Ordering number : EN2101E

2SA1507/2SC3902

Bipolar Transistor
(−)160V, (−)1.5A, Low V_{CE}(sat), (PNP)NPN Single TO-126ML

ON Semiconductor®
http://onsemi.com

Applications

・ Color TV audio output, converters, inverters

Features

・ High breakdown voltage ・ Large current capacity ・ Adoption of FBET and MBIT process
・ The plastic-covered heat sink eliminates the need for an insulator when mounting the 2SA1507/2SC3902

Specifications ( ): 2SA1507

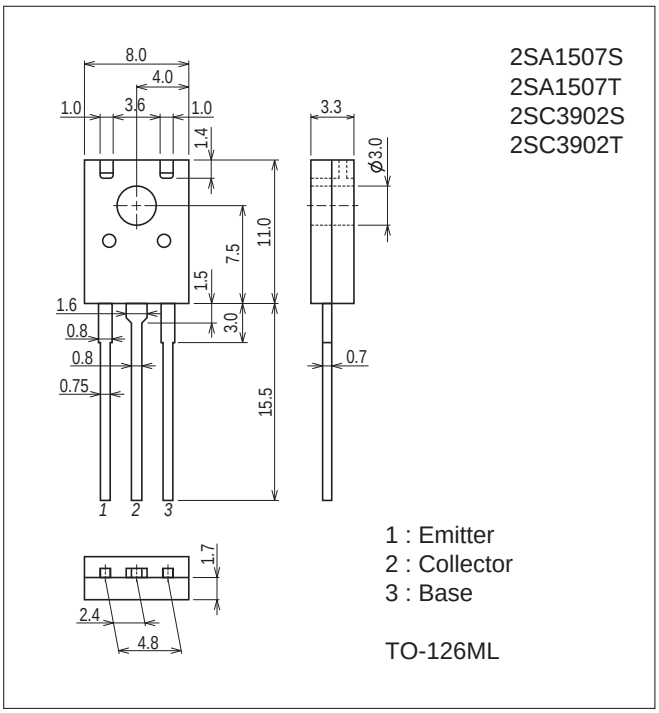
Absolute Maximum Ratings at Ta=25°C

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
Collector Dissipation	P_C		1.5	W
		Tc=25°C	10	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.

Package Dimensions

unit : mm (typ)
7516A-002



2SA1507S
2SA1507T
2SC3902S
2SC3902T

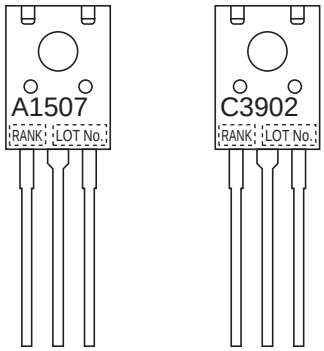
1 : Emitter
2 : Collector
3 : Base

TO-126ML

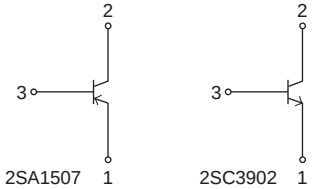
Product & Package Information

• Package : TO-126ML
• JEITA, JEDEC : TO-126
• Minimum Packing Quantity : 200 pcs./bag

Marking



Electrical Connection



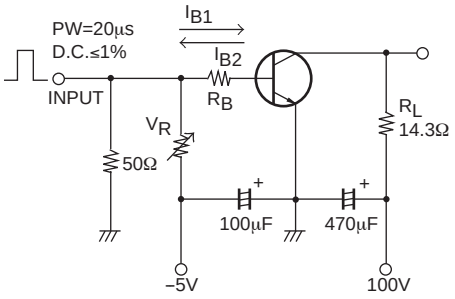
Electrical Characteristics at Ta=25°C

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	90			
Gain-Bandwidth Product	f_T	V_{CE}=(−)10V, I_C=(−)50mA		120		MHz
Output Capacitance	Cob	V_{CB}=(−)10V, f=1MHz		(22)14		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.		(0.7)0.04		μs
Storage Time	t_{stg}			(0.7)1.2		μs
Fall Time	t_f			(0.04)0.08		μs

* : The 2SA1507 / 2SC3902 are classified by 100mA h_{FE} as follows:

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

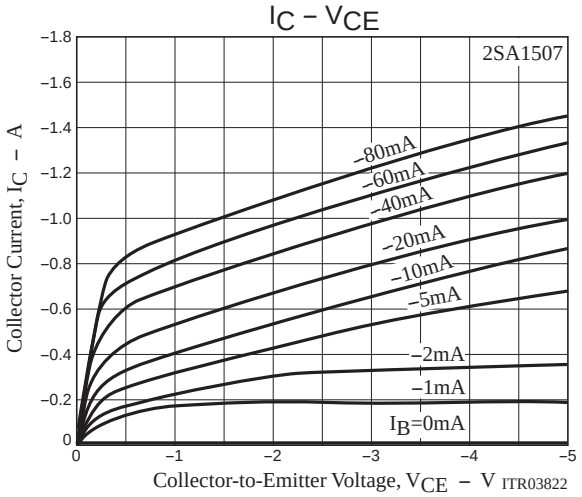
Switching Time Test Circuit

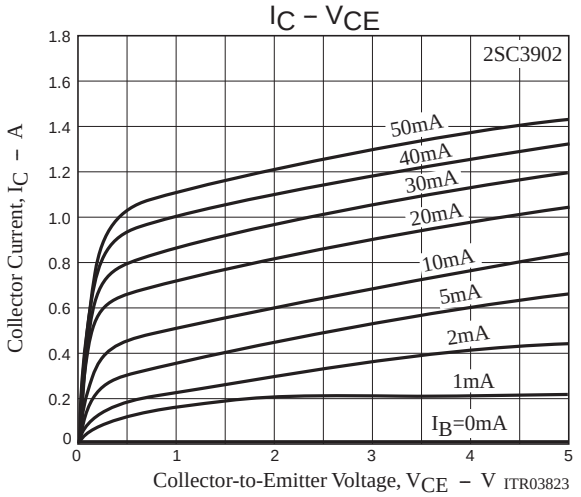


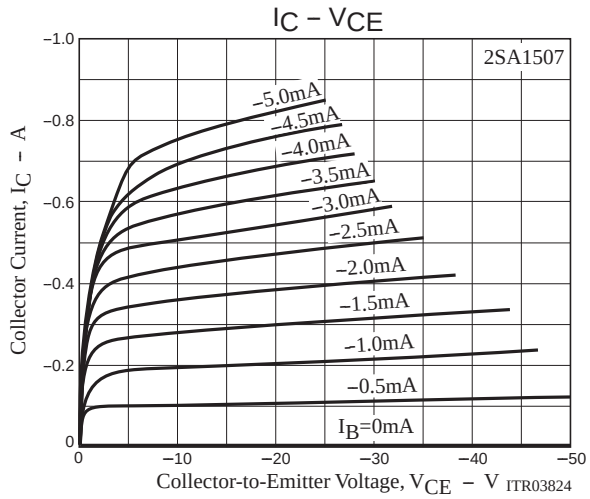
I_C=10I_{B1}=−10I_{B2}=0.7A
(For PNP, the polarity is reversed.)

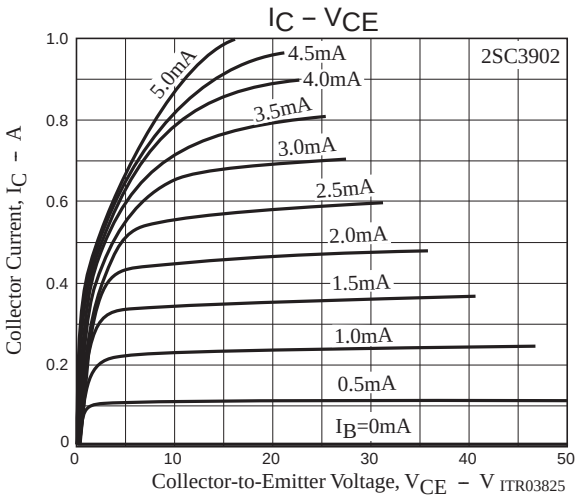
Ordering Information

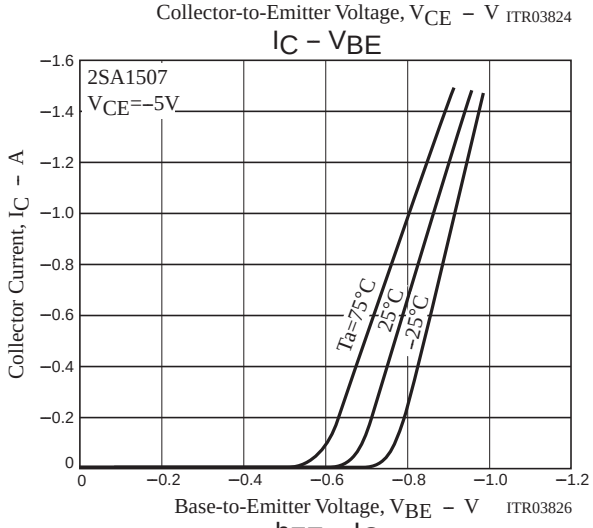
Device	Package	Shipping	memo
2SA1507S	TO-126ML	200pcs./bag	Pb Free
2SA1507T	TO-126ML	200pcs./bag	
2SC3902S	TO-126ML	200pcs./bag	
2SC3902T	TO-126ML	200pcs./bag	

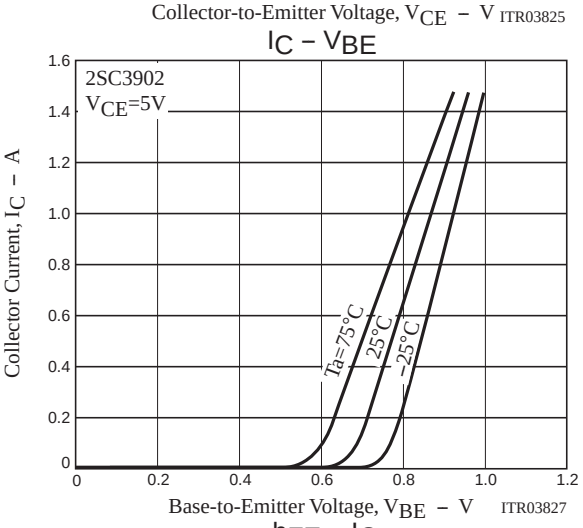


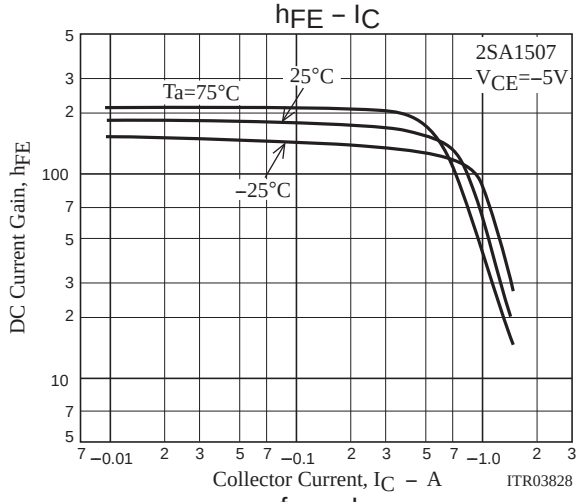


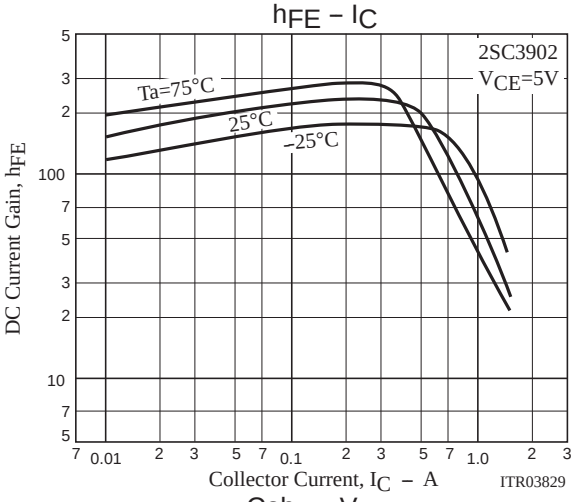

IC – VCE
2SA1507
–5.0mA
–4.5mA
–4.0mA
–3.5mA
–3.0mA
–2.5mA
–2.0mA
–1.5mA
–1.0mA
–0.5mA
IB=0mA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR03824

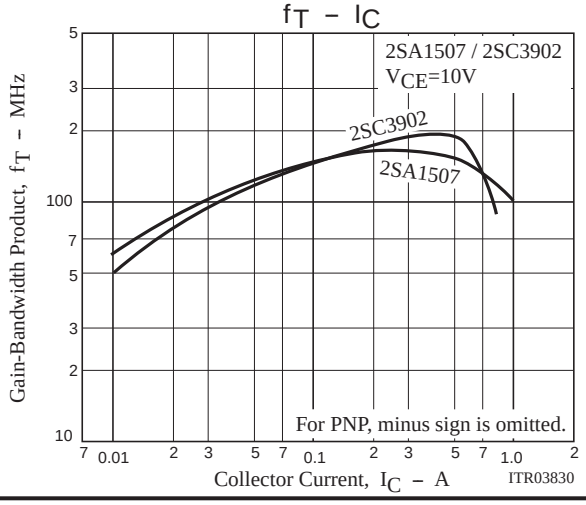

IC – VCE
2SC3902
5.0mA
4.5mA
4.0mA
3.5mA
3.0mA
2.5mA
2.0mA
1.5mA
1.0mA
0.5mA
IB=0mA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR03825

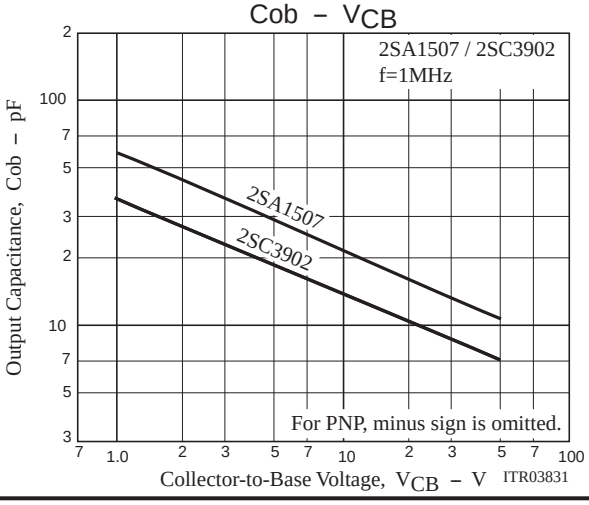

IC – VBE
2SA1507
VCE=–5V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
ITR03826


IC – VBE
2SC3902
VCE=5V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
ITR03827

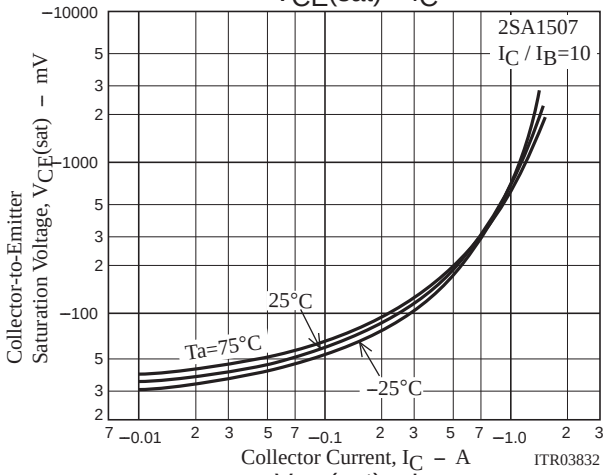

hFE – IC
2SA1507
VCE=–5V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
ITR03828


hFE – IC
2SC3902
VCE=5V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
ITR03829

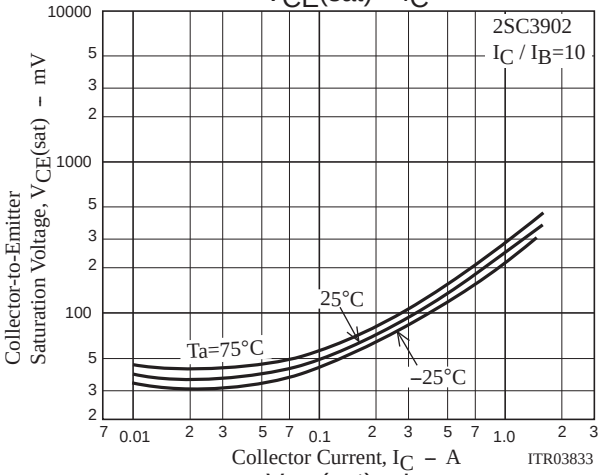

fT – IC
2SA1507 / 2SC3902
VCE=10V
2SC3902
2SA1507
For PNP, minus sign is omitted.
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
ITR03830


Cob – VCB
2SA1507 / 2SC3902
f=1MHz
2SA1507
2SC3902
For PNP, minus sign is omitted.
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
ITR03831

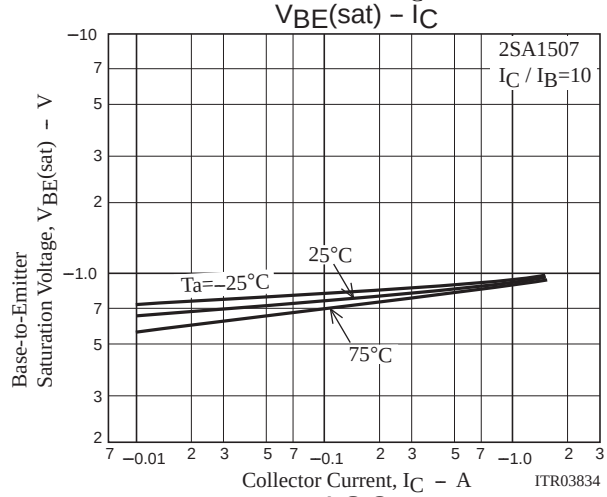
$V_{CE}(sat) - I_C$



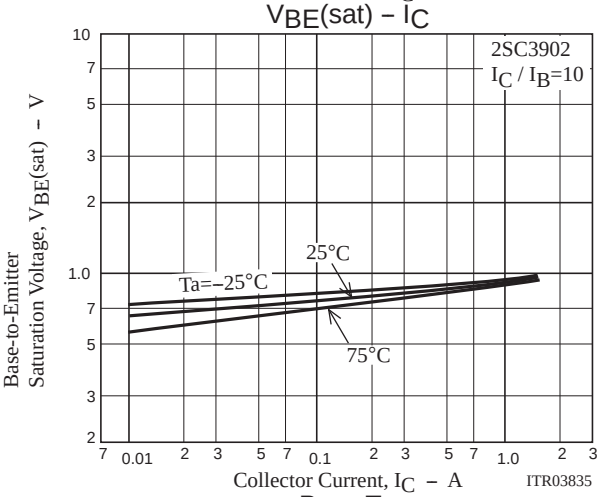
$V_{CE}(sat) - I_C$



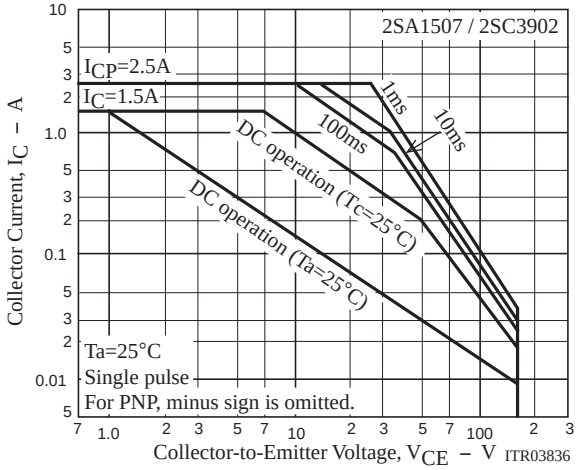
$V_{BE}(sat) - I_C$



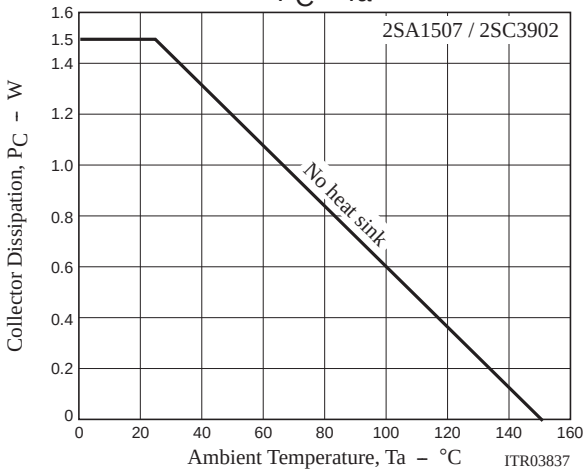
$V_{BE}(sat) - I_C$



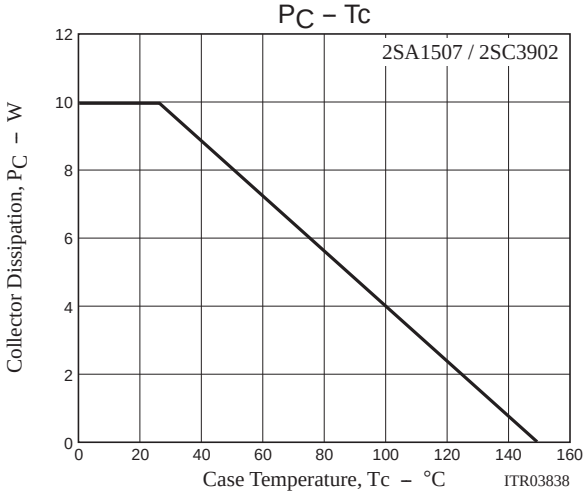
A S O



$P_C - Ta$



$P_C - Tc$



Bag Packing Specification

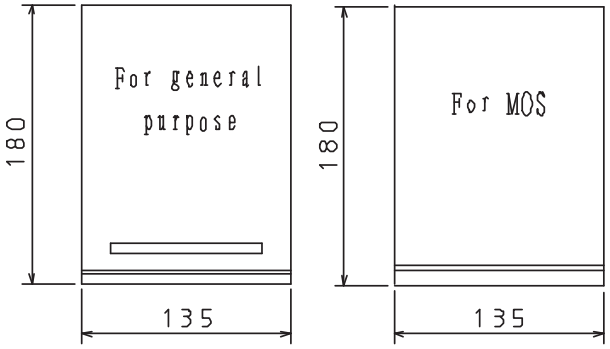
2SA1507S, 2SA1507T, 2SC3902S, 2SC3902T

1. Packing Format

Package Name	Maximum Number of devices contained (pcs)			Packing format	
	Bag	Inner box	Outer box	Inner BOX	Outer BOX
TO-126ML	200	4,000	12,000	B-1 20 bags contained Dimensions:mm (external) 445×225×55	A-2 3 inner boxes contained Dimensions:mm (external) 470×250×190

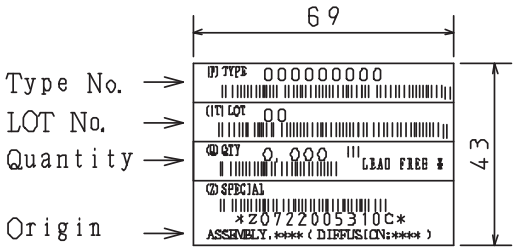
2. Bag dimensions

(unit:mm)



3. Bag label, Inner box label

(unit:mm)



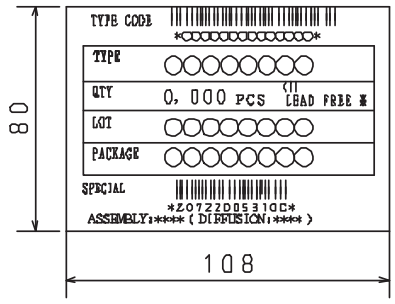
NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

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

2SA1507S, 2SA1507T, 2SC3902S, 2SC3902T