

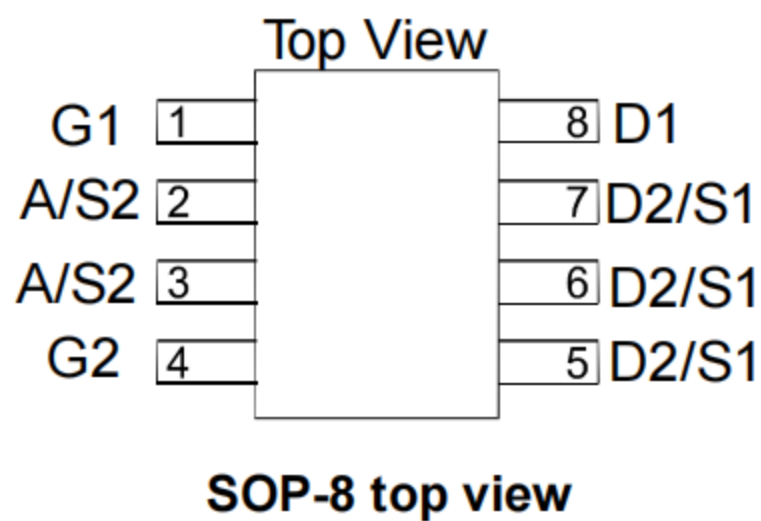
GENERAL FEATURES

- 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
 $V_{ds} = 30V$ $I_F = 2.0A$
 $V_{sd} = 0.5V @ 1.0A$

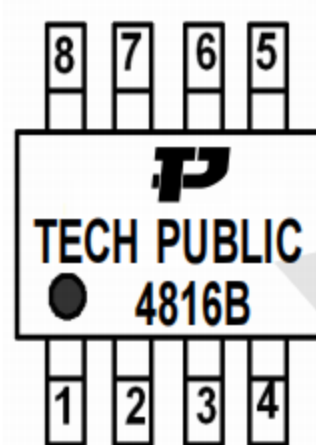
APPLICATIONS

- Synchronous Buck Converter
- Game Machine
- Notebook

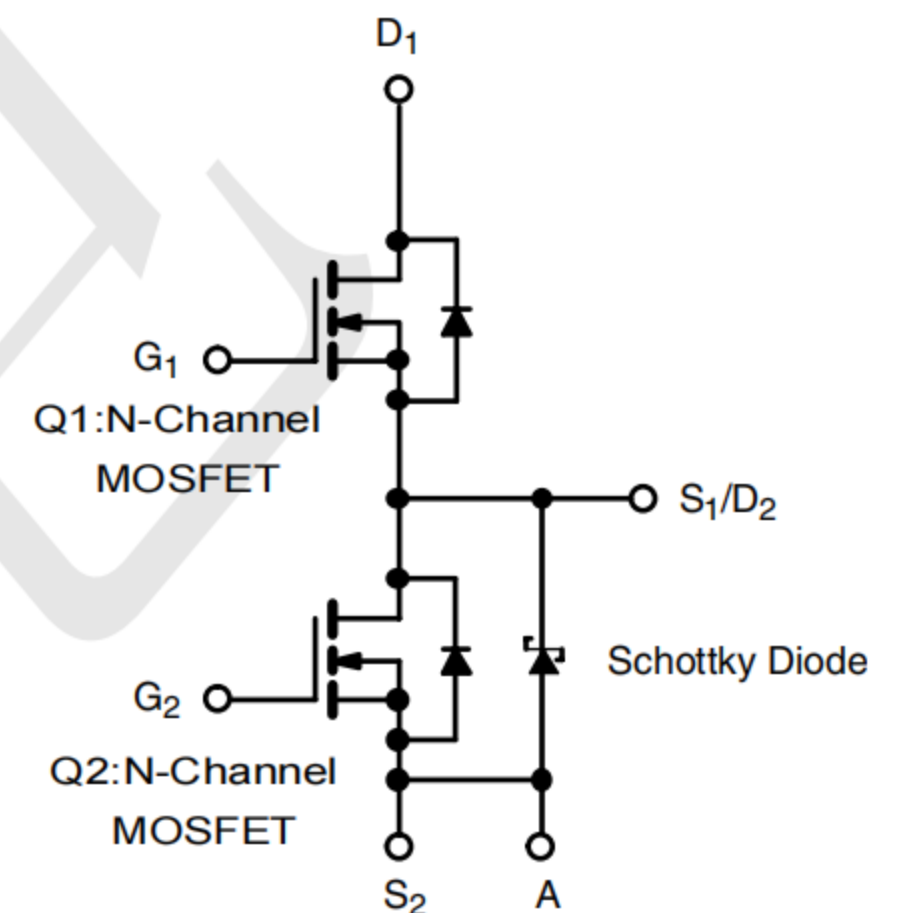
Package and Pin Configuration



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	± 20	± 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_j=25°C unless otherwise noted)

Q1 N-Channel MOSFET

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



Electrical Characteristics (T_j=25°C unless otherwise noted)

Q2 N-Channel MOSFET

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

Electrical Characteristics (T_j=25°C unless otherwise noted)

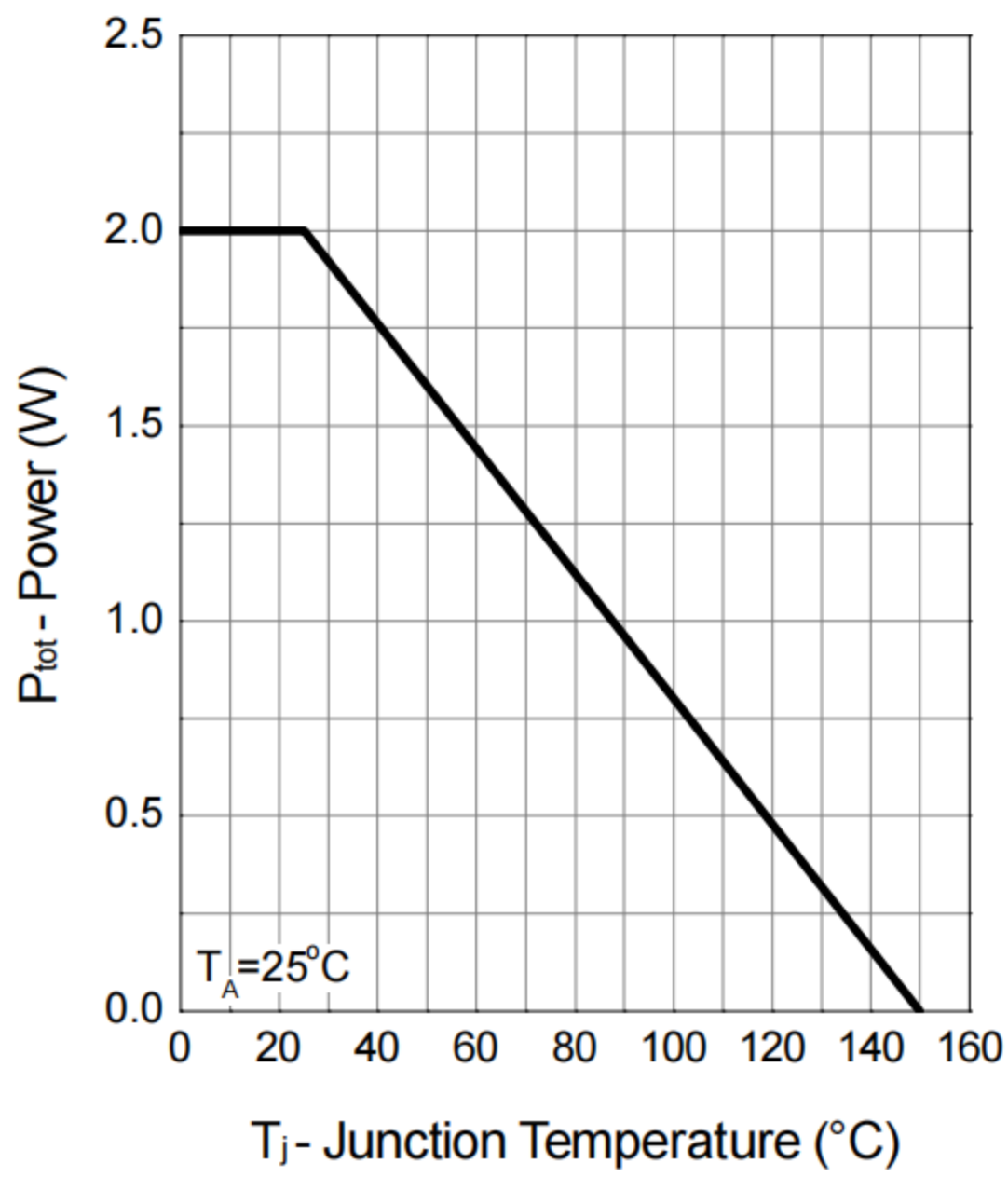
Schottky Diode

Symbol	TECH PUBLIC Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{BR} ^a	Reverse Breakdown Voltage	I _r =100uA	30	-	-	V
V _f	Forward Voltage	I _F =1.0A T _A = 25°C	-	0.48	0.5	V
		I _F =1.0A T _A = 125°C			0.42	
I _r	Leakage Current	V _r =30V T _A = 25°C	-	10	100	uA
C _t	Total Capacitance	V _r = 10V, f = 1.0MHz	-	50	-	pF

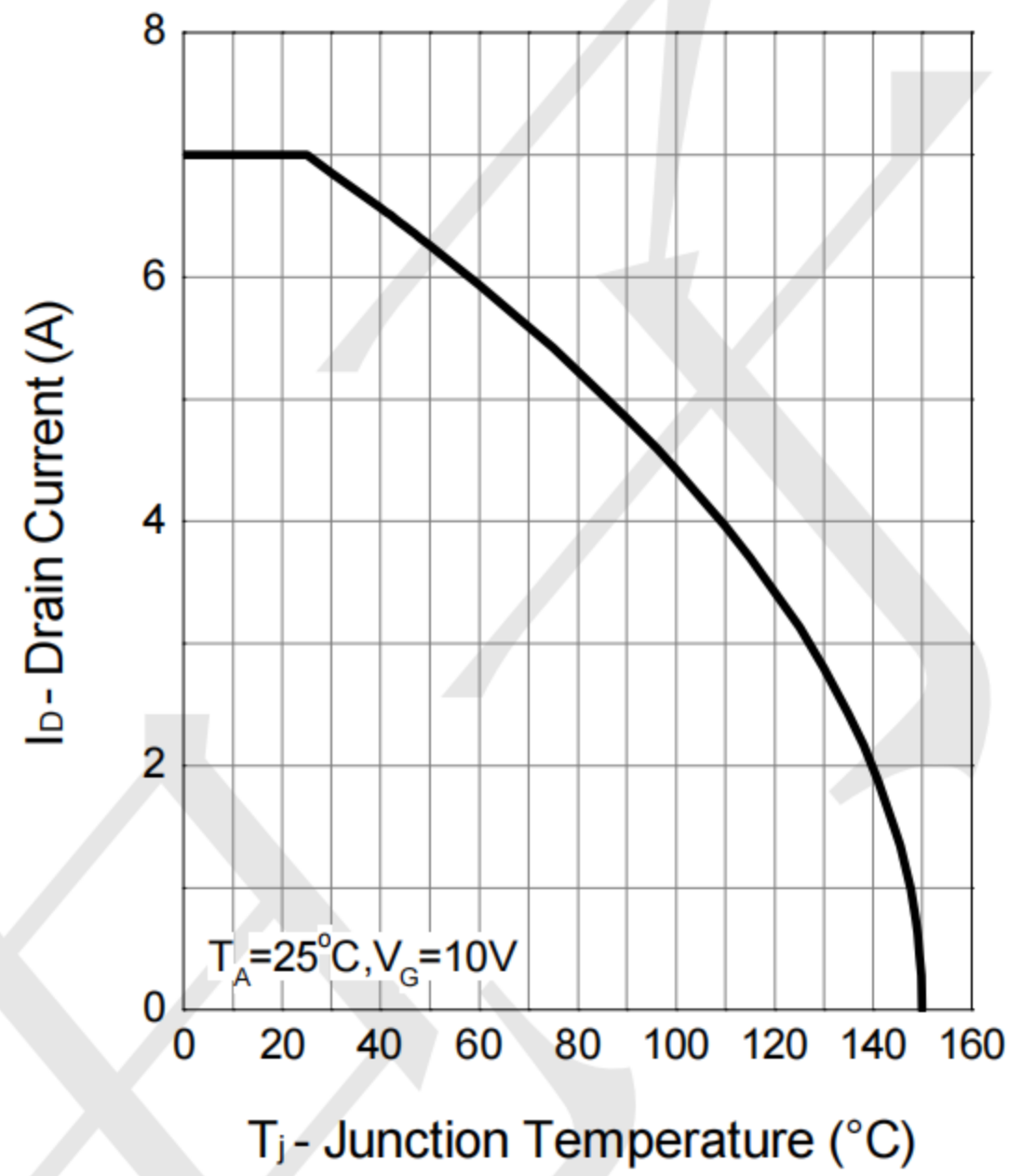
Typical Electrical and Thermal Characteristics

Q1-N-Channel

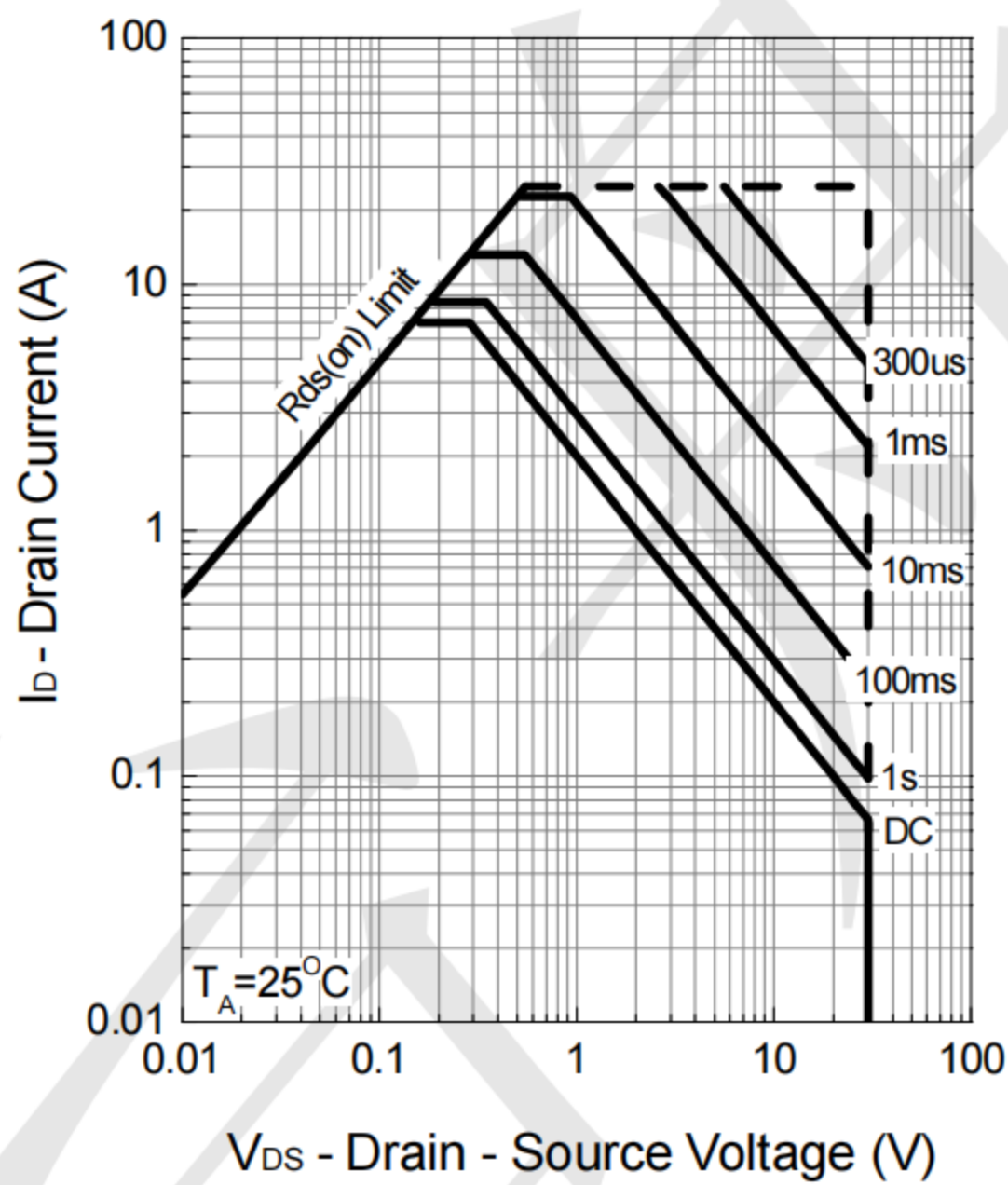
Power Dissipation



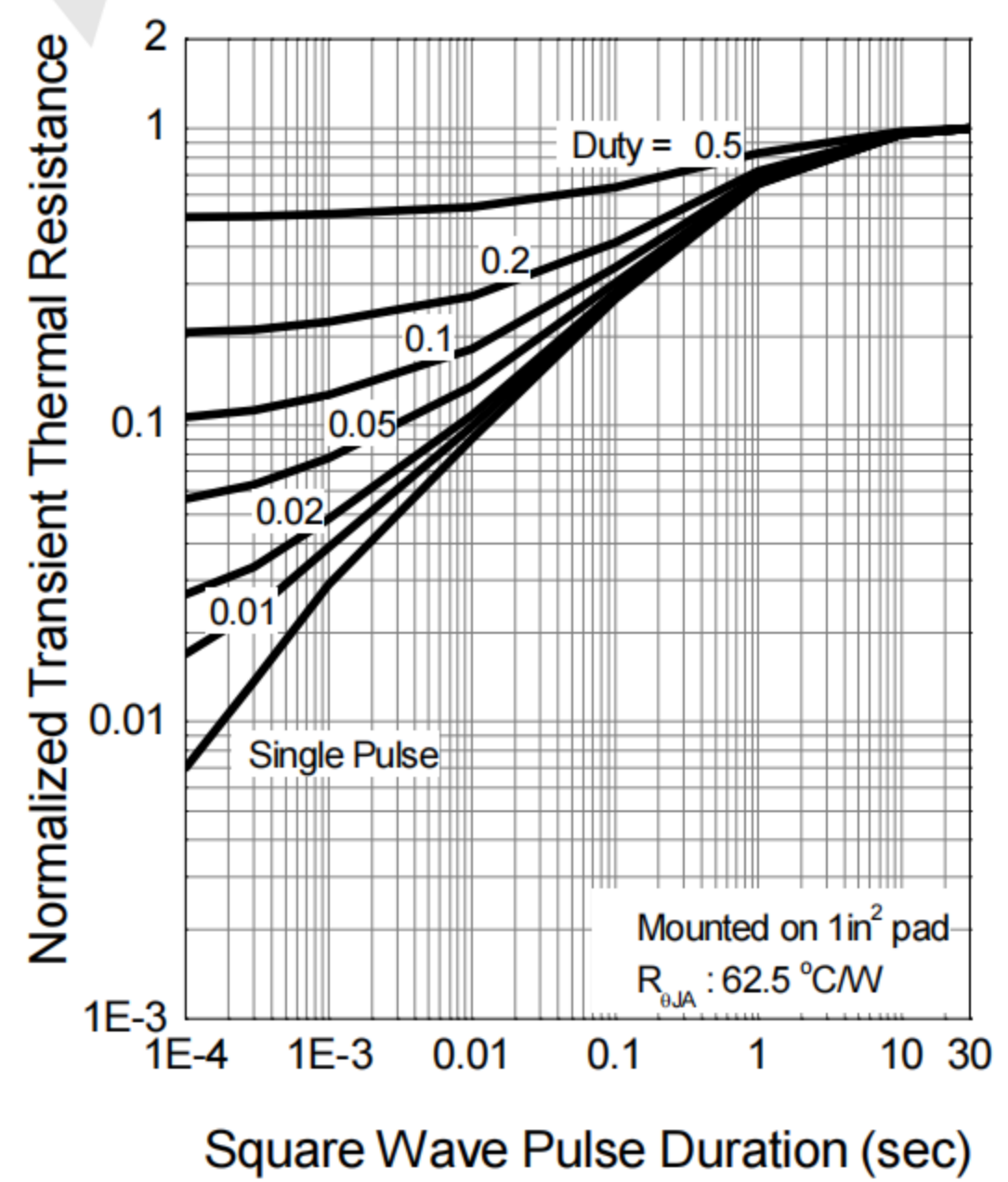
Drain Current



Safe Operation Area

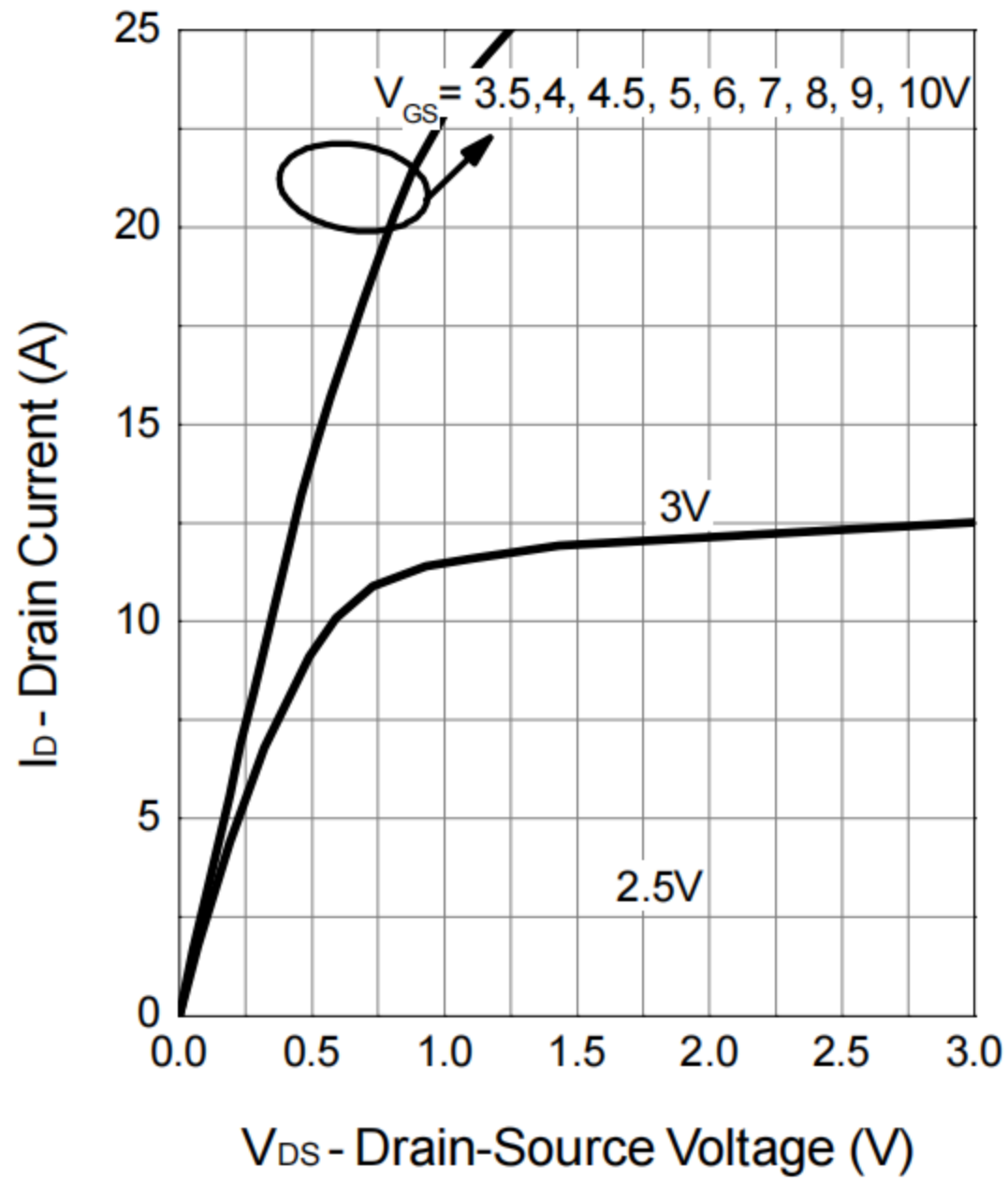


Thermal Transient Impedance

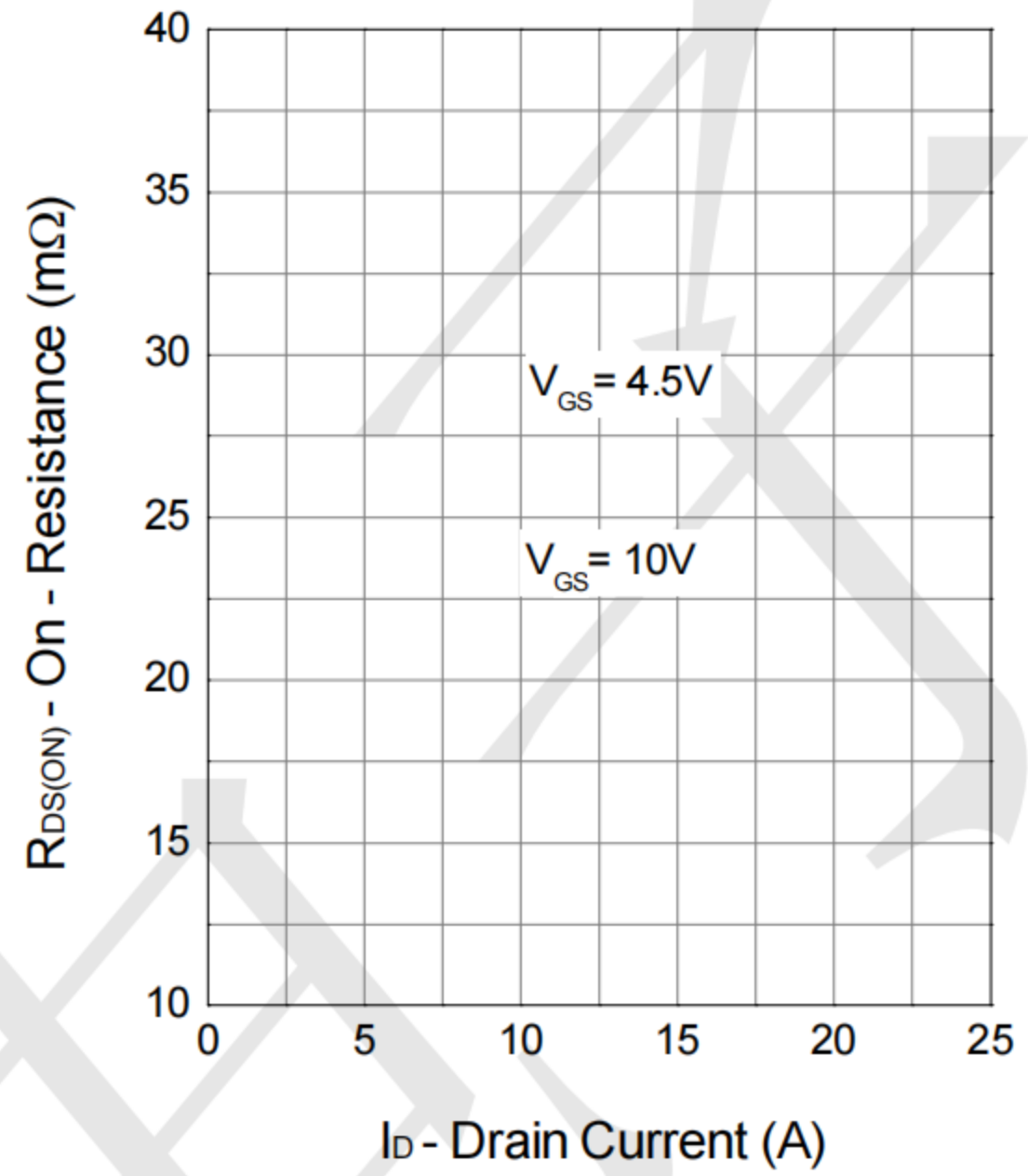


Q1-N-Channel

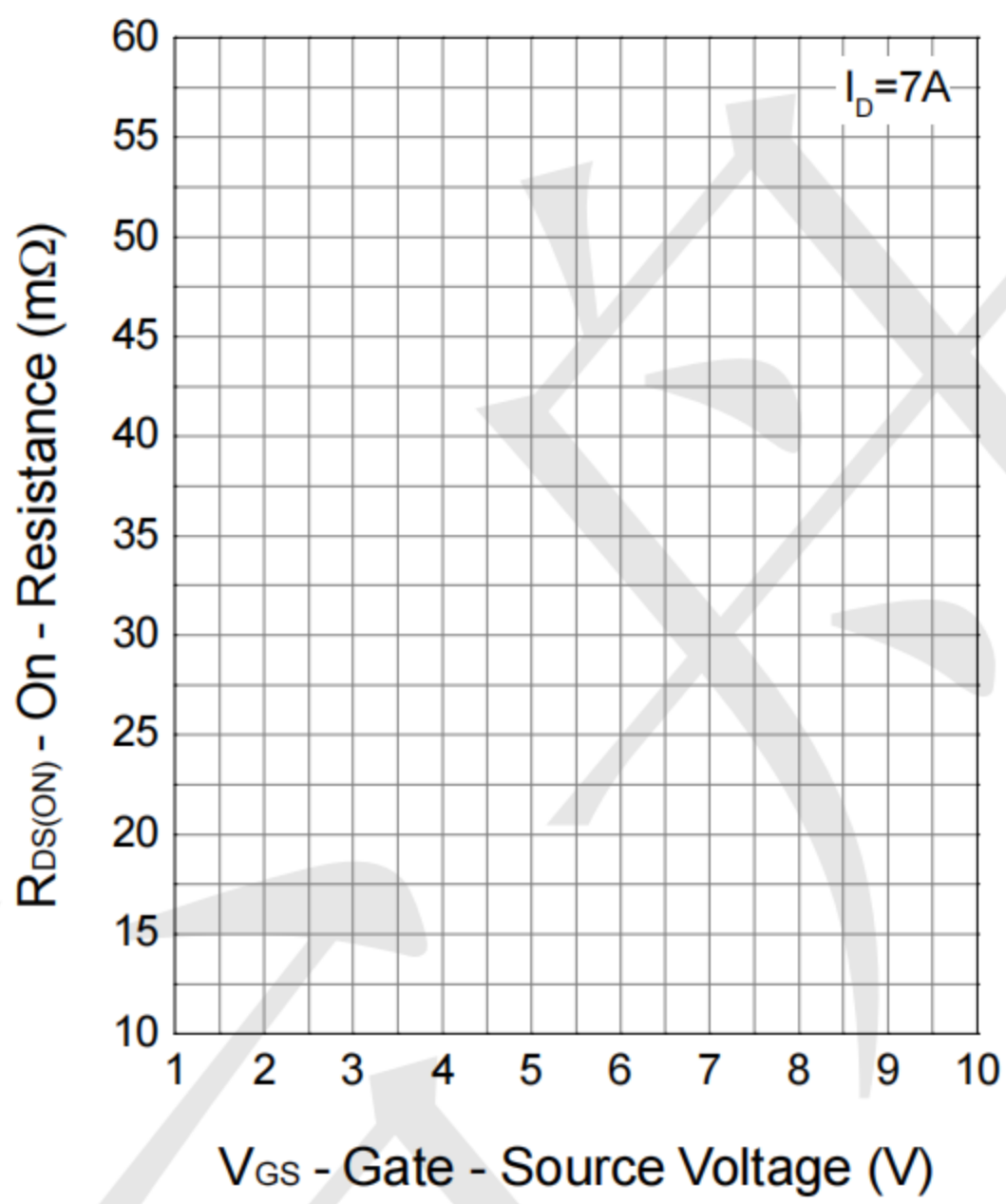
Output Characteristics



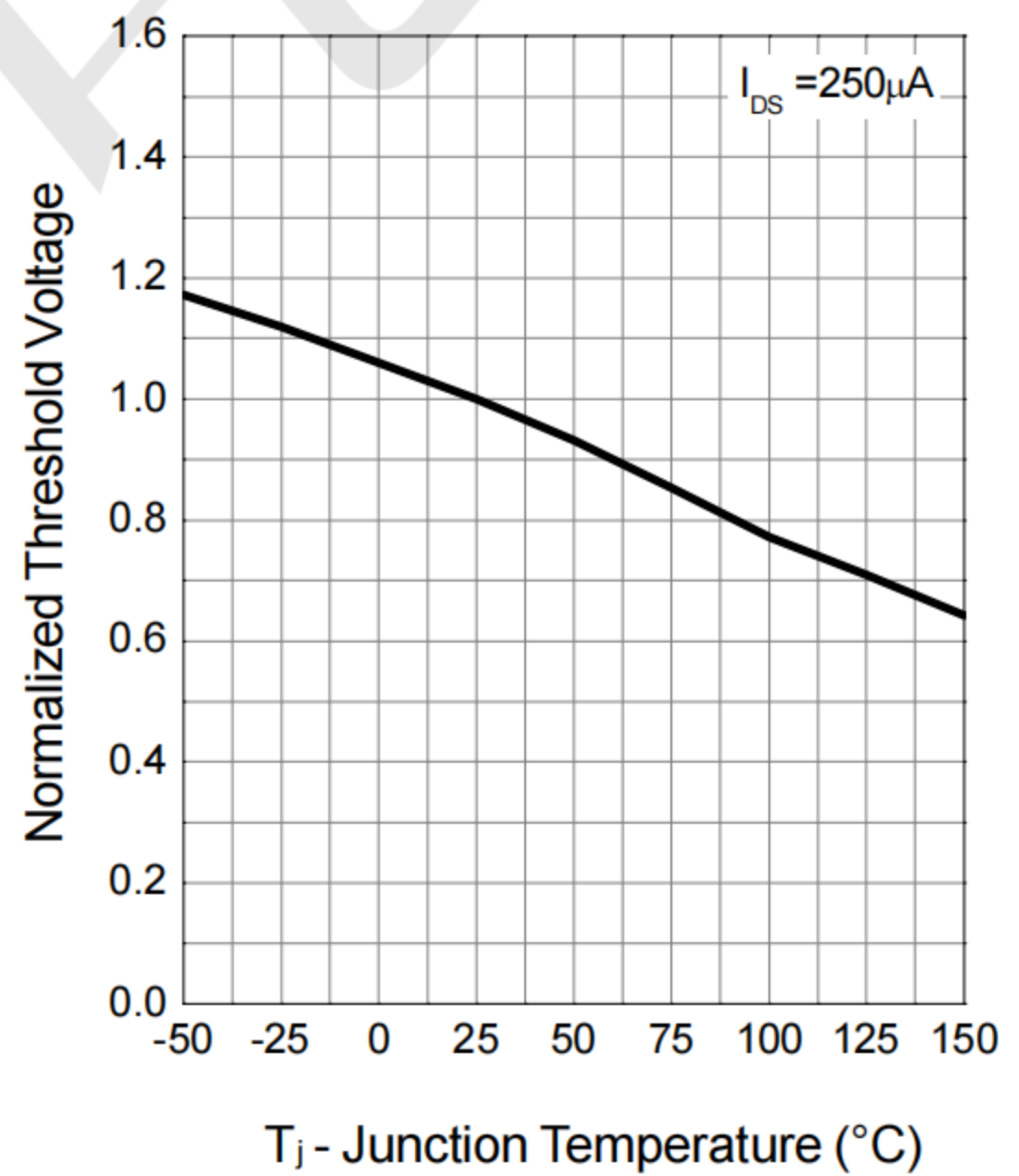
Drain-Source On Resistance



Drain-Source On Resistance

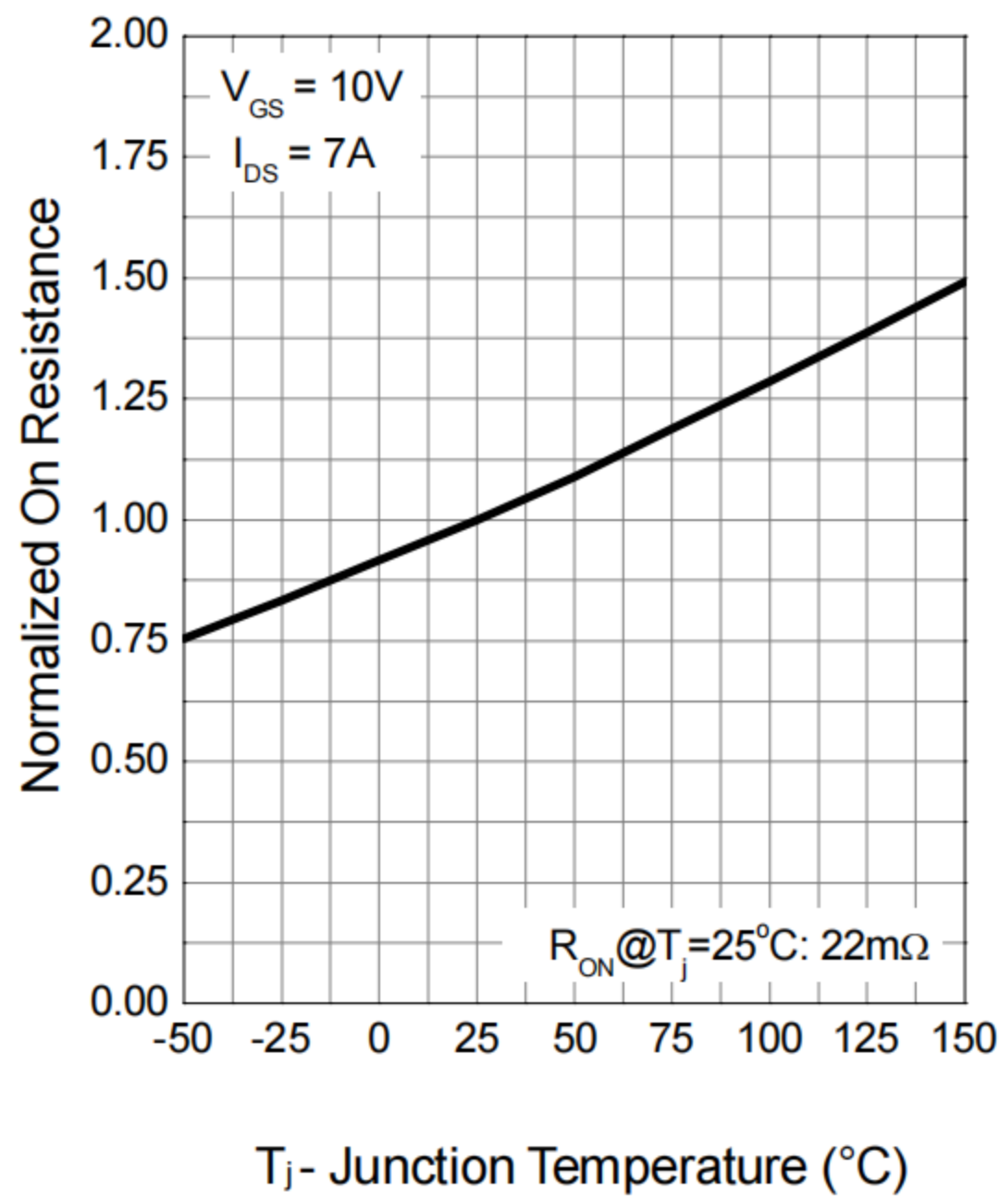


Gate Threshold Voltage

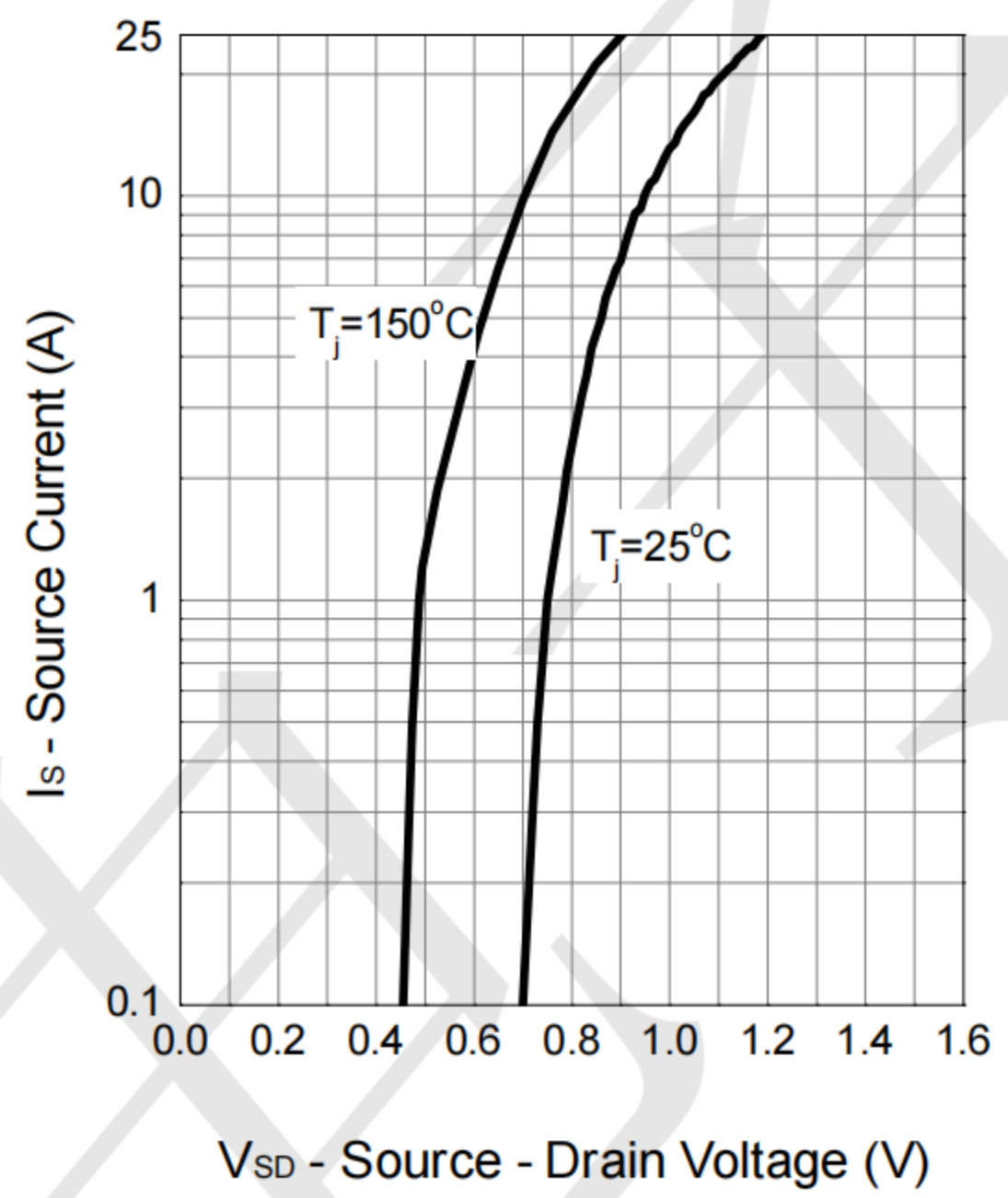


Q1-N-Channel

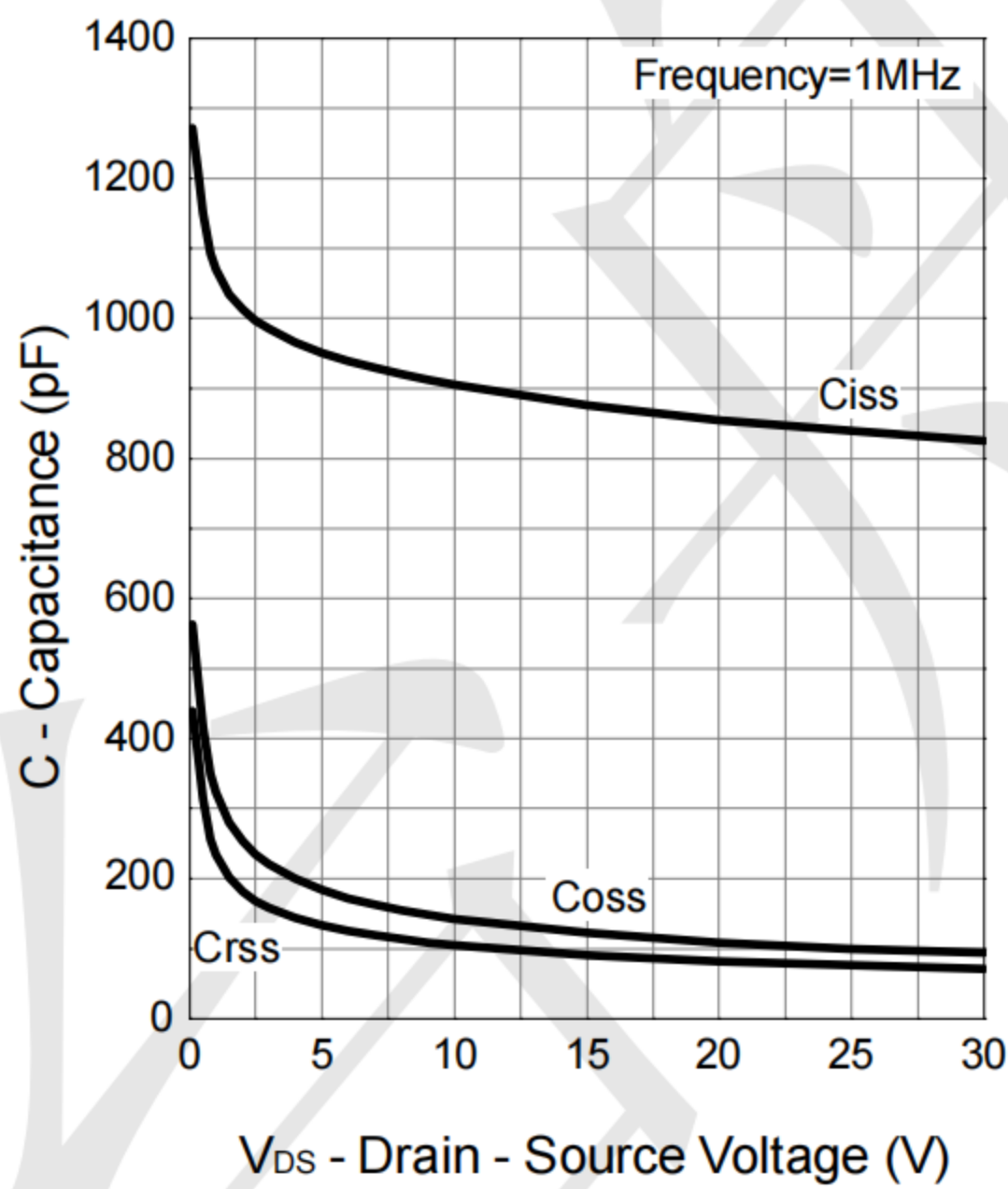
Drain-Source On Resistance



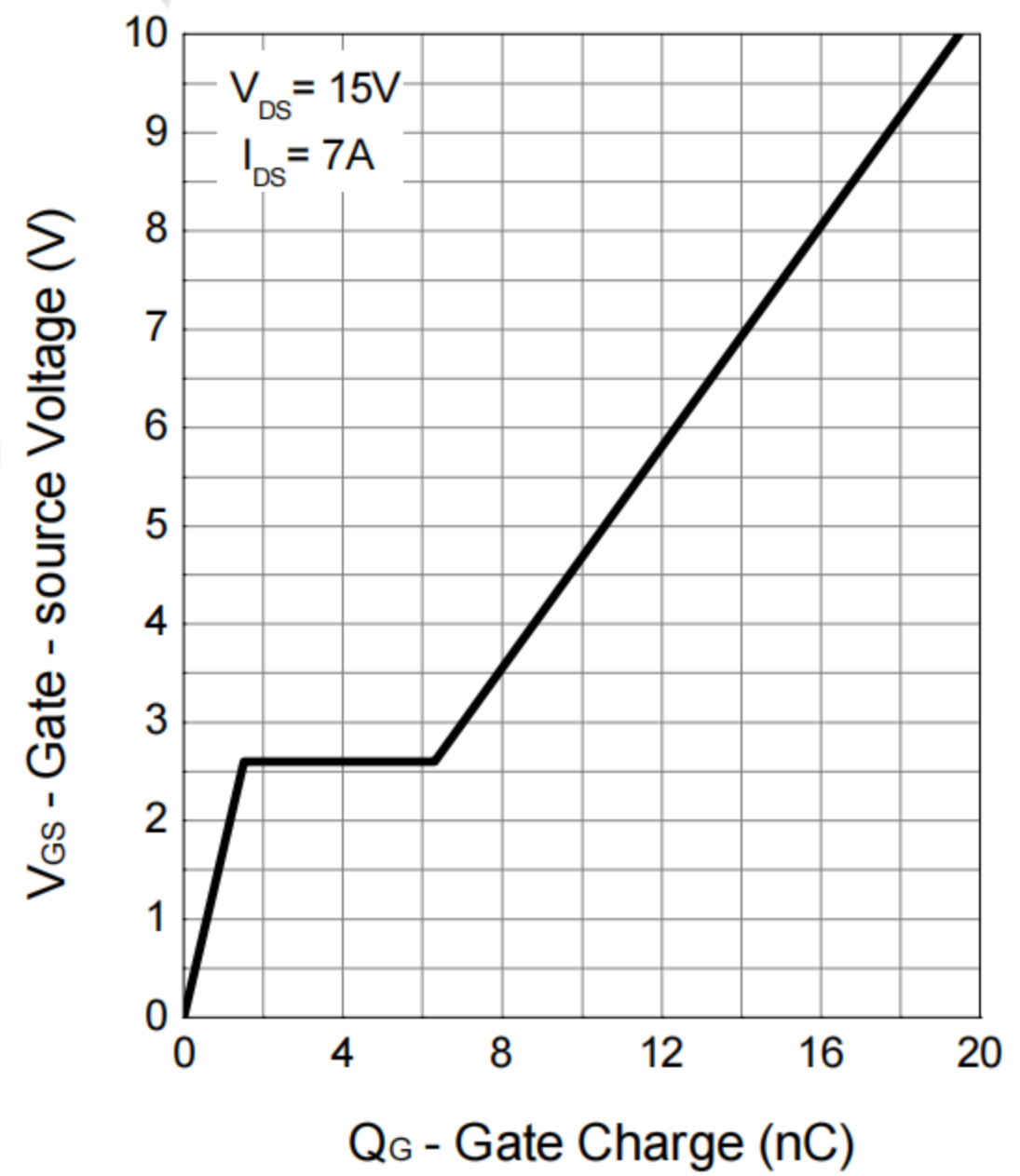
Source-Drain Diode Forward



Capacitance



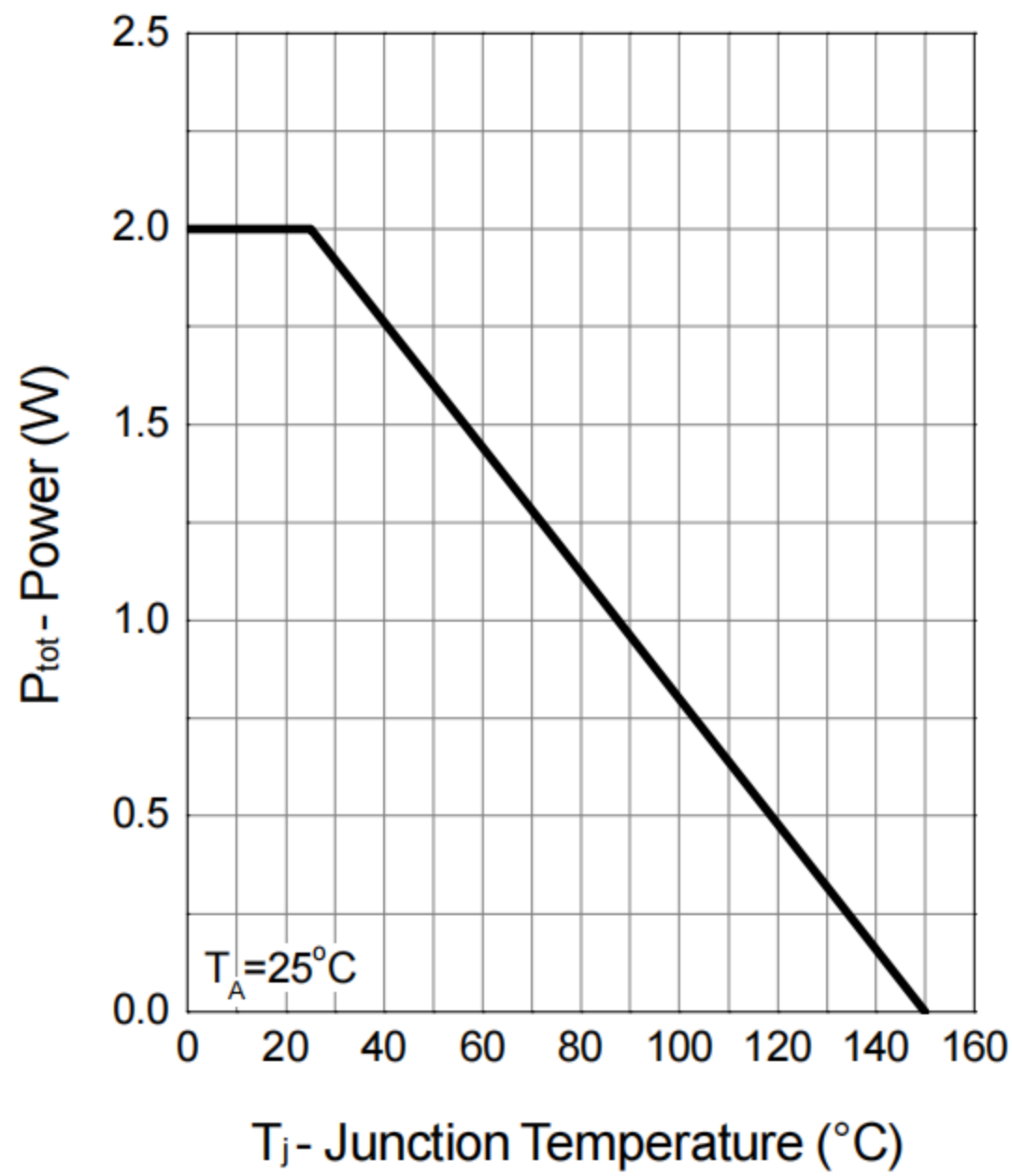
Gate Charge



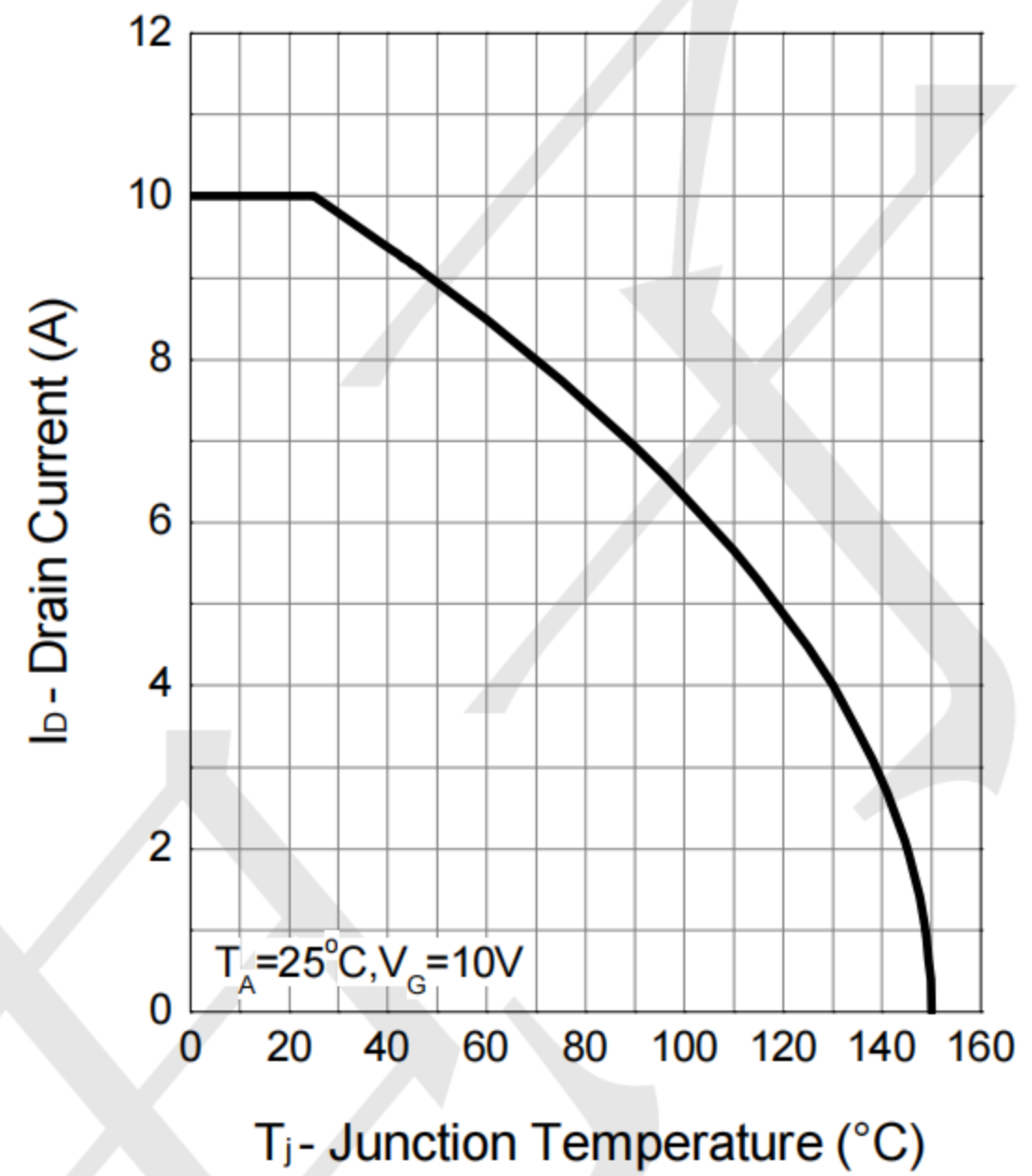
Typical Electrical and Thermal Characteristics

Q2-N-Channel

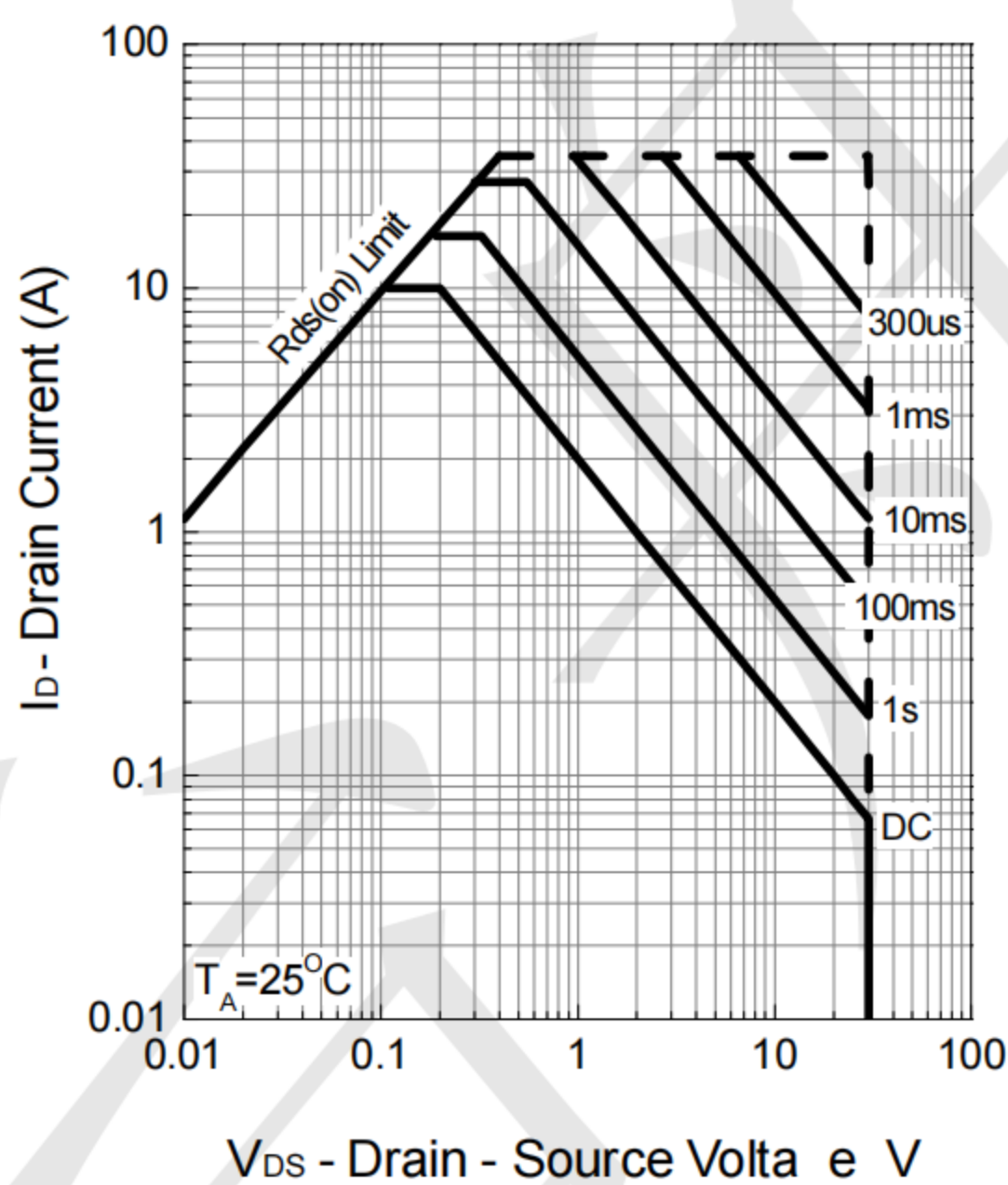
Power Dissipation



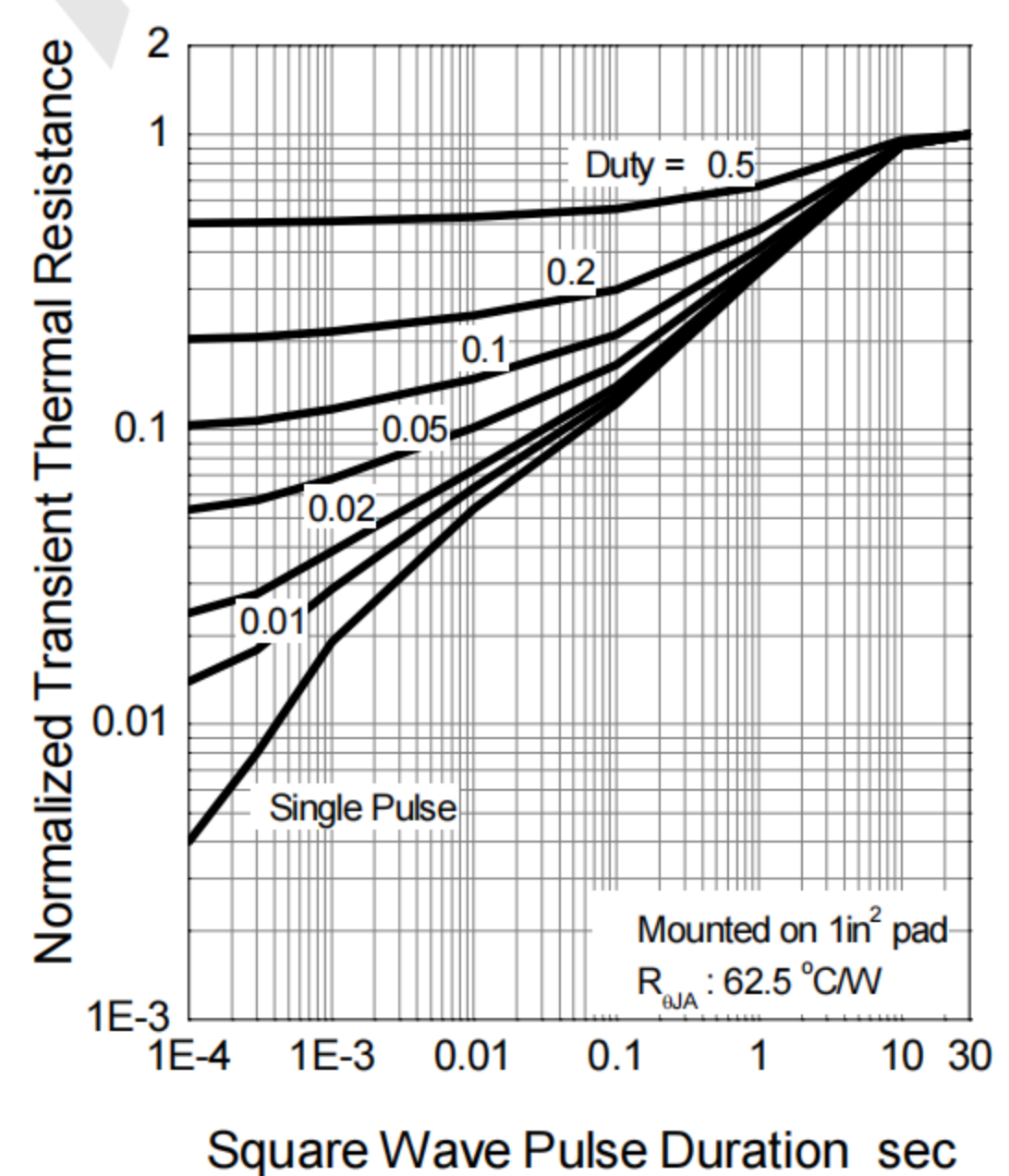
Drain Current



Safe Operation Area

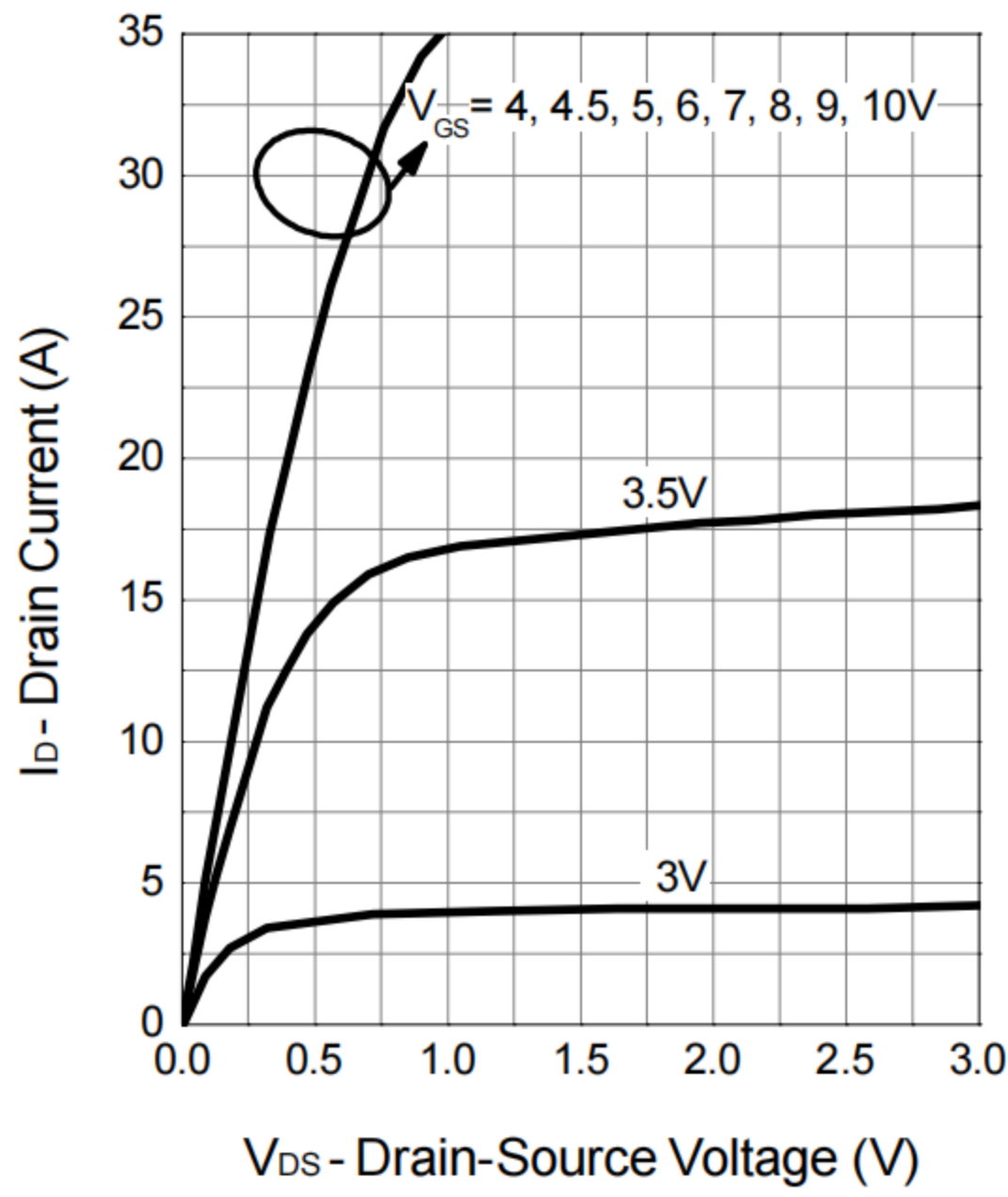


Thermal Transient Impedance

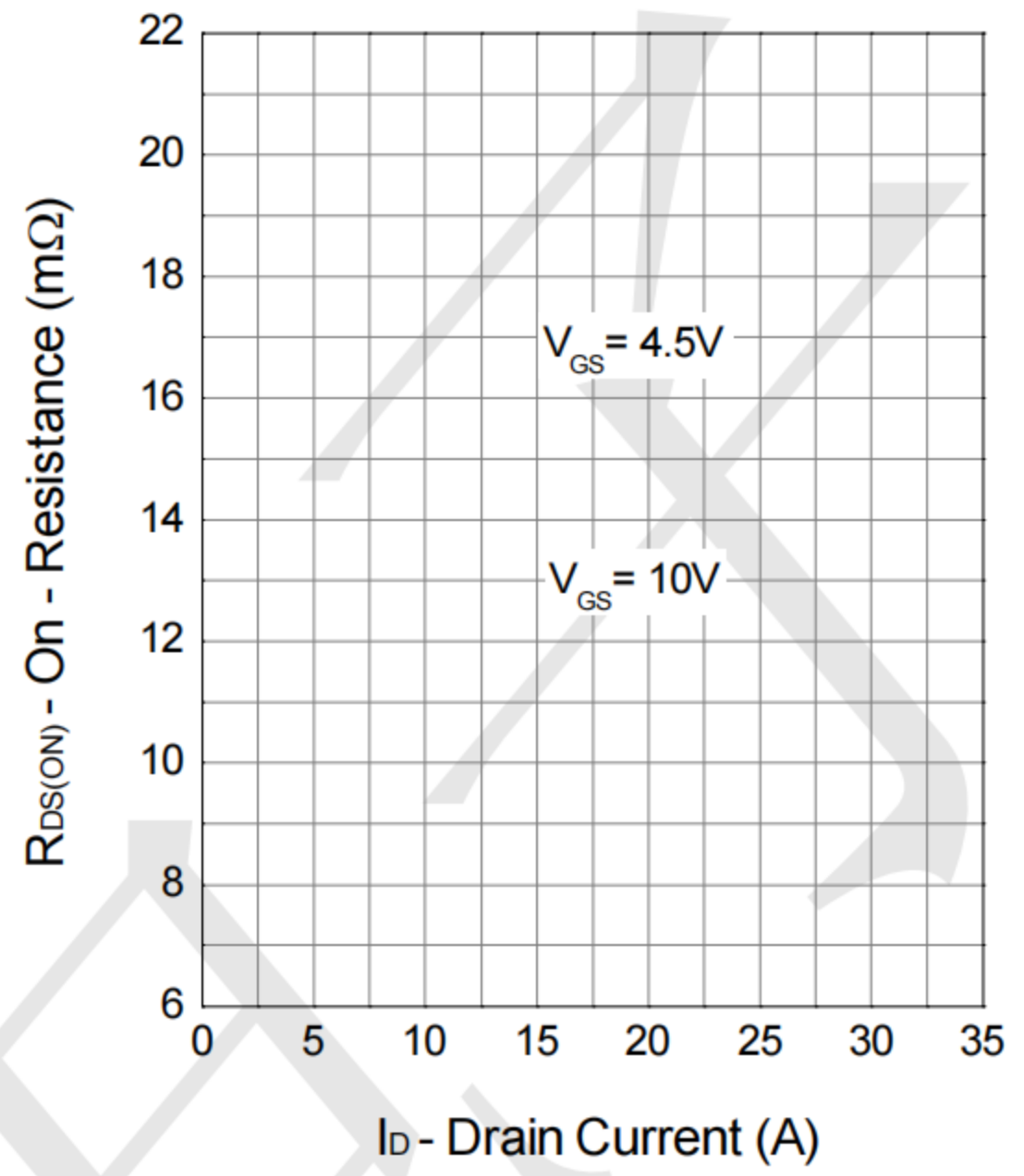


Q2-N-Channel

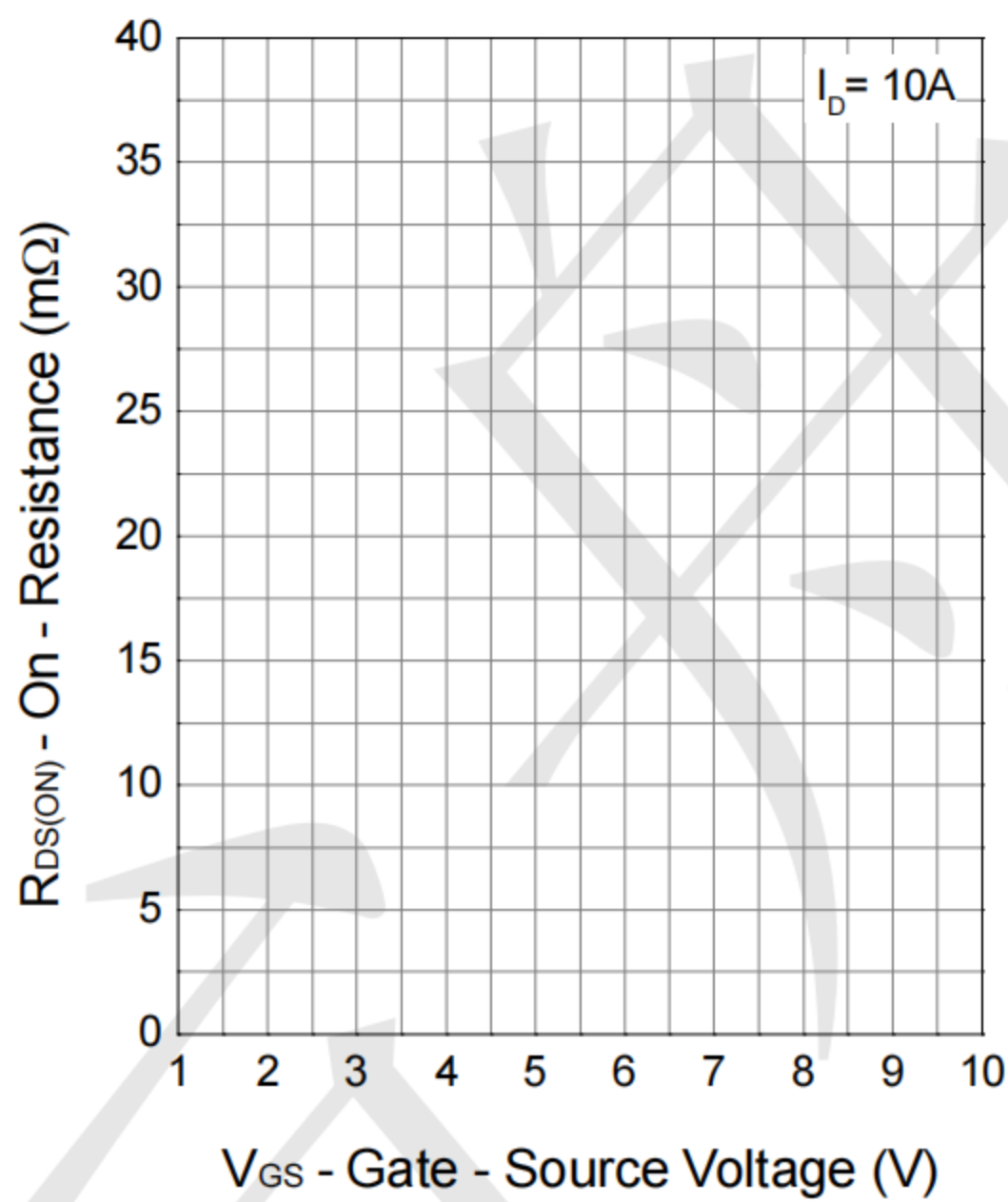
Output Characteristics



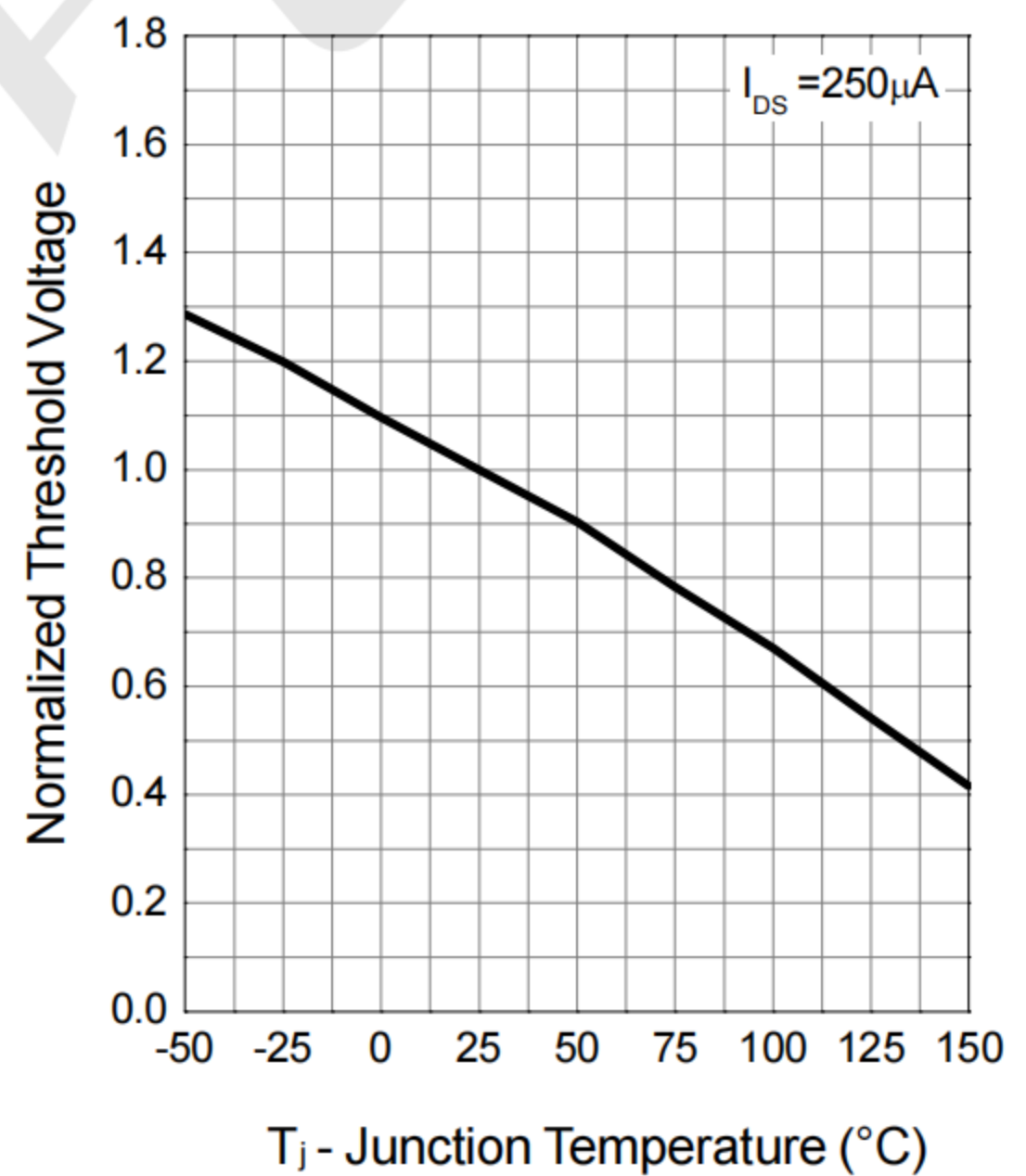
Drain-Source On Resistance



Drain-Source On Resistance

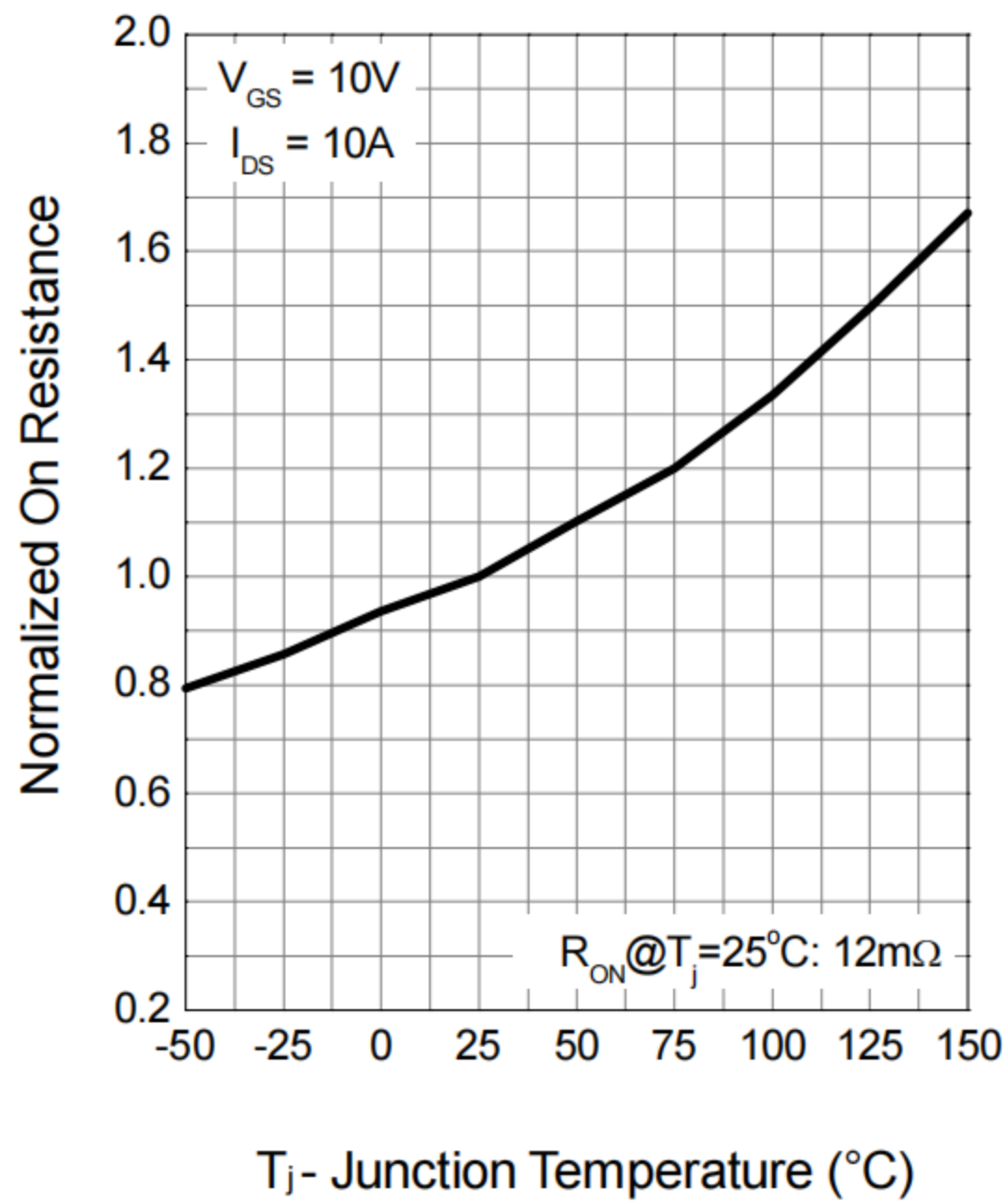


Gate Threshold Voltage

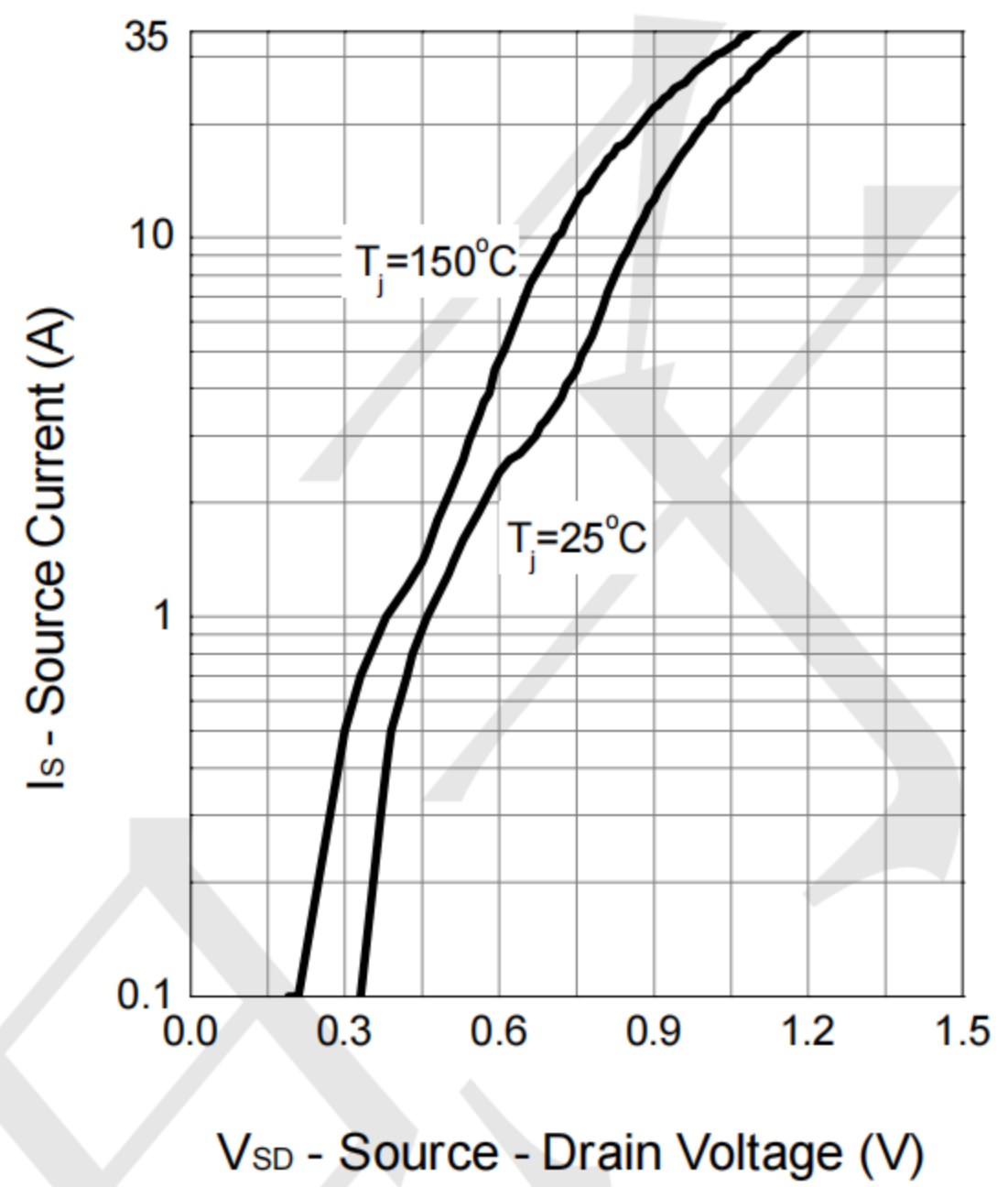


Q2-N-Channel

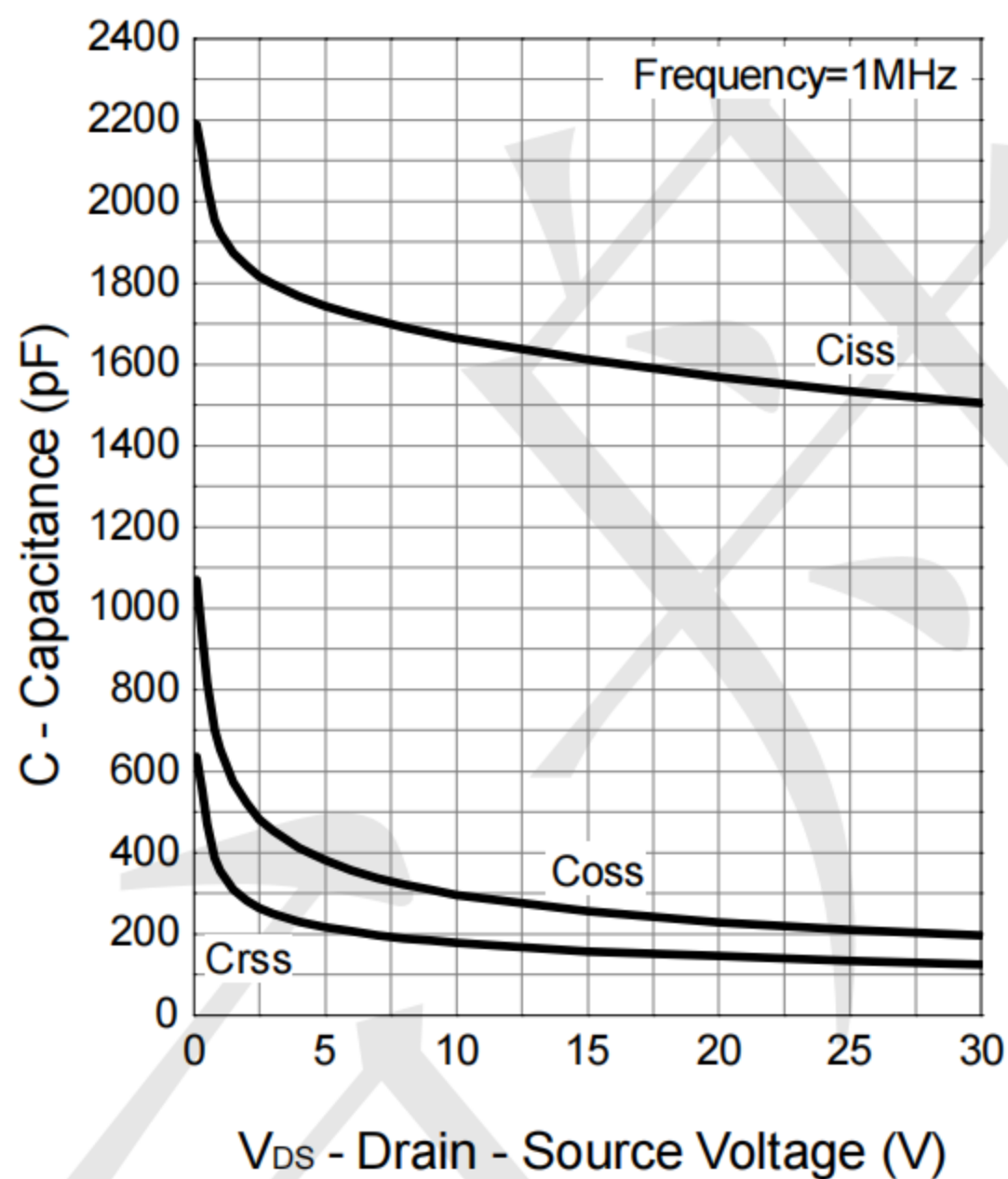
Drain-Source On Resistance



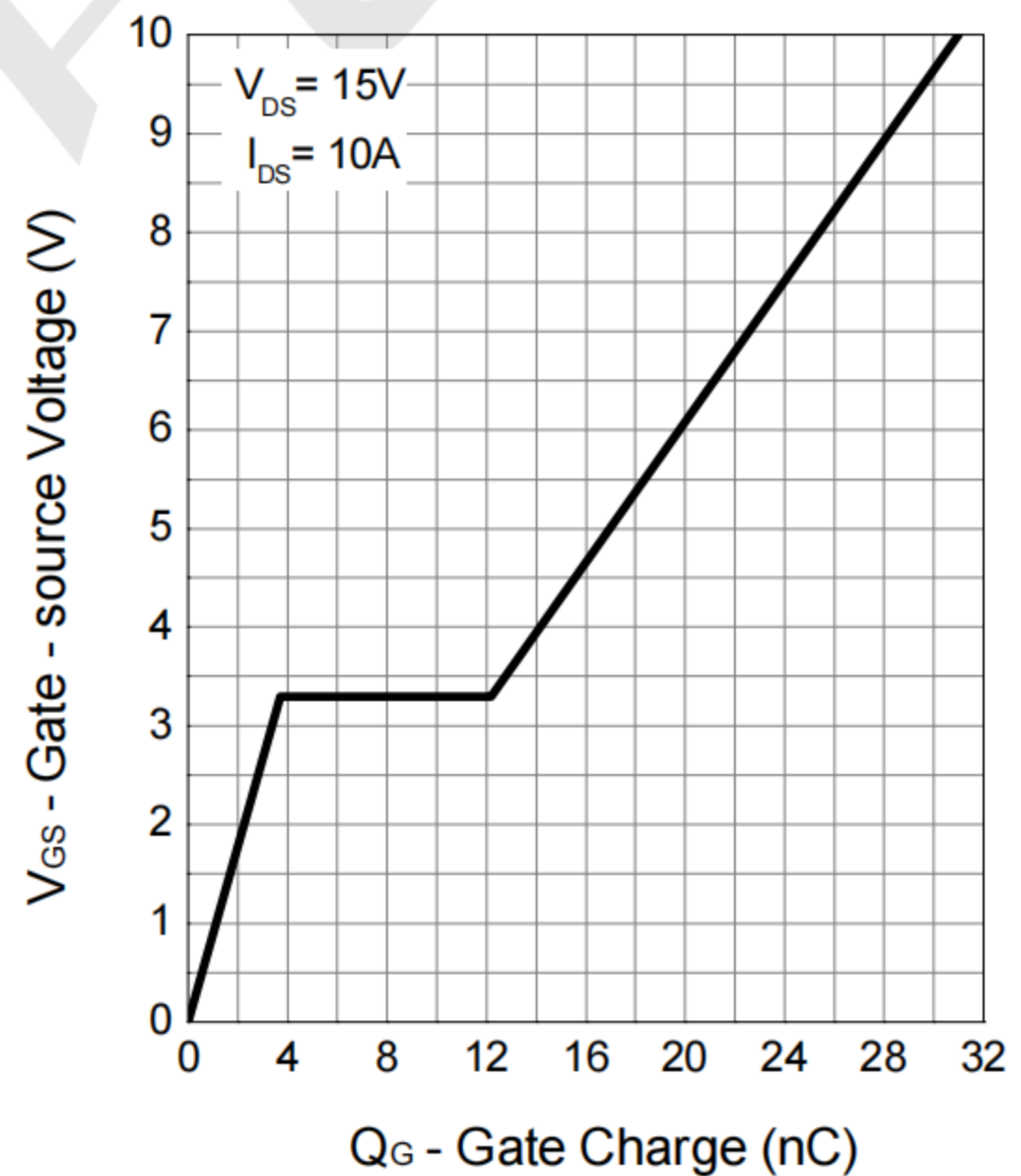
Source-Drain Diode Forward



Capacitance



Gate Charge



**Typical Electrical and Thermal Characteristics
Schottky Diode**

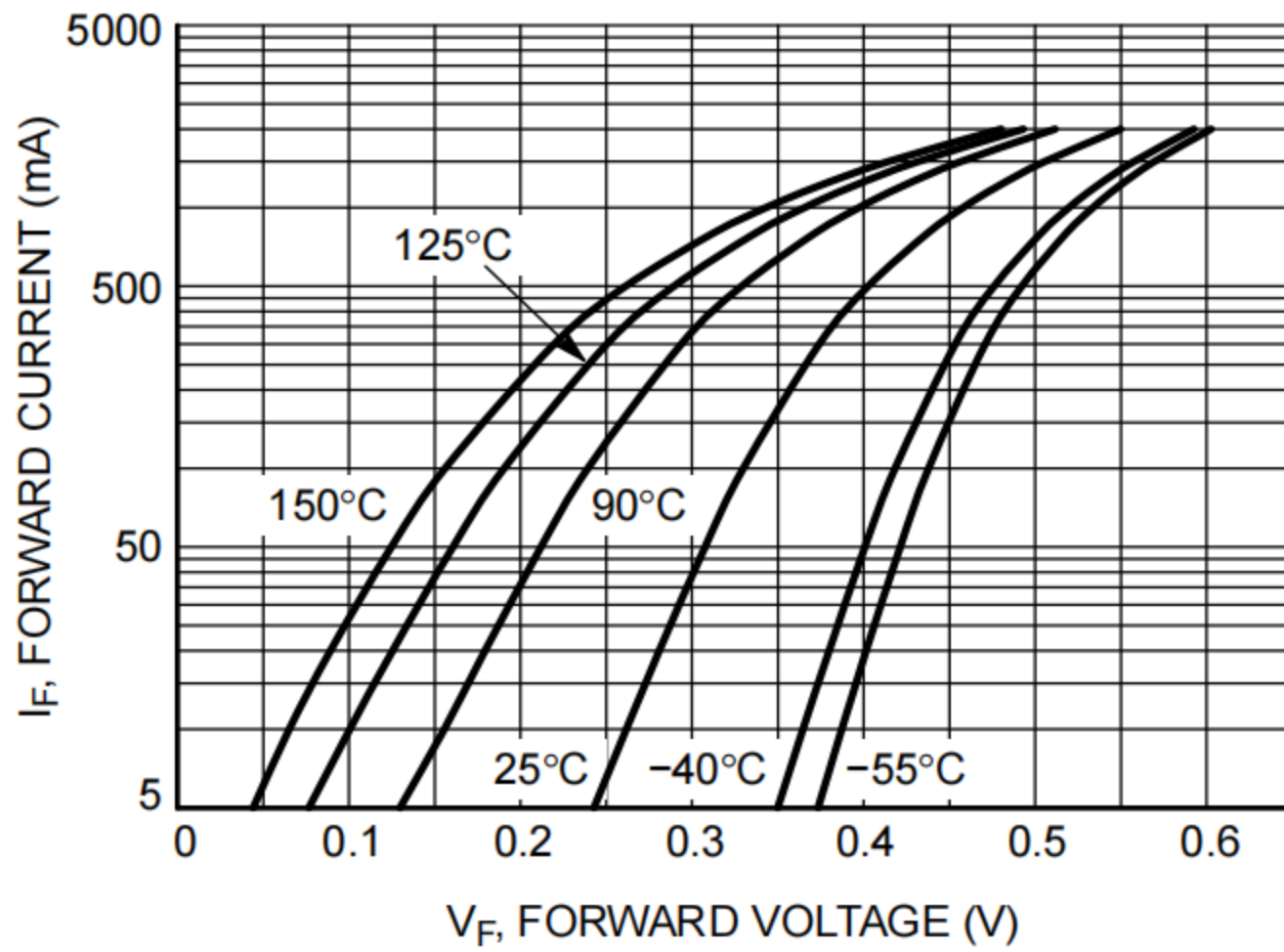


Figure 5. Forward Voltage

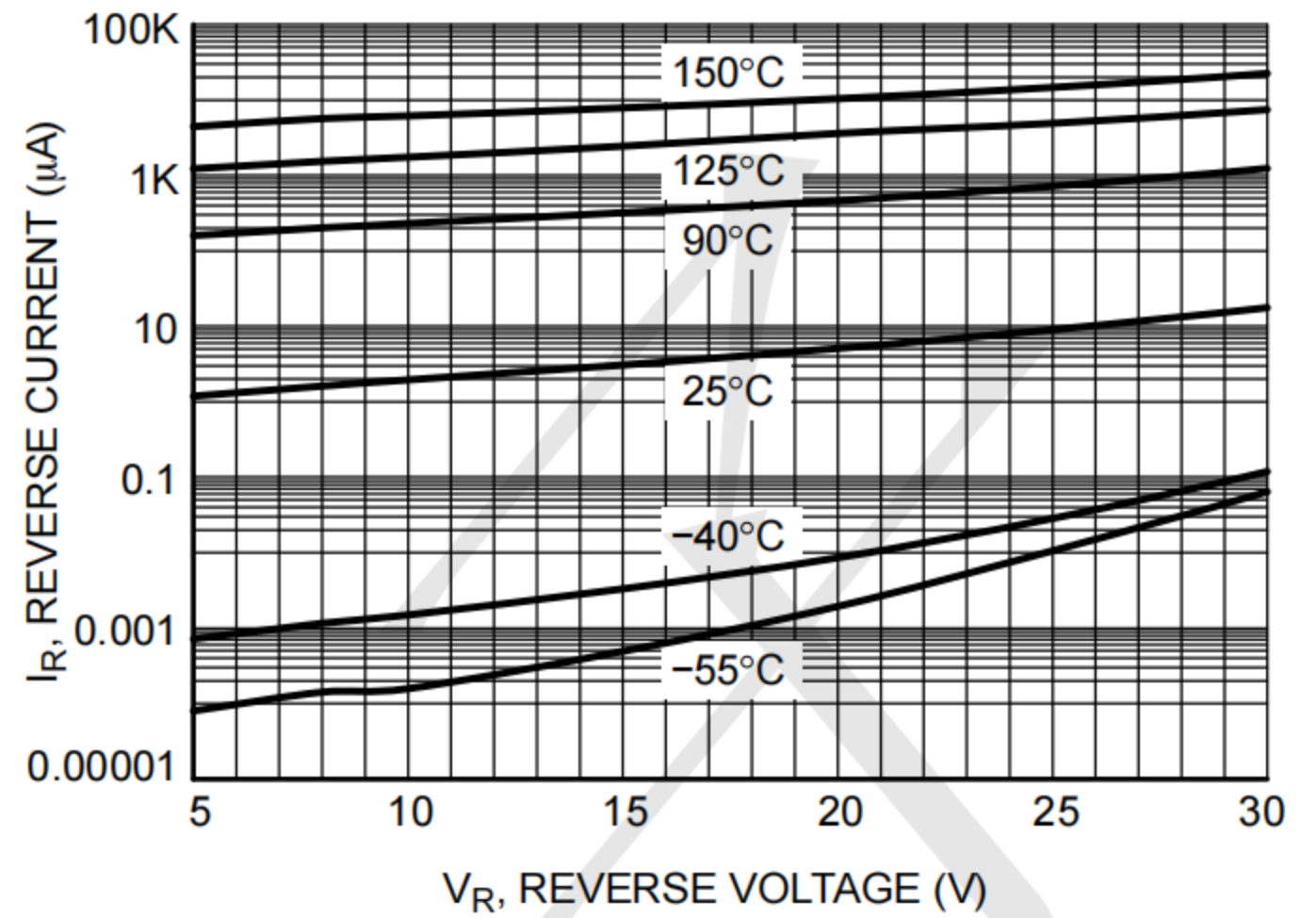


Figure 6. Leakage Current

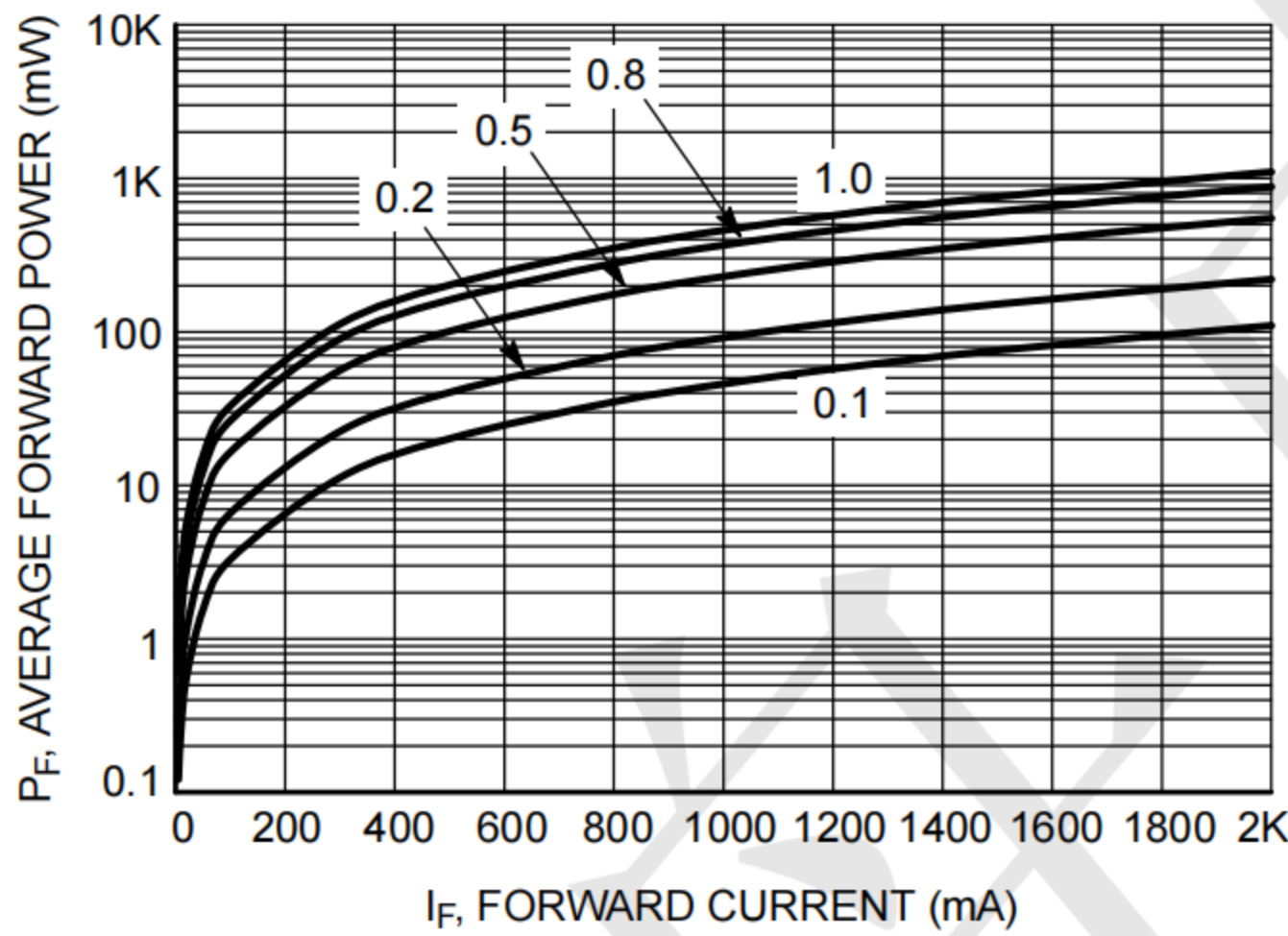


Figure 7. Average Forward Power Dissipation

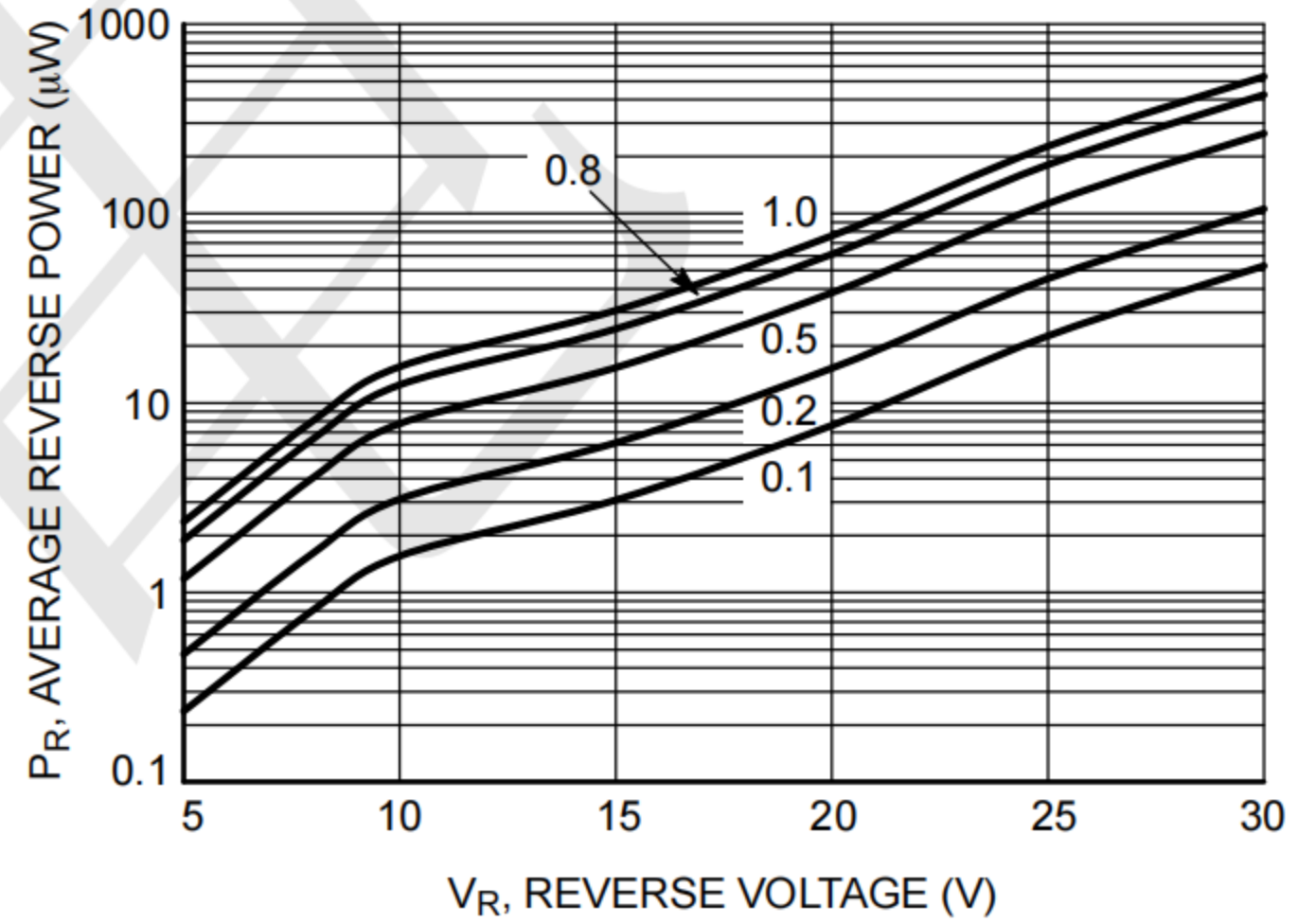


Figure 8. Average Reverse Power Dissipation

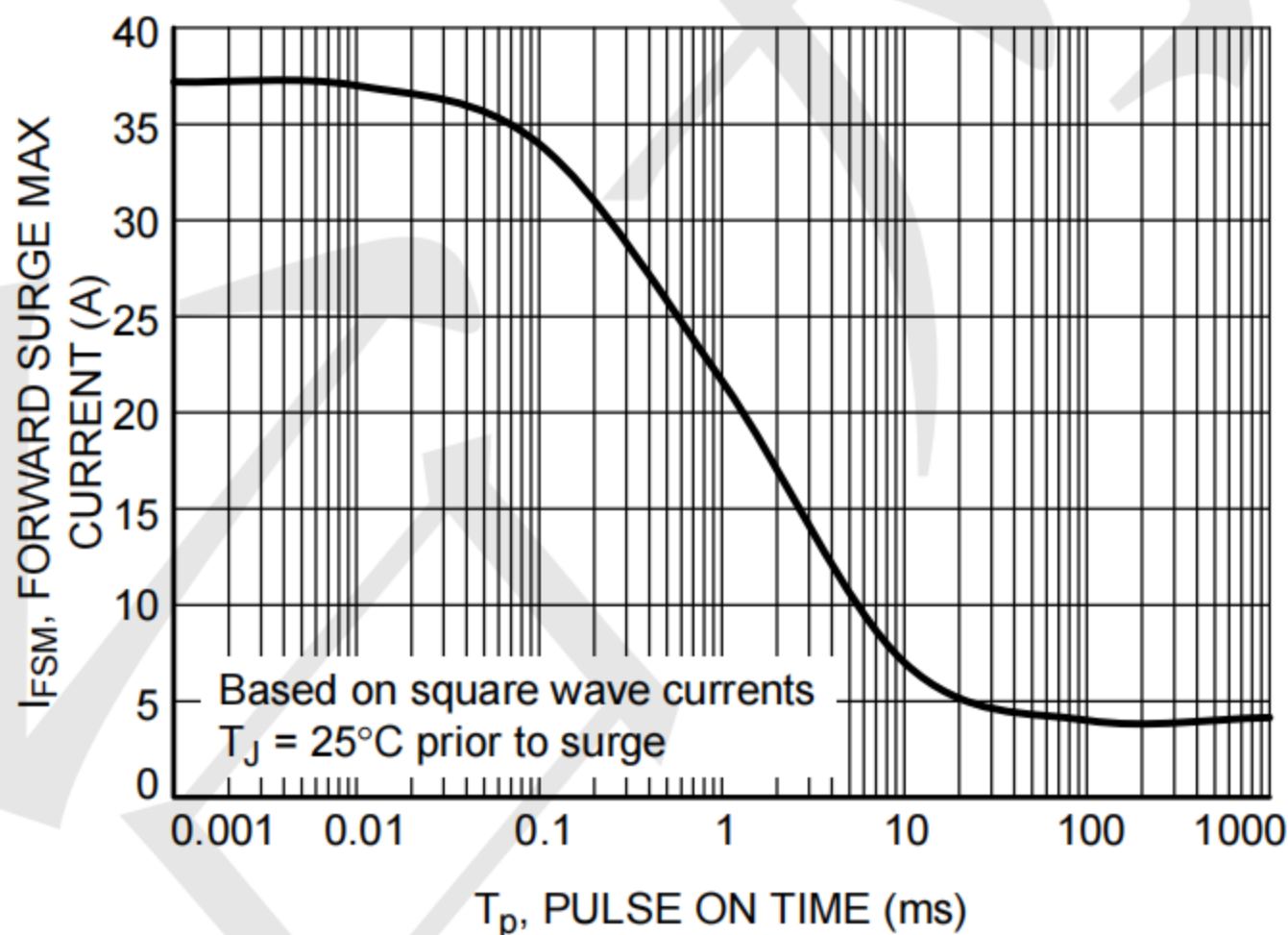
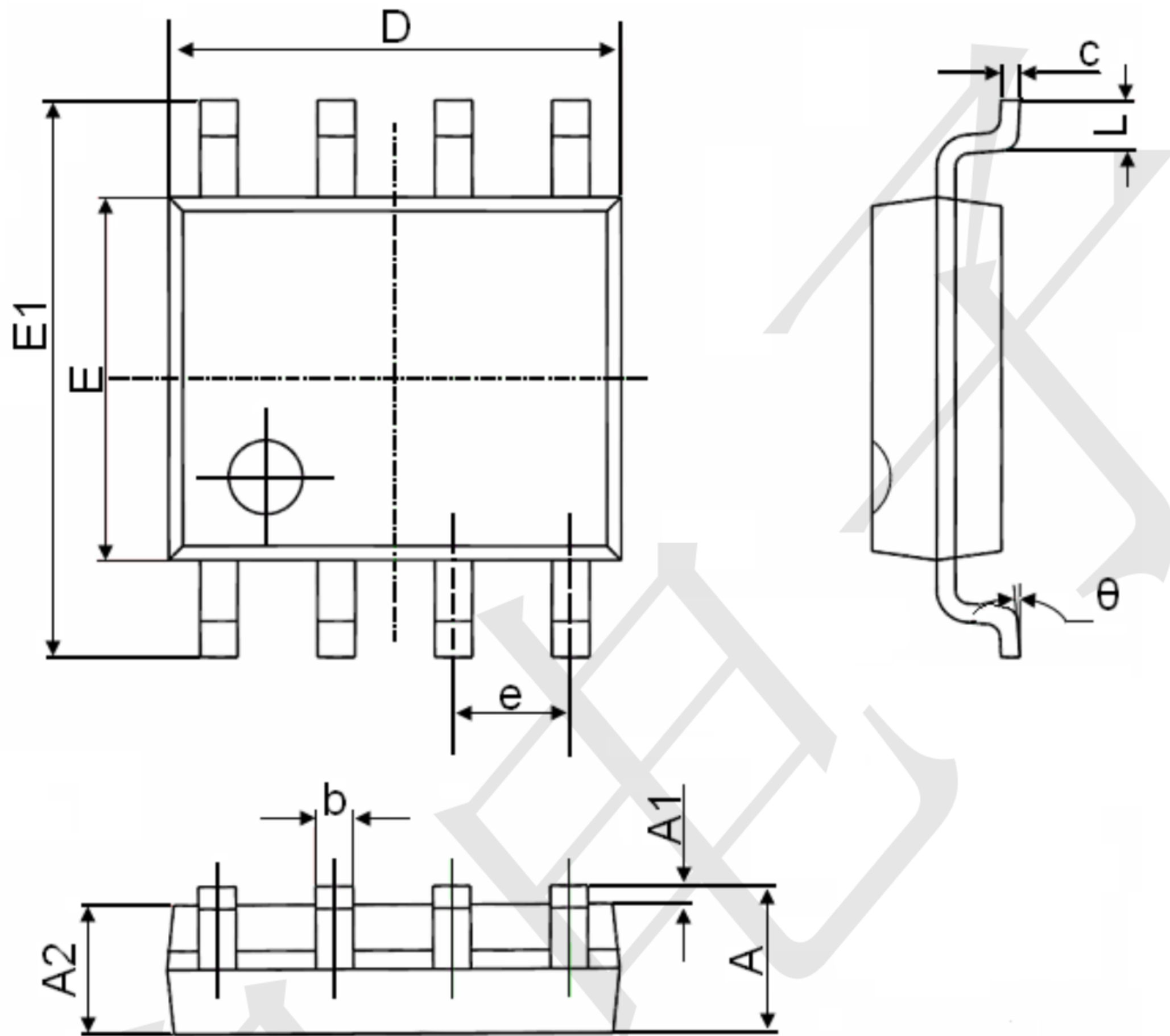


Figure 10. Forward Surge Maximum



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
θ	0°	8°	0°	8°