

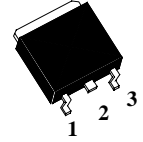
### NPN PLASTIC ENCAPSULATE TRANSISTORS

 Lead(Pb)-Free

#### Features:

- \* Designed for general purpose amplifier and low speed switching applications.
- \* Monolithic Construction With Built-in Base-Emitter Resistors.

1.BASE  
2.COLLECTOR  
3.EMITTER



**D-PAK(TO-252)**

#### ABSOLUTE MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$ )

Rating	Symbol	Value	Unit
Collector-Base Voltage	$V_{CB0}$	100	V
Collector-Emitter Voltage	$V_{CE0}$	100	V
Emitter-Base Voltage	$V_{EB0}$	5.0	V
Collector Current	$I_C$	6.0	A
Collector Power Dissipation	$P_D$	1.25	W
Junction Temperature	$T_j$	+150	$^{\circ}\text{C}$
Storage Temperature Range	$T_{stg}$	-65 to +150	$^{\circ}\text{C}$

**ELECTRICAL CHARACTERISTICS**( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

Parameter	Symbol	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage $I_C=0.1\text{mA}$	$BV_{CBO}$	100	-	-	V
Collector-Emitter Breakdown Voltage $I_C=30\text{mA}$	$BV_{CEO}$	100	-	-	V
Emitter-Base Breakdown Voltage $I_E=0.1\text{mA}$	$BV_{EBO}$	5.0	-	-	V
Collector Emitter Cutoff Current $V_{CB}=60\text{V}$	$I_{CEO}$	-	-	50	$\mu\text{A}$
Emitter Cutoff Current $V_{EB}=5.0\text{V}$	$I_{EBO}$	-	-	0.5	mA

**ON CHARACTERISTICS**

DC Current Gain $V_{CE}=4\text{V}, I_C=0.3\text{A}$ $V_{CE}=4\text{V}, I_C=3\text{A}$	$h_{FE(1)}$ $h_{FE(2)}$	30 15	- -	- 75	-
Collector-Emitter Saturation Voltage $I_C=6\text{A}, I_B=0.6\text{A}$	$V_{CE(sat)}$	-	-	1.5	V
Base-Emitter Voltage $V_{CE}=4\text{V}, I_C=6\text{A}$	$V_{BE}$	-	-	2	V
Transition frequency $V_{CE}=10\text{V}, I_C=0.5\text{A}, f=1\text{MHz}$	$f_T$	3	-	-	MHz

## TYPICAL CHARACTERISTICS

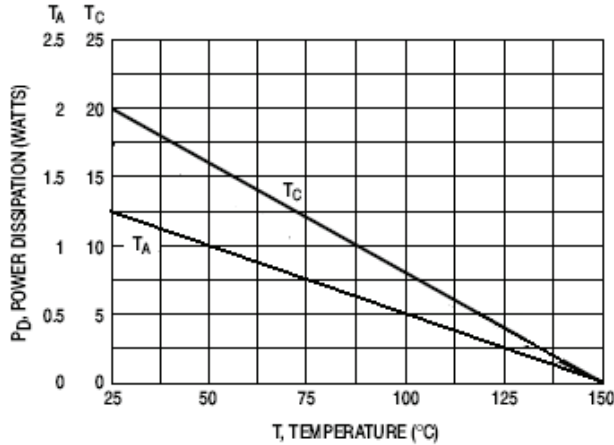


Figure 1. Power Derating

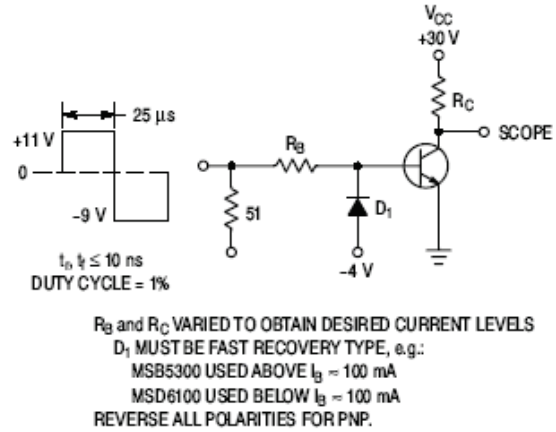


Figure 2. Switching Time Test Circuit

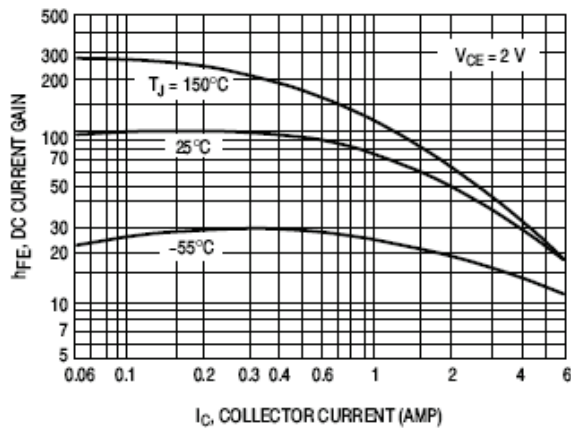


Figure 3. DC Current Gain

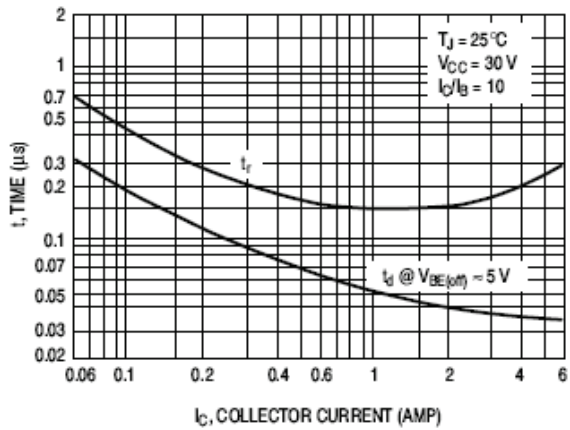


Figure 4. Turn-On Time

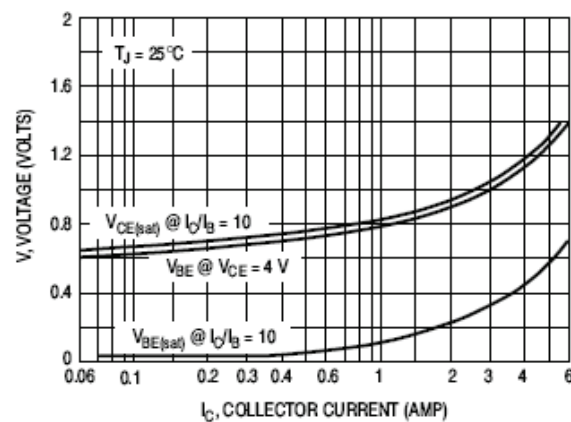


Figure 5. "On" Voltages

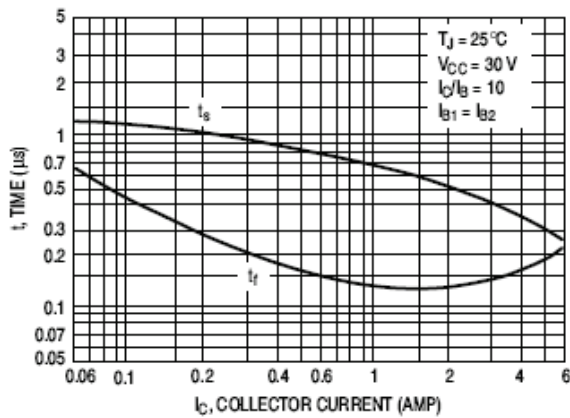


Figure 6. Turn-Off Time

## Typical Characteristics

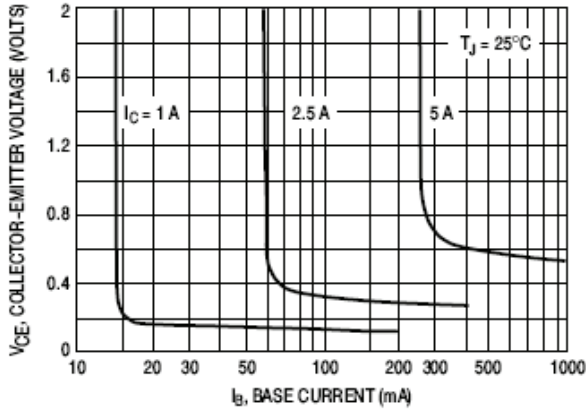


Figure 7. Collector Saturation Region

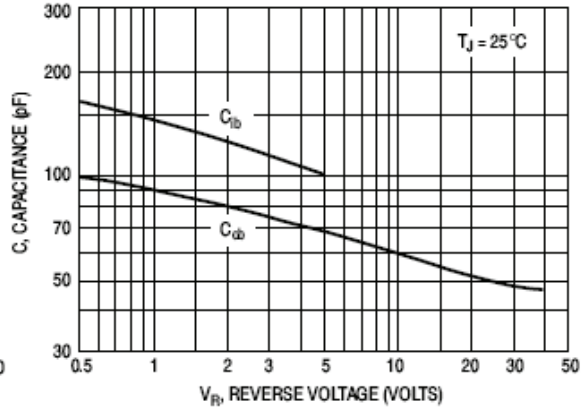


Figure 8. Capacitance

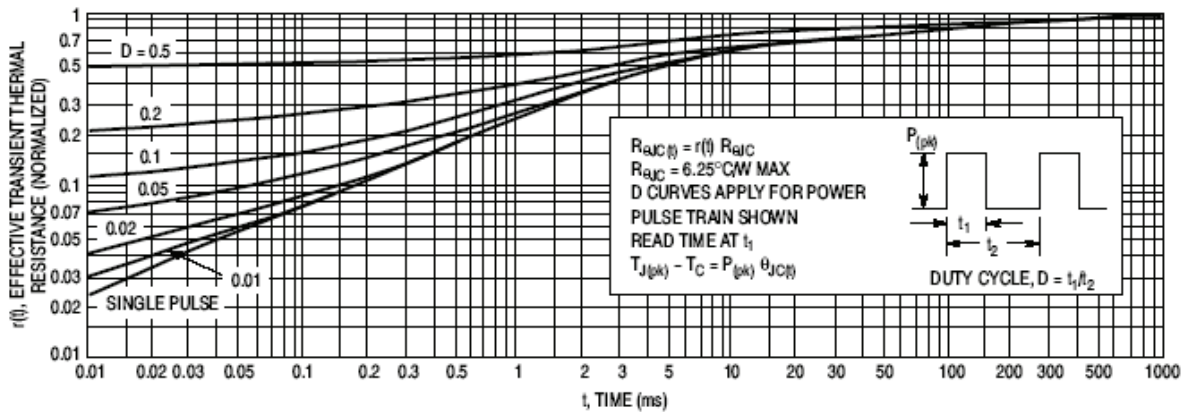


Figure 9. Thermal Response

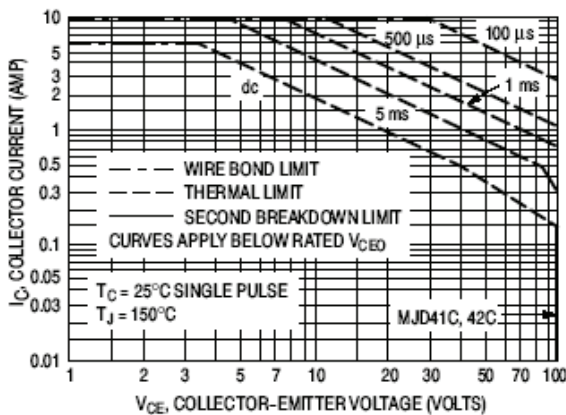


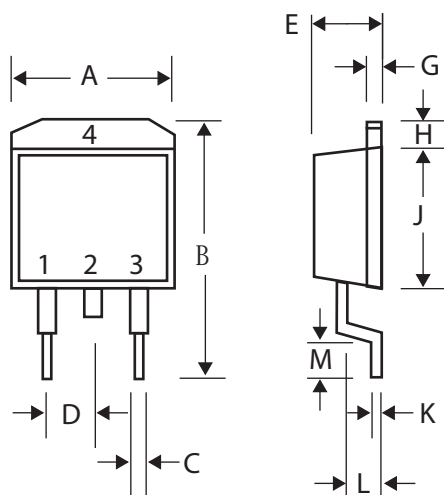
Figure 10. Maximum Forward Bias Safe Operating Area

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  $T_{J(pk)} = 150^\circ\text{C}$ ;  $T_C$  is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(pk)} \leq 150^\circ\text{C}$ .  $T_{J(pk)}$  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.

## TO-252 Outline Dimensions

unit:mm



TO-252		
Dim	Min	Max
A	6.40	6.80
B	9.00	10.00
C	0.50	0.80
D	-	2.30
E	2.20	2.50
G	0.45	0.55
H	1.00	1.60
J	5.40	5.80
K	0.30	0.64
L	0.70	1.70
M	0.90	1.50