SILICON DARLINGTON POWER TRANSISTOR

Monolithic high voltage npn Darlington circuit with integrated speed-up diode in a plastic SOT93 envelope, intended for fast switching application.

QUICK REFERENCE DATA

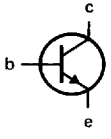
			BU826	BU826A	
Collector-emitter voltage (peak value; V_{BE} = 0)	V_{CESM}	max.	800	900	V
Collector-emitter voltage (open base)	V_{CEO}	max.	375	400	V
Collector-emitter saturation voltage	V_{CEsat}	max.	2,0		V
Collector current (DC)	I_C	max.	6		A
Collector current (peak value)	I_{CM}	max.	8		A
Total power dissipation up to T_{mb} = 25 °C	P_{tot}	max.	125		W
Collector saturation current	I_{Csat}	max.	2,5		A
Fall time	t_f	typ.	0,2		μs

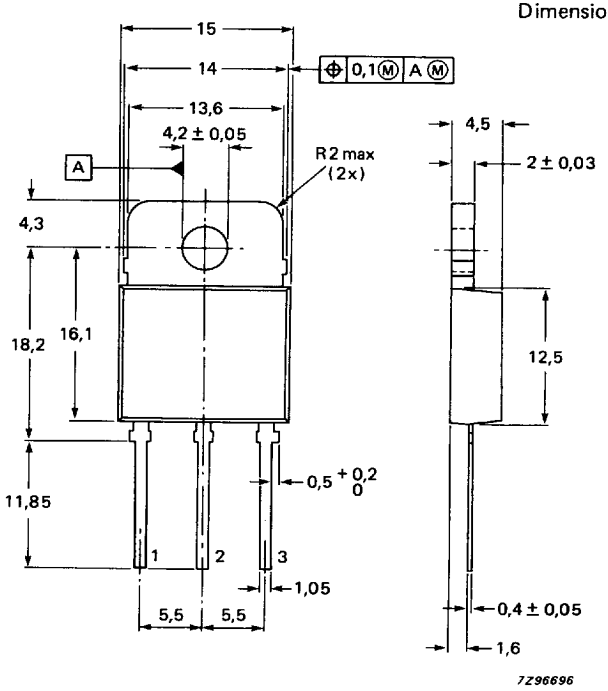
MECHANICAL DATA

Fig. 1 SOT93.

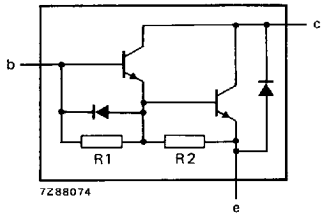
Collector connected to mounting base.

Dimensions in mm





Pinning:
1 = base
2 = collector
3 = emitter



R1 typ. 200 Ω
R2 typ. 100 Ω

Fig. 2 Circuit diagram.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

			BU826	BU826A	
Collector-emitter voltage (peak value; V_{BE} = 0)	V_{CESM}	max.	800	900	V
Collector-emitter voltage (open base)	V_{CEO}	max.	375	400	V
Collector current (DC)	I_C	max.	6		A
Collector current (peak value)	I_{CM}	max.	8		A
Saturation	I_{Csat}	max.	2,5		A
Base current (DC)	I_B	max.	2		A
Base current (peak value)	I_{BM}	max.	3		A
Total power dissipation up to T_{mb} = 25 °C	P_{tot}	max.	125		W
Storage temperature range	T_{stg}		−65 to + 150		°C
Junction temperature*	T_j	max.	150		°C

THERMAL RESISTANCE*

From junction to mounting base	$R_{th\ j\text{-}mb}$	=	1,0	K/W

* Based on maximum average junction temperature in line with common industrial practice. The resulting higher junction temperature of the output transistor part is taken into account.

CHARACTERISTICS

T_j = 25 °C unless otherwise specified

Collector cut-off current*			
$V_{CE} = V_{CESMmax}$; $V_{BE} = 0$	I_{CES}	max.	1 mA
$V_{CE} = V_{CESMmax}$; $V_{BE} = 0$; T_j = 125 °C	I_{CES}	max.	2 mA
Emitter cut-off current			
$I_C = 0$; $V_{EB} = 8$ V	I_{EBO}	max.	150 mA
		min.	50 mA
Collector-emitter sustaining voltage			
I_C = 100 mA; $I_{Boff} = 0$; L = 25 mH	$V_{CEOsust}$	min.	375 V
Saturation voltages			
I_C = 2,5 A; I_B = 55 mA	V_{CEsat}	max.	2,0 V
	V_{BEsat}	max.	2,2 V
I_C = 4 A; I_B = 200 mA	V_{CEsat}	max.	2,5 V

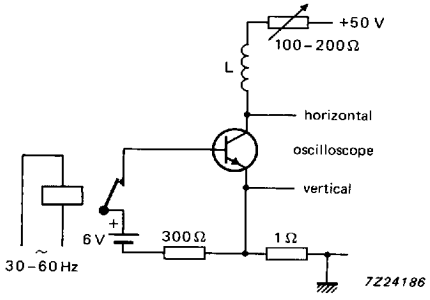


Fig. 3 Test circuit for $V_{CEOsust}$.

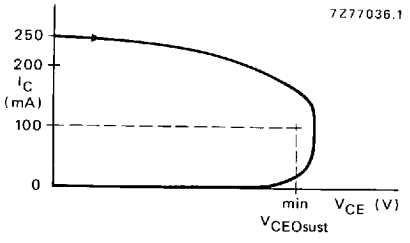


Fig. 4 Oscilloscope display for $V_{CEOsust}$.

* Measured with a half-sinewave voltage (curve tracer).

CHARACTERISTICS (continued)

Switching times (between 10% and 90% levels)

I_{Con} = 2,5 A; V_{CC} = 250 V

I_{Bon} = 55 mA; $-I_{Boff}$ = 1 A

Turn-on time	t_{on}	max.	1,3 μs
Turn-off time: Storage time	t_s	max.	2,0 μs
Fall time	t_f	typ.	0,2 μs
Fall time; T_{mb} = 100 °C	t_f	max.	0,6 μs

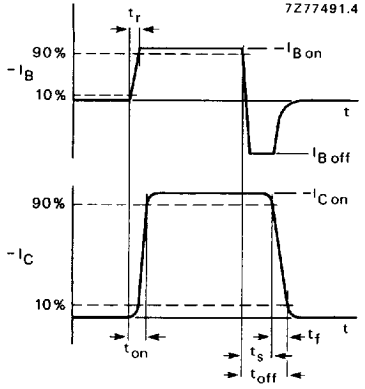


Fig. 5 Waveforms.

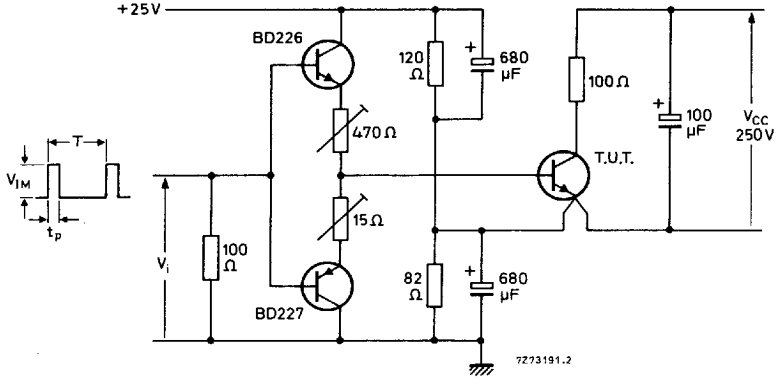
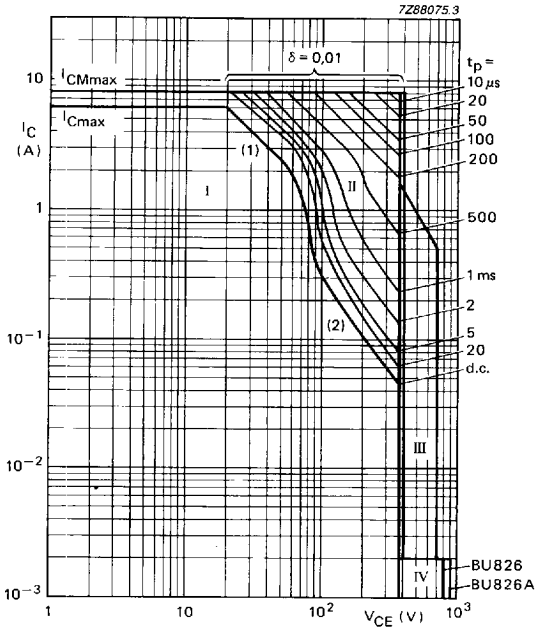


Fig. 6 Test circuit. T = 2 ms; t_p = 20 μs; V_{IM} = 15 V.



I Region of permissible DC operation.
II Permissible extension for repetitive pulse operation.
III Area of permissible operation during turn-on in single-transistor converters, provided $t_p < 1{,}3\ \mu s$.
IV Repetitive pulse operation in this region is permissible, provided $V_{BE} \leqslant 0$ and $t_p \leqslant 2$ ms.
(1) $P_{tot\ max}$ and $P_{peak\ max}$ lines.
(2) Second-breakdown limits.

Fig. 7 Safe operating area at T_{amb} = 25 °C.

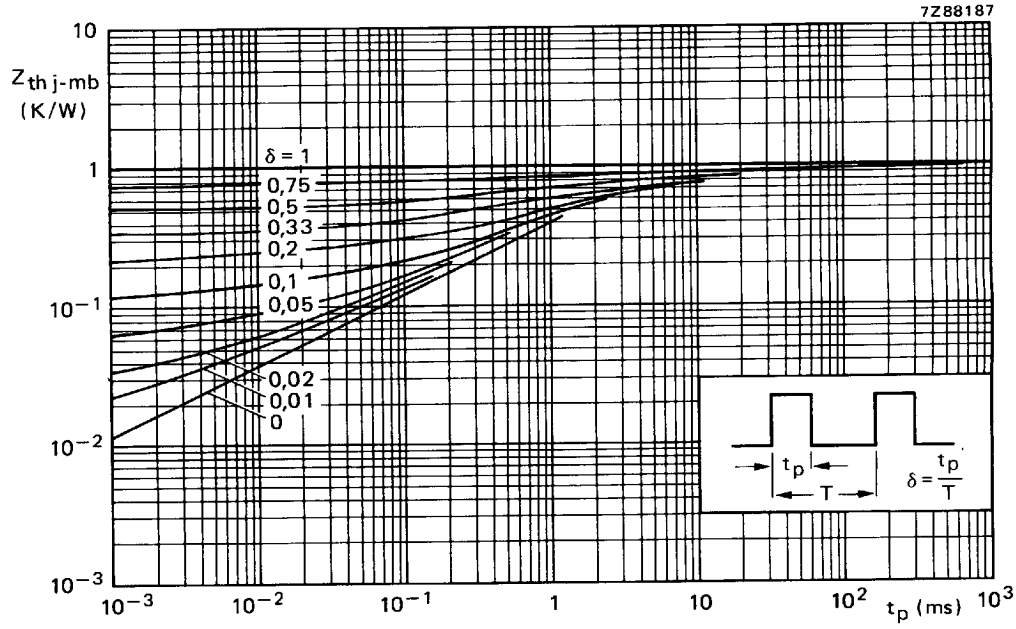


Fig. 8 Pulse power rating chart.

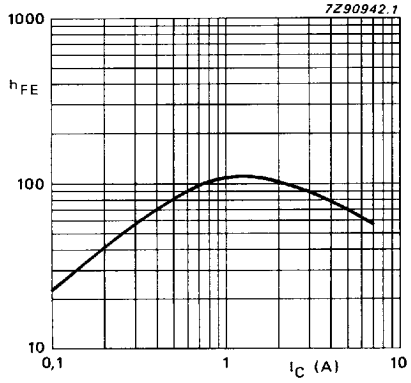


Fig. 9 DC current gain; V_{CE} = 5 V; T_j = 25 °C.

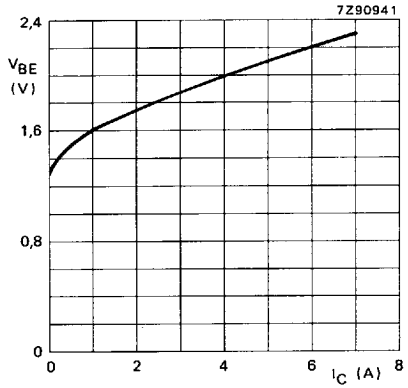


Fig. 10 V_{BEsat} curve; T_j = 25° C; typical values.