SHINDENGEN

VX-2 Series Power MOSFET

N-Channel Enhancement type

2SK2191
(F12S50VX2)

500V 12A

FEATURES

- Input capacitance (Ciss) is small. Especially, input capacitance at 0 biass is small.
- The static Rds(on) is small.
- The switching time is fast.

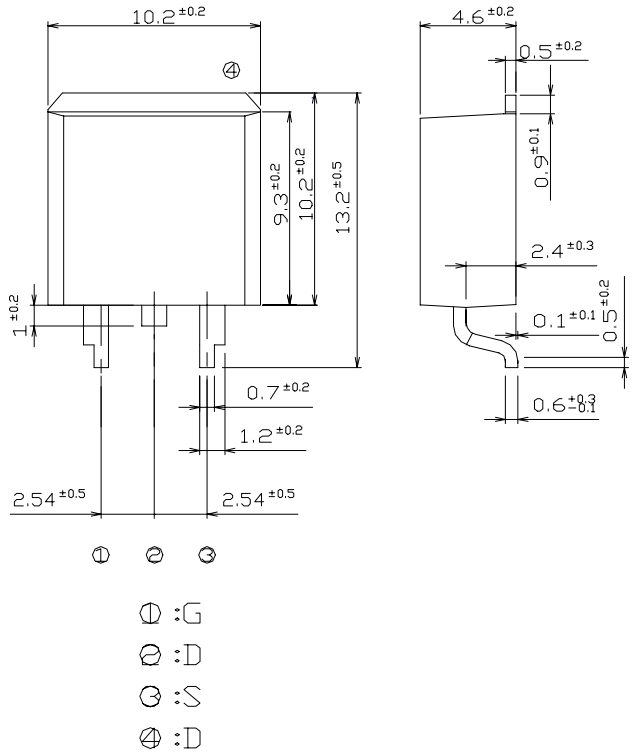
APPLICATION

- Switching power supply of AC 100V input
- High voltage power supply
- Inverter

OUTLINE DIMENSIONS

Case : STO-220

(Unit : mm)



RATINGS

●Absolute Maximum Ratings （Tc = 25℃）

Item	Symbol	Conditions	Ratings	Unit
Storage Temperature	T_{stg}		−55～150	℃
Channel Temperature	T_{ch}		150	
Drain-Source Voltage	V_{DSS}		500	V
Gate-Source Voltage	V_{GSS}		±30	
Continuous Drain Current(DC)	I_D		12	A
Continuous Drain Current(Peak)	I_{DP}		36	
Continuous Source Current(DC)	I_S		12	
Total Power Dissipation	P_T		60	W
Single Pulse Avalanche Current	I_{AS}	T_{ch} = 25℃	12	A

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●Electrical Characteristics Tc = 25℃

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 1mA, V_{GS} = 0V	500			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 500V, V_{GS} = 0V			250	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V			±0.1	
Forward Transconductance	g_{fs}	I_D = 6A, V_{DS} = 10V	3.0	7.6		S
Static Drain-Source On-state Resistance	$R_{DS(ON)}$	I_D = 6A, V_{GS} = 10V		0.55	0.7	Ω
Gate Threshold Voltage	V_{TH}	I_D = 1mA, V_{DS} = 10V	2.5	3.0	3.5	V
Source-Drain Diode Forwade Voltage	V_{SD}	I_S = 6A, V_{GS} = 0V			1.5	
Thermal Resistance	θ jc	junction to case			2.08	℃/W
Total Gate Charge	Q_g	V_{DD} = 400V, V_{GS} = 10V, I_D = 12A		42		nC
Input Capacitance	C_{iss}	V_{DS} = 10V, V_{GS} = 0V, f = 1MHz		1200		pF
Reverse Transfer Capacitance	C_{rss}			90		
Output Capacitance	C_{oss}			270		
Turn-On Time	t_{on}	I_D = 6A, V_{GS} = 10V, R_L = 25Ω		90	130	ns
Turn-Off Time	t_{off}			190	280	

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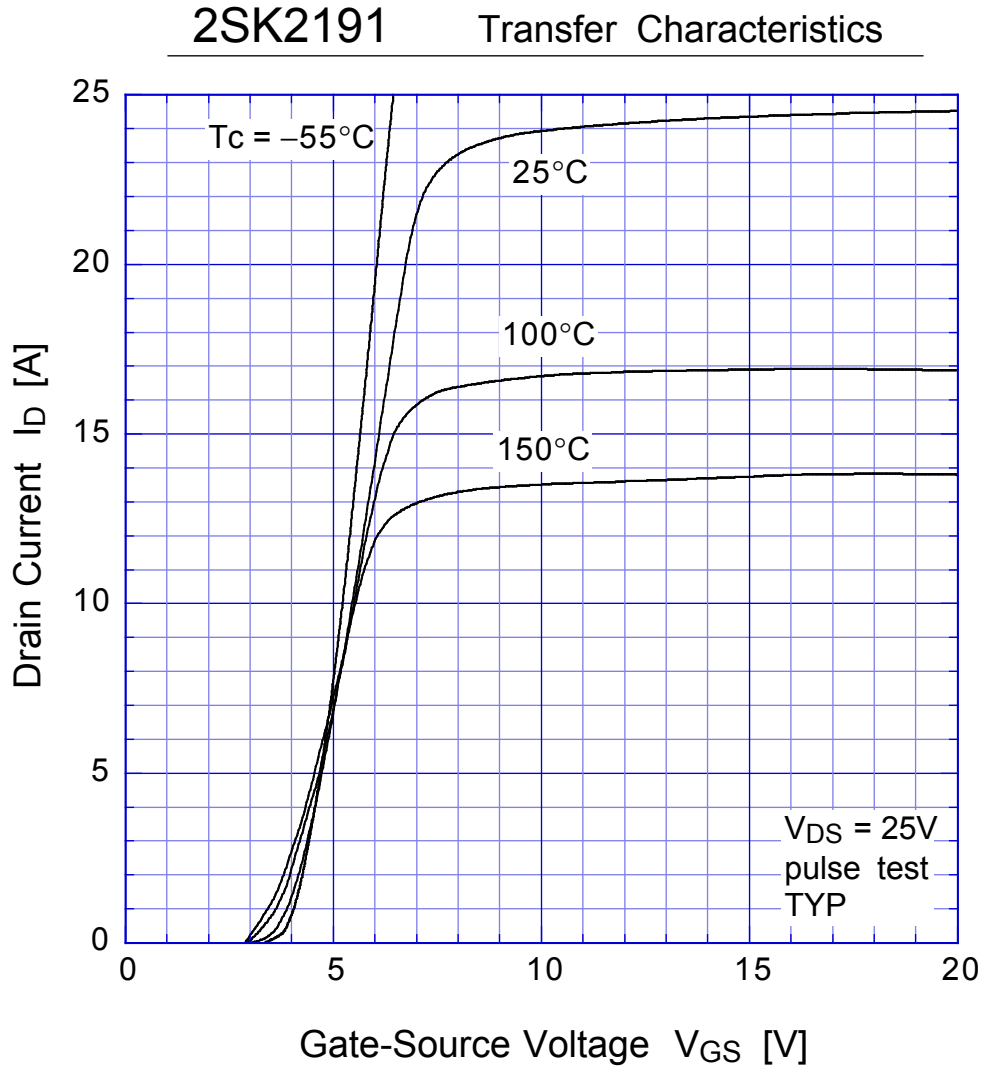
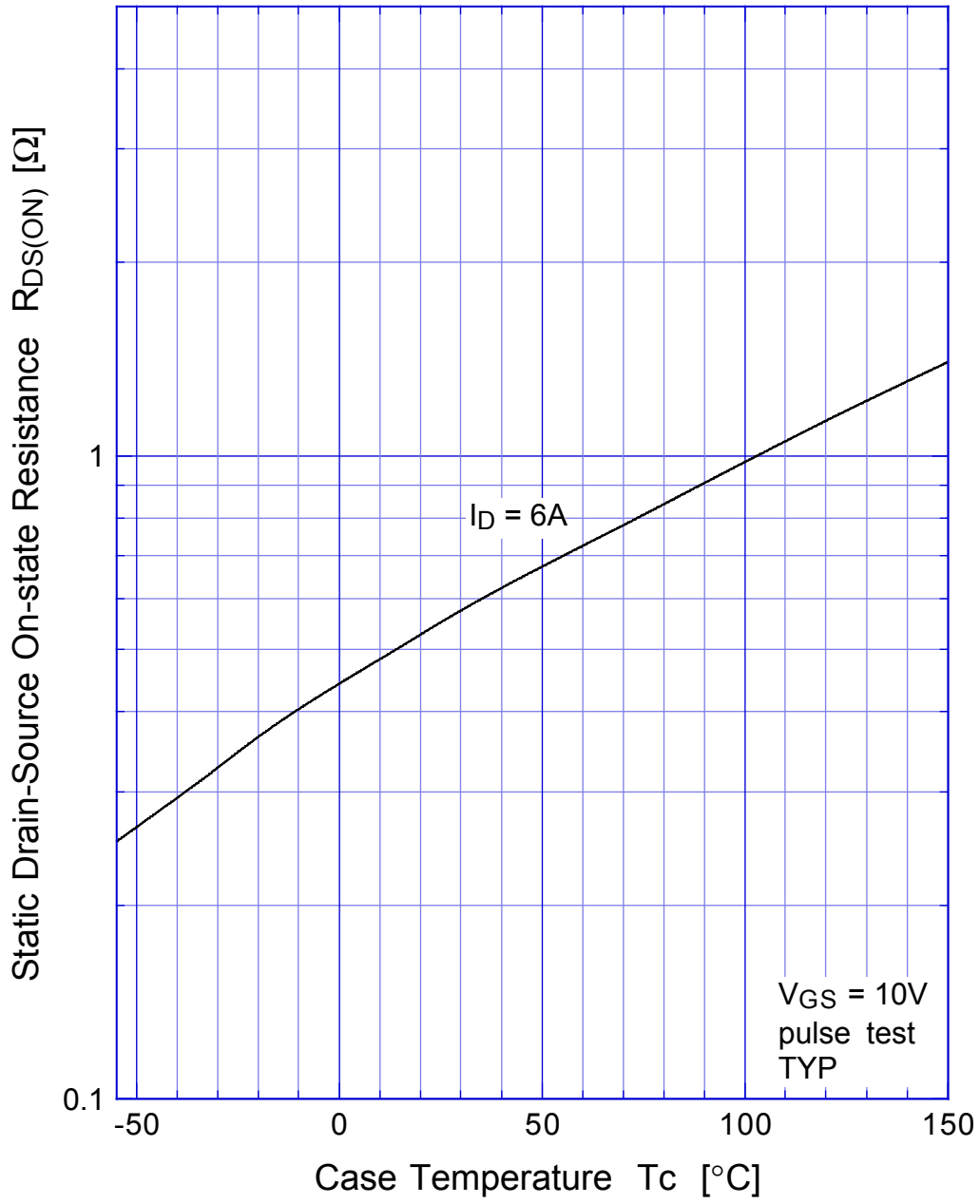
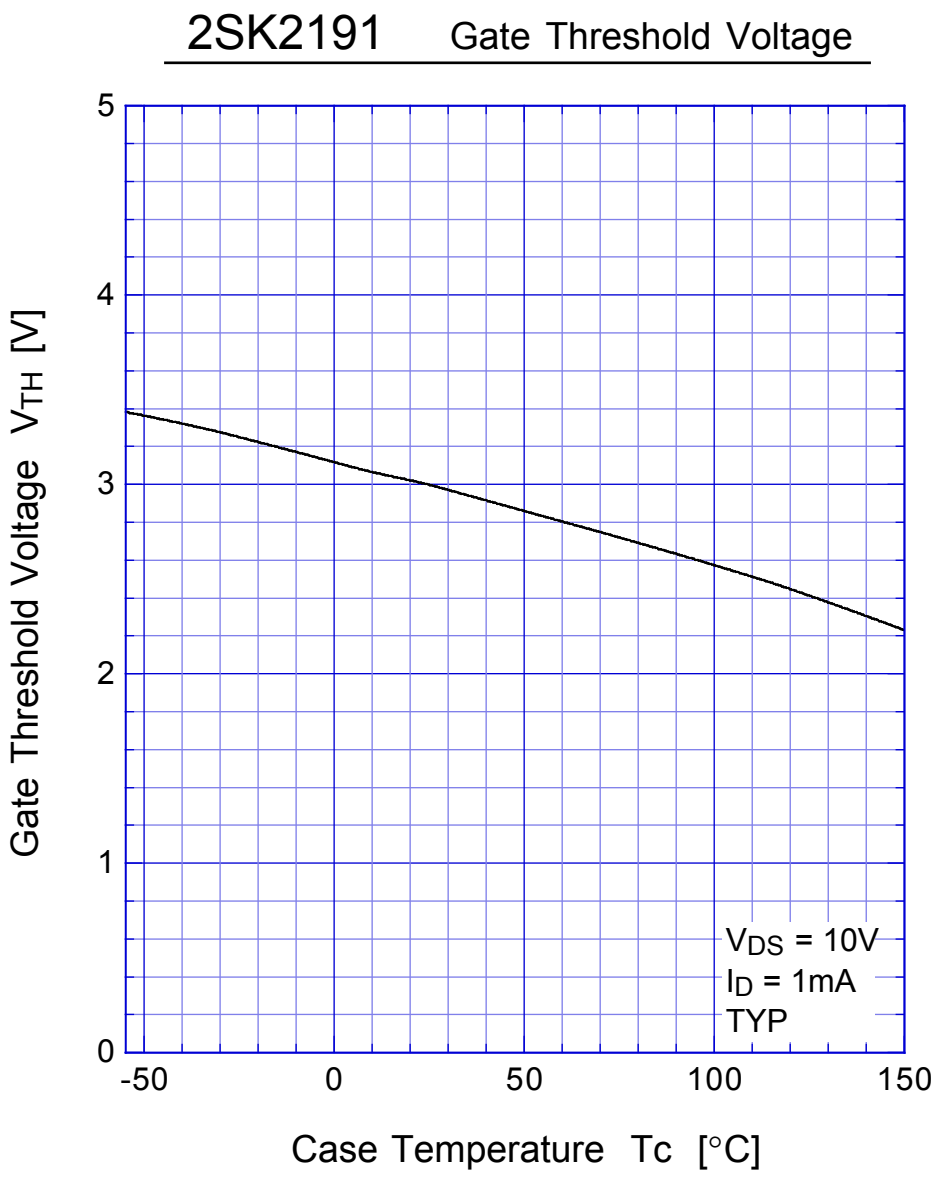
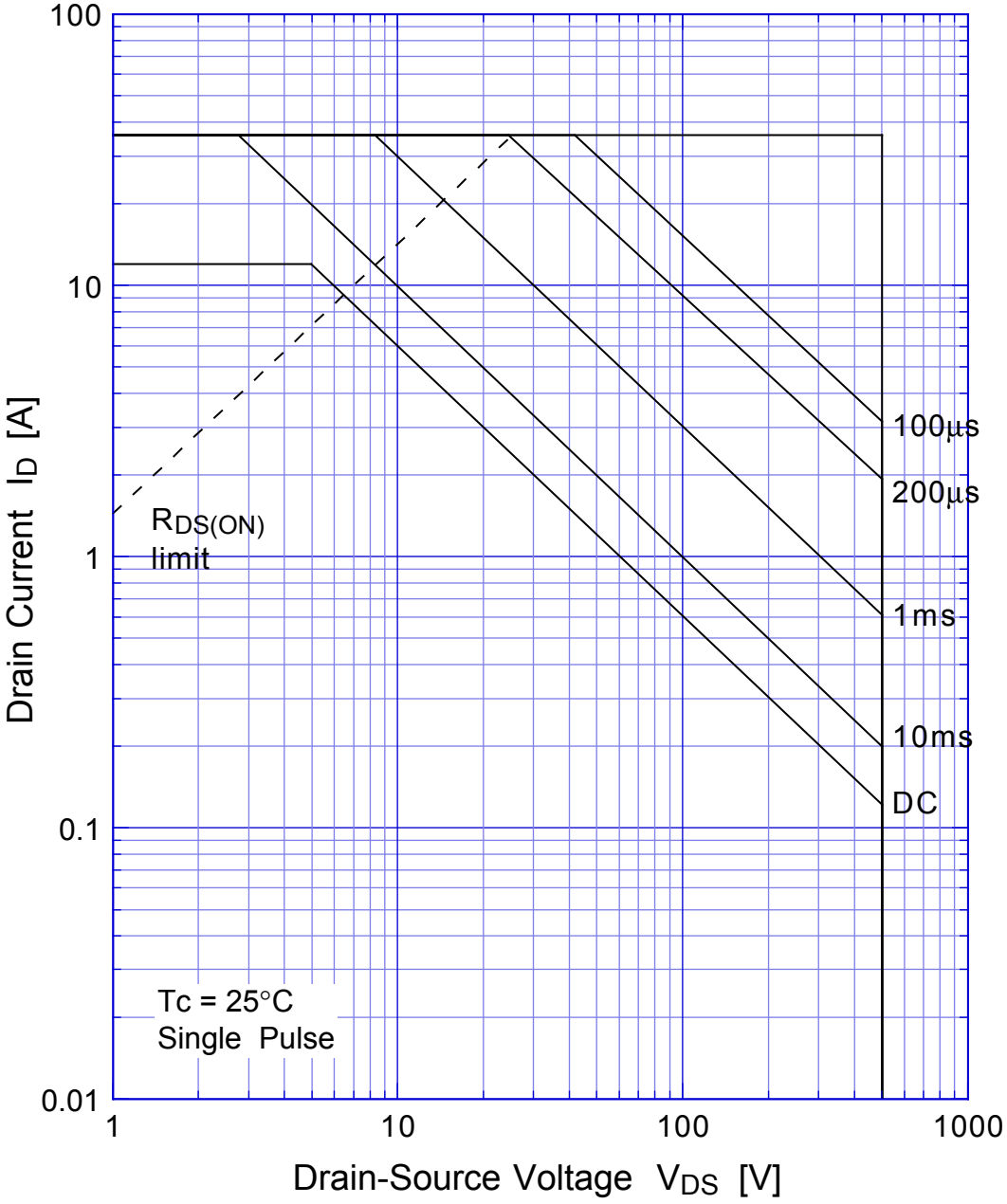

2SK2191
Transfer Characteristics
Tc = –55°C
25°C
100°C
150°C
VDS = 25V
pulse test
TYP
Drain Current ID [A]
Gate-Source Voltage VGS [V]
0
5
10
15
20
25

2SK2191 Static Drain-Source On-state Resistance

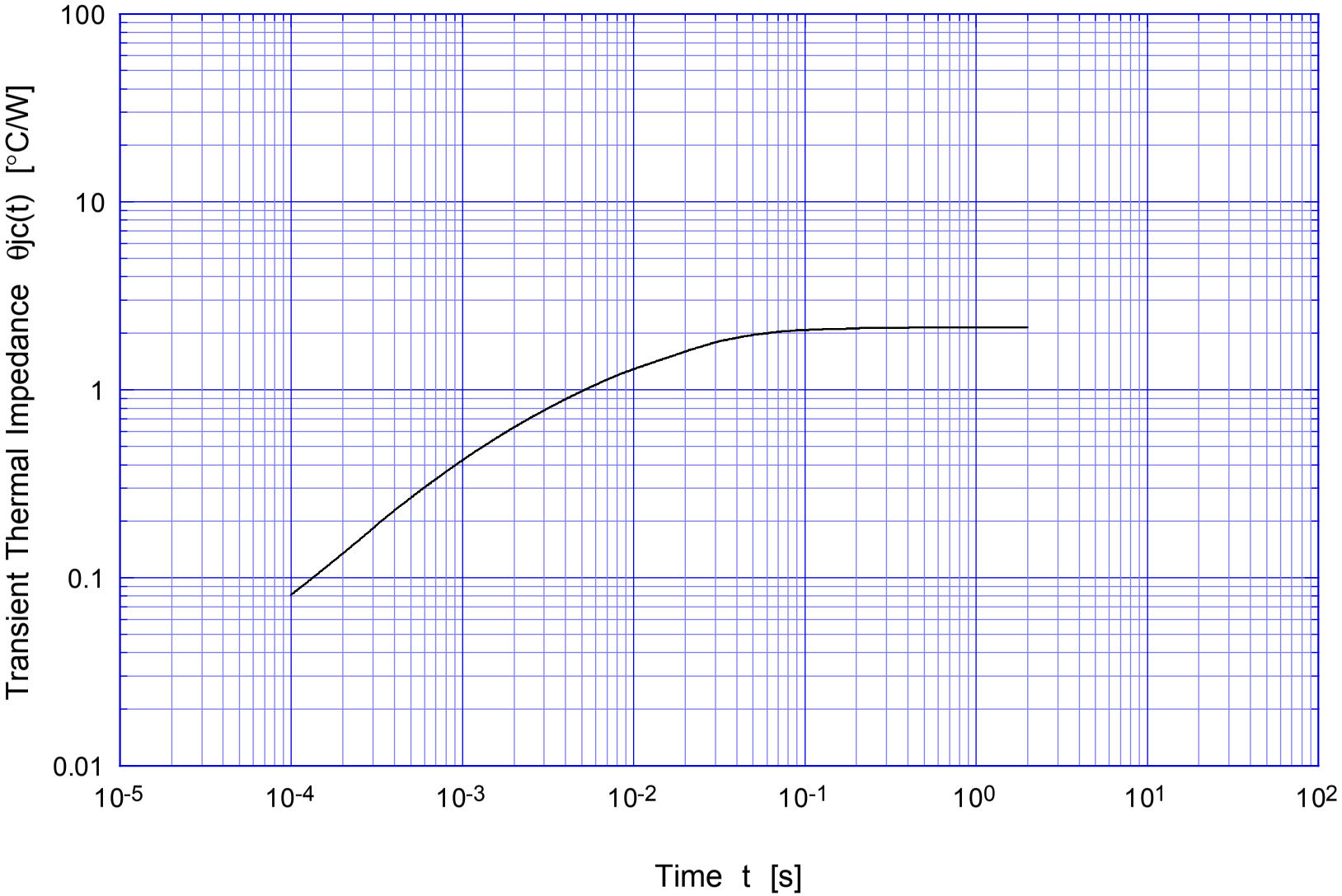



2SK2191 Gate Threshold Voltage
Gate Threshold Voltage V_{TH} [V]
5
4
3
2
1
0
-50
0
50
100
150
Case Temperature Tc [°C]
V_{DS} = 10V
I_D = 1mA
TYP

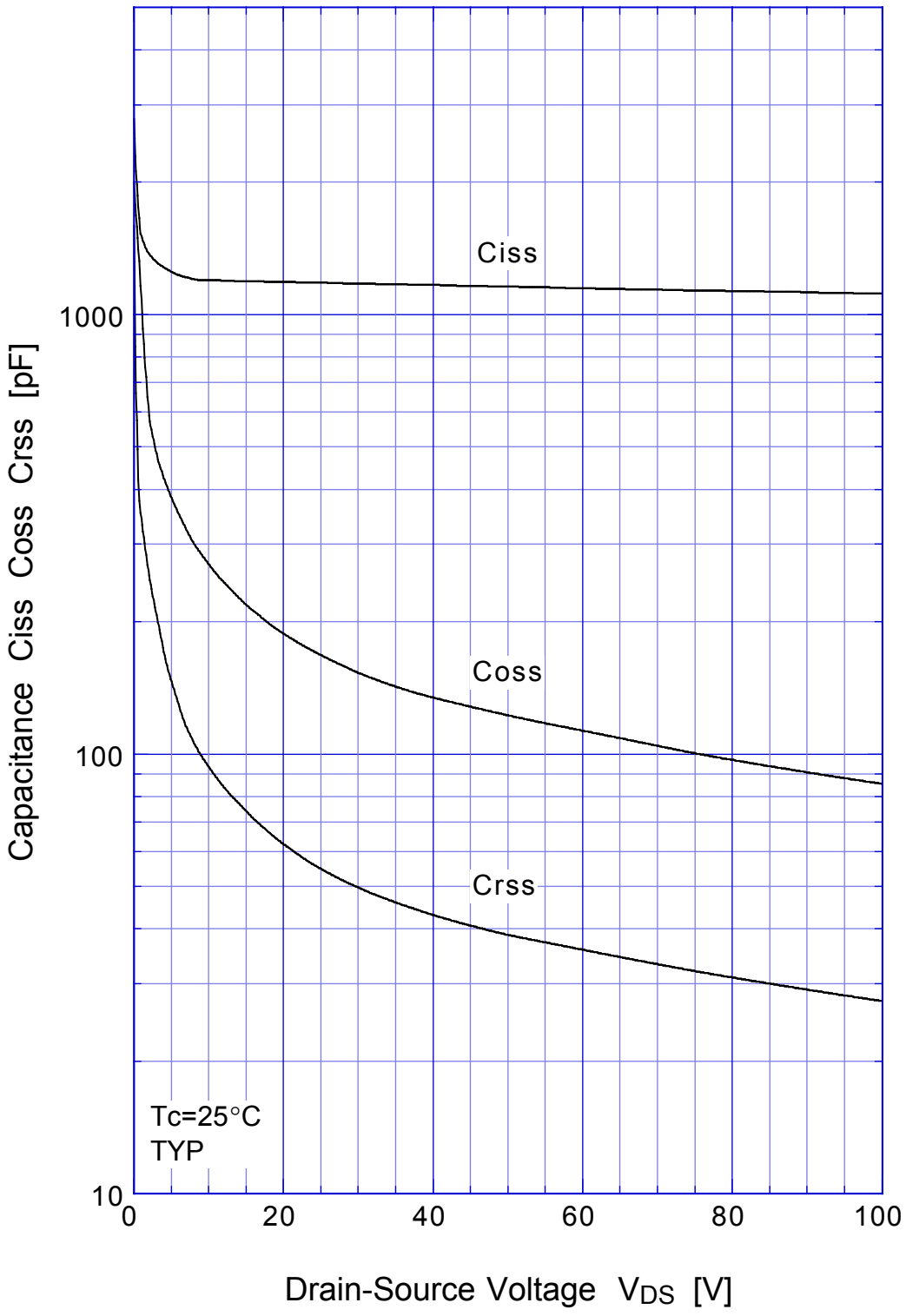
2SK2191 Safe Operating Area

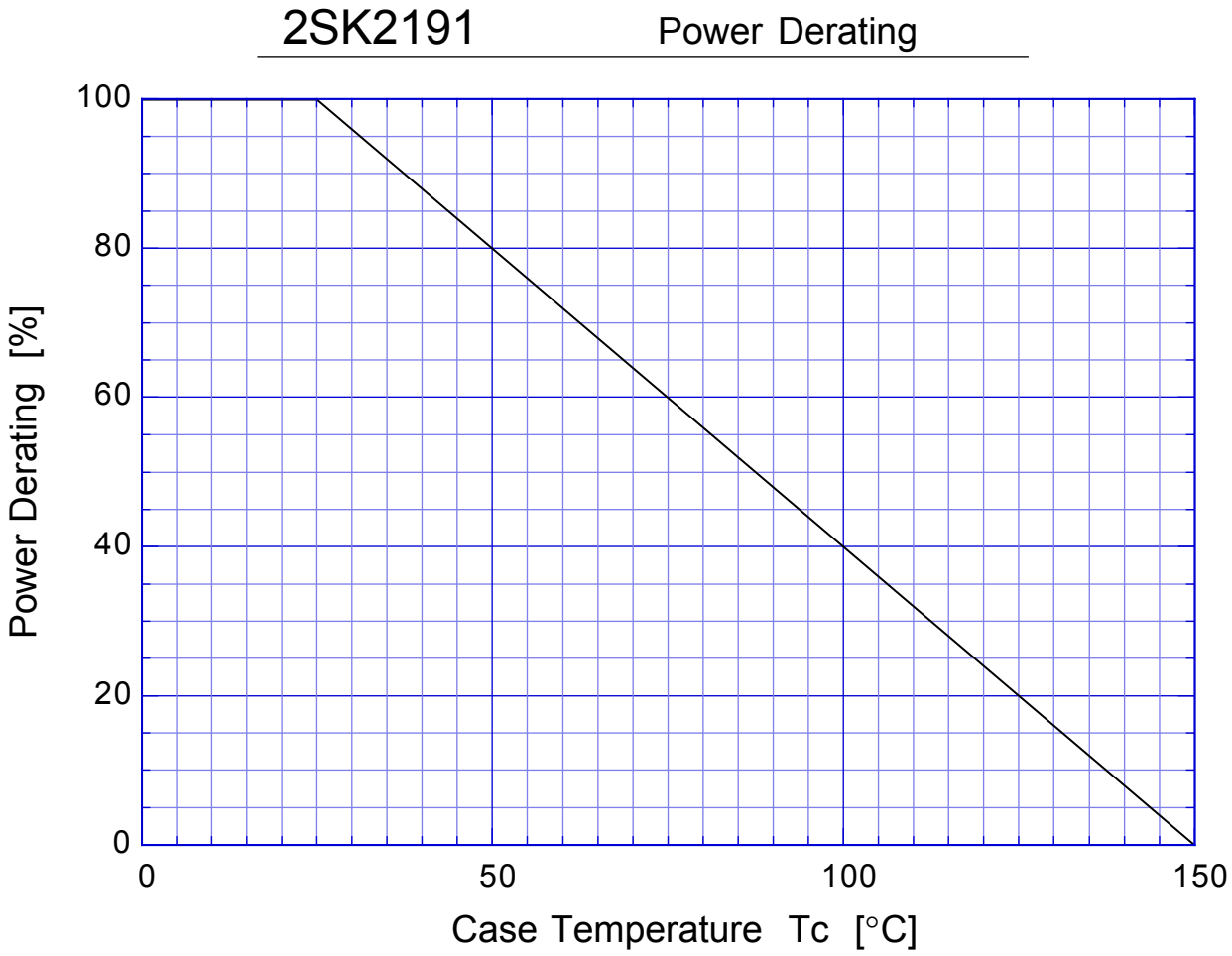


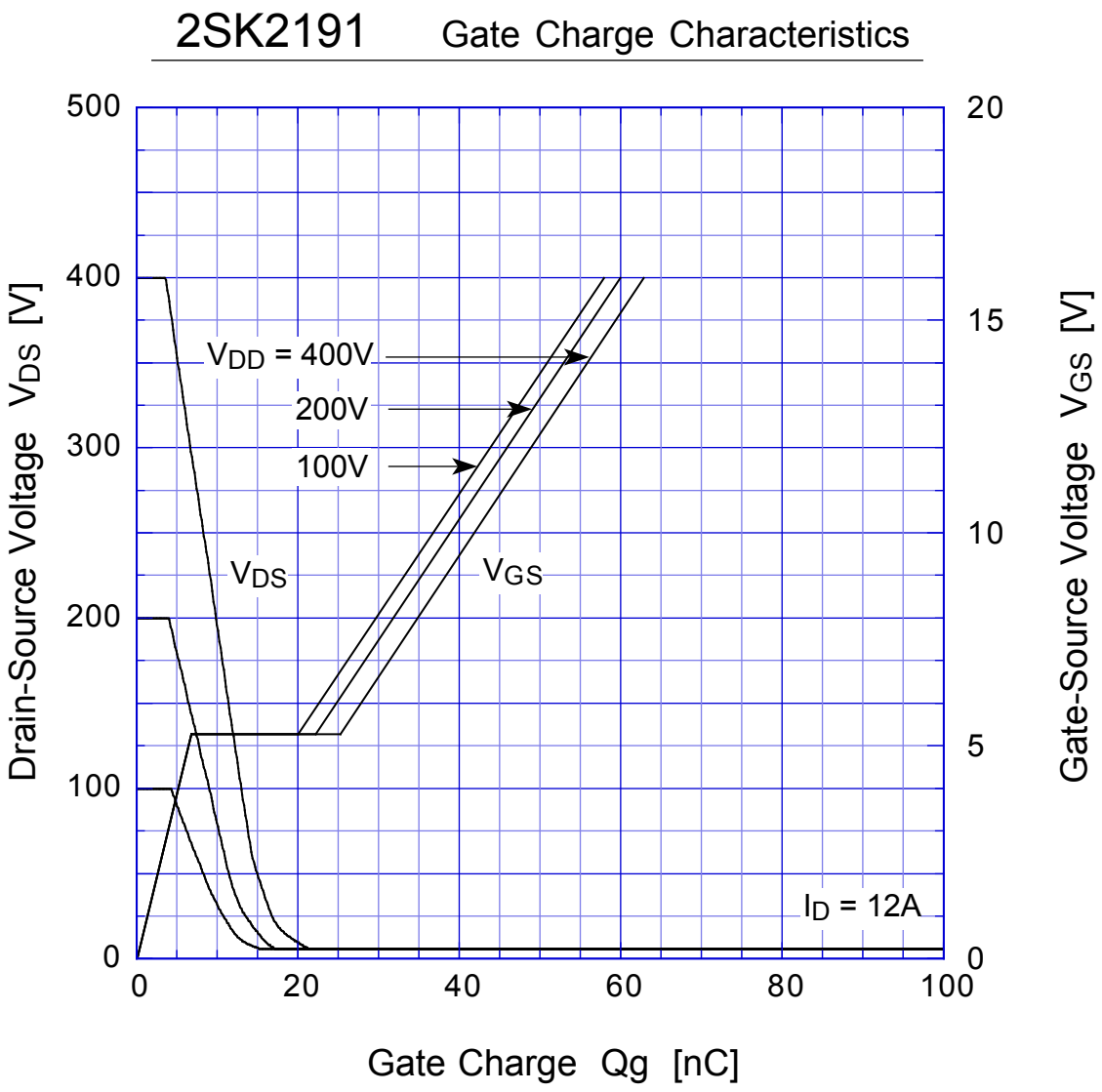
2SK2191 Transient Thermal Impedance



2SK2191 Capacitance




2SK2191
Power Derating
Power Derating [%]
100
80
60
40
20
0
0
50
100
150
Case Temperature Tc [°C]


2SK2191 Gate Charge Characteristics
Drain-Source Voltage V_{DS} [V]
Gate-Source Voltage V_{GS} [V]
Gate Charge Qg [nC]
V_{DD} = 400V
200V
100V
V_{DS}
V_{GS}
I_D = 12A
500
400
300
200
100
0
20
15
10
5
0
0
20
40
60
80
100