

# 2SA1943/FJL4215

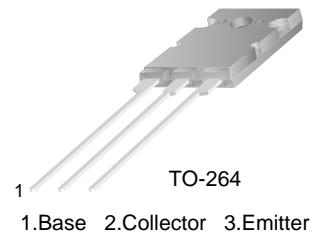
## PNP Epitaxial Silicon Transistor

### Applications

- High-Fidelity Audio Output Amplifier
- General Purpose Power Amplifier

### Features

- High Current Capability:  $I_C = -17A$ .
- High Power Dissipation : 150watts.
- High Frequency : 30MHz.
- High Voltage :  $V_{CEO} = -250V$
- Wide S.O.A for reliable operation.
- Excellent Gain Linearity for low THD.
- Complement to 2SC5200/FJL4315.
- Full thermal and electrical Spice models are available.
- Same transistor is also available in:
  - TO3P package, 2SA1962/FJA4213 : 130 watts
  - TO220 package, FJP1943 : 80 watts
  - TO220F package, FJPF1943 : 50 watts



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

| Symbol         | Parameter   | Ratings     | Units              |
|----------------|---|-------------|--------------------|
| $BV_{CBO}$     | Collector-Base Voltage  | -250        | V                  |
| $BV_{CEO}$     | Collector-Emitter Voltage   | -250        | V                  |
| $BV_{EBO}$     | Emitter-Base Voltage  | -5          | V                  |
| $I_C$          | Collector Current   | -17         | A                  |
| $I_B$          | Base Current  | -1.5        | A                  |
| $P_D$          | Total Device Dissipation( $T_C=25^\circ C$ )<br>Derate above $25^\circ C$ | 150<br>1.04 | W<br>W/ $^\circ C$ |
| $T_J, T_{STG}$ | Junction and Storage Temperature  | -50 ~ +150  | $^\circ C$         |

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

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

| Symbol          | Parameter                            | Max. | Units        |
|-----------------|--------------------------------------|------|--------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 0.83 | $^\circ C/W$ |

\* Device mounted on minimum pad size

### $h_{FE}$ Classification

| Classification | R        | O        |
|----------------|----------|----------|
| $h_{FE1}$      | 55 ~ 110 | 80 ~ 160 |

## Electrical Characteristics\*

$T_a=25^\circ\text{C}$  unless otherwise noted

| Symbol                      | Parameter                            | Test Condition                      | Min. | Typ. | Max. | Units         |
|-----------------------------|--------------------------------------|-------------------------------------|------|------|------|---------------|
| $\text{BV}_{\text{CBO}}$    | Collector-Base Breakdown Voltage     | $I_C=-5\text{mA}, I_E=0$            | -250 |      |      | V             |
| $\text{BV}_{\text{CEO}}$    | Collector-Emitter Breakdown Voltage  | $I_C=-10\text{mA}, R_{BE}=\infty$   | -250 |      |      | V             |
| $\text{BV}_{\text{EBO}}$    | Emitter-Base Breakdown Voltage       | $I_E=-5\text{mA}, I_C=0$            | -5   |      |      | V             |
| $I_{\text{CBO}}$            | Collector Cut-off Current            | $V_{CB}=-230\text{V}, I_E=0$        |      |      | -5.0 | $\mu\text{A}$ |
| $I_{\text{EBO}}$            | Emitter Cut-off Current              | $V_{EB}=-5\text{V}, I_C=0$          |      |      | -5.0 | $\mu\text{A}$ |
| $h_{\text{FE}1}$            | DC Current Gain                      | $V_{CE}=-5\text{V}, I_C=-1\text{A}$ | 55   |      | 160  |               |
| $h_{\text{FE}2}$            | DC Current Gain                      | $V_{CE}=-5\text{V}, I_C=-7\text{A}$ | 35   | 60   |      |               |
| $V_{\text{CE}(\text{sat})}$ | Collector-Emitter Saturation Voltage | $I_C=-8\text{A}, I_B=-0.8\text{A}$  |      | -0.4 | -3.0 | V             |
| $V_{\text{BE}(\text{on})}$  | Base-Emitter On Voltage              | $V_{CE}=-5\text{V}, I_C=-7\text{A}$ |      | -1.0 | -1.5 | V             |
| $f_T$                       | Current Gain Bandwidth Product       | $V_{CE}=-5\text{V}, I_C=-1\text{A}$ |      | 30   |      | MHz           |
| $C_{\text{ob}}$             | Output Capacitance                   | $V_{CB}=-10\text{V}, f=1\text{MHz}$ |      | 360  |      | pF            |

\* Pulse Test: Pulse Width=20 $\mu\text{s}$ , Duty Cycle $\leq 2\%$

## Ordering Information

| Part Number | Marking | Package | Packing Method | Remarks      |
|-------------|---------|---------|----------------|--------------|
| 2SA1943RTU  | A1943R  | TO-264  | TUBE           | hFE1 R grade |
| 2SA1943OTU  | A1943O  | TO-264  | TUBE           | hFE1 O grade |
| FJL4215RTU  | J4215R  | TO-264  | TUBE           | hFE1 R grade |
| FJL4215OTU  | J4215O  | TO-264  | TUBE           | hFE1 O grade |

## Typical Characteristics

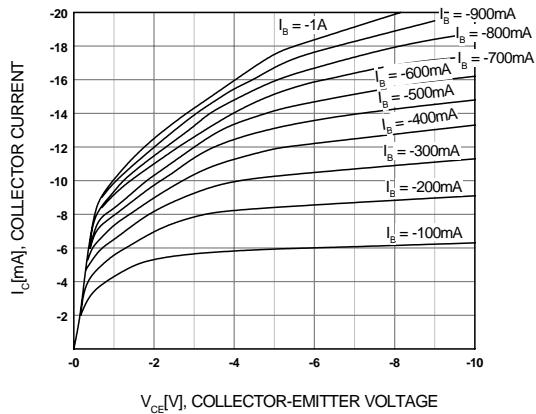


Figure 1. Static Characteristic

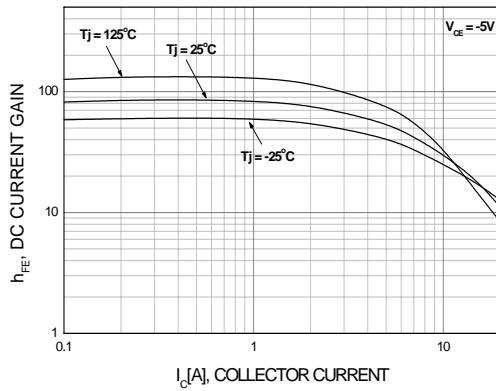


Figure 2. DC current Gain ( R Grade )

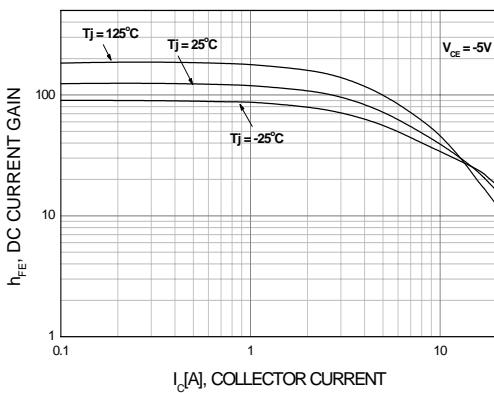


Figure 3. DC current Gain ( O Grade )

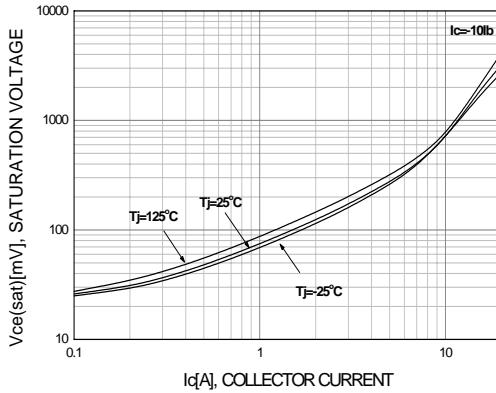


Figure 4. Collector-Emitter Saturation Voltage

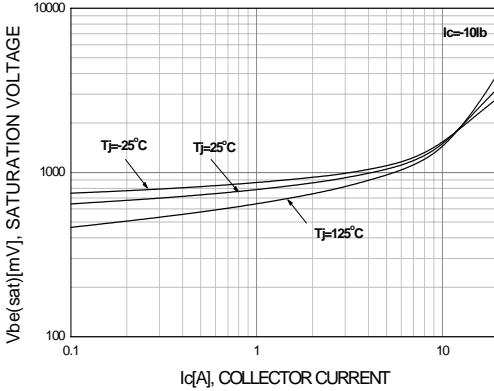


Figure 5. Base-Emitter Saturation Voltage

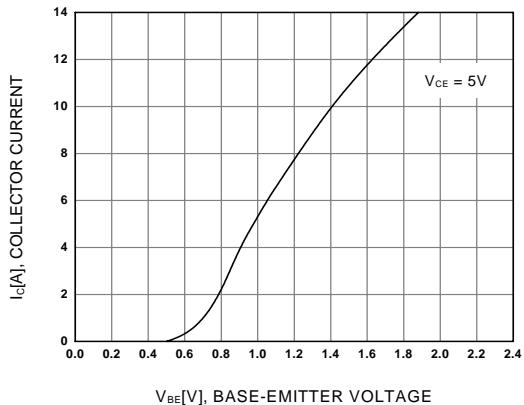


Figure 6. Base-Emitter On Voltage

## Typical Characteristics

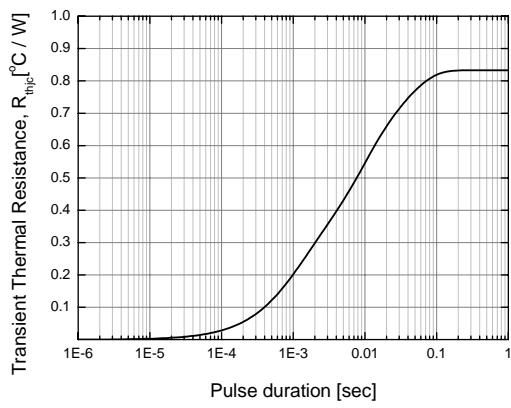


Figure 7. Thermal Resistance

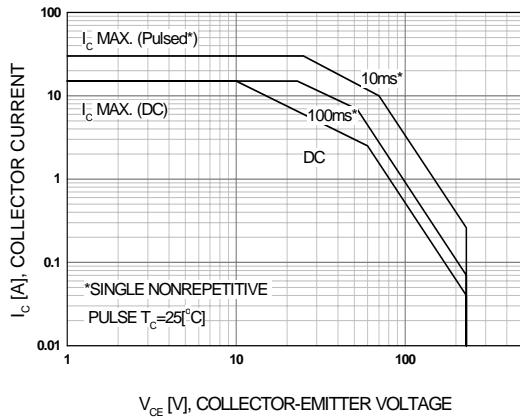


Figure 8. Safe Operating Area

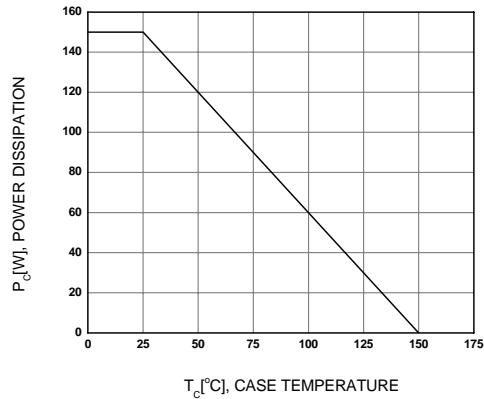
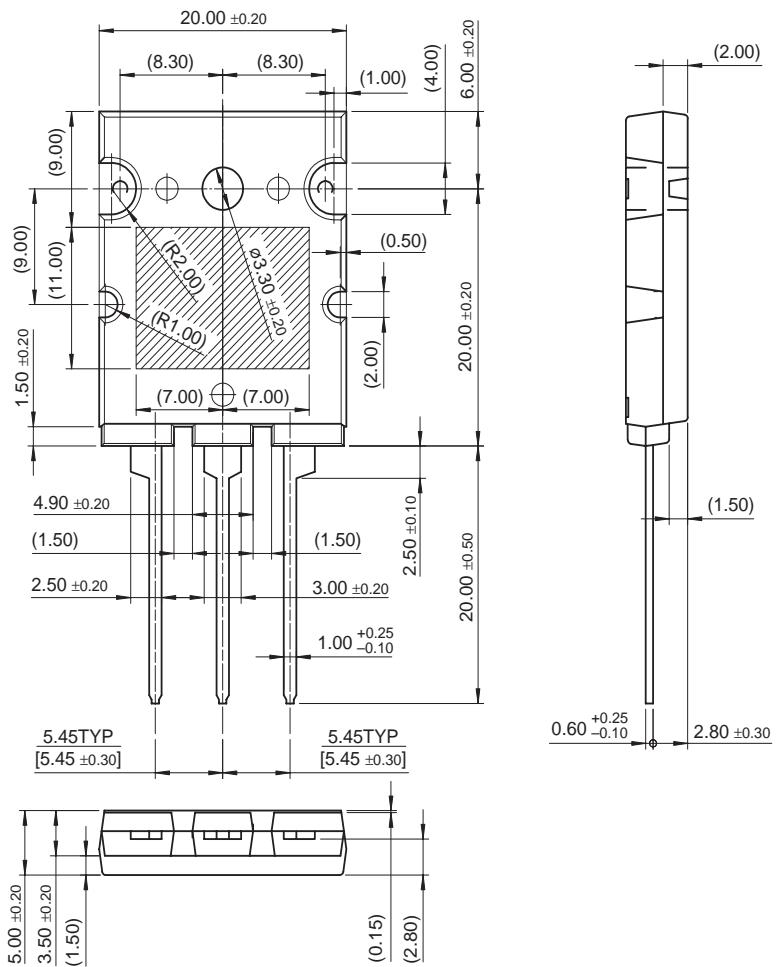


Figure 9. Power Derating

## Package Dimensions

## TO-264



Dimensions in Millimeters

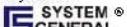


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