TECH PUBLIC
台舟电子

SI4816BDY

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

www.sot23.com.tw

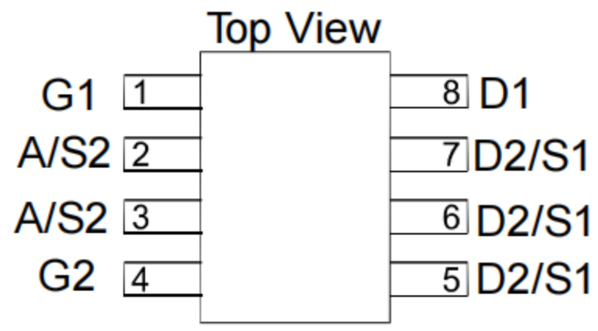
GENERAL FEATURES

- **Q1:N-Channel**
- 30V/7A,
  $R_{DS(ON)}$ = 19mΩ (typ.) @ V_{GS} = 10V
  $R_{DS(ON)}$ = 24mΩ (typ.) @ V_{GS} = 4.5V
- **Q2:N-Channel**
- 30V/11.2A,
  $R_{DS(ON)}$ = 10mΩ (typ.) @ V_{GS} =10V
  $R_{DS(ON)}$ = 14mΩ (typ.) @ V_{GS} =4.5V
- Schottky
  Vds=30V IF =2.0A
  Vsd: 0.5V@1.0A

APPLICATIONS

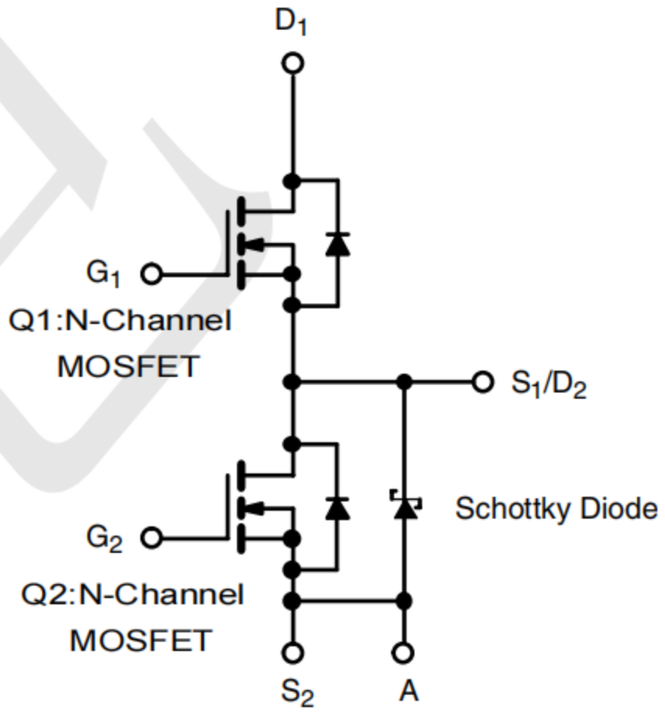
- Synchronous Buck Converter
- Game Machine
- Notebook

Package and Pin Configuration



SOP-8 top view

Circuit diagram



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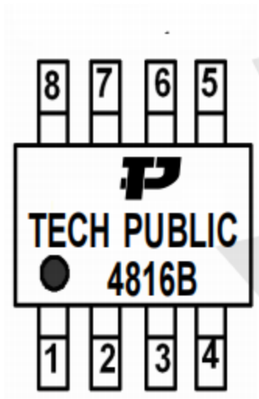


Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

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		°C
T_{STG}	Storage Temperature Range		-55 to 150		
P_D*	Power Dissipation	T_A=25°C	2		W
		T_A=100°C	0.8		
$R_{\theta JA}$*	Thermal Resistance-Junction to Ambient		62.5		°C/W

Electrical Characteristics (Tj=25℃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			1	μA
		T_J=85°C			30	
$V_{GS(th)}$	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		19	22	mΩ
		V_{GS}=4.5V, I_{DS}=5A		24	27	
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℃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			50	μA
		T_J=85°C			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℃unless otherwise noted)

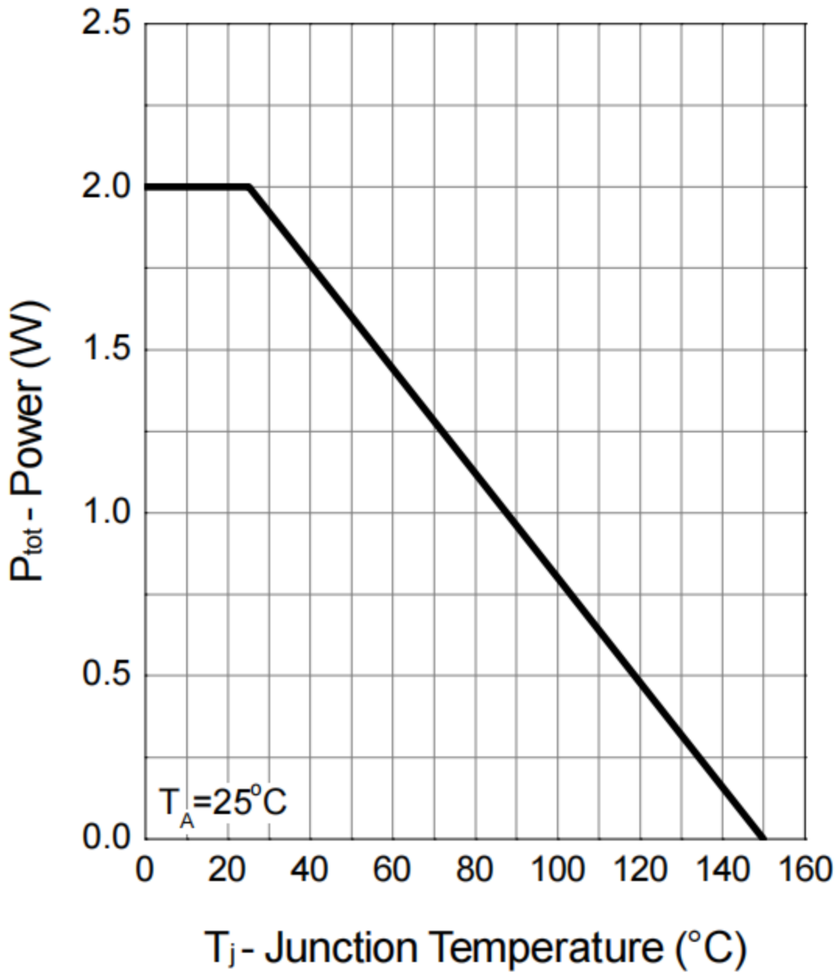
Schottky Diode

Symbol	TECH PUBLIC Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{BR} [a]	Reverse Breakdown Voltage	Ir=100uA	30	-	-	V
Vf	Forward Voltage	IF=1.0A T_A = 25°C	-	0.48	0.5	V
		IF=1.0A T_A = 125°C			0.42	
Ir	Leakage Current	Vr=30V T_A = 25°C	-	10	100	uA
Ct	Total Capacitance	Vr= 10V, f = 1.0MHz	-	50	-	pF

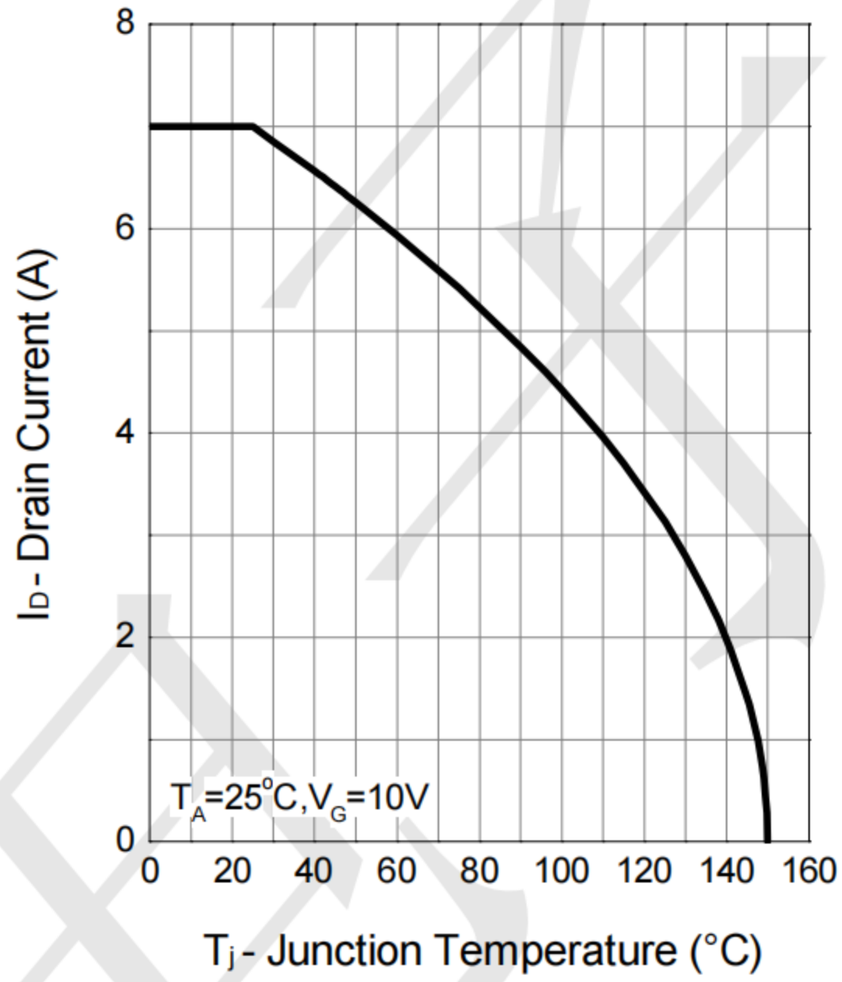
Typical Electrical and Thermal Characteristics

Q1-N-Channel

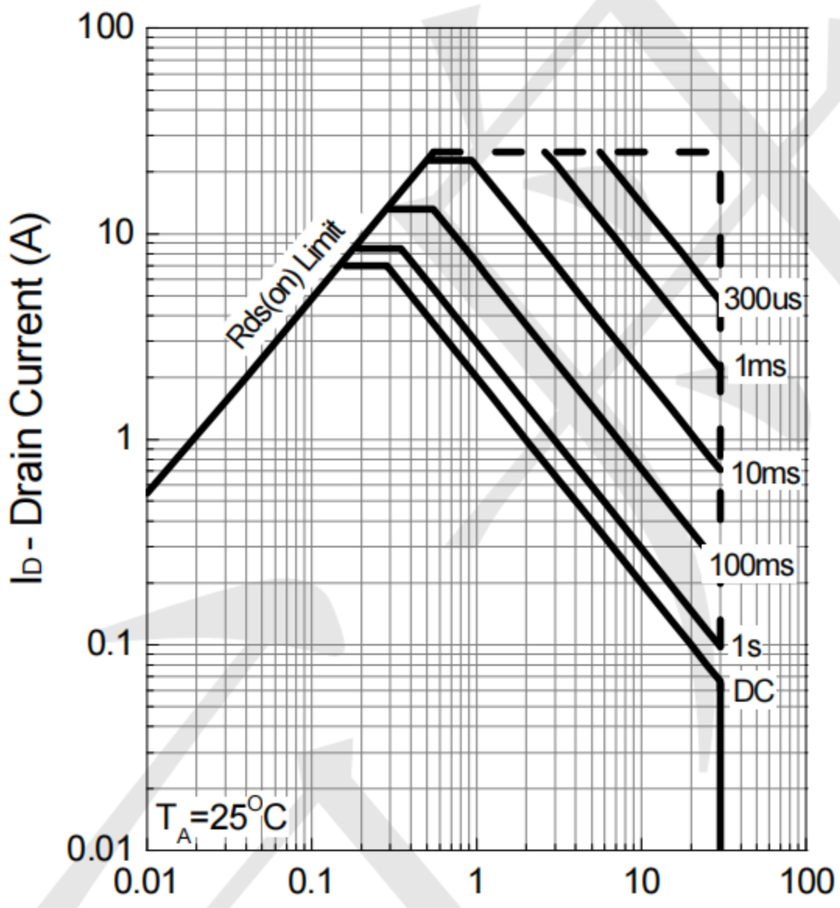
Power Dissipation



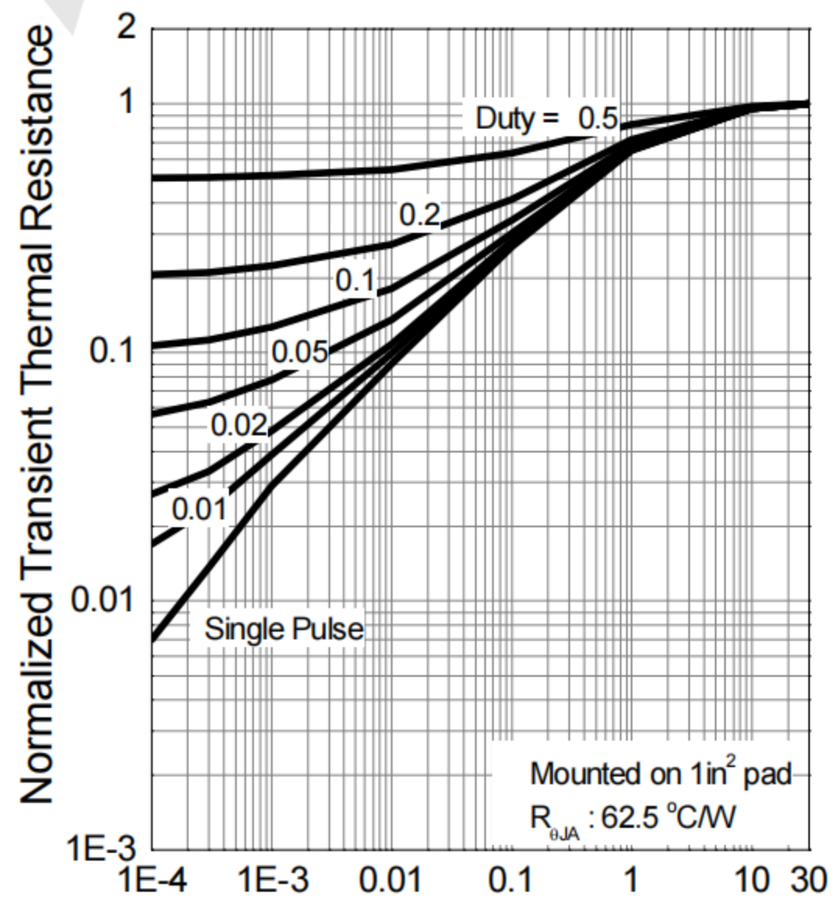
Drain Current



Safe Operation Area

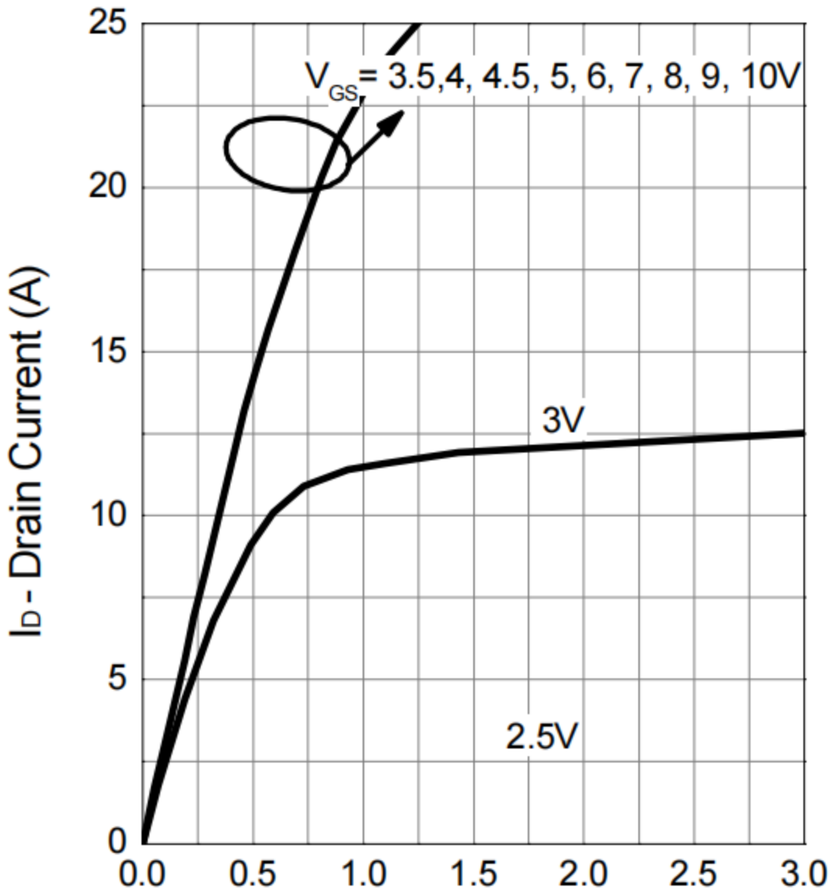


Thermal Transient Impedance

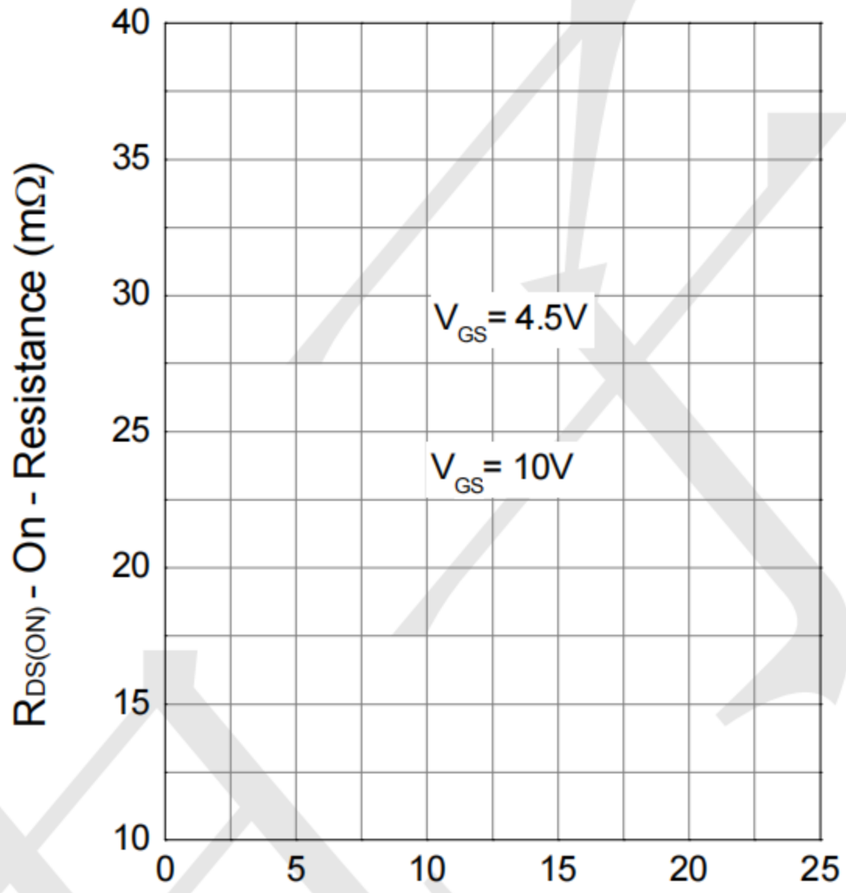


Q1-N-Channel

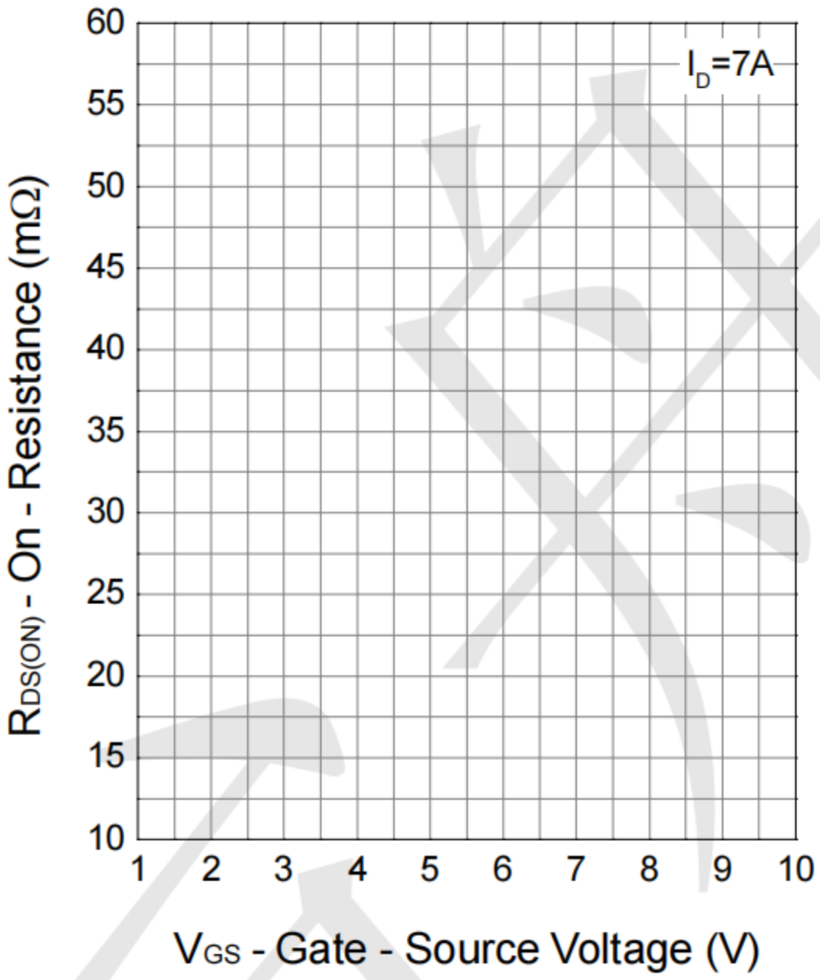
Output Characteristics



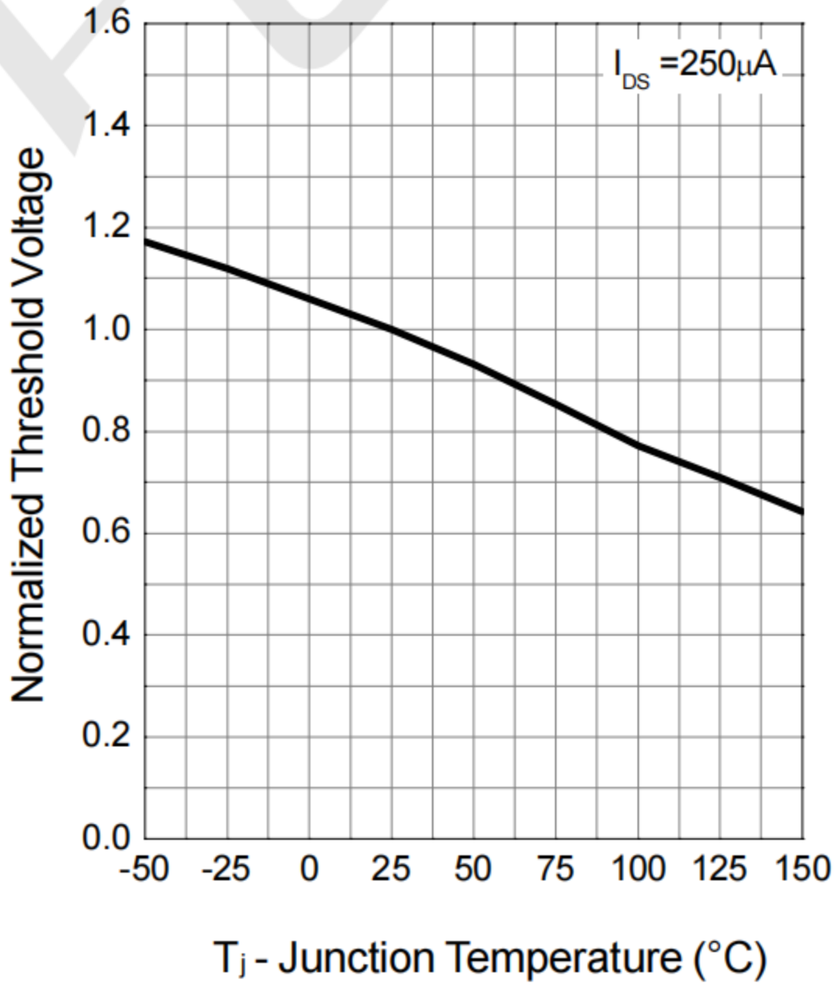
Drain-Source On Resistance



Drain-Source On Resistance

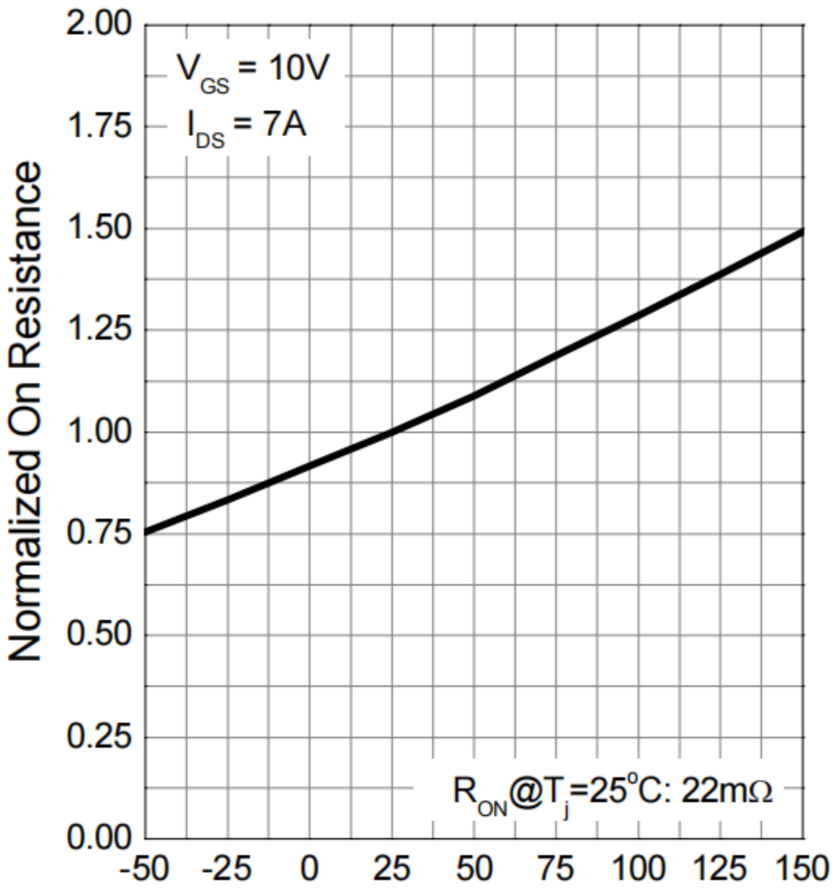


Gate Threshold Voltage

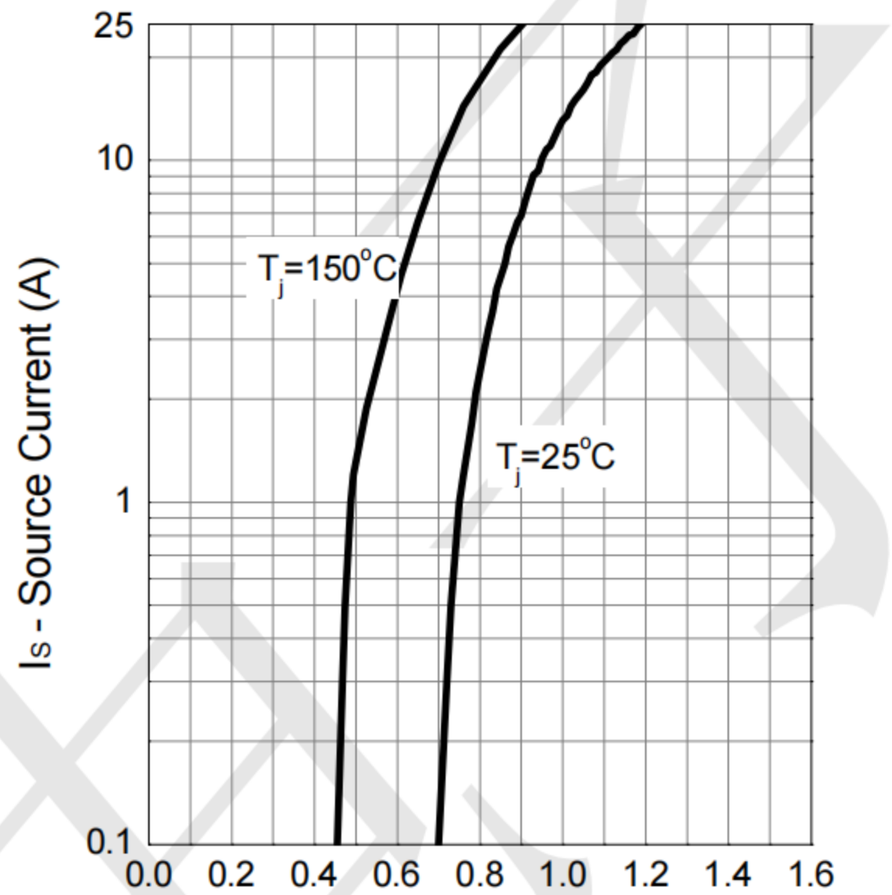


Q1-N-Channel

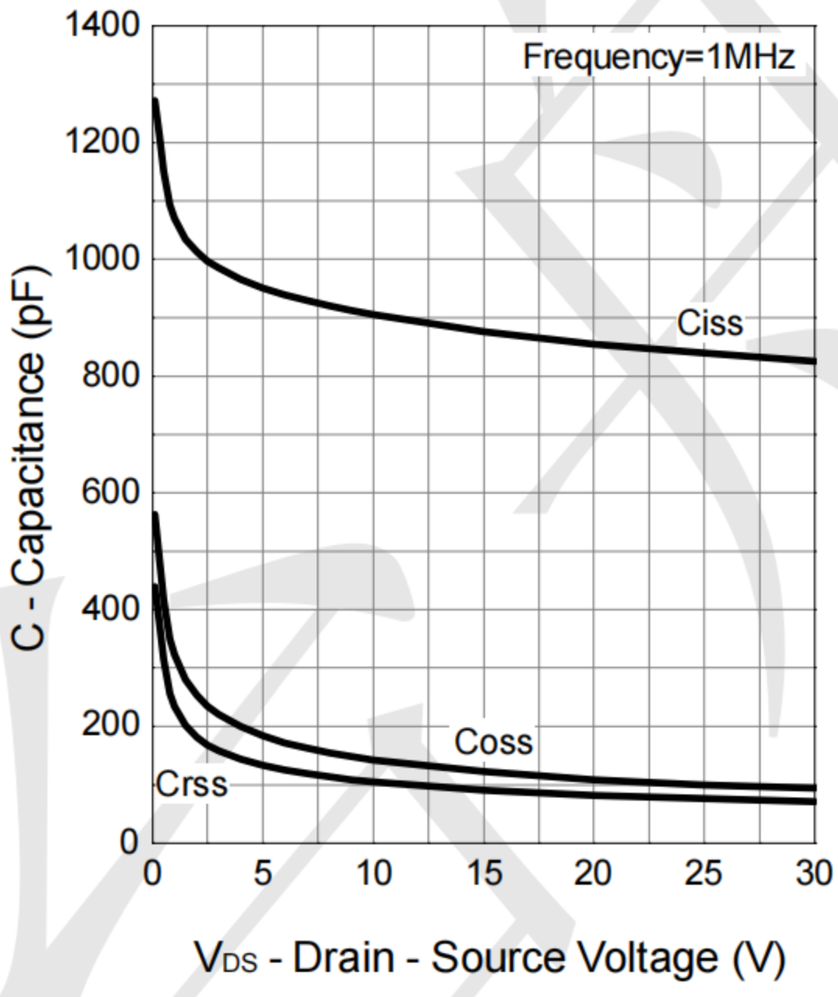
Drain-Source On Resistance



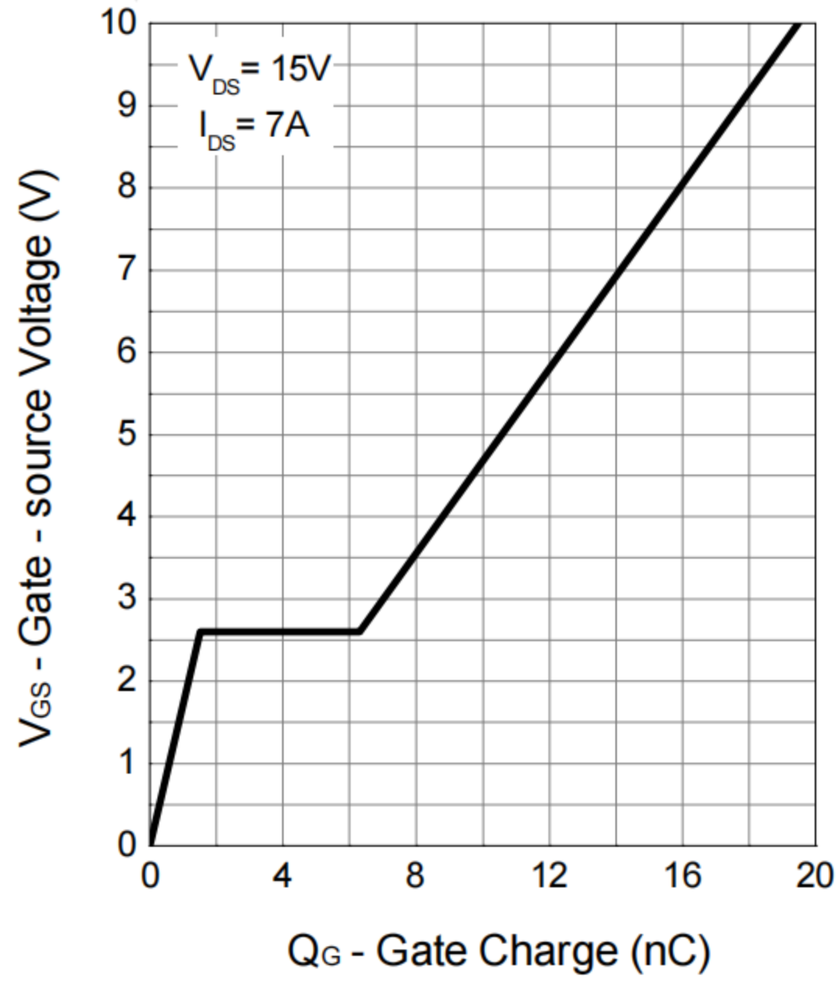
Source-Drain Diode Forward



Capacitance



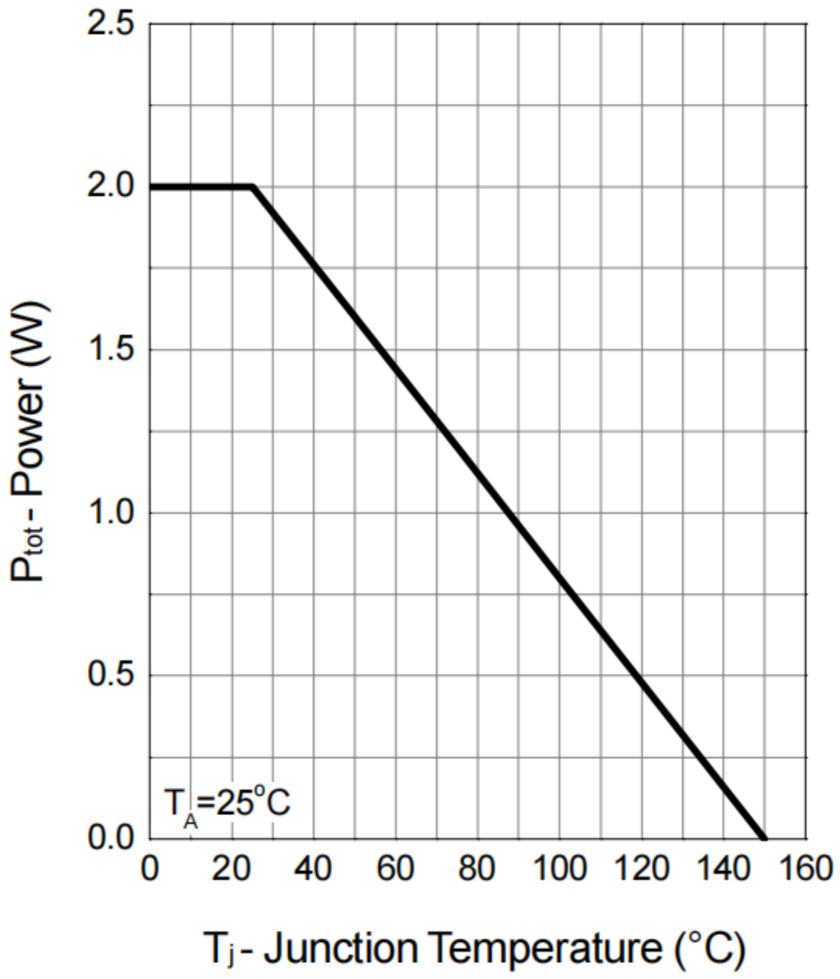
Gate Charge



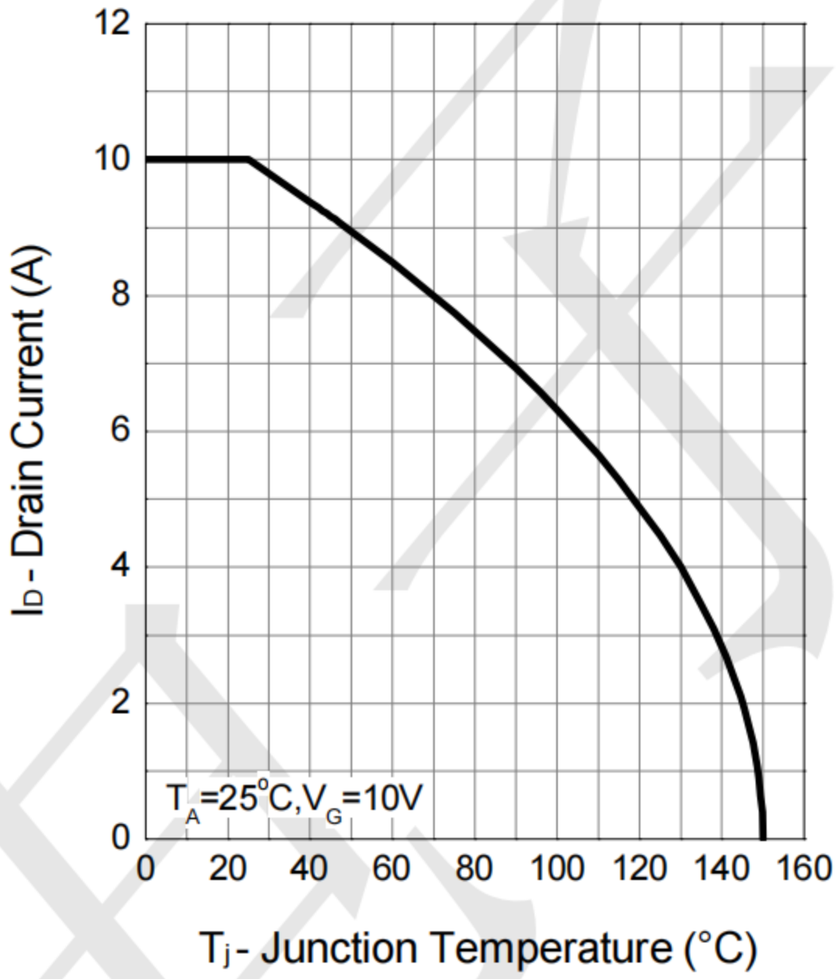
Typical Electrical and Thermal Characteristics

Q2-N-Channel

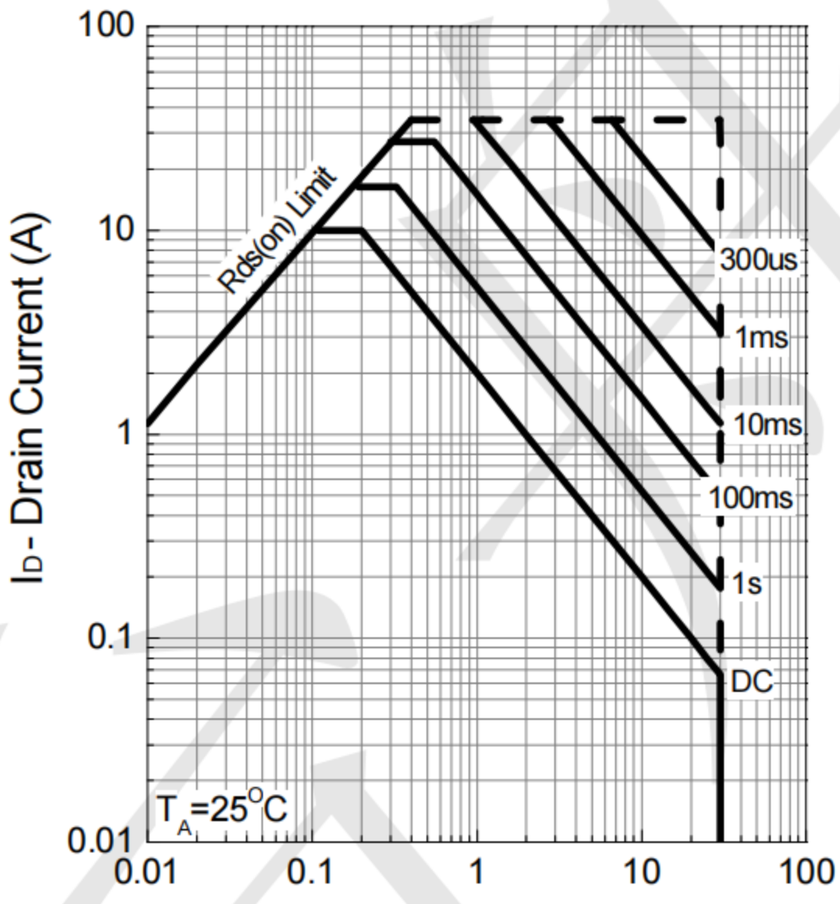
Power Dissipation



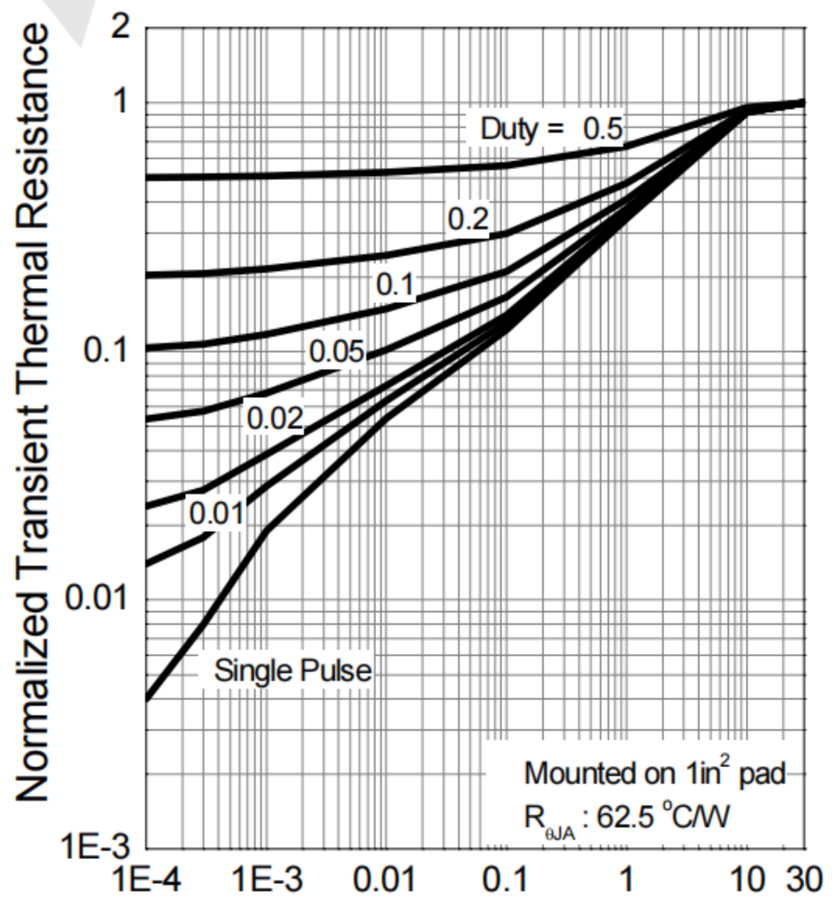
Drain Current



Safe Operation Area

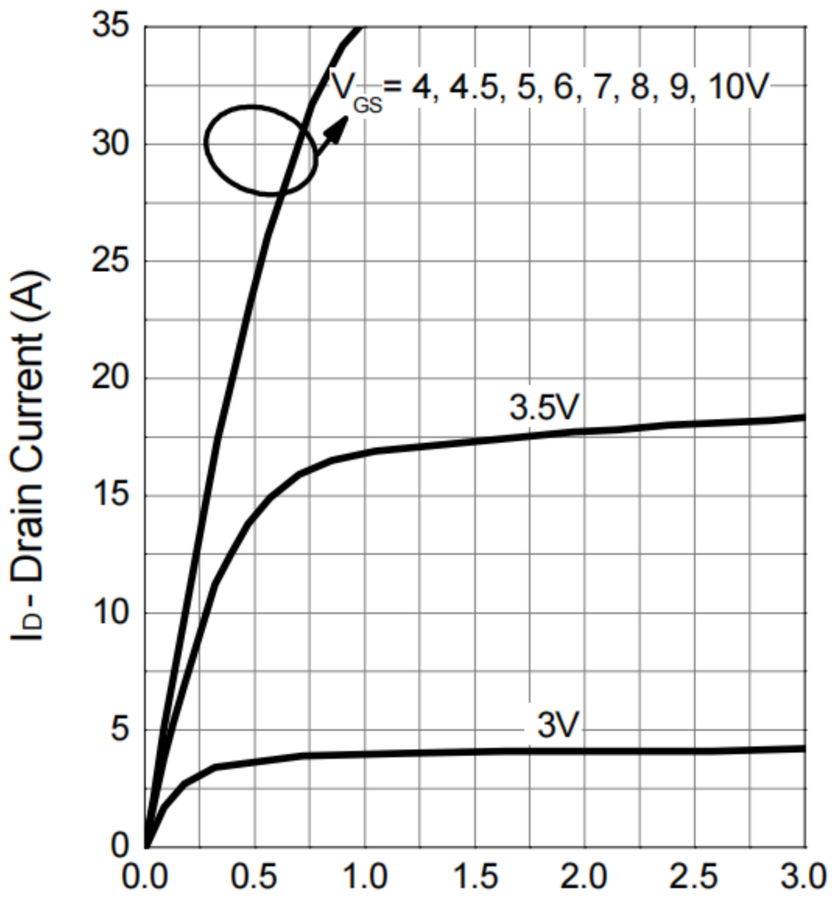


Thermal Transient Impedance

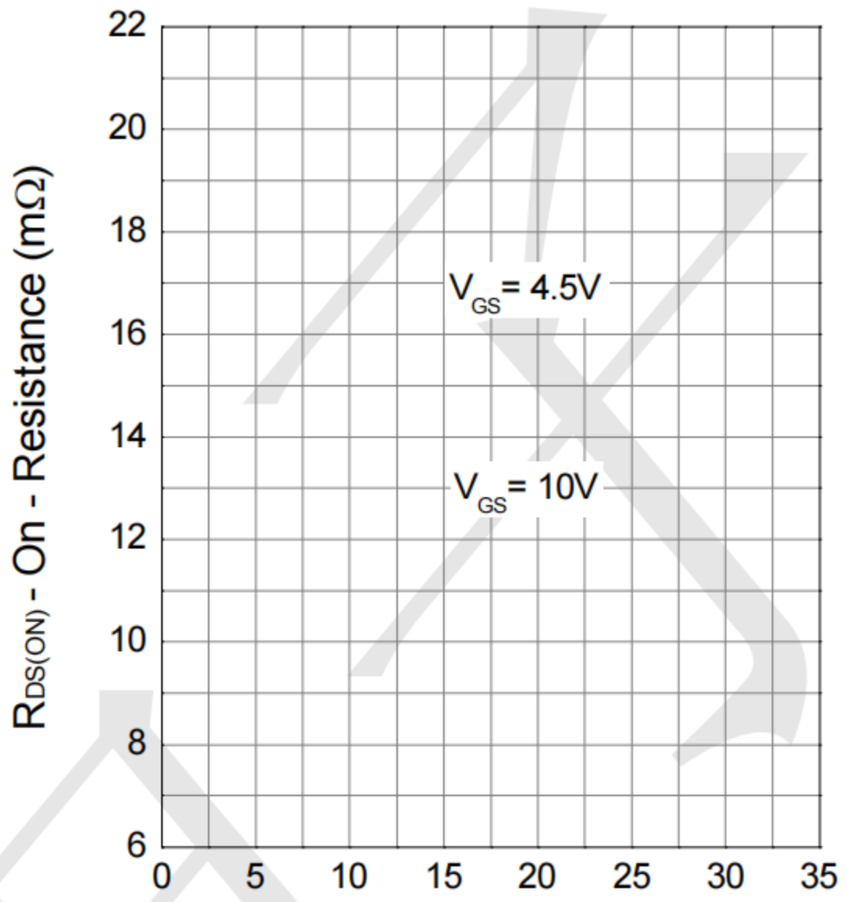


Q2-N-Channel

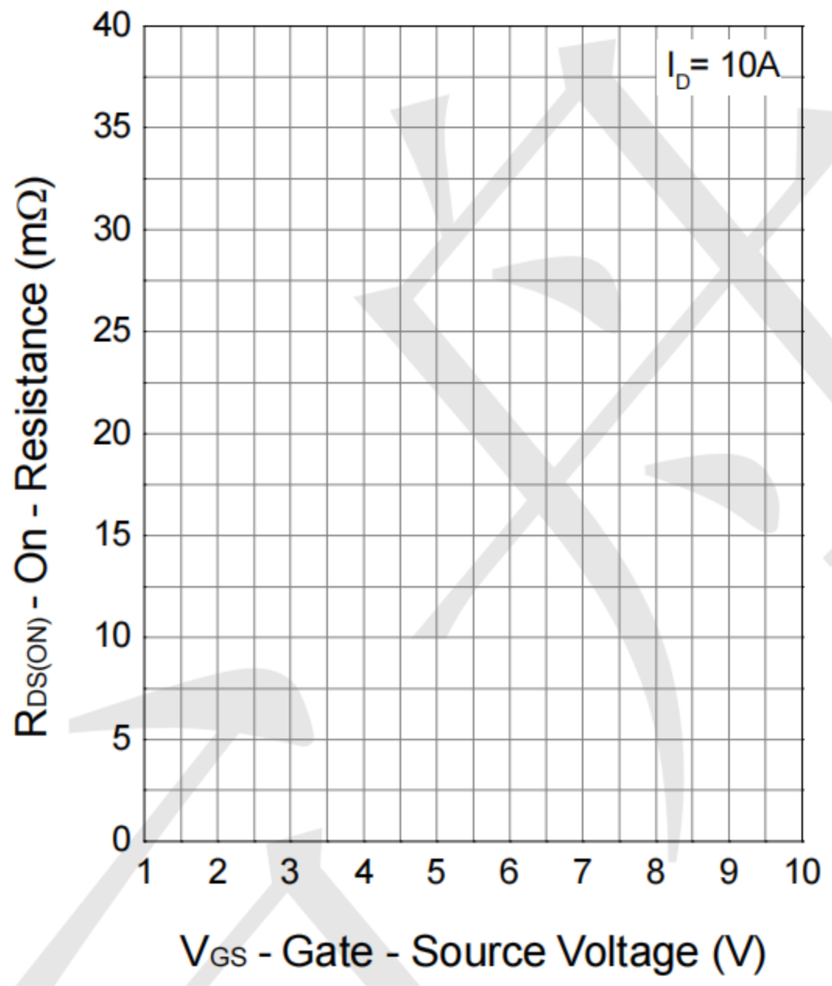
Output Characteristics



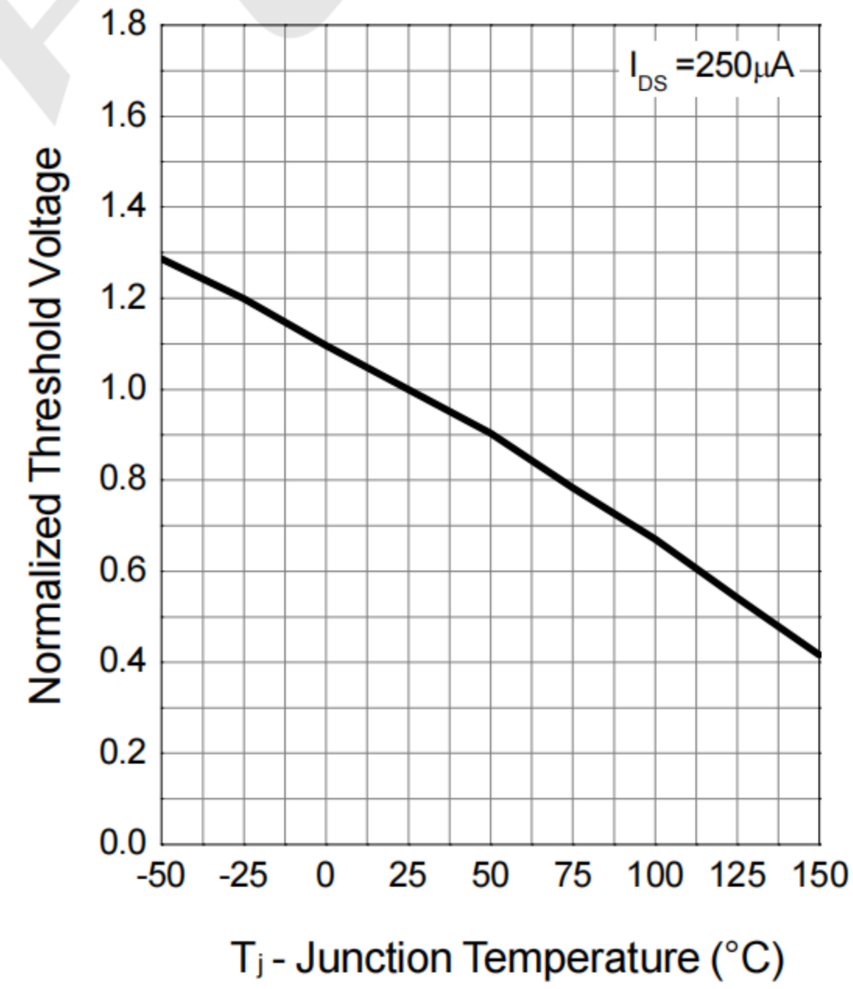
Drain-Source On Resistance



Drain-Source On Resistance

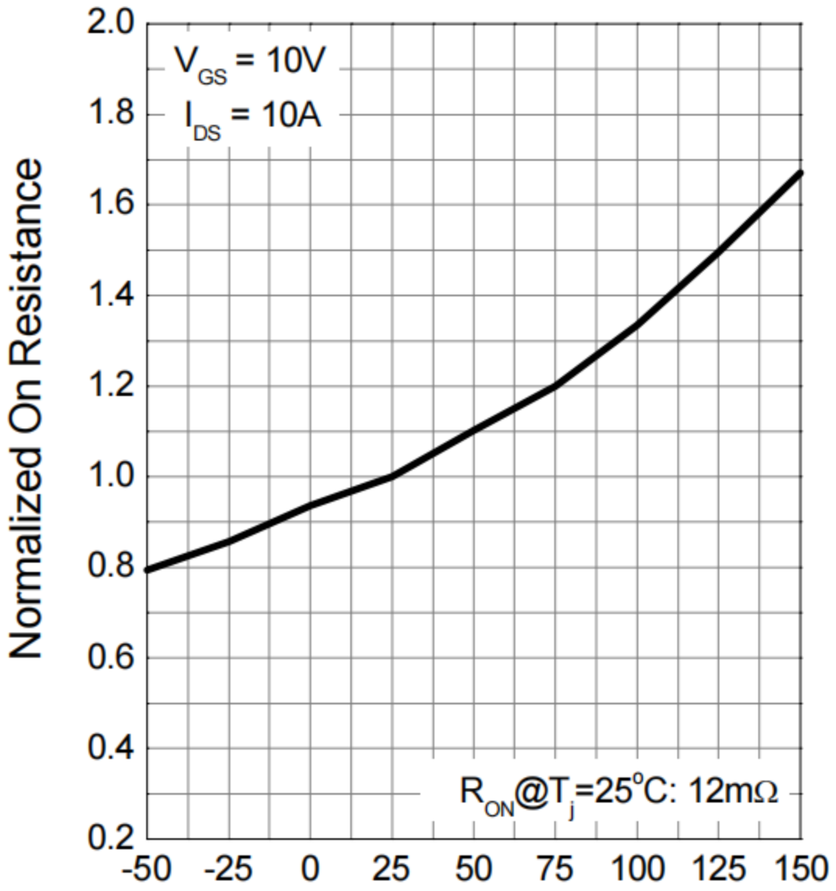


Gate Threshold Voltage

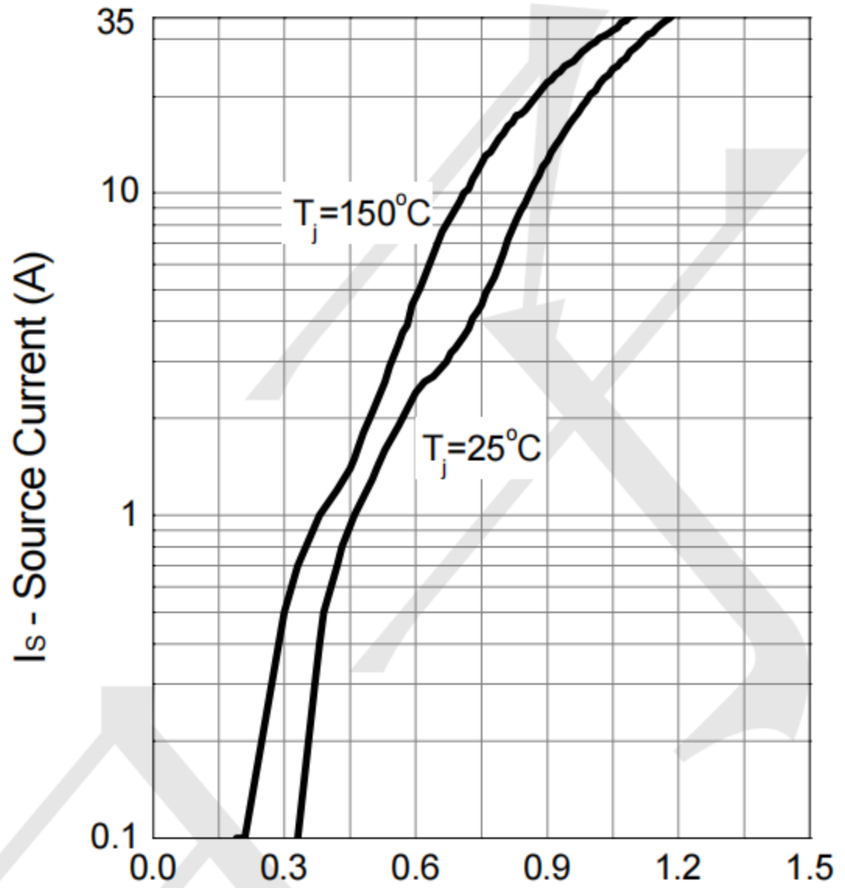


Q2-N-Channel

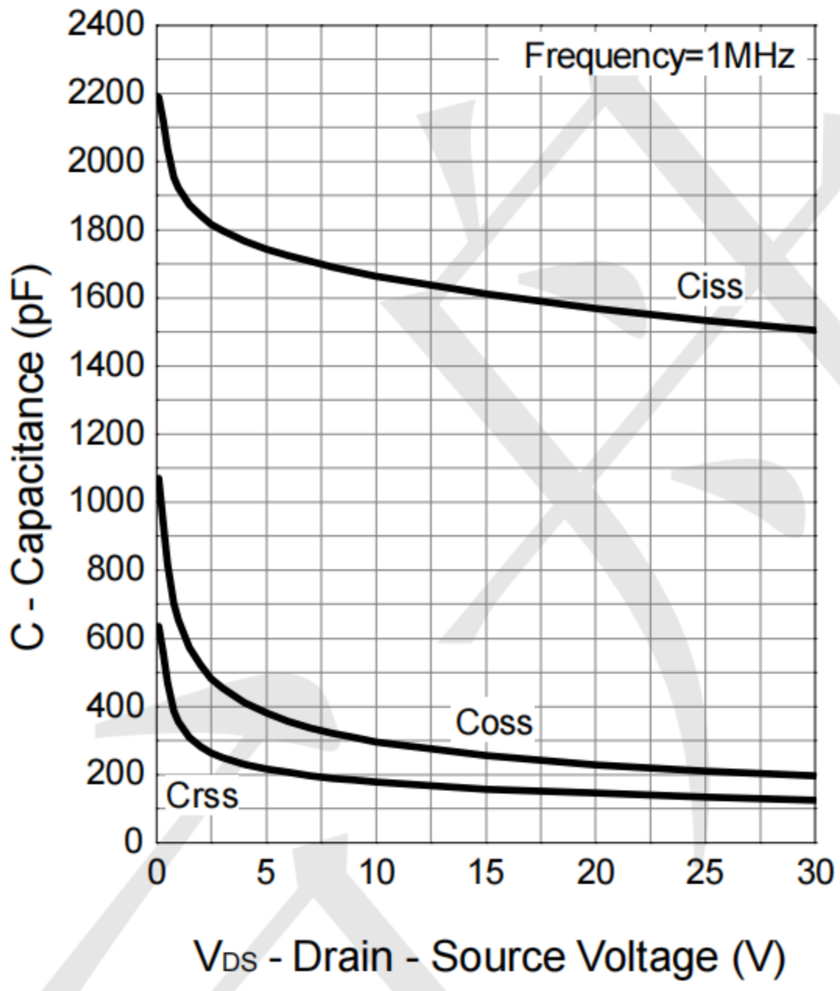
Drain-Source On Resistance



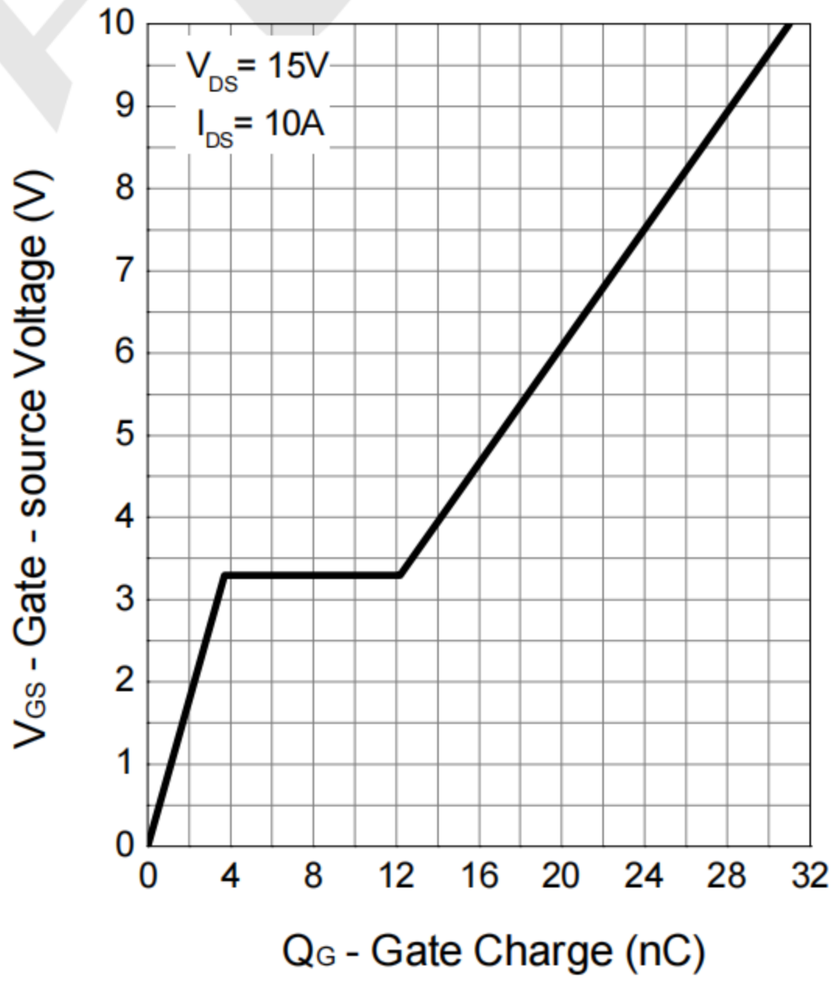
Source-Drain Diode Forward



Capacitance



Gate Charge



Typical Electrical and Thermal Characteristics

Schottky Diode

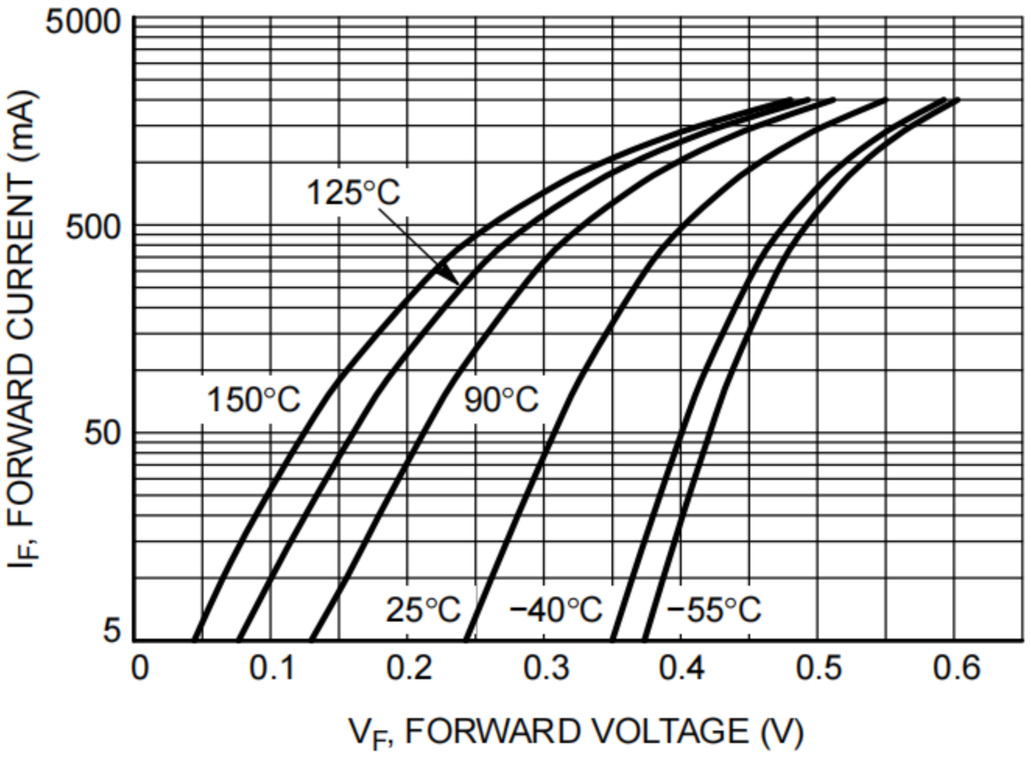


Figure 5. Forward Voltage

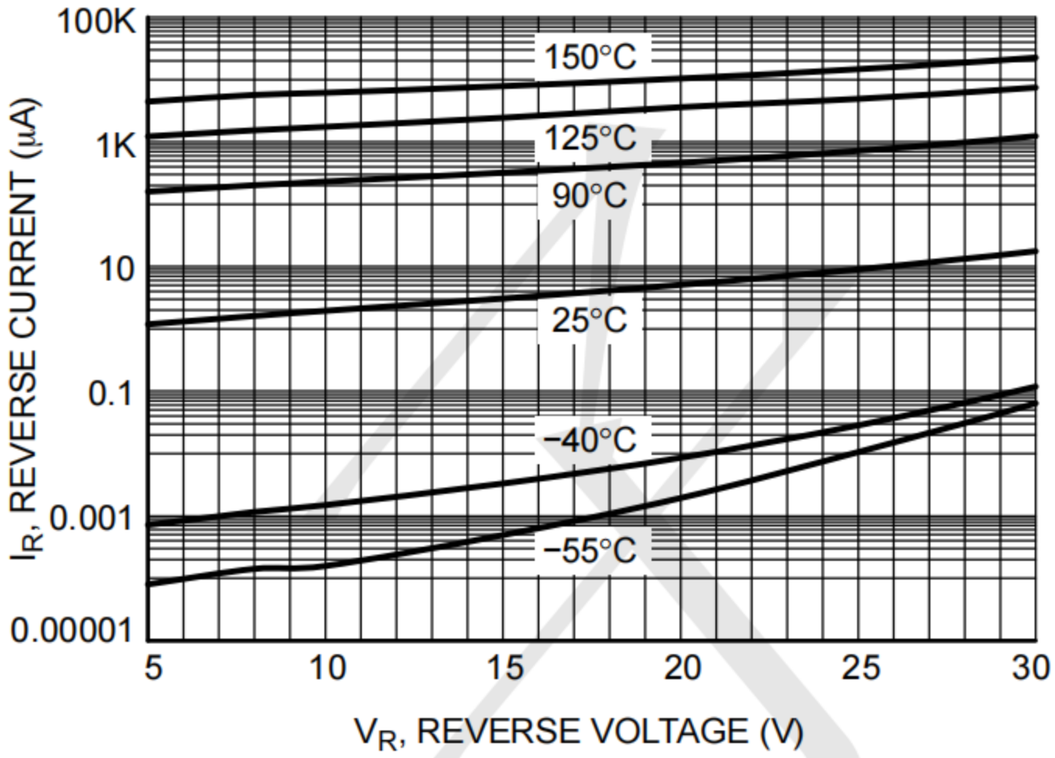


Figure 6. Leakage Current

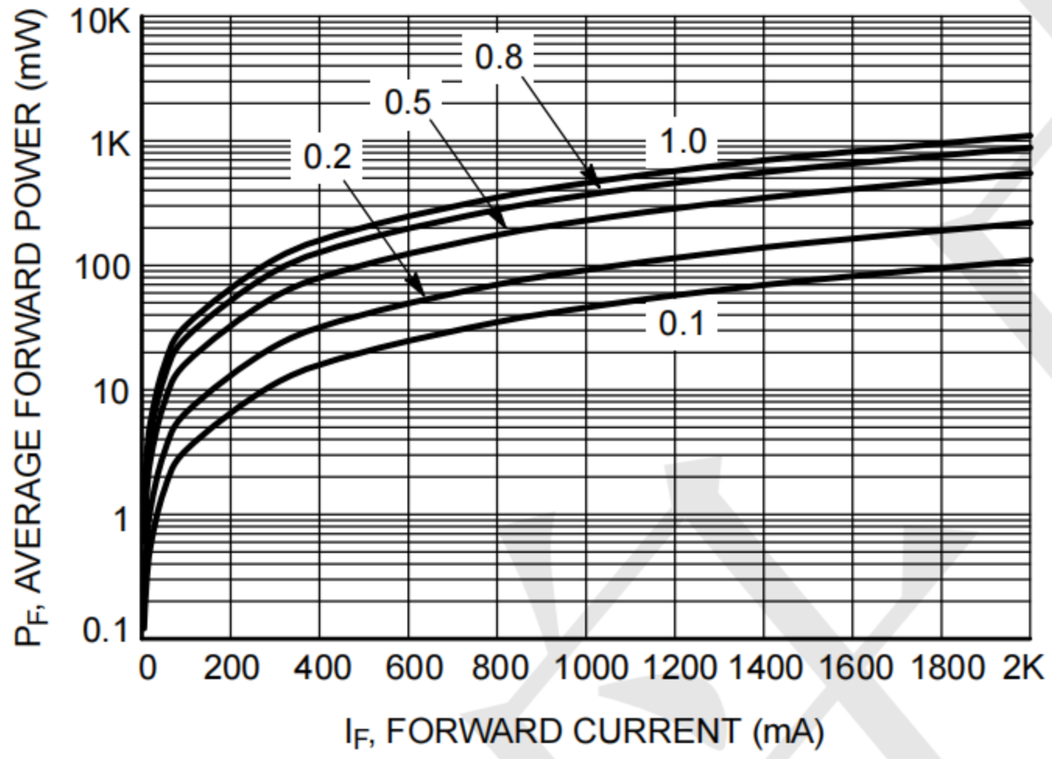


Figure 7. Average Forward Power Dissipation

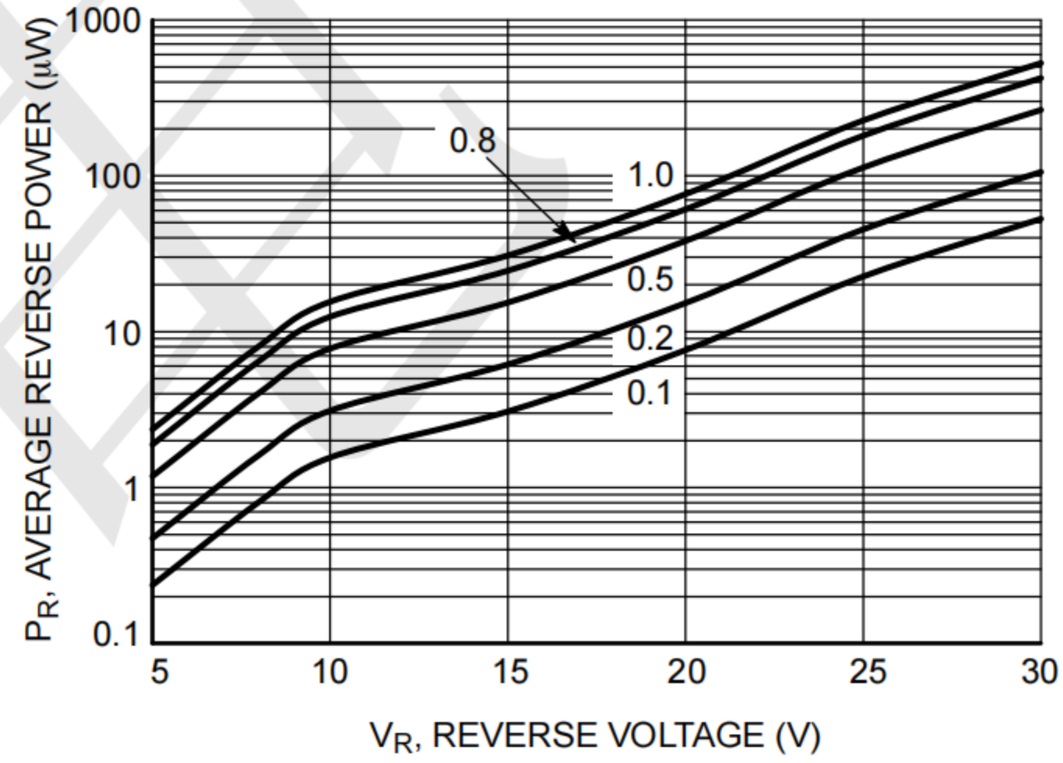


Figure 8. Average Reverse Power Dissipation

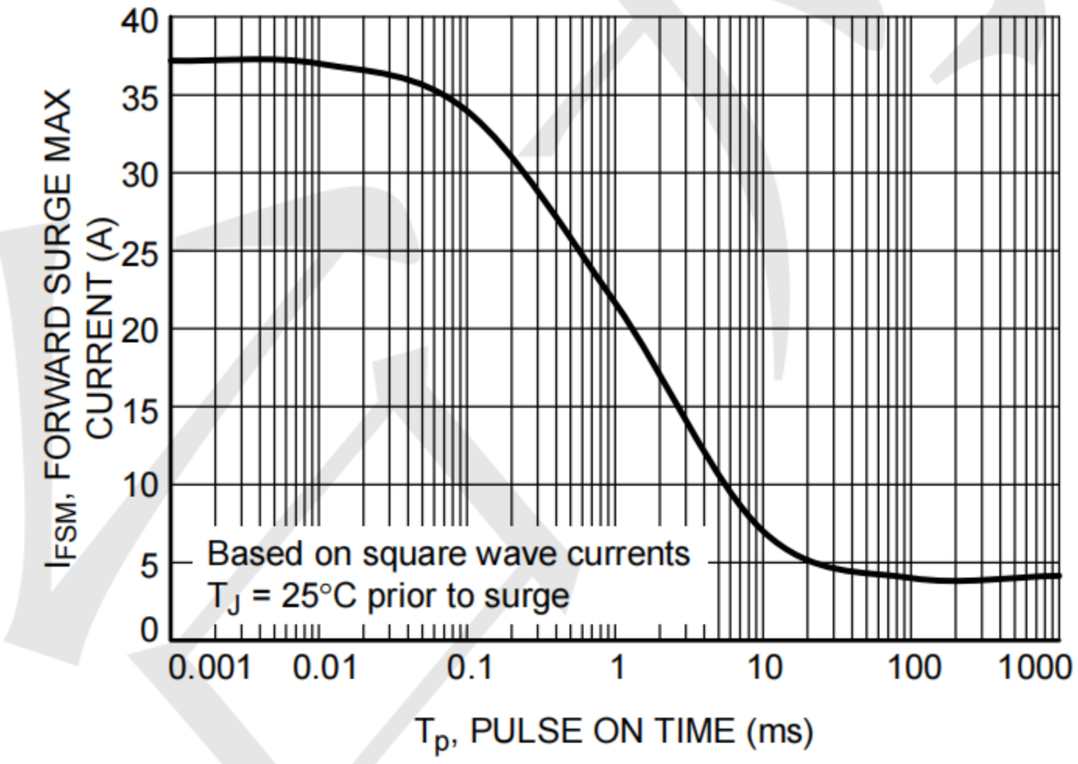
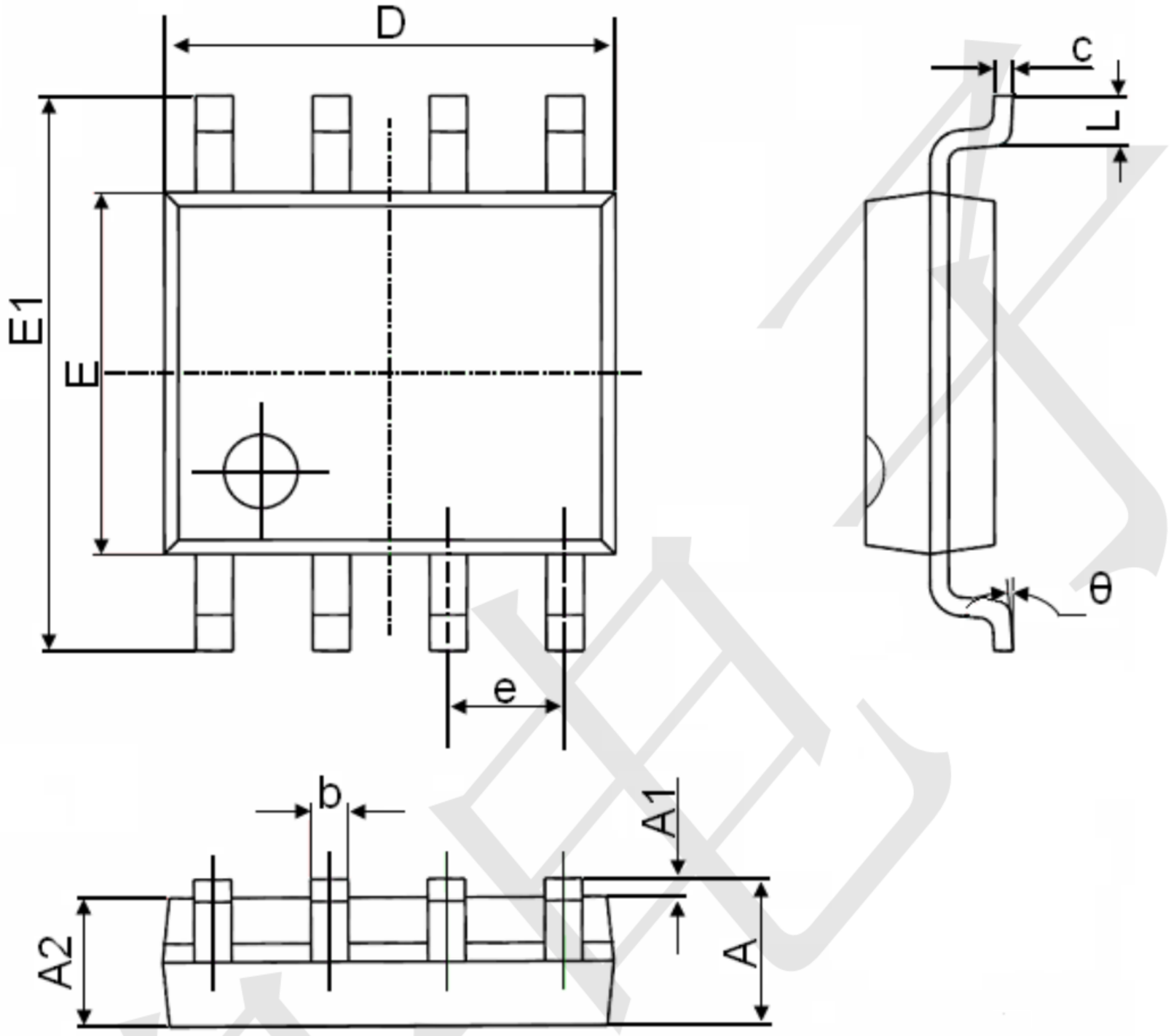


Figure 10. Forward Surge Maximum

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°

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