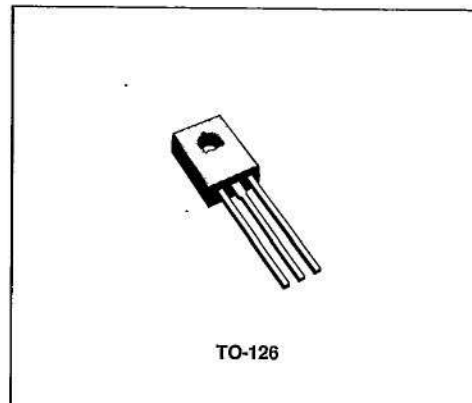


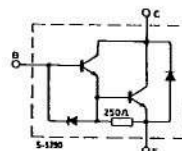
HIGH VOLTAGE FAST DARLINGTON

DESCRIPTION

The BU801 is a silicon epitaxial planar NPN Darlington transistor with integrated base-emitter speed-up diode, mounted in Jedec TO-126 plastic package. It is particularly suitable as output stage in medium power and driver stage in high power, fast switching applications.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
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 ($I_C = 0$)	7	V
I_C, I_E	Collector and Emitter Currents	3	A
I_B	Base Current	1	A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25^\circ\text{C}$	40	W
T_{stg}	Storage Temperature	- 65 to 150	$^\circ\text{C}$
T_j	Junction Temperature	150	$^\circ\text{C}$

$R_{thj-case}$	Thermal Resistance Junction-case	Max	3.12	°C/W
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ELECTRICAL CHARACTERISTICS ($T_{case} = 25\text{ °C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector-cutoff Current ($V_{BE} = 0$)	$V_{CE} = 600\text{ V}$			200	μA
I_{CEO}	Collector-cutoff Current ($I_B = 0$)	$V_{CE} = 400\text{ V}$			1	mA
I_{EBO}^*	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 7\text{ V}$			100	mA
$V_{CE(sus)}^*$	Collector-emitter Sustaining Voltage	$I_C = 10\text{ mA}$	400			V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 200\text{ A}$ $I_B = 2\text{ mA}$		1.0	1.5	V
		$I_C = 1\text{ A}$ $I_B = 20\text{ mA}$		1.2	2.0	V
		$I_C = 2\text{ A}$ $I_B = 200\text{ mA}$		1.8	3.0	V
$V_{BE(sat)}^*$	Base-emitter Saturation Voltage	$I_C = 200\text{ A}$ $I_B = 2\text{ mA}$			2	V
		$I_C = 1\text{ A}$ $I_B = 20\text{ mA}$			2.5	V
		$I_C = 2\text{ A}$ $I_B = 200\text{ mA}$			3	V
h_{FE}^*	DC Current Gain	$I_C = 200\text{ mA}$ $V_{CE} = 3\text{ V}$	100			
V_F^*	Diode Forward Voltage	$I_F = 1\text{ A}$			4	V

RESISTIVE SWITCHING TIMES

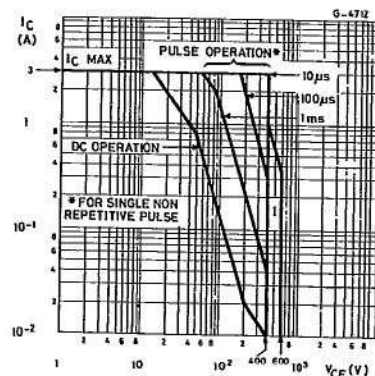
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit.
t_{on}	Turn-on Time	$V_{CC} = 250\text{ V}$ $I_C = 200\text{ mA}$ $I_{B1} = 2\text{ mA}$ $V_{BEoff} = -5\text{ V}$		0.17	0.8	μs
t_s	Storage Time			0.37	1	μs
t_f	Fall Time			0.13	0.5	μs
t_{on}	Turn-on Time	$V_{CC} = 250\text{ V}$ $I_C = 1\text{ A}$ $I_{B1} = 20\text{ mA}$ $V_{BEoff} = -5\text{ V}$		0.18	0.8	μs
t_s	Storage Time			0.38	1	μs
t_f	Fall Time			0.09	0.5	μs

INDUCTIVE SWITCHING TIMES

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit.
t_s	Storage Time	$V_{Clamp} = 250\text{ V}$ $I_C = 200\text{ mA}$ $V_{BEoff} = -5\text{ V}$ $I_{B1} = 2\text{ mA}$		0.35	1	μs
t_f	Fall Time			0.09	0.4	μs
t_s	Storage Time	$V_{Clamp} = 250\text{ V}$ $I_C = 1\text{ A}$ $V_{BEoff} = -5\text{ V}$ $I_{B1} = 20\text{ mA}$		0.5	1	μs
t_f	Fall Time			0.06	0.4	μs

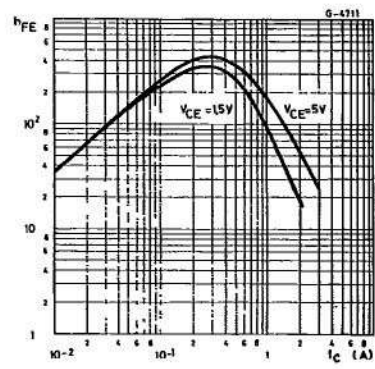
* Pulsed : pulse duration = 300 μs , duty cycle = 1.5 %.

Safe Operating Area.

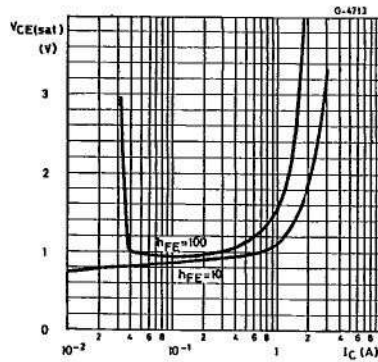


I = Area of permissible operation during turn-on with $t_p \leq 1$ ms.

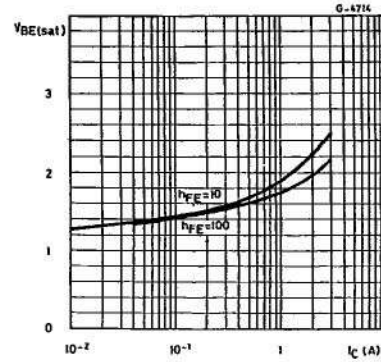
DC Current Gain.



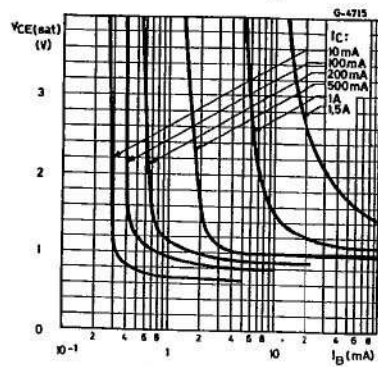
Collector-emitter Saturation Voltage.



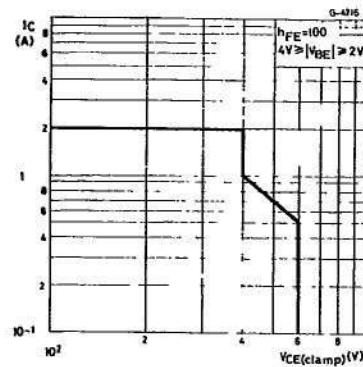
Base-emitter Saturation Voltage.



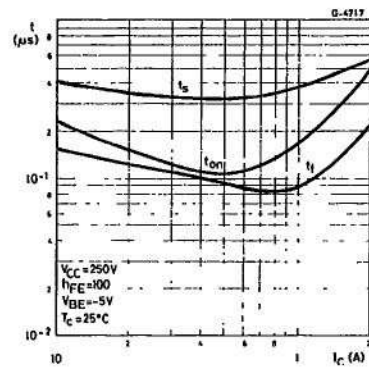
Collector-emitter Saturation Voltage.



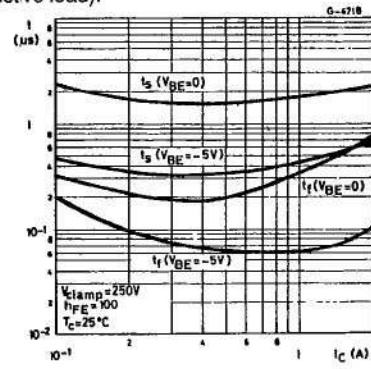
Clamped Reverse Bias Safe Operating Area.



Saturated Switching Characteristics (resistive load).



Saturated Switching Characteristics (inductive load).



Derating Curves.

