

# Medium Power Transistor

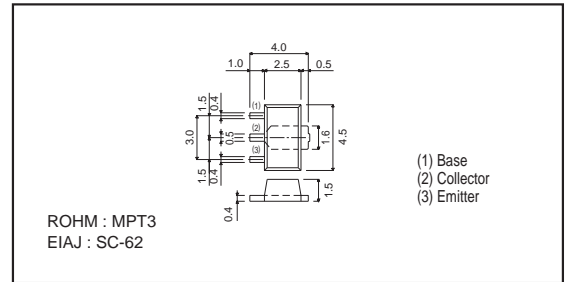
## (Motor, Relay drive) ( $90^{+20}_{-10}$ , 2A)

**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.

**●Dimensions (Unit : mm)**



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

Parameter	Symbol	Limits	Unit
Collector-base voltage	V <sub>CB0</sub>	90 $^{+20}_{-10}$	V
Collector-emitter voltage	V <sub>CE0</sub>	90 $^{+20}_{-10}$	V
Emitter-base voltage	V <sub>EBO</sub>	6	V
Collector current	I <sub>c</sub>	2	A (DC)
		3	A (Pulse)
Collector power dissipation	P <sub>c</sub>	0.5 *1	W
		2 *2	
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

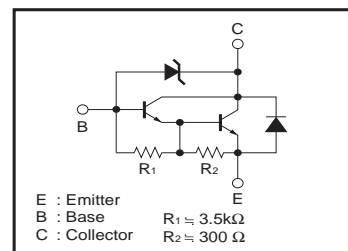
\*1 Single pulse P<sub>w</sub>=10ms,Duty=1/2

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

**●Packaging specifications and h<sub>FE</sub>**

Type	2SD2170
Package	MPT3
h <sub>FE</sub>	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 <sub>CB0</sub>	80	-	110	V	I <sub>c</sub> = 50μA
Collector-emitter breakdown voltage	BV <sub>CE0</sub>	80	-	110	V	I <sub>c</sub> = 1mA
Collector cutoff current	I <sub>cBO</sub>	-	-	10	μA	V <sub>CB</sub> = 70V
Emitter cutoff current	I <sub>EBO</sub>	-	-	3	mA	V <sub>EB</sub> = 5V
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	-	-	1.5	V	I <sub>c</sub> /I <sub>B</sub> = 1A/1mA
DC current transfer ratio	h <sub>FE</sub>	1000	-	10000	-	V <sub>CE</sub> = 2V , I <sub>c</sub> = 1A
Transition frequency	f <sub>r</sub>	-	80	-	MHz	V <sub>CE</sub> = 5V , I <sub>E</sub> = -0.1A , f = 30MHz
Output capacitance	C <sub>ob</sub>	-	25	-	pF	V <sub>CB</sub> = 10V , I <sub>E</sub> = 0A , f = 1MHz

\*1 Measured using pulse current.

\*2 Transition frequency of the device.

●Electrical characteristic curves

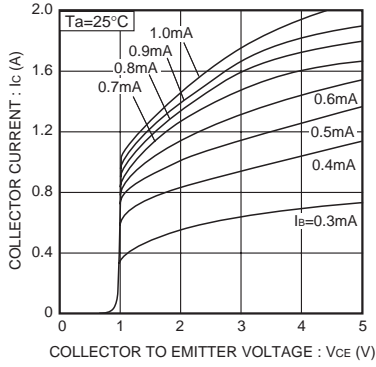


Fig.1 Grounded emitter output characteristics

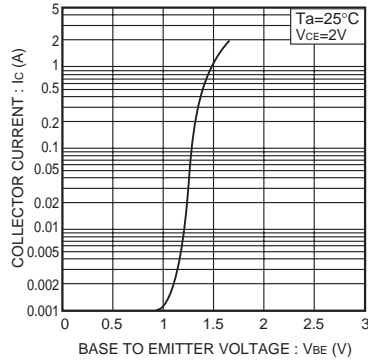


Fig.2 Grounded emitter propagation characteristics

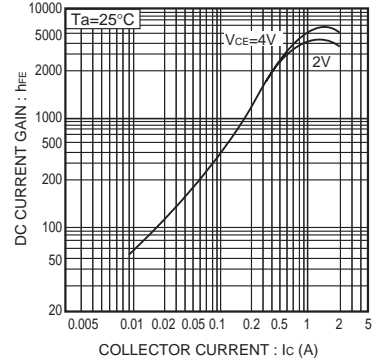


Fig.3 DC current gain vs. collector current

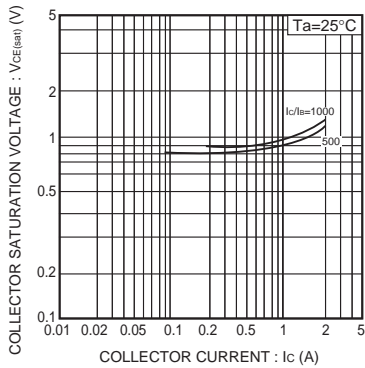


Fig.4 Collector-emitter saturation voltage vs. collector current

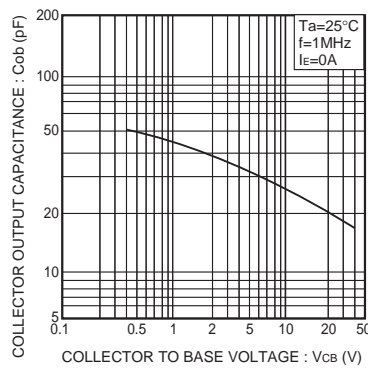


Fig.5 Collector output capacitance vs. collector-base voltage

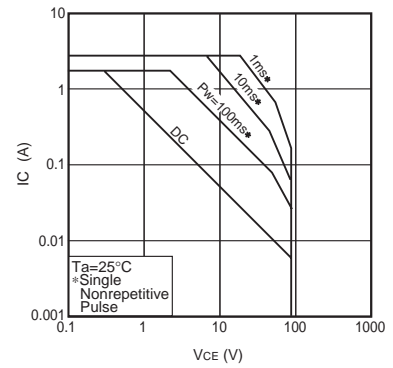


Fig.6 Safe operating area

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