

# High speed switching transistor (60V, 5A)

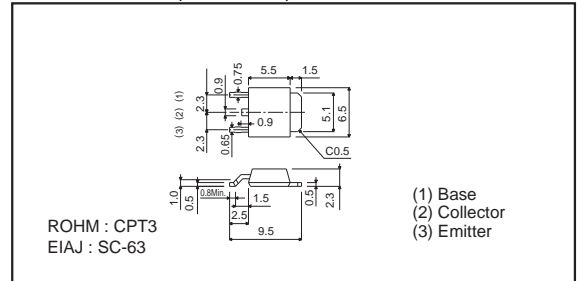
**2SC5103**
**●Features**

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

**●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) *
Collector power dissipation	$P_C$	1	W
		10	W(Tc=25°C)
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

\*Single pulse Pw=100ms

**●Dimensions (Unit : mm)**

**●Packaging specifications and hFE**

Type	2SC5103
Package	CPT3
hFE	Q
Code	TL
Basic ordering unit (pieces)	2500

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

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

\* Measured using pulse current.

●Electrical characteristics curves

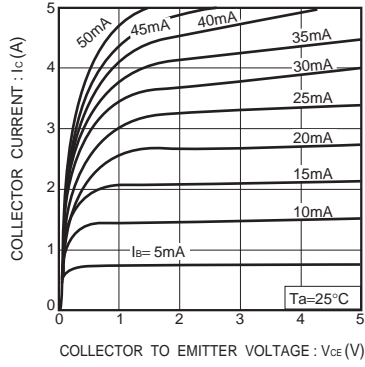


Fig.1 Ground emitter output characteristics

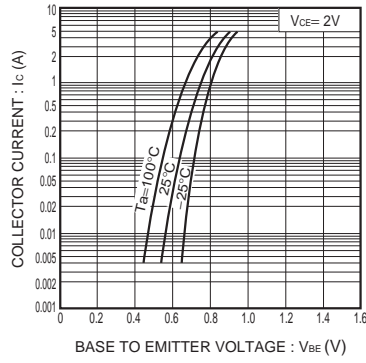


Fig.2 Ground emitter propagation characteristics

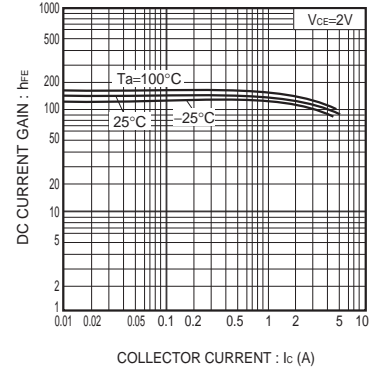


Fig.3 DC current gain vs. collector current

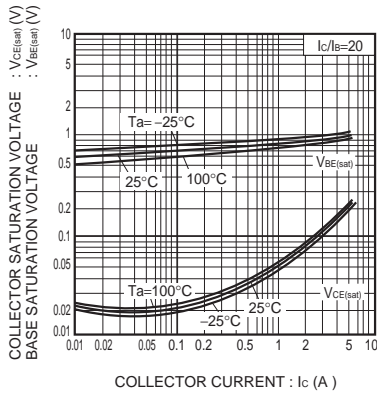


Fig.4 Collector-emitter saturation voltage  
Base-emitter saturation voltage—collector current

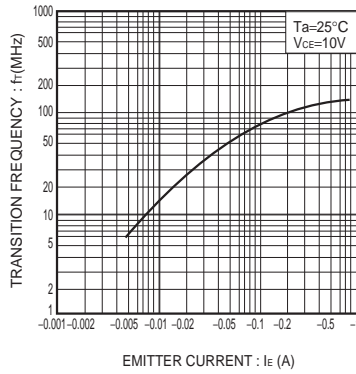


Fig.5 Gain bandwidth product vs. emitter current

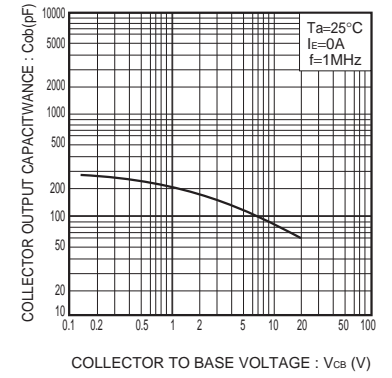


Fig.6 Collector output capacitance vs. collector-base voltage

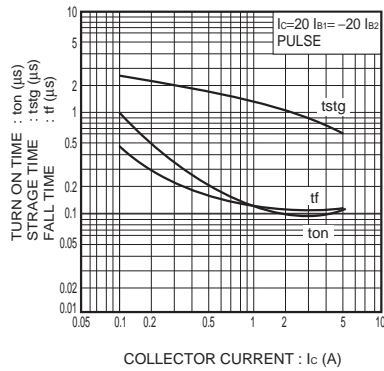


Fig.7 Switching characteristics

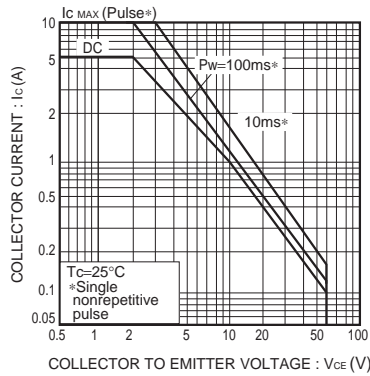


Fig.8 Safe operating area

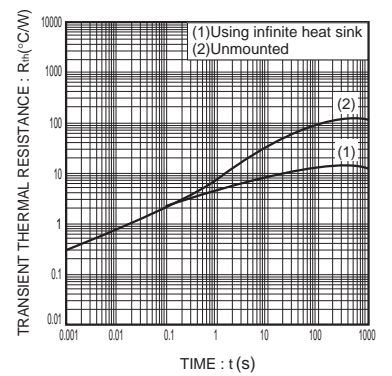


Fig.9 Transient thermal resistance

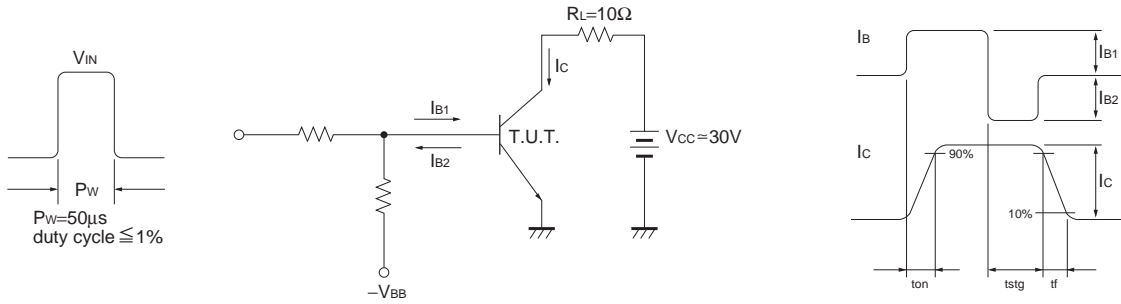


Fig.10 Switching characteristic circuit

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