Silicon Diffused Power Transistor BU2525AW

GENERAL DESCRIPTION

New generation, high-voltage, high-speed switching npn transistor in a plastic envelope intended for use in horizontal deflection circuits of large screen colour television receivers up to 32 kHz.

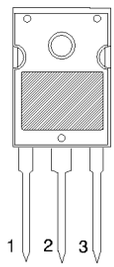
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	V_{BE} = 0	-	1500	V
V_{CEO}	Collector-emitter voltage (open base)		-	800	V
I_C	Collector current (DC)		-	12	A
I_{CM}	Collector current peak value		-	30	A
P_{tot}	Total power dissipation	$T_{mb} \leq 25$ ˚C	-	125	W
V_{CEsat}	Collector-emitter saturation voltage	I_C = 8.0 A; I_B = 1.6 A	-	5.0	V
I_{Csat}	Collector saturation current		8	-	A
t_f	Fall time	I_{Csat} = 8.0 A; $I_{B(end)}$ = 1.1 A	0.2	0.35	µs

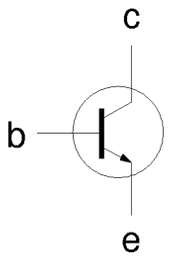
PINNING - SOT429

PIN	DESCRIPTION
1	base
2	collector
3	emitter
tab	collector

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	V_{BE} = 0 V	-	1500	V
V_{CEO}	Collector-emitter voltage (open base)		-	800	V
I_C	Collector current (DC)		-	12	A
I_{CM}	Collector current peak value		-	30	A
I_B	Base current (DC)		-	8	A
I_{BM}	Base current peak value		-	12	A
$-I_{B(AV)}$	Reverse base current	average over any 20 ms period	-	200	mA
$-I_{BM}$	Reverse base current peak value [1]		-	7	A
P_{tot}	Total power dissipation	$T_{mb} \leq$ 25 ˚C	-	125	W
T_{stg}	Storage temperature		-65	150	˚C
T_j	Junction temperature		-	150	˚C

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$R_{th\ j\text{-}mb}$	Junction to mounting base	-	-	1.0	K/W
$R_{th\ j\text{-}a}$	Junction to ambient	in free air	45	-	K/W

1 Turn-off current.

STATIC CHARACTERISTICS

T_{mb} = 25 ˚C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CES}	Collector cut-off current [2]	V_{BE} = 0 V; V_{CE} = $V_{CESMmax}$	-	-	1.0	mA
I_{CES}		V_{BE} = 0 V; V_{CE} = $V_{CESMmax}$; T_j = 125 ˚C	-	-	2.0	mA
I_{EBO}	Emitter cut-off current	V_{EB} = 7.5 V; I_C = 0 A	-	-	1.0	mA
BV_{EBO}	Emitter-base breakdown voltage	I_B = 1 mA	7.5	13.5	-	V
$V_{CEOsust}$	Collector-emitter sustaining voltage	I_B = 0 A; I_C = 100 mA; L = 25 mH	800	-	-	V
V_{CEsat}	Collector-emitter saturation voltage	I_C = 8.0 A; I_B = 1.6 A	-	-	5.0	V
V_{BEsat}	Base-emitter saturation voltage	I_C = 8.0 A; I_B = 1.6 A	-	-	1.3	V
h_{FE}	DC current gain	I_C = 100 mA; V_{CE} = 5 V	-	13	-	
h_{FE}		I_C = 8 A; V_{CE} = 5 V	5	7	9.5	

DYNAMIC CHARACTERISTICS

T_{mb} = 25 ˚C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
C_c	Collector capacitance	I_E = 0 A; V_{CB} = 10 V; f = 1 MHz	145	-	pF
	Switching times (32 kHz line deflection circuit)	I_{Csat} = 8.0 A; L_C = 260 µH; C_{fb} = 13 nF; $I_{B(end)}$ = 1.1 A; L_B = 2.5 µH; $-V_{BB}$ = 4 V; ($-dI_B/dt$ = 1.6 A/µs)			
t_s	Turn-off storage time		3.0	4.0	µs
t_f	Turn-off fall time		0.2	0.35	µs

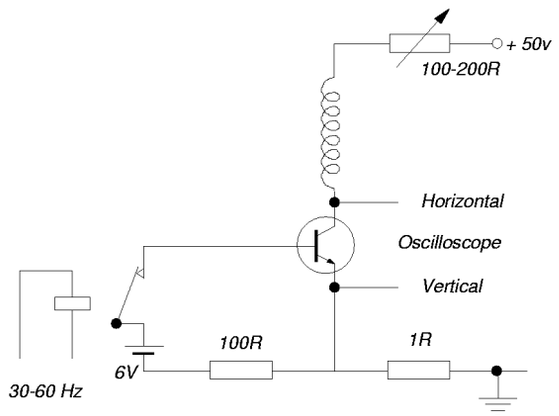


Fig.1. Test circuit for V_{CEO}sust.

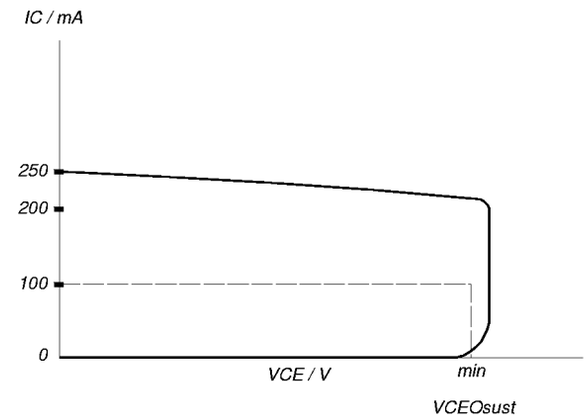


Fig.2. Oscilloscope display for V_{CEO}sust.

2 Measured with half sine-wave voltage (curve tracer).

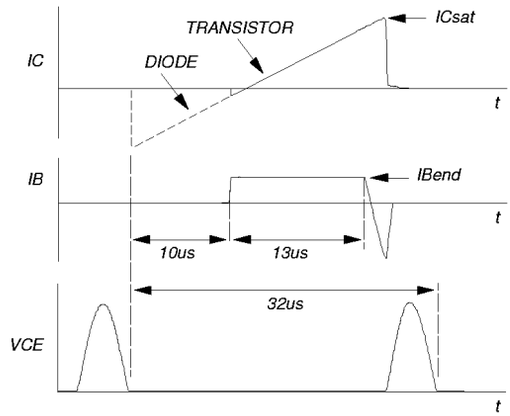


Fig.3. Switching times waveforms.

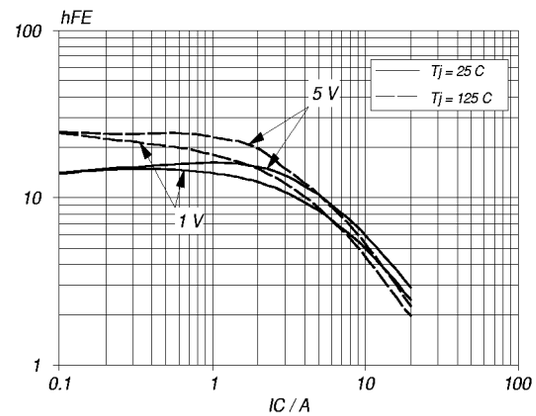


Fig.6. Typical DC current gain. h_{FE} = f (I_C) parameter V_{CE}

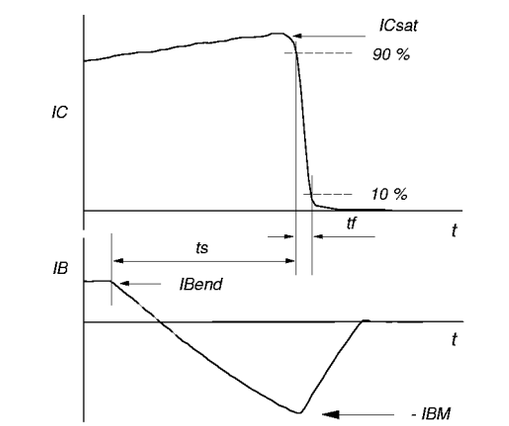


Fig.4. Switching times definitions.

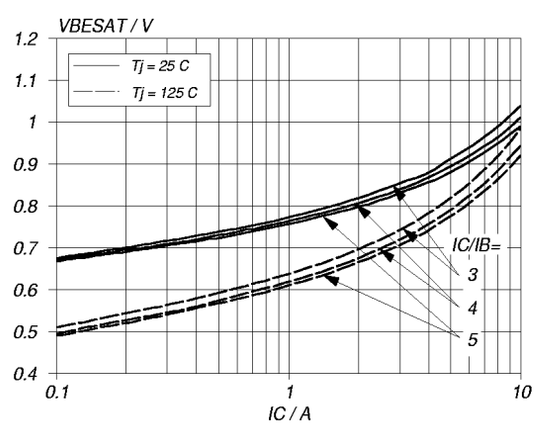


Fig.7. Typical base-emitter saturation voltage. V_{BE}sat = f (I_C); parameter I_C/I_B

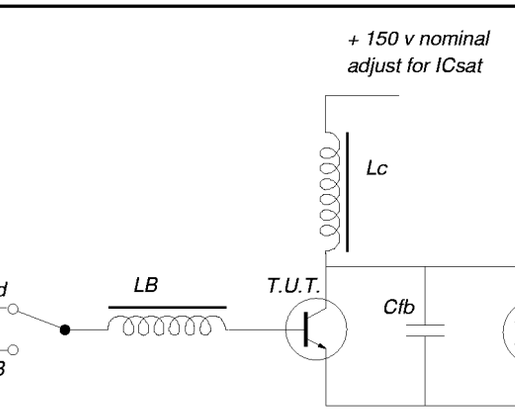


Fig.5. Switching times test circuit (BU2525A).

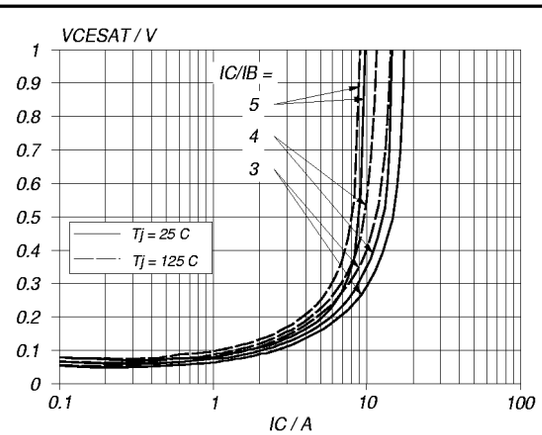


Fig.8. Typical collector-emitter saturation voltage. V_{CE}sat = f (I_C); parameter I_C/I_B

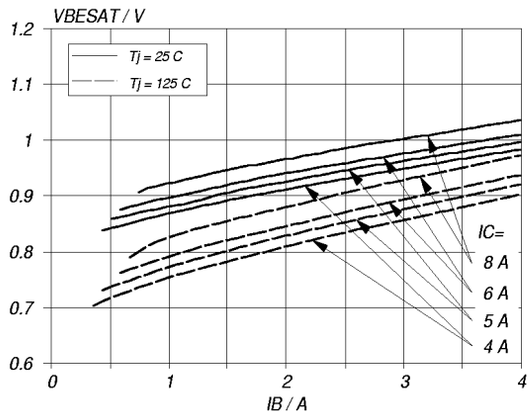


Fig.9. Typical base-emitter saturation voltage. $V_{BE}sat = f(I_B)$; parameter I_C

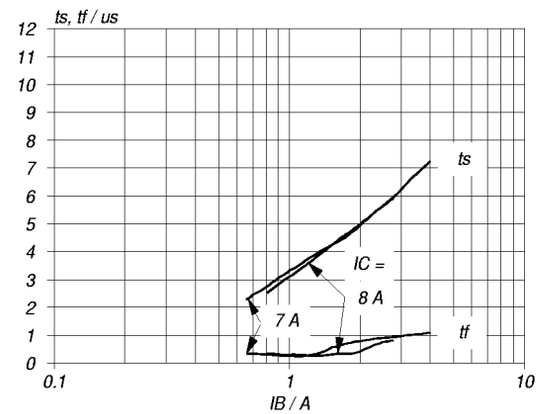


Fig.12. Typical collector storage and fall time. ts = f (I_B); tf = f (I_B); parameter I_C; T_j = 85˚C; f = 32 kHz

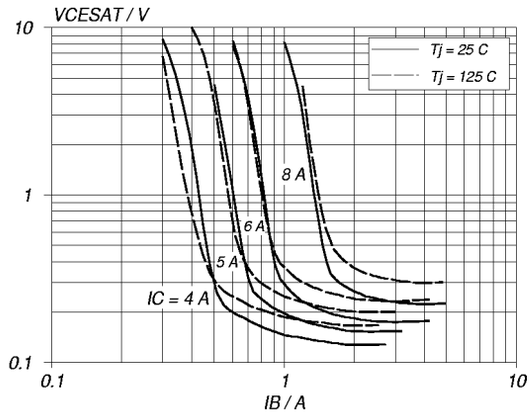


Fig.10. Typical collector-emitter saturation voltage. $V_{CE}sat = f(I_B)$; parameter I_C

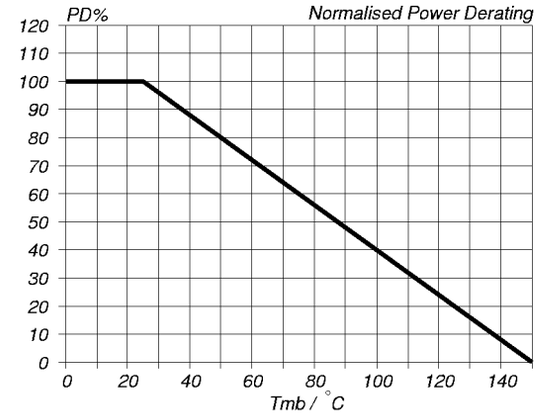


Fig.13. Normalised power dissipation. PD% = 100·$P_D/P_{D\ 25˚C} = f(T_{mb})$

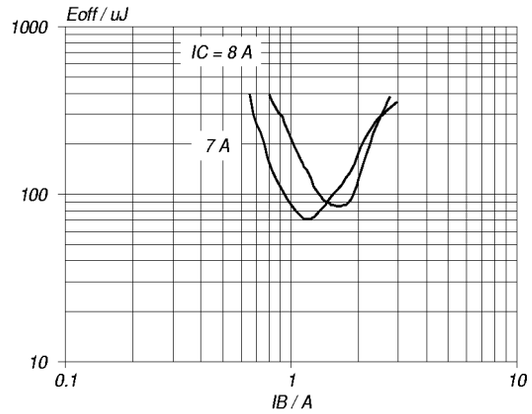


Fig.11. Typical turn-off losses. T_j = 85˚C Eoff = f (I_B); parameter I_C; f = 32 kHz

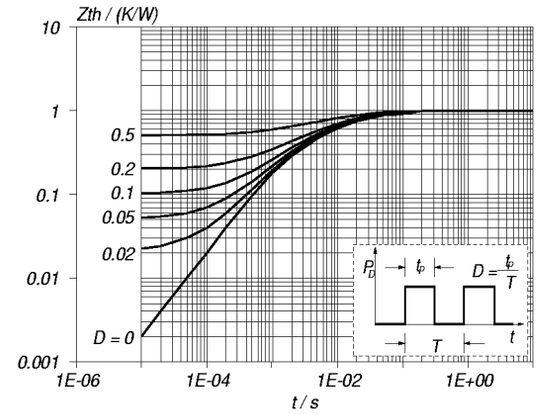


Fig.14. Transient thermal impedance. $Z_{th\ j\text{-}mb} = f(t)$; parameter D = t_p/T

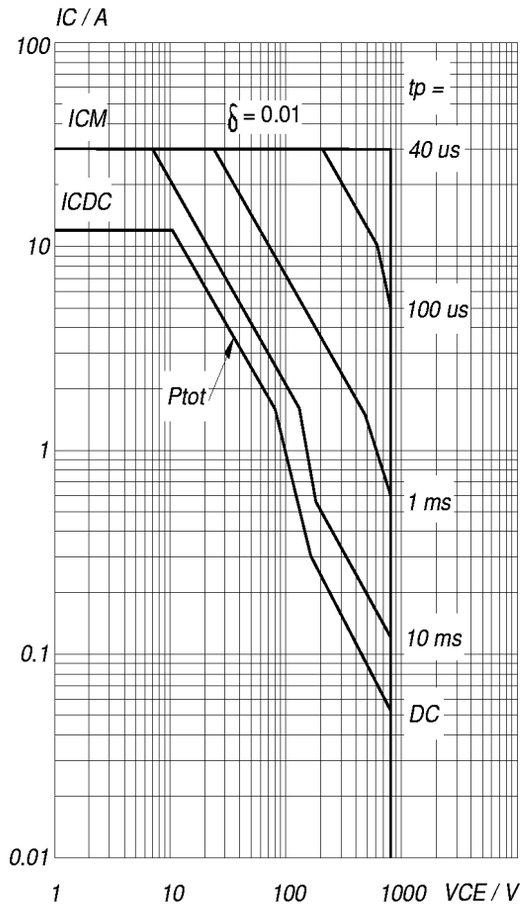


Fig.15. Forward bias safe operating area. T_{mb} = 25 ˚C
I_{CDC} & I_{CM} = f(V_{CE}); I_{CM} single pulse; parameter t_p;
Second-breakdown limits independant of temperature.

MECHANICAL DATA

Dimensions in mm

Net Mass: 5 g

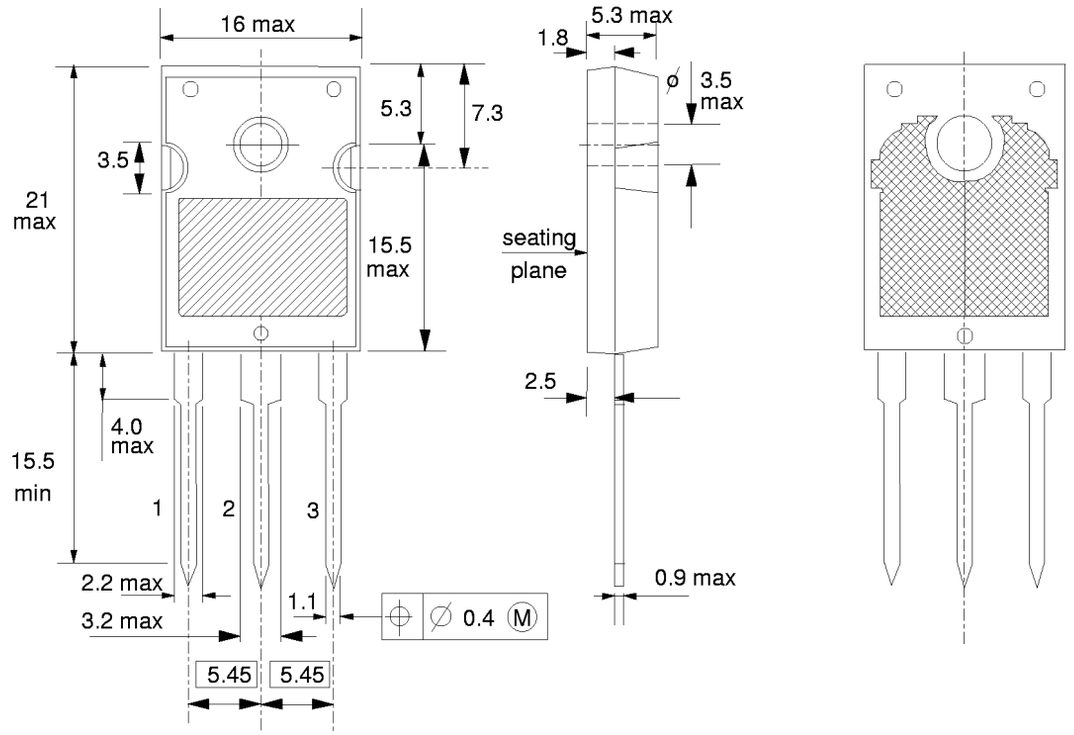


Fig.16. SOT429; pin 2 connected to mounting base.

Notes

1. Refer to mounting instructions for SOT429 envelope.
2. Epoxy meets UL94 V0 at 1/8".