

# Central<sup>TM</sup> Semiconductor Corp.

145 Adams Avenue, Hauppauge, NY 11788 USA  
Tel: (631) 435-1110 • Fax: (631) 435-1824

Manufacturers of World Class Discrete Semiconductors

2N4404  
2N4405

PNP SILICON TRANSISTOR

JEDEC TO-39 CASE

## DESCRIPTION

The CENTRAL SEMICONDUCTOR 2N4404, 2N4405 types are PNP Silicon Epitaxial Planar Transistors designed for general purpose and switching applications.

## MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ )

	<u>SYMBOL</u>		<u>UNITS</u>
Collector-Base Voltage	$V_{CBO}$	80	V
Collector-Emitter Voltage	$V_{CEO}$	80	V
Emitter-Base Voltage	$V_{EBO}$	5.0	V
Collector Current	$I_C$	1.0	A
Power Dissipation ( $T_A = 25^\circ\text{C}$ )	$P_D$	1.25	W
Power Dissipation	$P_D$	8.75	W
Operating and Storage			
Junction Temperature	$T_J, T_{stg}$	-65 to +200	$^\circ\text{C}$
Thermal Resistance	$\theta_{JA}$	140	$^\circ\text{C/W}$
Thermal Resistance	$\theta_{JC}$	25	$^\circ\text{C/W}$

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

<u>SYMBOL</u>	<u>TEST CONDITIONS</u>	<u>2N4404</u>		<u>2N4405</u>		<u>UNITS</u>
		<u>MIN</u>	<u>MAX</u>	<u>MIN</u>	<u>MAX</u>	
$I_{CBO}$	$V_{CB} = 60\text{V}$		25		25	nA
$I_{EBO}$	$V_{EB} = 3.0\text{V}$		25		25	nA
$BV_{CEO}$	$I_C = 10\text{mA}$	80		80		V
$BV_{CBO}$	$I_C = 10\mu\text{A}$	80		80		V
$BV_{EBO}$	$I_E = 10\mu\text{A}$	5.0		5.0		V
$V_{CE(SAT)}$	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$		0.15		0.15	V
$V_{CE(SAT)}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$		0.2		0.2	V
$V_{CE(SAT)}$	$I_C = 500\text{mA}, I_B = 50\text{mA}$		0.5		0.5	V
$V_{BE(SAT)}$	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$		0.8		0.8	V
$V_{BE(SAT)}$	$I_C = 500\text{mA}, I_B = 50\text{mA}$	0.85	1.2	0.85	1.2	V
$V_{BE(ON)}$	$V_{CE} = 1.0\text{V}, I_C = 150\text{mA}$		0.9		0.9	V
$h_{FE}$	$V_{CE} = 5.0\text{V}, I_C = 0.1\text{mA}$		30		75	
$h_{FE}$	$V_{CE} = 5.0\text{V}, I_C = 10\text{mA}$		40		100	
$h_{FE}$	$V_{CE} = 5.0\text{V}, I_C = 150\text{mA}$		40	120	300	
$h_{FE}$	$V_{CE} = 5.0\text{V}, I_C = 500\text{mA}$		30		50	

## ELECTRICAL CHARACTERISTICS (Continued)

<u>SYMBOL</u>	<u>TEST CONDITIONS</u>	<u>MIN</u>	<u>MAX</u>	<u>UNITS</u>
$f_T$	$V_{CE} = 20V, I_C = 50mA, f = 100MHz$	150	600	MHz
$C_{cb}$	$V_{CB} = 10V, I_E = 0, f = 1.0MHz$		20	pF
$C_{eb}$	$V_{BE} = 0.5V, I_C = 0, f = 1.0MHz$		110	pF
$t_d$	$V_{CC} = 30V, V_{BE(off)} = 2.0V, I_C = 500mA, I_{B1} = 50mA$		40	ns
$t_r$	$V_{CC} = 30V, V_{BE(off)} = 2.0V, I_C = 500mA, I_{B1} = 50mA$		60	ns
$t_s$	$V_{CC} = 30V, I_C = 500mA, I_{B1} = I_{B2} = 50mA$		350	ns
$t_f$	$V_{CC} = 30V, I_C = 500mA, I_{B1} = I_{B2} = 50mA$		50	ns

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[www.centalsemi.com](http://www.centalsemi.com)