

HSB-810-A02

Reliability Prediction Report (MTBF)

Report NO : 05I070002

01-17-2005

Issue Date

Wenyuan Yang

Manager

Jessica Chou

Test Engineer

Reliability Prediction (MTBF)

I . **Model Name:** 9697810A08 (ASS'Y.HSB-810A-VG.Rev.A0.2)

II . **Prediction Date:** Jan. 17, 2005

III . **Prediction Site:** AAEON Q.E. Dept.

IV . **Predicted by :** Jessica Chou

V . **Equipment:** Relex Ver.7.3 Visual Reliability Software

VI. Simulation Environment:

- Temperature: 24 degrees C
- Standard: Telcordia (Bellcore) Standard

VII. 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.

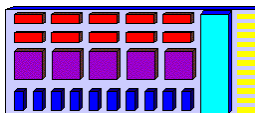
VIII. Prediction Result:

- Failure Rate: 12.673373 ppm
- MTBF: 78,906 Hours

IX. Prediction Table

Standard Reliability Prediction Report

Part Number 9697810A08
Reference Des
Date 一月 17, 2005
Environment GF, GU - Ground Fixed,
Temperature 24.00

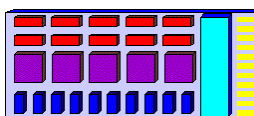


Description Top-level assembly
File Name 9697810A08.RPJ
Time 4:57 下午
Failure Rate 12.673373
MTBF 78,906

Assembly Name	Part Number	Ref Des	Qty	Failure Rate	MTBF
HSB-810A-A02	9697810A08		1.00	12.673373	78,906

Standard Reliability Prediction Report

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Reference Des
Date 一月 17, 2005
Environment GF, GU - Ground Fixed,
Temperature 24.00

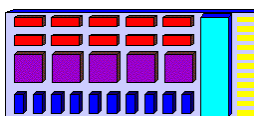


Description Top-level assembly
File Name 9697810A08.RPJ
Time 4:57 下午
Failure Rate 12.673373
MTBF 78,906

Part Number	Category	Ref Des	Failure Rate, Unit	Quantity	Failure Rate
1655003010	Connection	FAN1	0.001620	1.00	0.001620
1653006101	Connection	IR1	0.080986	1.00	0.080986
1653002101	Connection	JP1	0.026995	1.00	0.026995
1653002100	Connection	CN6	0.026995	1.00	0.026995
1655404020	Connection	ATX2	0.002160	1.00	0.002160
1750119013	Miscellaneous	BT1	0.900000	1.00	0.900000
1653005205	Connection	CN2	0.134977	1.00	0.134977
1653205203	Connection	COM1,COM2	0.005399	2.00	0.010798
1653005201	Connection	USB4	0.005399	1.00	0.005399
14S6200400	Integrated Circuit	U10	0.146414	1.00	0.146414
1652510201	Connection	LAN1	0.005399	1.00	0.005399
1655420020	Connection	ATX1	0.010798	1.00	0.010798
1655003022	Connection	CN1	0.001620	1.00	0.001620
1654606200	Connection	CN4	0.080986	1.00	0.080986
1655005021	Connection	CN5	0.002700	1.00	0.002700
1111622101	Capacitor	C1,C11-C13,C2,C3	0.025851	6.00	0.155103
1189656190	Capacitor	C164,C9	0.013870	2.00	0.027741
1654515308	Connection	VGA1	0.008099	1.00	0.008099
1653004200	Connection	FP1,FP2	0.107982	2.00	0.215963
1653220208	Connection	IDE1,IDE2	0.021596	2.00	0.043193
1653003100	Connection	JP2	0.001620	1.00	0.001620
1654804100	Connection	USB1-USB3	0.001620	3.00	0.004859
1653217205	Connection	FDD1	0.458922	1.00	0.458922
1119647191	Capacitor	C10,C165,C8	0.044878	3.00	0.134635
105A756033	Resistor	R180,R223,R244	0.002224	3.00	0.006671
1231325050	Miscellaneous	Y3	0.150000	1.00	0.150000
105A702203	Resistor	R184	0.002224	1.00	0.002224
105A503300	Resistor	R202-R204,R210- ,R240,R247,R320- ,R322,R324,R326- -R331,R335	0.000741	16.00	0.011859
105A536523	Resistor	R209	0.000741	1.00	0.000741
105A708223	Resistor	R105,R114,R115- ,R117,R118,R126- -R128,R176,R177- ,R193,R194,R261- ,R262	0.002224	14.00	0.031130
105A708223	Resistor	R272,R280-R282- ,R316,R57-R59,R- 61,R63,R69-R72,- R76-R80,R85-R87	0.002224	22.00	0.048918
105A560403	Resistor	R65,R66	0.002224	2.00	0.004447
105A548763	Resistor	R83	0.002224	1.00	0.002224
105A549963	Resistor	R130,R131,R137- ,R138,R141,R142- ,R149,R150,R238- ,R243,R278,R292- -R296,R91	0.002224	17.00	0.037800
105A707503	Resistor	R102,R113,R94	0.002224	3.00	0.006671
105A710033	Resistor	R100,R122,R211- ,R235,R236,R246- ,R253,R254,R259- ,R373,R381-R383	0.002224	13.00	0.028906

Standard Reliability Prediction Report

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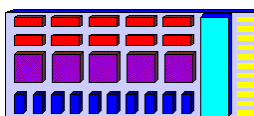


Description Top-level assembly
File Name 9697810A08.RPJ
Time 4:57 下午
Failure Rate 12.673373
MTBF 78,906

Part Number	Category	Ref Des	Failure Rate, Unit	Quantity	Failure Rate
105A505103	Resistor	R106,R107	0.002224	2.00	0.004447
175910000A	Miscellaneous	BZ1	0.150000	1.00	0.150000
1653925216	Connection	CFD1	0.026995	1.00	0.026995
1124533180	Capacitor	C17,C22	0.001053	2.00	0.002107
1129510060	Capacitor	C128	0.005991	1.00	0.005991
1189922180	Capacitor	C100,C37,C38,C-46,C68,C99	0.248951	6.00	1.493704
1129710050	Capacitor	C101,C111,C120-C131,C133,C150-C151,C41,C43,C-47,C70-C72,C79--C82	0.002705	17.00	0.045977
1129610051	Capacitor	C107,C109,C121-C127,C48,C51,C-52,C57,C63,C64,-C67	0.002705	11.00	0.029750
1124547080	Capacitor	C138,C149,C154-C157,C75-C78	0.001053	8.00	0.008426
1124568180	Capacitor	C93,C94	0.001053	2.00	0.002107
1301005440	Semiconductor	DD1,DD3,DD4	0.023202	3.00	0.069607
1300414843	Semiconductor	D4,D6-D8	0.023202	4.00	0.092809
1653213203	Connection	LPT1	0.350940	1.00	0.350940
1211103367	Inductor	L5	0.095430	1.00	0.095430
1211106870	Inductor	L12	0.084495	1.00	0.084495
1211100160	Inductor	L26,L27	0.084495	2.00	0.168990
1212308054	Inductor	L36-L38	0.002224	3.00	0.006671
121230603C	Inductor	L39,L41-L43	0.002224	4.00	0.008894
1311006910	Semiconductor	Q21	0.023202	1.00	0.023202
1654262300	Connection	MPCI1	0.066949	1.00	0.066949
1122701680	Capacitor	C166,M100-M105-M107,M110-M113-M115,M116,M118-M166,M168-M18-3,M185	0.001587	81.00	0.128557
1122701680	Capacitor	M186-M197,M2,M-200,M201,M203--M210,M212-M271-M3,M33-M35,M3-7-M40,M4	0.001587	92.00	0.146016
1122701680	Capacitor	M42-M44,M5,M49-M62,M6,M65,M66-M7,M69-M74,M7-8-M99,M8	0.001587	49.00	0.077769
14S2200900	Integrated Circuit	U26	0.055165	1.00	0.055165
1315492010	Semiconductor	U27	0.077341	1.00	0.077341
1315492010	Semiconductor	U33	0.143790	1.00	0.143790
14S3033800	Integrated Circuit	U28	0.108668	1.00	0.108668
14S3260700	Integrated Circuit	U30	0.163246	1.00	0.163246
1315995310	Semiconductor	U31	0.183374	1.00	0.183374
14S3115000	Integrated Circuit	U32	0.055165	1.00	0.055165
14S2303700	Integrated Circuit	U34	0.095210	1.00	0.095210
1651203291	Connection	U10	0.017277	1.00	0.017277
1231232720	Miscellaneous	Y1	0.150000	1.00	0.150000

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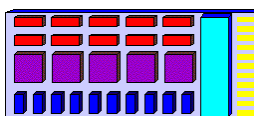


Description Top-level assembly
File Name 9697810A08.RPJ
Time 4:57 下午
Failure Rate 12.673373
MTBF 78,906

Part Number	Category	Ref Des	Failure Rate, Unit	Quantity	Failure Rate
105A722003	Resistor	R173	0.002224	1.00	0.002224
12313012A0	Miscellaneous	Y2	0.150000	1.00	0.150000
1231314350	Miscellaneous	Y4	0.150000	1.00	0.150000
1315700211	Semiconductor	Q24,Q6	0.077341	2.00	0.154681
1315041410	Semiconductor	Q11	0.210244	1.00	0.210244
1315041410	Semiconductor	Q26	0.154681	1.00	0.154681
1315041410	Semiconductor	Q12	0.210244	1.00	0.210244
1540700080	Resistor	RN33,RN42	0.005966	2.00	0.011932
1540782280	Resistor	RN37	0.005966	1.00	0.005966
106B501031	Resistor	RT1,RT2	0.010798	2.00	0.021596
105A700103	Resistor	R156,R158,R2,R3-,R68	0.002224	5.00	0.011118
105A501033	Resistor	M272,R10,R11,R-110,R16,R182,R1-85,R189-R192,R2-01,R207,R21,R21-7,R219	0.002224	16.00	0.035577
105A501033	Resistor	R251,R27,R275,-R286,R315,R33,-R34,R346,R35,R-350,R36,R389,R4-3,R44,R46,R8	0.002224	16.00	0.035577
105A501033	Resistor	R9	0.002224	1.00	0.002224
150A701003	Resistor	R14,R233,R234,-R241,R300-R307-,R325,R357	0.002224	14.00	0.031130
105A502833	Resistor	R23	0.002224	1.00	0.002224
105A500133	Resistor	R135,R136,R139-,R146,R157,R172-,R183,R205,R231-,R239,R256,R257-,R266	0.002224	13.00	0.028906
105A500133	Resistor	R267-R270,R28,-R284,R298,R299-,R319,R323,R332-,R334,R337,R370-,R386,R388	0.002224	17.00	0.037800
105A500133	Resistor	R394,R56	0.002224	2.00	0.004447
105A527463	Resistor	R109,R134,R147-,R153,R164	0.002224	5.00	0.011118
105A768003	Resistor	R119	0.002224	1.00	0.002224
105A537463	Resistor	R124	0.002224	1.00	0.002224
105A554963	Resistor	R148,R163,R265-,R359	0.002224	4.00	0.008894
105A747003	Resistor	R197,R198	0.002224	2.00	0.004447
1059701133	Resistor	R287	0.002224	1.00	0.002224
105A547503	Resistor	R308	0.002224	1.00	0.002224
105A702223	Resistor	R348,R349	0.002224	2.00	0.004447
105A702733	Resistor	R387	0.002224	1.00	0.002224
14S4280106	Integrated Circuit	U6	0.058414	1.00	0.058414
14S5A01400	Integrated Circuit	U11	0.055165	1.00	0.055165
14S4048501	Integrated Circuit	U14,U15	0.055165	2.00	0.110329
14S5A23200	Integrated Circuit	U19	0.067254	1.00	0.067254

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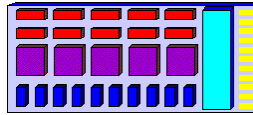


Description Top-level assembly
File Name 9697810A08.RPJ
Time 4:57 下午
Failure Rate 12.673373
MTBF 78,906

Part Number	Category	Ref Des	Failure Rate, Unit	Quantity	Failure Rate
14S4813000	Integrated Circuit	U23	0.055165	1.00	0.055165
1129701690	Capacitor	M10-M20,M22-M-30,M36,M45-M48-,M9	0.002522	26.00	0.065583
1129701790	Capacitor	N1,N10-N26,N2--N9	0.001587	26.00	0.041265
1752311000	Miscellaneous	P1,P2	0.030000	2.00	0.060000
1314111716	Integrated Circuit	Q19,Q2,Q23	0.055165	3.00	0.165494
105A700333	Resistor	R237,R242	0.002224	2.00	0.004447
105A701523	Resistor	R248	0.002224	1.00	0.002224
105A720033	Resistor	R252	0.002224	1.00	0.002224
105A516923	Resistor	R276	0.002224	1.00	0.002224
105A702723	Resistor	R290,R291,R362--R369,R374,R379	0.002224	12.00	0.026683
105A513703	Resistor	R314	0.002224	1.00	0.002224
105A702233	Resistor	R345	0.002224	1.00	0.002224
105A524903	Resistor	R361	0.002224	1.00	0.002224
14S4147600	Integrated Circuit	U1	0.093885	1.00	0.093885
14S4871202	Integrated Circuit	U4	0.053369	1.00	0.053369
14S4285501	Integrated Circuit	U8	0.037045	1.00	0.037045
14S5A12503	Integrated Circuit	U12,U16,U17	0.055165	3.00	0.165494
1315970110	Semiconductor	U13,U21,U22	0.154681	3.00	0.464043
14S4021310	Integrated Circuit	U18	0.055165	1.00	0.055165
14S3128420	Integrated Circuit	U20	0.055165	1.00	0.055165
14S4070610	Integrated Circuit	U24	0.055165	1.00	0.055165
14S5900700	Integrated Circuit	U25	0.099241	1.00	0.099241
1121501680	Capacitor	M114,M117	0.002522	2.00	0.005045
1124501780	Capacitor	N27-N29,N33-N35-,N37,N43-N45,N47-N59	0.001053	23.00	0.024226
1314917313	Integrated Circuit	Q1	0.055165	1.00	0.055165
1314108412	Integrated Circuit	Q3	0.096552	1.00	0.096552
1310390411	Semiconductor	Q13,Q14,Q16,Q17-,Q5,Q7	0.023202	6.00	0.139213
1315041210	Semiconductor	Q25	0.154681	1.00	0.154681
1315041210	Semiconductor	Q8	0.204645	1.00	0.204645
1315041210	Semiconductor	Q9	0.202438	1.00	0.202438
1315035200	Semiconductor	Q15	0.000000	1.00	0.000000
1540756081	Resistor	RN1,RN10-RN32-,RN2-RN9	0.005966	32.00	0.190909
1540701380	Resistor	RN36	0.005966	1.00	0.005966
1540727280	Resistor	RN38,RN39,RN45	0.005966	3.00	0.017898
105A703323	Resistor	R171,R174,R318	0.002224	3.00	0.006671
105A733003	Resistor	R1,R160,R165,R-179,R187,R188,R-230,R250,R260,R-274	0.002224	10.00	0.022236
105A533203	Resistor	R218,R220,R6	0.002224	3.00	0.006671
105A561903	Resistor	R12	0.002224	1.00	0.002224
105A743003	Resistor	R13	0.002224	1.00	0.002224

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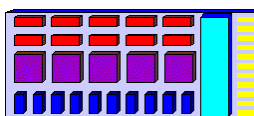


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105A704723	Resistor	R132,R133,R178- ,R195,R196,R22,- R255,R342,R343- ,R352,R353,R42,- R90	0.002224	13.00	0.028906
105A523233	Resistor	R24	0.002224	1.00	0.002224
105A505633	Resistor	R25	0.002224	1.00	0.002224
105A710053	Resistor	R225,R311,R312- ,R37,R53,R54	0.013341	6.00	0.080048
105A568163	Resistor	R112	0.002224	1.00	0.002224
105A520003	Resistor	R116,R288	0.002224	2.00	0.004447
105A530103	Resistor	R123,R154	0.002224	2.00	0.004447
105A522663	Resistor	R125	0.002224	1.00	0.002224
105A700233	Resistor	R145	0.002224	1.00	0.002224
105A512403	Resistor	R152,R164,R358	0.002224	3.00	0.006671
105A524963	Resistor	R175	0.002224	1.00	0.002224
14S6334605	Integrated Circuit	U29	0.028433	1.00	0.028433
14S4254102	Integrated Circuit	U9	0.064948	1.00	0.064948
105A747033	Resistor	R181,R224,R245	0.002224	3.00	0.006671
105A704733	Resistor	R199,R200	0.002224	2.00	0.004447
105A519623	Resistor	R206	0.002224	1.00	0.002224
1159775003	Resistor	R15,R212,R215	0.002224	3.00	0.006671
105A544223	Resistor	R216	0.002224	1.00	0.002224
105A751003	Resistor	R232	0.002224	1.00	0.002224
105A705609	Resistor	R38-R41,R49-R52	0.002224	8.00	0.017788
105A700003	Resistor	R144,R151,R166- ,R273,R309,R310- ,R371,R396,R45,- R60	0.002224	10.00	0.022236
1054600289	Resistor	R47,R48	0.002224	2.00	0.004447
105A733033	Resistor	R55	0.002224	1.00	0.002224
105A515003	Resistor	R103,R108,R129- ,R155,R360,R64,- R67,R95,R97	0.002224	9.00	0.020012
105A705603	Resistor	R121,R258,R263- ,R277,R74,R75,R- 88	0.002224	7.00	0.015565
105A560463	Resistor	R104,R81,R82	0.002224	3.00	0.006671
105A513003	Resistor	R84	0.002224	1.00	0.002224
105A510003	Resistor	R111,R186,R249- ,R279,R297,R92,- R93	0.002224	7.00	0.015565
105A548703	Resistor	R96	0.002224	1.00	0.002224
105A540263	Resistor	R140,R289,R99	0.002224	3.00	0.006671
105A528703	Resistor	R101	0.002224	1.00	0.002224
1174518180	Capacitor	CP1-CP4	0.001053	4.00	0.004213
1129747650	Capacitor	CA1,CA10-CA18,- CA2-CA9	0.002705	18.00	0.048681
1654030000	Connection	CN3	0.016197	1.00	0.016197

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Part Number	Category	Ref Des	Failure Rate, Unit	Quantity	Failure Rate
1121701081	Capacitor	C104,C106,C123- ,C14,C15,C158-C- 162,C18,C23,C25- ,C29,C34,C53,C5- 4,C65,C69	0.002522	19.00	0.047926
1121701081	Capacitor	C97,M273	0.002522	2.00	0.005045
1124510280	Capacitor	C125,C129,C21,- C24,C83,C90	0.001053	6.00	0.006320
1189610188	Capacitor	C108,C112,C113- ,C124,C136,C137- ,C153,C27,C28,C- 42	0.004837	10.00	0.048368
1124510080	Capacitor	C116-C119,C132- ,C134,C135,C139- -C147,C32,C33,C- 35,C36	0.001053	20.00	0.021066
1189615187	Capacitor	C110,C163,C169- ,C39,C40	0.004837	5.00	0.024184
1124522080	Capacitor	C105,C126,C130- ,C44,C45,C49,C5- 0,C55,C56,C60-C- 62,C66,C92,C95	0.001053	15.00	0.015799
1124547180	Capacitor	C73	0.001053	1.00	0.001053
1129722090	Capacitor	C74,C91,C96	0.001810	3.00	0.005430
1124518180	Capacitor	C88,C89	0.001053	2.00	0.002107
1124527180	Capacitor	C156	0.001053	1.00	0.001053
1124522281	Capacitor	C167	0.001053	1.00	0.001053
1300283540	Semiconductor	DD2	0.023202	1.00	0.023202
1301003240	Semiconductor	D2,D5	0.023202	2.00	0.046404
1304101340	Semiconductor	LED1	0.004449	1.00	0.004449
1214309002	Inductor	L1,L11,L2,L6,L7	0.002224	5.00	0.011118
121110010G	Inductor	L3	0.084495	1.00	0.084495
121110010H	Inductor	L10	0.103209	1.00	0.103209
121110010H	Inductor	L9	0.102830	1.00	0.102830
1059700001	Resistor	L13,L24,L25,L29,- L31,L32,L35	0.002224	7.00	0.015565
1211100102	Inductor	L14	0.084495	1.00	0.084495
121230603D	Inductor	L16-L22	0.002224	7.00	0.015565
1212306030	Inductor	L15,L28,L30,L33,- L34,L8	0.002224	6.00	0.013341
1651611990	Connection	CPU1	0.051981	1.00	0.051981
16515A0993	Connection	DIMM1	0.177867	1.00	0.177867
16515A0995	Connection	DIMM0	0.107982	1.00	0.107982
105A703363	Resistor	R226-R229	0.002224	4.00	0.008894
105A506823	Resistor	R390	0.002224	1.00	0.002224