

Test report

TLE27_01

EUT: RFID Reader / Short range device
Trade name: TLR 401
Tested type: TLR 401
FCC Identifier: Pending

Production level: 06/2008
S/N: xx
Responsible party: TimeLink International GmbH
Mollenbachstr. 19
71229 Leonberg / Germany

Test remit: FCC Rules 47 CFR Part 15
– Subpart C Section 15.209

The standards were: ☒ kept*
☐ not kept*

*Remark: ☒ Validation covered by the accredited scope
☐ Validation not covered by the accredited scope
according: _____

Applicant: TimeLink International GmbH
Mollenbachstr. 19
71229 Leonberg / Germany

EUT-
Date of arrival: 06/27/2008
Test ID: PRE26_08
Date(s) of test: 06/30/2008

Burgrieden, 07/14/2008

Released by:


Principal engineer - Christian Vogelmann

Test laboratory: ☒ EMCE GmbH
Ingenieurbüro für EMV-Prüfungen und Schaltungsentwicklung
Untere Wiesen 1 / 88483 Burgrieden

DAR-Registration No.: DAT-P-153/98-01
CAB-Registration No.: BnetzA-CAB-02/21-01/1
FCC-Registration No.: 90568

☐ Hochschule Ulm
Eberhard-Finckh-Str. 11 / 89075 Ulm
The susceptibility test according EN 61000-4-3
carried out in the EMC-testing laboratory of the Hochschule Ulm

Responsible inspector: Mr. Hauser
EMCE GmbH
Ingenieurbüro für EMV-Prüfungen und Schaltungsentwicklung

Contact person: Mr. Titze

EUT-

Description: RFID Card Reader

Voltage supply: 115V / 60Hz

Frequency list: RFID frequency 13.56 MHz
Crystal frequency: 10.0 MHz

Temperature range: xx

Size: Approximately 115x65x50 mm (LxWxH)

Supplied /
used equipment:

Designation	S/N	FCC-ID	Manufacturer
Power Supply	G071108021370	xx	Sunny
Door unit	xx	xx	TimeLink International

Configuration: ☒ As-delivered condition
☐ Modified*
 * _____

Cable designation	Type	Length	Remarks
RS 485 and DC Power lead	unshielded	20m	xx

Remarks: xx

State of revision:

Source document	New Document	Date / Reviser	Modifications

Test equipment list of EMCE GmbH:

Inv.- No.	Designation	Type	Manufacturer	S/N	Calibration: Interval / valid until:
001	Test receiver	ESS 5Hz - 1000 MHz	Rohde & Schwarz	833776/008	1 year / 08/2008
002	Probe	ESH2-Z3	Rohde & Schwarz	-	1 year / 08/2007
003	LISN 1	ESH3-Z5	Rohde & Schwarz	835268/007	1 year / 08/2007
004	LISN 2	ESH3-Z5	Rohde & Schwarz	835268/003	1 year / 08/2007
005	LISN 3	NNB 4/32T	Rolf Heine HF- Technik	4/32T-96015	1 year / 07/2007
007	Absorbing clamp	MDS 21	Schwarzbeck	942436	1 year / 08/2007
008	Antenna 9kHz - 30MHz	HFH2-Z2	Rohde & Schwarz	835776/0002	3 years / 05/2010
009	Antenna 30 - 300MHz	VHBA9123 / BBA9106	Schwarzbeck	435	1 year / 08/2007
010	Antenna 250 -1200MHz	UHALP 9108A	Schwarzbeck	108	1 year / 08/2007
011	Antenna 30 - 300MHz	VHBA9123 / BBA9106	Schwarzbeck	0408/94	1 year / 08/2007
012	Antenna 250 -1200MHz	UHALP 9108A	Schwarzbeck	166	1 year / 08/2007
013	Antenna 9kHz - 30 MHz	Loop antenna 1.5m Ø	EMCE GmbH	-	1 year / 08/2007
014	OATS	3m	EMCE GmbH	-	3 years / 09/2007
015	OATS	10m	EMCE GmbH	-	1 year / 08/2007
020	Coupling clamp	IP4A	Haefely	082672-13	1 year / 08/2007
022	ESD-Gun	NSG 435	Schaffner	577	1 year / 08/2007
024	HF-Generator	SMY01	Rohde & Schwarz	844146/046	1 year / 08/2007
025	Current clamp BCI	F-120-2	FCC	47	1 year / 08/2007
026	Coupling device network	CDN 801-M3-25	FCC	92	1 year / 08/2007

Inv.- No.	Designation	Type	Manufacturer	S/N	Calibration: interval / valid until:
030	Coupling device network	CDN-S9	EMCE GmbH	-	1 year / 08/2007
031	Coupling device network	CDN-S9	EMCE GmbH	-	1 year / 08/2007
032	HF Amplifier	75A250	Amplifier Research	22789	1 year / 08/2007
033	Coupling device network	CDN-AF2	EMCE GmbH		1 year / 08/2007
034	Coupling device network	CDN-AF2	EMCE GmbH		1 year / 08/2007
035	3-φ- Coupling network	CDN-1000	EMC-Partner AG	CDN-1000-45	1 year / 08/2007
036	Coupling device network	CDN-M5-25	EMCE GmbH		1 year / 08/2007
037	Coupling device network	CDN-S1	EMCE GmbH		1 year / 08/2007
038	Helmholtz coil	Rectangular 1x1m	EMCE GmbH		1 year / 08/2007
039	Helmholtz coil	Rectangular 1x1m	EMCE GmbH		1 year / 08/2007
040	Current transformer		EMCE GmbH		1 year / 08/2007
041	HZ-10	Shielded coil	Rohde & Schwarz	849788/020	3 years / 05/2010
042	AC-Source / Analyser / Norm impedance	EMV D5000/PAS	Spitzenberger + Spies	A274700/ 0 0501	2 years / 09/2007
xx	Test equipment according DIN EN 61000-4-3	Full anechoic chamber 3m Test site	Siemens	xx	1 year / 06/2008
043	Receiver	3DH/E Field meter ESM-100	Maschek	971521	3 years / 12/2007
044	CDN	CN-U	EMC-Partner AG	86	3 years / 09/2008
045	CDN	DN-HF	EMC-Partner AG	86	3 years / 09/2008
046	CDN	DN-LF2	EMC-Partner AG	86	3 years / 09/2008
047	CDN	DN-LF1	EMC-Partner AG	86	3 years / 09/2008
048	ESD-/Burst-/Surge- Generator	Transient 2000	EMC-Partner AG	561	1 year / 08/2007

Inv.- No.	Designation	Type	Manufacturer	S/N	Calibration: interval / valid until:
050	Data Acquisition/Switch Unit	Agilent 34970A	Agilent Technologies Inc.	MY41019453	3 years / 11/2009
051	20 Channel Multiplexer	Agilent 34901A	Agilent Technologies Inc.	MY41013531	3 years / 11/2009
052	Function / Arbitrary Waveform Generator	Agilent 33220A	Agilent Technologies Inc.	MY43002650	3 years / 11/2009
054	Helmholtz coil	Rectangular 1.25x1.25m	EMCE GmbH		1 year / 08/2007
055	Helmholtz coil	Rectangular 1.25x1.25m	EMCE GmbH		1 year / 08/2007
057	Field probe	HI-6005	Holaday	34274	1 year / 04/2008
058	Receiver	ESIB 40	Rohde & Schwarz	100200	3 years / 08/2007
060	HF Coupling clamp	KEMA 801	Schaffner	20808	3 years / 11/2007

Scope:

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1 EMC-Test(s)

1.1 EMI Report FCC Rules 47 CFR Part 15 – Subpart C – Technical standards

1.1.1 Terminal voltage according 47 CFR Part 15 – Subpart C

- ☒ Full compliance
☐ Precompliance
☐ Test not requested
☐ Test not carried out*

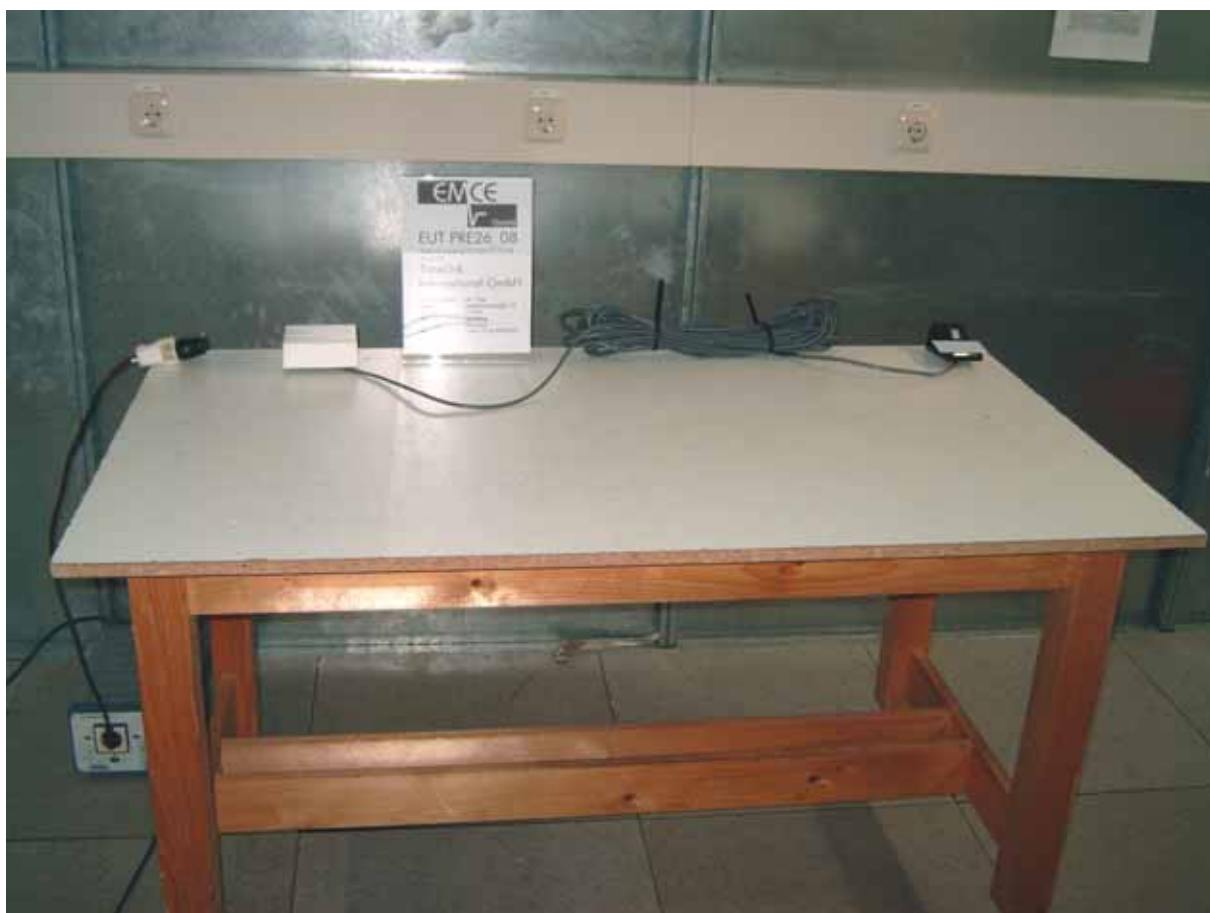
* _____

Test location

<input checked="" type="checkbox"/>	Inv.-No.	Designation	Type (LxWxH)	Manufacturer	Location
<input checked="" type="checkbox"/>	504	Shielded room #1	6.4 x 4.0 x 2.3m	Frankonia EMV-Messsysteme GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
	588	Shielded room #2	8.3/5.8 x 5.5/2.9 x 3.4m	EMC-Technik & Consulting GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
	584	Shielded room #3	3.6 x 3.6 x 2.5m	Siemens AG	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
	061	Semi anechoic chamber #1	4.0 x 4.0 x 3.5m	EMC-Technik & Consulting GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
	062	Semi anechoic chamber #2	13.5 x 6.1 x 5.5m	EMC-Technik & Consulting GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
		Alternative test site			

1.1.1.1 Test set up

According 47 CFR Part 15 – Subpart C



Used test equipment

<input checked="" type="checkbox"/>	Inv.-No.	Designation	Type	Manufacturer	S/N
<input checked="" type="checkbox"/>	001	Test receiver	ESS 5Hz - 1000 MHz	Rohde & Schwarz	833776/008
	002	Probe	ESH2-Z3	Rohde & Schwarz	-
<input checked="" type="checkbox"/>	003	LISN 1	ESH3-Z5	Rohde & Schwarz	835268/007
	004	LISN 2	ESH3-Z5	Rohde & Schwarz	835268/003
	005	LISN 3	NNB 4/32T	Rolf Heine HF-Technik	4/32T-96015
	006	LISN	NNBM 8125	Schwarzbeck	8125371
	007	Absorbing clamp	MDS 21	Schwarzbeck	942436
<input checked="" type="checkbox"/>	042	AC-Source / Analyser / Norm impedance	EMV D5000/PAS	Spitzenberger + Spies	A274700/ 0 0501
	058	Test receiver	ESIB 40	Rohde & Schwarz	100200
	060	HF coupling clamp	KEMA 801	Schaffner	20808

All used test equipment are checked resp. calibrated periodically.

☒ Test equipment was checked and complied to the requirements

Test / Measurement uncertainty

The measurement uncertainty in the test met the guideline of CISPR16-4-2 or better.

Measurement uncertainty of the terminal voltage with an extended coverage factor of $k=2$:

Frequency	Measurement uncertainty
9kHz – 150kHz	4.0dB
150kHz – 30MHz	3.6dB

1.1.1.2 Test

Regulation

FCC Rules 47 CFR Part 15 – Subpart C

☐ 9kHz - 30MHz

☒ 150kHz - 30MHz

Limits:

☒ Section 15.207

☐ __

Operation mode

EUT arrangement:

☒ Tabletop

☐ Floor standing

Power supply:

☐ 230V/50Hz

☒ 115V/60Hz

Port #	Leads	Remarks
#1	AC power line	L1/N
#2		
#3		

Continuous operation of the system. The TLR 401 was supplied via the door unit with the Sunny power supply. The RFID field was active during the test.

Environmental conditions

Temperature: 15 - 35 °C
Humidity: 30 - 60 %
Air pressure: 860 - 1060 hPa

Environmental conditions during the test: ☒ kept
☐ not kept

Test - / Measurement procedure

Measurements are made with a receiver according CISPR guidelines. The required frequency range is scanned in an automatically operation. If the emanation is closer than 6dB to the limits or more, the receiver will stop and measure the exact value with quasipeak or average detector. The frequency, the maximum reading and the limit will be printed out.

Test result

Limits for continuous disturbances: ☒ kept
☐ not kept

Evidence of conformity,
evaluated statistically with __ devices: ☐ kept
☐ not kept
☒ not carried out

Remarks: xx

Protocol scope

☒ Readings - continuous emanation
☒ Diagram - continuous emanation

EMCE GmbH Ing_buero fuer EMV_Pruefungen Terminal voltage

30. Jun 08 09:45

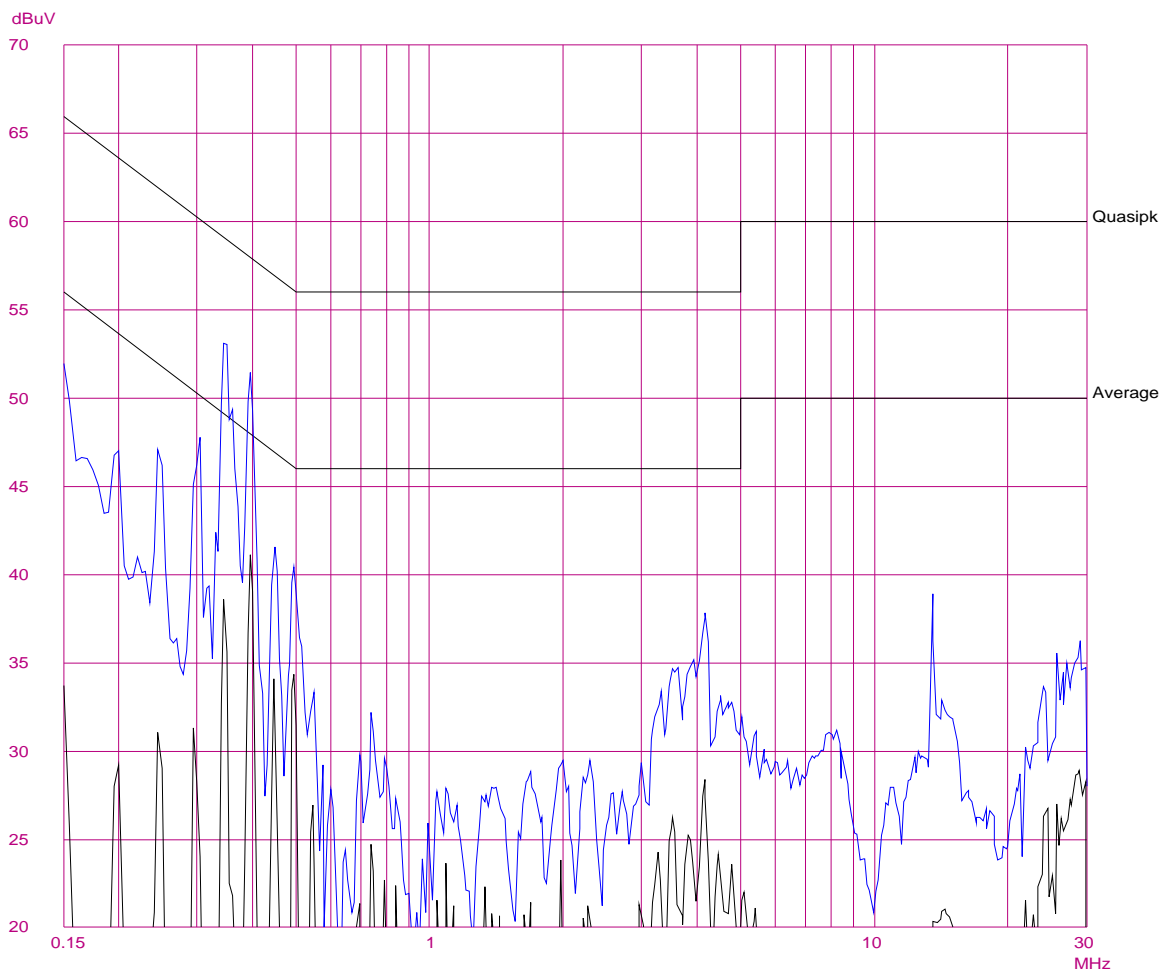
EUT: TLR 401
 Manuf: Timelink International GmbH
 Op Cond: Operation
 Operator: Mr. Hauser
 Test Spec: 47 CFR Part 15 Subpart C - Class B
 Comment: Test_ID PRE26_08
 TLE27_01, Phase L1

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	30M	5k	10k	PK+AV	20ms	AUTO	LN OFF	60dB

Final Measurement: x QP / + AV
 Meas Time: 1 s
 Subranges: 50
 Acc Margin: 6dB

Transducer No.	Start	Stop	Name
2	1Hz	1000M	Kabel_6m



EMCE GmbH Ing_buero fuer EMV_Pruefungen Terminal voltage

30. Jun 08 09:45

EUT: TLR 401
Manuf: Timelink International GmbH
Op Cond: Operation
Operator: Mr. Hauser
Test Spec: 47 CFR Part 15 Subpart C - Class B
Comment: Test_ID PRE26_08
TLE27_01, Phase L1

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	30M	5k	10k	PK+AV	20ms	AUTO	LN OFF	60dB

Final Measurement Results:

no Results

EMCE GmbH Ing_buero fuer EMV_Pruefungen Terminal voltage

30. Jun 08 09:56

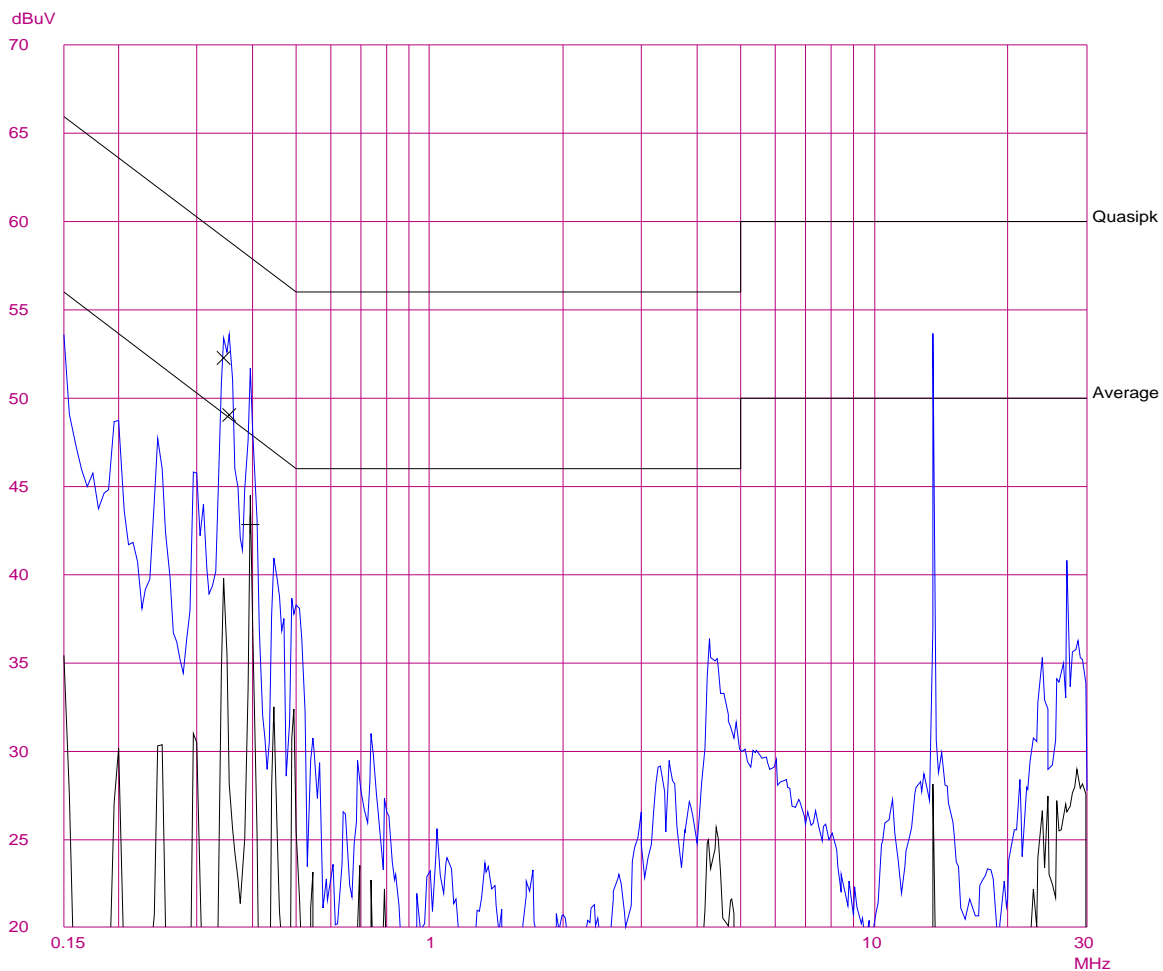
EUT: TLR 401
 Manuf: Timelink International GmbH
 Op Cond: Operation
 Operator: Mr. Hauser
 Test Spec: 47 CFR Part 15 Subpart C - Class B
 Comment: Test_ID PRE26_08
 TLE27_02, Phase N

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	30M	5k	10k	PK+AV	20ms	AUTO	LN	OFF 60dB

Final Measurement: x QP / + AV
 Meas Time: 1 s
 Subranges: 50
 Acc Margin: 6dB

Transducer No.	Start	Stop	Name
2	1Hz	1000M	Kabel_6m



EMCE GmbH Ing_buero fuer EMV_Pruefungen Terminal voltage

30. Jun 08 09:56

EUT: TLR 401

 Manuf: Timelink International GmbH

 Op Cond: Operation

 Operator: Mr. Hauser

 Test Spec: 47 CFR Part 15 Subpart C - Class B

 Comment: Test_ID PRE26_08

 TLE27_02, Phase N

Scan Settings (1 Range)

Frequencies			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150k	30M	5k	10k	PK+AV	20ms	AUTO	LN	OFF 60dB	

Final Measurement Results:

Frequency	QP Level	QP Limit
MHz	dBuV	dBuV
0.34500	52.3	59.1
0.35500	49.0	58.8

Frequency	AV Level	AV Limit
MHz	dBuV	dBuV
0.39500	42.8	47.9

* limit exceeded

1.1.2 Radio disturbances according 47 CFR Part 15 – Subpart C

- ☒ Full compliance
☐ Precompliance
☐ Test not requested
☐ Test not carried out*

* _____

Test location

<input checked="" type="checkbox"/>	Inv.-No.	Designation	Type (LxBxH)	Manufacturer	Location
	504	Shielded room #1	6.4 x 4.0 x 2.3m	Frankonia EMV-Messsysteme GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
	588	Shielded room #2	8.3/5.8 x 5.5/2.9 x 3.4m	EMC-Technik & Consulting GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
	584	Shielded room #3	3.6 x 3.6 x 2.5m	Siemens AG	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
	061	Semi anechoic chamber #1	4.0 x 4.0 x 3.5m	EMC-Technik & Consulting GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
	062	Semi anechoic chamber #2	13.5 x 6.1 x 5.5m	EMC-Technik & Consulting GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
	807	Semi anechoic chamber #3	7.6 x 4.6 x 3.6m	Siemens AG	Hochschule Ulm Eberhard-Finck-Str. 11 89075 Ulm
	014	OATS	3m – Test distance	EMCE GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
<input checked="" type="checkbox"/>	015	OATS	10m – Test distance	EMCE GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
	066	OATS	30m – Test distance	EMCE GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
		Alternative test site			

1.1.2.1 Test set up

According 47 CFR Part 15 – Subpart C



Used test equipment

<input checked="" type="checkbox"/>	Inv.-No.	Designation	Type	Manufacturer	S/N
<input checked="" type="checkbox"/>	001	Test receiver	ESS 5Hz - 1000 MHz	Rohde & Schwarz	833776/008
	003	LISN 1	ESH3-Z5	Rohde & Schwarz	835268/007
	004	LISN 2	ESH3-Z5	Rohde & Schwarz	835268/003
	005	LISN 3	NNB 4/32T	Rolf Heine HF-Technik	4/32T-96015
	006	LISN	NNBM 8125	Schwarzbeck	8125371
	007	Absorbing clamp	MDS 21	Schwarzbeck	942436
<input checked="" type="checkbox"/>	008	Antenna 9kHz - 30MHz	HFH2-Z2	Rohde & Schwarz	835776/0002
	009	Antenna 30 - 300MHz	VHBA9123 / BBA9106	Schwarzbeck	435
	010	Antenna 250 -1200MHz	UHALP 9108A	Schwarzbeck	108
	011	Antenna 30 - 300MHz	VHBA9123 / BBA9106	Schwarzbeck	0408/94
	012	Antenna 250 -1200MHz	UHALP 9108A	Schwarzbeck	166
	013	Antenna 9kHz - 30 MHz	Loop antenna 1.5m Ø	EMCE GmbH	-
	041	HZ-10	Shielded coil	Rohde & Schwarz	849788/020
<input checked="" type="checkbox"/>	042	AC-Source / Analyser / Norm impedance	EMV D5000/PAS	Spitzenberger + Spies	A274700/ 0 0501
	058	Test receiver	ESIB 40	Rohde & Schwarz	100200
	059	Logper. Antenna	HL050	Rohde & Schwarz	100006
	060	HF coupling clamp	KEMA 801	Schaffner	20808
	063	Logper. Antenna	HL023 A2	Rohde & Schwarz	

All used test equipment are checked resp. calibrated periodically.

☒ Test equipment was checked and complied to the requirements

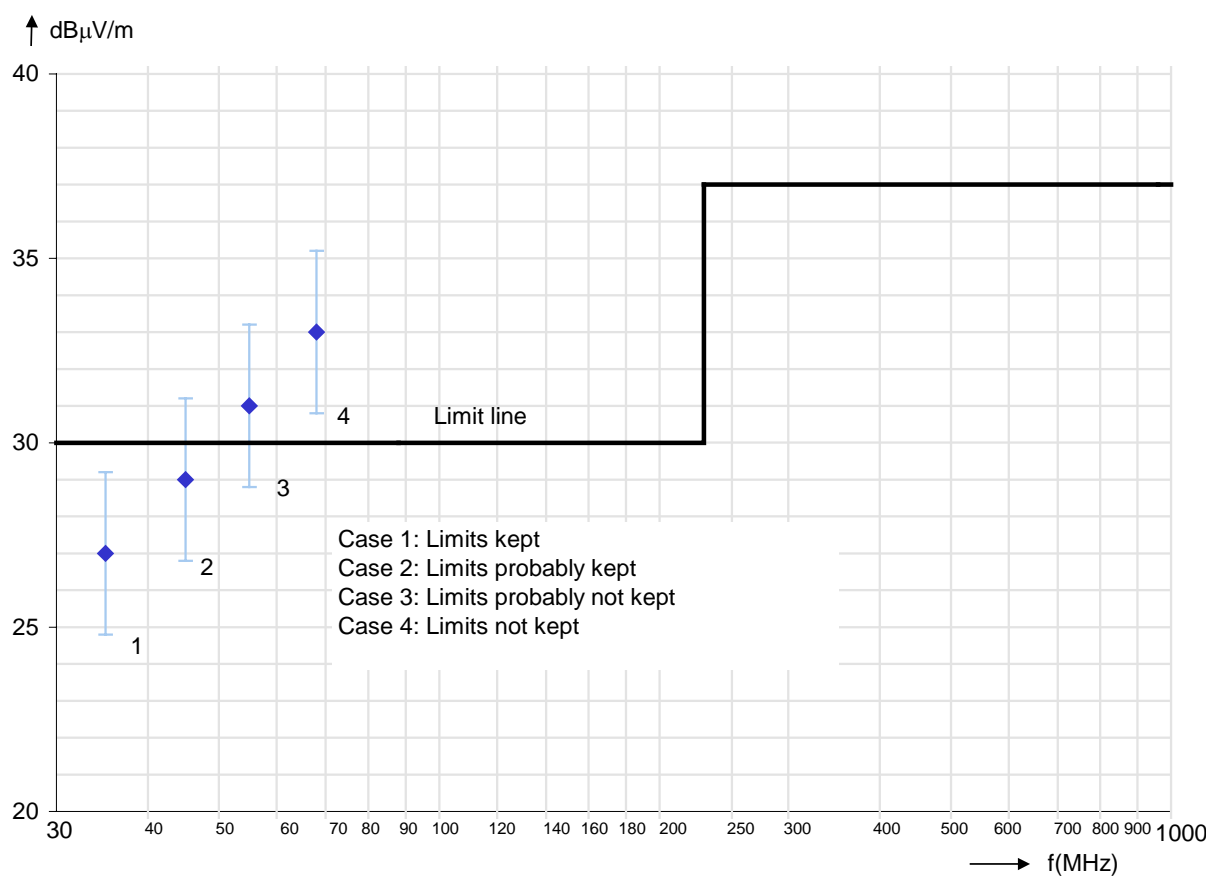
Test / Measurement uncertainty

The measurement uncertainty in the test met the guideline of CISPR16-4-2 or better.

Measurement uncertainty of the radiated emission with an extended coverage factor of $k=2$

Frequency	Measurement uncertainty
9kHz – 30MHz	on request
30MHz – 300MHz	4.4dB
300MHz – 1GHz	3.4dB
1GHz – 18GHz	on request

Annotation of the diagram



1.1.2.2 Test – intentional radiator

Regulation

47 CFR Part 15 – Subpart C

- | | |
|--------------------------------------------------|----------------------------------------|
| <input checked="" type="checkbox"/> 9kHz - 30MHz | <input type="checkbox"/> 150kHz – 1GHz |
| <input type="checkbox"/> 30MHz - 1000MHz | <input type="checkbox"/> 1 – 18GHz |

Limits: ☒ Section 15.209* ☒ Section 15.225*

* The limits for frequencies below 30MHz were corrected for a closer measuring distance by using an extrapolation factor of 40 dB/decade..

Antennena distance: ☐ 3m ☐ 5m
☒ 10m ☐ 30m

Operation mode

EUT arrangement: ☒ Tabletop ☐ Floor standing
Power supply: ☐ 230V/50Hz ☒ 115V/60Hz

Continuous operation of the system. The TLR 401 was supplied via the door unit with the Sunny power supply. The RFID field was active during the test.

Environmental conditions

Temperature: 15 - 35 °C
 Humidity: 30 - 60 %
 Air pressure: 860 - 1060 hPa

Environmental conditions during the test:
 ☒ were kept
☐ were not kept

Test - / Measurement procedure

The test was performed at an antenna to EUT distance of 10m. Measurements were made with a CISPR receiver with quasi-peak. The average detector is used in the frequency bands 9-90kHz, 110-490kHz and above 1000MHz. For pulse modulated devices with a pulse repetition frequency of 20Hz or less, peak detector is used (15.35a Note). The frequency, the measured value, antenna information and the limit will be printed out.

Test result

Limits for radiated disturbances:
 ☒ kept
☐ not kept

The level of any unwanted emissions from an intentional radiator shall not exceed the level of the fundamental wave:
 ☒ kept
☐ not kept

Remarks: There was no deviation of the fundamental frequency when the supply voltage was varied in the range of 115V \pm 15%

Protocol scope

- ☐ Readings - Antenna horizontal polarized.
- ☐ Diagram - Antenna horizontal polarized.
- ☒ Readings - Antenna vertical polarized.
- ☒ Diagram - Antenna vertical polarized.
- ☐ Bandwidth plot – Frequency response vs. supply voltage
- ☐ Precompliance measurement(s).

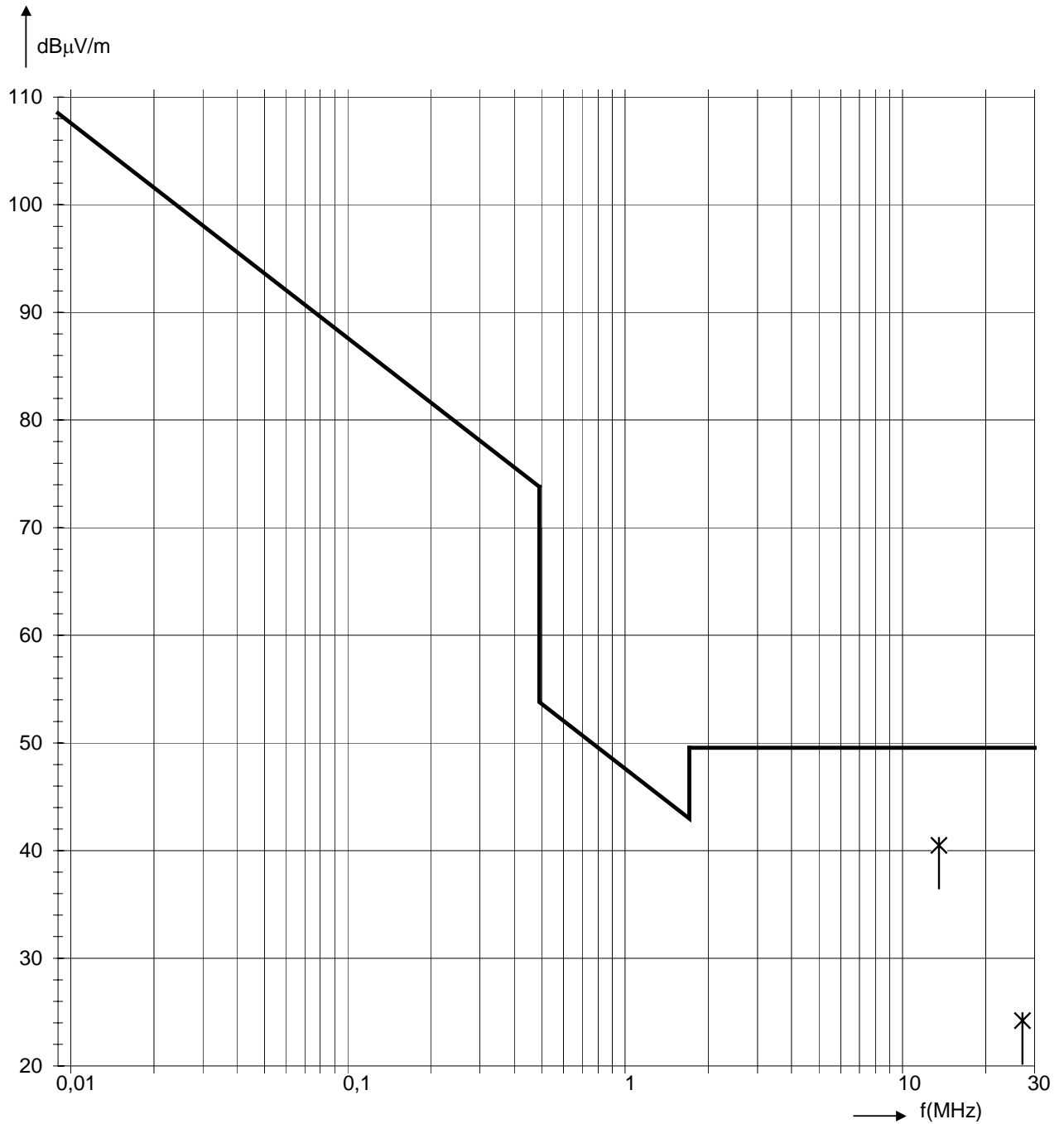
Readings - Antenna vertical polarized, Antenna loop center height 1m

Frequency	Reading	Limit	Margin	Ant. -	Ant. -	Detector	Receiver
	U			Distance	Polar.	Peak /	6dB BW
MHz	dB μ V/m	dB μ V/m	dB	m	H/V	QP / AV	kHz
13.5600	40.5	104.0	63.5	10.0	V	QP	10
27.1200	24.2	49.5	25.3	10.0	V	QP	10

Diagram - Antenna vertical polarized

Limits according FCC Rules CFR 47 Part 15 – Subpart C

☒ Section 15.209



1.1.2.3 Test – unintentional radiation

Regulation

47 CFR Part 15 – Subpart C

- | | | |
|---------------------|-----------------------------------------------------|----------------------------------------|
| | <input type="checkbox"/> 9kHz - 30MHz | <input type="checkbox"/> 150kHz – 1GHz |
| | <input checked="" type="checkbox"/> 30MHz - 1000MHz | <input type="checkbox"/> 1 – 18GHz |
| Limits: | <input checked="" type="checkbox"/> Section 15.209 | <input type="checkbox"/> __ |
| Antennena distance: | <input checked="" type="checkbox"/> 3m | <input type="checkbox"/> 5m |
| | <input type="checkbox"/> 10m | <input type="checkbox"/> 30m |

Operation mode

- | | | |
|------------------|----------------------------------------------|-----------------------------------------------|
| EUT arrangement: | <input checked="" type="checkbox"/> Tabletop | <input type="checkbox"/> Floor standing |
| Power supply: | <input type="checkbox"/> 230V/50Hz | <input checked="" type="checkbox"/> 115V/60Hz |

Continuous operation of the system. The TLR 401 was supplied via the door unit with the Sunny power supply. The RFID field was active during the test.

Environmental conditions

Temperature: 15 - 35 °C
Humidity: 30 - 60 %
Air pressure: 860 - 1060 hPa

Environmental conditions during the test: ☒ were kept
☐ were not kept

Test - / Measurement procedure

The test was performed at an antenna to EUT distance of 3m. Measurements were made with a CISPR receiver with quasi-peak. The average detector is used in the frequency bands 9-90kHz, 110-490kHz and above 1000MHz. For pulse modulated devices with a pulse repetition frequency of 20Hz or less, peak detector is used (15.35a Note). The frequency, the measured value, antenna information and the limit will be printed out.

Test result

Limits for radiated disturbances: ☒ kept
☐ not kept

Remarks: Radio disturbances below the limit line with a margin
> 10dB to the limit are generally not listed.

Protocol scope

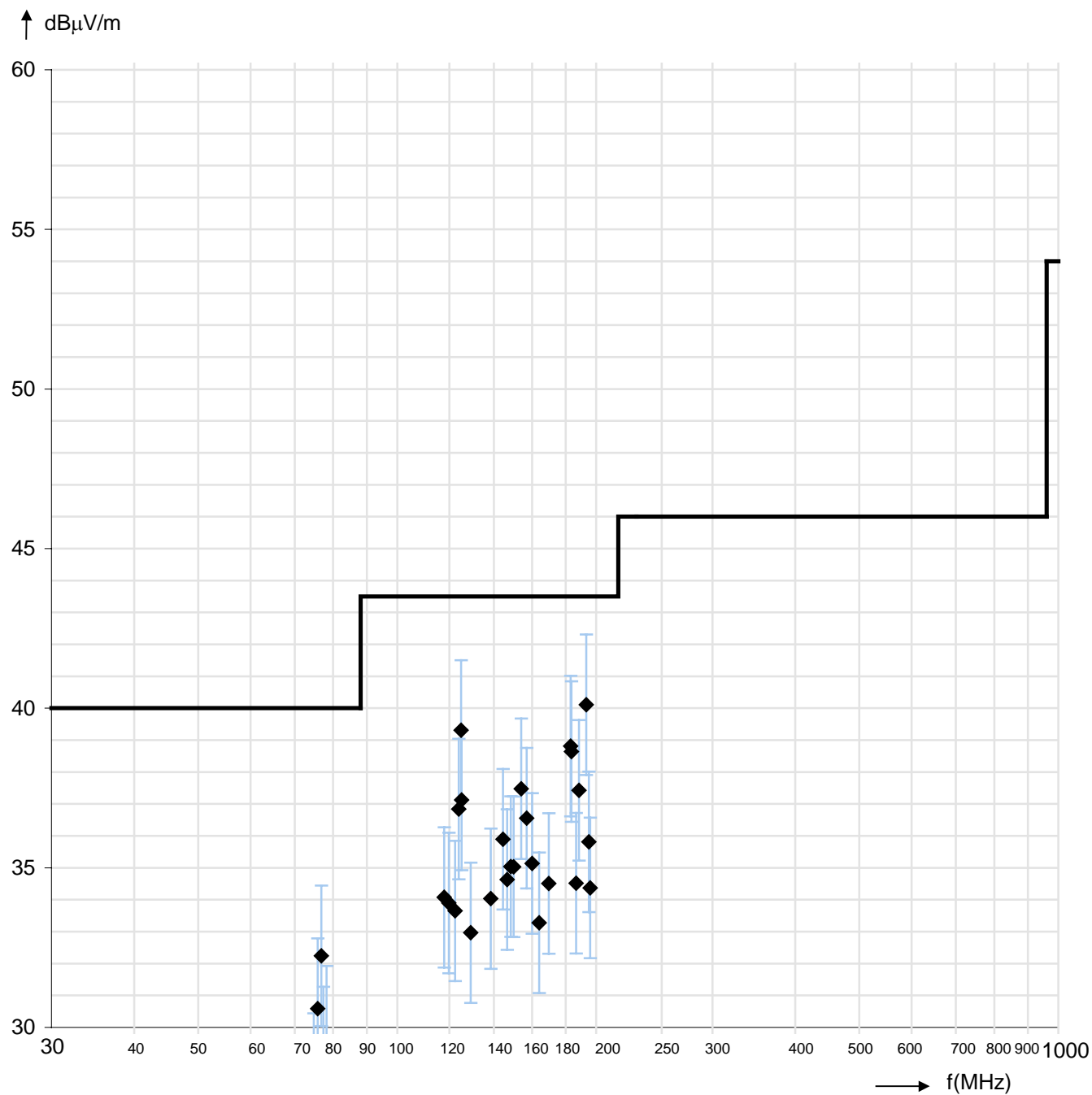
- | | |
|----------------------------------------------------------------------------|--------------------------------|
| <input checked="" type="checkbox"/> Readings | - Antenna horizontal polarized |
| <input checked="" type="checkbox"/> Diagram radio disturbances | - Antenna horizontal polarized |
| <input checked="" type="checkbox"/> Readings | - Antenna vertical polarized |
| <input checked="" type="checkbox"/> Diagram radio disturbances | - Antenna vertical polarized |
| <input type="checkbox"/> Precompliance measurement(s) in the shielded room | |

Readings - Antenna horizontal polarized

Frequency	Readings	+ AF Antenna correction factor	+ KF Cable correction factor	Field strength	Limit	Margin	Antenna- Height	Antenna- Polarisation
MHz	dBμV	dB/m	dB	dBμV/m	dBμV/m	dB	m	hor./ver.
75.800	20.1	8.8	1.7	30.6	40.0	9.4	3.0	H
76.800	21.7	8.8	1.7	32.2	40.0	7.8	3.0	H
117.710	21.0	10.8	2.2	34.1	43.5	9.4	2.5	H
119.730	20.7	10.9	2.3	33.9	43.5	9.6	2.5	H
122.310	20.3	11.1	2.3	33.6	43.5	9.9	2.5	H
123.860	23.4	11.1	2.3	36.8	43.5	6.7	2.5	H
124.910	25.8	11.2	2.3	39.3	43.5	4.2	2.5	H
125.190	23.6	11.2	2.3	37.1	43.5	6.4	2.5	H
138.500	19.7	11.9	2.5	34.0	43.5	9.5	2.5	H
144.500	21.2	12.2	2.5	35.9	43.5	7.6	2.5	H
146.700	19.8	12.3	2.5	34.6	43.5	8.9	2.5	H
148.500	20.1	12.4	2.6	35.0	43.5	8.5	2.5	H
150.000	20.0	12.5	2.6	35.0	43.5	8.5	2.5	H
154.000	22.2	12.7	2.6	37.5	43.5	6.0	2.5	H
157.000	21.1	12.8	2.6	36.6	43.5	6.9	2.5	H
160.000	19.5	13.0	2.7	35.1	43.5	8.4	1.8	H
169.480	18.3	13.5	2.7	34.5	43.5	9.0	1.8	H
182.970	21.8	14.2	2.9	38.8	43.5	4.7	1.8	H
183.500	21.6	14.2	2.9	38.6	43.5	4.9	1.8	H
186.450	17.3	14.3	2.9	34.5	43.5	9.0	1.8	H
188.330	20.1	14.4	2.9	37.4	43.5	6.1	1.8	H
193.090	22.5	14.7	2.9	40.1	43.5	3.4	1.8	H
194.880	18.1	14.8	3.0	35.8	43.5	7.7	1.8	H
195.890	16.6	14.8	3.0	34.4	43.5	9.1	1.8	H

Diagram radio disturbances – Antenna horizontal polarized

Limits: ☒ Section 15.209

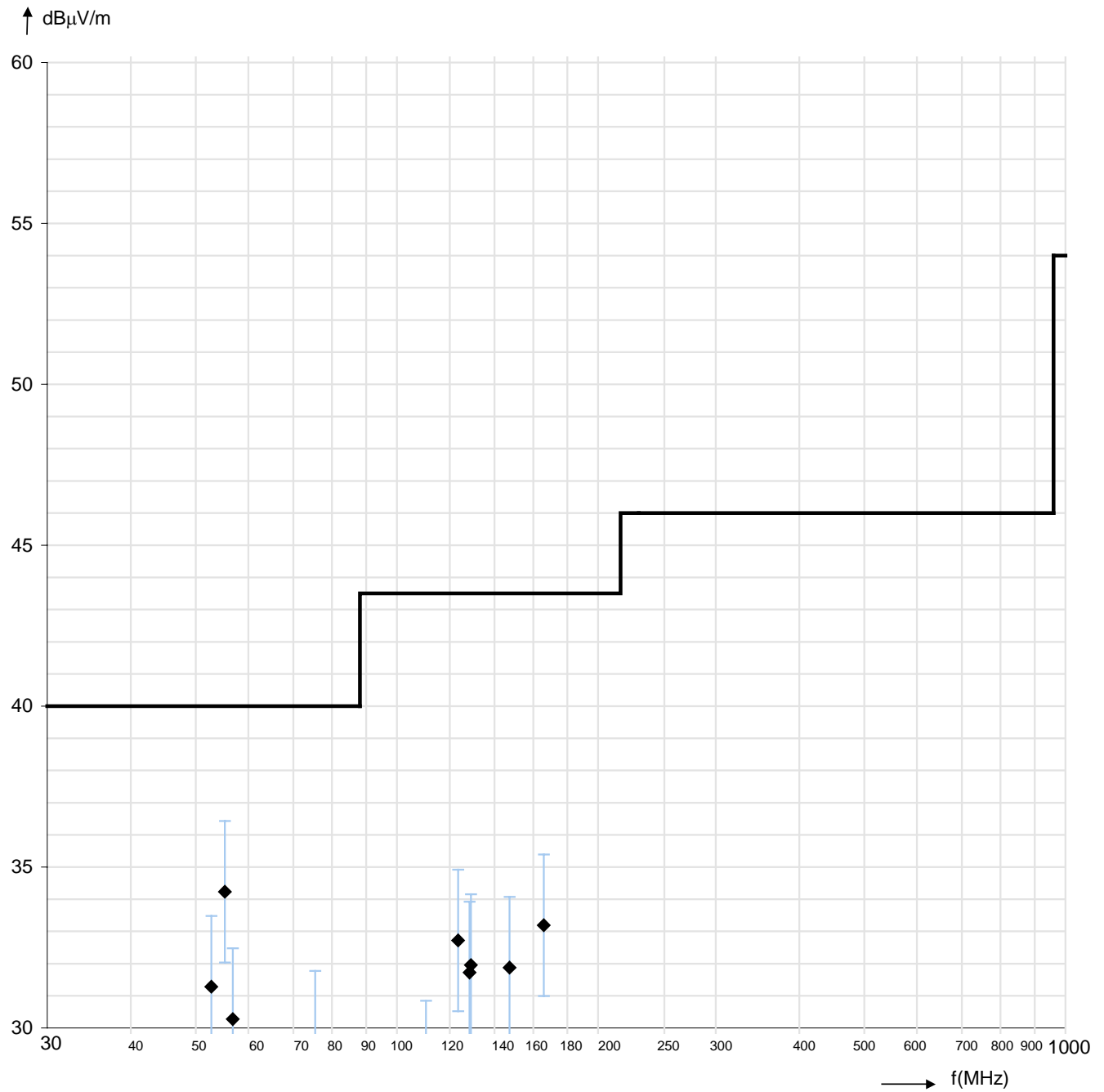


Readings - Antenna vertical polarized

Frequency	Readings	+ AF Antenna correction factor	+ KF Cable correction factor	Field strength	Limit	Margin	Antenna- Height	Antenna- Polarisation
MHz	dB μ V	dB/m	dB	dB μ V/m	dB μ V/m	dB	m	hor./ver.
52.790	21.7	8.2	1.4	31.3	40.0	8.7	1.0	H
55.293	24.6	8.2	1.4	34.2	40.0	5.8	1.0	H
56.810	20.6	8.2	1.5	30.3	40.0	9.7	1.0	H

Diagram radio disturbances – Antenna vertical polarized

Limits: ☒ Section 15.209



2 Summary

Regulation	Class / Test level	Result	Remark(s)
FCC Rules 47 CFR Part 15 Subpart C			
Terminal voltage 0.15-30MHz	Section 15.207	Limits kept	
Radiated emissions 0.009-30MHz	Section 15.209 15.225	Limits kept	Intentional / unwanted emissions
Radiated emissions 30-1000MHz	Section 15.209	Limits kept	Unintentional emissions

Burgrieden, 07/14/2008

Report generated by:


 Responsible Tester – Peter Hauser