SHINDENGEN

Switching Power Transistor

FX Series

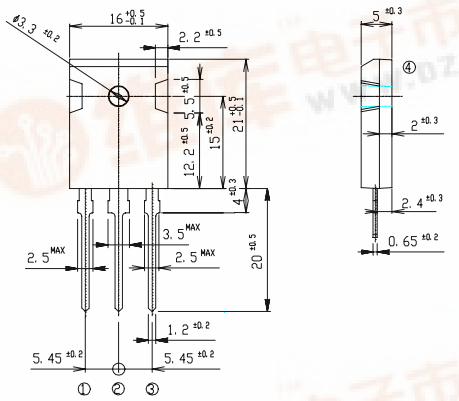
2SC4058
(T10W45FX)

10A NPN

OUTLINE DIMENSIONS

Case : MTO-3P

Unit : mm



RATINGS

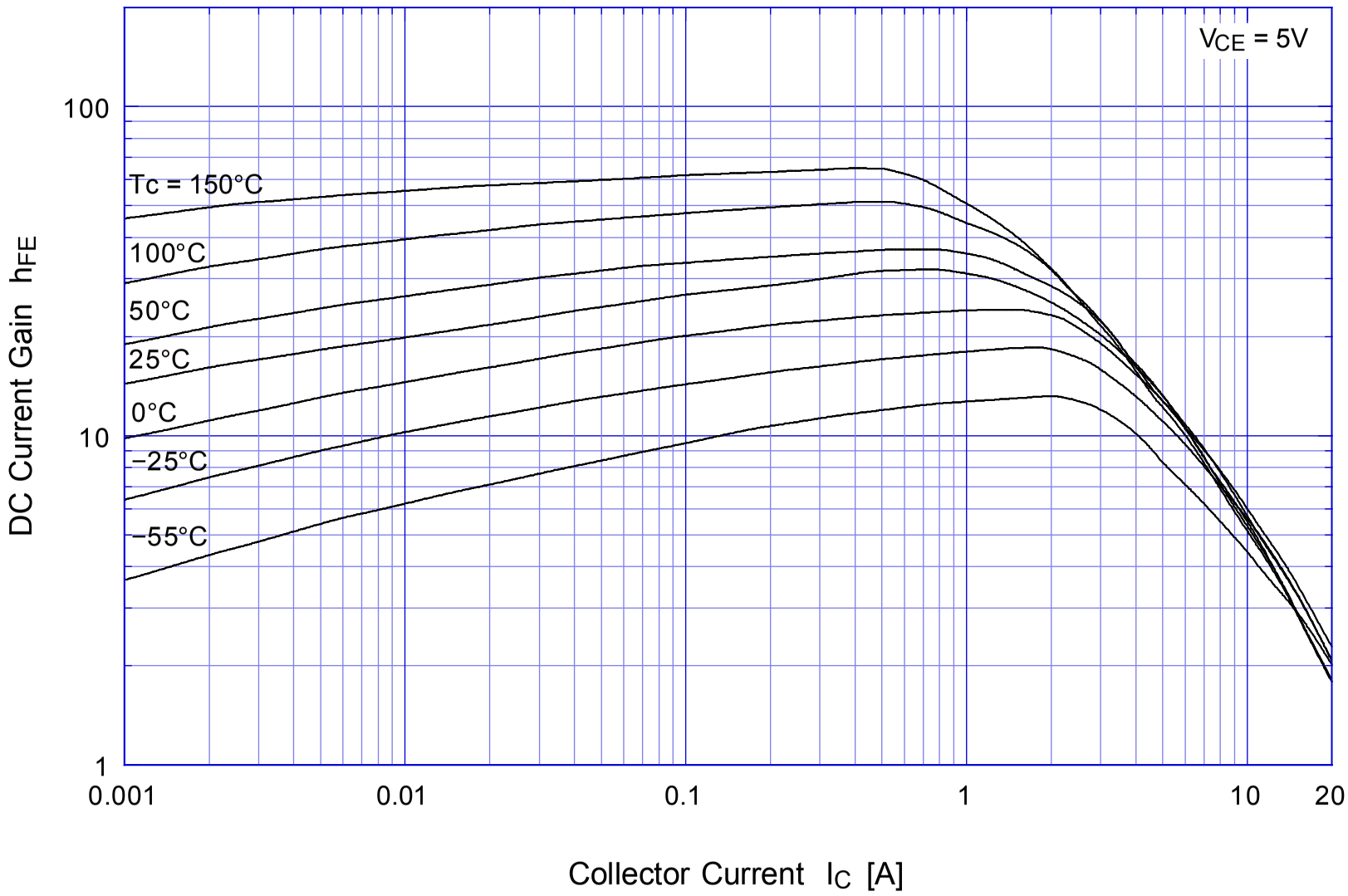
●Absolute Maximum Ratings

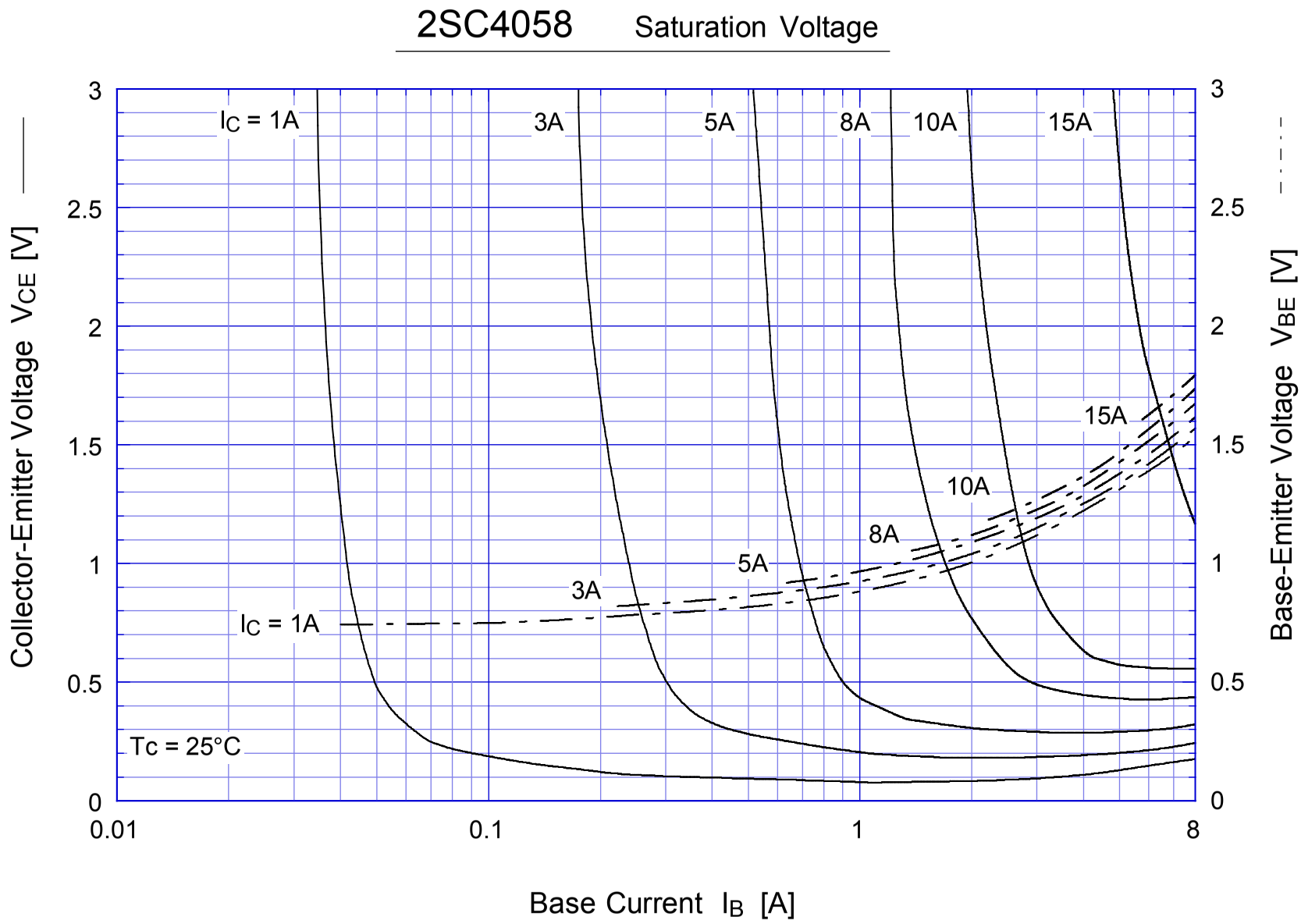
Item	Symbol	Conditions	Ratings	Unit
Storage Temperature	Tstg		−55～150	℃
Junction Temperature	Tj		150	℃
Collector to Base Voltage	V_{CBO}		600	V
Collector to Emitter Voltage	V_{CEO}		450	V
	V_{CEX}	V_{EB} = 5V	600	
Emitter to Base Voltage	V_{EBO}		7	V
Collector Current DC	I_C		10	A
Collector Current Peak	I_{CP}		20	
Base Current DC	I_B		4	A
Base Current Peak	I_{BP}		8	
Total Transistor Dissipation	P_T	Tc = 25℃	100	W
Mounting Torque	TOR		0.8	N·m

●Electrical Characteristics (Tc=25℃)

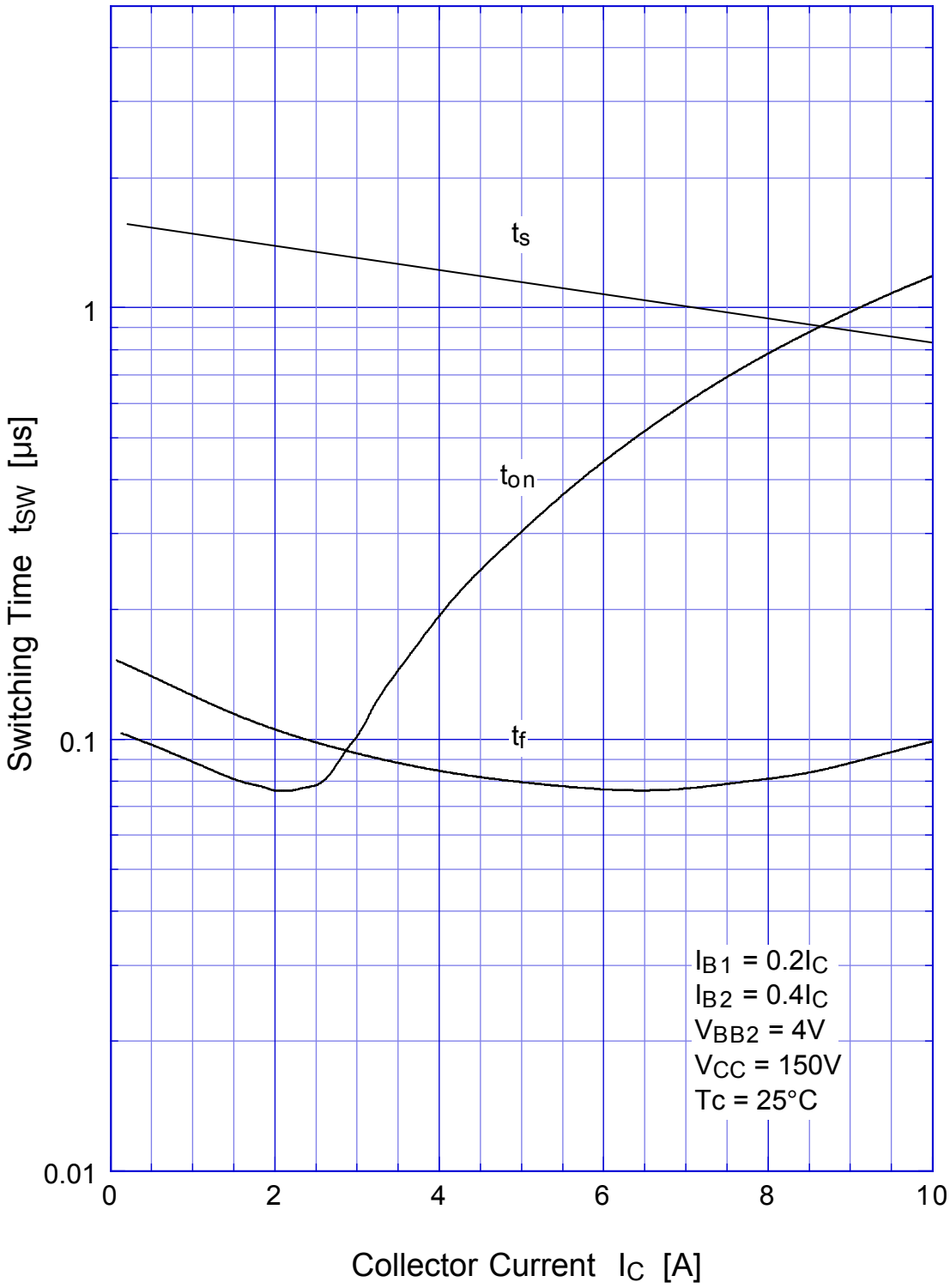
Item	Symbol	Conditions	Ratings	Unit
Collector to Emitter Sustaining Voltage	V_{CEO}(sus)	I_C = 0.2A	Min 450	V
Collector Cutoff Current	I_{CBO}	At rated Voltage	Max 0.1	mA
	I_{CEO}		Max 0.1	
Emitter Cutoff Current	I_{EBO}	At rated Voltage	Max 0.1	mA
DC Current Gain	h_{FE}	V_{CE} = 5V, I_C = 5A	Min 10	
	h_{FEL}	V_{CE} = 5V, I_C = 1mA	Min 5	
Collector to Emitter Saturation Voltage	V_{CE}(sat)	I_C = 5A	Max 1.0	V
Base to Emitter Saturation Voltage	V_{BE}(sat)	I_B = 1A	Max 1.5	V
Thermal Resistance	θ jc	Junction to case	Max 1.25	℃/W
Transition Frequency	f_T	V_{CE} = 10V, I_C = 1A	STD 20	MHz
Turn on Time	ton	I_C = 5A	Max 0.5	μ s
Storage Time	ts	I_{B1} = 1A, I_{B2} = 2A	Max 2.0	
Fall Time	tf	R_L = 30Ω, V_{BB2} = 4V	Max 0.2	

2SC4058 h_{FE} - I_C

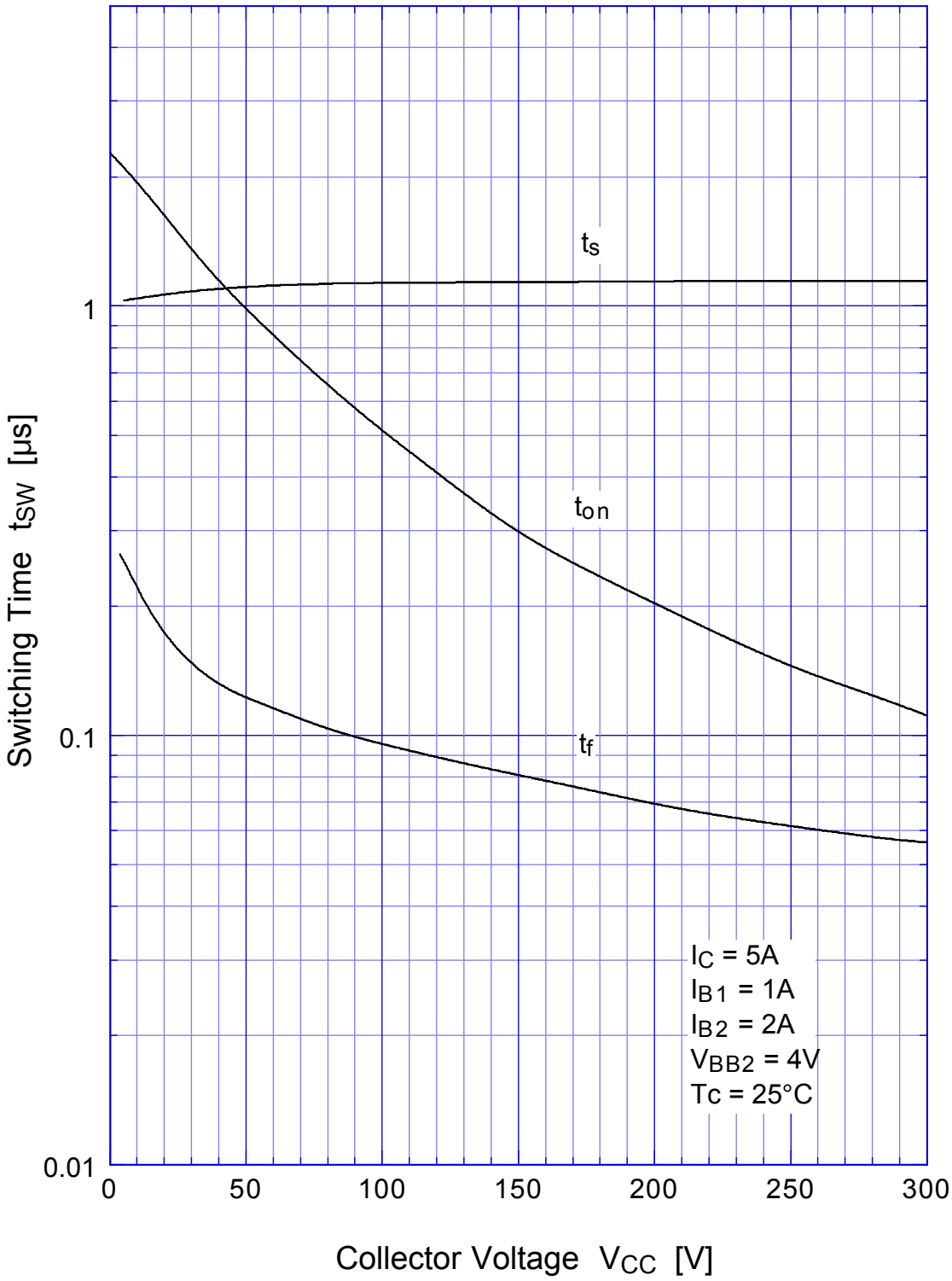



2SC4058 Saturation Voltage
Collector-Emitter Voltage VCE [V]
Base-Emitter Voltage VBE [V]
Base Current IB [A]
IC = 1A
3A
5A
8A
10A
15A
Tc = 25°C
0
0.5
1
1.5
2
2.5
3
0.01
0.1
1
8

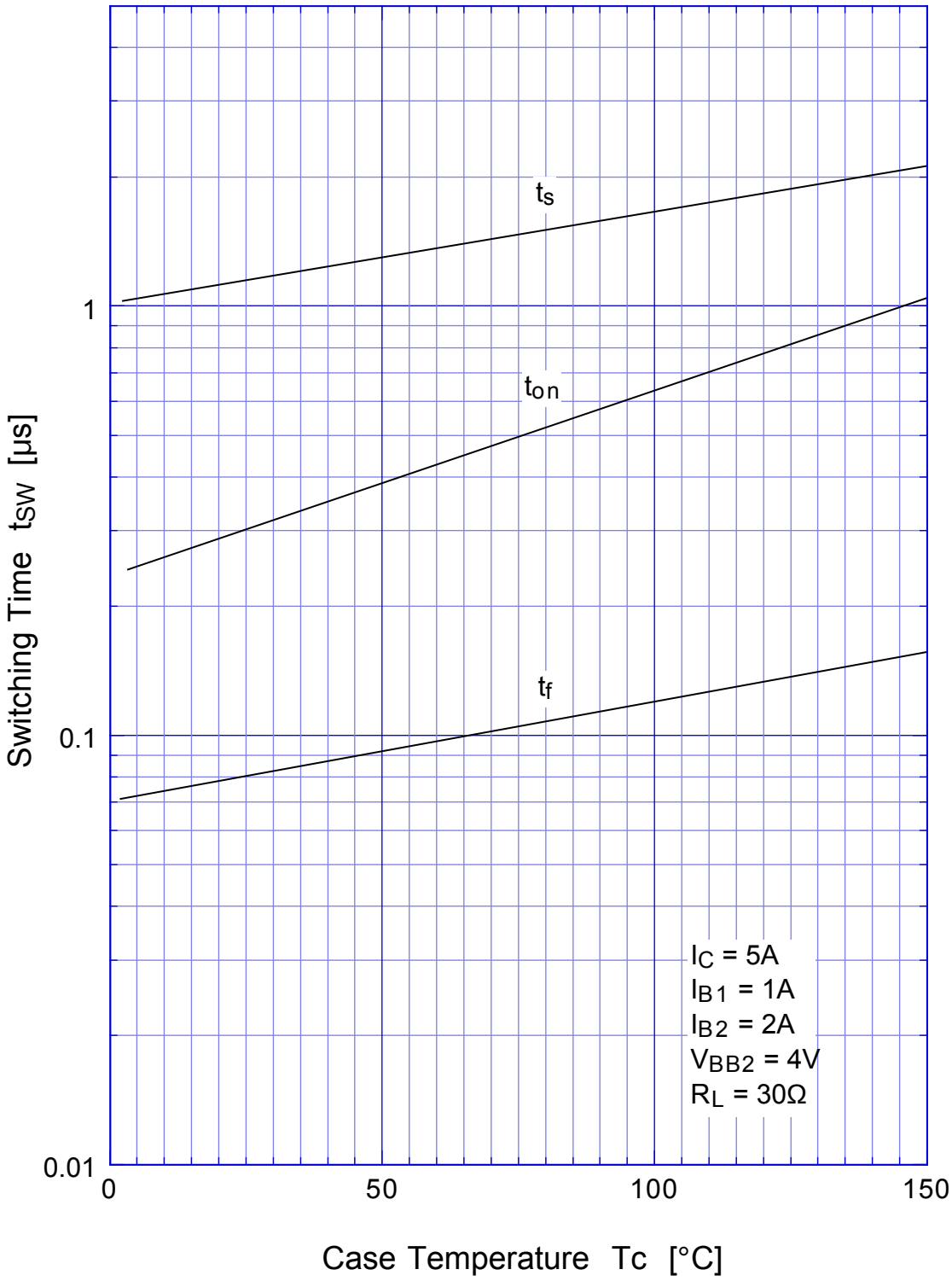
2SC4058 Switching Time - I_C



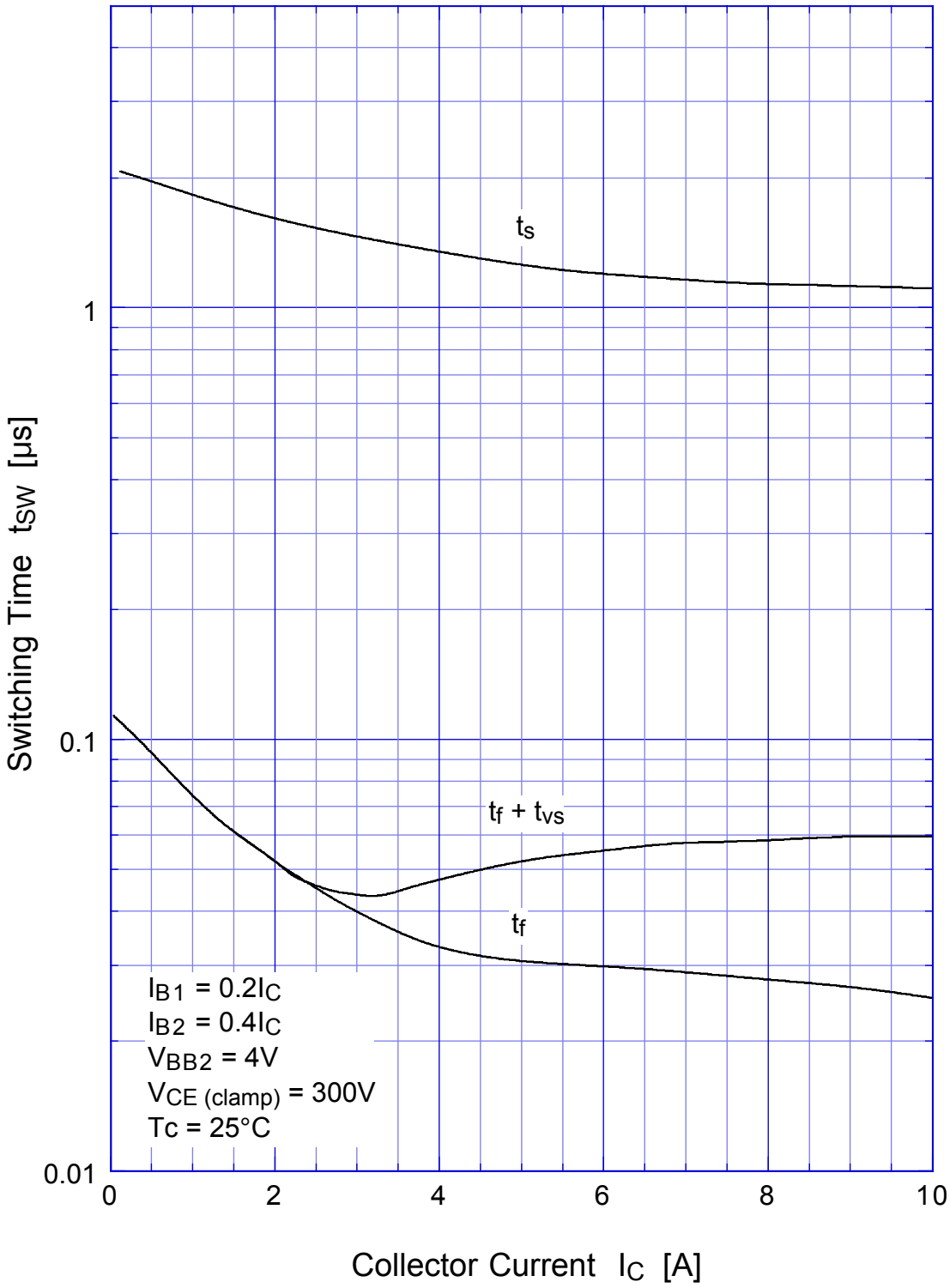
2SC4058 Switching Time - V_{CC}



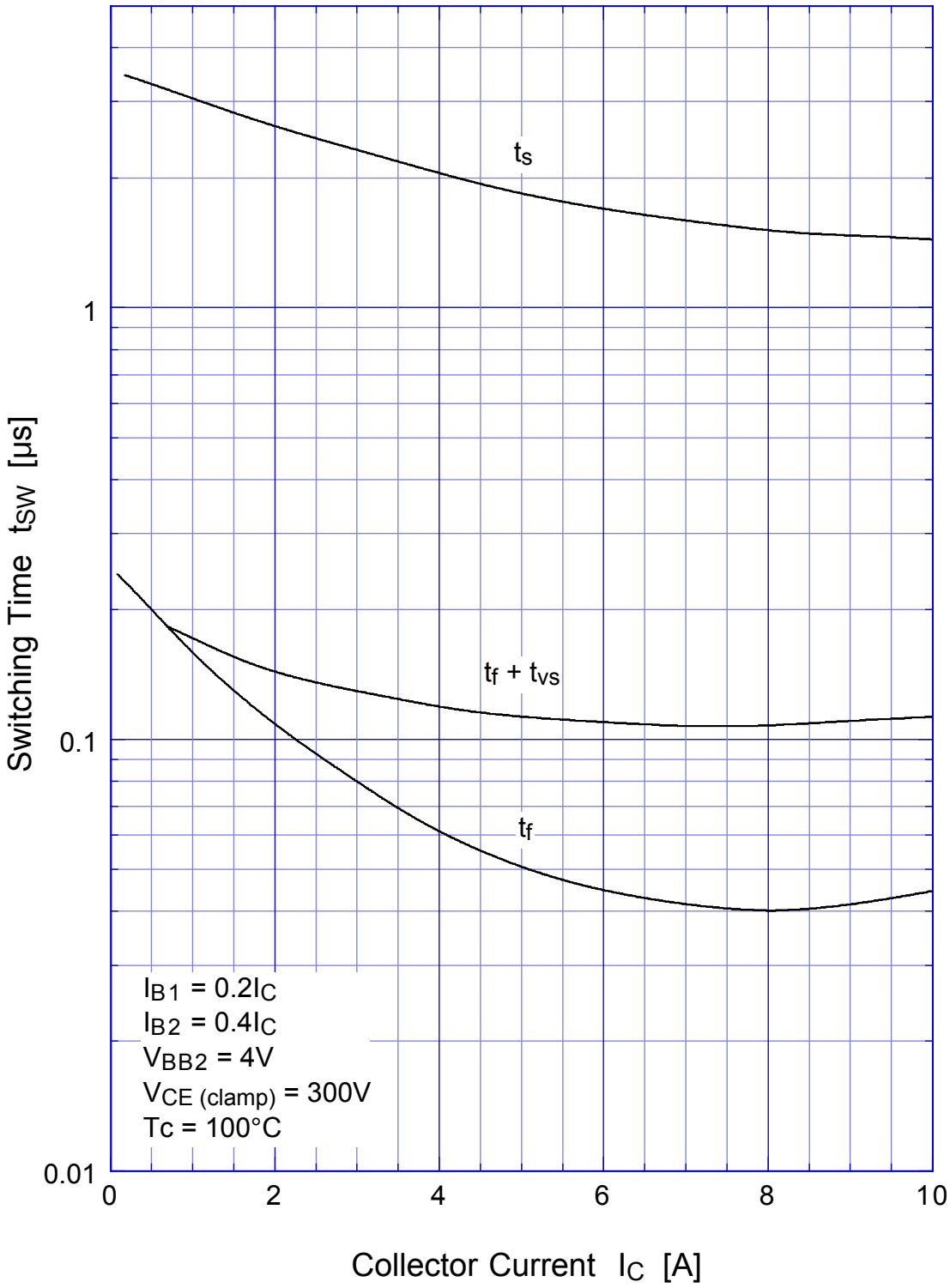
2SC4058 Switching Time - Tc

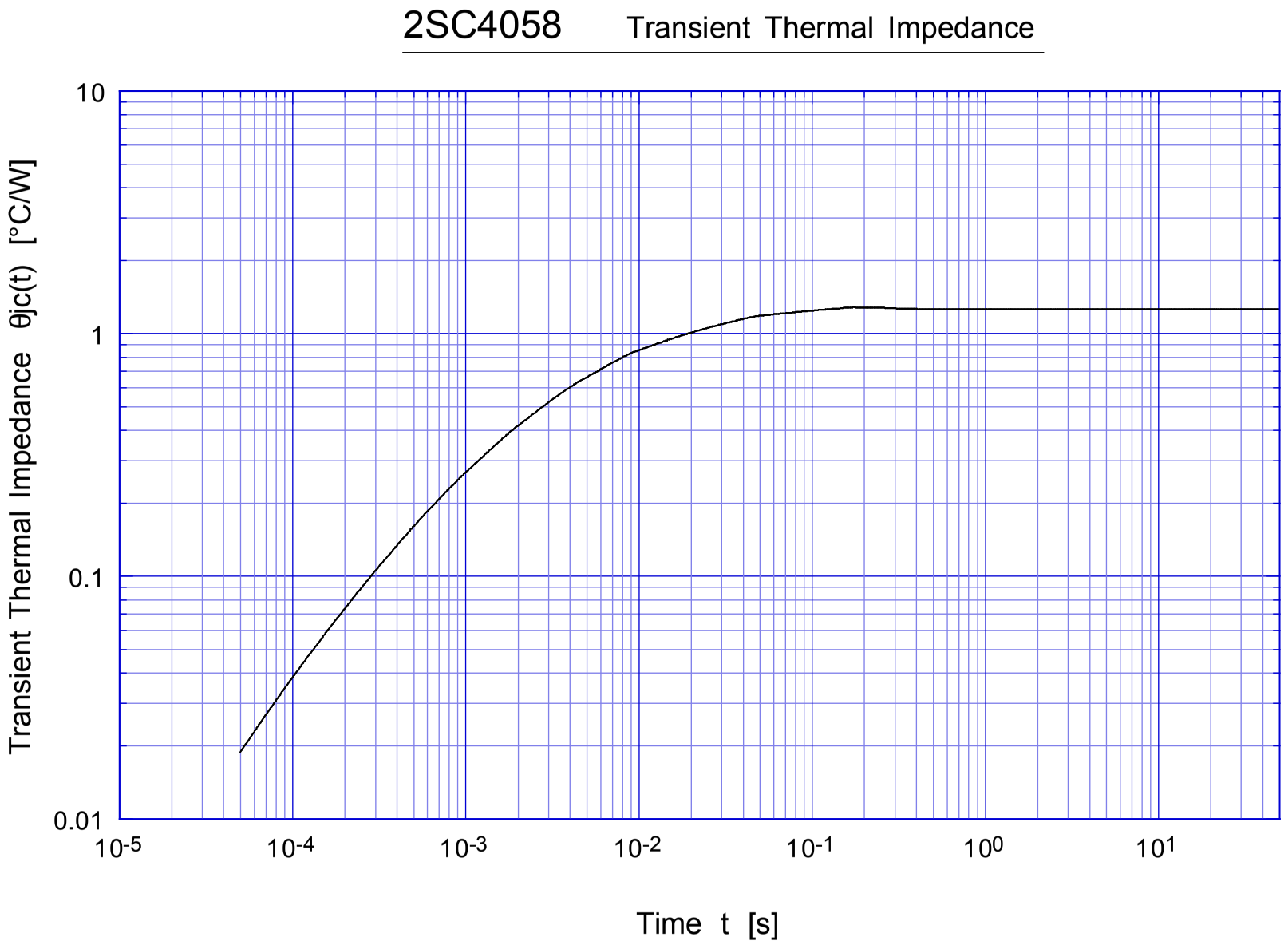


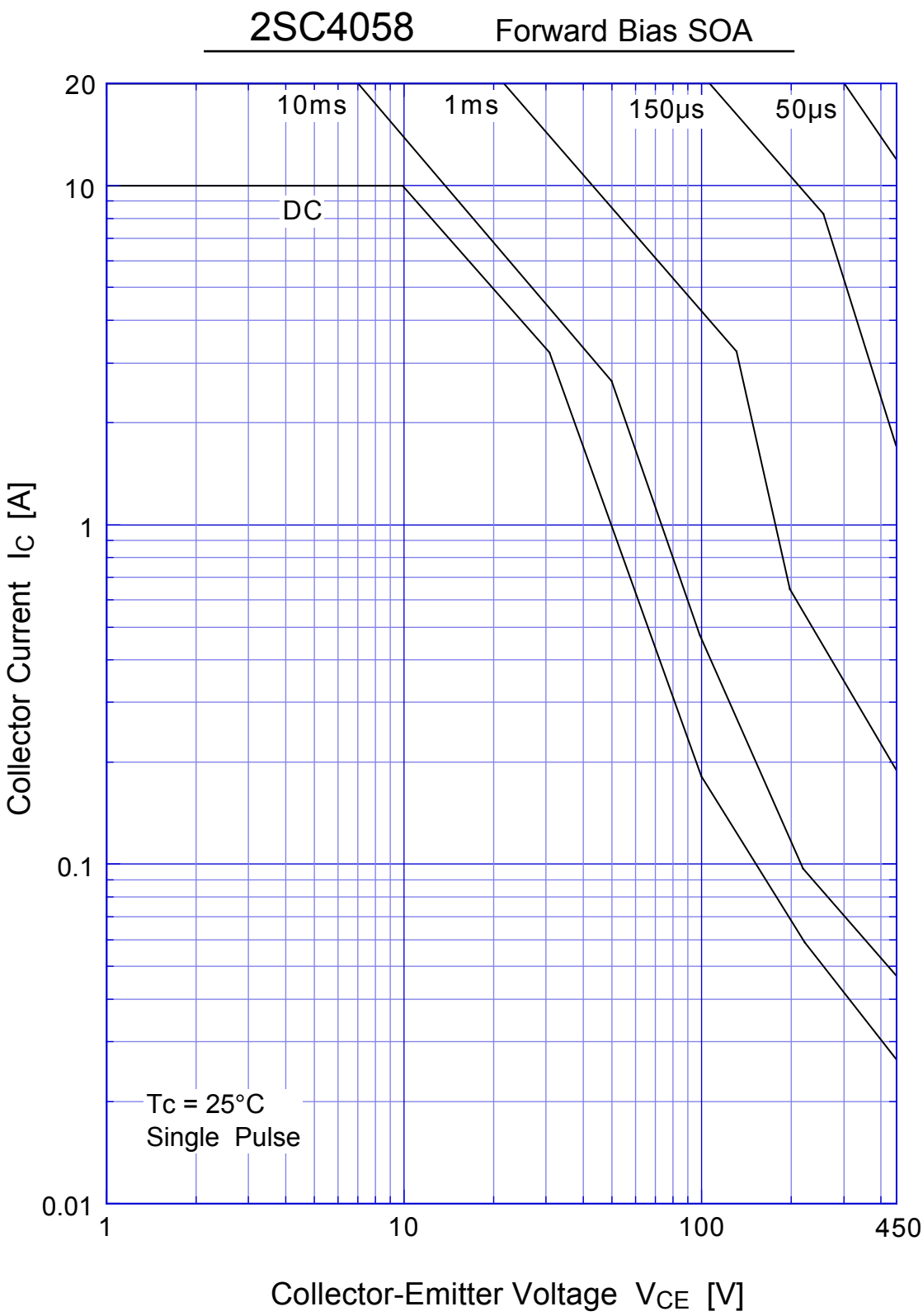
2SC4058 L-Load Switching Time - I_C

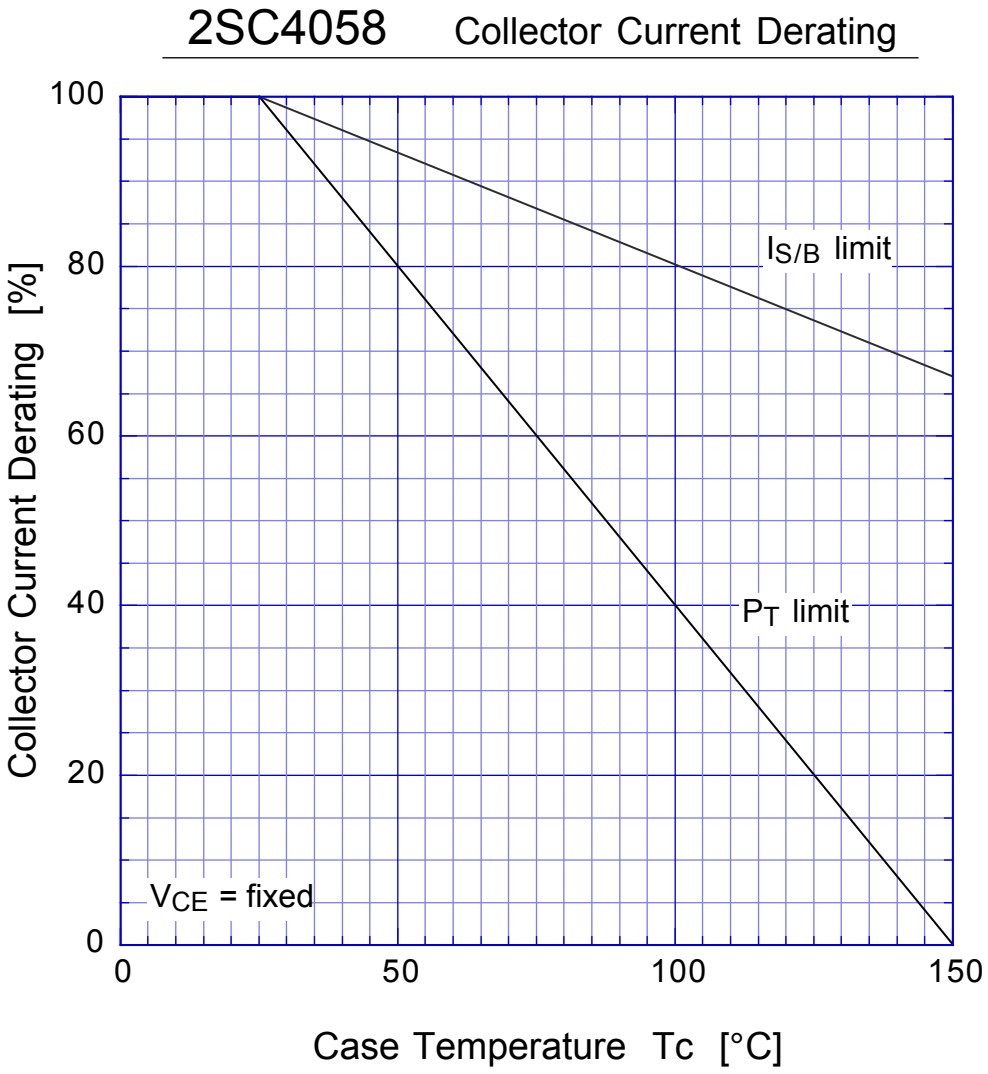


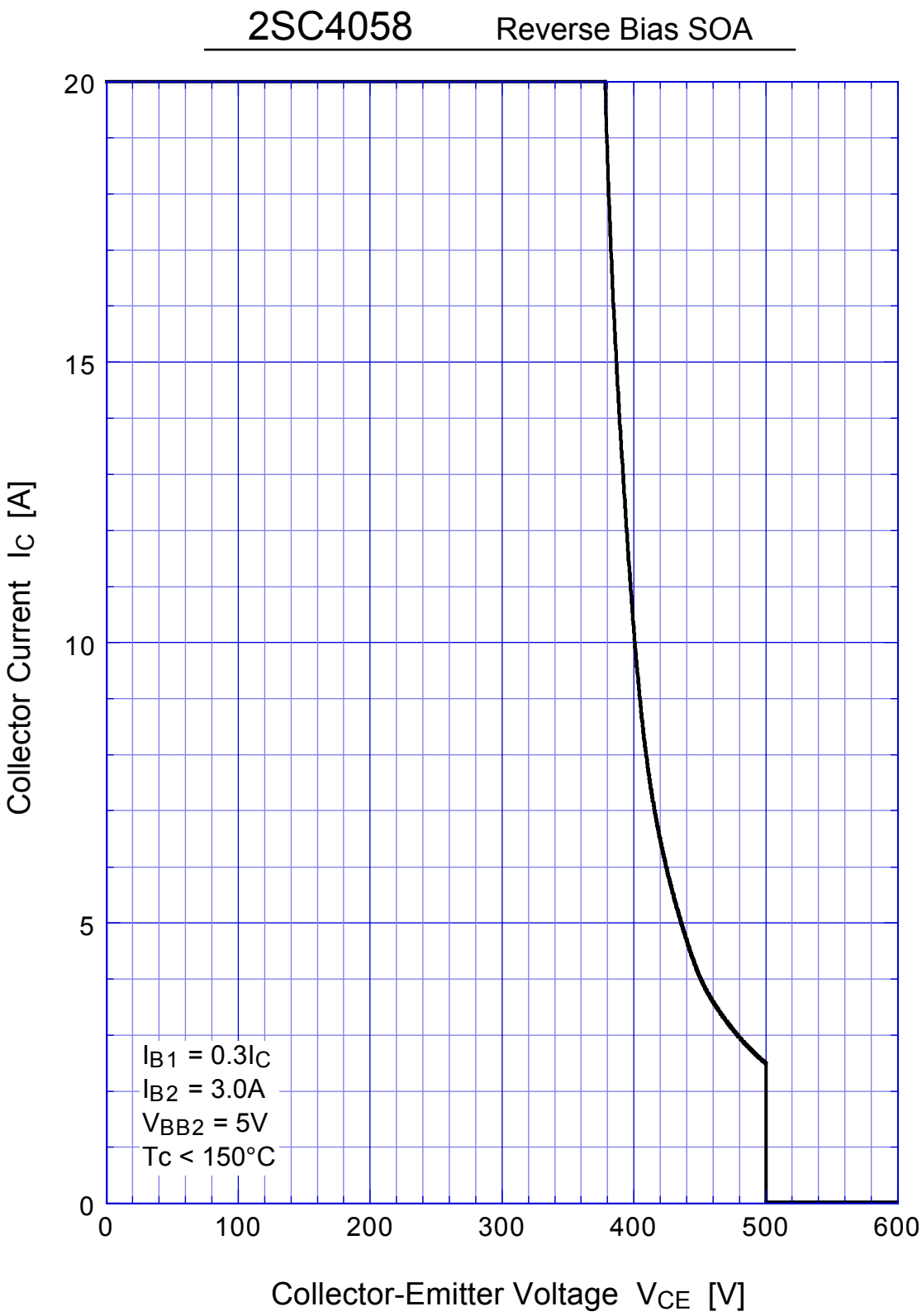
2SC4058 L-Load Switching Time - I_C (At High Temperature)




2SC4058
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
Time t [s]


2SC4058
Forward Bias SOA
10ms
1ms
150µs
50µs
DC
Tc = 25°C
Single Pulse
20
10
1
0.1
0.01
1
10
100
450
Collector Current IC [A]
Collector-Emitter Voltage VCE [V]


2SC4058 Collector Current Derating
100
80
60
40
20
0
Collector Current Derating [%]
$I_{S/B}$ limit
P_T limit
V_{CE} = fixed
0
50
100
150
Case Temperature Tc [°C]


2SC4058
Reverse Bias SOA
Collector Current I_C [A]
20
15
10
5
0
0
100
200
300
400
500
600
Collector-Emitter Voltage V_{CE} [V]
I_{B1} = 0.3I_C
I_{B2} = 3.0A
V_{BB2} = 5V
Tc < 150°C