



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

HSB-440I A0.1

Reliability Prediction Report

(MTBF)

Release Date: APR. 17, 2003

04-17-2003

Issue Stamp

Wayne Chen

DV Manager

Rex Chang

Test Engineer

Reliability Prediction (MTBF)

. Model Name: HSB-440I A0.1 (CPU : Embedded Low power STPC ATLAS 100/133 MHz processor)

.Description: Half-size CPU Card.

. Prediction Date: APR. 17. 2003

. Prediction Site: AAEON DV Dept.

. Predicted by : Rex Chang

. Equipment: Relex Ver.7.2 Visual Reliability Software

. Simulation Environment:

Temperature: 21.8 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:

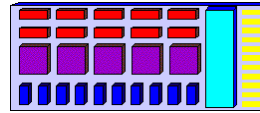
Failure Rate: 4.773401ppm

MTBF: 209,494Hours (about 23.9 years)

X. Prediction Table:

AAEON Reliability Prediction Report

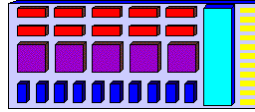
Part Number System
Reference Des
Date 04. 17, 2003
Environment GB, GC - Ground Benign, Controlled
Temperature 30.00



Description Top-level assembly
File Name HSB-440IA0.1.RPJ
Time 1:15 PM
Failure Rate 4.773401
MTBF 209,494

Assembly Name	Part Number	Model	Method	Environment	Duty Cycle	Qty	Failure Rate	MTBF
System	System	Bellcore	Method I Case 3	GB, GC - Ground Benign,	100.00	1.00	4.773401	209,494

AAEON Reliability Prediction Report



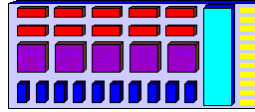
Part Number System
Reference Des
Date 04. 17, 2003
Environment GB, GC - Ground Benign, Controlled
Temperature 30.00

Description Top-level assembly
File Name HSB-440IA0.1.RPJ
Time 1:15 PM
Failure Rate 4.773401
MTBF 209,494

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1651032220	Connection	U34	Bellcore Issue 6	Level I		0.011771	1.00	.2466	0.011771	84956073.97
1654515302	Connection	VGA1	Bellcore Issue 6	Level I		0.005518	1.00	.1156	0.005518	181239624.47
1652512203	Connection	AN1	Bellcore Issue 6	Level I		0.004414	1.00	.0925	0.004414	226549530.58
1653120225	Connection	P104-2	Bellcore Issue 6	Level I		0.014713	1.00	.3082	0.014713	67964859.17
1750119011	Miscellaneous	BT1	Bellcore Issue 6	Level I		0.450000	1.00	9.4272	0.450000	2222222.22
1759100002	Miscellaneous	BZ1	Bellcore Issue 6	Level I		0.075000	1.00	1.5712	0.075000	13333333.33
1653004200	Connection	CN1	Bellcore Issue 6	Level I		0.002943	1.00	.0616	0.002943	339824295.87
1653222200	Connection	CN3	Bellcore Issue 6	Level I		0.016185	1.00	.3391	0.016185	61786235.61
1655106011	Connection	CN4	Bellcore Issue 6	Level I		0.002207	1.00	.0462	0.002207	453099061.16
1653209200	Connection	CN7	Bellcore Issue 6	Level I		0.006621	1.00	.1387	0.006621	151033020.39
1655005021	Connection	CN11	Bellcore Issue 6	Level I		0.001839	1.00	.0385	0.001839	543718873.40
1653005100	Connection	CN12	Bellcore Issue 6	Level I		0.001839	1.00	.0385	0.001839	543718873.40
1654409103	Connection	COM1	Bellcore Issue 6	Level I		0.003311	1.00	.0694	0.003311	302066040.78
1169639190	Capacitor	C108,C115,C39,C97	Bellcore Issue 6	Level I		0.033031	4.00	2.7679	0.132125	30274451.09
1161618110	Capacitor	C149	Bellcore Issue 6	Level I		0.001311	1.00	.0275	0.001311	762806343.57
1653220203	Connection	HDD1	Bellcore Issue 6	Level I		0.014713	1.00	.3082	0.014713	67964859.17
1653003101	Connection	JP2	Bellcore Issue 6	Level I		0.001104	1.00	.0231	0.001104	906198122.33
1653003201	Connection	JP5,JP7*2	Bellcore Issue 6	Level I		0.002207	3.00	.1387	0.006621	453099061.16
1653132220	Connection	P104-1	Bellcore Issue 6	Level I		0.023542	1.00	.4932	0.023542	42478036.98
1750220320	Connection	BT1	Bellcore Issue 6	Level I		0.000736	1.00	.0154	0.000736	1359297183.49
1653213201	Connection	CN2	Bellcore Issue 6	Level I		0.009564	1.00	.2004	0.009564	104561321.81
1653205203	Connection	CN5-6,CN8-9	Bellcore Issue 6	Level I		0.003678	4.00	.3082	0.014713	271859436.70
1655304020	Connection	CN10	Bellcore Issue 6	Level I		0.001471	1.00	.0308	0.001471	679648591.75
1654606200	Connection	CN13	Bellcore Issue 6	Level I		0.002207	1.00	.0462	0.002207	453099061.16
1653217202	Connection	FDD1	Bellcore Issue 6	Level I		0.012506	1.00	.2620	0.012506	79958657.85
1653003100	Connection	JP1,JP4	Bellcore Issue 6	Level I		0.001104	2.00	.0462	0.002207	906198122.33
1653002202	Connection	JP3,JP6	Bellcore Issue 6	Level I		0.001471	2.00	.0616	0.002943	679648591.75
14S6202002	Integrated Circuit	U15	Bellcore Issue 6	Level I		0.106747	1.00	2.2363	0.106747	9367974.40
1111622191	Capacitor	C162,C167,C184,C9	Bellcore Issue 6	Level I		0.017612	4.00	1.4758	0.070447	56779886.59
14S4397701	Integrated Circuit	U7	Bellcore Issue 6	Level I	12.60	0.052191	1.00	1.0934	0.052191	19160537.12
14S6334610	Integrated Circuit	U9	Bellcore Issue 6	Level I		0.021923	1.00	.4593	0.021923	45614435.26

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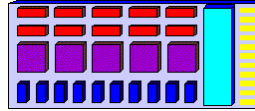
Part Number System
Reference Des
Date 04. 17, 2003
Environment GB, GC - Ground Benign, Controlled
Temperature 30.00



Description Top-level assembly
File Name HSB-440IA0.1.RPJ
Time 1:15 PM
Failure Rate 4.773401
MTBF 209,494

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1300011200	Semiconductor	U11	Bellcore Issue 6	Level I		0.013753	1.00	.2881	0.013753	72710998.66
14S4911216	Integrated Circuit	U12	Bellcore Issue 6	Level I	20.20	0.077005	1.00	1.6132	0.077005	12986205.97
14S4000200	Integrated Circuit	U13	Bellcore Issue 6	Level I	22.20	0.085047	1.00	1.7817	0.085047	11758191.96
1651203291	Connection	U15	Bellcore Issue 6	Level I		0.011771	1.00	.2466	0.011771	84956073.97
14S5813800	Integrated Circuit	U18	Bellcore Issue 6	Level I		0.025244	1.00	.5288	0.025244	39613193.55
14S4048500	Integrated Circuit	U20,U30	Bellcore Issue 6	Level I		0.042535	2.00	1.7821	0.085069	23510284.61
14S2303700	Integrated Circuit	U22	Bellcore Issue 6	Level I	16.50	0.128713	1.00	2.6965	0.128713	7769251.91
14S5800000	Integrated Circuit	U24	Bellcore Issue 6	Level I		0.016733	1.00	.3506	0.016733	59761038.85
14S5900600	Integrated Circuit	U32	Bellcore Issue 6	Level I	18.00	0.086552	1.00	1.8132	0.086552	11553773.87
1231332721	Miscellaneous	X1	Bellcore Issue 6	Level I		0.075000	1.00	1.5712	0.075000	13333333.33
1231314350	Miscellaneous	X3	Bellcore Issue 6	Level I		0.075000	1.00	1.5712	0.075000	13333333.33
1304900040	Semiconductor	LED2	Bellcore Issue 6	Level I		0.003823	1.00	.0801	0.003823	261592266.64
1211103360	Inductor	L1	Bellcore Issue 6	Level I	17.40	0.064810	1.00	1.3577	0.064810	15429787.46
1315993310	Semiconductor	Q1	Bellcore Issue 6	Level I		0.091687	1.00	1.9208	0.091687	10906649.80
1311119710	Semiconductor	Q3	Bellcore Issue 6	Level I		0.013753	1.00	.2881	0.013753	72710998.66
1540747285	Resistor	RN6	Bellcore Issue 6	Level I		0.003910	1.00	.0819	0.003910	255730457.04
1540733082	Resistor	RN7-10	Bellcore Issue 6	Level I		0.003910	4.00	.3277	0.015641	255730457.04
1540710084	Resistor	RN17-21	Bellcore Issue 6	Level I		0.003910	5.00	.4096	0.019552	255730457.04
1540782282	Resistor	RN23-26,RN30-32,RN34,RN36-37,-RN39-40	Bellcore Issue 6	Level I		0.003910	12.00	.9830	0.046924	255730457.04
1540727081	Resistor	RN28	Bellcore Issue 6	Level I		0.003910	1.00	.0819	0.003910	255730457.04
1540756281	Resistor	RN33,RN38	Bellcore Issue 6	Level I		0.003910	2.00	.1638	0.007821	255730457.04
105A733009	Resistor	R1,R4,R6,R38-39,R105,R143	Bellcore Issue 6	Level I		0.001249	7.00	.1831	0.008740	800930098.66
105A701009	Resistor	R107-108,R134-135,R138,R168,R3-R61-62,R64-66,R68	Bellcore Issue 6	Level I		0.001249	13.00	.3400	0.016231	800930098.66
105A708229	Resistor	R140-141,R163,R192,R8-9	Bellcore Issue 6	Level I		0.001249	6.00	.1569	0.007491	800930098.66
105A700139	Resistor	R11,R142,R166,R178,R180,R190--191,R21,R97	Bellcore Issue 6	Level I		0.001249	9.00	.2354	0.011237	800930098.66
105A501039	Resistor	R156,R16,R170-172,R176,R179,R-181,R194,R42-43,R73	Bellcore Issue 6	Level I		0.001249	12.00	.3139	0.014983	800930098.66
105A700009	Resistor	R102,R112-113,R115-116,R126,R-128-129,R137,R18,R193,R31,R36,-R87-89,R93	Bellcore Issue 6	Level I		0.001249	17.00	.4447	0.021225	800930098.66

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Time 1:15 PM
Failure Rate 4.773401
MTBF 209,494

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1129701690	Capacitor	C100,C103-106,C110,C113-114,C-116-117,C119-131,C138,C140-141-,C143-145,C147,C152-154,C157-1-61,C164,C166,C168-171,C17,C177-,C179-181,C183,C2,C20,C23-26,C-28-30,C33,C36,C38,C4,C41-45,C48-50,C58-61,C64,C69-77,C79-81,C8-3-85,C87-89,C92	Bellcore Issue 6	Level I		0.001311	96.00	2.6365	0.125851	762806343.57
1129722091	Capacitor	C19,C6	Bellcore Issue 6	Level I		0.000547	2.00	.0229	0.001095	1826769085.82
1129610260	Capacitor	C34	Bellcore Issue 6	Level I		0.000368	1.00	.0077	0.000368	2718958522.59
1124427090	Capacitor	C46-47	Bellcore Issue 6	Level I		0.000547	2.00	.0229	0.001095	1826769085.82
1129710090	Capacitor	C136,C51-52,C55-56,C94	Bellcore Issue 6	Level I		0.000547	6.00	.0688	0.003284	1826769085.82
1124412090	Capacitor	C66-67	Bellcore Issue 6	Level I		0.000547	2.00	.0229	0.001095	1826769085.82
1129701080	Capacitor	C150-151,C176,C98	Bellcore Issue 6	Level I		0.001406	4.00	.1178	0.005622	711449301.06
1129715090	Capacitor	C111,C132	Bellcore Issue 6	Level I		0.000547	2.00	.0229	0.001095	1826769085.82
105A507509	Resistor	R103,R104,R37,R40	Bellcore Issue 6	Level I		0.001249	4.00	.1046	0.004994	800930098.66
105A701539	Resistor	R98	Bellcore Issue 6	Level I		0.001249	1.00	.0262	0.001249	800930098.66
105A707509	Resistor	R130,R132,R145	Bellcore Issue 6	Level I		0.001249	3.00	.0785	0.003746	800930098.66
14S6811102	Integrated Circuit	U2	Bellcore Issue 6	Level I	15.10	0.170225	1.00	3.5661	0.170225	5874586.51
1653925216	Connection	CFD1	Bellcore Issue 6	Level I		0.018392	1.00	.3853	0.018392	54371887.34
1129710050	Capacitor	C1,C139,C15,C178,C180,C182,C21-22,C3,C31-32,C35,C54,C57,C63,C-78	Bellcore Issue 6	Level I		0.001406	16.00	.4711	0.022489	711449301.06
1124410190	Capacitor	C10,C101-102,C165,C82,C86,C99	Bellcore Issue 6	Level I		0.000547	7.00	.0803	0.003832	1826769085.82
1122722780	Capacitor	C37,C40	Bellcore Issue 6	Level I		0.000825	2.00	.0346	0.001650	1212335760.74
1129701790	Capacitor	C107,C109,C112,C142,C146,C148-,C155-156,C53,C62,C65,C90-91,C-93,C95-96	Bellcore Issue 6	Level I		0.000825	16.00	.2765	0.013198	1212335760.74
1129747650	Capacitor	C68	Bellcore Issue 6	Level I		0.001406	1.00	.0294	0.001406	711449301.06
14S4813905	Integrated Circuit	U8	Bellcore Issue 6	Level I	11.50	0.049257	1.00	1.0319	0.049257	20301761.27
1231325050	Miscellaneous	X2	Bellcore Issue 6	Level I		0.075000	1.00	1.5712	0.075000	13333333.33
1304100540	Semiconductor	LED1	Bellcore Issue 6	Level I		0.003823	1.00	.0801	0.003823	261592266.64
1213106008	Inductor	LN1-9	Bellcore Issue 6	Level I		0.001249	9.00	.2354	0.011237	800930098.66

