

APEX MICROTECHNOLOGY CORPORATION
RELIABILITY PREDICTION
PA89

by

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Date of prediction: 15-Mar-01

This reliability prediction is based on MIL-HDBK-217F,
December 2, 1991 including Notice 2, February 28, 1995.

Conditions of this prediction are as follows:

Hybrid quality level is	Commercial
Environment is Gf	Ground, Fixed
Case temperature is	35 C
Internal Power Dissipation =	10 W
Supply voltage is +/-	400 V
An AC signal is applied.	
Product introduction date:	01-Apr-90

The results of this prediction are:

62.2 failures per million hours; or,
MTBF=16.1 thousand hours.

Transistors, Low Frequency, Bipolar:

$$L_p = L_b * P_{iT} * P_{iR} * P_{iS}$$

Q26,36	Volts = 40	Watts = 1.2	Tj = 175	'K/W= 125
Usage: Vstress = 0.65	Vpwr = 0.65	Ic = 1E-05	Vs = 0.0163	Power = 7E-06
Lb PiT	PiR PiS	Nc	Tj = 35.001	
0.00074 1.25903	1.0698 0.0473	2		9.43E-05

Q1	Volts = 20	Watts = 0.38	Tj = 150	'K/W= 328.95
Usage: Vstress = 0.65	Vpwr = 0.65	Ic = 0.0007	Vs = 0.0325	Power = 0.0004
Lb PiT	PiR PiS	Nc	Tj = 35.139	
0.00074 1.262911	0.6991 0.0498	1		3.25E-05

Q2	Volts = 20	Watts = 0.38	Tj = 150	'K/W= 328.95
Usage: Vstress = 3	Vpwr = 3	Ic = 0.0007	Vs = 0.15	Power = 0.002
Lb PiT	PiR PiS	Nc	Tj = 35.641	
0.00074 1.277095	0.6991 0.0716	1		4.73E-05

Transistors, Low Frequency, Si JFET: Lb = 0.0045

$$L_p = L_b * P_{iT}$$

Q30,31,34,35	Volts = 30	Watts = 0.8	Tj = 150	'K/W= 156.25
Usage: Vpwr = 1.5	Id = 1E-06	Nc	Power = 2E-06	
Lb PiT		Tj = 35		
0.0045 1.233353		4		0.0222

Q57,59,60,61	Volts = 30	Watts = 0.8	Tj = 150	'K/W= 156.25
Usage: Vpwr = 2.5	Id = 1E-06	Nc	Power = 3E-06	
Lb PiT		Tj = 35		
0.0045 1.233357		4		0.0222

Q58	Volts = 30	Watts = 0.8	Tj = 150	'K/W= 156.25
Usage: Vpwr = 4	Id = 1E-06	Nc	Power = 4E-06	
Lb PiT		Tj = 35.001		
0.0045 1.233363		1		0.00555

Q25A,B	Volts = 25	Watts = 0.55	Tj = 150	'K/W= 227.27
Usage: Vpwr = 3.285	Id = 0.0007	Nc	Power = 0.0021	
Lb PiT		Tj = 35.485		
0.0045 1.245533		2		0.01121

Transistors, Low Frequency, Si MOSFET: Lb = 0.012

$$L_p = L_b * P_{iT}$$

Q8,14,20,42,50,56	Volts = 450	Watts = 25	Tj =	150	'K/W= 5	
Usage:	Fraction Output Pwr = 1/	3			Power = 3.3333	
Lb PiT				Nc	Tj = 51.667	
0.012 1.699907				6		0.122393
Q3,11,17	Volts = 450	Watts = 4	Tj =	150	'K/W= 31.25	
Usage:	Vpwr = 133.33	Id = 8E-05			Power = 0.0107	
Lb PiT				Nc	Tj = 35.333	
0.012 1.241709				3		0.044702
Q5,28,33,41,43,52	Volts = 450	Watts = 4	Tj =	150	'K/W= 31.25	
Usage:	Vpwr = 263.9	Id = 0.0025			Power = 0.6545	
Lb PiT				Nc	Tj = 55.452	
0.012 1.820134				6		0.13105
Q6,51	Volts = 450	Watts = 4	Tj =	150	'K/W= 31.25	
Usage:	Vpwr = 3	Id = 8E-05			Power = 0.0002	
Lb PiT				Nc	Tj = 35.007	
0.012 1.233523				2		0.029605
Q7,13,19,44,45,47,48,53,55	Volts = 450	Watts = 4	Tj =	150	'K/W= 31.25	
Usage:	Vpwr = 133.33	Id = 0.0013			Power = 0.1733	
Lb PiT				Nc	Tj = 40.417	
0.012 1.37403				9		0.148395
Q9,10,15,16,22,23	Volts = 450	Watts = 4	Tj =	150	'K/W= 31.25	
Usage:	Vpwr = 133.33	Id = 0.0007			Power = 0.0867	
Lb PiT				Nc	Tj = 37.708	
0.012 1.302402				6		0.093773
Q21,32,40,46,49,54	Volts = 450	Watts = 4	Tj =	150	'K/W= 31.25	
Usage:	Vpwr = 133.33	Id = 0.0003			Power = 0.04	
Lb PiT				Nc	Tj = 36.25	
0.012 1.264902				6		0.091073
Q29	Volts = 450	Watts = 4	Tj =	150	'K/W= 31.25	
Usage:	Vpwr = 6	Id = 0.0013			Power = 0.0075	
Lb PiT				Nc	Tj = 35.234	
0.012 1.239222				2		0.029741

