

# NIM-S13A

## Reliability Prediction Report (MTBF)

Summary	Failure Rate: 4413.452421 ppm MTBF: 226,580 Hours
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Issue date

QE Manager

Test Engineer

2016-07-21

KJ Wang

Louie Lee

# Reliability Prediction (MTBF)

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**I . Model Name:** NIM-S13A

**II . Prediction Date:** July. 21st, 2016

**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 (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:**

NIM-S26A (9697S13A04-D):

- Failure Rate: 4413.452421 ppm

- MTBF: 226,580 Hours

**AAEON Reliability Prediction  
Summary**

**File Name:** NIM-S13A.rfp  
**Duty Cycle:** 100  
**Calculation Model:** Telcordia Issue 2  
**Method:** Method I Case 3

**Failure Rate:** 4413.452421  
**MTBF (hrs):** 226,580  
**Temperature:** 30  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Assembly Name	Part Number	Ref Des	Quantity	Failure Rate	MTBF
NIM-S13A	9697S13A04-D		1	4413.452421	226,580

**File Name:** NIM-S13A.rfp  
**Assembly:** 9697S13A04-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 4413.452421  
**MTBF (hrs):** 226,580  
**Temperature:** 30  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050501054	Resistor	R458		2.547039	1	282340674.079668
1050503324	Resistor	R457		2.547039	1	282340674.079668
1050504724	Resistor	R431		2.547039	1	282340674.079668
1050504764	Resistor	R456		2.547039	1	282340674.079668
1050510034	Resistor	R242,R455		2.547039	2	154078778.388085
1050516004	Resistor	R374,R375,R 376, R377,R378,R 379, R380,R381,R 382, R383,R384,R 385, R386,R387,R 388, R389,R392,R 393, R394,R395,R 396, R397,R398,R 399, R400,R401,R 402, R403,R410,R 411, R412,R413		2.547039	32	11502702.879433
1050549934	Resistor	R1116		2.547039	1	282340674.079668
1050700002	Resistor	R130,R27		2.547039	2	154078778.388085
105A501139	Resistor	R76		2.547039	1	282340674.079668
105A501529	Resistor	R29,R38		2.547039	2	154078778.388085
105A501539	Resistor	R240		2.547039	1	282340674.079668
105A502039	Resistor	R1120		2.547039	1	282340674.079668
105A503309	Resistor	R25,R26,R41 ,R42		2.547039	4	82309758.689546
105A505629	Resistor	R71		2.547039	1	282340674.079668
105A523713	Resistor	R325,R330		2.547039	2	154078778.388085
105A530113	Resistor	R169,R170		2.547039	2	154078778.388085
105A533223	Resistor	R81,R92		2.547039	2	154078778.388085
105A546423	Resistor	R99		2.547039	1	282340674.079668
105A547509	Resistor	R253		2.547039	1	282340674.079668
105A549969	Resistor	R233,R234,R 266, R267		2.547039	4	82309758.689546
105A563419	Resistor	R97		2.547039	1	282340674.079668
105A593123	Resistor	R1121		2.547039	1	282340674.079668
105A700003	Resistor	R104,R109,R 1122, R1123,R1124 ,R512, R54		2.547039	7	48991237.965885

**Reliability Prediction  
Summary**

**File Name:** NIM-S13A.rfp  
**Assembly:** 9697S13A04-D  
**Ref Des:**  
**Description:**

**Failure Rate:** 4413.452421  
**MTBF (hrs):** 226,580  
**Temperature:** 30  
**Environment:** GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A700009	Resistor	R10,R100,R101,R102,R105,R106,R107,R108,R11,R110,R111,R112,R113,R114,R115,R116,R117,R118,R119,R12,R120,R121,R122,R123,R124,R125,R126,R127,R128,R129,R133,R134,R135,R136,R137,R138,R139,R140,R142,R15,R151,R153,R155,R156,R16,R165,R17,R171,R18,R188		2.547039	103	3675275.994176
105A700139	Resistor	R14,R141		2.547039	2	154078778.388085

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A701039	Resistor	R146,R147,R148, R149,R150,R159, R161,R162,R163, R164,R187,R188, R193,R195,R201, R203,R207,R209, R220,R226,R227, R235,R236,R238, R239,R249,R250, R251,R252,R255, R258,R263,R268, R271,R275,R283, R297,R311,R320, R321,R329,R334,R351, R356,R361,R369, R371,R52,R5		2.547039	57	6560413.827351
105A703309	Resistor	R57,R65		2.547039	2	154078778.388085

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
105A703329	Resistor	R194,R196,R202, R222,R256,R257, R261,R262,R270,R28, R288,R290,R294, R295,R301,R307, R308,R309,R310, R314,R315,R32,R323, R345,R348,R352, R353,R354,R357,R36, R360,R362,R367, R368,R37,R370,R406, R50,R55,R62		2.547039	40	9263254.152485
105A703363	Resistor	R83		2.547039	1	282340674.079668
105A708229	Resistor	R190,R198,R205, R210,R224,R343, R350,R363		2.547039	8	43225424.698300
105A747009	Resistor	R186,R208,R213, R218,R223,R346, R355,R407		2.547039	8	43225424.698300
1124427090	Capacitor	C33,C34,C37,C38		1.128806	4	196873384.410843
1129601080	Capacitor	C138,C139,C140, C150,C151,C153, C167,C171,C185, C186,C200,C216, C217,C219,C233, C234,C236,C239,C327		1.128806	19	44097696.883526
1129710090	Capacitor	C35,C36		1.128806	2	375289731.076049



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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1129710390	Capacitor	C143,C144,C145, C146,C149,C154, C155,C157,C159, C160,C166,C173, C174,C177,C179, C181,C182,C183, C189,C192,C194, C195,C198,C199, C202,C204,C205, C214,C220,C222, C224,C225,C227, C228,C230,C231		1.128806	36	23624151.295955
1189633151	Capacitor	C232		4.744484	1	159663026.715137
1189656196	Capacitor	C334		4.744484	1	159663026.715137
118C6331B0	Capacitor	C142,C914		4.744484	2	86049450.747498
11C2510480	Capacitor	C125,C126		1.128806	2	375289731.076049
11C2522480	Capacitor	C873		1.128806	1	704977644.692287
11C4501790	Capacitor	C147,C148,C152, C156,C158,C161, C165,C170,C175, C180,C190,C193, C201,C215,C221, C223,C226,C229		1.128806	18	46478509.590073
11C4522191	Capacitor	C329		1.128806	1	704977644.692287
11C9510050	Capacitor	C130,C4		1.128806	2	375289731.076049

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11C9510490	Capacitor	C10,C100,C104,C105,C109,C11,C113,C114,C12,C127,C128,C129,C13,C135,C136,C15,C16,C17,C18,C19,C20,C21,C22,C23,C241,C242,C245,C247,C25,C257,C258,C30,C317,C320,C322,C323,C326,C328,C340,C341,C40,C5,C6,C7,C8,C83,C85,C87,C88,C9,C97,C99		1.128806	52	16465757.036261
11E1510050	Capacitor	C106,C107,C111,C112,C243,C244,C246,C248,C254,C255,C318,C319,C321,C324,C332,C333,C335,C337,C342,C81,C82,C84,C86,C89,C90,C91,C92		1.128806	27	31305223.485317
11E2501690	Capacitor	C108,C31		1.128806	2	375289731.076049
11E2522090	Capacitor	C911		1.128806	1	704977644.692287
11E2610030	Capacitor	C3,C32,C913		1.128806	3	257514172.353070
11E9501091	Capacitor	C28		1.128806	1	704977644.692287
11E9547681	Capacitor	C27		1.128806	1	704977644.692287

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11E9610080	Capacitor	C162,C163,C168, C172,C176,C178, C187,C191,C203, C206,C207,C218, C235,C238,C24,C39		1.128806	16	52112480.802928
11E9622080	Capacitor	C325,C330		1.128806	2	375289731.076049
11EA647010	Capacitor	C137,C141,C164, C169,C184,C188, C208,C209,C210, C211,C212,C213, C237,C240		1.128806	14	59316298.011235
121110156P	Inductor	L2	24.6	7.610121	1	100547305.012046
121110226X	Inductor	L3	21.9	7.281500	1	105085103.518185
1211110062	Inductor	L1	21	7.173971	1	106660201.461576
1212306030	Inductor	FB21,FB22,FB23, FB24,FB25,FB26, FB27,FB28,FB29, FB30,FB31,FB32, FB34,FB35		4.944252	14	13381951.576219
1212308054	Inductor	FB10,FB11,FB12, FB15,FB16,FB17, FB18,FB40,FB41, FB42,FB43,FB7,FB8, FB86,FB88,FB9		4.944252	16	11765215.454728
12123A0009	Inductor	FB2,FB33,FB45,FB46		4.944252	4	43912872.424775
12123C001A	Inductor	FB1,FB19,FB20		4.944252	3	57363284.375370
123132505D	Miscellaneous	Y1,Y2		19.200000	2	8854051.752197

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Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1304200043	Optical Device	LED10,LED11,LED12,LED13,LED14,LED15,LED16,LED17,LED18,LED19,LED20,LED5,LED6,LED7,LED8, LED9		79.003355	16	641588.219771
1315060300	Semiconductor	Q1,Q5		22.463360	2	17315095.066101
1315070020	Semiconductor	Q15		22.463360	1	31642600.748419
1315200312	Integrated Circuit	Q13	22.6	194.009162	1	2650453.850644
1315200312	Integrated Circuit	Q14,Q3		43.803003	2	6834791.244197
1315200312	Integrated Circuit	Q4	22.4	191.644490	1	2683157.388038
1430006710	Integrated Circuit	U100	20.8	173.640998	1	2961353.225518
1440038080	Integrated Circuit	U6		43.803003	1	11739202.588727
1440580EB0	Integrated Circuit	U4		43.803003	1	11739202.588727
1440580EB0	Integrated Circuit	U5	31.8	335.687531	1	1531818.377469
14S3112400	Integrated Circuit	U3	18.3	148.543679	1	3461691.092488
14S4910400	Integrated Circuit	U2		26.018600	1	25551442.237972
14S6325600	Integrated Circuit	U8,U9		11.063278	2	32567094.099626
1654916030	Connection	CN2		16.184835	1	35685591.360212