



2SB1201/2SD1801

Bipolar Transistor

(-50V, (-)2A, Low $V_{CE(sat)}$, (PNP)NPN Single TP/TP-FA

ON Semiconductor®

<http://onsemi.com>

Applications

- Voltage regulators, relay drivers, lamp drivers, electrical equipment

Features

- Adoption of FBET, MBIT processes
- Large current capacitance and wide ASO
- Low collector-to-emitter saturation voltage
- Fast switching speed
- Small and slim package making it easy to make 2SB1201/2SD1801-used sets smaller

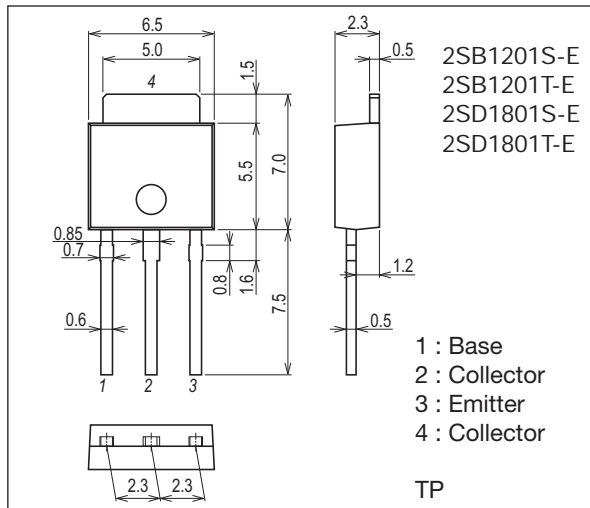
Specifications () : 2SB1201

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

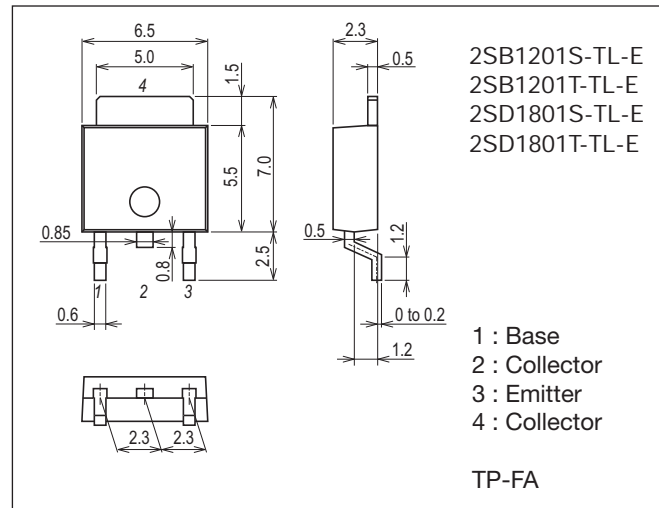
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(-)60	V
Collector-to-Emitter Voltage	V_{CEO}		(-)50	V
Emitter-to-Base Voltage	V_{EBO}		(-)6	V
Collector Current	I_C		(-)2	A
Collector Current (Pulse)	I_{CP}		(-)4	A

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Package Dimensions unit : mm (typ) 7518-003



Package Dimensions unit : mm (typ) 7003-003

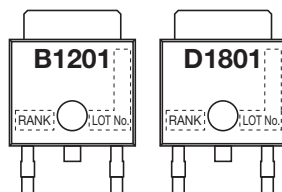


Product & Package Information

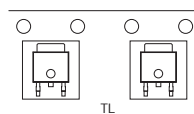
- Package : TP
- JEITA, JEDEC : SC-64, TO-251
- Minimum Packing Quantity : 500 pcs./bag

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

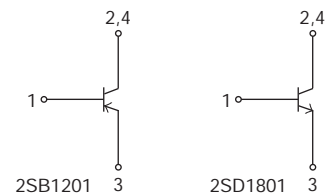
Marking (TP, TP-FA)



Packing Type (TP-FA) : TL



Electrical Connection



2SB1201 / 2SD1801

Continued from preceding page.

Parameter	Symbol	Conditions	Ratings	Unit
Collector Dissipation	PC		0.8	W
		$T_c=25^\circ\text{C}$	15	W
Junction Temperature	T_j		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

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.

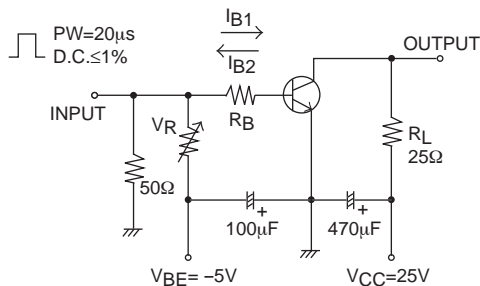
Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB}=-50\text{V}, I_E=0\text{A}$			(-)100	nA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=-4\text{V}, I_C=0\text{A}$			(-)100	nA
DC Current Gain	h_{FE1}	$V_{CE}=-2\text{V}, I_C=-100\text{mA}$	100*		560*	
	h_{FE2}	$V_{CE}=-2\text{V}, I_C=-1.5\text{A}$	40			
Gain-Bandwidth Product	f_T	$V_{CE}=-10\text{V}, I_C=-50\text{mA}$		150		MHz
Output Capacitance	C_{ob}	$V_{CB}=-10\text{V}, f=1\text{MHz}$		(22)12		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=-1\text{A}, I_B=-50\text{mA}$		(-0.3)0.15	(-0.7)0.4	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$V_{CE}=-1\text{A}, I_C=-50\text{mA}$		(-)0.9	(-)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=-10\mu\text{A}, I_E=0\text{A}$	(-)60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=-1\text{mA}, R_{BE}=\infty$	(-)50			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.		60		ns
Storage Time	t_{stg}			(450)550		ns
Fall Time	t_f			30		ns

* : The 2SB1201/2SD1801 are classified by 100mA h_{FE} as follows :

Rank	R	S	T	U
h_{FE}	100 to 200	140 to 280	200 to 400	280 to 560

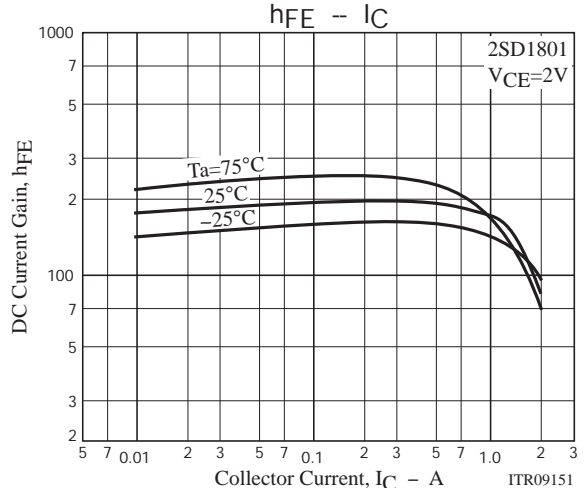
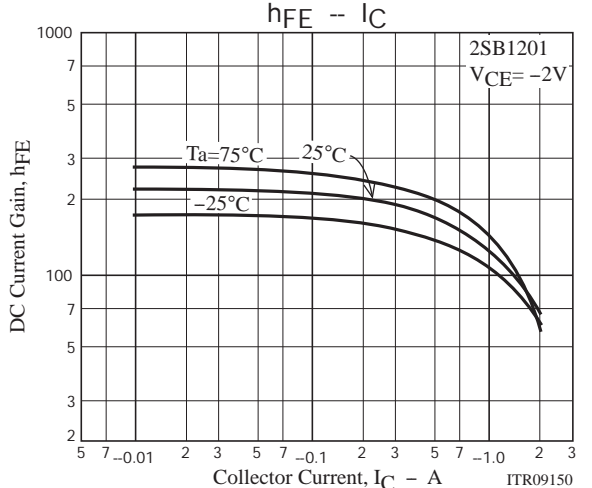
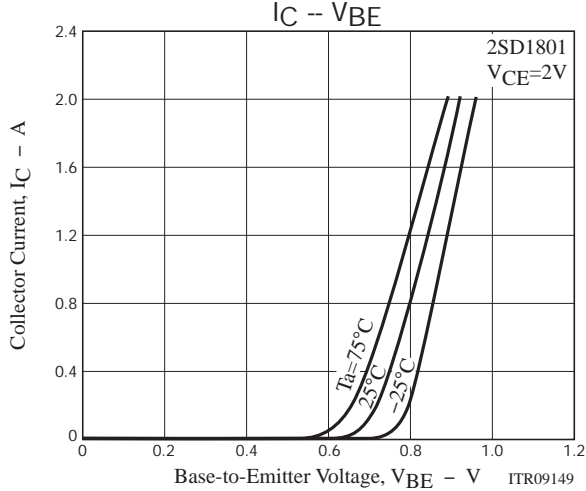
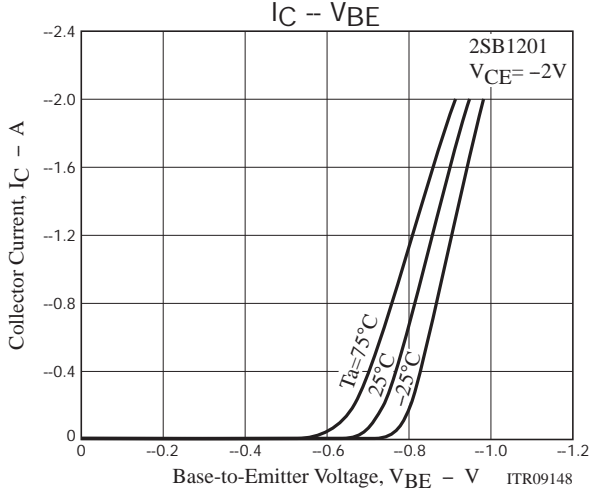
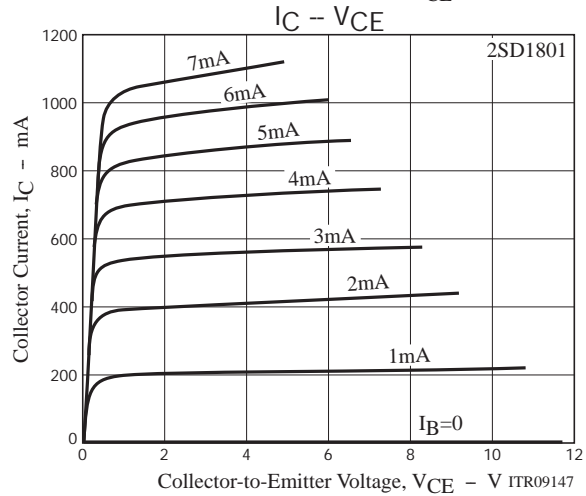
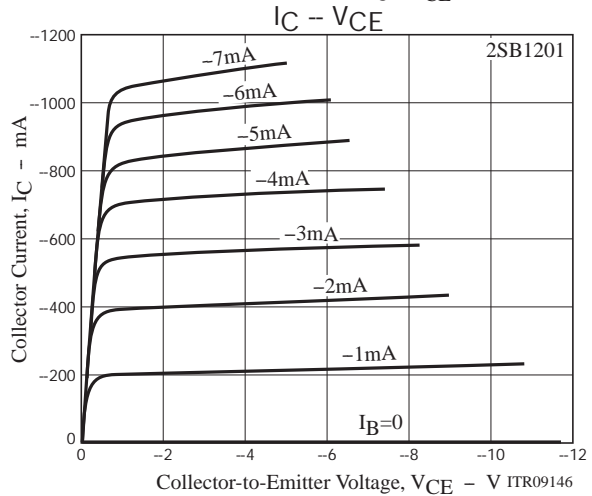
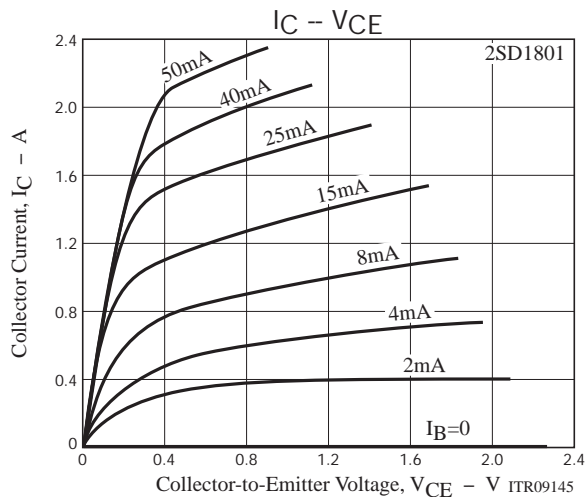
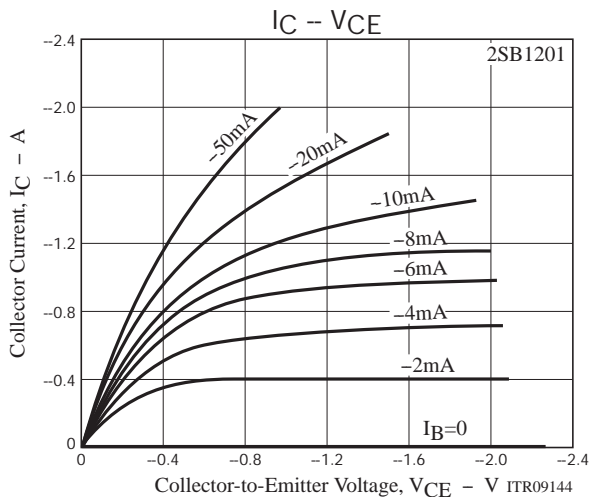
Switching Time Test Circuit

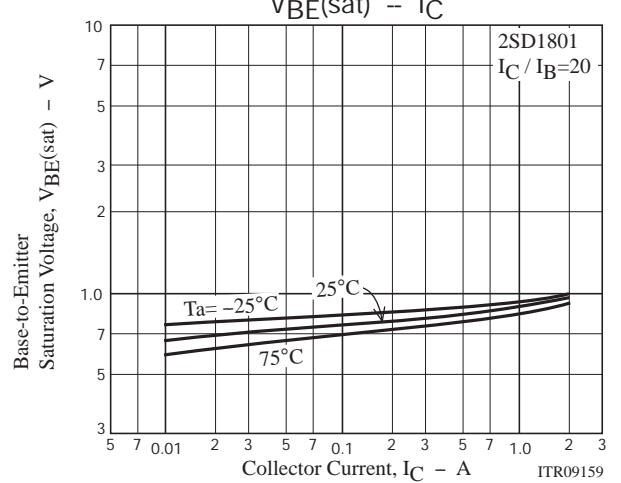
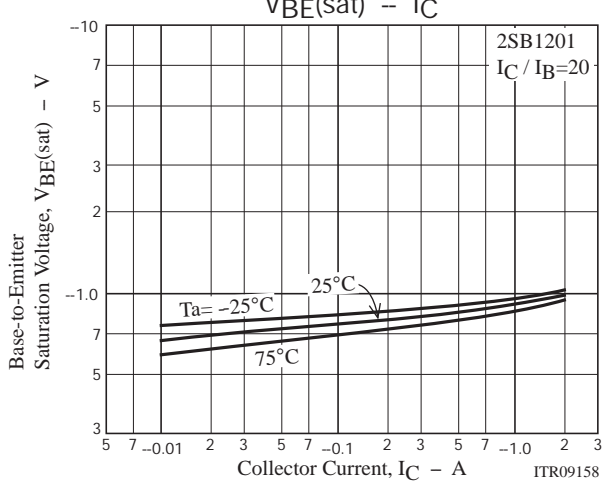
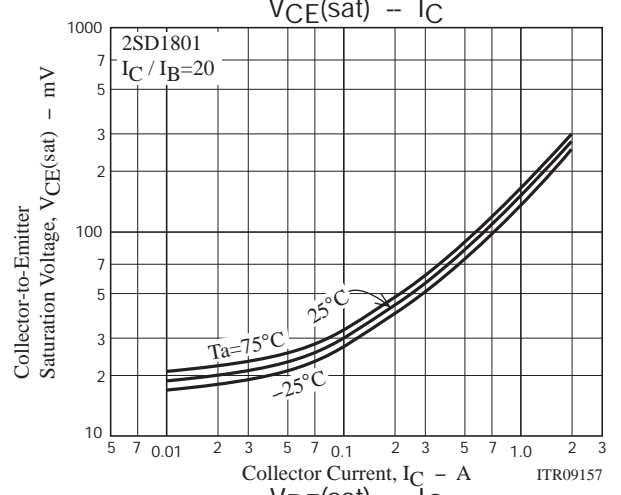
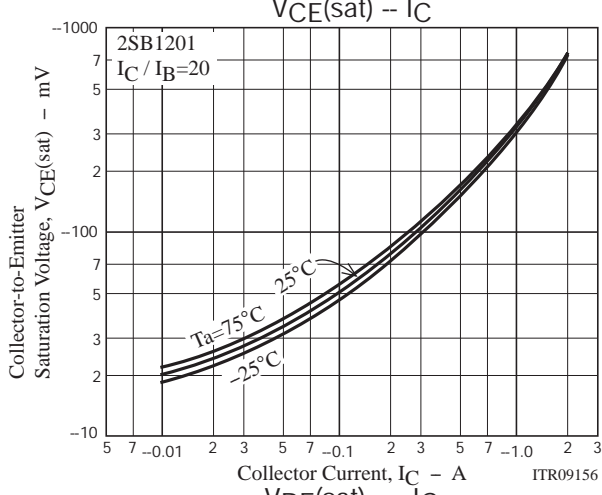
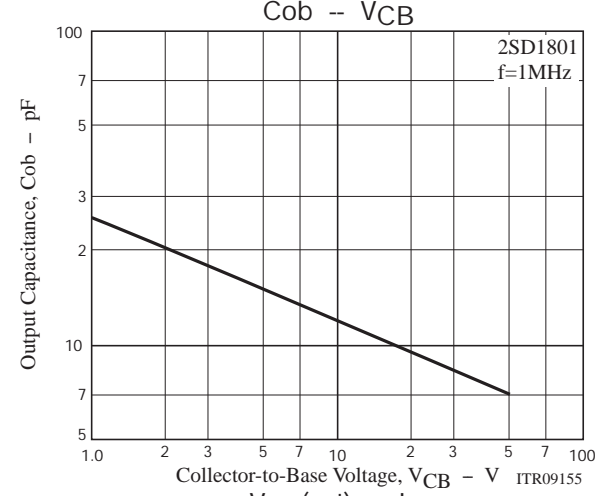
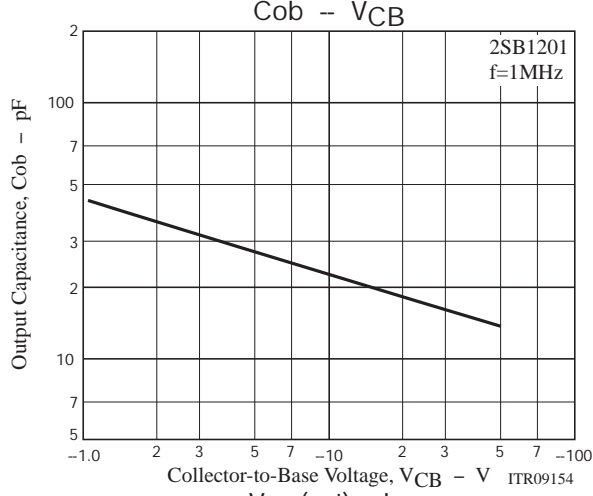
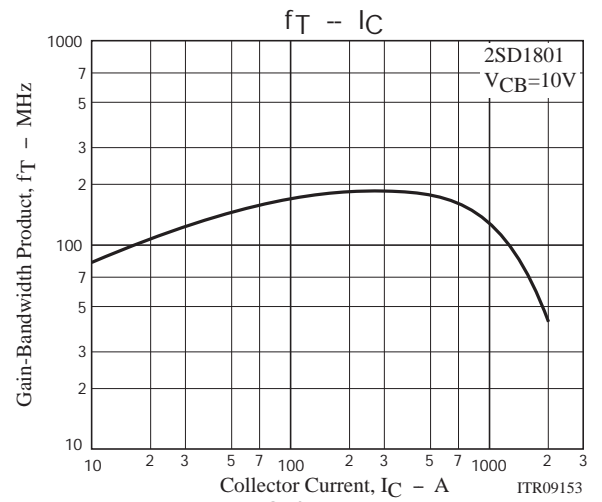
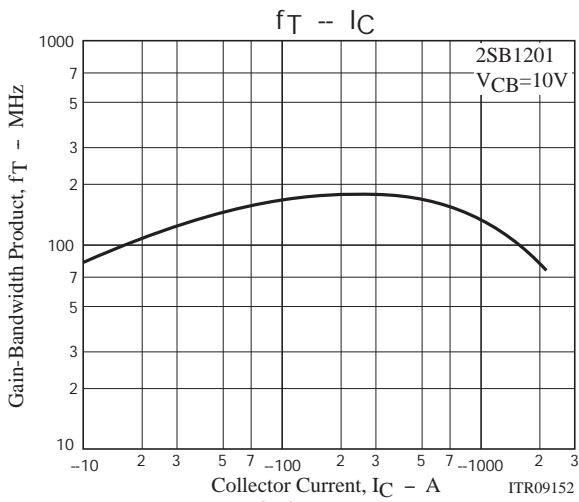


$I_C=10I_{B1}=-10I_{B2}=500\text{mA}$, $V_{CC}=25\text{V}$
For PNP, the polarity is reversed.

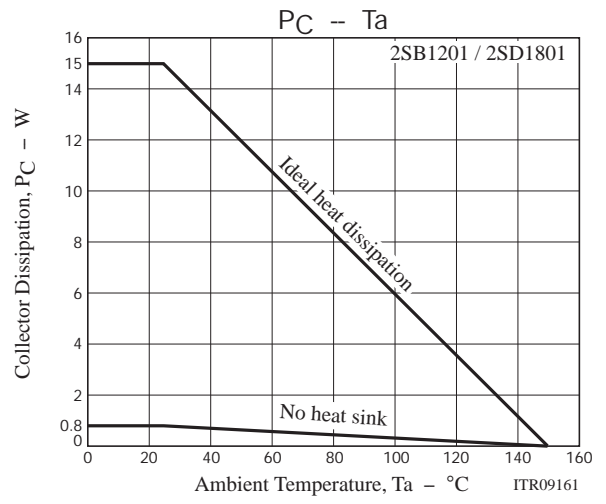
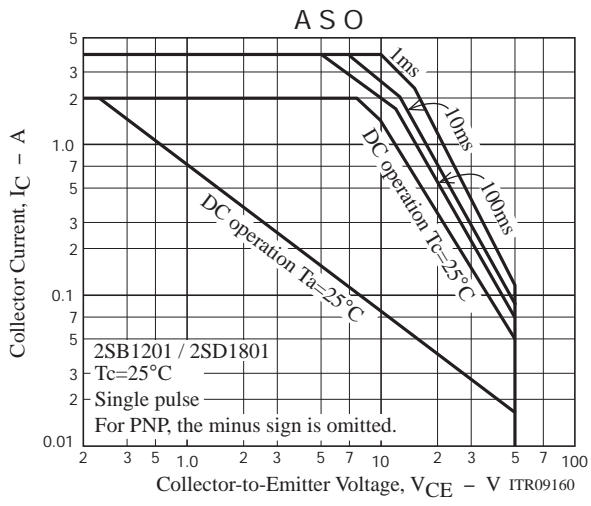
Ordering Information

Device	Package	Shipping	memo
2SB1201S-E	TP	500pcs./bag	Pb Free
2SB1201T-E	TP	500pcs./bag	
2SD1801S-E	TP	500pcs./bag	
2SD1801T-E	TP	500pcs./bag	
2SB1201S-TL-E	TP-FA	700pcs./reel	
2SB1201T-TL-E	TP-FA	700pcs./reel	
2SD1801S-TL-E	TP-FA	700pcs./reel	
2SD1801T-TL-E	TP-FA	700pcs./reel	





2SB1201 / 2SD1801



Taping Specification

2SB1201S-TL-E, 2SB1201T-TL-E, 2SD1801S-TL-E, 2SD1801T-TL-E

Packing Format

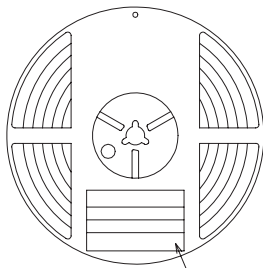
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
TP-FA	TP	700	2,100	12,600	3 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

Reel label, Inner box label
(unit:mm)

Outer box label

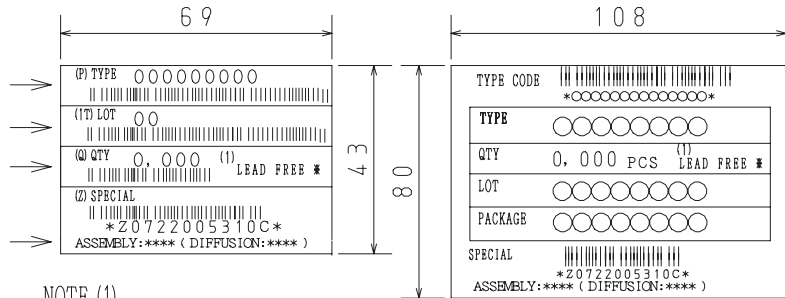
It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.

Packing method



Type No.
LOT No.
Quantity
Origin

Reel label



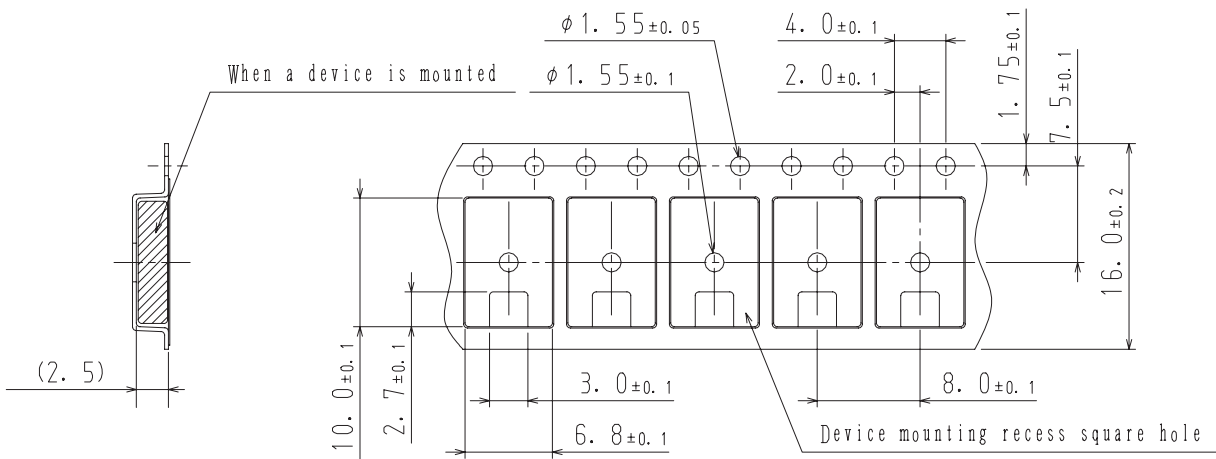
NOTE (1)

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

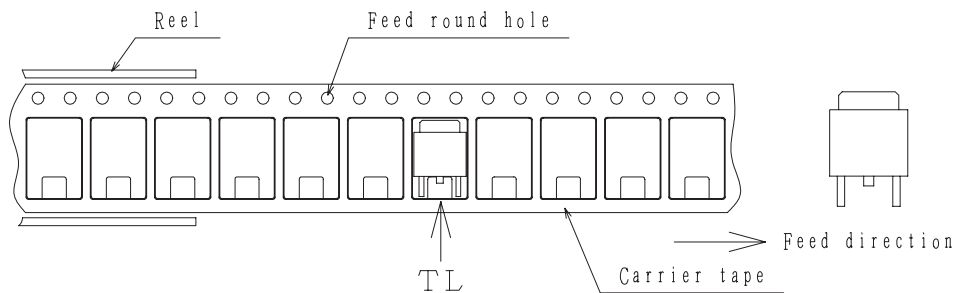
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

Taping configuration

1. Carrier tape size (unit:mm)



2. Device placement direction



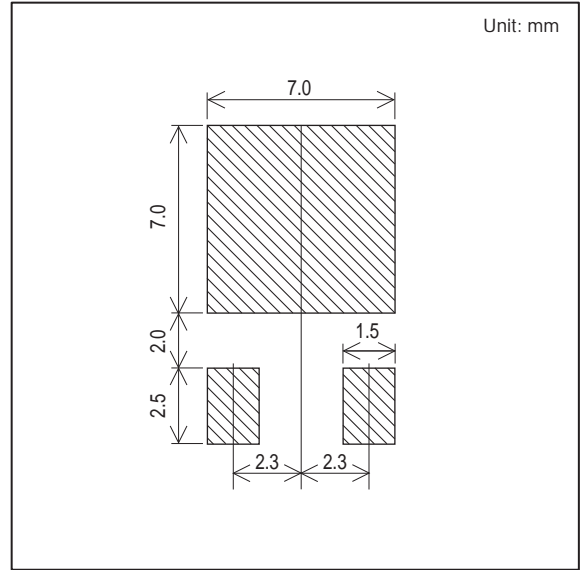
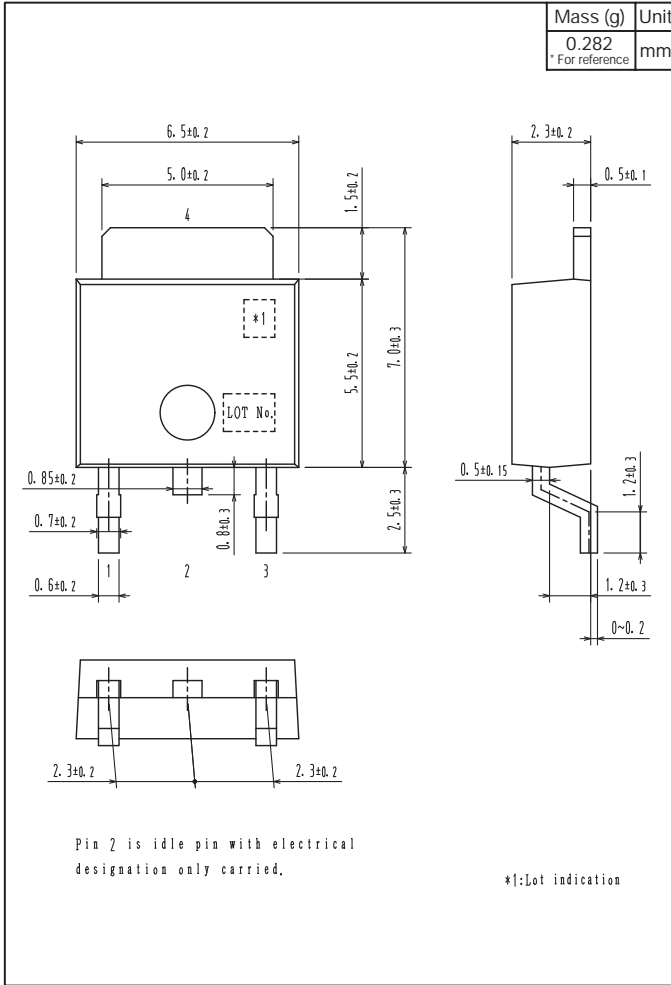
Those with one electrode terminal on the feed hole side.....TL

2SB1201 / 2SD1801

Outline Drawing

Land Pattern Example

2SB1201S-TL-E, 2SB1201T-TL-E, 2SD1801S-TL-E, 2SD1801T-TL-E



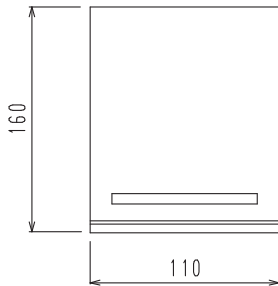
Bag Packing Specification

2SB1201S-E, 2SB1201T-E, 2SD1801S-E, 2SD1801T-E

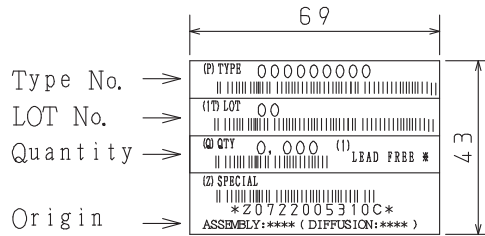
1. Packing Format

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.

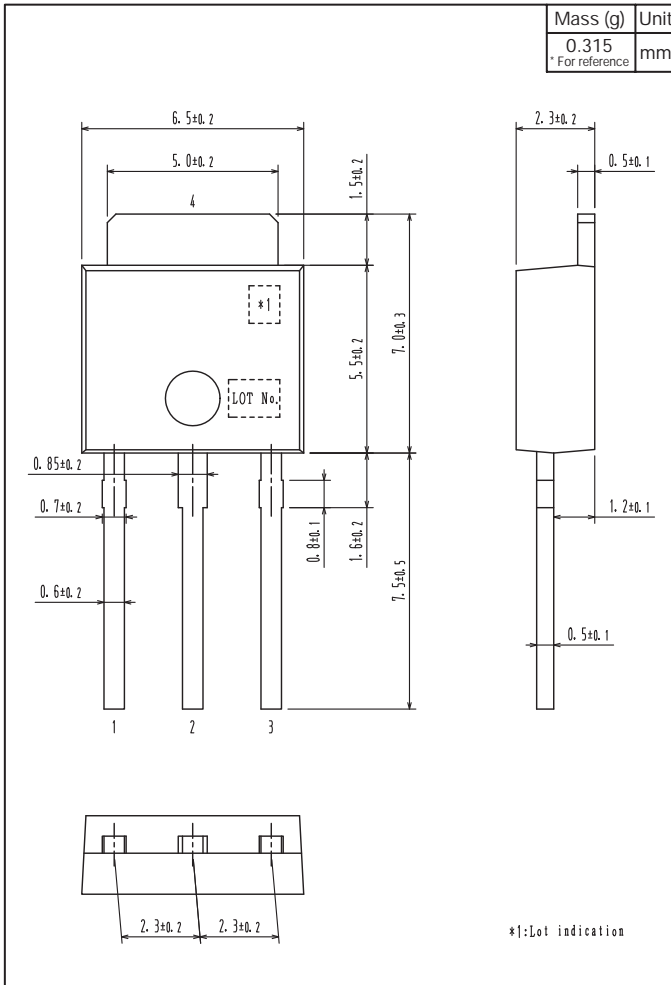
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3



2SB1201 / 2SD1801

Outline Drawing

2SB1201S-E, 2SB1201T-E, 2SD1801S-E, 2SD1801T-E



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