iM4716

Complementary Enhancement Mode MOSFET

Datasheet

1. Product Information

1.1 Features

- Advanced Trench Cell Design
- RoHS Compliant and Halogen Free
- Reliable and Rugged



1.2 Package Type

SOP-8L

1.3 Quick Reference

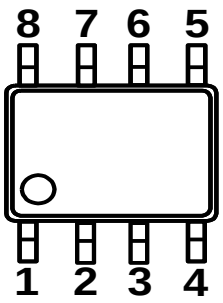
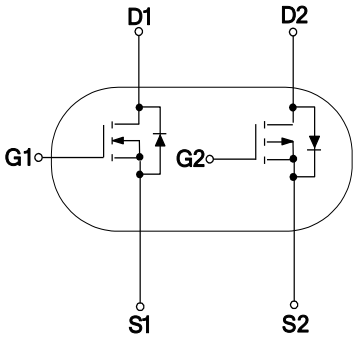
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Limiting Values						
P_{tot}	Total Power Dissipation	T_A = 25 ℃	-	-	2	W
I_D	Drain Current	N-Ch, T_A = 25 ℃, V_{GS} = 10 V	-	-	5.9	A
		P-Ch, T_A = 25 ℃, V_{GS} = - 10 V			-4.4	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	N-Ch, V_{GS} = 0 V, I_{DS} = 250 μA	60	-	-	V
		P-Ch, V_{GS} = 0 V, I_{DS} = - 250 μA	- 60	-	-	
$R_{DS(ON)}$	On-State Resistance	N-Ch, V_{GS} = 10 V, I_{DS} = 4 A	-	30	38	mΩ
		P-Ch, V_{GS} = -10 V, I_{DS} = - 3 A	-	53	67	

2. Ordering Code & Marking Information

Ordering Code	Marking Information
iM4716	iM4716 XXXXX X : Date Code

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3. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Source (S1)	 Top View	
2	Gate (G1)		
3	Source(S2)		
4	Gate(G2)		
5,6	Drain(D2)		
7,8	Drain(D1)		

4. Limiting Values

Symbol	Parameter		Rating	Unit
P_{tot}	Total Power Dissipation	T_A = 25 ℃	2	W
$R_{\theta JA}$ Note1	Thermal Resistance- Junction to Ambient		62.5	℃ / W
T_{stg}	Storage Temperature		- 55~150	℃
T_J	Junction Temperature		150	℃
N-Channel				
V_{DS}	Drain-Source Voltage		60	V
V_{GS}	Gate-Source Voltage		± 20	V
I_D	Drain Current	T_A = 25 ℃, V_{GS} = 10 V	5.9	A
		T_A = 100 ℃, V_{GS} = 10 V	3.7	A
I_{DM} Note2	Pulsed Source Current	T_A = 25 ℃, V_{GS} = 10 V	23.6	A
P-Channel				
V_{DS}	Drain-Source Voltage		-60	V
V_{GS}	Gate-Source Voltage		± 20	V
I_D	Drain Current	T_A = 25 ℃, V_{GS} = - 10 V	-4.4	A
		T_A = 100 ℃, V_{GS} = - 10 V	-2.8	A
I_{DM} Note2	Pulsed Source Current	T_A = 25 ℃, V_{GS} = - 10 V	-17.6	A

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5. Electrical Characteristics (T_A = 25 °C Unless Otherwise Noted)

N-Channel

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown	V_{GS} = 0 V, I_{DS} = 250 μA	60	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = 250 μA	1.25	-	2.5	V
I_{DSS}	Drain Leakage Current	V_{DS} = 48 V, V_{GS} = 0 V	-	-	1	μA
I_{GSS}	Gate Leakage Current	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
$R_{DS(ON)}$	On-State Resistance	V_{GS} = 10 V, I_{DS} = 4 A	-	30	38	mΩ
		V_{GS} = 4.5 V, I_{DS} = 3 A	-	38	50	
Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_{SD} = 1 A, V_{GS} = 0 V	-	0.8	1.2	V
t_{rr} Note3	Reverse Recovery Time	I_{SD} = 4 A, V_{GS} = 0 V	-	37	-	nS
Q_{rr} Note3	Reverse Recovery Charge	dI_{SD}/dt = 100 A/μs	-	3.8	-	nC
Dynamic Characteristics Note3						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 25 V Frequency = 1 MHz	-	1042	-	pF
C_{oss}	Output Capacitance		-	48.6	-	
C_{rss}	Reverse Transfer Capacitance		-	38	-	
t_d(on)	Turn-on Delay Time	V_{DS} = 30 V, V_{GEN} = 10 V, R_G = 6 Ω, R_L = 7.5 Ω, I_{DS} = 4 A	-	4.8	-	nS
t_r	Turn-on Rise Time		-	18.5	-	
t_d(off)	Turn-off Delay Time		-	14.5	-	
t_f	Turn-off Fall Time		-	18	-	
Gate Charge Characteristics Note3						
Q_g	Total Gate Charge	V_{DS} = 30 V, V_{GS} = 10 V, I_{DS} = 4 A	-	19	-	nC
Q_{gs}	Gate-Source Charge		-	4.2	-	
Q_{gd}	Gate-Drain Charge		-	2.6	-	

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5. Electrical Characteristics (T_A = 25 °C Unless Otherwise Noted)

P-Channel

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown	V_{GS} = 0 V, I_{DS} = - 250 μA	- 60	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = - 250 μA	- 1.25	-	- 2.5	V
I_{DSS}	Drain Leakage Current	V_{DS} = - 48 V, V_{GS} = 0 V	-	-	- 1	μA
I_{GSS}	Gate Leakage Current	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
$R_{DS(ON)}$	On-State Resistance	V_{GS} = - 10 V, I_{DS} = - 3 A	-	53	67	mΩ
		V_{GS} = - 4.5 V, I_{DS} = - 2 A	-	67	88	
Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_{SD} = - 1 A, V_{GS} = 0 V	-	- 0.8	- 1.2	V
t_{rr} Note3	Reverse Recovery Time	I_{SD} = - 3 A, V_{GS} = 0 V	-	32	-	nS
Q_{rr} Note3	Reverse Recovery Charge	dI_{SD}/dt = 100 A/μs	-	8.5	-	nC
Dynamic Characteristics Note3						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = - 2.5 V Frequency = 1 MHz	-	1325	-	pF
C_{oss}	Output Capacitance		-	75	-	
C_{rss}	Reverse Transfer Capacitance		-	58	-	
t_d(on)	Turn-on Delay Time	V_{DS} = - 30 V, V_{GEN} = - 10 V, R_G = 3.3 Ω, R_L = 10 Ω, I_{DS} = - 3 A	-	8.6	-	nS
t_r	Turn-on Rise Time		-	30	-	
t_d(off)	Turn-off Delay Time		-	253	-	
t_f	Turn-off Fall Time		-	104	-	
Gate Charge Characteristics Note3						
Q_g	Total Gate Charge	V_{DS} = - 30 V, V_{GS} = - 10 V, I_{DS} = - 3 A	-	25	-	nC
Q_{gs}	Gate-Source Charge		-	5.8	-	
Q_{gd}	Gate-Drain Charge		-	3.1	-	

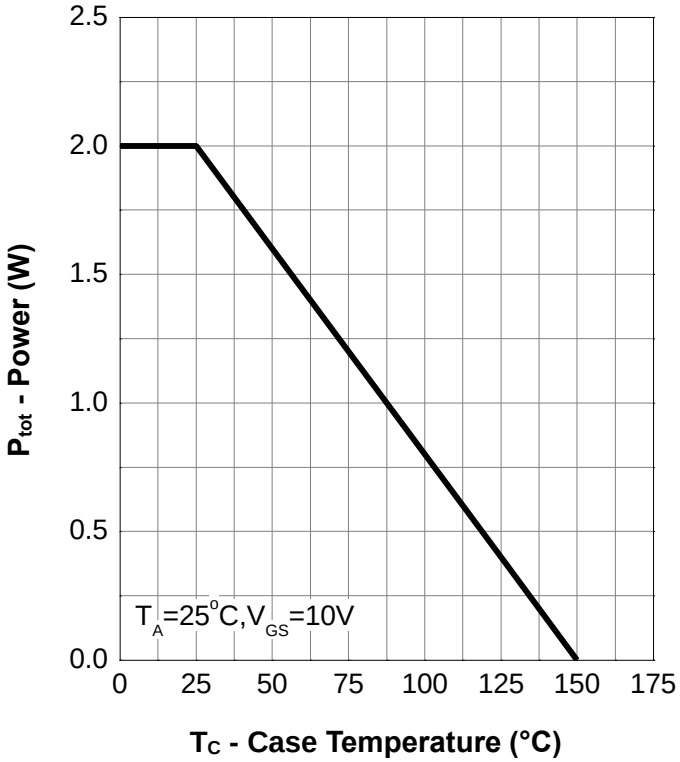
Note 1: Surface Mounted on 1 in^2 pad area, t ≤ 10 sec.
Note 2: Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
Note 3: Guaranteed by design, not subject to production testing.

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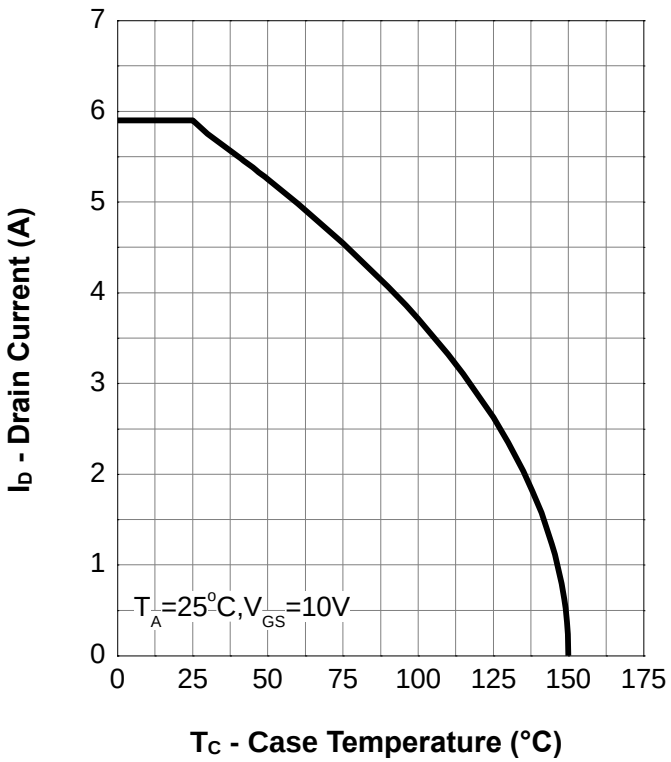
6. Typical Characteristics

N-Channel

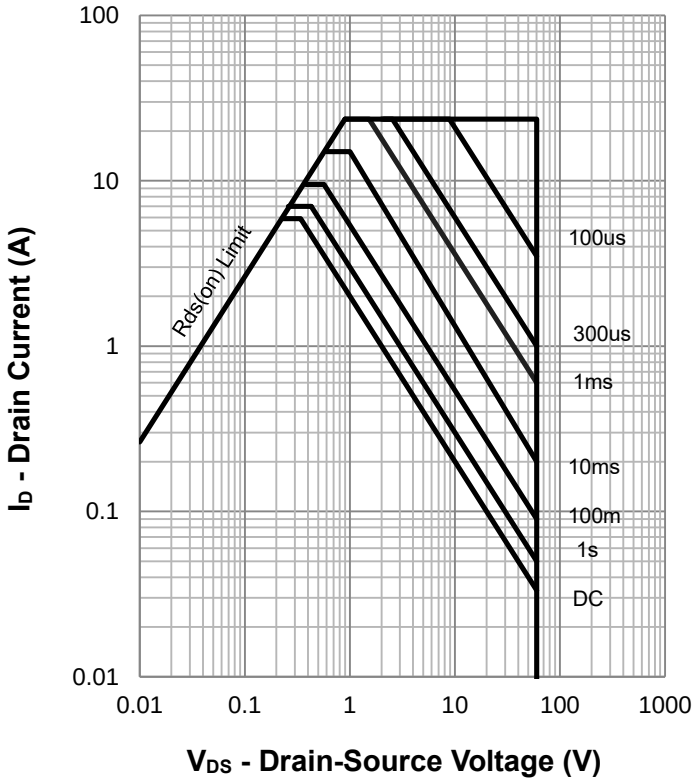
Power Capability



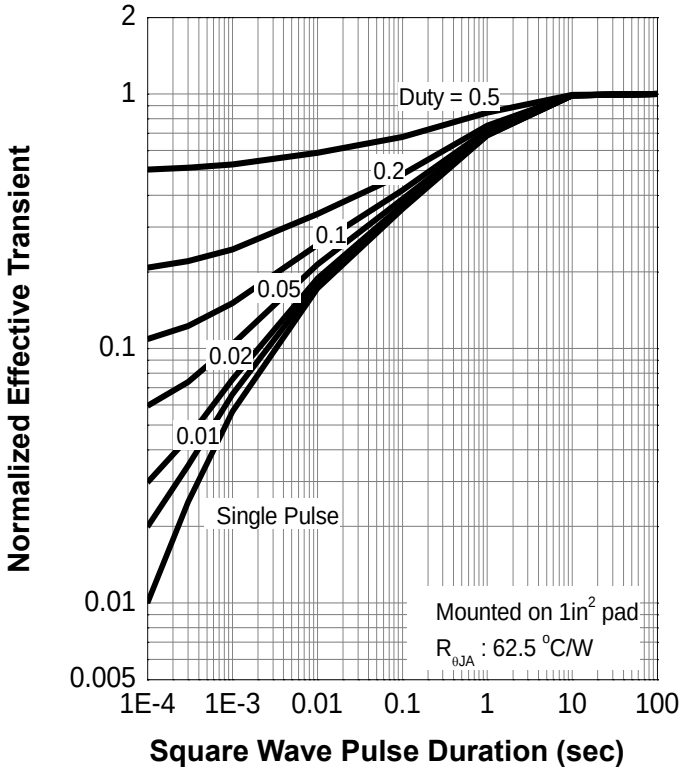
Current Capability



Safe Operating Area



Transient Thermal Impedance



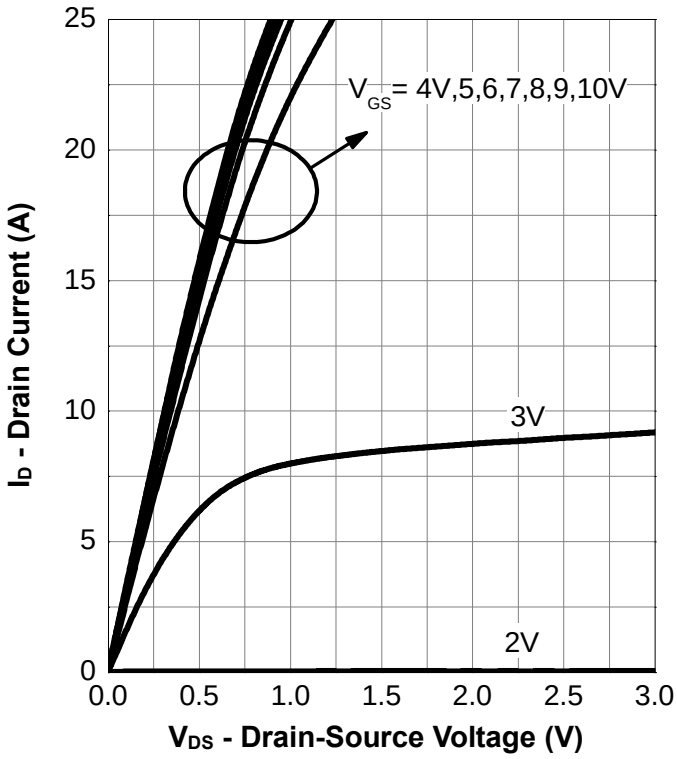
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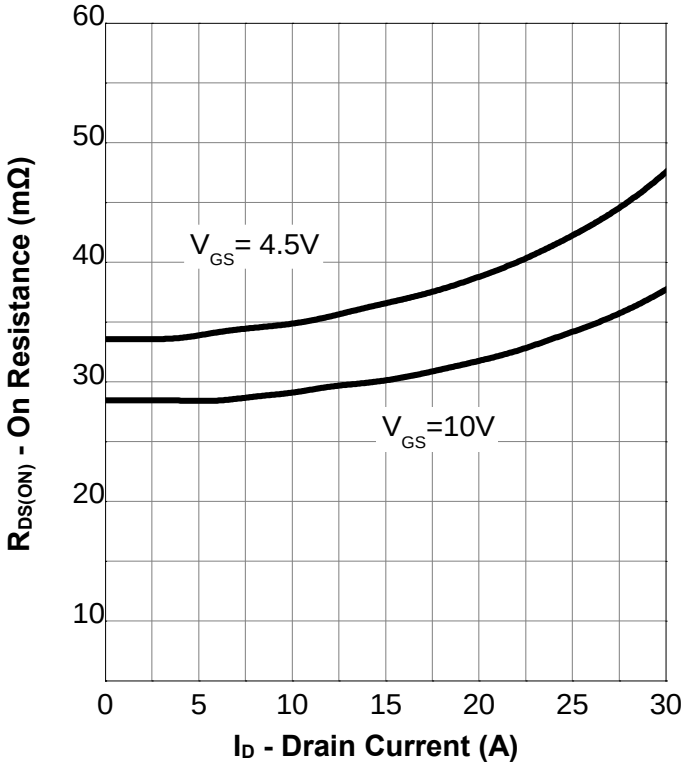
6. Typical Characteristics

N-Channel

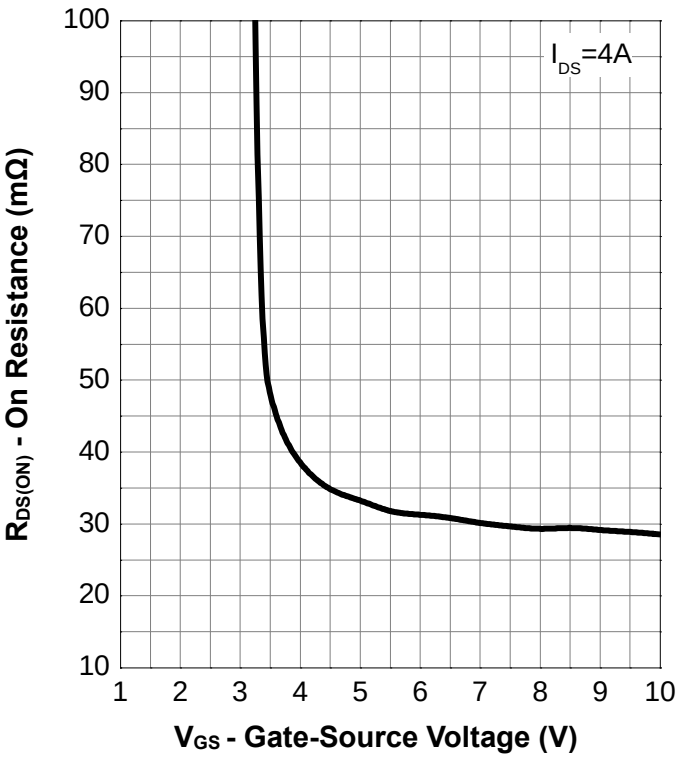
Output Characteristics



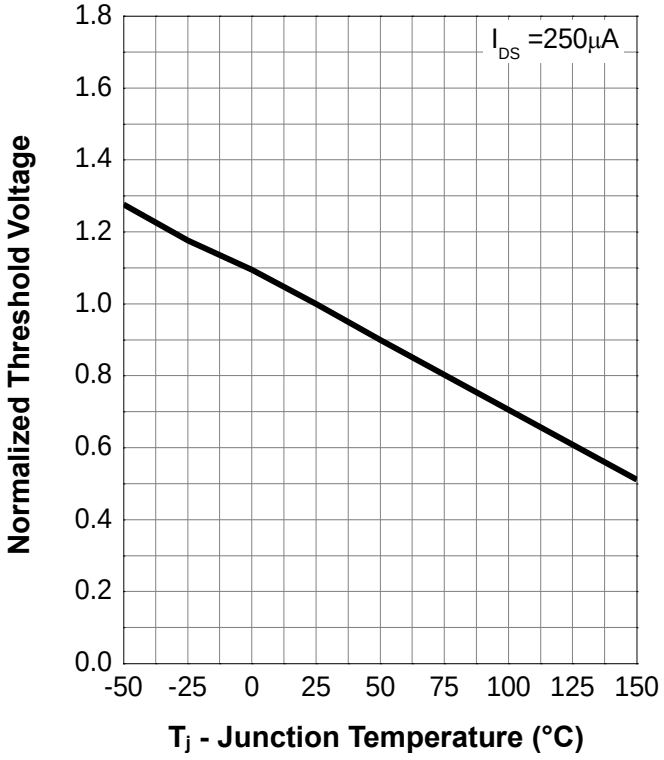
On Resistance



Transfer Characteristics



Normalized Threshold Voltage

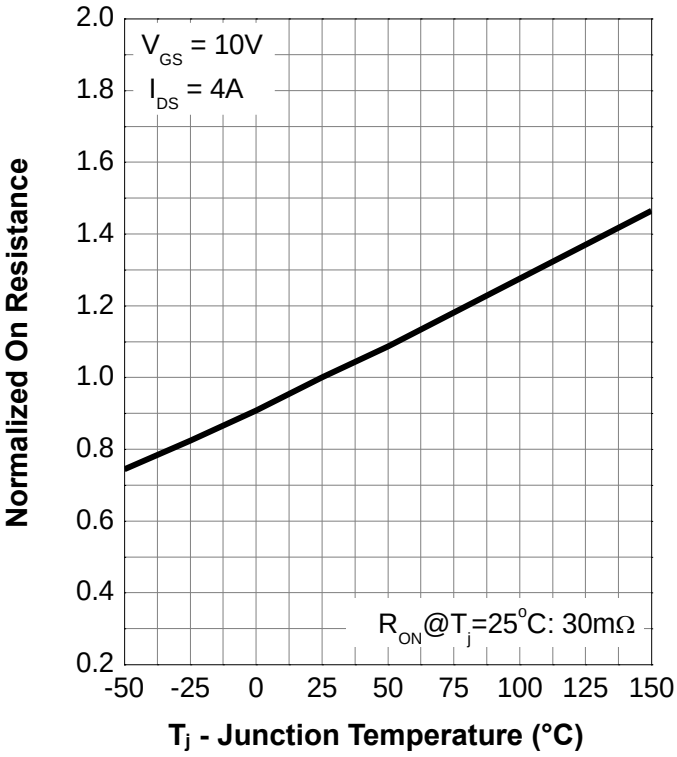


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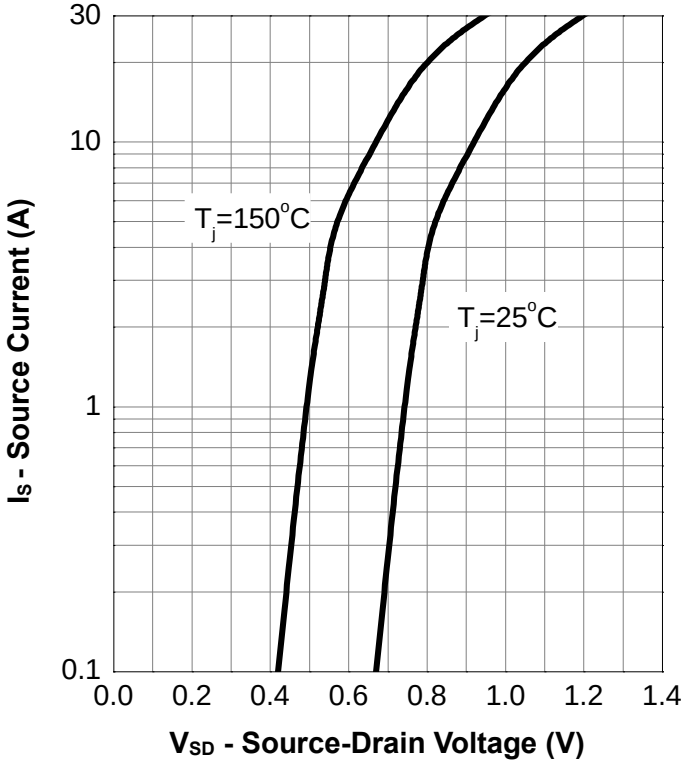
6. Typical Characteristics

N-Channel

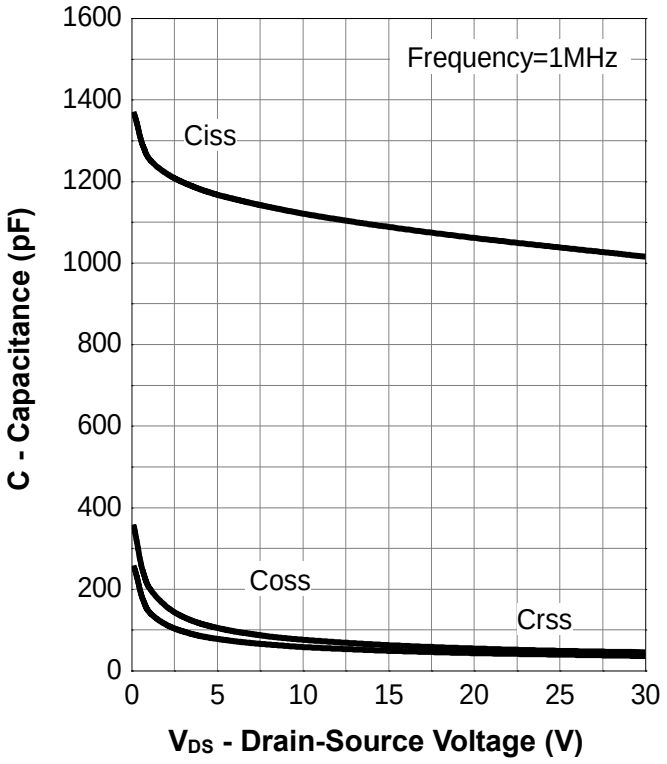
Normalized On Resistance



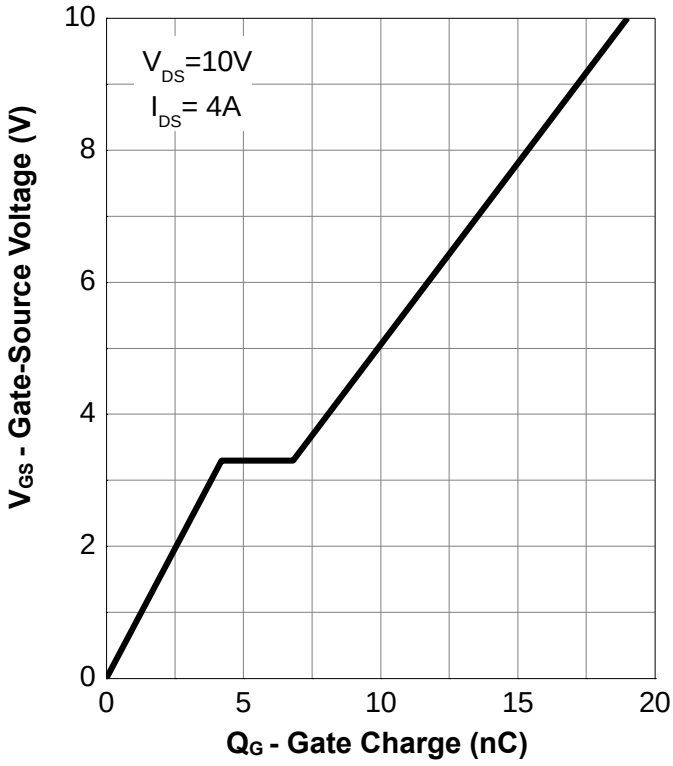
Diode Forward Current



Capacitance



Gate Charge

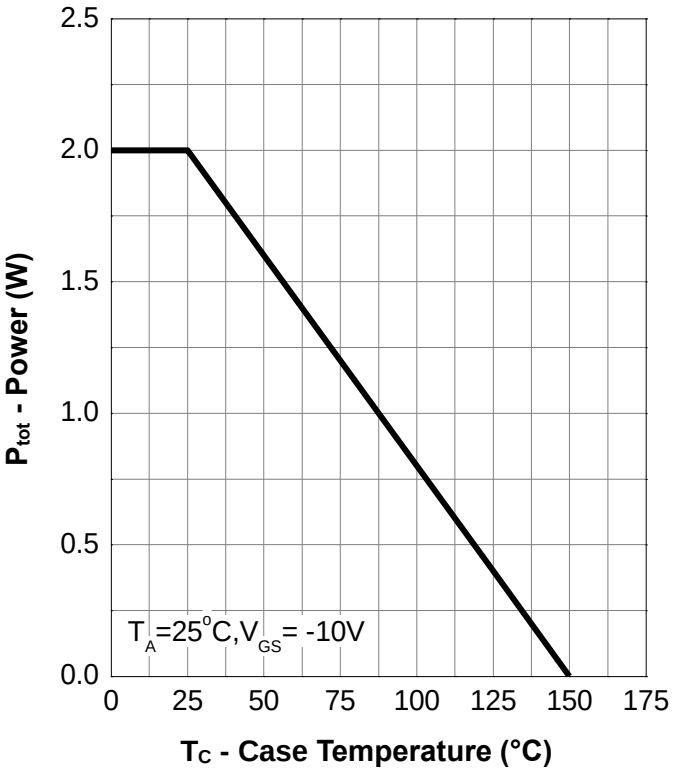


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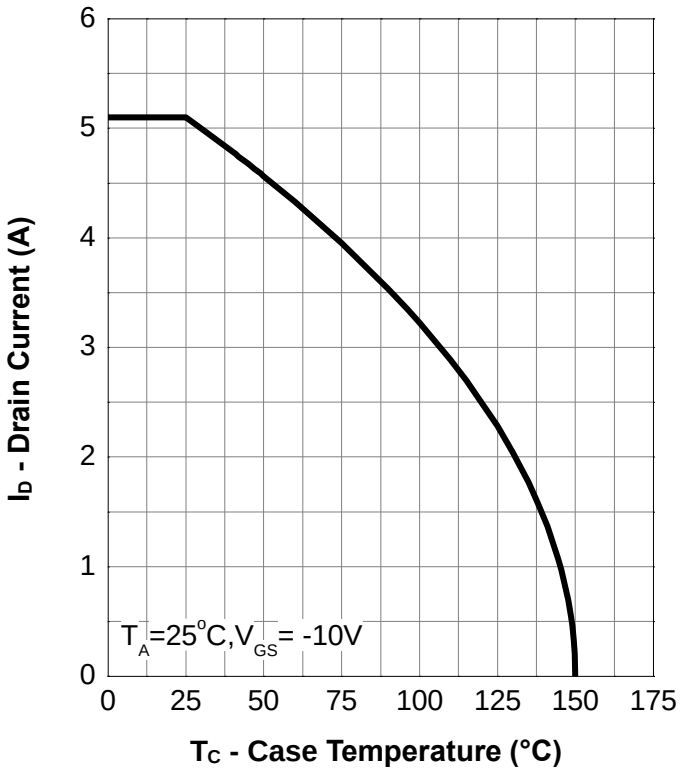
6. Typical Characteristics

P-Channel

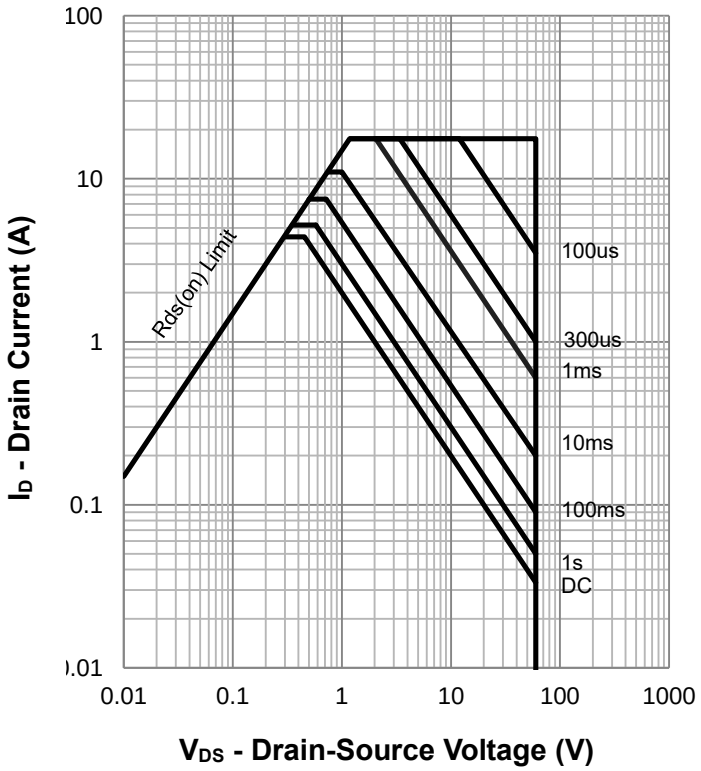
Power Capability



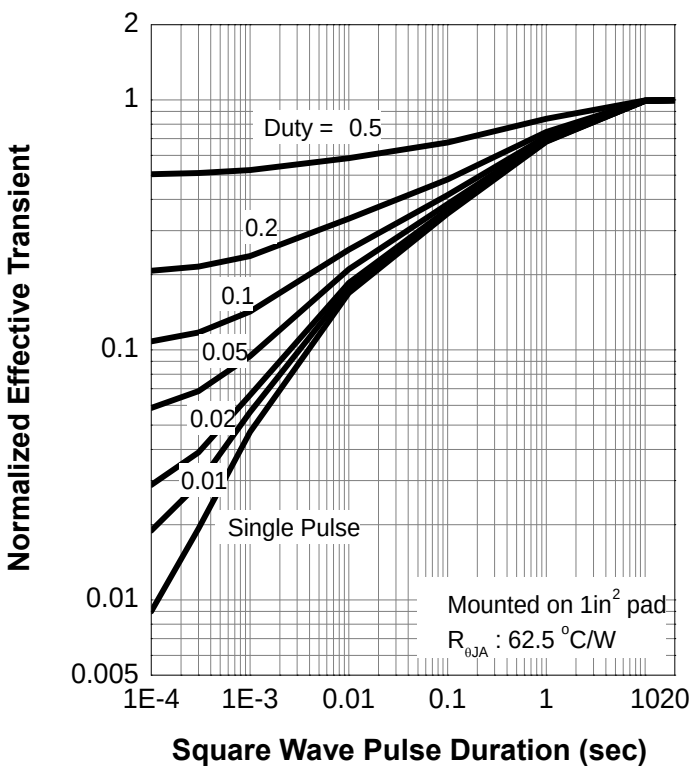
Current Capability



Safe Operating Area



Transient Thermal Impedance

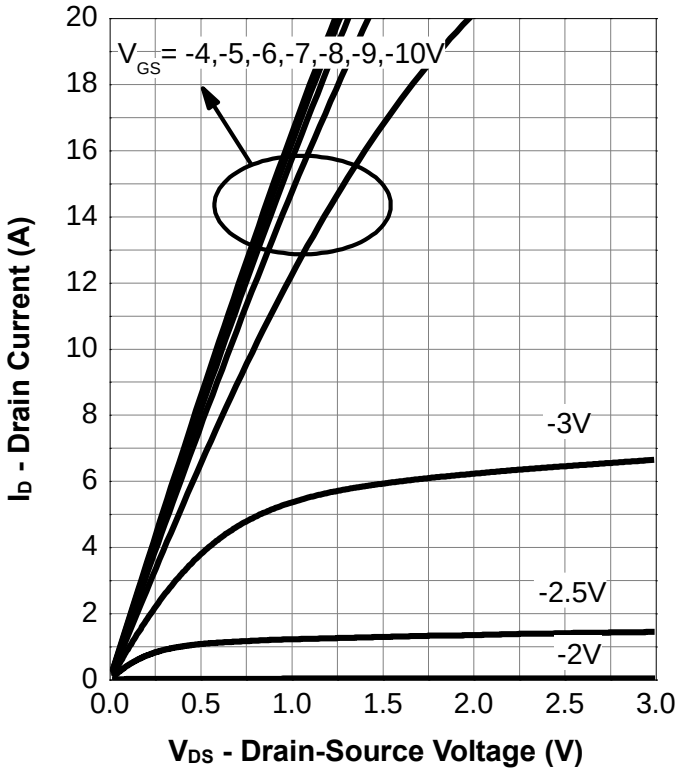


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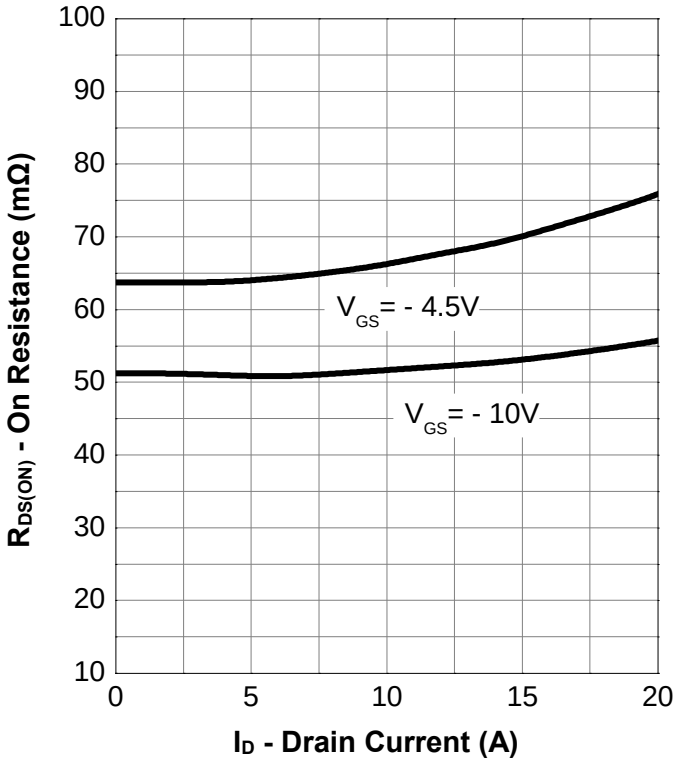
6. Typical Characteristics

P-Channel

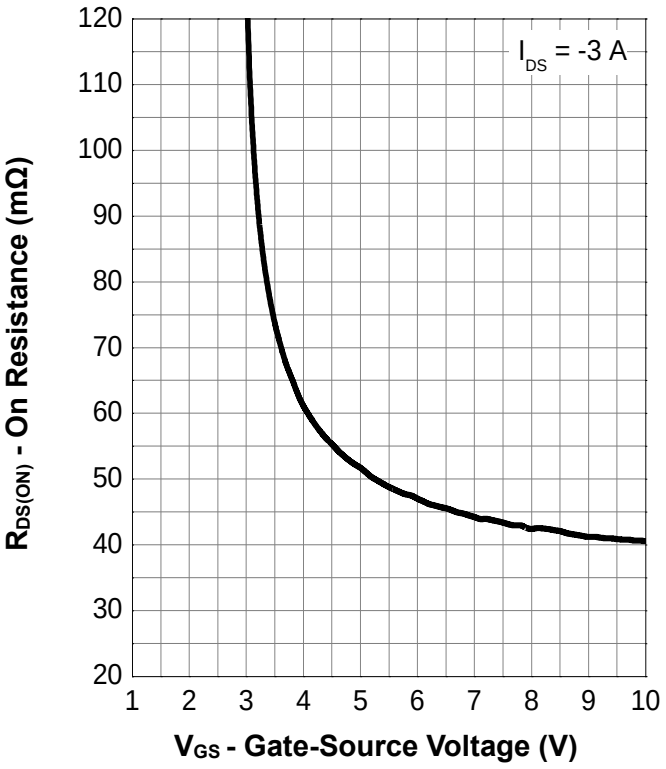
Output Characteristics



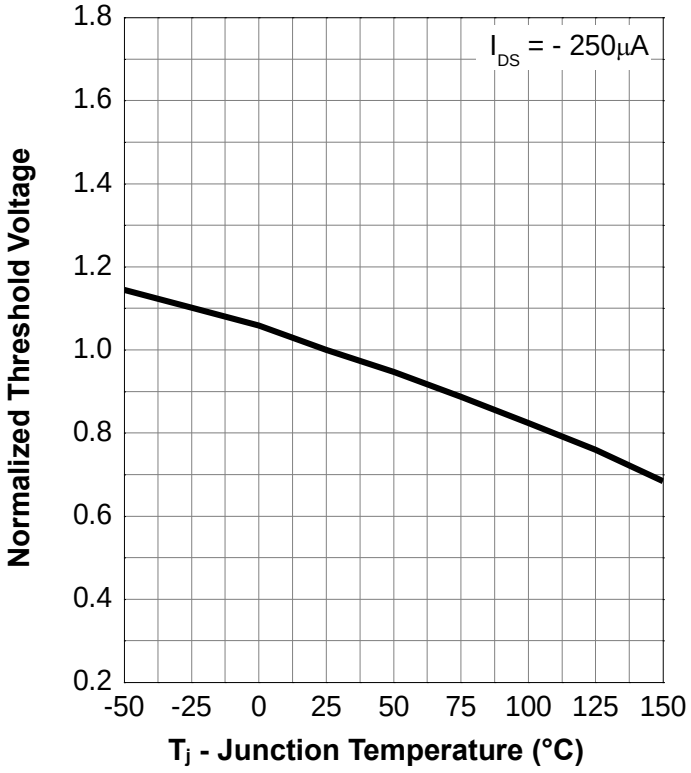
On Resistance



Transfer Characteristics



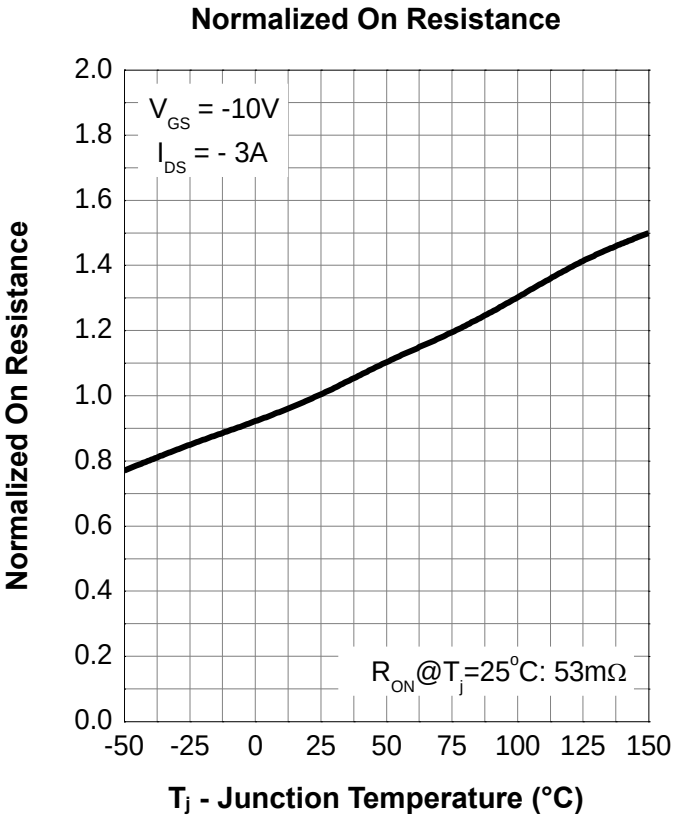
Normalized Threshold Voltage

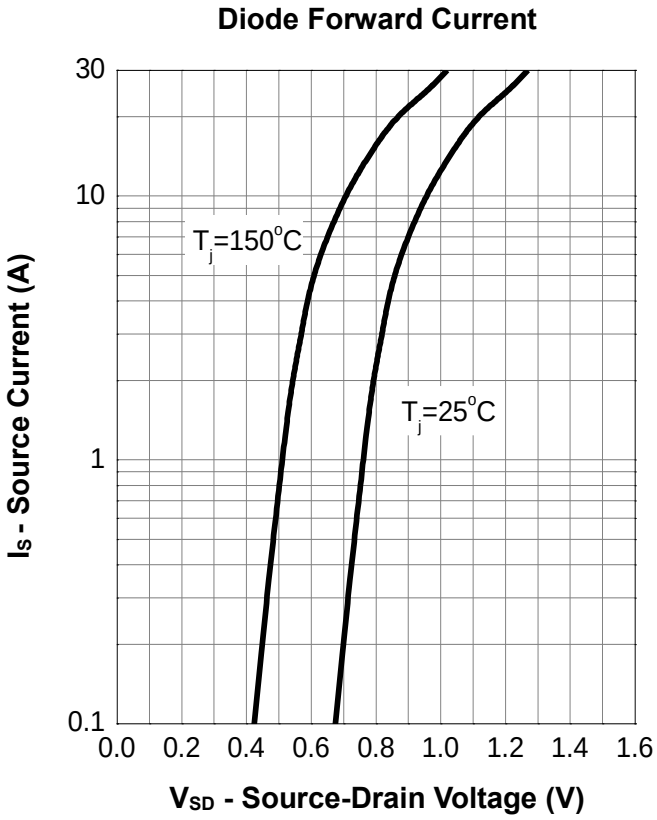


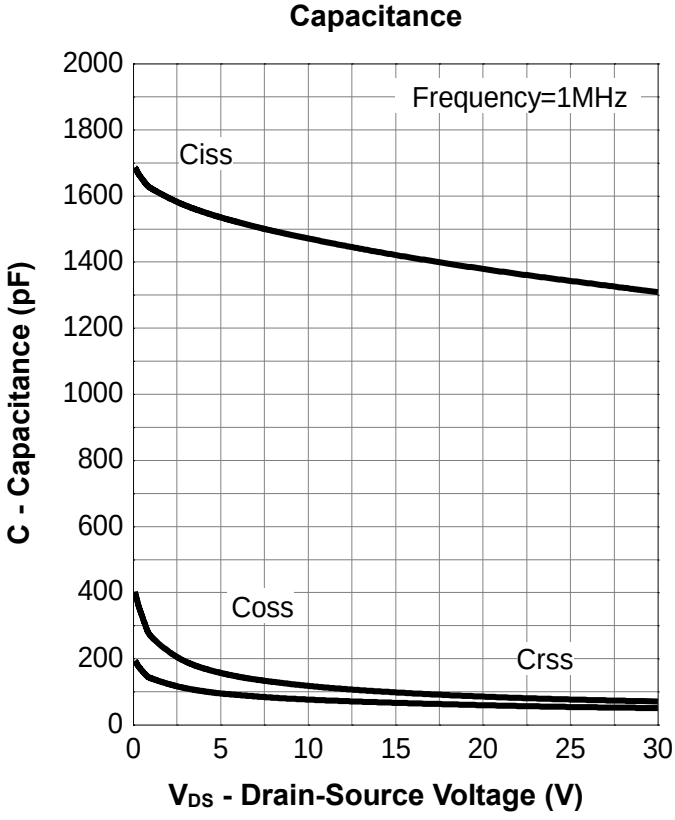
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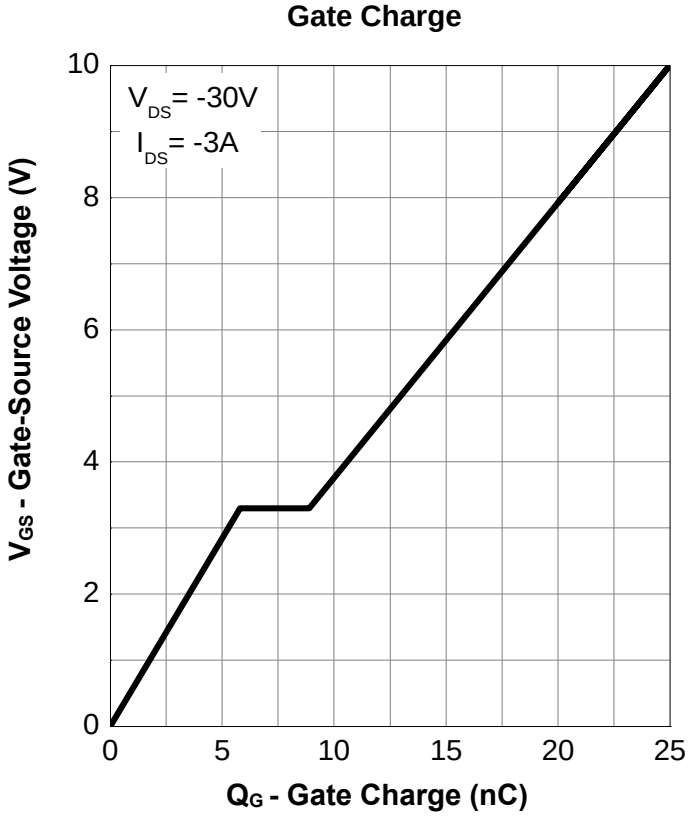
6. Typical Characteristics

P-Channel









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