



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

# **PCM-6890**

## **Reliability Prediction Report**

### **(MTBF)**

**Release Date: Dec. 24, 1999**

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**Issue Stamp**

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**QA Manager**

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**QE Manager**

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**Test Engineer**

# Reliability Prediction (MTBF)

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**I . Model Name: PCM-6890**

**II . Description: Socket 370 Little Board with LCD, Ethernet, Audio, & 4 COMs**

**III . Prediction Date: Dec. 24, 1999**

**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:**

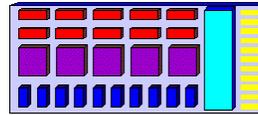
- **Failure Rate: 12.045774 ppm**
- **MTBF: 83,017. hours**

**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** 9697689002-3  
**Reference Des**  
**Date** 12. 24, 1999  
**Environment** GF, GU - Ground Fixed, Uncontrolled  
**Temperature** 25.00

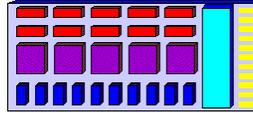


**Description** Top-level assembly  
**File Name** 6890a12.rpj  
**Time** 3:22 PM  
**Failure Rate** 12.045774  
**MTBF** 83,017

Assembly Name	Part Number	Model	Method	Environment	Duty Cycle	Qty	Failure Rate	MTBF
PCM-6890	9697689002-3	Bellcore	Method I Case 3	GF, GU - Ground Fixed,	100.00	1.00	12.045774	83,017

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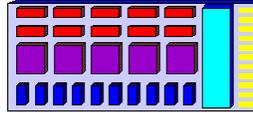
**Description** Top-level assembly  
**File Name** 6890a12.rpj  
**Time** 3:22 PM  
**Failure Rate** 12.045774  
**MTBF** 83,017

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
106B501030	Resistor	J2	Bellcore Issue 6	Level I		0.011379	1.00	.0945	0.011379	87878027.07
1119610291	Capacitor	C4-5,C9-10,C21,C30-31,C34-35,C-55	Bellcore Issue 6	Level I		0.075338	10.00	6.2543	0.753382	13273483.15
1119610293	Capacitor	C7-8	Bellcore Issue 6	Level I		0.071121	2.00	1.1809	0.142243	14060484.33
1211100100	Inductor	L3	Bellcore Issue 6	Level I	17.00	0.118096	1.00	.9804	0.118096	8467693.01
1211102762	Inductor	L2	Bellcore Issue 6	Level I	21.00	0.126566	1.00	1.0507	0.126566	7900993.32
1231124550	Miscellaneous	X1	Bellcore Issue 6	Level I		0.150000	1.00	1.2452	0.150000	6666666.67
1231143180	Miscellaneous	Y1	Bellcore Issue 6	Level I		0.150000	1.00	1.2452	0.150000	6666666.67
1600001203	Switching Device	SW1	Bellcore Issue 6	Level I		0.038756	1.00	.3217	0.038756	25802421.24
1651003222	Connection	U18	Bellcore Issue 6	Level I		0.018207	1.00	.1511	0.018207	54923766.92
1651584490	Connection	DIM1	Bellcore Issue 6	Level I		0.095587	1.00	.7935	0.095587	10461669.89
1651607920	Connection	CPU1	Bellcore Issue 6	Level I		0.210519	1.00	1.7477	0.210519	4750163.63
1652508204	Connection	CN15	Bellcore Issue 6	Level I		0.004552	1.00	.0378	0.004552	219695067.68
1653002100	Connection	J6	Bellcore Issue 6	Level I		0.001138	1.00	.0094	0.001138	878780270.71
1653003101	Connection	J1,J8-9	Bellcore Issue 6	Level I		0.001707	3.00	.0425	0.005121	585853513.81
1653003200	Connection	LED2	Bellcore Issue 6	Level I		0.003414	1.00	.0283	0.003414	292926756.90
1653003201	Connection	J3-5,J7,J10,J7A	Bellcore Issue 6	Level I		0.003414	6.00	.1700	0.020483	292926756.90
1653004200	Connection	CN3,CN7	Bellcore Issue 6	Level I		0.004552	2.00	.0756	0.009104	219695067.68
1653004205	Connection	CN11	Bellcore Issue 6	Level I		0.003983	1.00	.0331	0.003983	251080077.35
1653005100	Connection	CN8	Bellcore Issue 6	Level I		0.002845	1.00	.0236	0.002845	351512108.28
1653020200	Connection	CN16	Bellcore Issue 6	Level I		0.022759	1.00	.1889	0.022759	43939013.54
1653025201	Connection	CN10	Bellcore Issue 6	Level I		0.028449	1.00	.2362	0.028449	35151210.83
1653120225	Connection	CN5	Bellcore Issue 6	Level I		0.022759	1.00	.1889	0.022759	43939013.54
1653132220	Connection	CN2	Bellcore Issue 6	Level I		0.036414	1.00	.3023	0.036414	27461883.46
1653207200	Connection	CN13	Bellcore Issue 6	Level I		0.007966	1.00	.0661	0.007966	125540038.67
1653208200	Connection	CN12	Bellcore Issue 6	Level I		0.009104	1.00	.0756	0.009104	109847533.84
1653213201	Connection	CN14	Bellcore Issue 6	Level I		0.014793	1.00	.1228	0.014793	67598482.36
1653217202	Connection	CN17	Bellcore Issue 6	Level I		0.019345	1.00	.1606	0.019345	51692957.10
1653222200	Connection	CN6	Bellcore Issue 6	Level I		0.025035	1.00	.2078	0.025035	39944557.76
16542C0200	Connection	PCI1	Bellcore Issue 6	Level I		0.068276	1.00	.5668	0.068276	14646337.85
1655003000	Connection	CN1	Bellcore Issue 6	Level I		0.001707	1.00	.0142	0.001707	585853513.81



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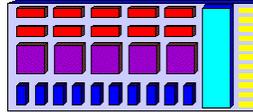


**Description** Top-level assembly  
**File Name** 6890a12.rpj  
**Time** 3:22 PM  
**Failure Rate** 12.045774  
**MTBF** 83,017

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
101A710019	Resistor	R37,R48,R59,R62,R88,R125,R131- ,R137,R139,R144,R149,R151-152,- R156,R196,R202-203,R216,R221,- R244-248	Bellcore Issue 6	Level I		0.002268	24.00	.4518	0.054425	440974090.03
101A710029	Resistor	R38,R104,R124,R250-251	Bellcore Issue 6	Level I		0.002268	5.00	.0941	0.011339	440974090.03
101A715009	Resistor	R133-134,R146,R154	Bellcore Issue 6	Level I		0.002268	4.00	.0753	0.009071	440974090.03
101A715029	Resistor	R65,R236,R238	Bellcore Issue 6	Level I		0.002268	3.00	.0565	0.006803	440974090.03
101A733009	Resistor	R5,R73,R102,R126,R132,R135-136- ,R138,R142-143,R150,R153,R159,- R175,R177-179,R227	Bellcore Issue 6	Level I		0.002268	18.00	.3389	0.040819	440974090.03
101A747009	Resistor	R92-94,R214	Bellcore Issue 6	Level I		0.002268	4.00	.0753	0.009071	440974090.03
1059700001	Resistor	L21	Bellcore Issue 6	Level I		0.002268	1.00	.0188	0.002268	440974090.03
1059710059	Resistor	R87	Bellcore Issue 6	Level I		0.013606	1.00	.1130	0.013606	73495681.67
105A502833	Resistor	R232	Bellcore Issue 6	Level I		0.002268	1.00	.0188	0.002268	440974090.03
105A504763	Resistor	R30,R33	Bellcore Issue 6	Level I		0.002268	2.00	.0377	0.004535	440974090.03
105A507503	Resistor	R112,R116,R145	Bellcore Issue 6	Level I		0.002268	3.00	.0565	0.006803	440974090.03
105A510003	Resistor	R109	Bellcore Issue 6	Level I		0.002268	1.00	.0188	0.002268	440974090.03
105A515003	Resistor	R110-111,R117	Bellcore Issue 6	Level I		0.002268	3.00	.0565	0.006803	440974090.03
105A521033	Resistor	R224	Bellcore Issue 6	Level I		0.002268	1.00	.0188	0.002268	440974090.03
105A549963	Resistor	R44,R47,R50-51	Bellcore Issue 6	Level I		0.002268	4.00	.0753	0.009071	440974090.03
105A560423	Resistor	R225-226	Bellcore Issue 6	Level I		0.002268	2.00	.0377	0.004535	440974090.03
105A700333	Resistor	R35	Bellcore Issue 6	Level I		0.002268	1.00	.0188	0.002268	440974090.03
105A701823	Resistor	R130	Bellcore Issue 6	Level I		0.002268	1.00	.0188	0.002268	440974090.03
105A702033	Resistor	R77-80	Bellcore Issue 6	Level I		0.002268	4.00	.0753	0.009071	440974090.03
105A702723	Resistor	R100,R122-123,R127-128,R140,R- 184,R186,R201	Bellcore Issue 6	Level I		0.002268	9.00	.1694	0.020409	440974090.03
105A705103	Resistor	R31,R119	Bellcore Issue 6	Level I		0.002268	2.00	.0377	0.004535	440974090.03
105A705603	Resistor	R118,R129	Bellcore Issue 6	Level I		0.002268	2.00	.0377	0.004535	440974090.03
105A707523	Resistor	R32	Bellcore Issue 6	Level I		0.002268	1.00	.0188	0.002268	440974090.03
105A710033	Resistor	R95,R108	Bellcore Issue 6	Level I		0.002268	2.00	.0377	0.004535	440974090.03
105A720003	Resistor	R249	Bellcore Issue 6	Level I		0.002268	1.00	.0188	0.002268	440974090.03
105A751033	Resistor	R60	Bellcore Issue 6	Level I		0.002268	1.00	.0188	0.002268	440974090.03
105A756033	Resistor	R43,R52	Bellcore Issue 6	Level I		0.002268	2.00	.0377	0.004535	440974090.03

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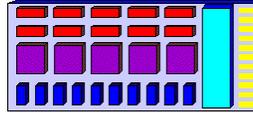


**Description** Top-level assembly  
**File Name** 6890a12.rpj  
**Time** 3:22 PM  
**Failure Rate** 12.045774  
**MTBF** 83,017

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
105A768003	Resistor	R148	Bellcore Issue 6	Level I		0.002268	1.00	.0188	0.002268	440974090.03
1121701050	Capacitor	C83,C85	Bellcore Issue 6	Level I		0.002539	2.00	.0422	0.005078	393852661.82
1122701680	Capacitor	M1-160	Bellcore Issue 6	Level I		0.001598	160.00	2.1220	0.255610	625953979.55
1122733750	Capacitor	C84	Bellcore Issue 6	Level I		0.001598	1.00	.0133	0.001598	625953979.55
1124501780	Capacitor	C72,C90	Bellcore Issue 6	Level I		0.001060	2.00	.0176	0.002120	943198589.05
1124510080	Capacitor	C2,C12-18,C61,C63-66,C82,C87	Bellcore Issue 6	Level I		0.001060	15.00	.1320	0.015903	943198589.05
1124510180	Capacitor	C37,C73	Bellcore Issue 6	Level I		0.001060	2.00	.0176	0.002120	943198589.05
1124510280	Capacitor	C25,C33,C46-47,C69,C70-71	Bellcore Issue 6	Level I		0.001060	7.00	.0616	0.007422	943198589.05
1124515080	Capacitor	C26,C29,C67-68	Bellcore Issue 6	Level I		0.001060	4.00	.0352	0.004241	943198589.05
1124520080	Capacitor	C51-52,C57-58,C62	Bellcore Issue 6	Level I		0.001060	5.00	.0440	0.005301	943198589.05
1124522080	Capacitor	C74-75	Bellcore Issue 6	Level I		0.001060	2.00	.0176	0.002120	943198589.05
1124522180	Capacitor	C22	Bellcore Issue 6	Level I		0.001060	1.00	.0088	0.001060	943198589.05
1124522280	Capacitor	C36,C44	Bellcore Issue 6	Level I		0.001060	2.00	.0176	0.002120	943198589.05
1124547080	Capacitor	C98,C101-102	Bellcore Issue 6	Level I		0.001060	3.00	.0264	0.003181	943198589.05
1124547180	Capacitor	C54,C78,C92-93,C95-96	Bellcore Issue 6	Level I		0.001060	6.00	.0528	0.006361	943198589.05
1124547280	Capacitor	C20	Bellcore Issue 6	Level I		0.001060	1.00	.0088	0.001060	943198589.05
1129610290	Capacitor	C94	Bellcore Issue 6	Level I		0.000712	1.00	.0059	0.000712	1403854368.14
1129701080	Capacitor	C3,C6,C11,C19,C38-39,C41,C43,C-45,C48-50,C53,C79,C97,C99-100,-O1-O20	Bellcore Issue 6	Level I		0.005466	37.00	1.6788	0.202228	182961702.19
1129747650	Capacitor	C40,C56,P1-13	Bellcore Issue 6	Level I		0.005466	15.00	.6806	0.081984	182961702.19
1141610050	Capacitor	C32,C42,C76-77,C89,F1-20	Bellcore Issue 6	Level I		0.002357	25.00	.4892	0.058927	424256814.77
1142610060	Capacitor	C59-60	Bellcore Issue 6	Level I		0.001587	2.00	.0264	0.003174	630075050.70
1149610180	Capacitor	C80-81,C86,C88,C91	Bellcore Issue 6	Level I		0.004535	5.00	.1883	0.022677	220487045.01
1149633190	Capacitor	C1,C23-24,C27-28	Bellcore Issue 6	Level I		0.004933	5.00	.2048	0.024664	202722669.92
1174510180	Capacitor	NC3-10	Bellcore Issue 6	Level I		0.001118	8.00	.0743	0.008947	894119057.63
1174547080	Capacitor	NC1-2	Bellcore Issue 6	Level I		0.001060	2.00	.0176	0.002120	943198589.05
1211102200	Inductor	L5	Bellcore Issue 6	Level I		0.002268	1.00	.0188	0.002268	440974090.03
1212306031	Inductor	L25-33	Bellcore Issue 6	Level I		0.002268	9.00	.1694	0.020409	440974090.03
1212308050	Inductor	L1,L4,L6-20,L23-24,L34	Bellcore Issue 6	Level I		0.002268	20.00	.3765	0.045354	440974090.03
1231332721	Miscellaneous	Y2-3	Bellcore Issue 6	Level I		0.150000	2.00	2.4905	0.300000	666666.67
1233314351	Miscellaneous	X3-4	Bellcore Issue 6	Level I		0.360000	2.00	5.9772	0.720000	277777.78

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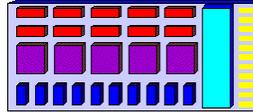


**Description** Top-level assembly  
**File Name** 6890a12.rpj  
**Time** 3:22 PM  
**Failure Rate** 12.045774  
**MTBF** 83,017

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1233350050	Miscellaneous	X2	Bellcore Issue 6	Level I		0.360000	1.00	2.9886	0.360000	2777777.78
1300014040	Semiconductor	D2	Bellcore Issue 6	Level I		0.023881	1.00	.1983	0.023881	41874327.58
1300414800	Semiconductor	D1,D3,D6	Bellcore Issue 6	Level I		0.023881	3.00	.5948	0.071643	41874327.58
1301005440	Semiconductor	D4,D7	Bellcore Issue 6	Level I		0.023881	2.00	.3965	0.047762	41874327.58
1302000340	Semiconductor	D5	Bellcore Issue 6	Level I		0.027212	1.00	.2259	0.027212	36747840.84
1304100540	Semiconductor	LED1	Bellcore Issue 6	Level I		0.004877	1.00	.0405	0.004877	205063180.81
1310390410	Semiconductor	Q7	Bellcore Issue 6	Level I		0.023881	1.00	.1983	0.023881	41874327.58
1314108300	Integrated Circuit	Q4	Bellcore Issue 6	Level I	30.00	0.436008	1.00	3.6196	0.436008	2293534.80
1314108410	Integrated Circuit	Q5	Bellcore Issue 6	Level I	17.00	0.192530	1.00	1.5983	0.192530	5193998.23
1314108511	Integrated Circuit	Q1	Bellcore Issue 6	Level I	9.00	0.112485	1.00	.9338	0.112485	8890058.82
1314780500	Integrated Circuit	Q6	Bellcore Issue 6	Level I	8.00	0.104969	1.00	.8714	0.104969	9526603.44
1315500311	Semiconductor	Q2-3	Bellcore Issue 6	Level I	20.00	0.136415	2.00	2.2649	0.272829	7330589.09
1315700210	Semiconductor	Q8-9	Bellcore Issue 6	Level I		0.079603	2.00	1.3217	0.159207	12562298.27
1428274074	Integrated Circuit	U8	Bellcore Issue 6	Level I	12.00	0.111857	1.00	.9286	0.111857	8939965.74
1428474008	Integrated Circuit	U15	Bellcore Issue 6	Level I	13.00	0.114774	1.00	.9528	0.114774	8712810.69
1440074007	Integrated Circuit	U17	Bellcore Issue 6	Level I	13.00	0.115258	1.00	.9568	0.115258	8676209.89
14S1486300	Integrated Circuit	U19	Bellcore Issue 6	Level I	12.00	0.138049	1.00	1.1460	0.138049	7243806.82
14S3128420	Integrated Circuit	U28	Bellcore Issue 6	Level I	9.00	0.112485	1.00	.9338	0.112485	8890058.82
14S3155300	Integrated Circuit	U3	Bellcore Issue 6	Level I		0.059366	1.00	.4928	0.059366	16844654.92
14S3200400	Integrated Circuit	U26	Bellcore Issue 6	Level I	8.00	0.104969	1.00	.8714	0.104969	9526603.44
14S3924800	Integrated Circuit	U1	Bellcore Issue 6	Level I	25.00	0.320878	1.00	2.6638	0.320878	3116453.93
14S4021300	Integrated Circuit	U29-32	Bellcore Issue 6	Level I	10.00	0.120485	4.00	4.0009	0.481941	8299772.79
14S4048500	Integrated Circuit	U25,U27	Bellcore Issue 6	Level I	4.00	0.079239	2.00	1.3156	0.158478	12620044.05
14S4070600	Integrated Circuit	U33	Bellcore Issue 6	Level I	4.00	0.079239	1.00	.6578	0.079239	12620044.05
14S4237120	Integrated Circuit	U14	Bellcore Issue 6	Level I	16.00	0.095944	1.00	.7965	0.095944	10422762.91
14S4244300	Integrated Circuit	U2	Bellcore Issue 6	Level I	31.00	0.204745	1.00	1.6997	0.204745	4884119.83
14S4378100	Integrated Circuit	U23	Bellcore Issue 6	Level I	11.00	0.128997	1.00	1.0709	0.128997	7752127.40
14S4397700	Integrated Circuit	U22	Bellcore Issue 6	Level I	11.00	0.073313	1.00	.6086	0.073313	13640096.66
14S4813901	Integrated Circuit	U5	Bellcore Issue 6	Level I	23.00	0.137870	1.00	1.1446	0.137870	7253191.45
14S4866100	Integrated Circuit	U21	Bellcore Issue 6	Level I	11.00	0.073313	1.00	.6086	0.073313	13640096.66
14S4900000	Integrated Circuit	U13	Bellcore Issue 6	Level I	25.00	0.152477	1.00	1.2658	0.152477	6558369.27

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14S5324500	Integrated Circuit	U20	Bellcore Issue 6	Level I	10.00	0.103929	1.00	.8628	0.103929	9621974.55
14S5801400	Integrated Circuit	U9,U12	Bellcore Issue 6	Level I	13.00	0.078802	2.00	1.3084	0.157603	12690106.59
14S5A15700	Integrated Circuit	U7	Bellcore Issue 6	Level I	13.00	0.079479	1.00	.6598	0.079479	12581983.53
14S6202000	Integrated Circuit	U16	Bellcore Issue 6	Level I	10.00	0.329865	1.00	2.7384	0.329865	3031542.00
14S6334600	Integrated Circuit	U6	Bellcore Issue 6	Level I	17.00	0.099232	1.00	.8238	0.099232	10077347.00
14S8416800	Integrated Circuit	U11	Bellcore Issue 6	Level I	11.00	0.073313	1.00	.6086	0.073313	13640096.66
14S9137300	Integrated Circuit	U4	Bellcore Issue 6	Level I	22.00	0.131039	1.00	1.0878	0.131039	7631339.56
14S9972100	Integrated Circuit	U10	Bellcore Issue 6	Level I	20.00	0.233882	1.00	1.9416	0.233882	4275661.99
1540701308	Resistor	RN32	Bellcore Issue 6	Level I		0.006246	1.00	.0519	0.006246	160102772.00
1540715308	Resistor	RN18	Bellcore Issue 6	Level I		0.006246	1.00	.0519	0.006246	160102772.00
1540722008	Resistor	RN21,RN25-26,RN28-29,RN31,RN-33,RN35	Bellcore Issue 6	Level I		0.006246	8.00	.4148	0.049968	160102772.00
1540727208	Resistor	RN1-2,RN11,RN16,RN23,RN27	Bellcore Issue 6	Level I		0.006246	6.00	.3111	0.037476	160102772.00
1540747208	Resistor	RN3-4,RN22	Bellcore Issue 6	Level I		0.006246	3.00	.1556	0.018738	160102772.00
1540756008	Resistor	RP1-RP28	Bellcore Issue 6	Level I		0.006246	28.00	1.4519	0.174888	160102772.00
1540782208	Resistor	RN5-10,RN12-15,RN17,RN19-20,-RN24,RN30,RN34,RN36	Bellcore Issue 6	Level I		0.006246	17.00	.8815	0.106182	160102772.00
1651203291	Connection	PLCC	Bellcore Issue 6	Level I		0.018207	1.00	.1511	0.018207	54923766.92
1752000700	Miscellaneous	FS3	Bellcore Issue 6	Level I		0.030000	1.00	.2490	0.030000	33333333.33
1752000800	Miscellaneous	FS1-2,FS4	Bellcore Issue 6			0.010000	3.00	.2490	0.030000	10000000.00