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2N6036 (PNP) & 2N6039 (NPN) Silicon Complementary Transistors Darlington Power Amplifier TO-126 Type Package

Description:

The 2N6036 (PNP) and 2N6039 (NPN) are silicon complementary Darlington power transistors in a TO-126 type case designed for general-purpose amplifier and low-speed switching applications.

Absolute Maximum Ratings: (Note 1)

Collector-Emitter Voltage, V_{CEO}	80V
Collector-Base Voltage, V_{CBO}	80V
Emitter-Base Voltage, V_{EBO}	5V
Collector Current, I_C	
Continuous	4A
Peak	8A
Base Current, I_B	100mA
Total Power Dissipation ($T_C = +25^\circ\text{C}$), P_D	40W
Derate Above 25°C	320mW/ $^\circ\text{C}$
Total Power Dissipation ($T_A = +25^\circ\text{C}$), P_D	1.5W
Derate Above 25°C	12mW/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-65° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+150^\circ\text{C}$
Thermal Resistance, Junction-to-Case, R_{thJC}	3.12 $^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient, R_{thJA}	83.3 $^\circ\text{C/W}$

Electrical Characteristics: ($T_C = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 100\text{mA}$, $I_B = 0$	80	—	—	V
Collector Cutoff Current	I_{CEO}	$V_{CE} = 80\text{V}$, $I_B = 0$	—	—	100	μA
	I_{CBO}	$V_{CB} = 80\text{V}$, $I_E = 0$	—	—	500	μA
	I_{CEX}	$V_{CE} = 80\text{V}$, $V_{BE(off)} = 1.5\text{V}$	—	—	100	μA
		$T_C = +125^\circ\text{C}$	—	—	500	μA
Emitter Cutoff Current	I_{EBO}	$V_{BE} = 5\text{V}$, $I_C = 0$	—	—	2.0	mA

Note 1. Stresses exceeding maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Electrical Characteristics (Cont'd): ($T_C = +25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics						
DC Current Gain	h_{FE}	$V_{CE} = 3\text{V}, I_C = 0.5\text{A}$	500	–	–	
		$V_{CE} = 3\text{V}, I_C = 2\text{A}$	750	–	15000	
		$V_{CE} = 3\text{V}, I_C = 4\text{A}$	100	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 2\text{A}, I_B = 8\text{mA}$	–	–	2.0	V
		$I_C = 4\text{A}, I_B = 40\text{mA}$	–	–	3.0	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 4\text{A}, I_B = 40\text{mA}$	–	–	4.0	V
Base–Emitter ON Voltage	$V_{BE(on)}$	$V_{CE} = 3\text{V}, I_C = 2\text{A}$	–	–	2.8	V
Dynamic Characteristics						
Small–Signal Current–Gain	$ h_{fe} $	$V_{CE} = 10\text{V}, I_C = 750\text{mA}, f = 1\text{MHz}$	25	–	–	
Output Capacitance 2N6036	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0, f = 0.1\text{MHz}$	–	–	200	pF
2N6039			–	–	100	pF

