

RELIABILITY PARTS STRESS PREDICTION REPORT

FOR THE

SAM POWER SUPPLY

Prepared by

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## 1.0 INTRODUCTION AND SUMMARY

This document presents the Sample Company Reliability Prediction Report performed on the SAM Power Supply. It was analyzed for Mean Time Between Failure (MTBF) in accordance with Task 203 of MIL-STD-785B; paragraph 2.4 of Task 100 of MIL-STD-756B; and the Parts Stress Analysis method of MIL-HDBK-217F (N1/2), Sections 5 through 23.

The SAM Power Supply was found to have a Mean Time Between Failure (MTBF) of 31,582 hours of operation. This statement is fully supported by the reliability mathematical model presented in Section 3.0, the SAM Power Supply Functional Block Diagram of Figure 1, the Reliability Logic Block Diagram of Figure 2, the Table 1 Failure Rate Data Summary and the detailed reliability parts stress and failure rate data analysis tables presented in Appendix A of this report.

*This example is not a complete report. The remaining text, mathematical models and detailed appendix data tables will be provided upon the purchase of this report. Continue to scroll down to view example appendix data tables.*

## APPENDIX A

### Reliability Parts Stress And Failure Rate Data Tabulation for the SAM Power Supply

RELIABILITY STRESS AND FAILURE RATE DATA

System: SAM Power Supply

Assembly: Converter

Schematic No.: 30684941

Part Ambient Temperature, Worst Case: 55.00 Degrees Celsius Environment: SF Prepared By: J. Smith

Ref. Desig.	Description/ Part Number	Type/ Value	Specification	Stress		Stress Ratio	Pi E	Pi Q	Pi T	Pi L	Pi A	Pi S	Failure Rate in Parts Per Million Hours	
				Rated	Applied								Base	Total
U1	Intgrtd Ckt.   54LS00   Quadruple 2-Input Positive-NAND Gates	LSTTL   H FP	Mil-Std-883/ Class B-1	Tj   Deg. C   175.00   55.519	Tj   Deg. C   55.519	14 Pins,   $\theta_{jc}, ^\circ C/W$   = 22.00	0.5	2.00	0.6	1.00			<=100 Gates   5.00 Supply Voltage   0.024 Watts Dissipated	0.00671
U2	Intgrtd Ckt.   LM139AJ   Linear, Voltage Comparators	LIN BIP   H DIP	Mil-Std-883/ Class B-1	Tj   Deg. C   150.00   56.602	Tj   Deg. C   56.602	14 Pins,   $\theta_{jc}, ^\circ C/W$   = 28.00	0.5	2.00	1.1	1.00			<=100 Trans.   12.00 Supply Voltage   0.057 Watts Dissipated	0.02748
CR1	Diode   1N4148-1   Switching	General   Purpose	Mil-S-19500/ 116 JANTX	Tj   Deg. C   175.00   55.240	Tj   Deg. C   55.240	0.002   $\theta_{jc}, ^\circ C/W$   = 120.00	0.5	1.00	2.6	0.108	1.00		0.00100   40.00 Applied Volts   100.00 Rated Volts	0.00014
VR1	Diode   1N4461   Voltage Regulator and	Zener/   Avalnch	Mil-S-19500/ 406 JANTX	Tj   Deg. C   175.00   55.850	Tj   Deg. C   55.850	0.007   $\theta_{jc}, ^\circ C/W$   = 125.00	0.5	1.00	1.8	1.000	1.00		0.00200	0.00183
Q1	Transistor   2N2222A   *NPN and PNP Linear Amplification	NPN/PNP	Mil-S-19500/ 225 JANTX	Tj   Deg. C   150.00   55.210	Tj   Deg. C   55.210	0.003   $\theta_{jc}, ^\circ C/W$   = 70.00	0.5	1.00	1.9	1.50	0.21		0.00074   25.00 Applied Volts   50.00 Rated Volts	0.00017
Q2	Transistor   2N2907A   NPN and PNP Switching	NPN/PNP	Mil-S-19500/ 291 JANTX	Tj   Deg. C   150.00   56.411	Tj   Deg. C   56.411	0.014   $\theta_{jc}, ^\circ C/W$   = 98.00	0.5	1.00	2.0	0.70	0.30		0.00074   37.00 Applied Volts   60.00 Rated Volts	0.00011
R1	Resistor   RCR07G102JS	1.00K   Ohms	Mil-R-39008, S   Insltd Fxd Comp	0.250   Watts	0.001   Watts	< 0.1	0.5	0.03	1.00				0.00053	0.00001
R2	Resistor   RWR74S1210FP	121.00   Ohms	Mil-R-39007, P   Power Fixed WW	5.000   Watts	0.065   Watts	< 0.1	0.3	0.30	1.00				0.00632	0.00057
R3	Resistor   RJR24FW501P	500.00   Ohms	Mil-R-39035, P   Trimmer NonWW	0.500   Watts	0.004   Watts	< 0.1	0.5	0.20	1.00	1.00	1.00		0.02548   3 Tap Connect'ns on Pots	0.00255
R4	Resistor   M83401/01	50.00   Ohms	Mil-R-83401, Mil   Netwrk Fxd Film	1.750   Watts	0.800   Watts	0.5	0.5	1.00		8.37	8		0.00006   8 Film Resistors in use	0.00201
C1	Capacitor   CKR06BX104KP	100.00   nF	Mil-C-39014, P   Ceramc, Gen. Pur.	100.0   Volts	25.00   Volts	0.3	0.4	0.30	1.45				0.00118	0.00021
C2	Capacitor   CMR06F471JDPDP	470.00   pF	Mil-C-39001, P   Mica, Dipped	500.0   Volts	24.00   Volts	< 0.1	0.5	0.30	1.06				0.00046	0.00007
C3	Capacitor   CLR73BH330KGP	33.00   uF	Mil-C-39006, P   Tntlm Elctrlytc	30.0   Volts	12.00   Volts	0.4	0.5	0.30	1.03	2.00			0.00521   Slug, Hermetic Construct'n	0.00161
C4	Capacitor   CSR13F476KP	47.00   uF	Mil-C-39003, P   Tntlm Elctrlytc	35.0   Volts	12.00   Volts	0.3	0.4	0.30	1.59	0.07			0.00964   Cir. Res. = 1.0 Ohms/Volt	0.00012
T1	Transformer   TF4R03GA203	Power	Mil-T-27, Mil   Audio, Pwr, HiPwr	130.00   Deg. C	75.00   Deg. C		0.5	8.00					0.00354   Power Transformers and Filters	0.01416

0.05775

RELIABILITY STRESS AND FAILURE RATE DATA

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Schematic No.: 30684941

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Ref. Desig.	Description/ Part Number	Type/ Value	Specification	Stress		Stress Ratio	Pi E	Pi Q	Pi C	Pi P	Pi K	Failure Rate in Parts Per Million Hours		
				Rated	Applied							Base	Total	
L1	Coil CL3500GA203	Variabl	Mil-C-15305,Mil Fxd and Var, RF Variable Construction	125.00	75.00		0.5	4.00	2.00				0.00063	0.00251
J1	Connector G06 Series	0.40A/ Contact	Mil-C-24308,Mil Rack and Panel 22 Actv Cntcts				0.5		4.31	2.00			0.00105	0.00454
J2	PCB Connector TP 32PSTR	0.40A/ Contact	Mil-C-55302,Mil PCB Two-Piece 32 Active Pins				0.5		5.94	2.00			0.00053	0.00314
J3	IC Socket ICS 16PSTR		Mil-S-83734,Mil Plug-in Socket 16 Actv Cntcts				0.5		3.42				0.00042	0.00072
P1	Intercon Assy 3068491 FWB	1 Ckt. Planes	,Mil Printed Wiring				0.5	1.00	1.00				0.000041	0.00254
	Connections	Manual Tools	Standard ,Mil Solderless wrap				0.5	1.00					0.0000035	0.00002
													N1= 40 Wave solder PTHs. N2= 6 Hand solder PTHs. N = 10 Connections	
													0.01347	