Micro Commercial Components

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MJD31C

Silicon NPN epitaxial planer Transistors

Features

- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Electrically Similar to Popular TIP31 and TIP32 Series
- Designed for general purpose amplifier and low speed switching applications.
- Maximum Thermal Resistance: 100°C/W Junction to Ambient

Maximum Ratings @ 25°C Unless Otherwise Specified

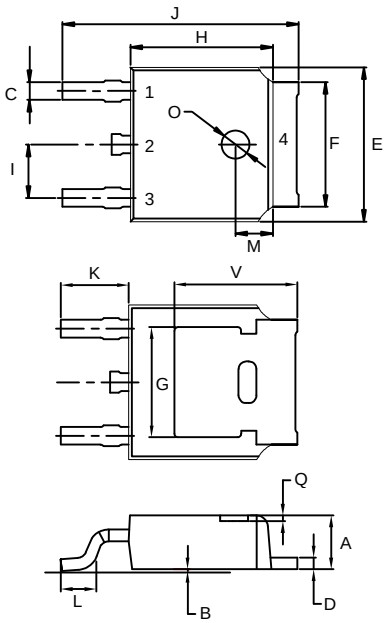
Symbol	Rating	Rating	Unit
V_{CEO}	Collector-Emitter Voltage	100	V
V_{CBO}	Collector-Base Voltage	100	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current-Continuous	3	A
P_C	Collector Dissipation	1.25	W
T_J	Operating Junction Temperature	150	℃
T_{STG}	Storage Temperature	-65 to +150	℃

Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Typ	Max	Units
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage (I_C=30mAdc, I_B=0)	100	---	---	Vdc
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage (I_C=1mAdc, I_E=0)	100	---	---	Vdc
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_E=1mAdc, I_C=0)	5	---	---	Vdc
I_{CEO}	Collector Cutoff Current (V_{CE}=60Vdc, I_B=0)	---	---	50	uAdc
I_{CES}	Collector Cutoff Current (V_{CE}=100Vdc, V_{EB}=0)	---	---	20	uAdc
I_{EBO}	Emitter Cutoff Current (V_{EB}=5Vdc, I_C=0)	---	---	1	mAdc
h_{FE}	DC Current Gain (I_C=1Adc, V_{CE}=4Vdc) (I_C=3Adc, V_{CE}=4Vdc)	25 10	--- ---	--- 50	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage (I_C=3Adc, I_B=0.375Adc) (note 1)	---	---	1.2	Vdc
$V_{BE(on)}$	Base-Emitter Voltage (I_C=3Adc, V_{CE}=4Vdc) (note 1)	---	---	1.8	Vdc
f_T	Transition frequency (V_{CE}=10Vdc,I_C=0.5Adc,f_T=1KHz)	3	---	---	MHz

Note: 1. Pulse Test: PW≤300μs, Duty Cycle≤2%

DPAK



PIN 1. BASE
PIN 2. 4. COLLECTOR
PIN 3. EMITTER

DIMENSIONS					
	INCHES		MM		
DIM	MIN	MAX	MIN	MAX	NOTE
A	0.087	0.094	2.20	2.40	
B	0.000	0.005	0.00	0.13	
C	0.026	0.034	0.66	0.86	
D	0.018	0.023	0.46	0.58	
E	0.256	0.264	6.50	6.70	
F	0.201	0.215	5.10	5.46	
G	0.190		4.83		
H	0.236	0.244	6.00	6.20	
I	0.086	0.094	2.18	2.39	
J	0.386	0.409	9.80	10.40	
K	0.114		2.90		
L	0.055	0.067	1.40	1.70	
M	0.063		1.60		
O	0.043	0.051	1.10	1.30	
Q	0.000	0.012	0.00	0.30	
V	0.211		5.35		

TYPICAL CHARACTERISTICS

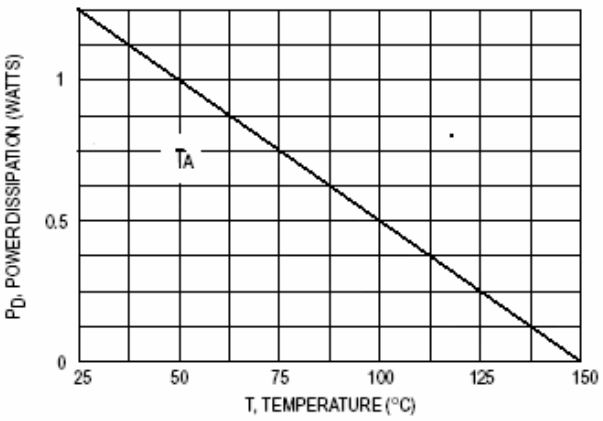
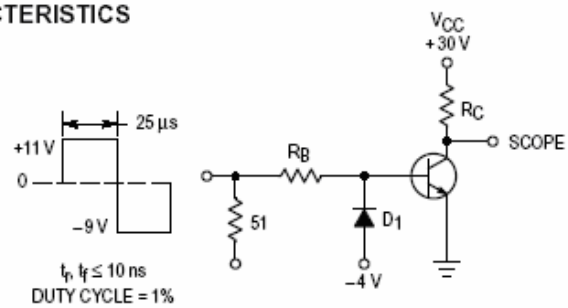


Figure 1. Power Derating



R_B and R_C VARIED TO OBTAIN DESIRED CURRENT LEVELS
D_1 MUST BE FAST RECOVERY TYPE, e.g.:
1N5825 USED ABOVE I_B ≈ 100 mA
MSD6100 USED BELOW I_B ≈ 100 mA
REVERSE ALL POLARITIES FOR PNP.

Figure 2. Switching Time Test Circuit

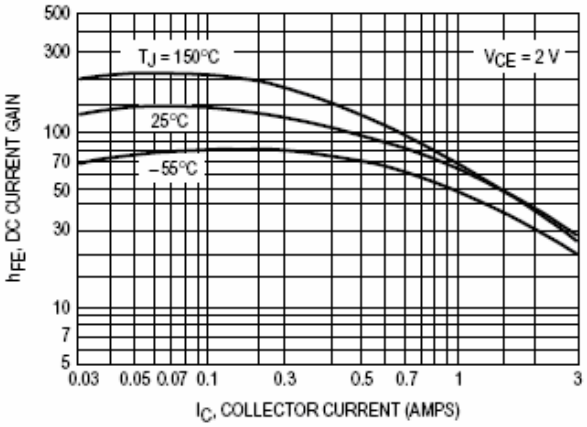


Figure 3. DC Current Gain

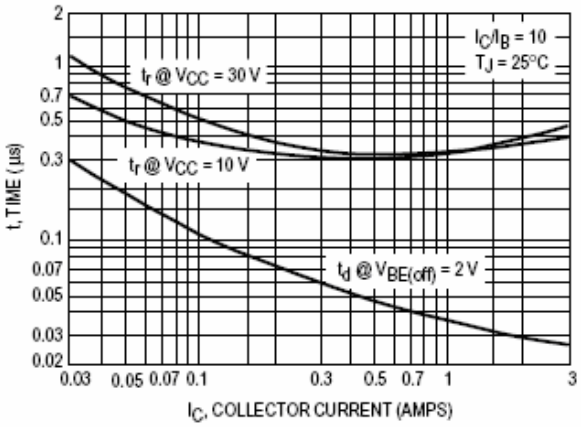


Figure 4. Turn–On Time

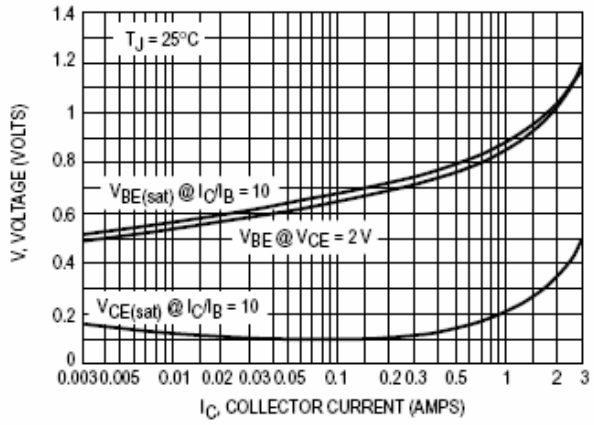


Figure 5. “On” Voltages

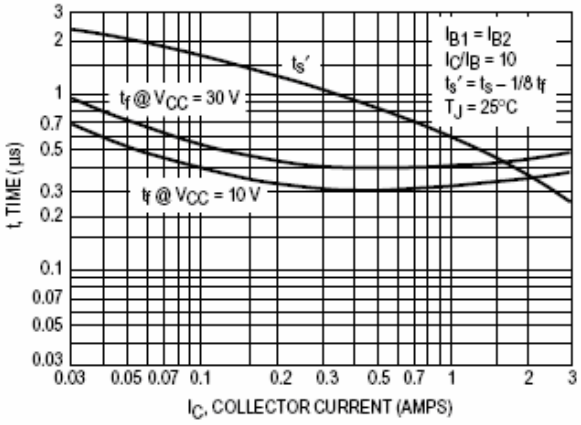


Figure 6. Turn–Off Time

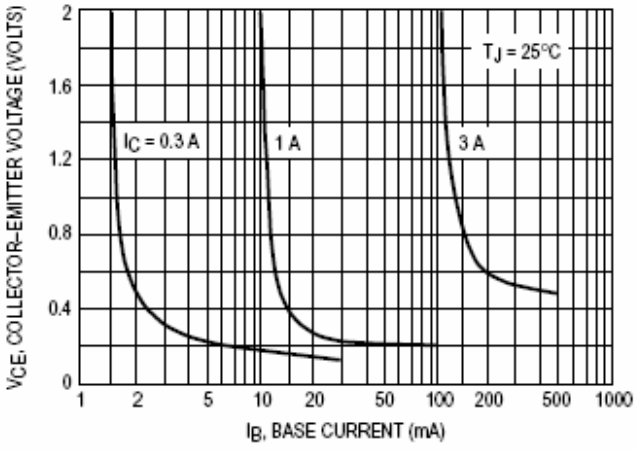


Figure 7. Collector Saturation Region

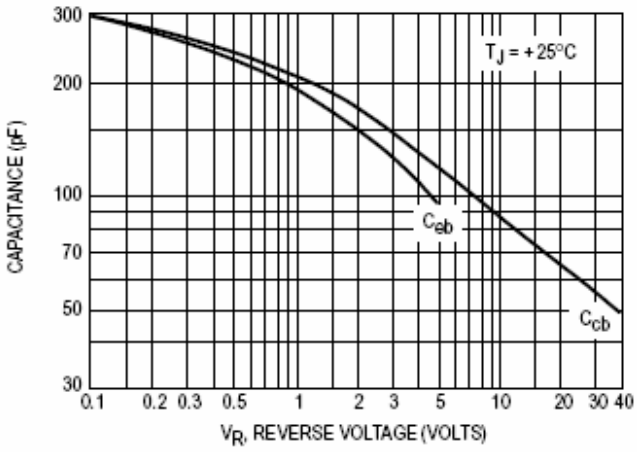


Figure 8. Capacitance

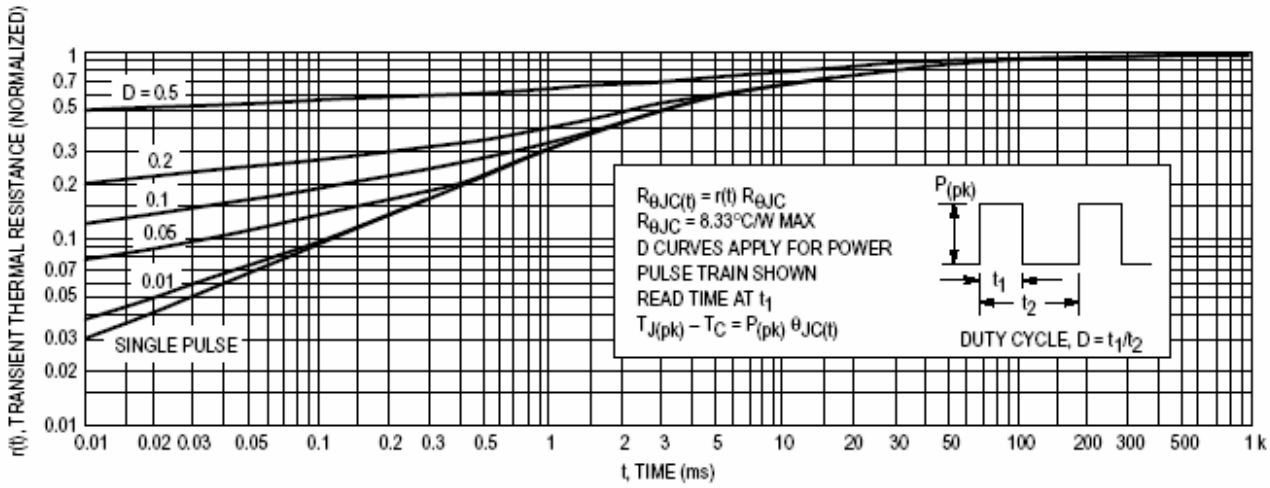


Figure 9. Thermal Response

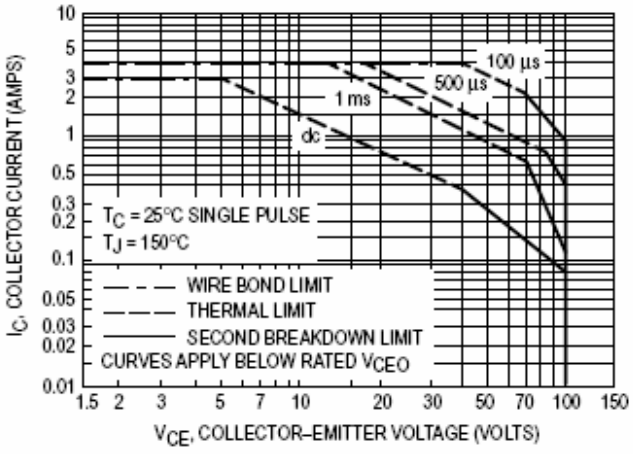


Figure 10. Active Region Safe Operating Area

There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 10 is based on $T_{J(pk)}$ = 150°C; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150°C$. $T_{J(pk)}$ may be calculated from the data in Figure 9. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel: 2.5Kpcs/Reel

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