



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

# **SBC-556**

## **Reliability Prediction Report**

### **(MTBF)**

**Release Date: Nov. 30, 1999**

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**Issue Stamp**

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**QA Manager**

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**QE Manager**

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**Test Engineer**



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**QA Manager**

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**Test Engineer**

# Reliability Prediction (MTBF)

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**I . Model Name: SBC-556**

**II . Description: Pentium MMX, K6 Half-size CPU Card with LCD, Ethernet, & SSD**

**III. Prediction Date: Nov. 30, 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:**

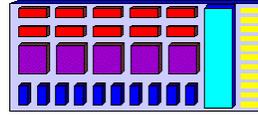
- **Failure Rate: 9.129032 ppm**
- **MTBF: 109,541. hours**

**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** 9697556000  
**Reference Des**  
**Date** 11. 30, 1999  
**Environment** GF, GU - Ground Fixed, Uncontrolled  
**Temperature** 25.00

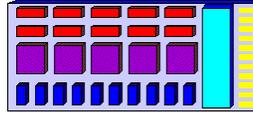


**Description** Top-level assembly  
**File Name** SBC-556A1.RPJ  
**Time** 1:12 PM  
**Failure Rate** 9.129032  
**MTBF** 109,541

Assembly Name	Part Number	Model	Method	Environment	Duty Cycle	Qty	Failure Rate	MTBF
SBC-556	9697556000	Bellcore	Method I Case 3	GF, GU - Ground Fixed,	100.00	1.00	9.129032	109,541

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**Temperature** 25.00

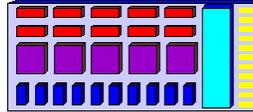


**Description** Top-level assembly  
**File Name** SBC-556A1.RPJ  
**Time** 1:12 PM  
**Failure Rate** 9.129032  
**MTBF** 109,541

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
101A501039	Resistor	R141	Bellcore Issue 6	Level I		0.002268	1.00	.0248	0.002268	440974090.03
101A512119	Resistor	R142	Bellcore Issue 6	Level I		0.002268	1.00	.0248	0.002268	440974090.03
101A516929	Resistor	R127	Bellcore Issue 6	Level I		0.002268	1.00	.0248	0.002268	440974090.03
101A590929	Resistor	R28,R125	Bellcore Issue 6	Level I		0.002268	2.00	.0497	0.004535	440974090.03
101A700009	Resistor	R2,R40,R46,R84,R128,R131,R134-R146,R189,R215,R219,R244,	Bellcore Issue 6	Level I		0.002268	12.00	.2981	0.027212	440974090.03
101A701009	Resistor	R114-115,R166,R182,R214	Bellcore Issue 6	Level I		0.002268	5.00	.1242	0.011339	440974090.03
101A702059	Resistor	R167	Bellcore Issue 6	Level I		0.013606	1.00	.1490	0.013606	73495681.67
101A702209	Resistor	R34-38,R41-42,R150-152,R206-207	Bellcore Issue 6	Level I		0.002268	12.00	.2981	0.027212	440974090.03
101A702229	Resistor	R48,R80,R117,R129,R169	Bellcore Issue 6	Level I		0.002268	5.00	.1242	0.011339	440974090.03
101A703309	Resistor	R8-R23,R54-55,R57-58,R60-62,R64-79,R89,R100,R103,R105,R108,R110,R178,R224	Bellcore Issue 6	Level I		0.002268	47.00	1.1675	0.106582	440974090.03
101A703329	Resistor	R201,R208	Bellcore Issue 6	Level I		0.002268	2.00	.0497	0.004535	440974090.03
101A704729	Resistor	R5,R25-27,R63,R81,R90-97,R113,-R122,R126,R132-133,R143,R148--149,R153-156,R162-164,R168,R170,R172,R177,R180-181,R183,R188-,R198,R200,R202,R204,R209-213,-R217-218,R221-223,R226-227,R230-233,R239-241,R243,R247-251	Bellcore Issue 6	Level I		0.002268	66.00	1.6395	0.149669	440974090.03
101A710019	Resistor	R59,R82,R85-88,R147,R119,R171-R175,R190,R203,R225	Bellcore Issue 6	Level I		0.002268	13.00	.3229	0.029480	440974090.03
101A710029	Resistor	R24,R32,R43-45,R47,R98-99,R104-,R106-107,R109,R118,R161,R173,-R187,R192,R199,R205,R234-236	Bellcore Issue 6	Level I		0.002268	22.00	.5465	0.049890	440974090.03
101A715009	Resistor	R179,R195-196	Bellcore Issue 6	Level I		0.002268	3.00	.0745	0.006803	440974090.03
101A733009	Resistor	R51-52,R174,R176,R228-229,R237--238	Bellcore Issue 6	Level I		0.002268	8.00	.1987	0.018142	440974090.03
101A747009	Resistor	R49	Bellcore Issue 6	Level I		0.002268	1.00	.0248	0.002268	440974090.03
101A756009	Resistor	R116	Bellcore Issue 6	Level I		0.002268	1.00	.0248	0.002268	440974090.03
1050700002	Resistor	R165	Bellcore Issue 6	Level I		0.002268	1.00	.0248	0.002268	440974090.03
1050701002	Resistor	R145	Bellcore Issue 6	Level I		0.002268	1.00	.0248	0.002268	440974090.03
1059710059	Resistor	R216	Bellcore Issue 6	Level I		0.013606	1.00	.1490	0.013606	73495681.67
105A502833	Resistor	R33	Bellcore Issue 6	Level I		0.002268	1.00	.0248	0.002268	440974090.03
105A507503	Resistor	R120-121,R123-124	Bellcore Issue 6	Level I		0.002268	4.00	.0994	0.009071	440974090.03

**AAEON Reliability Prediction Report**

**Part Number** 9697556000  
**Reference Des**  
**Date** 11. 30, 1999  
**Environment** GF, GU - Ground Fixed, Uncontrolled  
**Temperature** 25.00

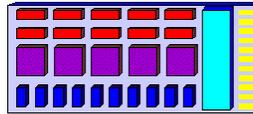


**Description** Top-level assembly  
**File Name** SBC-556A1.RPJ  
**Time** 1:12 PM  
**Failure Rate** 9.129032  
**MTBF** 109,541

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
105A521033	Resistor	R31	Bellcore Issue 6	Level I		0.002268	1.00	.0248	0.002268	440974090.03
105A560423	Resistor	R29-30	Bellcore Issue 6	Level I		0.002268	2.00	.0497	0.004535	440974090.03
105A701823	Resistor	R130	Bellcore Issue 6	Level I		0.002268	1.00	.0248	0.002268	440974090.03
105A702723	Resistor	R53,R140	Bellcore Issue 6	Level I		0.002268	2.00	.0497	0.004535	440974090.03
105A704733	Resistor	R101,R246	Bellcore Issue 6	Level I		0.002268	2.00	.0497	0.004535	440974090.03
105A705103	Resistor	R6-7,R111-112	Bellcore Issue 6	Level I		0.002268	4.00	.0994	0.009071	440974090.03
105A722033	Resistor	R138	Bellcore Issue 6	Level I		0.002268	1.00	.0248	0.002268	440974090.03
105A751003	Resistor	R184-186	Bellcore Issue 6	Level I		0.002268	3.00	.0745	0.006803	440974090.03
105A751033	Resistor	R139	Bellcore Issue 6	Level I		0.002268	1.00	.0248	0.002268	440974090.03
106B501030	Resistor	R3-4,R50	Bellcore Issue 6	Level I		0.011379	3.00	.3740	0.034138	87878027.07
1119610291	Capacitor	EC1-2,EC7-8	Bellcore Issue 6	Level I		0.075338	4.00	3.3010	0.301353	13273483.15
1121747660	Capacitor	BC2,BC5,BC8-9,BC61-62,BC66-67-C101	Bellcore Issue 6	Level I		0.002539	9.00	.2503	0.022851	393852661.82
1122701680	Capacitor	C1,C3-5,C7-11,C19,C53,C57-60,C62-69,C72-77,C79-81,C89,C94-96,-C99,C103,C111,C116,C120-121,C-135,TC6,BC3-4,BC6-7,BC11-60,B-C63-65,BC68-105	Bellcore Issue 6	Level I		0.001598	139.00	2.4325	0.222061	625953979.55
1124501780	Capacitor	BC10,C124-126,C131-134	Bellcore Issue 6	Level I		0.001060	8.00	.0929	0.008482	943198589.05
1124510080	Capacitor	C6,C12-18,C49,C84-85,C88	Bellcore Issue 6	Level I		0.001060	12.00	.1394	0.012723	943198589.05
1124510280	Capacitor	C54,C56,C61,C127-130	Bellcore Issue 6	Level I		0.001060	7.00	.0813	0.007422	943198589.05
1124522080	Capacitor	C52,C113-114,C117-118	Bellcore Issue 6	Level I		0.001060	5.00	.0581	0.005301	943198589.05
1124522180	Capacitor	C20-36,C38-45,C71,C78,C82-83,C86-87,C91-92,C98,C102,C104-110-C112	Bellcore Issue 6	Level I		0.001060	43.00	.4994	0.045590	943198589.05
1124527080	Capacitor	C97,C100	Bellcore Issue 6	Level I		0.001060	2.00	.0232	0.002120	943198589.05
1124533080	Capacitor	C50-51	Bellcore Issue 6	Level I		0.001060	2.00	.0232	0.002120	943198589.05
1124547080	Capacitor	C37,C46-48,C115,C119,C122-123	Bellcore Issue 6	Level I		0.001060	8.00	.0929	0.008482	943198589.05
1124547180	Capacitor	C55	Bellcore Issue 6	Level I		0.001060	1.00	.0116	0.001060	943198589.05
1141601090	Capacitor	BC1,C93	Bellcore Issue 6	Level I		0.002357	2.00	.0516	0.004714	424256814.77
1141610050	Capacitor	TC2-5,TC7-12,TC14-29	Bellcore Issue 6	Level I		0.002357	26.00	.6713	0.061284	424256814.77
1141647080	Capacitor	C70,C90	Bellcore Issue 6	Level I		0.002357	2.00	.0516	0.004714	424256814.77
1149610180	Capacitor	C136	Bellcore Issue 6	Level I		0.002502	1.00	.0274	0.002502	399749835.57

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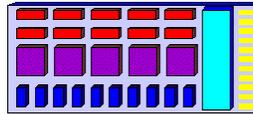


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**File Name** SBC-556A1.RPJ  
**Time** 1:12 PM  
**Failure Rate** 9.129032  
**MTBF** 109,541

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1149622050	Capacitor	TC13	Bellcore Issue 6	Level I		0.002502	1.00	.0274	0.002502	399749835.57
1169701700	Capacitor	C2	Bellcore Issue 6	Level I		0.000718	1.00	.0079	0.000718	1392389831.84
1189633110	Capacitor	EC3	Bellcore Issue 6	Level I		0.045203	1.00	.4952	0.045203	22122471.91
1211102763	Inductor	L1	Bellcore Issue 6	Level I		0.086173	1.00	.9439	0.086173	11604581.32
1212308050	Inductor	L2-28	Bellcore Issue 6	Level I		0.002268	27.00	.6707	0.061228	440974090.03
1231143180	Miscellaneous	Y1	Bellcore Issue 6	Level I		0.150000	1.00	1.6431	0.150000	6666666.67
1231327680	Miscellaneous	Y2	Bellcore Issue 6	Level I		0.150000	1.00	1.6431	0.150000	6666666.67
1233350050	Miscellaneous	X1	Bellcore Issue 6	Level I		0.360000	1.00	3.9435	0.360000	2777777.78
1252000020	Integrated Circuit	U21	Bellcore Issue 6	Level I		0.059366	1.00	.6503	0.059366	16844654.92
1300001240	Semiconductor	D13,R135	Bellcore Issue 6	Level I		0.008403	2.00	.1841	0.016805	119010035.80
1300001440	Semiconductor	D12	Bellcore Issue 6	Level I		0.008403	1.00	.0920	0.008403	119010035.80
1300164040	Semiconductor	Q1	Bellcore Issue 6	Level I	10.00	0.031537	1.00	.3455	0.031537	31709191.24
1300414800	Semiconductor	D1,D3-6,D8-10,D14	Bellcore Issue 6	Level I		0.023881	9.00	2.3543	0.214929	41874327.58
1304023000	Semiconductor	D2	Bellcore Issue 6	Level I		0.004877	1.00	.0534	0.004877	205063180.81
1305099140	Semiconductor	Q5-7	Bellcore Issue 6	Level I		0.023881	3.00	.7848	0.071643	41874327.58
1310390410	Semiconductor	Q9-11	Bellcore Issue 6	Level I		0.023881	3.00	.7848	0.071643	41874327.58
1311290710	Semiconductor	Q8	Bellcore Issue 6	Level I		0.014526	1.00	.1591	0.014526	68844291.41
1311390610	Semiconductor	Q12	Bellcore Issue 6	Level I		0.023881	1.00	.2616	0.023881	41874327.58
1315070310	Semiconductor	Q2,Q4	Bellcore Issue 6	Level I	10.00	0.105122	2.00	2.3030	0.210244	9512757.37
1315995300	Semiconductor	U902	Bellcore Issue 6	Level I	7.00	0.484469	1.00	5.3069	0.484469	2064114.28
1428474008	Integrated Circuit	U17	Bellcore Issue 6	Level I	10.00	0.101068	1.00	1.1071	0.101068	9894315.61
1428474125	Integrated Circuit	U34	Bellcore Issue 6	Level I	8.00	0.092724	1.00	1.0157	0.092724	10784640.85
1440274244	Integrated Circuit	U31	Bellcore Issue 6	Level I	13.00	0.116205	1.00	1.2729	0.116205	8605475.30
1440274245	Integrated Circuit	U27-30	Bellcore Issue 6	Level I	14.00	0.123066	4.00	5.3923	0.492262	8125752.25
1440474004	Integrated Circuit	U1	Bellcore Issue 6	Level I	15.00	0.125285	1.00	1.3724	0.125285	7981782.34
14S3200400	Integrated Circuit	U3	Bellcore Issue 6	Level I		0.059366	1.00	.6503	0.059366	16844654.92
14S3515600	Integrated Circuit	U24	Bellcore Issue 6	Level I	12.00	0.138049	1.00	1.5122	0.138049	7243806.82
14S4021300	Integrated Circuit	U2,U9	Bellcore Issue 6	Level I	11.00	0.128997	2.00	2.8261	0.257994	7752127.40
14S4048500	Integrated Circuit	U19-20	Bellcore Issue 6	Level I	10.00	0.080508	2.00	1.7638	0.161016	12421092.82
14S4378100	Integrated Circuit	U12	Bellcore Issue 6	Level I	11.00	0.073313	1.00	.8031	0.073313	13640096.66
14S4387701	Integrated Circuit	U10	Bellcore Issue 6	Level I	7.00	0.058743	1.00	.6435	0.058743	17023277.62

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**Environment** GF, GU - Ground Fixed, Uncontrolled  
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**File Name** SBC-556A1.RPJ  
**Time** 1:12 PM  
**Failure Rate** 9.129032  
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Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
14S4558200	Integrated Circuit	U14	Bellcore Issue 6	Level I	9.00	0.065672	1.00	.7194	0.065672	15227088.64
14S4813901	Integrated Circuit	U23	Bellcore Issue 6	Level I	13.00	0.081727	1.00	.8952	0.081727	12235812.22
14S4900000	Integrated Circuit	U8	Bellcore Issue 6	Level I	12.00	0.077420	1.00	.8481	0.077420	12916624.12
14S4914804	Integrated Circuit	U11	Bellcore Issue 6	Level I	14.00	0.157897	1.00	1.7296	0.157897	6333229.12
14S5200400	Integrated Circuit	U26	Bellcore Issue 6	Level I	8.00	0.093116	1.00	1.0200	0.093116	10739336.70
14S5513800	Integrated Circuit	U32-33	Bellcore Issue 6	Level I	10.00	0.103537	2.00	2.2683	0.207074	9658393.86
14S6025610	Integrated Circuit	U5	Bellcore Issue 6	Level I		0.189533	1.00	2.0762	0.189533	5276139.49
14S6046400	Integrated Circuit	U22	Bellcore Issue 6	Level I	17.00	0.588571	1.00	6.4472	0.588571	1699031.58
14S6202000	Integrated Circuit	U15	Bellcore Issue 6	Level I	10.00	0.329865	1.00	3.6134	0.329865	3031542.00
14S6334600	Integrated Circuit	U7	Bellcore Issue 6	Level I	9.00	0.033819	1.00	.3705	0.033819	29568818.55
14S8203240	Integrated Circuit	U18	Bellcore Issue 6	Level I	15.00	0.106953	1.00	1.1716	0.106953	9349867.27
14S8416800	Integrated Circuit	U16	Bellcore Issue 6	Level I	12.00	0.082348	1.00	.9020	0.082348	12143542.82
14S9055500	Integrated Circuit	U25	Bellcore Issue 6	Level I	7.00	0.072174	1.00	.7906	0.072174	13855483.31
1540700008	Resistor	RN10-11,RN18	Bellcore Issue 6	Level I		0.006246	3.00	.2053	0.018738	160102772.00
1540710008	Resistor	RN19,RN22-25	Bellcore Issue 6	Level I		0.006246	5.00	.3421	0.031230	160102772.00
1540710308	Resistor	RN1-2,RN4-5,RN15	Bellcore Issue 6	Level I		0.006246	5.00	.3421	0.031230	160102772.00
1540733008	Resistor	RN3	Bellcore Issue 6	Level I		0.006246	1.00	.0684	0.006246	160102772.00
1540747208	Resistor	RN6-9,RN12-13,RN16-17,RN20-21- RN26-39	Bellcore Issue 6	Level I		0.006246	24.00	1.6421	0.149904	160102772.00
1651003222	Connection	U13	Bellcore Issue 6	Level I		0.018207	1.00	.1994	0.018207	54923766.92
1651203291	Connection	U15	Bellcore Issue 6	Level I		0.018207	1.00	.1994	0.018207	54923766.92
1651432120	Connection	U6	Bellcore Issue 6	Level I		0.182640	1.00	2.0006	0.182640	5475266.48
1651572000	Connection	SIMM1-2	Bellcore Issue 6	Level I		0.040966	2.00	.8975	0.081932	24410563.08
1652508202	Connection	CN12	Bellcore Issue 6	Level I		0.004552	1.00	.0499	0.004552	219695067.68
1653002100	Connection	CN3-4,JP4	Bellcore Issue 6	Level I		0.001138	3.00	.0374	0.003414	878780270.71
1653003100	Connection	CN6,JP2,JP12	Bellcore Issue 6	Level I		0.001707	3.00	.0561	0.005121	585853513.81
1653003200	Connection	JP1,JP3,JP6,JP8,JP11	Bellcore Issue 6	Level I		0.003414	5.00	.1870	0.017069	292926756.90
1653004100	Connection	JP5	Bellcore Issue 6	Level I		0.002276	1.00	.0249	0.002276	439390135.35
1653004200	Connection	JP7	Bellcore Issue 6	Level I		0.004552	1.00	.0499	0.004552	219695067.68
1653005100	Connection	CN1-2	Bellcore Issue 6	Level I		0.002845	2.00	.0623	0.005690	351512108.28
1653005200	Connection	CN11	Bellcore Issue 6	Level I		0.005690	1.00	.0623	0.005690	175756054.14

