

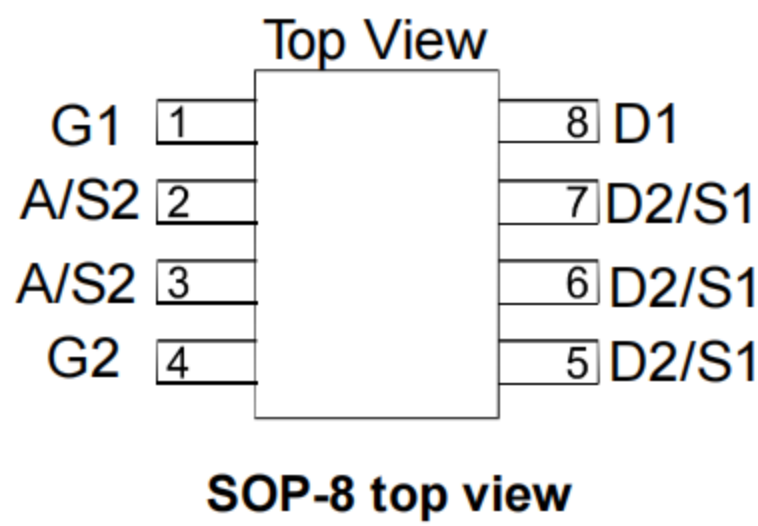
**GENERAL FEATURES**

- Q1:N-Channel
- 30V/7A,  
 $R_{DS(ON)} = 19m\Omega$  (typ.) @  $V_{GS} = 10V$   
 $R_{DS(ON)} = 24m\Omega$  (typ.) @  $V_{GS} = 4.5V$
- Q2:N-Channel
- 30V/11.2A,  
 $R_{DS(ON)} = 10m\Omega$  (typ.) @  $V_{GS} = 10V$   
 $R_{DS(ON)} = 14m\Omega$  (typ.) @  $V_{GS} = 4.5V$
- Schottky  
 $V_{ds} = 30V$   $I_F = 2.0A$   
 $V_{sd} = 0.5V @ 1.0A$

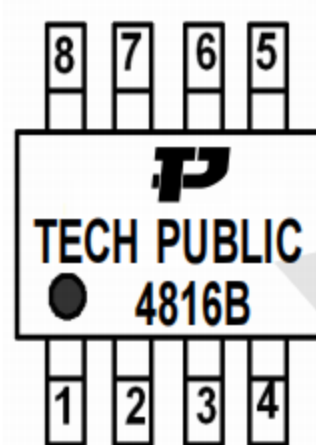
**APPLICATIONS**

- Synchronous Buck Converter
- Game Machine
- Notebook

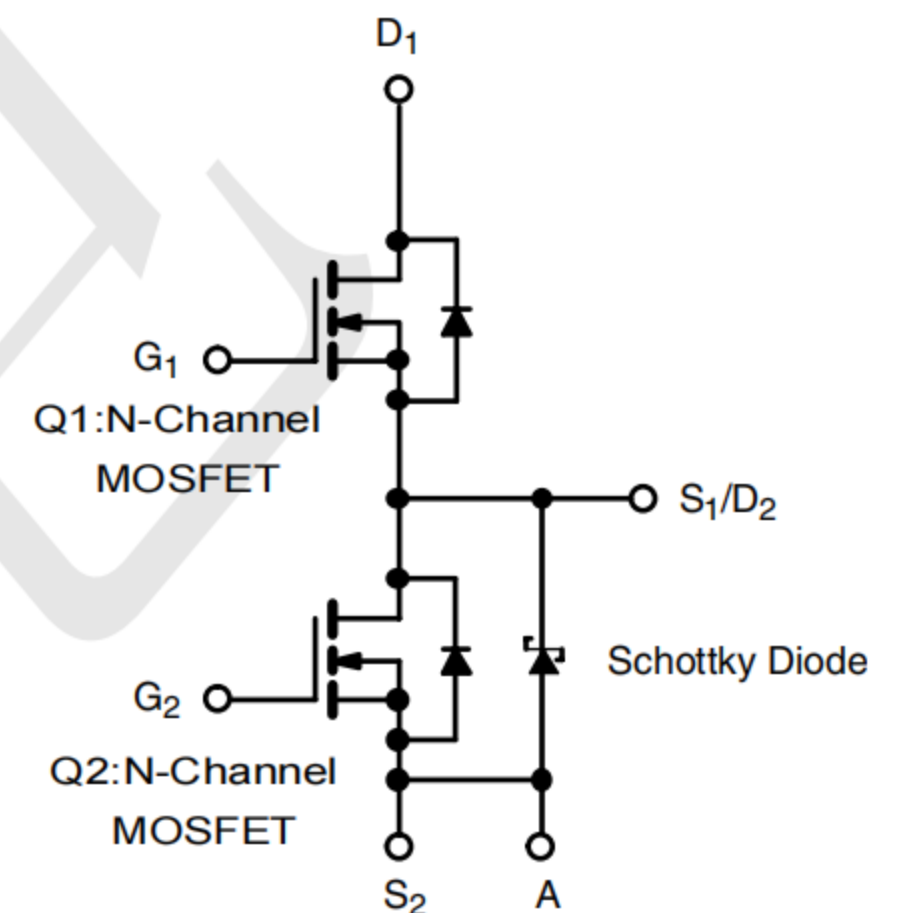
**Package and Pin Configuration**



**Marking:**



**Circuit diagram**



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

Symbol	TECH PUBLIC Parameter	Channel 1	Channel 2	Unit
$V_{DSS}$	Drain-Source Voltage	30	30	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	$\pm 20$	
$I_D^*$	Continuous Drain Current	7	11.2	A
$I_{DM}^*$	Pulsed Drain Current	27	37	
$I_S^*$	Diode Continuous Forward Current	2.5	3	A
$T_J$	Maximum Junction Temperature	150		$^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to 150		
$P_D^*$	Power Dissipation	$T_A = 25^\circ C$	2	W
		$T_A = 100^\circ C$	0.8	
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient	62.5		$^\circ C/W$

**Electrical Characteristics (T<sub>j</sub>=25°C unless otherwise noted)**

**Q1 N-Channel MOSFET**

Symbol	TECH PUBLIC Parameter	Test Condition	Channel 1			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	30			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			1 30	μA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	1		2.5	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
R <sub>DS(ON)</sub> <sup>a</sup>	Drain-Source On-state Resistance	V <sub>GS</sub> =10V, I <sub>DS</sub> =6.8A V <sub>GS</sub> =4.5V, I <sub>DS</sub> =5A		19 24	22 27	mΩ
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	I <sub>SD</sub> =2.5A, V <sub>GS</sub> =0V		0.8	1.1	V
<b>Gate Charge Characteristics<sup>b</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>DS</sub> =7A		10	14	nC
Q <sub>gs</sub>	Gate-Source Charge			1.5		
Q <sub>gd</sub>	Gate-Drain Charge			5		
<b>Dynamic Characteristics<sup>b</sup></b>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz		1.5		Ω
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, Frequency=1.0MHz		880		pF
C <sub>oss</sub>	Output Capacitance			125		
C <sub>rss</sub>	Reverse Transfer Capacitance			90		
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> =15V, R <sub>L</sub> =15Ω, I <sub>DS</sub> =1A, V <sub>GEN</sub> =10V, R <sub>G</sub> =6Ω		6	12	ns
t <sub>r</sub>	Turn-on Rise Time			11	21	
t <sub>d(OFF)</sub>	Turn-off Delay Time			27	50	
t <sub>f</sub>	Turn-off Fall Time			5	10	



**TECH PUBLIC**

—台丹电子—

**TPSI4816BDY-T1-GE3**

Dual N-Channel 30-V (D-S) MOSFET with Schottky Diode

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**Electrical Characteristics (T<sub>j</sub>=25°C unless otherwise noted)**

**Q2 N-Channel MOSFET**

Symbol	TECH PUBLIC Parameter	Test Condition	Channel 2			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	30			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			50	μA
					5	mA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	1.0		2.5	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
R <sub>DS(ON)</sub> <sup>a</sup>	Drain-Source On-state Resistance	V <sub>GS</sub> =10V, I <sub>DS</sub> =10A		10	12	mΩ
		V <sub>GS</sub> =4.5V, I <sub>DS</sub> =7A		14	17	
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	I <sub>SD</sub> =1A, V <sub>GS</sub> =0V			0.52	V
<b>Gate Charge Characteristics<sup>b</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>DS</sub> =10A		16	22	nC
Q <sub>gs</sub>	Gate-Source Charge			3.7		
Q <sub>gd</sub>	Gate-Drain Charge			8.5		
<b>Dynamic Characteristics<sup>b</sup></b>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz		1.7		Ω
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, Frequency=1.0MHz		1610		pF
C <sub>oss</sub>	Output Capacitance			255		
C <sub>rss</sub>	Reverse Transfer Capacitance			160		
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> =15V, R <sub>L</sub> =15Ω, I <sub>DS</sub> =1A, V <sub>GEN</sub> =10V, R <sub>G</sub> =6Ω		10	19	ns
t <sub>r</sub>	Turn-on Rise Time			11	21	
t <sub>d(OFF)</sub>	Turn-off Delay Time			39	71	
t <sub>f</sub>	Turn-off Fall Time			12	23	

**Electrical Characteristics (T<sub>j</sub>=25°C unless otherwise noted)**

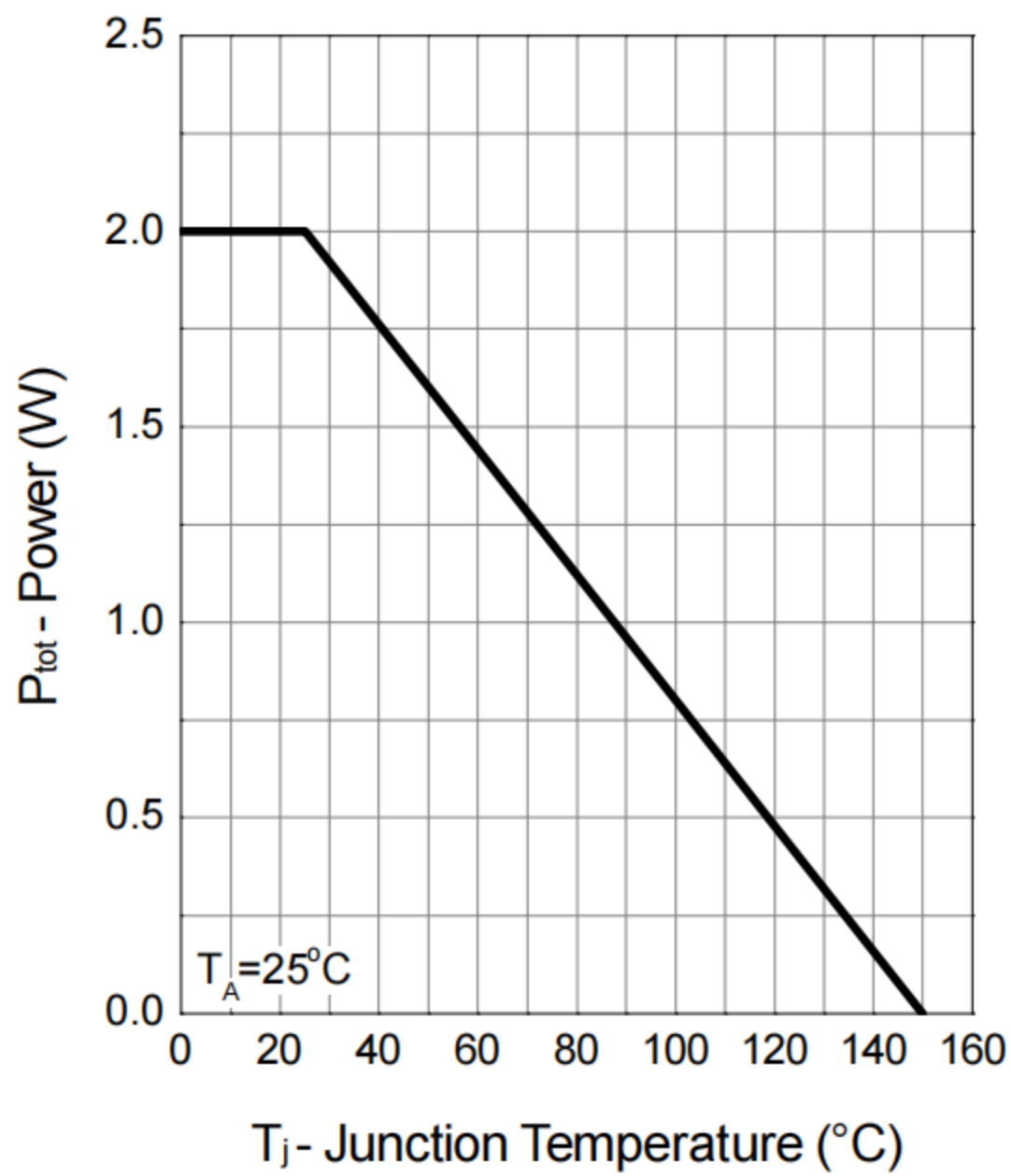
**Schottky Diode**

Symbol	TECH PUBLIC Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V <sub>BR</sub> <sup>a</sup>	Reverse Breakdown Voltage	I <sub>r</sub> =100uA	30	-	-	V
V <sub>f</sub>	Forward Voltage	I <sub>F</sub> =1.0A T <sub>A</sub> = 25°C	-	0.48	0.5	V
		I <sub>F</sub> =1.0A T <sub>A</sub> = 125°C			0.42	
I <sub>r</sub>	Leakage Current	V <sub>r</sub> =30V T <sub>A</sub> = 25°C	-	10	100	uA
C <sub>t</sub>	Total Capacitance	V <sub>r</sub> = 10V, f = 1.0MHz	-	50	-	pF

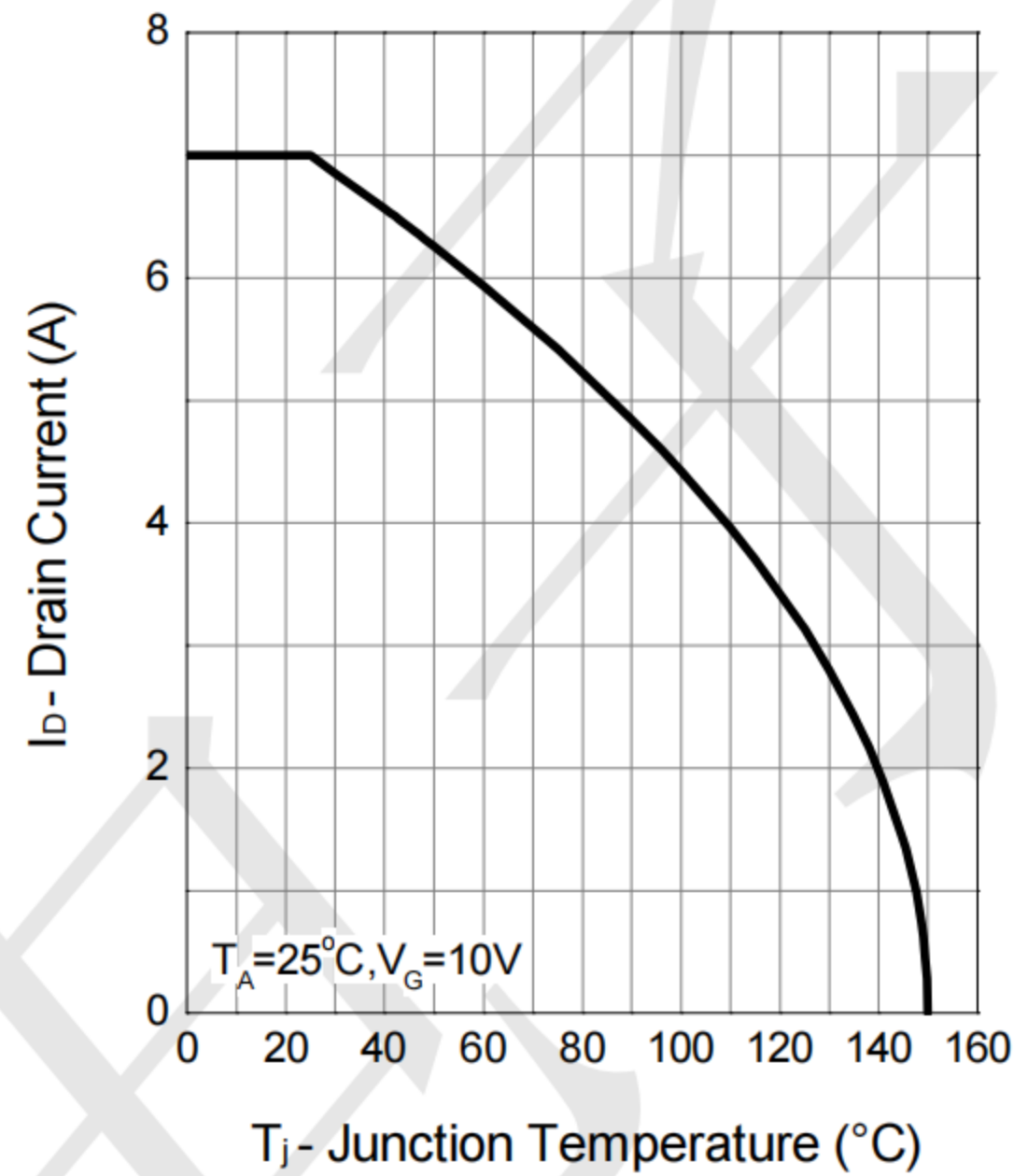
Typical Electrical and Thermal Characteristics

Q1-N-Channel

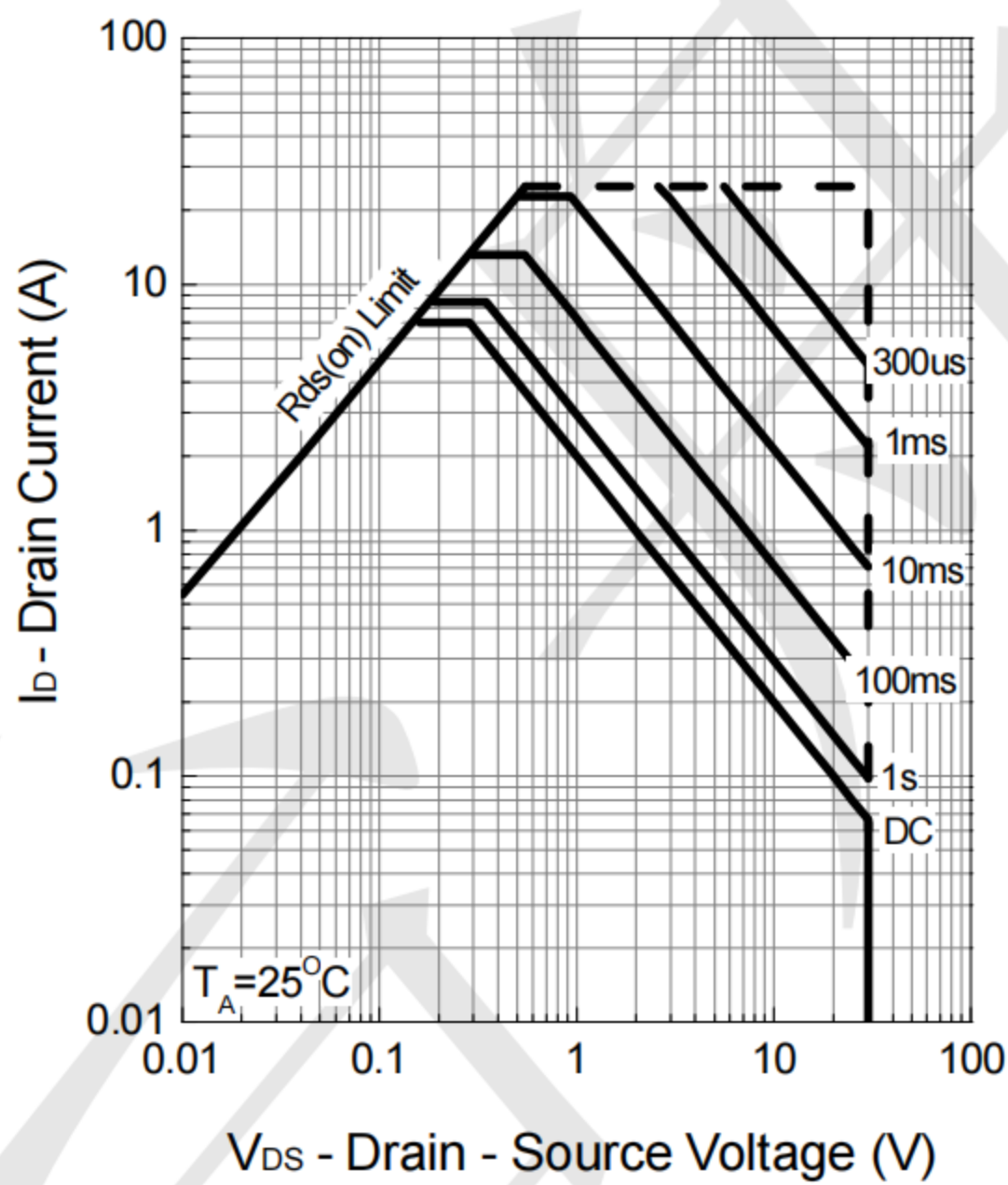
Power Dissipation



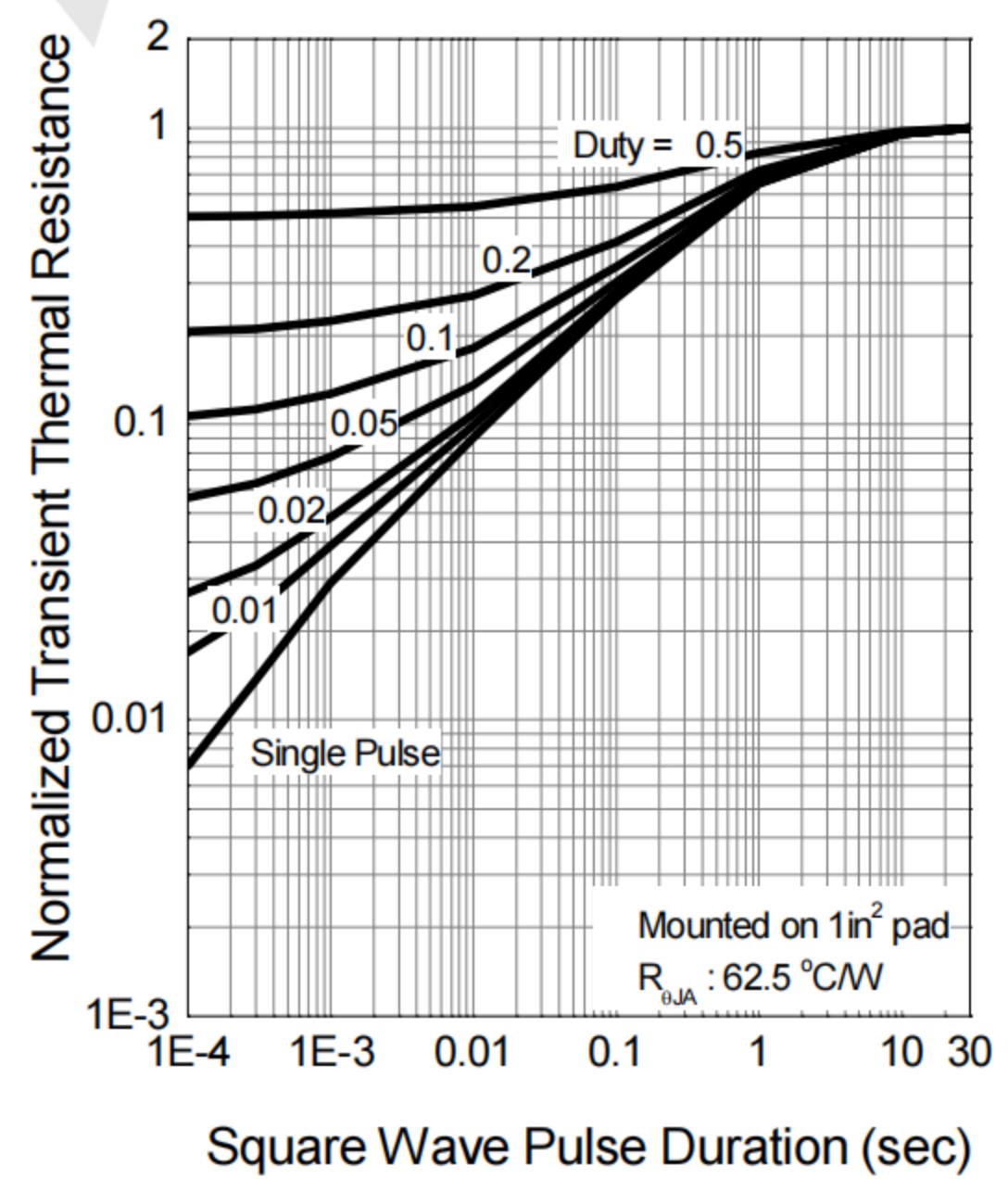
Drain Current



Safe Operation Area

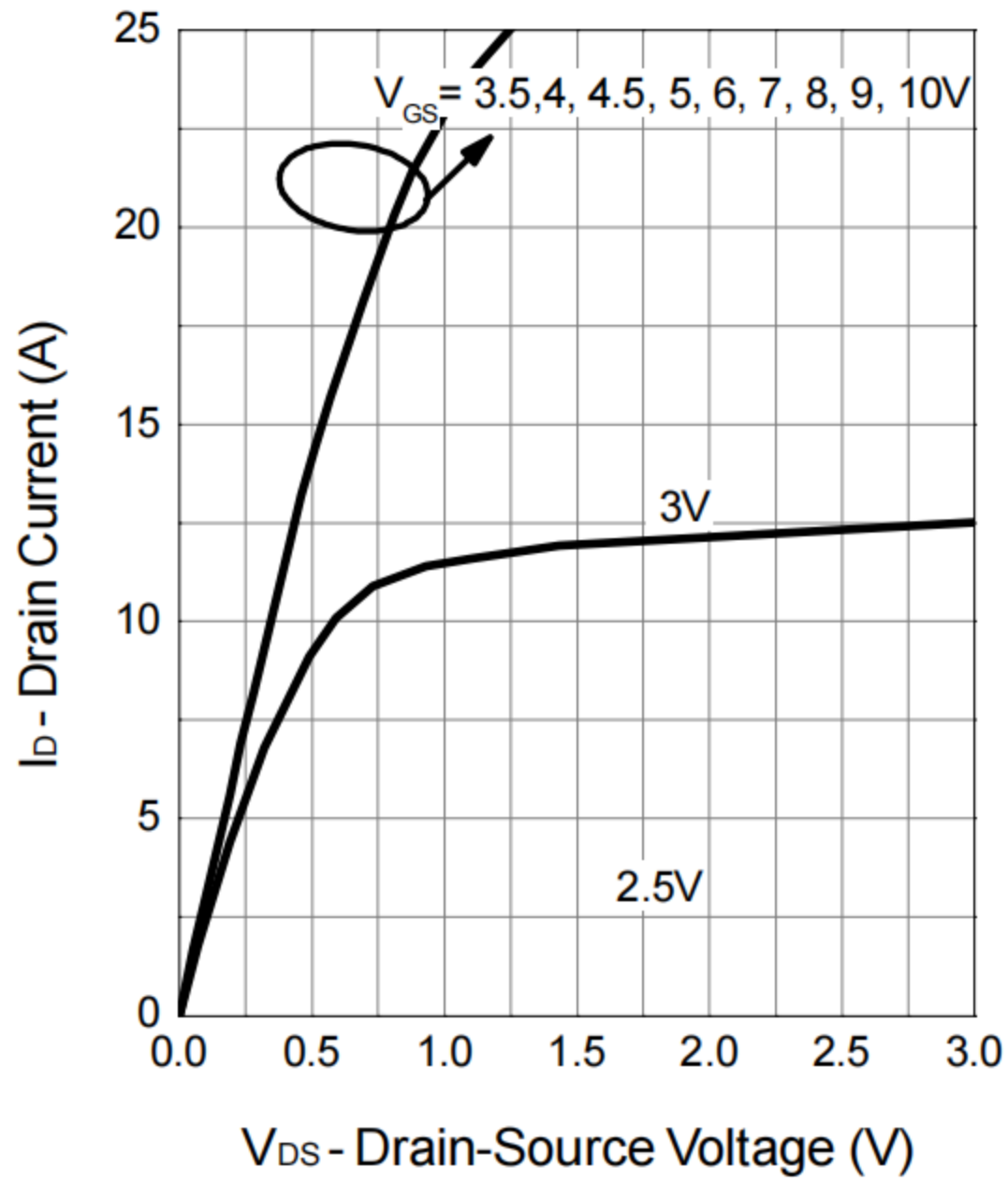


Thermal Transient Impedance

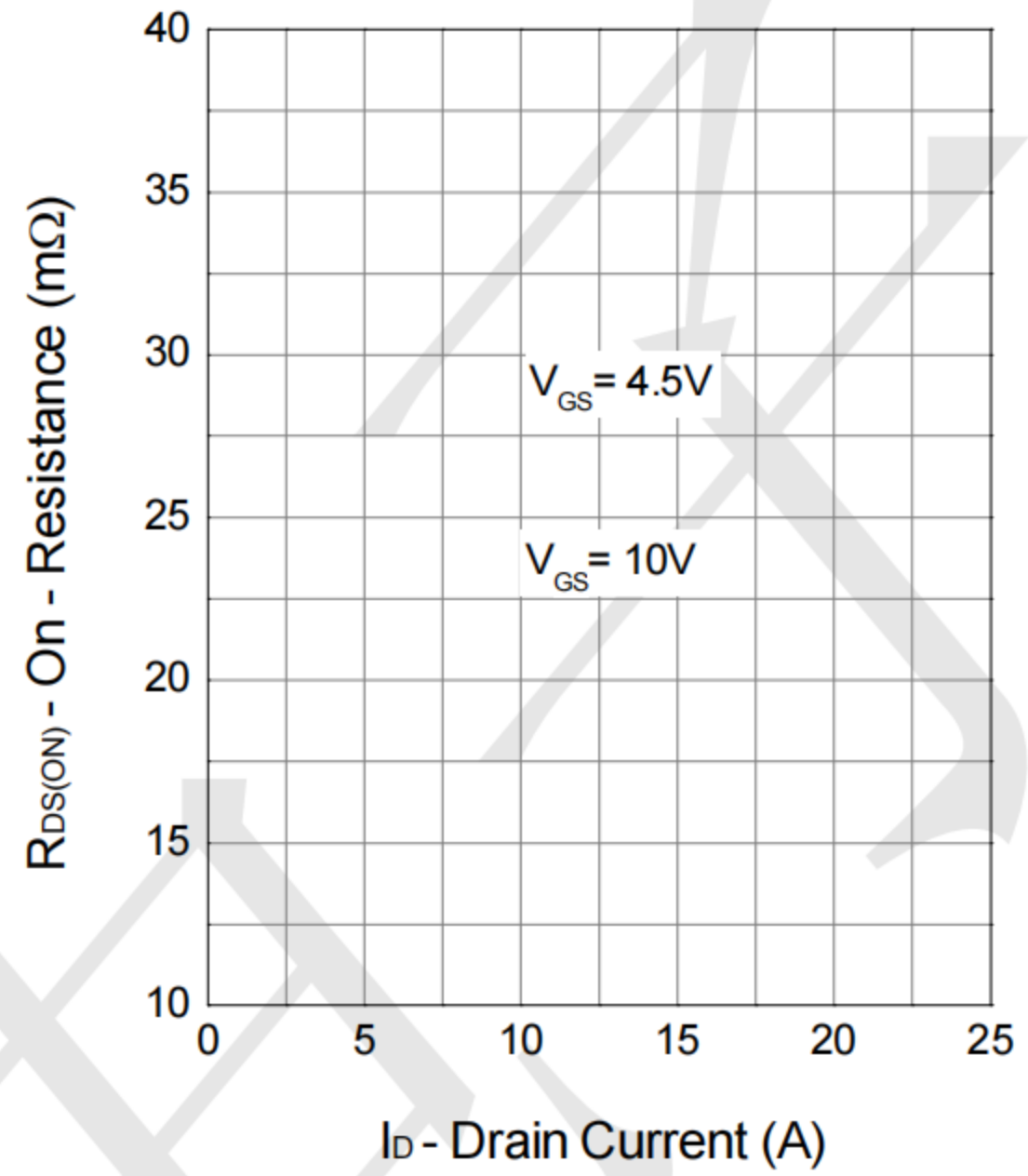


**Q1-N-Channel**

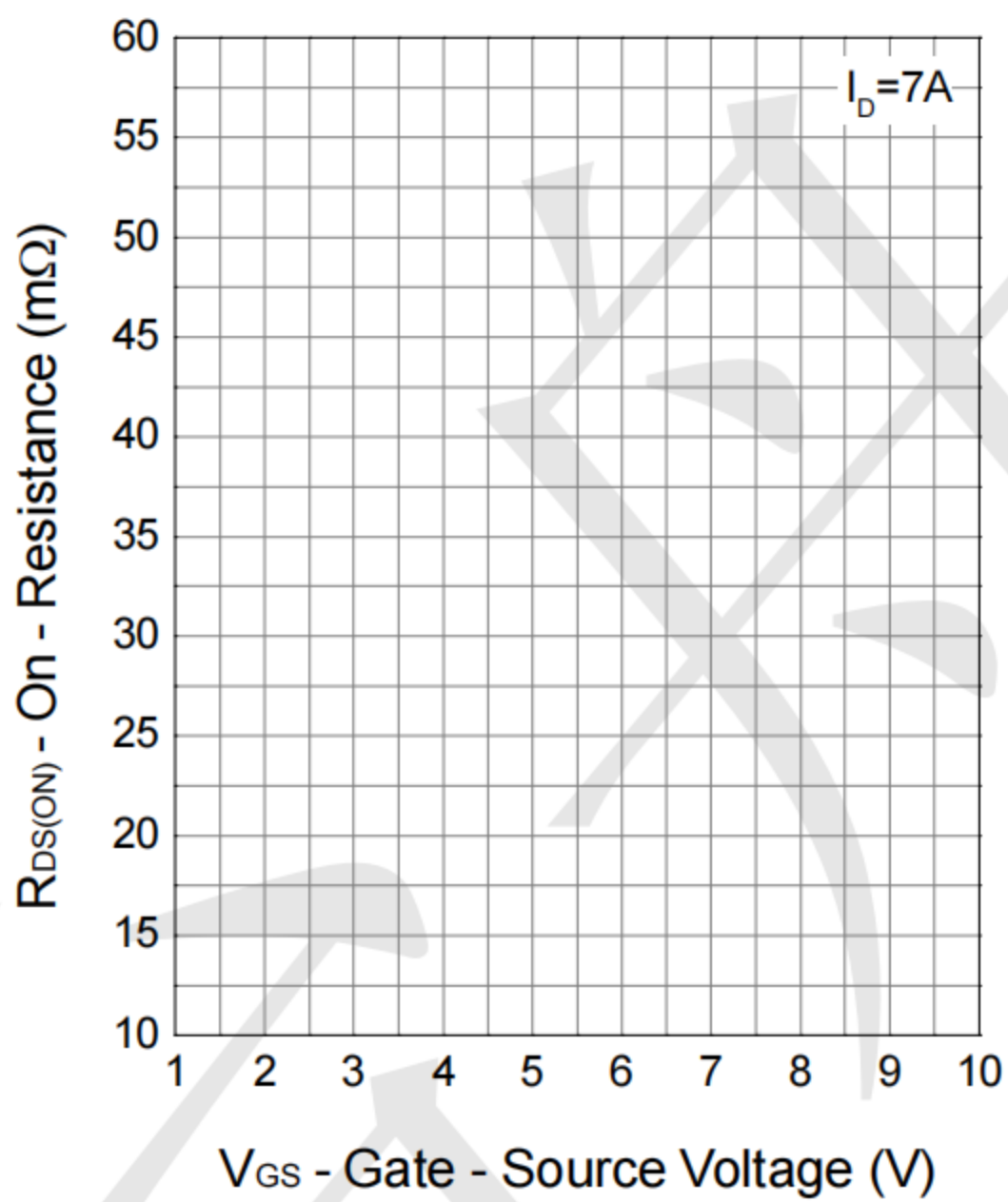
**Output Characteristics**



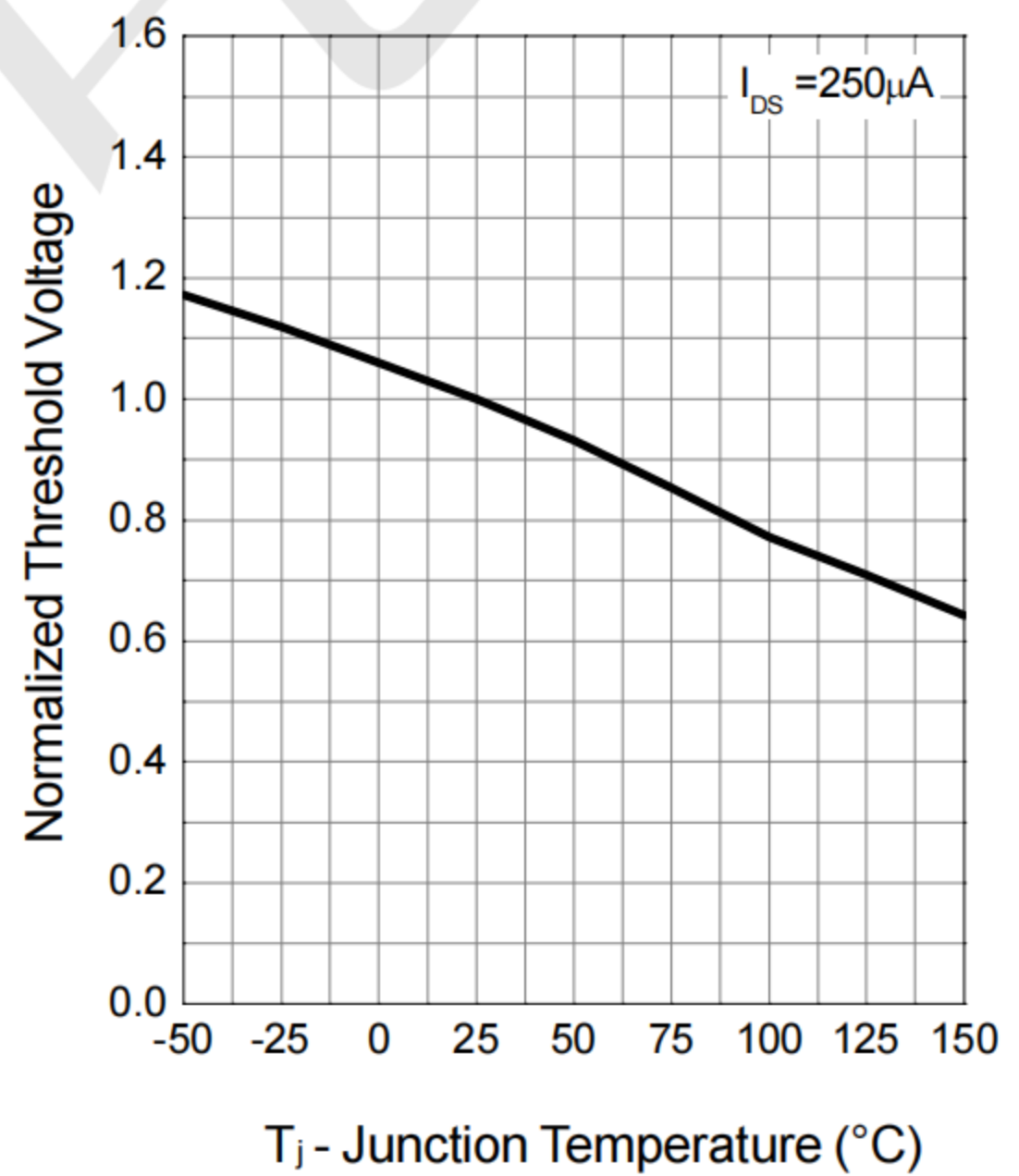
**Drain-Source On Resistance**



**Drain-Source On Resistance**

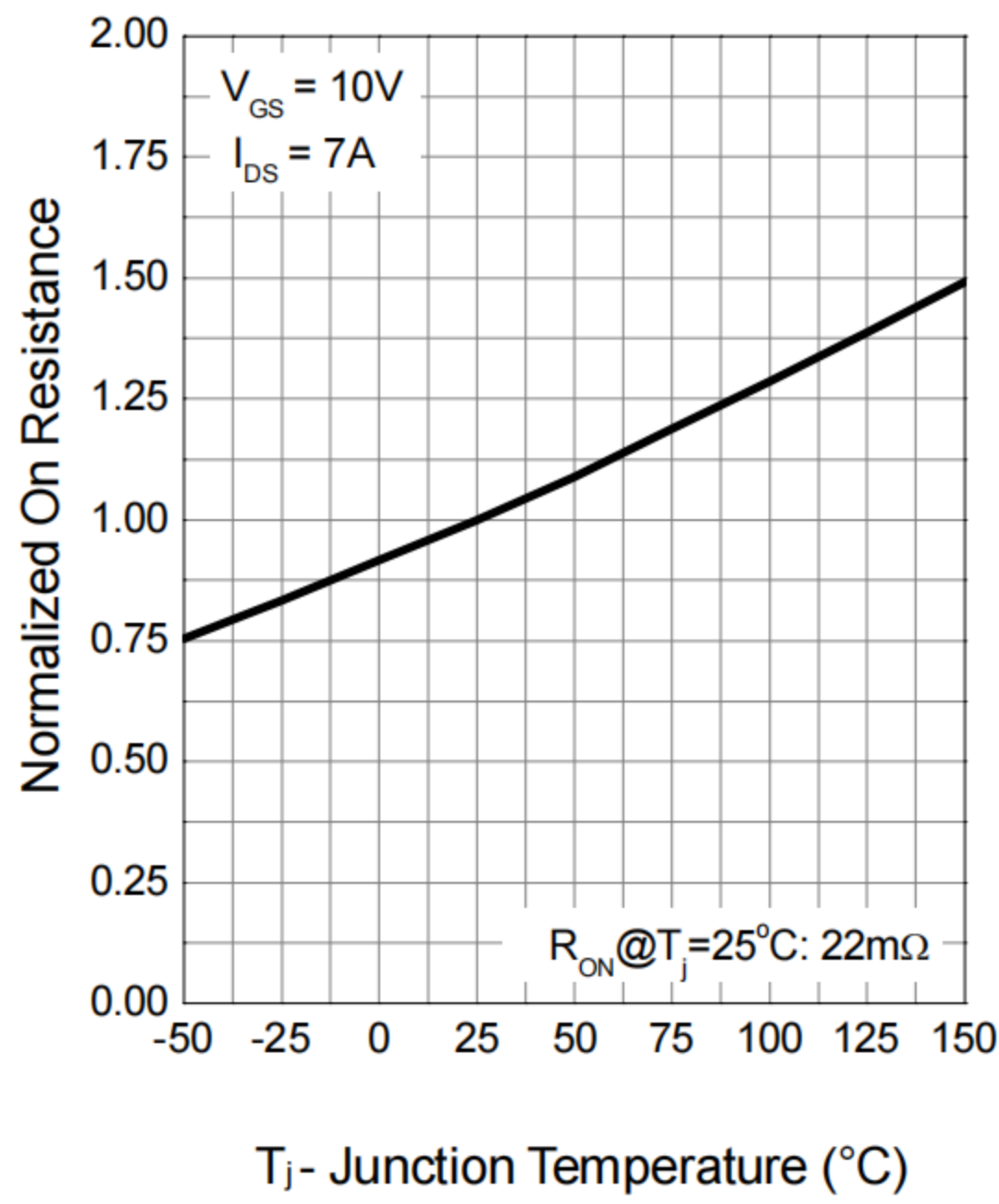


**Gate Threshold Voltage**

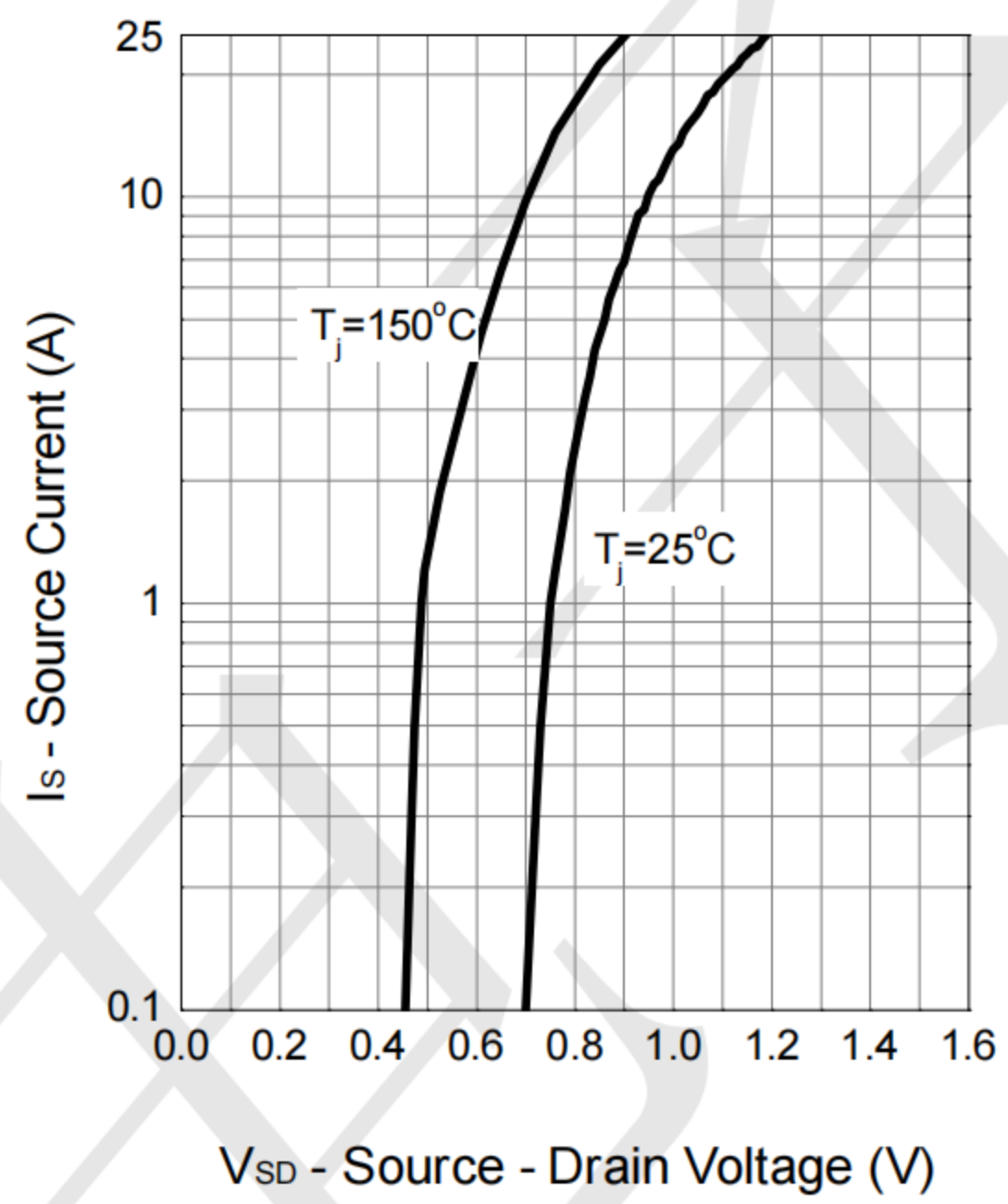


**Q1-N-Channel**

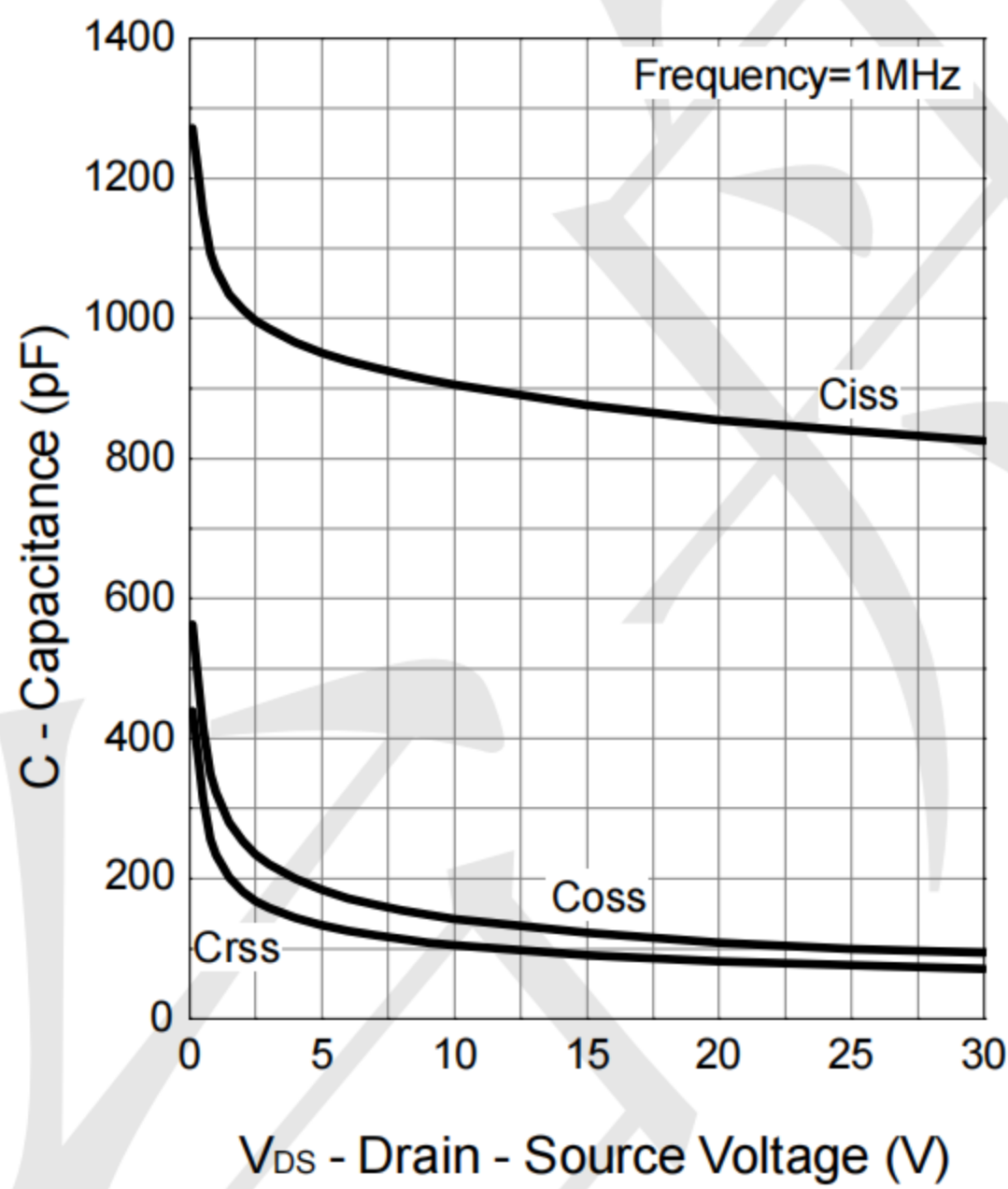
**Drain-Source On Resistance**



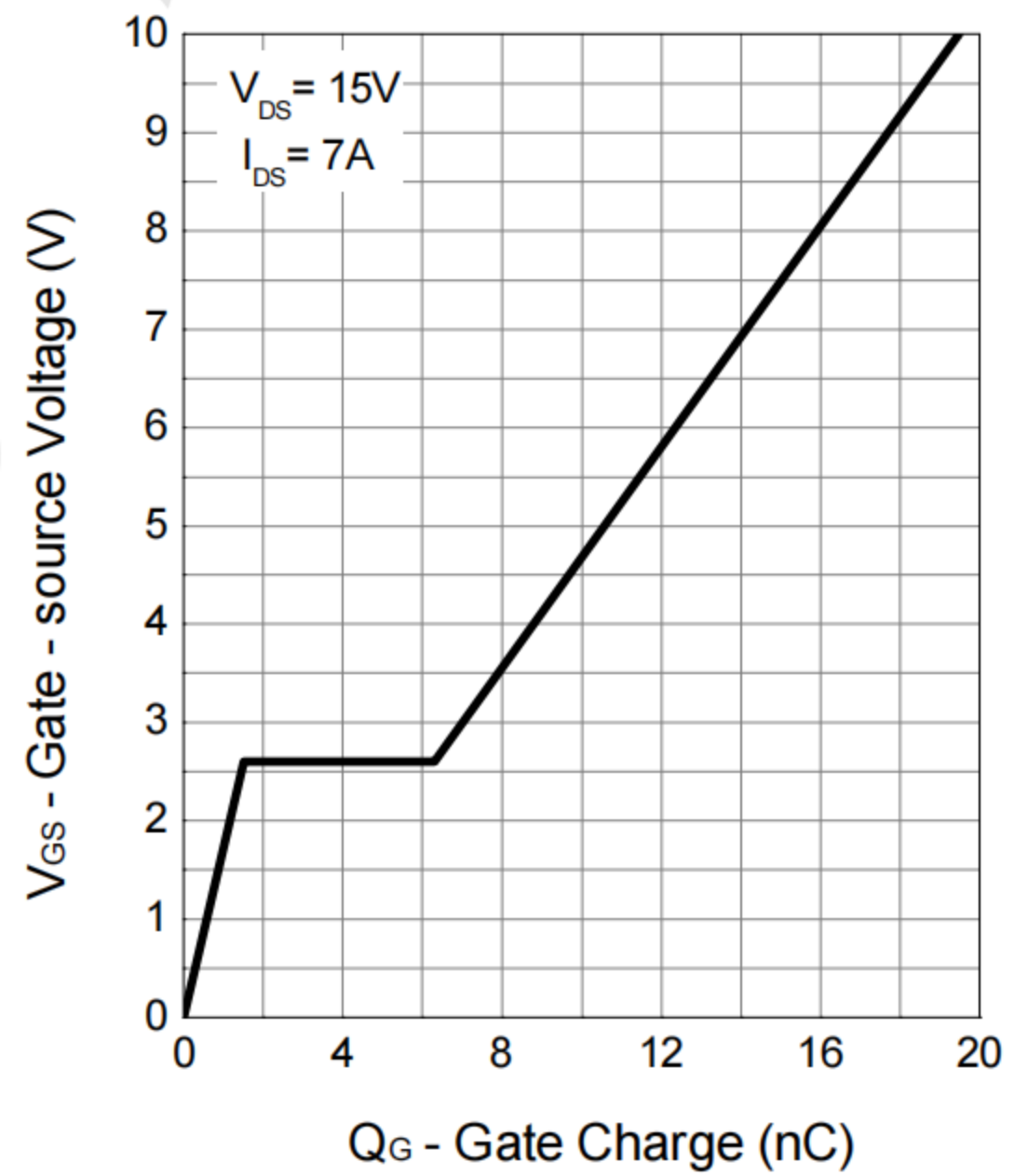
**Source-Drain Diode Forward**



**Capacitance**



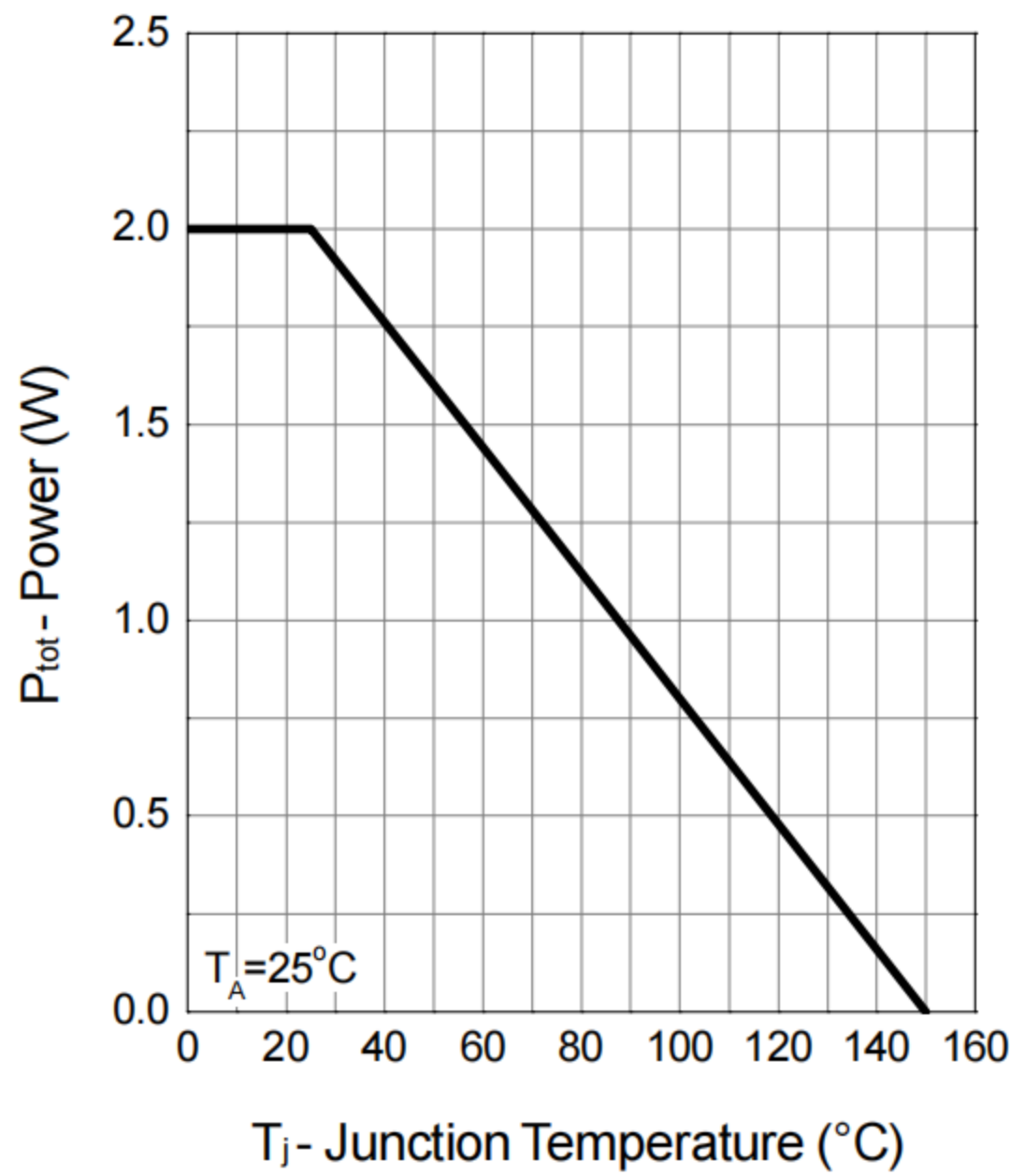
**Gate Charge**



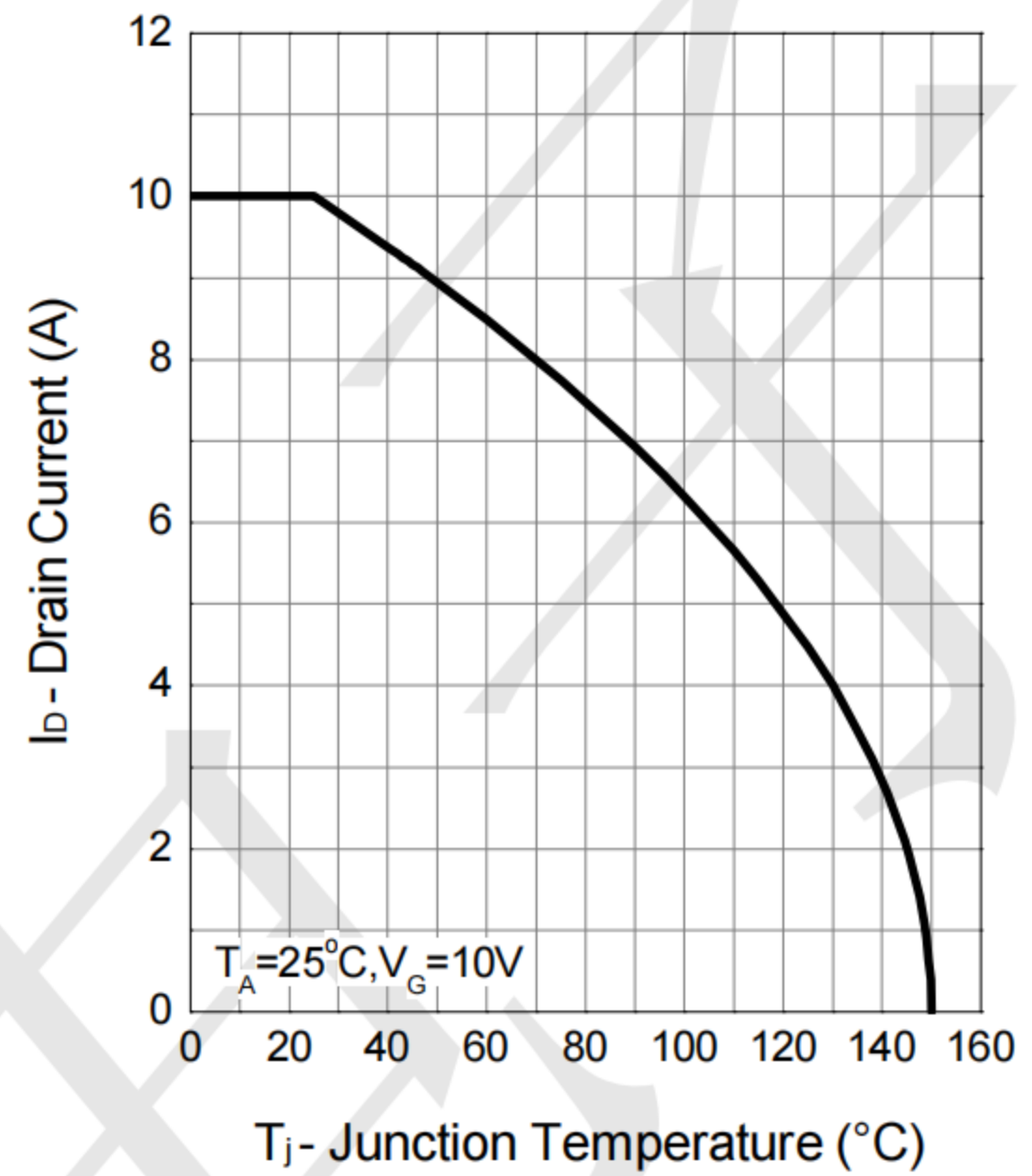
Typical Electrical and Thermal Characteristics

Q2-N-Channel

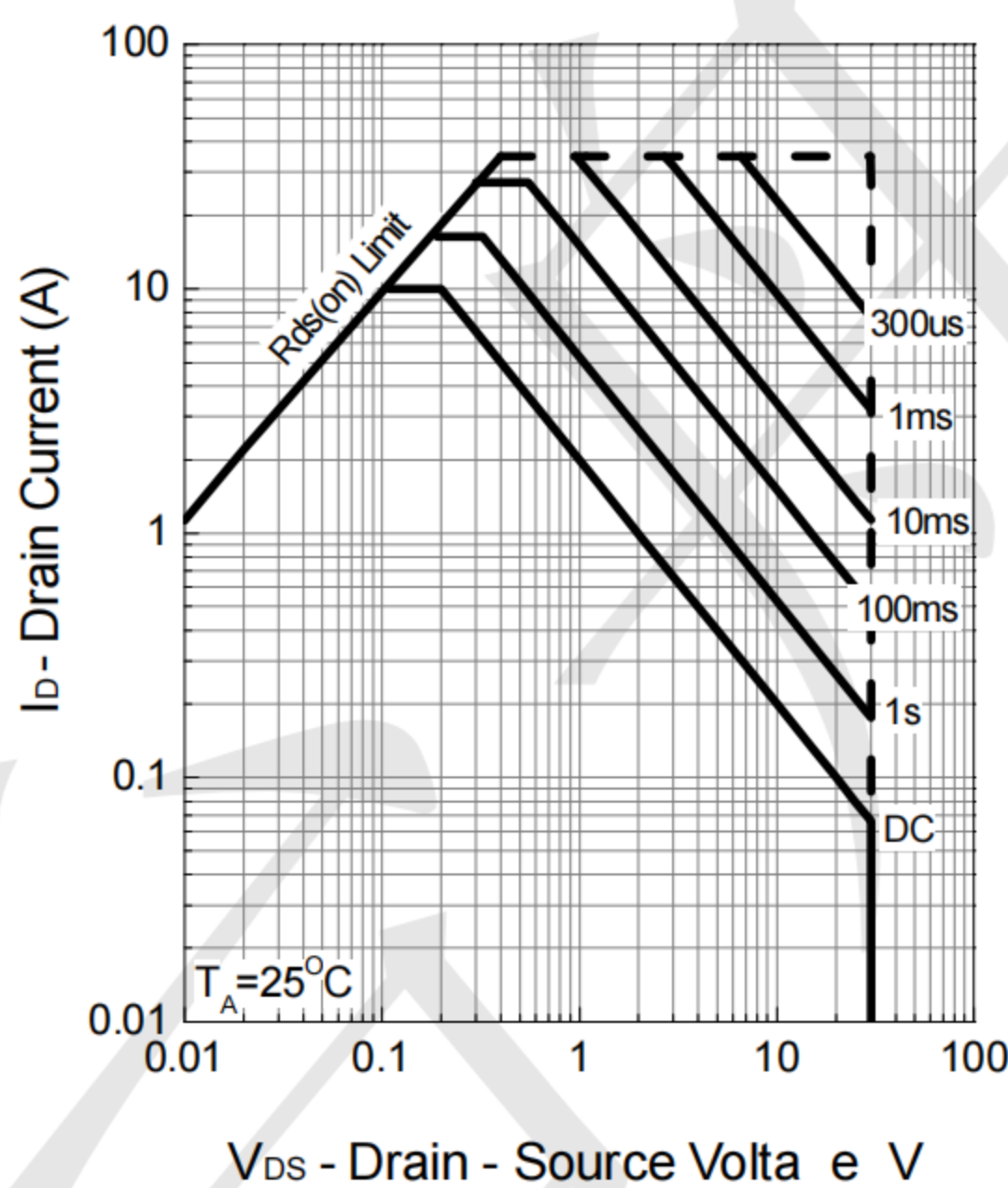
Power Dissipation



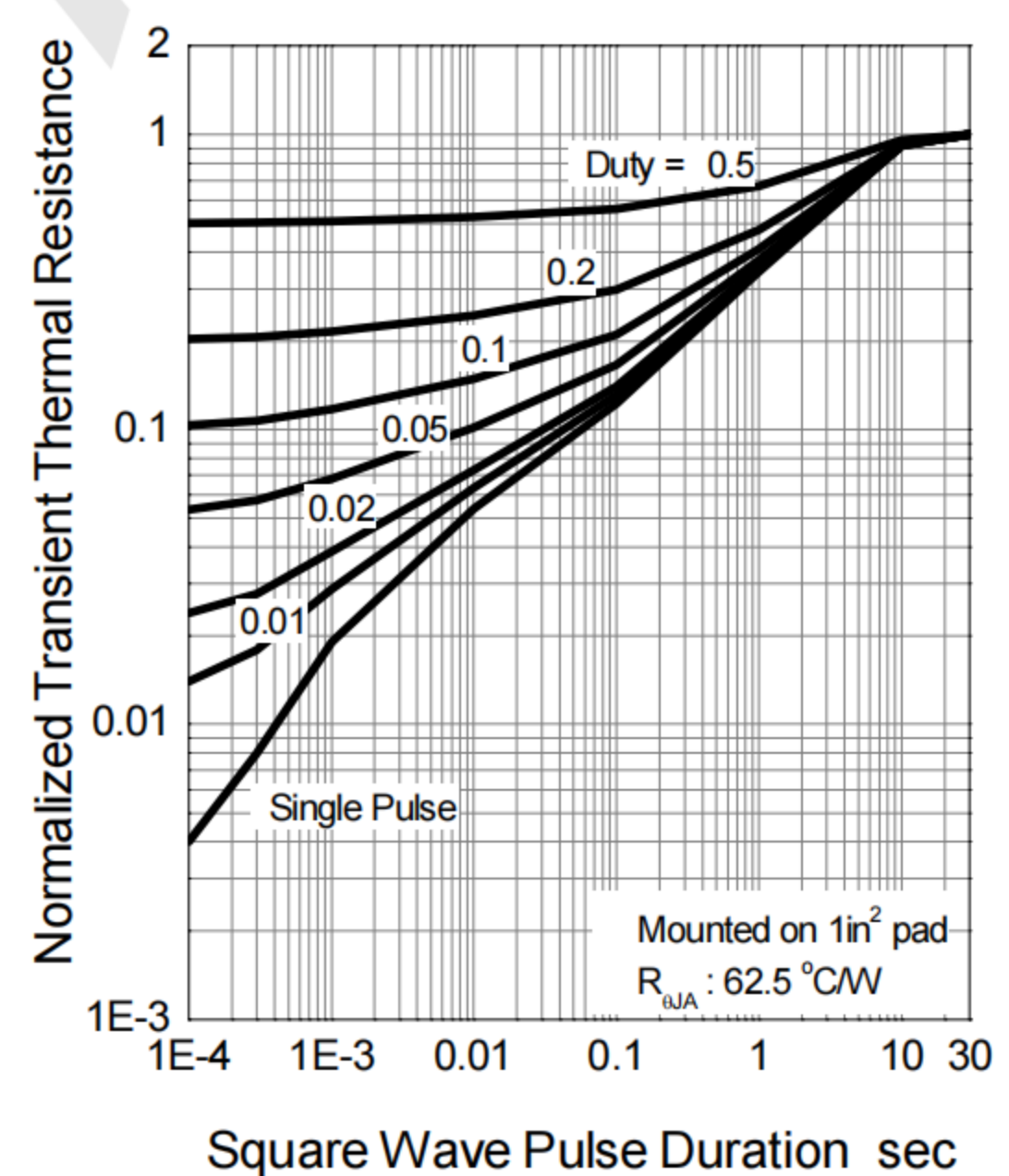
Drain Current



Safe Operation Area

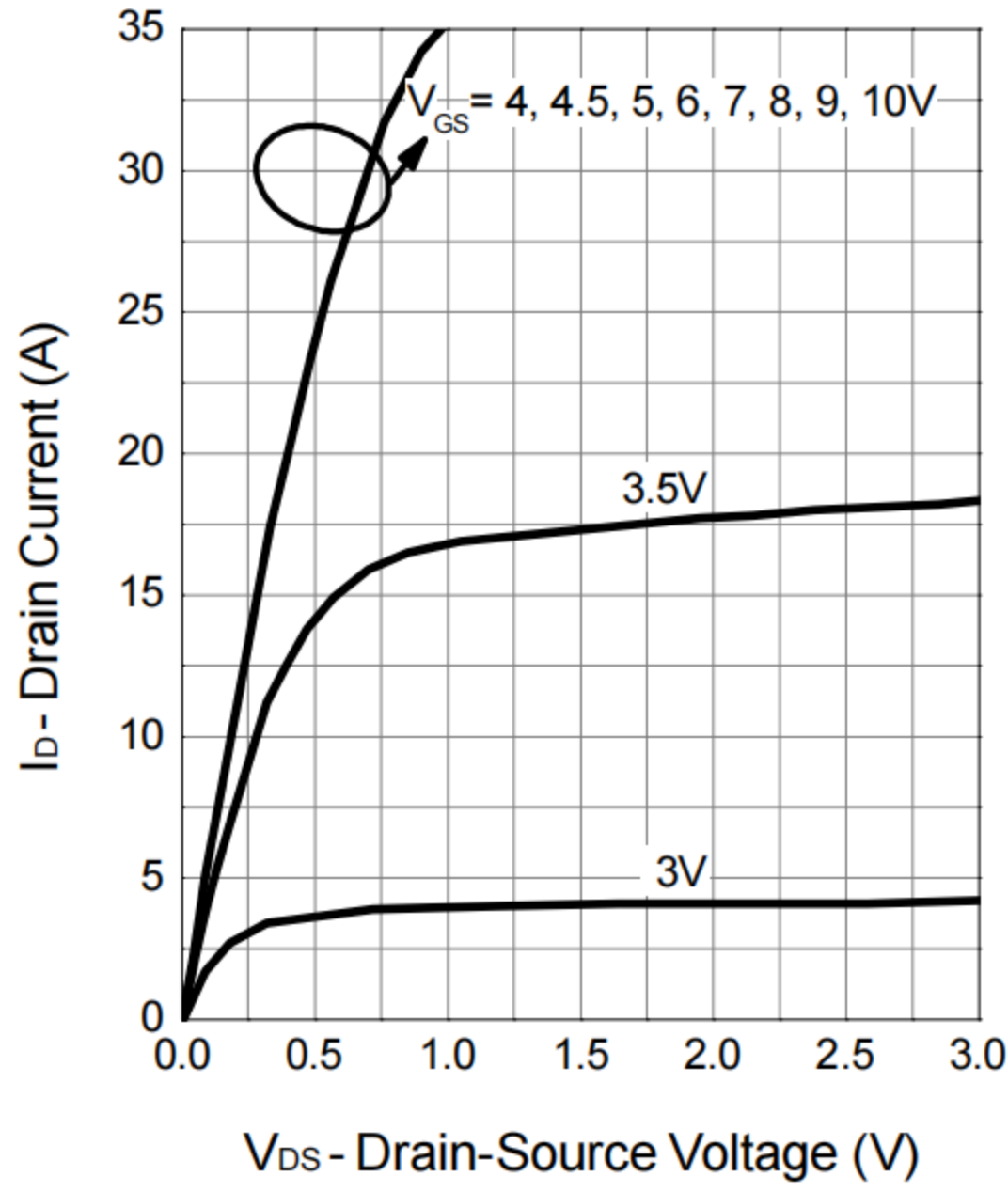


Thermal Transient Impedance

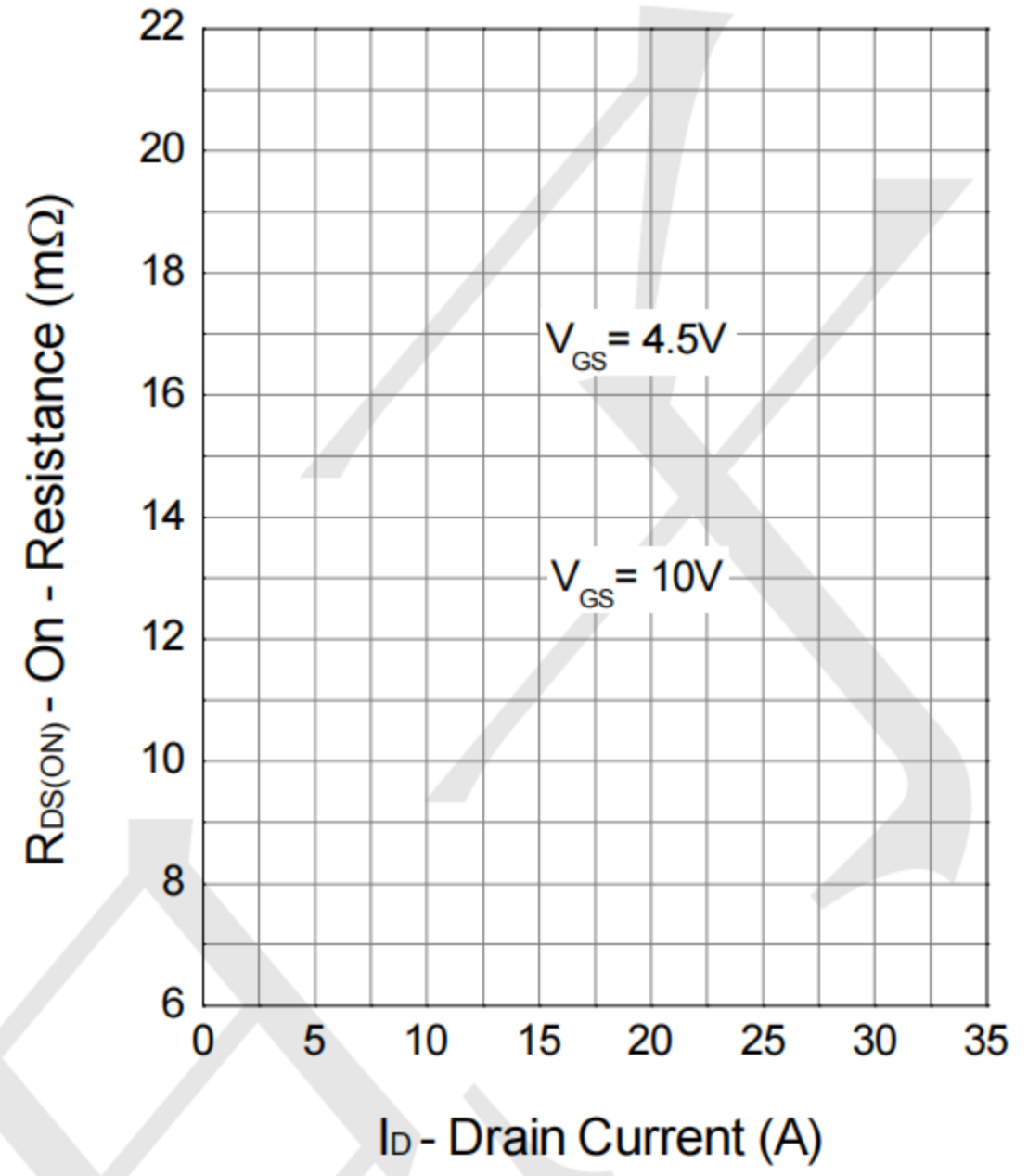


**Q2-N-Channel**

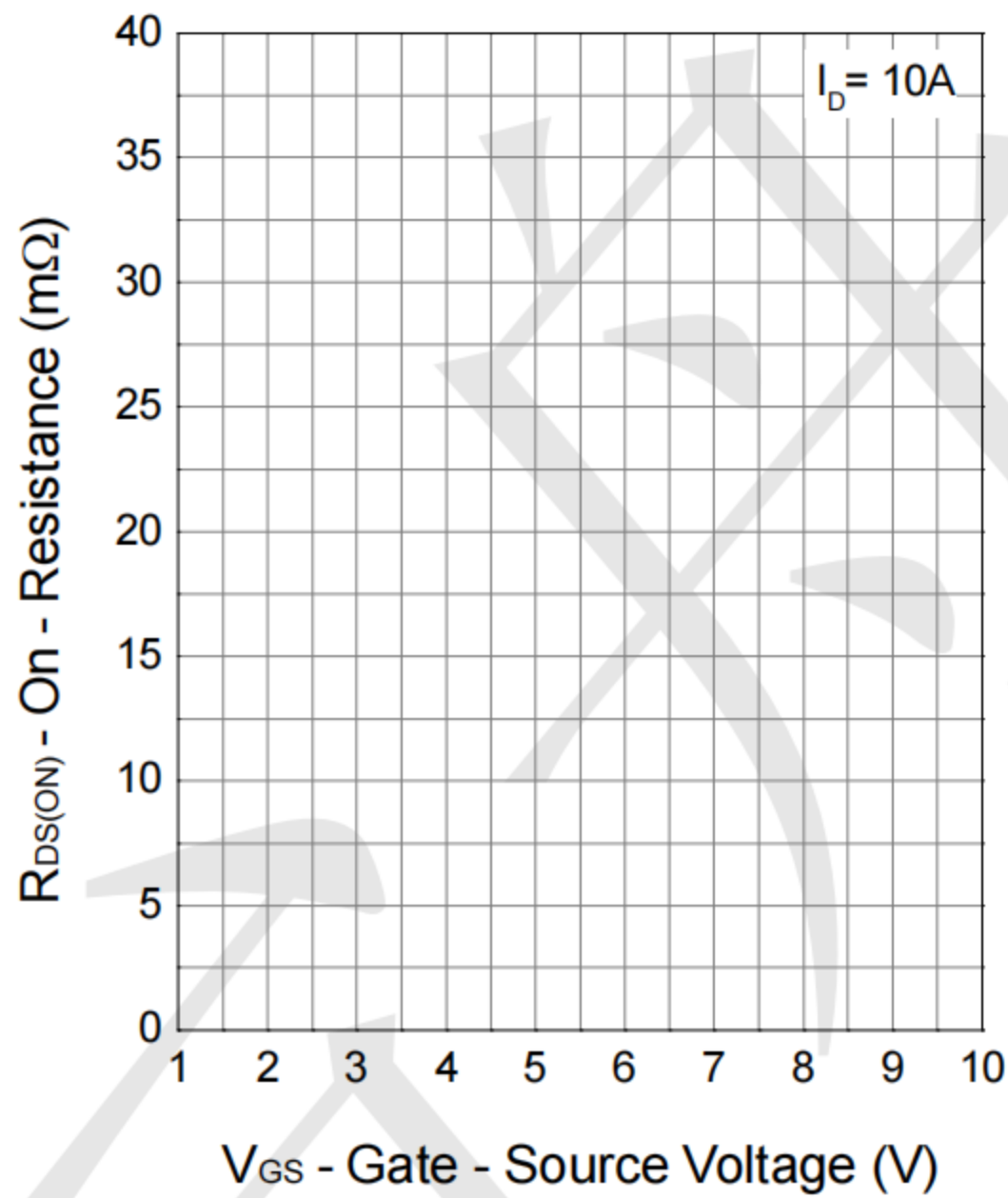
**Output Characteristics**



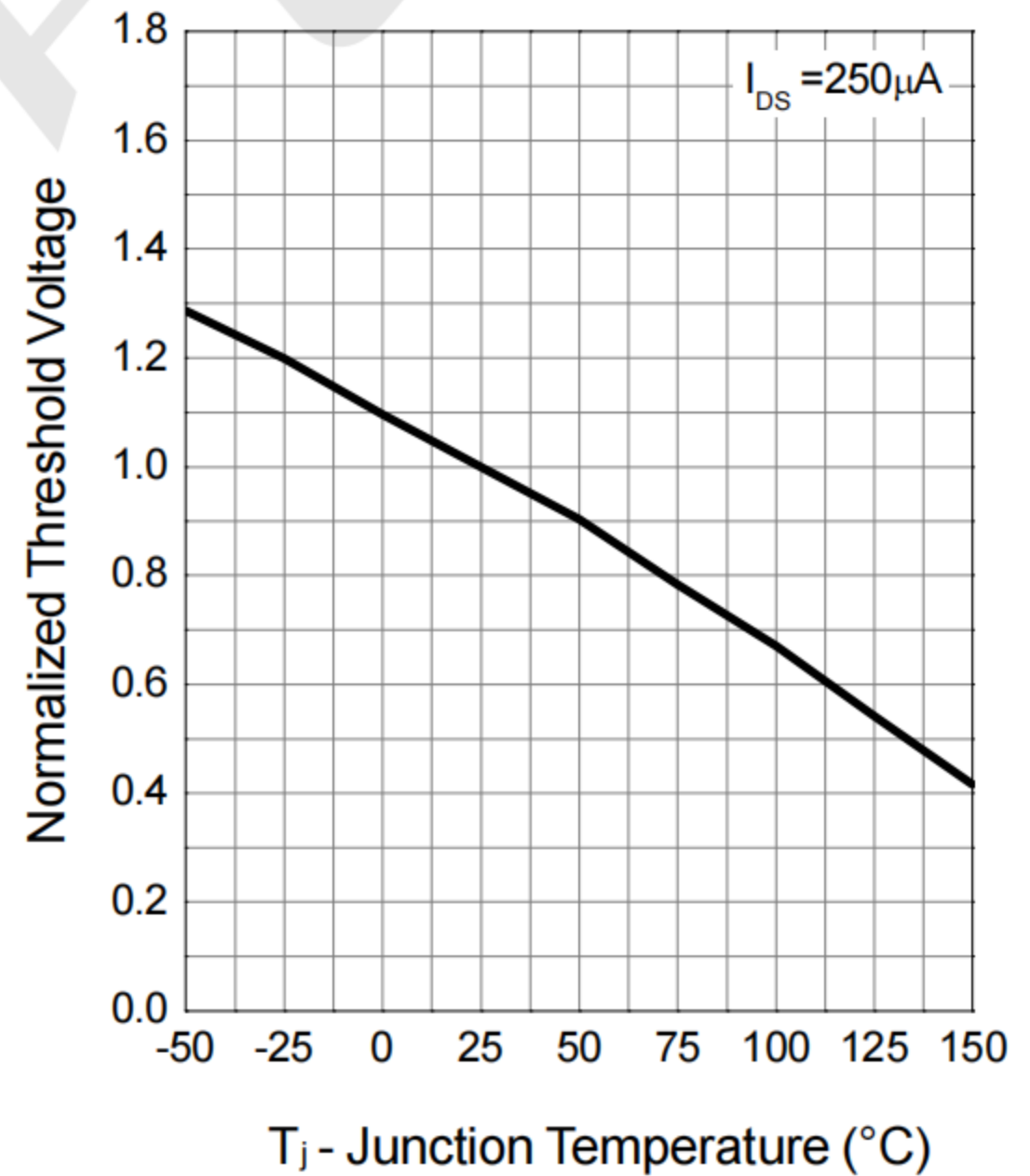
**Drain-Source On Resistance**



**Drain-Source On Resistance**



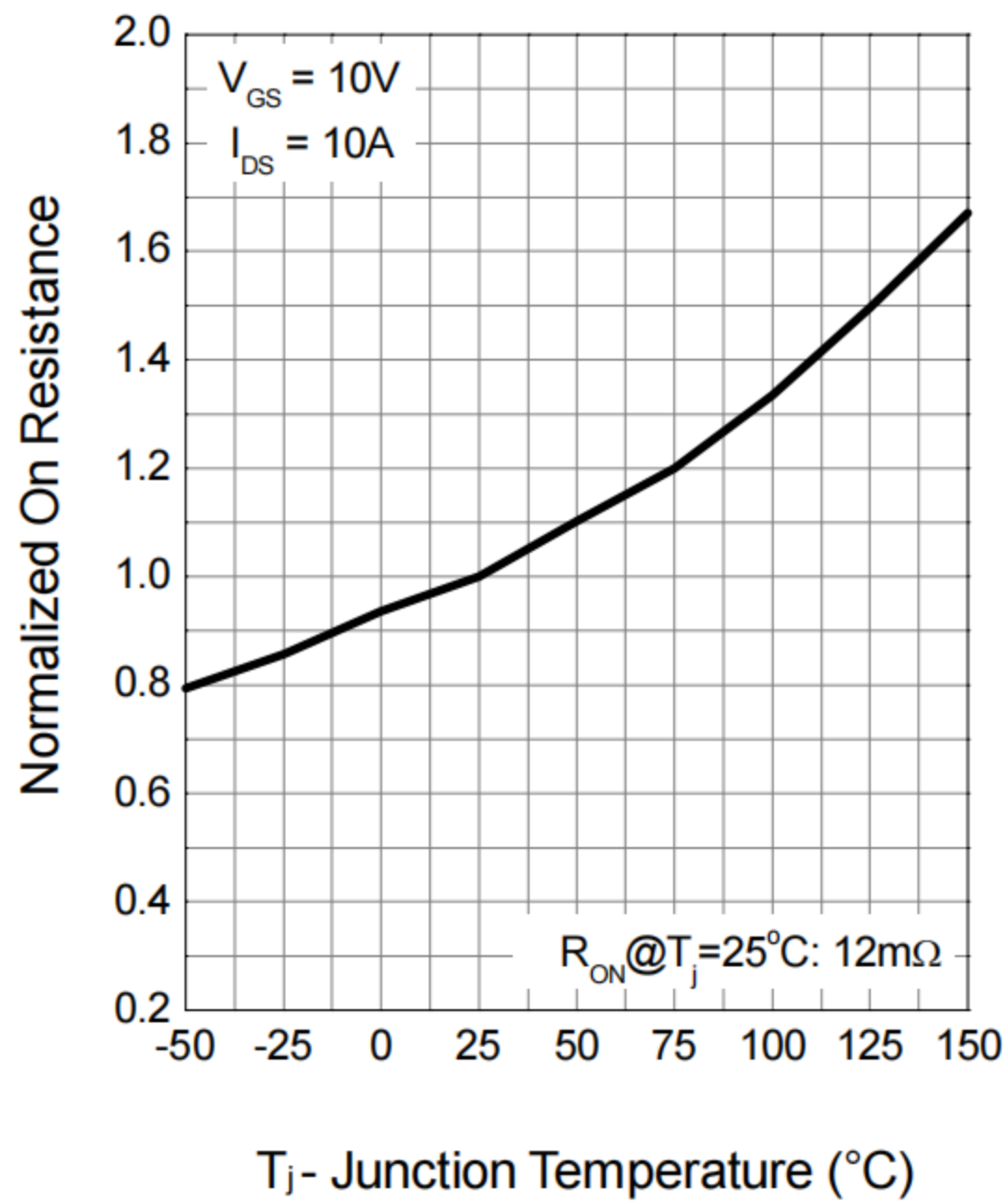
**Gate Threshold Voltage**



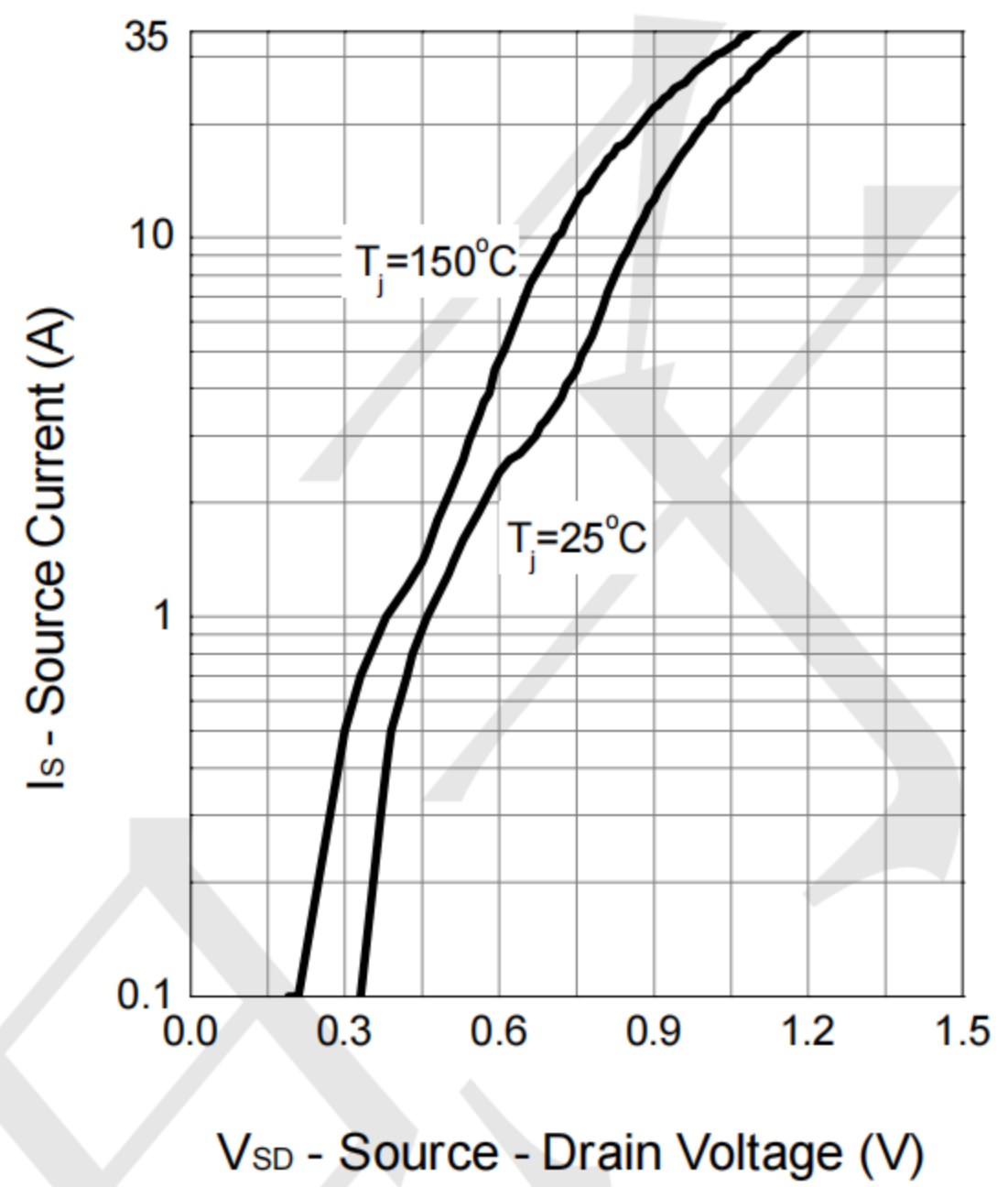


**Q2-N-Channel**

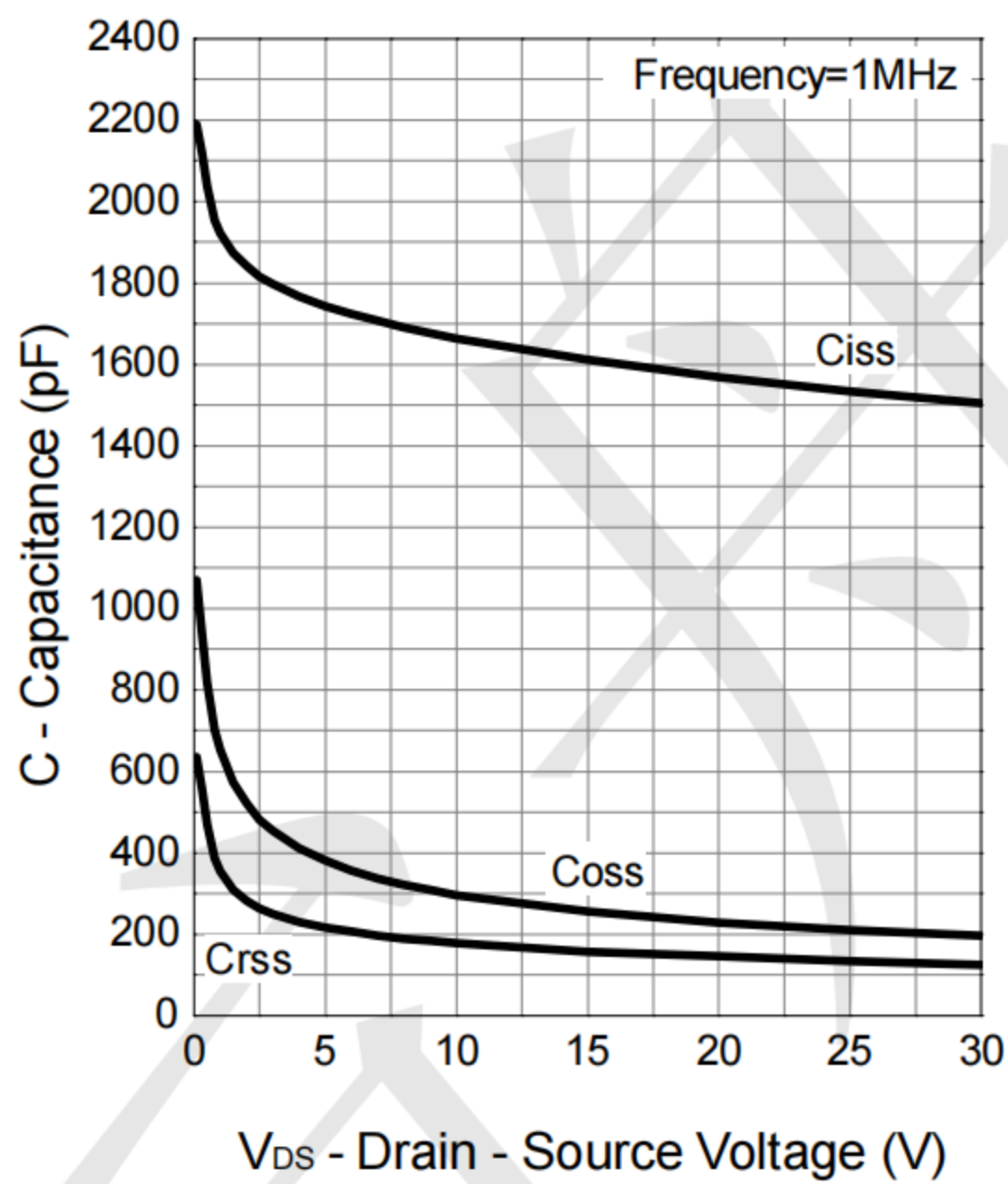
**Drain-Source On Resistance**



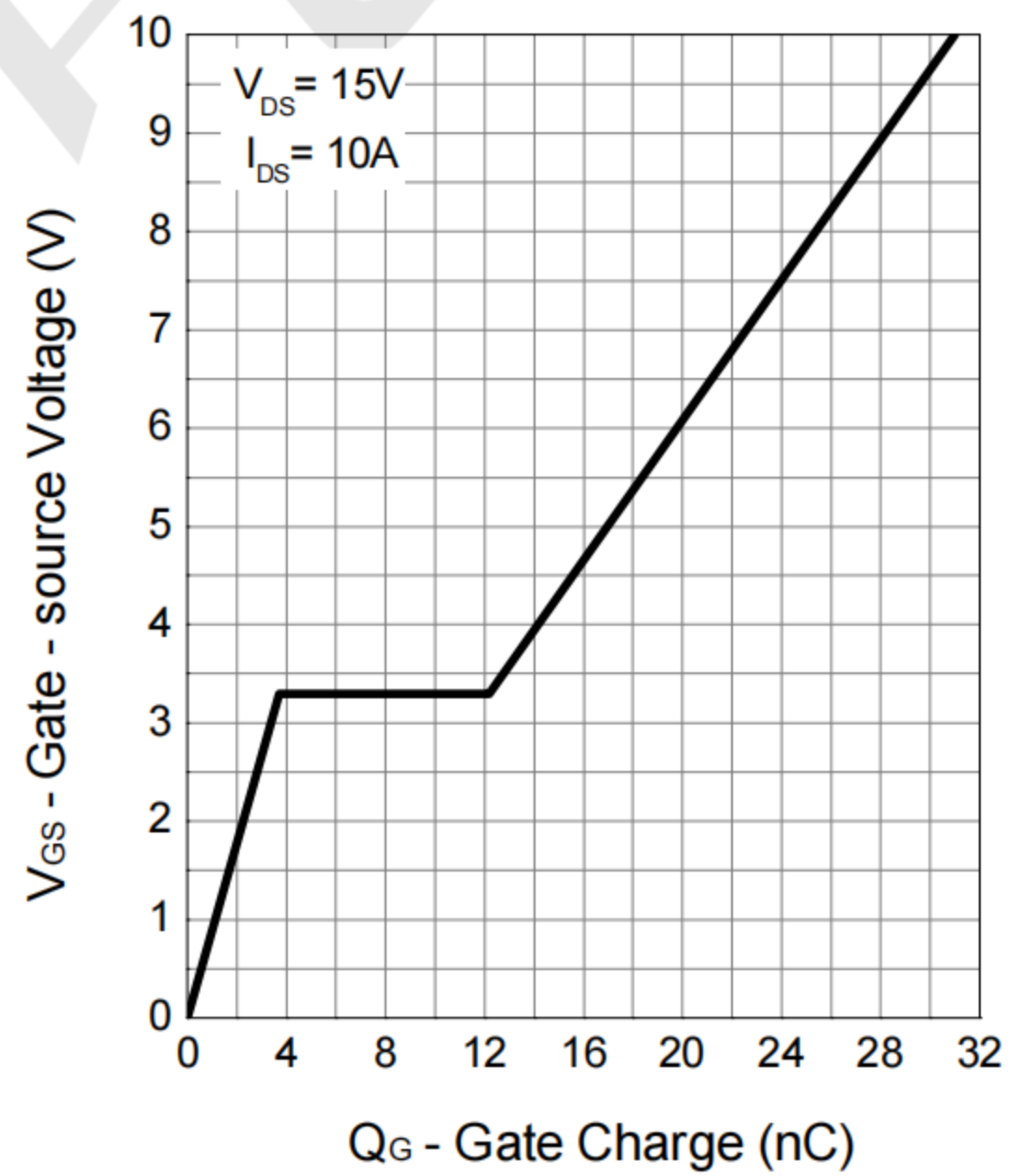
**Source-Drain Diode Forward**



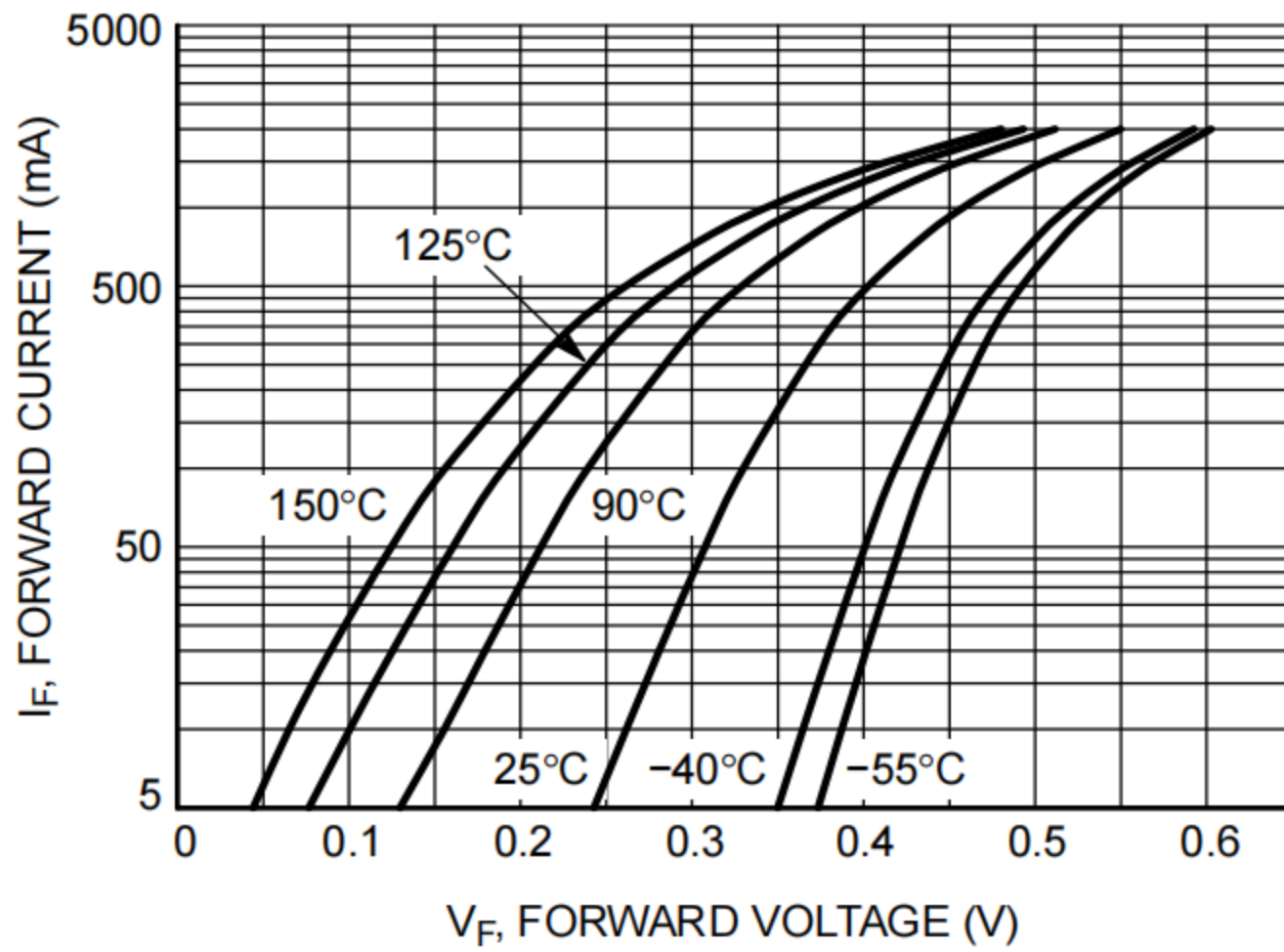
**Capacitance**



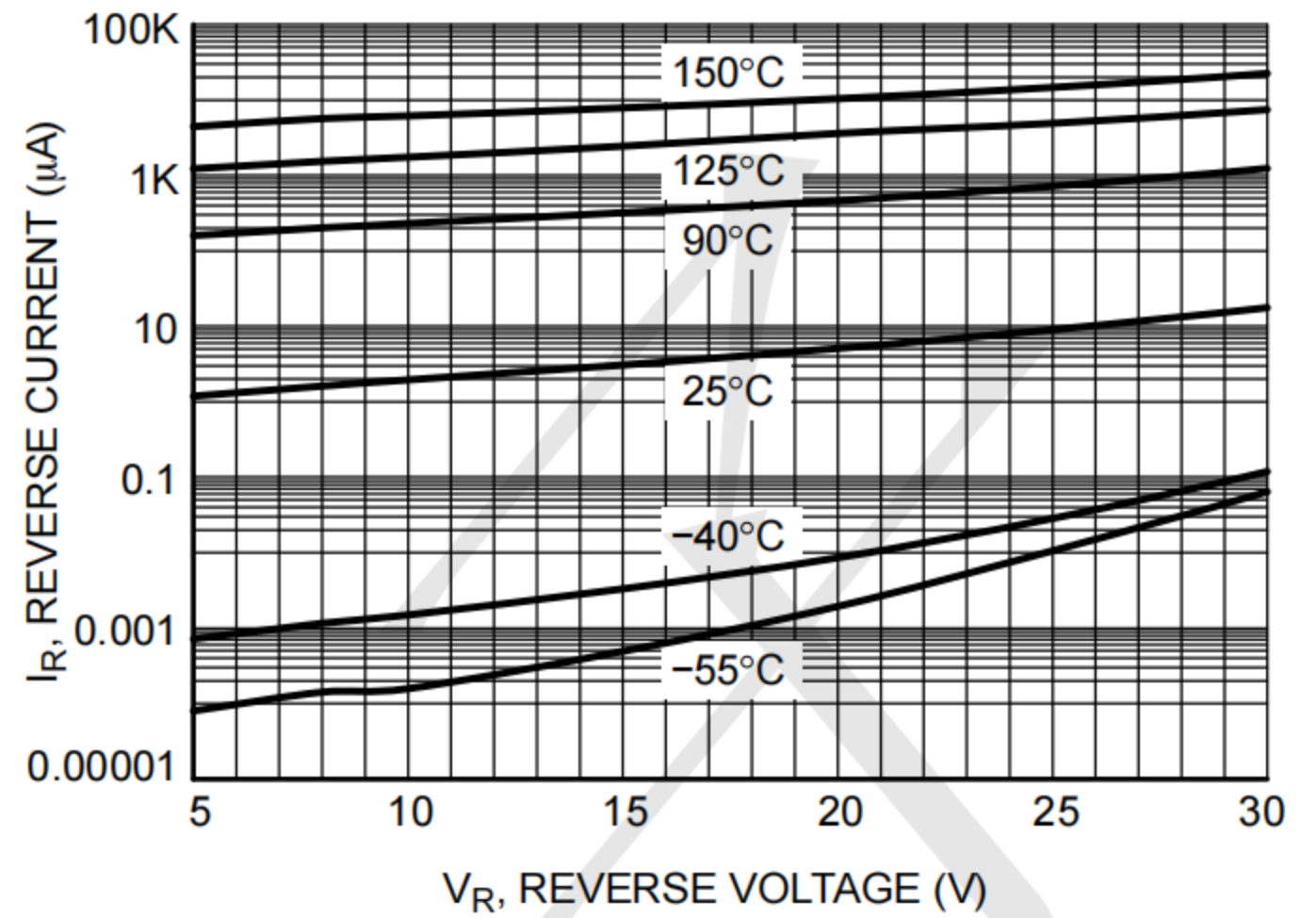
**Gate Charge**



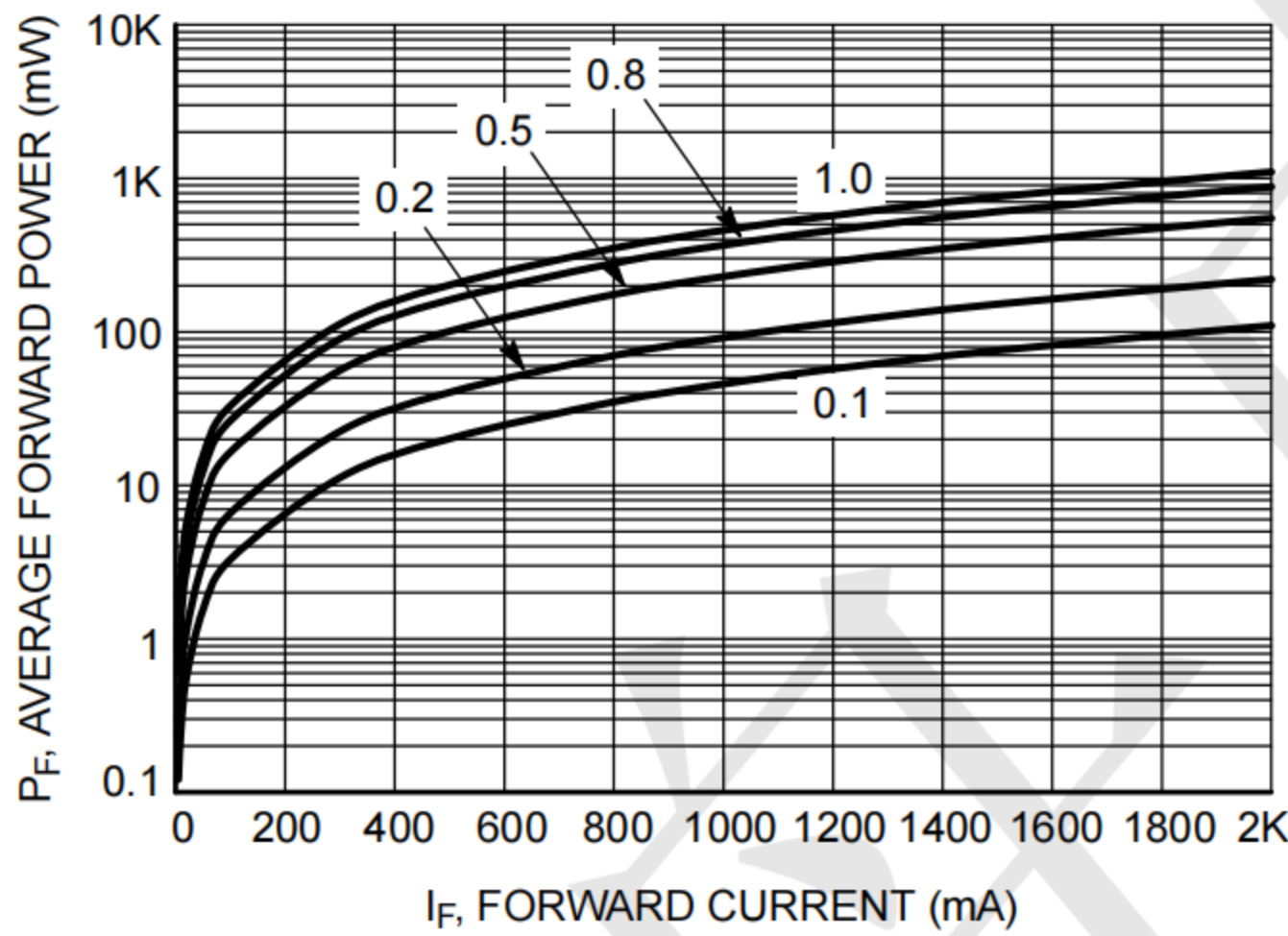
**Typical Electrical and Thermal Characteristics  
Schottky Diode**



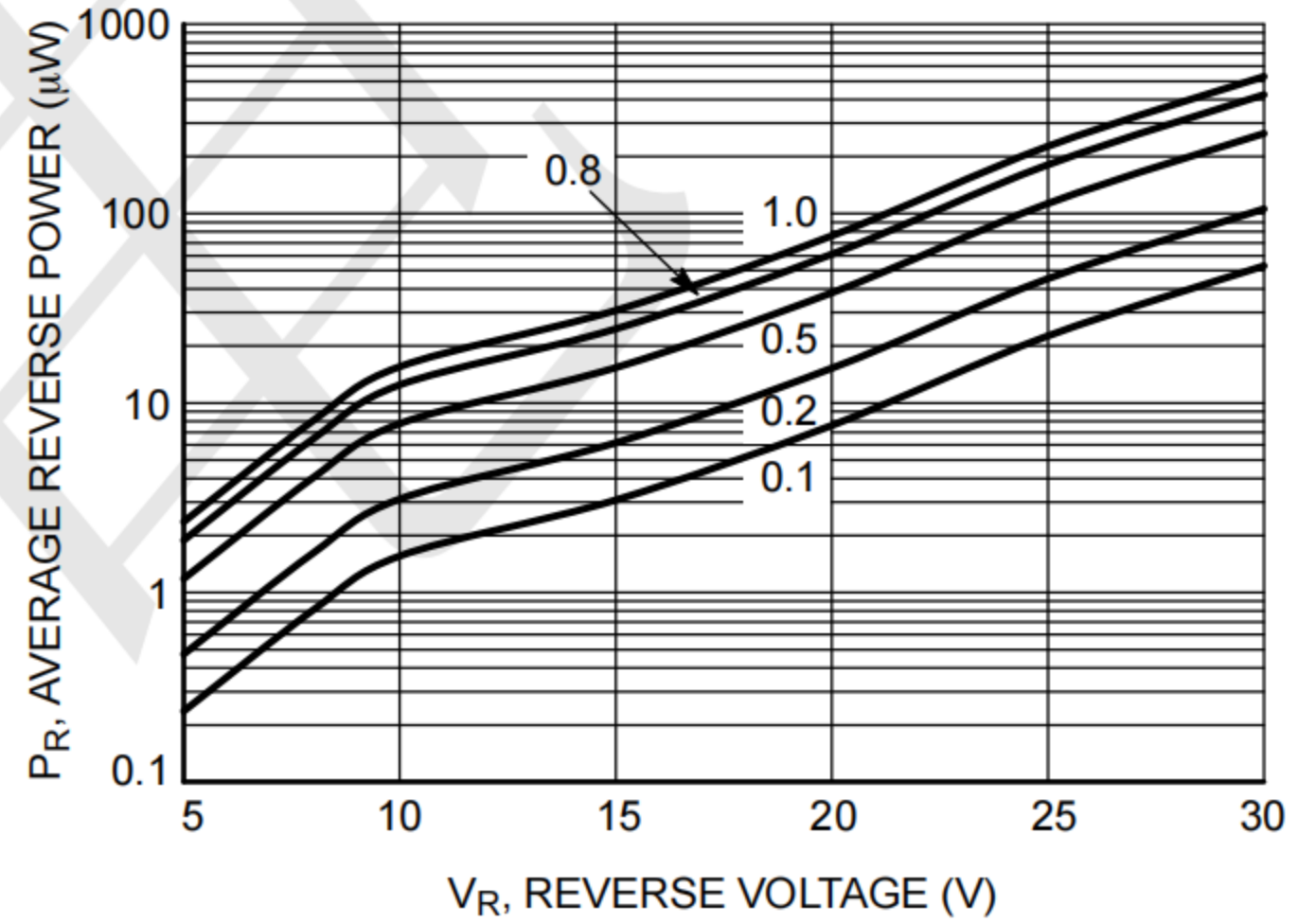
**Figure 5. Forward Voltage**



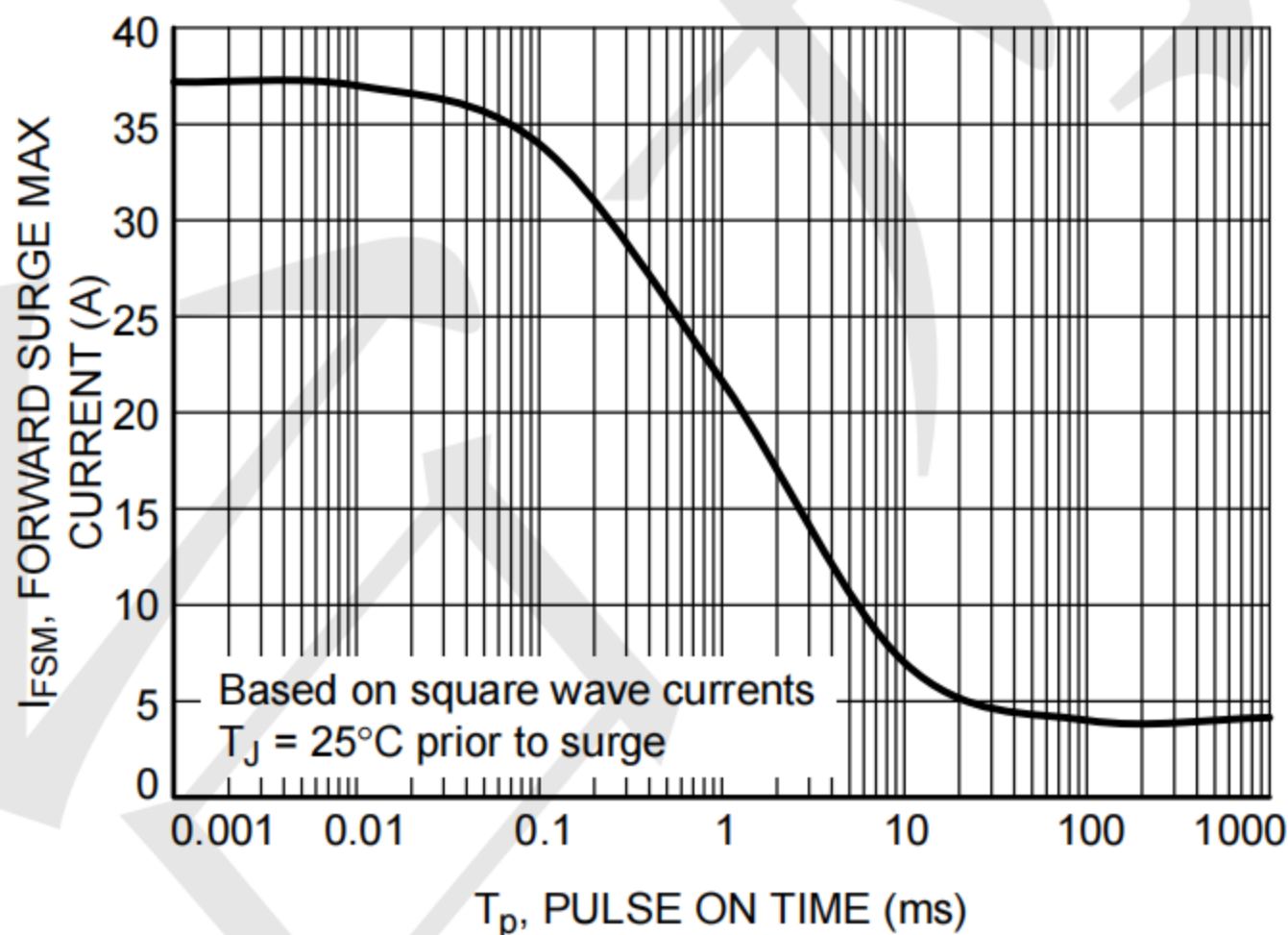
**Figure 6. Leakage Current**



**Figure 7. Average Forward Power Dissipation**



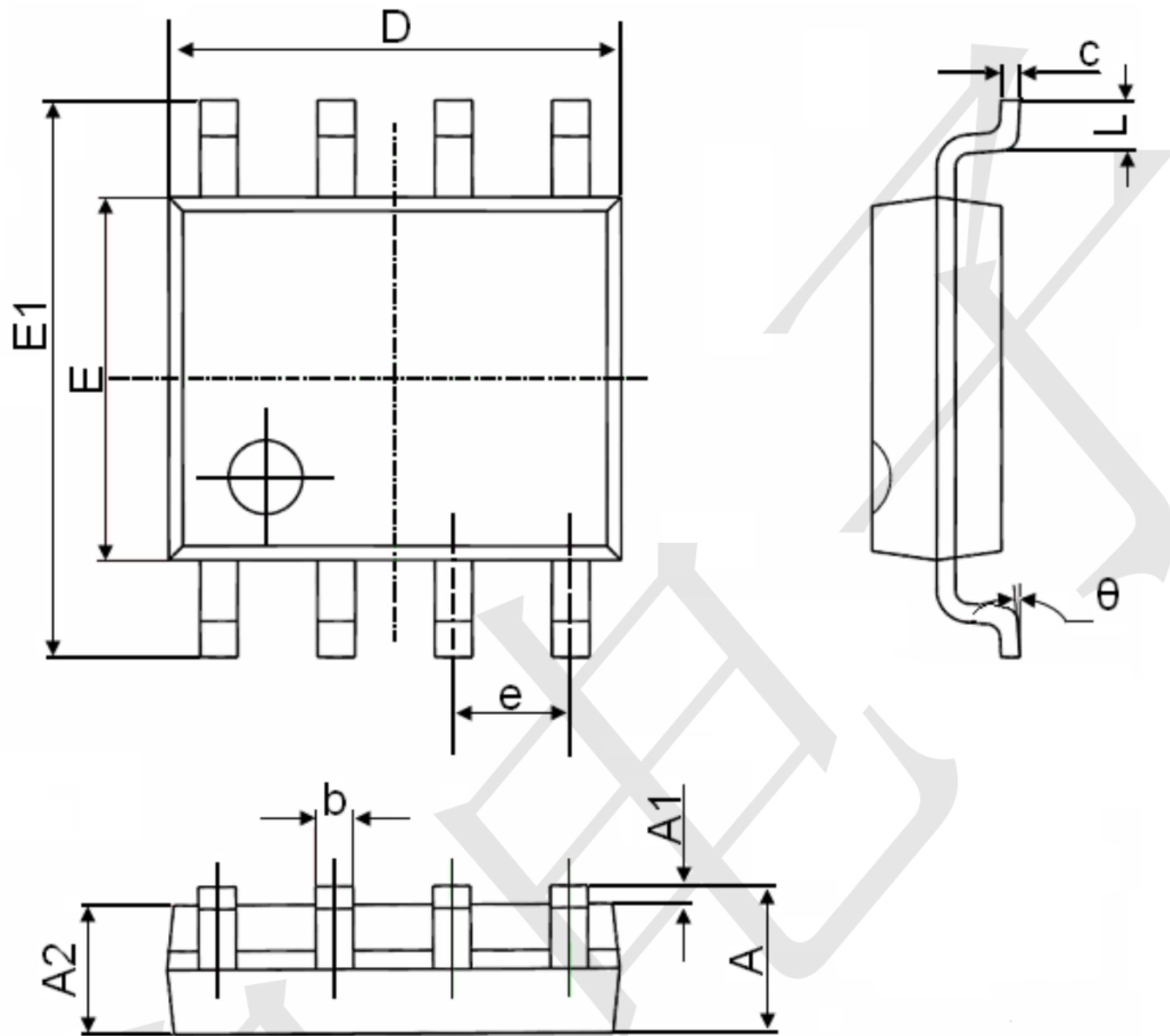
**Figure 8. Average Reverse Power Dissipation**



**Figure 10. Forward Surge Maximum**



SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
$\theta$	0°	8°	0°	8°

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