

# UP-GWS01

## Reliability Prediction Report (MTBF)

Summary	Failure Rate: 3695.503597 MTBF: 270,599 Hours
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Issue date	QE Manager	Test Engineer
2017-10-25	KJ Wang	Danny Chen

# Reliability Prediction (MTBF)

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**I . Model Name:** UP-GWS01

**II . Prediction Date:** Oct. 25th, 2017

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

**IV . Predicted by:** Danny Chen

**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:**

UP-GWS01 (M/B: 9697UP018A-D):

- Failure Rate: 3695.503597

- MTBF: 270,599 Hours

**AAEON Reliability Prediction  
Summary**

**File Name:** UP-GWS01.rfp  
**Duty Cycle:** 100  
**Calculation Model:** Telcordia Issue 2  
**Method:** Method I Case 3

**Failure Rate:** 3695.503597  
**MTBF (hrs):** 270,599  
**Temperature:** 30  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Assembly Name	Part Number	Ref Des	Quantity	Failure Rate	MTBF
UP-GWS01	9697UP018A-D		1	3695.503597	270,599

**File Name:** UP-GWS01.rfp  
**Assembly:** 9697UP018A-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 3695.503597  
**MTBF (hrs):** 270,599  
**Temperature:** 30  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050501004	Resistor	R1581,R1582		2.547039	2	154078778.388085
1050501054	Resistor	R365,R463		2.547039	2	154078778.388085
1050501234	Resistor	R1585		2.547039	1	282340674.079668
1050504724	Resistor	R202,R207,R211, R216		2.547039	4	82309758.689546
1050511503	Resistor	R18		2.547039	1	282340674.079668
1050513034	Resistor	R456		2.547039	1	282340674.079668
1050518204	Resistor	R1		2.547039	1	282340674.079668
1050520034	Resistor	R1596,R1619,R1621,R171,R50		2.547039	5	67008142.102588
1050524004	Resistor	R1529,R1530,R1686,R1687,R1688,R1689,R198,R199		2.547039	8	43225424.698300
1050524924	Resistor	R466,R469		2.547039	2	154078778.388085
1050528734	Resistor	R455		2.547039	1	282340674.079668
1050530164	Resistor	R1671		2.547039	1	282340674.079668
1050540204	Resistor	R10,R13,R8,R9		2.547039	4	82309758.689546
1050545364	Resistor	R19		2.547039	1	282340674.079668
1050549964	Resistor	R26		2.547039	1	282340674.079668
1050580664	Resistor	R12		2.547039	1	282340674.079668
1050591034	Resistor	R457		2.547039	1	282340674.079668
1050701504	Resistor	R439		2.547039	1	282340674.079668
1059700001	Resistor	R1413,R1414,R1666		2.547039	3	107020754.986850
105A500139	Resistor	R1664,R190,R45		2.547039	3	107020754.986850
105A501039	Resistor	R1591,R1592,R1674,R1704		2.547039	4	82309758.689546
105A501043	Resistor	R459		2.547039	1	282340674.079668
105A501539	Resistor	R380		2.547039	1	282340674.079668
105A502039	Resistor	R138,R21,R27,R28,R29,R46,R460,R60		2.547039	8	43225424.698300
105A505109	Resistor	R187,R188,R189,R192,R193		2.547039	5	67008142.102588
105A510009	Resistor	R11,R1661,R31,R458		2.547039	4	82309758.689546
105A514009	Resistor	R1672		2.547039	1	282340674.079668
105A515009	Resistor	R1670,R374,R375,R4, R5		2.547039	5	67008142.102588
105A524919	Resistor	R25,R377		2.547039	2	154078778.388085

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A530109	Resistor	R262		2.547039	1	282340674.079668
105A549933	Resistor	R501		2.547039	1	282340674.079668
105A700009	Resistor	R1570,R1571 ,R1575, R1584,R1606 ,R1607, R1612,R1613 ,R1614, R1659,R1694 ,R1695, R1696,R1702 ,R241, R265,R41,R4 41,R461, R462,R480		2.547039	21	17274945.076062
105A70000A	Resistor	R378,R38,R4 0,R470, R471		2.547039	5	67008142.102588
105A700239	Resistor	R269		2.547039	1	282340674.079668
105A701039	Resistor	R1576,R1577 ,R1578, R1579,R1580 ,R498, R500		2.547039	7	48991237.965885
105A701069	Resistor	R49		2.547039	1	282340674.079668
105A702229	Resistor	R1488,R1615 ,R1616, R1617,R1618 ,R1629, R1630,R1631 ,R1632, R393,R394,R 448		2.547039	12	29507083.749401
105A703329	Resistor	R280,R281,R 282		2.547039	3	107020754.986850
105A704763	Resistor	R454		2.547039	1	282340674.079668
105A733009	Resistor	R376,R499		2.547039	2	154078778.388085
105A768009	Resistor	R381,R382,R 383, R384,R385,R 387, R389,R390		2.547039	8	43225424.698300

**Reliability Prediction  
Summary**

**File Name:** UP-GWS01.rfp  
**Assembly:** 9697UP018A-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 3695.503597  
**MTBF (hrs):** 270,599  
**Temperature:** 30  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105B700009	Resistor	R1531,R1532 ,R1533, R1534,R1535 ,R1536, R1537,R1538 ,R1539, R1540,R1541 ,R1542, R1543,R1544 ,R1545, R1546,R1547 ,R1548, R1549,R1550 ,R1551, R1552,R1553 ,R1555, R1556,R1557 ,R1558, R1559,R1573 ,R1574, R1677,R1679 ,R1690, R1691,R264, R366, R367,R368,R 369, R372,R386,R 46		2.547039	50	7454870.155519
105B701039	Resistor	R1415,R1416 ,R1560, R1589,R1590 ,R1594, R1595,R1597 ,R1598, R1600,R1662 ,R1678, R1698,R177, R179, R181,R182,R 184, R185,R204,R 323, R370,R395,R 429, R449,R91 R1657		2.547039	26	14061076.827148
105B702205	Resistor	R1657		2.547039	1	282340674.079668

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105B710039	Resistor	R1562,R1593 ,R1624, R1625,R1667 ,R1669, R1699,R1700 ,R1703, R1705,R30,R 396		2.547039	12	29507083.749401
106B504734	Resistor	RT1,RT2		2.547039	2	154078778.388085
1121501691	Capacitor	C126,C127,C 138, C171,C172,C 176, C185,C196,C 197, C200,C204,C 206, C274,C277,C 280, C355,C360,C 377, C378,C383,C 386		1.128806	21	40003791.624280
1121622780	Capacitor	C207		1.128806	1	704977644.692287
1124368690	Capacitor	C344,C345		1.128806	2	375289731.076049
1124412090	Capacitor	C42,C43		1.128806	2	375289731.076049
1129701791	Capacitor	C141,C142,C 390		1.128806	3	257514172.353070
1129710391	Capacitor	C356		1.128806	1	704977644.692287
11A2422190	Capacitor	C201		1.128806	1	704977644.692287
11A4418040	Capacitor	C40,C41		1.128806	2	375289731.076049
11C4547190	Capacitor	C122,C123,C 129, C130,C385		1.128806	5	159367490.199266
11E2522631	Capacitor	C189		1.128806	1	704977644.692287
11E2610032	Capacitor	C174,C175,C 184, C211,C216		1.128806	5	159367490.199266
11E4433090	Capacitor	C143,C144		1.128806	2	375289731.076049
11E9547630	Capacitor	C218,C221,C 223, C224,C229,C 234, C235,C236,C 242, C375,C376,C 379, C380,C381,C 382		1.128806	15	55479656.844874



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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
11E9622080	Capacitor	C12,C13,C21 2,C213, C217,C219,C 220, C222,C225,C 226, C228,C4,C5		1.128806	13	63728475.410842
11E9647690	Capacitor	C145,C147,C 149,C15, C151,C153,C 227, C230,C231,C 232, C233,C237,C 238, C240,C241,C 243, C244,C245,C 246, C247,C248,C 310, C346,C348,C 350, C351,C54		1.128806	27	31305223.485317
11EA501050	Capacitor	C10,C11,C14 ,C16, C160,C17,C1 8,C19, C20,C21,C22 ,C23, C24,C25,C26 ,C27, C28,C29,C30 ,C31, C311,C312,C 313, C314,C317,C 318, C319,C32,C3 20,C33, C34,C37,C38 ,C39, C55,C56,C57 ,C58,C6, C61,C62,C63 ,C64, C68,C7,C8,C 9		1.128806	47	18185851.719462

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
11EA510450	Capacitor	C106,C107,C136, C137,C139,C140, C146,C148,C150, C152,C154,C155, C156,C157,C158, C159,C161,C162, C163,C164,C165, C166,C167,C168,C2, C257,C258,C259, C260,C3,C315,C316, C321,C322,C325, C326,C327,C328, C329,C330,C331, C332,C333,C334, C341,C342,C343, C347,C349		1.128806	68	12644624.424143
11EA610040	Capacitor	C205,C35,C352,C353, C354,C36,C89		1.128806	7	115633865.771428
11EA622640	Capacitor	C202		1.128806	1	704977644.692287
11EB510640	Capacitor	C128,C203,C209, C210,C256,C370		1.128806	6	133979725.056342
11EB522011	Capacitor	C125,C194,C195, C198,C199,C273, C275,C276,C278, C279,C281,C387, C388,C389		1.128806	14	59316298.011235
11EB522640	Capacitor	C208,C239		1.128806	2	375289731.076049
121110156U	Inductor	L1		4.944252	1	154760964.143460
1211104776	Inductor	L3,L4		4.944252	2	83201062.149749

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1211110078	Inductor	L2		4.944252	1	154760964.143460
1211115073	Inductor	L5,L6,L7,L8		4.944252	4	43912872.424775
12123A000B	Inductor	FB11		4.944252	1	154760964.143460
12123C0026	Inductor	FB12,FB6		4.944252	2	83201062.149749
1214109000	Inductor	CH1,CH10,C H11,CH12, CH13,CH14,C H15, CH16,CH17,C H6,CH7		4.944252	11	16872203.304846
1214109004	Inductor	CH2,CH3		4.944252	2	83201062.149749
12310024A0	Miscellaneous	Y5		19.200000	1	23844262.770939
12310025A5	Miscellaneous	Y4		19.200000	1	23844262.770939
12310192A0	Miscellaneous	Y1		19.200000	1	23844262.770939
1231332726	Miscellaneous	Y2		19.200000	1	23844262.770939
1233324055	Miscellaneous	Y6		19.200000	1	23844262.770939
1301005444	Semiconductor	D1,D16,D2		7.793411	3	35106858.962001
1301053040	Semiconductor	D8		7.793411	1	92807310.010983
1304000043	Optical Device	LED2		79.003355	1	6497172.749112
1304101440	Optical Device	LED3		79.003355	1	6497172.749112
1304200043	Optical Device	LED4		79.003355	1	6497172.749112
1304300140	Optical Device	LED1		79.003355	1	6497172.749112
1305040241	Semiconductor	D10,D13,D15 ,D6,D7		7.793411	5	21965031.404253
1305050040	Semiconductor	D11,D12,D9		7.793411	3	35106858.962001
1315013810	Semiconductor	Q14,Q17,Q2 0		22.463360	3	12043329.789539
1315230111	Semiconductor	Q18,Q19		22.463360	2	17315095.066101
1315EM6K10	Semiconductor	Q15,Q5		22.463360	2	17315095.066101
142ADC0810	Integrated Circuit	U103		43.803003	1	11739202.588727
1430087620	Integrated Circuit	U48		43.803003	1	11739202.588727
1430097420	Integrated Circuit	U32,U60,U61		43.803003	3	4923240.069161
1430455200	Integrated Circuit	U52		43.803003	1	11739202.588727
14309039A0	Integrated Circuit	U49		43.803003	1	11739202.588727
1445Z83500	Integrated Circuit	U1		21.706765	1	23689035.791249
1448111GC0	Integrated Circuit	U35		43.803003	1	11739202.588727
1462025640	Integrated Circuit			11.063278	1	58231413.220643
1462UPC1B0	Integrated Circuit	U18		43.803003	1	11739202.588727
1468G63CM0	Integrated Circuit	U11,U12,U97 ,U98		11.063278	4	17763990.409389
1469KS32G0	Integrated Circuit	U19		11.063278	1	58231413.220643
14825M1600	Integrated Circuit	U104		43.803003	1	11739202.588727
1490046041	Integrated Circuit	U99		43.803003	1	11739202.588727
149TS01040	Integrated Circuit	U4,U8		43.803003	2	6834791.244197
14S3104500	Integrated Circuit	U25,U27,U30 ,U33, U36,U37,U38		43.803003	7	2408529.736257

**File Name:** UP-GWS01.rfp  
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**Description:**

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**Temperature:** 30  
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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
14S5A30601	Integrated Circuit	U101,U105,U106,U13		26.018600	4	7696979.559193
1540100040	Resistor	RN7		9.971436	1	51606907.671214
1601000990	Connection	SW1		16.184835	1	35685591.360212
1652503109	Connection	CN30		16.184835	1	35685591.360212
1652814202	Connection	CN10		16.184835	1	35685591.360212
1653002101	Connection	CN14		16.184835	1	35685591.360212
1653006205	Connection	CN34		16.184835	1	35685591.360212
165302020L	Connection	CN12		16.184835	1	35685591.360212
1654401932	Connection	CN11		16.184835	1	35685591.360212
1654801010	Connection	CN6		16.184835	1	35685591.360212
1654808309	Connection	CN8,CN9		16.184835	2	20390152.380746
1654902130	Connection	CN32		16.184835	1	35685591.360212
1654904130	Connection	CN31		16.184835	1	35685591.360212
1655810131	Connection	CN7		16.184835	1	35685591.360212
1655902034	Connection	CN1,CN33		16.184835	2	20390152.380746
175011301J	Miscellaneous	CN1		306.000000	1	1681683.006787
1752007500	Miscellaneous	FB7		2.400000	1	254626042.602335
1752011002	Miscellaneous	F1		2.400000	1	254626042.602335
1752300001	Miscellaneous	F2		2.400000	1	254626042.602335