

# Medium Power Transistor

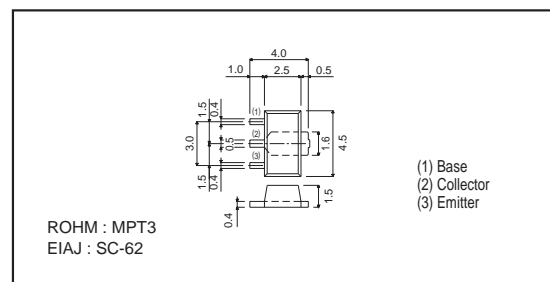
## (Motor, Relay drive) ( $90^{+20}_{-10}$ , 2A)

**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	$V_{CBO}$	$90^{+20}_{-10}$	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

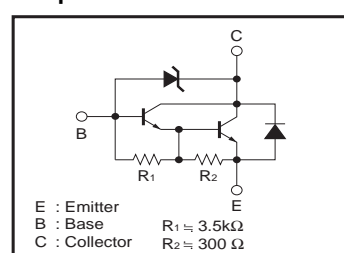
\*1 Single pulse  $P_w=10ms$ ,  $Duty=1/2$

\*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	$I_C = 50\mu A$
Collector-emitter breakdown voltage	$BV_{CEO}$	80	-	110	V	$I_C = 1mA$
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	$I_C/I_B = 1A/1mA$ *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.

# ●Electrical characteristic curves

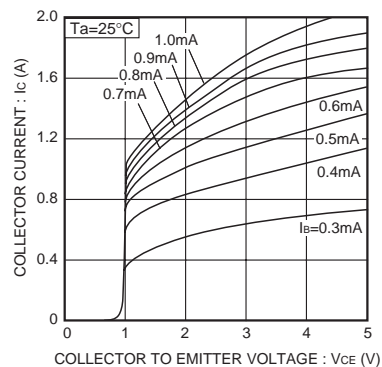


Fig.1 Grounded emitter output characteristics

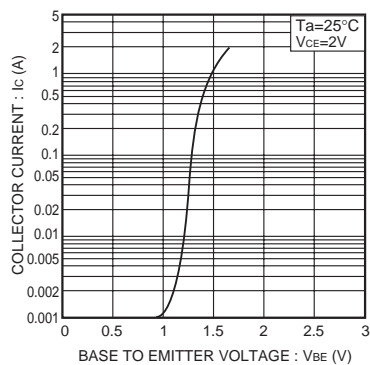


Fig.2 Grounded emitter propagation characteristics

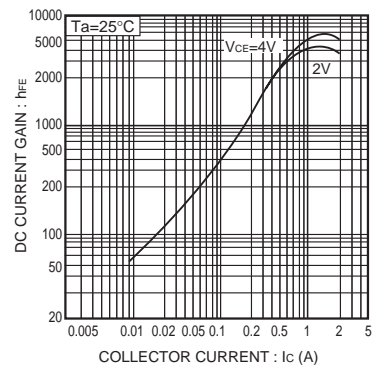


Fig.3 DC current gain vs. collector current

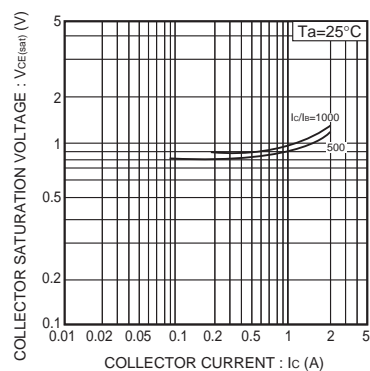


Fig.4 Collector-emitter saturation voltage vs. collector current

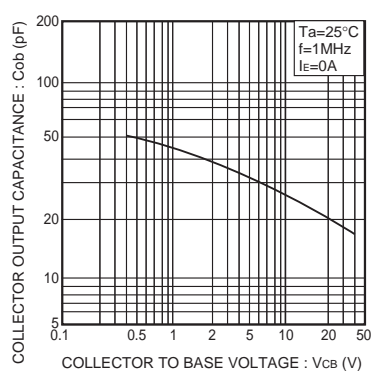


Fig.5 Collector output capacitance vs. collector-base voltage

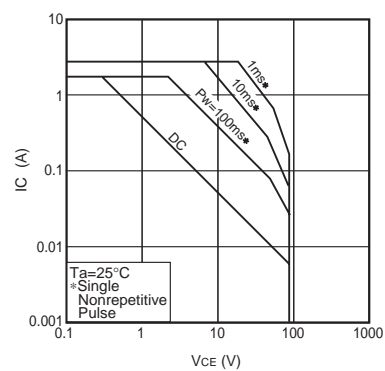


Fig.6 Safe operating area

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