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2N3442 Silicon NPN Transistor High Power Industrial TO-3 Type Package

Description:

The 2N3442 is a silicon NPN power transistor in a TO-3 type package designed for applications in industrial and commercial equipment including high fidelity audio amplifiers, series and shunt regulators and power switches.

Features:

- Collector-Emitter Sustaining Voltage: $V_{CEO(sus)} = 140V$ Min
- Excellent Second Breakdown Capability

Absolute Maximum Ratings:

Collector-Emitter Voltage, V_{CEO}	140V
Collector-Base Voltage, V_{CBO}	160V
Emitter-Base Voltage, V_{EB}	7V
Collector Current, I_C	
Continuous	10A
Peak	15A
Total Power Dissipation ($T_C = +25^\circ C$), P_D	117W
Derate Above $25^\circ C$	0.67W/ $^\circ C$
Operating Junction Temperature Range, T_J	-65° to $+200^\circ C$
Storage Temperature Range, T_{stg}	-65° to $+200^\circ C$
Thermal Resistance, Junction-to-Case, R_{thJC}	1.5 $^\circ C/W$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 200mA, I_B = 0$	140	-	-	V
Collector Cutoff Current	I_{CEO}	$V_{CE} = 140V, I_B = 0$	-	-	200	mA
	I_{CEX}	$V_{CE} = 140V, V_{BE(off)} = 1.5V$	-	-	5	mA
		$V_{CE} = 140V, V_{BE(off)} = 1.5V, T_C = +150^\circ C$	-	-	30	mA
Emitter Cutoff Current	I_{EBO}	$V_{BE} = 7V, I_C = 0$	-	-	5	mA

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics (Note 1)						
DC Current Gain	h_{FE}	$V_{CE} = 4\text{V}, I_C = 3\text{A}$	20	-	70	
		$V_{CE} = 4\text{V}, I_C = 10\text{A}$	7.5	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{A}, I_B = 2\text{A}$	-	-	5	V
Base-Emitter On Voltage	$V_{BE(on)}$	$V_{CE} = 4\text{V}, I_C = 10\text{A}$	-	-	5.7	V
Dynamic Characteristics						
Current Gain-Bandwidth Product	f_T	$V_{CE} = 4\text{V}, I_C = 2\text{A}, f_{test} = 40\text{kHz}$, Note 2	80	-	-	kHz
Small-Signal Current Gain	h_{fe}	$V_{CE} = 4\text{V}, I_C = 2\text{A}, f_{test} = 1\text{kHz}$	12	-	72	

Note 1. Pulse Test: Pulse Width = $300\mu\text{s}$, Duty Cycle $\leq 2\%$.

Note 2. $f_T = |h_{fe}| \cdot f_{test}$

