Silicon Diffused Power Transistor BU4507DX

GENERAL DESCRIPTION

Enhanced performance, new generation, high-voltage, high-speed switching npn transistor in a plastic full-pack envelope with an integrated damper diode intended for use in horizontal deflection circuits of colour television receivers and computer monitors. Features exceptional tolerance to base drive and collector current load variations resulting in a very low worst case dissipation.

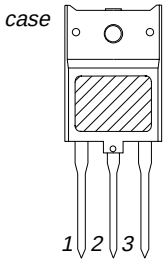
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	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)		-	8	A
I_{CM}	Collector current peak value		-	15	A
P_{tot}	Total power dissipation	$T_{hs} \leq 25$ ˚C	-	45	W
V_{CEsat}	Collector-emitter saturation voltage	I_C = 4 A; I_B = 1.0 A	-	3.0	V
I_{Csat}	Collector saturation current	f = 16kHz	4	-	A
V_F	Diode forward voltage	I_F = 4 A	1.7	2.1	V
t_f	Fall time	I_{Csat} = 4 A; f = 16kHz	300	400	ns

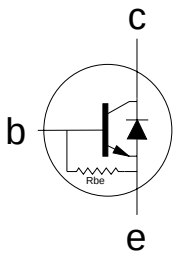
PINNING - SOT399

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
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)		-	8	A
I_{CM}	Collector current peak value		-	15	A
I_B	Base current (DC)		-	4	A
I_{BM}	Base current peak value		-	6	A
$-I_{BM}$	Reverse base current peak value [1]		-	5	A
P_{tot}	Total power dissipation	$T_{hs} \leq 25$ ˚C	-	45	W
T_{stg}	Storage temperature		-65	150	˚C
T_j	Junction temperature		-	150	˚C

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$R_{th\ j\text{-}hs}$	Junction to heatsink	with heatsink compound	-	2.8	K/W
$R_{th\ j\text{-}a}$	Junction to ambient	in free air	35	-	K/W

1 Turn-off current.

ISOLATION LIMITING VALUE & CHARACTERISTIC

T_{hs} = 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

T_{hs} = 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
$V_{CEOsust}$	Collector-emitter sustaining voltage	I_B = 0 A; I_C = 100 mA; L = 25 mH	800	-	-	V
BV_{EBO}	Emitter-base breakdown voltage	I_B = 600 mA	7.5	13.5	-	V
R_{be}	Base-emitter resistance	V_{EB} = 6 V	-	30	-	Ω
V_{CEsat}	Collector-emitter saturation voltages	I_C = 4 A; I_B = 1.0 A	-	-	3.0	V
V_{BEsat}	Base-emitter saturation voltage	I_C = 4 A; I_B = 1.0 A	0.83	0.92	1.01	V
h_{FE}	DC current gain	I_C = 500 mA; V_{CE} = 5 V	-	7	-	
h_{FE}		I_C = 4 A; V_{CE} = 5 V	4.2	5.7	7.3	
V_F	Diode forward voltage	I_F = 4 A	-	1.7	2.1	V

DYNAMIC CHARACTERISTICS

T_{hs} = 25 ˚C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
	Switching times (16 kHz line deflection circuit)	I_{Csat} = 4 A; I_{B1} = 0.8 A;(I_{B2} = -2 A)			
t_s	Turn-off storage time		3.7	4.6	µs
t_f	Turn-off fall time		300	400	ns
V_{fr}	Anti-parallel diode forward recovery voltage	I_F = 4 A; dI_F/dt = 50 A/µs	18.5	-	V
t_{fr}	Anti-parallel diode forward recovery time	V_F = 5 V	500	-	ns

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

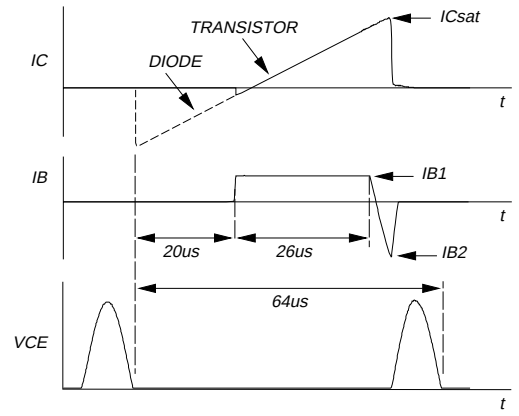


Fig.1. Switching times waveforms (16 kHz).

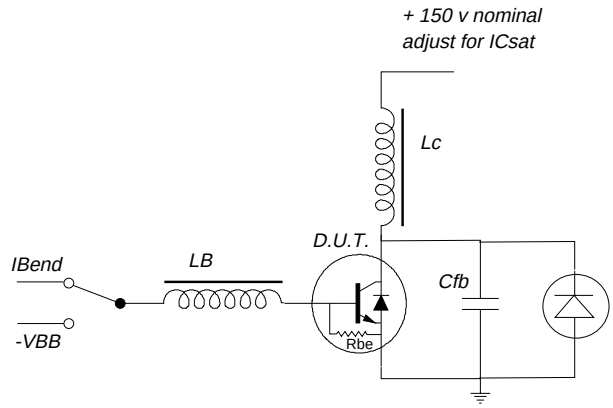


Fig.4. Switching times test circuit.

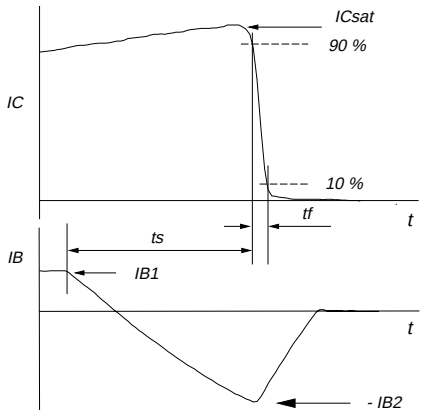


Fig.2. Switching times definitions.

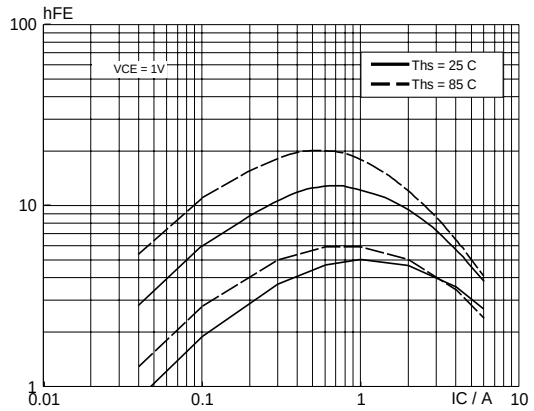


Fig.5. High and low DC current gain.

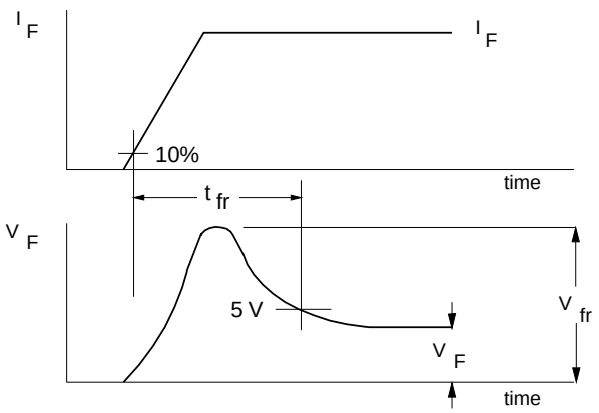


Fig.3. Definition of anti-parallel diode V_{fr} and t_{fr}.

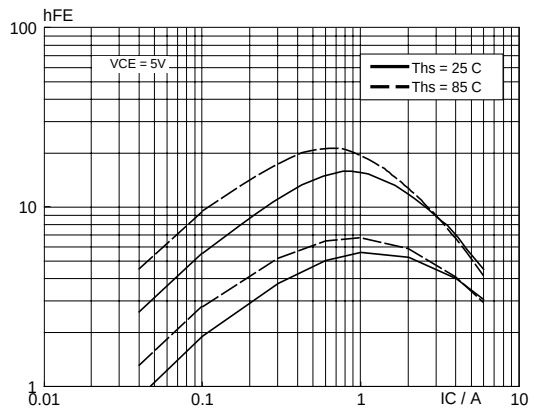


Fig.6. High and low DC current gain.

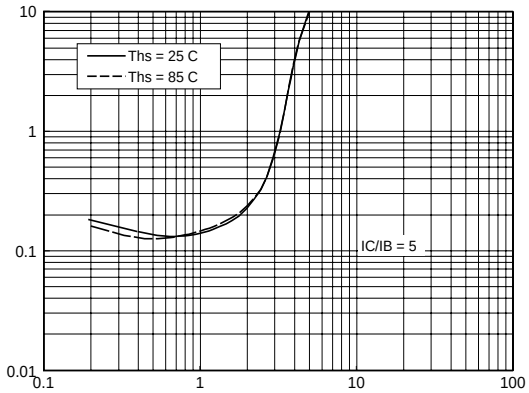


Fig.7. Typical collector-emitter saturation voltage.

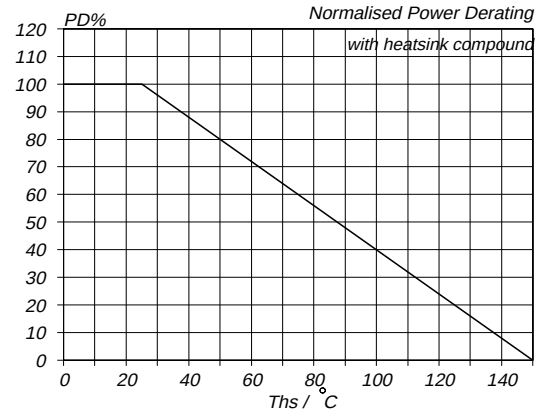


Fig.10. Normalised power dissipation.
PD% = 100·P_D/$P_{D\ 25^{\circ}C}$

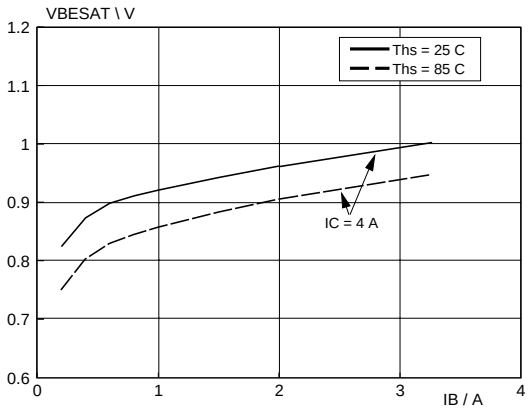


Fig.8. Typical base-emitter saturation voltage.

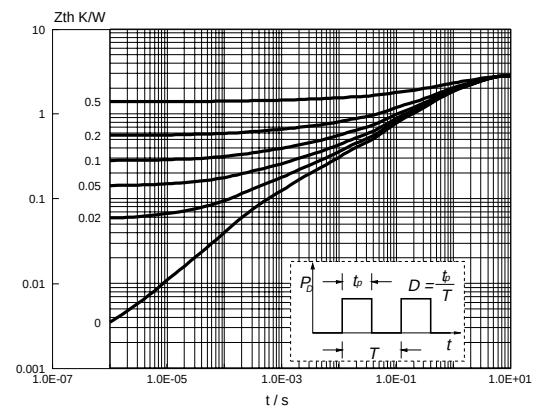


Fig.11. Transient thermal impedance.

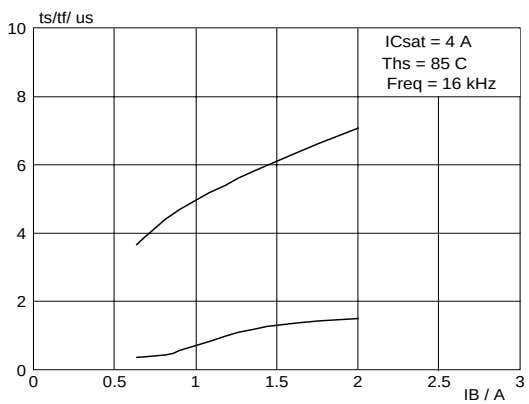


Fig.9. Typical collector storage and fall time.
I_C =4 A; T_j = 85˚C; f = 16kHz

MECHANICAL DATA

Dimensions in mm

Net Mass: 5.88 g

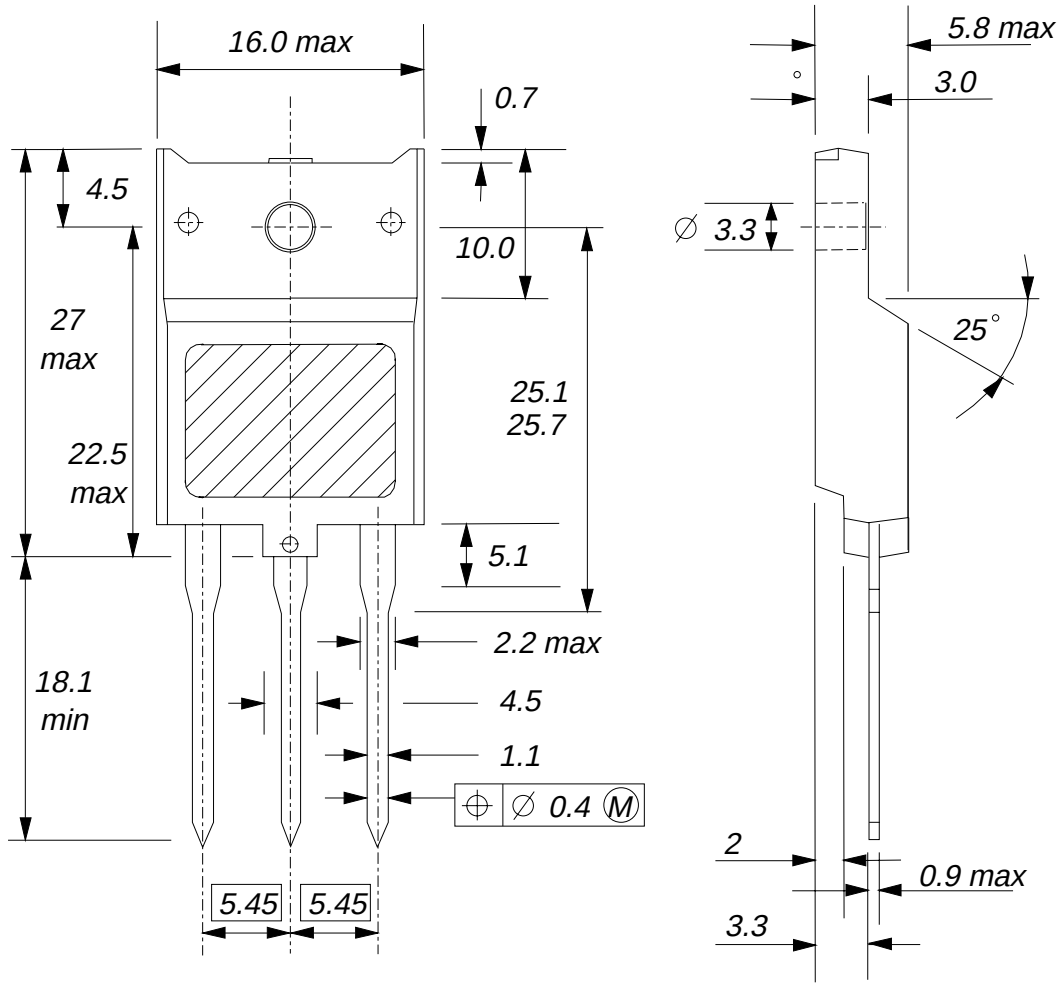


Fig.12. SOT399; The seating plane is electrically isolated from all terminals.

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.	
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