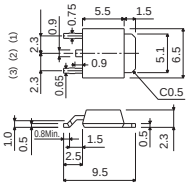
High speed switching transistor (60V, 5A)

2SC5103

●Features

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

●Dimensions (Unit : mm)



ROHM : CPT3
EIAJ : SC-63

(1) Base
(2) Collector
(3) Emitter

●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	Tj	150	°C
Storage temperature	Tstg	−55 to +150	°C

＊Single pulse Pw=100ms

●Packaging specifications and h_{FE}

Type	2SC5103
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_{CBO}	100	−	−	V	I_C = 50μA
Collector-emitter breakdown voltage	BV_{CEO}	60	−	−	V	I_C = 1mA
Emitter-base breakdown voltage	BV_{EBO}	5	−	−	V	I_E = 50μA
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	Cob	−	80	−	pF	V_{CE} = 10V , I_E = 0A , f = 1MHz ＊
Turn-on time	ton	−	−	0.3	μs	I_C = 3A , R_L = 10Ω
Storage time	tstg	−	−	1.5	μs	I_{B1} = −I_{B2} = 0.15A
Fall time	tf	−	0.1	0.3	μs	V_{CC} ≃ 30V

＊ Measured using pulse current.

●Electrical characteristics curves

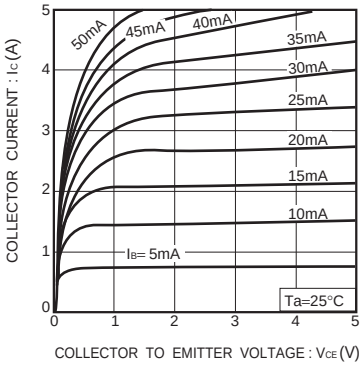


Fig.1 Ground emitter output characteristics

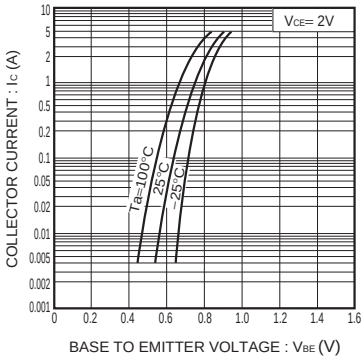


Fig.2 Ground emitter propagation characteristics

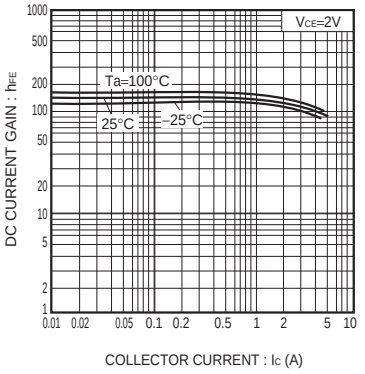


Fig.3 DC current gain vs. collector current

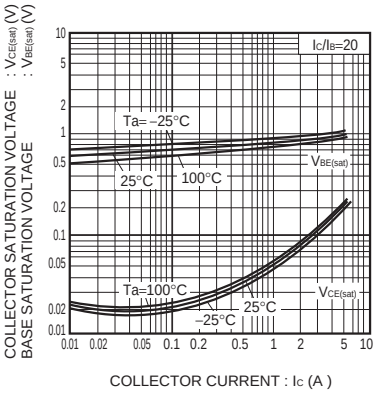


Fig.4 Collector-emitter saturation voltage
Base-emitter saturation voltage –collector current

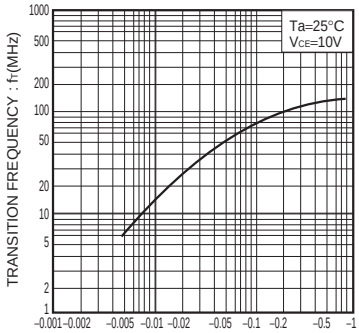


Fig.5 Gain bandwidth product vs.emitter current

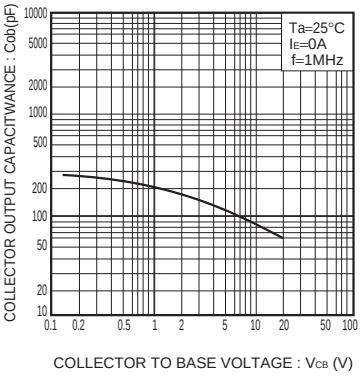


Fig.6 Collector output capacitance vs. collector-base voltage

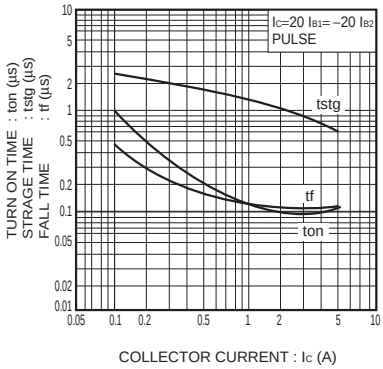


Fig.7 Switching characteristics

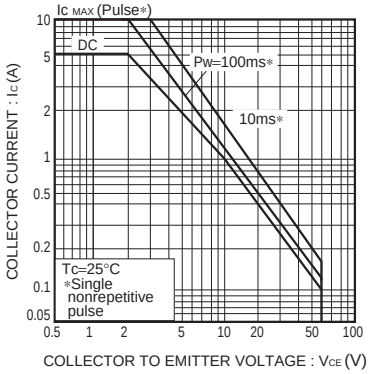


Fig.8 Safe operating area

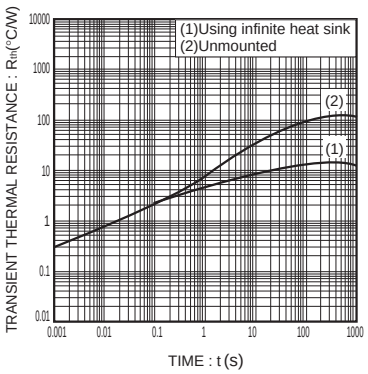


Fig.9 Transient thermal resistance

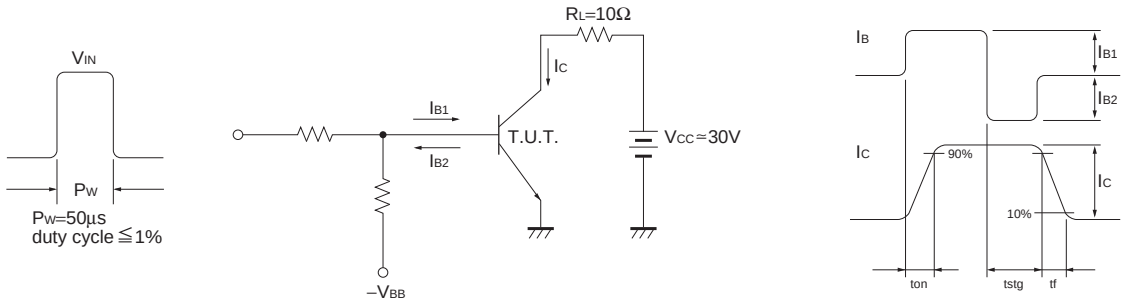


Fig.10 Switching characteristic circuit

Notes

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