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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°C), P_D 117W
  Derate Above 25°C . . . . . 0.67W/°C
Operating Junction Temperature Range, T_J . . . . . –65° to +200°C
Storage Temperature Range, T_{stg} . . . . . –65° to +200°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 1.5°C/W

Electrical Characteristics: (T_C = +25°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°C	–	–	30	mA
Emitter Cutoff Current	I_{EBO}	V_{BE} = 7V, I_C = 0	–	–	5	mA

Electrical Characteristics (Cont'd): (T_C = +25°C unless otherwise specified)

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

Note 1. Pulse Test: Pulse Width = 300μs, Duty Cycle ≤ 2%.
Note 2. $f_T = |h_{fe}| \bullet f_{test}$