2N1038 thru 2N1041 (GERMANIUM)
2N2552 thru 2N2559

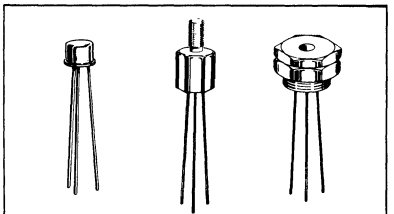
PNP GERMANIUM MEDIUM POWER TRANSISTORS

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

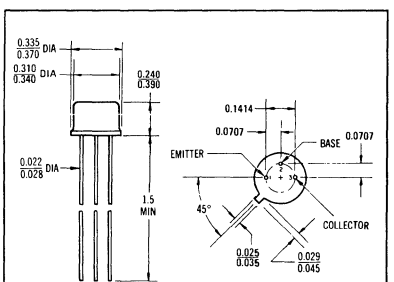
- High Current Capability – I_C = 3.0 Amperes
- Guaranteed Excellent Collector-Emitter Sustaining Voltage
- 20-Watt Power Dissipation at 25°C Case Temperature
- 100°C Maximum Junction Temperature

PNP GERMANIUM POWER TRANSISTORS

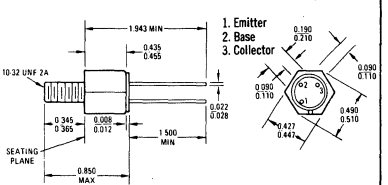
40–100 VOLTS
20 WATTS



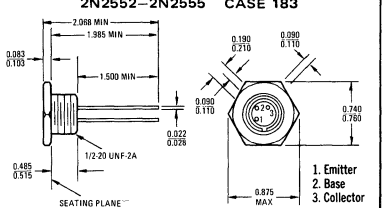
CASE 180 CASE 183 CASE 184



2N1038–2N1041 CASE 180



2N2552–2N2555 CASE 183



2N2556–2N2559 CASE 184
Collector Connected to Case
(All Types)

*MAXIMUM RATINGS

Rating	Symbol	2N1038 2N2552 2N2556	2N1039 2N2553 2N2557	2N1040 2N2554 2N2558	2N1041 2N2555 2N2559	Unit
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	3.0				Adc
Base Current – Continuous	I_B	1.0				Adc
Total Device Dissipation @ T_A = 25°C	P_D	450				mW
Derate above 25°C		6.0				mW/°C
Total Device Dissipation @ T_C = 25°C	P_D	20				Watts
Derate above 25°C (Note 1)		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	θ_{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.

*ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage (I_C = 100 mAdc, I_B = 0)	2N1038, 2N2552, 2N2556	$V_{CEO(sus)}$	30	-	Vdc
	2N1039, 2N2553, 2N2557		40	-	
	2N1040, 2N2554, 2N2558		50	-	
	2N1041, 2N2555, 2N2559		60	-	
Collector Cutoff Current		I_{CEO}			mAdc
(V_{CE} = 15 Vdc, I_B = 0)	2N1038, 2N2552, 2N2556		-	25	
(V_{CE} = 20 Vdc, I_B = 0)	2N1039, 2N2553, 2N2557		-	20	
(V_{CE} = 25 Vdc, I_B = 0)	2N1040, 2N2554, 2N2558		-	20	
(V_{CE} = 30 Vdc, I_B = 0)	2N1041, 2N2555, 2N2559		-	20	
Collector-Emitter Cutoff Current		I_{CEX}			mAdc
(V_{CE} = 40 Vdc, $V_{BE(off)}$ = 0.2 Vdc)	2N1038, 2N2552, 2N2556		-	0.65	
(V_{CE} = 60 Vdc, $V_{BE(off)}$ = 0.2 Vdc)	2N1039, 2N2553, 2N2557		-	0.65	
(V_{CE} = 80 Vdc, $V_{BE(off)}$ = 0.2 Vdc)	2N1040, 2N2554, 2N2558		-	0.65	
(V_{CE} = 100 Vdc, $V_{BE(off)}$ = 0.2 Vdc)	2N1041, 2N2555, 2N2559		-	0.65	
(V_{CE} = 20 Vdc, $V_{BE(off)}$ = 0.2 Vdc, T_C = 85°C)	2N1038, 2N2552, 2N2556		-	5.0	
(V_{CE} = 30 Vdc, $V_{BE(off)}$ = 0.2 Vdc, T_C = 85°C)	2N1039, 2N2553, 2N2557		-	5.0	
(V_{CE} = 40 Vdc, $V_{BE(off)}$ = 0.2 Vdc, T_C = 85°C)	2N1040, 2N2554, 2N2558		-	5.0	
(V_{CE} = 50 Vdc, $V_{BE(off)}$ = 0.2 Vdc, T_C = 85°C)	2N1041, 2N2555, 2N2559		-	5.0	
Collector Cutoff Current		I_{CBO}			μAdc
(V_{CB} = 20 Vdc, I_E = 0)	2N1038, 2N2552, 2N2556		-	125	
(V_{CB} = 30 Vdc, I_E = 0)	2N1039, 2N2553, 2N2557		-	125	
(V_{CB} = 40 Vdc, I_E = 0)	2N1040, 2N2554, 2N2558		-	125	
(V_{CB} = 50 Vdc, I_E = 0)	2N1041, 2N2555, 2N2559		-	125	
**(V_{CB} = 40 Vdc, I_E = 0)	2N1038, 2N2552, 2N2556		-	750	
**(V_{CB} = 60 Vdc, I_E = 0)	2N1039, 2N2553, 2N2557		-	750	
**(V_{CB} = 80 Vdc, I_E = 0)	2N1040, 2N2554, 2N2558		-	750	
**(V_{CB} = 100 Vdc, I_E = 0)	2N1041, 2N2555, 2N2559		-	750	
Emitter Cutoff Current (V_{BE} = 20 Vdc, I_C = 0)		I_{EBO}	-	650	μAdc
ON CHARACTERISTICS					
DC Current Gain		h_{FE}			-
(I_C = 50 mAdc, V_{CE} = 0.5 Vdc)			33	200	
(I_C = 1.0 Adc, V_{CE} = 0.5 Vdc)			20	60	
Collector-Emitter Saturation Voltage (I_C = 1.0 Adc, I_B = 100 mAdc)		$V_{CE(sat)}$	-	0.25	Vdc
Base-Emitter Input Voltage (I_C = 1.0 Adc, V_{CE} = 0.5 Vdc)		V_{BE}	-	1.0	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Small-Signal Current Gain (I_C = 500 mAdc, V_{CE} = 1.5 Vdc, f = 1.0 kHz)		h_{fe}	18	72	-
Small-Signal Current Gain (I_C = 500 mAdc, V_{CE} = 1.5 Vdc, f = 112.5 kHz)		$\lvert h_{fe} \rvert$	2.0	-	-

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