Silicon diffused power transistor — BU705

High-voltage, high-speed switching, glass passivated npn power transistor in a SOT93A envelope, intended for use in horizontal deflection circuits of television receivers.

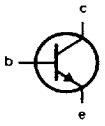
QUICK REFERENCE DATA

Collector-emitter voltage			
peak value; $V_{BE} = 0$	V_{CESM}	max.	1500 V
open base	V_{CEO}	max.	700 V
Collector-emitter saturation voltage	V_{CEsat}	max.	1 V
Collector current			
saturation	I_{Csat}	max.	2 A
DC	I_C	max.	2.5 A
peak value	I_{CM}	max.	4 A
Total power dissipation up to $T_{mb} = 25\ ^oC$	P_{tot}	max.	75 W
Fall time inductive load	t_f	typ.	0.7 μs

MECHANICAL DATA

Dimensions in mm

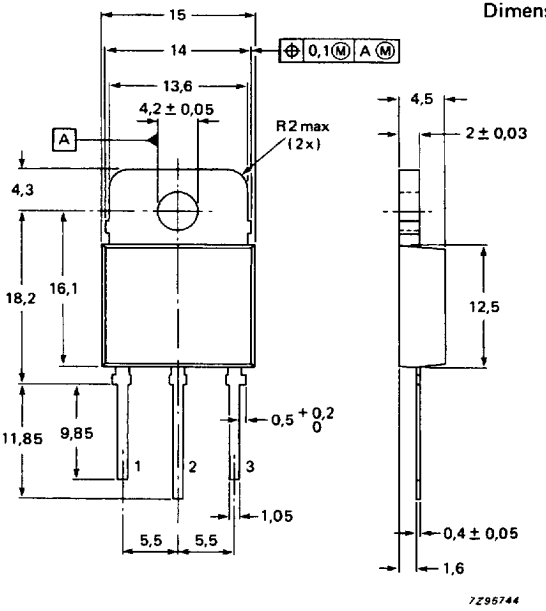
Fig. 1 SOT93A.



BU705

Pinning
1 = base
2 = collector
3 = emitter

Collector connected to tab.



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RATINGS

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

Collector-emitter voltage (peak value; V_{BE} = 0)	V_{CESM}	max.	1500 V
Collector-emitter voltage (open base)	V_{CEO}	max.	700 V
Collector current (DC)	I_C	max.	2,5 A
Collector current (peak value; $t_p < 2$ ms)	I_{CM}	max.	4 A
Base current	I_B	max.	2 A
Base current (peak value; $t_p < 2$ ms)	I_{BM}	max.	4 A
Total power dissipation up to T_{mb} = 25 °C	P_{tot}	max.	75 W
Storage temperature range	T_{stg}		−65 to +150 °C
Junction temperature	T_j	max.	150 °C

THERMAL RESISTANCE

From junction to mounting base	$R_{th\ j\text{-}mb}$	=	1,67 K/W

CHARACTERISTICS

T_j = 25 °C unless otherwise specified

Collector cut-off current*			
$V_{CE} = V_{CESMmax}$; V_{BE} = 0	I_{CES}	max.	0,15 mA
$V_{CE} = V_{CESMmax}$; V_{BE} = 0; T_j = 125 °C	I_{CES}	max.	1 mA
Emitter cut-off current			
I_C = 0; V_{EB} = 5 V	I_{EBO}	max.	1 mA
Emitter-base voltage			
I_C = 0; I_E = 10 mA	V_{EBO}	min.	6 V
Saturation voltage			
I_C = 2 A; I_B = 0,9 A	V_{CEsat}	max.	1 V
	V_{BEsat}	max.	1,3 V
Collector-emitter sustaining voltage			
I_C = 100 mA; I_B = 0; L = 25 mH	$V_{CEOsust}$	min.	700 V
Collector saturation current			
V_{CE} = 5 V	I_{Csat}	typ.	2 A
DC current gain			
I_C = 2 A; V_{CE} = 5 V	h_{FE}	min.	2,2
I_C = 100 mA; V_{CE} = 5 V	h_{FE}	min.	6
	h_{FE}	typ.	13
	h_{FE}	max.	30
Second breakdown current			
V_{CE} = 120 V; t = 200 μs	I_{SB}	max.	2,0 A
Transition frequency at f = 5 MHz			
I_C = 0,1 A; V_{CE} = 5 V	f_T	typ.	7 MHz

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

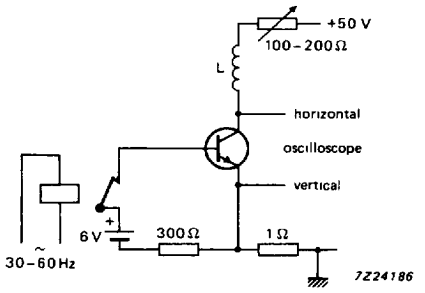


Fig. 2 Test circuit for sustaining voltage.

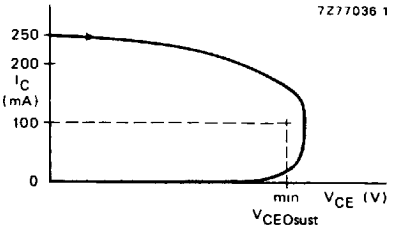


Fig. 3 Oscilloscope display for sustaining voltage.

Switching times (in horizontal deflection circuit)
$-V_{dr}$ = 4 V; L_B = 15 μH; I_{CM} = 2 A
$I_{B(end)}$ = 0,9 A;

fall time	t_f	typ.	0,9 μs
storage time	t_s	typ.	7,5 μs

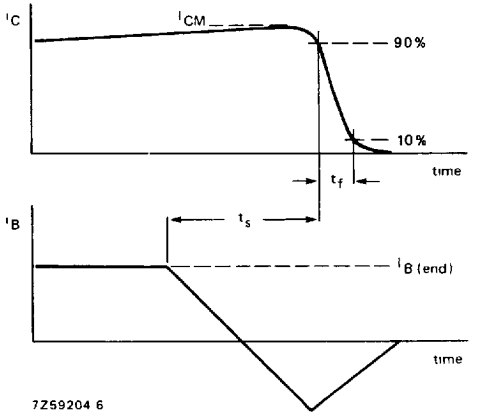
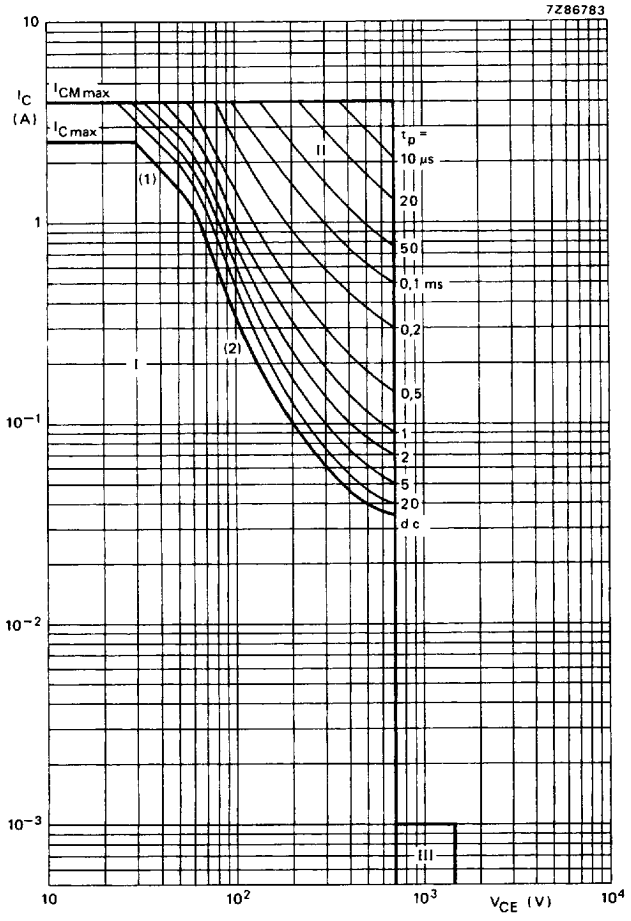


Fig. 4 Switching times waveform.



(1) $P_{tot\,max}$ and $P_{peak\,max}$ lines.
(2) Second breakdown limits.
I Region of permissible DC operation.
II Permissible extension for repetitive pulse operation.
III Repetitive pulse operation in this region is allowable, provided $R_{BE} < 100\ \Omega$, $t_p = 20\ \mu s$, d = 0,25.

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

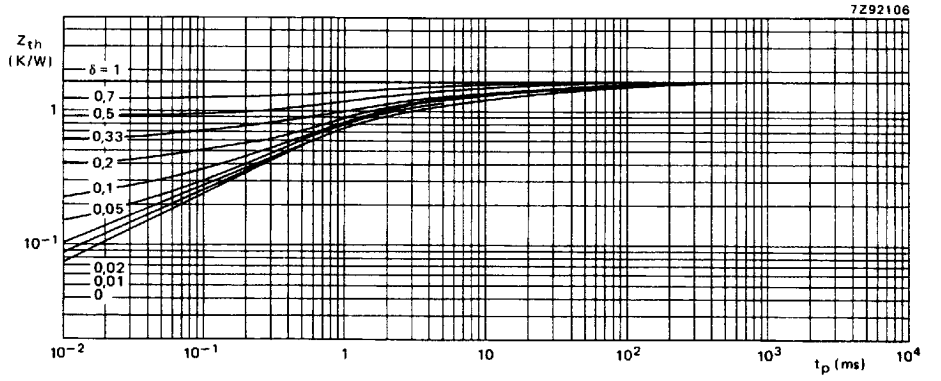


Fig. 6 Pulse power rating chart.

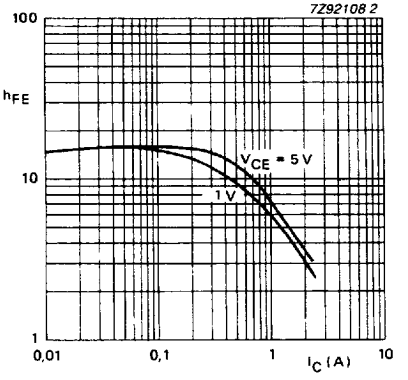


Fig. 7 Typical DC current gain; T_j = 25 °C.

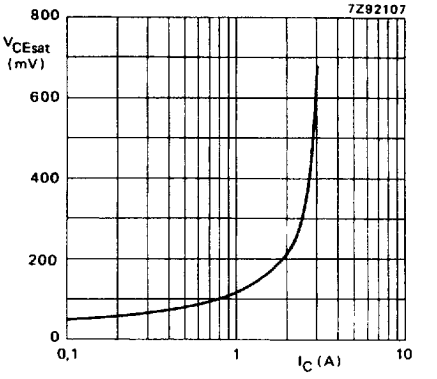


Fig. 8 Typical values V_{CEsat} I_C/I_B = 2; T_j = 25 °C.

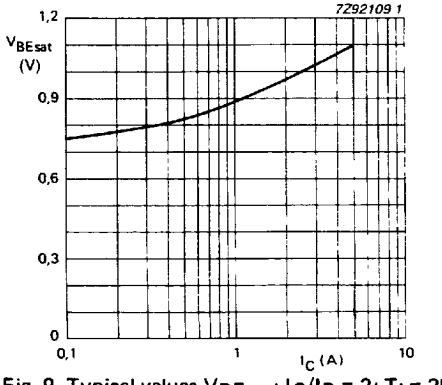


Fig. 9 Typical values V_{BEsat}; I_C/I_B = 2; T_j = 25 °C.

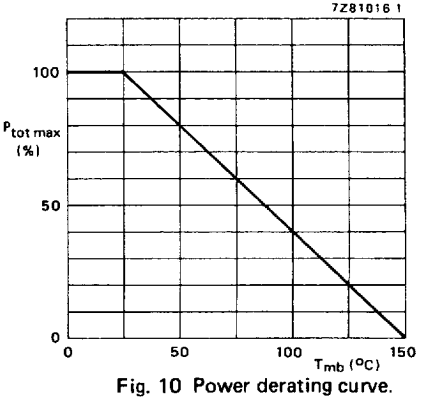


Fig. 10 Power derating curve.