

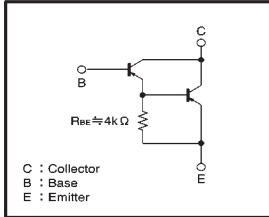
# Power Transistor (−40V, −2A)

2SB1183 / 2SB1239 / 2SB786F

●Features

- 1) Darlington connection for high DC current gain.
- 2) Built-in 4 kΩ resistor between base and emitter.
- 3) Complements the 2SD1759 / 2SD1861 / 2SD947F.

●Circuit diagram



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V <sub>CB0</sub>	−40	V
Collector-emitter voltage	V <sub>CE0</sub>	−40	V
Emitter-base voltage	V <sub>EB0</sub>	−5	V
Collector current	I <sub>c</sub>	−2	A (DC)
		−3	A (Pulse) *1
		1	W
Collector power dissipation	P <sub>c</sub>	10	W (T <sub>c</sub> =25°C)
		1	W *2
		1.2	W
		5	W (T <sub>c</sub> =25°C)
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	−55~+150	°C

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

\*2 Printed circuit board 1.7mm thick, collector plating 100mm<sup>2</sup> or larger.

●Packaging specifications and hfe

Type	2SB1183	2SB1239	2SB786F
Package	CPT3	ATV	TO-126FP
h <sub>FE</sub>	1k~200k	1k~	1k~
Code	TL	T146	—
Basic ordering unit (pieces)	2500	2500	1000

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV <sub>CB0</sub>	−40	—	—	V	I <sub>c</sub> =−50 μA
Collector-emitter breakdown voltage	BV <sub>CE0</sub>	−40	—	—	V	I <sub>c</sub> =−1mA, R <sub>BE</sub> =10kΩ
Emitter-base breakdown voltage	BV <sub>EB0</sub>	−5	—	—	V	I <sub>e</sub> =−50 μA
Collector cutoff current	I <sub>c0</sub>	—	—	−1	μA	V <sub>CB</sub> =−24V
Emitter cutoff current	I <sub>e0</sub>	—	—	−1	μA	V <sub>EB</sub> =−4V
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	—	—	−1.5	V	I <sub>c</sub> /I <sub>e</sub> =−0.6A/−1.2mA
DC current transfer ratio	h <sub>FE</sub>	2SB1183	1000	—	20000	V <sub>CE</sub> /I <sub>c</sub> =−2V/−0.5A
		2SB1239,2SB786F	1000	—	—	
Output capacitance	C <sub>ob</sub>	—	11	—	pF	V <sub>CB</sub> =−10V, I <sub>e</sub> =0A, f=1MHz

(96-126-B23)

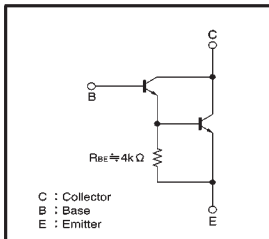
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- 3) Complements the 2SB1183 / 2SB1239 / 2SB786F.

●Circuit diagram



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V <sub>CB0</sub>	40	V
Collector-emitter voltage	V <sub>CE0</sub>	40	V (R <sub>BE</sub> =10kΩ)
Emitter-base voltage	V <sub>EB0</sub>	5	V
Collector current	I <sub>c</sub>	2	A (DC)
		3	A (Pulse) *1
		1	W *2
Collector power dissipation	P <sub>c</sub>	10	W (T <sub>c</sub> =25°C)
		1.2	W
		5	W (T <sub>c</sub> =25°C)
		—	—
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	−55~+150	°C

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

\*2 Printed circuit board 1.7mm thick, collector plating 1cm<sup>2</sup> or larger.

●Packaging specifications and hfe

Type	2SD1759	2SD1861	2SD947F
Package	CPT3	ATV	TO-126FP
h <sub>FE</sub>	1k~200k	1k~	1k~
Code	TL	TV2	—
Basic ordering unit (pieces)	2500	2500	1000

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV <sub>CB0</sub>	40	—	—	V	I <sub>c</sub> =50 μA
Collector-emitter breakdown voltage	BV <sub>CE0</sub>	40	—	—	V	I <sub>c</sub> =1mA, R <sub>BE</sub> =10kΩ
Emitter-base breakdown voltage	BV <sub>EB0</sub>	5	—	—	V	I <sub>e</sub> =50 μA
Collector cutoff current	I <sub>c0</sub>	—	—	1	μA	V <sub>CB</sub> =24V
Emitter cutoff current	I <sub>e0</sub>	—	—	1	μA	V <sub>EB</sub> =4V
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	—	—	1.5	V	I <sub>c</sub> /I <sub>e</sub> =0.6mA/1.2mA
DC current transfer ratio	h <sub>FE</sub>	2SD1759	1000	—	20000	V <sub>CE</sub> /I <sub>c</sub> =3V/0.5A
		2SD1861,2SD947F	1000	—	—	
Output capacitance	C <sub>ob</sub>	—	11	—	pF	V <sub>CB</sub> =10V, I <sub>e</sub> =0A, f=1MHz

(94S-321-D23)