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2N4923 Silicon NPN Transistor Audio Power Amp, Switch TO-126 Type Package

Description:

The 2N4923 is a silicon NPN transistors in a TO-126 plastic package designed for use as driver circuits, switching, and amplifier applications.

Features:

- Lo saturation Voltage: $V_{CE(sat)} = 600\text{mV (Max) @ } I_C = 1\text{A}$
- Excellent Power Dissipation: $P_D = 30\text{W @ } T_C = +25^\circ\text{C}$
- Excellent Safe Operating Area
- Gain Specified to $I_C = 1\text{A}$

Absolute Maximum Ratings:

Collector-Emitter Voltage, V_{CEO}	80V
Collector-Base Voltage, V_{CB}	80V
Emitter-Base Voltage, V_{EB}	5V
Continuous Collector Current (Note 1), I_C	1A (3A)
Continuous Base Current, I_B	1A
Total Power Dissipation ($T_C = +25^\circ\text{C}$), P_D	30W
Derate Above 25°C	240mW/ $^\circ\text{C}$
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 (Note 2), R_{thJC}	4.16 $^\circ\text{C/W}$

- Note 1. The 1A maximum I_C value is based upon JEDEC current gain requirements.
 The 3A maximum value is based upon actual current handling capability of the device.
- Note 2. Recommend use of thermal compound for lowest thermal resistance.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 100\text{mA}, I_B = 0$, Note 3	80	-	-	V
Collector Cutoff Current	I_{CEO}	$V_{CE} = 40\text{V}, I_B = 0$	-	-	0.5	mA
		$V_{CE} = 80\text{V}, V_{EB(off)} = 1.5\text{V}$	-	-	0.1	mA
	$V_{CE} = 80\text{V}, V_{EB(off)} = 1.5\text{V}, T_C = +125^\circ\text{C}$	-	-	0.5	mA	
	I_{CBO}	$V_{CB} = 80\text{V}, I_E = 0$	-	-	0.1	mA
Emitter Cutoff Current	I_{EBO}	$V_{BE} = 5\text{V}, I_C = 0$	-	-	1.0	mA

Note 3. Pulse test: Pulse Width = 300 μs , Duty Cycle = 2%.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics (Note 3)						
DC Current Gain	h_{FE}	$I_C = 50\text{mA}, V_{CE} = 1\text{V}$	40	-	-	
		$I_C = 500\text{mA}, V_{CE} = 1\text{V}$	30	-	150	
		$I_C = 1\text{A}, V_{CE} = 1\text{V}$	10	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1\text{A}, I_B = 100\text{mA}$	-	-	0.6	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 1\text{A}, I_B = 100\text{mA}$	-	-	1.3	V
Base-Emitter ON Voltage	$V_{BE(on)}$	$I_C = 1\text{A}, V_{CE} = 1\text{V}$	-	-	1.3	V
Dynamic Characteristics						
Current Gain-Bandwidth Product	f_T	$I_C = 250\text{mA}, V_{CE} = 10\text{V}, f = 1\text{MHz}$	3.0	-	-	MHz
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0, f = 100\text{kHz}$	-	-	100	pF
Small-Signal Current Gain	h_{fe}	$I_C = 250\text{mA}, V_{CE} = 10\text{V}, f = 1\text{MHz}$	25	-	-	

Note 3. Pulse test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

