

# High-speed Switching Transistor (–60V, –5A)

## 2SA1952

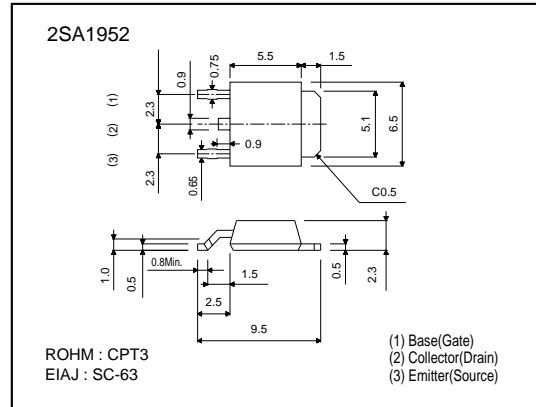
### ●Features

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

### ●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CB0}$	–100	V
Collector-emitter voltage	$V_{CE0}$	–60	V
Emitter-base voltage	$V_{EB0}$	–5	V
Collector current	$I_C$	–5	A
		–10	A(Pulse)
Collector power dissipation	$P_C$	1	W
		10	W(Tc=25°C)
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	–55–+150	°C

### ●External dimensions (Unit : mm)



### ●Packaging specifications and hFE

Type	2SA1952
Package	CPT3
$h_{FE}$	Q
Code	TL
Basic ordering unit (pieces)	2500

### ●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CB0}$	–100	–	–	V	$I_C = -50\mu A$
Collector-emitter breakdown voltage	$BV_{CE0}$	–60	–	–	V	$I_C = -1mA$
Emitter-base breakdown voltage	$BV_{EB0}$	–5	–	–	V	$I_E = -50\mu A$
Collector cutoff current	$I_{CBO}$	–	–	–10	$\mu A$	$V_{CB} = -100V$
Emitter cutoff current	$I_{EBO}$	–	–	–10	$\mu A$	$V_{EB} = -5V$
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	$V_{BE(sat)}$	–	–	–1.5	V	$I_C/I_B = -4A/-0.2A$
		–	–	–	–	$V_{CE} = -2V, I_C = -1A$
DC current transfer ratio	$h_{FE1}$	120	–	–	–	$V_{CE} = -2V, I_C = -3A$
	$h_{FE2}$	40	–	–	–	$V_{CE} = -2V, I_C = -3A$
Transition frequency	$f_T$	–	80	–	MHz	$V_{CE} = -10V, I_E = 0.5A, f = 30MHz$
Output capacitance	$C_{ob}$	–	130	–	pF	$V_{CB} = -10V, I_E = 0A, f = 1MHz$
Turn-on time	$t_{on}$	–	–	0.3	$\mu s$	$I_C = -3A, R_L = 10\Omega$
Storage time	$t_{stg}$	–	–	1.5	$\mu s$	$I_{B1} = -I_{B2} = -0.15A$
Fall time	$t_f$	–	–	0.3	$\mu s$	$V_{CC} = -30V$

Transistors

●Electrical characteristics curves

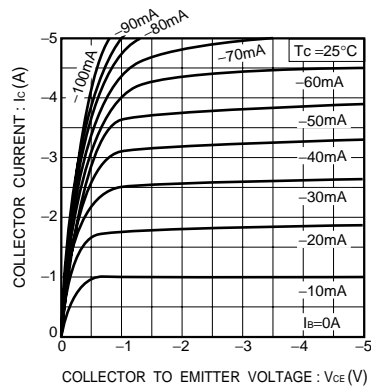


Fig.1 Ground emitter output characteristics

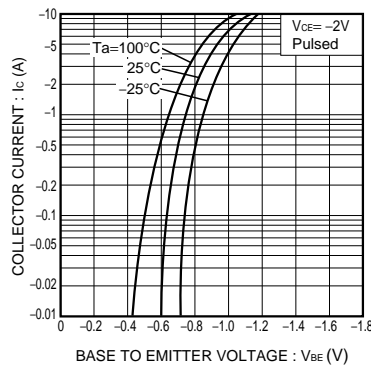


Fig.2 Ground emitter propagation characteristics

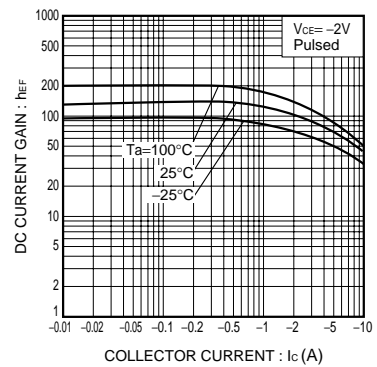


Fig.3 DC current gain vs. collector current

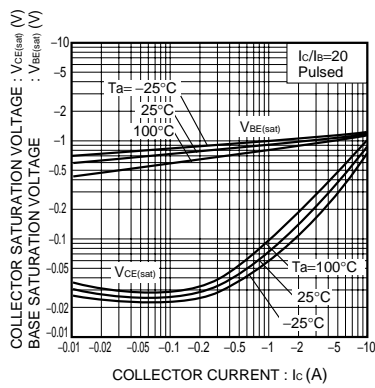


Fig.4 Collector-emitter saturation voltage vs. collector current  
Base-emitter saturation voltage

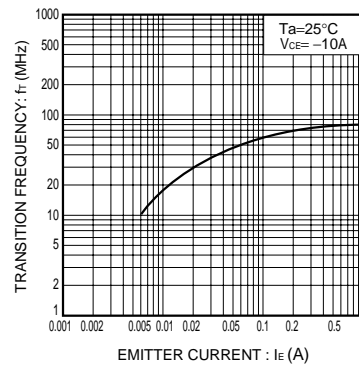


Fig.5 Resistance ratio vs. emitter current

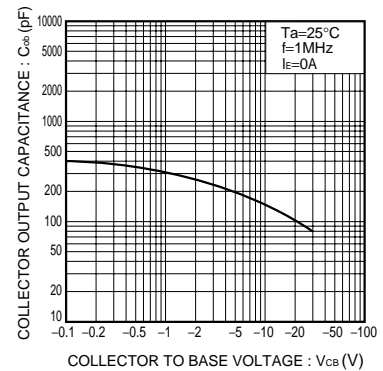


Fig.6 Collector output capacitance vs. collector-base voltage

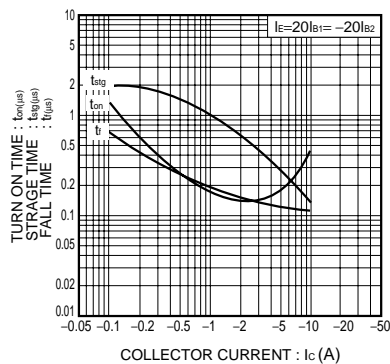


Fig.7 Switching characteristics

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