iMN009N04G

N-Channel Enhancement Mode MOSFET

Datasheet

1. Product Information

1.1 Features

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



1.2 Package Type

PDFN5X6B-EP1-8L / PDFN5x6C-EP1-8L

1.3 Quick Reference

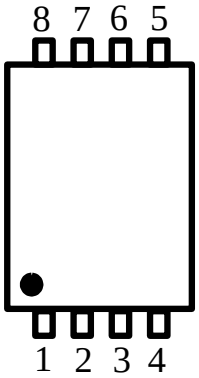
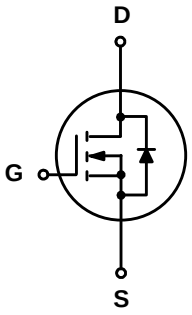
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Limiting Values						
P_{tot}	Total Power Dissipation	T_C = 25 ℃	-	-	150	W
I_{DS}	Drain-Source Current	T_C = 25 ℃, V_{GS} = 10 V	-	-	297	A
		T_C = 100 ℃, V_{GS} = 10 V	-	-	210	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_{DS} = 250 μA	40	-	-	V
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = 250 μA	2	-	4	
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS} = 10 V, I_{DS} = 30 A	-	0.84	1.0	mΩ
		V_{GS} = 6 V, I_{DS} = 20 A	-	2.45	3.1	

2. Ordering Code & Marking Information

Ordering Code	Marking Information
iMN009N04G	009N04 XXXXXX X: Data Code

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3. Pin Description

Pin	Description	Simplified Outline	Symbol
1 ~ 3	Source (S)		
4	Gate (G)		
5 ~ 8	Drain(D)		

4. Limiting Values

Symbol	Parameter		Rating	Unit
V_{DS}	Drain-Source Voltage		40	V
V_{GS}	Gate-Source Voltage		± 20	
I_{DS}	Drain-Source Current	T_C = 25 ℃, V_{GS} = 10 V,	297	A
		T_C = 100 ℃, V_{GS} = 10 V,	210	
I_{DM} Note1	Pulsed Drain-Source Current	T_C = 25 ℃, V_{GS} = 10 V,	1100	A
I_S	Diode Forward Current	T_C = 25 ℃, V_{GS} = 0 V,	297	
E_{AS}	Single Pulsed Avalanche Energy	L = 1.0 mH, V_{DD} = 40 V,	450	mJ
P_{tot}	Total Power Dissipation	T_C = 25 ℃	150	W
$R_{\theta JA}$ Note2	Thermal Resistance- Junction to Ambient		44.9	℃ / W
$R_{\theta JC}$	Thermal Resistance- Junction to Case		1	
T_{stg}	Storage Temperature		- 55 ~ 175	℃
T_J	Junction Temperature		175	

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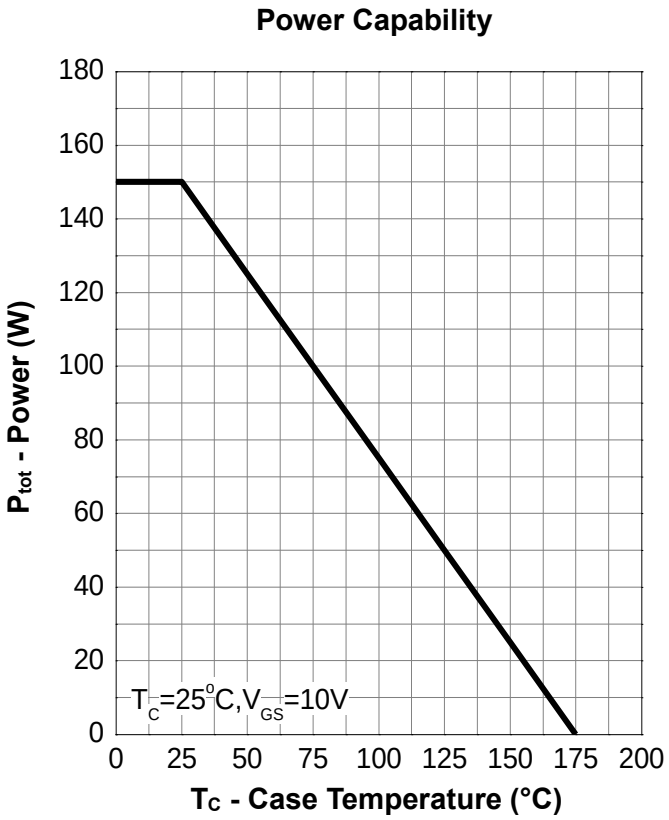
5. Electrical Characteristics (T_A = 25 °C Unless Otherwise Noted)

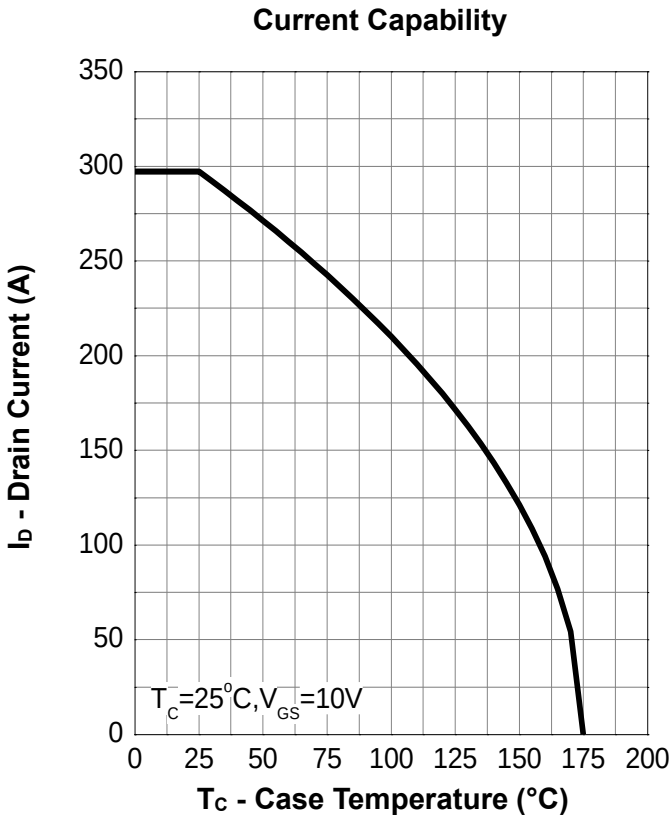
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_{DS} = 250 μA	40	-	-	V
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = 250 μA	2	-	4	
I_{DSS}	Drain-Source Leakage Current	V_{DS} = 32 V, V_{GS} = 0 V	-	-	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS} = 10 V, I_{DS} = 30 A	-	0.84	1.0	mΩ
		V_{GS} = 6 V, I_{DS} = 20 A	-	2.45	3.1	
Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_{SD} = 30 A, V_{GS} = 0 V	-	-	1.3	V
t_{rr} Note3	Reverse Recovery Time	I_{DS} = 30 A, V_{GS} = 0 V	-	62.3	-	nS
Q_{rr} Note3	Reverse Recovery Charge	dI_{SD}/dt = 100 A/μs	-	66.6	-	nC
Dynamic Characteristics Note3						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 20 V Frequency = 1 MHz	-	4875	-	pF
C_{oss}	Output Capacitance		-	2047	-	
C_{rss}	Reverse Transfer Capacitance		-	175	-	
t_d(on)	Turn-on Delay Time	V_{DS} = 20 V, V_{GEN} = 10 V, R_G = 3.9 Ω, R_L = 0.66 Ω, I_{DS} = 30 A	-	19	-	nS
t_r	Turn-on Rise Time		-	79	-	
t_d(off)	Turn-off Delay Time		-	52	-	
t_f	Turn-off Fall Time		-	44	-	
Gate Charge Characteristics Note3						
Q_g	Total Gate Charge	V_{DS} = 20 V, V_{GS} = 10 V, I_{DS} = 30 A	-	80	-	nC
Q_{gs}	Gate-Source Charge		-	27	-	
Q_{gd}	Gate-Drain Charge		-	19	-	

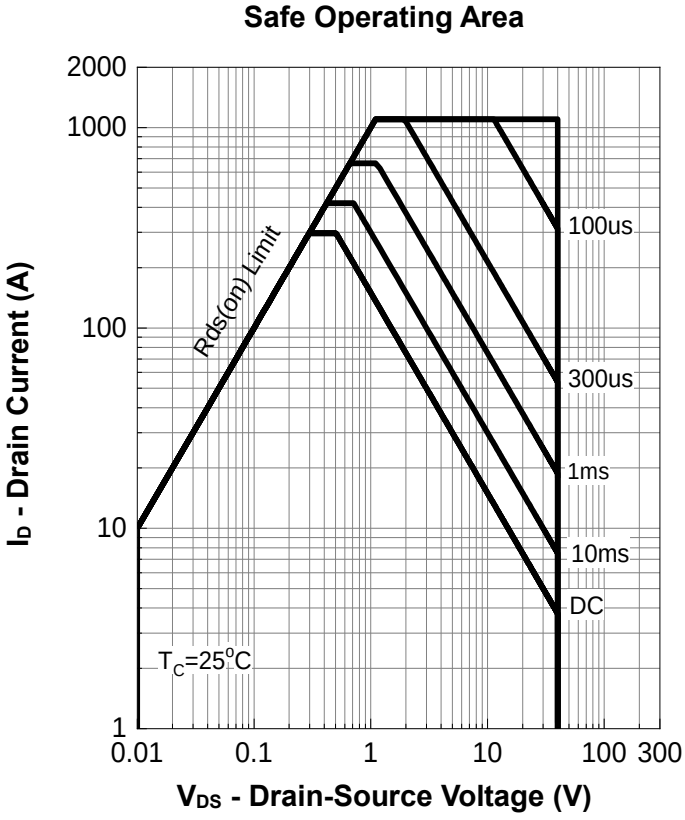
Note 1：Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
Note 2：Surface Mounted on 1 in^2 pad area, t ≤ 10 sec.
Note 3：Guaranteed by design, not subject to production testing.

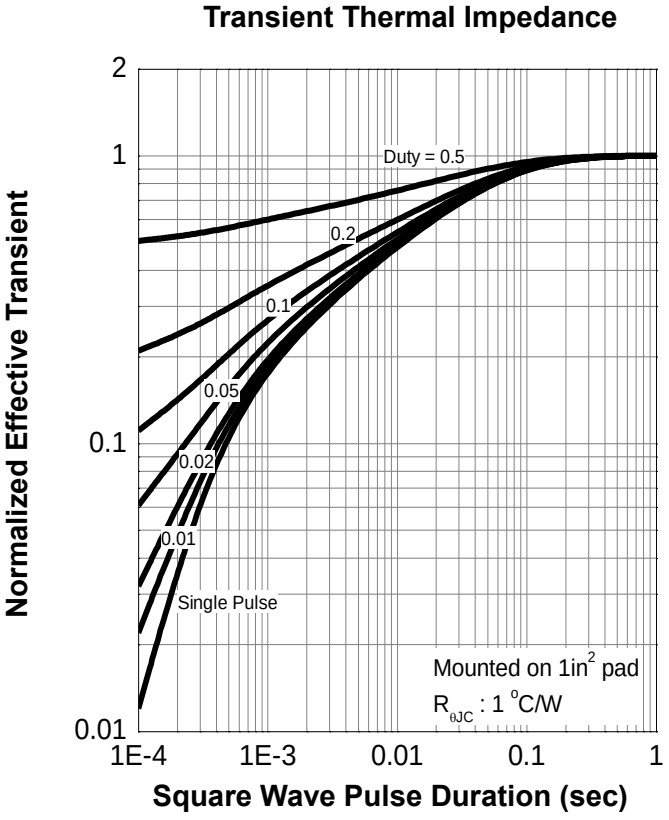
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6. Typical Characteristics



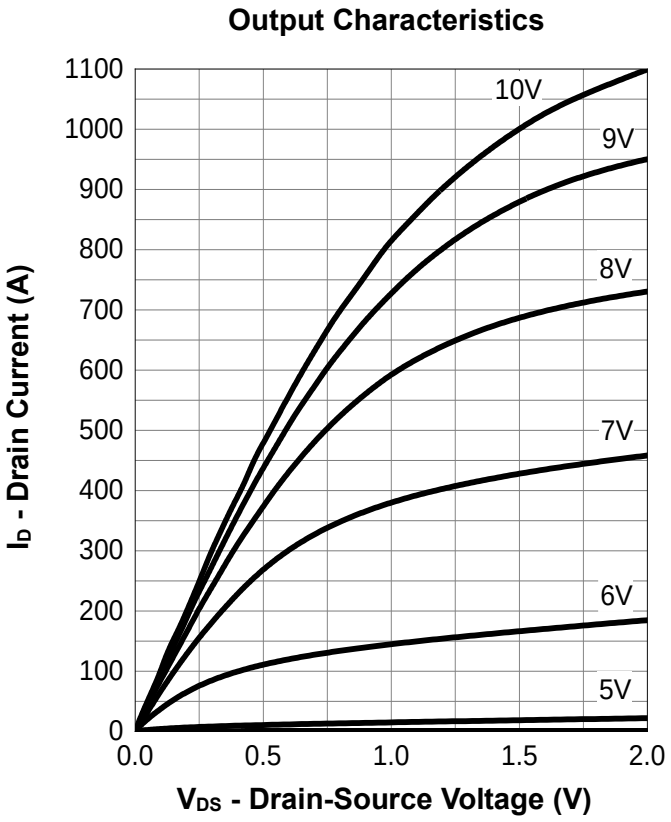


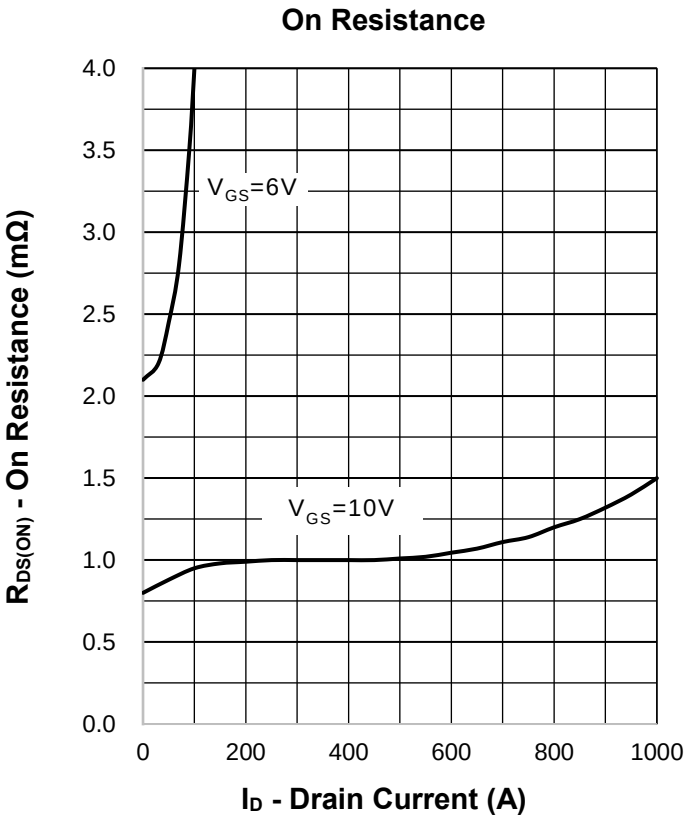


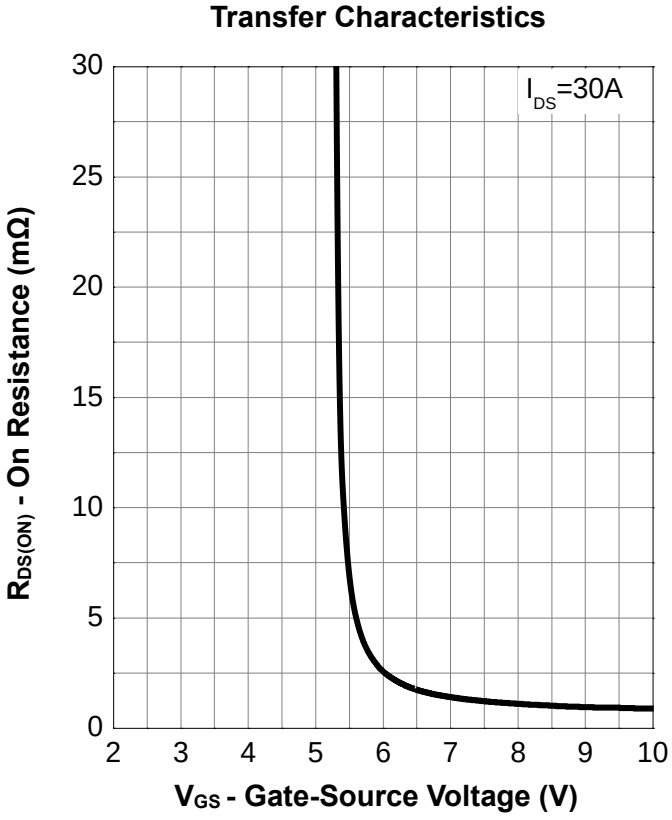


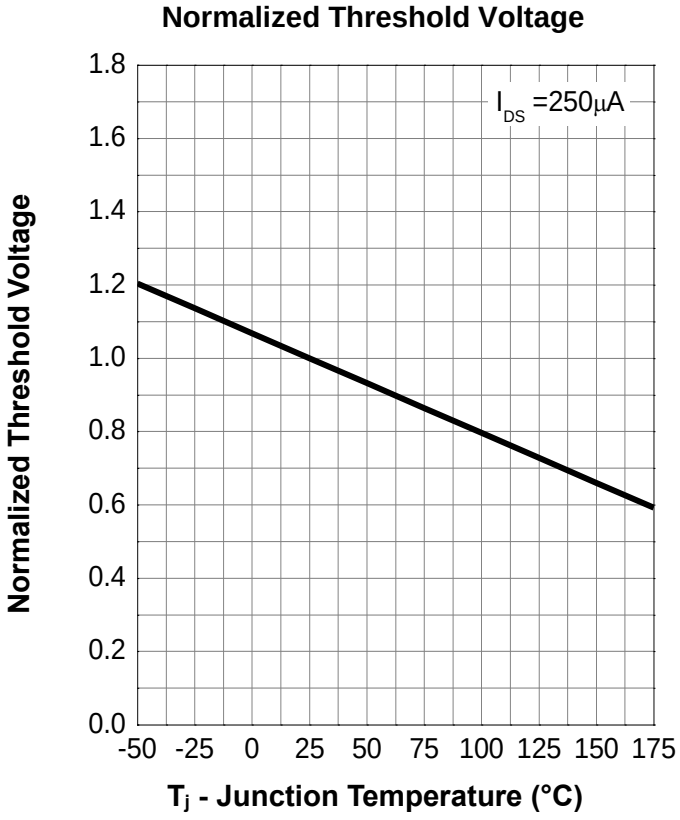
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6. Typical Characteristics





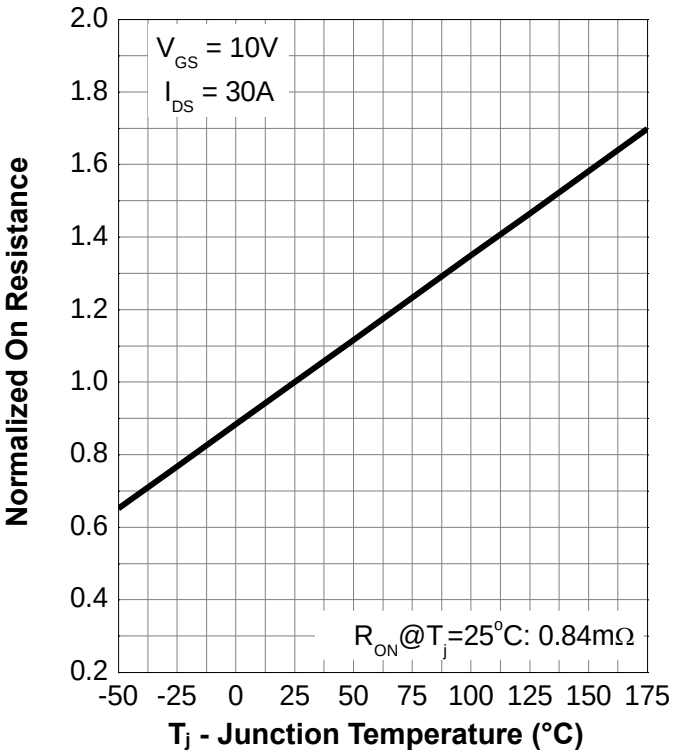




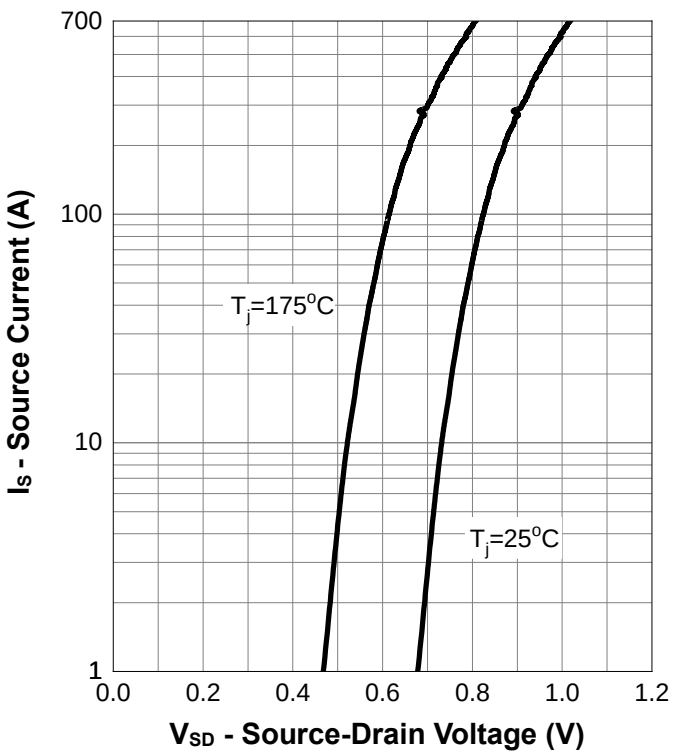
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6. Typical Characteristics

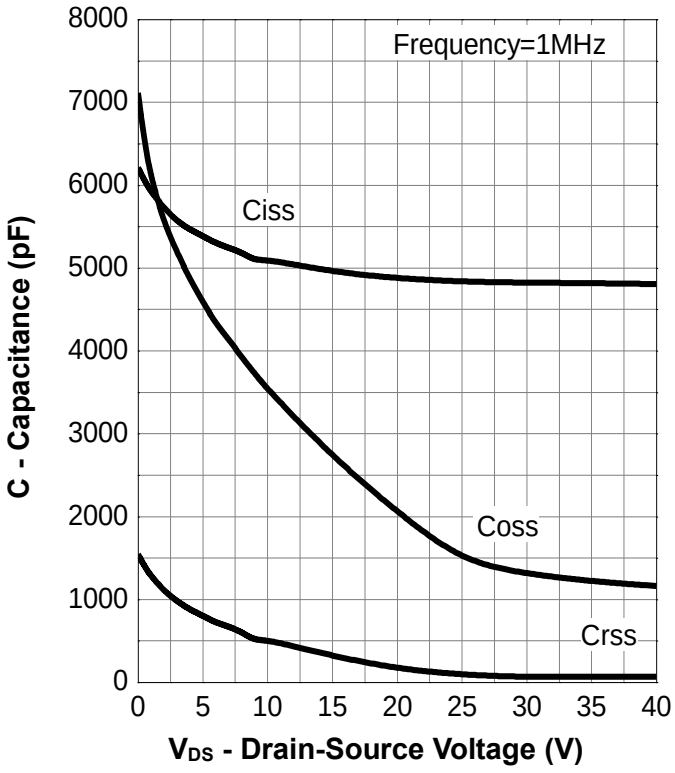
Normalized On Resistance



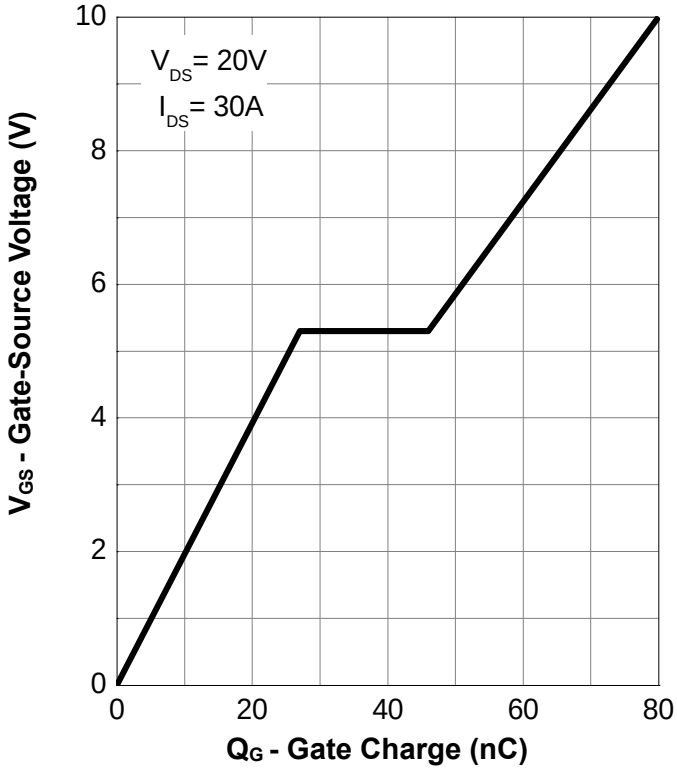
Diode Forward Current



Capacitance



Gate Charge



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