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DAT-P-252/98-02

TECHNICAL REPORT

Measurement of radiated radio-noise emissions

EUT:

SIMATIC Mobile Panel 277 wireless with loading cradle, accumulator, AC / DC Adapter and transponder

MLFB-no. of SIMATIC Mobile Panel 277 wireless (non safety): **6AV6 645-0DC01-0AX0**
MLFB-no. of accumulator: **6AV6 671-5CL00-0XA0**
MLFB-no. of transponder: **6AV6 671-5CM00-0AX0**
MLFB-no. of AC/DC adapter **6AV6 671-5CN00-0AX1**

Result:

The radiated and conducted radio-noise emissions of the EUT are in compliance with Part 15 of the FCC rules.
(CFR Title 47, Part 15B; FCC Class A)

This report replaces report no. **08-E003402-BM-B02, dated 2008/10/16**

08-E003402-BM-C01	Engineer:	Sign:	Date:	Page:
S	Michael Tirpitz	Förtsch	2008/10/21	1 of 130
	signed Tirpitz	**signed Förtsch**		

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DAT-P-252/98-02

Measurements and report prepared by:

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Manufacturer of EUT:

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Dept. EWA PU 25

92224 Amberg

Germany

Technical report distributed to:

A&D AS RD ST Type Test	Mr. Pemsel
A&D SE RD 5	File (Original)
A&D SE RD 5	Cover

EUT (Equipment Under Test):

Product Type:	**SIMATIC**
Marketing Designation:	**Mobile Panel 277 Wireless**
MLFB-no. of SIMATIC Mobile Panel 277 wireless:	**6AV6 645-0DC01-0AX0**
MLFB-no. of AC/DC adapter.	**6AV6 671-5CN00-0AX1**
MLFB-no. of accumulator:	**6AV6 671-5CL00-0XA0**
MLFB-no. of transponder:	**6AV6 671-5CM00-0AX0**

Periphery:

MLFB-no. of CPU317F-2PN/DP:	**6ES7 317-2FK13-0AB0**
MLFB-no. of SCALANCE:	**6GK5 788-1SR00-2AA6**

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1 General information

Product description and tested system details

See chapter 5.

Electrical ratings and firmware release of EUT and periphery

Voltage of loading cradle:	24 V DC
Voltage of loading cradle for loading EUT:	12 V DC
Voltage of AC / DC adapter	110 V, 60 Hz / 12 V DC
Voltage of Mobile Panel:	7.2 V DC from accumulator
Type test no. of CPU317F-2PN/DP periphery:	7978
Type test no. of 5 simulators:	7156, 3542, 4622, 3189, 3541
Type test no. of SCALANCE periphery:	7979
Firmware release of Mobile Panel:	2.33
BootCE loader release:	01.00.40
Operation system:	Windows CE 5.0

Software for EUT with transponder:
Typtest_Amberg_1_SAFETY_Transponder.hmi

Software for Periphery with transponder:
2008_02_13_Typtest_Mobile277WLAN_Safety_mit_Transponder_0.79_.zip

Test methodology

Both, conducted and radiated tests were performed according to the procedures in ANSI C63.4-2003.

Radiated testing was performed at an antenna to EUT distance of 10 meters in a semianechoic chamber.

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Test facility

The semianechoic chamber and conducted measurement facility used to monitor the emission data are located at

SIEMENS AG
Dept.: I IA SE DE EMC
Günther-Scharowsky-Straße 21
91058 Erlangen
Germany.

This site has been found to be in compliance with the requirements of section 2.948 of the FCC Rules (Refer to letter 31040/SIT/1300F2 from Oct. 20, 1997, registration last renewed on Sep. 12, 2006).

The department A&D SE RD 5 is recogniced to be competend to carry out conformity assessment tasks in relation to EMC within the framework of the Agreement concluded between the European Community and USA to the extend defined in the associated recognition notice (Recognition certified by registration number BNetzA-CAB-02/21-05/1)

2 AC powerline conducted emissions

2.1 Test procedure

Conducted emission measurements were performed in a semianechoic chamber using LISN for the EUT Peripherals are not connected to the EUT only a WLAN via radio interface was established during test.

For prescan measurements the test receiver was set into the peak detector mode using a measuring bandwith of 9 kHz (Appendix A).

Final measurements were carried out for significant emissions. Significant emissions were defined from peak detector mode prescan measurements in all cases where an acceptance margin of 6 dB below the quasi peak limit values was exceeded.
For final measurements the quasi peak detector mode was used with a bandwith of 9 kHz.

For further data see enclosed test results.

2.2 Test conditions

Date of test:	2008/10/21
Test staff:	Mr. Tirpitz SIEMENS AG Dept. I IA SE DE EMC 1
Location of test site:	SIEMENS AG Dept. I IA SE DE EMC Semianechoic Chamber in Building 47.1 Günther-Scharowsky-Straße 21 91058 Erlangen Germany
Temperature:	20 °C
Relative humidity:	54 %

2.3 Test instrumentation

Type	Model No.	Manufacturer	Inv. No.
Test receiver	ESHS 30	Rohde & Schwarz	REC6034
Pulse limiter	ESH - Z2	Rohde & Schwarz	ATT0024
LISN*) for EUT	ESH3-Z5	Rohde & Schwarz	NNB6008
Isolation transformer	1 kVA	Siemens	TTR6065

*) Line Impedance Simulation Network

Table 1: Equipment used for test

Opearation mode: refere to chapter radiated emsission

Detailed test setup: refere to chapter radiated emissions

2.4 Measured data

Table 2 indicates the results of quasi peak [QP] resp. average [Av] final measurements of significant emissions. Indicated are conductor, frequency, maximum measured peak resp. average value and corresponding quasi peak resp. average limit value.

Conductor	Frequency [MHz]	Maximum of measured value [dBµV]	Actual limit value (quasi peak resp. average) [dBµV]
Range 0.15 – 30:			
Neutral	180 kHz	Peak: 56.9 dBµV	Peak: 65 dBµV
		Average: 43.5 dBµV	Average: 55 dBµV
	240 kHz	Peak: 48.5 dBµV	Peak: 63.5 dBµV
		Average: 35.6 dBµV	Average: 53.5 dBµV
	26 MHz	Peak: 47.4 dBµV	Peak 60 dBµV
		Average: 47.0 dBµV	Average: 50 dBµV
Phase L1	180 kHz	Peak: 55.9 dBµV	Peak: 65 dBµV
		Average: 42.2 dBµV	Average: 55 dBµV

Conductor	Frequency [MHz]	Maximum of measured value [dBµV]	Actual limit value (quasi peak resp. average) [dBµV]
	240 kHz	Peak: 47.7 dBµV	Peak: 63.5 dBµV
		Average: 33.0 dBµV	Average: 53.5 dBµV
	26 MHz	Peak: 49.4 dBµV	Peak: 60 dBµV
		Average: 48.5 dBµV	Average: 50 dBµV

Table 2: Conducted final measurement results of critical frequencies

Judgement: The measured emissions kept within the limits of class B (FCC Part 15) with a margin of at least 1.5 dB.

The following records show the detailed measurementresult given as spectra of the conducted emissions.

08-E003402

21. Oct 08 10:32

Conducted emissions

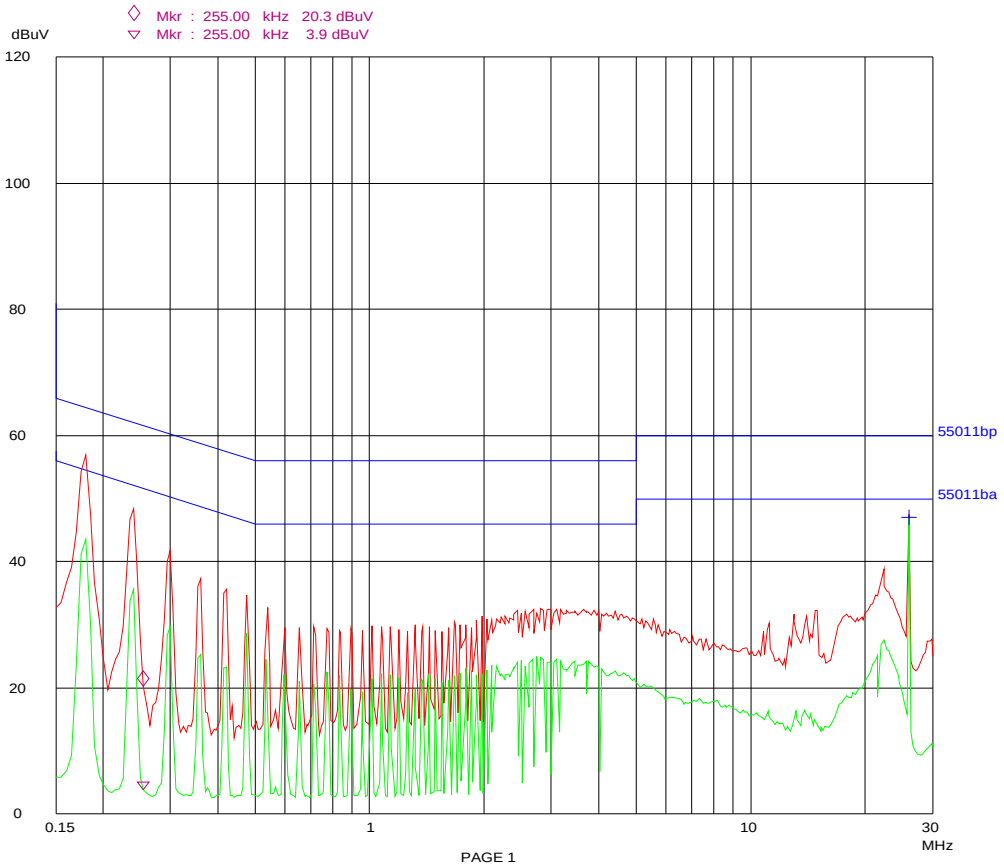
EUT: Mobile Panel 277 IWLAN
Manuf: Siemens AG
Op Cond: 20 deg. C. / 54% rel. Hum.
Operator: Tirpitz
Test Spec: FCC Part 15B Class B
Comment: AC 110V / 60 Hz
Line N

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	30M	5k	10k	PK+AV	50ms	AUTO	LN OFF	60dB

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB

Transducer No.	Start	Stop	Name
5	2 9k	30M	ATT0022
	3 9k	30M	DT_K1



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08-E003402

21. Oct 08 10:32

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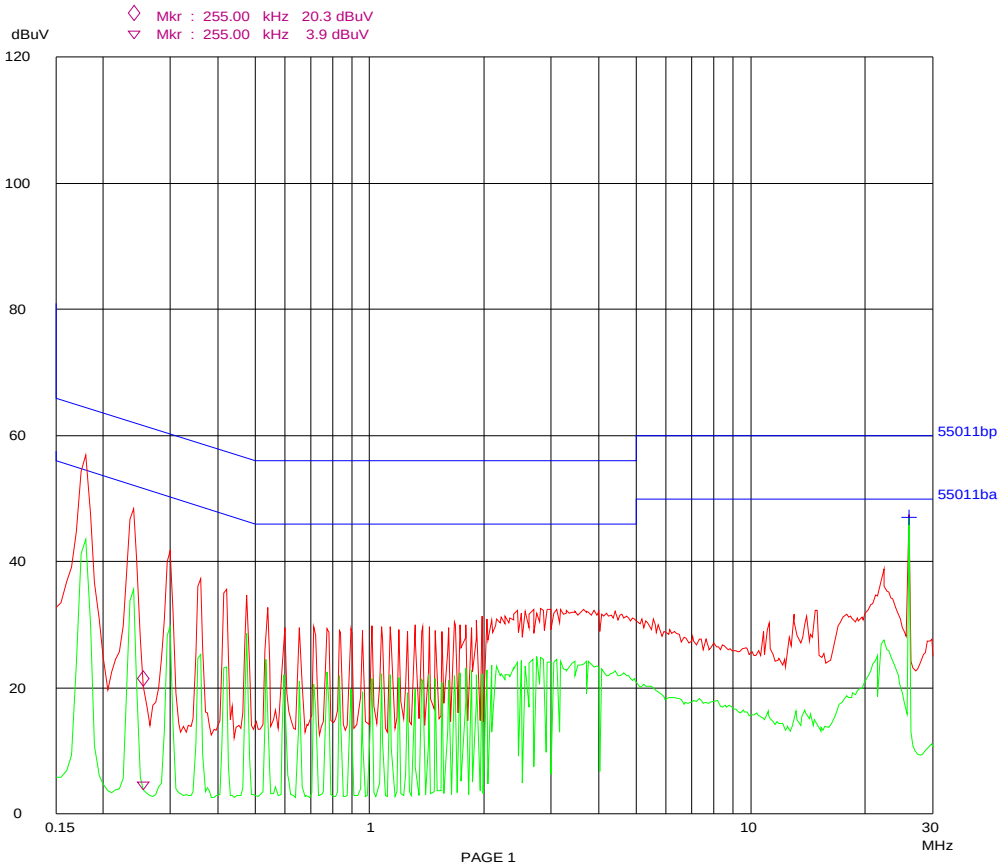

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3 Radiated emissions

3.1 Test procedure

General information:

Radiated emissions are measured in a semianechoic chamber.
The distance between EUT and antenna is 10 m.
The antenna used for testing is a "bilog" type (manufacturer CHASE, model CBL 6112) suited for 30 MHz to 2 GHz. The antenna used for testing is a "horn" type (manufacturer ETS, model 3117) suited for 1 GHz to 18 GHz and the antenna used for testing is a "horn" type (manufacturer A.H. Systems, model SAS-574) suited for 18 GHz to 40 GHz.

The prescan procedure is as follows:
The prescan is performed with a Hewlett Packard spectrum analyzer (8593 EM up to 2GHz) and with a Agilent spectrum analyzer (PSA 4446A up to 40GHz).
The spectrum analyzers were set to the peak detector mode using a measuring bandwidth of 120 kHz up to 1 GHz and a bandwidth of 1MHz up to 40GHz.

The EUT is placed on a turntable.

Measurements are carried out each 22.5 degrees. The antenna is moved between 130 and 370 cm by steps of 60 cm with horizontal and vertical polarization.
The maximum value is recorded and shown in a diagram. For each step the used EMI HP 85876B and Dare! Radimation Software records the actual spectrum and creates a list of worst case position (angle, mast height and polarization) for significant emissions.

Final measurements are carried out for significant emissions; that means: all emissions which exceed an acceptance margin 6 dB below the actual limit line.
For final measurements of these emissions a Rohde & Schwarz test receiver (ESCS30) is used in the quasi peak detector mode and with a bandwidth of 120 kHz up to 1 GHz. Also the Agilent analyzer is used in peak and average mode with a bandwidth of 1 MHz up to 40GHz for final measurment.
At first turntable and antenna are moved to the values of the list created in the prescan procedure and are then varied ± 30° and ± 30 cm in order to find the absolute maximum level of emission.
For further data see enclosed test results.

Operation modes:

The test was performed in the frequency range 30MHz-2GHz with the operation mode ProfiNet I/O 5.52GHz (OP1; intentional radiator) and the operation mode transponder mode 2.4GHz (OP2; intenional radiator) at the same time.
In the frequency range 1GHz-40GHz the test was performed in operation mode ProfiNet I/O 5.52GHz without operation mode transponder mode 2.4GHz for the first measurement.
The second measurement was performed with both operation modes ProfiNet I/O 5.52GHz and transponder mode 2.4GHz at the same time.

Detailed test setup:

Cyclic data transfer between each module and verification.

For emission tests the WLAN connection was set to channel 100 (frequency 5,520 GHz) at 28 MBit and 64 QAM.

The Effective Range System, consisting of the Effective Range Module -integrated insede the Mobile Panel 277 IWLAN- and Transponder Module -seperate unit- was activated during test in accordance to its specification.

Frequency range 2.4 bis 2.4835 GHz continius scan.

The ranging function is based on the measurement of the radio signals travelling time.

The reader (base module) contains a voltage controlled oscillator (VCO, >2.4 GHz… <2.4835 GHz). Its signal will get filtered and radiated afterwards through the transmitting port of a dual port antenna. Shortly after, the - by the transponder - backscatter modulated signal will appear at the receiving port of the same antenna. The signal gets filtered, amplified and fed into a mixer. The local oscillator signal of the mixer is also generated by the before mentioned VCO.

After the mixer, the signal is centred around 450 kHz, the subcarrier frequency used by the transponder. The signal gets narrowband filtered (bandwidth of some 15 kHz) and amplified. Then it gets converted by the means of an 10 bit analogue-to-digital converter.

The signal is BPSK subcarrier modulated and has also an on-off-keying modulation (OOK). This modulation is used for transmitting the identification of the particular transponder as well as some status information.

3.2 Test conditions

Date of test:	2008/10/15 and 2008/10/16
Test staff:	Mr. Förtsch, Mr. Tirpitz SIEMENS AG Dept. A&D SE RD 5
Location of test site:	SIEMENS AG Dept.: I IA SE DE EMC 1 SE RD 5 Semianechoic Chamber in Building 47.1 Günther-Scharowsky-Straße 21 91058 Erlangen Germany
Temperature:	19 °C and 19 °C
Relative humidity:	44 % and 45%

2.3 Test instrumentation

Type	Manufacturer Model	Inv. No.	Last calibration	Calibration interval
Test Equipment	EMI-Receiver R&S ESCS30 Spectrum-Analyzer HP8593 EM + Preamplifier HP 87405A Agilent E4446A	REC6055 ANA6065 AMP6001 ANA6138	2008/01 2008/01 2008/01 2008/02	1 year 1 year 1 year 1 year
Antenna(s)	Chase CBL6112A ETS Model 3117 A.H. Systems	ANT6067 ANT6141 ANT6144	2006/04 2007/06 2007/06	2 years 2 years 2 years
Isolation Transformer	Siemens 1kVA	TTR0541	---	---

Table 2.3.1: Equipment used for test

3.4 Field strength calculation

The field strength is calculated by adding the antenna factor and cable factor automatically to the measured value. The display of the receiver shows the corrected value. The complete table of correction factors is given on the next page. The basic equation with a sample calculation is as follows:

FS = MV + TF; **TF = AF + CF + AmF**

where	FS	=	Field Strength
	MV	=	Measured Value
	TF	=	Transducer Factor
	AF	=	Antenna Factor
	CF	=	Cable Attenuation Factor
	AmF	=	Amplifier Factor (negative prefix)

Assume a receiver reading of 28.5 dBµV is obtained. The antenna factor of 10.5 and a cable factor of 1.3 is added, resulting in a field strength of 40.3 dBµV/m.

FS = 28.5 + 10.5 + 1.3 = 40.3 dBµV/m

A negative TF is an amplification, a positive TF is an attenuation !

3.5.1 Table of correction factors frequency range 30MHz-2GHz

Remark: A negative TF is an amplification, a positive TF is an attenuation!

Frequency [MHz]	Transducer Factor TF [dB]
30.0	-3.8
50.0	-14.1
70.0	-16.2
80.0	-14.9
100.0	-11.3
150.0	-11.1
200.0	-12.1
260.0	-6.9
300.0	-7.3
400.0	-3.9
500.0	-1.9
600.0	-0.2
800.0	1.5
1000.0	3.0
1200.0	6.0
1400.0	7.8
1600.0	9.1
1800.0	10.1
2000.0	10.9

3.5.2 Table of correction factors frequency range 1GHz-18GHz

Antenna:

Frequency [MHz]	Transducer Factor TF [dB]
1000	27.4
1500	28.7
2000	32
2500	32.9
3000	33.8
3500	33.7
4000	34.1
4500	34.5
5000	34.8
5500	35.4
6000	36.2
6500	36.8
7000	36.8
7500	36.6
8000	36.7
8500	36.8
9000	37.1
9500	37.6
10000	38.4
10500	38.8
11000	39.1
11500	39.5
12000	39.8
12500	39.8
13000	39.5
13500	39.2
14000	39.8
14500	40.5
15000	40.5
15500	40.7
16000	41.2
16500	41.8
17000	42.4
17500	41.9
18000	41.8

Cables:

Frequency [GHz]	Transducer Factor TF [dB]
1	48,867
1,149	49,567
1,298	50,268
1,447	50,807
1,596	51,229
1,745	51,149
1,894	51,191
2,043	51,161
2,192	51,603
2,342	51,527
2,491	51,367
2,64	51,163
2,789	51,11
2,938	50,604
3,087	50,382
3,236	50,267
3,385	49,744
3,535	50,02
3,684	49,444
3,833	49,933
3,982	49,587
4,131	50,625
4,28	49,833
4,429	51,08
4,578	51,371
4,728	51,101
4,877	51,3
5,026	51,813
5,175	51,669
5,324	51,63
5,473	51,499
5,622	51,171
5,771	50,676
5,921	51,072
6,07	51,037
6,219	50,113
6,368	50,306

Frequency [GHz]	Transducer Factor TF [dB]
6,517	50,825
6,666	49,507
6,815	49,231
6,964	48,826
7,114	47,084
7,263	46,553
7,412	47,711
7,561	47,905
7,71	47,644
7,859	47,132
8,008	47,071
8,157	47,483
8,307	48,702
8,456	48,318
8,605	48,199
8,754	47,182
8,903	47,004
9,052	48,212
9,201	48,821
9,35	48,823
9,5	48,115
9,649	48,499
9,798	49,646
9,947	50,599
10,096	50,752
10,245	49,721
10,394	48,228
10,543	48,825
10,692	49,393
10,842	49,441
10,991	45,835
11,14	45,87
11,289	44,876
11,438	45,094
11,587	46,366
11,736	46,371
11,885	44,474
12,035	43,798
12,184	43,944

Frequency [GHz]	Transducer Factor TF [dB]
12,333	45,046
12,482	47,189
12,631	45,882
12,78	45,352
12,929	43,859
13,078	43,853
13,228	44,51
13,377	45,536
13,526	44,6
13,675	42,729
13,824	42,737
13,973	45,286
14,122	45,989
14,271	45,716
14,421	45,342
14,57	44,331
14,719	45,667
14,868	46,839
15,017	47,321
15,166	46,617
15,315	46,646
15,464	47,112
15,614	46,984
15,763	47,725
15,912	48,836
16,061	50,725
16,21	50,526
16,359	52,396
16,508	53,047
16,657	52,559
16,807	51,053
16,956	49,545
17,105	48,392
17,254	47,04
17,403	47,422
17,552	46,914
17,701	47,213
17,85	46,895
18	48,511

3.5.3 Table of correction factors frequency range 18GHz-40GHz

Antenna:

Frequency [MHz]	Transducer Factor TF [dB]
18000	40.4
19000	40.3
20000	40.1
21000	40
22000	40.1
23000	40.4
24000	40.6
25000	40.6
26000	40.7
27000	40.2
28000	40.9
29000	40.5
30000	40.7
31000	40.6
32000	40.4
33000	40.4
34000	40.8
35000	41
36000	40.9
37000	41.2
38000	41
39000	40.8
40000	41.1

Cable:

Frequency [GHz]	Transducer Factor TF [dB]
18	47.6
18,5	48.1
19	46.9
19,5	46.5
20	46.6
20,5	45.8
21	44.9
21,5	44.4
22	44.4
22,5	44.3
23	48
23,5	48
24	48
24,5	48
25	48
25,5	48
26	48
26,5	48
27	48
27,5	48
28	48
28,5	48
29	48
29,5	48
30	48
30,5	48
31	48
31,5	48
32	48
32,5	48
33	48
33,5	48
34	48
34,5	48
35	48
35,5	48
36	48

Frequency [GHz]	Transducer Factor TF [dB]
36,5	48
37	48
37,5	48
38	48
38,5	48
39	48
39,5	48
40	48

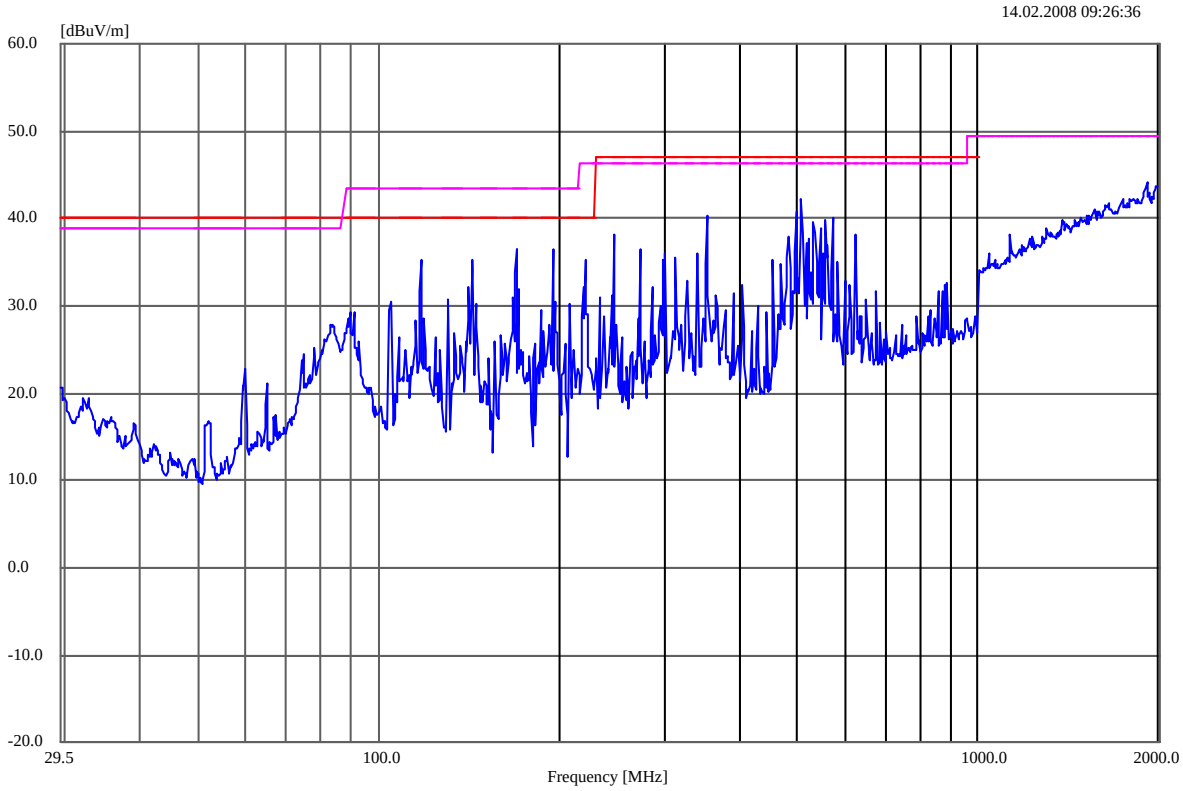
3.6 Measured data

The lists in the following chapter indicate the results of final measurements of significant emissions.
Indicated are frequency, turntable and antenna parameters for maximum indication, maximum measured values and corresponding quasi peak / peak / average limit values (FCC Class A).

Assessment: The measured emissions kept within the limits of Class A (FCC Part 15B) with a margin of at least 1.5 dB in the OP1 and with a margin of at least 1.5 dB in the OP1 together with OP2. The internal intentional radiators and their harmonics are not evaluated!

For more detailed test results see measurement records as shown in chapters 3.7.1 – 3.7.3.

3.7.1 Measurement records of radiated emission frequency range 30MHz – 2GHz in OP1 and OP2 mode together

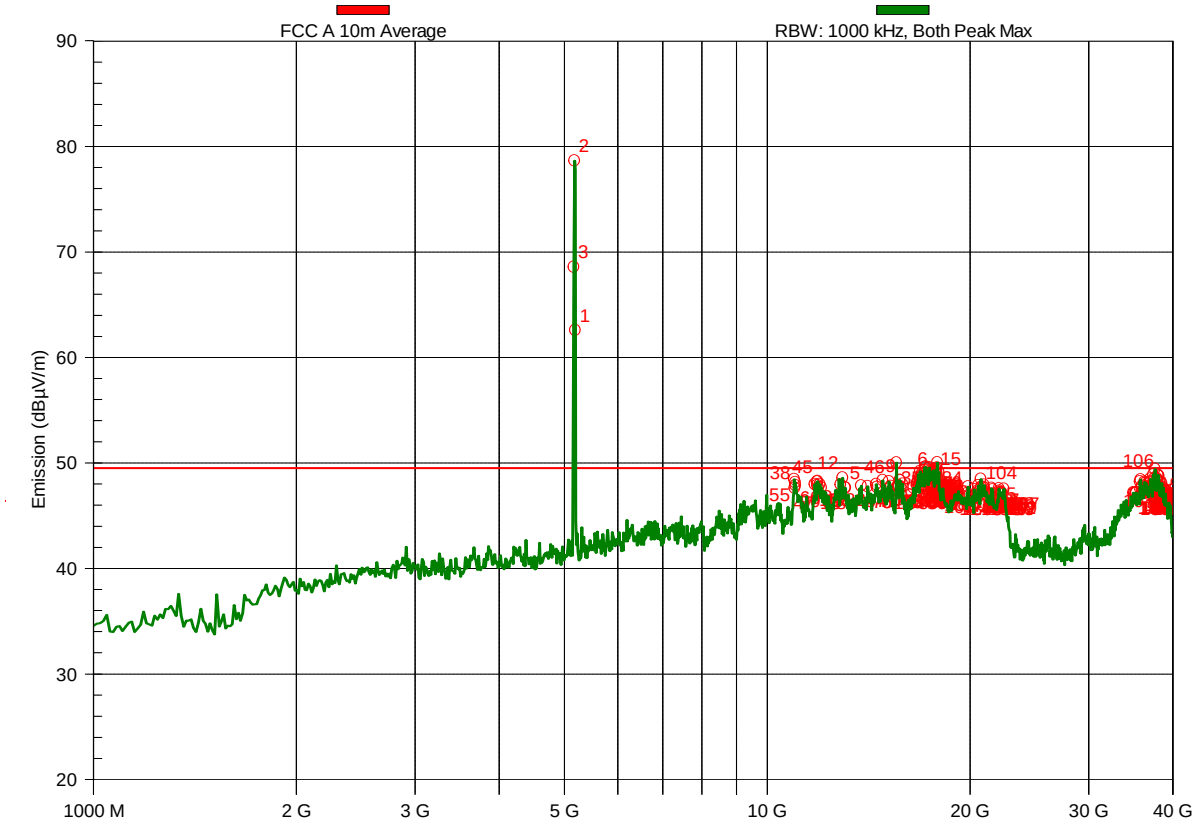


Criticals FCC A [0/815]

Frequency	Angle	Hgt	Pol	Peak	QP Lmt	QP	Avg Lmt
MHz	deg	cm		dBuV/m	dBuV/m	dBuV/m	dBuV/m

No Signals in this List

3.7.2 Measurement records of radiated emission frequency range 1GHz – 40GHz in OP1 mode



Result list (without internal intentional radiators):

No.	Frequency	Peak value	Limit of AV	Value of AV	Turntable	Antenna	Polarization
4	17,067 GHz	47,978 dBµV/m	49,5 dBµV/m	45,588 dBµV/m	0 Degree	250 m	Horizontal
5	13,067 GHz	47,623 dBµV/m	49,5 dBµV/m	47,523 dBµV/m	0 Degree	250 m	Vertical
6	17,567 GHz	48,987 dBµV/m	49,5 dBµV/m	46,747 dBµV/m	0 Degree	250 m	Vertical
7	17,183 GHz	49,622 dBµV/m	49,5 dBµV/m	46,992 dBµV/m	0 Degree	250 m	Vertical
8	17,15 GHz	49,116 dBµV/m	49,5 dBµV/m	46,366 dBµV/m	0 Degree	370 m	Horizontal
9	15,75 GHz	48,32 dBµV/m	49,5 dBµV/m	48,07 dBµV/m	0 Degree	370 m	Vertical
10	17,367 GHz	48,568 dBµV/m	49,5 dBµV/m	45,638 dBµV/m	0 Degree	370 m	Vertical
11	17 GHz	48,265 dBµV/m	49,5 dBµV/m	47,315 dBµV/m	21 Degree	370 m	Horizontal
12	12,933 GHz	48,598 dBµV/m	49,5 dBµV/m	45,198 dBµV/m	21 Degree	250 m	Horizontal
13	13,05 GHz	47,666 dBµV/m	49,5 dBµV/m	45,976 dBµV/m	21 Degree	129 m	Vertical
14	17,683 GHz	47,999 dBµV/m	49,5 dBµV/m	46,599 dBµV/m	21 Degree	129 m	Vertical
15	17,817 GHz	49,021 dBµV/m	49,5 dBµV/m	47,001 dBµV/m	44 Degree	129 m	Horizontal
16	16,917 GHz	48,227 dBµV/m	49,5 dBµV/m	45,607 dBµV/m	44 Degree	129 m	Vertical
17	17,033 GHz	48,937 dBµV/m	49,5 dBµV/m	46,727 dBµV/m	44 Degree	250 m	Vertical
18	17,117 GHz	48,591 dBµV/m	49,5 dBµV/m	45,351 dBµV/m	44 Degree	250 m	Vertical
19	17,833 GHz	49,383 dBµV/m	49,5 dBµV/m	46,713 dBµV/m	44 Degree	309 m	Horizontal
20	16,783 GHz	47,686 dBµV/m	49,5 dBµV/m	46,876 dBµV/m	44 Degree	370 m	Horizontal
21	16,9 GHz	47,958 dBµV/m	49,5 dBµV/m	46,038 dBµV/m	66 Degree	370 m	Vertical
22	15,733 GHz	48,359 dBµV/m	49,5 dBµV/m	45,789 dBµV/m	66 Degree	370 m	Horizontal
23	16,817 GHz	47,812 dBµV/m	49,5 dBµV/m	45,502 dBµV/m	66 Degree	309 m	Vertical
24	17,133 GHz	49,568 dBµV/m	49,5 dBµV/m	45,768 dBµV/m	66 Degree	189 m	Horizontal
25	17,233 GHz	48,782 dBµV/m	49,5 dBµV/m	47,592 dBµV/m	66 Degree	129 m	Horizontal
26	17,75 GHz	48,572 dBµV/m	49,5 dBµV/m	46,242 dBµV/m	66 Degree	129 m	Horizontal
27	16,867 GHz	49,198 dBµV/m	49,5 dBµV/m	46,228 dBµV/m	89 Degree	129 m	Horizontal
28	17,967 GHz	49,131 dBµV/m	49,5 dBµV/m	45,181 dBµV/m	89 Degree	129 m	Horizontal
29	17,25 GHz	48,594 dBµV/m	49,5 dBµV/m	46,554 dBµV/m	89 Degree	189 m	Horizontal
30	17,633 GHz	49,299 dBµV/m	49,5 dBµV/m	47,579 dBµV/m	89 Degree	189 m	Horizontal
31	17,6 GHz	49,16 dBµV/m	49,5 dBµV/m	47,03 dBµV/m	89 Degree	250 m	Horizontal
32	17,083 GHz	47,904 dBµV/m	49,5 dBµV/m	45,624 dBµV/m	89 Degree	250 m	Horizontal
33	17,933 GHz	48,514 dBµV/m	49,5 dBµV/m	45,684 dBµV/m	89 Degree	370 m	Vertical
34	15,8 GHz	47,609 dBµV/m	49,5 dBµV/m	46,429 dBµV/m	111 Degree	370 m	Vertical
35	15,55 GHz	50,011 dBµV/m	49,5 dBµV/m	44,191 dBµV/m	111 Degree	370 m	Horizontal
36	17,383 GHz	48,502 dBµV/m	49,5 dBµV/m	46,842 dBµV/m	111 Degree	370 m	Horizontal
37	17,1 GHz	47,779 dBµV/m	49,5 dBµV/m	45,799 dBµV/m	111 Degree	250 m	Horizontal
38	10,983 GHz	47,623 dBµV/m	49,5 dBµV/m	45,383 dBµV/m	111 Degree	189 m	Vertical
39	16,967 GHz	48,948 dBµV/m	49,5 dBµV/m	46,568 dBµV/m	111 Degree	129 m	Vertical

No.	Frequency	Peak value	Limit of AV	Value of AV	Turntable	Antenna	Polarization
40	15,883 GHz	47,998 dBµV/m	49,5 dBµV/m	44,468 dBµV/m	134 Degree	129 m	Vertical
41	17,333 GHz	48,79 dBµV/m	49,5 dBµV/m	45,52 dBµV/m	134 Degree	189 m	Vertical
42	16,7 GHz	48,103 dBµV/m	49,5 dBµV/m	44,203 dBµV/m	134 Degree	189 m	Vertical
43	17,517 GHz	48,806 dBµV/m	49,5 dBµV/m	46,766 dBµV/m	134 Degree	189 m	Vertical
44	15,25 GHz	47,797 dBµV/m	49,5 dBµV/m	45,517 dBµV/m	134 Degree	189 m	Horizontal
45	11,85 GHz	48,22 dBµV/m	49,5 dBµV/m	43,15 dBµV/m	134 Degree	250 m	Vertical
46	15,167 GHz	48,226 dBµV/m	49,5 dBµV/m	45,666 dBµV/m	134 Degree	370 m	Horizontal
47	11,917 GHz	47,652 dBµV/m	49,5 dBµV/m	45,202 dBµV/m	134 Degree	370 m	Vertical
48	17,85 GHz	49,035 dBµV/m	49,5 dBµV/m	46,225 dBµV/m	156 Degree	309 m	Horizontal
49	11,967 GHz	47,967 dBµV/m	49,5 dBµV/m	44,237 dBµV/m	156 Degree	309 m	Vertical
50	14,833 GHz	48,354 dBµV/m	49,5 dBµV/m	44,824 dBµV/m	156 Degree	189 m	Horizontal
51	17,05 GHz	47,882 dBµV/m	49,5 dBµV/m	47,942 dBµV/m	156 Degree	189 m	Horizontal
52	17,8 GHz	48,428 dBµV/m	49,5 dBµV/m	46,728 dBµV/m	156 Degree	189 m	Horizontal
53	15,65 GHz	47,777 dBµV/m	49,5 dBµV/m	44,707 dBµV/m	156 Degree	129 m	Horizontal
54	16,667 GHz	47,905 dBµV/m	49,5 dBµV/m	45,255 dBµV/m	179 Degree	129 m	Vertical
55	10,967 GHz	48,443 dBµV/m	49,5 dBµV/m	44,443 dBµV/m	179 Degree	189 m	Horizontal
56	17,283 GHz	48,555 dBµV/m	49,5 dBµV/m	46,185 dBµV/m	179 Degree	189 m	Horizontal
57	13,783 GHz	47,822 dBµV/m	49,5 dBµV/m	45,912 dBµV/m	179 Degree	250 m	Horizontal
58	17,783 GHz	49,003 dBµV/m	49,5 dBµV/m	46,083 dBµV/m	179 Degree	309 m	Horizontal
59	17,867 GHz	49,532 dBµV/m	49,5 dBµV/m	47,202 dBµV/m	201 Degree	370 m	Vertical
60	11 GHz	48,153 dBµV/m	49,5 dBµV/m	45,073 dBµV/m	201 Degree	370 m	Horizontal
61	16,85 GHz	48,172 dBµV/m	49,5 dBµV/m	46,232 dBµV/m	201 Degree	250 m	Vertical
62	17,45 GHz	48,608 dBµV/m	49,5 dBµV/m	47,448 dBµV/m	201 Degree	189 m	Horizontal
63	17,017 GHz	47,781 dBµV/m	49,5 dBµV/m	46,011 dBµV/m	201 Degree	129 m	Vertical
64	14,55 GHz	47,703 dBµV/m	49,5 dBµV/m	45,003 dBµV/m	201 Degree	129 m	Vertical
65	17,55 GHz	48,859 dBµV/m	49,5 dBµV/m	46,049 dBµV/m	224 Degree	189 m	Vertical
66	16,95 GHz	47,624 dBµV/m	49,5 dBµV/m	46,164 dBµV/m	224 Degree	189 m	Horizontal
67	16,717 GHz	48,193 dBµV/m	49,5 dBµV/m	45,903 dBµV/m	224 Degree	250 m	Vertical
68	11,867 GHz	47,883 dBµV/m	49,5 dBµV/m	45,123 dBµV/m	224 Degree	250 m	Vertical
69	17,7 GHz	47,729 dBµV/m	49,5 dBµV/m	46,989 dBµV/m	224 Degree	309 m	Vertical
70	14,517 GHz	47,97 dBµV/m	49,5 dBµV/m	44,02 dBµV/m	224 Degree	309 m	Vertical
71	16,883 GHz	48,213 dBµV/m	49,5 dBµV/m	46,503 dBµV/m	224 Degree	309 m	Vertical
72	17,467 GHz	49,065 dBµV/m	49,5 dBµV/m	45,845 dBµV/m	224 Degree	309 m	Horizontal
73	17,483 GHz	47,952 dBµV/m	49,5 dBµV/m	46,612 dBµV/m	246 Degree	370 m	Horizontal
74	17,4 GHz	49,556 dBµV/m	49,5 dBµV/m	46,496 dBµV/m	246 Degree	309 m	Horizontal
75	14,1 GHz	47,775 dBµV/m	49,5 dBµV/m	43,105 dBµV/m	246 Degree	309 m	Vertical
76	17,167 GHz	48,304 dBµV/m	49,5 dBµV/m	45,754 dBµV/m	246 Degree	309 m	Vertical
77	17,733 GHz	47,666 dBµV/m	49,5 dBµV/m	46,026 dBµV/m	246 Degree	250 m	Vertical
78	15,683 GHz	47,825 dBµV/m	49,5 dBµV/m	45,325 dBµV/m	246 Degree	189 m	Horizontal
79	16,983 GHz	48,127 dBµV/m	49,5 dBµV/m	46,417 dBµV/m	246 Degree	189 m	Horizontal

No.	Frequency	Peak value	Limit of AV	Value of AV	Turntable	Antenna	Polarization
80	17,267 GHz	48,888 dBµV/m	49,5 dBµV/m	45,538 dBµV/m	246 Degree	189 m	Horizontal
81	17,3 GHz	49,282 dBµV/m	49,5 dBµV/m	46,922 dBµV/m	246 Degree	189 m	Vertical
82	12,85 GHz	47,949 dBµV/m	49,5 dBµV/m	46,849 dBµV/m	269 Degree	129 m	Vertical
83	16,933 GHz	47,856 dBµV/m	49,5 dBµV/m	46,046 dBµV/m	269 Degree	250 m	Horizontal
84	17,883 GHz	50,029 dBµV/m	49,5 dBµV/m	46,599 dBµV/m	269 Degree	370 m	Horizontal
85	16,833 GHz	48,527 dBµV/m	49,5 dBµV/m	47,427 dBµV/m	269 Degree	370 m	Vertical
86	11,883 GHz	48,255 dBµV/m	49,5 dBµV/m	45,065 dBµV/m	291 Degree	309 m	Horizontal
87	17,65 GHz	48,379 dBµV/m	49,5 dBµV/m	46,859 dBµV/m	291 Degree	250 m	Horizontal
88	17,717 GHz	48,43 dBµV/m	49,5 dBµV/m	46,59 dBµV/m	291 Degree	250 m	Horizontal
89	16,5 GHz	47,648 dBµV/m	49,5 dBµV/m	44,638 dBµV/m	291 Degree	129 m	Horizontal
90	11,017 GHz	47,859 dBµV/m	49,5 dBµV/m	44,809 dBµV/m	314 Degree	129 m	Horizontal
91	17,9 GHz	48,076 dBµV/m	49,5 dBµV/m	47,026 dBµV/m	314 Degree	129 m	Horizontal
92	15,633 GHz	47,703 dBµV/m	49,5 dBµV/m	44,453 dBµV/m	314 Degree	250 m	Horizontal
93	17,2 GHz	48,71 dBµV/m	49,5 dBµV/m	47,76 dBµV/m	314 Degree	309 m	Vertical
94	17,5 GHz	48,589 dBµV/m	49,5 dBµV/m	46,689 dBµV/m	314 Degree	370 m	Horizontal
95	17,583 GHz	49,053 dBµV/m	49,5 dBµV/m	47,713 dBµV/m	314 Degree	370 m	Horizontal
96	15,583 GHz	47,72 dBµV/m	49,5 dBµV/m	43,61 dBµV/m	314 Degree	370 m	Vertical
97	17,433 GHz	49,211 dBµV/m	49,5 dBµV/m	47,601 dBµV/m	336 Degree	370 m	Vertical
98	12,033 GHz	47,641 dBµV/m	49,5 dBµV/m	44,251 dBµV/m	336 Degree	370 m	Horizontal
99	17,533 GHz	48,462 dBµV/m	49,5 dBµV/m	47,012 dBµV/m	336 Degree	370 m	Horizontal
100	11,767 GHz	47,976 dBµV/m	49,5 dBµV/m	44,416 dBµV/m	336 Degree	250 m	Horizontal
101	17,667 GHz	48,019 dBµV/m	49,5 dBµV/m	47,009 dBµV/m	336 Degree	250 m	Horizontal
102	17,617 GHz	48,68 dBµV/m	49,5 dBµV/m	46,63 dBµV/m	336 Degree	250 m	Horizontal
103	17,417 GHz	48,255 dBµV/m	49,5 dBµV/m	45,645 dBµV/m	336 Degree	129 m	Vertical
104	20,787 GHz	47,7 dBµV/m	49,5 dBµV/m	24,96 dBµV/m	0 Degree	129 m	Horizontal
105	18 GHz	47,26 dBµV/m	49,5 dBµV/m	44,77 dBµV/m	0 Degree	129 m	Horizontal
106	38,02 GHz	48,848 dBµV/m	49,5 dBµV/m	35,988 dBµV/m	0 Degree	189 m	Horizontal
107	38,057 GHz	47,823 dBµV/m	49,5 dBµV/m	35,303 dBµV/m	0 Degree	309 m	Horizontal
108	37,507 GHz	48,495 dBµV/m	49,5 dBµV/m	34,225 dBµV/m	21 Degree	189 m	Horizontal
109	21,52 GHz	47,6 dBµV/m	49,5 dBµV/m	24,56 dBµV/m	21 Degree	189 m	Horizontal
110	36,627 GHz	47,429 dBµV/m	49,5 dBµV/m	31,889 dBµV/m	21 Degree	129 m	Horizontal
111	36,297 GHz	48,189 dBµV/m	49,5 dBµV/m	32,119 dBµV/m	44 Degree	129 m	Vertical
112	37,58 GHz	47,794 dBµV/m	49,5 dBµV/m	35,444 dBµV/m	44 Degree	189 m	Horizontal
113	37,727 GHz	47,461 dBµV/m	49,5 dBµV/m	34,831 dBµV/m	44 Degree	309 m	Horizontal
114	18,99 GHz	47,037 dBµV/m	49,5 dBµV/m	40,607 dBµV/m	44 Degree	309 m	Horizontal
115	21,117 GHz	47,052 dBµV/m	49,5 dBµV/m	22,922 dBµV/m	44 Degree	309 m	Horizontal
116	35,967 GHz	47,77 dBµV/m	49,5 dBµV/m	30,49 dBµV/m	44 Degree	370 m	Vertical
117	36,773 GHz	47,181 dBµV/m	49,5 dBµV/m	31,651 dBµV/m	66 Degree	370 m	Horizontal
118	37,983 GHz	48,377 dBµV/m	49,5 dBµV/m	36,087 dBµV/m	66 Degree	370 m	Horizontal
119	36,48 GHz	47,736 dBµV/m	49,5 dBµV/m	33,726 dBµV/m	66 Degree	189 m	Horizontal

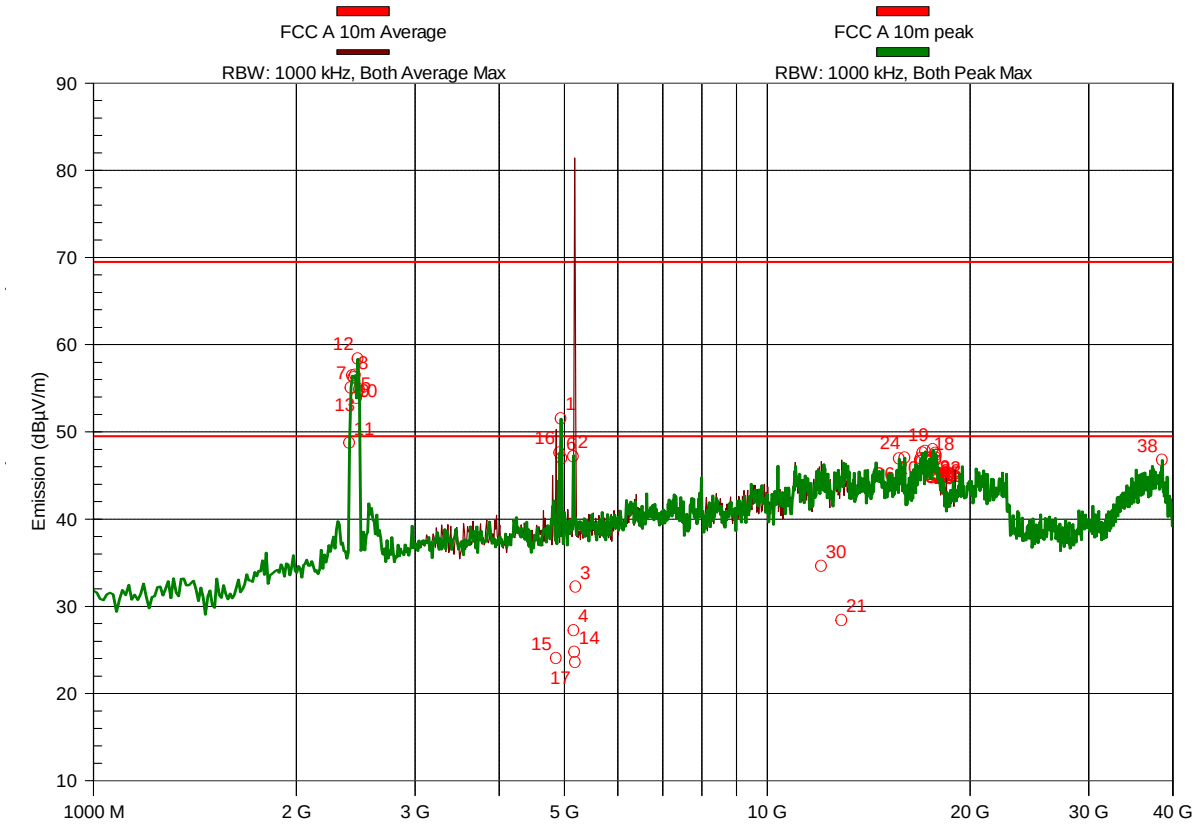
No.	Frequency	Peak value	Limit of AV	Value of AV	Turntable	Antenna	Polarization
120	21,593 GHz	47,45 dBµV/m	49,5 dBµV/m	24,92 dBµV/m	66 Degree	189 m	Vertical
121	36,187 GHz	47,267 dBµV/m	49,5 dBµV/m	30,867 dBµV/m	66 Degree	129 m	Horizontal
122	20,897 GHz	47,276 dBµV/m	49,5 dBµV/m	24,436 dBµV/m	89 Degree	189 m	Horizontal
123	38,13 GHz	48,732 dBµV/m	49,5 dBµV/m	35,962 dBµV/m	89 Degree	189 m	Horizontal
124	36,847 GHz	47,171 dBµV/m	49,5 dBµV/m	33,141 dBµV/m	89 Degree	250 m	Horizontal
125	35,27 GHz	47,194 dBµV/m	49,5 dBµV/m	28,764 dBµV/m	89 Degree	250 m	Horizontal
126	36,333 GHz	47,247 dBµV/m	49,5 dBµV/m	30,677 dBµV/m	89 Degree	250 m	Vertical
127	37,067 GHz	48,193 dBµV/m	49,5 dBµV/m	33,803 dBµV/m	89 Degree	370 m	Horizontal
128	36,223 GHz	47,335 dBµV/m	49,5 dBµV/m	32,675 dBµV/m	89 Degree	370 m	Vertical
129	37,03 GHz	48,476 dBµV/m	49,5 dBµV/m	32,716 dBµV/m	111 Degree	370 m	Vertical
130	36,957 GHz	47,277 dBµV/m	49,5 dBµV/m	32,397 dBµV/m	111 Degree	309 m	Vertical
131	20,273 GHz	47,482 dBµV/m	49,5 dBµV/m	23,712 dBµV/m	111 Degree	250 m	Vertical
132	37,14 GHz	47,418 dBµV/m	49,5 dBµV/m	34,368 dBµV/m	111 Degree	250 m	Vertical
133	37,36 GHz	47,892 dBµV/m	49,5 dBµV/m	34,032 dBµV/m	111 Degree	250 m	Vertical
134	19,137 GHz	47,033 dBµV/m	49,5 dBµV/m	38,343 dBµV/m	111 Degree	189 m	Vertical
135	20,75 GHz	48,455 dBµV/m	49,5 dBµV/m	23,435 dBµV/m	111 Degree	189 m	Vertical
136	36,663 GHz	47,295 dBµV/m	49,5 dBµV/m	32,885 dBµV/m	111 Degree	189 m	Vertical
137	20,97 GHz	47,907 dBµV/m	49,5 dBµV/m	23,687 dBµV/m	111 Degree	129 m	Vertical
138	36,553 GHz	47,929 dBµV/m	49,5 dBµV/m	32,549 dBµV/m	111 Degree	129 m	Vertical
139	20,603 GHz	47,244 dBµV/m	49,5 dBµV/m	25,114 dBµV/m	134 Degree	129 m	Vertical
140	37,947 GHz	48,327 dBµV/m	49,5 dBµV/m	36,507 dBµV/m	134 Degree	189 m	Vertical
141	35,783 GHz	47,5 dBµV/m	49,5 dBµV/m	29,32 dBµV/m	134 Degree	189 m	Vertical
142	22,18 GHz	47,192 dBµV/m	49,5 dBµV/m	24,912 dBµV/m	134 Degree	189 m	Horizontal
143	35,747 GHz	48,24 dBµV/m	49,5 dBµV/m	30,71 dBµV/m	134 Degree	309 m	Horizontal
144	37,763 GHz	47,671 dBµV/m	49,5 dBµV/m	33,931 dBµV/m	156 Degree	370 m	Vertical
145	35,05 GHz	47,15 dBµV/m	49,5 dBµV/m	29,2 dBµV/m	156 Degree	370 m	Horizontal
146	37,543 GHz	48,025 dBµV/m	49,5 dBµV/m	34,725 dBµV/m	156 Degree	370 m	Horizontal
147	38,68 GHz	47,662 dBµV/m	49,5 dBµV/m	35,432 dBµV/m	156 Degree	309 m	Horizontal
148	37,91 GHz	48,218 dBµV/m	49,5 dBµV/m	35,038 dBµV/m	156 Degree	189 m	Vertical
149	36,443 GHz	48,099 dBµV/m	49,5 dBµV/m	33,269 dBµV/m	156 Degree	129 m	Vertical
150	37,103 GHz	47,511 dBµV/m	49,5 dBµV/m	33,131 dBµV/m	179 Degree	189 m	Vertical
151	21,043 GHz	47,077 dBµV/m	49,5 dBµV/m	24,137 dBµV/m	179 Degree	189 m	Vertical
152	36,92 GHz	47,492 dBµV/m	49,5 dBµV/m	32,202 dBµV/m	179 Degree	189 m	Horizontal
153	37,213 GHz	47,243 dBµV/m	49,5 dBµV/m	34,693 dBµV/m	179 Degree	250 m	Horizontal
154	37,873 GHz	48,519 dBµV/m	49,5 dBµV/m	36,329 dBµV/m	179 Degree	250 m	Horizontal
155	21,153 GHz	47,225 dBµV/m	49,5 dBµV/m	23,475 dBµV/m	179 Degree	309 m	Vertical
156	36,003 GHz	47,231 dBµV/m	49,5 dBµV/m	30,681 dBµV/m	179 Degree	309 m	Horizontal
157	36,59 GHz	47,734 dBµV/m	49,5 dBµV/m	32,994 dBµV/m	179 Degree	370 m	Horizontal
158	20,567 GHz	47,839 dBµV/m	49,5 dBµV/m	23,789 dBµV/m	201 Degree	370 m	Horizontal
159	37,397 GHz	48,879 dBµV/m	49,5 dBµV/m	34,819 dBµV/m	201 Degree	309 m	Horizontal

No.	Frequency	Peak value	Limit of AV	Value of AV	Turntable	Antenna	Polarization
160	37,433 GHz	47,427 dBµV/m	49,5 dBµV/m	33,757 dBµV/m	201 Degree	250 m	Horizontal
161	38,313 GHz	47,525 dBµV/m	49,5 dBµV/m	36,185 dBµV/m	201 Degree	250 m	Horizontal
162	35,307 GHz	47,145 dBµV/m	49,5 dBµV/m	29,015 dBµV/m	201 Degree	189 m	Horizontal
163	38,167 GHz	47,647 dBµV/m	49,5 dBµV/m	35,667 dBµV/m	201 Degree	129 m	Vertical
164	38,497 GHz	48,089 dBµV/m	49,5 dBµV/m	35,319 dBµV/m	201 Degree	129 m	Horizontal
165	18,037 GHz	47,499 dBµV/m	49,5 dBµV/m	43,939 dBµV/m	224 Degree	129 m	Horizontal
166	36,37 GHz	47,314 dBµV/m	49,5 dBµV/m	31,384 dBµV/m	224 Degree	129 m	Vertical
167	22,437 GHz	47,536 dBµV/m	49,5 dBµV/m	24,376 dBµV/m	224 Degree	189 m	Horizontal
168	37,8 GHz	47,34 dBµV/m	49,5 dBµV/m	35,95 dBµV/m	224 Degree	189 m	Horizontal
169	38,643 GHz	47,317 dBµV/m	49,5 dBµV/m	35,357 dBµV/m	224 Degree	250 m	Horizontal
170	36,26 GHz	47,332 dBµV/m	49,5 dBµV/m	30,942 dBµV/m	224 Degree	309 m	Horizontal
171	19,87 GHz	47,737 dBµV/m	49,5 dBµV/m	32,347 dBµV/m	224 Degree	370 m	Horizontal
172	38,093 GHz	48,767 dBµV/m	49,5 dBµV/m	35,747 dBµV/m	246 Degree	370 m	Vertical
173	19,21 GHz	47,313 dBµV/m	49,5 dBµV/m	38,683 dBµV/m	246 Degree	309 m	Horizontal
174	37,177 GHz	47,775 dBµV/m	49,5 dBµV/m	34,165 dBµV/m	246 Degree	309 m	Horizontal
175	21,007 GHz	47,604 dBµV/m	49,5 dBµV/m	23,464 dBµV/m	246 Degree	250 m	Horizontal
176	35,82 GHz	48,42 dBµV/m	49,5 dBµV/m	30,49 dBµV/m	246 Degree	250 m	Horizontal
177	38,24 GHz	47,216 dBµV/m	49,5 dBµV/m	36,316 dBµV/m	246 Degree	129 m	Vertical
178	37,653 GHz	48,033 dBµV/m	49,5 dBµV/m	33,483 dBµV/m	269 Degree	129 m	Horizontal
179	22,107 GHz	47,339 dBµV/m	49,5 dBµV/m	25,479 dBµV/m	269 Degree	189 m	Vertical
180	34,94 GHz	47,174 dBµV/m	49,5 dBµV/m	28,274 dBµV/m	269 Degree	250 m	Horizontal
181	38,35 GHz	47,32 dBµV/m	49,5 dBµV/m	34,84 dBµV/m	269 Degree	309 m	Vertical
182	18,22 GHz	47,582 dBµV/m	49,5 dBµV/m	45,212 dBµV/m	269 Degree	370 m	Horizontal
183	36,993 GHz	47,553 dBµV/m	49,5 dBµV/m	32,933 dBµV/m	269 Degree	370 m	Horizontal
184	20,457 GHz	47,032 dBµV/m	49,5 dBµV/m	23,982 dBµV/m	269 Degree	370 m	Vertical
185	35,197 GHz	47,103 dBµV/m	49,5 dBµV/m	28,553 dBµV/m	291 Degree	370 m	Vertical
186	37,323 GHz	47,625 dBµV/m	49,5 dBµV/m	35,305 dBµV/m	291 Degree	370 m	Horizontal
187	37,25 GHz	47,79 dBµV/m	49,5 dBµV/m	34,81 dBµV/m	291 Degree	309 m	Horizontal
188	20,933 GHz	47,701 dBµV/m	49,5 dBµV/m	25,401 dBµV/m	291 Degree	309 m	Vertical
189	37,837 GHz	47,659 dBµV/m	49,5 dBµV/m	35,819 dBµV/m	291 Degree	250 m	Vertical
190	22,033 GHz	47,127 dBµV/m	49,5 dBµV/m	24,487 dBµV/m	291 Degree	250 m	Horizontal
191	37,617 GHz	49,423 dBµV/m	49,5 dBµV/m	34,673 dBµV/m	291 Degree	189 m	Vertical
192	36,737 GHz	47,095 dBµV/m	49,5 dBµV/m	32,015 dBµV/m	291 Degree	129 m	Horizontal
193	38,46 GHz	47,634 dBµV/m	49,5 dBµV/m	36,144 dBµV/m	314 Degree	189 m	Vertical
194	36,517 GHz	47,643 dBµV/m	49,5 dBµV/m	33,023 dBµV/m	314 Degree	189 m	Horizontal
195	20,53 GHz	47,343 dBµV/m	49,5 dBµV/m	24,143 dBµV/m	314 Degree	250 m	Horizontal
196	38,423 GHz	47,469 dBµV/m	49,5 dBµV/m	35,479 dBµV/m	314 Degree	250 m	Horizontal
197	22,29 GHz	47,121 dBµV/m	49,5 dBµV/m	23,391 dBµV/m	314 Degree	309 m	Vertical
198	22,07 GHz	47,563 dBµV/m	49,5 dBµV/m	25,473 dBµV/m	314 Degree	309 m	Horizontal
199	22,253 GHz	47,215 dBµV/m	49,5 dBµV/m	23,645 dBµV/m	314 Degree	370 m	Vertical

No.	Frequency	Peak value	Limit of AV	Value of AV	Turntable	Antenna	Polarization
200	37,47 GHz	48,244 dBµV/m	49,5 dBµV/m	34,634 dBµV/m	314 Degree	370 m	Vertical
201	38,973 GHz	47,099 dBµV/m	49,5 dBµV/m	36,659 dBµV/m	336 Degree	370 m	Horizontal
202	36,883 GHz	47,697 dBµV/m	49,5 dBµV/m	32,507 dBµV/m	336 Degree	250 m	Vertical
203	19,797 GHz	47,11 dBµV/m	49,5 dBµV/m	33,14 dBµV/m	336 Degree	129 m	Horizontal

No values besides the internal intentional radiators were above the limits! The peak limit is 20dB above the AV limit!

3.7.3 Measurement records of radiated emission frequency range 1GHz – 40GHz in OP1 and OP2 mode together



Result list (without internal intentional radiators and their harmonics):

No.	Frequency	Peak value	Limit of AV	Value of AV	Turntable	Antenna	Pol.
18	17,4 GHz	46,916 dBµV/m	49,5 dBµV/m	46,916 dBµV/m	0 Degree	370 m	Vertical
19	17,617 GHz	47,96 dBµV/m	49,5 dBµV/m	47,96 dBµV/m	44 Degree	250 m	Vertical
2	5,153 GHz	47,147 dBµV/m	49,5 dBµV/m	26,967 dBµV/m	21 Degree	309 m	Horizontal
20	17 GHz	47,585 dBµV/m	49,5 dBµV/m	47,585 dBµV/m	89 Degree	250 m	Vertical
21	12,9 GHz	28,37 dBµV/m	49,5 dBµV/m	46,77 dBµV/m	111 Degree	370 m	Vertical
22	17,567 GHz	46,787 dBµV/m	49,5 dBµV/m	46,787 dBµV/m	111 Degree	370 m	Vertical

No.	Frequency	Peak value	Limit of AV	Value of AV	Turntable	Antenna	Pol.
23	17,417 GHz	46,955 dBµV/m	49,5 dBµV/m	46,955 dBµV/m	111 Degree	309 m	Vertical
24	16 GHz	47,018 dBµV/m	49,5 dBµV/m	47,018 dBµV/m	111 Degree	189 m	Horizontal
25	17,367 GHz	46,608 dBµV/m	49,5 dBµV/m	46,608 dBµV/m	156 Degree	189 m	Horizontal
26	17,383 GHz	46,512 dBµV/m	49,5 dBµV/m	46,512 dBµV/m	156 Degree	129 m	Vertical
27	16,9 GHz	46,908 dBµV/m	49,5 dBµV/m	46,908 dBµV/m	179 Degree	309 m	Horizontal
28	17,817 GHz	47,311 dBµV/m	49,5 dBµV/m	47,311 dBµV/m	179 Degree	370 m	Horizontal
29	17,167 GHz	47,754 dBµV/m	49,5 dBµV/m	47,754 dBµV/m	179 Degree	370 m	Vertical
30	12,033 GHz	34,581 dBµV/m	49,5 dBµV/m	46,621 dBµV/m	246 Degree	309 m	Vertical
31	17,783 GHz	46,693 dBµV/m	49,5 dBµV/m	46,693 dBµV/m	269 Degree	129 m	Vertical
32	17,767 GHz	47,547 dBµV/m	49,5 dBµV/m	47,547 dBµV/m	269 Degree	370 m	Vertical
33	16,867 GHz	46,618 dBµV/m	49,5 dBµV/m	46,618 dBµV/m	291 Degree	250 m	Vertical
34	16,95 GHz	46,594 dBµV/m	49,5 dBµV/m	46,594 dBµV/m	291 Degree	250 m	Horizontal
35	17,8 GHz	47,008 dBµV/m	49,5 dBµV/m	47,008 dBµV/m	291 Degree	250 m	Horizontal
36	15,7 GHz	46,888 dBµV/m	49,5 dBµV/m	46,888 dBµV/m	314 Degree	129 m	Horizontal
37	17,333 GHz	46,72 dBµV/m	49,5 dBµV/m	46,72 dBµV/m	336 Degree	309 m	Horizontal
38	38,57 GHz	46,758 dBµV/m	49,5 dBµV/m	46,758 dBµV/m	269 Degree	129 m	Vertical

No values besides the internal intentional radiators were above the limits! The peak limit is 20dB above the AV limit!

4. Photos

4.1 Phtotos of AC Powerline conducted emissions

Photo 1: Test setup for AC powerline conducted emission (front side)

Photo 2: Test setup for AC powerline conducted emission (left side)

Photo 3: Test setup for AC powerline conducted emission (rear side)

Photo 4: Test setup for AC powerline conducted emission (right side)

Photo 5: AC Powerline Adapter

4.2 Photos of radiated measurements in the frequency range 30MHz-2GHz

Photo 6: Test setup for radiated RF-emission (front side; transponder left side, Mobile Panel in the middle and loading cradle on right side)

Photo 7: Test setup for radiated RF-emission (right side)

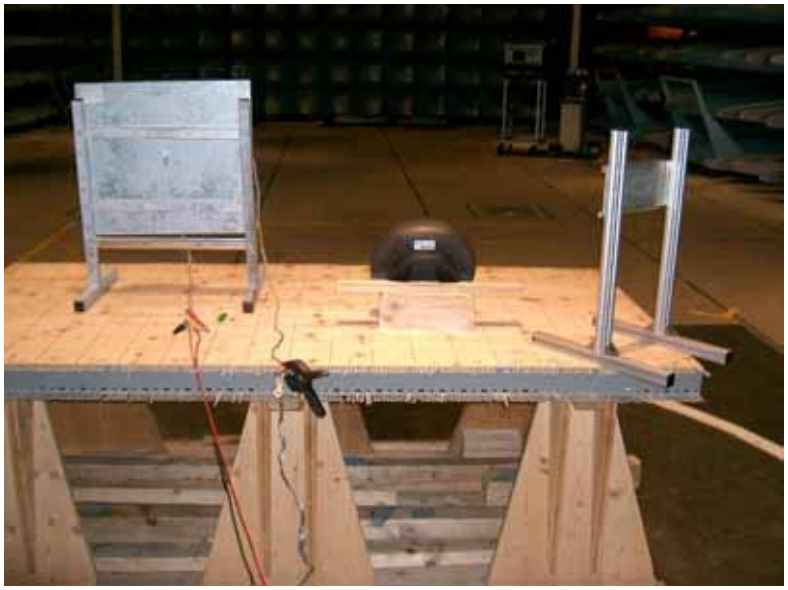


Photo 8: Test setup for radiated RF-emission (back side)

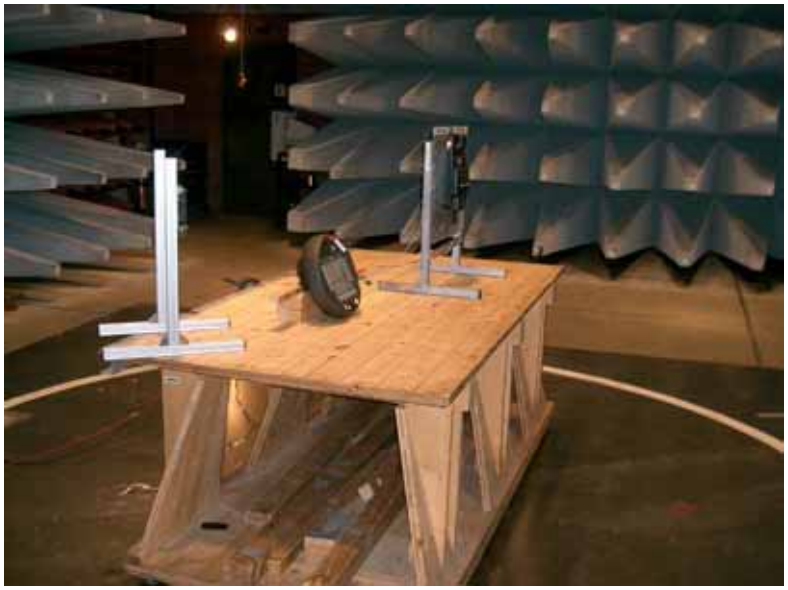


Photo 9: Test setup for radiated RF-emission (left side)

Photo 10: Test setup for radiated RF-emission (Antenna for WLan connection)

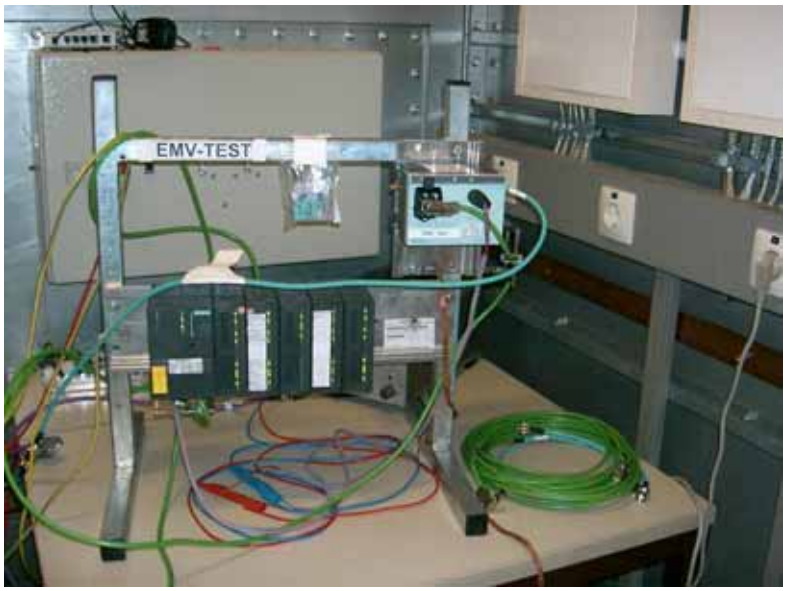


Photo 11: Test setup for radiated RF-emission (Periphery outside chamber)

4.2 Photos of radiated measurements in the frequency range 1GHz-40GHz

Photo 12: Test setup for radiated RF-emission (front side; transponder right side, Mobile Panel in the loading cradle on left side)

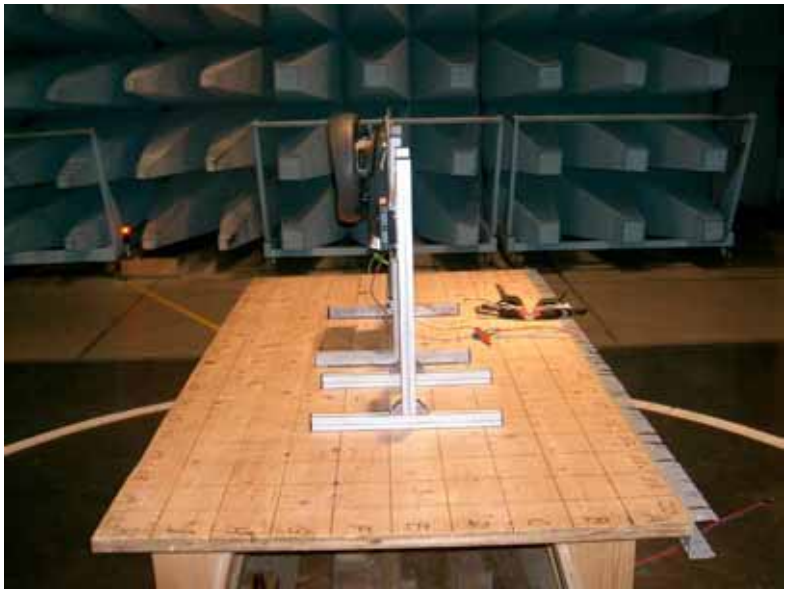


Photo 13: Test setup for radiated RF-emission (right side)

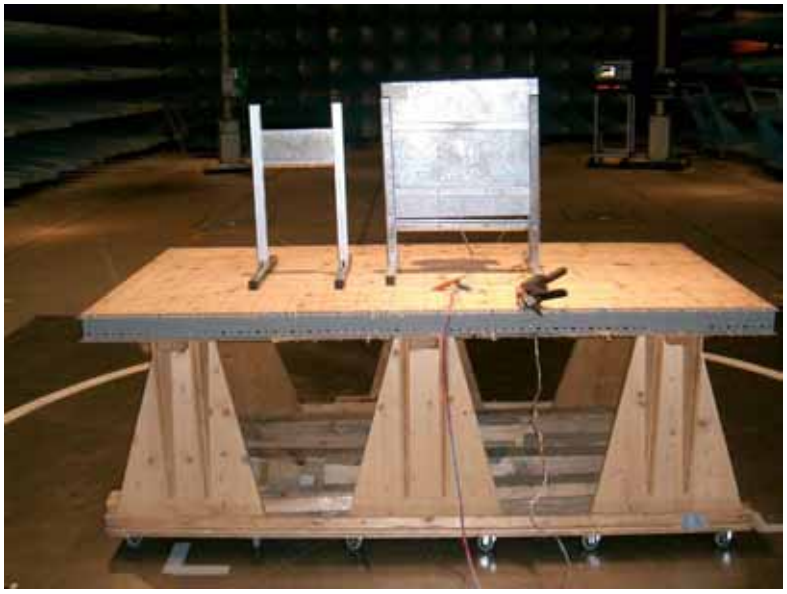


Photo 14: Test setup for radiated RF-emission (back side)

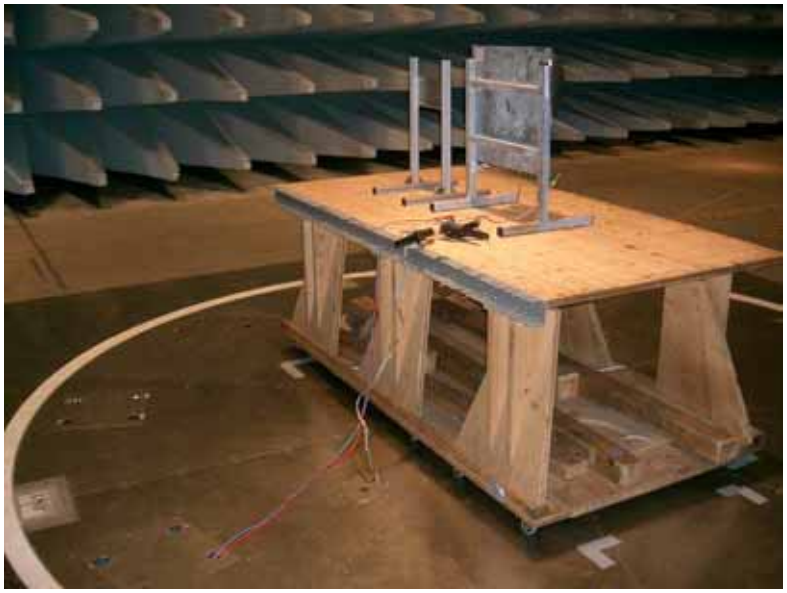


Photo 15: Test setup for radiated RF-emission (left side)

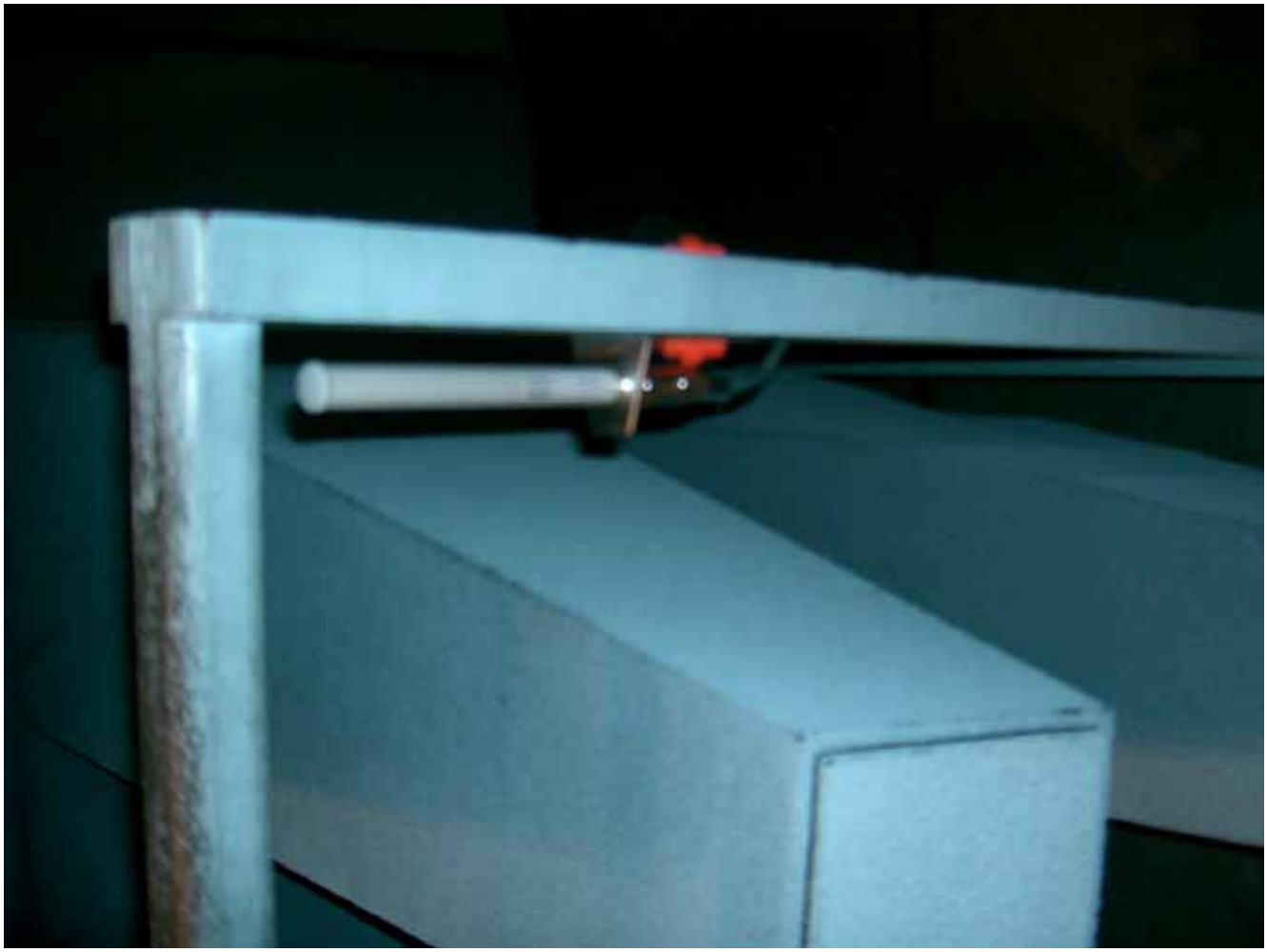
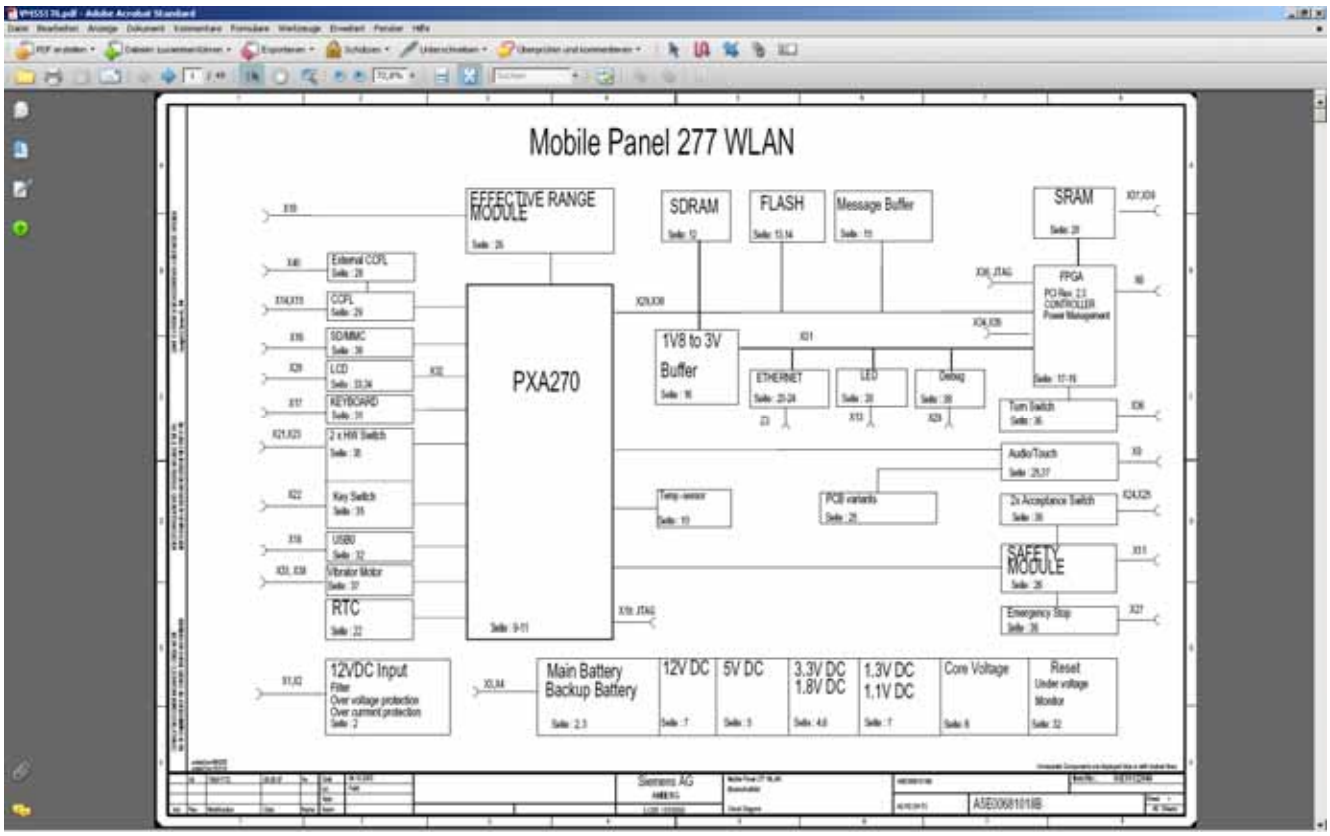
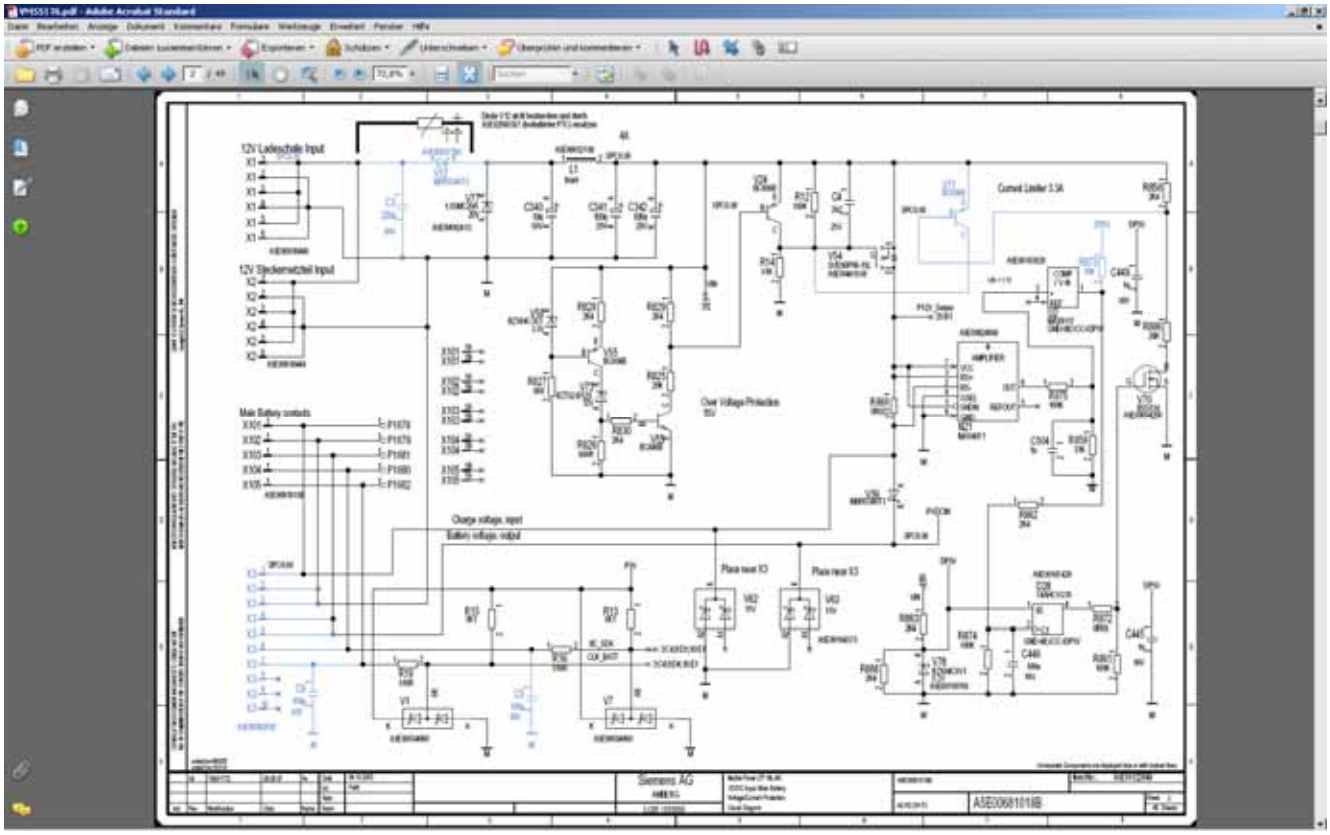


Photo 16: Test setup for radiated RF-emission (Antenna for WLan connection)

5 Description of EUT, peripherals and test details

- **Technical drawings:**




12V Ladeschale Input
12V Steckernetzteil Input
Main Battery contacts
Charge voltage input
Battery voltage output
Over Voltage Protection
Siemens AG
A5E00681018

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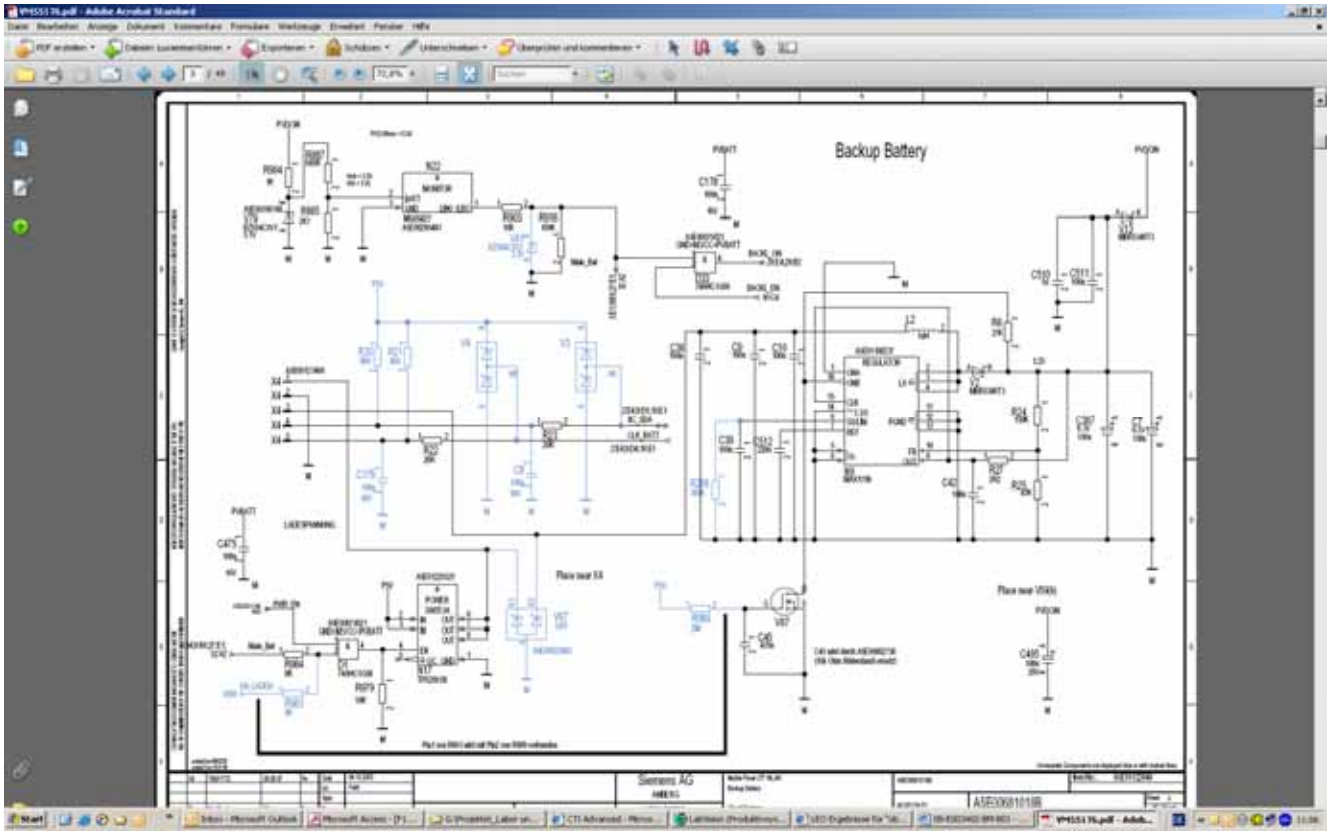
DAT-P-252/98-02



08-E003402-BM-C01 S ©'08, all rights reserved	EUT:	Date:	Page:
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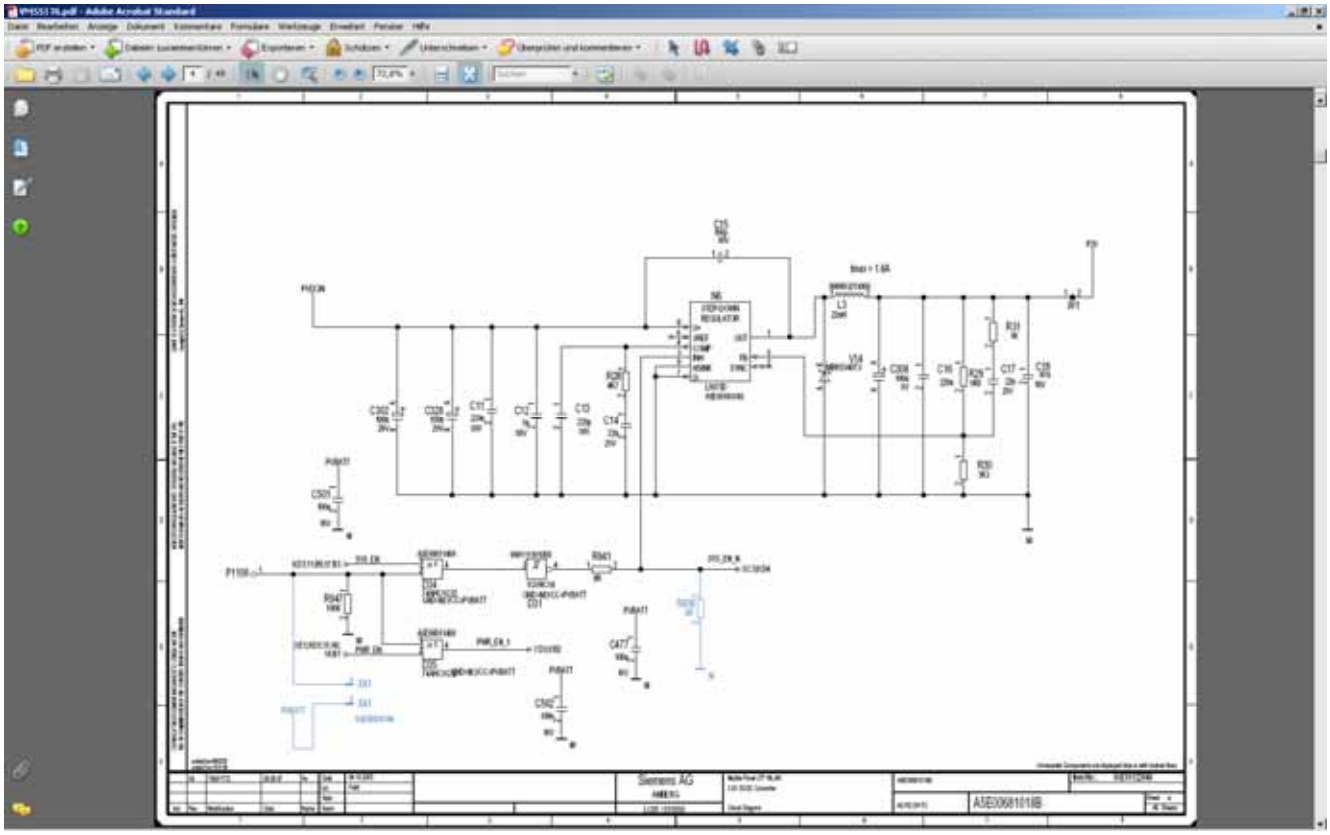

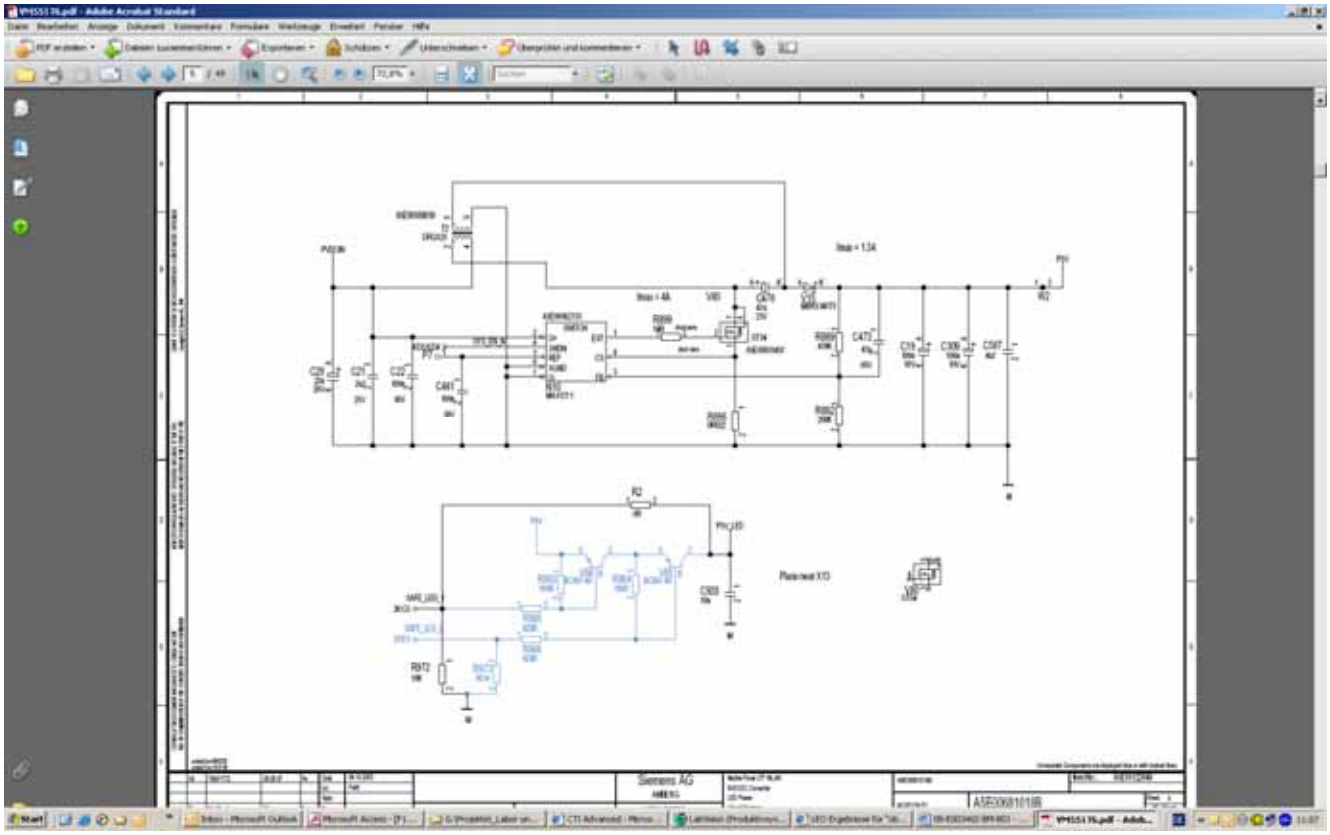

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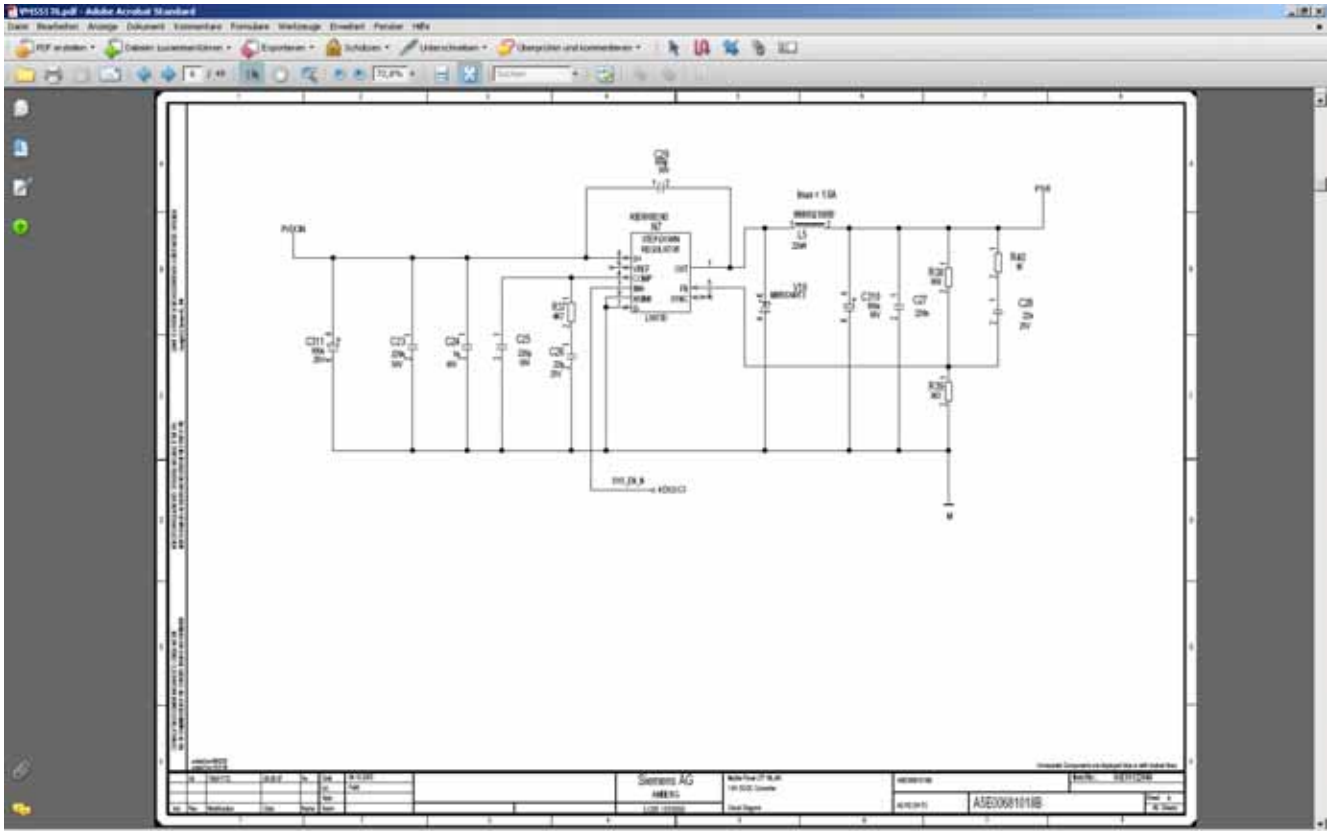

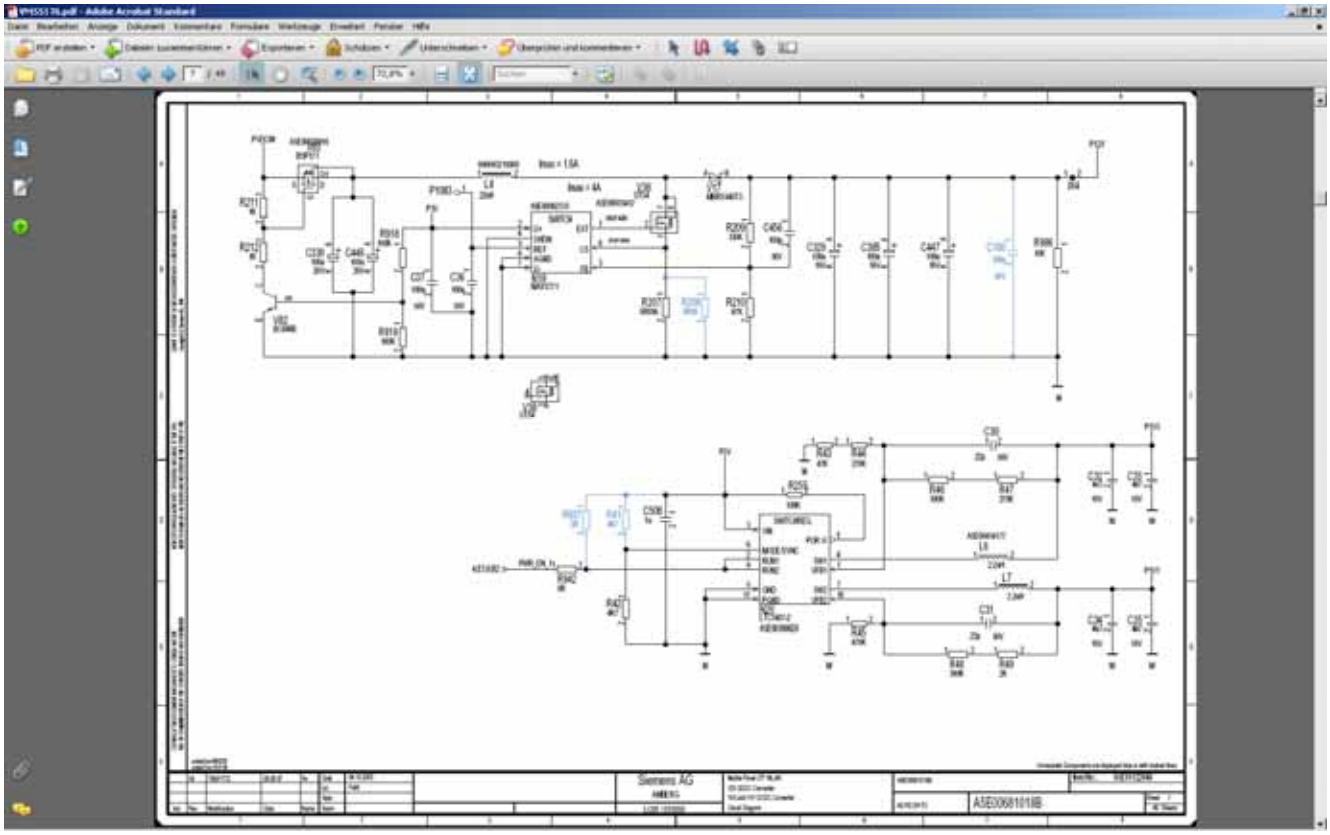

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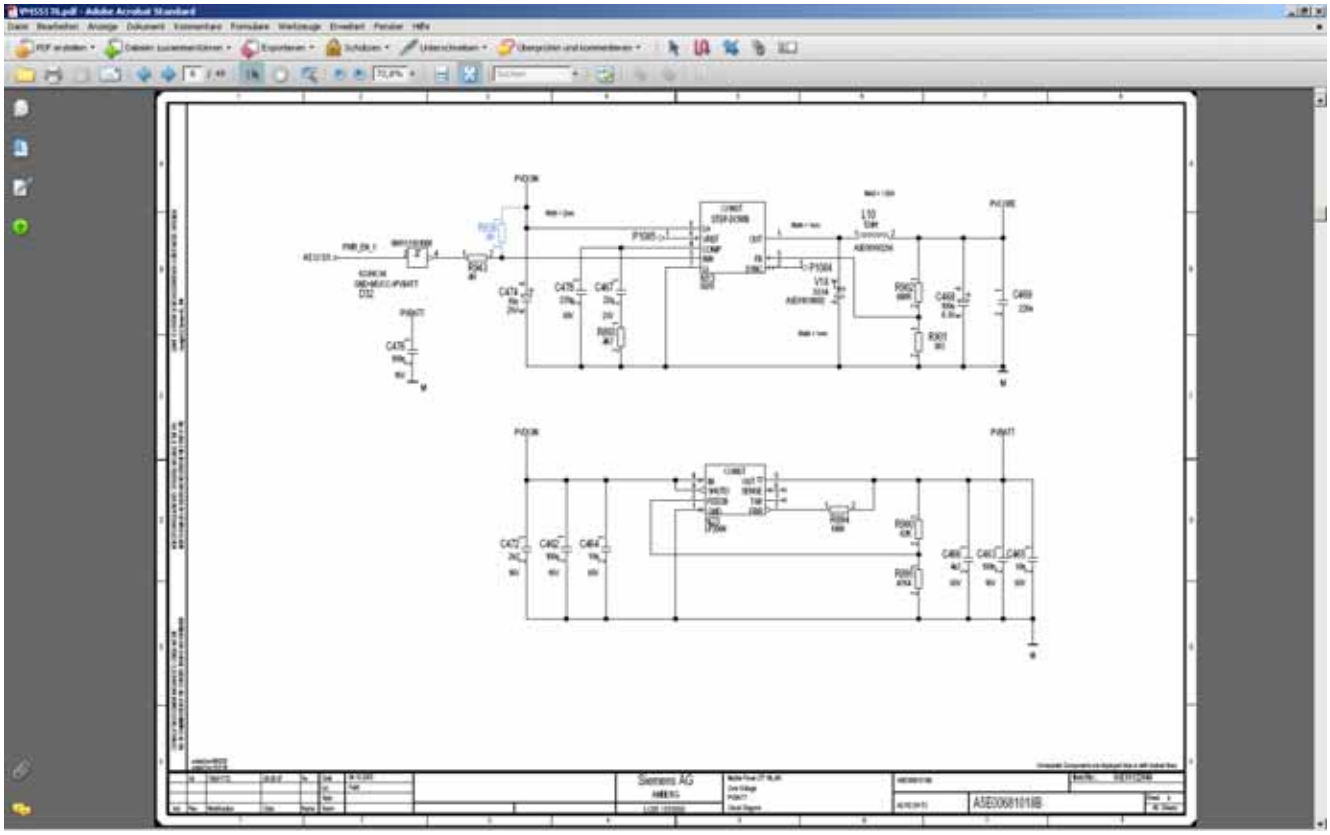

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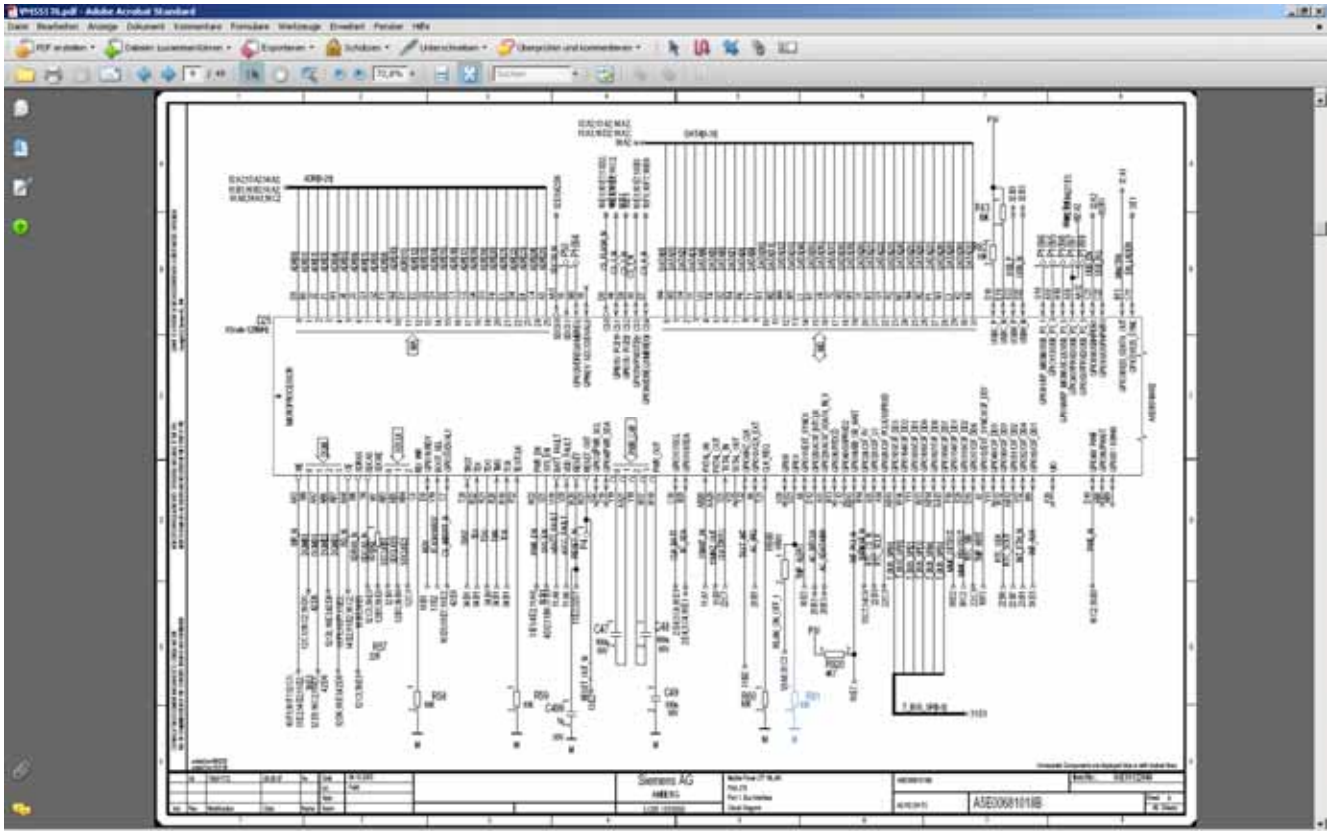

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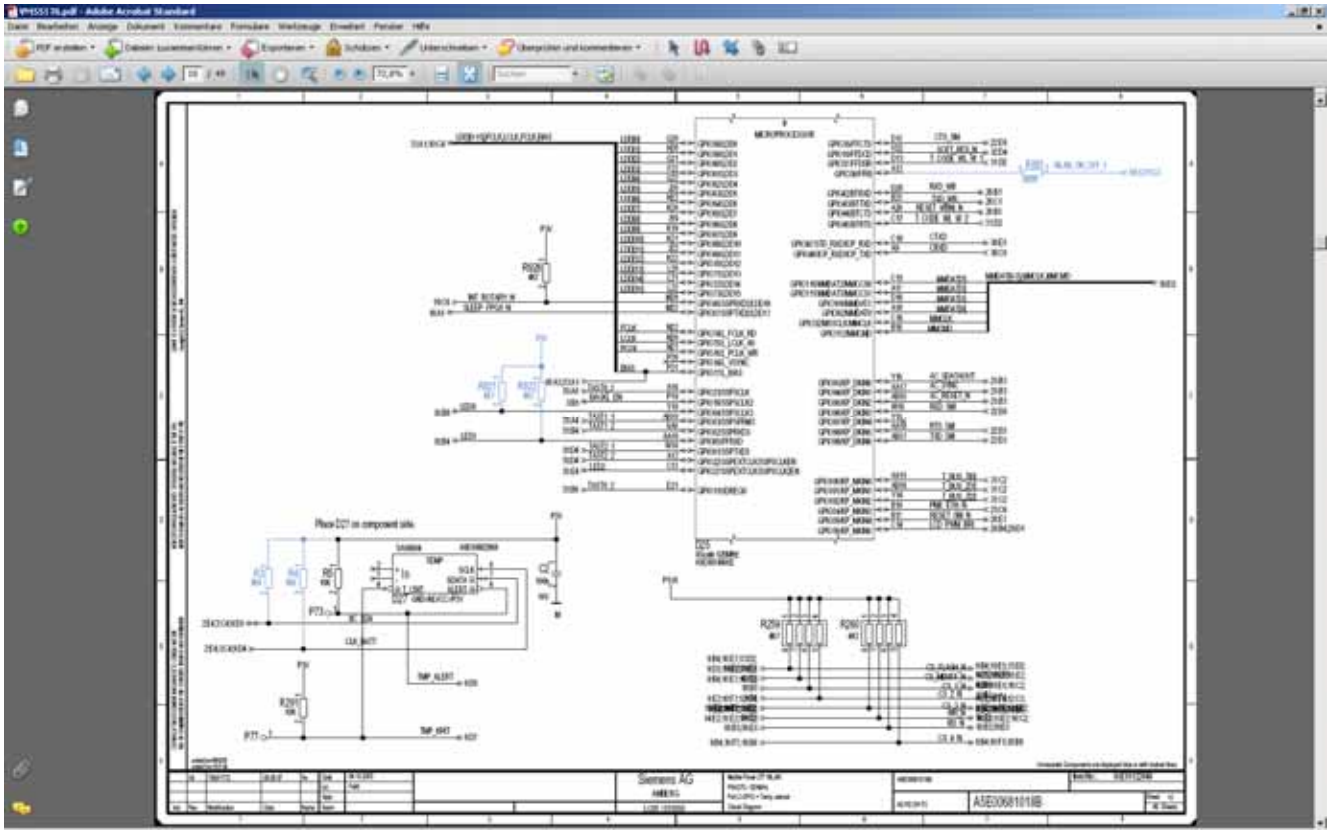

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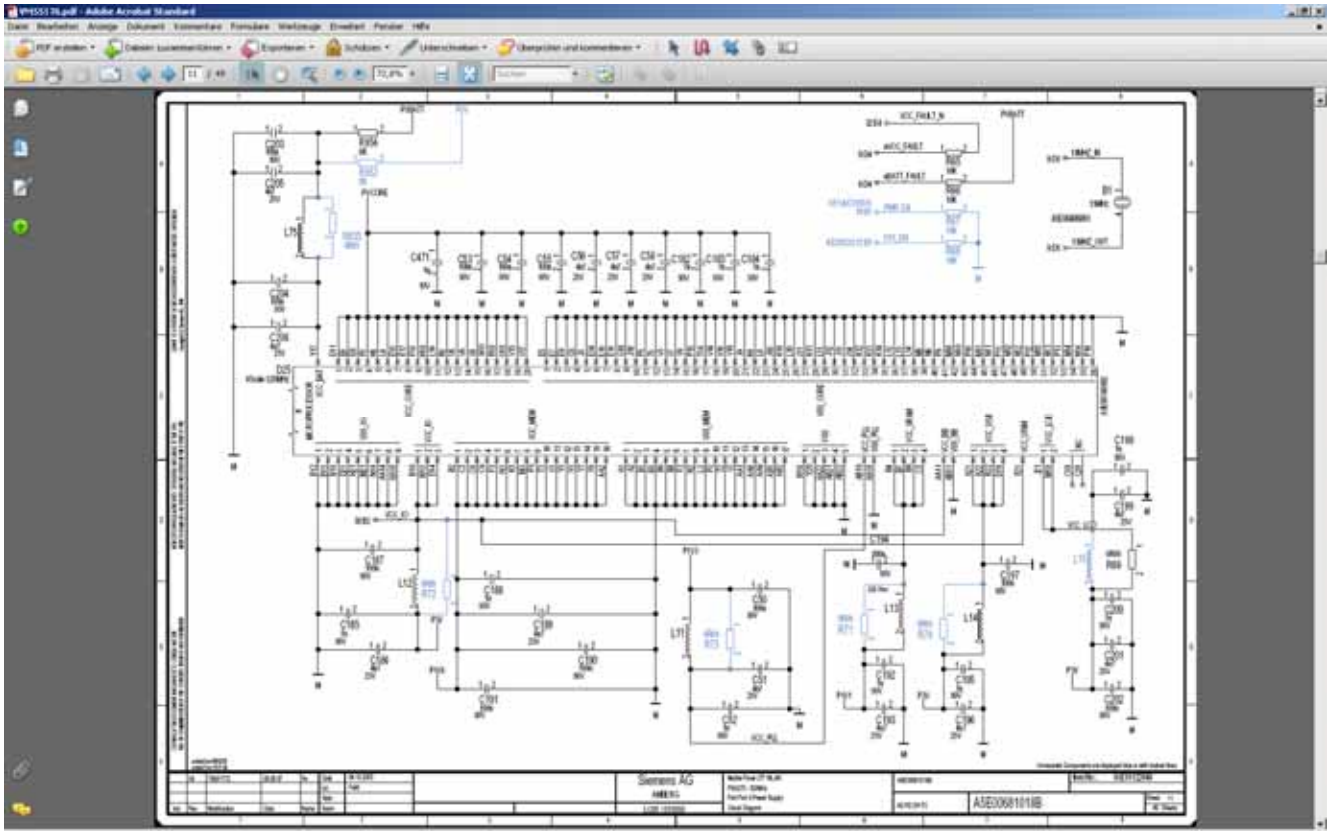

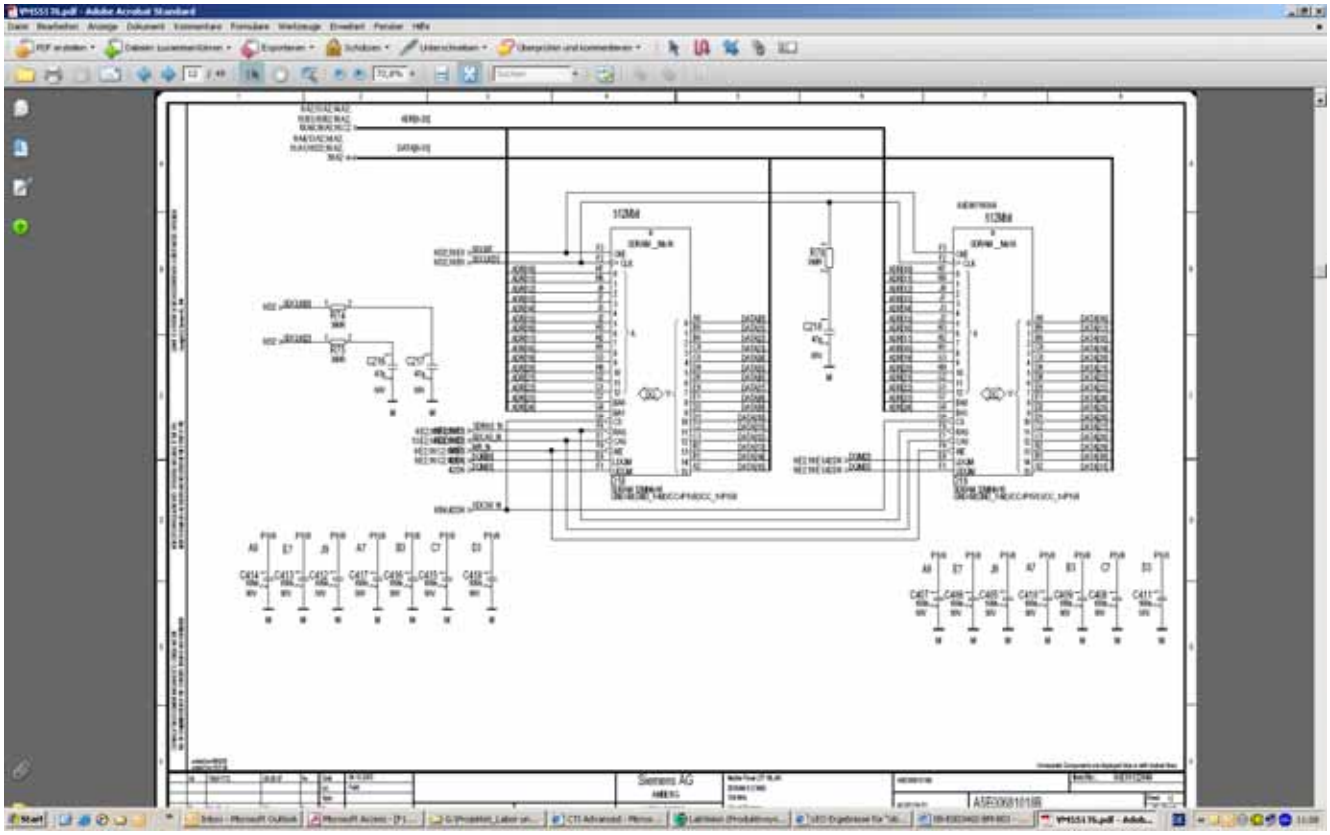

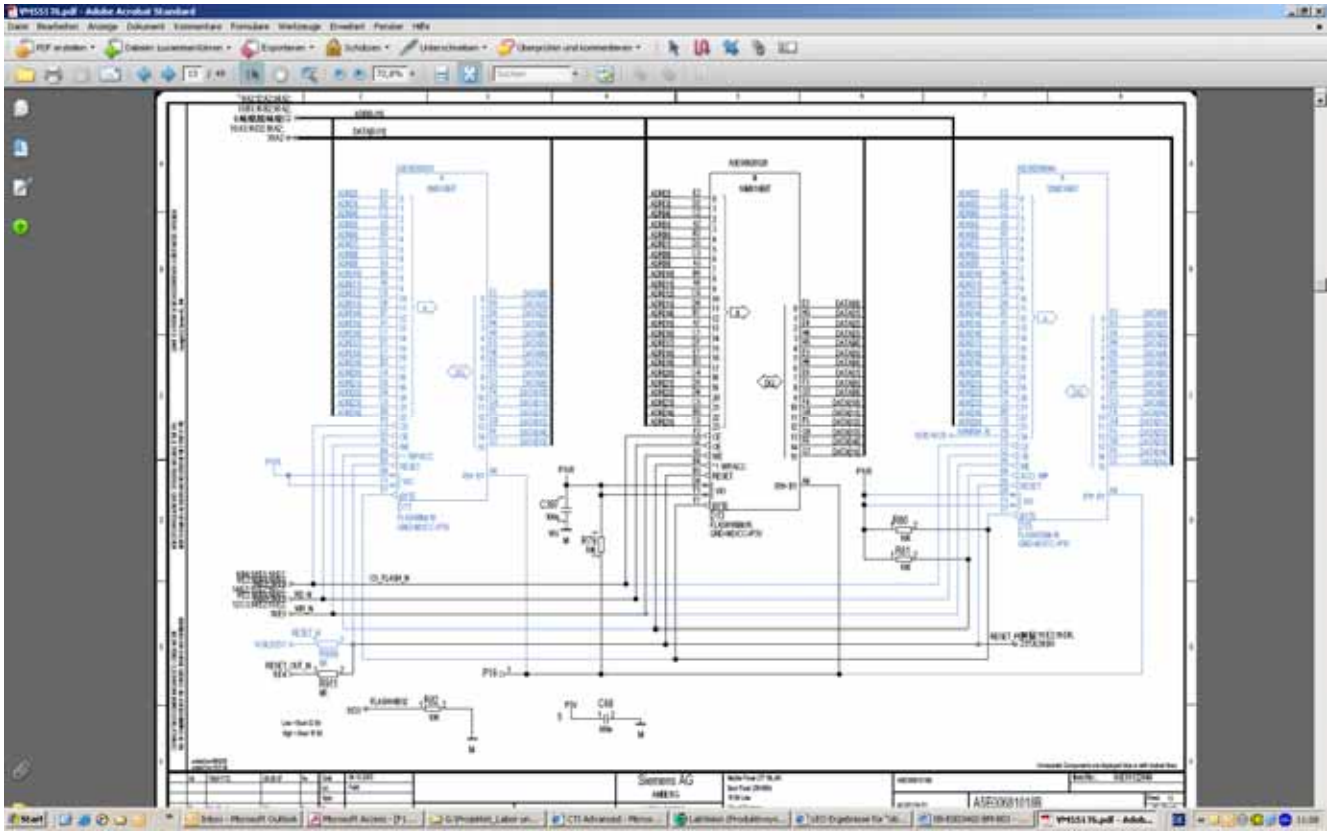

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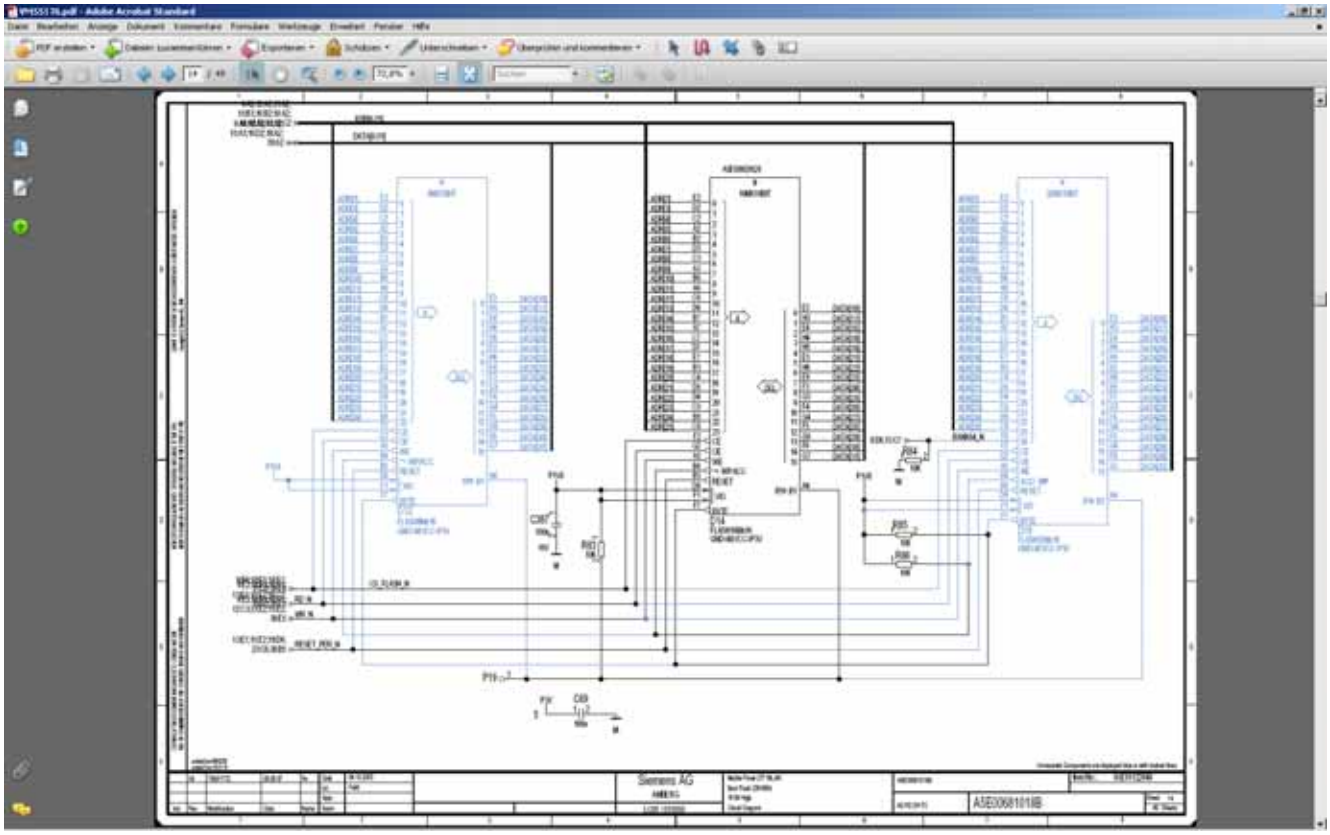

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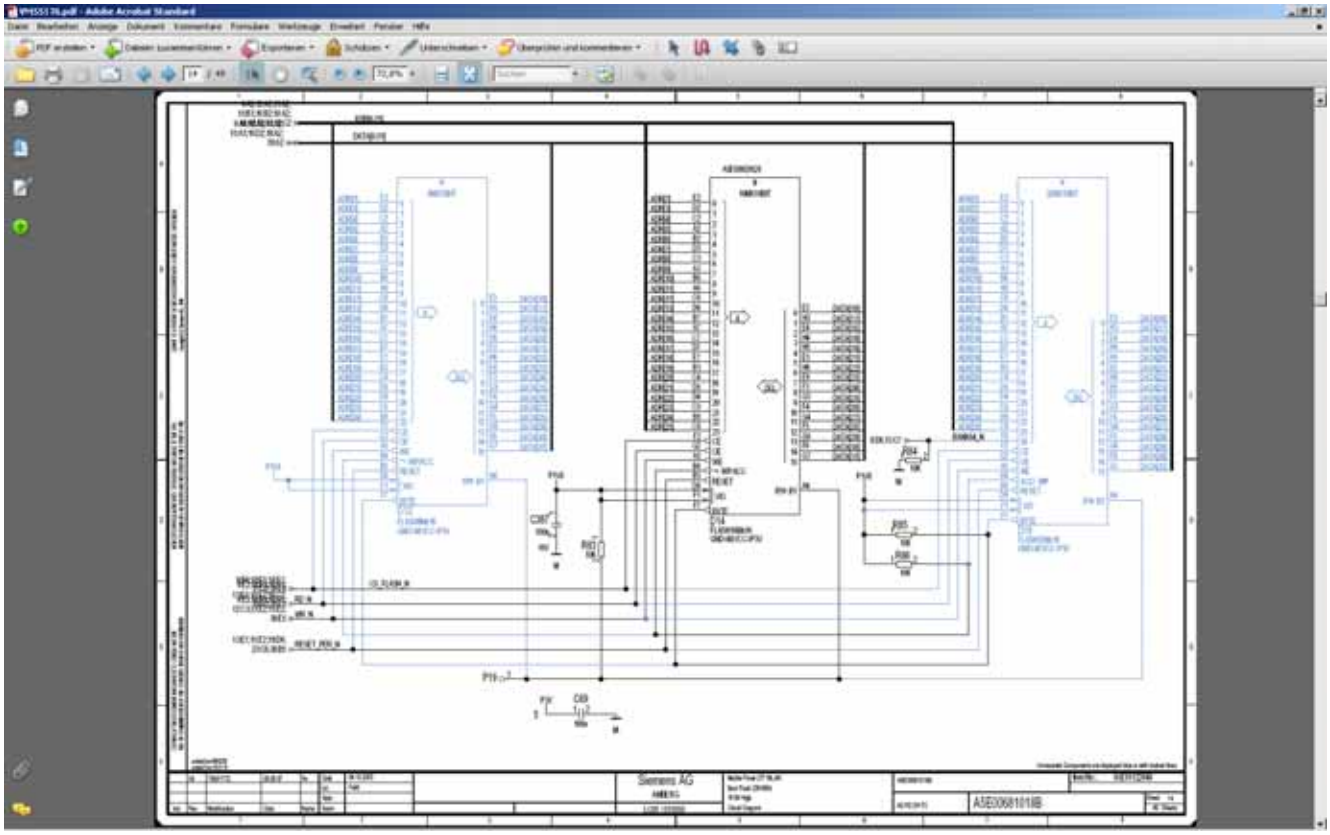

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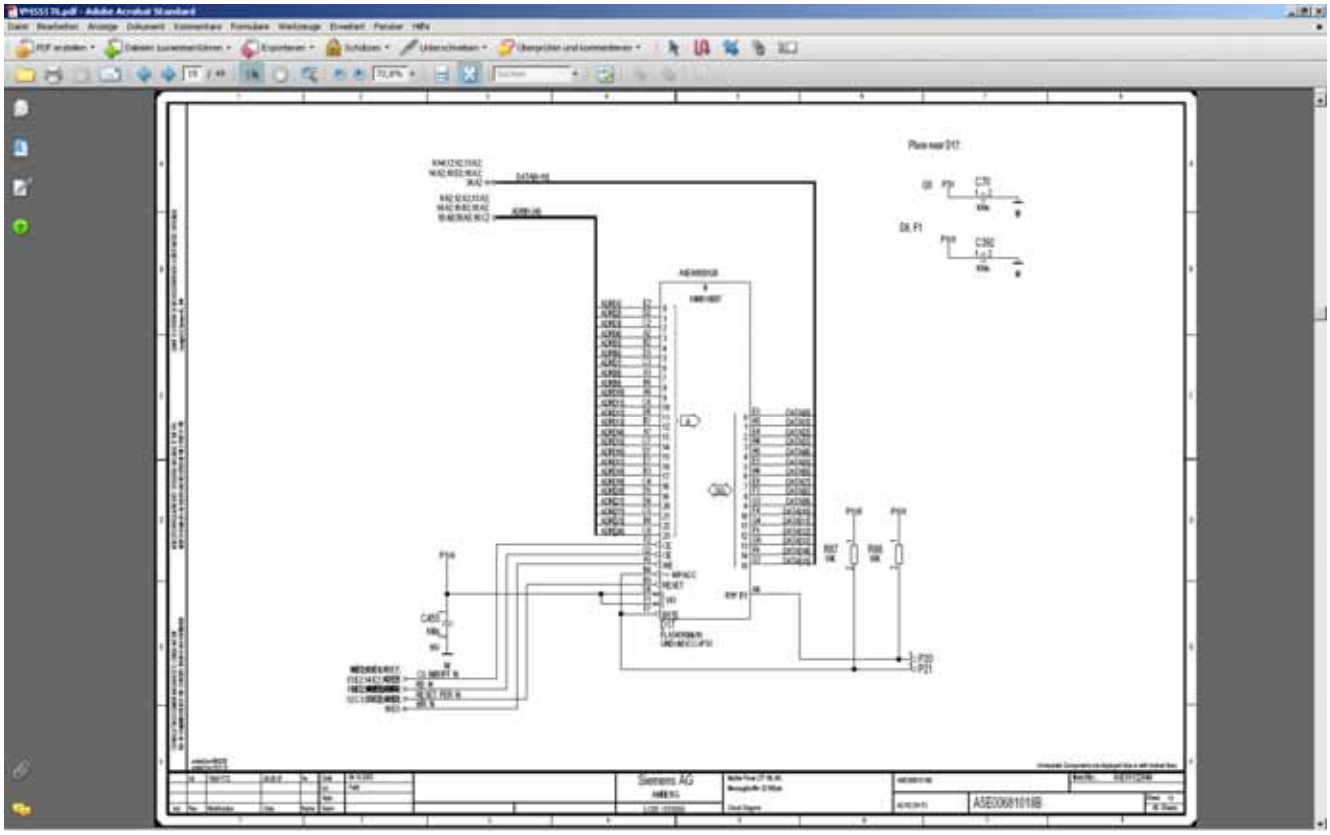

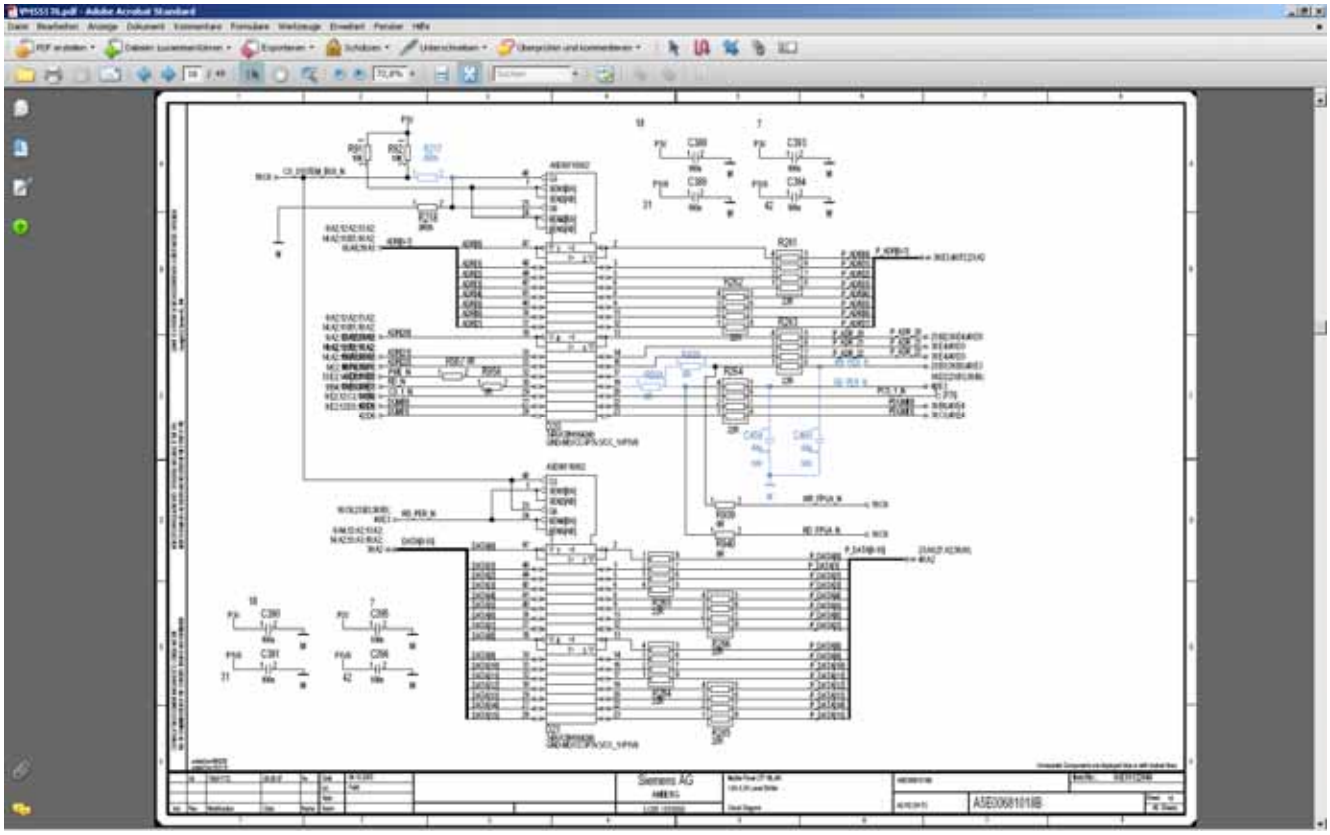

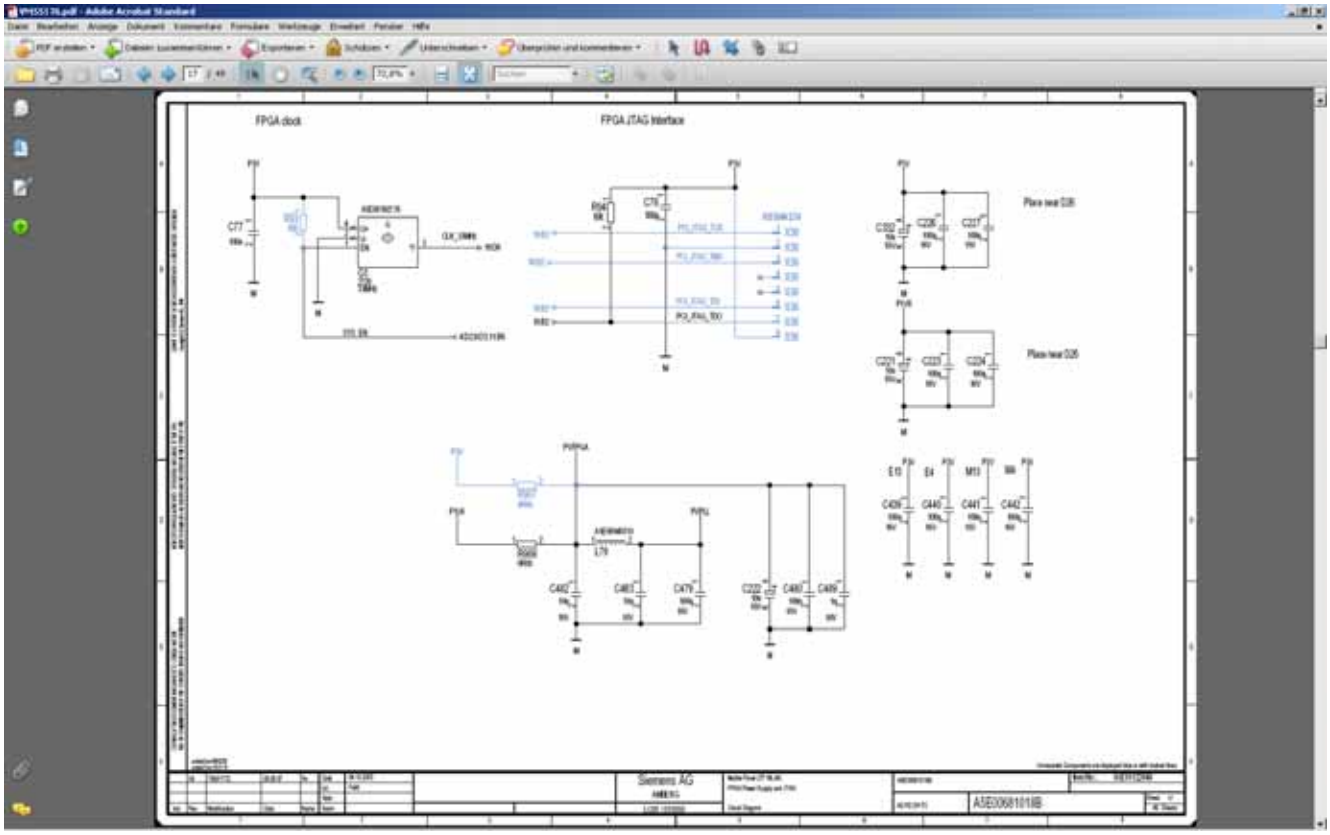

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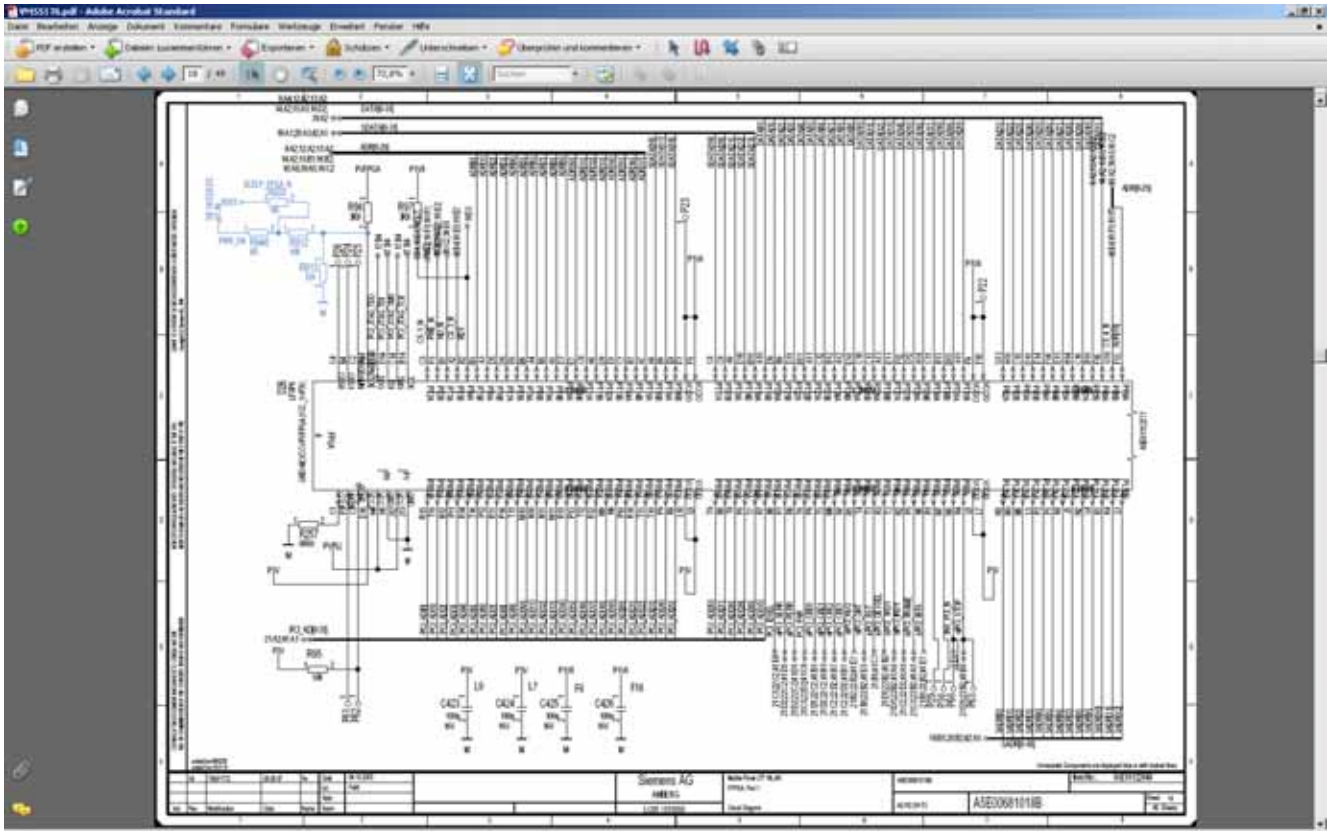

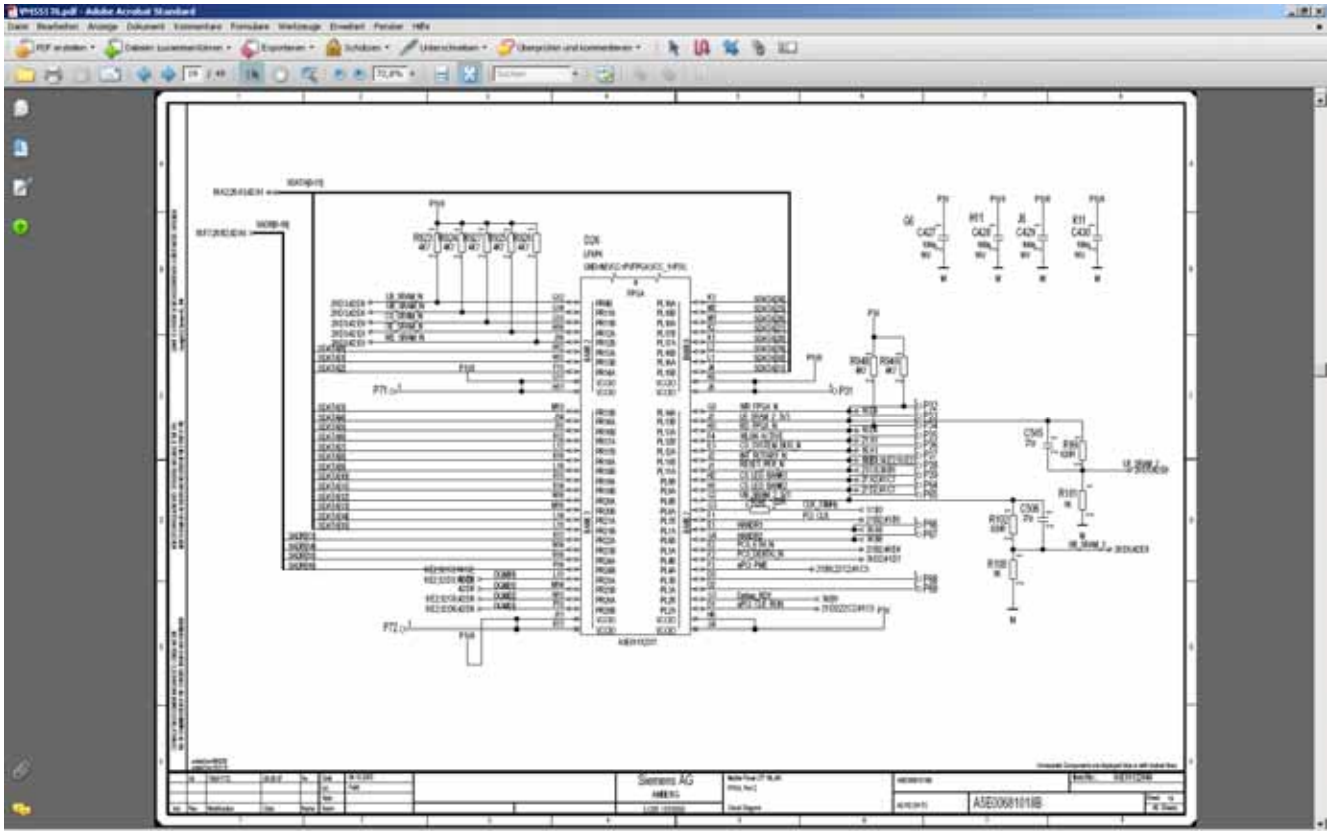

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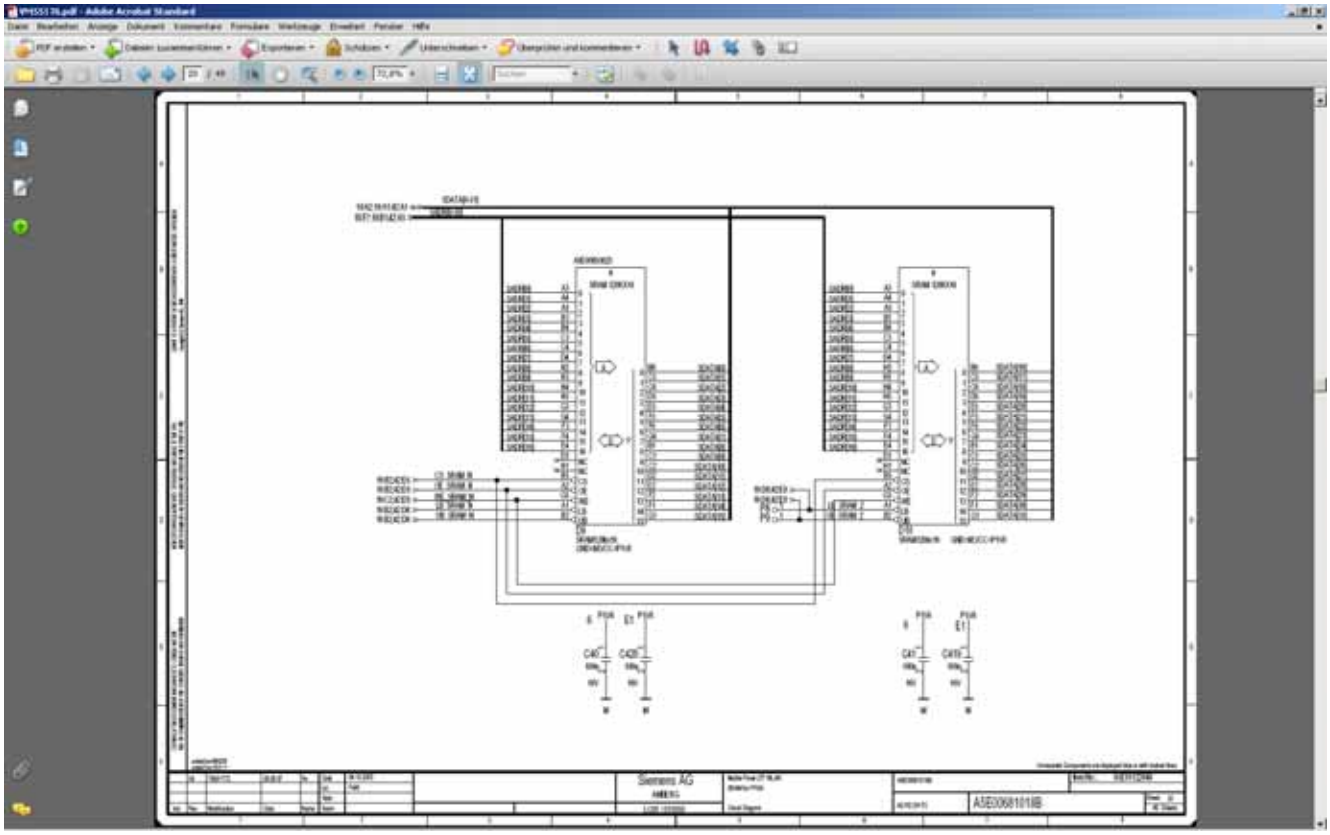

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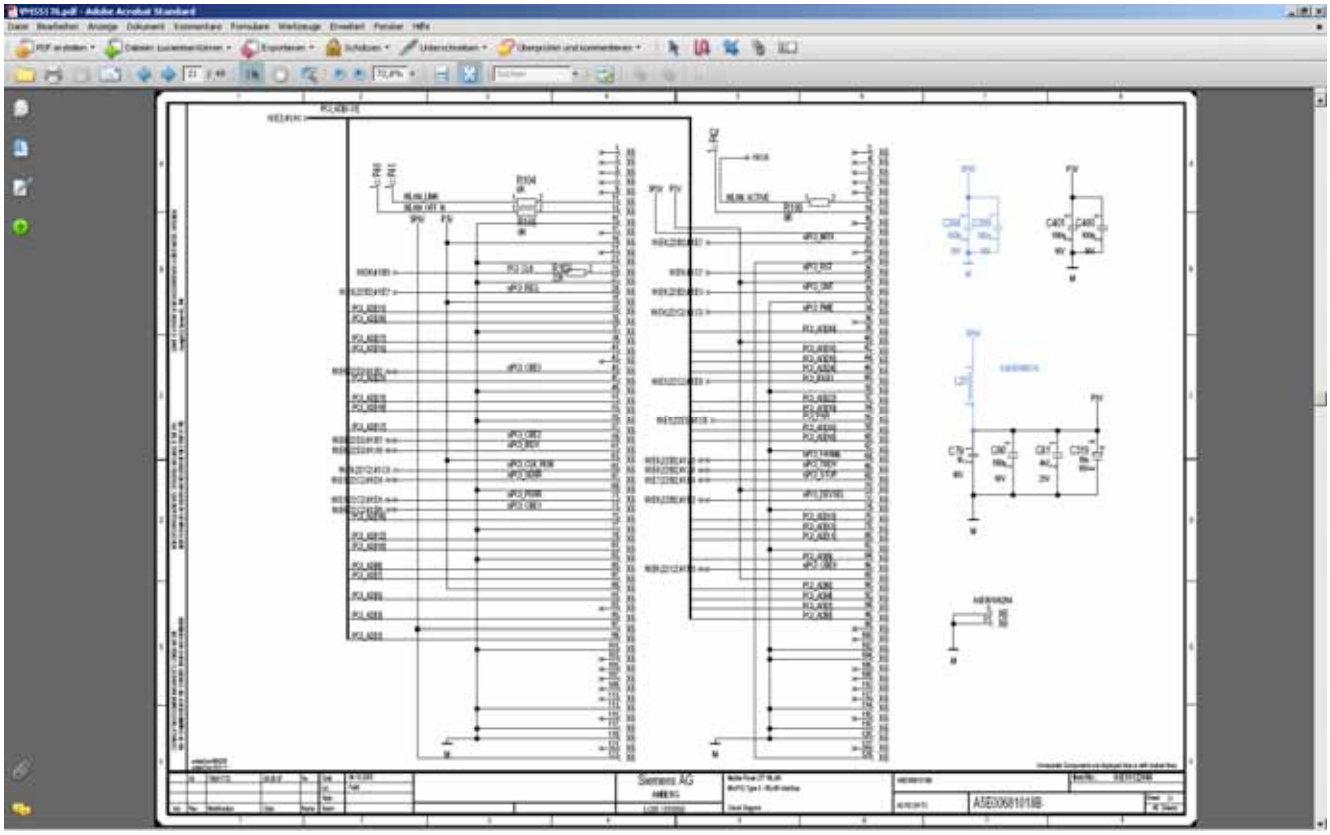

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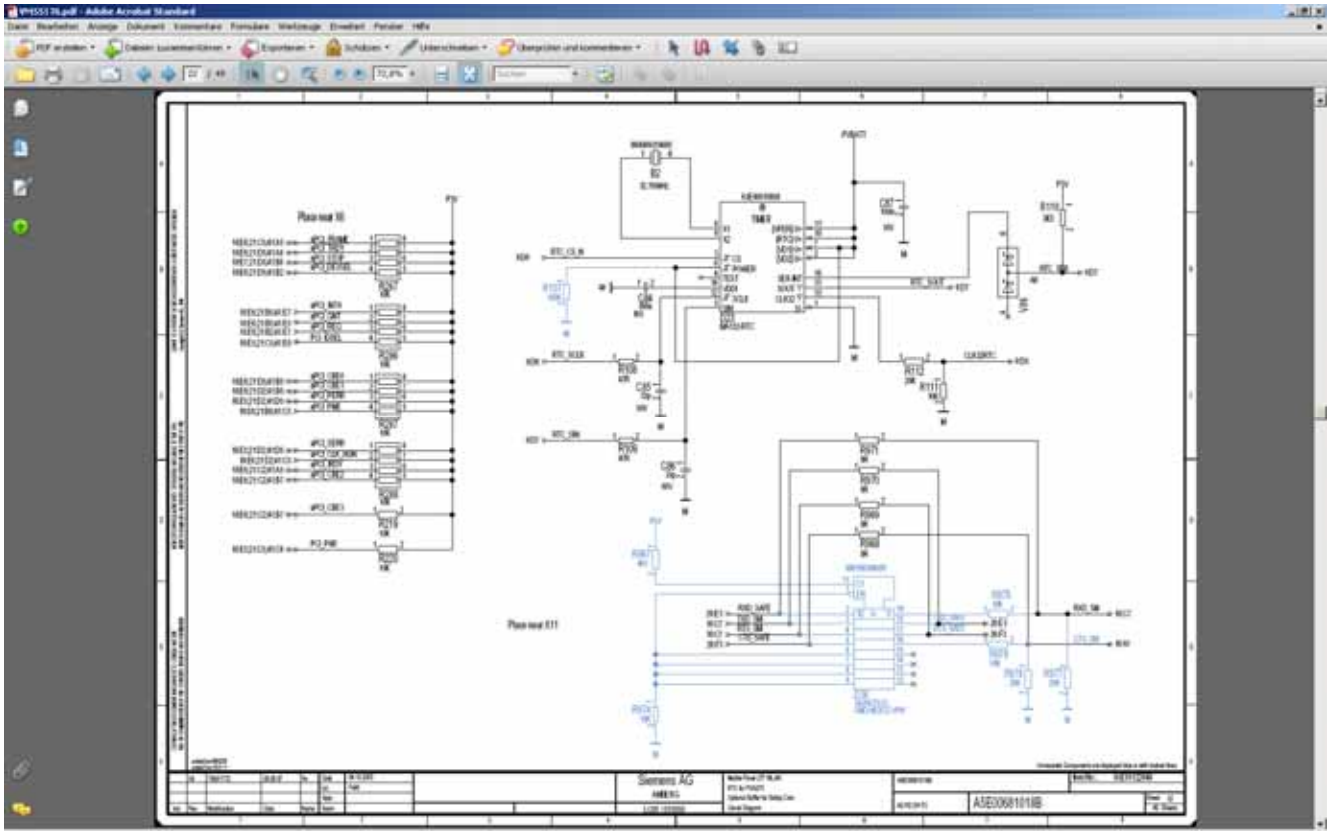

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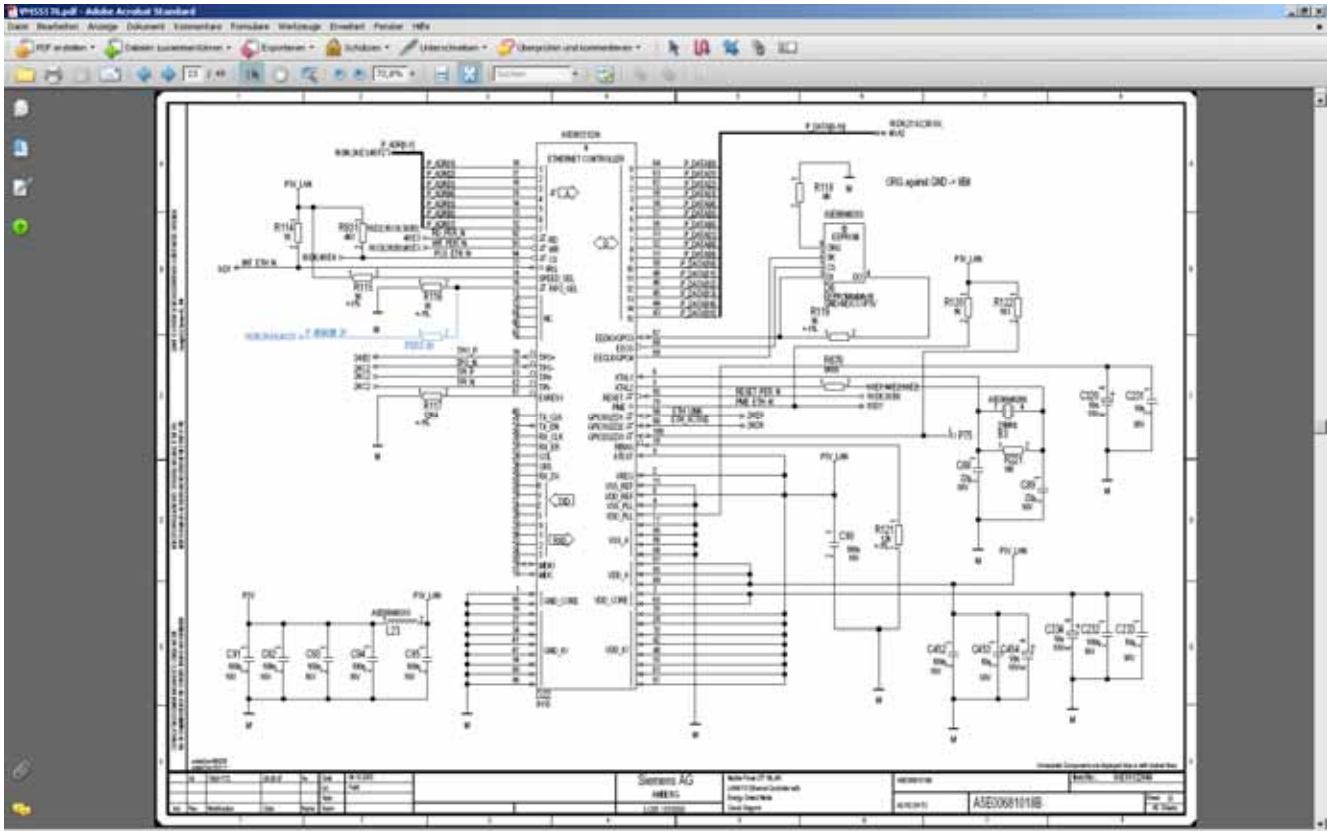
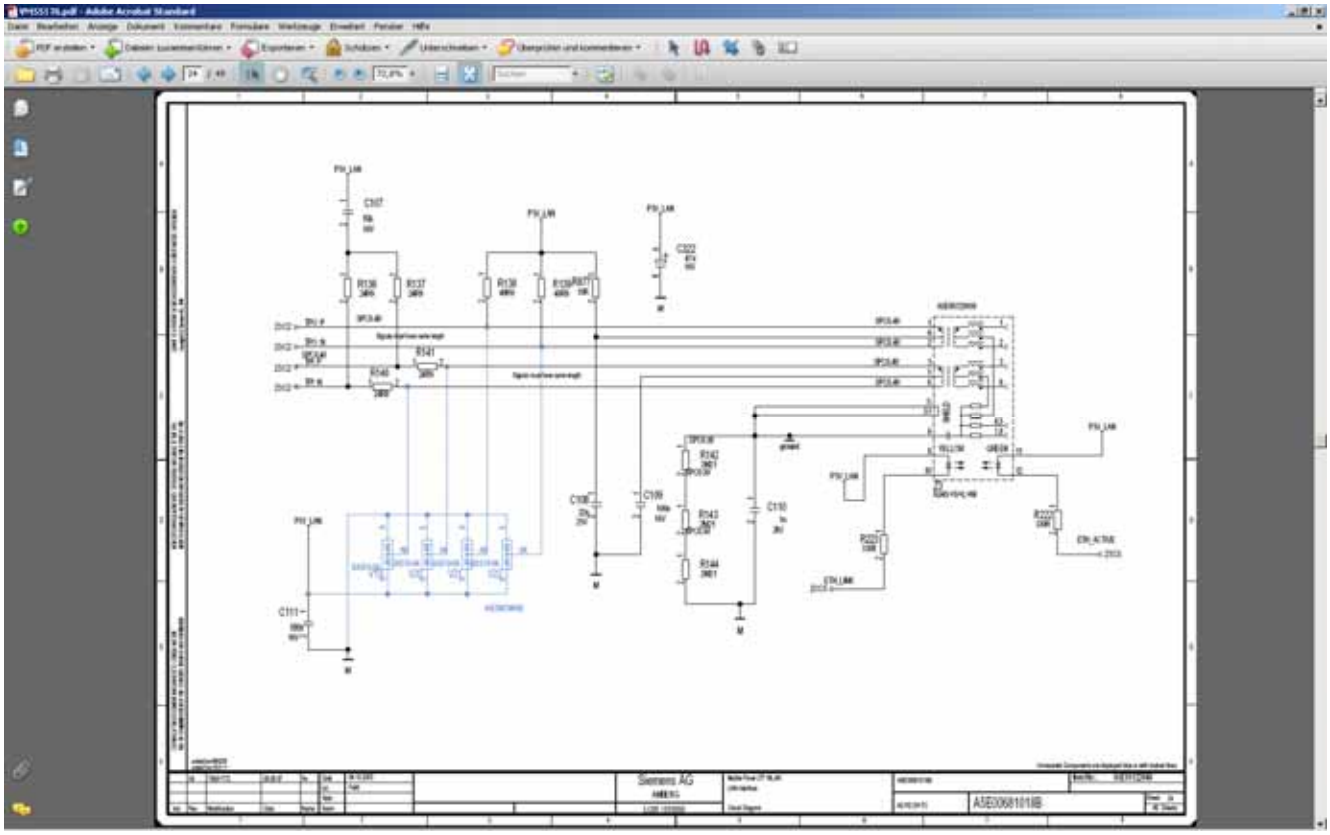
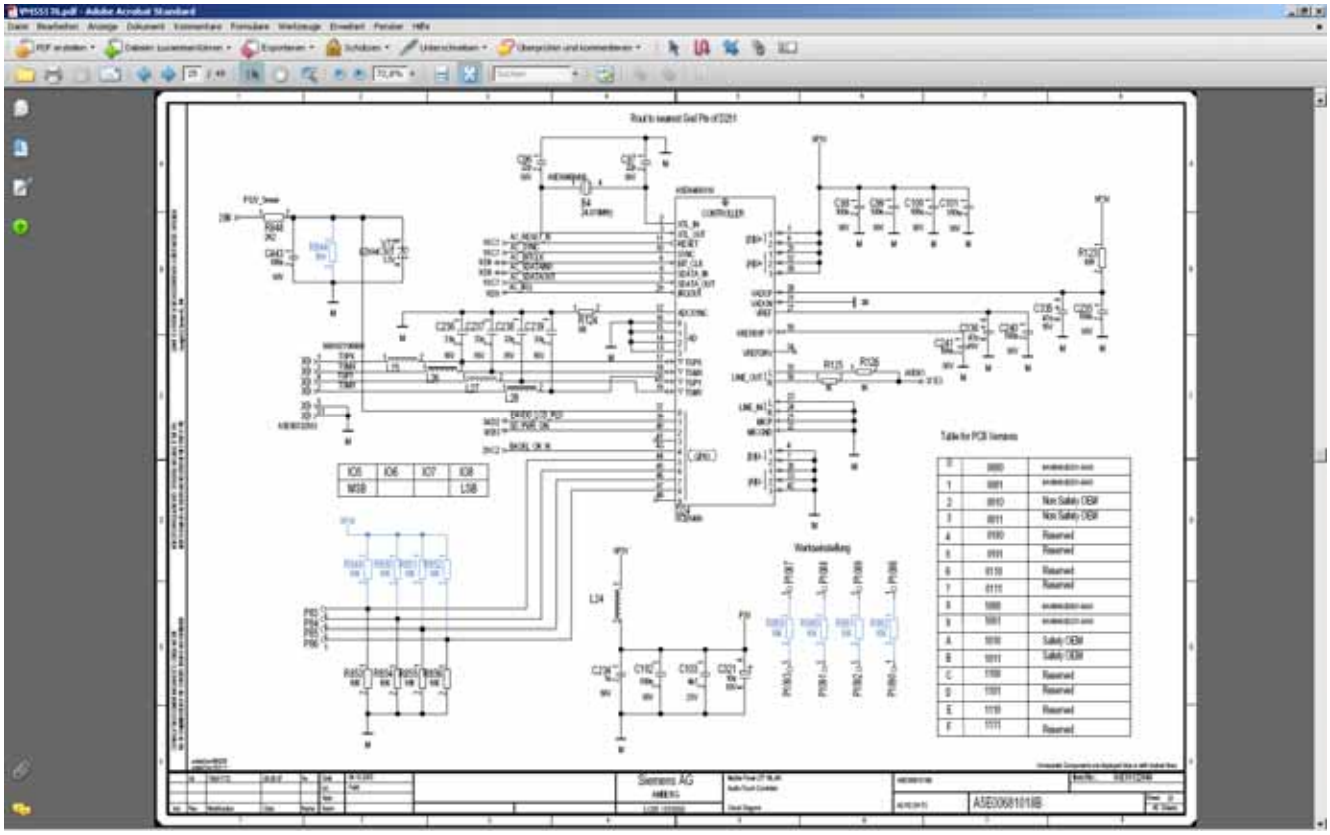
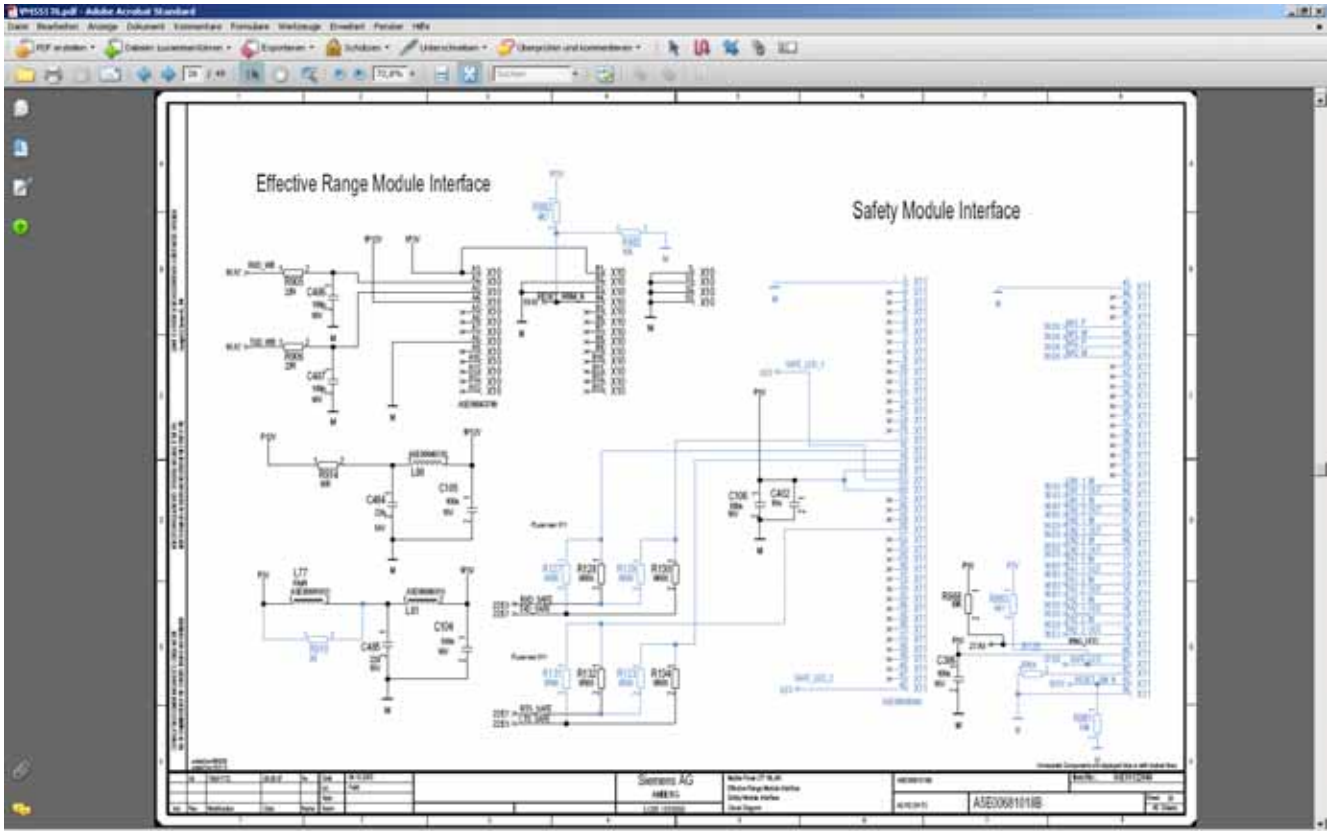
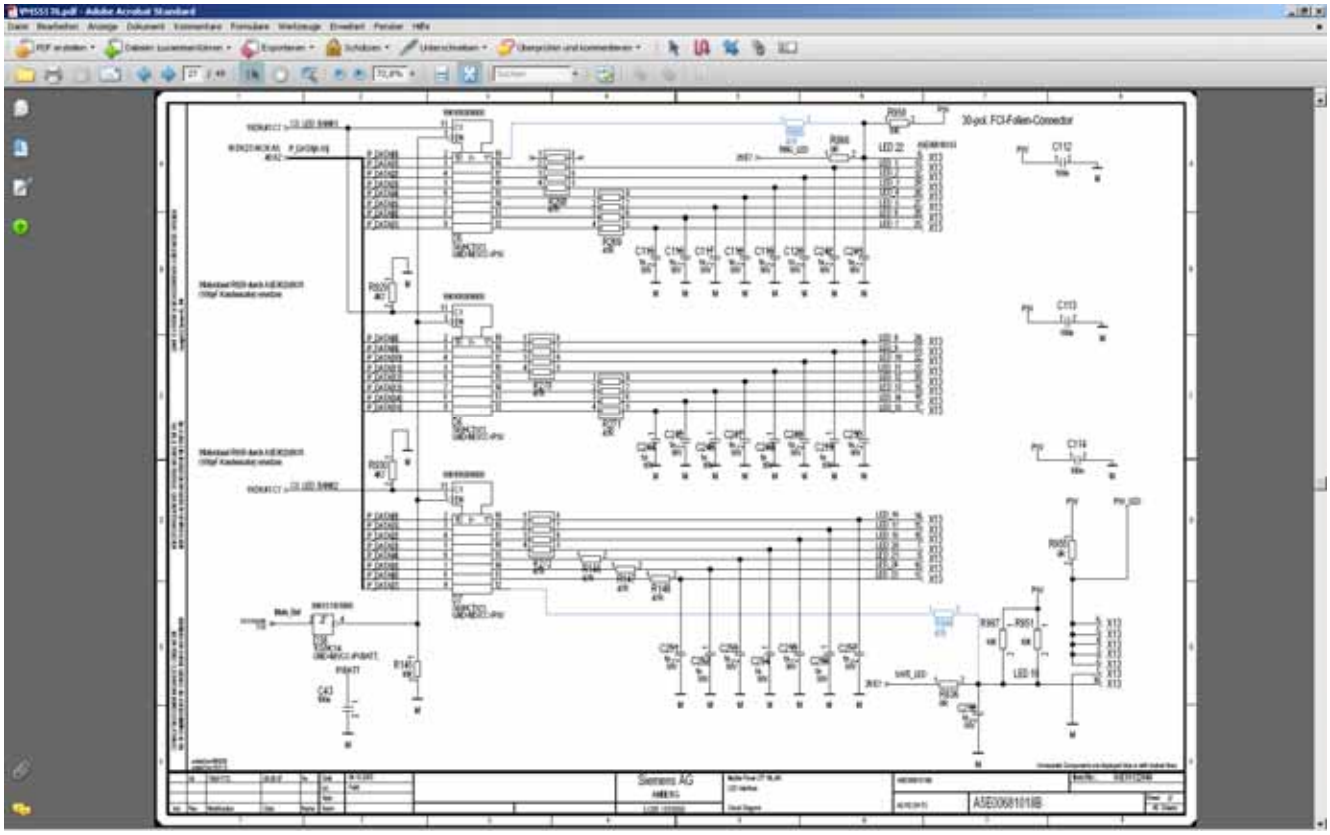
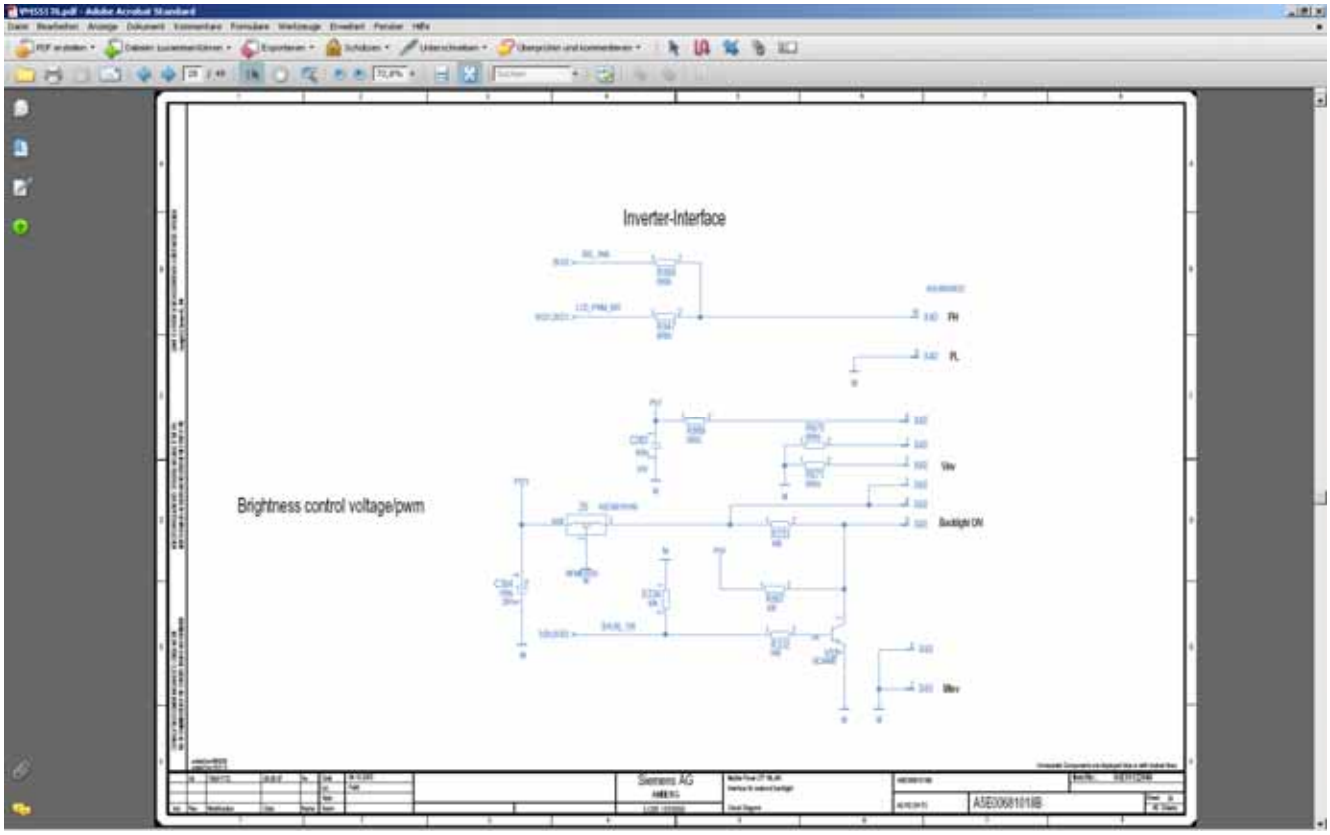







Effective Range Module Interface
Safety Module Interface

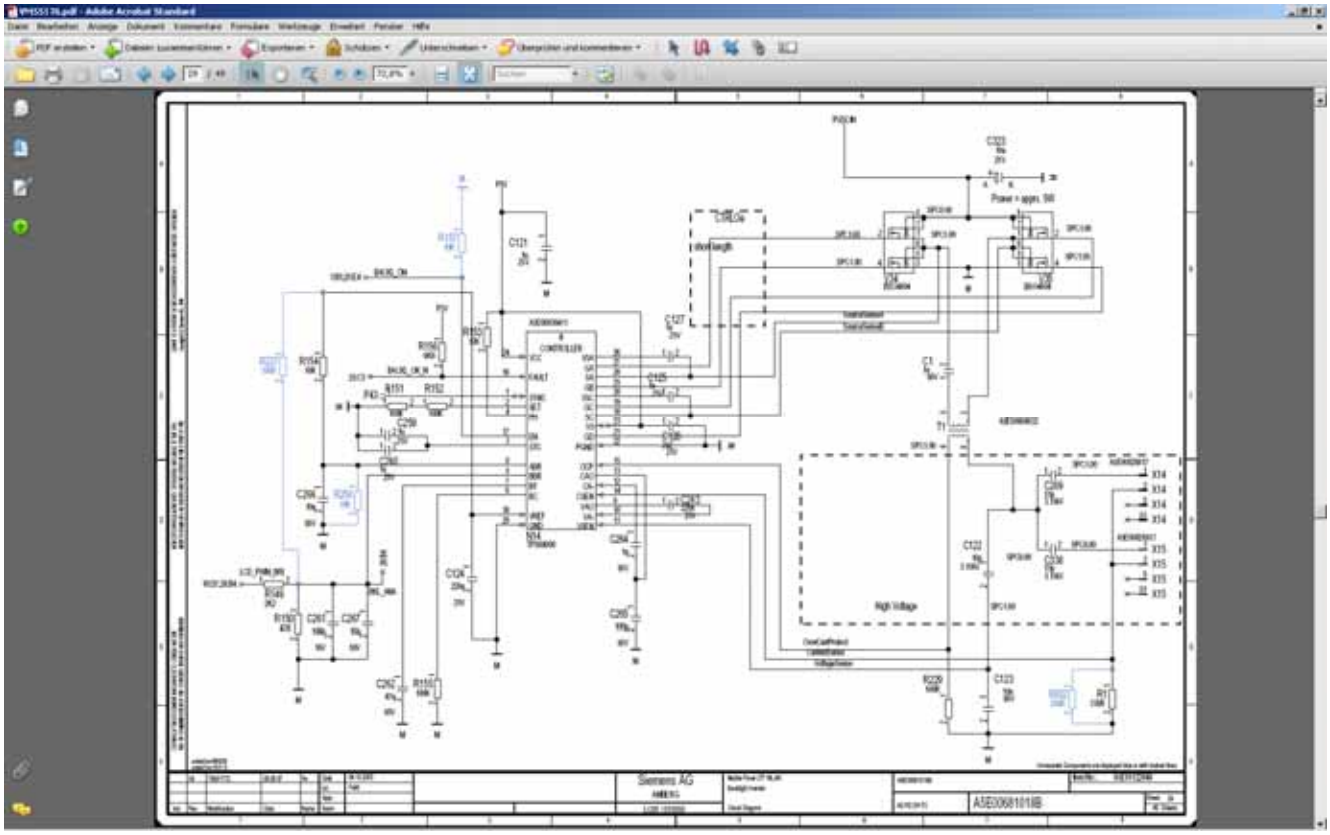



Inverter-Interface
Brightness control voltage/pwm
Backlight ON
Siemens AG

S

Deutscher Akkreditierungs Rat DAR

DAT-P-252/98-02



08-E003402-BM-C01	EUT:	Date:	Page:
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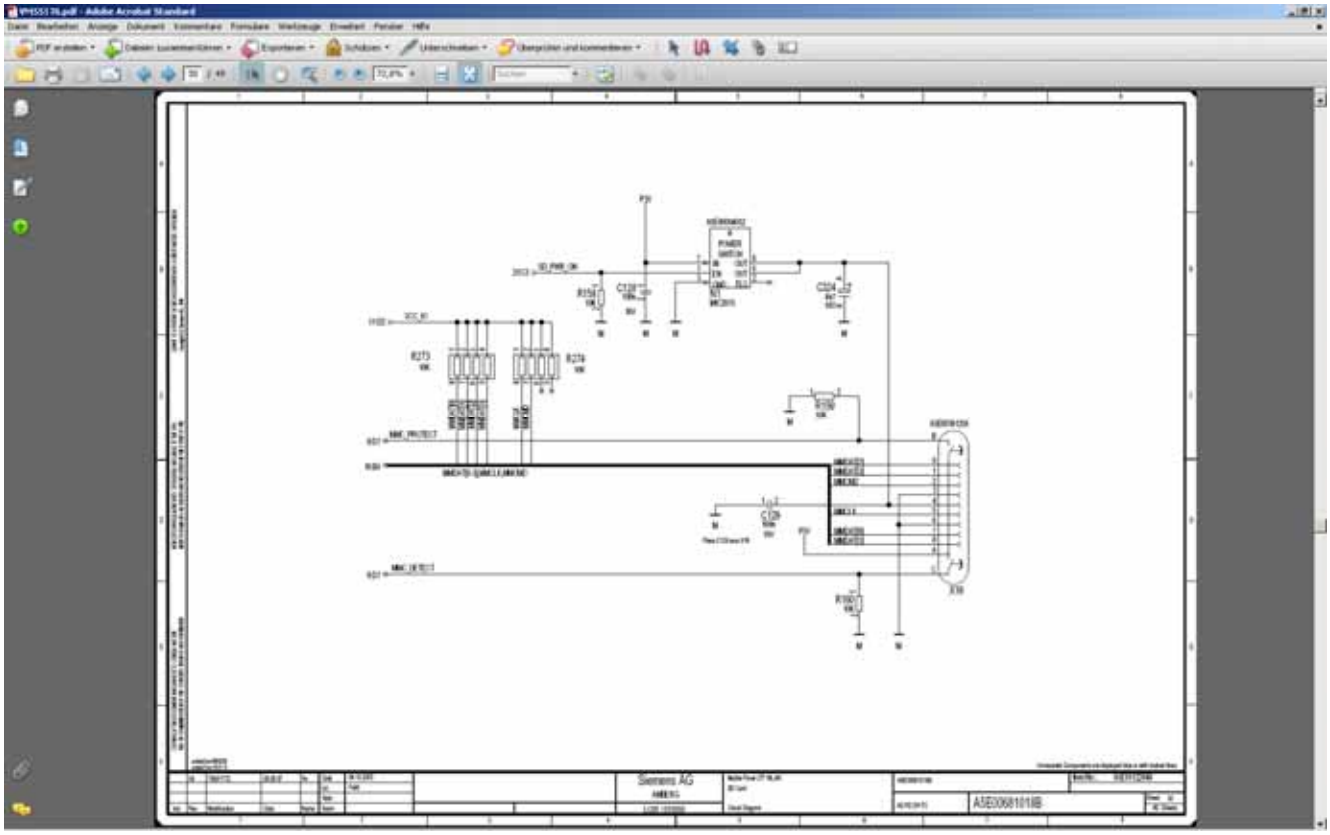

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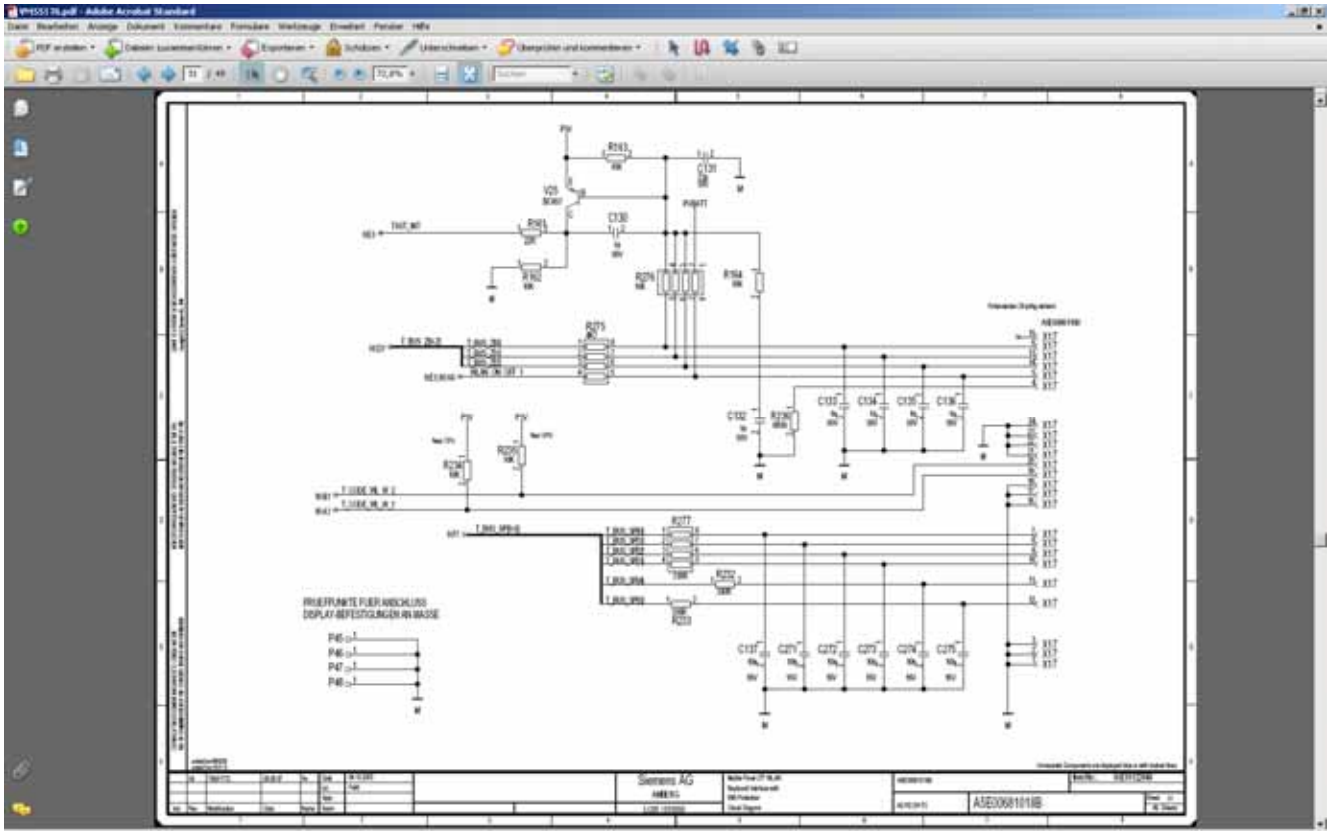

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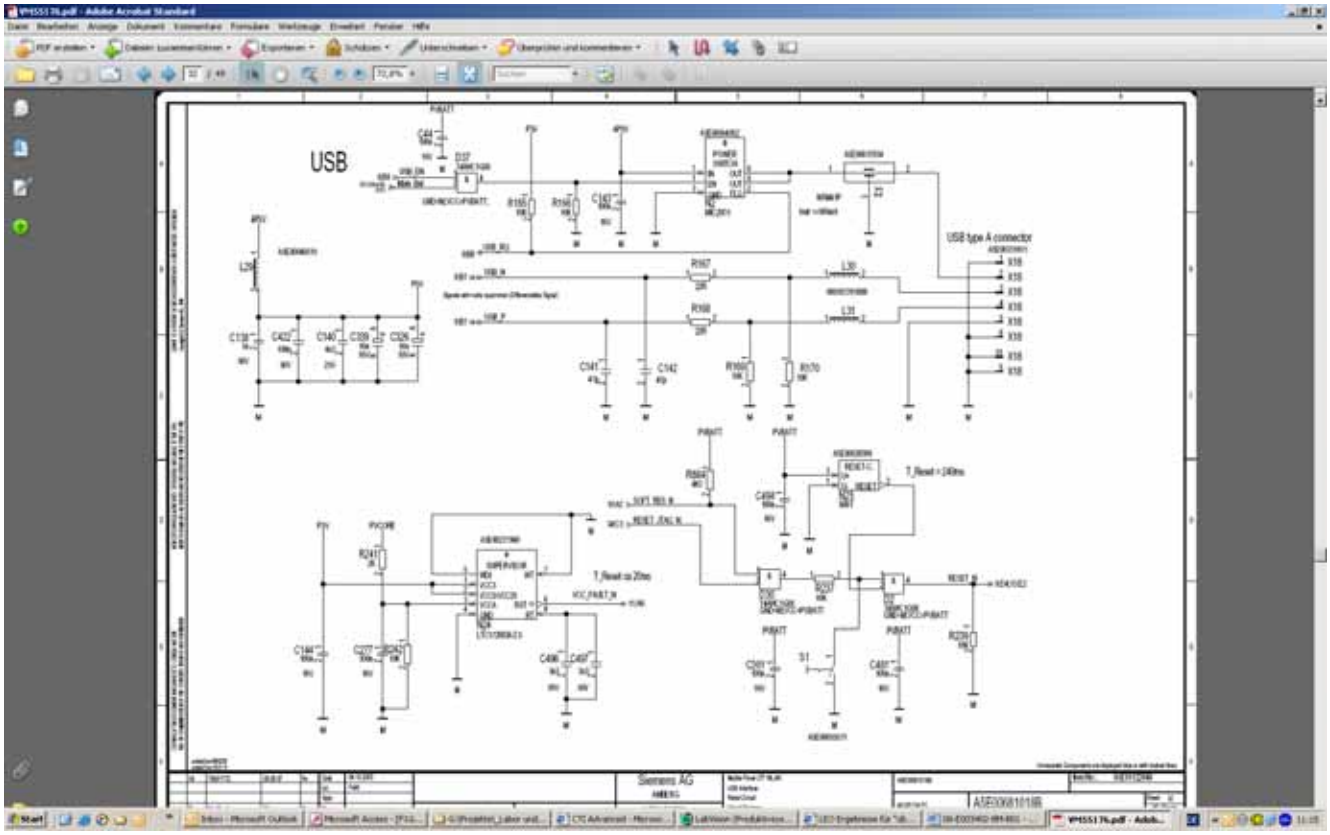

08-E003402-BM-C01	EUT:	Date:	Page:
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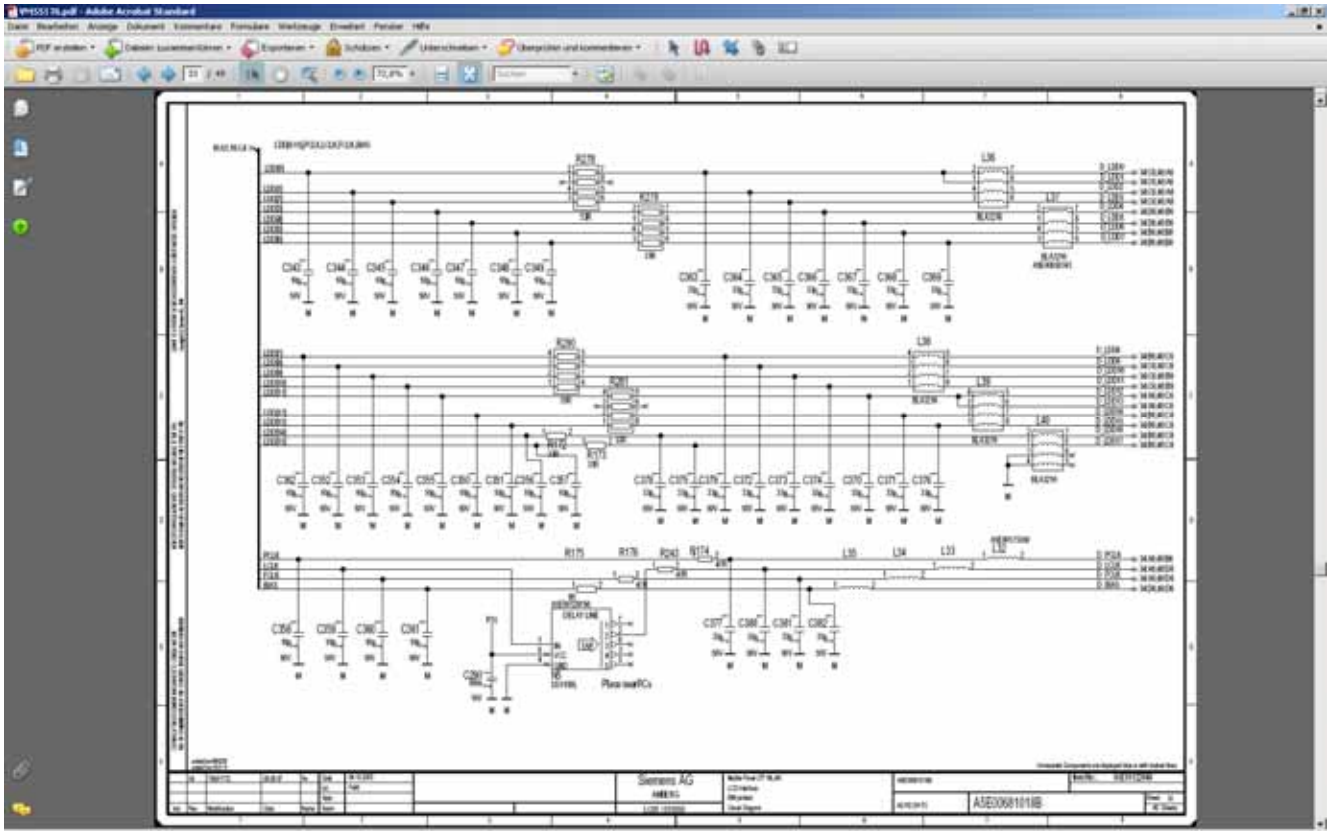

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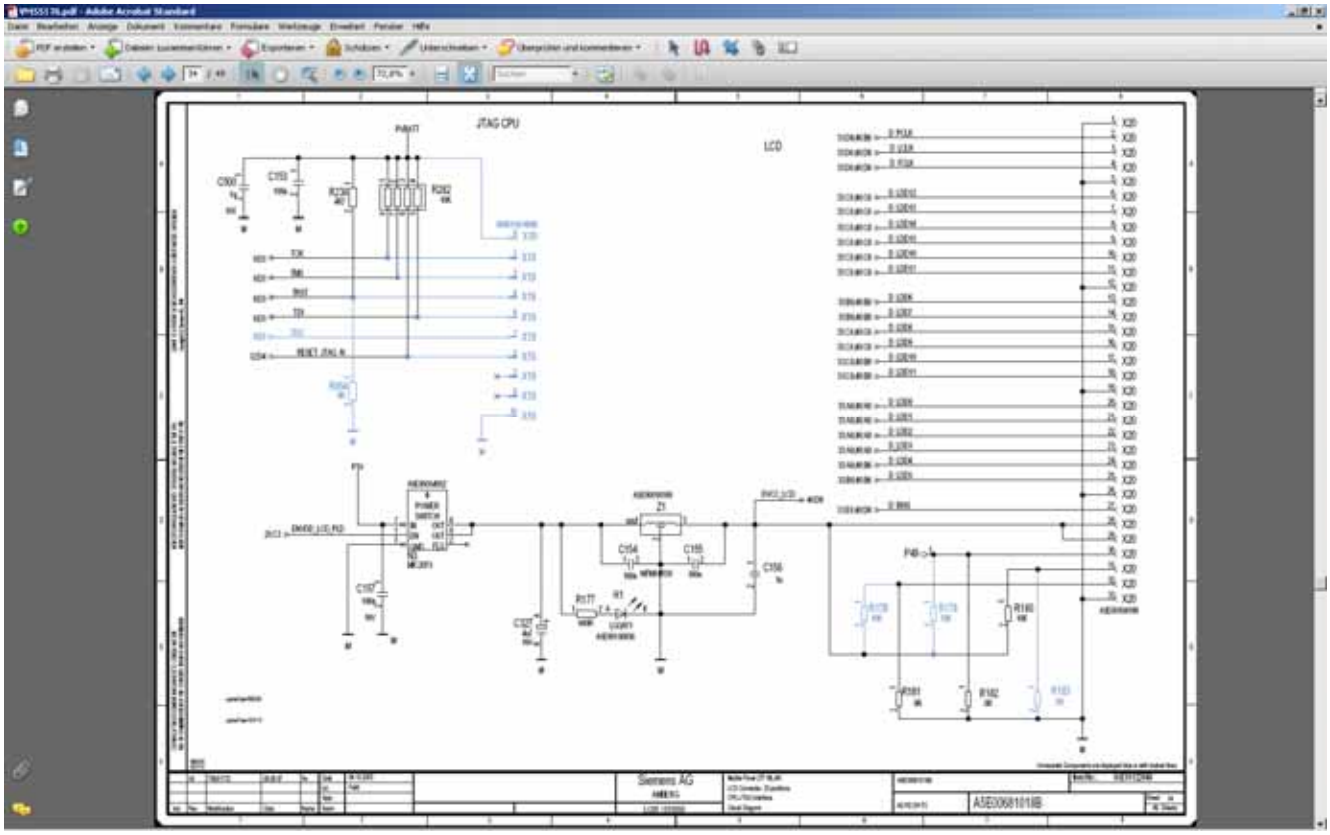
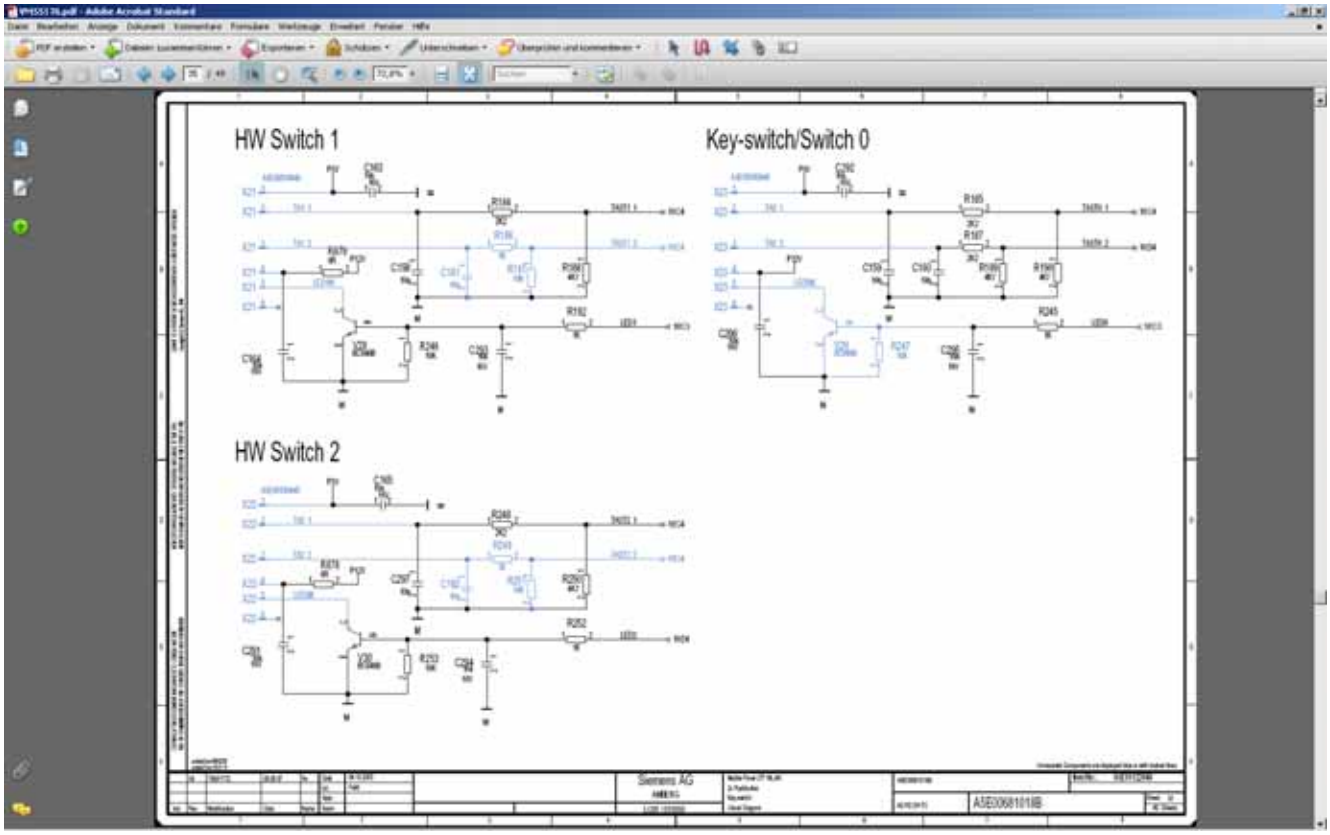

JTAG CPU
LCD
Siemens AG



08-E003402-BM-C01 S ©'08, all rights reserved	EUT:	Date:	Page:
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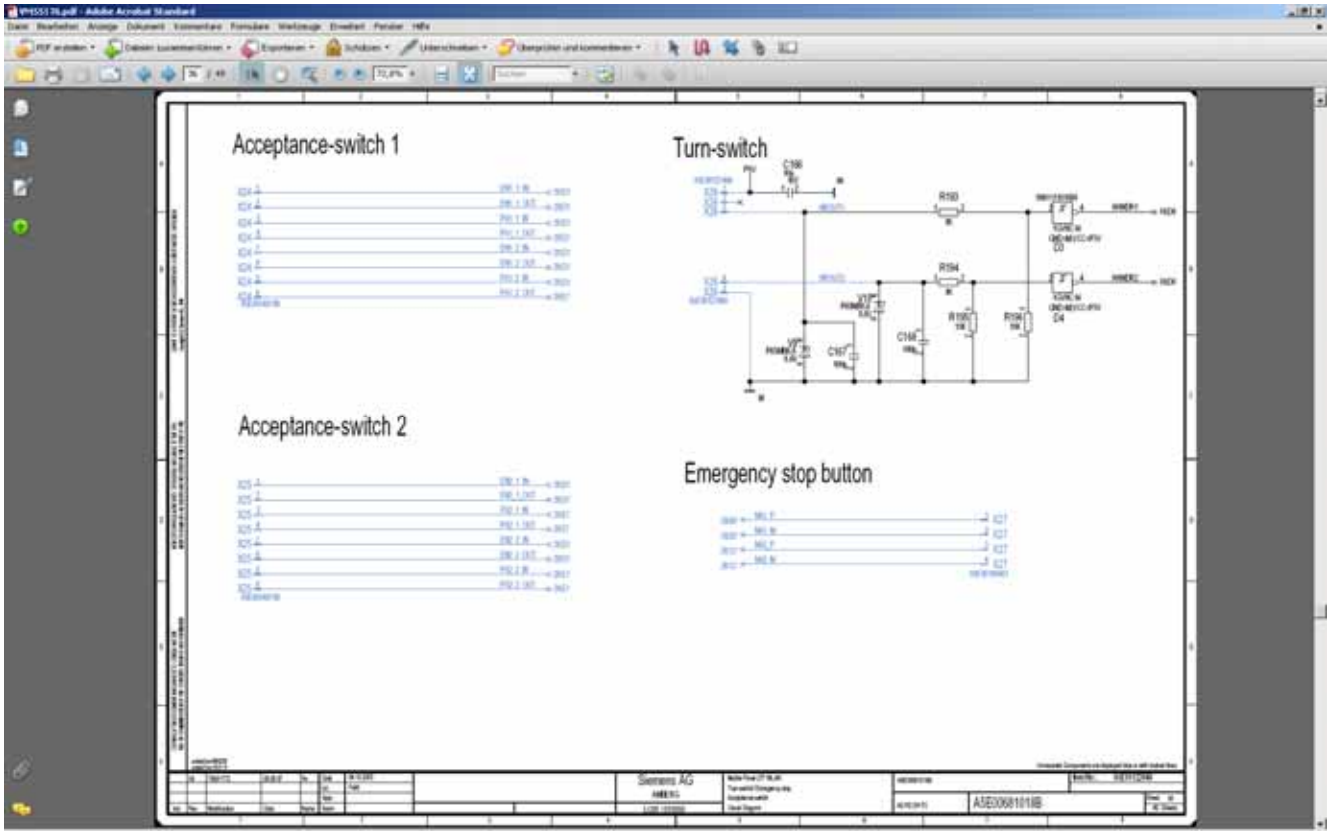
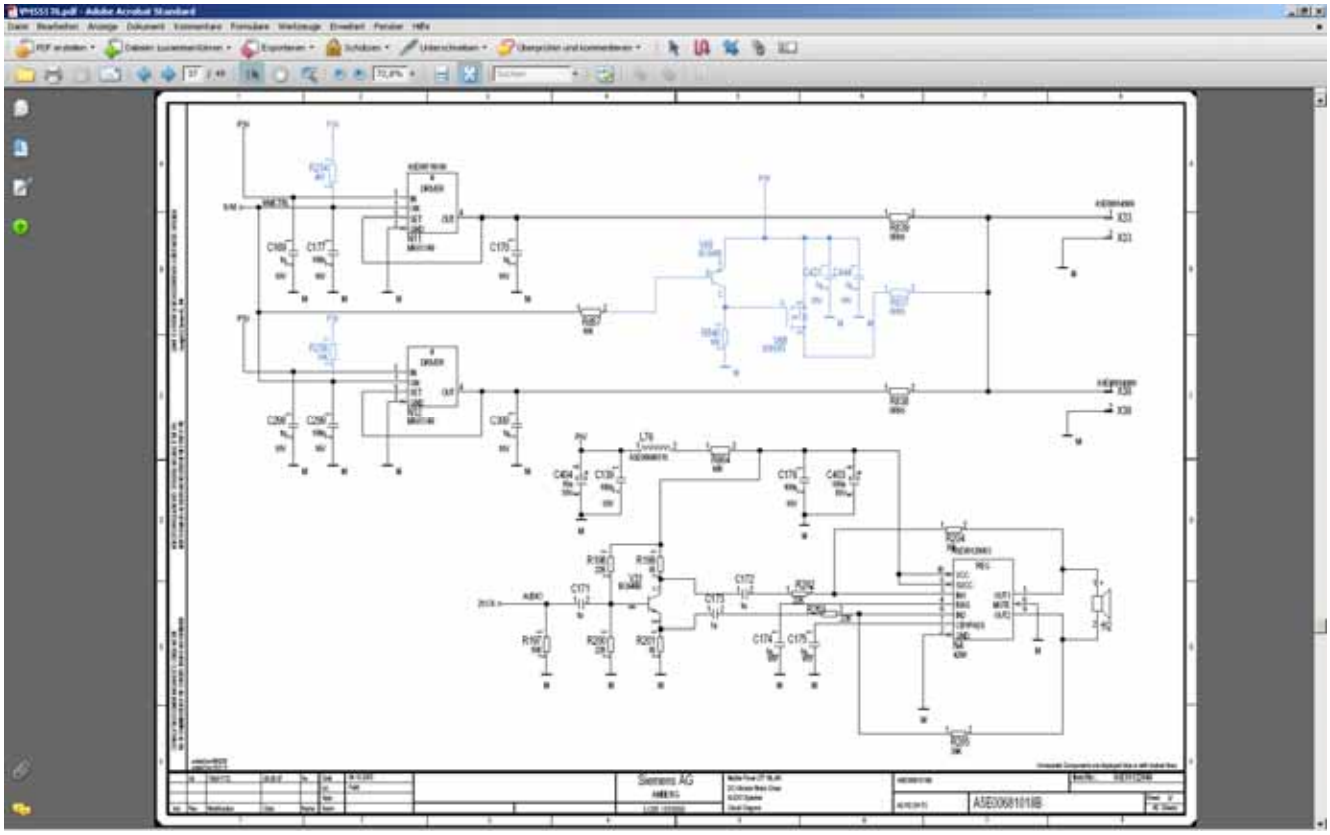
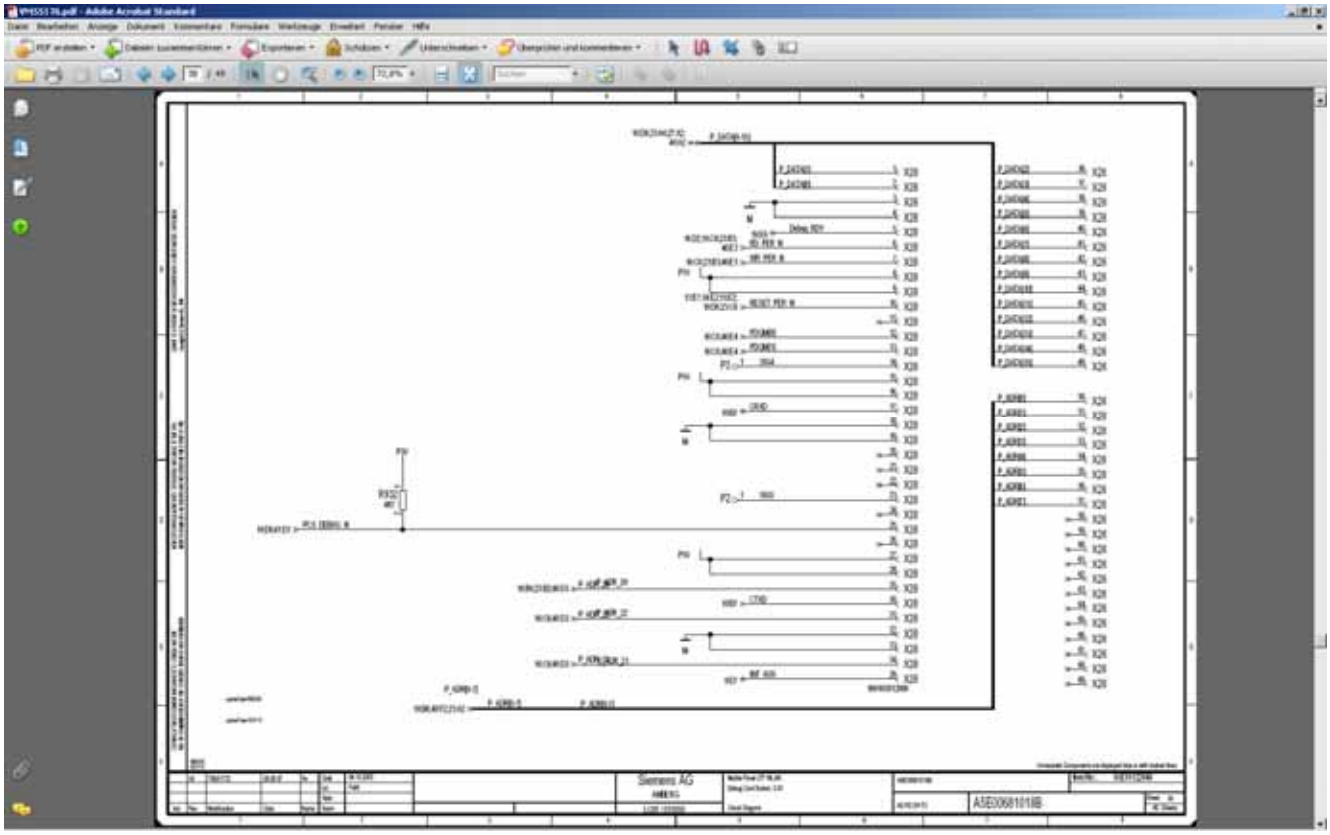

Acceptance-switch 1
Turn-switch
Acceptance-switch 2
Emergency stop button





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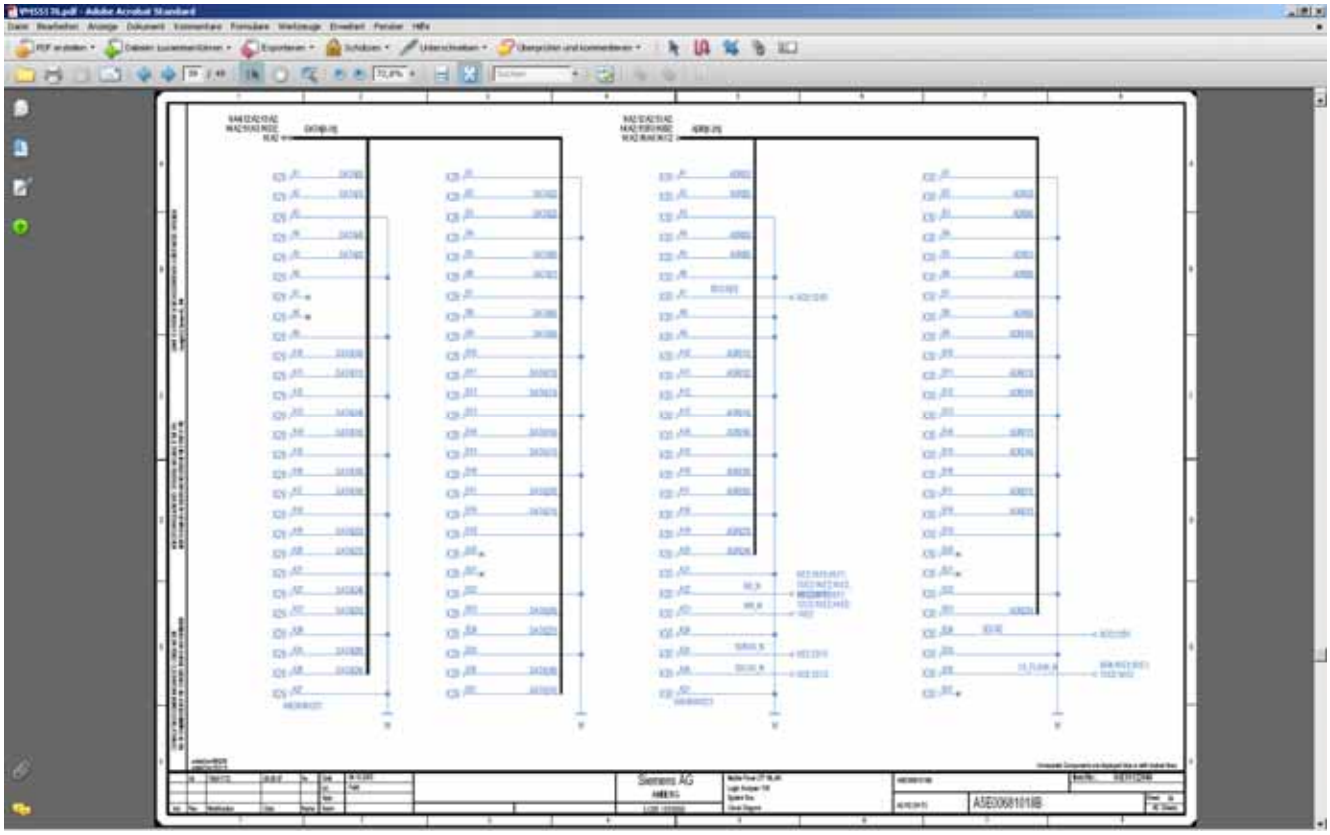

08-E003402-BM-C01 S ©'08, all rights reserved	EUT:	Date:	Page:
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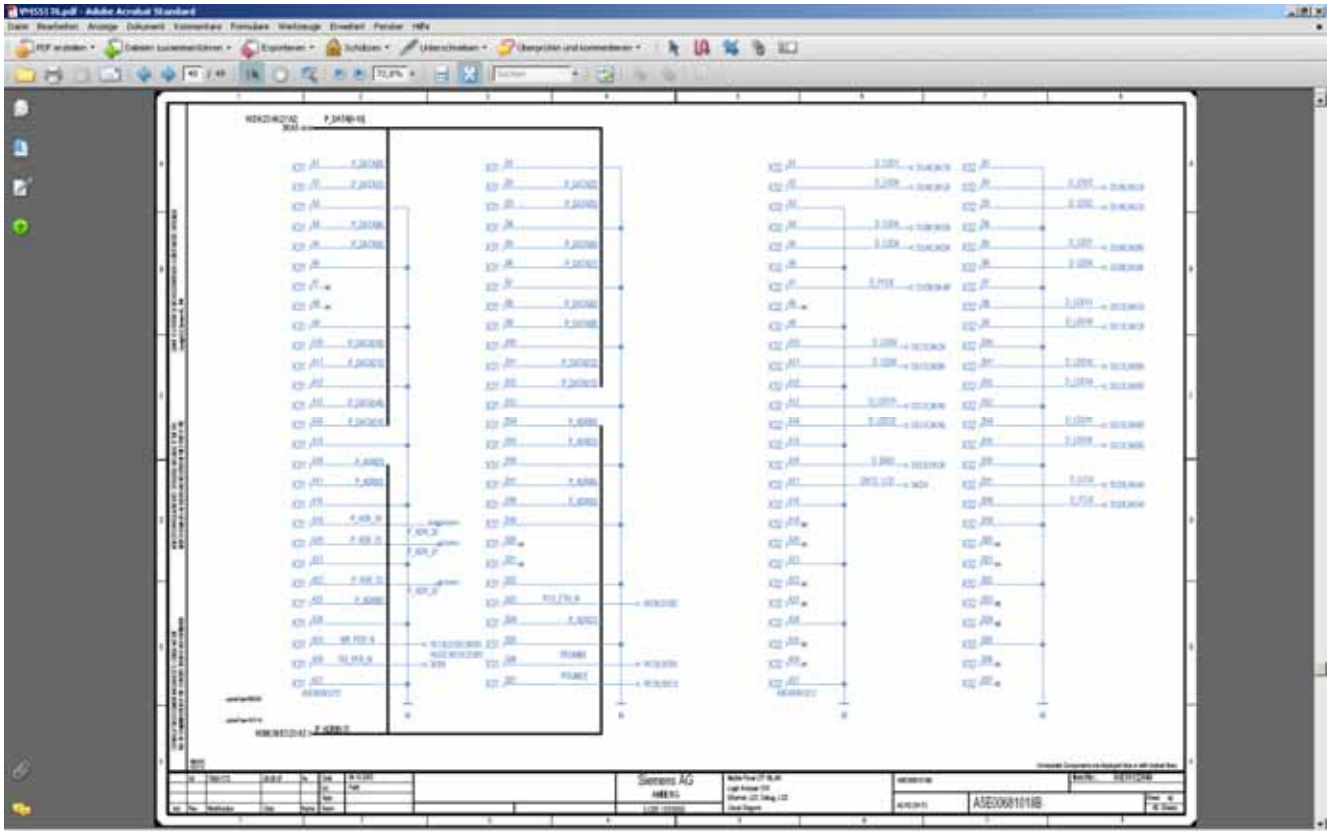

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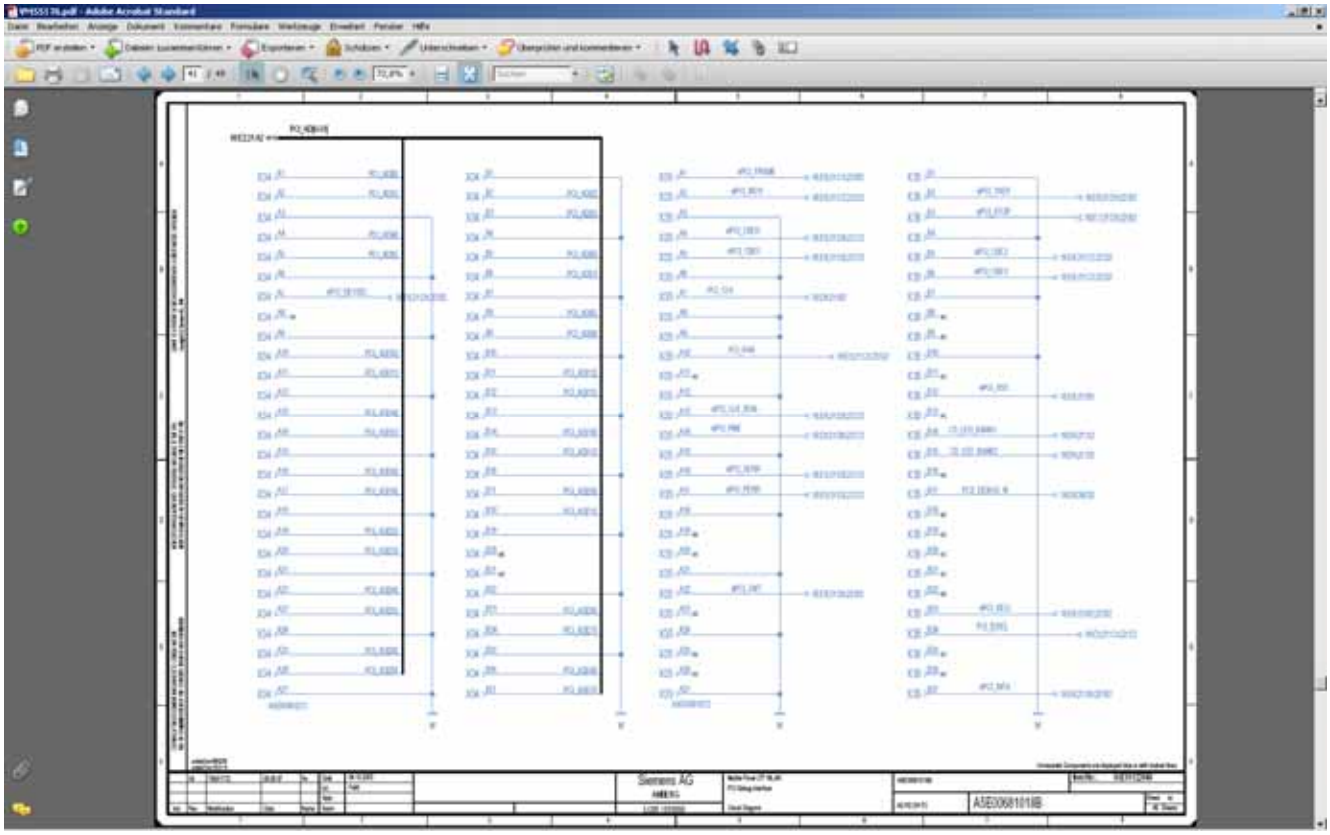

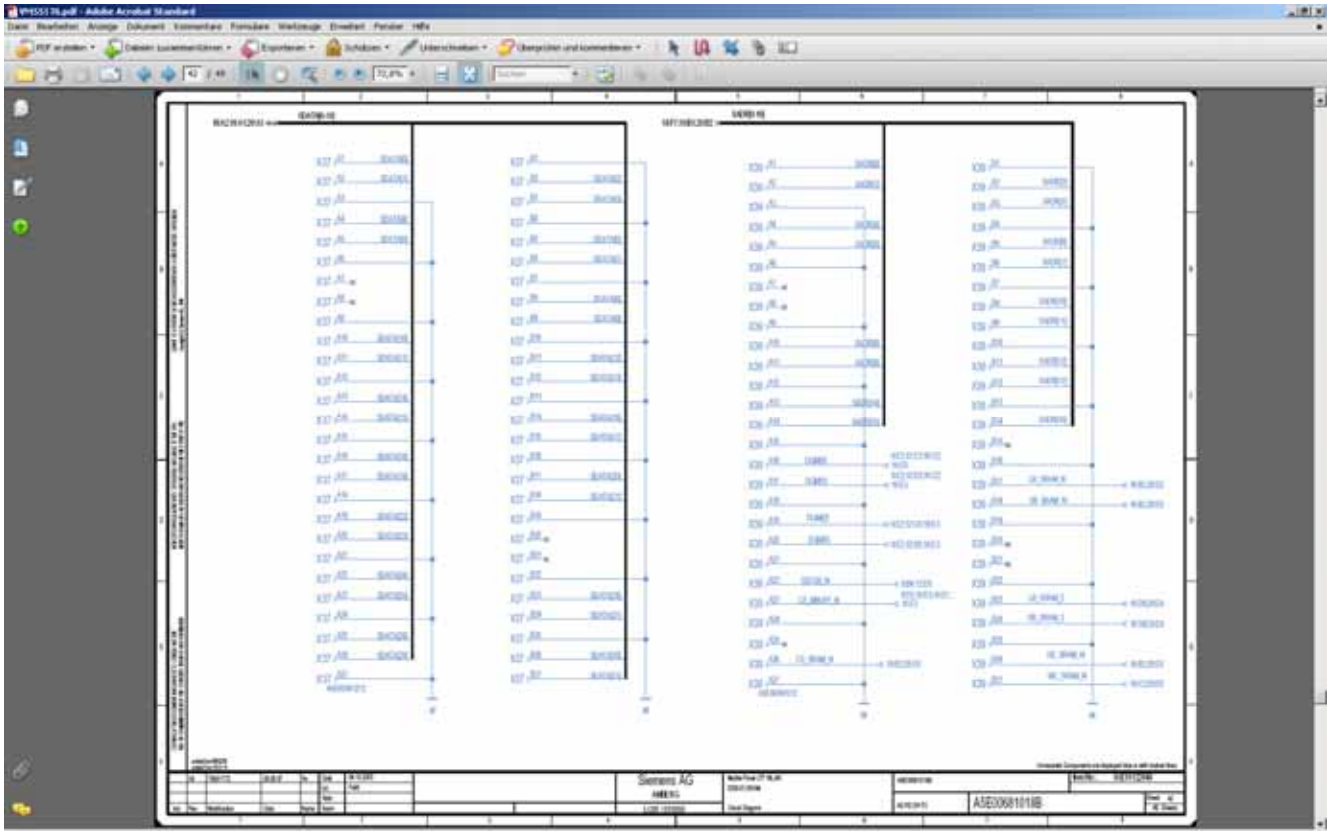

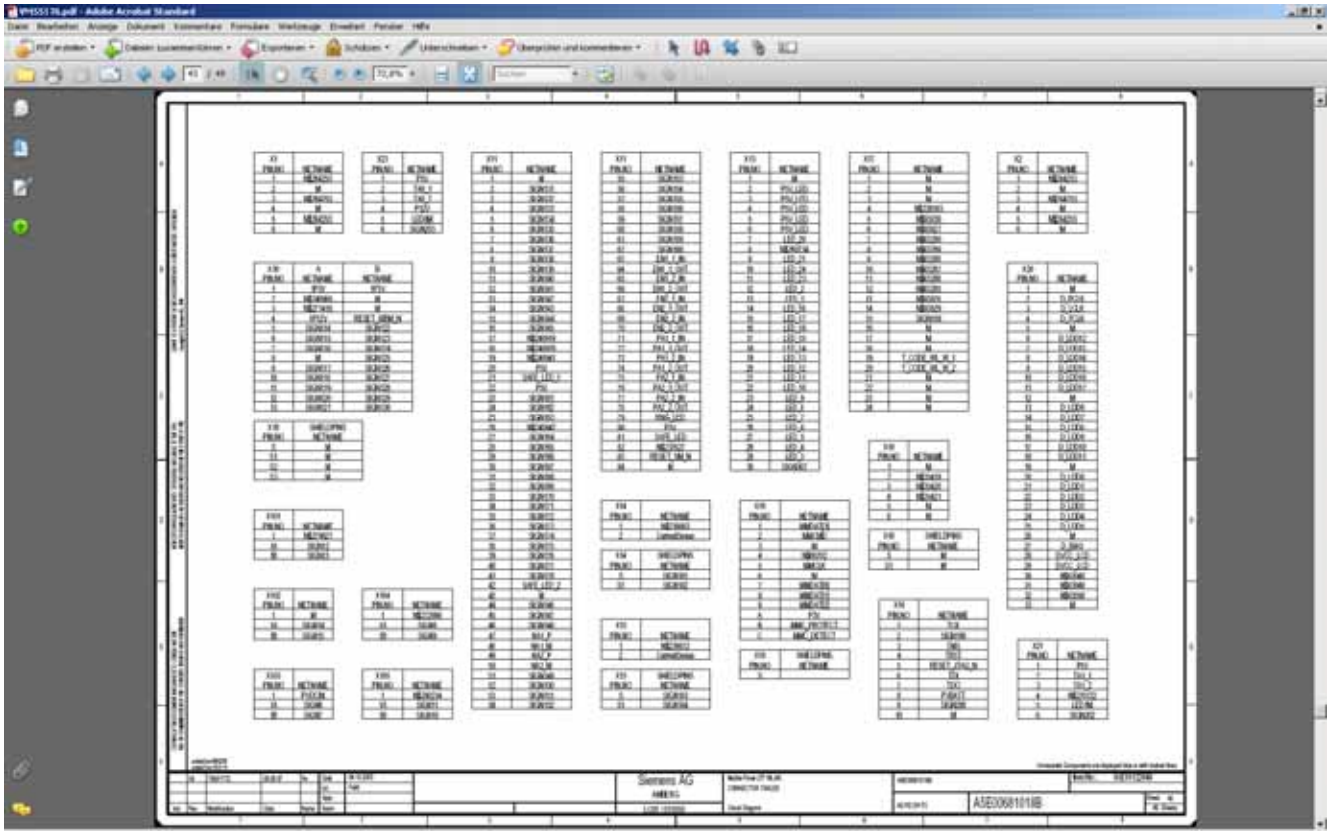

08-E003402-BM-C01 S ©'08, all rights reserved	EUT:	Date:	Page:
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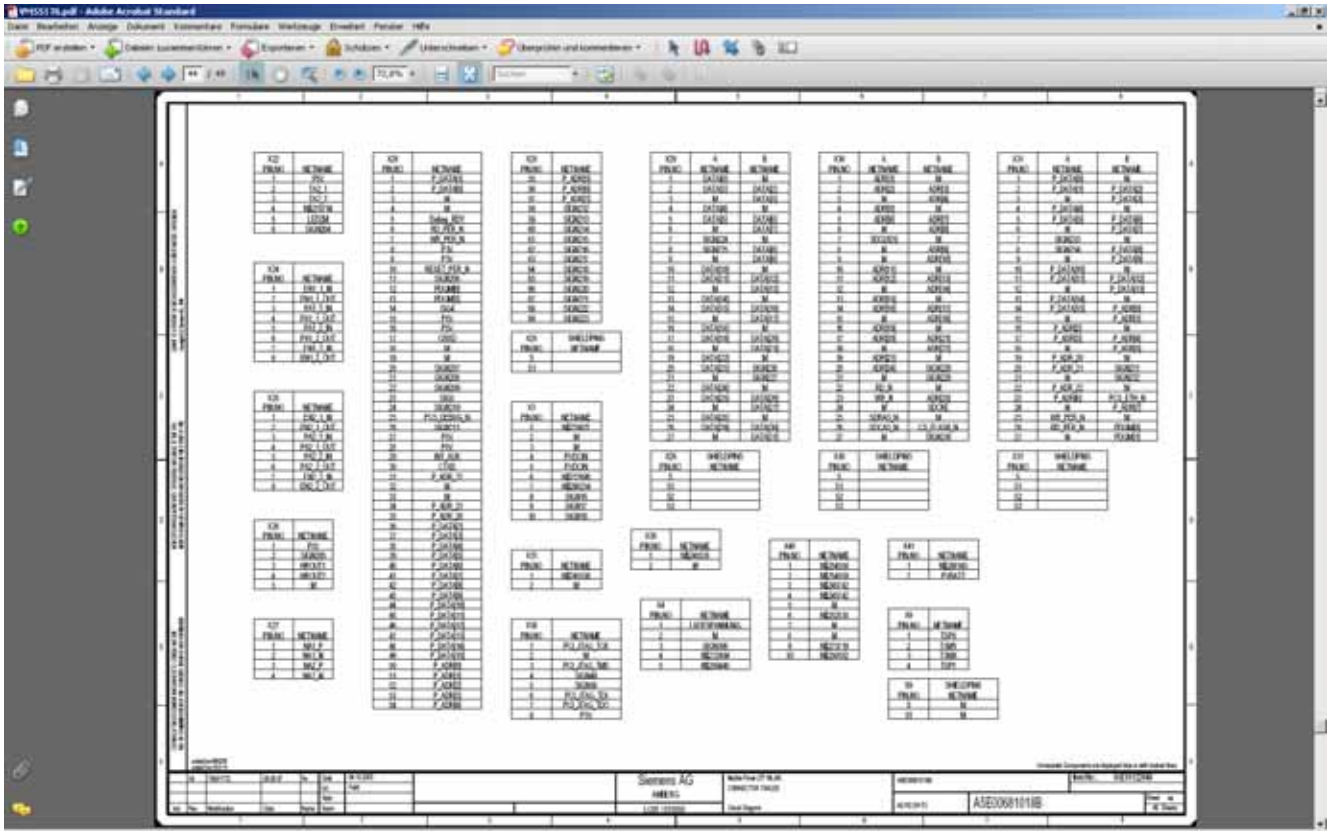

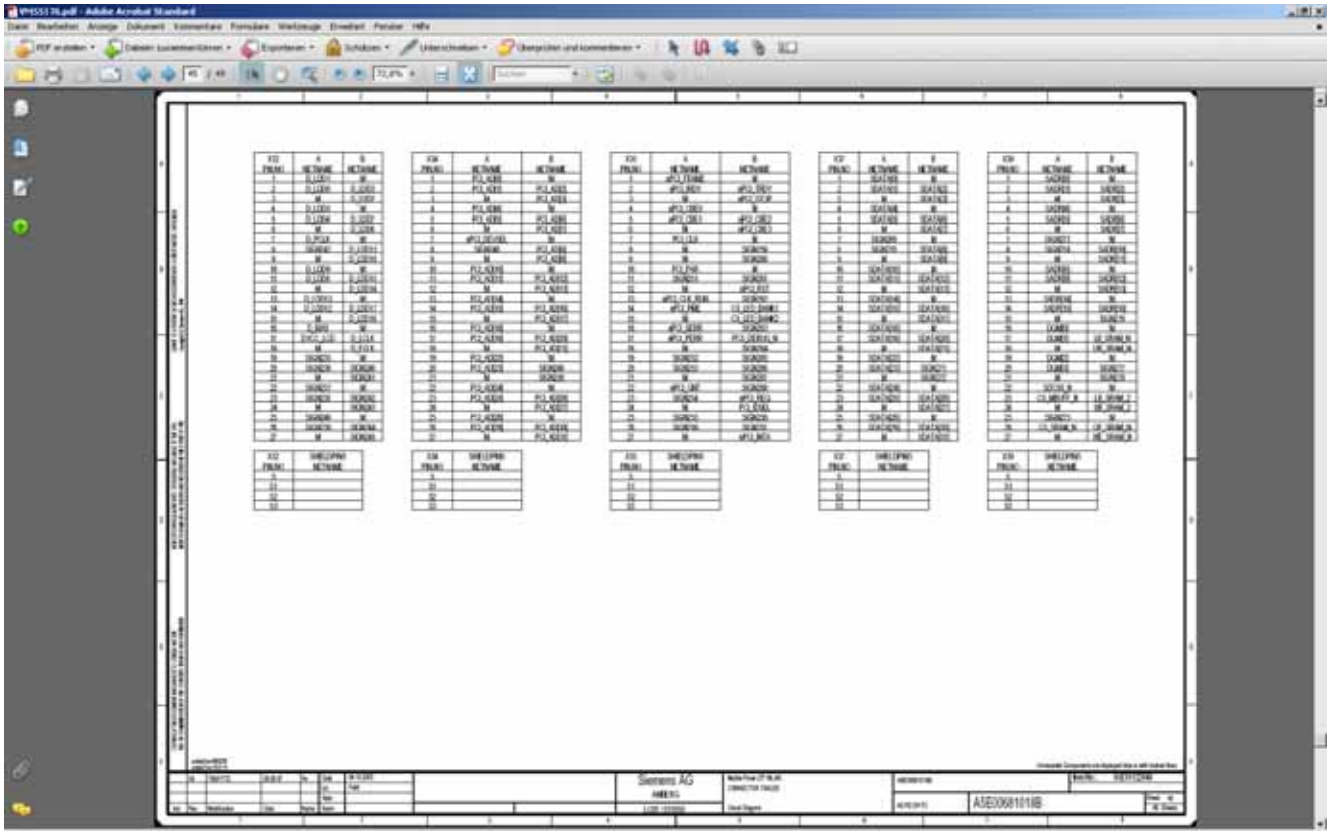

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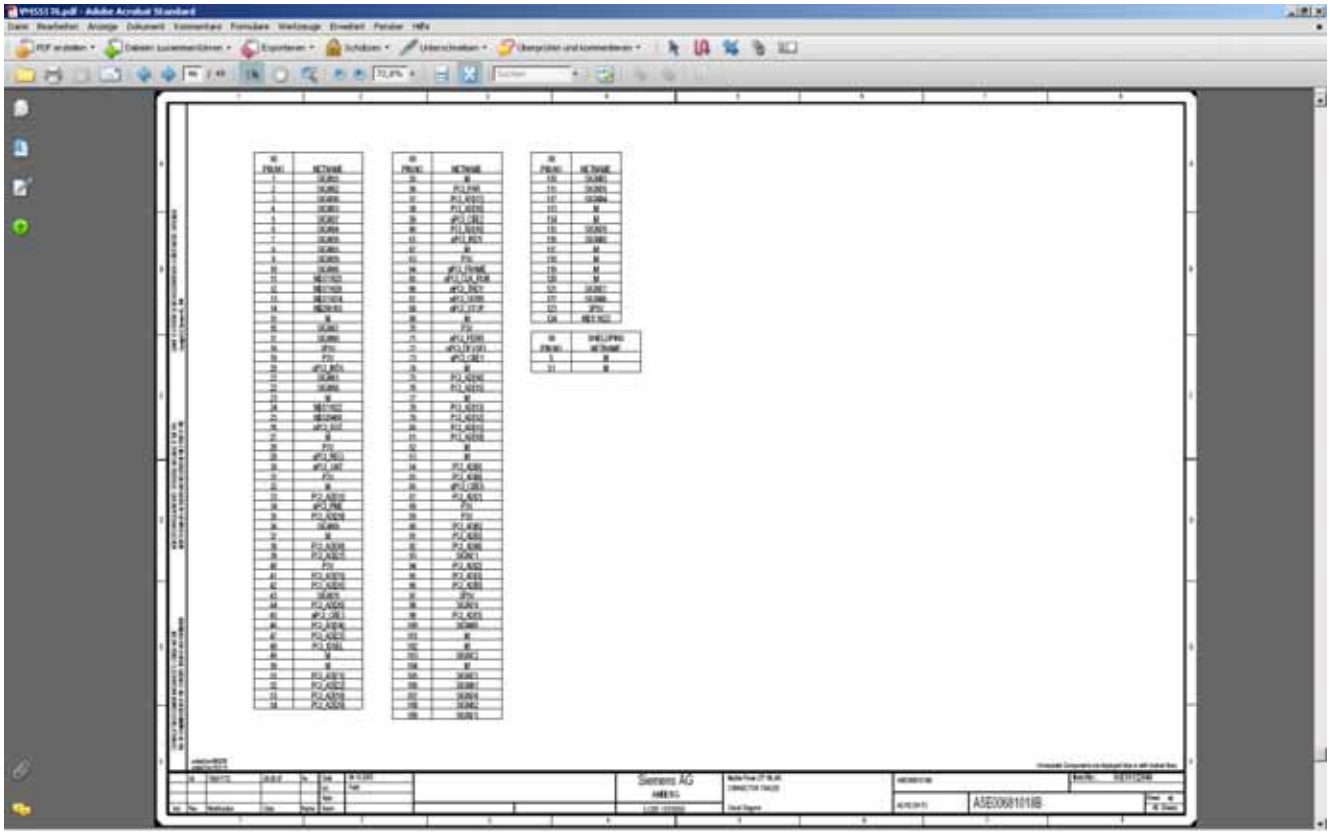

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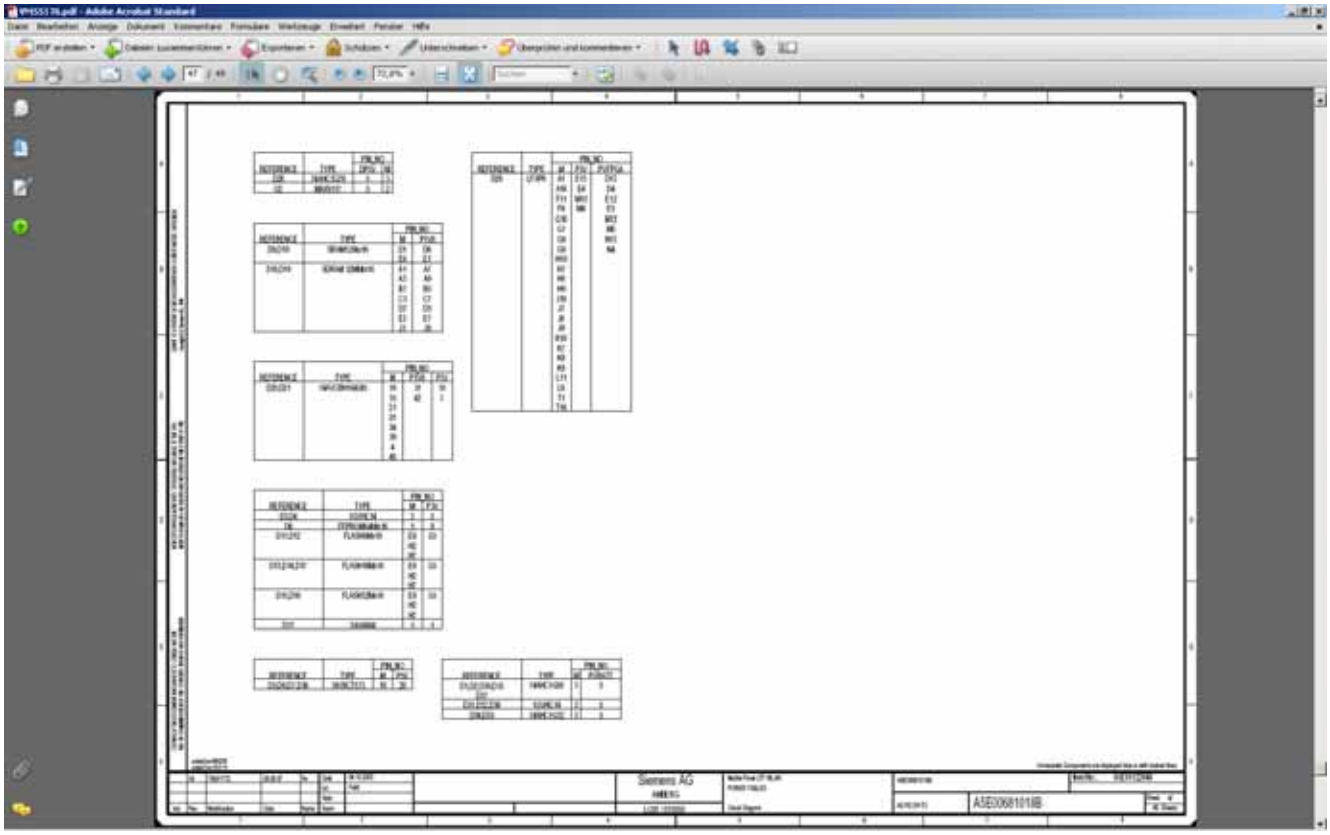

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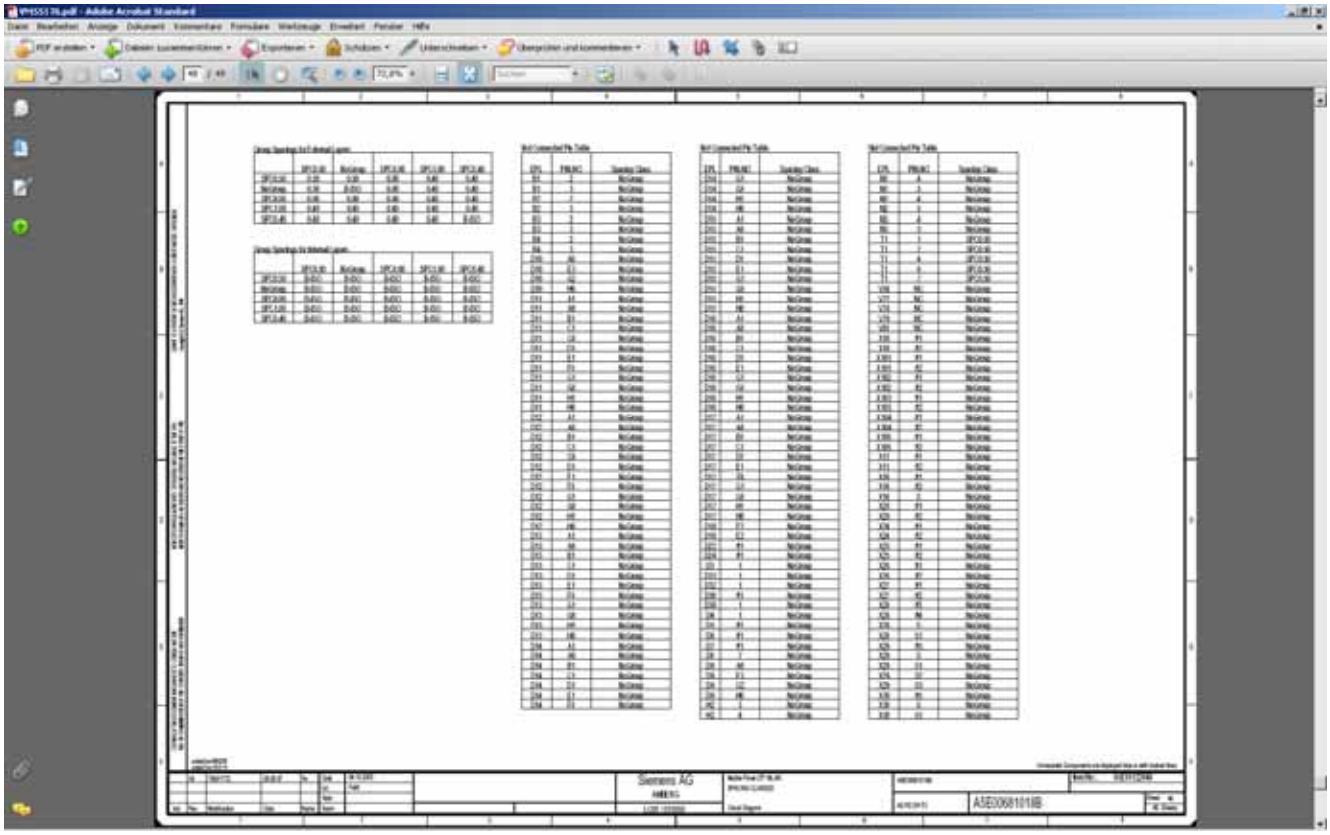

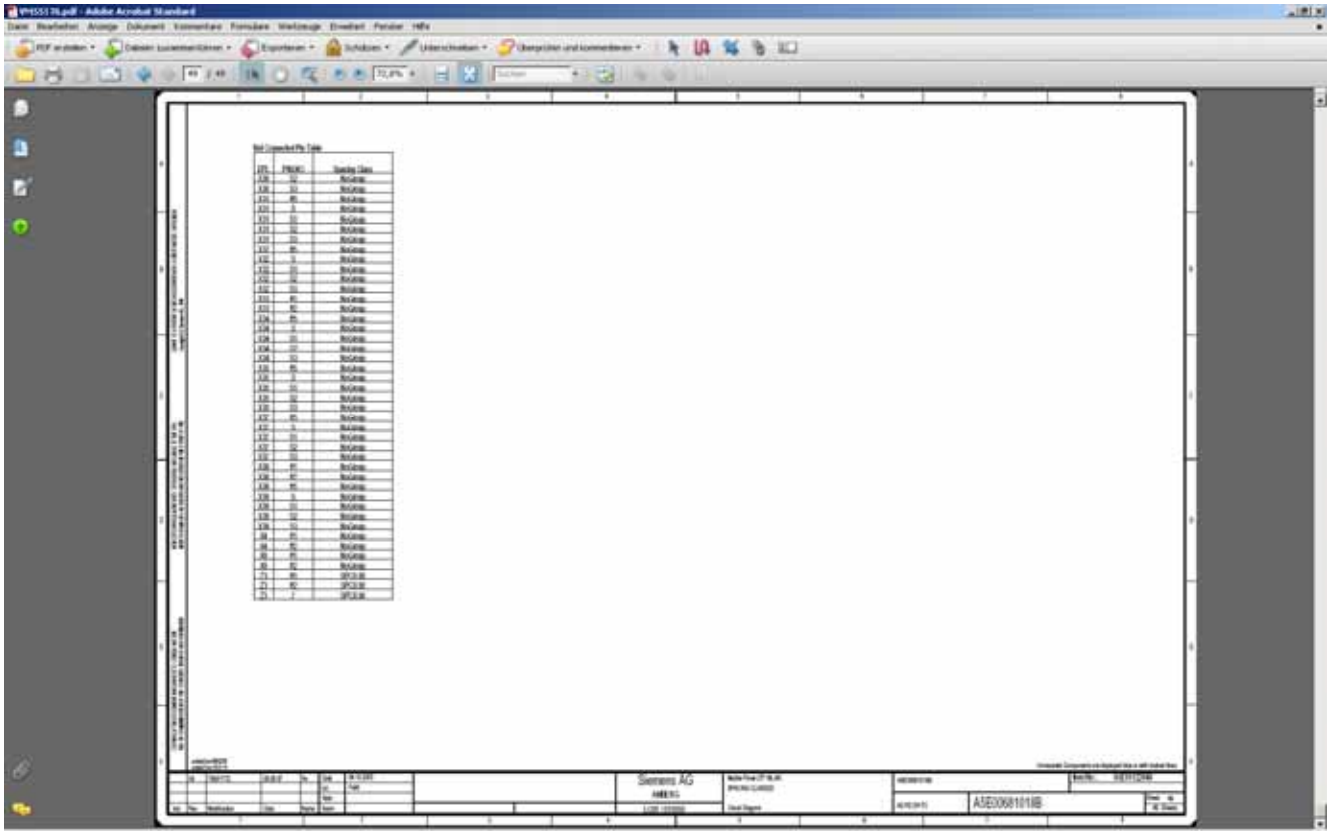

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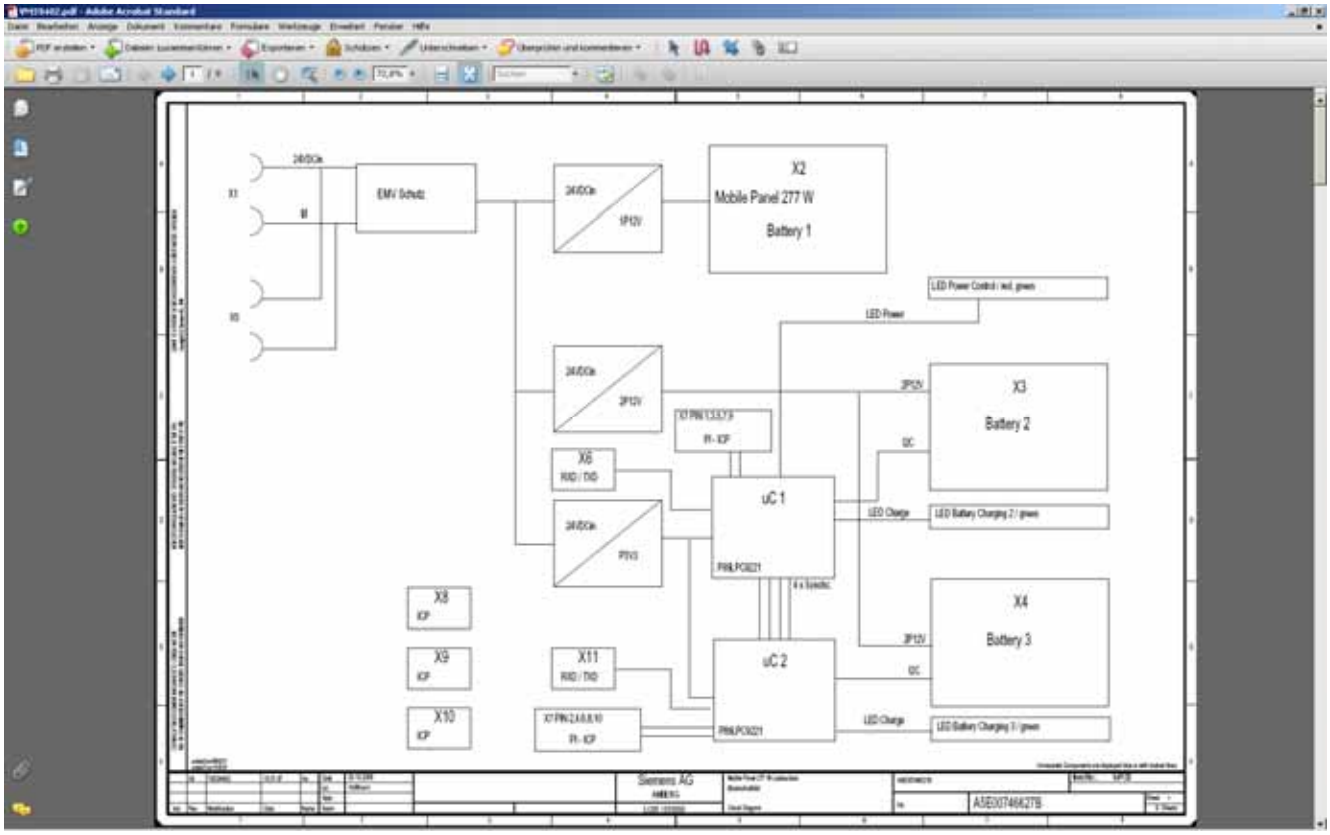

08-E003402-BM-C01 S ©'08, all rights reserved	EUT:	Date:	Page:
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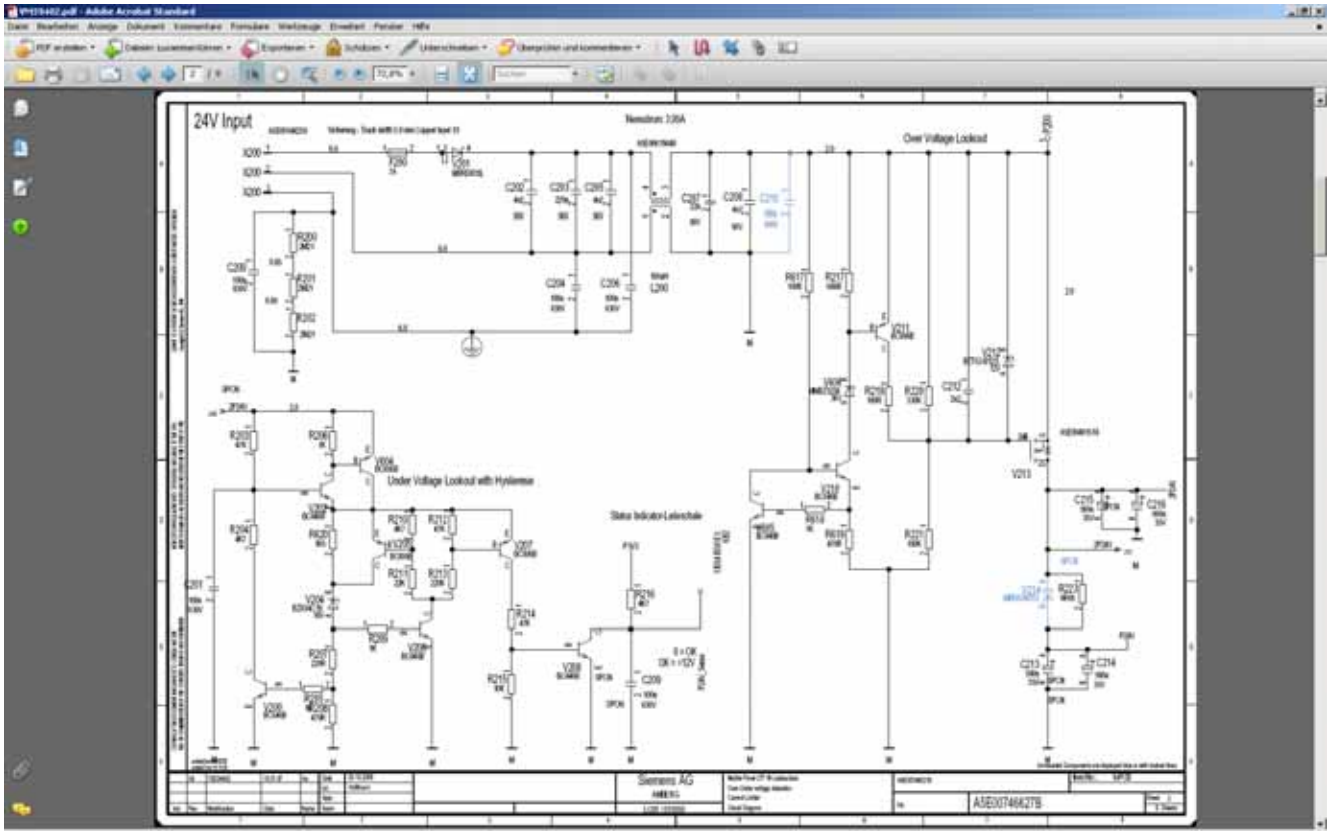
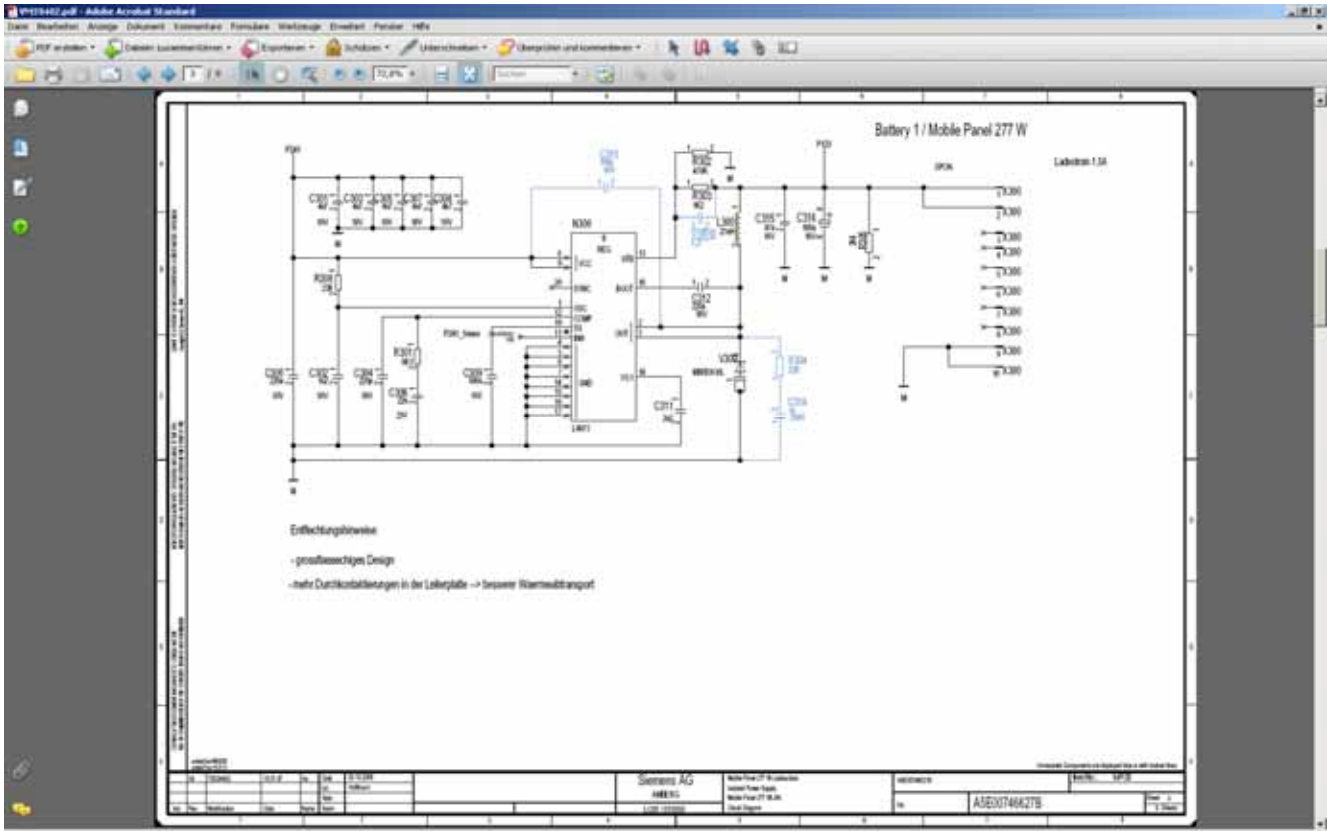

24V Input
Over Voltage Lockout
Under Voltage Lockout with Hysteresis
Status Indicator Latchchale
Siemens AG



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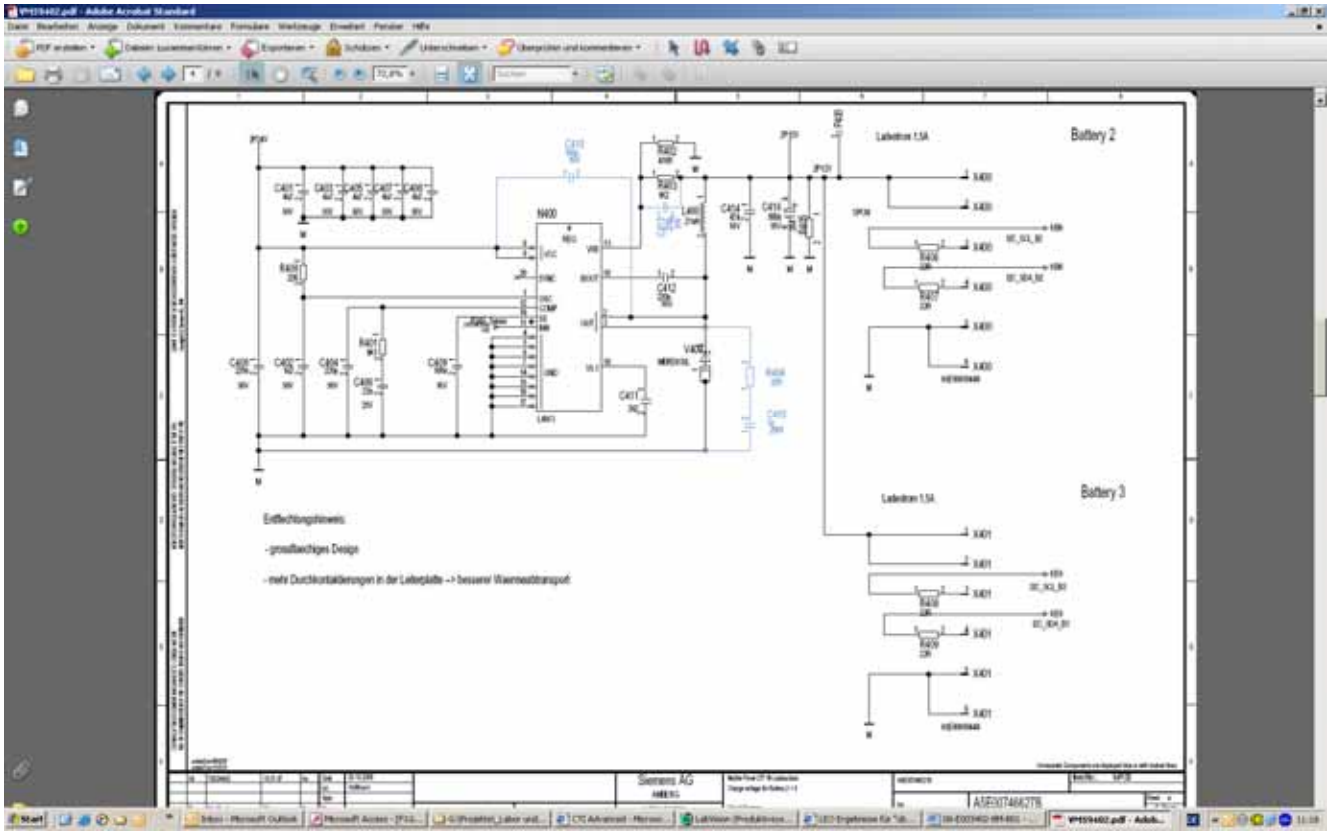

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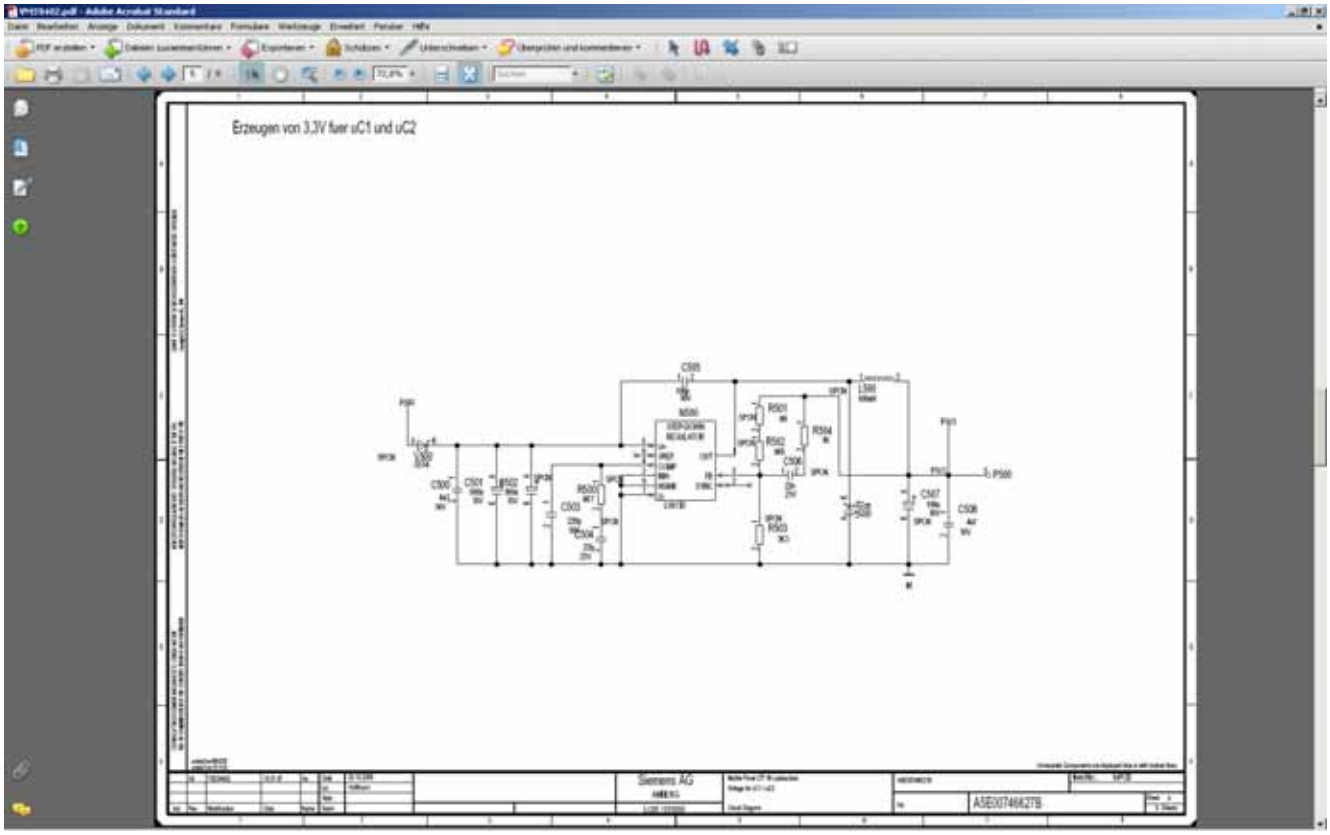
Erzeugen von 3,3V fuer uC1 und uC2
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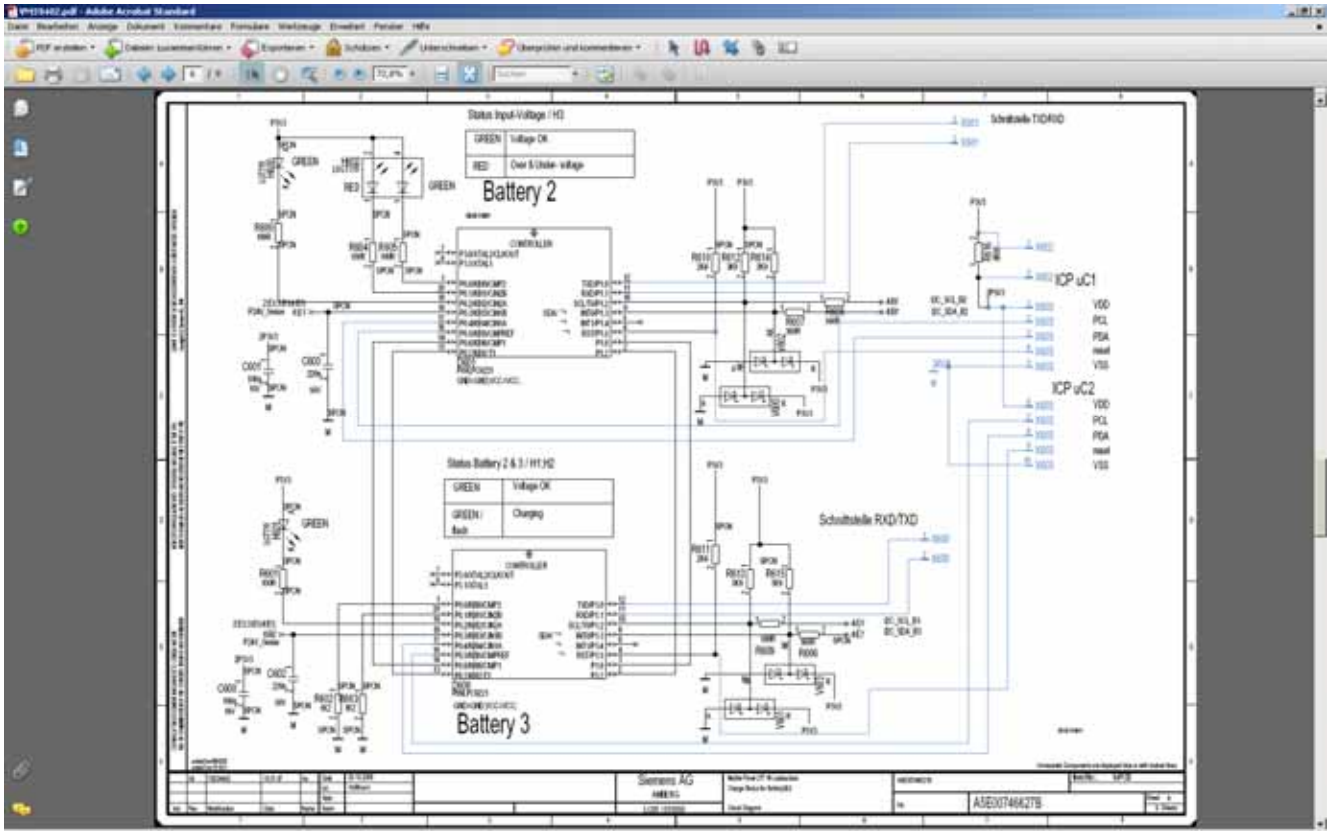
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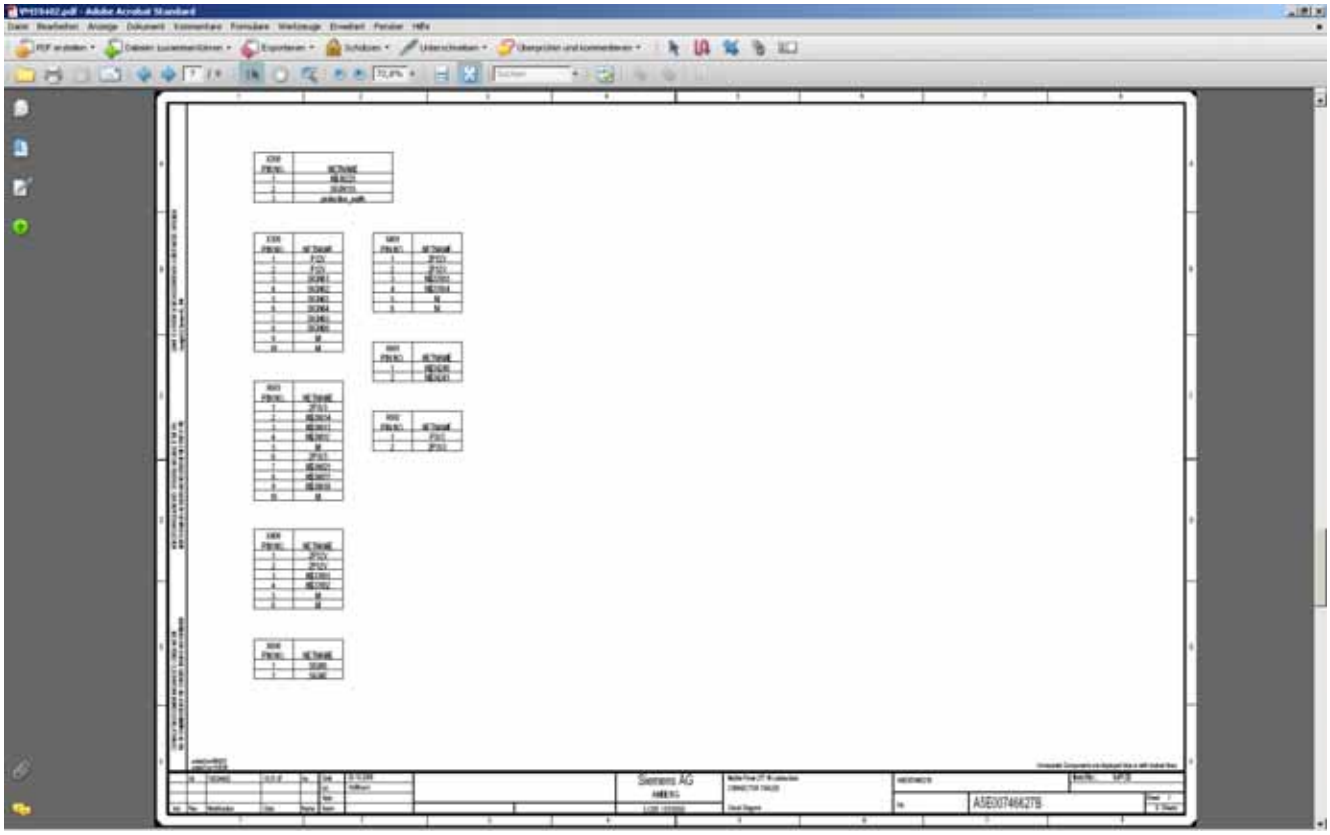
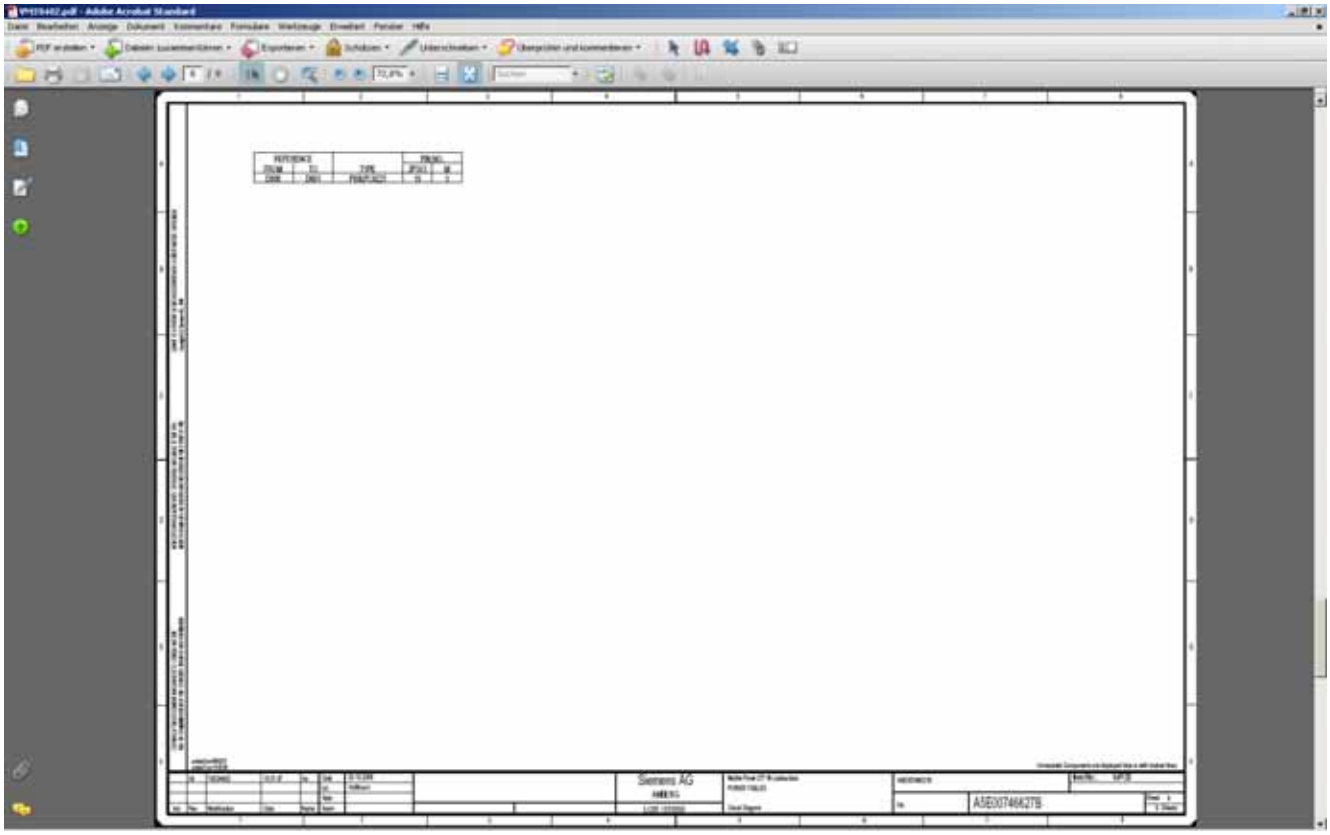
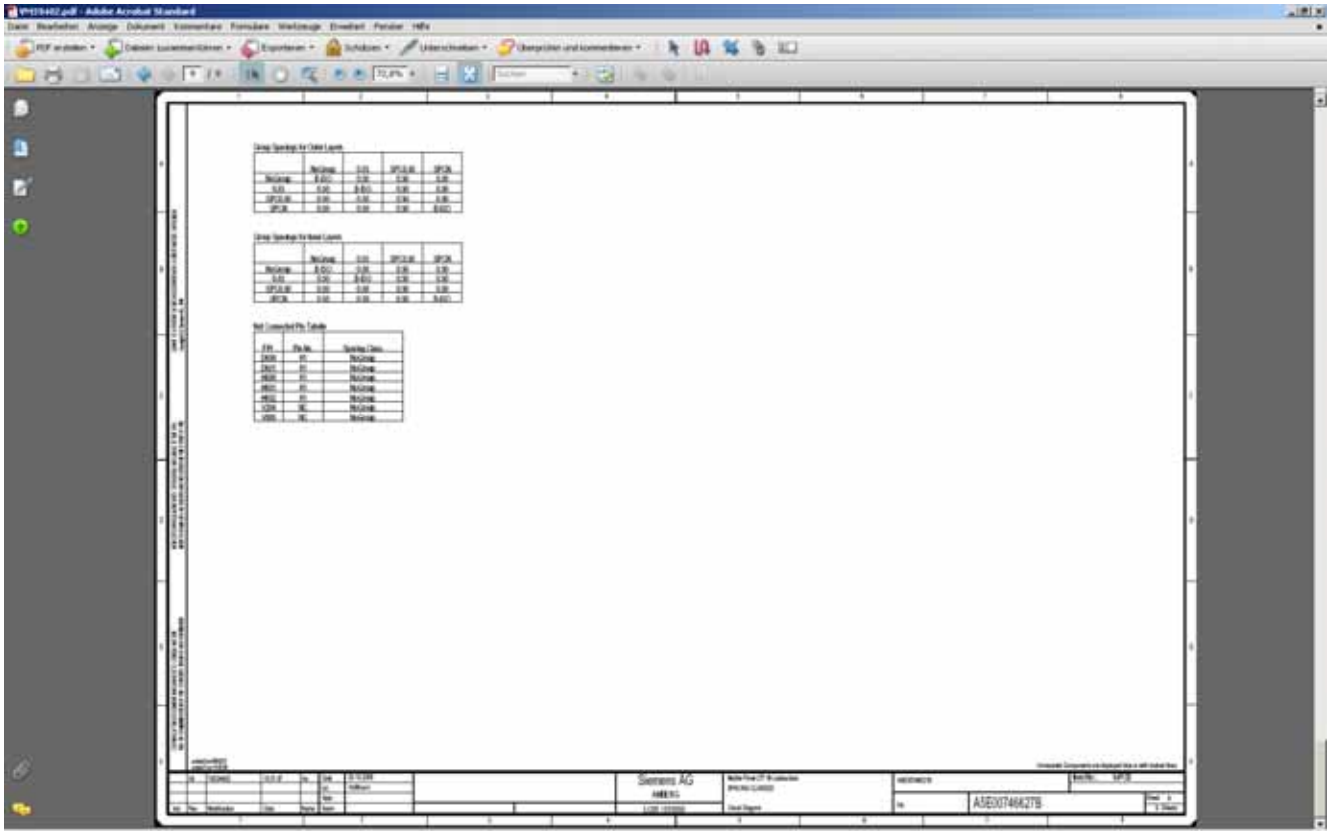
Battery 3
ICP uC1
ICP uC2
Schnittstelle RXD/TXD







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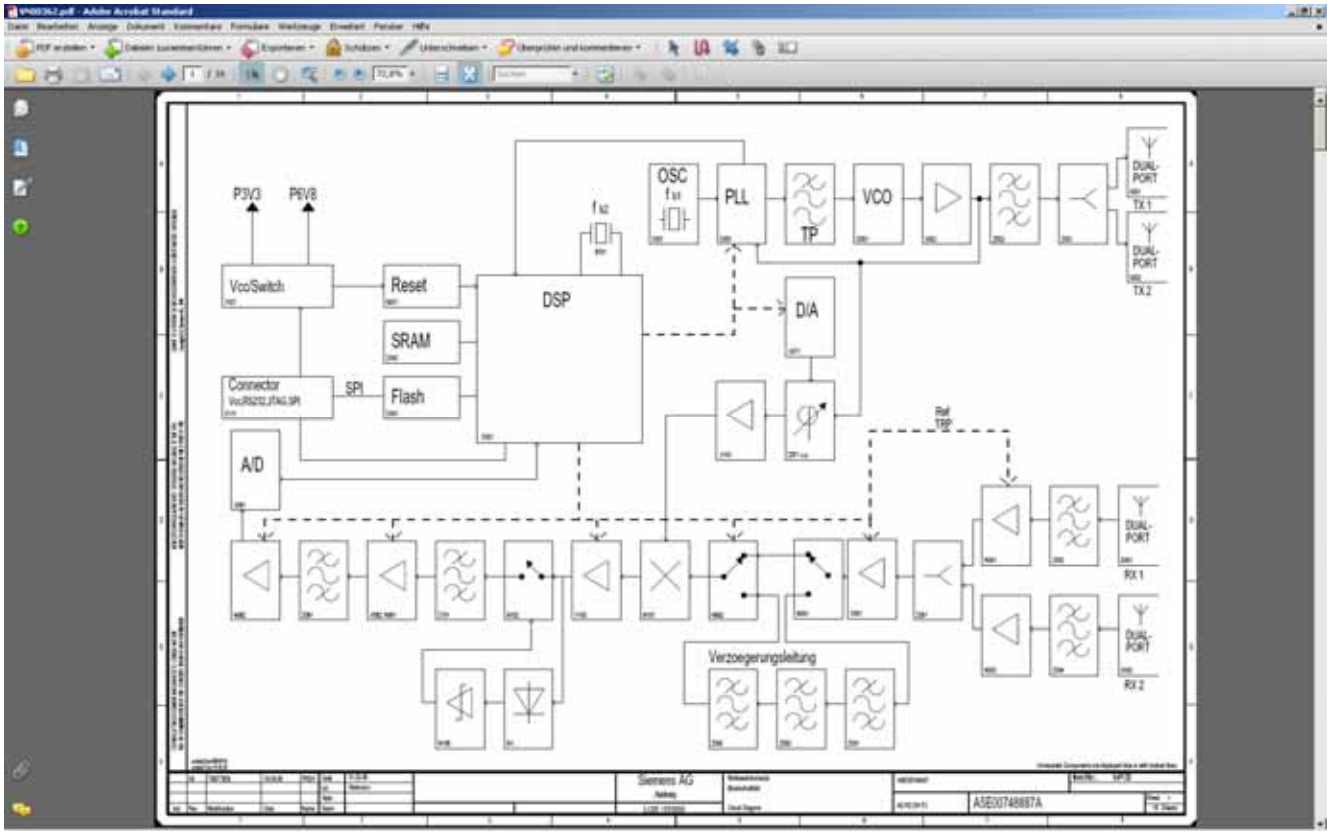

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S ©'08, all rights reserved	MLFB-no. of SIMATIC Mobile Panel 277): 6AV6 645-0DC01-0AX0 MLFB-no. of accumulator: 6AV6 671-5CL00-0XA0 MLFB-no. of transponder: 6AV6 671-5CM00-0AX0 MLFB-no. of AC/DC Adapter: 6AV6 671-5CN00-0AX1	2008/10/21	101 of 130

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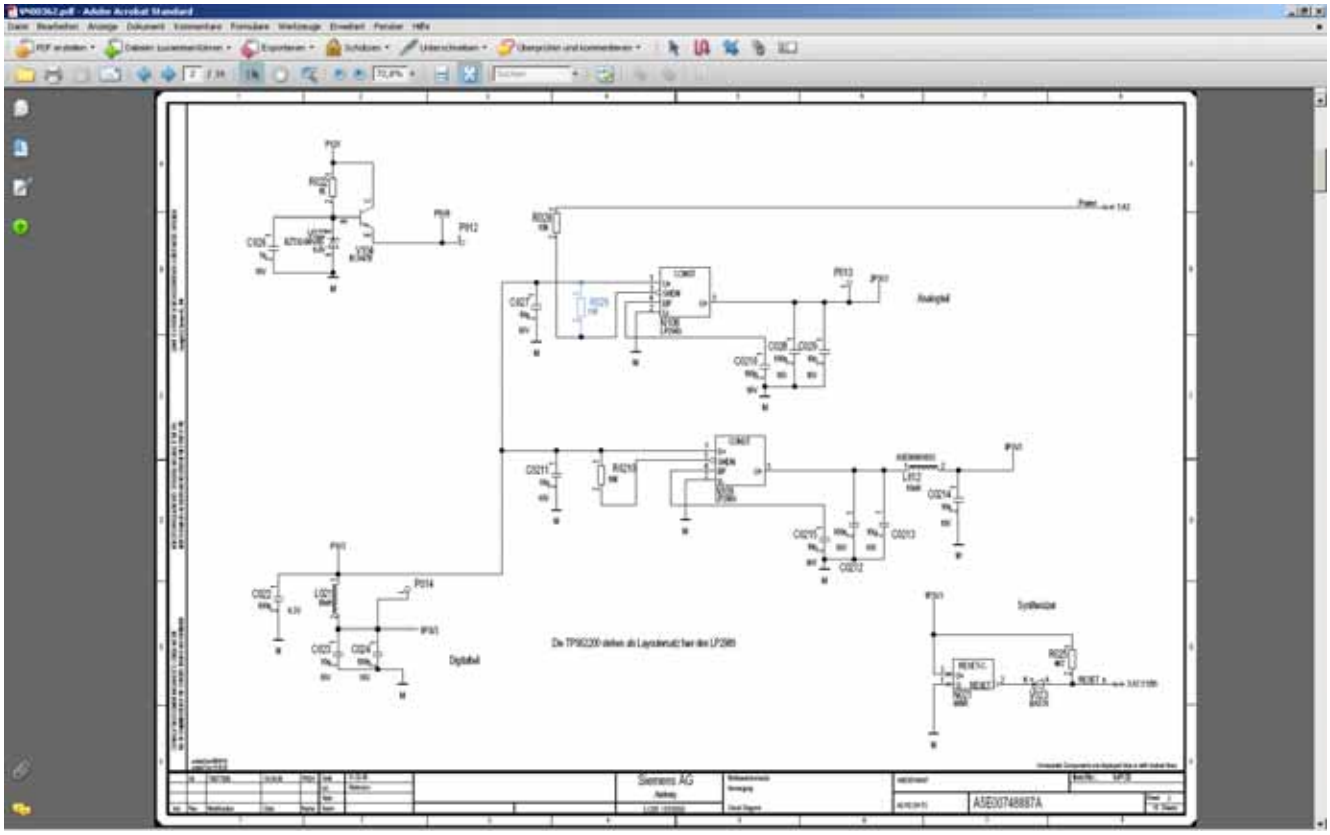

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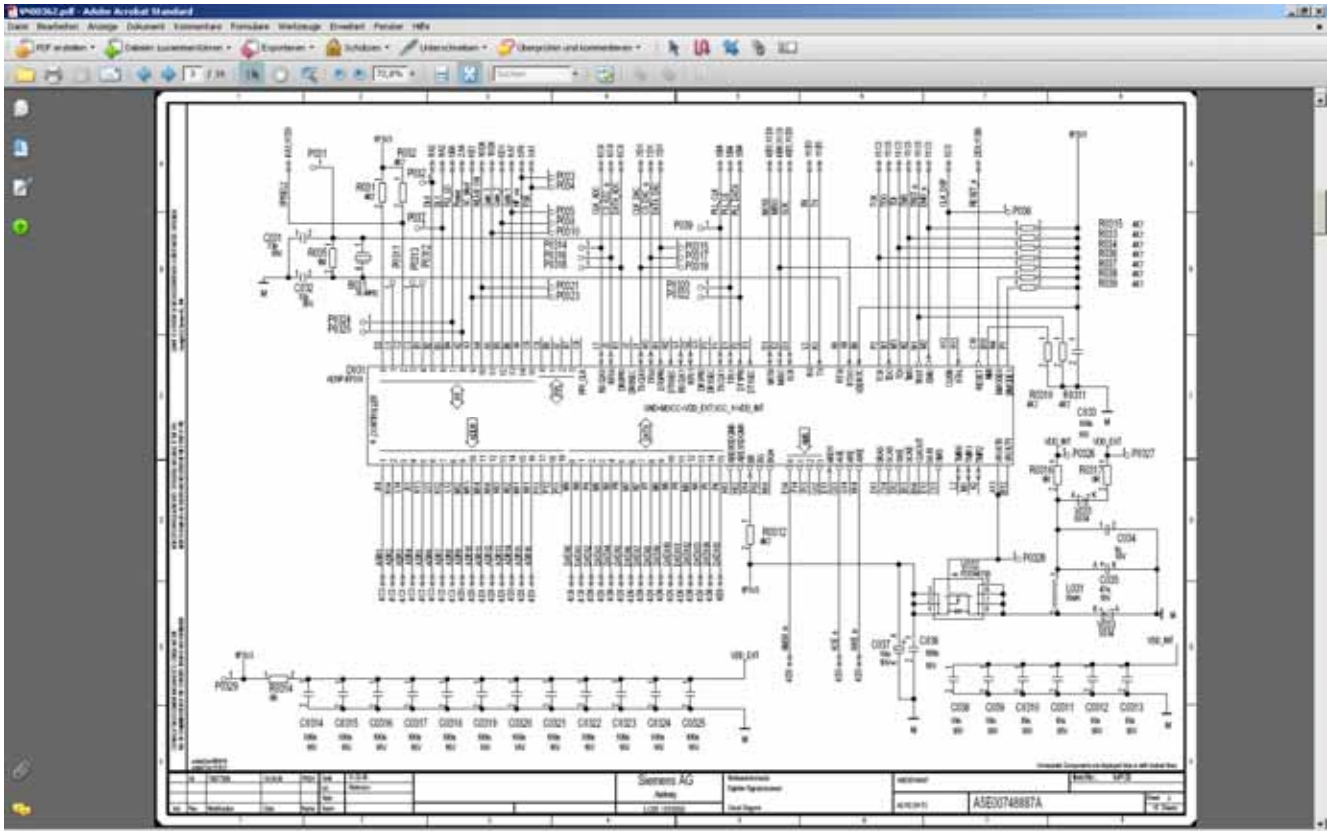

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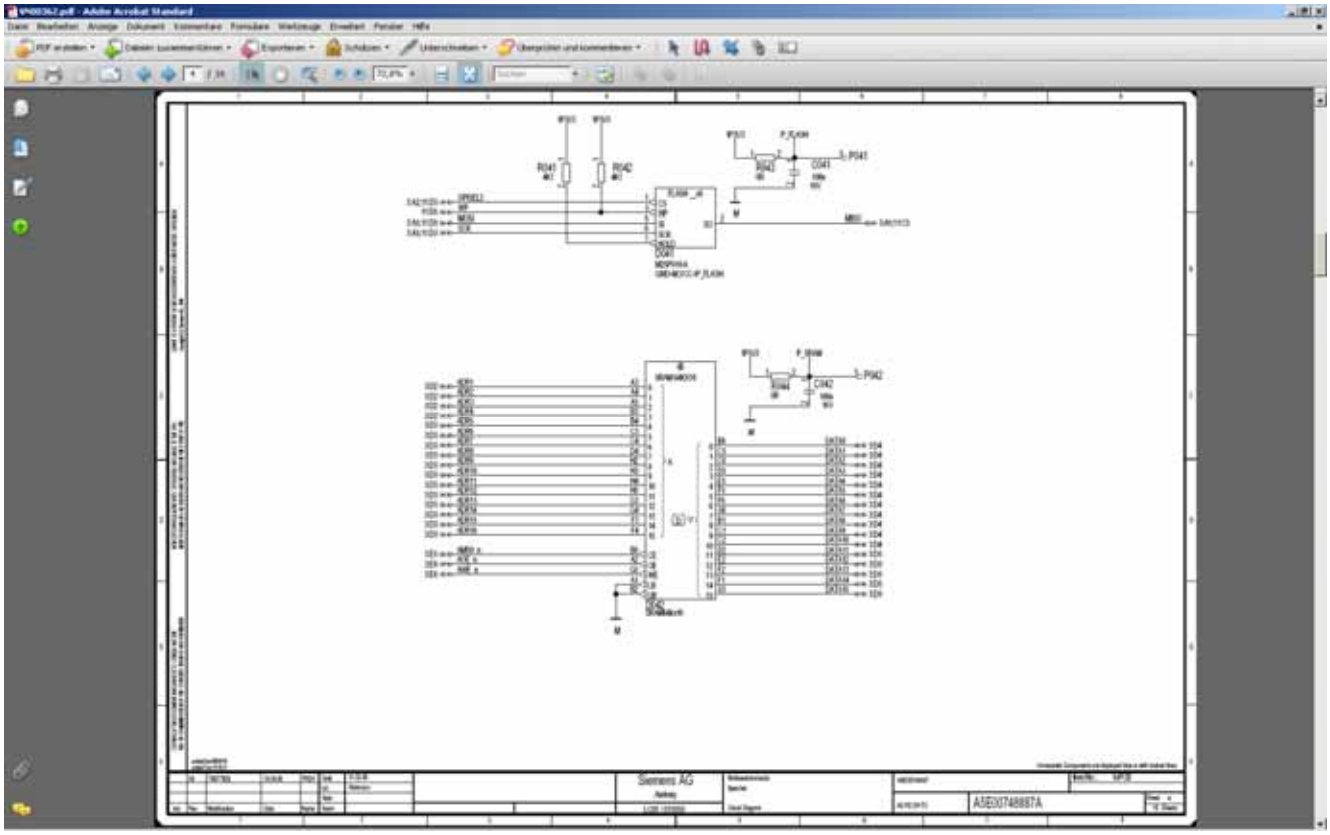

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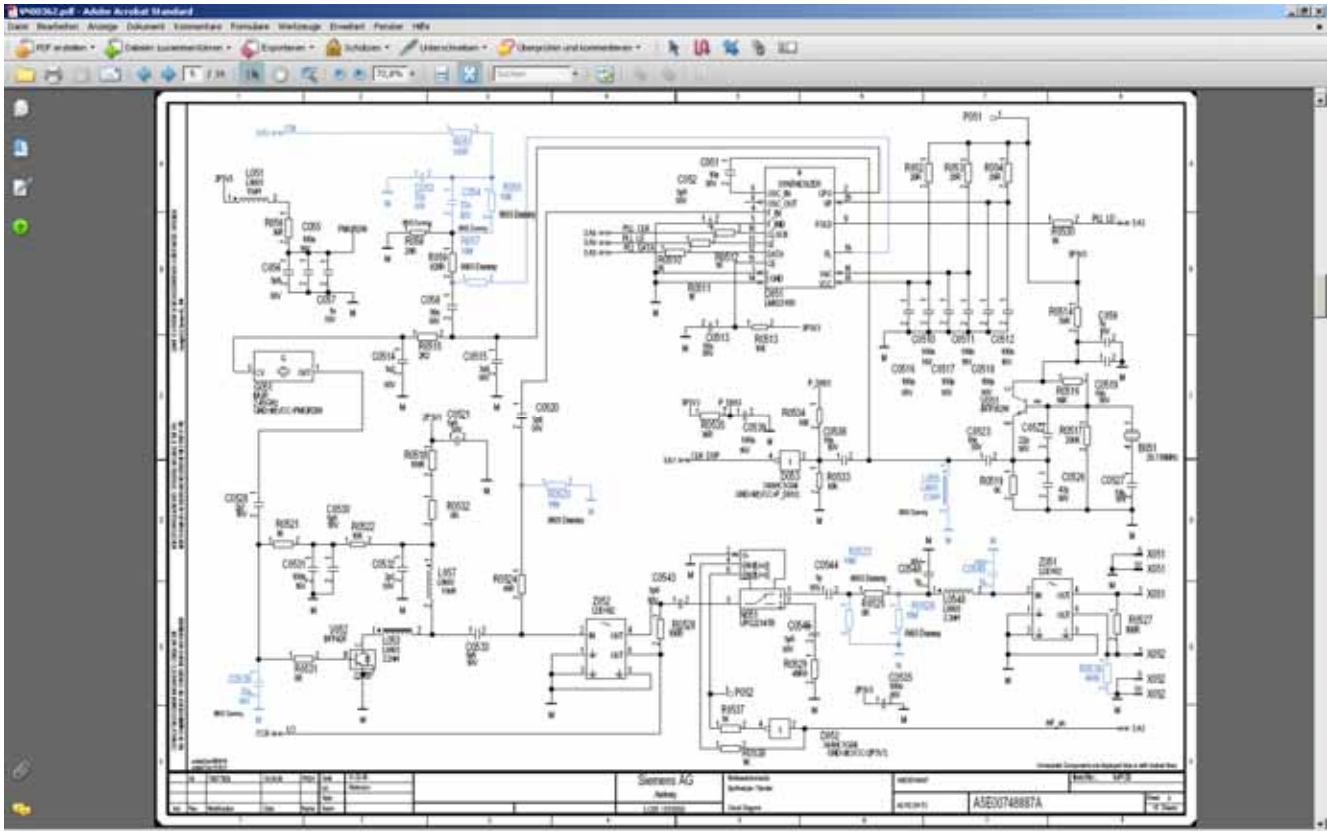
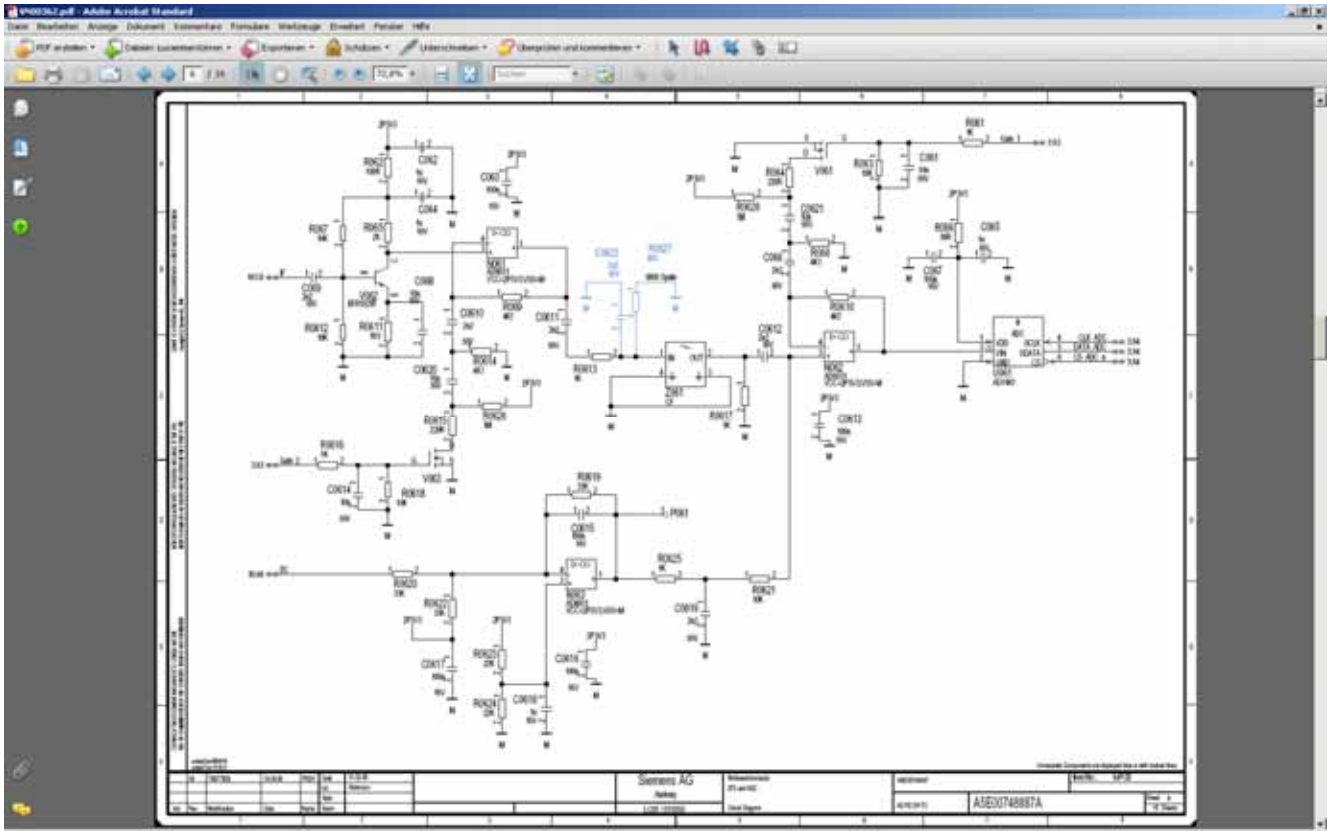
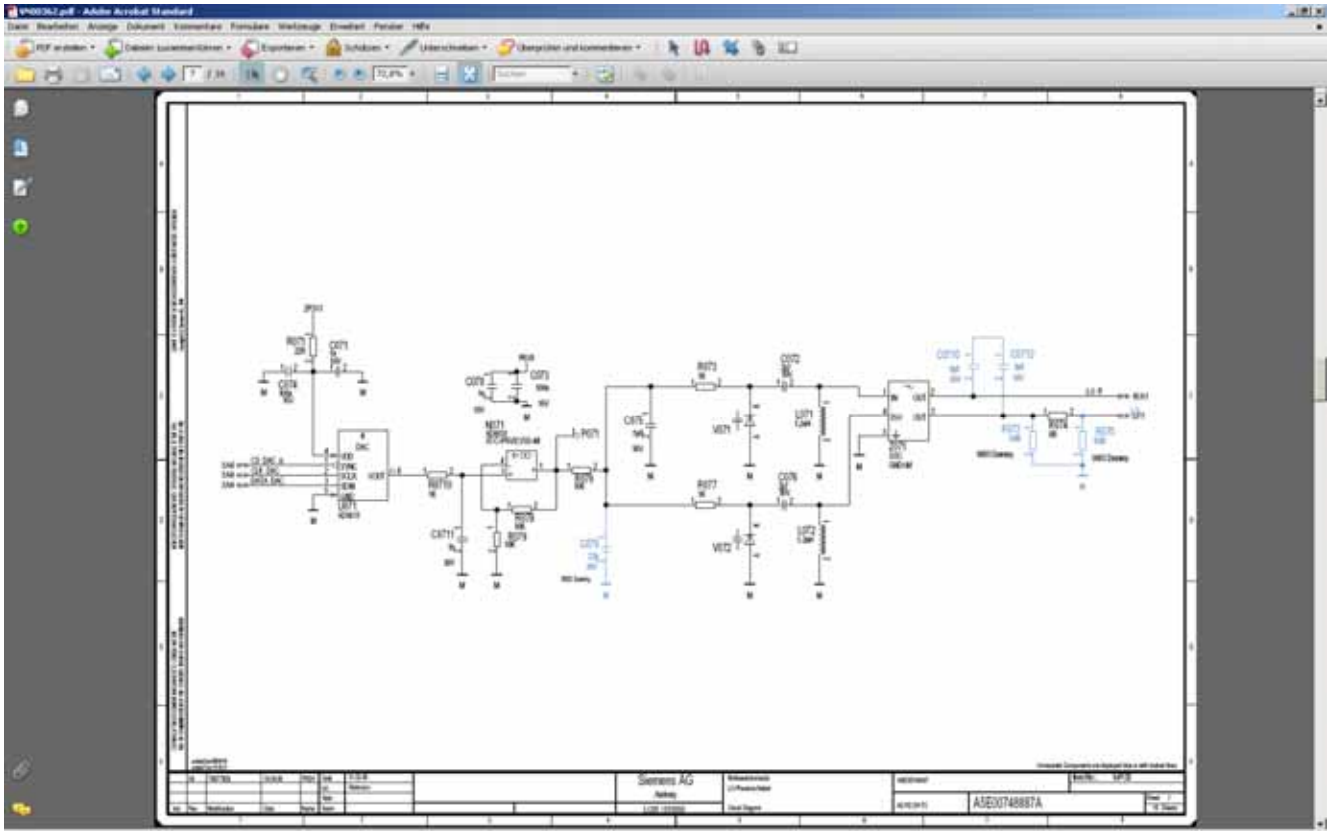
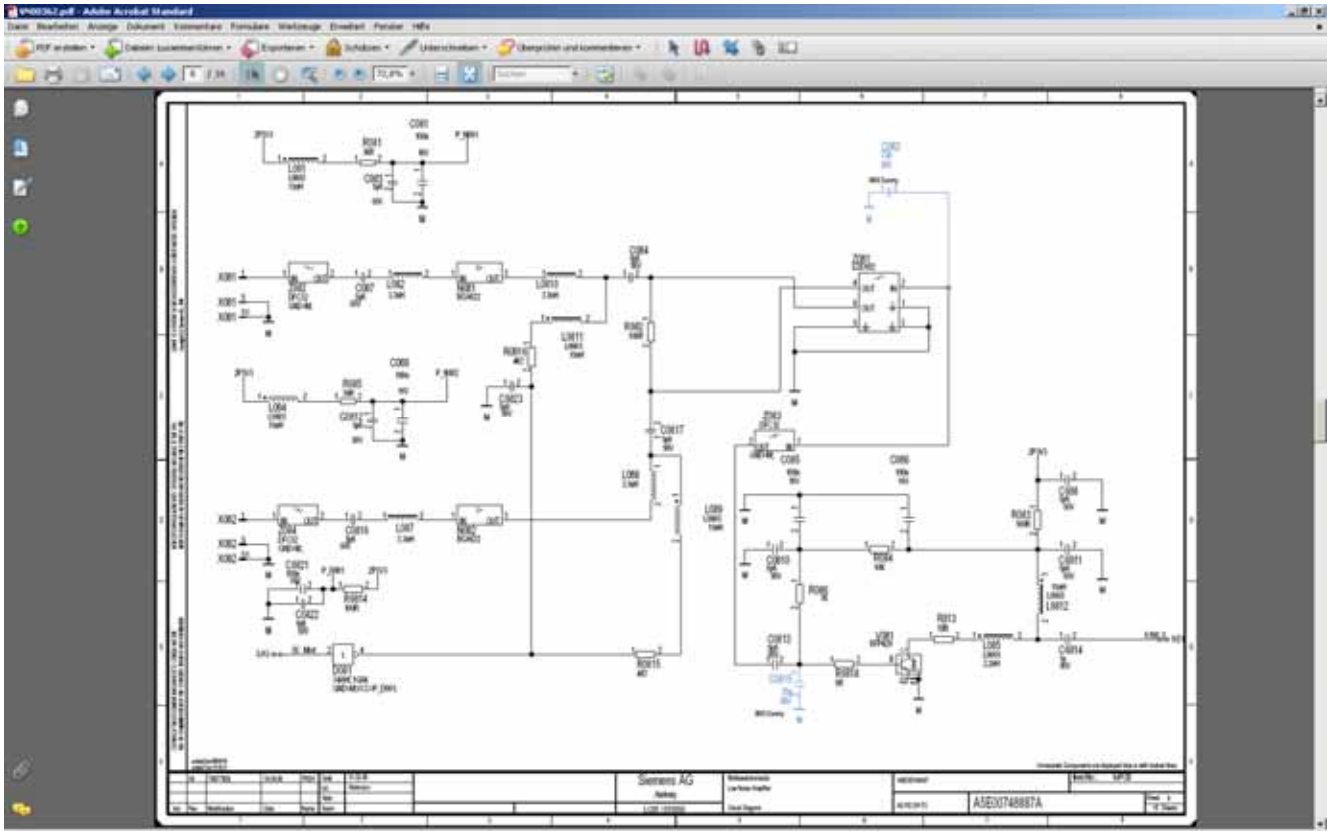
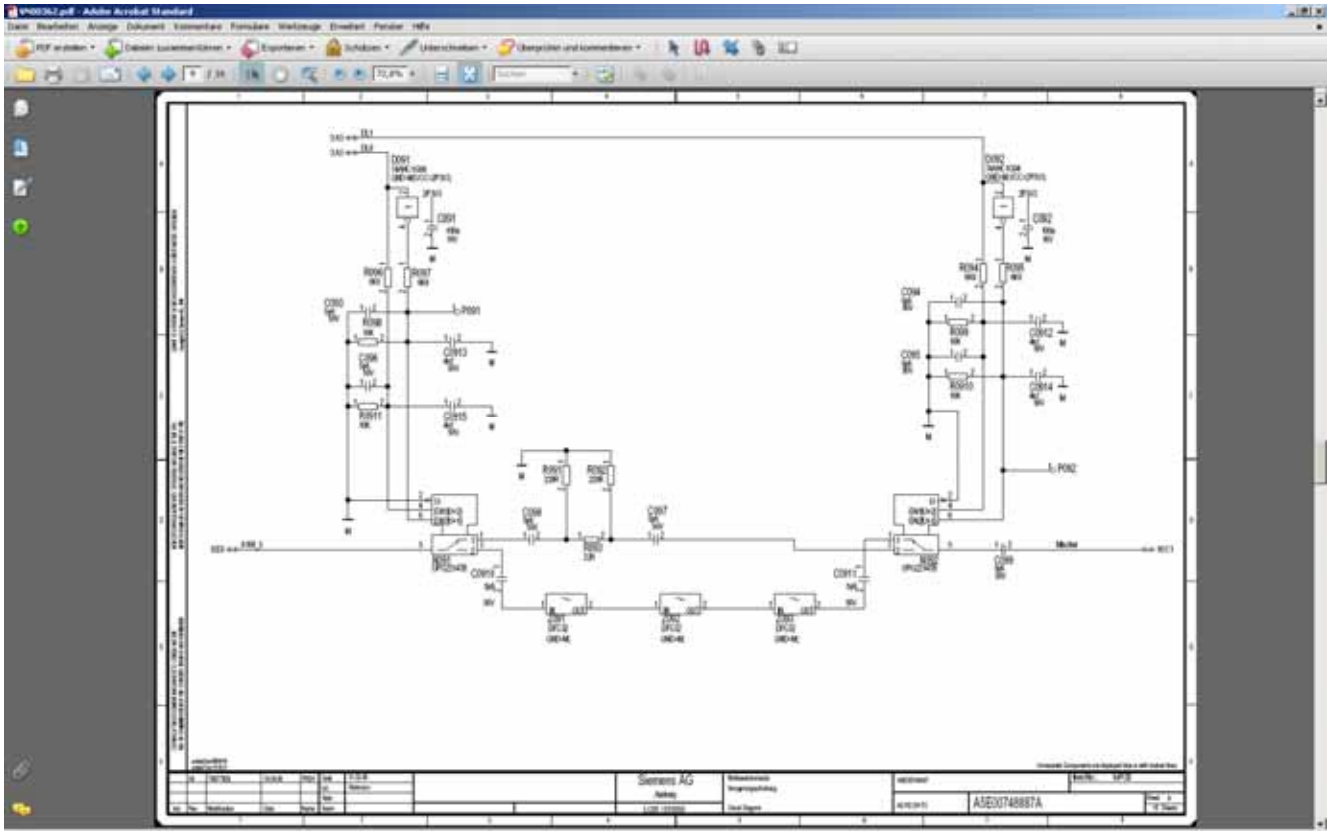




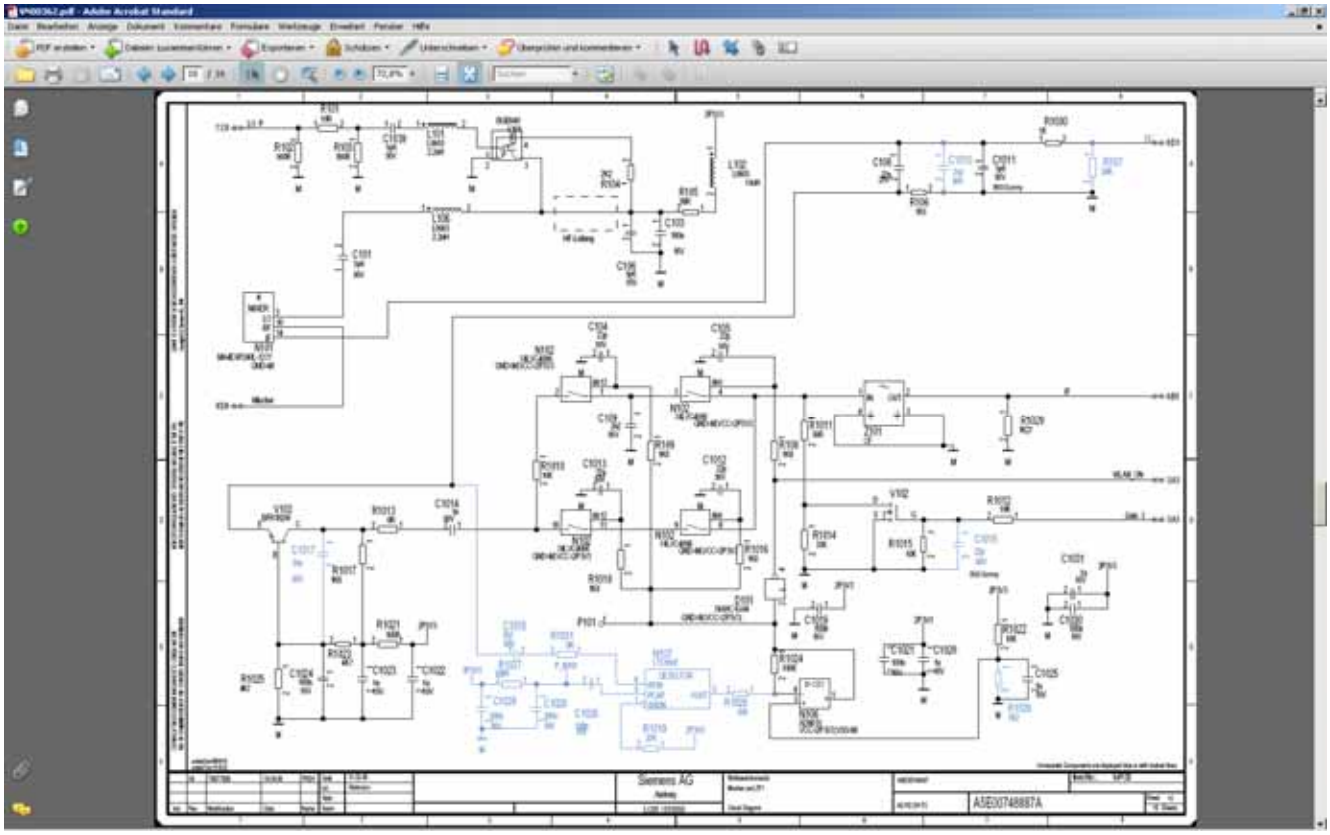




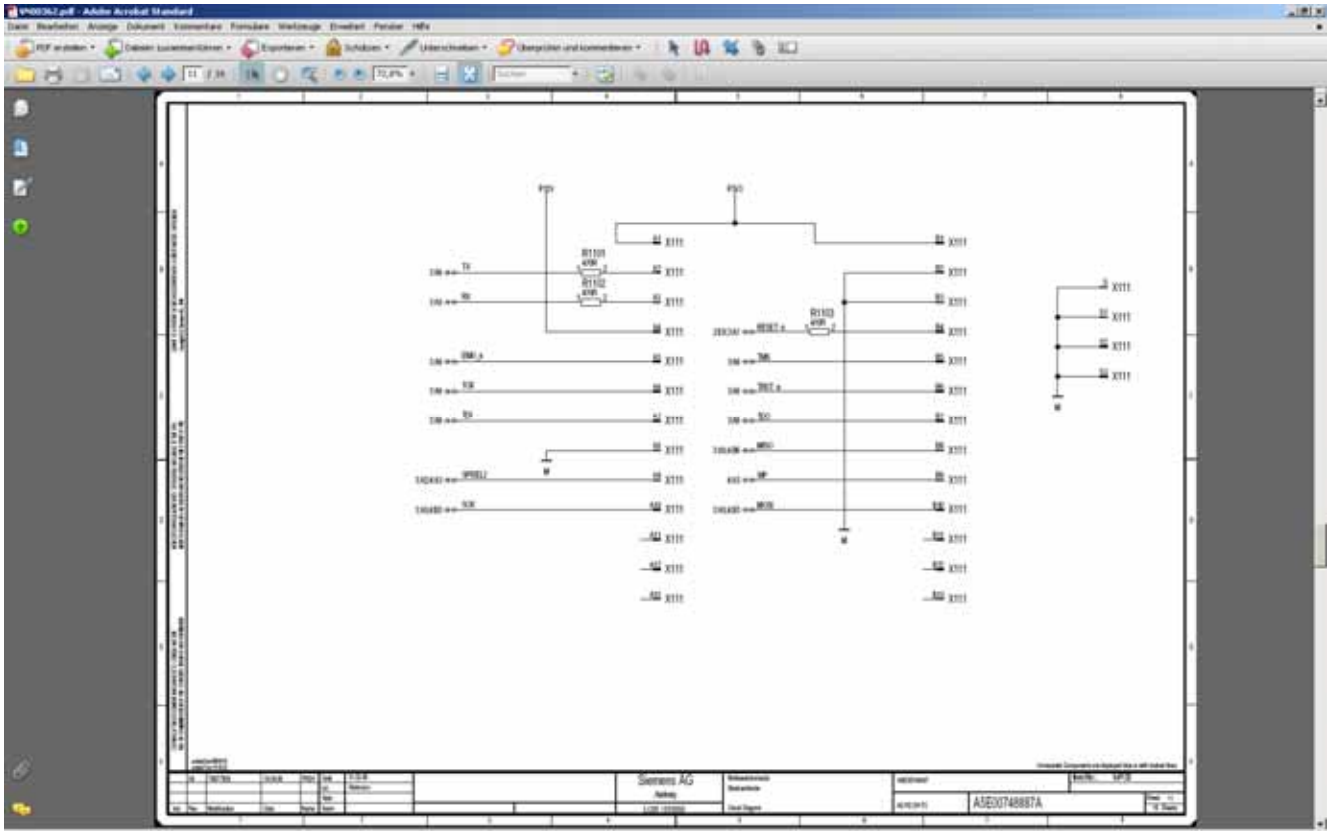
08-E003402-BM-C01 S 	EUT:	Date:	Page:
	MLFB-no. of SIMATIC Mobile Panel 277): 6AV6 645-0DC01-0AX0 MLFB-no. of accumulator: 6AV6 671-5CL00-0XA0 MLFB-no. of transponder: 6AV6 671-5CM00-0AX0 MLFB-no. of AC/DC Adapter: 6AV6 671-5CN00-0AX1	2008/10/21	108 of 130



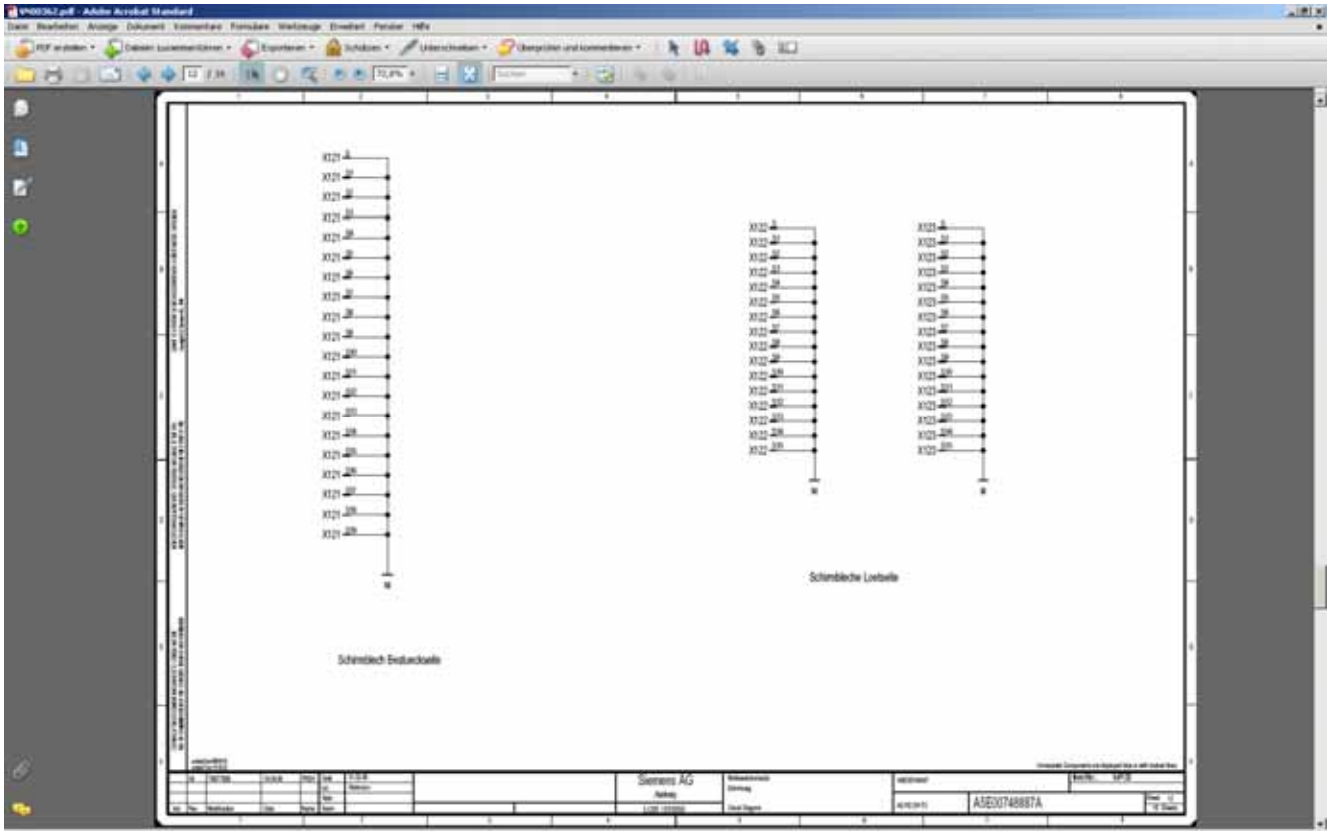
08-E003402-BM-C01 S 	EUT:	Date:	Page:
	MLFB-no. of SIMATIC Mobile Panel 277): 6AV6 645-0DC01-0AX0 MLFB-no. of accumulator: 6AV6 671-5CL00-0XA0 MLFB-no. of transponder: 6AV6 671-5CM00-0AX0 MLFB-no. of AC/DC Adapter: 6AV6 671-5CN00-0AX1	2008/10/21	109 of 130



08-E003402-BM-C01 S 	EUT:	Date:	Page:
	MLFB-no. of SIMATIC Mobile Panel 277): 6AV6 645-0DC01-0AX0 MLFB-no. of accumulator: 6AV6 671-5CL00-0XA0 MLFB-no. of transponder: 6AV6 671-5CM00-0AX0 MLFB-no. of AC/DC Adapter: 6AV6 671-5CN00-0AX1	2008/10/21	110 of 130



08-E003402-BM-C01 S 	EUT:	Date:	Page:
	MLFB-no. of SIMATIC Mobile Panel 277): 6AV6 645-0DC01-0AX0 MLFB-no. of accumulator: 6AV6 671-5CL00-0XA0 MLFB-no. of transponder: 6AV6 671-5CM00-0AX0 MLFB-no. of AC/DC Adapter: 6AV6 671-5CN00-0AX1	2008/10/21	111 of 130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Schirmblech Endstecksatz
Siemens AG
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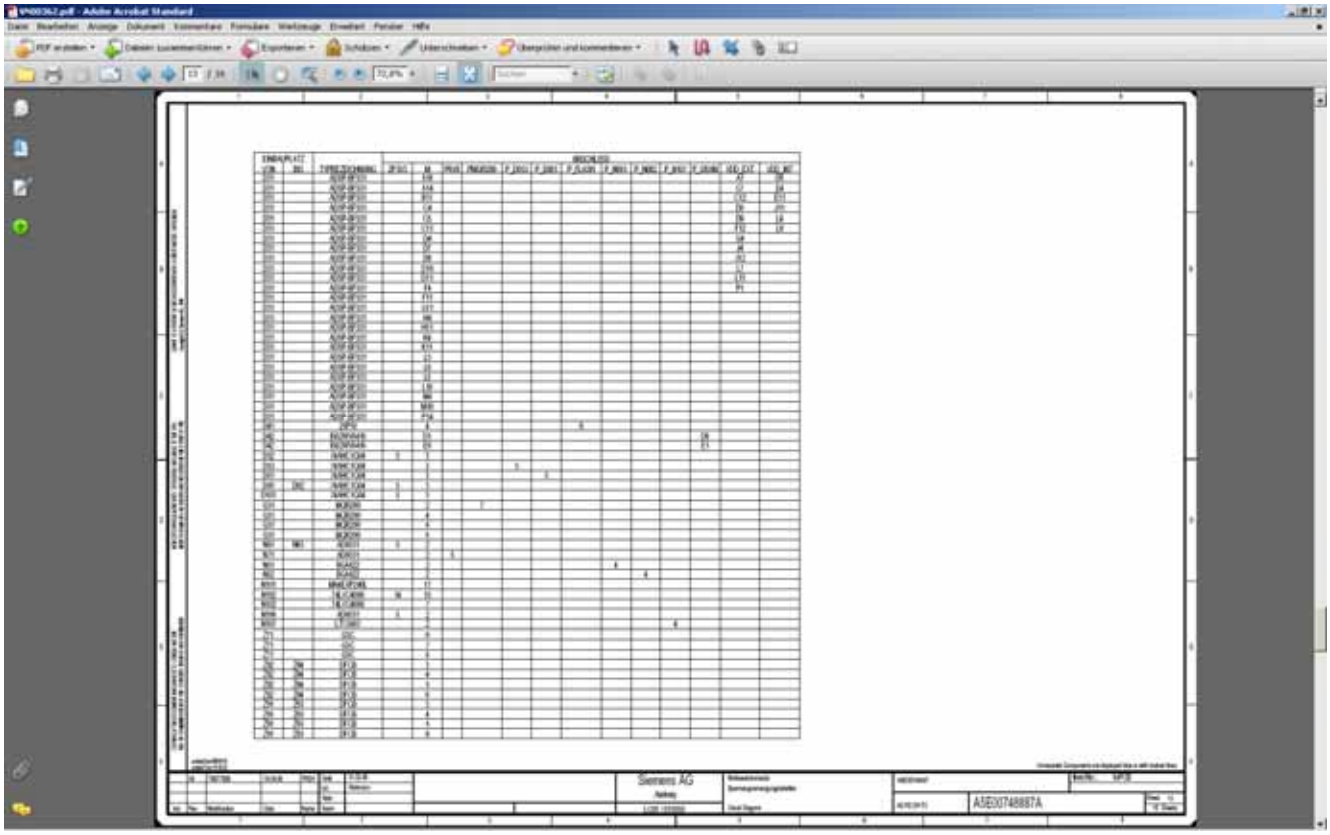


- **Photos of EUT:**

Photo 17: EUT front

Photo 18: EUT back

Photo 19: EUT side

Photo 20: EUT side

Photo 21: EUT side

Photo 22: Main Accumulator

Photo 23: Main Accumulator

Photo 24: Backup Accumulator

Photo 25: Backup Accumulator

- **Photos of PCBs:**

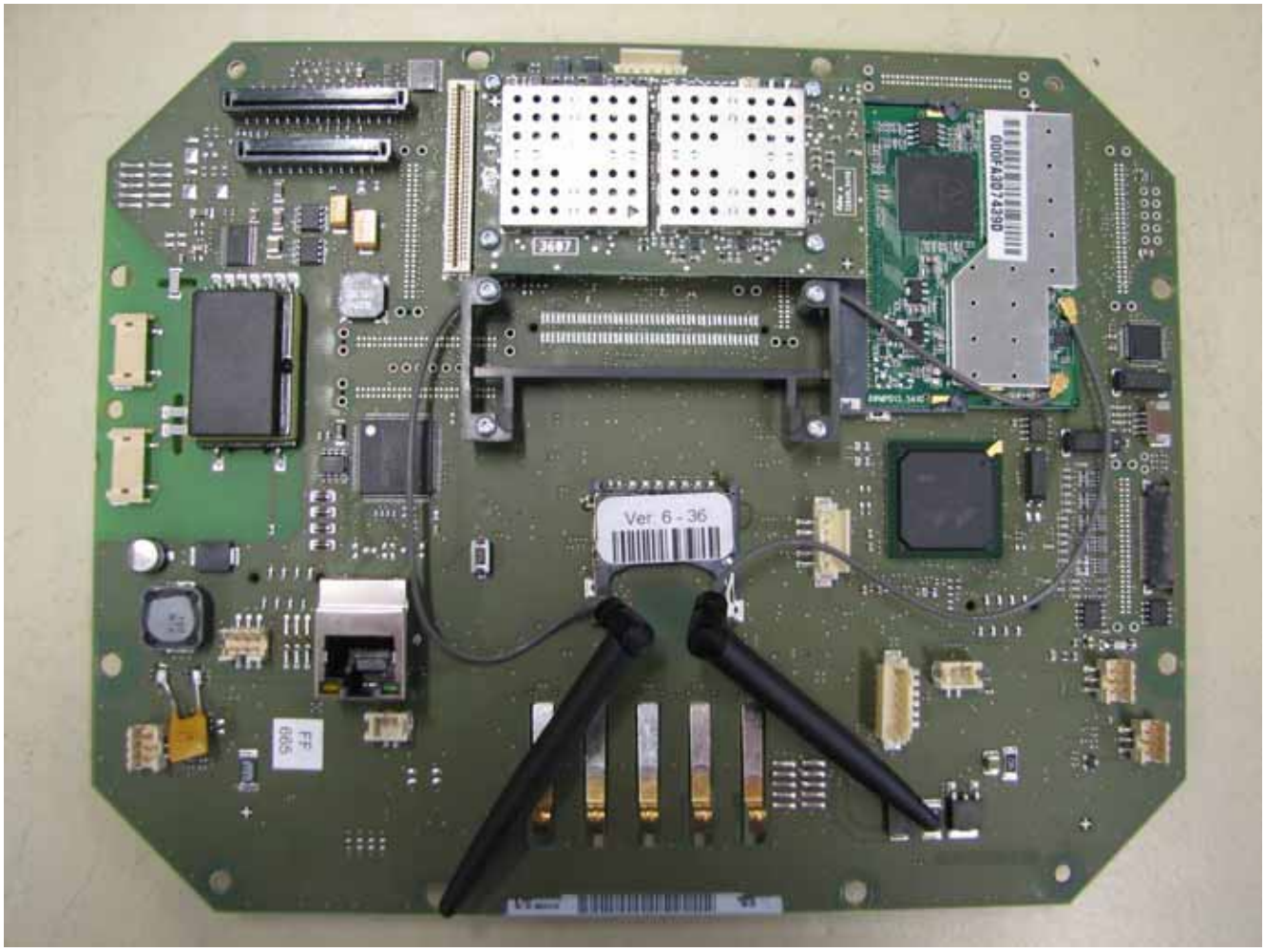


Photo 26: EUT PCB

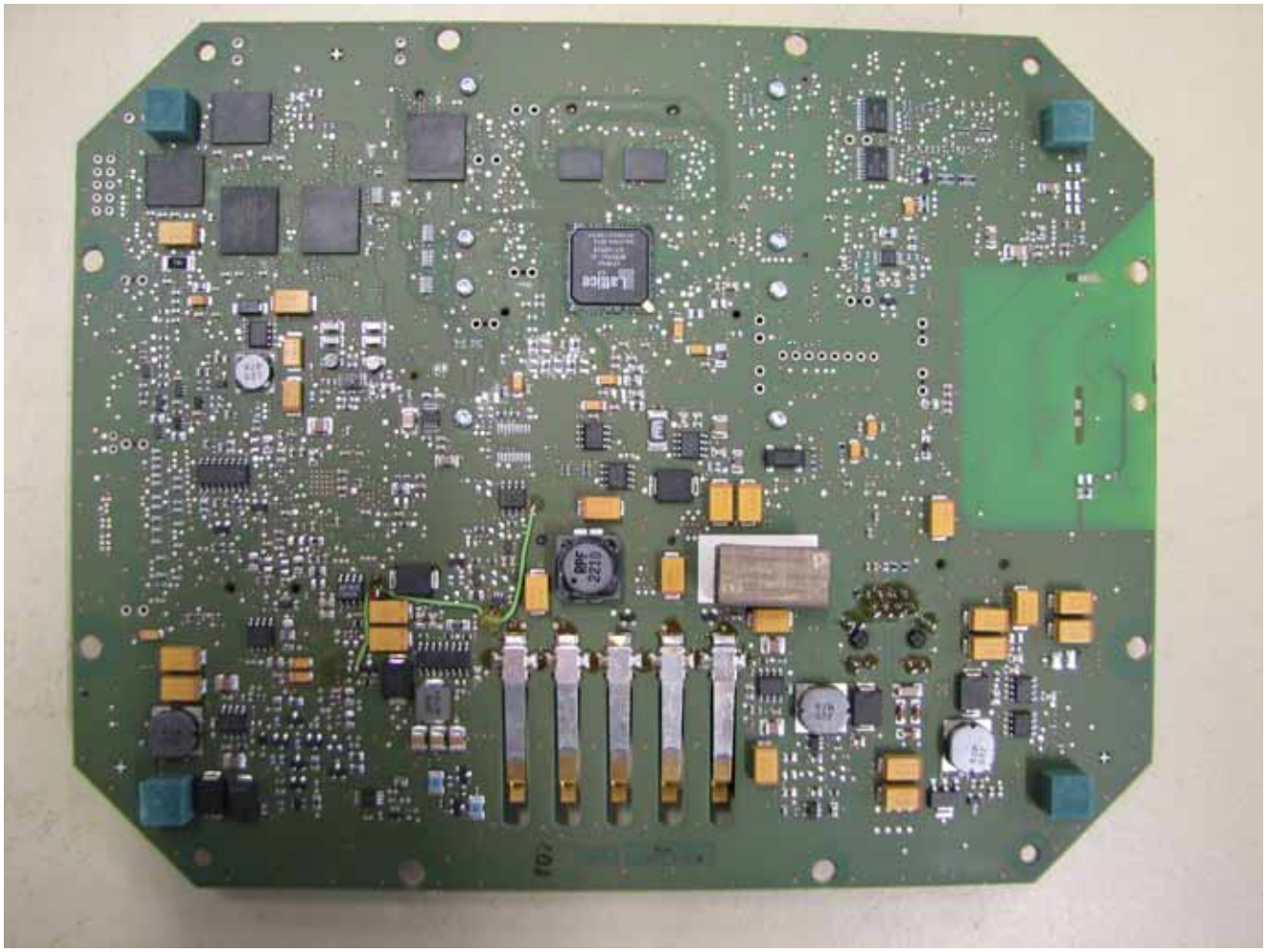


Photo 27: EUT PCB

Photo 28: WLan PCB

Photo 29: WLan PCB

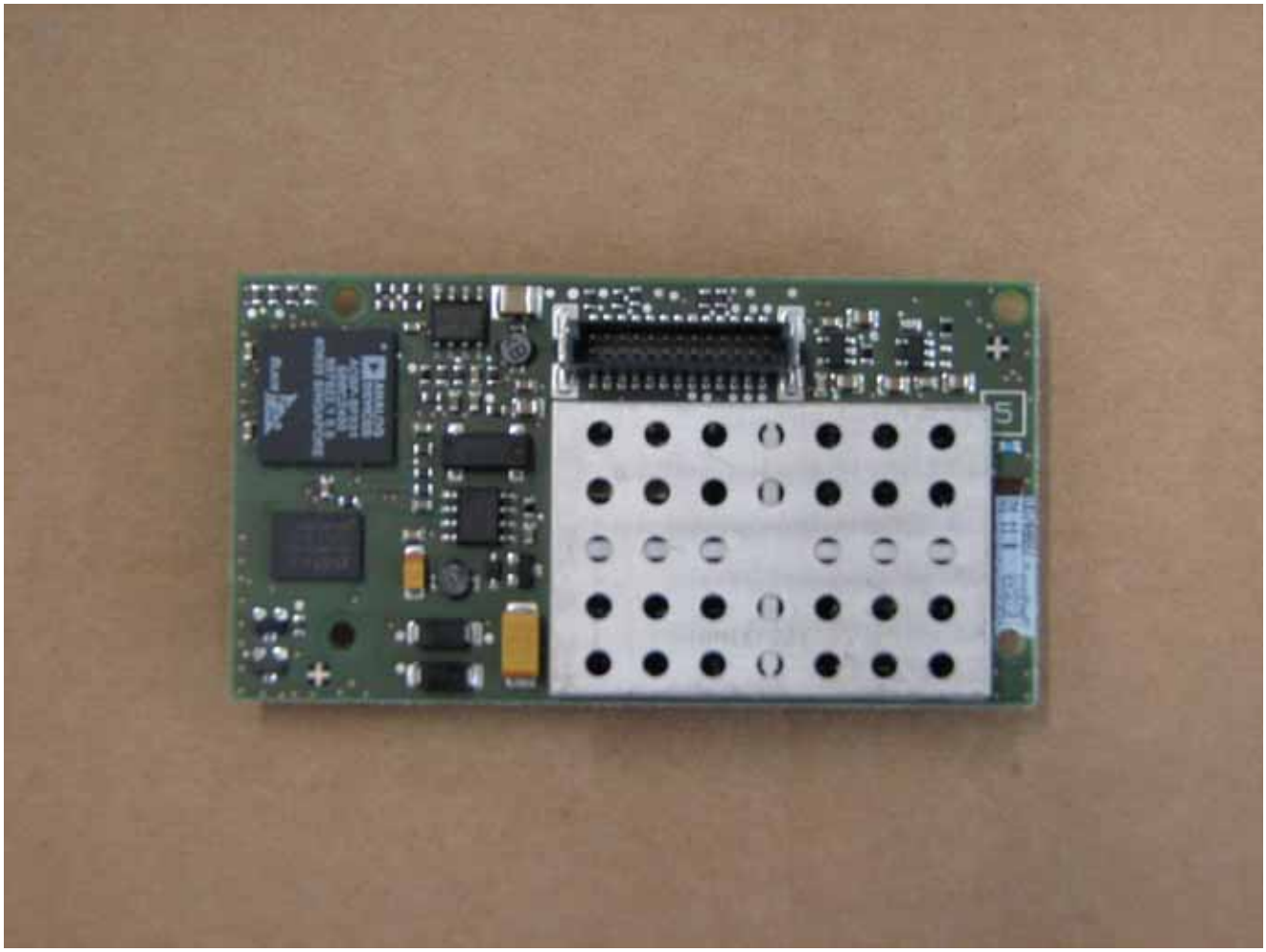


Photo 30: Effective range module PCB

Photo 31: Effective range module PCB

- **List of used frequencies inside EUT:**

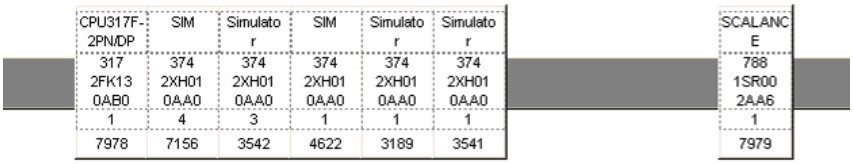
Main PCB:

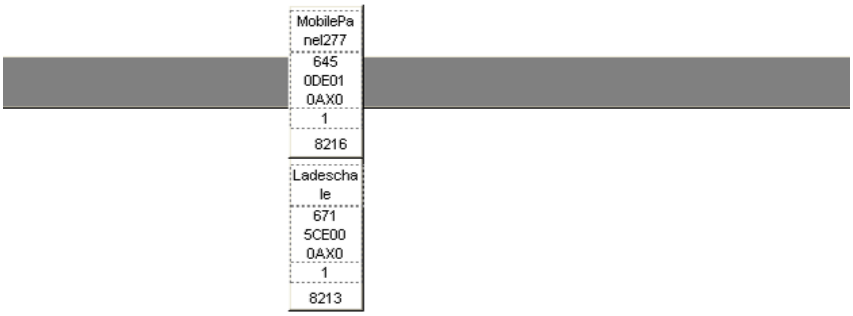
CPU:	13MHz
FPGA:	33MHz
RTC:	32.768MHz
Ethernet controller:	25MHz
Touch controller:	24.576MHz

Effective range module:

µ-Controler:	38.4kHz
Transmitter:	2.45GHz
DSP:	20.736MHz

- **Setup of EUT / periphery during tests:**





- **Used cables of EUT during tests:**

Power supply of the EUT: 2x1.5mm² laboratory cable for 24V DC power supply

- **Additional periphery:**

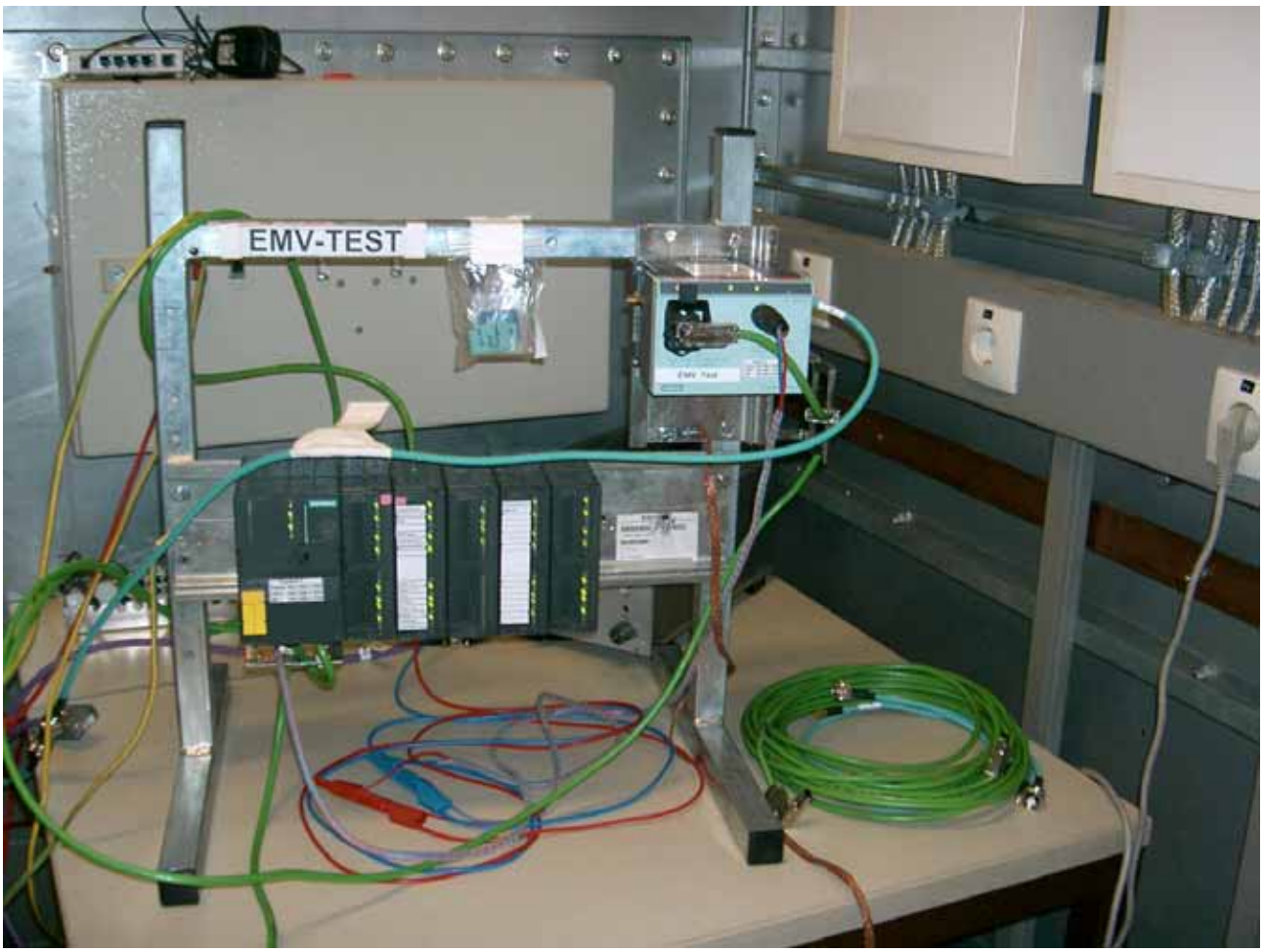


Photo 32: Periphery

- **Text for users manual:**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.