



NEW ENGLAND SEMICONDUCTOR

**2N5336
2N5337
2N5338
2N5339***

*also available as
JAN, JANTX,
JANTXV

MEDIUM-POWER NPN SILICON TRANSISTORS

... designed for switching and wide band amplifier applications.

- Low Collector-Emitter Saturation Voltage –
 $V_{CE(sat)} = 1.2 \text{ Vdc (Max) @ } I_C = 5.0 \text{ Amp}$
- DC Current Gain Specified to 5 Amperes
- Excellent Safe Operating Area
- Packaged in the Compact TO-39 Case for Critical Space-Limited Applications
- Complement to 2N6190 thru 2N6193

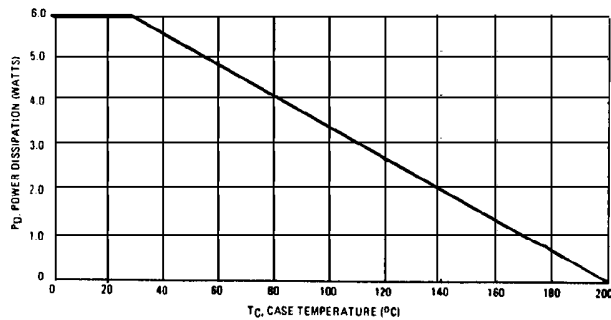
MAXIMUM RATINGS

| Rating | Symbol | 2N5336 2N5337 | 2N5338 2N5339 | Unit |
|--|----------------|------------------|------------------|-------------------------------|
| Collector-Emitter Voltage | V_{CEO} | 80 | 100 | Vdc |
| Collector-Base Voltage | V_{CB} | 80 | 100 | Vdc |
| Emitter-Base Voltage | V_{EB} | 6.0 | | Vdc |
| Collector Current – Continuous | I_C | 5.0 | | Adc |
| Base Current | I_B | 1.0 | | Adc |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 6.0 34.3 | | Watts mW/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -65 to +200 | | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|--------------------------------------|---------------|------|--------------------|
| Thermal Resistance, Junction to Case | θ_{JC} | 29.2 | $^\circ\text{C/W}$ |

FIGURE 1 – POWER-TEMPERATURE DERATING CURVE

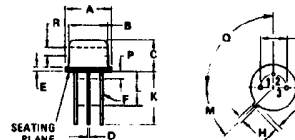


All limits are applicable and must be observed.

5 AMPERE

**POWER TRANSISTORS
PNP SILICON**

**80-100 VOLTS
6 WATTS**



STYLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 8.89 | 9.40 | 0.350 | 0.370 |
| B | 8.00 | 8.51 | 0.316 | 0.336 |
| C | 8.18 | 8.80 | 0.320 | 0.346 |
| D | 0.406 | 0.533 | 0.016 | 0.021 |
| E | 0.229 | 3.18 | 0.009 | 0.125 |
| F | 0.488 | 0.493 | 0.019 | 0.019 |
| G | 4.83 | 5.33 | 0.190 | 0.210 |
| H | 0.711 | 0.864 | 0.028 | 0.034 |
| J | 0.737 | 1.02 | 0.029 | 0.040 |
| K | 12.10 | - | 0.480 | - |
| L | 8.35 | - | 0.330 | - |
| M | 45.70 | MM | 1.800 | MM |
| P | - | 1.27 | - | 0.050 |
| Q | 80.0 | MM | 3.150 | MM |
| R | 2.54 | - | 0.100 | - |

AN JEDEC dimensions and notes apply.

TO-39

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1-800-446-1158 / (978) 794-1666 / FAX: (978) 689-0803

T4-4.8-860-330 REV: --



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ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$, unless otherwise noted)

| Characteristic | Fig. No. | Symbol | Min | Max | Unit |
|--|--|-------------------|----------------------------------|--------------------------------|-------------------------|
| OFF CHARACTERISTICS | | | | | |
| Collector-Emitter Sustaining Voltage* ($I_C = 50 \text{ mA}$, $I_B = 0$) | 2N5336, 2N5337 2N5338, 2N5339 | $BV_{CEO(sus)}$ * | 80 100 | — | Vdc |
| Collector Cutoff Current ($V_{CE} = 75 \text{ Vdc}$, $I_B = 0$) ($V_{CE} = 90 \text{ Vdc}$, $I_B = 0$) | 2N5336, 2N5337 2N5338, 2N5339 | I_{CEO} | — — | 100 100 | μA |
| Collector Cutoff Current ($V_{CE} = 75 \text{ Vdc}$, $V_{EB(off)} = 1.5 \text{ Vdc}$) ($V_{CE} = 90 \text{ Vdc}$, $V_{EB(off)} = 1.5 \text{ Vdc}$) ($V_{CE} = 75 \text{ Vdc}$, $V_{EB(off)} = 1.5 \text{ Vdc}$, $T_C = 150^\circ\text{C}$) ($V_{CE} = 90 \text{ Vdc}$, $V_{EB(off)} = 1.5 \text{ Vdc}$, $T_C = 150^\circ\text{C}$) | 2N5336, 2N5337 2N5338, 2N5339 2N5336, 2N5337 2N5338, 2N5339 | I_{CEX} | — — — | 10 10 1.0 | μA mA |
| Collector Cutoff Current ($V_{CB} = 80 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 100 \text{ Vdc}$, $I_E = 0$) | 2N5336, 2N5337 2N5338, 2N5339 | I_{CBO} | — — | 10 10 | μA |
| Emitter Cutoff Current ($V_{BE} = 6.0 \text{ Vdc}$, $I_C = 0$) | — | I_{EBO} | — | 100 | μA |
| ON CHARACTERISTICS | | | | | |
| DC Current Gain* ($I_C = 500 \text{ mA}$, $V_{CE} = 2.0 \text{ Vdc}$) ($I_C = 2.0 \text{ A}$, $V_{CE} = 2.0 \text{ Vdc}$) ($I_C = 5.0 \text{ A}$, $V_{CE} = 2.0 \text{ Vdc}$) | 2N5336, 2N5338 2N5337, 2N5339 2N5336, 2N5338 2N5337, 2N5339 2N5336, 2N5338 2N5337, 2N5339 | h_{FE} * | 30 60 30 60 20 40 | — — 120 240 — — | — |
| Collector-Emitter Saturation Voltage* ($I_C = 2.0 \text{ A}$, $I_B = 0.2 \text{ A}$) ($I_C = 5.0 \text{ A}$, $I_B = 0.5 \text{ A}$) | 9, 11, 13 | $V_{CE(sat)}$ * | — — | 0.7 1.2 | Vdc |
| Base-Emitter Saturation Voltage* ($I_C = 2.0 \text{ A}$, $I_B = 0.2 \text{ A}$) ($I_C = 5.0 \text{ A}$, $I_B = 0.5 \text{ A}$) | 11, 13 | $V_{BE(sat)}$ * | — — | 1.2 1.8 | Vdc |
| DYNAMIC CHARACTERISTICS | | | | | |
| Current-Gain-Bandwidth Product ($I_C = 0.5 \text{ A}$, $V_{CE} = 10 \text{ Vdc}$, $f = 10 \text{ MHz}$) | — | f_T | 30 | — | MHz |
| Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 100 \text{ kHz}$) | 7 | C_{ob} | — | 250 | pF |
| Input Capacitance ($V_{BE} = 2.0 \text{ Vdc}$, $I_C = 0$, $f = 100 \text{ kHz}$) | 7 | C_{ib} | — | 1,000 | pF |
| SWITCHING CHARACTERISTICS | | | | | |
| Delay Time ($V_{CC} = 40 \text{ Vdc}$, $V_{EB(off)} = 3.0 \text{ Vdc}$) | 2, 3 | t_d | — | 100 | ns |
| Rise Time ($I_C = 2.0 \text{ A}$, $I_{B1} = 0.2 \text{ A}$) | — | t_r | — | 100 | ns |
| Storage Time ($V_{CC} = 40 \text{ Vdc}$, $I_C = 2.0 \text{ A}$) | 2, 6 | t_s | — | 2.0 | μs |
| Fall Time ($I_{B1} = I_{B2} = 0.2 \text{ A}$) | — | t_f | — | 200 | ns |

*Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

FIGURE 2 - SWITCHING TIME TEST CIRCUIT

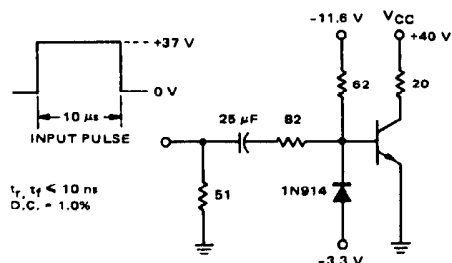
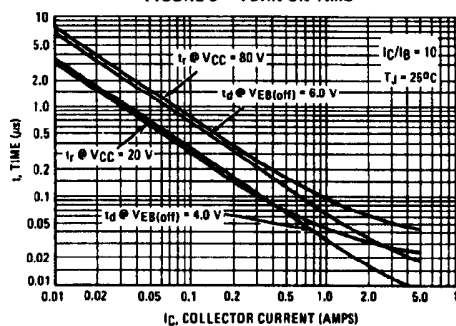


FIGURE 3 - TURN-ON TIME



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