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SPC-F005.DWG

## REVISIONS

DOC. NO. SPC-F005 \* Effective: 7/8/02 \* DCP No: 1398

| DCP # | REV | DESCRIPTION | DRAWN | DATE     | CHECKD | DATE   | APPRVD | DATE   |
|-------|-----|-------------|-------|----------|--------|--------|--------|--------|
| 1885  | A   | RELEASED    | EO    | 02/03/06 | HO     | 2/6/06 | JWM    | 2/6/06 |
|       |     |             |       |          |        |        |        |        |

### Features:

- Low Collector Emitter Saturation Voltage:  $V_{CE(sat)1V}$   $I_C = 15A$
- High Current Gain-Bandwidth Product:  $f_T = 4.0MHz$  (Min) @  $I_C = 1A$
- Low Leakage Current  $I_{CEX} = 1mA$  (max) at Rated Voltage
- Excellent DC Current Gain  $h_{FE} = 20$  (min) @  $I_C = 10A$

**Description:** High Power, TO-3, NPN, Transistor

### Electrical Characteristics: ( $T_A = +25^\circ C$ unless otherwise specified)

| Parameter                           | Symbol        | Test Conditions                    | Min | Max | Unit |
|-------------------------------------|---------------|------------------------------------|-----|-----|------|
| <b>OFF Characteristics</b>          |               |                                    |     |     |      |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = 200mA, I_B = 0, (Note 1)$   | 80  | —   | V    |
| Collector Cut-Off Current           | $I_{CEX}$     | $V_{CE} = 80V, V_{EB(off)} = 1.5V$ | —   | 1   | mA   |
|                                     | $I_{CBO}$     | $V_{CB} = 80V, I_E = 0$            | —   | 1   | mA   |
|                                     | $I_{CEO}$     | $V_{CB} = 40V, I_B = 0$            | —   | 2   | mA   |
| Emitter Cut-Off Current             | $I_{EBO}$     | $V_{EB} = 5V, I_C = 0$             | —   | 1   | mA   |

### ON Characteristics (Note 1)

|                                      |               |                          |    |     |   |
|--------------------------------------|---------------|--------------------------|----|-----|---|
| DC Current Gain                      | $h_{FE}$      | $V_{CE} = 4V, I_C = 3A$  | 35 | —   | — |
|                                      |               | $V_{CE} = 4V, I_C = 10A$ | 20 | 100 | — |
|                                      |               | $V_{CE} = 4V, I_C = 25A$ | 4  | —   | — |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 15A, I_B = 1.5A$  | —  | 1   | V |
|                                      |               | $I_C = 25A, I_B = 6.25A$ | —  | 4   | V |
| Base-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C = 25A, I_B = 6.25A$ | —  | 2.5 | V |
| Base-Emitter On Voltage              | $V_{BE(on)}$  | $I_C = 10A, V_{CE} = 4V$ | —  | 1.5 | V |

### Small-Signal Characteristics

|                                         |           |                                    |    |     |     |
|-----------------------------------------|-----------|------------------------------------|----|-----|-----|
| Current Gain-Bandwidth Product (Note 2) | $f_T$     | $V_{CE} = 10V, I_C = 1A, f = 1MHz$ | 4  | —   | MHz |
| Output Capacitance                      | $C_{obo}$ | $V_{CB} = 10V, I_E = 0, f = 1MHz$  | —  | 500 | pF  |
| Small-Signal Current Gain               | $h_{fe}$  | $V_{CE} = 4V, I_C = 3A, f = 1kHz$  | 20 | —   | —   |

### Switching Characteristics

|              |       |                                                 |   |     |    |
|--------------|-------|-------------------------------------------------|---|-----|----|
| Rise Time    | $t_r$ | $V_{CC} = 30V, I_C = 10A, I_{B1} = I_{B2} = 1A$ | — | 0.7 | us |
| Storage Time | $t_s$ | $V_{CC} = 30V, I_C = 10A, I_{B1} = I_{B2} = 1A$ | — | 1   | us |
| Fall Time    | $t_f$ |                                                 | — | 0.8 | us |

### Notes:

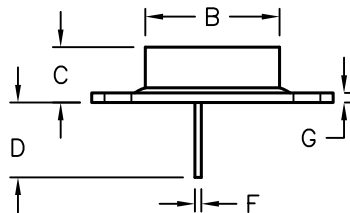
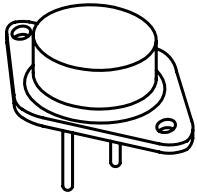
- Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
- $f_T$  is defined as the frequency at which  $|h_{fe}|$  extrapolates to unity.

### Absolute Maximum Ratings:

- Collector-Base Voltage,  $V_{CBO} = 80V$
- Collector-Emitter Voltage,  $V_{CEO} = 80V$
- Emitter-Base Voltage,  $V_{EBO} = 5V$
- Continuous Collector Current,  $I_C = 25A$
- Base Current,  $I_B = 7.5A$
- Total Device Dissipation ( $T_C = +25^\circ C$ ),  $P_D = 200W$   
Derate above  $25^\circ C = 1.15mW/^\circ C$
- Operating Junction Temperature Range,  $T_J = -65^\circ$  to  $+200^\circ C$
- Storage Temperature Range,  $T_{stg} = -65^\circ$  to  $+200^\circ C$



RoHS  
Compliant

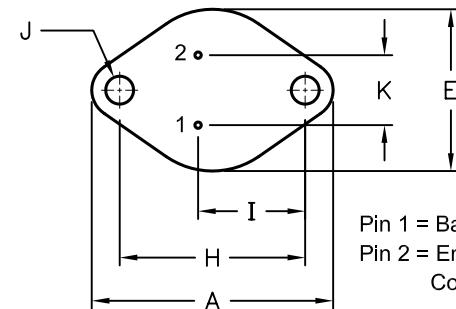


NPN

3 Collector

2 Base

1 Emitter



Pin 1 = Base

Pin 2 = Emitter

Collector (Case)

| DIM | MIN   | MAX   |
|-----|-------|-------|
| A   | 38.75 | 39.96 |
| B   | 19.28 | 22.23 |
| C   | 7.96  | 9.28  |
| D   | 11.18 | 12.19 |
| E   | 25.20 | 26.67 |
| F   | 0.92  | 1.09  |
| G   | 1.38  | 1.62  |
| H   | 29.90 | 30.40 |
| I   | 16.64 | 17.30 |
| J   | 3.88  | 4.36  |
| K   | 10.67 | 11.18 |

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### TOLERANCES:

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE FOR REFERENCE PURPOSES ONLY.

### DRAWN BY:

EKLAS ODISH

### DATE:

02/03/06

### CHECKED BY:

HISHAM ODISH

### DATE:

2/6/06

### APPROVED BY:

JEFF MCVICKER

### DATE:

2/6/06

### DRAWING TITLE:

High Power Transistor, Bipolar, Metal, TO-3, NPN

### SIZE

A

### DWG. NO.

2N5886

### ELECTRONIC FILE

01H1385.DWG

### REV

A

### SCALE:

NTS

### U.O.M.: Millimeters

### SHEET: 1 OF 1