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## 2N3054

### Silicon NPN Transistors

### Medium Power General Purpose Switch

### TO66 Type Package

**Description:**

The 2N3054 is a silicon NPN transistor in a TO66 type package designed for general purpose switching and amplifier applications

**Features:**

- Excellent Safe Operating Area
- DC Current Gain Specified to 3.0 Amps

**Absolute Maximum Ratings:**

Collector–Emitter Voltage, $V_{CEO}$ .....	55V
Collector–Emitter Voltage ( $R_{BE} = 100^\circ$ ), $V_{CER}$ .....	60V
Collector–Base Voltage, $V_{CB}$ .....	90V
Emitter–Base Voltage, $V_{EB}$ .....	7V
Collector Current, $I_C$	
Continuous .....	4A
Peak .....	10A
Base Current, $I_B$ .....	2A
Total Power Dissipation ( $T_C = +25^\circ C$ ), $P_D$ .....	25W
Derate above $25^\circ C$ .....	0.143W/ $^\circ C$
Operating Junction Temperature Range, $T_J$ .....	$-65^\circ$ to $+200^\circ C$
Storage Junction Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+200^\circ C$
Thermal Resistance, Junction to Case, $R_{\leq JC}$ .....	$7^\circ C/W$

**Electrical Characteristics:** ( $T_C = +25^\circ C$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 100mA, I_B = 0$ , Note 1	55	–	–	V
	$V_{CER(sus)}$	$I_C = 100mA, R_{BE} = 100^\circ$ , Note 1	60	–	–	V
Collector Cutoff Current	$I_{CEO}$	$V_{CE} = 30V, I_B = 0$	–	–	5	A
	$I_{CEX}$	$V_{CE} = 90V, V_{BE(off)} = 1.5V$	–	–	1.0	mA
		$V_{CE} = 90V, V_{BE(off)} = 1.5V, T_C = +150^\circ C$	–	–	6.0	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 7V, I_C = 0$	–	–	1.0	mA

Note 1. Pulse Test: Pulse Width  $\leq 300$  s, Duty Cycle  $\leq 2\%$ .

**Electrical Characteristics (Cont'd):** ( $T_C = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>ON Characteristics</b> (Note 1)						
DC Current Gain	$h_{FE}$	$I_C = 0.5\text{A}, V_{CE} = 4\text{V}$	25	-	150	
		$I_C = 3.0\text{A}, V_{CE} = 4\text{V}$	5.0	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 500\text{mA}, I_B = 50\text{mA}$	-	-	1.0	V
		$I_C = 3.0\text{A}, I_B = 1.0\text{A}$	-	-	6.0	V
Base-Emitter ON Voltage	$V_{BE(on)}$	$I_C = 500\text{mA}, V_{CE} = 4\text{V}$	-	-	1.7	V
<b>Dynamic Characteristics</b>						
Current Gain -Bandwidth Product	$f_T$	$I_C = 200\text{mA}, V_{CE} = 10\text{V}$	3.0	-	-	MHz
Small-Signal Current Gain	$h_{fe}$	$I_C = 100\text{mA}, V_{CE} = 4\text{V}, f = 1\text{kHz}$	25	-	180	
Common-Emitter Cutoff frequency	$f_{hfe}$	$I_C = 100\text{mA}, V_{CE} = 4\text{V}$	30	-	-	

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

