

High-speed Switching Transistor(—60V / —5A)

2SA1952 / 2SA1906 / 2SA1757

●Features

- 1) High switching speed, typically $t_f=0.15 \mu\text{s}$ at $I_C=-3A$.
- 2) Low saturation voltage, typically $V_{CE(sat)}=-0.2V$ at $I_C/I_B=-3A/-0.15A$.
- 3) Wide SOA. (safe operating area)
- 4) Complements the 2SC5103 / 2SC4596.

●Packaging specifications and hFE

Type	2SA1952	2SA1906	2SA1757
Package	CPT3	PSD3	TO-220FP
hFE	Q	DEF	F
Code	TL	TL	—
Basic ordering unit (pieces)	3000	1000	500

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	—100	V
Collector-emitter voltage	V_{CEO}	—60	V
Emitter-base voltage	V_{EBO}	—5	V
Collector current	I_C	—5 —10	A A (Pulse)
Collector power dissipation	2SA1757	1	W
		10	W (Tc=25°C)
	2SA1952	1.5	W
		2.5	W (Tc=25°C)
	2SA1757, 2SA1906	2	W
		25	W (Tc=25°C)
Junction temperature	T_J	150	°C
Storage temperature	T_{stg}	—55~+150	°C

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	—100	—	—	V	$I_C=-50 \mu A$
Collector-emitter voltage	$BV_{CEO(SUS)}$	—60	—	—	V	$I_C/I_B=-3A/-0.3A$, $L=1mH$
Collector-emitter breakdown voltage	BV_{CEO}	—60	—	—	V	$I_C=-1mA$
Emitter-base breakdown voltage	BV_{EBO}	—5	—	—	V	$I_E=-50 \mu A$
Collector cutoff current	I_{CBO}	—	—	—10	μA	$V_{CB}=-100V$
Emitter cutoff current	I_{EBO}	—	—	—10	μA	$V_{EB}=-5V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	—0.3	V	$I_C/I_B=-3A/-0.15A$
		—	—	—0.5	V	$I_C/I_B=-4A/-0.2A$
		—	—	—1.2	V	$I_C/I_B=-3A/-0.15A$
Base-emitter saturation voltage	$V_{BE(sat)}$	—	—	—1.2	V	$I_C/I_B=-3A/-0.15A$
		—	—	—1.5	V	$I_C/I_B=-4A/-0.2A$
		—	—	—	V	$I_C/I_B=-4A/-0.2A$
DC current transfer ratio	2SA1952	hFE	120	—	270	$V_{CE}=-2V$, $I_C=-1A$
	2SA1906		60	—	320	
	2SA1757		160	—	320	
Transition frequency	f_T	—	80	—	MHz	$V_{CE}=-10V$, $I_E=0.5A$, $f=30MHz$
Output capacitance	C_{ob}	—	130	—	pF	$V_{CE}=-10V$, $I_E=0A$, $f=1MHz$
Turn-on time	t_{on}	—	—	0.3	μs	$I_C=-3A$, $R_L=10 \Omega$
Storage time	t_{stg}	—	—	1.5	μs	$I_{B1}=-I_{B2}=-0.15A$
Fall time	t_f	—	—	0.3	μs	$V_{CC}=-30V$

(96-603-A314)

High-speed Switching Transistor(60V / 5A)

2SC5103 / 2SC4596

●Features

- 1) Low saturation voltage, typically $V_{CE(sat)}=0.15V$ at $I_C/I_B=3A/0.15A$.
- 2) High switching speed, typically $t_f=0.1 \mu s$ at $I_C=3A$.
- 3) Wide SOA. (safe operating area)
- 4) Complements the 2SA1952 / 2SA1757.

●Packaging specifications and hFE

Type	2SC5103	2SC4596
Package	CPT3	TO-220FP
hFE	PQ	EF
Code	TL	—
Basic ordering unit (pieces)	2500	500

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	100	V
Collector-emitter voltage	V_{CEO}	60	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	5	A (DC)
		10	A (Pulse) *
		1	W
Collector power dissipation	2SC5103	10	W (Tc=25°C)
		2	W
	2SC4596	25	W (Tc=25°C)
		25	W (Tc=25°C)
Junction temperature	T_J	150	°C
Storage temperature	T_{stg}	—55~+150	°C

* Single pulse $P_w=100ms$

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	100	—	—	V	$I_C=50 \mu A$
Collector-emitter voltage	$BV_{CEO(SUS)}$	60	—	—	V	$I_C/I_B=3A/0.3A$, $L=1mH$
Collector-emitter breakdown voltage	BV_{CEO}	60	—	—	V	$I_C=1mA$
Emitter-base breakdown voltage	BV_{EBO}	5	—	—	V	$I_E=50 \mu A$
Collector cutoff current	I_{CBO}	—	—	10	μA	$V_{CB}=100V$
Emitter cutoff current	I_{EBO}	—	—	10	μA	$V_{EB}=5V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	0.15	0.3	V	$I_C/I_B=3A/0.15A$
		—	—	0.5	V	$I_C/I_B=4A/0.2A$
		—	—	1.2	V	$I_C/I_B=3A/0.15A$
Base-emitter saturation voltage	$V_{BE(sat)}$	—	—	1.5	V	$I_C/I_B=4A/0.2A$
		—	—	—	V	$I_C/I_B=3A/0.15A$
		—	—	—	V	$I_C/I_B=4A/0.2A$
DC current transfer ratio	2SC5103	hFE	82	—	270	$V_{CE}/I_C=2V/1A$
	2SC4596		100	—	320	
Transition frequency	f_T	—	120	—	MHz	$V_{CE}=10V$, $I_E=0.5A$, $f=30MHz$
Output capacitance	C_{ob}	—	80	—	pF	$V_{CE}=10V$, $I_E=0A$, $f=1MHz$
Turn-on time	t_{on}	—	—	0.3	μs	$I_C=3A$, $R_L=10 \Omega$
Storage time	t_{stg}	—	—	1.5	μs	$I_{B1}=-I_{B2}=0.15A$
Fall time	t_f	—	—	0.1	μs	$V_{CC}=30V$

* Measured using pulse current.

(96-199-C314)