

POWERTECH INC

"BIG IDEAS IN  
BIG POWER"**PowerTech**

T-33-15

**90 AMPERES**

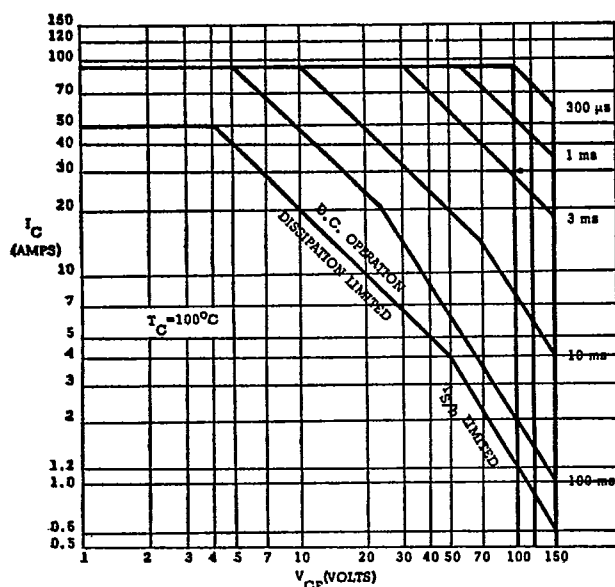
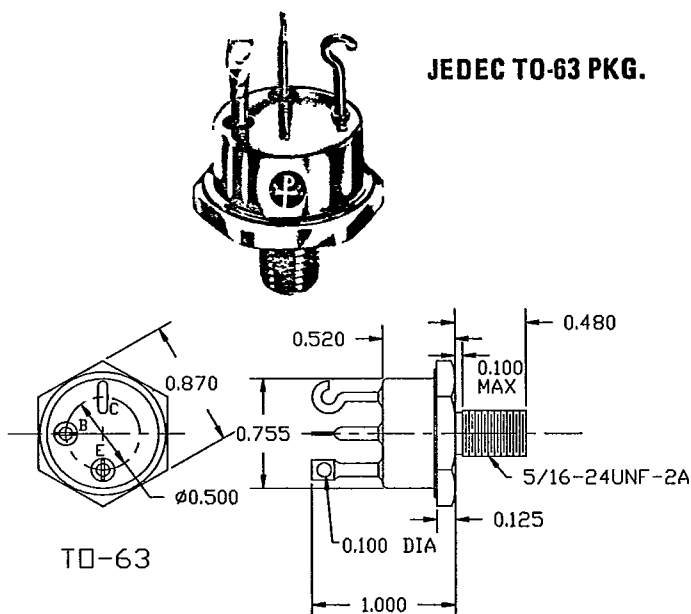
JAN TX2N5926

PT - 7507

PT - 7508

**SILICON NPN TRANSISTOR****FEATURES:**

$V_{CE(sat)}$  ..... 0.6 V @ 50 A     $h_{FE}$  ..... 5 min @ 90 A     $I_{S/b}$  ..... 1.2 A @ 100 V  
 $V_{BE}$  ..... 1.2 V @ 50 A     $t_f$  ..... 2  $\mu$  sec     $E_{S/b}$  ..... 6 Joules

**SAFE OPERATING AREA****JEDEC TO-63 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-7507****2N5926****PT-7508**

Collector-Base Voltage  
 Collector-Emitter Voltage  
 Emitter-Base Voltage  
 Peak Collector Current  
 D.C. Collector Current  
 Power Dissipation @ 25°C  
 Power Dissipation @ 100°C  
 Thermal Resistance  
 Operating Temperature Range  
 Storage Temperature Range

$V_{CBO}$   
 $V_{CEO}$  (sus)  
 $V_{EBO}$   
 $I_C$   
 $I_C$   
 $P_D$   
 $P_D$   
 $\theta_{J-C}$

120V  
 100V  
 10V  
 90A  
 50A  
 350W  
 200W  
 0.5° C/W  
 -65 to 200°C  
 -65 to 200°C

175V  
 150V

POWERTECH INC

| WERTECH INC                                        |                | 17E D  |      | LIMITS |      |        |      | UNITS     | TEST CONDITIONS<br><i>T-33-15</i>    |
|----------------------------------------------------|----------------|--------|------|--------|------|--------|------|-----------|--------------------------------------|
| TEST                                               | SYMBOL         | PT7507 |      | 2N5926 |      | PT7508 |      |           |                                      |
|                                                    |                | MIN.   | MAX. | MIN.   | MAX. | MIN.   | MAX. |           |                                      |
|                                                    |                |        |      |        |      |        |      |           |                                      |
| D.C. Current Gain*                                 | $h_{FE}$       | 10     | 40   | 10     | 40   | 10     | 40   | —         | $I_C = 50A, V_{CE} = 2V$             |
| D.C. Current Gain*                                 | $h_{FE}$       | 5      | —    | 5      | —    | 5      | —    | —         | $I_C = 90A, V_{CE} = 4V$             |
| Collector Saturation Voltg.*                       | $V_{CE(sat)}$  | —      | 0.60 | —      | 0.60 | —      | 0.60 | V         | $I_C = 50A, I_B =$                   |
| Collector Saturation Voltg.*                       | $V_{CE(sat)}$  | —      | 1.5  | —      | 1.5  | —      | 1.5  | V         | $I_C = 90A, I_B =$                   |
| Base Emitter Voltage*                              | $V_{BE}$       | —      | 1.2  | —      | 1.2  | —      | 1.2  | V         | $I_C = 50A, V_{CE} = 2V$             |
| Base Emitter Voltage*                              | $V_{BE}$       | —      | 2.5  | —      | 2.5  | —      | 2.5  | V         | $I_C = 90A, V_{CE} = 4V$             |
| Collector-Emitter Voltage*                         | $V_{CEO(sus)}$ | 100    | —    | 120    | —    | 150    | —    | V         | $I_C = 200mA, I_B = 0$               |
| Collector Cutoff Current                           | $I_{CBO}$      | —      | 2    | —      | —    | —      | —    | mA        | $V_{CB} = 120V, I_{EB} = 0$          |
| Collector Cutoff Current                           | $I_{CBO}$      | —      | —    | —      | 2    | —      | —    | mA        | $V_{CB} = 150V, I_{EB} = 0$          |
| Collector Cutoff Current                           | $I_{CBO}$      | —      | —    | —      | —    | —      | 2    | mA        | $V_{CB} = 175V, I_{EB} = 0$          |
| Collector Cutoff Current @ 150°C                   | $I_{CBO}$      | —      | 10   | —      | 10   | —      | 10   | mA        | $V_{CB} = 100V, I_{EB} = 0$          |
| Emitter Cutoff Current                             | $I_{EBO}$      | —      | 1    | —      | 1    | —      | 1    | mA        | $V_{EB} = 10V, I_{CB} = 0$           |
| Gain Bandwidth Product (Typ.)                      | $f_t$          | 1      | —    | 1      | —    | 1      | —    | MHz       | $I_C = 5A, V_{CE} = 10V, f = 100KHz$ |
| Collector Capacitance                              | $C_{obo}$      | —      | 1800 | —      | 1800 | —      | 1800 | pf.       | $V_{CB} = 10V$                       |
| Switching Speed (Typ.)<br>(PowerTech Test Circuit) | $t_r$          | —      | 2.5  | —      | 2.5  | —      | 2.5  | $\mu sec$ | $I_C = 50A,$                         |
|                                                    | $t_s$          | —      | 3    | —      | 3    | —      | 3    | $\mu sec$ |                                      |
|                                                    | $t_f$          | —      | 2.5  | —      | 2.5  | —      | 2.5  | $\mu sec$ | $I_{B1} = 5A \quad I_{B2} = 10A$     |

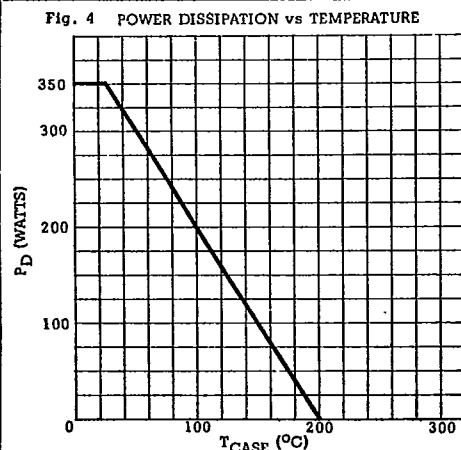
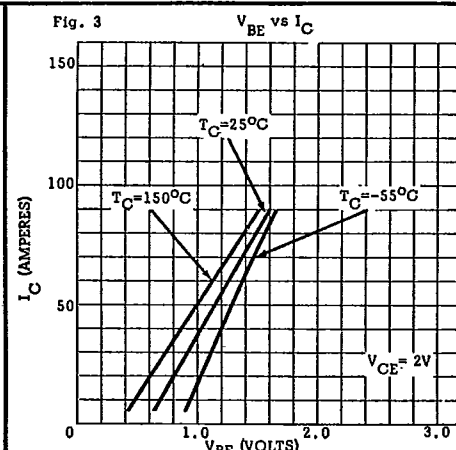
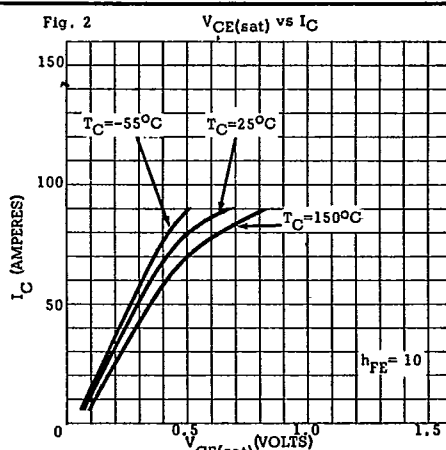
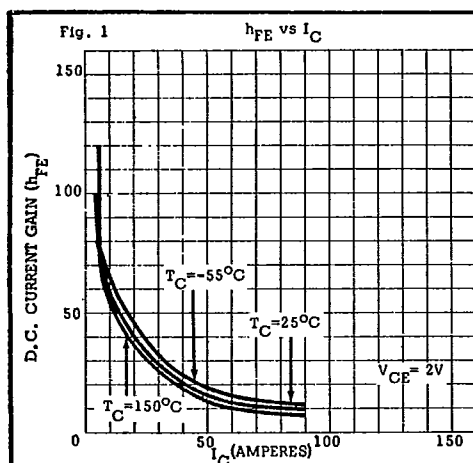
\*  $\leq 300\mu sec$  Pulse 2% Duty Cycle

Fig. 5 SWITCHING TEST CIRCUIT

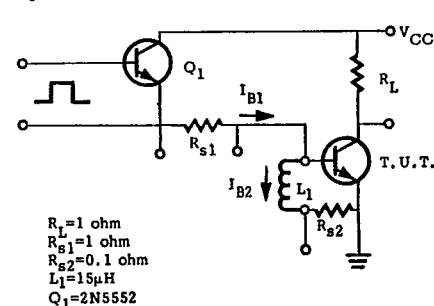
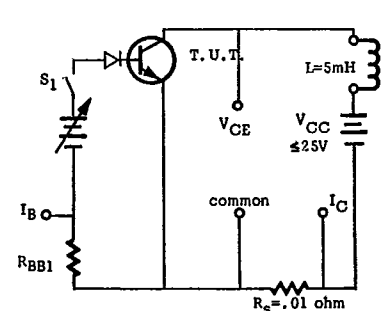


Fig. 6 UNCLAMPED INDUCTIVE SWEEP TEST



PROCEDURE  
With  $S_1$  closed, set  $I_B = 5A, I_C = 50A$   
Open  $S_1$   
 $E_s/b = 1/2 L I^2 = 6.25 \text{ Joules}$