

Darlington Transistors with Built-in Zener Diode

We have developed the following Darlington transistor series containing a C-B Zener diode to provide protection against surge at the inductive load mode.

Features

- ★ Stable Zener voltage because of precision diffusion process technology.
- ★ High surge handling capability and stable operation at the inductive load mode because of on-chip stable Zener diode connected across collector and base.
- ★ Capable of effectively providing protection against surge from L because high h_{FE} lightens the burden imposed on the Zener diode.
- ★ Especially suited for switching use at the inductive load mode.

Medium-Speed Type ($T_a=25^\circ\text{C}$)

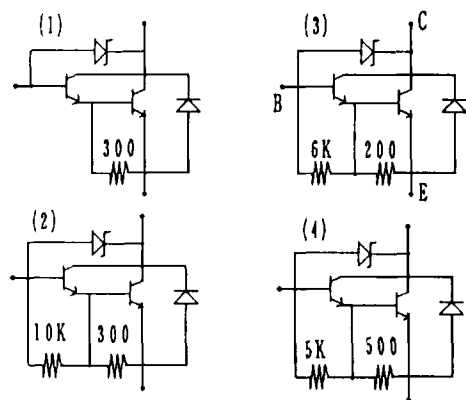
$P_c \propto T_c=25^\circ\text{C}$.

Type No.	V_{CBO}	V_{CEO}	I_C	P_C	h_{FE}	$V_{CE(sat)}$	*Es/b	Package	Equivalent Circuit
2SD1395	$60 \pm 10\text{V}$	$60 \pm 10\text{V}$	5A	*40W	3V, 2.5A 1000~	2.5A, 5mA max 1.5V	min 50mJ	TO-220	(3)
2SC4547	$95 \pm 10\text{V}$	$95 \pm 10\text{V}$	3A	*30W	3V, 1.5A 2000~	1.5V, 3mA max 1.5V	min 15mJ		(3)
2SD1838	$60 \pm 10\text{V}$	$60 \pm 10\text{V}$	5A	*25W	3V, 2.5A 1000~	2.5A, 5mA max 1.5V	min 50mJ	TO-220ML	(3)

High-Speed Type ($T_a=25^\circ\text{C}$)

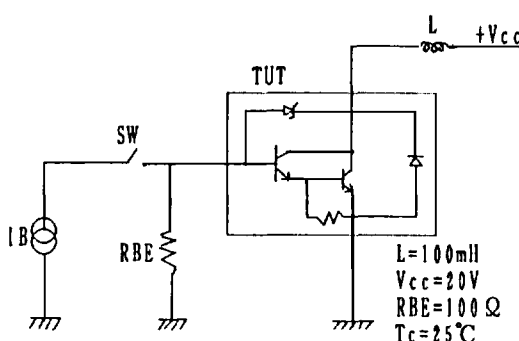
$P_c \propto T_c=25^\circ\text{C}$. Mounted on ceramic board (250mm $\times$ 0.8mm).

2SD2176	$60 \pm 10\text{V}$	$60 \pm 10\text{V}$	1.2A	☆1.3W	3V, 0.5A 1000~2000	0.5A, 1mA max 1.5V	min 15mJ	PCP	(4)
2SC4169	$60 \pm 10\text{V}$	$60 \pm 10\text{V}$	1.2A	1W	5V, 0.5A 1000~	0.5A, 2mA max 1.5V	min 50mJ	MP	(1)
2SC4671	$60 \pm 10\text{V}$	$60 \pm 10\text{V}$	2A	1W	5V, 1A 1000~	1A, 4mA max 1.5V	min 25mJ	NMP	(2)
2SC4696	$90 \pm 10\text{V}$	$90 \pm 10\text{V}$	0.8A	1W	3V, 0.5A 1000~	0.5A, 1mA max 1.5V	min 25mJ		(4)
2SC4737	$60 \pm 10\text{V}$	$60 \pm 10\text{V}$	2A	1.5W	5V, 1A 1000~	1A, 4mA max 1.5V	min 15mJ	FLP	(1)
2SC3705	$60 \pm 10\text{V}$	$60 \pm 10\text{V}$	1.2A	*10W	5V, 0.5A 1000~	0.5A, 2mA max 1.5V	min 15mJ	TO-126	(1)
2SC3784	$60 \pm 10\text{V}$	$60 \pm 10\text{V}$	1.2A	*20W	5V, 0.5A 1000~	0.5A, 2mA max 1.5V	min 15mJ	TO-126LP	(1)
2SC3785	$60 \pm 10\text{V}$	$60 \pm 10\text{V}$	2A	*20W	5V, 1A 1000~	1A, 4mA max 1.5V	min 25mJ		(2)
2SC3786	$60 \pm 10\text{V}$	$60 \pm 10\text{V}$	3A	*20W	5V, 1.5A 1000~	1.5A, 6mA max 1.5V	min 25mJ		(2)
2SC3293	$60 \pm 10\text{V}$	$60 \pm 10\text{V}$	2A	*20W	5V, 1A 1000~	1A, 4mA max 1.5V	min 25mJ	TO-220	(2)
2SC3986	$60 \pm 10\text{V}$	$60 \pm 10\text{V}$	2A	*15W	5V, 1A 1000~	1A, 4mA max 1.5V	min 25mJ	TO-220ML	(2)
2SC3987	$60 \pm 10\text{V}$	$60 \pm 10\text{V}$	3A	*20W	5V, 1.5A 1000~	1.5A, 6mA max 1.5V	min 30mJ		(2)
2SC4006	$50 \pm 8\text{V}$	$50 \pm 8\text{V}$	3A	*20W	5V, 1.5A 2000~	1.5A, 6mA max 1.5V	min 30mJ		(2)



Equivalent Circuit (NPN)

* Es/b Test Circuit ($T_c=25^\circ\text{C}$)



These specifications are subject to change without notice.