

APEX MICROTECHNOLOGY CORPORATION  
RELIABILITY PREDICTION  
SA50

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	40 C
Internal Power Dissipation =	5 W
Supply voltage is	28 V
An AC signal is applied.	
Product introduction date:	01-Jun-94

The results of this prediction are:

9.33 failures per million hours; or,  
MTBF=107 thousand hours.

Monolithic MOS Digital Devices:

$L_p = C_1 * PiT$

Monolithic Bipolar and MOS Linear Devices:

$L_p = C_1 * PiT$

IC1		Watts = 1.325	Tj = 125	#/Qs = 56	
Usage:		Watts = 0.432		Max Tj = 72.604	
C1	PiT			Nc	
0.01	3.26747			1	0.032675

IC1		Watts = 0.22	Tj = 135	#/Qs = 30	
Usage:		Watts = 0.0011		Max Tj = 40.54	
C1	PiT			Nc	
0.01	0.350636			1	0.003506

Transistors, Low Frequency, Si MOSFET:  $L_b = 0.012$

$L_p = L_b * PiT$

Q10,13		Volts = 100	Watts = 60	Tj = 175	'K/W= 2.5
Usage:		Fraction Output Pwr = 1/	2		Power = 2.5
Lb	PiT			Nc	Tj = 46.25
0.012	1.537218			2	0.036893

Q11,12		Volts = 100	Watts = 60	Tj = 175	'K/W= 2.5
Usage:		Fraction Output Pwr = 1/	20		Power = 0.25
Lb	PiT			Nc	Tj = 40.625
0.012	1.379647			2	0.033112

Capacitors, ceramic general purpose type CK:

$L_p = L_b * PiT * PiC * PiV$        $L_b = 0.00099$

C1		Volts = 50	pF = 10000		
Usage:	Vstress = 12			S = 0.24	
Lb	PiT	PiC	Pi V	Nc	
0.00099	1.92167	0.355	1.064	1	0.000718

C2,3		Volts = 25	pF = 100000		
Usage:	Vstress = 11.4			S = 0.456	
Lb	PiT	PiC	Pi V	Nc	
0.00099	1.92167	0.437	1.439	2	0.00239

