BU941ZP
BU941ZPFI

HIGH VOLTAGE IGNITION COIL DRIVER
NPN POWER DARLINGTON TRANSISTORS

- VERY RUGGED BIPOLAR TECHNOLOGY
- BUILT IN CLAMPING ZENER
- HIGH OPERATING JUNCTION TEMPERATURE
- FULLY INSULATED PACKAGE (U.L. COMPLIANT) FOR EASY MOUNTING

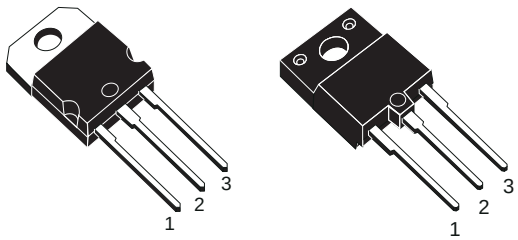
APPLICATION

- HIGH RUGGEDNESS ELECTRONIC IGNITIONS

DESCRIPTION

The devices are bipolar Darlington transistors manufactured using Multi-Epitaxial Planar technology. They have been properly designed to be used in Automotive environment as electronic ignition power actuators.

Figure 1: Package



TO-218 **ISOWATT218**

Figure 2: Internal Schematic Diagram

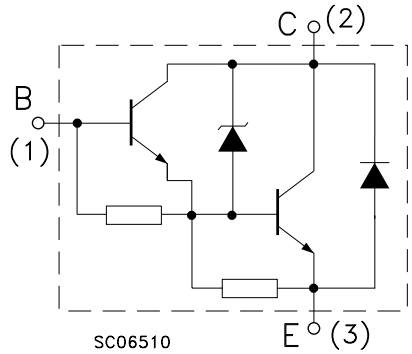


Table 1: Order Code

Part Number	Marking	Package	Packaging
BU941ZP	BU941ZP	TO-218	TUBE
BU941ZFI	BU941ZPFI	ISOWATT218	TUBE

Table 2: Absolute Maximum Ratings

Symbol	Parameter	Value		Unit
		BU941ZP	BU941ZPFI	Unit
V_{CEO}	Collector-Emitter Voltage (I_B= 0)	350		V
V_{EBO}	Emitter-Base Voltage (I_C= 0)	5		V
I_C	Collector Current	15		A
I_{CM}	Collector Peak Current (t_p < 5ms)	30		A
I_B	Base Current	1		A
I_{BM}	Base Peak Current (t_p < 5 ms)	5		A
P_{tot}	Total Dissipation at T_C = 25 °C	155	65	W
V_{isol}	Insulation Withstand Voltage (RMS) from All Three Leads to External Heatsink		2500	V
T_{stg}	Storage Temperature	-65 to 175	-65 to 175	°C
T_J	Max. Operating Junction Temperature	175	175	°C

Table 3: Thermal Data

		TO-218	ISOWATT218	Unit
$R_{thj\text{-}case}$	Thermal Resistance Junction-Case Max	0.97	2.3	°C/W

Table 4: Electrical Characteristics (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CEO}	Collector Cut-off Current (I_B = 0)	V_{CE} = 300 V				100	µA
		V_{CE} = 300 V	T_j = 125 °C			0.5	mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V				20	mA
V_{CL}*	Clamping Voltage	I_C = 100 mA		350		500	V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 8 A	I_B =100 mA			1.8	V
		I_C = 10 A	I_B = 250 mA			1.8	V
		I_C = 12 A	I_B = 300 mA			2	V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 8 A	I_B =100 mA			2.2	V
		I_C = 10 A	I_B = 250 mA			2.5	V
		I_C = 12 A	I_B = 300 mA			2.7	V
h_{FE}*	DC Current Gain	I_C = 5 A	V_{CE} = 10 V	300			
	Functional Test	V_{CC} = 24 V (see fig. 12)	L = 7 mH	10			A
t_s	INDUCTIVE LOAD Storage Time	V_{CC} = 12 V	L = 7 mH				
		$V_{BE(off)}$ = 0 V	R_{BE} =47 Ω		15		µs
t_f	Fall Time	V_{Clamp} = 300 V	I_C = 7 A		0.5		µs
		I_B = 70 mA	(see fig. 14)				
V_F	Diode Forward Voltage	I_F = 10 V				2.5	V

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

Figure 3: Safe Operating Area

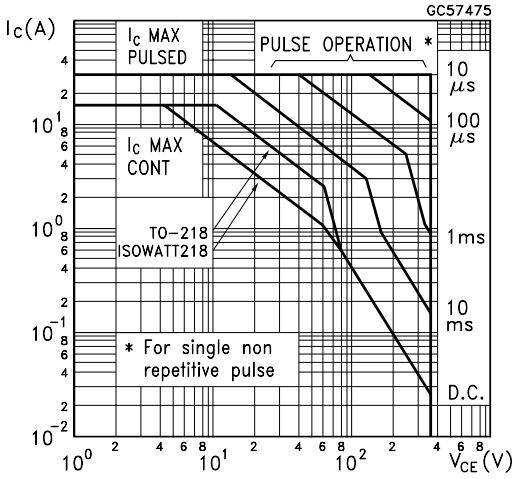


Figure 4: DC Current Gain

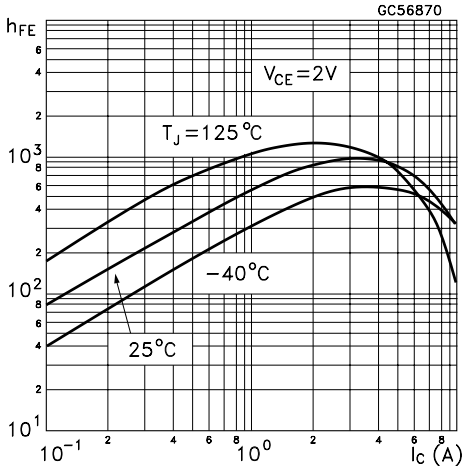


Figure 5: Collector-Emitter Saturation Voltage

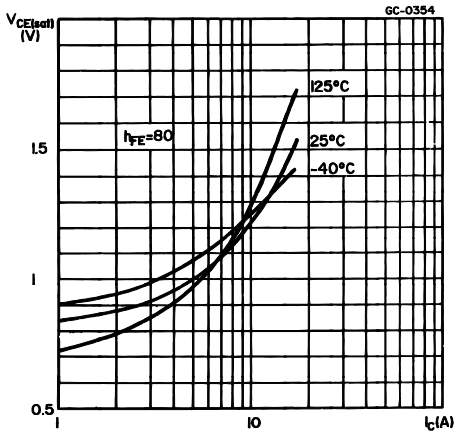


Figure 6: Derating Curves

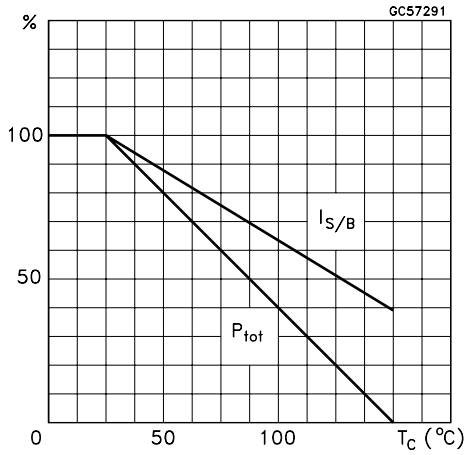


Figure 7: DC Current Gain

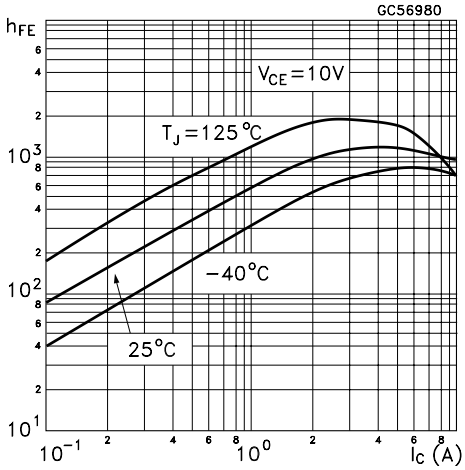


Figure 8: Collector-Emitter Saturation Voltage

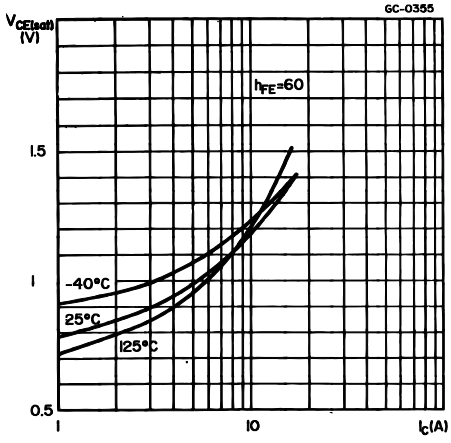


Figure 9: Base-Emitter Saturation Voltage

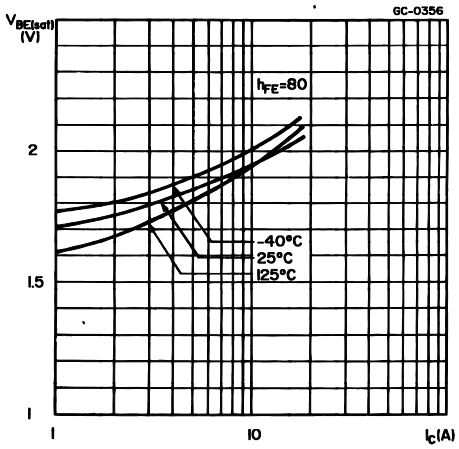


Figure 10: Collector-Emitter Saturation Voltage

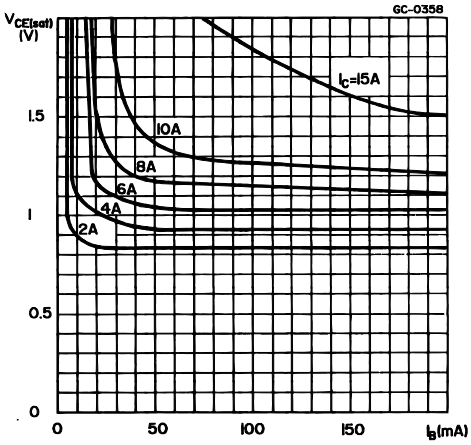


Figure 11: Base-Emitter Saturation Voltage

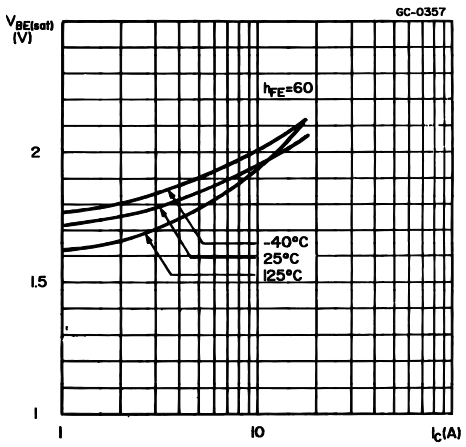


Figure 12: Functional Test Circuit

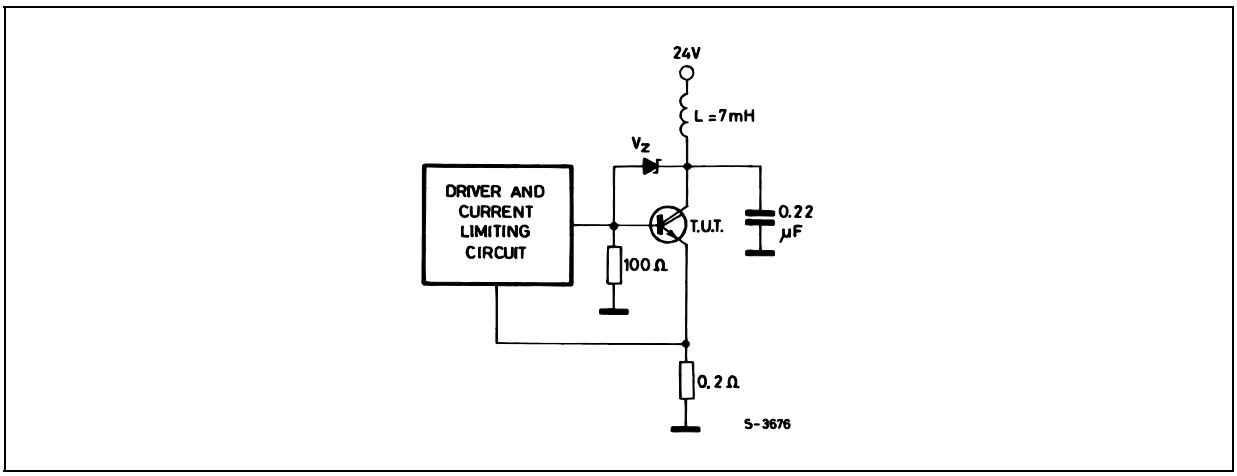


Figure 13: Functional Test Waveforms

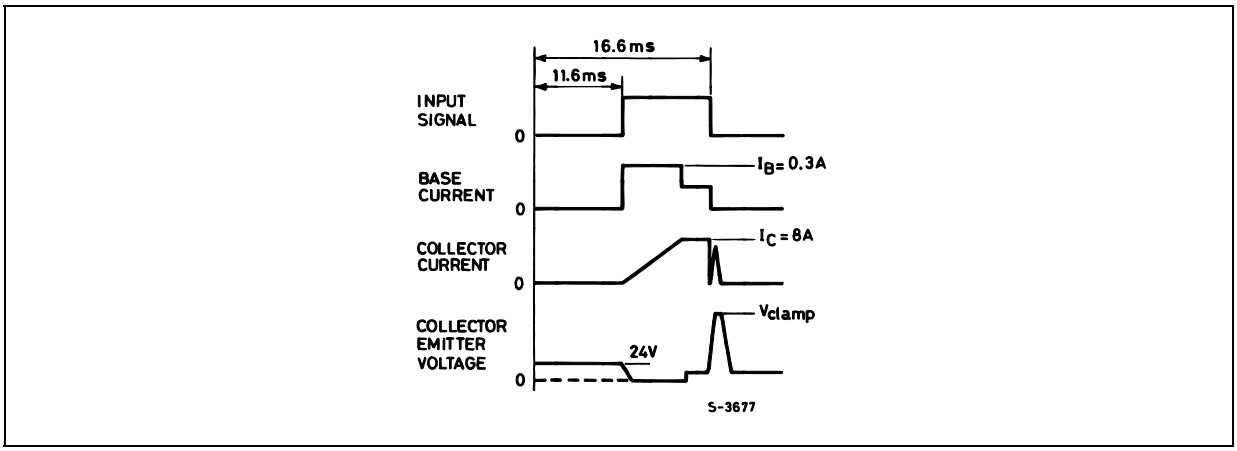
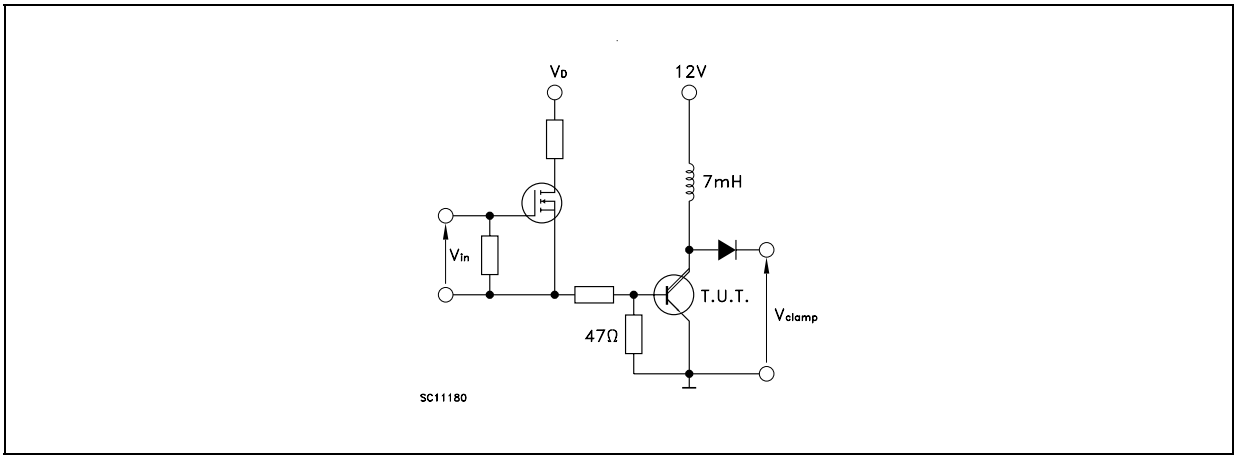
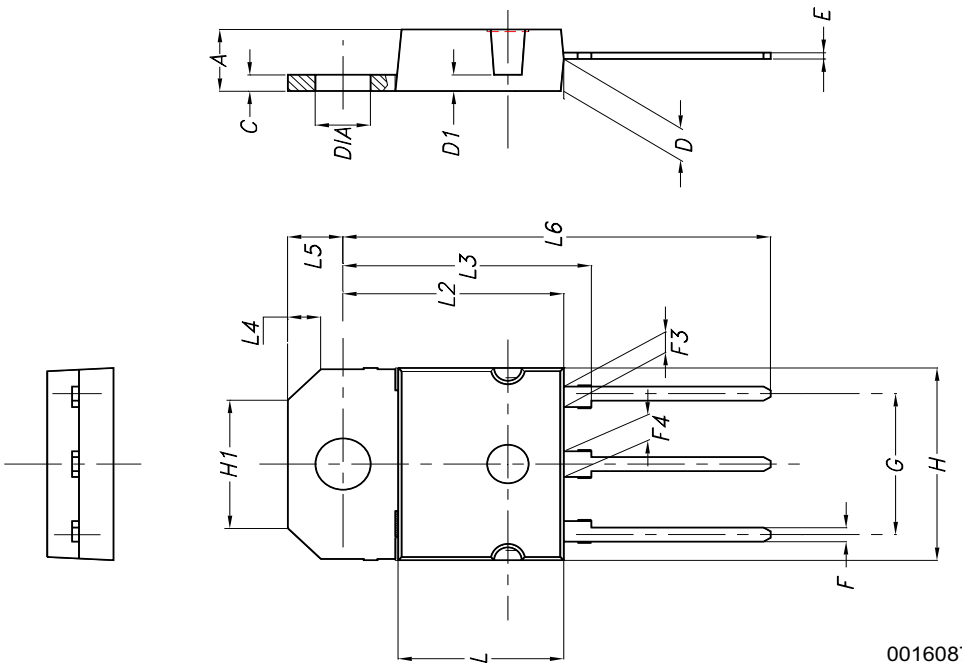


Figure 14: Switching Time Test Circuit



TO-218 (SOT-93) MECHANICAL DATA

DIM.	mm.		
	MIN.	TYP	MAX.
A	4.70		4.90
C	1.17		1.37
D		2.50	
D1		1.27	
E	0.50		0.78
F	1.10		1.30
F3		1.75	
F4		2.10	
G	10.80		11.10
H	14.70		15.20
H1		10.00	
L			12.20
L2			16.20
L3		18.00	
L4		2.40	
L5	3.95		4.15
L6		31.00	
Dia	4.00		4.10



ISOWATT218 (option “B”) MECHANICAL DATA

DIM.	mm.		
	MIN.	TYP	MAX.
A	5.35		5.65
B		2.5	
C	3.30		3.80
D	2.90		3.10
D1	1.88		2.08
E	0.75		0.95
F	0.75		0.95
F2	1.50		1.85
F3	1.90		2.20
F5			1.10
G	10.80		11.20
H	15.80		16.20
L		9	
L1	20.80		21.20
L2	19.10		19.90
L3	22.80		23.60
L4	40.50		42.50
L5	4.85		5.25
L6	20.25		20.75
N	2.0		2.40
R		4.6	
Dia	3.50		3.70

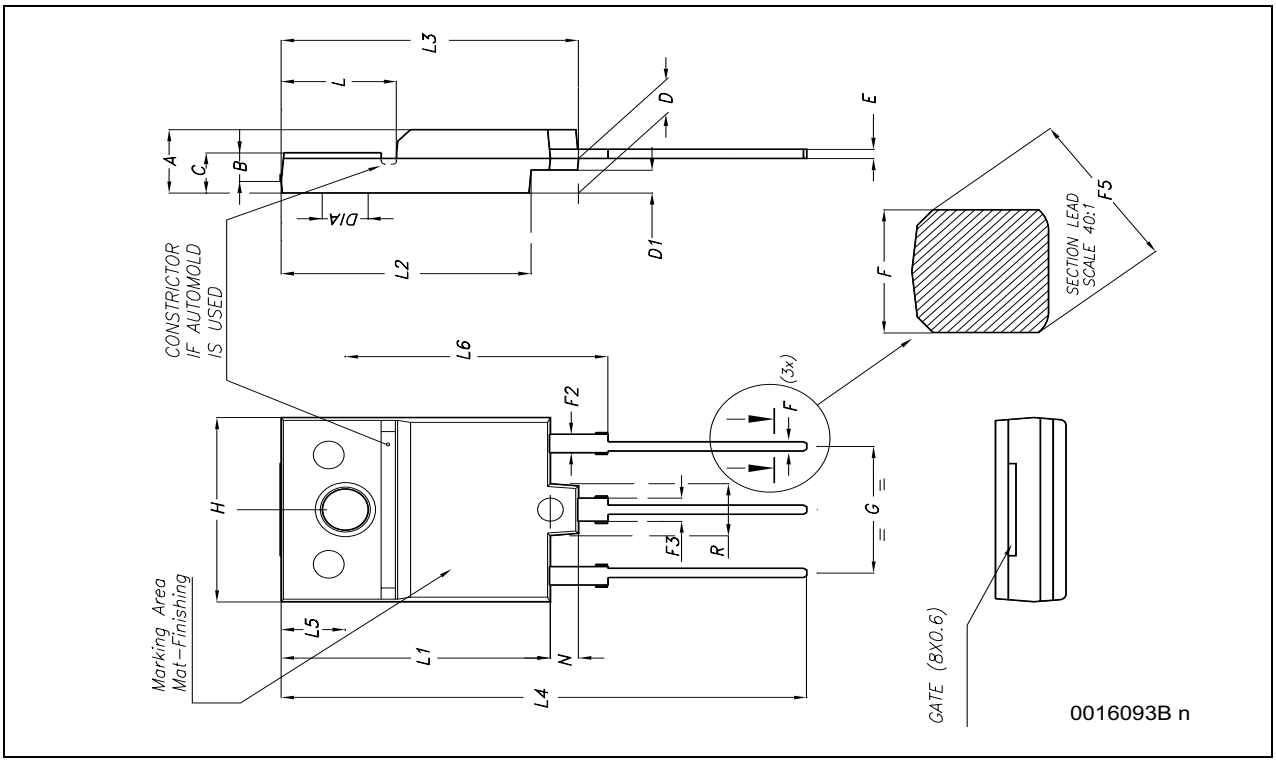


Table 5: Revision History

Date	Release	Change Designator
22-Apr-2002	4	Fourth Release
09-Sep-2004	5	Fifth Release
03-Feb-2005	6	Mechanical Data has been updated