

Silicon Diffused Power Transistor

BU2515DX

GENERAL DESCRIPTION

New generation, high-voltage, high-speed switching npn transistor with an integrated damper diode in a full plastic envelope intended for use in horizontal deflection circuits of pc monitors.

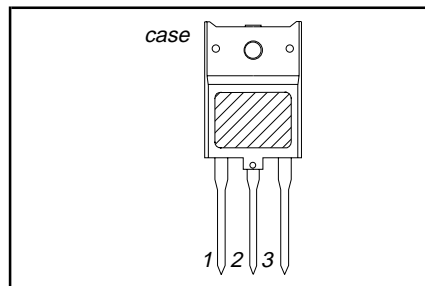
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	$V_{BE} = 0\text{ V}$	-	1500	V
V_{CEO}	Collector-emitter voltage (open base)		-	800	V
I_C	Collector current (DC)		-	9	A
I_{CM}	Collector current peak value		-	20	A
P_{tot}	Total power dissipation	$T_{hs} \leq 25\text{ °C}$	-	45	W
V_{CESat}	Collector-emitter saturation voltage	$I_C = 4.5\text{ A}; I_B = 0.9\text{ A}$	-	5.0	V
I_{Csat}	Collector saturation current	$f = 56\text{ kHz}$	4.5	-	A
V_F	Diode forward voltage	$I_F = 4.5\text{ A}$	-	2.2	V
t_f	Fall time	$I_{Csat} = 4.5\text{ A}; f = 56\text{ kHz}$	0.2	0.4	μs

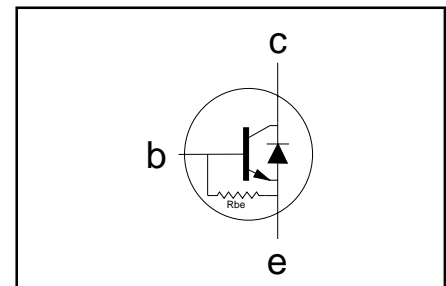
PINNING - SOT399

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
V_{CESM}	Collector-emitter voltage peak value	$V_{BE} = 0\text{ V}$	-	1500	V
V_{CEO}	Collector-emitter voltage (open base)		-	800	V
I_C	Collector current (DC)		-	9	A
I_{CM}	Collector current peak value		-	20	A
I_B	Base current (DC)		-	5	A
I_{BM}	Base current peak value		-	7.5	A
$-I_{B(AV)}$	Reverse base current	average over any 20 ms period	-	125	mA
$-I_{BM}$	Reverse base current peak value ¹		-	6	A
P_{tot}	Total power dissipation	$T_{hs} \leq 25\text{ °C}$	-	45	W
T_{stg}	Storage temperature		-55	150	°C
T_j	Junction temperature		-	150	°C

THERMAL RESISTANCES

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

¹ Turn-off current.

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ISOLATION LIMITING VALUE & CHARACTERISTIC

 $T_{hs} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

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

STATIC CHARACTERISTICS

 $T_{hs} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CES}	Collector cut-off current ²	$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$	-	-	1.0	mA
I_{CES}		$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$ $T_j = 125\text{ }^{\circ}\text{C}$	-	-	2.0	mA
I_{EBO}	Emitter cut-off current	$V_{EB} = 6\text{ V}; I_C = 0\text{ A}$	-	130	-	mA
BV_{EBO}	Emitter-base breakdown voltage	$I_B = 600\text{ mA}$	7.5	13.5	-	V
$V_{CEOsust}$	Collector-emitter sustaining voltage	$I_B = 0\text{ A}; I_C = 100\text{ mA};$ $L = 25\text{ mH}$	800	-	-	V
R_{be}	Base-emitter resistance	$V_{EB} = 6\text{ V}$	-	46	-	Ω
V_{CEsat}	Collector-emitter saturation voltage	$I_C = 4.5\text{ A}; I_B = 0.9\text{ A}$	-	-	5.0	V
V_{BEsat}	Base-emitter saturation voltage	$I_C = 4.5\text{ A}; I_B = 0.9\text{ A}$	-	-	1.0	V
h_{FE}	DC current gain	$I_C = 1.0\text{ A}; V_{CE} = 5\text{ V}$	-	13	-	
h_{FE}		$I_C = 4.5\text{ A}; V_{CE} = 5\text{ V}$	5	8	10.2	
V_F	Diode forward voltage	$I_F = 4.5\text{ A}$	-	-	2.2	V

DYNAMIC CHARACTERISTICS

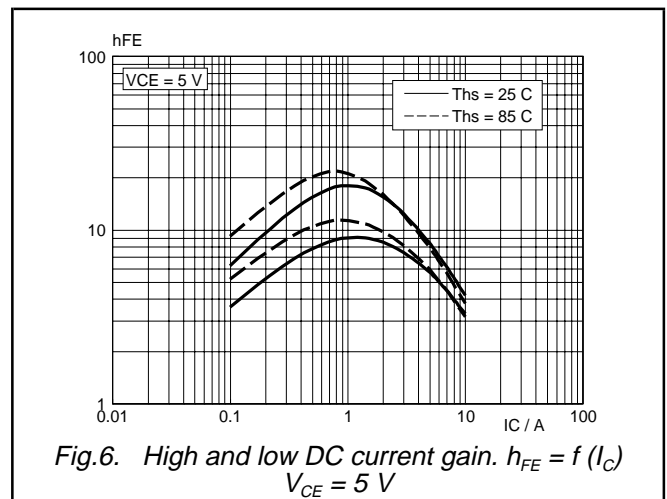
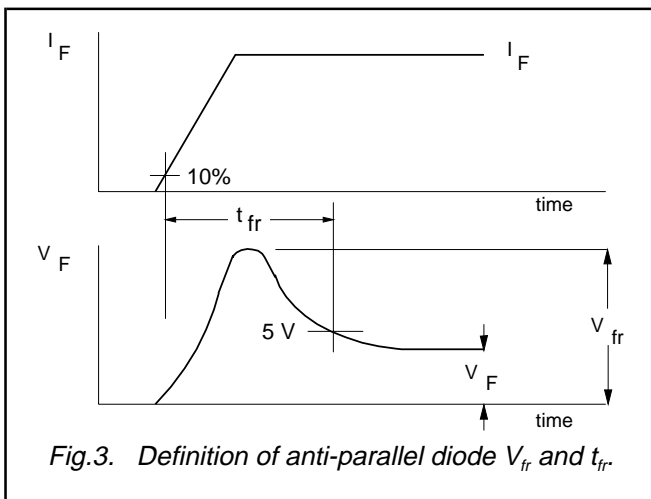
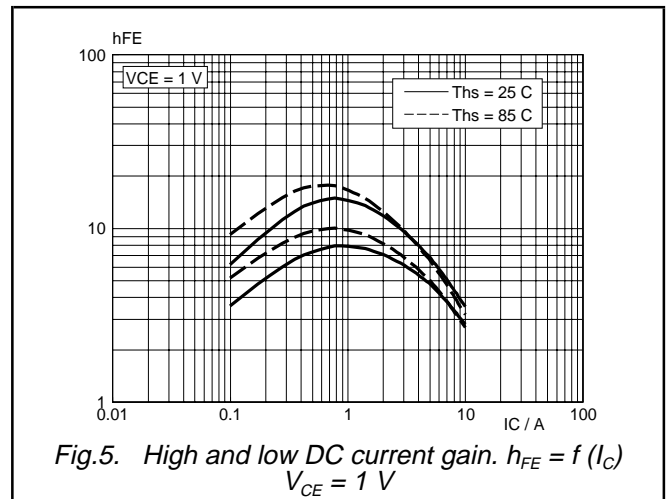
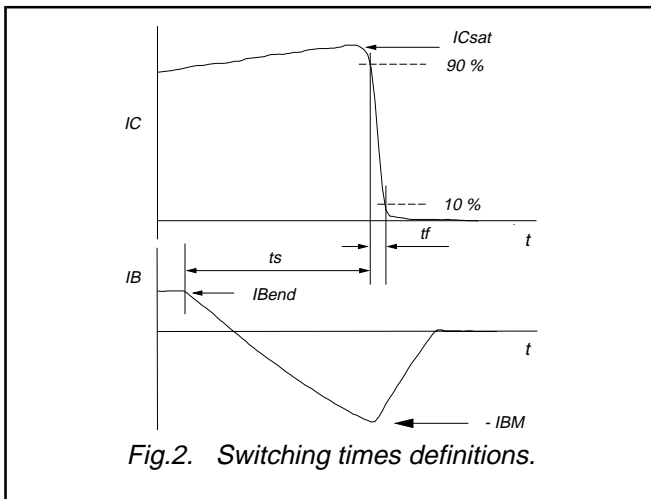
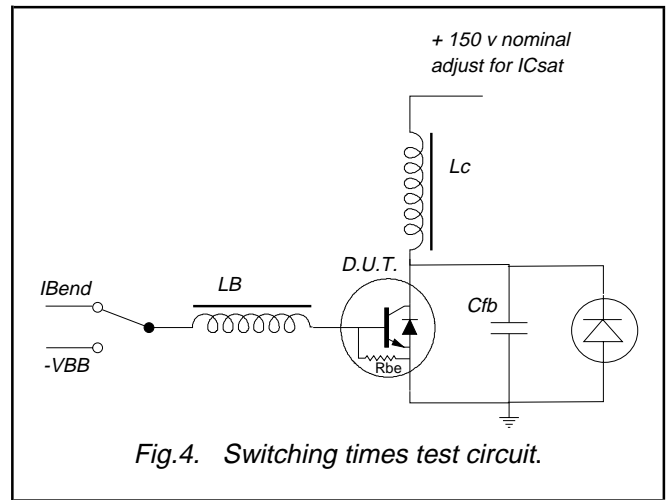
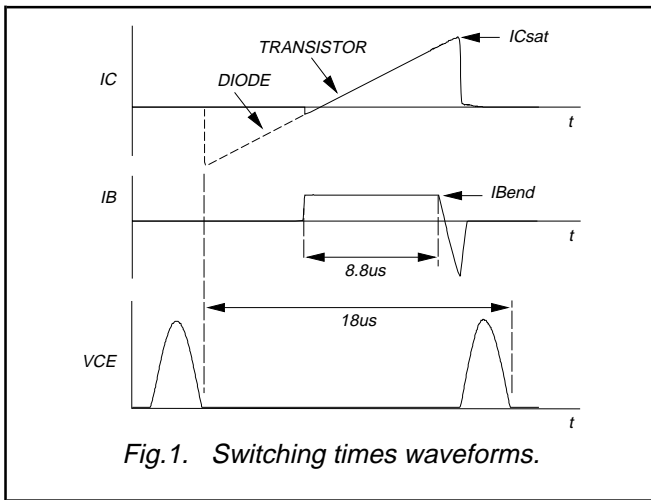
 $T_{hs} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
	Switching times (56 kHz line deflection circuit)	$I_{Csat} = 4.5\text{ A}; L_C = 250\text{ }\mu\text{H}; C_{fb} = 4\text{ nF};$ $I_{B(end)} = 0.65\text{ A}; L_B = 1.5\text{ }\mu\text{H};$ $-V_{BB} = -4\text{ V}; -I_{BM} = 2.7\text{ A}$			
t_s	Turn-off storage time		2.2	3.0	μs
t_f	Turn-off fall time		0.2	0.4	μs
V_{fr}	Anti-parallel diode forward recovery voltage	$I_F = 4.5\text{ A}; dI_F/dt = 50\text{ A}/\mu\text{s}$	17	-	V
t_{fr}	Anti-parallel diode forward recovery time	$V_F = 5\text{ V}$	360	-	ns

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

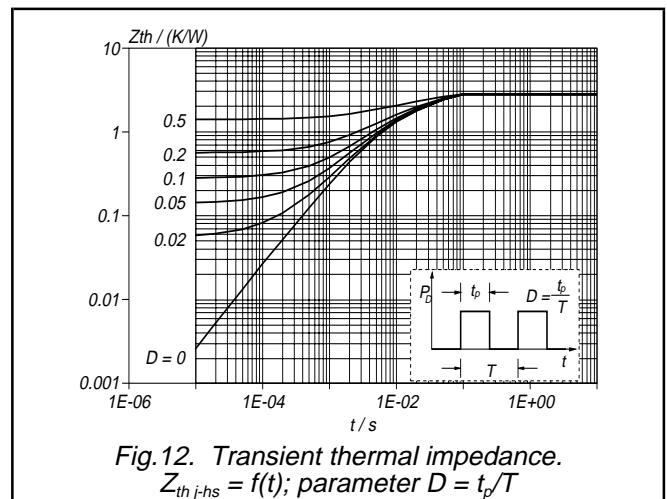
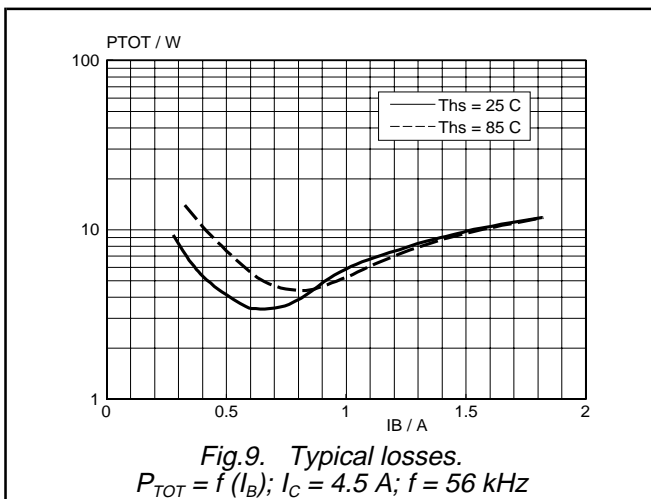
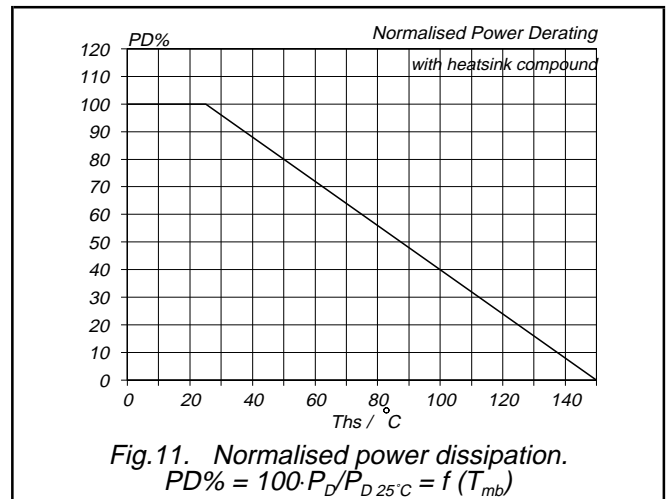
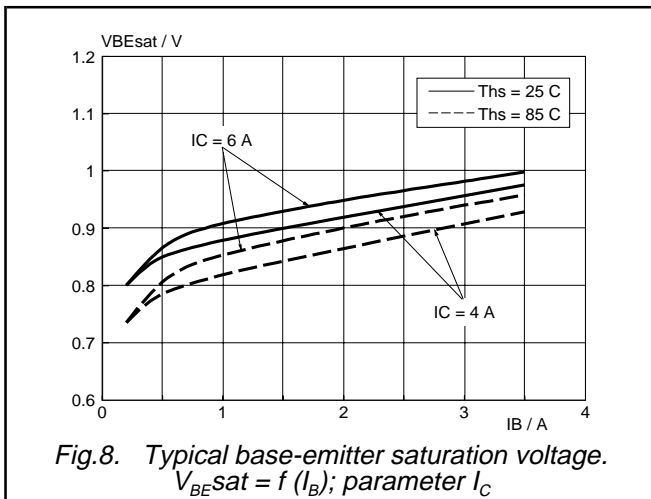
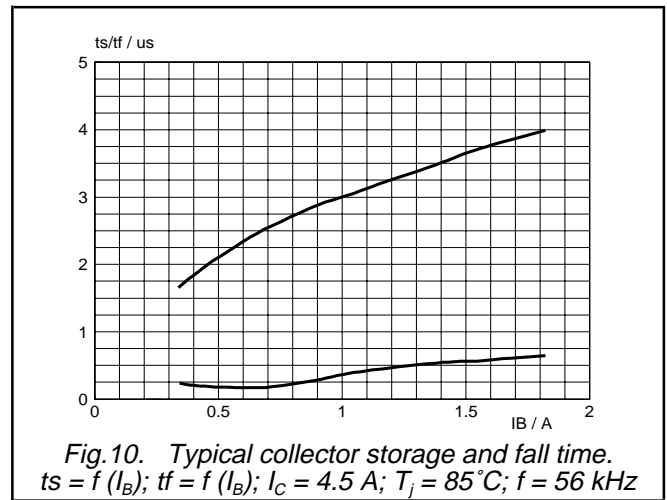
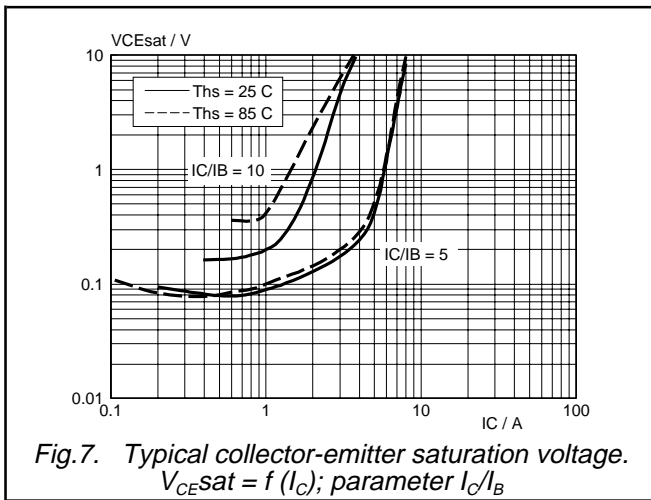
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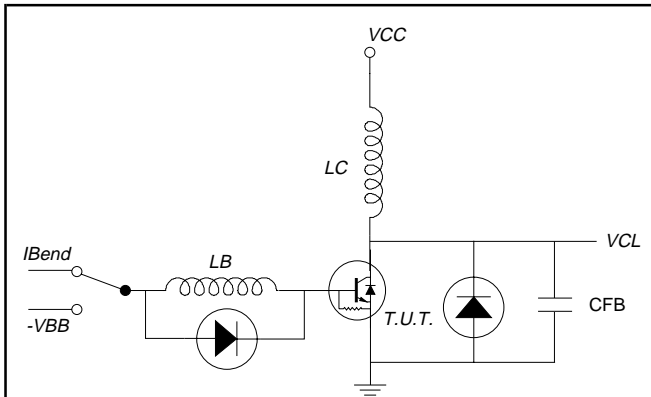


Fig.13. Test Circuit RBSOA. $V_{CC} = 150\text{ V}$;
 $-V_{BB} = 1 - 5\text{ V}$;
 $L_C = 1.5\text{ mH}$; $V_{CL} = 1450\text{ V}$; $L_B = 0.3 - 2\text{ }\mu\text{H}$;
 $C_{FB} = 0.5 - 8\text{ nF}$; $I_{B(end)} = 0.65 - 1.3\text{ A}$

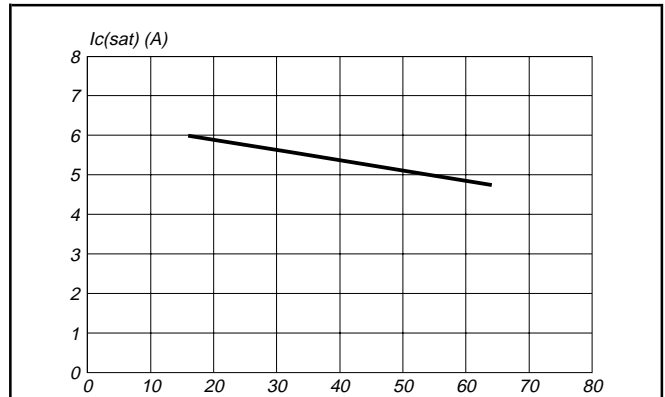


Fig.15. $I_{C(sat)}$ during normal running vs. frequency of operation for optimum performance

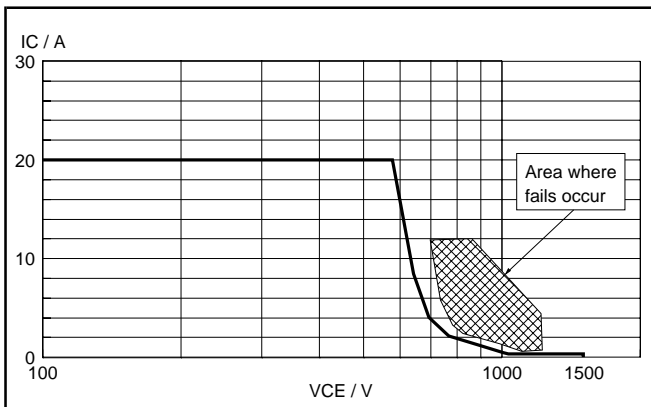
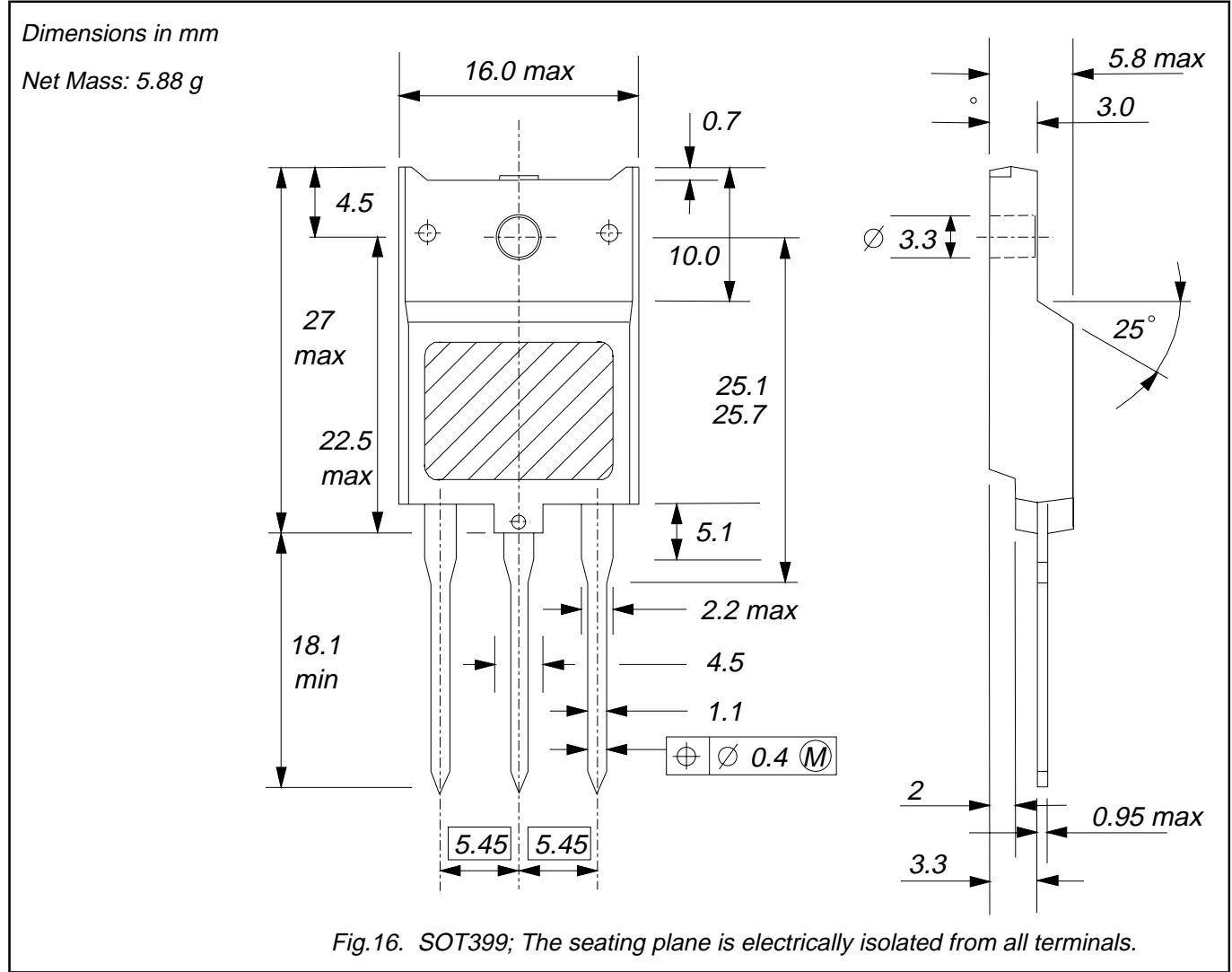


Fig.14. Reverse bias safe operating area. $T_j \leq T_{jmax}$

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MECHANICAL DATA



Notes

1. Refer to mounting instructions for F-pack envelopes.
2. Epoxy meets UL94 V0 at 1/8".