

High-speed Switching Transistor (−60V, −12A)

2SA1870

●Features

- 1) High speed switching, typically $t_f=0.17\ \mu\text{s}$ at $I_c=-6\text{A}$.
- 2) Low saturation voltage, typically $V_{CE(sat)}=-0.2\text{V}$ at $I_c/I_b=-6\text{A}/-0.3\text{A}$.
- 3) Wide SOA (safe operating area)

●Packaging specifications and h_{FE}

Type	2SA1870
Package	PSD3
h_{FE}	EF
Code	TL
Basic ordering unit (pieces)	1000

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

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CEC}	−100	V
Collector-emitter voltage	V_{CEO}	−60	V
Emitter-base voltage	V_{EBO}	−5	V
Collector current	I_c	−12	A
		−20	A (Pulse) ※
Collector power dissipation	P_c	1.5	W
		35	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, $P_w=100\text{ms}$

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	−100	—	—	V	$I_c=-50\ \mu\text{A}$
Collector-emitter breakdown voltage	$BV_{CEO(SUS)}$	−60	—	—	V	$I_c=-6\text{A}$, $I_b=-0.6\text{A}$, $L=1\text{mH}$
Collector-emitter breakdown voltage	BV_{CEO}	−60	—	—	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}	—	—	−10	μA	$V_{CB}=-100\text{V}$
Emitter cutoff current	I_{EBO}	—	—	−10	μA	$V_{EB}=-5\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	−0.2	−0.3	V	$I_c/I_b=-6\text{A}/-0.3\text{A}$
		—	—	−0.5	V	$I_c/I_b=-8\text{A}/-0.4\text{A}$
Base-emitter saturation voltage	$V_{BE(sat)}$	—	—	−1.2	V	$I_c/I_b=-6\text{A}/-0.3\text{A}$
		—	—	−1.5	V	$I_c/I_b=-8\text{A}/-0.4\text{A}$
DC current transfer ratio	h_{FE}	100	—	320	—	$V_{CE}=-2\text{V}$, $I_c=-2\text{A}$
Transition frequency	f_T	—	80	—	MHz	$V_{CB}=-10\text{V}$, $I_E=-1\text{A}$, $f=30\text{MHz}$
Output capacitance	C_{ob}	—	250	—	pF	$V_{CE}=-10\text{V}$, $I_E=0\text{A}$, $f=1\text{MHz}$
Turn-on time	t_{on}	—	—	0.3	μs	$I_c=-6\text{A}$
Storage time	t_{stg}	—	—	1.5	μs	$I_{B1}=-I_{B2}=-0.3\text{A}$
Fall time	t_f	—	0.17	0.3	μs	$V_{CC}\sim-30\text{V}$

(96-113-A325)