

## Description:

Switch mode Series NPN Power Transistors are designed for use in high-voltage, highspeed, power switching regulators, converters, inverters, motor control system application.

## Features:

- Collector-Emitter Sustaining Voltage -  
 $V_{CEO(sus)} = 400V$  (Min.)
- Collector-Emitter Saturation Voltage -  
 $V_{CE(sat)} = 1V$  (Max.) at  $I_C = 1A$ ,  $I_B = 0.2A$
- Switching Time-  $t_f = 0.6\mu s$  (Max.) at  $I_C = 1A$

## Maximum Ratings

Characteristic	Symbol	BU406	Unit
Collector-Emitter Voltage	$V_{CEO}$	400	V
Collector-Emitter Voltage ( $V_{BE} = 0$ )	$V_{CES}$	800	
Emitter-Base Voltage	$V_{EBO}$	10	
Collector Current-Continuous -Peak	$I_C$ $I_{CM}$	2 3	A
Base Current	$I_B$	0.75	
Total Power Dissipation at $T_C = 25^\circ C$ Derate above $25^\circ C$	$P_D$	40 0.32	W W/ $^\circ C$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +150	$^\circ C$

## Thermal Characteristics

Characteristic	Symbol	Max.	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	3.125	$^\circ C/W$

## Electrical Characteristics ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Unit
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### OFF Characteristics

Collector-Emitter Sustaining Voltage $I_C = 0.2\text{A}, I_B = 0, L = 25\text{mH}$	$V_{CEO(sus)}$	400	-	V
Collector Cut off Current $V_{CE} = V_{CES}, V_{BE} = 0$ $V_{CE} = V_{CES}, V_{BE} = 0, T_C = 125^\circ\text{C}$	$I_{CES}$	-	0.2 1.5	mA
Emitter Cut off Current $V_{EB} = 5\text{V}, I_C = 0$	$I_{EBO}$	-	1	

### ON Characteristics (1)

DC Current Gain $I_C = 100\text{mA}, V_{CE} = 5\text{V}$	$h_{FE}$	30 (Typ.)	-	-
Collector-Emitter Saturation Voltage $I_C = 0.3\text{A}, I_B = 30\text{mA}$ $I_C = 1\text{A}, I_B = 0.2\text{A}$	$V_{CE(sat)}$	-	0.8 1	V
Base-Emitter Saturation Voltage $I_C = 1\text{A}, I_B = 0.2\text{A}$	$V_{BE(sat)}$	-	1.1	

### Dynamic Characteristics

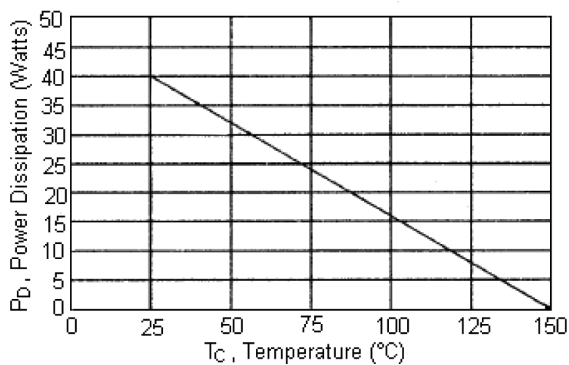
Current Gain-Bandwidth Product $I_C = 0.2\text{A}, V_{CE} = 10\text{V}, f = 1\text{MHz}$	$f_T$	20 (Typ.)	-	MHz
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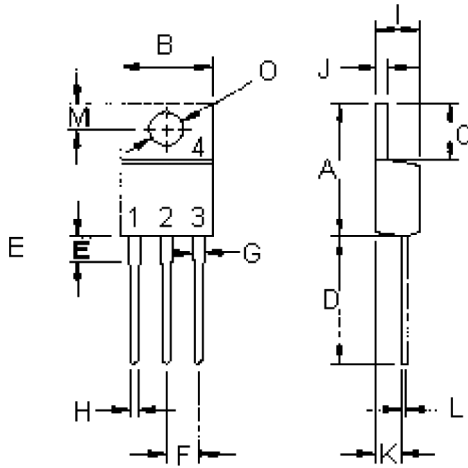
### Switching Characteristics

Turn On Time	$V_{CC} = 250\text{V}, I_C = 1\text{A}$ $I_{B1} = 0.2\text{A}, I_{B2} = -0.4\text{A}$	$t_{on}$	-	0.5	$\mu\text{s}$
Storage Time		$t_s$	-	3.5	
Fall Time		$t_f$	-	0.6	

(1) Pulse Test: Pulse Width = 300 $\mu\text{s}$ , Duty Cycle  $\leq 2\%$

Figure - 1 Power Derating





**Pin Configuration:**

- 1. Base
- 2. Collector
- 3. Emitter
- 4. Collector(Case)

Dimensions	Min.	Max.
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.2	2.97
L	0.33	0.55
M	2.48	2.98
O	3.7	3.9

Dimensions : Millimetres

**Part Number Table**

Description	Part Number
Transistor, NPN, TO-220	BUX84

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