Ordering number : ENA0544A

2SA2205

Bipolar Transistor
-100V, -2A, Low VCE(sat), PNP Single TP/TP-FA

ON Semiconductor®
http://onsemi.com

Applications

- DC / DC converter, Relay drivers, lamp drivers, motor drivers

Features

- Adoption of FBET, MBIT processes
- Low collector-to-emitter saturation voltage
- High allowable power dissipation
- Large current capacity
- High-speed switching

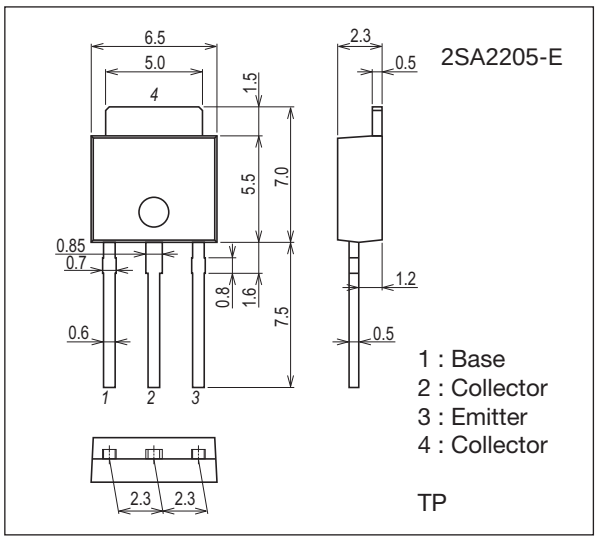
Specifications

Absolute Maximum Ratings at Ta=25°C

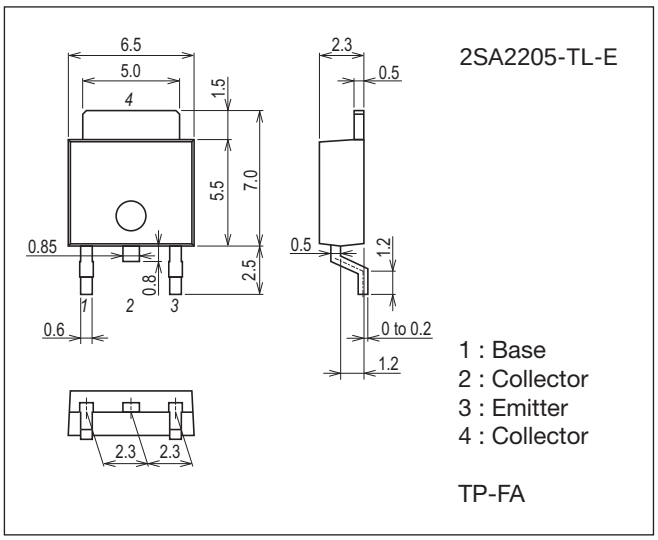
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		−100	V
Collector-to-Emitter Voltage	V_{CES}		−100	V
	V_{CEO}		−100	V
Emitter-to-Base Voltage	V_{EBO}		−7	V

Continued on next page.

Package Dimensions unit : mm (typ)
7518-003



Package Dimensions unit : mm (typ)
7003-003

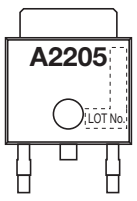


Product & Package Information

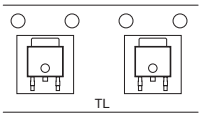
- Package : TP
- JEITA, JEDEC : SC-64, TO-251
- Minimum Packing Quantity : 500 pcs./bag

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

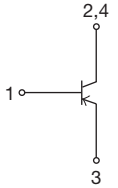
Marking (TP, TP-FA)



Packing Type (TP-FA) : TL



Electrical Connection



Continued from preceding page.

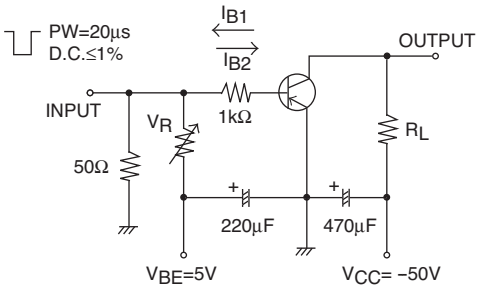
Parameter	Symbol	Conditions	Ratings	Unit
Collector Current	I_C		−2	A
Collector Current (Pulse)	I_{CP}		−3	A
Base Current	I_B		−400	mA
Collector Dissipation	P_C		0.8	W
		Tc=25°C	15	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

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 Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=−80V, I_E=0A			−1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=−4V, I_C=0A			−1	μA
DC Current Gain	h_{FE}	V_{CE}=−5V, I_C=−100mA	200		400	
Gain-Bandwidth Product	f_T	V_{CE}=−10V, I_C=−500mA		300		MHz
Output Capacitance	Cob	V_{CB}=−10V, f=1MHz		20		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=−1A, I_B=−100mA		−120	−240	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=−1A, I_B=−100mA		−0.85	−1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=−10μA, I_E=0A	−100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	I_C=−100μA, R_{BE}=0Ω	−100			V
	$V_{(BR)CEO}$	I_C=−1mA, R_{BE}=∞	−100			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=−10μA, I_C=0A	−7			V
Turn-ON Time	t_{on}	See specified Test Circuit.		40		ns
Storage Time	t_{stg}			600		ns
Fall Time	t_f			30		ns

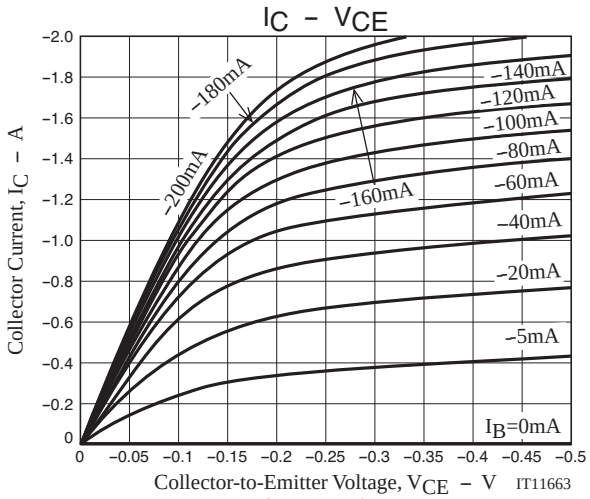
Switching Time Test Circuit

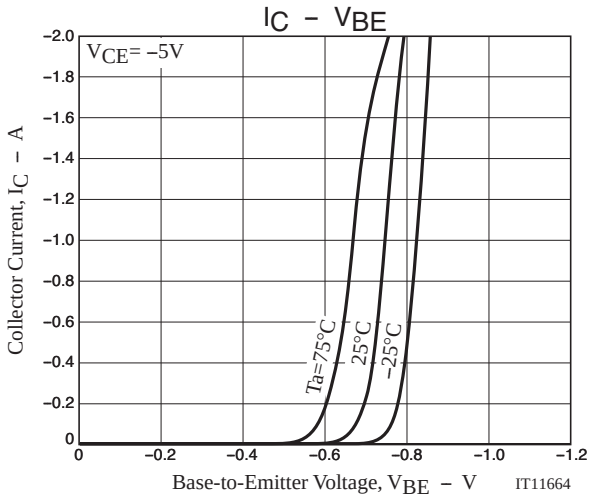


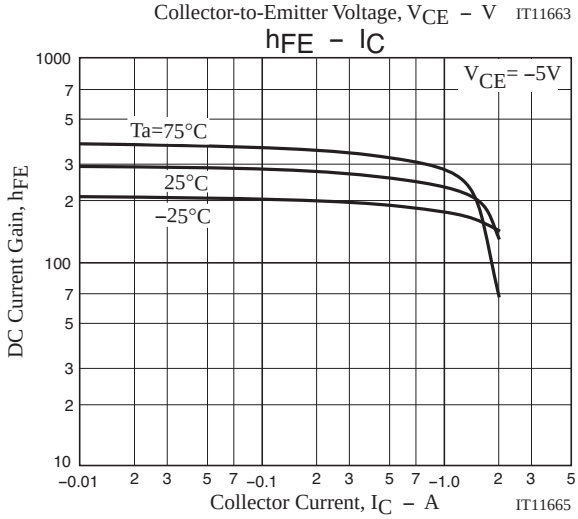
I_C=10I_{B1}= −10I_{B2}= −0.5A

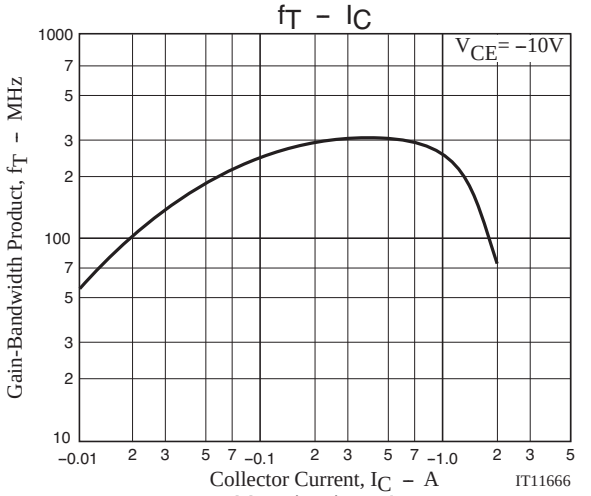
Ordering Information

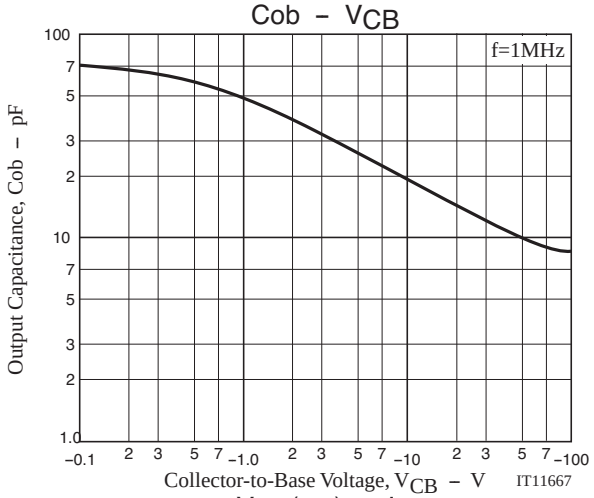
Device	Package	Shipping	memo
2SA2205-E	TP	500pcs./bag	Pb Free
2SA2205-TL-E	TP-FA	700pcs./reel	

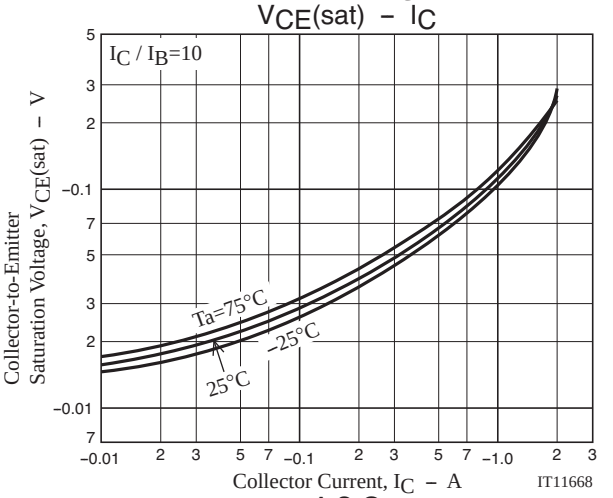

IC – VCE
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT11663
–180mA
–200mA
–160mA
–140mA
–120mA
–100mA
–80mA
–60mA
–40mA
–20mA
–5mA
IB=0mA

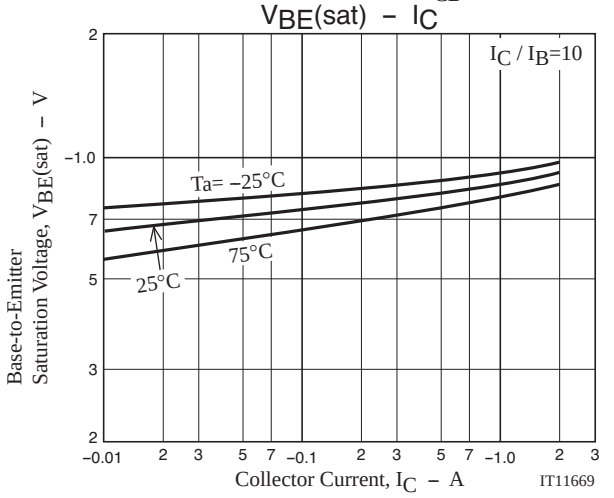

IC – VBE
VCE= –5V
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT11664
Ta=75°C
25°C
–25°C

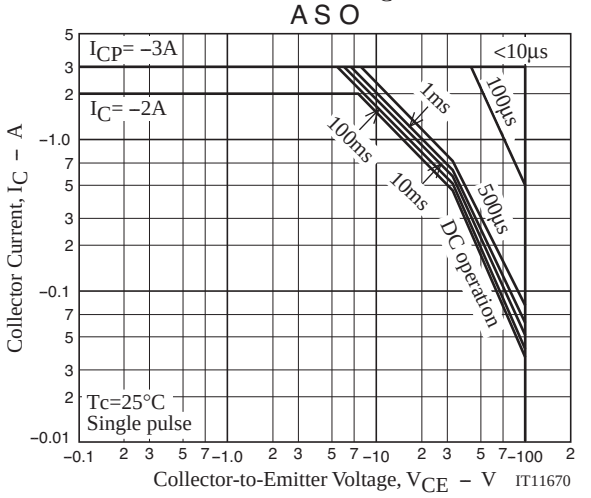

hFE – IC
VCE= –5V
DC Current Gain, hFE
Collector Current, IC – A
IT11665
Ta=75°C
25°C
–25°C


fT – IC
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT11666

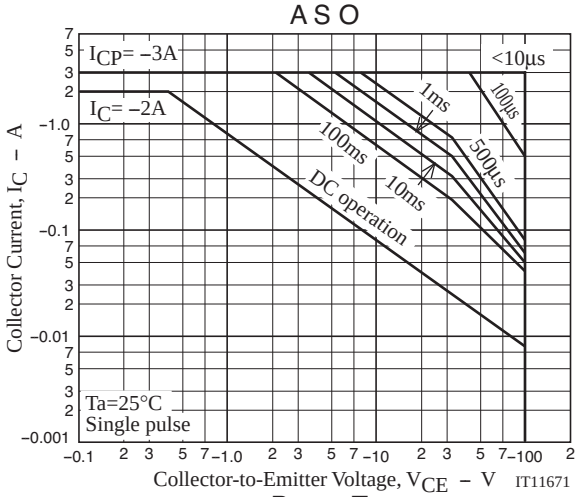

Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT11667


VCE(sat) – IC
IC / IB=10
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT11668
Ta=75°C
–25°C
25°C

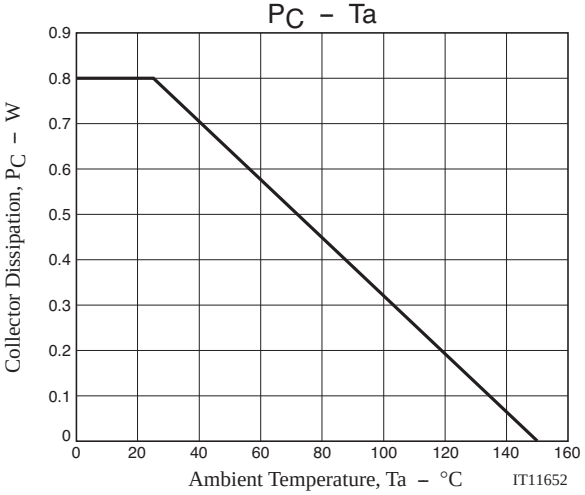

VBE(sat) – IC
IC / IB=10
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT11669
Ta= –25°C
75°C
25°C


A S O
ICP= –3A
IC= –2A
<10µs
100µs
1ms
10ms
100ms
500µs
DC operation
Tc=25°C
Single pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT11670

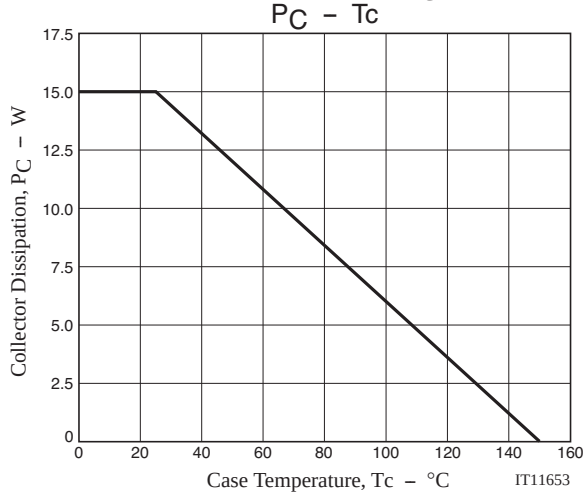
ASO



PC – Ta



PC – Tc



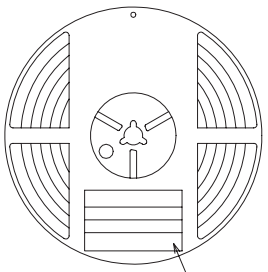
Taping Specification

2SA2205-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

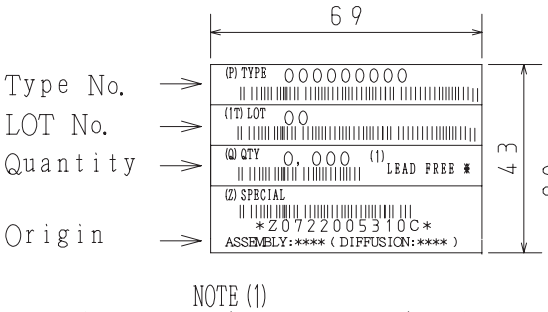
Packing method



Reel label

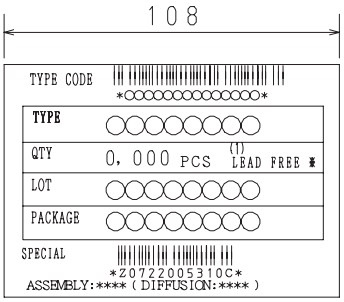
Reel label, Inner box label

(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.

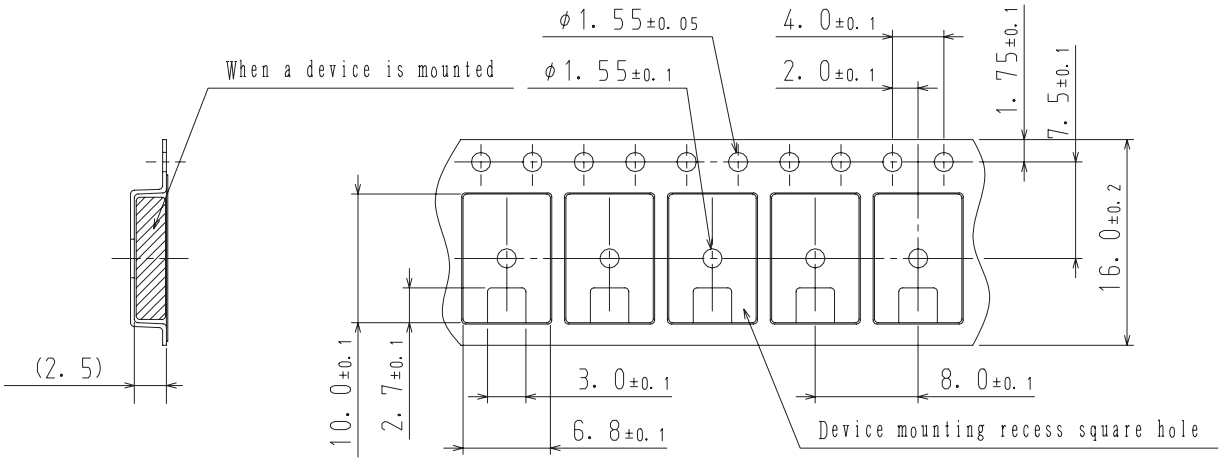


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

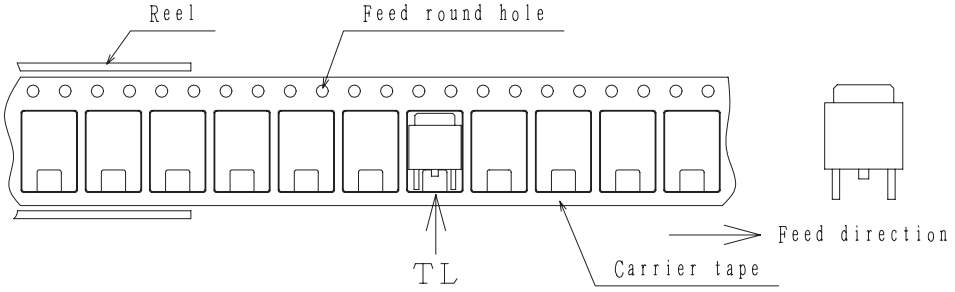
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

Taping configuration

1. Carrier tape size (unit:mm)



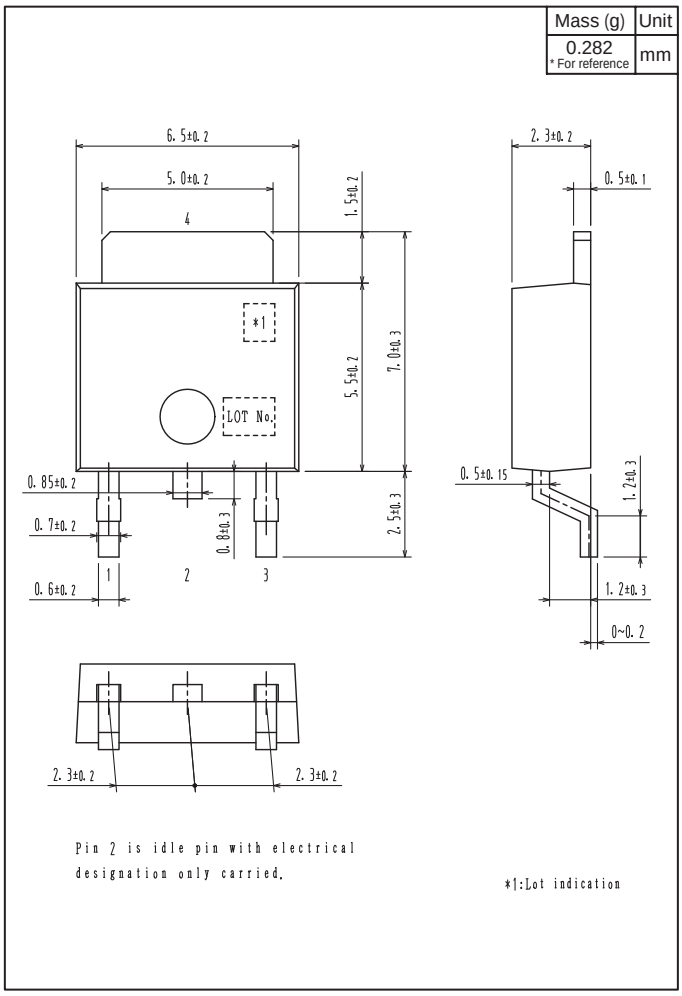
2. Device placement direction



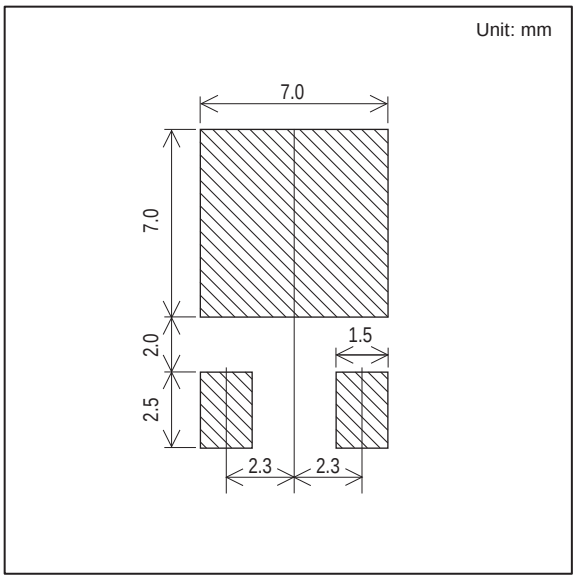
Those with one electrode terminal on the feed hole side·····TL

Outline Drawing

2SA2205-TL-E



Land Pattern Example



Bag Packing Specification

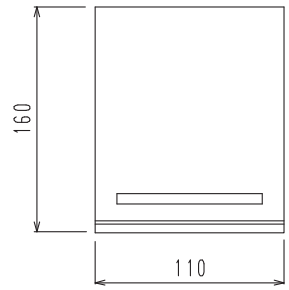
2SA2205-E

1. Packing Format

Package Name	Maximum Number of devices contained (pcs)			
	Bag	Inner box	Outer box	
TP		B-1	A-1	A-2
	500	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

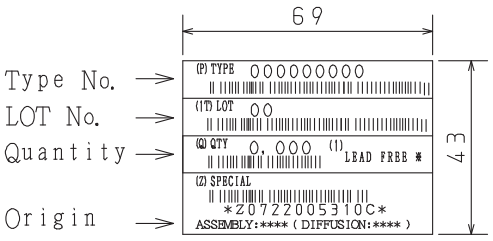
2. Bag dimensions

(unit: mm)



3. Bag label, Inner box label

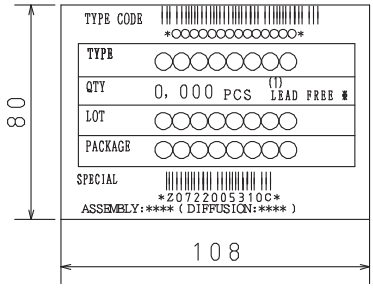
(unit: mm)



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.

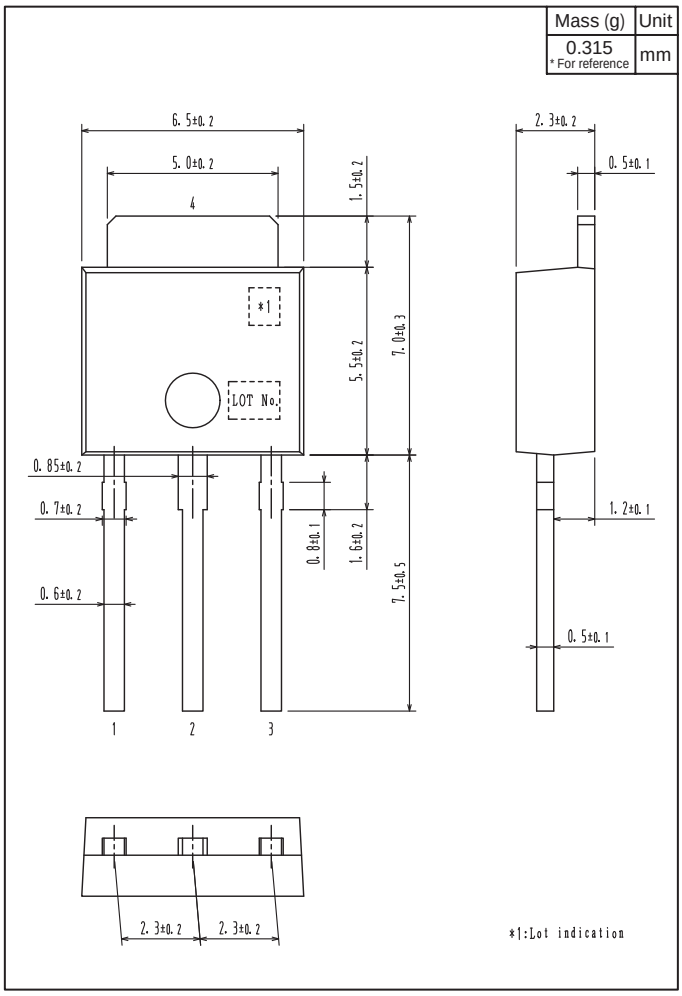


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

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

Outline Drawing

2SA2205-E



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