

UP-APL03

Reliability Prediction Report (MTBF)

Summary	Failure Rate: 1856.566158 MTBF: 538,629 Hours
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Issue date

2022-07-26

Supervisor

Rex Chang

Test Engineer

Louie Lee

Reliability Prediction (MTBF)

I . Model Name: UP-APL03

II . Prediction Date: July. 26th, 2022

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

IV . Predicted by: Louie Lee

V . Equipment: Windchill Quality Solutions 10.1

VI. Simulation Environment:

- Temperature: 30 degrees C
- Standard: Telcordia (SR-332) 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-APL03 (M/B: 9697UPAL1G-D):

- Failure Rate: 1856.566158
- MTBF: 538,629 Hours

File Name: UP-APL03.rfp

Duty Cycle: 100

Calculation Model: Telcordia Issue 2

Method: Method I Case 3

Failure Rate: 1856.566158

MTBF (hrs): 538,629

Temperature: 30

Environment: GF, GU - Ground Fixed, Uncontrolled

Assembly Name	Part Number	Ref Des	Quantity	Failure Rate	MTBF
UP-APL03	9697UPAL1G-D		1	1856.566158	538,629

File Name: UP-APL03.rfp
Assembly: 9697UPAL1G-D
Ref Des:
Description:

Failure Rate: 1856.566158
MTBF (hrs): 538,629
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050297624	Resistor	R599		0.849013	1	847022022.239005
1050501054	Resistor	R380,R393,R803, R804		0.849013	4	246929276.068637
1050501234	Resistor	R547		0.849013	1	847022022.239005
1050502004	Resistor	R55,R56,R57,R59, R60,R61,R62,R63		0.849013	8	129676274.094900
1050502234	Resistor	R334		0.849013	1	847022022.239005
1050502734	Resistor	R686		0.849013	1	847022022.239005
1050505134	Resistor	R584,R585,R588, R711		0.849013	4	246929276.068637
1050508224	Resistor	R527		0.849013	1	847022022.239005
1050510034	Resistor	R512,R602,R712, R770		0.849013	4	246929276.068637
1050510504	Resistor	R1,R2		0.849013	2	462236335.164256
1050510524	Resistor	R519		0.849013	1	847022022.239005
1050511304	Resistor	R25		0.849013	1	847022022.239005
1050512734	Resistor	R601,R769		0.849013	2	462236335.164256
1050513034	Resistor	R514		0.849013	1	847022022.239005
1050518034	Resistor	R765		0.849013	1	847022022.239005
1050520004	Resistor	R103,R156,R48		0.849013	3	321062264.960549
1050520034	Resistor	R131,R774,R776, R807,R809,R839, R840		0.849013	7	146973713.897655
1050522004	Resistor	R104		0.849013	1	847022022.239005
1050524004	Resistor	R205,R206,R230, R231,R777,R778, R779,R780		0.849013	8	129676274.094900
1050524934	Resistor	R598		0.849013	1	847022022.239005
1050528734	Resistor	R511,R789		0.849013	2	462236335.164256
1050540204	Resistor	R10,R8,R9		0.849013	3	321062264.960549
1050541224	Resistor	R583		0.849013	1	847022022.239005
1050547004	Resistor	R674,R675,R676, R678,R679,R680, R681,R682		0.849013	8	129676274.094900
1050591034	Resistor	R508		0.849013	1	847022022.239005
1059700001	Resistor	R833		0.849013	1	847022022.239005
105A500139	Resistor	R388,R401		0.849013	2	462236335.164256
105A500173	Resistor	R183,R184,R188, R189,R190,R191, R766		0.849013	7	146973713.897655

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105A501139	Resistor	R586		0.849013	1	847022022.239005
105A501539	Resistor	R390,R403		0.849013	2	462236335.164256
105A502039	Resistor	R517		0.849013	1	847022022.239005
105A502263	Resistor	R530,R552		0.849013	2	462236335.164256
105A505123	Resistor	R333		0.849013	1	847022022.239005
105A510009	Resistor	R513,R520,R 523, R533		0.849013	4	246929276.068637
105A515009	Resistor	R11,R12,R13 ,R383, R384,R396,R 397		0.849013	7	146973713.897655
105A524919	Resistor	R385,R398		0.849013	2	462236335.164256
105A538323	Resistor	R587		0.849013	1	847022022.239005
105A560469	Resistor	R22		0.849013	1	847022022.239005
105A700003	Resistor	R387,R400,R 522, R528,R534,R 553, R558,R582,R 787, R788,R805		0.849013	11	96149089.156414
105A700009	Resistor	R140,R141,R 142, R145,R169,R 185, R186,R187,R 26,R281, R282,R283,R 285, R293,R294,R 296, R314,R331,R 338, R343,R382,R 395, R428,R451,R 452, R453,R455,R 472, R473,R474,R 475, R515,R518,R 521, R524,R526,R 529, R531,R532,R 537, R540,R544,R 548, R554,R556,R 557, R559,R563,R		0.849013	89	12725694.483794

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A700139	Resistor	R109,R115,R116, R117,R118,R123, R124,R125,R127, R135,R161,R300, R301,R467,R468, R469,R470,R487, R697,R749,R757, R758		0.849013	22	49555753.728950
105A701039	Resistor	R108,R111,R112, R114,R128,R130, R133,R134,R162, R163,R164,R166, R167,R171,R178,R24, R297,R303,R304, R309,R316,R317, R323,R327,R336,R37, R381,R39,R394,R41, R42,R429,R430,R44, R45,R476,R478,R479, R481,R483,R485, R486,R488,R489,R49, R490,R52,R53,R58, R590,R5		0.849013	92	12318506.443221
105A701069	Resistor	R132		0.849013	1	847022022.239005
105A702039	Resistor	R160,R165		0.849013	2	462236335.164256

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105A702229	Resistor	R119,R120,R121,R3,R4,R412,R413,R492,R493,R494,R495,R5,R6,R790,R792,R794,R798		0.849013	17	63481266.897754
105A703309	Resistor	R138		0.849013	1	847022022.239005
105A703329	Resistor	R436,R437		0.849013	2	462236335.164256
105A704729	Resistor	R100,R101,R102,R110,R35,R36,R377,R38,R40,R600,R699,R71		0.849013	12	88521251.248203
105A704763	Resistor	R509		0.849013	1	847022022.239005
105A710039	Resistor	R136,R180,R195,R298,R299,R374,R376,R560,R561,R565,R572,R574,R578,R670,R673,R696,R764,R771,R772,R801,R802		0.849013	21	51824835.228185
105A733009	Resistor	R386,R399		0.849013	2	462236335.164256
105B700009	Resistor	R630,R730,R731		0.849013	3	321062264.960549
105B702205	Resistor	R751,R752,R753,R754		0.849013	4	246929276.068637
105B702225	Resistor	R440,R441,R442,R443		0.849013	4	246929276.068637

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1121501690	Capacitor	C110,C116,C12,C122,C126,C148,C149,C151,C152,C153,C155,C156,C158,C170,C171,C172,C173,C176,C177,C178,C179,C180,C181,C185,C2,C206,C208,C212,C219,C225,C227,C260,C270,C276,C278,C279,C293,C299,C3,C301,C302,C314,C327,C328,C331,C332,C334,C335,C339,		0.376269	111	23388260.730589
1121622780	Capacitor	C427		0.376269	1	2114932934.076862
1124418090	Capacitor	C11,C9		0.376269	2	1125869193.228148
1124547290	Capacitor	C447,C474		0.376269	2	1125869193.228148
1129522790	Capacitor	C272,C280,C281,C295,C303,C304		0.376269	6	401939175.169025
1129701790	Capacitor	C189,C484		0.376269	2	1125869193.228148
1129710090	Capacitor	C10,C368,C369,C370,C371,C8		0.376269	6	401939175.169025
118C6331B0	Capacitor	TC1,TC2		1.581495	2	258148352.242493
11A2422190	Capacitor	C425		0.376269	1	2114932934.076862
11C4510240	Capacitor	C476		0.376269	1	2114932934.076862
11C4510480	Capacitor	C430,C446,C469		0.376269	3	772542517.059210

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
11C4515230	Capacitor	C499		0.376269	1	2114932934.076862
11C4533380	Capacitor	C497		0.376269	1	2114932934.076862
11CB510350	Capacitor	C195,C196,C197, C199,C586,C587, C588,C589,C590, C591,C592		0.376269	11	224677749.839387
11E1501040	Capacitor	C100,C101,C102, C104,C105,C13,C14, C15,C169,C184,C207, C213,C220,C23,C24, C25,C26,C261,C27, C28,C284,C29,C30, C307,C31,C32,C33, C352,C373,C374, C375,C376,C377, C378,C379,C38,C380, C39,C40,C41,C42, C421,C43,C479,C488, C50,C51,C52,C53, C564,C565,C607,C63, C		0.376269	72	35856150.687924
11E2501080	Capacitor	C493		0.376269	1	2114932934.076862
11E2501690	Capacitor	C266,C289,C496		0.376269	3	772542517.059210
11E2522060	Capacitor	C494,C500		0.376269	2	1125869193.228148
11E4433090	Capacitor	C267,C268,C290, C291,C492		0.376269	5	478102470.597799
11E9547630	Capacitor	C489,C490		0.376269	2	1125869193.228148

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
11E9622052	Capacitor	C198,C205,C211, C218,C226,C392, C417,C418,C422, C426,C431,C433, C438,C467,C491		0.376269	15	166438970.534623
11E9622080	Capacitor	C103,C106,C114, C115,C120,C121, C125,C129,C182,C19, C20,C21,C22,C428, C44,C442,C443,C45, C450,C451,C455,C46, C461,C463,C47,C471, C475,C478,C48,C49, C501,C54,C55,C56, C57,C570,C571,C575, C58,C580,C581,C585, C59,C67,C73,C77, C78,C79,C80,C81, C82,C83,C84,C85		0.376269	57	45132000.088512
11E9647690	Capacitor	C107,C111,C112, C117,C118,C123, C127,C269,C275, C277,C292,C298, C300,C483,C485, C536,C567,C568, C573,C577,C578, C583,C599		0.376269	23	109828155.527500

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Description:

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
11EA510450	Capacitor	C159,C160,C161, C162,C163,C164, C165,C166,C167, C168,C174,C175, C209,C210,C214, C215,C216,C217, C221,C222,C262, C263,C264,C265, C285,C286,C287, C288,C308,C309, C310,C311,C312, C313,C315,C316, C319,C320,C321, C322,C323,C324, C325,C326,C533, C534,C593,C594		0.376269	48	53440620.674626
11EA610040	Capacitor	C271,C294,C330, C333,C503,C539, C544,C547,C550, C554,C555,C556, C557		0.376269	13	191185426.232527
11EA610120	Capacitor	C429,C436,C472, C473		0.376269	4	590620153.232529
11EA647010	Capacitor	C60,C61,C62		0.376269	3	772542517.059210
11EB522640	Capacitor	C329,C486,C487		0.376269	3	772542517.059210
11EB610050	Capacitor	C113,C119,C124, C128,C341,C342, C448,C457,C462, C569,C574,C579, C584		0.376269	13	191185426.232527

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
121110156T	Inductor	L16		1.648084	1	464282892.430380
1211102272	Inductor	L18		1.648084	1	464282892.430380
1211104779	Inductor	L17,L19,L20, L21, L22		1.648084	5	106895644.748998
1211147078	Inductor	L23		1.648084	1	464282892.430380
121230603N	Inductor	FB10,FB15,F B16, FB20,FB7,FB 8		1.648084	6	90167700.669027
12123C0001	Inductor	FB27,FB28,F B29, FB30		1.648084	4	131738617.274324
1214109000	Inductor	CH13,CH23,C H24, CH25,CH26,C H27, CH28,CH29,C H30,CH4, CH7,CH8		1.648084	12	46561849.550951
1214109004	Inductor	CH10,CH11,C H12, CH15,CH16,C H2,CH3, CH9		1.648084	8	68622147.294690
12310025A5	Miscellaneous	Y8,Y9		6.400000	2	26562155.256590
12310192A0	Miscellaneous	Y1		6.400000	1	71532788.312819
1231332726	Miscellaneous	Y2		6.400000	1	71532788.312819
1301005444	Semiconductor	D21		2.597804	1	278421930.032950
1301005450	Semiconductor	D1		2.597804	1	278421930.032950
1301020400	Semiconductor	D18		2.597804	1	278421930.032950
1301053040	Semiconductor	D23		2.597804	1	278421930.032950
1302052320	Semiconductor	D22		2.597804	1	278421930.032950
1304000043	Optical Device	LED4		26.334452	1	19491518.247337
1304101440	Optical Device	LED3		26.334452	1	19491518.247337
1304200043	Optical Device	LED2		26.334452	1	19491518.247337
1304300140	Optical Device	LED1,LED5		26.334452	2	11351167.746331
1305040241	Semiconductor	D10,D15,D6, D8,D9		2.597804	5	65895094.212760
1305050040	Semiconductor	D14		2.597804	1	278421930.032950
1310390410	Semiconductor	Q19		7.487787	1	94927802.245258
1311009210	Semiconductor	Q40		7.487787	1	94927802.245258
1315013810	Semiconductor	Q15,Q37		7.487787	2	51945285.198303
1315036640	Semiconductor	Q23		7.487787	1	94927802.245258
1315066810	Semiconductor	Q39		7.487787	1	94927802.245258
1315230111	Semiconductor	Q18		7.487787	1	94927802.245258
1315443512	Semiconductor	Q25,Q27,Q2 9		7.487787	3	36129989.368618
1315700216	Semiconductor	Q26,Q28,Q3 0,Q50		7.487787	4	27811823.136019
1315720010	Semiconductor	Q22		7.487787	1	94927802.245258

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1315762010	Semiconductor	Q24		7.487787	1	94927802.245258
1315EM6K10	Semiconductor	Q20,Q36,Q38,Q4,Q41,Q42,Q46,Q48,Q49,Q5,Q6		7.487787	11	10856774.044011
1430034250	Integrated Circuit	U57		14.601001	1	35217607.766180
1430053250	Integrated Circuit	U59,U60,U67,U70		14.601001	4	11637470.731983
1430087620	Integrated Circuit	U55		14.601001	1	35217607.766180
1430097420	Integrated Circuit	U18,U21,U25		14.601001	3	14769720.207483
1431MX55G0	Integrated Circuit	U68		14.601001	1	35217607.766180
1436509401	Integrated Circuit	U56		14.601001	1	35217607.766180
1440N42000	Integrated Circuit	U1		7.235588	1	71067107.373746
1448111GC0	Integrated Circuit	U33,U34		14.601001	2	20504373.732590
1462251281	Integrated Circuit			3.687759	1	174694239.661928
1462UPA1A5	Integrated Circuit	U43		3.687759	1	174694239.661928
1468MT53D1	Integrated Circuit	U10,U11,U71,U72		3.687759	4	53291971.228168
1469G8JEN0	Integrated Circuit	U41		3.687759	1	174694239.661928
148210M023	Integrated Circuit	U52		8.672867	1	76654326.713917
149TS01040	Integrated Circuit	U3,U46,U69		14.601001	3	14769720.207483
14S2204200	Integrated Circuit	U73		14.601001	1	35217607.766180
14S3104500	Integrated Circuit	U19,U20,U22,U23,U24,U26,U27,U29,U35,U36,U38,U39,U74		14.601001	13	4187593.633061
14S5A00821	Integrated Circuit	U65,U9		8.672867	2	42582758.600538
14S5A30601	Integrated Circuit	U16,U40,U75,U76,U78,U79		8.672867	6	15987763.656594
14S6324640	Integrated Circuit	U6		3.687759	1	174694239.661928
1601000990	Connection	SW1		5.394945	1	107056774.080635
1652503109	Connection	CN23		5.394945	1	107056774.080635
1652828200	Connection	CN18		5.394945	1	107056774.080635
165300210C	Connection	CN2,CN3		5.394945	2	61170457.142237
1653006205	Connection	CN22		5.394945	1	107056774.080635
165302020L	Connection	CN20		5.394945	1	107056774.080635
1654006000	Connection	CN21		5.394945	1	107056774.080635
1654207539	Connection	CN7		5.394945	1	107056774.080635
1654226303	Connection	CN8		5.394945	1	107056774.080635
1654403931	Connection	CN24		5.394945	1	107056774.080635
1654801010	Connection	CN13		5.394945	1	107056774.080635
1654801833	Connection	CN14		5.394945	1	107056774.080635
1654809302	Connection	CN15		5.394945	1	107056774.080635
1654902130	Connection	CN5		5.394945	1	107056774.080635

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1654903130	Connection	CN4		5.394945	1	107056774.080635
1654904130	Connection	CN6		5.394945	1	107056774.080635
1654907009	Connection	CN9		5.394945	1	107056774.080635
1655302025	Connection	CN10		5.394945	1	107056774.080635
1655802020	Connection	CN17		5.394945	1	107056774.080635
1655810131	Connection	CN16		5.394945	1	107056774.080635
1655902034	Connection	CN1		5.394945	1	107056774.080635
175011301K	Miscellaneous	M1		102.000000	1	5045049.020362
1752011002	Miscellaneous	F2,F3		0.800000	2	431834181.589876
1752300001	Miscellaneous	F1		0.800000	1	763878127.807005