

SBC-411E Reliability Prediction Report (MTBF)

Release Date: MAY.19, 2000

Issue Stamp QA Manager QE Manager Test Engineer

Reliability Prediction (MTBF)

I. Model Name: SBC-411E

II. Description: Half-size CPU Card with Ethernet & SSD

Ⅲ. Prediction Date:MAY. 19, 2000

IV. Prediction Site: AAEON QE Dept.

V. Predicted by: Milo Wang

VI.Equipment: Relex Ver.7.0 Visual Reliability Software

VII. Simulation Environment:

• Temperature: 25 degrees C

• Standard: Telcordia (Bellcore) Standard

VIII. Prediction Result:

Failure Rate: 6.999337 ppmMTBF: 142,871. 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 is always specified in hours.

AAEON Reliability Prediction Report

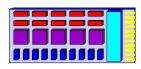
Part Number 9697411003

Reference Des

05. 19, 2000 Date

GF, GU - Ground Fixed, Uncontrolled **Environment**

25.00 **Temperature**



Top-level assembly **Description**

File Name Sbc411E.rpj 9:51 AM Time 6.999337 **Failure Rate** 142,871 **MTBF**

Assembly Name	Part Number	Model	Method	Environment	Duty Cycle	Qty	Failure Rate	MTBF
SBC-411E	9697411003	Bellcore	Method I Case 3	GF, GU - Ground Fixed,	100.00	1.00	6.999337	142,871

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AAEON Reliability Prediction Report

Part Number 9697411003

Reference Des

Date 05. 19, 2000

GF, GU - Ground Fixed, Uncontrolled **Environment**

25.00 **Temperature**



Description File Name

Top-level assembly

Sbc411E.rpj Time 9:51 AM 6.999337 **Failure Rate** 142,871 **MTBF**

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate,%	Failure Rate	MTBF, Unit
14S6025612	Integrated Circuit	U19-20,U22-24	Bellcore Issue 6	Level I	20.00	0.570397	5.00	40.7465	2.851986	1753164.34
1059701001	Resistor	R112,R120,R122-125,R139-140,R-143,R27,R53,R61,R64,R86	Bellcore Issue 6	Level I	.00	0.002268	15.00	.4860	0.034016	440974090.03
1059733001	Resistor	R110-R111,R19,R31,R34,R36,R93	Bellcore Issue 6	Level I	.00	0.002268	7.00	.2268	0.015874	440974090.03
1059703301	Resistor	R105,R107,R117,R127,R21,R97	Bellcore Issue 6	Level I	.00	0.002268	6.00	.1944	0.013606	440974090.03
1059747001	Resistor	R22,R98-R99	Bellcore Issue 6	Level I	.00	0.002268	3.00	.0972	0.006803	440974090.03
1059511311	Resistor	R51	Bellcore Issue 6	Level I	.00	0.002268	1.00	.0324	0.002268	440974090.03
1059500231	Resistor	R52	Bellcore Issue 6	Level I	.00	0.002268	1.00	.0324	0.002268	440974090.03
1059528711	Resistor	R114	Bellcore Issue 6	Level I	.00	0.002268	1.00	.0324	0.002268	440974090.03
1059571531	Resistor	R109	Bellcore Issue 6	Level I	.00	0.002268	1.00	.0324	0.002268	440974090.03
1059700001	Resistor	R121,R130,R146-147,R32-R33,R39- .R41,R45.R85	Bellcore Issue 6	Level I	.00	0.002268	10.00	.3240	0.022677	440974090.03
1059700131	Resistor	R133,R3,R62-63,R80-85	Bellcore Issue 6	Level I	.00	0.002268	10.00	.3240	0.022677	440974090.03
1059701031	Resistor	R1,R102-103,R11,R113,R115,R126-,R131,R30,R35,R4,R42,R49,R5,R5-4-R57,R59,R65-79,R88-90	Bellcore Issue 6	Level I	.00	0.002268	47.00	1.5227	0.106582	440974090.03
1059720001	Resistor	R138	Bellcore Issue 6	Level I	.00	0.002268	1.00	.0324	0.002268	440974090.03
1059722001	Resistor	R116	Bellcore Issue 6	Level I	.00	0.002268	1.00	.0324	0.002268	440974090.03
1059704721	Resistor	R10,R101,R104,R12-18,R24-26,R2- 8-29,R37,R43,R6,R60,R8-9,R94-96	Bellcore Issue 6	Level I	.00	0.002268	24.00	.7776	0.054425	440974090.03
1121701050	Capacitor	BC17,BC21,BC28-29,BC36,BC45 46,BC50,BC52,BC55-56,BC59-60,- BC63,BC66,BC70,BC79,BC81,BC84	Bellcore Issue 6	Level I	.00	0.002539	19.00	.6892	0.048241	393852661.82
1121747660	Capacitor	C22-23,C25-C28,C30-31	Bellcore Issue 6	Level I	.00	0.002539	8.00	.2902	0.020312	393852661.82
1124410050	Capacitor	C1-2,C32-33,C45,C49,C53,C56,C6-3,C66	Bellcore Issue 6	Level I	.00	0.001060	10.00	.1515	0.010602	943198589.05
1124501750	Capacitor	C36-37,C40-41,C43-44,C50,C64,C- 69,C70	Bellcore Issue 6	Level I	.00	0.001060	10.00	.1515	0.010602	943198589.05
1124415050	Capacitor	C3,C34-35,C38-39,C46,C51-52,C6- 2.C65	Bellcore Issue 6	Level I	.00	0.001060	10.00	.1515	0.010602	943198589.05
1124518150	Capacitor	BC88,C5-21	Bellcore Issue 6	Level I	.00	0.001060	18.00	.2727	0.019084	943198589.05
1124447050	Capacitor	C67,C68	Bellcore Issue 6	Level I	.00	0.001060	2.00	.0303	0.002120	943198589.05
1124556150	Capacitor	C4	Bellcore Issue 6	Level I	.00	0.001060	1.00	.0151	0.001060	943198589.05

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AAEON Reliability Prediction Report

Part Number 9697411003

Reference Des

05. 19, 2000 Date

GF, GU - Ground Fixed, Uncontrolled **Environment**

25.00 **Temperature**



Description File Name

Top-level assembly Sbc411E.rpj

Time 9:51 AM **Failure Rate** 142,871 **MTBF**

6.999337

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate,%	Failure Rate	MTBF, Unit
1124701650	Capacitor	BC14-24,BC31-35,BC37-44,BC47,- BC49,BC53-54,BC57-58,BC61-62,- BC64-65,BC67-69,BC71-78,BC80,- BC82-83,BC85-86,C24,C29,C57-59- .C71	Bellcore Issue 6	Level I	.00	0.001060	53.00	.8028	0.056192	943198589.05
1141601090	Capacitor	TC33	Bellcore Issue 6	Level I	.00	0.002357	1.00	.0337	0.002357	424256814.77
1141610050	Capacitor	TC24-25,TC27-32,TC38-40,TC42-4-5,TC47-50	Bellcore Issue 6	Level I	.00	0.002357	19.00	.6398	0.044784	424256814.77
1141647080	Capacitor	TC26,TC34,TC37,TC46	Bellcore Issue 6	Level I	.00	0.002357	4.00	.1347	0.009428	424256814.77
1142610060	Capacitor	TC41	Bellcore Issue 6	Level I	.00	0.001587	1.00	.0227	0.001587	630075050.70
1149610180	Capacitor	TC35-36	Bellcore Issue 6	Level I	.00	0.004535	2.00	.1296	0.009071	220487045.01
1212308050	Inductor	L2-L9	Bellcore Issue 6	Level I	.00	0.002268	8.00	.2592	0.018142	440974090.03
1300414840	Semiconductor	D2	Bellcore Issue 6	Level I	.00	0.023881	1.00	.3412	0.023881	41874327.58
1310390410	Semiconductor	Q2	Bellcore Issue 6	Level I	.00	0.015844	1.00	.2264	0.015844	63113712.43
14S5212500	Integrated Circuit	U6	Bellcore Issue 6	Level I	13.00	0.114774	1.00	1.6398	0.114774	8712810.69
14S5500401	Integrated Circuit	U26	Bellcore Issue 6	Level I	13.00	0.115258	1.00	1.6467	0.115258	8676209.89
14S4021100	Integrated Circuit	U17,U18	Bellcore Issue 6	Level I	8.00	0.104969	2.00	2.9994	0.209938	9526603.44
14S4046400	Integrated Circuit	U29	Bellcore Issue 6	Level I	13.00	0.147672	1.00	2.1098	0.147672	6771770.53
14S4066500	Integrated Circuit	U2	Bellcore Issue 6	Level I	9.00	0.065672	1.00	.9383	0.065672	15227088.64
14S4148700	Integrated Circuit	U7	Bellcore Issue 6	Level I	19.00	0.112292	1.00	1.6043	0.112292	8905354.44
14S4148910	Integrated Circuit	U4	Bellcore Issue 6	Level I	20.00	0.118260	1.00	1.6896	0.118260	8455912.86
14S4486500	Integrated Circuit	U12	Bellcore Issue 6	Level I	33.00	0.225347	1.00	3.2196	0.225347	4437595.93
14S4802910	Integrated Circuit	U1	Bellcore Issue 6	Level I	11.00	0.073313	1.00	1.0474	0.073313	13640096.66
14S5503200	Integrated Circuit	U28	Bellcore Issue 6	Level I	8.00	0.092724	1.00	1.3248	0.092724	10784640.85
14S6334600	Integrated Circuit	U21	Bellcore Issue 6	Level I	9.00	0.033819	1.00	.4832	0.033819	29568818.55
14\$8203250	Integrated Circuit	U8	Bellcore Issue 6	Level I	9.00	0.065672	1.00	.9383	0.065672	15227088.64
14S8416800	Integrated Circuit	U11	Bellcore Issue 6	Level I	11.00	0.070828	1.00	1.0119	0.070828	14118791.86
14S9055500	Integrated Circuit	U25	Bellcore Issue 6	Level I	5.00	0.060449	1.00	.8636	0.060449	16543006.68
1540733082	Resistor	RN1-5	Bellcore Issue 6	Level I	.00	0.006246	5.00	.4462	0.031230	160102772.00
1540747282	Resistor	RN6-11	Bellcore Issue 6	Level I	.00	0.006246	1.00	.0892	0.006246	160102772.00
1651203291	Connection	U14	Bellcore Issue 6	Level I	.00	0.018207	1.00	.2601	0.018207	54923766.92
1231124050	Miscellaneous	Y2	Bellcore Issue 6	Level I	.00	0.150000	1.00	2.1431	0.150000	6666666.67
1231114350	Miscellaneous	X1	Bellcore Issue 6	Level I	.00	0.150000	1.00	2.1431	0.150000	6666666.67

AAEON Reliability Prediction Report

Part Number 9697411003

Reference Des

05. 19, 2000 Date

GF, GU - Ground Fixed, Uncontrolled **Environment**

25.00 **Temperature**



Description File Name

Top-level assembly

Time **Failure Rate**

Sbc411E.rpj 9:51 AM 6.999337

142,871 **MTBF**

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate,%	Failure Rate	MTBF, Unit
4004400000	0	54	D. II		00	0.004077	4.00	0007	0.004077	005000400 04
1304100200	Semiconductor	D1	Bellcore Issue 6	Level I	.00	0.004877	1.00	.0697	0.004877	205063180.81
14D1605200	Semiconductor	Q1	Bellcore Issue 6	Level I	.00	0.039802	1.00	.5686	0.039802	25124596.55
14D3303100	Integrated Circuit	U16	Bellcore Issue 6	Level I	19.00	0.219285	1.00	3.1329	0.219285	4560283.10
14D4488600	Integrated Circuit	U9	Bellcore Issue 6	Level I	14.00	0.157897	1.00	2.2559	0.157897	6333229.12
14S6201010	Integrated Circuit	U14	Bellcore Issue 6	Level I	16.00	0.463238	1.00	6.6183	0.463238	2158717.51
15007103A0	Resistor	RP1-4,RP6-7,RP9-10	Bellcore Issue 6	Level I	.00	0.014053	8.00	1.6063	0.112428	71156787.55
15007472A0	Resistor	RP5,RP8	Bellcore Issue 6	Level I	.00	0.014053	2.00	.4016	0.028107	71156787.55
1651032220	Connection	U10	Bellcore Issue 6	Level I	.00	0.018207	1.00	.2601	0.018207	54923766.92
1651572000	Connection	SIMM1	Bellcore Issue 6	Level I	.00	0.040966	1.00	.5853	0.040966	24410563.08
1653002100	Connection	J1,J2,J9,JP1,JP3	Bellcore Issue 6	Level I	.00	0.001138	5.00	.0813	0.005690	878780270.71
1653003200	Connection	JP2	Bellcore Issue 6	Level I	.00	0.003414	1.00	.0488	0.003414	292926756.90
1653004100	Connection	J3	Bellcore Issue 6	Level I	.00	0.002276	1.00	.0325	0.002276	439390135.35
1653005100	Connection	J6	Bellcore Issue 6	Level I	.00	0.002845	1.00	.0406	0.002845	351512108.28
1653120225	Connection	CON2	Bellcore Issue 6	Level I	.00	0.022759	1.00	.3252	0.022759	43939013.54
1653132220	Connection	CON1	Bellcore Issue 6	Level I	.00	0.036414	1.00	.5203	0.036414	27461883.46
1653205200	Connection	CN5,CN6	Bellcore Issue 6	Level I	.00	0.005690	2.00	.1626	0.011379	175756054.14
1653213201	Connection	CN3	Bellcore Issue 6	Level I	.00	0.014793	1.00	.2114	0.014793	67598482.36
1653217202	Connection	CN2	Bellcore Issue 6	Level I	.00	0.019345	1.00	.2764	0.019345	51692957.10
1653220203	Connection	CN1	Bellcore Issue 6	Level I	.00	0.022759	1.00	.3252	0.022759	43939013.54
1655106011	Connection	CN4	Bellcore Issue 6	Level I	.00	0.085346	1.00	1.2193	0.085346	11717070.28
1654606200	Connection	CN11	Bellcore Issue 6	Level I	.00	0.003414	1.00	.0488	0.003414	292926756.90
1655005021	Connection	CN10	Bellcore Issue 6	Level I	.00	0.002845	1.00	.0406	0.002845	351512108.28
1752000500	Miscellaneous	F1	Bellcore Issue 6	Level I	.00	0.030000	1.00	.4286	0.030000	33333333.33
1759100002	Miscellaneous	BZ1	Bellcore Issue 6	Level I	.00	0.150000	1.00	2.1431	0.150000	6666666.67
1231120050	Miscellaneous	Y1	Bellcore Issue 6	Level I	.00	0.150000	1.00	2.1431	0.150000	6666666.67
1304100300	Semiconductor	LED1	Bellcore Issue 6	Level I	.00	0.004877	1.00	.0697	0.004877	205063180.81
14D3000110	Integrated Circuit	U3	Bellcore Issue 6	Level I	.00	0.031683	1.00	.4527	0.031683	31562338.41
1652508202	Connection	CN7	Bellcore Issue 6	Level I	.00	0.004552	1.00	.0650	0.004552	219695067.68
1653002200	Connection	J4,J5	Bellcore Issue 6	Level I	.00	0.002276	1.00	.0325	0.002276	439390135.35