**FAIRCHILD**

**SEMICONDUCTOR®**

May 2008

# KSA1281
# Audio Power Amplifier

- Collector Power Dissipation : PC=1W
- 3 Watt Output Application

TO-92L

1. Emitter  2. Collector 3. Base
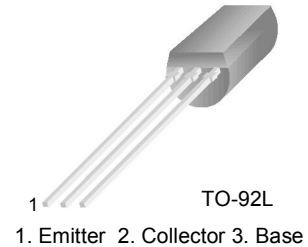
## Absolute Maximum Ratings* $T_a$=25°C unless otherwise noted

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | -50 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | -50 | V |
| $V_{EBO}$ | Emitter-Base Voltage | -5 | V |
| $I_C$ | Collector Current (DC) | -2 | A |
| $P_C$ | Collector Dissipation ($T_C$=25°C) | 1 | W |
| $T_J$ | Junction Temperature | 150 | °C |
| $T_{STG}$ | Storage Temperature | -55 ~ 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°C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

## Electrical Characteristics* $T_a$ = 25°C unless otherwise noted

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| $BV_{CBO}$ | Collector-Base Breakdown Voltage | $I_C$= -100, $I_E$=0 | -50 | | | V |
| $BV_{CEO}$ | Collector-Emitter Breakdown Voltage | $I_C$= -10mA, $I_B$=0 | -50 | | | V |
| $BV_{EBO}$ | Emitter-Base Breakdown Voltage | $I_E$= -1mA, $I_C$=0 | -5 | | | V |
| $I_{CBO}$ | Collector Cut-off Current | $V_{CB}$= -50V, $I_E$=0 | | | -100 | nA |
| $I_{EBO}$ | Emitter Cut-off Current | $V_{EB}$= -5V, $I_C$=0 | | | -100 | nA |
| $h_{FE1}$ $h_{FE2}$ | DC Current Gain | $V_{CE}$= -2V, $I_C$= -500mA $V_{CE}$= -2V, $I_C$= -1.5A | 70 40 | | 240 | |
| $V_{BE}$ (sat) | Base-Emitter Saturation Voltage | $I_C$= -1A, $I_B$= -0.05A | | | -1.2 | V |
| $V_{CE}$ (sat) | Collector-Emitter Saturation Voltage | $I_C$= -1A, $I_B$= -0.05A | | | -0.5 | V |
| $C_{ob}$ | Output Capacitance | $V_{CB}$= -10V, $I_E$=0, f=1MHz | | 40 | | pF |
| $f_T$ | Current Gain Bandwidth Product | $V_{CE}$= -2V, $I_C$= -500mA | | 100 | | MHz |

* Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2.0%

## $h_{FE}$ Classification

| Classification | R | O |
|---|---|---|
| $h_{FE}$ | 55 ~ 110 | 80 ~ 160 |

www.fairchildsemi.com

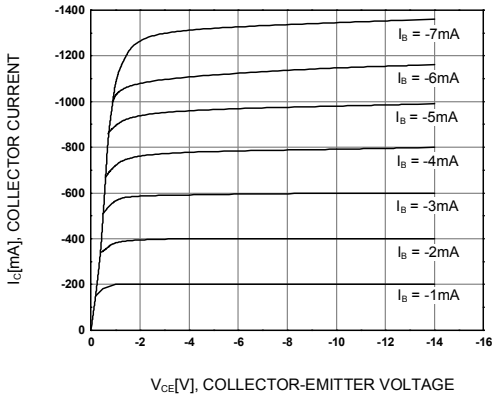# Typical Characteristics



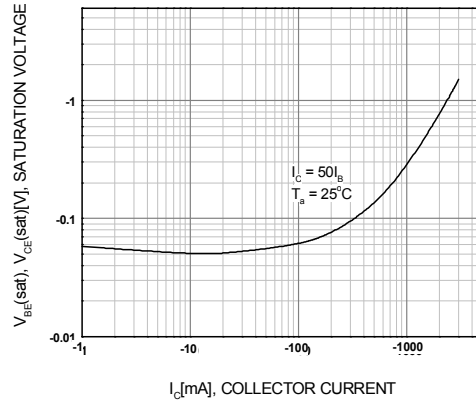**Figure 1. Static Characteristic**



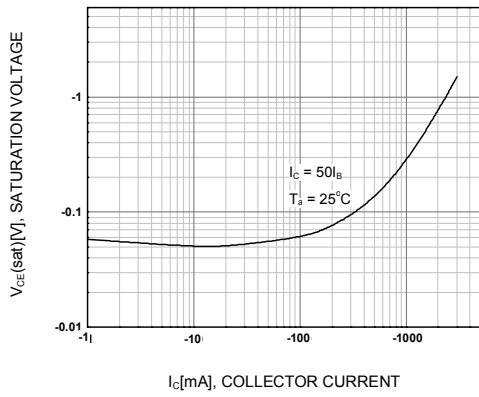**Figure 2. Base-Emitter Saturation Voltage**
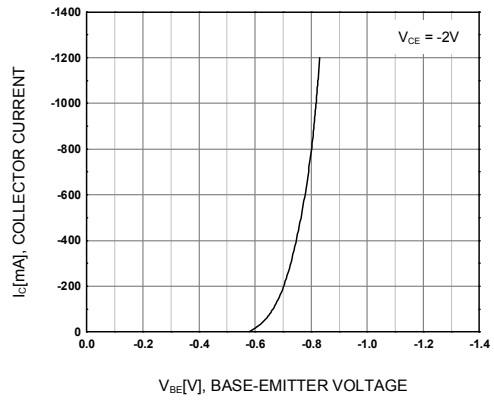


**Figure 3. Collector-Emitter Saturation Voltage**
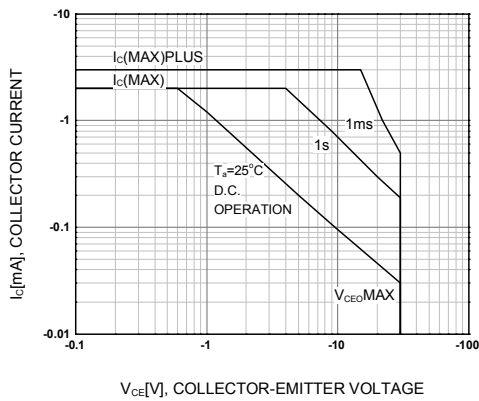


**Figure 4. Base-Emitter On Voltage**



**Figure 5. Safe Operating Area**



**Figure 6. Power Derating**

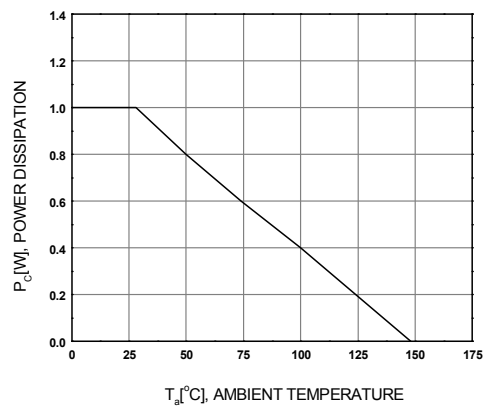
## TRADEMARKS

The following are registered and unregistered trademarks and service marks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

| | | | |
|---|---|---|---|
| ACEx® | Green FPS™ | Power247® | SuperSOT™-8 |
| Build it Now™ | Green FPS™ e-Series™ | POWEREDGE® | SyncFET™ |
| CorePLUS™ | GTO™ | Power-SPM™ | The Power Franchise® |
| CROSSVOLT™ | i-Lo™ | PowerTrench® | the **p** wer® franchise |
| CTL™ | IntelliMAX™ | Programmable Active Droop™ | |
| Current Transfer Logic™ | ISOPLANAR™ | QFET® | TinyBoost™ |
| EcoSPARK® | MegaBuck™ | QS™ | TinyBuck™ |
| F® | MICROCOUPLER™ | QT Optoelectronics™ | TinyLogic® |
| Fairchild® | MicroFET™ | Quiet Series™ | TINYOPTO™ |
| Fairchild Semiconductor® | MicroPak™ | RapidConfigure™ | TinyPower™ |
| FACT Quiet Series™ | MillerDrive™ | SMART START™ | TinyPWM™ |
| FACT® | Motion-SPM™ | SPM® | TinyWire™ |
| FAST® | OPTOLOGIC® | STEALTH™ | µSerDes™ |
| FastvCore™ | OPTOPLANAR® | SuperFET™ | UHC® |
| FPS™ | ® | SuperSOT™-3 | UniFET™ |
| FRFET® | PDP-SPM™ | SuperSOT™-6 | VCX™ |
| Global Power Resource℠ | Power220® | | |

## DISCLAIMER
FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN 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 COVERS THESE PRODUCTS.

## 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 significant injury to the user.

2. A critical component is 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.

## PRODUCT STATUS DEFINITIONS
### Definition of Terms

| Datasheet Identification | Product Status | Definition |
|---|---|---|
| Advance Information | Formative or In Design | This datasheet contains the design specifications for product development. Specifications may change in any manner without notice. |
| Preliminary | First Production | This 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. |
| No Identification Needed | Full Production | This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design. |
| Obsolete | Not In Production | This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only. |

Rev. I31