

Switching Power Supply/Adaptor MTBF Report

Part No. : CSS500 Series

Description : 500W

Date : 2010.03.10

MTBF Model

The calculation is based on Bellcore TR-332 Issue 6 Method I Case 1 Part Counts Reliability. The prediction were performed with the power supply operating in a Ground Benign (Gb) controlled environment. The Component operating temperature is 40 degree C, Electrical Stress is 50% and PI-Q = 1 (Quality Level II).

$$MTBF = \frac{1}{\lambda_{\text{equip}}} = \frac{1}{\sum_{j=1}^n N_j (\lambda_G) I(\pi_Q) i} \times 10^9$$

Where : λ_G : Generic Failure Rate for the 'i'ith (Failures / 10^9 Hours)
 λ_{equip} : Total Equipment Failure Rate (Failures / 10^9 Hours)
 N_i : Quantity of the 'i'ith Generic Part
 π_Q : Quality Factor
 π_T : Temperature Factor
 n : Number of different Generic Part categories

Part Type	λ_G	π_Q	π_T	N_i	λ_{equip}	Remark
Resistor, Fixed, Film (Carbon, Oxide, Metal)	3	1	1.3	143	557.7	
Capacitors discrete, Fixed, Aluminum <400uf	15	1	2.4	14	504	
Capacitors discrete, Fixed, Aluminum 400uf - 12000uf	25	1	2.4	3	180	
Capacitors discrete, Fixed, Ceramic	1	1	1.1	62	68.2	Including of EMI Y Cap.
Capacitors discrete, Fixed, Plastic	10	1	1.3	5	65	Including of EMI X Cap.
Varistor, Silicom Carbide or Metal Oxide	10	1	1	0	0	
Thermistor Disk	10	1	1	1	10	
Thermistor Rod	15	1	1	1	15	
Polymetric Positive Temp. Coefficient Device	10	1	1	2	20	
Diodes, Silicon, General Purpose < 1A	12	1	1	39	468	
Diodes, Silicon, General Purpose 1 - 20A	30	1	3.07	9	828.9	Including of Bridge Diode
Diodes, Silicon, General Purpose > 20A	120	1	3.07	0	0	Output Rectifiers
Voltage Regulator <= 0.5W	3	1	1	4	12	TL431/Zener Diode
Voltage Regulator 0.6-1.5W	6	1	1	0	0	
Transistors, NPN/PNP <= 0.6W	4	1	1	12	48	
Transistors, Field Effect, Switch	20	1	3.07	9	552.6	
Diodes, Thyristor > 1A	25	1	1	0	0	
Integrated Circuits Analog, 200 Transistors	52	1	1	5	260	PWM IC
Single Isolators, Phototransistor Detector	15	1	1	3	45	Optocouplers
Resistors, Variable, Non-Wirewound, Trimmer < 200K Ohm	25	1	1	2	50	
Inductive Devices, Transformer, Power	19	1	2.15	3	122.55	Transformer
Inductive Devices, Coil, Power Filter	19	1	2.15	5	204.25	Line Filter
Miscellaneous Devices, Fuse < 30A	5	1	1	2	10	
Rotating Devices, Fan Assembly < 6" Diameter	100	1	1	1	100	
Switches, Toggle, Push-button, Rocker or Slide(Add 5 per Contact Pair)	10	1	1	0	0	
Connectors, General Purpose, Power (Per Pin)	5	1	1	27	135	Input & Output Connector

Total Equipment Failure Rate (Failures / 10^9 Hours)

4256.2

MTBF = 234,951 Hours