

Descriptions

Silicon PNP transistor in a SOT-89 Plastic Package

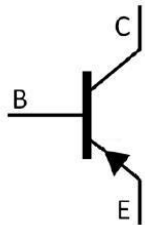
Features

- Low $V_{CE(sat)}$
- Excellent DC current gain characteristics.

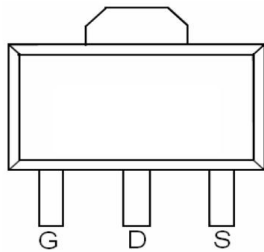
Applications

General purpose amplifier.

Equivalent Circuit



Pinning



SOT-89 top view

PIN1: Base PIN 2: Collector PIN 3: Emitter

hFE Classifications & Marking

| | | |
|--|---------|---------|
| h _{FE} Classifications Symbol | Q | R |
| h _{FE} Range | 120~270 | 180~390 |
| Marking | HAEQ | HAER |

Absolute Maximum Ratings(Ta=25°C)

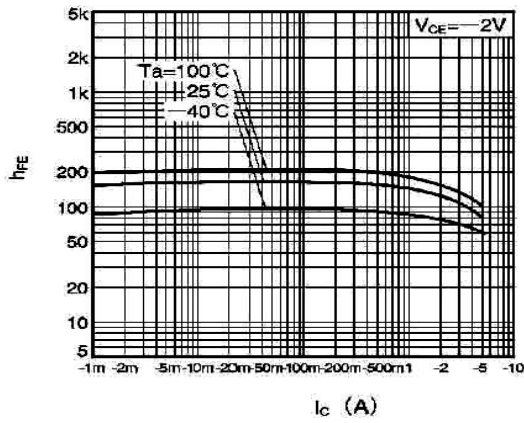
| Parameter | Symbol | Rating | Unit |
|--------------------------------------|-----------|---------|------|
| Collector to Base Voltage | V_{CBO} | -20 | V |
| Collector to Emitter Voltage | V_{CEO} | -20 | V |
| Emitter to Base Voltage | V_{EBO} | -6.0 | V |
| Collector Current-Continuous | I_C | -3.0 | A |
| Collector Current -Continuous(Pulse) | I_{CP} | -5.0 | A |
| Collector Power Dissipation | P_C | 0.6 | W |
| Junction Temperature | T_j | 150 | °C |
| Storage Temperature Range | T_{stg} | -55~150 | °C |

Electrical Characteristics(Ta=25°C)

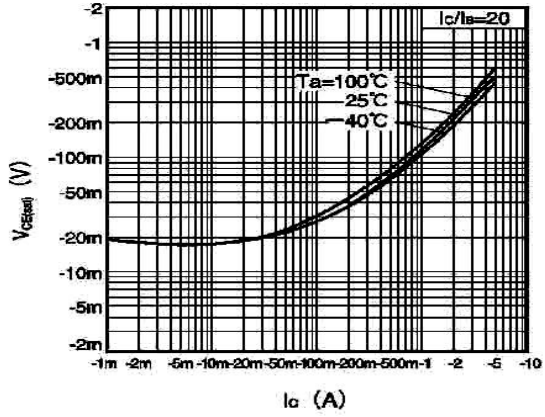
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---------------|---------------------------------------|------|-----|------|---------|
| Collector to Base Breakdown Voltage | V_{CBO} | $I_C=-50\mu A$ $I_E=0$ | -20 | | | V |
| Collector to Emitter Breakdown Voltage | V_{CEO} | $I_C=-1.0mA$ $I_B=0$ | -20 | | | V |
| Emitter to Base Breakdown Voltage | V_{EBO} | $I_E=-50\mu A$ $I_C=0$ | -6.0 | | | V |
| Collector Cut-Off Current | I_{CBO} | $V_{CB}=-20V$ $I_E=0$ | | | -0.1 | μA |
| Emitter Base Cut-Off Current | I_{EBO} | $V_{EB}=-5.0V$ $I_C=0$ | | | -0.1 | μA |
| DC Current Gain | h_{FE} | $V_{CE}=-2.0V$ $I_C=-0.1A$ | 120 | | 390 | |
| Collector to Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=-2.0A$ $I_B=-0.1A$ | | | -0.5 | V |
| Transition Frequency | f_T | $V_{CE}=-2.0V$ $f=100MHz$ $I_C=-0.5A$ | | 240 | | MHz |
| Collector Output Capacitance | C_{ob} | $V_{CB}=-10V$ $f=1.0MHz$ $I_E=0$ | | 35 | | pF |

Electrical Characteristic Curve

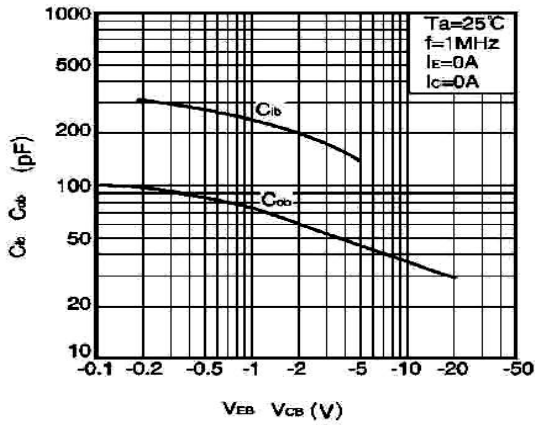
$h_{FE} - I_C$



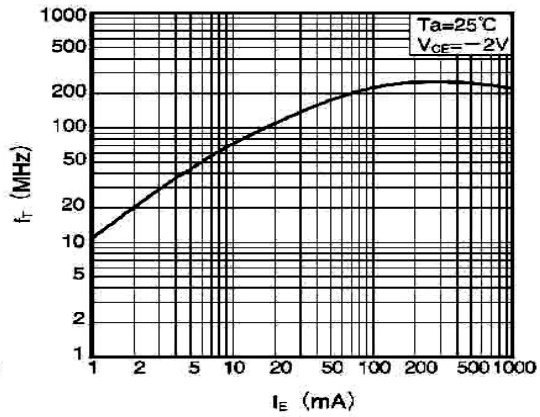
$V_{CE(sat)} - I_C$



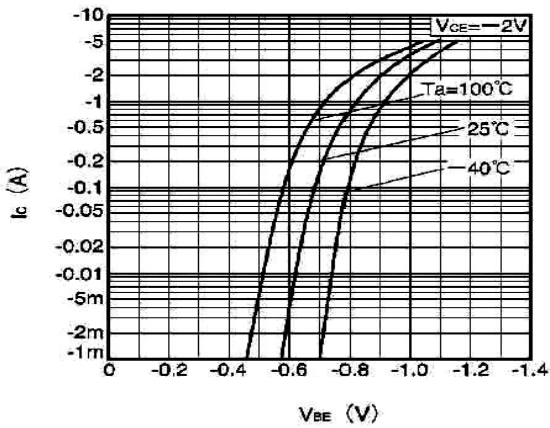
$C_{ib} C_{ob} - V_{EB} V_{CE}$



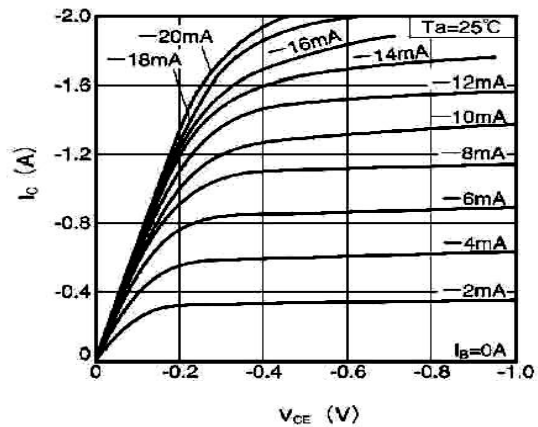
$f_T - I_E$



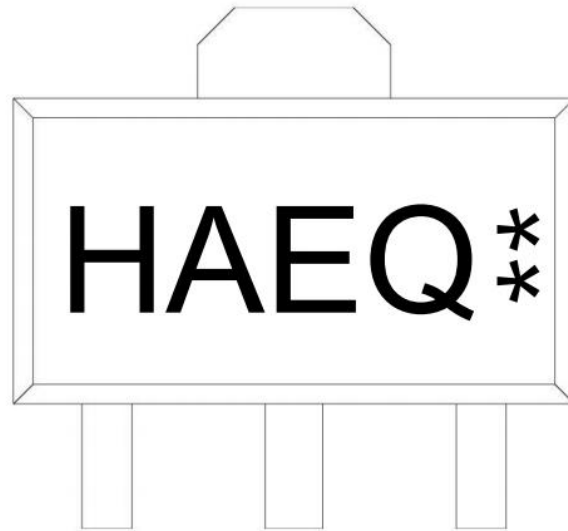
$I_C - V_{BE}$



$I_C - V_{CE}$



Marking Instructions



Note:

- H: Company Code
- AE: Product Type
- Q: h_{FE} Classifications Symbol
- ** : Lot No. Code, code change with Lot No

| | | |
|---------------------------------|---------|---------|
| h_{FE} Classifications Symbol | Q | R |
| h_{FE} Range | 120~270 | 180~390 |
| Marking | HAEQ | HAER |

Packaging SPEC

REEL INFORMATION

| Package Type | Units | | | | | Dimension (unit: mm ³) | | |
|--------------|------------|-----------------|-----------------|-----------------------|-----------------|------------------------------------|-------------|-------------|
| | Units/Reel | Reels/Inner Box | Units/Inner Box | Inner Boxes/Outer Box | Units/Outer Box | Reel | Inner Box | Outer Box |
| SOT-89 | 1,000 | 7 | 7,000 | 8 | 56,000 | 7" ×12 | 180×120×180 | 385×257×392 |

Package Outline Dimensions

SOT-89

单位: mm

