

# Central<sup>TM</sup>

## Semiconductor Corp.

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 Manufacturer of World Class Discrete Semiconductors  
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2N2411  
 2N2412

PNP SILICON TRANSISTOR

JEDEC TO-18 CASE

### DESCRIPTION:

The CENTRAL SEMICONDUCTOR 2N2411, 2N2412 types are PNP Saturated Switching Transistors designed for high speed switching applications.

### MAXIMUM RATINGS:

	SYMBOL		UNITS
Collector-Base Voltage	$V_{CB0}$	25	V
Collector-Emitter Voltage	$V_{CE0}$	15	V
Emitter-Base Voltage	$V_{EB0}$	5.0	V
Collector Current	$I_C$	100	mA
Power Dissipation	$P_D$	0.5	W
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	1.2	W
Operating and Storage Junction Temperature	$T_J, T_{stg}$	-65 to +200	$^\circ\text{C}$
Thermal Resistance	$\theta_{JA}$	350	$^\circ\text{C/W}$
Thermal Resistance	$\theta_{JC}$	146	$^\circ\text{C/W}$

### ELECTRICAL CHARACTERISTICS:

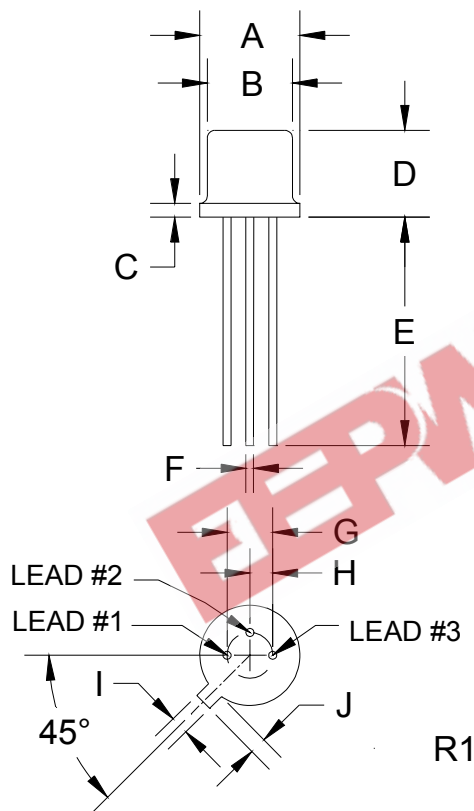
SYMBOL	TEST CONDITIONS	2N2411		2N2412		UNITS
		MIN	MAX	MIN	MAX	
$I_{CES}$	$V_{CE}=15\text{V}$		10		10	nA
$I_{CES}$	$V_{CE}=15\text{V}, T_A=150^\circ\text{C}$		10		10	$\mu\text{A}$
$I_{EBO}$	$V_{EB}=5.0\text{V}$				10	$\mu\text{A}$
$BV_{CB0}$	$I_C=10\mu\text{A}$	25		25		V
$BV_{CE0}$	$I_C=10\text{mA}$	15		15		V
$V_{CE(SAT)}$	$I_C=10\text{mA}, I_B=1.0\text{mA}$		0.2		0.2	V
$V_{BE(SAT)}$	$I_C=10\text{mA}, I_B=1.0\text{mA}$	0.7	0.9	0.7	0.9	V
$h_{FE}$	$V_{CE}=0.5\text{V}, I_C=50\mu\text{A}$	10		20		
$h_{FE}$	$V_{CE}=0.5\text{V}, I_C=10\text{mA}$	20	60	40	120	
$h_{FE}$	$V_{CE}=0.5\text{V}, I_C=10\text{mA}, T_A=-55^\circ\text{C}$		10		20	
$h_{FE}$	$V_{CE}=1.0\text{V}, I_C=50\text{mA}$	10		20		
$h_{fe}$	$V_{CE}=10\text{V}, I_C=10\text{mA}, f=100\text{MHz}$	1.4		1.4		
$C_{ob}$	$V_{CB}=5.0\text{V}, I_E=0, f=1.0\text{MHz}$		5.0		5.0	pF
$C_{ib}$	$V_{EB}=0.5\text{V}, I_C=0, f=1.0\text{MHz}$		8.0		8.0	pF

(CONTINUED ON REVERSE SIDE)

## ELECTRICAL CHARACTERISTICS (Continued)

SYMBOL	TEST CONDITIONS	2N2411		2N2412		UNITS
		MIN	MAX	MIN	MAX	
$t_d$	$V_{BE(off)}=1.2V, I_C=10mA, I_{B1}=2.5mA, R_L=300\Omega$		10		10	ns
$t_r$	$V_{BE(off)}=1.2V, I_C=10mA, I_{B1}=2.5mA, R_L=300\Omega$		20		20	ns
$t_{on}$	$V_{BE(off)}=1.2V, I_C=10mA, I_{B1}=2.5mA, R_L=300\Omega$		25		25	ns
$t_s$	$I_C=10mA, I_{B1}=2.5mA, I_{B2}=2.0mA, R_L=300\Omega$		90		90	ns
$t_f$	$I_C=10mA, I_{B1}=2.5mA, I_{B2}=2.0mA, R_L=300\Omega$		20		20	ns
$t_{off}$	$I_C=10mA, I_{B1}=2.5mA, I_{B2}=2.0mA, R_L=300\Omega$		100		100	ns

## JEDEC TO-18 CASE - MECHANICAL OUTLINE



DIMENSIONS				
SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A (DIA)	0.209	0.230	5.31	5.84
B (DIA)	0.178	0.195	4.52	4.95
C	-	0.030	-	0.76
D	0.170	0.210	4.32	5.33
E	0.500	-	12.70	-
F (DIA)	0.016	0.019	0.41	0.48
G (DIA)	0.100		2.54	
H	0.050		1.27	
I	0.036	0.046	0.91	1.17
J	0.028	0.048	0.71	1.22

TO-18 (REV: R1)

Lead Code:

- 1) Emitter
- 2) Base
- 3) Collector

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