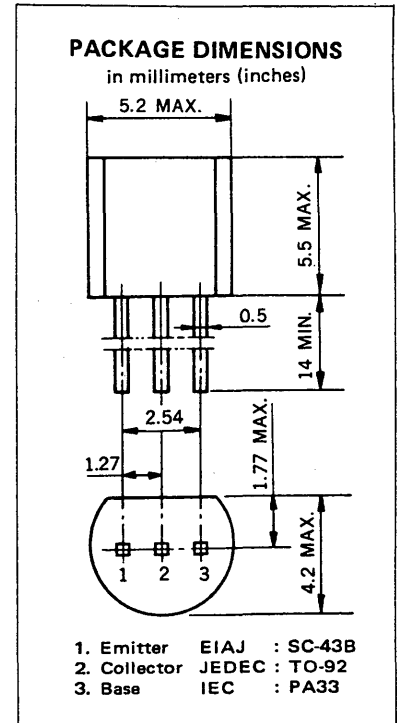


**DESCRIPTION** The 2SC3616 is designed for general-purpose applications requiring High DC Current Gain. This is suitable for all kind of driving, instead of Darlington Transistor, or muting.

- FEATURES**
- High DC Current Gain.  
 $h_{FE} = 800$  to  $3200$  (@  $V_{CE} = 2.0$  V,  $I_C = 300$  mA)
  - Low Collector Saturation Voltage.  
 $V_{CE(sat)} = 0.14$  V TYP. (@  $I_C/I_B = 300$  mA/3.0 mA)
  - High  $V_{EBO}$  :  $V_{EBO} = 15$  V
  - Large Current :  $I_C(DC) = 700$  mA,  $I_C(pulse) = 1.0$  A
  - High Total Power Dissipation. :  $P_T = 0.75$  W ( $T_a = 25$  °C)

**ABSOLUTE MAXIMUM RATINGS**

|  |                      |
|--|----------------------|
| Maximum Temperatures                           |                      |
| Storage Temperature                            | ..... -55 to +150 °C |
| Junction Temperature                           | ..... 150 °C Maximum |
| Maximum Power Dissipation ( $T_a = 25$ °C)     |                      |
| Total Power Dissipation                        | ..... 0.75 W         |
| Maximum Voltages and Currents ( $T_a = 25$ °C) |                      |
| $V_{CBO}$ Collector to Base Voltage            | ..... 25 V           |
| $V_{CEO}$ Collector to Emitter Voltage         | ..... 25 V           |
| $V_{EBO}$ Emitter to Base Voltage              | ..... 15 V           |
| $I_C$ Collector Current (DC)                   | ..... 700 mA         |
| $I_C$ Collector Current (pulse)*               | ..... 1.0 A          |
| *PW ≤ 10 ms, Duty Cycle ≤ 50 %                 |                      |



**ELECTRICAL CHARACTERISTICS ( $T_a = 25$  °C)**

| SYMBOL             | CHARACTERISTIC               | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS   |
|--------------------|------------------------------|------|------|------|------|---|
| $h_{FE1}^{**}$     | DC Current Gain              | 800  |      | 3200 | —    | $V_{CE} = 2.0$ V, $I_C = 300$ mA  |
| $h_{FE2}^{**}$     | DC Current Gain              | 640  |      |      | —    | $V_{CE} = 2.0$ V, $I_C = 500$ mA  |
| $f_T$              | Gain Bandwidth Product       | 150  | 250  |      | MHz  | $V_{CE} = 5.0$ V, $I_E = -300$ mA   |
| $C_{ob}$           | Output Capacitance           |      | 10   |      | pF   | $V_{CB} = 10$ V, $I_E = 0$ , $f = 1.0$ MHz  |
| $I_{CBO}$          | Collector Cutoff Current     |      |      | 100  | nA   | $V_{CB} = 25$ V, $I_E = 0$  |
| $I_{EBO}$          | Emitter Cutoff Current       |      |      | 100  | nA   | $V_{EB} = 10$ V, $I_C = 0$  |
| $V_{BE}^{**}$      | Base to Emitter Voltage      | 600  |      | 700  | mV   | $V_{CE} = 2.0$ V, $I_C = 50$ mA   |
| $V_{CE(sat)}^{**}$ | Collector Saturation Voltage |      | 0.14 | 0.3  | V    | $I_C = 300$ mA, $I_B = 3.0$ mA  |
| $V_{BE(sat)}^{**}$ | Base Saturation Voltage      |      | 0.77 | 1.2  | V    | $I_C = 300$ mA, $I_B = 3.0$ mA  |
| $t_{on}$           | Turn-On Time                 |      | 0.13 |      | μs   | $(V_{CC} = 10$ V, $V_{BE(off)} \doteq -2.7$ V)<br>$I_C = 200$ mA<br>$I_{B1} = -I_{B2} = 4.0$ mA |
| $t_{stg}$          | Storage Time                 |      | 0.90 |      | μs   |   |
| $t_{off}$          | Turn-Off Time                |      | 1.1  |      | μs   |   |

\*\*Pulsed PW ≤ 350 μs, Duty Cycle ≤ 2 %

**Classification of  $h_{FE1}$**

| Rank  | M           | L            | K            |
|-------|-------------|--------------|--------------|
| Range | 800 to 1600 | 1200 to 2400 | 2000 to 3200 |

Test Conditions:  $V_{CE} = 2.0$  V,  $I_C = 300$  mA

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

