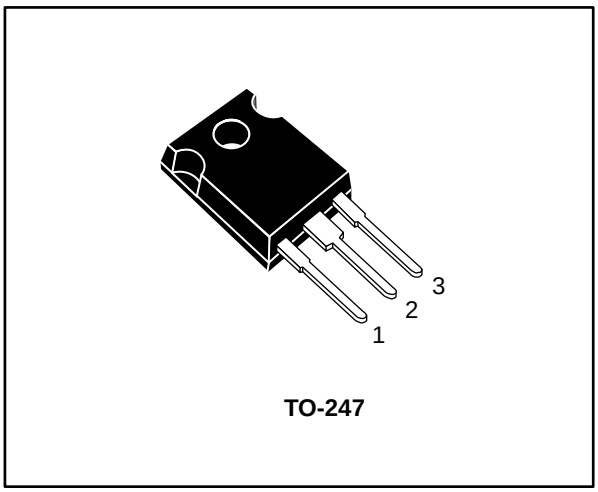
BU931P

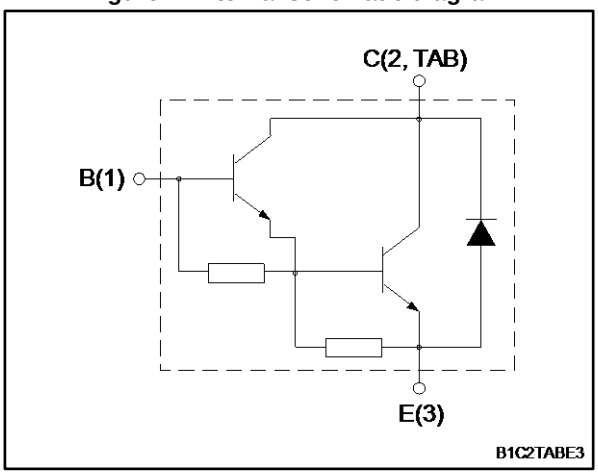
Automotive-grade high voltage ignition coil driver NPN power Darlington transistor

Datasheet - production data



TO-247

Figure 1: Internal schematic diagram



Features

- AEC-Q101 qualified
- Very rugged Bipolar technology
- High operating junction temperature

Applications

- High ruggedness electronic ignitions

Description

This is a high voltage power Darlington transistor developed using multi-epitaxial planar technology. It has been properly designed for automotive environment as electronic ignition power actuators.

Table 1: Device summary

Order code	Marking	Package	Packing
BU931P	BU931P	TO-247	Tube

This is information on a product in full production.

www.st.com

Contents

1 Electrical ratings

Table 2: Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CES}	Collector-emitter voltage (V_{BE} = 0)	500	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	400	V
V_{EBO}	Emitter-base voltage (I_C = 0)	5	V
I_C	Collector current	15	A
I_{CM}	Collector peak current	30	A
I_B	Base current	1	A
I_{BM}	Base peak current	5	A
P_{TOT}	Total dissipation at Tc = 25 °C	135	W
T_{stg}	Storage temperature range	-65 to 175	°C
T_j	Operating junction temperature range		°C

Table 3: Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Thermal resistance junction-case	1.1	°C/W
R_{thJA}	Thermal resistance junction-ambient	50	°C/W

2 Electrical characteristics

(T_C = 25 °C unless otherwise specified)

Table 4: Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current	V_{BE} = 0 V, V_{CE} = 500 V		-	100	µA
		V_{BE} = 0 V, V_{CE} = 500 V, T_C = 125 °C (1)		-	0.5	mA
I_{CEO}	Collector cut-off current	I_B = 0 A, V_{CE} = 450 V		-	100	µA
		I_B = 0 A, V_{CE} = 450 V, T_C = 125 °C (1)		-	0.5	mA
I_{EBO}	Emitter cut-off current	I_C= 0 A, V_{EB} = 5 V		-	20	mA
$V_{CEO(sus)}$(2)	Collector-emitter sustaining voltage	I_B= 0 A, I_C = 100 mA	400	-		V
$V_{CE(sat)}$(2)	Collector-emitter saturation voltage	I_C = 7 A, I_B = 70 mA		-	1.6	V
		I_C = 8 A, I_B = 100 mA		-	1.8	V
		I_C = 10 A, I_B = 250 mA		-	1.8	V
$V_{BE(sat)}$(2)	Base-emitter saturation voltage	I_C = 7 A, I_B = 70 mA		-	2.2	V
		I_C = 8 A, I_B = 100 mA		-	2.4	V
		I_C = 10 A, I_B = 250 mA		-	2.5	V
h_{FE}(2)	DC current gain	I_C = 5 A, V_{CE} = 10 V	300	-		
V_F	Diode forward voltage	I_F = 10 A		-	2.5	V
	Functional test	V_{CC} = 24 V, L = 7 mH, V_{clamp} = 400 V (see *Figure 10: "Functional test circuit"*)	8	-		A

Notes:

(1)Defined by design, not subject to production test.

(2)Pulse test: pulse duration ≤ 300 µs, duty cycle ≤ 2 %.

Table 5: Inductive load switching times

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
t_s	Storage time	V_{BE}=0, V_{CC} = 12 V, V_{clamp} = 300 V, L = 7 mH, R_{BE} = 47 Ω, I_C = 7 A, I_B = 70 mA (see *Figure 12: "Switching time test circuit"*)	-	15	-	µs
t_f	Fall time		-	0.5	-	µs

2.1 Electrical characteristics (curves)

Figure 2: Safe operating area

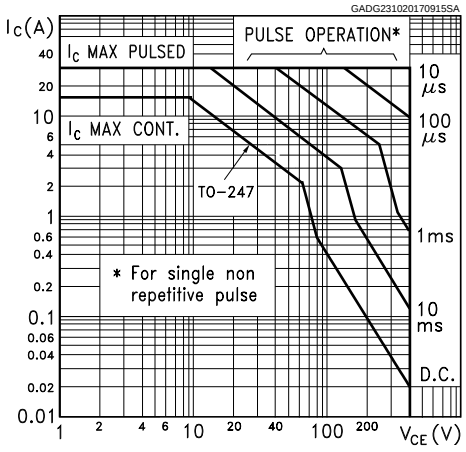


Figure 3: DC current gain

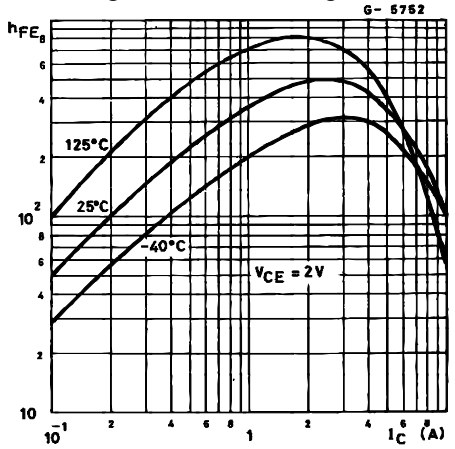


Figure 4: Switching time inductive load

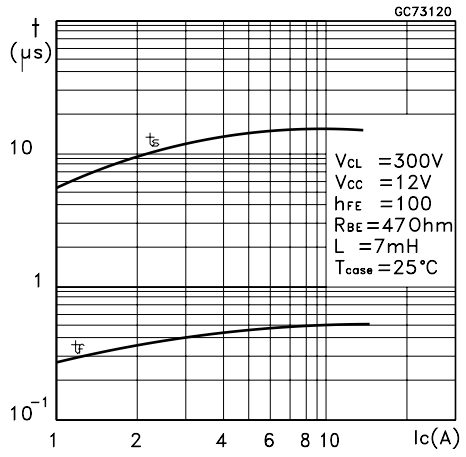


Figure 5: Collector-emitter saturation voltage @ hFE = 50

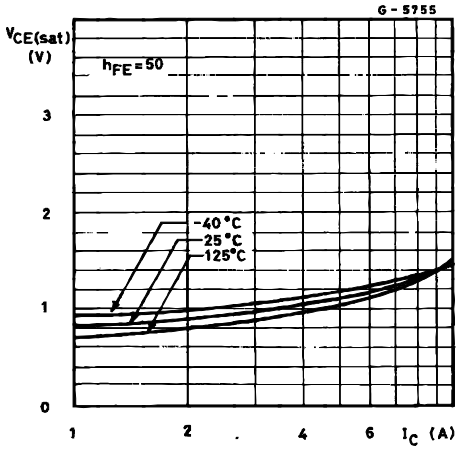


Figure 6: Collector-emitter saturation voltage @ h_{FE} = 100

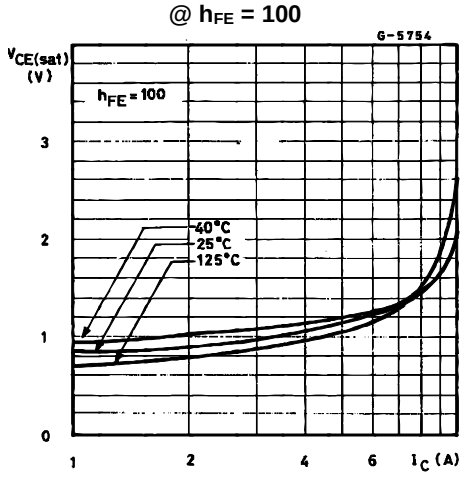


Figure 7: Collector-emitter saturation voltage

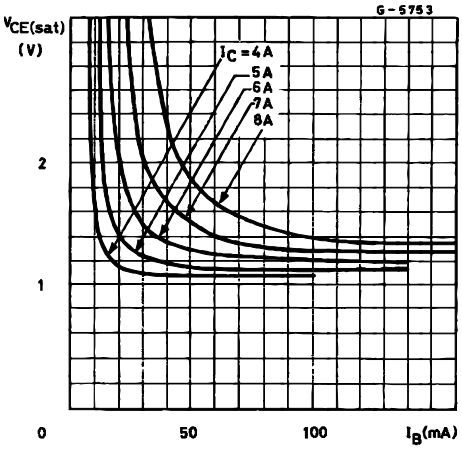


Figure 8: Base-emitter saturation voltage @ h_{FE} = 50

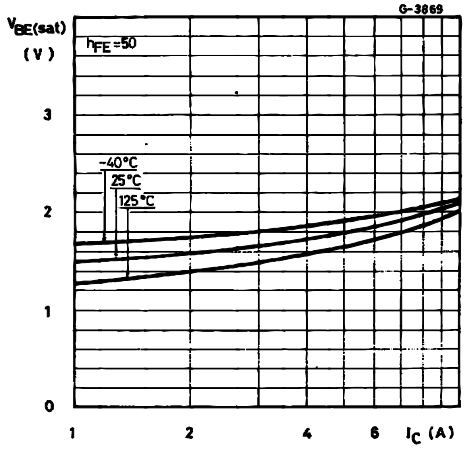
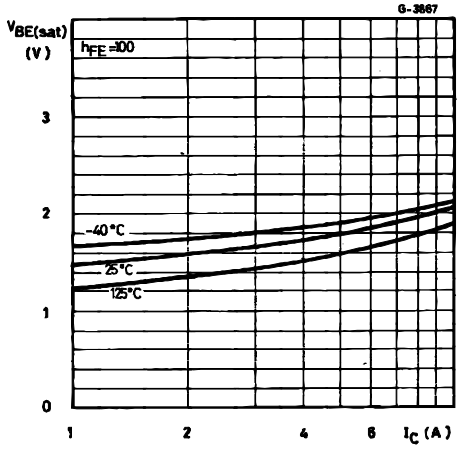


Figure 9: Base-emitter saturation voltage @ hFE = 100



3 Test circuits

Figure 10: Functional test circuit

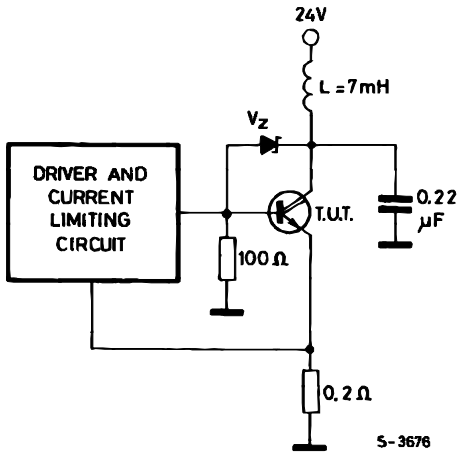


Figure 11: Functional test waveforms

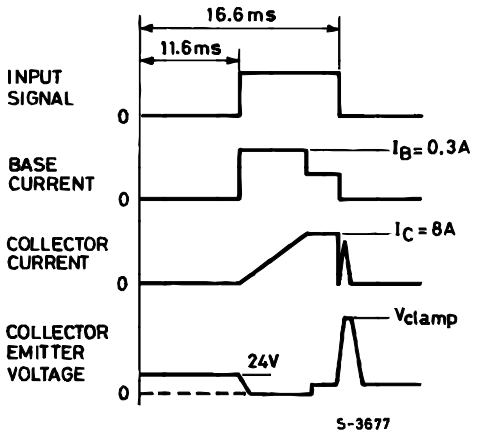


Figure 12: Switching time test circuit

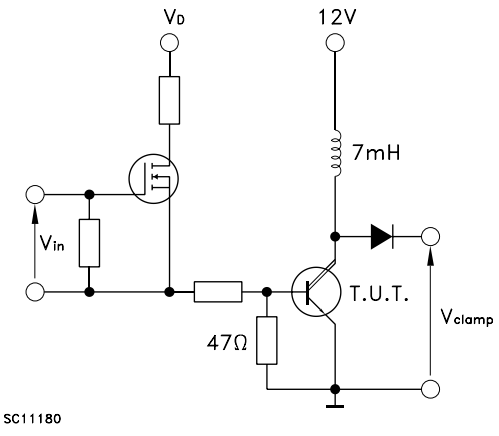
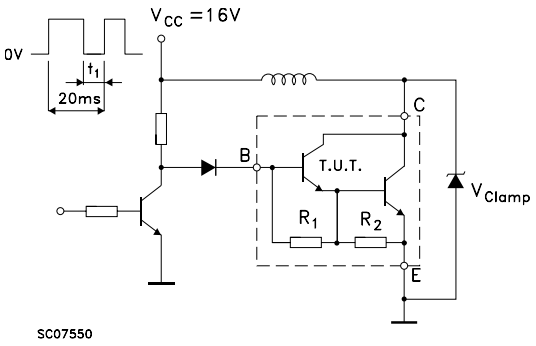


Figure 13: Sustaining voltage test circuit



4 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: ***www.st.com***. ECOPACK® is an ST trademark.

4.1 TO-247 package information

Figure 14: TO-247 package outline

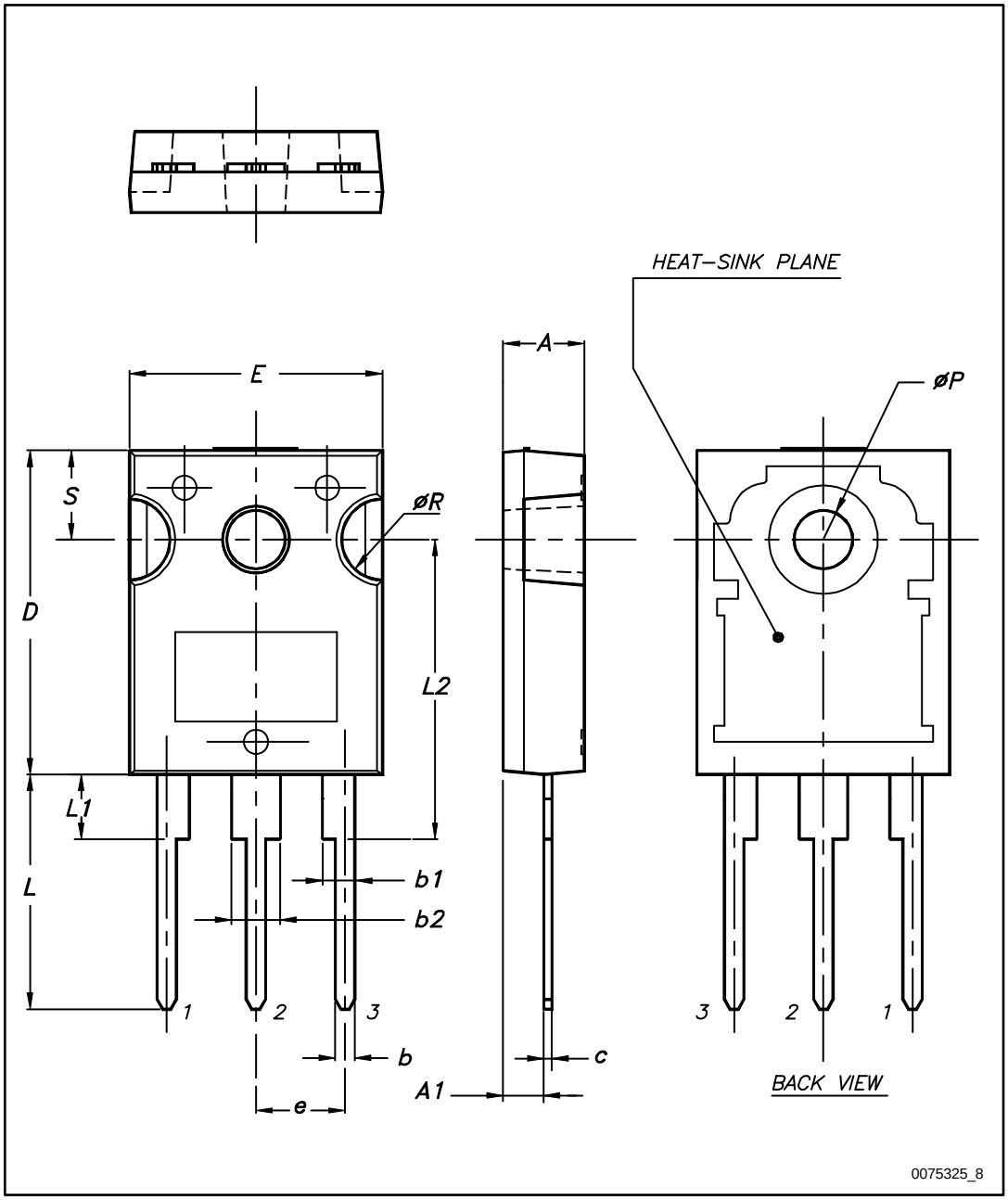


Table 6: TO-247 package mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	4.85		5.15
A1	2.20		2.60
b	1.0		1.40
b1	2.0		2.40
b2	3.0		3.40
c	0.40		0.80
D	19.85		20.15
E	15.45		15.75
e	5.30	5.45	5.60
L	14.20		14.80
L1	3.70		4.30
L2		18.50	
ØP	3.55		3.65
ØR	4.50		5.50
S	5.30	5.50	5.70

5 Revision history

Table 7: Document revision history

Date	Revision	Changes
23-Oct-2017	1	Initial release. Part number previously included in datasheet DocID1004.

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2017 STMicroelectronics – All rights reserved

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Darlington Transistors ***category:***

Click to view products by STMicroelectronics ***manufacturer:***

Other Similar products are found below :

NJVMJD128T4G 281287X BDV64B NJVMJD117T4G LB1205-L-E 2N6053 MPSA14 TIP140 MPSA13 TIP127L-BP 2N6383 ULN2003ACM/TR 2N7371 2N6058 2N6059 2N6051 MJ2501 MJ3001 2SB1560 2SB852KT146B 2SD2560 TIP112TU BCV27 MMBTA13-TP MMSTA28T146 NTE2557 NJVNJD35N04T4G MPSA29-D26Z FJB102TM BSP61H6327XTSA1 BU941ZPFI NTE2350 NTE245 NTE246 NTE2649 NTE46 NTE98 ULN2003ADR2G NTE2344 NTE2349 NTE2405 NTE243 NTE244 NTE247 NTE248 NTE249 NTE253 NTE2548 NTE261 NTE262