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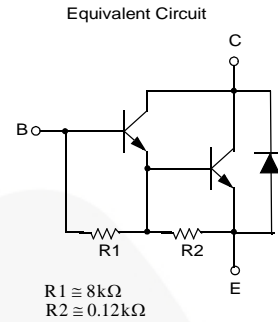
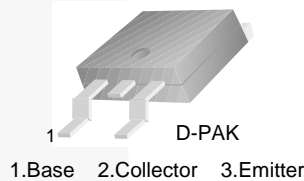


March 2016

# MJD122 NPN Silicon Darlington Transistor

## Features

- D-PAK for Surface Mount Applications
- High DC Current Gain
- Built-in a Damper Diode at E-C
- Lead Formed for Surface Mount Applications
- Electrically Similar to Popular TIP122
- Complement to MJD127



## Ordering Information

Part Number	Top Mark	Package	Packing Method
MJD122TF	MJD122	TO-252 3L (DPAK)	Tape and Reel

## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  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)	8	A
$I_{CP}$	Collector Current (Pulse)	16	A
$I_B$	Base Current	120	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 to 150	$^\circ\text{C}$

## Electrical Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Test Condition	Min.	Max.	Units
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage <sup>(1)</sup>	$I_C = 30\text{ mA}, I_B = 0$	100		V
$I_{CEO}$	Collector Cut-off Current	$V_{CE} = 50\text{ V}, I_B = 0$		10	$\mu\text{A}$
$I_{CBO}$	Collector Cut-off Current	$V_{CB} = 100\text{ V}, I_E = 0$		10	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 5\text{ V}, I_C = 0$		2	mA
$h_{FE}$	DC Current Gain <sup>(1)</sup>	$V_{CE} = 4\text{ V}, I_C = 4\text{ A}$ $V_{CE} = 4\text{ V}, I_C = 8\text{ A}$	1000 100	12K	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage <sup>(1)</sup>	$I_C = 4\text{ A}, I_B = 16\text{ mA}$ $I_C = 8\text{ A}, I_B = 80\text{ mA}$		2 4	V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage <sup>(1)</sup>	$I_C = 8\text{ A}, I_B = 80\text{ mA}$		4.5	V
$V_{BE(on)}$	Base-Emitter On Voltage <sup>(1)</sup>	$V_{CE} = 4\text{ V}, I_C = 4\text{ A}$		2.8	V
$C_{ob}$	Output Capacitance	$V_{CB} = 10\text{ V}, I_E = 0$ $f = 0.1\text{ MHz}$		200	pF

### Note:

1. Pulse test:  $p_w \leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .

## Typical Performance Characteristics

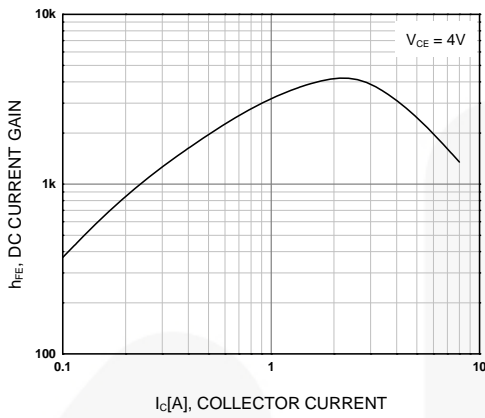


Figure 1. DC current Gain

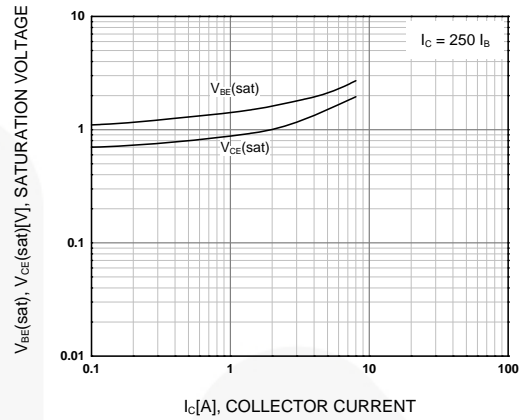


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

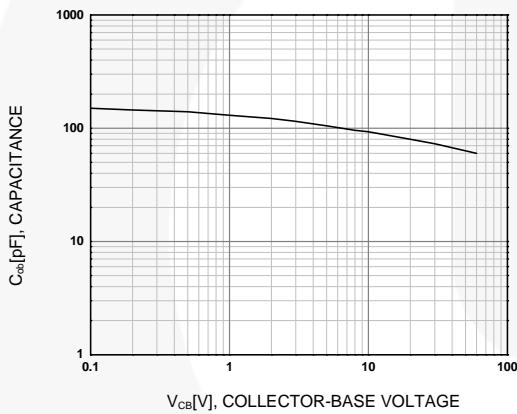


Figure 3. Collector Output Capacitance

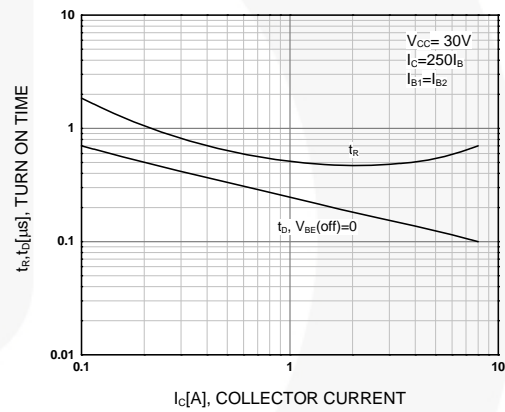


Figure 4. Turn On Time

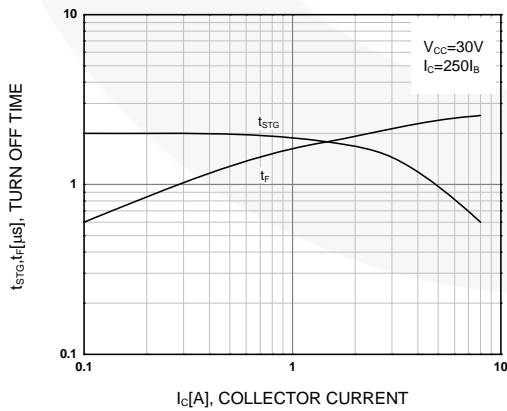


Figure 5. Turn Off Time

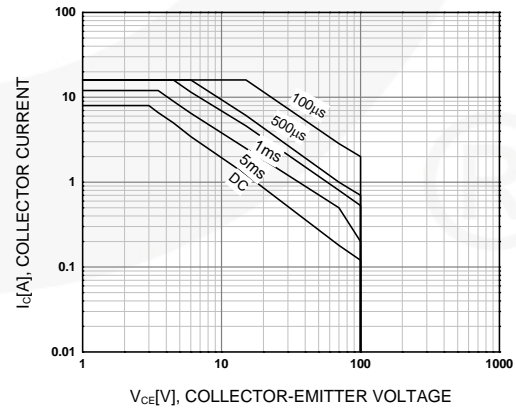
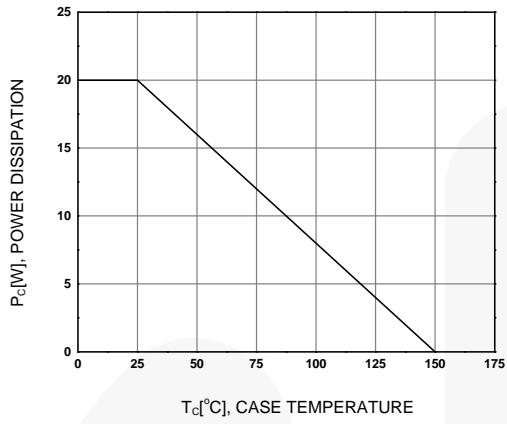


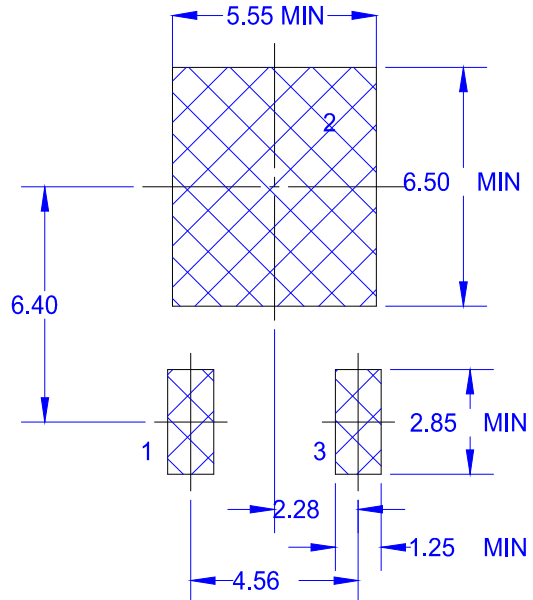
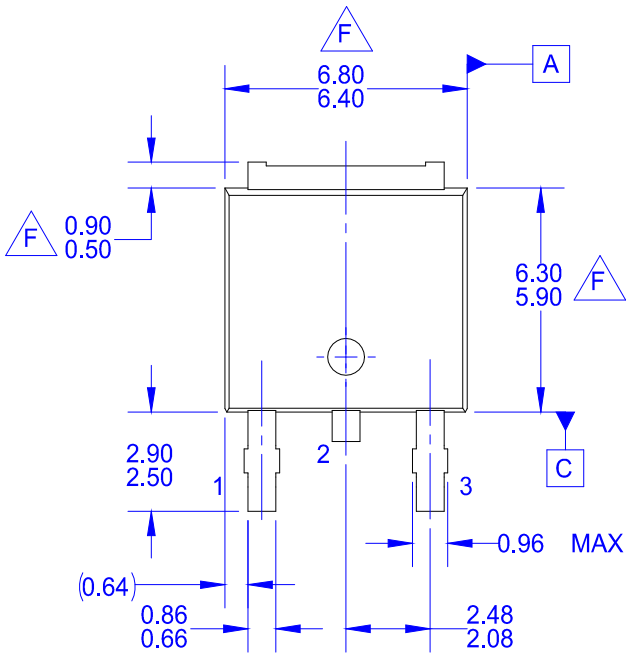
Figure 6. Safe Operating Area

### Typical Performance Characteristics (Continued)

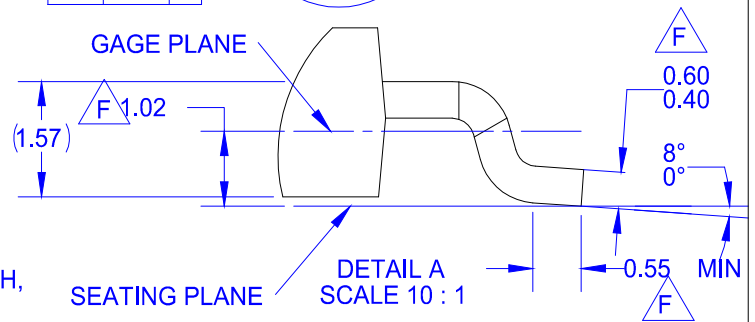
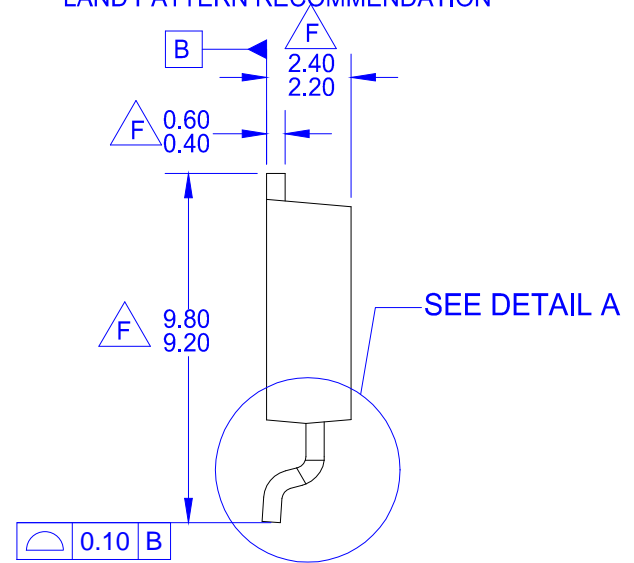
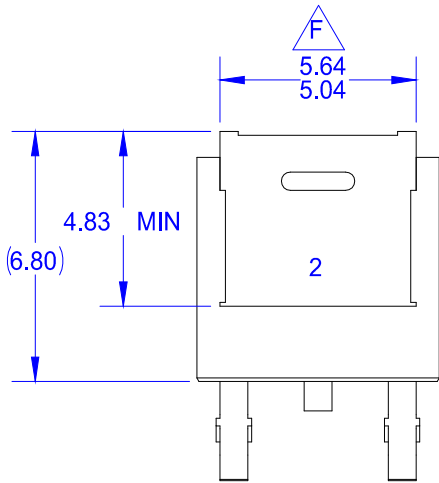


**Figure 7. Power Derating Curve**





LAND PATTERN RECOMMENDATION



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- B) ALL DIMENSION ARE IN MILLIMETER
- C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS
- D) LAD PATTERN PER IPC7351A ATANDARD TO228P991X239-3N
- E) DRAWING FILE NAME: MKT-TO252D03REV4.
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