

BOXER-6404

Reliability Prediction Report (MTBF)

Summary	Failure Rate : 6550.079725 ppm MTBF : 152,670 Hours
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Issue date

2015/09/09

Approval

KJ Wang

Test Engineer

Aslen Hsieh

Reliability Prediction (MTBF)

I . Model Name: BOXER-6404

II . Prediction Date: SEP. 09, 2015

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

IV . Predicted by: Aslen Hsieh

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:

BOXER-6404 (M/B: 9697BT04P2-D):

- Failure Rate: 6550.079725 ppm
- MTBF: 152,670 Hours

**AAEON Reliability Prediction
Summary**

File Name: BOXER-6404.rfp
Duty Cycle: 100
Calculation Model: Telcordia Issue 2
Method: Method I Case 3

Failure Rate: 6550.079725
MTBF (hrs): 152,670
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Assembly Name	Part Number	Ref Des	Quantity	Failure Rate	MTBF
Boxer-6404	9697BT04P2-D		1	6550.079725	152,670

File Name: BOXER-6404.rfp
Assembly: 9697BT04P2-D
Ref Des:
Description:

Failure Rate: 6550.079725
MTBF (hrs): 152,670
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050501224	Resistor	R133,R511		2.547039	2	154078778.388085
1050501634	Resistor	R349		2.547039	1	282340674.079668
1050502004	Resistor	R377,R443		2.547039	2	154078778.388085
1050502724	Resistor	R74		2.547039	1	282340674.079668
1050504724	Resistor	R346,R351,R482, R486,R68,R72		2.547039	6	56573956.677649
1050505124	Resistor	R414		2.547039	1	282340674.079668
1050507530	Resistor	R229		2.547039	1	282340674.079668
1050508224	Resistor	R66,R73		2.547039	2	154078778.388085
1050510034	Resistor	R336,R384,R77,R78		2.547039	4	82309758.689546
1050516004	Resistor	R743,R744,R747, R748,R753,R755, R762,R766		2.547039	8	43225424.698300
1050516204	Resistor	R65		2.547039	1	282340674.079668
1050516964	Resistor	R376,R447		2.547039	2	154078778.388085
1050520034	Resistor	R127,R152,R485, R489		2.547039	4	82309758.689546
1050523264	Resistor	R64		2.547039	1	282340674.079668
1050527424	Resistor	R439		2.547039	1	282340674.079668
1050529464	Resistor	R70		2.547039	1	282340674.079668
1050530124	Resistor	R430		2.547039	1	282340674.079668
1050540204	Resistor	R102,R115,R131		2.547039	3	107020754.986850
1050540214	Resistor	R125		2.547039	1	282340674.079668
1050545364	Resistor	R154,R440		2.547039	2	154078778.388085
1050547564	Resistor	R126		2.547039	1	282340674.079668
1050561934	Resistor	R241		2.547039	1	282340674.079668
1050564904	Resistor	R333		2.547039	1	282340674.079668
1050573264	Resistor	R365,R375,R379		2.547039	3	107020754.986850
1050756004	Resistor	R354,R355,R368, R370,R371,R372		2.547039	6	56573956.677649
1059700001	Resistor	R326,R327,R328, R330		2.547039	4	82309758.689546
1059700101	Resistor	R81		2.547039	1	282340674.079668
1059710001	Resistor	R493,R498,R499		2.547039	3	107020754.986850
105A500103	Resistor	R3		2.547039	1	282340674.079668
105A500139	Resistor	R148,R155,R332		2.547039	3	107020754.986850
105A501013	Resistor	R331		2.547039	1	282340674.079668

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105A501039	Resistor	R362,R509,R510		2.547039	3	107020754.986850
105A501139	Resistor	R335		2.547039	1	282340674.079668
105A501539	Resistor	R277		2.547039	1	282340674.079668
105A502039	Resistor	R382		2.547039	1	282340674.079668
105A502403	Resistor	R69,R76		2.547039	2	154078778.388085
105A503309	Resistor	R113		2.547039	1	282340674.079668
105A505109	Resistor	R103,R112,R122, R134,R149		2.547039	5	67008142.102588
105A507533	Resistor	R20		2.547039	1	282340674.079668
105A510009	Resistor	R217,R378,R383, R389,R395,R487,R67		2.547039	7	48991237.965885
105A510223	Resistor	R16		2.547039	1	282340674.079668
105A515009	Resistor	R114		2.547039	1	282340674.079668
105A518003	Resistor	R403		2.547039	1	282340674.079668
105A533269	Resistor	R158		2.547039	1	282340674.079668
105A547529	Resistor	R276		2.547039	1	282340674.079668
105A549919	Resistor	R236,R237,R238,R55		2.547039	4	82309758.689546
105A549969	Resistor	R101,R107,R157,R93, R96,R98		2.547039	6	56573956.677649
105A561909	Resistor	R381,R409,R466, R467,R468,R469, R470,R471,R472, R473,R474,R475, R476,R477,R478, R479,R480,R481		2.547039	18	20032117.836120
105A700003	Resistor	R220,R337,R367, R393,R75,R87		2.547039	6	56573956.677649

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105A700009	Resistor	R109,R13,R135,R160,R164,R17,R170,R192,R193,R196,R197,R198,R199,R200,R201,R202,R203,R204,R205,R206,R207,R208,R209,R210,R211,R212,R213,R214,R215,R222,R275,R356,R358,R364,R373,R380,R385,R422,R431,R441,R445,R453,R454,R455,R456,R457,R458,R460,R4		2.547039	58	6449958.733144
105A700139	Resistor	R12,R172,R218,R334,R433,R514,R516,R54,R71,R88		2.547039	10	35079934.879747

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105A701039	Resistor	R118,R123,R124, R136,R137,R15, R161,R162,R169,R171, R174,R175,R176, R179,R189,R190, R191,R194,R221, R223,R23,R230,R231, R232,R233,R234,R24, R242,R243,R244, R245,R246,R247, R248,R249,R25,R251, R252,R253,R254, R255,R256,R257, R258,R259,R26,R260, R261,R262,R		2.547039	126	3014741.579367
105A701059	Resistor	R387,R435		2.547039	2	154078778.388085
105A701069	Resistor	R416		2.547039	1	282340674.079668
105A702039	Resistor	R108,R110,R97		2.547039	3	107020754.986850
105A702229	Resistor	R111,R116,R141, R144,R147,R182, R183,R185,R186, R428,R432,R442, R444,R86,R89,R99		2.547039	16	22425139.809646
105A702269	Resistor	R235		2.547039	1	282340674.079668
105A703309	Resistor	R401,R407,R413, R461,R462		2.547039	5	67008142.102588

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105A703329	Resistor	R310,R311,R312, R313,R314,R315, R317,R318,R319, R320,R321,R322		2.547039	12	29507083.749401
105A704729	Resistor	R225,R226,R227, R228,R340,R341, R344,R347,R366, R394,R400,R408, R427,R450,R488, R492,R508		2.547039	17	21160422.299251
105A705139	Resistor	R18,R6,R8		2.547039	3	107020754.986850
105A708209	Resistor	R738,R739,R740, R741,R742,R745, R746,R749,R751, R752,R754,R756, R761,R763,R764, R765		2.547039	16	22425139.809646
105A708229	Resistor	R452		2.547039	1	282340674.079668
105A710039	Resistor	R10,R178,R184,R195, R21,R224,R240,R250, R329,R353,R4,R429, R5		2.547039	13	27342571.921361
105A720009	Resistor	R117		2.547039	1	282340674.079668
105A733009	Resistor	R1,R2,R216, R219, R374,R390		2.547039	6	56573956.677649
105A747039	Resistor	R348		2.547039	1	282340674.079668
106BA01033	Resistor	RT1		7.724580	1	66247589.526685
1121501690	Capacitor	C49		1.128806	1	704977644.692287

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1121501691	Capacitor	C10,C110,C113,C117,C12,C120,C134,C142,C147,C16,C166,C178,C179,C180,C181,C187,C189,C19,C191,C194,C195,C196,C197,C198,C199,C200,C202,C203,C204,C205,C206,C207,C208,C209,C21,C210,C211,C212,C213,C214,C215,C216,C217,C218,C224,C225,C226,C228,C220,C221		1.128806	162	5363166.795253
1124410191	Capacitor	C220,C221		1.128806	2	375289731.076049
1124418090	Capacitor	C353,C356		1.128806	2	375289731.076049
1124427091	Capacitor	C33,C34,C35,C36,C365,C366,C50,C51,C52,C53		1.128806	10	82101057.548118
1124533280	Capacitor	C124,C188		1.128806	2	375289731.076049
1129622690	Capacitor	C121,C131,C298,C379,C76,C79,C86,C89		1.128806	8	101746760.035398
1129701791	Capacitor	C141,C169,C17,C18,C234,C346,C59,C65,C7		1.128806	9	90863428.080946
1129710091	Capacitor	C227		1.128806	1	704977644.692287
1129710391	Capacitor	C256		1.128806	1	704977644.692287
1129722091	Capacitor	C258		1.128806	1	704977644.692287
1129747090	Capacitor	C296		1.128806	1	704977644.692287
1189615154	Capacitor	C378		1.128806	1	704977644.692287
1189622154	Capacitor	TC1,TC2,TC3,TC4		4.744484	4	45505862.704531

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1189633151	Capacitor	TC6		4.744484	1	159663026.715137
1189922181	Capacitor	TC5		4.744484	1	159663026.715137
11C1501080	Capacitor	C140,C144,C183, C535		1.128806	4	196873384.410843
11C1510390	Capacitor	C171,C175,C190, C192		1.128806	4	196873384.410843
11C1539840	Capacitor	C64,C66,C67,C68		1.128806	4	196873384.410843
11C2522780	Capacitor	C285		1.128806	1	704977644.692287
11C4522290	Capacitor	C1		1.128806	1	704977644.692287
11C4547190	Capacitor	C261,C262,C263, C267,C268,C269, C273,C274,C275, C279,C280,C281		1.128806	12	68856937.301178
11C4547290	Capacitor	C580		1.128806	1	704977644.692287
11C9510490	Capacitor	C11,C309		1.128806	2	375289731.076049
11E1510050	Capacitor	C222		1.128806	1	704977644.692287
11E2501690	Capacitor	C233,C243		1.128806	2	375289731.076049
11E2510010	Capacitor	C230,C231,C232, C235,C236		1.128806	5	159367490.199266
11E2647650	Capacitor	C253		1.128806	1	704977644.692287
11E4433090	Capacitor	C367		1.128806	1	704977644.692287

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11E9501091	Capacitor	C101,C103,C107,C108,C111,C115,C116,C119,C122,C125,C130,C133,C135,C136,C137,C138,C139,C14,C143,C145,C146,C15,C150,C151,C153,C155,C156,C157,C158,C159,C160,C161,C172,C173,C174,C177,C185,C186,C193,C20,C22,C23,C237,C238,C240,C241,C26,C27,C30,C31		1.128806	63	13632557.733278
11E9510050	Capacitor	C3		1.128806	1	704977644.692287
11E9547790	Capacitor	C106		1.128806	1	704977644.692287
11E9610080	Capacitor	C176,C219,C304,C325,C361,C372,C78,C80,C85		1.128806	9	90863428.080946
11E9622050	Capacitor	C54		1.128806	1	704977644.692287
11E9622080	Capacitor	C100,C109,C114,C118,C152,C168,C182,C260		1.128806	8	101746760.035398
11E9647690	Capacitor	C104,C112		1.128806	2	375289731.076049

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11EA610040	Capacitor	C105,C123,C126, C127,C128,C129, C132,C148,C149, C239,C242,C264, C270,C276,C282, C303,C308,C310, C313,C315,C317, C319,C322,C337,C38, C41,C44,C47,C571, C60,C61,C62,C63, C75,C83,C84		1.128806	36	23624151.295955
11EA647010	Capacitor	C286,C289,C290, C293,C299,C301, C306,C323,C327, C341,C342,C347, C348		1.128806	13	63728475.410842
11EB501040	Capacitor	C257		1.128806	1	704977644.692287
11EB522640	Capacitor	C295		1.128806	1	704977644.692287
11EB610050	Capacitor	C102,C13,C162,C163, C164,C165,C287, C288,C316,C324,C4, C74,C91,C92,C93, C94		1.128806	16	52112480.802928
11EB622010	Capacitor	C2,C254,C297,C302, C345,C369,C370, C371		1.128806	8	101746760.035398
121110226X	Inductor	L2		4.944252	1	154760964.143460
1211103377	Inductor	L7		4.944252	1	154760964.143460
1211103377	Inductor	L8	29.7	8.255701	1	92684696.080233
1211106867	Inductor	L4		4.944252	1	154760964.143460
1211110073	Inductor	L3	30.4	8.346861	1	91672442.699153
1211110079	Inductor	L1	39.7	9.616939	1	79565564.028724
1211115073	Inductor	L6		4.944252	1	154760964.143460
121113307B	Inductor	L5,L9		4.944252	2	83201062.149749

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1212306030	Inductor	FB2		4.944252	1	154760964.143460
12310025A2	Miscellaneous	Y1,Y2,Y3,Y4, Y7		19.200000	5	3616053.141544
1231332726	Miscellaneous	Y6		19.200000	1	23844262.770939
12330024A1	Miscellaneous	Y5		19.200000	1	23844262.770939
1301005442	Semiconductor	D9		7.793411	1	92807310.010983
1301005443	Semiconductor	D8		7.793411	1	92807310.010983
1301005444	Semiconductor	D3,D4		7.793411	2	50578095.223398
1301013040	Semiconductor	D6		7.793411	1	92807310.010983
1301400642	Semiconductor	D12		7.793411	1	92807310.010983
1304101340	Optical Device	D1,D11,D2		79.003355	3	2725958.067754
1304300140	Optical Device	D10		79.003355	1	6497172.749112
1305080040	Optical Device	U10,U36,U37, U42, U43,U9		79.003355	6	1523626.609050
1310390411	Semiconductor	Q38,Q39		22.463360	2	17315095.066101
1310390413	Semiconductor	Q21,Q25,Q3 2		22.463360	3	12043329.789539
1311390610	Semiconductor	Q7,Q8		22.463360	2	17315095.066101
1315036640	Semiconductor	Q31		22.463360	1	31642600.748419
1315036640	Semiconductor	Q33	31.6	49.768093	1	14282225.447910
1315200312	Semiconductor	Q22		22.463360	1	31642600.748419
1315443512	Semiconductor	Q2		22.463360	1	31642600.748419
1315443512	Semiconductor	Q5	29.2	47.099755	1	15091355.072679
1315700212	Semiconductor	Q40		22.463360	1	31642600.748419
1315700216	Semiconductor	Q23,Q34,Q3 7,Q6		22.463360	4	9270607.712006
1315720010	Semiconductor	Q24,Q26		22.463360	2	17315095.066101
1315762010	Semiconductor	Q1		22.463360	1	31642600.748419
1315971500	Semiconductor	U100		22.463360	1	31642600.748419
1315EM6K10	Semiconductor	Q10,Q12,Q1 4,Q17, Q18,Q19,Q2 0,Q27, Q28,Q29,Q3, Q30,Q36, Q4,Q41,Q42		22.463360	16	2533798.883137
1430532190	Integrated Circuit	U18		43.803003	1	11739202.588727
1430959602	Integrated Circuit	U27	31.6	331.816573	1	1549688.504870
1437323KA0	Integrated Circuit	U19		43.803003	1	11739202.588727
1440002130	Integrated Circuit	U17	27.9	267.062402	1	1925438.868022
1440211AT0	Integrated Circuit	U20,U21,U22		11.063278	3	22909630.505226
1440211AT0	Integrated Circuit	U23	28.3	34.754491	1	18536605.381895
1440J19000	Integrated Circuit	U29	25.8	62.122990	1	8277327.382216
14412F5080	Integrated Circuit			11.063278	1	58231413.220643
1462B404B0	Integrated Circuit	U41		11.063278	1	58231413.220643
1489GBT051	Integrated Circuit	U25		43.803003	1	11739202.588727
149TB01040	Integrated Circuit	U31,U32,U40		43.803003	3	4923240.069161

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14S3104500	Integrated Circuit	U11,U12,U13 ,U14, U15,U16,U35		43.803003	7	2408529.736257
14S3902500	Integrated Circuit	U33		43.803003	1	11739202.588727
14S3E00100	Integrated Circuit	U28		43.803003	1	11739202.588727
14S4180100	Integrated Circuit	U30		43.803003	1	11739202.588727
14S4631500	Integrated Circuit	U5		43.803003	1	11739202.588727
14S5912300	Integrated Circuit	U24		26.018600	1	25551442.237972
14S5A00821	Integrated Circuit	U26,U8		26.018600	2	14194252.866846
14S5A30601	Integrated Circuit	U38,U39,U6, U7		26.018600	4	7696979.559193
14S6206403	Integrated Circuit			11.063278	1	58231413.220643
1540710280	Resistor	RP2		9.971436	1	51606907.671214
1540722281	Resistor	RP1		9.971436	1	51606907.671214
1601613200	Connection	SW1		16.184835	1	35685591.360212
16515A2990	Connection	CN9		16.184835	1	35685591.360212
1652503209	Connection	CN2		16.184835	1	35685591.360212
1652814202	Connection	CN3,CN4,CN 5,CN6		16.184835	4	11344857.509064
165300320L	Connection	CN10,CN12		16.184835	2	20390152.380746
165300520Y	Connection	CN16		16.184835	1	35685591.360212
1653300102	Connection	CN12(4-6)		16.184835	1	35685591.360212
1653300108	Connection	CN12(1-3)		16.184835	1	35685591.360212
165390003B	Connection	CN24		16.184835	1	35685591.360212
1653924110	Connection	CN11		16.184835	1	35685591.360212
1654226303	Connection	CN13		16.184835	1	35685591.360212
1654401935	Connection	CN20,CN21		16.184835	2	20390152.380746
1654409103	Connection	CN1		16.184835	1	35685591.360212
165480430A	Connection	CN18,CN19		16.184835	2	20390152.380746
1654809301	Connection	CN17		16.184835	1	35685591.360212
1654900703	Connection	CN8		16.184835	1	35685591.360212
1655302025	Connection	CN7		16.184835	1	35685591.360212
1655802020	Connection	CN14,CN15		16.184835	2	20390152.380746
1655812130	Connection	CN22		16.184835	1	35685591.360212
1655907131	Connection	CN23		16.184835	1	35685591.360212
175011301C	Miscellaneous	M1		306.000000	1	1681683.006787
1752001603	Miscellaneous	FS1		2.400000	1	254626042.602335
1752002500	Miscellaneous	FS3		2.400000	1	254626042.602335