

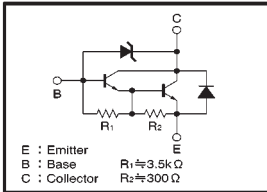
# Medium Power Transistor (Motor or Relay drive) ( $90^{+20}_{-10}$ V, $-2$ A)

2SD2170

## ●Features

- 1) Built-in zener diode between collector and base.
- 2) Zener diode has low dispersion.
- 3) Strong protection against reverse power surges due to "L" loads.
- 4) Darlington connection for high DC current gain.
- 5) Built-in resistor between base and emitter.
- 6) Built-in damper diode.

## ●Circuit diagram



## ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	80	—	110	V	$I_C = 50 \mu A$
Collector-emitter breakdown voltage	$BV_{CEO}$	80	—	110	V	$I_C = 1 mA$
Collector cutoff current	$I_{CBO}$	—	—	10	$\mu A$	$V_{CB} = 70V$
Emitter cutoff current	$I_{EBO}$	—	—	3	mA	$V_{EB} = 5V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	1.5	—	V	$I_C/I_E = 1A/1mA$ *1
DC current transfer ratio	$h_{FE}$	1000	—	10000	—	$V_{CE} = 2V, I_C = 1A$ *1
Transition frequency	$f_T$	—	80	—	MHz	$V_{CE} = 5V, I_E = -0.1A, f = 30MHz$ *2
Output capacitance	$C_{ob}$	—	25	—	pF	$V_{CB} = 10V, I_E = 0A, f = 1MHz$

\*1 Measured using pulse current.

\*2 Transition frequency of the device.

(96-241-D405)

# Medium Power Transistor (Motor or Relay drive) ( $60 \pm 10$ A, $4$ A)

2SC4574

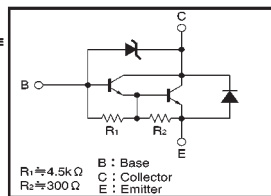
## ●Features

- 1) Built-in zener diode between collector and base.
- 2) Strong protection against reverse power surges due to "L" loads.
- 3) Built-in resistor between base and emitter.
- 4) Built-in damper diode.

## ●Packaging specifications and hFE

Type	2SC4574
Package	TO-220FP
$h_{FE}$	2k~20k
Code	—
Basic ordering unit (pieces)	500

## ●Circuit diagram



## ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	50	60	70	V	$I_C = 50 \mu A$
Collector-emitter breakdown voltage	$BV_{CEO}$	50	60	70	V	$I_C = 5mA$
Collector cutoff current	$I_{CBO}$	—	—	10	$\mu A$	$V_{CB} = 40V$
Emitter cutoff current	$I_{EBO}$	—	—	3	mA	$V_{EB} = 5V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	1	1.5	V	$I_C/I_E = 1.5A/6mA$ *1
DC current transfer ratio	$h_{FE}$	2000	—	10000	—	$V_{CE}/I_C = 5V/1.5A$ *1
Transition frequency	$f_T$	—	80	—	MHz	$V_{CE} = 5V, I_E = -0.2A, f = 30MHz$ *2
Output capacitance	$C_{ob}$	—	30	—	pF	$V_{CB} = 10V, I_E = 0A, f = 1MHz$
Turn-on time	$t_{on}$	—	0.4	—	$\mu s$	$I_C = 1.5A, R_L = 14\Omega$
Storage time	$t_{stg}$	—	1.5	—	$\mu s$	$I_{B1} = -I_{B2} = 6mA$
Fall time	$t_f$	—	0.4	—	$\mu s$	$V_{CC} \approx 20V$

\*1 Measured using pulse current.

\*2 Transition frequency of the device.

(94L-686-D406)

## ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CBO}$	$90 \pm 5$	V
Collector-emitter voltage	$V_{CES}$	$90 \pm 5$	V
Emitter-base voltage	$V_{EBO}$	6	V
Collector current	$I_C$	2	A (DC)
		3	A (Pulse) *1
Collector power dissipation	$P_C$	2	W *2
Junction temperature	$T_J$	150	°C
Storage temperature	$T_{stg}$	$-55 \sim +150$	°C

\*1 Single pulse  $P_w = 10ms, Duty = 1/2$ \*2 When mounted on a  $40 \times 40 \times 0.7$  mm ceramic board.

## ●Packaging specifications and hFE

Type	2SD2170
Package	MPT3
$h_{FE}$	1k~10k
Marking	DM
Code	T100
Basic ordering unit (pieces)	1000

## ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CBO}$	$60 \pm 10$	V
Collector-emitter voltage	$V_{CEO}$	$60 \pm 10$	V
Emitter-base voltage	$V_{EBO}$	6	V
Collector current	$I_C$	4	A (DC)
		6	A (Pulse) *
Collector power dissipation	$P_C$	5	W
		30	W ( $T_C = 25^\circ C$ )
Junction temperature	$T_J$	150	°C
Storage temperature	$T_{stg}$	$-55 \sim +150$	°C

\* Single pulse,  $P_w = 100ms$