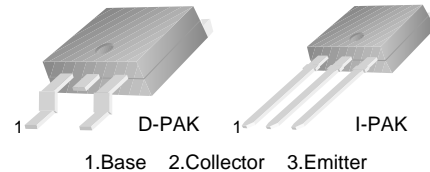


# MJD31/31C

## NPN Epitaxial Silicon Transistor

### Features

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



### Absolute Maximum Ratings $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units	
$V_{CBO}$	Collector-Base Voltage	: MJD31	40	V
		: MJD31C	100	V
$V_{CEO}$	Collector-Emitter Voltage	: MJD31	40	V
		: MJD31C	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	$^\circ\text{C}$	

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

Symbol	Parameter	Test Condition	Min.	Max.	Units
$V_{CEO(sus)}$	* Collector-Emitter Sustaining Voltage	: MJD31	$I_C = 30\text{mA}, I_B = 0$	40	V
		: MJD31C	$I_C = 30\text{mA}, I_B = 0$	100	V
$I_{CEO}$	Collector Cut-off Current	: MJD31	$V_{CE} = 40\text{V}, I_B = 0$	50	$\mu\text{A}$
		: MJD31C	$V_{CE} = 60\text{V}, I_B = 0$	50	$\mu\text{A}$
$I_{CES}$	Collector Cut-off Current	: MJD31	$V_{CE} = 40\text{V}, V_{BE} = 0$	20	$\mu\text{A}$
		: MJD31C	$V_{CE} = 100\text{V}, V_{BE} = 0$	20	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current	$V_{BE} = 5\text{V}, I_C = 0$		1	mA
$h_{FE}$	* DC Current Gain	$V_{CE} = 4\text{V}, I_C = 1\text{A}$	25		
		$V_{CE} = 4\text{V}, I_C = 3\text{A}$	10	50	
$V_{CE(sat)}$	* Collector-Emitter Saturation Voltage	$I_C = 3\text{A}, I_B = 375\text{mA}$		1.2	V
$V_{BE(on)}$	* Base-Emitter On Voltage	$V_{CE} = 4\text{A}, I_C = 3\text{A}$		1.8	V
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 10\text{V}, I_C = 500\text{mA}$	3		MHz

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

## Typical Performance Characteristics

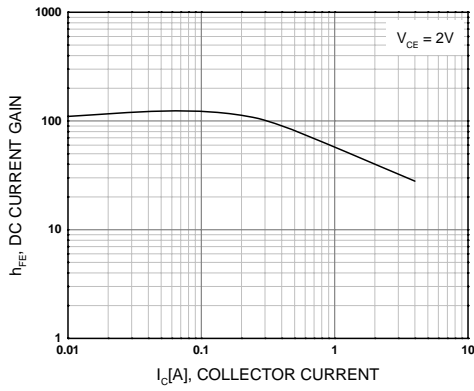


Figure 1. DC current Gain

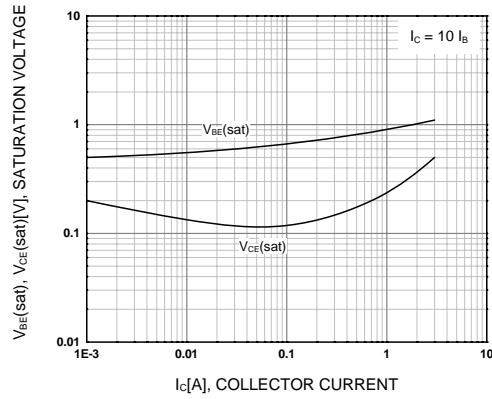


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

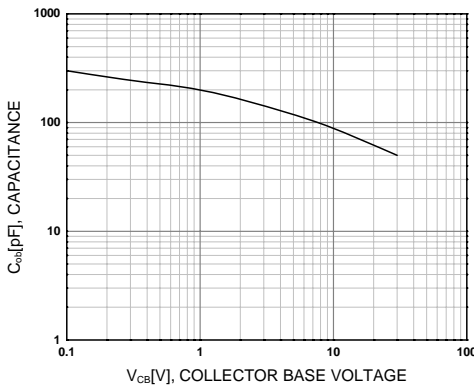


Figure 3. Collector Capacitance

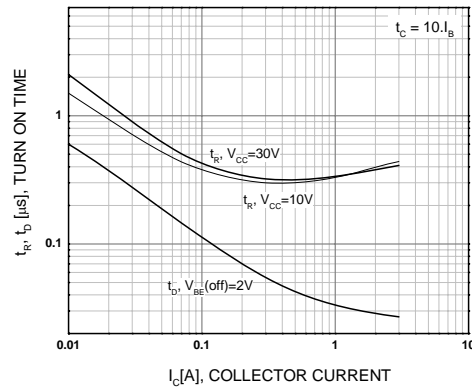


Figure 4. Turn On Time

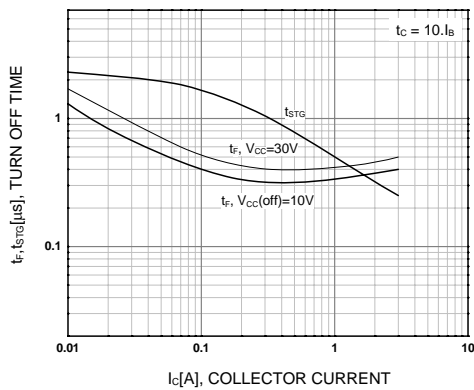


Figure 5. Turn Off Time

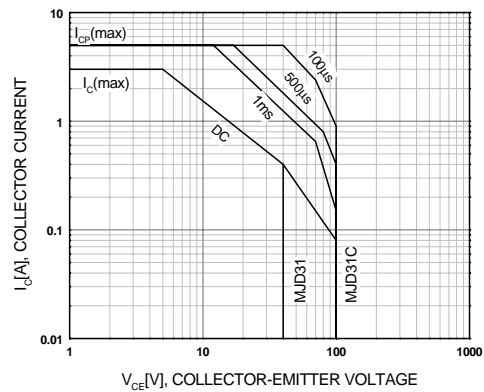
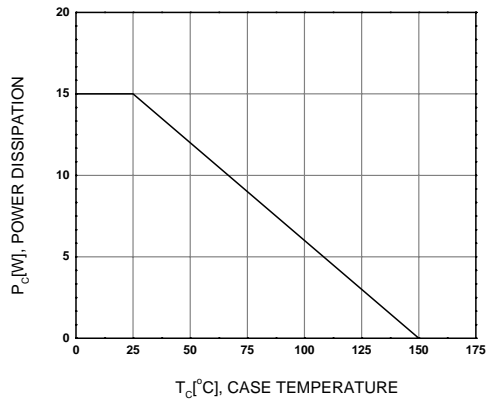


Figure 6. Safe Operating

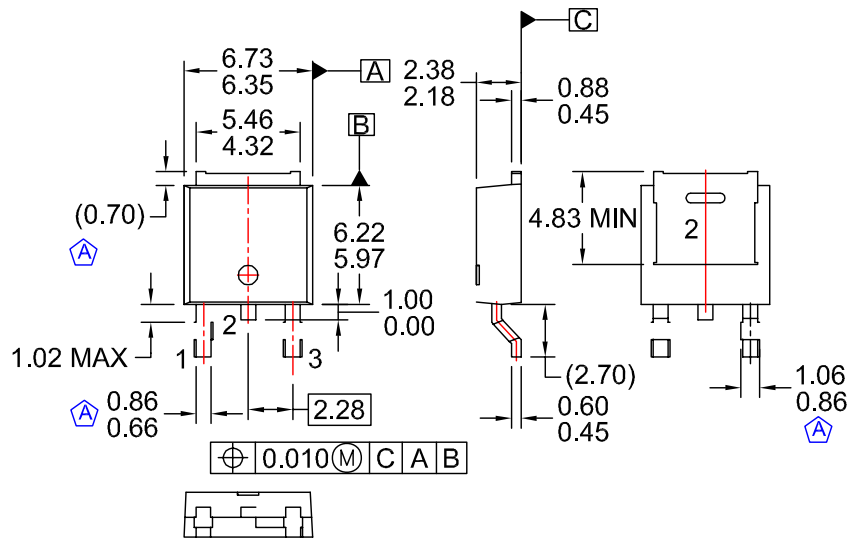
### Typical Performance Characteristics (Continued)



**Figure 7. Power Derating**

Physical Dimensions

D-PAK



- NOTES: UNLESS OTHERWISE SPECIFIED
- A) CONFORMS TO JEDEC TO-252 VARIATION AB EXCEPT WHERE NOTED
  - B) ALL DIMENSIONS ARE IN MILLIMETERS.
  - C) DRAWING CONFORMS TO ASME Y14.5M-1994
  - D) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
  - E) FORMERLY NAMED BD1733
  - F) DRAWING FILE NAME: MKT-TO252D03REV1

Dimensions in Millimeters



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- |                          |                          |                                       |  |
|--------------------------|--------------------------|---------------------------------------|--|
| AccuPower™               | F-PFS™                   | Power-SPM™                            | <p>SYSTEM GENERAL®<br/>The Power Franchise®<br/>the power franchise™<br/>TinyBoost™<br/>TinyBuck™<br/>TinyCalc™<br/>TinyLogic®<br/>TINYOPTO™<br/>TinyPower™<br/>TinyPWM™<br/>TinyWire™<br/>TriFault Detect™<br/>TRUECURRENT™<br/>µSerDes™<br/>UHC®<br/>Ultra FRFET™<br/>UniFET™<br/>VCX™<br/>VisualMax™<br/>XST™</p> |
| Auto-SPM™                | FRFET®                   | PowerTrench®                          |  |
| Build it Now™            | Global Power Resource SM | PowerXS™                              |  |
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| Current Transfer Logic™  | IntelliMAX™              | RapidConfigure™                       |  |
| DEUXPEED®                | ISOPLANAR™               | ™                                     |  |
| Dual Cool™               | MegaBuck™                | Saving our world, 1mW/W/kW at a time™ |  |
| EcoSPARK®                | MICROCOUPLER™            | SignalWise™                           |  |
| EfficientMax™            | MicroFET™                | SmartMax™                             |  |
| ESBC™                    | MicroPak™                | SMART START™                          |  |
| ™                        | MicroPak2™               | SPM®                                  |  |
| Fairchild®               | MillerDrive™             | STEALTH™                              |  |
| Fairchild Semiconductor® | MotionMax™               | SuperFET®                             |  |
| FACT Quiet Series™       | Motion-SPM™              | SuperSOT™-3                           |  |
| FACT®                    | OptoHiT™                 | SuperSOT™-6                           |  |
| FAST®                    | OPTOLOGIC®               | SuperSOT™-8                           |  |
| FastvCore™               | OPTOPLANAR®              | SupreMOS®                             |  |
| FETBench™                | ™                        | SyncFET™                              |  |
| FlashWriter®*            |                          | Sync-Lock™                            |  |
| FPS™                     |                          |                                       |  |

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