



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## 2SB1215/2SD1815 — PNP/NPN Epitaxial Planar Silicon Transistor

### High-Current Switching Applications

#### 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  $f_T$
- Excellent linearity of  $h_{FE}$
- Fast switching time

#### Specifications ( ) : 2SB1215

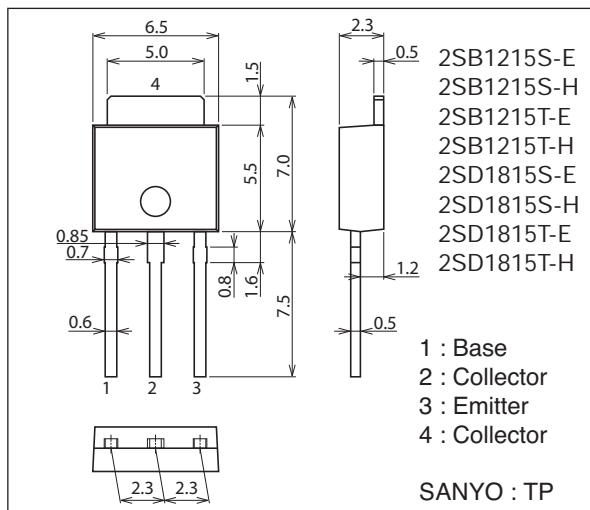
Absolute Maximum Ratings at  $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		(-)120	V
Collector-to-Emitter Voltage	$V_{CE0}$		(-)100	V
Emitter-to-Base Voltage	$V_{EB0}$		(-)6	V
Collector Current	$I_C$		(-)3	A
Collector Current (Pulse)	$I_{CP}$		(-)6	A

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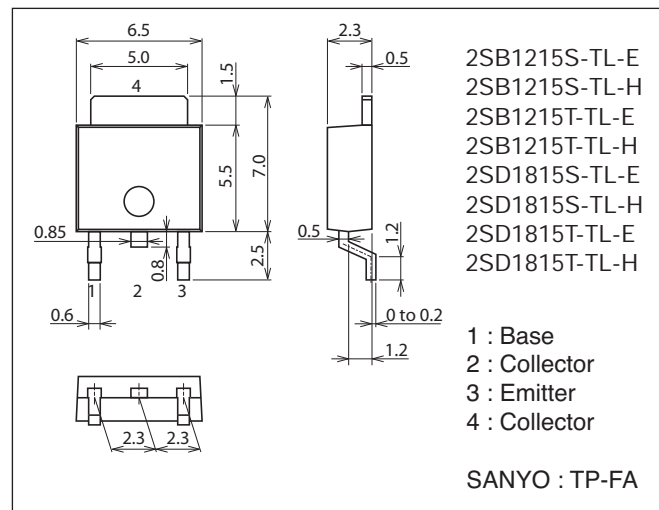
#### Package Dimensions unit : mm (typ.)

7518-003



#### Package Dimensions unit : mm (typ.)

7003-003

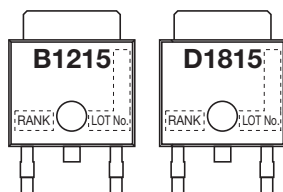


#### Product & Package Information

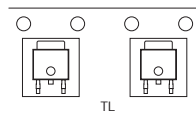
- Package : TP
- JEITA, JEDEC : SC-64, TO-251, SOT-553, DPAK
- Minimum Packing Quantity : 500 pcs./bag

- Package : TP-FA
- JEITA, JEDEC : SC-63, TO-252, SOT-428, DPAK
- Minimum Packing Quantity : 700 pcs./reel

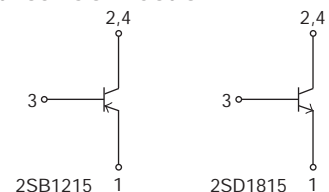
#### Marking (TP, TP-FA)



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



#### Electrical Connection



SANYO Semiconductor Co., Ltd.

<http://semicon.sanyo.com/en/network>

## 2SB1215/2SD1815

Continued from preceding page.

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	$^\circ\text{C}$

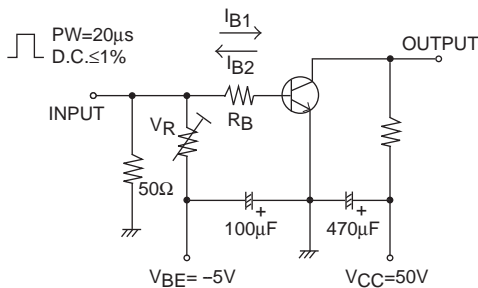
### Electrical Characteristics at $T_a=25^\circ\text{C}$

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	$h_{FE1}$	$V_{CE}=(-)5\text{V}, I_C=(-)0.5\text{A}$	70*		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	$V_{BE(sat)}$	$V_{CE}=(-)1.5\text{A}, I_C=(-)0.15\text{A}$		(-) $0.9$	(-) $1.2$	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 100mA  $h_{FE}$  as follows :

Rank	Q	R	S	T
$h_{FE}$	70 to 140	100 to 200	140 to 280	200 to 400

### Switching Time Test Circuit

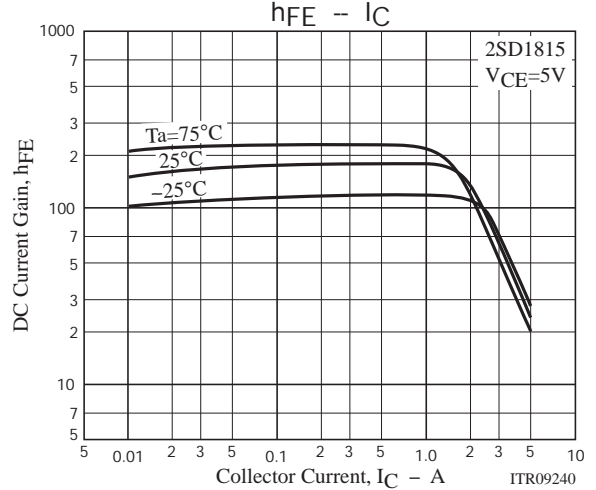
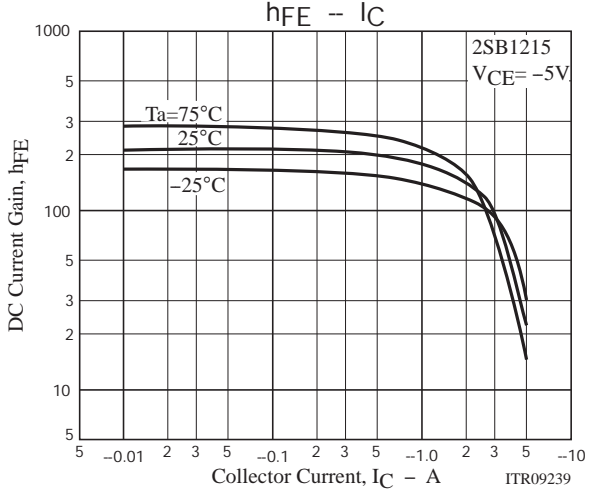
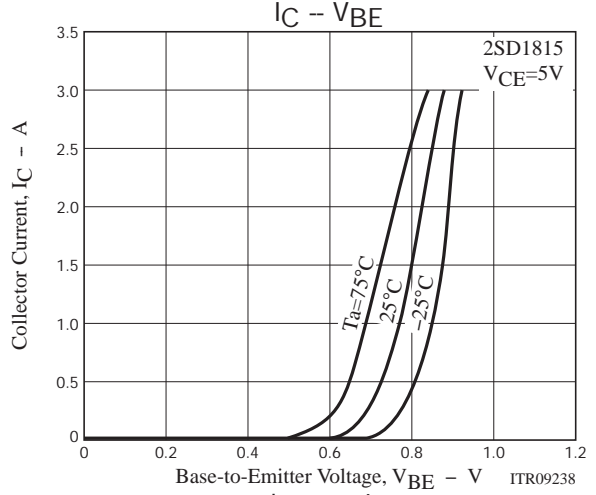
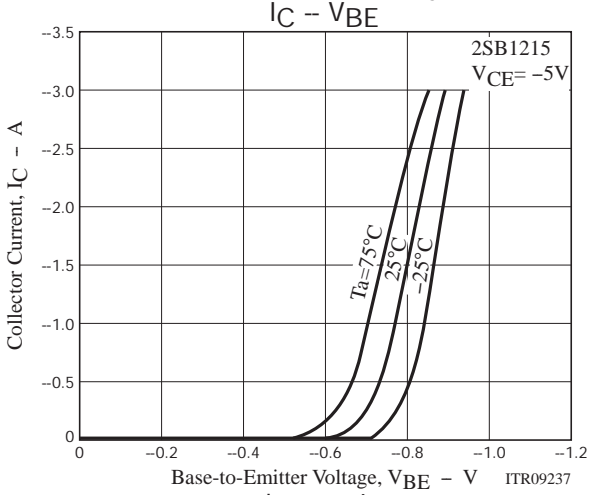
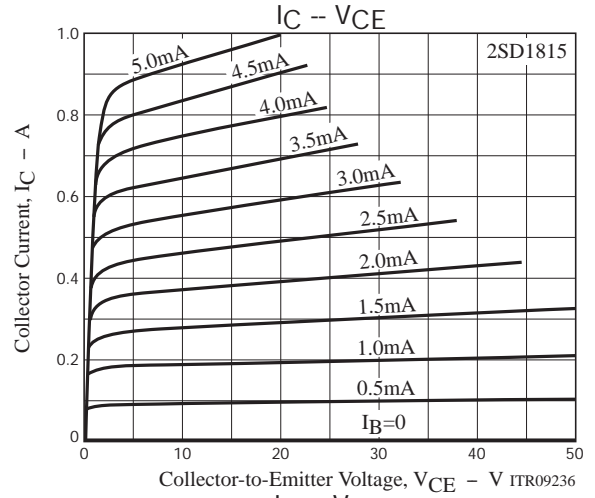
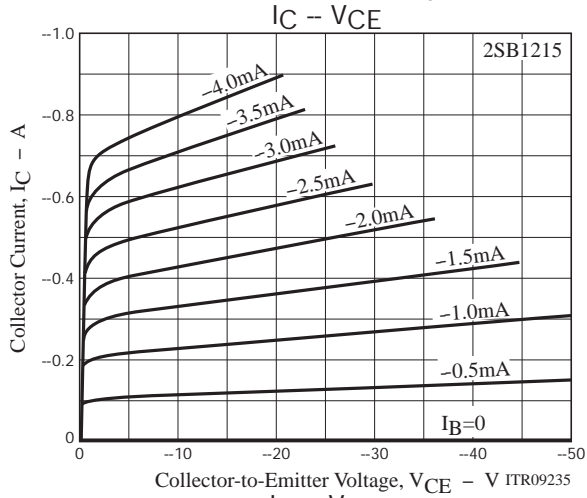
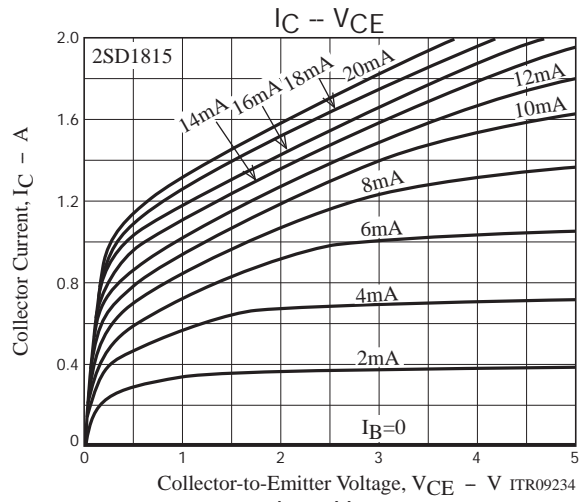
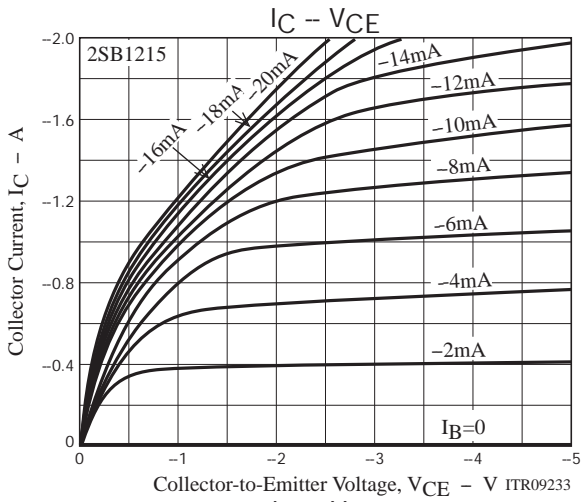


$I_C=10I_{B1} = -10I_{B2}=1.5\text{A}$   
For PNP, the polarity is reversed.

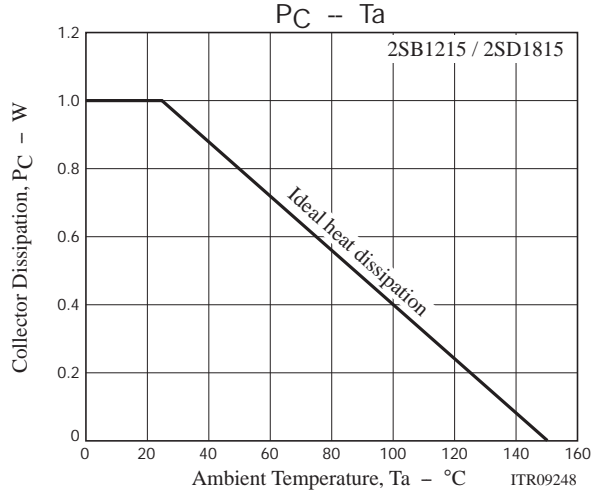
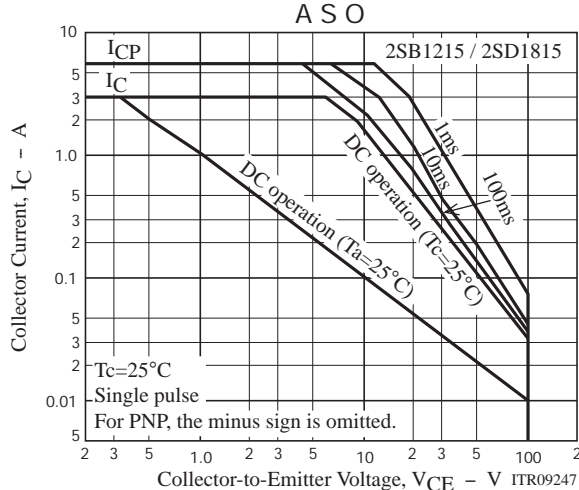
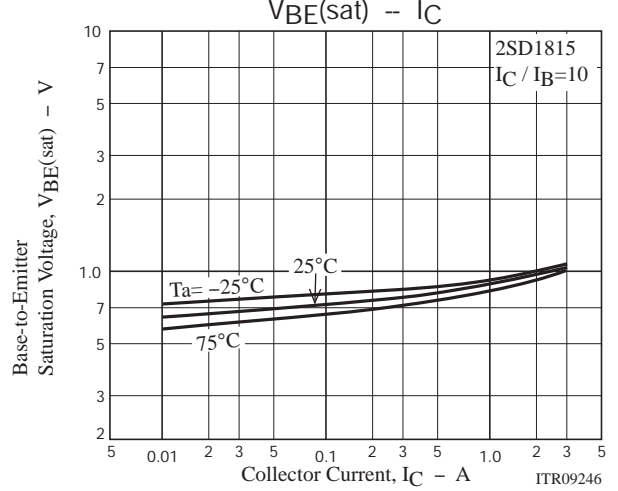
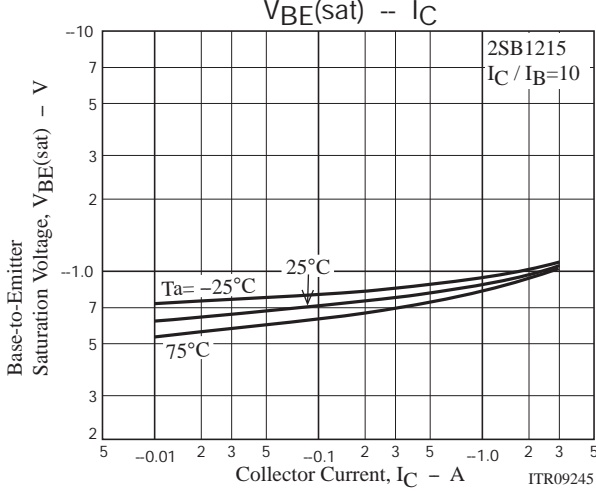
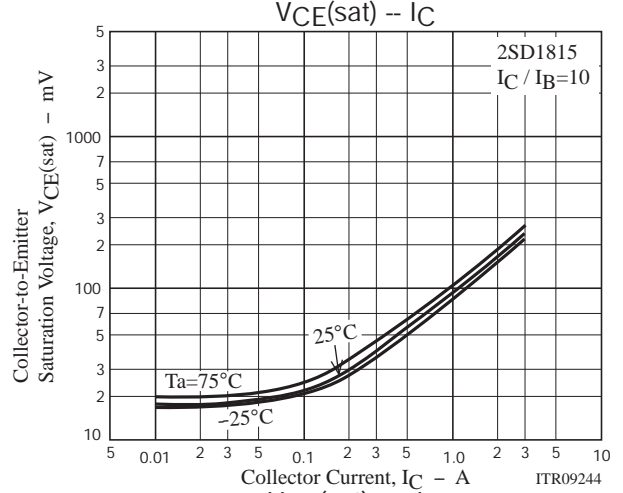
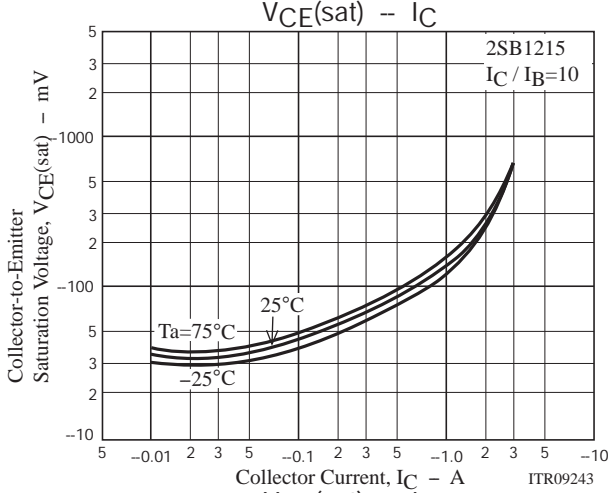
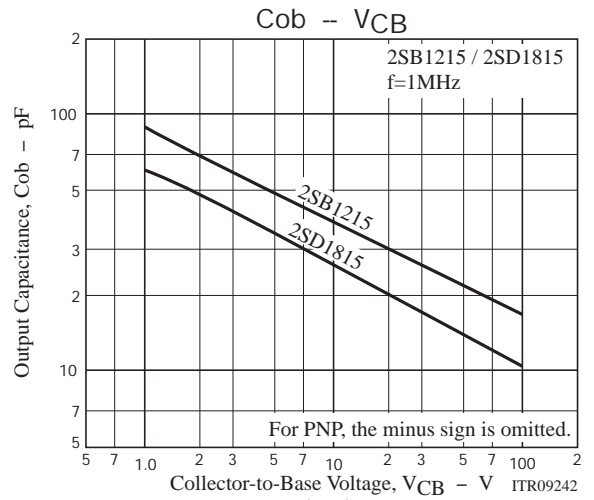
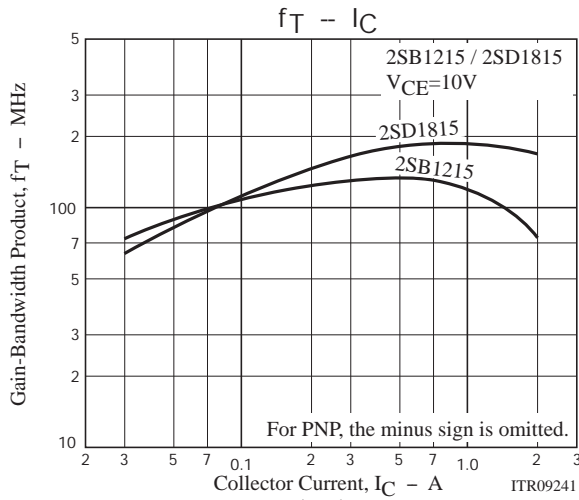
### Ordering Information

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

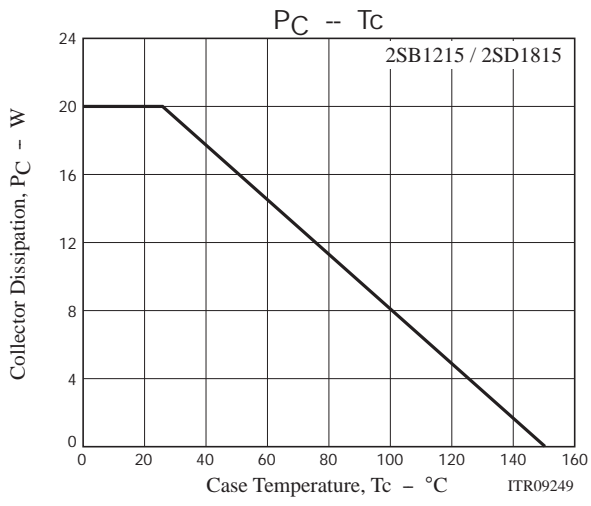
2SB1215/2SD1815



# 2SB1215/2SD1815



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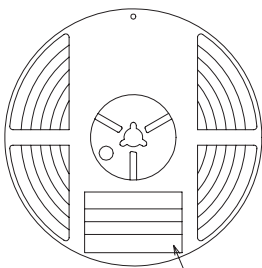
## Taping Specification

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

## Packing Format

Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
TP-FA	TP	700	2,100	12,600	3 reels contained Dimensions: mm (external) 183×72×185	6 inner boxes contained Dimensions: mm (external) 440×195×210

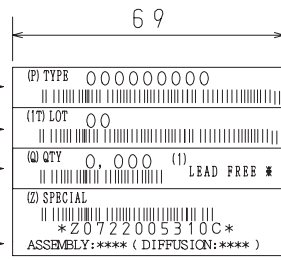
## Packing method



Reel label

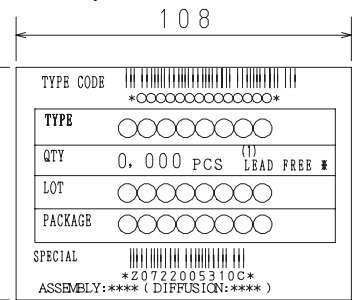
Type No.  
LOT No.  
Quantity  
Origin

Reel label, Inner box label  
(unit: mm)



Outer box label

It is a label at the time of factory shipments. The form of a label may change in physical distribution process.



### NOTE (1)

The LEAD FREE \* description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

## Taping configuration

### 1. Carrier tape size (unit: mm)



### 2. Device placement direction

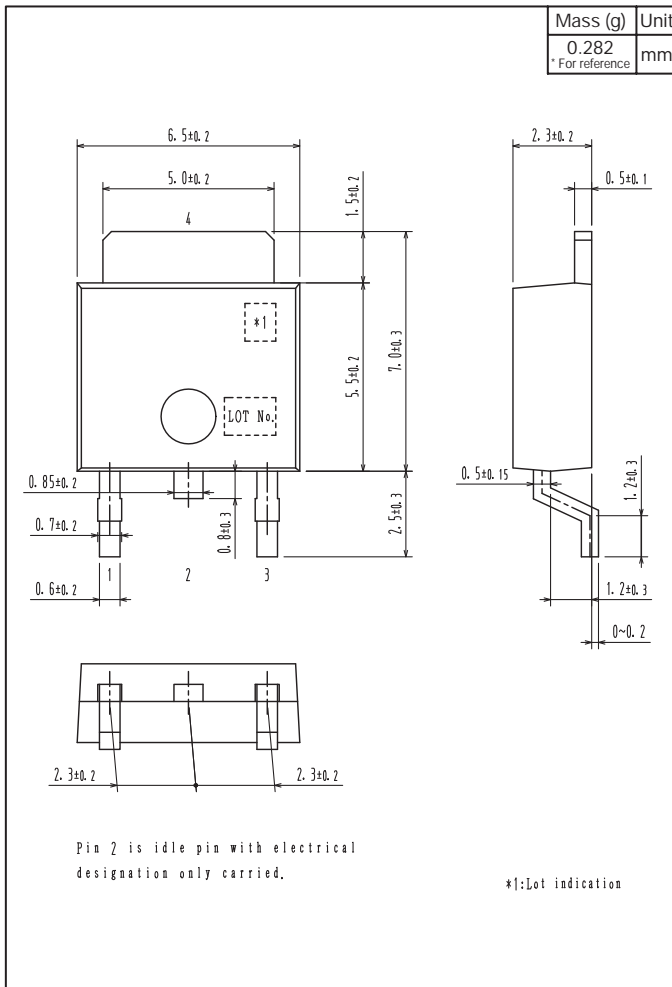


Those with one electrode terminal on the feed hole side.....TL

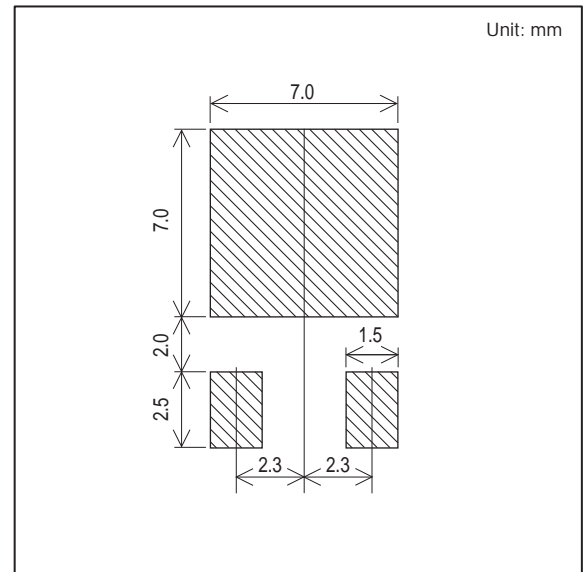
# 2SB1215/2SD1815

## 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



# 2SB1215/2SD1815

## Bag Packing Specification

2SB1215S-E, 2SB1215S-H, 2SB1215T-E2SB1215T-H, 2SD1815S-E, 2SD1815S-H, 2SD1815T-E, 2SD1815T-H

### 1. Packing Format

Package Name	Maximum Number of devices contained (pcs)			
	Bag	Inner box	Outer box	
TP	500	B-1	A-1	A-2
		10,000	50,000	30,000
	Packing format (Dimensions:mm (external))			
		Inner box	Outer box	
		B-1	A-1	A-2
		445×225×55	470×250×300	470×250×190

### 2. Bag dimensions (unit:mm)



### 3. Bag label, Inner box label (unit:mm)



### 4. Outer box label (unit:mm)

It is a label at the time of factory shipments.  
The form of a label may change in physical distribution process.

#### NOTE (1)

The LEAD FREE \* description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3





# 2SB1215/2SD1815

## Outline Drawing

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



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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
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