SILICON DIFFUSED POWER TRANSISTORS

Monolithic high-voltage npn Darlington transistors with integrated speed-up diode in a SOT82 envelope, intended for fast switching applications such as small motor control and switch-mode power supplies (SMPS).

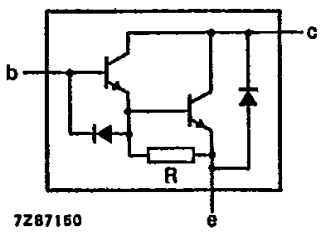
QUICK REFERENCE DATA

			BU724	724A	
Collector-emitter voltage					
peak value; V_{BE} = 0	V_{CESM}	max.	650	850	V
open base	V_{CEO}	max.	375	400	V
Collector-emitter saturation voltage	V_{CEsat}	max.	3.0		V
Collector current					
saturation	I_{Csat}	max.	0.4	0.3	A
DC	I_C	max.	2.0		A
peak value	I_{CM}	max.	3.0		A
Total power dissipation					
up to T_{mb} = 25 °C	P_{tot}	max.	1.5		W

MECHANICAL DATA

Dimensions in mm

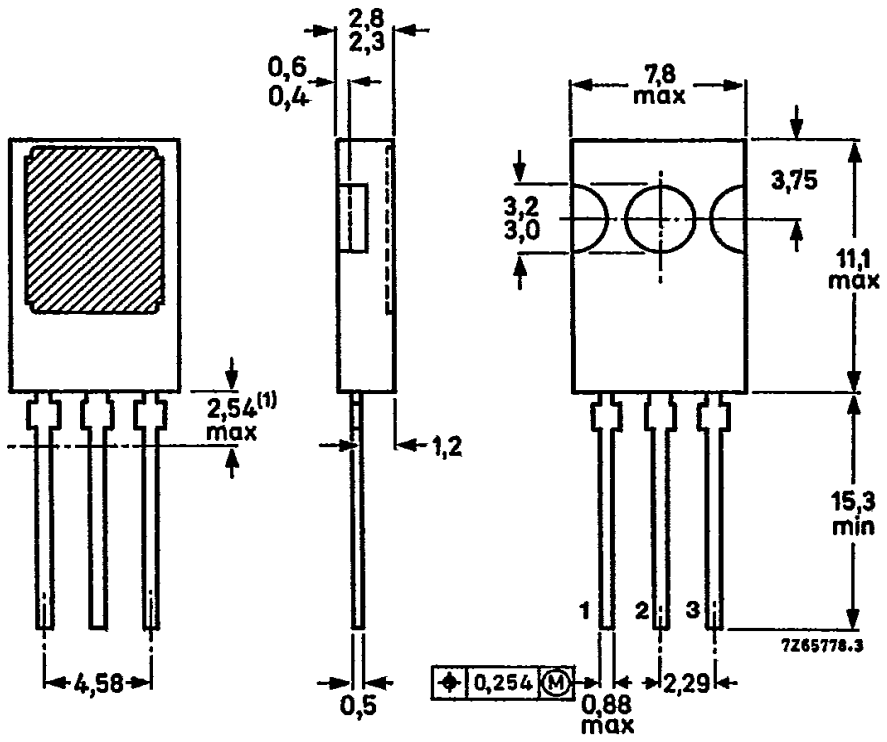
Fig. 1 SOT82.



R = typical 600 Ω

Pinning:
1 = base
2 = collector
3 = emitter

Collector connected to mounting base.



RATINGS

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

			BU724	724A	
Collector-emitter voltage					
peak value; $V_{BE} = 0$	V_{CESM}	max.	650	850	V
open base	V_{CEO}	max.	375	400	V
Collector current					
saturation	I_{Csat}	max.	0.4	0.3	A
DC	I_C	max.	2.0		A
peak value	I_{CM}	max.	3.0		A
Base current					
DC	I_B	max.	0.2		A
peak value	I_{BM}	max.	1.0		A
Total power dissipation					
up to $T_{amb} = 25\ ^oC$	P_{tot}	max.	1.5		W
Total power dissipation					
up to $T_{mb} = 25\ ^oC$	P_{tot}	max.	25		W
Storage temperature range	T_{stg}		−65 to + 150		^oC
Junction temperature	T_j	max.	150		^oC

THERMAL RESISTANCE

From junction to mounting base	$R_{th\ j\text{-}mb}$	=	5.0	K/W
From junction to ambient	$R_{th\ j\text{-}amb}$	=	83	K/W

CHARACTERISTICS

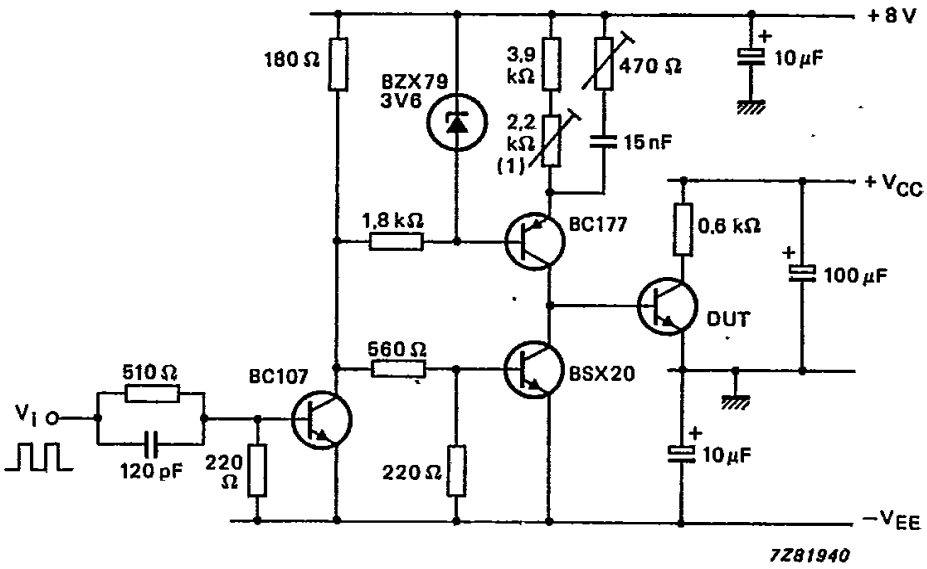
T_j = 25 °C unless otherwise specified

Collector cut-off currents*				
$V_{CE} = V_{CESM\,max}$; V_{BE} = 0.3 V	I_{CES}	max.	0.1	mA
$V_{CE} = V_{CES\,max}$; V_{BE} = 0.3 V; T_j = 125 °C	I_{CES}	max.	0.2	mA
Emitter cut-off current				
V_{EB} = 5 V; I_C = 0	I_{EBO}	max.	2.0	mA
	I_{EBO}	min.	3.3	mA

			BU724	724A	
Collector-emitter sustaining voltage					
I_B = 0; I_C = 10 mA	V_{CEO}	min.	375	400	V
Saturation voltages					
I_C = 400 mA; I_B = 1.0 mA	V_{CEsat}	max.	5.0	–	V
I_C = 300 mA; I_B = 1.0 mA	V_{CEsat}	max.	–	3.0	V
	V_{BEsat}	max.	2.0		V
Parasitic collector current					
V_{CE} = 10 V; $-I_B$ = 250 mA	I_{cp}	max.	100		μA
Switching times resistive load					
$I_{C\,on}$ = 0.4 A; I_{BM} = 9 mA					
$-V_{EE}$ = 1 V; V_{CC} = 250 V					
I_B = 1 mA; T_{mb} = 100 °C					
rise time	t_{on}	max.	1.0		μs
storage time	t_s	max.	1.5		μs
fall time	t_f	max.	1.5		μs

DEVELOPMENT DATA

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



(1) For adjustment of I_B = 1 mA let V_{EE} = 0 V.

Fig. 2 Switching times test circuit.

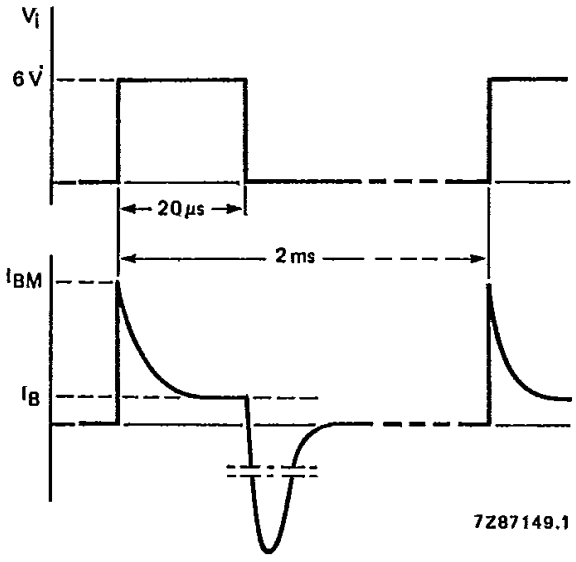


Fig. 3 Input current and current waveforms.

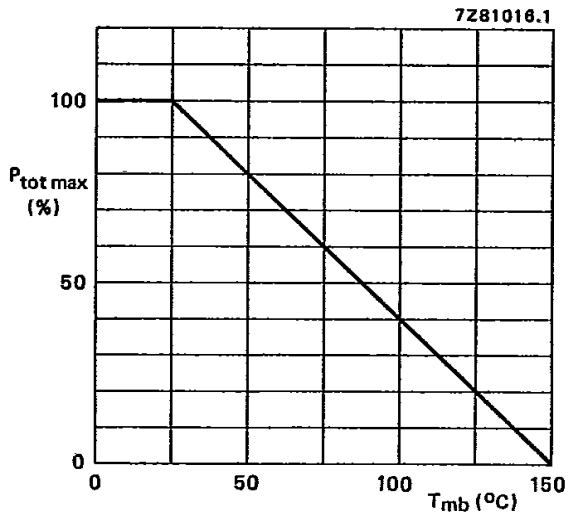
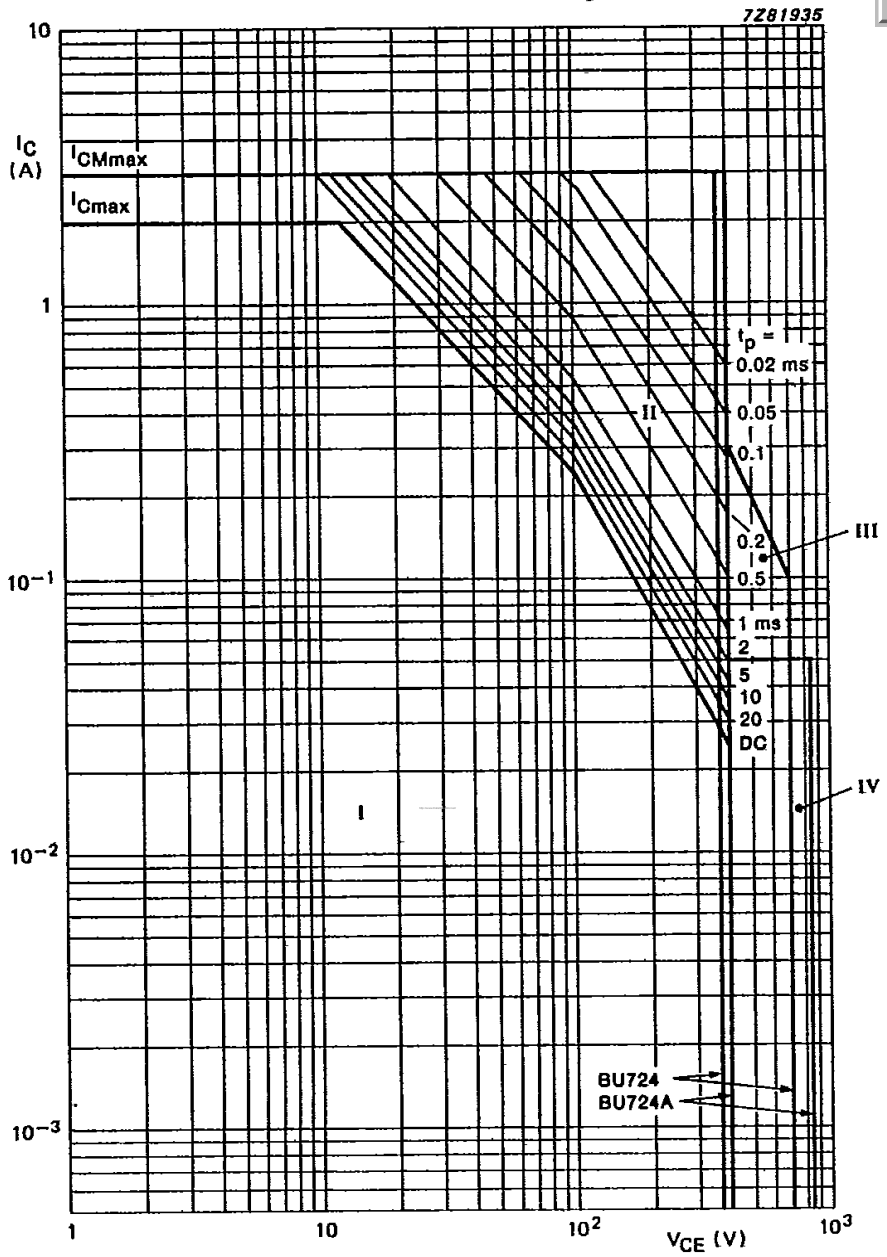


Fig. 4 Power derating curve.

DEVELOPMENT DATA



I Region of permissible DC operation.

II Permissible extension for repetitive pulse operation.

III Permissible extension for turn-on provided $t_p \leqslant 0.4\ \mu s$ and $R_{BE} \leqslant 100\ \Omega$.

IV Permissible extension for turn-off provided $I_E = 0$; $t_p \leqslant 0.4\ \mu s$ and $dV_{CB}/d_t \leqslant 5000\ V/\mu s$.

Fig. 5 Safe operating area; $T_{mb} = 25\ ^oC$.

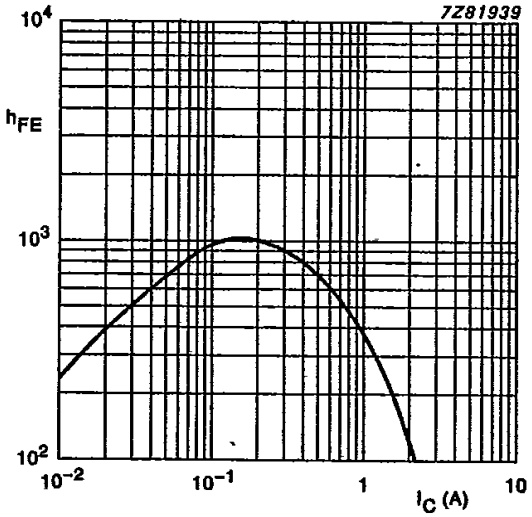


Fig. 6 Typical DC current gain; V_{CE} = 5 V; T_{mb} = 25 °C.

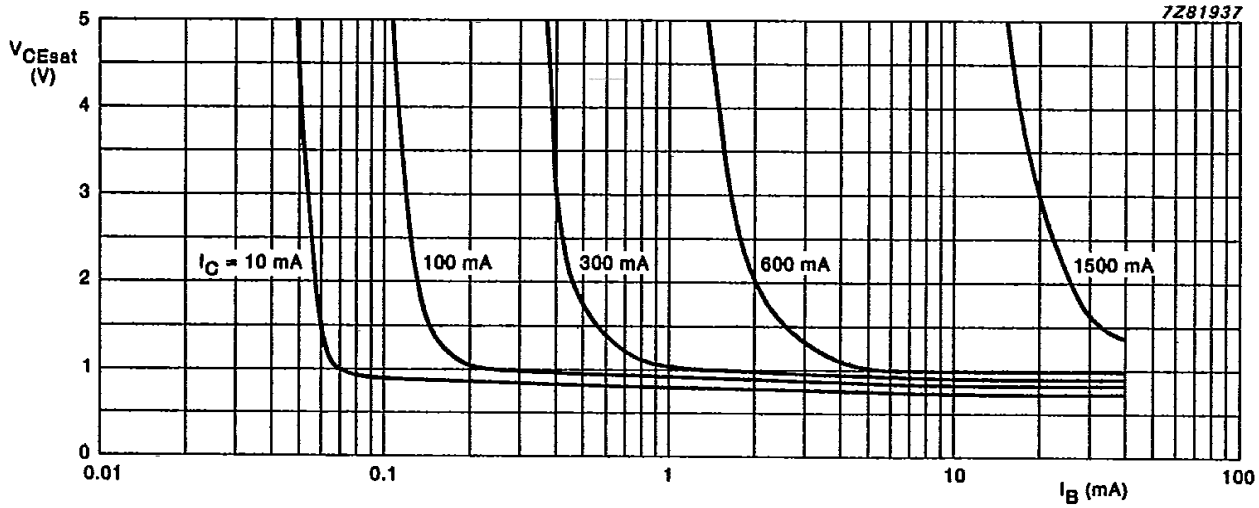


Fig. 7 Typical collector-emitter saturation voltage as a function of base current; T_{mb} = 25 °C.

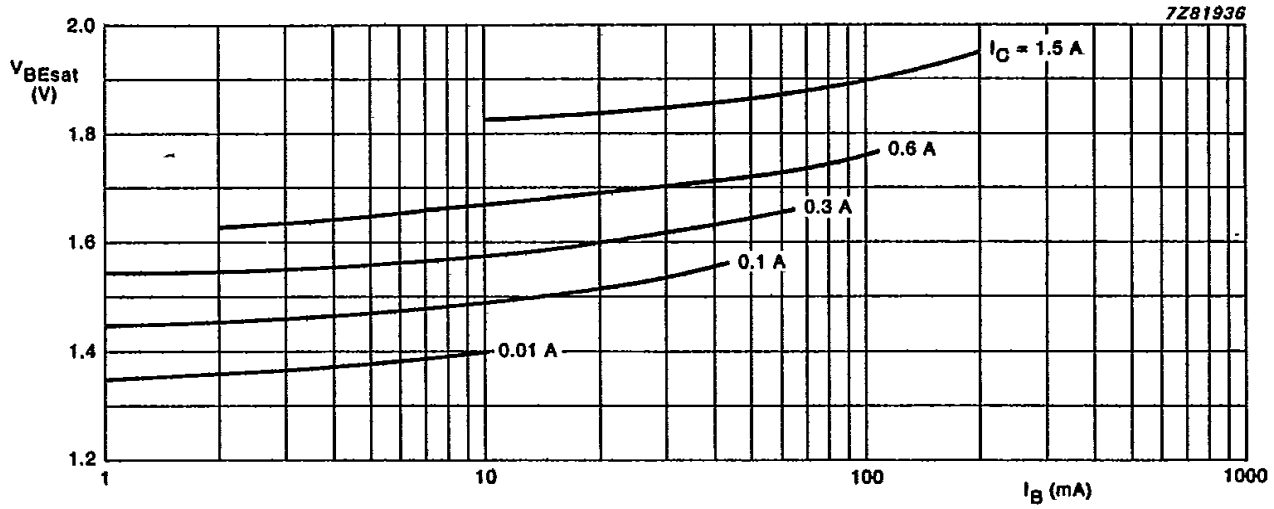


Fig. 8 Typical base-emitter saturation voltage as a function of base current.

DEVELOPMENT DATA

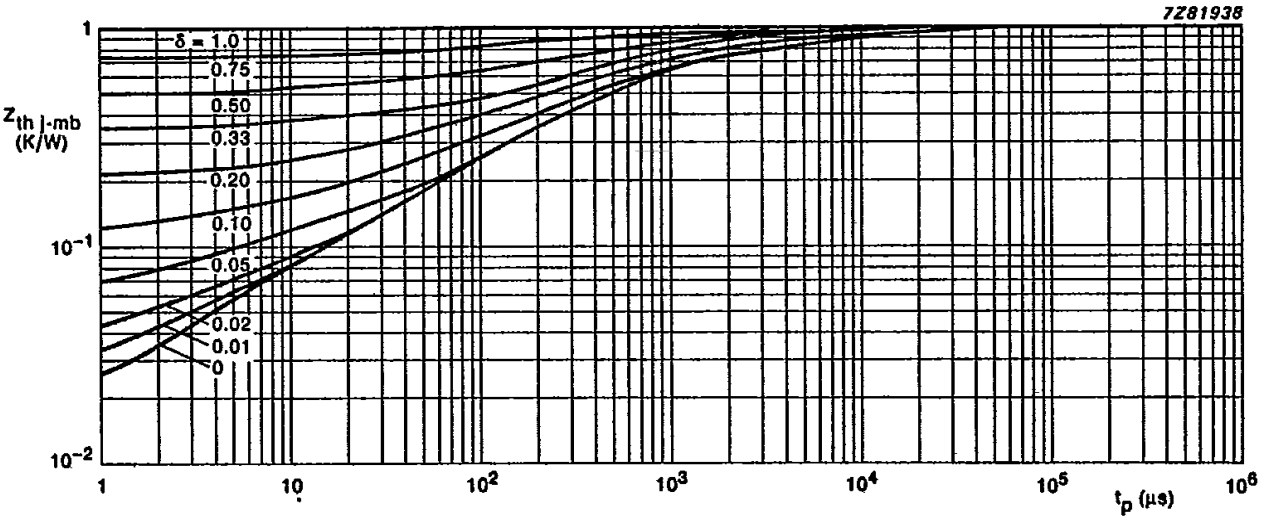


Fig. 9 Normalized thermal response at pulse power conditions.