



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

SBC-656

Reliability Prediction Report

(MTBF)

Release Date: Jan. 27, 2000

Issue Stamp

QA Manager

QE Manager

Test Engineer

Reliability Prediction (MTBF)

I . Model Name: SBC-656

II . Description: Intel Celeron Half-size CPU Card with LCD, Ethernet, & SSD

III. Prediction Date: Jan. 27, 2000

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:

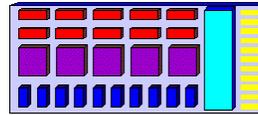
- **Failure Rate: 8.329000 ppm**
- **MTBF: 120,062. hours**

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 9697656001-2
Reference Des
Date 01. 27, 2000
Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00

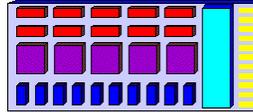


Description Top-level assembly
File Name 656a11.RPJ
Time 10:58 AM
Failure Rate 8.329000
MTBF 120,062

Assembly Name	Part Number	Model	Method	Environment	Duty Cycle	Qty	Failure Rate	MTBF
SBC-656	9697656001-2	Bellcore	Method I Case 3	GF, GU - Ground Fixed,	100.00	1.00	8.329000	120,062

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Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00

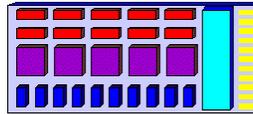


Description Top-level assembly
File Name 656a11.RPJ
Time 10:58 AM
Failure Rate 8.329000
MTBF 120,062

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
106B501030	Resistor	J1	Bellcore Issue 6	Level I		0.011379	1.00	.1366	0.011379	87878027.07
1111622191	Capacitor	C5,C9	Bellcore Issue 6	Level I		0.027242	2.00	.6541	0.054484	36707972.85
1119610291	Capacitor	C1,C11,C13-15	Bellcore Issue 6	Level I		0.075338	5.00	4.5226	0.376691	13273483.15
1119610293	Capacitor	C4,C8	Bellcore Issue 6	Level I		0.071121	2.00	1.7078	0.142243	14060484.33
1211100101	Inductor	L1	Bellcore Issue 6	Level I		0.086173	1.00	1.0346	0.086173	11604581.32
1211102764	Inductor	L2	Bellcore Issue 6	Level I		0.086173	1.00	1.0346	0.086173	11604581.32
1233314350	Miscellaneous	X2	Bellcore Issue 6	Level I		0.360000	1.00	4.3222	0.360000	2777777.78
1233324050	Miscellaneous	X3	Bellcore Issue 6	Level I		0.360000	1.00	4.3222	0.360000	2777777.78
1314108301	Integrated Circuit	Q4	Bellcore Issue 6	Level I	23.00	0.283084	1.00	3.3988	0.283084	3532517.66
1314108501	Integrated Circuit	Q1	Bellcore Issue 6	Level I	14.00	0.157897	1.00	1.8958	0.157897	6333229.12
1540747208	Resistor	RN12	Bellcore Issue 6	Level I		0.006246	1.00	.0750	0.006246	160102772.00
1651003222	Connection	U19	Bellcore Issue 6	Level I		0.018207	1.00	.2186	0.018207	54923766.92
1651584490	Connection	DIMM	Bellcore Issue 6	Level I		0.095587	1.00	1.1476	0.095587	10461669.89
1651607920	Connection	CPU1	Bellcore Issue 6	Level I		0.210519	1.00	2.5275	0.210519	4750163.63
1652512200	Connection	CN14	Bellcore Issue 6	Level I		0.006828	1.00	.0820	0.006828	146463378.45
1653003101	Connection	J3	Bellcore Issue 6	Level I		0.001707	1.00	.0205	0.001707	585853513.81
1653003201	Connection	J4-5	Bellcore Issue 6	Level I		0.003414	3.00	.1230	0.010241	292926756.90
1653005201	Connection	CN7	Bellcore Issue 6	Level I		0.005690	1.00	.0683	0.005690	175756054.14
1653120225	Connection	CN5	Bellcore Issue 6	Level I		0.022759	1.00	.2732	0.022759	43939013.54
1653132220	Connection	CN4	Bellcore Issue 6	Level I		0.036414	1.00	.4372	0.036414	27461883.46
1654106020	Connection	CN11	Bellcore Issue 6	Level I		0.004552	1.00	.0546	0.004552	219695067.68
1655003000	Connection	CN1	Bellcore Issue 6	Level I		0.001707	1.00	.0205	0.001707	585853513.81
1655112010	Connection	PWR1	Bellcore Issue 6	Level I		0.006828	1.00	.0820	0.006828	146463378.45
1659254005	Connection	CN8	Bellcore Issue 6	Level I		0.002845	1.00	.0342	0.002845	351512108.28
1750119013	Miscellaneous	BT1	Bellcore Issue 6	Level I		0.900000	1.00	10.8056	0.900000	1111111.11
1759400002	Miscellaneous	BZ1	Bellcore Issue 6	Level I		0.150000	1.00	1.8009	0.150000	6666666.67
101A501039	Resistor	R198-200,R202-203	Bellcore Issue 6	Level I		0.002268	5.00	.1361	0.011339	440974090.03
101A590929	Resistor	R207	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
101A700009	Resistor	R2,R55,R178,R174,RP5-8,RP13	Bellcore Issue 6	Level I		0.002268	9.00	.2450	0.020409	440974090.03
101A701009	Resistor	R68,R70-72,R74,R78-80,R85,R96--99,R102-103,R106,R108-110,R205	Bellcore Issue 6	Level I		0.002268	20.00	.5445	0.045354	440974090.03

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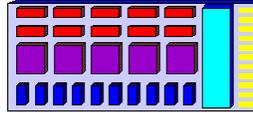


Description Top-level assembly
File Name 656a11.RPJ
Time 10:58 AM
Failure Rate 8.329000
MTBF 120,062

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
101A702059	Resistor	R32	Bellcore Issue 6	Level I		0.013606	1.00	.1634	0.013606	73495681.67
101A702209	Resistor	R39,R83,R130	Bellcore Issue 6	Level I		0.002268	3.00	.0817	0.006803	440974090.03
101A703309	Resistor	R23-24,R111,R147,R171,R183-184-R191	Bellcore Issue 6	Level I		0.002268	8.00	.2178	0.018142	440974090.03
101A704709	Resistor	R104	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
101A704729	Resistor	R13-15,R17,R25,R38,R56-57,R95,-R107,R117,R123,R134,R175,R186-R188,R215-216	Bellcore Issue 6	Level I		0.002268	18.00	.4901	0.040819	440974090.03
101A705629	Resistor	R41-42,R51,R81,R100,R125,R139-R179,R190,R195	Bellcore Issue 6	Level I		0.002268	10.00	.2723	0.022677	440974090.03
101A707509	Resistor	R59-65	Bellcore Issue 6	Level I		0.002268	7.00	.1906	0.015874	440974090.03
101A708229	Resistor	R5,R10-12,R18,R20-22,R27-31,R33-37,R46,R76,R122,R144-145,R156,R158-159,R163-165,R167,R169--170,R172-173,R176-177,R180,R182,R185,R187	Bellcore Issue 6	Level I		0.002268	40.00	1.0891	0.090708	440974090.03
101A710019	Resistor	R7,R53,R88-89,R92,R118,R121,R124,R154,R189,R194,R196-197,R210-214	Bellcore Issue 6	Level I		0.002268	18.00	.4901	0.040819	440974090.03
101A710029	Resistor	R73,R146	Bellcore Issue 6	Level I		0.002268	2.00	.0545	0.004535	440974090.03
101A715029	Resistor	R66-67	Bellcore Issue 6	Level I		0.002268	2.00	.0545	0.004535	440974090.03
101A733009	Resistor	R58,R91,R93,R112,R115-116,R119--120,R126,R129,R132,R148,R153,-R157,R160-162	Bellcore Issue 6	Level I		0.002268	17.00	.4629	0.038551	440974090.03
101A747009	Resistor	R43-44,R113,R143	Bellcore Issue 6	Level I		0.002268	4.00	.1089	0.009071	440974090.03
105A502833	Resistor	R201	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
105A504763	Resistor	R69,R82	Bellcore Issue 6	Level I		0.002268	2.00	.0545	0.004535	440974090.03
105A505103	Resistor	R75,R105	Bellcore Issue 6	Level I		0.002268	2.00	.0545	0.004535	440974090.03
105A507503	Resistor	R114,R128,R135	Bellcore Issue 6	Level I		0.002268	3.00	.0817	0.006803	440974090.03
105A510003	Resistor	R8,R16,R141,R209	Bellcore Issue 6	Level I		0.002268	4.00	.1089	0.009071	440974090.03
105A510703	Resistor	RR3	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
105A511503	Resistor	RR1	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
105A515003	Resistor	R94,R131,R133,R86,R127,R136,R140	Bellcore Issue 6	Level I		0.002268	7.00	.1906	0.015874	440974090.03
105A518703	Resistor	RR2	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
105A521033	Resistor	R208	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03

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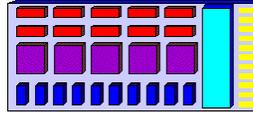


Description Top-level assembly
File Name 656a11.RPJ
Time 10:58 AM
Failure Rate 8.329000
MTBF 120,062

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
105A549963	Resistor	R47-50	Bellcore Issue 6	Level I		0.002268	4.00	.1089	0.009071	440974090.03
105A553603	Resistor	RR4	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
105A556003	Resistor	R19	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
105A560423	Resistor	R204,R206	Bellcore Issue 6	Level I		0.002268	2.00	.0545	0.004535	440974090.03
105A700333	Resistor	R84	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
105A701823	Resistor	R45	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
105A702233	Resistor	R150	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
105A702723	Resistor	R3,R6,R26,R77,R137,R142,R149,- R151,R155,R166,R168,R181	Bellcore Issue 6	Level I		0.002268	13.00	.3539	0.029480	440974090.03
105A705603	Resistor	R87,R138	Bellcore Issue 6	Level I		0.002268	2.00	.0545	0.004535	440974090.03
105A707523	Resistor	R101	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
105A710033	Resistor	R9,R40	Bellcore Issue 6	Level I		0.002268	2.00	.0545	0.004535	440974090.03
105A747033	Resistor	R54,R193	Bellcore Issue 6	Level I		0.002268	2.00	.0545	0.004535	440974090.03
105A756033	Resistor	R52,R192	Bellcore Issue 6	Level I		0.002268	2.00	.0545	0.004535	440974090.03
105A768003	Resistor	R90	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
1121747660	Capacitor	C17,C23-25	Bellcore Issue 6	Level I		0.002539	4.00	.1219	0.010156	393852661.82
1122701680	Capacitor	M1-129	Bellcore Issue 6	Level I		0.001598	129.00	2.4743	0.206085	625953979.55
1124501780	Capacitor	C38	Bellcore Issue 6	Level I		0.001060	1.00	.0127	0.001060	943198589.05
1124510080	Capacitor	C29,C31-33,C35-37,C40-41,C46,C- 55,C59	Bellcore Issue 6	Level I		0.001060	12.00	.1528	0.012723	943198589.05
1124510180	Capacitor	C39	Bellcore Issue 6	Level I		0.001060	1.00	.0127	0.001060	943198589.05
1124510280	Capacitor	C22,C51,C53-54,C60	Bellcore Issue 6	Level I		0.001060	5.00	.0636	0.005301	943198589.05
1124515080	Capacitor	C2-3,C20-21	Bellcore Issue 6	Level I		0.001060	4.00	.0509	0.004241	943198589.05
1124518180	Capacitor	CC1-CC17	Bellcore Issue 6	Level I		0.001060	17.00	.2164	0.018024	943198589.05
1124520080	Capacitor	C18-19,C45	Bellcore Issue 6	Level I		0.001060	3.00	.0382	0.003181	943198589.05
1124522180	Capacitor	C43	Bellcore Issue 6	Level I		0.001060	1.00	.0127	0.001060	943198589.05
1124547180	Capacitor	C61-62	Bellcore Issue 6	Level I		0.001060	2.00	.0255	0.002120	943198589.05
1124547280	Capacitor	C44	Bellcore Issue 6	Level I		0.001060	1.00	.0127	0.001060	943198589.05
1129610290	Capacitor	C26	Bellcore Issue 6	Level I		0.000712	1.00	.0086	0.000712	1403854368.14
1129701080	Capacitor	C16,C34,C42,C47-48,C56	Bellcore Issue 6	Level I		0.005466	6.00	.3937	0.032794	182961702.19
1129747650	Capacitor	P1-16,C57-58	Bellcore Issue 6	Level I		0.005466	18.00	1.1812	0.098381	182961702.19
1141610050	Capacitor	F1-15	Bellcore Issue 6	Level I		0.002357	15.00	.4245	0.035356	424256814.77

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Temperature 25.00



Description Top-level assembly
File Name 656a11.RPJ
Time 10:58 AM
Failure Rate 8.329000
MTBF 120,062

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1141622060	Capacitor	C50	Bellcore Issue 6	Level I		0.002357	1.00	.0283	0.002357	424256814.77
1142610060	Capacitor	C27-28	Bellcore Issue 6	Level I		0.001587	2.00	.0381	0.003174	630075050.70
1149633190	Capacitor	C6-7,C10,C12,C30,C49,C52,C63-66	Bellcore Issue 6	Level I		0.004933	11.00	.6515	0.054261	202722669.92
1174510180	Capacitor	NC2,NC4-5,NC7	Bellcore Issue 6	Level I		0.001060	16.00	.2037	0.016964	943198589.05
1174547080	Capacitor	NC1,NC3,NC6,NC8	Bellcore Issue 6	Level I		0.001060	16.00	.2037	0.016964	943198589.05
1211102200	Inductor	L18	Bellcore Issue 6	Level I		0.002268	1.00	.0272	0.002268	440974090.03
1212306031	Inductor	L6-L9,L11-15	Bellcore Issue 6	Level I		0.002268	9.00	.2450	0.020409	440974090.03
1212308050	Inductor	L3-5,L10,L16-17,L19-30	Bellcore Issue 6	Level I		0.002268	18.00	.4901	0.040819	440974090.03
1231314320	Miscellaneous	Y1	Bellcore Issue 6	Level I		0.150000	1.00	1.8009	0.150000	6666666.67
1231332721	Miscellaneous	Y2	Bellcore Issue 6	Level I		0.150000	1.00	1.8009	0.150000	6666666.67
1233350050	Miscellaneous	X1	Bellcore Issue 6	Level I		0.360000	1.00	4.3222	0.360000	2777777.78
1300003240	Semiconductor	D4	Bellcore Issue 6	Level I		0.023881	1.00	.2867	0.023881	41874327.58
1300014040	Semiconductor	D1	Bellcore Issue 6	Level I		0.023881	1.00	.2867	0.023881	41874327.58
1300283540	Semiconductor	D5	Bellcore Issue 6	Level I		0.023881	1.00	.2867	0.023881	41874327.58
1300414800	Semiconductor	D3	Bellcore Issue 6	Level I		0.023881	1.00	.2867	0.023881	41874327.58
1301005440	Semiconductor	D2	Bellcore Issue 6	Level I		0.023881	1.00	.2867	0.023881	41874327.58
1304100540	Semiconductor	LED1	Bellcore Issue 6	Level I		0.004877	1.00	.0585	0.004877	205063180.81
1314108513	Integrated Circuit	Q5	Bellcore Issue 6	Level I	3.00	0.073774	1.00	.8857	0.073774	13554975.01
1315500310	Semiconductor	Q2,Q6	Bellcore Issue 6	Level I	10.00	0.105122	2.00	2.5242	0.210244	9512757.37
14S3128420	Integrated Circuit	U14	Bellcore Issue 6	Level I	6.00	0.091286	1.00	1.0960	0.091286	10954631.16
14S3155300	Integrated Circuit	U1	Bellcore Issue 6	Level I	12.00	0.138049	1.00	1.6574	0.138049	7243806.82
14S3200400	Integrated Circuit	U23	Bellcore Issue 6	Level I		0.059366	1.00	.7128	0.059366	16844654.92
14S3924800	Integrated Circuit	U2	Bellcore Issue 6	Level I	28.00	0.386120	1.00	4.6359	0.386120	2589866.28
14S4021300	Integrated Circuit	U16,U20	Bellcore Issue 6	Level I	4.00	0.079239	2.00	1.9027	0.158478	12620044.05
14S4048500	Integrated Circuit	U17-18	Bellcore Issue 6	Level I	5.00	0.085069	2.00	2.0427	0.170138	11755142.30
14S4070610	Integrated Circuit	U9	Bellcore Issue 6	Level I	4.00	0.079239	1.00	.9514	0.079239	12620044.05
14S4237120	Integrated Circuit	U6	Bellcore Issue 6	Level I	7.00	0.058743	1.00	.7053	0.058743	17023277.62
14S4244300	Integrated Circuit	U3	Bellcore Issue 6	Level I	16.00	0.095944	1.00	1.1519	0.095944	10422762.91
14S4378100	Integrated Circuit	U21	Bellcore Issue 6	Level I	4.00	0.079239	1.00	.9514	0.079239	12620044.05
14S4397700	Integrated Circuit	U11	Bellcore Issue 6	Level I	8.00	0.062123	1.00	.7459	0.062123	16097220.79
14S4813902	Integrated Circuit	U10	Bellcore Issue 6	Level I	7.00	0.058743	1.00	.7053	0.058743	17023277.62

