

N-Channel Enhancement Mode MOSFET

GENERAL DESCRIPTION

The PW2324 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

FEATURES

$V_{DS} = 100V$, $I_D = 3.7A$

$R_{DS(ON)} < 240m\Omega$ @ $V_{GS} = 10V$

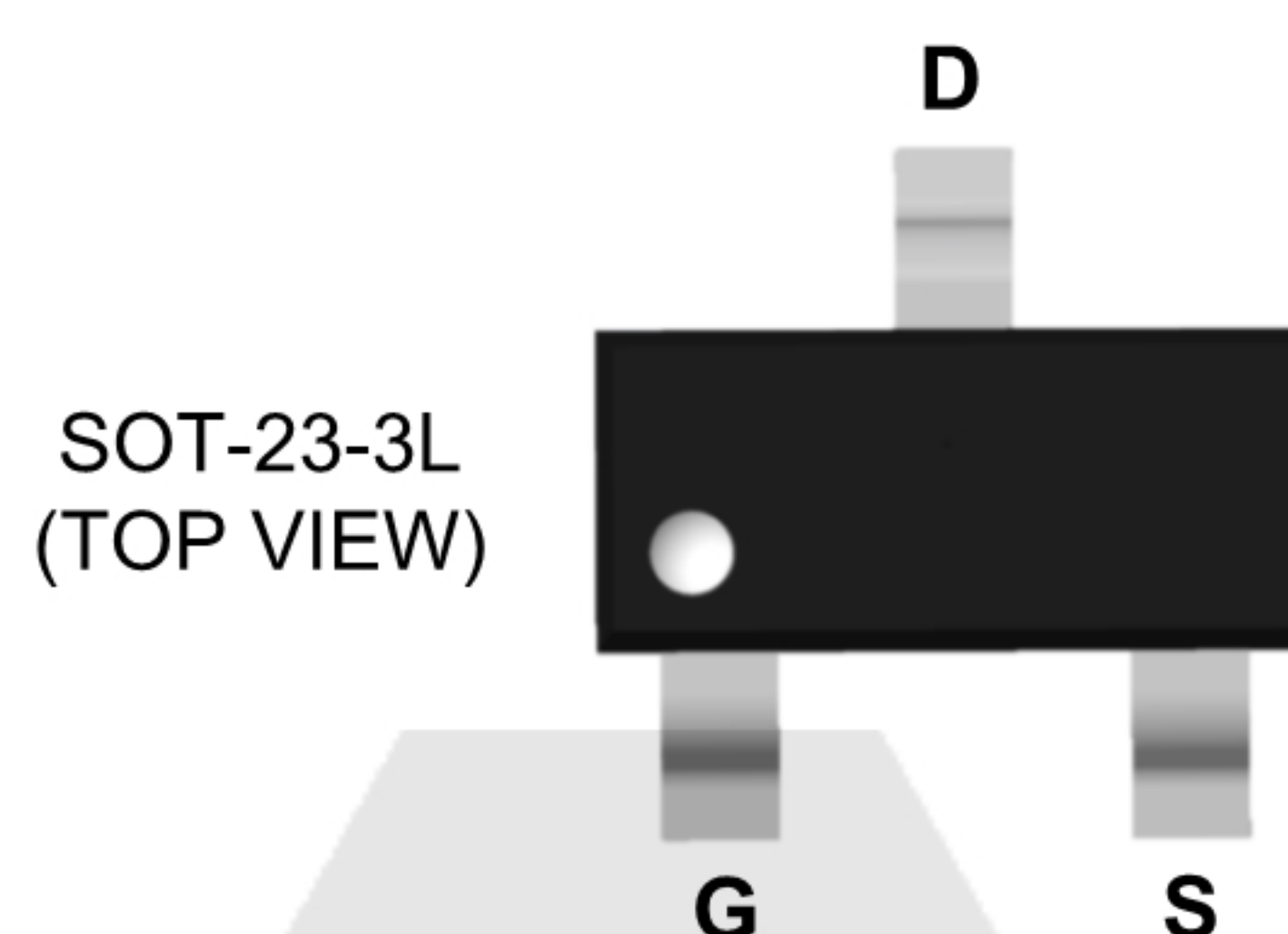
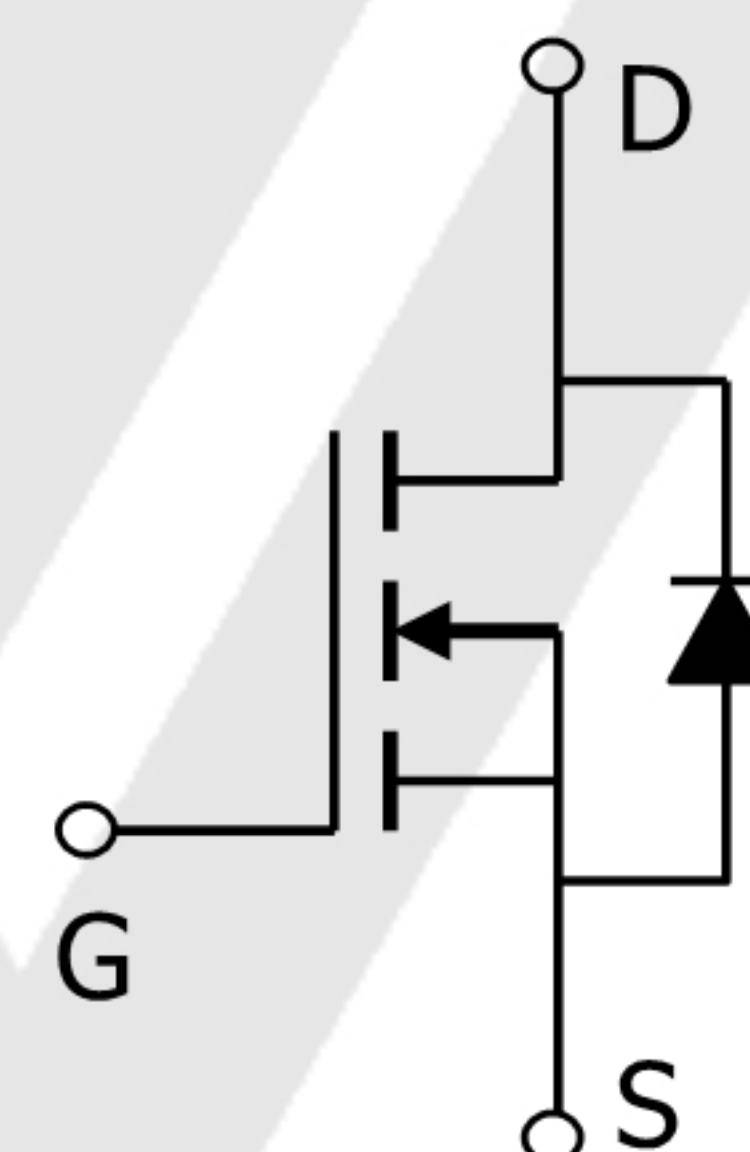
Available in a 3-Pin SOT23-3 Package

Application

Battery protection

Load switch

Uninterruptible power supply



Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_D @ T_A = 25^\circ C$	3.8	A
	$I_D @ T_A = 100^\circ C$	2	
Pulsed Drain Current (NOTE1)	I_{DM}	8	A
Power Dissipation	$P_D @ T_A = 25^\circ C$	3.76	W
Power Dissipation – Derate above 25°C	P_{DD}	0.5	W/°C
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	°C
Thermal Resistance Junction-Ambient	$R_{\theta JA} (MAX)$	70	°C/W
Thermal Resistance Junction-Case	$R_{\theta JC} (MAX)$	30	°C/W

Note 1、 Repetitive Rating : Pulsed width limited by maximum junction temperature.

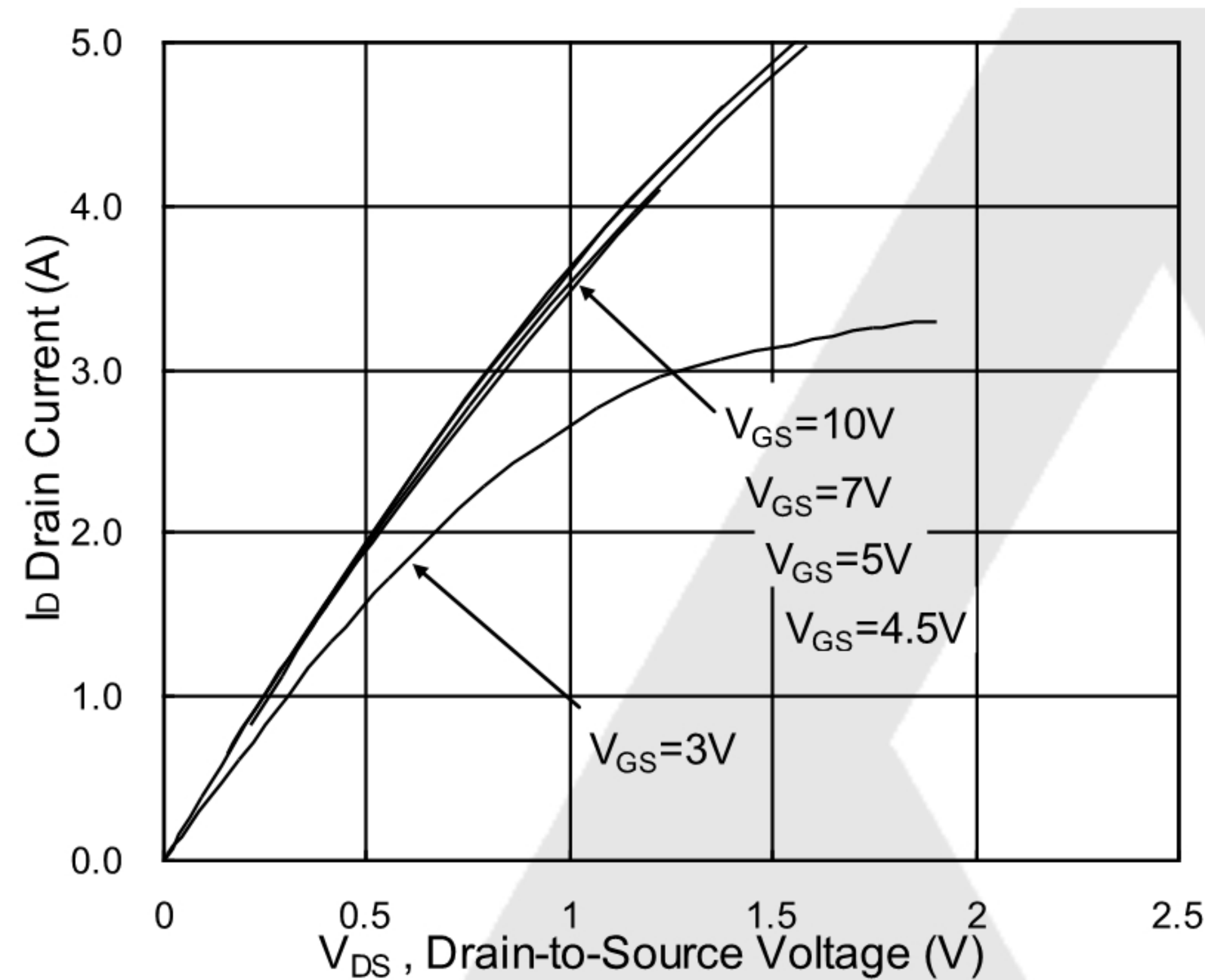
ELECTRICAL CHARACTERISTICS

(TA = 25°C, unless otherwise noted.)

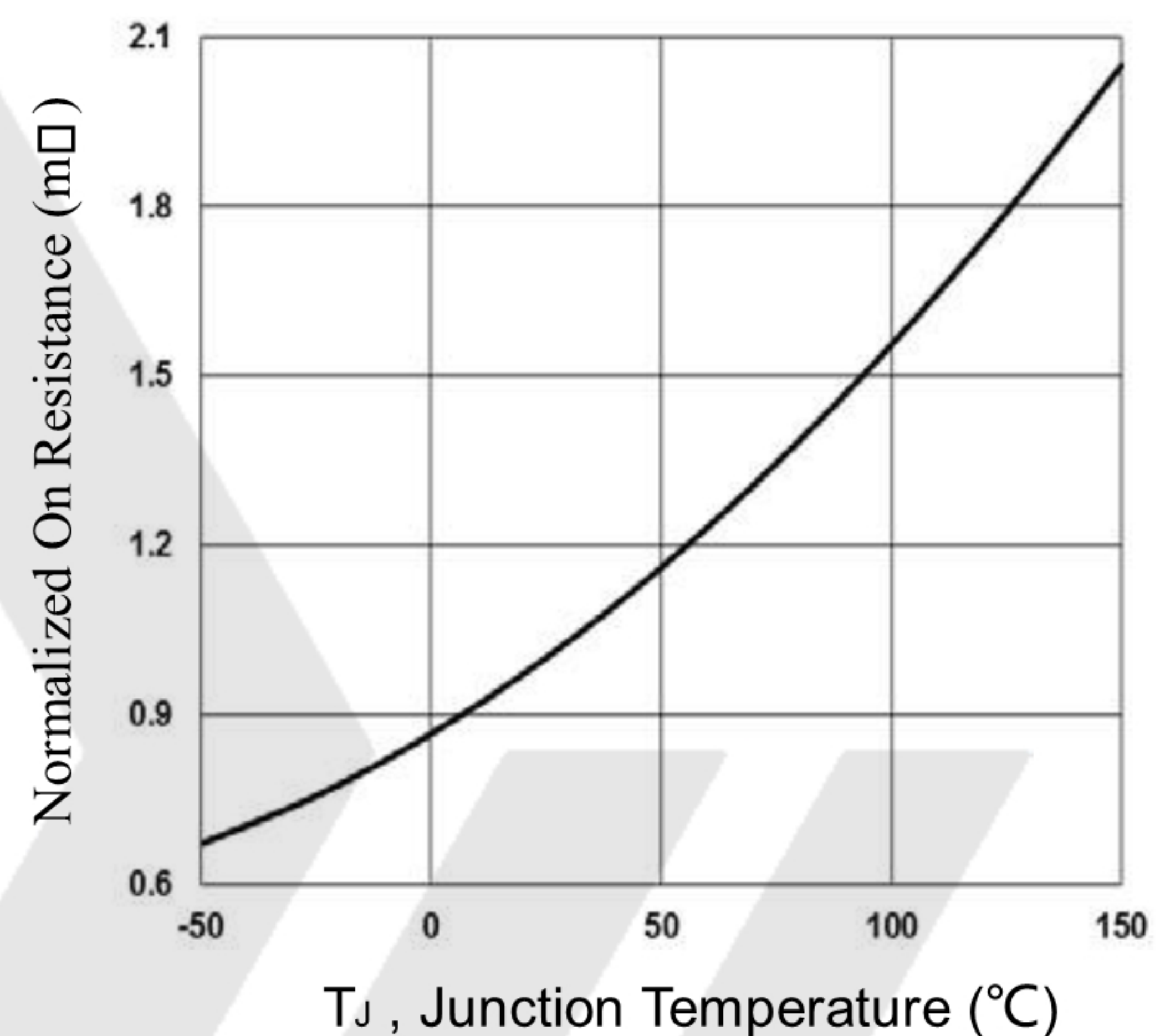
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =-250uA	100			V
$\Delta BV_{DSS}/\Delta T_J$	BV _{DSS} Temperature Coefficient	Reference to 25°C , I _D =-1mA		0.09		V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V , I _D =1A		210	240	mΩ
		V _{GS} =4.5V , I _D =0.5A		240	280	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	1.0	1.9	2.5	V
$\Delta V_{GS(th)}$	V _{GS(th)} Temperature Coefficient			-5		mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =100V , V _{GS} =0V , T _J =25°C			1	uA
		V _{DS} =80V , V _{GS} =0V , T _J =125°C			10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V			±100	nA
g _{fs}	Forward Transconductance	V _{DS} =10V , I _D =2A		2.3		S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz		2.8	5.6	Ω
Q _g	Total Gate Charge (NOTE1)	V _{DS} =50V , V _{GS} =10V , I _D =1A		9	18	nC
Q _{gs}	Gate-Source Charge (NOTE1)			2.3	4.6	nC
Q _{gd}	Gate-Drain Charge (NOTE1)			1.1	2.5	nC
T _{d(on)}	Turn-On Delay Time (NOTE1)	V _{DS} =50V , V _{GS} =10V , R _G =3.3Ω , I _D =1A		5.2	10	ns
T _r	Rise Time (NOTE1)			6.8	12	ns
T _{d(off)}	Turn-Off Delay Time (NOTE1)			14.5	28	ns
T _f	Fall Time (NOTE1)			2.1	5	ns
C _{iss}	Input Capacitance	V _{DS} =25V , V _{GS} =0V , f=1MHz		152	200	pF
C _{oss}	Output Capacitance			17	20	pF
C _{rss}	Reverse Transfer Capacitance			10	15	pF
I _S	Continuous Source Current	V _G =V _D =0V , Force Current			4	A
I _{SM}	Pulsed Source Current				8	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S =1A , T _J =25°C			1	V

Note 1. Essentially independent of operating temperature. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.Note

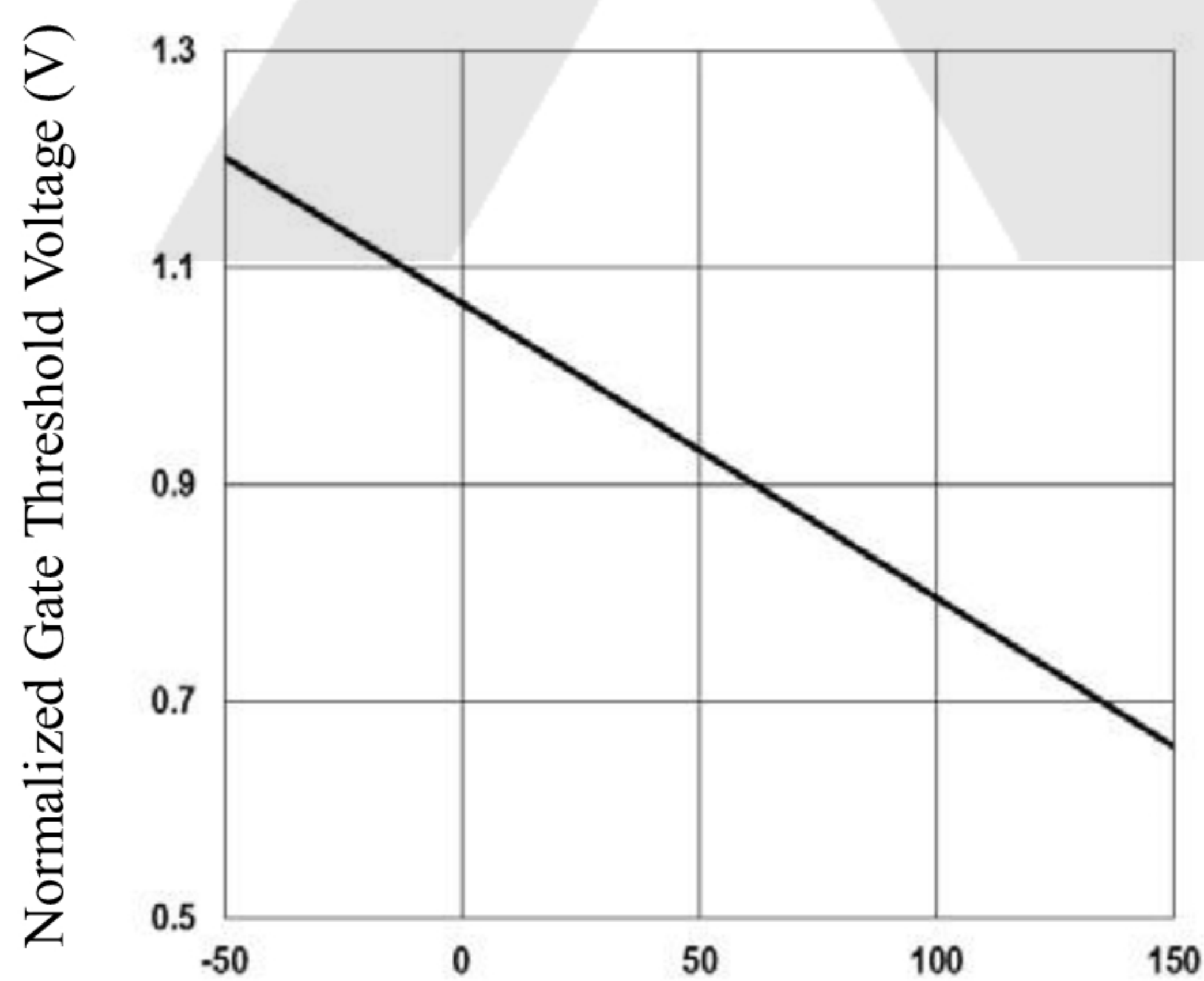
Thermal Characteristics And Typical electrical



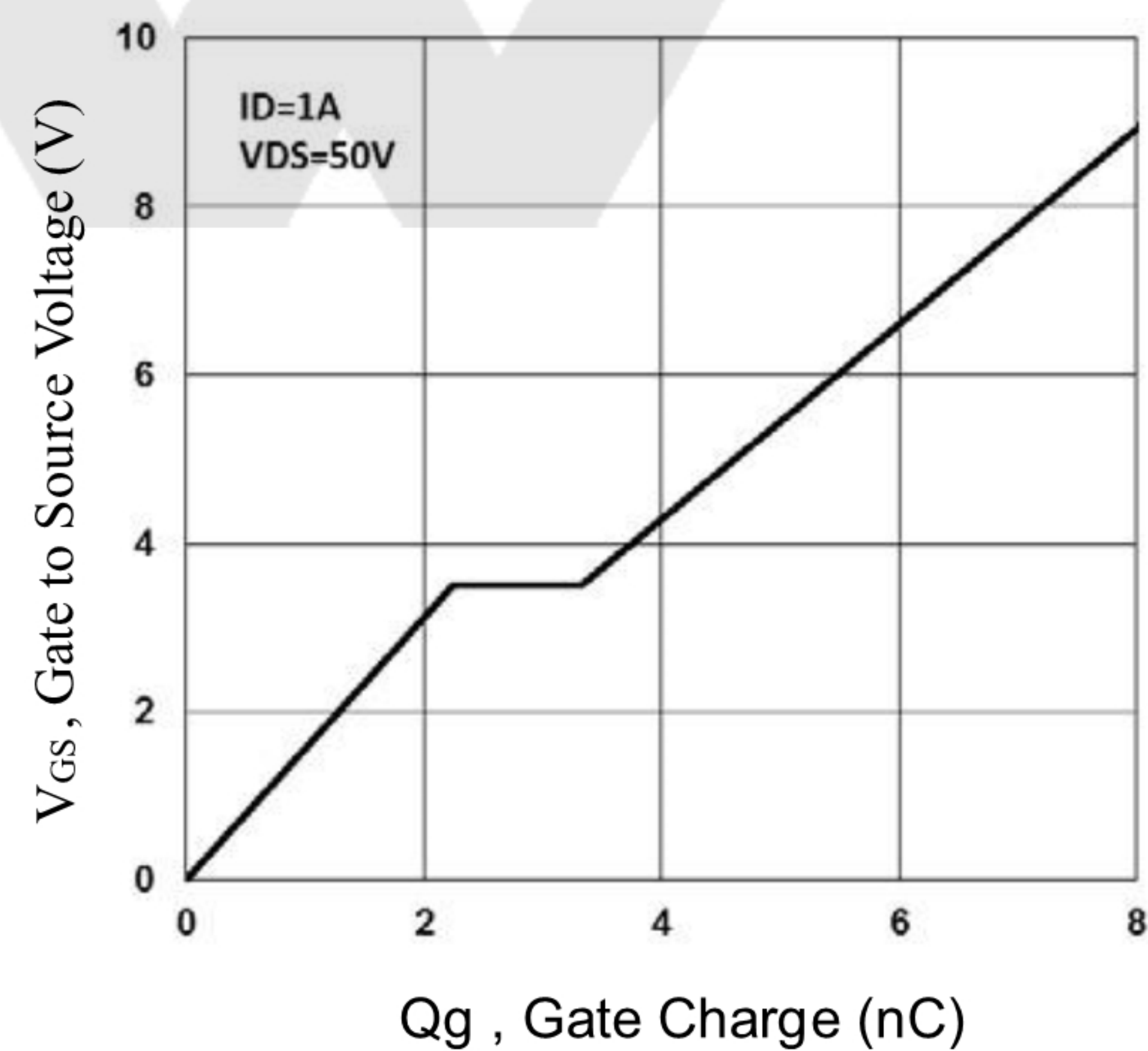
Typical Output Characteristics



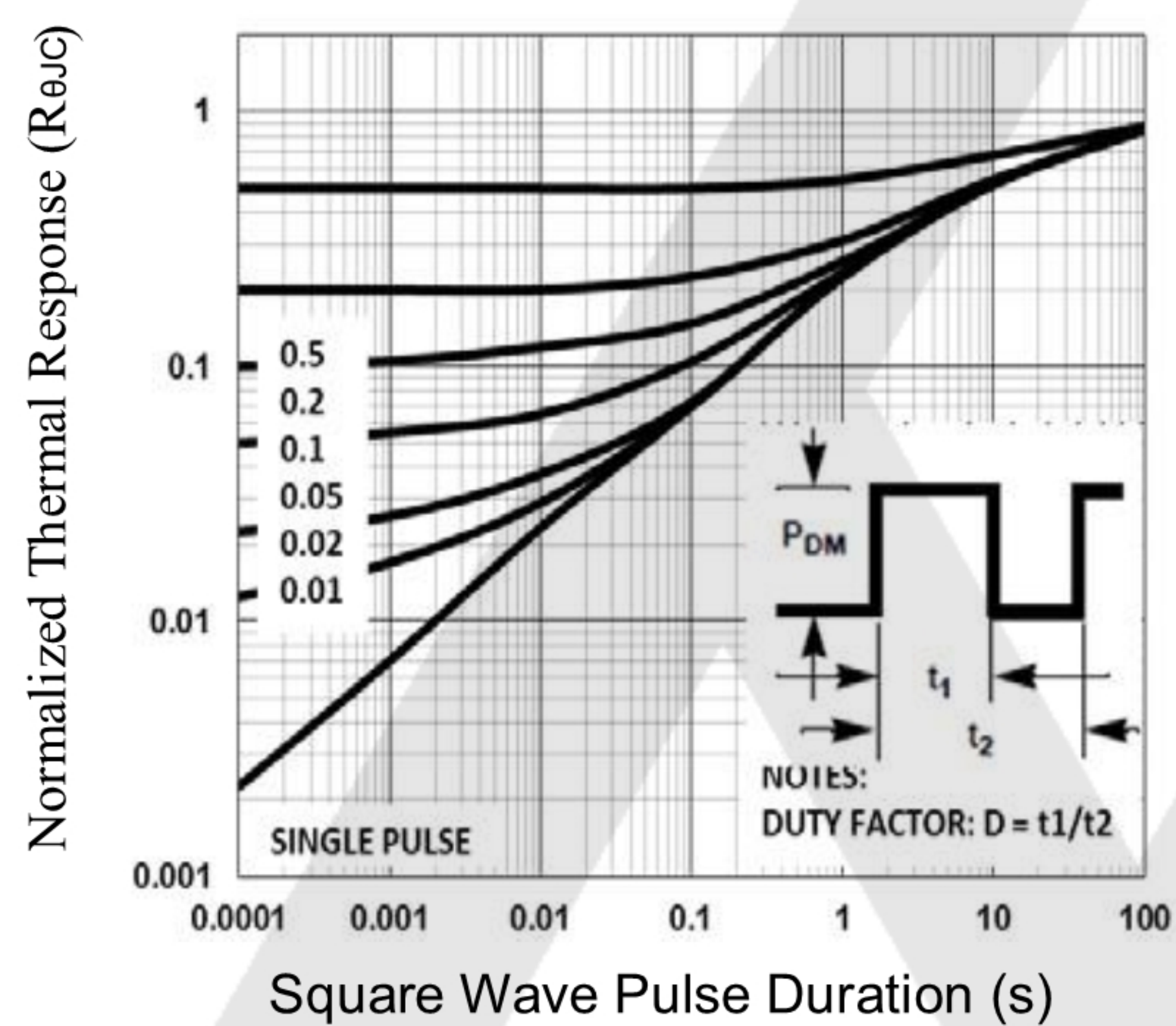
Normalized $R_{DS(on)}$ vs. T_J



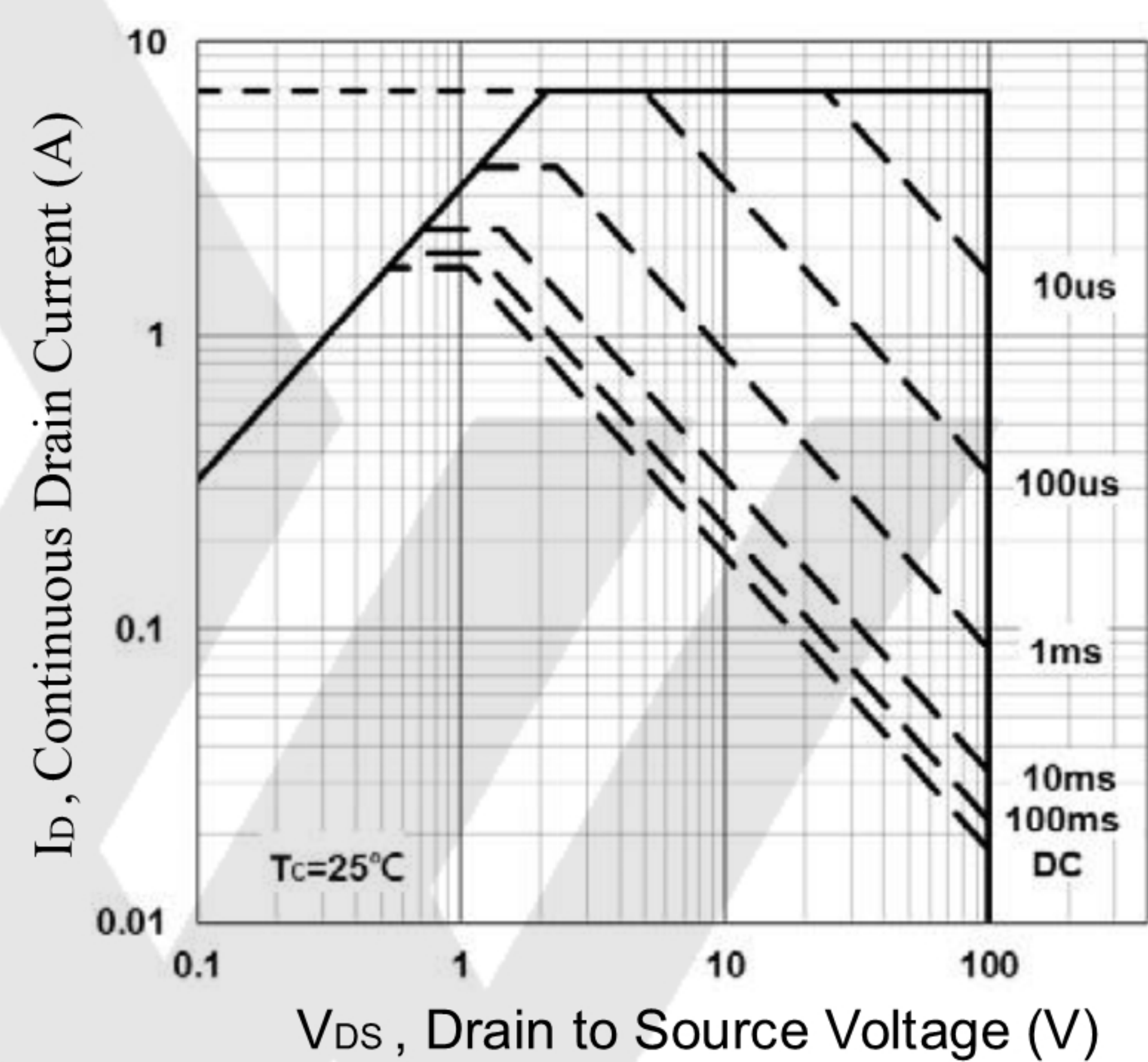
Normalized V_{th} vs. T_J



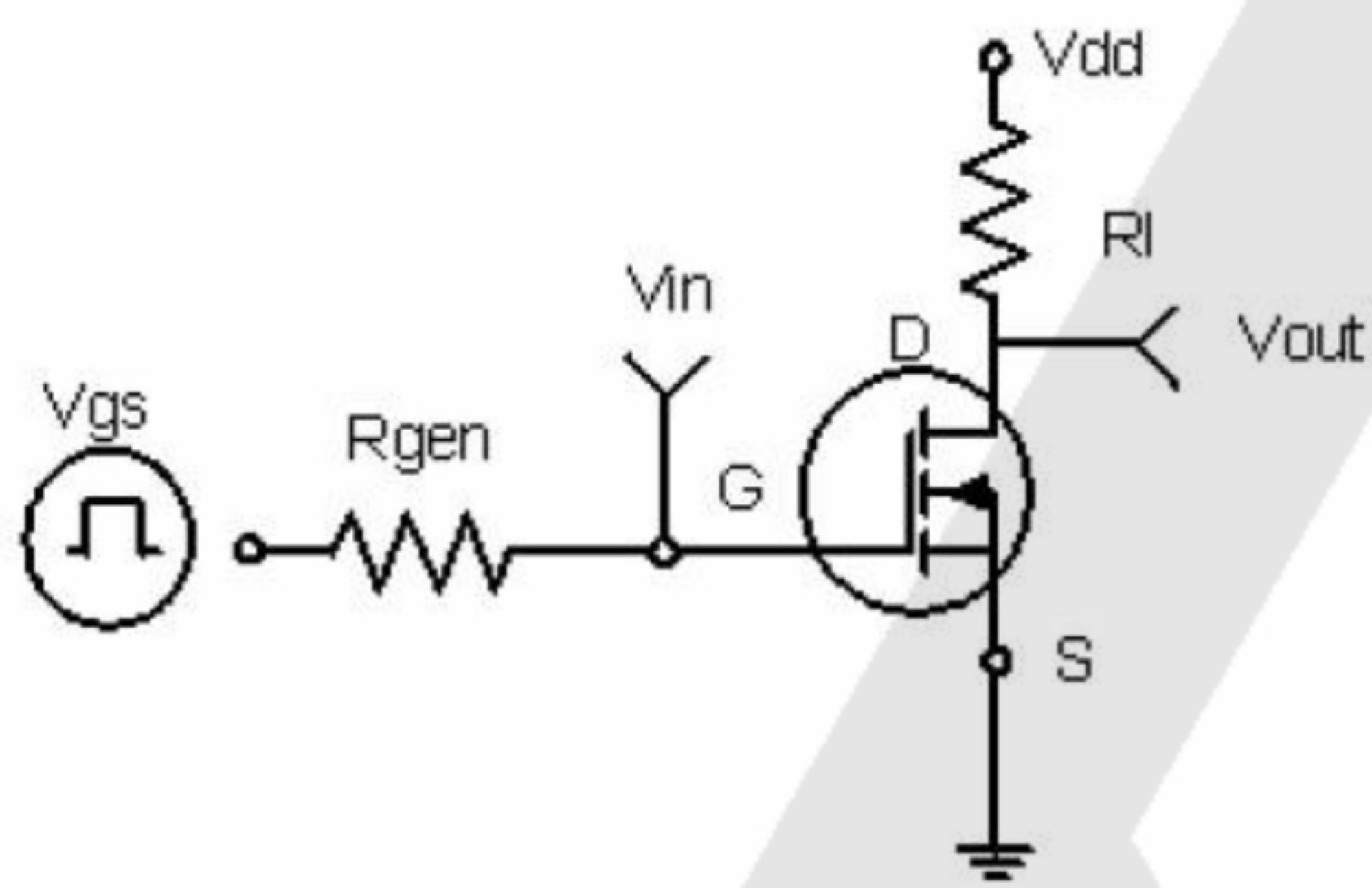
Gate Charge Waveform



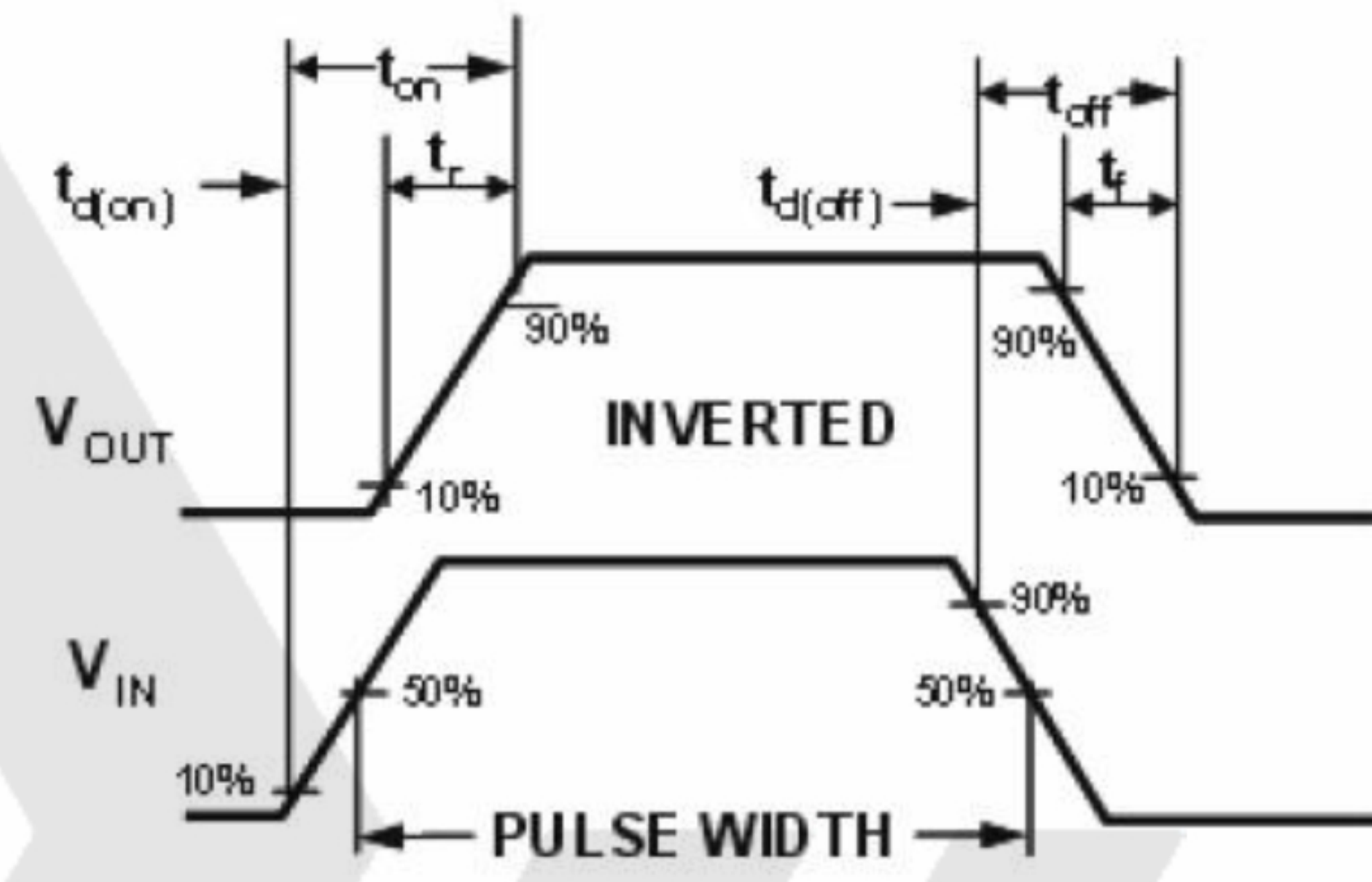
Normalized Transient Impedance



Maximum Safe Operation Area



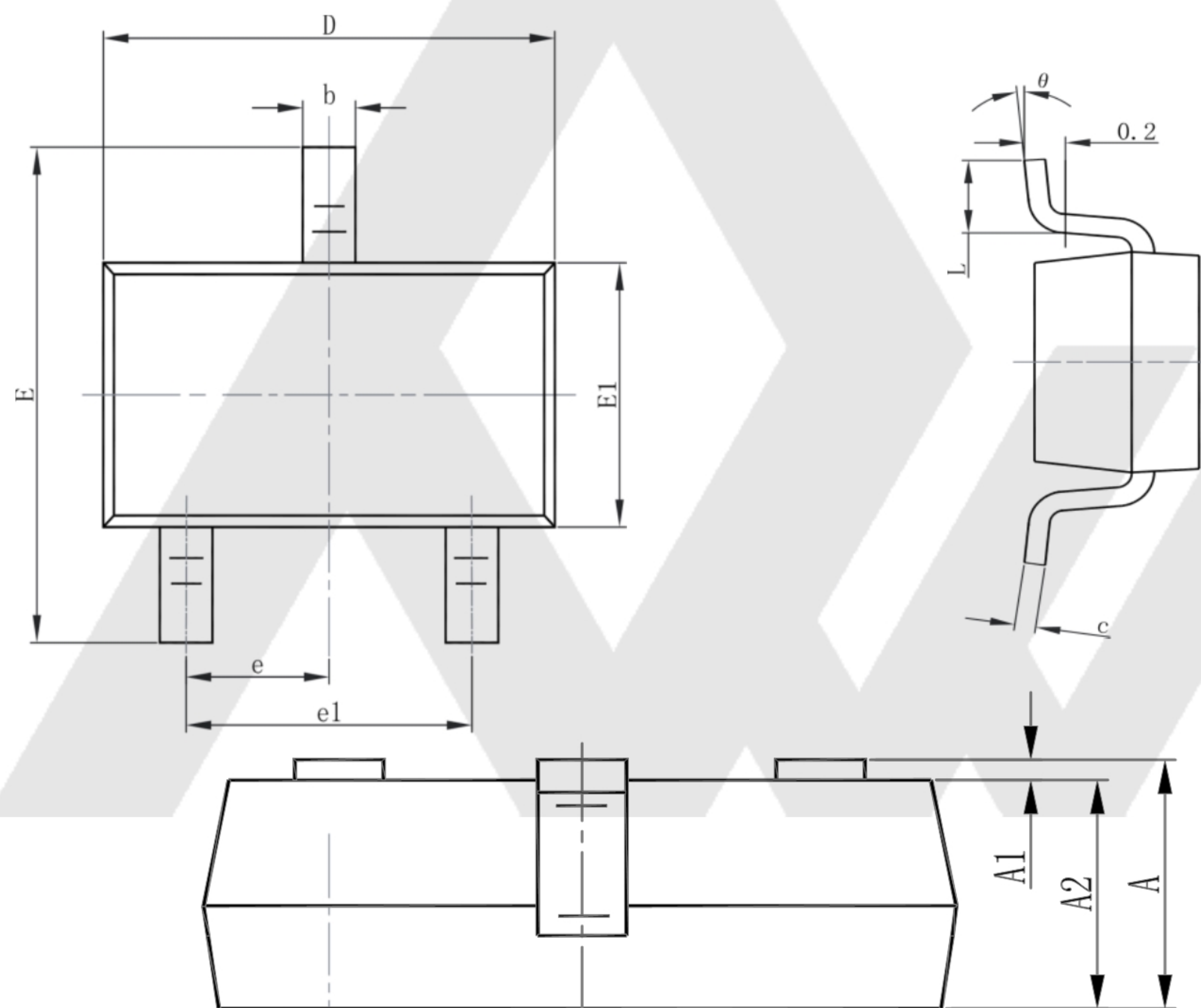
Switching Test Circuit



Switching Waveforms

PACKAGE DESCRIPTION

SOT23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Notes

1. All dimensions are in millimeters.
2. Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

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