

Medium Power Transistor (Motor or Relay drive)

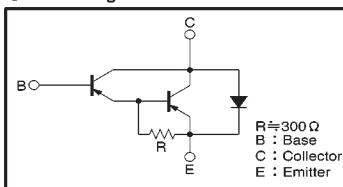
(−80V, −4A)

2SB1616

●Features

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

●Circuit diagram



●Electrical characteristics (Ta=25°C)

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

*1 Measured using pulse current.

*2 Transition frequency of the device.

(SPEC-B426)

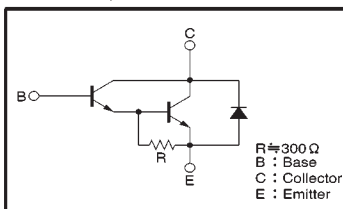
Power Transistor (80V, 4A)

2SD2478

●Features

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

●Circuit diagram



●Electrical characteristics (Ta=25°C)

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

*1 Measured using pulse current.

*2 Transition frequency of the device.

●Absolute maximum ratings (Ta=25°C)

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°C)
		30	W (Tc=25°C)
Junction temperature	T_J	150	°C
Storage temperature	T_{stg}	−55~+150	°C

* Single pulse. $P_w = 100\text{ms}$

●Packaging specifications and hfe

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

●Absolute maximum ratings (Ta=25°C)

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 ($t = 100\text{ms}$)
Collector power dissipation	P_C	2	W
		30	W (Tc=25°C)
Junction temperature	T_J	150	°C
Storage temperature	T_{stg}	−55~+150	°C

●Packaging specifications and hfe

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