

## NPN SILICON POWER TRANSISTOR

...2N3441 transistor is designed for use in general purpose switching and linear amplifier application requiring high breakdown voltages.

### FEATURES

- \* Driver for High Power Outputs
- \* Series and Shunt Regulators
- \* Solenoid and Relay Drivers
- \* Power Switching Circuits

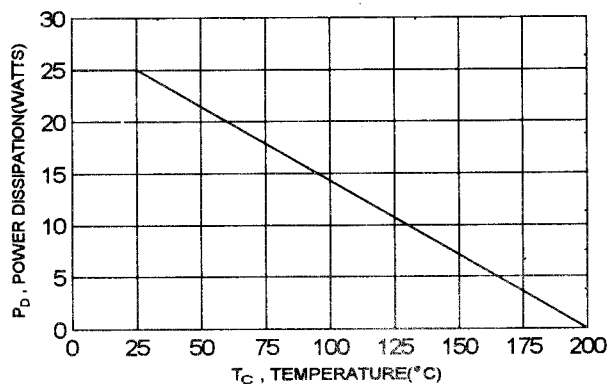
### MAXIMUM RATINGS

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	$V_{CBO}$	160	V
Collector-Emitter Voltage	$V_{CEO}$	140	V
Emitter-Base Voltage	$V_{EBO}$	7.0	V
Collector Current - Continuous	$I_C$	3.0	A
Base Current-Continuous	$I_B$	2.0	A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	25 0.142	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +200	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

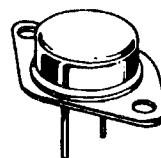
Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	7.0	$^\circ\text{C/W}$

FIGURE -1 POWER DERATING

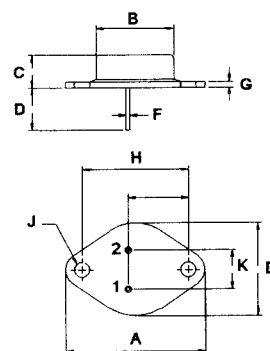


**NPN  
2N3441**

**3 AMPERE  
SILICON POWER  
TRANSISTORS  
140 VOLTS  
25 WATTS**



**TO-66**



PIN 1.BASE  
2.EMITTER  
COLLECTOR(CASE)

DIM	MILLIMETERS	
	MIN	MAX
A	30.60	32.52
B	13.85	14.16
C	6.54	7.22
D	9.50	10.50
E	17.26	18.46
F	0.76	0.92
G	1.38	1.65
H	24.16	24.78
I	13.84	15.60
J	3.32	3.92
K	4.86	5.34

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

Characteristic	Symbol	Min	Max	Unit
----------------	--------	-----	-----	------

## OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage(1) ( $I_C = 50\text{ mA}$ , $I_B = 0$ )	$V_{CEO(sus)}$	140		V
Collector Cutoff Current ( $V_{CE} = 140\text{ V}$ , $I_B = 0$ )	$I_{CEO}$		50	mA
Collector Cutoff Current ( $V_{CE} = 140\text{ V}$ , $V_{BE(off)} = 1.5\text{ V}$ )	$I_{CEX}$		5.0	mA
Emitter Cutoff Current ( $V_{EB} = 7.0\text{ V}$ , $I_C = 0$ )	$I_{EBO}$		1.0	mA

## ON CHARACTERISTICS (1)

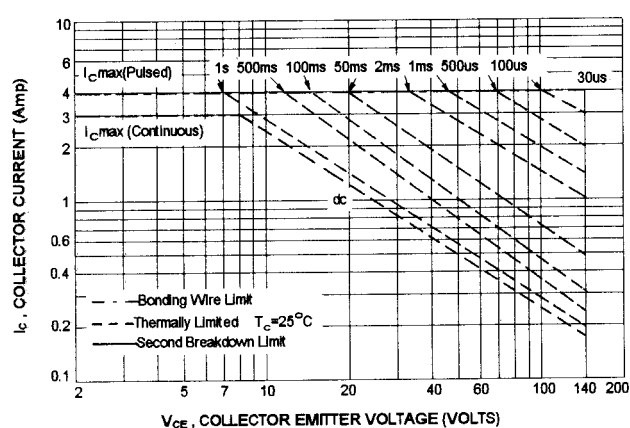
DC Current Gain ( $I_C = 0.5\text{ A}$ , $V_{CE} = 4.0\text{ V}$ ) ( $I_C = 2.7\text{ A}$ , $V_{CE} = 4.0\text{ V}$ )	$h_{FE}$	25 5.0	100	
Collector-Emitter Saturation Voltage ( $I_C = 2.7\text{ A}$ , $I_B = 0.9\text{ A}$ )	$V_{CE(sat)}$		6.0	V
Base-Emitter On Voltage ( $I_C = 2.7\text{ A}$ , $V_{CE} = 4.0\text{ V}$ )	$V_{BE(on)}$		6.7	V

## DYNAMIC CHARACTERISTICS

Small-Signal Current Gain ( $I_C = 0.5\text{ A}$ , $V_{CE} = 4.0\text{ V}$ , $f = 1.0\text{ KHz}$ )	$h_{fe}$	15		
Small-Signal Current Gain ( $I_C = 0.5\text{ A}$ , $V_{CE} = 4.0\text{ V}$ , $f = 0.4\text{ MHz}$ )	$ h_{fe} $	5.0		

(1) Pulse Test: Pulse width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ 

## ACTIVE REGION SAFE OPERATING AREA (SOA)



There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate  $I_C$ - $V_{CE}$  limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

The data of SOA curve is base on  $T_{J(PK)} = 200^\circ\text{C}$ ;  $T_C$  is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(PK)} \leq 200^\circ\text{C}$ . At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

## Notice

MOSPEC reserves the rights to make changes of the content herein the document anytime without notification. MOSPEC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies. Please refer to MOSPEC website for the last document.

MOSPEC disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially incurred.

Application shown on the herein document are examples of standard use and operation. Customers are responsible for comprehending suitable use in particular applications. MOSPEC makes no representation or warranty that such application will be suitable for the specified use without further testing or modification.

The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by MOSPEC for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of MOSPEC or others.

These MOSPEC products are intended for usage in general electronic equipment. Please make sure to consult with MOSPEC before you use these MOSPEC products in equipment which require specialized quality and/or reliability, and in equipment which could have major impact to the welfare of human life ( atomic energy control, aeronautics , traffic control, combustion control, safety devices etc.)