Ordering number : ENA0269A

2SA2186

Bipolar Transistor
-50V, -2A, Low VCE(sat), PNP Single NMP

ON Semiconductor®
http://onsemi.com

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

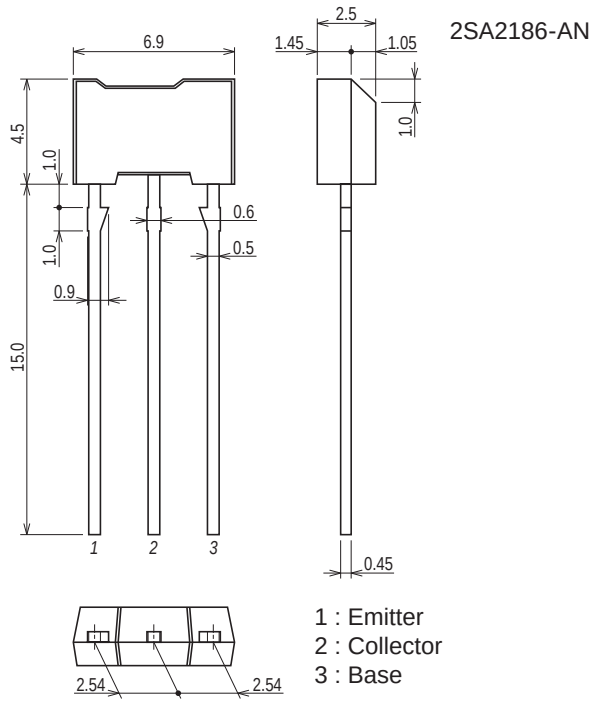
Features
- Adoption of MBIT processes
- Low collector-to-emitter saturation voltage
- Large current capacity
- High-speed switching

Specifications
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		−50	V
Collector-to-Emitter Voltage	V_{CEO}		−50	V
Emitter-to-Base Voltage	V_{EBO}		−6	V
Collector Current	I_C		−2	A
Collector Current (Pulse)	I_{CP}		−4	A
Base Current	I_B		−400	mA
Collector Dissipation	P_C		0.9	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

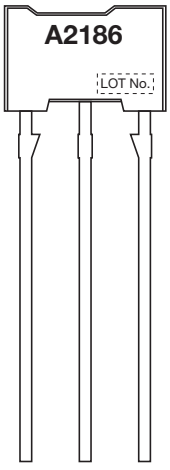
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions
unit : mm (typ)
7540-001

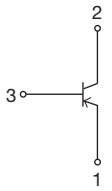


Product & Package Information
- Package : NMP(Taping)
- JEITA, JEDEC : SC-71
- Minimum Packing Quantity : 2,500 pcs./box

Marking(NMP(Taping))



Electrical Connection

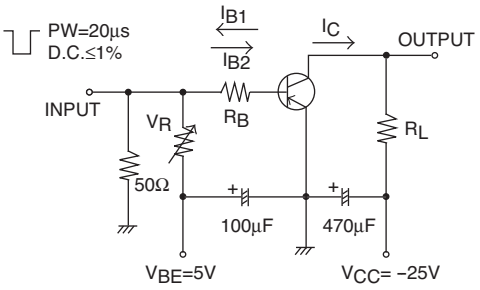


Semiconductor Components Industries, LLC, 2013

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	$h_{FE}1$	V_{CE}=−2V, I_C=−100mA	200		560	
	$h_{FE}2$	V_{CE}=−2V, I_C=−1.5A	40			
Gain-Bandwidth Product	f_T	V_{CE}=−10V, I_C=−300mA		420		MHz
Output Capacitance	Cob	V_{CB}=−10V, f=1MHz		16		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=−1A, I_B=−50mA		−0.22	−0.43	V
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=−1A, I_B=−50mA		−0.9	−1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=−10μA, I_E=0A	−50			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=−1mA, R_{BE}=∞	−50			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.		35		ns
Storage Time	t_{stg}			200		ns
Fall Time	t_f			24		ns

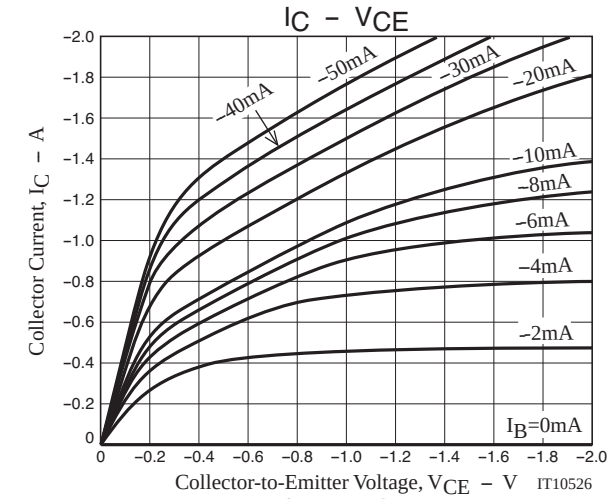
Switching Time Test Circuit

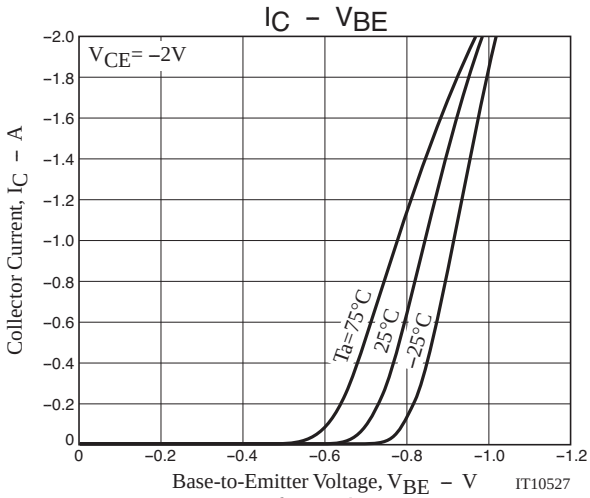


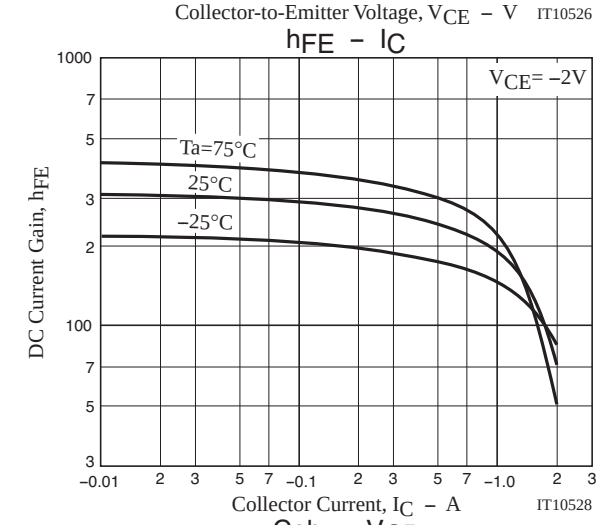
I_C=10I_{B1}= −10I_{B2}= −0.7A

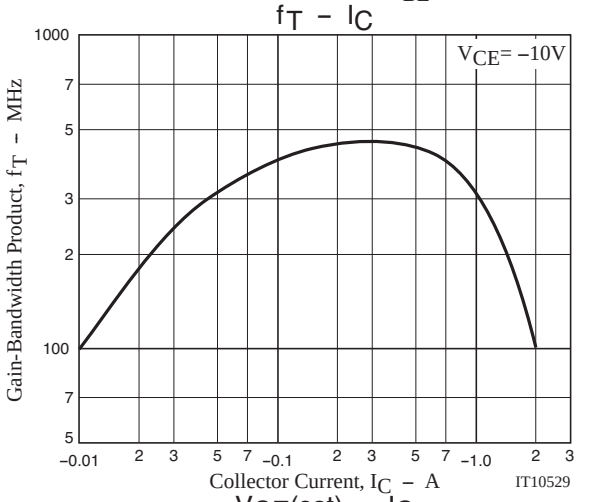
Ordering Information

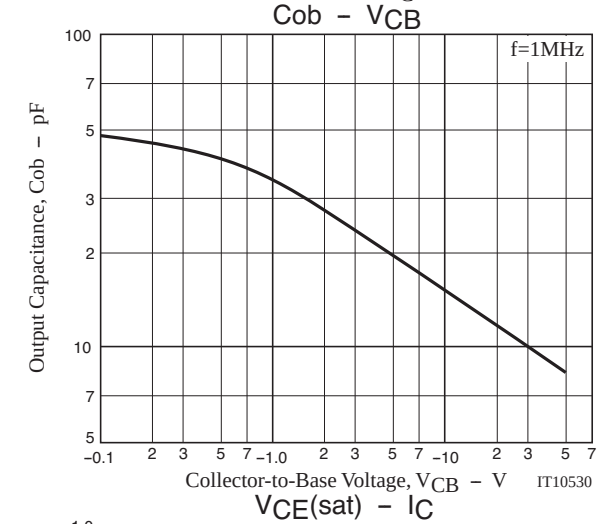
Device	Package	Shipping	memo
2SA2186-AN	NMP(Taping)	2,500pcs./box	Pb Free

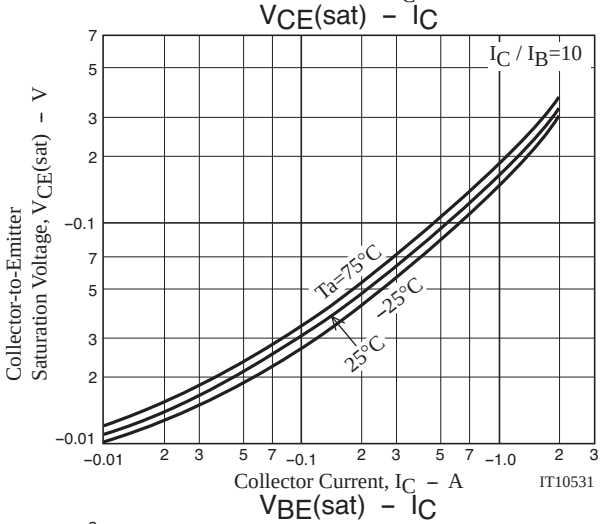

IC – VCE
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT10526
–40mA
–50mA
–30mA
–20mA
–10mA
–8mA
–6mA
–4mA
–2mA
IB=0mA

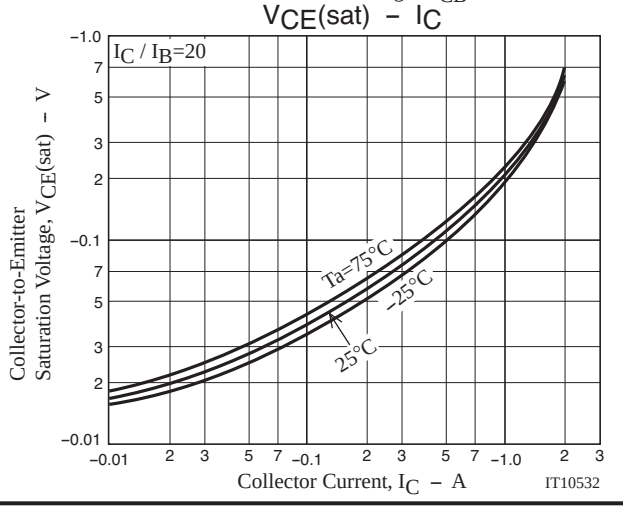

IC – VBE
VCE= –2V
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT10527
Ta=75°C
25°C
–25°C

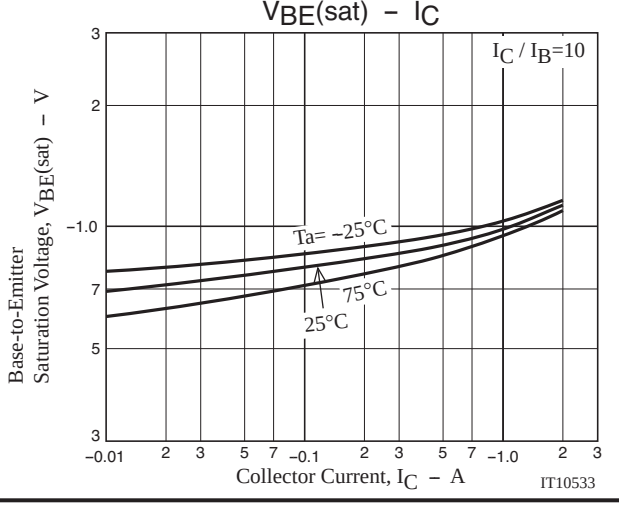

hFE – IC
VCE= –2V
DC Current Gain, hFE
Collector Current, IC – A
IT10528
Ta=75°C
25°C
–25°C

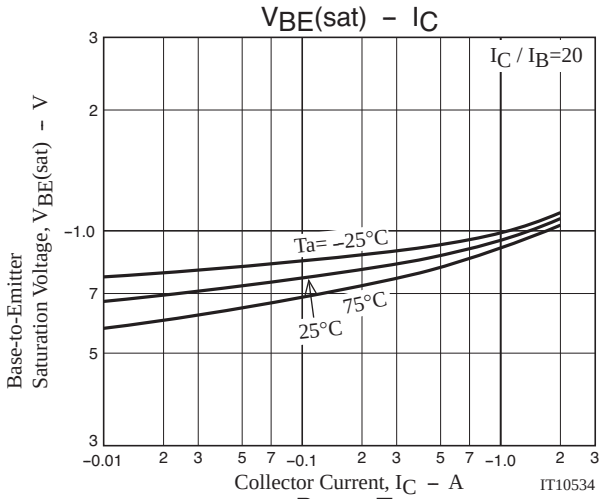

fT – IC
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT10529

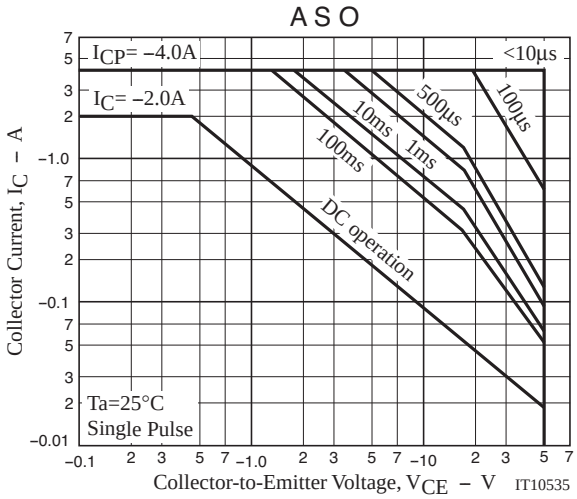

Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT10530

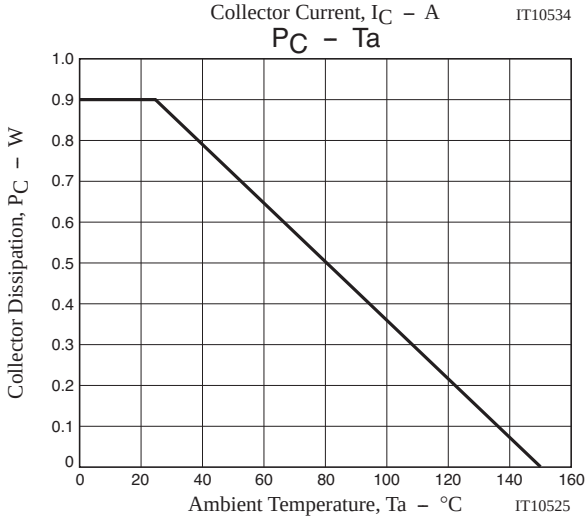

VCE(sat) – IC
IC / IB=10
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT10531
Ta=75°C
–25°C
25°C


VCE(sat) – IC
IC / IB=20
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT10532
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
IT10533
Ta= –25°C
75°C
25°C


VBE(sat) – IC
IC / IB=20
Ta= –25°C
75°C
25°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT10534


A S O
ICP= –4.0A
IC= –2.0A
<10µs
500µs
100µs
10ms
1ms
100ms
DC operation
Ta=25°C
Single Pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT10535


PC – Ta
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT10525

Bag Packing Specification

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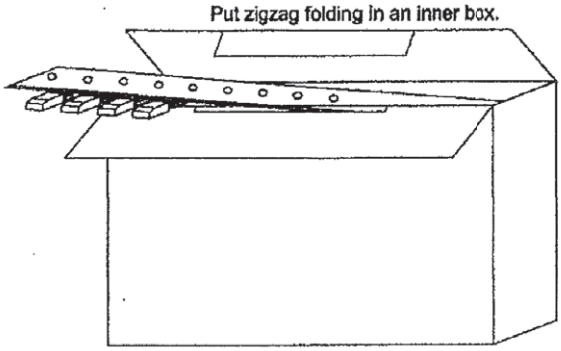
NMP (Zigzag folding)

Storage package Outline name	Package type	Maximum Number of devices contained (pcs.)		Packing format	
		Inner box No.	Storage quantity	Outer box (C—6)	Outer box (C—8)
NMP	AN/AZ	C—3 Inner box Dimensions :mm(external) 330×45×125	2,500	8 inner boxes contained(20,000pcs.) Outer box Dimensions:mm(external) 585×345×195	4 inner boxes contained(10,000pcs.) Outer box Dimensions:mm(external) 345×300×195

1. Packing format

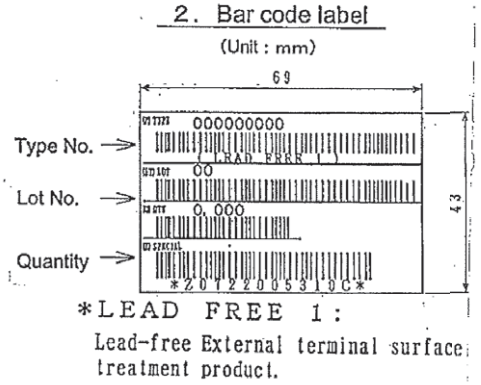
Packing method

Put zigzag folding in an inner box.



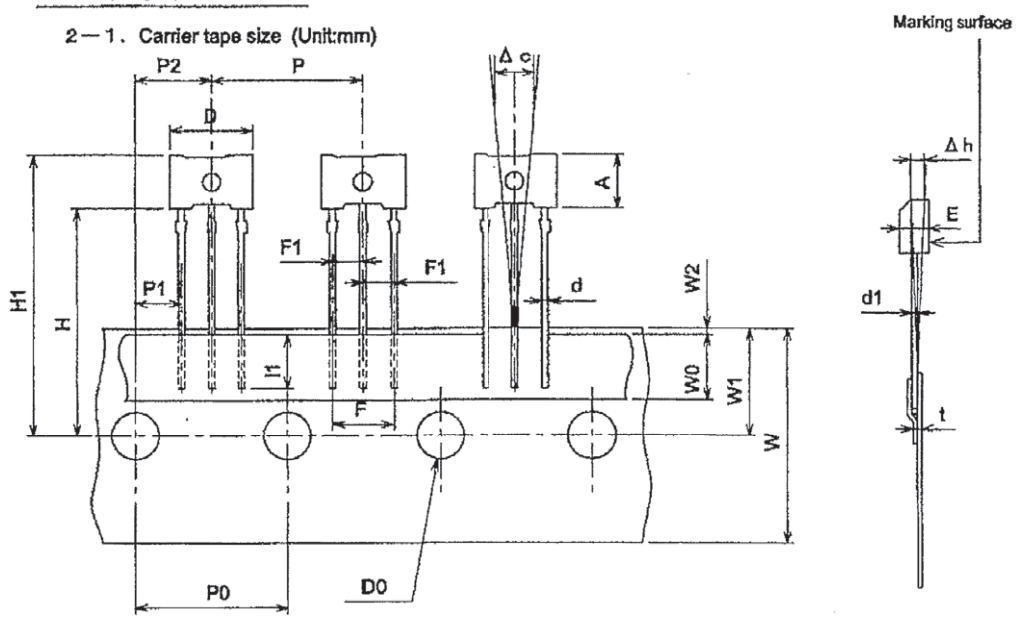
2. Bar code label

(Unit : mm)



2. Taping specifications

2—1. Carrier tape size (Unit:mm)



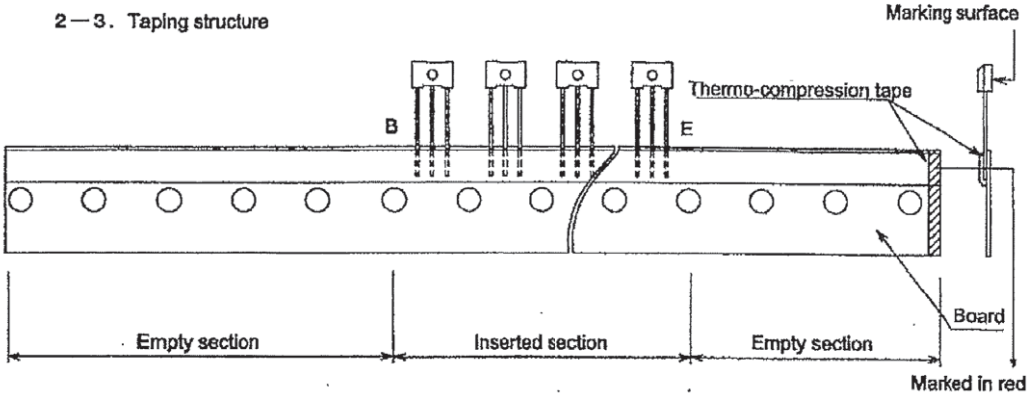
2—2. Taping size standard

Unit:mm

Item	Symbol	Standard	Tolerance
Work piece outside diameter	D	6.9	±0.2
	E	2.5	±0.2
Work piece height	A	4.5	±0.2
Lead wire diameter	d	0.5	±0.1
Lead wire thickness	d1	0.45	±0.1
Bonded lead wire	l1	3.0MIN	
Pitch between products	P	12.7	±0.5
Pitch between perforations	P0	12.7	±0.2
Total pitch for 21 perforations	P0×20	254.0	±1.0
Distance between lead wire	F	5.0	+0.8 -0.2
Lead wire pitch distance	F1	2.54	+0.4 -0.1
Displacement of perforations	P1	3.81	±0.3
	P2	6.35	±0.3
Displacement of tape	W2	0～0.5	

Item	Symbol	Standard	Tolerance
Tape width	W	18.0	±0.5
Adhesive tape	W0	6.0	±0.5
Displacement of perforations	W1	9.0	±0.5
Work piece bottom surface position	H	19.0	+1.0 -0.5
Work piece upper limit position	H1	23.5	±1.0
Perforations diameter	D0	ϕ4.0	±0.2
Tape thickness (total thickness)	t	0.6	±0.2
Product inclination	Δc	0	±0.7
Product inclination	Δh	0	±1.0

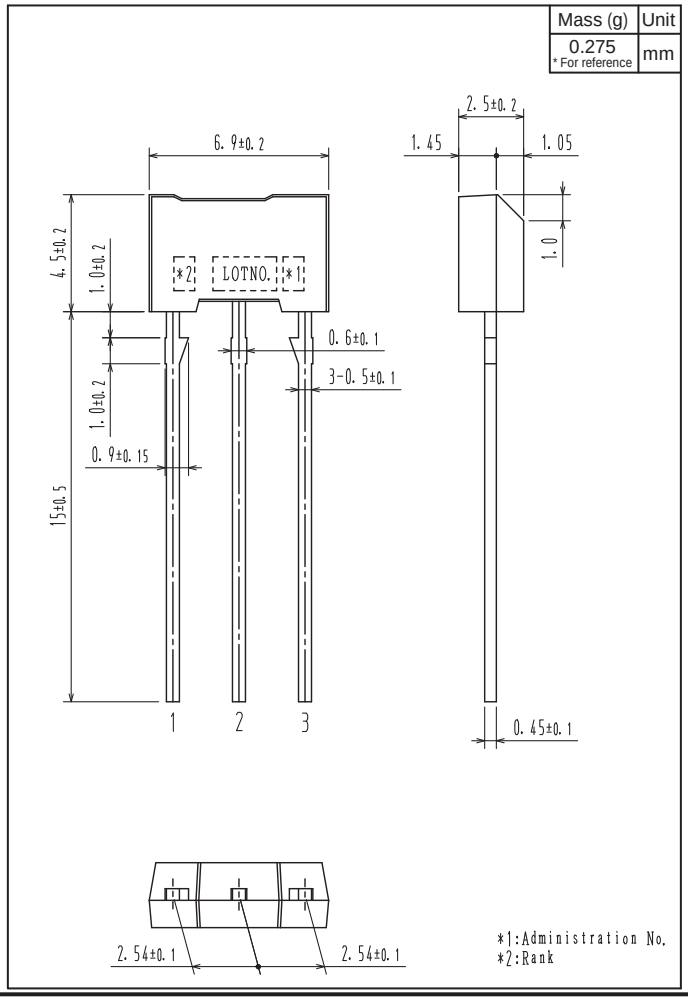
2—3. Taping structure



- Provide an empty section for about three to five pieces in leading and end portions of the tape.
- Provide an empty section in the fold-back portion.
- Provide marking in red to the E-side end of the board.

Outline Drawing

2SA2186-AN



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