

# 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 hfe

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

### ●Absolute maximum ratings (Ta=25°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 (Tc=25°C)
Junction temperature	$T_J$	150	°C
Storage temperature	$T_{stg}$	−55~+150	°C

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

### ●Electrical characteristics (Ta=25°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	$\mu\text{A}$	$V_{CB}=-100\text{V}$
Emitter cutoff current	$I_{EBO}$	—	—	−10	$\mu\text{A}$	$V_{EB}=-5\text{V}$
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	$\mu\text{s}$	$I_c=-6\text{A}$
Storage time	$t_{stg}$	—	—	1.5	$\mu\text{s}$	$I_{B1}=-I_{B2}=-0.3\text{A}$
Fall time	$t_f$	—	0.17	0.3	$\mu\text{s}$	$V_{CC}=-30\text{V}$

(96-113-A325)