

# 2SD1645

## Silicon NPN epitaxial planar type darlington

For low frequency amplification

### ■ Features

- Built-in zener diode (60 V) between collector-base and collector-emitter
- Small variation in withstand pressure
- Darlington connection
- Extremely satisfactory linearity of the forward current transfer ratio  $h_{FE}$

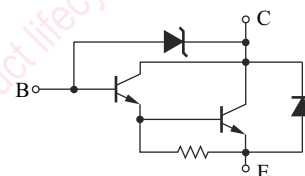
### ■ Package

- Code TO-126B-A1
- Pin Name
  1. Emitter
  2. Collector
  3. Base

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

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	$V_{CBO}$	60±10	V
Collector-emitter voltage (Base open)	$V_{CEO}$	60±10	V
Emitter-base voltage (Collector open)	$V_{EBO}$	5	V
Collector current	$I_C$	1.0	A
Peak collector current	$I_{CP}$	1.5	A
Collector power dissipation	$P_C$	1.2	W
		5.0 *	
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

### ■ Internal Connection



Note) \*: With a 100 mm × 100 mm × 2 mm Al heat sink at  $T_a = 25^\circ\text{C}$

### ■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	$V_{CBO}$	$I_C = 100 \mu\text{A}, I_E = 0$	50		70	V
Collector-emitter voltage (Base open)	$V_{CEO}$	$I_C = 1 \text{ mA}, I_B = 0$	50		70	V
Emitter-base voltage (Collector open)	$V_{EBO}$	$I_E = 100 \mu\text{A}, I_C = 0$	5			V
Collector-base cutoff current (Emitter open)	$I_{CBO}$	$V_{CB} = 25 \text{ V}, I_E = 0$			1	$\mu\text{A}$
Emitter-base cutoff current (Collector open)	$I_{EBO}$	$V_{EB} = 4 \text{ V}, I_C = 0$			1	$\mu\text{A}$
Forward current transfer ratio *1	$h_{FE}^{*2}$	$V_{CE} = 10 \text{ V}, I_C = 1.0 \text{ A}$	4000		40000	—
Collector-emitter saturation voltage *1	$V_{CE(sat)}$	$I_C = 1.0 \text{ A}, I_B = 1.0 \text{ mA}$			1.8	V
Base-emitter saturation voltage *1	$V_{BE(sat)}$	$I_C = 1.0 \text{ A}, I_B = 1.0 \text{ mA}$			2.2	V
Transition frequency	$f_T$	$V_{CB} = 10 \text{ V}, I_E = -50 \text{ mA}, f = 200 \text{ MHz}$		150		MHz

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

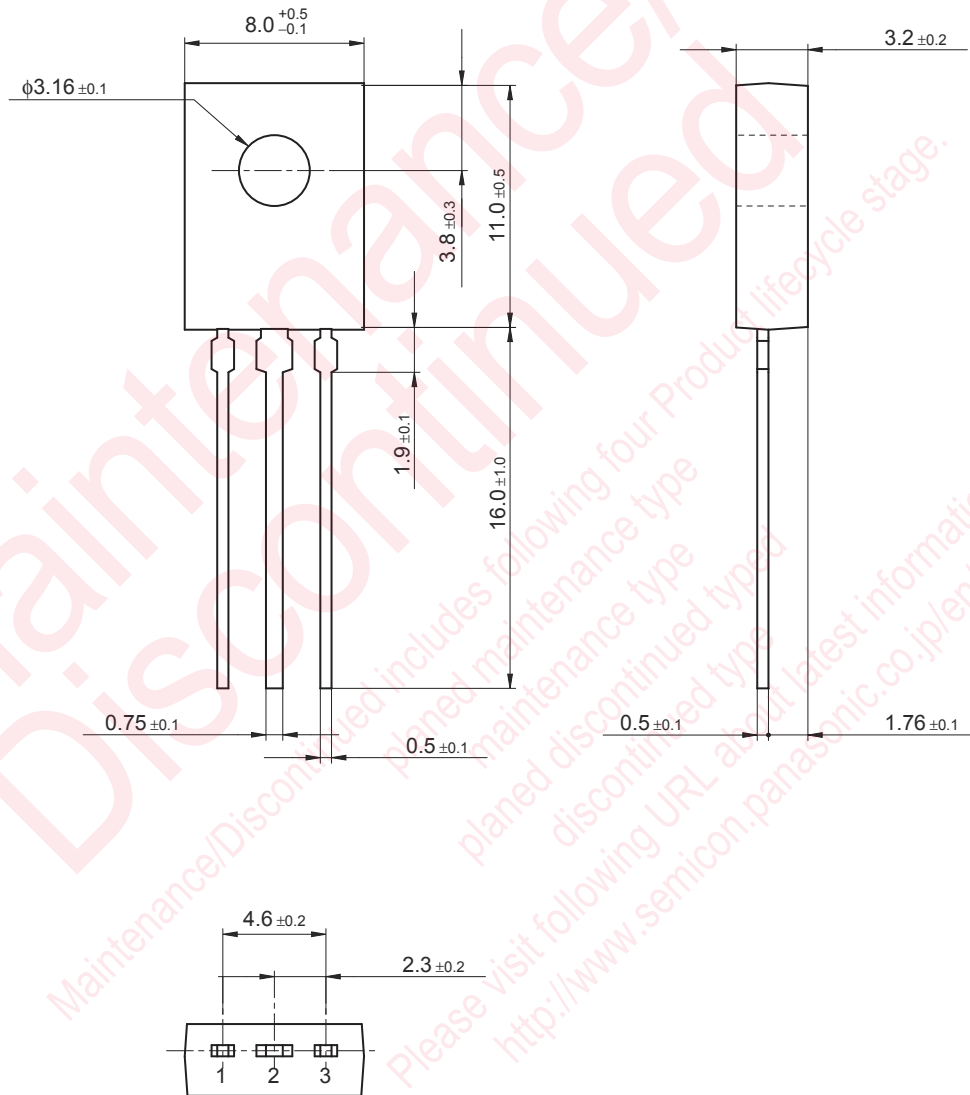
2. \*1: Pulse measurement

\*2: Rank classification

Rank	Q	R	S
$h_{FE}$	4000 to 10000	8000 to 12000	16000 to 40000

TO-126B-A1

Unit: mm



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