



# 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

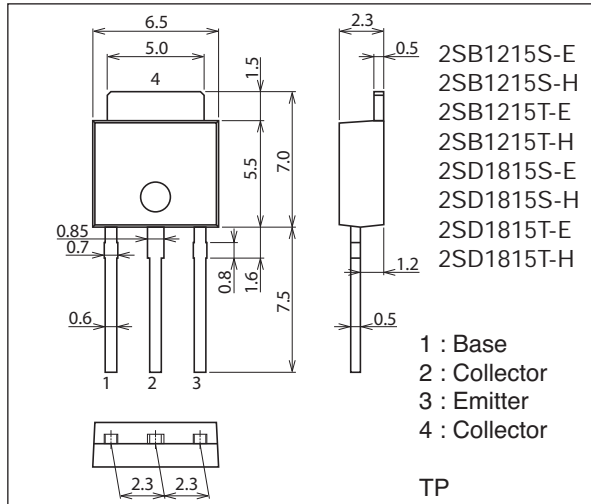
Absolute Maximum Ratings at  $T_a=25^\circ C$

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

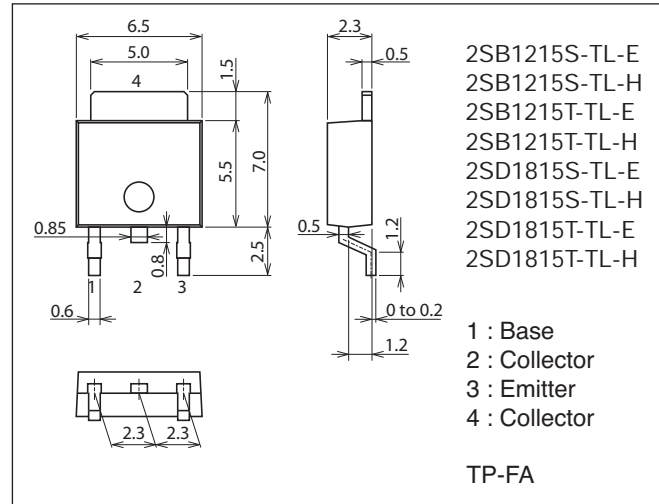
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Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions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

### Package Dimensions unit : mm (typ) 7518-003



### Package Dimensions unit : mm (typ) 7003-003

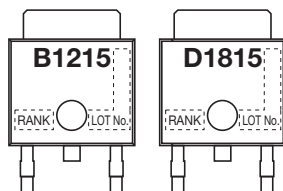


### Product & Package Information

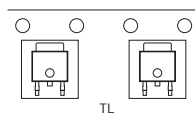
- Package : TP
- JEITA, JEDEC : SC-64, TO-251
- Minimum Packing Quantity : 500 pcs./bag

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

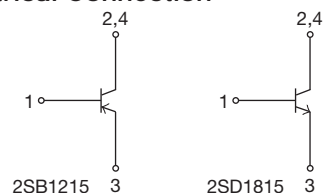
### Marking (TP, TP-FA)



### Packing Type (TP-FA) : TL



### Electrical Connection



## 2SB1215/2SD1815

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Parameter	Symbol	Conditions	Ratings	Unit
Collector Dissipation	PC		1	W
		$T_c=25^\circ\text{C}$	20	W
Junction Temperature	$T_j$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

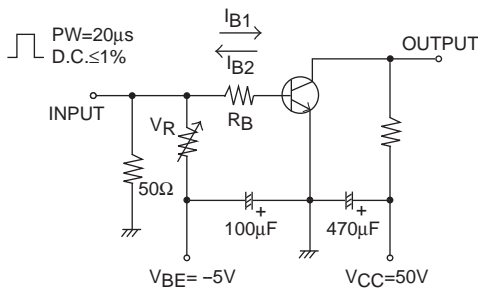
### Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)100\text{V}, I_E=0\text{A}$			(-) $1$	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4\text{V}, I_C=0\text{A}$			(-) $1$	$\mu\text{A}$
DC Current Gain	$h_{FE1}$	$V_{CE}=(-)5\text{V}, I_C=(-)0.5\text{A}$	140*		400*	
	$h_{FE2}$	$V_{CE}=(-)5\text{V}, I_C=(-)2\text{A}$	40			
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10\text{V}, I_C=(-)0.5\text{A}$		(130)180		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10\text{V}, f=1\text{MHz}$		(40)25		pF
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)1.5\text{A}, I_B=(-)0.15\text{A}$		(-200)150	(-500)400	mV
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)1.5\text{A}, I_B=(-)0.15\text{A}$		(-) $0.9$	(-) $1.2$	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu\text{A}, I_E=0\text{A}$	(-) $120$			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1\text{mA}, R_{BE}=\infty$	(-) $100$			V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu\text{A}, I_C=0\text{A}$	(-) $6$			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

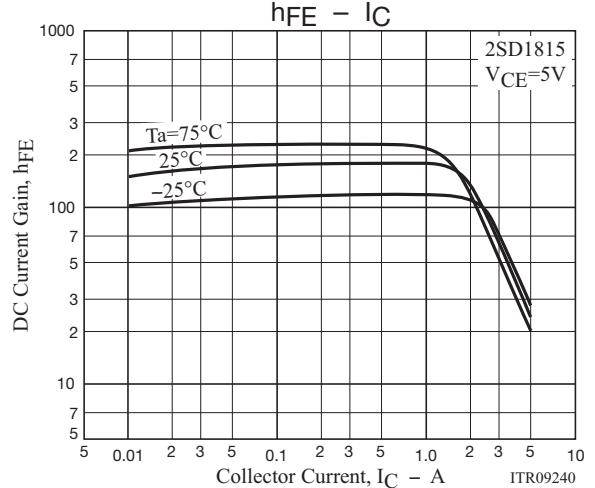
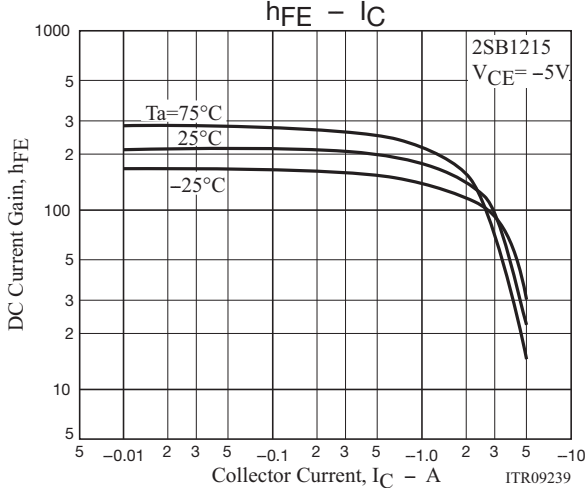
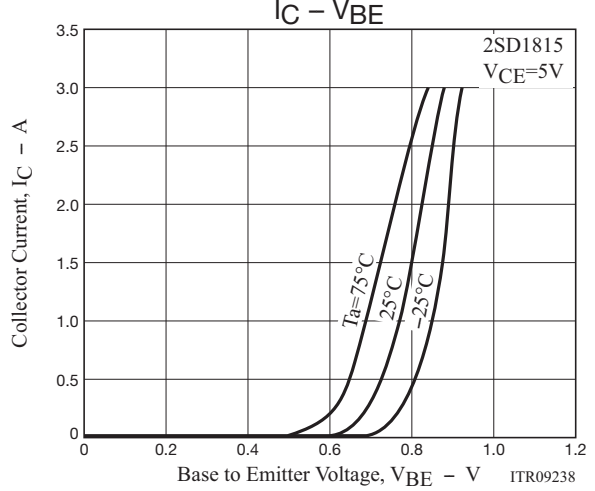
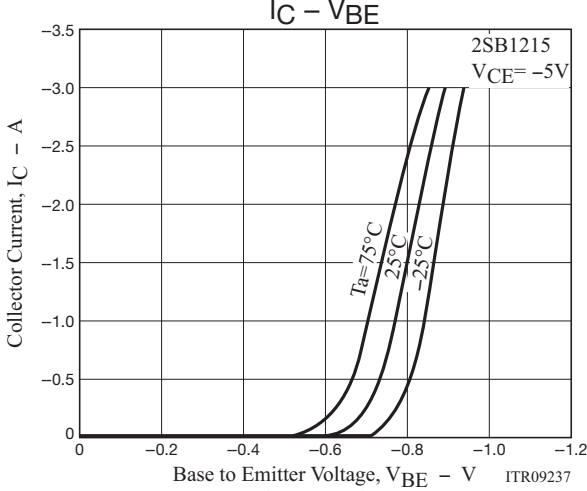
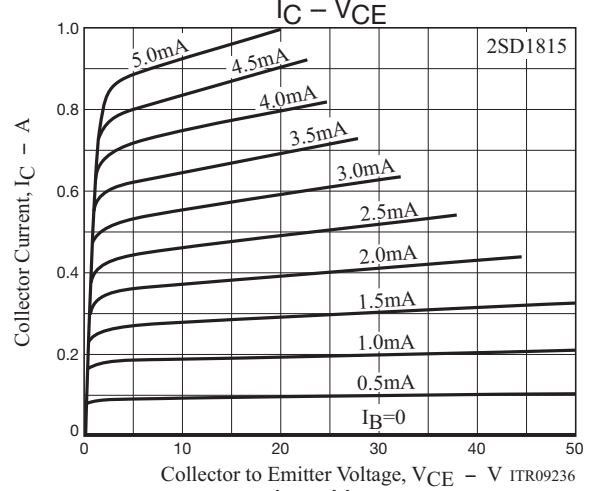
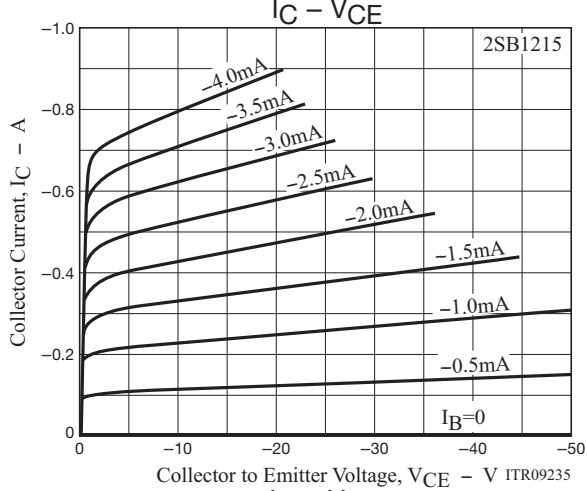
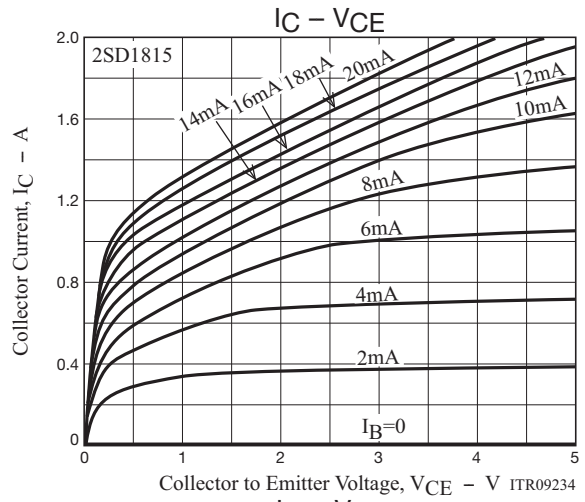
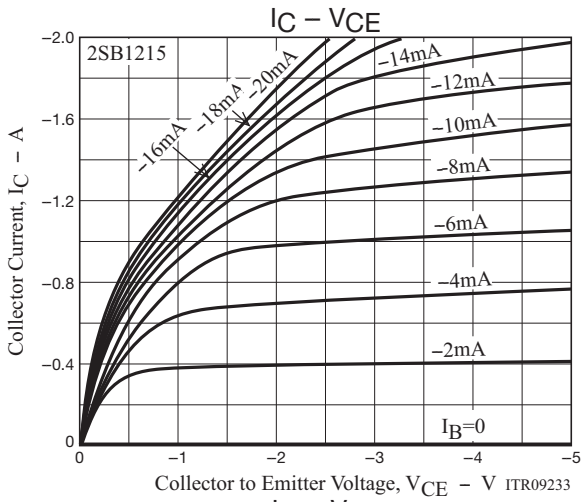


$I_C=10I_{B1} = -10I_{B2}=1.5\text{A}$   
For PNP, the polarity is reversed.

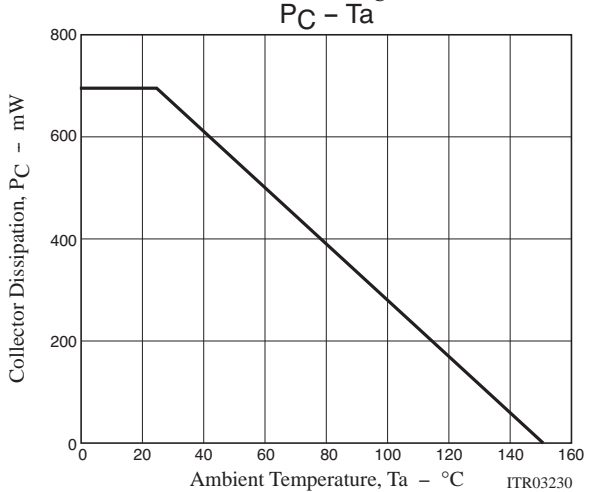
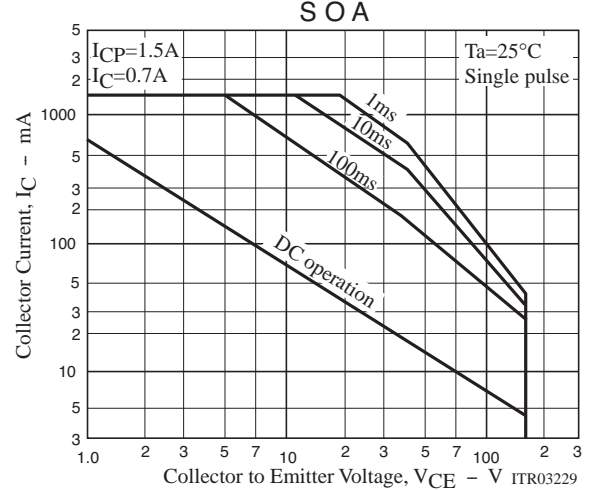
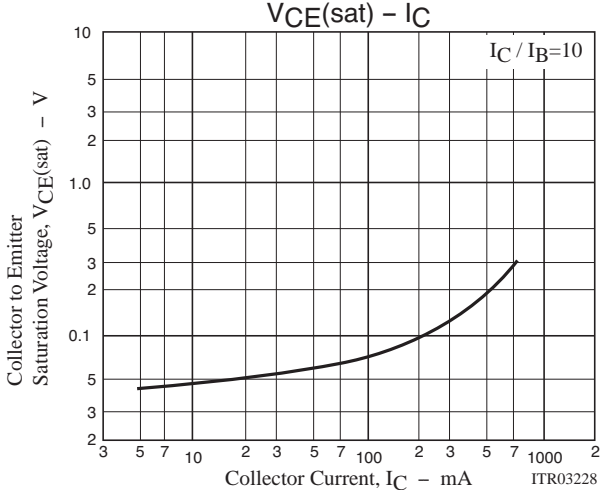
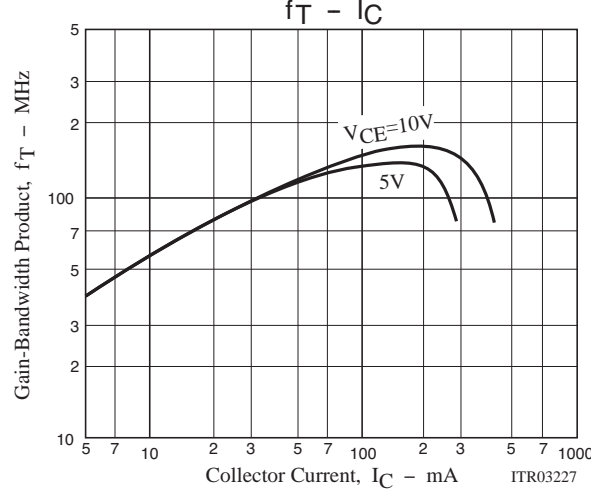
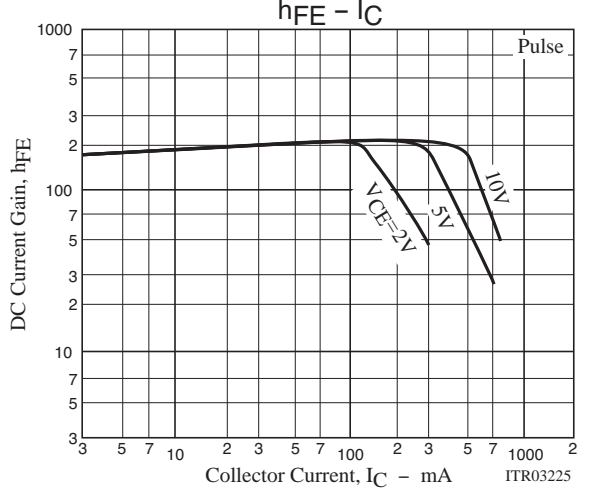
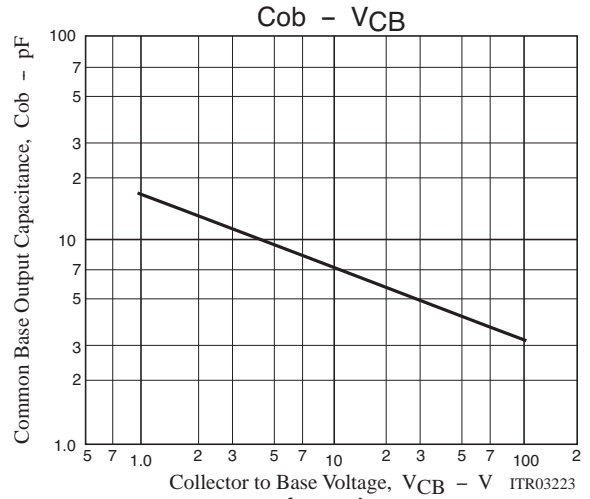
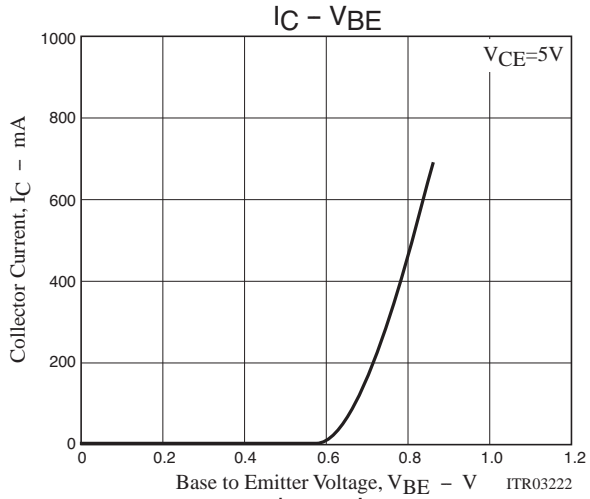
### Ordering Information

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

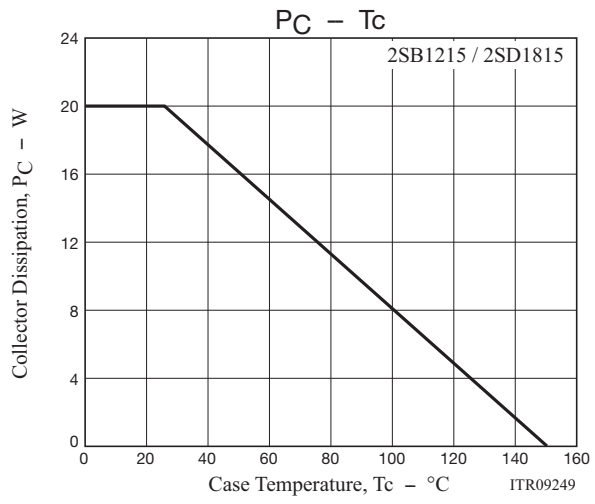
2SB1215/2SD1815



2SB1215/2SD1815



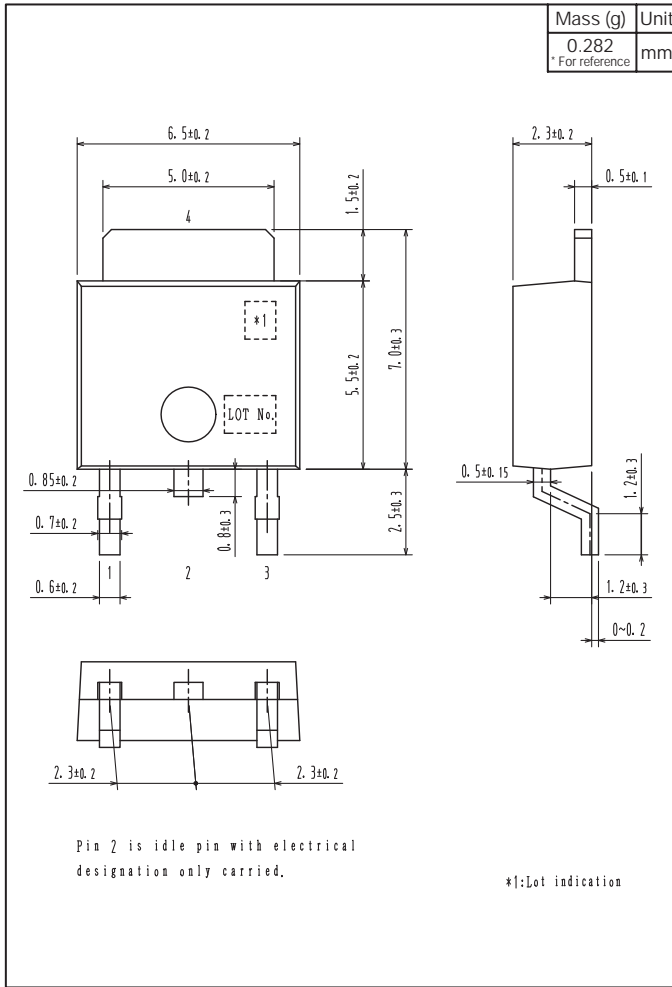
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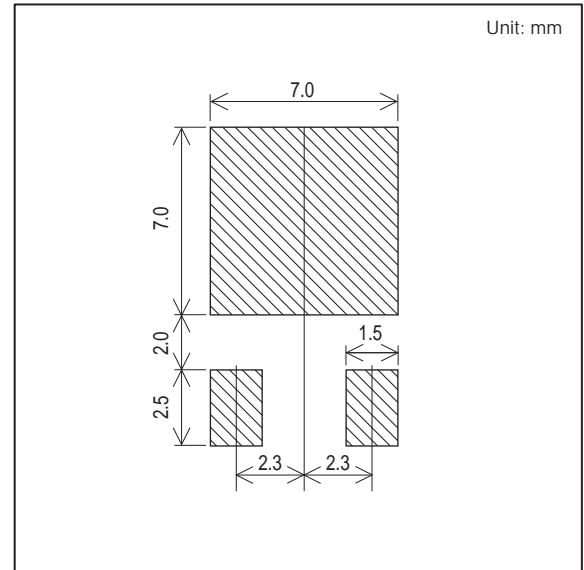
# 2SB1215/2SD1815

## 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

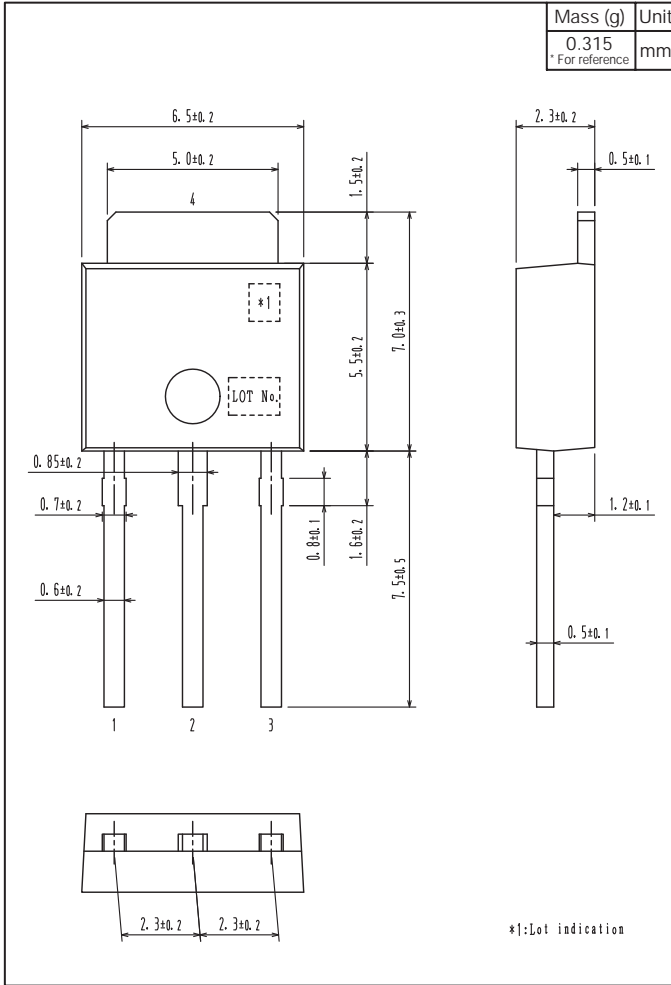


Unit: mm

## 2SB1215/2SD1815

### Outline Drawing

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



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