



2SB1143/2SD1683

Bipolar Transistor

(-50V, (-)4A, Low $V_{CE(sat)}$, (PNP)NPN Single TO-126ML

ON Semiconductor®

<http://onsemi.com>

Applications

- Voltage regulators, relay drivers, lamp drivers, electrical equipment

Features

- Adoption of FBET, MBIT processes
- Large current capacity and wide ASO
- Low saturation voltage

Specifications () : 2SB1143

Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

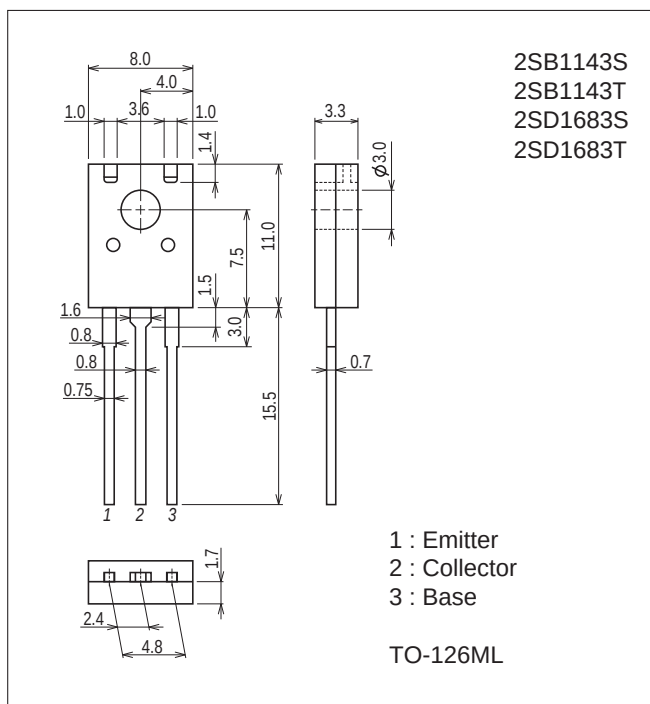
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(-)60	V
Collector-to-Emitter Voltage	V_{CEO}		(-)50	V
Emitter-to-Base Voltage	V_{EBO}		(-)6	V
Collector Current	I_C		(-)4	A
Collector Current (Pulse)	I_{CP}		(-)6	A
Collector Dissipation	P_C		1.5	W
		$T_c=25^\circ\text{C}$	10	W
Junction Temperature	T_j		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

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)

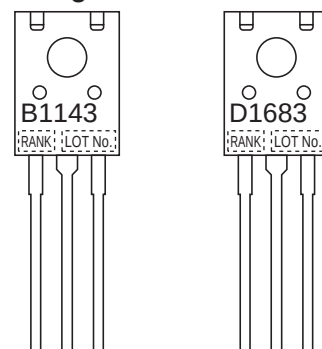
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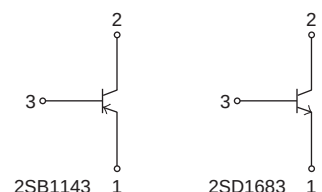
Product & Package Information

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

Marking



Electrical Connection



2SB1143 / 2SD1683

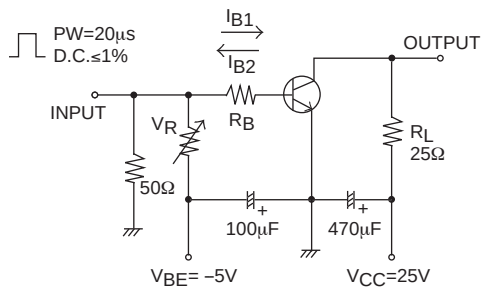
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB}=(-)40V, I_E=0A$			(-) 1	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=(-)4V, I_C=0A$			(-) 1	μA
DC Current Gain	h_{FE1}	$V_{CE}=(-)2V, I_C=(-)100mA$	100*		560*	
	h_{FE2}	$V_{CE}=(-)2V, I_C=(-)3A$	40			
Gain-Bandwidth Product	f_T	$V_{CE}=(-)10V, I_C=(-)50mA$		150		MHz
Output Capacitance	C_{ob}	$V_{CB}=(-)10V, f=1MHz$		(39)25		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)2A, I_B=(-)100mA$		(-350)190	(-700)500	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)2A, I_B=(-)100mA$		(-)0.94	(-)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0A$	(-)60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-)50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu A, I_C=0A$	(-)6			V
Turn-On Time	t_{on}	See specified Test Circuit.		(70)70		ns
Storage Time	t_{stg}			(450)650		ns
Fall Time	t_f			(30)35		ns

* : The 2SB1143/2SD1683 are classified by 100mA h_{FE} as follows :

Rank	R	S	T	U
h_{FE}	100 to 200	140 to 280	200 to 400	280 to 560

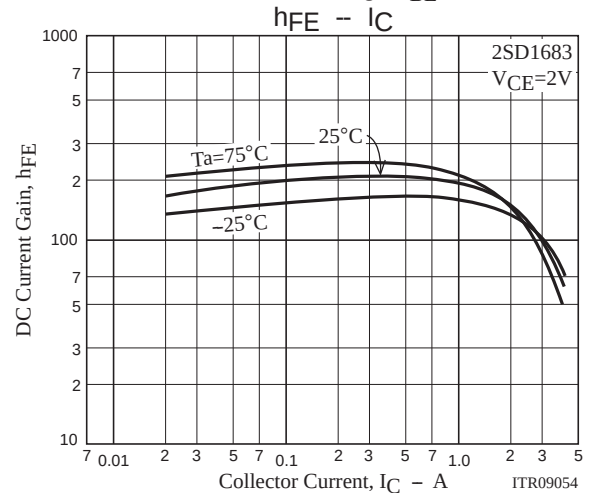
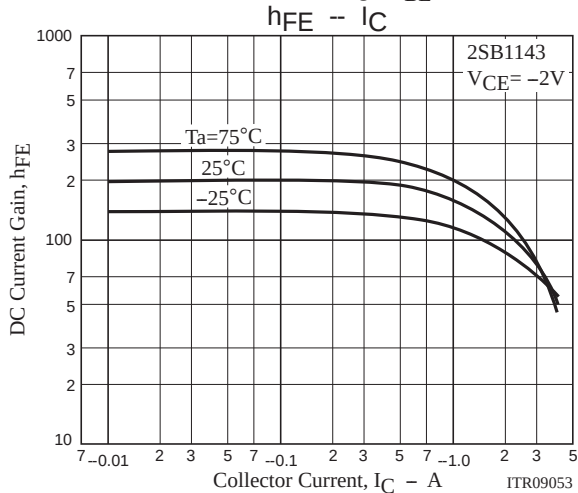
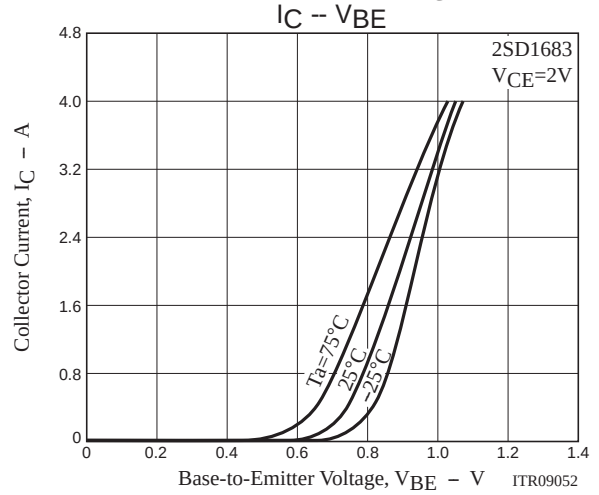
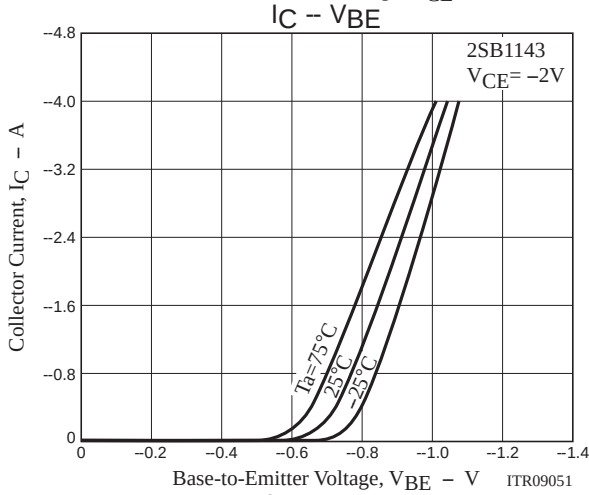
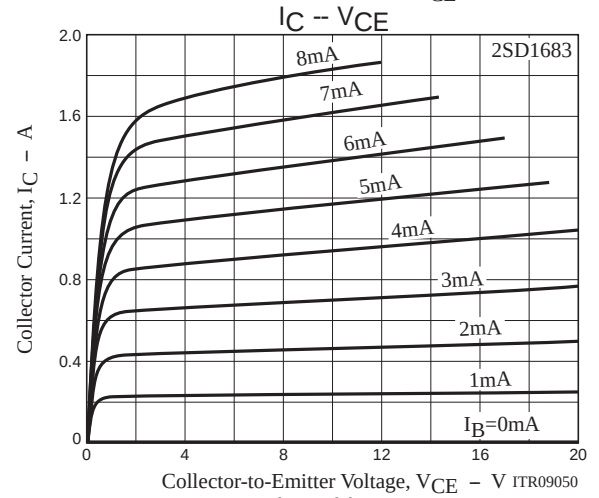
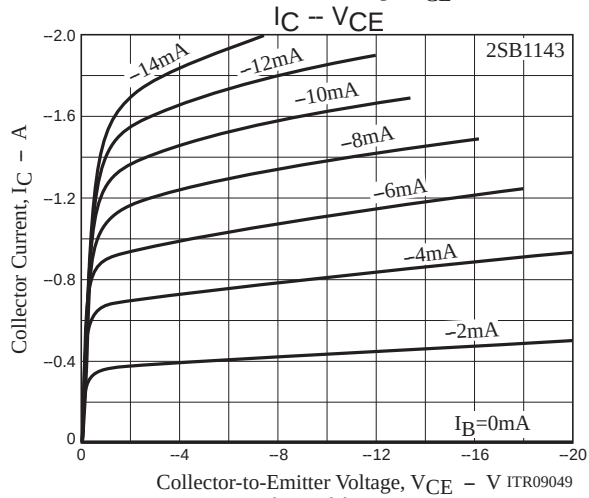
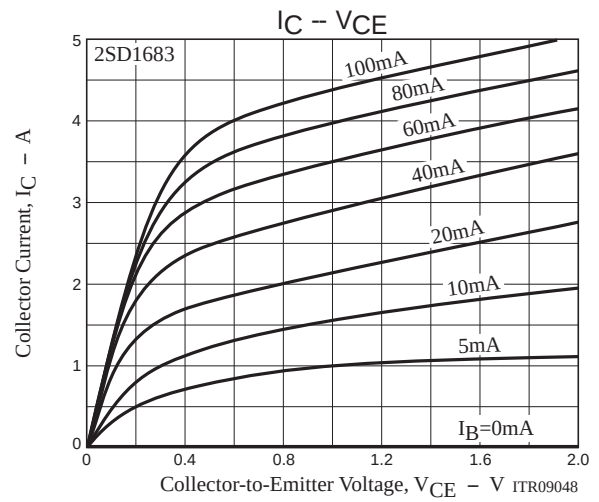
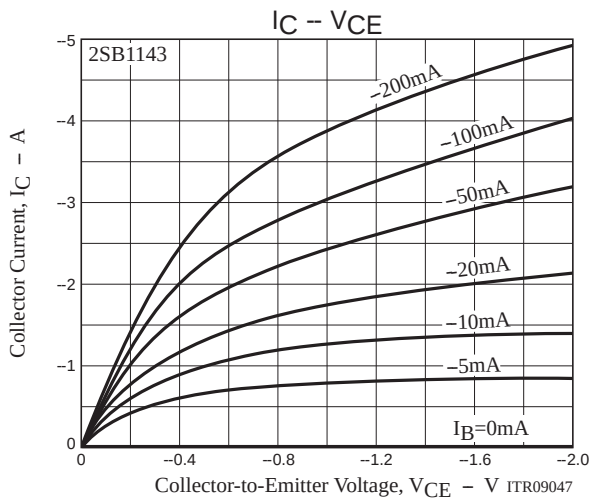
Switching Time Test Circuit



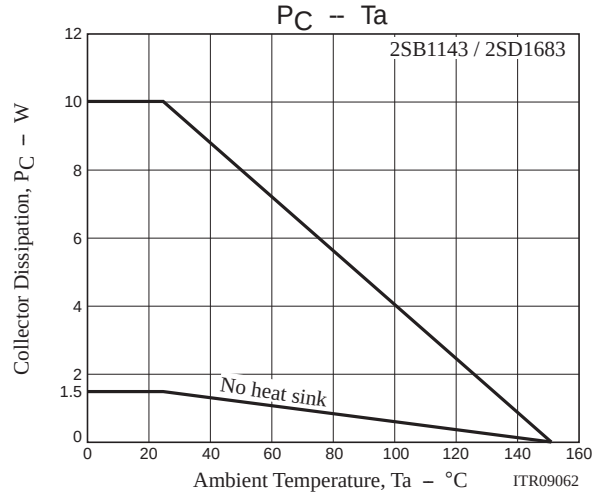
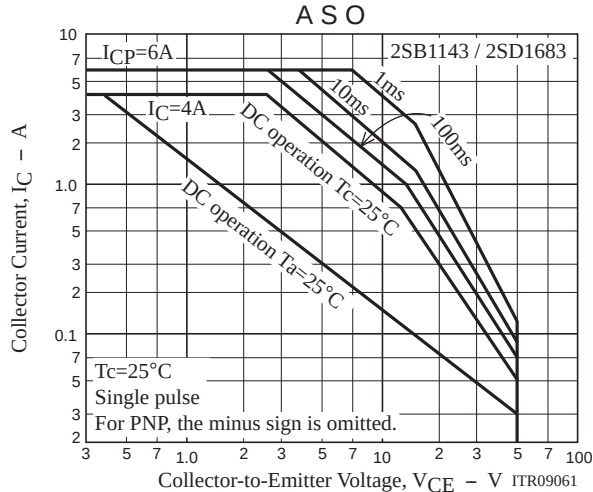
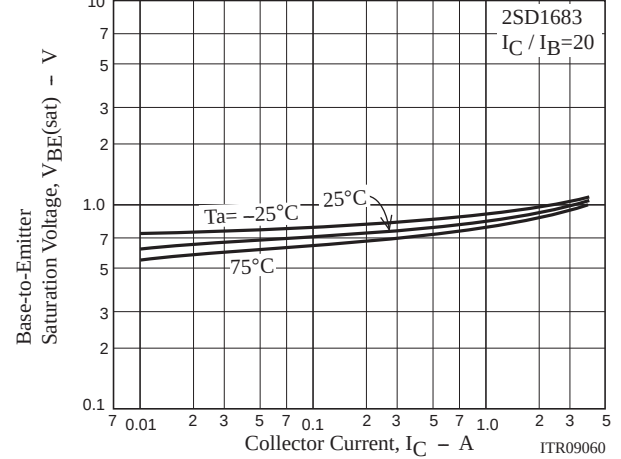
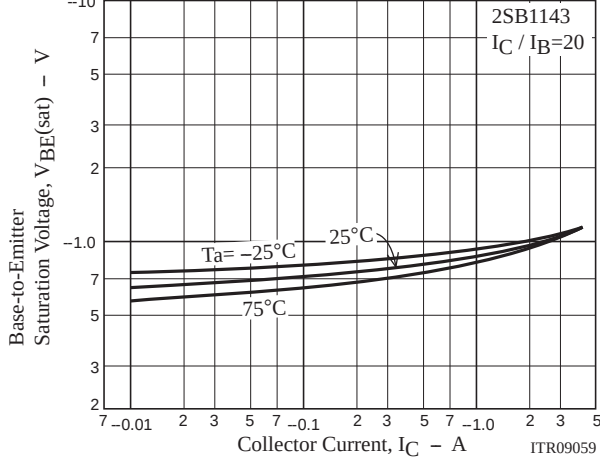
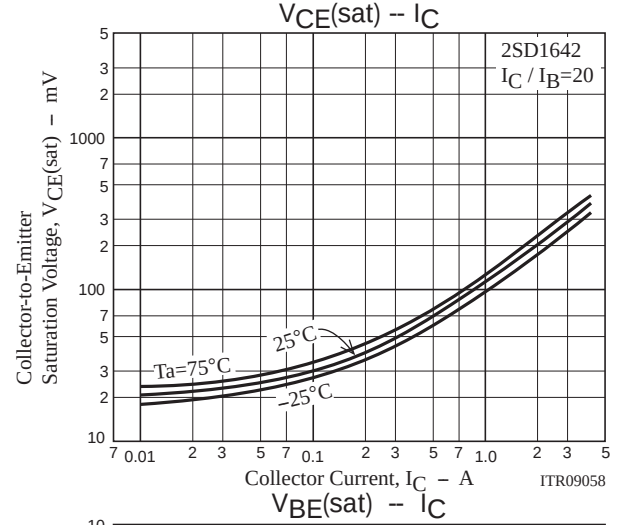
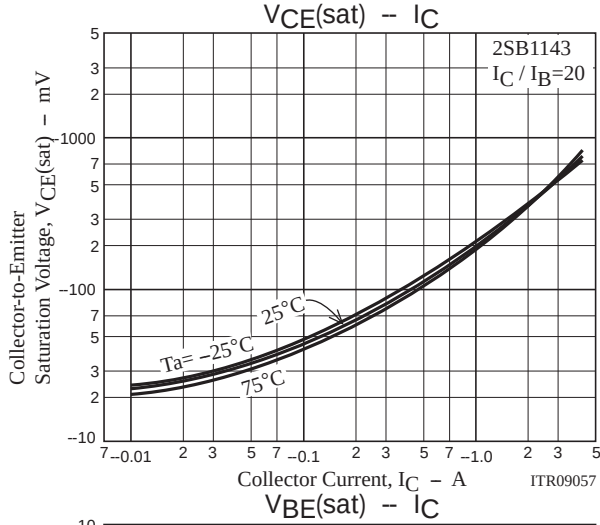
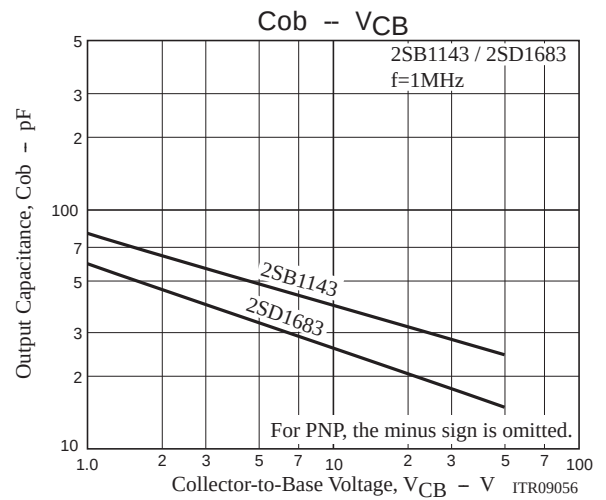
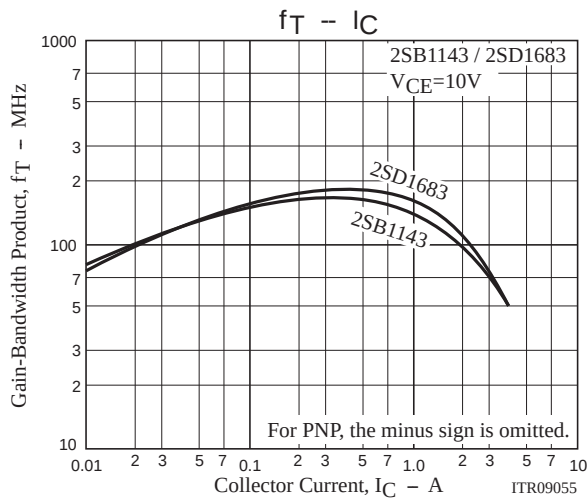
$I_C=10I_{B1}=-10I_{B2}=1A$
(For PNP, the polarity is reversed.)

Ordering Information

Device	Package	Shipping	memo
2SB1143S	TO-126ML	200pcs./bag	Pb Free
2SB1143T	TO-126ML	200pcs./bag	
2SD1683S	TO-126ML	200pcs./bag	
2SD1683T	TO-126ML	200pcs./bag	



2SB1143 / 2SD1683



Bag Packing Specification

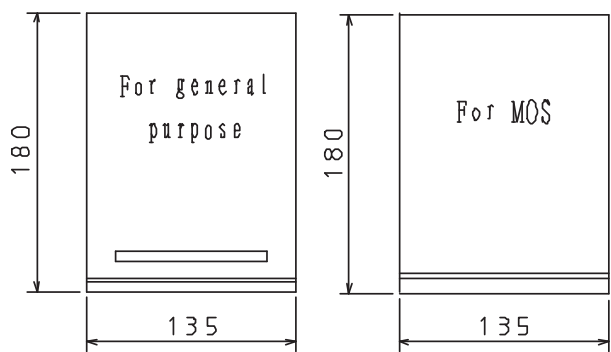
2SB1143S, 2SB1143T, 2SD1683S, 2SD1683T

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

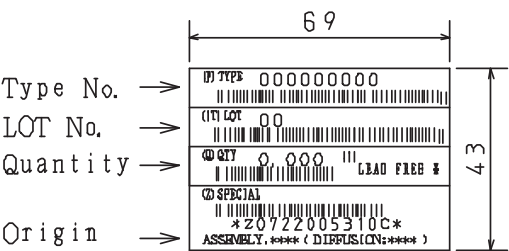
2. Bag dimensions

(unit:mm)



3. Bag label, Inner box label

(unit:mm)



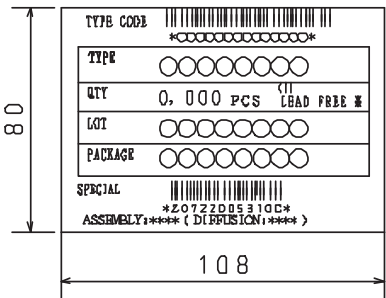
NOTE (1)
The LEAD FREE # description shows that the surface treatment of the terminal is lead free.

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

4. Outer box label

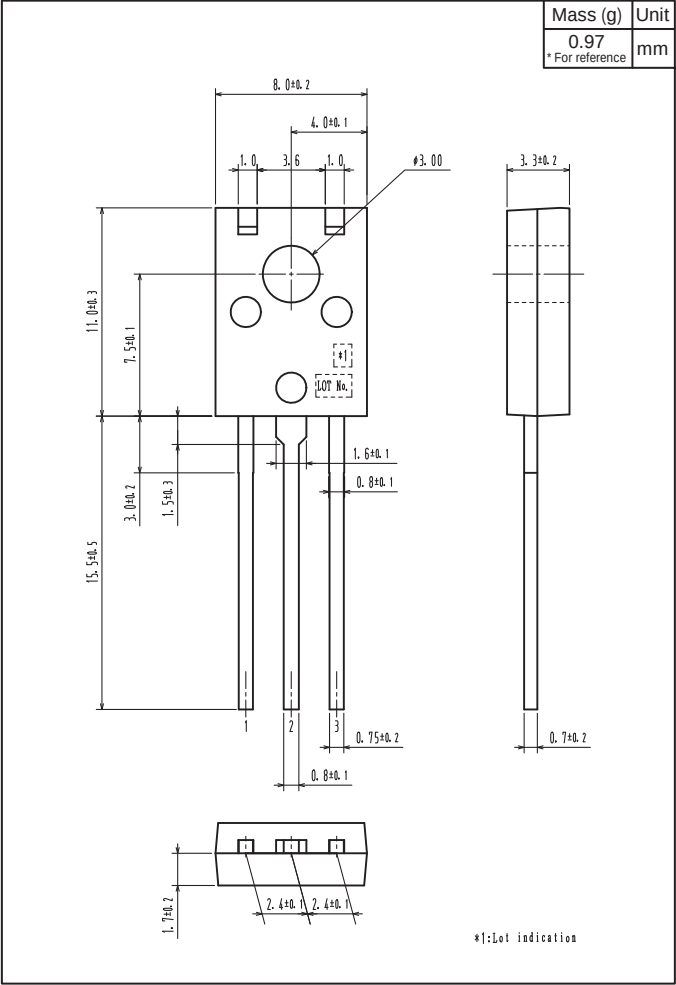
(unit:mm)

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



Outline Drawing

2SB1143S, 2SB1143T, 2SD1683S, 2SD1683T



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