

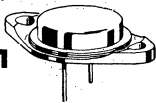
# 2N376A (GERMANIUM)

For Specifications, See 2N350A Data.

## 2N378 thru 2N380 (GERMANIUM)

2N459, A

CASE 11  
(TO-3)



PNP germanium power transistors for general purpose power amplifier and switching applications.

### MAXIMUM RATINGS

Rating	Symbol	2N378	2N379	2N380	2N459	2N459A	Unit	
Collector-Emitter Voltage	$V_{CEO}$	20	40	30	60	60	Vdc	
Collector-Emitter Voltage ( $V_{BE} = 1.5$ V) ( $V_{BE} = 1.0$ V)	$V_{CEX}$	40 -	80 -	60 -	- 105	- 105	Vdc	
Collector-Emitter Voltage	$V_{CES}$	-	-	-	70	70	Vdc	
Collector-Base Voltage	$V_{CB}$	-	-	-	-	105	Vdc	
Emitter-Base Voltage	$V_{EB}$	-	-	-	10	25	Vdc	
Collector Current	$I_C$	5.0						A dc
Operating Junction Temperature Range	$T_J$	-65 to +110						°C
Total Device Dissipation @ $T_C = 25^\circ$ C	$P_D$	106						Watts

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ$ C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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#### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ( $I_C = 100$ mA dc)	2N378 2N379 2N380 2N459, 2N459A	$BV_{CEO}$	20 40 30 60	- - - -	Vdc
Collector Cutoff Current ( $V_{CE} = 40$ Vdc, $V_{BE(off)} = 1.5$ Vdc) ( $V_{CE} = 60$ Vdc, $V_{BE(off)} = 1.5$ Vdc) ( $V_{CE} = 80$ Vdc, $V_{BE(off)} = 1.5$ Vdc) ( $V_{CE} = 105$ Vdc, $V_{BE(off)} = 1.5$ Vdc) ( $V_{CE} = 105$ Vdc, $V_{BE(off)} = 1.0$ Vdc)	2N378 2N380 2N379 2N459 2N459A	$I_{CEX}$	- - - - -	10 10 10 10 10	mA dc
Collector Cutoff Current ( $V_{CB} = 25$ Vdc) ( $V_{CB} = 25$ Vdc, $T_C = 85^\circ$ C)		$I_{CBO}$	- -	0.5 7.5	mA dc
Emitter Cutoff Current ( $V_{BE} = 10$ Vdc) ( $V_{BE} = 25$ Vdc)	2N380 2N459 2N459A	$I_{EBO}$	- - -	1.5 2.0 2.0	mA dc

**2N378, thru 2N380 2N459, 2N459 A (continued)**

**ELECTRICAL CHARACTERISTICS (continued)**

Characteristic	Symbol	Min	Max	Unit
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**ON CHARACTERISTICS**

DC Current Gain ( $I_C = 2.0 \text{ Adc}$ , $V_{CE} = 2.0 \text{ Vdc}$ )	2N378	$h_{FE}$	40	80	-
	2N379, 2N459		20	70	
(I <sub>C</sub> = 5.0 Adc, V <sub>CE</sub> = 2.0 Vdc)	2N380		30	70	
	2N459A		40	70	
	2N459A		20	-	
Collector-Emitter Saturation Voltage ( $I_C = 2.0 \text{ Adc}$ , $I_B = 0.2 \text{ Adc}$ )	2N378-2N380, 2N459 2N459A	$V_{CE(sat)}$	-	1.0	Vdc
			-	0.3	
Base-Emitter Voltage ( $I_C = 2.0 \text{ Adc}$ , $V_{CE} = 2.0 \text{ Vdc}$ )	2N378	$V_{BE(on)}$	-	1.6	Vdc
	2N379, 2N459, 2N459A		-	1.3	
	2N380		-	1.0	

**DYNAMIC CHARACTERISTICS**

Common-Emitter Cutoff Frequency ( $I_C = 1.0 \text{ Adc}$ , $V_{CE} = 2.0 \text{ Vdc}$ )	2N378-2N380, 2N459	$f_{\alpha e}$	5.0	-	kHz
( $I_C = 2.0 \text{ Adc}$ , $V_{CE} = 2.0 \text{ Vdc}$ )	2N459A		5.0	-	