

SHINDENGEN

VR Series Power MOSFET

N-Channel Enhancement type

2SK1931
(F5E20)

200V 5A

FEATURES

- Applicable to 4V drive.
- The static $R_{ds(on)}$ is small.
- Built-in ZD for Gate Protection.

APPLICATION

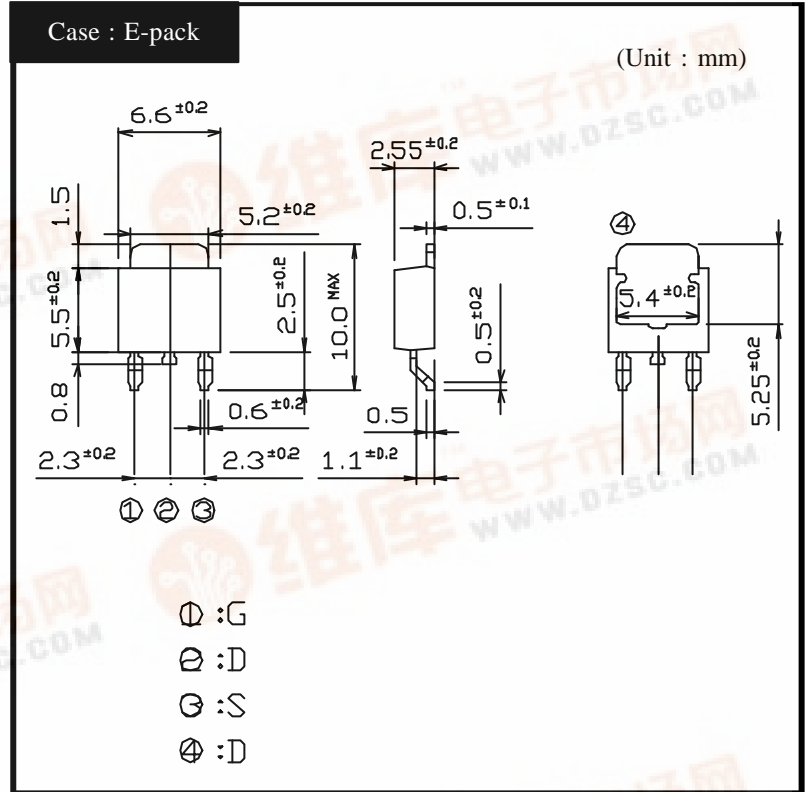
- DC/DC converters
- Power supplies of DC 12-24V input
- Product related to Integrated Service Digital Network

RATINGS

Absolute Maximum Ratings ($T_c = 25$)

Item	Symbol	Conditions	Ratings	Unit
Storage Temperature	T_{stg}		-55 ~ 150	
Channel Temperature	T_{ch}		150	
Drain-Source Voltage	V_{DSS}		200	V
Gate-Source Voltage	V_{GSS}		± 30	
Continuous Drain Current (DC)	I_D		5	A
Continuous Drain Current (Peak)	I_{DP}		10	
Continuous Source Current (DC)	I_S		5	
Total Power Dissipation	P_T		20	W

OUTLINE DIMENSIONS



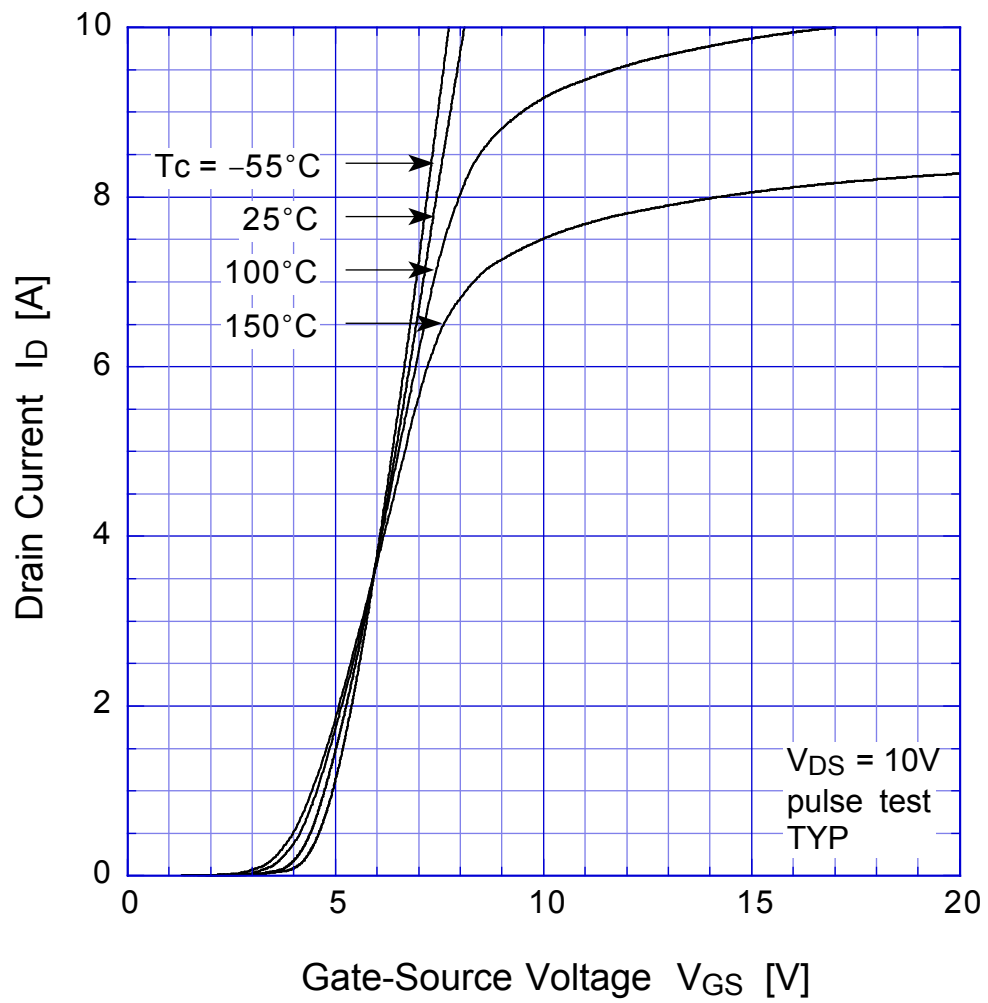
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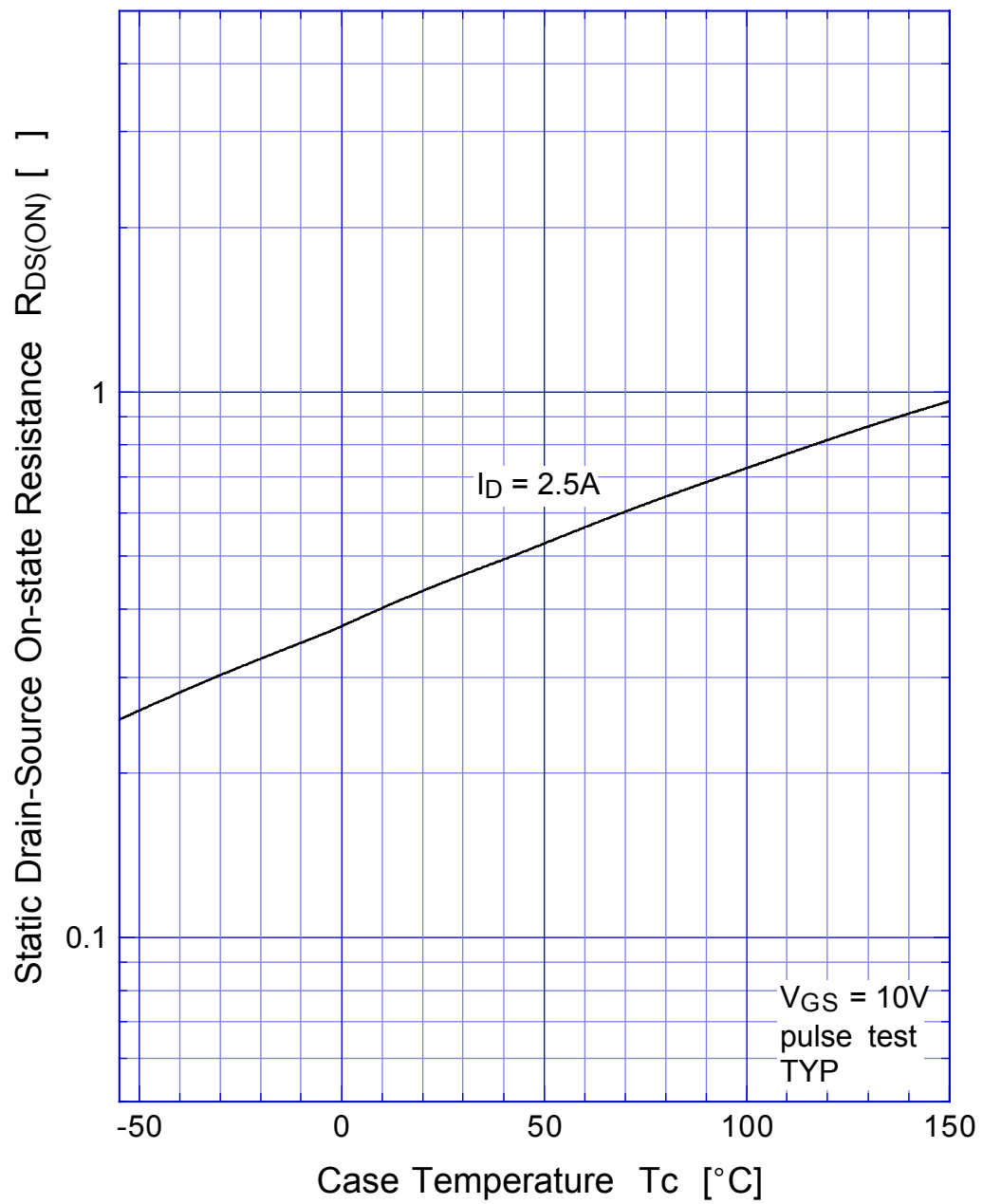
●Electrical Characteristics $T_c = 25^\circ\text{C}$

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 1\text{mA}, V_{GS} = 0\text{V}$	200			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 200\text{V}, V_{GS} = 0\text{V}$			250	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS} = \pm 30\text{V}, V_{DS} = 0\text{V}$			± 0.1	
Forward Transconductance	g_{fs}	$I_D = 2.5\text{A}, V_{DS} = 10\text{V}$	0.9	1.8		S
Static Drain-Source On-state Resistance	$R_{DS(ON)}$	$I_D = 2.5\text{A}, V_{GS} = 10\text{V}$		0.45	0.65	Ω
Gate Threshold Voltage	V_{TH}	$I_D = 1\text{mA}, V_{DS} = 10\text{V}$	2	3	4	V
Source-Drain Diode Forward Voltage	V_{SD}	$I_S = 2.5\text{A}, V_{GS} = 0\text{V}$			1.5	
Thermal Resistance	θ_{jc}	junction to case			6.25	$^\circ\text{C}/\text{W}$
Total Gate Charge	Q_g	$V_{GS} = 10\text{V}, I_D = 5\text{A}, V_{DD} = 150\text{V}$		11		nC
Input Capacitance	C_{iss}	$V_{DS} = 10\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$		360		pF
Reverse Transfer Capacitance	C_{rss}			45		
Output Capacitance	C_{oss}			190		
Turn-On Time	t_{on}	$I_D = 2.5\text{A}, V_{GS} = 10\text{V}, R_L = 40\Omega$		55	110	ns
Turn-Off Time	t_{off}			75	150	

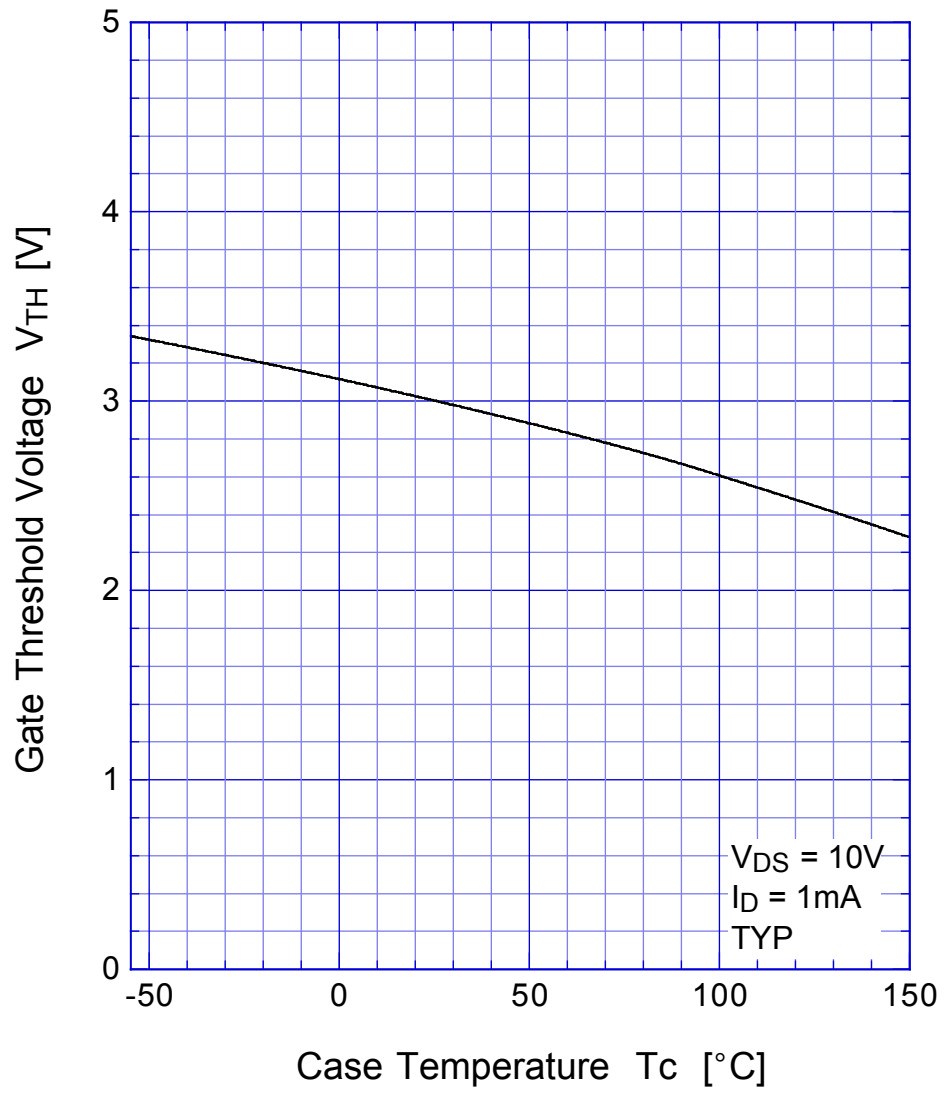
2SK1931 Transfer Characteristics



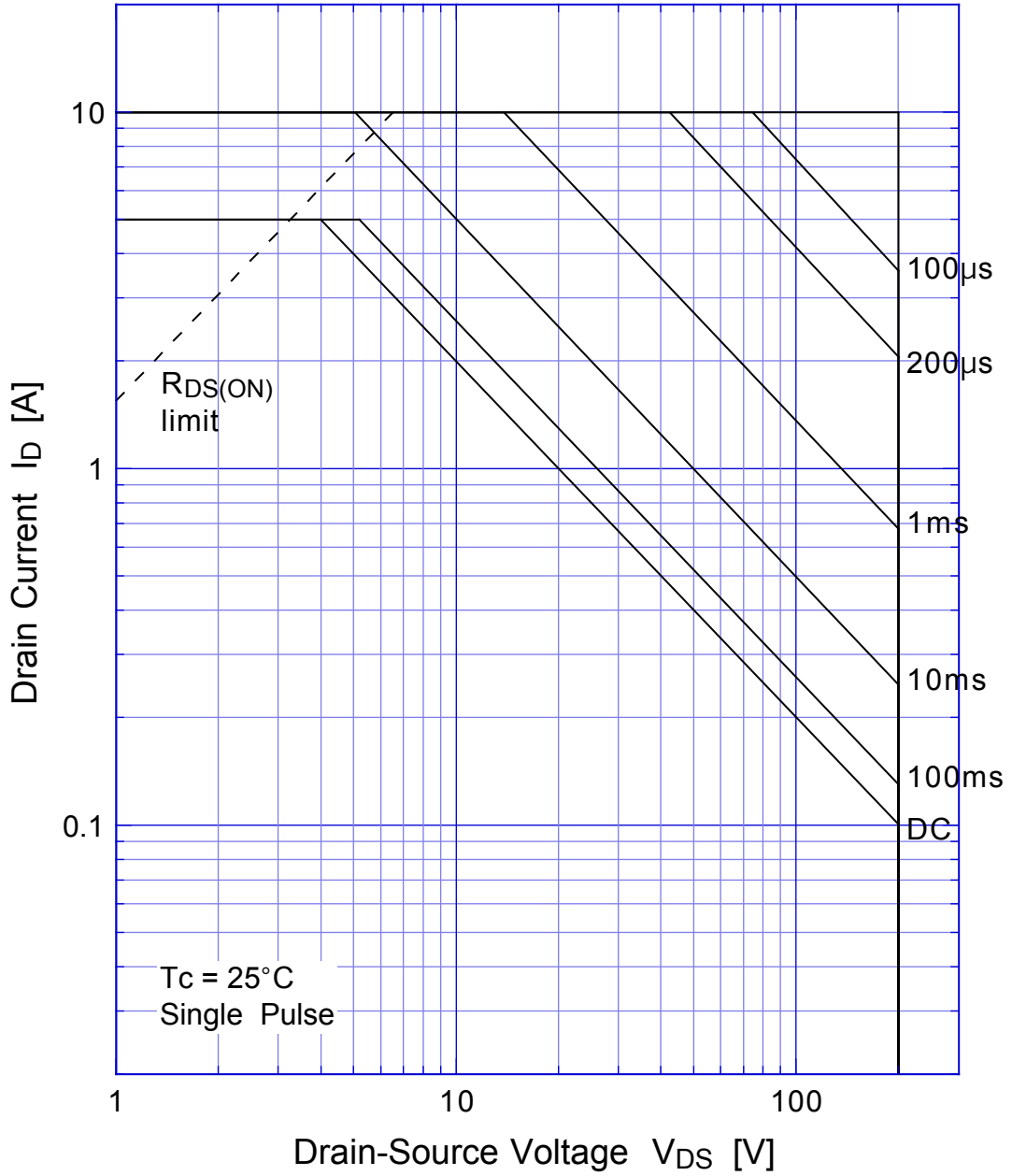
2SK1931 Static Drain-Source On-state Resistance



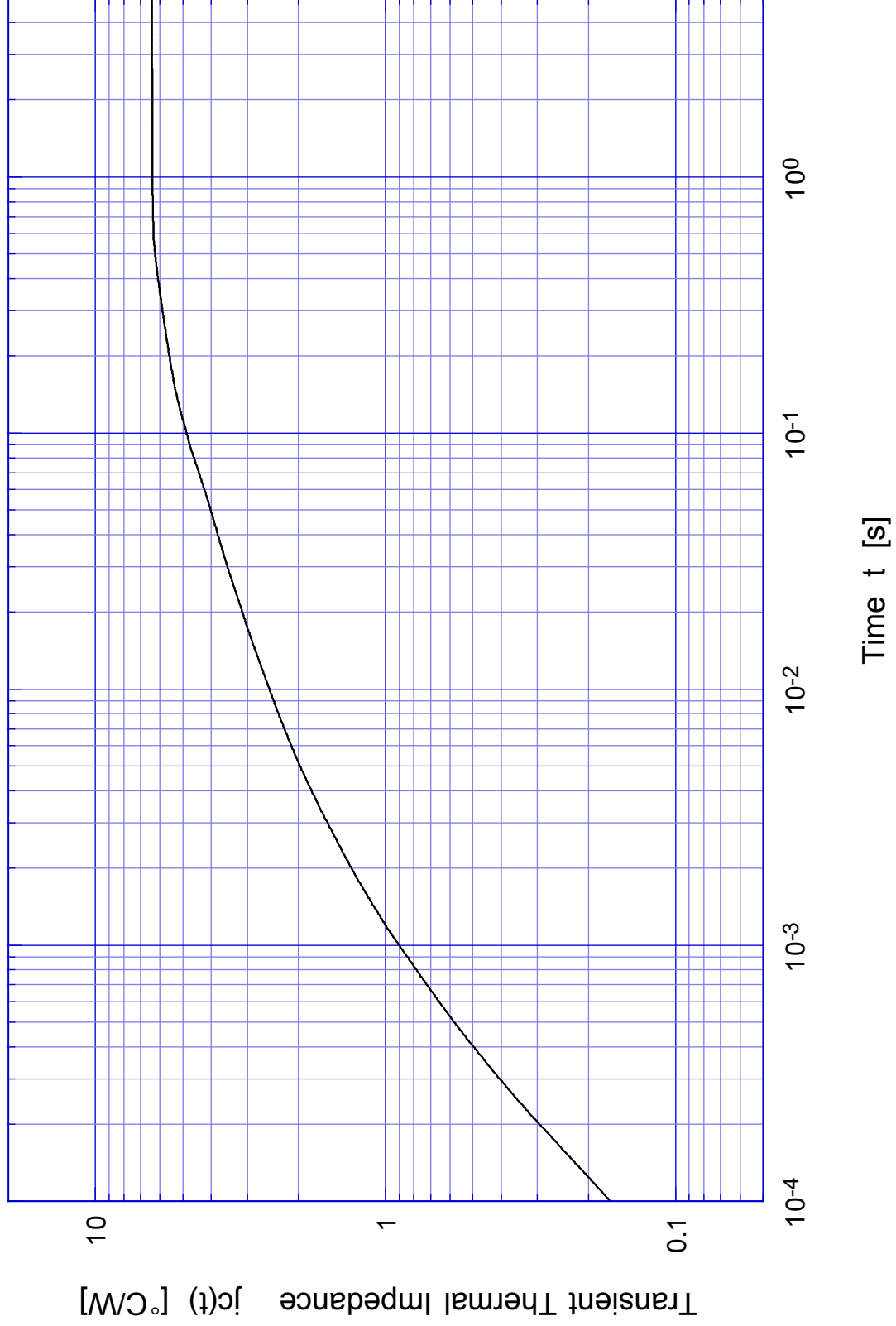
2SK1931 Gate Threshold Voltage



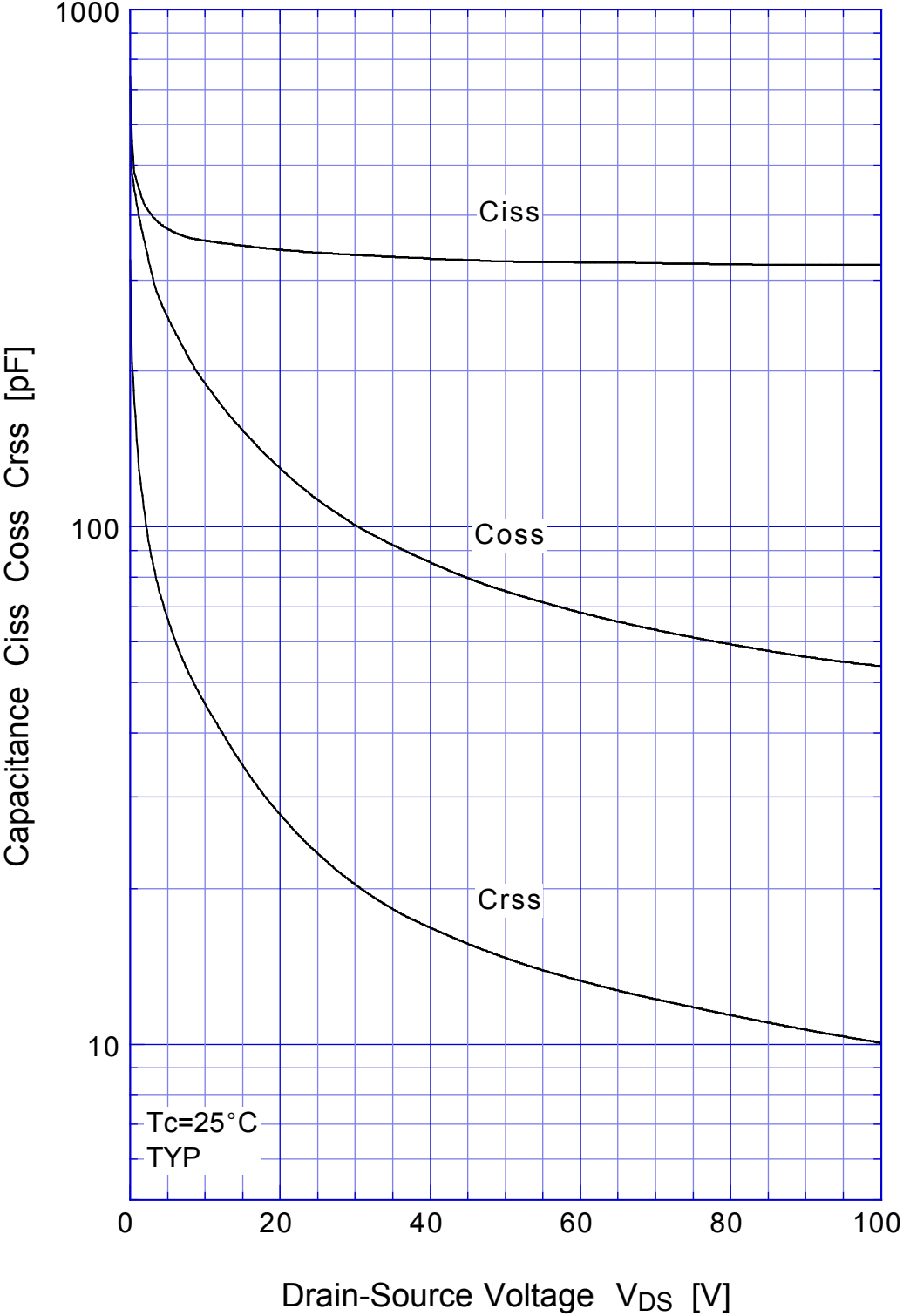
2SK1931 Safe Operating Area



2SK1931 Transient Thermal Impedance



2SK1931 Capacitance



2SK1931

Power Derating

