

**61096**

**GENERAL PURPOSE (NPN) TRANSISTOR  
(2N2222A)**



**OPTOELECTRONIC PRODUCTS  
DIVISION**

**Features:**

- Hermetically sealed
- Rugged package-able to withstand high acceleration load
- TO-18 package
- MIL-PRF-19500 screening available

**Applications:**

- Analog Switches
- Signal Conditioning
- Small Signal Amplifiers
- High Density Packaging

**DESCRIPTION**

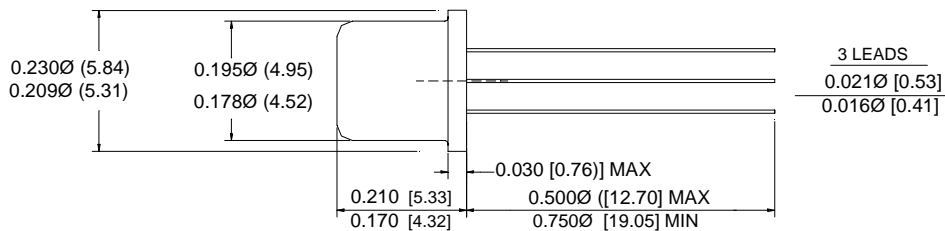
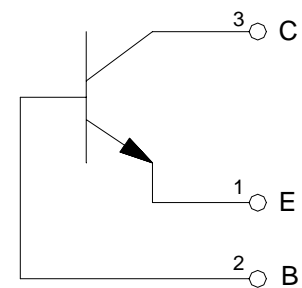
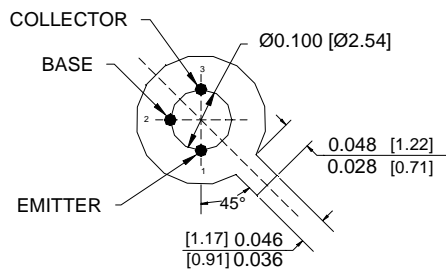
The **61096** is a hermetically sealed general purpose switching transistor in a TO-18 package. This rugged package is able to withstand high acceleration loads and is ideal for designs where durability and device weight are important requirements. This device is available custom binned to customer specifications or screened to MIL-PRF-19500.

**ABSOLUTE MAXIMUM RATINGS**

Collector-Base Voltage .....	75V
Collector-Emitter Voltage .....	50V
Emitter-Collector Voltage .....	6V
Continuous Collector Current.....	800mA
Power Dissipation (Derate at the rate of 3.33 mW/°C above 25°C) .....	500mW
Maximum Junction Temperature .....	+200°C
Operating Temperature (See part selection guide for actual operating temperature) .....	-65°C to +200°C
Storage Temperature .....	-65°C to +200°C
Lead Soldering Temperature (vapor phase reflow for 30 seconds) .....	215°C

**Package Dimensions**

**Schematic Diagram**



DIMENSIONS ARE IN INCHES (MILLIMETERS)

## OPTICAL/ELECTRICAL CHARACTERISTICS

T<sub>A</sub> = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	MAX	UNITS	TEST CONDITIONS	NOTE
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	75		V	I <sub>C</sub> = 10μA, I <sub>E</sub> = 0	
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	50		V	I <sub>C</sub> = 10mA, I <sub>B</sub> = 0μA	
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	6		V	I <sub>C</sub> = 0, I <sub>E</sub> = 10μA	
Collector-Base Cutoff Current	I <sub>CBO</sub>		10	nA	V <sub>CB</sub> = 60V, I <sub>E</sub> = 0	
			10	μA	V <sub>CB</sub> = 60V, I <sub>E</sub> = 0, T <sub>A</sub> = 150°C	
Collector-Emitter Cutoff Current	I <sub>CES</sub>		50	nA	V <sub>CE</sub> = 50V	
Emitter-Base Cutoff Current	I <sub>EBO</sub>		10	nA	V <sub>EB</sub> = 4.0V, I <sub>C</sub> = 0	
Forward-Current Transfer Ratio	h <sub>fe1</sub>	50		-	V <sub>CE</sub> = 10V, I <sub>C</sub> = 0.1mA	
		75	325	-	V <sub>CE</sub> = 10V, I <sub>C</sub> = 1mA	
	Forward-Current Transfer Ratio	100		-	V <sub>CE</sub> = 10V, I <sub>C</sub> = 10mA	
		100	300	-	V <sub>CE</sub> = 10V, I <sub>C</sub> = 150mA	1
		30		-	V <sub>CE</sub> = 10V, I <sub>C</sub> = 500mA	1
		35		-	V <sub>CE</sub> = 10V, I <sub>C</sub> = 1mA @ -55°C	
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>		0.30	V	I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA	1
			1.0	V	I <sub>C</sub> = 500, I <sub>B</sub> = 50mA	1
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	0.6	1.20	V	I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA	1
			2.0	V	I <sub>C</sub> = 500mA, I <sub>E</sub> = 50mA	1

## SMALL-SIGNAL CHARACTERISTICS

Small Signal Forward Current Transfer Ratio	h <sub>re</sub>	50		-	V <sub>CE</sub> = 10V, I <sub>C</sub> = 1mA, f = 1kHz	
Small Signal Forward Current Transfer Ratio	h <sub>re</sub>	2.5		-	V <sub>CE</sub> = 20V, I <sub>C</sub> = 20mA, f = 100kHz	
Open Circuit Output Capacitance	C <sub>OBO</sub>		8	pF	V <sub>CB</sub> = 10V, 100kHz, ≤ f ≤ 1 MHz	
Input Capacitance (Output Open Capacitance)	C <sub>IBO</sub>		25	pF	V <sub>EB</sub> = 0.5 V, 100kHz, ≤ f ≤ 1 MHz	
Turn-On Time	t <sub>on</sub>		35	ns	V <sub>CC</sub> = 30V, I <sub>C</sub> = 150mA, I <sub>B1</sub> = 15mA	
Turn-Off Time	t <sub>off</sub>		300	ns	V <sub>CC</sub> = 30V, I <sub>C</sub> = 150mA, I <sub>B1</sub> = I <sub>B2</sub> = 15mA	

## NOTES:

- Pulse width ≤ 300μs, duty cycle ≤ 2.0%.

## RECOMMENDED OPERATING CONDITIONS:

PARAMETER	SYMBOL	MIN	MAX	UNITS
Bias Voltage-Collector/Emitter	I <sub>C</sub>	10	150	mA
Collector-Emitter Voltage	V <sub>CE</sub>	5	20	V

## SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
61096-001	2N2222A PNP transistor, commercial version
61096-002	2N2222A PNP transistor, JAN level screening
61096-101	2N2222A PNP transistor, JANTX level screening
61096-102	2N2222A PNP transistor, JANTXV level screening
61096-103	2N2222A PNP transistor, JANS level screening