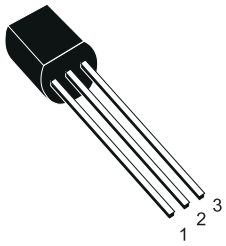
STX13005
STX13005-AP

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

Ordering Code	Marking	Shipment
STX13005 STX13005-AP	X13005 X13005	Bulk Ammopack

- HIGH VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED



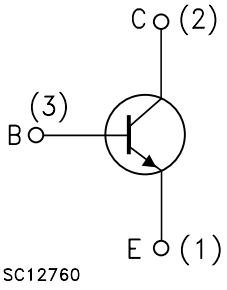
TO-92

APPLICATIONS:
- COMPACT FLUORESCENT LAMPS (CFLS)
- SWITCH MODE POWER SUPPLIES (AC / DC CONVERTERS)

DESCRIPTION
The device is manufactured using High Voltage Multi Epitaxial Planar technology for high switching speeds and high voltage capability.

It uses a Cellular Emitter structure with planar edge termination to enhance switching speeds while maintaining a wide RBSOA.

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage (V_{BE} = 0)	700	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	400	V
V_{EBO}	Emitter-Base Voltage (I_C = 0, I_B < 1.5 A, t_p < 10 ms)	$V_{(BR)EBO}$	V
I_C	Collector Current	3	A
I_{CM}	Collector Peak Current (t_p < 5 ms)	6	A
I_B	Base Current	1.5	A
I_{BM}	Base Peak Current (t_p < 5 ms)	3	A
P_{tot}	Total Dissipation at T_c = 25 °C	2.8	W
T_{stg}	Storage Temperature	–65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

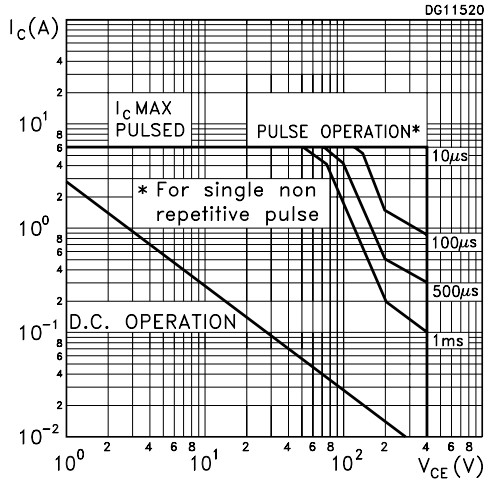
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	44.6	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	Max	150	°C/W

ELECTRICAL CHARACTERISTICS (T_j = 25 °C unless otherwise specified)

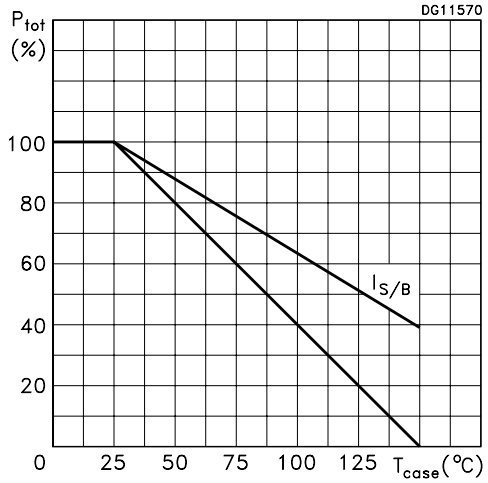
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 700 V V_{CE} = 700 V	 T_j = 100 °C			1 5	mA mA
I_{CEO}	Collector Cut-off Current (I_B = 0)	V_{CE} = 400 V				1	mA
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_C = 0)	I_E = 10 mA		9		18	V
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 10 mA		400			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 1 A I_C = 2 A I_C = 3 A	I_B = 200 mA I_B = 500 mA I_B = 750 mA			0.5 0.6 5	V V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 1 A I_C = 2 A	I_B = 200 mA I_B = 500 mA			1.2 1.6	V V
h_{FE}*	DC Current Gain	I_C = 1 A I_C = 2 A	V_{CE} = 5 V V_{CE} = 5 V	10 8		30 24	
 t_s t_f	RESISTIVE LOAD Storage Time Fall Time	I_C = 2 A I_{B1} = -I_{B2} = 400 mA (See Figure 1)	V_{CC} = 125 V t_p = 30 µs		 1.65 260		 µs ns
 t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 1 A I_{B1} = 200 mA L = 50 mH (See Figure 2)	V_{clamp} = 300 V $V_{BE(off)}$ = -5 V R_{BB} = 0		 0.8 150		 µs ns

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

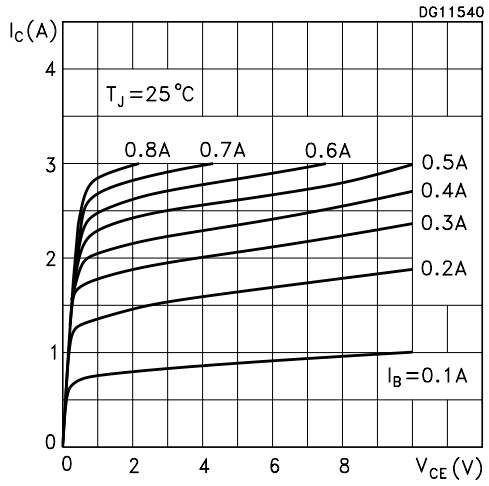
Safe Operating Area



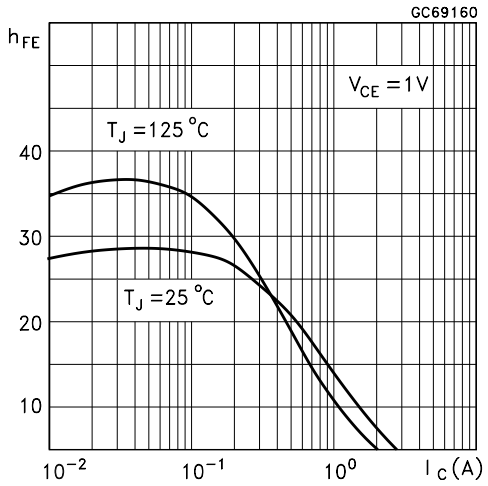
Derating Curve



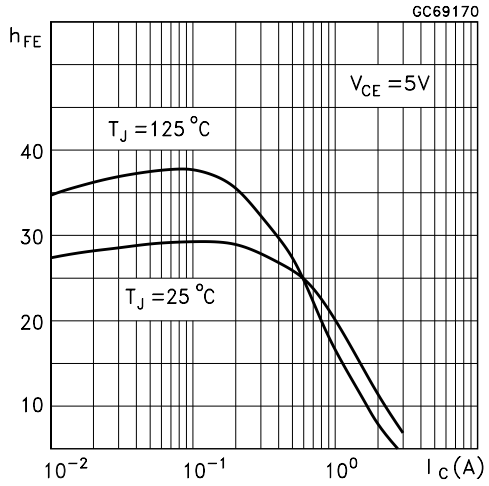
Output Characteristics



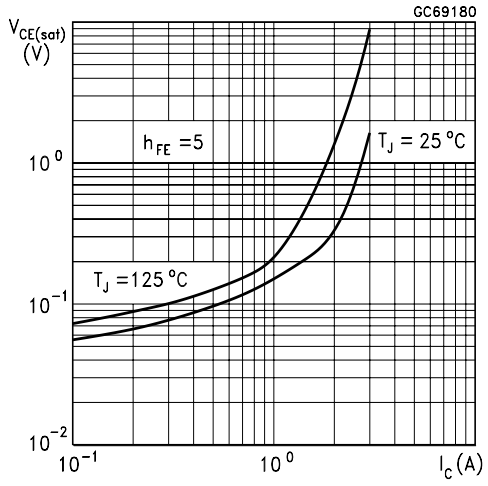
DC Current Gain



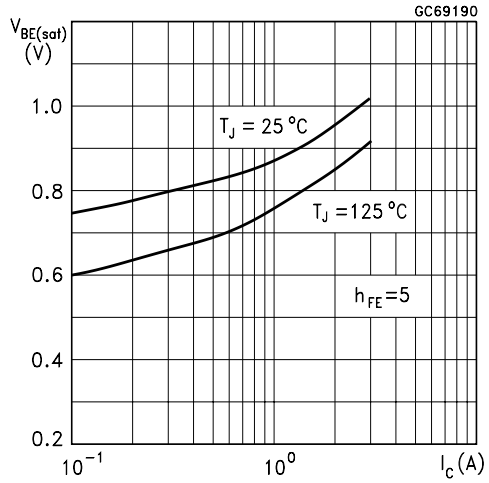
DC Current Gain



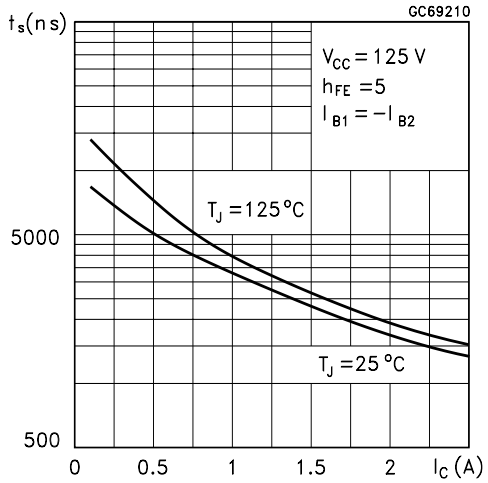
Collector-Emitter Saturation Voltage



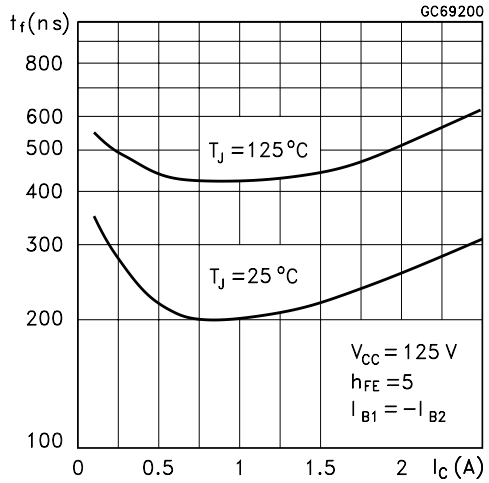
Base-Emitter Saturation Voltage



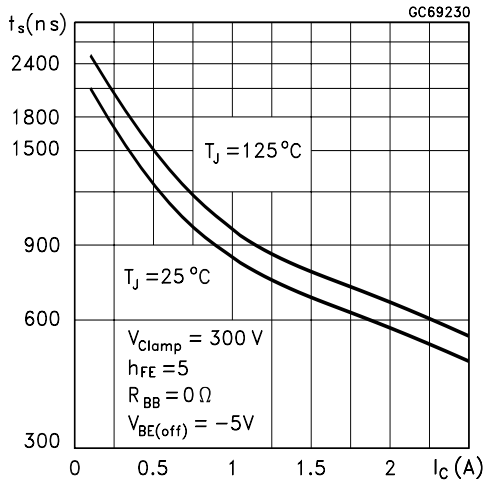
Resistive Load Storage Time



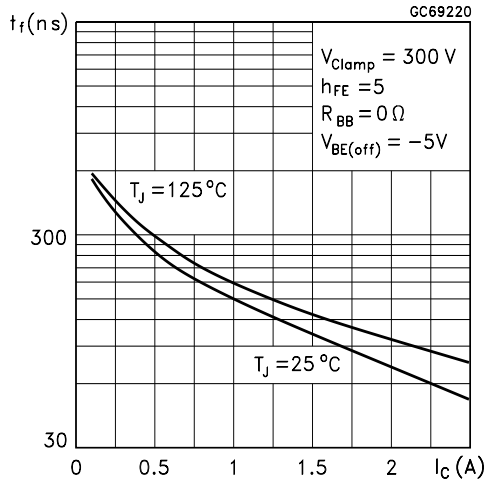
Resistive Load Fall Time



Inductive Load Storage Time



Inductive Load Fall Time



Reverse Biased Safe Operating Area

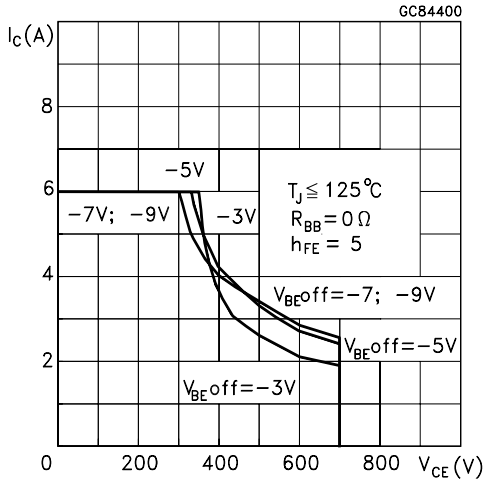


Figure 1: Resistive Load Switching Test Circuit

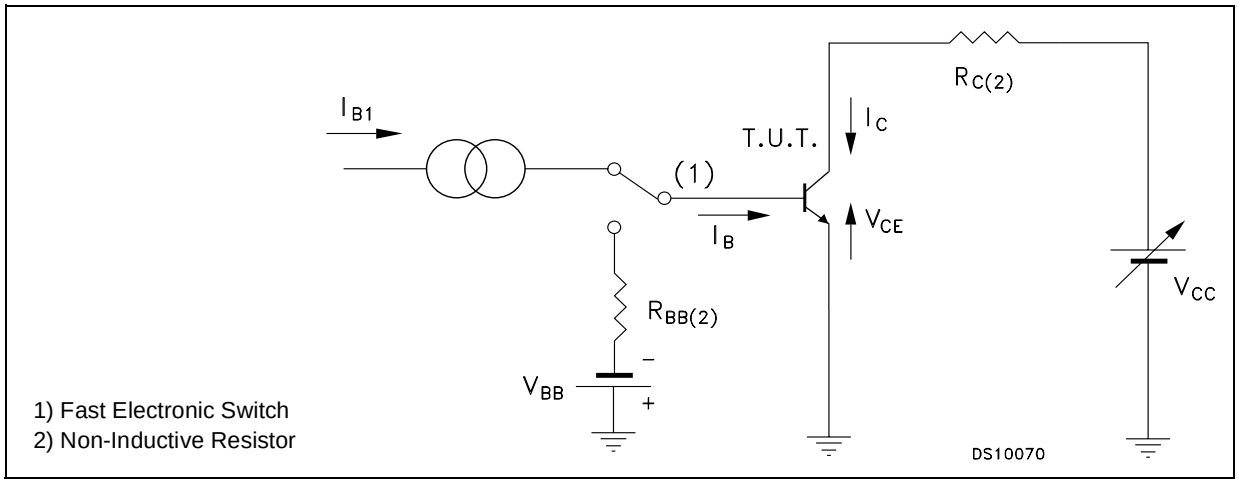
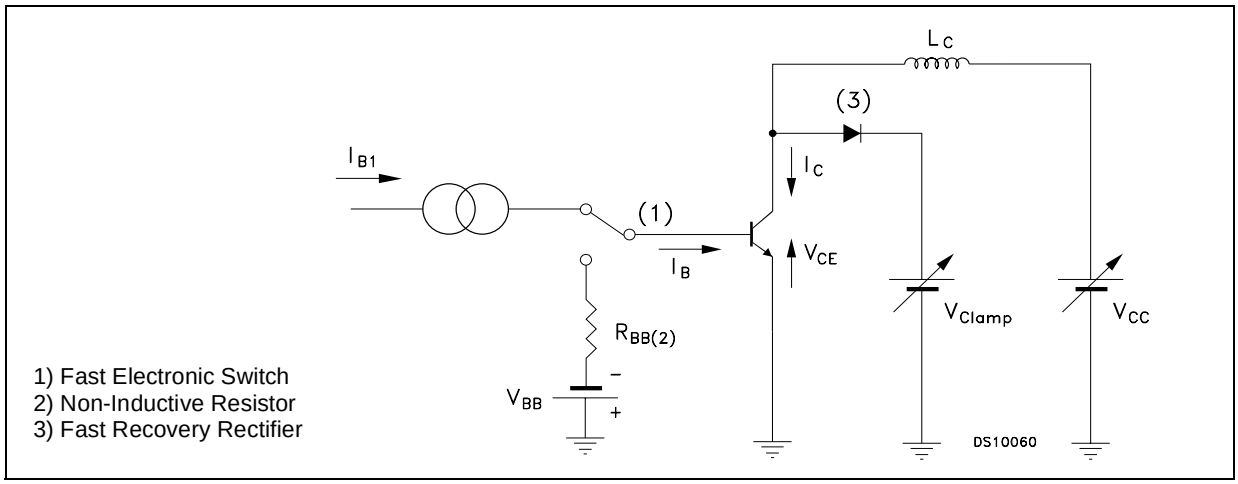
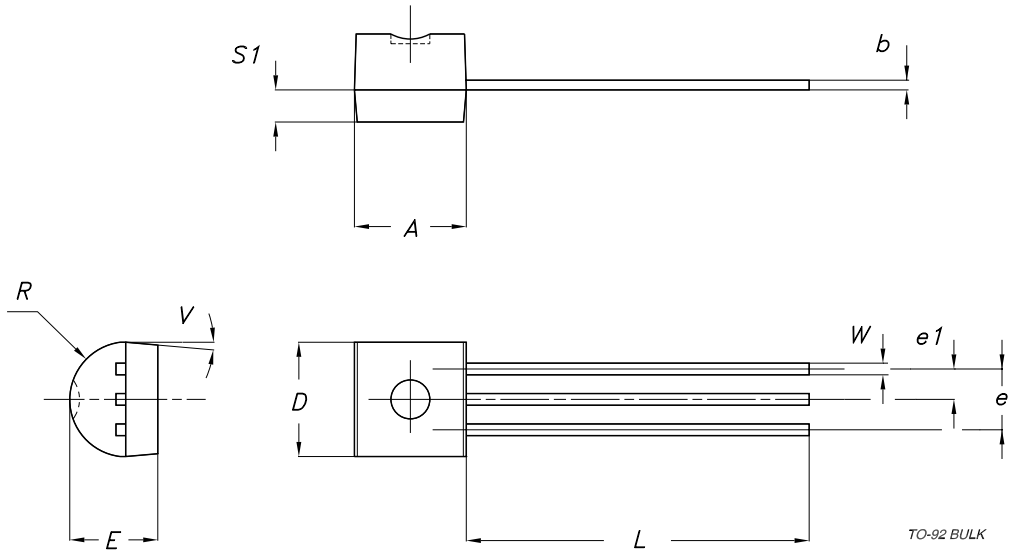


Figure 2: Inductive Load Switching Test Circuit



TO-92 BULK SHIPMENT MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.32		4.95	0.170		0.195
b	0.36		0.51	0.014		0.020
D	4.45		4.95	0.175		0.195
E	3.30		3.94	0.130		0.155
e	2.41		2.67	0.095		0.105
e1	1.14		1.40	0.045		0.055
L	12.70		15.49	0.500		0.610
R	2.16		2.41	0.085		0.095
S1	0.92		1.52	0.036		0.060
W	0.41		0.56	0.016		0.022
V		5°			5°	



TO-92 AMMOPACK SHIPMENT (Suffix "-AP") MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A1			4.80			0.189
T			3.80			0.150
T1			1.60			0.063
T2			2.30			0.091
d			0.48			0.019
P0	12.50	12.70	12.90	0.492	0.500	0.508
P2	5.65	6.35	7.05	0.222	0.250	0.278
F1, F2	2.44	2.54	2.94	0.096	0.100	0.116
delta H	-2.00		2.00	-0.079		0.079
W	17.50	18.00	19.00	0.689	0.709	0.748
W0	5.70	6.00	6.30	0.224	0.236	0.248
W1	8.50	9.00	9.25	0.335	0.354	0.364
W2			0.50			0.020
H	18.50		20.50	0.728		0.807
H0	15.50	16.00	16.50	0.610	0.630	0.650
H1			25.00			0.984
D0	3.80	4.00	4.20	0.150	0.157	0.165
t			0.90			0.035
L			11.00			0.433
l1	3.00			0.118		
delta P	-1.00		1.00	-0.039		0.039