



# POWER TRANSISTORS

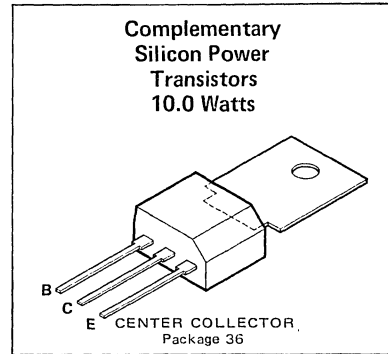
**NPN**  
NSE180, NSE181  
**PNP**  
NSE170, NSE171

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**PNP NSE170, NSE171**

Double diffused planar power transistors designed with National's revolutionary "Epoxy B" concept to provide exceptional reliability.

## Applications

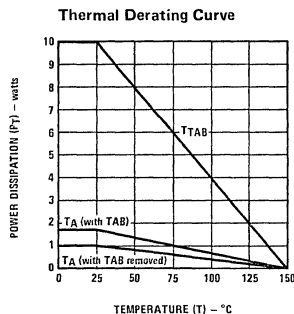
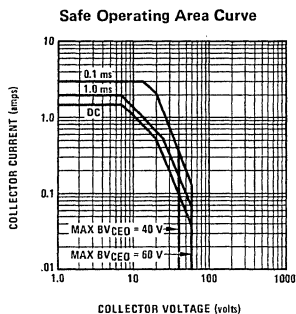
- Audio output and/or driver
- High frequency inverters/converters
- Series, shunt and switching regulators



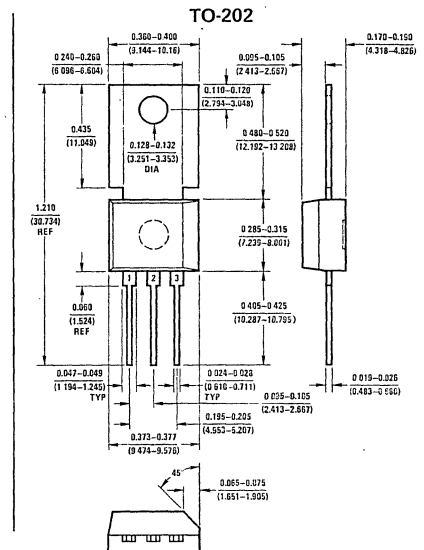
## Maximum Ratings

Parameter	Symbol	NSE180 NSE170	NSE181 NSE171	Units
Collector-Base Voltage	$V_{CB}$	60	80	V
Collector-Emitter Voltage	$V_{CEO}$	40	60	V
Emitter-Base Voltage	$V_{EB}$	5	5	V
Collector Current	$I_C$	3	3	A
Power Dissipation ( $T_A = 25^\circ\text{C}$ )	$T_j, T_{stg}$	1.75	1.75	W
( $T_C = 25^\circ\text{C}$ )		10.0	10.0	W
Temperature	$T_j, T_{stg}$	-55 to +150	-55 to +150	$^\circ\text{C}$
Thermal Resistance	$\theta_{JA}$	71.4	71.4	$^\circ\text{C/W}$
	$\theta_{JC}$	12.5	12.5	$^\circ\text{C/W}$

## Typical Performance Characteristics



## Physical Dimensions

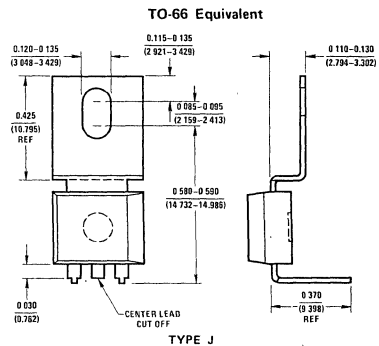
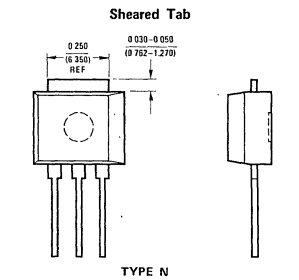
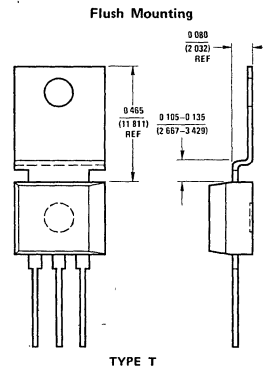
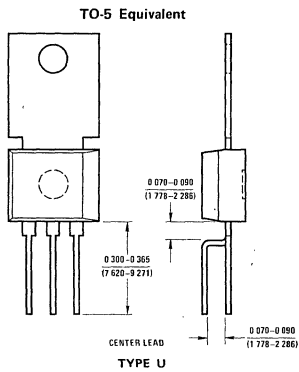


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## Electrical Characteristics

Parameter	Symbol	Min.	Max.	Units
Collector-Emitter Sustaining Voltage $I_C = 10 \text{ mA}, I_B = 0$	$BV_{CEO}$			
NSE170, 180		40		V
NSE171, 181		60		V
Collector Cutoff Current $V_{CB} = 60 \text{ V}, I_E = 0$	$I_{CBO}$		0.1	$\mu\text{A}$
NSE170, 180			0.1	$\mu\text{A}$
$V_{CB} = 80 \text{ V}, I_E = 0$				
NSE171, 181				
Emitter Cutoff Current $V_{BE} = 5.0 \text{ V}, I_C = 0$	$I_{EBO}$		0.1	$\mu\text{A}$
DC Current Gain	$h_{FE}$			
$I_C = 100 \text{ mA}, V_{CE} = 1.0 \text{ V}$		50	250	
$I_C = 500 \text{ mA}, V_{CE} = 1.0 \text{ V}$		30		
$I_C = 1.5 \text{ A}, V_{CE} = 1.0 \text{ V}$		12		
Collector-Emitter Saturation Voltage $I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$	$V_{CE(sat)}$		0.3	V
$I_C = 1.5 \text{ A}, I_B = 150 \text{ mA}$			0.9	V
Base-Emitter Saturation Voltage $I_C = 1.5 \text{ A}, I_B = 150 \text{ mA}$	$V_{BE(sat)}$		1.5	V
Base-Emitter ON Voltage $I_C = 500 \text{ mA}, V_{CE} = 1.0 \text{ V}$	$V_{BE(on)}$		1.2	V
Gain Bandwidth Product $I_C = 100 \text{ mA}, V_{CE} = 10 \text{ V}, f = 10 \text{ MHz}$	$f_t$	50		MHz

## Physical Dimensions



National Semiconductor Corporation offers a wide variety of tab/lead configurations. These standard types may be ordered as shown or in combination (i.e., Type NU). Should an application require a configuration not shown, contact your NS sales representative for assistance.