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MJ15003 (NPN) & MJ15004 (PNP) Silicon Complementary Transistors High Power Audio, Disk Head Positioner for Linear Applications TO-3 Type Package

Description:

The MJ15003 (NPN) and MJ15004 (PNP) are complementary silicon power transistors in a TO-3 type package designed for high power audio, disk head positioners, and other linear applications.

Features:

- High Safe Operating Area: 250W @ 50V
- For Low Distortion Complementary Designs
- High DC Current Gain: $h_{FE} = 25$ Min @ $I_C = 5A$

Absolute Maximum Ratings:

| | |
|--|-------------------------------|
| Collector-Emitter Voltage, $V_{CEO(sus)}$ | 140V |
| Collector-Base Voltage, V_{CBO} | 140V |
| Emitter-Base Voltage, V_{EBO} | 5V |
| Continuous Collector Current, I_C | 20A |
| Continuous Base Current, I_B | 5A |
| Continuous Emitter Current, I_E | 25A |
| Total Power Dissipation ($T_C = +25^\circ C$), P_D | 250W |
| Derate Above $25^\circ C$ | 1.43W/ $^\circ C$ |
| 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} | $0.70^\circ C/W$ |
| Lead Temperature (During Soldering, 1/16" from Case, 10sec Max), T_L | $+265^\circ C$ |

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--------------------------------------|----------------|---|-----|-----|-----|---------|
| OFF Characteristics | | | | | | |
| Collector-Emitter Sustaining Voltage | $V_{CEO(sus)}$ | $I_C = 200mA, I_B = 0$, Note 1 | 140 | - | - | V |
| Collector Cutoff Current | I_{CEX} | $V_{CE} = 140V, V_{BE(off)} = 1.5V$ | - | - | 100 | μA |
| | | $V_{CE} = 140V, V_{BE(off)} = 1.5V, T_C = +150^\circ C$ | - | - | 2 | mA |
| | I_{CEO} | $V_{CE} = 140V, I_B = 0$ | - | - | 250 | μA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB} = 5V, I_C = 0$ | - | - | 100 | μA |

Note 1. 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 |
|---|---------------|--|-----|-----|------|---------------|
| Second Breakdown | | | | | | |
| Second Breakdown Collector Current with Base Forward Bias | $I_{S/b}$ | $V_{CE} = 50\text{V}, t = 1\text{s}$ (non-repetitive) | 5 | - | - | μA |
| | | $V_{CE} = 100\text{V}, t = 1\text{s}$ (non-repetitive) | 1 | - | - | μA |
| ON Characteristics | | | | | | |
| DC Current Gain | h_{FE} | $V_{CE} = 2\text{V}, I_C = 5\text{A}$ | 25 | - | 150 | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 5\text{A}, I_B = 500\text{mA}$ | - | - | 1 | V |
| Base-Emitter On Voltage | $V_{BE(on)}$ | $V_{CE} = 2\text{V}, I_C = 5\text{A}$ | - | - | 2 | V |
| Dynamic Characteristics | | | | | | |
| Current Gain-Bandwidth Product | f_T | $V_{CE} = 10\text{V}, I_C = 500\text{mA}, f_{\text{test}} = 0.5\text{MHz}$ | 2 | - | - | MHz |
| Output Capacitance | C_{ob} | $V_{CB} = 10\text{V}, I_E = 0, f_{\text{test}} = 1\text{MHz}$ | - | - | 1000 | pF |

