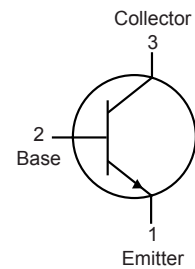


RoHS  
Compliant



NPN



## Features:

- High Collector Emitter Sustaining Voltage : $V_{CEO} = 80V @ I_C = 200mA$
- Low Collector Emitter saturation Voltage  $V_{CE(sat)} 0.75V @ I_C = 10A$

## Description:

High Power TO-3, NPN, Silicon Transistor Designed for use in power amplifier and switching circuits applications

## Maximum Ratings:

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	$V_{CBO}$	40	V
Collector-Emitter Voltage	$V_{CEO}$		
Continuous Collector Current	$I_C$	30	A
Base Current	$I_B$	7.5	
Total Device Dissipation ( $T_C = +25^\circ C$ ) Derate Above $25^\circ C$	$P_D$	200 1.14	W mW/ $^\circ C$
Operating Junction Temperature Range	$T_J$	-65 to +200	$^\circ C$
Storage Temperature Range	$T_{stg}$		

## Electrical Characteristics ( $T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Max.	Unit
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### OFF Characteristics

Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 200\text{mA}, I_B = 0$ (Note 1)	40	-	V
Collector Cut-Off Current	$I_{CEO}$	$V_{CB} = 40\text{V}, I_B = 0$	-	5	mA
	$I_{CEX}$	$V_{CE} = 40\text{V}, V_{EB(off)} = 1.5\text{V}$		1	
	$I_{CBO}$	$V_{CB} = 40\text{V}, I_E = 0$			
Emitter Cut-Off Current	$I_{EBO}$	$V_{EB} = 5\text{V}, I_C = 0$		5	

### ON Characteristics

DC Current Gain (Note 1)	$h_{FE}$	$V_{CE} = 2\text{V}, I_C = 1\text{A}$	40	-	-
		$V_{CE} = 2\text{V}, I_C = 15\text{A}$	15	60	
		$V_{CE} = 4\text{V}, I_C = 30\text{A}$	5	-	
Collector - Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{A}, I_B = 1\text{A}$	-	0.75	V
		$I_C = 20\text{A}, I_B = 2\text{A}$		2	
		$I_C = 30\text{A}, I_B = 6\text{A}$		3	
Base - Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{A}, I_B = 1\text{A}$	-	1.7	V
		$I_C = 15\text{A}, I_B = 1.5\text{A}$		1.8	
		$I_C = 20\text{A}, I_B = 2\text{A}$		2.5	
Base - Emitter Saturation Voltage	$V_{BE(on)}$	$I_C = 15\text{A}, V_{CE} = 2\text{V}$	-	1.7	V
		$I_C = 30\text{A}, V_{CE} = 4\text{V}$		3	

### Small Signal Characteristics

Current Gain-Bandwidth Product (Note 2)	$f_T$	$V_{CE} = 10\text{V}, I_C = 1\text{A}, f = 1\text{MHz}$	2	-	MHz
Small-Signal Current Gain	$h_{fe}$	$V_{CE} = 10\text{V}, I_C = 1\text{A}, f = 1\text{kHz}$	40	-	-

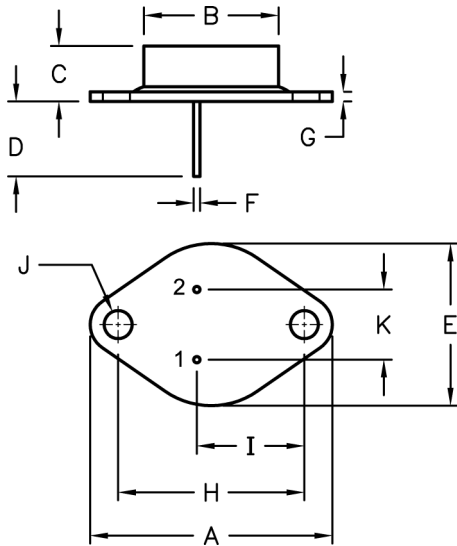
### Switching Characteristics

Rise Time	$t_r$	$V_{CC} = 30\text{V}, I_C = 10\text{A}, I_{B1} = 1\text{A}$	-	1	us
Storage Time	$t_s$	$V_{CC} = 30\text{V}, I_C = 10\text{A}, I_{B1} = I_{B2} = 1\text{A}$		2	
Fall Time	$t_f$			1	

Note 1 : Pulse Test : Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

Note 2 :  $f_T$  is defined as the frequency at which  $|h_{fe}|$  extrapolates to unity

# Bipolar Transistor



Dimensions	Min.	Max.
A	38.75	39.96
B	19.28	22.23
C	7.96	9.23
D	11.18	12.19
E	25.2	26.67
F	0.92	1.09
G	1.38	1.62
H	29.9	30.4
I	16.64	17.3
J	3.88	4.36
K	10.67	11.18

Dimensions : Millimetres

## Part Number Table

Description	Part Number
Transistor, NPN, 30A, 40V, TO-3	2N5301

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