SGS-THOMSON MICROELECTRONICS

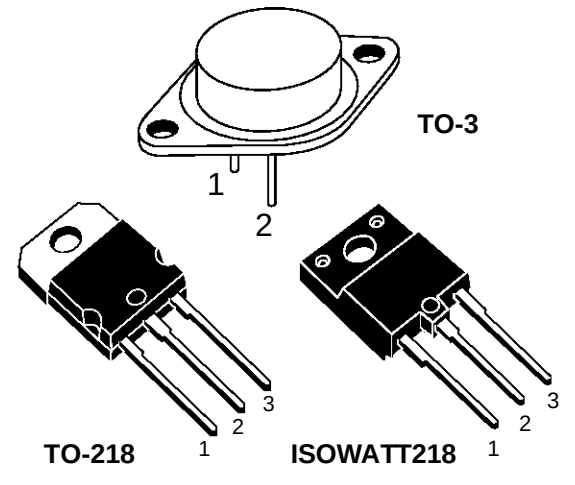
BU931/BU931P BU931PFI

HIGH VOLTAGE IGNITION COIL DRIVER NPN POWER DARLINGTON

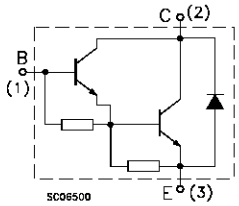
- VERY RUGGED BIPOLAR TECHNOLOGY
- HIGH OPERATING JUNCTION TEMPERATURE
- WIDE RANGE OF PACKAGES

APPLICATIONS

- HIGH RUGGEDNESS ELECTRONIC IGNITIONS



INTERNAL SCHEMATIC DIAGRAM



for **TO-3**
Emitter: pin 2
Base: pin1
Collector: tab

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value			Unit
		BU931	BU931P	BU931PFI	
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 T_c = 25 °C	175	135	60	W
T_{stg}	Storage Temperature	-65 to 200	-65 to 175	-65 to 175	°C
T_j	Max. Operating Junction Temperature	200	175	175	°C

THERMAL DATA

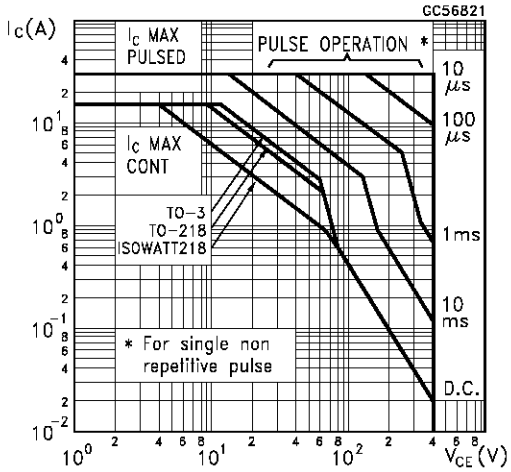
		TO-3	TO-218	ISOWATT218	
$R_{thj\text{-}case}$	Thermal Resistance Junction-case Max	1	1.1	2.5	°C/W

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

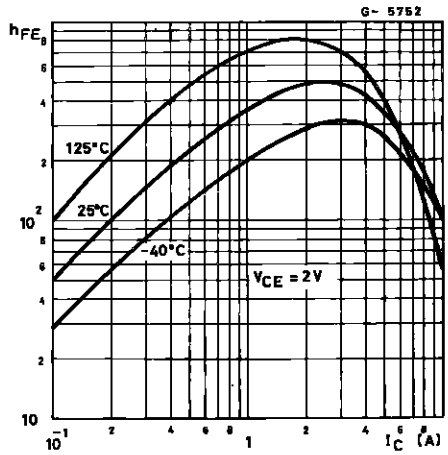
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 500 V V_{CE} = 500 V T_j = 125 °C			100 0.5	µA mA
I_{CEO}	Collector Cut-off Current (I_B = 0)	V_{CE} = 450 V V_{CE} = 450 V T_j = 125 °C			100 0.5	µA mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V			20	mA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage	I_C = 100 mA L = 10 mH I_B = 0 V_{CLAMP} = RATED V_{CEO} (See FIG.4)	400			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 7 A I_B = 70 mA I_C = 8 A I_B = 100 mA I_C = 10 A I_B = 250 mA			1.6 1.8 1.8	V V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 7 A I_B = 70 mA I_C = 8 A I_B = 100 mA I_C = 10 A I_B = 250 mA			2.2 2.4 2.5	V V V
h_{FE}*	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 (see fig. 1)	V_{CC} = 24 V V_{clamp} = 400 V L= 7 mH	8			A
• t_s t_f	INDUCTIVE LOAD Storage Time Fall Time (see fig. 3)	V_{CC} = 12 V V_{clamp} = 300 V L= 7 mH I_C = 7 A I_B = 70 mA V_{BE} = 0 R_{BE} = 47 Ω		 15 0.5		 µs µs

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

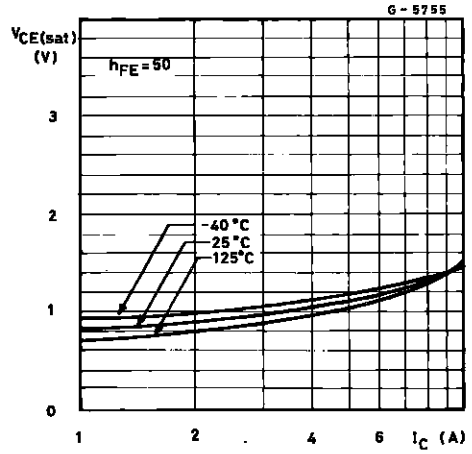
Safe Operating Area



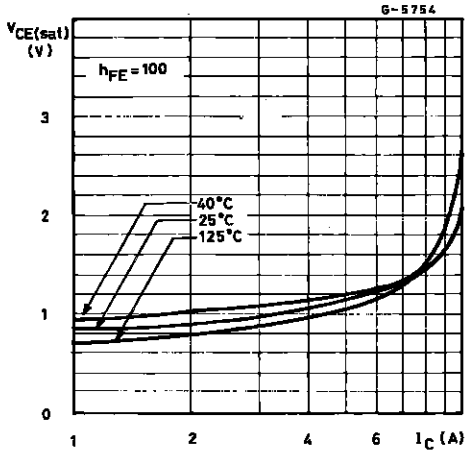
DC Current Gain



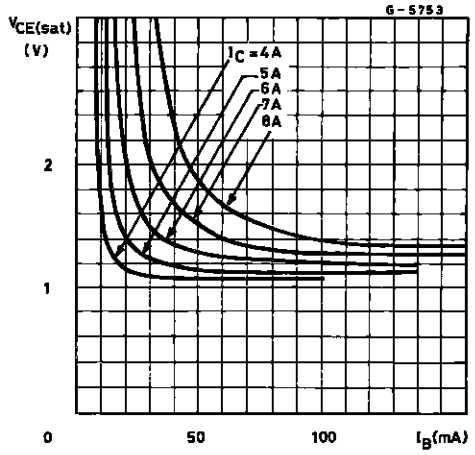
Collector Emitter Saturation Voltage



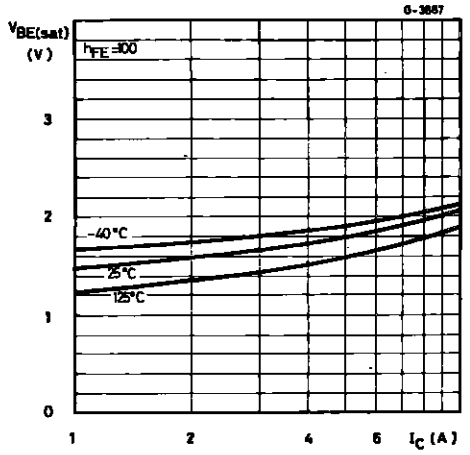
Collector Emitter Saturation Voltage



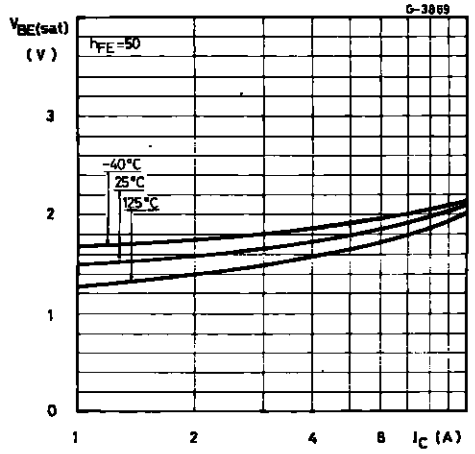
Collector Emitter Saturation Voltage



Base Emitter Saturation Voltage



Base Emitter Saturation Voltage



Switching Time Inductive Load

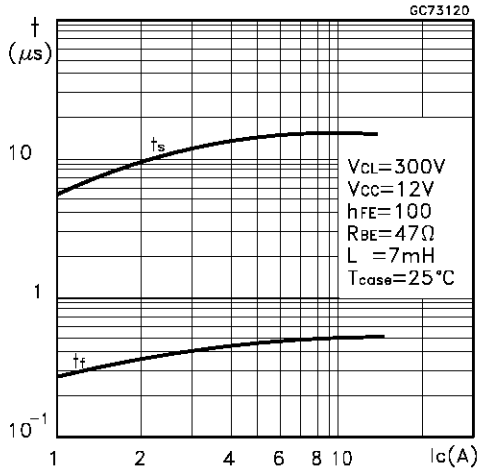


FIGURE 1: Functional Test Circuit

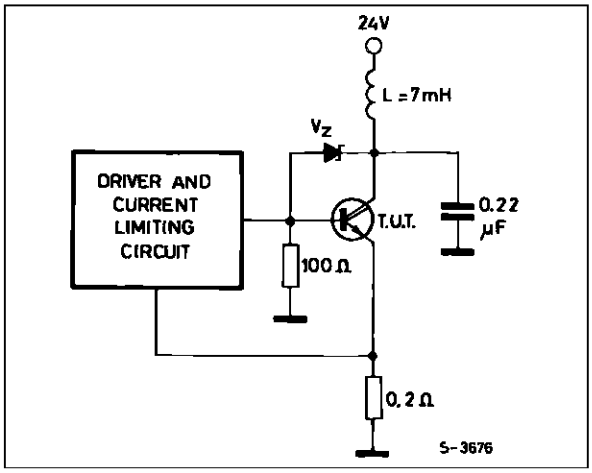


FIGURE 2: Functional Test Waveforms

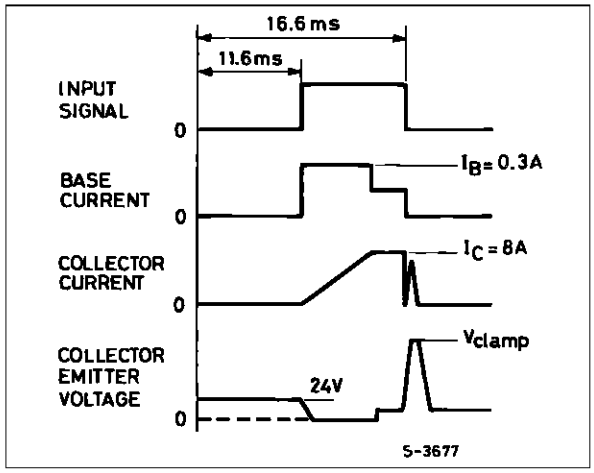


FIGURE 3: Switching Time Test Circuit

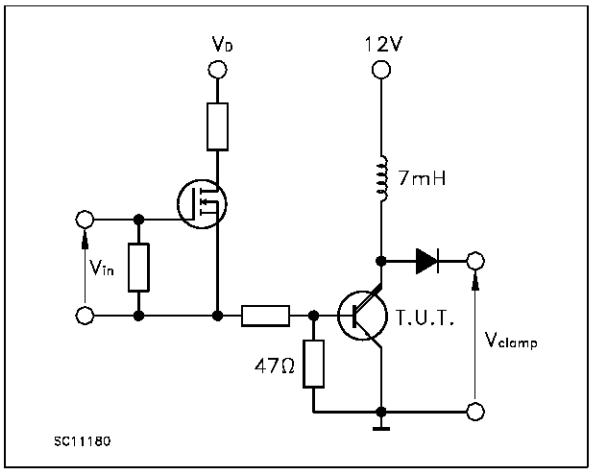
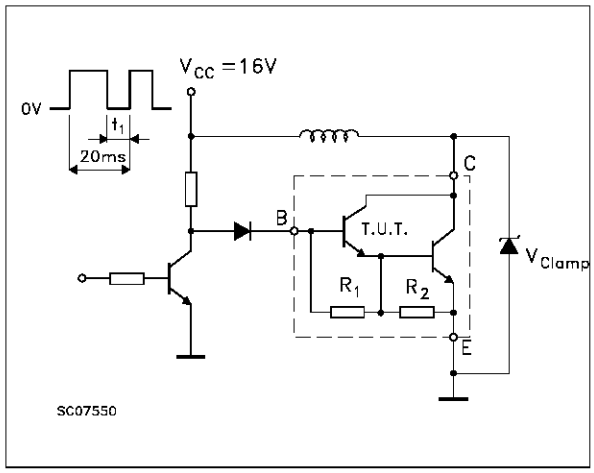
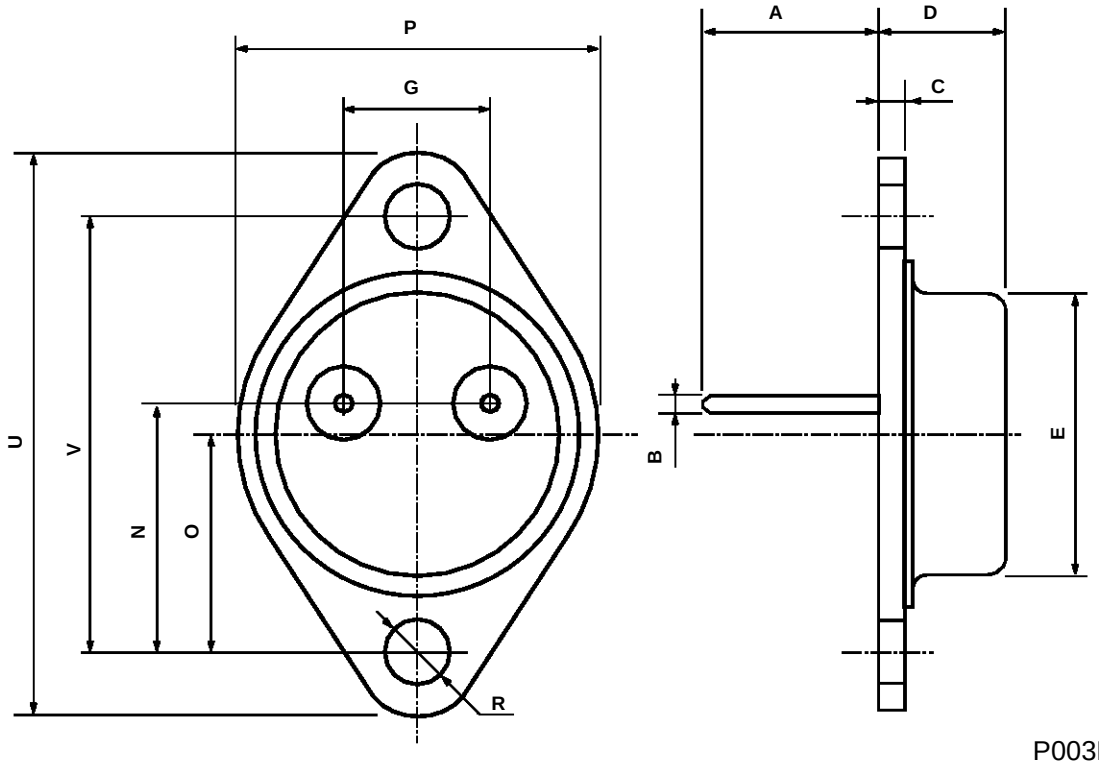


FIGURE 4: Sustaining Voltage Test Circuit



TO-3 MECHANICAL DATA

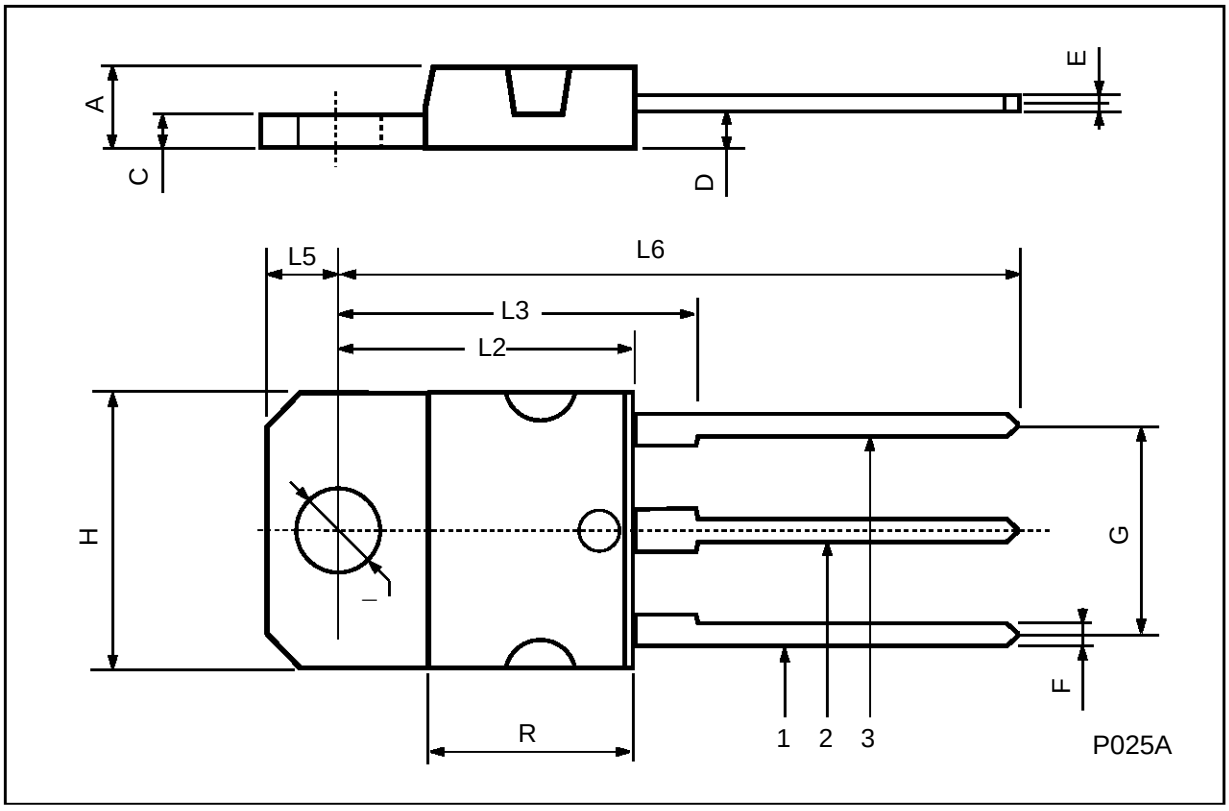
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	11.00		13.10	0.433		0.516
B	0.97		1.15	0.038		0.045
C	1.50		1.65	0.059		0.065
D	8.32		8.92	0.327		0.351
E	19.00		20.00	0.748		0.787
G	10.70		11.10	0.421		0.437
N	16.50		17.20	0.649		0.677
P	25.00		26.00	0.984		1.023
R	4.00		4.09	0.157		0.161
U	38.50		39.30	1.515		1.547
V	30.00		30.30	1.187		1.193



P003F

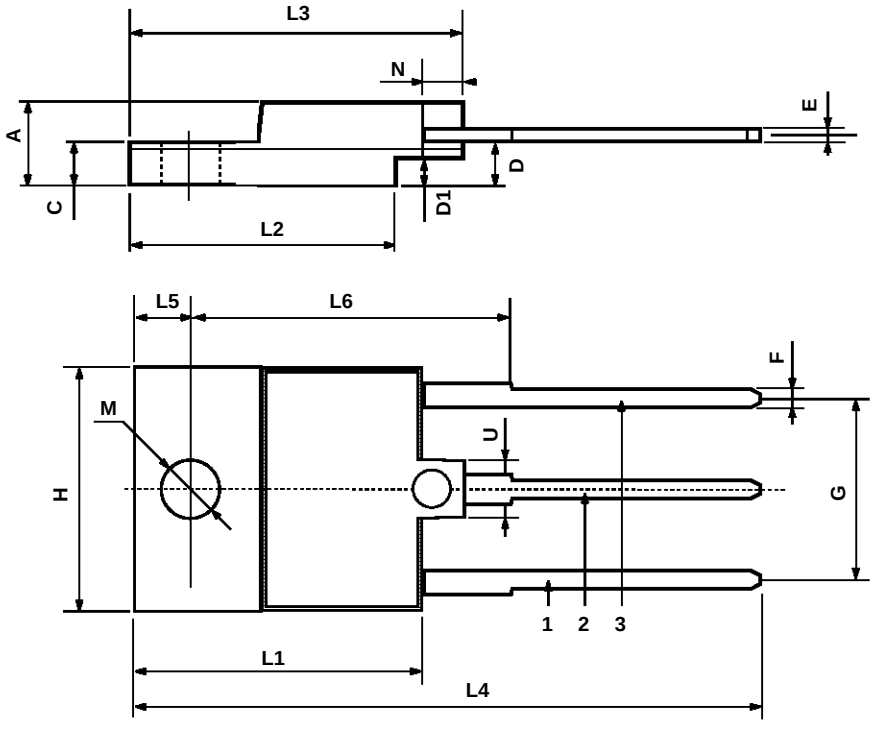
TO-218 (SOT-93) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.7		4.9	0.185		0.193
C	1.17		1.37	0.046		0.054
D		2.5			0.098	
E	0.5		0.78	0.019		0.030
F	1.1		1.3	0.043		0.051
G	10.8		11.1	0.425		0.437
H	14.7		15.2	0.578		0.598
L2	–		16.2	–		0.637
L3		18			0.708	
L5	3.95		4.15	0.155		0.163
L6		31			1.220	
R	–		12.2	–		0.480
Ø	4		4.1	0.157		0.161



ISOWATT218 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	5.35		5.65	0.210		0.222
C	3.3		3.8	0.130		0.149
D	2.9		3.1	0.114		0.122
D1	1.88		2.08	0.074		0.081
E	0.75		1	0.029		0.039
F	1.05		1.25	0.041		0.049
G	10.8		11.2	0.425		0.441
H	15.8		16.2	0.622		0.637
L1	20.8		21.2	0.818		0.834
L2	19.1		19.9	0.752		0.783
L3	22.8		23.6	0.897		0.929
L4	40.5		42.5	1.594		1.673
L5	4.85		5.25	0.190		0.206
L6	20.25		20.75	0.797		0.817
M	3.5		3.7	0.137		0.145
N	2.1		2.3	0.082		0.090
U		4.6			0.181	



P025C