

# BUD43B

## SWITCHMODE™ NPN Silicon Planar Power Transistor

The BUD43B has an application specific state-of-the-art die designed for use in 220 V line operated Switchmode Power supplies and electronic ballast ("light ballast"). The main advantages brought by this new transistor are:

- Improved Efficiency Due to Low Base Drive Requirements:
- High and Flat DC Current Gain  $h_{FE}$
- Fast and Tightened Switching Distributions
- No Coil Required in Base Circuit for Fast Turn-off (no current tail)



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**POWER TRANSISTORS  
2 AMPERES  
700 VOLTS, 25 WATTS**

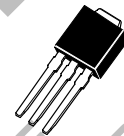
### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Sustaining Voltage	$V_{CEO}$	350	Vdc
Collector-Base Breakdown Voltage	$V_{CBO}$	650	Vdc
Collector-Emitter Breakdown Voltage	$V_{CES}$	650	Vdc
Emitter-Base Voltage	$V_{EBO}$	9	Vdc
Collector Current — Continuous	$I_C$	2	Adc
— Peak (1)	$I_{CM}$	4	
Base Current — Continuous	$I_B$	1	Adc
— Peak (1)	$I_{BM}$	2	
*Total Device Dissipation @ $T_C = 25^\circ\text{C}$	$P_D$	25	W
*Derate above $25^\circ\text{C}$		0.2	W/ $^\circ\text{C}$
Operating and Storage Temperature	$T_J, T_{stg}$	-65 to 150	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Thermal Resistance			$^\circ\text{C}/\text{W}$
— Junction to Case	$R_{\theta JC}$	5	
— Junction to Ambient	$R_{\theta JA}$	71.4	
Maximum Lead Temperature for Soldering	$T_L$	260	$^\circ\text{C}$
Purposes: 1/8" from case for 5 seconds			

(1) Pulse Test: Pulse Width = 5 ms, Duty Cycle

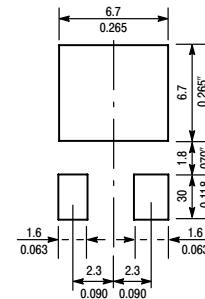


CASE 369-07



CASE 369A-13

**MINIMUM PAD SIZES  
RECOMMENDED FOR  
SURFACE MOUNTED  
APPLICATIONS**



# BUD43B

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

Characteristic	Symbol	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage ( $I_C = 100\text{ mA}$ , $L = 25\text{ mH}$ )	$V_{CEO(sus)}$	350			Vdc
Collector Cutoff Current ( $V_{CE} = \text{Rated } V_{CEO}$ , $I_B = 0$ )	$I_{CEO}$			100	$\mu\text{A}$
Collector Cutoff Current ( $V_{CE} = \text{Rated } V_{CES}$ , $V_{BE} = 0$ ) @ $T_C = 25^\circ\text{C}$ @ $T_C = 125^\circ\text{C}$	$I_{CES}$			10 200	$\mu\text{A}$
Emitter-Cutoff Current ( $V_{EB} = 9\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$			100	$\mu\text{A}$

### ON CHARACTERISTICS

Base-Emitter Saturation Voltage ( $I_C = 2\text{ Adc}$ , $I_B = 0.5\text{ Adc}$ )	$V_{BE(sat)}$			125	Vdc
Collector-Emitter Saturation Voltage ( $I_C = 2\text{ Adc}$ , $I_B = 0.5\text{ Adc}$ ) @ $T_C = 25^\circ\text{C}$	$V_{CE(sat)}$			1	Vdc
DC Current Gain ( $I_C = 1\text{ Adc}$ , $V_{CE} = 2\text{ Vdc}$ ) ( $I_C = 2\text{ Adc}$ , $V_{CE} = 5\text{ Vdc}$ ) @ $T_C = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$	$h_{FE}$	8 6			

### DYNAMIC CHARACTERISTICS

Current Gain Bandwidth ( $I_C = 0.5\text{ Adc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1\text{ MHz}$ )	$f_T$		13		MHz
Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $I_E = 0$ , $f = 1\text{ MHz}$ )	$C_{ob}$		40		pF
Input Capacitance ( $V_{EB} = 8\text{ V}$ )	$C_{ib}$		400		pF

### SWITCHING CHARACTERISTICS (Resistive Load) (D.C. $\leq 10\%$ , Pulse Width = $20\ \mu\text{s}$ )

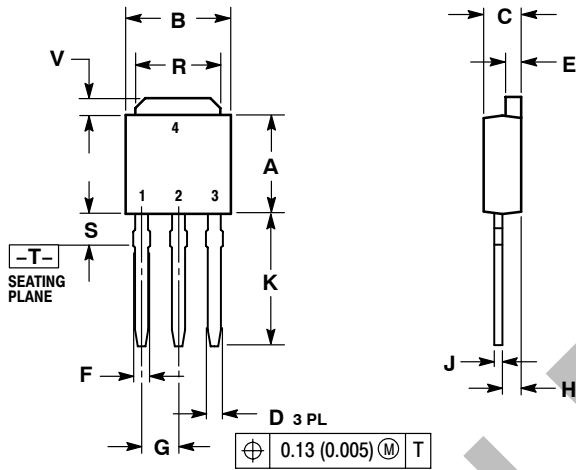
Turn-on Time ( $I_C = 1.2\text{ Adc}$ , $I_{B1} = 0.4\text{ Adc}$ , $I_{B2} = 0.1\text{ Adc}$ , $V_{CC} = 300\text{ V}$ ) @ $T_C = 25^\circ\text{C}$	$t_{off}$	4.7		5.8	$\mu\text{s}$
Fall Time ( $I_C = 2.5\text{ Adc}$ , $I_{B1} = 0.5\text{ Adc}$ , $I_{B2} = 0.5\text{ Adc}$ , $V_{CC} = 150\text{ V}$ ) @ $T_C = 25^\circ\text{C}$	$t_f$			800	ns

# BUD43B

## PACKAGE DIMENSIONS

### DPAK CASE 369-07 ISSUE M

SCALE 1:1

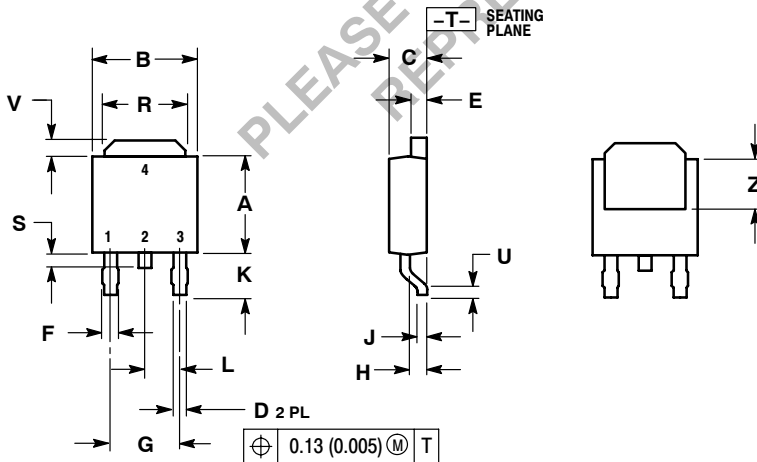


NOTES:

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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	0.250	5.97	6.35
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.033	0.040	0.84	1.01
F	0.037	0.047	0.94	1.19
G	0.090 BSC		2.29 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.350	0.380	8.89	9.65
R	0.175	0.215	4.45	5.46
S	0.050	0.090	1.27	2.28
V	0.030	0.050	0.77	1.27

### DPAK CASE 369A-13 ISSUE AA




NOTES:

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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	0.250	5.97	6.35
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.033	0.040	0.84	1.01
F	0.037	0.047	0.94	1.19
G	0.180 BSC		4.58 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.102	0.114	2.60	2.89
L	0.090 BSC		2.29 BSC	
R	0.175	0.215	4.45	5.46
S	0.020	0.050	0.51	1.27
U	0.020	---	0.51	---
V	0.030	0.050	0.77	1.27
Z	0.138	---	3.51	---

**OBSOLETE**  
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