



# 2SD1805

## Bipolar Transistor 20V, 5A, Low VCE(sat), NPN Single TP/TP-FA

ON Semiconductor®

<http://onsemi.com>

### Applications

- Strobes, voltage regulators, relay drivers, lamp drivers

### Features

- Low saturation voltage
- Fast switching time
- Large current capacity
- Small and slim package making it easy to make 2SD1805-applied sets smaller

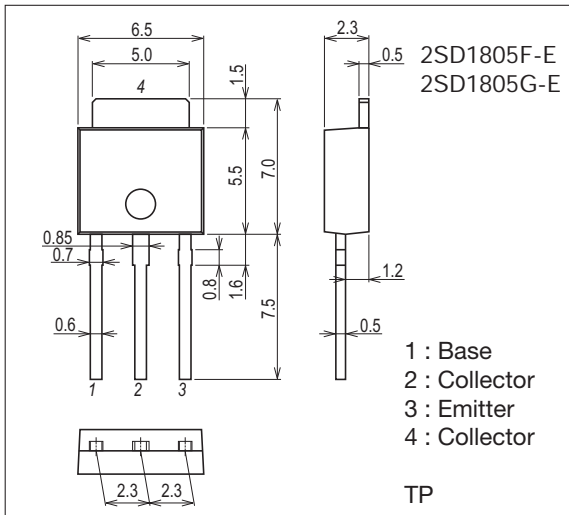
### Specifications

Absolute Maximum Ratings at Ta=25°C

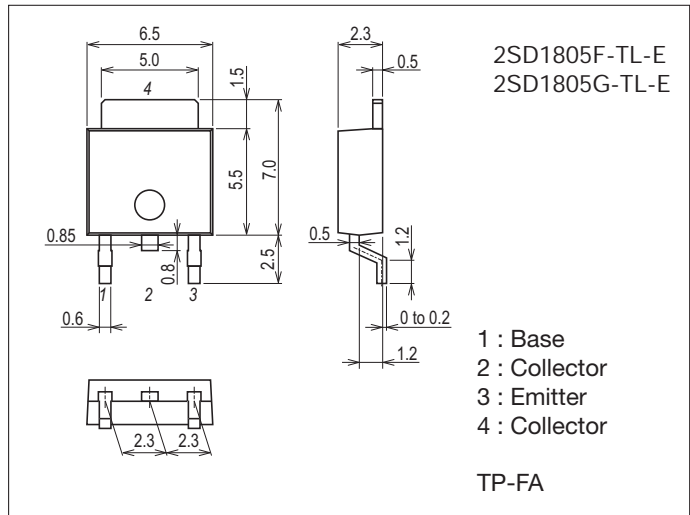
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CB0</sub>		60	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		20	V
Emitter-to-Base Voltage	V <sub>EB0</sub>		6	V
Collector Current	I <sub>C</sub>		5	A
Collector Current (Pulse)	I <sub>CP</sub>		8	A
Collector Dissipation	P <sub>C</sub>	T <sub>c</sub> =25°C	1	W
			15	W
Junction Temperature	T <sub>j</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-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.

Package Dimensions unit : mm (typ)  
7518-003



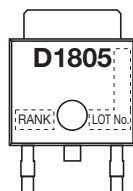
Package Dimensions unit : mm (typ)  
7003-003



### Product & Package Information

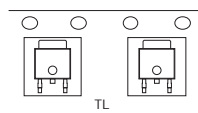
- Package : TP
- JEITA, JEDEC : SC-64, TO-251
- Minimum Packing Quantity : 500 pcs./bag

### Marking (TP, TP-FA)

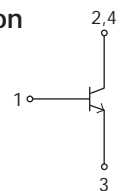


- Package : TP-FA
- JEITA, JEDEC : SC-63, TO-252
- Minimum Packing Quantity : 700 pcs./reel

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



### Electrical Connection



## 2SD1805

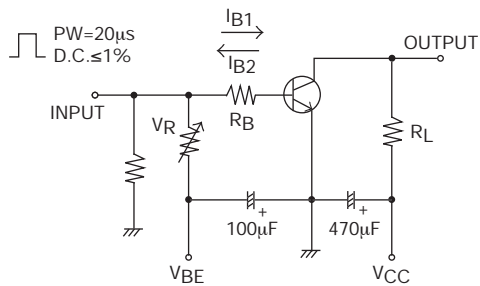
### Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	ICBO	V <sub>CB</sub> =50V, I <sub>E</sub> =0A			100	nA
Emitter Cutoff Current	IEBO	V <sub>EB</sub> =5V, I <sub>C</sub> =0A			100	nA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =500mA	120*		560*	
	h <sub>FE2</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =3A	95			
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =50mA		120		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, f=1MHz		45		pF
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =3A, I <sub>B</sub> =60mA		220	500	mV
Base-to-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =3A, I <sub>B</sub> =60mA			1.5	V
Collector-to-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =10μA, I <sub>E</sub> =0A	60			V
Collector-to-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =1mA, R <sub>BE</sub> =∞	20			V
Emitter-to-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =10μA, I <sub>C</sub> =0A	6			V
Turn-On Time	t <sub>on</sub>	See specified Test Circuit		30		ns
Storage Time	t <sub>stg</sub>			300		ns
Fall Time	t <sub>f</sub>			40		ns

\* : The 2SD1805 is classified by 500mA h<sub>FE</sub> as follows.

Rank	E	F	G
h <sub>FE</sub>	120 to 200	160 to 320	280 to 560

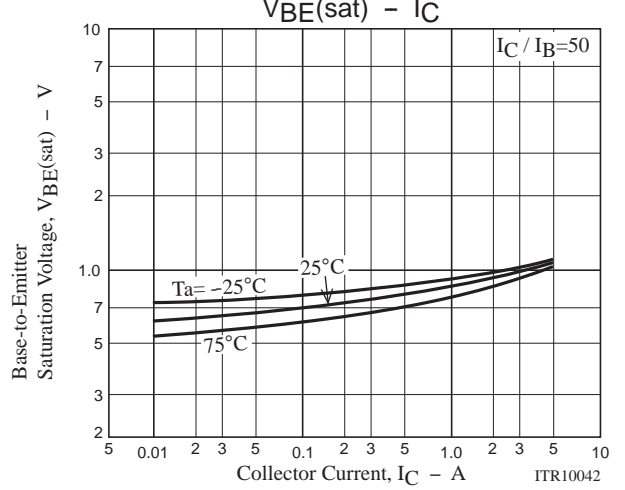
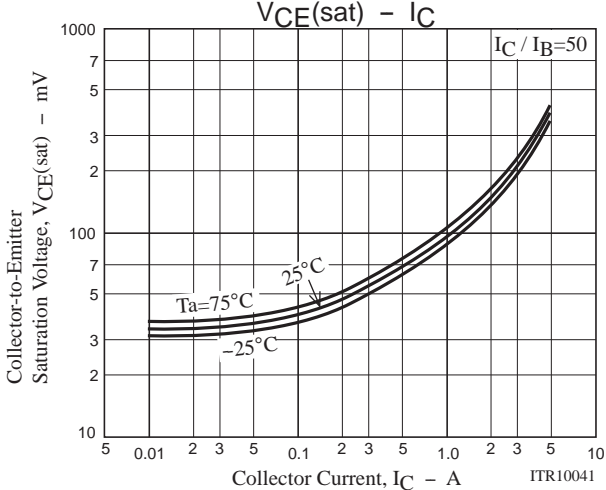
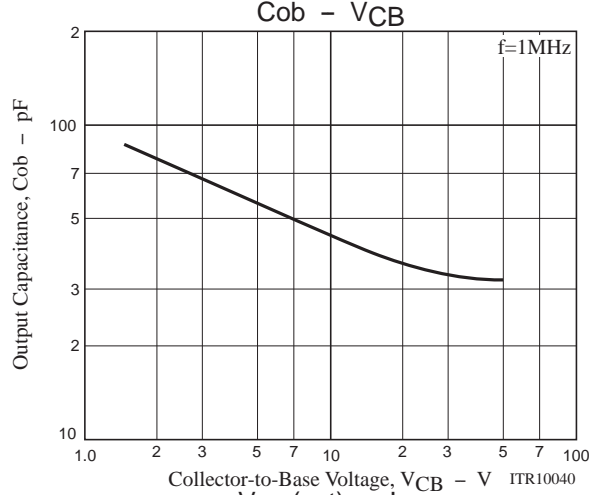
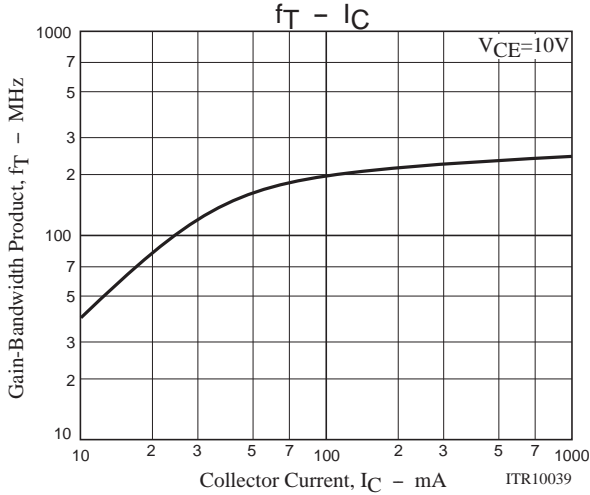
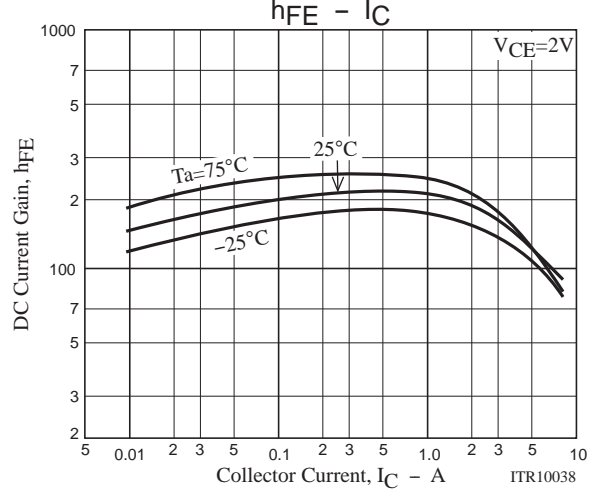
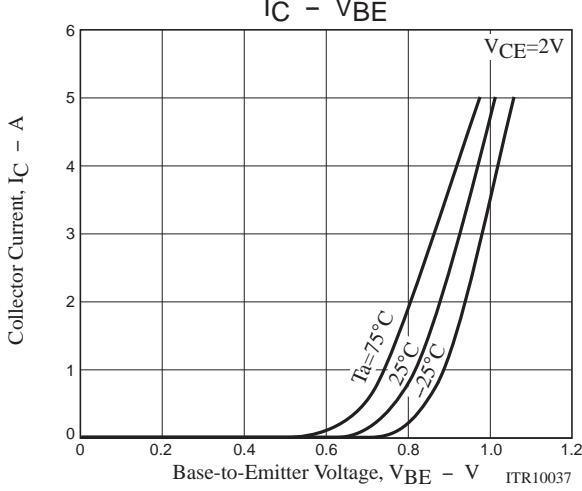
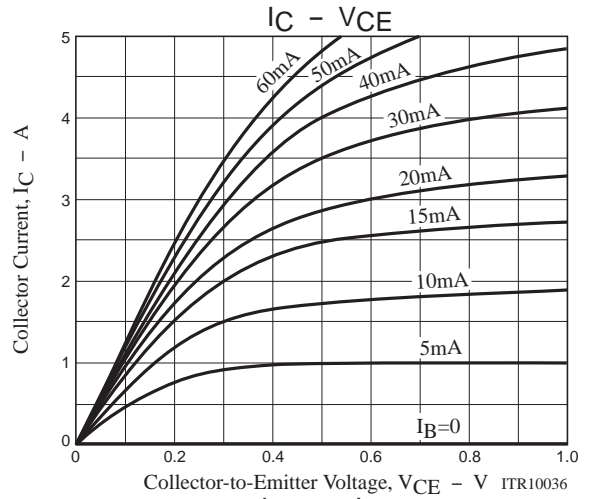
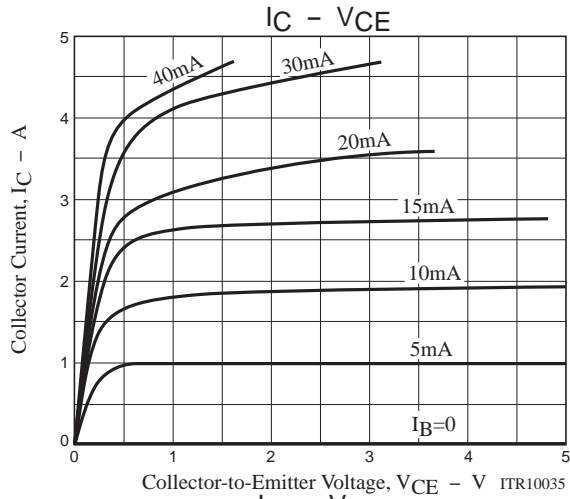
### Switching Time Test Circuit

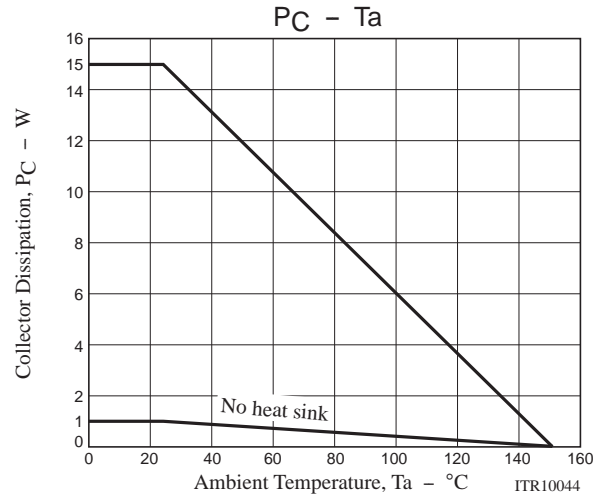
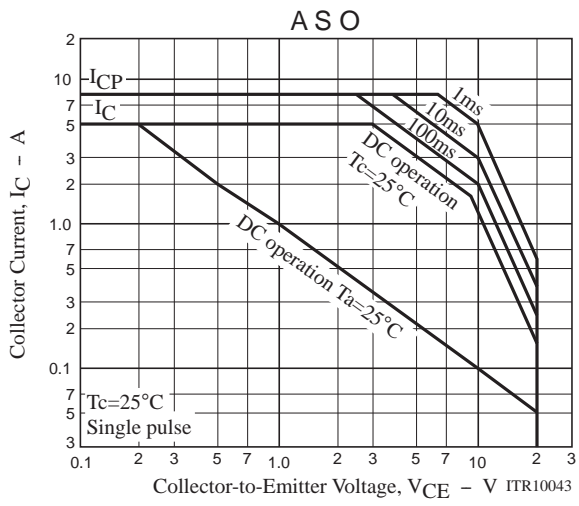


$$I_C = 10I_{B1} = -10I_{B2} = 2A, V_{CC} = 10V$$

### Ordering Information

Device	Package	Shipping	memo
2SD1805F-E	TP	500pcs./bag	Pb Free
2SD1805G-E	TP	500pcs./bag	
2SD1805F-TL-E	TP-FA	700pcs./reel	
2SD1805G-TL-E	TP-FA	700pcs./reel	





Taping Specification

2SD1805F-TL-E, 2SD1805G-TL-E

Packing Format

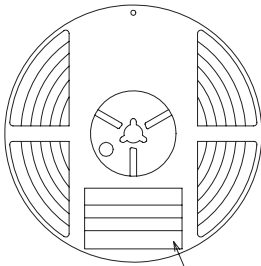
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
TP-FA	TP	700	2,100	12,600	3 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

Reel label, Inner box label  
(unit:mm)

Outer box label

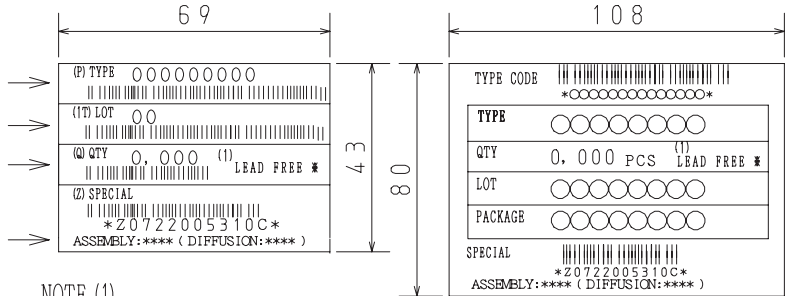
It is a label at the time of factory shipments.  
The form of a label may change in physical distribution process.

Packing method



Type No.  
LOT No.  
Quantity  
Origin

Reel label



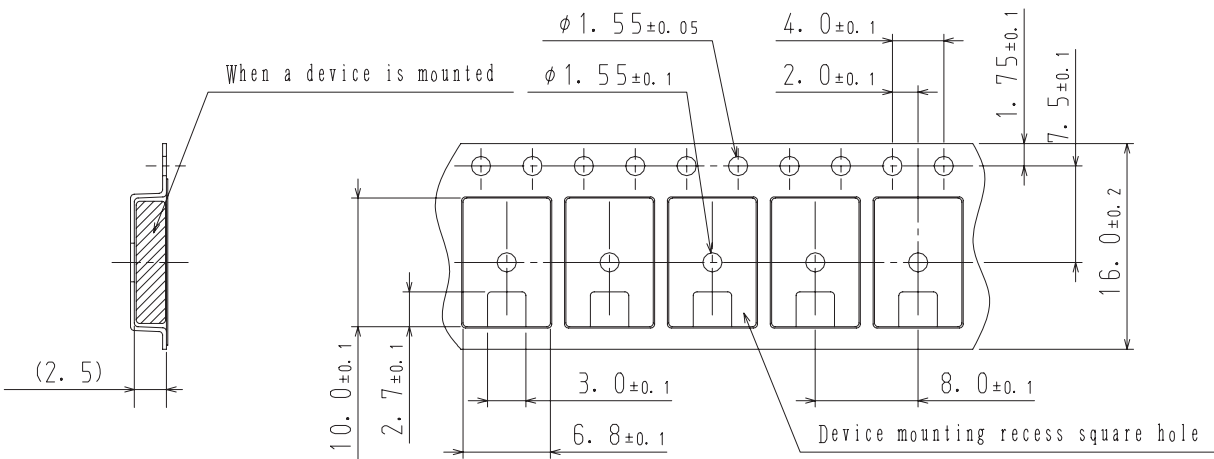
NOTE (1)

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

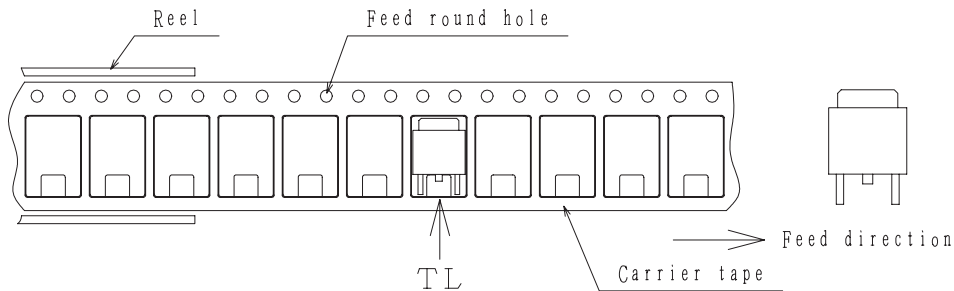
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

Taping configuration

1. Carrier tape size (unit:mm)



2. Device placement direction

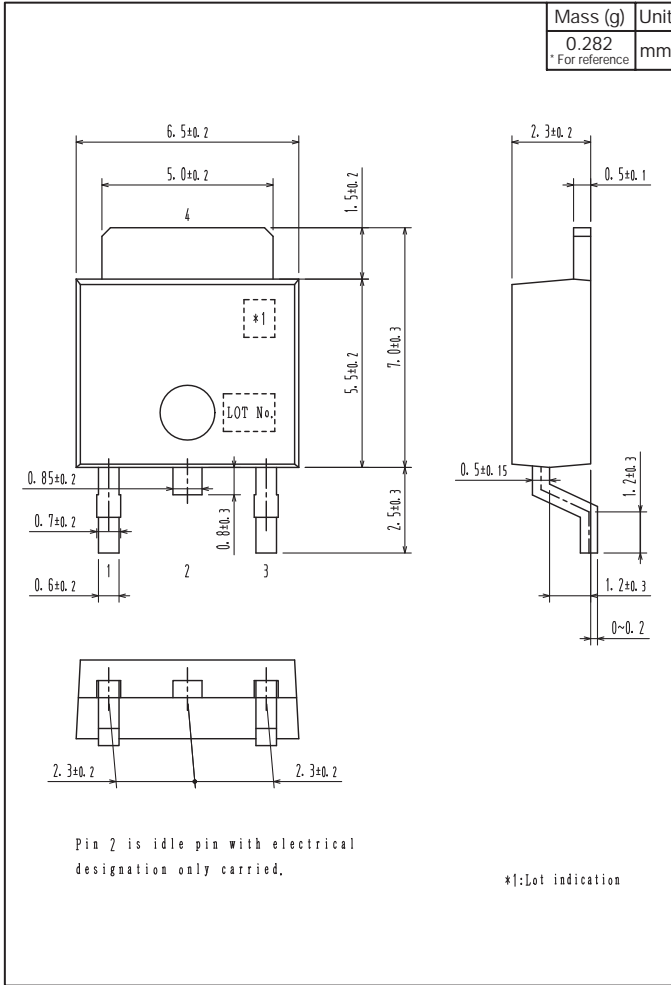


Those with one electrode terminal on the feed hole side.....TL

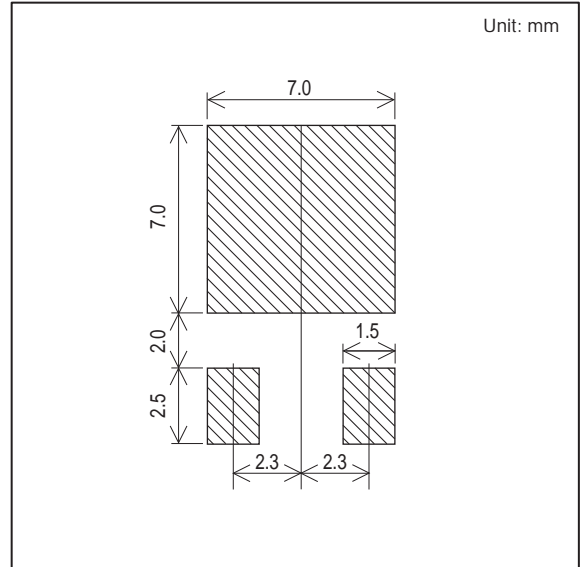
# 2SD1805

## Outline Drawing

2SD1805F-TL-E, 2SD1805G-TL-E



## Land Pattern Example



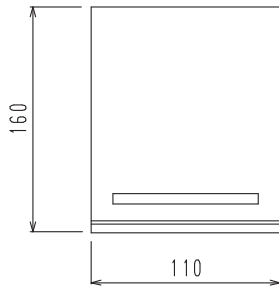
Bag Packing Specification

2SD1805F-E, 2SD1805G-E

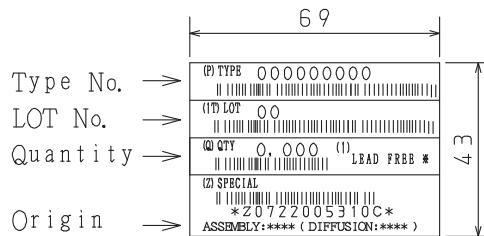
1. Packing Format

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)



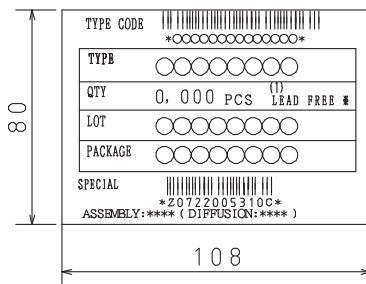
4. Outer box label  
(unit:mm)

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.

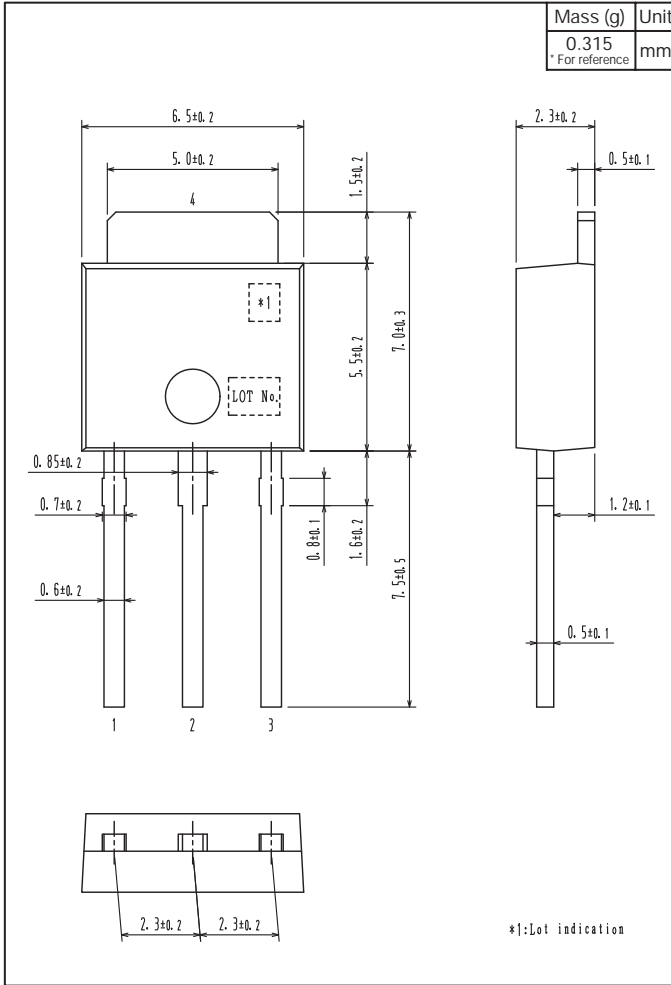
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3



# 2SD1805

## Outline Drawing



2SD1805F-E, 2SD1805G-E



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