

RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

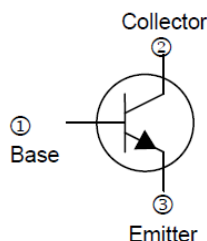
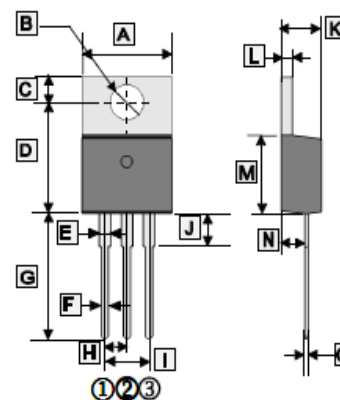
## FEATURES

- Low collector saturation voltage:  $V_{CE(sat)}=1V$  (Max.)

## CLASSIFICATION OF $h_{FE}$

Product-Rank	Y
Range	100-200

TO-220J



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	9.57	10.57	I	4.68	5.48
B	3.54	4.14	J	2.95	3.96
C	2.54	2.94	K	4.27	4.87
D	11.86	13.26	L	1.07	1.47
E	0.97	1.57	M	8.0	10.0
F	0.51	1.11	N	2.03	2.92
G	12.7	13.8	Q	0.30	0.65
H	2.540 TYP.				

## ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ C$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Collector to Base Voltage	$V_{CBO}$	60	V
Collector to Emitter Voltage	$V_{CEO}$	60	V
Emitter to Base Voltage	$V_{EBO}$	7	V
Collector Current	$I_C$	3	A
Collector Power Dissipation	$P_C$	2	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	150	$^\circ C$
Junction and Storage Temperature	$T_J, T_{STG}$	150, -55~150	$^\circ C$

## ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ C$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	60	-	-	V	$I_C=0.1mA, I_E=0$
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	60	-	-	V	$I_C=50mA, I_B=0$
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	7	-	-	V	$I_E=0.1mA, I_C=0$
Collector Cut-Off Current	$I_{CBO}$	-	-	100	$\mu A$	$V_{CB}=60V, I_E=0$
Emitter Cut-Off Current	$I_{EBO}$	-	-	100	$\mu A$	$V_{EB}=7V, I_C=0$
DC Current Gain	$h_{FE}$	100	-	200		$V_{CE}=5V, I_C=0.5A$
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	-	-	1	V	$I_C=2A, I_B=0.2A$
Base to Emitter Voltage	$V_{BE(on)}$	-	-	1	V	$V_{CE}=5V, I_C=0.5A$
Transition Frequency	$f_T$	-	3	-	MHz	$V_{CE}=5V, I_C=0.5A$
Collector Output Capacitance	$C_{ob}$	-	35	-	pF	$V_{CB}=10V, I_E=0, f=1MHz$
Turn-on Time	$t_{on}$		0.65		$\mu S$	<p> <math>I_{B1} = -I_{B2} = 0.2A</math>  <math>DUTY\ CYCLE \leq 1\%</math>  <math>V_{CC} = 30V</math> </p>
Storage Time	$t_{stg}$		1.3			
Fall Time	$t_f$	0.65				

**CHARACTERISTIC CURVES**

