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## MJD117

### D-PAK for Surface Mount Applications

- High DC Current Gain
- Built-in a Damper Diode at E-C
- Lead Formed for Surface Mount Applications (No Suffix)
- Straight Lead (I-PAK, “ - I ” Suffix)
- Electrically Similar to Popular TIP117

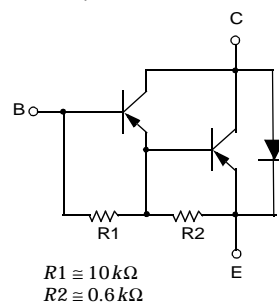


### PNP Silicon Darlington Transistor

#### Absolute Maximum Ratings $T_C=25^\circ\text{C}$ 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 ( $T_C=25^\circ\text{C}$ )	20	W
	Collector Dissipation ( $T_a=25^\circ\text{C}$ )	1.75	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 65 ~ 150	$^\circ\text{C}$

Equivalent Circuit



#### Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

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

\* Pulse Test:  $PW \leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

# Typical Characteristics

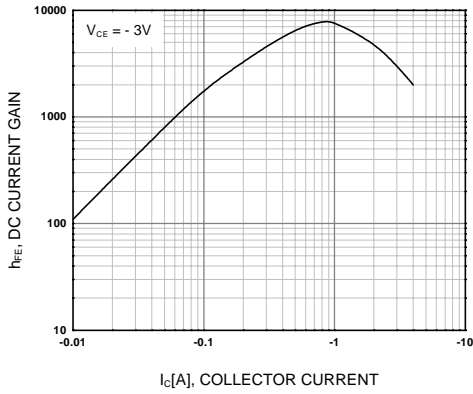


Figure 1. DC current Gain

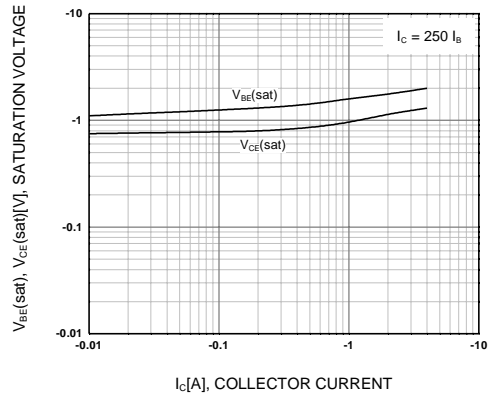


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

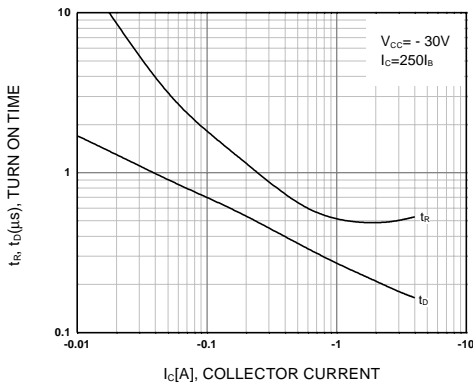


Figure 3. Collector Output Capacitance

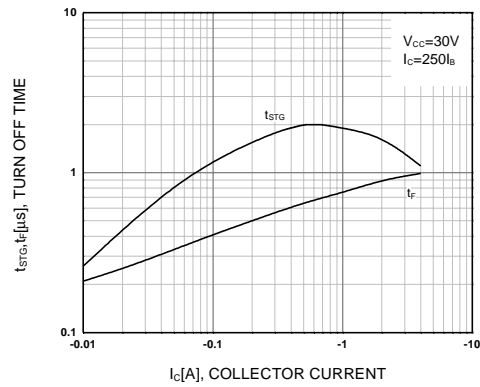


Figure 4. Turn On Time

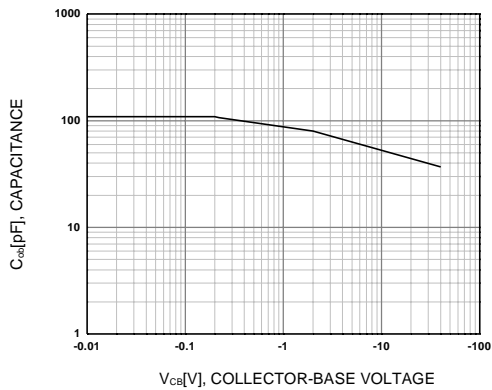


Figure 5. Turn Off Time

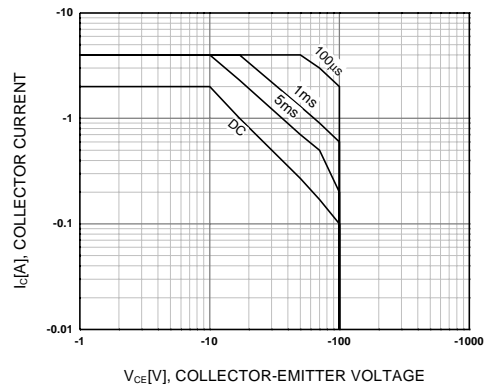


Figure 6. Safe Operating Area

# Typical Characteristics (Continued)

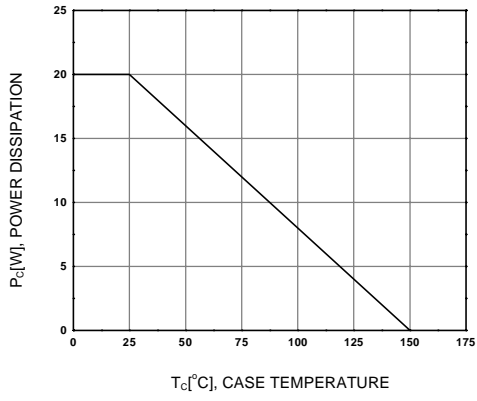
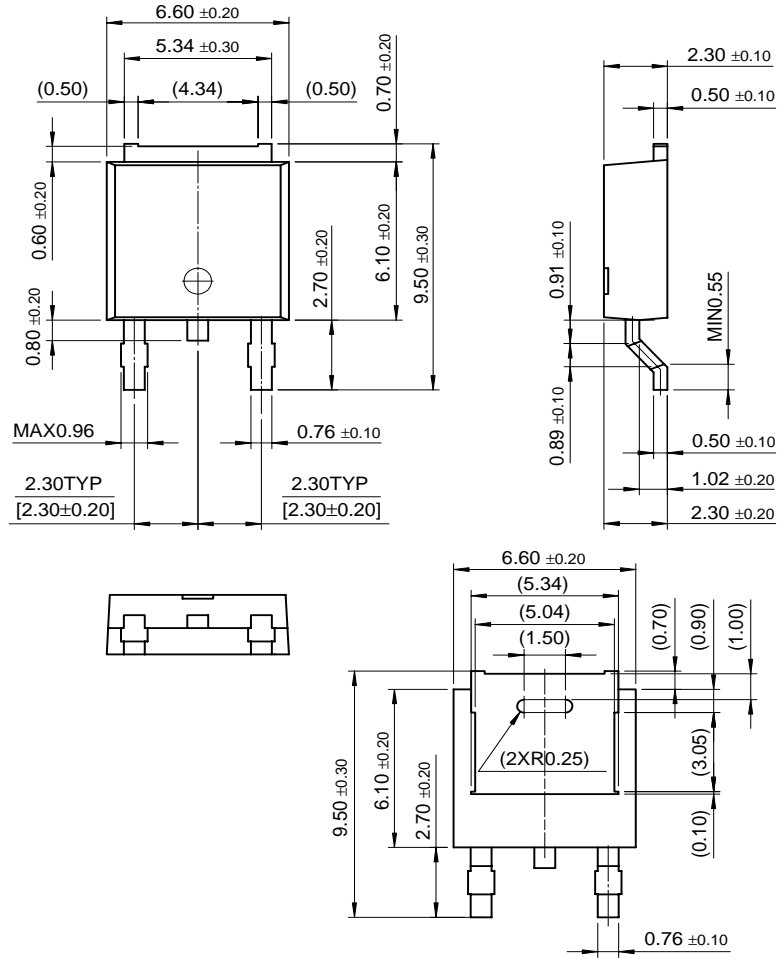


Figure 7. Power Derating

Package Dimensions

D-PAK



Dimensions in Millimeters

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