BUV28F
BUV28AF

T-33-11

SILICON DIFFUSED POWER TRANSISTORS

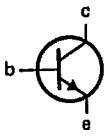
High-voltage, high-speed, glass-passivated npn power transistor in a SOT186 envelope with electrically isolated mounting base, intended for use in converters, inverters, switching regulators, motor control systems, etc.

QUICK REFERENCE DATA

			BUV28F	28AF	
Collector-emitter voltage					
peak value; V_{BE} = 0	V_{CESM}	max.	400	450	V
open base	V_{CEO}	max.	200	225	V
Collector-emitter saturation voltage	V_{CEsat}	max.	1.5	1.5	V
Collector current					
saturation	I_{Csat}	max.	6.0	4.0	A
DC	I_C	max.	10		A
peak value	I_{CM}	max.	20		A
Total power dissipation					
up to T_h = 25 °C	P_{tot}	max.	18		W
Fall time; inductive load	t_f	typ.	40		ns

MECHANICAL DATA

Fig. 1 SOT186.

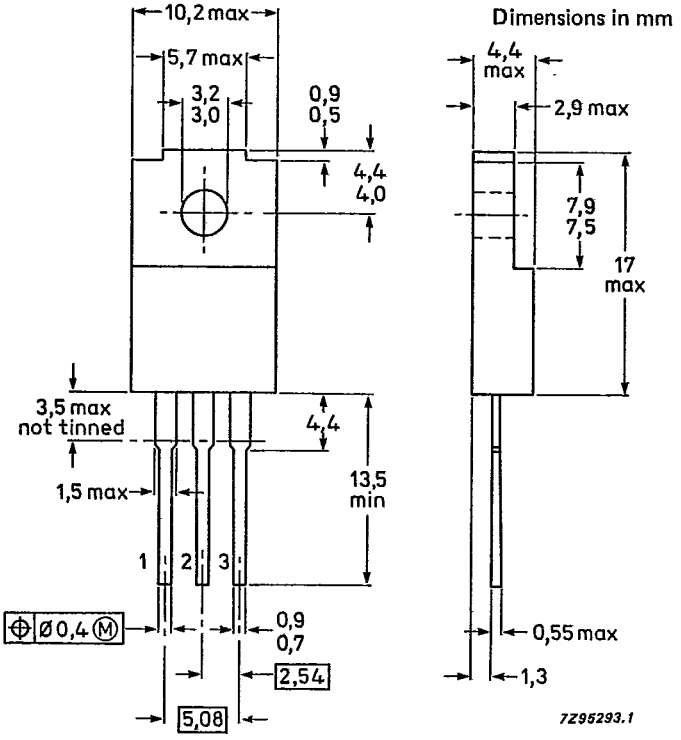


Pinning:

1 = base
2 = collector
3 = emitter

Mounting base is electrically isolated from all terminals.

Dimensions in mm



RATINGS

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

			BUV28F	28AF	
Collector-emitter voltage					
peak value; V_{BE} = 0	V_{CESM}	max.	400	450	V
open base	V_{CEO}	max.	200	225	V
Collector current					
saturation	I_{Csat}	max.	6.0	4.0	A
DC	I_C	max.	10		A
peak value	I_{CM}	max.	20		A
Base current					
DC	I_B	max.	2.0		A
peak value	I_{BM}	max.	4.0		A
Total power dissipation					
up to T_h = 25 °C	P_{tot}	max.	18		W
Storage temperature range	T_{stg}		−65 to + 150		°C
Junction temperature	T_j	max.	150		°C

THERMAL RESISTANCE

From junction to heatsink (note 1)	$R_{th\ j\text{-}h}$	=	7.0	K/W
From junction to heatsink (note 2)	$R_{th\ j\text{-}h}$	=	4.5	K/W
From junction to ambient	$R_{th\ j\text{-}a}$	=	55	K/W

ISOLATION

Isolation voltage from all terminals to external heatsink (peak value)	V_{isol}	max.	1500	V
Isolation capacitance from collector to external heatsink	C_{isol}	typ.	12	pF

Notes

1. Mounted without heatsink compound and 30 ± 5 newtons pressure on centre of envelope.
2. Mounted with heatsink compound and 30 ± 5 newtons pressure on centre of envelope.

CHARACTERISTICS

T_j = 25 °C unless otherwise specified

Collector cut-off currents					
$V_{CE} = V_{CESmax}$; V_{BE} = −1.5 V; T_j = 125 °C	I_{CEX}	max.		1.0	mA
$V_{CE} = V_{CESmax}$; V_{BE} = 0 V; T_j = 125 °C	I_{CES}	max.		3.0	mA
Emitter cut-off current					
V_{EB} = 5 V; I_C = 0	I_{EBO}	max.		1.0	mA
			BUV28F	28AF	
Saturation voltages					
$I_C = I_{Csat}$; $I_B = I_{Csat}/10$	V_{CEsat}	max.	1.5	1.5	V
	V_{BEsat}	max.	2.0	2.0	V
Collector-emitter sustaining voltage (Figs 2 and 3)					
I_C = 200 mA; I_B = 0; L = 25 mH	$V_{CEOsust}$	min.	200	225	V
Switching times resistive load (Figs 4 and 5)					
$I_{C\,on} = I_{Csat}$; $I_{B\,on} = I_{Csat}/10$; $I_{Boff} = 2I_{Bon}$					
Turn-on time	t_{on}	typ.		0.3	μs
Turn-off; storage time	t_s	typ.		0.5	μs
fall time	t_f	typ.		0.1	μs
Turn-on time	t_{on}	max.		1.0	μs
Turn-off; storage time	t_s	max.		1.5	μs
fall time	t_f	max.		0.25	μs
Switching times inductive load (Figs 6 and 7)					
$I_C = I_{Csat}$; $I_{B\,on} = I_{Csat}/10$ at T_j = 25 °C					
Turn-off; storage time at T_j = 25 °C	t_s	typ.		1.0	μs
fall time	t_f	typ.		40	ns
Turn-off; storage time at T_j = 125 °C	t_s	typ.		3.0	μs
fall time	t_f	max.		200	ns

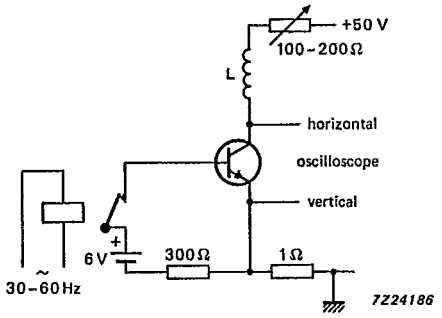


Fig. 2 Test circuit for $V_{CEOsust}$.

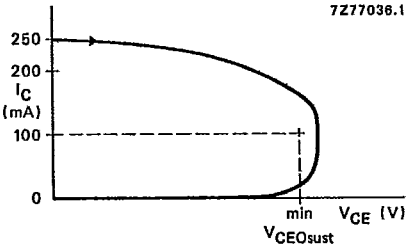
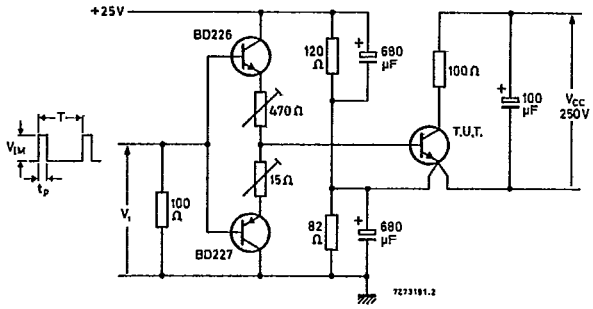


Fig. 3 Oscilloscope display for sustaining voltage.



t_p = 20 µs
T = 2 ms
V_{IM} = 15 V

Fig. 4 Test circuit resistive load; V_{CC} = 50 V; R_L = 4 Ω; R1 = 82 Ω.

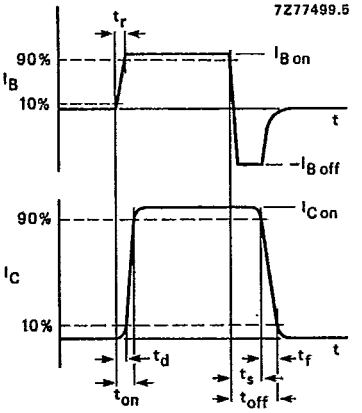


Fig. 5 Switching times waveforms with resistive load; $t_r \leqslant 30$ ns.

V_{clamp} = 40 V
$-V_{BE}$ = −5 V
L_B = 0.5 µH

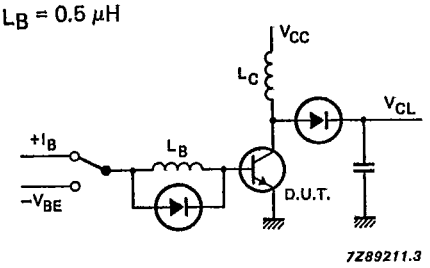


Fig. 6 Test circuit inductive load; V_{CC} = 30 V; L_C = 200 µH.

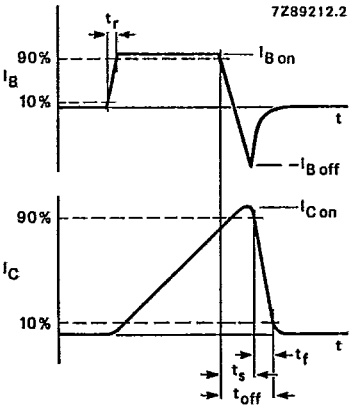
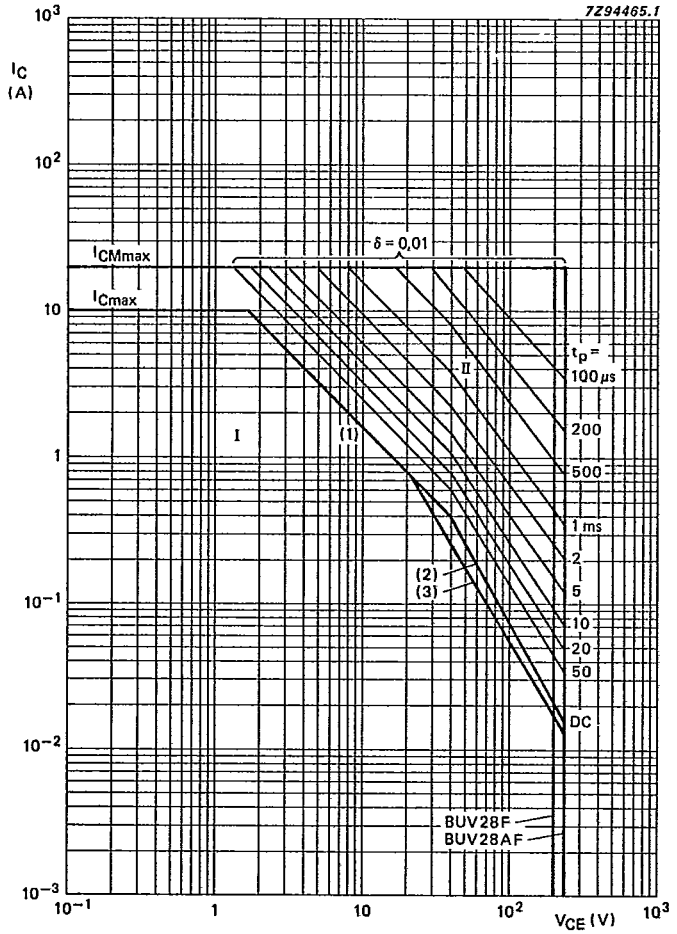


Fig. 7 Switching times waveforms with inductive load.



I Region of permissible DC operation
II Permissible extension for repetitive pulse operation

(1) P_{tot} and $P_{tot\ max}$ lines
(2) Second-breakdown limits without heatsink compound
(3) Second-breakdown limits with heatsink compound.

Fig. 8 Forward bias SOAR at $T_{mb} < 25\ ^{o}C$.

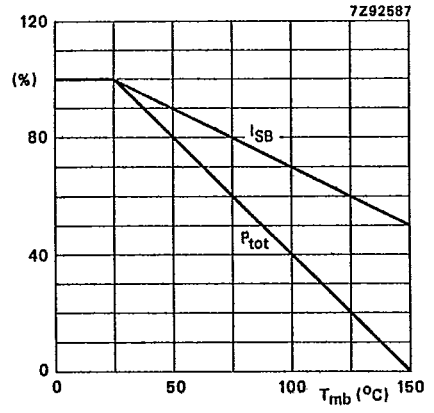


Fig. 9 Power dissipation and second-breakdown current derating curve.

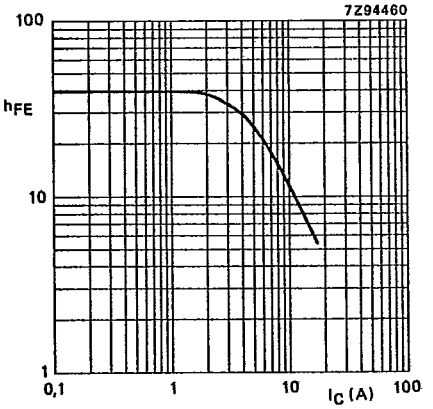


Fig. 10 Typical DC current gain; V_{CE} = 5 V; T_j = 25 °C.

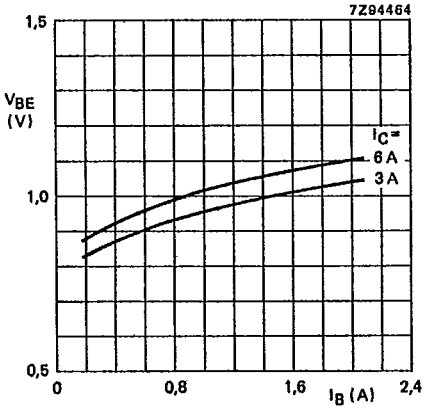


Fig. 11 Base-emitter voltage as a function of base current.

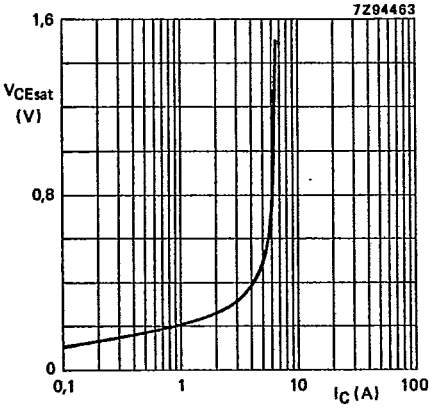


Fig. 12 Collector-emitter saturation voltage as a function of collector current; I_C/I_B = 10.