

## Plastic NPN Silicon High-Voltage Power Transistor

... designed for use in line-operated equipment such as audio output amplifiers; low-current, high-voltage converters; and AC line relays.

- Excellent DC Current Gain -  
 $h_{FE} = 30-250 @ I_C = 100 \text{ mAdc}$
- Current-Gain - Bandwidth Product -  
 $f_T = 10 \text{ MHz (Min) } @ I_C = 50 \text{ mAdc}$

### MAXIMUM RATINGS (1)

Rating	Symbol	2N5655	2N5657	Unit
Collector-Emitter Voltage	$V_{CEO}$	250	350	Vdc
Collector-Base Voltage	$V_{CB}$	275	375	Vdc
Emitter-Base Voltage	$V_{EB}$	6.0		Vdc
Collector Current - Continuous Peak	$I_C$	0.5 1.0		Adc
Base Current	$I_B$	0.25		Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	20 0.16		Watts W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +150		$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$\theta_{JC}$	6.25	$^\circ\text{C/W}$

(1) Indicates JEDEC Registered Data.

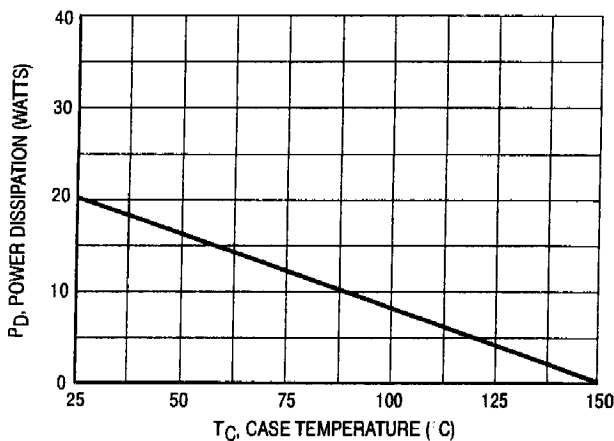


Figure 1. Power Derating

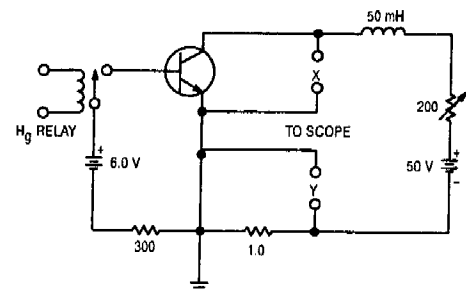
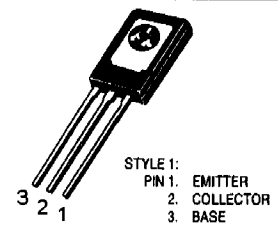


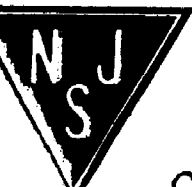
Figure 2. Sustaining Voltage Test Circuit

**2N5655  
 2N5657**

**0.5 AMPERE  
 POWER TRANSISTORS  
 NPN SILICON  
 250-350 VOLTS  
 20 WATTS**



TO-225AA



## 2N5655 2N5657

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

Characteristic	Symbol	Min	Max	Unit	
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Sustaining Voltage ( $I_C = 100\text{ mAdc}$ (inductive), $L = 50\text{ mH}$ )	2N5655 2N5657	$V_{CEO(sus)}$	250 350	– –	Vdc
Collector–Emitter Breakdown Voltage ( $I_C = 1.0\text{ mAdc}$ , $I_B = 0$ )	2N5655 2N5657	$V_{(BR)CEO}$	250 350	– –	Vdc
Collector Cutoff Current ( $V_{CE} = 150\text{ Vdc}$ , $I_B = 0$ ) ( $V_{CE} = 250\text{ Vdc}$ , $I_B = 0$ )	2N5655 2N5657	$I_{CEO}$	– –	0.1 0.1	mAdc
Collector Cutoff Current ( $V_{CE} = 250\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ ) ( $V_{CE} = 350\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ ) ( $V_{CE} = 150\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ , $T_C = 100^\circ\text{C}$ ) ( $V_{CE} = 250\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ , $T_C = 100^\circ\text{C}$ )	2N5655 2N5657 2N5655 2N5657	$I_{CEX}$	– – – –	0.1 0.1 1.0 1.0	mAdc
Collector Cutoff Current ( $V_{CB} = 275\text{ Vdc}$ , $I_E = 0$ ) ( $V_{CB} = 375\text{ Vdc}$ , $I_E = 0$ )	2N5655 2N5657	$I_{CBO}$	– –	10 10	$\mu\text{Adc}$
Emitter Cutoff Current ( $V_{EB} = 6.0\text{ Vdc}$ , $I_C = 0$ )		$I_{EBO}$	–	10	$\mu\text{Adc}$
<b>ON CHARACTERISTICS</b>					
DC Current Gain (1) ( $I_C = 50\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 100\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 250\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 500\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ )		$h_{FE}$	25 30 15 5.0	– 250 – –	–
Collector–Emitter Saturation Voltage (1) ( $I_C = 100\text{ mAdc}$ , $I_B = 10\text{ mAdc}$ ) ( $I_C = 250\text{ mAdc}$ , $I_B = 25\text{ mAdc}$ ) ( $I_C = 500\text{ mAdc}$ , $I_B = 100\text{ mAdc}$ )		$V_{CE(sat)}$	– – –	1.0 2.5 10	Vdc
Base–Emitter Voltage (1) ( $I_C = 100\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ )		$V_{BE}$	–	1.0	Vdc
<b>DYNAMIC CHARACTERISTICS</b>					
Current–Gain – Bandwidth Product (2) ( $I_C = 50\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 10\text{ MHz}$ )		$f_T$	10	–	MHz
Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $I_E = 0$ , $f = 100\text{ kHz}$ )		$C_{ob}$	–	25	pF
Small–Signal Current Gain ( $I_C = 100\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )		$h_{fe}$	20	–	–

\*Indicates JEDEC Registered Data for 2N5655 Series.

(1) Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

(2)  $f_T$  is defined as the frequency at which  $|h_{fe}|$  extrapolates to unity.