6.1 DIODES, LOW FREQUENCY

SPECIFICATION
MIL-S-19500

DESCRIPTION
Low Frequency Diodes: General Purpose Analog, Switching, Fast Recovery, Power Rectifier, Transient Suppressor, Current Regulator, Voltage Regulator, Voltage Reference

$$\lambda_p = \lambda_b \pi_T \pi_S \pi_C \pi_Q \pi_E \quad \text{Failures/}10^6 \text{ Hours}$$

Base Failure Rate - λ_b

Diode Type/Application	λ_b
General Purpose Analog	.0038
Switching	.0010
Power Rectifier, Fast Recovery	.069
Power Rectifier/Schottky Power Diode	.0030
Power Rectifier with High Voltage Stacks	.0050/ Junction
Transient Suppressor/Varistor	.0013
Current Regulator	.0034
Voltage Regulator and Voltage Reference (Avalanche and Zener)	.0020

Temperature Factor - π_T
(General Purpose Analog, Switching, Fast Recovery, Power Rectifier, Transient Suppressor)

T_J (°C)	π_T	T_J (°C)	π_T
25	1.0	105	9.0
30	1.2	110	10
35	1.4	115	11
40	1.6	120	12
45	1.9	125	14
50	2.2	130	15
55	2.6	135	16
60	3.0	140	18
65	3.4	145	20
70	3.9	150	21
75	4.4	155	23
80	5.0	160	25
85	5.7	165	28
90	6.4	170	30
95	7.2	175	32
100	8.0		

$$\pi_T = \exp\left(-3091\left(\frac{1}{T_J + 273} - \frac{1}{298}\right)\right)$$

T_J = Junction Temperature (°C)

Temperature Factor - π_T
(Voltage Regulator, Voltage Reference, and Current Regulator)

T_J (°C)	π_T	T_J (°C)	π_T
25	1.0	105	3.9
30	1.1	110	4.2
35	1.2	115	4.5
40	1.4	120	4.8
45	1.5	125	5.1
50	1.6	130	5.4
55	1.8	135	5.7
60	2.0	140	6.0
65	2.1	145	6.4
70	2.3	150	6.7
75	2.5	155	7.1
80	2.7	160	7.5
85	3.0	165	7.9
90	3.2	170	8.3
95	3.4	175	8.7
100	3.7		

$$\pi_T = \exp\left(-1925\left(\frac{1}{T_J + 273} - \frac{1}{298}\right)\right)$$

T_J = Junction Temperature (°C)