SHINDENGEN

Switching Power Transistor

FX Series

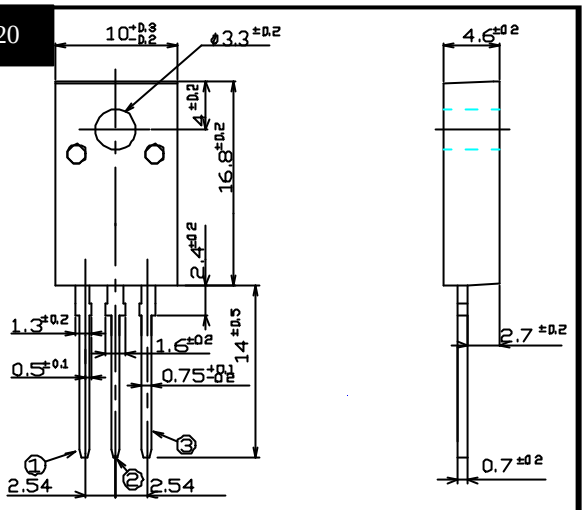
2SC4052
(TP3V45FX)

3A NPN

OUTLINE DIMENSIONS

Case : ITO-220

Unit : mm



①:B
②:C
③:E

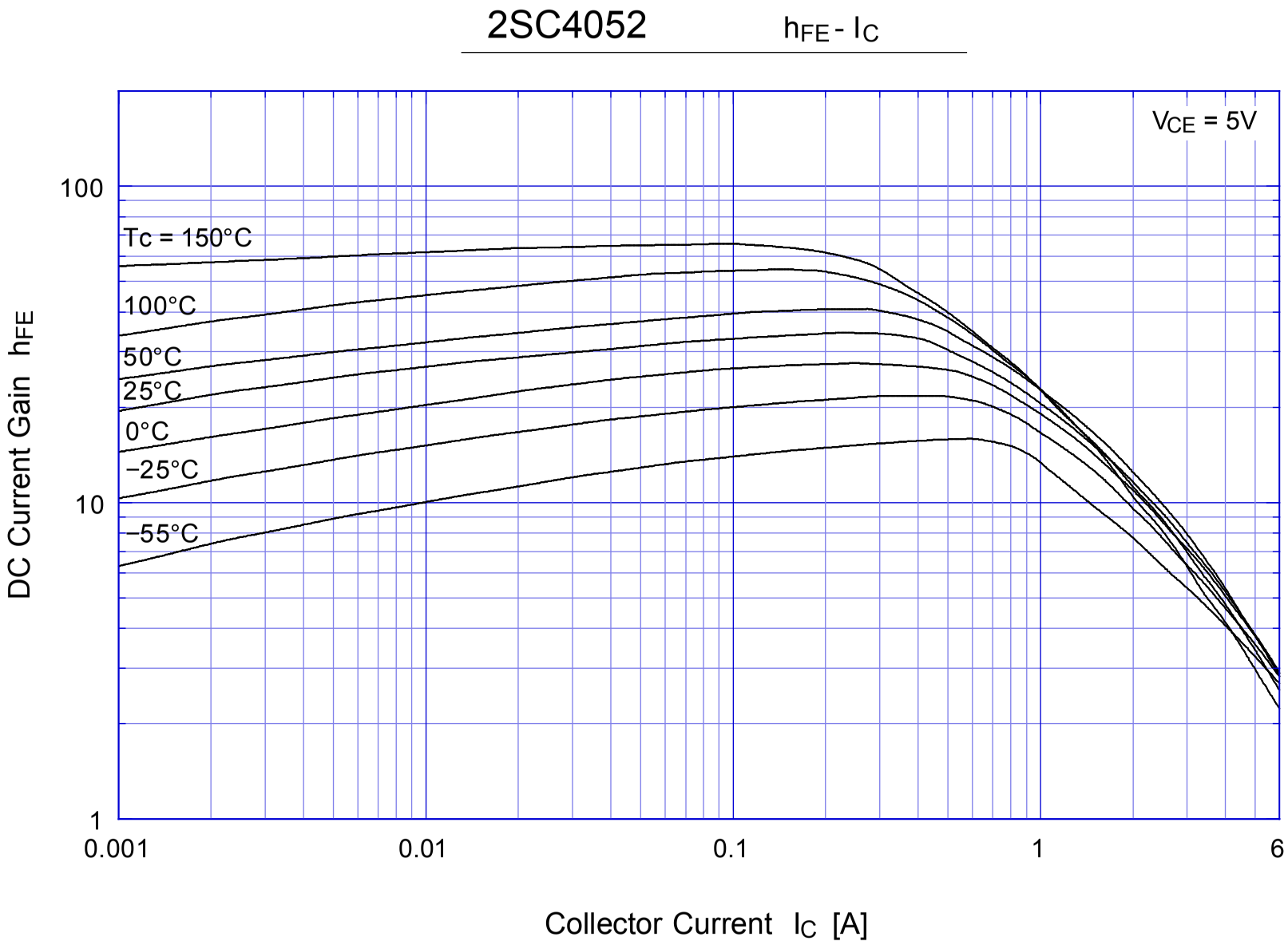
RATINGS

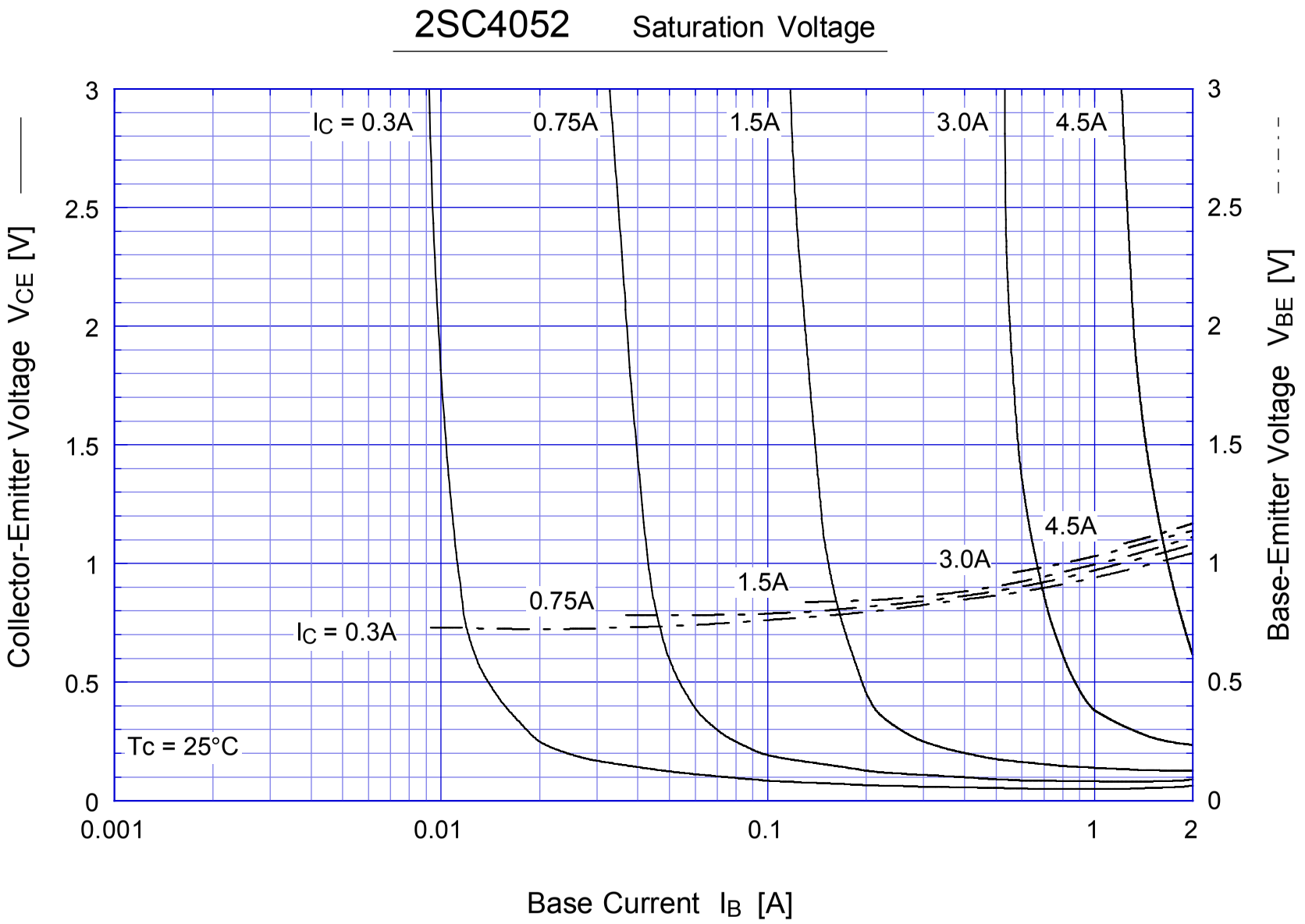
●Absolute Maximum Ratings

Item	Symbol	Conditions	Ratings	Unit
Storage Temperature	Tstg		-55～150	℃
Junction Temperature	Tj		150	℃
Collector to Base Voltage	V_{CBO}		600	V
Collector to Emitter Voltage	V_{CEO}		450	V
	V_{CEX}	V_{EB} = 5V	600	
Emitter to Base Voltage	V_{EBO}		7	V
Collector Current DC	I_C		3	A
Collector Current Peak	I_{CP}		6	
Base Current DC	I_B		1	A
Base Current Peak	I_{BP}		2	
Total Transistor Dissipation	P_T	T_C = 25°C	25	W
Dielectric Strength	Vdis	Terminals to case, AC 1 minute	2	kV
Mounting Torque	TOR		0.5	N·m

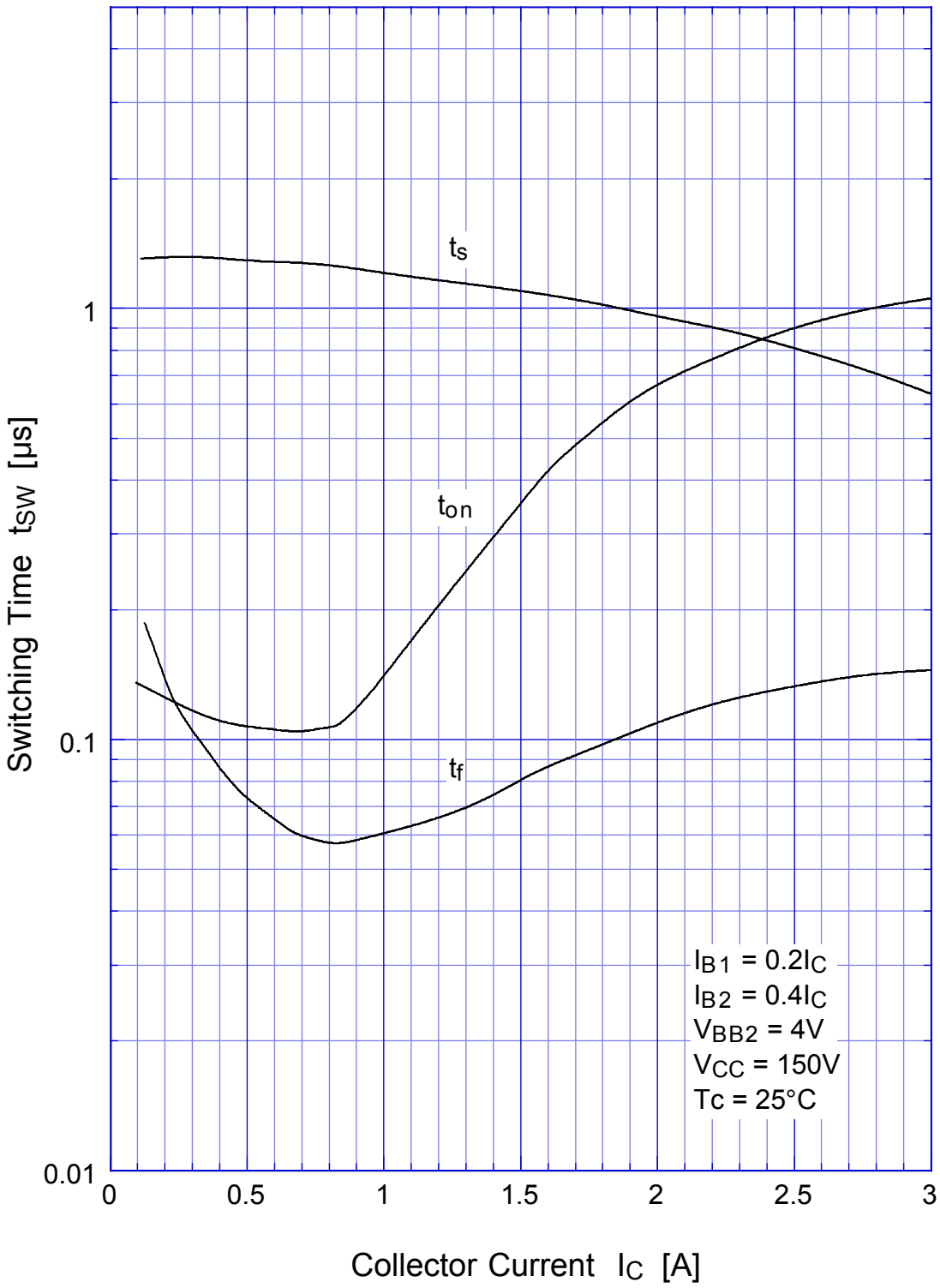
●Electrical Characteristics (Tc=25°C)

Item	Symbol	Conditions	Ratings	Unit
Collector to Emitter Sustaining Voltage	V_{CEO}(sus)	I_C = 0.1A	Min 450	V
Collector Cutoff Current	I_{CBO}	At rated Voltage	Max 0.1	mA
	I_{CEO}		Max 0.1	
Emitter Cutoff Current	I_{EBO}	At rated Voltage	Max 0.1	mA
DC Current Gain	h_{FE}	V_{CE}= 5V, I_C = 1.5A	Min 10	
	h_{FEL}	V_{CE}= 5V, I_C = 1mA	Min 5	
Collector to Emitter Saturation Voltage	V_{CE}(sat)	I_C = 1.5A	Max 1.0	V
Base to Emitter Saturation Voltage	V_{BE}(sat)	I_B = 0.3A	Max 1.5	V
Thermal Resistance	θjc	Junction to case	Max 5.0	℃/W
Transition Frequency	f_T	V_{CE}= 10V, I_C = 0.3A	STD 20	MHz
Turn on Time	ton	I_C = 1.5A	Max 0.5	μs
Storage Time	ts	I_{B1} = 0.3A, I_{B2} = 0.6A	Max 2.0	
Fall Time	tf	R_L = 100Ω, V_{BB2} = 4V	Max 0.2	

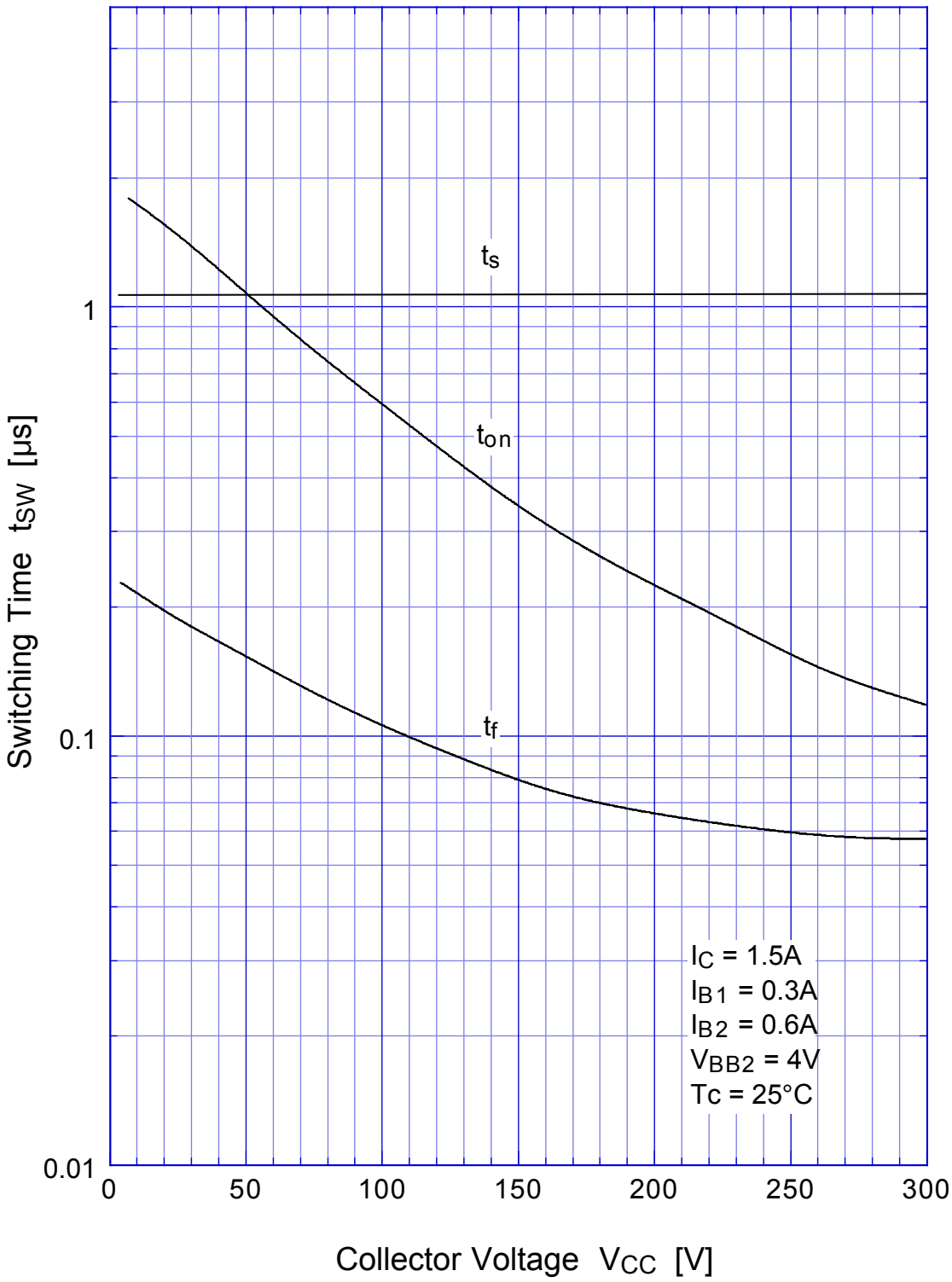

2SC4052
hFE - IC
VCE = 5V
Tc = 150°C
100°C
50°C
25°C
0°C
−25°C
−55°C
100
10
1
0.001
0.01
0.1
1
6
DC Current Gain hFE
Collector Current IC [A]


2SC4052 Saturation Voltage
Collector-Emitter Voltage V_{CE} [V]
Base-Emitter Voltage V_{BE} [V]
Base Current I_B [A]
I_C = 0.3A
0.75A
1.5A
3.0A
4.5A
Tc = 25°C
0
0.5
1
1.5
2
2.5
3
0.001
0.01
0.1
1
2

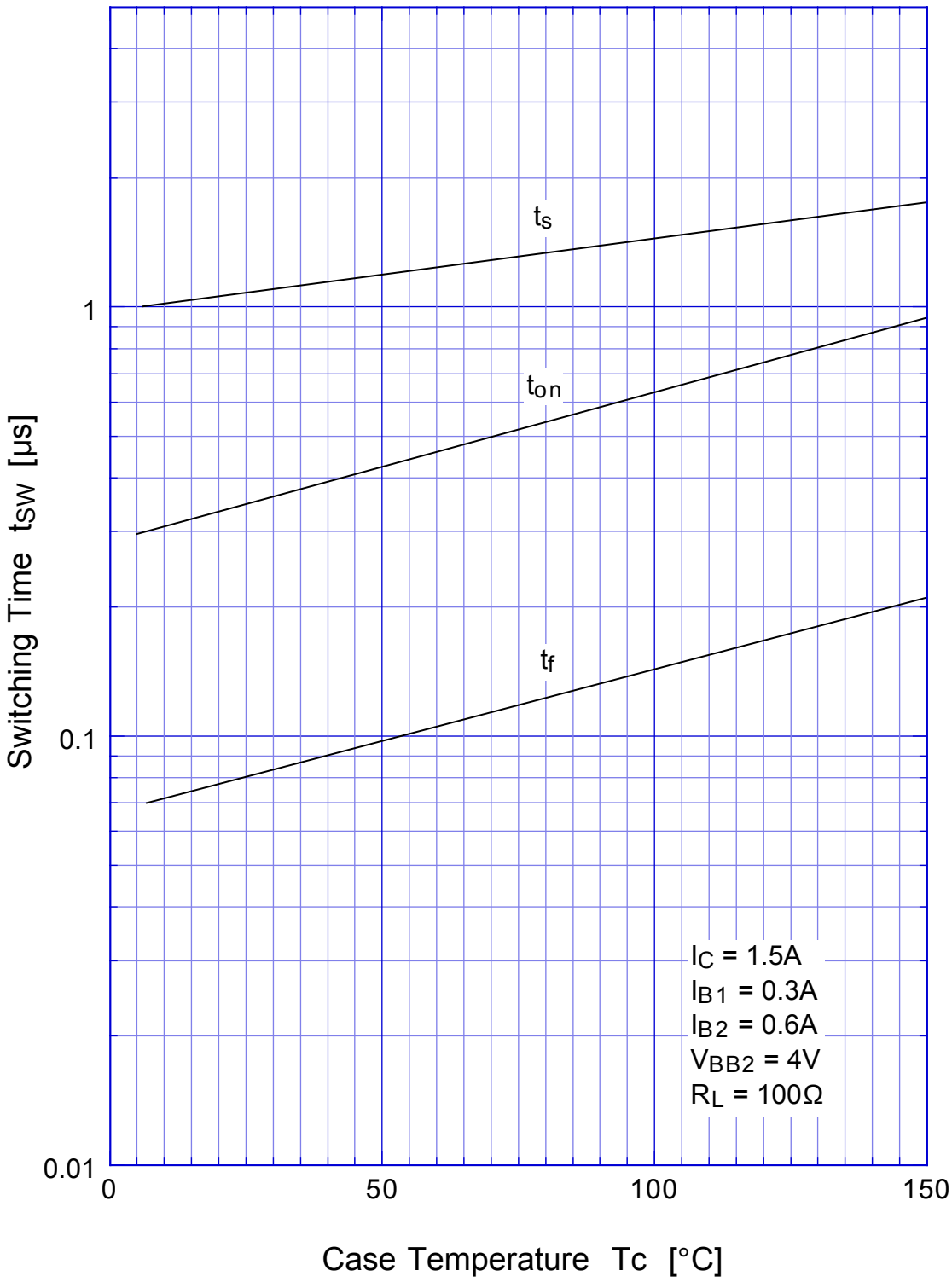
2SC4052 Switching Time - I_C



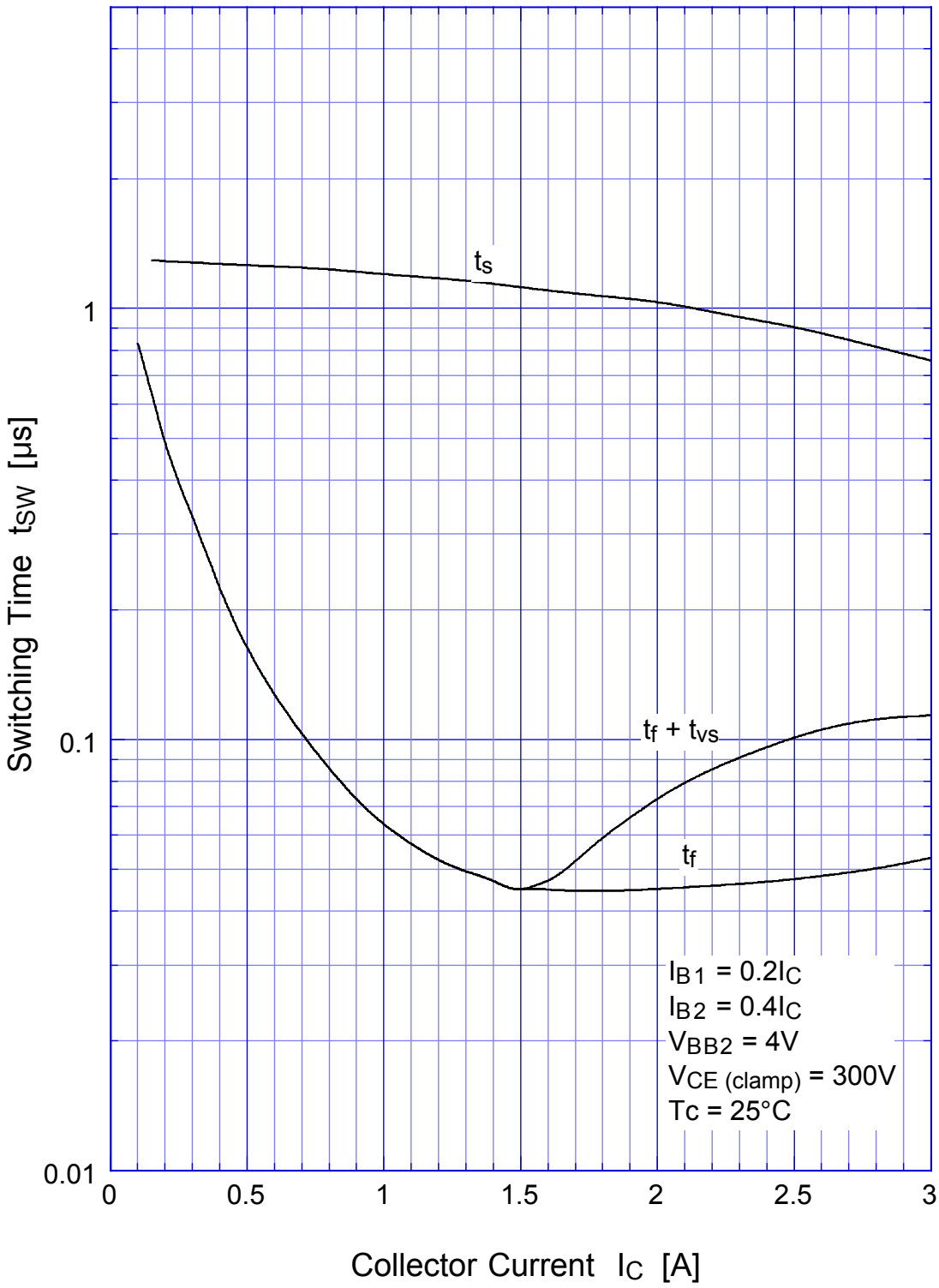
2SC4052 Switching Time - V_{CC}



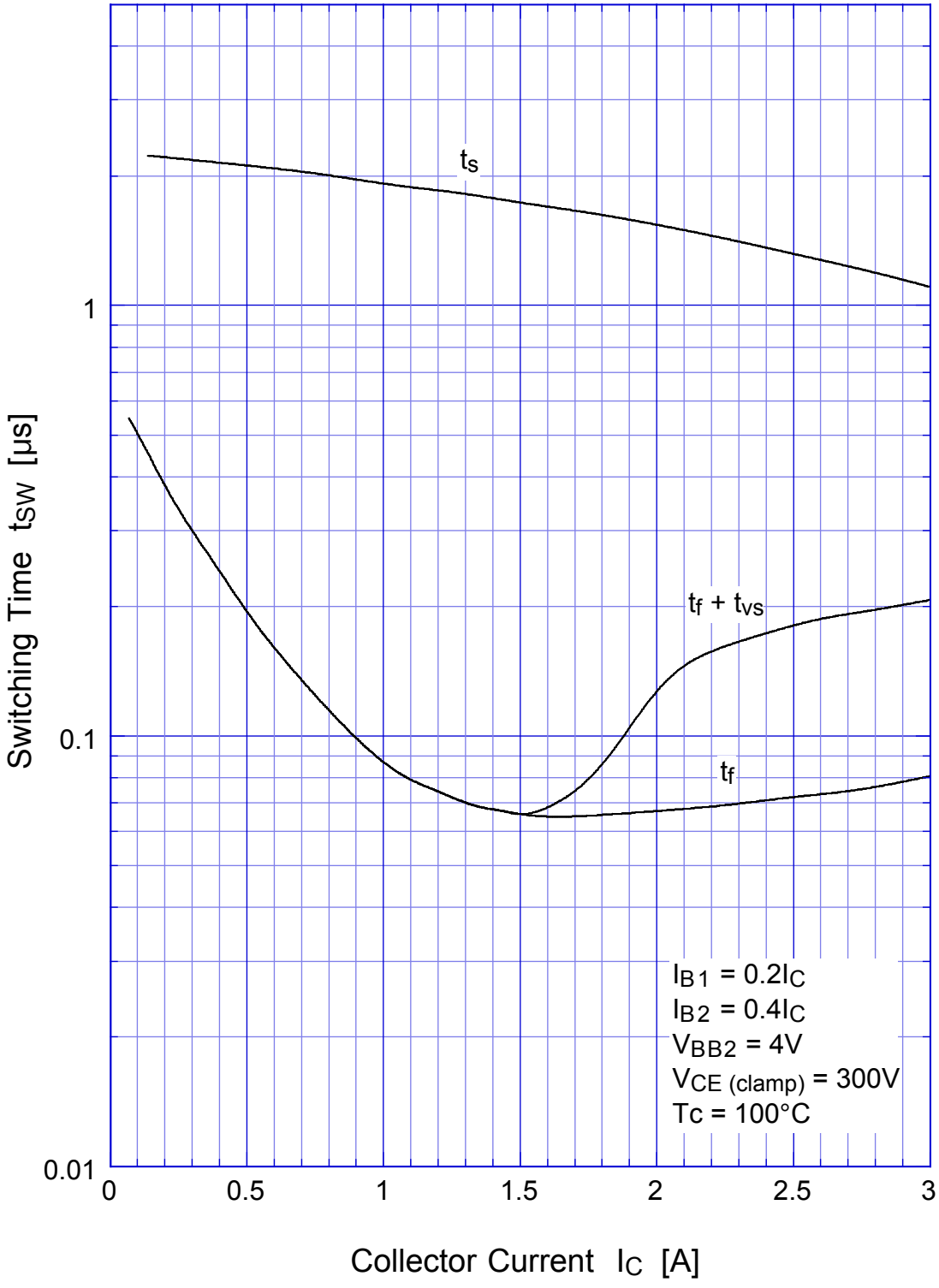
2SC4052 Switching Time - Tc

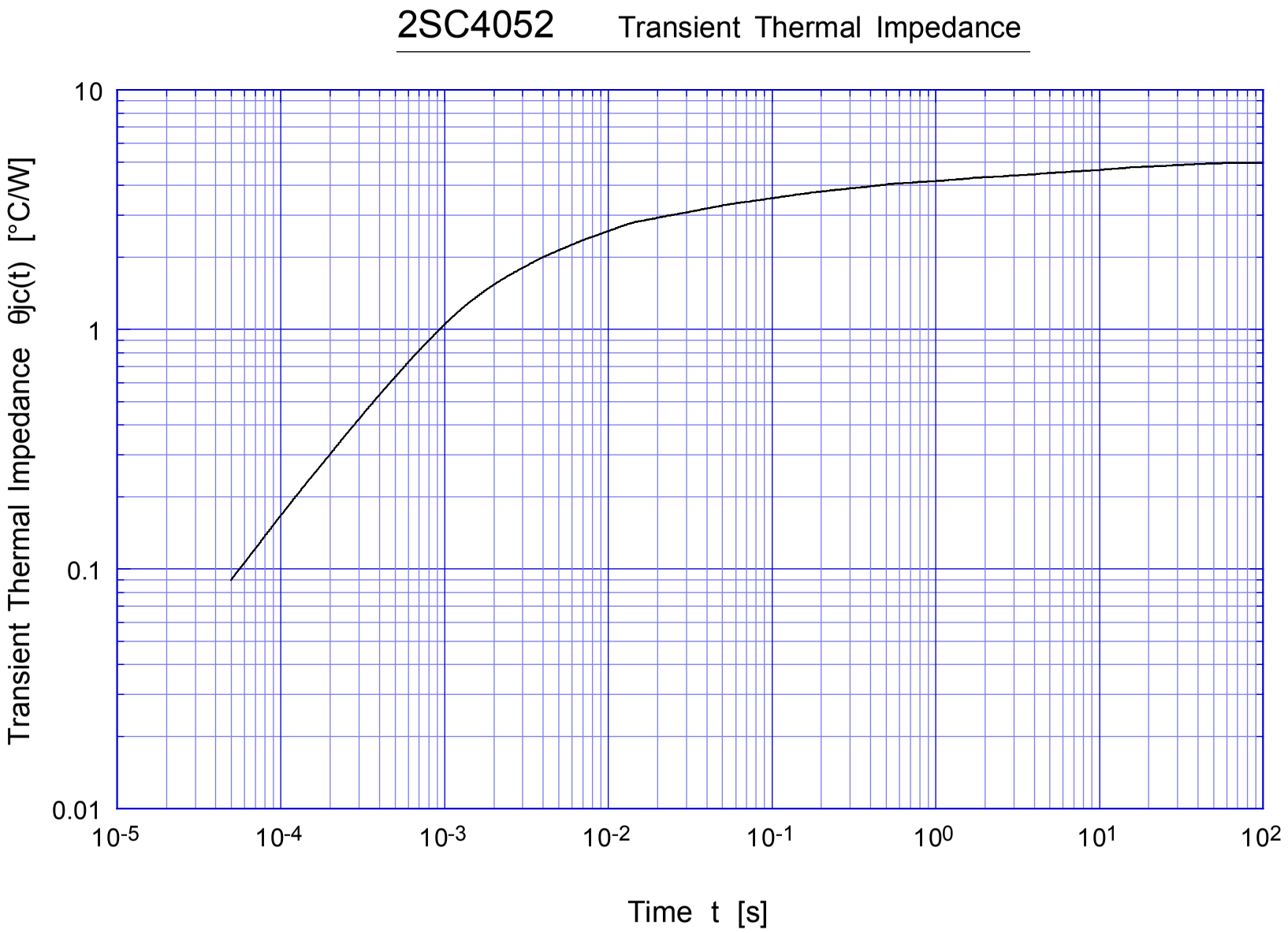


2SC4052 L-Load Switching Time - I_C

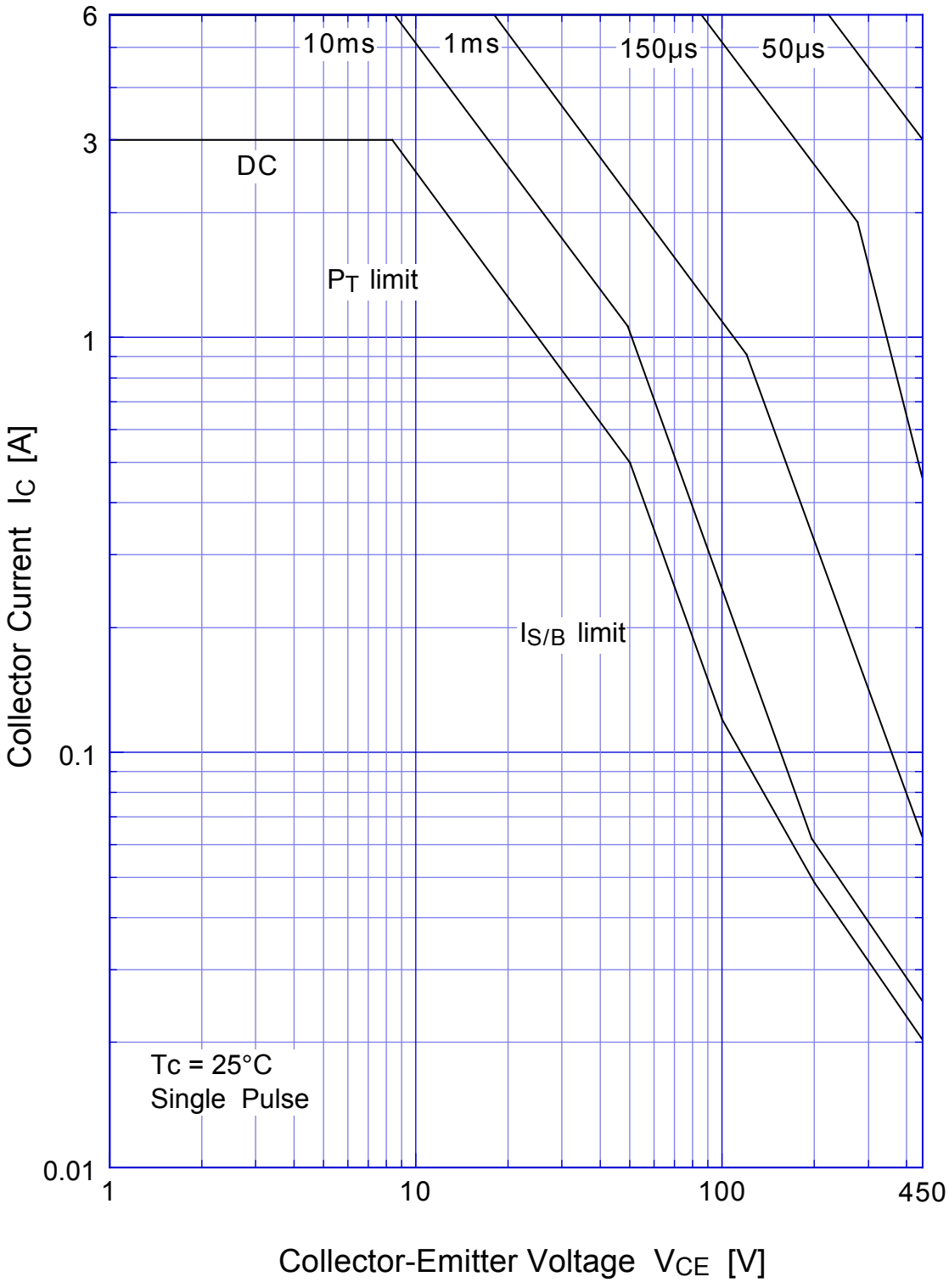


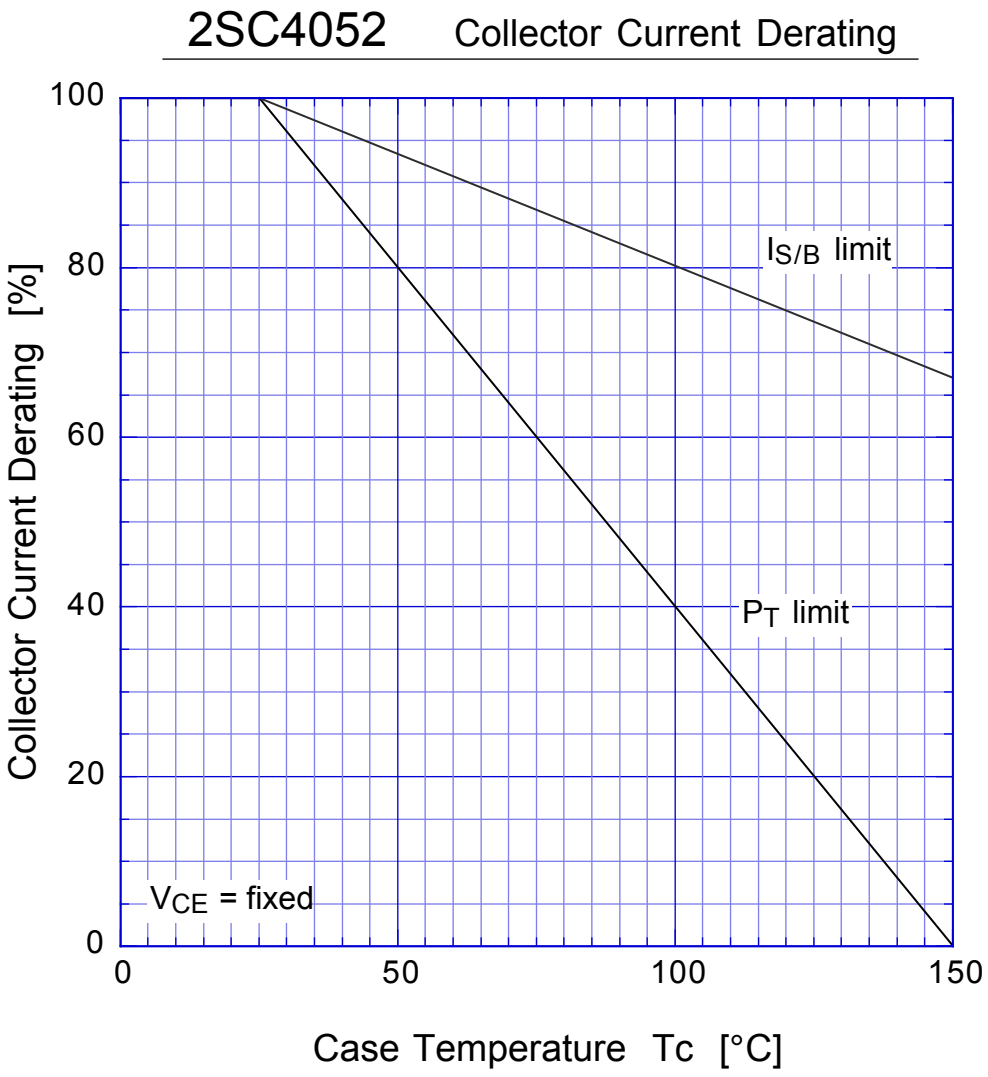
2SC4052 L-Load Switching Time - I_C (At High Temperature)




2SC4052
Transient Thermal Impedance
Transient Thermal Impedance θjc(t) [°C/W]
10
1
0.1
0.01
10-5
10-4
10-3
10-2
10-1
100
101
102
Time t [s]

2SC4052 Forward Bias SOA




2SC4052 Collector Current Derating
100
80
60
40
20
0
Collector Current Derating [%]
0
50
100
150
Case Temperature Tc [°C]
$I_{S/B}$ limit
P_T limit
V_{CE} = fixed

2SC4052 Reverse Bias SOA