



# BUT11A

## HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

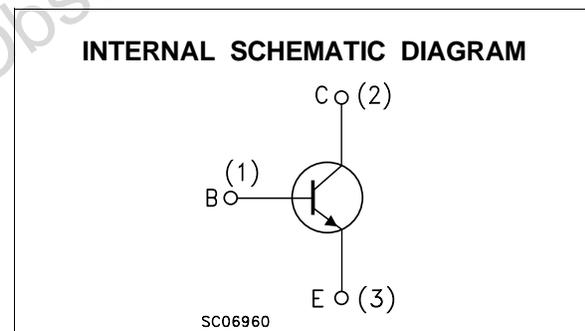
- STMicroelectronics PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH VOLTAGE CAPABILITY
- FAST SWITCHING SPEED

### APPLICATIONS:

- FLYBACK AND FORWARD SINGLE TRANSISTOR LOW POWER CONVERTERS

### DESCRIPTION

The BUT11A is a silicon Multiepitaxial Mesa NPN transistor in Jedec TO-220 plastic package, particularly intended for switching application.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CES}$	Collector-Emitter Voltage ( $V_{BE} = 0$ V)	1000	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	450	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	9	V
$I_C$	Collector Current	5	A
$I_{CM}$	Collector Peak Current ( $t_p < 5$ ms)	10	A
$I_B$	Base Current	2	A
$I_{BM}$	Base Peak Current ( $t_p < 5$ ms)	4	A
$P_{tot}$	Total Power Dissipation at $T_c \leq 25$ °C	83	W
$T_{stg}$	Storage Temperature	-65 to 150	°C
$T_j$	Max. Operating Junction Temperature	150	°C

**THERMAL DATA**

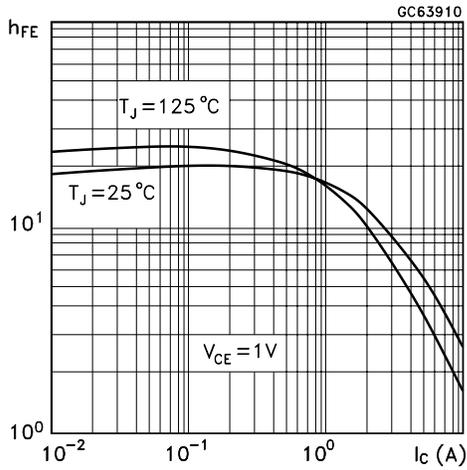
$R_{thj-case}$	Thermal Resistance Junction-case	Max	1.5	$^{\circ}C/W$
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**ELECTRICAL CHARACTERISTICS** ( $T_{case} = 25^{\circ}C$  unless otherwise specified)

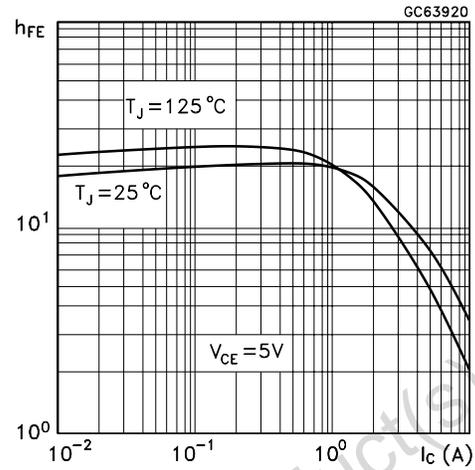
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cut-off Current ( $V_{BE} = 0$ )	$V_{CE} = \text{rated } V_{CES}$ at $T_c = 125^{\circ}C$			1 2	mA mA
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$I_C = 0$ $V_{BE} = 9 V$			10	mA
$V_{CEO(sus)*}$	Collector-emitter Sustaining Voltage ( $I_B = 0$ )	$I_{B(off)} = 0$ $I_C = 100 mA$	450			V
$V_{CE(sat)*}$	Collector-emitter Saturation Voltage	$I_C = 2.5 A$ $I_B = 0.5 A$			1.5	V
$V_{BE(sat)*}$	Base-emitter Saturation Voltage	$I_C = 2.5 A$ $I_B = 0.5 A$			1.3	V
$h_{FE}$	DC Current Gain	$I_C = 5 mA$ $V_{CE} = 5 V$ $I_C = 0.5 A$ $V_{CE} = 5 V$	10 10		35 35	
$t_{on}$ $t_s$ $t_f$	RESISTIVE LOAD Turn on Time Storage Time Fall Time	$I_C = 2.5 A$ $V_{CC} = 250 V$ $I_B = -I_{B2} = 0.5 A$			1 4 0.8	$\mu s$ $\mu s$ $\mu s$

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

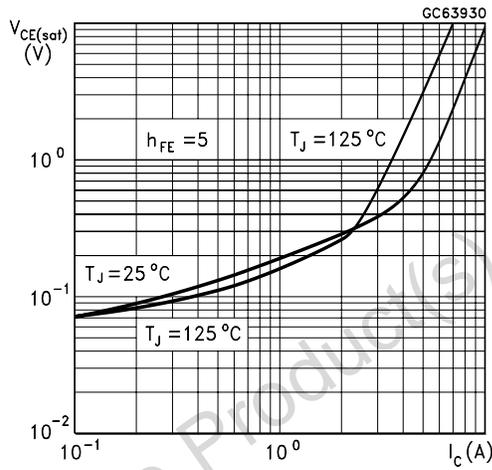
DC Current Gain



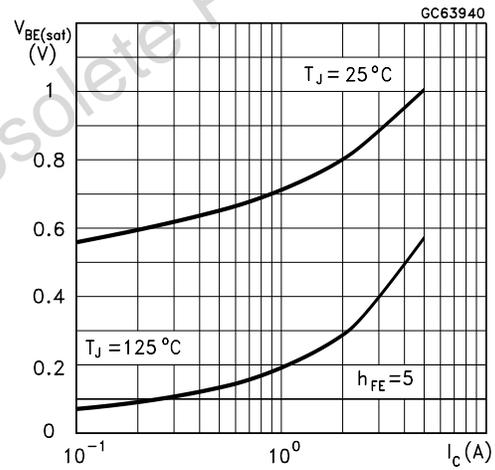
DC Current Gain



Collector-Emitter Saturation Voltage

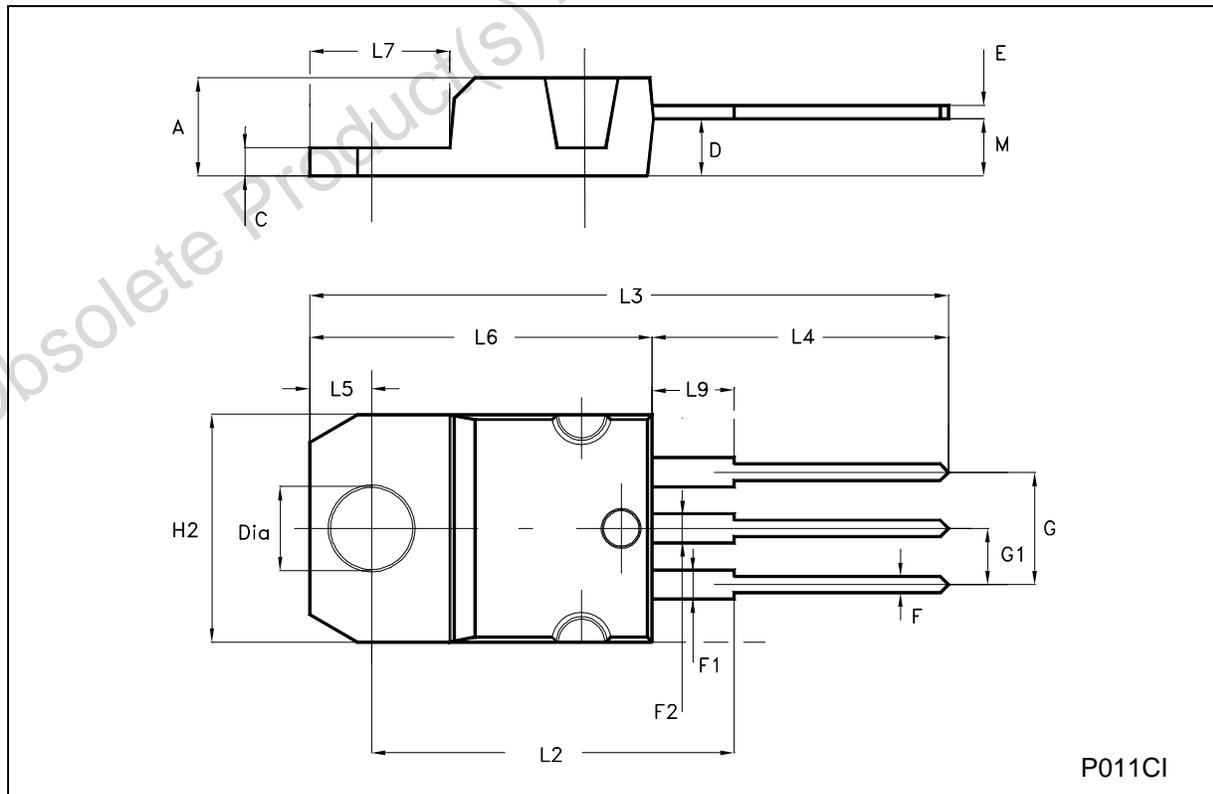


Base-Emitter Saturation Voltage



**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		0.052
D	2.40		2.72	0.094		0.107
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		0.202
G1	2.40		2.70	0.094		0.106
H2	10.00		10.40	0.394		0.409
L2		16.40			0.645	
L4	13.00		14.00	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.20		6.60	0.244		0.260
L9	3.50		3.93	0.137		0.154
M		2.60		0.102		
DIA.	3.75		3.85	0.147		0.151



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