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2N5683

Silicon PNP Transistor

High Power, High Current Switch

TO-3 Type Package

Description:

The 2N5683 is a PNP power transistor a TO-3 type case designed for use in high power amplifier and switching circuit applications.

Features:

- High Current Capability: $I_C = 50A$ (Continuous)
- DC Current Gain: $h_{FE} = 15$ to 60 @ $I_C = 25A_{dc}$
- Low Collector-Emitter Saturation Voltage: $V_{CE(sat)} = 1V$ Max @ $I_C = 25A_{dc}$

Absolute Maximum Ratings:

| | |
|---|-------------------------------|
| Collector-Emitter Voltage, V_{CEO} | 60V |
| Collector-Base Voltage, V_{CB} | 60V |
| Emitter-Base Voltage, V_{EB} | 5V |
| Continuous Collector Current, I_C | 50A |
| Base Current, I_B | 15A |
| Total Device Dissipation ($T_C = +25^\circ C$), P_D | 300W |
| Derate Above $25^\circ C$ | 1.715W/ $^\circ C$ |
| 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} | 0.584 $^\circ C/W$ |

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--------------------------------------|--|------------------------------------|-----|-----|-----|------|
| OFF Characteristics | | | | | | |
| Collector-Emitter Sustaining Voltage | $V_{CEO(sus)}$ | $I_C = 0.2A, I_B = 0,$ | 60 | - | - | V |
| Collector Cutoff Current | I_{CEO} | $V_{CE} = 30V, I_B = 0$ | - | - | 1 | mA |
| | | $V_{CE} = 60V, V_{EB(off)} = 1.5V$ | - | - | 2 | mA |
| | $V_{CE} = 60V, V_{EB(off)} = 1.5V, T_C = +150^\circ C$ | - | - | 10 | mA | |
| | I_{CBO} | $V_{CB} = 60V, I_E = 0$ | - | - | 2 | mA |
| Emitter Cutoff Current | I_{EBO} | $V_{BE} = 5V, I_C = 0$ | - | - | 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 | | | | | | |
| DC Current Gain | h_{FE} | $I_C = 25\text{A}, V_{CE} = 2\text{V}, \text{Note 1}$ | 15 | - | 60 | |
| | | $I_C = 50\text{A}, V_{CE} = 5\text{V}, \text{Note 1}$ | 5 | - | - | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 25\text{A}, I_B = 2.5\text{A}, \text{Note 1}$ | - | - | 1 | V |
| | | $I_C = 50\text{A}, I_B = 10\text{A}, \text{Note 1}$ | - | - | 5 | V |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C = 25\text{A}, I_B = 2.5\text{A}$ | - | - | 2 | V |
| Base-Emitter ON Voltage | $V_{BE(on)}$ | $I_C = 25\text{A}, V_{CE} = 2\text{V}$ | - | - | 2 | V |
| Dynamic Characteristics | | | | | | |
| Current Gain-Bandwidth Product | f_T | $I_C = 5\text{A}, V_{CE} = 10\text{V}, f = 1\text{MHz}$ | 2 | - | - | MHz |
| Output Capacitance | C_{ob} | $V_{CB} = 10\text{V}, I_E = 0, f = 0.1\text{MHz}$ | - | - | 2000 | pF |
| Small-Signal Current Gain | h_{fe} | $I_C = 10\text{A}, V_{CE} = 5\text{V}, f = 1\text{kHz}$ | 15 | - | - | |

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

