

**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).

**Bell Core**

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

Where :

$\lambda_G$  : Generic Failure Rate for the 'ith (Failures /  $10^9$  Hours)  
 $\lambda_{\text{equip}}$  : Total Equipment Failure Rate (Failures /  $10^9$  Hours)  
 $N_i$  : Quantity of the 'ith Generic Part

$\pi_Q$  : Quality Factor  
 $\pi_T$  : Temperature Factor  
 $n$  : Number of different Generic Part categories

Part Type	$\lambda_G$	$\pi_Q$	Temp.	$\pi_T$	$N_i$	$\lambda_{\text{equip}}$	Remark
Resistor, Fixed, Film (Carbon, Oxide, Metal)	3	1	60	1.3	82	319.8	
Capacitors discrete, Fixed, Aluminum <400uf	15	1	60	2.4	9	324	
Capacitors discrete, Fixed, Aluminum 400uf - 12000uf	25	1	60	2.4	4	240	
Capacitors discrete, Fixed, Ceramic	1	1	60	1.1	36	39.6	Including of EMI Y Cap.
Capacitors discrete, Fixed, Plastic	10	1	60	1.3	5	65	Including of EMI X Cap.
Varistor, Silicom Carbide or Metal Oxide	10	1	40	1	0	0	
Thermistor Disk	10	1	40	1	1	10	
Thermistor Rod	15	1	40	1	0	0	
Polymetric Positive Temp. Coefficient Device	10	1	40	1	2	20	
Diodes, Silicon, General Purpose < 1A	12	1	40	1	19	228	
Diodes, Silicon, General Purpose 1 - 20A	30	1	90	3.07	7	644.7	Including of Bridge Diode
Diodes, Silicon, General Purpose > 20A	120	1	90	3.07	0	0	Output Rectifiers
Voltage Regulator <= 0.5W	3	1	40	1	12	36	TL431/Zener Diode
Voltage Regulator 0.6-1.5W	6	1	40	1	0	0	
Transistors, NPN/PNP <= 0.6W	4	1	40	1	3	12	
Transistors, Field Effect, Switch	20	1	90	3.07	8	491.2	
Diodes, Thyristor > 1A	25	1	40	1	1	25	
Integrated Circuits Analog, 200 Transistors	52	1	40	1	3	156	PWM IC
Single Isolators, Phototransistor Detector	15	1	40	1	3	45	Optocouplers
Resistors, Variable, Non-Wirewound, Trimmer < 200K Ohm	25	1	40	1	1	25	
Inductive Devices, Transformer, Power	19	1	90	2.15	4	163.4	Transformer
Inductive Devices, Coil, Power Filter	19	1	90	2.15	5	204.25	Line Filter
Miscellaneous Devices, Fuse < 30A	5	1	40	1	2	10	
Rotating Devices, Fan Assembly < 6" Diameter	100	1	40	1	1	100	
Switchs, Toggle, Push-button, Rocker or Slide( Add 5 per Contact Pair)	10	1	40	1	1	10	
Connectors, General Purpose, Power (Per Pin)	5	1	40	1	16	80	Input & Output Connector

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

3248.95

**MTBF =**307,792 **Hours**