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Transistors

High-voltage Switching Transistor (Telephone, Power supply) (−600V, −1A)

2SA1807

● Features

- 1) High breakdown voltage. ($BV_{CE0} = -600V$)
- 2) Low saturation voltage, typically $V_{CE(sat)} = -0.25V$ at $I_C / I_B = -300mA / -60mA$.
- 3) High switching speed, typically $t_f = 0.4 \mu s$ at $I_C = -500mA$
- 4) Wide SOA (safe operating area).

● Packaging specifications and h_{FE}

Type	2SA1807
Package	CPT3
h_{FE}	NP
Code	TL
Basic ordering unit (pieces)	2500

● Absolute maximum ratings ($T_a = 25^\circ C$)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CB0}	-600	V
Collector-emitter voltage	V_{CE0}	-600	V
Emitter-base voltage	V_{EB0}	-7	V
Collector current	I_C	-1	A (DC)
		-2	A (Pulse) *
Collector power dissipation	P_C	1	W
		10	W ($T_c = 25^\circ C$)
Junction temperature	T_J	150	$^\circ C$
Storage temperature	T_{stg}	-55 ~ +150	$^\circ C$

* Single pulse, $P_w = 100ms$

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CB0}	-600	—	—	V	$I_C = -50 \mu A$
Collector-emitter breakdown voltage	BV_{CE0}	-600	—	—	V	$I_C = -1mA$
Emitter-base breakdown voltage	BV_{EB0}	-7	—	—	V	$I_E = -50 \mu A$
Collector cutoff current	I_{CB0}	—	—	-10	μA	$V_{CB} = -600V$
Emitter cutoff current	I_{EB0}	—	—	-10	μA	$V_{EB} = -7V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	-0.25	-1	V	$I_C / I_B = -300mA / -60mA$
Base-emitter saturation voltage	$V_{CE(sat)}$	—	—	-1.2	V	$I_C / I_B = -300mA / -60mA$
DC current transfer ratio	h_{FE}	56	—	180	—	$V_{CE} = -5V, I_C = -100mA$
Transition frequency	f_T	—	15	—	MHz	$V_{CB} = -10V, I_E = 50mA, f = 5MHz$
Output capacitance	C_{ob}	—	40	—	pF	$V_{CE} = -10V, I_E = 0A, f = 1MHz$
Turn-on time	t_{on}	—	0.2	—	μs	$I_C = -500mA, R_L = 500 \Omega$
Storage time	t_{stg}	—	1.8	—	μs	$I_{B1} = -I_{B2} = -100mA$
Fall time	t_r	—	0.4	—	μs	$V_{CC} \approx -250V$

(96-102-A331)

High-voltage Switching Transistor (Telephone, Power supply) (−400V, −2A)

2SA1862

● Features

- 1) High breakdown voltage. ($BV_{CE0} = -400V$)
- 2) Low saturation voltage, typically $V_{CE(sat)} = -0.3V$ at $I_C / I_B = -500mA / -100mA$.
- 3) High switching speed, typically $t_f = 0.4 \mu s$ at $I_C = -1A$.
- 4) Wide SOA (safe operating area).

● Packaging specifications and h_{FE}

Type	2SA1862
Package	CPT3
h_{FE}	P
Code	TL
Basic ordering unit (pieces)	2500

● Absolute maximum ratings ($T_a = 25^\circ C$)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CB0}	-400	V
Collector-emitter voltage	V_{CE0}	-400	V
Emitter-base voltage	V_{EB0}	-7	V
Collector current	I_C	-2	A (DC)
		-4	A (Pulse) *
Collector power dissipation	P_C	1	W
		10	W ($T_c = 25^\circ C$)
Junction temperature	T_J	150	$^\circ C$
Storage temperature	T_{stg}	-55 ~ +150	$^\circ C$

* Single pulse, $P_w = 10ms$

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CB0}	-400	—	—	V	$I_C = -50 \mu A$
Collector-emitter breakdown voltage	BV_{CE0}	-400	—	—	V	$I_C = -1mA$
Emitter-base breakdown voltage	BV_{EB0}	-7	—	—	V	$I_E = -50 \mu A$
Collector cutoff current	I_{CB0}	—	—	-10	μA	$V_{CB} = -400V$
Emitter cutoff current	I_{EB0}	—	—	-10	μA	$V_{EB} = -5V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	-0.3	-0.5	V	$I_C / I_B = -0.5A / -0.1A$
Base-emitter saturation voltage	$V_{CE(sat)}$	—	—	-1.2	V	$I_C / I_B = -0.5A / -0.1A$
DC current transfer ratio	h_{FE}	82	—	180	—	$V_{CE} = -5V, I_C = -0.1A$
Transition frequency	f_T	—	18	—	MHz	$V_{CB} = -10V, I_E = 0.1A, f = 5MHz$
Output capacitance	C_{ob}	—	30	—	pF	$V_{CE} = -10V, I_E = 0A, f = 1MHz$
Turn-on time	t_{on}	—	0.2	—	μs	$I_C = -1A, R_L = 150 \Omega$
Storage time	t_{stg}	—	1.8	—	μs	$I_{B1} = -I_{B2} = -0.2A$
Fall time	t_r	—	0.4	—	μs	$V_{CC} \approx 150V$

(96-109-A343)

Appendix

Notes

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