

## 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.

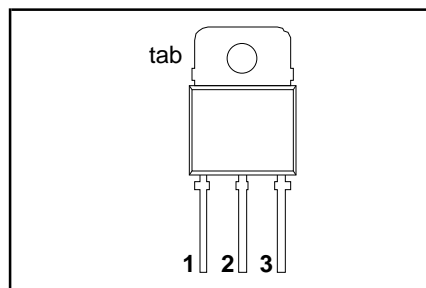
## QUICK REFERENCE DATA

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	$T_{mb} \leq 25\text{ °C}$	-	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	-	$\mu\text{s}$
$t_r$	Fall time	$I_C = 10\text{ A}; I_{B(on)} = 300\text{ mA}$	1	-	$\mu\text{s}$

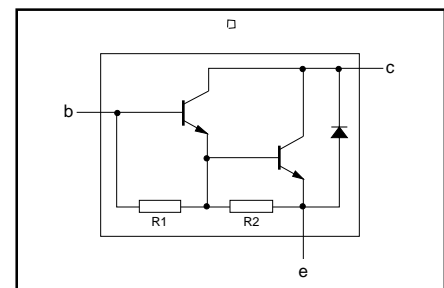
## PINNING - SOT93

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	$T_{mb} \leq 25\text{ °C}$	-	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
$R_{th\ j-mb}$	Junction to mounting base		-	1	K/W

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## STATIC CHARACTERISTICS

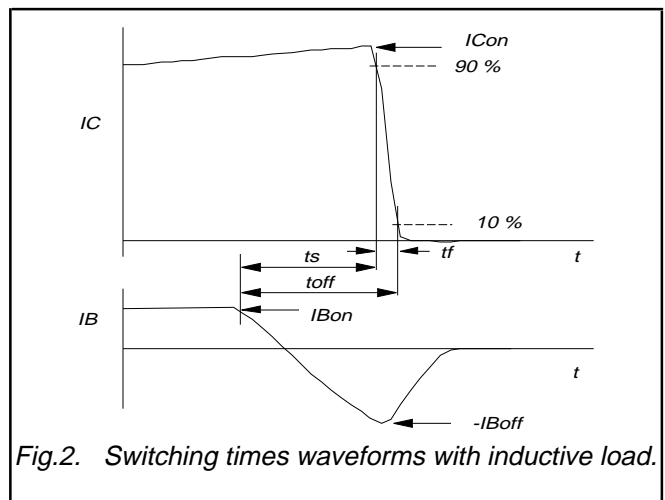
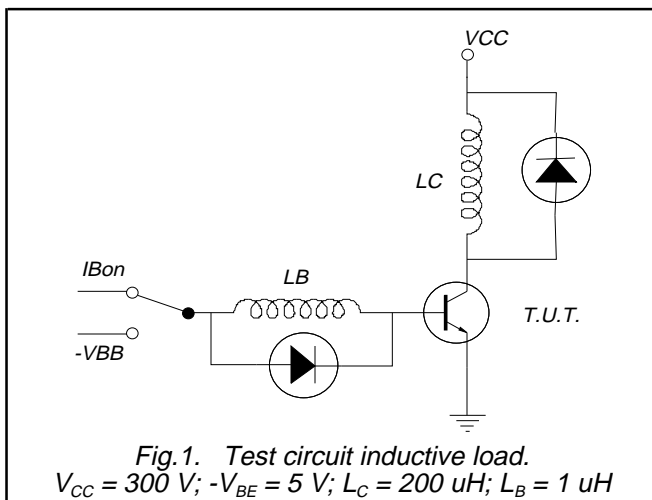
$T_{mb} = 25\text{ }^\circ\text{C}$  unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CES}$	Collector cut-off current <sup>1</sup>	$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$	-	-	1.0	mA
$I_{CES}$		$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$ $T_j = 125\text{ }^\circ\text{C}$	-	-	3.0	mA
$I_{EBO}$	Emitter cut-off current	$V_{EB} = 6\text{ V}; I_C = 0\text{ A}$	-	-	20	mA
R1	Base-emitter resistor - driver transistor.		-	500	-	$\Omega$
R2	Base-emitter resistor - output transistor.		-	500	-	$\Omega$
$V_F$	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
$V_{CEsat}$		$I_C = 6\text{ A}; I_B = 0.1\text{ A};$	-	-	1.5	V
$V_{BEsat}$		$T_{hs} = 150\text{ }^\circ\text{C}$	-	-	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

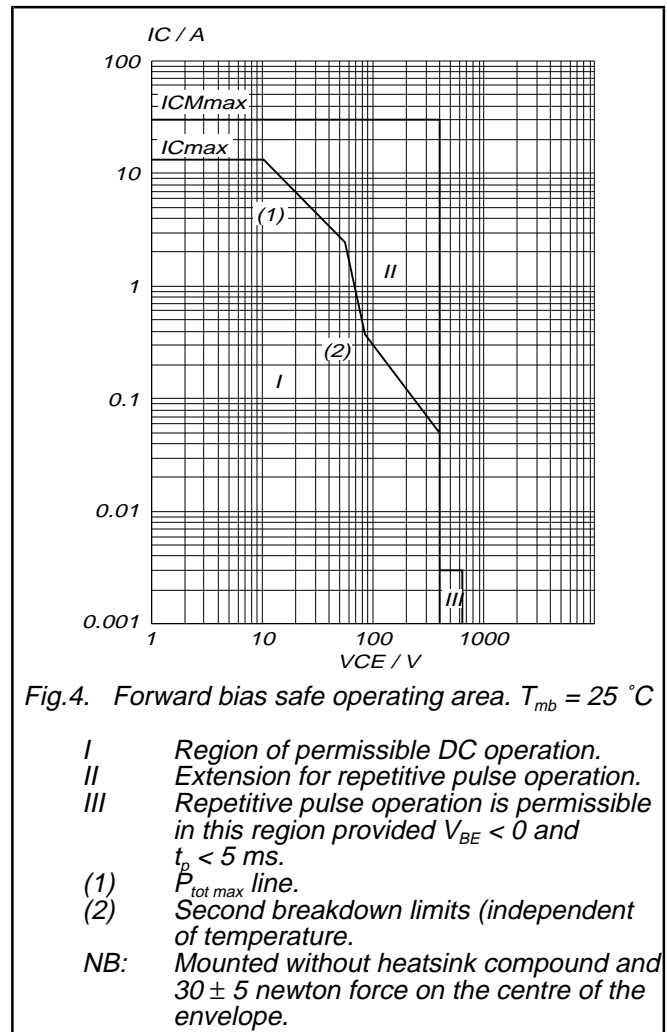
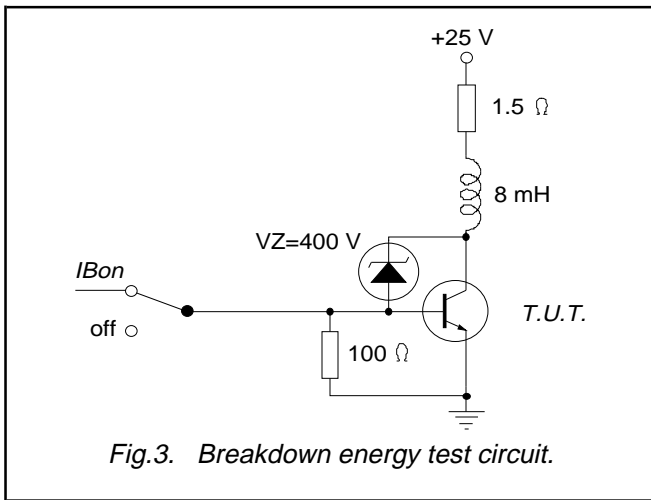
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$t_f$	Switching times inductive load		-	0.7	-	$\mu\text{s}$
$t_f$	Turn-off fall time	$I_C = 5\text{ A}; I_{B(on)} = 50\text{ mA}$	-	1	-	$\mu\text{s}$
$t_f$	Turn-off fall time	$I_C = 10\text{ A}; I_{B(on)} = 300\text{ mA}$	-	-	-	$\mu\text{s}$



<sup>1</sup> Measured with half sine-wave voltage (curve tracer).

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**DEFINITIONS**

<b>Data sheet status</b>	
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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
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