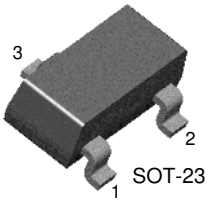
FAIRCHILD SEMICONDUCTOR®

November 2006

MMBT4401K

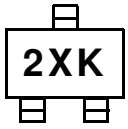
NPN Epitaxial Silicon Transistor

Switching Transistor



1. Base 2. Emitter 3. Collector

Marking



Absolute Maximum Ratings T_a = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current	600	mA
P_C	Collector Dissipation	350	mW
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 ~ 150	°C

Electrical Characteristics T_a=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
BV_{CBO}	Collector-Base Breakdown Voltage	I_C = 100μA, I_E = 0	60		V
BV_{CEO}	Collector-Emitter Breakdown Voltage *	I_C = 1.0mA, I_B = 0	40		V
BV_{EBO}	Emitter-Base Breakdown Voltage	I_E = 100μA, I_C = 0	6		V
I_{BEV}	Base Cut-off Current	V_{CE} = 35V, V_{EB} = 0.4V		100	nA
I_{CEX}	Collector Cut-off Current	V_{CE} = 35V, V_{EB} = 0.4V		100	nA
h_{FE}	DC Current Gain *	V_{CE} = 1V, I_C = 0.1mA V_{CE} = 1V, I_C = 1mA V_{CE} = 1V, I_C = 10mA V_{CE} = 1V, I_C = 150mA V_{CE} = 2V, I_C = 500mA	20 40 80 100 40	 300 	
V_{CE} (sat)	Collector-Emitter Saturation Voltage *	I_C = 150mA, I_B = 15mA I_C = 500mA, I_B = 50mA		0.4 0.75	V V
V_{BE} (sat)	Base-Emitter Saturation Voltage *	I_C= 150mA, I_B = 15mA I_C = 500mA, I_B = 50mA	0.75	0.95 1.2	V V
f_T	Current Gain Bandwidth Product	I_C = 20mA, V_{CE} = 10V, f = 100MHz	250		MHz
C_{ob}	Output Capacitance	V_{CB}=5V, I_E=0, f=100KHz		6.5	pF
t_{ON}	Turn On Time	V_{CC} = 30V, V_{BE} = 2V I_C = 150mA, I_{B1} = 15mA		35	ns
t_{OFF}	Turn Off Time	V_{CC} = 30V, I_C = 150mA I_{B1} = I_{B2} = 15mA		255	ns

* Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

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Typical Performance Characteristics

Figure 1. DC current Gain

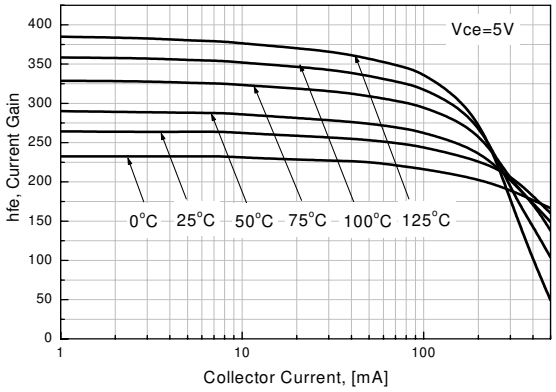


Figure 2. Collector-Emitter Saturation Voltage

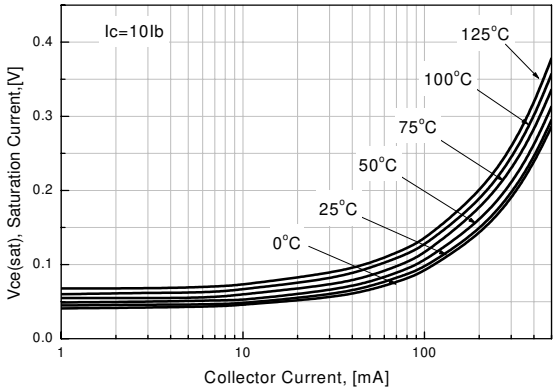


Figure 3. Base-Emitter Saturation Voltage

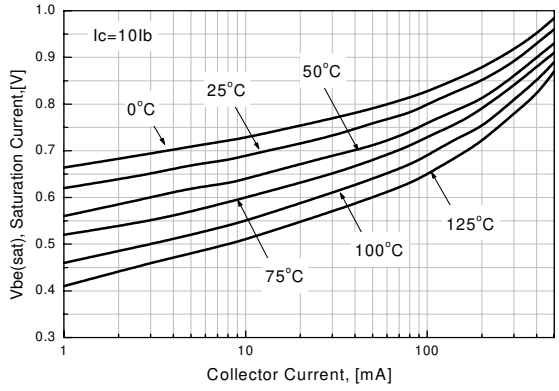


Figure 4. Collector - Base Leakage Current

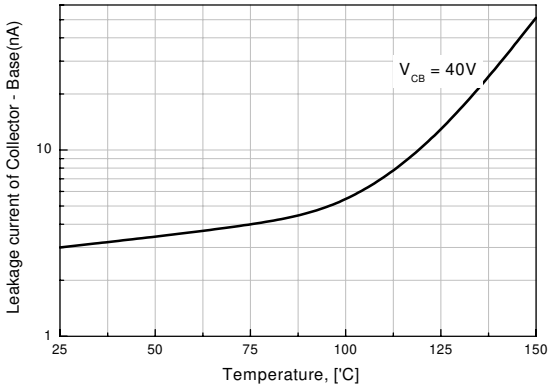


Figure 5. Collector-Base Capacitance

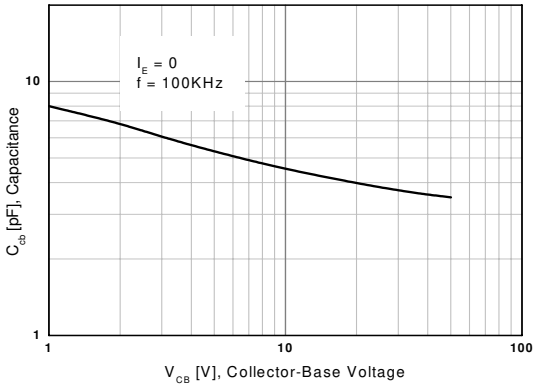
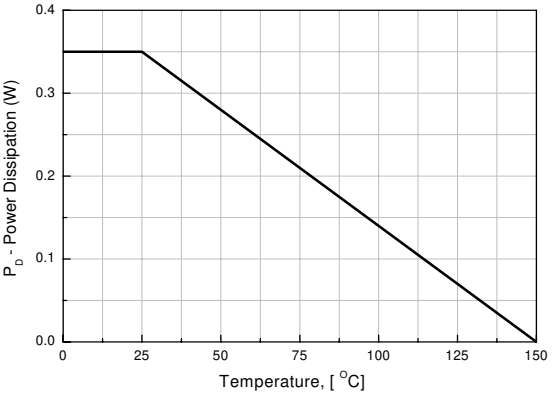
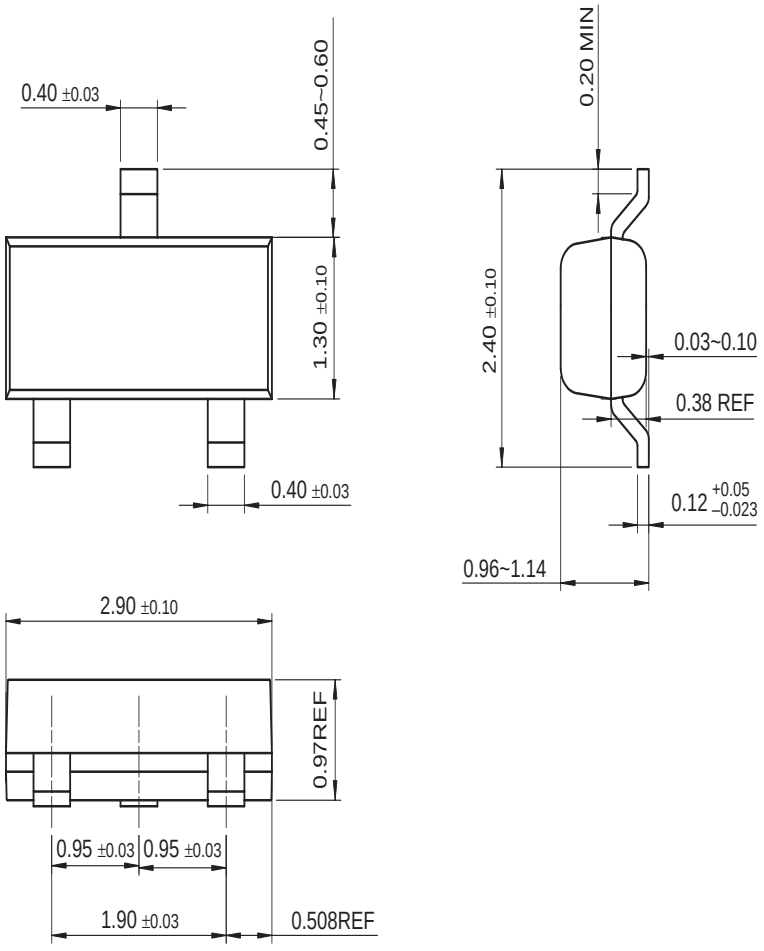


Figure 6. Power Dissipation vs Ambient Temperature



Mechanical Dimensions

SOT-23



Dimensions in Millimeters

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