6.4 TRANSISTORS, LOW FREQUENCY, SI FET

SPECIFICATION
MIL-S-19500

DESCRIPTION
N-Channel and P-Channel Si FET (Frequency ≤ 400 MHz)

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

Base Failure Rate - λ_b

Transistor Type	λ_b
MOSFET	.012
JFET	.0045

Temperature Factor - π_T

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)

Quality Factor - π_Q

Quality	π_Q
JANTXV	.70
JANTX	1.0
JAN	2.4
Lower	5.5
Plastic	8.0

Application Factor - π_A

Application (P_r, Rated Output Power)	π_A
Linear Amplification (P_r < 2W)	1.5
Small Signal Switching	.70
Power FETs (Non-linear, $P_r \geq$ 2W)	
$2 \leq P_r <$ 5W	2.0
$5 \leq P_r <$ 50W	4.0
$50 \leq P_r <$ 250W	8.0
$P_r \geq$ 250W	10

Environment Factor - π_E

Environment	π_E
G_B	1.0
G_F	6.0
G_M	9.0
N_S	9.0
N_U	19
A_{IC}	13
A_{IF}	29
A_{UC}	20
A_{UF}	43
A_{RW}	24
S_F	.50
M_F	14
M_L	32
C_L	320