



ON Semiconductor®

MJD31CE

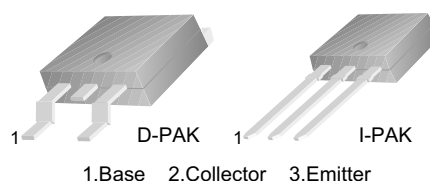
NPN Epitaxial Silicon Transistor

Features

- General-Purpose Amplifier
- Low-Speed Switching Applications
- Lead Formed for Surface Mount Application (No Suffix)
- Electrically Similar to Popular TIP31 and TIP31C

Application

- Switching Regulators
- Converters
- Power Amplifiers



Ordering Information

Part Number	Top Mark	Package	Packing Method
MJD31CETF-SN00207	MJD31CE	TO-252 3L (DPAK)	Tape and Reel
MJD31CEITU	MJD31C-I	TO-251 3L (IPAK)	Rail

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)	3	A
I_{CP}	Collector Current (Pulse)	5	A
I_B	Base Current	1	A
P_C	Collector Dissipation ($T_C=25^\circ\text{C}$)	15	W
	Collector Dissipation ($T_A=25^\circ\text{C}$)	1.56	W
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature	- 65 to +150	$^\circ\text{C}$

MJD31CE — NPN Epitaxial Silicon Transistor

Electrical Characteristics

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

Symbol	Parameter	Conditions	Min.	Max.	Units
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage ⁽¹⁾	$I_C = 30\text{ mA}, I_B = 0$	100		V
I_{CEO}	Collector Cut-off Current	$V_{CE} = 60\text{ V}, I_B = 0$		50	μA
I_{CES}	Collector Cut-off Current	$V_{CE} = 100\text{ V}, V_{BE} = 0$		20	μA
I_{EBO}	Emitter Cut-off Current	$V_{BE} = 5\text{ V}, I_C = 0$		1	mA
h_{FE}	DC Current Gain ⁽¹⁾	$V_{CE} = 1\text{ V}, I_C = 100\text{ mA}$ $V_{CE} = 4\text{ V}, I_C = 1\text{ A}$ $V_{CE} = 4\text{ V}, I_C = 3\text{ A}$	60 25 10	130 50	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ⁽¹⁾	$I_C = 3\text{ A}, I_B = 375\text{ mA}$		1.2	V
$V_{BE(on)}$	Base-Emitter On Voltage ⁽¹⁾	$V_{CE} = 4\text{ A}, I_C = 3\text{ A}$		1.8	V
f_T	Current Gain Bandwidth Product	$V_{CE} = 10\text{ V}, I_C = 500\text{ mA}$	3		MHz

Note:

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

Typical Performance Characteristics

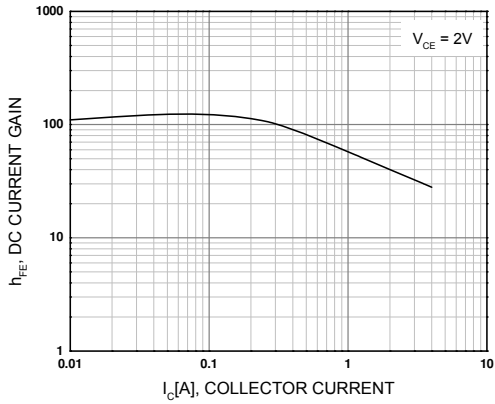


Figure 1. DC current Gain

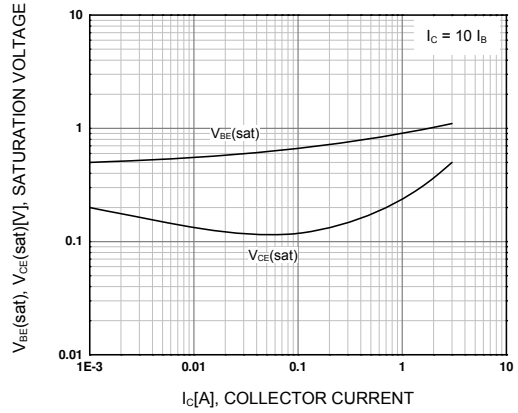


Figure 2. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

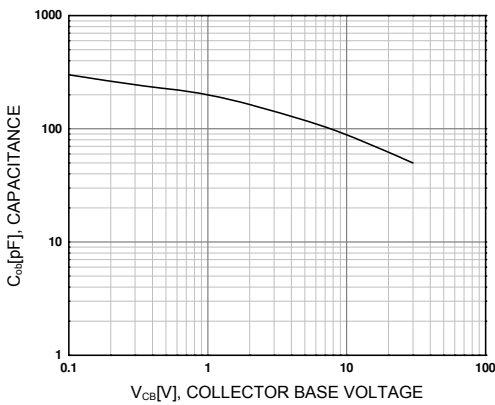


Figure 3. Collector Capacitance

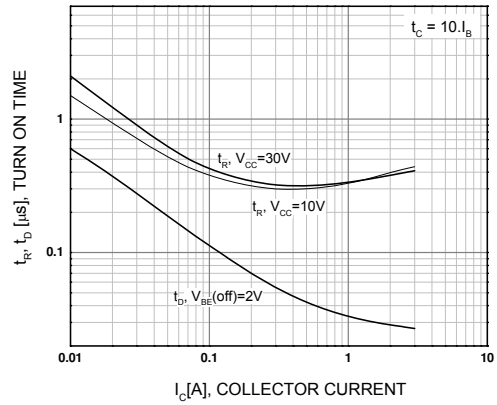


Figure 4. Turn On Time

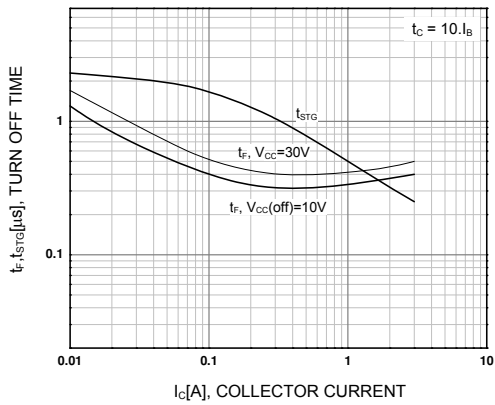


Figure 5. Turn Off Time

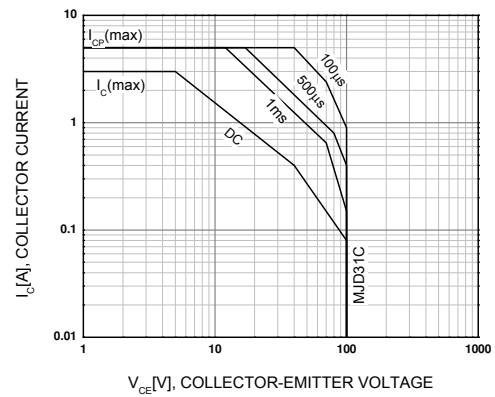


Figure 6. Safe Operating

Typical Performance Characteristics (Continued)

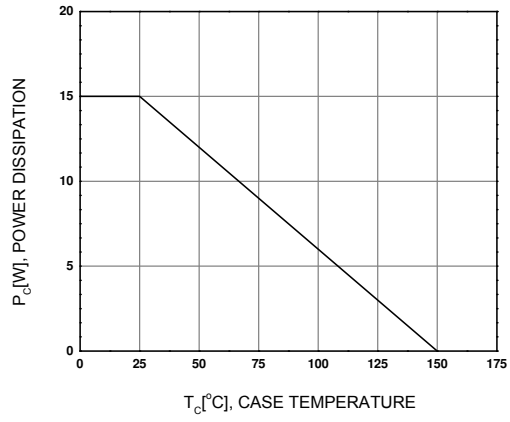


Figure 7. Power Derating

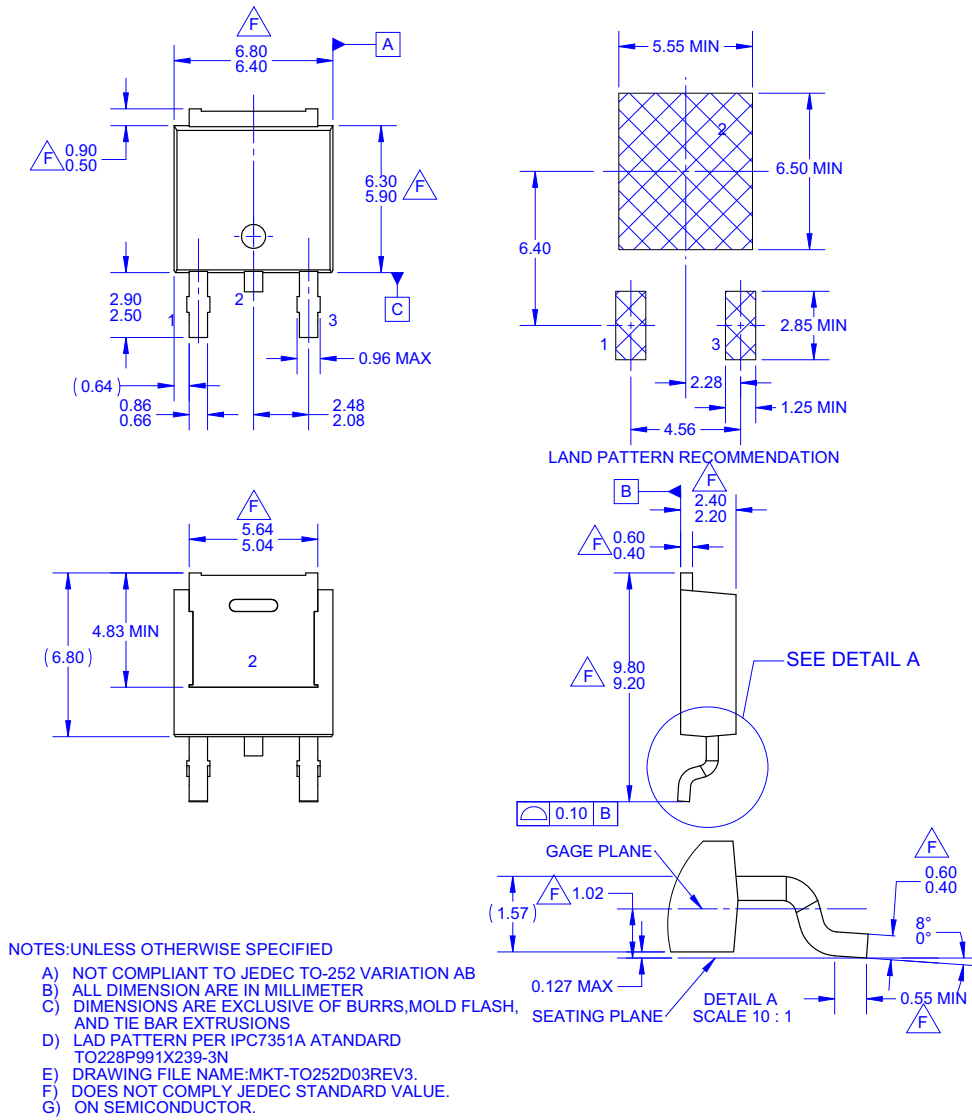


Figure 8. TO-252 3L (DPAK)

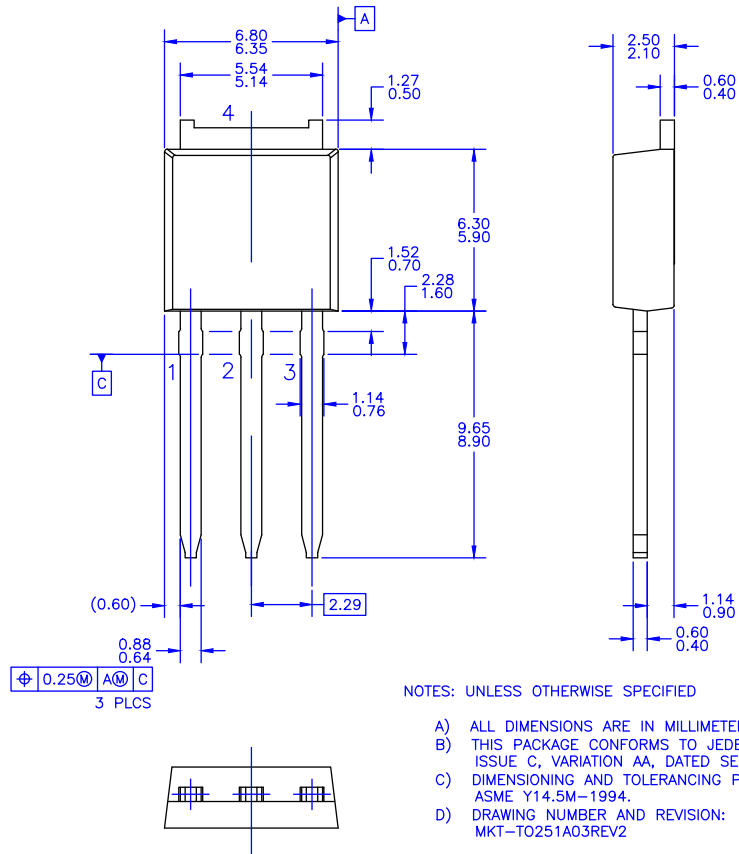


Figure 9. TO-251 3L (IPAK)

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