BU505

High Voltage NPN Multiepitaxial Fast-Switching Transistor

Features

- HIGH VOLTAGE CAPABILITY
- VERY HIGH SWITCHING SPEED
- HIGH RUGGEDNESS

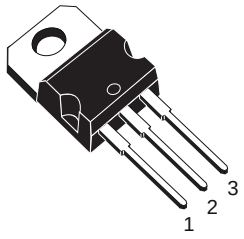
Applications

- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING
- SWITCH MODE POWER SUPPLIES

Description

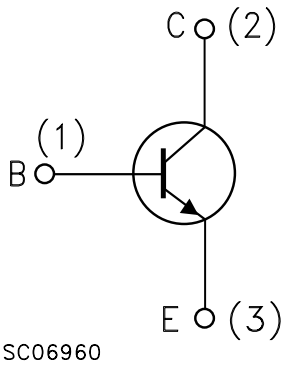
The BU505 is a High Voltage NPN fastswitching transistor designed to be used in lighting application, like electronic ballast for fluorescent lamps.

It's characteristics make also ideal for power supplies.



TO-220

Internal Schematic Diagram



Order Codes

Part Number	Marking	Package	Packing
BU505	BU505	TO-220	TUBE

1 Absolute Maximum Ratings

Table 1. Absolute Maximum Rating

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage (V_{BE} = 0)	1500	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	700	V
I_C	Collector Current	2.5	A
I_{CM}	Collector Peak Current (t_P < 5ms)	4	A
I_B	Base Current	1	A
I_{BM}	Base Peak Current (t_P < 5ms)	2	A
P_{TOT}	Total dissipation at T_c = 25°C	75	W
T_{STG}	Storage Temperature	-65 to 150	°C
T_J	Max. Operating Junction Temperature	150	°C

Table 2. Thermal Data

Symbol	Parameter		Value	Unit
$R_{thJ\text{-}case}$	Thermal Resistance Junction-Case	Max	1.67	°C/W

2 Electrical Characteristics

Table 3. 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} = 1500V V_{CE} = 1500V T_C = 125°C			0.15 1	mA mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5V			1	mA
$V_{CEO(SUS)}$ *Note: 1*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 10mA L = 25mH	700			V
$V_{CE(sat)}$ *Note: 1*	Collector-Emitter Saturation Voltage	I_C = 2A I_B = 0.9A			1	V
$V_{BE(sat)}$ *Note: 1*	Base-Emitter Saturation Voltage	I_C = 2A I_B = 0.9A			1.3	V
$I_{s/b}$	Second Breakdown Current	V_{CE} = 120V t = 220µs	2			A
 t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 2A V_{clamp} = 250V I_{B1} = 0.7A $V_{be(off)}$ = -5A R_{bb} = 0 L = 200 µH		 2 350		 µs ns

Note: 1 Pulsed duration = 300 µs, duty cycle ≤1.5%.

2.1 Typical Characteristics

Figure 1. Safe Operating Area

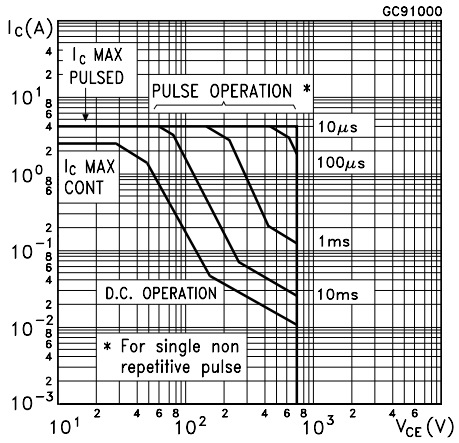


Figure 2. Derating Curve

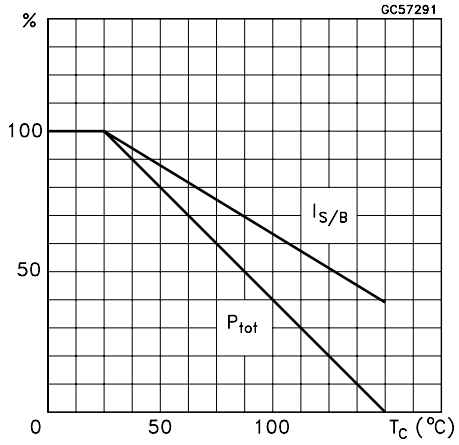


Figure 3. DC Current Gain

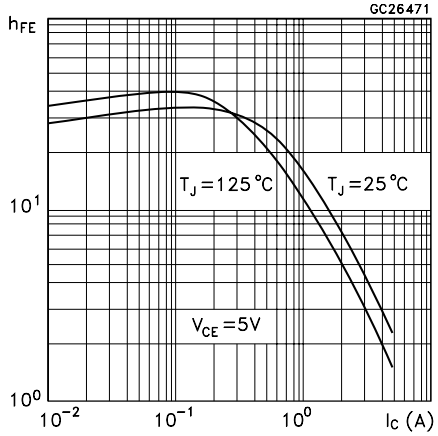


Figure 4. Collector Emitter Saturation Voltage

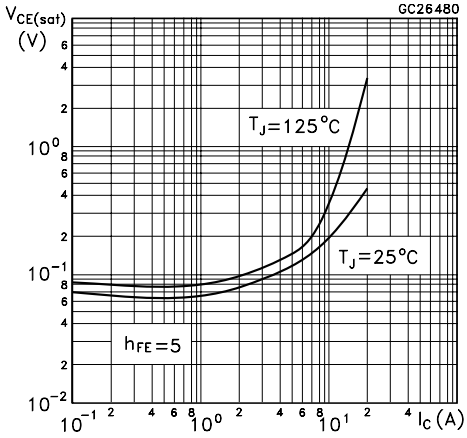


Figure 5. Base Emitter Storage Time

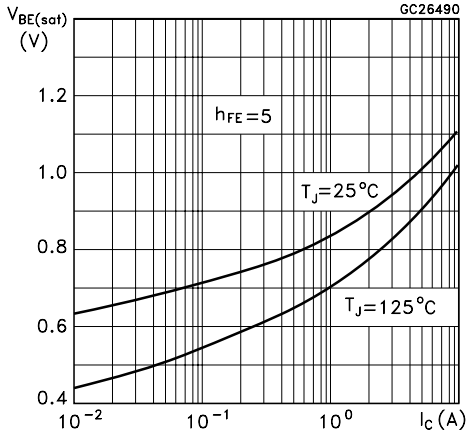


Figure 6. Inductive Fall Time

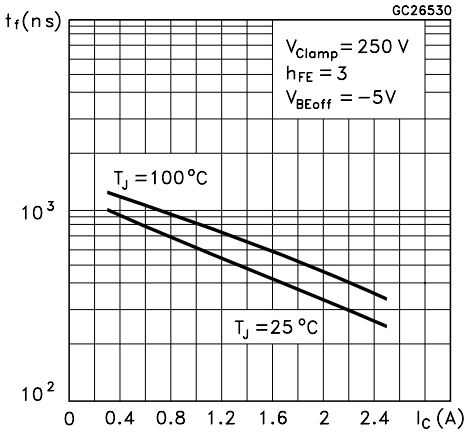


Figure 7. Inductive Storage Time

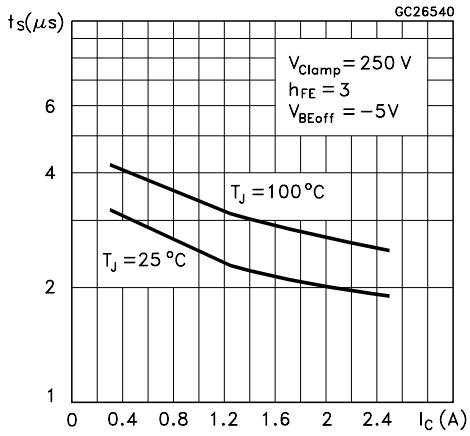
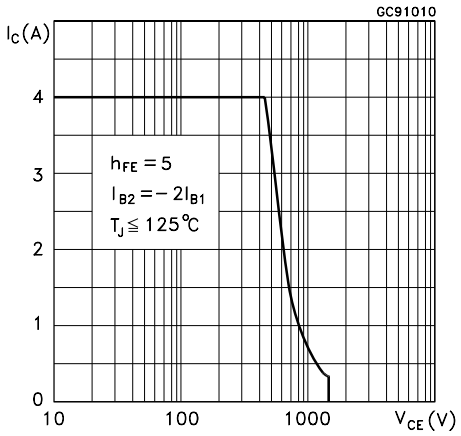
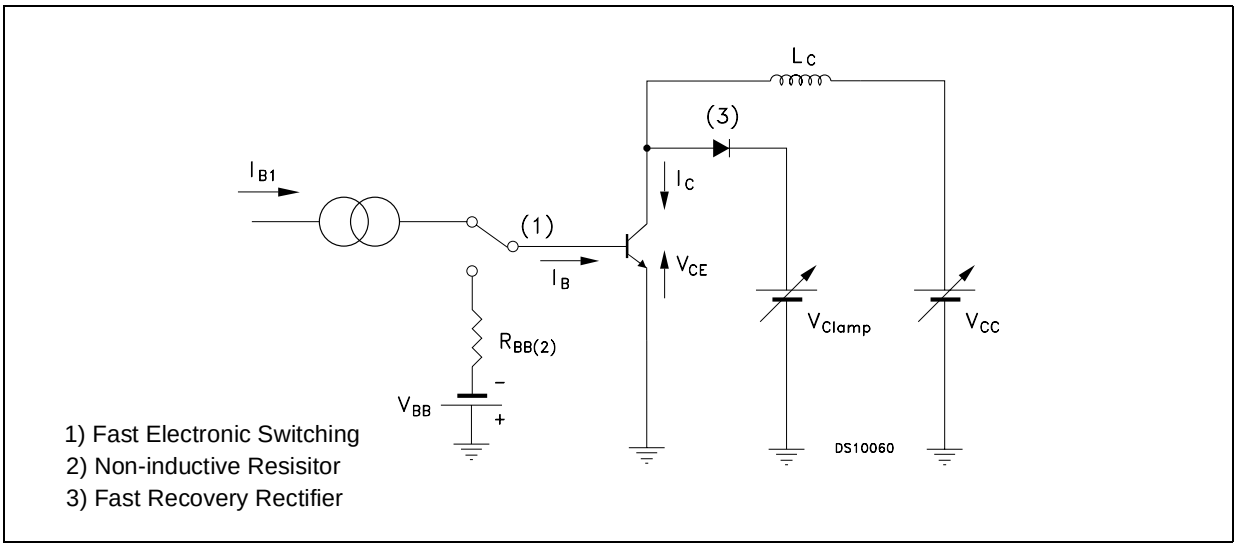


Figure 8. Reverse Biased SOA



3 Test Circuits

Figure 9. Inductive Load Switching Test Circuit

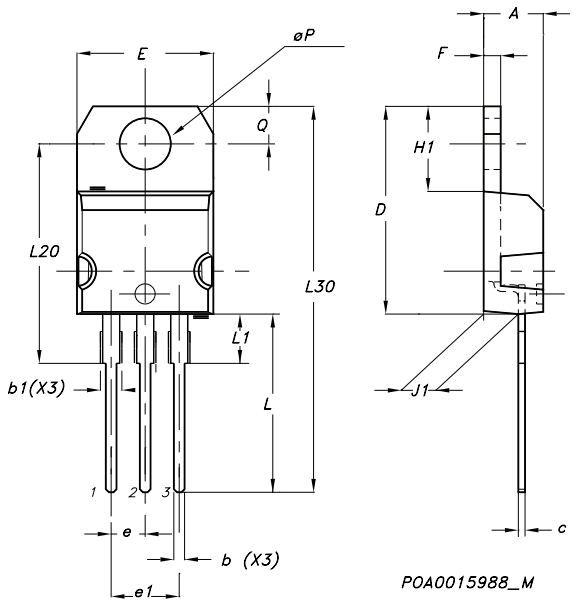


4 Package Mechanical Data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

TO-220 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
b	0.61		0.88	0.024		0.034
b1	1.15		1.70	0.045		0.066
c	0.49		0.70	0.019		0.027
D	15.25		15.75	0.60		0.620
E	10		10.40	0.393		0.409
e	2.40		2.70	0.094		0.106
e1	4.95		5.15	0.194		0.202
F	1.23		1.32	0.048		0.052
H1	6.20		6.60	0.244		0.256
J1	2.40		2.72	0.094		0.107
L	13		14	0.511		0.551
L1	3.50		3.93	0.137		0.154
L20		16.40			0.645	
L30		28.90			1.137	
øP	3.75		3.85	0.147		0.151
Q	2.65		2.95	0.104		0.116



5 Revision History

Date	Revision	Changes
05-Sep-2001	1	Initial release.
06-Jul-2005	2	Some value change in *Table 3.*
25-Jul-2005	3	New Template
19-Aug-2005	4	New ECOPACK® label