Silicon Diffused Power Transistor BU2727AW

GENERAL DESCRIPTION

High voltage, high-speed switching npn transistor in a plastic envelope intended for use in horizontal deflection circuits of high resolution monitors, suitable for operation up to 64 kHz. Designed to withstand V_{CES} pulses up to 1700V.

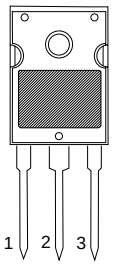
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	V_{BE} = 0 V	-	1700	V
V_{CEO}	Collector-emitter voltage (open base)		-	825	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 = 5.0 A; I_B = 0.91 A	-	1.0	V
I_{Csat}	Collector saturation current		5.0	-	A
t_s	Storage time	I_{CM} = 5.0 A; $I_{B(end)}$ = 0.9 A	2.2	tbf	µs

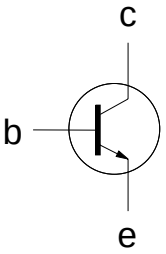
PINNING - SOT429

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	-	1700	V
V_{CEO}	Collector-emitter voltage (open base)		-	825	V
I_C	Collector current (DC)		-	12	A
I_{CM}	Collector current peak value		-	30	A
I_B	Base current (DC)		-	12	A
I_{BM}	Base current peak value		-	25	A
$-I_{B(AV)}$	Reverse base current	average over any 20 ms period	-	200	mA
$-I_{BM}$	Reverse base current peak value [1]		-	25	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

ESD LIMITING VALUES

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_C	Electrostatic discharge capacitor voltage	Human body model (250 pF, 1.5 kΩ)	-	10	kV

1 Turn-off current.

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

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	825	-	-	V
V_{CEsat}	Collector-emitter saturation voltage	I_C = 5.0 A; I_B = 0.91 A	-	-	1.0	V
V_{BEsat}	Base-emitter saturation voltage	I_C = 5.0 A; I_B = 0.91 A	0.78	0.86	0.95	V
h_{FE}	DC current gain	I_C = 0.1 A; V_{CE} = 5 V	12	22	35	
h_{FE}		I_C = 5 A; V_{CE} = 1 V	5.5	8	11	

DYNAMIC CHARACTERISTICS

T_{mb} = 25 ˚C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
	Switching times (64 kHz line deflection circuit)	I_{CM} = 5.0 A; L_C = 260 µH; C_{fb} = 4.8 nF; V_{CC} = 180 V; $I_{B(end)}$ = 0.9 A; L_B = 0.6 µH; $-V_{BB}$ = 2 V; $(-dI_B/dt$ = 3.33 A/µs)			
t_s	Turn-off storage time		2.2	tbf	µs
t_f	Turn-off fall time		tbf	tbf	µs

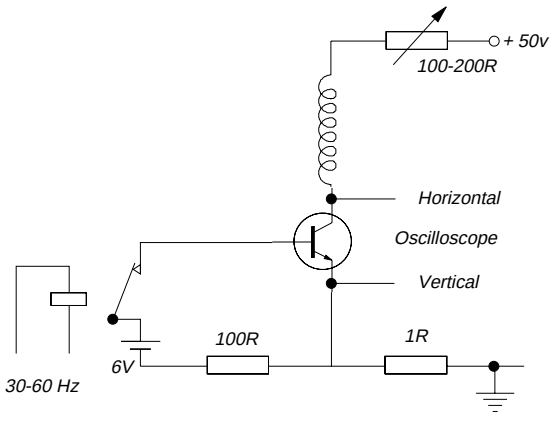


Fig.1. Test circuit for $V_{CEOsust}$.

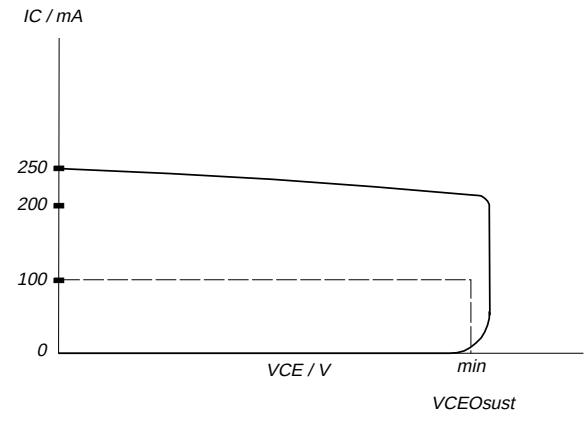


Fig.2. Oscilloscope display for $V_{CEOsust}$.

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

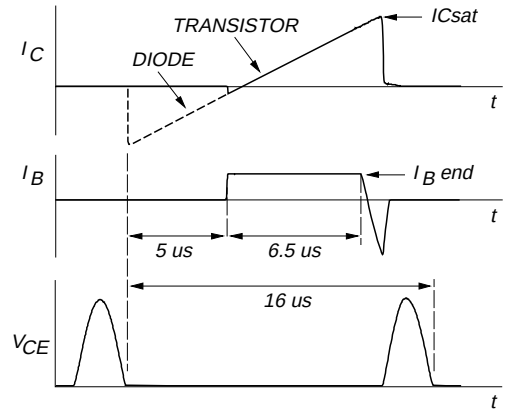


Fig.3. Switching times waveforms (64 kHz).

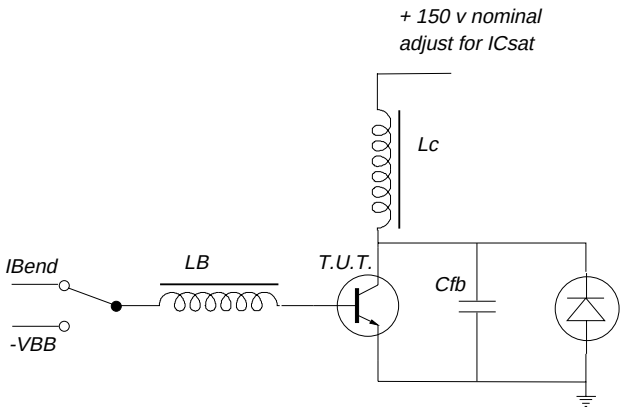


Fig.5. Switching times test circuit.

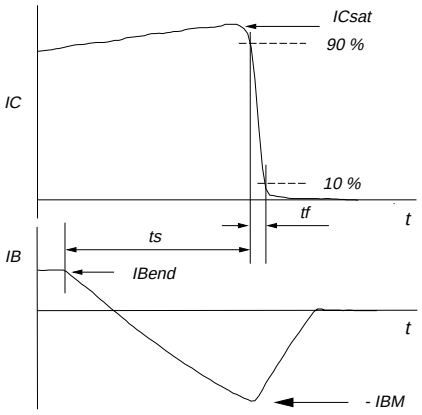


Fig.4. Switching times definitions.

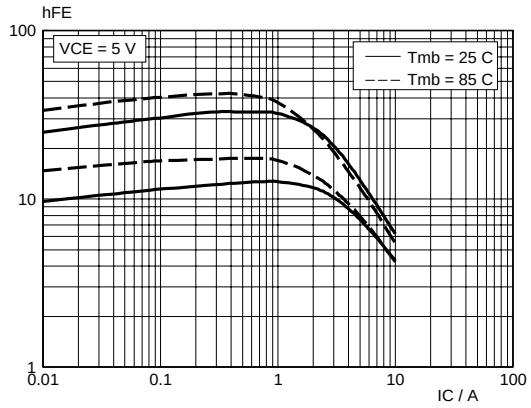


Fig.6. DC current gain. $h_{FE} = f(I_C)$
Parameter T_{mb}
(Low and high gain)

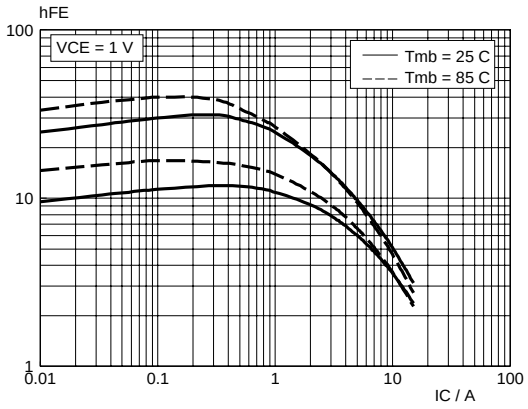


Fig.7. DC current gain. $h_{FE} = f(I_C)$
Parameter T_{mb}
(Low and high gain)

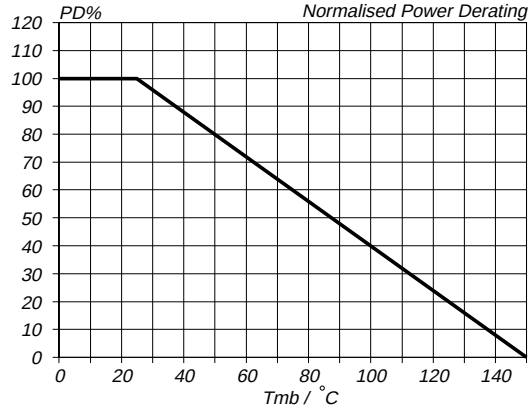


Fig.10. Normalised power dissipation.
PD% = 100·PD/PD 25˚C = f (T_{mb})

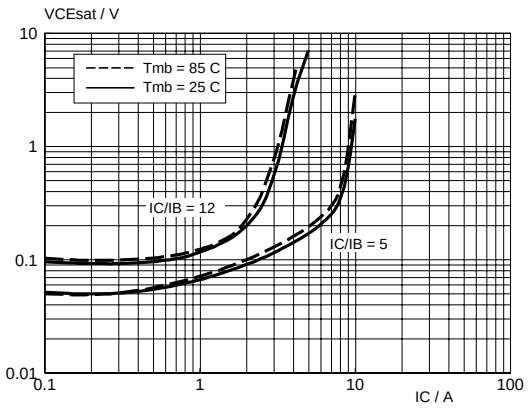


Fig.8. Typical collector-emitter saturation voltage.
$V_{CEsat} = f(I_C)$; parameter I_C/I_B

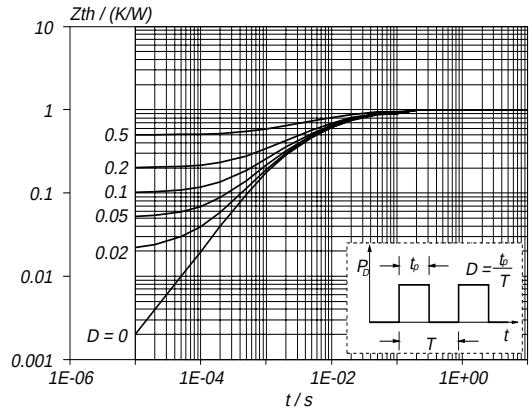


Fig.11. Transient thermal impedance.
$Z_{th\ j\text{-}mb} = f(t)$; parameter $D = t_p/T$

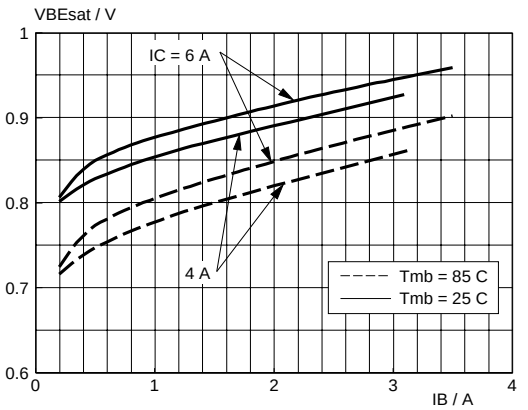


Fig.9. Typical base-emitter saturation voltage.
$V_{BEsat} = f(I_B)$; parameter I_C

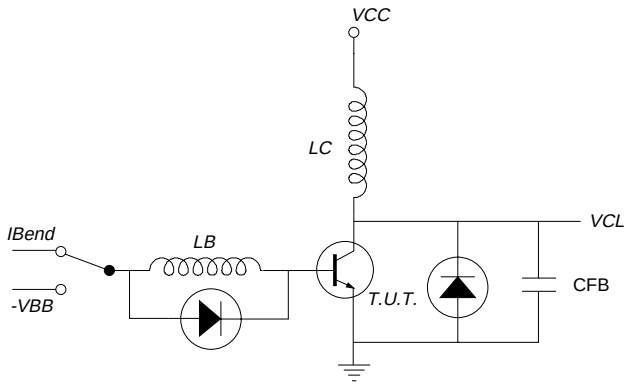


Fig.12. Test Circuit RBSOA.
V_{CC} = 150 V; $-V_{BB}$ = 1 - 4 V;
L_C = 1 mH; V_{CL} = 1500 V; L_B = 0.5 - 2 μH;
C_{FB} = 1 - 3 nF; $I_{B(end)}$ = 0.8 - 4 A

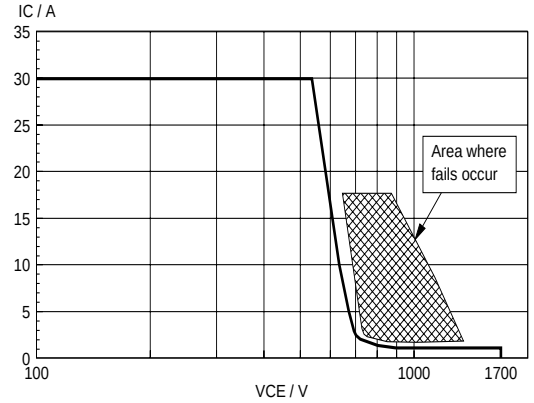


Fig.13. Reverse bias safe operating area. $T_j \leq T_{jmax}$

MECHANICAL DATA

Dimensions in mm

Net Mass: 5 g

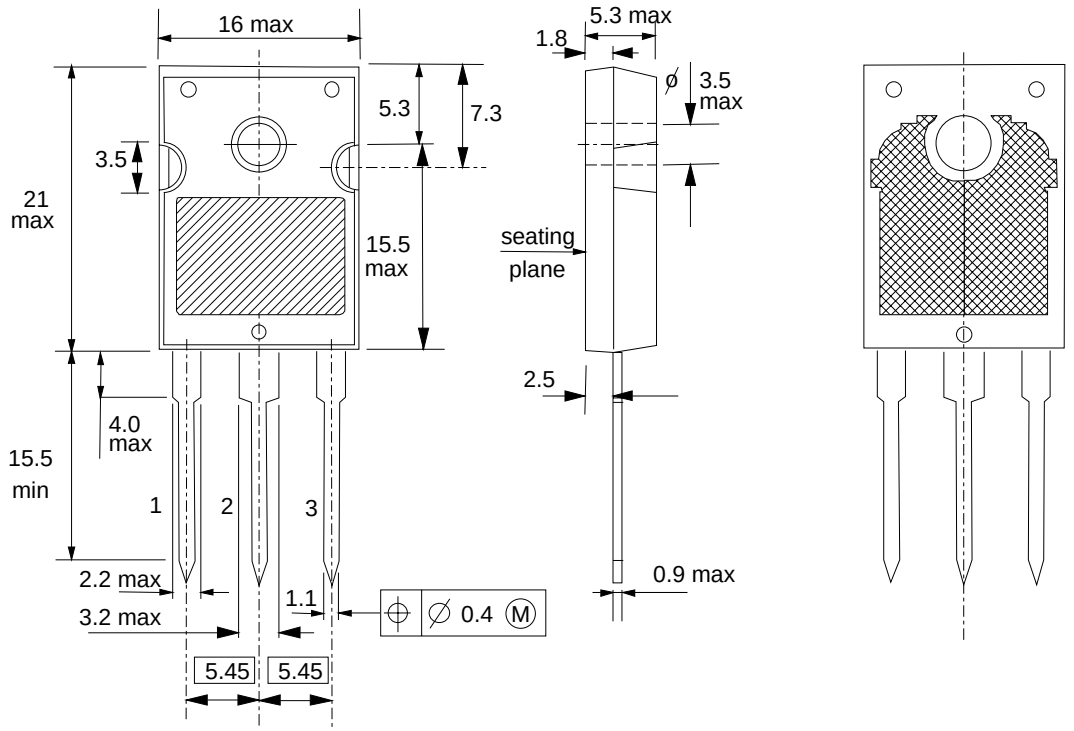


Fig.14. SOT429; pin 2 connected to mounting base.

Notes

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

DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values are given in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of this specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	
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