Ordering number : ENA0412A

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

2SC6097 — NPN Epitaxial Planar Silicon Transistor
High-Current Switching Applications

Applications

- DC / DC converter, relay drivers, lamp drivers, motor drivers, inverter

Features

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

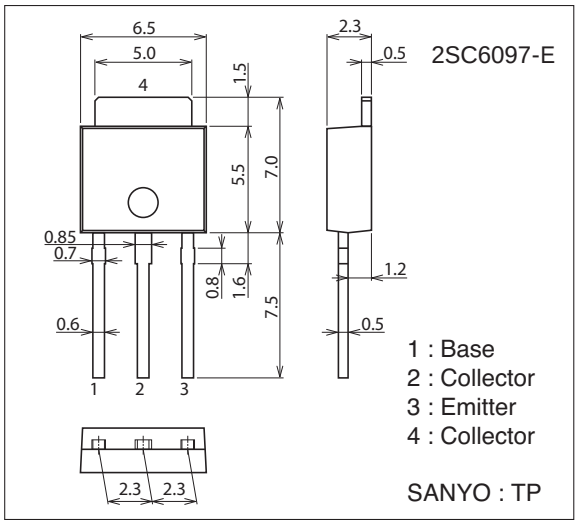
Specifications

Absolute Maximum Ratings at Ta=25°C

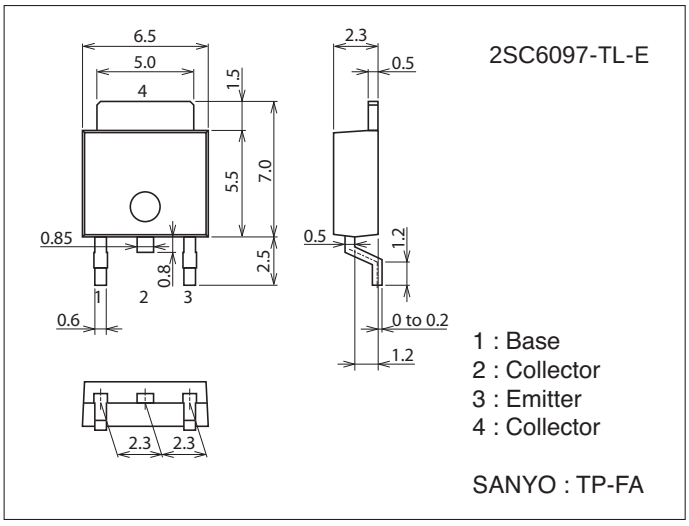
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		100	V
Collector-to-Emitter Voltage	V_{CES}		100	V
Collector-to-Emitter Voltage	V_{CEO}		60	V
Emitter-to-Base Voltage	V_{EBO}		6.5	V
Collector Current	I_C		3	A
Collector Current (Pulse)	I_{CP}		5	A
Base Current	I_B		600	mA

Continued on next page.

Package Dimensions unit : mm (typ)
7518-003



Package Dimensions unit : mm (typ)
7003-003

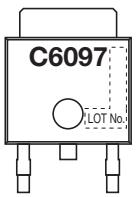


Product & Package Information

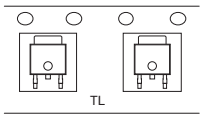
- Package : TP
- JEITA, JEDEC : SC-64, TO-251
- Minimum Packing Quantity : 500 pcs./bag

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

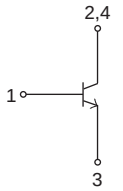
Marking (TP, TP-FA)



Packing Type (TP-FA) : TL



Electrical Connection



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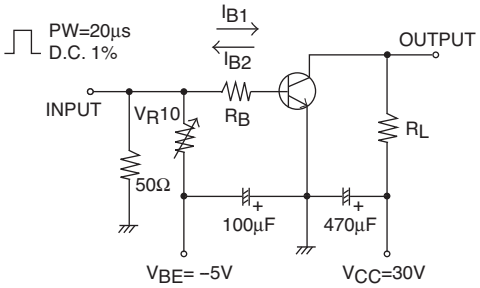
Parameter	Symbol	Conditions	Ratings	Unit
Collector Dissipation	P_C		0.8	W
		Tc=25°C	15	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=50V, 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}=2V, I_C=100mA	300		600	
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=500mA		390		MHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		18		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)1	I_C=1A, I_B=50mA		100	150	mV
	V_{CE}(sat)2	I_C=1A, I_B=100mA		90	135	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=1A, I_B=100mA		0.84	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
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=1mA, R_{BE}=∞	60			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=10μA, I_C=0A	6.5			V
Turn-On Time	t_{on}	See specified Test Circuit		35		ns
Storage Time	t_{stg}			680		ns
Fall Time	t_f			24		ns

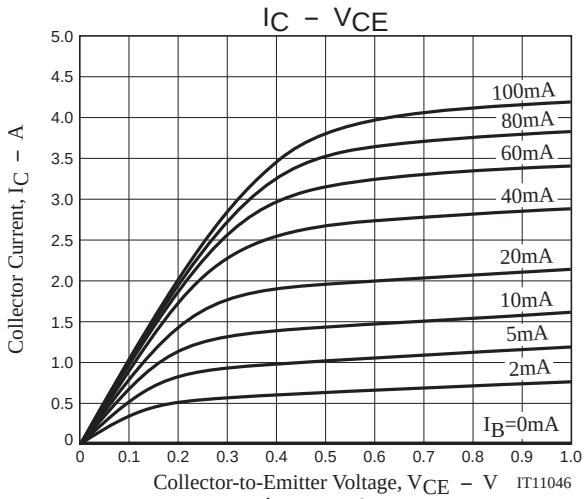
Switching Time Test Circuit

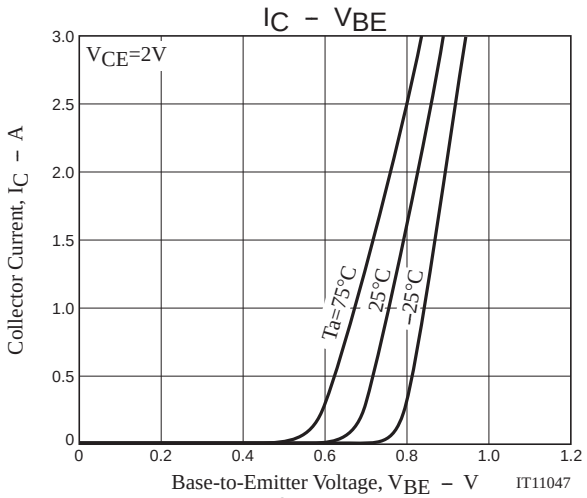


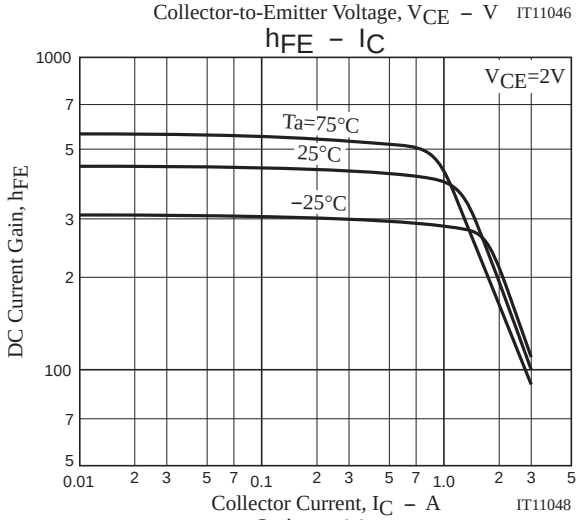
I_C=10I_{B1}= −10I_{B2}=0.5A

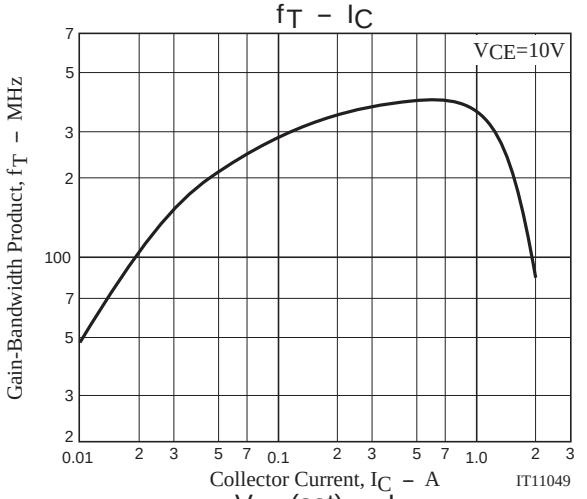
Ordering Information

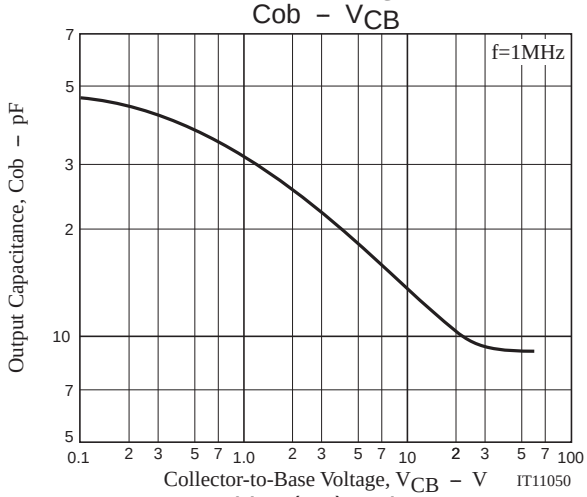
Device	Package	Shipping	memo
2SC6097-E	TP	500pcs./bag	Pb Free
2SC6097-TL-E	TP-FA	700pcs./reel	Pb Free

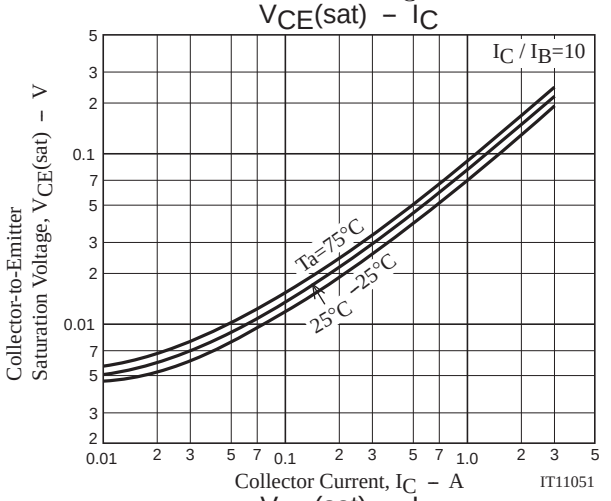

IC – VCE
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT11046
100mA
80mA
60mA
40mA
20mA
10mA
5mA
2mA
IB=0mA

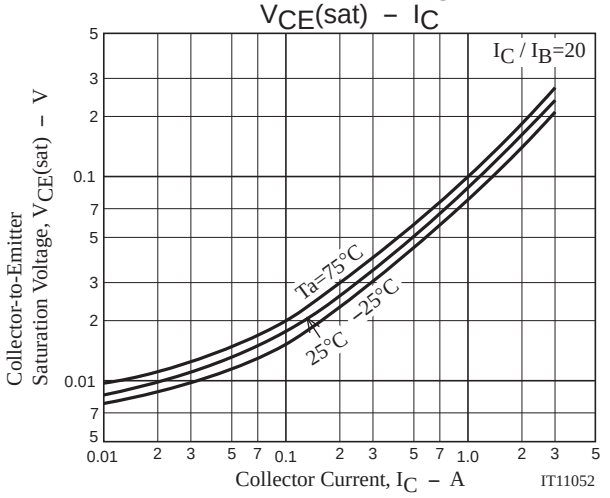

IC – VBE
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT11047
VCE=2V
Ta=75°C
25°C
–25°C

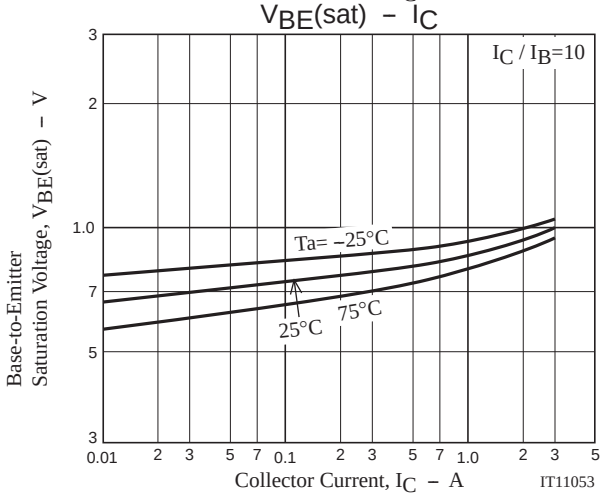

hFE – IC
DC Current Gain, hFE
Collector Current, IC – A
IT11048
VCE=2V
Ta=75°C
25°C
–25°C

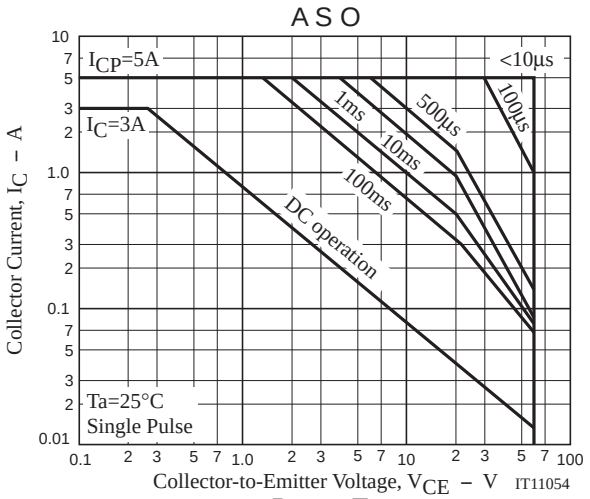

fT – IC
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT11049
VCE=10V

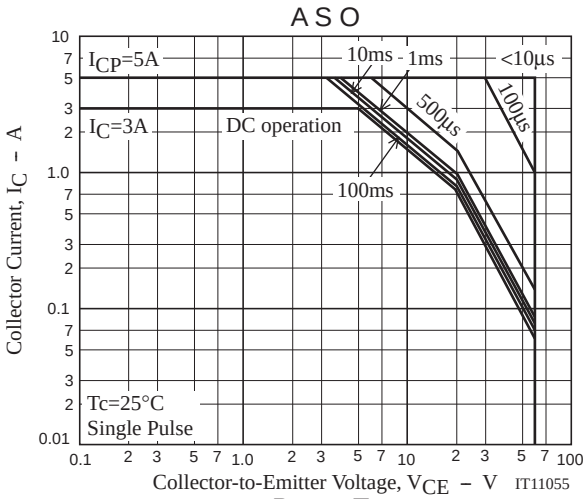

Cob – VCB
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT11050
f=1MHz

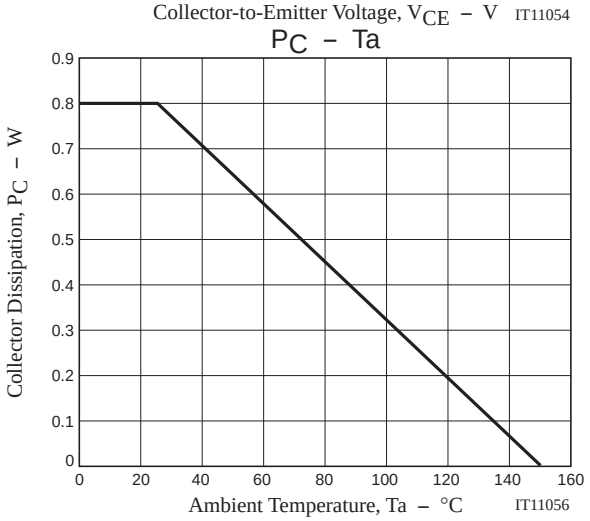

VCE(sat) – IC
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT11051
IC / IB=10
Ta=75°C
25°C
–25°C

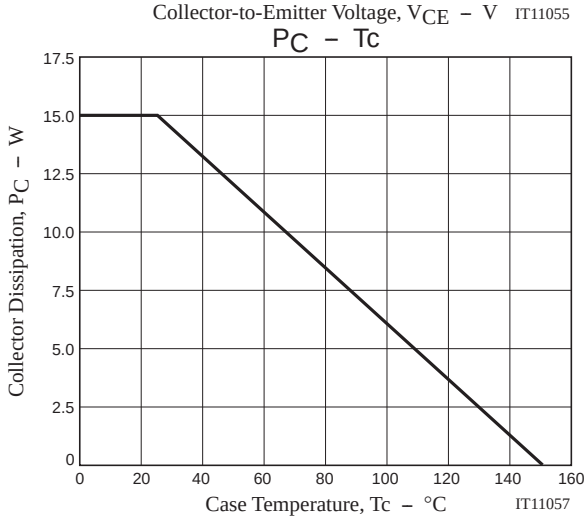

VCE(sat) – IC
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT11052
IC / IB=20
Ta=75°C
25°C
–25°C


VBE(sat) – IC
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT11053
IC / IB=10
Ta= –25°C
25°C
75°C


ASO
ICP=5A
<10µs
IC=3A
1ms
10ms
500µs
100µs
100ms
DC operation
Ta=25°C
Single Pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT11054


ASO
ICP=5A
10ms
1ms
<10µs
IC=3A
DC operation
500µs
100µs
100ms
Tc=25°C
Single Pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT11055


PC – Ta
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT11056


PC – Tc
Collector Dissipation, PC – W
Case Temperature, Tc – °C
IT11057

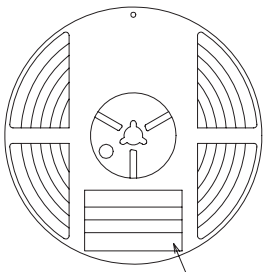
Taping Specification

2SC6097-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

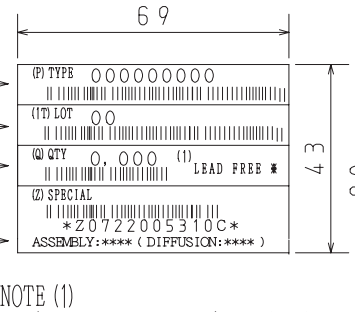
Packing method



Reel label

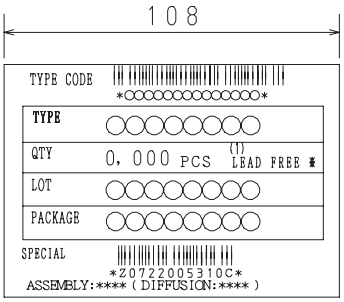
Reel label, Inner box label

(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.

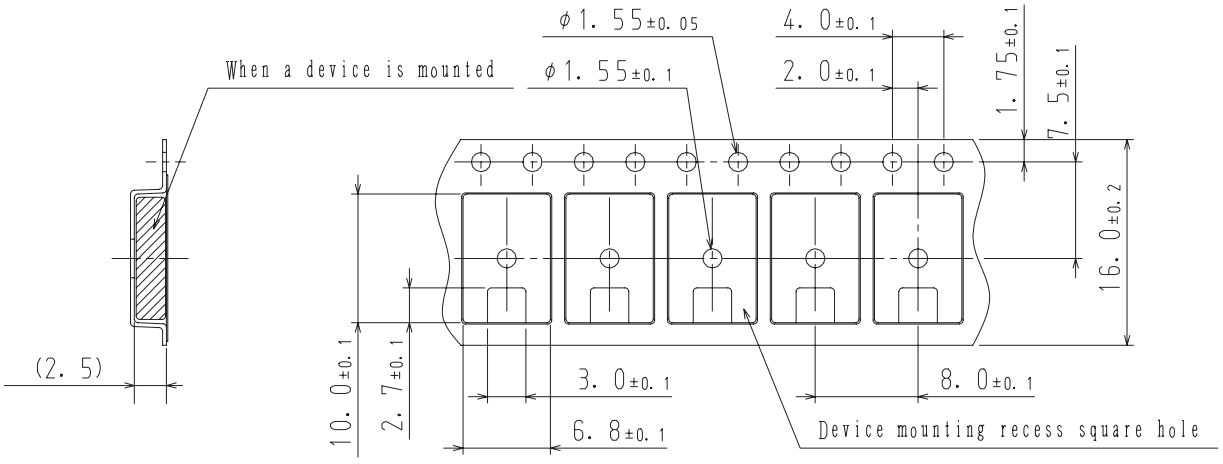


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

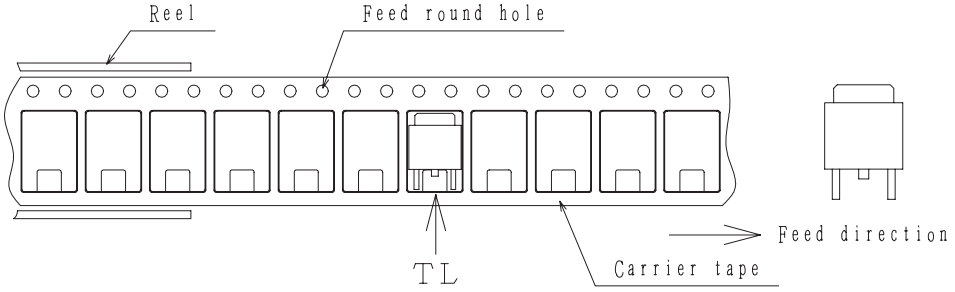
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

Taping configuration

1. Carrier tape size (unit:mm)



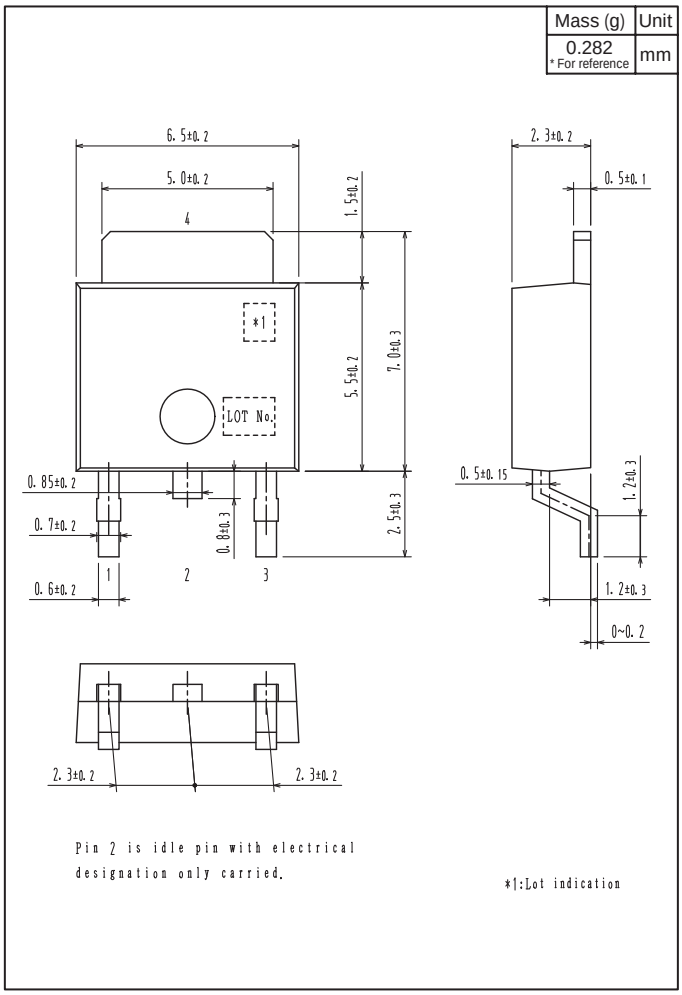
2. Device placement direction



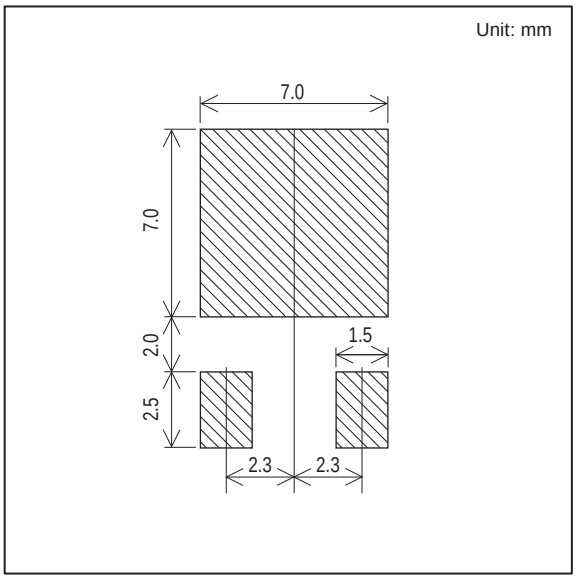
Those with one electrode terminal on the feed hole side·····TL

Outline Drawing

2SC6097-TL-E



Land Pattern Example



Bag Packing Specification

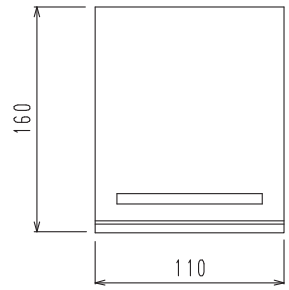
2SC6097-E

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

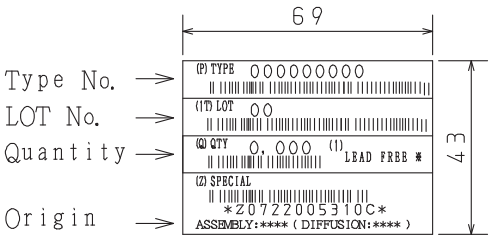
2. Bag dimensions

(unit: mm)



3. Bag label, Inner box label

(unit: mm)



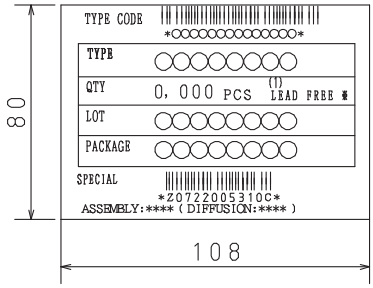
NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

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

4. Outer box label

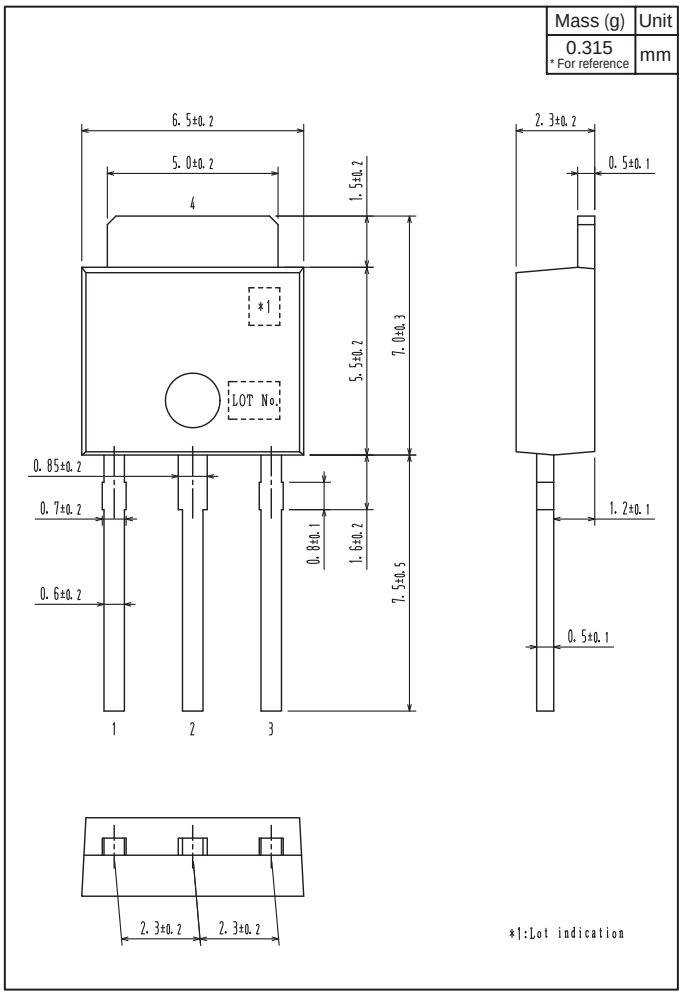
(unit: mm)

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



Outline Drawing

2SC6097-E



Стандарт Электрон Связь

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Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331