

# 2N1042 thru 2N1045 (GERMANIUM)

# 2N2560 thru 2N2567

## PNP GERMANIUM MEDIUM POWER TRANSISTORS

... designed for relay drivers, pulse amplifiers, audio amplifiers and high-current switching applications.

- High Current Capability –  $I_C = 3.5$  Amperes
- Guaranteed Excellent Collector-Emitter Sustaining Voltage
- 20-Watt Power Dissipation at 25°C Case Temperature
- 100°C Maximum Junction Temperature

### \* MAXIMUM RATINGS

Rating	Symbol	2N1042	2N1043	2N1044	2N1045	Unit
		2N2560	2N2561	2N2562	2N2563	
Collector-Emitter Voltage	$V_{CEO}$	30	40	50	60	Vdc
Collector-Base Voltage	$V_{CB}$	40	60	80	100	Vdc
Emitter-Base Voltage	$V_{EB}$	← 20 →				Vdc
Collector Current – Continuous	$I_C$	← 3.5 →				Adc
Base Current – Continuous	$I_B$	← 1.0 →				Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	$P_D$	← 450 →				mW
		← 6.0 →				mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C (Note 1)	$P_D$	← 20 →				Watts
		← 0.267 →				W/°C
** Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	← -65 to +100 →				°C

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$\theta_{JC}$	3.75	°C/W

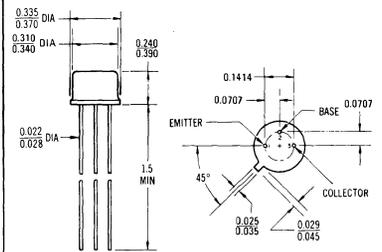
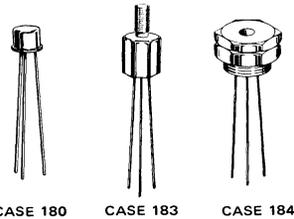
\*Indicates JEDEC Registered Data.

Note 1: Case Temperature shall be measured 0.100 ± 0.010 inches above the seating plane.

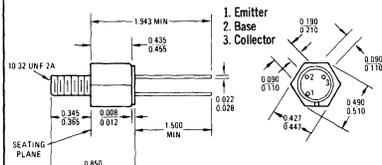
\*\*Motorola guarantees this data in addition to the JEDEC Registered Data shown.

## PNP GERMANIUM POWER TRANSISTORS

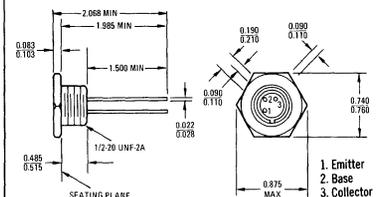
40–100 VOLTS  
20 WATTS



2N2564 – 2N2567 CASE 180



2N2560 – 2N2563 CASE 183



2N1042 – 2N1045 CASE 184  
Collector Connected to Case  
(All Types)

## 2N1042 thru 2N1045/2N2560 thru 2N2567 (continued)

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Sustaining Voltage ( $I_C = 100 \text{ mAdc}$ , $I_B = 0$ )	$V_{CE(sus)}$	30 40 50 60	—	Vdc
Collector Cutoff Current ( $V_{CE} = 15 \text{ Vdc}$ , $I_B = 0$ )	$I_{CEO}$	—	25	mAdc
( $V_{CE} = 20 \text{ Vdc}$ , $I_B = 0$ )		—	20	
( $V_{CE} = 25 \text{ Vdc}$ , $I_B = 0$ )		—	20	
( $V_{CE} = 30 \text{ Vdc}$ , $I_B = 0$ )		—	20	
Collector-Emitter Cutoff Current ( $V_{CE} = 40 \text{ Vdc}$ , $V_{BE(off)} = 0.2 \text{ Vdc}$ )	$I_{CEX}$	—	0.65	mAdc
( $V_{CE} = 60 \text{ Vdc}$ , $V_{BE(off)} = 0.2 \text{ Vdc}$ )		—	0.65	
( $V_{CE} = 80 \text{ Vdc}$ , $V_{BE(off)} = 0.2 \text{ Vdc}$ )		—	0.65	
( $V_{CE} = 100 \text{ Vdc}$ , $V_{BE(off)} = 0.2 \text{ Vdc}$ )		—	0.65	
( $V_{CE} = 20 \text{ Vdc}$ , $V_{BE(off)} = 0.2 \text{ Vdc}$ , $T_C = 85^\circ\text{C}$ )		—	5.0	
( $V_{CE} = 30 \text{ Vdc}$ , $V_{BE(off)} = 0.2 \text{ Vdc}$ , $T_C = 85^\circ\text{C}$ )		—	5.0	
( $V_{CE} = 40 \text{ Vdc}$ , $V_{BE(off)} = 0.2 \text{ Vdc}$ , $T_C = 85^\circ\text{C}$ )		—	5.0	
( $V_{CE} = 50 \text{ Vdc}$ , $V_{BE(off)} = 0.2 \text{ Vdc}$ , $T_C = 85^\circ\text{C}$ )		—	5.0	
Collector Cutoff Current ( $V_{CB} = 20 \text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	—	125	$\mu\text{Adc}$
( $V_{CB} = 30 \text{ Vdc}$ , $I_E = 0$ )		—	125	
( $V_{CB} = 40 \text{ Vdc}$ , $I_E = 0$ )		—	125	
( $V_{CB} = 50 \text{ Vdc}$ , $I_E = 0$ )		—	125	
**( $V_{CB} = 40 \text{ Vdc}$ , $I_E = 0$ )		—	750	
**( $V_{CB} = 60 \text{ Vdc}$ , $I_E = 0$ )		—	750	
**( $V_{CB} = 80 \text{ Vdc}$ , $I_E = 0$ )		—	750	
**( $V_{CB} = 100 \text{ Vdc}$ , $I_E = 0$ )		—	750	
Emitter Cutoff Current ( $V_{BE} = 20 \text{ Vdc}$ , $I_C = 0$ )		$I_{EBO}$	—	
<b>ON CHARACTERISTICS</b>				
DC Current Gain ( $I_C = 50 \text{ mAdc}$ , $V_{CE} = 0.5 \text{ Vdc}$ )	$h_{FE}$	50	—	—
( $I_C = 1.0 \text{ Adc}$ , $V_{CE} = 1.0 \text{ Vdc}$ )		—	150	
( $I_C = 3.0 \text{ Adc}$ , $V_{CE} = 1.0 \text{ Vdc}$ )		20	60	
Collector-Emitter Saturation Voltage ( $I_C = 1.0 \text{ Adc}$ , $I_B = 100 \text{ mAdc}$ )	$V_{CE(sat)}$	—	0.25	Vdc
( $I_C = 3.0 \text{ Adc}$ , $I_B = 300 \text{ mAdc}$ )		—	0.75	
Base-Emitter Input Voltage ( $I_C = 3.0 \text{ Adc}$ , $V_{CE} = 1.0 \text{ Vdc}$ )	$V_{BE}$	—	1.5	Vdc
<b>SMALL-SIGNAL CHARACTERISTICS</b>				
Small-Signal Current Gain ( $I_C = 500 \text{ mAdc}$ , $V_{CE} = 1.5 \text{ Vdc}$ , $f = 1.0 \text{ kHz}$ )	$h_{fe}$	25	100	—
Small-Signal Current Gain ( $I_C = 500 \text{ mAdc}$ , $V_{CE} = 1.5 \text{ Vdc}$ , $f = 125 \text{ kHz}$ )	$ h_{fe} $	2.0	—	—

\*Indicates JEDEC Registered Data.

\*\*Motorola Guarantees this data in addition to the JEDEC Registered Data Shown.