



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## 2SD1835 — NPN Epitaxial Planar Silicon Transistor Driver Applications

### Applications

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

### Features

- Adoption of FBET, MBIT processes
- Low collector-to-emitter saturation voltage
- Large current capacity
- Fast switching time

### Specifications

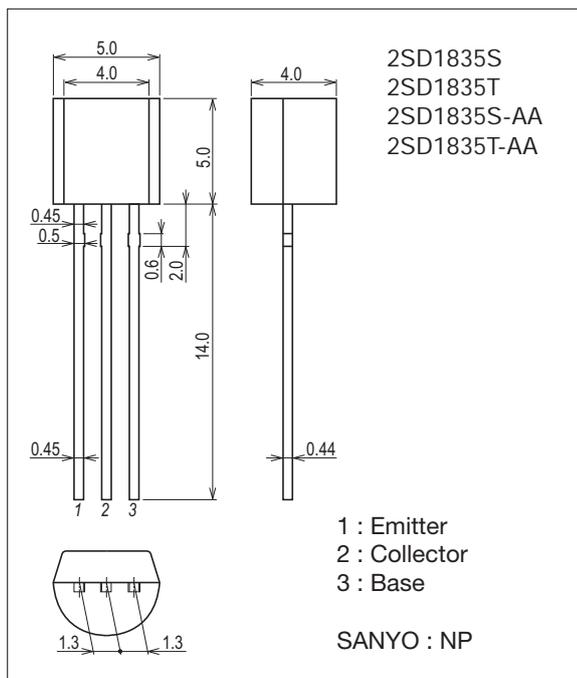
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CBO</sub>		60	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		50	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		6	V
Collector Current	I <sub>C</sub>		2	A
Collector Current (Pulse)	I <sub>CP</sub>		3	A
Collector Dissipation	P <sub>C</sub>		0.75	W
Junction Temperature	T <sub>j</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

### Package Dimensions

unit : mm (typ)

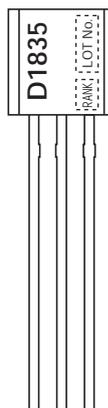
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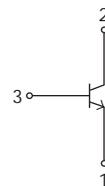
### Product & Package Information

- Package : NP
- JEITA, JEDEC : SC-34A, TO-92, TO-226AA, SOT-54
- Minimum Packing Quantity : 1,500 pcs./box, 500pcs./bag

### Marking



### Electrical Connection



# 2SD1835

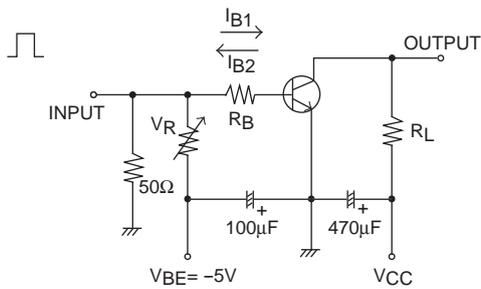
## Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	ICBO	V <sub>CB</sub> =50V, I <sub>E</sub> =0A			100	nA
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> =4V, I <sub>C</sub> =0A			100	nA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =100mA	100*		560*	
	h <sub>FE2</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =1.5A	40			
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =50mA		150		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, f=1MHz		12		pF
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =1A, I <sub>B</sub> =50mA		0.15	0.4	V
Base-to-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =1A, I <sub>B</sub> =50mA		0.9	1.2	V
Collector-to-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =10μA, I <sub>E</sub> =0A	60			V
Collector-to-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =1mA, R <sub>BE</sub> =∞	50			V
Emitter-to-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =10μA, I <sub>C</sub> =0A	6			V
Turn-ON Time	t <sub>on</sub>	See specified Test Circuit.		60		ns
Storage Time	t <sub>stg</sub>			550		ns
Fall Time	t <sub>f</sub>			30		ns

\* : The 2SD1835 is classified by 100mA h<sub>FE</sub> as follows :

Rank	R	S	T	U
h <sub>FE</sub>	100 to 200	140 to 280	200 to 400	280 to 560

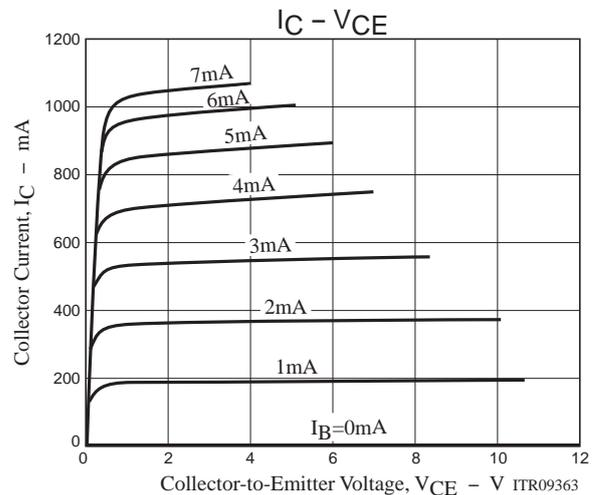
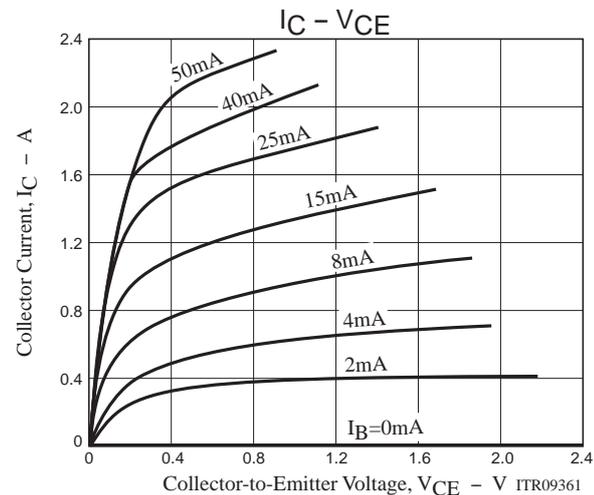
## Switching Time Test Circuit

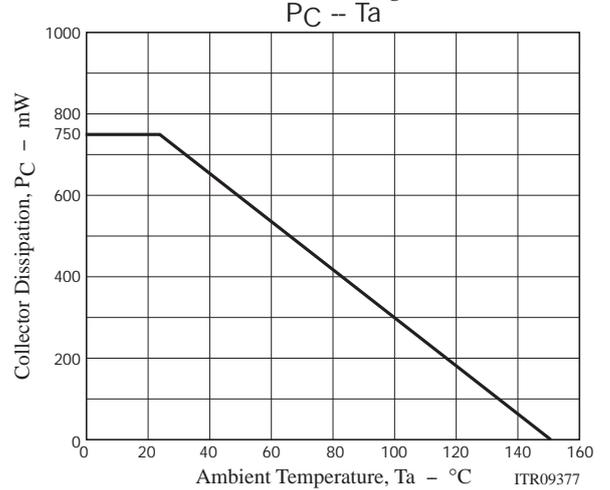
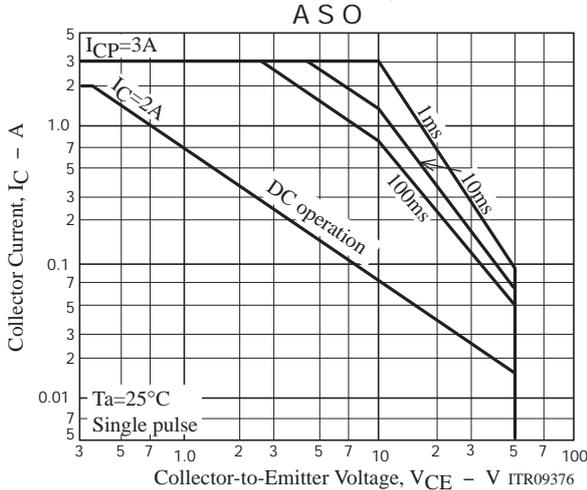
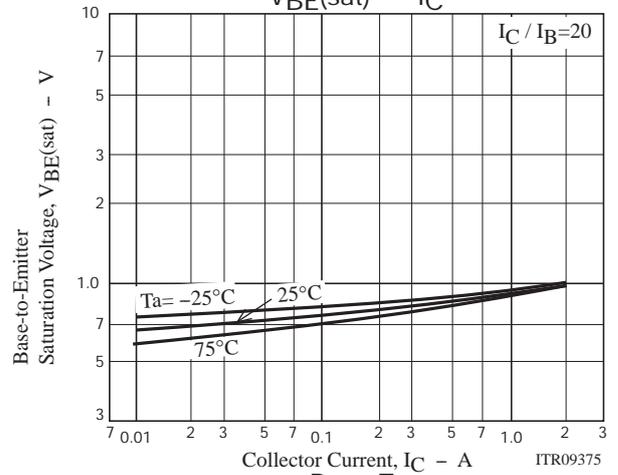
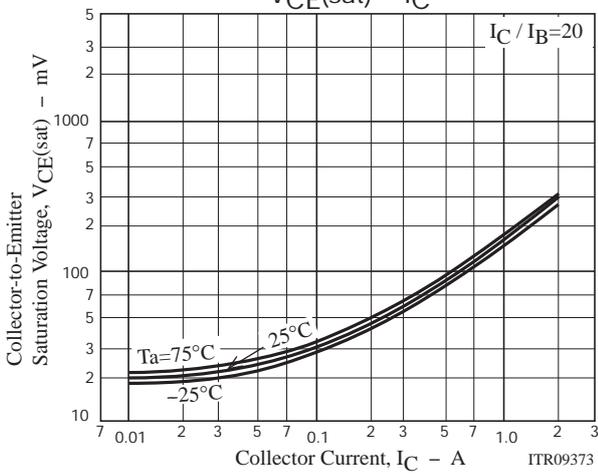
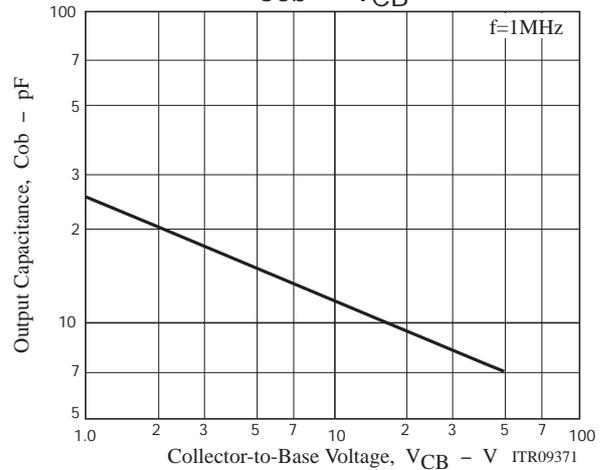
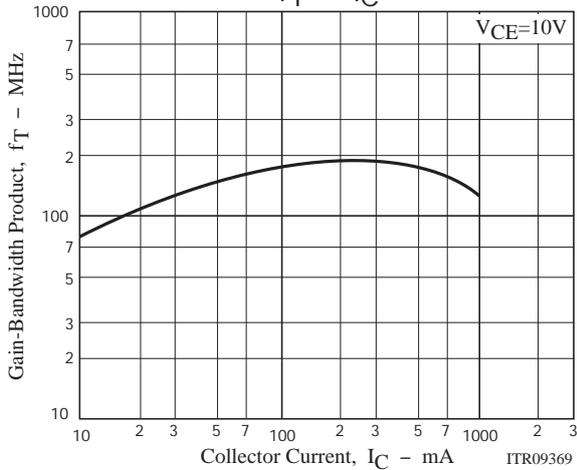
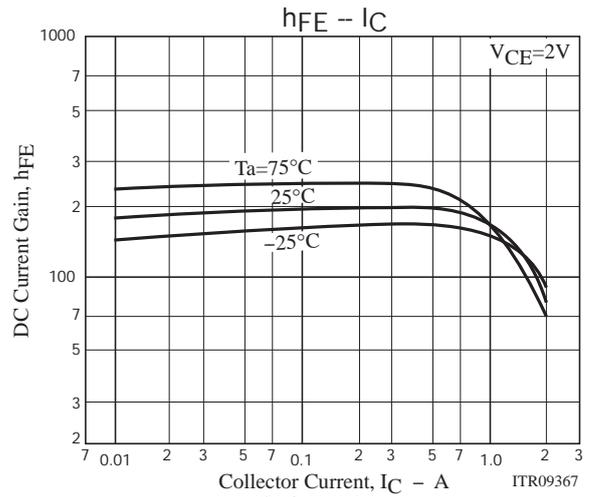
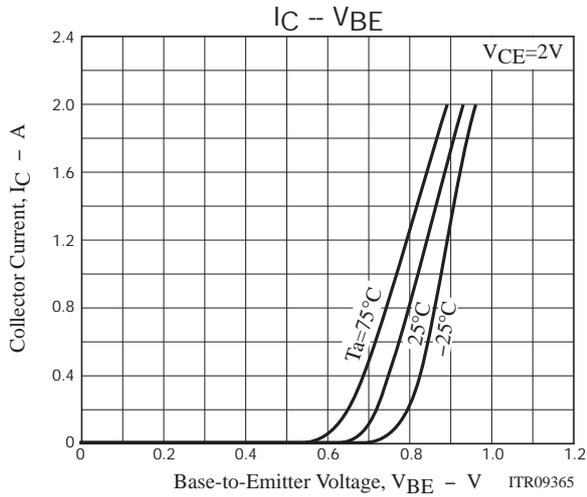


$$I_C = 10I_{B1} = -10I_{B2} = 500\text{mA}, V_{CC} = 25\text{V}$$

## Ordering Information

Device	Package	Shipping	memo
2SD1835S	NP	500pcs./bag	Pb Free
2SD1835T	NP	500pcs./bag	
2SD1835S-AA	NP	1,500pcs./box	
2SD1835T-AA	NP	1,500pcs./box	





**Taping Specification**

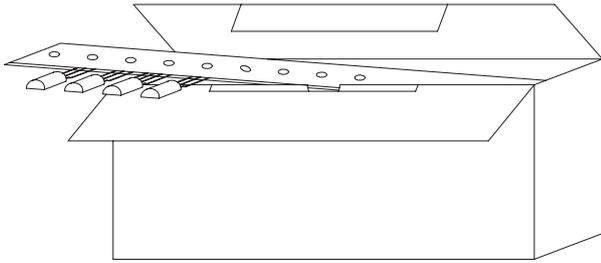
2SD1835S-AA, 2SD1835T-AA

1. Packing Format

Package Name	Packing Type	Maximum Number of devices contained (pcs)		Packing format
		Inner BOX (C-2)	number of contained	
N P	A A	Dimensions:mm (external)	1, 500	16 inner boxes contained (24, 000pcs) Dimensions:mm (external) 585×345×200
		330×45×145		

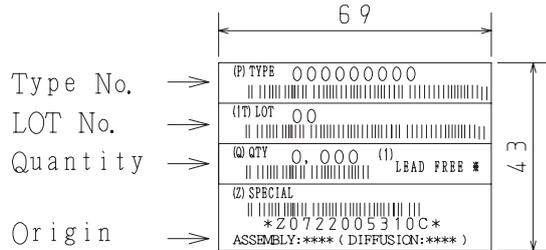
Packing method

Put zigzag folding in an inner box.



Inner box label

(unit:mm)



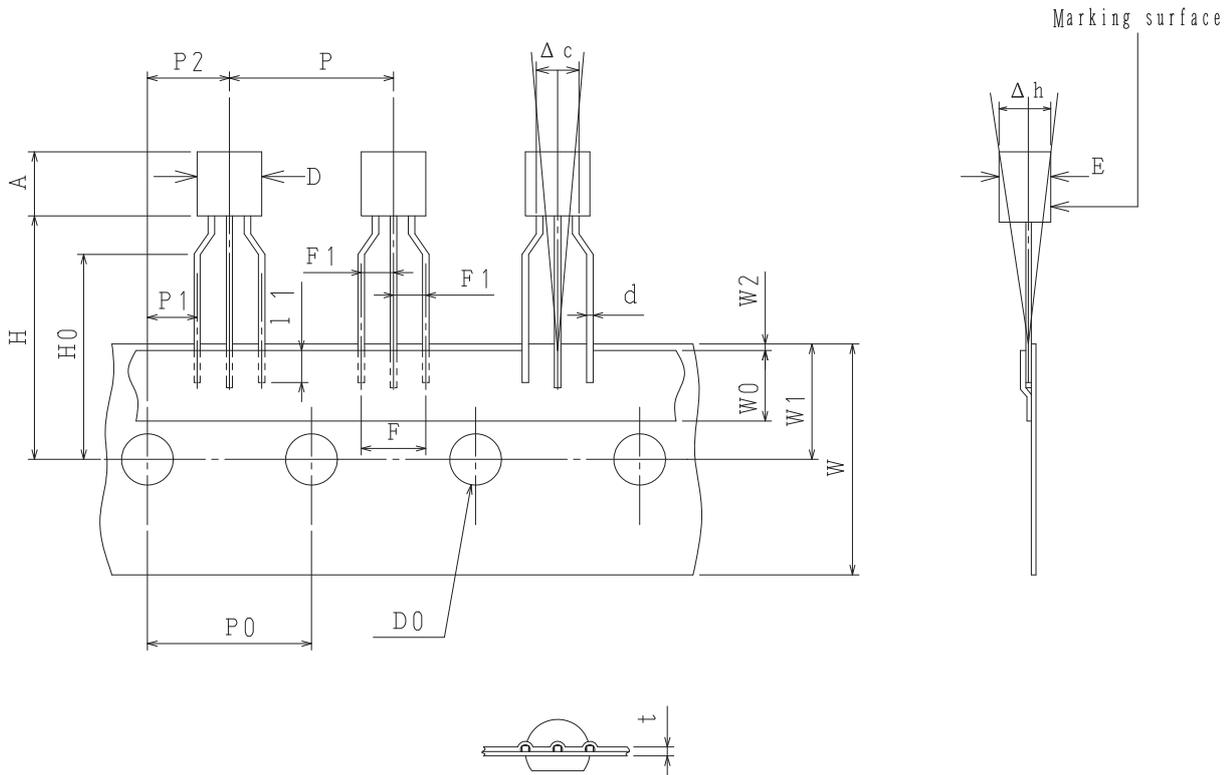
NOTE (1)

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

2. Taping specifications

2-1. Carrier tape size



2-2. Taping size standard

unit:mm

Item	Symbol	Standard	Tolerance	
Work piece outside diameter	D	5.0	±0.2	
	E	4.0	±0.2	
Work piece height	A	5.0	±0.2	
Lead wire diameter	d	0.45×0.44t	±0.1	
Bonded lead wire	l1	2.0MIN		
Pitch between products	P	12.7	±0.5	
Pitch between perforations	P0	12.7	±0.2	
Distance between lead wire	F	5.0	+0.8 -0.2	
Lead wire pitch distance	F1	2.5	+0.2 -0.1	
Product inclination	Δh	0	±2.0	
Displacement of perforations	P1	3.85	±0.3	Measurement position is the bottom of the clinch
	P2	6.35	±0.3	
Displacement of tape	W2	0.5MAX		Not to be displaced to the outside of the board
Tape width	W	18.0	+1.0 -0.5	
Adhesive tape	W0	6.0	±1.5	
Displacement of perforations	W1	9.0	±0.5	
Work piece bottom surface position	H	19.0	±1.0	
Insert stopper position	H0	16.0	±0.5	
Work piece upper limit position	H1	24.5	±1.5	
Perforations diameter	D0	φ4.0	±0.2	
Tape thickness	t	0.6	±0.2	
Product inclination	Δc	0	±1.0	

Bag Packing Specification

2SD1835S, 2SD1835T

1. Packing condition

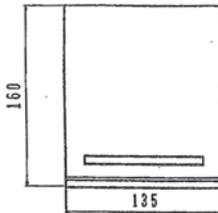
Storage package outline name	Maximum number of devices contained (pcs.)		Packing condition	
	Bags	Inner box	Devices contained	Outer box ( A-1 )
NP	500	B-1 Inner box dimensions : mm (external) 445×225×55	10,000	Outer box ( A-1 ) 5 inner boxes contained 50,000 Outer box dimensions : mm (external) 470 × 250 × 300
				Outer box ( A-2 ) 3 inner boxes contained 30,000 Outer box dimensions : mm (external) 470 × 250 × 190

3. Bar code label

(Unit : mm)

2. Bag dimensions

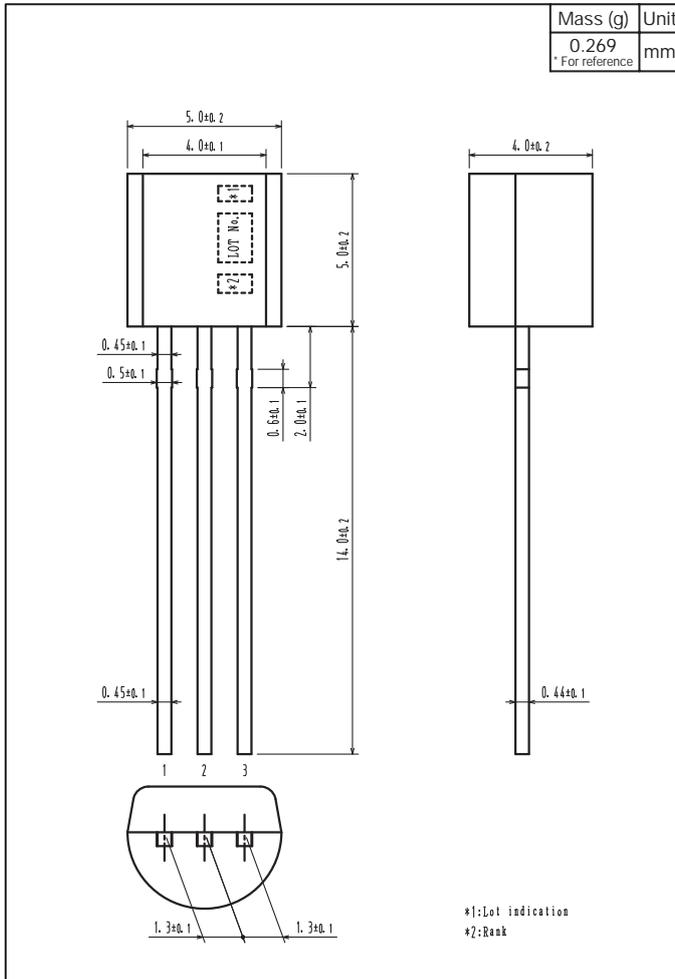
(Unit : mm)



\*LEAD FREE 1 :  
Lead-free External terminal surface treatment product.

Outline Drawing

2SD1835S, 2SD1835T



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