

**Preliminary Reliability Prediction Analysis
For
Power Supply Model: SCS120PW-12 through 24V**

1) INTRODUCTION

This analysis and prediction is based on Part Count Reliability Prediction method as specified in MIL-HDBK-217F. The component list is based on the schematic diagram of the power supply unit. It must be understood that reliability prediction is of an estimation and statistical nature and much depends on the quality factory of the components being used. In addition, the ambient temp for the MTBF prediction is based on 30⁰C.

2) RELIABILITY PREDICTION RESULT

A summary of the reliability prediction is given in Table 1.
And the predicted mean time between failure (MTBF): 229,881 hrs.

3) COMMENTS

It must be noted that however, the loading is assumed to be at worst case and 100% duty cycle for all components, together with fact that the quality factors for most of the components are estimated rather conservatively. In practice, therefore, the MTBF (hrs) can be expected to be higher than this calculated figure.

MTBF CALCULATION

TABLE 1.

ITEM	COMPONENT TYPE	λG	πQ	Ni	λEQUIP
------	----------------	-------------	---------	----	------------------------

RESISTOR:

1.	Fixed Film	0.0037	10	60	2.22
2.	Film Power	0.01	10	0	0
3.	Thermister	0.0014	10	1	0.014
4.	Varistor	0.0029	8	1	0.0232

CAPACITOR:

1.	Electrolytic	0.0013	10	7	0.091
2.	Ceramic	0.0017	10	4	0.068
3.	Metallized Paper / Plastic	0.0007	10	3	0.021

SEMICONDUCTOR:

1.	Diode, General Purpose	0.0036	8	10	0.2016
2.	Diode, Fast Recovery Pwr. Rectifier	0.023	8	2	0.368
3.	Diode, Power Rectifier Schottky Pwr.	0.0028	8	0	0.0448
4.	Zener Diode, General Purpose	0.0033	8	3	0.0264
5.	Si Power MOSFET	0.014	8	4	0.112
6.	SCR	0.0025	8	0	0.04
7.	Transistors	0.00015	8	8	0.0024

INDUCTIVE PARTS:

1.	Transformer, Flyback	0.0058	3	2	0.0348
2.	Coil, Fixed Inductor or Choke	0.000032	3	7	0.000672

INTEGRATED CIRCUIT:

1.	Linear	0.0095	10	3	0.285
2.	Opto Isolator	0.027	8	2	0.432

OTHERS:

1.	Fuse	0.01	1	1	0.01
2.	Printed Wire Board	0.022	2	1	0.044
3.	I/P Connector	0.05	2	2	0.2
4.	PCB Connector	0.044	2	1	0.088

TOTAL EQUIP. FAILURE RATE = 4.350072

$$\text{MTBF (hrs)} = \frac{1 \times 10^6 \text{ hrs}}{\text{Total } \lambda \text{ EQUIP}} = 229,881 \text{ hrs}$$