

"BIG IDEAS IN  
BIG POWER"

# PowerTech

**150 AMPERES**

2N5928

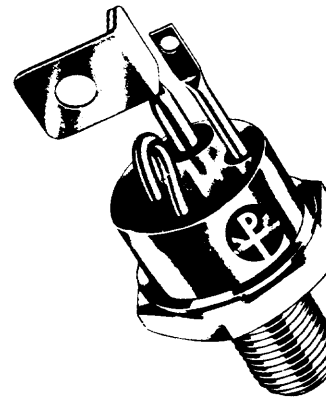
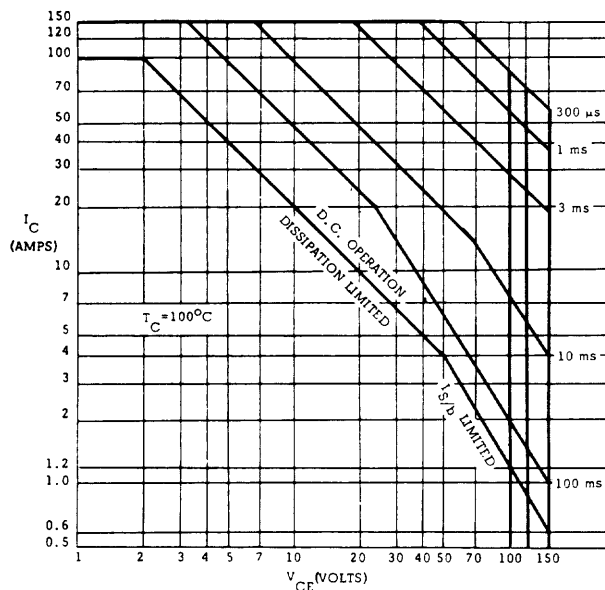
PT-8502

## SILICON NPN TRANSISTOR

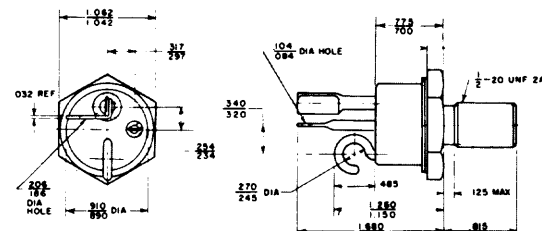
### FEATURES:

|                     |               |                |               |                 |               |
|---------------------|---------------|----------------|---------------|-----------------|---------------|
| $V_{CE(sat)}$ ..... | 1.0 V @ 100 A | $h_{FE}$ ..... | 5 min @ 150 A | $I_{S/b}$ ..... | 1.2 A @ 100 V |
| $V_{BE}$ .....      | 2.0 V @ 100 A | $t_f$ .....    | 2.5 $\mu$ sec | $E_{S/b}$ ..... | 6 Joules      |

### SAFE OPERATING AREA



JEDEC TO-114 PKG.



PowerTech's transistors offer high current capability, high breakdown voltage and the lowest available saturation voltage. They have exceptional resistance to both forward and reverse second breakdown. This unique combination of device characteristics makes them particularly suited for a wide variety of high current applications, which include series and switching regulators, motor controls, servoamplifiers and power control circuits. The transistors will provide outstanding performance when used as replacements for paralleled lower current devices, resulting in considerable reductions in weight, space and circuit complexity. Their reliability is assured through 100% power testing at 50V, 4A @ 100°C case temperature. These transistors exceed the requirements of MIL-S-19500 and are well suited for the most severe military-aerospace applications.

### MAXIMUM RATINGS

### SYMBOL

### PT-8502

### 2N5928

|                             |                 |              |              |
|-----------------------------|-----------------|--------------|--------------|
| Collector-Base Voltage      | $V_{CBO}$       | 100V         | 120V         |
| Collector-Emitter Voltage   | $V_{CEO}$ (sus) | 100V         | 120V         |
| Emitter-Base Voltage        | $V_{EBO}$       | 10V          | 10V          |
| Peak Collector Current      | $I_C$           | 150A         | 150A         |
| D.C. Collector Current      | $I_C$           | 100A         | 100A         |
| Power Dissipation @ 25°C    | $P_D$           | 350W         | 350W         |
| Power Dissipation @ 100°C   | $P_D$           | 200W         | 200W         |
| Thermal Resistance          | $\theta_{J-C}$  | 0.5° C/W     | 0.5° C/W     |
| Operating Temperature Range |                 | -65 to 200°C | -65 to 200°C |
| Storage Temperature Range   |                 | -65 to 200°C | -65 to 200°C |

# ELECTRICAL CHARACTERISTICS 25°C

| TEST                                               | SYMBOL         | LIMITS |      |        |      | UNITS     | TEST CONDITIONS                      |
|----------------------------------------------------|----------------|--------|------|--------|------|-----------|--------------------------------------|
|                                                    |                | PT8502 |      | 2N5928 |      |           |                                      |
|                                                    |                | MIN.   | MAX. | MIN.   | MAX. |           |                                      |
| D.C. Current Gain*                                 | $h_{FE}$       | 10     | 40   | 10     | 40   | —         | $I_C = 100A, V_{CE} = 2V$            |
| D.C. Current Gain*                                 | $h_{FE}$       | 5      | —    | 5      | —    | —         | $I_C = 150A, V_{CE} = 4V$            |
| Collector Saturation Voltg.*                       | $V_{CE(sat)}$  | —      | 1.0  | —      | 1.0  | V         | $I_C = 100A, I_B = 10A$              |
| Collector Saturation Voltg.*                       | $V_{CE(sat)}$  | —      | 2.0  | —      | 2.0  | V         | $I_C = 150A, I_B = 25A$              |
| Base Emitter Voltage*                              | $V_{BE}$       | —      | 2.0  | —      | 2.0  | V         | $I_C = 100A, V_{CE} = 2V$            |
| Base Emitter Voltage*                              | $V_{BE}$       | —      | 3.0  | —      | 3.0  | V         | $I_C = 150A, V_{CE} = 4V$            |
| Collector-Emitter Voltage*                         | $V_{CEO(sus)}$ | 100    | —    | 120    | —    | V         | $I_C = 200mA, I_B = 0$               |
| Collector Cutoff Current                           | $I_{CBO}$      | —      | 2    | —      | —    | mA        | $V_{CB} = 100V, I_{EB} = 0$          |
| Collector Cutoff Current                           | $I_{CBO}$      | —      | —    | —      | 2    | mA        | $V_{CB} = 120V, I_{EB} = 0$          |
| Collector Cutoff Current @ 150°C                   | $I_{CBO}$      | —      | 10   | —      | 10   | mA        | $V_{CB} = 100V, I_{EB} = 0$          |
| Emitter Cutoff Current                             | $I_{EBO}$      | —      | 1    | —      | 1    | mA        | $V_{EB} = 10V, I_{CB} = 0$           |
| Gain Bandwidth Product (Typ.)                      | $f_t$          | 1      | —    | 1      | —    | MHz       | $I_C = 5A, V_{CE} = 10V, f = 100KHz$ |
| Collector Capacitance                              | $C_{obo}$      | —      | 1800 | —      | 1800 | pf.       | $V_{CB} = 10V, f = 100KHz$           |
| Switching Speed (Typ.)<br>(PowerTech Test Circuit) | $t_r$          | —      | 2.5  | —      | 2.5  | $\mu sec$ | $I_C = 50A$                          |
|                                                    | $t_s$          | —      | 3    | —      | 3    | $\mu sec$ |                                      |
|                                                    | $t_f$          | —      | 2.5  | —      | 2.5  | $\mu sec$ | $I_{B1} = 10A, -I_{B2} = 5A$         |

\*  $\leq 300 \mu sec$  Pulse 2% Duty Cycle

