

**61113 GENERAL PURPOSE (NPN) TRANSISTOR  
SURFACE MOUNT PACKAGE  
(2N2369AUB)**

**Mii**  
OPTOELECTRONIC PRODUCTS  
DIVISION

**Features:**

- Hermetically sealed
- Hermetically sealed 3 pin LCC
- MIL-PRF-19500 screening available

**Applications:**

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

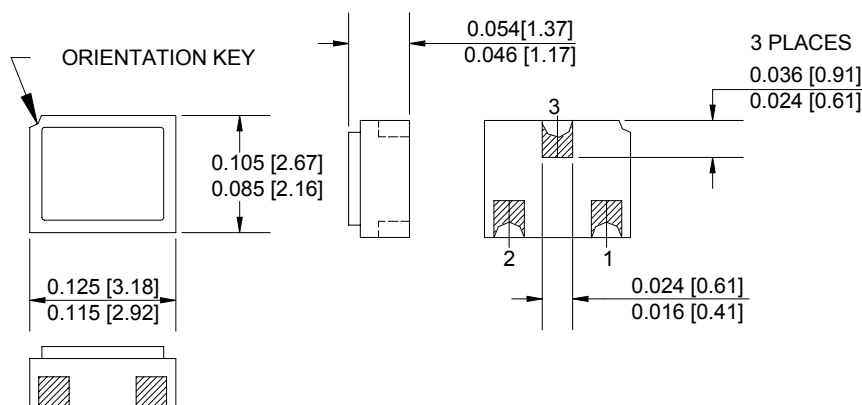
**DESCRIPTION**

The **61113** is a N-P-N, general-purpose switching and amplifier transistor in a 3 pin leadless chip carrier package. All packages are hermetically sealed for high reliability and harsh environments. This device is available custom binned to customer specifications in commercial or screened to MIL-PRF-19500 up to JANS level.

**ABSOLUTE MAXIMUM RATINGS**

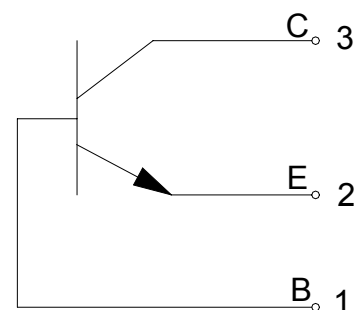
|                                                                                   |                 |
|-----------------------------------------------------------------------------------|-----------------|
| Collector-Base Voltage - $V_{CBO}$                                                | 40Vdc           |
| Collector-Emitter Voltage - $V_{CEO}$                                             | 15Vdc           |
| Collector-Emitter Voltage - $V_{CES}$                                             | 40Vdc           |
| Emitter-Base Voltage - $V_{EBO}$                                                  | 4.5Vdc          |
| Collector Current - $I_{C(Peak)}$                                                 | 500mA           |
| Continuous Collector Current                                                      | 200mA           |
| Maximum Junction Temperature                                                      | +200°C          |
| Operating Temperature (See part selection guide for actual operating temperature) | -65°C to +125°C |
| Storage Temperature                                                               | -65°C to +200°C |
| Lead Soldering Temperature (vapor phase reflow for 30 seconds)                    | 215°C           |

**Package Dimensions**



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

**Schematic Diagram**



**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>     | 40   |      | V <sub>dc</sub> | I <sub>C</sub> = 10μA, I <sub>E</sub> = 0                         |      |
| Collector-Emitter Breakdown Voltage  | BV <sub>CEO</sub>     | 40   |      | V <sub>dc</sub> | I <sub>C</sub> = 10μA, I <sub>B</sub> = 0μA                       |      |
| Collector-Emitter Sustaining Voltage | BV <sub>CES</sub>     | 15   |      | V <sub>dc</sub> | I <sub>C</sub> = 10mA, I <sub>B</sub> = 0μA                       |      |
| Emitter-Base Breakdown Voltage       | BV <sub>EBO</sub>     | 4.5  |      | V <sub>dc</sub> | I <sub>C</sub> = 0, I <sub>E</sub> = 10μA                         |      |
| Collector-Base Cutoff Current        | I <sub>CBO</sub>      |      | 0.4  | μA              | V <sub>CB</sub> = 20V, I <sub>E</sub> = 0                         |      |
|                                      |                       |      | 30   | μA              | V <sub>CB</sub> = 20V, I <sub>E</sub> = 0, T <sub>A</sub> = 150°C |      |
| Collector-Emitter Cutoff Current     | I <sub>CES</sub>      |      | 0.4  | μA              | V <sub>CE</sub> = 20V                                             |      |
|                                      |                       |      |      |                 |                                                                   |      |
| Forward-Current Transfer Ratio       | h <sub>fe</sub>       | -    | 120  | -               | V <sub>CE</sub> = 1V, I <sub>C</sub> = 10mA                       |      |
|                                      | h <sub>fe</sub>       | 20   |      | -               | V <sub>CE</sub> = 1V, I <sub>C</sub> = 100mA                      |      |
|                                      | h <sub>fe</sub>       | 20   |      | -               | V <sub>CE</sub> = 2V, I <sub>C</sub> = 100mA                      |      |
|                                      | h <sub>fe4</sub>      | 20   |      | -               | V <sub>CE</sub> = 1V, I <sub>C</sub> = 10mA @ -55°C               | 1    |
|                                      | h <sub>fe6</sub>      | 30   |      | -               | V <sub>CE</sub> = 0.35V, I <sub>C</sub> = 10mA @ -55°C            |      |
|                                      |                       |      |      |                 |                                                                   |      |
| Collector-Emitter Saturation Voltage | V <sub>CE</sub> (SAT) |      | 0.20 | V               | I <sub>C</sub> = 10mA, I <sub>B</sub> = 1mA                       | 1    |
|                                      | V <sub>CE</sub> (SAT) |      | 0.30 | V               | I <sub>C</sub> = 10mA, I <sub>B</sub> = 1mA @ +125°C              |      |
|                                      | V <sub>CE</sub> (SAT) |      | 0.25 | V               | I <sub>C</sub> = 30mA, I <sub>B</sub> = 3mA                       |      |
|                                      | V <sub>CE</sub> (SAT) |      | 0.50 | V               | I <sub>C</sub> = 100mA, I <sub>B</sub> = 10mA                     | 1    |
| Base-Emitter Saturation Voltage      | V <sub>BE</sub> (SAT) | 0.7  | 0.85 | V               | I <sub>C</sub> = 10mA, I <sub>B</sub> = 1mA                       | 1    |
|                                      | V <sub>BE</sub> (SAT) | 0.59 | -    | V               | I <sub>C</sub> = 10mA, I <sub>B</sub> = 1mA @ +125°C              |      |
|                                      | V <sub>BE</sub> (SAT) |      | 1.02 | V               | I <sub>C</sub> = 10mA, I <sub>B</sub> = 1mA @ -55°C               |      |
|                                      |                       |      | 1.15 | V               | I <sub>C</sub> = 30mA, I <sub>B</sub> = 3mA                       |      |
|                                      | V <sub>BE</sub> (SAT) |      | 1.60 | V               | I <sub>C</sub> = 100mA, I <sub>E</sub> = 10mA                     | 1    |

**SMALL-SIGNAL CHARACTERISTICS**

|                                                |                  |     |     |     |                                                                                            |  |
|------------------------------------------------|------------------|-----|-----|-----|--------------------------------------------------------------------------------------------|--|
| Current-Gain – Bandwidth Product               | f <sub>r</sub>   | 500 |     | MHz | V <sub>CB</sub> = 10V, 100kHz, ≤ f ≤ 1 MHz                                                 |  |
| Input Capacitance<br>(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,<br>I <sub>B1</sub> = 15mA                   |  |
| Turn-Off Time                                  | t <sub>off</sub> |     | 300 | nS  | V <sub>CC</sub> = 30V, I <sub>C</sub> = 150mA,<br>I <sub>B1</sub> = I <sub>B2</sub> = 15mA |  |

**NOTES:**

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

**SELECTION GUIDE**

| PART NUMBER | PART DESCRIPTION                                 |
|-------------|--------------------------------------------------|
| 61113-001   | 2N2369AUB PNP transistor, commercial version     |
| 61113-002   | 2N2369AUB PNP transistor, JAN level screening    |
| 61113-003   | 2N2369AUB PNP transistor, JANTX level screening  |
| 61113-004   | 2N2369AUB PNP transistor, JANTXV level screening |
| 61113-005   | 2N2369AUB PNP transistor, JANS level screening   |

**NOTE:** Also available in dual and quad configurations upon request. Can also be supplied in gull wing surface mount versions.