SHINDENGEN

Darlington Transistor

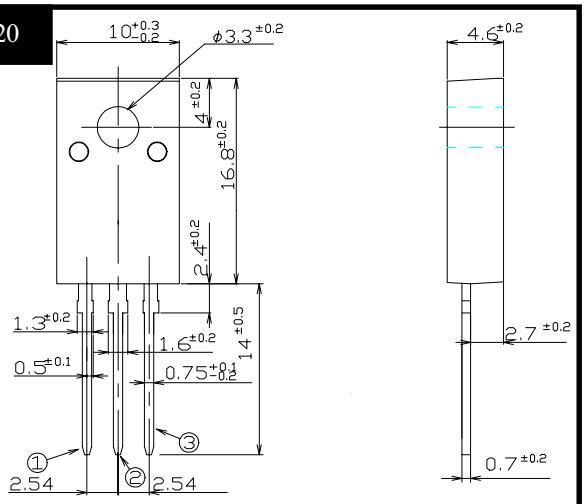
2SD1788
(TP4L10)

± 4A NPN

OUTLINE DIMENSIONS

Case : ITO-220

Unit : mm



① :B
② :C
③ :E

RATINGS

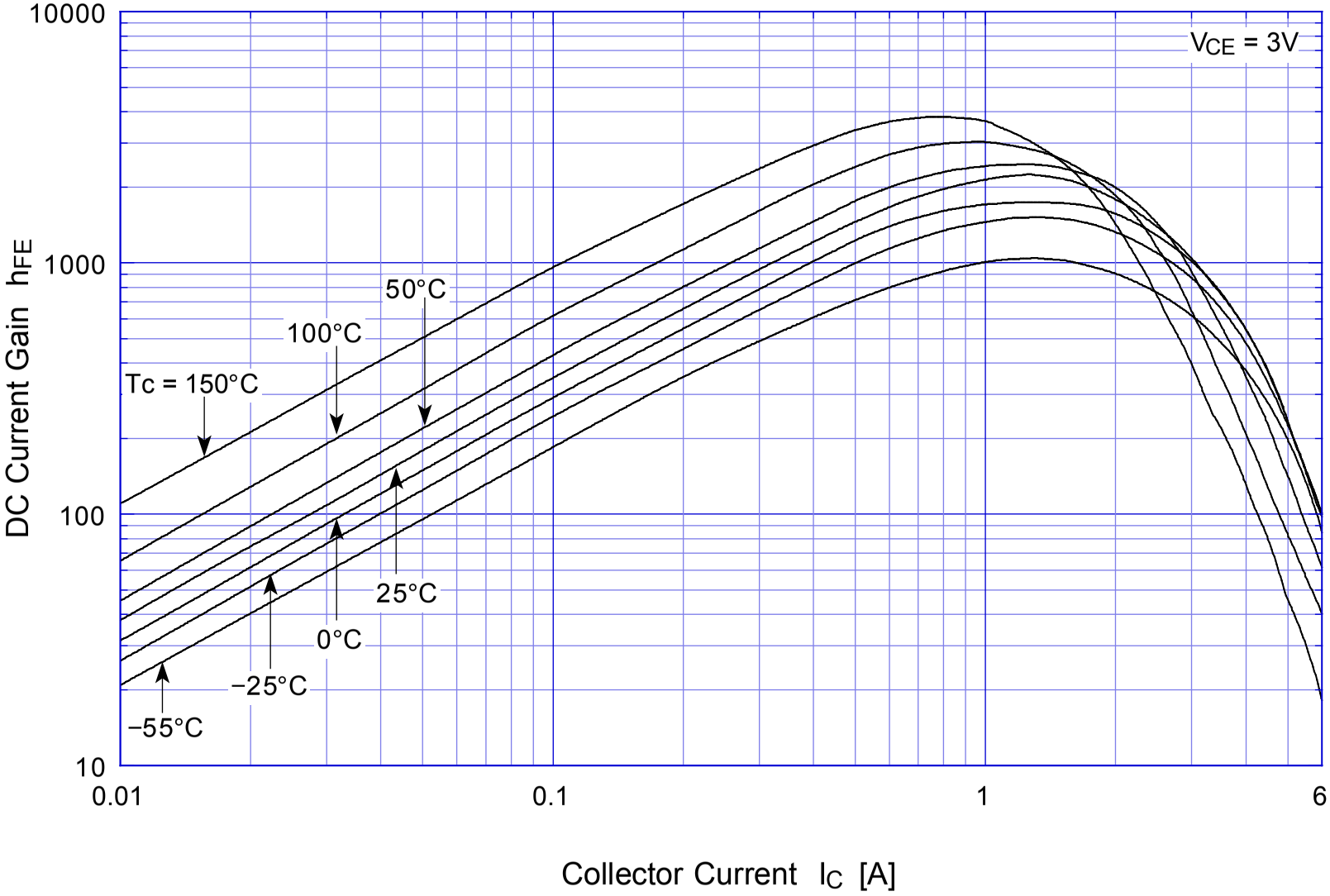
●Absolute Maximum Ratings

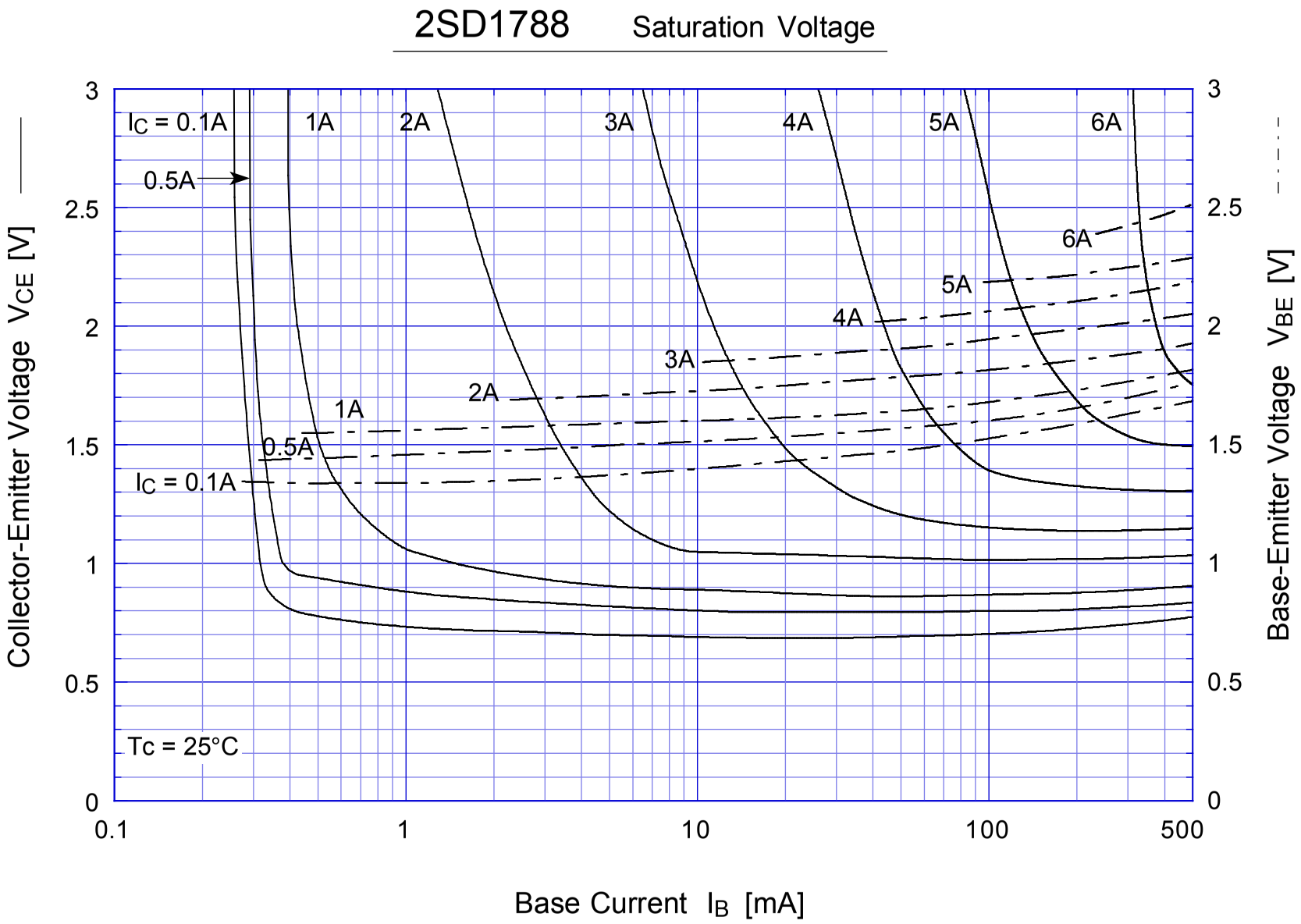
Item	Symbol	Conditions	Ratings	Unit
Storage Temperature	Tstg		−55～+150	℃
Junction Temperature	Tj		+150	℃
Collector to Base Voltage	V_{CBO}		100	V
Collector to Emitter Voltage	V_{CEO}		100	V
Emitter to Base Voltage	V_{EBO}		7	V
Collector Current DC	I_C		±4	A
Collector Current Peak	I_{CP}		±6	A
Base Current DC	I_B		0.3	A
Base Current Peak	I_{BP}		0.5	A
Total Transistor Dissipation	P_T	Tc = 25℃	25	W
Dielectric Strength	Vdis	Terminals to case AC 1 minute	2	kV
Mounting Torque	TOR	(Recommended torque : 0.3N･m)	0.5	N･m

●Electrical Characteristics (Tc=25℃)

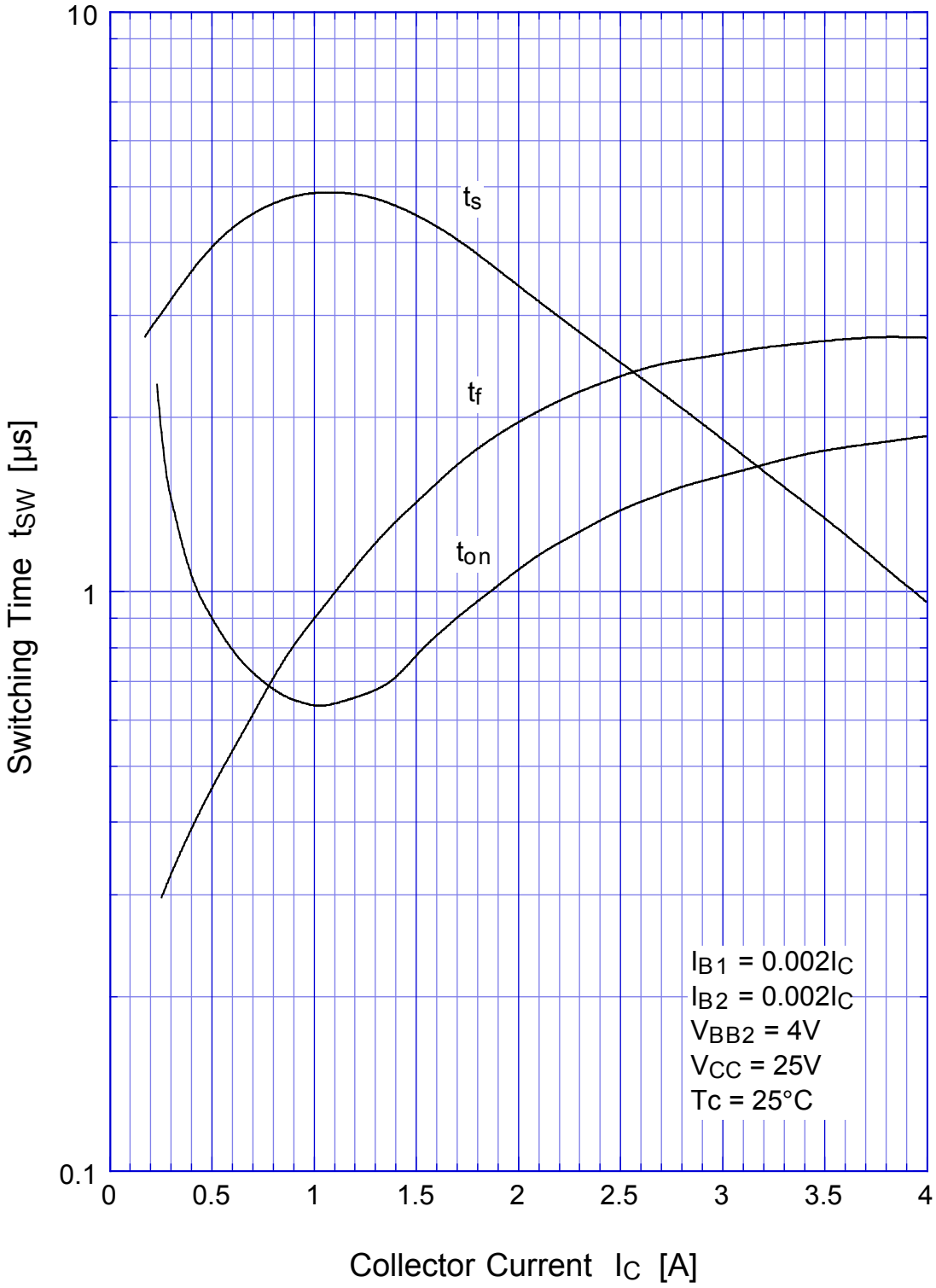
Item	Symbol	Conditions	Ratings	Unit
Collector Cutoff Current	I_{CBO}	V_{CB} = 100V	Max 0.1	mA
	I_{CEO}	V_{CE} = 100V	Max 0.1	
Emitter Cutoff Current	I_{EBO}	V_{EB} = 7V	Max 5	mA
DC Current Gain	h_{FE}	V_{CE} = 3V, I_C = 1A	Min 1,500	
			Max 30,000	
Collector to Emitter Saturation Voltage	V_{CE}(sat)	I_C = 1A	Max 1.5	V
Base to Emitter Saturation Voltage	V_{BE}(sat)	I_B = 2mA	Max 2.0	V
Thermal Resistance	θ jc	Junction to case	Max 5.0	℃/W
Transition Frequency	f_T	V_{CE} = 10V, I_C = 0.4A	TYP 20	MHz
Turn on Time	ton	I_C = 1A I_{B1} = I_{B2} = 2mA R_L = 25Ω V_{BB2} = 4V	Max 2	μs
Storage Time	ts		Max 12	
Fall Time	tf		Max 5	

2SD1788 h_{FE} - I_C

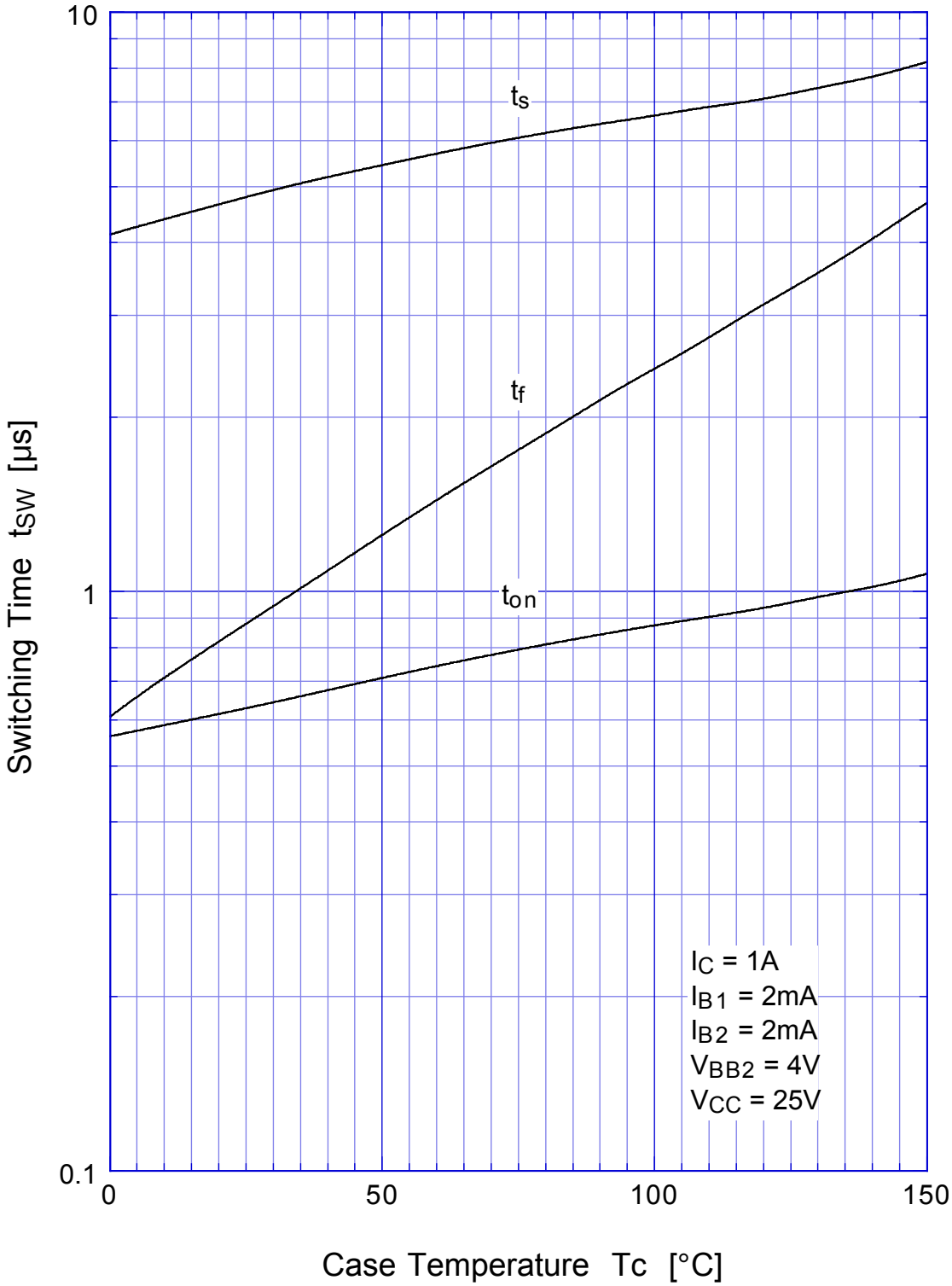


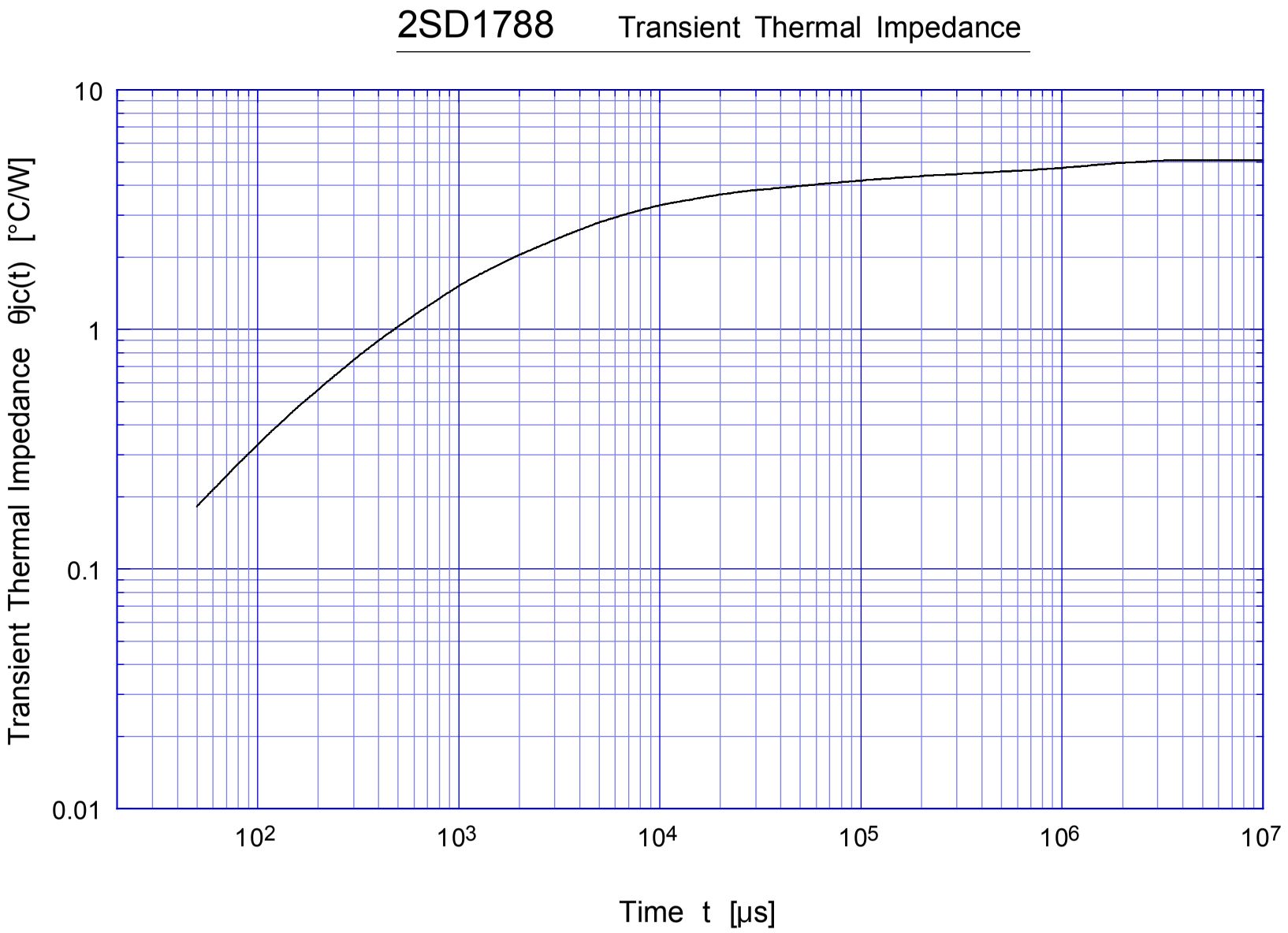

2SD1788 Saturation Voltage
Collector-Emitter Voltage V_{CE} [V]
Base-Emitter Voltage V_{BE} [V]
Base Current I_B [mA]
I_C = 0.1A
0.5A
1A
2A
3A
4A
5A
6A
Tc = 25°C
0
0.5
1
1.5
2
2.5
3
0.1
1
10
100
500

2SD1788 Switching Time - I_C

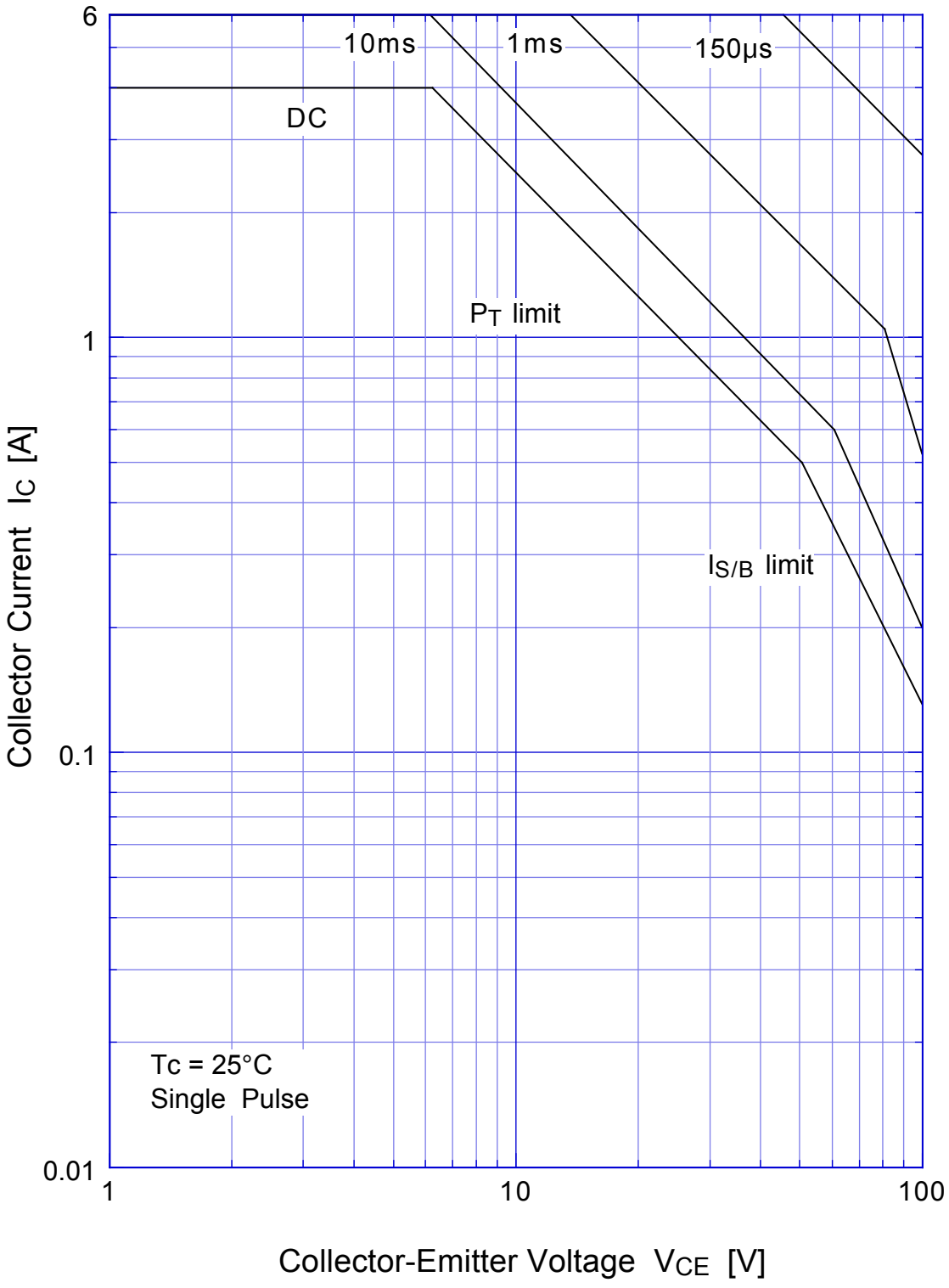


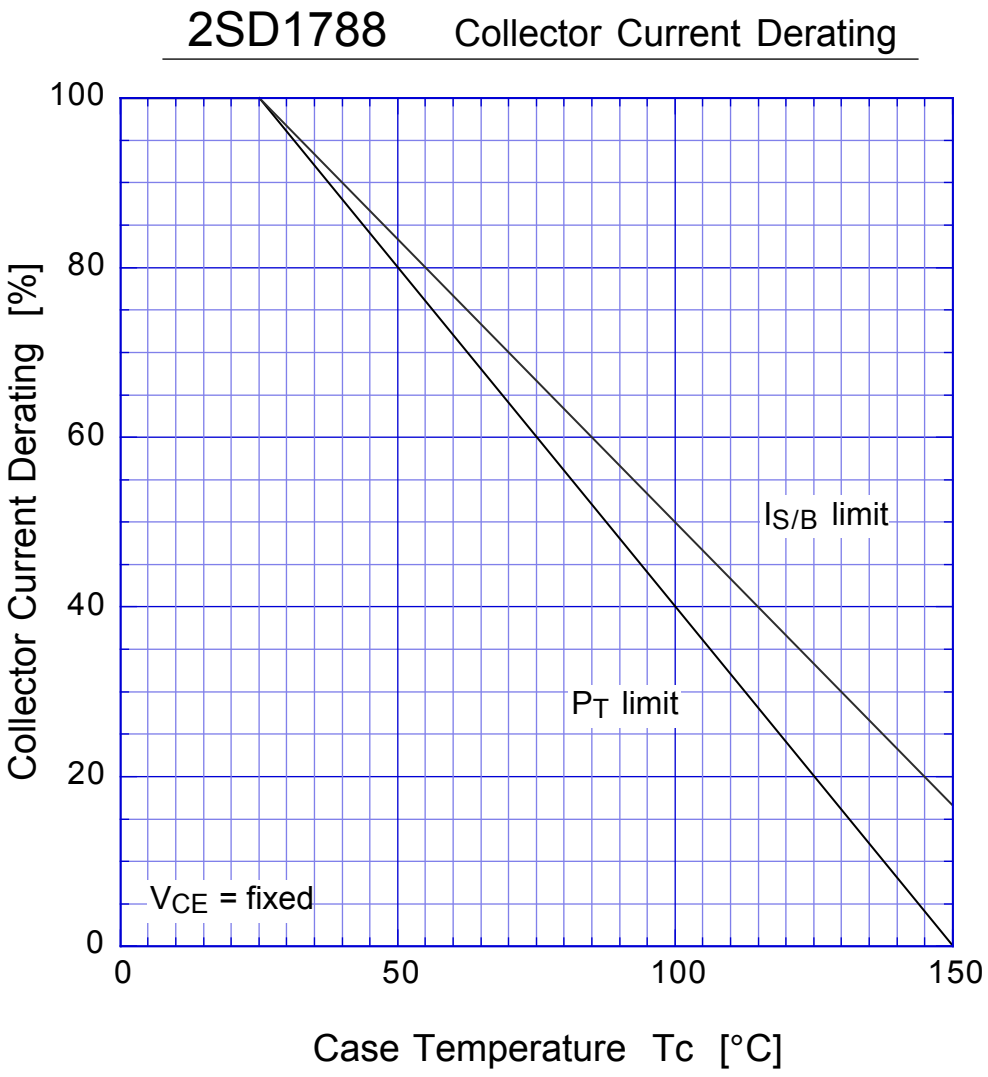
2SD1788 Switching Time - Tc




2SD1788 Transient Thermal Impedance
Transient Thermal Impedance θjc(t) [°C/W]
10
1
0.1
0.01
10²
10³
10⁴
10⁵
10⁶
10⁷
Time t [μs]

2SD1788 Forward Bias SOA




2SD1788 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

2SD1788 Derating Curve