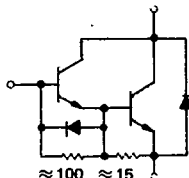


T-33-29

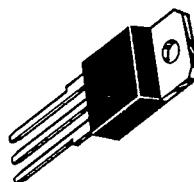
MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA
BUT50P
ADVANCE INFORMATION
SWITCHMODE[▲] SERIES
NPN SILICON POWER DARLINGTON TRANSISTORS

The BUT50P darlington transistor is designed for high-voltage, high-speed, power switching in inductive circuits where fall time is critical. It is particularly suited for line operated switch-mode applications such as :

- Switching Regulators
- Inverters
- Solenoid and Relay Drivers
- Motor Controls
- Deflection Circuits


8 AMPERES
NPN SILICON
POWER DARLINGTON
TRANSISTORS

500 VOLTS- $V_{CE0(sus)}$
 100 WATTS
 850 VOLTS- V_{CES}

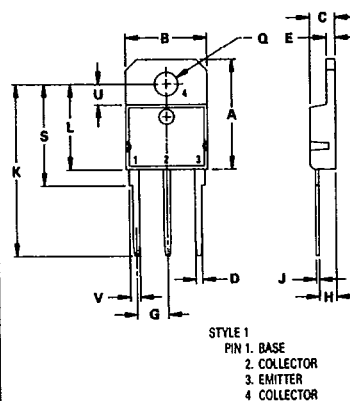

MAXIMUM RATINGS

Rating	Symbol	BUT50P	Unit
Collector-Emitter Voltage	$V_{CE0(sus)}$	500	Vdc
Collector-Emitter Voltage	$V_{CEX(sus)}$	850	Vdc
Collector-Emitter Voltage	V_{CEV}	850	Vdc
Emitter Base Voltage	V_{EB}	8	Vdc
Collector Current — Continuous	I_C	8	Adc
— Peak (1)	I_{CM}	16	
Base Current — Continuous	I_B	2	Adc
— Peak (1)	I_{BM}	4	
Free Wheel Diode :			
Forward Current — continous	I_F	8	Adc
— peak	I_{FM}	16	
Total Power Dissipation @ $T_C=25^\circ\text{C}$	P_D	100	Watts
@ $T_C=100^\circ\text{C}$		40	
Derate above 25°C		.8	W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to + 150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.25	$^\circ\text{C/W}$

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



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

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	19.00	19.60	0.749	0.771
B	14.00	14.50	0.551	0.570
C	4.20	4.70	0.165	0.185
D	1.00	1.30	0.040	0.051
E	1.45	1.65	0.058	0.064
G	5.21	5.72	0.206	0.225
H	2.60	3.00	0.103	0.118
J	0.40	0.60	0.016	0.023
K	28.50	32.00	1.123	1.259
L	14.70	15.30	0.579	0.602
Q	4.00	4.25	0.158	0.167
S	17.50	18.10	0.689	0.712
U	3.40	3.80	0.134	0.149
V	1.50	2.00	0.060	0.078

CASE 3400-01
TO-218 TYPE

ELECTRICAL CHARACTERISTICS (TC = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage (IC = 100 mA, IB = 0)	VCEO(sus)	500	—	—	Vdc
Collector Cutoff Current (VCEV = Rated Value, VBE(off) = 1.5 Vdc) (VCEV = Rated Value, VBE(off) = 1.5 Vdc, TC = 100°C)	ICEV	—	—	0.25 2.5	mAdc
Emitter Cutoff Current (VEB = 8.0 V, IC = 0)	IEBO	—	—	175	mAdc

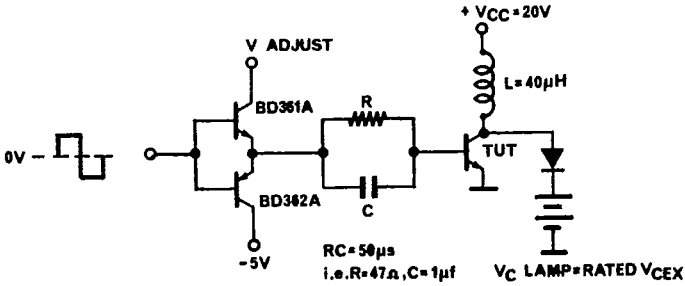
ON CHARACTERISTICS (1)

DC Current Gain (IC = 2 Adc, VCE = 5 V)	hFE	30	—	—	—
Collector-Emitter Saturation Voltage (IC = 5 Adc, IB = 0.25 Adc) (IC = 8 Adc, IB = 1 Adc) (IC = 5 Adc, IB = 0.25 Adc, TC = 100°C)	VCE(sat)	—	—	2.0 3.0 2.5	Vdc
Base-Emitter Saturation Voltage (IC = 5 Adc, IB = 0.25 Adc) (IC = 5 Adc, IB = 0.25 Adc, TC = 100°C)	VBE(sat)	—	—	2.5 2.5	Vdc
Diode Forward Voltage (IF = 5 Adc)	VF	—	—	4.0	Vdc

SWITCHING CHARACTERISTICS
Inductive Load, Clamped

Storage Time	(IC = 5 A, IB1 = 0.25 A, Vbe(off) = 5 V)	ts	—	0.75	—	μs
Fall Time		tf	—	0.10	—	μs

(1) Pulse Test: PW = 300 μs, Duty Cycle ≤ 2%



SWITCHING TIMES TEST CIRCUIT