

# UPC-PLUS

## Reliability Prediction Report (MTBF)

Summary	Failure Rate: 3960.544266 MTBF: 252,491 Hours
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Issue date	QE Manager	Test Engineer
2019-03-13	KJ Wang	Mike Lee

# Reliability Prediction (MTBF)

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**I . Model Name:** UPC-PLUS

**II . Prediction Date:** March. 13th, 2019

**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:**

UPC-PLUS (M/B: 9697UPCP0H-D):

- Failure Rate: 3960.544266

- MTBF: 252,491 Hours

**AAEON Reliability Prediction  
Summary**

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

**Failure Rate:** 3960.544266  
**MTBF (hrs):** 252,491  
**Temperature:** 30  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Assembly Name	Part Number	Ref Des	Quantity	Failure Rate	MTBF
UPC-PLUS	9697UPCPOH-D		1	3960.544266	252,491

**File Name:** UPC-PLUS.rfp  
**Assembly:** 9697UPCP0H-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 3960.544266  
**MTBF (hrs):** 252,491  
**Temperature:** 30  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050297624	Resistor	R255		2.547039	1	282340674.079668
1050501054	Resistor	R406		2.547039	1	282340674.079668
1050501234	Resistor	R354		2.547039	1	282340674.079668
1050501514	Resistor	R304,R306,R344		2.547039	3	107020754.986850
1050502734	Resistor	R341		2.547039	1	282340674.079668
1050505134	Resistor	R176,R177,R178, R281		2.547039	4	82309758.689546
1050505934	Resistor	R72		2.547039	1	282340674.079668
1050508224	Resistor	R144		2.547039	1	282340674.079668
1050510004	Resistor	R130,R137,R364		2.547039	3	107020754.986850
1050510014	Resistor	R86		2.547039	1	282340674.079668
1050510034	Resistor	R134,R142,R168, R182,R183,R184, R197,R198,R245, R288,R299,R329, R391,R409,R75,R80, R93,R94,R98,R99		2.547039	20	18104712.511396
1050510504	Resistor	R290,R291		2.547039	2	154078778.388085
1050510524	Resistor	R173		2.547039	1	282340674.079668
1050511304	Resistor	R340		2.547039	1	282340674.079668
1050512734	Resistor	R100,R85		2.547039	2	154078778.388085
1050520004	Resistor	R283		2.547039	1	282340674.079668
1050520034	Resistor	R133,R268		2.547039	2	154078778.388085
1050520534	Resistor	R62		2.547039	1	282340674.079668
1050524004	Resistor	R101,R150,R154, R189,R250,R317, R332,R393		2.547039	8	43225424.698300
1050524934	Resistor	R254		2.547039	1	282340674.079668
1050535724	Resistor	R174		2.547039	1	282340674.079668
1050540204	Resistor	R356,R359,R366		2.547039	3	107020754.986850
1050541224	Resistor	R343		2.547039	1	282340674.079668

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050700004	Resistor	R116,R136,R141,R16,R171,R175,R179,R180,R2,R202,R22,R23,R236,R24,R246,R25,R26,R27,R28,R287,R29,R307,R318,R319,R333,R334,R345,R349,R353,R355,R36,R360,R363,R365,R367,R374,R410,R413,R45,R63, R854		2.547039	41	9043562.562696
1050701034	Resistor	R14,R188,R31,R390,R70,R71		2.547039	6	56573956.677649
105A500173	Resistor	R253,R314,R346,R362,R369,R371, R375		2.547039	7	48991237.965885
105A500239	Resistor	R315,R380,R412		2.547039	3	107020754.986850
105A501139	Resistor	R327		2.547039	1	282340674.079668
105A501539	Resistor	R394		2.547039	1	282340674.079668
105A502263	Resistor	R115,R181		2.547039	2	154078778.388085
105A560469	Resistor	R310		2.547039	1	282340674.079668
105A700003	Resistor	R138,R143,R17,R342,R438,R441,R88		2.547039	7	48991237.965885
105A700139	Resistor	R415		2.547039	1	282340674.079668
105A701069	Resistor	R51		2.547039	1	282340674.079668
105A702039	Resistor	R414,R416		2.547039	2	154078778.388085
105A702269	Resistor	R196		2.547039	1	282340674.079668
105B520005	Resistor	R215,R230		2.547039	2	154078778.388085

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105B700009	Resistor	R118,R119,R123, R126,R127,R128, R135,R139,R145, R146,R149,R153, R155,R158,R169, R186,R199,R206, R211,R212,R213, R214,R216,R217, R222,R233,R257, R258,R270,R272, R273,R274,R277, R280,R282,R292, R294,R295,R296, R297,R300,R301, R303,R308,R309, R311,R312,R313,		2.547039	69	5443052.870268
105B700139	Resistor	R247,R348,R66		2.547039	3	107020754.986850
105B701009	Resistor	R417,R418,R419, R420,R421,R422, R423,R424,R425, R426,R446,R447,R77		2.547039	13	27342571.921361

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105B701039	Resistor	R10,R102,R104,R105,R106,R109,R11,R110,R112,R114,R117,R12,R121,R122,R125,R129,R13,R131,R140,R147,R160,R165,R185,R191,R20,R200,R204,R207,R208,R21,R220,R221,R223,R225,R227,R235,R237,R238,R240,R241,R242,R243,R244,R248,R251,R266,R267,R276,R278,R2		2.547039	80	4709205.918606
105B702009	Resistor	R32,R33,R34,R35,R44,R45,R48,R49		2.547039	8	43225424.698300
105B702205	Resistor	R107,R108,R159,R161		2.547039	4	82309758.689546
105B702225	Resistor	R201,R231,R232,R239,R256,R259,R265,R284,R289,R443,R444,R92,R95		2.547039	13	27342571.921361
105B703309	Resistor	R7		2.547039	1	282340674.079668
105B704725	Resistor	R15,R229,R252,R382,R383,R384,R42,R96		2.547039	8	43225424.698300
105B710039	Resistor	R249,R379,R389,R392,R84,R90		2.547039	6	56573956.677649



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105B733019	Resistor	R120,R162		2.547039	2	154078778.388085
1121501690	Capacitor	C112,C120,C15,C150,C197,C20,C220,C24,C252,C255,C258,C260,C268,C276,C285,C291,C293,C309,C36,C46,C48,C54,C58,C62,C741,C78,C86,C97,C99		1.128806	29	29193260.380640
1122522890	Capacitor	C28		1.128806	1	704977644.692287
1124547290	Capacitor	C51,C82		1.128806	2	375289731.076049
1129522790	Capacitor	C96		1.128806	1	704977644.692287
1129701791	Capacitor	C88		1.128806	1	704977644.692287
1129710091	Capacitor	C328		1.128806	1	704977644.692287
1129710390	Capacitor	C251		1.128806	1	704977644.692287
118C6331B0	Capacitor	TC1,TC2,TC3,TC4		4.744484	4	45505862.704531
11A2410051	Capacitor	C55,C59		1.128806	2	375289731.076049
11C4501640	Capacitor	C342		1.128806	1	704977644.692287
11C4515290	Capacitor	C85		1.128806	1	704977644.692287
11C4533380	Capacitor	C68		1.128806	1	704977644.692287

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11E1501040	Capacitor	C1,C101,C102,C114,C119,C127,C128,C132,C136,C141,C145,C152,C153,C159,C163,C168,C169,C170,C171,C172,C177,C178,C18,C187,C188,C189,C190,C191,C192,C195,C196,C199,C2,C200,C203,C205,C206,C208,C209,C214,C221,C222,C223,C224,C235,C237,C244,C247,C26, C		1.128806	61	14072541.885825
11E2501030	Capacitor	C246		1.128806	1	704977644.692287
11E2501690	Capacitor	C84		1.128806	1	704977644.692287
11E2522060	Capacitor	C241		1.128806	1	704977644.692287
11E3510012	Capacitor	C284,C290,C306		1.128806	3	257514172.353070
11E4401809	Capacitor	C10,C11		1.128806	2	375289731.076049
11E4433090	Capacitor	C238		1.128806	1	704977644.692287
11E4510440	Capacitor	C283		1.128806	1	704977644.692287

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11E9510490	Capacitor	C104,C105,C106, C109,C115,C124, C138,C142,C143, C147,C151,C154, C155,C156,C16, C161,C162,C164,C165, C173,C175,C180, C181,C185,C186, C194,C198,C202, C213,C22,C23,C231, C232,C245,C273, C274,C288,C295, C296,C297,C298, C299,C300,C301, C302,C303,C304,C32, C334		1.128806	64	13422762.501881
11E9547680	Capacitor	C240		1.128806	1	704977644.692287
11E9622052	Capacitor	C294		1.128806	1	704977644.692287

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11E9622080	Capacitor	C107,C111,C113, C116,C117,C125, C126,C131,C133, C134,C137,C139, C144,C146,C148, C149,C158,C166, C174,C179,C184, C201,C204,C210, C211,C212,C215, C216,C217,C227, C228,C230,C234, C236,C242,C243, C250,C254,C256, C257,C261,C262, C263,C267,C269, C270,C277,C31,C		1.128806	58	14788723.209389
11E9647690	Capacitor	C121,C13,C207,C218, C219,C229,C278, C280,C33,C42,C43, C67,C73,C76,C79, C80,C90,C93		1.128806	18	46478509.590073
11EA501050	Capacitor	C286,C287		1.128806	2	375289731.076049
11EA610040	Capacitor	C135,C14,C157,C160, C17,C193,C21,C29, C34,C37		1.128806	10	82101057.548118
11EA647010	Capacitor	C118,C129,C140		1.128806	3	257514172.353070
11EB522640	Capacitor	C225,C249,C27		1.128806	3	257514172.353070

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11EB610041	Capacitor	C122,C123,C226, C233,C239,C25,C279, C281,C30,C332,C333, C335,C337,C339,C44, C63,C89,C92		1.128806	18	46478509.590073
11EB622030	Capacitor	C130,C167,C176, C182,C271,C272,C3, C307,C331,C5,C7, C739,C740		1.128806	13	63728475.410842
11EB647020	Capacitor	C275,C282		1.128806	2	375289731.076049
1211102272	Inductor	L2		4.944252	1	154760964.143460
121110477A	Inductor	L5,L6		4.944252	2	83201062.149749
121110477B	Inductor	L3,L4,L8		4.944252	3	57363284.375370
1211133075	Inductor	L7		4.944252	1	154760964.143460
1211147078	Inductor	L9		4.944252	1	154760964.143460
121230603N	Inductor	FB3		4.944252	1	154760964.143460
12123D0008	Inductor	FB1,FB2,FB4,FB5		4.944252	4	43912872.424775
1214109000	Inductor	CH10,CH3,CH5,CH7, CH8,CH9		4.944252	6	30055900.223009
1214109004	Inductor	CH1,CH2,CH4,CH6		4.944252	4	43912872.424775
12310192A0	Miscellaneous	Y2		19.200000	1	23844262.770939
1231332726	Miscellaneous	Y1		19.200000	1	23844262.770939
1233327611	Miscellaneous	Y3		19.200000	1	23844262.770939
1301005444	Semiconductor	D2		7.793411	1	92807310.010983
1301005450	Semiconductor	D7		7.793411	1	92807310.010983
1301020400	Semiconductor	D3		7.793411	1	92807310.010983
1301053040	Semiconductor	D5		7.793411	1	92807310.010983
1304320TB0	Optical Device	LED1		79.003355	1	6497172.749112
1305040241	Semiconductor	D1,D4,D6		7.793411	3	35106858.962001
1310390410	Semiconductor	Q5		22.463360	1	31642600.748419
1315036640	Semiconductor	Q11		22.463360	1	31642600.748419
1315230111	Semiconductor	Q6		22.463360	1	31642600.748419
1315443512	Semiconductor	Q1,Q23,Q24, Q3		22.463360	4	9270607.712006
1315642DT0	Semiconductor	Q15,Q22		22.463360	2	17315095.066101
1315700216	Semiconductor	Q7		22.463360	1	31642600.748419

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1315EM6K70	Semiconductor	Q10,Q12,Q13,Q14,Q16,Q17,Q19,Q2,Q20,Q21,Q25,Q4,Q8,Q9		22.463360	14	2878021.548809
1430006710	Integrated Circuit	U13		43.803003	1	11739202.588727
1430034250	Integrated Circuit	U11		43.803003	1	11739202.588727
1430053250	Integrated Circuit	U19,U2,U21,U6		43.803003	4	3879156.910661
1430097420	Integrated Circuit	U28,U29		43.803003	2	6834791.244197
1436509401	Integrated Circuit	U10		43.803003	1	11739202.588727
143EN63470	Integrated Circuit	U87		43.803003	1	11739202.588727
1440E39500	Integrated Circuit	U8		21.706765	1	23689035.791249
144AP63550	Integrated Circuit	U18		43.803003	1	11739202.588727
1462251281	Integrated Circuit	U9		11.063278	1	58231413.220643
1468K4F6E1	Integrated Circuit	U12,U20,U22,U7		11.063278	4	17763990.409389
146900000K	Integrated Circuit	U17		11.063278	1	58231413.220643
149TS01040	Integrated Circuit	U4		43.803003	1	11739202.588727
14S3104500	Integrated Circuit	U14,U15,U24,U25,U26,U27,U3		43.803003	7	2408529.736257
14S5A30601	Integrated Circuit	U5		26.018600	1	25551442.237972
1601000990	Connection	SW1		16.184835	1	35685591.360212
1652503109	Connection	CN8		16.184835	1	35685591.360212
1654010006	Connection	CN10,CN12		16.184835	2	20390152.380746
1654800938	Connection	CN6		16.184835	1	35685591.360212
1654801033	Connection	CN9		16.184835	1	35685591.360212
1654902130	Connection	CN13		16.184835	1	35685591.360212
1654903130	Connection	CN11		16.184835	1	35685591.360212
1654904130	Connection	CN3		16.184835	1	35685591.360212
1654920309	Connection	CN7		16.184835	1	35685591.360212
1655804131	Connection	CN14		16.184835	1	35685591.360212
1655810131	Connection	CN2		16.184835	1	35685591.360212
1655902034	Connection	CN1,CN5		16.184835	2	20390152.380746
1655907130	Connection	CN4		16.184835	1	35685591.360212
175011301K	Miscellaneous	M1		306.000000	1	1681683.006787
1752011002	Miscellaneous	F2		2.400000	1	254626042.602335
1752300001	Miscellaneous	F1		2.400000	1	254626042.602335