

**Features**

- 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 (Note1) ("P" Suffix Designates RoHS Compliant. See Ordering Information)

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

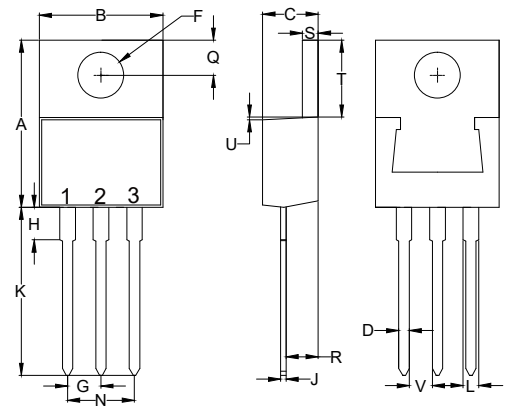
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 83.3°C/W Junction to Ambient

Parameter	Symbol	Rating	Unit
Collector-Base Voltage	$V_{CBO}$	700	V
Collector-Emitter Voltage	$V_{CEO}$	400	V
Emitter-Base Voltage	$V_{EBO}$	9	V
Continuous Collector Current	$I_C$	1.5	A
Power Dissipation	$P_D$	1.5	W

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

**NPN Silicon  
Plastic-Encapsulate  
Transistor**

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-Base Breakdown Voltage	$V_{(BR)CBO}$	700			V	$I_C=1\text{mA}, I_E=0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	400			V	$I_C=10\text{mA}, I_B=0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	9			V	$I_E=1\text{mA}, I_C=0$
Collector Cutoff Current	$I_{CBO}$			1	mA	$V_{CB}=700\text{V}, I_E=0$
Collector Cutoff Current	$I_{CEO}$			0.5	mA	$V_{CE}=400\text{V}, I_B=0$
Emitter Cutoff Current	$I_{EBO}$			1	mA	$V_{EB}=9\text{V}, I_C=0$
DC Current Gain	$h_{FE(1)}$	8		40		$V_{CE}=5\text{V}, I_C=0.5\text{A}$
	$h_{FE(2)}$	5				$V_{CE}=5\text{V}, I_C=1.5\text{A}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			1.0	V	$I_C=1000\text{mA}, I_B=250\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			1.2	V	$I_C=1000\text{mA}, I_B=250\text{mA}$
Base-Emitter Voltage	$V_{BE}$			3.0	V	$I_E=2000\text{mA}$
Transition Frequency	$f_T$	5			MHz	$V_{CE}=10\text{V}, I_C=0.1\text{A}, f=1\text{MHz}$
Storage Time	$t_s$			2.5	$\mu\text{s}$	$V_{CC}=100\text{V}, I_C=1\text{A}, I_{B1}=I_{B2}=0.2\text{A}$
Fall Time	$t_f$			0.5	$\mu\text{s}$	

## Curve Characteristics

Fig. 1 - Static Characteristics

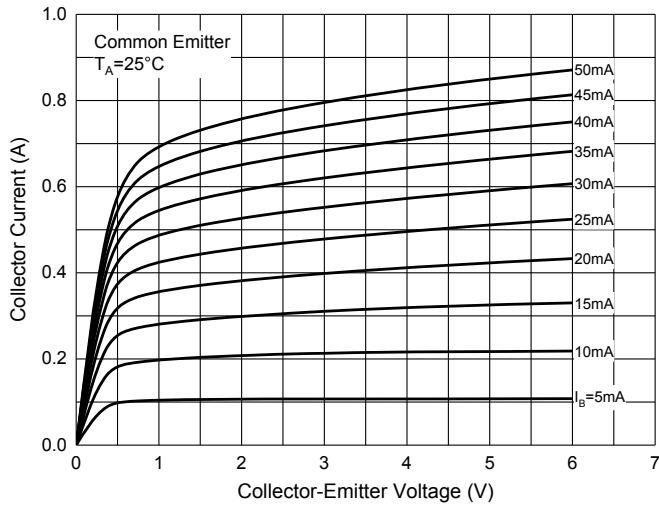


Fig. 2 - DC Current Gain Characteristics

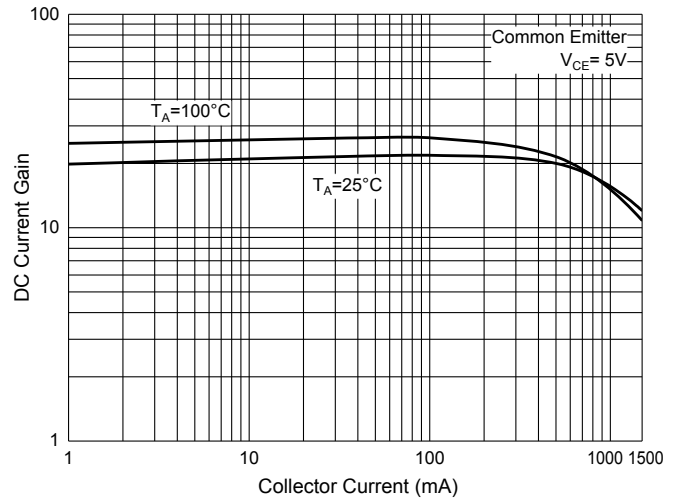


Fig. 3 - Base-Emitter Saturation Voltage Characteristics

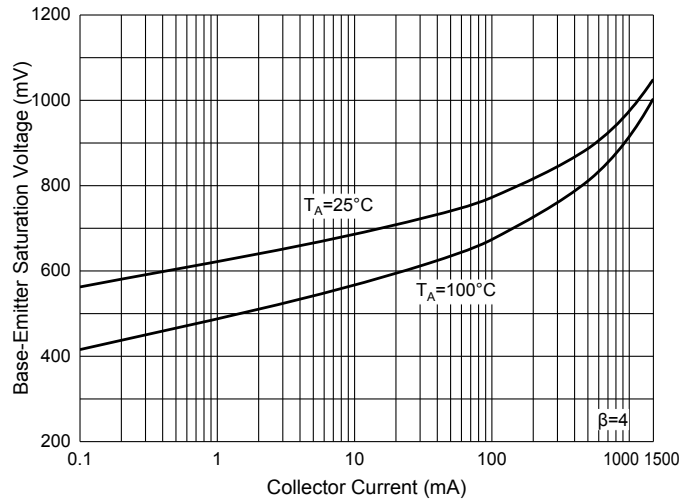


Fig. 4 - Collector-Emitter Saturation Voltage Characteristics

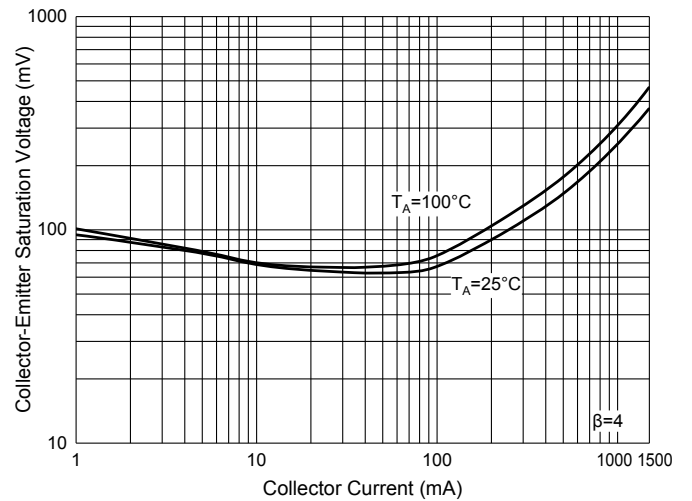


Fig. 5 - Base-Emitter Voltage Characteristics

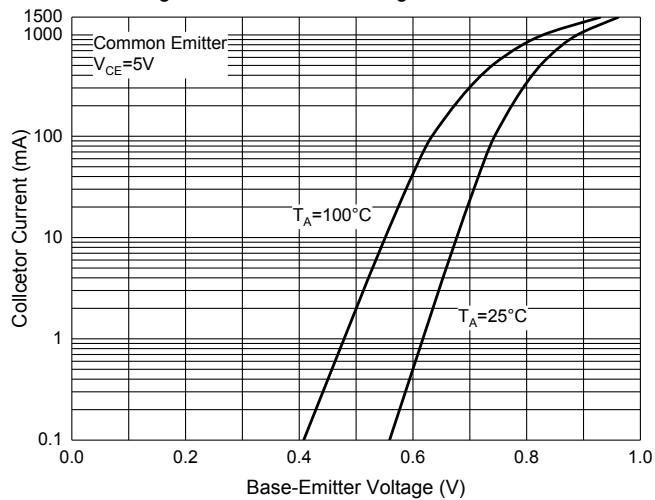
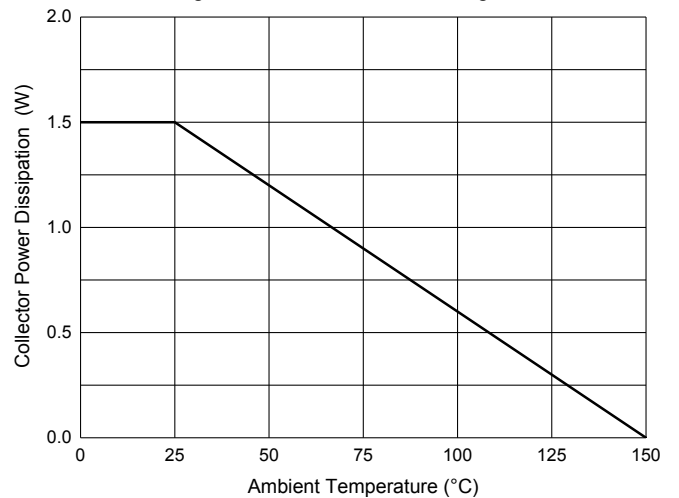


Fig. 6 - Collector Power Derating Curve



## 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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