

GENE-5312

Reliability Prediction Report (MTBF)

Report NO : 05E070024

11-22-2005

Issue Date

Wenyuan Yang

Manager

Liping Hsieh

Test Engineer

Reliability Prediction (MTBF)

I . Model Name: GENE-5312

II . Prediction Date: Nov.21, 2005

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

IV . Predicted by: Liping Hsieh

V . Equipment: Relex Ver.7.3 Visual Reliability Software

VI. Simulation Environment:

- Temperature: 25 degrees C
- Standard: Telcordia (Bellcore) Standard

VII. Term and Definition:

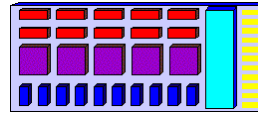
- Unit : An assembly of device.
- Duty Cycle : Used to specify the percentage of time that the element is in an on state, and it is equal to the percentage of total time the item is in the active environment.
- Quantity : The quantity of the selected item.
- Failure Rate : Used to specify that the failure 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: 11.295318 ppm
- MTBF: 88,532 Hours

AAEON Reliability Prediction Report

Part Number 9697531202
Reference Des
Date 11. 22, 2005
Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00

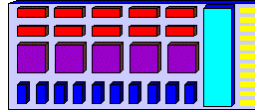


Description Top-level assembly
File Name GENE5312.RPJ
Time 11:19 上午
Failure Rate 11.295318
MTBF 88,532

Assembly Name	Part Number	Model	Method	Environment	Duty Cycle	Qty	Failure Rate	MTBF
GENE5312	9697531202	Bellcore	Method I Case 3	GF, GU - Ground Fixed,	100.00	1.00	11.295318	88,532

AAEON Reliability Prediction Report

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Date 11. 22, 2005
Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00

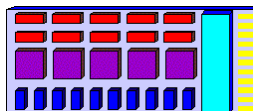


Description Top-level assembly
File Name GENE5312.RPJ
Time 11:19 上午
Failure Rate 11.295318
MTBF 88,532

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1653003101	Connection	JP2,JP3,JP6	Bellcore Issue 6	Level I		0.001707	3.00	.0453	0.005121	585853513.81
SST49LF004	Integrated Circuit	U8	Bellcore Issue 6	Level I		0.043131	1.00	.3818	0.043131	23185427.29
1656304022	Connection	CN9	Bellcore Issue 6	Level I		0.002276	1.00	.0201	0.002276	439390135.35
1653006101	Connection	CN17	Bellcore Issue 6	Level I		0.003414	1.00	.0302	0.003414	292926756.90
1654409103	Connection	CN19	Bellcore Issue 6	Level I		0.005121	1.00	.0453	0.005121	195284504.60
1653005201	Connection	CN4	Bellcore Issue 6	Level I		0.005690	1.00	.0504	0.005690	175756054.14
1654515308	Connection	CN20	Bellcore Issue 6	Level I		0.008535	1.00	.0756	0.008535	117170702.76
1111610194	Capacitor	EC1~EC5	Bellcore Issue 6	Level I		0.042673	5.00	1.8890	0.213364	23434140.55
1189656190	Capacitor	EC6	Bellcore Issue 6	Level I		0.071121	1.00	.6297	0.071121	14060484.33
1653002100	Connection	JP1	Bellcore Issue 6	Level I		0.001138	1.00	.0101	0.001138	878780270.71
1759100008	Miscellaneous	SP1	Bellcore Issue 6	Level I		0.150000	1.00	1.3280	0.150000	6666666.67
1655306020	Connection	CN8	Bellcore Issue 6	Level I		0.003414	1.00	.0302	0.003414	292926756.90
1653132220	Connection	CN11	Bellcore Issue 6	Level I		0.036414	1.00	.3224	0.036414	27461883.46
1655003023	Connection	CN14	Bellcore Issue 6	Level I		0.001707	1.00	.0151	0.001707	585853513.81
162512206	Connection	CN15,CN16	Bellcore Issue 6	Level I		0.006828	1.00	.0604	0.006828	146463378.45
1654606306	Connection	CN18	Bellcore Issue 6	Level I		0.003414	1.00	.0302	0.003414	292926756.90
1653003201	Connection	JP4	Bellcore Issue 6	Level I		0.003414	1.00	.0302	0.003414	292926756.90
1655902030	Connection	BAT1	Bellcore Issue 6	Level I		0.001138	1.00	.0101	0.001138	878780270.71
175011901C	Miscellaneous	BAT1	Bellcore Issue 6	Level I		0.900000	1.00	7.9679	0.900000	1111111.11
105A710039	Resistor	R107, R113, R175, R182, R183, R184, R192, R194, R368, R369, R370, R371, R94	Bellcore Issue 6	Level I		0.002268	13.00	.2610	0.029480	440974090.03
1050502204	Resistor	R101, R102, R105, R109, R116, R118, R120, R121, R123~125, R131~135	Bellcore Issue 6	Level I		0.002268	16.00	.3212	0.036283	440974090.03
105A700003	Resistor	R157, R204, R320, R341	Bellcore Issue 6	Level I		0.002268	4.00	.0803	0.009071	440974090.03
105A501039	Resistor	R162, R166, R167, R179, R180, R188, R189	Bellcore Issue 6			0.000756	7.00	.0468	0.005291	1322922270.09
106B501031	Resistor	R172,R266	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
105A503033	Resistor	R190	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A703323	Resistor	R240,R319	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
105A502223	Resistor	R262,R333	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
105A507509	Resistor	R312, R313, R317	Bellcore Issue 6	Level I		0.002268	3.00	.0602	0.006803	440974090.03

AAEON Reliability Prediction Report

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Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00

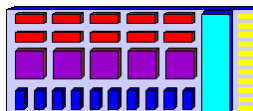


Description Top-level assembly
File Name GENE5312.RPJ
Time 11:19 上午
Failure Rate 11.295318
MTBF 88,532

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
105A514713	Resistor	R332	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A568103	Resistor	R258	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A702733	Resistor	R263,R318	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
105A546403	Resistor	R323	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
1189615190	Capacitor	TCI	Bellcore Issue 6	Level I	15.50	0.006053	1.00	.0536	0.006053	165195381.48
1189615190	Capacitor	TC3, TC5, TC6	Bellcore Issue 6	Level I		0.004535	3.00	.1205	0.013606	220487045.01
1653925216	Connection	CFD1	Bellcore Issue 6	Level I		0.028449	1.00	.2519	0.028449	35151210.83
1653213207	Connection	CN3	Bellcore Issue 6	Level I		0.014793	1.00	.1310	0.014793	67598482.36
14S5801402	Integrated Circuit	U11	Bellcore Issue 6	Level I		0.037889	1.00	.3354	0.037889	26392869.26
14S3149103	Integrated Circuit	U13	Bellcore Issue 6	Level I	19.30	0.223575	1.00	1.9794	0.223575	4472772.10
14S5A00820	Integrated Circuit	U17	Bellcore Issue 6	Level I	2.50	0.072731	1.00	.6439	0.072731	13749244.25
14S2303700	Integrated Circuit	U22	Bellcore Issue 6	Level I	12.60	0.143752	1.00	1.2727	0.143752	6956415.52
14S9820800	Integrated Circuit	U40	Bellcore Issue 6	Level I		0.070411	1.00	.6234	0.070411	14202225.56
1654262300	Miscellaneous	Y1	Bellcore Issue 6	Level I		0.150000	1.00	1.3280	0.150000	6666666.67
1654262300	Connection	MPCI1	Bellcore Issue 6	Level I		0.070552	1.00	.6246	0.070552	14173875.33
1311119710	Semiconductor	Q3,Q6	Bellcore Issue 6	Level I		0.023881	2.00	.4228	0.047762	41874327.58
1540733085	Resistor	RP1, RP2, RP69~73, RP86~90	Bellcore Issue 6	Level I		0.006246	12.00	.6636	0.074952	160102772.00
1540756081	Resistor	RP10~25, RP7~9	Bellcore Issue 6	Level I		0.006246	19.00	1.0506	0.118674	160102772.00
105A710053	Resistor	R1	Bellcore Issue 6	Level I		0.013606	1.00	.1205	0.013606	73495681.67
105A516513	Resistor	R3	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A702269	Resistor	R148,R149,R242,R255,R5,R6	Bellcore Issue 6	Level I		0.002268	6.00	.1205	0.013606	440974090.03
105A704729	Resistor	RP27~42, RP50~52,RP54, RP56, RP57, RP77~79	Bellcore Issue 6	Level I		0.002268	25.00	.5019	0.056693	440974090.03
105A702229	Resistor	R14, R174, R245, R246, R27, R347, R348	Bellcore Issue 6	Level I		0.002268	7.00	.1405	0.015874	440974090.03
105A705609	Resistor	R177, R181, R195, R215, R216, R217, R220, R223, R227, R228, R235, R241, R244, R271, R286, R302, R306, R310, R328, R340, R344, R346, R82, R96, R97	Bellcore Issue 6	Level I		0.002268	25.00	.5019	0.056693	440974090.03
105A720053	Resistor	R58	Bellcore Issue 6	Level I		0.013606	1.00	.1205	0.013606	73495681.67
105A568123	Resistor	R80	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03

AAEON Reliability Prediction Report

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Environment GF, GU - Ground Fixed, Uncontrolled
Temperature 25.00

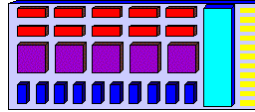


Description Top-level assembly
File Name GENE5312.RPJ
Time 11:19 上午
Failure Rate 11.295318
MTBF 88,532

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
105A700139	Resistor	R177, R181, R195, R215~217, R220, R223, R227, R228, R235, R241, R244, R271, R286, R302, R306, R310, R328, R340, R344, R346, R82, R96, R97	Bellcore Issue 6	Level I		0.002268	25.00	.5019	0.056693	440974090.03
105A549969	Resistor	R139~146	Bellcore Issue 6	Level I		0.002268	8.00	.1606	0.018142	440974090.03
105A506823	Resistor	R160,R191	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
105A547003	Resistor	R186,R208	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
105A705629	Resistor	R218, R253, R259, R270, R276	Bellcore Issue 6	Level I		0.002268	5.00	.1004	0.011339	440974090.03
105A507533	Resistor	R257,R276	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
14S5A01400	Integrated Circuit	U26,U46	Bellcore Issue 6	Level I	4.80	0.080932	2.00	1.4330	0.161865	12355989.78
1315993311	Semiconductor	U31	Bellcore Issue 6	Level I		0.079603	1.00	.7047	0.079603	12562298.27
14S4553501	Integrated Circuit	U3	Bellcore Issue 6	Level I	7.30	0.097529	1.00	.8634	0.097529	10253371.72
1315446310	Semiconductor	U5,U9	Bellcore Issue 6	Level I		0.079603	2.00	1.4095	0.159207	12562298.27
14S4911216	Integrated Circuit	U7	Bellcore Issue 6	Level I	16.50	0.186320	1.00	1.6495	0.186320	5367123.60
14S2202600	Integrated Circuit	U25	Bellcore Issue 6	Level I		0.059366	1.00	.5256	0.059366	16844654.92
1315992601	Semiconductor	U27	Bellcore Issue 6	Level I	14.20	0.117519	1.00	1.0404	0.117519	8509284.25
14S5A12505	Integrated Circuit	U28	Bellcore Issue 6	Level I	5.20	0.082031	1.00	.7262	0.082031	12190539.63
14S2272700	Integrated Circuit	U30	Bellcore Issue 6	Level I		0.059366	1.00	.5256	0.059366	16844654.92
14S2272700	Integrated Circuit	U39	Bellcore Issue 6	Level I	15.50	0.174439	1.00	1.5443	0.174439	5732676.86
14S6334610	Integrated Circuit	U32,U35	Bellcore Issue 6	Level I		0.022683	2.00	.4016	0.045365	44086680.49
14S4758300	Integrated Circuit	U37	Bellcore Issue 6	Level I	15.60	0.175595	1.00	1.5546	0.175595	5694921.04
14S4871202	Integrated Circuit	U1	Bellcore Issue 6	Level I	13.00	0.124450	1.00	1.1018	0.124450	8035381.07
14S2533100	Integrated Circuit	U2	Bellcore Issue 6	Level I	22.50	0.274286	1.00	2.4283	0.274286	3645829.71
14S3156500	Semiconductor	U6	Bellcore Issue 6	Level I	13.20	0.068683	1.00	.6081	0.068683	14559626.92
1651203291	Connection	U8	Bellcore Issue 6	Level I		0.035845	1.00	.3173	0.035845	27897786.37
14S4810000	Integrated Circuit	U10	Bellcore Issue 6	Level I	10.50	0.111955	1.00	.9912	0.111955	8932124.90
14S4810000	Integrated Circuit	U33	Bellcore Issue 6	Level I	14.80	0.134160	1.00	1.1877	0.134160	7453812.96
14S4040002	Integrated Circuit	U12	Bellcore Issue 6	Level I	18.30	0.074260	1.00	.6574	0.074260	13466197.80
14S4021301	Integrated Circuit	U15	Bellcore Issue 6	Level I	12.20	0.139927	1.00	1.2388	0.139927	7146589.18
14S4021301	Integrated Circuit	U14	Bellcore Issue 6	Level I		0.059366	1.00	.5256	0.059366	16844654.92
14S3128420	Integrated Circuit	U16	Bellcore Issue 6	Level I		0.070411	1.00	.6234	0.070411	14202225.56

AAEON Reliability Prediction Report

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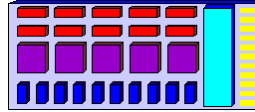


Description Top-level assembly
File Name GENE5312.RPJ
Time 11:19 上午
Failure Rate 11.295318
MTBF 88,532

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
14S4081110	Integrated Circuit	U18	Bellcore Issue 6	Level I		0.059366	1.00	.5256	0.059366	16844654.92
14S5A12503	Integrated Circuit	U23,U47	Bellcore Issue 6	Level I		0.059366	2.00	1.0512	0.118732	16844654.92
14S5A03200	Integrated Circuit	U36	Bellcore Issue 6	Level I	3.00	0.074382	1.00	.6585	0.074382	13444079.84
14S4048502	Integrated Circuit	U41,U45	Bellcore Issue 6	Level I		0.059366	2.00	1.0512	0.118732	16844654.92
1315970110	Integrated Circuit	U42,U43	Bellcore Issue 6	Level I		0.059366	2.00	1.0512	0.118732	16844654.92
1231332721	Miscellaneous	Y2	Bellcore Issue 6	Level I		0.150000	1.00	1.3280	0.150000	6666666.67
1231314350	Miscellaneous	Y3	Bellcore Issue 6	Level I		0.150000	1.00	1.3280	0.150000	6666666.67
1231325050	Miscellaneous	Y4,Y5	Bellcore Issue 6	Level I		0.150000	2.00	2.6560	0.300000	6666666.67
1211104769	Inductor	L3	Bellcore Issue 6	Level I	5.00	0.002497	1.00	.0221	0.002497	400465049.33
1211104769	Inductor	L2	Bellcore Issue 6	Level I		0.086173	1.00	.7629	0.086173	11604581.32
121110010T	Inductor	L4	Bellcore Issue 6	Level I		0.086173	1.00	.7629	0.086173	11604581.32
1315700212	Semiconductor	Q1, Q10, Q2, Q5, Q9	Bellcore Issue 6	Level I		0.047952	5.00	2.1227	0.239760	20854149.54
1310390411	Semiconductor	Q7,Q8	Bellcore Issue 6	Level I	50.60	0.054925	2.00	.9725	0.109849	18206736.57
1311390610	Semiconductor	Q11	Bellcore Issue 6	Level I		0.023881	1.00	.2114	0.023881	41874327.58
1540710382	Resistor	RP3~6,RP26, RP43~49, RP53, RP55, RP58, RP59, RP68, RP74, RP76, RP81~85	Bellcore Issue 6	Level I		0.006246	24.00	1.3271	0.149904	160102772.00
1540722085	Resistor	RP27~42, RP50~52, RP54, RP56, RP57, RP77~ RP79	Bellcore Issue 6	Level I		0.006246	25.00	1.3824	0.156150	160102772.00
1540715380	Resistor	RP75	Bellcore Issue 6	Level I		0.006246	1.00	.0553	0.006246	160102772.00
105A500139	Resistor	R2, R25, R26, R55, R56	Bellcore Issue 6	Level I		0.002268	5.00	.1004	0.011339	440974090.03
105A701003	Resistor	R289, R290, R298, R324, R4, R83	Bellcore Issue 6	Level I		0.002268	6.00	.1205	0.013606	440974090.03
105A733009	Resistor	R152, R154, R155, R156, R161, R168, R178, R367, R7	Bellcore Issue 6	Level I		0.002268	9.00	.1807	0.020409	440974090.03
105A701039	Resistor	R15, R17, R103, R111, R115, R129, R130, R136, R153, R163, R165, R176, R193, R197, R200, R206, R207, R209, R210, R212, R214, R219, R221, R222, R224~226, R229, R231~233, R238, R243, R252, R264, R265, R268, R278, R279, R283, R284, R292, R293, R296, R299, R30	Bellcore Issue 6	Level I		0.002268	58.00	1.1644	0.131527	440974090.03
105A702209	Resistor	R10~13,R147, R247~251, R326, R335~336, R59~74, R86, R88~90	Bellcore Issue 6	Level I		0.002268	33.00	.6625	0.074834	440974090.03

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Failure Rate 11.295318
MTBF 88,532

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1212306030	Inductor	FB1, FB12, FB14, FB16, FB26, FB27, FB28, FB29, FB30, FB34, FB36, FB37, FB39, FB40, FB41, FB42, FB44, FB45, FB46, FB47, FB48, FB8	Bellcore Issue 6	Level I		0.002268	22.00	.4417	0.049890	440974090.03
1212306035	Inductor	FB10, FB11, FB13, FB18, FB19, FB2, FB20, FB21, FB22, FB23, FB24, FB25, FB3, FB31, FB32, FB33, FB35, FB4, FB5, FB9	Bellcore Issue 6	Level I		0.002268	20.00	.4015	0.045354	440974090.03
1212308054	Inductor	FB17, FB6, FB7	Bellcore Issue 6	Level I		0.002268	3.00	.0602	0.006803	440974090.03
121230603L	Inductor	FB15, FB43	Bellcore Issue 6	Level I		0.002268	2.00	.0402	0.004535	440974090.03
121230805D	Inductor	FB38	Bellcore Issue 6	Level I		0.002268	1.00	.0201	0.002268	440974090.03
1653006203	Connection	JP5	Bellcore Issue 6	Level I		0.006828	1.00	.0604	0.006828	146463378.45
1211103366	Inductor	L1	Bellcore Issue 6	Level I		0.086173	1.00	.7629	0.086173	11604581.32
1653217209	Connection	CN2	Bellcore Issue 6	Level I		0.019345	1.00	.1713	0.019345	51692957.10
1124433690	Capacitor	C107, C116	Bellcore Issue 6	Level I		0.004535	2.00	.0803	0.009071	220487045.01
14S3020300	Integrated Circuit	U24	Bellcore Issue 6	Level I	21.60	0.259068	1.00	2.2936	0.259068	3859990.25
14S4888801	Integrated Circuit	U34	Bellcore Issue 6	Level I	10.70	0.112914	1.00	.9997	0.112914	8856283.72
1304001340	Semiconductor	D24	Bellcore Issue 6	Level I		0.004877	1.00	.0432	0.004877	205063180.81
1615313800	Semiconductor	U4	Bellcore Issue 6	Level I		0.079603	1.00	.7047	0.079603	12562298.27
1615313800	Semiconductor	U44	Bellcore Issue 6	Level I	14.00	0.116904	1.00	1.0350	0.116904	8553992.85
14S9386100	Integrated Circuit	U19~21	Bellcore Issue 6	Level I		0.064937	3.00	1.7247	0.194811	15399556.24