



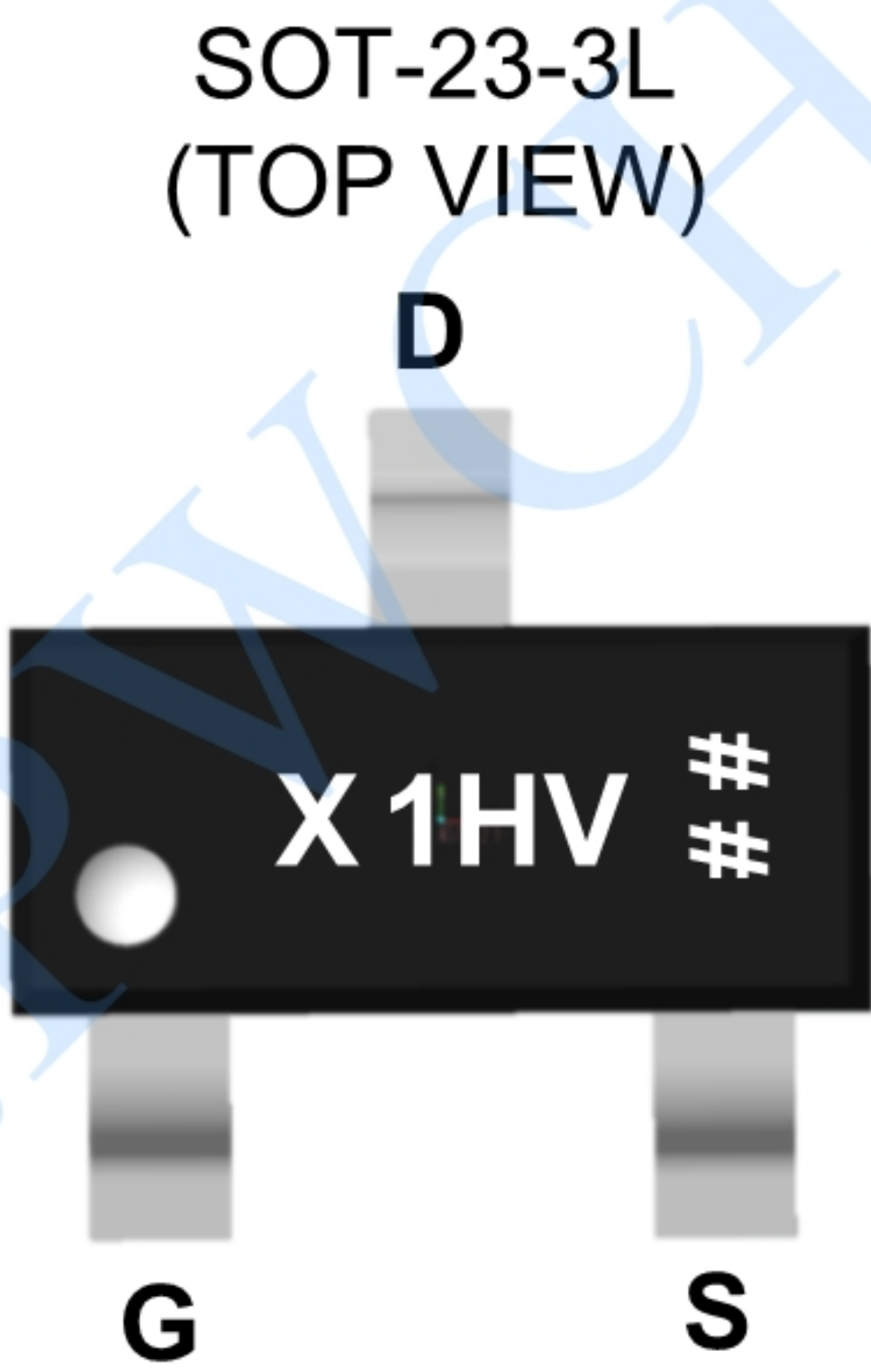
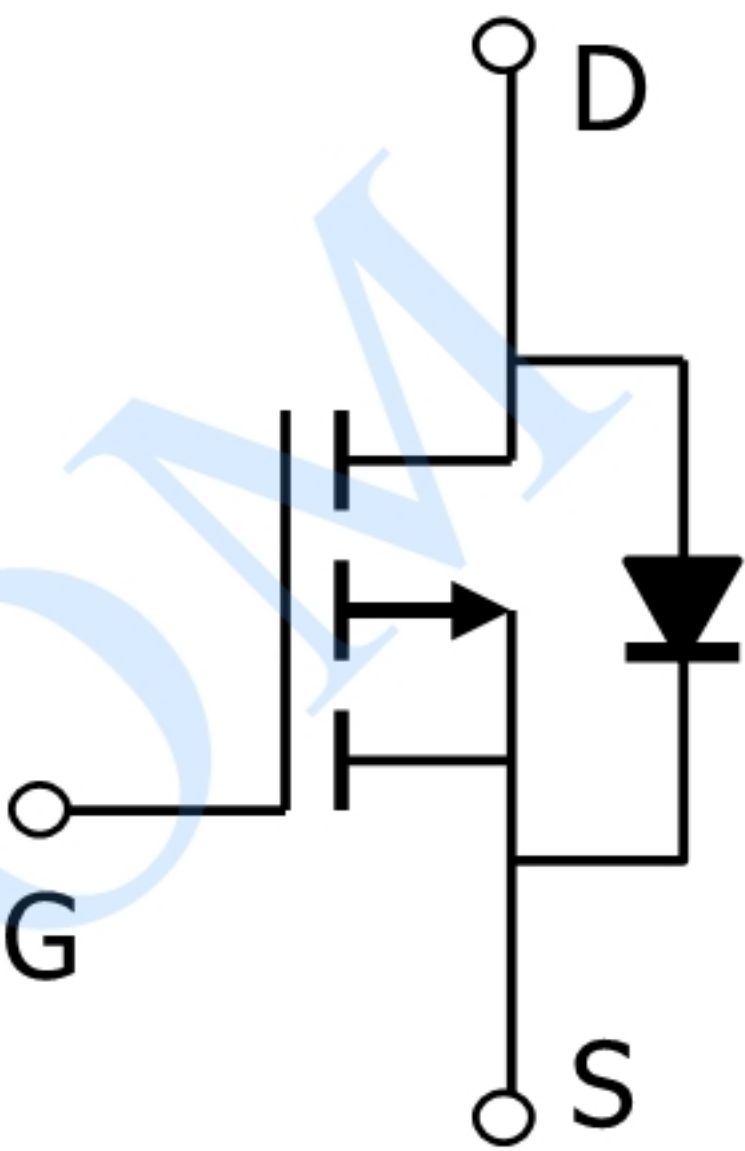
P-Channel Enhancement Mode MOSFET

GENERAL DESCRIPTION

The AO3401 uses advanced trench technology to provide excellent RDS(ON), This device is suitable for use as a load switch or in PWM applications.

FEATURES

- VDS = -30V, ID = -4.2A
- RDS(ON) < 55mΩ @ VGS=-10V
- RDS(ON) < 65mΩ @ VGS=-4.5V
- Available in a 3-Pin SOT23-3 Package



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V <sub>DS</sub>	-30	V
Gate-Source Voltage	V <sub>GS</sub>	±12	V
Drain Current Continuous	I <sub>D</sub>	-4.3	A
Drain Current Pulsed <sup>(Note 1)</sup>	I <sub>DM</sub>	-20	A
Maximun Power Dissipation	P <sub>o</sub>	1.4	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 To 150	°C
Thermal Resistance , Junction-to-Ambient <sup>(Note 2)</sup>	RθJA	125	°C/W





ELECTRICAL CHARACTERISTICS

(TA = 25°C, unless otherwise noted.)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V I <sub>D</sub> =-250μA	-30		-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-24V,V <sub>GS</sub> =0V	-	-	-1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V,V <sub>DS</sub> =0V	-	-	±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> ,I <sub>D</sub> =-250μA	-0.5	-1	-1.2	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-3A	-	48	55	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3A	-	56	65	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2A		72	85	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-5V,I <sub>D</sub> =-3A	-	5.6	-	S
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-15V,V <sub>GS</sub> =0V, F=1.0MHz	-	880	-	PF
Output Capacitance	C <sub>oss</sub>		-	105	-	PF
Reverse Transfer Capacitance	C <sub>rss</sub>		-	65	-	PF
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =-15V,I <sub>D</sub> =-3.0A V <sub>GS</sub> =-10V,R <sub>GEN</sub> =3.3Ω	-	6.6	-	nS
Turn-on Rise Time	t <sub>r</sub>		-	27.8	-	nS
Turn-Off Delay Time	t <sub>d(off)</sub>		-	46.2	-	nS
Turn-Off Fall Time	t <sub>f</sub>		-	20.6	-	nS
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-15V,I <sub>D</sub> =-3.0A,V <sub>GS</sub> =-4.5V	-	11.9	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	1.8	-	nC
Gate-Drain Charge	Q <sub>gd</sub>		-	3.0	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage <sup>(Note 3)</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V,I <sub>S</sub> =-1A	-	-	-1.2	V

Notes:

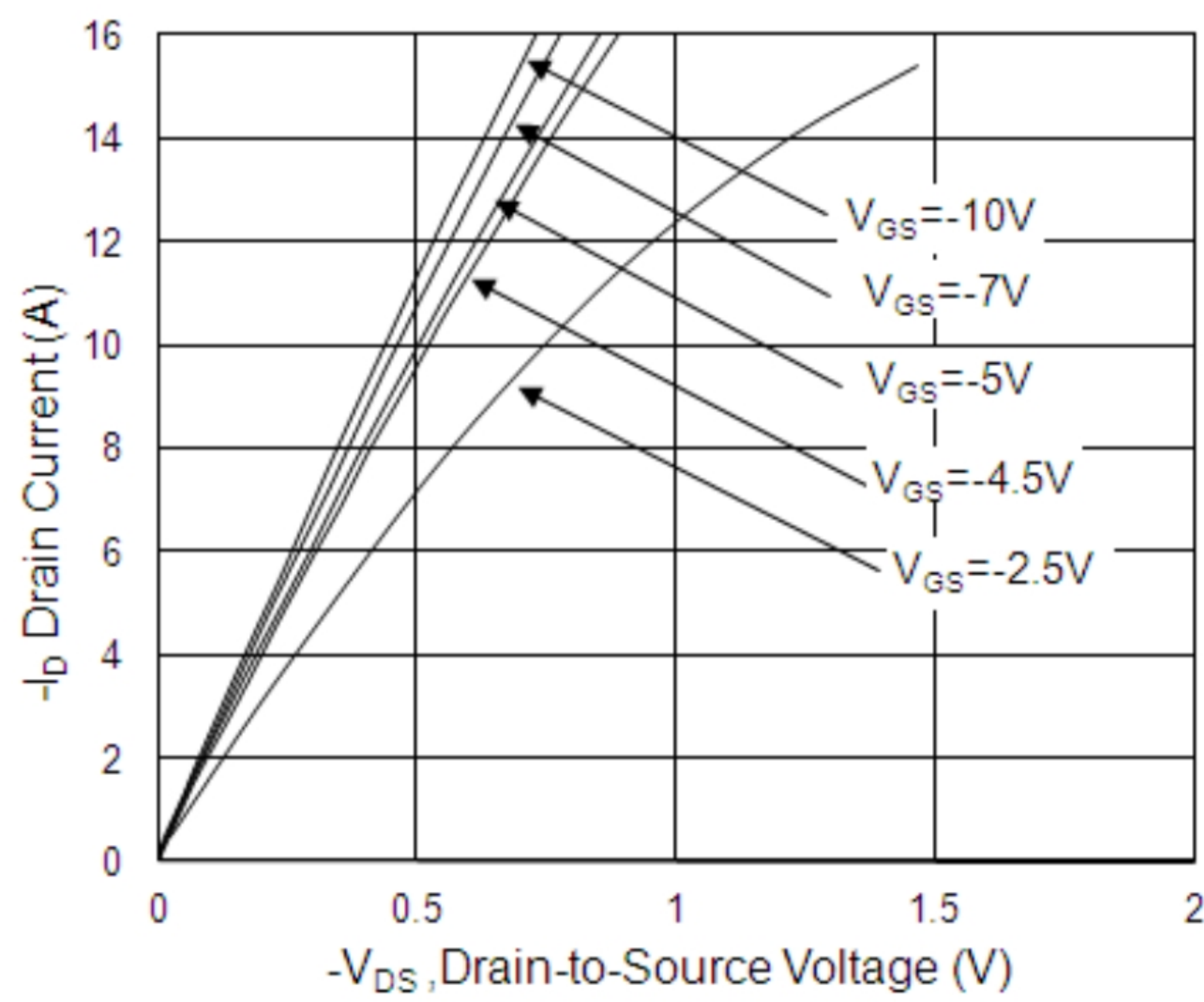
- 1、 Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2、 Surface Mounted on FR4 Board, t ≤ 10 sec.
- 3、 Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 4、 Guaranteed by design, not subject to production

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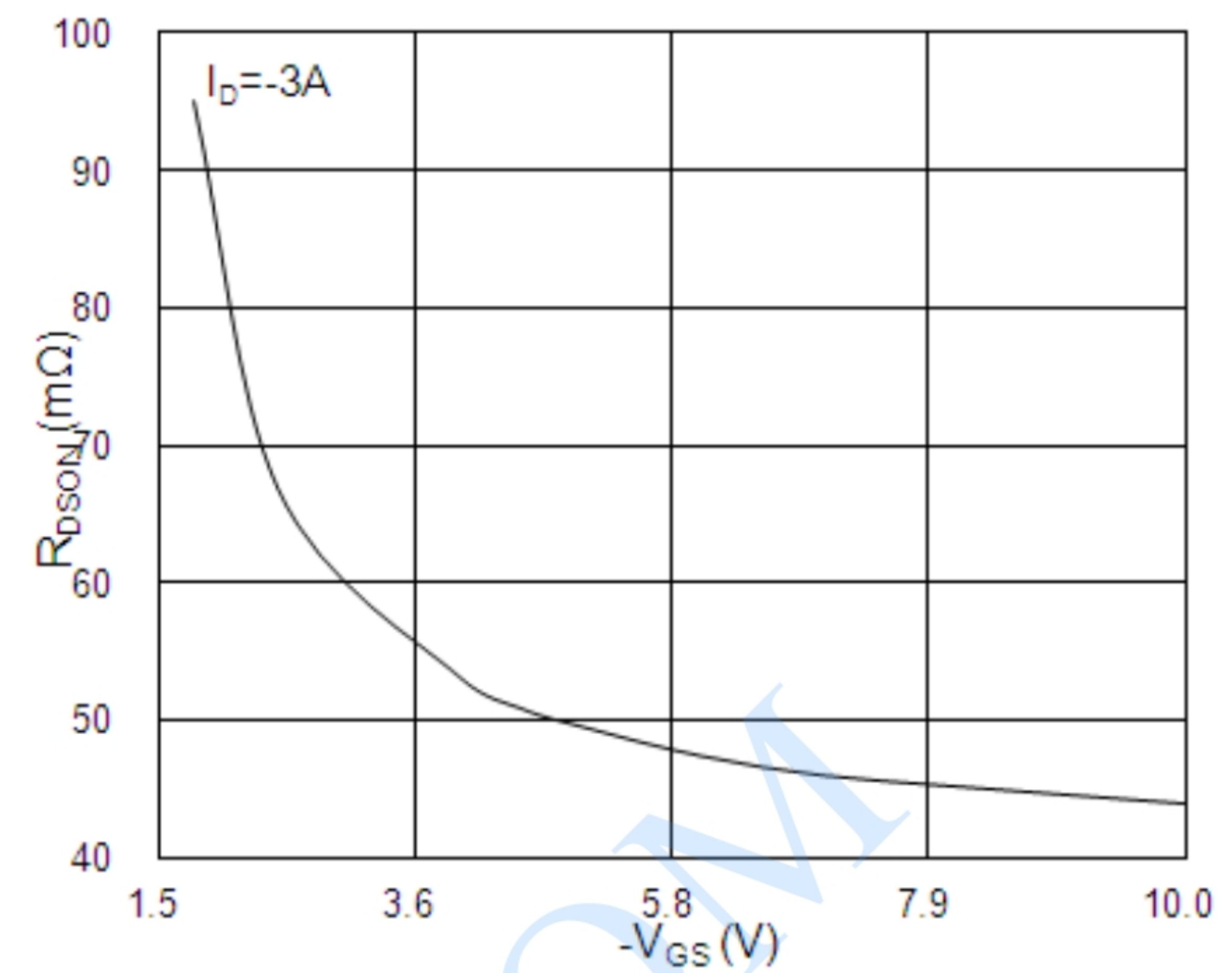




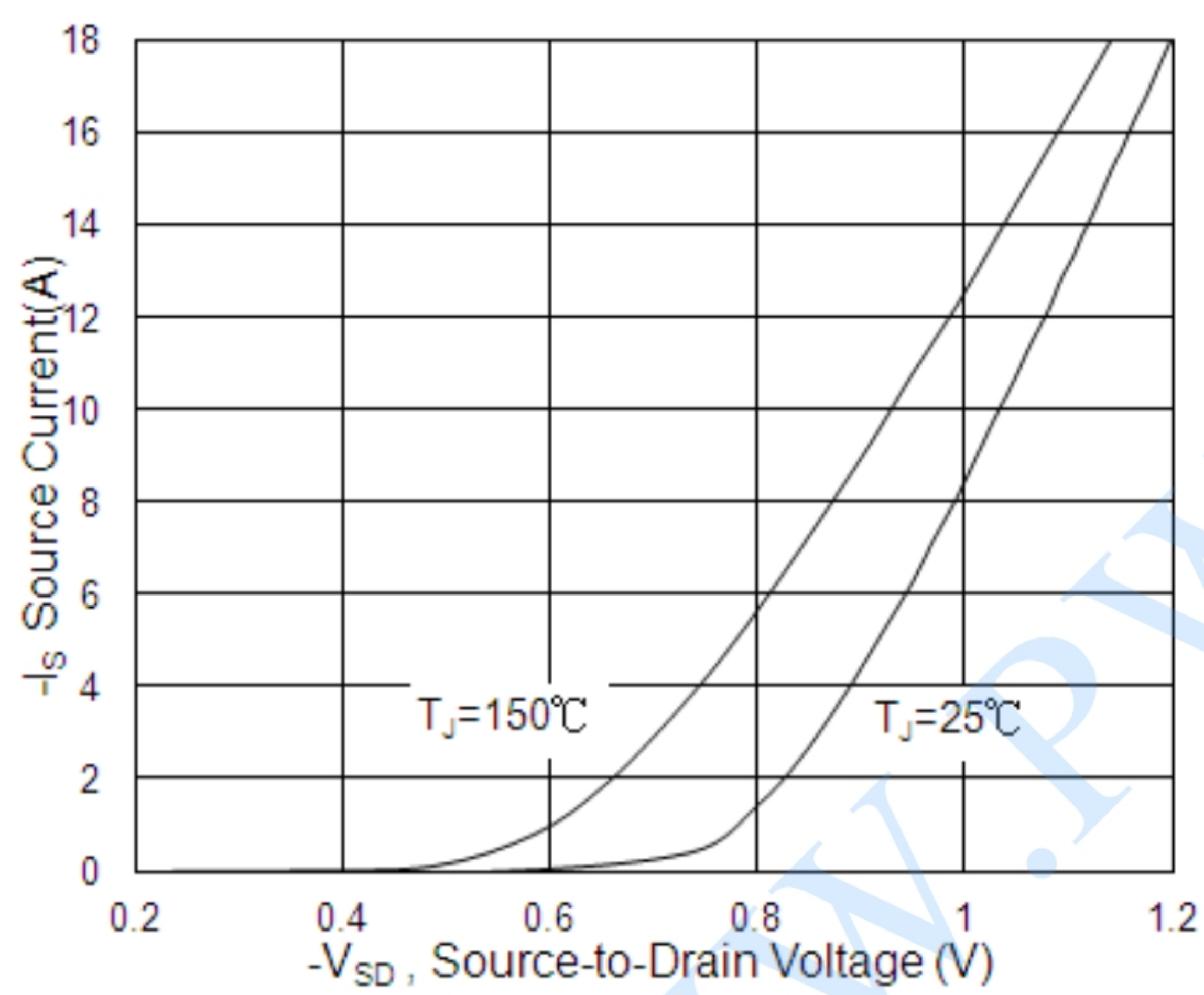
## Typical Characteristics



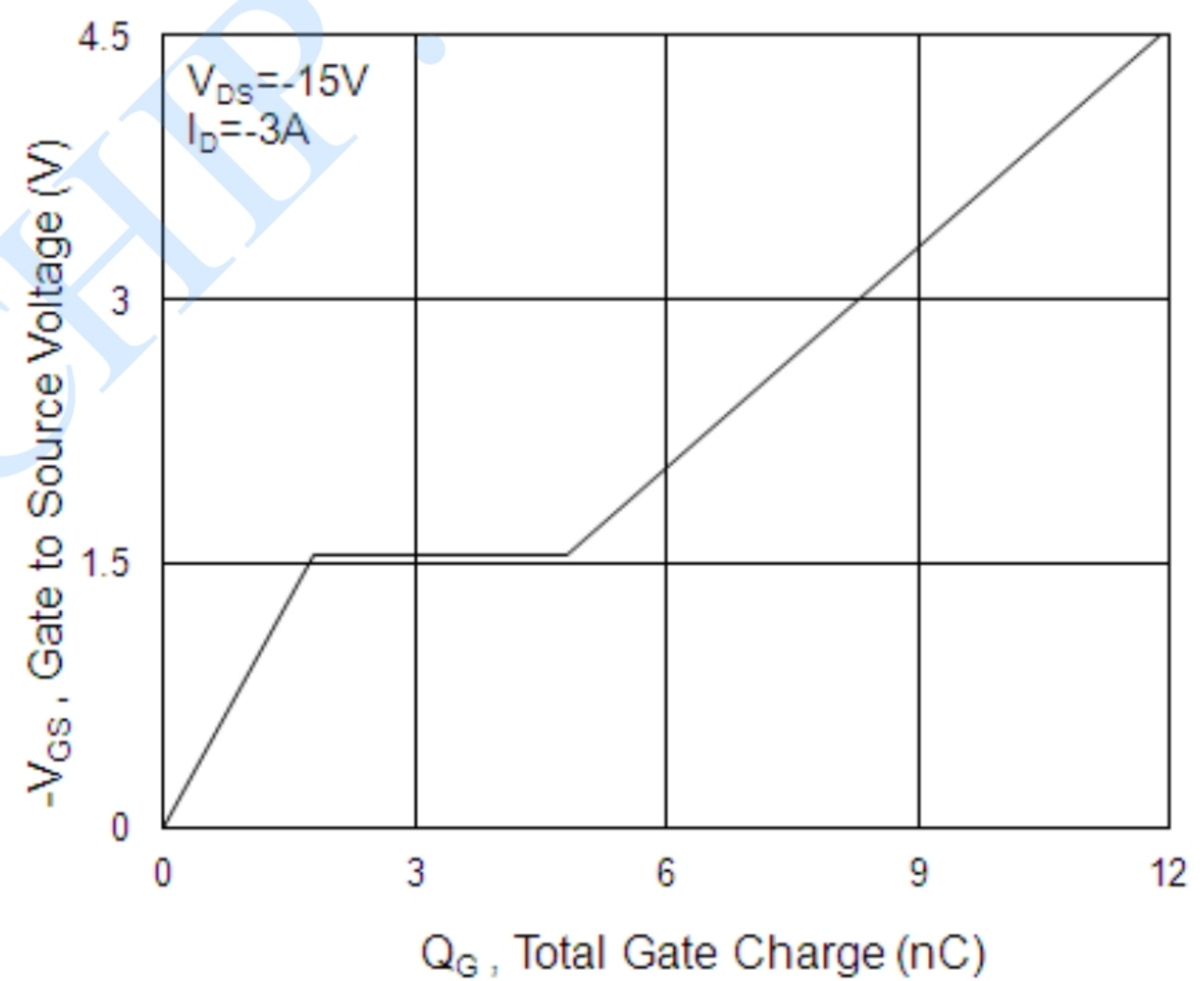
Typical Output Characteristics



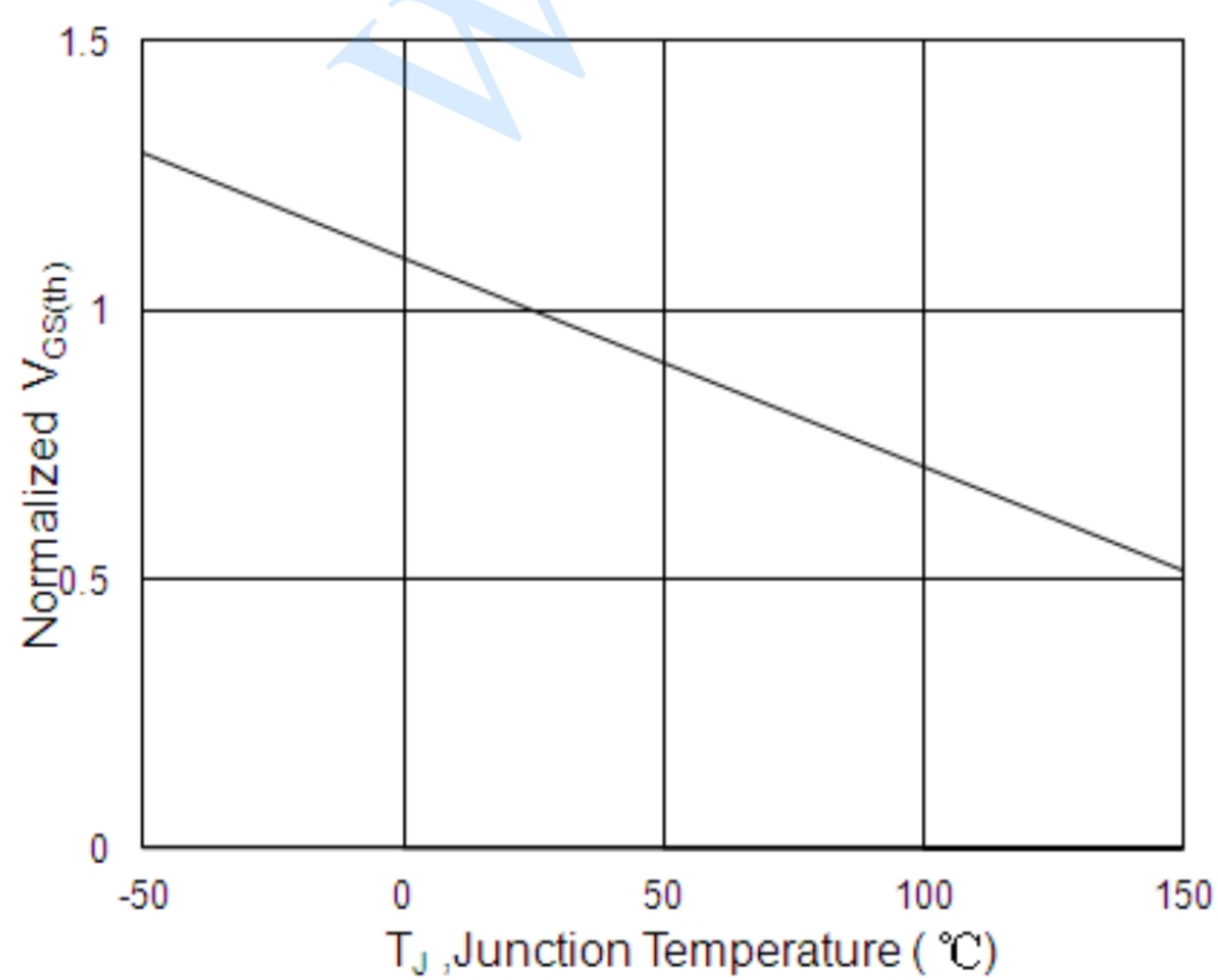
On-Resistance vs. G-S Voltage



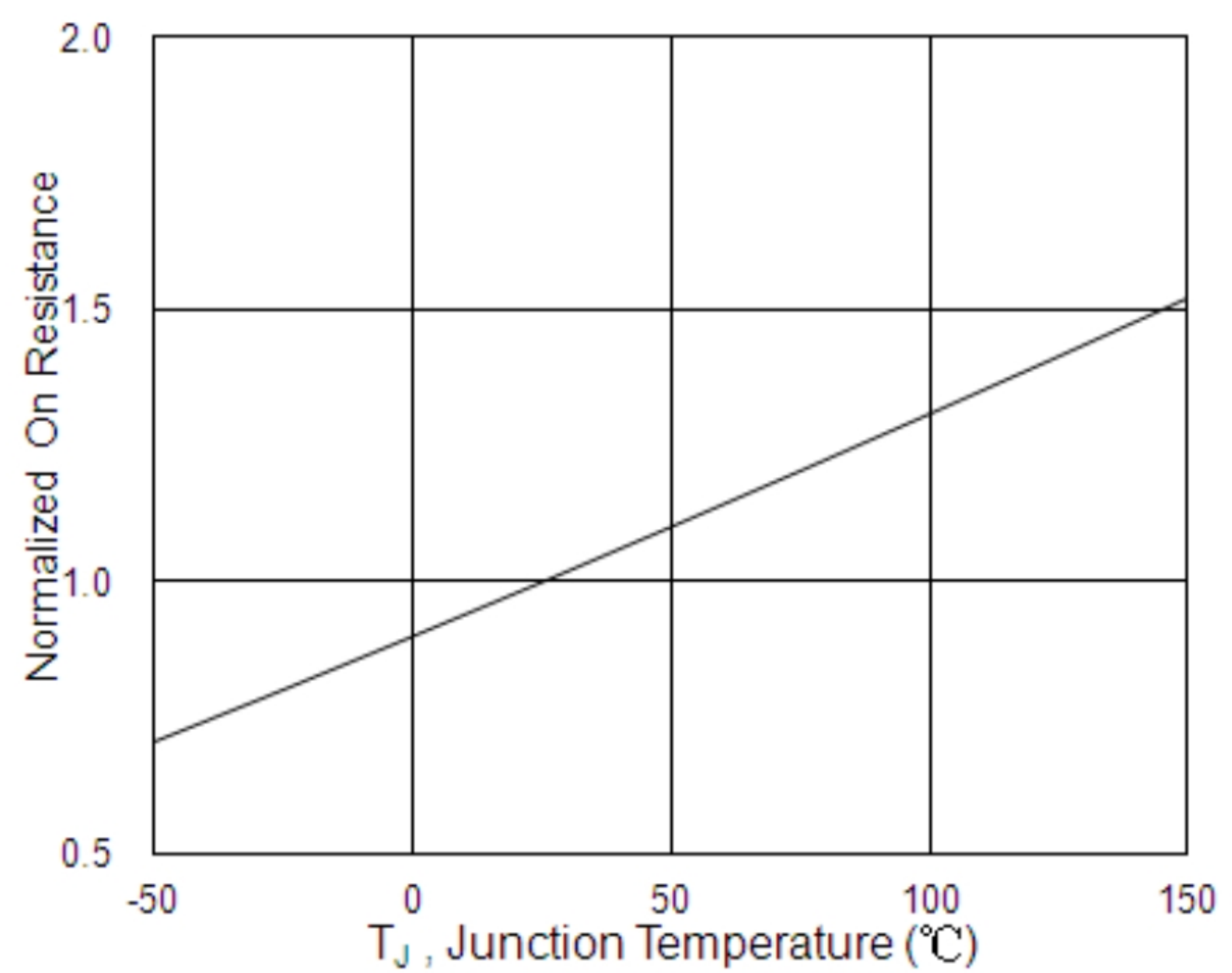
Forward Characteristics Of Reverse



Gate-Charge Characteristics

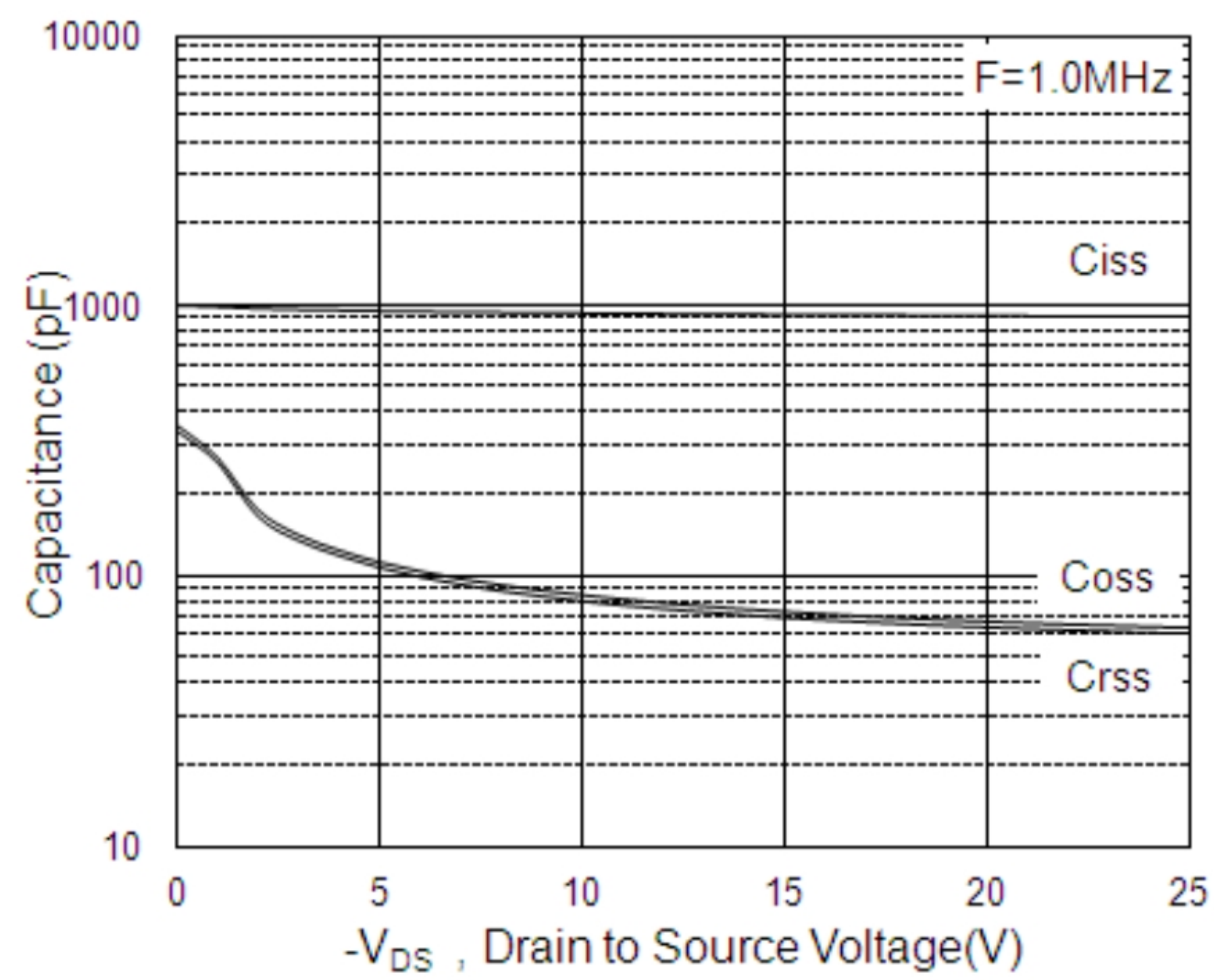


Normalized  $V_{GS(th)}$  vs.  $T_J$

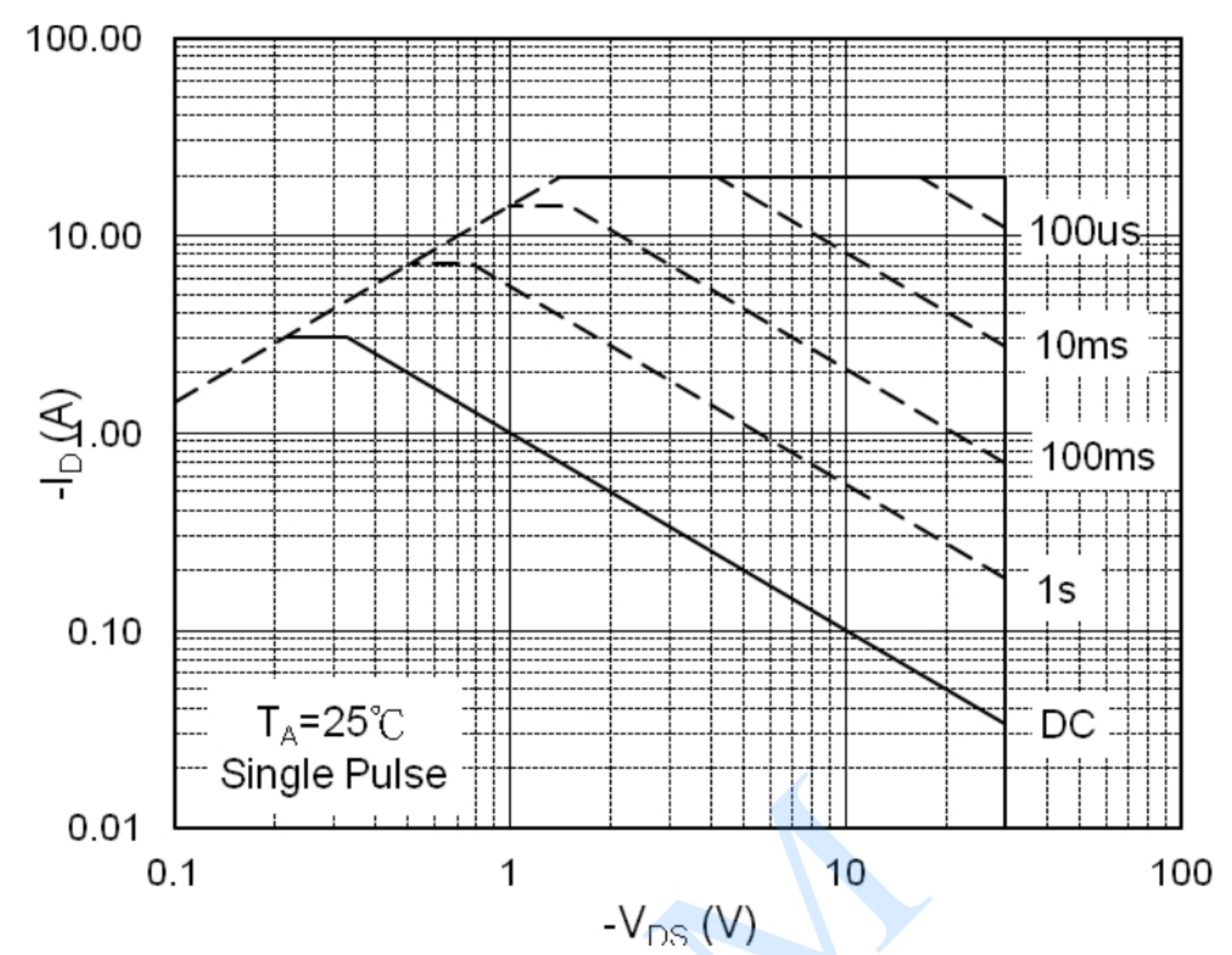


Normalized  $R_{DS(on)}$  vs.  $T_J$

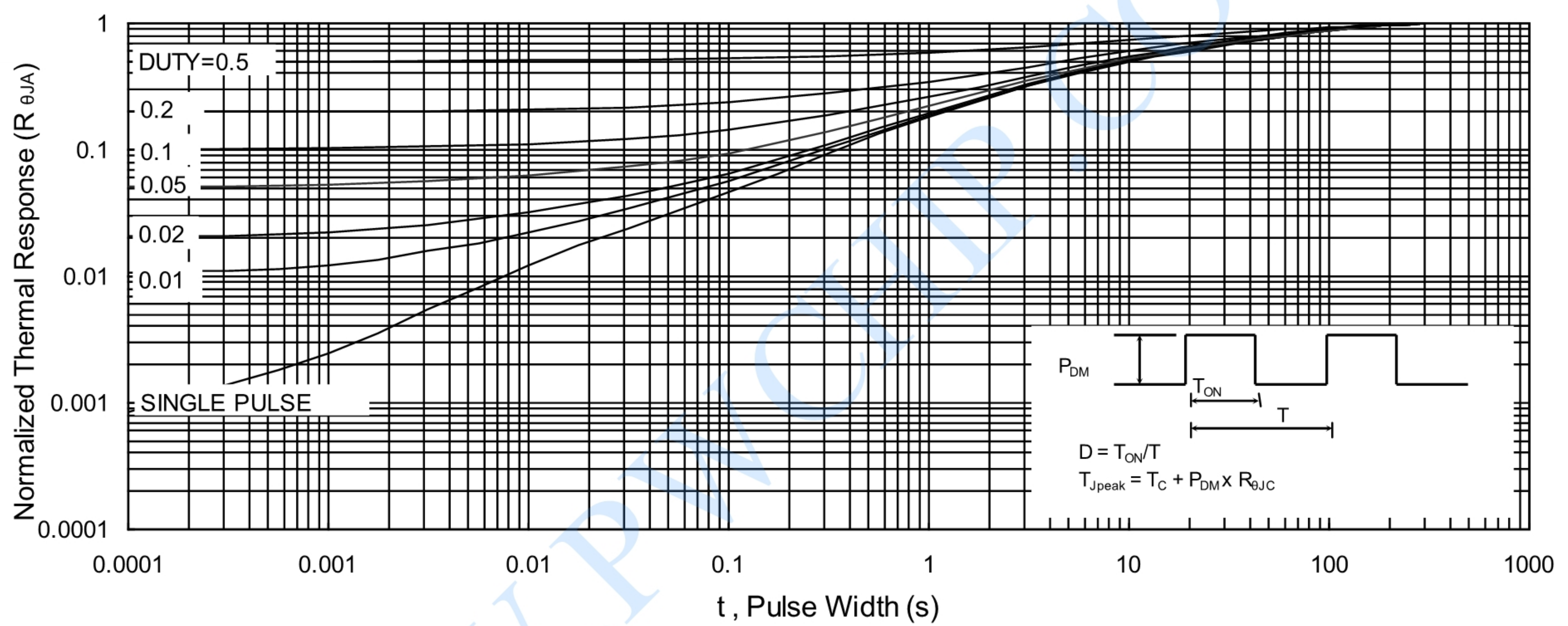




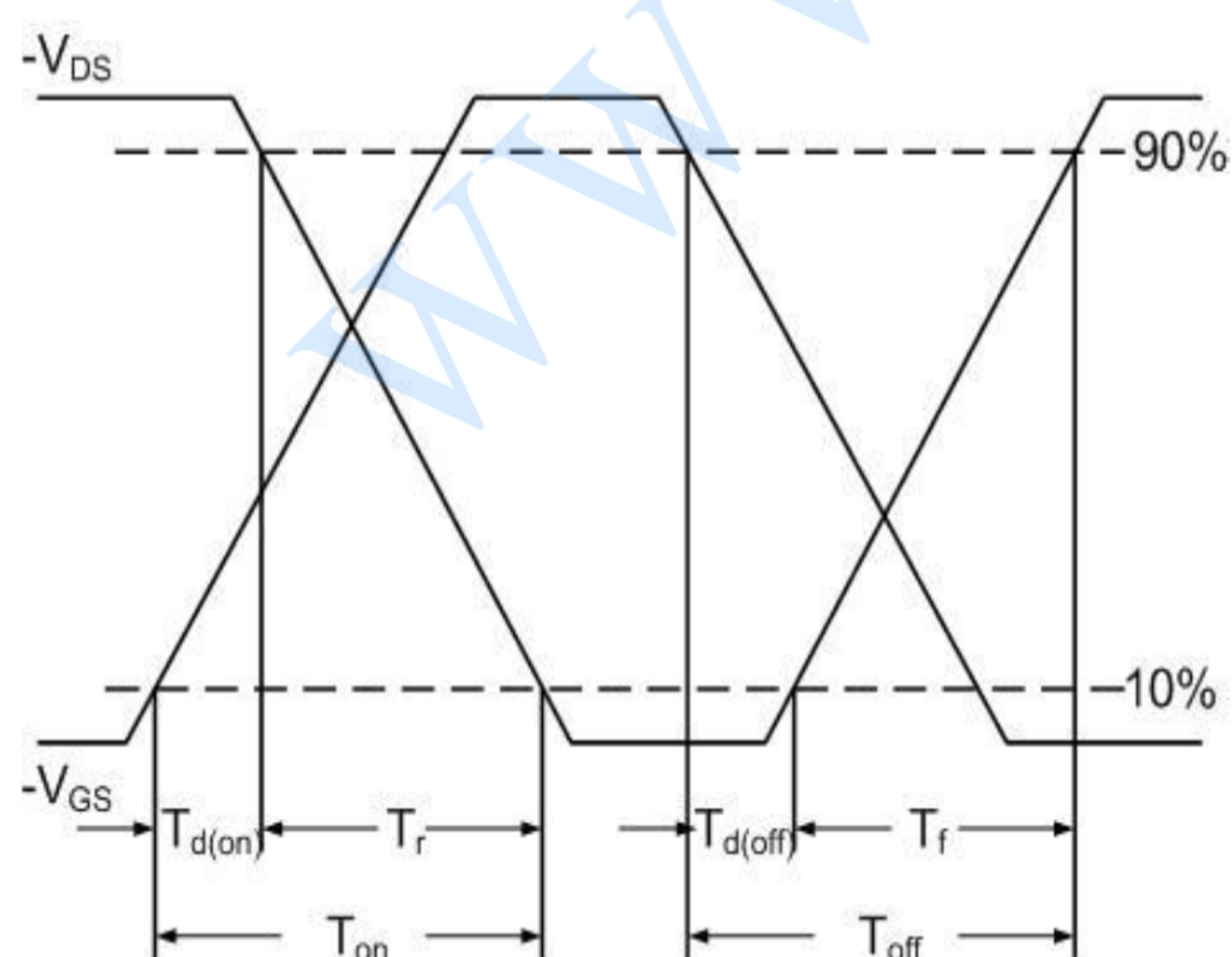
Capacitance



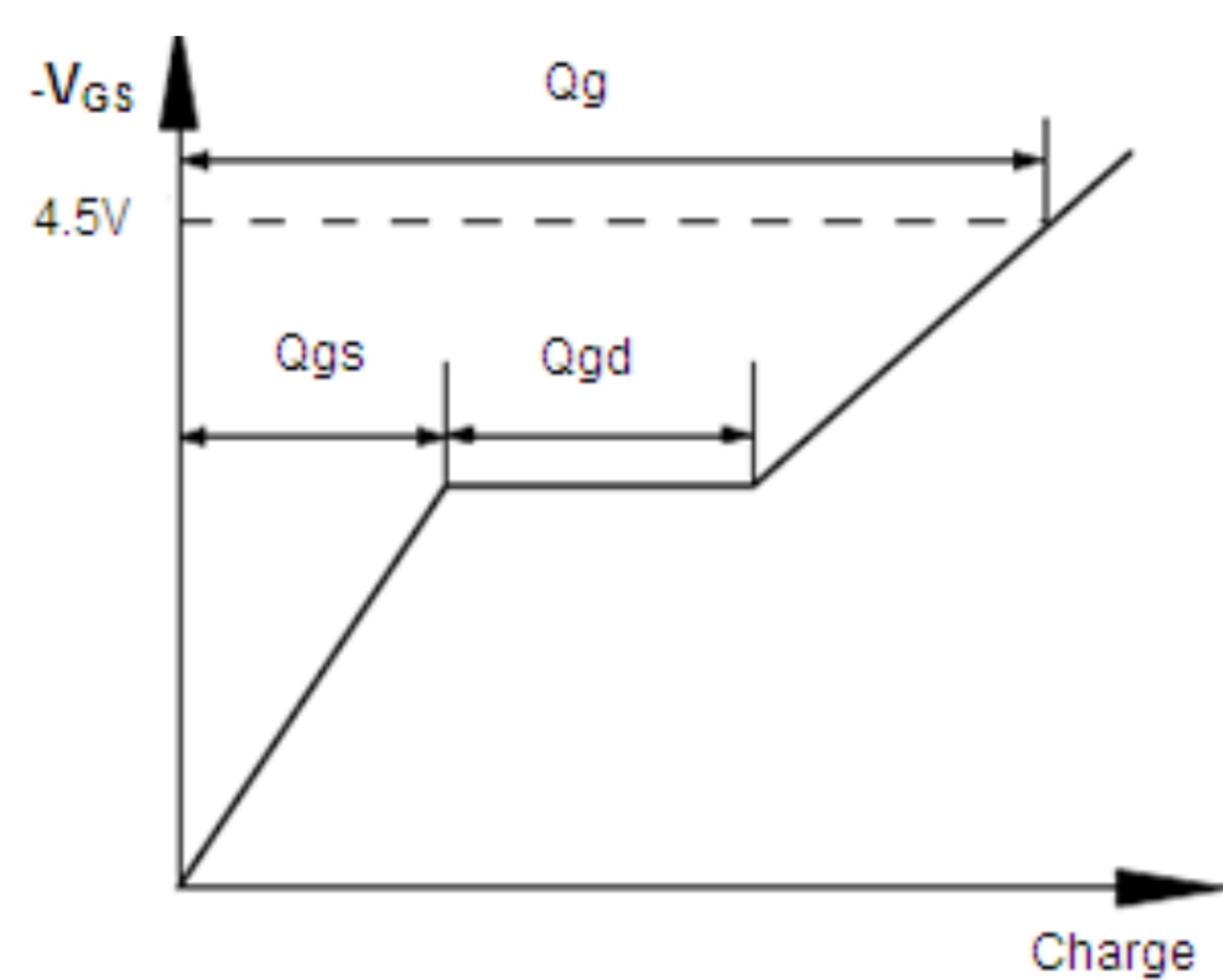
Safe Operating Area



Normalized Maximum Transient Thermal Impedance



Switching Time Waveform

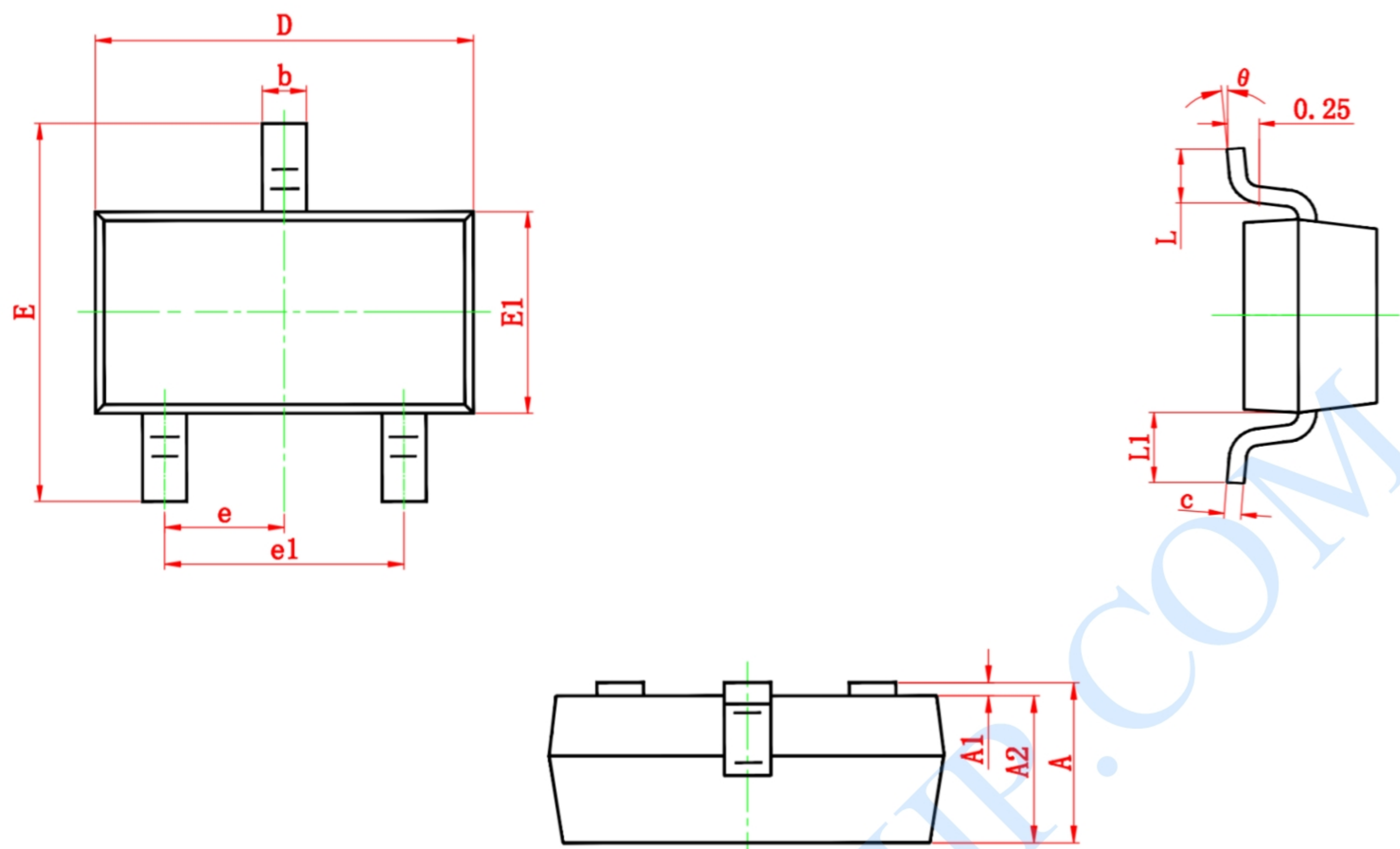


Gate Charge Waveform





PACKAGE DESCRIPTION



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.