SGS-THOMSON MICROELECTRONICS

BU931T/BU931TFI BU931SM

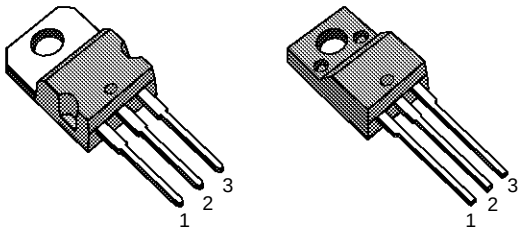
HIGH VOLTAGE IGNITION COIL DRIVER NPN POWER DARLINGTON

PRELIMINARY DATA

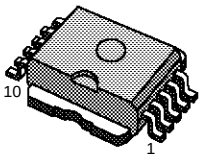
- VERY RUGGED BIPOLAR TECHNOLOGY
- HIGH OPERATING JUNCTION TEMPERATURE
- WIDE RANGE OF PACKAGES
- POWER PACKAGE SPECIFICALLY DESIGNED FOR SURFACE MOUNTING (Power SO-10™)

APPLICATIONS

- HIGH RUGGEDNESS ELECTRONIC IGNITIONS

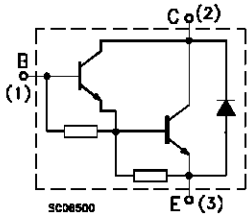


TO-220 **ISOWATT220**



Power SO-10™

INTERNAL SCHEMATIC DIAGRAM



for **Power SO-10**
Emitter: pins 1 - 5
Base: pins 6 - 10
Collector: tab

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value			Unit
		BU931T	BU931TFI	BU931SM	
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	10			A
I_{CM}	Collector Peak Current	15			A
I_B	Base Current	1			A
I_{BM}	Base Peak Current	5			A
P_{tot}	Total Dissipation at T_c = 25 °C	125	45	125	W
T_{stg}	Storage Temperature	-65 to 175	-65 to 175	-65 to 175	°C
T_j	Max. Operating Junction Temperature	175	175	175	°C

THERMAL DATA

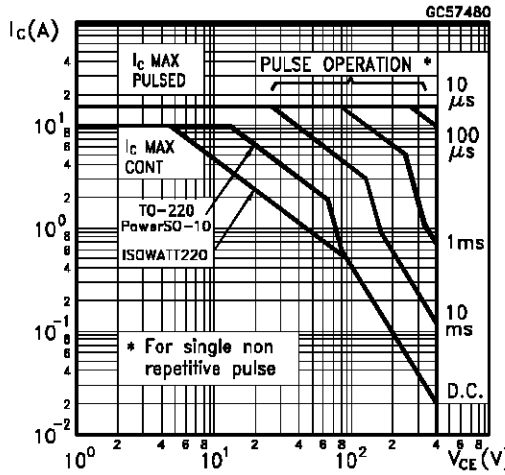
		TO-220	ISOWATT220	PowerSO-10	
$R_{thj\text{-}case}$	Thermal Resistance Junction-case Max	1.2	3.3	1.2	°C/W

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

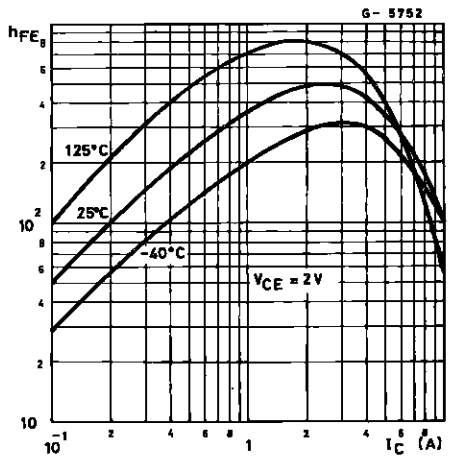
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 500 V V_{CE} = 500 V T_j = 125 °C			100 0.5	µA mA
I_{CEO}	Collector Cut-off Current (I_B = 0)	V_{CE} = 400 V V_{CE} = 450 V T_j = 125 °C			100 0.5	µA mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V			20	mA
$V_{CEO(SUS)}$*	Collector-Emitter Saturation 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			1.6 1.8	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			2.2 2.4	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 %

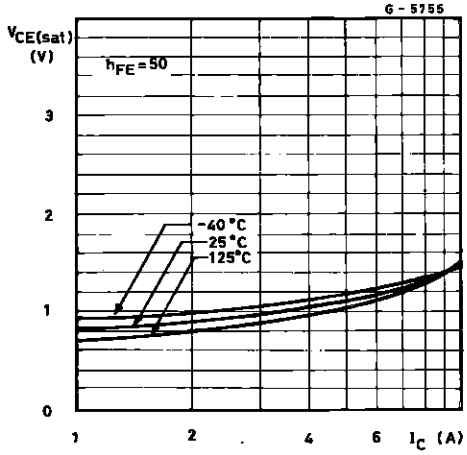
Safe Operating Areas



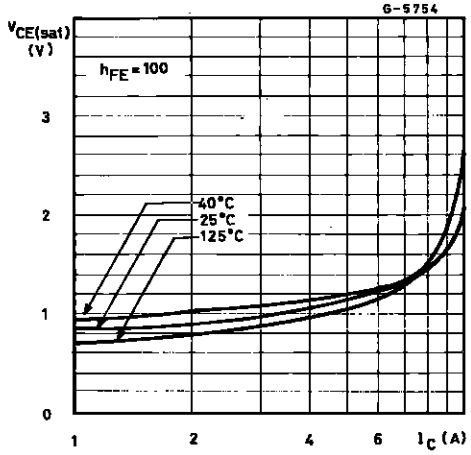
DC Current Gain



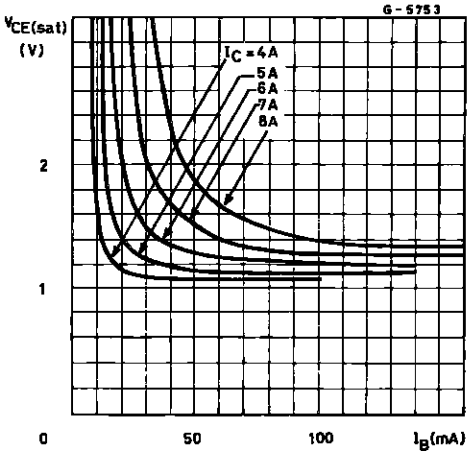
Collector-emitter Sturation Voltage



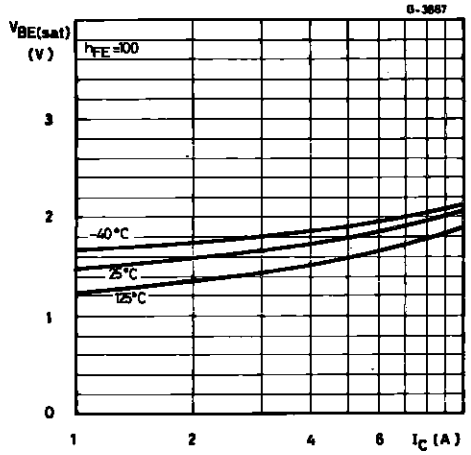
Collector-emitter Sturation Voltage



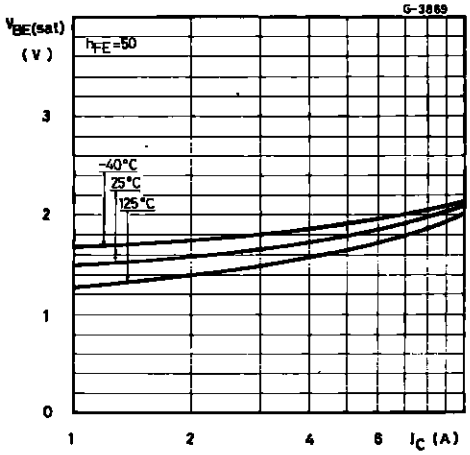
Collector-emitter Sturation Voltage



Base-emitter Sturation Voltage



Base-emitter Sturation Voltage



Switching Times Inductive Load

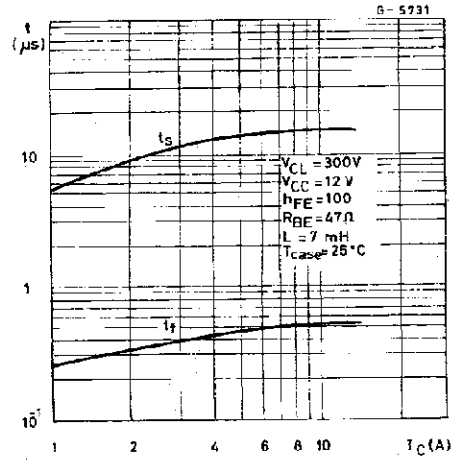


FIGURE 1: Functional Test Circuit

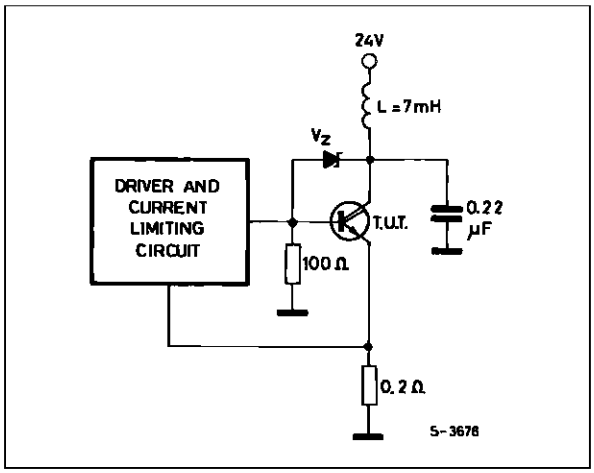


FIGURE 2: Functional Test Waveforms

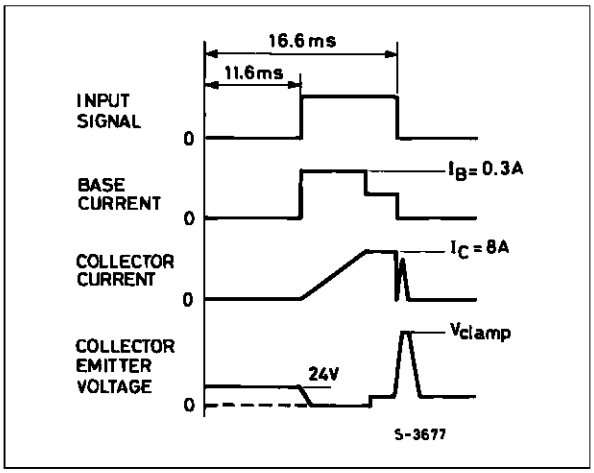


FIGURE 3: Switching Time Test Circuit

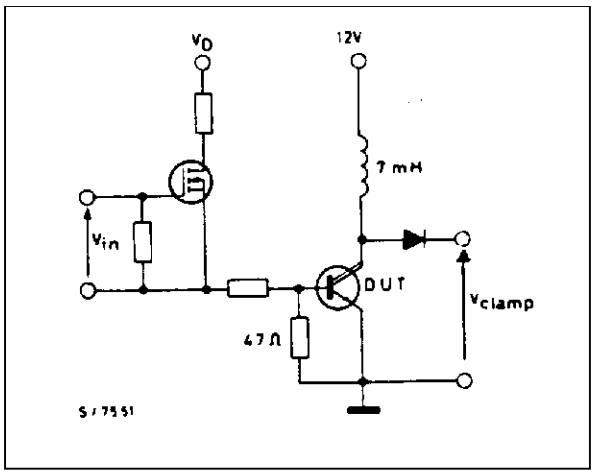
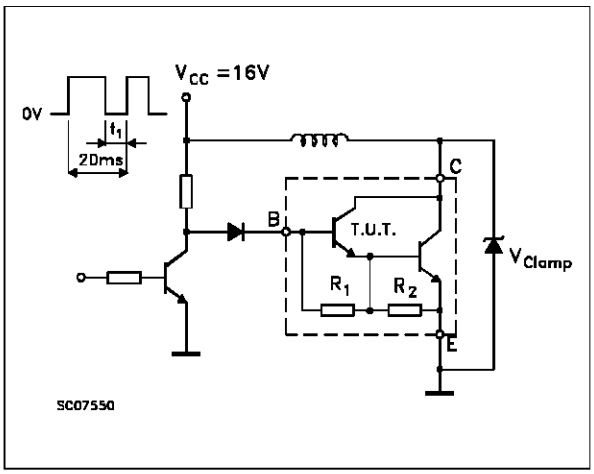
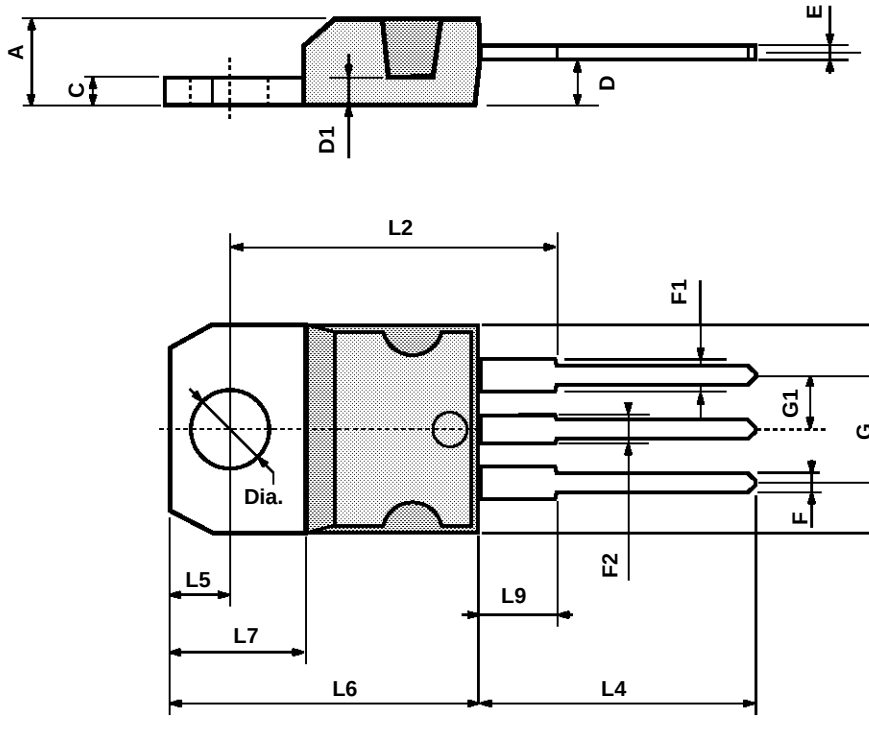


FIGURE 4: Sustaining Voltage Test Circuit



TO-220 MECHANICAL DATA

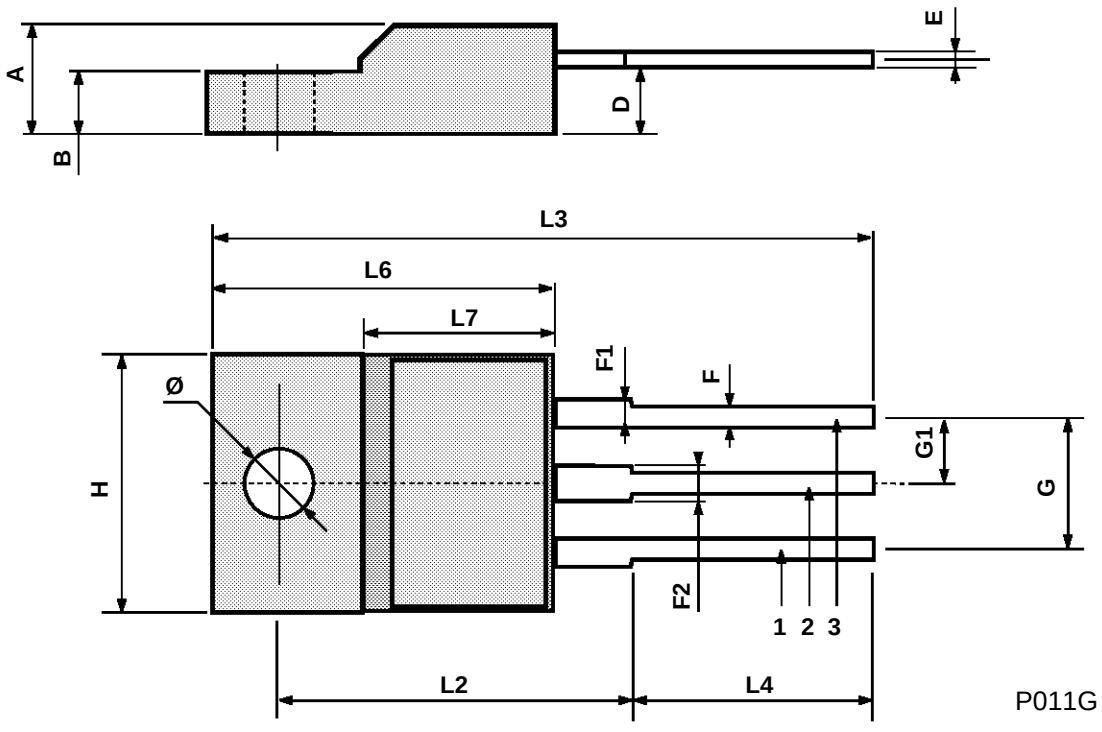
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151



P011C

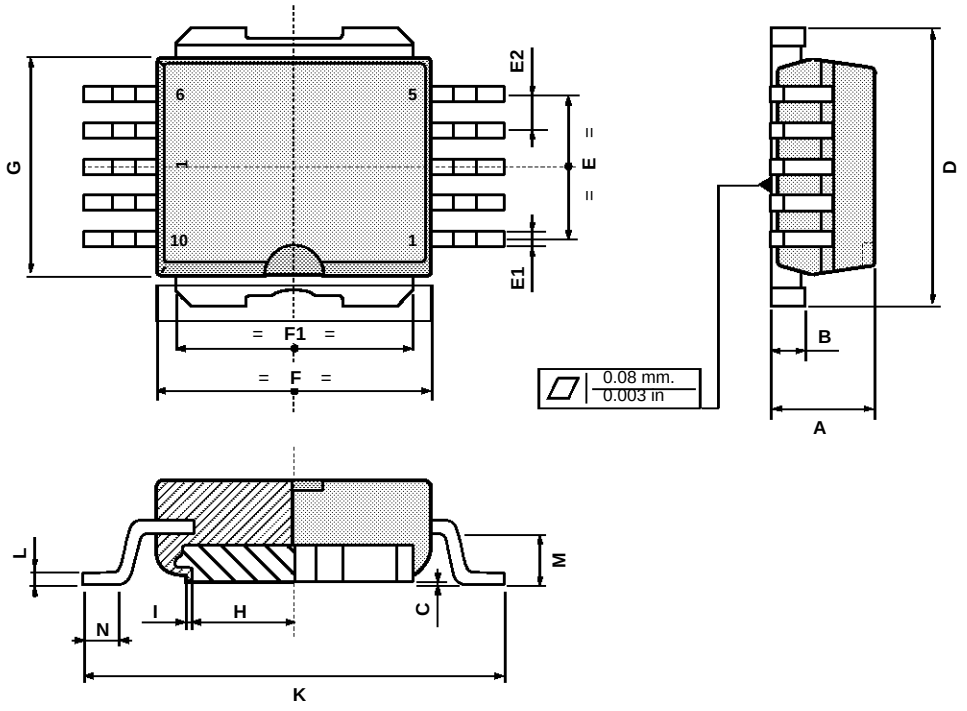
ISOWATT220 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
B	2.5		2.7	0.098		0.106
D	2.5		2.75	0.098		0.108
E	0.4		0.7	0.015		0.027
F	0.75		1	0.030		0.039
F1	1.15		1.7	0.045		0.067
F2	1.15		1.7	0.045		0.067
G	4.95		5.2	0.195		0.204
G1	2.4		2.7	0.094		0.106
H	10		10.4	0.393		0.409
L2		16			0.630	
L3	28.6		30.6	1.126		1.204
L4	9.8		10.6	0.385		0.417
L6	15.9		16.4	0.626		0.645
L7	9		9.3	0.354		0.366
Ø	3		3.2	0.118		0.126



Power SO-10 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	3.45	3.5	3.55	0.135	0.137	0.140
B		1.28	1.30		0.050	0.051
C			0.15			0.006
D	9.40	9.50	9.60	0.370	0.374	0.378
E	4.98	5.08	5.48	0.196	0.200	0.216
E1	0.40	0.45	0.60	0.016	0.018	0.024
E2	1.17	1.27	1.37	0.046	0.050	0.054
F	9.30	9.40	9.50	0.366	0.370	0.374
F1	7.95	8.00	8.15	0.313	0.315	0.321
G	7.40	7.50	7.60	0.291	0.295	0.299
H	6.80	6.90	7.00	0.267	0.417	0.421
I		0.10			0.004	
K	13.80	14.10	14.40	0.543	0.555	0.567
L		0.40	0.50		0.016	0.020
M	1.60	1.67	1.80	0.063	0.066	0.071
N	0.60	0.08	1.00	0.024	0.031	0.039



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