Silicon NPN Power Transistor

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Features:

- High voltage capability
- High current capability
- Fast switching speed

Applications:

Designed for high-voltage, high-speed, power switching in inductive circuits where fall time is critical. They are particularly suited for line-operated switch mode applications such as:

- Switching regulators
- Inverters
- Solenoid and relay drivers
- Motor controls
- Deflection circuits

PIN
1. Base
2. Emitter
3. Collector (case)
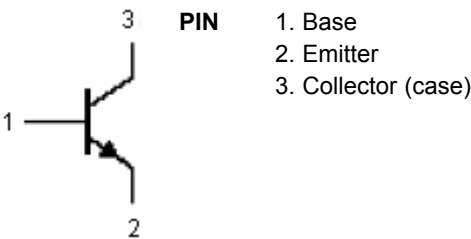
TO-3
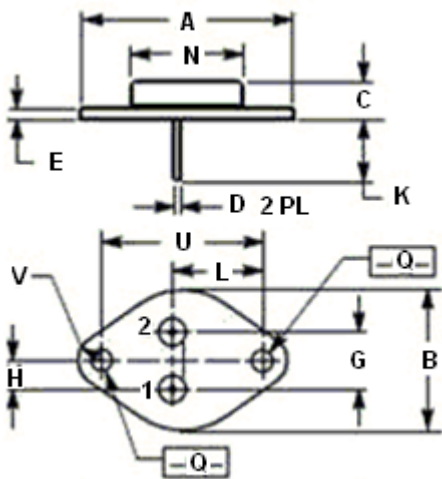
Dimension	mm	
	Minimum	**Maximum**
A	39	
B	25.3	26.67
C	7.8	8.3
D	0.9	1.1
E	1.4	1.6
G	10.92	
H	5.46	
K	11.4	13.5
L	16.75	17.5
N	19.4	19.62
Q	4	4.2
U	30	30.2
V	4.3	4.5

Dimensions : Millimetres

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Absolute Maximum Ratings (T_a = 25°C)

Symbol	Parameter	Value	Unit
V_{CEX}	Collector - emitter voltage (V_{BE} = -1.5 V)	850	V
V_{CEO}	Collector - emitter voltage	400	V
V_{EBO}	Emitter - base voltage	7	V
I_C	Collector current - continuous	15	A
I_{CM}	Collector current - peak	30	A
I_B	Base current - continuous	4	A
I_{BM}	Base current - peak	20	A
P_C	Collector power dissipation at T_C = 25°C	175	W
T_j	Junction temperature	200	°C
T_{stg}	Storage temperature range	-65 to 200	°C

Thermal Characteristics

Symbol	Parameter	Maximum	Unit
$R_{th\ j-c}$	Thermal resistance, junction to case	1	°C/W

Electrical Characteristics (T_C = 25°C Unless Otherwise Specified)

Symbol	Parameter	Conditions	Minimum	Maximum	Unit
$V_{CEO\ (SUS)}$	Collector - emitter sustaining voltage	I_C = 0.2 A; I_B = 0; L = 25 mH	400	-	V
$V_{(BR)\ EBO}$	Emitter - base breakdown voltage	I_E = 50 mA; I_C = 0	7	-	V
$V_{CE\ (sat)\ -1}$	Collector - emitter sustaining voltage	I_C = 10 A; I_B = 2 A I_C = 10 A; I_B = 2 A; T_C = 100°C	-	1.5 2	V
$V_{CE\ (sat)\ -2}$	Collector - emitter sustaining voltage	I_C = 15 A; I_B = 3 A	-	5	V
$V_{BE(sat)}$	Base - emitter sustaining voltage	I_C = 10 A; I_B = 2 A I_C = 10 A; I_B = 2 A; T_C = 100°C	-	1.6 1.6	V
I_{CER}	Collector cutoff current	V_{CE} = rated V_{CER}; R_{BE} = 10 Ω V_{CE} = rated V_{CER}; R_{BE} = 10 Ω; T_C = 125°C	-	0.5 4	mA
I_{CEX}	Collector cutoff current	V_{CE} = rated V_{CES}; $R_{BE\ (off)}$ = 10 Ω V_{CE} = rated V_{CES}; $R_{BE\ (off)}$ = 10 Ω; T_C = 125°C	-	0.2 2	mA
I_{EBO}	Emitter cutoff current	V_{EB} = 5 V; I_C = 0	-	0.1	mA
h_{FE}	DC current gain	I_C = 10 A; V_{CE} = 5 V	8	-	-
C_{OB}	Output Capacitance	I_E = 0 ; V_{CB} = 10 V, f_{test} = 1 MHz	-	350	pF
Switching times resistive load					
t_{on}	Turn-on time	I_C = 10 A ;I_{B1} = -I_{B2} = 2 A; V_{CC} = 300 V $V_{BE(off)}$ = 5 V, Duty Cycle ≤ 2%	-	0.9	µs
t_s	storage time		-	2	µs
t_f	Fall time		-	0.4	µs

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hFE-IC Characteristics

VCE = 5 V
TC = 25°C

DC Current Gain hFE vs Collector Current IC (A)

VCE = 5 V

VCE (sat) -IC Characteristics

IC / IB = 5

Maximum Power Dissipation PC (W) vs Collector Current IC (A)

TC = 25°C

VBE (sat)-IC Characteristics

Saturation Voltage VBE (sat) (V) vs Collector Current IC (A)

TJ = 25°C

TJ = 100°C

Safe Operating Area

Collector Current IC (A) vs Collector-Emitter Voltage VCE (V)

DC

1 ms

Limit Only For Turn on

1,50.7µs

TC = 25°C

Power Derating

Maximum Power Dissipation PC (W) vs Case Temperature TC (°C)
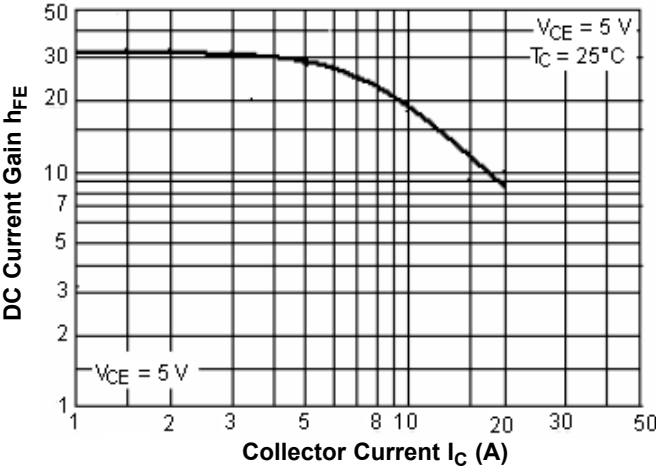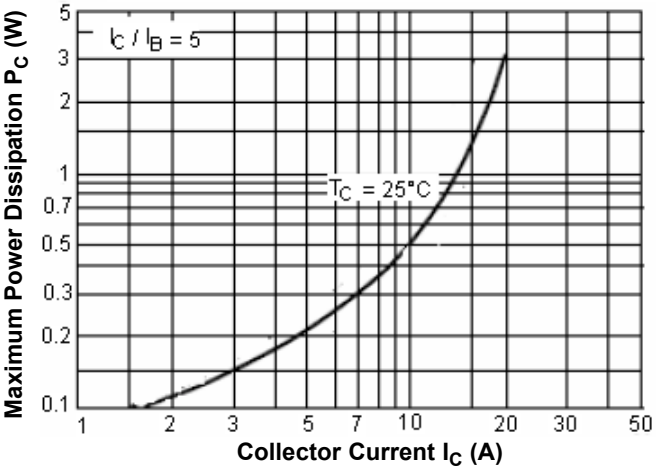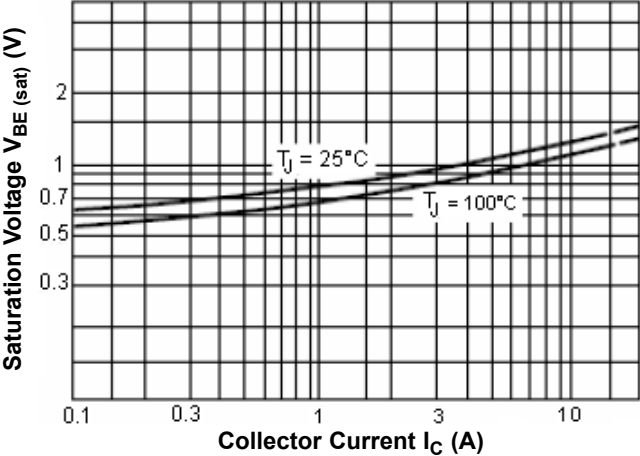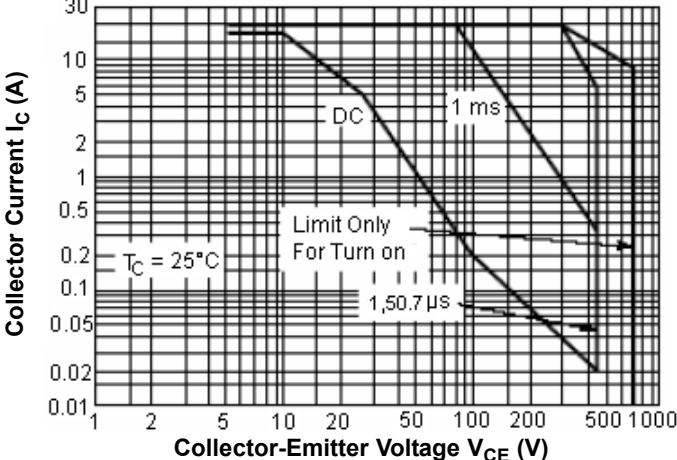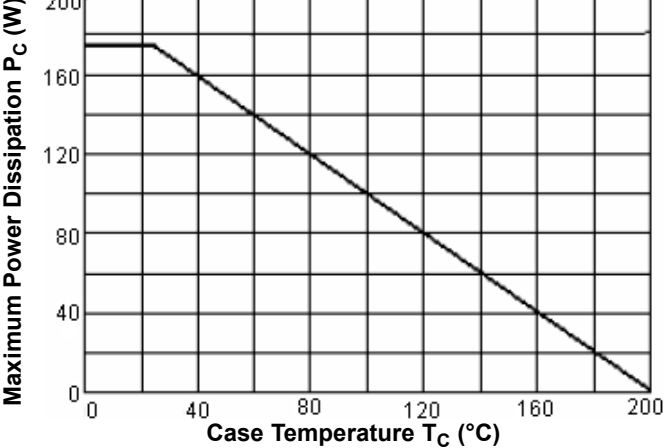
Part Number Table

Description	Part Number
Silicon NPN Power Transistor	BUX48

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