

2SB1203 / 2SD1803

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

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.

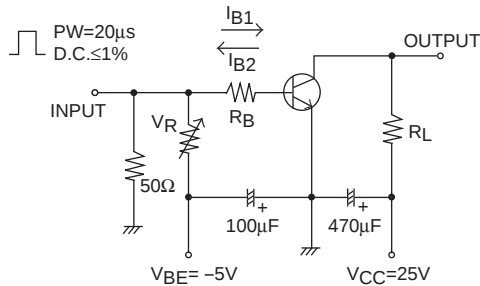
Electrical Characteristics at T_a=25°C

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 =(-)0.5A	70*		400*	
	h _{FE2}	V _{CE} =(-)2V, I _C =(-)4A	35			
Gain-Bandwidth Product	f _T	V _{CE} =(-)5V, I _C =(-)1A		(130)180		MHz
Output Capacitance	C _{ob}	V _{CB} =(-)10V, f=1MHz		(60)40		pF
Collector-to-Emitter Saturation Voltage	V _{CE(sat)}	I _C =(-)3A, I _B =(-)0.15A		(-280)220	(-550)400	mV
Base-to-Emitter Saturation Voltage	V _{BE(sat)}	I _C =(-)3A, I _B =(-)0.15A		(-)0.95	(-)1.3	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.		(50)50		ns
Storage Time	t _{stg}			(450)500		ns
Fall Time	t _f			(20)20		ns

* : The 2SB1203/2SD1803 are classified by 0.5A 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

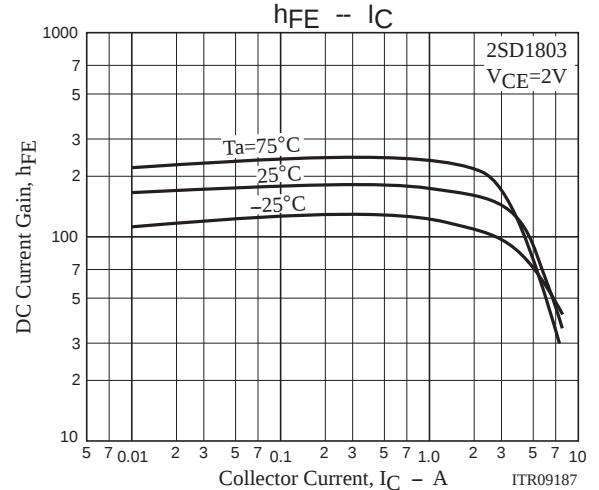
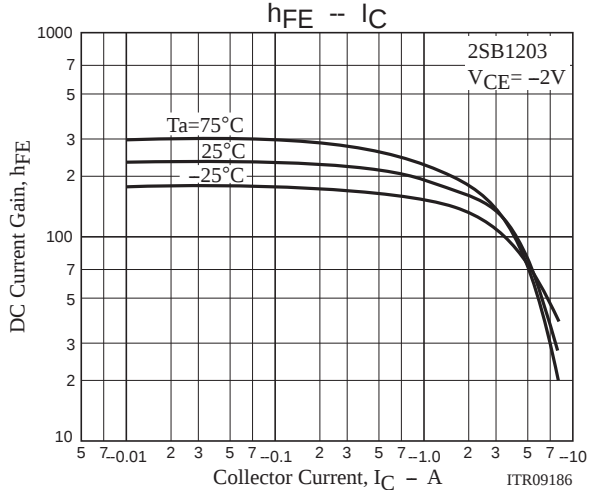
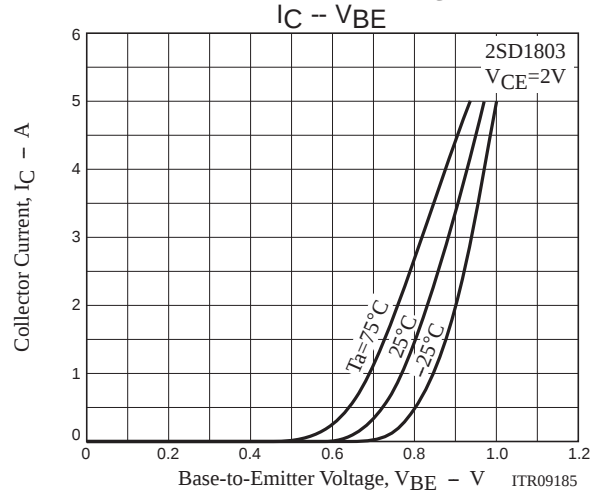
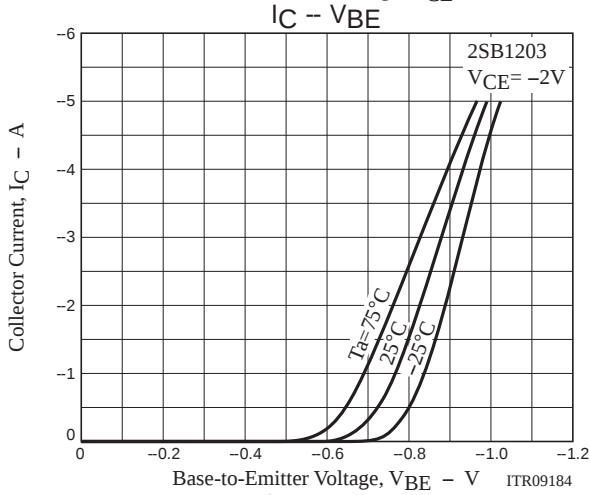
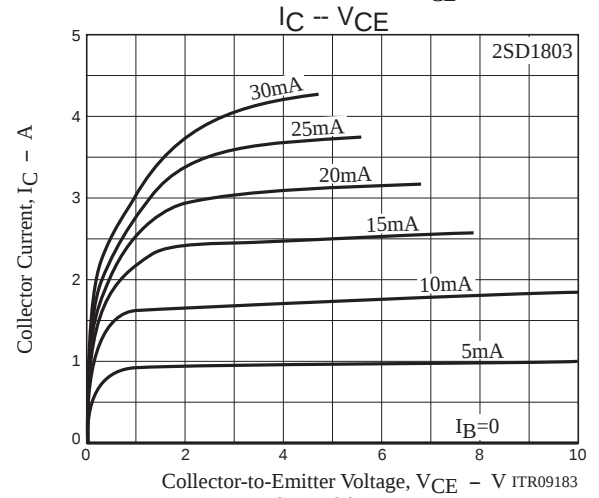
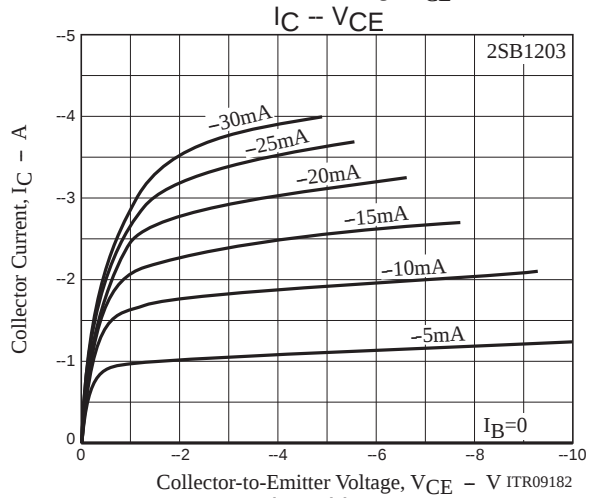
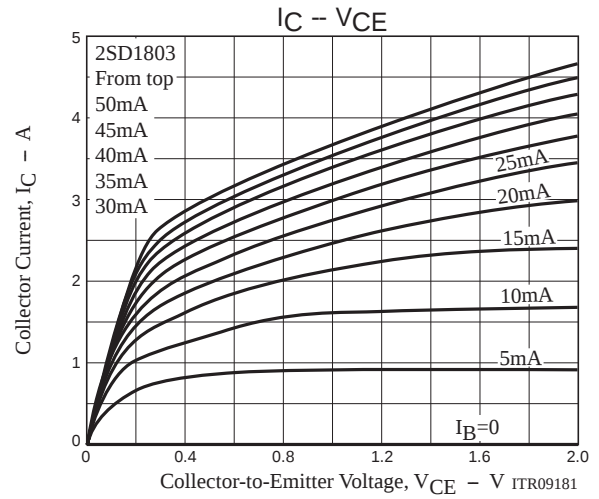
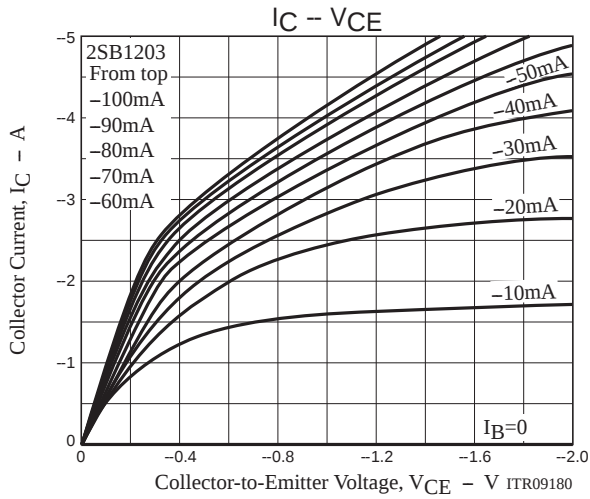


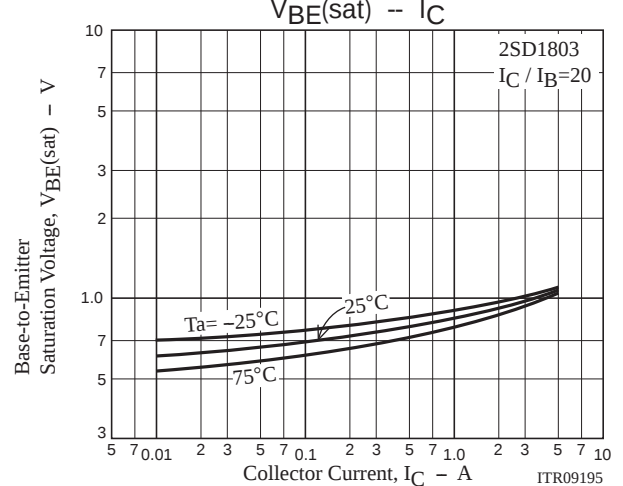
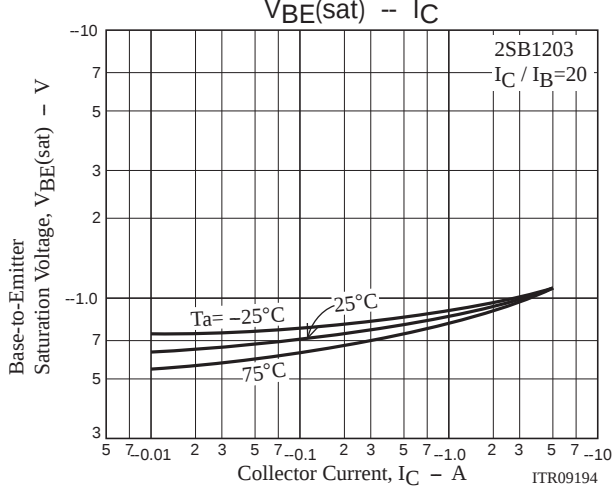
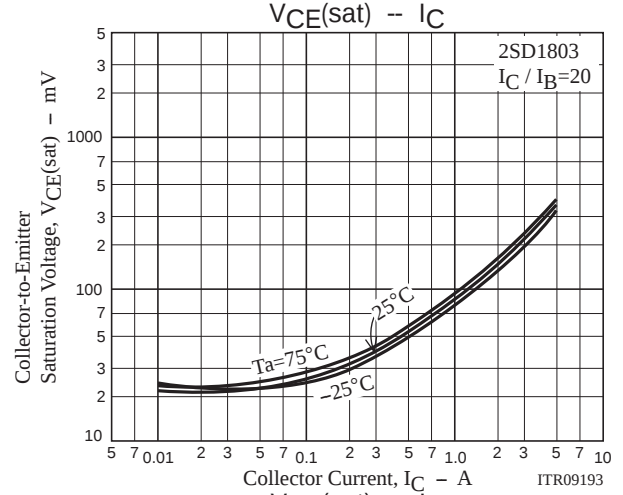
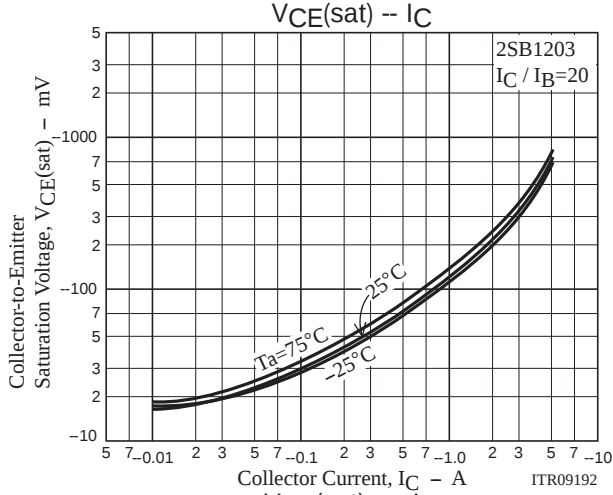
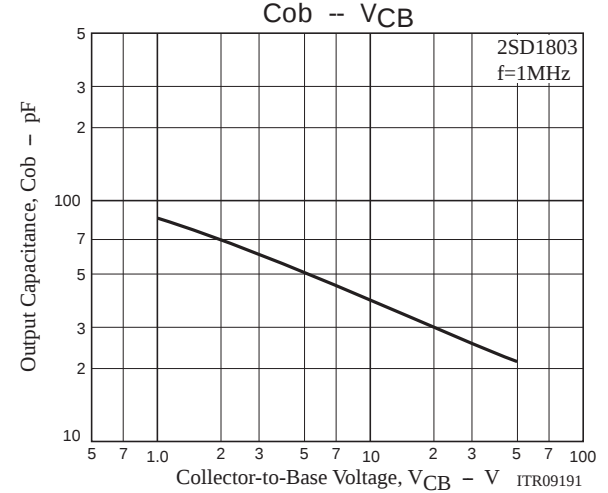
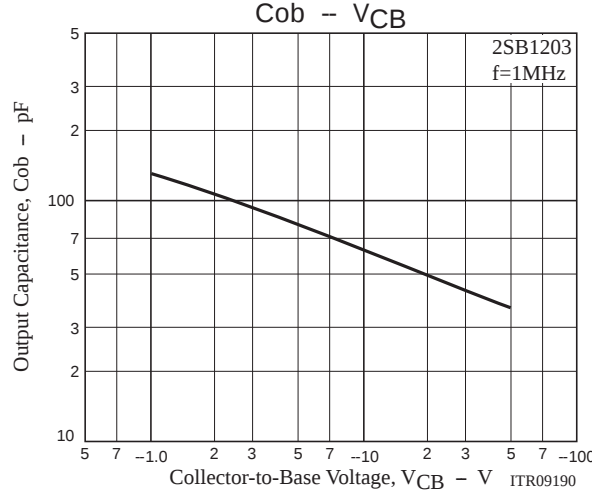
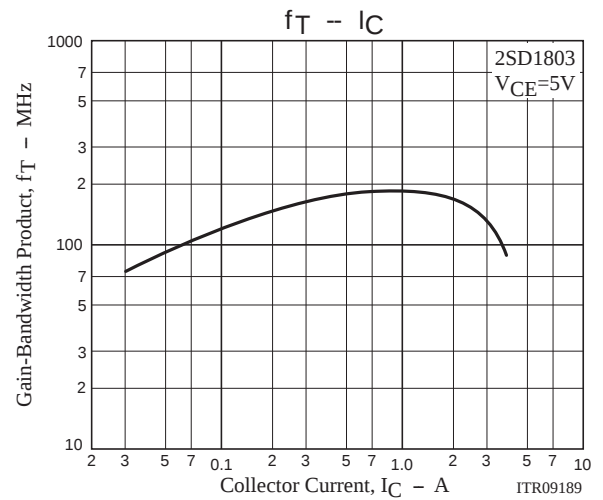
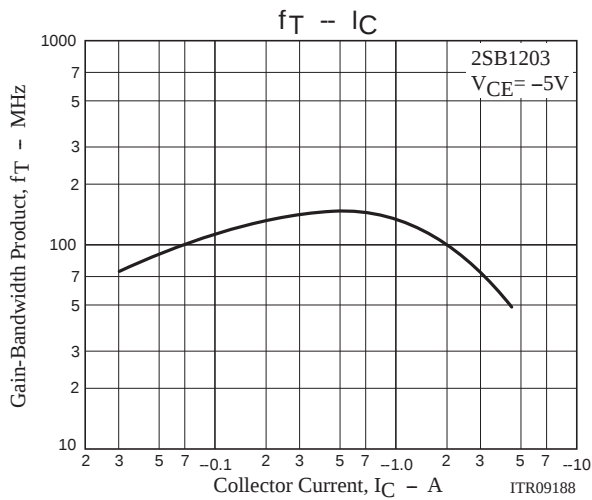
$$I_C = 10I_{B1} = -10I_{B2} = 2A$$

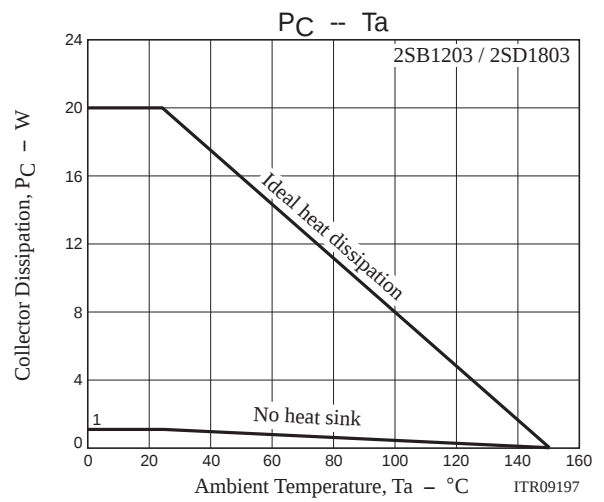
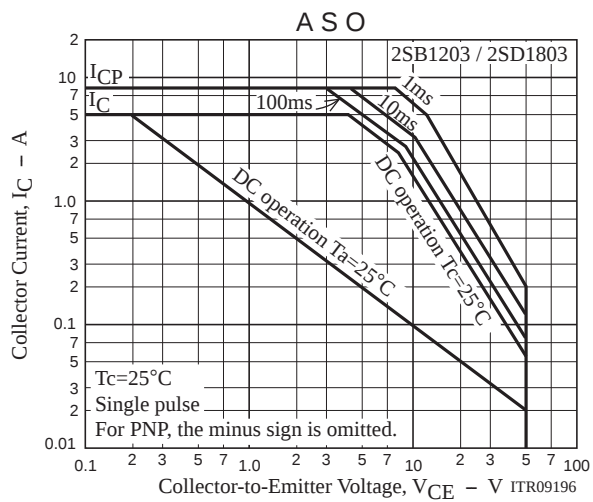
For PNP, the polarity is reversed.

Ordering Information

Device	Package	Shipping	memo
2SB1203S-E	TP	500pcs./bag	Pb Free
2SB1203S-H	TP	500pcs./bag	Pb Free and Halogen Free
2SD1203T-E	TP	500pcs./bag	Pb Free
2SD1203T-H	TP	500pcs./bag	Pb Free and Halogen Free
2SB1803S-E	TP	500pcs./bag	Pb Free
2SB1803S-H	TP	500pcs./bag	Pb Free and Halogen Free
2SD1803T-E	TP	500pcs./bag	Pb Free
2SD1803T-H	TP	500pcs./bag	Pb Free and Halogen Free
2SB1203S-TL-E	TP-FA	700pcs./reel	Pb Free
2SB1203S-TI-H	TP-FA	700pcs./reel	Pb Free and Halogen Free
2SB1203T-TL-E	TP-FA	700pcs./reel	Pb Free
2SB1203T-TI-H	TP-FA	700pcs./reel	Pb Free and Halogen Free
2SB1803S-TL-E	TP-FA	700pcs./reel	Pb Free
2SB1803S-TI-H	TP-FA	700pcs./reel	Pb Free and Halogen Free
2SB1803T-TL-E	TP-FA	700pcs./reel	Pb Free
2SB1803T-TI-H	TP-FA	700pcs./reel	Pb Free and Halogen Free







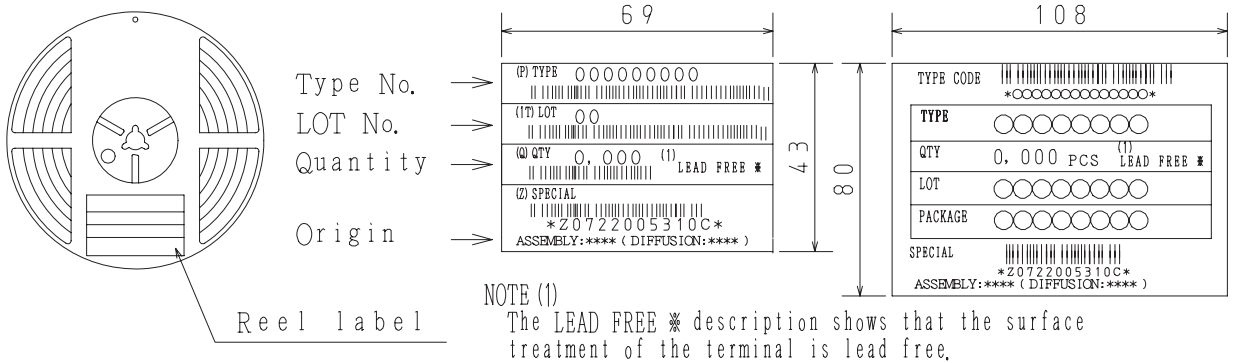
Taping Specification

2SB1203S-TL-E, 2SB1203S-TL-H, 2SB1203T-TL-E, 2SB1203T-TL-H, 2SB1803S-TL-E, 2SB1803S-TL-H, 2SB1803T-TL-E, 2SB1803T-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

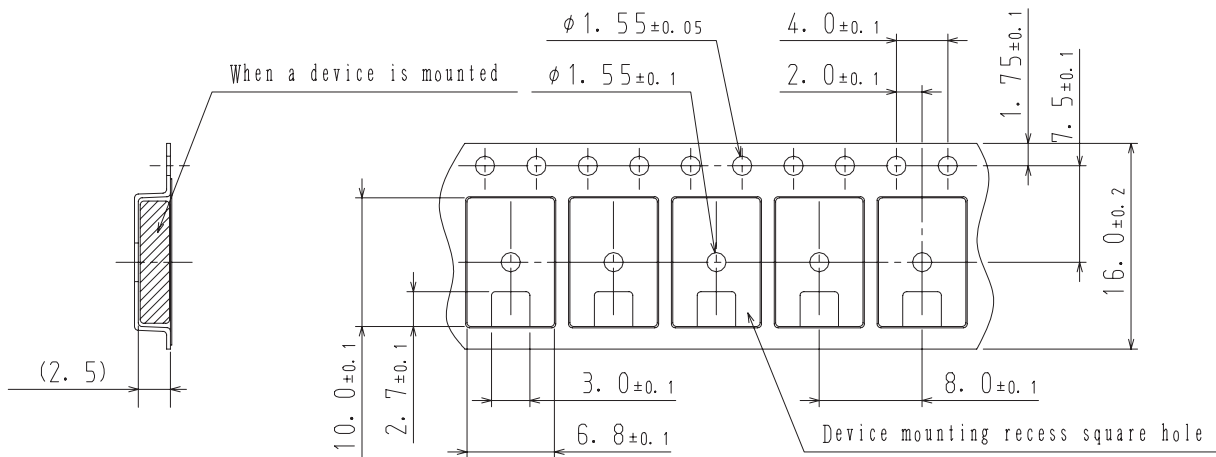
Packing method



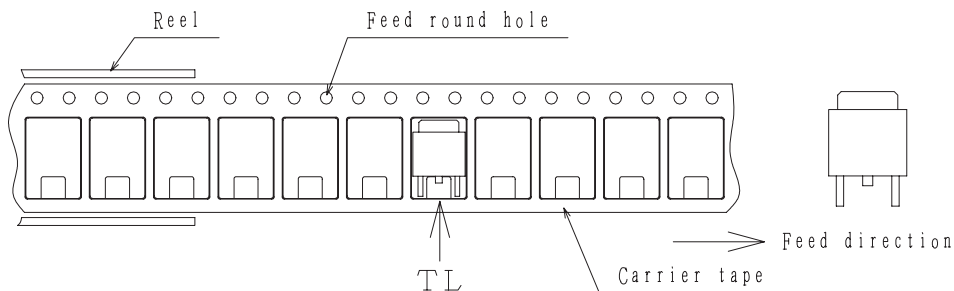
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

Taping configuration

1. Carrier tape size (unit:mm)



2. Device placement direction

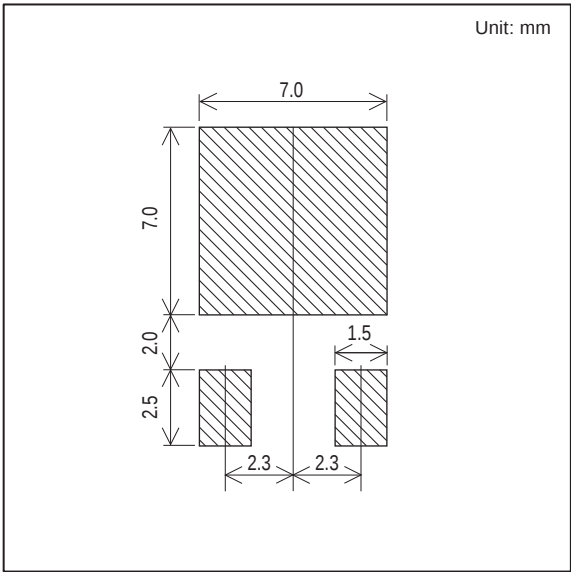
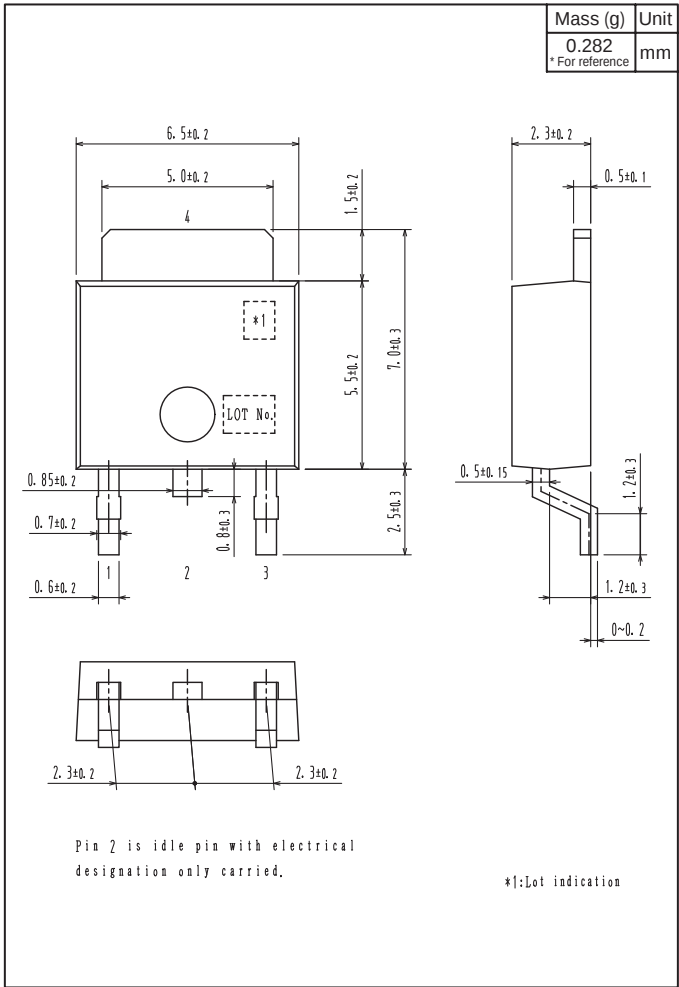


Those with one electrode terminal on the feed hole side.....TL

Outline Drawing

Land Pattern Example

2SB1203S-TL-E, 2SB1203S-Tl-H, 2SB1203T-TL-E, 2SB1203T-Tl-H, 2SB1803S-TL-E, 2SB1803S-Tl-H, 2SB1803T-TL-E, 2SB1803T-Tl-H



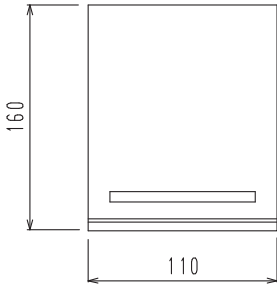
Bag Packing Specification

2SB1203S-E, 2SB1203S-H, 2SD1203T-E, 2SD1203T-H, 2SB1803S-E, 2SB1803S-H, 2SD1803T-E, 2SD1803T-H

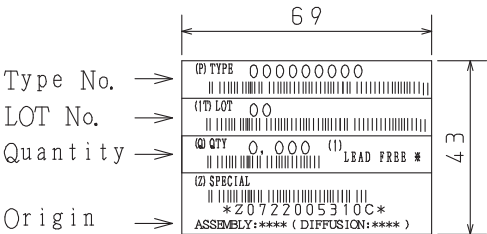
1. Packing Format

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)

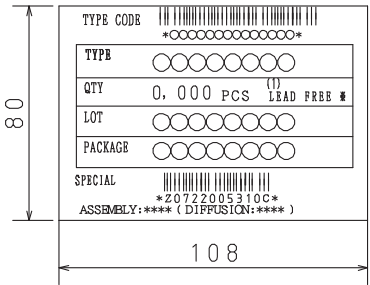


4. Outer box label
(unit:mm)

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.

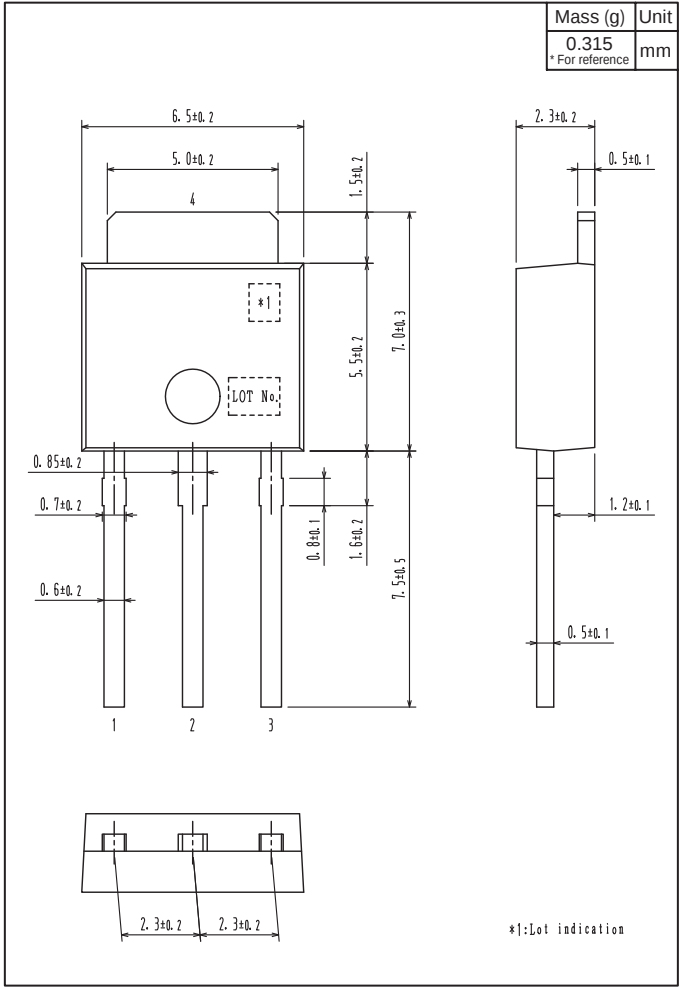
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3



2SB1203 / 2SD1803

Outline Drawing

2SB1203S-E, 2SB1203S-H, 2SD1203T-E, 2SD1203T-H, 2SB1803S-E, 2SB1803S-H, 2SD1803T-E, 2SD1803T-H



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