Ordering number : EN2158B

2SD1835

Bipolar Transistor
50V, 2A, Low V_{CE}(sat), NPN Single NP

ON Semiconductor®
http://onsemi.com

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

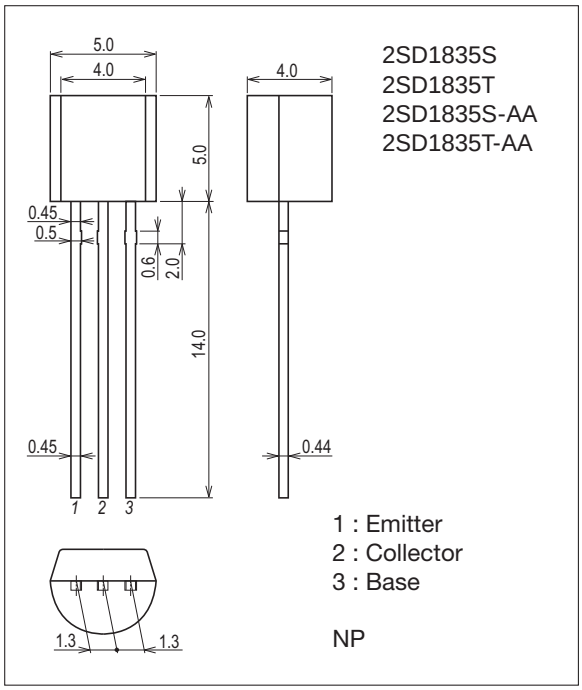
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		60	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}		3	A
Collector Dissipation	P_C		0.75	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

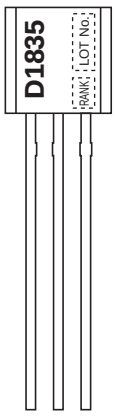
unit : mm (typ)
7522-002



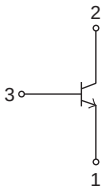
Product & Package Information

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

Marking



Electrical Connection



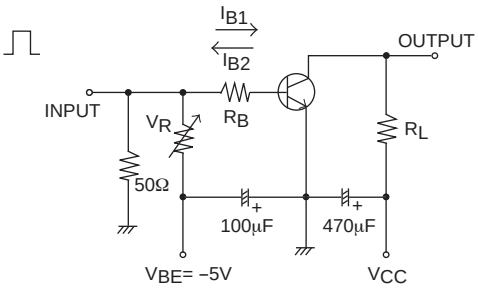
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=50V, I_E=0A			100	nA
Emitter Cutoff Current	I_{EBO}	V_{EB}=4V, I_C=0A			100	nA
DC Current Gain	$h_{FE}1$	V_{CE}=2V, I_C=100mA	100*		560*	
	$h_{FE}2$	V_{CE}=2V, I_C=1.5A	40			
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=50mA		150		MHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		12		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=1A, I_B=50mA		0.15	0.4	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	60			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.		60		ns
Storage Time	t_{stg}			550		ns
Fall Time	t_f			30		ns

* : The 2SD1835 is 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

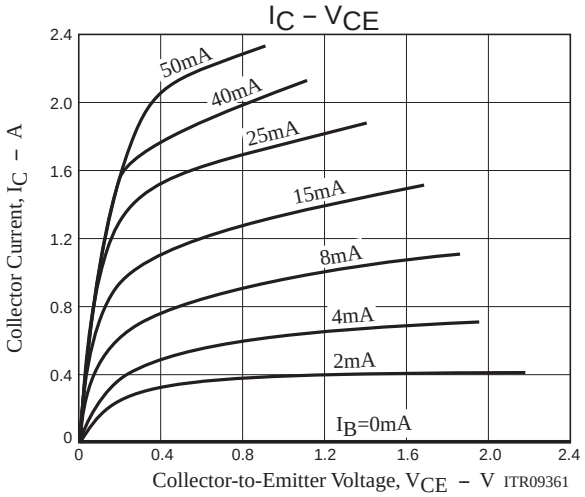
Switching Time Test Circuit

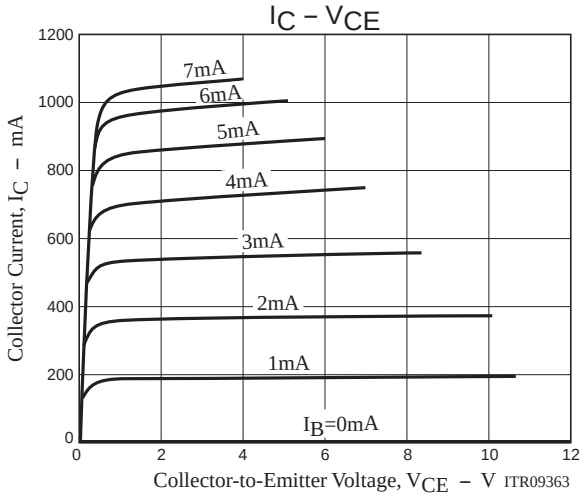


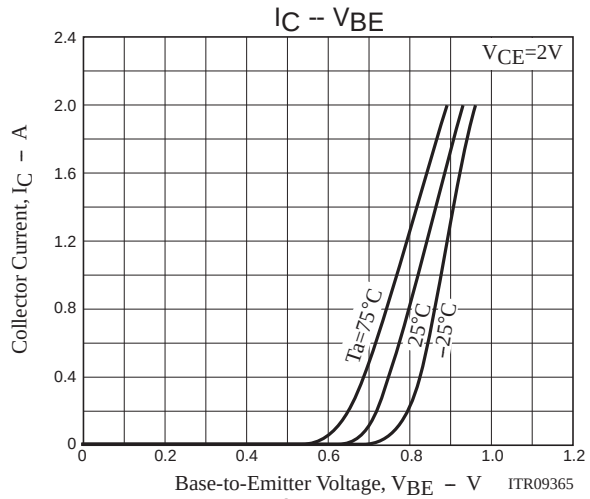
I_C=10I_{B1}= −10I_{B2}=500mA, V_{CC}=25V

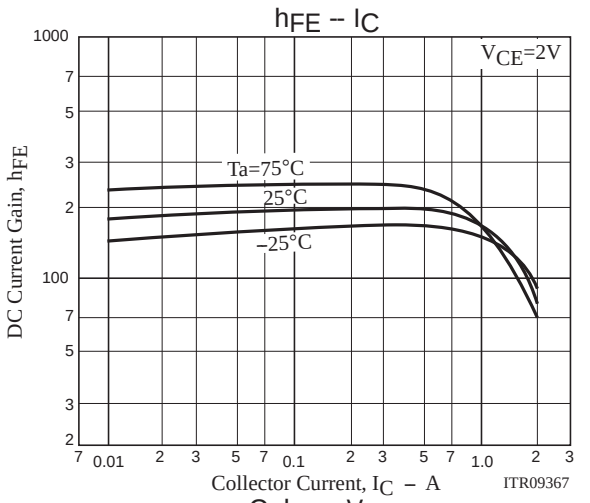
Ordering Information

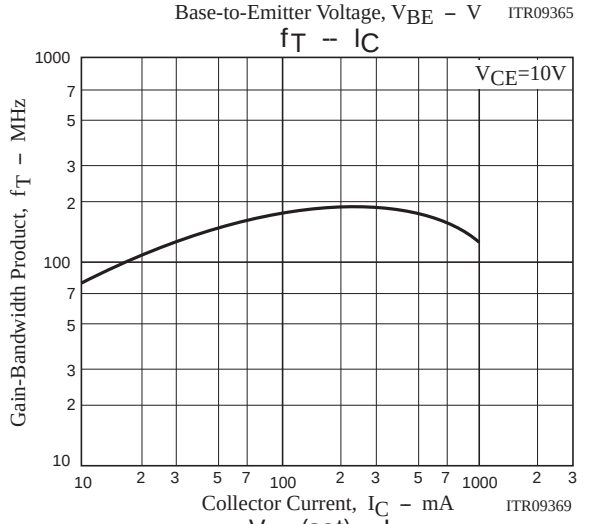
Device	Package	Shipping	memo
2SD1835S	NP	500pcs./bag	Pb Free
2SD1835T	NP	500pcs./bag	
2SD1835S-AA	NP	1,500pcs./box	
2SD1835T-AA	NP	1,500pcs./box	

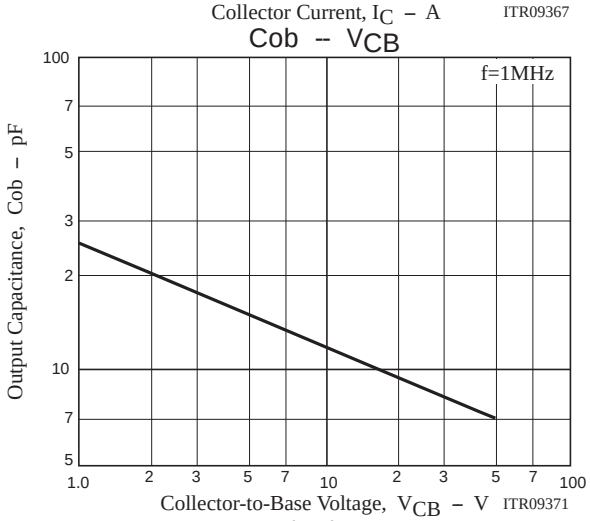


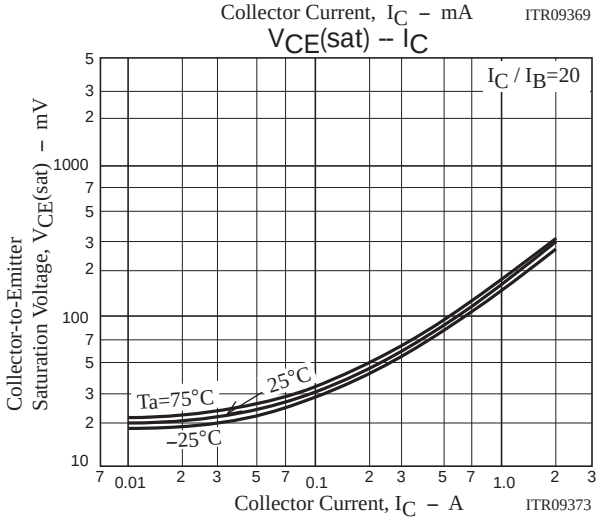


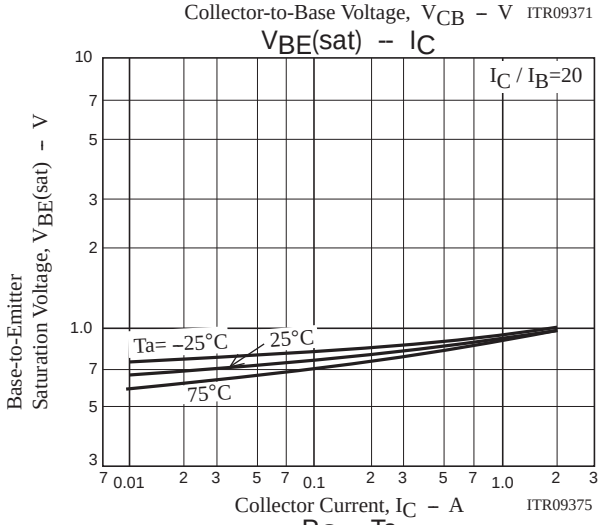

IC -- VBE
VCE=2V
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
Ta=75°C
25°C
–25°C
ITR09365

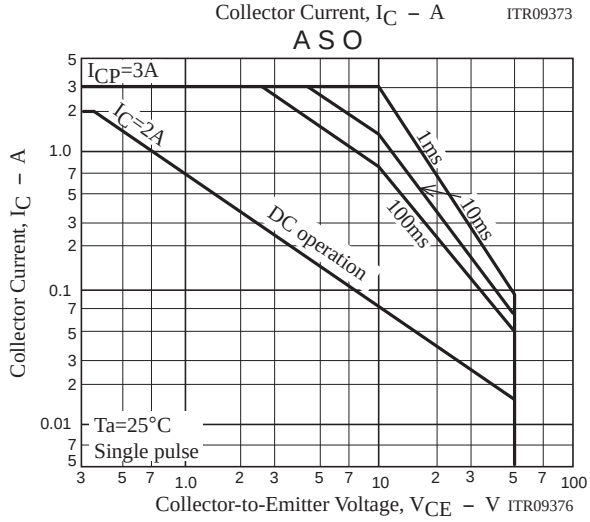

hFE -- IC
VCE=2V
DC Current Gain, hFE
Collector Current, IC – A
Ta=75°C
25°C
–25°C
ITR09367

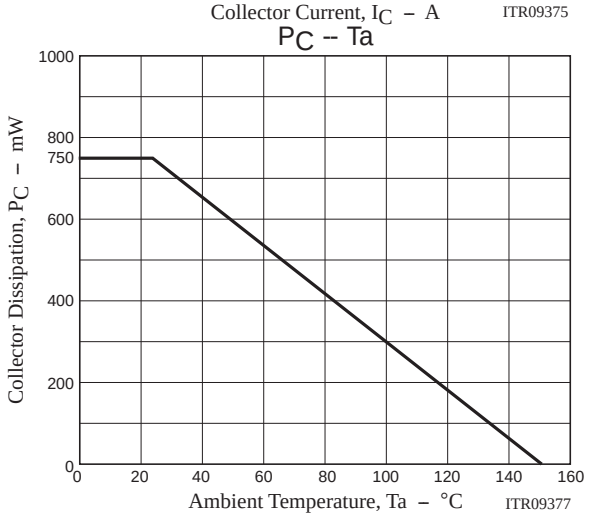

fT – IC
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA
ITR09369


Cob -- VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
ITR09371


VCE(sat) -- IC
IC / IB=20
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
Ta=75°C
25°C
–25°C
ITR09373


VBE(sat) -- IC
IC / IB=20
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
Ta= –25°C
25°C
75°C
ITR09375


A S O
ICP=3A
IC=2A
1ms
10ms
100ms
DC operation
Ta=25°C
Single pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR09376


PC -- Ta
Collector Dissipation, PC – mW
Ambient Temperature, Ta – °C
ITR09377

Taping Specification

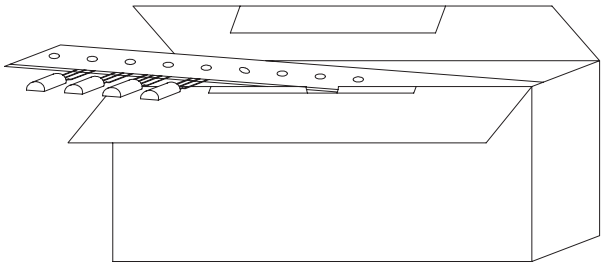
2SD1835S-AA, 2SD1835T-AA

1. Packing Format

Package Name	Packing Type	Maximum Number of devices contained (pcs)		Packing format
		Inner BOX (C-2)	number of contained	Outer BOX (C-6)
N P	A A	Dimensions:mm (external) 330×45×145	1, 500	16 inner boxes contained (24, 000pcs) Dimensions:mm (external) 585×345×200

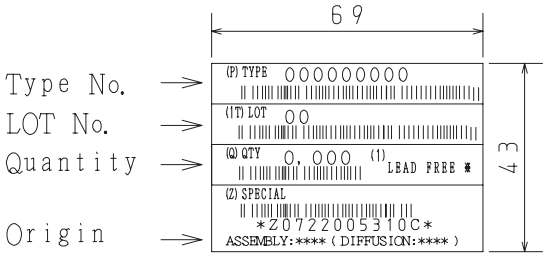
Packing method

Put zigzag folding in an inner box.



Inner box label

(unit:mm)



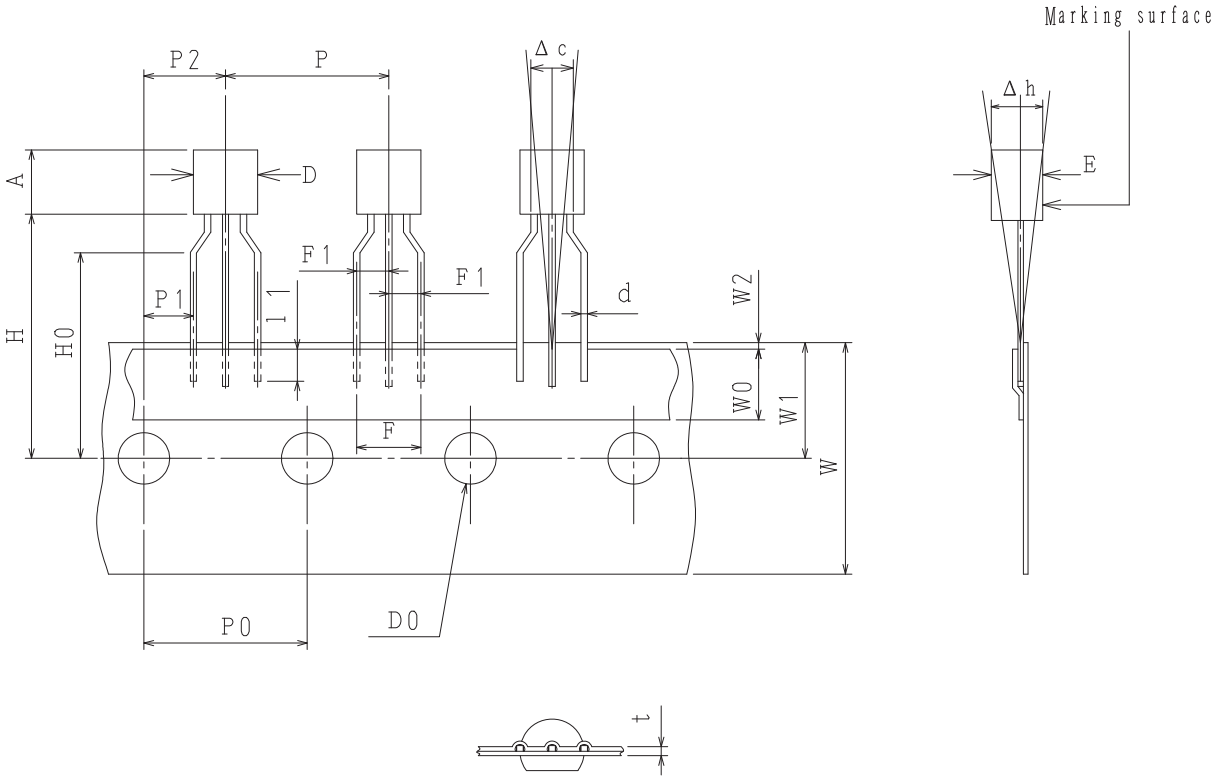
NOTE (1)

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	△h	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

Item	Symbol	Standard	Tolerance
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	△c	0	±1.0

Bag Packing Specification

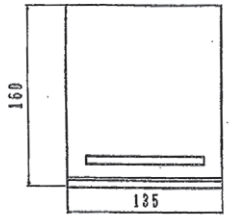
2SD1835S, 2SD1835T

1 . Packing condition

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

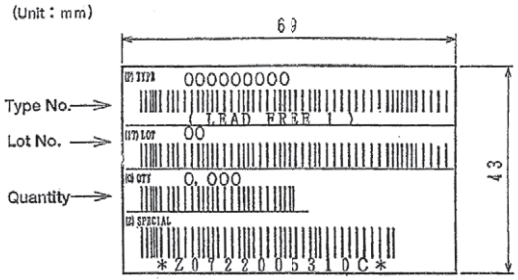
2. Bag dimensions

(Unit : mm)



3. Bar code label

(Unit : mm)



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

Outline Drawing

2SD1835S, 2SD1835T

Mass (g)	Unit
0.269 * For reference	mm