

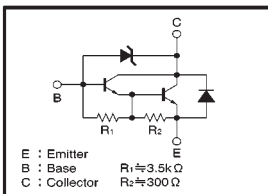
Medium Power Transistor (Motor or Relay drive) (90^{+20}_{-10} V, -2 A)

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 ($T_a=25^\circ\text{C}$)

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

*1 Measured using pulse current.

*2 Transition frequency of the device.

●Absolute maximum ratings ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	$90 \pm \frac{20}{10}$	V
Collector-emitter voltage	V_{CES}	$90 \pm \frac{20}{10}$	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	$^\circ\text{C}$
Storage temperature	T_{stg}	$-55 \sim +150$	$^\circ\text{C}$

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

●Packaging specifications and hFE

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

(96-241-D405)

Medium Power Transistor (Motor or Relay drive) (60 ± 10 A, 4A)

2SC4574

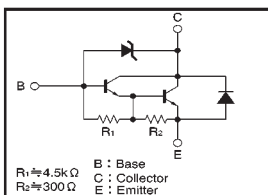
●Features

- 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}	$2k \sim 20k$
Code	—
Basic ordering unit (pieces)	500

●Circuit diagram



●Absolute maximum ratings ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	60 ± 10	V
Collector-emitter voltage	V_{CEO}	60 ± 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 ($T_C=25^\circ\text{C}$)
Junction temperature	T_J	150	$^\circ\text{C}$
Storage temperature	T_{stg}	$-55 \sim +150$	$^\circ\text{C}$

* Single pulse, $P_w=100\text{ms}$

●Electrical characteristics ($T_a=25^\circ\text{C}$)

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

*1 Measured using pulse current.

*2 Transition frequency of the device.

(94L-686-D406)