



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

2SB1204 — PNP 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
- High current and high f_T
- Excellent linearity of h_{FE}
- Fast switching speed
- Small and slim package making it easy to make 2SB1204-applied sets smaller

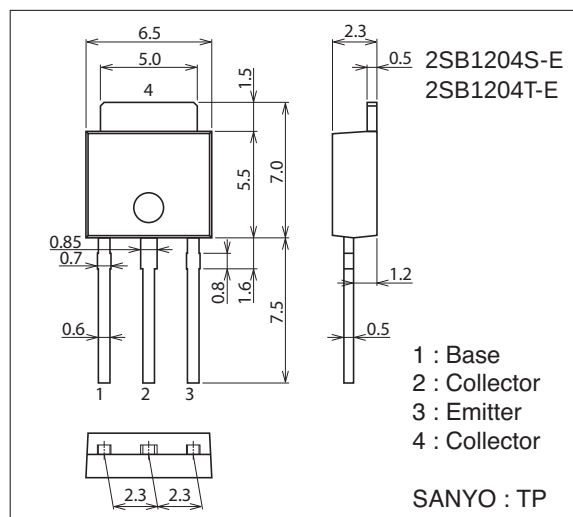
Specifications

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

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		-8	A
Collector Current (Pulse)	I_{CP}		-12	A
Collector Dissipation	P_C		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	$^\circ\text{C}$

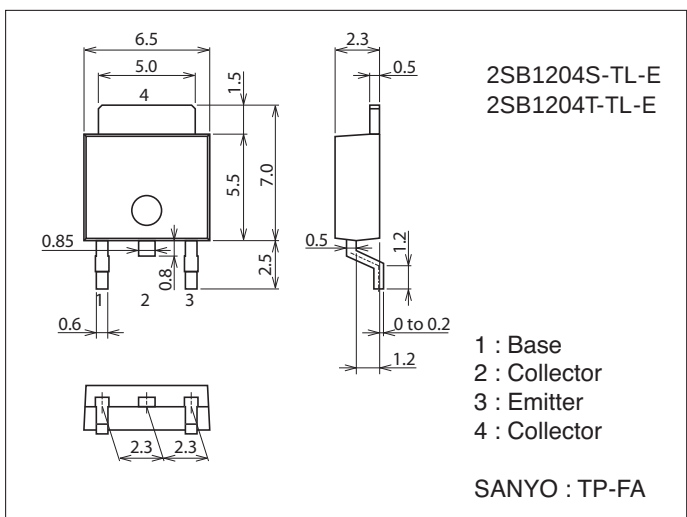
Package Dimensions unit : mm (typ)

7518-003



Package Dimensions unit : mm (typ)

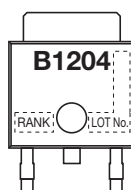
7003-003



Product & Package Information

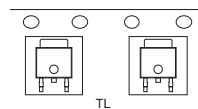
- Package : TP
- JEITA, JEDEC : SC-64, TO-251
- Minimum Packing Quantity : 500 pcs./bag

Marking (TP, TP-FA)

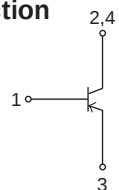


- Package : TP-FA
- JEITA, JEDEC : SC-63, TO-252
- Minimum Packing Quantity : 700 pcs./reel

Packing Type (TP-FA) : TL



Electrical Connection



SANYO Semiconductor Co., Ltd.

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

2SB1204

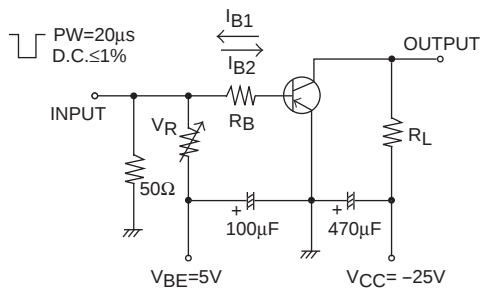
Electrical Characteristics at Ta=25°C

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}	$V_{CE} = -2V, I_C = -6A$	35			
Gain-Bandwidth Product	f_T	$V_{CE} = -5V, I_C = -1A$		130		MHz
Output Capacitance	C_{ob}	$V_{CB} = -10V, f = 1MHz$		95		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -4A, I_B = -0.2A$		-250	-500	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = -4A, I_B = -0.2A$		-0.95	-1.3	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = -10\mu A, I_E = 0A$	-60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -1mA, R_{BE} = \infty$	-50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = -10\mu A, I_C = 0A$	-6			V
Turn-On Time	t_{on}	See specified Test Circuit		50		ns
Storage Time	t_{stg}			450		ns
Fall Time	t_f			20		ns

* : The 2SB1204 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

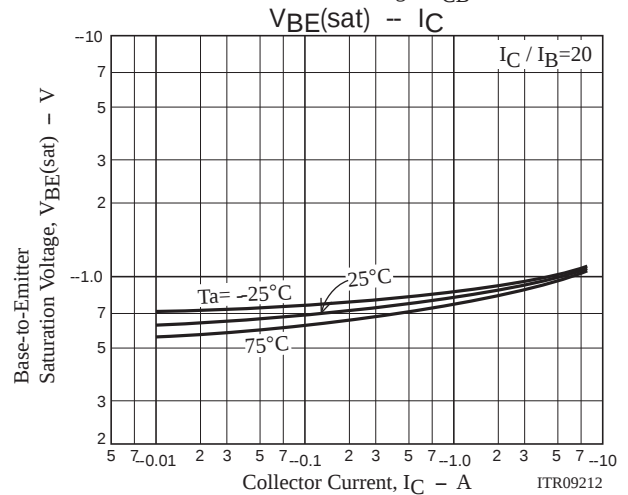
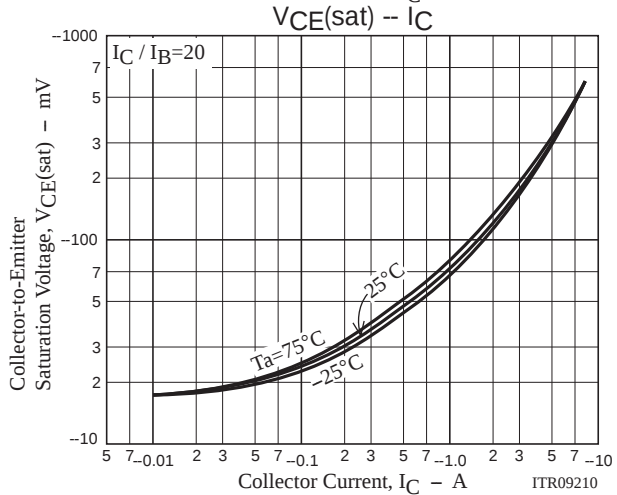
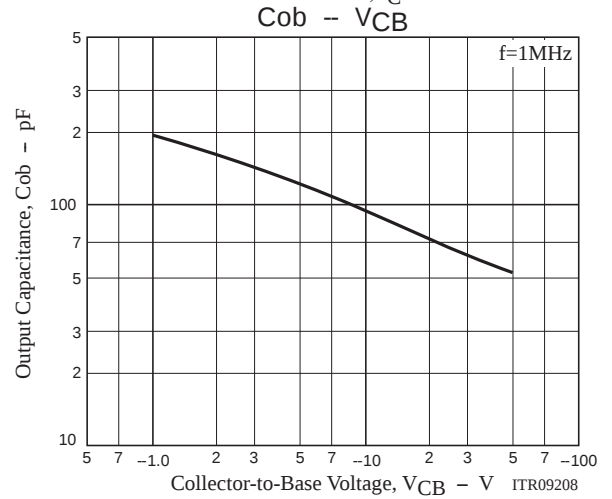
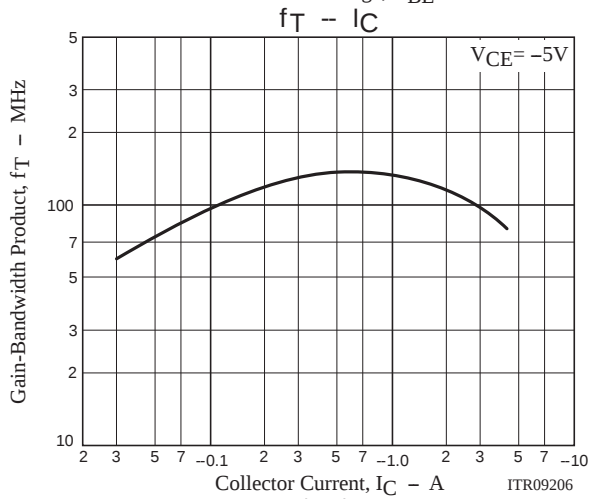
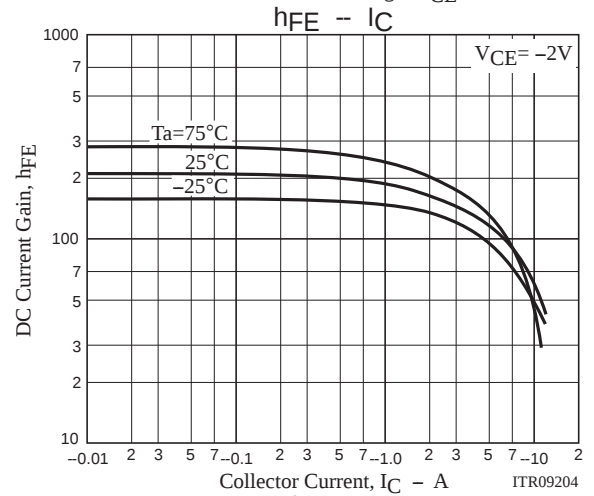
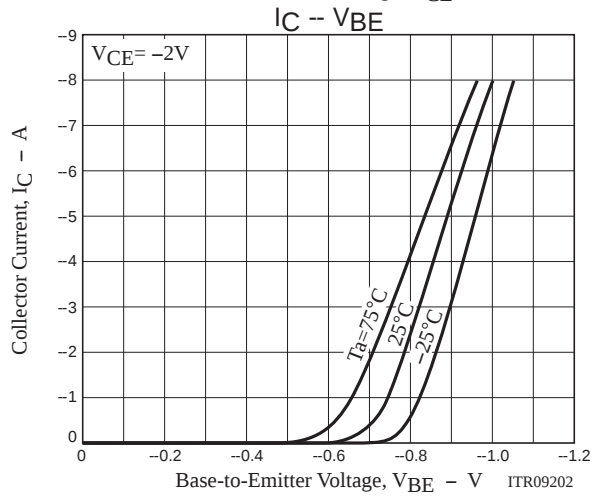
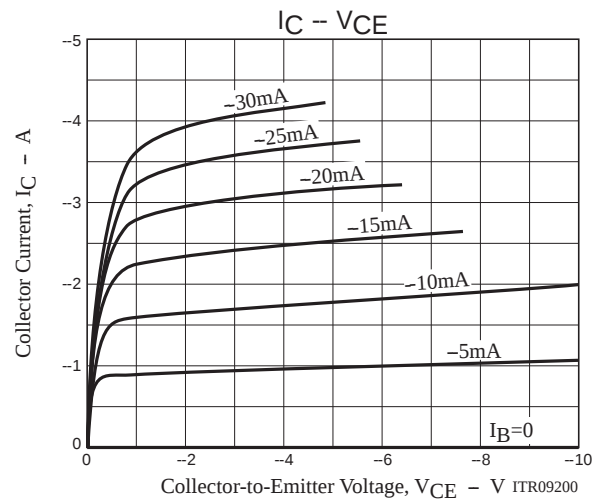
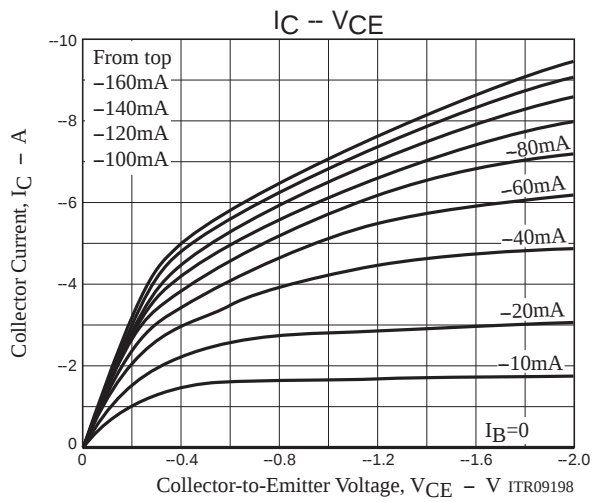
Switching Time Test Circuit

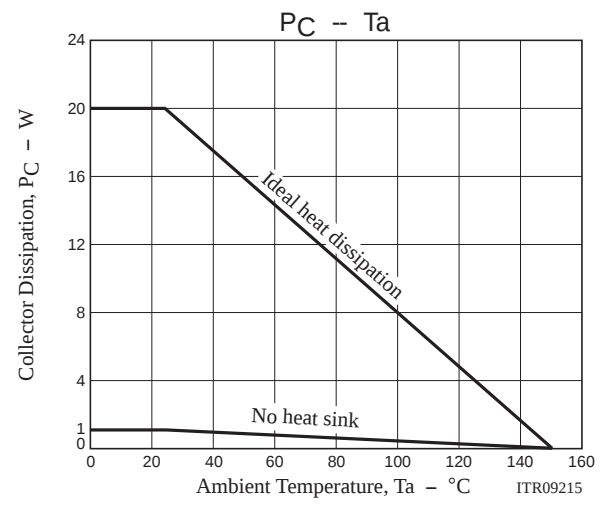
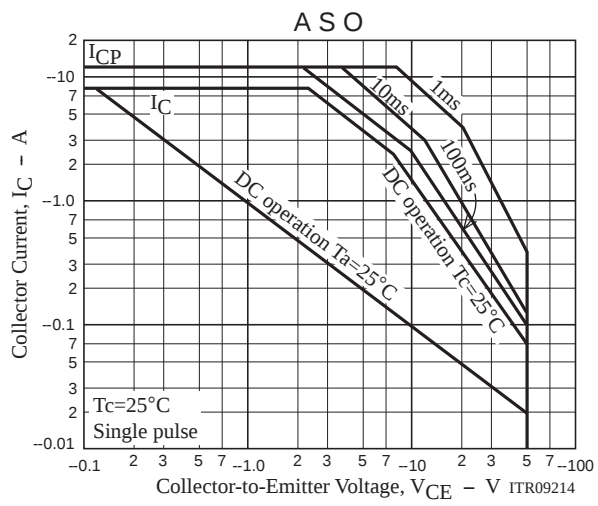


$$I_C = -10I_{B1} = 10I_{B2} = -4A$$

Ordering Information

Device	Package	Shipping	memo
2SB1204S-E	TP	500pcs./bag	Pb Free
2SB1204T-E	TP	500pcs./bag	
2SB1204S-TL-E	TP-FA	700pcs./reel	
2SB1204T-TL-E	TP-FA	700pcs./reel	





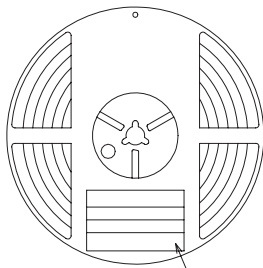
Taping Specification

2SB1204S-TL-E, 2SB1204T-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



Reel label

Type No.
LOT No.
Quantity
Origin

Reel label, Inner box label
(unit:mm)

(P) TYPE	000000000
(1) LOT	00
(Q) QTY	0,000 (1) LEAD FREE *
(Z) SPECIAL	*20722005310C*
ASSEMBLY:**** (DIFFUSION:****)	

Outer box label

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

TYPE CODE	
TYPE	○○○○○○○○
QTY	0,000 PCS (1) LEAD FREE *
LOT	○○○○○○○○
PACKAGE	○○○○○○○○
SPECIAL	
ASSEMBLY:**** (DIFFUSION:****)	

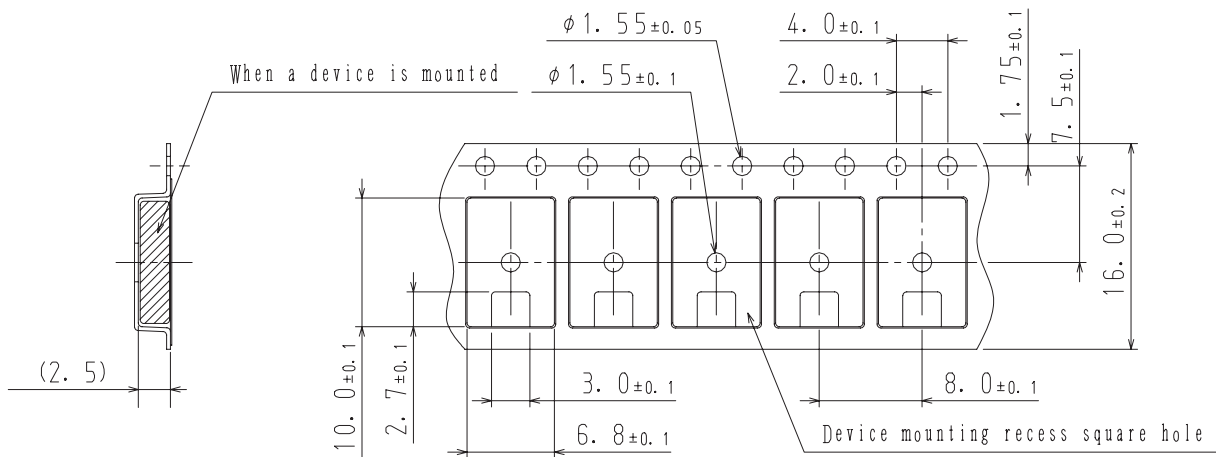
NOTE (1)

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

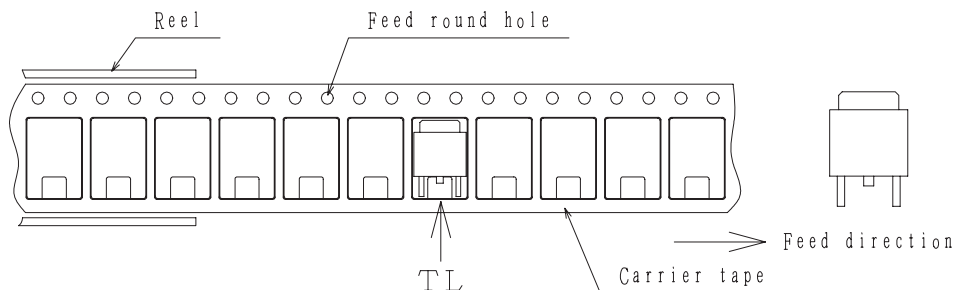
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

Taping configuration

1. Carrier tape size (unit:mm)

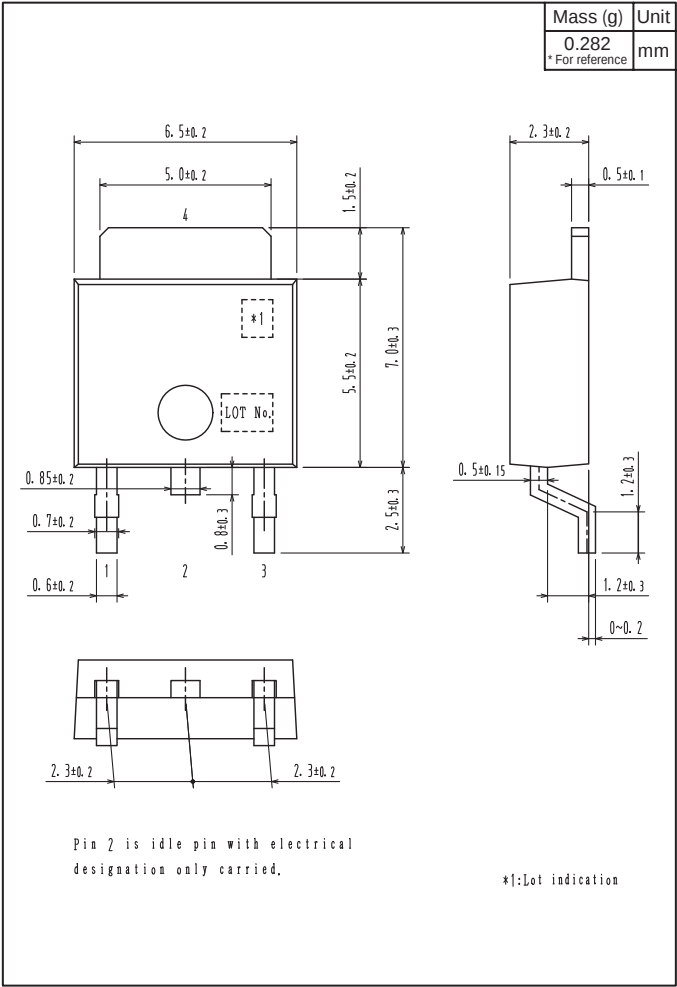


2. Device placement direction

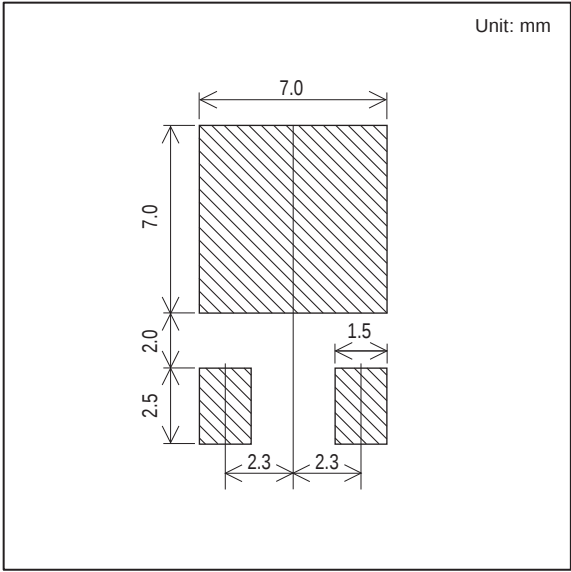


Outline Drawing

2SB1204S-TL-E, 2SB1204T-TL-E



Land Pattern Example

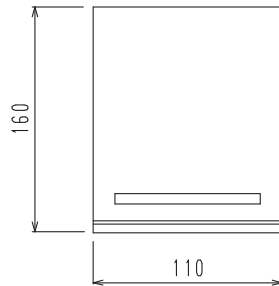
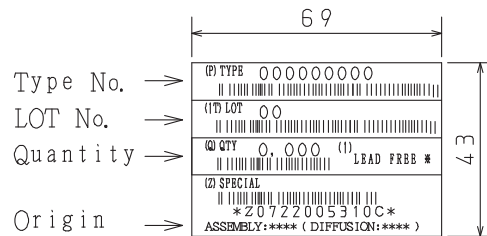


Bag Packing Specification

2SB1204S-E, 2SB1204T-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

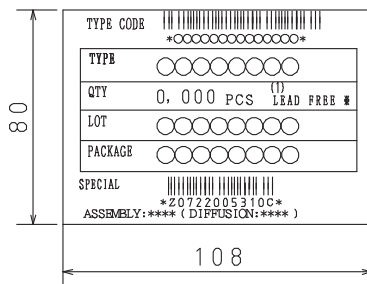
2. Bag dimensions
(unit:mm)3. Bag label, Inner box label
(unit:mm)4. Outer box label
(unit:mm)

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

NOTE (1)

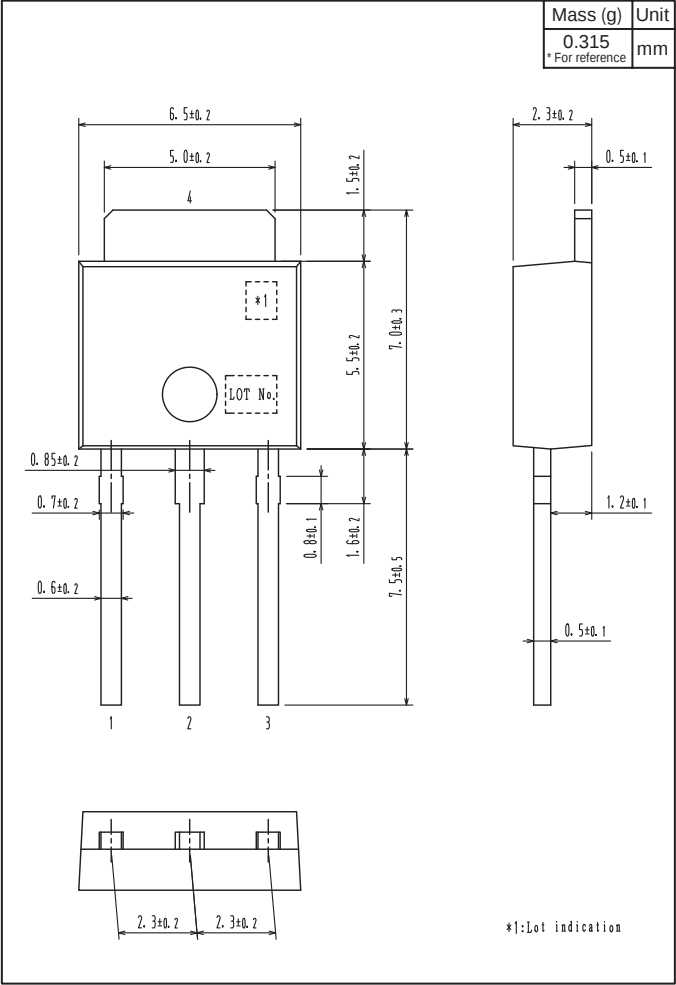
The LEAD FREE * description shows that the
surface treatment of the terminal is lead free.

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



Outline Drawing

2SB1204S-E, 2SB1204T-E



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