

# 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

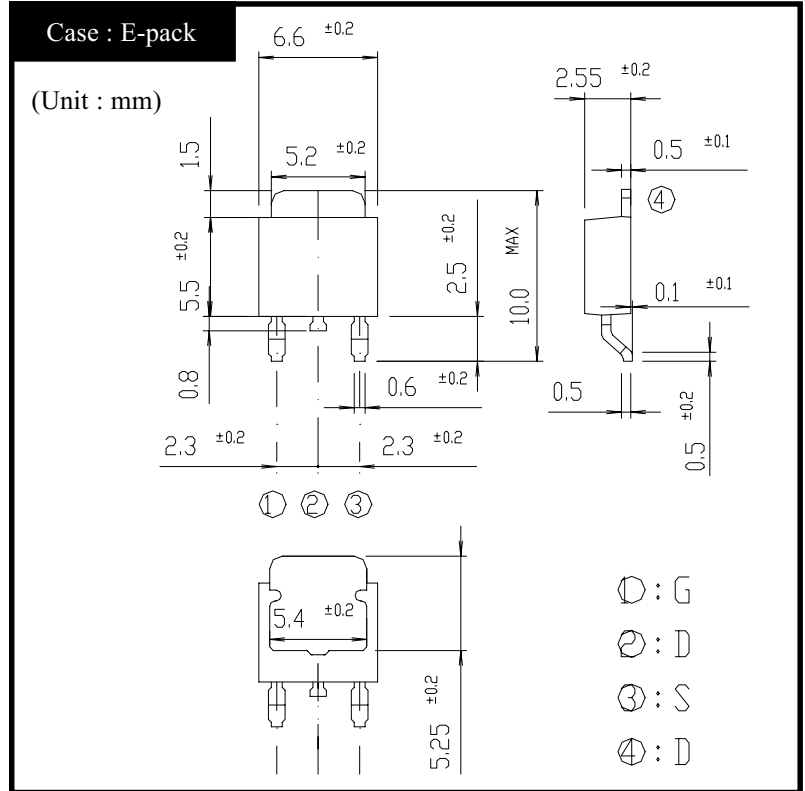
- DC/DC converters
- Power supplies of DC 12-24V input
- Product related to Integrated Service Digital Network

### RATINGS

- Absolute Maximum Ratings ( $T_c = 25^\circ\text{C}$ )

Item	Symbol	Conditions	Ratings	Unit
Storage Temperature	$T_{stg}$		-55~150	°C
Channel Temperature	$T_{ch}$		150	
Drain-Source Voltage	$V_{DSS}$		200	V
Gate-Source Voltage	$V_{GSS}$		$\pm 30$	
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

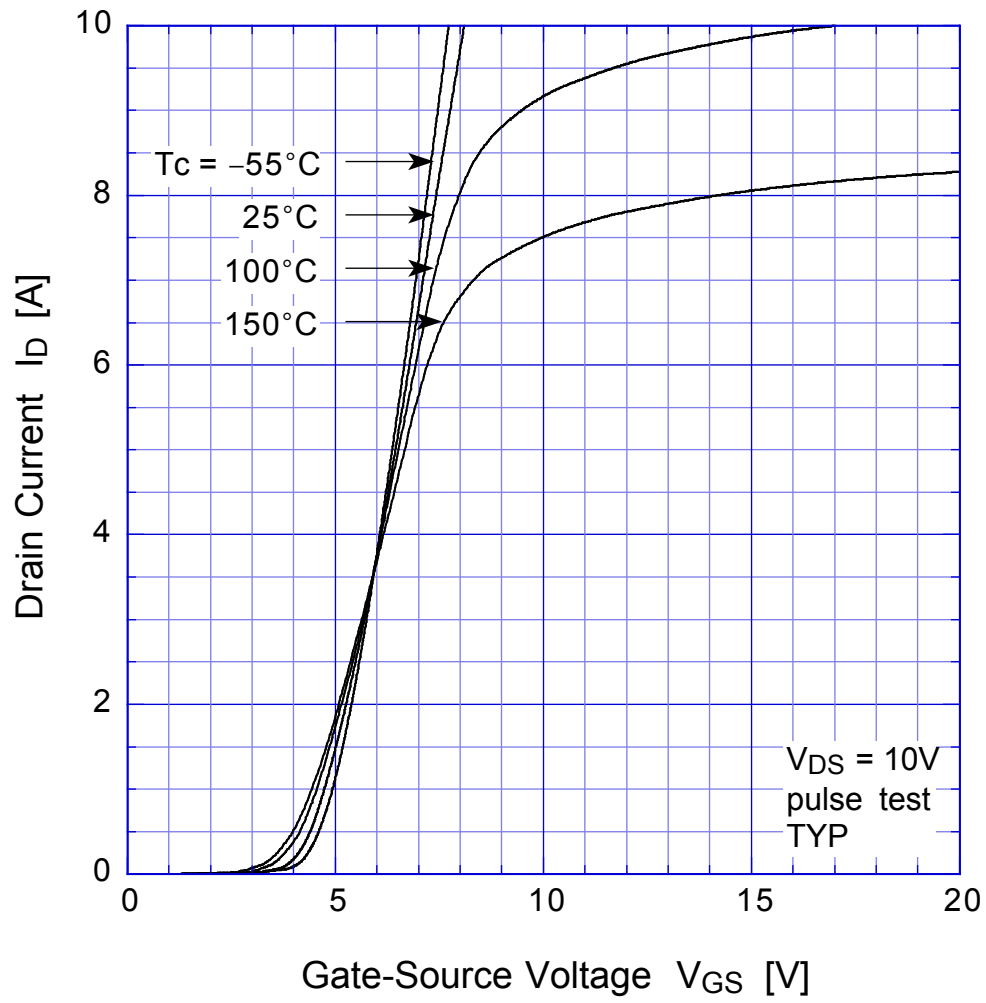


● Electrical Characteristics  $T_c = 25^\circ\text{C}$ 

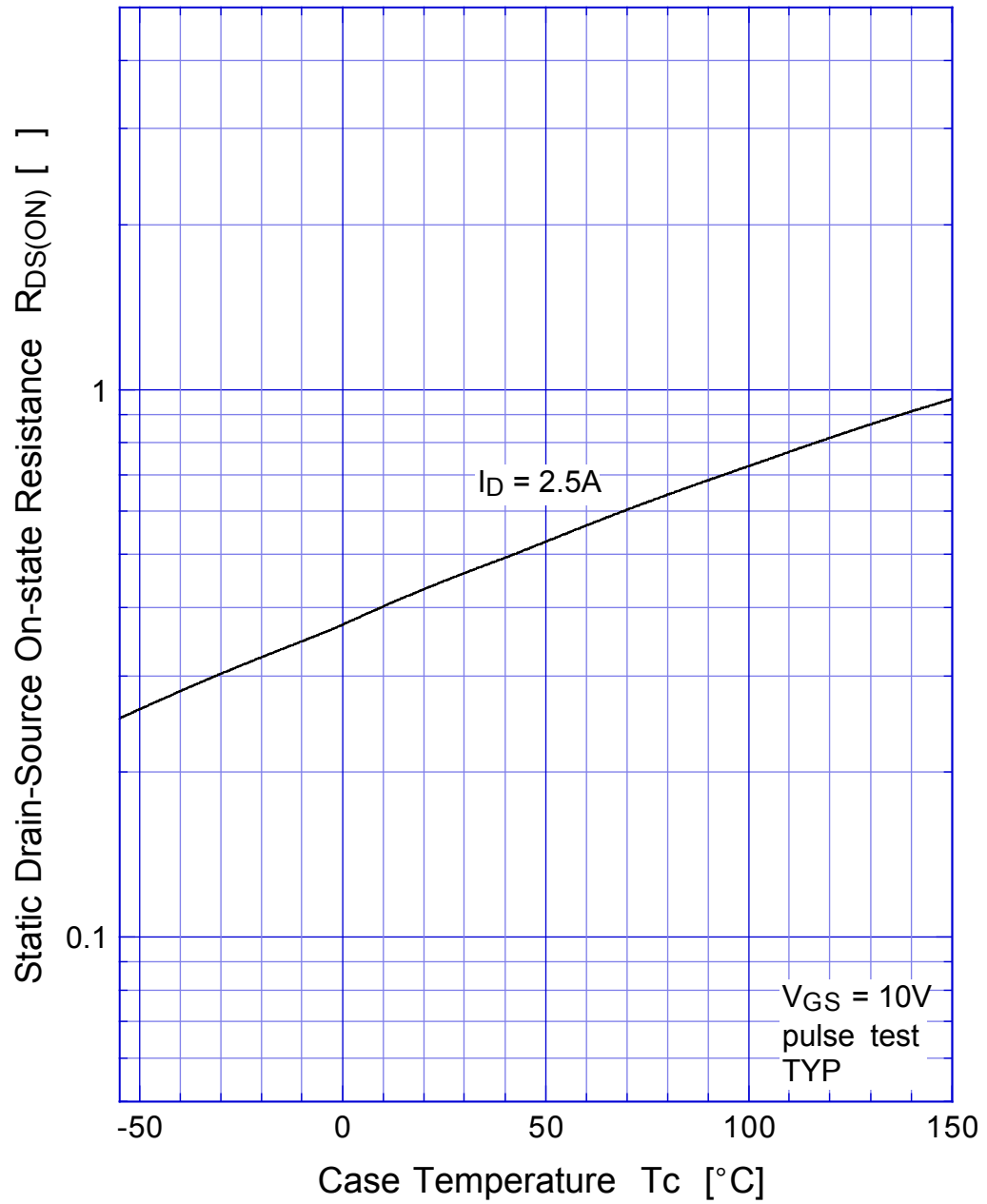
Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 1\text{mA}$ , $V_{GS} = 0\text{V}$	200			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 200\text{V}$ , $V_{GS} = 0\text{V}$			250	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 30\text{V}$ , $V_{DS} = 0\text{V}$			$\pm 0.1$	
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	$\Omega$
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	$\theta_{jc}$	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

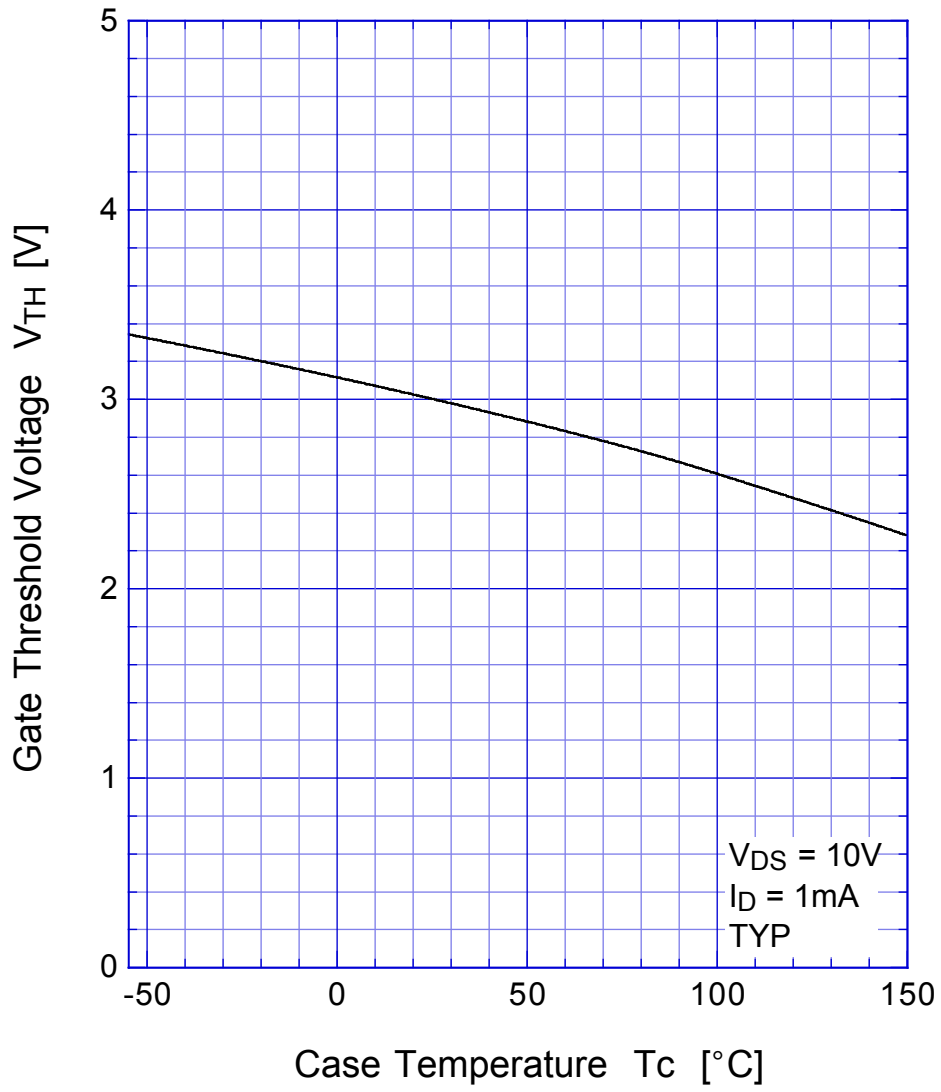
# Transfer Characteristics



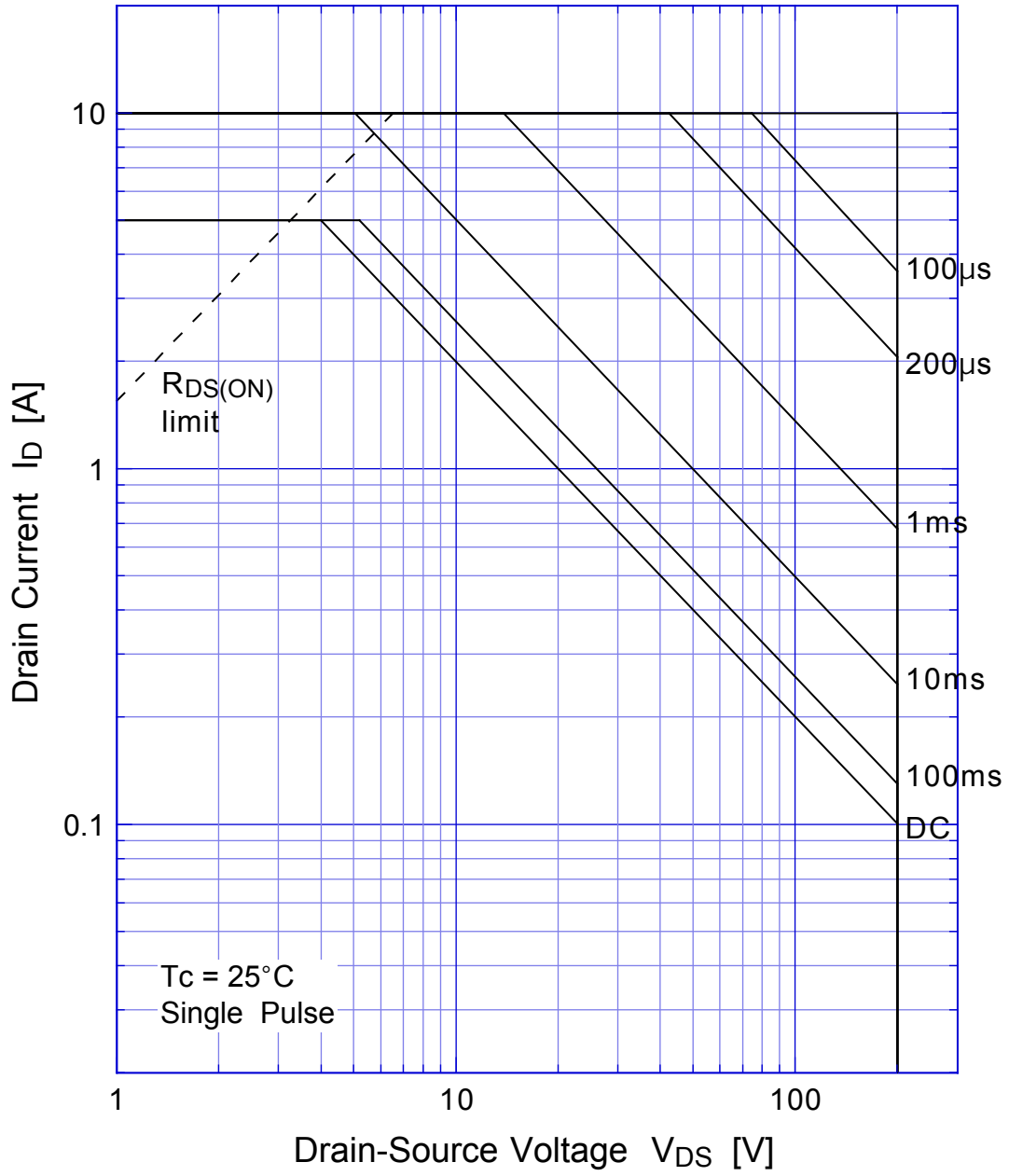
## 2SK1931 Static Drain-Source On-state Resistance



2SK1931 Gate Threshold Voltage

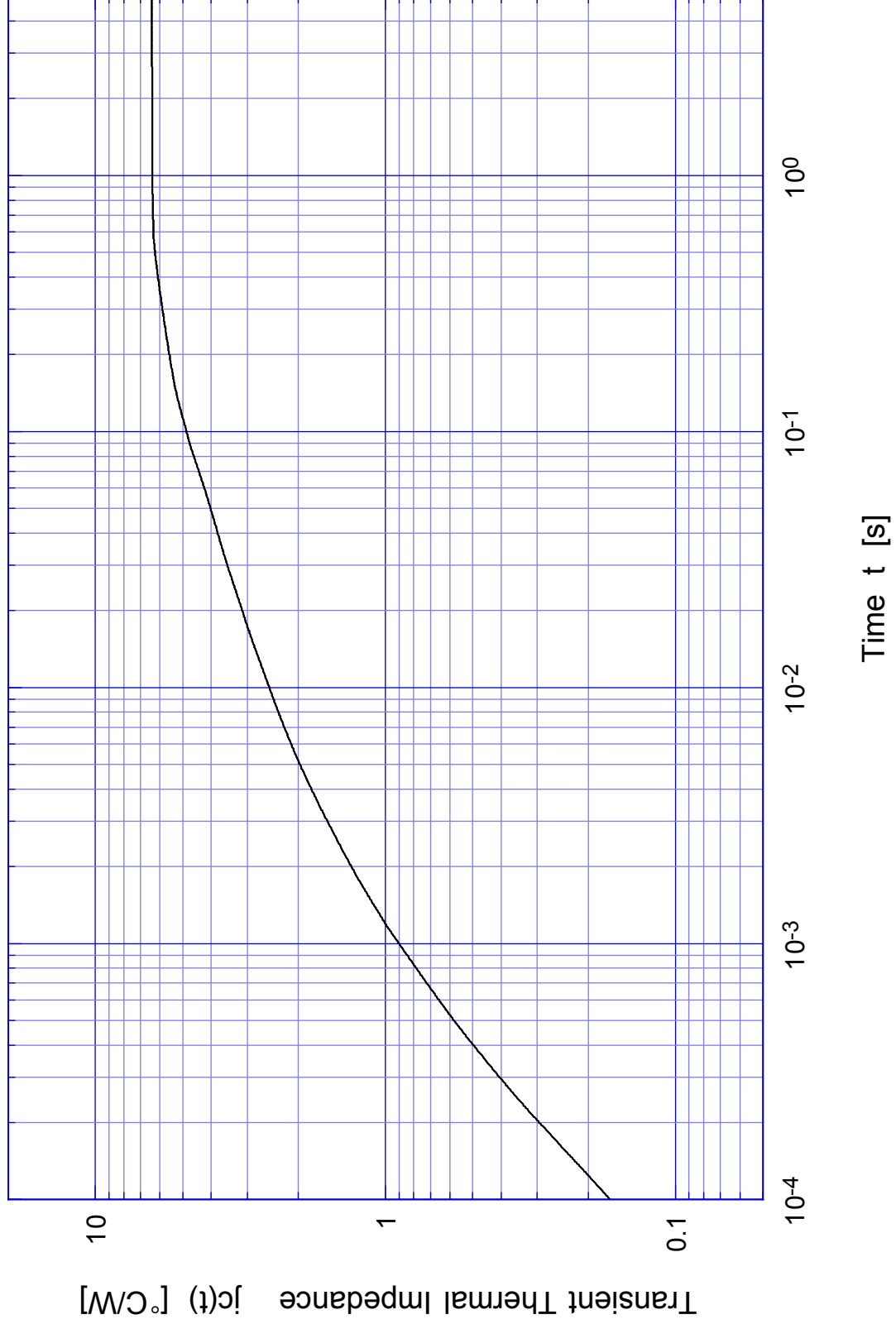


# 2SK1931 Safe Operating Area

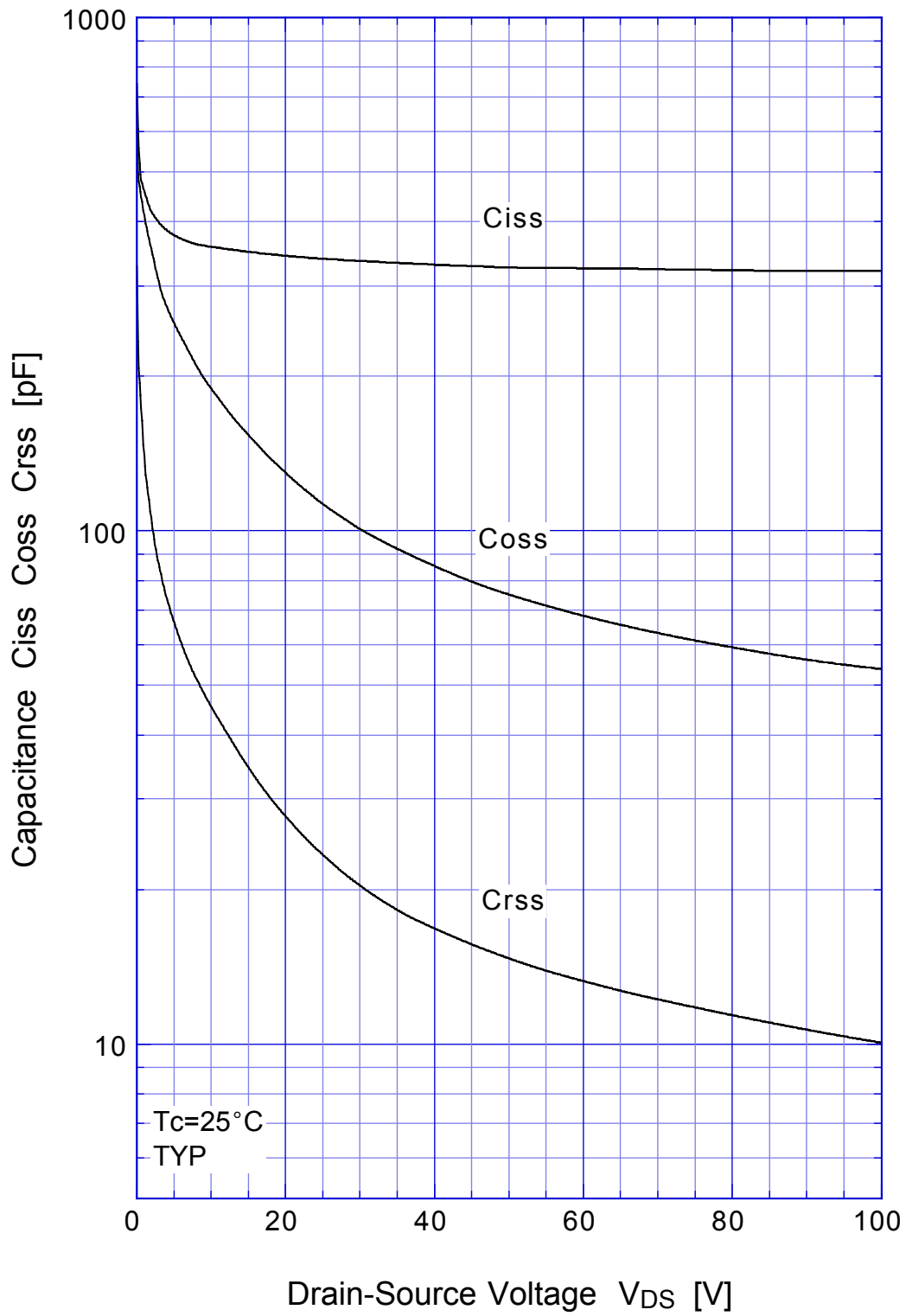


2SK1931

Transient Thermal Impedance



# 2SK1931 Capacitance





2SK1931

Power Derating

