

# Low Frequency Transistor (20V, 3A)

## 2SD2150 / 2SC4115S / 2SD2264

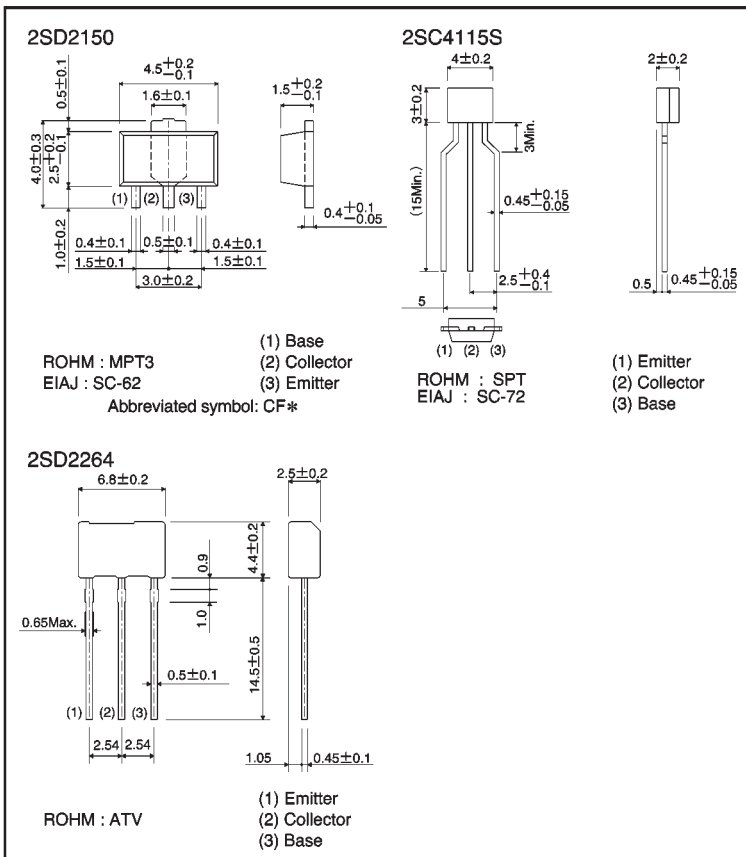
### ●Features

- 1) Low  $V_{CE(sat)}$ .  
 $V_{CE(sat)} = 0.2V$  (Typ.)  
( $I_C / I_B = 2A / 0.1A$ )
- 2) Excellent current gain characteristics.
- 3) Complements the  
2SB1424 / 2SA1585S.

### ●Structure

Epitaxial planar type  
NPN silicon transistor

### ●External dimensions (Units: mm)



\* Denotes  $h_{FE}$

●Absolute maximum ratings (Ta = 25°C)

| Parameter                   |          | Symbol           | Limits   | Unit         |
|-----------------------------|----------|------------------|----------|--------------|
| Collector-base voltage      |          | V <sub>CB0</sub> | 40       | V            |
| Collector-emitter voltage   |          | V <sub>CE0</sub> | 20       | V            |
| Emitter-base voltage        |          | V <sub>EB0</sub> | 6        | V            |
| Collector current           |          | I <sub>c</sub>   | 3        | A (DC)       |
|                             |          |                  | 5        | A (Pulse) *1 |
| Collector power dissipation | 2SD2150  | P <sub>c</sub>   | 0.5      | W            |
|                             | 2SC4115S |                  | 0.3      |              |
|                             | 2SD2264  |                  | 1        |              |
| Junction temperature        |          | T <sub>j</sub>   | 150      | °C           |
| Storage temperature         |          | T <sub>stg</sub> | −55~+150 | °C           |

\*1 Single pulse P<sub>w</sub>=10ms

\*2 Printed circuit board, 1.7mm thick, collector copper plating 100mm<sup>2</sup> or larger.

●Electrical characteristics (Ta = 25°C)

| Parameter                            |          | Symbol               | Min. | Typ. | Max. | Unit | Conditions                                           |
|--------------------------------------|----------|----------------------|------|------|------|------|------------------------------------------------------|
| Collector-base breakdown voltage     |          | BV <sub>CB0</sub>    | 40   | —    | —    | V    | I <sub>c</sub> =50 μA                                |
| Collector-emitter breakdown voltage  |          | BV <sub>CE0</sub>    | 20   | —    | —    | V    | I <sub>c</sub> =1mA                                  |
| Emitter-base breakdown voltage       |          | BV <sub>EB0</sub>    | 6    | —    | —    | V    | I <sub>E</sub> =50 μA                                |
| Collector cutoff current             |          | I <sub>CB0</sub>     | —    | —    | 0.1  | μA   | V <sub>CB</sub> =30V                                 |
| Emitter cutoff current               |          | I <sub>EB0</sub>     | —    | —    | 0.1  | μA   | V <sub>EB</sub> =5V                                  |
| Collector-emitter saturation voltage |          | V <sub>CE(sat)</sub> | —    | 0.2  | 0.5  | V    | I <sub>c</sub> /I <sub>B</sub> =2A/0.1A *            |
| DC current transfer ratio            | 2SD2150  | h <sub>FE</sub>      | 180  | —    | 560  | —    | V <sub>CE</sub> =2V, I <sub>c</sub> =0.1A            |
|                                      | 2SC4115S |                      | 120  | —    | 560  |      |                                                      |
|                                      | 2SD2264  |                      | 180  | —    | 390  |      |                                                      |
| Transition frequency                 |          | f <sub>T</sub>       | —    | 290  | —    | MHz  | V <sub>CE</sub> =2V, I <sub>E</sub> =−0.5A, f=100MHz |
| Output capacitance                   |          | C <sub>ob</sub>      | —    | 25   | —    | pF   | V <sub>CE</sub> =10V, I <sub>E</sub> =0A, f=1MHz     |

\* Measured using pulse current.

●Packaging specifications and h<sub>FE</sub>

| Type     | h <sub>FE</sub> | Package                      | Taping |      |      |
|----------|-----------------|------------------------------|--------|------|------|
|          |                 | Code                         | T100   | TP   | TV2  |
|          |                 | Basic ordering unit (pieces) | 1000   | 5000 | 2500 |
| 2SD2150  | RS              |                              | ○      | —    | —    |
| 2SC4115S | QRS             |                              | —      | ○    | —    |
| 2SD2264  | R               |                              | —      | —    | ○    |

h<sub>FE</sub> values are classified as follows :

| Item            | Q       | R       | S       |
|-----------------|---------|---------|---------|
| h <sub>FE</sub> | 120~270 | 180~390 | 270~560 |

## ●Electrical characteristic curves

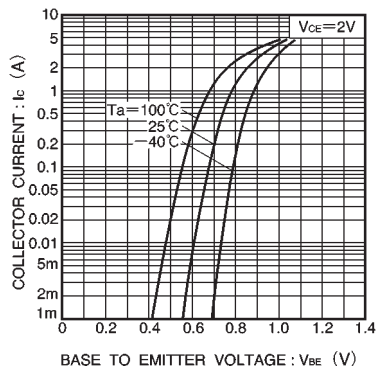


Fig.1 Grounded emitter propagation characteristics

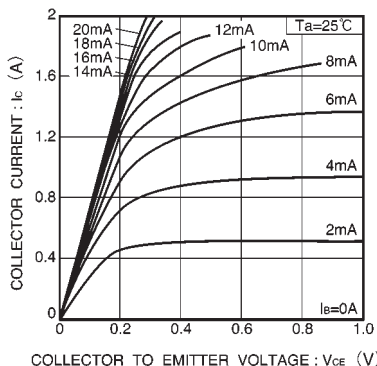


Fig.2 Grounded emitter output characteristics ( I )

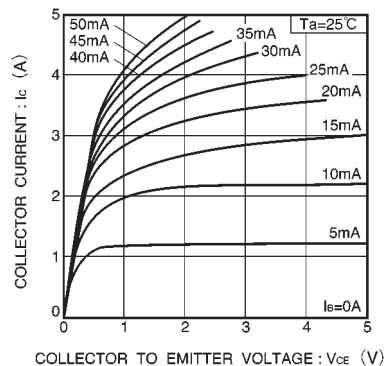


Fig.3 Grounded emitter output characteristics ( II )

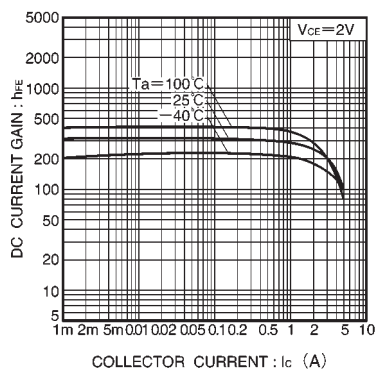


Fig.4 DC current gain vs. collector current

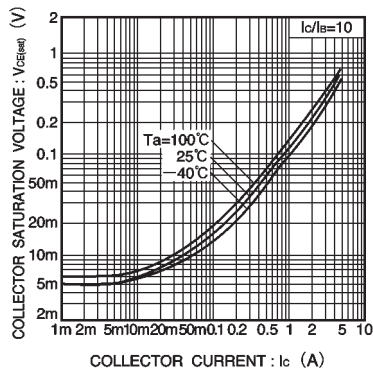


Fig.5 Collector-emitter saturation voltage vs. collector current ( I )

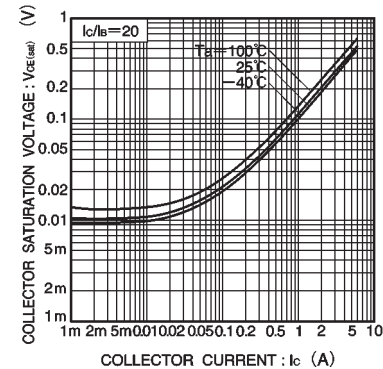


Fig.6 Collector-emitter saturation voltage vs. collector current ( II )

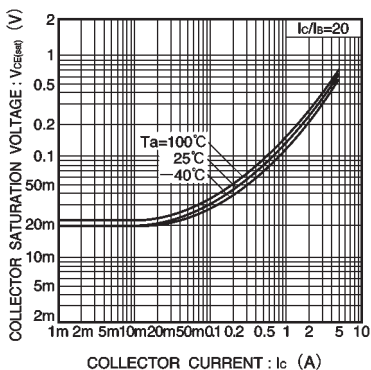


Fig.7 Collector-emitter saturation voltage vs. collector current ( III )

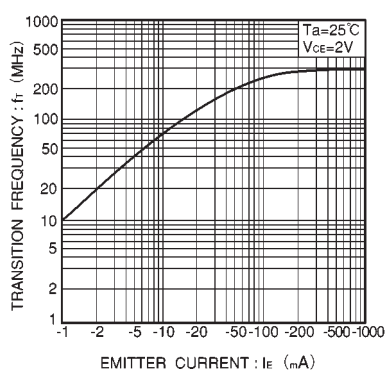
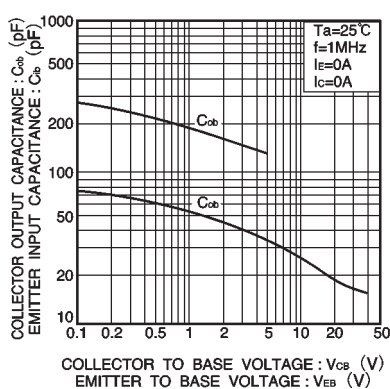


Fig.8 Gain bandwidth product vs. emitter current

Fig.9 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage