## BC556/557/558/559/560
### PNP Epitaxial Silicon Transistor

#### Features
- Switching and Amplifier
- High Voltage: BC556, $V_{CEO} = -65V$
- Low Noise: BC559, BC560
- Complement to BC546 ... BC 550

#### Absolute Maximum Ratings $T_a = 25^\circ C$ unless otherwise noted

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{CBO}$</td>
<td>Collector-Base Voltage</td>
<td>BC556 : -80 V</td>
<td>BC557/560 : -50 V</td>
</tr>
<tr>
<td>$V_{EBO}$</td>
<td>Emitter-Base Voltage</td>
<td>-5 V</td>
<td></td>
</tr>
<tr>
<td>$I_C$</td>
<td>Collector Current (DC)</td>
<td>-100 mA</td>
<td></td>
</tr>
<tr>
<td>$P_C$</td>
<td>Collector Power Dissipation</td>
<td>500 mW</td>
<td></td>
</tr>
<tr>
<td>$T_J$</td>
<td>Junction Temperature</td>
<td>150 $^\circ C$</td>
<td></td>
</tr>
<tr>
<td>$T_{STG}$</td>
<td>Storage Temperature</td>
<td>-65 ~ 150 $^\circ C$</td>
<td></td>
</tr>
</tbody>
</table>

#### Electrical Characteristics $T_a = 25^\circ C$ unless otherwise noted

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Test Condition</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_{CBO}$</td>
<td>Collector Cut-off Current</td>
<td>$V_{CE} = -30V$, $I_E = 0$</td>
<td>-15 nA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$h_{FE}$</td>
<td>DC Current Gain</td>
<td>$V_{CE} = -5V$, $I_C = 2mA$</td>
<td>110</td>
<td>800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_{CE(sat)}$</td>
<td>Collector-Emitter Saturation Voltage</td>
<td>$I_C = -10mA$, $I_B = -0.5mA$</td>
<td>-90 mV</td>
<td>-250 mV</td>
<td>-650 mV</td>
<td></td>
</tr>
<tr>
<td>$V_{BE(sat)}$</td>
<td>Collector-Base Saturation Voltage</td>
<td>$I_C = -10mA$, $I_B = -5mA$</td>
<td>-700 mV</td>
<td>-900 mV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_{BE(on)}$</td>
<td>Base-Emitter On Voltage</td>
<td>$V_{CE} = -5V$, $I_C = -2mA$, $I_C = -10mA$</td>
<td>-600 mV</td>
<td>-660 mV</td>
<td>-750 mV</td>
<td>-800 mV</td>
</tr>
<tr>
<td>$f_T$</td>
<td>Current Gain Bandwidth Product</td>
<td>$V_{CE} = -5V$, $I_C = -10mA$, $f=10MHz$</td>
<td>150 MHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$C_{ob}$</td>
<td>Output Capacitance</td>
<td>$V_{CB} = -10V$, $I_E = 0$, $f=1MHz$</td>
<td>6 pF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NF</td>
<td>Noise Figure</td>
<td>BC556/557/558 : $V_{CE} = -5V$, $I_C = -200\mu A$, $f=1KHz$, $R_O=2K\Omega$, $V_{CE}= -5V$, $I_C = -200\mu A$, $R_O=2K\Omega$, $f=30~15000MHz$</td>
<td>2 dB</td>
<td>10 dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BC557/558 :</td>
<td></td>
<td>1 dB</td>
<td>4 dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BC559 :</td>
<td></td>
<td>1.2 dB</td>
<td>4 dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BC560 :</td>
<td></td>
<td>1.2 dB</td>
<td>2 dB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### $h_{FE}$ Classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>$h_{FE}$</td>
<td>110 ~ 220</td>
<td>200 ~ 450</td>
<td>420 ~ 800</td>
</tr>
</tbody>
</table>
Typical Performance Characteristics

- Figure 1. Static Characteristic
  - $V_{CE}$, Collector-Emitter Voltage
  - $I_{C}$, Collector Current

- Figure 2. DC current Gain
  - $h_{FE}$, DC Current Gain

- Figure 3. Base-Emitter Saturation Voltage
  - $V_{BE}(sat)$, Base-Emitter Voltage

- Figure 4. Base-Emitter On Voltage
  - $V_{BE}$, Base-Emitter Voltage

- Figure 5. Collector Output Capacitance
  - $C_{ob}$, Collector-Base Capacitance

- Figure 6. Current Gain Bandwidth Product
  - $f_{T}$, Current Gain-Bandwidth Product
Physical Dimensions

TO-92

Dimensions in Millimeters

NOTES: UNLESS OTHERWISE SPECIFIED
A) DRAWING WITH REFERENCE TO JEDEC TO-92
   RECOMMENDATIONS.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DRAWING CONFORMS TO ASME Y14.5M-1994.
D) TO-92 (92,94,96,97,98) PIN CONFIGURATION:

<table>
<thead>
<tr>
<th>P</th>
<th>92</th>
<th>94</th>
<th>96</th>
<th>97</th>
<th>98</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
</tbody>
</table>

LEGEND: P = PNP, F = Emitter, D = Drain, E = Base, C = Collector, G = Gate

FOR PACKAGE 92, 94, 96, 97 AND 98:
PIN CONFIGURATION DRAIN "D" AND SOURCE "S" ARE INTERCHANGEABLE AT FET "F" OPTION.

DRAWING FILENAME: BC556/557/558/559/560.DWG
TRADEMARKS
The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

- 2Cool™
- AccuPower™
- AX-CAP™
- BISIC™
- Build it Now™
- CorePLUS™
- CorePOWER™
- CROSSVOLT™
- CTL™
- Current Transfer Logic™
- DEUXPEED™
- Dual Cool™
- EcoSPARK®
- EfficientMax™
- ESBC®
- FashCore™
- Fast™
- FETBench™
- FlashWriter™
- FPS™
- F-PFS™
- FRFET™
- Global Power Resource™
- GreenBridge™
- Green FPS™
- Green FPS™ e-Series™
- Gmax™
- GTI™
- IntelliMAX™
- ISOPLANAR™
- Making Small Speakers Sound Louder and Better™
- MegaBuck™
- MicroCOUPLER™
- MicroFET™
- MicroPak™
- MicroPak2™
- MillerDrive™
- MotionMax™
- mWSaver™
- OptiH™
- OPTOLOGIC®
- OPTOPLANAR®
- PowerTrench®
- PowerXS™
- Programmable Active Droop™
- QFET™
- QS™
- Quiet Series™
- RapidConfigure™
- Saving our world, 1mW/kW at a time™
- SignalWise™
- SmartMax™
- SMART START™
- Solutions for Your Success™
- SPM®
- STEALTH™
- SuperFET™
- SuperSOT™-3
- SuperSOT™-6
- SuperSOT™-8
- SupreMOS®
- SyncFET™
- Sync-Lock™
- SYSTEM GENERAL™
- TriFault Detect™
- TRUECURRENT™
- uSerDes™
- UHC®
- Ultra FRFET™
- UniFET™
- VXCM™
- VisualMax™
- VoltagePlus™
- XS™
- e-Series

* Trademarks of System General Corporation, used under license by Fairchild Semiconductor.

DISCLAIMER
FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HERIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH CONSTITUTES THE ENTIRE UNDERSTANDING BETWEEN FAIRCHILD AND ITS CUSTOMERS.

LIFE SUPPORT POLICY
FAIRCHILD's PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

As used herein:
1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

ANTI-COUNTERFEITING POLICY
Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Fairchild's Anti-Counterfeiting Policy is also stated on our external website, www.fairchildsemi.com, under Sales Support.

Counterfeitering of semiconductor parts is a growing problem in the industry. All manufacturers of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed applications, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Fairchild strongly encourages customers to purchase Fairchild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from Fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild's quality standards for handling and storage and provide access to Fairchild's full range of up-to-date technical and product information. Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address any warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Fairchild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

PRODUCT STATUS DEFINITIONS
Definition of Terms

<table>
<thead>
<tr>
<th>Datasheet Identification</th>
<th>Product Status</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advance Information</td>
<td>Formative / In Design</td>
<td>Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.</td>
</tr>
<tr>
<td>Preliminary</td>
<td>First Production</td>
<td>Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.</td>
</tr>
<tr>
<td>No Identification Needed</td>
<td>Full Production</td>
<td>Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.</td>
</tr>
<tr>
<td>Obsolete</td>
<td>Not In Production</td>
<td>Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.</td>
</tr>
</tbody>
</table>

Rev. 162

© Fairchild Semiconductor Corporation  www.fairchildsemi.com