FAIRCHILD SEMICONDUCTOR®

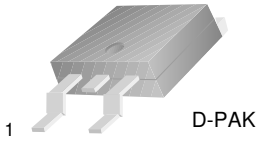
November 2006

MJD112

NPN Silicon Darlington Transistor

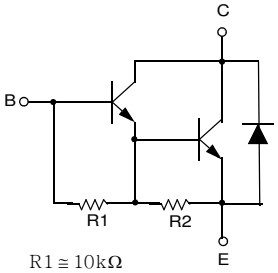
Features

- High DC Current Gain
- Built-in a Damper Diode at E-C
- Lead Formed for Surface Mount Applications (No Suffix)



1.Base 2.Collector 3.Emitter

Equivalent Circuit



$R1 \cong 10k\Omega$
$R2 \cong 0.6k\Omega$

Absolute Maximum Ratings* T_a = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	100	V
V_{CEO}	Collector-Emitter Voltage	100	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current (DC)	2	A
I_{CP}	Collector Current (Pulse)	4	A
I_B	Base Current	50	mA
P_C	Collector Dissipation (T_C=25°C)	20	W
	Collector Dissipation (T_a=25°C)	1.75	W
T_J	Junction Temperature	150	°C
T_{STG}	Storage Temperature	- 65 ~ 150	°C

* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

Electrical Characteristics* T_a=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
V_{CEO}(sus)	Collector-Emitter Sustaining Voltage	I_C = 30mA, I_B = 0	100		V
I_{CEO}	Collector Cut-off Current	V_{CE} = 50V, I_B = 0		20	μA
I_{CBO}	Collector Cut-off Current	V_{CB} = 100V, I_B = 0		20	μA
I_{EBO}	Emitter Cut-off Current	V_{EB} = 5V, I_C = 0		2	mA
h_{FE}	* DC Current Gain	V_{CE} = 3V, I_C = 0.5A V_{CE} = 3V, I_C = 2A V_{CE} = 3V, I_C = 4A	500 1000 200	 12K	
V_{CE}(sat)	* Collector-Emitter Saturation Voltage	I_C = 2A, I_B = 8mA I_C = 4A, I_B = 40mA		2 3	V V
V_{BE}(sat)	* Base-Emitter Saturation Voltage	I_C = 4A, I_B = 40mA		4	V
V_{BE}(on)	* Base-Emitter On Voltage	V_{CE} = 3A, I_C = 2A		2.8	V
f_T	Current Gain Bandwidth Product	V_{CE} = 10V, I_C = 0.75A	25		MHz
C_{ob}	Output Capacitance	V_{CB} = 10V, I_E = 0 f = 0.1MHz		100	pF

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

Typical Characteristics

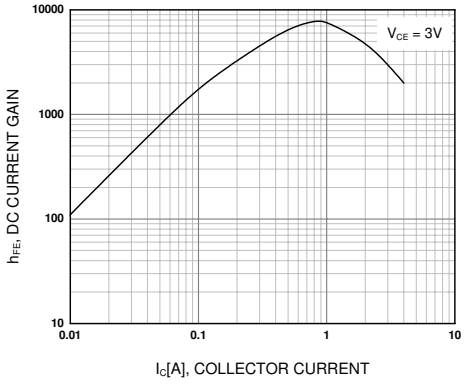


Figure 1. DC current Gain

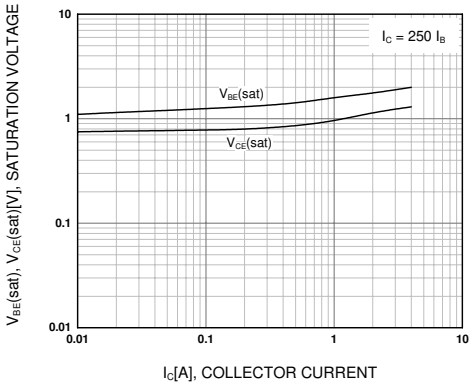


Figure 2. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage

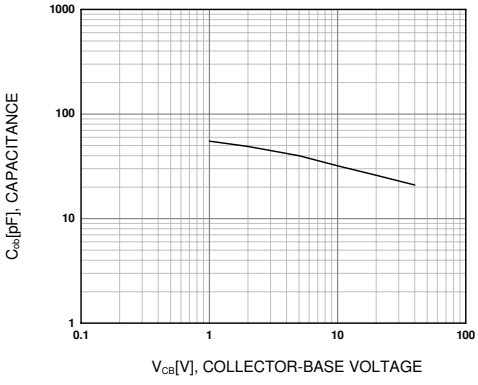


Figure 3. Collector Output Capacitance

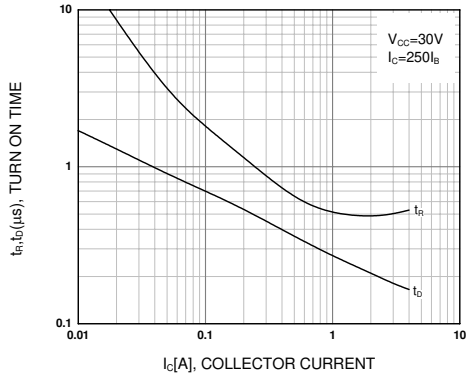


Figure 4. Turn On Time

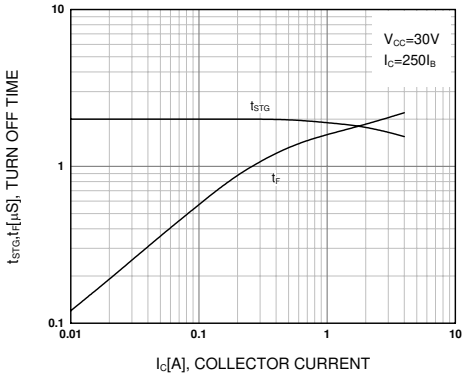


Figure 5. Turn Off Time

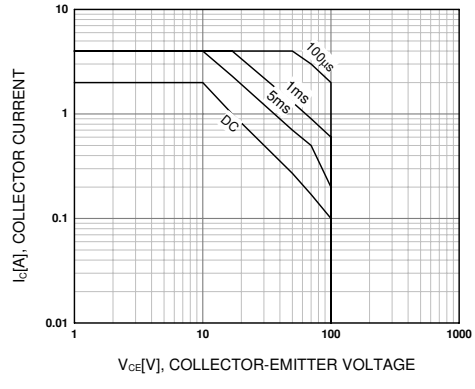


Figure 6. Safe Operating Area

Typical Characteristics (Continued)

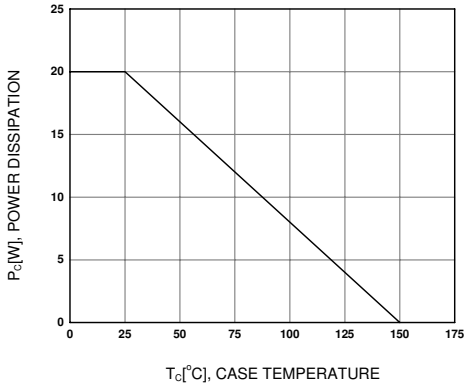
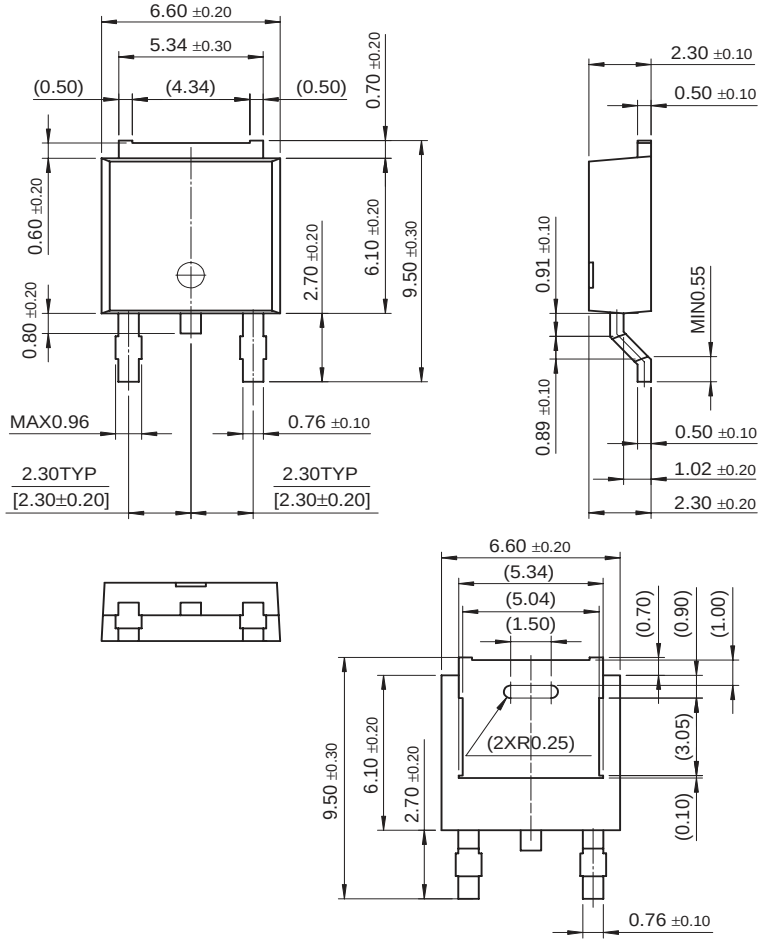


Figure 1. Power Derating

Mechanical Dimensions

D-PAK



Dimensions in Millimeters

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