

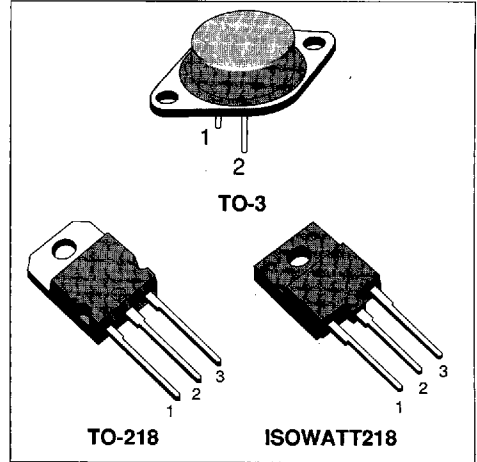
## HIGH VOLTAGE IGNITION COIL DRIVER NPN POWER DARLINGTON

PRELIMINARY DATA

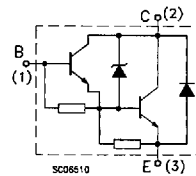
- VERY RUGGED BIPOLAR TECHNOLOGY
- BUILT IN CLAMPING ZENER
- HIGH OPERATING JUNCTION TEMPERATURE
- WIDE RANGE OF PACKAGES

### APPLICATIONS

- HIGH RUGGEDNESS ELECTRONIC IGNITIONS



### INTERNAL SCHEMATIC DIAGRAM



for TO-3  
 Emitter: pin 2  
 Base: pin 1  
 Collector: tab

### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value			Unit
		BU931Z	BU931ZP	BU931ZPFI	
$V_{CES}$	Collector-Base Voltage ( $V_{BE} = 0$ )	350			V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	350			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 $T_c = 25^\circ\text{C}$	175	150	60	W
$T_{stg}$	Storage Temperature	-65 to 200	-65 to 175	-65 to 150	$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	200	175	150	$^\circ\text{C}$

**THERMAL DATA**

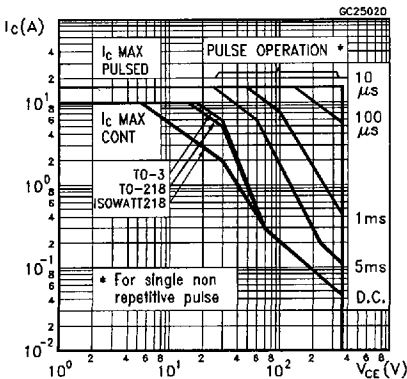
		<b>TO-3</b>	<b>TO-218</b>	<b>ISOWATT218</b>	
$R_{thj-case}$	Thermal Resistance Junction-case Max	1	1	2.8	°C/W

**ELECTRICAL CHARACTERISTICS** ( $T_{case} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)

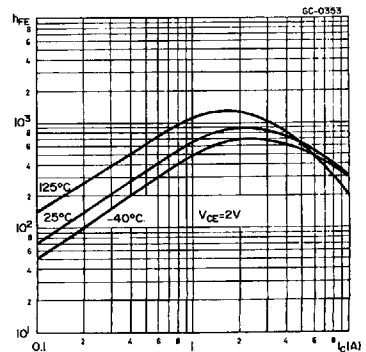
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cut-off Current ( $V_{BE} = 0$ )	$V_{CE} = 450\text{ V}$			250	$\mu\text{A}$
		$V_{CE} = 450\text{ V}$ $T_j = 150\text{ }^{\circ}\text{C}$			0.5	$\text{mA}$
$I_{CES}$	Collector Cut-off Current ( $V_{BE} = 0$ )	$V_{CE} = 400\text{ V}$			250	$\mu\text{A}$
					0.5	$\text{mA}$
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = 5\text{ V}$			20	$\text{mA}$
$V_{CL}^*$	Clamping Voltage	$I_C = 100\text{ mA}$	350		500	V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 7\text{ A}$ $I_B = 70\text{ mA}$			1.6	V
		$I_C = 8\text{ A}$ $I_B = 100\text{ mA}$			1.8	V
		$I_C = 10\text{ A}$ $I_B = 250\text{ mA}$			1.8	V
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = 10\text{ A}$ $I_B = 250\text{ mA}$			2.5	V
$h_{FE}^*$	DC Current Gain	$I_C = 5\text{ A}$ $V_{CE} = 10\text{ V}$	300		2000	
$V_F$	Diode Forward Voltage	$I_F = 10\text{ A}$			2	V
	Functional Test (see fig. 1)	$V_{CC} = 24\text{ V}$ $L = 7\text{ mH}$	8			A
$t_s$ $t_f$	INDUCTIVE LOAD Storage Time Fall Time (see fig. 3)	$V_{CC} = 12\text{ V}$ $L = 7\text{ mH}$ $V_{clamp} = 300\text{ V}$		15		$\mu\text{s}$
		$I_C = 7\text{ A}$ $I_B = 70\text{ mA}$ $V_{BE} = 0$ $R_{BE} = 47\text{ }\Omega$		0.5		$\mu\text{s}$

\* Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle 1.5 %

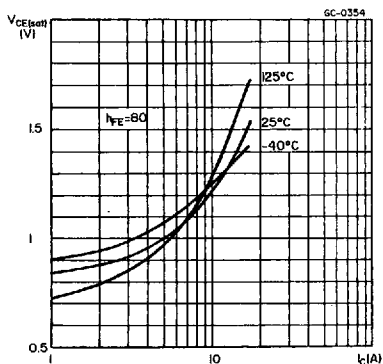
**Safe Operating Areas**



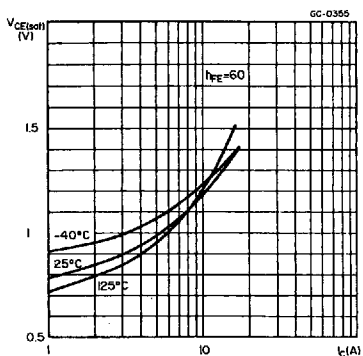
**DC Current Gain**



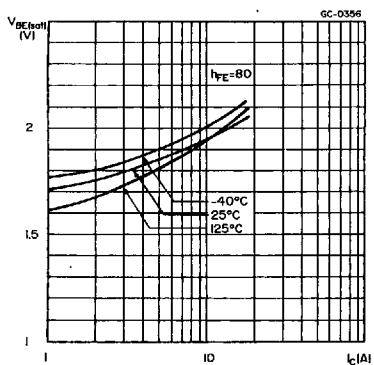
Collector-emitter Saturation Voltage



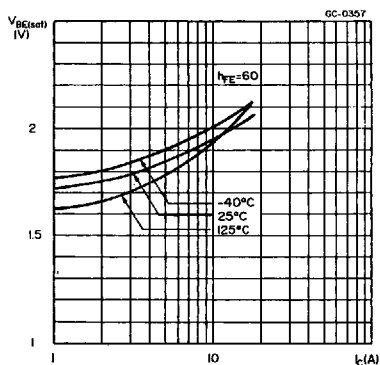
Collector-emitter Saturation Voltage



Base-emitter Saturation Voltage



Base-emitter Saturation Voltage



Collector-emitter Saturation Voltage

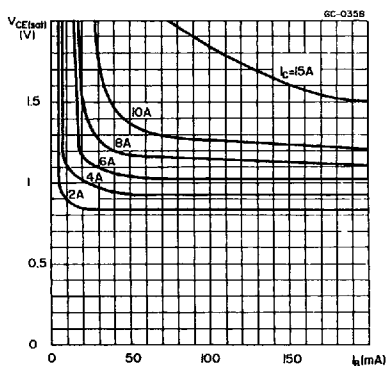


FIGURE 1: Functional Test Circuit

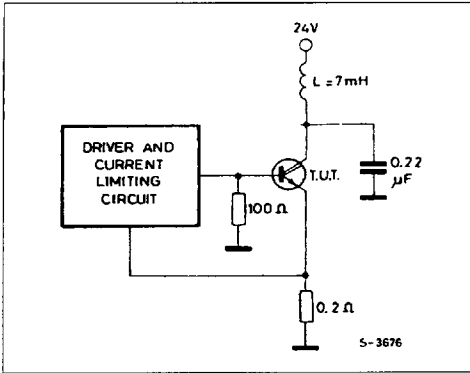


FIGURE 2: Functional Test Waveform

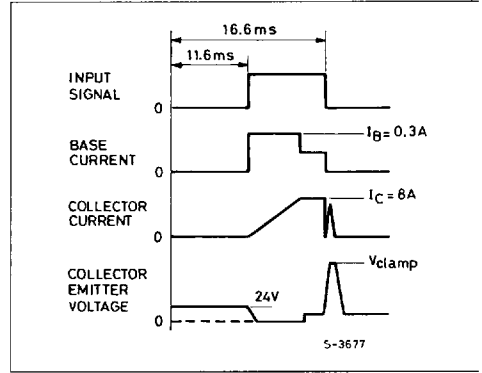


FIGURE 3: Switching Time Test Circuit

