

**Features**

- The Complementary PNP Types are the TIP32 Respectively
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant(Note 1) ("P" Suffix Designates RoHS Compliant. See Ordering Information)

**Maximum Ratings @ 25°C Unless Otherwise Specified**

- Operating Junction Temperature Range: -65°C to +150°C
- Storage Temperature Range: -65°C to +150°C
- Thermal Resistance: 3.125°C/W Junction to Case
- Thermal Resistance: 62.5°C/W Junction to Ambient

Parameter	Symbol	Rating	Unit
Collector-Base Voltage	TIP31	40	V
	TIP31A	60	
	TIP31B	80	
	TIP31C	100	
Collector-Emitter Voltage	TIP31	40	V
	TIP31A	60	
	TIP31B	80	
	TIP31C	100	
Emitter-Base Voltage	$V_{EBO}$	5	V
Continuous Collector Current	$I_C$	3	A
Peak Collector Current	$I_{CM}$	5	A
Base Current	$I_B$	1	A
Power Dissipation @ $T_C=25^\circ C$	$P_D$	40	W
Power Dissipation @ $T_A=25^\circ C$	$P_D$	2	W

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

**NPN**  
**Silicon Power**  
**Transistors**

**TO-220**

1.BASE  
2.COLLECTOR  
3.EMITTER

DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.560	0.625	14.22	15.88	
B	0.380	0.420	9.65	10.67	
C	0.140	0.190	3.56	4.82	
D	0.020	0.045	0.51	1.14	
F	0.139	0.161	3.53	4.09	Φ
G	0.090	0.110	2.29	2.79	
H	----	0.250	----	6.35	
J	0.012	0.025	0.30	0.64	
K	0.500	0.580	12.70	14.73	
L	0.045	0.060	1.14	1.52	
N	0.190	0.210	4.83	5.33	
Q	0.100	0.135	2.54	3.43	
R	0.080	0.115	2.04	2.92	
S	0.045	0.055	1.14	1.39	
T	0.230	0.270	5.84	6.86	
U	----	0.050	----	1.27	
V	0.045	----	1.15	----	

**Electrical Characteristics @  $T_A=25^\circ\text{C}$  Unless Otherwise Specified**

Parameter		Symbol	Min	Typ	Max	Units	Conditions
Collector-Emitter Breakdown Voltage	TIP31	$V_{(BR)CEO}$	40			V	$I_C=30\text{mA}, I_B=0$
	TIP31A		60				
	TIP31B		80				
	TIP31C		100				
Collector Cutoff Current	TIP31	$I_{CES}$			200	$\mu\text{A}$	$V_{CE}=40\text{V}, V_{EB}=0$
	TIP31A				200	$\mu\text{A}$	$V_{CE}=60\text{V}, V_{EB}=0$
	TIP31B				200	$\mu\text{A}$	$V_{CE}=80\text{V}, V_{EB}=0$
	TIP31C				200	$\mu\text{A}$	$V_{CE}=100\text{V}, V_{EB}=0$
Collector Cutoff Current	TIP31	$I_{CEO}$			300	$\mu\text{A}$	$V_{CE}=30\text{V}, I_B=0$
	TIP31A				300	$\mu\text{A}$	$V_{CE}=30\text{V}, I_B=0$
	TIP31B				300	$\mu\text{A}$	$V_{CE}=60\text{V}, I_B=0$
	TIP31C				300	$\mu\text{A}$	$V_{CE}=60\text{V}, I_B=0$
Emitter Cutoff Current		$I_{EBO}$			1	mA	$V_{EB}=5\text{V}, I_C=0$
DC Current Gain		$h_{FE(1)}$	25				$V_{CE}=4\text{V}, I_C=1\text{A}$
		$h_{FE(2)}$	10		75		$V_{CE}=4\text{V}, I_C=3\text{A}$
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$			1.2	V	$I_C=3\text{A}, I_B=0.375\text{A}$
Base-Emitter Voltage		$V_{BE}$			1.8	V	$V_{CE}=4\text{V}, I_C=3\text{A}$
Transition Frequency		$f_T$	3			MHz	$V_{CE}=10\text{V}, I_C=500\text{mA}$

## Curve Characteristics

Fig. 1 - DC Current Gain Curve

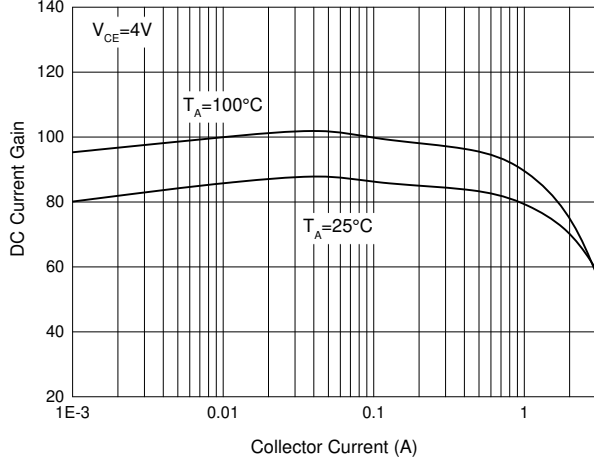


Fig. 2 - Collector-emitter Saturation Voltage Curve

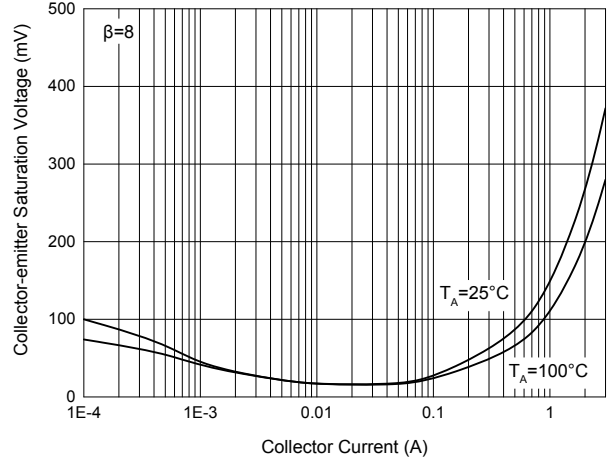


Fig. 3 - Base-emitter Voltage Curve

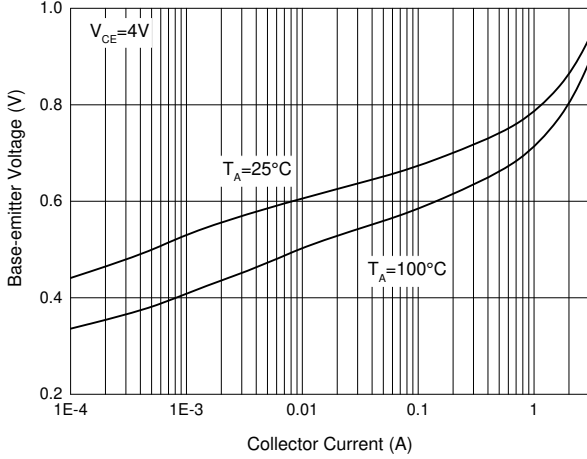
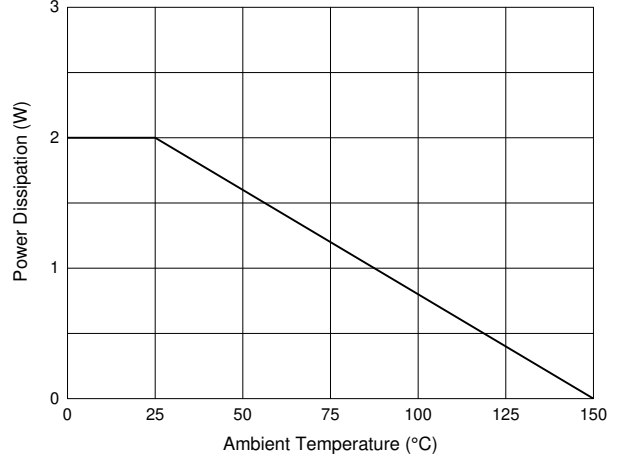


Fig. 4 - Power Derating Curve



## Ordering Information

Device	Packing
Part Number-BP	Bulk:50pcs/Tube, 1Kpcs/Box, 5Kpcs/Carton

Note : Adding "-HF" Suffix For Halogen Free, eg. Part Number-BP-HF

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