

# MICRO

ELECTRONICS

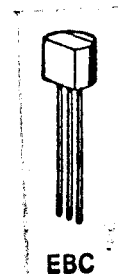
## PN3638,A

PNP

SILICON

TRANSISTORS

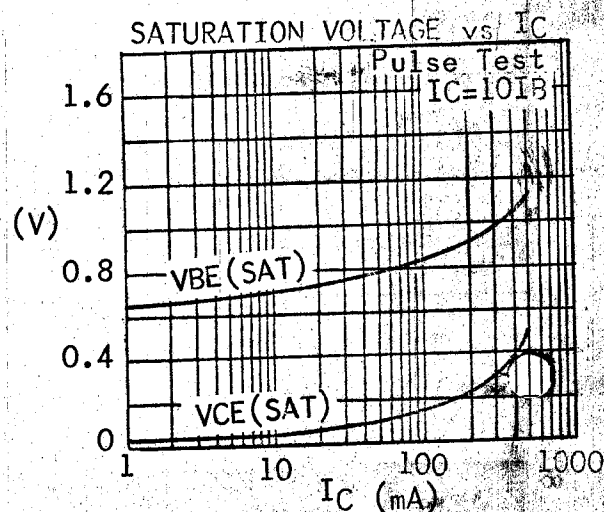
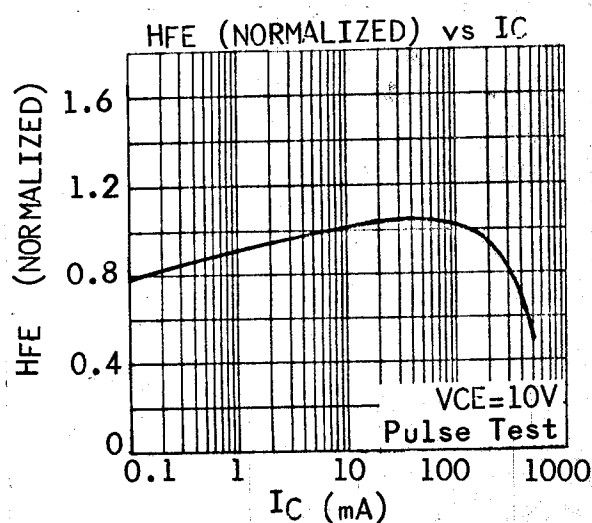
PN3638, PN3638A are PNP silicon planar epitaxial transistors designed for small signal general purpose amplifiers and switches.



### ABSOLUTE MAXIMUM RATINGS

|                                                                                      |                |               |
|--------------------------------------------------------------------------------------|----------------|---------------|
| Collector-Base Voltage                                                               | $V_{CB0}$      | 25V           |
| Collector-Emitter Voltage ( $V_{BE}=0$ )                                             | $V_{CES}$      | 25V           |
| Collector-Emitter Voltage ( $I_B=0$ )                                                | $V_{CE0}$      | 25V           |
| Emitter-Base Voltage                                                                 | $V_{EB0}$      | 4V            |
| Collector Current-Continuous                                                         | $I_C$          | 500mA         |
| Total Power Dissipation ( $T_A=25^{\circ}\text{C}$ )<br>( $T_C=25^{\circ}\text{C}$ ) | $P_{tot}$      | 625mW<br>1W   |
| Operating Junction & Storage Temperature                                             | $T_j, T_{stg}$ | -55 to +150°C |

### TYPICAL CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ )



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

| PARAMETER                            | SYMBOL               | MIN      | MAX  | UNIT          | TEST CONDITIONS                              |
|--------------------------------------|----------------------|----------|------|---------------|----------------------------------------------|
| Collector-Base Breakdown Voltage     | BVCBO                | 25       |      | V             | $I_C=100\mu\text{A}$ $I_E=0$                 |
| Collector-Emitter Breakdown Voltage  | BVCEs                | 25       |      | V             | $I_C=100\mu\text{A}$ $V_{BE}=0$              |
| Collector-Emitter Breakdown Voltage  | LVCEO                | 25       |      | V             | $I_C=10\text{mA}$ $I_B=0^*$                  |
| Emitter-Base Breakdown Voltage       | BVEBO                | 4        |      | V             | $I_E=100\mu\text{A}$ $I_C=0$                 |
| Collector Reverse Current            | ICES                 |          | 35   | nA            | $V_{CE}=15\text{V}$ $V_{BE}=0$               |
|                                      |                      |          | 2    | $\mu\text{A}$ | $V_{CE}=15\text{V}$ $T_A=65^{\circ}\text{C}$ |
| D.C. Current Gain                    | PN3638               | HFE      | 20   |               | $I_C=10\text{mA}$ $V_{CE}=10\text{V}$        |
|                                      |                      |          | 30   |               | $I_C=50\text{mA}$ $V_{CE}=1\text{V}^*$       |
|                                      |                      |          | 20   |               | $I_C=300\text{mA}$ $V_{CE}=2\text{V}^*$      |
|                                      | PN3638A              | HFE      | 80   |               | $I_C=1\text{mA}$ $V_{CE}=10\text{V}$         |
|                                      |                      |          | 100  |               | $I_C=10\text{mA}$ $V_{CE}=10\text{V}$        |
|                                      |                      |          | 100  |               | $I_C=50\text{mA}$ $V_{CE}=1\text{V}^*$       |
|                                      |                      |          | 20   |               | $I_C=300\text{mA}$ $V_{CE}=2\text{V}^*$      |
| Collector-Emitter Saturation Voltage | $V_{CE}(\text{sat})$ |          | 0.25 | V             | $I_C=50\text{mA}$ $I_B=2.5\text{mA}^*$       |
|                                      |                      |          | 1.0  | V             | $I_C=300\text{mA}$ $I_B=30\text{mA}^*$       |
| Base-Emitter Saturation Voltage      | $V_{BE}(\text{sat})$ |          | 1.1  | V             | $I_C=50\text{mA}$ $I_B=2.5\text{mA}^*$       |
|                                      |                      | 0.8      | 2.0  | V             | $I_C=300\text{mA}$ $I_B=30\text{mA}^*$       |
| Current Gain-Bandwidth Product       | PN3638               | $f_T$    | 100  | MHz           | $I_C=50\text{mA}$ $V_{CE}=3\text{V}$         |
|                                      | PN3638A              |          | 150  |               | $f=100\text{MHz}$                            |
| Output Capacitance                   | PN3638               | $C_{ob}$ | 20   | pF            | $V_{CB}=10\text{V}$ $I_E=0$ $f=1\text{MHz}$  |
|                                      | PN3638A              |          | 10   |               |                                              |
| Input Capacitance                    | $C_{ib}$             |          | 25   | pF            | $V_{EB}=0.5\text{V}$ $I_C=0$ $f=1\text{MHz}$ |

\* Pulse Test : Pulse Width =  $300\mu\text{S}$ , Duty Cycle = 1%.

h-PARAMETER @  $I_C=10\text{mA}$   $V_{CE}=10\text{V}$   $f=1\text{kHz}$

| PARAMETER                 | SYMBOL   | PN3638<br>MIN | PN3638<br>MAX | PN3638A<br>MIN | PN3638A<br>MAX | UNIT             |
|---------------------------|----------|---------------|---------------|----------------|----------------|------------------|
| Small Signal Current Gain | $h_{fe}$ | 25            |               | 100            |                |                  |
| Input Resistance          | $h_{ie}$ |               | 1.5           |                | 2.0            | $\text{K}\Omega$ |
| Output Conductance        | $h_{oe}$ |               | 1.2           |                | 1.2            | mmhos            |
| Voltage Feedback Ratio    | $h_{re}$ |               | 2.6           |                | 1.5            | $\times 10^{-3}$ |