

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 $40\times 40\times 0.7\text{ mm}$ ceramic board)

●Packaging specifications and h_{FE}

Type	2SD2167
Package	MPT3
h_{FE}	NPQ
Marking	DL*
Code	T100
Basic ordering unit (pieces)	1000

* Denotes h_{FE} ●Electrical characteristics ($T_a=25^\circ\text{C}$)

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	$^\circ\text{C}$
Storage temperature	T_{stg}	-55~+150	$^\circ\text{C}$

*1 $P_w=20\text{ ms}$, $duty=1/2$ *2 When mounted on a $40\times 40\times 0.7\text{ mm}$ ceramic board.●Absolute maximum ratings ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	27	—	35	V	$I_C=50\ \mu\text{A}$
Collector-emitter breakdown voltage	BV_{CEO}	27	—	35	V	$I_C=1\text{ mA}$
Emitter-base breakdown voltage	BV_{EBO}	5	—	—	V	$I_E=50\ \mu\text{A}$
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	h_{FE}	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 h_{FE}

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

●Electrical characteristics ($T_a=25^\circ\text{C}$)

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	$^\circ\text{C}$
Storage temperature	T_{stg}	-55~+150	$^\circ\text{C}$

* Single pulse, $P_w=100\text{ ms}$ ●Absolute maximum ratings ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	80	—	—	V	$I_C=50\ \mu\text{A}$
Collector-emitter breakdown voltage	BV_{CEO}	60	—	—	V	$I_C=1\text{ mA}$
Emitter-base breakdown voltage	BV_{EBO}	7	—	—	V	$I_E=50\ \mu\text{A}$
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	
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	h_{FE}	100	—	320	—	$V_{CE}/I_C=5\text{ V}/0.5\text{ A}$
		160	—	320	—	
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)

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Datasheets for electronic components.