

Power Transistor (31±4V, 2A)

2SD2167

●Features

- 1) Built-in zener diode between collector and base.
- 2) Zener diode has low voltage dispersion.
- 3) Strong protection against reverse power surges due to low loads.
- 4) $P_c=2\text{ W}$ (on 40×40×0.7mm ceramic board)

●Packaging specifications and hFE

Type	2SD2167
Package	MPT3
hFE	NPQ
Marking	DL*
Code	T100
Basic ordering unit (pieces)	1000

* Denotes hFE

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	31±4	V
Collector-emitter voltage	V_{CEO}	31±4	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	2	A (DC)
		3	A (Pulse) *1
Collector power dissipation	P_C	0.5	W
		2	W *2
Junction temperature	T_J	150	°C
Storage temperature	T_{stg}	-55~+150	°C

*1 $P_w=20\text{ms}$, duty=1/2

*2 When mounted on a 40×40×0.7 mm ceramic board.

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	27	—	35	V	$I_C=50\text{ }\mu\text{A}$
Collector-emitter breakdown voltage	BV_{CEO}	27	—	35	V	$I_C=1\text{mA}$
Emitter-base breakdown voltage	BV_{EBO}	5	—	—	V	$I_E=50\text{ }\mu\text{A}$
Collector cutoff current	I_{CBO}	—	—	1	μA	$V_{CB}=20\text{V}$
Emitter cutoff current	I_{EBO}	—	—	1	μA	$V_{EB}=5\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	1	V	$I_C/I_E=2\text{A}/0.2\text{A}$ *
		—	0.25	0.5	V	$I_C/I_E=1\text{A}/50\text{mA}$ *
DC current transfer ratio	hFE	56	—	270	—	$V_{CE}/I_C=3\text{V}/0.5\text{A}$
Transition frequency	f_T	—	100	—	MHz	$V_{CE}=3\text{V}$, $I_E=-0.5\text{A}$, $f=30\text{MHz}$ *
Output capacitance	C_{ob}	—	25	—	pF	$V_{CB}=10\text{V}$, $I_E=0\text{A}$, $f=1\text{MHz}$

* Measured using pulse current.

(92S-358-D310)

Power Transistor (60V, 3A)

2SD2394 / 2SD2576

●Features

- 1) Low saturation voltage, typically $V_{CE(sat)}=0.3\text{V}$ at $I_C/I_E=2\text{A}/0.2\text{A}$.
- 2) Excellent DC current gain characteristics.
- 3) Wide SOA (safe operating area).

●Packaging specifications and hFE

Type	2SD2394	2SD2576
Package	TO-220FN	TO-220FN
hFE	EF	F
Code	—	—
Basic ordering unit (pieces)	500	500

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	80	V
Collector-emitter voltage	V_{CEO}	60	V
Emitter-base voltage	V_{EBO}	7	V
Collector current	I_C	3	A (DC)
		6	A (Pulse) *
Collector power dissipation	P_C	2	W
		25	W ($T_C=25^\circ\text{C}$)
Junction temperature	T_J	150	°C
Storage temperature	T_{stg}	-55~+150	°C

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

●Absolute maximum ratings (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}	60	—	—	V	$I_C=1\text{mA}$
Emitter-base breakdown voltage	BV_{EBO}	7	—	—	V	$I_E=50\text{ }\mu\text{A}$
Collector cutoff current	I_{CBO}	—	—	10	μA	$V_{CB}=60\text{V}$
Emitter cutoff current	I_{EBO}	—	—	10	μA	$V_{EB}=7\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	1	V	$I_C/I_E=2\text{A}/0.2\text{A}$
		—	—	0.8	V	$I_C/I_E=2\text{A}/0.2\text{A}$
Base-emitter saturation voltage	$V_{BE(sat)}$	—	—	1.5	V	$I_C/I_E=2\text{A}/0.2\text{A}$ *
DC current transfer ratio	hFE	100	—	320	—	$V_{CE}/I_C=5\text{V}/0.5\text{A}$
		160	—	320	—	$V_{CE}/I_C=5\text{V}/0.5\text{A}$
Transition frequency	f_T	—	8	—	MHz	$V_{CE}=5\text{V}$, $I_E=-0.5\text{A}$, $f=5\text{MHz}$ *
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.

(94L-1098-D348)