

# PNP Epitaxial Silicon Transistor

## FJL4215, 2SA1943

### Features

- High Current Capability:  $I_C = 17\text{ A}$
- High Power Dissipation: 150 W
- High Frequency: 30 MHz
- High Voltage:  $V_{CEO} = -250\text{ V}$
- Wide S.O.A. for Reliable Operation
- Excellent Gain Linearity for Low THD
- Complement to 2SC5200 / FJL4315
- 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
- These Devices are Pb-Free and are RoHS Compliant

### Applications

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

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

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

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS (Note 1)

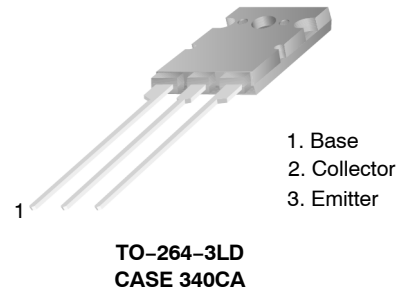
( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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

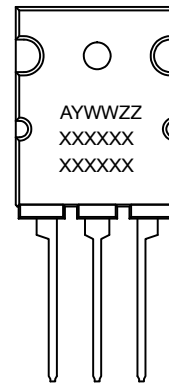
1. Device mounted on minimum pad size.

### $h_{FE}$ CLASSIFICATION

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



### MARKING DIAGRAM



A = Assembly Location  
 YWW = Date Code  
 ZZ = Assembly Lot  
 xxxxx = Specific Device Code  
 (J4215O or A1943O)

### ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

## FJL4215, 2SA1943

### ELECTRICAL CHARACTERISTICS (Note 2) ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

| Symbol        | Parameter                            | Conditions                                | Min. | Typ. | Max. | Unit          |
|---------------|--------------------------------------|-------------------------------------------|------|------|------|---------------|
| $BV_{CBO}$    | Collector–Base Breakdown Voltage     | $I_C = 5\text{ mA}, I_E = 0$              | –250 |      |      | V             |
| $BV_{CEO}$    | Collector–Emitter Breakdown Voltage  | $I_C = 10\text{ mA}, R_{BE} = \infty$     | –250 |      |      | V             |
| $BV_{EBO}$    | Emitter–Base Breakdown Voltage       | $I_E = 5\text{ mA}, I_C = 0$              | –5   |      |      | V             |
| $I_{CBO}$     | Collector Cut–Off Current            | $V_{CB} = -230\text{ V}, I_E = 0$         |      |      | –5.0 | $\mu\text{A}$ |
| $I_{EBO}$     | Emitter Cut–Off Current              | $V_{EB} = -5\text{ V}, I_C = 0$           |      |      | –5.0 | $\mu\text{A}$ |
| $h_{FE1}$     | DC Current Gain                      | $V_{CE} = -5\text{ V}, I_C = -1\text{ A}$ | 55   |      | 160  |               |
| $h_{FE2}$     | DC Current Gain                      | $V_{CE} = -5\text{ V}, I_C = -7\text{ A}$ | 35   | 60   |      |               |
| $V_{CE(sat)}$ | Collector–Emitter Saturation Voltage | $I_C = -8\text{ A}, I_B = -0.8\text{ A}$  |      | –0.4 | –3.0 | V             |
| $V_{BE(on)}$  | 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           |
| $C_{ob}$      | Output Capacitance                   | $V_{CB} = -10\text{ V}, f = 1\text{ MHz}$ |      | 360  |      | pF            |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

### ORDERING INFORMATION

| Part Number | Marking | Package              | Shipping         | Remarks           |
|-------------|---------|----------------------|------------------|-------------------|
| 2SA1943OTU  | A1943O  | TO–264–3LD (Pb–Free) | 375 Units / Tube | $h_{FE1}$ O grade |
| FJL4215OTU  | J4215O  | TO–264–3LD (Pb–Free) | 375 Units / Tube | $h_{FE1}$ O grade |

TYPICAL CHARACTERISTICS

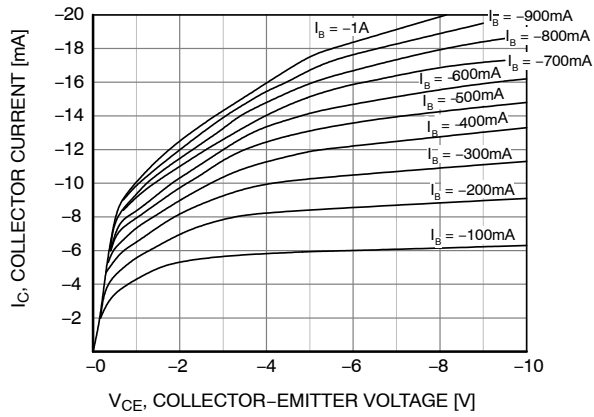


Figure 1. Static Characteristic

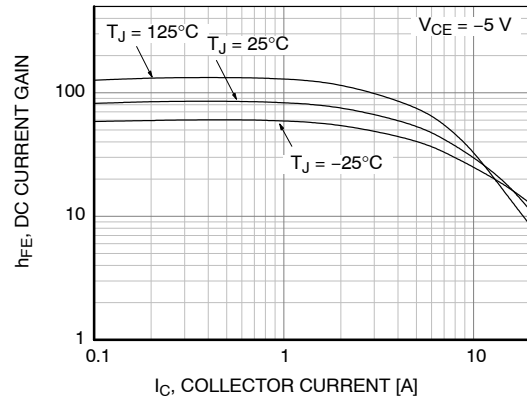


Figure 2. DC Current Gain (R Grade)

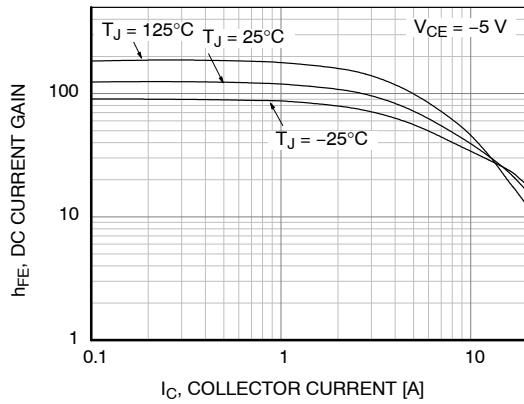


Figure 3. DC Current Gain (O Grade)

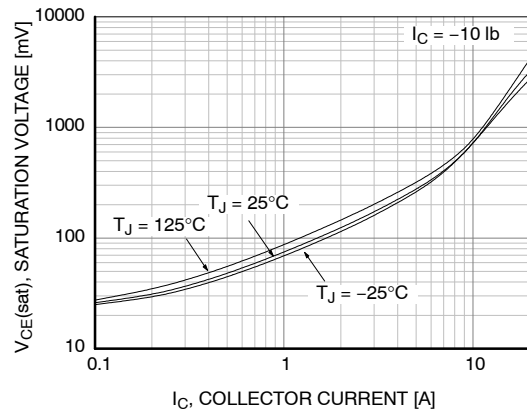


Figure 4. Collector-Emitter Saturation Voltage

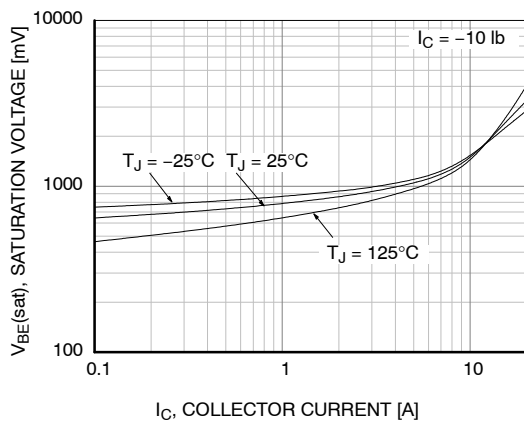


Figure 5. Base-Emitter Saturation Voltage

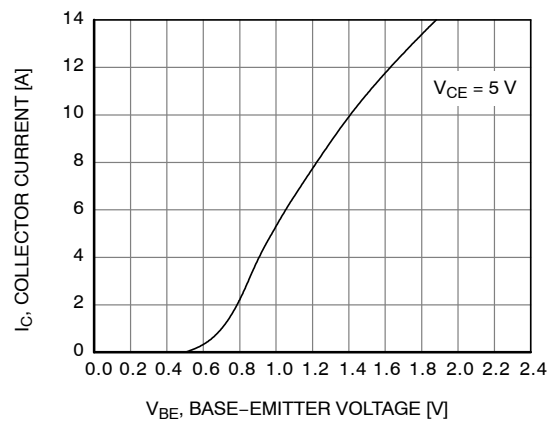


Figure 6. Base-Emitter On Voltage

TYPICAL CHARACTERISTICS

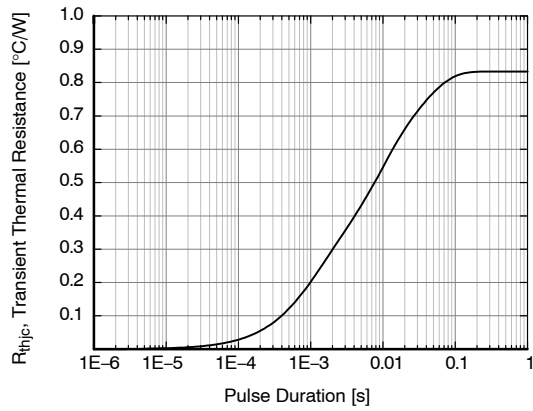


Figure 7. Thermal Resistance

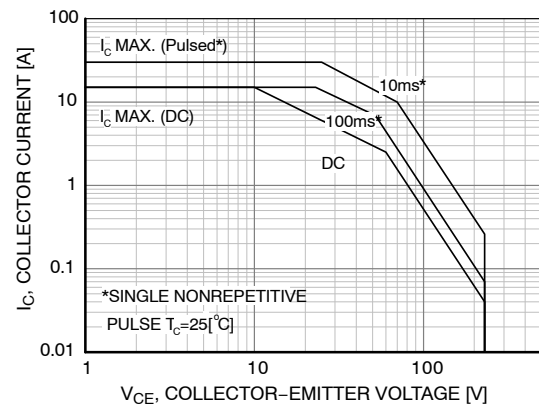


Figure 8. Safe Operating Area

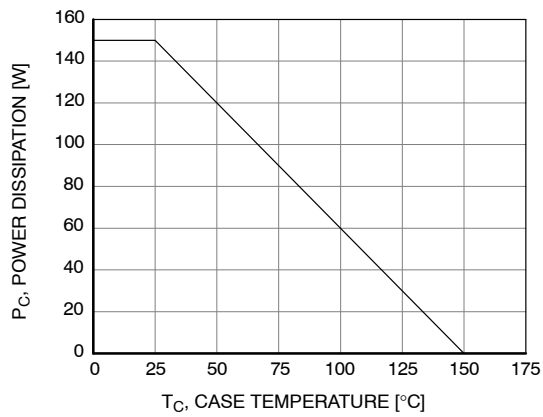
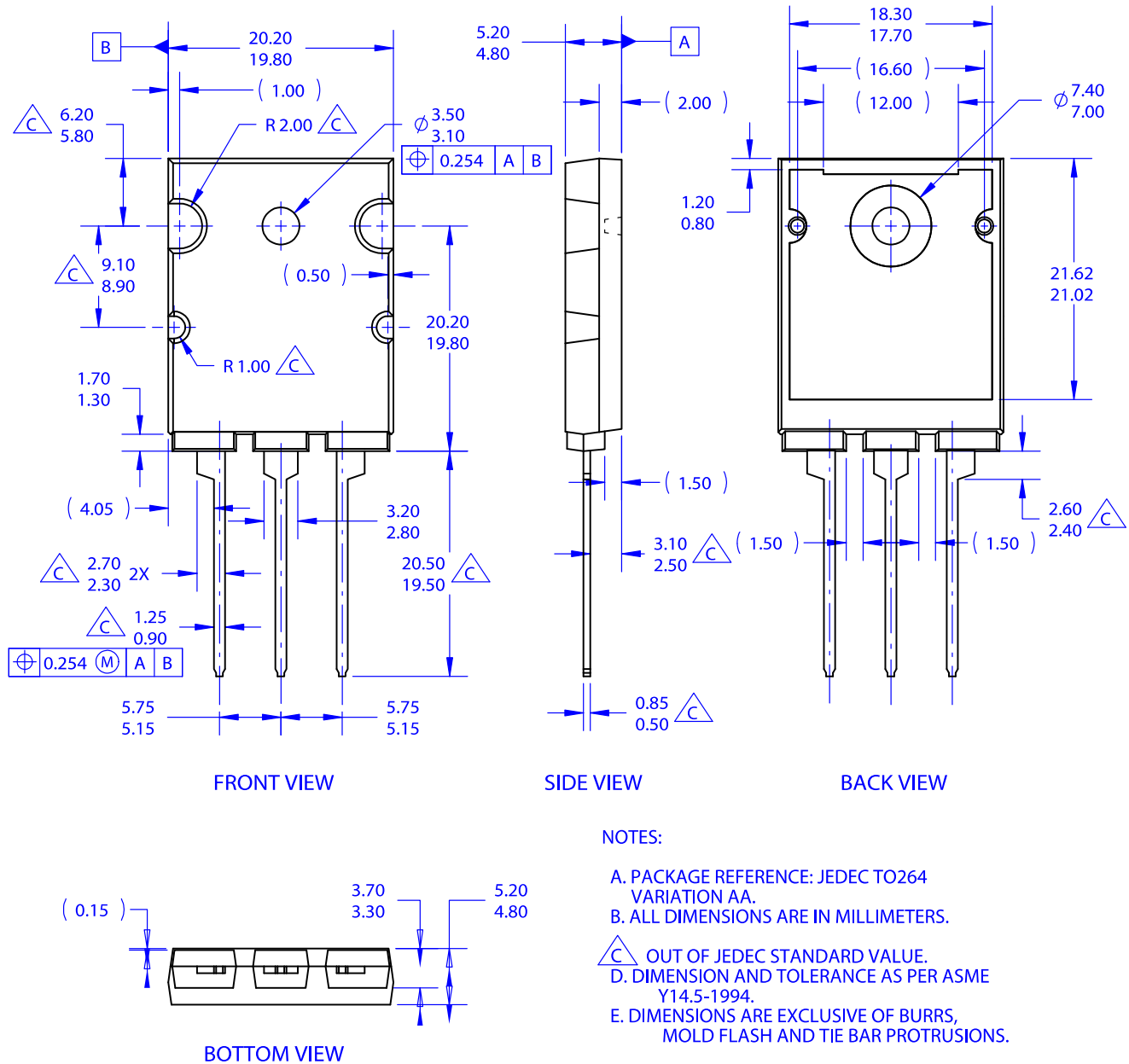


Figure 9. Power Derating

TO-264-3LD  
CASE 340CA  
ISSUE O

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|                  |             |                                                                                                                                                                                     |
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| DESCRIPTION:     | TO-264-3LD  | PAGE 1 OF 1                                                                                                                                                                         |

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