

# BOXER-6951

## Reliability Prediction Report (MTBF)

Summary	Failure Rate: 15534.680486 ppm MTBF: 64,372 Hours
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Issue date

QE Manager

Test Engineer

2016/02/04

KJ Wang

Jack Huang

# Reliability Prediction (MTBF)

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**I . Model Name:** TF-BOXER-6951-A01-1010

**II . Prediction Date:** Feb. 04, 2016

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

**IV . Predicted by:** Jack Huang

**V . Equipment:** Windchill Quality Solutions 10.1

## **VI. Simulation Environment:**

- Temperature: 45 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:**

TF-BOXER-6951-A01-1010 (9697QM77F1-D, 9697T39200-D):

- Failure Rate: 15534.680486 ppm

- MTBF: 64,372 Hours

**AAEON Reliability Prediction  
Summary**

**File Name:** Copy of BOXER-6951.rfp  
**Duty Cycle:** 100  
**Calculation Model:** Telcordia Issue 2  
**Method:** Method I Case 3

**Failure Rate:** 15534.680486  
**MTBF (hrs):** 64,372  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Assembly Name	Part Number	Ref Des	Quantity	Failure Rate	MTBF
BOXER-6951	System		1	15534.680486	64,372
(TF)ASS'Y. PBA-QM77. Rev. D1. 0_0_0. W/BGA1023. 2. 2GHz. Celeron 1020E. for BOXER-6951	9697QM77F1-D		1	14053.625109	71,156
(TF)SMD ASS'Y.PCI/e Riser Card.PER-T392.Rev.A0.1_0_0.W/2PCI.for BOXER-6951	9697T39200-D		1	1679.726529	595,335

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697QM77F1-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 14053.625109  
**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050501004	Resistor	R32,R35		3.339527	2	117515025.681470
1050501054	Resistor	R105,R123		3.339527	2	117515025.681470
1050502424	Resistor	R766		3.339527	1	215339658.793410
1050504724	Resistor	R332,R479,R481, R508,R509,R510, R511,R513,R514, R516		3.339527	10	26755270.851866
1050504734	Resistor	R331		3.339527	1	215339658.793410
1050505124	Resistor	R523,R753		3.339527	2	117515025.681470
1050505604	Resistor	R2,R793,R800		3.339527	3	81624133.461474
1050505633	Resistor	R648,R761		3.339527	2	117515025.681470
1050506234	Resistor	R702		3.339527	1	215339658.793410
1050510034	Resistor	R222,R223,R225, R226,R259,R298, R301,R507,R521, R594,R595,R603, R619,R659,R670, R676,R731,R740, R792,R846,R847, R848		3.339527	22	12598632.407495
1050511034	Resistor	R741		3.339527	1	215339658.793410
1050512104	Resistor	R490		3.339527	1	215339658.793410
1050514324	Resistor	R612		3.339527	1	215339658.793410
1050519114	Resistor	R772,R775		3.339527	2	117515025.681470
1050520004	Resistor	R6		3.339527	1	215339658.793410
1050520034	Resistor	R273,R707,R720, R752		3.339527	4	62777194.286125
1050524904	Resistor	R1,R16		3.339527	2	117515025.681470
1050533034	Resistor	R192,R99		3.339527	2	117515025.681470
1050533214	Resistor	R657		3.339527	1	215339658.793410
1050539214	Resistor	R781		3.339527	1	215339658.793410
1050539224	Resistor	R758		3.339527	1	215339658.793410
1050540224	Resistor	R655,R658		3.339527	2	117515025.681470
1050584514	Resistor	R760		3.339527	1	215339658.793410
1050700002	Resistor	R317		3.339527	1	215339658.793410
1050702734	Resistor	R474		3.339527	1	215339658.793410
1050704304	Resistor	R21,R41		3.339527	2	117515025.681470
1050756004	Resistor	R532,R533,R534		3.339527	3	81624133.461474
1052500171	Resistor	R37		3.339527	1	215339658.793410

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697QM77F1-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 14053.625109  
**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105270000A	Resistor	R857		3.339527	1	215339658.793410
1053500489	Resistor	R1184,R855		3.339527	2	117515025.681470
1054700289	Resistor	R1185,R678, R692, R705,R715,R 737, R748		3.339527	7	37365344.195727
1059700001	Resistor	R734,R744,R 755, R768,R777,R 782, R802,R807,R 811, R814,R820,R 825, R885,R890,R 891, R934		3.339527	16	17103529.170016
1059700201	Resistor	R877		3.339527	1	215339658.793410
1059701001	Resistor	R840		3.339527	1	215339658.793410
1059702261	Resistor	R735		3.339527	1	215339658.793410
105A500103	Resistor	R683,R693,R 738, R763,R779,R 803, R812,R821		3.339527	8	32967790.546203
105A500133	Resistor	R636		3.339527	1	215339658.793410
105A500139	Resistor	R110,R137,R 15,R18, R187,R188,R 227,R25, R27,R276,R2 95,R476, R50,R51,R52 ,R55, R551,R56,R5 8,R59, R604,R607,R 61,R64, R671,R72,R7 3,R83, R837,R84,R9 6		3.339527	31	9047005.760307
105A500239	Resistor	R483		3.339527	1	215339658.793410
105A501033	Resistor	R870,R981		3.339527	2	117515025.681470

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**Assembly:** 9697QM77F1-D  
**Ref Des:**  
**Description:**

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**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A501039	Resistor	R113,R114,R125, R126,R129,R135, R136,R138,R145, R155,R156,R158, R161,R162,R164, R165,R167,R168, R171,R172,R175, R181,R185,R20,R241, R242,R243,R249, R250,R255,R266, R267,R268,R270, R271,R272,R274, R277,R278,R280, R281,R282,R283, R285,R286,R287, R288,R289,R		3.339527	82	3505822.575424
105A501333	Resistor	R697,R984		3.339527	2	117515025.681470
105A501539	Resistor	R843		3.339527	1	215339658.793410
105A502033	Resistor	R328,R649		3.339527	2	117515025.681470
105A502039	Resistor	R325,R478,R480, R482,R653,R668, R689,R699,R730, R788,R839		3.339527	11	24444124.838111
105A502223	Resistor	R721		3.339527	1	215339658.793410
105A502263	Resistor	R691		3.339527	1	215339658.793410
105A503033	Resistor	R646		3.339527	1	215339658.793410
105A503039	Resistor	R664,R667,R673, R757,R787		3.339527	5	51106736.582629

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A503309	Resistor	R116,R121,R334, R335,R336,R337, R339,R340,R349, R350,R351,R352, R353,R354,R355, R356,R357,R358, R359,R360,R361, R362,R363,R364, R365,R366,R367, R368,R369,R370, R371,R372,R373, R374,R375,R376, R377,R378,R379, R380,R381,R382, R383,R384,R385, R386,R387		3.339527	47	6039107.403714
105A504323	Resistor	R708		3.339527	1	215339658.793410
105A504333	Resistor	R751		3.339527	1	215339658.793410
105A505109	Resistor	R10,R12,R13,R8,R9		3.339527	5	51106736.582629
105A505123	Resistor	R327		3.339527	1	215339658.793410
105A506834	Resistor	R719		3.339527	1	215339658.793410
105A507509	Resistor	R19,R40,R564,R565, R566		3.339527	5	51106736.582629
105A508223	Resistor	R1162		3.339527	1	215339658.793410
105A510003	Resistor	R881,R882,R888, R889		3.339527	4	62777194.286125
105A510033	Resistor	R875		3.339527	1	215339658.793410
105A511823	Resistor	R844		3.339527	1	215339658.793410
105A512033	Resistor	R695		3.339527	1	215339658.793410
105A512039	Resistor	R696		3.339527	1	215339658.793410
105A512133	Resistor	R876		3.339527	1	215339658.793410
105A512413	Resistor	R871,R872		3.339527	2	117515025.681470
105A513009	Resistor	R24,R39,R794		3.339527	3	81624133.461474



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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A513733	Resistor	R783		3.339527	1	215339658.793410
105A514009	Resistor	R5		3.339527	1	215339658.793410
105A514033	Resistor	R869		3.339527	1	215339658.793410
105A514723	Resistor	R874		3.339527	1	215339658.793410
105A515009	Resistor	R219,R220,R221, R561,R562,R563		3.339527	6	43148641.502926
105A516523	Resistor	R759,R780,R804, R813,R822		3.339527	5	51106736.582629
105A518723	Resistor	R762,R795		3.339527	2	117515025.681470
105A522123	Resistor	R983		3.339527	1	215339658.793410
105A522663	Resistor	R257		3.339527	1	215339658.793410
105A523713	Resistor	R212		3.339527	1	215339658.793410
105A524003	Resistor	R742		3.339527	1	215339658.793410
105A525563	Resistor	R4		3.339527	1	215339658.793410
105A528723	Resistor	R767,R786,R806, R816,R824		3.339527	5	51106736.582629
105A530133	Resistor	R815,R823		3.339527	2	117515025.681470
105A531623	Resistor	R684		3.339527	1	215339658.793410
105A532429	Resistor	R614		3.339527	1	215339658.793410
105A536503	Resistor	R492		3.339527	1	215339658.793410
105A537463	Resistor	R112		3.339527	1	215339658.793410
105A539003	Resistor	R284		3.339527	1	215339658.793410
105A539033	Resistor	R764,R784,R805		3.339527	3	81624133.461474
105A549919	Resistor	R30,R610,R921,R964		3.339527	4	62777194.286125
105A549923	Resistor	R609		3.339527	1	215339658.793410
105A549963	Resistor	R115,R184		3.339527	2	117515025.681470
105A551003	Resistor	R1179,R1180		3.339527	2	117515025.681470
105A551123	Resistor	R756		3.339527	1	215339658.793410
105A553623	Resistor	R739		3.339527	1	215339658.793410
105A575009	Resistor	R117,R191		3.339527	2	117515025.681470
105A590963	Resistor	R179		3.339527	1	215339658.793410

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**Ref Des:**  
**Description:**

**Failure Rate:** 14053.625109  
**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A700003	Resistor	R315,R318,R323, R338,R498,R519, R675,R677,R685, R688,R698,R704, R706,R713,R718, R722,R747,R750, R799,R878,R880, R884,R904,R906, R947,R949,R977, R978,R980		3.339527	29	9650189.756110
105A700009	Resistor	R102,R11,R111, R1174,R118,R120, R130,R131,R132,R14, R147,R148,R149, R150,R151,R152, R153,R154,R159, R160,R163,R166, R180,R193,R195, R197,R198,R199, R200,R201,R202, R203,R205,R256, R258,R260,R28,R29, R290,R296,R3,R31, R312,R314,R319, R322,R33,R34,R346, R36		3.339527	141	2058374.475294

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A700139	Resistor	R1167,R1168 ,R1169, R1175,R1176 ,R831, R838,R907,R 950		3.339527	9	29557799.726907
105A701009	Resistor	R313,R316,R 774		3.339527	3	81624133.461474
105A701033	Resistor	R466,R467,R 652		3.339527	3	81624133.461474
105A701039	Resistor	R1164,R1165 ,R1166, R1170,R1171 ,R540, R541,R542,R 567, R625,R626,R 627, R635,R901,R 902, R903,R908,R 909, R910,R911,R 912, R913,R915,R 916, R917,R918,R 919, R920,R922,R 944, R945,R946,R 951, R952,R953,R 954, R955,R956,R 958, R959,R960,R 961, R962,R963,R 965, R988,R989		3.339527	47	6039107.403714
105A701053	Resistor	R177		3.339527	1	215339658.793410
105A701069	Resistor	R95		3.339527	1	215339658.793410
105A701539	Resistor	R204,R661,R 669		3.339527	3	81624133.461474
105A702053	Resistor	R642		3.339527	1	215339658.793410
105A702209	Resistor	R261,R262,R 263, R557,R558,R 559, R560		3.339527	7	37365344.195727

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A702229	Resistor	R133,R134,R139, R140,R141,R142, R143,R144,R157, R206,R207,R208, R209,R210,R211, R213,R214,R217, R218,R251,R291, R341,R342,R347, R348,R469		3.339527	26	10724304.941525
105A702239	Resistor	R94,R97		3.339527	2	117515025.681470
105A703033	Resistor	R765		3.339527	1	215339658.793410
105A703329	Resistor	R472,R923,R924, R925,R928,R929, R966,R967,R968, R971,R972		3.339527	11	24444124.838111
105A704729	Resistor	R1161,R1163,R1172, R1173,R344,R345, R493,R495,R496, R500,R543,R544, R549,R552,R553, R554,R556,R905, R948		3.339527	19	14505827.012438
105A704739	Resistor	R264,R265		3.339527	2	117515025.681470
105A705129	Resistor	R468,R471		3.339527	2	117515025.681470
105A705139	Resistor	R453,R455,R462, R464,R465,R555, R622		3.339527	7	37365344.195727
105A706209	Resistor	R17,R853,R854		3.339527	3	81624133.461474

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A708229	Resistor	R100,R183,R189, R196,R228,R229, R230,R231,R232, R233,R234,R235, R236,R237,R238, R239,R240,R244, R245,R246,R247, R248		3.339527	22	12598632.407495
105A710009	Resistor	R45,R470,R48		3.339527	3	81624133.461474
105A710039	Resistor	R186,R700,R712, R714,R745,R828, R829,R830,R834, R835,R841		3.339527	11	24444124.838111
105A720009	Resistor	R22,R23		3.339527	2	117515025.681470
105A733003	Resistor	R593,R639,R643, R644		3.339527	4	62777194.286125
105A733009	Resistor	R127,R930,R932, R973,R976		3.339527	5	51106736.582629
105A747003	Resistor	R1181,R1182		3.339527	2	117515025.681470
105A747009	Resistor	R491		3.339527	1	215339658.793410
105A747033	Resistor	R873		3.339527	1	215339658.793410
106B510030	Resistor	RT3,RT4,RT5,RT6, RT7,RT8,RT9		3.339527	7	37365344.195727
106B701031	Resistor	RT1,RT2		3.339527	2	117515025.681470

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1121501690	Capacitor	C1,C108,C109,C110,C111,C112,C114,C117,C125,C127,C134,C135,C136,C137,C139,C141,C149,C156,C157,C158,C159,C160,C161,C162,C163,C164,C169,C170,C174,C176,C181,C186,C187,C188,C190,C199,C2,C204,C211,C212,C213,C214,C216,C220,C228,C232,C233,C234,C236		1.235480	126	6283925.263030
1121501691	Capacitor	C470,C541,C778,C779,C781,C782,C783,C785,C793,C794,C798,C799,C801,C802,C803,C804,C812,C814		1.235480	18	42465448.737033
1121533480	Capacitor	C653		1.235480	1	644108261.978977
1121610180	Capacitor	C442,C443,C445,C446		1.235480	4	179874885.987536
1121647780	Capacitor	C441		1.235480	1	644108261.978977
1122522890	Capacitor	C566		1.235480	1	644108261.978977
1124410190	Capacitor	C645,C669		1.235480	2	342886357.095000

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1124410191	Capacitor	C260,C261,C263, C264,C267,C268		1.235480	6	122411609.071844
1124418090	Capacitor	C151,C153,C167, C168		1.235480	4	179874885.987536
1124418190	Capacitor	C372,C373,C374, C375,C380,C381, C382,C383,C385, C386,C387,C389, C392,C395,C396, C397,C398,C399, C400,C401,C402, C403,C404,C405, C406,C407,C408, C409,C410,C416, C417,C418,C419, C420,C421,C422, C423,C424,C425, C426,C430,C431, C432,C433,C434, C435,C436,C437		1.235480	48	16275478.407468
1124427090	Capacitor	C495,C496,C497, C498,C499,C500		1.235480	6	122411609.071844
1124427091	Capacitor	C788,C789,C807, C808		1.235480	4	179874885.987536
1124468090	Capacitor	C718		1.235480	1	644108261.978977
1124501780	Capacitor	C752		1.235480	1	644108261.978977
1124510280	Capacitor	C759		1.235480	1	644108261.978977

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697QM77F1-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 14053.625109  
**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1124522280	Capacitor	C585,C594,C625, C641,C649,C650, C651,C655,C666, C668,C671,C675, C682,C684,C685, C689,C696,C698, C701,C707,C710		1.235480	21	36549772.733476
1124522680	Capacitor	C755,C763		1.235480	2	342886357.095000
1124533190	Capacitor	C554		1.235480	1	644108261.978977
1129522790	Capacitor	C598		1.235480	1	644108261.978977
1129610080	Capacitor	C604,C611,C637, C735,C736,C737, C738		1.235480	7	105649773.249837
1129701790	Capacitor	C173,C180,C197, C448,C449,C450, C454,C618,C620		1.235480	9	83018071.820158
1129710090	Capacitor	C490,C491,C492, C493,C494		1.235480	5	145607336.489381
1129710091	Capacitor	C254		1.235480	1	644108261.978977
1129710390	Capacitor	C569,C571,C575		1.235480	3	235279809.562882
1161627100	Capacitor	C643,C644,C687		1.235480	3	235279809.562882
1169682192	Capacitor	C617		1.235480	1	644108261.978977
1181610195	Capacitor	TC1		6.220688	1	121774100.762610
1183615110	Capacitor	EC1		6.220688	1	121774100.762610
1183622190	Capacitor	C753,C758,C772		6.220688	3	45303377.170823
1189610151	Capacitor	C719		6.220688	1	121774100.762610
1189615154	Capacitor	C259,C262,C335, C339,C344,C346, C464,C465		6.220688	8	18107860.321453
1189627150	Capacitor	C218,C222,C732		6.220688	3	45303377.170823
1189633162	Capacitor	C115,C138		6.220688	2	65629436.579506



**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697QM77F1-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 14053.625109  
**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1189647185	Capacitor	C646,C647,C664, C665,C68,C680,C681, C694,C695		6.220688	9	16187391.434154
1189647187	Capacitor	C50,C706,C777		6.220688	3	45303377.170823
1189922181	Capacitor	C583,C592		6.220688	2	65629436.579506
1189933180	Capacitor	C606		6.220688	1	121774100.762610
118C622190	Capacitor	C612,C636		6.220688	2	65629436.579506
11C1533890	Capacitor	C652,C670,C686, C699,C711,C728, C733		1.235480	7	105649773.249837
11C1539840	Capacitor	C787,C806		1.235480	2	342886357.095000
11C1547890	Capacitor	C3		1.235480	1	644108261.978977
11C2501790	Capacitor	C713,C714		1.235480	2	342886357.095000
11C2510480	Capacitor	C546,C547,C548, C744		1.235480	4	179874885.987536
11C2522650	Capacitor	C764		1.235480	1	644108261.978977
11C2610030	Capacitor	C103,C104,C105, C106,C107,C113, C123,C124,C128, C129,C130,C131, C132,C133,C147, C148,C175,C185, C205,C238,C239, C240,C241,C249, C253,C256,C334, C338,C343,C345, C463,C468,C483, C484,C486,C487, C527,C528,C549, C578,C579,C582, C589,C591,C593, C597,C615,C619,		1.235480	72	10920082.868224

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697QM77F1-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 14053.625109  
**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
11C4510380	Capacitor	C756		1.235480	1	644108261.978977
11C4547190	Capacitor	C790,C791,C792, C809,C810,C811		1.235480	6	122411609.071844
11C4547680	Capacitor	C740,C741,C746		1.235480	3	235279809.562882
11C5501650	Capacitor	C734,C739,C843, C844		1.235480	4	179874885.987536
11C9510050	Capacitor	C599,C600,C607, C608,C631,C633, C842		1.235480	7	105649773.249837
11C9510490	Capacitor	C623		1.235480	1	644108261.978977
11E1522680	Capacitor	C116,C118,C126, C140,C142,C150, C614,C654,C841		1.235480	9	83018071.820158
11E1547090	Capacitor	C596		1.235480	1	644108261.978977
11E1622060	Capacitor	C471		1.235480	1	644108261.978977
11E2501080	Capacitor	C676,C692,C704, C761		1.235480	4	179874885.987536

**Reliability Prediction  
Summary**

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697QM77F1-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 14053.625109  
**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
11E2501690	Capacitor	C388,C390,C391, C393,C394,C411, C412,C413,C414, C415,C451,C452, C453,C455,C456, C457,C458,C459, C460,C462,C467, C469,C504,C505, C506,C507,C508, C509,C510,C511, C512,C513,C514, C577,C580,C584, C587,C588,C621, C626,C642,C657, C678,C688,C700, C715,C720,C722		1.235480	48	16275478.407468
11E2510060	Capacitor	C776		1.235480	1	644108261.978977
11E2601050	Capacitor	C616		1.235480	1	644108261.978977
11E2610030	Capacitor	C773		1.235480	1	644108261.978977
11E3510010	Capacitor	C742,C745,C747, C748,C749,C750, C751,C757		1.235480	8	92961711.994425

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697QM77F1-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 14053.625109  
**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
11E9501091	Capacitor	C10,C119,C12,C120,C121,C122,C143,C144,C145,C146,C15,C152,C154,C155,C16,C17,C172,C177,C178,C18,C183,C184,C19,C191,C192,C193,C194,C196,C20,C201,C202,C206,C207,C209,C21,C210,C215,C217,C219,C22,C221,C223,C224,C225,C226,C227,C230,C235,C237,C242,C		1.235480	100	7896679.279273
11E9522490	Capacitor	C627		1.235480	1	644108261.978977
11E9547680	Capacitor	C661		1.235480	1	644108261.978977
11E9610080	Capacitor	C780,C784,C786,C797,C800,C805		1.235480	6	122411609.071844
11E9622052	Capacitor	C189,C723,C724,C725,C727,C730		1.235480	6	122411609.071844

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697QM77F1-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 14053.625109  
**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
11E9622080	Capacitor	C100,C101,C102,C11,C182,C195,C198,C200,C208,C23,C24,C25,C26,C27,C28,C29,C30,C31,C32,C33,C34,C35,C36,C37,C38,C41,C42,C43,C44,C48,C49,C6,C624,C65,C66,C67,C7,C72,C74,C75,C76,C77,C78,C79,C8,C84,C86,C87,C88,C89,C9,C90,C91,C92,C93,C99		1.235480	56	13986530.841440
11E9647690	Capacitor	C231,C628		1.235480	2	342886357.095000
1211100113	Inductor	L2,L4,L5		6.482612	3	43750657.339495
1211100160	Inductor	L3		6.482612	1	118035324.955653
121110106G	Inductor	L21		6.482612	1	118035324.955653
121110156M	Inductor	L23		6.482612	1	118035324.955653
121110226M	Inductor	L30		6.482612	1	118035324.955653
121110336X	Inductor	L20		6.482612	1	118035324.955653
121110336Y	Inductor	L19		6.482612	1	118035324.955653
1211103671	Inductor	L25,L26,L27,L28,L29		6.482612	5	27176237.526745
1211122071	Inductor	L22,L24		6.482612	2	63456986.468484
1212306030	Inductor	FB3,FB4,FB5		6.482612	3	43750657.339495
121230603S	Inductor	FB21,FB29		6.482612	2	63456986.468484
1212308054	Inductor	FB16,FB17,FB18,FB19,FB27,FB28		6.482612	6	22923467.615315
12123A0009	Inductor	FB24,FB25,FB26		6.482612	3	43750657.339495
12123C0003	Inductor	FB1,FB2		6.482612	2	63456986.468484
12123D0001	Inductor	FB10,FB11,FB6,FB7,FB8,FB9		6.482612	6	22923467.615315

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697QM77F1-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 14053.625109  
**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1214309008	Inductor	L10,L11,L12, L13, L14,L15,L16, L17, L18,L31,L32, L7,L8, L9		6.482612	14	10206339.897027
123132505D	Miscellaneous	Y2,Y6,Y7		19.200000	3	5742504.738137
1231332722	Miscellaneous	Y1		19.200000	1	23844262.770939
1233348051	Miscellaneous	Y5		19.200000	1	23844262.770939
1300414841	Semiconductor	D45		11.595248	1	62377748.142388
1301003440	Semiconductor	D36,D37		11.595248	2	33994603.280641
1301005440	Semiconductor	D30		11.595248	1	62377748.142388
1301005442	Semiconductor	D10,D11,D16 ,D17, D25,D8,D9		11.595248	7	10789221.478130
1301005444	Semiconductor	D12,D15,D6, D7		11.595248	4	18139931.994805
1301005450	Semiconductor	D13,D14		11.595248	2	33994603.280641
1301075140	Semiconductor	D1,D2		11.595248	2	33994603.280641
1301400541	Semiconductor	D18		11.595248	1	62377748.142388
1301400642	Semiconductor	D39		11.595248	1	62377748.142388
1302005641	Semiconductor	D38		11.595248	1	62377748.142388
1304001340	Semiconductor	LED3,LED4		11.595248	2	33994603.280641
1304100054	Semiconductor	LED5		11.595248	1	62377748.142388
1305080040	Semiconductor	U10,U11,U12 ,U13,U8, U9		11.595248	6	12461429.505610
1305100541	Semiconductor	D19,U19,U20 ,U22, U23,U25,U26 ,U28, U29,U86,U87 ,U88, U89		11.595248	13	6017522.642026
1305104041	Semiconductor	U21,U24,U27 ,U30, U31,U32,U33 ,U34, U35,U36,U37 ,U38, U39,U40,U41 ,U42		11.595248	16	4934456.315563
130533CA40	Semiconductor	D32		11.595248	1	62377748.142388
1310390410	Semiconductor	Q27,Q28,Q4 3,Q45, Q47,Q48,Q9 5		33.421598	7	3714120.132407
1310390413	Semiconductor	Q91		33.421598	1	21267658.547818
1311390610	Semiconductor	Q94		33.421598	1	21267658.547818
1311390612	Semiconductor	Q90		33.421598	1	21267658.547818
131411171G	Semiconductor	U53		33.421598	1	21267658.547818

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697QM77F1-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 14053.625109  
**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1314880511	Semiconductor	Q10		33.421598	1	21267658.547818
1315009250	Semiconductor	Q49,Q50,Q51,Q54		33.421598	4	6230970.738382
13150123N0	Semiconductor	Q85,Q86		33.421598	2	11637840.154692
1315013810	Semiconductor	Q5		33.421598	1	21267658.547818
1315441012	Semiconductor	Q78		33.421598	1	21267658.547818
1315443512	Semiconductor	Q66,Q68		33.421598	2	11637840.154692
1315700216	Semiconductor	Q1,Q13,Q14,Q15,Q16,Q19,Q2,Q20,Q21,Q22,Q23,Q24,Q25,Q26,Q3,Q31,Q32,Q33,Q36,Q37,Q4,Q42,Q44,Q46,Q6,Q67,Q69,Q7,Q70,Q74,Q75,Q76,Q79,Q8,Q80,Q88,Q89,Q9		33.421598	38	740276.525117
1315762010	Semiconductor	Q52,Q53		33.421598	2	11637840.154692
1315806510	Semiconductor	Q65,Q71,Q72,Q73,Q77		33.421598	5	5075750.476986
1315971500	Semiconductor	U43,U44,U45,U46,U84,U85		33.421598	6	4287387.237441
1315D4C500	Semiconductor	Q55,Q56,Q57,Q58,Q59,Q60,Q61,Q62,Q63,Q64		33.421598	10	2661848.628443
1315S4C550	Semiconductor	Q84,Q87		33.421598	2	11637840.154692
1430059300	Integrated Circuit	U81		120.428261	1	4269864.283173
143ALC8920	Integrated Circuit	U7		120.428261	1	4269864.283173
1440211AT0	Integrated Circuit	U90,U92		120.428261	2	2485997.732466
1441020E00	Integrated Circuit	U1		40.842323	1	12590183.363325
1462W00A20	Integrated Circuit	BIOS_FLASH 1,U14		20.816089	2	17308669.290643
1469128350	Integrated Circuit			20.816089	1	30948670.786519
14S2965000	Integrated Circuit	U77		120.428261	1	4269864.283173
14S3112300	Integrated Circuit	U72		120.428261	1	4269864.283173
14S3121600	Integrated Circuit	U75		120.428261	1	4269864.283173
14S3121800	Integrated Circuit	U73,U74,U76		120.428261	3	1790715.065177
14S3378900	Integrated Circuit	U83		120.428261	1	4269864.283173
14S3528000	Integrated Circuit	U101		120.428261	1	4269864.283173

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697QM77F1-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 14053.625109  
**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
14S4021301	Integrated Circuit	U50,U51,U58 ,U59, U60,U95		120.428261	6	1000601.617218
14S4048501	Integrated Circuit	U98		120.428261	1	4269864.283173
14S4048503	Integrated Circuit	U99		120.428261	1	4269864.283173
14S4186600	Integrated Circuit	U54		120.428261	1	4269864.283173
14S4QM7700	Integrated Circuit	U4		120.428261	1	4269864.283173
14S5908000	Integrated Circuit	U6		48.955248	1	13580010.001602
14S5A00601	Integrated Circuit	U97		48.955248	1	13580010.001602
14S5A00702	Integrated Circuit	U15,U2,U5		48.955248	3	5287946.772940
14S5A00704	Integrated Circuit	U3,U65,U71		48.955248	3	5287946.772940
14S5A00802	Integrated Circuit	U62,U66,U68 ,U70		48.955248	4	4090769.453344
14S5A00821	Integrated Circuit	U55		48.955248	1	13580010.001602
14S5A12503	Integrated Circuit	U96		48.955248	1	13580010.001602
14S5A12506	Integrated Circuit	U100		48.955248	1	13580010.001602
14S5A73200	Integrated Circuit	U56		48.955248	1	13580010.001602
14S9108500	Integrated Circuit	U63,U64,U67 ,U69		120.428261	4	1410953.888602
14S9160100	Integrated Circuit	U78,U79,U80		120.428261	3	1790715.065177
14S9811500	Integrated Circuit	U94		120.428261	1	4269864.283173
1540722281	Resistor	RP13		18.761737	1	27427896.859981
1540733085	Resistor	RP2,RP4		18.761737	2	15967382.997484
1651520400	Connection	DIMM2		33.330365	1	17328504.903443
16515A2995	Connection	DIMM1		33.330365	1	17328504.903443
1652002101	Connection	CN45		33.330365	1	17328504.903443
165251420B	Connection	CN42,CN43		33.330365	2	9901219.008680
1653003101	Connection	JP1,JP3		33.330365	2	9901219.008680
1653003201	Connection	JP8		33.330365	1	17328504.903443
165300420L	Connection	CN3		33.330365	1	17328504.903443
1653005209	Connection	JP2		33.330365	1	17328504.903443
165300520J	Connection	CN32		33.330365	1	17328504.903443
165320820B	Connection	CN47		33.330365	1	17328504.903443
1653212100	Connection	CN23		33.330365	1	17328504.903443
1653300107	Connection	JP1(1-2),JP8 (1-2), JP8(3- 4),JP8(5-6)		33.330365	4	5508929.836423
165330010E	Connection	JP3(2-3)		33.330365	1	17328504.903443
1654203623	Connection	CN29		33.330365	1	17328504.903443
1654226303	Connection	CN46		33.330365	1	17328504.903443
1654418103	Connection	CN34,CN48		33.330365	2	9901219.008680
165480430A	Connection	CN44		33.330365	1	17328504.903443
1654818301	Connection	CN35,CN36		33.330365	2	9901219.008680
1654903900	Connection	CN25		33.330365	1	17328504.903443
165490700G	Connection	SATA1		33.330365	1	17328504.903443
1655004011	Connection	PWR1		33.330365	1	17328504.903443
1655004014	Connection	CN19		33.330365	1	17328504.903443



**Reliability Prediction  
Summary**

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697QM77F1-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 14053.625109  
**MTBF (hrs):** 71,156  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1655102110	Connection	CN39		33.330365	1	17328504.903443
1655302020	Connection	PSONCN1,P WRSW1		33.330365	2	9901219.008680
1655902030	Connection	BAT1		33.330365	1	17328504.903443
1655905038	Connection	CN31		33.330365	1	17328504.903443
1655909031	Connection	CN15,CN16		33.330365	2	9901219.008680
1655910032	Connection	CN21		33.330365	1	17328504.903443
175011901C	Connection	BAT1-CR1		33.330365	1	17328504.903443
1752001900	Miscellaneous	FS6,FS7		2.400000	2	143944727.196625
1752002400	Miscellaneous	FS9		2.400000	1	254626042.602335
1752011002	Miscellaneous	FS2		2.400000	1	254626042.602335
175910000B	Connection	BZ1		33.330365	1	17328504.903443

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697T39200-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 1679.726529  
**MTBF (hrs):** 595,335  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050502204	Resistor	R21,R26		3.339527	2	117515025.681470
1050504724	Resistor	R1,R10,R101 ,R102, R11,R12,R13 ,R14, R15,R16,R17 ,R18,R2, R20,R22,R23 ,R24, R25,R3,R35, R36,R4, R5,R53,R54, R56,R6, R66,R7,R74, R75,R79, R8,R81,R83, R85,R9		3.339527	37	7620834.284112
1050505124	Resistor	R65,R82		3.339527	2	117515025.681470
1050510034	Resistor	R109		3.339527	1	215339658.793410
1050569824	Resistor	R112		3.339527	1	215339658.793410
105A500139	Resistor	R100,R19,R2 7,R32, R37,R39,R40 ,R43, R73		3.339527	9	29557799.726907
105A501039	Resistor	R110,R114		3.339527	2	117515025.681470
105A502133	Resistor	R48		3.339527	1	215339658.793410
105A504773	Resistor	R42		3.339527	1	215339658.793410
105A506829	Resistor	R47		3.339527	1	215339658.793410
105A509123	Resistor	R44		3.339527	1	215339658.793410
105A562034	Resistor	R111		3.339527	1	215339658.793410
105A700009	Resistor	R105,R49,R5 5,R58, R59,R70,R71 ,R72, R77,R86,R91 ,R92, R97,R98,R99		3.339527	15	18192384.632667
105A700139	Resistor	R108,R45,R4 6		3.339527	3	81624133.461474
105A705129	Resistor	R38		3.339527	1	215339658.793410
105A710039	Resistor	R104,R106,R 107, R113		3.339527	4	62777194.286125
1111610194	Capacitor	C50,C51,C52 ,C53, C58,C59,C60 ,C61		6.220688	8	18107860.321453
1112610102	Capacitor	C66,C67		6.220688	2	65629436.579506

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697T39200-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 1679.726529  
**MTBF (hrs):** 595,335  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1121501690	Capacitor	C1,C10,C14, C15,C16, C17,C18,C19 ,C20, C22,C23,C24 ,C25, C26,C27,C28 ,C29, C30,C31,C32 ,C41, C42,C43,C44 ,C5,C55, C56,C57,C63 ,C64, C65,C69,C70 ,C71, C73,C74,C78 ,C79,C9		1.235480	39	19955353.567419
1121501691	Capacitor	C46		1.235480	1	644108261.978977
1121610060	Capacitor	C36,C37,C38		1.235480	3	235279809.562882
1124410190	Capacitor	C35		1.235480	1	644108261.978977
1124427091	Capacitor	C45		1.235480	1	644108261.978977
1124547190	Capacitor	C39		1.235480	1	644108261.978977
1129701791	Capacitor	C82		1.235480	1	644108261.978977
11426150D0	Capacitor	C40		1.235480	1	644108261.978977
11826150D1	Capacitor	C76		6.220688	1	121774100.762610
1189622150	Capacitor	C47		6.220688	1	121774100.762610
1189633193	Capacitor	C80		6.220688	1	121774100.762610
11C2501790	Capacitor	C12,C13,C6, C7,C8		1.235480	5	145607336.489381
11C2510480	Capacitor	C75,C77		1.235480	2	342886357.095000
11C4501380	Capacitor	C83		1.235480	1	644108261.978977
11E1510050	Capacitor	C54,C62,C68 ,C72		1.235480	4	179874885.987536
11E1647650	Capacitor	C11,C2,C21, C3,C33, C34,C4		1.235480	7	105649773.249837
11E2510060	Capacitor	C84		1.235480	1	644108261.978977
11E9501090	Capacitor	C81		1.235480	1	644108261.978977
11E9501091	Capacitor	C49		1.235480	1	644108261.978977
11E9610080	Capacitor	C48		1.235480	1	644108261.978977
121110336Y	Inductor	L2		6.482612	1	118035324.955653
1211110007	Inductor	L1		6.482612	1	118035324.955653
1212308054	Inductor	FB1		6.482612	1	118035324.955653
12123C0010	Inductor	FB2,FB3,FB4		6.482612	3	43750657.339495
1301003440	Semiconductor	D1		11.595248	1	62377748.142388
1315482110	Semiconductor	Q1,Q2		33.421598	2	11637840.154692
14S2321900	Integrated Circuit	U5		120.428261	1	4269864.283173
14S3306300	Integrated Circuit	U3		120.428261	1	4269864.283173

**File Name:** Copy of BOXER-6951.rfp  
**Assembly:** 9697T39200-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 1679.726529  
**MTBF (hrs):** 595,335  
**Temperature:** 45  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
14S3973100	Integrated Circuit	U4		120.428261	1	4269864.283173
14S4011100	Integrated Circuit	U1		120.428261	1	4269864.283173
1653003101	Connection	JP3,JP5		33.330365	2	9901219.008680
1653003201	Connection	JP2,JP4		33.330365	2	9901219.008680
1653300102	Connection	JP3(1-2),JP5 (1-2)		33.330365	2	9901219.008680
1653300107	Connection	JP2(1-3),JP2 (2-4), JP4(1-3),JP4(2-4)		33.330365	4	5508929.836423
1654260207	Connection	CN1,CN4		33.330365	2	9901219.008680