Ordering number : EN2262E

SANYO Semiconductors

DATA SHEET

2SA1552/2SC4027 — High-Voltage Switching Applications

PNP/NPN Epitaxial Planar Silicon Transistor

Applications

・ Converters, inverters, color TV audio output

Features

・ Adoption of FBET, MBIT processes ・ High voltage and large current capacity ・ Ultrahigh-speed switching
・ Small and slim package permitting 2SA1552 / 2SC4027-applied sets to be made more compact

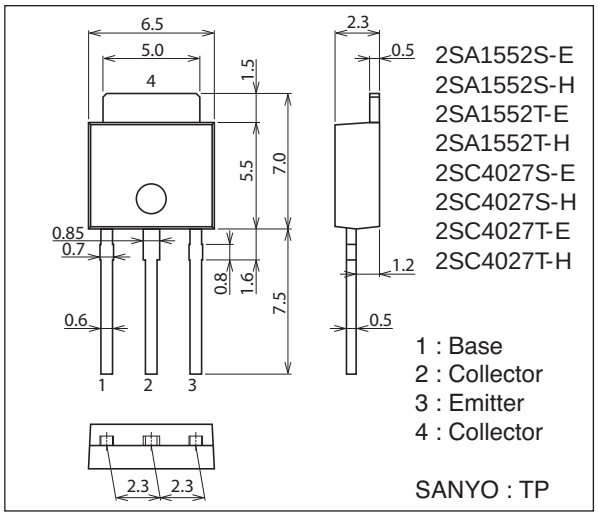
Specifications ( ): 2SA1552

Absolute Maximum Ratings at Ta=25°C

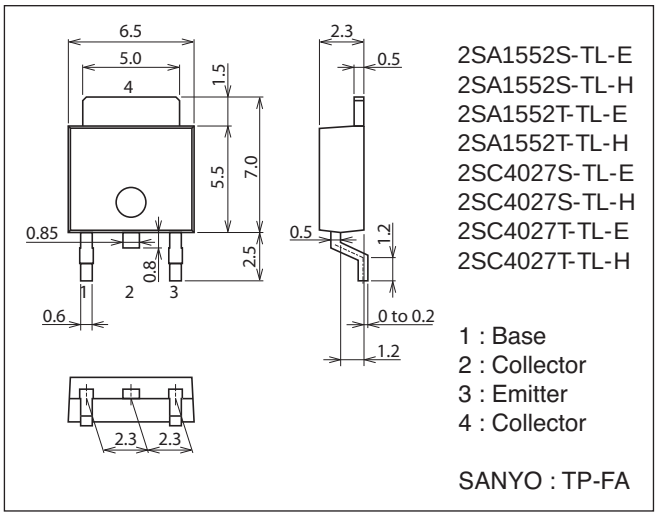
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)180	V
Collector-to-Emitter Voltage	V_{CEO}		(–)160	V
Emitter-to-Base Voltage	V_{EBO}		(–)6	V
Collector Current	I_C		(–)1.5	A
Collector Current (Pulse)	I_{CP}		(–)2.5	A

Continued on next page.

Package Dimensions unit : mm (typ)
7518-003



Package Dimensions unit : mm (typ)
7003-003

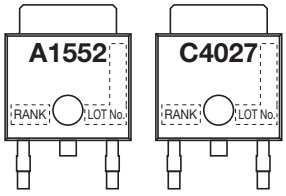


Product & Package Information

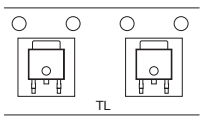
- Package : TP
- JEITA, JEDEC : SC-64, TO-251
- Minimum Packing Quantity : 500 pcs./bag

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

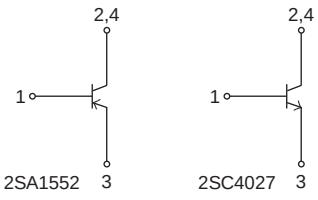
Marking (TP, TP-FA)



Packing Type (TP-FA) : TL



Electrical Connection



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Parameter	Symbol	Conditions	Ratings	Unit
Collector Dissipation	P_C		1	W
		Tc=25°C	15	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

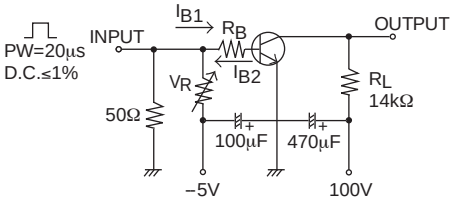
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(−)120V, I_E=0A			(−)1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(−)4V, I_C=0A			(−)1.0	μA
DC Current Gain	$h_{FE}1$	V_{CE}=(−)5V, I_C=(−)100mA	100*		400*	
	$h_{FE}2$	V_{CE}=(−)5V, I_C=(−)10mA	80			
Gain-Bandwidth Product	f_T	V_{CE}=(−)10V, I_C=(−)50mA		120		MHz
Output Capacitance	Cob	V_{CB}=(−)10V, f=1MHz		(22)12		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=(−)500mA, I_B=(−)50mA		(−0.2)0.13	(−0.5)0.45	V
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=(−)500mA, I_B=(−)50mA		(−)0.85	(−)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(−)10μA, I_E=0A	(−)180			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(−)1mA, R_{BE}=∞	(−)160			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.		60		ns
Storage Time	t_{stg}			(0.7)1.2		μs
Fall Time	t_f			(50)80		ns

* : The 2SA1552 / 2SC4027 are classified by 100mA h_{FE} as follows : (unit : μA)

Rank	R	S	T
h_{FE}	100 to 200	140 to 280	200 to 400

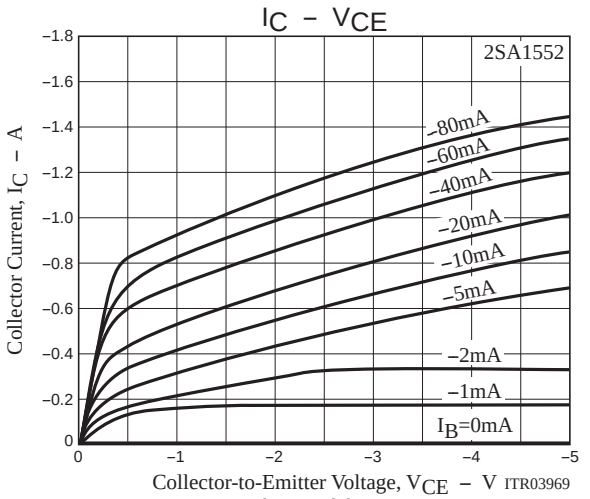
Switching Time Test Circuit

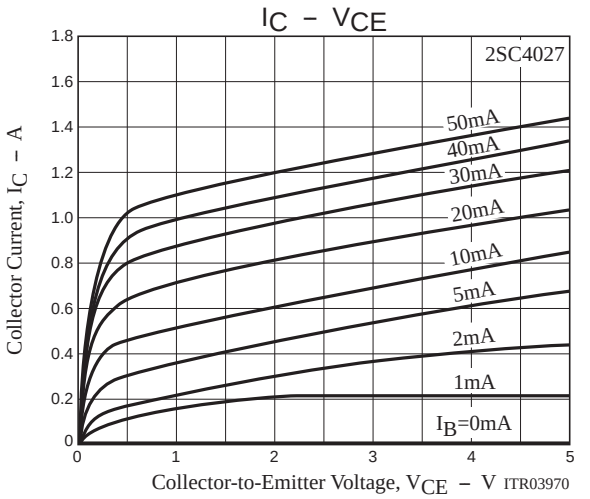


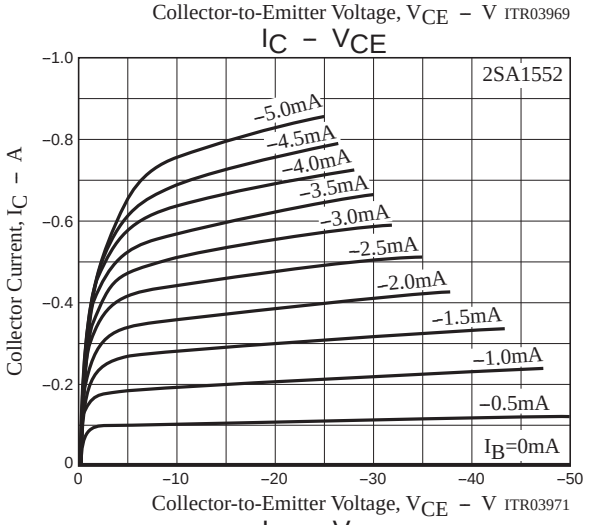
$10I_{B1}$= −$10I_{B2}$=I_C=0.7A
For PNP, the polarity is reversed.

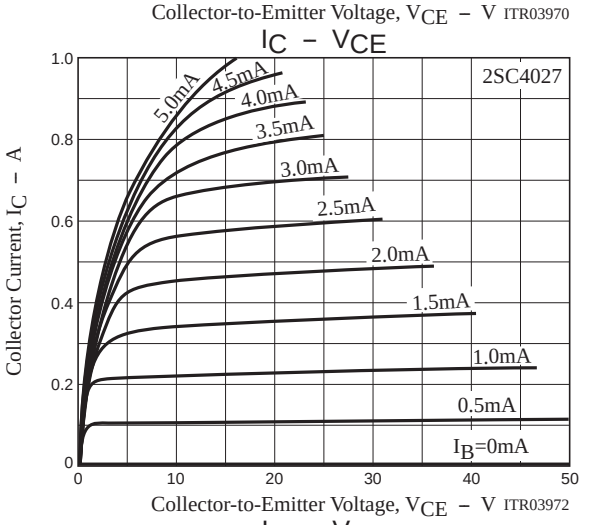
Ordering Information

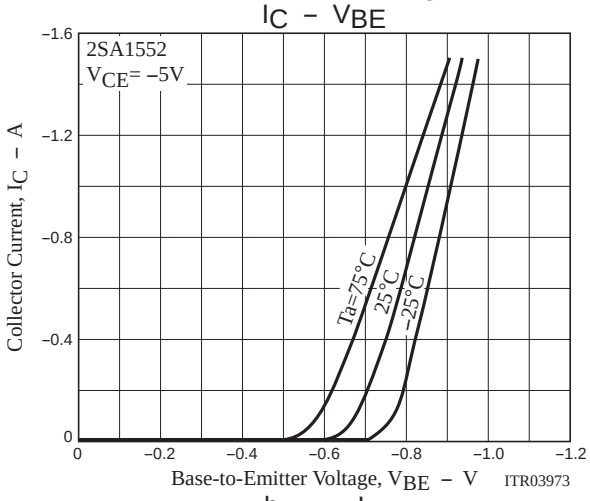
Device	Package	Shipping	memo
2SA1552S-E	TP	500pcs./bag	Pb Free
2SA1552S-H	TP	500pcs./bag	Pb Free and Halogen Free
2SA1552T-E	TP	500pcs./bag	Pb Free
2SA1552T-H	TP	500pcs./bag	Pb Free and Halogen Free
2SC4027S-E	TP	500pcs./bag	Pb Free
2SC4027S-H	TP	500pcs./bag	Pb Free and Halogen Free
2SC4027T-E	TP	500pcs./bag	Pb Free
2SC4027T-H	TP	500pcs./bag	Pb Free and Halogen Free
2SA1552S-TL-E	TP-FA	700pcs./reel	Pb Free
2SA1552S-TL-H	TP-FA	700pcs./reel	Pb Free and Halogen Free
2SA1552T-TL-E	TP-FA	700pcs./reel	Pb Free
2SA1552T-TL-H	TP-FA	700pcs./reel	Pb Free and Halogen Free
2SC4027S-TL-E	TP-FA	700pcs./reel	Pb Free
2SC4027S-TL-H	TP-FA	700pcs./reel	Pb Free and Halogen Free
2SC4027T-TL-E	TP-FA	700pcs./reel	Pb Free
2SC4027T-TL-H	TP-FA	700pcs./reel	Pb Free and Halogen Free

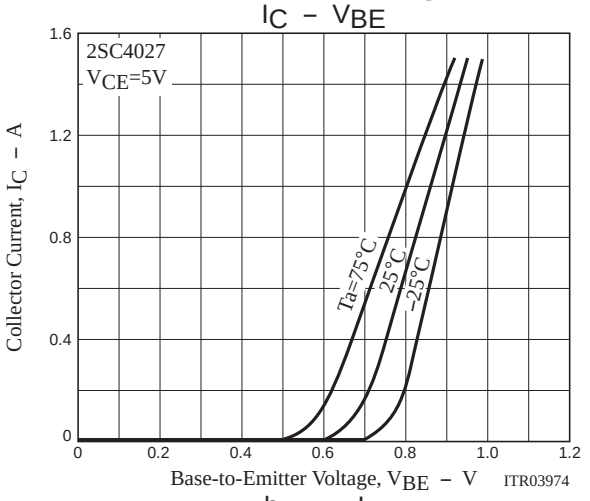

IC – VCE
2SA1552
–80mA
–60mA
–40mA
–20mA
–10mA
–5mA
–2mA
–1mA
IB=0mA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR03969

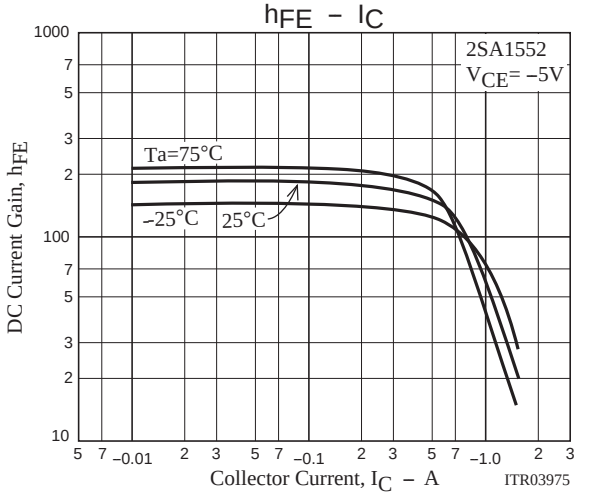

IC – VCE
2SC4027
50mA
40mA
30mA
20mA
10mA
5mA
2mA
1mA
IB=0mA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR03970

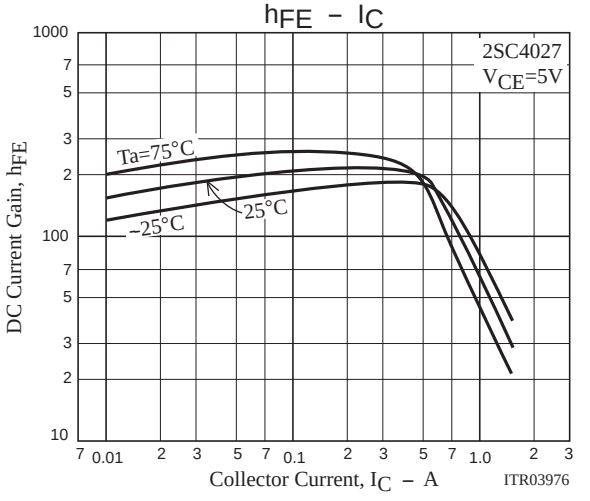

IC – VCE
2SA1552
–5.0mA
–4.5mA
–4.0mA
–3.5mA
–3.0mA
–2.5mA
–2.0mA
–1.5mA
–1.0mA
–0.5mA
IB=0mA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR03971

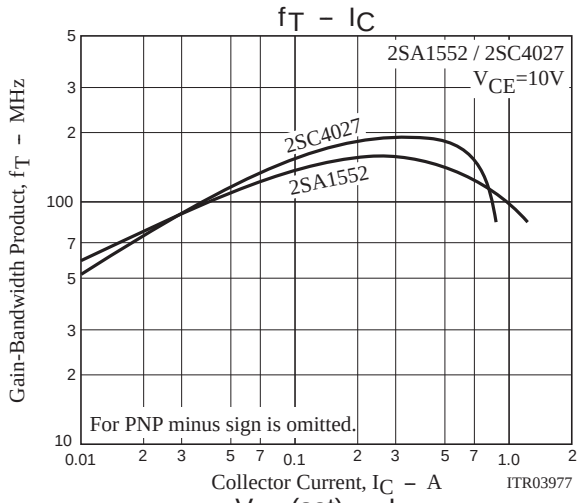

IC – VCE
2SC4027
5.0mA
4.5mA
4.0mA
3.5mA
3.0mA
2.5mA
2.0mA
1.5mA
1.0mA
0.5mA
IB=0mA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR03972

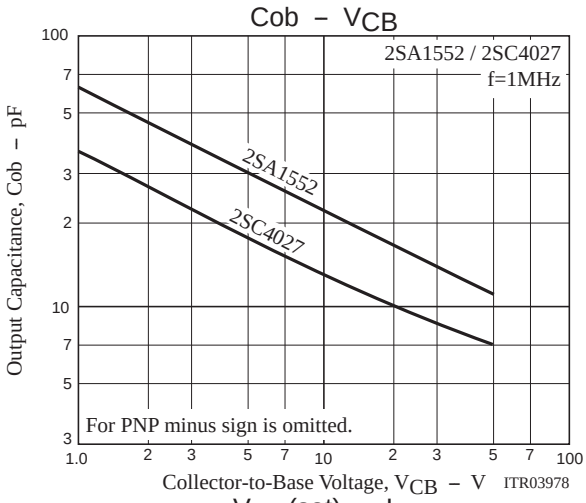

IC – VBE
2SA1552
VCE= –5V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
ITR03973

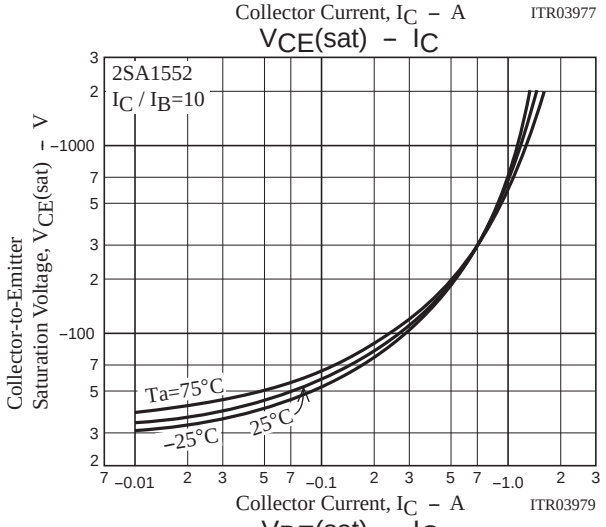

IC – VBE
2SC4027
VCE=5V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
ITR03974

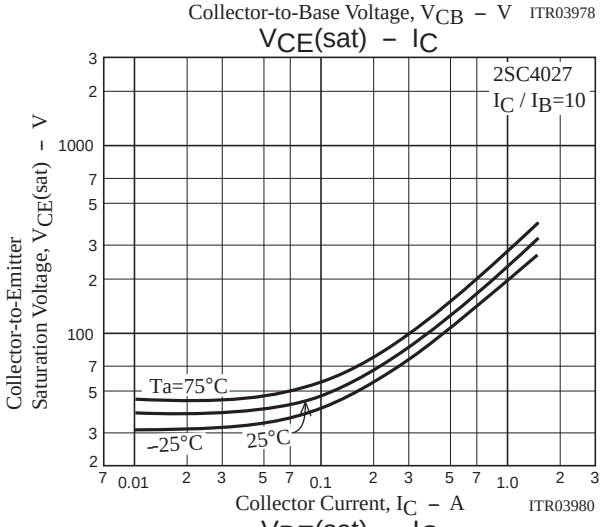

hFE – IC
2SA1552
VCE= –5V
Ta=75°C
–25°C
25°C
DC Current Gain, hFE
Collector Current, IC – A
ITR03975

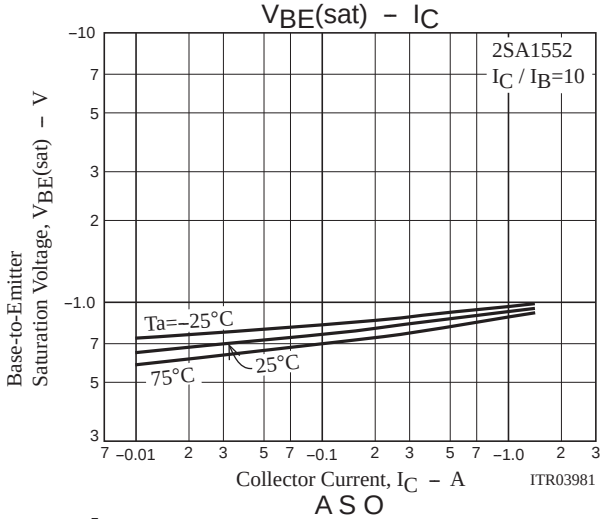

hFE – IC
2SC4027
VCE=5V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
ITR03976

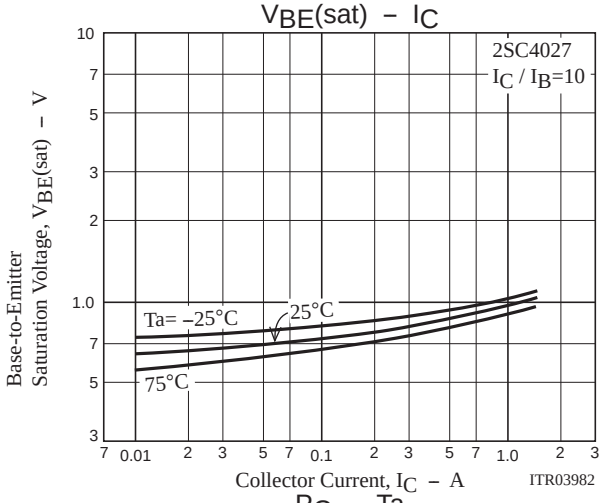

fT – IC
2SA1552 / 2SC4027
VCE=10V
2SC4027
2SA1552
For PNP minus sign is omitted.
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
ITR03977

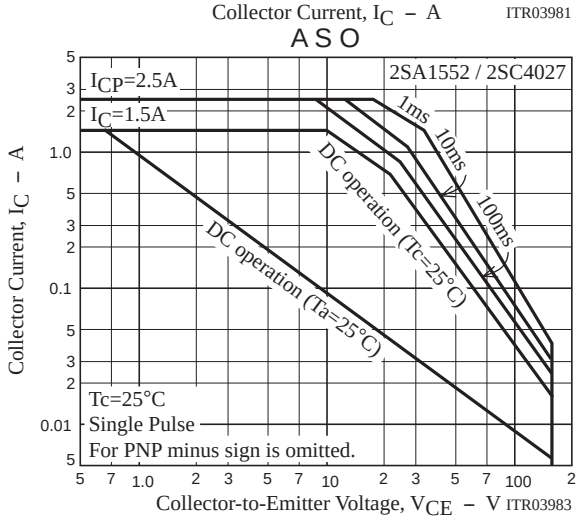

Cob – VCB
2SA1552 / 2SC4027
f=1MHz
2SA1552
2SC4027
For PNP minus sign is omitted.
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
ITR03978

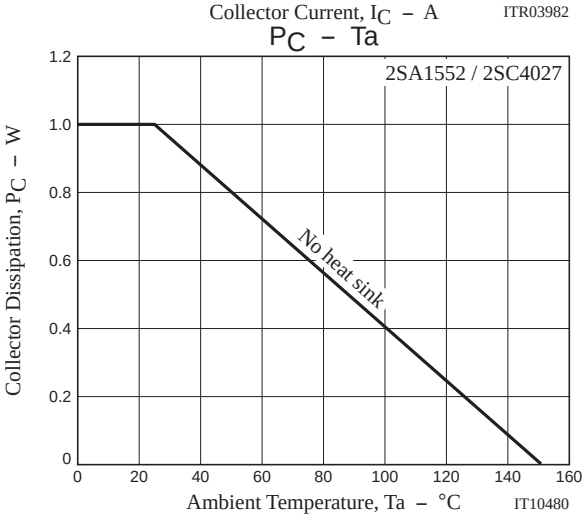

VCE(sat) – IC
2SA1552
IC / IB=10
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
ITR03979

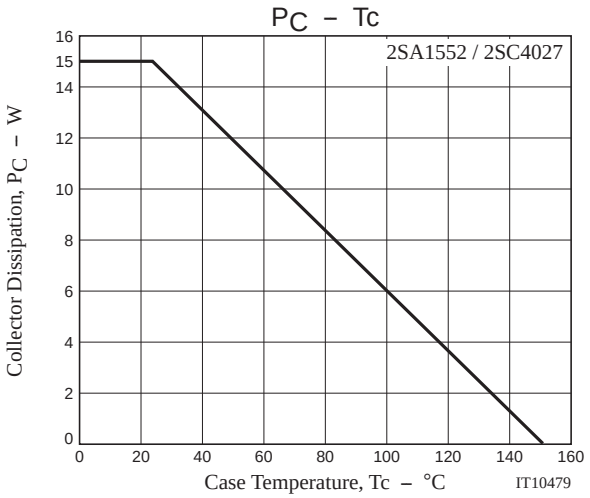

VCE(sat) – IC
2SC4027
IC / IB=10
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
ITR03980


VBE(sat) – IC
2SA1552
IC / IB=10
Ta=–25°C
25°C
75°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
ITR03981


VBE(sat) – IC
2SC4027
IC / IB=10
Ta= –25°C
25°C
75°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
ITR03982


ASO
2SA1552 / 2SC4027
ICP=2.5A
IC=1.5A
1ms
10ms
100ms
DC operation (Tc=25°C)
DC operation (Ta=25°C)
Tc=25°C
Single Pulse
For PNP minus sign is omitted.
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR03983


PC – Ta
2SA1552 / 2SC4027
No heat sink
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT10480


PC – Tc
2SA1552 / 2SC4027
Collector Dissipation, PC – W
16
15
14
12
10
8
6
4
2
0
0
20
40
60
80
100
120
140
160
Case Temperature, Tc – °C
IT10479

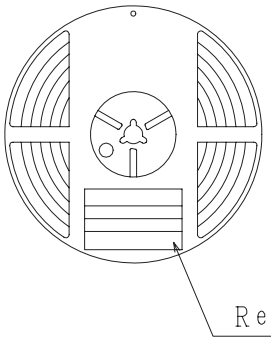
Taping Specification

2SA1552S-TL-E, 2SA1552S-TL-H, 2SA1552T-TL-E, 2SA1552T-TL-H, 2SC4027S-TL-E, 2SC4027S-TL-H, 2SC4027T-TL-E, 2SC4027T-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

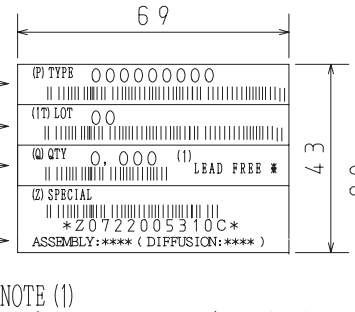
Packing method



Reel label

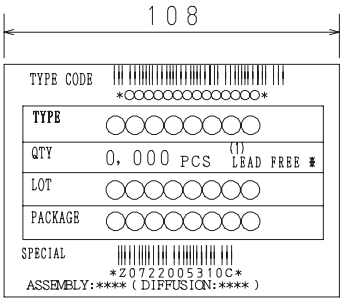
Reel label, Inner box label

(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.

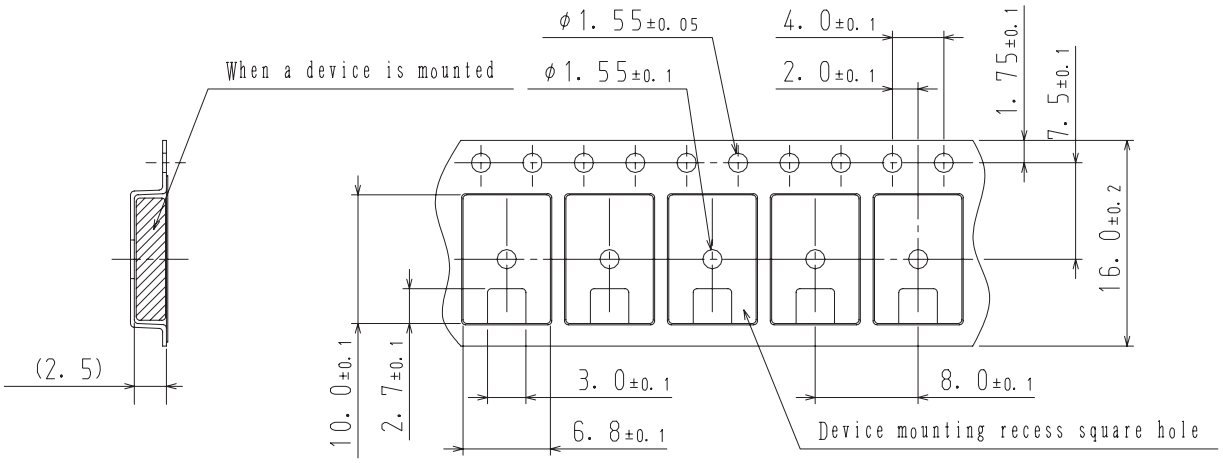


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

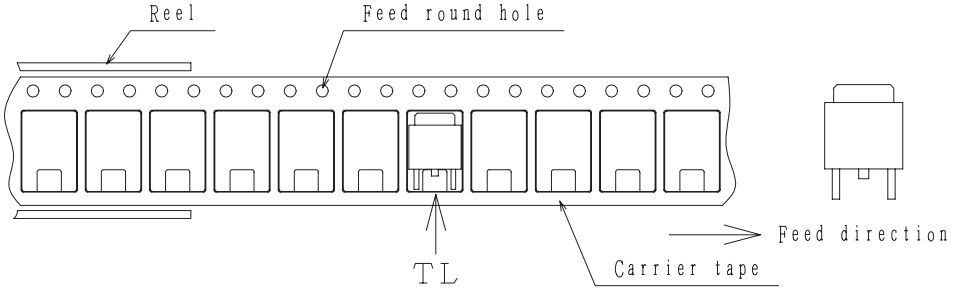
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

Taping configuration

1. Carrier tape size (unit:mm)



2. Device placement direction

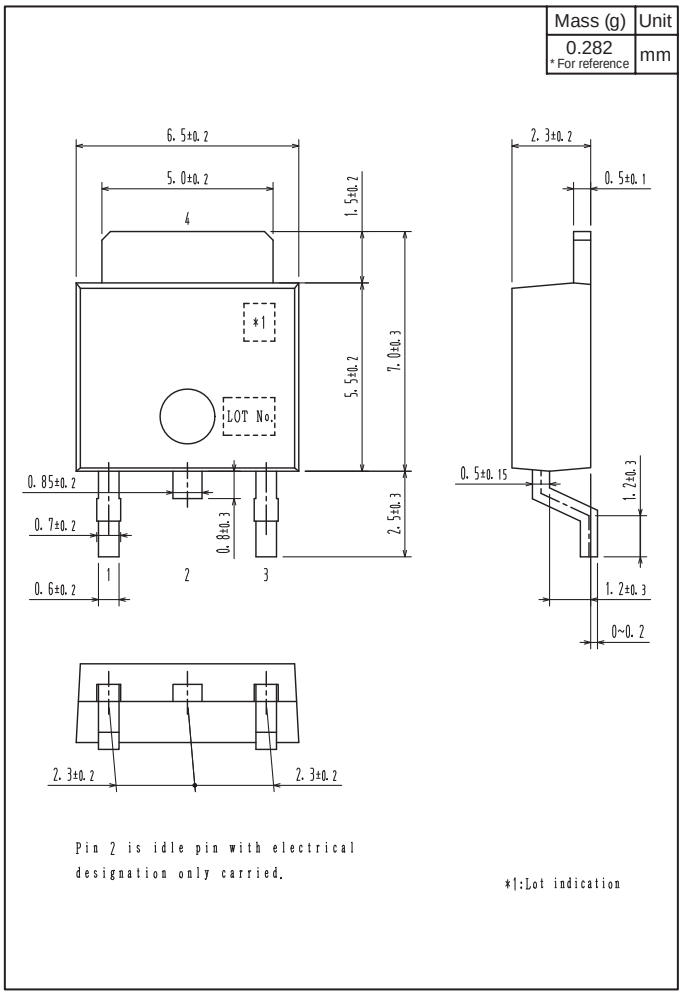


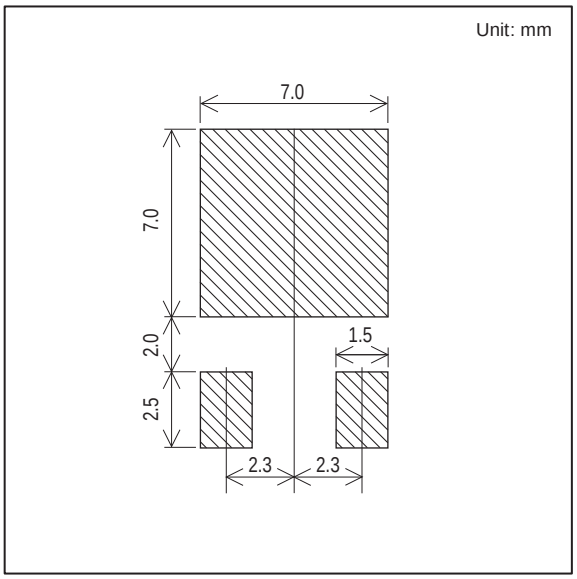
Those with one electrode terminal on the feed hole side·····TL

Outline Drawing

Land Pattern Example

2SA1552S-TL-E, 2SA1552S-TL-H, 2SA1552T-TL-E, 2SA1552T-TL-H, 2SC4027S-TL-E, 2SC4027S-TL-H, 2SC4027T-TL-E, 2SC4027T-TL-H





Bag Packing Specification

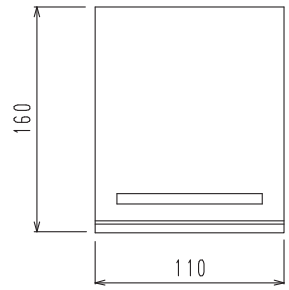
2SA1552S-E, 2SA1552S-H, 2SA1552T-E, 2SA1552T-H, 2SC4027S-E, 2SC4027S-H, 2SC4027T-E, 2SC4027T-H

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

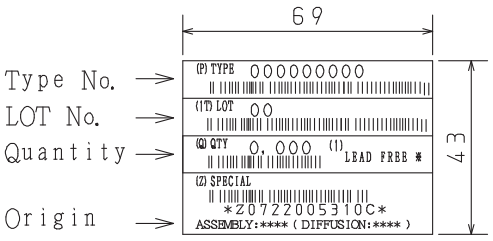
2. Bag dimensions

(unit: mm)



3. Bag label, Inner box label

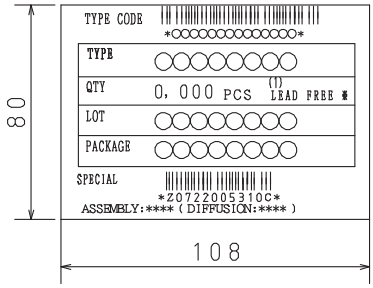
(unit: mm)



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

2SA1552S-E, 2SA1552S-H, 2SA1552T-E, 2SA1552T-H, 2SC4027S-E, 2SC4027S-H, 2SC4027T-E, 2SC4027T-H