

Silicon Diffused Darlington Power Transistor

BUV90

GENERAL DESCRIPTION

High-voltage, monolithic npn power Darlington transistor in a SOT93 envelope intended for use in car ignition systems, DC and AC motor controls, solenoid drivers, etc.

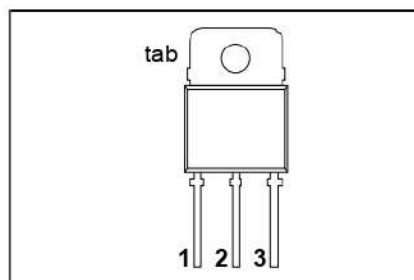
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	$V_{BE} = 0\text{ V}$	-	650	V
V_{CEO}	Collector-emitter voltage (open base)		-	400	V
I_C	Collector current (DC)		-	12	A
I_{CM}	Collector current peak value		-	30	A
P_{tot}	Total power dissipation	$T_{mb} \leq 25\text{ }^{\circ}\text{C}$	-	125	W
V_{CESat}	Collector-emitter saturation voltage	$I_C = 5\text{ A}; I_B = 0.05\text{ A}$	-	1.5	V
V_{CESat}	Collector-emitter saturation voltage	$I_C = 10\text{ A}; I_B = 0.3\text{ A}$	-	2	V
I_{Csat}	Collector saturation current		10	-	A
t_f	Fall time	$I_C = 5\text{ A}; I_{B(on)} = 50\text{ mA}$	0.7	-	μs
t_f	Fall time	$I_C = 10\text{ A}; I_{B(on)} = 300\text{ mA}$	1	-	μs

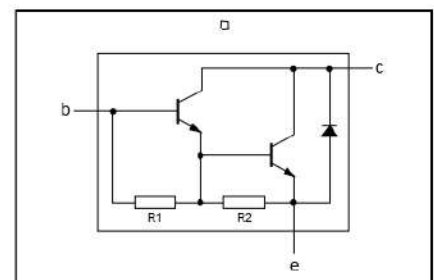
PINNING - SOT93

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	$V_{BE} = 0\text{ V}$	-	650	V
V_{CEO}	Collector-emitter voltage (open base)		-	400	V
$E_{(BR)}$	Turn-off breakdown energy with inductive load	$I_C = 10\text{ A}; I_{B(on)} = 0.3\text{ A}; L_C = 8\text{ mH}$	-	400	mJ
I_C	Collector current (DC)		-	12	A
I_{CM}	Collector current peak value		-	30	A
I_B	Base current (DC)		-	4	A
I_{BM}	Base current peak value		-	6	A
P_{tot}	Total power dissipation	$T_{mb} \leq 25\text{ }^{\circ}\text{C}$	-	125	W
T_{stg}	Storage temperature		-65	150	$^{\circ}\text{C}$
T_j	Junction temperature		-	150	$^{\circ}\text{C}$

THERMAL RESISTANCE

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
R_{thj-mb}	Junction to mounting base		-	1	K/W

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STATIC CHARACTERISTICS

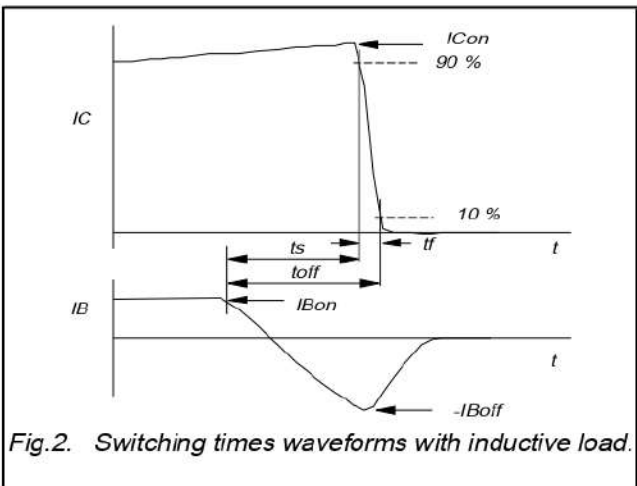
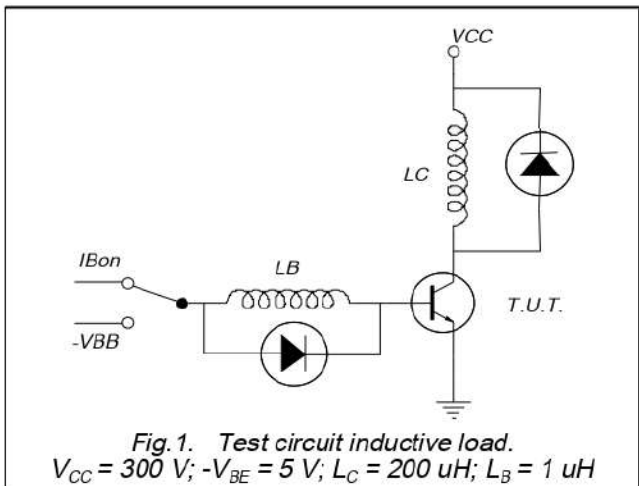
$T_{mb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CES}	Collector cut-off current ¹	$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$	-	-	1.0	mA
I_{CES}		$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$	-	-	3.0	mA
I_{EBO}	Emitter cut-off current	$T_j = 125\text{ }^{\circ}\text{C}$	-	-	20	mA
R1	Base-emitter resistor - driver transistor.	$V_{EB} = 6\text{ V}; I_C = 0\text{ A}$	-	500	-	Ω
R2	Base-emitter resistor - output transistor.		-	500	-	Ω
V_F	Diode forward voltage	$I_F = 8\text{ A}; I_B = 0\text{ A}$	-	-	3	V
$V_{CEOsust}$	Collector-emitter sustaining voltage	$I_B = 0\text{ A}; I_C = 100\text{ mA}; L = 25\text{ mH}$	400	-	-	V
V_{CEsat}	Saturation voltages	$I_C = 5\text{ A}; I_B = 0.05\text{ A}$	-	-	1.5	V
V_{BEsat}			-	-	2.0	V
V_{CEsat}		$I_C = 6\text{ A}; I_B = 0.1\text{ A}; T_{hs} = 150\text{ }^{\circ}\text{C}$	-	-	1.5	V
V_{BEsat}			-	-	2.0	V
V_{CEsat}		$I_C = 10\text{ A}; I_B = 0.3\text{ A}$	-	-	2.0	V
V_{BEsat}			-	-	2.5	V

DYNAMIC CHARACTERISTICS

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

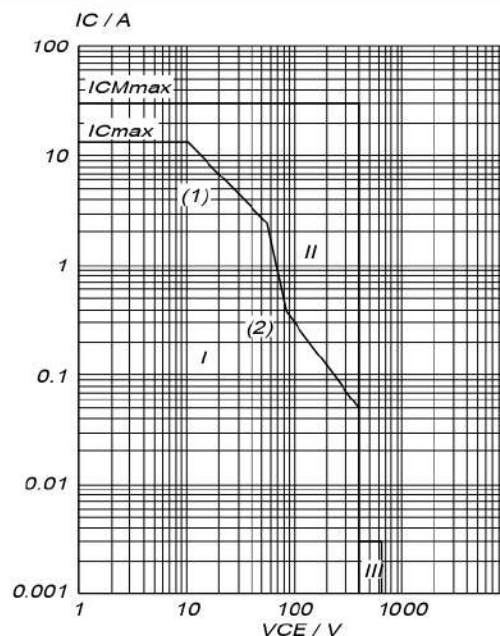
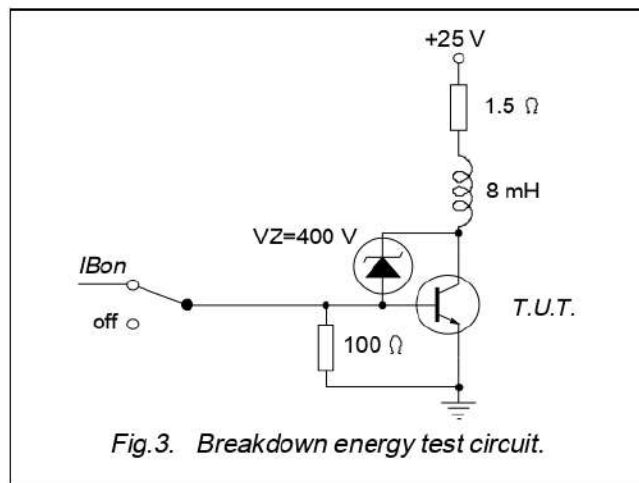
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
t_f	Switching times inductive load	$I_C = 5\text{ A}; I_{B(on)} = 50\text{ mA}$	-	0.7	-	μs
t_f	Turn-off fall time	$I_C = 10\text{ A}; I_{B(on)} = 300\text{ mA}$	-	1	-	μs



¹ Measured with half sine-wave voltage (curve tracer).

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Fig.4. Forward bias safe operating area. $T_{mb} = 25\text{ }^{\circ}\text{C}$

- I Region of permissible DC operation.
- II Extension for repetitive pulse operation.
- III Repetitive pulse operation is permissible in this region provided $V_{BE} < 0$ and $t_p < 5\text{ ms}$.

- (1) $P_{tot\text{ max}}$ line.
- (2) Second breakdown limits (independent of temperature).

NB: Mounted without heatsink compound and 30 ± 5 newton force on the centre of the envelope.

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MECHANICAL DATA

Dimensions in mm

Net Mass: 5 g

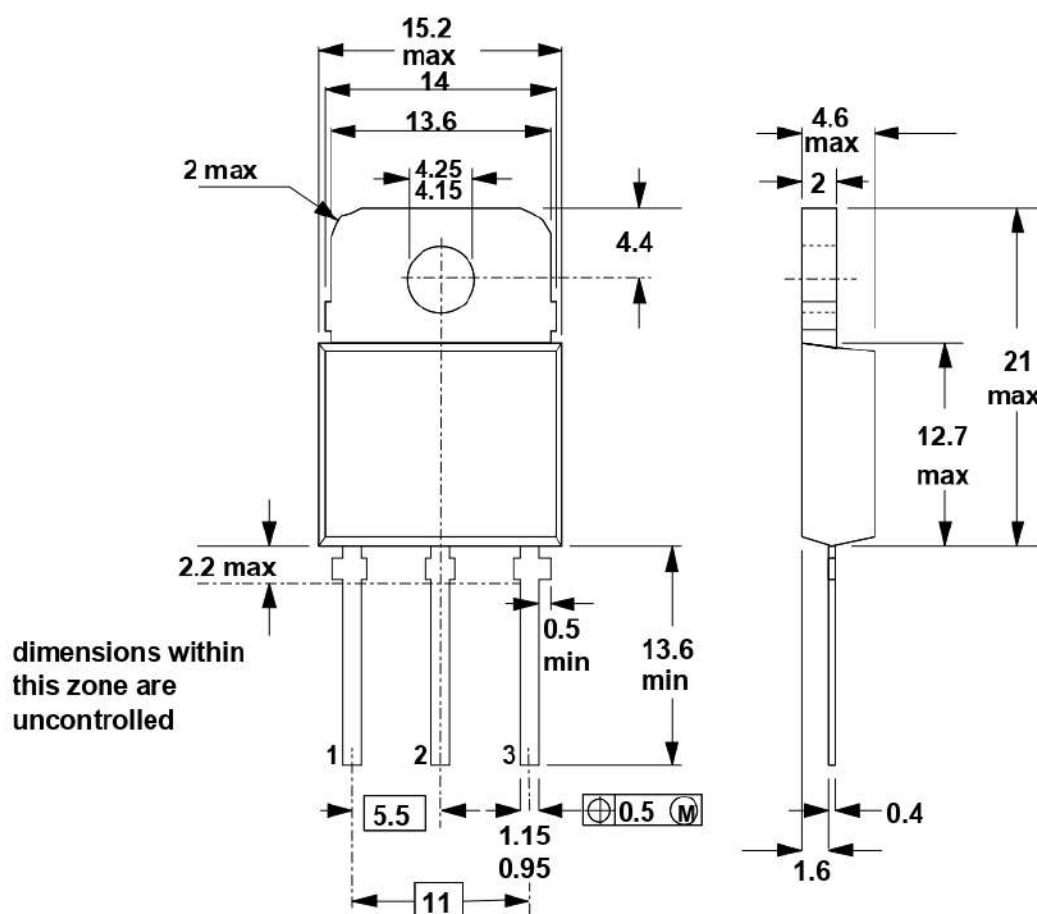


Fig.5. SOT93; pin 2 connected to mounting base.

Notes

1. Accessories supplied on request: refer to mounting instructions for SOT93 envelope.

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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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