

POWER TRANSISTORS

20 Amp, 150 V, Double Diffused NPN Mesa

2N6354
 2N6496

FEATURES

- Collector-Base Voltage: up to 150V
- Peak Collector Current: 30A
- Rise Time: $\leq 500\text{ns}$ } @ I_C up to 12A
- Fall Time: $\leq 500\text{ns}$ }

DESCRIPTION

These double diffused glass passivated mesa power transistors combine fast-switching, low saturation voltage and rugged $E_{s/b}$ capability. They are designed for use in switching regulators, converters, inverters and switching-control amplifiers.

ABSOLUTE MAXIMUM RATINGS*

| | 2N6354 | 2N6496 |
|--|--------------|--------|
| Collector-Base Voltage, V_{CBO} | 150V | 150V |
| Collector-Emitter Sustaining Voltage, $V_{CER(SUS)}$ (1) | — | 130V |
| | 120V | 110V |
| Emitter-Base Voltage, V_{EBO} | 6.5V | 7V |
| Collector Current, I_C continuous | 10A | 15A |
| Collector Current, I_{CM} peak | 12A | — |
| Base Current, I_B continuous | 5A | 5A |
| Power Dissipation, 25°C Case | 140W | 140W |
| Operating and Storage Temperature Range | -65 to 200°C | |

(1) With $R_{\theta C} \leq 50\Omega$

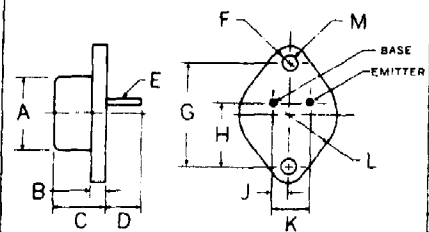
* JEDEC registered values.

MECHANICAL SPECIFICATIONS

NOTE:

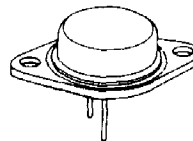
Leads may be soldered to within $\frac{1}{16}$ " of base provided temperature-time exposure is less than 260°C for 10 seconds.

2N6354, 2N6496



| | ins. | mm. |
|---|----------------|-----------------|
| A | .875 MAX. | 22.23 MAX. |
| B | .135 MAX. | 3.43 MAX. |
| C | .250-.450 | 6.35-11.43 |
| D | .312 MIN. | 7.92 MIN. |
| E | .038-.043 DIA. | 0.97-1.09 DIA. |
| F | .188 MAX. RAD. | 4.78 MAX. RAD. |
| G | 1.177-1.197 | 29.90-30.40 |
| H | .655-.675 | 16.64-17.15 |
| J | .205-.225 | 5.21-5.72 |
| K | .420-.440 | 10.67-11.18 |
| L | .525 MAX. RAD. | 13.34 MAX. RAD. |
| M | .151-.161 DIA. | 3.84-4.09 DIA. |

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Quality Semi-Conductors



Electrical Specifications (at 25°C unless noted)

| Test | Symbol | 2N6354 | | 2N6496 | | Units | Test Conditions |
|--|-----------------|--------|------|--------|------|-------|--|
| | | MIN. | MAX. | MIN. | MAX. | | |
| D.C. Current Gain (Note 1) | h_{FE} | — | — | — | — | | $I_C = 2A, V_{CE} = 5V$ |
| | | 20 | 150 | — | — | | $I_C = 5A, V_{CE} = 2V$ |
| D.C. Current Gain (Note 1) | h_{FE} | — | — | 12 | 100 | | $I_C = 8A, V_{CE} = 2V$ |
| | | 10 | 100 | — | — | | $I_C = 10A, V_{CE} = 2V$ |
| D.C. Current Gain (Note 1) | h_{FE} | — | — | — | — | | $I_C = 10A, V_{CE} = 5V$ |
| | | — | — | — | — | | $I_C = 12A, V_{CE} = 5V$ |
| Collector Saturation Voltage (Note 1) | $V_{CE(sat)}$ | — | 0.5 | — | — | V | $I_C = 5A, I_B = .5A$ |
| | | — | — | — | 1.0 | | $I_C = 8A, I_B = .8A$ |
| Collector Saturation Voltage (Note 1) | $V_{CE(sat)}$ | — | 1.0 | — | — | V | $I_C = 10A, I_B = 1.0A$ |
| Collector Saturation Voltage (Note 1) | $V_{CE(sat)}$ | — | — | — | — | V | $I_C = 12A, I_B = 1.2A$ |
| | | — | — | — | — | | $I_C = 20A, I_B = 5A$ |
| Base Saturation Voltage (Note 1) | $V_{BE(sat)}$ | — | 1.3* | — | — | V | $I_C = 5A, I_B = 0.5A$ |
| | | — | — | — | 2.0 | | $I_C = 8A, I_B = 0.8A$ |
| Base Saturation Voltage (Note 1) | $V_{BE(sat)}$ | — | 2.0 | — | — | V | $I_C = 10A, I_B = 1A$ |
| | | — | — | — | — | V | $I_C = 20A, I_B = 5A$ |
| Collector-Emitter Sustaining Voltage (Note 2) | $V_{CEO(sus)}$ | 120 | — | 100 | — | V | $I_C = 0.2A$ |
| Collector-Emitter Sustaining Voltage (Note 2) | $V_{CEX(sus)}$ | — | — | — | — | V | $I_C = 0.2A$ $V_{BE} = -1.5V$ $I_B = 0$ $R_{BE} = 100 \Omega$ |
| Collector-Emitter Sustaining Voltage (Note 2) | $V_{CER(sus)}$ | — | — | 130 | — | V | $R_{BE} = 50 \Omega, I_C = 0.2A$ |
| | | 130 | — | — | — | | $R_{BE} = 100 \Omega, I_C = 0.2A$ |
| Emitter-Base Voltage | V_{EBO} | 6.5 | — | — | — | V | $I_E = 5mA$ |
| | | — | — | 7.0 | — | | $I_E = 50mA$ |
| Collector Cutoff Current | I_{CBO} | — | 5 | — | — | mA | $V_{CB} = 150V$ |
| Collector Cutoff Current | I_{CEO} | — | — | — | — | mA | $V_{CE} = 55V$ |
| | | — | — | — | — | | $V_{CE} = 70V$ |
| | | — | 20 | — | — | | $V_{CE} = 100V$ |
| Collector Cutoff Current | I_{CEV} | — | — | — | 20 | mA | $V_{CE} = 110V, V_{BE} = -1.5V$ |
| | | — | — | — | — | | $V_{CE} = 130V, V_{BE} = 0$ |
| | | — | — | — | — | | $V_{CE} = 140V, V_{BE} = -1.5V$ |
| | | — | 10 | — | — | | $V_{CE} = 140V, V_{BE} = 0$ |
| Collector Cutoff Current, 125°C | I_{CEV} | — | 20 | — | — | mA | $V_{CE} = 140V$ |
| Collector Cutoff Current, 150°C | I_{CEV} | — | — | — | — | mA | $V_{CE} = 85V, V_{BE} = -1.5V$ |
| | | — | — | — | — | | $V_{CE} = 100V, V_{BE} = -1.5V$ |
| | | — | — | — | 25 | | $V_{CE} = 130V, V_{BE} = 0V$ |
| Emitter Cutoff Current | I_{EBO} | — | 5.0 | — | — | mA | $V_{BE} = -5V$ |
| | | — | — | — | 50 | | $V_{BE} = -6.5V$ |
| | | — | — | — | — | | $V_{BE} = -7V$ |
| Magnitude of Small Signal Forward — Current Transfer Ratio | $ h_{ie} $ | — | — | 12 | — | | $V_{CE} = 10V, I_C = 2A, f = 5 \text{ MHz}$ |
| | | 8.0 | — | — | — | | $V_{CE} = 10V, I_C = 1A, f = 10 \text{ MHz}$ |
| Collector Capacitance | C_{ob} | — | 300 | — | 300 | pF | $V_{CB} = 10V, f = 1 \text{ MHz}$ |
| Thermal Resistance: Junction-to-Case | $R_{\theta JC}$ | — | — | — | 1.25 | °C/W | $V_{CE} = 10V, I_C = 10A$ |
| | | — | 1.25 | — | — | | $V_{CE} = 20V, I_C = 1A$ |

Notes:

- Pulse width = 250µs; duty cycle ≤ 1%.
- Sustaining Voltage. Measured at a high current point where collector-emitter voltage is lowest. Current pulse length = 50µs; duty cycle ≤ 1%.
Voltage clamped at maximum collector-emitter voltage.

* JEDEC registered values.