

2N4910-2N4912

NPN SILICON MEDIUM POWER TRANSISTORS

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

| Rating | Symbol | 2N4910 | 2N4911 | 2N4912 | Unit |
|--|----------------|-------------|--------|--------|------------------------------|
| Collector-emitter voltage | V_{CEO} | 40 | 60 | 80 | Vdc |
| Collector-base voltage | V_{CB} | 40 | 60 | 80 | Vdc |
| Emitter-base voltage | V_{EB} | 5.0 | | | Vdc |
| Collector current – continuous | I_C | 1.0 4.0 | | | Adc |
| Base current | I_B | 1.0 | | | Adc |
| Total device dissipation $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 25 0.143 | | | Watts W/ $^\circ\text{C}$ |
| Operating and storage junction temperature range | T_J, T_{stg} | -65 to +200 | | | $^\circ\text{C}$ |
| Thermal resistance, junction to case | Θ_{JC} | 7.0 | | | $^\circ\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

| Characteristics | Symbol | Min | Max | Unit |
|--|----------------------------|---------------------|----------------|---------------------------|
| OFF CHARACTERISTICS | | | | |
| Collector emitter sustaining voltage ($I_C = 0.1\text{Adc}, I_B = 0$) | 2N4910 2N4911 2N4912 | $B_{V_{CEO(sus)}}$ | 40 60 80 | - - - Vdc |
| Collector cutoff current ($V_{CE} = 20\text{Vdc}, I_B = 0$) ($V_{CE} = 30\text{Vdc}, I_B = 0$) ($V_{CE} = 40\text{Vdc}, I_B = 0$) | 2N4910 2N4911 2N4912 | I_{CEO} | - - - | 0.5 0.5 0.5 mAdc |
| Collector cutoff current ($V_{CE} = \text{rated } V_{CEO}, V_{BE(off)} = 1.5\text{Vdc}$) ($V_{CE} = \text{rated } V_{CEO}, V_{BE(off)} = 1.5\text{Vdc}, T_C = 150^\circ\text{C}$) | | I_{CEX} | - - | 0.1 1.0 mAdc |
| Collector cutoff current ($V_{CB} = \text{rated } V_{CB}, I_E = 0$) | | I_{CBO} | - | 0.1 mAdc |
| Emitter cutoff current ($V_{BE} = 5.0\text{Vdc}, I_C = 0$) | | I_{EBO} | - | 1.0 mAdc |
| ON CHARACTERISTICS | | | | |
| DC current gain ⁽¹⁾ ($I_C = 50\text{mAdc}, V_{CE} = 1.0\text{Vdc}$) ($I_C = 500\text{mAdc}, V_{CE} = 1.0\text{Vdc}$) ($I_C = 1.0\text{Adc}, V_{CE} = 1.0\text{Vdc}$) | | $h_{FE}^{(1)}$ | 40 20 10 | - 100 - - |
| Collector emitter saturation voltage ($I_C = 1.0\text{Adc}, I_B = 0.1\text{Adc}$) | | $V_{CE(sat)}^{(1)}$ | - | 0.6 Vdc |
| Base emitter saturation voltage ($I_C = 1.0\text{Adc}, I_B = 0.1\text{Adc}$) | | $V_{BE(sat)}^{(1)}$ | - | 1.3 Vdc |

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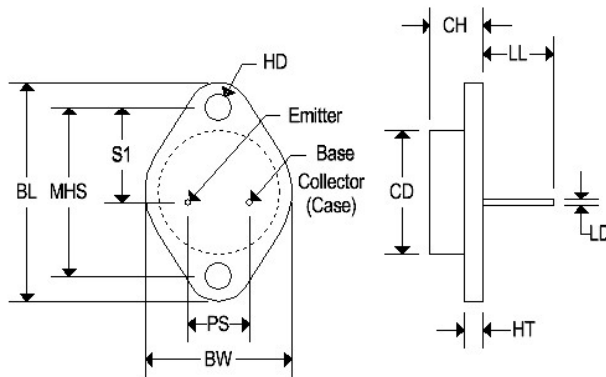
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ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

| Characteristics | Symbol | Min | Max | Unit |
|---|--------------------|-----|-----|------|
| Base emitter on voltage ($I_C = 1.0\text{Adc}$, $V_{CE} = 1.0\text{Vdc}$) | $V_{BE(on)}^{(1)}$ | - | 1.3 | Vdc |
| SMALL SIGNAL CHARACTERISTICS | | | | |
| Current gain - bandwidth product ($I_C = 250\text{mAdc}$, $V_{CE} = 10\text{vdc}$, $f = 1.0\text{MHz}$) | f_T | 3.0 | - | MHz |
| Output capacitance ($V_{CB} = 10\text{Vdc}$, $I_E = 0$, $f = 100\text{kHz}$) | C_{ob} | - | 100 | Pf |
| Small signal current gain ($I_C = 250\text{mAdc}$, $V_{CE} = 10\text{Vdc}$, $f = 1.0\text{kHz}$) | h_{re} | 25 | - | - |

MECHANICAL CHARACTERISTICS

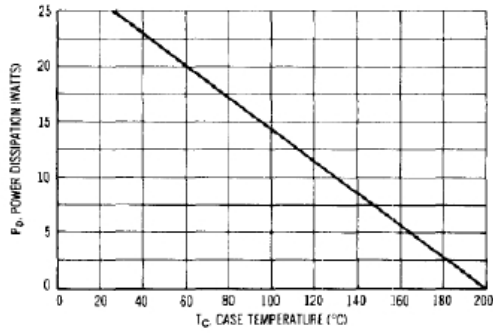
| | |
|----------|---------------|
| Case | TO-66 |
| Marking | Alpha-numeric |
| Polarity | See below |



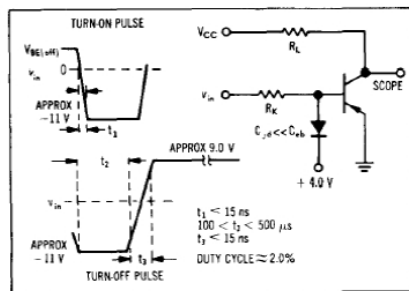
| Dim | TO-66 | | | |
|-----|--------|-------|-------------|--------|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| BL | 1.205 | 1.280 | 30.60 | 32.50 |
| CD | 0.445 | 0.557 | 11.303 | 14.148 |
| CH | 0.257 | 0.284 | 6.540 | 7.220 |
| LL | 0.374 | 0.413 | 9.500 | 10.50 |
| BW | 0.680 | 0.727 | 17.26 | 18.46 |
| LD | 0.030 | 0.036 | 0.760 | 0.920 |
| HT | 0.054 | 0.065 | 1.380 | 1.650 |
| MHS | 0.951 | 0.976 | 24.16 | 24.78 |
| S1 | 0.545 | 0.614 | 13.84 | 15.60 |
| HD | 0.131 | 0.154 | 3.320 | 3.920 |
| PS | 0.191 | 0.210 | 4.860 | 5.340 |

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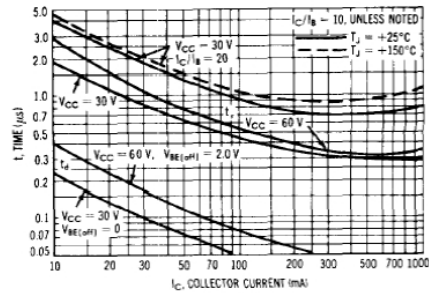
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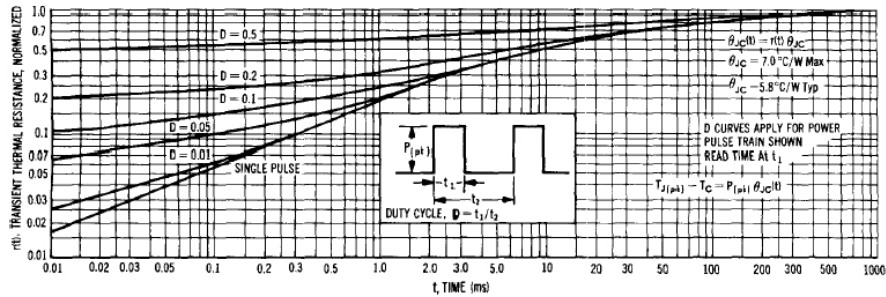
POWER TEMPERATURE DERATING CURVE



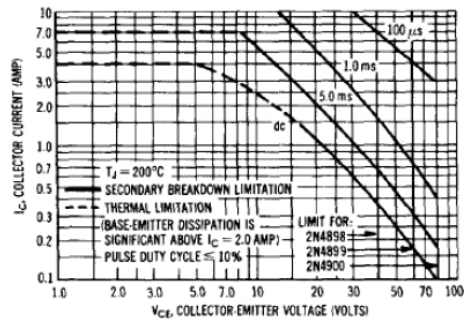
SWITCHING TIME EQUIVALENT CIRCUIT



TURN ON TIME



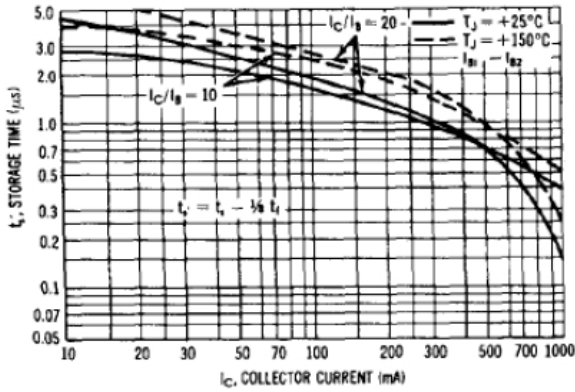
THERMAL RESPONSE



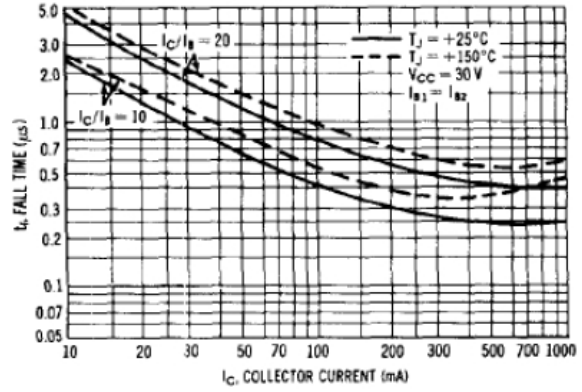
ACTIVE REGION SAFE OPERATING AREA

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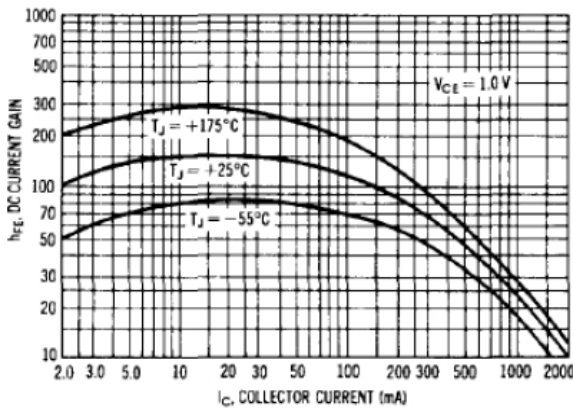
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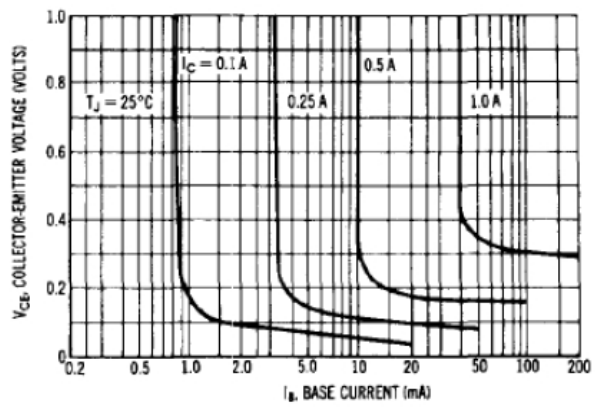
STORAGE TIME



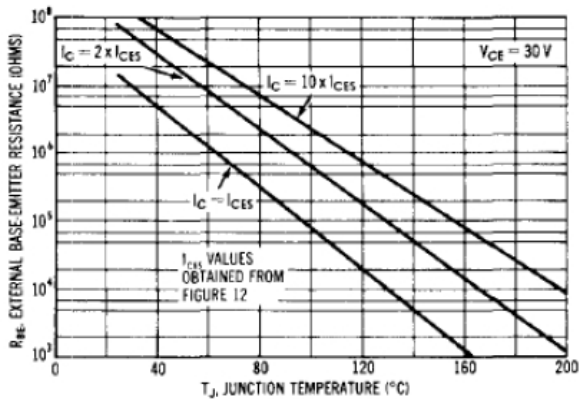
FALL TIME



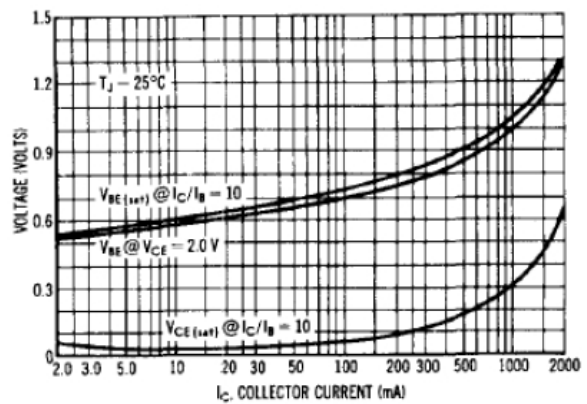
CURRENT GAIN



COLLECTOR SATURATION REGION



EFFECTS OF BASE-EMITTER RESISTANCE



"ON" VOLTAGE

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