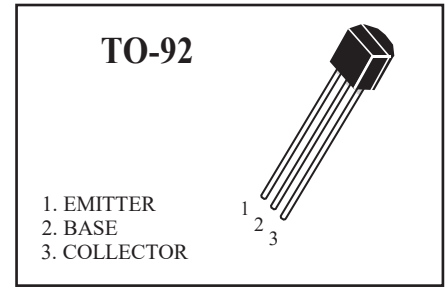




NPN General Purpose Transistors

 Lead(Pb)-Free



ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	25	V _{dc}
Collector-Base Voltage	V _{CBO}	40	V _{dc}
Emitter-Base Voltage	V _{EBO}	5.0	V _{dc}
Collector Current	I _C	500	mA _{dc}
Total Device Dissipation TA=25 C	P _D	0.625	W
Junction Temperature	T _j	150	°C
Storage, Temperature	T _{stg}	-55 to +150	°C

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min	Max	Unit
Collector-Emitter Breakdown Voltage (I _C = 0.1 mA _{dc} , I _B =0)	V _{(BR)CEO}	25	-	V _{dc}
Collector-Base Breakdown Voltage (I _C = 100 μA _{dc} , I _E =0)	V _{(BR)CBO}	40	-	V _{dc}
Emitter-Base Breakdown Voltage (I _E = 100 μA _{dc} , I _C =0)	V _{(BR)EBO}	5.0	-	V _{dc}
Collector Cutoff Current (V _{CE} = 20 V _{dc} , I _B =0)	I _{CE0}	-	0.1	μA _{dc}
Collector Cutoff Current (V _{CB} = 40 V _{dc} , I _E =0)	I _{CBO}	-	0.1	μA _{dc}
Emitter Cutoff Current (V _{EB} = 3.0V _{dc} , I _C =0)	I _{EBO}	-	0.1	μA _{dc}

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

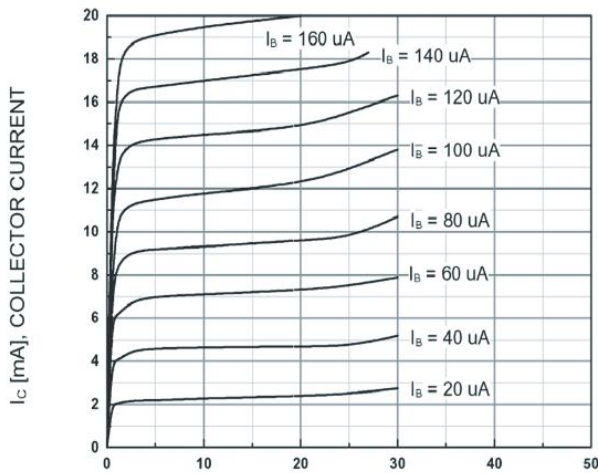
Characteristics	Symbol	Min	TYP	Max	Unit
DC Current Gain ($I_C = 50\text{ Adc}$, $V_{CE} = 1.0\text{ Vdc}$)	$h_{FE(1)}$	85	-	300	-
DC Current Gain ($I_C = 500\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$)	$h_{FE(2)}$	50	-	-	-
Collector-Emitter Saturation Voltage ($I_C = 500\text{ Adc}$, $I_B = 50\text{ mAdc}$)	$V_{CE(sat)}$	-	-	0.6	Vdc
Base-Emitter Saturation Voltage ($I_C = 500\text{ mAdc}$, $I_B = 50\text{ mAdc}$)	$V_{BE(sat)}$	-	-	1.2	Vdc
Current-Gain-Bandwidth Product ($I_C = 20\text{ mAdc}$, $V_{CE} = 6.0\text{ Vdc}$, $f = 30\text{ MHz}$)	f_T	150	-	-	MHz

Classification of $h_{FE(1)}$

Rank	B	C	D
Range	85-160	120-200	160-300

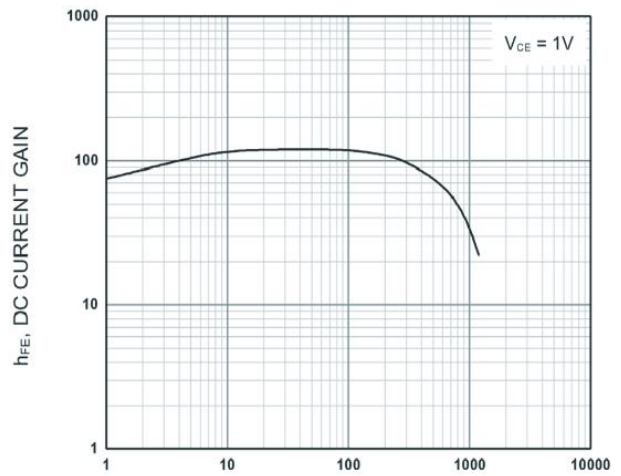


Typical Characteristics



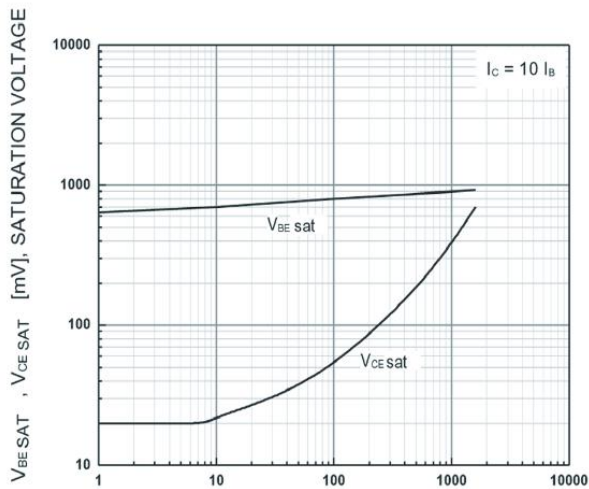
V_{CE} [V], COLLECTOR-EMITTER VOLTAGE

Static Characteristic



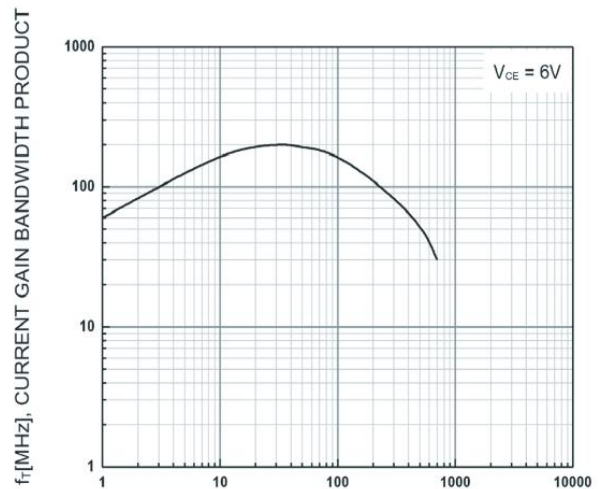
I_C [mA], COLLECTOR CURRENT

DC current Gain



I_C [mA], COLLECTOR CURRENT

Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage



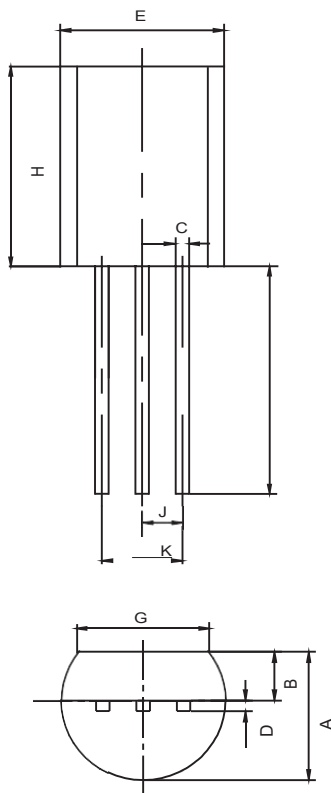
I_C [mA], COLLECTOR CURRENT

Current Gain Bandwidth Product



TO-92 Outline Dimensions

unit:mm



TO-92		
Dim	Min	Max
A	3.30	3.70
B	1.10	1.40
C	0.38	0.55
D	0.36	0.51
E	4.40	4.70
G	3.43	-
H	4.30	4.70
J	1.270TYP	
K	2.44	2.64
L	14.10	14.50

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