

2N2102  
2N2102A

SILICON  
NPN TRANSISTOR



TO-39 CASE



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

**DESCRIPTION:**

The CENTRAL SEMICONDUCTOR 2N2102,A is a silicon NPN epitaxial planar transistor designed for high current general purpose switching applications.

**MARKING: FULL PART NUMBER**

**MAXIMUM RATINGS:** ( $T_A=25^\circ\text{C}$  unless otherwise noted)

	SYMBOL		UNITS
Collector-Base Voltage	$V_{CBO}$	120	V
Collector-Emitter Voltage	$V_{CER}$	80	V
Collector-Emitter Voltage	$V_{CEO}$	65	V
Emitter-Base Voltage	$V_{EBO}$	7.0	V
Continuous Collector Current	$I_C$	1.0	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	5.0	W
Power Dissipation	$P_D$	1.0	W
Operating and Storage Junction Temperature	$T_J, T_{stg}$	-65 to +200	$^\circ\text{C}$
Thermal Resistance	$\theta_{JA}$	175	$^\circ\text{C}/\text{W}$
Thermal Resistance	$\theta_{JC}$	35	$^\circ\text{C}/\text{W}$

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

SYMBOL	TEST CONDITIONS	MIN	MAX	UNITS
$I_{CBO}$	$V_{CB}=60\text{V}$		2.0	nA
$I_{CBO}$	$V_{CB}=60\text{V}, T_A=150^\circ\text{C}$		2.0	$\mu\text{A}$
$I_{EBO}$	$V_{EB}=5.0\text{V}$		2.0	nA
$BV_{CBO}$	$I_C=100\mu\text{A}$	120		V
$BV_{CER}$	$I_C=100\text{mA}, R_{BE}=10\Omega$	80		V
$BV_{CEO}$	$I_C=100\text{mA}$	65		V
$BV_{EBO}$	$I_E=100\mu\text{A}$	7.0		V
$V_{CE}(\text{SAT})$	$I_C=150\text{mA}, I_B=15\text{mA}$ (2N2102)		0.5	V
$V_{CE}(\text{SAT})$	$I_C=150\text{mA}, I_B=15\text{mA}$ (2N2102A)		0.3	V
$V_{BE}(\text{SAT})$	$I_C=150\text{mA}, I_B=15\text{mA}$		1.1	V
$h_{FE}$	$V_{CE}=10\text{V}, I_C=10\mu\text{A}$	10		
$h_{FE}$	$V_{CE}=10\text{V}, I_C=100\mu\text{A}$	20		
$h_{FE}$	$V_{CE}=10\text{V}, I_C=10\text{mA}$	35		
$h_{FE}$	$V_{CE}=10\text{V}, I_C=10\text{mA}, T_A=-55^\circ\text{C}$	20		
$h_{FE}$	$V_{CE}=10\text{V}, I_C=150\text{mA}$	40	200	
$h_{FE}$	$V_{CE}=10\text{V}, I_C=500\text{mA}$	25		

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**ELECTRICAL CHARACTERISTICS - Continued:** ( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

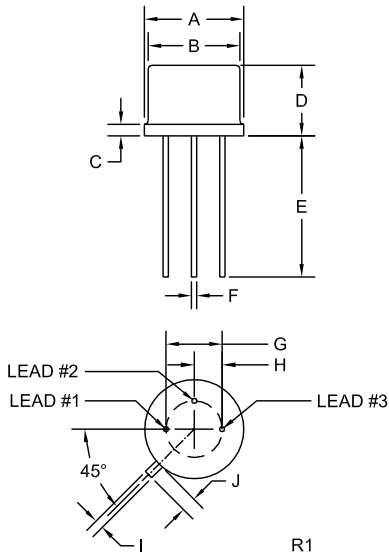
SYMBOL	TEST CONDITIONS	MIN	MAX	UNITS
$h_{FE}$	$V_{CE}=10\text{V}$ , $I_C=1.0\text{A}$	10		
$h_{fe}$	$V_{CE}=5.0\text{V}$ , $I_C=1.0\text{mA}$ , $f=1.0\text{kHz}$	30	100	
$h_{fe}$	$V_{CE}=10\text{V}$ , $I_C=5.0\text{mA}$ , $f=1.0\text{kHz}$	35	150	
$h_{ib}$	$V_{CB}=5.0\text{V}$ , $I_C=1.0\text{mA}$ , $f=1.0\text{kHz}$	24	34	$\Omega$
$h_{ib}$	$V_{CB}=10\text{V}$ , $I_C=5.0\text{mA}$ , $f=1.0\text{kHz}$	4.0	8.0	$\Omega$
$h_{rb}$	$V_{CB}=5.0\text{V}$ , $I_C=1.0\text{mA}$ , $f=1.0\text{kHz}$		$3 \times 10^{-4}$	
$h_{rb}$	$V_{CB}=10\text{V}$ , $I_C=5.0\text{mA}$ , $f=1.0\text{kHz}$		$3 \times 10^{-4}$	
$h_{ob}$	$V_{CB}=5.0\text{V}$ , $I_C=1.0\text{mA}$ , $f=1.0\text{kHz}$	0.08	0.5	$\mu\text{S}$
$h_{ob}$	$V_{CB}=10\text{V}$ , $I_C=5.0\text{mA}$ , $f=1.0\text{kHz}$	0.08	1.0	$\mu\text{S}$
$f_T$	$V_{CE}=10\text{V}$ , $I_C=50\text{mA}$ , $f=20\text{MHz}$	60		MHz
$C_{ob}$	$V_{CB}=10\text{V}$ , $I_E=0$ , $f=100\text{kHz}$		15	pF
$C_{ib}$	$V_{EB}=0.5\text{V}$ , $I_C=0$ , $f=100\text{kHz}$		80	pF
NF	$V_{CE}=10\text{V}$ , $I_C=300\mu\text{A}$ , $f=1.0\text{kHz}$		6.0	dB

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TO-39 CASE - MECHANICAL OUTLINE



SYMBOL	DIMENSIONS			
	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A (DIA)	0.335	0.370	8.51	9.40
B (DIA)	0.315	0.335	8.00	8.51
C	-	0.040	-	1.02
D	0.240	0.260	6.10	6.60
E	0.500	-	12.70	-
F (DIA)	0.016	0.021	0.41	0.53
G (DIA)	0.200		5.08	
H	0.100		2.54	
I	0.028	0.034	0.71	0.86
J	0.029	0.045	0.74	1.14

TO-39 (REV: R1)

LEAD CODE:

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

MARKING: FULL PART NUMBER

## OUTSTANDING SUPPORT AND SUPERIOR SERVICES



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### PRODUCT SUPPORT

Central's operations team provides the highest level of support to insure product is delivered on-time.

- Supply management (Customer portals)
- Inventory bonding
- Consolidated shipping options
- Custom bar coding for shipments
- Custom product packing

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### DESIGNER SUPPORT/SERVICES

Central's applications engineering team is ready to discuss your design challenges. Just ask.

- Free quick ship samples (2<sup>nd</sup> day air)
- Online technical data and parametric search
- SPICE models
- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
- Up-screening capabilities
- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

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### REQUESTING PRODUCT PLATING

1. If requesting Tin/Lead plated devices, add the suffix "TIN/LEAD" to the part number when ordering (example: 2N2222A TIN/LEAD).
2. If requesting Lead (Pb) Free plated devices, add the suffix "PBFREE" to the part number when ordering (example: 2N2222A PBFREE).

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### CONTACT US

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