BU930Z
BU930ZP

MULTIEPITAXIAL BIPLANAR NPN

PRELIMINARY DATA

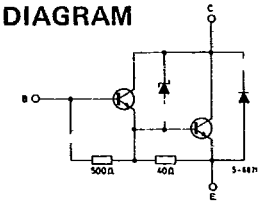
NPN POWER DARLINGTONS

The BU930Z and BU930ZP are silicon NPN multiepitaxial biplanar darlingtons respectively in TO-3 and SOT-93 package. They are designed for applications in high performance electronic car ignition.
They features very high ruggedness thanks to the integrated high voltage zener.

ABSOLUTE MAXIMUM RATINGS

		BU930Z	BU930ZP
V_{CBO}	Collector-base voltage ($I_E = 0$)	350V	
V_{CER}	Collector-emitter voltage ($R_{BE} = 100\Omega$)	350V	
V_{CES}	Collector-base voltage ($V_{BE} = 0$)	350V	
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	350V	
V_{EBO}	Emitter-base voltage ($I_C = 0$)	5V	
I_C	Collector current	20A	
I_B	Base current	5A	
P_{tot}	Total power dissipation at $T_{amb} = 25°C$	175W	150W
T_{stg}	Storage temperature	-40 to +200°C	-40 to +175°C
T_j	Junction temperature	200°C	175°C

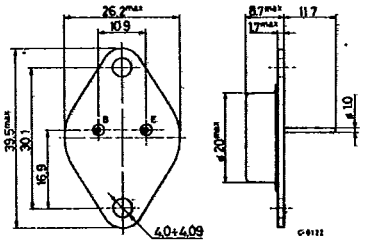
INTERNAL SCHEMATIC DIAGRAM



MECHANICAL DATA

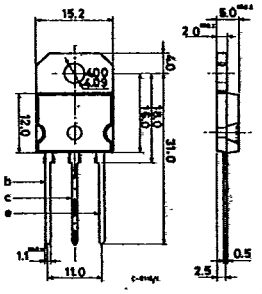
Dimension in mm

Collector connected to case



TO-3

Collector connected to tab



(sim. to TO-218) SOT-93

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THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max.	1	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C unless otherwise specified)

Parameter		Test Conditions	Min.	Typ.	Max.	Unit
I_{CL}	Clamping current	V_{CE} = 350V either $I_B = 0$ or $V_{BE} = 0$			1 1	mA mA
$I_{CE(off)}$	Collector-emitter off state current $I_B = 0$	V_{CC} = 16V T_j = 125°C V_{BE} = 400mV			0.5	mA
I_{EBO}	Emitter cutoff current ($I_C = 0$)	V_{EB} = 5V			50	mA
V_{CL}	Clamping voltage	either $I_B = 0$ or $V_B = 0$ and I_C = 100mA same, T_j = 125°C	 350 350		 500 500	 V V
$V_{CE(sat)}$*	Collector-emitter saturation voltage	I_C = 7A I_B = 70mA same, T_j = 125°C I_C = 8A I_B = 100mA same, T_j = 125°C I_C = 10A I_B = 150mA same, T_j = 125°C		1.25 1.30 1.45 1.65 1.65 1.85	1.6 1.8 1.8 2.1 2 2.4	V V V V V V
$V_{BE(sat)}$*	Base-emitter saturation voltage	I_C = 8A I_B = 100mA I_C = 10A I_B = 250mA			2.2 2.5	V V
$V_{BE(on)}$*	Base-emitter voltage	I_C = 5A V_{CE} = 2V same, T_j = -40°C same, T_j = 125°C I_C = 10A V_{CE} = 2V same, T_j = -40°C same, T_j = 125°C	 1.3 1.4	1.67 2 	 2.1 2.4 	V V V V V V
V_F*	Diode forward voltage	I_F = 10A			2.5	V

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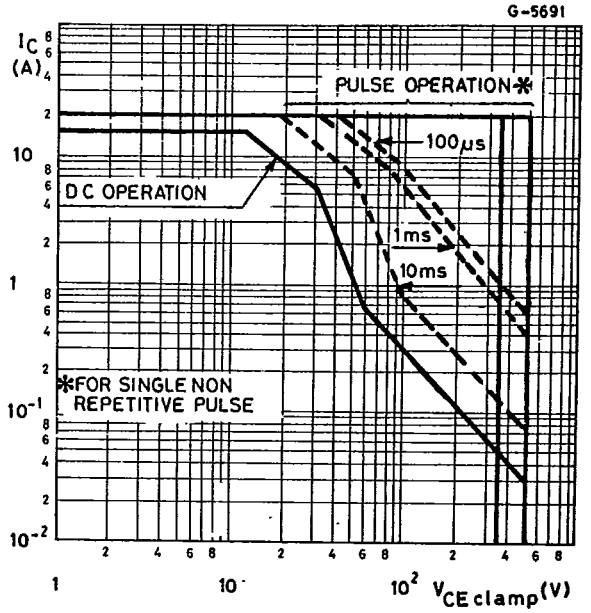
ELECTRICAL CHARACTERISTICS (continued

Parameter		Test conditions		Min.	Typ.	Max.	Unit
$E_{s/b}$	Second breakdown energy unclamped (see fig. 1)	V_{CC} = 40V I_C = 14A V_{BE} = 0V	L = 12mH I_B = 350mA	700			mJ
	INDUCTIVE	V_{CC} = 12V	L = 6mH				
t_s	Storage time	I_C = 7A	I_B = 70mA		8.5		μs
t_f	Fall time (see fig. 1)	V_{CL} = 350V	V_{BE} = 0V		2.6		μs
$I_{s/b}$	Second breakdown collector current	V_{CE} = 30V t = 500ms for **BU930Z** t = 250ms for **BU930P**		6 6			A A

* Pulsed: pulse duration = 300μs, duty cycle = 1.5%

Safe operating areas



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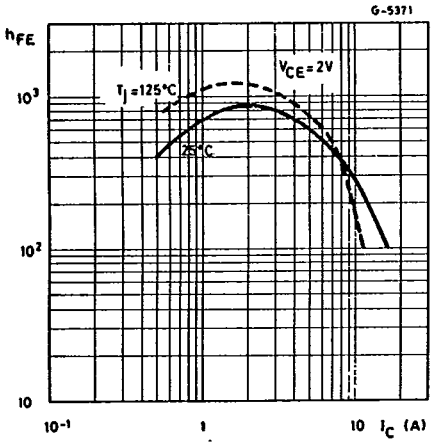
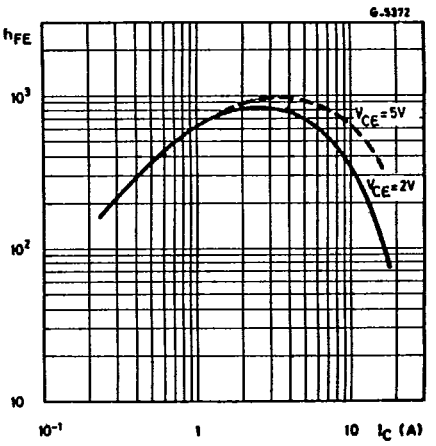
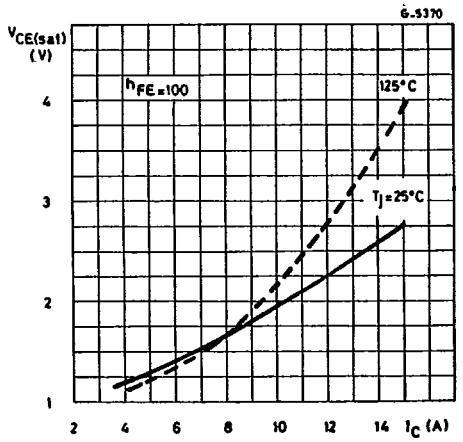
DC current gain



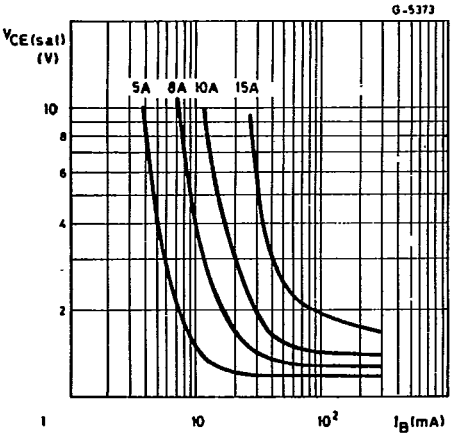
DC current gain



Collector-emitter saturation voltage



Collector-emitter saturation voltage



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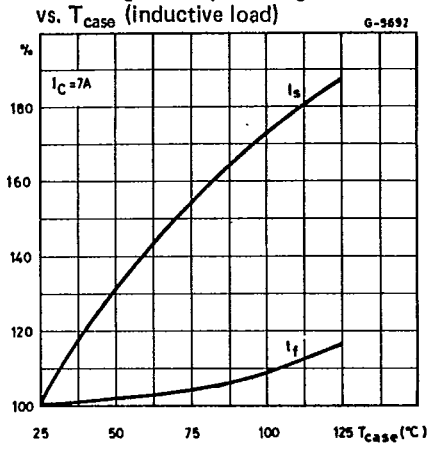
Switching times percentage variations vs. T_{case} (inductive load)



Base-emitter saturation voltage

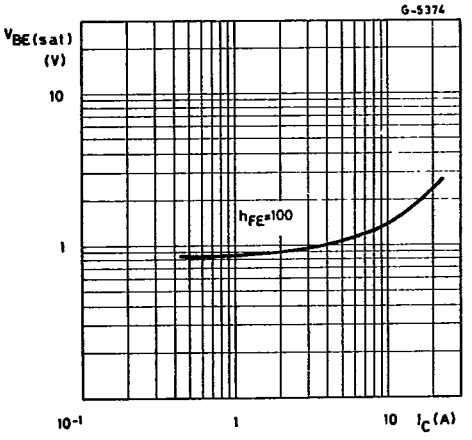
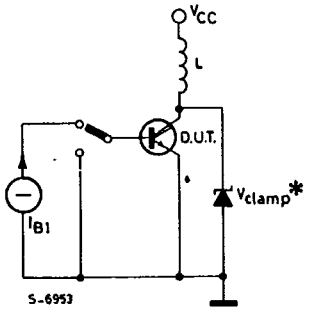


Fig. 1 - Switching times and $E_{s/b}$ test circuit.



* Only for switching times