APEX MICROTECHNOLOGY CORPORATION
RELIABILITY PREDICTION
PA95

by

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Date of prediction: 20-May-04

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	40	C
Internal Power Dissipation =	1	W
Supply voltage is +/-	400	V

An AC signal is applied.
Product introduction date: 25-Nov-99

The results of this prediction are:
24.4 failures per million hours; or,
MTBF=41 thousand hours.

Transistors, Low Frequency, Bipolar:
Lp = Lb * PiT * PiR * PiS

Q14,21			Volts =	40	Watts =	1.2	Tj =	175	'K/W=	125	
Usage:	Vstress =	4	Vpwr =	2	Ic =	1E-06	Vs =	0.1	Power =	2E-06	
Lb	PiT		PiR	PiS				Nc	Tj =	40	
0.00074	1.404908		1.0698	0.0614				2			0.000136
Q1			Volts =	20	Watts =	0.38	Tj =	150	'K/W=	328.95	
Usage:	Vstress =	0.65	Vpwr =	0.65	Ic =	0.0001	Vs =	0.0325	Power =	8E-05	
Lb	PiT		PiR	PiS				Nc	Tj =	40.027	
0.00074	1.40571		0.6991	0.0498				1			3.62E-05
Q2			Volts =	20	Watts =	0.38	Tj =	150	'K/W=	328.95	
Usage:	Vstress =	3	Vpwr =	3	Ic =	0.0001	Vs =	0.15	Power =	0.0004	
Lb	PiT		PiR	PiS				Nc	Tj =	40.123	
0.00074	1.408643		0.6991	0.0716				1			5.22E-05

Transistors, Low Frequency, Si JFET: Lb = 0.0045
Lp = Lb * PiT

Q15A,B		Volts =	25	Watts =	0.55	Tj =	150	'K/W=	227.27	
Usage:		Vpwr =	4	Id =	0.0001			Power =	0.0005	
Lb	PiT						Nc	Tj =	40.114	
0.0045	1.365887						2			0.012293
Q6,8,9,31,32		Volts =	450	Watts =	0.38	Tj =	150	'K/W=	328.95	
Usage:		Vpwr =	0.7	Id =	1E-07			Power =	7E-08	
Lb	PiT						Nc	Tj =	40	
0.0045	1.362842						5			0.030664

Transistors, Low Frequency, Si MOSFET: Lb = 0.012
Lp = Lb * PiT

Q30		Volts =	450	Watts =	15	Tj =	150	'K/W=	8.3333	
Usage:		Vpwr =	200	Id =	0.0008			Power =	0.15	
Lb	PiT						Nc	Tj =	41.25	
0.012	1.396593						2			0.033518
Q12,13		Volts =	450	Watts =	4	Tj =	150	'K/W=	31.25	
Usage:		Vpwr =	397	Id =	0.0001			Power =	0.0496	
Lb	PiT						Nc	Tj =	41.551	
0.012	1.404797						2			0.033715
Q28		Volts =	450	Watts =	4	Tj =	150	'K/W=	31.25	
Usage:		Vpwr =	397	Id =	0.0003			Power =	0.0993	
Lb	PiT						Nc	Tj =	43.102	
0.012	1.447614						2			0.034743
Q5,11,25,31		Volts =	450	Watts =	25	Tj =	150	'K/W=	5	
Usage:		Fraction Output Pwr = 1/			2			Power =	0.5	
Lb	PiT						Nc	Tj =	42.5	
0.012	1.430902						4			0.068683

Q3,10,24			Volts =	450	Watts =	4	Tj =	150	'K/W=	31.25	
Usage:			Vpwr =	200	Id =	0.0008			Power =	0.15	
Lb	PiT							Nc	Tj =	44.688	
0.012	1.492299							3			0.053723

Q29			Volts =	450	Watts =	4	Tj =	150	'K/W=	31.25	
Usage:			Vpwr =	5	Id =	0.0005			Power =	0.0025	
Lb	PiT							Nc	Tj =	40.078	
0.012	1.364935							1			0.016379

Capacitors, ceramic general purpose type CK:
Lp = Lb * PiT * PiC * PiV Lb = 0.00099

C2			Volts =	50	pF =	470				
Usage:	Vstress =	1.5					S =	0.03		
Lb	PiT	PiC	Pi V					Nc		
0.00099	1.92167	0.269	1.0001					1		0.000513

C1,3,4,5			Volts =	500	pF =	22				
Usage:	Vstress =	395					S =	0.79		
Lb	PiT	PiC	Pi V					Nc		
0.00099	1.92167	0.205	3.2826					4		0.00511

Diodes, Low Frequency:
Lp = Lb * PiT * PiS * PiC

Diodes, Zener, Lb = 0.002

D1,2			Volts =	5.6	Watts =	1.35	Tj =	175	'K/W=	111.11	
Usage:					Ic =	1E-06			Power =	6E-06	
Lb	PiT	PiS	PiC					Nc	Tj =	40.001	
0.002	1.362858	1	2					2			0.010903

Sum of all components 0.300469

Hybrid microcircuit:
Lp=sumLc*(1+.2*PiE) * PiF * PiQ * PiL

0.300469	1.4	5.8	10	1

Total failures per million hours = 24.398
Mean time between failures = 40987