

EMB-QM87A

Reliability Prediction Report (MTBF)

Summary	Failure Rate: 9407.217823 ppm MTBF: 106,301 Hours
---------	--

Issue date	Approval	Test Engineer
2014/02/18	Tom Lin	Max Chang

Reliability Prediction (MTBF)

I . Model Name: EMB-QM87A

II . Prediction Date: February, 18, 2014

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

IV . Predicted by: Max Chang

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:

EMB-QM87A (9697M87A02-D):

- Failure Rate: 9407.217823 ppm

- MTBF: 106,301 Hours

**AAEON Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Duty Cycle: 100
Calculation Model: Telcordia Issue 2
Method: Method I Case 3

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Assembly Name	Part Number	Ref Des	Quantity	Failure Rate	MTBF
EMB-QM87A	9697M87A02-D		1	9407.217823	106,301

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050500104.0000 00000000000	Resistor	R170,R181,R 237, R369,R440,R 64,R957		2.547039	7	48991237.965885
1050501004.0000 00000000000	Resistor	R209,R214		2.547039	2	154078778.388085
1050501054.0000 00000000000	Resistor	R257		2.547039	1	282340674.079668
1050501234.0000 00000000000	Resistor	R909		2.547039	1	282340674.079668
1050502204.0000 00000000000	Resistor	R245,R248,R 846, R875,R876,R 877, R990,R991,R 992, R993		2.547039	10	35079934.879747
1050502224.0000 00000000000	Resistor	R484,R489,R 556, R558,R559,R 561, R591,R594,R 722, R723,R731,R 732, R756,R776,R 778, R780,R866,R 867, R868,R883,R 884, R885,R887,R 888, R965,R966		2.547039	26	14061076.827148
1050502234.0000 00000000000	Resistor	R378,R586,R 588		2.547039	3	107020754.986850
1050502734.0000 00000000000	Resistor	R619,R680		2.547039	2	154078778.388085
1050503914.0000 00000000000	Resistor	R97		2.547039	1	282340674.079668
1050503934.0000 00000000000	Resistor	R925		2.547039	1	282340674.079668
1050504334.0000 00000000000	Resistor	R99		2.547039	1	282340674.079668
1050504734.0000 00000000000	Resistor	R460,R750,R 751		2.547039	3	107020754.986850
1050505124.0000 00000000000	Resistor	R505		2.547039	1	282340674.079668
1050505604.0000 00000000000	Resistor	R206		2.547039	1	282340674.079668
1050505633.0000 00000000000	Resistor	R316		2.547039	1	282340674.079668

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050507524.0000 00000000000	Resistor	R148,R190,R 254, R291,R820		2.547039	5	67008142.102588
1050507530.0000 00000000000	Resistor	R915		2.547039	1	282340674.079668
1050508224.0000 00000000000	Resistor	R115,R118,R 121, R247,R375,R 769, R779		2.547039	7	48991237.965885
1050510034.0000 00000000000	Resistor	R150,R194,R 453, R947		2.547039	4	82309758.689546
1050511034.0000 00000000000	Resistor	R377		2.547039	1	282340674.079668
1050515034.0000 00000000000	Resistor	R903,R907,R 911		2.547039	3	107020754.986850
1050515434.0000 00000000000	Resistor	R225,R293,R 332		2.547039	3	107020754.986850
1050519114.0000 00000000000	Resistor	R350		2.547039	1	282340674.079668
1050520034.0000 00000000000	Resistor	R100,R380		2.547039	2	154078778.388085
1050524004.0000 00000000000	Resistor	R157		2.547039	1	282340674.079668
1050524904.0000 00000000000	Resistor	R140,R141,R 144, R658,R90		2.547039	5	67008142.102588
1050527034.0000 00000000000	Resistor	R330		2.547039	1	282340674.079668
1050533004.0000 00000000000	Resistor	R595,R596,R 697, R701		2.547039	4	82309758.689546
1050533034.0000 00000000000	Resistor	R154,R795		2.547039	2	154078778.388085
1050533214.0000 00000000000	Resistor	R321		2.547039	1	282340674.079668
1050539224.0000 00000000000	Resistor	R142		2.547039	1	282340674.079668
1050540224.0000 00000000000	Resistor	R318,R320		2.547039	2	154078778.388085
1050549964.0000 00000000000	Resistor	R163,R835,R 836		2.547039	3	107020754.986850
1050551004.0000 00000000000	Resistor	R16		2.547039	1	282340674.079668
1050564904.0000 00000000000	Resistor	R879		2.547039	1	282340674.079668
1050564914.0000 00000000000	Resistor	R252		2.547039	1	282340674.079668
1050590964.0000 00000000000	Resistor	R295		2.547039	1	282340674.079668

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1050597604.0000 00000000000	Resistor	R284,R862		2.547039	2	154078778.388085
1050597623.0000 00000000000	Resistor	R344		2.547039	1	282340674.079668
1050701504.0000 00000000000	Resistor	R108,R76,R7 70		2.547039	3	107020754.986850
1050704304.0000 00000000000	Resistor	R179,R185		2.547039	2	154078778.388085
1050708234.0000 00000000000	Resistor	R195		2.547039	1	282340674.079668
1052500171.0000 00000000000	Resistor	R805,R825,R 839, R840,R845,R 880		2.547039	6	56573956.677649
	Resistor	R950		2.547039	1	282340674.079668
1054700289.0000 00000000000	Resistor	R17,R383,R9 54, R999		2.547039	4	82309758.689546
1054700289.0000 00000000000	Resistor	R171	21.7	1.246240	1	577041659.424593
	Resistor	R1001,R1005 ,R132, R134,R14,R1 9,R208, R27,R278,R2 79,R292, R313,R315,R 32,R325, R342,R384,R 402, R407,R422,R 443, R455,R488,R 54,R544, R654,R657,R 766,R79, R82,R83,R91 ,R972		2.547039	33	11164784.962504
	Resistor	R153,R160,R 203, R249		2.547039	4	82309758.689546
	Resistor	R22		2.547039	1	282340674.079668
	Resistor	R341,R895		2.547039	2	154078778.388085

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
	Resistor	R145,R24,R251,R302,R363,R368,R401,R408,R428,R434,R444,R445,R611,R618,R62,R673,R676,R719,R720,R899,R901,R906,R908,R920,R924,R931,R932,R933,R934,R935,R936,R944,R958,R959,R960, R962		2.547039	36	10261285.143207
	Resistor	R705,R891		2.547039	2	154078778.388085
	Resistor	R477,R478,R543, R569		2.547039	4	82309758.689546
	Resistor	R347		2.547039	1	282340674.079668
	Resistor	R178		2.547039	1	282340674.079668
	Resistor	R379		2.547039	1	282340674.079668
	Resistor	R281,R322,R4,R421,R429,R49,R6,R904		2.547039	8	43225424.698300
	Resistor	R158,R197,R21,R23,R282,R317,R33,R337,R382,R493,R721, R974		2.547039	12	29507083.749401
	Resistor	R280,R283,R323, R374		2.547039	4	82309758.689546

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
	Resistor	R231,R233,R243, R244,R471,R553, R577,R578,R579, R580,R581,R582, R583,R620,R621, R622,R623,R624, R625,R626,R627, R628,R629,R630, R631,R632,R633, R634,R635,R636, R637,R638,R639, R640,R641,R642, R643,R644,R645,		2.547039	54	6915869.790048
	Resistor	R554,R979		2.547039	2	154078778.388085
	Resistor	R166,R180,R187, R201		2.547039	4	82309758.689546
	Resistor	R557,R562		2.547039	2	154078778.388085
	Resistor	R794		2.547039	1	282340674.079668
	Resistor	R334		2.547039	1	282340674.079668
	Resistor	R1004		2.547039	1	282340674.079668
	Resistor	R136		2.547039	1	282340674.079668
	Resistor	R204,R547,R549, R551,R575,R576, R587,R589,R592, R597,R738		2.547039	11	32049696.385471
	Resistor	R234,R241,R454, R616,R675,R700, R727,R735		2.547039	8	43225424.698300
	Resistor	R202		2.547039	1	282340674.079668
	Resistor	R138,R217,R331		2.547039	3	107020754.986850

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
	Resistor	R522,R540,R548, R550,R552,R837, R856,R857,R858		2.547039	9	38754445.632391
	Resistor	R975		2.547039	1	282340674.079668
	Resistor	R219,R287,R349		2.547039	3	107020754.986850
	Resistor	R819		2.547039	1	282340674.079668
	Resistor	R457		2.547039	1	282340674.079668
	Resistor	R336		2.547039	1	282340674.079668
	Resistor	R256,R854		2.547039	2	154078778.388085
	Resistor	R216,R286,R333		2.547039	3	107020754.986850
	Resistor	R479		2.547039	1	282340674.079668
	Resistor	R437		2.547039	1	282340674.079668
	Resistor	R146		2.547039	1	282340674.079668
	Resistor	R724		2.547039	1	282340674.079668
	Resistor	R143,R177,R192, R211,R240,R289, R298,R299,R300, R351,R412,R468, R470,R51,R764,R790, R797,R801,R808, R811,R816,R826, R832,R843,R844, R847,R851,R853, R860,R863,R864, R865,R882,R942, R952		2.547039	35	10545622.718268

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
	Resistor	R105,R12,R124,R126,R127,R128,R129,R13,R130,R131,R135,R161,R169,R182,R188,R220,R226,R228,R230,R235,R242,R250,R259,R265,R266,R267,R268,R271,R272,R273,R274,R277,R294,R297,R304,R305,R306,R307,R310,R312,R314,		2.547039	150	2539270.158817
	Resistor	R1000,R123,R172,R210,R296,R30,R458,R777,R838,R859,R902,R912		2.547039	12	29507083.749401
	Resistor	R359,R360		2.547039	2	154078778.388085

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
	Resistor	R1003,R101, R103, R104,R109,R 110, R112,R114,R 119, R125,R165,R 186, R189,R193,R 199, R255,R260,R 275, R290,R3,R30 3,R319, R365,R373,R 376, R396,R406,R 413, R430,R435,R 439, R461,R465,R 472, R490,R5,R50 ,R500, R60,R612,R6 13,R		2.547039	80	4709205.918606
	Resistor	R149		2.547039	1	282340674.079668
	Resistor	R223,R426,R 438		2.547039	3	107020754.986850
	Resistor	R89		2.547039	1	282340674.079668
	Resistor	R253,R792,R 799		2.547039	3	107020754.986850
	Resistor	R205,R276,R 414		2.547039	3	107020754.986850
	Resistor	R18,R20,R25 ,R26, R29,R31,R32 7,R328, R395,R442,R 462, R463,R466,R 473, R502,R506,R 545, R668,R681,R 704, R707,R709,R 713, R714,R715,R 717, R733,R741,R 970, R997,R998		2.547039	31	11861900.957214

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
	Resistor	R212		2.547039	1	282340674.079668
	Resistor	R168,R183,R415, R416,R694,R749, R814,R823,R828, R829,R927,R928, R961,R968		2.547039	14	25477245.255648
	Resistor	R889,R892,R893, R894,R900,R905, R910,R914,R918, R921		2.547039	10	35079934.879747
	Resistor	R137,R152,R155, R198,R348,R387, R419,R433,R48, R571, R573,R584,R70, R730, R870,R873,R874, R917,R94		2.547039	19	19019185.781770
	Resistor	R147,R151,R308, R309		2.547039	4	82309758.689546
	Resistor	R607,R608,R609, R610,R661,R662, R663,R664,R669, R670,R671,R672		2.547039	12	29507083.749401
	Resistor	R963		2.547039	1	282340674.079668
	Resistor	R1,R10,R2,R665, R666,R674,R8,R9		2.547039	8	43225424.698300
	Resistor	R52,R53,R63		2.547039	3	107020754.986850
	Resistor	R238		2.547039	1	282340674.079668
	Resistor	RT3,RT4,RT5,RT6		2.547039	4	82309758.689546
	Resistor	RT1,RT2		2.547039	2	154078778.388085
	Capacitor	C350,C353,C369, C371		1.128806	4	196873384.410843

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
	Capacitor	C367,C368,C375, C376,C377,C379		1.128806	6	133979725.056342
	Capacitor	C239		1.128806	1	704977644.692287
	Capacitor	C203,C252,C595, C598		1.128806	4	196873384.410843
	Capacitor	C1,C10,C105,C16, C17,C18,C19,C2,C21, C22,C23,C24,C25, C26,C27,C28,C29,C3, C30,C31,C32,C4,C6, C7,C9		1.128806	25	33748887.792763
	Capacitor	C141,C192,C275, C593		1.128806	4	196873384.410843
	Capacitor	C169		1.128806	1	704977644.692287
	Capacitor	C580		1.128806	1	704977644.692287
	Capacitor	C121,C291,C643,C84		1.128806	4	196873384.410843
	Capacitor	C112,C113,C114, C143,C180,C181, C182,C183,C186, C188,C193,C205, C207,C42,C473,C615, C86		1.128806	17	49133303.073811

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
	Capacitor	C122,C123,C129,C13,C132,C135,C136,C140,C146,C154,C163,C168,C174,C175,C224,C229,C241,C251,C253,C258,C277,C280,C282,C284,C287,C289,C290,C297,C305,C306,C307,C333,C348,C41,C420,C454,C564,C567,C604,C605,C606,		1.128806	59	14541999.022292
	Capacitor	C600,C602		1.128806	2	375289731.076049
	Capacitor	C281,C506,C616,C98		1.128806	4	196873384.410843
	Capacitor	C118,C507		1.128806	2	375289731.076049

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
	Capacitor	C101,C178,C190, C195,C20,C256,C303, C327,C341,C345, C346,C349,C381, C382,C394,C396, C397,C398,C399, C400,C401,C402, C410,C411,C424, C425,C427,C428, C429,C430,C431, C432,C44,C45,C46, C47,C478,C48,C485, C49,C498,C499,C		1.128806	94	9187567.535390
	Capacitor	C149,C194,C248		1.128806	3	257514172.353070
	Capacitor	C300		1.128806	1	704977644.692287
	Capacitor	C404,C434		1.128806	2	375289731.076049
	Capacitor	C619,C623,C639, C661,C662		1.128806	5	159367490.199266
	Capacitor	C104,C354,C355, C378,C380		1.128806	5	159367490.199266
	Capacitor	C227		1.128806	1	704977644.692287

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
	Capacitor	C116,C117,C176, C177,C197,C230, C232,C240,C304, C330,C385,C386, C387,C388,C389,C39, C390,C391,C412, C413,C414,C415, C416,C417,C418, C467,C470,C496, C497,C508,C509, C513,C514,C54,C55, C56,C57,C577,C58, C581,C59,C60,C6		1.128806	43	19845816.558772
	Capacitor	C100,C472,C486, C487,C488,C489, C490,C491,C492, C493,C494,C495, C510,C515,C516, C517,C518,C519, C520,C521,C522, C523,C524,C650		1.128806	24	35120617.936543
	Capacitor	C299		1.128806	1	704977644.692287
	Capacitor	C625		1.128806	1	704977644.692287

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1121501690.0000 00000000000	Capacitor	BC1,BC10,BC11,BC12,BC13,BC14,BC15,BC16,BC2,BC3,BC4,BC5,BC6,BC7,BC8,BC9,C106,C109,C12,C137,C139,C144,C145,C150,C153,C159,C160,C162,C164,C173,C199,C201,C208,C209,C210,C211,C212,C213,C216,C218,C219,C221,C222,		1.128806	239	3647696.039086
1121501691.0000 00000000000	Capacitor	C134,C223,C228,C234,C293,C294,C302,C75		1.128806	8	101746760.035398
1121533480.0000 00000000000	Capacitor	C601		1.128806	1	704977644.692287
1121610060.0000 00000000000	Capacitor	C272		1.128806	1	704977644.692287
1121701790.0000 00000000000	Capacitor	C108		1.128806	1	704977644.692287
1124418090.0000 00000000000	Capacitor	C191,C196,C88,C92		1.128806	4	196873384.410843
1124427080.0000 00000000000	Capacitor	C582,C583		1.128806	2	375289731.076049
1124427090.0000 00000000000	Capacitor	C278,C288,C591,C656,C666		1.128806	5	159367490.199266
1124433190.0000 00000000000	Capacitor	C462		1.128806	1	704977644.692287
1124515281.0000 00000000000	Capacitor	C152,C198,C215		1.128806	3	257514172.353070
1124522280.0000 00000000000	Capacitor	C130,C156,C254		1.128806	3	257514172.353070

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1124533191.0000 00000000000	Capacitor	C244,C255		1.128806	2	375289731.076049
1129522790.0000 00000000000	Capacitor	C107,C110,C115, C119,C120,C124, C128,C131,C133, C147,C151,C165, C167,C171,C179, C185,C200,C204,C34, C36,C40,C43,C66, C67,C73,C74,C77, C79,C80,C83,C89, C91,C97,C99		1.128806	34	24984844.161172
1129601080.0000 00000000000	Capacitor	C301		1.128806	1	704977644.692287
1129610051.0000 00000000000	Capacitor	C217,C283,C586, C587		1.128806	4	196873384.410843
1129610080.0000 00000000000	Capacitor	C202		1.128806	1	704977644.692287
1129622690.0000 00000000000	Capacitor	C103		1.128806	1	704977644.692287
1129701790.0000 00000000000	Capacitor	C214		1.128806	1	704977644.692287
1129710090.0000 00000000000	Capacitor	C342,C343,C344, C356,C357,C358, C359,C361,C363, C365,C668,C673		1.128806	12	68856937.301178
1129710390.0000 00000000000	Capacitor	C187,C189,C206, C338,C340,C644		1.128806	6	133979725.056342
1129715090.0000 00000000000	Capacitor	C259,C260		1.128806	2	375289731.076049
1129722091.0000 00000000000	Capacitor	C292,C316,C329, C360,C362,C364		1.128806	6	133979725.056342
1129747090.0000 00000000000	Capacitor	C220		1.128806	1	704977644.692287

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1189933180.0000 00000000000	Capacitor	C393,C407,C 463		1.128806	3	257514172.353070
1211102470.0000 00000000000	Inductor	L3,L8		4.944252	2	83201062.149749
1211102470.0000 00000000000	Inductor	L6	19.7	7.020420	1	108993082.039950
1211133075.0000 00000000000	Inductor	L9		4.944252	1	154760964.143460
	Inductor	L12		4.944252	1	154760964.143460
	Inductor	L1		4.944252	1	154760964.143460
	Inductor	L2		4.944252	1	154760964.143460
	Inductor	L10		4.944252	1	154760964.143460
	Inductor	L15,L16		4.944252	2	83201062.149749
	Inductor	L7		4.944252	1	154760964.143460
1212306030.0000 00000000000	Inductor	FB12,FB14,F B15, FB39,FB40,F B41		4.944252	6	30055900.223009
1212308054.0000 00000000000	Inductor	FB1,FB10,FB 11,FB13, FB16,FB2,FB 20,FB3, FB34,FB35,F B36, FB37,FB38,F B43,FB9		4.944252	15	12521115.446963
	Inductor	FB4,FB5,FB6, FB8		4.944252	4	43912872.424775
	Inductor	FB17,FB18,F B19, FB21,FB22,F B23		4.944252	6	30055900.223009
	Inductor	FB32		4.944252	1	154760964.143460
	Inductor	FB30		4.944252	1	154760964.143460
	Inductor	FB33,FB7		4.944252	2	83201062.149749
	Inductor	FB24,FB25,F B26, FB27,FB28,F B29		4.944252	6	30055900.223009
	Inductor	CH1,CH10,C H13,CH14, CH15,CH16,C H4,CH5, CH6,CH7,CH 8,CH9		4.944252	12	15520616.516984

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
	Inductor	CH11,CH12,C H17, CH18,CH19,C H2,CH20, CH21,CH22,C H3		4.944252	10	18485101.557872
1231327053.0000 00000000000	Miscellaneous	Y3,Y6		19.200000	2	8854051.752197
1231332721.0000 00000000000	Miscellaneous	Y1		19.200000	1	23844262.770939
	Miscellaneous	Y2,Y4,Y5		19.200000	3	5742504.738137
1251901610.0000 00000000000	Integrated Circuit	U37		43.803003	1	11739202.588727
1300414843.0000 00000000000	Semiconductor	D15,D16		7.793411	2	50578095.223398
1301005440.0000 00000000000	Semiconductor	D1,D20,D21, D22,D9		7.793411	5	21965031.404253
1301005442.0000 00000000000	Semiconductor	D10,D11,D17		7.793411	3	35106858.962001
1301053040.0000 00000000000	Semiconductor	D2,D3,D4		7.793411	3	35106858.962001
1301400541.0000 00000000000	Semiconductor	D12,D13,D14 ,D19		7.793411	4	26989084.126235
1301400642.0000 00000000000	Semiconductor	D18,D5,D6,D 7,D8		7.793411	5	21965031.404253
1305100541.0000 00000000000	Semiconductor	U100,U101,U 102, U103,U112,U 113, U114,U115,U 3,U4, U58,U59,U60 ,U61, U62,U63,U64 ,U65, U72,U73		22.463360	20	2046335.090970

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1309020640.0000 00000000000	Semiconductor	U1,U104,U105,U106,U107,U108,U109,U110,U111,U12,U43,U44,U45,U48,U49,U50,U53,U54,U55,U74,U75,U76,U77,U78,U79,U92,U93,U94,U95,U96,U97,U98,U99		22.463360	33	1262760.774886
1310390410.0000 00000000000	Semiconductor	Q18		22.463360	1	31642600.748419
1310390411.0000 00000000000	Semiconductor	Q46		22.463360	1	31642600.748419
1310390413.0000 00000000000	Semiconductor	Q32,Q33,Q35,Q45,Q59,Q60		22.463360	6	6378891.324740
1311390610.0000 00000000000	Semiconductor	Q1,Q10,Q11,Q12,Q2,Q3,Q4,Q47,Q49,Q5,Q6,Q7,Q8,Q9		22.463360	14	2878021.548809
1314010910.0000 00000000000	Semiconductor	U88		22.463360	1	31642600.748419
1315013810.0000 00000000000	Semiconductor	Q30		22.463360	1	31642600.748419
1315034430.0000 00000000000	Semiconductor	Q50		22.463360	1	31642600.748419
1315050311.0000 00000000000	Semiconductor	Q37,Q41		22.463360	2	17315095.066101
1315200312.0000 00000000000	Semiconductor	Q26,Q27,Q38		22.463360	3	12043329.789539
1315230111.0000 00000000000	Semiconductor	Q31		22.463360	1	31642600.748419
1315230511.0000 00000000000	Semiconductor	Q36		22.463360	1	31642600.748419
1315700211.0000 00000000000	Semiconductor	Q40,Q48		22.463360	2	17315095.066101
1315700216.0000 00000000000	Semiconductor	Q43,Q44		22.463360	2	17315095.066101

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1315700217.0000 00000000000	Semiconductor	Q13,Q14,Q15,Q16, Q22,Q25,Q28,Q34, Q39,Q51,Q52,Q53, Q54,Q55,Q56,Q57, Q58,Q61,Q63,Q64, Q65		22.463360	21	1952685.860459
1315720010.0000 00000000000	Semiconductor	Q29,Q42		22.463360	2	17315095.066101
1315762010.0000 00000000000	Semiconductor	Q62		22.463360	1	31642600.748419
1315805710.0000 00000000000	Semiconductor	Q19,Q20		22.463360	2	17315095.066101
1315806511.0000 00000000000	Semiconductor	Q21		22.463360	1	31642600.748419
1430516310.0000 00000000000	Semiconductor	U29		22.463360	1	31642600.748419
1430973740.0000 00000000000	Semiconductor	U14		22.463360	2	17315095.066101
1430973740.0000 00000000000	Semiconductor	U31	33.6	52.075558	1	13649381.032605
1430973740.0000 00000000000	Semiconductor	U16	49.7	147.224541	1	4827993.512975
	Integrated Circuit	U9	14.2	39.548046	1	13002218.246557
	Integrated Circuit	U12	9.8	85.750043	1	5996642.225425
	Integrated Circuit	U87		43.803003	1	11739202.588727
	Integrated Circuit	U38		43.803003	1	11739202.588727
	Integrated Circuit	U41	14.5	116.615488	1	4409468.587143
	Integrated Circuit	U34		43.803003	1	11739202.588727
	Integrated Circuit	U46,U47,U51, U52, U56,U57		43.803003	6	2750969.191556
	Integrated Circuit	U32		43.803003	1	11739202.588727
	Integrated Circuit	U8		43.803003	1	11739202.588727
	Integrated Circuit	U11		43.803003	1	11739202.588727
	Integrated Circuit	U84		43.803003	1	11739202.588727
	Integrated Circuit	U18,U82		43.803003	2	6834791.244197
	Integrated Circuit	U83	18.6	151.372018	1	3397010.455996
	Integrated Circuit	U42,U66,U67, U68, U69,U70		43.803003	6	2750969.191556
	Integrated Circuit	U117,U118		43.803003	2	6834791.244197
	Integrated Circuit	U5		43.803003	1	11739202.588727
	Integrated Circuit	U36		43.803003	1	11739202.588727
	Integrated Circuit	U89		26.018600	1	25551442.237972

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
	Integrated Circuit	U90		26.018600	1	25551442.237972
	Integrated Circuit	U15		26.018600	1	25551442.237972
	Integrated Circuit	U27,U28,U7		26.018600	3	9949526.289768
	Integrated Circuit	U6		26.018600	1	25551442.237972
	Integrated Circuit	U20,U21,U22,U23		26.018600	4	7696979.559193
	Integrated Circuit	U30,U71,U86		26.018600	3	9949526.289768
	Integrated Circuit	U91		26.018600	1	25551442.237972
	Integrated Circuit			11.063278	1	58231413.220643
	Integrated Circuit			43.803003	1	11739202.588727
	Integrated Circuit	U33		43.803003	1	11739202.588727
	Integrated Circuit	U17,U24,U26		43.803003	3	4923240.069161
	Integrated Circuit	U39,U40		43.803003	2	6834791.244197
	Integrated Circuit	U19		43.803003	1	11739202.588727
	Integrated Circuit	U85	19.3	158.161082	1	3251193.792283
1463520060.000000000000000000	Integrated Circuit	U116		11.063278	1	58231413.220643
1469128350.000000000000000000	Integrated Circuit	U10		11.063278	1	58231413.220643
1540710280.000000000000000000	Resistor	RP3,RP4		9.971436	2	30043399.401299
1540722281.000000000000000000	Resistor	RP1		9.971436	1	51606907.671214
1540733085.000000000000000000	Resistor	RP2		9.971436	1	51606907.671214
1651520400.000000000000000000	Connection	DIMM1		16.184835	1	35685591.360212
	Connection	DIMM2		16.184835	1	35685591.360212
1653004202.000000000000000000	Connection	CN12		16.184835	1	35685591.360212
	Connection	FP1		16.184835	1	35685591.360212
	Connection	DIO1,USB1,USB2		16.184835	3	14515880.849373
	Connection	COM2,COM3,COM4,COM5,COM6		16.184835	5	9343344.843761
1654030006.000000000000000000	Connection	LVDS1		16.184835	1	35685591.360212
1654226303.000000000000000000	Connection	CN26		16.184835	1	35685591.360212
1655907131.000000000000000000	Connection	CN11		16.184835	1	35685591.360212
1655912021.000000000000000000	Connection	CN18		16.184835	1	35685591.360212
1752000501.000000000000000000	Miscellaneous	FS9		2.400000	1	254626042.602335

**Reliability Prediction
Summary**

File Name: EMB-QM87A.rfp
Assembly: 9697M87A02-D
Ref Des:
Description:

Failure Rate: 9407.217823
MTBF (hrs): 106,301
Temperature: 30
Environment: GF, GU - Ground Fixed, Uncontrolled

Part Number	Category	Ref Des	Tem.Rise	Unit Failure Rate	Quantity	MTBF,Unit
1752002700.0000 000000000000	Miscellaneous	FS1,FS10,FS 11,FS2, FS4,FS7,FS8		2.400000	7	48163316.738466
1752026002.0000 000000000000	Miscellaneous	FS3,FS5,FS6		2.400000	3	101854599.204190