

High speed switching transistor (60V, 5A)

2SC5103

●Features

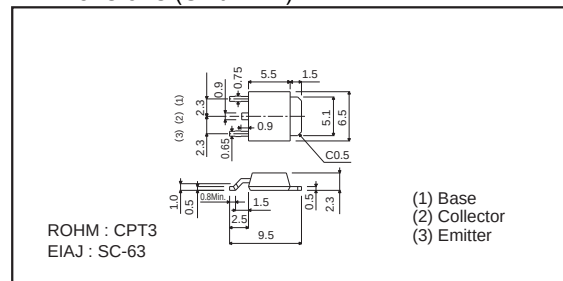
- 1) Low $V_{CE(sat)}$ (Typ. 0.15V at $I_C / I_B = 3 / 0.15A$)
- 2) High speed switching (t_f : Typ. 0.1 μs at $I_C = 3A$)
- 3) Wide SOA. (safe operating area)
- 4) Complements the 2SA1952.

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

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($T_C=25^\circ C$)
Junction temperature	T_j	150	$^\circ C$
Storage temperature	T_{stg}	-55 to +150	$^\circ C$

* Single pulse $P_w=100ms$

●Dimensions (Unit : mm)



●Packaging specifications and h_{FE}

Type	2SC5103
Package	CPT3
h_{FE}	Q
Code	TL
Basic ordering unit (pieces)	2500

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

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	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	$I_C/I_B = 4A/0.2A$ *
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	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	0.3	μs	$V_{CC} \approx 30V$

* Measured using pulse current.

Electrical characteristics curves

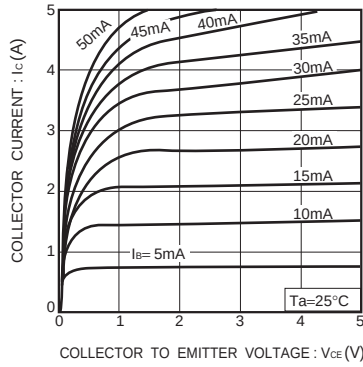


Fig.1 Ground emitter output characteristics

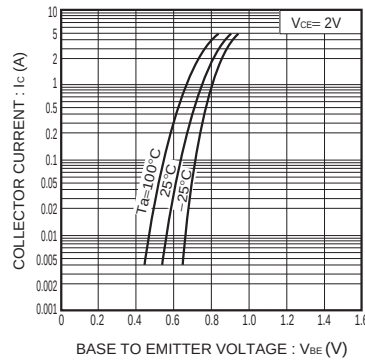


Fig.2 Ground emitter propagation characteristics

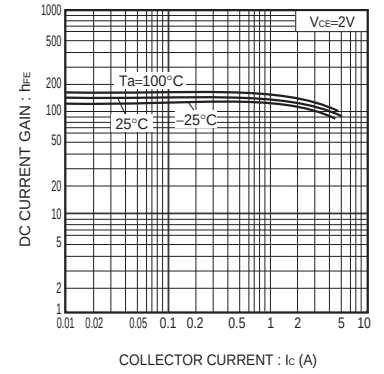


Fig.3 DC current gain vs. collector current

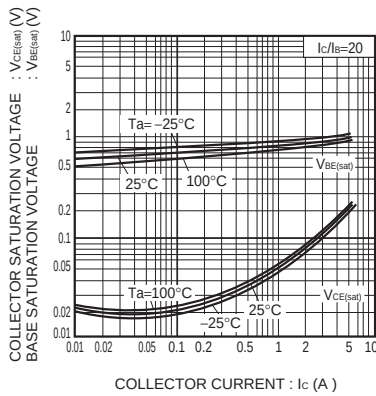
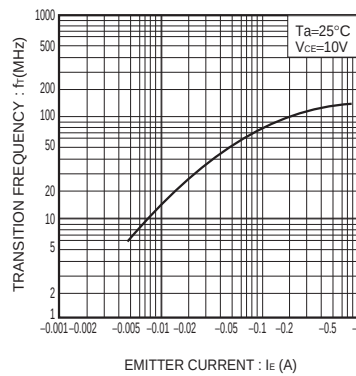
Fig.4 Collector-emitter saturation voltage
Base-emitter saturation voltage-collector current

Fig.5 Gain bandwidth product vs. emitter current

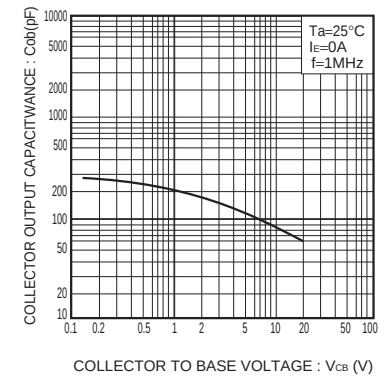
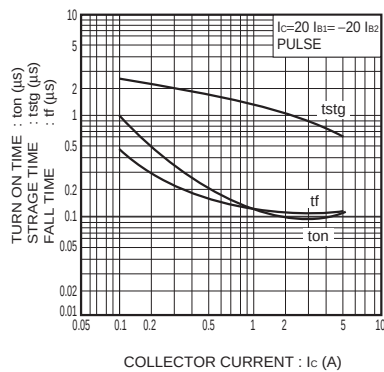
Fig.6 Collector output capacitance vs.
collector-base voltage

Fig.7 Switching characteristics

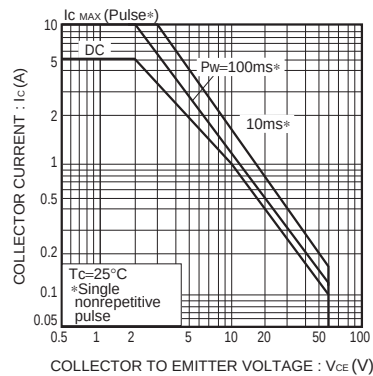


Fig.8 Safe operating area

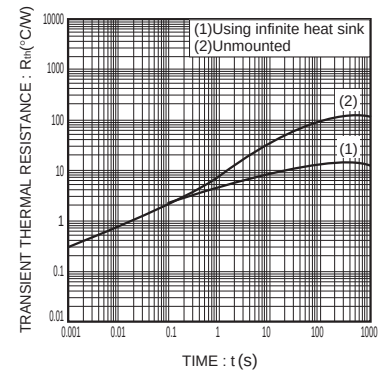


Fig.9 Transient thermal resistance

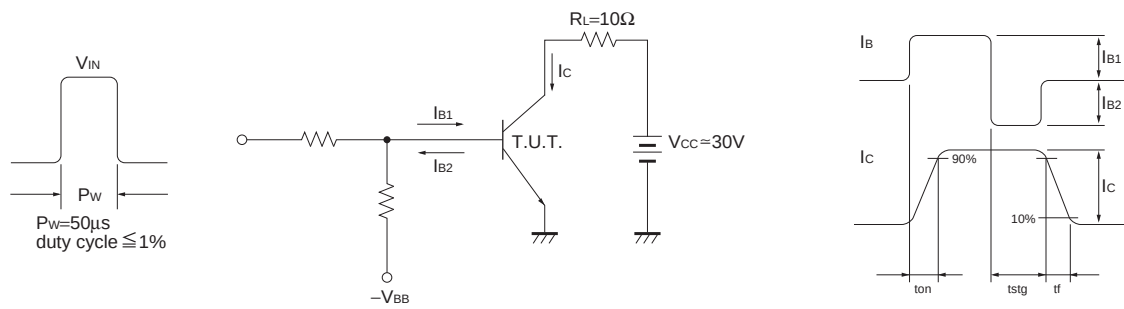


Fig.10 Switching characteristic circuit