# BU810

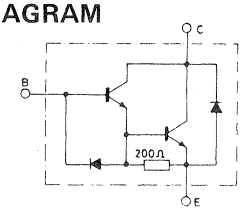
## MEDIUM POWER FAST SWITCHING

The BU810 is a silicon epitaxial planar NPN Darlington transistor with integrated base-emitter speed-up diode, mounted in Jedec TO-220 plastic package.

## ABSOLUTE MAXIMUM RATINGS

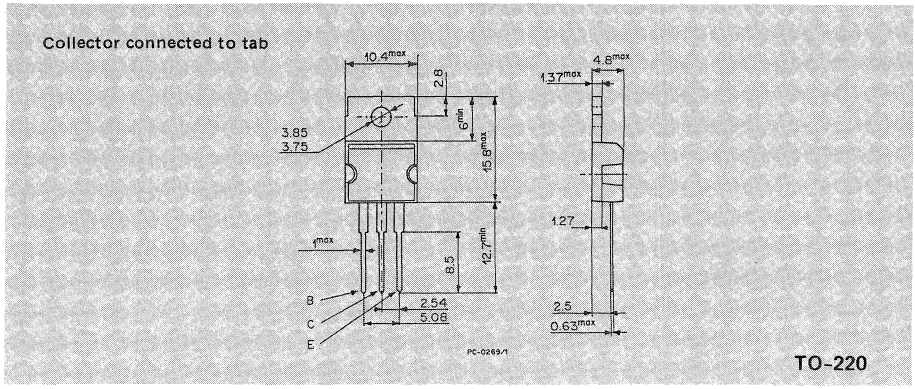
| | | | |
|---|---|---|---|
| $V_{CBO}$ | Collector-base voltage ($I_E = 0$) | 600 | V |
| $V_{CEO}$ | Collector-emitter voltage ($I_B = 0$) | 400 | V |
| $V_{EBO}$ | Emitter-base voltage ($I_C = 0$) | 5 | V |
| $I_C$ | Collector current | 7 | A |
| $I_{CM}$ | Collector peak current | 10 | A |
| $I_B$ | Base current | 2 | A |
| $P_{tot}$ | Total power dissipation at $T_{case} \leqslant 25°C$ | 75 | W |
| $T_{stg}$ | Storage temperature | -65 to 150 | °C |
| $T_j$ | Junction temperature | 150 | °C |

## INTERNAL SCHEMATIC DIAGRAM




## MECHANICAL DATA

Dimensions in mm



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## THERMAL DATA

| | | | | |
|---|---|---|---|---|
| $R_{th\ j\text{-}case}$ | Thermal resistance junction-case | max. | 1.66 | °C/W |

## ELECTRICAL CHARACTERISTICS ($T_{case}$ = 25°C unless otherwise specified)

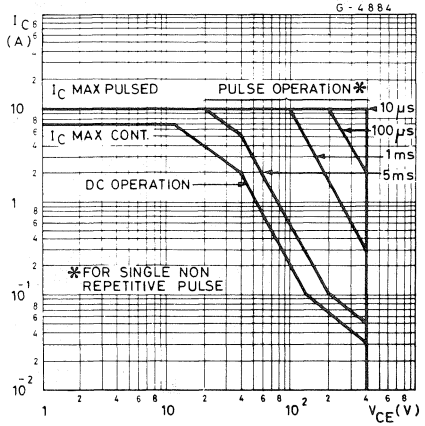
| Parameter | | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{CES}$ | Collector cutoff current ($V_{BE}$ = 0) | $V_{CE}$ = 600V | | | 200 | μA |
| $I_{CEO}$ | Collector cutoff current ($I_B$ = 0) | $V_{CE}$ = 400V | | | 1 | mA |
| $I_{EBO}$ * | Emitter cutoff current ($I_C$ = 0) | $V_{EB}$ = 5V | | | 150 | mA |
| $V_{CEO(sus)}$ * | Collector-emitter sustaining voltage | $I_C$ = 100mA | 400 | | | V |
| $V_{CE(sat)}$ * | Collector-emitter saturation voltage | $I_C$ = 2A $I_B$ = 20mA<br>$I_C$ = 4A $I_B$ = 200mA<br>$I_C$ = 7A $I_B$ = 0.7A | | | 2<br>2.5<br>3 | V<br>V<br>V |
| $V_{BE(sat)}$ * | Base-emitter saturation voltage | $I_C$ = 2A $I_B$ = 20mA<br>$I_C$ = 4A $I_B$ = 200mA | | | 2.2<br>3 | V<br>V |
| $V_F$ * | Diode forward voltage | $I_F$ = 7A | | | 3 | V |

### RESISTIVE SWITCHING TIMES

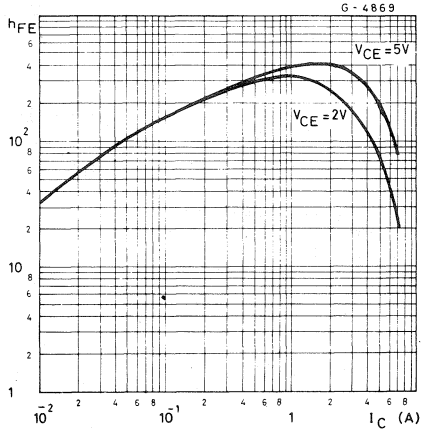
| | | | | | |
|---|---|---|---|---|---|
| $t_{on}$ | Turn-on time | $V_{CC}$ = 250V<br>$I_C$ = 2A $I_{B1}$ = 20mA<br>$V_{BE(off)}$ = -5V | | 0.6 | μs |
| $t_s$ | Storage time | | | 1.5 | μs |
| $t_f$ | Fall time | | | 0.5 | μs |

* Pulsed: pulse duration = 300 μs, duty cycle = 1.5%.

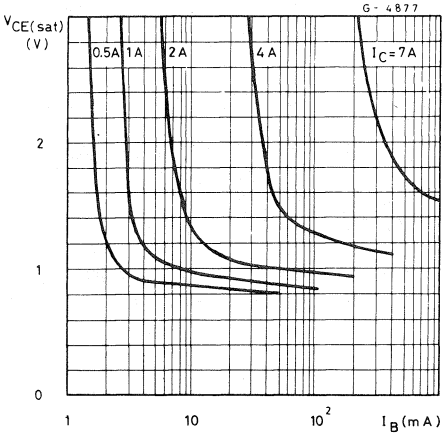
## Safe operating areas



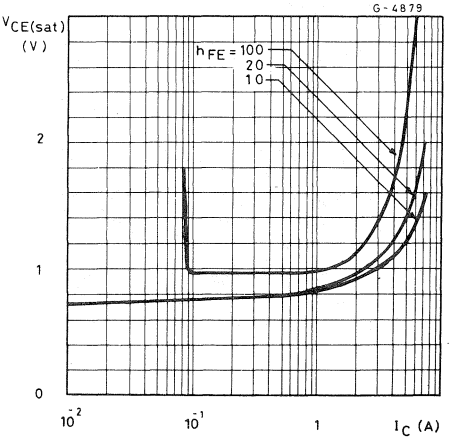

## DC current gain



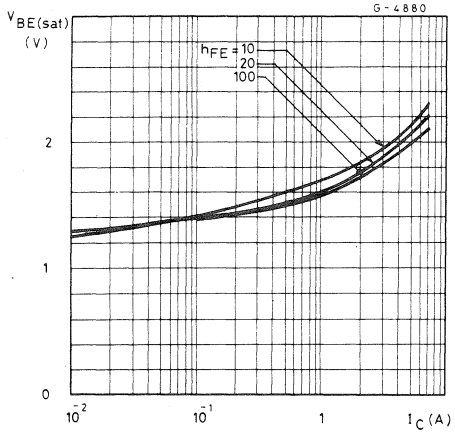

## Collector-emitter saturation voltage



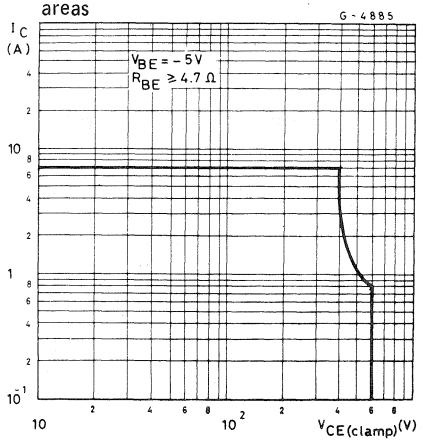

## Collector-emitter saturation voltage



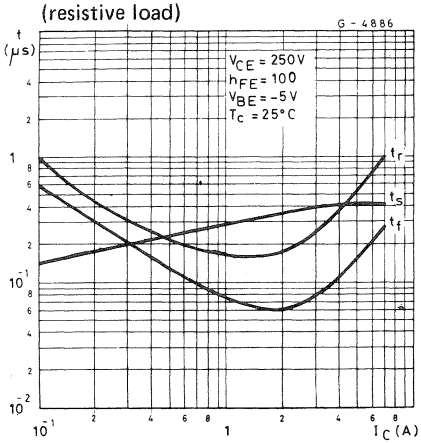
Base-emitter saturation voltage




Clampled reverse bias safe operating areas




Saturated switching characteristics (resistive load)




Saturated switching characteristics