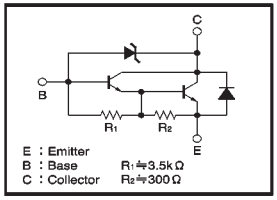
Medium Power Transistor (Motor, Relay or Solenoid drive) (60±10V, 2A)

2SD2212 / 2SD2143 / 2SD1866 / 2SD1764

●**Features**

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

●**Circuit diagram**



●**Absolute maximum ratings** (Ta=25℃)

Parameter		Symbol	Limits	Unit
Collector-base voltage		V_{CBO}	60±10	V
Collector-emitter voltage		V_{CES}	60±10	V
Emitter-base voltage		V_{EBO}	6	V
Collector current		I_C	2	A (DC)
			3	A (Pulse) ✻1
Collector power dissipation	2SD2212	P_C	2	W ✻2
	2SD2143		10	W (Tc=25℃)
	2SD1866		1	W ✻3
	2SD1764		20	W (Tc=25℃)
Junction temperature		Tj	150	℃
Storage temperature		Tstg	−55～+150	℃

✻1 Single pulse Pw=100ms ✻2 When mounted on a 40×40×0.7mm ceramic board.
✻3 Printed circuit board 1.7mm thick, collector plating 1cm² or larger.

●**Packaging specifications and h_{FE}**

Type	2SD2212	2SD2143	2SD1866	2SD1764
Package	MPT3	CPT3	ATV	TO-220FP
h_{FE}	1k～10k	1k～10k	1k～10k	1k～10k
Code	T100	TL	TV2	—
Basic ordering unit (pieces)	1000	2500	2500	500

●**Electrical characteristics** (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	50	—	70	V	I_C=50μA
Collector-emitter breakdown voltage	BV_{CEO}	50	—	70	V	I_C=5mA
Collector cutoff current	I_{CBO}	—	—	1.0	μA	V_{CB}=40V
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 ✻
DC current transfer ratio	h_{FE}	1000	—	10000	—	V_{CE}=2V, I_C=1A
Output capacitance	Cob	—	25	—	pF	V_{CB}=10V, I_E=0A, f=1MHz

✻ Measured using pulse current.

(96-762-D84)

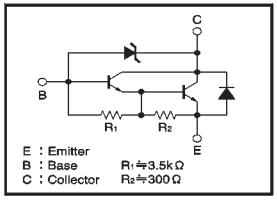
Medium Power Transistor (Motor, Relay or Solenoid drive) (60±10V, 5A)

2SD1856

●**Features**

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

●**Circuit diagram**



●**Absolute maximum ratings** (Ta=25℃)

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	5	A (DC)
		10	A (Pulse) ✻
Collector power dissipation	P_C	2	W
		25	W (Tc=25℃)
Junction temperature	Tj	150	℃
Storage temperature	Tstg	−55～+150	℃

✻ Single pulse Pw=10ms

●**Packaging specifications and h_{FE}**

Type	2SD1856
Package	TO-220FP
h_{FE}	2k～30k
Code	—
Basic ordering unit (pieces)	500

●**Electrical characteristics** (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	50	—	70	V	I_C=50μA
Collector-emitter breakdown voltage	BV_{CEO}	50	—	70	V	I_C=5mA
Collector cutoff current	I_{CBO}	—	—	10	μA	V_{CB}=40V
Emitter cutoff current	I_{EBO}	—	—	3	mA	V_{EB}=5V
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	1.5	V	I_C/I_B=2A/2mA ✻
DC current transfer ratio	h_{FE}	2000	—	30000	—	V_{CE}/I_C=3V/2A ✻
Output capacitance	Cob	—	75	—	pF	V_{CB}=10V, I_E=0A, f=1MHz

✻ Measured using pulse current.

(94L-885-D87)