



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

# PCM-5335 Rev:B1.0

## Reliability Prediction Report

### (MTBF)

Release Date: Dec , 24 , 2002

12-24-2002

Issue Stamp

Wayne Chen

A.V.P

Rex Chang

Test Engineer

# Reliability Prediction (MTBF)

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- . Model Name: PCM-5335 (Rev.B1.0)
- . Description: Embedded Low power NS Geode GX1-300 MHz PC/104 CPU Modules
- . Prediction Date: Dec.24, 2002
- . Prediction Site: AAEON DV Dept.
- . Predicted by : Rex Chang
- . Equipment: Relex Ver.7.2 Visual Reliability Software
- . Simulation Environment:
  - Temperature: 25 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.

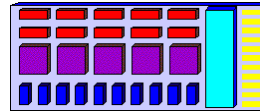
## IX. Prediction Result:

Failure Rate: 5.028567ppm  
MTBF: 198,864Hours ( about 22.7 years )

## X. Prediction Table:

**AAEON Reliability Prediction Report**

**Part Number** System  
**Reference Des**  
**Date** 05. 26, 2003  
**Environment** GB, GC - Ground Benign, Controlled  
**Temperature** 30.00

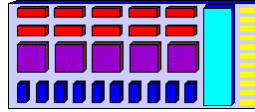


**Description** Top-level assembly  
**File Name** 5335b1.RPJ  
**Time** 2:43 PM  
**Failure Rate** 5.028567  
**MTBF** 198,864

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	5.028567	198,864

**AAEON Reliability Prediction Report**

**Part Number** System  
**Reference Des**  
**Date** 05. 26, 2003  
**Environment** GB, GC - Ground Benign, Controlled  
**Temperature** 30.00

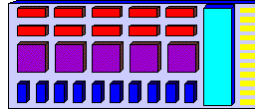


**Description** Top-level assembly  
**File Name** 5335b1.RPJ  
**Time** 2:43 PM  
**Failure Rate** 5.028567  
**MTBF** 198,864

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1655004110	Connection	CN15	Bellcore Issue 6	Level I		0.001471	1.00	.0293	0.001471	679648591.75
1653003101	Connection	JP2,JP4	Bellcore Issue 6	Level I		0.001104	2.00	.0439	0.002207	906198122.33
1653003201	Connection	JP3*2,JP5	Bellcore Issue 6	Level I		0.002207	3.00	.1317	0.006621	453099061.16
1653120221	Connection	CN3	Bellcore Issue 6	Level I		0.014713	1.00	.2926	0.014713	67964859.17
1653022100	Connection	CN1	Bellcore Issue 6	Level I		0.006253	1.00	.1244	0.006253	159917315.71
1653132225	Connection	CN5	Bellcore Issue 6	Level I		0.023542	1.00	.4682	0.023542	42478036.98
1653003200	Connection	CN4	Bellcore Issue 6	Level I		0.002207	1.00	.0439	0.002207	453099061.16
1750119014	Miscellaneous	BAT1	Bellcore Issue 6	Level I		0.450000	1.00	8.9489	0.450000	2222222.22
1653003100	Connection	JP1	Bellcore Issue 6	Level I		0.001104	2.00	.0439	0.002207	906198122.33
1122568290	Capacitor	C19,C2	Bellcore Issue 6	Level I		0.000825	1.00	.0164	0.000825	1212335760.74
1129701690	Capacitor	C10,C100,C102,C104-105,C107-1-09,C111-114,C116-118,C122,C125-128,C13-17,C131,C133-134,C136-137,C142,C144-148,C150-151,C1-58,C163-165,C168-169,C171-175,-C177-179,C182-185,C194,C198-1-99,C203,C29,C3,C31-32,C39,C43,-C46,C49,C5,C52,C54-57,C60-61,C-63,C69-70	Bellcore Issue 6	Level I		0.001311	79.00	2.0595	0.103565	762806343.57
1129701080	Capacitor	C115,C119,C138-139,C152,C155,C-186,C190,C22,C38,C4,C40,C7	Bellcore Issue 6	Level I		0.002822	13.00	.7296	0.036686	354356744.52
1129710050	Capacitor	C103,C106,C120,C132,C135,C140-,C166,C170,C18,C187-189,C191,C-37,C41,C58,C59,C6,C62,C64,C78,-C84,C98	Bellcore Issue 6	Level I		0.002822	23.00	1.2908	0.064906	354356744.52
1653205201	Connection	CN10,CN12,CN14,CN6	Bellcore Issue 6	Level I		0.003678	4.00	.2926	0.014713	271859436.70
1653213207	Connection	CN8	Bellcore Issue 6	Level I		0.009564	1.00	.1902	0.009564	104561321.81
1124433090	Capacitor	C11,C195	Bellcore Issue 6	Level I		0.000547	2.00	.0218	0.001095	1826769085.82
1124547190	Capacitor	C20,C25-28	Bellcore Issue 6	Level I		0.000547	5.00	.0544	0.002737	1826769085.82
1122722890	Capacitor	C21	Bellcore Issue 6	Level I		0.000825	1.00	.0164	0.000825	1212335760.74
1121610060	Capacitor	C193,C23-24	Bellcore Issue 6	Level I		0.001311	3.00	.0782	0.003933	762806343.57
1129710090	Capacitor	C34-35,C53,C74-75	Bellcore Issue 6	Level I		0.000547	5.00	.0544	0.002737	1826769085.82
1129747090	Capacitor	C42,C44-45,C48,C65-68,C71-73	Bellcore Issue 6	Level I		0.000547	11.00	.1197	0.006022	1826769085.82

**AAEON Reliability Prediction Report**

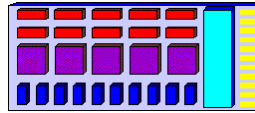
**Part Number** System  
**Reference Des**  
**Date** 05. 26, 2003  
**Environment** GB, GC - Ground Benign, Controlled  
**Temperature** 30.00



**Description** Top-level assembly  
**File Name** 5335b1.RPJ  
**Time** 2:43 PM  
**Failure Rate** 5.028567  
**MTBF** 198,864

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1124405090	Capacitor	141,143	Bellcore Issue 6	Level I		0.000547	2.00	.0218	0.001095	1826769085.82
105A701539	Resistor	R140,R58-60,R81	Bellcore Issue 6	Level I		0.001249	5.00	.1241	0.006243	800930098.66
105A701009	Resistor	R61-62,R77-80	Bellcore Issue 6	Level I		0.001249	6.00	.1490	0.007491	800930098.66
105A507509	Resistor	R143,R147,R151-152,R64,R82-83	Bellcore Issue 6	Level I		0.001249	7.00	.1738	0.008740	800930098.66
105A710039	Resistor	R87	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
105A702229	Resistor	R154,R88	Bellcore Issue 6	Level I		0.001249	2.00	.0497	0.002497	800930098.66
105A575009	Resistor	R89	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
105A501539	Resistor	R109	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
105A501529	Resistor	R110	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
105A700133	Resistor	R123	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
105A505109	Resistor	R141-142,R148-149	Bellcore Issue 6	Level I		0.001249	4.00	.0993	0.004994	800930098.66
1189633180	Capacitor	TC1	Bellcore Issue 6	Level I	41.20	0.005401	1.00	.1074	0.005401	185155812.37
1213160008	Inductor	BP2-5	Bellcore Issue 6	Level I		0.001249	4.00	.0993	0.004994	800930098.66
1759100006	Miscellaneous	BUZZ1	Bellcore Issue 6	Level I		0.075000	1.00	1.4915	0.075000	13333333.33
1653217209	Connection	CN11	Bellcore Issue 6	Level I		0.012506	1.00	.2487	0.012506	79958657.85
1654040000	Connection	CN13	Bellcore Issue 6	Level I		0.014713	1.00	.2926	0.014713	67964859.17
1174510080	Capacitor	CP1	Bellcore Issue 6	Level I		0.000547	1.00	.0109	0.000547	1826769085.82
105A516519	Resistor	R6	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
105A700139	Resistor	R139,R146,R28,R34,R50,R7,R76	Bellcore Issue 6	Level I		0.001249	7.00	.1738	0.008740	800930098.66
105A704729	Resistor	R102,R11,R115,R121,R124-125,R-130,R145,R150,R153,R155,R29,R5-3,R9,R92	Bellcore Issue 6	Level I		0.001249	15.00	.3724	0.018728	800930098.66
105A702209	Resistor	R10,R107,R12-16,R19,R63,R86	Bellcore Issue 6	Level I		0.001249	10.00	.2483	0.012485	800930098.66
105A747009	Resistor	R119,R2,R22,R35-36	Bellcore Issue 6	Level I		0.001249	5.00	.1241	0.006243	800930098.66
105A733009	Resistor	R104,R132,R24,R27	Bellcore Issue 6	Level I		0.001249	4.00	.0993	0.004994	800930098.66
105A501309	Resistor	R31	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
105A515419	Resistor	R32	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
105A704739	Resistor	R33	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
105A703309	Resistor	R111-112,R128,R39-44,R49,R56-5-7,R71-75	Bellcore Issue 6	Level I		0.001249	17.00	.4221	0.021225	800930098.66
105A500139	Resistor	R46	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
105A705629	Resistor	R118,R127,R54	Bellcore Issue 6	Level I		0.001249	3.00	.0745	0.003746	800930098.66

### AAEON Reliability Prediction Report



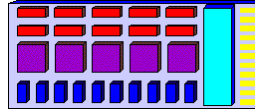
**Part Number** System  
**Reference Des**  
**Date** 05. 26, 2003  
**Environment** GB, GC - Ground Benign, Controlled  
**Temperature** 30.00

**Description** Top-level assembly  
**File Name** 5335b1.RPJ  
**Time** 2:43 PM  
**Failure Rate** 5.028567  
**MTBF** 198,864

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
105A701003	Resistor	R4,R47	Bellcore Issue 6	Level I		0.001249	2.00	.0497	0.002497	800930098.66
105A701039	Resistor	R100,R103,R106,R134-135,R17,R-20,R23,R25-26,R38,R5,R70,R90-91-,R95,R97-98	Bellcore Issue 6	Level I		0.001249	18.00	.4469	0.022474	800930098.66
14S2303700	Integrated Circuit	U1	Bellcore Issue 6	Level I		0.042535	1.00	.8459	0.042535	23510284.61
14S4030000	Integrated Circuit	U2	Bellcore Issue 6	Level I	34.30	0.151271	1.00	3.0082	0.151271	6610643.69
14S4397701	Integrated Circuit	U4	Bellcore Issue 6	Level I	30.40	0.126220	1.00	2.5101	0.126220	7922657.37
14S4813905	Integrated Circuit	U6	Bellcore Issue 6	Level I	19.00	0.072506	1.00	1.4419	0.072506	13791915.59
1315970110	Semiconductor	U10,U8	Bellcore Issue 6	Level I		0.091687	2.00	3.6467	0.183374	10906649.80
14S2652000	Integrated Circuit	U9	Bellcore Issue 6	Level I	26.30	0.235734	1.00	4.6879	0.235734	4242064.72
14S5837301	Integrated Circuit	U13	Bellcore Issue 6	Level I	20.50	0.077718	1.00	1.5455	0.077718	12866971.58
14S4070610	Integrated Circuit	U15	Bellcore Issue 6	Level I		0.042535	1.00	.8459	0.042535	23510284.61
1651203291	Connection	U16	Bellcore Issue 6	Level I		0.011771	1.00	.2341	0.011771	84956073.97
14S3128420	Integrated Circuit	U18	Bellcore Issue 6	Level I		0.042535	1.00	.8459	0.042535	23510284.61
14S6334610	Integrated Circuit	U20	Bellcore Issue 6	Level I		0.021923	1.00	.4360	0.021923	45614435.26
14S4048501	Integrated Circuit	U22,U23	Bellcore Issue 6	Level I		0.042535	2.00	1.6917	0.085069	23510284.61
1231314350	Miscellaneous	Y2	Bellcore Issue 6	Level I		0.075000	1.00	1.4915	0.075000	13333333.33
1212306033	Inductor	FB27-30	Bellcore Issue 6	Level I		0.001249	4.00	.0993	0.004994	800930098.66
1129610260	Capacitor	HC1	Bellcore Issue 6	Level I		0.000368	1.00	.0073	0.000368	2718958522.59
1304100540	Semiconductor	LED2	Bellcore Issue 6	Level I		0.003823	1.00	.0760	0.003823	261592266.64
1315992600	Semiconductor	Q3	Bellcore Issue 6	Level I	72.20	0.231853	1.00	4.6107	0.231853	4313086.43
1310222210	Semiconductor	Q2	Bellcore Issue 6	Level I		0.014983	1.00	.2979	0.014983	66744174.89
1315993310	Semiconductor	Q5	Bellcore Issue 6	Level I		0.091687	1.00	1.8233	0.091687	10906649.80
1540733085	Resistor	RP1,RP13-16	Bellcore Issue 6	Level I		0.003910	5.00	.3888	0.019552	255730457.04
15407103A0	Resistor	RP3-6,RP8-9	Bellcore Issue 6	Level I		0.004888	6.00	.5832	0.029328	204584365.63
1540733181	Resistor	RP7	Bellcore Issue 6	Level I		0.003910	1.00	.0778	0.003910	255730457.04
15407272A0	Resistor	RP11	Bellcore Issue 6	Level I		0.004888	1.00	.0972	0.004888	204584365.63
1540710280	Resistor	RP17,RP20,RP23	Bellcore Issue 6	Level I		0.003910	3.00	.2333	0.011731	255730457.04
1540722085	Resistor	RP18-19,RP21-22	Bellcore Issue 6	Level I		0.003910	4.00	.3111	0.015641	255730457.04
105A702263	Resistor	R3,R51	Bellcore Issue 6	Level I		0.001249	2.00	.0497	0.002497	800930098.66
1124427090	Capacitor	C180-181	Bellcore Issue 6	Level I		0.000547	2.00	.0218	0.001095	1826769085.82

**AAEON Reliability Prediction Report**

**Part Number** System  
**Reference Des**  
**Date** 05. 26, 2003  
**Environment** GB, GC - Ground Benign, Controlled  
**Temperature** 30.00



**Description** Top-level assembly  
**File Name** 5335b1.RPJ  
**Time** 2:43 PM  
**Failure Rate** 5.028567  
**MTBF** 198,864

Part Number	Category	Location	Calculation Model	Quality	Tem. Rise	Failure Rate, Unit	Quantity	Failure Rate, %	Failure Rate	MTBF, Unit
1121501680	Capacitor	C196-197	Bellcore Issue 6	Level I		0.001311	2.00	.0521	0.002622	762806343.57
1651572990	Connection	DIMM1	Bellcore Issue 6	Level I		0.052969	1.00	1.0534	0.052969	18879127.55
1301005440	Semiconductor	D1-3,D6-7	Bellcore Issue 6	Level I		0.013753	5.00	1.3675	0.068765	72710998.66
1302001240	Semiconductor	D4	Bellcore Issue 6	Level I		0.014983	1.00	.2979	0.014983	66744174.89
1212306030	Inductor	FB1,FB16,FB19-23,FB25-26,FB31,- FB4,FB7	Bellcore Issue 6	Level I		0.001249	12.00	.2979	0.014983	800930098.66
1212306032	Inductor	FB12,FB17-18,FB2,FB32-38,F5-6	Bellcore Issue 6	Level I		0.001249	13.00	.3228	0.016231	800930098.66
121230805E	Inductor	FB13,FB15,FB3,FB8	Bellcore Issue 6	Level I		0.001249	4.00	.0993	0.004994	800930098.66
1212306035	Inductor	FB9-11,FB14	Bellcore Issue 6	Level I		0.001249	4.00	.0993	0.004994	800930098.66
1212308054	Inductor	FB24	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
1129722091	Capacitor	C33,C36	Bellcore Issue 6	Level I		0.000547	2.00	.0218	0.001095	1826769085.82
1129701790	Capacitor	C124,C200-202,C85	Bellcore Issue 6	Level I		0.000825	5.00	.0820	0.004124	1212335760.74
1124418090	Capacitor	C153-154	Bellcore Issue 6	Level I		0.000547	2.00	.0218	0.001095	1826769085.82
105A701069	Resistor	R113-114	Bellcore Issue 6	Level I		0.007491	2.00	.2979	0.014983	133488349.78
105A501829	Resistor	R138	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
1189615182	Capacitor	TC4,TC5	Bellcore Issue 6	Level I		0.002716	2.00	.1080	0.005432	368200063.66
1213112008	Inductor	BP1	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
1213106008	Inductor	BP6-9	Bellcore Issue 6	Level I		0.001249	4.00	.0993	0.004994	800930098.66
1653208205	Connection	CN7	Bellcore Issue 6	Level I		0.005885	1.00	.1170	0.005885	169912147.94
1653222208	Connection	CN9	Bellcore Issue 6	Level I		0.016185	1.00	.3219	0.016185	61786235.61
1653925210	Connection	CN16	Bellcore Issue 6	Level I		0.018392	1.00	.3657	0.018392	54371887.34
1124420090	Capacitor	C1,C12	Bellcore Issue 6	Level I		0.000547	2.00	.0218	0.001095	1826769085.82
105A700003	Resistor	R37	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
105A549969	Resistor	R45	Bellcore Issue 6	Level I		0.001249	1.00	.0248	0.001249	800930098.66
14S3000201	Inductor	TF1	Bellcore Issue 6	Level I		0.074913	1.00	1.4897	0.074913	13348834.98
14S4553011	Integrated Circuit	U3	Bellcore Issue 6	Level I	30.80	0.128611	1.00	2.5576	0.128611	7775387.58
14S3149100	Integrated Circuit	U5	Bellcore Issue 6	Level I		0.026234	1.00	.5217	0.026234	38118760.86
14S5A00401	Integrated Circuit	U21,U7	Bellcore Issue 6	Level I		0.026234	2.00	1.0434	0.052468	38118760.86
14S3020100	Integrated Circuit	U11	Bellcore Issue 6	Level I		0.042535	1.00	.8459	0.042535	23510284.61
14S2252600	Integrated Circuit	U14	Bellcore Issue 6	Level I		0.042535	1.00	.8459	0.042535	23510284.61
14S5A00820	Integrated Circuit	U17	Bellcore Issue 6	Level I		0.026234	1.00	.5217	0.026234	38118760.86

