APEX MICROTECHNOLOGY CORPORATION
RELIABILITY PREDICTION
PA94

by

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Date of prediction: 05-Dec-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	40	C
Internal Power Dissipation =	5	W
Supply voltage is +/-	400	V

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

The results of this prediction are:
26.8 failures per million hours; or,
MTBF=37.4 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 =	0.0025	Vs =	0.0325	Power =	0.0016	
Lb	PiT		PiR	PiS				Nc	Tj =	40.535	
0.00074	1.421171		0.6991	0.0498				1			3.66E-05
Q2			Volts =	20	Watts =	0.38	Tj =	150	'K/W=	328.95	
Usage:	Vstress =	3	Vpwr =	3	Ic =	0.0025	Vs =	0.15	Power =	0.0075	
Lb	PiT		PiR	PiS				Nc	Tj =	42.467	
0.00074	1.481101		0.6991	0.0716				1			5.49E-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 =	0.0025			Power =	0.01	
Lb	PiT						Nc	Tj =	42.273	
0.0045	1.424622						2			0.012822
Q6		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						1			0.006133

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 =	0.01			Power =	2	
Lb	PiT						Nc	Tj =	56.667	
0.012	1.859858						1			0.022318
Q12,13		Volts =	450	Watts =	4	Tj =	150	'K/W=	31.25	
Usage:		Vpwr =	397	Id =	0.0025			Power =	0.9846	
Lb	PiT						Nc	Tj =	70.768	
0.012	2.3632						2			0.056717

Q28		Volts =	450	Watts =	4	Tj =	150	'K/W=	31.25	
Usage:		Vpwr =	397	Id =	0.005			Power =	1.985	
Lb	PiT						Nc	Tj =	102.03	
0.012	3.769061						1			0.045229

Q5,11,25,31		Volts =	450	Watts =	25	Tj =	150	'K/W=	5	
Usage:		Fraction Output Pwr = 1/			2			Power =	2.5	
Lb	PiT						Nc	Tj =	52.5	
0.012	1.725908						4			0.082844

Q3,10,24		Volts =	450	Watts =	25	Tj =	150	'K/W=	5	
Usage:		Vpwr =	200	Id =	0.01			Power =	2	
Lb	PiT						Nc	Tj =	50	
0.012	1.648687						3			0.059353

Q29		Volts =	450	Watts =	25	Tj =	150	'K/W=	5	
Usage:		Vpwr =	5	Id =	0.005			Power =	0.025	
Lb	PiT						Nc	Tj =	40.125	
0.012	1.366192						1			0.016394

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 =	8.7	Watts =	1.35	Tj =	175	'K/W=	111.11	
Usage:					Ic =	1E-06			Power =	9E-06	
Lb	PiT	PiS	PiC					Nc	Tj =	40.001	
0.002	1.362867	1	2					2			0.010903

Sum of all components	0.318562

Hybrid microcircuit:

Lp=sumLc*(1+.2*PiE)	* PiF	* PiQ	* PiL
0.318562	1.4	5.8	10	1.0343

Total failures per million hours =	26.753
Mean time between failures =	37379