

P-Channel Enhancement Mode MOSFET

GENERAL DESCRIPTION

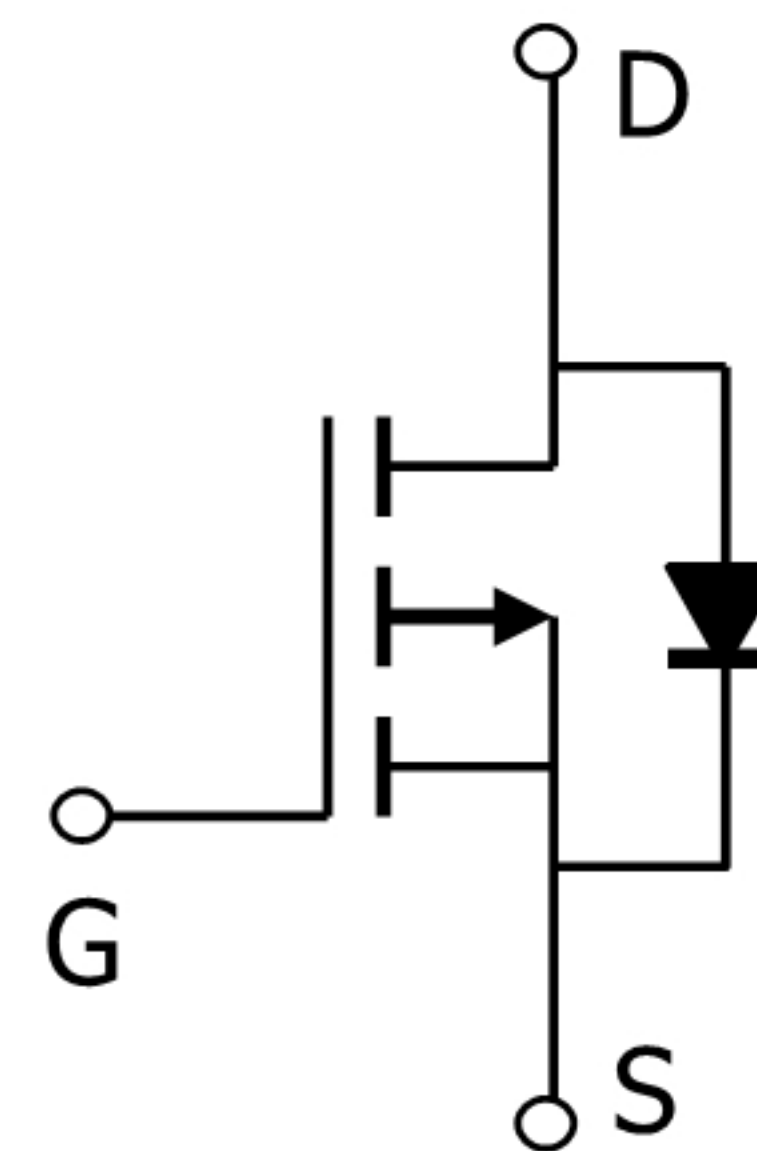
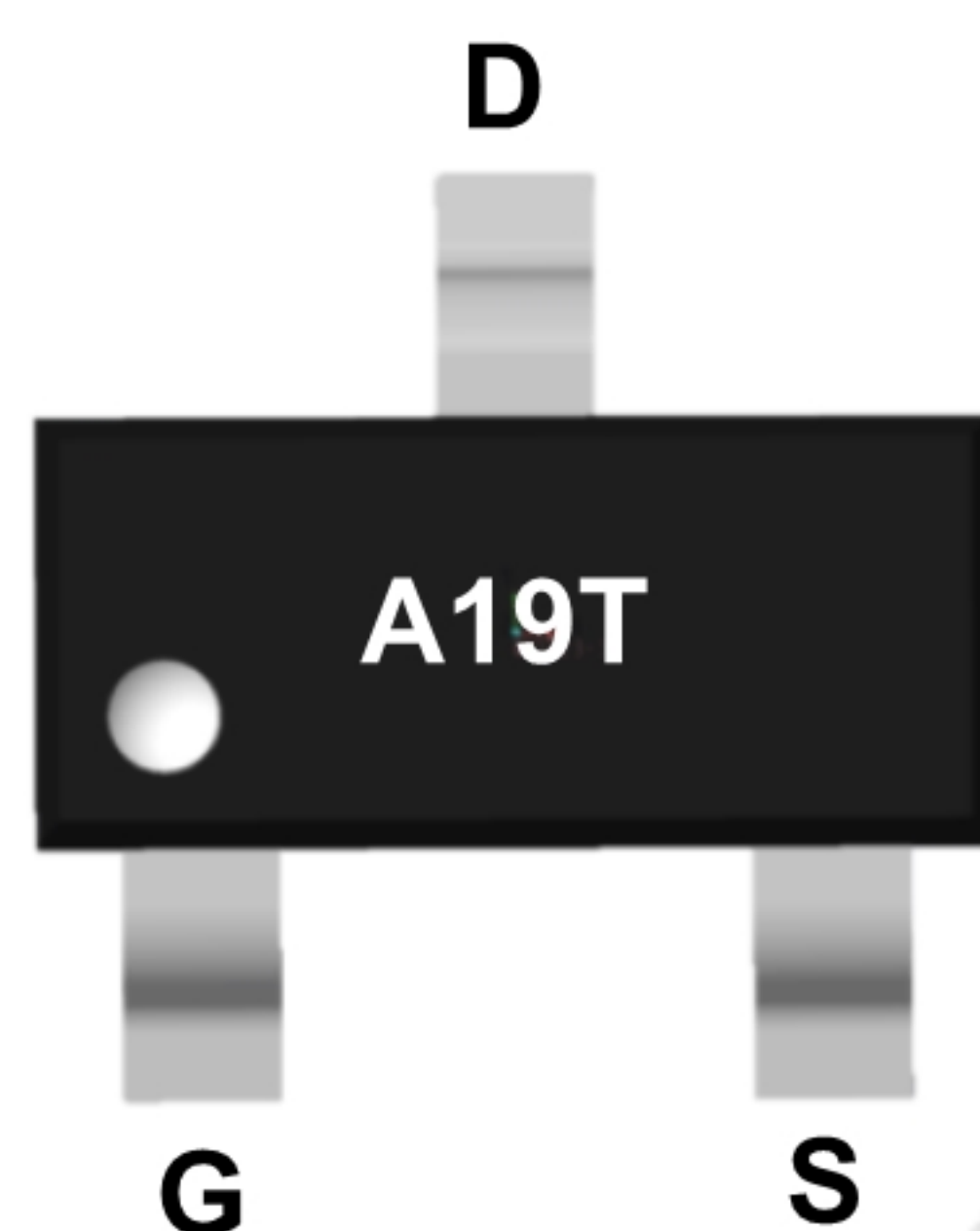
The PW3401A uses advanced trench technology to provide excellent $R_{DS(ON)}$. This device is suitable for use as a load switch or in PWM applications.

FEATURES

$V_{DS} = -30V, I_D = -4.2A$
 $R_{DS(ON)} < 55m\Omega$ @ $V_{GS} = -10V$
 $R_{DS(ON)} < 75m\Omega$ @ $V_{GS} = -4.5V$
 Available in a 3-Pin SOT23-3 Package



SOT-23-3L
(TOP VIEW)



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current Continuous	I_D	-4.2	A
Drain Current Pulsed ^(Note 1)	I_{DM}	-30	A
Maximum Power Dissipation	P_D	1.2	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	104	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS

(TA = 25°C, unless otherwise noted.)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =-250μA	-30		-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24V,V _{GS} =0V	-	-	-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V,V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =-250μA	-0.7	-1	-1.3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-4.2A	-	48	55	mΩ
		V _{GS} =-4.5V, I _D =-4A	-	56	75	mΩ
		V _{GS} =-2.5V, I _D =-1A		72	90	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5V,I _D =-4.2A	-	10	-	S
Input Capacitance	C _{iss}	V _{DS} =-15V,V _{GS} =0V, F=1.0MHz	-	880	-	PF
Output Capacitance	C _{oss}		-	105	-	PF
Reverse Transfer Capacitance	C _{rss}		-	65	-	PF
Turn-on Delay Time	t _{d(on)}		-	7	-	nS
Turn-on Rise Time	t _r	V _{DD} =-15V,I _D =-4.2A V _{GS} =-10V,R _{GEN} =6Ω	-	3	-	nS
Turn-Off Delay Time	t _{d(off)}		-	30	-	nS
Turn-Off Fall Time	t _f		-	12	-	nS
Total Gate Charge	Q _g	V _{DS} =-15V,I _D =-4.2A,V _{GS} =-4.5V	-	8.5	-	nC
Gate-Source Charge	Q _{gs}		-	1.8	-	nC
Gate-Drain Charge	Q _{gd}		-	2.7	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V,I _S =-4.2A	-	-	-1.2	V

Notes:

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

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Typical Characteristics

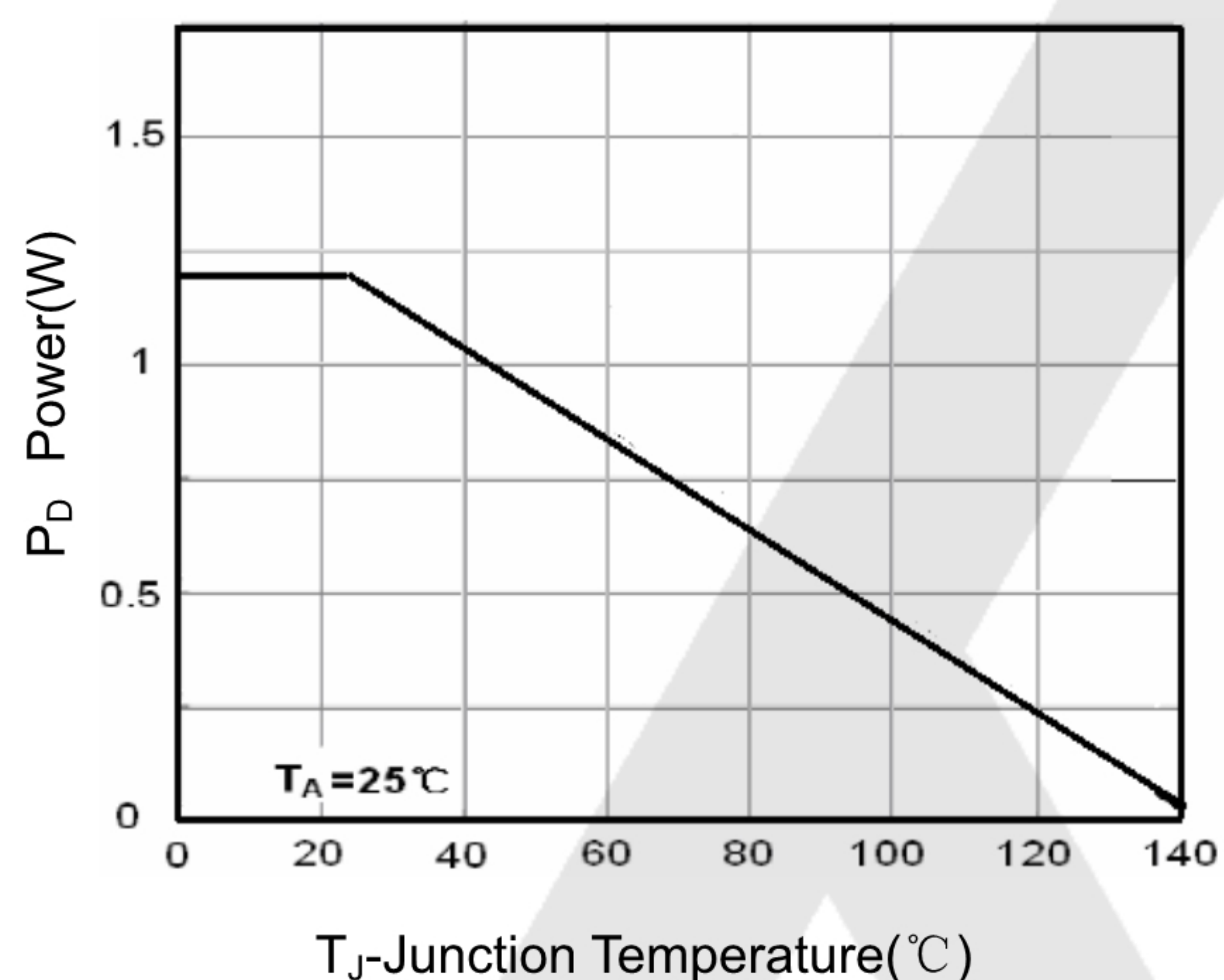


Figure 1 Power Dissipation

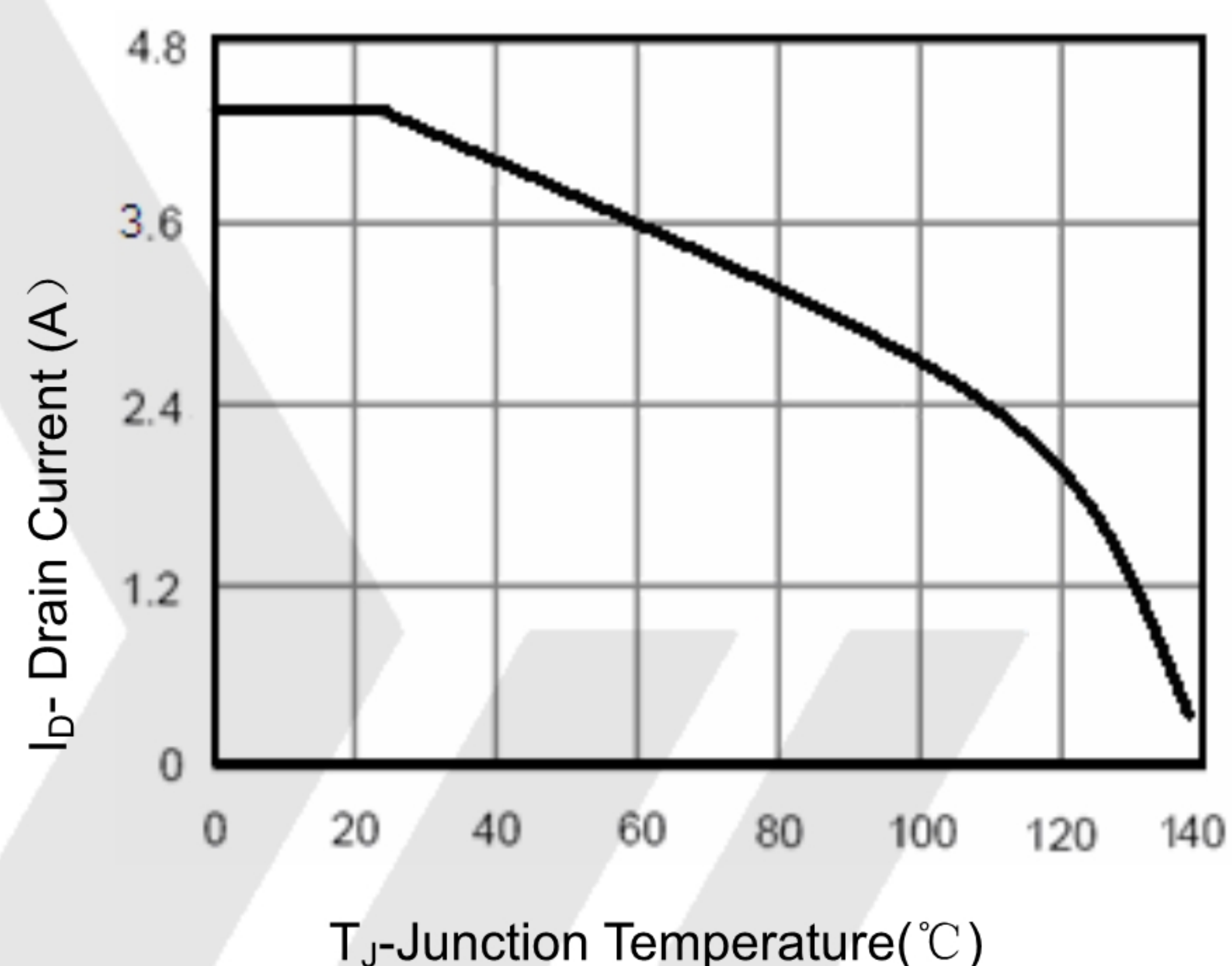


Figure 2 Drain Current

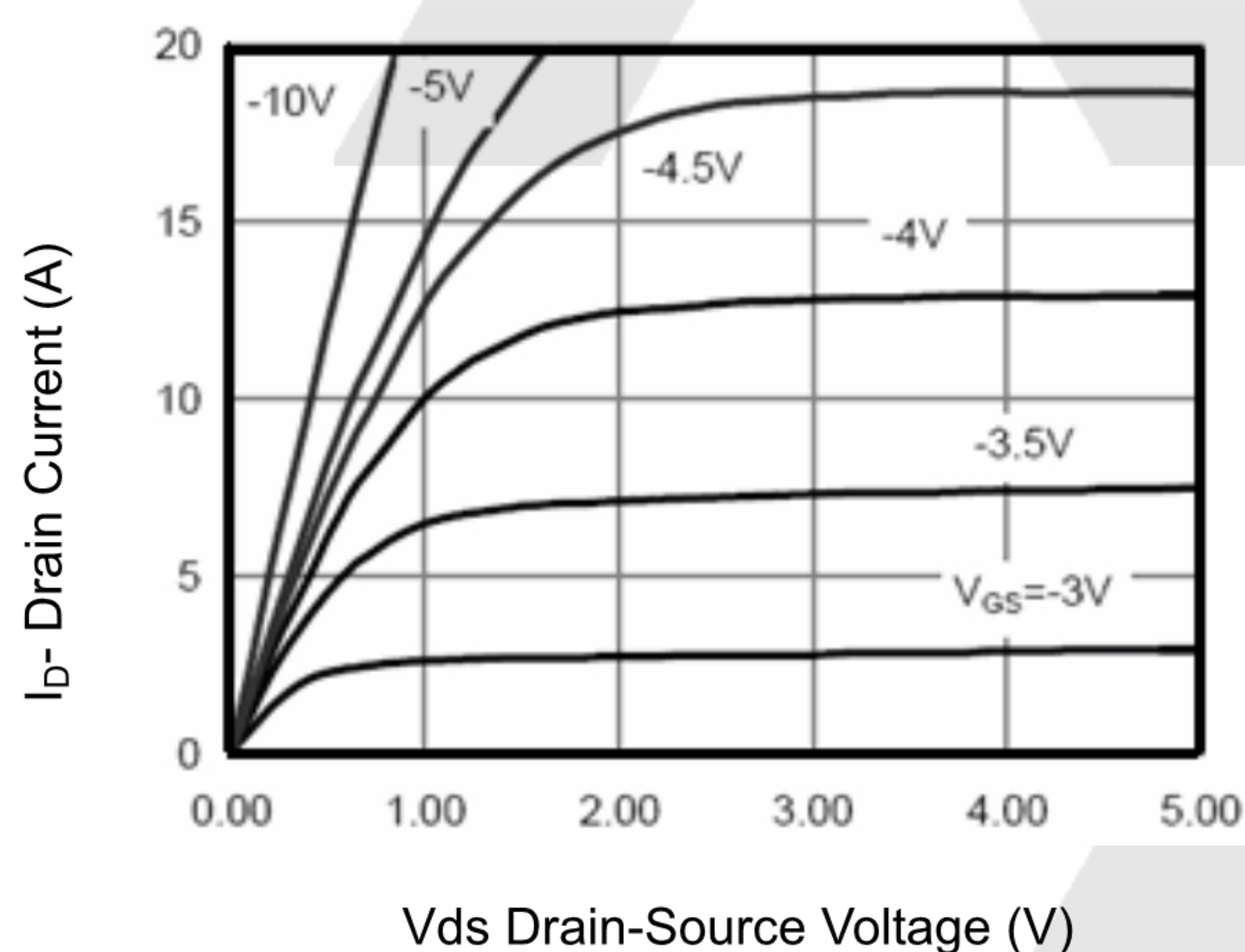


Figure 3 Output Characteristics

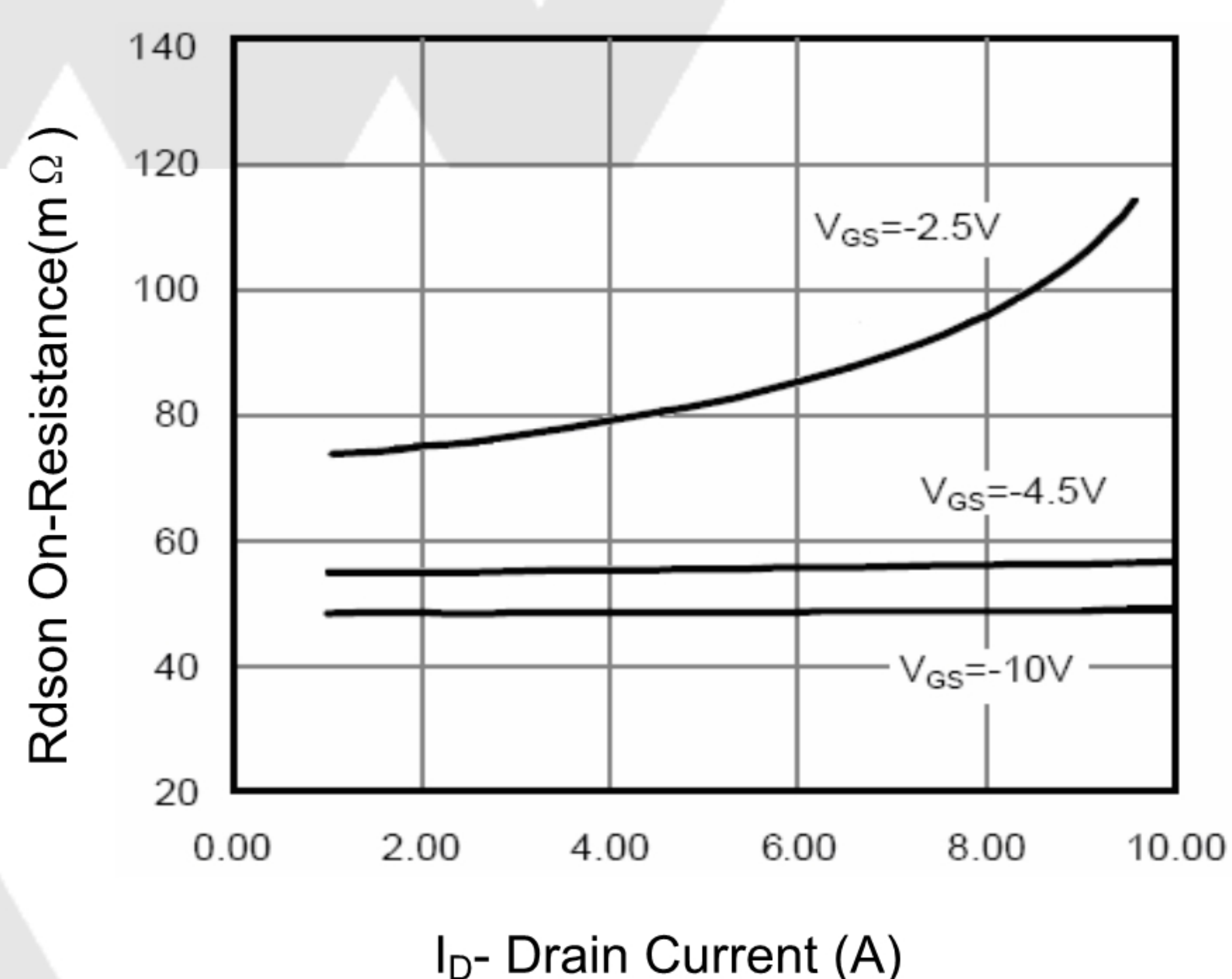


Figure 4 Drain-Source On-Resistance

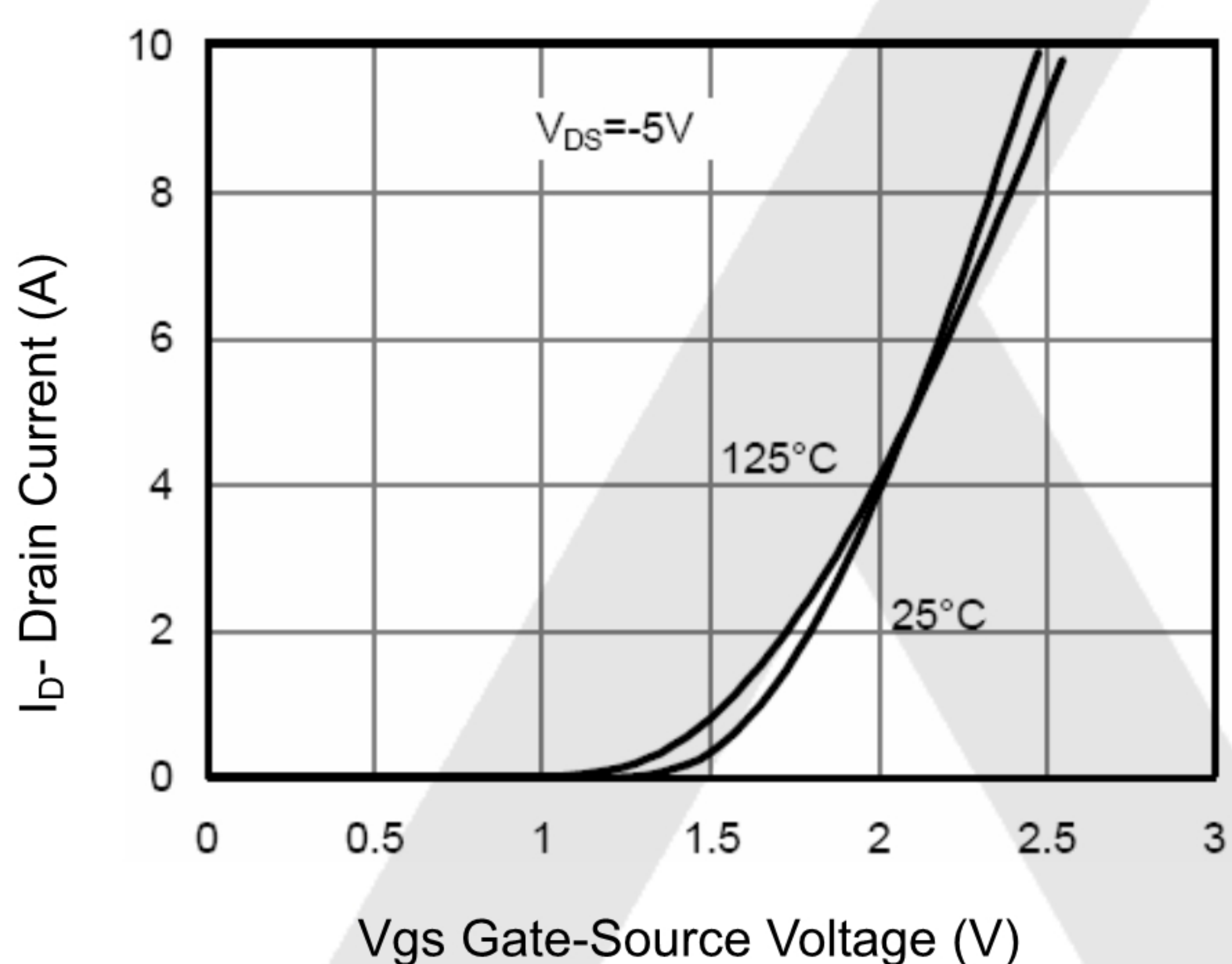


Figure 5 Transfer Characteristics

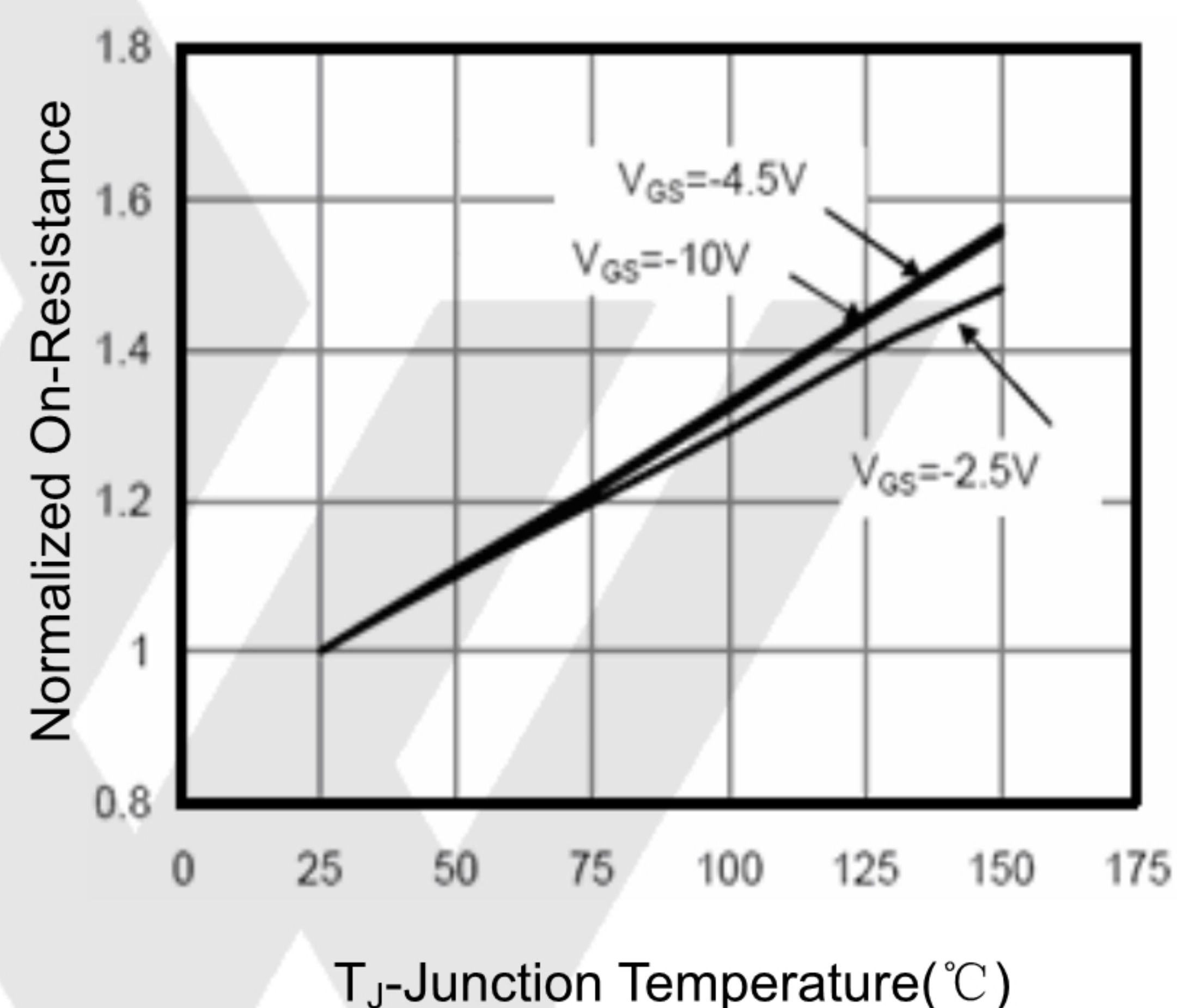


Figure 6 Drain-Source On-Resistance

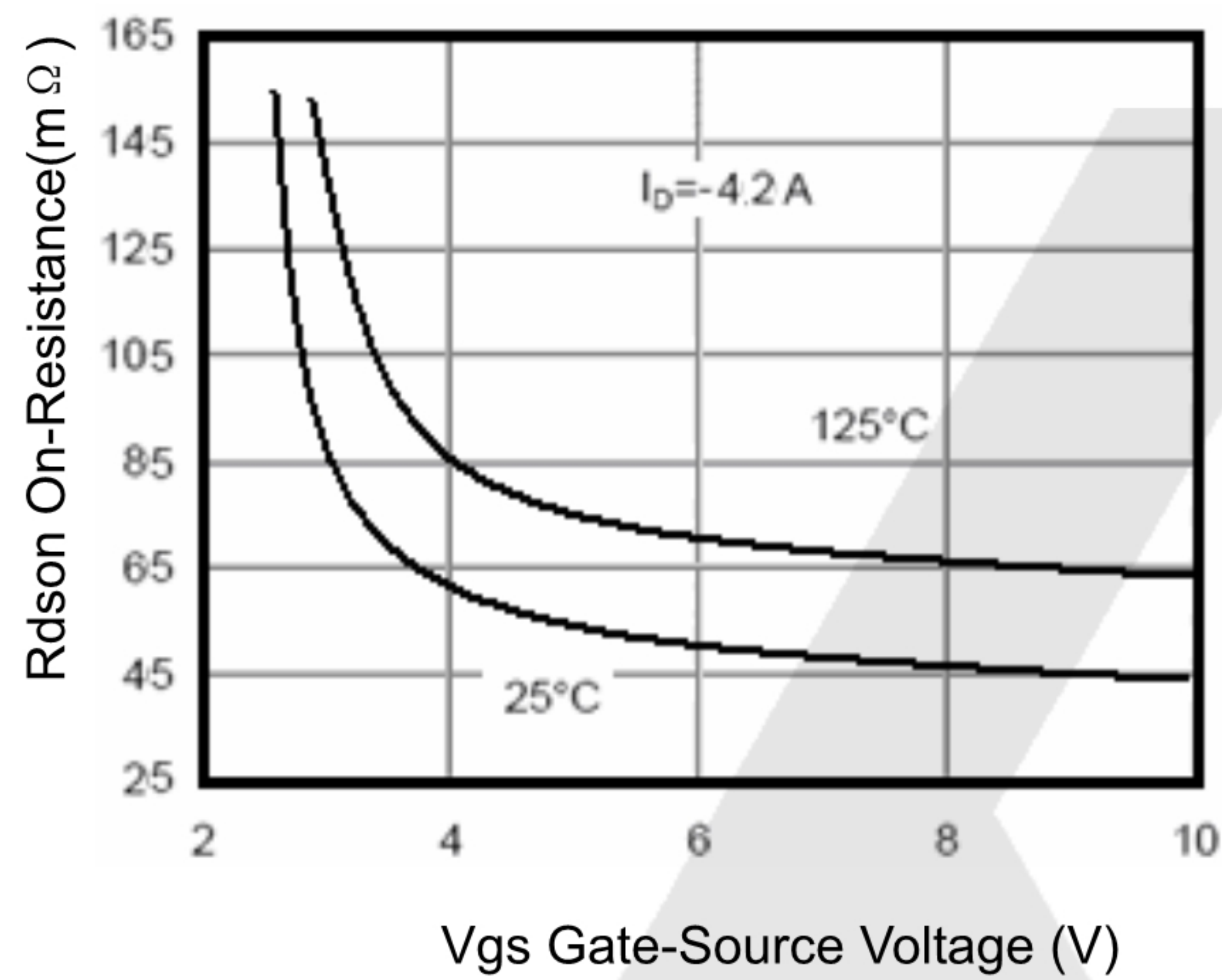


Figure 7 Rdson vs Vgs

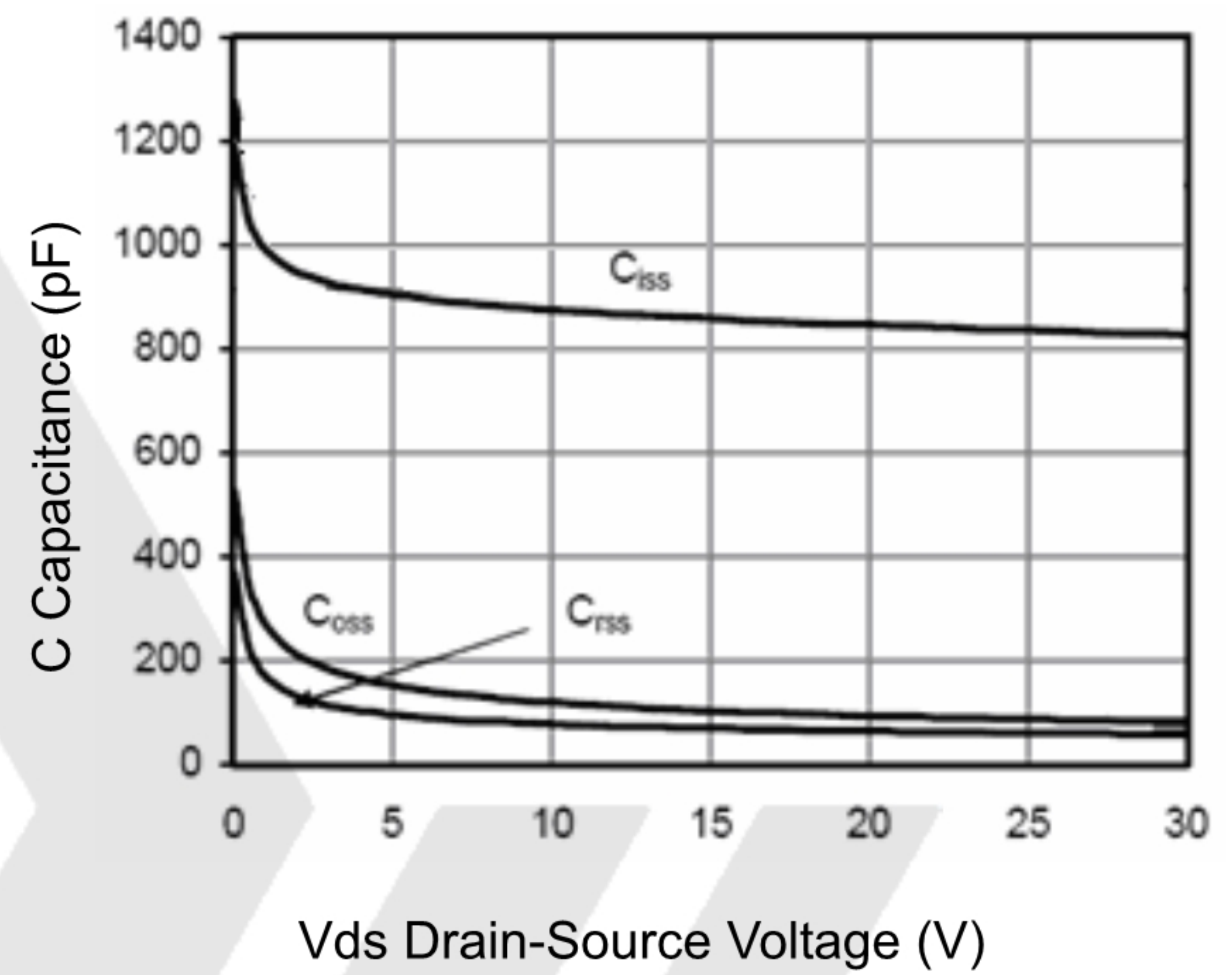


Figure 8 Capacitance vs Vds

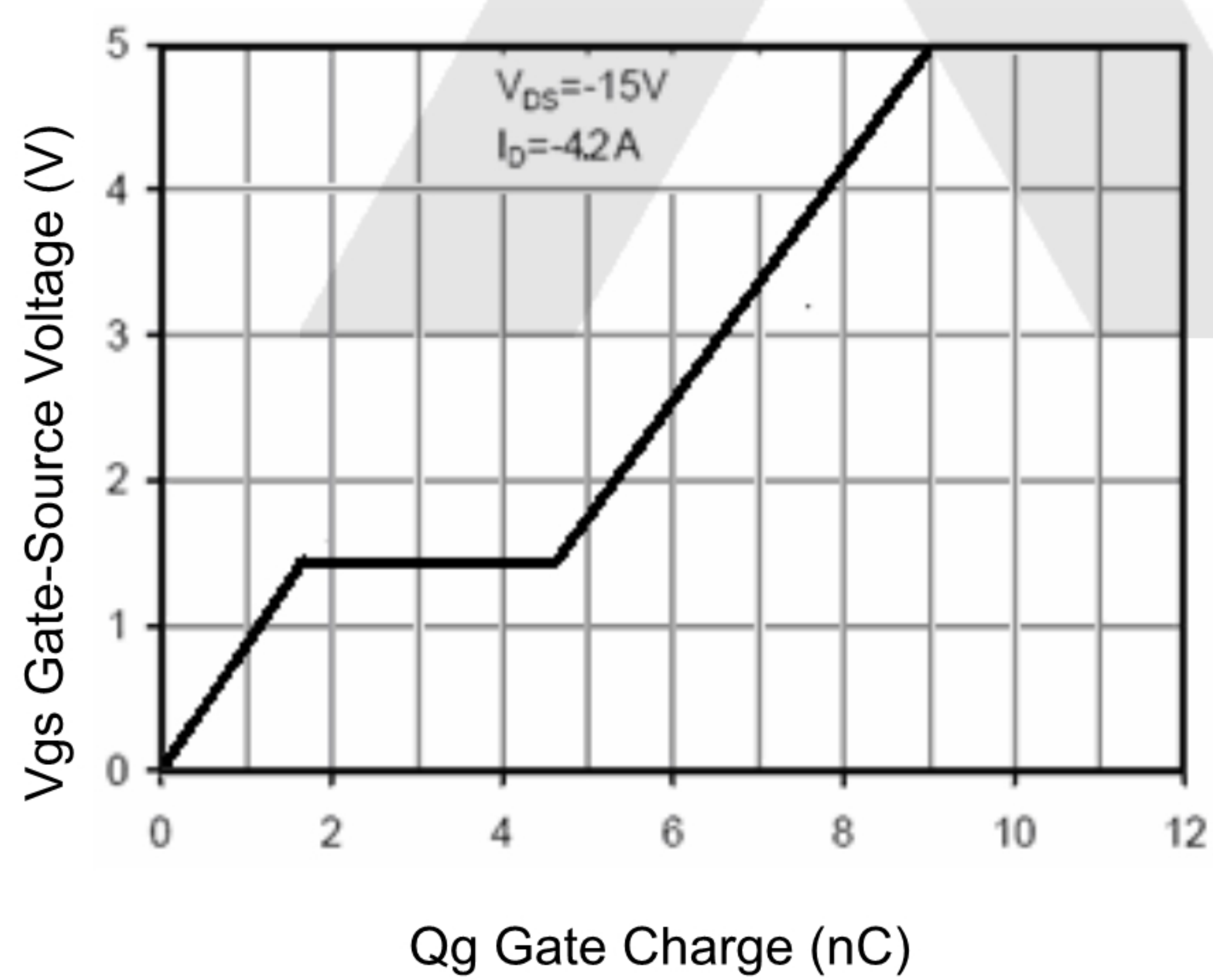


Figure 9 Gate Charge

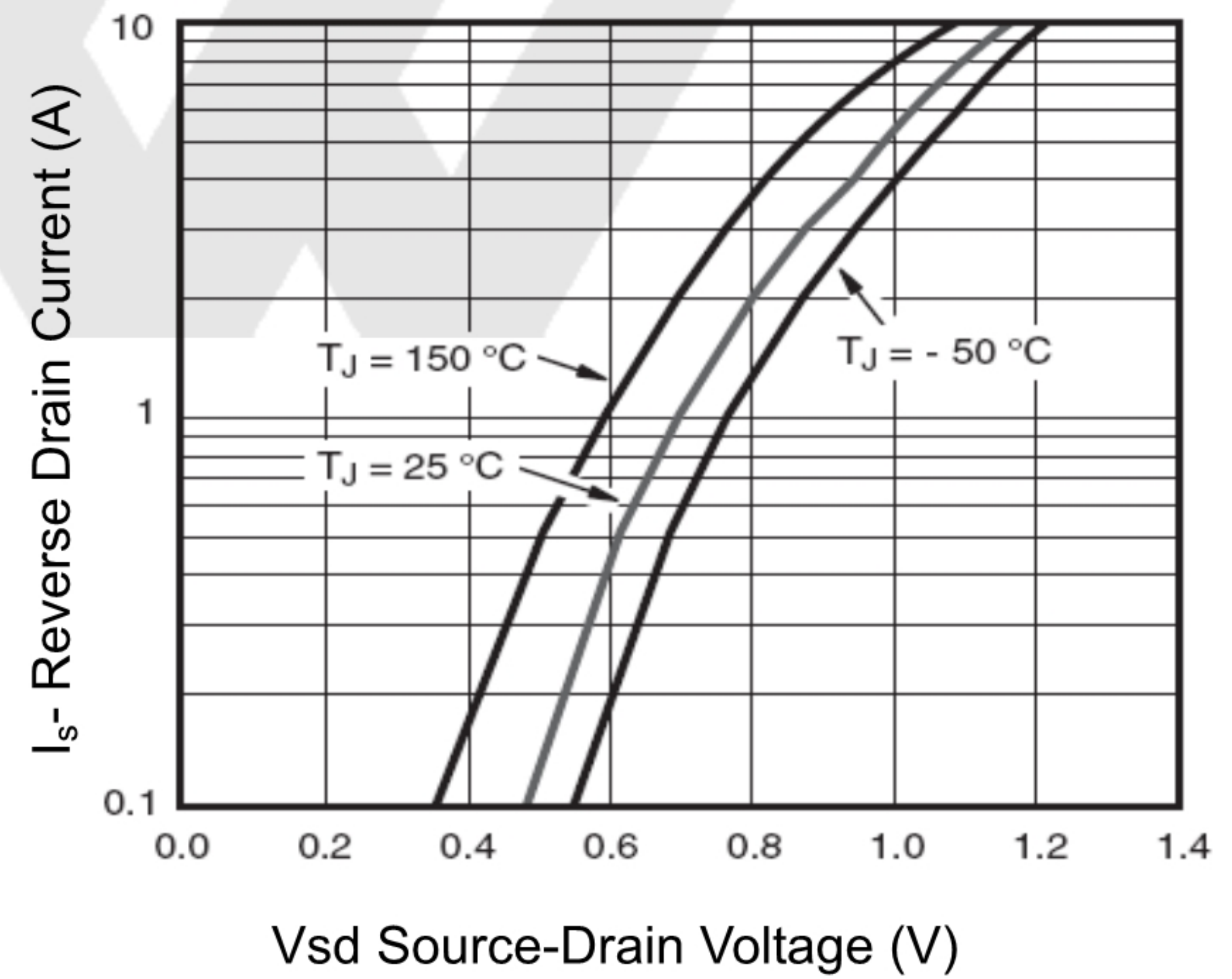


Figure 10 Source- Drain Diode Forward

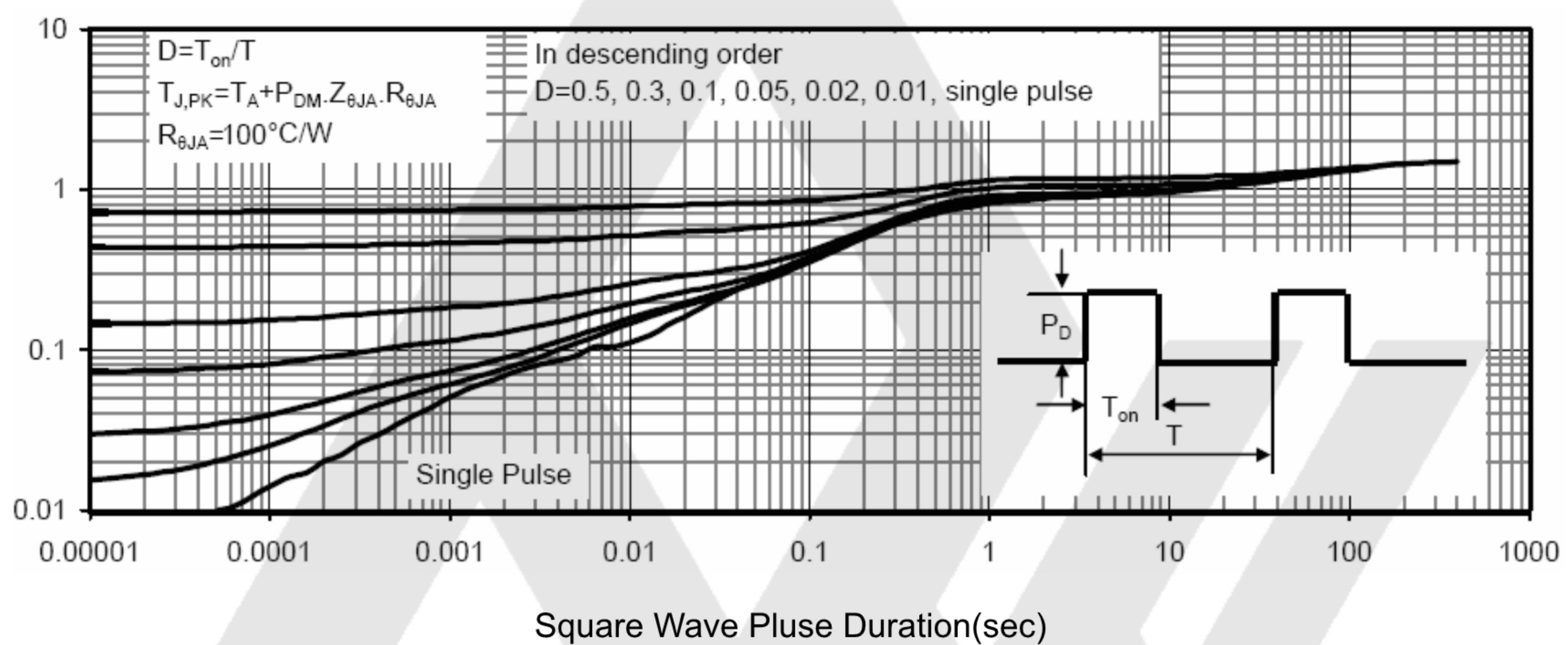
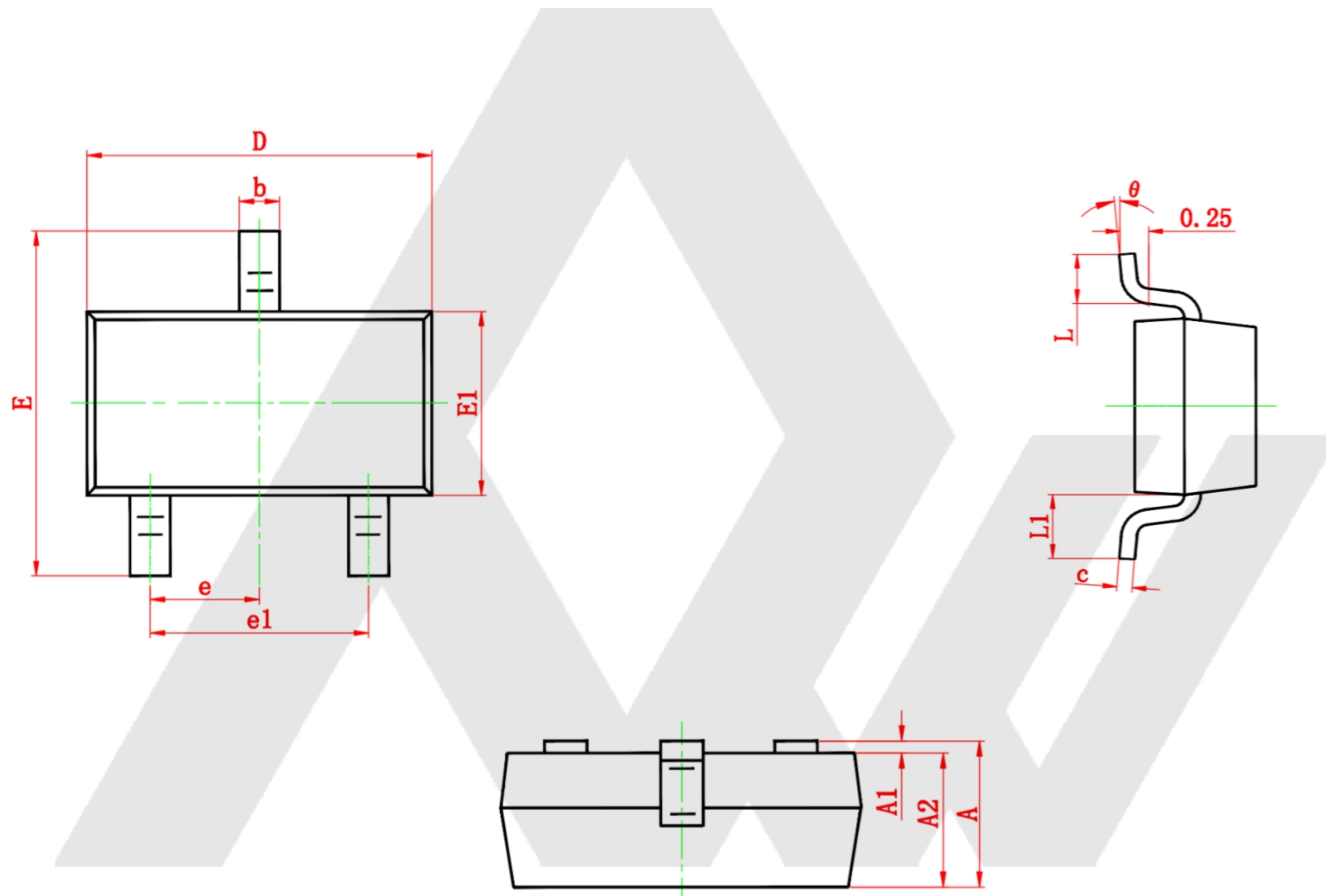


Figure 11 Normalized Maximum Transient Thermal Impedance

PACKAGE DESCRIPTION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	2.250	2.550	0.089	0.100
E1	1.200	1.400	0.047	0.055
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.300	0.500	0.012	0.020
L1	0.550 REF.		0.022 REF.	
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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