

SHINDENGEN

VR Series Power MOSFET

N-Channel Enhancement type

F05B23VR

230V 0.5A

FEATURES

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

APPLICATION

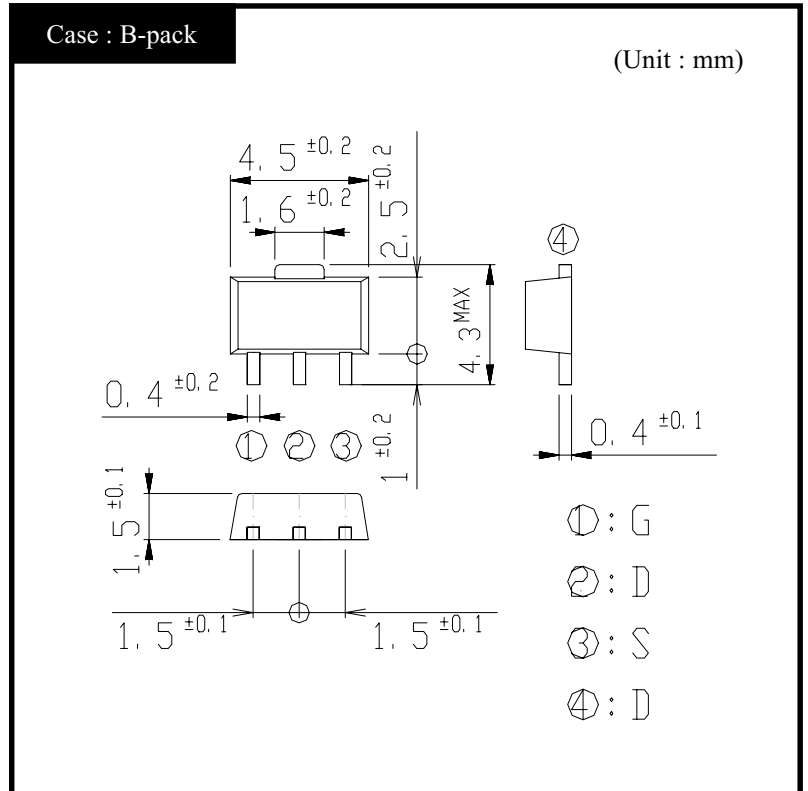
- DC/DC converters
- Power supplies of DC 12-24V input
- Product related to Integrated Service Digital Network

RATINGS

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

Item	Symbol	Conditions	Ratings	Unit
Storage Temperature	T_{stg}		-55~150	$^\circ\text{C}$
Channel Temperature	T_{ch}		150	
Drain-Source Voltage	V_{DSS}		230	V
Gate-Source Voltage	V_{GSS}		± 20	
Continuous Drain Current(DC)	I_D		0.5	A
Continuous Drain Current(Peak)	I_{DP}		1	
Continuous Source Current(DC)	I_S		0.5	
Total Power Dissipation	P_T	On alumina substrate, 50.8mm^2 , substrate thickness 0.64t, $T_a = 25^\circ\text{C}$	1.5	W
			3.5	

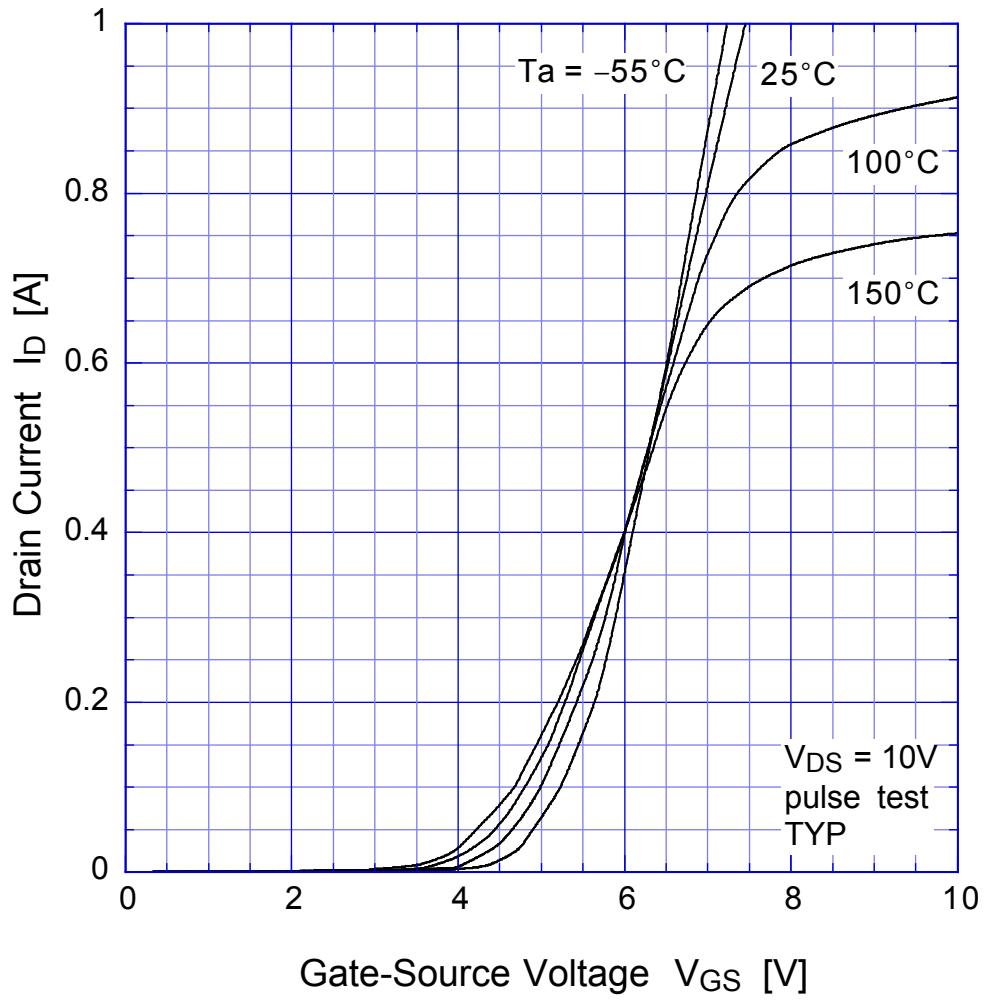
OUTLINE DIMENSIONS



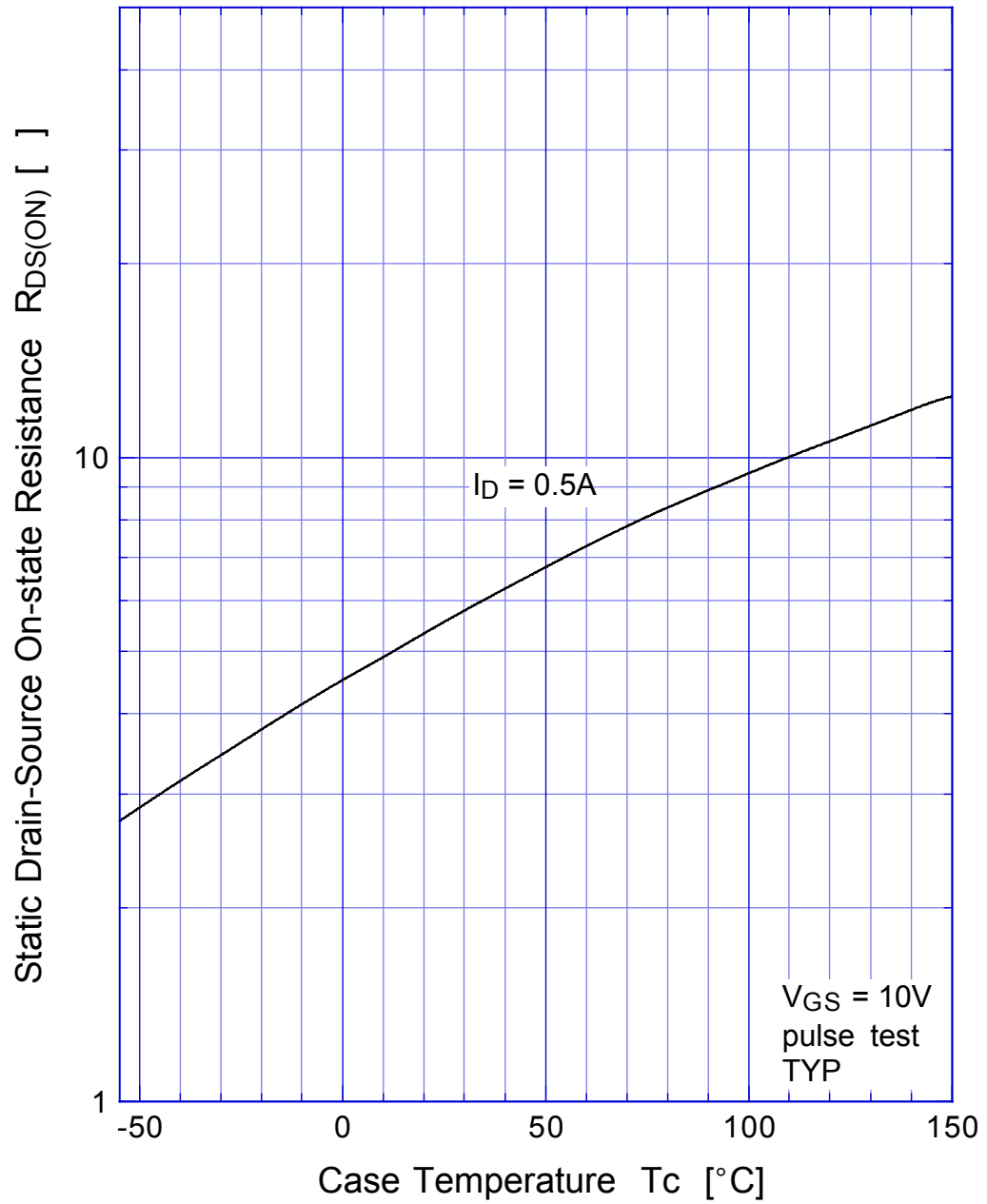
●Electrical Characteristics $T_c = 25^\circ\text{C}$

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\ \mu\text{A}$, $V_{GS} = 0\text{V}$	230			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 230\text{V}$, $V_{GS} = 0\text{V}$			250	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$			± 0.1	
Forward Transconductance	g_{fs}	$I_D = 0.5\text{A}$, $V_{DS} = 10\text{V}$	0.2	0.4		S
Static Drain-Source On-state Resistance	$R_{DS(ON)}$	$I_D = 0.5\text{A}$, $V_{GS} = 10\text{V}$		5.5	8	Ω
Gate Threshold Voltage	V_{TH}	$I_D = 0.2\text{mA}$, $V_{DS} = 10\text{V}$	2	3	4	V
Source-Drain Diode Forward Voltage	V_{SD}	$I_S = 0.5\text{A}$, $V_{GS} = 0\text{V}$			1.5	
Thermal Resistance	θ_{ja}	junction to ambient, on alumina substrate			83.3	$^\circ\text{C}/\text{W}$
	θ_{jc}	junction to case			35.7	
Total Gate Charge	Q_g	$V_{GS} = 10\text{V}$, $I_D = 0.5\text{A}$, $V_{DD} = 200\text{V}$		2.7		nC
Input Capacitance	C_{iss}	$V_{DS} = 10\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$		45		pF
Reverse Transfer Capacitance	C_{rss}			4.5		
Output Capacitance	C_{oss}			30		
Turn-On Time	t_{on}	$I_D = 0.5\text{A}$, $V_{GS} = 10\text{V}$, $R_L = 200\ \Omega$		30	60	ns
Turn-Off Time	t_{off}			50	100	

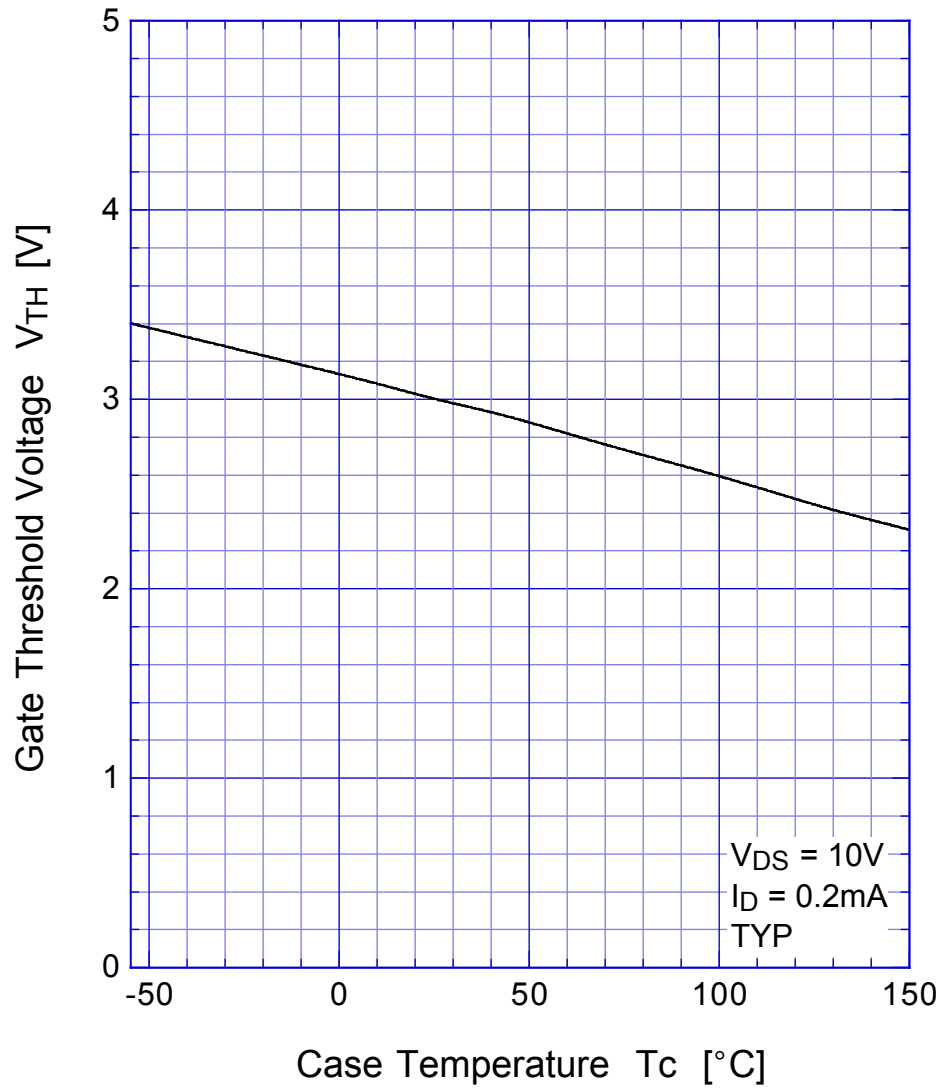
F05B23VR Transfer Characteristics



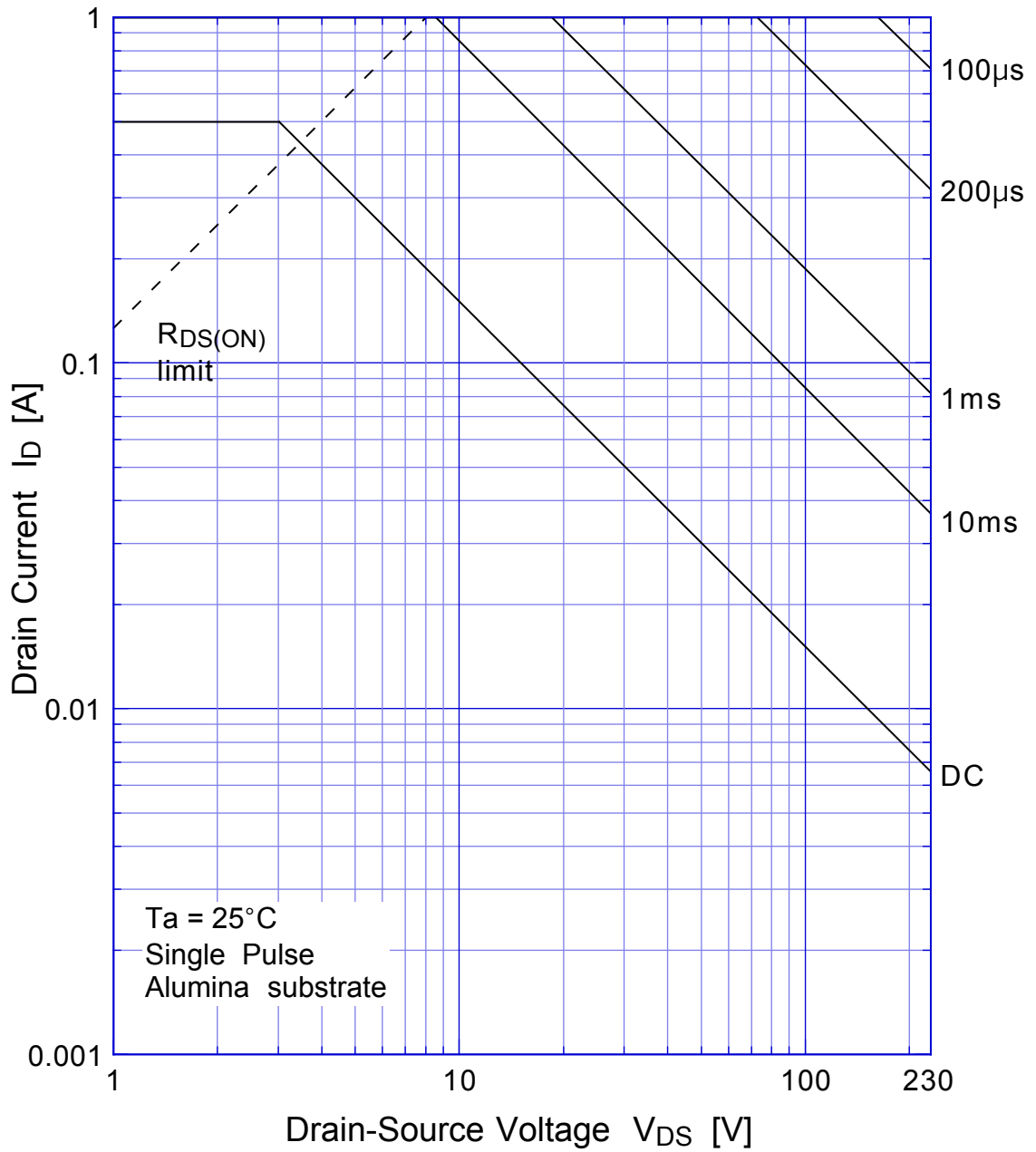
F05B23VR Static Drain-Source On-state Resistance



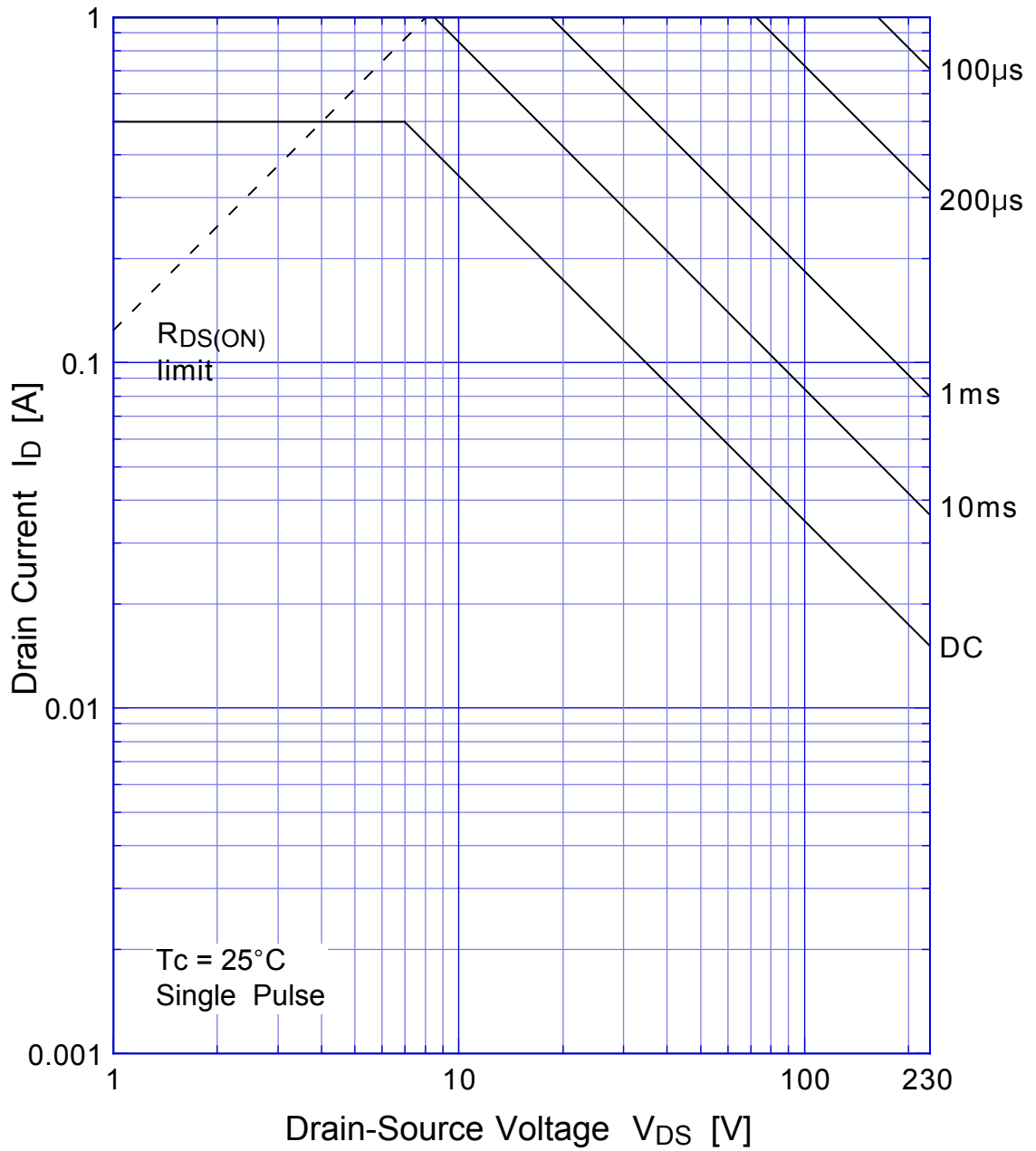
F05B23VR Gate Threshold Voltage



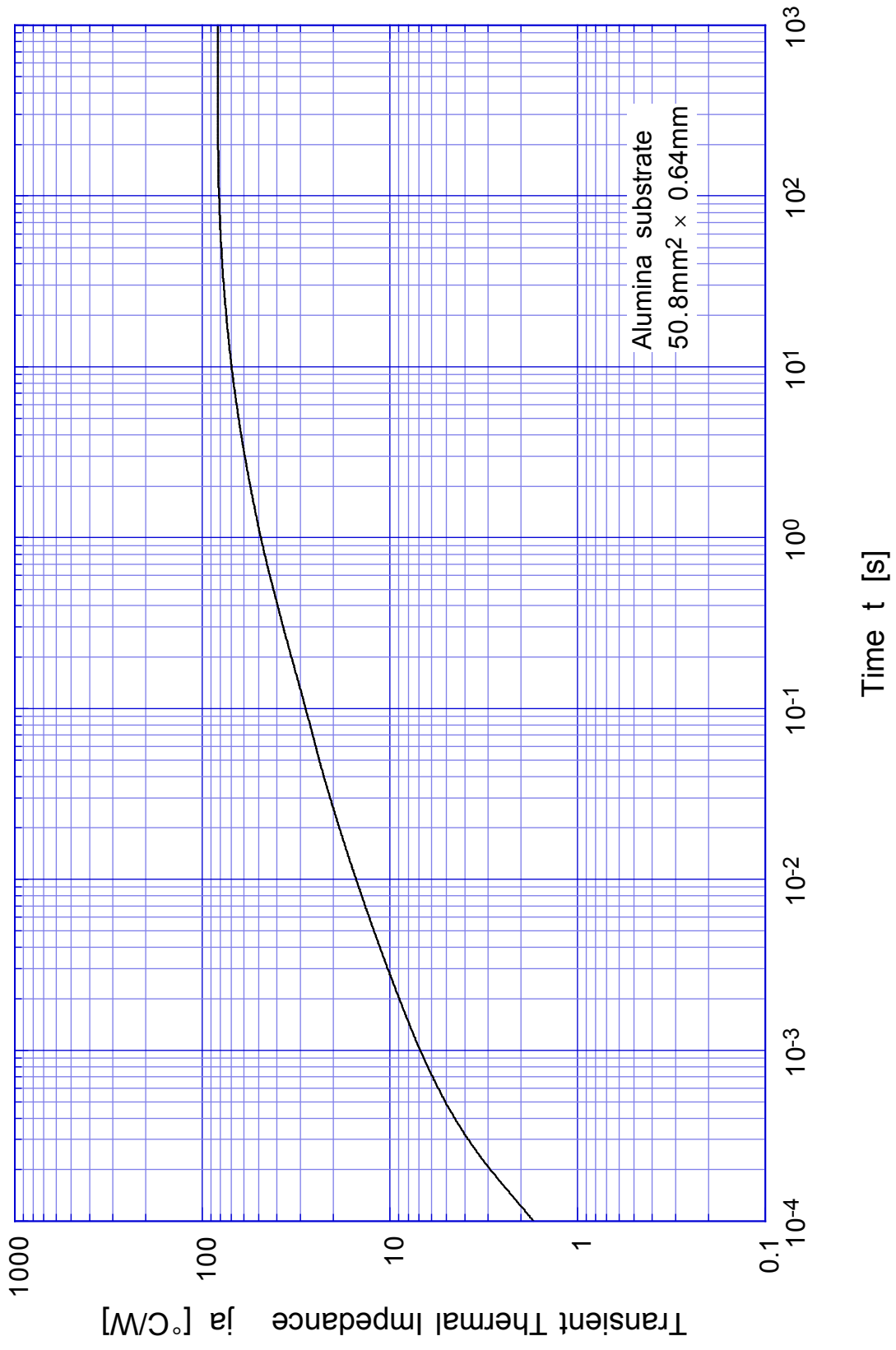
F05B23VR Safe Operating Area



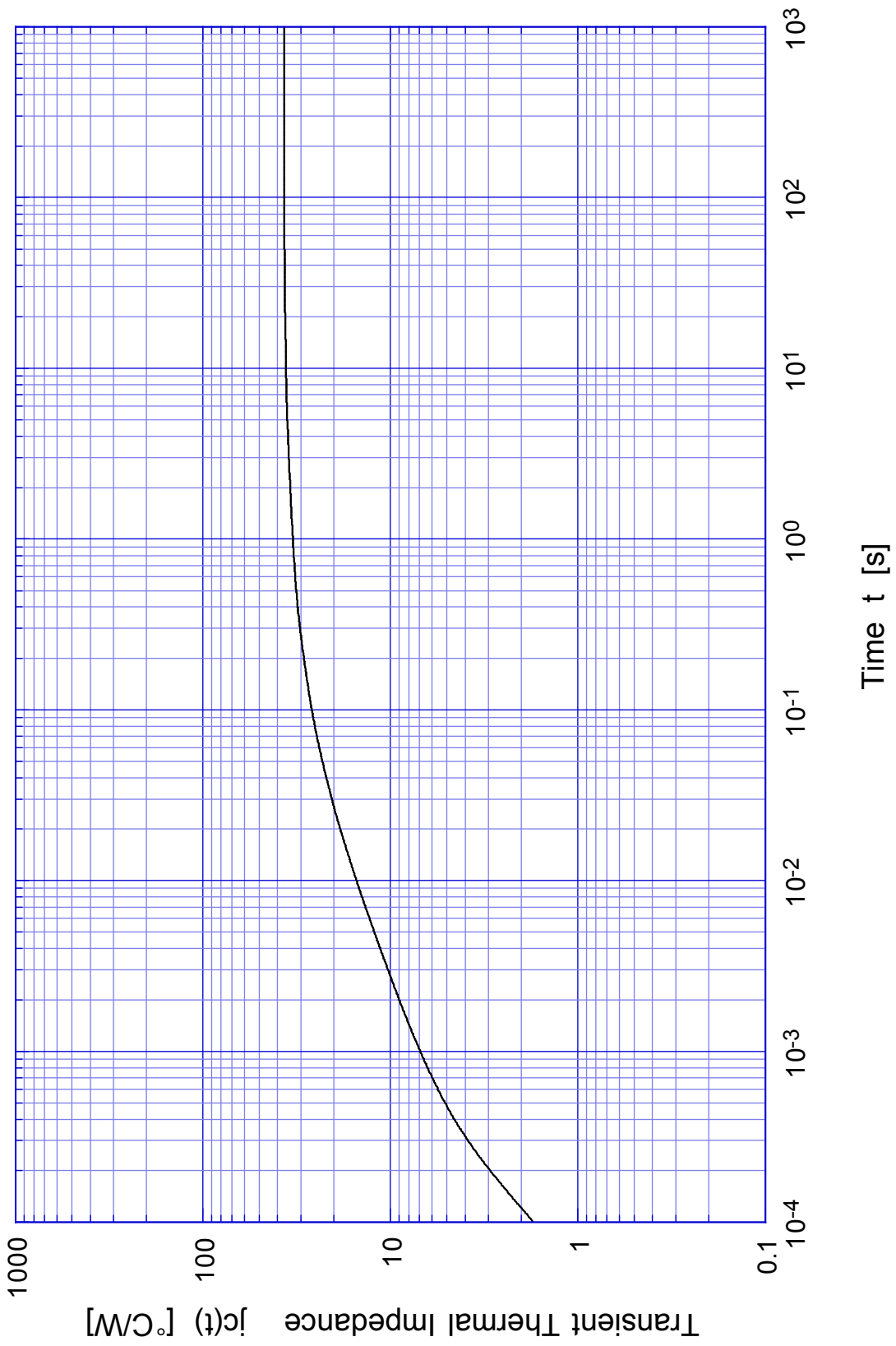
F05B23VR Safe Operating Area



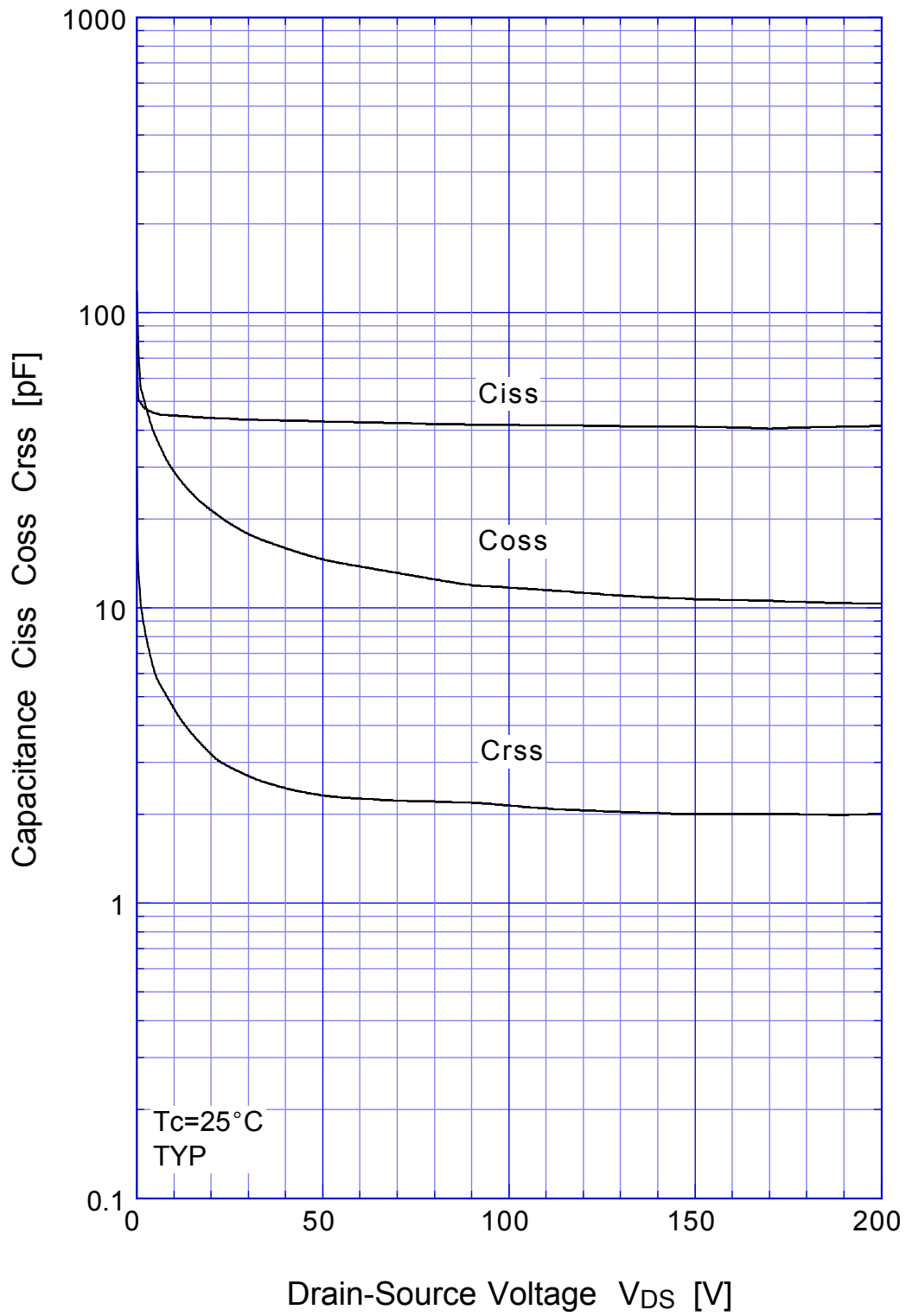
F05B23VR Transient Thermal Impedance



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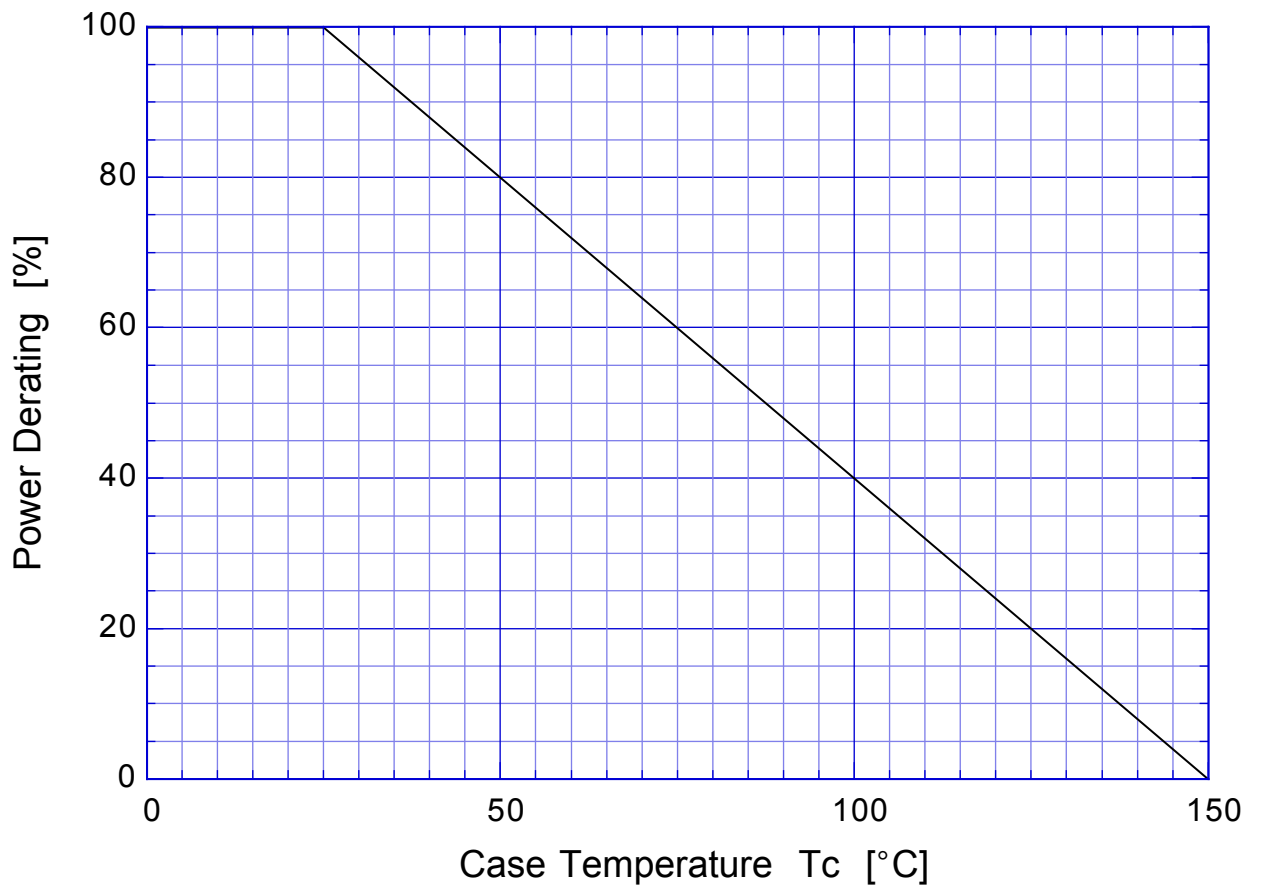


F05B23VR Capacitance



F05B23VR

Power Derating



F05B23VR Gate Charge Characteristics

