



**Zuverlässigkeitsanalyse
nach
MIL-HDBK-217 F notice 2
mit 3 Einsatzphasen**

**ABC Computer
System Model ABC/XT
- 8086-based**

Überarbeitet am 15.08.2001

**Project definitions:**

The following definitions have been determined in accordance with MIL-HDBK-217 F, notice 2:

Conditions: normal operating conditions for environment and temperature

Component stress: in accordance with the circuit diagram

Result:

These are the results from the defect rate prediction for the project ABC Computer System Model ABC/XT - 8086-based Microcomputer.:

Failure rate = 19,6306 fpmh

MTBF = 50940,84 h

Mission Phases:

The following mission phases have been determined in accordance with MIL-HDBK-217 F, notice 2:

Phase	Duration	Temperature	Environment
1	25%	313K	GM (ground mobile)
2	50%	298K	GM (ground mobile)
3	25%	298K	GB (ground benign)

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Part Number	Cat Key	Pi Factors, Keyword Format	Failure Rate	N	N x Failure Rate
T110-91920A	MIL-CR	I_BASE=2.12326e-037, pi_E=-7.28151e-012, pi_Q=2.36426e-038, pi_T=-1.70687e+035, pi_CV=-1.56407e-029, pi_S=-1.81899e-012, pi_SR=5.73972e-041	0,43	4	1,72
CQ-10NF	MIL-CR	I_BASE=2.12326e-037, pi_E=-7.28151e-012, pi_Q=2.36426e-038, pi_T=-1.70687e+035, pi_CV=-1.56407e-029, pi_S=-1.81899e-012, pi_SR=5.73972e-041	0,03	5	0,13
90968G	MIL-CR	I_BASE=2.12326e-037, pi_E=-7.28151e-012, pi_Q=2.36426e-038, pi_T=-1.70687e+035, pi_CV=-1.56407e-029, pi_S=-1.81899e-012, pi_SR=5.73972e-041	0,06	1	0,06
FP2-16264XM	MIL-RS	I_BASE=2.12326e-037, pi_E=-7.28151e-012, pi_Q=2.36426e-038, pi_T=-1.70687e+035, pi_P=-1.56407e-029, pi_S=-1.81899e-012	0,02	6	0,11
ZS122	MIL-LD	I_BASE=2.12326e-037, pi_E=-7.28151e-012, pi_Q=2.36426e-038, pi_T=-1.70687e+035, pi_S=-1.56407e-029, pi_C=-1.81899e-012	0,02	4	0,06
90968G	MIL-CR	I_BASE=2.12326e-037, pi_E=-7.28151e-012, pi_Q=2.36426e-038, pi_T=-1.70687e+035, pi_CV=-1.56407e-029, pi_S=-1.81899e-012, pi_SR=5.73972e-041	0,07	1	0,07
TRANS. MODEL A7-3	MIL-TF	I_BASE=2.12326e-037, pi_E=-7.28151e-012, pi_Q=2.36426e-038, pi_T=-1.70687e+035	0,02	1	0,02
0805 COG	MIL-CR	I_BASE=2.12326e-037, pi_E=-7.28151e-012, pi_Q=2.36426e-038, pi_T=-1.70687e+035, pi_CV=-1.56407e-029, pi_S=-1.81899e-012, pi_SR=5.73972e-041	0,01	3	0,04



Pat Number	Ref. ID	Category Keyword	Pi Factors, Keyword Format	FR [fpmh]	Quantity (N)	N x Failure Rate
AB194 8ST	SW1	MIL-SW	I_BASE=2.12326e-037, pi_E=-7.28151e-012, pi_Q=2.36426e-038, pi_CT=-1.70687e+035, pi_LS=-1.56407e-029	4,13037	1	4,13037
AB194 8ST	SW1	MIL-SW	I_BASE=2.12326e-037, pi_E=-7.28151e-012, pi_Q=2.36426e-038, pi_CT=-1.70687e+035, pi_LS=-1.56407e-029	4,13037	1	4,13037
T110-91920A	C13-16	MIL-CR	I_BASE=2.12326e-037, pi_E=-7.28151e-012, pi_Q=2.36426e-038, pi_T=-1.70687e+035, pi_CV=-1.56407e-029, pi_S=-1.81899e-012, pi_SR=5.73972e-041	0,42933	4	1,71732
2164	DISPLAY RAMS 1-24	MIL-MM	pi_E=2.12326e-037, pi_Q=-7.28151e-012, pi_L=2.36426e-038, pi_T=-1.70687e+035, I_C1=-1.56407e-029, I_C2=-1.81899e-012, A1=5.73972e-041, A2=1.58481e+029, B1=9.42435e-038, B2=2.12324e-037, I_CYC=-4.53165e-034	0,06143	24	1,47421
2164	RAM1-16	MIL-MM	pi_E=2.12326e-037, pi_Q=-7.28151e-012, pi_L=2.36426e-038, pi_T=-1.70687e+035, I_C1=-1.56407e-029, I_C2=-1.81899e-012, A1=5.73972e-041, A2=1.58481e+029, B1=9.42435e-038, B2=2.12324e-037, I_CYC=-4.53165e-034	0,06306	16	1,00889
6665	RAM17-32	MIL-MM	pi_E=2.12326e-037, pi_Q=-7.28151e-012, pi_L=2.36426e-038, pi_T=-1.70687e+035, I_C1=-1.56407e-029, I_C2=-1.81899e-012, A1=5.73972e-041, A2=1.58481e+029, B1=9.42435e-038, B2=2.12324e-037, I_CYC=-4.53165e-034	0,06211	16	0,99379



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Nummer	Reference ID	Kategorie-Schlüssel	Parameter
90968G	C1-5	MIL-CR	Quantity=5, Environment=Ground,benign, Ambient Temperature=40, Quality,Capacitors=Nonestablished Reliab, Elec Stress Calc Mode=User Specified, Voltage Stress Ratio=0.8, Operating Voltage (V)=0.8, Circuit Resistance=0, Connection Type=Reflow Solder, Adjustment Factor=1, Capacitor Style=Al Elect,Dry El,Polar, Capacitance (Microf)=4700, Rated Voltage (V)=1, No of Pins=2
CW15A222K	C6	MIL-CR	Quantity=1, Environment=Ground,benign, Ambient Temperature=40, Quality,Capacitors=Nonestablished Reliab, Elec Stress Calc Mode=User Specified, Voltage Stress Ratio=0.8, Operating Voltage (V)=0.8, Circuit Resistance=0.6, Connection Type=Reflow Solder, Adjustment Factor=1, Capacitor Style=Ceramic,General,NER, Capacitance (Microf)=0.1, Rated Voltage (V)=1, No of Pins=2
2164	DISPLAY RAMS 1-24	MIL-MM	Quantity=24, Environment=Ground,benign, Quality,Microelectronics=Commercial or Unknown, Total Point Valuation=0, Junction Temperature=50, Junction Temp Calc Mode=Full Model, Ambient Temperature=40, Case Temperature=48.5, Operating Power (W)=0.1, Connection Type=Reflow Solder, No of Active Pins=16, Adjustment Factor=1, Type,MM=DRAM, Technology=N Ch Metal Oxide Semicon, Memory Size (kBits)=64, Package Type=Non-Hermetic Dip, No of Yrs in Production=2, Die Area (in2)=0, No of Pins=16, Theta Case / Ambient=85, Theta Junction Case=15
74LS30	IC1-IC8	MIL-DI	Quantity=8, Environment=Ground,benign, Quality,Microelectronics=Commercial or Unknown, Total Point Valuation=0, Junction Temperature=41, Junction Temp Calc Mode=Full Model, Ambient Temperature=40, Case Temperature=40.85, Operating Power (W)=0.01, Connection Type=Reflow Solder, No of Active Pins=16, Adjustment Factor=1, Technology=Low Power Schottky TTL, No of Gates=1, Package Type=Non-Hermetic Dip, No of Yrs in Production=2, Die Area (in2)=0, No of Pins=16, Theta Case / Ambient=85, Theta Junction Case=15
74LS374	IC10-12	MIL-DI	Quantity=3, Environment=Ground,benign, Quality,Microelectronics=Commercial or Unknown, Total Point Valuation=0, Junction Temperature=62, Junction Temp Calc Mode=Full Model, Ambient Temperature=40, Case Temperature=58.7, Operating Power (W)=0.22, Connection Type=Reflow Solder, No of Active Pins=16, Adjustment Factor=1, Technology=Low Power Schottky TTL, No of Gates=80, Package Type=Non-Hermetic Dip, No of Yrs in Production=2, Die Area (in2)=0, No of Pins=16, Theta Case / Ambient=85, Theta Junction Case=15



Nummer	Kategorie-Schlüssel	Parameter - Schlüsselformat
CW15A222K	MIL-CR	QUAN=1, ENVI=GB, TEMP=35, QUALCR=NER, STMODE=STUSER, VOLT=0.8, VOLTOP=0.8, CRES=0.6, CONN=RESO, ADJF=1, STYLCR=CK, CAPC=0.1, VOLTRA=1, PINS=2
90968G	MIL-CR	QUAN=5, ENVI=GB, TEMP=35, QUALCR=NER, STMODE=STUSER, VOLT=0.8, VOLTOP=0.8, CRES=0, CONN=RESO, ADJF=1, STYLCR=CE, CAPC=4700, VOLTRA=1, PINS=2
74LS30	MIL-DI	QUAN=8, ENVI=GB, QUALMI=COMM, PVAL=0, JTMP=36, MODE=MODE1, TEMP=35, CTMP=35.85, POWEOP=0.01, CONN=RESO, ACTC=16, ADJF=1, TECH=LSTTL, GATS=1, PACKIC=NDIP, YEAR=2, AREA=0, PINS=16, THCA=85, THJC=15
74LS166	MIL-DI	QUAN=1, ENVI=GB, QUALMI=COMM, PVAL=0, JTMP=56, MODE=MODE1, TEMP=35, CTMP=52.85, POWEOP=0.21, CONN=RESO, ACTC=16, ADJF=1, TECH=LSTTL, GATS=68, PACKIC=NDIP, YEAR=2, AREA=0, PINS=16, THCA=85, THJC=15
74LS374	MIL-DI	QUAN=3, ENVI=GB, QUALMI=COMM, PVAL=0, JTMP=57, MODE=MODE1, TEMP=35, CTMP=53.7, POWEOP=0.22, CONN=RESO, ACTC=16, ADJF=1, TECH=LSTTL, GATS=80, PACKIC=NDIP, YEAR=2, AREA=0, PINS=16, THCA=85, THJC=15
2N4403	MIL-LB	QUAN=4, APPLB=LINE, ENVI=GB, QUALDS=PLAS, JTMP=35, MODE=MODE6, TEMP=35, CTMP=0, POWEOP=0, STMODE=STUSER, VOLT=0.8, VOLTOP=0.8, CONN=RESO, ADJF=1, RATP=1, VOLTRA=1, PINS=3, THCA=0, THJC=0
2164	MIL-MM	QUAN=24, ENVI=GB, QUALMI=COMM, PVAL=0, JTMP=45, MODE=MODE1, TEMP=35, CTMP=43.5, POWEOP=0.1, CONN=RESO, ACTC=16, ADJF=1, TYPEMM=DRAM, TECH=NMOS, KBIT=64, PACKIC=NDIP, YEAR=2, AREA=0, PINS=16, THCA=85, THJC=15
4610X101-40338G	MIL-RS	QUAN=1, ENVI=GB, TEMP=35, QUALRS=NER, STMODE=STUSER, POWE=0.75, POWEOP=0.1, CONN=RESO, ADJF=1, STYLRS=RZ, POWERA=0.133333, PINS=10
FP2-16264XM	MIL-RS	QUAN=1, ENVI=GB, TEMP=35, QUALRS=NER, STMODE=STUSER, POWE=0.75, POWEOP=0.1, CONN=RESO, ADJF=1, STYLRS=RC, POWERA=0.133333, PINS=2