

2N 4234 · 2N 4237 2N 4235 · 2N 4238

COMPLEMENTARY SILICON AF MEDIUM POWER AMPLIFIERS & SWITCHES

THE 2N4234, 2N4235 (PNP) AND 2N4237, 2N4238 (NPN) ARE COMPLEMENTARY SILICON PLANAR EPITAXIAL TRANSISTORS FOR USE IN AF MEDIUM POWER DRIVERS AND OUTPUTS, AS WELL AS FOR SWITCHING APPLICATIONS ABOVE 1 AMPERE. THEY FEATURE LOW COLLECTOR-EMITTER SATURATION VOLTAGE (0.6V MAX @ $I_C=1A$).

CASE TO-39



ABSOLUTE MAXIMUM RATINGS

For p-n-p devices, voltage and current values are negative.

| | | (PNP) 2N4234 | (PNP) 2N4235 | (NPN) 2N4237 | (NPN) 2N4238 |
|--|----------------|---|-----------------|-----------------|-----------------|
| Collector-Base Voltage | V_{CB0} | 40V | 60V | 50V | 80V |
| Collector-Emitter Voltage | V_{CEO} | 40V | 60V | 40V | 60V |
| Emitter-Base Voltage | V_{EB0} | 7V | 7V | 6V | 6V |
| Collector Current | I_C | 3A | 3A | 3A** | 3A** |
| Total Power Dissipation ($T_C \leq 25^\circ C$) ($T_A \leq 25^\circ C$) | P_{tot} | $\leftarrow 6W, \text{ derate } 34mW/^\circ C \text{ above } 25^\circ C \rightarrow$ $\leftarrow 1W, \text{ derate } 5.7mW/^\circ C \text{ above } 25^\circ C \rightarrow$ | | | |
| Operating Junction & Storage Temperature | T_j, T_{stg} | -65 to $200^\circ C$ | | | |

** 1A in JEDEC Registration

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ C$ unless otherwise noted)

| PARAMETER | SYMBOL | MIN | TYP | MAX | UNIT | TEST CONDITIONS |
|---|-------------|-----|-----|-----|------|--|
| Collector-Emitter Breakdown Voltage 2N4234, 2N4237 2N4235, 2N4238 | V_{CEO}^* | 40 | | 60 | V | $I_C=100mA$ $I_B=0$ |
| Collector Cutoff Current 2N4234 2N4235 2N4237 2N4238 | I_{CEV} | | 0.1 | | mA | $V_{CE}=40V$ $V_{EB}=1.5V$ $V_{CE}=60V$ $V_{EB}=1.5V$ $V_{CE}=45V$ $V_{EB}=1.5V$ $V_{CE}=75V$ $V_{EB}=1.5V$ |
| Collector Cutoff Current 2N4234 2N4235 2N4237 2N4238 | I_{CEV} | | 1 | | mA | $V_{CE}=30V$ $V_{EB}=1.5V$ $T_A=150^\circ C$ $V_{CE}=40V$ $V_{EB}=1.5V$ $T_A=150^\circ C$ $V_{CE}=30V$ $V_{EB}=1.5V$ $T_A=150^\circ C$ $V_{CE}=50V$ $V_{EB}=1.5V$ $T_A=150^\circ C$ |
| Collector Cutoff Current | I_{CB0} | | 0.1 | | mA | $V_{CB}=V_{CB0}$ $I_E=0$ |

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| PARAMETER | SYMBOL | MIN | TYP | MAX | UNIT | TEST CONDITIONS |
|--|-----------------|--------|------|-----|------|--------------------------------------|
| Collector Cutoff Current | I_{CEO} | | | 1 | mA | $V_{CE}=30V$ $I_B=0$ |
| | | 2N4234 | | 1 | mA | $V_{CE}=40V$ $I_B=0$ |
| | | 2N4235 | | 0.7 | mA | $V_{CE}=40V$ $I_B=0$ |
| | | 2N4237 | | 0.7 | mA | $V_{CE}=60V$ $I_B=0$ |
| 2N4238 | | | | | | |
| Emitter Cutoff Current | I_{EBO} | | | 0.5 | mA | $V_{EB}=V_{EBO}$ $I_C=0$ |
| Collector-Emitter Saturation Voltage 2N4234, 2N4235 only | $V_{CE(sat)}^*$ | | 0.35 | 0.6 | V | $I_C=1A$ $I_B=125mA$ |
| Collector-Emitter Saturation Voltage 2N4237, 2N4238 only | $V_{CE(sat)}^*$ | | 0.18 | 0.3 | V | $I_C=500mA$ $I_B=50mA$ |
| | | | 0.35 | 0.6 | V | $I_C=1A$ $I_B=0.1A$ |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}^*$ | | 1.0 | 1.5 | V | $I_C=1A$ $I_B=0.1A$ |
| Base-Emitter Voltage | V_{BE}^* | | 0.78 | 1.0 | V | $I_C=250mA$ $V_{CE}=1V$ |
| D.C. Current Gain 2N4234, 2N4235 only | H_{FE}^* | 40 | | | | $I_C=100mA$ $V_{CE}=1V$ |
| | | 30 | | 150 | | $I_C=250mA$ $V_{CE}=1V$ |
| | | 20 | | | | $I_C=500mA$ $V_{CE}=1V$ |
| | | 10 | | | | $I_C=1A$ $V_{CE}=1V$ |
| D.C. Current Gain 2N4237, 2N4238 only | H_{FE}^* | 30 | | | | $I_C=50mA$ $V_{CE}=1V$ |
| | | 30 | | 150 | | $I_C=250mA$ $V_{CE}=1V$ |
| | | 30 | | | | $I_C=500mA$ $V_{CE}=1V$ |
| | | 15 | | | | $I_C=1A$ $V_{CE}=1V$ |
| Current Gain-Bandwidth Product 2N4234, 2N4235 2N4237, 2N4238 | f_T | 3 | 70 | | MHz | $I_C=100mA$ $V_{CE}=10V$ |
| | | 2 | 70 | | MHz | $I_C=100mA$ $V_{CE}=10V$ |
| Collector-Base Capacitance | C_{ob} | | | 100 | pF | $V_{CB}=10V$ $I_E=0$ $f=100KHz$ |
| Small Signal Current Gain 2N4234, 2N4235 2N4237, 2N4238 | h_{fe} | 25 | | | | $I_C=50mA$ $V_{CE}=10V$ $f=1KHz$ |
| | | 30 | | | | $I_C=100mA$ $V_{CE}=10V$ $f=1KHz$ |

* Pulse Test : Pulse Width=0.3ms, Duty Cycle=1%

