

# **PRELIMINARY RELIABILITY PREDICTION ANALYSIS FOR POWER SUPPLY MODEL: SCS6012**

## **1) INTRODUCTION**

This report is a summary presentation of the results of reliability analysis of power supply model SCS6012.

The power supply is rated as follows:

### INPUT

85Vac-265Vac  
47Hz-63Hz

### OUTPUT

+12V @ 5.0A

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 an estimation and statistical nature and much dependent on the quality factory of the components being used. In addition, the ambient temp for the MTBF prediction is based on 30°C.

## **2) RELIABILITY PREDICTION RESULT**

A summary of the reliability prediction is given in Table 1.

And the predicted mean time between failure (MTBF): 299,788hrs.

## **3) COMMENTS**

It must be noted that however, the loading is assumed to be a t 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 figures.

## MTBF CALCULATION

**TABLE 1.**

ITEM	COMPONENT TYPE	$\lambda G$	$\pi Q$	Ni	$\lambda_{EQUIP}$
------	----------------	-------------	---------	----	-------------------

**RESISTOR:**

1.	Fixed Film	0.0037	10	26	0.962
2.	Film Power	0.01	10	5	0.5
3.	Thermistor	0.0014	10	1	0.014
4.	Non-Wirewound Variable	0.0029	8	1	0.0232

**CAPACITOR:**

1.	Electrolytic	0.0013	10	7	0.091
2.	Ceramic	0.0017	10	10	0.17
3.	Metallized Paper / Plastic	0.0007	10	7	0.049

**SEMICONDUCTOR:**

1.	Diode, General Purpose	0.0036	8	7	0.2016
2.	Diode, Fast Recovery Pwr. Rectifier	0.023	8	2	0.368
3.	Diode, Power Rectifier Schottky Pwr.	0.0028	8	1	0.0224
4.	Zener Diode, General Purpose	0.0033	8	1	0.0264
5.	Si Power MOSFET	0.014	8	1	0.112
6.	SCR	0.0025	8	2	0.04
7.	Transistors	0.00015	8	2	0.0024

**INDUCTIVE PARTS:**

1.	Transformer, Flyback	0.0058	3	1	0.0174
2.	Coil, Fixed Inductor or Choke	0.000032	3	3	0.000288

**INTEGRATED CIRCUIT:**

1.	Linear	0.0095	10	2	0.19
2.	Opto Isolator	0.027	8	1	0.216

**OTHERS:**

1.	Fuse	0.010	N/A	1	0.01
2.	Printed Wire Board	0.022	2	1	0.044
3.	I/P Connector	0.050	2	1	0.1
4.	PCB Connector	0.044	2	2	0.176

**TOTAL EQUIP. FAILURE RATE = 3.335688**

$$\text{MTBF (hrs)} = \frac{1 \times 10^6 \text{ hrs}}{\text{Total } \lambda \text{ EQUIP}} = 299,788 \text{ hrs}$$