Silicon Diffused Power Transistor BU2527AX

GENERAL DESCRIPTION

New generation, high-voltage, high-speed switching npn transistor in a plastic full-pack envelope intended for use in horizontal deflection circuits of high resolution monitors. Features improved RBSOA performance and is suitable for operation up to 64 kHz.

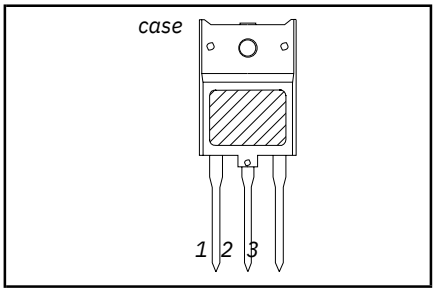
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
VCESM	Collector-emitter voltage peak value	VBE = 0 V	-	1500	V
VCEO	Collector-emitter voltage (open base)		-	800	V
IC	Collector current (DC)		-	12	A
ICM	Collector current peak value		-	30	A
Ptot	Total power dissipation	Ths ≤ 25 ˚C	-	45	W
VCEsat	Collector-emitter saturation voltage	IC = 6.0 A; IB = 1.2 A	-	5.0	V
ICsat	Collector saturation current		6.0	-	A
ts	Storage time	ICsat = 6.0 A; IB(end) = 0.55 A	1.7	2.0	µs

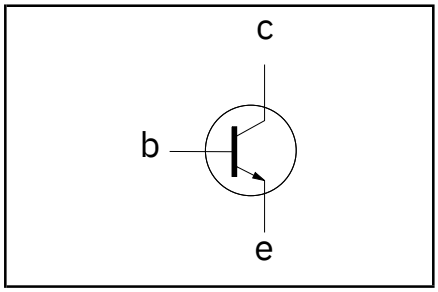
PINNING - SOT399

PIN	DESCRIPTION
1	base
2	collector
3	emitter
case	isolated

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
VCESM	Collector-emitter voltage peak value	VBE = 0 V	-	1500	V
VCEO	Collector-emitter voltage (open base)		-	800	V
IC	Collector current (DC)		-	12	A
ICM	Collector current peak value		-	30	A
IB	Base current (DC)		-	8	A
IBM	Base current peak value		-	12	A
-IB(AV)	Reverse base current	average over any 20 ms period	-	200	mA
-IRev1BM	erse base current peak value		-	7	A
Ptot	Total power dissipation	Ths ≤ 25 ˚C	-	45	W
Tstg	Storage temperature		-55	150	˚C
Tj	Junction temperature		-	150	˚C

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
Rth j-hs	Junction to heatsink	without heatsink compound	-	3.7	K/W
Rth j-hs	Junction to heatsink	with heatsink compound	-	2.8	K/W
Rth j-a	Junction to ambient	in free air	35	-	K/W

1 Turn-off current.

ISOLATION LIMITING VALUE & CHARACTERISTIC

Ths = 25 ˚C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{isol}	Repetitive peak voltage from all three terminals to external heatsink	R.H. ≤ 65 % ; clean and dustfree	-		2500	V
C_{isol}	Capacitance from T2 to external heatsink	f = 1 MHz	-	22	-	pF

STATIC CHARACTERISTICS

Ths = 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} = $V_{CESMmax}$	-	-	0.25	mA
		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	-	-	0.25	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 = 6.0 A; I_B = 1.2 A	-	-	5.0	V
V_{BEsat}	Base-emitter saturation voltage	I_C = 6.0 A; I_B = 1.2 A	-	-	1.3	V
h_{FE}	DC current gain	I_C = 1 A; V_{CE} = 5 V	6	10	21	
h_{FE}		I_C = 6 A; V_{CE} = 5 V	5	7	9	

DYNAMIC CHARACTERISTICS

Ths = 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 (64 kHz line deflection circuit)	I_{Csat} = 6.0 A; L_C = 170 µH; Cfb = 5.4 nF; $I_{B(end)}$ = 0.55 A; L_B = 0.6 µH; -V_{BB} = 2 V; (-dI_B/dt = 3.33 A/µs)			
t_s	Turn-off storage time		1.7	2.0	µs
t_f	Turn-off fall time		0.1	0.2	µs

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

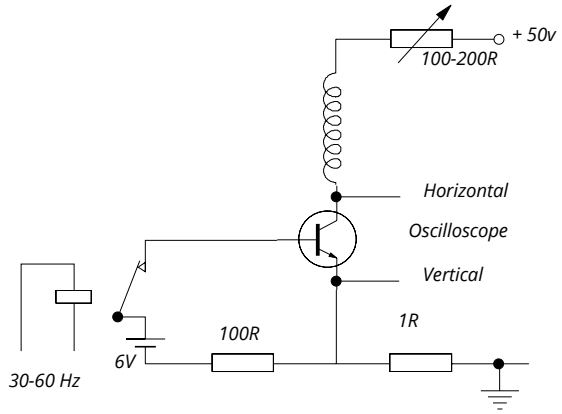


Fig.1. Test circuit for V CEOsust.

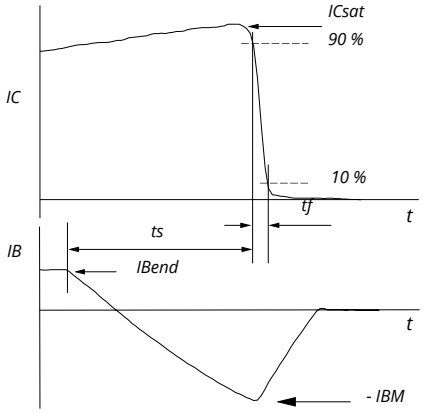


Fig.4. Switching times definitions.

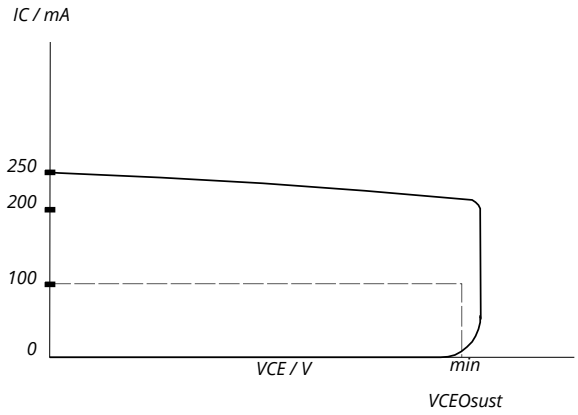


Fig.2. Oscilloscope display for V CEOsust.

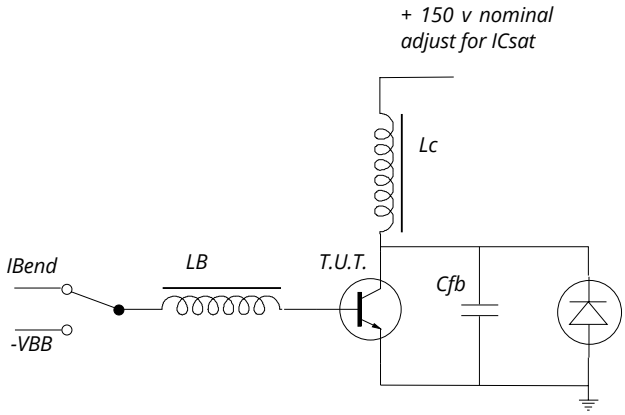


Fig.5. Switching times test circuit.

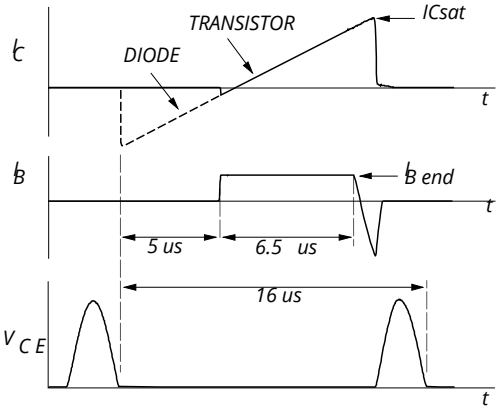


Fig.3. Switching times waveforms.

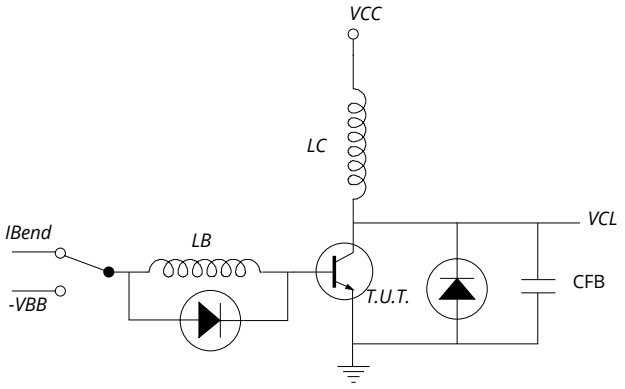


Fig.6. Test Circuit RBSOA. VCC = 140 V; -VBB = 4 V; LC = 100 - 200 µH; VCL ≤ 1500 V; LB = 3 µH; CFB = 1 - 2.2 nF; IB(end) = 1 - 2 A

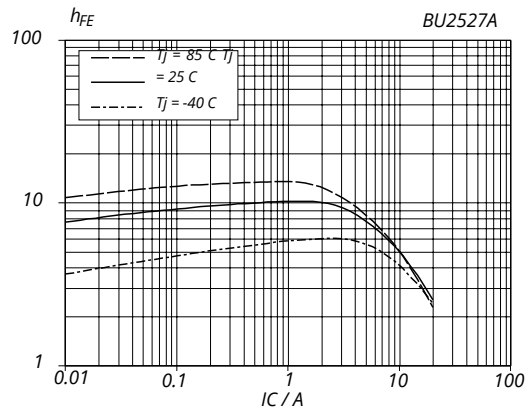


Fig.7. Typical DC current gain. hFE = f (IC)
VCE = 5 V

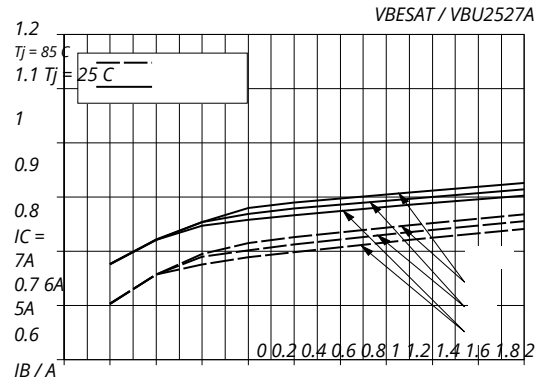


Fig.10. Typical base-emitter saturation voltage.
VBEsat = f (IB); parameter IC

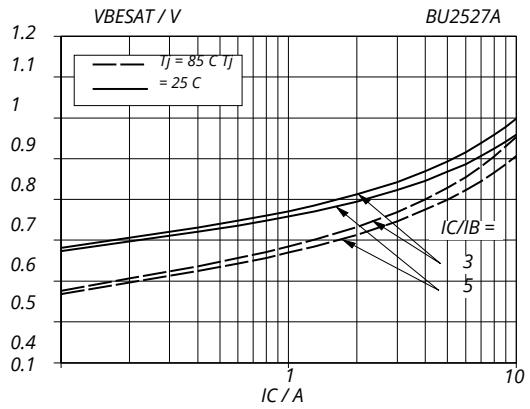


Fig.8. Typical base-emitter saturation voltage.
VBEsat = f (IC); parameter IC/IB

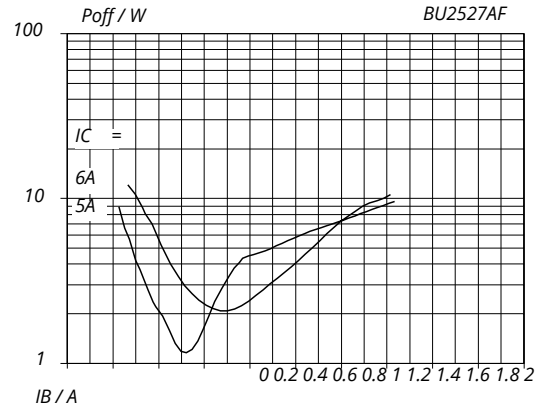


Fig.11. Typical turn-off losses. Tj = 85C ˚
Poff = f (IB); parameter IC; f = 64 kHz

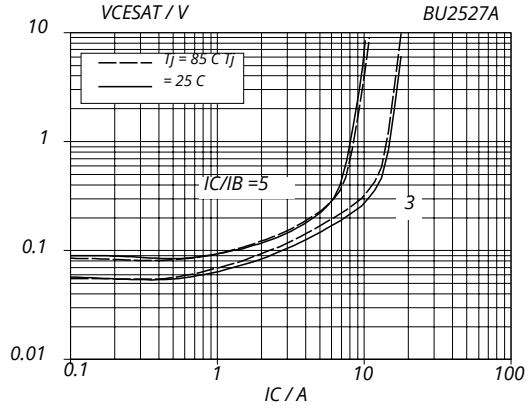


Fig.9. Typical collector-emitter saturation voltage.
VCEsat = f (IC); parameter IC/IB

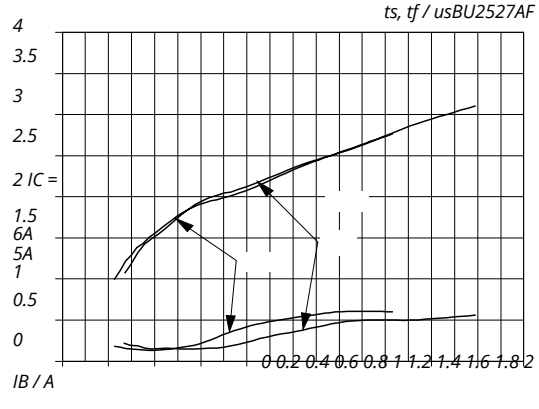


Fig.12. Typical collector storage and fall time.
ts = f (IB); tf = f (IB); parameter IC; Tj = 85C ˚; f = 64 kHz

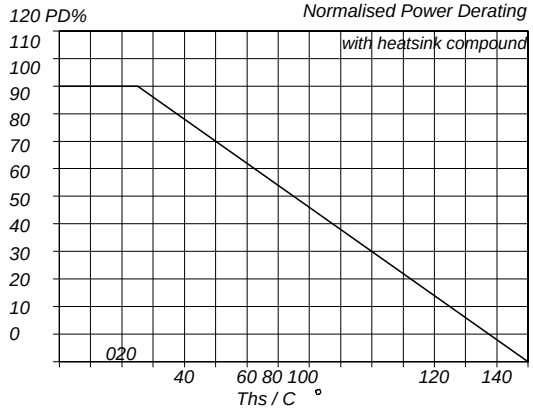


Fig.13. Normalised power dissipation. PD% = 100 · PD/PD 25C° = f (Ths)

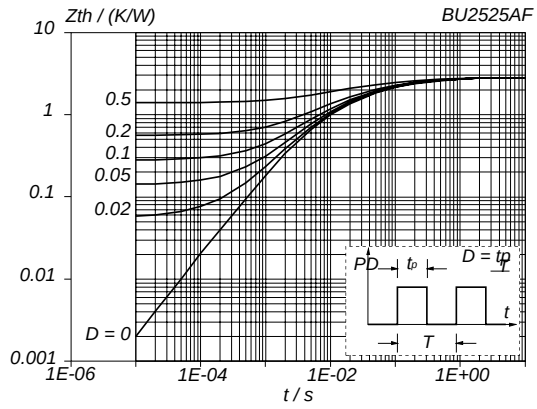


Fig.14. Transient thermal impedance. Zth j-hs = f(t); parameter D = tp/T

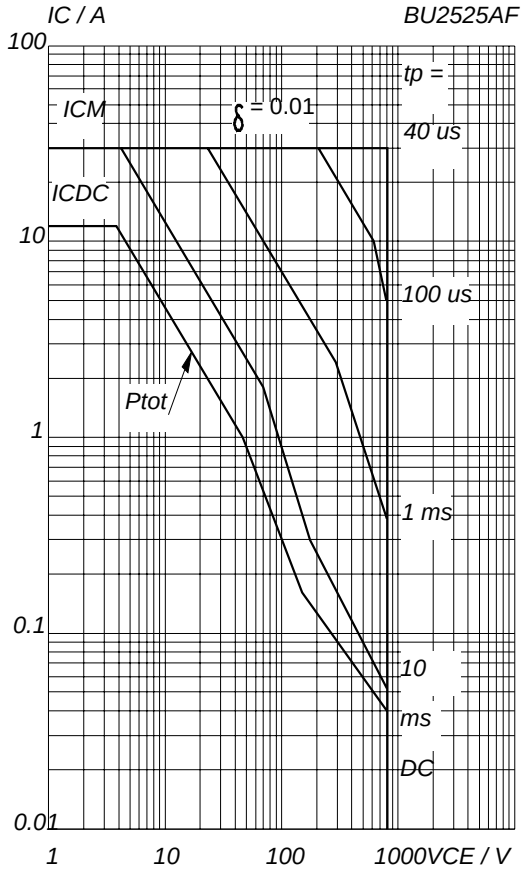


Fig.15. Forward bias safe operating area. Ths = 25 C° ICDC & ICM = f(VCE); ICM single pulse; parameter tp Second-breakdown limits independant of temperature. Mounted with heatsink compound.

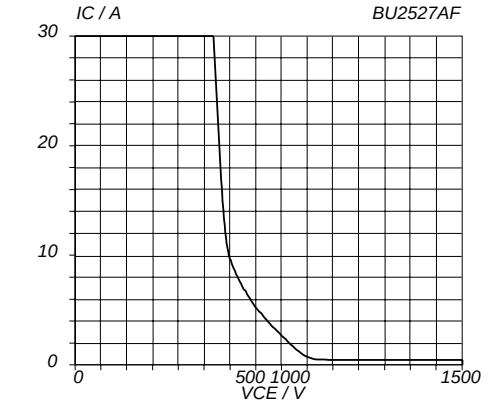


Fig.16. Reverse bias safe operating area. Tj ≤ T_{jmax}

MECHANICAL DATA

Dimensions in mm

Net Mass: 5.88 g

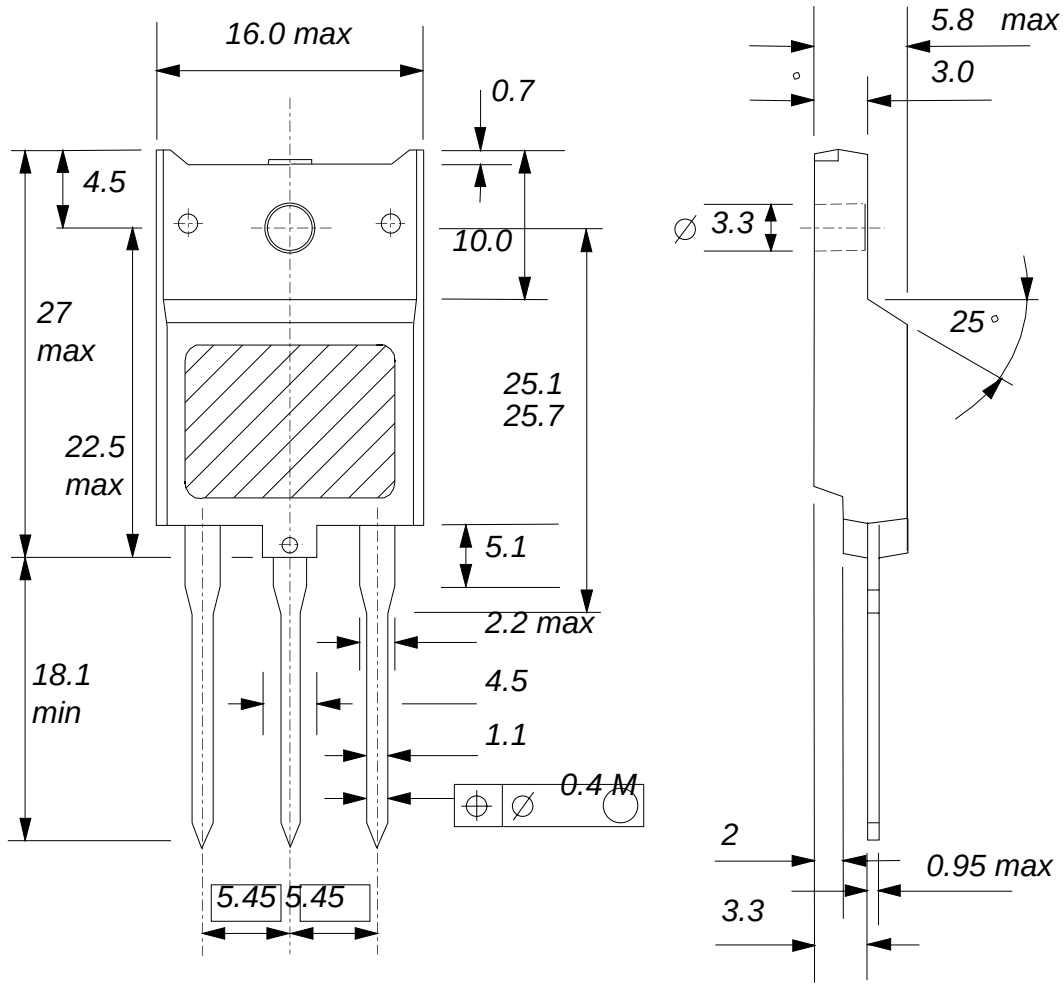


Fig.17. SOT399; The seating plane is electrically isolated from all terminals.

Notes
1. Refer to mounting instructions for F-pack envelopes.
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.

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.