BU705
BU705D

T-33-13

SILICON DIFFUSED POWER TRANSISTOR

High-voltage, high-speed switching, glass passivated npn power transistor in a SOT93A envelope, intended for use in horizontal deflection circuits of television receivers. The BU705D has an integrated efficiency diode

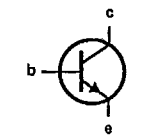
QUICK REFERENCE DATA

Collector-emitter voltage peak value; $V_{BE} = 0$	V_{CESM}	max.	1500 V
Collector-emitter voltage open base	V_{CEO}	max.	700 V
Collector-emitter saturation voltage	V_{CEsat}	max.	1 V
Collector current saturation	I_{Csat}	max.	2 A
Collector current DC	I_C	max.	2.5 A
Collector current peak value	I_{CM}	max.	4 A
Diode forward voltage (BU705D)	V_F	typ.	1.8 V
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.



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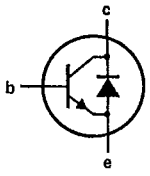

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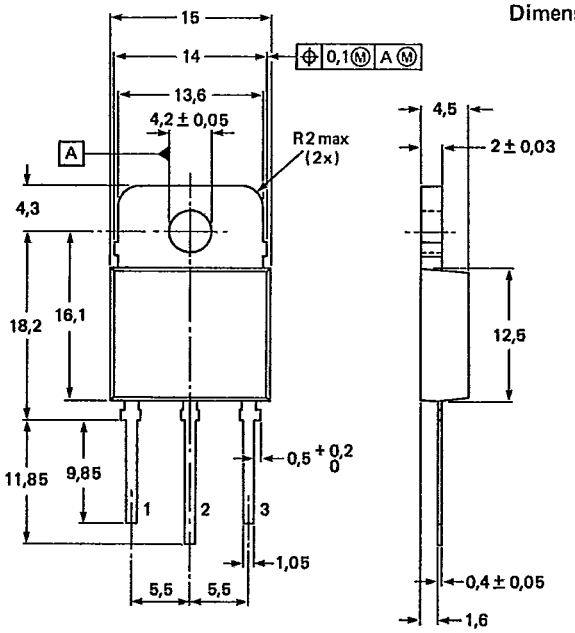

7Z95744

Pinning

1 = base
2 = collector
3 = emitter

Collector connected to tab.

BU705
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T-33-13

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
Diode forward voltage (BU705D)				
I_F = 3A	V_F	typ.	1,8	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).

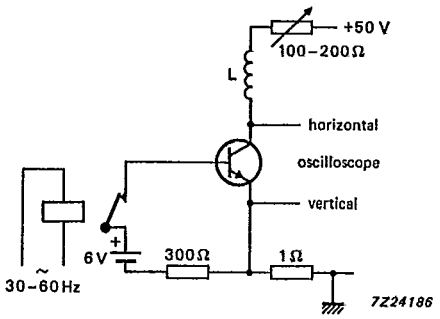


Fig. 2 Test circuit for sustaining voltage.

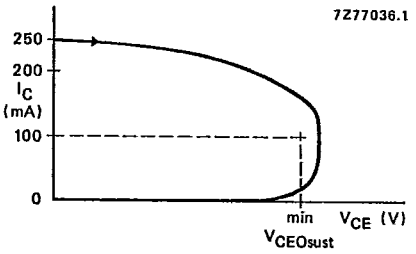


Fig. 3 Oscilloscope display for sustaining voltage.

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

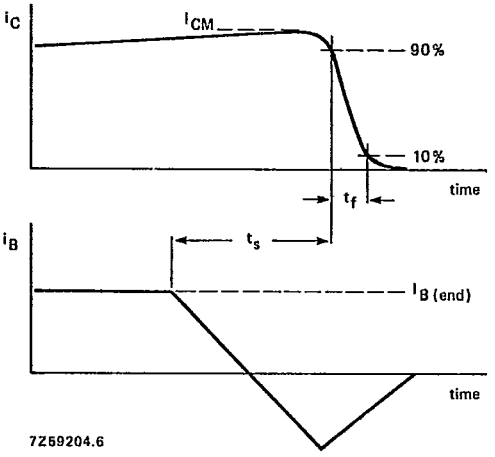
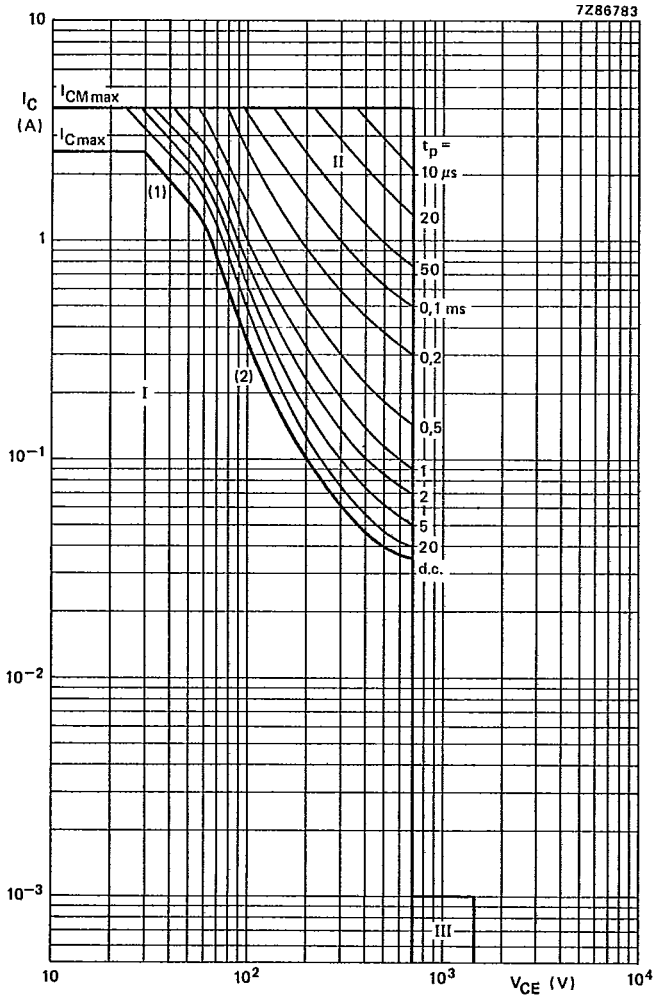


Fig. 4 Switching times waveform.



(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; $T_{mb} = 25\ ^oC$.

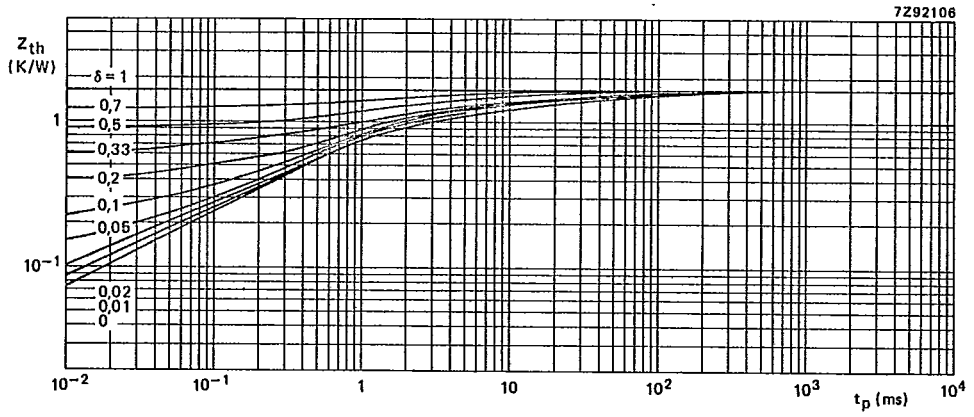


Fig. 6 Pulse power rating chart.

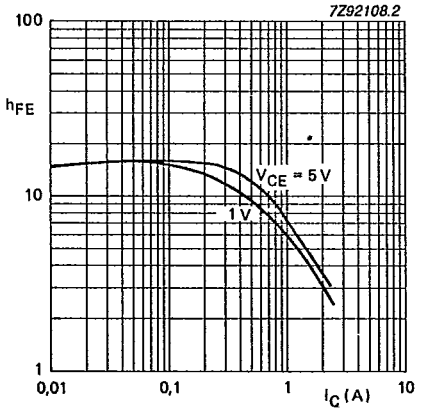


Fig. 7 Typical DC current gain; T_j = 25 °C.

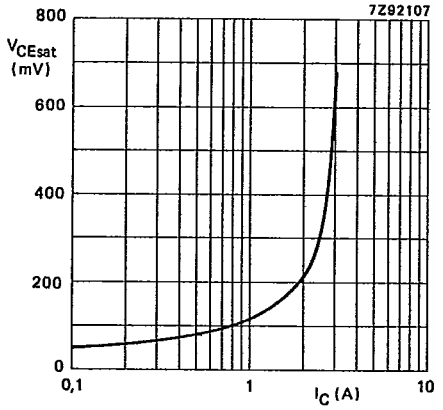


Fig. 8 Typical values V_{CEsat} I_C/I_B = 2; T_j = 25 °C.

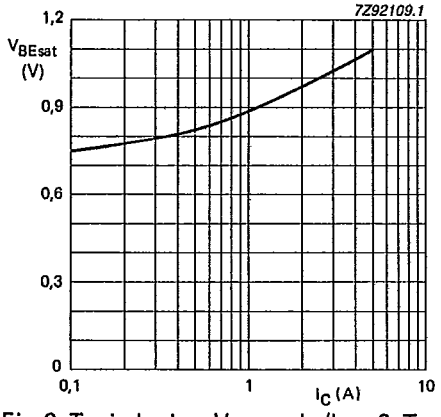


Fig. 9 Typical values V_{BEsat}; I_C/I_B = 2; T_j = 25 °C.

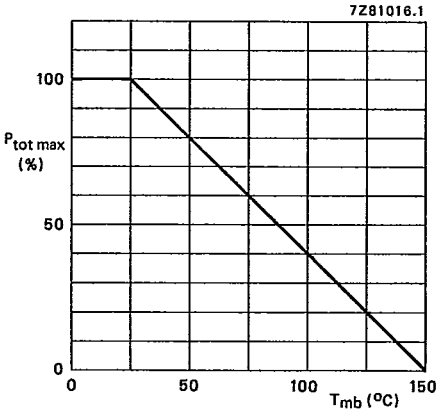


Fig. 10 Power derating curve.