

Silicon NPN Power Transistors

2SC4231

DESCRIPTION

- With ITO-220 package
- Switching power transistor
- High voltage ,high speed

PINNING

PIN	DESCRIPTION
1	Base
2	Collector
3	Emitter

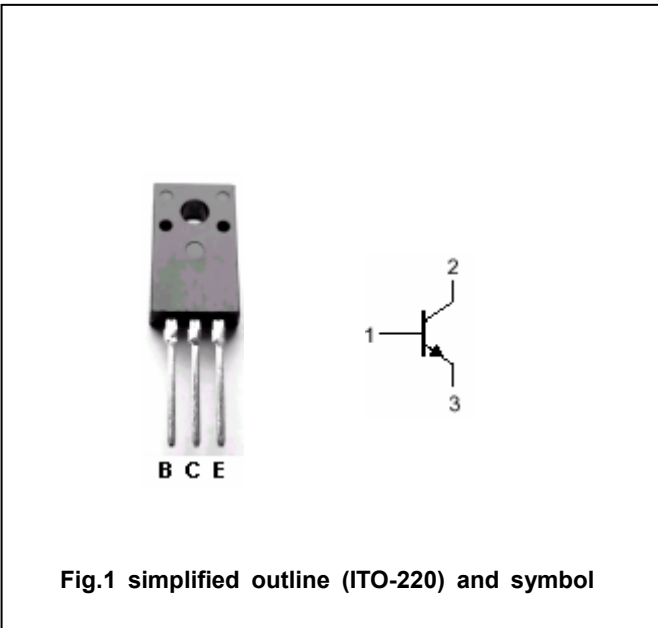


Fig.1 simplified outline (ITO-220) and symbol

Absolute maximum ratings(Ta=25°C)

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
V _{CBO}	Collector-base voltage	Open emitter	1200	V
V _{CEO}	Collector-emitter voltage	Open base	800	V
V _{EBO}	Emitter-base voltage	Open collector	7	V
I _C	Collector current		2	A
I _{CM}	Collector current-Peak		4	A
I _B	Base current		1	A
I _{BM}	Base current-Peak		2	A
P _T	Total power dissipation	T _C =25°C	30	W
T _j	Junction temperature		150	°C
T _{stg}	Storage temperature		-55~150	°C

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	MAX	UNIT
R _{th j-c}	Thermal resistance junction case	4.16	°C/W

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CHARACTERISTICS

T_j=25°C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V _{CE0(SUS)}	Collector-emitter sustaining voltage	I _C =0.1A; I _B =0	800			V
V _{CEsat}	Collector-emitter saturation voltage	I _C =1A; I _B =0.2A			1.0	V
V _{BEsat}	Base-emitter saturation voltage	I _C =1A; I _B =0.2A			1.5	V
I _{CBO}	Collector cut-off current	At rated voltage			0.1	mA
I _{CEO}	Collector cut-off current					
I _{EBO}	Emitter cut-off current	At rated voltage			0.1	mA
h _{FE-1}	DC current gain	I _C =1A; V _{CE} =5V	8			
h _{FE-2}	DC current gain	I _C =1mA; V _{CE} =5V	7			
f _T	Transition frequency	I _C =0.2A; V _{CE} =10V		8		MHz
t _{on}	Turn-on time	I _C =1; I _{B1} =0.2A; I _{B2} =0.4A; R _L =250Ω V _{BB2} =4V			0.5	μs
t _s	Storage time				3.5	μs
t _f	Fall time				0.3	μs

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PACKAGE OUTLINE

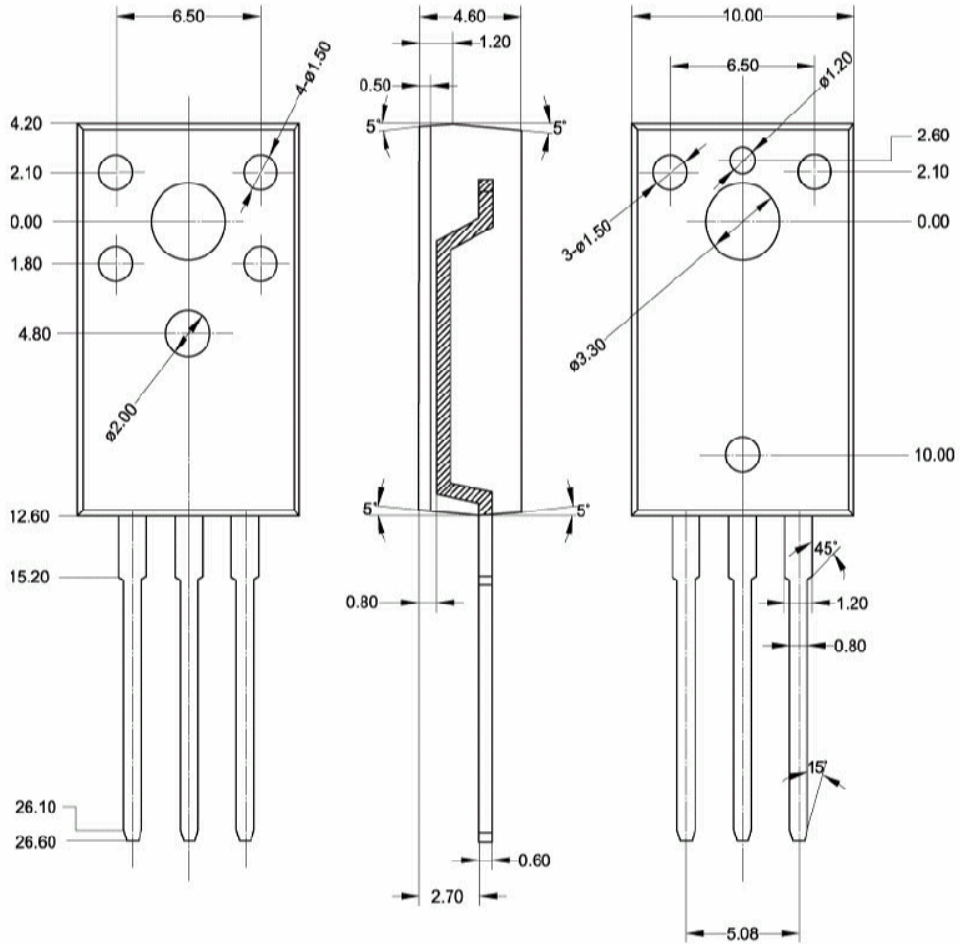
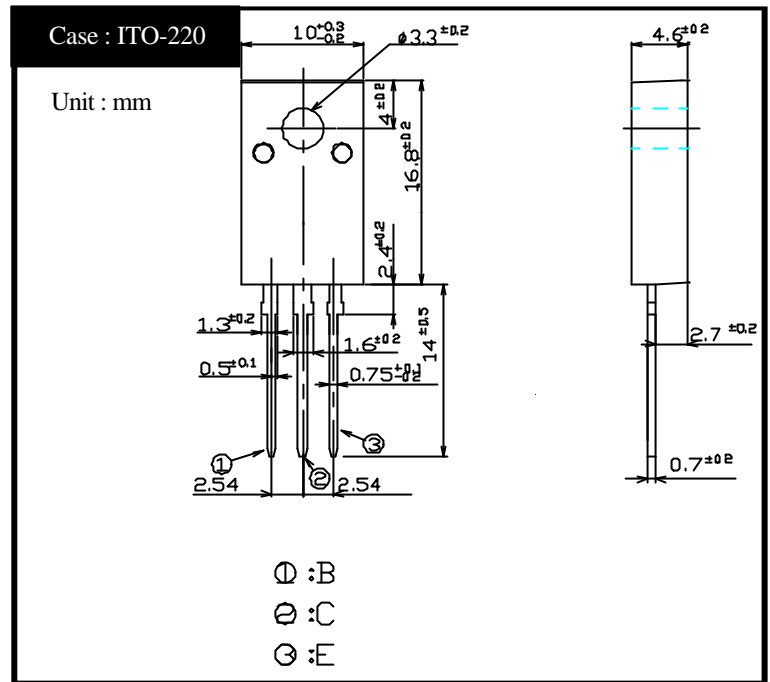


Fig.2 Outline dimensions (unindicated tolerance: ± 0.20 mm)

2SC4231
(TP2V80HFX)

2A NPN

OUTLINE DIMENSIONS



RATINGS

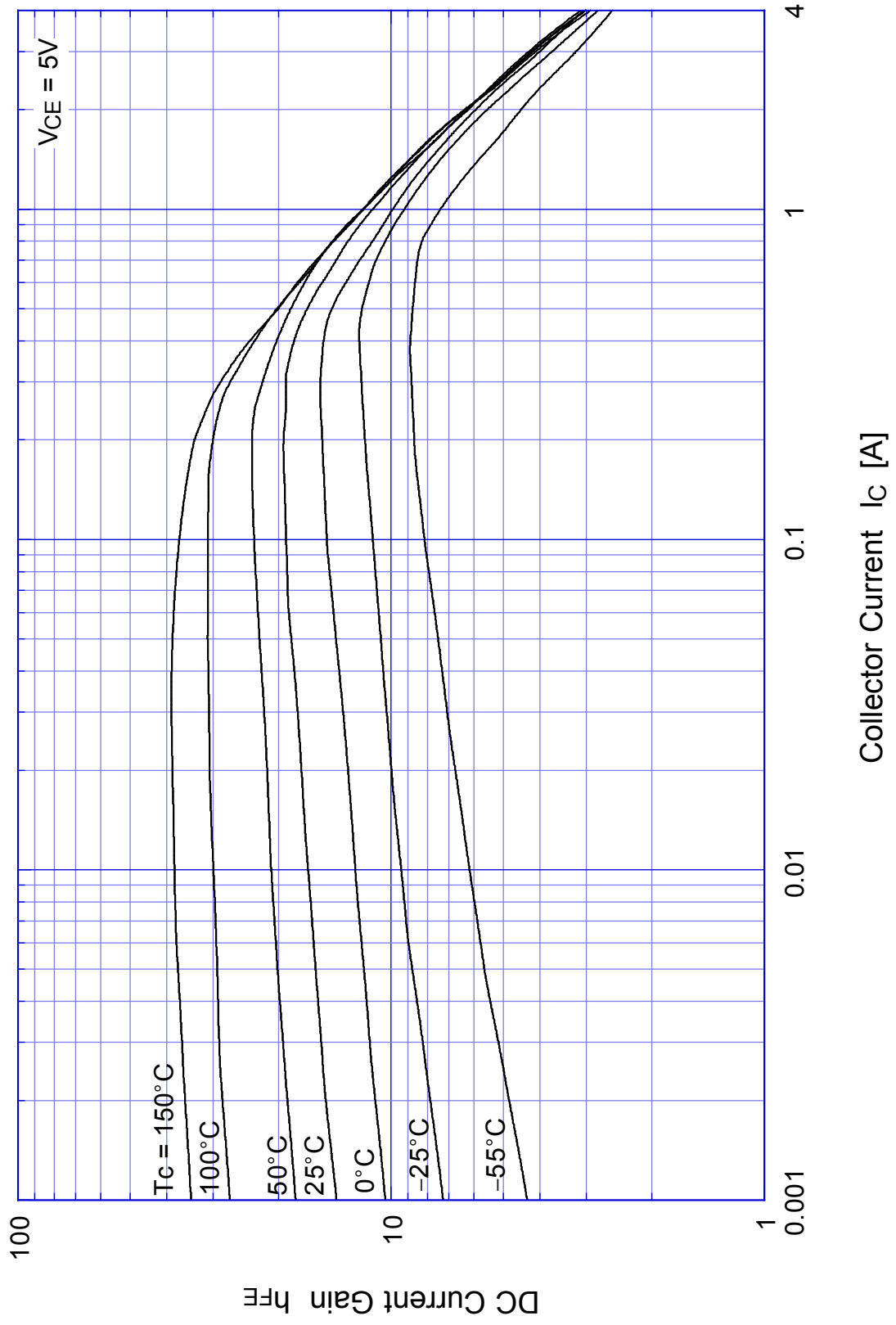
Absolute Maximum Ratings

Item	Symbol	Conditions	Ratings	Unit
Storage Temperature	T_{stg}		-55 ~ 150	
Junction Temperature	T_j		150	
Collector to Base Voltage	V_{CBO}		1200	V
Collector to Emitter Voltage	V_{CEO}		800	V
Emitter to Base Voltage	V_{EBO}		7	V
Collector Current DC	I_C		2	A
Collector Current Peak	I_{CP}		4	
Base Current DC	I_B		1	A
Base Current Peak	I_{BP}		2	
Total Transistor Dissipation	P_T	$T_C = 25$	30	W
Dielectric Strength	V_{dis}	Terminals to case, AC 1 minute	2	kV
Mounting Torque	TOR	(Recommended torque : 0.3N·m)	0.5	N·m

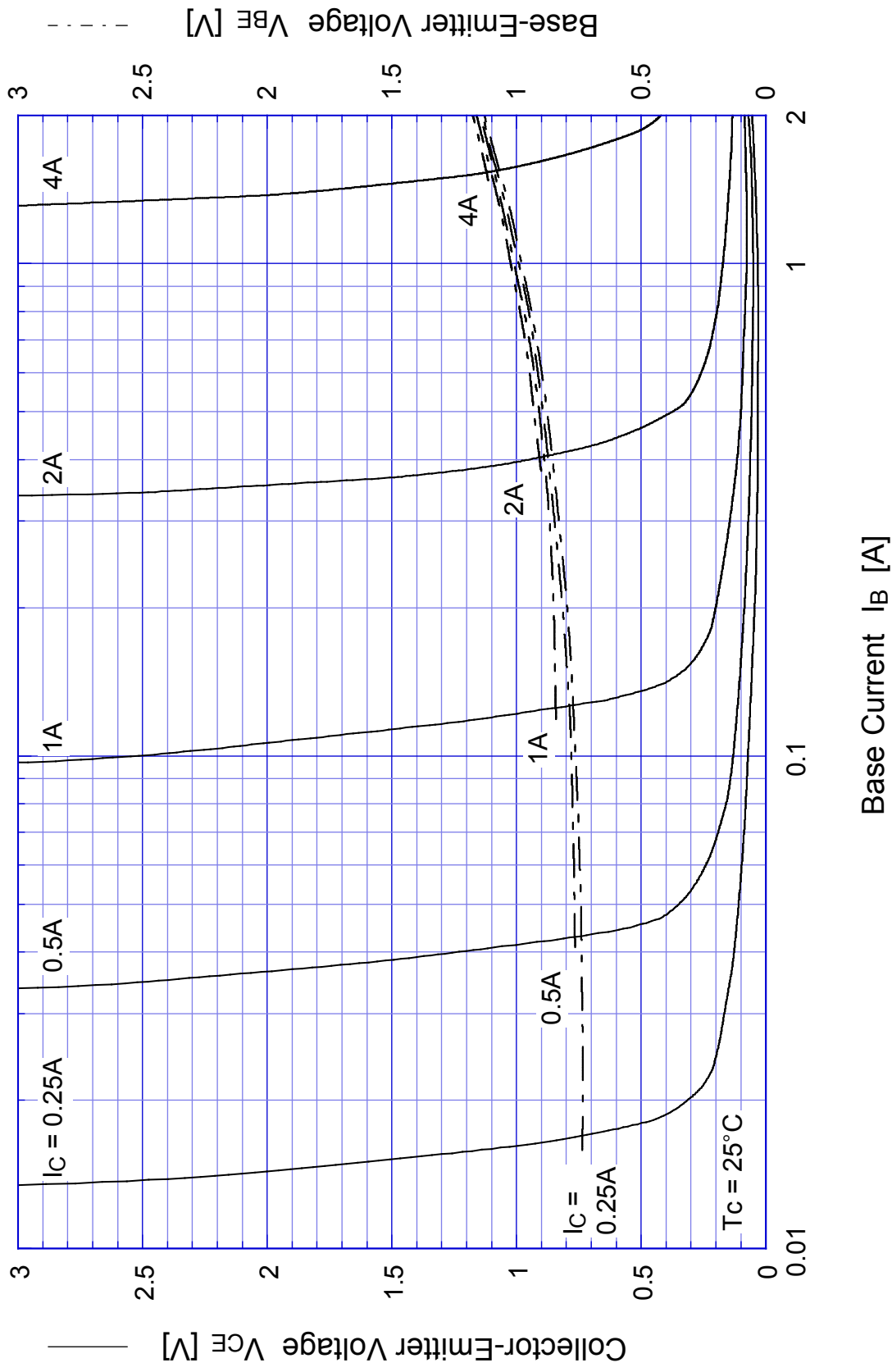
Electrical Characteristics ($T_C=25$)

Item	Symbol	Conditions	Ratings	Unit
Collector to Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 0.1A$	Min 800	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}	$V_{CE} = 5V, I_C = 1A$	Min 8	
	h_{FEL}	$V_{CE} = 5V, I_C = 1mA$	Min 7	
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1A$	Max 1.0	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	$I_B = 0.2A$	Max 1.5	V
Thermal Resistance	θ_{jC}	Junction to case	Max 4.16	/W
Transition Frequency	f_T	$V_{CE} = 10V, I_C = 0.2A$	TYP 8	MHz
Turn on Time	t_{on}	$I_C = 1A$	Max 0.5	μs
Storage Time	t_s	$I_{B1} = 0.2A, I_{B2} = 0.4A$	Max 3.5	
Fall Time	t_f	$R_L = 250 \Omega, V_{BB2} = 4V$	Max 0.3	

2SC4231 $h_{FE} - I_C$

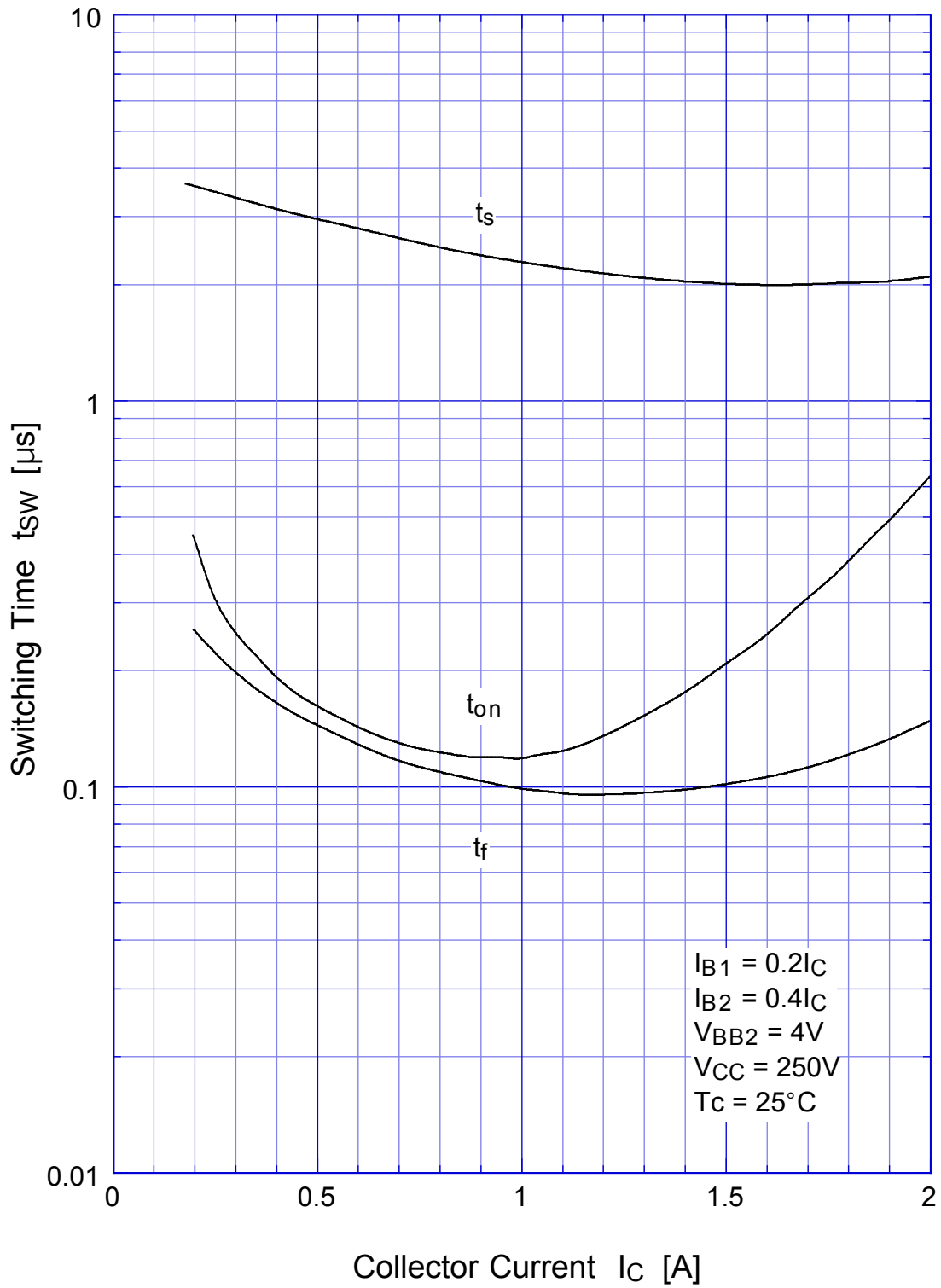


2SC4231 Saturation Voltage

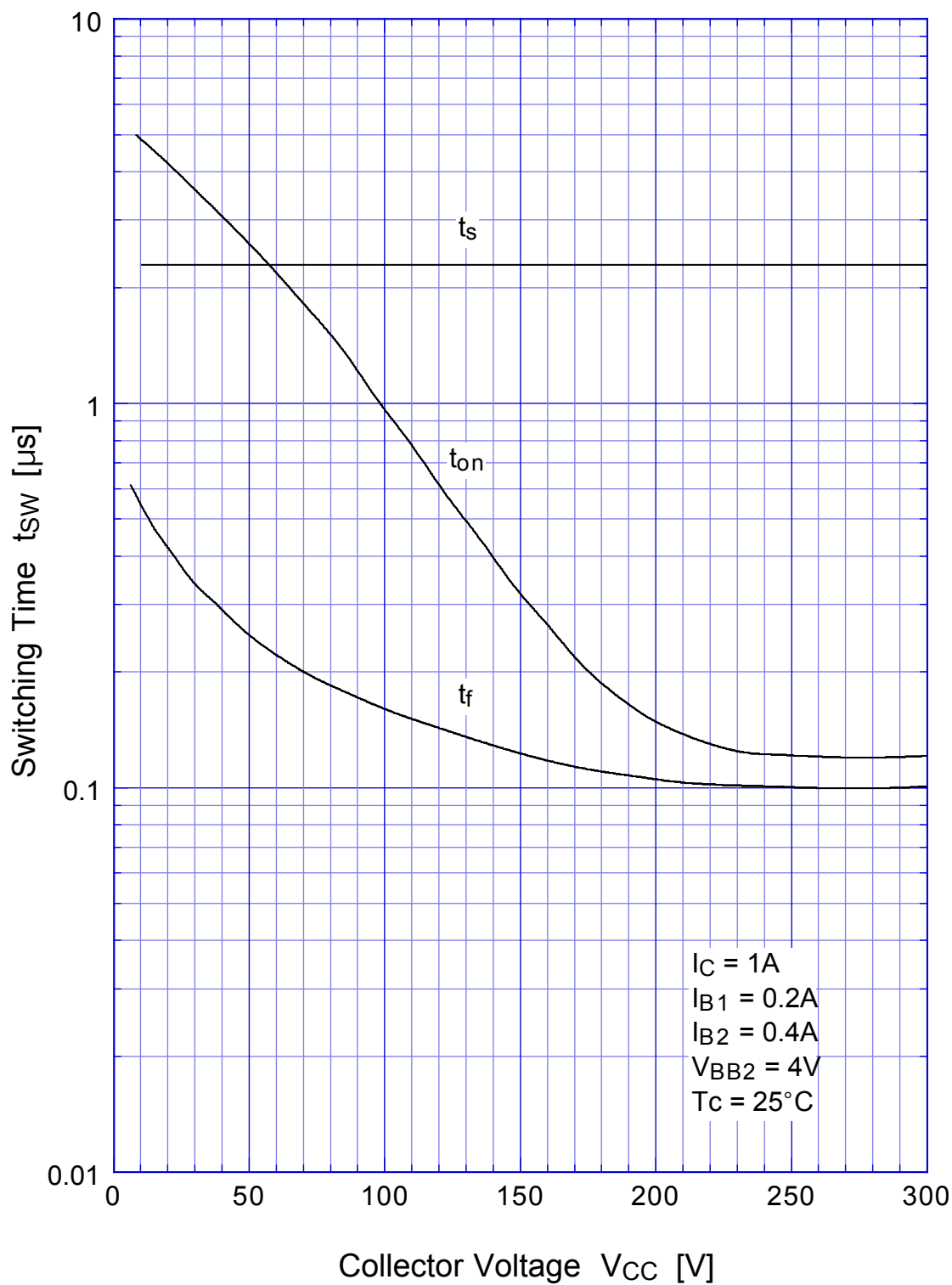


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Switching Time - I_C

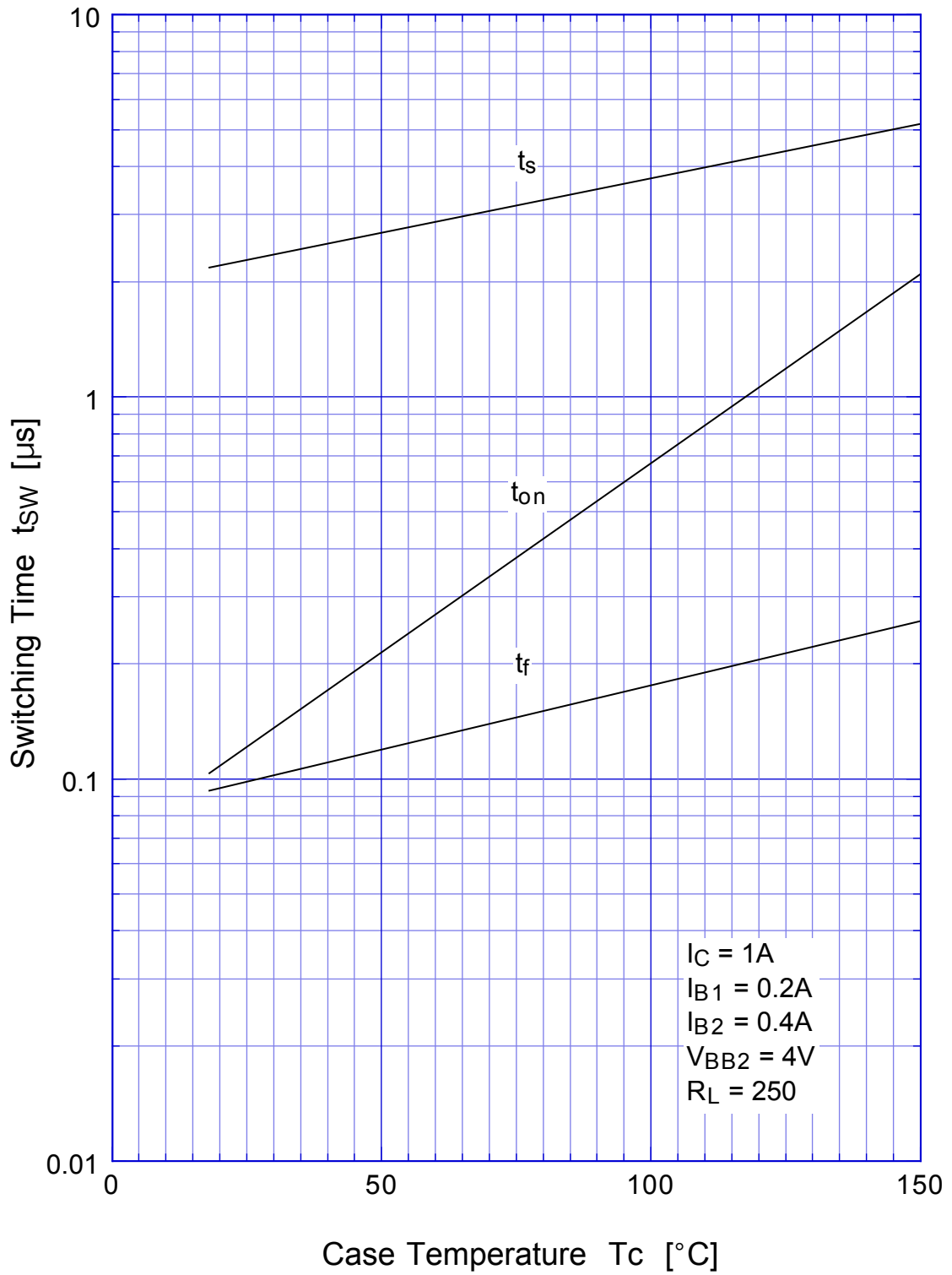


2SC4231 Switching Time - V_{CC}

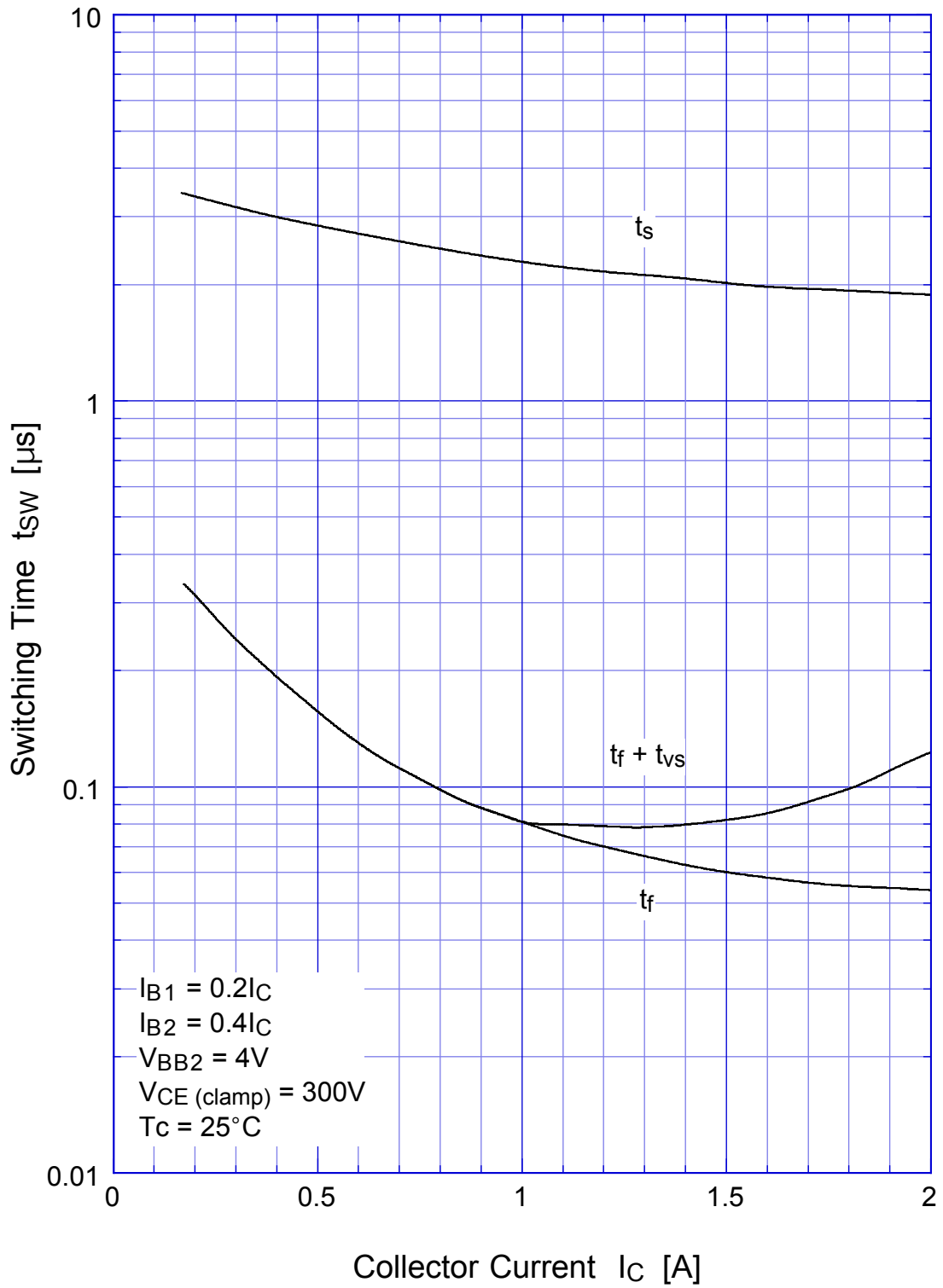


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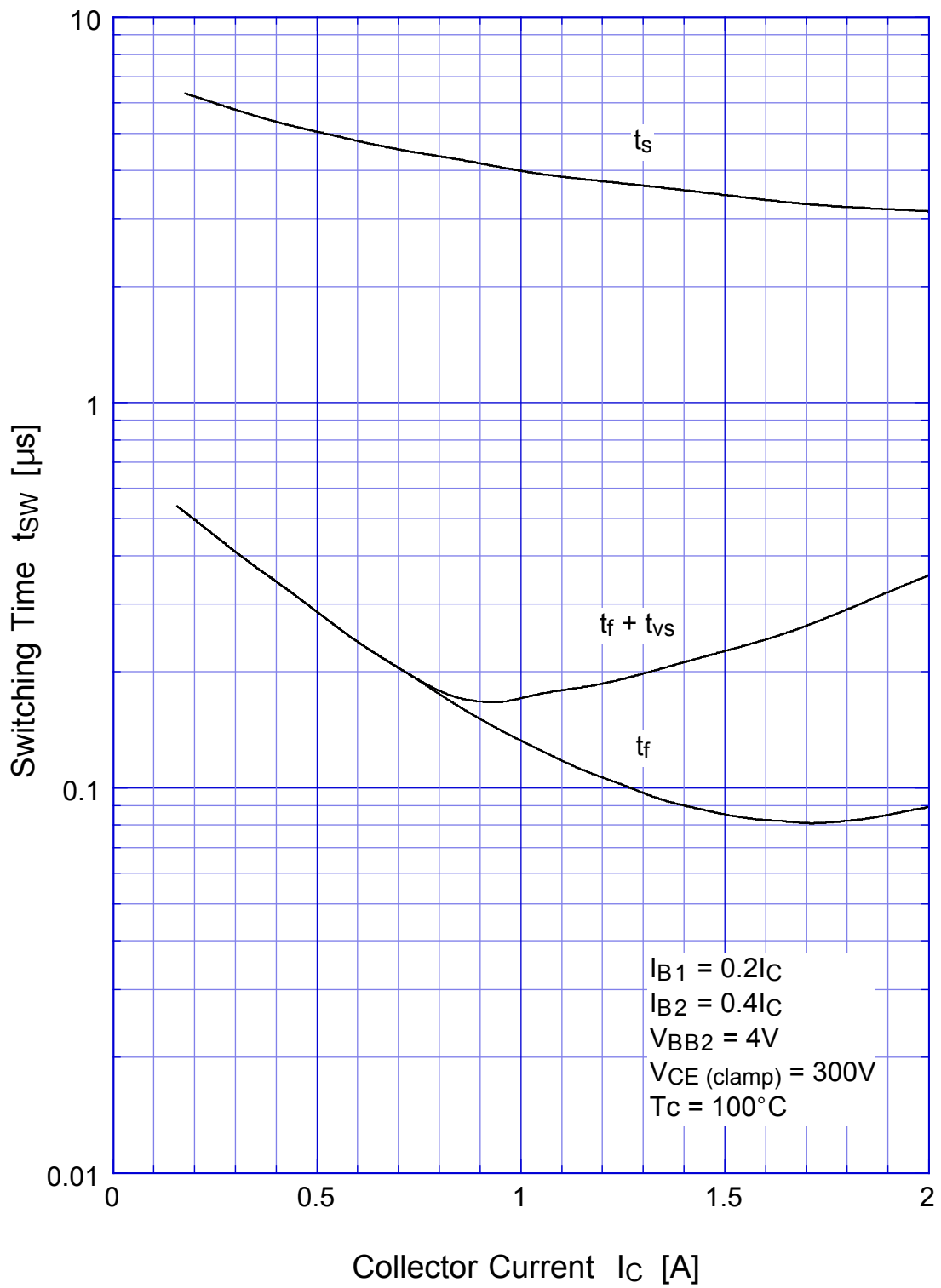
Switching Time - Tc



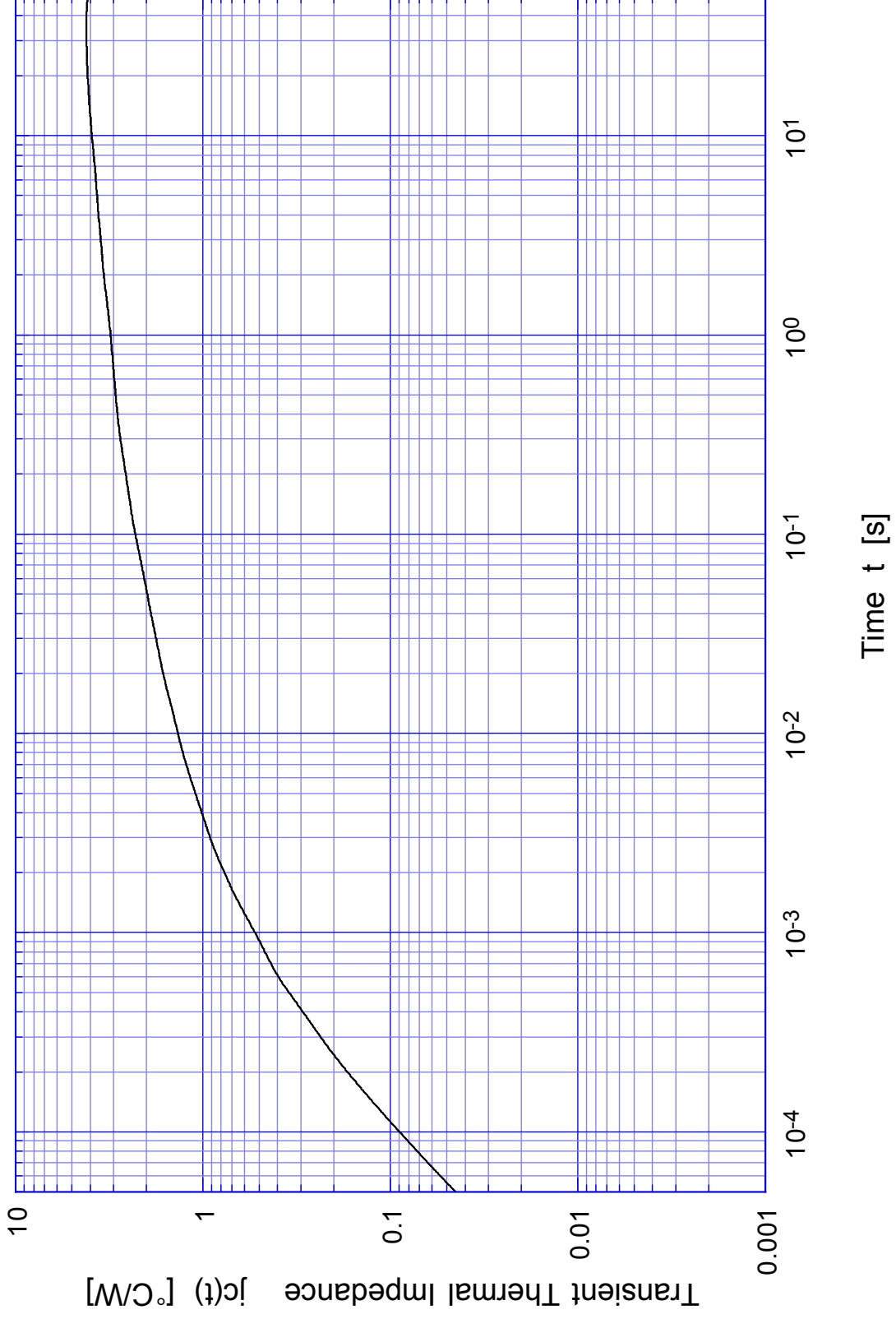
2SC4231 L-Load Switching Time - I_C



2SC4231 L-Load Switching Time - I_C (At High Temperature)

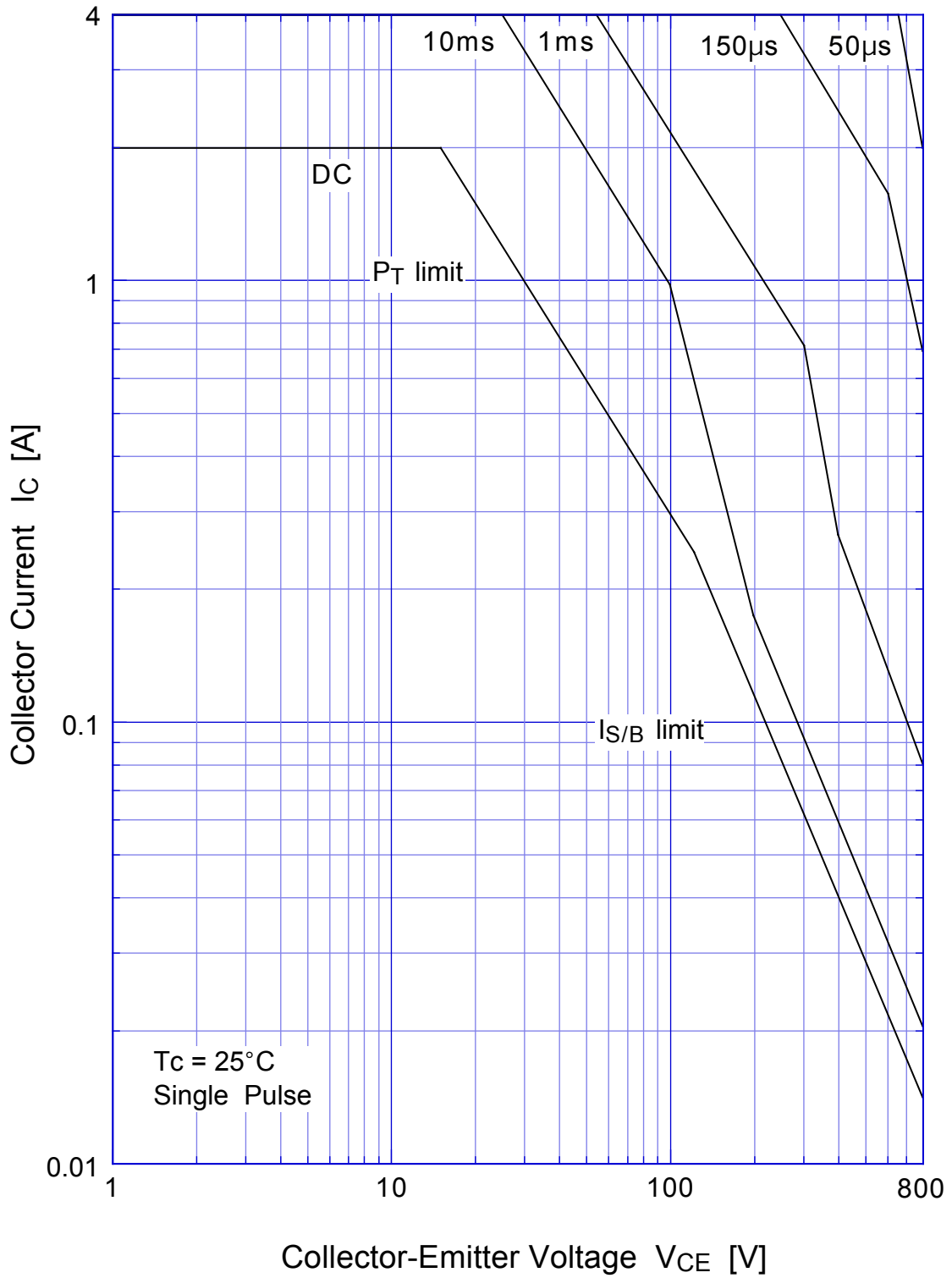


2SC4231 Transient Thermal Impedance

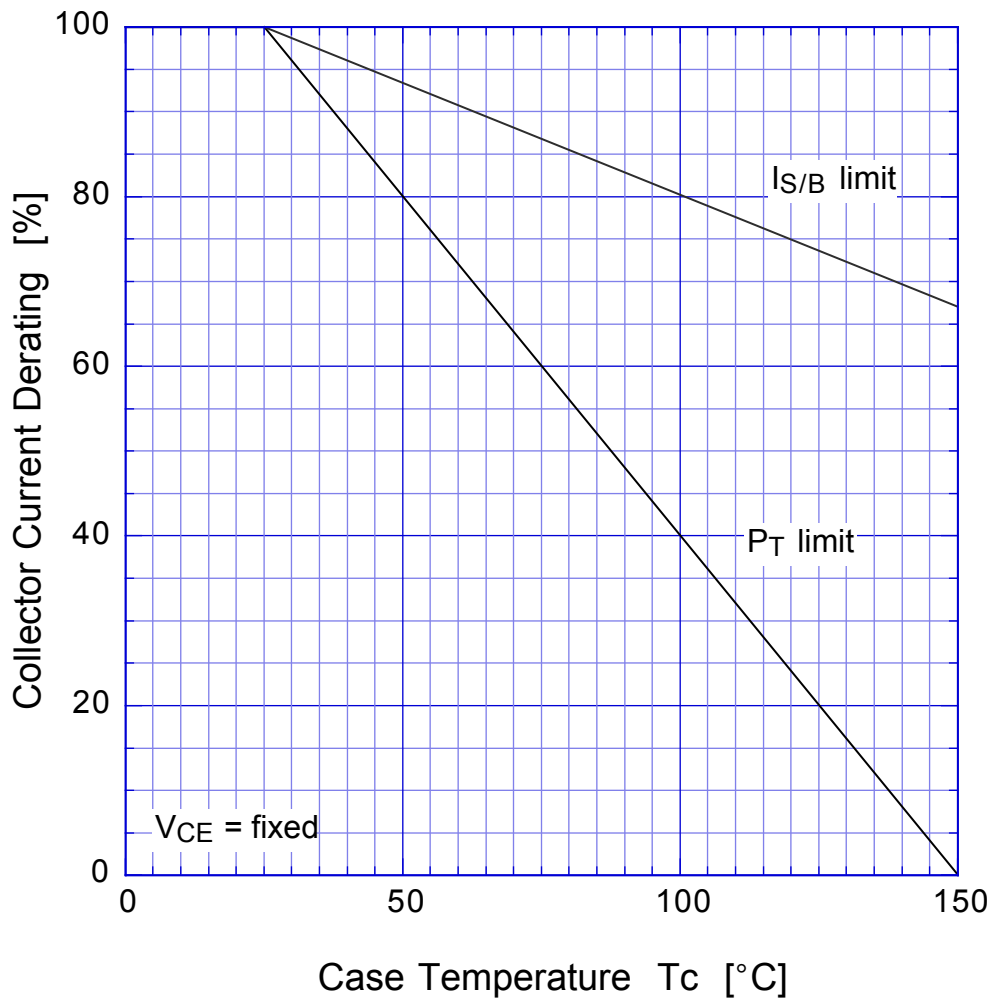


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Forward Bias SOA



2SC4231 Collector Current Derating



2SC4231

Reverse Bias SOA

