

**TIP100  
TIP101  
TIP102**

**NPN Plastic  
Medium-Power  
Silicon Transistors**

**Features**

- Mounting Torque: 5 in-lbs Maximum
- Lead Free Finish/RoHS Compliant(Note 1) ("P" Suffix designates RoHS Compliant. See ordering information)
- High DC Current Gain :  $h_{FE}=2500$  (Typ) @  $I_C=4.0A_{dc}$
- Halogen free available upon request by adding suffix "-HF"
- Low Collector-Emitter Saturation Voltage
- Monolithic Construction with Built-in Base-Emitter Shunt Resistors
- TO-220 Compact package
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

**Maximum Ratings**

Symbol	Parameter	Rating	Unit	
$V_{CEO}$	Collector-Emitter Voltage	TIP100	60	V
		TIP101	80	
		TIP102	100	
$V_{CBO}$	Collector-Base Voltage	TIP100	60	V
		TIP101	80	
		TIP102	100	
$V_{EBO}$	Emitter-Base Voltage	5.0	V	
$I_C$	Collector Current-continuous	8.0	A	
$I_{CP}$	Collector Current-peak	15	A	
$I_B$	Base Current	1.0	A	
$P_D$	Collector Dissipation @ $T_C=25^{\circ}C$	80	W	
	Derate above $25^{\circ}C$	0.64	W/ $^{\circ}C$	
$T_J$	Junction Temperature	-55 to +150	$^{\circ}C$	
$T_{STG}$	Storage Temperature	-55 to +150	$^{\circ}C$	

**Electrical Characteristics @ 25°C Unless Otherwise Specified**

Symbol	Parameter	Min	Max	Units
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**OFF CHARACTERISTICS**

$V_{CEO(SUS)}$	Collector-Emitter Sustaining Voltage ( $I_C=30mA_{dc}$ , $I_B=0$ )	TIP100	60	---	Vdc
		TIP101	80	---	
		TIP102	100	---	
$I_{CEO}$	Collector Cut-off Current ( $V_{CE}=30V_{dc}$ , $I_B=0$ ) ( $V_{CE}=40V_{dc}$ , $I_B=0$ ) ( $V_{CE}=50V_{dc}$ , $I_B=0$ )	TIP100	---	50	$\mu A_{dc}$
		TIP101	---	50	
		TIP102	---	50	
$I_{CBO}$	Collector Cut-off Current ( $V_{CB}=60V_{dc}$ , $I_E=0$ ) ( $V_{CB}=80V_{dc}$ , $I_E=0$ ) ( $V_{CB}=100V_{dc}$ , $I_E=0$ )	TIP100	---	50	$\mu A_{dc}$
		TIP101	---	50	
		TIP102	---	50	
$I_{EBO}$	Emitter Cut-off Current ( $V_{BE}=5.0V_{dc}$ , $I_C=0$ )	---	8.0	mAdc	

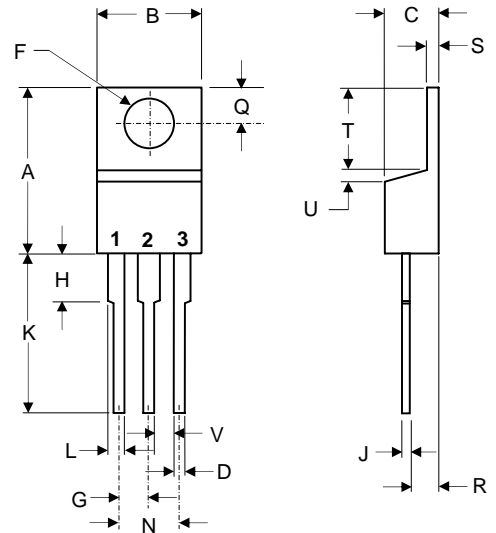
**ON CHARACTERISTICS (1)**

$h_{FE(1)}$	DC Current Gain ( $I_C=3.0A_{dc}$ , $V_{CE}=4.0V_{dc}$ ) ( $I_C=8.0A_{dc}$ , $V_{CE}=4.0V_{dc}$ )	1000 200	20000 ---	----
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ( $I_C=3.0A_{dc}$ , $I_B=6.0mA_{dc}$ ) ( $I_C=8.0A_{dc}$ , $I_B=80mA_{dc}$ )	---	2.0 2.5	Vdc
$V_{BE(ON)}$	Base-Emitter On Voltage ( $I_C=8.0A_{dc}$ , $V_{CE}=4.0A_{dc}$ )	---	2.8	Vdc
hfe	Small-Signal Current Gain ( $I_C=3.0A_{dc}$ , $V_{CE}=4.0V_{dc}$ , $f=1.0MHz$ )	4.0	---	---
$C_{ob}$	Output Capacitance ( $V_{CB}=10V$ , $I_E=0$ , $f=0.1MHz$ )	---	200	pF

(1) Pulse Test: Pulse Width<300us, Duty Cycle<2%

Notes:1.High Temperature Solder Exemption Applied, see EU Directive Annex 7.

**TO-220**



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

DIM	DIMENSIONS				NOTE
	INCHES		MM		
A	.560	.625	14.22	15.88	
B	.380	.420	9.65	10.67	
C	.140	.190	3.56	4.82	
D	.020	.045	0.51	1.14	
F	.139	.161	3.53	4.09	∅
G	.190	.110	2.29	2.79	
H	---	.157	---	4.00	
J	.012	.025	0.30	0.64	
K	.500	.580	12.70	14.73	
L	.045	.060	1.14	1.52	
N	.190	.210	4.83	5.33	
Q	.100	.135	2.54	3.43	
R	.080	.115	2.04	2.92	
S	.045	.055	1.14	1.39	
T	.230	.270	5.84	6.86	
U	----	.050	----	1.27	
V	.045	----	1.15	----	

# TIP100,101,102

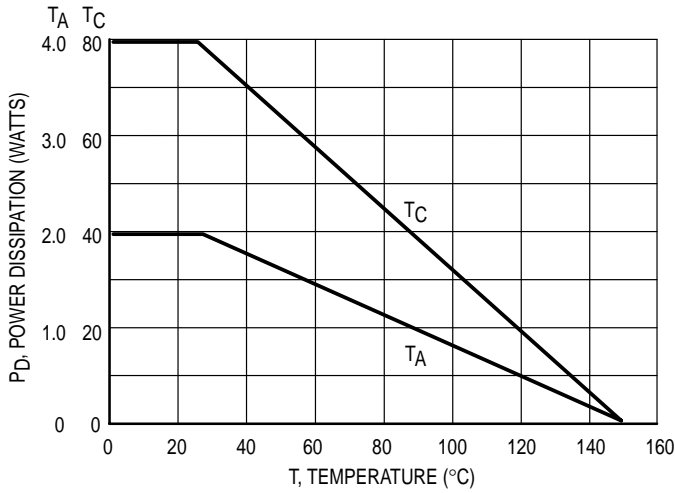


Figure 1. Power Derating

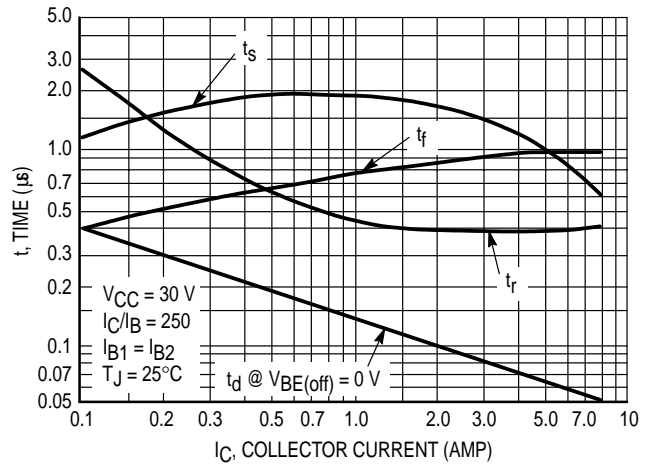


Figure 2. Switching Times

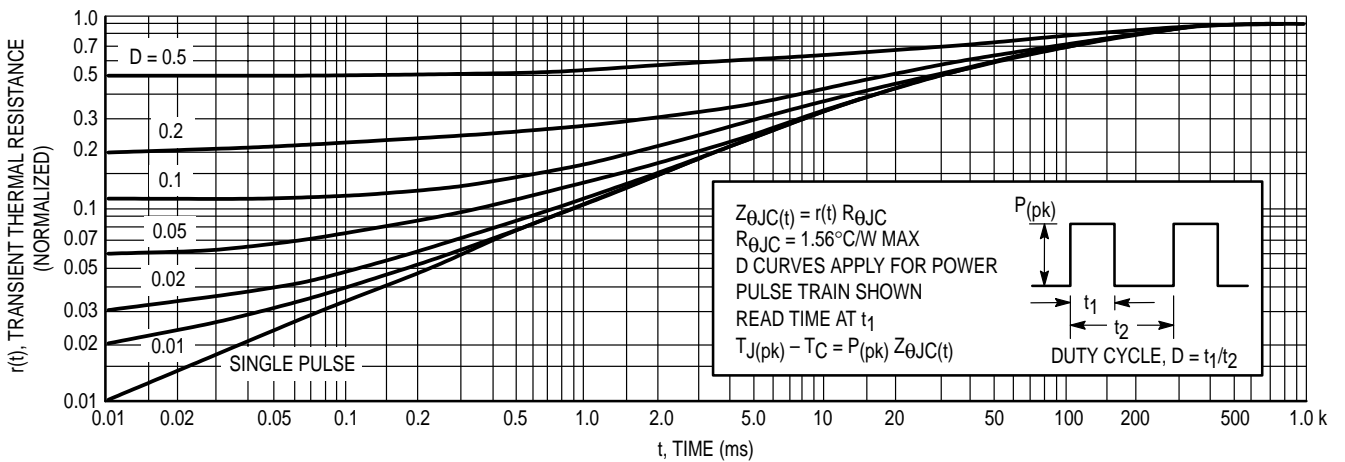


Figure 3. Thermal Response

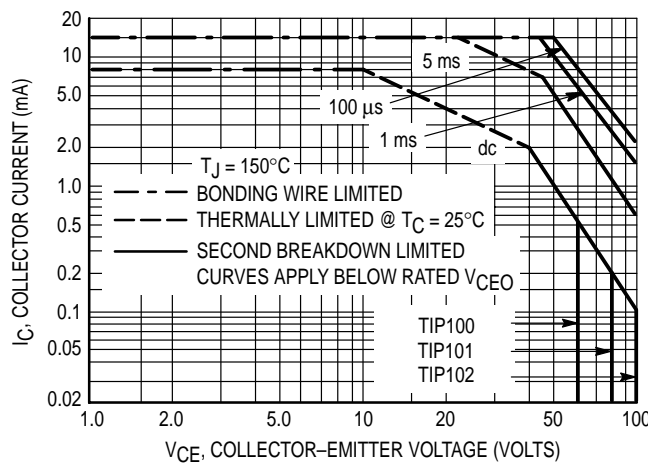
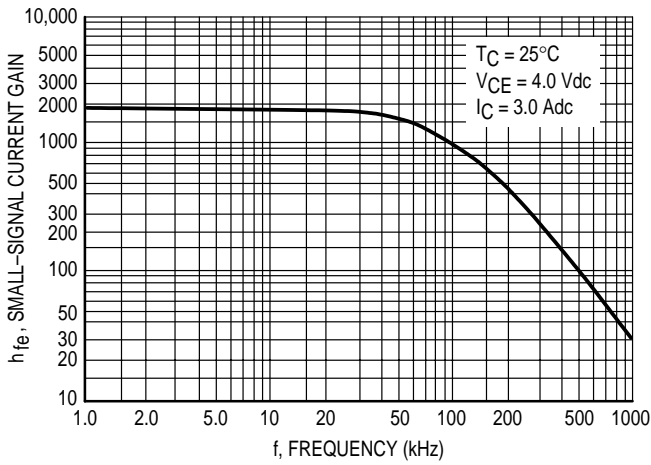
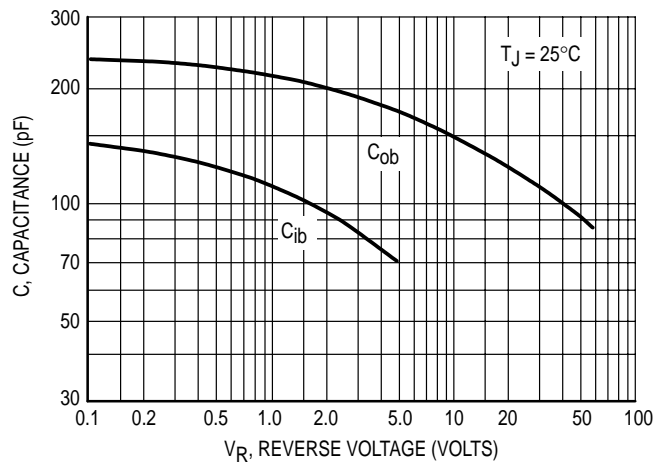


Figure 4. Active-Region Safe Operating Area

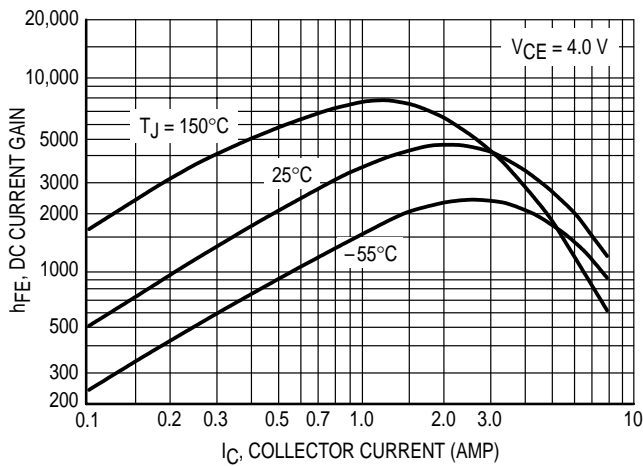
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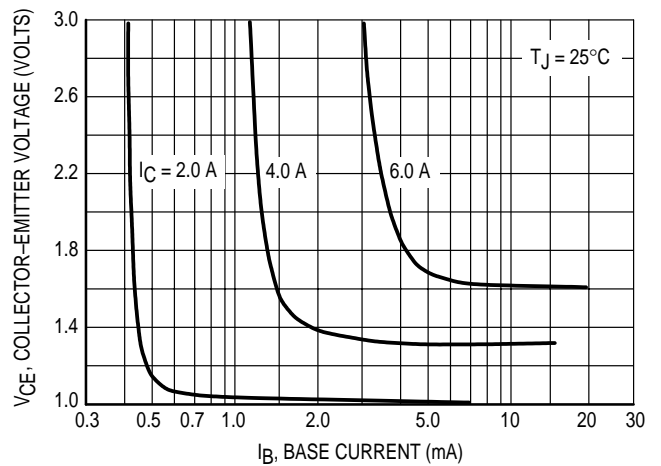
**Figure 5. Small-Signal Current Gain**



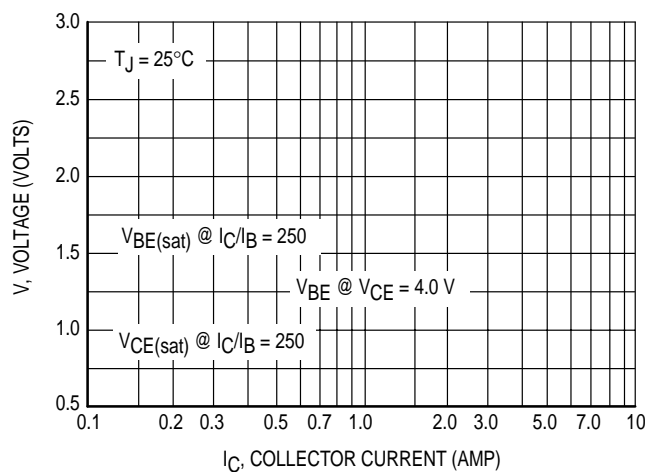
**Figure 6. Capacitance**



**Figure 7. DC Current Gain**



**Figure 8. Collector Saturation Region**



**Figure 9. "On" Voltages**



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### Ordering Information :

Device	Packing
Part Number-BP	Bulk; 1Kpcs/Box

Note : Adding "-HF" suffix for halogen free, eg. Part Number-BP-HF

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