested by:	P. Vesely

10.8 Test Report EN 61000-4-8

Power Frequency Magnetic Field Immunity Test

Model:	KFM19_e DC
Applicant:	Kontron Embedded Computers AG
Operation mode:	Test software: see Point 4.1 (Operation Mode)
Regulation(s):	EN 61000-4-8: 1993 + A1: 2001
Requirements:	50 Hz; 30 A/m
Performance criteria:	No temporary degradation or loss of function or performance (criterion A)
Test result:	No inadmissible errors detected.
Classification:	The requirements are fulfilled.
Date of test:	month: 05 day: 11 year: 2005
Tested by:	P. Vesely

11. Measurement Uncertainty Values:

11.1 Emission Testing

Used measuring instrument	Unit	Tolerance
Test Receiver ESMI		< 1,5dB
LISN ESH3-Z5		≤ ± 20%
LISN ESH3-Z6		≤ ± 20%
LISN ENV4200		≤ ± 20%
Pulse Limiter ESH3-Z3		≤ ± 0,2dB
Cable attenuation incl. PSU 10kHz - 30MHz 30MHz - 200MHz 200MHz - 1GHz		 ≤ ± 0,5dB ≤ ± 1,5dB ≤ ± 2,7dB
Pre Amplifier ESMI-Z7		max. + 2dB/-1dB
Current Clamp -ESH2-Z1	uA	≤ ± 1dB
Current Clamp -ESV-Z1	uA	≤ ± 0,5dB
Current Clamp -F61	uA	≤ ± 1,8dB
Current Clamp F-65A	uA	≤ ± 1,8dB
Current Clamp F-36-4	uA	≤ ± 1,8dB
Current Clamp F-2000	uA	≤ ± 1,8dB

11.2 Immunity Testing

Used measuring instrument	Unit	Tolerance
Harmonics current PHE5000/PAS	Measured current	± 1 %
Flicker PHE5000/PAS	Higher than specified by IEC868 + AMD 1	
PHE5000/PAS	Adjusted voltage	± 1 %
ESD generator NSG 435	Air discharge	± 5 %
	Contact discharge	± 5 %
Burst generator NSG 2025	Test level voltage	± 10 %
	Frequency	± 2 %
	Phase angle	± 2°
	Pulse rise time: BNC output below 1500V BNC output above 1500V	 ± 30 % ± 20 %
	Mains output	± 30 %
	Pulse width:	± 30 %
	Generator impedance:	± 10 %
Surge generator NSG 650	Test level voltage	± 10 %
	Phase angle	V ≤ 4 kV ± 15° V > 4 kV ± 25°
Current Clamp -F61	uA	≤ ± 1,8dB
Current Clamp F-65A	uA	≤ ± 1,8dB
Current Clamp F-120-9A	uA	≤ ± 1,8dB
EM-Clamp	uA	≤ ± 1,8dB
19“ Rack EN61000-4-6	Frequency	≤ ± 0,1Hz
	Output Level	≤ ± 2dB

12. Reference Standards

Tested standard	Reference standards (identical/similar to)
EN 55022: 1998	DIN EN 55022: 1998 CISPR 22: 1997 NBN EN 55022: 1998 NEN EN 55022: 1995 NFC 91-022: 1987 NF EN 55022: 1994 + (AMD 1: 1996) SS EN 55022: 1994 + (AMD 1: 1995) VDE 0878(PT22): 1995 + (AMD 1: 1995)
EN 61000-3-2: 1995	BS EN 61000 PT3-2: 1995 DIN EN 61000 PT3-2: 1996 IEC 1000 PT3-2: 1995 NEN 11000-3-2: 1995 NF EN 61000-3-2: 1995 SS EN 61000-3-2: 1996 VDE 0838(PT2): 1996
EN 61000-3-3: 1995	BS EN 61000 PT3-3: 1995 DIN EN 61000 PT3-3: 1996 IEC 1000 PT3-3: 1994 NEN 11000-3-3: 1995 NF EN 61000-3-3: 1995 SS EN 61000-3-3: 1995 VDE 0838(PT3): 1996
EN 61000-4-2: 1995	IEC 1000-4-2: 1995 BS EN 61000-4-2: 1995 N EN 11000-4-2: 1995 NF EN 61000-4-2: 1995 DIN EN 61000-4-2: 1996 VDE 0847-4-2: 1996
EN 61000-4-4: 1995	BS EN 61000 PT4-4: 1995 DIN EN 61000 PT4-4: 1996 IEC 1000 PT4-4: 1995 NEN 11000-4-4: 1995 NF EN 61000-4-4: 1995 SS EN 61000-4-4: 1996 VDE 0847(PT4-4)+ AMD 1: 1997

Tested standard *continued*	**Reference standards (identical/similar to)** *continued*
EN 61000-4-5: 1995	IEC 1000-4-5: 1995 BS EN 61000-4-5: 1996 N EN 11000-4-5: 1995 NF EN 61000-4-5: 1995 SS EN 61000-4-5: 1996 DIN EN 61000-4-5: 1996 VDE 0847-4-5: 1996
EN 61000-4-6: 1996	BS EN 61000 PT4-6: 1997 DIN EN 61000 PT4-6: 1997 IEC 1000 PT4-6: 1996 NF EN 61000-4-6: 1997 SS EN 61000-4-6: 1996 VDE 0847(PT4-6): 1997
EN 61000-4-8: 1993	BS EN 61000 PT4-8: 1994 DIN EN 61000 PT4-8: 1994 IEC 1000 PT4-8: 1993 NBN EN 61000-4-8: 1995 NEN 11000-4-8: 1994 NF EN 61000-4-8: 1994 SS EN 61000-4-8: 1994 VDE 0847(PT4-8): 1994
EN 61000-4-11: 1994	BS EN 61000 PT4-11: 1994 DIN EN 61000 PT4-11: 1995 IEC 1000 PT4-11: 1994 NBN EN 61000-4-11: 1995 NF EN 61000-4-11: 1995 SS EN 61000-4-11: 1995 VDE 0847(PT4-11): 1995