

**2N3585**

**APPLICATIONS:**

- Off-Line Inverters
- Switching Regulators
- Motor Controls
- Deflection Circuits
- DC-DC Converters
- High Voltage Amplifiers

**FEATURES:**

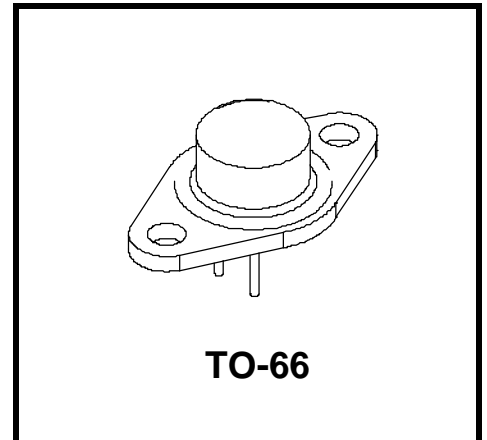
- High Voltage: 250 to 500V
- Fast Switching:  $t_f < 3\mu\text{sec.}$
- High Power: 35 Watts
- High Current: 2 Amps
- Low  $V_{CE(SAT)}$

**5 Amp, 500V,  
 High Voltage  
 NPN Silicon Power  
 Transistors**

**DESCRIPTION:**

These power transistors are produced by PPC's DOUBLE DIFFUSED PLANAR process. This technology produces high voltage devices with excellent switching speeds, frequency response, gain linearity, saturation voltages, high current gain, and safe operating areas. They are intended for use in Commercial, Industrial, and Military power switching, amplifier, and regulator applications.

Ultrasonically bonded leads and controlled die mount techniques are utilized to further increase the SOA capability and inherent reliability of these devices. The temperature range to 200°C permits reliable operation in high ambients, and the hermetically sealed package insures maximum reliability and long life.



**ABSOLUTE MAXIMUM RATINGS:**

| SYMBOL        | CHARACTERISTIC                                | VALUE      | UNITS |
|---------------|---|------------|-------|
| $V_{CBO}^*$   | Collector-Base Voltage                        | 500        | Volts |
| $V_{CEO}^*$   | Collector-Emitter Voltage                     | 300        | Volts |
| $V_{CER}^*$   | Collector-Emitter Voltage $R_{BE} = 50\Omega$ | 400        | Volts |
| $V_{EBO}^*$   | Emitter-Base Voltage                          | 6          | Volts |
| $I_C^*$       | Peak Collector Current                        | 5          | Amps  |
| $I_C^*$       | Continuous Collector Current                  | 2          | Amps  |
| $I_B^*$       | Base Current                                  | 1          | Amps  |
| $T_{STG}^*$   | Storage Temperature                           | -65 to 200 | °C    |
| $T_J^*$       | Operating Junction Temperature                | -65 to 200 | °C    |
| *             | Lead Temperature 1/16" from Case for 10 Sec.  | 235        | °C    |
| $P_T^*$       | Power Dissipation                             | 35         | Watts |
| $\theta_{JC}$ | $T_C = 25^\circ\text{C}$<br>Thermal Impedance | 5.0        | °C/W  |

\* Indicates JEDEC registered data.

**ELECTRICAL CHARACTERISTICS:  
 (25° Case Temperature Unless Otherwise Noted)**

| SYMBOL          | CHARACTERISTIC  | TEST CONDITIONS   | VALUE         |                   | Units                |
|-----------------|---|---|---------------|-------------------|----------------------|
|                 |   |   | Min.          | Max.              |                      |
| $V_{CE(sus)}^*$ | Collector-Emitter Sustaining Voltage  | $I_C = 0.2 \text{ Amp}$ (Notes 1 and 2)   | 300           | ----              | Volts                |
| $V_{CER(sus)}$  | Collector-Emitter Sustaining Voltage  | $I_C = 0.2A, R_{BE} = 50\Omega$ (Notes 1 and 2)                                       | 400           | ----              | Volts                |
| $I_{CEV}^*$     | Collector Cutoff Current  | $V_{CE} = 450V, V_{BE} = -1.5V$   | ----          | 1.0               | mA.                  |
| $I_{CEV}^*$     | Collector Cutoff Current  | $V_{CE} = 300V, V_{BE} = -1.5V$<br>$T_C = 150^\circ C$                                | ----          | 3.0               | mA.                  |
| $I_{CEO}^*$     | Collector Cutoff Current  | $V_{CE} = 150V, I_B = 0$  | ----          | 5.0               | mA.                  |
| $I_{EB0}^*$     | Emitter Cutoff Current  | $V_{EB} = 6V, I_C = 0$  | ----          | 0.5               | mA.                  |
| $h_{FE}^*$      | DC Forward Current Transfer Ratio (Note 1)                                      | $I_C = 0.1A, V_{CE} = 10V$<br>$I_C = 1.0A, V_{CE} = 10V$<br>$I_C = 1.0A, V_{CE} = 2V$ | 40<br>25<br>8 | ----<br>100<br>80 | ----<br>----<br>---- |
| $V_{CE(sat)}^*$ | Collector-Emitter Saturation Voltage (Note 1)                                   | $I_C = 1.0A, I_B = 0.125A$  | ----          | 0.75              | Volts                |
| $V_{BE(sat)}^*$ | Base-Emitter Saturation Voltage (Note 1)  | $I_C = 1.0A, I_B = 0.10A$   | ----          | 1.4               | Volts                |
| $I_{S/b}$       | Second-Breakdown Collector Current (with base forward biased)                   | $V_{CE} = 100V, t = 1.0\text{sec.}$   | 0.35          | ----              | A                    |
| $E_{S/b}^*$     | Second-Breakdown Energy (with base reverse biased)                              | $V_{EB} = 4V, R_{BE} = 20\Omega, L = 100\mu h$  | 200           | ----              | $\mu J$              |
| $h_{fe}^*$      | Common-Emitter Small-Signal Forward Current Transfer Ratio                      | $V_{CE} = 10V, I_C = 0.2A, f = 5 \text{ MHz}$   | 3             | ----              | ----                 |
| $ h_{fe} ^*$    | Common-Emitter Small-Signal Forward Current Transfer Ratio, $f = 5 \text{ MHz}$ | $V_{CE} = 10V, I_C = 0.2A$  | 2.0           | ----              | ----                 |
| $C_{Ob}$        | Collector-Base Capacitance  | $V_{CB} = 10V, I_E = 0, f = 1.0\text{MHz}$  | ----          | 120               | pf                   |
| $tr^*$          | Rise Time   | $I_C = 1.0A, I_{B2} = 0.10A$  | ----          | 3.0               | $\mu\text{sec.}$     |
| $ts^*$          | Storage Time  | $I_C = 1.0A, I_{B1} = I_{B2} = 0.10A$   | ----          | 4.0               | $\mu\text{sec.}$     |
| $tf^*$          | Fall Time   | $I_C = 1.0A, I_{B1} = I_{B2} = 0.10A$   | ----          | 3.0               | $\mu\text{sec.}$     |

Note 1: Pulse Test: Pulse width = 300 $\mu$ Sec., Rep. Rate 60Hz.

Note 2: Caution - Do not use Curve Tracer.

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**PACKAGE MECHANICAL DATA:**

