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## 2N3055

### Silicon NPN Power Transistor

### Audio Power Amp, Medium Speed Switch

### TO-3 Type Package

**Description:**

The 2N3055 is a silicon NPN transistor in a TO3 type case designed for general purpose switching and amplifier applications.

**Features:**

- DC Current Gain:  $h_{FE} = 20 - 70 @ I_C = 4A$
- Collector-Emitter Saturation Voltage:  $V_{CE(sat)} = 1.1V (Max) @ I_C = 4A$
- Excellent Safe Operating Area

**Absolute Maximum Ratings:**

Collector-Emitter Voltage, $V_{CEO}$ .....	60V
Collector-Emitter Voltage, $V_{CER}$ .....	70V
Collector-Base Voltage, $V_{CB}$ .....	100V
Emitter-Base Voltage, $V_{EB}$ .....	7V
Continuous Collector Current, $I_C$ .....	15A
Base Current, $I_B$ .....	7A
Total Device Dissipation ( $T_C = +25^{\circ}C$ ), $P_D$ .....	115W
Derate Above $25^{\circ}C$ .....	0.657W/ $^{\circ}C$
Operating Junction Temperature Range, $T_J$ .....	$-65^{\circ}$ to $+200^{\circ}C$
Storage Temperature Range, $T_{stg}$ .....	$-65^{\circ}$ to $+200^{\circ}C$
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	1.52 $^{\circ}C/W$

Note 1. Maximum Ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

**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	$V_{CEO(sus)}$	$I_C = 200mA, I_B = 0, \text{Note 2}$	60	-	-	V
Collector-Emitter Sustaining Voltage	$V_{CER(sus)}$	$I_C = 200mA, R_{BE} = 100\Omega, \text{Note 2}$	70	-	-	V
Collector Cutoff Current	$I_{CEO}$	$V_{CE} = 30V, I_B = 0$	-	-	0.7	mA
		$V_{CE} = 100V, V_{BE(off)} = 1.5V$	-	-	1.0	mA
	$V_{CE} = 100V, V_{BE(off)} = 1.5V, T_C = +150^{\circ}C$	-	-	5.0	mA	
Emitter Cutoff Current	$I_{EBO}$	$V_{BE} = 7V, I_C = 0$	-	-	5.0	mA

Note 2. Pulse Test: Pulse Width  $\leq 300\mu s$ . 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 2)						
DC Current Gain	$h_{FE}$	$I_C = 4\text{A}, V_{CE} = 4\text{V}$	20	-	70	
		$I_C = 10\text{A}, V_{CE} = 4\text{V}$	5	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 4\text{A}, I_B = 400\text{mA}$	-	-	1.1	V
		$I_C = 10\text{A}, I_B = 3.3\text{A}$	-	-	3.0	V
Base-Emitter ON Voltage	$V_{BE(on)}$	$I_C = 4\text{A}, V_{CE} = 4\text{V}$	-	-	1.5	V
<b>Second Breakdown</b>						
Second Breakdown Collector Current with Base Forward Biased	$I_{s/b}$	$V_{CE} = 40\text{V}, t = 1.0\text{s};$ Nonrepetitive	2.87	-	-	A
<b>Dynamic Characteristics</b>						
Current Gain-Bandwidth Product	$f_T$	$I_C = 500\text{mA}, V_{CE} = 10\text{V}, f = 1\text{MHz}$	2.5	-	-	MHz
Small-Signal Current Gain	$h_{fe}$	$I_C = 1\text{A}, V_{CE} = 4\text{V}, f = 1\text{kHz}$	15	-	120	
Small-Signal Current Gain Cutoff Frequency	$f_{hfe}$	$V_{CE} = 4\text{V}, I_C = 1\text{A}, f = 1\text{kHz}$	10	-	-	kHz

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

