iM1717

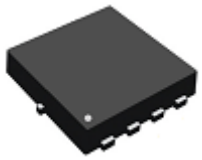
Complementary Enhancement Mode MOSFET

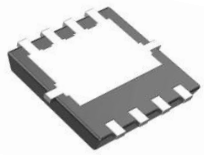
Datasheet

1. Product Information

1.1 Features

- Advanced Trench Cell Design
- RoHS Compliant and Halogen Free
- Reliable and Rugged
- Single pad Dual MOS Design





1.2 Package Type

PDFN3.3X3.3A-EP1-8L

1.3 Quick Reference

Symbol	Channel	Conditions	Min	Typ	Max	Unit
Limiting Values						
P_{tot}	Channel 1	T_C = 25 ℃	-	-	18	W
	Channel 2		-	-	18	W
I_D Note3	Channel 1	T_C = 25 ℃, V_{GS} = 10 V	-	-	24	A
	Channel 2	T_C = 25 ℃, V_{GS} = -10 V	-	-	24	
Static Characteristics						
BV_{DSS}	Channel 1	V_{GS} = 0 V, I_{DS} = 250 μA	30	-	-	V
	Channel 2	V_{GS} = 0 V, I_{DS} = -250 μA	-30	-	-	
$R_{DS(ON)}$	Channel 1	V_{GS} = 10 V, I_{DS} = 10 A	-	7	8.7	mΩ
		V_{GS} = 4.5 V, I_{DS} = 5 A	-	9.5	12.3	
	Channel 2	V_{GS} = -10 V, I_{DS} = -10 A	-	16	20	
		V_{GS} = -4.5 V, I_{DS} = -5 A	-	25	32	

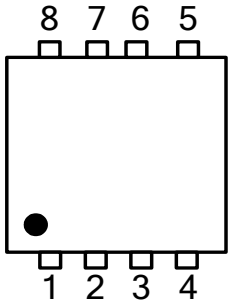
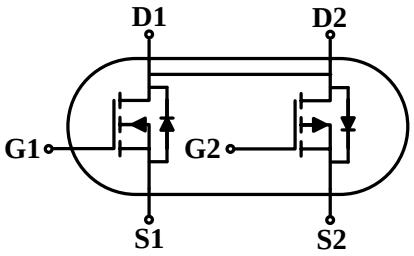
Note 1：Surface Mounted on 1 in^2 pad area, t ≤ 10 sec.
Note 2：Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
Note 3：Limited by bonding wire.

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2. Ordering Code & Marking Information

Ordering Code	Marking Information
iM1717	iM1717 XXXXX X : Date Code

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		Channel 1	Channel 2	Unit
V_{DS}	Drain-Source Voltage		30	-30	V
V_{GS}	Gate-Source Voltage		± 20	± 20	V
I_D Note3	Drain Current	T_C = 25 ℃	24	-24	A
		T_C = 100 ℃	23	-15	
I_{DM} Note2	Pulsed Source Current	T_C = 25 ℃	96	-85	A
I_S	Diode Forward Current	T_C = 25 ℃	24	-24	A
E_{AS}	Single Pulsed Avalanche Energy	L= 1.0mH	72	98	mJ
P_{tot}	Total Power Dissipation	T_C = 25 ℃	18	18	W
$R_{\theta JA}$ Note1	Thermal Resistance- Junction to Ambient		75	75	℃ / W
$R_{\theta JC}$	Thermal Resistance- Junction to Case		6.9	6.9	℃ / W
T_{stg}	Storage Temperature		-55 ~ 150		℃
T_J	Junction Temperature		150		℃

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：Limited by bonding wire.

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

5.1 Channel 1

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 Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = 250 μA	1	-	2	V
I_{DSS}	Drain Leakage Current	V_{DS} = 24 V, V_{GS} = 0 V	-	-	1	μA
I_{GSS}	Gate Leakage Current	V_{DS} = 0 V, V_{GS} = ±20 V	-	-	±100	nA
$R_{DS(ON)}$ Note1	On-State Resistance	V_{GS} = 10 V, I_{DS} = 10 A	-	7	8.7	mΩ
		V_{GS} = 4.5 V, I_{DS} = 5 A	-	9.5	12.3	
Diode Characteristics						
V_{SD} Note1	Diode Forward Voltage	I_{SD} = 10 A, V_{GS} = 0 V	-	-	1.3	V
t_{rr}	Reverse Recovery Time	I_{SD} = 10 A, dI_{SD}/dt = 100 A/μs	-	17	-	nS
Q_{rr}	Reverse Recovery Charge		-	6	-	nC
Dynamic Characteristics Note2						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 15 V Frequency = 1 MHz	-	724	-	pF
C_{oss}	Output Capacitance		-	312	-	
C_{rss}	Reverse Transfer Capacitance		-	49	-	
t_d(on)	Turn-on Delay Time	V_{DS} = 15 V, V_{GEN} = 10 V, R_G = 3.9 Ω, R_L = 1.5 Ω, I_{DS} = 10 A	-	5	-	nS
t_r	Turn-on Rise Time		-	28	-	
t_d(off)	Turn-off Delay Time		-	15	-	
t_f	Turn-off Fall Time		-	6	-	
Gate Charge Characteristics Note2						
Q_g	Total Gate Charge	V_{DS} = 15 V, V_{GS} = 10 V, I_{DS} = 10 A	-	14	-	nC
Q_{gs}	Gate-Source Charge		-	2.9	-	
Q_{gd}	Gate-Drain Charge		-	2.4	-	

Note 1: Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
Note 2: Guaranteed by design, not subject to production testing.

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5.2 Channel 2

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 Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = -250 μA	- 1	-	- 2.5	V
I_{DSS}	Drain Leakage Current	V_{DS} = -24 V, V_{GS} = 0 V	-	-	-1	μA
I_{GSS}	Gate Leakage Current	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	±100	nA
$R_{DS(ON)}$ Note1	On-State Resistance	V_{GS} = -10 V, I_{DS} = -10 A	-	16	20	mΩ
		V_{GS} = -4.5 V, I_{DS} = -5 A	-	25	32	
Diode Characteristics						
V_{SD} Note1	Diode Forward Voltage	I_{SD} = - 10 A, V_{GS} = 0 V	-	-	- 1.3	V
t_{rr}	Reverse Recovery Time	I_{SD} = - 10 A, dI_{SD}/dt = 100 A/μs	-	11	-	nS
Q_{rr}	Reverse Recovery Charge		-	5	-	nC
Dynamic Characteristics Note2						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = -15 V Frequency = 1 MHz	-	1987	-	pF
C_{oss}	Output Capacitance		-	167	-	
C_{rss}	Reverse Transfer Capacitance		-	149	-	
t_d(on)	Turn-on Delay Time	V_{DS} = - 15 V, V_{GEN} = -10 V, R_G = 3.9 Ω, R_L = 1.5 Ω, I_{DS} = -10 A	-	6	-	nS
t_r	Turn-on Rise Time		-	34	-	
t_d(off)	Turn-off Delay Time		-	109	-	
t_f	Turn-off Fall Time		-	45	-	
Gate Charge Characteristics Note2						
Q_g	Total Gate Charge	V_{GS} = - 15 V, V_{DS} = - 20 V, I_{DS} = - 10 A	-	33	-	nC
Q_{gs}	Gate-Source Charge		-	7.9	-	
Q_{gd}	Gate-Drain Charge		-	4.3	-	

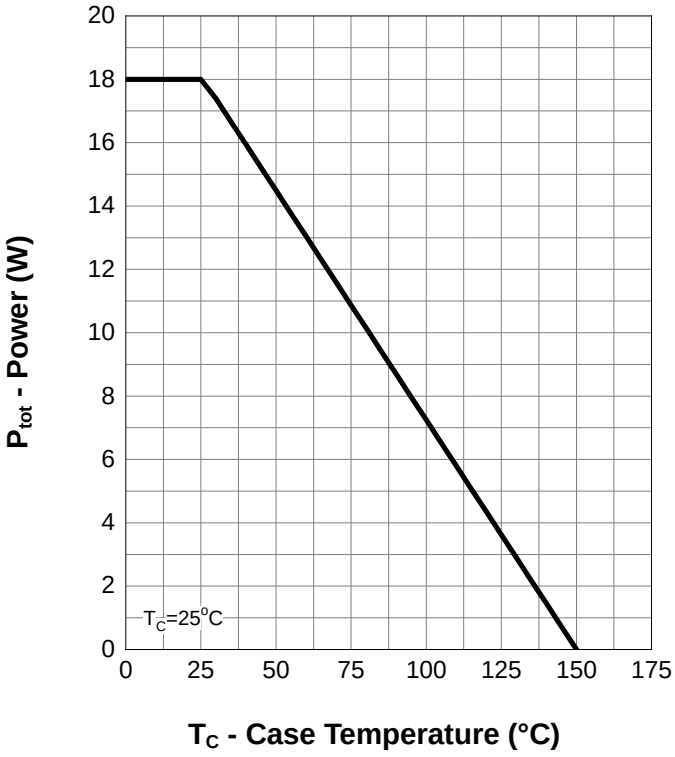
Note 1: Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
Note 2: Guaranteed by design, not subject to production testing.

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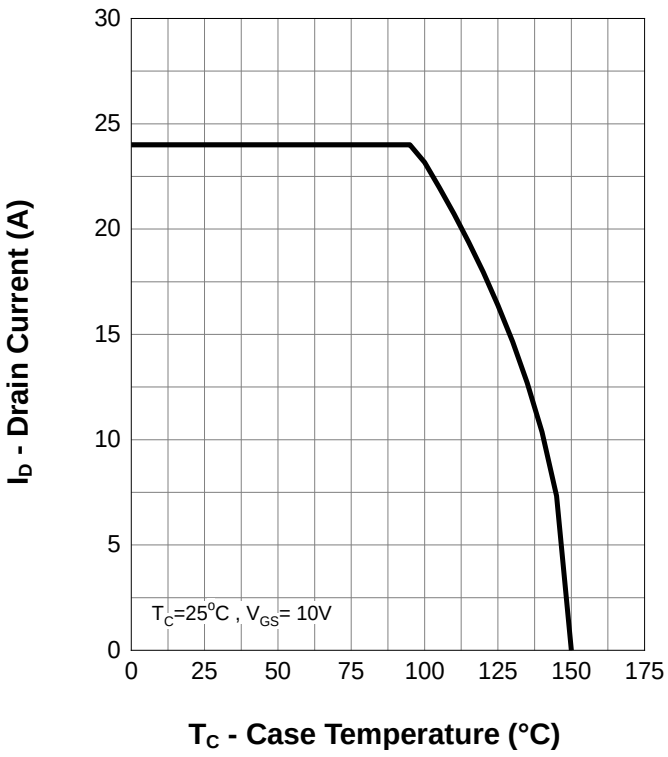
6. Typical Characteristics

6.1 Channel 1

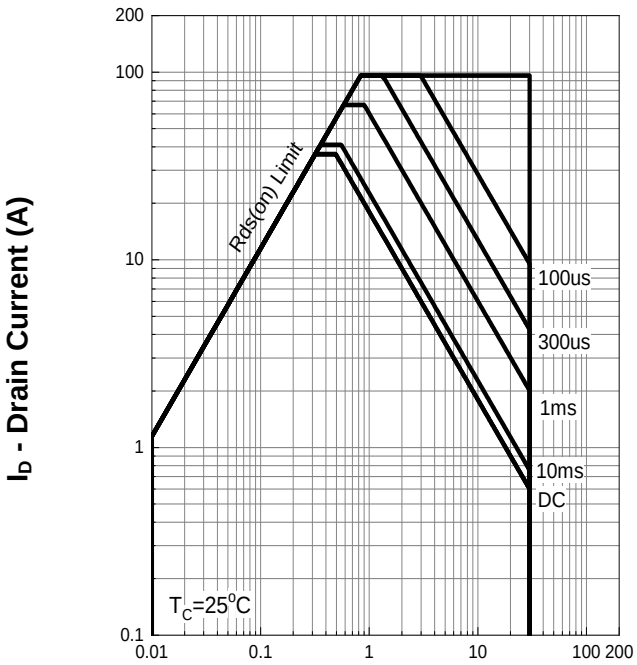
Power Capability



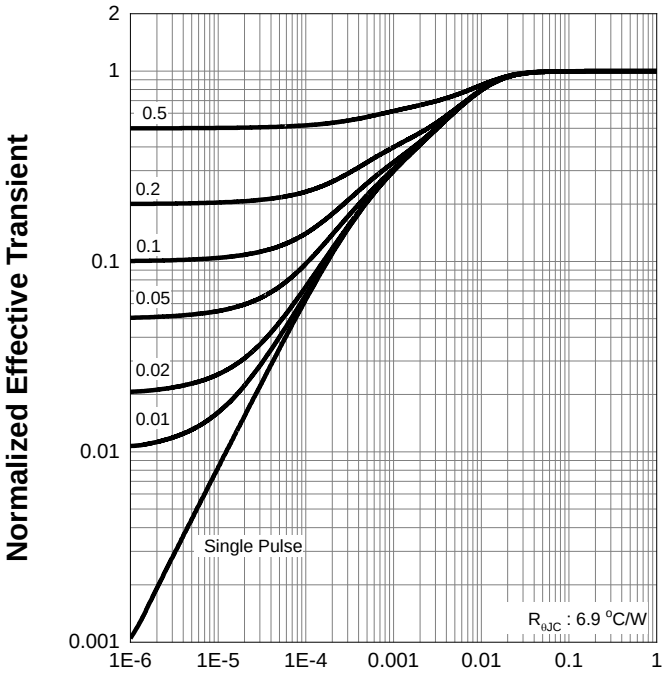
Current Capability



Safe Operating Area



Transient Thermal Impedance

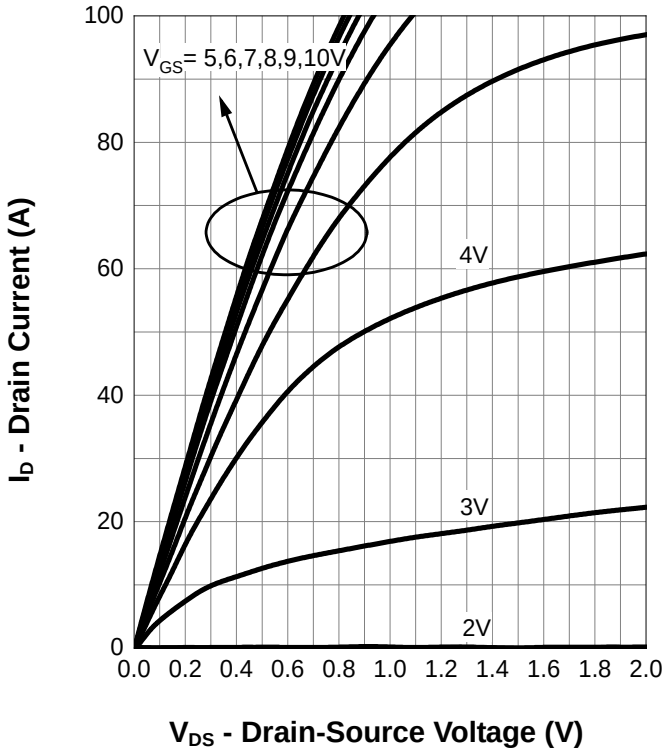


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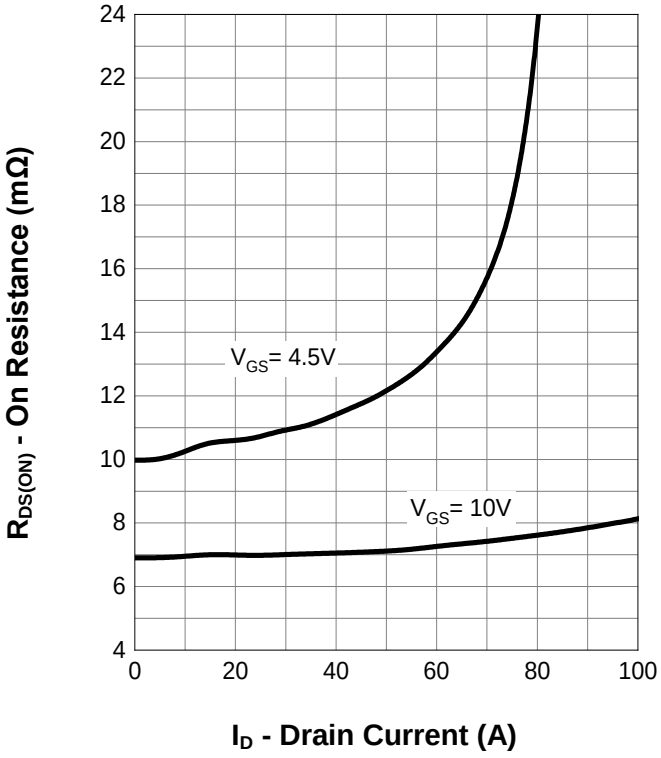
6. Typical Characteristics

6.2 Channel 1

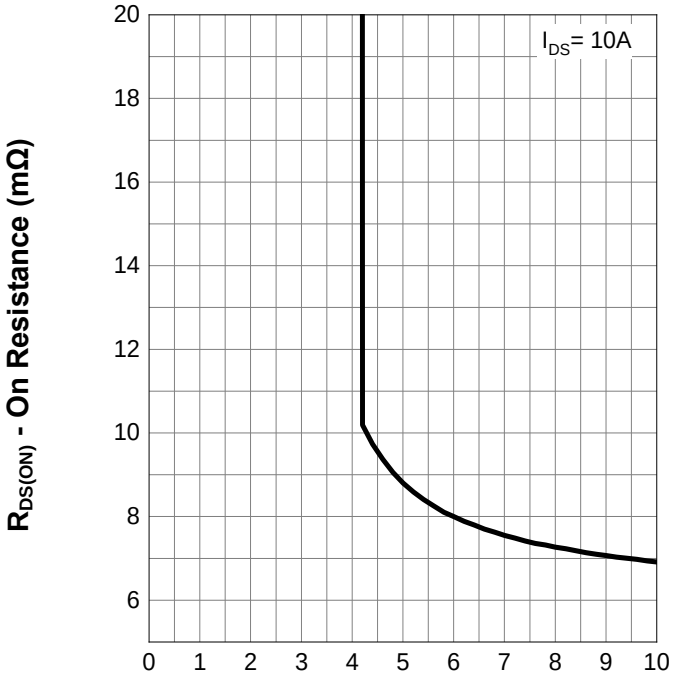
Output Characteristics



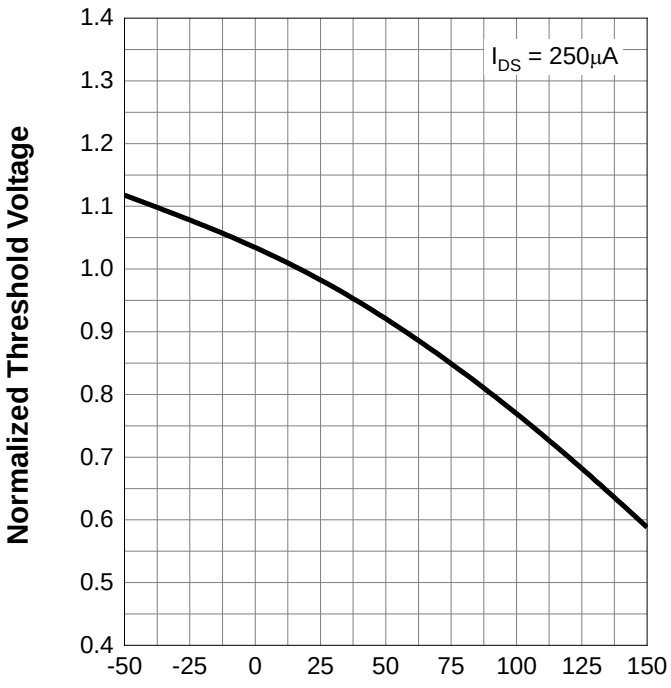
On Resistance



Transfer Characteristics



Normalized Threshold Voltage

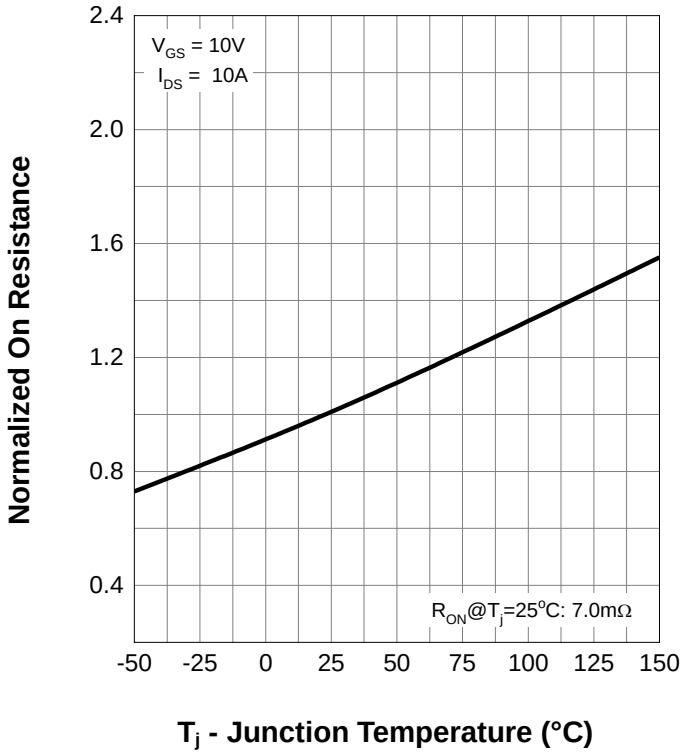


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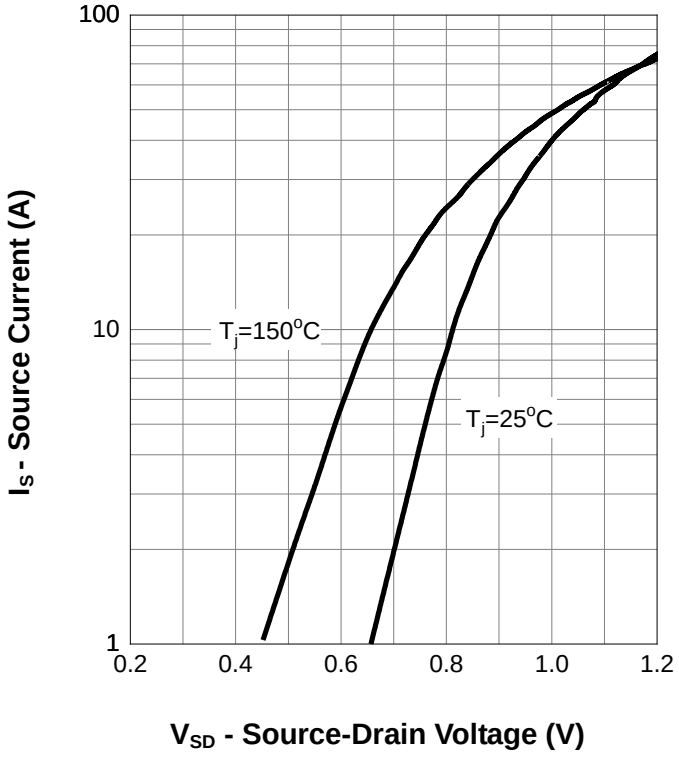
6. Typical Characteristics

6.3 Channel 1

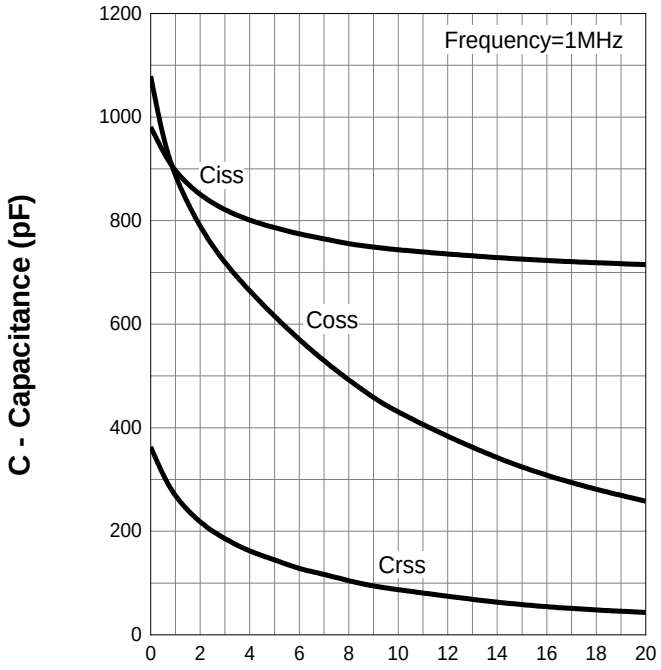
Normalized On Resistance



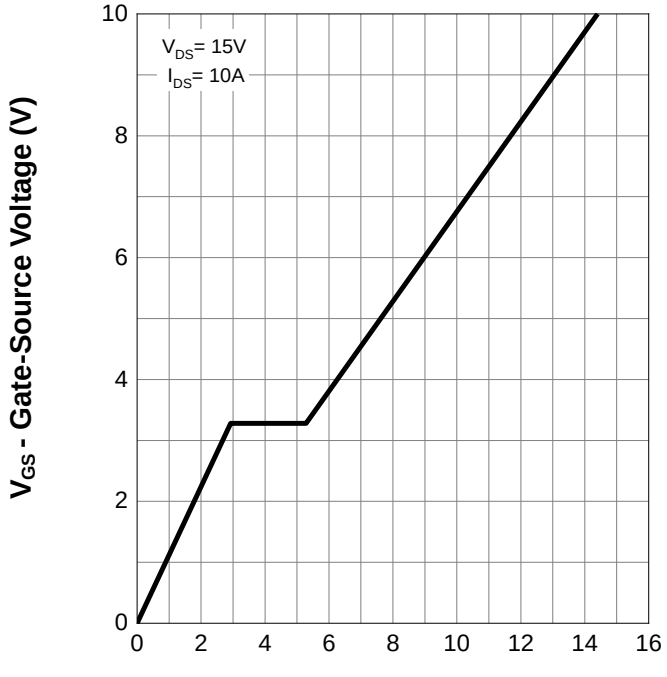
Diode Forward Current



Capacitance



Gate Charge

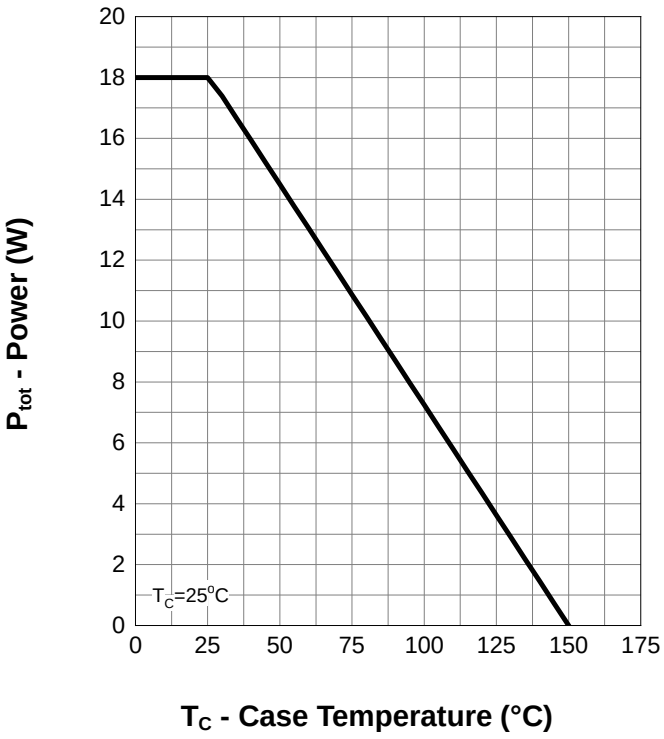


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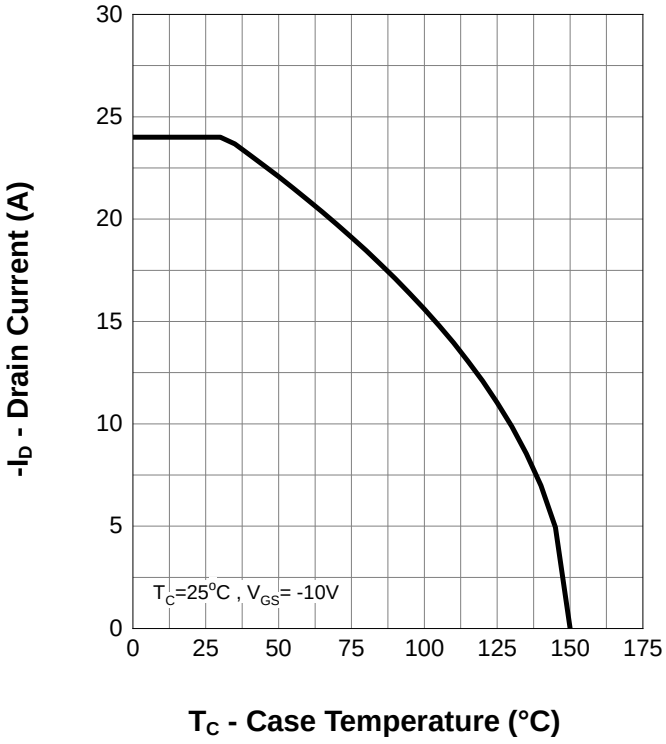
7. Typical Characteristics

7.1 Channel 2

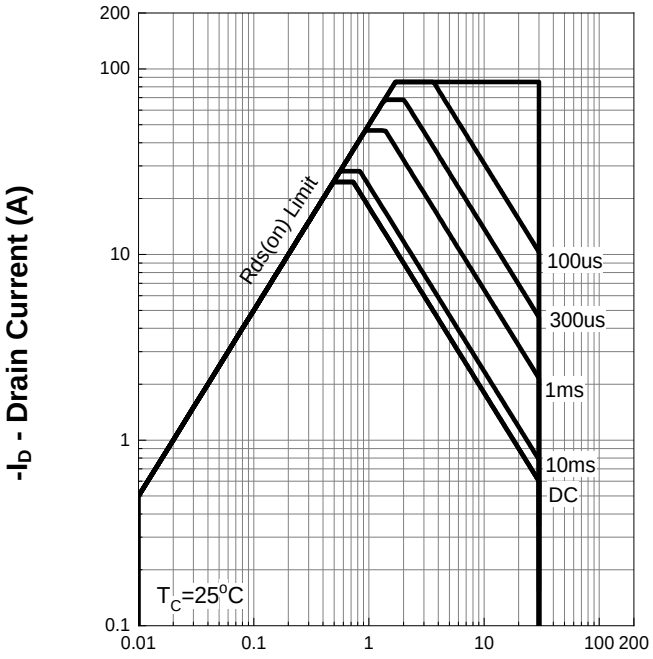
Power Capability



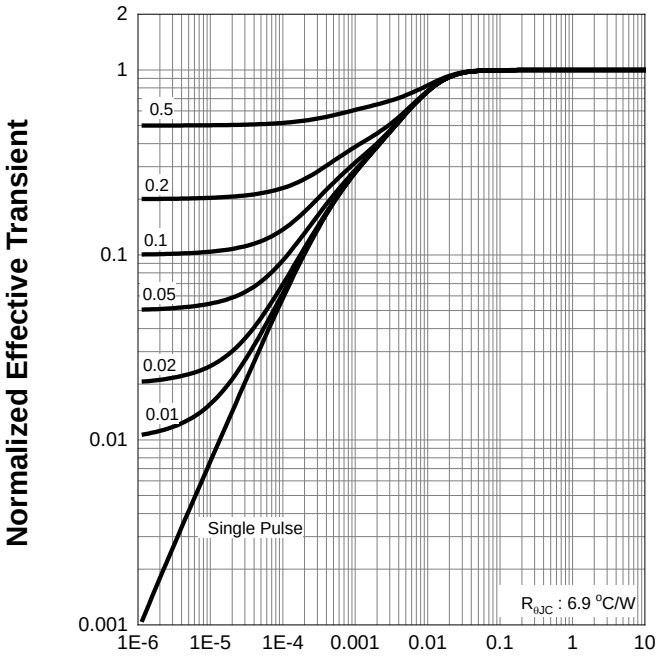
Current Capability



Safe Operating Area



Transient Thermal Impedance

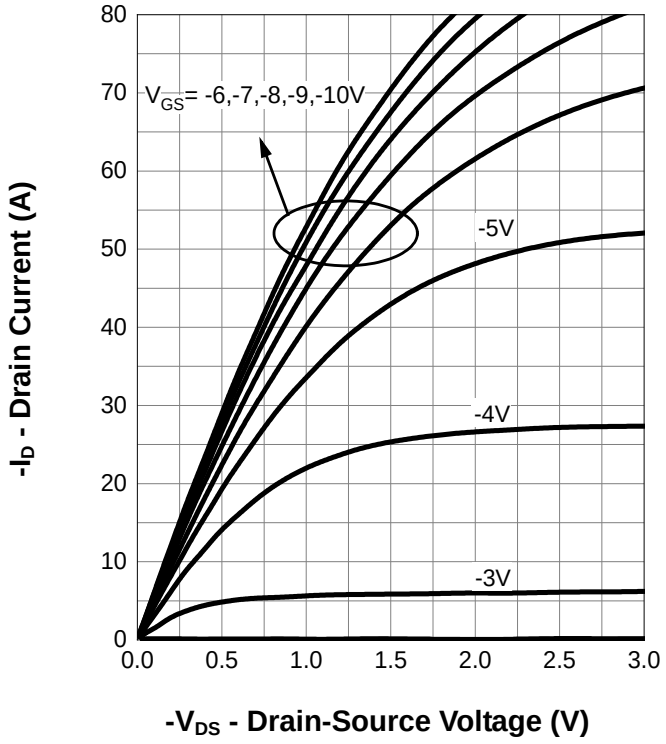


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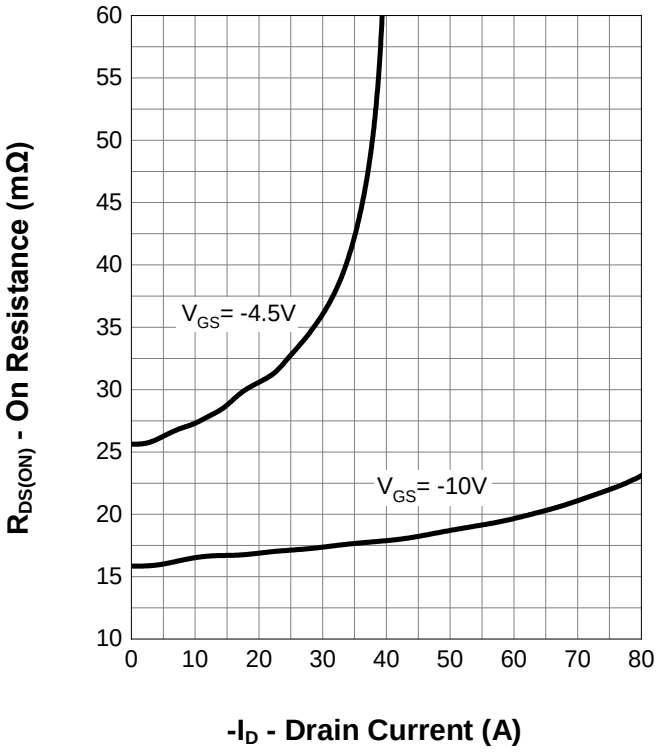
7. Typical Characteristics

7.2 Channel 2

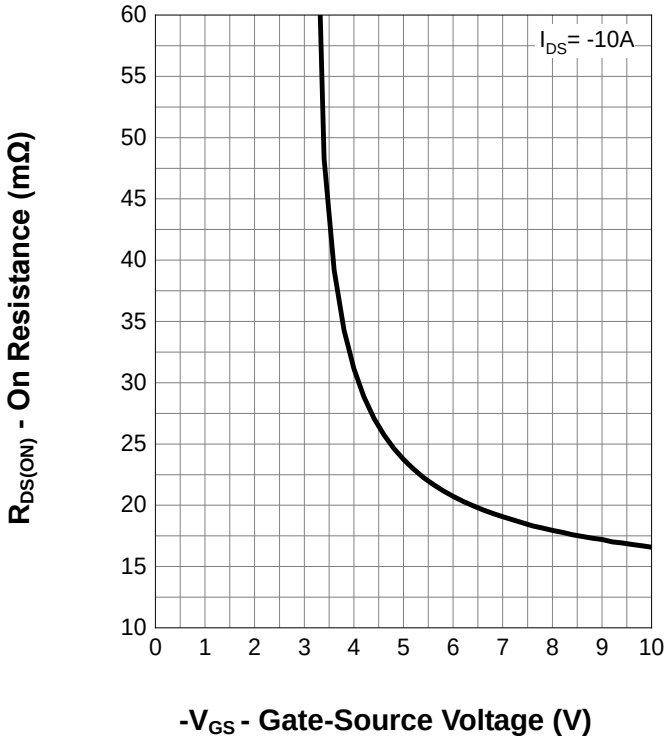
Output Characteristics



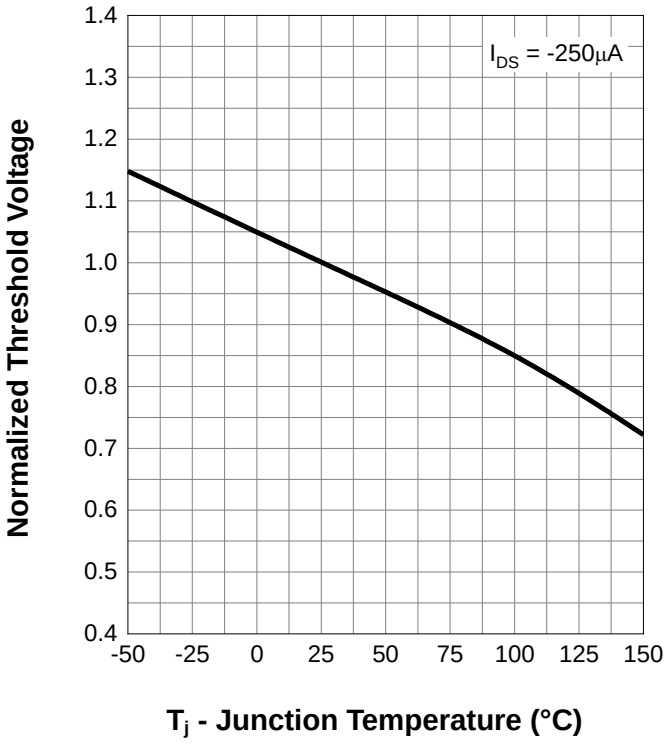
On Resistance



Transfer Characteristics



Normalized Threshold Voltage

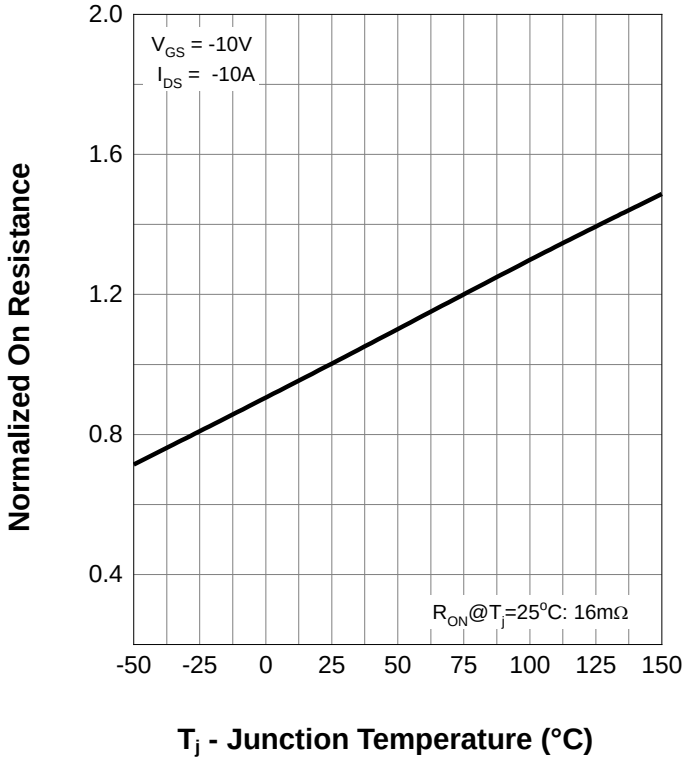


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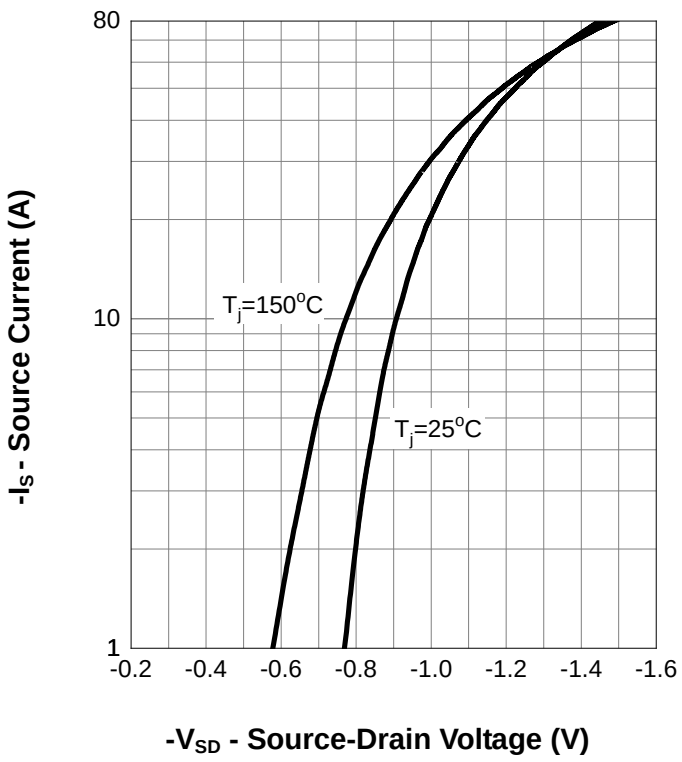
7. Typical Characteristics

7.3 Channel 2

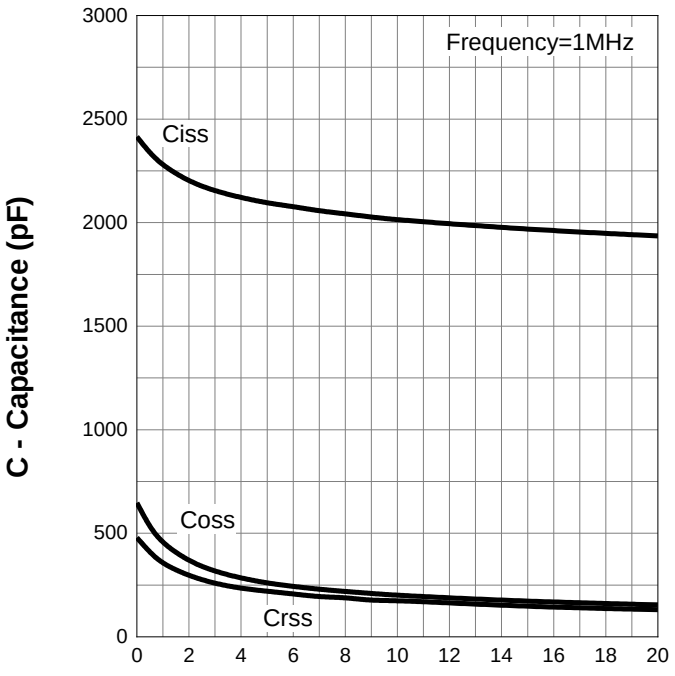
Normalized On Resistance



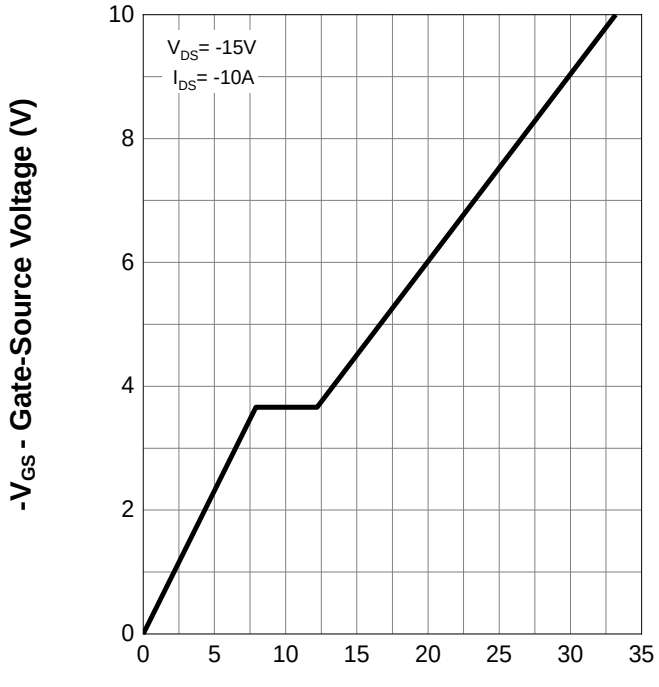
Diode Forward Current



Capacitance



Gate Charge



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