iM4720

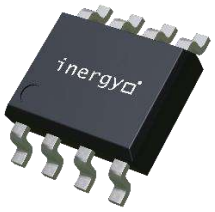
Complementary Enhancement Mode MOSFET

Datasheet

1. Product Information

1.1 Features

- Surface-mount Package
- Advanced Trench Technology
- RoHS Compliant and Halogen Free
- Reliable and Rugged
- Key Applications：MB and NB, Motor Drivers, Half-bridge Drivers



1.2 Package Type

SOP8A-8L

1.3 Quick Reference

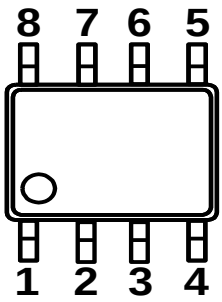
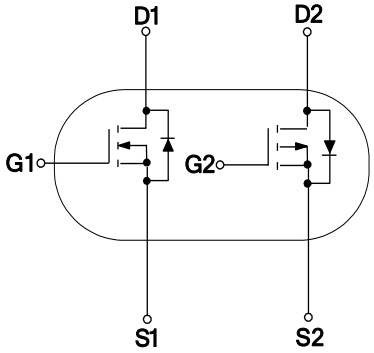
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Limiting Values						
P_{tot}	Total Power Dissipation	T_A = 25 ℃	-	-	1.9	W
I_{DS}	Drain-Source Current	N-ch, T_A = 25 ℃, V_{GS} = 10 V	-	-	6.7	A
		P-ch, T_A = 25 ℃, V_{GS} = - 10 V	-	-	- 5.3	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	N-ch, V_{GS} = 0 V, I_{DS} = 250 μA	30	-	-	V
		P-ch, V_{GS} = 0 V, I_{DS} = - 250 μA	- 30	-	-	
$V_{GS(th)}$	Gate-Source Threshold Voltage	N-ch, V_{GS} = V_{DS}, I_{DS} = 250 μA	1	-	2	
		P-ch, V_{GS} = V_{DS}, I_{DS} = - 250 μA	- 1	-	- 2	
$R_{DS(ON)}$	Drain-Source On-State Resistance	N-ch, V_{GS} = 10 V, I_{DS} = 6 A	-	21	26	mΩ
		P-ch, V_{GS} = - 10 V, I_{DS} = - 5 A	-	38	47	

2. Ordering Code & Marking Information

Ordering Code	Marking Information
iM4720	iM4720 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 ℃	1.9	W
T_{stg}	Storage Temperature		- 55 ~ 150	℃
T_J	Junction Temperature		150	
$R_{\theta JA}$ Note1	Thermal Resistance- Junction to Ambient		65	℃ / W
N-channel				
V_{DS}	Drain-Source Voltage	T_A = 25 ℃	30	V
V_{GS}	Gate-Source Voltage	T_A = 25 ℃	± 20	
I_{DS}	Drain-Source Current (DC)	T_A = 25 ℃, V_{GS} = 10 V	6.7	A
		T_A = 100 ℃, V_{GS} = 10 V	4.2	
I_{DM} Note2	Pulsed Drain-Source Current	T_A = 25 ℃, V_{GS} = 10 V	27	
P-channel				
V_{DS}	Drain-Source Voltage	T_A = 25 ℃	- 30	V
V_{GS}	Gate-Source Voltage	T_A = 25 ℃	± 20	V
I_D	Drain-Source Current (DC)	T_A = 25 ℃, V_{GS} = - 10 V	- 5.3	A
		T_A = 100 ℃, V_{GS} = - 10 V	- 3.3	A
I_{DM} Note2	Pulsed Drain-Source Current	T_A = 25 ℃, V_{GS} = - 10 V	- 21	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 Voltage	V_{GS} = 0 V, I_{DS} = 250 μA	30	-	-	V
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = 250 μA	1	-	2	
I_{DSS}	Drain Leakage Current	V_{DS} = 24 V, V_{GS} = 0 V	-	-	1	μA
I_{GSS}	Gate Leakage Current	V_{GS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS} = 10 V, I_{DS} = 6 A	-	21	26	mΩ
		V_{GS} = 4.5 V, I_{DS} = 3 A	-	31	41	
Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_{SD} = 6 A, V_{GS} = 0 V	-	-	1.3	V
t_{rr} Note3	Reverse Recovery Time	I_{DS} = 6 A, V_{GS} = 0 V dI_{SD}/dt = 100 A/μs	-	3.8	-	nS
Q_{rr} Note3	Reverse Recovery Charge		-	1.0	-	nC
Dynamic Characteristics Note3						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 15 V Frequency = 1 MHz	-	383	-	pF
C_{oss}	Output Capacitance		-	49	-	
C_{rss}	Reverse Transfer Capacitance		-	40	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DS} = 15 V, V_{GEN} = 10 V, R_G = 3.9 Ω, R_L = 2.5 Ω, I_{DS} = 6 A	-	3.3	-	nS
t_r	Turn-on Rise Time		-	42	-	
$t_{d(off)}$	Turn-off Delay Time		-	10	-	
t_f	Turn-off Fall Time		-	5.4	-	
Gate Charge Characteristics Note3						
Q_g	Total Gate Charge	V_{DS} = 15 V, V_{GS} = 10 V, I_{DS} = 6 A	-	8	-	nC
Q_{gs}	Gate-Source Charge		-	2.2	-	
Q_{gd}	Gate-Drain Charge		-	1.2	-	

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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 Voltage	V_{GS} = 0 V, I_{DS} = - 250 μA	- 30	-	-	V
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = - 250 μA	- 1	-	- 2	
I_{DSS}	Drain Leakage Current	V_{DS} = - 24 V, V_{GS} = 0 V	-	-	1	μA
I_{GSS}	Gate Leakage Current	V_{GS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS} = - 10 V, I_{DS} = - 5 A	-	38	47	mΩ
		V_{GS} = - 4.5 V, I_{DS} = - 3 A	-	60	78	
Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_{SD} = 5 A, V_{GS} = 0 V	-	-	1.3	V
t_{rr} Note3	Reverse Recovery Time	I_{DS} = 5 A, V_{GS} = 0 V dI_{SD}/dt = 100 A/μs	-	7.8	-	nS
Q_{rr} Note3	Reverse Recovery Charge		-	3.8	-	nC
Dynamic Characteristics Note3						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 15 V Frequency = 1 MHz	-	722	-	pF
C_{oss}	Output Capacitance		-	80	-	
C_{rss}	Reverse Transfer Capacitance		-	69	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DS} = 15 V, V_{GEN} = 10 V, R_G = 3.9 Ω, R_L = 3 Ω, I_{DS} = 5 A	-	4.3	-	nS
t_r	Turn-on Rise Time		-	34	-	
$t_{d(off)}$	Turn-off Delay Time		-	38	-	
t_f	Turn-off Fall Time		-	28	-	
Gate Charge Characteristics Note3						
Q_g	Total Gate Charge	V_{DS} = 15 V, V_{GS} = 10 V, I_{DS} = 5 A	-	14	-	nC
Q_{gs}	Gate-Source Charge		-	3.6	-	
Q_{gd}	Gate-Drain Charge		-	2.0	-	

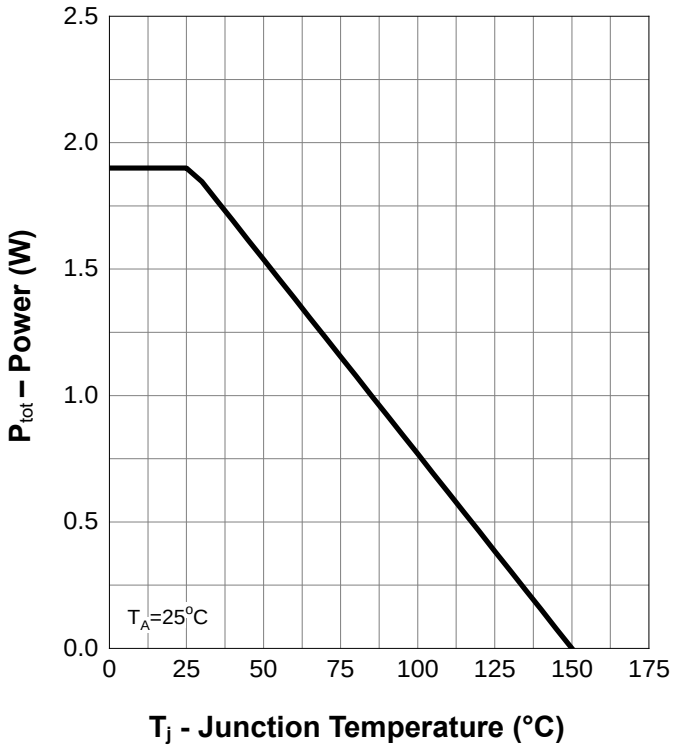
Note1 : Surface Mount on 1 in^2 pad area, t ≦ 10 sec.
Note2 : Pulse width ≦ 300 μs, duty cycle ≦ 2 %.
Note3 : Guaranteed by design, not subject to production testing.

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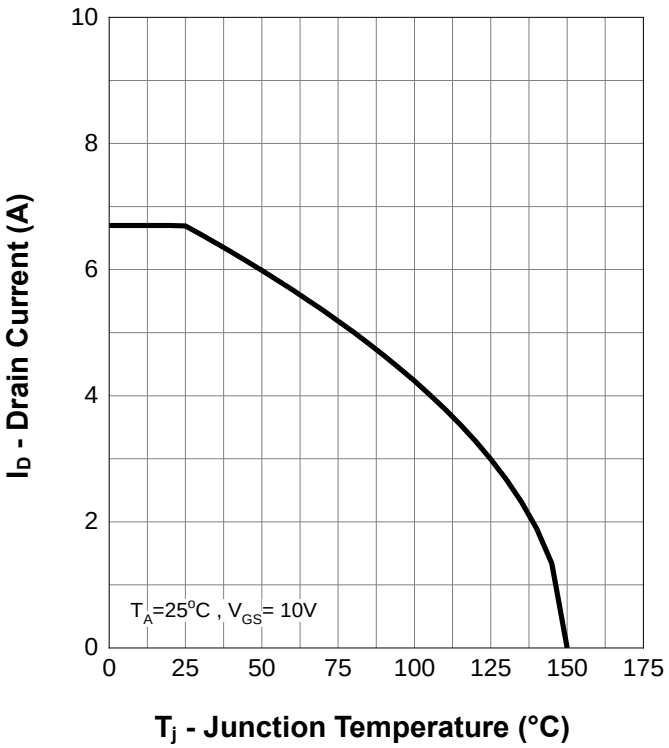
6. Typical Characteristics

N-channel:

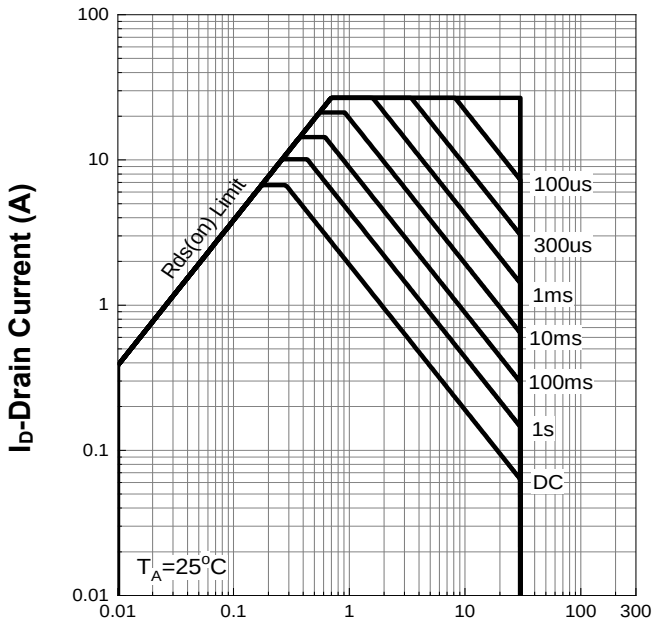
Power Capability



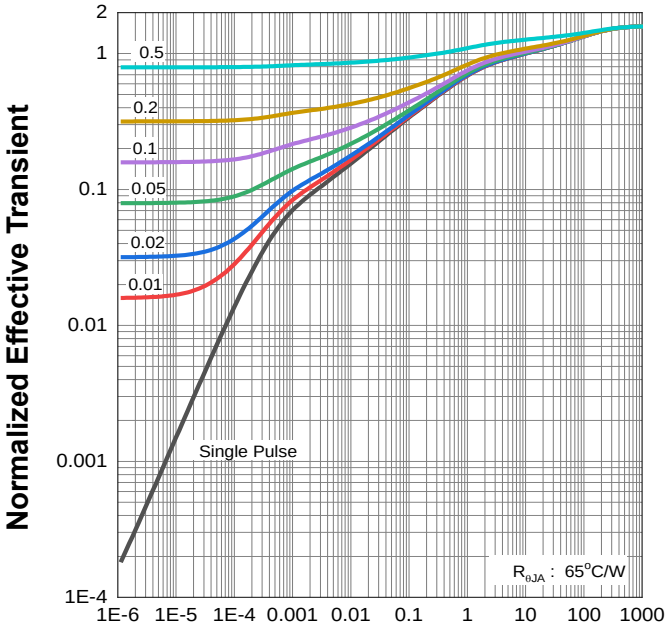
Current Capability



Safe Operation Area



Transient Thermal Impedance

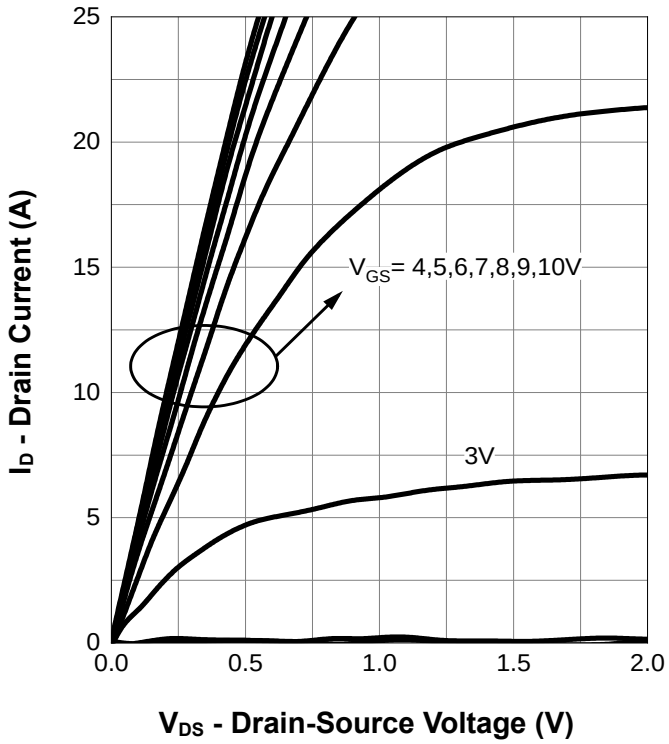


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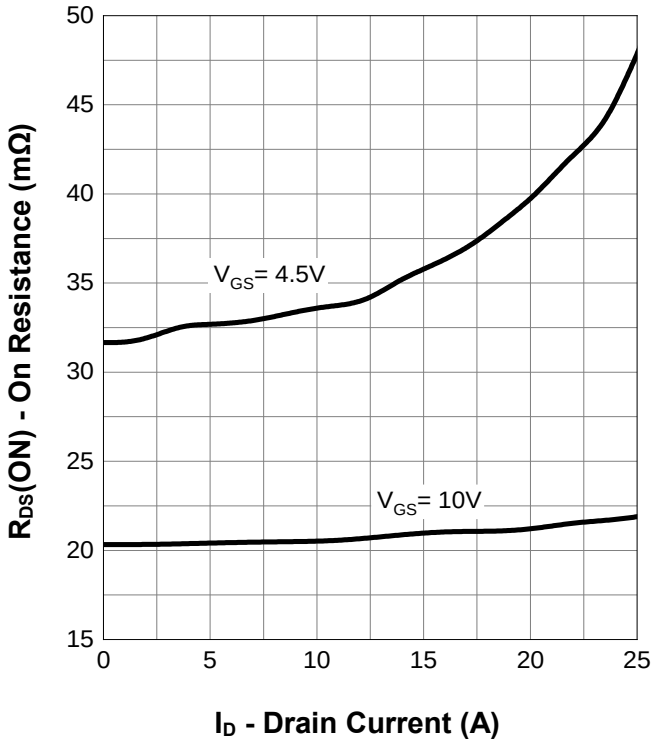
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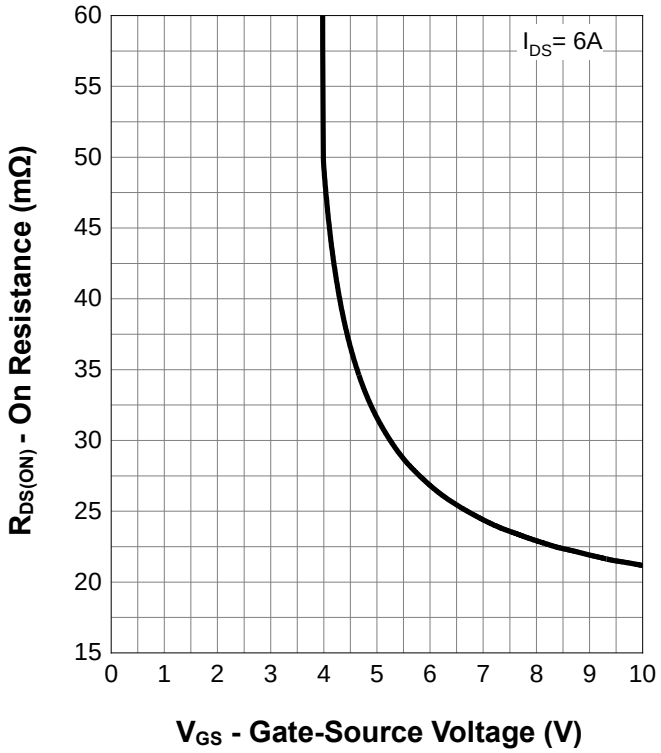
Output Characteristics



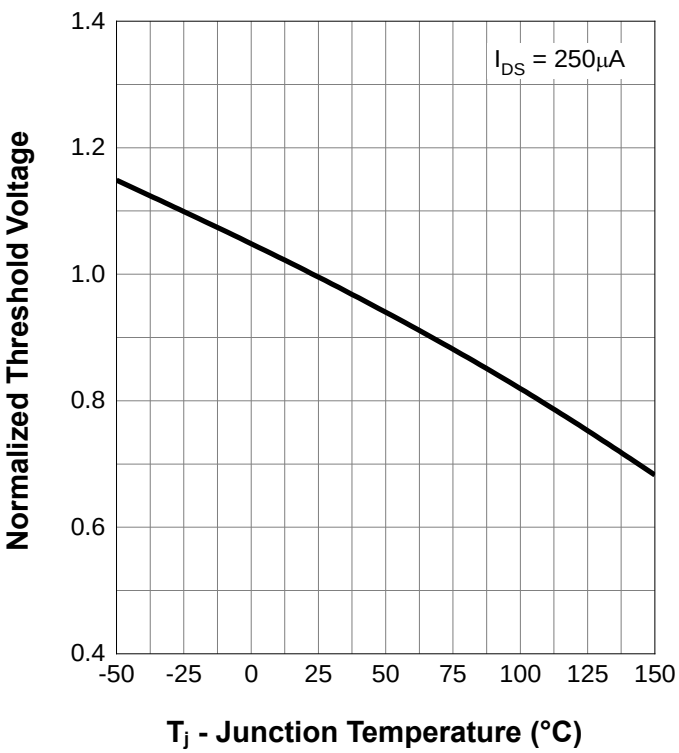
On Resistance



Transfer Characteristics



Normalized Threshold Voltage

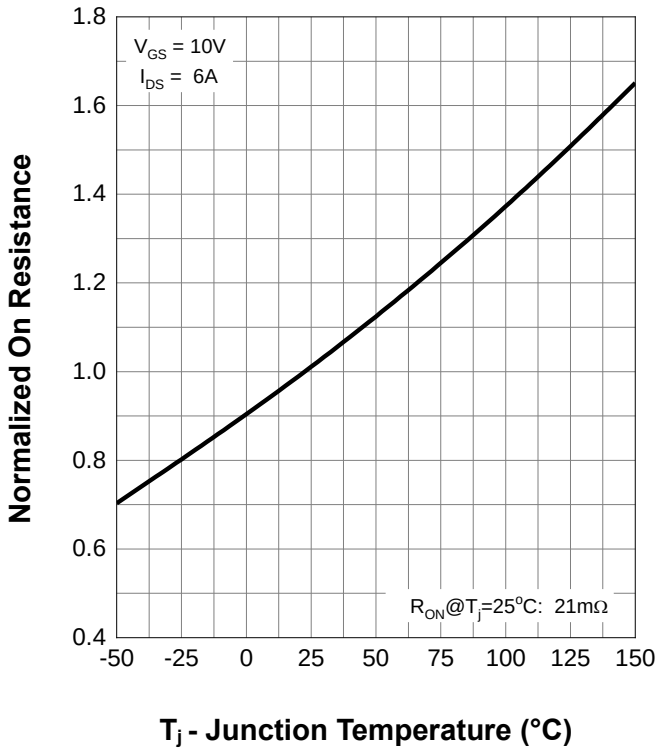


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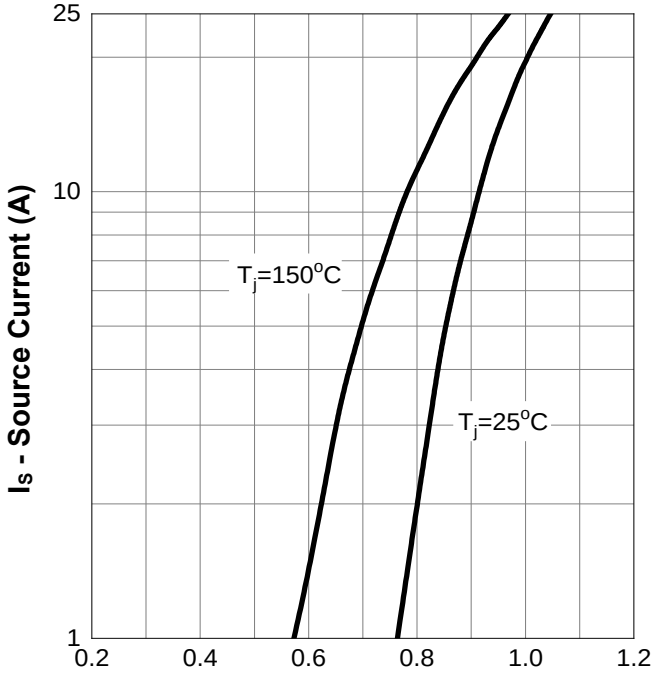
6. Typical Characteristics (cont.)

N-channel:

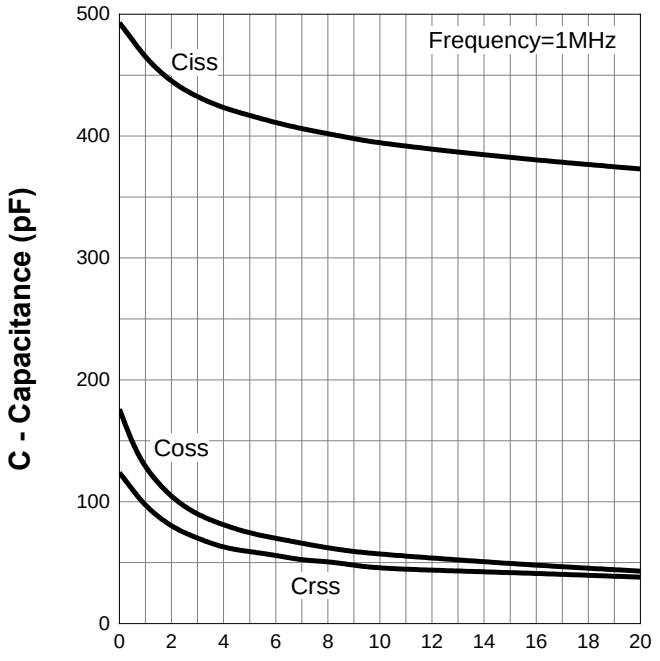
Normalized On Resistance



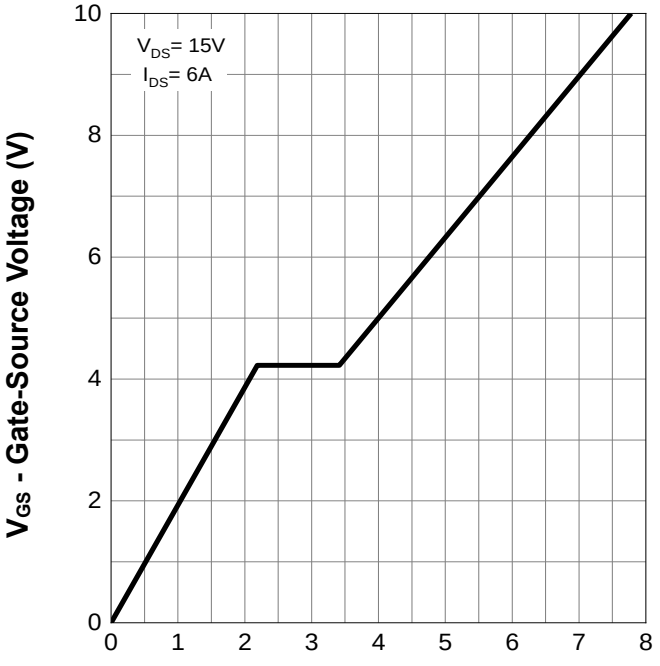
Diode Forward Current



Capacitance



Gate Charge

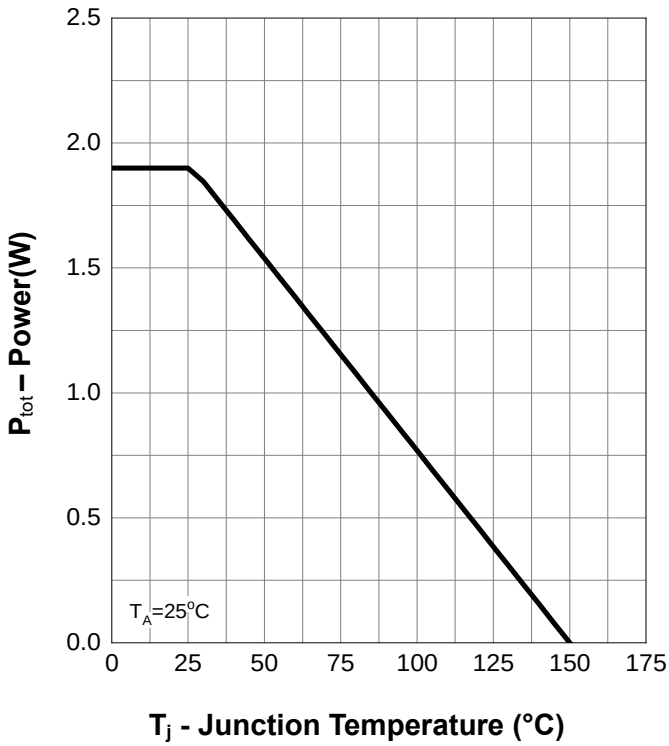


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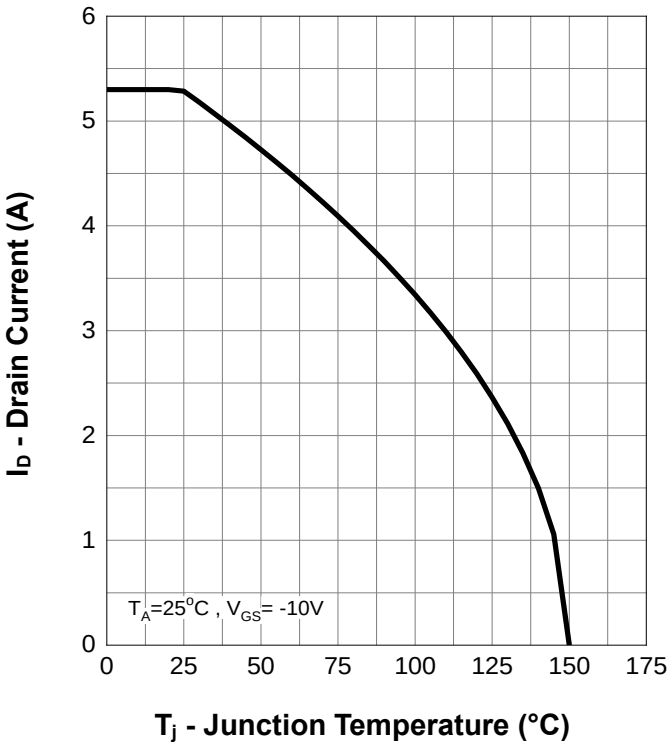
6. Typical Characteristics (cont.)

P-channel:

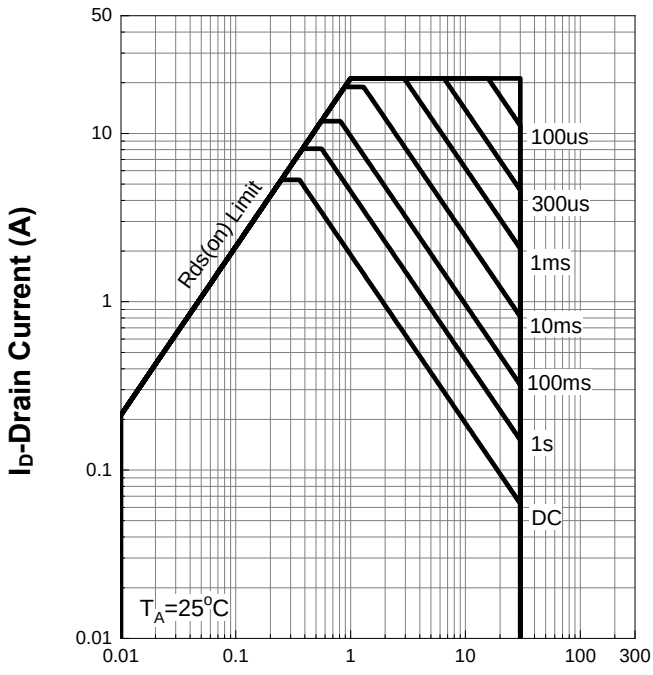
Power Capability



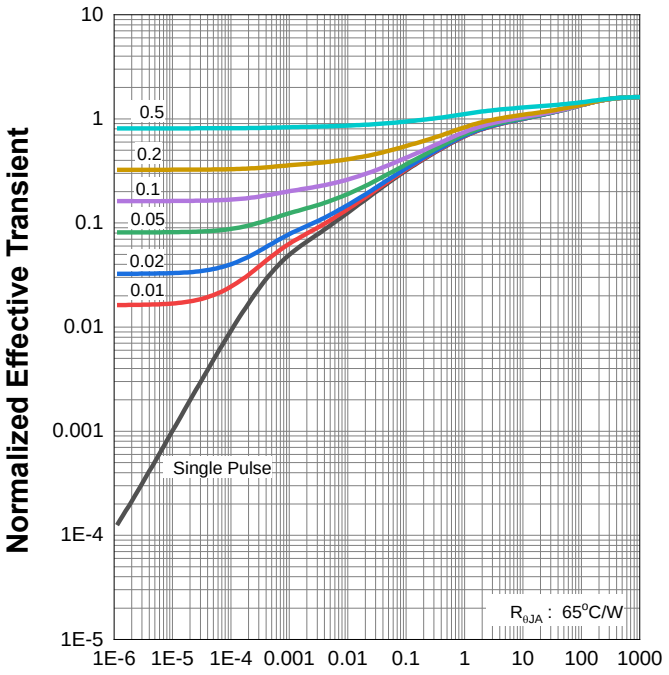
Current Capability



Safe Operation Area



Transient Thermal Impedance

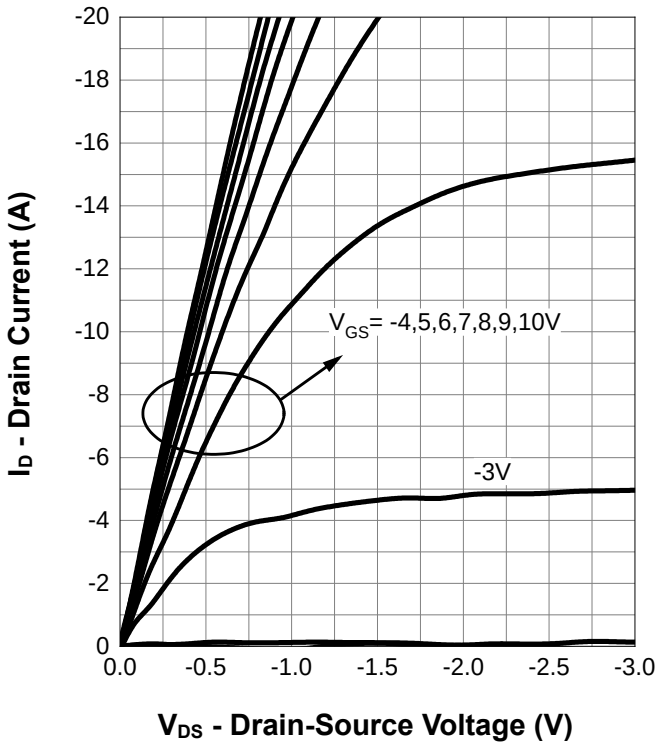


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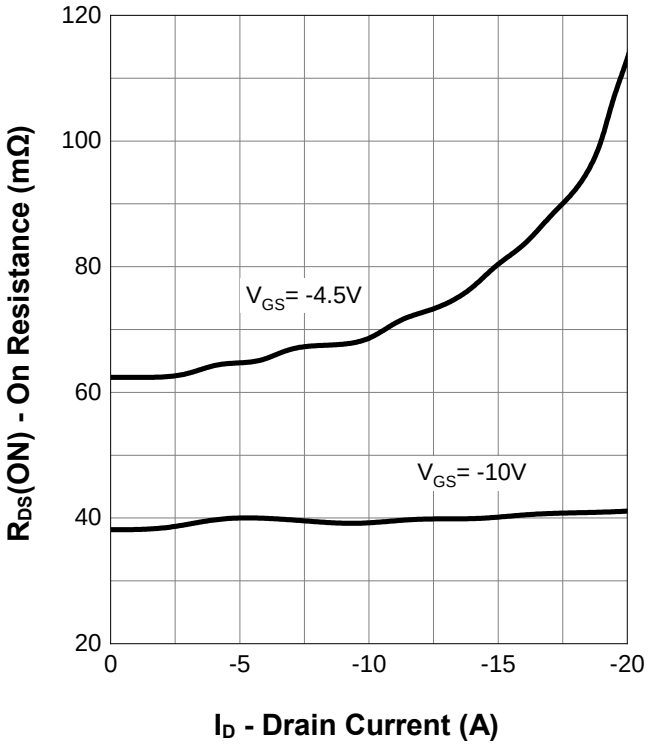
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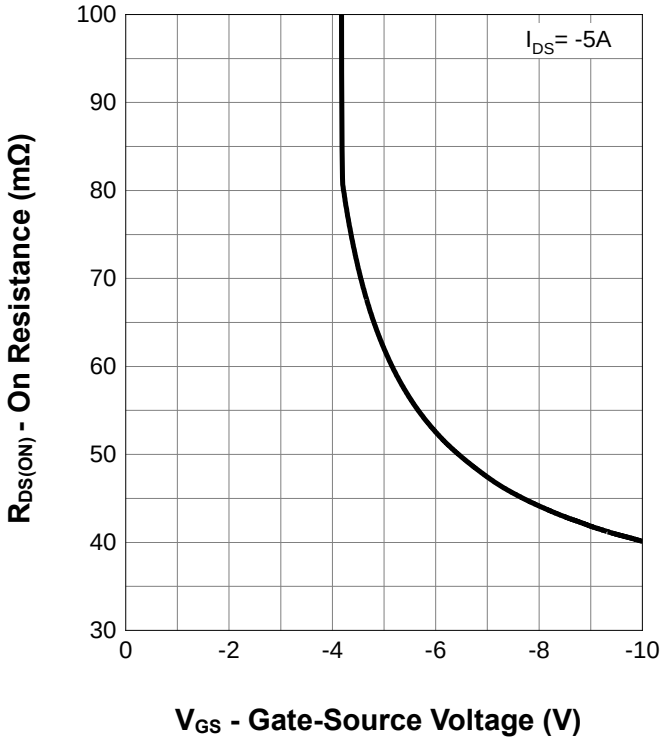
Output Characteristics



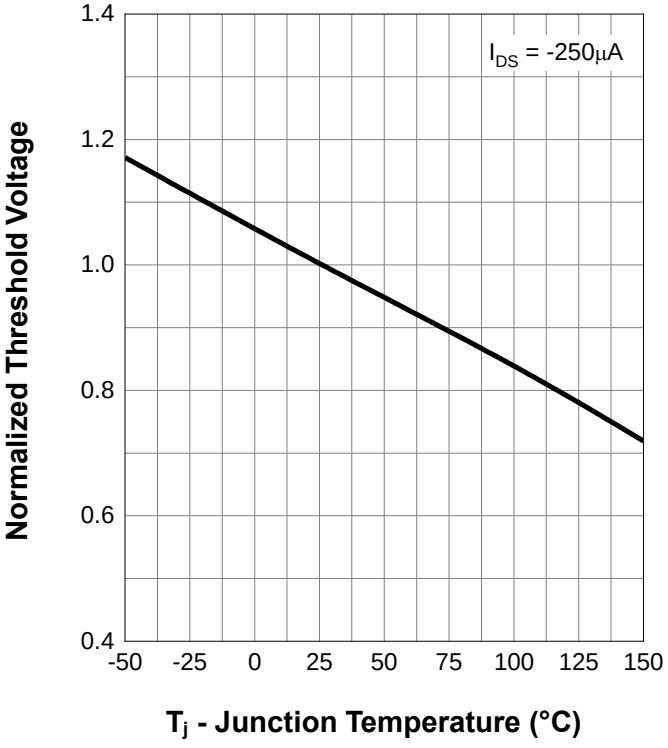
On Resistance



Transfer Characteristics



Normalized Threshold Voltage

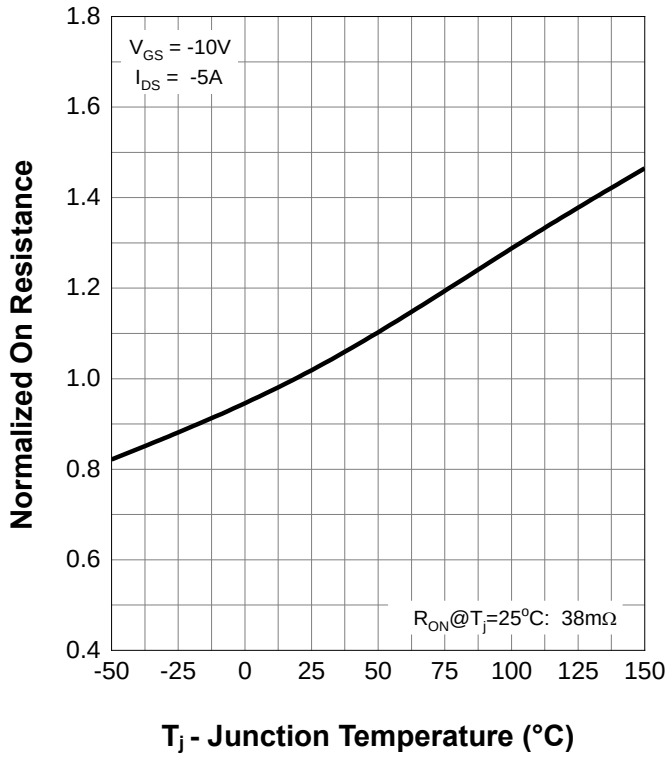


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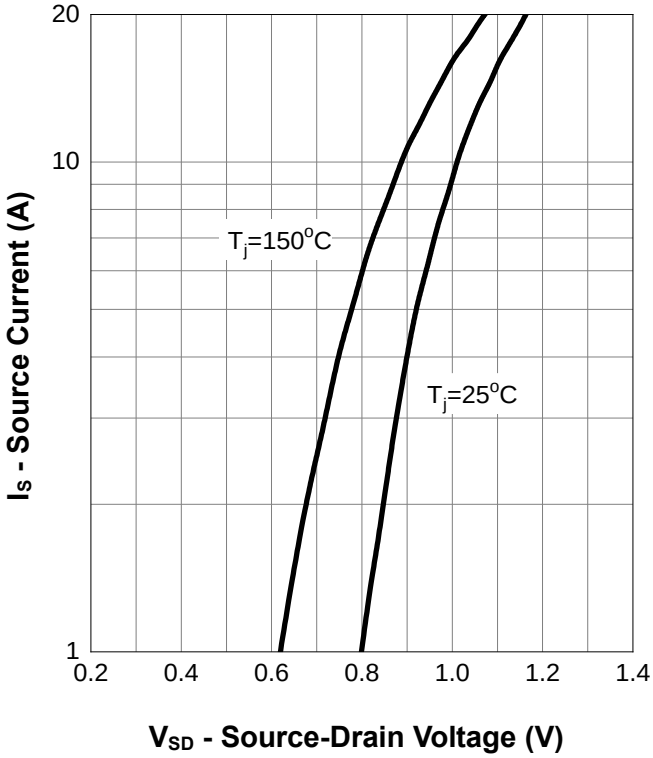
6. Typical Characteristics (cont.)

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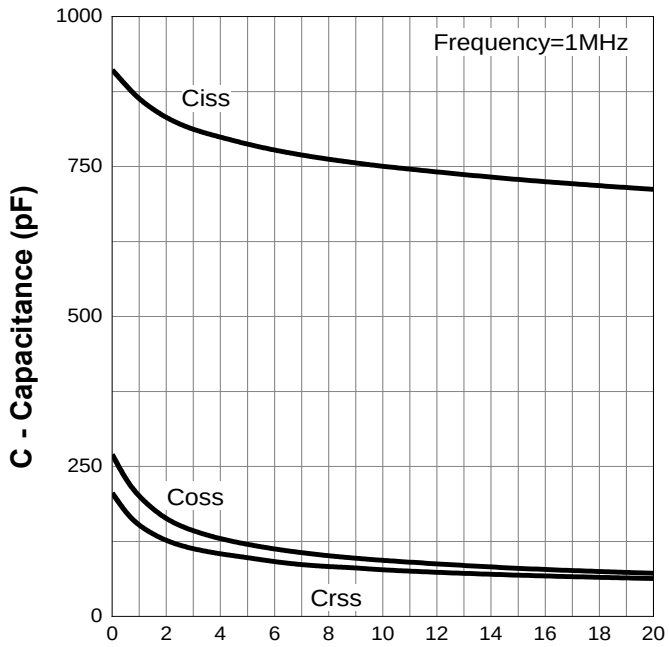
Normalized On Resistance



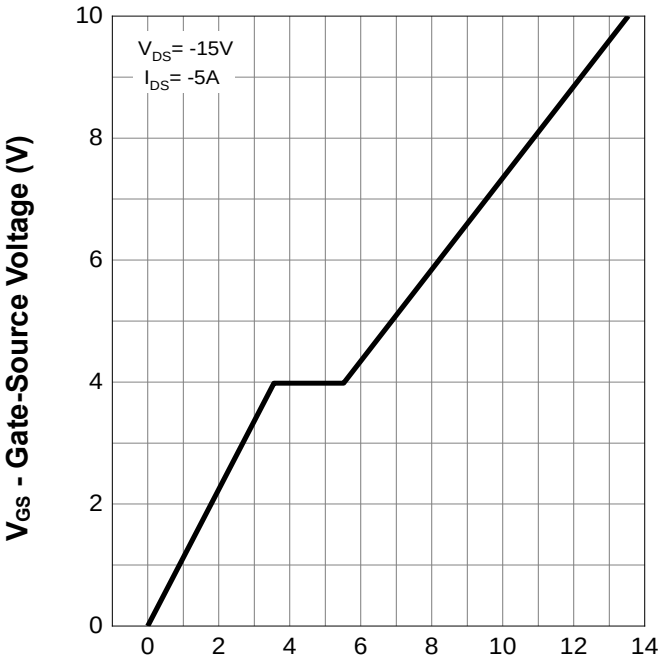
Diode Forward Current



Capacitance



Gate Charge



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