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2N3417

NPN Silicon Transistor General Purpose Amplifier TO-92 Type Package

Description:

The 2N3417 is a silicon NPN transistor in a TO-92 type package designed for use as a general purpose amplifier and switch requiring collector currents to 300mA.

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$, Note 1 unless otherwise specified)

Collector-Emitter Voltage, V_{CEO}	50V
Collector-Base Voltage, V_{CBO}	50V
Emitter-Base Voltage, V_{EBO}	5V
Continuous Collector Current, I_C	500mA
Total Device Dissipation, P_D	625mW
Derat Above $+25^\circ\text{C}$	5mW/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$
Thermal Resistance, Junction-to-Case, R_{thJC}	$+83.3^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient, R_{thJA}	$+200^\circ\text{C/W}$

Note 1. These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

Note 2. These ratings are based on a maximum junction temperature of $+150$ degrees C.

Note 3. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle. operations.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 10\text{mA}$, $I_B = 0$, Note 4	50	-	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\leq\text{A}$, $I_E = 0$	50	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)CEO}$	$I_E = 10\leq\text{A}$, $I_C = 0$	5	-	-	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 25\text{V}$, $I_E = 0$	-	-	100	nA
		$V_{CB} = 18\text{V}$, $I_E = 0$, $T_A = +100^\circ\text{C}$	-	-	15	$\leq\text{A}$
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5\text{V}$, $I_C = 0$	-	-	100	nA

Note 4. Pulse test: Pulse Width $\leq 300\leq\text{s}$, Duty Cycle $\leq 2\%$.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics (Note 4)						
DC Current Gain	h_{FE}	$V_{CE} = 4.5\text{V}, I_C = 2\text{mA}$	180	-	540	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 50\text{mA}, I_B = 3\text{mA}$	-	-	0.3	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 50\text{mA}, I_B = 3\text{mA}$	0.6	-	1.3	V
Small-Signal Characteristics						
Small-Signal Current Gain	h_{fe}	$I_C = 2\text{mA}, V_{CE} = 4\text{V}, f = 1\text{kHz}$	180	-	-	

Note 4. Pulse test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

