



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

2SB1202/2SD1802 — PNP/NPN Epitaxial Planar Silicon Transistor

High-Current Switching Applications

Applications

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

Features

- Adoption of FBET and MBIT processes
- Low collector-to-emitter saturation voltage
- Small and slim package making it easy to make 2SB1202/2SD1802-used sets smaller
- Large current capacitance and wide ASO
- Fast switching speed

Specifications () : 2SB1202

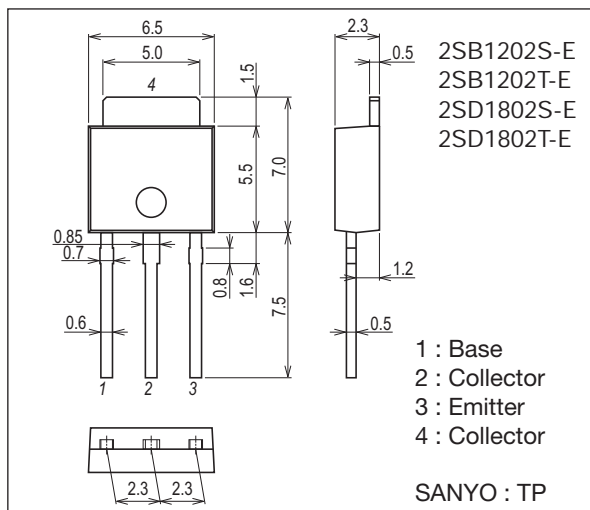
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V _{CB0}		(-)60	V
Collector-to-Emitter Voltage	V _{CE0}		(-)50	V
Emitter-to-Base Voltage	V _{EB0}		(-)6	V
Collector Current	I _C		(-)5	A
Collector Current (Pulse)	I _{CP}		(-)6	A

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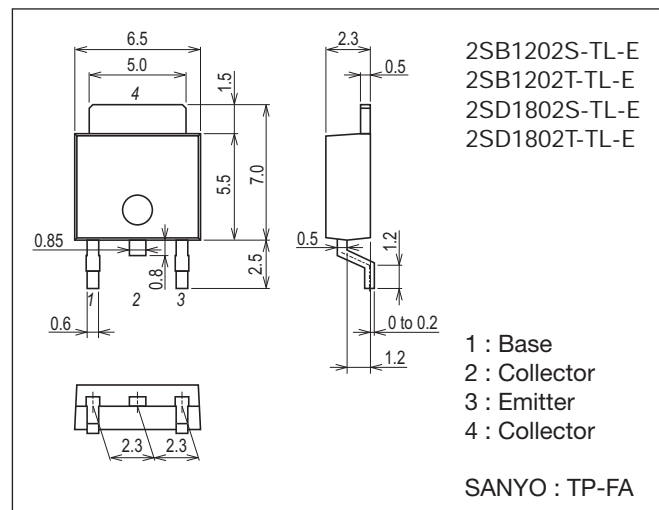
Package Dimensions unit : mm (typ)

7518-003



Package Dimensions unit : mm (typ)

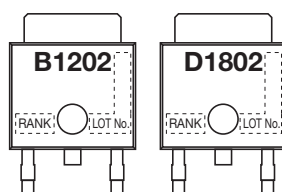
7003-003



Product & Package Information

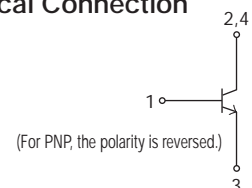
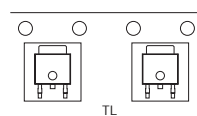
- Package : TP
- JEITA, JEDEC : SSC-64, TO-251
- Minimum Packing Quantity : 500 pcs./bag

Marking (TP, TP-FA)



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

Packing Type (TP-FA) : TL Electrical Connection



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Parameter	Symbol	Conditions	Ratings	Unit
Collector Dissipation	P _C		1	W
		T _C =25°C	15	W
Junction Temperature	T _J		150	°C
Storage Temperature	T _{stg}		-55 to +150	°C

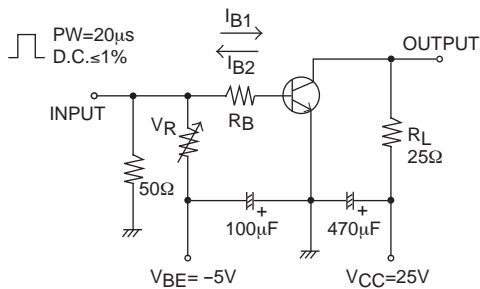
Electrical Characteristics at T_a=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I _{CBO}	V _{CB} =(-)40V, 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} =(-)2V, I _C =(-)100mA	100*		560*	
	h _{FE2}	V _{CE} =(-)2V, I _C =(-)3A	35			
Gain-Bandwidth Product	f _T	V _{CE} =(-)10V, I _C =(-)50mA		150		MHz
Output Capacitance	C _{ob}	V _{CB} =(-)10V, f=1MHz		(39)25		pF
Collector-to-Emitter Saturation Voltage	V _{CE(sat)}	I _C =(-)2A, I _B =(-)100mA		(-0.35)0.19	(-0.7)0.5	mV
Base-to-Emitter Saturation Voltage	V _{BE(sat)}	V _{CE} =(-)2V, I _C =(-)100mA		(-)0.94	(-)1.2	V
Collector-to-Base Breakdown Voltage	V(BR)CBO	I _C =(-)10μA, I _E =0A	(-)60			V
Collector-to-Emitter Breakdown Voltage	V(BR)CEO	I _C =(-)1mA, R _{BE} =∞	(-)50			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.		70		ns
Storage Time	t _{stg}			(450)650		ns
Fall Time	t _f			35		ns

* : The 2SB1202/2SD1802 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



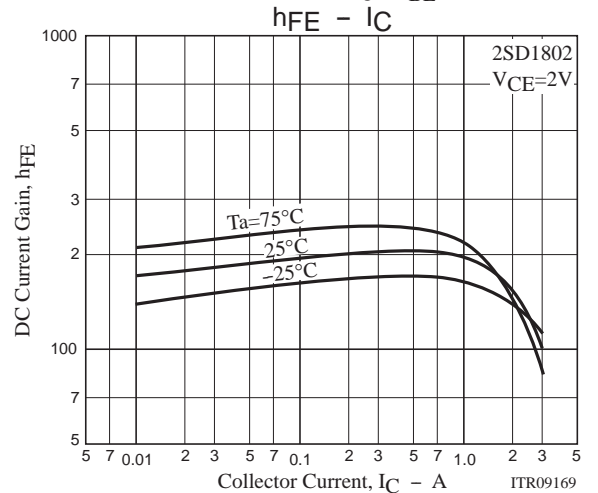
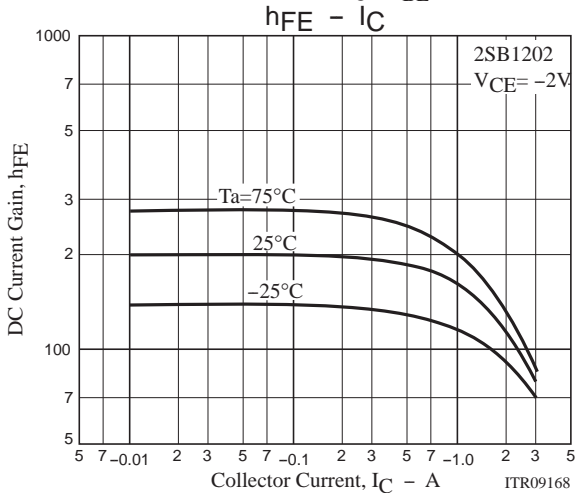
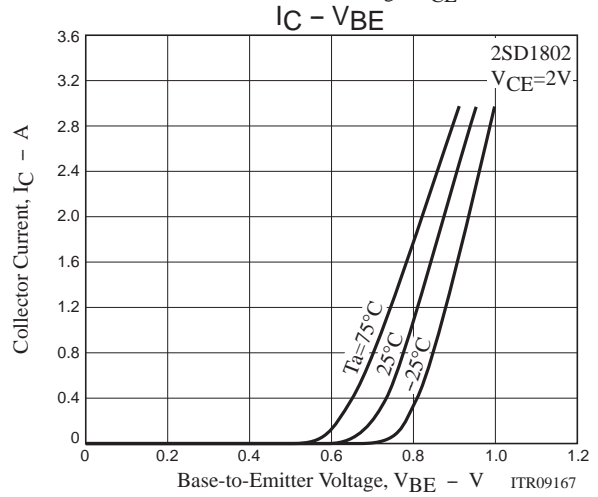
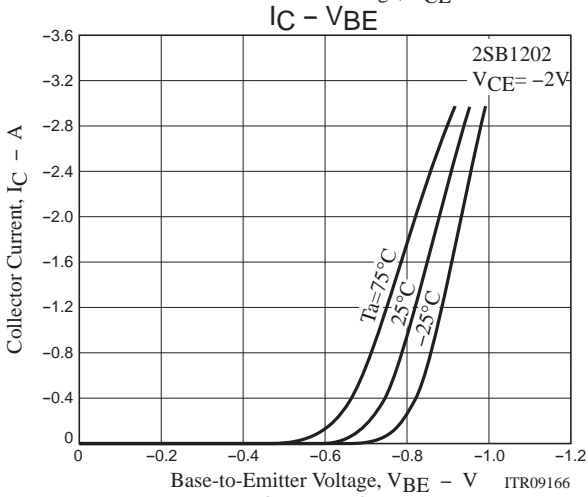
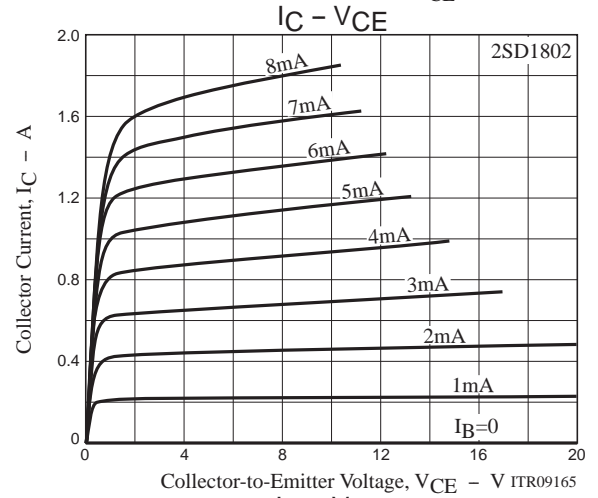
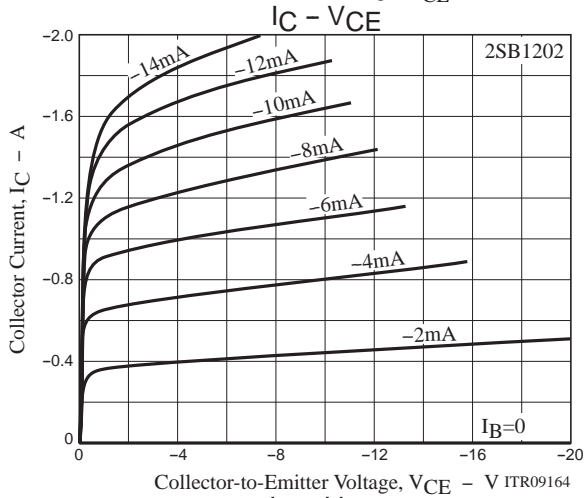
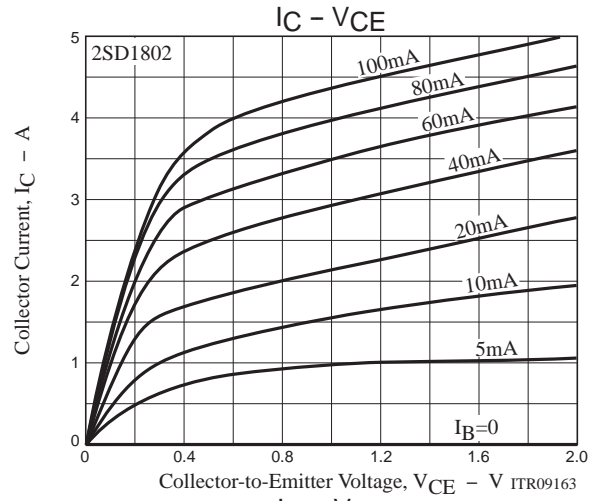
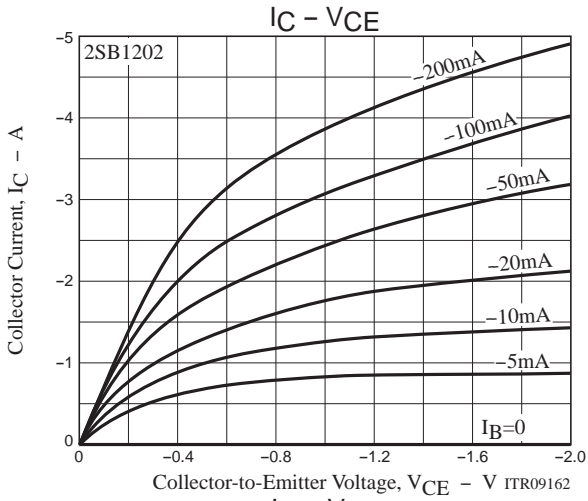
$$I_C = 10I_{B1} = -10I_{B2} = 1A$$

For PNP, the polarity is reversed.

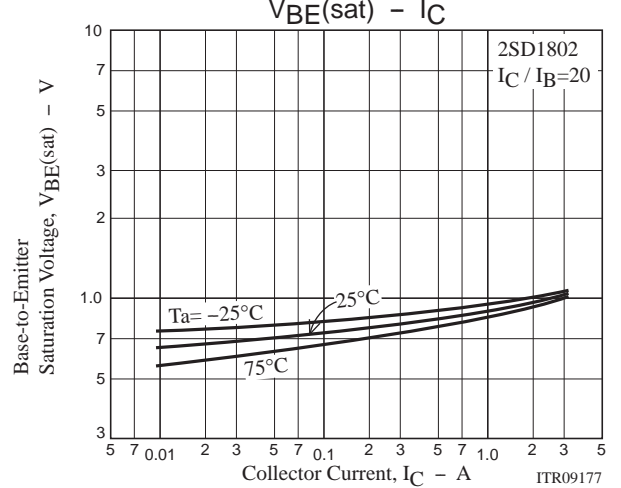
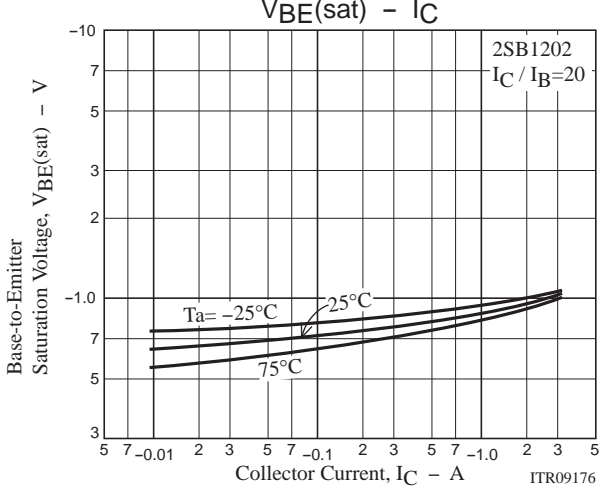
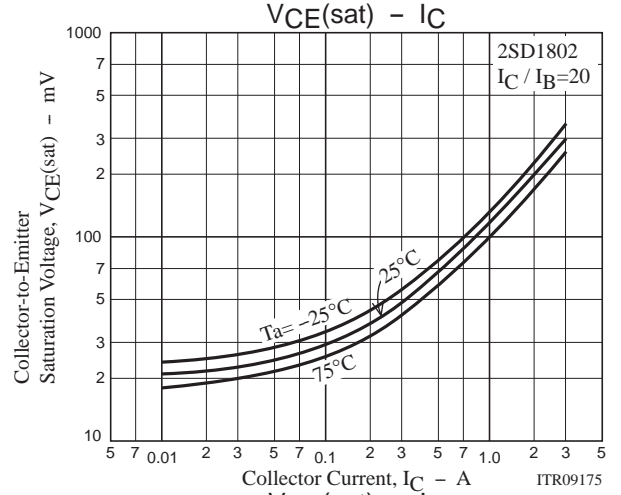
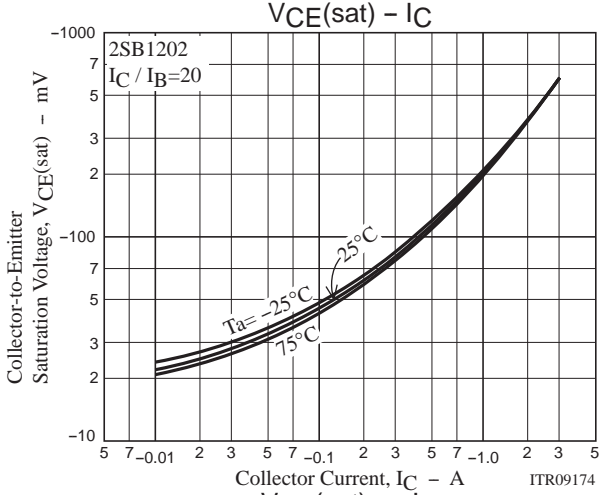
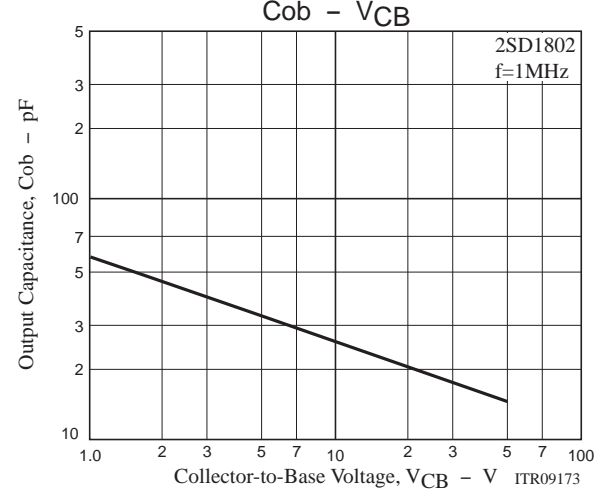
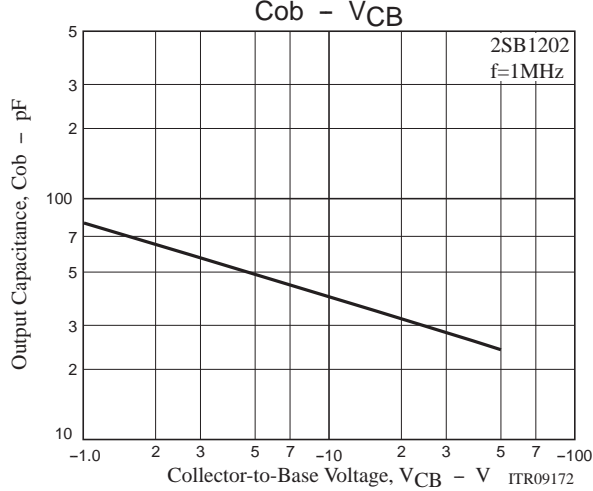
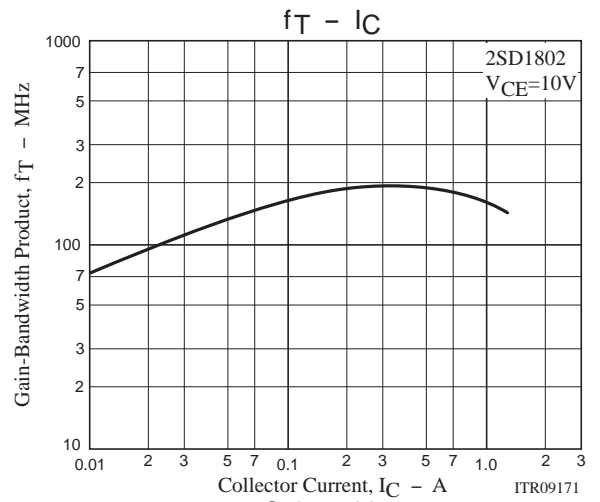
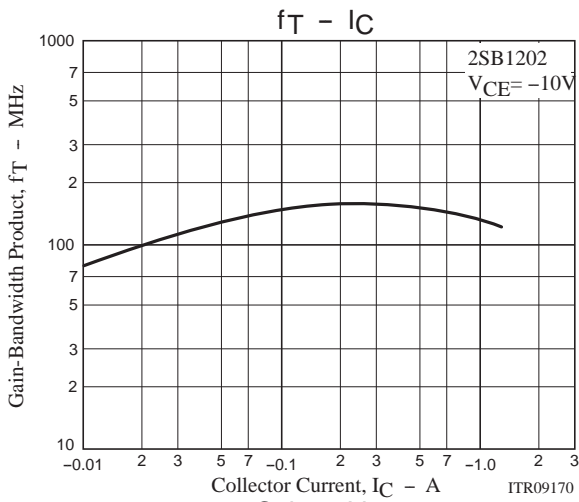
Ordering Information

Device	Package	Shipping	memo
2SB1202S-E	TP	500pcs./bag	Pb Free
2SB1202T-E	TP	500pcs./bag	
2SD1802S-E	TP	500pcs./bag	
2SD1802T-E	TP	500pcs./bag	
2SB1202S-TL-E	TP-FA	700pcs./reel	
2SB1202T-TL-E	TP-FA	700pcs./reel	
2SD1802S-TL-E	TP-FA	700pcs./reel	
2SD1802T-TL-E	TP-FA	700pcs./reel	

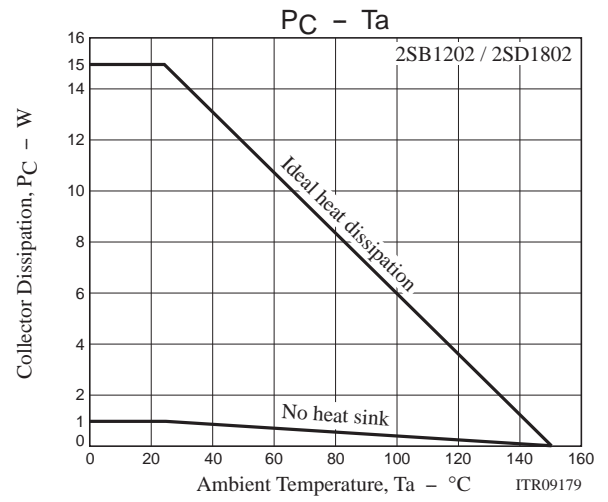
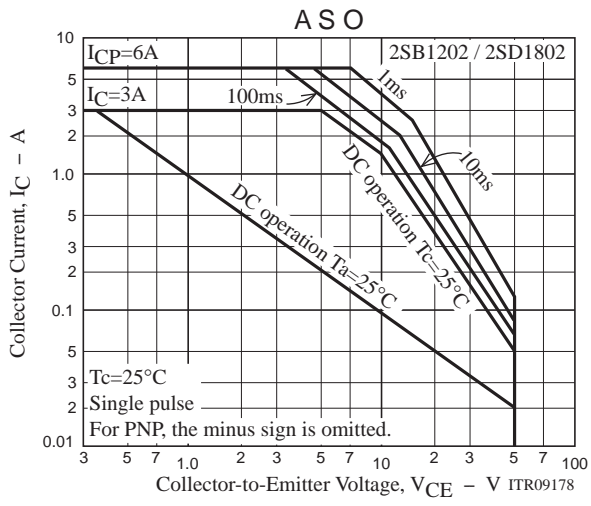
2SB1202/2SD1802



2SB1202/2SD1802



2SB1202/2SD1802



2SB1202/2SD1802

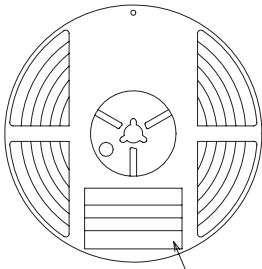
Taping Specification

2SB1202S-TL-E, 2SB1202T-TL-E, 2SD1802S-TL-E, 2SD1802T-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

Packing method



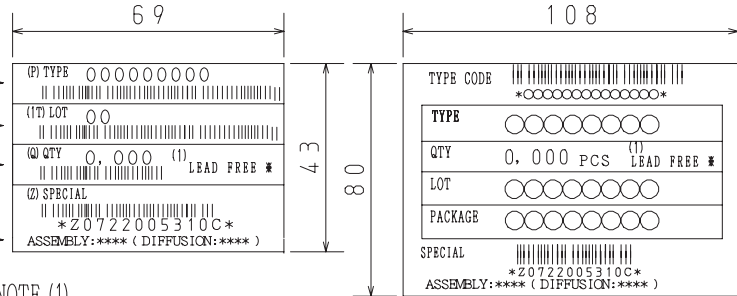
Type No.
LOT No.
Quantity
Origin

Reel label

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.



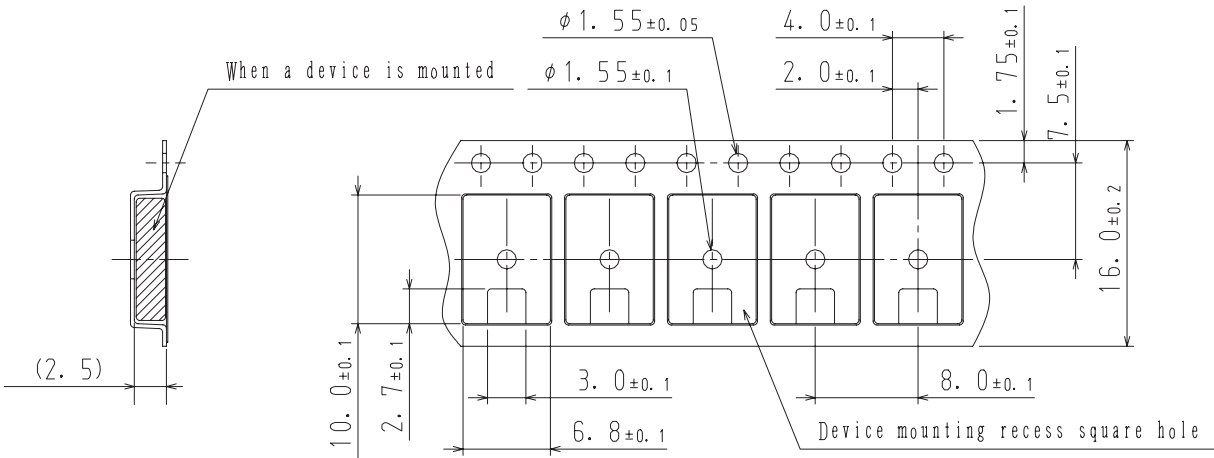
NOTE (1)

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

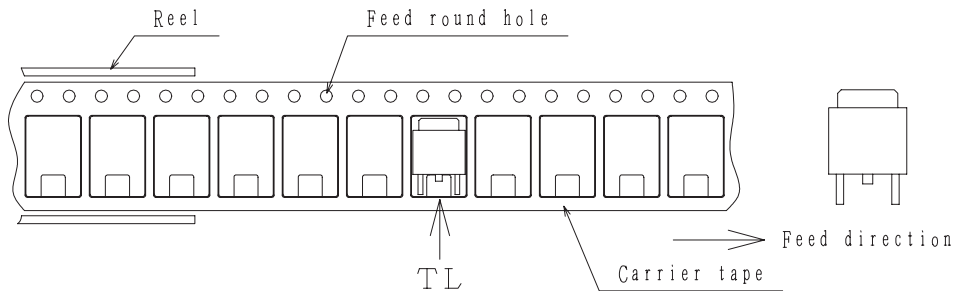
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

Taping configuration

1. Carrier tape size (unit:mm)



2. Device placement direction



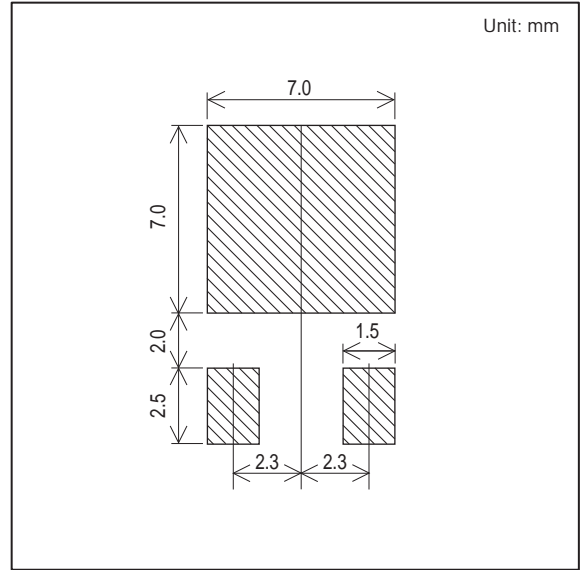
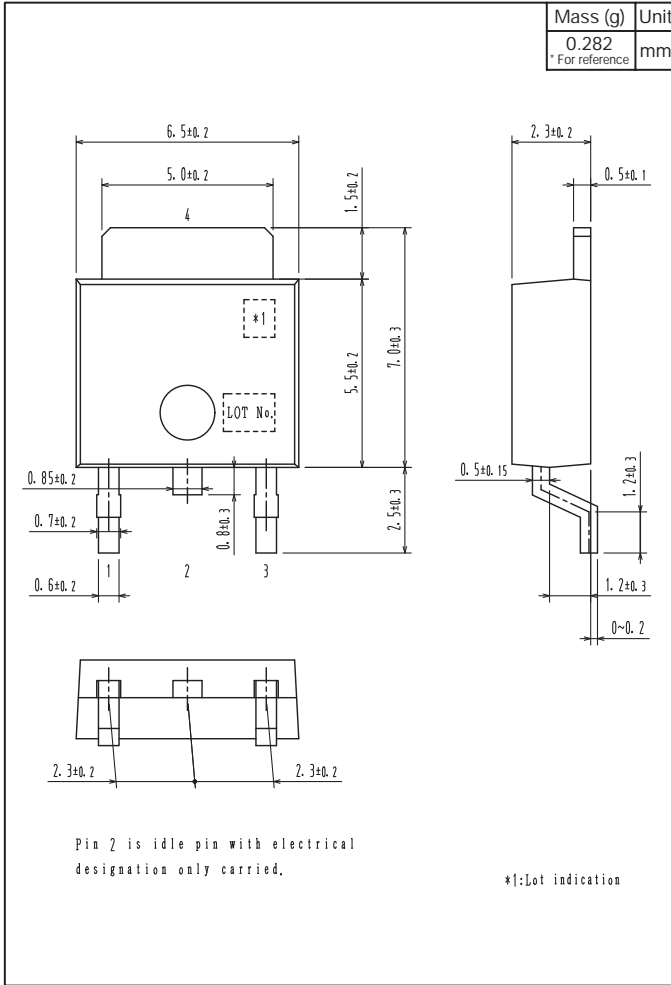
Those with one electrode terminal on the feed hole side.....TL

2SB1202/2SD1802

Outline Drawing

Land Pattern Example

2SB1202S-TL-E, 2SB1202T-TL-E, 2SD1802S-TL-E, 2SD1802T-TL-E



2SB1202/2SD1802

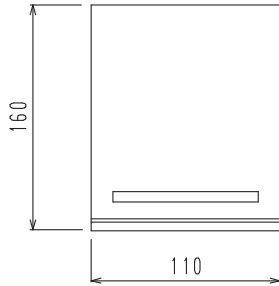
Bag Packing Specification

2SB1202S-E, 2SB1202T-E, 2SD1802S-E, 2SD1802T-E

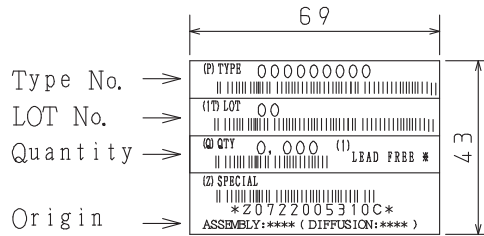
1. Packing Format

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)



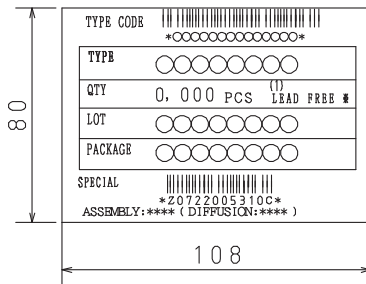
4. Outer box label (unit:mm)

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.

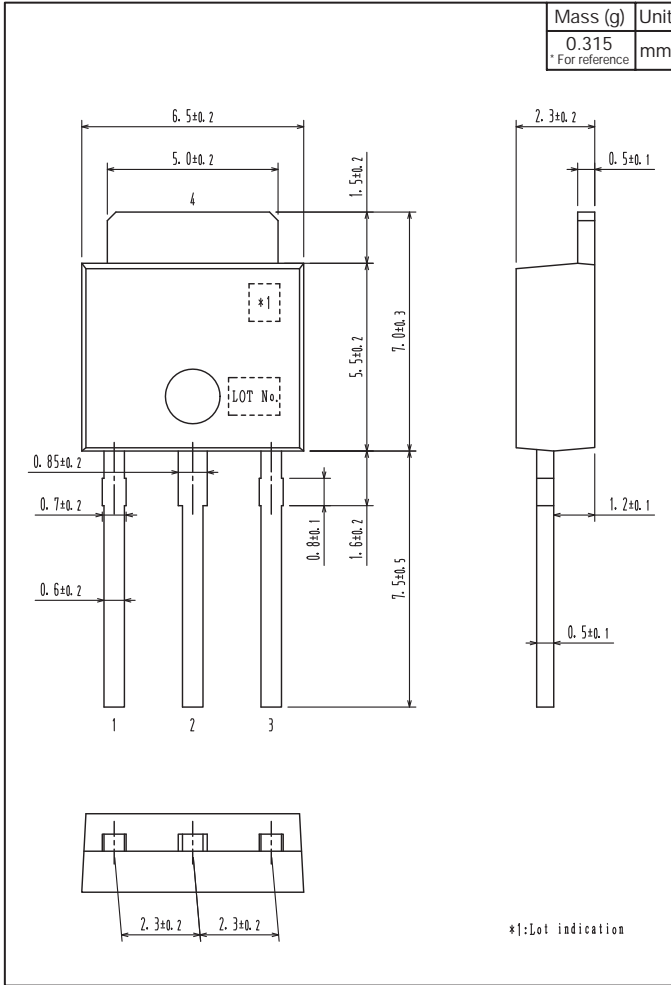
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3



2SB1202/2SD1802

Outline Drawing

2SB1202S-E, 2SB1202T-E, 2SD1802S-E, 2SD1802T-E



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