



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

PCM-4896L  
Reliability Prediction Report  
(MTBF)

Release Date: JUL.17, 2002

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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-4896L(Rev.C1.0)

**II . Description:** AIO Compact Board. GX1. LCD/Ethernet/Audio/4COMs, CPU-300.

**III . Prediction Date:** JUL.17, 2002

**IV . Prediction Site:** AAEON QE Dept.

**V . Predicted by :** Linda Sun

**VI . Equipment:** Relx Ver.7.2 Visual Reliability Software

## **VII. Simulation Environment:**

- Temperature: 25 degrees C(No temperature rise condition )
- Standard: Telcordia (Bellcore) Standard

## **VIII. 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: 8.544376ppm
- MTBF: 117,036Hours ( about 13.4 years )

## **X. Prediction Table:**

**AAEON Reliability Prediction Report**

**Part Number** 9697489642  
**Reference Des**  
**Date** 07. 17, 2002  
**Environment** GF, GU - Ground Fixed, Uncontrolled  
**Temperature** 25.00



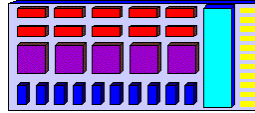
**Description** Top-level assembly  
**File Name** PCM-4896LC10.RPJ  
**Time** 5:51 PM  
**Failure Rate** 8.544376  
**MTBF** 117,036

Assembly Name	Part Number	Model	Method	Environment	Duty Cycle	Qty	Failure Rate	MTBF
PCM-4896L-C10	9697489642	Bellcore	Method I Case 3	GF, GU - Ground Fixed,	100.00	1.00	8.544376	117,036



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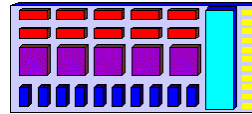


**Description** Top-level assembly  
**File Name** PCM-4896LC10.RPJ  
**Time** 5:51 PM  
**Failure Rate** 8.544376  
**MTBF** 117,036

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
105A707503	Resistor	R83,R86,R288,R291,R295,R299,R-302	Bellcore Issue 6	Level I		0.002268	7.00	.1858	0.015874	440974090.03
105A705623	Resistor	R70,R218,R312	Bellcore Issue 6	Level I		0.002268	3.00	.0796	0.006803	440974090.03
105A710003	Resistor	R16,R38,R73,R289	Bellcore Issue 6	Level I		0.002268	4.00	.1062	0.009071	440974090.03
105A733003	Resistor	R106,R178,R183,R217,R219,R223-R281	Bellcore Issue 6	Level I		0.002268	7.00	.1858	0.015874	440974090.03
105A747003	Resistor	R69,R87-89	Bellcore Issue 6	Level I		0.002268	4.00	.1062	0.009071	440974090.03
105A710053	Resistor	R74,R165	Bellcore Issue 6	Level I		0.013606	2.00	.3185	0.027212	73495681.67
105A700303	Resistor	R25,R31	Bellcore Issue 6	Level I		0.002268	2.00	.0531	0.004535	440974090.03
105A701823	Resistor	R319	Bellcore Issue 6	Level I		0.002268	1.00	.0265	0.002268	440974090.03
105A702233	Resistor	R19	Bellcore Issue 6	Level I		0.002268	1.00	.0265	0.002268	440974090.03
105A702723	Resistor	R91,R94,R100,R103,R148,R151-152,R155,R158,R161-162	Bellcore Issue 6	Level I		0.002268	11.00	.2919	0.024945	440974090.03
105A704733	Resistor	R273-274,R278-279,R282-284	Bellcore Issue 6	Level I		0.002268	7.00	.1858	0.015874	440974090.03
105A705103	Resistor	R138	Bellcore Issue 6	Level I		0.002268	1.00	.0265	0.002268	440974090.03
105A710033	Resistor	R67,R259-260,R272	Bellcore Issue 6	Level I		0.002268	4.00	.1062	0.009071	440974090.03
105A701533	Resistor	R201,R204,R212,R215,R290,R298	Bellcore Issue 6	Level I		0.002268	6.00	.1592	0.013606	440974090.03
105A718003	Resistor	R326	Bellcore Issue 6	Level I		0.002268	1.00	.0265	0.002268	440974090.03
105A711003	Resistor	R325	Bellcore Issue 6	Level I		0.002268	1.00	.0265	0.002268	440974090.03
105A701033	Resistor	R14,R17,R21-22,R36-37,R40,R59,-R61,R68,R71,R79,R92-93,R126-127,R134-136,R143,R154,R157,R170-,R188,R196,R206,R209-210,R214,-R220-222,R232-234,R237-239,R244-248,R250-252,R255,R257,R262-264,R266,R268-271,R277,R293-294,R296-297	Bellcore Issue 6	Level I		0.002268	61.00	1.6190	0.138330	440974090.03
105A702033	Resistor	R253,R261	Bellcore Issue 6	Level I		0.002268	2.00	.0531	0.004535	440974090.03
106B501030	Resistor	J2	Bellcore Issue 6	Level I		0.011379	1.00	.1332	0.011379	87878027.07
1121701050	Capacitor	C65,C82-85	Bellcore Issue 6	Level I		0.002539	5.00	.1486	0.012695	393852661.82
1122701680	Capacitor	C25,C151-152,M1-38,M42-79,M81--86,M88-106,M109-117,M119-120,-M122,M125-150	Bellcore Issue 6	Level I		0.001598	142.00	2.6550	0.226854	625953979.55
1122747880	Capacitor	C75	Bellcore Issue 6	Level I		0.001598	1.00	.0187	0.001598	625953979.55
1124447080	Capacitor	C27-30,C104-105,C108-109,C111,-C115-116	Bellcore Issue 6	Level I		0.001060	11.00	.1365	0.011662	943198589.05

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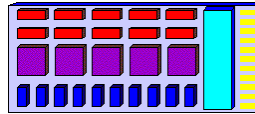


**Description** Top-level assembly  
**File Name** PCM-4896LC10.RPJ  
**Time** 5:51 PM  
**Failure Rate** 8.544376  
**MTBF** 117,036

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1124433080	Capacitor	C26,C77	Bellcore Issue 6	Level I		0.001060	2.00	.0248	0.002120	943198589.05
1124415080	Capacitor	C5-7,C13,C36-42,C52-55,C69	Bellcore Issue 6	Level I		0.001060	16.00	.1985	0.016964	943198589.05
1124410080	Capacitor	C81	Bellcore Issue 6	Level I		0.001060	1.00	.0124	0.001060	943198589.05
1124501780	Capacitor	C20,C22-24,C56,C67,C71	Bellcore Issue 6	Level I		0.001060	7.00	.0869	0.007422	943198589.05
1124547180	Capacitor	C101-102,C107,C110	Bellcore Issue 6	Level I		0.001060	4.00	.0496	0.004241	943198589.05
1124522180	Capacitor	C66,C70,C100,C106,C119-148	Bellcore Issue 6	Level I		0.001060	34.00	.4219	0.036048	943198589.05
1124515281	Capacitor	C11,C17	Bellcore Issue 6	Level I		0.001060	2.00	.0248	0.002120	943198589.05
1124515180	Capacitor	C16	Bellcore Issue 6	Level I		0.001060	1.00	.0124	0.001060	943198589.05
1124510280	Capacitor	C86-88,C90-93	Bellcore Issue 6	Level I		0.001060	7.00	.0869	0.007422	943198589.05
1124510180	Capacitor	C43-44,C46-47,C57-58,C60,C94,C-114	Bellcore Issue 6	Level I		0.001060	9.00	.1117	0.009542	943198589.05
1129610260	Capacitor	C103	Bellcore Issue 6	Level I		0.000712	1.00	.0083	0.000712	1403854412.74
1129701080	Capacitor	C73-74,C79,C95-97,C117,M40,M87-M154	Bellcore Issue 6	Level I		0.005466	10.00	.6397	0.054656	182961702.19
1129710060	Capacitor	C10,C14,C61-64,C68,C72,C76,C78-C80,C89,C149-150,F7-19,F21-22	Bellcore Issue 6	Level I		0.005466	29.00	1.8551	0.158503	182961702.19
1119610299	Capacitor	F3-4	Bellcore Issue 6	Level I		0.071121	2.00	1.6648	0.142243	14060484.33
1119610291	Capacitor	C12,F1-2,F5-6,F21	Bellcore Issue 6	Level I		0.075338	6.00	5.2904	0.452029	13273483.15
1112610190	Capacitor	C34-35	Bellcore Issue 6	Level I		0.020771	2.00	.4862	0.041542	48143876.61
1141601090	Capacitor	C21	Bellcore Issue 6	Level I		0.002357	1.00	.0276	0.002357	424256814.77
1143610080	Capacitor	C2,C4	Bellcore Issue 6	Level I		0.001300	2.00	.0304	0.002600	769190733.80
1231114350	Miscellaneous	Y1	Bellcore Issue 6	Level I		0.150000	1.00	1.7555	0.150000	6666666.67
1231232720	Miscellaneous	Y2	Bellcore Issue 6	Level I		0.150000	1.00	1.7555	0.150000	6666666.67
1233325053	Miscellaneous	OSC1	Bellcore Issue 6	Level I		0.360000	1.00	4.2133	0.360000	2777777.78
1211100100	Inductor	L3	Bellcore Issue 6	Level I		0.086173	1.00	1.0085	0.086173	11604581.32
1211102762	Inductor	L1	Bellcore Issue 6	Level I	11.00	0.002792	1.00	.0327	0.002792	358207088.13
1212106350	Inductor	L4	Bellcore Issue 6	Level I		0.002268	1.00	.0265	0.002268	440974090.03
1212303610	Inductor	L10,L14,L16,L24,L26-27	Bellcore Issue 6	Level I		0.002268	6.00	.1592	0.013606	440974090.03
1212306031	Inductor	L15,L17-19,L28-29,L32,L34-35,L37-45	Bellcore Issue 6	Level I		0.002268	18.00	.4777	0.040819	440974090.03
1212308050	Inductor	L2-3,L5-9,L11-12,L20,L30,L46-47	Bellcore Issue 6	Level I		0.002268	13.00	.3450	0.029480	440974090.03
1314108312	Integrated Circuit	Q1	Bellcore Issue 6	Level I	16.10	0.181482	1.00	2.1240	0.181482	5510184.25
1314101010	Integrated Circuit	Q10	Bellcore Issue 6	Level I	10.60	0.125529	1.00	1.4691	0.125529	7966288.17

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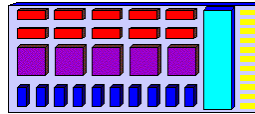


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**File Name** PCM-4896LC10.RPJ  
**Time** 5:51 PM  
**Failure Rate** 8.544376  
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1300414840	Semiconductor	D1,D3-8	Bellcore Issue 6	Level I		0.023881	7.00	1.9565	0.167167	41874327.58
1302001240	Semiconductor	Q7	Bellcore Issue 6	Level I		0.027212	1.00	.3185	0.027212	36747840.84
1301005400	Semiconductor	D10	Bellcore Issue 6	Level I		0.023881	1.00	.2795	0.023881	41874327.58
1300034040	Semiconductor	ZD1	Bellcore Issue 6	Level I	7.70	0.029631	1.00	.3468	0.029631	33749004.20
1304100540	Semiconductor	D2	Bellcore Issue 6	Level I		0.004877	1.00	.0571	0.004877	205063180.81
1315550310	Semiconductor	Q2-3	Bellcore Issue 6	Level I		0.159207	2.00	3.7266	0.318413	6281149.14
1310222210	Semiconductor	Q5-6,Q8	Bellcore Issue 6	Level I		0.023881	3.00	.8385	0.071643	41874327.58
14S4030000	Integrated Circuit	U7	Bellcore Issue 6	Level I	13.30	0.083060	1.00	.9721	0.083060	12039471.34
14S5500800	Integrated Circuit	U20	Bellcore Issue 6	Level I		0.064937	1.00	.7600	0.064937	15399556.24
14S5512500	Integrated Circuit	U17	Bellcore Issue 6	Level I		0.064937	1.00	.7600	0.064937	15399556.24
14S3149100	Integrated Circuit	U5	Bellcore Issue 6	Level I	12.70	0.080413	1.00	.9411	0.080413	12435743.52
14S5324500	Integrated Circuit	U37	Bellcore Issue 6	Level I	14.20	0.124096	1.00	1.4524	0.124096	8058290.21
14S5801400	Integrated Circuit	U15	Bellcore Issue 6	Level I		0.037889	1.00	.4434	0.037889	26392869.26
14S5537300	Integrated Circuit	U34	Bellcore Issue 6	Level I	11.80	0.116888	1.00	1.3680	0.116888	8555188.35
14S5537300	Integrated Circuit	U35	Bellcore Issue 6	Level I	11.60	0.115903	1.00	1.3565	0.115903	8627929.38
14S5517400	Integrated Circuit	U38	Bellcore Issue 6	Level I	11.60	0.112881	1.00	1.3211	0.112881	8858912.56
14S8203280	Integrated Circuit	U13	Bellcore Issue 6	Level I	11.80	0.090028	1.00	1.0536	0.090028	11107716.55
14S8416803	Integrated Circuit	U19	Bellcore Issue 6	Level I	9.70	0.068263	2.00	1.5978	0.136525	14649283.25
14S8416803	Integrated Circuit	U36	Bellcore Issue 6	Level I	10.60	0.071725	2.00	1.6789	0.143451	13942087.52
14S1486300	Integrated Circuit	U23	Bellcore Issue 6	Level I	10.60	0.125529	1.00	1.4691	0.125529	7966288.17
14S2143000	Integrated Circuit	U2	Bellcore Issue 6	Level I		0.059366	1.00	.6948	0.059366	16844654.92
14S2252600	Integrated Circuit	U11	Bellcore Issue 6	Level I		0.059366	1.00	.6948	0.059366	16844654.92
14S3181900	Integrated Circuit	U22	Bellcore Issue 6	Level I	23.10	0.284874	1.00	3.3341	0.284874	3510323.17
14S4021300	Integrated Circuit	U28-31	Bellcore Issue 6	Level I		0.059366	4.00	2.7792	0.237464	16844654.92
14S9055500	Integrated Circuit	U9	Bellcore Issue 6	Level I		0.059366	1.00	.6948	0.059366	16844654.92
14S4048500	Integrated Circuit	U26-27	Bellcore Issue 6	Level I		0.059366	2.00	1.3896	0.118732	16844654.92
14S3128400	Integrated Circuit	U32-33	Bellcore Issue 6	Level I		0.050100	2.00	1.1727	0.100201	19959892.45
14S3200400	Integrated Circuit	TF1	Bellcore Issue 6	Level I		0.059366	1.00	.6948	0.059366	16844654.92
14S4070610	Integrated Circuit	U16	Bellcore Issue 6	Level I		0.059366	1.00	.6948	0.059366	16844654.92
14S4866100	Integrated Circuit	U25	Bellcore Issue 6	Level I	8.10	0.062470	1.00	.7311	0.062470	16007755.39
14S4378100	Integrated Circuit	U3	Bellcore Issue 6	Level I		0.039296	1.00	.4599	0.039296	25448028.36

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14S4553011	Integrated Circuit	U14	Bellcore Issue 6	Level I	18.20	0.107709	1.00	1.2606	0.107709	9284236.29
14S4813904	Integrated Circuit	U10	Bellcore Issue 6	Level I	14.30	0.087642	1.00	1.0257	0.087642	11410032.60
14S4731700	Integrated Circuit	U24	Bellcore Issue 6	Level I		0.039296	1.00	.4599	0.039296	25448028.36
14S6334610	Integrated Circuit	U12	Bellcore Issue 6	Level I		0.030598	1.00	.3581	0.030598	32681842.61
14S6202000	Integrated Circuit	U1	Bellcore Issue 6	Level I		0.136173	1.00	1.5937	0.136173	7343591.05
1540701380	Resistor	RN2,RP1,RP3	Bellcore Issue 6	Level I		0.006246	3.00	.2193	0.018738	160102772.00
1540710080	Resistor	RN3-23	Bellcore Issue 6	Level I		0.006246	21.00	1.5351	0.131166	160102772.00
1540710380	Resistor	RN30-31,RN42,RN44-45,RP2	Bellcore Issue 6	Level I		0.006246	6.00	.4386	0.037476	160102772.00
1540722080	Resistor	RN40-41,RN43	Bellcore Issue 6	Level I		0.006246	3.00	.2193	0.018738	160102772.00
1540733082	Resistor	RN24-29,RN32-39	Bellcore Issue 6	Level I		0.006246	14.00	1.0234	0.087444	160102772.00
1540700080	Resistor	RN46-49	Bellcore Issue 6	Level I		0.006246	4.00	.2924	0.024984	160102772.00
1653003201	Connection	J6,J11-12,J14	Bellcore Issue 6	Level I		0.003414	4.00	.1598	0.013655	292926756.90
1653005201	Connection	CN15	Bellcore Issue 6	Level I		0.005690	1.00	.0666	0.005690	175756054.14
1653025201	Connection	CN7	Bellcore Issue 6	Level I		0.028449	1.00	.3330	0.028449	35151210.83
1653207200	Connection	CN10	Bellcore Issue 6	Level I		0.007966	1.00	.0932	0.007966	125540038.67
1653208200	Connection	CN9	Bellcore Issue 6	Level I		0.009104	1.00	.1065	0.009104	109847533.84
1653213201	Connection	CN11	Bellcore Issue 6	Level I		0.014793	1.00	.1731	0.014793	67598482.36
1653002101	Connection	J1	Bellcore Issue 6	Level I		0.001138	1.00	.0133	0.001138	878780270.71
1653003101	Connection	J4,J9,J10	Bellcore Issue 6	Level I		0.001707	3.00	.0599	0.005121	585853513.81
1653222200	Connection	CN4	Bellcore Issue 6	Level I		0.025035	1.00	.2930	0.025035	39944557.76
1655304020	Connection	J7	Bellcore Issue 6	Level I		0.002276	1.00	.0266	0.002276	439390135.35
1653120225	Connection	CN3	Bellcore Issue 6	Level I		0.022759	1.00	.2664	0.022759	43939013.54
1653132220	Connection	CN1	Bellcore Issue 6	Level I		0.036414	1.00	.4262	0.036414	27461883.46
1651032220	Connection	U4	Bellcore Issue 6	Level I		0.018207	1.00	.2131	0.018207	54923766.92
1651584490	Connection	DIMM1	Bellcore Issue 6	Level I		0.095587	1.00	1.1187	0.095587	10461669.89
1654260201	Connection	PCI1	Bellcore Issue 6	Level I		0.068276	1.00	.7991	0.068276	14646337.85
1651203291	Connection	U1	Bellcore Issue 6	Level I		0.018207	1.00	.2131	0.018207	54923766.92
1653003200	Connection	LED1	Bellcore Issue 6	Level I		0.003414	1.00	.0400	0.003414	292926756.90
1653003201	Connection	J13*2	Bellcore Issue 6	Level I		0.003414	2.00	.0799	0.006828	292926756.90
1653004200	Connection	CN2,CN5	Bellcore Issue 6	Level I		0.004552	2.00	.1065	0.009104	219695067.68
1653004205	Connection	CN8	Bellcore Issue 6	Level I		0.003983	1.00	.0466	0.003983	251080077.35



