



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

HSB-660S A0.2

Reliability Prediction Report

(MTBF)

Release Date: Aug. 12, 2003

08-12-2003

Issue Stamp

Wayne Chen

A.V.P

Rex Chang

Test Engineer

Reliability Prediction (MTBF)

. Model Name: HSB-660I A0.2 (CPU : Pentium 1.26GHz)

.Description: Half-size CPU Card.

. Prediction Date: Aug. 12. 2003

. Prediction Site: AAeon DV Dept.

. Predicted by : Rex Chang

. Equipment: Relx Ver.7.2 Visual Reliability Software

. Simulation Environment:

Temperature: 22.0 degrees C (No temperature rise condition)

Standard: Telcordia (Bellcore) Standard

. 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.

IX. Prediction Result:

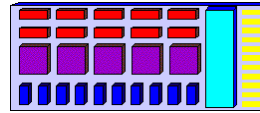
Failure Rate: 12.277660ppm

MTBF: 88,671Hours (about 10.12 years)

X. Prediction Table:

AAEON Reliability Prediction Report

Part Number System
Reference Des
Date 08. 11, 2003
Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00

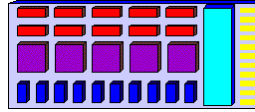


Description Top-level assembly
File Name HSB-660S_I.RPJ
Time 1:47 PM
Failure Rate 11.277660
MTBF 88,671

Assembly Name	Part Number	Model	Method	Environment	Duty Cycle	Qty	Failure Rate	MTBF
System	System	Bellcore	Method I Case 3	GF, GU - Ground Fixed,	100.00	1.00	11.277660	88,671

AAEON Reliability Prediction Report

Part Number System
Reference Des
Date 08. 11, 2003
Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00

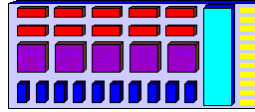


Description Top-level assembly
File Name HSB-660S_I.RPJ
Time 1:47 PM
Failure Rate 11.277660
MTBF 88,671

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1653007204	Connection	CN1	Bellcore Issue 6	Level I		0.007966	1.00	.0706	0.007966	125540038.67
1653220208	Connection	CN4	Bellcore Issue 6	Level I		0.022759	1.00	.2018	0.022759	43939013.54
1655420020	Connection	CN8	Bellcore Issue 6	Level I		0.011379	1.00	.1009	0.011379	87878027.07
1653005100	Connection	CN16	Bellcore Issue 6	Level I		0.002845	1.00	.0252	0.002845	351512108.28
106B501030	Resistor	RT1,RT2	Bellcore Issue 6	Level I		0.011379	2.00	.2018	0.022759	87878027.07
1211100105	Inductor	L1	Bellcore Issue 6	Level I	9.10	0.102451	1.00	.9084	0.102451	9760726.59
1651584490	Connection	DIMM1	Bellcore Issue 6	Level I		0.095587	1.00	.8476	0.095587	10461669.89
1653120225	Connection	CN17	Bellcore Issue 6	Level I		0.022759	1.00	.2018	0.022759	43939013.54
1653006101	Connection	CN20	Bellcore Issue 6	Level I		0.003414	1.00	.0303	0.003414	292926756.90
1654606303	Connection	CN22	Bellcore Issue 6	Level I		0.003414	1.00	.0303	0.003414	292926756.90
1189668190	Capacitor	EC1,EC2	Bellcore Issue 6	Level I		0.004933	2.00	.0875	0.009866	202722669.92
1653003201	Connection	JP1*2,JP2-4	Bellcore Issue 6	Level I		0.003414	5.00	.1514	0.017069	292926756.90
1653003101	Connection	JP5	Bellcore Issue 6	Level I		0.001707	1.00	.0151	0.001707	585853513.81
1653005200	Connection	JP6	Bellcore Issue 6	Level I		0.005690	1.00	.0505	0.005690	175756054.14
1211102560	Inductor	L2	Bellcore Issue 6	Level I	12.10	0.108224	1.00	.9596	0.108224	9240063.72
1750119011	Miscellaneous	BAT1	Bellcore Issue 6	Level I		0.900000	1.00	7.9804	0.900000	1111111.11
1653013202	Connection	CN3	Bellcore Issue 6	Level I		0.014793	1.00	.1312	0.014793	67598482.36
1653017201	Connection	CN5	Bellcore Issue 6	Level I		0.019345	1.00	.1715	0.019345	51692957.10
1653017202	Connection	CN12,CN6,CN7,CN9	Bellcore Issue 6	Level I		0.005690	4.00	.2018	0.022759	175756054.14
1654020000	Connection	CN10	Bellcore Issue 6	Level I		0.011379	1.00	.1009	0.011379	87878027.07
1654040000	Connection	CN13	Bellcore Issue 6	Level I		0.022759	1.00	.2018	0.022759	43939013.54
1652512200	Connection	CN14-15	Bellcore Issue 6	Level I		0.006828	2.00	.1211	0.013655	146463378.45
1653132220	Connection	CN17	Bellcore Issue 6	Level I		0.036414	1.00	.3229	0.036414	27461883.46
1655304020	Connection	CN18	Bellcore Issue 6	Level I		0.002276	1.00	.0202	0.002276	439390135.35
1655003010	Connection	CN19	Bellcore Issue 6	Level I		0.001707	1.00	.0151	0.001707	585853513.81
1655005021	Connection	CN21	Bellcore Issue 6	Level I		0.002845	1.00	.0252	0.002845	351512108.28
1651607921	Connection	SKT1	Bellcore Issue 6	Level I		0.210519	1.00	1.8667	0.210519	4750163.63
14S6290401	Integrated Circuit	U12	Bellcore Issue 6	Level I		0.160483	1.00	1.4230	0.160483	6231185.16
1169615210	Capacitor	EC3-4,EC6-7	Bellcore Issue 6	Level I		0.157666	4.00	5.5922	0.630664	6342524.36
1654415304	Connection	CN11	Bellcore Issue 6	Level I		0.008535	1.00	.0757	0.008535	117170702.76
1540701380	Resistor	RP59	Bellcore Issue 6	Level I		0.006246	1.00	.0554	0.006246	160102772.00

AAEON Reliability Prediction Report

Part Number System
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Date 08. 11, 2003
Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00

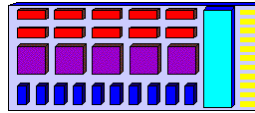


Description Top-level assembly
File Name HSB-660S_I.RPJ
Time 1:47 PM
Failure Rate 11.277660
MTBF 88,671

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1231324551	Miscellaneous	Y4	Bellcore Issue 6	Level I		0.150000	1.00	1.3301	0.150000	6666666.67
105A561903	Resistor	R234	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
1315993310	Semiconductor	Q22	Bellcore Issue 6	Level I		0.159207	1.00	1.4117	0.159207	6281149.14
1540722084	Resistor	RP1,RP10-11,RP16-17,RP26,RP4-5- RP8-9	Bellcore Issue 6	Level I		0.006246	10.00	.5538	0.062460	160102772.00
15407560A0	Resistor	RP18-25,RP27-29,RP32-34	Bellcore Issue 6	Level I		0.006246	14.00	.7754	0.087444	160102772.00
1540747282	Resistor	RP35-36,RP38-41,RP43,RP45-48,R- P64-66,RP68-71	Bellcore Issue 6	Level I		0.006246	18.00	.9969	0.112428	160102772.00
1540756280	Resistor	RP44,RP67	Bellcore Issue 6	Level I		0.006246	2.00	.1108	0.012492	160102772.00
105A511503	Resistor	R5	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
1124510180	Capacitor	C14,C23-24,C27	Bellcore Issue 6	Level I		0.001060	4.00	.0376	0.004241	943198589.05
1124547080	Capacitor	C101-102,C119-120,C122-123,C17- -18,C25,C30,C36-39,C57	Bellcore Issue 6	Level I		0.001060	15.00	.1410	0.015903	943198589.05
1124522080	Capacitor	C21,C22	Bellcore Issue 6	Level I		0.001060	2.00	.0188	0.002120	943198589.05
1129747650	Capacitor	C142,C149,C156,C166,C186,C188- ,C223-224,C227,C229,C231,C29,C- 41-42	Bellcore Issue 6	Level I		0.002722	14.00	.3379	0.038112	367335960.60
1124501780	Capacitor	C103,C107-108,C128-129,C131,C- 163,C181,C191,C193,C204-207,C2- 20-221,C43,C49,C54,C65,C83	Bellcore Issue 6	Level I		0.001060	21.00	.1974	0.022265	943198589.05
1124527180	Capacitor	C10-11	Bellcore Issue 6	Level I		0.001060	2.00	.0188	0.002120	943198589.05
14S4048500	Integrated Circuit	U17-18	Bellcore Issue 6	Level I		0.059366	2.00	1.0528	0.118732	16844654.92
14S2039300	Integrated Circuit	U19	Bellcore Issue 6	Level I		0.045998	1.00	.4079	0.045998	21739992.33
14S5500401	Integrated Circuit	U24	Bellcore Issue 6	Level I		0.065211	1.00	.5782	0.065211	15334865.74
14S5A00700	Integrated Circuit	U27	Bellcore Issue 6	Level I	10.70	0.069538	1.00	.6166	0.069538	14380709.91
14S4070610	Integrated Circuit	U28	Bellcore Issue 6	Level I	10.50	0.124675	1.00	1.1055	0.124675	8020834.01
14S5524400	Integrated Circuit	U30	Bellcore Issue 6	Level I	17.50	0.142179	1.00	1.2607	0.142179	7033391.37
14S3505600	Integrated Circuit	U33	Bellcore Issue 6	Level I	23.30	0.139980	1.00	1.2412	0.139980	7143885.05
1122710090	Capacitor	C44	Bellcore Issue 6	Level I		0.001598	1.00	.0142	0.001598	625953979.55
1124510080	Capacitor	C157-158,C169-177,C209-212,C2- 14-215,C62,C74	Bellcore Issue 6	Level I		0.001060	19.00	.1786	0.020144	943198589.05
1121722650	Capacitor	C77	Bellcore Issue 6	Level I		0.002539	1.00	.0225	0.002539	393852661.82
1124527080	Capacitor	C159-160,C218-219	Bellcore Issue 6	Level I		0.001060	4.00	.0376	0.004241	943198589.05

AAEON Reliability Prediction Report

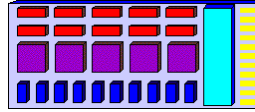
Part Number System
Reference Des
Date 08. 11, 2003
Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00



Description Top-level assembly
File Name HSB-660S_I.RPJ
Time 1:47 PM
Failure Rate 11.277660
MTBF 88,671

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
105A704723	Resistor	R10,R110-113,R115,R120,R148-149,R164-165,R169,R182-184,R189-190,R192-193,R206-208,R222-223,R228,R308,R342,R344,R351-352,R358,R57,R62-63,R74,R76,R83,R85,R94	Bellcore Issue 6	Level I		0.002268	39.00	.7842	0.088441	440974090.03
105A702723	Resistor	R12,R22,R229,R354-355,R58,R80,-R98-99	Bellcore Issue 6	Level I		0.002268	9.00	.1810	0.020409	440974090.03
105A507503	Resistor	R13,R130,R144,R16-17,R269,R291	Bellcore Issue 6	Level I		0.002268	7.00	.1408	0.015874	440974090.03
105A702233	Resistor	R20	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A701033	Resistor	R100-101,R129,R131,R155,R175,R179,R188,R220-221,R224,R232,R236,R242-243,R245-246,R25-26,R270,R284,R286,R293,R295,R32,R32-4,R48,R52,R64,R66	Bellcore Issue 6	Level I		0.002268	30.00	.6032	0.068031	440974090.03
105A703303	Resistor	FB30-31,FB34-35,FB37,FB39-40,FB43,R104,R119,R151,R18,R180-181,R19,R212,R226,R23-24,R255,R27-30,R33,R42,R82,R91-92	Bellcore Issue 6	Level I		0.002268	29.00	.5831	0.065764	440974090.03
105A710003	Resistor	R150,R96	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
105A705603	Resistor	R265,R51	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
105A733003	Resistor	R213,R244,R281-282,R304,R320,R329,R332,R335,R339,R346,R353,R60,R77,R87-88,R90,R95,R97	Bellcore Issue 6	Level I		0.002268	19.00	.3821	0.043086	440974090.03
105A515003	Resistor	R146,R268,R290,R78-79	Bellcore Issue 6	Level I		0.002268	5.00	.1005	0.011339	440974090.03
105A706803	Resistor	R253-254,R93	Bellcore Issue 6	Level I		0.002268	3.00	.0603	0.006803	440974090.03
105A708223	Resistor	R108,R285	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
105A704733	Resistor	R121,R135	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
105A756033	Resistor	R123,R139,R141,R143	Bellcore Issue 6	Level I		0.002268	4.00	.0804	0.009071	440974090.03
105A704763	Resistor	R126-127,R166-167,R287	Bellcore Issue 6	Level I		0.002268	5.00	.1005	0.011339	440974090.03
105A501033	Resistor	R133,R171,R176-177,R292	Bellcore Issue 6	Level I		0.002268	5.00	.1005	0.011339	440974090.03
105A553623	Resistor	R170	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A514703	Resistor	R186	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A501003	Resistor	R199	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03

AAEON Reliability Prediction Report



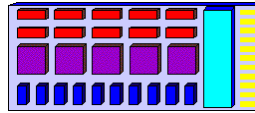
Part Number System
Reference Des
Date 08. 11, 2003
Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00

Description Top-level assembly
File Name HSB-660S_I.RPJ
Time 1:47 PM
Failure Rate 11.277660
MTBF 88,671

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
105A715003	Resistor	R219,R328,R330-331,R348-350	Bellcore Issue 6	Level I		0.002268	7.00	.1408	0.015874	440974090.03
105A707503	Resistor	R240-241,R261-262,R283,R302-3-03,R319	Bellcore Issue 6	Level I		0.002268	8.00	.1609	0.018142	440974090.03
105A701823	Resistor	R263	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A501223	Resistor	R322	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A533003	Resistor	R323	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A505603	Resistor	R338	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A705103	Resistor	R343	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A501403	Resistor	R347	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
14S1488000	Integrated Circuit	U1	Bellcore Issue 6	Level I		0.059366	1.00	.5264	0.059366	16844654.92
14S4860600	Integrated Circuit	U3	Bellcore Issue 6	Level I	13.50	0.083959	1.00	.7445	0.083959	11910536.23
14S4268601	Integrated Circuit	U5	Bellcore Issue 6	Level I	13.60	0.084412	1.00	.7485	0.084412	11846650.03
14S4021310	Integrated Circuit	U6	Bellcore Issue 6	Level I		0.059366	1.00	.5264	0.059366	16844654.92
14S4255101	Integrated Circuit	U9	Bellcore Issue 6	Level I	9.20	0.066404	1.00	.5888	0.066404	15059442.94
14S3831600	Integrated Circuit	U11	Bellcore Issue 6	Level I	16.90	0.100613	1.00	.8921	0.100613	9939089.98
1651203291	Connection	U12	Bellcore Issue 6	Level I		0.018207	1.00	.1614	0.018207	54923766.92
105A501633	Resistor	R158	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A704703	Resistor	R198,R214	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
105A549963	Resistor	R200,R238-239,R259-260,R280,R-298-301,R315-316,R318	Bellcore Issue 6	Level I		0.002268	13.00	.2614	0.029480	440974090.03
105A710033	Resistor	R209-210,R230,R237,R250	Bellcore Issue 6	Level I		0.002268	5.00	.1005	0.011339	440974090.03
105A702033	Resistor	R271	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A768003	Resistor	R327	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A511103	Resistor	R341	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
1759100006	Miscellaneous	SP1	Bellcore Issue 6	Level I		0.150000	1.00	1.3301	0.150000	6666666.67
14S5A01400	Integrated Circuit	U15,U2,U35	Bellcore Issue 6	Level I		0.059366	1.00	.5264	0.059366	16844654.92
14S3020011	Integrated Circuit	U4	Bellcore Issue 6	Level I	14.20	0.160018	1.00	1.4189	0.160018	6249310.80
14S6334610	Integrated Circuit	U7	Bellcore Issue 6	Level I		0.030598	1.00	.2713	0.030598	32681842.61
14S3000201	Inductor	U10	Bellcore Issue 6	Level I		0.136062	1.00	1.2065	0.136062	7349568.17
105A518703	Resistor	R4	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
1231314350	Miscellaneous	Y2	Bellcore Issue 6	Level I		0.150000	1.00	1.3301	0.150000	6666666.67
1231325050	Miscellaneous	Y3,Y5	Bellcore Issue 6	Level I		0.150000	2.00	2.6601	0.300000	6666666.67

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Part Number System
Reference Des
Date 08. 11, 2003
Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00



Description Top-level assembly
File Name HSB-660S_I.RPJ
Time 1:47 PM
Failure Rate 11.277660
MTBF 88,671

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1129701080	Capacitor	C109,C12-13,C132,C141,C143,C1-45,C147-148,C161-162,C164-165,-C167-168,C182-184,C19,C197-198-,C20,C208,C222,C230,C31-32,C34--35,C6,C63,C8-9,C85	Bellcore Issue 6	Level I		0.002722	34.00	.8207	0.092558	367335960.60
105A700003	Resistor	C151,FB19-20,FB29,FB36,FB56-57-,FB66,FB76,R103,R122,R134,R136-,R14,R147,R185,R191,R203,R256,-R275,R277,R313,R317,R321,R337-,R357,R47,R73,R86	Bellcore Issue 6	Level I		0.002268	29.00	.5831	0.065764	440974090.03
1059701001	Resistor	R21	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A708203	Resistor	R153-154,R31	Bellcore Issue 6	Level I		0.002268	3.00	.0603	0.006803	440974090.03
105A502200	Resistor	R114,R215-218,R252,R272-273,R-310-311,R34,R36-37,R39-41,R43--45,R65,R67-68,R70-72	Bellcore Issue 6	Level I		0.002268	25.00	.5027	0.056693	440974090.03
105A705623	Resistor	R152,R156	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
105A701003	Resistor	FB16,FB23,R288-289,R61	Bellcore Issue 6	Level I		0.002268	5.00	.1005	0.011339	440974090.03
105A747003	Resistor	R106	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A701523	Resistor	R116-117	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
105A747033	Resistor	R124,R137-138,R142	Bellcore Issue 6	Level I		0.002268	4.00	.0804	0.009071	440974090.03
105A702203	Resistor	R132,R172-174,R249,R249,R251	Bellcore Issue 6	Level I		0.002268	6.00	.1206	0.013606	440974090.03
14S5A01430	Integrated Circuit	U23	Bellcore Issue 6	Level I		0.037889	1.00	.3360	0.037889	26392869.26
14S5824500	Integrated Circuit	U25-26	Bellcore Issue 6	Level I		0.038318	2.00	.6795	0.076636	26097332.06
14S4911216	Integrated Circuit	U29	Bellcore Issue 6	Level I		0.039296	1.00	.3484	0.039296	25448028.36
14S9820800	Integrated Circuit	U32	Bellcore Issue 6	Level I		0.039296	1.00	.3484	0.039296	25448028.36
1124568080	Capacitor	C233-241,C46,C48	Bellcore Issue 6	Level I		0.001060	11.00	.1034	0.011662	943198589.05
1124510280	Capacitor	C110-111,C116,C126-127,C134-1-35,C144,C66,C68,C71,C72,C78,C8-1-82,C87-88,C91-92	Bellcore Issue 6	Level I		0.001060	19.00	.1786	0.020144	943198589.05
1129610060	Capacitor	C179	Bellcore Issue 6	Level I		0.006031	1.00	.0535	0.006031	165815676.81
1121722780	Capacitor	C194	Bellcore Issue 6	Level I		0.002539	1.00	.0225	0.002539	393852661.82
1231332721	Miscellaneous	Y1	Bellcore Issue 6	Level I		0.150000	1.00	1.3301	0.150000	6666666.67
1301005440	Semiconductor	D11,D6-8	Bellcore Issue 6	Level I		0.023881	4.00	.8470	0.095524	41874327.58

