



**SGS-THOMSON**  
MICROELECTRONICS

**BU921ZP/ZPFI**  
**BU921ZT/ZTFI**

S G S-THOMSON

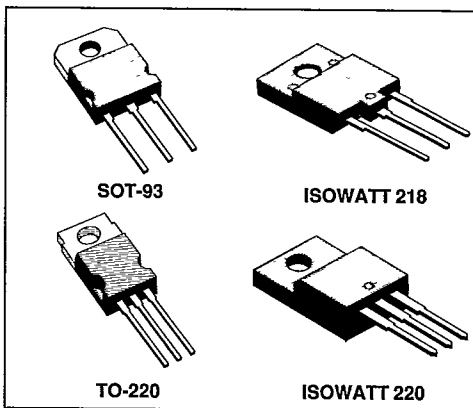
30E D  
**NPN POWER DARLINGTON**

ADVANCE DATA

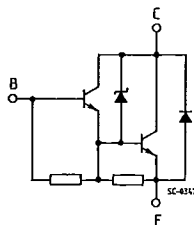
- HIGH RUGGEDNESS
- INTEGRATED HIGH VOLTAGE ZENER

#### AUTOMOTIVE MARKET

- APPLICATION IN HIGH PERFORMANCE ELECTRONIC CAR IGNITION



#### INTERNAL SCHEMATIC DIAGRAM



#### DESCRIPTION

The BU921ZP, BU921ZT, BU921ZPFI and BU921ZTFI are silicon multi epitaxial biplanar NPN transistors in monolithic darlington configuration mounted respectively in SOT-93, TO-220 plastic packages and ISOWATT218, ISOWATT220 fully isolated packages.

#### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter                                           | Value         |                   |               |                   | Unit           |
|-----------|-----------------------------------------------------|---------------|-------------------|---------------|-------------------|----------------|
| $V_{CBO}$ | Collector-base Voltage ( $I_E = 0$ )                | 350           |                   |               |                   | V              |
| $V_{CER}$ | Collector-emitter Voltage ( $R_{BE} = 100 \Omega$ ) | 350           |                   |               |                   | V              |
| $V_{CES}$ | Collector-emitter Voltage ( $V_{BE} = 0$ )          | 350           |                   |               |                   | V <sub>s</sub> |
| $V_{CEO}$ | Collector-emitter Voltage ( $I_B = 0$ )             | 350           |                   |               |                   | V              |
| $V_{EBO}$ | Emitter-base Voltage ( $I_C = 0$ )                  | 5             |                   |               |                   | V              |
| $I_C$     | Collector Current                                   | 16            |                   |               |                   | A              |
| $I_B$     | Base Current                                        | 5             |                   |               |                   | A              |
|           |                                                     | <b>SOT-93</b> | <b>ISOWATT218</b> | <b>TO-220</b> | <b>ISOWATT220</b> |                |
| $P_{tot}$ | Total Dissipation at $T_o < 25^\circ C$             | 125           | 60                | 100           | 40                | W              |
| $T_{stg}$ | Storage Temperature                                 | - 40 to 150   |                   |               |                   | $^\circ C$     |
| $T_J$     | Max. Operating Junction Temperature                 | 150           |                   |               |                   | $^\circ C$     |

## THERMAL DATA

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30E D

|                  |                                  |     | SOT-93 | ISOWATT218 | TO-220 | ISOWATT220 |               |
|------------------|----------------------------------|-----|--------|------------|--------|------------|---------------|
| $R_{th\ j-case}$ | Thermal Resistance Junction-case | Max | 1      | 2.08       | 1.25   | 3.12       | $^{\circ}C/W$ |

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ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}C$  unless otherwise specified)

| Symbol          | Parameter                                  | Test Conditions              |                                                                      | Min.       | Typ. | Max.       | Unit    |
|-----------------|--------------------------------------------|------------------------------|----------------------------------------------------------------------|------------|------|------------|---------|
| $I_{CEO}$       | Collector Cut-off Current<br>( $I_B = 0$ ) | $V_{CE} = 350\ V$            |                                                                      |            |      | 250        | $\mu A$ |
| $I_{EBO}$       | Emitter Cut-off Current<br>( $I_C = 0$ )   | $V_{BE} = -5\ V$             |                                                                      |            |      | 50         | mA      |
| $V_{CL}$        | Clamping Voltage                           | either<br>and<br>same        | $I_B = 0$ or $V_{BE} = 0$<br>$I_C = 100\ mA$<br>$T_j = 125^{\circ}C$ | 350<br>350 |      | 500<br>500 | V<br>V  |
| $V_{CE(sat)}^*$ | Collector-emitter Saturation<br>Voltage    | $I_C = 5\ A$                 | $I_B = 50\ mA$                                                       |            | 1.03 | 1.4        | V       |
|                 |                                            | $I_C = 6\ A$                 | $I_B = 75\ mA$                                                       |            | 1.08 | 1.5        | V       |
|                 |                                            | $I_C = 8\ A$                 | $I_B = 120\ mA$                                                      |            | 1.17 | 1.6        | V       |
|                 |                                            | $T_j = 125^{\circ}C$         |                                                                      |            |      |            |         |
|                 |                                            | $I_C = 5\ A$                 | $I_B = 50\ mA$                                                       |            | 0.98 |            | V       |
|                 |                                            | $I_C = 6\ A$                 | $I_B = 75\ mA$                                                       |            | 1.04 |            | V       |
| $V_{BE(sat)}^*$ | Base-emitter Saturation<br>Voltage         | $I_C = 6\ A$                 | $I_B = 75\ mA$                                                       |            |      | 2.2        | V       |
|                 |                                            | $I_C = 8\ A$                 | $I_B = 120\ mA$                                                      |            |      | 2.3        | V       |
| $h_{FE}$        | DC Current Gain                            | $I_C = 5\ A$                 | $V_{CE} = 10\ V$                                                     | 300        |      |            |         |
| $V_F^*$         | Diode Forward Voltage                      | $I_F = 10\ A$                |                                                                      |            |      | 2.5        | V       |
|                 | USE TEST                                   | $V_{CC} = 24\ V$ $L = 8\ mH$ |                                                                      | 8          |      |            | A       |

\* Pulsed : pulsed duration = 300  $\mu s$ , duty cycle = 1.5 %.