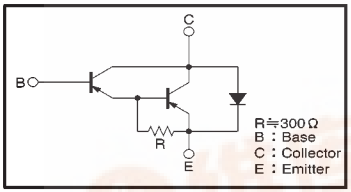
Medium Power Transistor (Motor or Relay drive) (−80V, −4A)

2SB1616

●Features
1) Darlington connection for a high h_{FE}.
2) Built-in resistor between base and emitter.
3) Built-in damper doide.
4) Complements the 2SD2478.

●Circuit diagram



●Absolute maximum ratings (Ta=25℃)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	−80	V
Collector-emitter voltage	V_{CEO}	−80	V
Emitter-base voltage	V_{EBO}	−7	V
Collector current	I_C	−4	A
	I_{CP}	−6	A (Pulse) ✻
Collector power dissipation	P_C	2	W (Ta=25℃)
		30	W (Tc=25℃)
Junction temperature	Tj	150	℃
Storage temperature	Tstg	−55～+150	℃

✻ Single pulse, Pw=100ms

●Packaging specifications and h_{FE}

Type	2SB1616
Package	TO-220FP
h_{FE}	1k～10k
Code	—
Basic ordering unit (pieces)	500

●Electrical characteristics (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	BV_{CEO}	−80	—	—	V	I_C=−1mA
Collector-base breakdown voltage	BV_{CBO}	−80	—	—	V	I_C=−50μA
Emitter-base breakdown voltage	BV_{EBO}	−7	—	—	V	I_E=−50μA
Collector cutoff current	I_{CBO}	—	—	−10	μA	V_{CB}=−80V
Emitter cutoff current	I_{EBO}	—	—	−10	μA	V_{EB}=−5V
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	−1.5	V	I_C/I_B=−2A/−4mA ✻1
DC current transfer ratio	h_{FE}	1000	—	10000	—	V_{CE}/I_C=−3V/−2A ✻1
Transition frequency	f_T	—	20	—	MHz	V_{CE}=5V, I_E=−50mA, f=5MHz ✻2
Output capacitance	Cob	—	22	—	pF	V_{CB}=−10V, I_E=0A, f=1MHz

✻1 Measured using pulse current. ✻2 Transition frequency of the device.

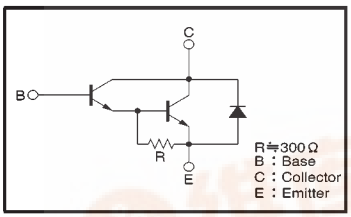
(SPEC-B426)

Power Transistor (80V, 4A)

2SD2478

●Features
1) Darlington connection for a high h_{FE}.
2) Built-in resistor between base and emitter.
3) Built-in damper doide.
4) Complements the 2SB1616.

●Circuit diagram



●Absolute maximum ratings (Ta=25℃)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	80	V
Collector-emitter voltage	V_{CEO}	80	V
Emitter-base voltage	V_{EBO}	7	V
Collector current	I_C	4	A (DC)
	I_{CP}	6	A (t=100ms)
Collector power dissipation	P_C	2	W
		30	W (Tc=25℃)
Junction temperature	Tj	150	℃
Storage temperature	Tstg	−55～+150	℃

●Packaging specifications and h_{FE}

Type	2SD2478
Package	TO-220FP
h_{FE}	1k～10k
Code	—
Basic ordering unit (pieces)	500

●Electrical characteristics (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	80	—	—	V	I_C=50μA
Collector-emitter breakdown voltage	BV_{CEO}	80	—	—	V	I_C=−1mA
Collector cutoff current	I_{CBO}	—	—	100	μA	V_{CB}=80V
Emitter cutoff current	I_{EBO}	—	—	10	μA	V_{EB}=5V
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	1.5	V	I_C/I_B=2A/4mA ✻1
DC current transfer ratio	h_{FE}	1000	—	10000	—	V_{CE}/I_C=3V/2A ✻1
Transition frequency	f_T	—	40	—	MHz	V_{CE}=−5V, I_E=0.5A, f=10MHz ✻2
Output capacitance	Cob	—	35	—	pF	V_{CB}=10V, I_E=0A, f=1MHz

✻1 Measured using pulse current. ✻2 Transition frequency of the device.