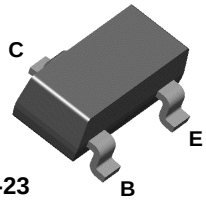
FAIRCHILD
SEMICONDUCTOR TM

# BSS64




**SOT-23**
**Mark: U3**

## NPN General Purpose Amplifier

This device is designed for general purpose high voltage amplifiers and gas discharge display driving. Sourced from Process 16.

### Absolute Maximum Ratings* TA = 25°C unless otherwise noted

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CEO}$ | Collector-Emitter Voltage | 80 | V |
| $V_{CBO}$ | Collector-Base Voltage | 120 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 5.0 | V |
| $I_C$ | Collector Current - Continuous | 200 | mA |
| $T_J$, $T_{stg}$ | Operating and Storage Junction Temperature Range | -55 to +150 | °C |

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

**NOTES**:
**1)** These ratings are based on a maximum junction temperature of 150 degrees C.
**2)** These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### Thermal Characteristics TA = 25°C unless otherwise noted

| Symbol | Characteristic | Max | Units |
|---|---|---|---|
| | | ***BSS64** | |
| $P_D$ | Total Device Dissipation<br>Derate above 25°C | 350<br>2.8 | mW<br>mW/°C |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 357 | °C/W |

*Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

## NPN General Purpose Amplifier
(continued)

### Electrical Characteristics
TA = 25°C unless otherwise noted

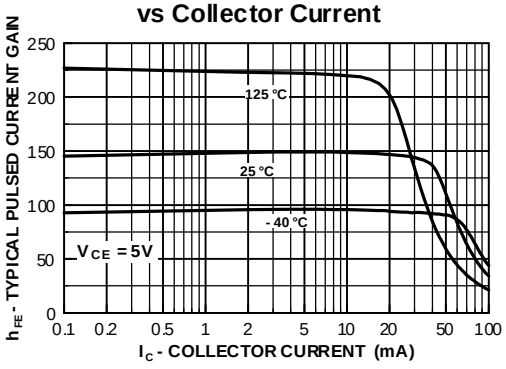
| Symbol | Parameter | Test Conditions | Min | Max | Units |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | $I_C$ = 4.0 mA, $I_B$ = 0 | 80 | | V |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage | $I_C$ = 100 µA, $I_E$ = 0 | 120 | | V |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage | $I_E$ = 100 µA, $I_C$ = 0 | 5.0 | | V |
| $I_{CBO}$ | Collector-Cutoff Current | $V_{CB}$ = 90 V, $I_E$ = 0<br>$V_{CB}$ = 90 V, $I_E$ = 0, $T_A$ = 150°C | | 0.1<br>50 | µA<br>µA |
| $I_{EBO}$ | Emitter-Cutoff Current | $V_{EB}$ = 5.0 V, $I_C$ = 0 | | 200 | nA |
| **ON CHARACTERISTICS** | | | | | |
| $h_{FE}$ | DC Current Gain | $I_C$ = 10 mA, $V_{CE}$ = 1.0 V | 20 | | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C$ = 4.0 mA, $I_B$ = 400 µA<br>$I_C$ = 50 mA, $I_B$ = 15 mA | | 0.15<br>0.2 | V<br>V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C$ = 4.0 mA, $I_B$ = 400 µA | | 1.2 | V |
| **SMALL SIGNAL CHARACTERISTICS** | | | | | |
| $f_T$ | Current Gain - Bandwidth Product | $I_C$ = 4.0 mA, $V_{CE}$ = 10,<br>f = 35 MHz | 60 | | MHz |
| $C_{ob}$ | Output Capacitance | $V_{CB}$ = 10 V, f = 1.0 MHz | | 5.0 | pF |

### Spice Model

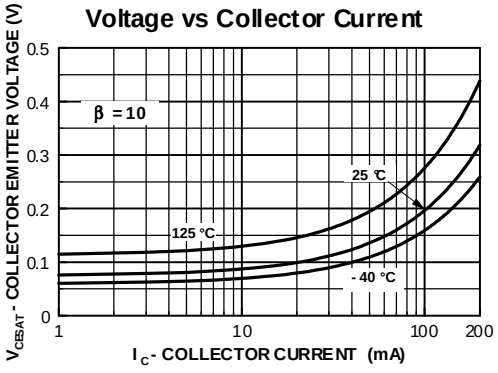
NPN (Is=2.511f Xti=3 Eg=1.11 Vaf=100 Bf=242.6 Ne=1.249 Ise=2.511f Ikf=.3458 Xtb=1.5 Br=3.197 Nc=2 Isc=0 Ikr=0 Rc=1 Cjc=4.883p Mjc=.3047 Vjc=.75 Fc=.5 Cje=18.79p Mje=.3416 Vje=.75 Tr=1.202n Tf=560p Itf=50m Vtf=5 Xtf=8 Rb=10)

### Typical Characteristics

**Typical Pulsed Current Gain vs Collector Current**

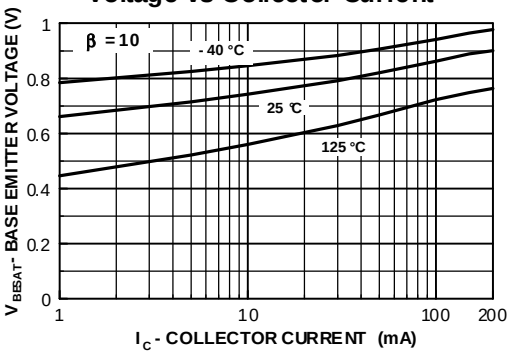



**Collector-Emitter Saturation Voltage vs Collector Current**

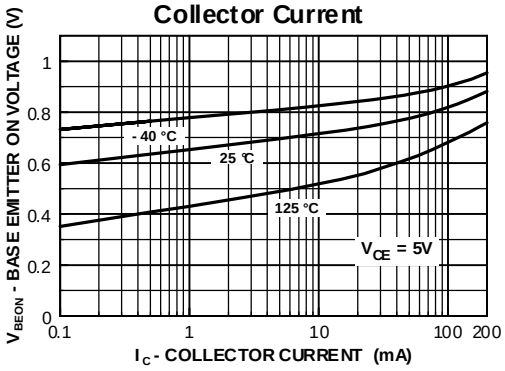


## Typical Characteristics

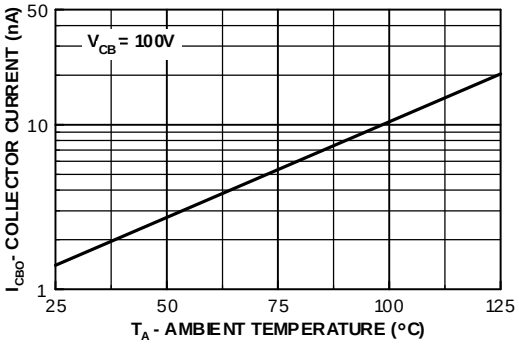
**Base-Emitter Saturation Voltage vs Collector Current**



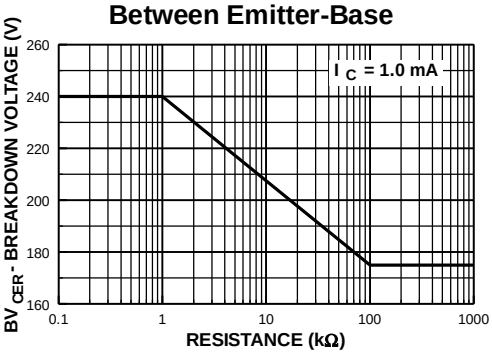

**Base Emitter ON Voltage vs Collector Current**



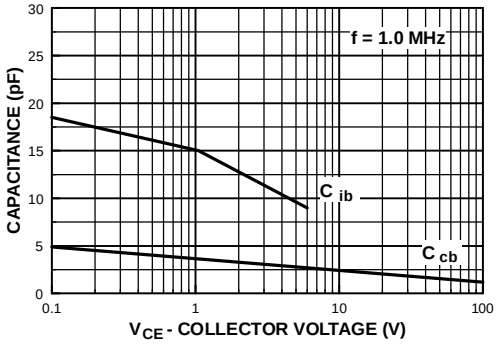

**Collector-Cutoff Current vs. Ambient Temperature**



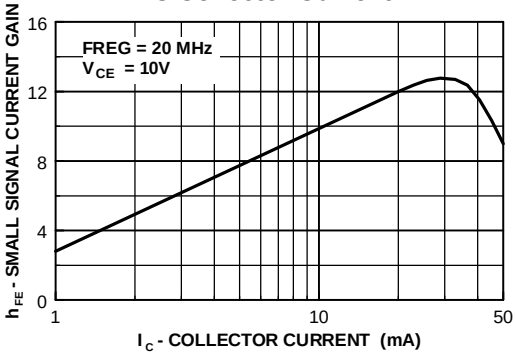

**Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base**




**Input and Output Capacitance vs Reverse Voltage**

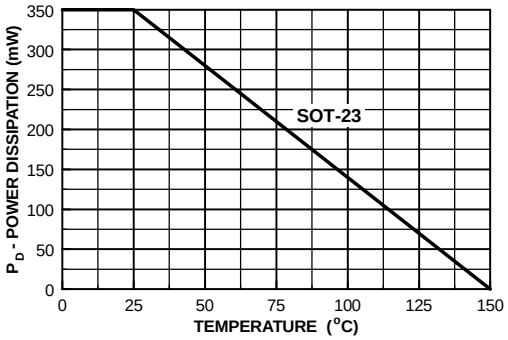



**Small Signal Current Gain vs Collector Current**



## Typical Characteristics (continued)

**Power Dissipation vs Ambient Temperature**



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