



2SB1215/2SD1815

Bipolar Transistor

(-100V, (-)3A, Low $V_{CE(sat)}$ (PNP)NPN Single TP/TP-FA

ON Semiconductor®

<http://onsemi.com>

Applications

- Relay drivers, high-speed inverters, converters, and other general high-current switching applications

Features

- Low collector to emitter saturation voltage
- Small-sized package permitting 2SB1215/2SD1815-applied sets to be made small and slim
- High f_T
- Halogen free compliance
- Excellent linearity of h_{FE}
- Fast switching time

Specifications () : 2SB1215

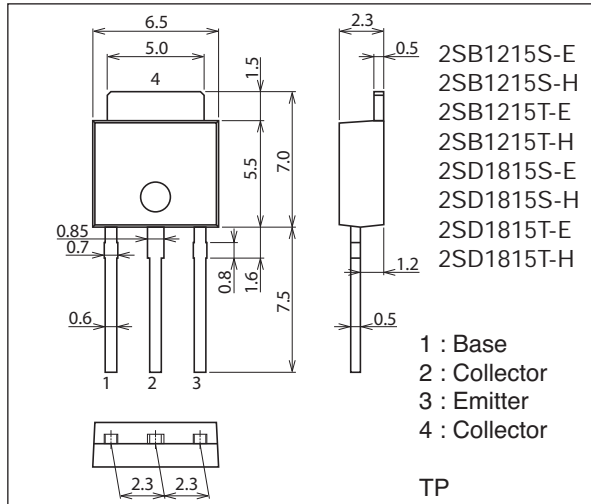
Absolute Maximum Ratings at $T_a=25^\circ C$

| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|-----------|------------|---------|------|
| Collector to Base Voltage | V_{CBO} | | (-)120 | V |
| Collector to Emitter Voltage | V_{CEO} | | (-)100 | V |
| Emitter to Base Voltage | V_{EBO} | | (-)6 | V |
| Collector Current | I_C | | (-)3 | A |
| Collector Current (Pulse) | I_{CP} | | (-)6 | A |

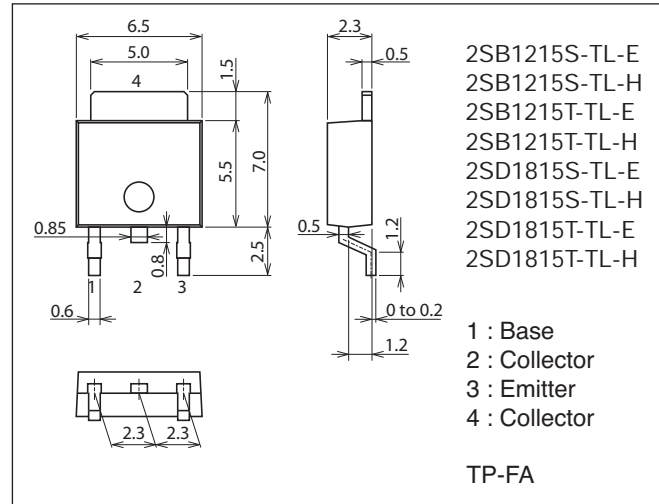
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Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions unit : mm (typ) 7518-003



Package Dimensions unit : mm (typ) 7003-003

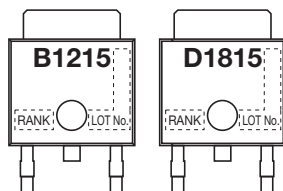


Product & Package Information

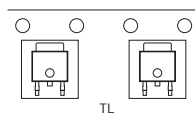
- Package : TP
- JEITA, JEDEC : SC-64, TO-251
- Minimum Packing Quantity : 500 pcs./bag

- Package : TP-FA
- JEITA, JEDEC : SC-63, TO-252
- Minimum Packing Quantity : 700 pcs./reel

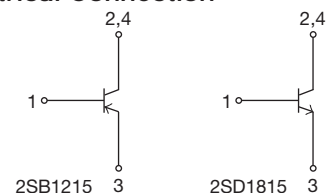
Marking (TP, TP-FA)



Packing Type (TP-FA) : TL



Electrical Connection



2SB1215/2SD1815

Continued from preceding page.

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------|------------------|----------------------|-------------|------|
| Collector Dissipation | P _C | | 1 | W |
| | | T _C =25°C | 20 | W |
| Junction Temperature | T _J | | 150 | °C |
| Storage Temperature | T _{stg} | | -55 to +150 | °C |

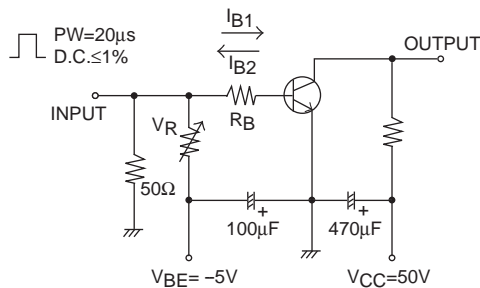
Electrical Characteristics at T_a=25°C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|----------------------|---|---------|-----------|-----------|------|
| | | | min | typ | max | |
| Collector Cutoff Current | I _{CBO} | V _{CB} =(-)100V, I _E =0A | | | (-)1 | μA |
| Emitter Cutoff Current | I _{EBO} | V _{EB} =(-)4V, I _C =0A | | | (-)1 | μA |
| DC Current Gain | h _{FE1} | V _{CE} =(-)5V, I _C =(-)0.5A | 140* | | 400* | |
| | h _{FE2} | V _{CE} =(-)5V, I _C =(-)2A | 40 | | | |
| Gain-Bandwidth Product | f _T | V _{CE} =(-)10V, I _C =(-)0.5A | | (130)180 | | MHz |
| Output Capacitance | C _{ob} | V _{CB} =(-)10V, f=1MHz | | (40)25 | | pF |
| Collector to Emitter Saturation Voltage | V _{CE(sat)} | I _C =(-)1.5A, I _B =(-)0.15A | | (-200)150 | (-500)400 | mV |
| Base to Emitter Saturation Voltage | V _{BE(sat)} | I _C =(-)1.5A, I _B =(-)0.15A | | (-)0.9 | (-)1.2 | V |
| Collector to Base Breakdown Voltage | V(BR)CBO | I _C =(-)10μA, I _E =0A | (-)120 | | | V |
| Collector to Emitter Breakdown Voltage | V(BR)CEO | I _C =(-)1mA, R _{BE} =∞ | (-)100 | | | V |
| Emitter to Base Breakdown Voltage | V(BR)EBO | I _E =(-)10μA, I _C =0A | (-)6 | | | V |
| Turn-On Time | t _{on} | See specified Test Circuit. | | 100 | | ns |
| Storage Time | t _{stg} | | | (800)900 | | ns |
| Fall Time | t _f | | | 50 | | ns |

* : The 2SB1215/2SD1815 are classified by 0.5A h_{FE} as follows :

| Rank | S | T |
|-----------------|------------|------------|
| h _{FE} | 140 to 280 | 200 to 400 |

Switching Time Test Circuit

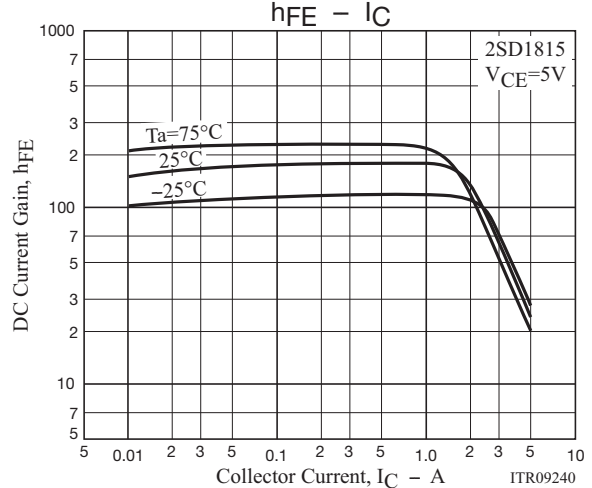
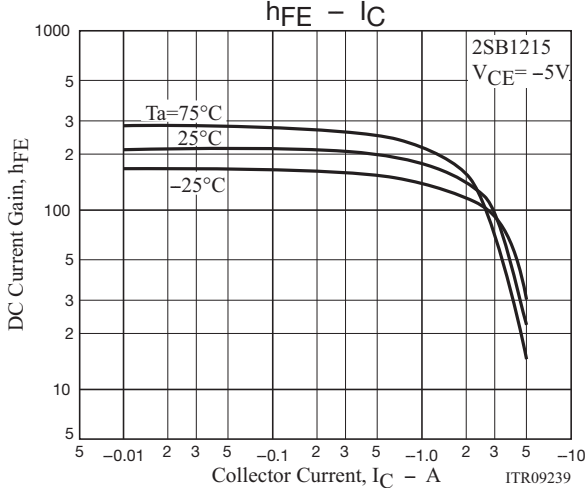
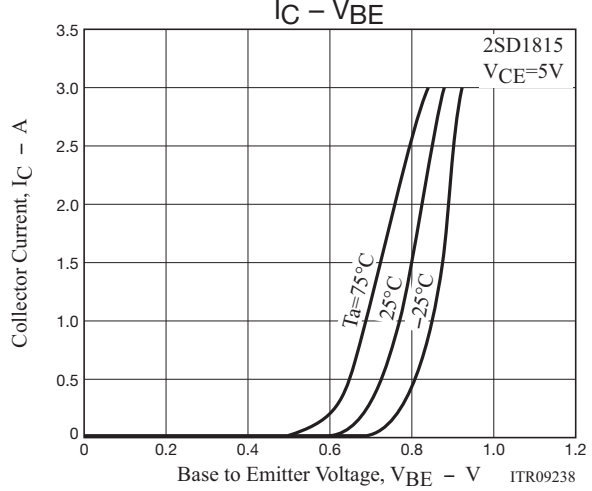
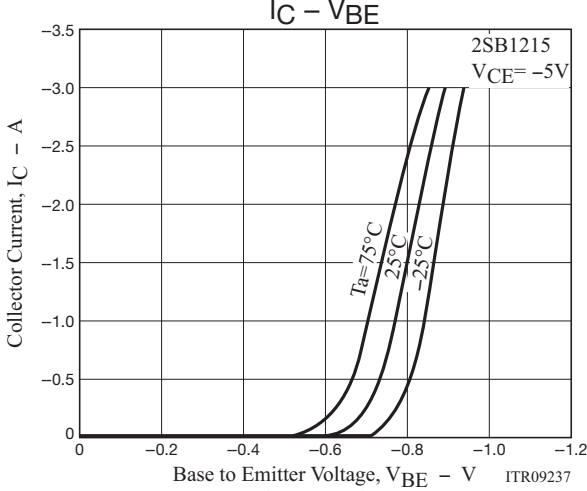
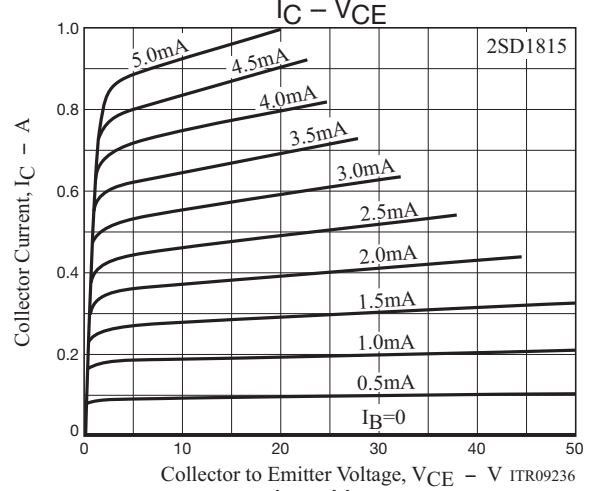
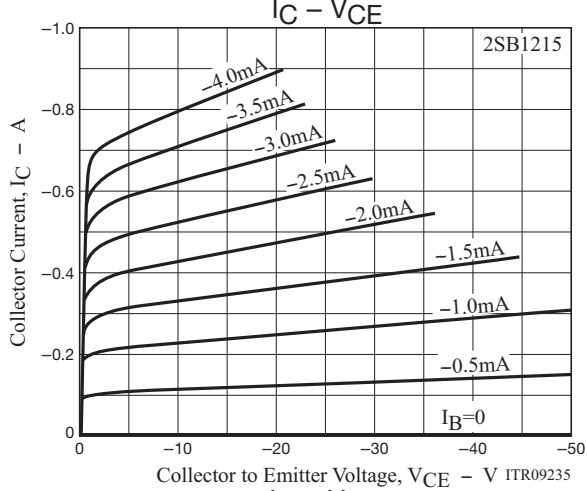
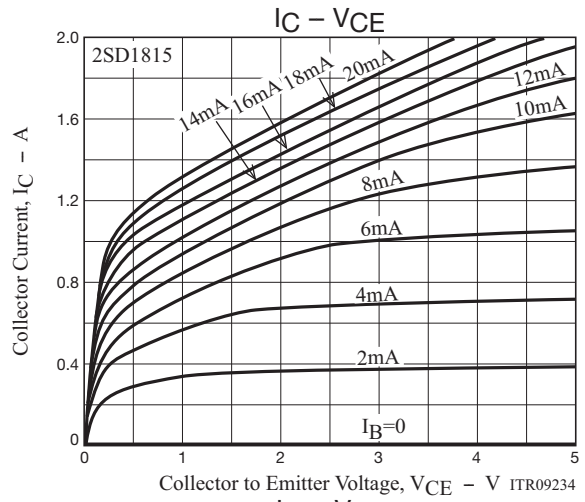
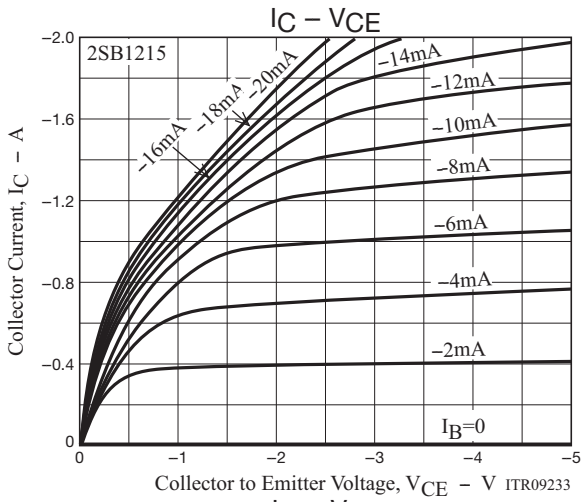


I_C=10I_{B1} = -10I_{B2}=1.5A
For PNP, the polarity is reversed.

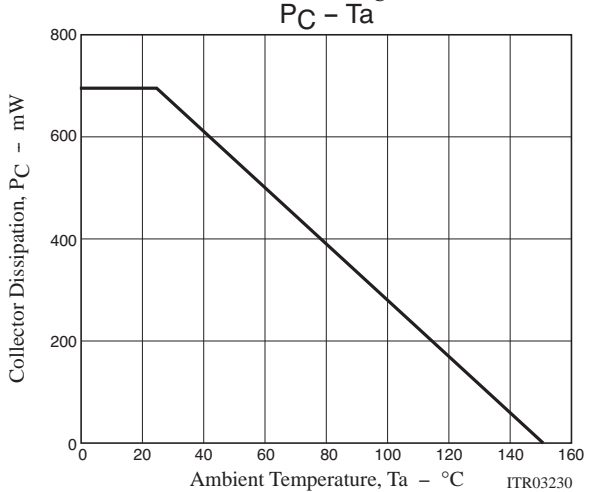
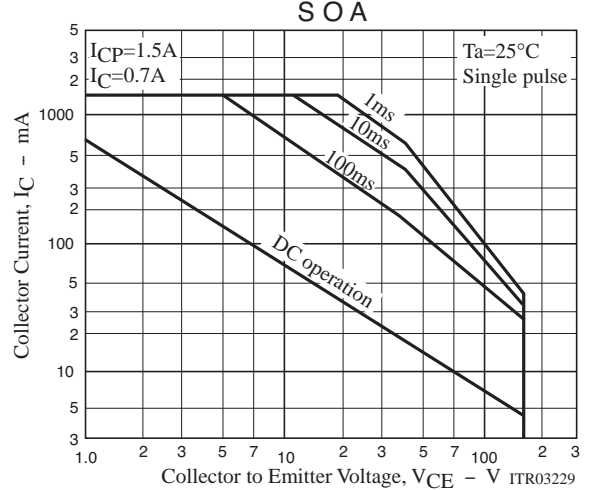
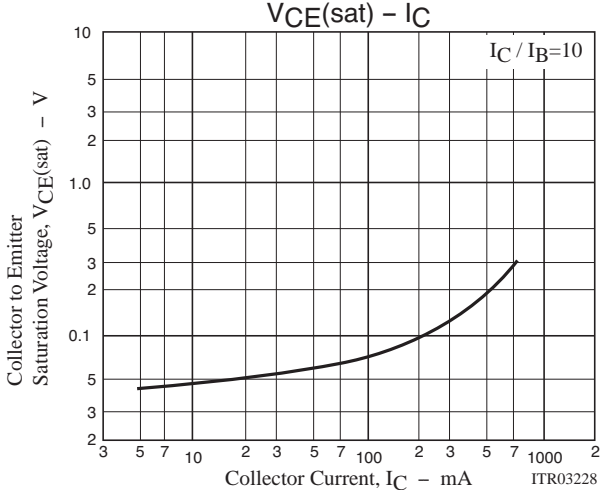
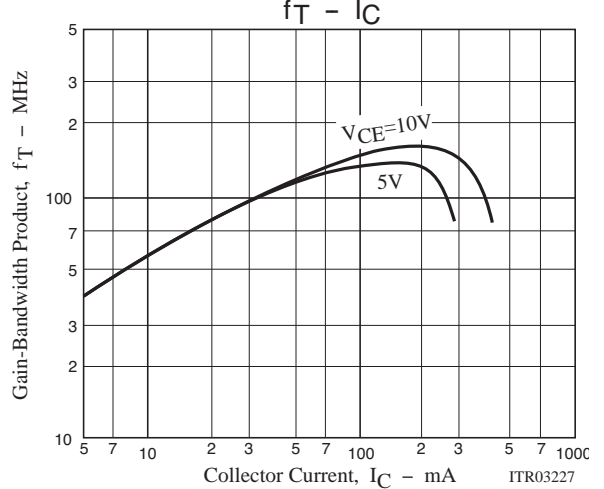
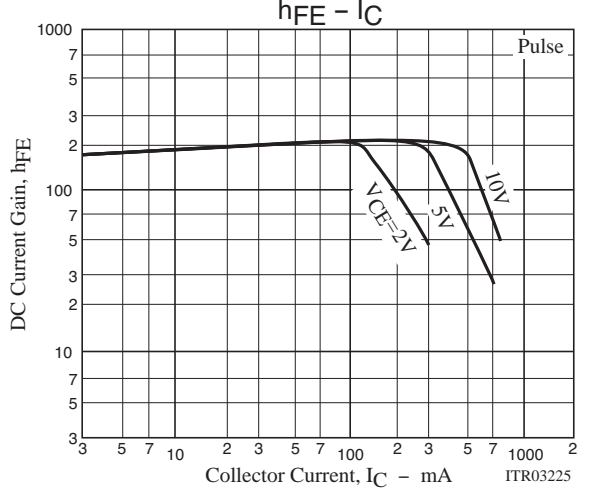
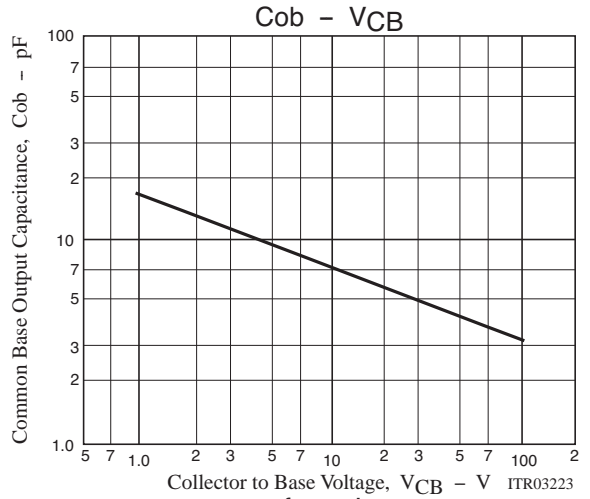
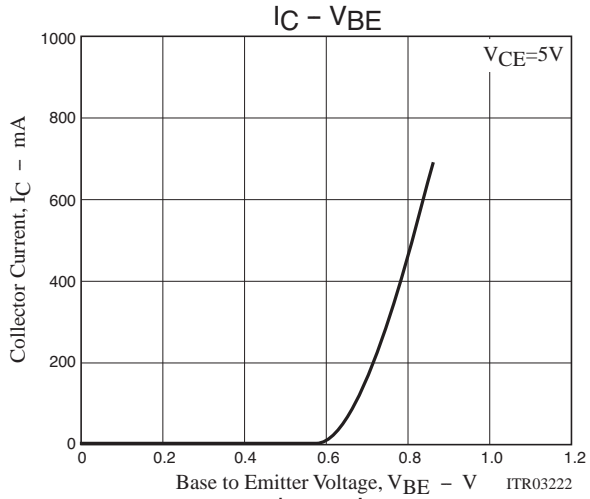
Ordering Information

| Device | Package | Shipping | memo |
|---------------|---------|--------------|--------------------------|
| 2SB1215S-E | TP | 500pcs./bag | Pb Free |
| 2SB1215S-H | TP | 500pcs./bag | Pb Free and Halogen Free |
| 2SB1215T-E | TP | 500pcs./bag | Pb Free |
| 2SB1215T-H | TP | 500pcs./bag | Pb Free and Halogen Free |
| 2SD1815S-E | TP | 500pcs./bag | Pb Free |
| 2SD1815S-H | TP | 500pcs./bag | Pb Free and Halogen Free |
| 2SD1815T-E | TP | 500pcs./bag | Pb Free |
| 2SD1815T-H | TP | 500pcs./bag | Pb Free and Halogen Free |
| 2SB1215S-TL-E | TP-FA | 700pcs./reel | Pb Free |
| 2SB1215S-TL-H | TP-FA | 700pcs./reel | Pb Free and Halogen Free |
| 2SB1215T-TL-E | TP-FA | 700pcs./reel | Pb Free |
| 2SB1215T-TL-H | TP-FA | 700pcs./reel | Pb Free and Halogen Free |
| 2SD1815S-TL-E | TP-FA | 700pcs./reel | Pb Free |
| 2SD1815S-TL-H | TP-FA | 700pcs./reel | Pb Free and Halogen Free |
| 2SD1815T-TL-E | TP-FA | 700pcs./reel | Pb Free |
| 2SD1815T-TL-H | TP-FA | 700pcs./reel | Pb Free and Halogen Free |

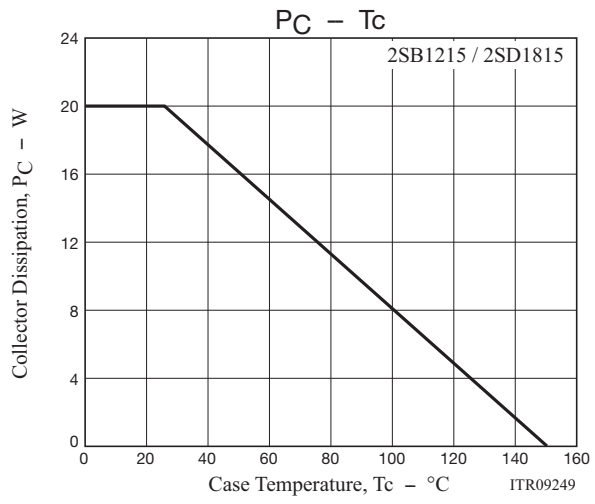
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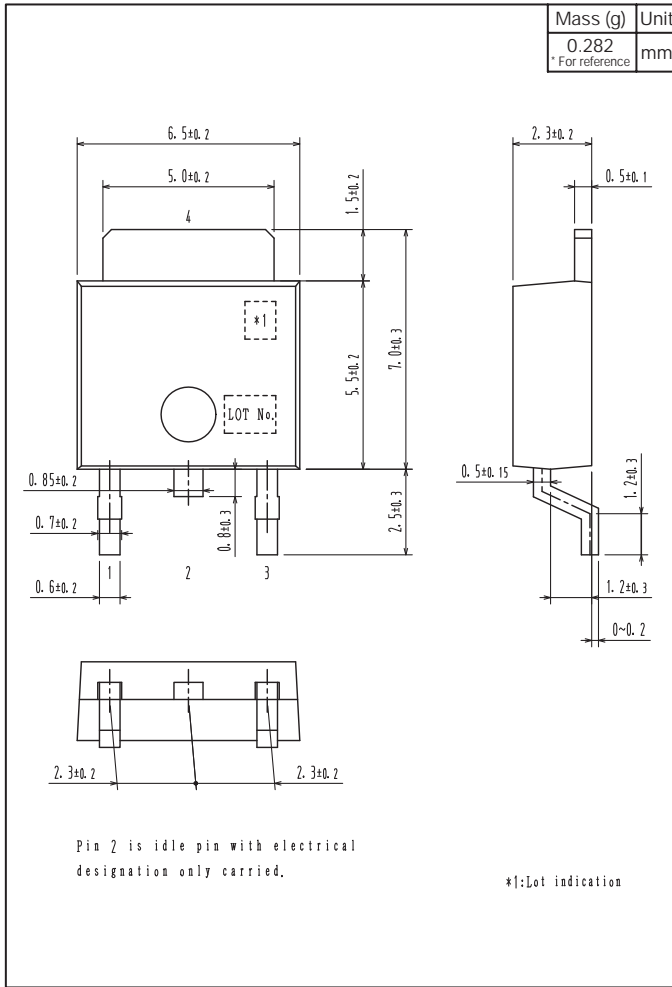
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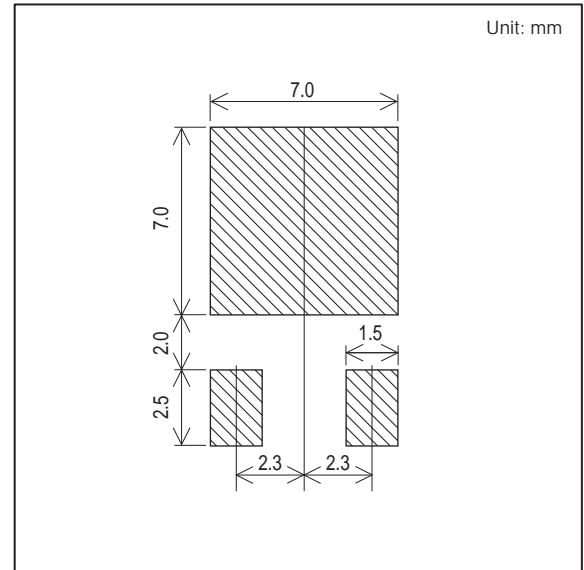
2SB1215/2SD1815

Outline Drawing

2SB1215S-TL-E, 2SB1215S-TL-H, 2SB1215T-TL-E, 2SB1215T-TL-H, 2SD1815S-TL-E, 2SD1815S-TL-H, 2SD1815T-TL-E, 2SD1815T-TL-H



Land Pattern Example

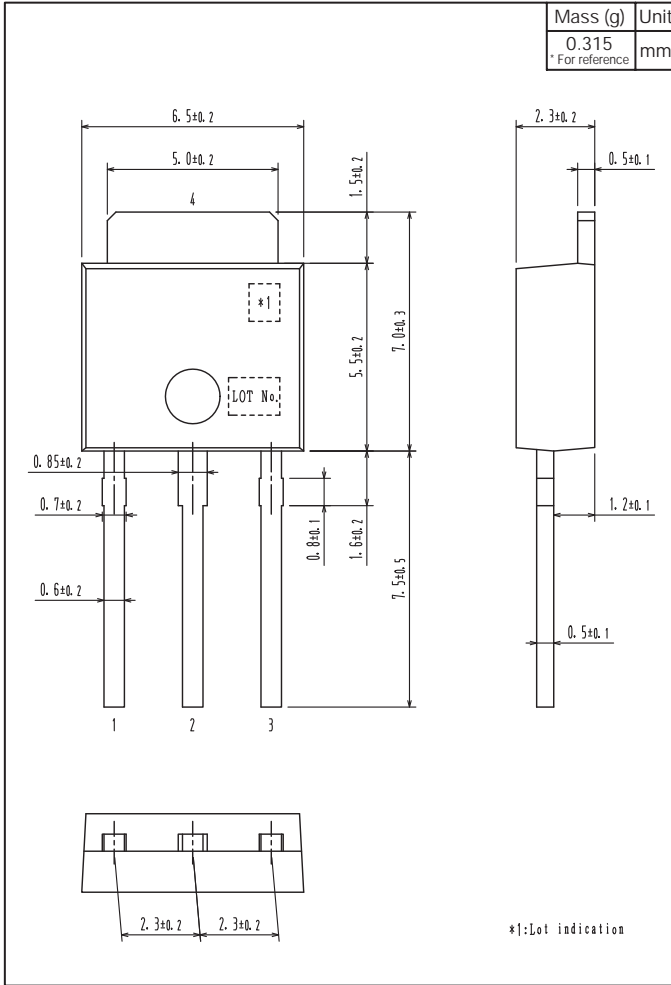


Unit: mm

2SB1215/2SD1815

Outline Drawing

2SB1215S-E, 2SB1215S-H, 2SB1215T-E, 2SB1215T-H, 2SD1815S-E, 2SD1815S-H, 2SD1815T-E, 2SD1815T-H



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