



ST13007

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

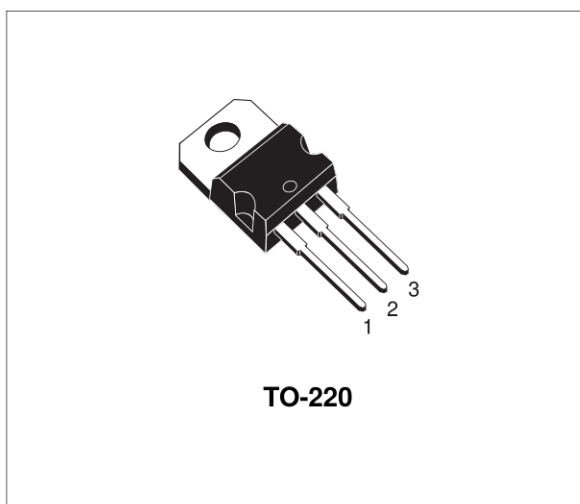
- IMPROVED SPECIFICATION:
 - LOWER LEAKAGE CURRENT
 - TIGHTER GAIN RANGE
 - DC CURRENT GAIN PRESELECTION
 - TIGHTER STORAGE TIME RANGE
- HIGH VOLTAGE CAPABILITY
- NPN TRANSISTOR
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED
- FULLY CHARACTERIZED AT 125 °C
- LARGE RBSOA

APPLICATIONS

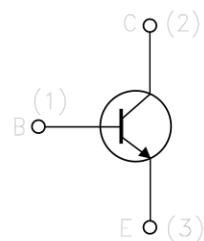
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING
- SWITCH MODE POWER SUPPLIES

DESCRIPTION

The device is manufactured using high voltage Multi Epitaxial Planar technology for high switching speeds and high voltage capability. They use a Cellular Emitter structure to enhance switching speeds.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CEV}	Collector-Emitter Voltage ($V_{BE} = -1.5V$)	700	V
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	400	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	9	V
I_C	Collector Current	8	A
I_{CM}	Collector Peak Current	16	A
I_B	Base Current	4	A
I_{BM}	Base Peak Current	8	A
P_{tot}	Total Dissipation at $T_c \leq 25^\circ C$	80	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-case	Max	1.56	$^{\circ}\text{C}/\text{W}$
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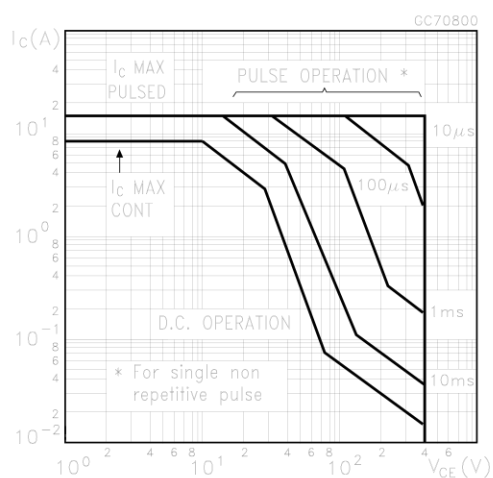
ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEV}	Collector Cut-off Current ($V_{BE} = -1.5\text{V}$)	$V_{CE} = \text{rated } V_{CEV}$ $V_{CE} = \text{rated } V_{CEV} \quad T_c = 100^{\circ}\text{C}$			10 0.5	μA mA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = 9\text{V}$			1	mA
$V_{CEO(sus)}^*$	Collector-Emitter Sustaining Voltage	$I_C = 10\text{mA}$	400			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 2\text{A} \quad I_B = 0.4\text{A}$ $I_C = 5\text{A} \quad I_B = 1\text{A}$ $I_C = 8\text{A} \quad I_B = 2\text{A}$ $I_C = 5\text{A} \quad I_B = 1\text{A} \quad T_c = 100^{\circ}\text{C}$			1 2 3 3	V V V V
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = 2\text{A} \quad I_B = 0.4\text{A}$ $I_C = 5\text{A} \quad I_B = 1\text{A}$ $I_C = 5\text{A} \quad I_B = 1\text{A} \quad T_c = 100^{\circ}\text{C}$			1.2 1.6 1.5	V V V
h_{FE}^*	DC Current Gain	$I_C = 2\text{A} \quad V_{CE} = 5\text{V}$ Group A Group B $I_C = 5\text{A} \quad V_{CE} = 5\text{V}$	16 26 5		30 40 30	
t_s t_f	RESISTIVE LOAD Storage Time Fall Time	$I_C = 2\text{A} \quad V_{CC} = 300\text{V}$ $I_{B1} = 0.4\text{A} \quad I_{B2} = -0.4\text{A}$ $t_p = 30\mu\text{s}$	3		4.5 350	μs ns
t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	$I_C = 5\text{A} \quad V_{CL} = 250\text{V}$ $I_{B1} = 1\text{A} \quad I_{B2} = -2\text{A}$ $L = 200\mu\text{H}$		1.6 60	2.5 110	μs ns
t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	$I_C = 5\text{A} \quad V_{CL} = 250\text{V}$ $I_{B1} = 1\text{A} \quad I_{B2} = -2\text{A}$ $L = 200\mu\text{H} \quad T_c = 125^{\circ}\text{C}$		2.3 110		μs ns

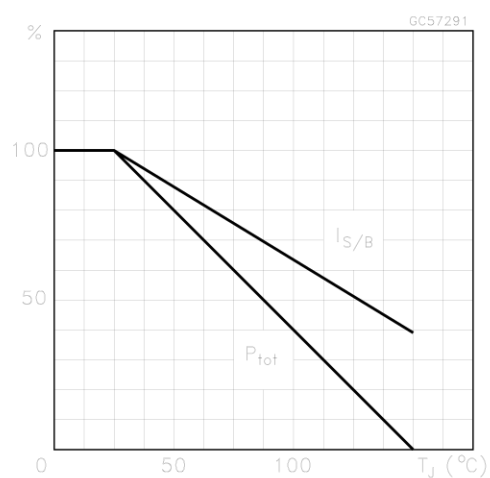
* Pulsed: Pulse duration = 300 μs , duty cycle 2 %

Note : DC current gain pre-selected product (Group A and Group B). STMicroelectronics reserves the right to ship either groups according to production availability. Please contact your nearest STMicroelectronics sales office for delivery details.

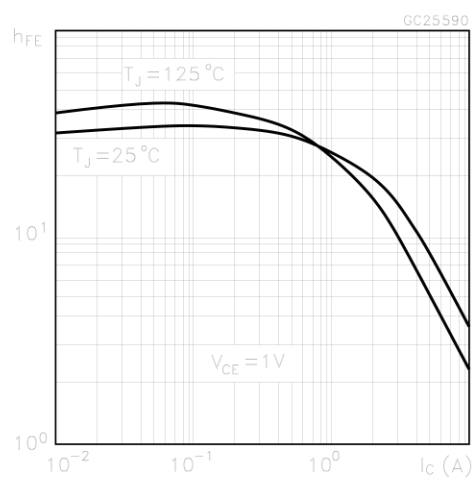
Safe Operating Areas



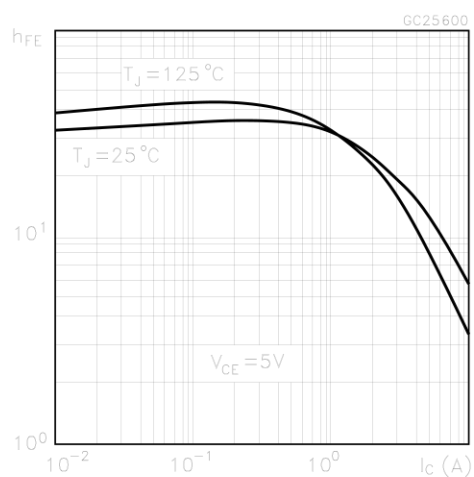
Derating Curve



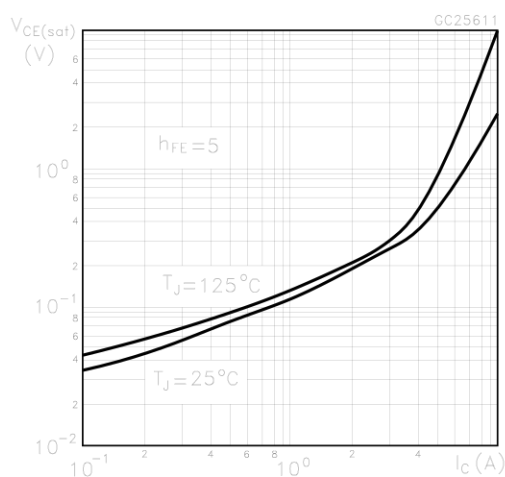
DC Current Gain



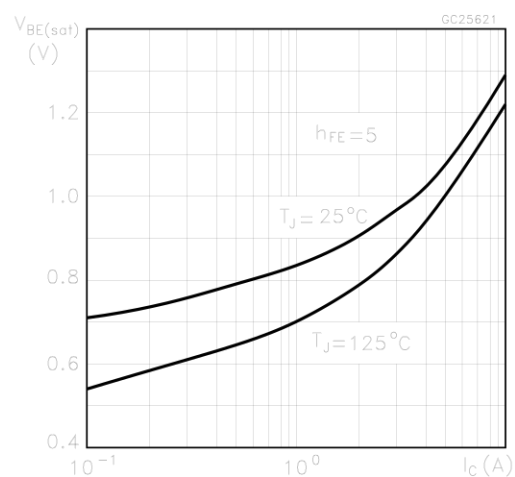
DC Current Gain



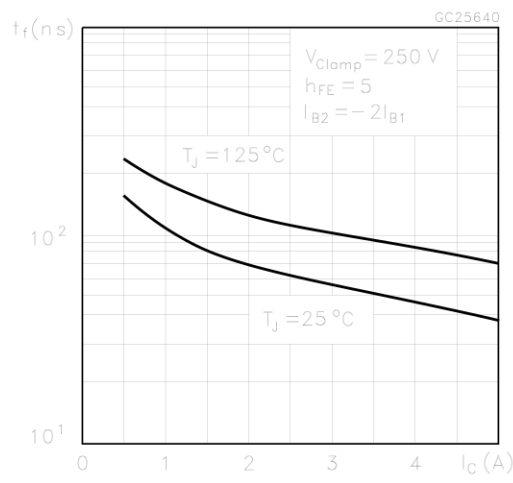
Collector Emitter Saturation Voltage



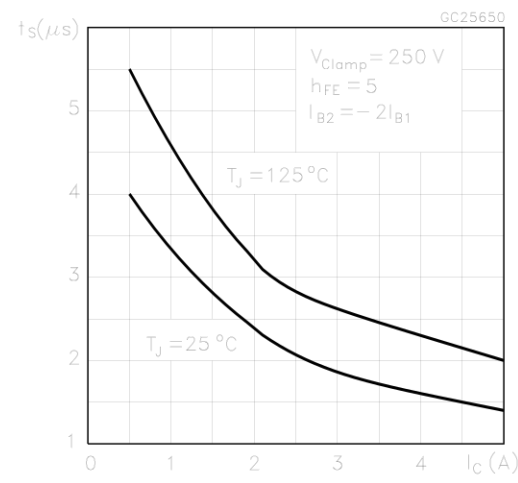
Base Emitter Saturation Voltage



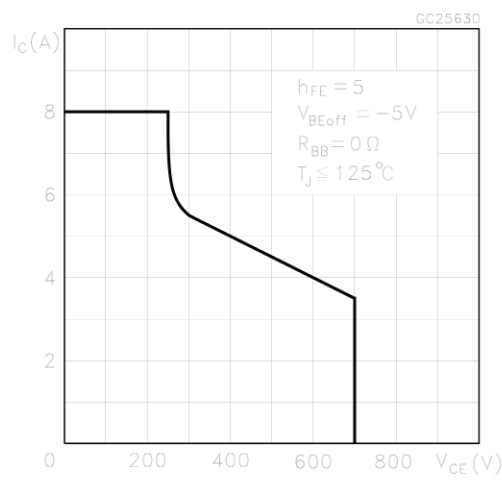
Inductive Fall Time



Inductive Storage Time

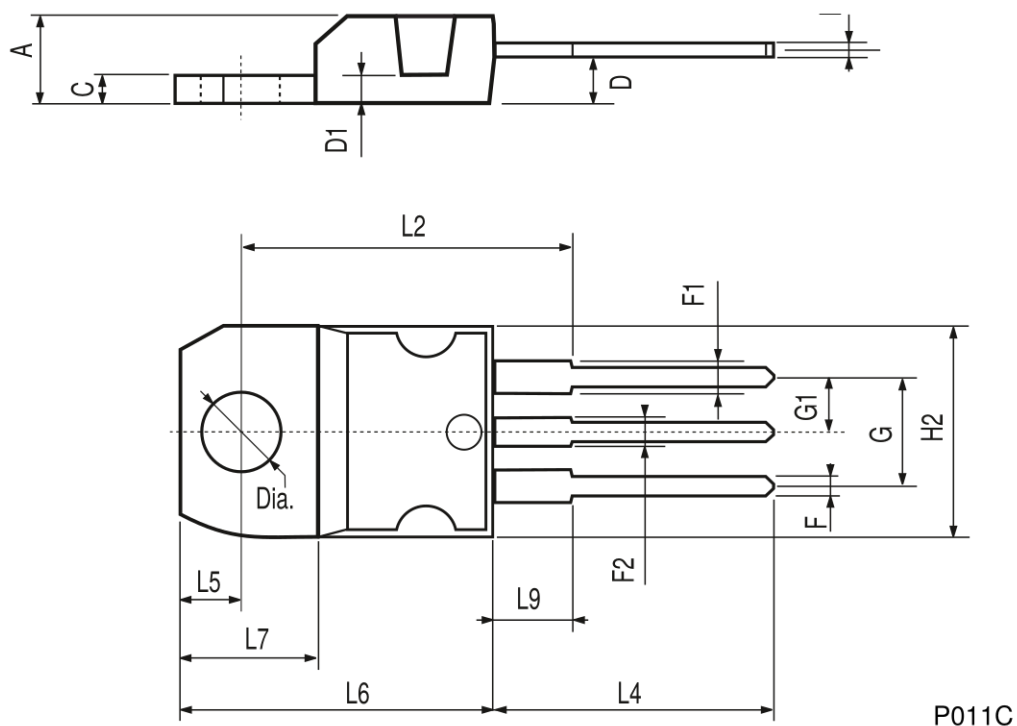


Reverse Biased SOA



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



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