



**NEW ENGLAND SEMICONDUCTOR**

**NCC2222AUB**

## SURFACE MOUNT SMALL SIGNAL NPN TRANSISTORS

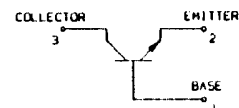
- Hermetic Ceramic Package
- Screening to SX Level Available
- Electrical Specifications Similar to 2N2222A
- Group B and C Testing Available

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

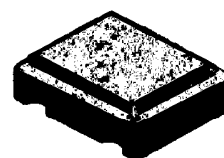
| Rating                                                                                   | Symbol         | NCC2222AUB                                  | Unit                        |
|------------------------------------------------------------------------------------------|----------------|---------------------------------------------|-----------------------------|
| Collector-Emitter Voltage                                                                | $V_{CE0}$      | 50                                          | Vdc                         |
| Emitter-Base Voltage                                                                     | $V_{EB}$       | 6.0                                         | Vdc                         |
| Collector-Base Voltage                                                                   | $V_{CB}$       | 75                                          | Vdc                         |
| Collector Current - Continuous                                                           | $I_C$          | 800                                         | mA                          |
| Total Power Dissipation<br>@ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 0.4                                         | Watts<br>$W/^\circ\text{C}$ |
| Operating and Storage Junction<br>Temperature Range                                      | $T_J, T_{stg}$ | $-65^\circ\text{C}$ to $+200^\circ\text{C}$ | $^\circ\text{C}$            |

## PRODUCT DESCRIPTION

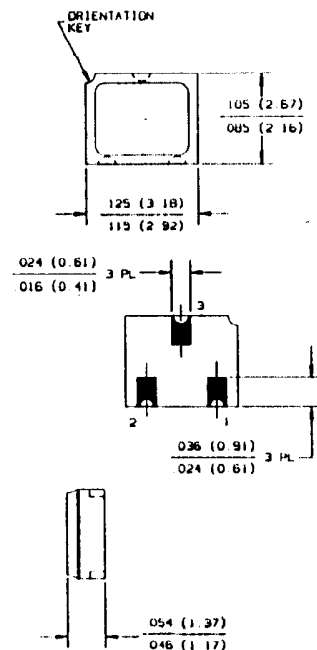
The NCC2222AUB is a small signal NPN Transistor packaged in a 3 pin hermetically sealed ceramic leadless chip carrier. The Electrical Characteristics of each chip are similar to the MIL -S-19500/255 (2N2222A).



CIRCUIT DIAGRAM



3 PIN LCC



DIMENSIONS ARE IN INCHES (MILLIMETERS)

MECHANICAL OUTLINE

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6 Lake Street Lawrence, MA 01841  
1-800-446-1158 / (978) 794-1666 / FAX: (978) 689-0803

T4-4.8-860-009 REV: --



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NCC2222AUB

Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

| SYMBOL                       | PARAMETER                                   | MIN  | TYP | MAX  | UNITS   | TEST CONDITIONS                                        |
|------------------------------|---------------------------------------------|------|-----|------|---------|--------------------------------------------------------|
| Off Characteristics          |                                             |      |     |      |         |                                                        |
| $V_{(BR)CBO}$                | Collector-Base Breakdown Voltage            | 75   |     |      | V       | $I_C = 10.0 \mu A, I_E = 0$                            |
| $V_{(BR)CEO}$                | Collector-Emitter Breakdown Voltage         | 50   |     |      | V       | $I_C = 10.0 mA, I_B = 0$                               |
| $V_{(BR)EBO}$                | Emitter-Base Breakdown Voltage              | 6.0  |     |      | V       | $I_E = 10.0 \mu A, I_C = 0$                            |
| $I_{CBO}$                    | Collector-Base Cutoff Current               |      |     | 10.0 | nA      | $V_{CB} = 60 V, I_E = 0$                               |
|                              |                                             |      |     | 10.0 | $\mu A$ | $V_{CB} = 60 V, I_E = 0, T_A = 150^{\circ}C$           |
| $I_{EBO}$                    | Emitter-Base Cutoff Current                 |      |     | 10.0 | nA      | $V_{EB} = 4.0 V, I_C = 0$                              |
| $I_{CES}$                    | Collector-Emitter Cutoff Current            |      |     | 1.0  | $\mu A$ | $V_{CE} = 50 V$                                        |
| On Characteristics           |                                             |      |     |      |         |                                                        |
| $h_{FE}$                     | Forward Current Transfer Ratio              | 50   |     |      | -       | $V_{CE} = 10.0 V, I_C = 0.1 mA$                        |
|                              |                                             | 75   |     | 325  | -       | $V_{CE} = 10.0 V, I_C = 1.0 mA$                        |
|                              |                                             | 100  |     |      | -       | $V_{CE} = 10.0 V, I_C = 10.0 mA$                       |
|                              |                                             | 100  |     | 300  | -       | $V_{CE} = 10.0 V, I_C = 150 mA^{(3)}$                  |
|                              |                                             | 30   |     |      | -       | $V_{CE} = 10.0 V, I_C = 500 mA^{(3)}$                  |
|                              |                                             | 35   |     |      | -       | $V_{CE} = 10.0 V, I_C = 10.0 mA, T_A = -55^{\circ}C$   |
| $V_{CE(SAT)}$                | Collector-Emitter Saturation Voltage        |      |     | 0.30 | V       | $I_C = 150 mA, I_B = 15 mA^{(3)}$                      |
|                              |                                             |      |     | 1.0  | V       | $I_C = 500 mA, I_B = 50 mA^{(3)}$                      |
| $V_{BE(SAT)}$                | Base-Emitter Saturation Voltage             | 0.60 |     | 1.20 | V       | $I_C = 150 mA, I_B = 15 mA^{(3)}$                      |
|                              |                                             |      |     | 2.0  | V       | $I_C = 500 mA, I_B = 50 mA^{(3)}$                      |
| Small-Signal Characteristics |                                             |      |     |      |         |                                                        |
| $h_{fe}$                     | Small-Signal Forward Current Transfer Ratio | 50   |     |      | -       | $V_{CE} = 10.0 V, I_C = 1.0 mA, f = 1.0 kHz$           |
| $ h_{fe} $                   | Small-Signal Forward Current Transfer Ratio | 2.5  |     |      | -       | $V_{CE} = 20 V, I_C = 20 mA, f = 100 MHz$              |
| $C_{obo}$                    | Open Circuit Output Capacitance             |      |     | 8.0  | pF      | $V_{CB} = 10.0 V, 100 kHz \leq f \leq 1.0 MHz$         |
| $C_{ibo}$                    | Input Capacitance (Output Open Capacitance) |      |     | 33   | pF      | $V_{EB} = 0.5 V, 100 kHz \leq f \leq 1.0 MHz$          |
| Switching Characteristics    |                                             |      |     |      |         |                                                        |
| $t_{on}$                     | Turn-On Time                                |      |     | 35   | ns      | $V_{CC} = 30 V, I_C = 150 mA, I_{B1} = 15 mA$          |
| $t_{off}$                    | Turn-Off Time                               |      |     | 300  | ns      | $V_{CC} = 30 V, I_C = 150 mA, I_{B1} = I_{B2} = 15 mA$ |

(3) Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

### SX LEVEL RELIABILITY TESTING

| 100 SCREENING                                                                                                                      | GROUP A                                                                                                                                                    | GROUP B<br>(Sample)                                                                                                                                                  | GROUP C<br>(Sample)                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Internal Visual<br>Temp Cycle<br>Thermal Response<br>Constant Acceleration<br>PIND<br>Fine and Gross Leak<br>HTRB<br>Power Burn In | Visual and Mechanical<br>DC Static Tests $25^\circ\text{C}$<br>DC Static Tests High Temp<br>DC Static Tests Low Temp<br>Dynamic Tests @ $25^\circ\text{C}$ | Solderability<br>Temp Cycle<br>Fine and Gross Leak<br>Bond Strength<br>Intermittent Op Life<br>Steady State Op life<br>Thermal Resistance<br>Hi-Temp (non operating) | Physical Dimensions<br>Thermal Shock<br>Terminal Strength<br>Hermetic Seal<br>Moisture Resistance<br>Shock Test<br>Vibration Test<br>Constant Acceleration<br>Salt Atmosphere<br>Operation Life |

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