



AAEON Technology INC.
ISO-9001/ISO-14001 Certified
Industrial Automation PCs

MB-562D

Reliability Prediction Report

(MTBF)

Release Date: Dec. 14, 1999

Issue Stamp

QA Manager

QE Manager

Test Engineer

Reliability Prediction (MTBF)

I . Model Name: MB-562D

II . Description: Pentium MMX, K6 LPX Board with LCD, Ethernet, Audio, & 4 COMs

III. Prediction Date: Dec. 14, 1999

IV. Prediction Site: AAEON QE Dept.

V. Predicted by : Chasel Wang

VI. Equipment: Relx Ver.7.0 Visual Reliability Software

VII. Simulation Environment:

- **Temperature: 25 degrees C**
- **Standard: Telcordia (Bellcore) Standard**

VIII. Prediction Result:

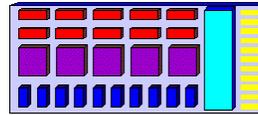
- **Failure Rate: 11.780786 ppm**
- **MTBF: 84,884. hours**

IX. Term and Definition:

- **Unit** An assembly of device.
- **Duty Cycle** Used to specify the percentage of time that the element is in an on state, and it is equal to the percentage of total time the item is in the active environment.
- **Quantity** The quantity of the selected item.
- **Failure Rate** Used to specify that the failure rate is to be calculated based the selected calculation models. The multiplier is 1,000,000.
- **MTBF** MTBF is always specified in hours.

AAEON Reliability Prediction Report

Part Number 9697562001
Reference Des
Date 12. 14, 1999
Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00

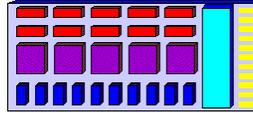


Description Top-level assembly
File Name 562d.rpj
Time 1:51 PM
Failure Rate 11.780786
MTBF 84,884

Assembly Name	Part Number	Model	Method	Environment	Duty Cycle	Qty	Failure Rate	MTBF
MB-562D	9697562001	Bellcore	Method I Case 3	GF, GU - Ground Fixed,	100.00	1.00	11.780786	84,884

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Date 12. 14, 1999
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Temperature 25.00

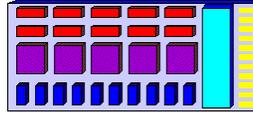


Description Top-level assembly
File Name 562d.rpj
Time 1:51 PM
Failure Rate 11.780786
MTBF 84,884

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
101A516929	Resistor	R122	Bellcore Issue 6	Level I		0.001209	1.00	.0103	0.001209	827315499.15
101A547039	Resistor	R198	Bellcore Issue 6	Level I		0.001185	1.00	.0101	0.001185	843606472.40
101A590929	Resistor	R116	Bellcore Issue 6	Level I		0.001209	1.00	.0103	0.001209	827315499.15
101A700009	Resistor	R57,R136,R137,R138,R140,R143,- R154,R185,R223-224,R227	Bellcore Issue 6	Level I		0.001209	11.00	.1129	0.013296	827315499.15
101A701009	Resistor	R14-17,R19,R21,R29,R121,R157,- R174,R218	Bellcore Issue 6	Level I		0.001209	11.00	.1129	0.013296	827315499.15
101A701059	Resistor	R18,R35,R169-R172	Bellcore Issue 6	Level I		0.001209	6.00	.0616	0.007252	827315499.15
101A702229	Resistor	R33-34,R36-37,R45,R118,R167-168	Bellcore Issue 6	Level I		0.001209	8.00	.0821	0.009670	827315499.15
101A703309	Resistor	R8,R11-R13,R20,R22,R23-R28,,R- 55,R60,R63,R68,R69,R70-R79,R84- -R97,R99,R100,R107,R109-R115,- R131,R133,R147,R150-R153,R156- R206,R215,R222	Bellcore Issue 6	Level I		0.001209	62.00	.6361	0.074941	827315499.15
101A703329	Resistor	R30,R52,R155	Bellcore Issue 6	Level I		0.001209	3.00	.0308	0.003626	827315499.15
101A704729	Resistor	R2,R5,R7,R9,R41,R61,,R135,R145- ,R146,R148,R158,R178,R180,R181- ,R188,R190,R191,R195,R197,R199- ,R200,R201,R203,R208,R210,R221- ,R124,R179,R132	Bellcore Issue 6	Level I		0.001209	29.00	.2975	0.035053	827315499.15
101A710019	Resistor	R62,R98,R105,R117,R130,R166,R- 176,R161-164,R149,R211	Bellcore Issue 6	Level I		0.001209	13.00	.1334	0.015713	827315499.15
101A710029	Resistor	R4,R6,R43,R50,R51,R129,R159,R- 165,R204,R207,R231,R123	Bellcore Issue 6	Level I		0.001209	12.00	.1231	0.014505	827315499.15
101A715009	Resistor	R213,R214,R217	Bellcore Issue 6	Level I		0.001209	3.00	.0308	0.003626	827315499.15
101A715029	Resistor	R125-R128,R160	Bellcore Issue 6	Level I		0.001209	5.00	.0513	0.006044	827315499.15
101A722009	Resistor	R219,R220	Bellcore Issue 6	Level I		0.001209	2.00	.0205	0.002417	827315499.15
101A722039	Resistor	R196	Bellcore Issue 6	Level I		0.001209	1.00	.0103	0.001209	827315499.15
101A33009	Resistor	R173,R177,R187,R193,R209,R212	Bellcore Issue 6	Level I		0.001209	6.00	.0616	0.007252	827315499.15
101A747009	Resistor	R44,R64,R65	Bellcore Issue 6	Level I		0.001209	3.00	.0308	0.003626	827315499.15
101A782009	Resistor	R80	Bellcore Issue 6	Level I		0.001209	1.00	.0103	0.001209	827315499.15
105A528713	Resistor	R104	Bellcore Issue 6	Level I		0.001209	1.00	.0103	0.001209	827315499.15
105A571533	Resistor	R103	Bellcore Issue 6	Level I		0.001209	1.00	.0103	0.001209	827315499.15
105A707523	Resistor	R31-32	Bellcore Issue 6	Level I		0.002268	2.00	.0385	0.004535	440974090.03
105A768003	Resistor	R205	Bellcore Issue 6	Level I		0.002268	1.00	.0192	0.002268	440974090.03

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Reference Des
Date 12. 14, 1999
Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00

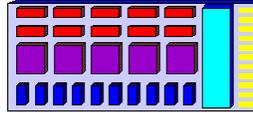


Description Top-level assembly
File Name 562d.rpj
Time 1:51 PM
Failure Rate 11.780786
MTBF 84,884

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1111622191	Capacitor	EC2-EC5	Bellcore Issue 6	Level I		0.027242	4.00	.9250	0.108968	36707972.85
1111647190	Capacitor	EC17,EC18	Bellcore Issue 6	Level I		0.045403	2.00	.7708	0.090807	22024783.71
1119610290	Capacitor	EC20	Bellcore Issue 6	Level I		0.071121	1.00	.6037	0.071121	14060484.33
1119610291	Capacitor	EC6-EC11	Bellcore Issue 6	Level I		0.075338	6.00	3.8370	0.452029	13273483.15
1121701050	Capacitor	C90,C113,BC10,BC13,BC14,BC16-BC17,BC20,BC24,BC166,BC169,-BC175	Bellcore Issue 6	Level I		0.002539	12.00	.2586	0.030468	393852661.82
1121501680	Capacitor	BC1,BC5,C13,C14,C25,C41,C61,C64,C76,C79,C84,BC15,BC18,BC19-BC21-BC23,BC25-BC30,BC32-BC37,BC39,BC40,BC42,BC44-BC48,-BC50-BC53,BC55,BC56,BC60-BC68,BC70-BC74,BC77-BC98,C108,-C112,C114,C162,BC100,BC101,B-C167,BC168,BC103-BC165,BC176-BC204,BC170-BC174	Bellcore Issue 6	Level I		0.002539	184.00	3.9656	0.467180	393852661.82
1124501780	Capacitor	BC2-BC4,BC6-BC9,C81,C82,BC11-BC12,BC38,BC41,BC43,BC49,BC69,BC75,BC76,BC99,C165,C166,-BC102,C31-C36	Bellcore Issue 6	Level I		0.001060	28.00	.2520	0.029686	943198589.05
1124510080	Capacitor	C1-C8,C15-C24,C66-C67,C96	Bellcore Issue 6	Level I		0.001060	21.00	.1890	0.022265	943198589.05
1124510280	Capacitor	C42,C77,C80,C83,C110	Bellcore Issue 6	Level I		0.001060	5.00	.0450	0.005301	943198589.05
1124518180	Capacitor	C43-C59,115,,C119-C159	Bellcore Issue 6	Level I		0.001060	59.00	.5310	0.062553	943198589.05
1124520080	Capacitor	C9,C11,C39,C40,C164	Bellcore Issue 6	Level I		0.001060	5.00	.0450	0.005301	943198589.05
1124522180	Capacitor	C60,C65,C74,C75	Bellcore Issue 6	Level I		0.001060	4.00	.0360	0.004241	943198589.05
1124533080	Capacitor	C10	Bellcore Issue 6	Level I		0.001060	1.00	.0090	0.001060	943198589.05
1124547080	Capacitor	C62,C63,C68,C69,C71,C72,C85,C87,C88,C89,C100-C103	Bellcore Issue 6	Level I		0.001060	14.00	.1260	0.014843	943198589.05
1124547180	Capacitor	C78,BC31	Bellcore Issue 6	Level I		0.001060	2.00	.0180	0.002120	943198589.05
1129610290	Capacitor	C167	Bellcore Issue 6	Level I		0.000712	1.00	.0060	0.000712	1403854368.14
1141601090	Capacitor	TC7	Bellcore Issue 6	Level I		0.001637	1.00	.0139	0.001637	610743359.67
1141610050	Capacitor	TC1-TC2,TC8-TC22,TC25-TC36,T-C38,TC39,TC41,TC42,TC45-TC48	Bellcore Issue 6	Level I		0.002357	37.00	.7403	0.087211	424256814.77
1141647080	Capacitor	TC5,TC6,TC23	Bellcore Issue 6	Level I		0.002357	3.00	.0600	0.007071	424256814.77
1149610180	Capacitor	TC37,TC40,TC43,TC44	Bellcore Issue 6	Level I		0.002502	4.00	.0849	0.010006	399749835.57
1189622110	Capacitor	EC1,EC19	Bellcore Issue 6	Level I		0.028376	2.00	.4817	0.056753	35240428.38

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Reference Des
Date 12. 14, 1999
Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00

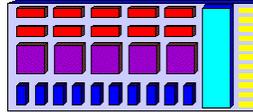


Description Top-level assembly
File Name 562d.rpj
Time 1:51 PM
Failure Rate 11.780786
MTBF 84,884

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1189633110	Capacitor	EC12-EC16	Bellcore Issue 6	Level I		0.045203	5.00	1.9185	0.226015	22122471.91
1211102761	Inductor	L13	Bellcore Issue 6	Level I		0.086173	1.00	.7315	0.086173	11604581.32
1212308050	Inductor	L1-L3,L5-L11,L14-L19,L23-L25,L27-L29	Bellcore Issue 6	Level I		0.002268	21.00	.4042	0.047622	440974090.03
1212308055	Inductor	L30-32	Bellcore Issue 6	Level I		0.002268	1.00	.0192	0.002268	440974090.03
1231120050	Miscellaneous	Y3	Bellcore Issue 6	Level I		0.150000	1.00	1.2733	0.150000	6666666.67
1231143180	Miscellaneous	Y1,Y4	Bellcore Issue 6	Level I		0.150000	2.00	2.5465	0.300000	6666666.67
1231327680	Miscellaneous	Y2	Bellcore Issue 6	Level I		0.150000	1.00	1.2733	0.150000	6666666.67
1121722780	Capacitor	C27,C28,C37,C38,C111,C118	Bellcore Issue 6	Level I		0.002539	6.00	.1293	0.015234	393852661.82
1122747880	Capacitor	C29	Bellcore Issue 6	Level I		0.001598	1.00	.0136	0.001598	625953979.55
1124456080	Capacitor	C160,C161,C163	Bellcore Issue 6	Level I		0.001060	3.00	.0270	0.003181	943198589.05
1252000020	Integrated Circuit	U48	Bellcore Issue 6	Level I	25.00	0.120485	1.00	1.0227	0.120485	8299772.79
130001240	Semiconductor	D4	Bellcore Issue 6	Level I		0.002801	1.00	.0238	0.002801	357030107.40
130001440	Semiconductor	D5	Bellcore Issue 6	Level I		0.002801	1.00	.0238	0.002801	357030107.40
1300164000	Semiconductor	U44	Bellcore Issue 6	Level I	9.00	0.030697	1.00	.2606	0.030697	32576723.81
1300414800	Semiconductor	D1,D3,D6-D17	Bellcore Issue 6	Level I		0.023881	14.00	2.8380	0.334334	41874327.58
1304100200	Semiconductor	D2	Bellcore Issue 6	Level I		0.004877	1.00	.0414	0.004877	205063180.81
1310390410	Semiconductor	Q2,Q3	Bellcore Issue 6	Level I	5.00	0.005865	2.00	.0996	0.011729	170512837.82
1311390610	Semiconductor	Q1	Bellcore Issue 6	Level I		0.005741	1.00	.0487	0.005741	174188498.97
1315450300	Semiconductor	Q4,Q5	Bellcore Issue 6	Level I	12.00	0.049868	2.00	.8466	0.099736	20052889.59
1315045310	Semiconductor	Q6	Bellcore Issue 6	Level I	5.00	0.091687	1.00	.7783	0.091687	10906649.80
1428274125	Integrated Circuit	U32	Bellcore Issue 6	Level I	13.00	0.142621	1.00	1.2106	0.142621	7011606.41
1428474008	Integrated Circuit	U23	Bellcore Issue 6	Level I	9.00	0.096820	1.00	.8218	0.096820	10328441.13
1428474244	Integrated Circuit	U25	Bellcore Issue 6	Level I	9.00	0.098028	1.00	.8321	0.098028	10201202.37
1428474245	Integrated Circuit	U10,U11,U13,U14	Bellcore Issue 6	Level I	19.00	0.151106	4.00	5.1306	0.604425	6617861.97
1440474004	Integrated Circuit	U3,U24	Bellcore Issue 6	Level I	10.00	0.101494	2.00	1.7231	0.202989	9852751.54
14D1151700	Integrated Circuit	U5	Bellcore Issue 6	Level I	18.00	0.205515	1.00	1.7445	0.205515	4865835.10
14D3000110	Integrated Circuit	U49	Bellcore Issue 6	Level I	3.00	0.039373	1.00	.3342	0.039373	25398365.86
14D3780500	Integrated Circuit	U8	Bellcore Issue 6	Level I	17.00	0.106435	1.00	.9035	0.106435	9395362.14
14D6202000	Integrated Circuit	U20	Bellcore Issue 6	Level I	11.00	0.359247	1.00	3.0494	0.359247	2783600.86
14S3186900	Integrated Circuit	U12	Bellcore Issue 6	Level I	17.00	0.192530	1.00	1.6343	0.192530	5193998.23

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Temperature 25.00



Description Top-level assembly
File Name 562d.rpj
Time 1:51 PM
Failure Rate 11.780786
MTBF 84,884

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
14S3515600	Integrated Circuit	U45	Bellcore Issue 6	Level I	6.00	0.091286	1.00	.7749	0.091286	10954631.16
14S4048500	Integrated Circuit	U46,U47	Bellcore Issue 6	Level I	5.00	0.056843	2.00	.9650	0.113686	17592254.32
14S4066900	Integrated Circuit	U37	Bellcore Issue 6	Level I	11.00	0.073313	1.00	.6223	0.073313	13640096.66
14S4418500	Integrated Circuit	U18,U26,U29,U34	Bellcore Issue 6	Level I	15.00	0.090066	4.00	3.0581	0.360262	11103017.29
14S4555001	Integrated Circuit	U36	Bellcore Issue 6	Level I	30.00	0.195076	1.00	1.6559	0.195076	5126205.46
14S4558200	Integrated Circuit	U15	Bellcore Issue 6	Level I	14.00	0.086245	1.00	.7321	0.086245	11594908.63
14S4802910	Integrated Circuit	U28	Bellcore Issue 6	Level I	9.00	0.065672	1.00	.5575	0.065672	15227088.64
14S4866100	Integrated Circuit	U30	Bellcore Issue 6	Level I	11.00	0.073313	1.00	.6223	0.073313	13640096.66
14S5203200	Integrated Circuit	U27	Bellcore Issue 6	Level I	9.00	0.096820	1.00	.8218	0.096820	10328441.13
14S5513800	Integrated Circuit	U22	Bellcore Issue 6	Level I	9.00	0.099185	1.00	.8419	0.099185	10082168.03
14S5701410	Integrated Circuit	U39	Bellcore Issue 6	Level I	5.00	0.050589	1.00	.4294	0.050589	19767021.97
14S6024000	Integrated Circuit	U17	Bellcore Issue 6	Level I	16.00	0.980762	1.00	8.3251	0.980762	1019614.89
14S6025610	Integrated Circuit	U16	Bellcore Issue 6	Level I	10.00	0.403850	1.00	3.4280	0.403850	2476167.34
14S6125802	Integrated Circuit	U40-U43	Bellcore Issue 6	Level I	9.00	0.161261	4.00	5.4754	0.645043	6201138.02
14S6334600	Integrated Circuit	U33	Bellcore Issue 6	Level I	10.00	0.062100	1.00	.5271	0.062100	16103141.87
14S8203280	Integrated Circuit	U31	Bellcore Issue 6	Level I	11.00	0.073313	1.00	.6223	0.073313	13640096.66
14S8416800	Integrated Circuit	U35	Bellcore Issue 6	Level I	11.00	0.073313	1.00	.6223	0.073313	13640096.66
14S9055500	Integrated Circuit	U38	Bellcore Issue 6	Level I	6.00	0.067290	1.00	.5712	0.067290	14861100.04
14S9486101	Integrated Circuit	U4	Bellcore Issue 6	Level I	11.00	0.128997	1.00	1.0950	0.128997	7752127.40
1500747210	Resistor	RP1-RP7	Bellcore Issue 6	Level I		0.028107	7.00	1.6701	0.196749	35578393.78
154070008	Resistor	RN14-RN17,RN19,RN29,RN32-RN-34,RN54,RN55	Bellcore Issue 6	Level I		0.006246	11.00	.5832	0.068706	160102772.00
1540701308	Resistor	RN56,RN57,RN60,RN61,RN65	Bellcore Issue 6	Level I		0.006246	5.00	.2651	0.031230	160102772.00
1540710008	Resistor	RN9,RN10	Bellcore Issue 6	Level I		0.006246	2.00	.1060	0.012492	160102772.00
1540710308	Resistor	RN1,RN5,RN20,RN22	Bellcore Issue 6	Level I		0.006246	4.00	.2121	0.024984	160102772.00
1540733008	Resistor	RN2-RN4,RN6-RN8,RN21,RN23-R-28,RN30,RN31,RN41,RN43,RN45-,RN58,RN59,RN62,RN63,RN66	Bellcore Issue 6	Level I		0.006246	23.00	1.2194	0.143658	160102772.00
1540747208	Resistor	RN11,RN13,RN18,RN35-RN38,RN-40,RN42,RN44,RN46-RN53,RN64	Bellcore Issue 6	Level I		0.006246	19.00	1.0074	0.118674	160102772.00
1540722208	Resistor	RN67	Bellcore Issue 6	Level I		0.006246	1.00	.0530	0.006246	160102772.00
1600000300	Switching Device	S1	Bellcore Issue 6	Level I		0.024815	1.00	.2106	0.024815	40297682.24
1600000400	Switching Device	SW4	Bellcore Issue 6	Level I		0.033087	1.00	.2809	0.033087	30223261.68

