

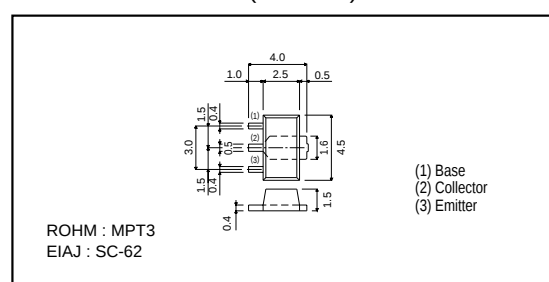
Medium Power Transistor (Motor, Relay drive) (90^{+20}_{-10} , 2A)

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.

●External dimensions (Unit : mm)



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	90^{+20}_{-10}	V
Collector-emitter voltage	V_{CEO}	90^{+20}_{-10}	V
Emitter-base voltage	V_{EBO}	6	V
Collector current	I_C	2	A (DC)
		3	A (Pulse)
Collector power dissipation	P_C	0.5 *1	W
		2 *2	
Junction temperature	T_J	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

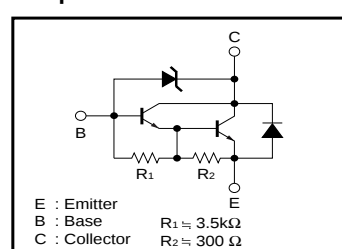
*1 Single pulse $P_W=10\text{ms}$, $Duty=1/2$

*2 When mounted on a 40 x 40 x 0.7 mm ceramic board.

●Packaging specifications and h_{FE}

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

●Equivalent circuit



●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	80	—	110	V	$I_C=50\mu\text{A}$
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 Measure using pulse current. *2 Transition frequency of the device.

Transistors

●Electrical characteristic curves

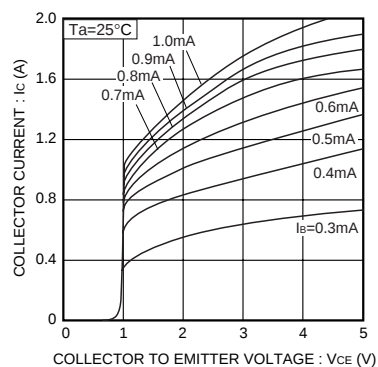


Fig.1 Grounded emitter output characteristics

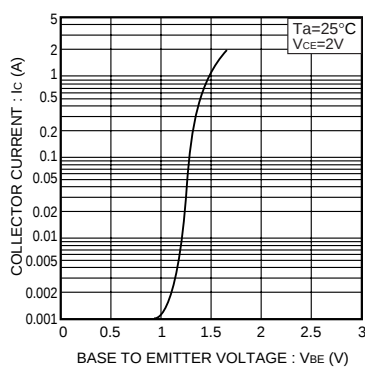


Fig.2 Grounded emitter propagation characteristics

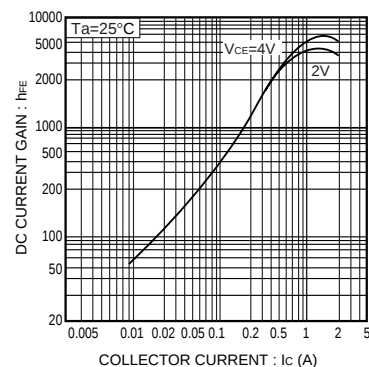


Fig.3 DC current gain vs. collector current

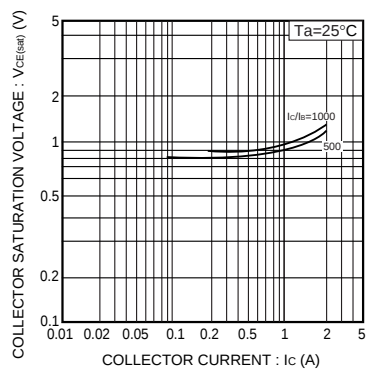


Fig.4 Collector-emitter saturation voltage vs. collector current

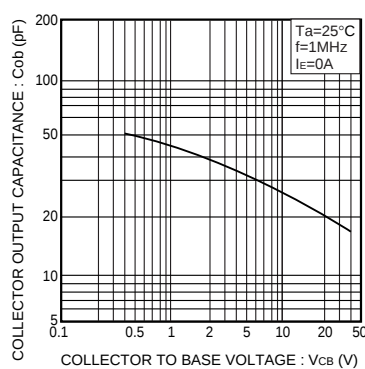


Fig.5 Collector output capacitance vs. collector-base voltage

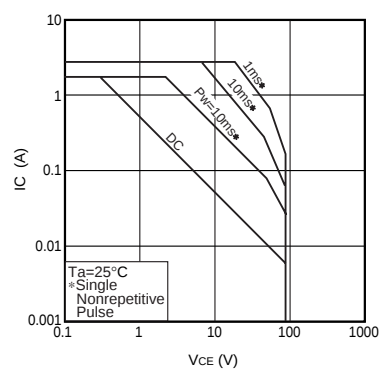


Fig.6 Safe operating area

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