

AEC-6977

Reliability Prediction Report (MTBF)

Summary	Failure Rate: 16675.261882 ppm MTBF: 59,969 Hours
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Issue date	Approval	Test Engineer
2014/05/22	Tom Lin	Mike Lee

Reliability Prediction (MTBF)

I . Model Name: AEC-6977

II . Prediction Date: May. 22, 2014

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

IV . Predicted by: Mike Lee

V . Equipment: Windchill Quality Solutions 10.1

VI. Simulation Environment:

- Temperature: 30 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 Failure rate multiplier is 1000000000.
- MTBF : MTBF is always specified in hours.

VIII. Prediction Result:

AEC-6977 (M/B : 9697QM77C5-D / Riser card : 9697T22901-D):

- Failure Rate: 16675.261882 ppm
- MTBF: 59,969 Hours

**AAEON Reliability Prediction
Summary**

File Name: AEC-6977.rfp
Duty Cycle: 100
Calculation Model: Telcordia Issue 2
Method: Method I Case 3

Failure Rate: 16675.261882
MTBF (hrs): 59,969
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Assembly Name	Part Number	Ref Des	Quantity	Failure Rate	MTBF
AEC-6977	System		1	16675.261882	59,969
M/B	9697QM77C5-D		1	16521.066963	60,529
Riser card	9697T22901-D		1	213.181558	4,690,837

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

Failure Rate: 16521.066963
MTBF (hrs): 60,529
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050501004	Resistor	R30,R31,R88 2		2.547039	3	107020754.986850
1050501054	Resistor	R116		2.547039	1	282340674.079668
1050501234	Resistor	R737,R758,R 759		2.547039	3	107020754.986850
1050502204	Resistor	R317		2.547039	1	282340674.079668
1050502224	Resistor	R585,R587		2.547039	2	154078778.388085
1050502234	Resistor	R81,R84		2.547039	2	154078778.388085
1050504724	Resistor	R1124,R1126 ,R1129, R1147,R1149 ,R1156, R1158,R1159 ,R314, R318,R337,R 372, R373,R393,R 430, R446,R449,R 994		2.547039	18	20032117.836120
1050505164	Resistor	R772		2.547039	1	282340674.079668
1050505604	Resistor	R3,R801		2.547039	2	154078778.388085
1050505633	Resistor	R658		2.547039	1	282340674.079668
1050507530	Resistor	R774,R775,R 783		2.547039	3	107020754.986850
1050510034	Resistor	R1075,R1080 ,R1089, R1092,R1096 ,R1098, R1127,R213, R214, R216,R217,R 242, R283,R286,R 604, R646,R669,R 760, R897,R899,R 905,R92, R921,R987,R 988		2.547039	25	14603612.751152
1050514324	Resistor	R735,R914		2.547039	2	154078778.388085
1050519114	Resistor	R798,R816		2.547039	2	154078778.388085
1050520004	Resistor	R6		2.547039	1	282340674.079668
1050520034	Resistor	R257,R784		2.547039	2	154078778.388085
1050524904	Resistor	R1,R16		2.547039	2	154078778.388085
1050524934	Resistor	R739		2.547039	1	282340674.079668
1050527424	Resistor	R805,R814		2.547039	2	154078778.388085
1050533034	Resistor	R177,R87		2.547039	2	154078778.388085
1050533214	Resistor	R666		2.547039	1	282340674.079668

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

Failure Rate: 16521.066963
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Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050536514	Resistor	R847,R848,R861, R870,R881		2.547039	5	67008142.102588
1050538314	Resistor	R804,R813		2.547039	2	154078778.388085
1050540224	Resistor	R664,R667		2.547039	2	154078778.388085
1050547004	Resistor	R1010,R1014 ,R1018, R1022		2.547039	4	82309758.689546
1050548714	Resistor	R785		2.547039	1	282340674.079668
1050549904	Resistor	R789,R812,R820, R827		2.547039	4	82309758.689546
1050557614	Resistor	R821		2.547039	1	282340674.079668
1050584514	Resistor	R734,R736		2.547039	2	154078778.388085
1050700002	Resistor	R293		2.547039	1	282340674.079668
1050702734	Resistor	R471,R505		2.547039	2	154078778.388085
1050704304	Resistor	R21,R36		2.547039	2	154078778.388085
1050747012	Resistor	R1011,R1015 ,R1019, R1023		2.547039	4	82309758.689546
1050756004	Resistor	R1138,R1139 ,R1140, R1141		2.547039	4	82309758.689546
1052500171	Resistor	R39		2.547039	1	282340674.079668
1052510719	Resistor	R1008,R1012 ,R1016, R1020		2.547039	4	82309758.689546
105270000A	Resistor	R923		2.547039	1	282340674.079668
1052730009	Resistor	R1104,R1105 ,R1106, R1107,R1108 ,R1109, R1110,R1111		2.547039	8	43225424.698300
1053502579	Resistor	R1101,R1102		2.547039	2	154078778.388085
1054700289	Resistor	R1068,R70,R78		2.547039	3	107020754.986850
1059700001	Resistor	L6,R1036,R1067		2.547039	3	107020754.986850
1059700201	Resistor	R1090		2.547039	1	282340674.079668
1059701001	Resistor	R890		2.547039	1	282340674.079668
1059702261	Resistor	R836,R838,R857, R866,R878		2.547039	5	67008142.102588
105A500133	Resistor	R303,R308		2.547039	2	154078778.388085

**Reliability Prediction
Summary**

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

Failure Rate: 16521.066963
MTBF (hrs): 60,529
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A500139	Resistor	R1047,R1083 ,R1145, R126,R15,R1 69,R18, R218,R24,R2 6,R261, R280,R284,R 338, R383,R400,R 405, R406,R408,R 42,R46, R48,R49,R49 2,R493, R52,R55,R57 ,R59, R60,R61,R63 ,R678, R729,R730,R 732, R733,R83,R8 87,R906, R912,R95,R9 9		2.547039	43	8634227.613564
105A500239	Resistor	R1151		2.547039	1	282340674.079668

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105A501039	Resistor	R1009,R1013 ,R1017, R1021,R104, R105, R1059,R1087 ,R1095, R1131,R1132 ,R1133, R1157,R1162 ,R1164, R1166,R1167 ,R124, R125,R127,R 134, R140,R145,R 146, R147,R149,R 151, R152,R153,R 156, R157,R159,R 163, R167,R168,R 175,R20, R232,R233,R 234, R249,R255,R 256, R259,R260,R 2		2.547039	92	4106168.814407
105A501053	Resistor	R1073,R1076 ,R85		2.547039	3	107020754.986850
105A501139	Resistor	R1094,R738, R797, R822		2.547039	4	82309758.689546
105A501529	Resistor	R277		2.547039	1	282340674.079668
105A501539	Resistor	R1077,R896		2.547039	2	154078778.388085
105A502033	Resistor	R310,R313,R 659		2.547039	3	107020754.986850
105A502039	Resistor	R1079,R1146 ,R1148, R1150,R677, R756, R892		2.547039	7	48991237.965885
105A502823	Resistor	R790		2.547039	1	282340674.079668
105A503033	Resistor	R656		2.547039	1	282340674.079668
105A503039	Resistor	R673,R676,R 682		2.547039	3	107020754.986850
105A503309	Resistor	R109,R114,R 244, R245,R246,R 96,R98		2.547039	7	48991237.965885
105A503333	Resistor	R699		2.547039	1	282340674.079668

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105A503423	Resistor	R823		2.547039	1	282340674.079668
105A505109	Resistor	R11,R12,R13 ,R8,R9		2.547039	5	67008142.102588
105A505123	Resistor	R311		2.547039	1	282340674.079668
105A507503	Resistor	R319,R320,R 321, R322,R323,R 324		2.547039	6	56573956.677649
105A507509	Resistor	R19,R543,R5 44,R545, R802		2.547039	5	67008142.102588
105A507523	Resistor	R700,R704		2.547039	2	154078778.388085
105A508223	Resistor	R1040		2.547039	1	282340674.079668
105A509123	Resistor	R1103		2.547039	1	282340674.079668
105A510009	Resistor	R299		2.547039	1	282340674.079668
105A510213	Resistor	R750,R753		2.547039	2	154078778.388085
105A511823	Resistor	R895		2.547039	1	282340674.079668
105A512039	Resistor	R1069,R1074		2.547039	2	154078778.388085
105A513009	Resistor	R23,R35,R80 3		2.547039	3	107020754.986850
105A514009	Resistor	R4		2.547039	1	282340674.079668
105A515009	Resistor	R210,R211,R 212, R540,R541,R 542		2.547039	6	56573956.677649
105A515433	Resistor	R1093		2.547039	1	282340674.079668
105A516933	Resistor	R792		2.547039	1	282340674.079668
105A518223	Resistor	R691		2.547039	1	282340674.079668
105A522123	Resistor	R686		2.547039	1	282340674.079668
105A522663	Resistor	R241		2.547039	1	282340674.079668
105A523713	Resistor	R1100,R205		2.547039	2	154078778.388085
105A525563	Resistor	R5		2.547039	1	282340674.079668
105A526114	Resistor	R799,R818		2.547039	2	154078778.388085
105A532429	Resistor	R916		2.547039	1	282340674.079668
105A533213	Resistor	R384		2.547039	1	282340674.079668
105A535713	Resistor	R752,R754		2.547039	2	154078778.388085
105A536523	Resistor	R698		2.547039	1	282340674.079668
105A537463	Resistor	R103		2.547039	1	282340674.079668
105A539003	Resistor	R272		2.547039	1	282340674.079668
105A539203	Resistor	R795		2.547039	1	282340674.079668
105A545303	Resistor	R1052,R1058		2.547039	2	154078778.388085
105A545313	Resistor	R398		2.547039	1	282340674.079668
105A548713	Resistor	R694		2.547039	1	282340674.079668
105A549913	Resistor	R495,R497		2.547039	2	154078778.388085
105A549919	Resistor	R1072,R29,R 911		2.547039	3	107020754.986850
105A549923	Resistor	R910		2.547039	1	282340674.079668
105A549963	Resistor	R106		2.547039	1	282340674.079668

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

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Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A549969	Resistor	R174		2.547039	1	282340674.079668
105A556213	Resistor	R695,R701		2.547039	2	154078778.388085
105A566519	Resistor	R755,R757		2.547039	2	154078778.388085
105A571513	Resistor	R696		2.547039	1	282340674.079668
105A575003	Resistor	R693		2.547039	1	282340674.079668
105A575009	Resistor	R1051,R1054 ,R110, R176		2.547039	4	82309758.689546
105A590963	Resistor	R165		2.547039	1	282340674.079668
105A700003	Resistor	R291,R309,R 315, R385,R386,R 389, R392,R414,R 415, R416,R417,R 420, R453,R454,R 459, R589,R708,R 709, R778,R807		2.547039	20	18104712.511396
105A700009	Resistor	R10,R1004,R 1005, R1006,R1007 ,R102, R1055,R1097 ,R1099, R111,R1120, R1121, R113,R1136, R1144, R1152,R1153 ,R1154, R1155,R1160 ,R1161, R119,R120,R 123, R136,R137,R 138, R139,R14,R1 41,R142, R143,R144,R 148, R150,R154,R 155, R158,R160,R 166, R178,R183,R 184, R185,R186,R R809		2.547039	191	2000990.400924
105A700109	Resistor	R809		2.547039	1	282340674.079668

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105A700139	Resistor	R1050,R1062 ,R1064, R1066,R356, R886, R891		2.547039	7	48991237.965885
105A700239	Resistor	R787,R873		2.547039	2	154078778.388085
105A701003	Resistor	R687,R690,R 714		2.547039	3	107020754.986850
105A701009	Resistor	R1070,R1071 ,R1088, R1091,R289, R292, R724,R746,R 788, R793,R825,R 830, R849,R850,R 862, R871		2.547039	16	22425139.809646
105A701033	Resistor	R312,R644,R 645, R685,R692,R 713		2.547039	6	56573956.677649
105A701039	Resistor	R1057,R1061 ,R1063, R1065,R161, R401, R409,R412,R 481, R546,R566,R 625, R626,R627,R 630, R631,R632,R 744		2.547039	18	20032117.836120
105A701053	Resistor	R164		2.547039	1	282340674.079668
105A701069	Resistor	R82		2.547039	1	282340674.079668
105A701539	Resistor	R193,R670,R 679		2.547039	3	107020754.986850
105A702039	Resistor	R663		2.547039	1	282340674.079668
105A702053	Resistor	R301		2.547039	1	282340674.079668
105A702209	Resistor	R394,R536,R 537, R538,R539		2.547039	5	67008142.102588

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105A702229	Resistor	R121,R122,R128, R129,R130,R131, R132,R133,R197, R198,R199,R200, R201,R202,R203, R204,R208,R209, R275,R325,R326, R344,R345,R464, R496,R547,R548, R567,R568,R602		2.547039	30	12244464.256771
105A702233	Resistor	R329,R330		2.547039	2	154078778.388085
105A702263	Resistor	R688,R689,R707, R710,R711,R712		2.547039	6	56573956.677649
105A703329	Resistor	R468,R502		2.547039	2	154078778.388085
105A704729	Resistor	R1000,R1037,R1048, R1049,R1060,R1081, R1082,R1084,R1085, R1086,R433,R482, R485,R499,R551, R576,R579,R580, R586,R702,R705, R990		2.547039	22	16518584.576317
105A704739	Resistor	R251,R252		2.547039	2	154078778.388085
105A705129	Resistor	R1165,R463,R466, R494,R498,R769		2.547039	6	56573956.677649
105A705139	Resistor	R527,R528,R529, R530,R531,R532, R533		2.547039	7	48991237.965885
105A706209	Resistor	R17,R395,R483		2.547039	3	107020754.986850
105A706823	Resistor	R534,R535		2.547039	2	154078778.388085

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105A708229	Resistor	R170,R171,R182, R219,R220,R221, R222,R223,R224, R225,R226,R227, R228,R229,R230, R236,R237,R238, R354,R478,R86		2.547039	21	17274945.076062
105A710009	Resistor	R41,R465,R47,R503		2.547039	4	82309758.689546
105A710039	Resistor	R1163,R457,R458, R680,R725,R740, R741,R742,R747, R773,R779,R883, R884,R885,R888, R889,R893		2.547039	17	21160422.299251
105A715003	Resistor	R391,R419		2.547039	2	154078778.388085
105A720009	Resistor	R179,R22		2.547039	2	154078778.388085
105A727033	Resistor	R791,R824		2.547039	2	154078778.388085
105A733003	Resistor	R298,R306,R307, R989,R991		2.547039	5	67008142.102588
105A733009	Resistor	R117		2.547039	1	282340674.079668
106B701031	Resistor	RT1,RT2,RT3,RT6		7.724580	4	21923287.146155
106B747030	Resistor	RT4,RT5		7.724580	2	38596617.434771
1114633130	Capacitor	C602,C603		1.128806	2	375289731.076049
1119633195	Capacitor	C259,C262,C273, C276,C364		1.128806	5	159367490.199266
1121501680	Capacitor	BC27,BC28		1.128806	2	375289731.076049

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1121501690	Capacitor	BC10,BC100, BC101, BC102,BC10 3,BC104, BC105,BC10 6,BC107, BC108,BC10 9,BC11, BC110,BC11 1,BC112, BC113,BC11 4,BC115, BC116,BC11 7,BC118, BC119,BC12, BC120, BC121,BC12 2,BC123, BC124,BC12 5,BC126, BC127,BC12 8,BC129, BC13,BC130, BC131, BC132,BC13 3,BC134, BC135,BC13 6,		1.128806	232	3756860.935890
1121501691	Capacitor	BC1,BC2,BC3 ,C2, C385,C387,C 403, C472,C623,C 624, C625,C626,C 627, C629,C636		1.128806	15	55479656.844874
1121610060	Capacitor	C607,C612,C 614, C618,C620		1.128806	5	159367490.199266
1121610180	Capacitor	C225,C226,C 227, C228,C229,C 230, C630,C631,C 632, C633		1.128806	10	82101057.548118
1121622780	Capacitor	C398		1.128806	1	704977644.692287
1121633180	Capacitor	C542		1.128806	1	704977644.692287
1121647480	Capacitor	C448		1.128806	1	704977644.692287
1121647780	Capacitor	C395,C396		1.128806	2	375289731.076049

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1121701080	Capacitor	BC146,C202, C207, C215,C260,C 274, C367,C377		1.128806	8	101746760.035398
1121747890	Capacitor	C3		1.128806	1	704977644.692287
1122522890	Capacitor	C382,C410,C 415, C450		1.128806	4	196873384.410843
1122601680	Capacitor	BC24,BC25		1.128806	2	375289731.076049
1124410190	Capacitor	C606,C617		1.128806	2	375289731.076049
1124418090	Capacitor	C123,C125,C 145, C146		1.128806	4	196873384.410843
1124418190	Capacitor	C317,C318,C 319, C320,C321,C 322, C323,C324,C 325, C326,C327,C 328, C329,C330,C 331, C332,C333,C 334, C335,C336,C 337, C338,C339,C 340, C341,C342,C 343, C344,C345,C 346, C347,C348		1.128806	32	26512863.286539
1124427090	Capacitor	C252,C253,C 352, C353,C354,C 357, C358,C359,C 360		1.128806	9	90863428.080946
1124433190	Capacitor	C429		1.128806	1	704977644.692287
1124468090	Capacitor	C240,C243,C 469		1.128806	3	257514172.353070
1124518280	Capacitor	C393		1.128806	1	704977644.692287
1124522190	Capacitor	C378,C379,C 380, C381		1.128806	4	196873384.410843
1124533190	Capacitor	C203		1.128806	1	704977644.692287
1124547190	Capacitor	C444		1.128806	1	704977644.692287
1124582880	Capacitor	C437		1.128806	1	704977644.692287

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

Failure Rate: 16521.066963
MTBF (hrs): 60,529
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1129522790	Capacitor	C438,C439,C443, C446,C447,C455, C456,C460,C462, C464		1.128806	10	82101057.548118
1129610051	Capacitor	TC20,TC41,TC45, TC46		1.128806	4	196873384.410843
1129610080	Capacitor	C102,C103,C107, C108,C109,C110, C111,C112,C121, C122,C153,C173, C217,C245,C547, C548,C88,C89,C90, C91,C92,C93,TC11, TC13,TC17,TC18, TC25,TC32,TC33, TC34,TC35,TC36, TC37,TC38,TC39, TC53,TC65		1.128806	37	22998172.632301
1129701690	Capacitor	C550,C557,C558, C559,C560,C561, C562,C568,C569, C570,C571,C572, C573,C574,C576		1.128806	15	55479656.844874

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

Failure Rate: 16521.066963
MTBF (hrs): 60,529
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1129701790	Capacitor	C152,C159,C160,C205,C250,C283,C284,C285,C286,C287,C288,C289,C290,C291,C292,C293,C294,C295,C296,C297,C298,C299,C300,C301,C302,C316,C419,C434,C610,C619		1.128806	30	28241202.507613
1129710050	Capacitor	TC52		1.128806	1	704977644.692287
1129710090	Capacitor	C349,C350,C351,C355,C356,C361,C362		1.128806	7	115633865.771428
1129710390	Capacitor	C267,C268,C383,C384,C386,C388,C390,C399,C402,C430,C457,C458,C461,C463,C465		1.128806	15	55479656.844874
1129722091	Capacitor	C218		1.128806	1	704977644.692287
1129747090	Capacitor	C445,C611		1.128806	2	375289731.076049
1129747091	Capacitor	C431		1.128806	1	704977644.692287
1129747650	Capacitor	C219,C220,C223,C224		1.128806	4	196873384.410843
1169656132	Capacitor	EC14,EC25		4.744484	2	86049450.747498
1174522180	Capacitor	CP1,CP2,CP3,CP4		4.744484	4	45505862.704531
1181610180	Capacitor	EC10,EC22,EC6		4.744484	3	59399119.141203
1181610191	Capacitor	EC15,EC16,EC3		4.744484	3	59399119.141203
1181627193	Capacitor	EC27		4.744484	1	159663026.715137
1181633112	Capacitor	C609,C613		4.744484	2	86049450.747498
1189610151	Capacitor	C470		4.744484	1	159663026.715137

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

Failure Rate: 16521.066963
MTBF (hrs): 60,529
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
118961018A	Capacitor	C235,EC5,EC9		4.744484	3	59399119.141203
1189633162	Capacitor	C408,C409,C414, C427,C48,EC1,EC12, EC2,EC23,EC24		4.744484	10	19193879.126421
1189647180	Capacitor	EC17,EC18,EC19, EC20,EC21,EC26, EC28		4.744484	7	26949727.707925
1189647190	Capacitor	EC11,EC7		4.744484	3	59399119.141203
1189647190	Capacitor	EC8	23.1	7.126377	3	39545786.894302
1189656193	Capacitor	C187,C192		4.744484	2	86049450.747498
11A4410280	Capacitor	C204		1.128806	1	704977644.692287
11C1522480	Capacitor	C397,C436,C615, C616		1.128806	4	196873384.410843
11C1533890	Capacitor	C476,C480		1.128806	2	375289731.076049
11C1547890	Capacitor	C604		1.128806	1	704977644.692287
11C2501050	Capacitor	C392		1.128806	1	704977644.692287
11C2501790	Capacitor	C466,C467		1.128806	2	375289731.076049
11C2510190	Capacitor	TC42,TC43,TC44		1.128806	3	257514172.353070
11C2510480	Capacitor	BC164,BC165,BC166, BC46,BC65		1.128806	5	159367490.199266
11C2522650	Capacitor	TC29,TC30		1.128806	2	375289731.076049
11C2610030	Capacitor	C265,C266,C278, C281,C365,C543, C544,TC14,TC15, TC16,TC27,TC28, TC31,TC54,TC55, TC56,TC57,TC58, TC59,TC60,TC61, TC62,TC63,TC64		1.128806	24	35120617.936543
11C4501650	Capacitor	C579,C582,C583, C600,C605,C608, C621		1.128806	7	115633865.771428
11C4501790	Capacitor	C453		1.128806	1	704977644.692287
11C4515190	Capacitor	C433,C449		1.128806	2	375289731.076049

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

Failure Rate: 16521.066963
MTBF (hrs): 60,529
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
11C4547690	Capacitor	C577,C578,C580,C581,C601		1.128806	5	159367490.199266
11C5501650	Capacitor	C549,C553,C554,C555,C556		1.128806	5	159367490.199266
11C9510050	Capacitor	TC19,TC21,TC26,TC40,TC47,TC48,TC49,TC50,TC51,TC66,TC67		1.128806	11	74892583.279796
11C9510290	Capacitor	C244,C254,C551,C575		1.128806	4	196873384.410843
11E1510050	Capacitor	C406,C407,C412,C413,TC12		1.128806	5	159367490.199266
11E1522680	Capacitor	C584		1.128806	1	704977644.692287
11E1547090	Capacitor	C221,C222		1.128806	2	375289731.076049
11E2510060	Capacitor	C622		1.128806	1	704977644.692287
11E2647650	Capacitor	C375,C376,C477,C482		1.128806	4	196873384.410843
11E9501090	Capacitor	C411,C479,C545		1.128806	3	257514172.353070

**Reliability Prediction
Summary**

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

Failure Rate: 16521.066963
MTBF (hrs): 60,529
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
11E9501091	Capacitor	C100,C101,C117, C118,C119,C12, C120,C124,C126,C127, C13,C14,C15,C155, C156,C158,C16,C165, C166,C168,C169,C17, C172,C174,C175,C177, C178,C179,C18,C180, C181,C182,C184, C186,C188,C189, C190,C191,C193, C194,C195,C198, C200,C211,C212, C213,C214,C239, C264,C27		1.128806	86	10030762.325574
11E9510050	Capacitor	TC1,TC10,TC2,TC3, TC4,TC5,TC6,TC7, TC8,TC9		1.128806	10	82101057.548118
11E9522680	Capacitor	C104,C105,C106,C85, C86,C87		1.128806	6	133979725.056342
11E9547680	Capacitor	C208,C209,C210, C249,C368		1.128806	5	159367490.199266

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

Failure Rate: 16521.066963
MTBF (hrs): 60,529
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
11E9622050	Capacitor	C10,C11,C15 7,C161, C176,C183,C 19,C20, C21,C22,C23 ,C24, C25,C26,C27 ,C28, C29,C30,C31 ,C32, C33,C34,C35 ,C36, C40,C41,C41 6,C417, C42,C420,C4 25,C43, C471,C473,C 474, C475,C478,C 59,C60, C61,C69,C7, C70,C71, C72,C73,C74 ,C75, C76,C77,C78 ,C79,C8, C80,C81,C82 ,C83, C8		1.128806	59	14541999.022292
11E9622080	Capacitor	C163,C164,C 241		1.128806	3	257514172.353070
11E9647680	Capacitor	C199		1.128806	1	704977644.692287
1211100110	Inductor	L35		4.944252	1	154760964.143460
1211100113	Inductor	L1,L4,L5		4.944252	3	57363284.375370
1211100160	Inductor	L2		4.944252	1	154760964.143460
1211101064	Inductor	L20,L22		4.944252	2	83201062.149749
121110156A	Inductor	L21,L23		4.944252	2	83201062.149749
1211103671	Inductor	L24,L25,L26, L27, L28		4.944252	5	35631881.582999
1211103672	Inductor	L18		4.944252	2	83201062.149749
1211103672	Inductor	L19	37.7	9.334511	2	44069476.133956
1211104760	Inductor	L11		4.944252	1	154760964.143460
1212306030	Inductor	FB13,FB16,F B17, FB25,FB3,FB 4,FB5, FB6		4.944252	8	22874049.098230
1212306032	Inductor	FB29,FB30,L 29,L30		4.944252	4	43912872.424775
121230603S	Inductor	FB15,FB21		4.944252	2	83201062.149749

File Name: AEC-6977.rfp
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Ref Des:
Description:

Failure Rate: 16521.066963
MTBF (hrs): 60,529
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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
121230603Z	Inductor	FB10,FB11,F B12, FB20,FB7,FB 8,FB9		4.944252	7	25970990.056682
1212308054	Inductor	FB14,L13,L1 4,L15, L16,L17		4.944252	6	30055900.223009
12123D0001	Inductor	FB22,FB23,F B24		4.944252	3	57363284.375370
1214309009	Inductor	CH1,CH2,CH 3,CH4, CH5,CH6,CH 7,CH8		4.944252	8	22874049.098230
12143E0002	Inductor	L31		4.944252	1	154760964.143460
123132505D	Miscellaneous	Y2,Y3,Y5		19.200000	3	5742504.738137
1231332722	Miscellaneous	Y1		19.200000	1	23844262.770939
1233348051	Miscellaneous	OSC1		19.200000	1	23844262.770939
12510MA010	Integrated Circuit	U71		43.803003	2	6834791.244197
12510MA010	Integrated Circuit	U83	29.2	288.389442	2	1038125.324778
1300414841	Semiconductor	D62,D63		7.793411	2	50578095.223398
1301003440	Semiconductor	D54,D55,D66 ,D67, D68,D69,D82		7.793411	7	16052497.121446
1301005440	Semiconductor	D43,D44,D48 ,D52,D8		7.793411	5	21965031.404253
1301005442	Semiconductor	D4,D5,D58,D 60,D64, D65,D80		7.793411	7	16052497.121446
1301005444	Semiconductor	D1,D2,D3,D5 9,D76, D77,D78,D79		7.793411	8	14161142.003130
1301005450	Semiconductor	D6,D7		7.793411	2	50578095.223398
1301013041	Semiconductor	D71		7.793411	1	92807310.010983
1301SK5640	Semiconductor	D81	29.4	16.416443	1	44058599.528871
1302005641	Semiconductor	D70		7.793411	1	92807310.010983
1304001340	Optical Device	D10,LED1,LE D2		79.003355	3	2725958.067754
1304451400	Optical Device	D57		79.003355	1	6497172.749112
1305040241	Semiconductor	D27,D28,D29 ,D30, D31,D32,D33 ,D34, D35,D36,D37 ,D38, D39,D40,D41 ,D42		7.793411	16	7341618.295818

**Reliability Prediction
Summary**

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

Failure Rate: 16521.066963
MTBF (hrs): 60,529
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1305100541	Semiconductor	D11,D12,D13 ,D14, D15,D16,D17 ,D18, D19,D20,D21 ,D22, D23,D24,D25 ,D26, D45,D46,D47 ,D49, D50,D51,D53		7.793411	23	5179880.110743
130533CA40	Semiconductor	D61		7.793411	1	92807310.010983
1310390410	Semiconductor	Q29,Q78,Q8, Q80,Q82, Q87,Q88,Q9 4,Q97		22.463360	9	4366472.106532
1310390413	Semiconductor	Q93		22.463360	1	31642600.748419
1311138610	Semiconductor	Q18,Q19		22.463360	2	17315095.066101
1311390610	Semiconductor	Q89		22.463360	1	31642600.748419
1311390612	Semiconductor	Q90		22.463360	1	31642600.748419
1314780511	Semiconductor	U49		22.463360	1	31642600.748419
1314880511	Semiconductor	U20		22.463360	1	31642600.748419
1314895510	Semiconductor	U63		22.463360	1	31642600.748419
1315013810	Semiconductor	Q5		22.463360	1	31642600.748419
1315050311	Semiconductor	Q40,Q41,Q4 5,Q48, Q50,Q52,Q5 4,Q55, Q60,Q63,Q6 6		22.463360	11	3618924.681337
1315230511	Semiconductor	Q27,Q85,Q8 6		22.463360	3	12043329.789539
1315441012	Semiconductor	Q76		22.463360	1	31642600.748419
1315482410	Semiconductor	U62,U64,U65 ,U67		22.463360	4	9270607.712006
1315567011	Semiconductor	Q100,Q95,Q 96,Q98		22.463360	4	9270607.712006
1315667910	Semiconductor	U61	19.6	37.473850	1	18967870.268867
1315668510	Semiconductor	Q70		22.463360	1	31642600.748419
1315700211	Semiconductor	Q20,Q21,Q2 2,Q23, Q83,Q84		22.463360	6	6378891.324740
1315700216	Semiconductor	Q1,Q104,Q1 05,Q47, Q6,Q69,Q7,Q 71,Q72, Q73,Q74,Q7 5,Q77, Q79,Q81,Q9 1,Q92		22.463360	17	2391128.567891

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

Failure Rate: 16521.066963
MTBF (hrs): 60,529
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Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1315700217	Semiconductor	Q10,Q11,Q12,Q13,Q14,Q15,Q16,Q17,Q24,Q25,Q26,Q30		22.463360	12	3332353.664911
1315889612	Semiconductor	Q101,Q99		22.463360	2	17315095.066101
1315970211	Semiconductor	U15,U16,U17,U18,U19		22.463360	5	7551839.591592
1315R30310	Semiconductor	Q42,Q43,Q46,Q49,Q51,Q53,Q56,Q57,Q58,Q59,Q61,Q62,Q64,Q65,Q67,Q68		22.463360	16	2533798.883137
143ALC8920	Integrated Circuit	U8	23.9	210.030202	1	2448278.033076
1443612QE0	Integrated Circuit	U1	11.7	35.724189	1	14393953.878267
1462001280	Integrated Circuit			11.063278	1	58231413.220643
1462A977A0	Integrated Circuit	BIOS_FLASH 1		11.063278	1	58231413.220643
14S2083600	Integrated Circuit	U58		43.803003	1	11739202.588727
14S2200900	Integrated Circuit	U26		43.803003	1	11739202.588727
14S3052400	Integrated Circuit	U28,U29,U31,U32		43.803003	4	3879156.910661
14S3111600	Integrated Circuit	U56		43.803003	1	11739202.588727
14S3121800	Integrated Circuit	U57		43.803003	1	11739202.588727
14S3378000	Integrated Circuit	U89		43.803003	1	11739202.588727
14S3435600	Integrated Circuit	U86		43.803003	1	11739202.588727
14S3520900	Integrated Circuit	U90		43.803003	1	11739202.588727
14S3524700	Integrated Circuit	Q28		43.803003	1	11739202.588727
14S3587000	Integrated Circuit	U54,U55		43.803003	2	6834791.244197
14S4021301	Integrated Circuit	U22,U23,U24,U25,U75		43.803003	6	2750969.191556
14S4021301	Integrated Circuit	U84	28.3	273.468488	6	440638.383844
14S4048503	Integrated Circuit	U80,U81		43.803003	2	6834791.244197
14S4186600	Integrated Circuit	U91		43.803003	1	11739202.588727
14S4257900	Integrated Circuit	U12		43.803003	1	11739202.588727
14S4622800	Integrated Circuit	U50		43.803003	1	11739202.588727
14S4825740	Integrated Circuit	U35		43.803003	1	11739202.588727
14S4963501	Integrated Circuit	U10		43.803003	1	11739202.588727
14S4QM7700	Integrated Circuit	U4	22.5	192.823564	1	2666750.464119
14S5908000	Integrated Circuit	U48,U7		26.018600	2	14194252.866846
14S5A00601	Integrated Circuit	U79		26.018600	1	25551442.237972
14S5A00702	Integrated Circuit	U11,U2,U5		26.018600	3	9949526.289768
14S5A00704	Integrated Circuit	U3,U41,U47		26.018600	3	9949526.289768

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

Failure Rate: 16521.066963
MTBF (hrs): 60,529
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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
14S5A00802	Integrated Circuit	U39,U42,U44,U46		26.018600	4	7696979.559193
14S5A00821	Integrated Circuit	U21,U33		26.018600	2	14194252.866846
14S5A12503	Integrated Circuit	U78		26.018600	1	25551442.237972
14S5A12506	Integrated Circuit	U85		26.018600	1	25551442.237972
14S5A73200	Integrated Circuit	U34		26.018600	1	25551442.237972
14S6308002	Integrated Circuit	U36		11.063278	1	58231413.220643
14S7035701	Integrated Circuit	ISO2,ISO4,ISO6, ISO8		43.803003	4	3879156.910661
14S7041000	Integrated Circuit	ISO1,ISO3,ISO5,ISO7,ISO9		43.803003	6	2750969.191556
14S7041000	Integrated Circuit	ISO10	25.6	232.773096	6	517674.570410
14S7141100	Integrated Circuit	U72		43.803003	2	6834791.244197
14S7141100	Integrated Circuit	U76	25.6	232.773096	2	1286164.029768
14S7141200	Integrated Circuit	U74,U82		43.803003	2	6834791.244197
14S9108500	Integrated Circuit	U38,U40,U43,U45		43.803003	4	3879156.910661
14S9341101	Integrated Circuit	U27,U30		43.803003	2	6834791.244197
14S9620800	Integrated Circuit	U59,U60		43.803003	2	6834791.244197
1540710382	Resistor	RP10,RP11		9.971436	2	30043399.401299
1540722281	Resistor	RP4		9.971436	1	51606907.671214
1540733085	Resistor	RP5,RP6,RP7,RP8, RP9		9.971436	5	14126297.426094
1601123600	Connection	SW1		16.184835	1	35685591.360212
1651520401	Connection	DIMM2	24.8	51.558968	1	11202035.500893
16515A2994	Connection	DIMM1	23.1	47.891049	1	12059986.178951
1651900860	Connection	U9		16.184835	1	35685591.360212
1652003101	Connection	CN31		16.184835	1	35685591.360212
1652010100	Connection	CN29		16.184835	1	35685591.360212
1652517205	Connection	AUDIO1		16.184835	1	35685591.360212
1652532207	Connection	CN6,CN7		16.184835	2	20390152.380746
1653002101	Connection	J6		16.184835	1	35685591.360212
1653003101	Connection	JP1,JP2,JP3,JP4, JP5		16.184835	5	9343344.843761
1653003201	Connection	JP8		16.184835	1	35685591.360212
1653003202	Connection	JP11,JP9		16.184835	2	20390152.380746
165300420L	Connection	CN3		16.184835	1	35685591.360212
1653005209	Connection	CN1		16.184835	1	35685591.360212
165320520C	Connection	CN10,CN11,DIO2, USB1		16.184835	4	11344857.509064
1653212100	Connection	CN9		16.184835	1	35685591.360212
1653300102	Connection	JP11(5-6),JP8(1-2),JP8(3-4),JP8(5-6), JP9(5-6)		16.184835	5	9343344.843761

File Name: AEC-6977.rfp
Assembly: 9697QM77C5-D
Ref Des:
Description:

Failure Rate: 16521.066963
MTBF (hrs): 60,529
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1653300107	Connection	JP1(1-2),JP2(1-2), JP3(1-2),JP4(2-3), JP5(2-3)		16.184835	5	9343344.843761
165390003B	Connection	CN8_1		16.184835	1	35685591.360212
1653924110	Connection	CN8		16.184835	1	35685591.360212
1654030003	Connection	CN17		16.184835	1	35685591.360212
1654226303	Connection	CN21,CN24		16.184835	2	20390152.380746
1654232200	Connection	CN26,CN33		16.184835	2	20390152.380746
1654418103	Connection	CN13,CN30		16.184835	2	20390152.380746
1654430301	Connection	CN16		16.184835	1	35685591.360212
1654434300	Connection	CN15_1		16.184835	1	35685591.360212
1654903900	Connection	SIM1		16.184835	1	35685591.360212
1654907002	Connection	SATA3,SATA4		16.184835	2	20390152.380746
165490700C	Connection	SATA1,SATA2		16.184835	2	20390152.380746
1654914300	Connection	CN27		16.184835	1	35685591.360212
1655004011	Connection	PWR1,PWR2		16.184835	2	20390152.380746
1655004014	Connection	FAN1,FAN2		16.184835	2	20390152.380746
1655103010	Connection	CN32		16.184835	1	35685591.360212
1655304020	Connection	CN5		16.184835	1	35685591.360212
1655305020	Connection	CN18		16.184835	1	35685591.360212
1655404020	Connection	CN2		16.184835	1	35685591.360212
175011901H	Miscellaneous	BAT1		306.000000	1	1681683.006787
1750220323	Connection	BAT1		16.184835	1	35685591.360212
1752000501	Miscellaneous	FS8,FS9		2.400000	2	143944727.196625
1752001603	Miscellaneous	FS3,FS4,FS5,FS6, FS7		2.400000	5	65101085.623547
1752001900	Miscellaneous	F1,F2		2.400000	2	143944727.196625
1752011000	Miscellaneous	FS2		2.400000	1	254626042.602335

**Reliability Prediction
Summary**

File Name: AEC-6977.rfp
Assembly: 9697T22901-D
Ref Des:
Description:

Failure Rate: 213.181558
MTBF (hrs): 4,690,837
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050504724	Resistor	R1,R2		2.547039	2	154078778.388085
1121501690	Capacitor	BC1,BC2,BC3 ,BC4, BC5,BC6,BC7 ,BC8,C1, C2		1.128806	10	82101057.548118
1129747650	Capacitor	C3,C4,C5,C6		1.128806	4	196873384.410843
118961018A	Capacitor	EC1,EC2		4.744484	2	86049450.747498
11C9510050	Capacitor	TC1,TC2		1.128806	2	375289731.076049
14S5A00702	Integrated Circuit	U1,U2		43.803003	2	6834791.244197
1654232200	Connection	PCIE1,PCIE2		16.184835	2	20390152.380746