FAILURE MODES, EFFECTS AND CRITICALITY ANAYSIS REPORT

FOR THE

SAM POWER SUPPLY

Prepared by

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1.0 INTRODUCTION AND SUMMARY

This document presents the Sample Company Failure Mode, Effects and Criticality Analysis (FMECA) Report performed on the SAM Power Supply. It was prepared in accordance with MIL-STD-1629A, Notice 2, “Procedures for Performing A Failure Mode, Effects and Criticality Analysis”.

The results of this analysis indicate that the SAM Power Supply meets the fail-safe operation requirements of its Performance Specification. This statement is fully supported by the Failure Mode, Effects and Criticality Analysis data tables presented in the appendices to this report.

This example is not a complete report. The remaining text 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

Failure Mode And Effects Analysis
for the
SAM Power Supply

FAILURE MODE AND EFFECTS ANALYSIS

System: SAM Power Supply
Indenture Level: 3
Reference Drawing: Converter, 30684941
Mission: Space, Flight (SF)

Date:
Sheet: 1
Compiled By: J. Smith
Approved By: M. Anderson

Ident. No.	Item/Functional Identification (Nomenclature)	Function	Failure Modes and Causes	Mission Phase/ Operational Mode	Failure Effects			Failure Detection Method	Compensating Provisions	Severity Class	Remarks
					Local Effects	Next Higher Level	End Effects				
Q1-1	Transistor 2N2907A Low Frequency Bipolar (NPN/PNP)	Switch Transistor Driver	Open	Power On	5V Regulator Inoperative	Loss of 5 Volts	Converter Inoperative	No 1553 Response	Redundant Circuits	III	
Q1-2			Short	Power On	5V Regulator Full On	26V on 5V Line. Parts Damaged	Open Primary Circuit Breaker	No 1553 Response	Redundant Circuits	IV	
CR1-1	Diode 1N4148-1 General Purpose	Overvoltage Protection	Open	Power On	Loss of Overvoltage Protection	Possible Damage to U19	Possible Converter Malfunction	Periodic Test	Redundant Circuits	IV	
CR1-2			Short	Power On	5V Applied to U19 Analog Channel 7	U19 Analog Channel 7 Inoperative	Converter Inoperative	Periodic Test	Redundant Circuits	III	
R1-1	Resistor RCR07G102JS Insulated Fixed Composition, ER	Current Limit	Open	Power On	Q1,Q2,Q3,U2 Inoperative	Current Test Inoperative	Converter Malfunctions	Periodic Test	Redundant Circuits	III	
R1-2			Short	Power On	Possible damage to Q2	Current Test Inoperative	Converter Malfunctions	Periodic Test	Redundant Circuits	III	
C1-1	Capacitor CKR06BX104KP General Purpose Ceramic, ER	Feedback Capacitor	Open	Power On	Malfunction of Active Low Power Filter	Degraded Filtering for U19, Analog Channel	Possible Converter Malfunction	Periodic Test	Redundant Circuits	III	
C1-2			Short	Power On	Active Low Power Filter Inoperative	Loss of Signal to U19, Analog Channel 7	Converter Inoperative	Periodic Test	Redundant Circuits	IV	

APPENDIX B

Failure Mode, Effects And Criticality Analysis
for the
SAM Power Supply

System: SAM Power Supply
Indenture Level: 3
Reference Drawing: Converter, 30684941
Mission: Space, Flight (SF)

Date:
Sheet: 4
Compiled By: J. Smith
Approved By: M. Anderson

Ident. No.	Item/Functional Identification (Nomenclature)	Function	Failure Modes and Causes	Mission Phase/ Operational Mode	Severity Class	Failure Probability: Failure Rate Data Source	Failure Effect Probability (β)	Failure Mode Ratio (α)	Failure Rate (λp) --PPMH	Operating Time (t) --Hours	Failure Mode Crit # Cm=βαλpt	Item Crit # Cr=Σ(Cm)	Remarks
Q1-1	Transistor 2N2907A Low Frequency Bipolar (NPN/PNP)	Switch Transistor Driver	Open	Power On	III	MIL-HDBK-217F, N1/2	0.50	0.40	1.10E-01	1.00E-01	2.20E-12	2.20E-12	
Q1-2			Short	Power On	IV	MIL-HDBK-217F, N1/2	0.10	0.60	1.10E-10	1.00E-01	6.60E-13	6.60E-13	
CR1-1	Diode 1N4148-1 General Purpose	Overvoltage Protection	Open	Power On	IV	MIL-HDBK-217F, N1/2	0.10	0.40	1.40E-10	1.00E-01	5.60E-13	1.22E-12	
CR1-2			Short	Power On	III	MIL-HDBK-217F, N1/2	0.50	0.60	1.40E-10	1.00E-01	4.20E-12	6.40E-12	
R1-1	Resistor RCR07G102JS Insulated Fixed Composition, ER	Current Limit	Open	Power On	III	MIL-HDBK-217F, N1/2	0.50	0.85	1.00E-11	1.00E-01	4.25E-13	6.83E-12	
R1-2			Short	Power On	III	MIL-HDBK-217F, N1/2	0.50	0.15	1.00E-11	1.00E-01	7.50E-14	6.90E-12	
C1-1	Capacitor CKR06BX104KP General Purpose Ceramic, ER	Feedback Capacitor	Open	Power On	III	MIL-HDBK-217F, N1/2	0.50	0.85	2.10E-10	1.00E-00	8.93E-12	1.58E-11	
C1-2			Short	Power On	IV	MIL-HDBK-217F, N1/2	0.10	0.15	2.10E-10	1.00E-01	3.15E-13	1.53E-12	

APPENDIX C

Failure Mode, Effects And Criticality Analysis – Maintainability Information
for the
SAM Power Supply

FAILURE MODE EFFECTS AND CRITICALITY ANALYSIS - MAINTAINABILITY INFORMATION

System/Subsystem Nomenclature: SAM Power Supply | System Identification No.: | Date:
Sheet: 1
Indenture Level: 3 | Reference Drawing: 30684941 | Mission: Space, Flight (SF) | Prepared By: J. Smith
Approved By: M. Anderson
System/Subsystem Description: Converter | Compensating Provisions:

Ident. No.	Item/Functional Identification (Nomenclature)	Function No.	Function Ltr	Functional Failure No.	Engineering Failure Mode	Mission Phase	Failure Effects: Local Effects	Failure Effects: Next Higher Level	Failure Effects: End Effects	Failure Detection Method	Severity Class	Minimum Equipment List	Failure Mode MTBF and Remarks
Q1-1	Transistor 2N2907A Low Frequency Bipolar (NPN/PNP)	Switch Transistor Driver	Open	Open	Power On	5V Regulator Inoperative	Loss of 5 Volts	Converter Inoperative	No 1553 Response	III	No	MTBF~Hrs.: 9.091E+15	
Q1-2		Short	Short	Power On	5V Regulator Full On	26V on 5V Line. Parts Damaged	Open Primary Circuit Breaker	No 1553 Response	IV	No	MTBF~Hrs.: 9.091E+15	
CR1-1	Diode 1N4148-1 General Purpose	Overvoltage Protection	Open	Open	Power On	Loss of Overvoltage Protection	Possible Damage to U19	Possible Converter Malfunction	Periodic Test	IV		MTBF~Hrs.: 7.143E+15	
CR1-2		Short	Short	Power On	5V Applied to U19 Analog Channel 7	U19 Analog Channel 7 Inoperative	Converter Inoperative	Periodic Test	III		MTBF~Hrs.: 7.143E+15	
R1-1	Resistor RCR07G102JS Insulated Fixed Composition, ER	Current Limit	Open	Open	Power On	Q1,Q2,Q3,U2 Inoperative	Current Test Inoperative	Converter Malfunctions	Periodic Test	III		MTBF~Hrs.: 1.000E+17	
R1-2		Short	Short	Power On	Possible damage to Q2	Current Test Inoperative	Converter Malfunctions	Periodic Test	III		MTBF~Hrs.: 1.000E+17	
C1-1	Capacitor CKR06BX104KP General Purpose Ceramic, ER	Feedback Capacitor	Open	Open	Power On	Malfunction of Active Low Power Filter	Degraded Filtering for U19, Analog Channel 7	Possible Converter Malfunction	Periodic Test	III		MTBF~Hrs.: 4.762E+15	
C1-2		Short	Short	Power On	Active Low Power Filter Inoperative	Loss of Signal to U19, Analog Channel 7	Converter Inoperative	Periodic Test	IV		MTBF~Hrs.: 4.762E+15	