

SWITCHMODE™ Series NPN Silicon Power Transistors

The BUS50 transistor is designed for low voltage, high-speed, power switching in inductive circuits where fall time is critical. It is particularly suited for battery SWITCHMODE applications such as:

- Switching Regulators
- Inverters
- Solenoid and Relay Drivers
- Motor Controls
- Fast Turn-Off Times
300 ns Inductive Fall Time -25°C (Typ)
- Operating Temperature Range -65 to $+200^{\circ}\text{C}$

MAXIMUM RATINGS

Rating	Symbol	BUS50	Unit
Collector-Emitter Voltage	$V_{\text{CEO(sus)}}$	125	Vdc
Collector-Emitter Voltage	V_{CEV}	200	Vdc
Emitter Base Voltage	V_{EB}	7	Vdc
Collector Current — Continuous	I_{C}	70	Adc
— Peak (1)	I_{CM}	140	
— Overload	I_{ol}		
Base Current — Continuous	I_{B}	20	Adc
— Peak (1)	I_{BM}		
Total Power Dissipation — $T_{\text{C}} = 25^{\circ}\text{C}$	P_{D}	350	Watts
— $T_{\text{C}} = 100^{\circ}\text{C}$		200	
Derate above 25°C		2	W/ $^{\circ}\text{C}$
Operating and Storage Junction Temperature Range	$T_{\text{J}}, T_{\text{stg}}$	-65 to $+200$	$^{\circ}\text{C}$

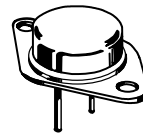
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta\text{JC}}$	0.5	$^{\circ}\text{C/W}$
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	T_{L}	275	$^{\circ}\text{C}$

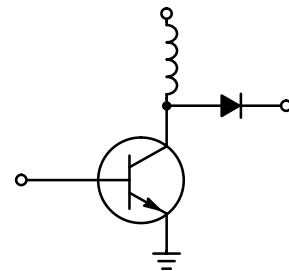
(1) Pulse Test: Pulse Width = 5 ms, Duty Cycle $\leq 10\%$.

BUS50

70 AMPERES
NPN SILICON
POWER TRANSISTOR
125 VOLTS (BVCEO)
350 WATTS
200 V (BVCEV)



CASE 197A-05
TO-204AE



BUS50

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS²

Collector–Emitter Sustaining Voltage ($I_C = 200\text{ mA}$, $I_B = 0$, $L = 25\text{ mH}$)	$V_{CEO(sus)}$	125		Vdc
Collector Cutoff Current at Reverse Bias ($V_{CE} = 200\text{ V}$, $V_{BE} = -1.5\text{ V}$) ($V_{CE} = 200\text{ V}$, $V_{BE} = -1.5\text{ V}$, $T_C = 125^\circ\text{C}$)	I_{CEX}		0.2 2	mAdc
Collector–Emitter Cutoff Current ($V_{CE} = 125\text{ V}$)	I_{CEO}		1	mAdc
Emitter Cutoff Current ($V_{EB} = 7\text{ V}$)	I_{EBO}		0.2	mAdc

ON CHARACTERISTICS²

DC Current Gain ($I_C = 5\text{ A}$, $V_{CE} = 4\text{ V}$) ($I_C = 50\text{ A}$, $V_{CE} = 4\text{ V}$)	h_{FE}	20 15		
Collector–Emitter Saturation Voltage ($I_C = 35\text{ A}$, $I_B = 2\text{ A}$) ($I_C = 70\text{ A}$, $I_B = 7\text{ A}$)	$V_{CE(sat)}$		1 1.2	Vdc
Base–Emitter Saturation Voltage ($I_C = 35\text{ A}$, $I_B = 2\text{ A}$) ($I_C = 70\text{ A}$, $I_B = 7\text{ A}$)	$V_{BE(sat)}$		1.8 2	Vdc

SWITCHING CHARACTERISTICS (Resistive Load) t_{on} and (Inductive Load) t_{sv} , t_{fi}

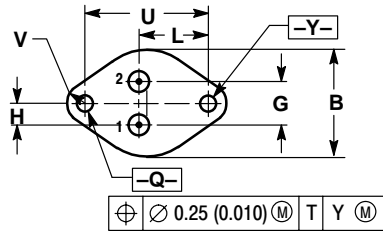
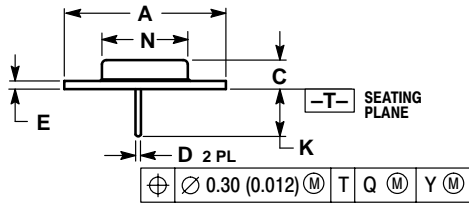
Turn–On Time	$I_C = 70\text{ A}$, $I_{B1} = 7\text{ A}$ $V_{BE(off)} = -5\text{ V}$ ($V_{CC} = 125\text{ V}$)	t_{on}	1.2	μs
Storage Time		t_{sv}	1.5	
Fall Time		t_{fi}	0.3	

² Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2\%$.

BUS50

PACKAGE DIMENSIONS


TO-204AE (TO-3)
CASE 197A-05
ISSUE J



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.530 REF		38.86 REF	
B	0.990	1.050	25.15	26.67
C	0.250	0.335	6.35	8.51
D	0.057	0.063	1.45	1.60
E	0.060	0.070	1.53	1.77
G	0.430 BSC		10.92 BSC	
H	0.215 BSC		5.46 BSC	
K	0.440	0.480	11.18	12.19
L	0.665 BSC		16.89 BSC	
N	0.760	0.830	19.31	21.08
Q	0.151	0.165	3.84	4.19
U	1.187 BSC		30.15 BSC	
V	0.131	0.188	3.33	4.77

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