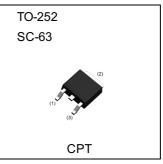


Power Transistor (100V, 2A)

Parameter	Value
V <sub>CEO</sub>	100V
Ι <sub>C</sub>	2A
R <sub>1</sub>	3.5kΩ
R <sub>2</sub>	300Ω

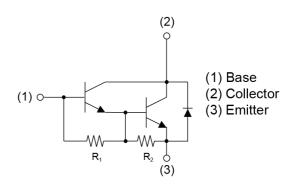
## Outline



## Features

- 1)Darlington connection for high DC current again.
- 2)Built-in resistor between base and emitter.
- 3)Built -in damper diode.
- 4)Complements the 2SB1316.

## Inner circuit



## Application

RELAY DRIVE, MOTOR DRIVE

## Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
2SD1980	TO-252 (CPT)	6595	TL	330	16	2500	D1980

## ●Absolute maximum ratings (T<sub>a</sub> = 25°C)

Parameter	Symbol	Values	Unit
Collector-base voltage	V <sub>CBO</sub>	100	V
Collector-emitter voltage	V <sub>CEO</sub>	100	V
Emitter-base voltage	V <sub>EBO</sub>	6	V
	I <sub>C</sub>	2	А
Collector current	I <sub>CP</sub> *1	3	А
	PD	1.0	W
Power dissipation	P <sub>D</sub> <sup>*2</sup>	10	W
Junction temperature	T <sub>j</sub>	150	°C
Range of storage temperature	T <sub>stg</sub>	-55 to +150	°C

## •Electrical characteristics (T<sub>a</sub> = 25°C)

Deremeter	Symbol	Conditions	Values			Unit
Parameter	Symbol Conditions –		Min.	Тур.	Max.	Unit
Collector-base breakdown voltage	BV <sub>CBO</sub>	Ι <sub>C</sub> = 50μΑ	100	-	-	V
Collector-emitter breakdown voltage	BV <sub>CEO</sub>	I <sub>C</sub> = 5mA	100	-	-	V
Emitter-base breakdown voltage	BV <sub>EBO</sub>	I <sub>E</sub> = 5mA	6	-	-	V
Collector cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> = 100V	-	-	10	μA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> = 5V	-	-	3	mA
Collector-emitter saturation voltage	V <sub>CE(sat)</sub> *3	I <sub>C</sub> = 1A, I <sub>B</sub> = 1mA	-	-	1.5	V
DC current gain	$h_{FE}^{*3}$	V <sub>CE</sub> = 2V, I <sub>C</sub> = 1A	1k	-	10k	-
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> = 5V, I <sub>E</sub> = -0.1A, f = 30MHz	-	80	-	MHz
Output capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10V, I <sub>E</sub> = 0A, f = 1MHz	-	25	-	pF

\* Pw=100ms, Single Pulse.

\*2 Tc=25°**C** 

\*3 Pulsed



## •Electrical characteristic curves(T<sub>a</sub> = 25°C)

Fig.1 Ground Emitter Propagation

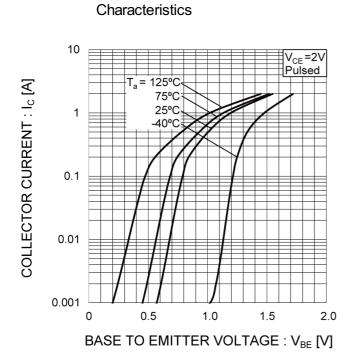
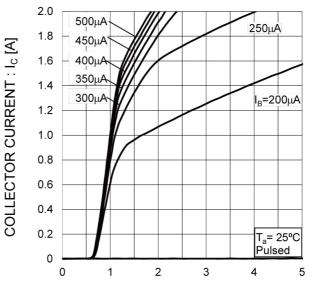


Fig.2 Typical Output Characteristics

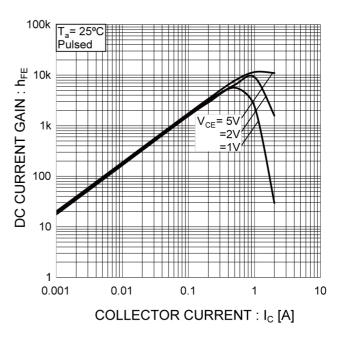


COLLECTOR TO EMITTER VOLTAGE :  $V_{CE}$  [V]

Fig.3 DC Current Gain vs. Collector Current (I)

100k V<sub>CF</sub>= 2V Pulsed T<sub>a</sub> = 125⁰C DC CURRENT GAIN : hee 10k 75°C 25°C 40°C 1k 100 10 1 0.001 0.01 0.1 1 10 COLLECTOR CURRENT : Ic [A]

Fig.4 DC Current Gain vs. Collector Current (II)





## ●Electrical characteristic curves(T<sub>a</sub> = 25°C)

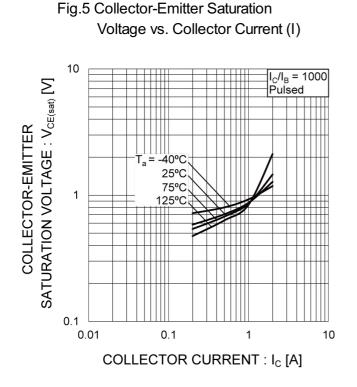


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

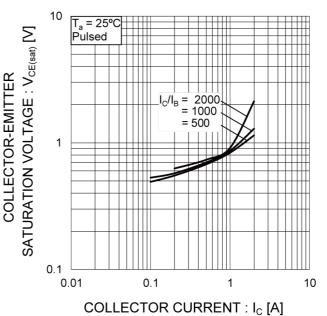


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

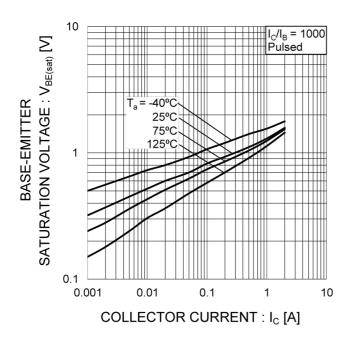
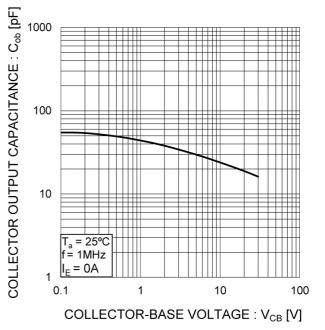
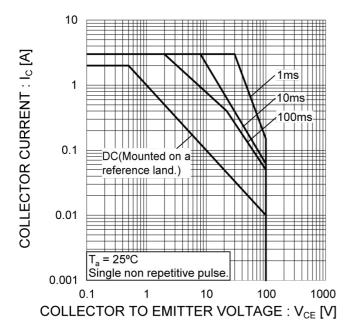


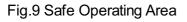
Fig.8 Collector Output Capacitance vs. Collector-Base Voltage





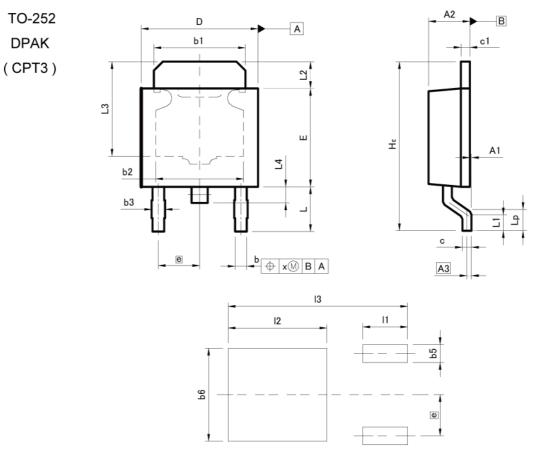
## • Electrical characteristic curves( $T_a = 25^{\circ}C$ )







### Dimensions



Pattern of terminal position areas [Not a pattern of soldering pads]

DIM	MILIMETERS		INC	HES	
	MIN	MAX	MIN	MAX	
A1	0.00	0.15	0.000	0.006	
A2	2.20	2.50	0.087	0.098	
A3	0.	25	0.010		
b	0.55	0.75	0.022	0.030	
b1	5.00	5.30	0.197	0.209	
b2	4.	90	0.1	93	
b3	0.	75	0.0	30	
С	0.40	0.60	0.016	0.024	
c1	0.40	0.60	0.016	0.024	
D	6.30	6.70	0.248	0.264	
E	5.40	5.80	0.213	0.228	
е	2.	30	0.0	0.091	
HE	9.00	10.00	0.354	0.394	
L	2.20	2.80	0.087	0.110	
L1	0.80	1.40	0.031	0.055	
L2	1.20	1.80	0.047	0.071	
L3	5.30		0.2	0.209	
L4	0.	90	0.0		
Lp	1.00	1.60	0.039	0.063	
х	_	0.25	-	0.010	
	MILIM	ETERS	INC	HES	
DIM	MIN	MAX	MIN	MAX	
b5	_	1.00	-	0.04	
b6	-	5.20	-	0.205	
11	-	2.50	-	0.098	
12	-	5.50	-	0.217	
13	-	10.00		0.394	

Dimension in mm/inches



# Notice

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(Note1) Medical Equipment Classification of the Specific Applications
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JÁPAN	USA	EU	CHINA
CLASSⅢ	CLASSⅢ	CLASS II b	CLASSII
CLASSⅣ	CLASSII	CLASSⅢ	CLASSI

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  - [b] Installation of redundant circuits to reduce the impact of single or multiple circuit failure
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  - [b] Use of our Products outdoors or in places where the Products are exposed to direct sunlight or dust
  - [c] Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, and NO<sub>2</sub>
  - [d] Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
  - [e] Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
  - [f] Sealing or coating our Products with resin or other coating materials
  - [g] Use of our Products without cleaning residue of flux (even if you use no-clean type fluxes, cleaning residue of flux is recommended); or Washing our Products by using water or water-soluble cleaning agents for cleaning residue after soldering
  - [h] Use of the Products in places subject to dew condensation
- 4. The Products are not subject to radiation-proof design.
- 5. Please verify and confirm characteristics of the final or mounted products in using the Products.
- 6. In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse. is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.
- 7. De-rate Power Dissipation depending on ambient temperature. When used in sealed area, confirm that it is the use in the range that does not exceed the maximum junction temperature.
- 8. Confirm that operation temperature is within the specified range described in the product specification.
- 9. ROHM shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

#### Precaution for Mounting / Circuit board design

- 1. When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.
- 2. In principle, the reflow soldering method must be used on a surface-mount products, the flow soldering method must be used on a through hole mount products. If the flow soldering method is preferred on a surface-mount products, please consult with the ROHM representative in advance.

For details, please refer to ROHM Mounting specification

#### Precautions Regarding Application Examples and External Circuits

- 1. If change is made to the constant of an external circuit, please allow a sufficient margin considering variations of the characteristics of the Products and external components, including transient characteristics, as well as static characteristics.
- 2. You agree that application notes, reference designs, and associated data and information contained in this document are presented only as guidance for Products use. Therefore, in case you use such information, you are solely responsible for it and you must exercise your own independent verification and judgment in the use of such information contained in this document. ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of such information.

#### **Precaution for Electrostatic**

This Product is electrostatic sensitive product, which may be damaged due to electrostatic discharge. Please take proper caution in your manufacturing process and storage so that voltage exceeding the Products maximum rating will not be applied to Products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of lonizer, friction prevention and temperature / humidity control).

#### Precaution for Storage / Transportation

- 1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
  - [a] the Products are exposed to sea winds or corrosive gases, including Cl2, H2S, NH3, SO2, and NO2
  - [b] the temperature or humidity exceeds those recommended by ROHM
  - [c] the Products are exposed to direct sunshine or condensation
  - [d] the Products are exposed to high Electrostatic
- 2. Even under ROHM recommended storage condition, solderability of products out of recommended storage time period may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is exceeding the recommended storage time period.
- 3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.
- 4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

#### **Precaution for Product Label**

A two-dimensional barcode printed on ROHM Products label is for ROHM's internal use only.

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When disposing Products please dispose them properly using an authorized industry waste company.

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## 2SD1980 - Web Page

**Distribution Inventory** 

Part Number	2SD1980
Package	CPT3
Unit Quantity	2500
Minimum Package Quantity	2500
Packing Type	Taping
Constitution Materials List	inquiry
RoHS	Yes