

COM-BT

Reliability Prediction Report (MTBF)

Summary	Failure Rate: 11064.948936 ppm MTBF: 90.375 Hours
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Issue date

Approval

Test Engineer

2014/10/07

Tom Lin

Danny Chen

Reliability Prediction (MTBF)

I . Model Name: COM-BT

II . Prediction Date: Oct .7, 2014

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

IV . Predicted by: Danny

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:

COM-BT (9697BT0008-D):

- Failure Rate: 11064.948936 ppm

- MTBF: 90.375 Hours

**AAEON Reliability Prediction
Summary**

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

Failure Rate: 11064.948936
MTBF (hrs): 90,375
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Assembly Name	Part Number	Ref Des	Quantity	Failure Rate	MTBF
System	9697BT0008-D		1	11064.948936	90,375

File Name: COM-BT.rfp
Assembly: 9697BT0008-D
Ref Des:
Description:

Failure Rate: 11064.948936
MTBF (hrs): 90,375
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050500334	Resistor	R481,R497,R498		2.547039	3	107020754.986850
1050501054	Resistor	R630		2.547039	1	282340674.079668
1050501064	Resistor	R1001,R241		2.547039	2	154078778.388085
1050501234	Resistor	R629		2.547039	1	282340674.079668
1050501634	Resistor	R490		2.547039	1	282340674.079668
1050502004	Resistor	R253,R254		2.547039	2	154078778.388085
1050502224	Resistor	R380,R384,R472, R525		2.547039	4	82309758.689546
1050503934	Resistor	R827,R844		2.547039	2	154078778.388085
1050504324	Resistor	R817		2.547039	1	282340674.079668
1050504724	Resistor	R160,R161,R364, R411,R414,R415, R416,R417,R420, R425,R426		2.547039	11	32049696.385471
1050504734	Resistor	R603		2.547039	1	282340674.079668
1050505124	Resistor	R807		2.547039	1	282340674.079668
1050505633	Resistor	R849		2.547039	1	282340674.079668
1050507524	Resistor	R806		2.547039	1	282340674.079668
1050507530	Resistor	R792		2.547039	1	282340674.079668
1050510034	Resistor	R735,R738,R752, R753,R763,R776, R782,R787,R796		2.547039	9	38754445.632391
1050510524	Resistor	R808		2.547039	1	282340674.079668
1050511034	Resistor	R852		2.547039	1	282340674.079668
1050513034	Resistor	R777		2.547039	1	282340674.079668
1050515034	Resistor	R841,R845		2.547039	2	154078778.388085
1050516204	Resistor	R159		2.547039	1	282340674.079668
1050516934	Resistor	R832		2.547039	1	282340674.079668
1050516964	Resistor	R252		2.547039	1	282340674.079668
1050520034	Resistor	R261,R784		2.547039	2	154078778.388085
1050522124	Resistor	R857		2.547039	1	282340674.079668
1050524924	Resistor	R851		2.547039	1	282340674.079668
1050527424	Resistor	R759		2.547039	1	282340674.079668
1050529464	Resistor	R158		2.547039	1	282340674.079668
1050530124	Resistor	R761		2.547039	1	282340674.079668
1050531624	Resistor	R811,R812		2.547039	2	154078778.388085
1050540214	Resistor	R232		2.547039	1	282340674.079668
1050545364	Resistor	R243,R255		2.547039	2	154078778.388085
1050549934	Resistor	R781		2.547039	1	282340674.079668
1050561934	Resistor	R793		2.547039	1	282340674.079668
1050568124	Resistor	R632		2.547039	1	282340674.079668

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1050573264	Resistor	R199,R265,R266, R268,R822,R823, R824		2.547039	7	48991237.965885
1059700001	Resistor	R591		2.547039	1	282340674.079668
105A500103	Resistor	R791,R850,R859		2.547039	3	107020754.986850
105A500139	Resistor	R239,R240,R330, R332,R334,R335, R499,R545,R779, R805		2.547039	10	35079934.879747
105A501003	Resistor	R819		2.547039	1	282340674.079668
105A501039	Resistor	R333,R336,R383, R388,R390,R393, R396,R401,R469, R471,R728,R730, R734,R775,R834		2.547039	15	23852782.943395
105A502039	Resistor	R258,R267		2.547039	2	154078778.388085
105A503039	Resistor	R760,R771,R816		2.547039	3	107020754.986850
105A503633	Resistor	R767		2.547039	1	282340674.079668
105A505109	Resistor	R242,R245,R247, R248,R250		2.547039	5	67008142.102588
105A510003	Resistor	R741,R742,R743, R744		2.547039	4	82309758.689546
105A510009	Resistor	R473,R491,R526		2.547039	3	107020754.986850
105A510223	Resistor	R795		2.547039	1	282340674.079668
105A511523	Resistor	R764		2.547039	1	282340674.079668
105A512413	Resistor	R230		2.547039	1	282340674.079668
105A515009	Resistor	R197,R201,R202, R203		2.547039	4	82309758.689546
105A515034	Resistor	R833		2.547039	1	282340674.079668
105A515423	Resistor	R758		2.547039	1	282340674.079668
105A518723	Resistor	R818,R848		2.547039	2	154078778.388085
105A522133	Resistor	R860		2.547039	1	282340674.079668
105A523263	Resistor	R157		2.547039	1	282340674.079668
105A529429	Resistor	R853,R861		2.547039	2	154078778.388085
105A533269	Resistor	R839		2.547039	1	282340674.079668
105A535703	Resistor	R200		2.547039	1	282340674.079668

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A540203	Resistor	R182,R183,R188		2.547039	3	107020754.986850
105A540233	Resistor	R815		2.547039	1	282340674.079668
105A543223	Resistor	R786		2.547039	1	282340674.079668
105A544229	Resistor	R809		2.547039	1	282340674.079668
105A547563	Resistor	R231		2.547039	1	282340674.079668
105A549919	Resistor	R590		2.547039	1	282340674.079668
105A549969	Resistor	R189,R190,R198, R256,R257		2.547039	5	67008142.102588
105A553623	Resistor	R790		2.547039	1	282340674.079668
105A564933	Resistor	R842		2.547039	1	282340674.079668
105A578713	Resistor	R840		2.547039	1	282340674.079668
105A578733	Resistor	R820		2.547039	1	282340674.079668
105A700003	Resistor	R756,R757,R766, R773,R780,R799, R802,R803,R810, R846		2.547039	10	35079934.879747
105A700009	Resistor	R10,R1005,R1006, R1007,R1008,R1009, R1010,R1017,R1018, R17,R19,R228,R233, R234,R235,R236, R246,R284,R285, R286,R358,R365, R370,R402,R403, R405,R427,R430, R438,R445,R446, R447,R448,R458, R459,R461,R463, R476,R478,R487, R494,R495,R517, R518,R521,R522, R5		2.547039	72	5221030.678313

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105A70000A	Resistor	R1036,R1037, R307, R309,R311,R 314, R548,R549,R 574, R576,R578		2.547039	11	32049696.385471
105A700139	Resistor	R13,R264,R7 11,R712		2.547039	4	82309758.689546
105A701039	Resistor	R212,R223,R 224, R318,R326,R 327, R352,R353,R 361, R362,R378,R 400, R456,R457,R 462, R464,R465,R 467, R468,R477,R 479, R489,R492,R 493, R496,R500,R 502, R503,R504,R 505, R506,R508,R 513, R514,R528,R 547, R577,R579,R 580, R581,R582,R 583, R584,R595,R 615, R617,R618,R 621,		2.547039	62	6043178.840887
105A701059	Resistor	R227,R347,R 359, R368,R374,R 406, R482,R501,R 740		2.547039	9	38754445.632391
105A702039	Resistor	R731		2.547039	1	282340674.079668
105A702209	Resistor	R982,R984,R 985, R986		2.547039	4	82309758.689546

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105A702229	Resistor	R204,R205,R208, R209,R210,R211, R216,R217,R225, R226,R237,R238,R24, R259,R260,R262, R263,R272,R274, R275,R304,R315, R372,R409,R428, R436,R440,R444, R453,R454,R460, R509,R510,R560, R561,R562,R564, R567,R586,R587, R588,R653,R655		2.547039	43	8634227.613564
105A702239	Resistor	R25		2.547039	1	282340674.079668
105A702263	Resistor	R754,R755,R765, R856		2.547039	4	82309758.689546
105A703309	Resistor	R531		2.547039	1	282340674.079668
105A703363	Resistor	R804		2.547039	1	282340674.079668
105A704729	Resistor	R27,R480,R483,R484, R485,R486,R550, R551		2.547039	8	43225424.698300
105A704739	Resistor	R12,R14,R15, ,R4,R7		2.547039	5	67008142.102588
105A708229	Resistor	R270,R271		2.547039	2	154078778.388085
105A710009	Resistor	R277,R278,R280		2.547039	3	107020754.986850

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105A710039	Resistor	R155,R156,R276, R338,R340,R345, R357,R369,R375, R376,R377,R379, R381,R382,R546, R622,R623,R624, R626,R732,R745, R768,R835,R836, R976		2.547039	25	14603612.751152
105A720009	Resistor	R213,R251		2.547039	2	154078778.388085
105A733009	Resistor	R736,R737		2.547039	2	154078778.388085
105A743033	Resistor	R847		2.547039	1	282340674.079668
105A747009	Resistor	R540,R696,R701, R704,R707,R710, R718		2.547039	7	48991237.965885
106B501034	Resistor	RT1,RT2		7.724580	2	38596617.434771
106B510034	Resistor	RT3,RT4,RT5, ,RT6		7.724580	4	21923287.146155
1121415090	Capacitor	C394,C402		1.128806	2	375289731.076049

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1121501690	Capacitor	C113,C114,C115, C116,C117,C118, C119,C120,C121, C122,C123,C124, C125,C126,C127, C130,C131,C134, C140,C141,C143, C144,C145,C146, C147,C148,C149, C150,C151,C152, C153,C154,C155, C156,C157,C158, C159,C161,C162, C163,C165,C170, C174,C180,C181, C183,C185,C186,		1.128806	125	6932186.898081
1121533480	Capacitor	C385		1.128806	1	704977644.692287
1122568290	Capacitor	C693		1.128806	1	704977644.692287
1124418090	Capacitor	C10,C257,C262,C6, C7,C9		1.128806	6	133979725.056342
1124427091	Capacitor	C223,C224		1.128806	2	375289731.076049
1124515281	Capacitor	C386		1.128806	1	704977644.692287
1124522290	Capacitor	C393,C401		1.128806	2	375289731.076049
1129522790	Capacitor	C340		1.128806	1	704977644.692287
1129601080	Capacitor	C325,C326,C330		1.128806	3	257514172.353070
1129622690	Capacitor	C137,C139,C23,C24, C29,C30,C55,C56, C93,C95		1.128806	10	82101057.548118

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1129701790	Capacitor	C142,C160,C2,C339,C44,C517,C518,C519,C520,C521,C522,C523,C524,C84		1.128806	14	59316298.011235
1129710391	Capacitor	C132,C313,C317		1.128806	3	257514172.353070
1129722091	Capacitor	C387		1.128806	1	704977644.692287
1189610153	Capacitor	C328,TC2,TC3		4.744484	3	59399119.141203
1189615154	Capacitor	TC6		4.744484	1	159663026.715137
1189633151	Capacitor	TC1,TC4,TC5,TC7,TC8		4.744484	5	36944177.000623
1189933180	Capacitor	TC10,TC11,TC12,TC9		4.744484	4	45505862.704531
11A2410240	Capacitor	C184		1.128806	1	704977644.692287
11C1501080	Capacitor	C331		1.128806	1	704977644.692287
11C1539840	Capacitor	C222		1.128806	1	704977644.692287
11C2510190	Capacitor	C653		1.128806	1	704977644.692287
11C2510480	Capacitor	C312,C354,C367,C368		1.128806	4	196873384.410843
11C2522650	Capacitor	C654,C657,C658,C663		1.128806	4	196873384.410843
11C4522290	Capacitor	C358		1.128806	1	704977644.692287
11C9510050	Capacitor	C345		1.128806	1	704977644.692287
11C9522060	Capacitor	C319		1.128806	1	704977644.692287
11E1522680	Capacitor	C383,C660,C661		1.128806	3	257514172.353070
11E2501030	Capacitor	C381		1.128806	1	704977644.692287
11E2501690	Capacitor	C129,C335,C346,C350,C351,C399,C656,C659,C662		1.128806	9	90863428.080946
11E2647650	Capacitor	C359		1.128806	1	704977644.692287
11E3510010	Capacitor	C128,C135,C352,C353,C389,C390,C391,C392,C396,C397,C398		1.128806	11	74892583.279796
11E4433090	Capacitor	C321,C322,C327,C379		1.128806	4	196873384.410843
11E9501080	Capacitor	C400		1.128806	1	704977644.692287

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11E9501090	Capacitor	C15,C16,C16 9,C17, C171,C18,C1 9,C22, C225,C25,C2 6,C27, C279,C285,C 32,C33, C34,C343,C3 82,C47, C48,C49,C58 ,C59, C600,C601,C 603,C62, C63,C64,C65 ,C66, C67,C68,C69 ,C70, C71,C75,C76 ,C77, C78,C79,C80 ,C81, C82,C83,C85 ,C87, C88,C89,C90		1.128806	51	16783130.571525
11E9501091	Capacitor	C107,C108,C 109,C11, C110,C12,C1 3,C264, C266,C320,C 357, C371		1.128806	12	68856937.301178
11E9510050	Capacitor	C356		1.128806	1	704977644.692287
11E9522490	Capacitor	C378,C380,C 388		1.128806	3	257514172.353070
11E9547680	Capacitor	C136,C138,C 364, C384		1.128806	4	196873384.410843
11E9547790	Capacitor	C74		1.128806	1	704977644.692287
11E9610080	Capacitor	C100,C101,C 102, C105,C106,C 182, C226,C234,C 239, C251,C255,C 323, C324,C329,C 337, C341,C342,C 366, C370,C40,C4 1,C50, C51,C52,C73 ,C99		1.128806	26	32480878.530766

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11E9622050	Capacitor	C302,C304,C307, C310,C314,C348, C349		1.128806	7	115633865.771428
11E9622052	Capacitor	C308		1.128806	1	704977644.692287
11E9622080	Capacitor	C133,C35,C36,C37, C38,C39,C43,C463, C464,C465,C466, C467,C468,C469, C470,C72		1.128806	16	52112480.802928
11E9647690	Capacitor	C53,C54		1.128806	2	375289731.076049
11EB610050	Capacitor	C333,C334,C361, C362		1.128806	4	196873384.410843
121110156R	Inductor	L1	59	12.606908	1	60695068.747681
121110156W	Inductor	L2		4.944252	1	154760964.143460
1211104270	Inductor	L6	65.1	13.652256	1	56047671.932130
1211104270	Inductor	L7		4.944252	1	154760964.143460
121113307A	Inductor	L5		4.944252	1	154760964.143460
121113307G	Inductor	L3	66.4	13.881283	1	55122942.605393
1212306030	Inductor	FB1,FB2,FB3		4.944252	3	57363284.375370
1231324055	Miscellaneous	Y6		19.200000	1	23844262.770939
123132505D	Miscellaneous	Y1,Y5		19.200000	2	8854051.752197
1231332726	Miscellaneous	Y2		19.200000	1	23844262.770939
1301005444	Semiconductor	D10,D11,D6		7.793411	3	35106858.962001
1301005450	Semiconductor	D1,D13,D16, D18,D19, D2,D3,D4,D5, D7,D8		7.793411	11	10495888.688121
1301400642	Semiconductor	D17		7.793411	1	92807310.010983
1301793040	Semiconductor	D9		7.793411	1	92807310.010983
1304001340	Optical Device	LED1,LED3		79.003355	2	3783722.582110
1304300140	Optical Device	LED2		79.003355	1	6497172.749112
1315230511	Semiconductor	Q9		22.463360	1	31642600.748419
1315443512	Semiconductor	Q20,Q21		22.463360	2	17315095.066101
1315490110	Semiconductor	Q36	64.4	98.330879	1	7228646.131912
1315700216	Semiconductor	Q22,Q38		22.463360	2	17315095.066101
1315720010	Semiconductor	Q33,Q34,Q35		22.463360	3	12043329.789539
1315762010	Semiconductor	Q32		22.463360	1	31642600.748419
1315EM6K10	Semiconductor	Q13,Q14,Q19,Q23, Q24,Q39,Q41,Q42, Q44,Q48,Q49,Q50,Q7		22.463360	13	3088344.241500

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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
1426GP2120	Integrated Circuit	U12,U9		43.803003	2	6834791.244197
1430012830	Integrated Circuit	U51,U52,U53		43.803003	3	4923240.069161
1430021430	Integrated Circuit	U55		43.803003	1	11739202.588727
1430455200	Integrated Circuit	U38,U39,U40 ,U41, U42,U44		43.803003	6	2750969.191556
1430532190	Integrated Circuit	U56	64.4	1877.967405	1	273813.234415
1430973740	Integrated Circuit	U59	63.7	1815.635879	1	283213.355300
143S596410	Integrated Circuit	U58		43.803003	1	11739202.588727
1440211AT0	Integrated Circuit	U31		43.803003	1	11739202.588727
1440J19000	Integrated Circuit	U3	58	186.904676	1	2751200.991164
1490001080	Integrated Circuit	U61		43.803003	1	11739202.588727
149TB01040	Integrated Circuit	U20,U24		43.803003	2	6834791.244197
149TS01040	Integrated Circuit	U23,U29,U30 ,U60		43.803003	4	3879156.910661
14E0085280	Integrated Circuit	U25		43.803003	1	11739202.588727
14S3010700	Integrated Circuit	U37		43.803003	1	11739202.588727
14S3112400	Integrated Circuit	U57		43.803003	1	11739202.588727
14S3121600	Integrated Circuit	U54		43.803003	1	11739202.588727
14S3524701	Integrated Circuit	U10		43.803003	1	11739202.588727
14S3621601	Integrated Circuit	U26		43.803003	1	11739202.588727
14S4081102	Integrated Circuit	U27		43.803003	1	11739202.588727
14S4251402	Integrated Circuit	U35		43.803003	1	11739202.588727
14S4911216	Integrated Circuit	U22		43.803003	1	11739202.588727
14S5A00802	Integrated Circuit	U46,U47		26.018600	2	14194252.866846
14S5A00821	Integrated Circuit	U11,U48,U50		26.018600	3	9949526.289768
14S5A03200	Integrated Circuit	U45		26.018600	1	25551442.237972
14S5A12506	Integrated Circuit	U17,U2		26.018600	2	14194252.866846
14S5A30601	Integrated Circuit	U5		26.018600	1	25551442.237972
14S6206403	Integrated Circuit	U18		11.063278	1	58231413.220643
14S6216060	Integrated Circuit	U28		11.063278	1	58231413.220643
14S9108500	Integrated Circuit	U43,U49		43.803003	2	6834791.244197
14S9330600	Integrated Circuit	U14,U15,U7, U8		26.018600	4	7696979.559193
14S9346000	Integrated Circuit	U13		43.803003	1	11739202.588727
1540700081	Resistor	RP28,RP29,R P30, RP31,RP32		9.971436	5	14126297.426094
1600030803	Connection	SW1		16.184835	1	35685591.360212
16515A2991	Connection	DIMM1		16.184835	1	35685591.360212
1651900860	Connection	U28		16.184835	1	35685591.360212
16540M0000	Connection	CN1,CN2		16.184835	2	20390152.380746
1655305130	Connection	CN4		16.184835	1	35685591.360212
1655830100	Connection	CN3		16.184835	1	35685591.360212
1655902030	Connection	BAT1		16.184835	1	35685591.360212
1655907130	Connection	CN5		16.184835	1	35685591.360212
1655912032	Connection	CN6		16.184835	1	35685591.360212

**Reliability Prediction
Summary**

File Name: COM-BT.rfp
Assembly: 9697BT0008-D
Ref Des:
Description:

Failure Rate: 11064.948936
MTBF (hrs): 90,375
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1752002400	Miscellaneous	FS1		2.400000	1	254626042.602335